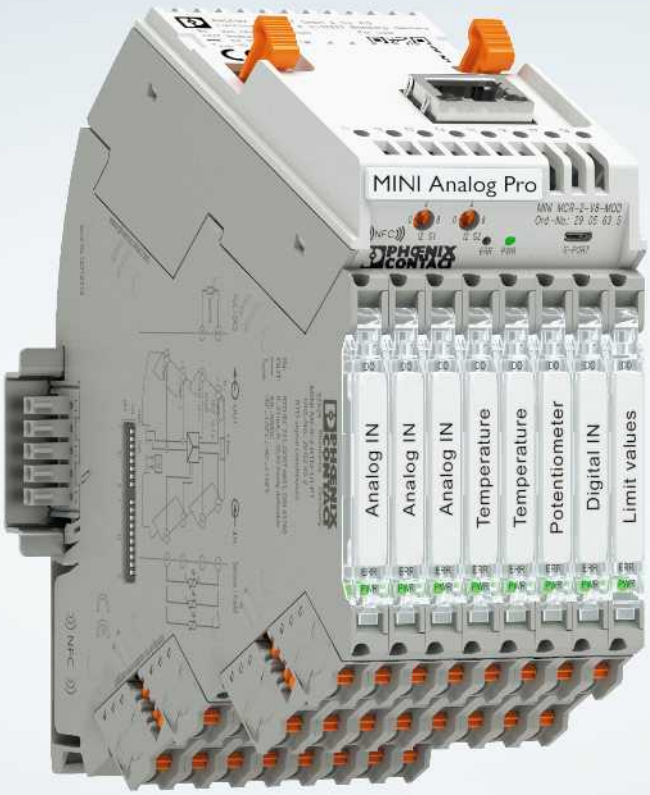
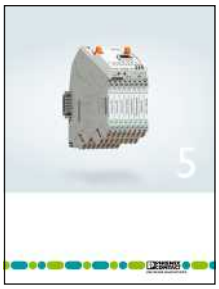


5

Interface Technology and Switching Devices

2017 / 2018

PHOENIX CONTACT
INSPIRING INNOVATIONS



Interface technology and switching devices

Terminal blocks

- Terminal blocks

Sensor/actuator cabling and connectors

- Sensor/actuator cabling
- Cables and lines
- Connectors

Marking systems, tools and mounting material

- Marking and labeling
- Tools
- Installation and mounting material

Power supplies, surge protection and device circuit breakers

- Surge protection and interference suppression filters
- Power supplies and UPS
- Protective devices

Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers

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Table of contents

Complete overview 4

Electronic switching devices and motor control 8

Measurement and control technology 54

Monitoring 198

Relay modules 282

System cabling for controllers 460

Technical information/index 602

Electronic switching devices and motor control

Motor management
Page 14

Hybrid motor starters
Page 23

Solid-state contactors
Page 40

IP67 motor starters
Page 50

Multiplexer for HART signals
Page 166

Process indicators and field devices
Page 178

Controllers
See Catalog 6

Monitoring

Energy meters, function and communication modules
Page 208

Test disconnect terminal blocks
See Catalog 1

Current transducers, current protector
Page 240

SOLARCHECK photovoltaic panel shutdown
Page 252

SOLARCHECK
Photovoltaic string monitoring
Page 256

Multifunctional time relays
Page 278

Function modules
Page 280

Lightning monitoring system
See Catalog 4

HMIs
See Catalog 6

Measurement and control technology

Frequency inverters
Page 52

Highly compact signal conditioners with plug-in connection technology Page 68

(Ex i) signal conditioners with SIL functional safety Page 140

(Ex i) signal conditioners with PL functional safety Page 168

Complete packages for data logging
Page 215

Compressed air meters
Page 216

Current transformers
Page 220

Current transformers for retrofitting
Page 234

Charging technology for E-Mobility
See Catalog 2

Compact monitoring relays
Page 262

Multifunctional monitoring relays
Page 266

Ultra-narrow time relays
Page 276

Signal towers
See Catalog 6

Relay modules

RIFLINE complete
Page 296

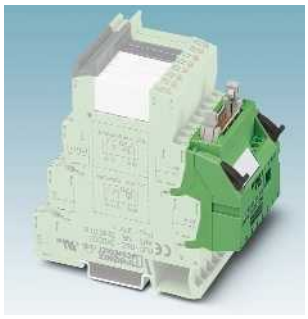
PLC-INTERFACE
Page 372

Programmable logic relay system PLC logic
Page 426

DEK series
Page 437

System cabling for controllers

Controller-specific system cabling
Page 470



V8 adapters
Page 425

Retrofit and modernization components
Page 558

Universal modules
Page 566

Safety devices
See Catalog 6

Monitoring relays
Page 262

Time relays
Page 276

Universal cables
Page 582

Potential distributors
Page 598

S-PORT
PWR
DAT
Err
BF
SF
EM-PB-GATEWAY-IFS
Profibus „SUB D"
S-PORT
PWR
DAT
Err
L
R
Reset
EMM 3-24DC/500AC-16-IFS
max. 9 A
PWR
Err
ON
Reset
ELR H3-IES-PT-24DC/500AC-9
max. 9 A
PWR
DAT
DIAG
L
R
Set/Reset
ELR H5-IES-PT/500AC-9-IFS
max. 9 A
PWR
Err
L
R
Reset
ELR H51-IESSC-24DC-500AC-9

Electronic switching devices and motor control

Switching devices for starting, reversing, and protecting electric motors rank among the components used in automation technology. These components are designed redundantly for safety-sensitive applications. When it comes to reducing installation time and space requirements, CONTACTRON hybrid motor starters are the state-of-the-art alternative.

This is because CONTACTRON hybrid motor starters combine up to four functions in a single device. They are integrated into popular fieldbus systems via the Interface system connection or via the SmartWire-DT™ wiring system.

For protection of the entire system, the product range now includes the electronic motor manager (EMM). In addition to typical measured values such as voltage and current, the behavior of the system is monitored and protected by means of real power measurement. The process data in all popular fieldbus systems can be supplied with the gateway and evaluated by a controller.

Product range overview

Product overview	**10**
Electronic motor management	**12**
Network-capable hybrid motor starters with reversing function	**20**
Hybrid motor starters with reversing function	**24**
Network-capable hybrid motor starters with direct start function	**26**
Hybrid motor starters with direct start function	**30**
Hybrid motor starters with short-circuit protection	**33**
3-phase solid-state reversing contactors	**40**
3-phase solid-state contactors	**42**
Solid-state reversing contactor for DC motors	**46**
Single-phase solid-state contactors	**48**
IP67 motor starters	**50**
IP20 frequency inverters	**52**

Product overview

Motor management

Electronic motor management
Page 14

Gateways
Page 16

IFS extension module for the Interface system
Page 17

Hybrid motor starters

Network-capable hybrid motor starters with reversing function
Page 23

Hybrid motor starters with reversing function
Page 24

Network-capable hybrid motor starters with direct start function
Page 29

Hybrid motor starters with direct start function
Page 30

Solid-state contactors

3-phase solid-state reversing contactors
Page 40

3-phase solid-state contactors
Page 42

Semiconductor reversing contactor with soft starter
Page 44

Solid-state reversing contactor for DC motors
Page 46

IP67 motor starters

PROFINET motor starter for distributed use
Page 50

Stainless steel base, IP67 protection
Page 51

Frequency inverters

Inline frequency inverters for the control cabinet
Page 52

Hybrid motor starters with short-circuit protection Page 33

Continuous bridge for hybrid motor starters Page 34

SmartWire-DT™ accessories Page 36

Single-phase solid-state contactors Page 48

Electronic motor management (EMM)

The electronic motor management modules offer all the advantages of modern real power monitoring.

The measuring and evaluation electronics for all performance classes. EMM offers the same functionality for all performance classes, only without a power section.

Power within limits

Monitoring is based on freely parameterizable switching and signaling thresholds for overload and underload detection. Identical or separate settings can be made for the thresholds for both directions of rotation. The real power consumed, calculated from three currents, voltages, and the phase angle, is used for parameterization. As it is independent of voltage fluctuations and drive load, the parameterization is thus much more precise than when only the current is taken into consideration. If a switching threshold is violated, an emergency shutdown of the motor is initiated immediately or with an adjustable "delay time". In addition, a message is sent via an output.

This state can only be deactivated via a defined reset. If the real power consumed is determined as being above or below the message thresholds, all that occurs is that a check-back is returned for the duration for which the module was addressed.

In addition, signals are generated by the module for the recognition of the direction of rotation. Asymmetry and phase failures are detected and signalized.

Permanent status monitoring with high scanning rates and the fast semiconductor switch enable complete system protection, including motor protection.

Without any extra wiring - and with just a single device - pumps, actuating drives, fans, and tools are monitored for proper functioning, contamination (filter or similar), and wear. The adjustable "inrush suppression" time can be used to mask out the switching operation from the monitoring process.

Interface system

The Interface system (IFS) consists of devices which can be connected to each other via the DIN rail connector. A gateway with up to 32 IFS devices forms the head of Interface system. The station is managed by the gateway.

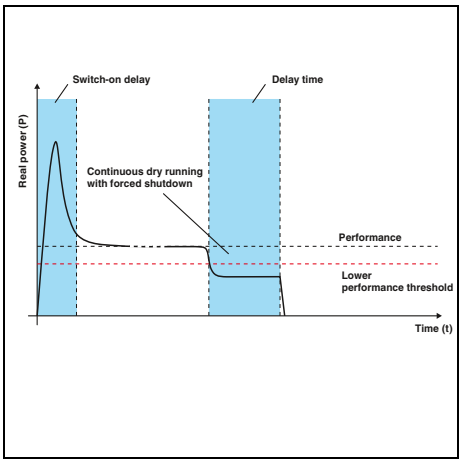
Interface system properties:

– Use of the Interface system via the DIN rail connector for the purpose of parameterization, diagnostics, and the exchange of data with each other
– Compatible with defined IFS accessories
– 24 V supply of the devices (e.g., EMM...IFS, ELR...IFS, EM-GATEWAY-IFS) via the DIN rail connector

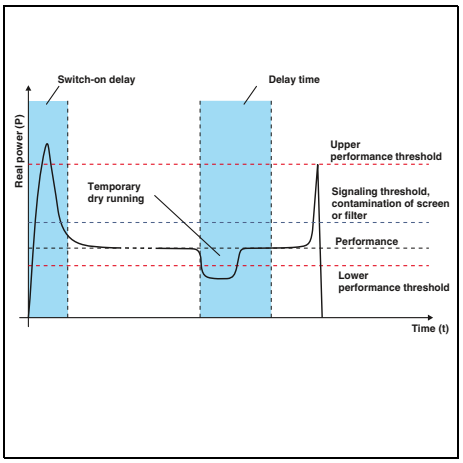
Protection against dry running, blocking, and cavitation, warning thresholds to indicate filter contamination.

Protection against blocking, warning thresholds for bearing wear and other cases that trigger overload.

Protection against blocking and broken tools, warning thresholds for tool and bearing wear.

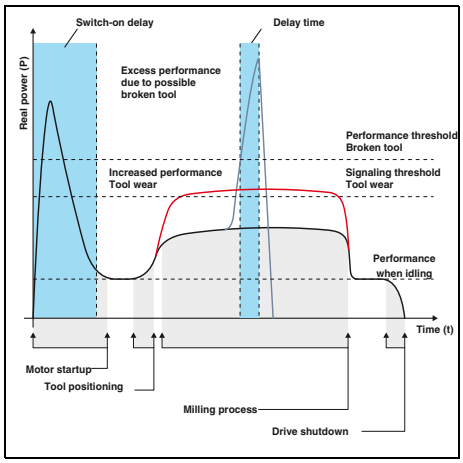


In the case of motor-driven pumps, the lower performance threshold provides reliable protection against hazardous dry running.



Forced shutdown of the drive is delayed by the “delay time”.

This prevents forced shutdown in the event of air bubbles.



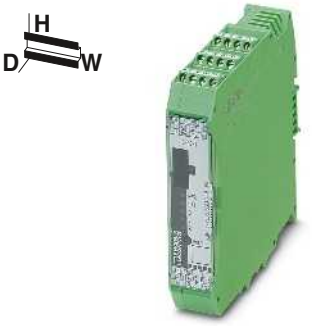
Machine tools are monitored and protected in a similar way when drilling, milling or grinding. If the feed value on a milling machine is set too high, a tool may break in the “worst-case” scenario. The power threshold, parameterized accordingly, can be used to resolve this issue.

Additionally, a message threshold signals tool wear in advance.

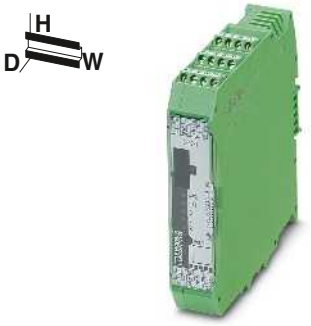
Electronic motor management

EMM motor management (with or without current transformer) for all performance classes monitors and protects 3-phase loads, such as electrical drives.

– Freely parameterizable signaling or switching thresholds
– Digital outputs control external switching elements
– Optional connection to the Interface system (e.g., IFS gateways) via DIN rail connector

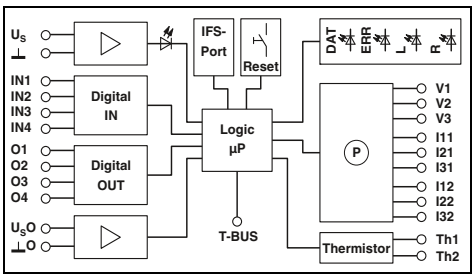


Allows the use of external current transformers



With integrated current transformers

Ex:



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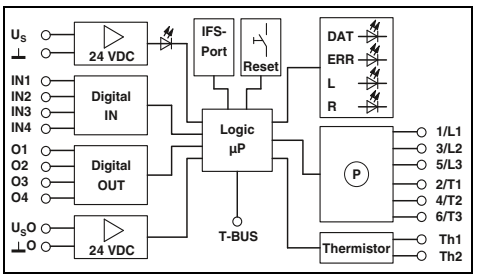


Technical data

Input data			
Rated control supply voltage U_S	24 V DC	230 V AC	
Control supply voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC	
Rated control supply current I_S at U_S	25 mA	10 mA	
Input data of digital inputs	EMM 3- 24DC/500AC-IFS	EMM 3-230AC/500AC-IFS	
Number of inputs	4 (IN1 - IN4)	4 (IN1 - IN4)	
Rated actuating voltage U_C	24 V DC	230 V AC	
Rated actuating current I_C	3.3 mA	3.5 mA	
Power measurement			
Voltage measuring input	42 V AC ... 575 V AC	42 V AC ... 575 V AC	
Nominal current, voltage measuring input	< 0.5 mA	< 0.5 mA	
Current measuring input	5 A (Secondary external converter)	5 A (Secondary external converter)	
Output data for confirmation contacts			
O1 - O4 in the case of 1 signal	24 V DC (semiconductor output) / 500 mA	230 V AC (Relay output) / 500 mA	
General data			
Rated insulation voltage	500 V		
Rated surge voltage	6 kV	6 kV	
Ambient temperature (operation)	-25 °C ... 70 °C		
Standards/regulations	DIN EN 50178 / EN 60947 / EN 60947-4-2		
Degree of protection in acc. with IEC 60529/EN 60529	IP20		
Mounting position	Vertical (horizontal DIN rail)		
Screw connection solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14		
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm		
EMC note	Class A product, see page 605		

Technical data

Input data			
Rated control supply voltage U_S	24 V DC	230 V AC	
Control supply voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC	
Rated control supply current I_S at U_S	25 mA	10 mA	
Input data of digital inputs	EMM 3- 24DC/500AC-16-IFS	EMM 3-230AC/500AC-16-IFS	
Number of inputs	4 (IN1 - IN4)	4 (IN1 - IN4)	
Rated actuating voltage U_C	24 V DC	230 V AC	
Rated actuating current I_C	3.3 mA	3.5 mA	
Power measurement			
Voltage measuring input	42 V AC ... 575 V AC	42 V AC ... 575 V AC	
Nominal current, voltage measuring input	< 0.5 mA	< 0.5 mA	
Current measuring input	max. 16 A	max. 16 A	
Output data for confirmation contacts			
O1 - O4 in the case of 1 signal	24 V DC (semiconductor output) / 500 mA	230 V AC (Relay output) / 500 mA	
General data			
Rated insulation voltage	500 V		
Rated surge voltage	6 kV	6 kV	
Ambient temperature (operation)	-25 °C ... 70 °C		
Standards/regulations	DIN EN 50178 / EN 60947 / EN 60947-4-2		
Degree of protection in acc. with IEC 60529/EN 60529	IP20		
Mounting position	Vertical (horizontal DIN rail)		
Screw connection solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14		
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm		
EMC note	Class A product, see page 605		

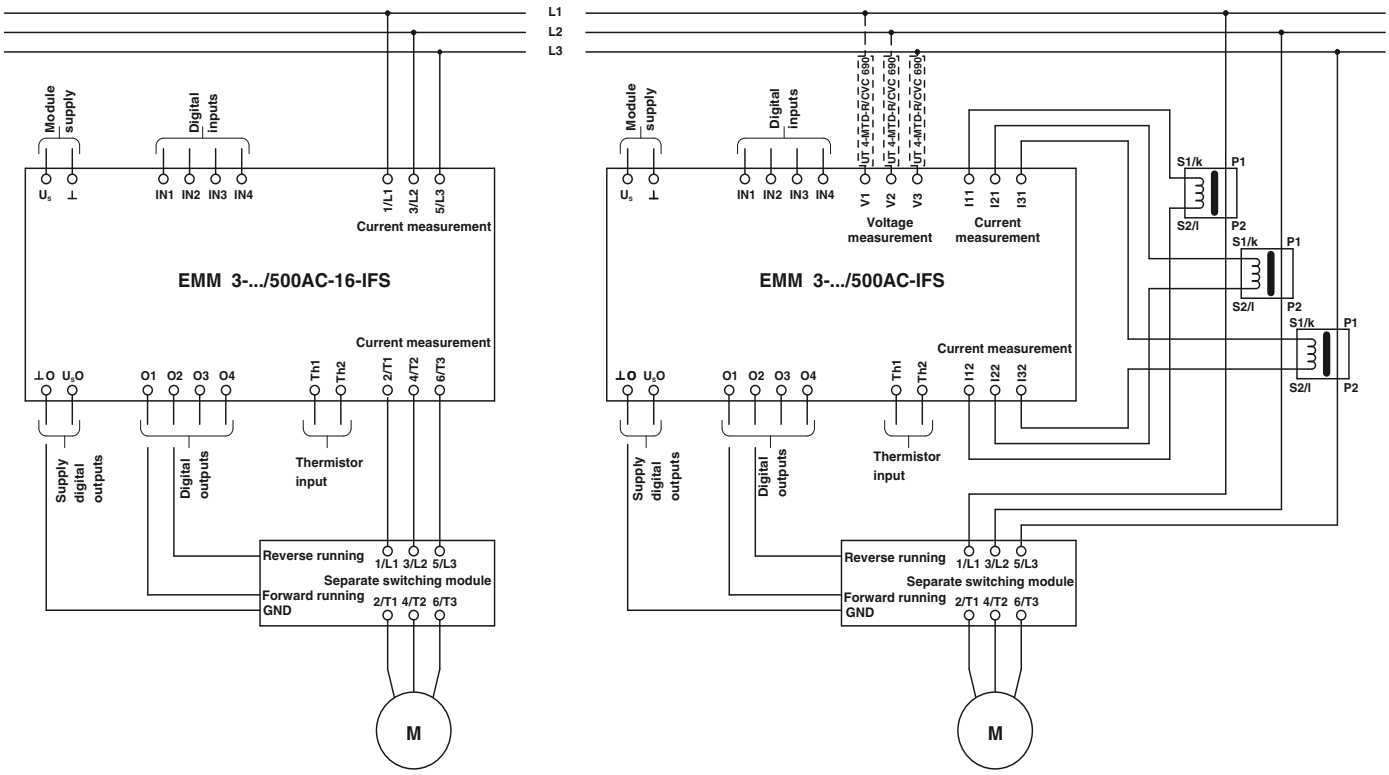
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Electronic motor management			
	EMM 3- 24DC/500AC-IFS	2297497	1
	EMM 3-230AC/500AC-IFS	2297507	1
Accessories			
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50
Voltage transducer for 690 V, for EMM 3-.../500AC-IFS, comprising 3 terminal blocks and cover	**UT 4-MTD-R/CVC 690/SET**	2901667	1
Multi-functional memory module for the Interface system			
- Flat design	**IFS-CONFSTICK**	2986122	1
- Tall design	**IFS-CONFSTICK-L**	2901103	1
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

Ordering data

Type	Order No.	Pcs./ Pkt.
EMM 3- 24DC/500AC-16-IFS	2297523	1
EMM 3-230AC/500AC-16-IFS	2297536	1
Accessories		
MM-CONF-SET	2297992	1
IFS-USB-PROG-ADAPTER	2811271	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
IFS-CONFSTICK	2986122	1
IFS-CONFSTICK-L	2901103	1
MC 1,5/ 5-ST-3,81	1803604	250
IMC 1,5/ 5-ST-3,81	1857919	50

Electronic motor management



The electronic motor management modules (EMM) offer all the advantages of modern real power monitoring. Every 6.6 ms, the real power consumed of a drive system or another 3-phase load is determined based on three currents, voltages, and the phase angle. Currents up to 16 A are directly acquired and currents >16 A are fed through external converters. Separate mechanical or electronic switching elements, which take care of the actual load switching, are controlled via digital outputs. The EMM is designed to reliably protect connected loads - irrespective of their power consumption - against overload and underload, and to provide continuous status monitoring.

Up to 8 freely parameterizable switching, message thresholds and up to four freely configurable inputs and outputs enable the protection of electrical drives and the system.

The EMM modules can record the following data:

– Apparent, real, and reactive power
– Currents and voltages
– Phase angle
– Switching-cycle and operating-hours
– Power meter

Additional functions:

– Adjustable bimetal function class 5-30
– Thermistor monitor
– Recording measured values
– GATEWAY connection via DIN rail connector
– Pre-configured motor feeders such as reversing starters, star-delta starters, etc.

With the EMM modules, complete "driving curves" are recorded, which can be used for the system documentation, for example.

With the forward running, reverse running, reversing, and limit switch (with integrated restart lock) operating modes, actuators and control drives, pumps and similar are switched and monitored for wear.

Current transformer

The external converters should be selected with a secondary nominal current of 5 A. The primary current is determined by the current consumption of the load (refer to connection diagram). For suitable current transformers, see Interface catalog.

DIN rail connectors

The DIN rail connectors (Order No. 2707437) are used to supply several EMMs with 24 V DC or to couple up to 32 EMMs (for example) to the PROFIBUS-GATEWAY-IFS.

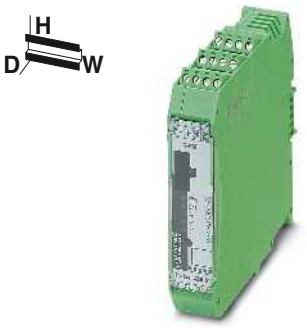
Switching element

Depending on the requirements for the actual load switching, an electromechanical contactor or a reversing contactor combination or a solid-state contactor/solid-state reversing contactor is used. These switching elements are controlled via the digital outputs of the EMM modules.

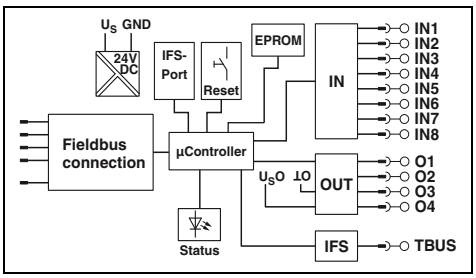
IFS gateways for Interface system devices

EM...GATEWAY-IFS for connecting Interface system devices (IFS) to popular bus systems: PROFIBUS DP, Modbus, Modbus/TCP, DeviceNet™, CANopen®, and PROFINET, EtherNet/IP™.

– Communication via DIN rail connector with up to 32 Interface system devices, such as EMM...IFS- and ELR...IFS modules
– Equipped with freely parameterizable digital inputs and outputs
– Digital switching outputs for direct control



IFS gateways



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -20 % ... +25 %
Rated control supply current I_S		85 mA (plus load current of the outputs)
Input circuit		Reverse polarity protection
Digital inputs		
Number of inputs		8
Rated actuating voltage U_C		24 V DC ±20 %
Rated actuating current I_C		3 mA
Input circuit		Reverse polarity protection
Digital outputs		
Number of outputs		4
Maximum switching voltage		23 V DC (U_B - $U_{resid.}$ of the output)
Max. switching current		500 mA
Residual voltage		1 V
Output protection		Parallel protection against polarity reversal, pay attention to the fuse
General data		
Ambient temperature (operation)		-35 °C ... 50 °C
Nominal operating mode		100% operating factor
Standards/regulations		EN 50178
Degree of protection		IP20
Mounting position/mounting		any / In rows with zero spacing
Connection data solid/stranded/AWG		0.2 ... 2 mm² / 0.2 ... 2.5 mm² / 12 - 24
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
EMC note		Class A product, see page 605

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
IFS gateway for			
PROFIBUS DP	**EM-PB-GATEWAY-IFS**	2297620	1
RS-232	**EM-RS232-GATEWAY-IFS**	2901526	1
RS-485	**EM-RS485-GATEWAY-IFS**	2901527	1
Modbus/TCP	**EM-MODBUS-GATEWAY-IFS**	2901528	1
DeviceNet™	**EM-DNET-GATEWAY-IFS**	2901529	1
CANopen®	**EM-CAN-GATEWAY-IFS**	2901504	1
PROFINET	**EM-PNET-GATEWAY-IFS**	2904472	1
EtherNet/IP™	**EM-ETH-GATEWAY-IFS**	2901988	1

Accessories

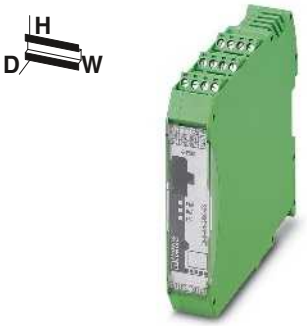
Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

IFS extension module for the Interface system

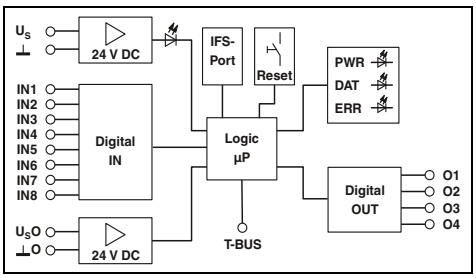
EM-D-8/4… IFS digital extension module for the Interface system (IFS). For more complex applications, in order to process additional signals in the field.

– Communication with an IFS gateway via DIN rail connector as the slave
– Freely configurable digital inputs and outputs

new



IFS extension module



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -20 % ... +25 %
Rated control supply current I_S		85 mA (plus load current of the outputs)
Input circuit		Reverse polarity protection
Digital inputs		
Number of inputs		8
Rated actuating voltage U_C		24 V DC ±20 %
Rated actuating current I_C		3 mA
Input circuit		Reverse polarity protection
Digital outputs		
Number of outputs		4
Maximum switching voltage		23 V DC (U_B - $U_{resid.}$ of the output)
Max. switching current		500 mA (per output)
Residual voltage		1 V
Output protection		Parallel protection against polarity reversal, pay attention to the fuse
General data		
Ambient temperature (operation)		-35 °C ... 50 °C
Nominal operating mode		100% operating factor
Standards/regulations		EN 61131-2
Degree of protection		IP20
Mounting position/mounting		any / In rows with zero spacing
Connection data solid/stranded/AWG		0.2 ... 2 mm² / 0.2 ... 2.5 mm² / 12 - 24
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
IFS extension module, with 8 digital inputs and 4 digital outputs	**EM-D-8/4-24DC-IFS**	2904473	1

Accessories

Configuration package for the EMM...IFS, comprising CONTACTRON-DTM-IFS, USB programming adapter, and user manual on CD	**MM-CONF-SET**	2297992	1
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50
MINI COMBICON connectors			
- Female contact	**MC 1,5/ 5-ST-3,81**	1803604	250
- Male contact	**IMC 1,5/ 5-ST-3,81**	1857919	50

The CONTACTRON hybrid motor starters combine up to four functions in one device: motor starter, reversing function, motor protection against overload, and emergency stop.

In addition to standard devices for parallel wiring, network-capable versions, which can be integrated into fieldbus environments, are also available.

CONTACTRON hybrid motor starter technology is a microprocessor-controlled combination of wear-free solid-state technology and robust relay technology. The semiconductors execute the wear-prone on and off switching procedures, while the relays only conduct low-loss current. This enables soft switching and considerably reduces the load on the relay contacts.

Switch motors safely and reliably with compact hybrid motor starters.

The devices are used wherever three-phase asynchronous motors, from 50 W to 3 kW, need to be reversed and protected. The product range of hybrid motor starters consists of direct and reversing starters, which are available with various functions such as emergency stop and motor protection.

Hybrid motor starter with up to four functions in one device: forward running, reverse running, motor protection, and emergency stop.

Short-circuit-proof hybrid motor starter with integrated fuses, for mounting on 35 mm DIN rail and 60 mm busbar systems.

Connection of hybrid motor starters in a bus system via SmartWire-DT™. Gateways are available for the most important bus systems: PROFIBUS, Modbus/TCP, EtherNet/IP™, and CANopen®.

Connection of the hybrid motor starter to a bus system via the IFS Interface system. Gateways are available for the most important bus systems: PROFIBUS DP, Modbus/TCP, EtherNet/IP™, CANopen®, DeviceNet™, PROFINET, etc.

Network-capable hybrid motor starter with reversing function

These 3-phase hybrid motor starters offer up to four functions: forward running, reverse running, motor protection, and emergency stop up to SIL3 / PL e.

They offer the following advantages:

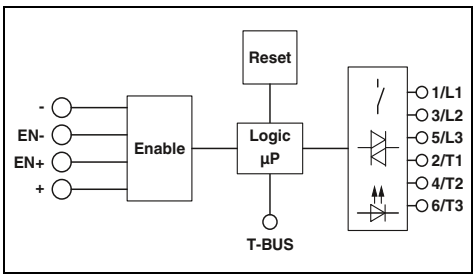
– Bus connection via Interface system (IFS) or via IO-Link
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

Motor protection, emergency stop, and Interface system support



Technical data

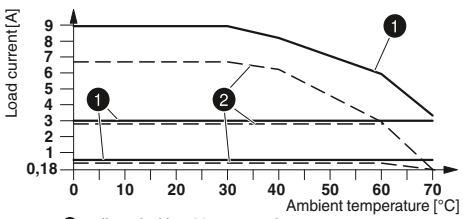
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Reverse polarity protection , Surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5 °C ... 60 °C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		vertical (horizontal DIN rail, motor output below)
Mounting		alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H5-IES-SC/500AC-06-IFS**	2905151	1
Push-in connection	**ELR H5-IES-PT/500AC-06-IFS**	2905138	1
Load current 0.18 A ... 3 A			
Screw connection	**ELR H5-IES-SC/500AC-3-IFS**	2905152	1
Push-in connection	**ELR H5-IES-PT/500AC-3-IFS**	2905139	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H5-IES-SC/500AC-9-IFS**	2905153	1
Push-in connection	**ELR H5-IES-PT/500AC-9-IFS**	2905140	1

Accessories

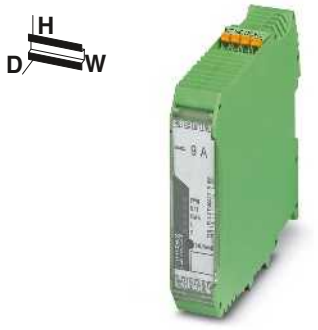
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50



❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

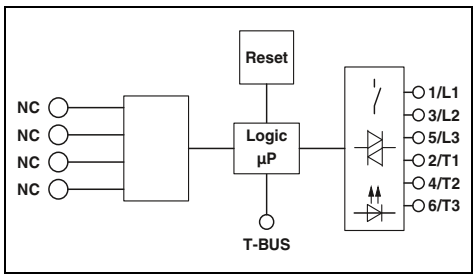
Derating curve

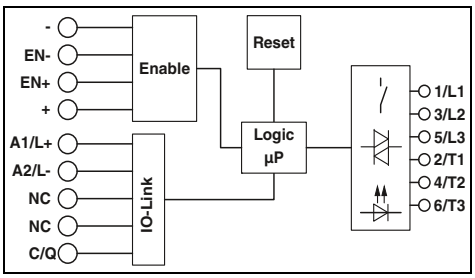
new



Motor protection and
Interface system support

Motor protection, emergency stop, and
IO-Link support





Technical data

24 V DC	24 V DC
19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
60 mA	65 mA
-	24 V DC
-	19.2 V DC ... 30 V DC
-	7 mA
Reverse polarity protection , Surge protection	Reverse polarity protection , Surge protection
Green LED / Yellow LED / Red LED	Green LED / Yellow LED / Red LED
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	Surge protection
550 V	550 V
6 kV	6 kV
-5 °C ... 60 °C (observe derating)	-5 °C ... 55 °C (observe derating)
IEC 60947-1 / EN 60947-4-2	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
vertical (horizontal DIN rail, motor output below)	vertical (horizontal DIN rail, motor output below)
alignable, for spacing see derating	alignable, for spacing see derating
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
22.5 mm / 99 mm / 114.5 mm	22.5 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H5-I-SC/500AC-06-IFS	2905157	1
ELR H5-I-PT/500AC-06-IFS	2905144	1
ELR H5-I-SC/500AC-3-IFS	2905159	1
ELR H5-I-PT/500AC-3-IFS	2905146	1
ELR H5-I-SC/500AC-9-IFS	2905160	1
ELR H5-I-PT/500AC-9-IFS	2905147	1

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H5-IES-PT/500AC-3-IOL	2908669	1
ELR H5-IES-PT/500AC-9-IOL	2908670	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50

Accessories

Network-capable hybrid motor starter with reversing function

These 3-phase hybrid motor starters offer up to four functions: forward running, reverse running, motor protection, and emergency stop up to SIL3 / PL e.

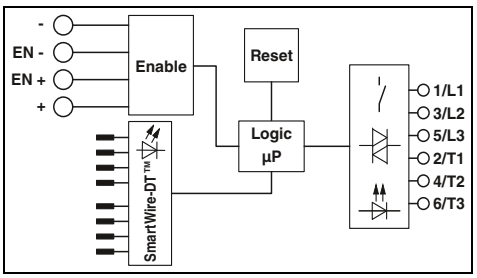
They offer the following advantages:

– Connection to SmartWire-DT™ (SWD)
– 22.5 mm wide
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Motor protection, emergency stop, and SmartWire-DT™ support



Technical data

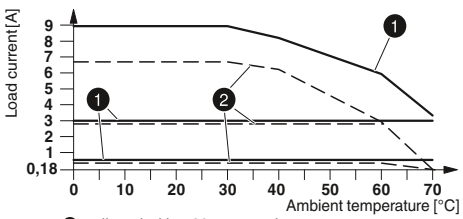
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Reverse polarity protection , Surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5 °C ... 55 °C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		vertical (horizontal DIN rail, motor output below)
Mounting		alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Push-in connection	**ELR H5-IES-PT-SWD/500AC-06**	2903933	1
Load current 0.18 A ... 2.4 A			
Push-in connection	**ELR H5-IES-PT-SWD/500AC-3**	2903934	1
Load current 1.5 A ... 9 A			
Push-in connection	**ELR H5-IES-PT-SWD/500AC-9**	2903935	1

Accessories

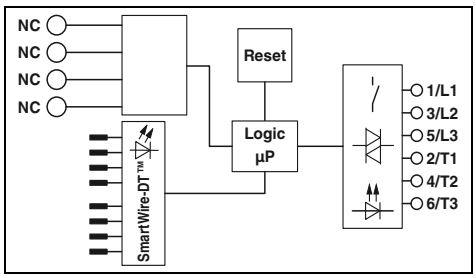
Device plug, 8-pos.	**SWD4-8SF2-5 PXC**	2903107	10



❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve

Motor protection and SmartWire-DT™ support



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	60 mA
	-
	-
	-
	Reverse polarity protection , Surge protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	Surge protection
	550 V
	6 kV
	-5 °C ... 55 °C (observe derating)
	IEC 60947-1 / EN 60947-4-2
	vertical (horizontal DIN rail, motor output below)
	alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H5-I-PT-SWD/500AC-06	2905073	1
ELR H5-I-PT-SWD/500AC-3	2905074	1
ELR H5-I-PT-SWD/500AC-9	2905075	1

Accessories

SWD4-8SF2-5 PXC	2903107	10

Hybrid motor starters with reversing function

These 3-phase hybrid motor starters offer up to four functions: forward running, reverse running, motor protection, and emergency stop up to SIL3 / PL e.

They offer the following advantages:

– 22.5 mm wide
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

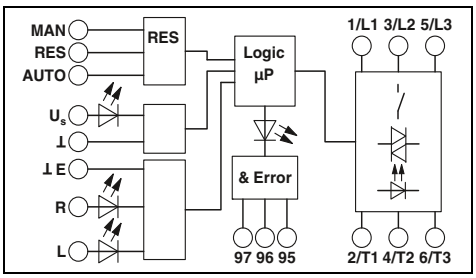
Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

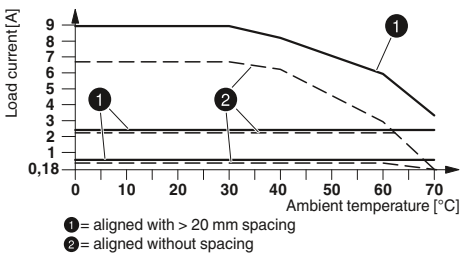
Motor protection and emergency stop

Ex:



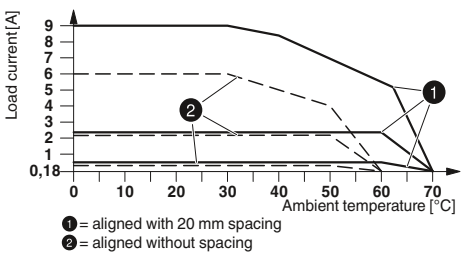
Technical data

Input data		
Rated control supply voltage U_S	24 V DC	230 V AC (50/60 Hz)
Control supply voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated control supply current I_S at U_S	40 mA	4 mA
Rated actuating voltage U_C R/L	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated actuating current I_C at U_C	5 mA	7 mA
Input circuit	Reverse polarity protection , Surge protection	Surge protection
Operating voltage / status / error indicator	Green LED / Yellow LED / Red LED	
Output data load side		
Operating voltage range	42 V AC ... 550 V AC	42 V AC ... 550 V AC
Output protection	Surge protection	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	4 kV
Ambient temperature (operation)	-25 °C ... 70 °C (observe derating)	
Standards/regulations	IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Mounting position	vertical (horizontal DIN rail, motor output below)	
Mounting	alignable, for spacing see derating	
Connection data solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm	



1 = aligned with > 20 mm spacing
2 = aligned without spacing

Derating curve for ELR H5...24DC...



1 = aligned with 20 mm spacing
2 = aligned without spacing

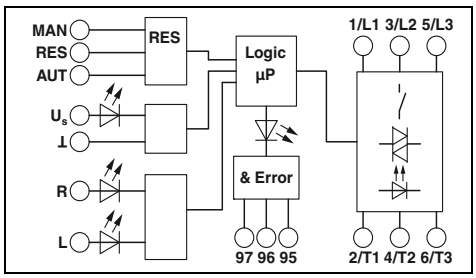
Derating curve for ELR H5...230AC...

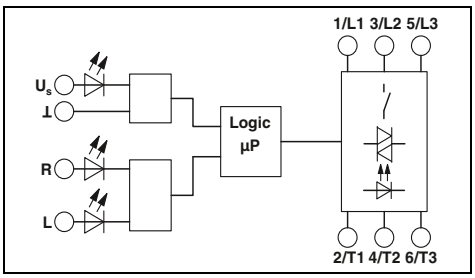
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-0,6**	2900582	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-0,6**	2903902	1
Load current 0.18 A ... 2.4 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-2**	2900414	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-2**	2903904	1
Screw connection	**ELR H5-IES-SC-230AC/500AC-2**	2900420	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H5-IES-SC- 24DC/500AC-9**	2900421	1
Push-in connection	**ELR H5-IES-PT- 24DC/500AC-9**	2903906	1
Screw connection	**ELR H5-IES-SC-230AC/500AC-9**	2900422	1
Load current 0 A ... 9 A			
Screw connection			
Screw connection			

Motor protection

Reversing function only





Technical data

24 V DC	230 V AC (50/60 Hz)
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA	7 mA
Reverse polarity protection , Surge protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25 °C ... 70 °C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
vertical (horizontal DIN rail, motor output below)	
alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H5-I-SC- 24DC/500AC-0,6	**2900573**	1
ELR H5-I-PT- 24DC/500AC-0,6	**2903908**	1
ELR H5-I-SC- 24DC/500AC-2	**2900574**	1
ELR H5-I-PT- 24DC/500AC-2	**2903910**	1
ELR H5-I-SC-230AC/500AC-2	**2900575**	1
ELR H5-I-SC- 24DC/500AC-9	**2900576**	1
ELR H5-I-PT- 24DC/500AC-9	**2903912**	1
ELR H5-I-SC-230AC/500AC-9	**2900578**	1

Technical data

24 V DC	230 V AC (50/60 Hz)
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA	7 mA
Reverse polarity protection , Surge protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25 °C ... 70 °C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
vertical (horizontal DIN rail, motor output below)	
alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H5-SC- 24DC/500AC-9	**2900538**	1
ELR H5-SC-230AC/500AC-9	**2900539**	1

Network-capable hybrid motor starter with direct start function

These 3-phase hybrid motor starters offer up to three functions: forward running, motor protection, and emergency stop up to SIL3 / PL e.

They offer the following advantages:

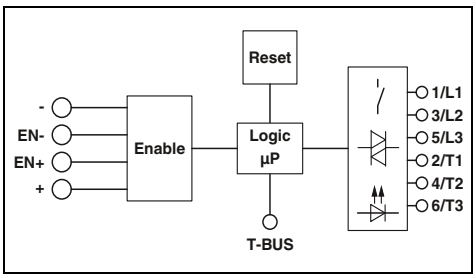
– Bus connection via Interface system (IFS) or via IO-Link
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

Motor protection, emergency stop, and Interface system support



Technical data

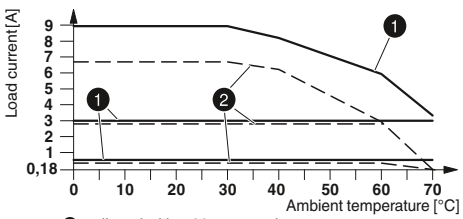
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Reverse polarity protection , Surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5 °C ... 60 °C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		vertical (horizontal DIN rail, motor output below)
Mounting		alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H3-IES-SC/500AC-06-IFS**	2905154	1
Push-in connection	**ELR H3-IES-PT/500AC-06-IFS**	2905141	1
Load current 0.18 A ... 3 A			
Screw connection	**ELR H3-IES-SC/500AC-3-IFS**	2905155	1
Push-in connection	**ELR H3-IES-PT/500AC-3-IFS**	2905142	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H3-IES-SC/500AC-9-IFS**	2905156	1
Push-in connection	**ELR H3-IES-PT/500AC-9-IFS**	2905143	1

Accessories

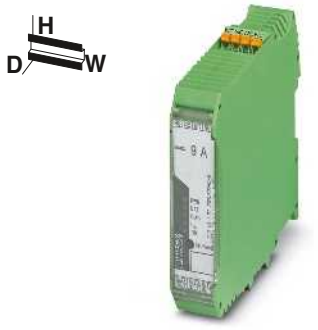
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50



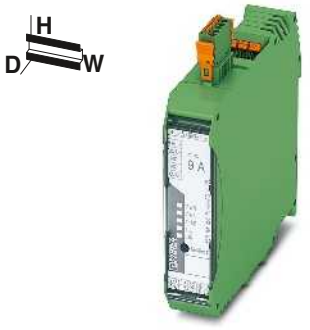
❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve

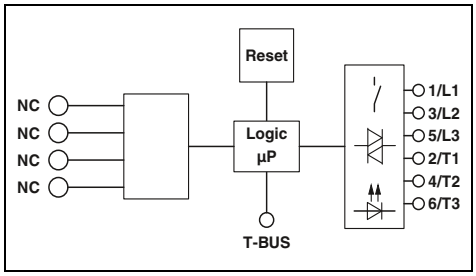
new

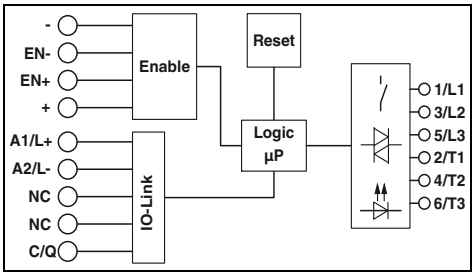


Motor protection and
Interface system support



Motor protection, emergency stop, and
IO-Link support





Technical data

24 V DC	24 V DC
19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
60 mA	65 mA
-	24 V DC
-	19.2 V DC ... 30 V DC
-	7 mA
Reverse polarity protection , Surge protection	Reverse polarity protection , Surge protection
Green LED / Yellow LED / Red LED	Green LED / Yellow LED / Red LED
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	Surge protection
550 V	550 V
6 kV	6 kV
-5 °C ... 60 °C (observe derating)	-5 °C ... 55 °C (observe derating)
IEC 60947-1 / EN 60947-4-2	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
vertical (horizontal DIN rail, motor output below)	vertical (horizontal DIN rail, motor output below)
alignable, for spacing see derating	alignable, for spacing see derating
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
22.5 mm / 99 mm / 114.5 mm	22.5 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H3-I-SC/500AC-06-IFS	2905162	1
ELR H3-I-PT/500AC-06-IFS	2905148	1
ELR H3-I-SC/500AC-3-IFS	2905163	1
ELR H3-I-PT/500AC-3-IFS	2905149	1
ELR H3-I-SC/500AC-9-IFS	2905164	1
ELR H3-I-PT/500AC-9-IFS	2905150	1

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H3-IES-PT/500AC-3-IOL	2908671	1
ELR H3-IES-PT/500AC-9-IOL	2908672	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50

Accessories

Network-capable hybrid motor starter with direct start function

These 3-phase hybrid motor starters offer up to three functions: forward running, motor protection, and emergency stop up to SIL3 / PL e.

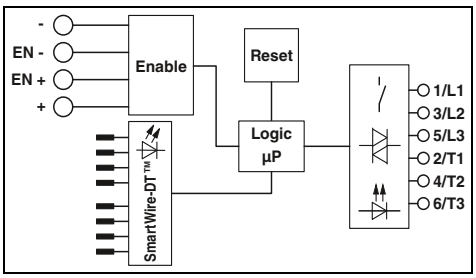
They offer the following advantages:

– Connection to SmartWire-DT™ (SWD)
– 22.5 mm wide
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Motor protection, emergency stop, and SmartWire-DT™ support



Technical data

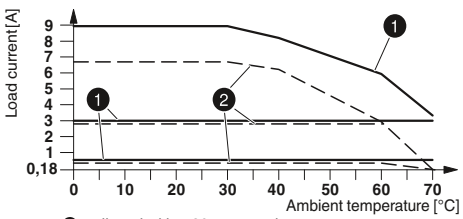
Input data		
Rated control supply voltage U_S		24 V DC
Control supply voltage range		19.2 V DC ... 30 V DC
Rated control supply current I_S at U_S		60 mA
Rated actuating voltage U_C EN+		24 V DC
Actuating voltage range		19.2 V DC ... 30 V DC
Rated actuating current I_C at U_C		7 mA
Input circuit		Reverse polarity protection , Surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Operating voltage range		42 V AC ... 550 V AC
Output protection		Surge protection
General data		
Rated insulation voltage		550 V
Rated surge voltage		6 kV
Ambient temperature (operation)		-5 °C ... 55 °C (observe derating)
Standards/regulations		IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
Mounting position		vertical (horizontal DIN rail, motor output below)
Mounting		alignable, for spacing see derating
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Push-in connection	**ELR H3-IES-PT-SWD/500AC-06**	2903936	1
Load current 0.18 A ... 2.4 A			
Push-in connection	**ELR H3-IES-PT-SWD/500AC-3**	2903937	1
Load current 1.5 A ... 9 A			
Push-in connection	**ELR H3-IES-PT-SWD/500AC-9**	2903938	1

Accessories

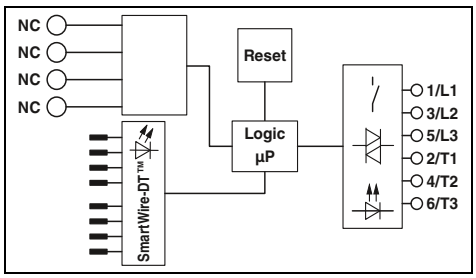
Device plug, 8-pos.	**SWD4-8SF2-5 PXC**	2903107	10



❶ = aligned with > 20 mm spacing
❷ = aligned without spacing

Derating curve

Motor protection and SmartWire-DT™ support



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	60 mA
	-
	-
	-
	Reverse polarity protection , Surge protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	Surge protection
	550 V
	6 kV
	-5 °C ... 55 °C (observe derating)
	IEC 60947-1 / EN 60947-4-2
	vertical (horizontal DIN rail, motor output below)
	alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H3-I-PT-SWD/500AC-06	2905076	1
ELR H3-I-PT-SWD/500AC-3	2905078	1
ELR H3-I-PT-SWD/500AC-9	2905079	1

Accessories

SWD4-8SF2-5 PXC	2903107	10

Hybrid motor starters with direct start function

These 3-phase hybrid motor starters offer up to three functions: forward running, motor protection, and emergency stop up to SIL3 / PL e.

They offer the following advantages:

– 22.5 mm wide
– Reduction in wiring
– Bi-metal function, adjustable up to 9 A
– Long service life
– Space-saving
– 3-phase loop bridging

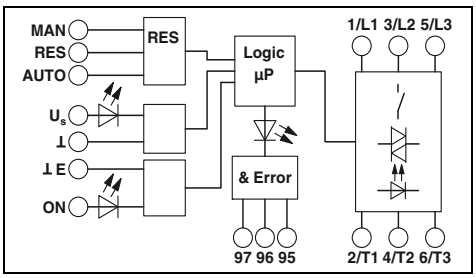
Safety level according to:

– IEC 61508-1: SIL3
– ISO 13849: PL e

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

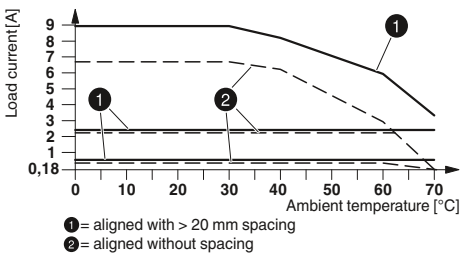
Motor protection and emergency stop

Ex:



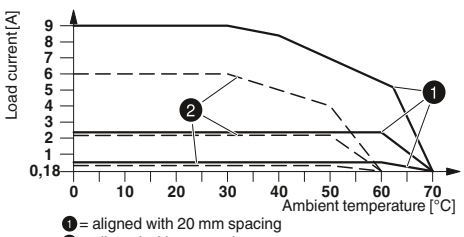
Technical data

Input data		
Rated control supply voltage U_S	24 V DC	230 V AC (50/60 Hz)
Control supply voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated control supply current I_S at U_S	40 mA	4 mA
Rated actuation voltage U_C ON	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
Rated actuating current I_C at U_C	5 mA	7 mA
Input circuit	Reverse polarity protection , Surge protection	Surge protection
Operating voltage / status / error indicator	Green LED / Yellow LED / Red LED	
Output data load side		
Operating voltage range	42 V AC ... 550 V AC	42 V AC ... 550 V AC
Output protection	Surge protection	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	4 kV
Ambient temperature (operation)	-25 °C ... 70 °C (observe derating)	
Standards/regulations	IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
Mounting position	vertical (horizontal DIN rail, motor output below)	
Mounting	alignable, for spacing see derating	
Connection data solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
Dimensions W / H / D	22.5 mm / 99 mm / 114.5 mm	



1 = aligned with > 20 mm spacing
2 = aligned without spacing

Derating curve for ELR H3...24DC...



1 = aligned with 20 mm spacing
2 = aligned without spacing

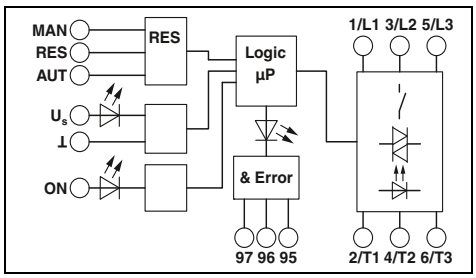
Derating curve for ELR H3...230AC...

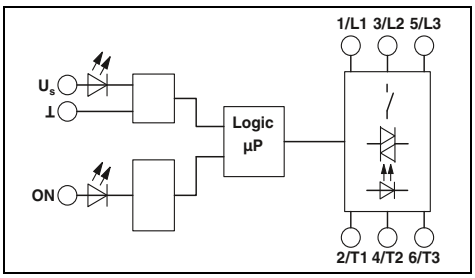
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Load current 0.075 A ... 0.6 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-0,6**	**2900566**	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-0,6**	**2903914**	1
Load current 0.18 A ... 2.4 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-2**	**2900567**	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-2**	**2903916**	1
Screw connection	**ELR H3-IES-SC-230AC/500AC-2**	**2900568**	1
Load current 1.5 A ... 9 A			
Screw connection	**ELR H3-IES-SC- 24DC/500AC-9**	**2900569**	1
Push-in connection	**ELR H3-IES-PT- 24DC/500AC-9**	**2903918**	1
Screw connection	**ELR H3-IES-SC-230AC/500AC-9**	**2900570**	1
Load current 0 A ... 9 A			
Screw connection			
Screw connection			

Motor protection

Direct start function only





Technical data

24 V DC	230 V AC (50/60 Hz)
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA	7 mA
Reverse polarity protection , Surge protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25 °C ... 70 °C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
vertical (horizontal DIN rail, motor output below)	
alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H3-I-SC- 24DC/500AC-0,6	2900542	1
ELR H3-I-PT- 24DC/500AC-0,6	2903920	1
ELR H3-I-SC- 24DC/500AC-2	2900543	1
ELR H3-I-PT- 24DC/500AC-2	2903922	1
ELR H3-I-SC-230AC/500AC-2	2900544	1
ELR H3-I-SC- 24DC/500AC-9	2900545	1
ELR H3-I-PT- 24DC/500AC-9	2903924	1
ELR H3-I-SC-230AC/500AC-9	2900546	1

Technical data

24 V DC	230 V AC (50/60 Hz)
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
40 mA	4 mA
24 V DC	230 V AC
19.2 V DC ... 30 V DC	85 V AC ... 253 V AC
5 mA	7 mA
Reverse polarity protection , Surge protection	Surge protection
Green LED / Yellow LED / Red LED	
42 V AC ... 550 V AC	42 V AC ... 550 V AC
Surge protection	
500 V	
6 kV	4 kV
-25 °C ... 70 °C (observe derating)	
IEC 60947-1 / IEC 60947-4-2 / IEC 61508 / ISO 13849	
vertical (horizontal DIN rail, motor output below)	
alignable, for spacing see derating	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
22.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H3-SC- 24DC/500AC-9	2900530	1
ELR H3-SC-230AC/500AC-9	2900531	1

Hybrid motor starters with short-circuit protection

These short-circuit-proof 3-phase hybrid motor starters for mounting on 35 mm DIN rails or 60 mm power busbars combine four functions in one device: forward running, reverse running, motor protection, and emergency stop up to SIL3 / PL e.

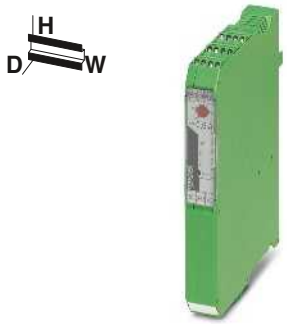
They offer the following advantages:

- 22.5 mm wide
- Bi-metal function can be set up to 9 A
- Long service life
- Space-saving
- Reduction in wiring
- 3-phase loop bridging
- Plug-in motor output terminal block
- Coordination type 2 according to IEC/EN 60947-4-2
- IEC 61508-1: SIL3
- ISO 13849: PL e

Input data
Rated control supply voltage U_S
Control supply voltage range
Rated control supply current I_S at U_S
Rated actuating voltage U_C R/L
Actuating voltage range
Rated actuating current I_C at U_C
Input circuit
Operating voltage / status / error indicator
Output data load side
Operating voltage range
Load current range
Output protection
General data
Rated insulation voltage
Rated surge voltage
Ambient temperature (operation)
Standards/regulations
Mounting position
Mounting
Screw connection solid/stranded/AWG
Dimensions W / H / D

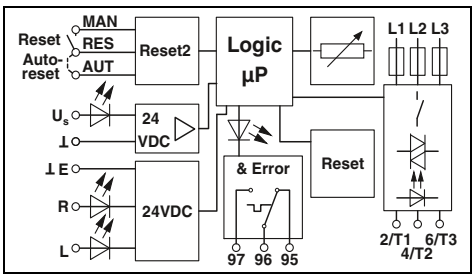
Description
Short-circuit-proof hybrid motor starter
Hybrid motor starter
DIN rail adapter
Busbar adapter, 160 mm
Busbar adapter, 200 mm
Set consisting of short-circuit-proof hybrid motor starter and adapter
- with DIN rail adapter
- with busbar adapter, 160 mm
- with busbar adapter, 200 mm

Fuse
Coordination type 2 to 10 kA/500 V
Coordination type 2 to 5 kA/400 V
Coordination type 1 to 30 kA/500 V



For reversing 3~ AC motors up to 550 V AC/3 x 0.6 A

Ex:



Technical data

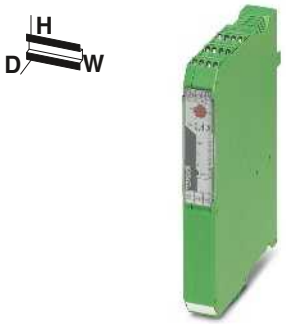
	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Reverse polarity protection , Surge protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	75 mA ... 600 mA (see derating)
	Surge protection , Short-circuit protection
	500 V
	6 kV
	-25 °C ... 70 °C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	vertical (horizontal DIN rail, motor output below)
	alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H51-IESSC-24DC500AC-06	**2902746**	1
EM RD-ADAPTER	**2902747**	1
EM RI-ADAPTER COMPACT	**2902748**	1
EM RI-ADAPTER CLASSIC	**2902831**	1
ELR H51-0.6-DIN-RAIL-SET	**2902952**	1
ELR-H51-0,6-BUSBAR-COMPACT-SET	**2904333**	1
ELR-H51-0,6-BUSBAR-CLASSIC-SET	**2904334**	1

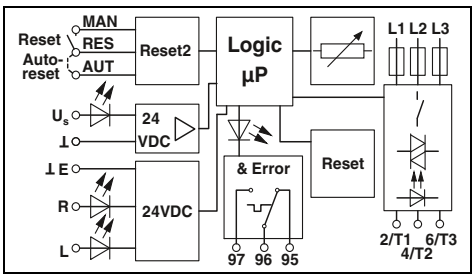
Accessories

FUSE-10X38-16A-GR	**2903126**	10
FUSE-10X38-20A-GR	**2903384**	10
FUSE-10X38-30A-MR	**2903119**	10



For reversing 3~ AC motors up to 550 V AC/3 x 2.4 A

Ex:



Technical data

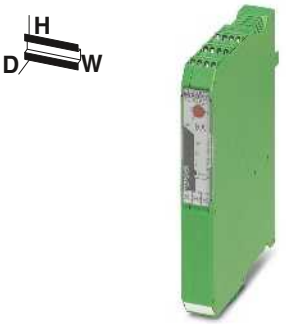
	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Reverse polarity protection , Surge protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	180 mA ... 2.4 A (see derating)
	Surge protection , Short-circuit protection
	500 V
	6 kV
	-25 °C ... 70 °C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	vertical (horizontal DIN rail, motor output below)
	alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H51-IESSC-24DC500AC-2	**2902744**	1
EM RD-ADAPTER	**2902747**	1
EM RI-ADAPTER COMPACT	**2902748**	1
EM RI-ADAPTER CLASSIC	**2902831**	1
ELR H51-2.4-DIN-RAIL-SET	**2902953**	1
ELR-H51-2,4-BUSBAR-COMPACT-SET	**2904335**	1
ELR-H51-2,4-BUSBAR-CLASSIC-SET	**2904336**	1

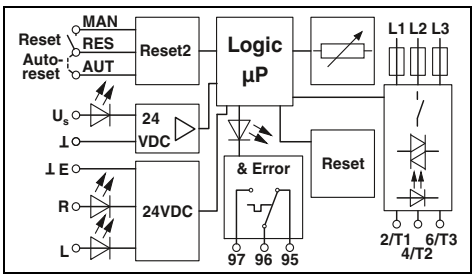
Accessories

FUSE-10X38-16A-GR	**2903126**	10
FUSE-10X38-20A-GR	**2903384**	10
FUSE-10X38-30A-MR	**2903119**	10



For reversing 3~ AC motors up to 550 V AC/3 x 9 A

Ex:



Technical data

	24 V DC
	19.2 V DC ... 30 V DC
	40 mA
	24 V DC
	19.2 V DC ... 30 V DC
	5 mA
	Reverse polarity protection , Surge protection
	Green LED / Yellow LED / Red LED
	42 V AC ... 550 V AC
	1.5 A ... 9 A (see derating)
	Surge protection , Short-circuit protection
	500 V
	6 kV
	-25 °C ... 70 °C (observe derating)
	IEC 60947-1 / EN 60947-4-2 / IEC 61508 / ISO 13849
	vertical (horizontal DIN rail, motor output below)
	alignable, for spacing see derating
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
	22.5 mm / 160 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR H51-IESSC-24DC500AC-9	**2902745**	1
EM RD-ADAPTER	**2902747**	1
EM RI-ADAPTER COMPACT	**2902748**	1
EM RI-ADAPTER CLASSIC	**2902831**	1
ELR H51-9-DIN-RAIL-SET	**2902954**	1
ELR-H51-9-BUSBAR-COMPACT-SET	**2904337**	1
ELR-H51-9-BUSBAR-CLASSIC-SET	**2904338**	1

Accessories

FUSE-10X38-16A-GR	**2903126**	10
FUSE-10X38-20A-GR	**2903384**	10
FUSE-10X38-30A-MR	**2903119**	10

Continuous bridge for hybrid motor starters

The flexible CONTACTRON loop bridge (BRIDGE-...) simplifies the supply and looping through of phases L1, L2, and L3. It is available in 2 to 10-way versions for modules in the CONTACTRON family with 22.5 mm housing width.

Features of the 3-phase loop bridge:

– Considerable reduction in wiring
– Suitable for CONTACTRON series
  - ELR H3...
  - ELR H5...
  - ELR (W)3...
  - EMM...IFS
– Bridging of 2 to 10 devices with maximum module spacing of 22.5 mm
– Up to 575 V AC/3 x 25 A
– Additional bridge versions available on request

0.3 m connecting cable for hybrid motor starter with screw connection

EAC

Technical data

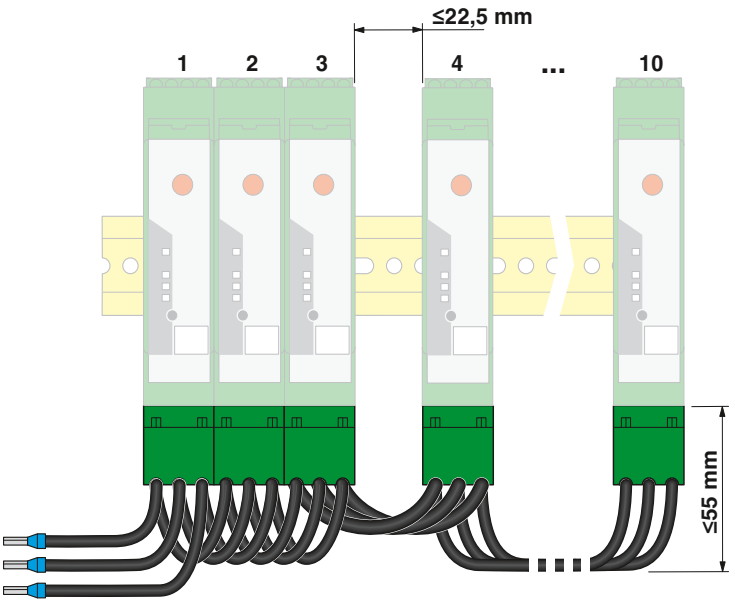
General data	
Nominal voltage U_N	42 V AC ... 575 V AC
Nominal current at U_N	≤ 25 A
Cross section	2.5 mm²

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
3-phase loop bridge			
2-way	**BRIDGE- 2**	2900746	1
3-way	**BRIDGE- 3**	2900747	1
4-way	**BRIDGE- 4**	2900748	1
5-way	**BRIDGE- 5**	2900749	1
6-way	**BRIDGE- 6**	2900750	1
7-way	**BRIDGE- 7**	2900751	1
8-way	**BRIDGE- 8**	2900752	1
9-way	**BRIDGE- 9**	2900753	1
10-way	**BRIDGE-10**	2900754	1

Accessories

Covering hood for unused connectors	**BRIDGE COVER**	2906240	10



3 m connecting cable for hybrid motor starter with screw connection

3 m connecting cable for hybrid motor starter with Push-in connection

EAC

Technical data
42 V AC ... 575 V AC
≤ 25 A
2.5 mm²

Ordering data

Type	Order No.	Pcs./ Pkt.
BRIDGE- 2-3M	2901543	1
BRIDGE- 3-3M	2901656	1
BRIDGE- 4-3M	2901659	1
BRIDGE- 5-3M	2901545	1
BRIDGE- 6-3M	2901697	1
BRIDGE- 7-3M	2901698	1
BRIDGE- 8-3M	2901700	1
BRIDGE- 9-3M	2901701	1
BRIDGE-10-3M	2901702	1

Accessories

BRIDGE COVER	2906240	10

EAC

Technical data
42 V AC ... 575 V AC
≤ 25 A
2.5 mm²

Ordering data

Type	Order No.	Pcs./ Pkt.
BRIDGE-PT 2	2904490	1
BRIDGE-PT 3	2904491	1
BRIDGE-PT 4	2904492	1
BRIDGE-PT 5	2904493	1
BRIDGE-PT 6	2904494	1
BRIDGE-PT 7	2904495	1
BRIDGE-PT 8	2904496	1
BRIDGE-PT 9	2904497	1
BRIDGE-PT 10	2904498	1

Accessories

BRIDGE COVER	2906240	10

SmartWire-DT™ accessories

Devices are integrated seamlessly into the fieldbus world via SmartWire-DT™ with the SmartWire-DT™ "EM SWD-ADAPTER" adapter for CONTACTRON 24 V DC devices. Corresponding gateways are available for the following bus systems:
– PROFIBUS DP
– CANopen®
– Modbus/TCP / EtherNet/IP™

SmartWire-DT™ adapter

Technical data

Input data		
Supply voltage U_{AUX}		-
Rated current I_{AUX}		-
Supply voltage U_{POW}		-
Rated current I_{POW}		-
Input data		
Description		Enable input
Input voltage		24 V DC
Input current		5 mA
Output data		
Description		-
Output supply		-
Output current		-
SmartWire-DT interface		
Connection method		Pin strip, 8-pos.
Data rate		125 kBd / 250 kBd
Current consumption I_{AUX}		120 mA
Current consumption I_{POW}		25 mA
General data		
Ambient temperature (operation)		-25 °C ... 55 °C
Standards/regulations		IEC 60947-1 / EN 60947-1
Degree of protection in acc. with IEC 60529/EN 60529		IP20
Mounting position		any
Mounting		On CONTACTRON hybrid motor starter
Connection data solid/stranded/AWG		0.14 - 1 mm² / 0.14 - 1 mm² / 26 - 18
Dimensions	W / H / D	22.5 mm / 165 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
SmartWire-DT™ adapter			
	EM SWD-ADAPTER	2902776	1
Gateways			
CANopen®			
PROFIBUS			
Ethernet			
I/O modules			
Digital, 4 inputs, 4 outputs			
Digital, 4 inputs			
Digital, 8 outputs			
Analog, 2 inputs, 2 outputs			
Power feed module for supplying further SmartWire-DT™ devices			

Gateways

I/O modules

Power feed

Technical data		
24 V DC -15 % ... +20 %	-	24 V DC -15 % ... +20 %
3 A	-	3 A
24 V DC -15 % ... +20 %	-	24 V DC -15 % ... +20 %
700 mA	-	700 mA
-	Digital inputs	-
-	24 V DC	-
-	typ. 4 mA	-
-	Digital outputs	-
-	24 V DC -15 % ... +20 %	-
-	typ. 500 mA	-
Pin strip, 8-pos.	Pin strip, 8-pos.	Pin strip, 8-pos.
125 kBd / 250 kBd	125 kBd / 250 kBd	125 kBd / 250 kBd
-	-	-
-	-	-
-25 °C ... 55 °C	-25 °C ... 55 °C	-25 °C ... 55 °C
EN 50178	EN 50178	EN 50178
IP20	IP20	IP20
any	any	any
-	-	-
0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16	0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16	0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
35 mm / 90 mm / 127 mm	35 mm / 90 mm / 101 mm	35 mm / 90 mm / 124 mm

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
EU5C-SWD-CAN PXC	2903098	1
EU5C-SWD-DP PXC	2903100	1
EU5C-SWD-EIP-MODTCP PXC	2903244	1

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
EU5E-SWD-4D4D PXC	2903101	1
EU5E-SWD-4DX PXC	2903102	1
EU5E-SWD-X8D PXC	2903103	1
EU5E-SWD-2A2A PXC	2903104	1

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
EU5C-SWD-PF2-1 PXC	2903113	1

SmartWire-DT™ accessories

Plug tools

Flat-ribbon cable, 8-pos.

Description	Color	Ordering data			Ordering data		
		Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Pliers for device plugs		**SWD4-CRP-1 PXC**	2903110	1			
Pliers for flat plugs		**SWD4-CRP-2 PXC**	2903114	1			
Flat-ribbon cable, 8-pos., 100 m					**SWD4-100LF-8-24 PXC**	2903111	1
Flat-ribbon cable, assembled with 2 flat plugs, 8-pos., 3 m					**SWD4-3LF8-24-2S PXC**	2903112	1

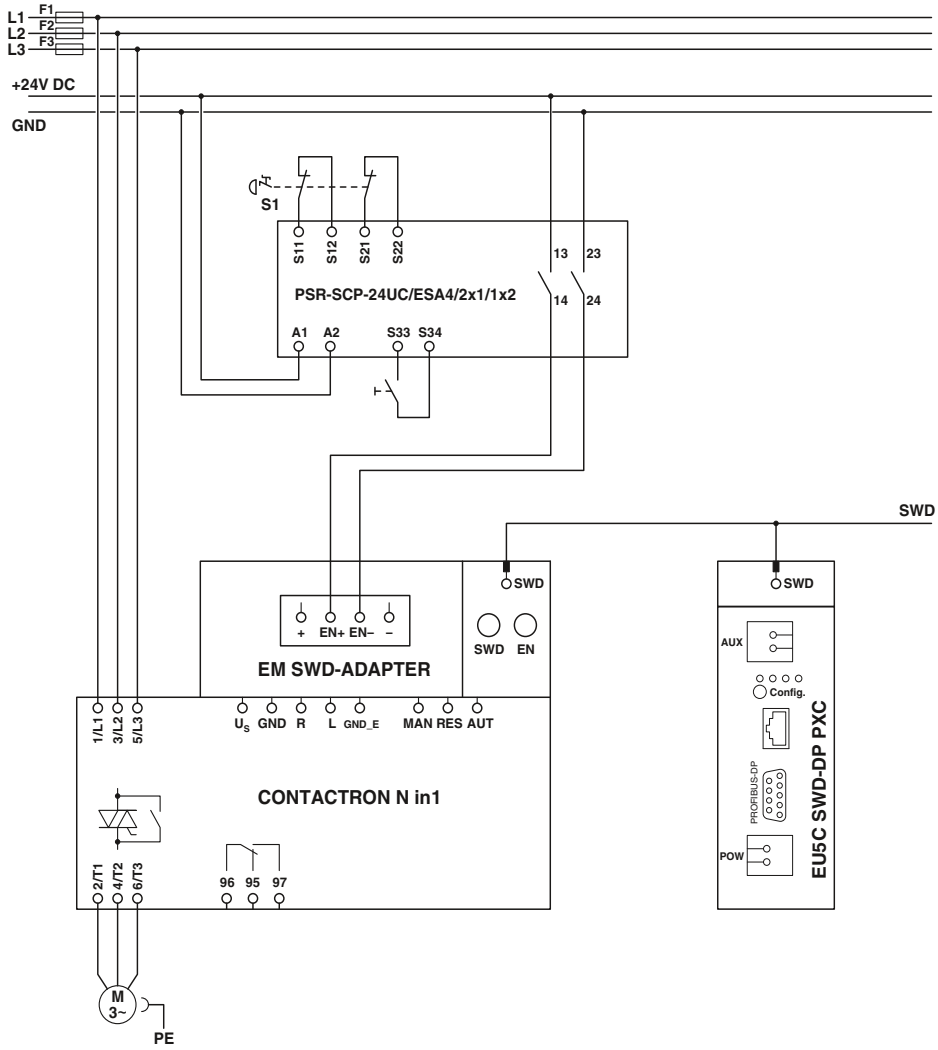
SmartWire-DT™ accessories

Accessories for SmartWire-DT™ and SmartWire-DT™ devices for connecting digital and analog input and output signals.

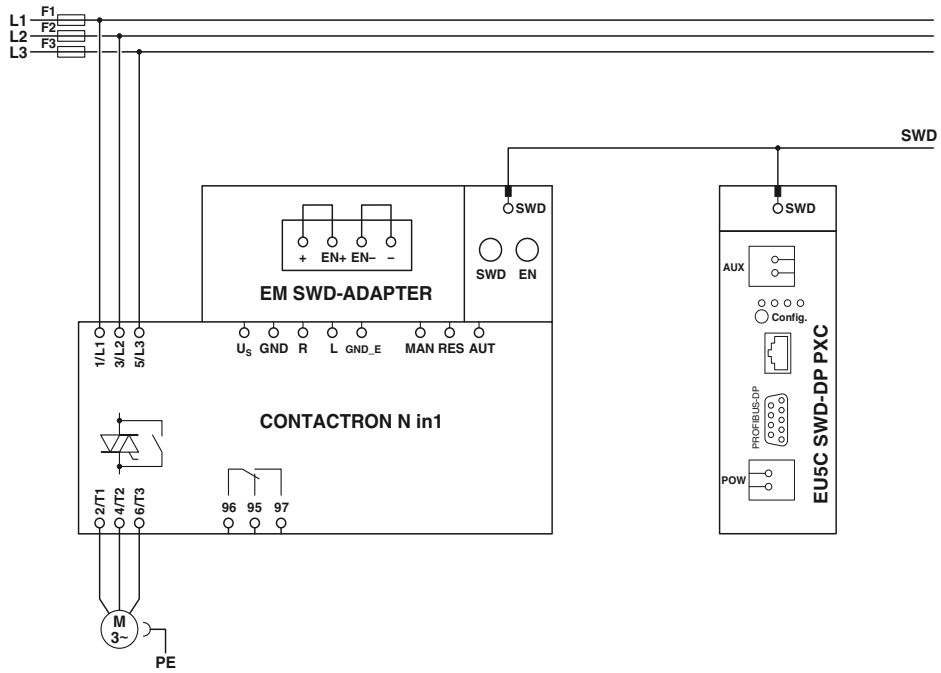
Plug and coupling

Programming adapter

Description	Color	Ordering data			Ordering data		
		Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Plug and coupling							
Network dummy plug		**SWD4-RC8-10 PXC**	2903106	1			
Device plug, 8-pos.		**SWD4-8SF2-5 PXC**	2903107	10			
Flat plug, 8-pos.		**SWD4-8MF2 PXC**	2903108	10			
Coupling for 8-pos. flat plug		**SWD4-8SFF2-5 PXC**	2903109	1			
Programming adapter					**EU4A-RJ45-USB-CAB1 PXC**	2903465	1



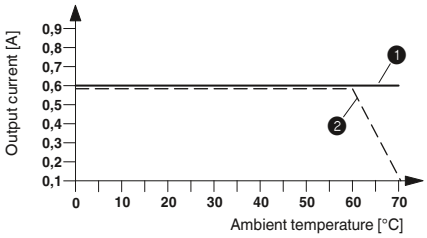
Emergency stop wiring example (two-channel)



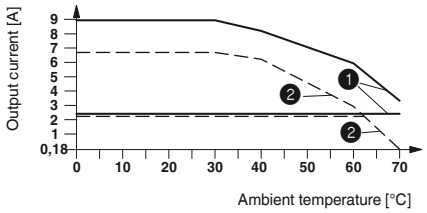
Wiring example without emergency stop

Intended use
The SmartWire-DT™ adapter is approved exclusively for use in conjunction with the following CONTACTRON hybrid motor starters. If other switching devices are used, correct operation, in particular of the safety function, cannot be ensured.

Motor protection and safe shutdown	
2900582	ELR H5-IES-SC-24DC/500AC-0,6
2900414	ELR H5-IES-SC-24DC/500AC-2
2900421	ELR H5-IES-SC-24DC/500AC-9
2900566	ELR H3-IES-SC-24DC/500AC-0,6
2900567	ELR H3-IES-SC-24DC/500AC-2
2900569	ELR H3-IES-SC-24DC/500AC-9
2297031	ELR W3- 24DC/500AC-2I
2297057	ELR W3- 24DC/500AC-9I
2902952	ELR H51-0,6-DINRAIL-SET
2902953	ELR H51-2,4-DINRAIL-SET
2902954	ELR H51-9-DINRAIL-SET
2902746	ELR H51-IESSC-24DC500AC-06
2902744	ELR H51-IESSC-24DC500AC-2
2902745	ELR H51-IESSC-24DC500AC-9
Motor protection only	
2900573	ELR H5-I-SC-24DC/500AC-0,6
2900574	ELR H5-I-SC-24DC/500AC-2
2900576	ELR H5-I-SC-24DC/500AC-9
2900542	ELR H3-I-SC-24DC/500AC-0,6
2900543	ELR H3-I-SC-24DC/500AC-2
2900545	ELR H3-I-SC-24DC/500AC-9



ELR H5-IES-SC-SWD/500AC-0,6 derating curve 100% operating time



ELR H5-IES-SC-SWD/500AC-2 and ELR H5-IES-SC-SWD/500AC-9 derating curve 100% operating time

❶ Aligned with > 20 mm spacing
❷ Aligned without spacing

3-phase solid-state reversing contactors

The 3-phase solid-state reversing contactors with integrated locking circuit and load wiring are the ideal match for applications such as:
– Control valves
– Slides
– Switches
– Ship steering gear

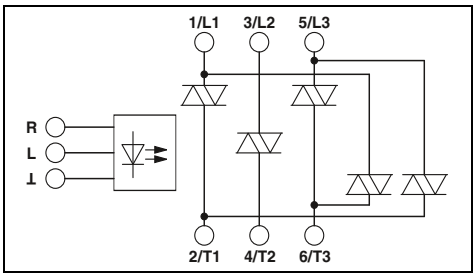
The power spectrum ranges from 575 V AC/3 x 2 A to 575 V AC/3 x 37 A. This corresponds to 1 kW to 18.5 kW.

Advantages of 3-phase solid-state reversing contactor:
– Noise-free and wear-free switching
– Integrated protective circuit
– Stable and short switching times
– Long service life
– High switching frequency
– Integrated locking and load wiring
– Thermal fuse optional

Notes:
Type of insulation housing: **ELR W 3...2, ELR W 3...9** Polyamide PA, non-reinforced, color: green **ELR W 3...16, ELR W 3...37** Polyester PBT, non-reinforced, color: green
Marking systems and mounting material See Catalog 3

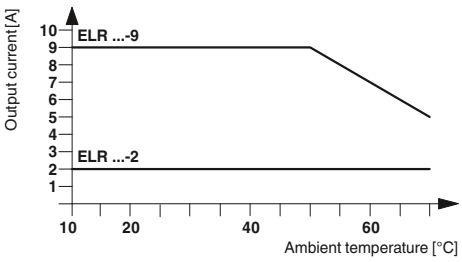
For reversing 3~ AC motors up to 575 V AC/3 x 2 A

cULus EAC DNV GL

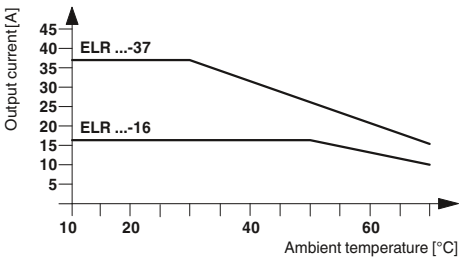


Technical data

Input data		
Rated actuating voltage U_C R/L	24 V DC	230 V AC
Actuating voltage range	19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
Rated actuating current I_C at U_C	12.7 mA	11.2 mA
Input circuit	Reverse polarity protection, Surge protection	Surge protection
Operating voltage / status / error indicator	- / Yellow LED / Red LED	
Output data load side		
Operating voltage range	48 V AC ... 575 V AC	48 V AC ... 575 V AC
Periodic peak reverse voltage	1200 V	1200 V
Load current range	100 mA ... 2 A (see derating)	100 mA ... 2 A (see derating)
Residual voltage	< 1.5 V	< 1.5 V
Leakage current	6 mA	6 mA
Max. load value I^2 x t (t = 10 ms)	250 A^2s	250 A^2s
Output protection	RCV circuit	
General data		
Rated insulation voltage	500 V	
Rated surge voltage	6 kV	6 kV
Insulation	Basic insulation	
Reversing frequency	≤ 10 Hz	≤ 2 Hz
Switching frequency	max. 5 Hz	max. 1 Hz
Ambient temperature (operation)	-25 °C ... 70 °C	
Standards/regulations	DIN EN 50178 / EN 60947	
Degree of protection in acc. with IEC 60529/EN 60529	IP20	
Mounting position	Vertical (horizontal DIN rail)	
Mounting	Can be aligned with spacing = 20 mm	
Screw connection solid/stranded/AWG		
- Control side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
- Load side	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
Dimensions W / H / D	40 mm / 99 mm / 114.5 mm	



Load current as a function of the ambient temperature
Operating time: 100% operating factor



Load current as a function of the ambient temperature
Operating time: 100% operating factor

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
3-phase solid-state reversing contactor			
	ELR W3- 24DC/500AC- 2	2297293	1
	ELR W3-230AC/500AC- 2	2297303	1

Accessories

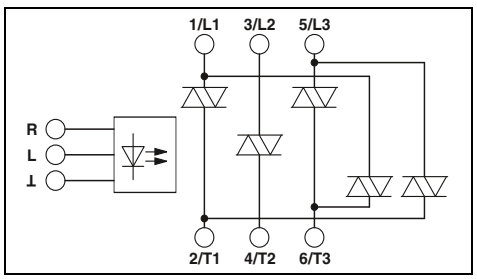
Thermal fuse	**THERMAL FUSE TF104**	2900796	1

For reversing 3~ AC motors up to 575 V AC/3 x 9 A

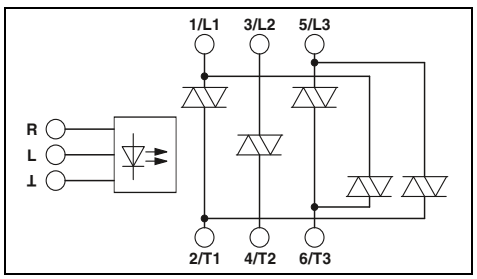
For reversing 3~ AC motors up to 575 V AC/3 x 16 A

For reversing 3~ AC motors up to 575 V AC/3 x 37 A

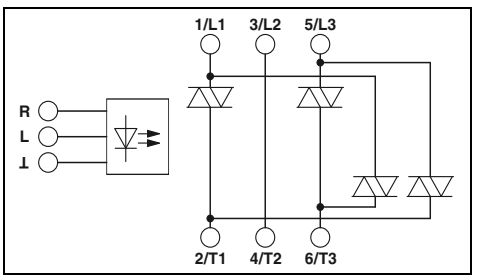
DNV GL



DNV GL



DNV GL



Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
12.7 mA	11.2 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 9 A (see derating)	100 mA ... 9 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 2 Hz
max. 5 Hz	max. 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 20 mm	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
67.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR W3- 24DC/500AC- 9	2297316	1
ELR W3-230AC/500AC- 9	2297329	1

Accessories

THERMAL FUSE TF104	2900796	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
12.7 mA	11.2 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 16 A (see derating)	100 mA ... 16 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 2 Hz
max. 5 Hz	max. 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR W3- 24DC/500AC-16	2297332	1
ELR W3-230AC/500AC-16	2297345	1

Accessories

THERMAL FUSE TF104	2900796	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
12.7 mA	11.2 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
200 mA ... 37 A (see derating)	200 mA ... 37 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
9000 A²s	9000 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 2 Hz
max. 5 Hz	max. 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR W2+1- 24DC/500AC-37	2297374	1
ELR W2+1-230AC/500AC-37	2297387	1

Accessories

THERMAL FUSE TF104	2900796	1

3-phase semiconductor contactor

The 3-phase solid-state contactors are an ideal match for applications such as:
– Mixers
– Machine tools
– Conveying systems
– Pumps
– Fans

The power spectrum ranges from 575 V AC/3 x 2 A to 575 V AC/3 x 37 A. This corresponds to 1 kW to 18.5 kW.

Advantages of 3-phase semiconductor contactor:
– Noise-free and wear-free switching
– Integrated protective circuit
– Stable and short switching times
– Long service life
– High switching frequency
– Thermal fuse optional

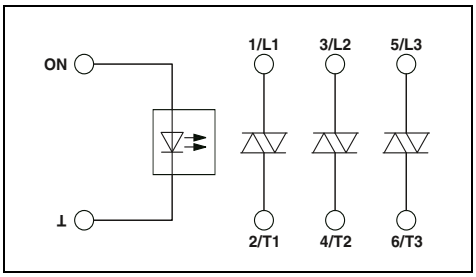
Notes:

Type of insulation housing:
ELR 3...2, ELR 3...9
Polyamide PA, non-reinforced, color: green
ELR 3...16, ELR 3...37
Polyester PBT, non-reinforced, color: green

Marking systems and mounting material
See Catalog 3

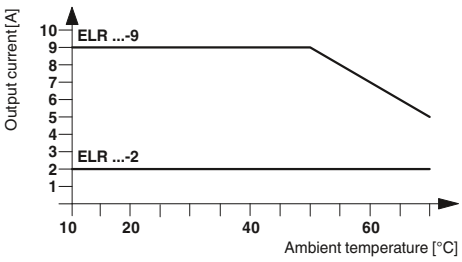
For switching 3~ AC motors up to 575 V AC/3 x 2 A

DNV GL

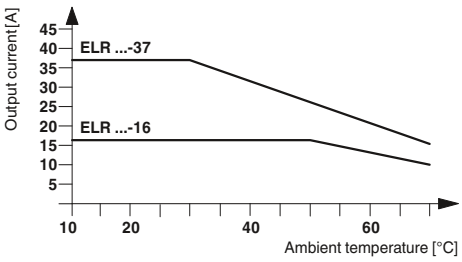


Technical data

Input data			
Rated actuation voltage U_C ON		24 V DC	230 V AC
Actuating voltage range		19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
Rated actuating current I_C at U_C		8.3 mA	12.5 mA
Input circuit		Reverse polarity protection, Surge protection	Surge protection
Operating voltage / status / error indicator		- / Yellow LED / Red LED	
Output data load side			
Operating voltage range		48 V AC ... 575 V AC	48 V AC ... 575 V AC
Periodic peak reverse voltage		1200 V	1200 V
Load current range		100 mA ... 2 A (see derating)	100 mA ... 2 A (see derating)
Residual voltage		< 1.5 V	< 1.5 V
Leakage current		6 mA	6 mA
Max. load value I^2 x t (t = 10 ms)		250 A^2s	250 A^2s
Output protection		RCV circuit	
General data			
Rated insulation voltage		500 V	
Rated surge voltage		6 kV	6 kV
Insulation		Basic insulation	
Switching frequency		≤ 10 Hz	≤ 1 Hz
Ambient temperature (operation)		-25 °C ... 70 °C	
Standards/regulations		DIN EN 50178 / EN 60947	
Degree of protection in acc. with IEC 60529/EN 60529		IP20	
Mounting position		Vertical (horizontal DIN rail)	
Mounting		Can be aligned with spacing = 20 mm	
Screw connection solid/stranded/AWG			
- Control side		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
- Load side		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
Dimensions	W / H / D	40 mm / 99 mm / 114.5 mm	



Load current as a function of the ambient temperature
Operating time: 100% operating factor



Load current as a function of the ambient temperature
Operating time: 100% operating factor

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
3-phase semiconductor contactor			
	ELR 3- 24DC/500AC- 2	2297196	1
	ELR 3-230AC/500AC- 2	2297206	1

Accessories

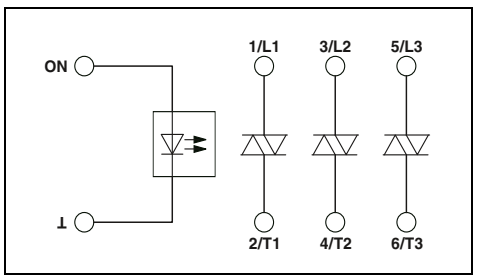
Thermal fuse	**THERMAL FUSE TF104**	2900796	1

For switching 3~ AC motors up to 575 V AC/3 x 9 A

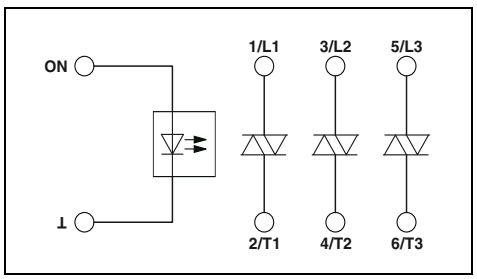
For switching 3~ AC motors up to 575 V AC/3 x 16 A

For switching 3~ AC motors up to 575 V AC/3 x 37 A

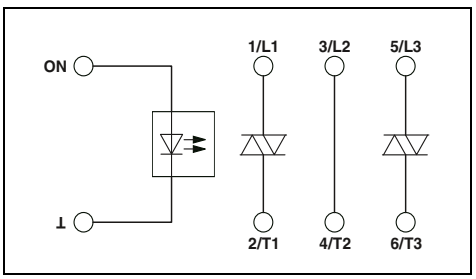
cULus EAC DNV GL



cULus EAC DNV GL



cULus EAC DNV GL



Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
8.3 mA	12.5 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 9 A (see derating)	100 mA ... 9 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 20 mm	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14	
67.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR 3- 24DC/500AC- 9	2297219	1
ELR 3-230AC/500AC- 9	2297222	1

Accessories

THERMAL FUSE TF104	2900796	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
8.3 mA	12.5 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
100 mA ... 16 A (see derating)	100 mA ... 16 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
580 A²s	580 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR 3- 24DC/500AC-16	2297235	1
ELR 3-230AC/500AC-16	2297248	1

Accessories

THERMAL FUSE TF104	2900796	1

Technical data

24 V DC	230 V AC
19.2 V DC ... 30 V DC	92 V AC ... 253 V AC
8.3 mA	12.5 mA
Reverse polarity protection, Surge protection	Surge protection
- / Yellow LED / Red LED	
48 V AC ... 575 V AC	48 V AC ... 575 V AC
1200 V	1200 V
200 mA ... 37 A (see derating)	200 mA ... 37 A (see derating)
< 1.5 V	< 1.5 V
6 mA	6 mA
9000 A²s	9000 A²s
RCV circuit	
500 V	
6 kV	6 kV
Basic insulation	
≤ 10 Hz	≤ 1 Hz
-25 °C ... 70 °C	
DIN EN 50178 / EN 60947	
IP20	
Vertical (horizontal DIN rail)	
Can be aligned with spacing = 40 mm	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
0.5 - 16 mm² / 0.5 - 16 mm² / 20 - 6	
147.5 mm / 99 mm / 114.5 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR 2+1- 24DC/500AC-37	2297277	1
ELR 2+1-230AC/500AC-37	2297280	1

Accessories

THERMAL FUSE TF104	2900796	1

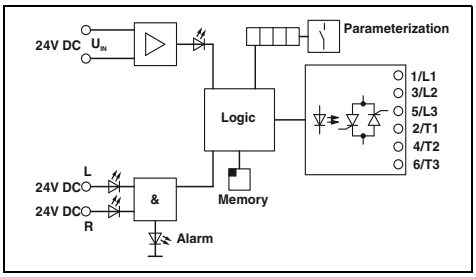
Semiconductor reversing contactor with soft starter

With the ELR W 3/9-400 S soft switch, you can extend the service life of a 3-phase asynchronous motor.

– Parameterization takes place via display and keypad directly on the device
– Friction time
– Torque, start
– Start up time
– Stop time
– Torque, stop
– Braking time
– Braking torque
– Drive can be controlled locally via keypad

Notes:
Type of housing: Polycarbonate PC, color: green.
Marking systems and mounting material See Catalog 3

Solid-state reversing contactor with soft starter

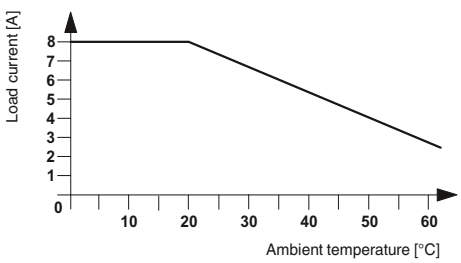


Technical data

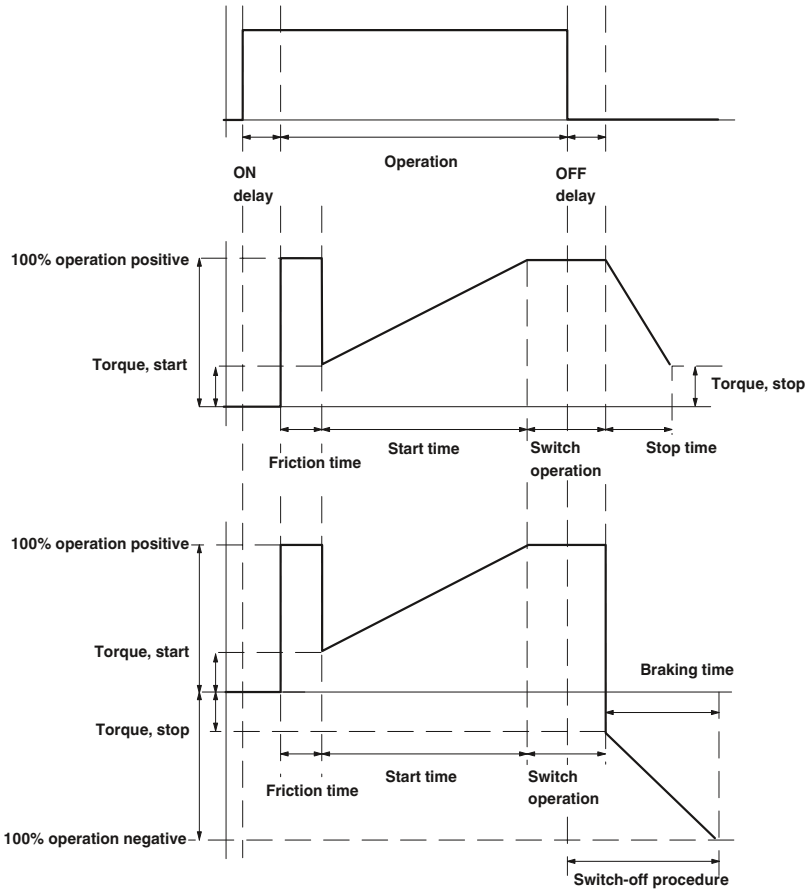
Input data		
Supply nominal voltage U_{VN}		24 V DC
Supply voltage range with reference to U_{VN}		0.8 ... 1.2
Quiescent current		85 mA
Control voltage U_{ST} right/left		24 V DC
Control voltage range in reference to U_{ST}		0.8 ... 1.2
Typ. input current at U_N		5 mA
Input circuit		Reverse polarity protection, surge protection
Operating voltage / status / error indicator		Green LED / Yellow LED / Red LED
Output data load side		
Max. switching voltage		440 V AC (L1/T1) 440 V AC (L2/T2) 440 V AC (L3/T3)
Operating voltage range		110 V AC ... 433 V AC
Periodic peak reverse voltage		1000 V
Load current range		150 mA ... 8 A (at 20 °C T_A, see derating)
Residual voltage		typ. 1.5 V (For IL)
Leakage current		5 mA (IL1, in switched-off state)
Output protection		RC element, surge protection
General data		
Test voltage input/output		2.5 kV
Ambient temperature (operation)		-20 °C ... 60 °C
Standards/regulations		DIN EN 50178
Degree of protection in acc. with IEC 60529/EN 60529		IP20
Mounting position		Vertical (horizontal DIN rail)
Mounting		Can be aligned with > 20 mm spacing
Screw connection solid/stranded/AWG		0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10
Dimensions	W / H / D	62 mm / 94 mm / 122 mm
EMC note		Class A product, see page 605

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Solid-state reversing contactor, with integrated soft switch	**ELR W3/ 9-400 S**	2963569	1



Load current as a function of the ambient temperature
Operating time: 100% operating factor



The figure shows the control of the reversing load relay with a soft starter and the operation of a three-phase current load.

Electronic reversing load relay for DC motors

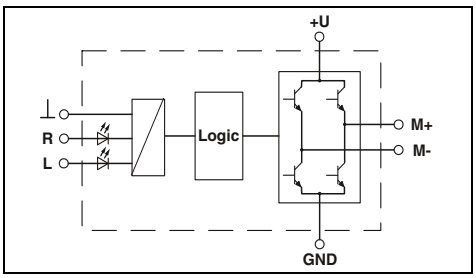
The ELR-DC electronic reversing load relays allow mechanically commutated DC motors to be switched. They reverse and reduce the speed of DC motors up to 24 V/6 A in a wear-free manner. A short-circuit, surge-voltage and overload-proof output guarantees reliable use in the plant.

When a 24 V DC signal is applied at the "left" input, the output supplies the motor with voltage. When the "right" output is activated, the polarity of the voltage at the output is reversed. If the signal is applied at both inputs, i.e., "right" and "left", the motor is short-circuited internally via the ELR-DC and reduces the speed.

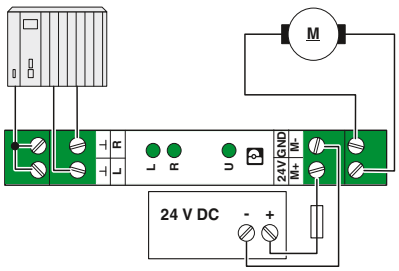
Thanks to the internal interlocking circuit and load wiring, wiring is reduced to a minimum.

Notes:
Type of housing: Polycarbonate PC, color: green.
Marking systems and mounting material See Catalog 3
PWM = Pulse Width Modulation

Electronic reversing load relay for DC motors



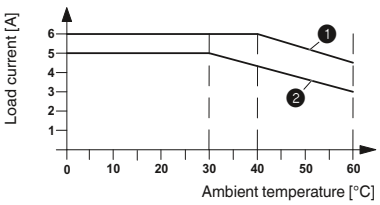
Application example



Status table

Input		Output	
Right	Left	M +	M –
0	0	High resistance	High resistance
1	0	+ 24 V	GND
0	1	GND	+ 24 V
1	1	GND	GND

Load current depending on ambient temperature
Operating time: 100% (ED)



❶ Stand-alone device
❷ Aligned without spacing

Technical data

Input data			
Control voltage U_{ST} right/left		24 V DC	24 V DC
Control voltage range in reference to U_{ST}		0.8 ... 1.2	0.8 ... 1.2
Typ. input current at U_N		3 mA	3 mA
Input circuit		Reverse polarity protection, surge protection	
Operating voltage / status / error indicator		Green LED / Yellow LED / -	
Output data load side			
Operating voltage range		10 V DC ... 30 V DC	10 V DC ... 30 V DC
Load current		2 A (Mounted in rows with zero spacing)	6 A (see derating)
Quiescent current		approx. 7 mA (When switched off)	approx. 7 mA (When switched off)
Current limitation at short-circuits		15 A	20 A
Output protection		Reverse polarity protection, surge protection	
Operating voltage / status / error indicator		Green LED / - / -	
General data			
Test voltage input/output		2.5 kV AC	
Ambient temperature (operation)		-20 °C ... 60 °C	
Nominal operating mode		100% operating factor	
Standards/regulations		EN 50178	
Degree of protection in acc. with IEC 60529/EN 60529		IP20	
Mounting position		Vertical (horizontal DIN rail)	
Screw connection solid/stranded/AWG		0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10	
Dimensions	W / H / D	12.5 mm / 99 mm / 114.5 mm	
EMC note		Class A product, see page 605	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Electronic reversing load relay, for controlling DC motors			
	ELR W1/ 2-24DC	2963598	1
	ELR W1/ 6-24DC	2982090	1

Single-phase solid-state contactors

Single-phase solid-state contactors are used in AC voltage networks, where silent switching, high switching frequencies, and practically unlimited service life are required.

The robust power semi-conductors switch to zero voltage crossing. In doing so, they do not generate any additional high-frequency interfering impulses. The modules are resistant to shock and vibration, they can even be used without problem in aggressive environments containing harmful substances.

They offer the following advantages:

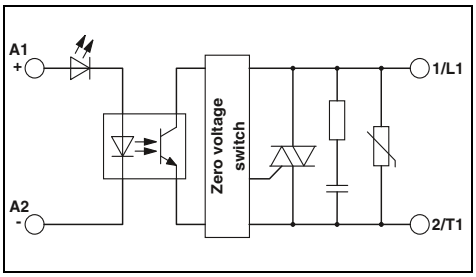
– High switching frequency
– Wear-free and bounce-free
– Input voltage versions 24 V DC and 230 V AC

The areas of application are:

– Production machines
– Temperature controllers
– Conveyor equipment
– Light and lighting systems

Notes:
Type of housing: Polycarbonate PC, color: green.
Marking systems and mounting material See Catalog 3

For switching 1~ AC motors up to 660 V AC/20 A

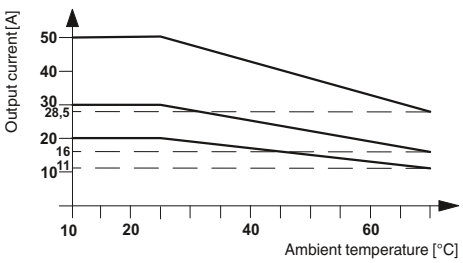


Technical data

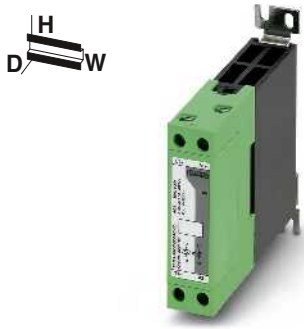
Input data			
Actuating voltage range		4 V DC ... 32 V DC	24 V AC ... 275 V AC
Rated actuating current I_C at U_C		12 mA	17 mA
Switching level	1 signal ("H") 0 signal ("L")	≥ 4 V DC ("1" signal) ≤ 1 V DC ("0" signal)	≥ 22 V AC ("1" signal) ≤ 6 V AC ("0" signal)
Transmission frequency f_{limit}		25 Hz	6 Hz
Operating voltage / status / error indicator		Green LED / - / -	
Output data load side			
Operating voltage range		42 V AC ... 660 V AC (45/65 Hz)	42 V AC ... 660 V AC (45/65 Hz)
Periodic peak reverse voltage		1200 V	1200 V
Load current range		350 mA ... 20 A (see derating)	350 mA ... 20 A (see derating)
Residual voltage		< 1.6 V	< 1.6 V
Leakage current		< 3 mA (In off state)	< 3 mA (In off state)
Phase angle (cos ϕ)		0.5	0.5
Max. load value I^2 x t (t = 10 ms)		525 A^2s	525 A^2s
Output protection		RCV circuit	
General data			
Test voltage input/output		4 kV_{rms}	
Insulation		Basic insulation	
Ambient temperature (operation)		-30 °C ... 70 °C	
Standards/regulations		EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 55011	
Mounting position		Vertical (horizontal DIN rail)	
Mounting		Can be aligned with ≥ 22.5 mm spacing	
Screw connection solid/stranded/AWG			
- Control side		0.5 - 2.5 mm^2 / 0.5 - 2.5 mm^2 / 20 - 14	
- Load side		0.5 - 4 mm^2 / 0.5 - 4 mm^2 / 20 - 12	
Dimensions	W / H / D	22.5 mm / 103 mm / 103 mm	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Single-phase electronic load relay			
	ELR 1- 24DC/600AC-20	2297138	1
	ELR 1-230AC/600AC-20	2297141	1

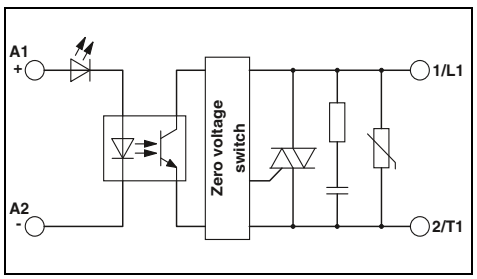


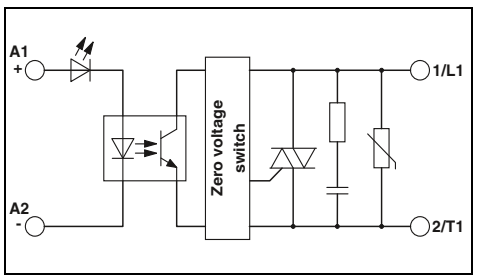
Load current as a function of the ambient temperature
Operating time: 100% operating factor



For switching 1~ AC motors up to 660 V AC/30 A

For switching 1~ AC motors up to 660 V AC/50 A





Technical data

4 V DC ... 32 V DC	24 V AC ... 275 V AC
12 mA	17 mA
≥ 4 V DC (“1” signal)	≥ 22 V AC (“1” signal)
≤ 1 V DC (“0” signal)	≤ 6 V AC (“0” signal)
25 Hz	6 Hz
Green LED / - / -	
42 V AC ... 660 V AC (45/65 Hz)	42 V AC ... 660 V AC (45/65 Hz)
1200 V	1200 V
150 mA ... 30 A (see derating)	150 mA ... 30 A (see derating)
< 1.6 V	< 1.6 V
< 3 mA (In off state)	< 3 mA (In off state)
0.5	0.5
1800 A²s	1800 A²s
RCV circuit	

4 kV_{rms}
Basic insulation
-30 °C ... 70 °C
EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 55011
Vertical (horizontal DIN rail)
Can be aligned with ≥ 22.5 mm spacing

0.5 - 2.5 mm² / 0.5 - 2.5 mm² / 20 - 14
0.5 - 4 mm² / 0.5 - 4 mm² / 20 - 12
22.5 mm / 103 mm / 103 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR 1- 24DC/600AC-30	2297154	1
ELR 1-230AC/600AC-30	2297167	1

Technical data

4 V DC ... 32 V DC	24 V AC ... 275 V AC
12 mA	17 mA
≥ 4 V DC (“1” signal)	≥ 22 V AC (“1” signal)
≤ 1 V DC (“0” signal)	≤ 6 V AC (“0” signal)
25 Hz	6 Hz
Green LED / - / -	
42 V AC ... 660 V AC (45/65 Hz)	42 V AC ... 660 V AC (45/65 Hz)
1200 V	1200 V
150 mA ... 50 A (see derating)	150 mA ... 50 A (see derating)
< 1.6 V	< 1.6 V
< 3 mA (In off state)	< 3 mA (In off state)
0.5	0.5
18000 A²s	18000 A²s
RCV circuit	

4 kV_{rms}
Basic insulation
-30 °C ... 70 °C
EN 61000-4-2 / EN 61000-4-3 / EN 61000-4-4 / EN 61000-4-5 / EN 61000-4-6 / EN 55011
Vertical (horizontal DIN rail)
Can be aligned with ≥ 22.5 mm spacing

0.5 - 4 mm² / 0.5 - 4 mm² / 20 - 14
4 - 25 mm² / 4 - 25 mm² / 12 - 3
45 mm / 103 mm / 103 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
ELR 1- 24DC/600AC-50	2297170	1
ELR 1-230AC/600AC-50	2297183	1

PROFINET motor starter

Motor starters in robust stainless steel housing (IP67) can be used directly in the system as a compact function unit. This eliminates the complex wiring of individual functions in the control cabinet.

The motor starter can be used to control three-phase asynchronous motors in two directions of rotation, completely via PROFINET. Distributed sensors and actuators can be directly connected to PROFINET without the need for further intermediate stations or additional cabling. A complete PROFINET motor starter consists of three products. For example:

– ELR 5011 IP PN
– IBS IP 400 MBH-F
– IBS PG SET

Additional features:

– Performance classes: 1.1 kW to 3.0 kW
– One and two-motor reversing starters (CONTACTRON hybrid motor starter)
– Easy assembly
– Plug-in connection system
– Exchangeable module electronics
– Status and diagnostic indicators on the module
– 10 digital inputs for connecting sensors
– 4 digital outputs for connecting actuators

Electronic motor starters, 1 x 1.1 kW and 2 x 1.1 kW

Technical data

	ELR 5011 IP PN	ELR 5011-2 IP PN
Interface		
Fieldbus system	PROFINET	
Connection method	8-pos. RJ45 socket on motor starter	
Power supply for module electronics		
Supply voltage	24 V DC (U_{S1} / U_{S2})	
Supply voltage range	20 V DC ... 30 V DC (including ripple)	
Power supply for sensors		
Minimum voltage	U_{INI} = U_{S1} minus 1 V	
Nominal current per sensor	500 mA	
Type of protection	Short-circuit/overload protection	
Digital inputs		
Number of inputs	10	
Connection method	M12 connector	
Connection method	2, 3, 4-wire	
Digital outputs		
Number of outputs	4	
Connection method	M12 connector	
Connection method	2-wire	
Output current	max. 500 mA (per channel)	
Motor starter, output		
Connection method	POWER-COMBICON	
Operating voltage	360 V AC ... 550 V AC (line voltage 50/60 Hz)	
Nominal current range	0.18 A ... 2.4 A	
Frequency range	50 Hz ... 60 Hz (mains frequency)	
Nominal motor power	1.1 kW (at U_{mains}= 400 V AC)	
Motor monitoring		
Parameterization range	0.2 A ... 2.4 A	
Tripping class	Based on class 10 A of IEC 60947	
General data		
Weight	2115 g	2425 g
Degree of protection	IP67 in acc. with IEC 60529	
Ambient temperature (operation)	-25 °C ... 50 °C (non-condensing)	
EMC note		

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
PROFINET motor starter			
- 1-channel reversing starter, 1.1 kW	**ELR 5011 IP PN**	2700745	1
- 2-channel reversing starter, 1.1 kW	**ELR 5011-2 IP PN**	2701007	1
PROFINET motor starter			
- 1-channel reversing starter, 3.0 kW			
- 2-channel reversing starter, 3.0 kW			
Lower part of the housing, high-grade steel			
- Standard version	**IBS IP 400 MBH -F**	2732868	1
Pg screw connection, plastic (IP67), for INTERBUS and PROFINET motor starters and variable frequency drives.	**IBS PG SET**	2836599	1

Accessories

RJ45 connector, shielded, with bend protection sleeve, x 2			
- gray for straight cables	**FL PLUG RJ45 GR/2**	2744856	1
– green for crossed cables	**FL PLUG RJ45 GN/2**	2744571	1
Bus system cable	**VS-937/...**	1402611	1
Crimping pliers, for assembling the RJ45 connectors	**FL CRIMPTOOL**	2744869	1

Electronic motor starters, 1 x 3.0 kW and 2 x 3.0 kW

High-grade steel lower part, IP67 protection

Technical data		Technical data
ELR 5030 IP PN	ELR 5030-2 IP PN	
PROFINET		-
8-pos. RJ45 socket on motor starter		-
24 V DC (U_{S1} / U_{S2})		-
20 V DC ... 30 V DC (including ripple)		-
U_{INI} = U_{S1} minus 1 V		-
500 mA		-
Short-circuit/overload protection		-
10		-
M12 connector		-
2, 3, 4-wire		-
4		-
M12 connector		-
2-wire		-
max. 500 mA (per channel)		-
POWER-COMBICON		-
360 V AC ... 550 V AC (line voltage 50/60 Hz)		-
2.4 A ... 6 A		-
50 Hz ... 60 Hz (mains frequency)		-
3 kW (at U_{mains}= 400 V AC)		-
2.4 A ... 6 A		-
Based on class 10 A of IEC 60947		-
2115 g	2425 g	1130 g
IP67 in acc. with IEC 60529		IP67 in acc. with IEC 60529
-25 °C ... 50 °C (non-condensing)		-
		Class A product, see page 605

Ordering data			Ordering data		
Type	**Order No.**	Pcs./ Pkt.	**Type**	**Order No.**	Pcs./ Pkt.
ELR 5030 IP PN	**2701006**	1			
ELR 5030-2 IP PN	**2701008**	1			
IBS IP 400 MBH -F	**2732868**	1	**IBS IP 400 MBH -F**	**2732868**	1
IBS PG SET	**2836599**	1	**IBS PG SET**	**2836599**	1

Accessories			Accessories		
FL PLUG RJ45 GR/2	**2744856**	1	**FL PLUG RJ45 GR/2**	**2744856**	1
FL PLUG RJ45 GN/2	**2744571**	1	**FL PLUG RJ45 GN/2**	**2744571**	1
VS-937/...	**1402611**	1	**VS-937/...**	**1402611**	1
FL CRIMPTOOL	**2744869**	1	**FL CRIMPTOOL**	**2744869**	1

Inline frequency inverters

Inline frequency inverters for the control cabinet are the compact solution for extending your Easy Automation solution to include electronic speed regulation for asynchronous motors. The devices seamlessly integrate into the Inline system and have IP20 protection. Depending on the drive task, you can select frequency inverters from various performance classes, up to a maximum of 4 kW. In order to connect to the Inline system via the Fieldline local bus, you just need the IB IL 24 FLM-PAC Inline module. The Inline frequency inverter can be connected to a Phoenix Contact controller via the Inline module.

Additional features:

- Max. motor power 0.75 kW, 1.5 kW, 2.2 kW, and 4.0 kW
- 3 x 400 V mains input (±15%) 50/60 Hz
- DTM for parameterization and diagnostics
- 8 freely programmable parameter records
- PTC evaluation for 2.2 kW and 4.0 kW versions
- Integrated line filter
- U/f linear and U/f square operating modes
- S-ramp function
- Motor protection function (I^2t)
- Connection of a braking resistor
- DC braking
- Evaluation of the temperature switch in the motor
- Voltage boost
- 1 x analog input, 1 x analog output, 1 x relay output

Frequency inverter for a maximum motor power of up to 0.75 kW

Technical data

Interface	
Designation	Fieldline local bus
Connection method	9-pos. D-SUB connector/socket
Power supply for module electronics	
Supply voltage	24 V DC ±15 %
Supply voltage range	20.4 V DC ... 27.6 V DC ±15 %
Digital inputs	
Number of inputs	5
Connection method	COMBICON
Connection method	Plug-in screw connection
Analog inputs	
Number of inputs	1
Connection method	COMBICON
Connection method	Plug-in screw connection
Analog outputs	
Number of inputs	1
Connection method	COMBICON
Connection method	Plug-in screw connection
Frequency inverter output	
Rated current	2.6 A +20 %
Frequency range	0 Hz ... 400 Hz
Parameterization	Via INTERBUS
Tripping class	5.6 A OC tripping current
General data	
Weight	1400 g
Degree of protection	IP20 in acc. with IEC 60529/ EN 60529
Width	90 mm
Height	173 mm
Depth	153.5 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Inline frequency inverter for the control cabinet			
	VFD 5007 IL IB	2701054	1

Accessories

Inline Modular branch terminal for coupling one Fieldline Modular M8 local bus at the end of an Inline station	**IB IL 24 FLM-PAC**	2736903	1
Remote bus cable, highly flexible, 3 x 2 x 0.25 mm²	**IBS RBC/F-T/**	2740151	1

Frequency inverter for a maximum motor power of up to 1.5 kW

Technical data	
Fieldline local bus	
9-pos. D-SUB connector/socket	
24 V DC ±15 %	
20.4 V DC ... 27.6 V DC ±15 %	
5	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
4.1 A +20 %	
0 Hz ... 400 Hz	
Via INTERBUS	
8.8 A OC tripping current	
1400 g	
IP20 in acc. with IEC 60529/ EN 60529	
90 mm	
173 mm	
153.5 mm	

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
VFD 5015 IL IB	2701055	1

Accessories		
IB IL 24 FLM-PAC	2736903	1
IBS RBC/F-T/	2740151	1

Frequency inverter for a maximum motor power of up to 2.2 kW

Technical data	
Fieldline local bus	
9-pos. D-SUB connector/socket	
24 V DC ±15 %	
20.4 V DC ... 27.6 V DC ±15 %	
5	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
5.8 A +20 %	
0 Hz ... 400 Hz	
Via INTERBUS	
12.5 A OC tripping current	
2200 g	
IP20 in acc. with IEC 60529/ EN 60529	
117 mm	
173 mm	
174.5 mm	

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
VFD 5022 IL IB	2701057	1

Accessories		
IB IL 24 FLM-PAC	2736903	1
IBS RBC/F-T/	2740151	1

Frequency inverter for a maximum motor power of up to 4.0 kW

Technical data	
Fieldline local bus	
9-pos. D-SUB connector/socket	
24 V DC ±15 %	
20.4 V DC ... 27.6 V DC ±15 %	
5	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
1	
COMBICON	
Plug-in screw connection	
9.5 A +20 %	
0 Hz ... 400 Hz	
Via INTERBUS	
21 A OC tripping current	
2200 g	
IP20 in acc. with IEC 60529/ EN 60529	
117 mm	
173 mm	
174.5 mm	

Ordering data		
Type	**Order No.**	Pcs./ Pkt.
VFD 5040 IL IB	2701058	1

Accessories		
IB IL 24 FLM-PAC	2736903	1
IBS RBC/F-T/	2740151	1

MACX MCR-T-UIREL-UP
MACX MCR-EX-SL-RTD-I
MACX PL-RPSSI-2I
PWR
DAT
ERR
DO1
DO2
DO3

12.09
ON

Measurement and control technology

From highly compact 6 mm signal conditioners and functionally safe signal conditioners to signal isolators for intrinsically safe circuits in the Ex area: our signal conditioner range and process indicators offer a solution for all applications in analog signal conditioning.

We offer the following product ranges:

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

For maximum convenience during installation and servicing

– Overall width of just 6.2 mm
– Current measurement, without disconnection
– Safe electrical isolation

Signal conditioners with SIL functional safety – MACX Analog

For maximum signal safety

– Consistent SIL certification
– Safe electrical isolation

Signal conditioners with PL functional safety – MACX Safety

The proven MACX range for safety applications according to the Machinery Directive

Ex i signal conditioners with SIL functional safety – MACX Analog Ex

For intrinsically safe circuits in the Ex area

– Maximum explosion protection for all Ex zones and gas groups
– Safe electrical isolation

Ex i signal conditioners with PL functional safety – MACX Safety Ex

The proven MACX EX range for safety applications according to the Machinery Directive

Process indicators and field devices – Field Analog

– Monitoring and display of analog and temperature signals
– Control via digital and analog inputs and outputs
– Record and convert temperatures directly in the field

Product range overview

Product overview	**56**
Selection guide for signal conditioners	**58**
Basics	**62**
Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro	**68**
Signal conditioners with functional safety and explosion protection – the MACX ranges	**106**
Signal conditioners with SIL functional safety – MACX Analog	**116**
Signal conditioners with PL functional safety – MACX Safety	**138**
Ex i signal conditioners with SIL functional safety – MACX Analog Ex	**140**
Ex i signal conditioners with PL functional safety – MACX Safety Ex	**168**
Multiplexer for HART signals	**166**
Process indicators and field devices – Field Analog	**178**

Highly compact signal conditioners with plug-in connection technology

MINI Analog Pro
Page 68

MINI Analog Pro gateways
Page 94

System cabling, Termination Carriers
Page 98

Accessories for MINI Analog Pro
Page 100

Multiplexers

Multiplexer for HART signals
Page 166

MACX Analog accessories

Supply components, marking material
Page 174

System cabling, Termination Carriers
Page 164

Process indicators and field devices

Process indicators and field devices
Page 178

Current measurement

PACT current transformers
Page 222

PACT RCP current transformers for retrofitting
Page 236

AC current transducers, AC/DC, AC current protector
Page 240

Test disconnect terminal blocks
See Catalog 1

Controllers

Controllers
See Catalog 6

Surge protection

Surge protection for measurement and control technology
See Catalog 4

Signal conditioners with SIL functional safety

MACX Analog
Page 116

Signal conditioners with PL functional safety

MACX Safety
Page 138

Ex i signal conditioners with SIL functional safety

MACX Analog Ex
Page 140

Ex i signal conditioners with PL functional safety

MACX Safety Ex
Page 168

Process indicators
Page 184

Energy and power measurement

EMpro energy meters, function and communication modules
Page 208

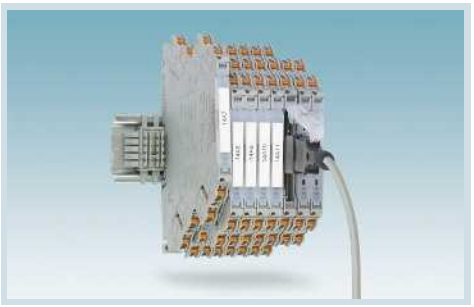
Software for usage data acquisition
Page 214

PSK compressed air meters
Page 216

Monitoring and diagnostics

SOLARCHECK PV string monitoring
Page 256

EMD-BL
Compact monitoring relays
Page 262



Highly compact signal conditioners – MINI Analog Pro

Analog IN/Analog OUT		Page
3-way signal conditioners	Configurable	From 70
	Fixed signal combinations	74
4-way signal duplicators	Configurable	76
3-way repeater power supplies	1-channel	75
2-way passive isolators	Input loop-powered	78
	Output loop-powered	79
Temperature		
Temperature transducers	For resistance thermometers (RTD)	80
	For thermocouples	82
Frequency		
Frequency transducers	Universal	84
Analog frequency transducers		86
Potentiometer/resistor		
Potiposition transducers		88
Digital IN		
Signal conditioners	NAMUR sensors, floating contacts	90
Limit values		
Threshold value switches	Standard analog signals, universal	91
	Temperature	92
MINI Analog Pro gateways		
Bus systems	Modbus RTU/TCP	96
	PROFIBUS DP	96
Accessories		
Configuration	Programming adapters	105
Constant voltage source, constant current source		100
Setpoint potentiometer		101
System cabling	System adapters	97
	1:1 feed-through terminal block	104
Supply components	Power terminal, fault signaling modules, DIN rail connector, system power supply	From 100
Marking material		105
Connector set	Screw connection or Push-in connection	101

Process indicators and field devices – Field Analog

Process indicators		Page
Multifunctional process indicators	Configurable	From 180
Loop-powered process indicators	Configurable	From 182
Standard signals	Configurable	184
Frequency	Configurable	185
Setpoint adjusters	Configurable	186
Head-mounted transducers		
Temperature	Loop-powered	From 187
Accessories		From 192
DIN rail measuring transducers		
Temperature	Loop-powered	From 194

Signal conditioners with SIL functional safety – MACX Analog

Analog IN/Analog OUT		Page
3-way signal conditioners	Configurable	From 116
3-way repeater power supplies	1-channel	120
	Signal duplicators	121
	2-channel	123
2-way passive isolators	Input loop-powered, 1 or 2-channel	124
	Input loop-powered, 5 kV, 1 or 2-channel	125
3-way output isolators	Fixed signal combinations	126
Temperature		
Temperature transducers	Universal	From 127
	For resistance thermometers (RTD)	130
	For thermocouples	131
Potentiometer/resistor		
Potiposition transducers		From 127
Digital IN		
Signal conditioners	NAMUR sensors, floating contacts	From 132
	Signal duplicators	133 136
	NAMUR output, floating contacts	From 134 137
	NAMUR sensors on NAM	
Digital OUT		
Solenoid drivers	Loop-powered	
	With line fault detection	
Limit values		
Threshold value switches	Analog current signal	127
	Temperature	127
Accessories		
Programming adapters		105
Display unit and operator interface, removable		171
Holder module for display unit and operator interface		171
Termination Carriers		165
Multiplexer for HART signals		166
Supply components	Power terminal, fault signaling modules, DIN rail connector, system power supply	From 174
Marking material		177
Shield fast connection		172
Test plug		176
Resistance circuit	For line fault detection	176

Signal conditioners with PL functional safety – MACX Safety

Ex i signal conditioners with SIL functional safety – MACX Analog Ex

Ex i signal conditioners with PL functional safety – MACX Safety Ex

	Page	Page	Page
		140	
	138	141	168
		142	169
		144	
	139	From 148	170
		145	
		146	
	139	From 148	170
		151 155	
		152 155	
		From 153 156	
		157	
		From 162	
		159	
	127	127	127
	139	150	170
	105	105	105
		165	
		166	
		174	
		177	
		172	
		176	
		176	

Input

Maximum input signal

The maximum input signal describes the value achieved before any damage occurs to the module and the signal generator. If these values are exceeded, suppresser diodes can be triggered to short circuit this input when a surge voltage is detected. The transmission range of the analog signals is located exclusively within the specified input ranges.

Input resistance

The input resistance of a signal conditioner or measuring transducer is determined in such a way as to ensure that the input signal is loaded only slightly. This results in a low-resistance input for current inputs and a high-resistance input for voltage inputs.

Voltage drop

In the case of passive isolators, the input voltage drop occurs as a result of the voltage drop of the operational load and the auxiliary power consumption of the module. The greater the auxiliary power consumption of the passive isolator, the smaller the operational output load is allowed to be. Low auxiliary power consumption is regarded as an indicator of device quality.

Common mode rejection

In the case of signal conditioners, operational amplifiers are used internally for transmission purposes. In theory, operational amplifiers should display ideal transmission and amplification behavior. However, it is a different matter in practice. When both input voltages are changed concordantly, i.e., exactly the same voltage to ground is applied to both input terminal blocks, this leads to an unintended output signal. Theoretically, if the operational amplifier is ideal, no output signal should appear since the differential input signal is "0 V". Common mode rejection indicates the factor (in dB) by which the common input voltage at both inputs is amplified to a lesser extent than the difference in voltage between the two inputs.

Analog output

Maximum output signal

During uninterrupted operation of the devices, an overload at the input cannot cause greater values than at the output.

Zero/span adjustment

When the zero point is set, the zero point of an analog output is adjusted and set in relation to the input signal.

When the "amplification" span is set, the analog output is adjusted in relation to the input signal. In this case, the output characteristic curve is increased or decreased by an amplification factor.

Load

The load on the output side indicates the load-carrying capacity of a measuring transducer or a signal conditioner. Current outputs can drive a maximum of 500 Ω. Voltage outputs have a load-carrying capacity of up to at least 10 kΩ.

Residual ripple/ripple

A superimposed ripple can appear on the output signal due to signal conditioning required by the circuit. The residual ripple is indicated in mV_{PP} or mV_{rms}.

Open-circuit behavior

With some measuring transducers, the input signal is permanently monitored for possible open circuits in the signal line. If the signal exceeds or falls below a tolerance limit, an open circuit is detected and a defined output signal is sent. With programmable devices, the output signals can be freely selected.

Digital output

Relays

Many of the products with a relay output that are shown in the catalog feature hard gold-plated relay contact material. The voltage range has an important role to play in terms of how this contact material can be used. Up to 50 mA can be switched with voltage ranges of up to 30 V AC/36 V DC. Even very small currents are transmitted perfectly. If the aforementioned voltage range is exceeded and values of 250 V AC/DC are processed, currents of up to 2 A can flow. However, in this case the subsequent transmission of small currents can no longer be guaranteed.

Transistor

A PNP transistor switching output can be used to transmit 24 V DC switching signals up to approximately 100 mA.

General data

Supply voltage

The product range includes DC and AC power supply units for specific products. There is a standard power supply unit available in the form of a 24 V DC version that operates within a voltage range of 20 to 30 V DC. For other supply voltages, please refer to the technical data.

Current consumption

The value specified here describes the self-consumption of the devices. It also includes the output current and, where applicable, the switching output load.

Transmission errors

The transmission precision is a gauge of the quality of a measuring transducer. It is the deviation from the ideal transmission characteristic curve and includes linearity, span, and offset errors.

Non-linearity

Non-linearity is the deviation from the ideal transmission precision without including span and offset errors.

The non-linearity of a signal makes it possible to evaluate the course from zero to endpoint. Normally, the linearity errors are expressed as a percentage that indicates the extent of deviation from the ideal transmission characteristic curve.

Temperature coefficient

The temperature coefficient provides an assessment of the extent to which precision deviates when the ambient temperature around a signal conditioner or measuring transducer changes. In many cases this is specified as a percentage. An alternative definition is ppm/K (parts per million/Kelvin).
Example: 250 ppm/K = 0.025%/K.

Cut-off frequency

Signal conditioners are basically designed to transmit DC signals. However, signal changes call for a dynamic form of behavior so that small AC quantities (normally: 30 Hz) can also be transmitted. This is achieved by defining a cut-off frequency. At the same time, a low cut-off frequency can be used to suppress higher-frequency AC components.

Step response

The step response indicates the response time of the output signal when an input signal step occurs (10 to 90%). The step response is inversely proportional to the cut-off frequency. This means that the response time decreases as the cut-off frequency increases.

Test voltage

The test voltage indicates the electric strength of an isolated distance and is determined by type tests. In this test, a 50 Hz voltage is applied for one minute; it describes the value achieved before a disruptive discharge to another potential level occurs in the device.

Safe isolation

"Safe isolation" is defined as protection against hazardous shock currents. When module specifications are provided in accordance with EN 61010, a distinction is made between error-free operation and operation under fault conditions. With error-free operation, nominal supply voltages of 30 V AC/60 V DC are applicable.

Ambient temperature range

The temperature limits specified here relate exclusively to operation. These limits do not apply to storage and transport. It is here where the temperature limits of the materials used are the decisive factor. If the devices are outside of the specified temperature range during assembly, they must be brought back within the specified temperature range prior to system startup. It is important to make sure that no condensation occurs.

Protective circuit

In order to protect the measurement and control modules against surge voltages, suppressor diodes are connected upstream of the signal and supply paths. These diodes behave in a similar manner to conventional Zener diodes. Except for the fact that suppressor diodes have faster response times and a higher maximum current.

Information on directives and standards

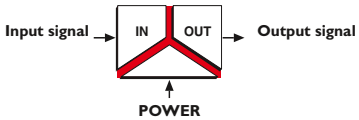
When carrying out further processing of non-independent items of equipment (components), the applicable regulations pertaining to installation must be observed.

The relevant device-specific regulations also apply with regard to installation in devices.
(Standards applicable at the time of going to print)

Directives	EU	International
EMC Directive (electromagnetic compatibility)	2004/108/EC	-
Low Voltage Directive	2006/95/EC	-
Ex Directive (ATEX)	94/9/EC	-
Product standards		
Electronic equipment for use in power installations	EN 50178:1997	-
Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1:2001	IEC 61010-1:2004
Programmable logic controllers - Part 2: Equipment requirements and tests	EN 61131-2:2007	IEC 61131-2:2007
EMC		
EMC - Part 6-2: Generic standards - Immunity for industrial environments	EN 61000-6-2:2005	IEC 61000-6-2:2005
EMC - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4:2007	IEC 61000-6-4:2006
Electrical equipment for measurement, control, and laboratory use EMC requirements	EN 61326-1:2006	IEC 61326-1:2005
ATEX		
Electrical apparatus for explosive gas atmospheres - Part 0: General requirements	EN 60079-0:2006	IEC 60079-0:2007
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	EN 60079-11:2007	IEC 60079-11:2006
Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test, and marking of type of protection "n" electrical apparatus	EN 60079-15:2005	IEC 60079-15:2005
Environmental tests		
Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1:2007	IEC 60068-2-1:2007
Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2:2007	IEC 60068-2-2:2007
Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6:2008	IEC 60068-2-6:2008

Active isolation

3-way isolation

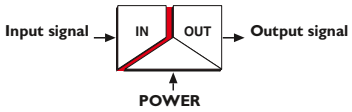


In the case of modules with this isolation method, all components that are connected to the input, output or power supply are protected against interference from each other. All three directions (input, output, and power supply) are electrically isolated from one another accordingly.

The 3-way isolation provides electrical isolation between the measurement sensor and the controller as well as between the controller and the actuating element.

On the input side, the modules need active signals. On the output side, they provide a filtered and amplified signal.

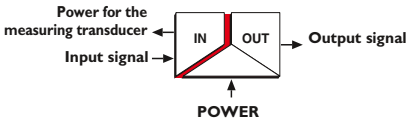
Input isolation



In the case of modules with this isolation method, the electronics connected on the output side (e.g., the controller) are to be protected from interference from the field. For this reason, only the input is electrically isolated from the output and the power supply which are at the same potential.

On the input side, the modules need active signals (e.g., from measurement sensors). On the output side, they provide a filtered and amplified signal (e.g., from the controller).

Repeater power supply



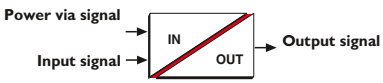
Repeater power supplies use the signal input side not only for measured value acquisition, but also to provide the necessary power to the passive measurement sensors connected on the input side.

On the output side, they provide a filtered and amplified signal (e.g., from the controller).

The isolation method used by these modules is input isolation.

Passive isolation

Passive isolation, supplied on the input side



The modules draw the power needed for signal transmission and electrical isolation from the active input circuit. On the output side, a conditioned current signal is provided to the controller or to actuating elements.

This passive isolation allows signal conditioning (interruption of ground loops) and filtering without an additional power supply.

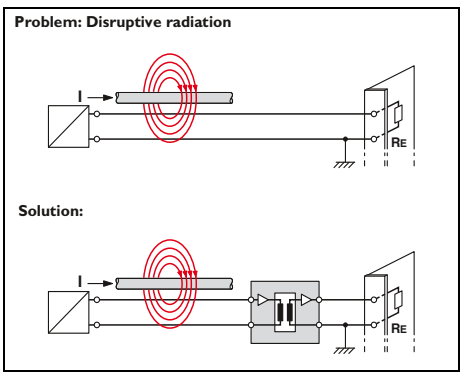
Passive isolation, supplied on the output side (loop-powered)

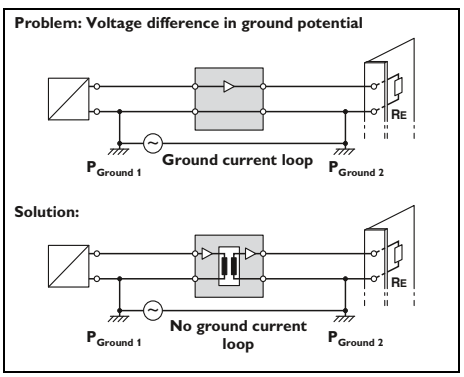
The modules draw the power needed for signal transmission and electrical isolation from the active output circuit, ideally from a PLC input card that supplies power.

On the output side, the loop-powered modules operate with a 4 to 20 mA standard signal. On the input side, the passive isolator processes active signals.

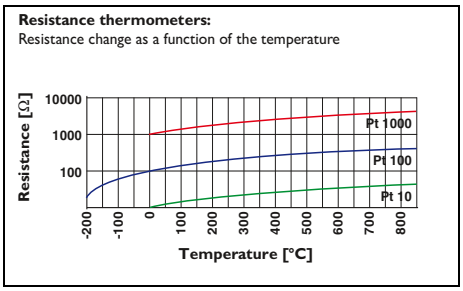
When this isolation method is used, it is important to make sure that the active signal source connected on the output side (e.g., an active PLC input card) is able to supply the passive isolator with power, as well as operate its load.

Applications





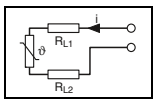
Resistance thermometers



Resistance thermometers (e.g., Pt 100, Ni 1000) change their resistance value depending on the temperature. The measurement and control temperature transducers detect this change and convert it into a proportional analog signal.

To avoid unwanted self-heating of the sensor, the constant measured current used is kept as low as possible (MCR-T-UI... → 250 mA).

Two-conductor connection technology

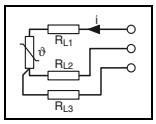


The resistance thermometer is connected to the measurement and control measuring transducer using a two-wire cable. Please note that the supply cable resistances are added to the measured resistance and consequently distort the result.

A distance of 10 m should not be exceeded.

Example: a 50 meter long copper cable with a cross section of 0.5 mm² has a specific resistance of 3.4 Ω. A Pt 100 sensor has a resistance change of 0.384 Ω for every 1 K temperature change. This corresponds to an error of 8.8°C.

Three-conductor connection technology



Three-conductor technology is normally used to minimize the effect of cable resistances. An additional cable is connected to the resistance thermometer, so that the latter can be measured using two measuring circuits, one of which acts as a reference. In this way, it is possible to compensate for the cable resistance.

Identical cable lengths and an identical ambient temperature are essential here.

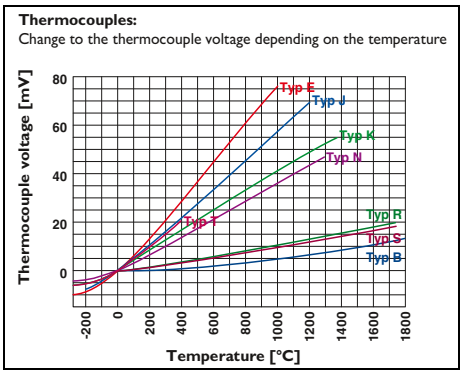
Since this is more or less the case in the majority of applications, three-conductor technology is the most commonly encountered today. Line compensation is not necessary.

Four-conductor connection technology

Four-conductor connection technology is an ideal connection technology for resistance thermometers.

The measurement result is affected neither by cable resistances nor by their temperature-dependent fluctuations. The voltage drop on the supply and return lines can therefore be measured and compensated for separately. Line compensation is not necessary.

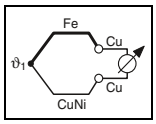
Thermocouples



In contrast to resistance thermometers, thermocouples are active sources that generate a voltage in the microvolt range. The temperature difference measured between the measurement junction and the cold junction is converted into an absolute temperature with the help of cold junction compensation.

Operating principle:

If different metals are joined together, a thermal voltage is produced in the metal atoms as a result of the different binding energies of the electrons. This voltage is dependent firstly on the metals themselves and secondly on the temperature.



If the same temperature prevails at the measuring junction (ϑ_1) and the cold junction (ϑ_2), no current will flow because the generated partial voltages cancel each other out. However, if the temperatures at the measuring junction and the cold junction are different, different voltages are produced. These voltages do not completely cancel each other out, and thus current flows.

A thermocouple thus always measures only one temperature difference. This is derived from the difference between the thermal voltages at the measuring junction and at the cold junction.

The voltage produced by the thermoelectric effect is very low; only a few microvolts per Kelvin.

Example: if a type J thermocouple (FE-CuNi) is connected to a copper terminal, thermal voltages with opposite signs will be generated (at the iron-copper and copper-constantan transitions) and cancel each other out.

Therefore, only the difference in the thermal voltages between constantan (Cu-Ni) and iron is of relevance.

The temperature at the terminal point is also significant. If it is known, the temperature at the measuring junction can be derived by adding the thermal voltage measured at the same junction.

The MCR temperature transducers for thermocouples therefore detect the temperature at the terminal points and compensate this value, which is also referred to as the reference junction or the cold junction.

This process is sometimes called cold junction compensation.

Digital displays

Use of the freely programmable characteristic curve

The freely programmable characteristic curve, i.e., the assignment of the displayed value to the input value, is important in process applications for indicating flow rates or liquid levels.

The purpose of level measurements is very often not to determine how much liquid is still inside the tank, but rather to establish how much has been drawn out of it. In this case, the characteristic curve can simply be inverted in order to display the required value.

Parameterization of the characteristic curve using interpolation points

With non-linear input signals, the received analog values can be assigned to the value to be displayed by means of a programmable characteristic curve. This curve can consist of up to 24 interpolation points. This allows flow sensors with a non-linear characteristic curve to be adapted, for instance. The analog signal digital displays in the Function Line additionally feature a summing function which - to take a typical example from bottling technology - allows you to switch over at the touch of a button from the instantaneous value (= flow rate in l/min) to the total flow integrated in the background, which can be displayed in any unit. This saves space and money, because there is no need for a second digital display.

Limit values can also be called at the touch of a button. Limit values 1 and 2 can be assigned to either the actual value or the cumulative value. If this value is exceeded, one of the two output relays is activated.

Other applications include indicating liquid levels, pressures, and temperatures. With servo motors, the analog output signals (0 to 10 V) generated by the tachometer can be supplied to the input of the digital display in order to indicate the motor speed.

Application:
Pressure measurement and display on MCR-SL-D-U-I

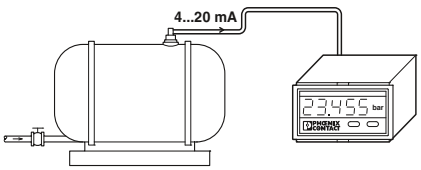
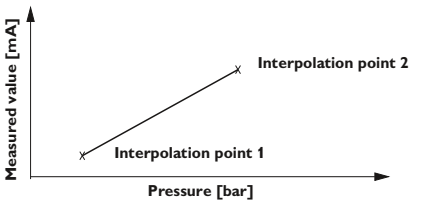


Table:	Analog signal	Display value
Interpolation point 1	4 mA	15 bar
Interpolation point 2	20 mA	30 bar

Characteristic curve:



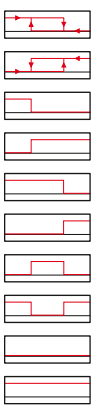
Switching behavior of relay or transistor outputs:

A different kind of switching behavior can be defined for each relay or each transistor when it reaches a preset switching point.

All the possible settings for the switching behavior are shown and explained in the list:

– The first two options include hysteresis, i.e., the behavior of the relay depends on the direction from which a switching point is reached.
– For the remaining options, with the exception of the last two ("on" and "off"), a switching tolerance is taken into account to prevent the relay contact from "chattering". The relay is not switched until the switching point plus switching tolerance has been reached.
– In the "on" state, the relay is permanently picked up. It only responds if there is an open circuit and it has been set to drop out when this happens.
– In the "off" state, the relay only responds if there is an open circuit and it has been set to pick up when this happens.

Possible settings for the switching behavior



Relay picks up when the value is below SPL, hysteresis active

Relay picks up when SPH is exceeded, hysteresis active

Relay picks up when the value is below SPL

Relay picks up when SPL is exceeded

Relay picks up when the value is below SPH

Relay picks up when SPH is exceeded

Relay picks up when value is between SPL and SPH

Relay picks up when value is outside SPL and SPH

Relay is constantly in a de-energized state

Relay is constantly in an energized state

SPL = Set Point Low (lower switching point)
SPH = Set Point High (upper switching point)

Non-intrinsically-safe signal transmission in potentially explosive areas

Electrical equipment operated in systems with potentially explosive areas is subject to different usage requirements, depending on the application.

For example, electrical equipment could be used in the following locations when analog signals are being transmitted:

– Sensors and actuators can be located in Zone 0, Zone 1 or Zone 2.
– Signal transmitters can be located in Zone 1, Zone 2 or the safe area.
– The controller, e.g., PLC, is in the safe area.

For examples of the kinds of electrical devices that can be installed for the purpose of transmitting signals, please see the figure.

Devices must be designed to offer a suitable protection type if they are to be used in Zone 2. The MINI Analog Pro, MINI Analog, and MACX Analog ranges are designed to provide "n" protection for this purpose and must be installed in Zone 2 in suitable and approved housing (EN 60079-15 and EN 60079-0) with at least IP54 protection class.

Example:

A sensor/actuator with protection type "n" can be connected to an isolator from the MINI Analog Pro, MINI Analog or MACX Analog ranges in Zone 2.

When selecting suitable devices for Zone 2, it must be ensured that the electrical data of the sensors and actuators is not exceeded.

If the sensors and actuators are mounted in flameproof enclosure housing or if they have their own flameproof enclosure housing, they can also be installed in Zone 1.

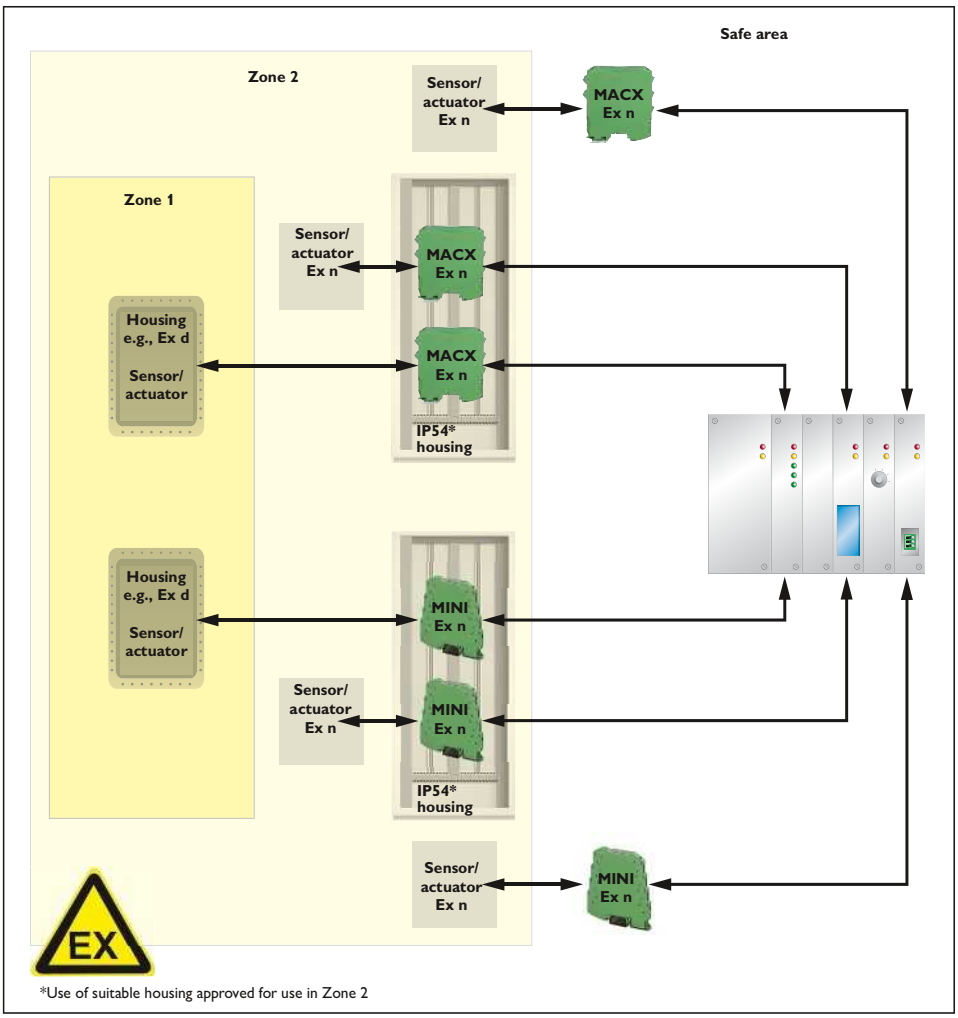
Installation requirements

The figure shows a range of options for installing electrical devices in areas with a danger of gas explosions. Special requirements regarding the configuration, selection, and installation of electrical systems in areas with a danger of gas explosions can be found in EN 60079-14.

In the 2008 edition, relevant content from EN 61241-14 was incorporated in EN 60079-14.

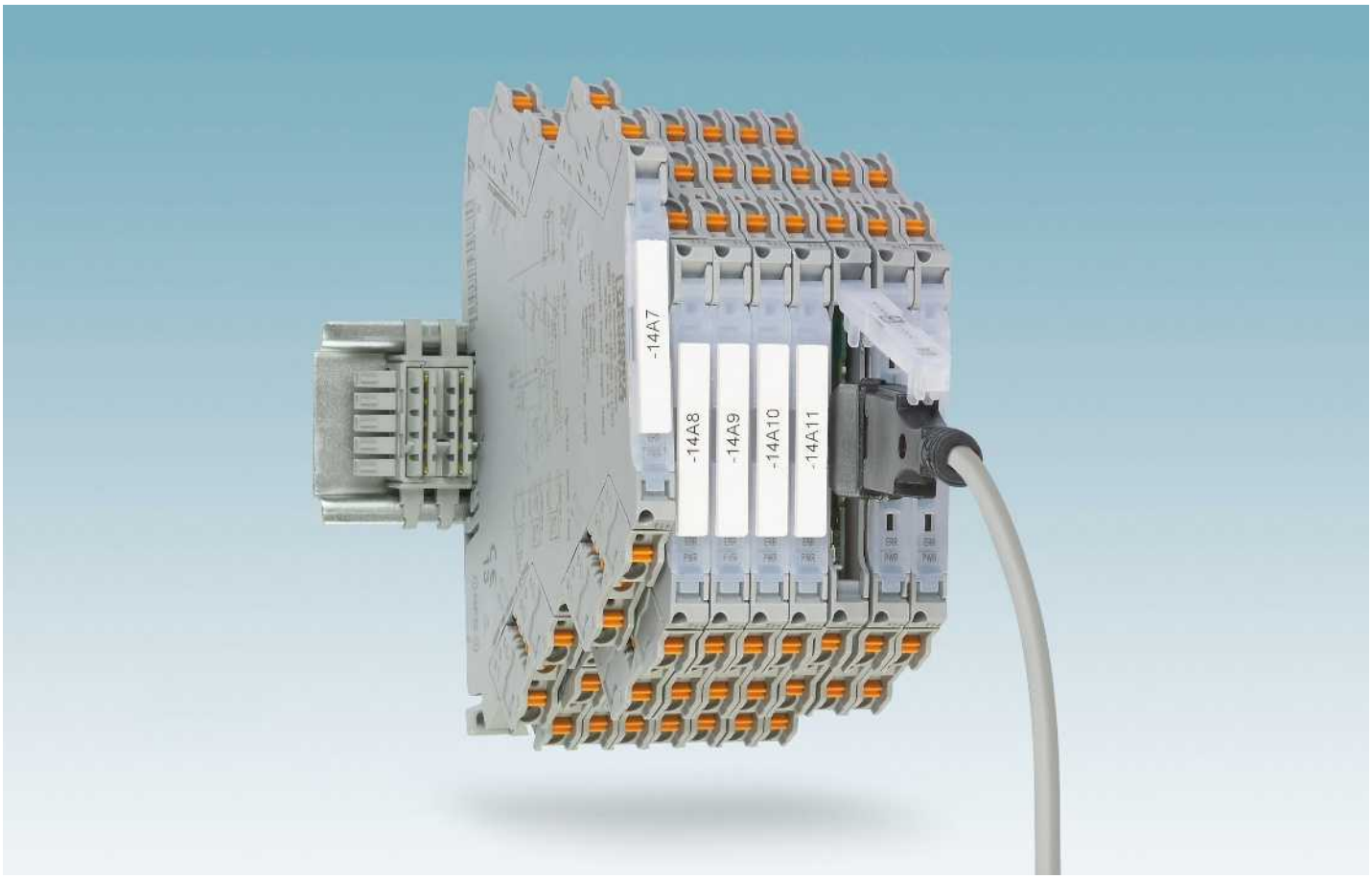
EN 61241-14 must still be observed when installing electrical equipment in areas containing combustible dust. Other important factors when it comes to running systems in potentially explosive areas are inspection, maintenance, and repairs. Specifications regarding these matters can be found in EN 60079-17 and EN 60079-19.

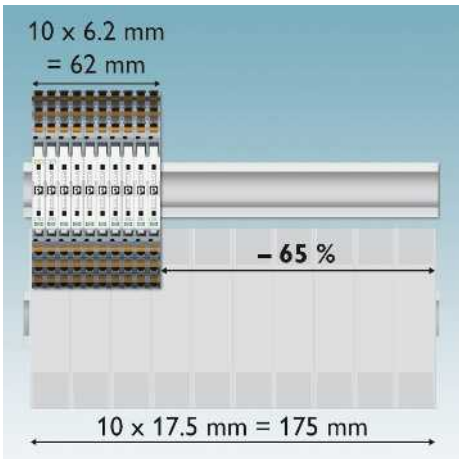
Installation of electrical devices for signal transmission



*Use of suitable housing approved for use in Zone 2

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro





Easier than ever but as slim as before

MINI Analog Pro offers you the easiest installation and startup in confined spaces.

– Space savings of up to 65%

Select from the following categories

– Analog IN/OUT
– Temperature
– Frequency
– Potentiometers
– Digital IN
– Limit values
– Accessories

Easy installation

– Easily visible and accessible terminal points and FASTCON Pro plug-in connection terminal blocks

Power bridging and fault monitoring

– The DIN rail connector simplifies supply and enables remote diagnostics by means of group error monitoring

DIN-rail-connector-compatible
The DIN rail connector enables modular bridging of the 24 V supply voltage.

Measure current signals during operation

Measure signals conveniently for startup and servicing during operation, thanks to integrated knife disconnect terminal blocks.

– The circuit does not have to be disconnected in order to integrate the measuring device in the signal circuit
– By setting the connector to the disconnect position, signal circuits can be easily interrupted during servicing and startup

Numerous parameterization options

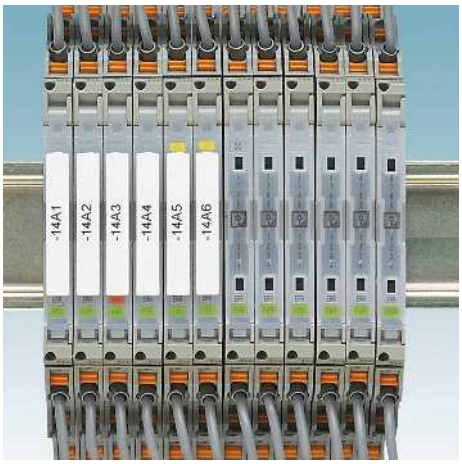
– Via DIP, PC or smartphone app

App functions via NFC communication

Access to information
– Call module information

DIP switch setting help
– Call module information
– Display DIP switch setting help on the smartphone

Configuration via NFC
– Call module information
– Display DIP switch setting help
– Wireless configuration via smartphone



Service-friendly

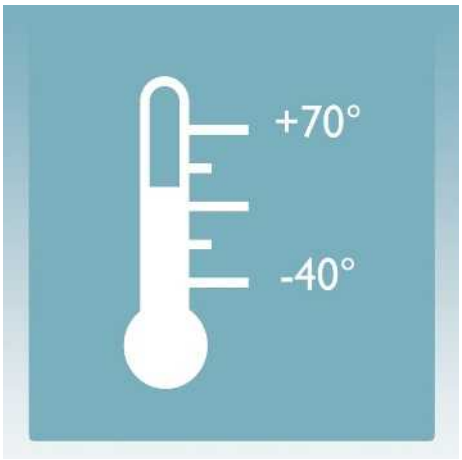
– Large-surface marking areas for complete loop identification using standard marking material as well as permanently visible status LEDs on each module

Choice of connection technology

– Wiring with screw connection or fast and tool-free with Push-in connection technology

Optimum signal quality

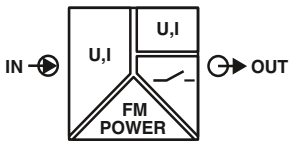
– The latest transmission technology and safe electrical isolation between input, output, and supply with 3 kV test voltage

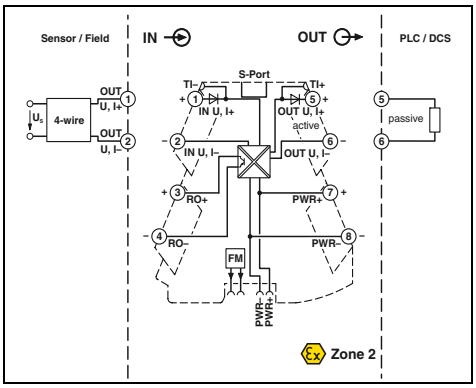


Suitable for any application

– Extended supply voltage and temperature range as well as multifunctional device types

Analog IN/Analog OUT
4-way signal conditioner





Universal 4-way signal conditioner with switching output, configurable

Ex:

Housing width 6.2 mm

- Universally configurable, highly compact signal conditioner with switching output for electrical isolation, conversion, amplification, and filtering of standard analog signals
- Plug-in connection system
- Safe 4-way isolation
- Standard signal combinations configurable via DIP switches
- Freely configurable with software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Limiting behavior at the output configurable
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Technical data

Input data		
Input signal (configurable via DIP switch or freely via software)	U input	I input
	0 V ... 10 V	0 mA ... 20 mA
	2 V ... 10 V	4 mA ... 20 mA
	0 V ... 5 V	0 mA ... 10 mA
	1 V ... 5 V	2 mA ... 10 mA
	10 V ... 0 V	20 mA ... 0 mA
	10 V ... 2 V	20 mA ... 4 mA
	5 V ... 0 V	10 mA ... 0 mA
	5 V ... 1 V	10 mA ... 2 mA
	0 V ... 12 V	0 mA ... 24 mA
Input resistance	> 120 kΩ	approx. 50 Ω (+ 0.7 V for test diode)
Output data	U output	I output
Output signal (configurable via DIP switch or freely via software)	0 V ... 10 V	0 mA ... 20 mA
	2 V ... 10 V	4 mA ... 20 mA
	0 V ... 5 V	0 mA ... 10 mA
	1 V ... 5 V	2 mA ... 10 mA
	0 V ... 10.5 V	0 mA ... 21 mA
Maximum output signal	approx. 12.3 V	24.6 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 600 Ω)	< 20 mV_{PP} (at 600 Ω)
Switching output		
Relay output	1 N/O contact	
Max. switching voltage	30 V DC	
Maximum switching current	100 mA (at 30 V)	
General data	U output	I output
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	32 mA (24 V DC)	63 mA (12 V DC)
Power consumption		≤ 1 W (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)
Maximum transmission error	0.1 % (of final value)	
Temperature coefficient	0.01 %/K , typ. 0.01 %/K	
Step response (10-90%)	approx. 140 ms (15 Hz sample rate) approx. 45 ms (60 Hz sample rate) approx. 25 ms (240 Hz sample rate)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Ambient temperature (operation)	-40 °C ... 70 °C	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
GL	GL applied for	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
4-way signal conditioner with switching output, for electrical isolation of analog signals				
Standard configuration	Push-in connection	**MINI MCR-2-UNI-UI-UIRO-PT**	2902028	1
Standard configuration	Screw connection	**MINI MCR-2-UNI-UI-UIRO**	2902026	1
Order configuration	Push-in connection	**MINI MCR-2-UNI-UI-UIRO-PT-C**	2902027	1
Order configuration	Screw connection	**MINI MCR-2-UNI-UI-UIRO-C**	2902024	1

Accessories

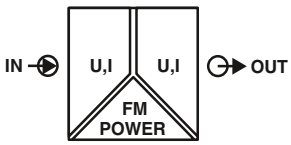
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

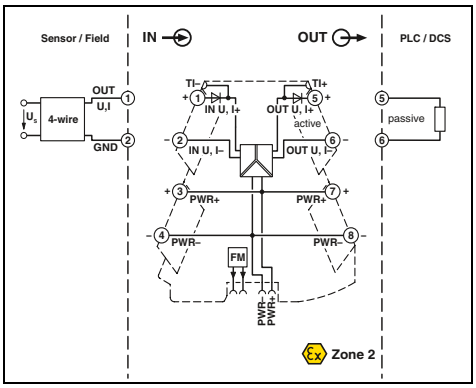
Order key for MINI MCR-2-UNI-UI-UIRO(-PT)(-C) 4-way signal conditioners (standard configuration entered as an example)

Order No.	Input			Sample rate	Output			Output limitation	
	Input signal	Start	End		Output signal	Start	End		
2902024	**I**	**0.0**	**20.0**	**15**	**I**	**0.0**	**20.0**	**0**	**...**
2902024 ≙ MINI MCR-2-UNI-UI-UIRO-C 2902027 ≙ MINI MCR-2-UNI-UI-UIRO-PT-C	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	15 ≙ 15 Hz 60 ≙ 60 Hz 240 ≙ 240 Hz	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	0 ≙ OFF 1 ≙ ON	
	Measuring range span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA				Output signal span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA				

	Failure information			
	Behavior in the event of an error	Open circuit/short circuit	Measured value overrange	Measured value underrange
...	**NE43DO**	**0.0**	**0.0**	**0.0**
	FD ≙ Freely definable	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (free definition only for unlimited output) (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (free definition only for unlimited output) (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (free definition only for unlimited output) (signal type corresponds to selected output signal)
	Note: Failure information according to NE 43 can only be selected for 4 ... 20 mA output			
	NE43UP ≙ NE 43 upscale NE43DO ≙ NE 43 downscale NE430 ≙ NE 43 0 mA NE43UD ≙ NE 43 upscale/downscale	21.5 mA 3.5 mA 0 mA 3.5 mA	21.5 mA 3.5 mA 0 mA 21.5 mA	21.5 mA 3.5 mA 0 mA 21.5 mA

Analog IN/Analog OUT
3-way signal conditioner





3-way signal conditioner for standard signals, configurable

Ex:

Housing width 6.2 mm

- Configurable, ultra-compact signal conditioner for electrical isolation, conversion, amplification, and filtering of standard analog signals
- Plug-in connection system
- Safe 3-way isolation
- Standard signal combinations configurable via DIP switches
- Power supply and fault monitoring possible via DIN rail connector
- Status LED

Notes:

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Technical data

Input data	**U input**	**I input**
Input signal (configurable using the DIP switch)	0 V ... 5 V 1 V ... 5 V -5 V ... 5 V 0 V ... 10 V 2 V ... 10 V -10 V ... 10 V 0 V ... 20 V 4 V ... 20 V -20 V ... 20 V 0 V ... 24 V 4.8 V ... 24 V -24 V ... 24 V 0 V ... 30 V 6 V ... 30 V -30 V ... 30 V	0 mA ... 20 mA 4 mA ... 20 mA -20 mA ... 20 mA
Input resistance	> 1000 kΩ	approx. 63 Ω (+ 0.7 V for test diode)
Output data	**U output**	**I output**
Output signal (configurable using the DIP switch)	0 V ... 5 V 1 V ... 5 V -5 V ... 5 V 0 V ... 10 V 2 V ... 10 V -10 V ... 10 V	0 mA ... 20 mA 4 mA ... 20 mA
Maximum output signal		22 mA
No-load voltage		< 17 V
Short-circuit current	< 32 mA	
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 600 Ω)	< 20 mV_{PP} (at 600 Ω)
General data	**U output**	**I output**
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	25 mA (Current output, at 24 V DC incl. load)	54 mA (Current output, at 12 V DC incl. load)
Power consumption		≤ 800 mW (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)
Maximum transmission error	≤ 0.1 % (of final value)	
Temperature coefficient	0.01 %/K , typ. 0.01 %/K	
Limit frequency (3 dB)	30 Hz (via DIP switch)	
Step response (10-90%)	< 8.5 ms (with 30 Hz filter)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Mounting	any	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
DNV GL	C, EMC2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
3-way signal conditioner, for electrical isolation of analog signals				
Standard configuration	Push-in connection	**MINI MCR-2-UI-UI-PT**	2902040	1
Standard configuration	Screw connection	**MINI MCR-2-UI-UI**	2902037	1
Order configuration	Push-in connection	**MINI MCR-2-UI-UI-PT-C**	2902039	1
Order configuration	Screw connection	**MINI MCR-2-UI-UI-C**	2902036	1

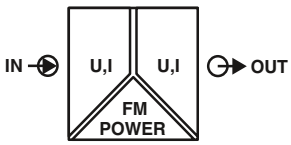
Order key for MINI MCR-2-UI-UI(-PT)(-C) 3-way signal conditioners (standard configuration entered as an example)

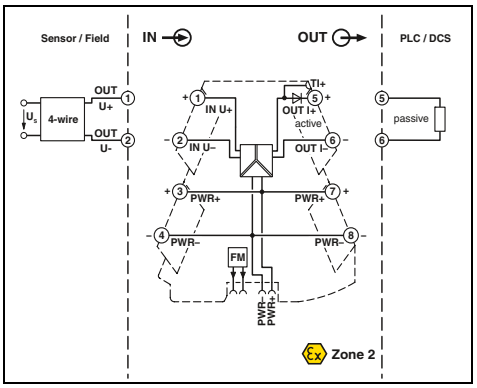
Order No.	Input	Output	Cut-off frequency
2902036	IN03	OUT01	5K
2902036 ≙ MINI MCR-2-UI-UI-C 2902039 ≙ MINI MCR-2-UI-UI-PT-C	IN 01 ≙ 0 ... 20 mA IN 02 ≙ 4 ... 20 mA IN 03 ≙ 0 ... 10 V IN 04 ≙ 2 ... 10 V IN 05 ≙ 0 ... 5 V IN 06 ≙ 1 ... 5 V IN 21 ≙ -5 ... 5 V IN 22 ≙ -10 ... 10 V IN 23 ≙ -20 ... 20 V IN 32 ≙ 0 ... 20 V IN 35 ≙ -20 ... 20 mA IN 38 ≙ 0 ... 24 V IN 39 ≙ 0 ... 30 V IN 80 ≙ -30 ... 30 V IN 93 ≙ -24 ... 24 V IN 94 ≙ 4.8 ... 24 V IN 95 ≙ 6 ... 30 V IN 96 ≙ 4 ... 20 V	OUT 01 ≙ 0 ... 20 mA OUT 02 ≙ 4 ... 20 mA OUT 03 ≙ 0 ... 10 V OUT 04 ≙ 2 ... 10 V OUT 05 ≙ 0 ... 5 V OUT 06 ≙ 1 ... 5 V OUT 13 ≙ -5 ... 5 V OUT 14 ≙ -10 ... 10 V	30 Hz 5 kHz

Signal combinations for MINI MCR-2-UI-UI(-PT)(-C) signal conditioners

	Output							
Input	0 ... 20 mA	4 ... 20 mA	0 ... 5 V	1 ... 5 V	-5 ... 5 V	0 ... 10 V	2 ... 10 V	-10 ... 10 V
0 ... 20 mA	X	X	X	X	X	X	X	X
4 ... 20 mA	X	X	X	X	X	X	X	X
-20 ... 20 mA	X	X	X	X	X	X	X	X
0 ... 5 V	X	X	X	X	X	X	X	X
1 ... 5 V	X	X	X	X	X	X	X	X
-5 ... 5 V	X	X	X	X	X	X	X	X
0 ... 10 V	X	X	X	X	X	X	X	X
2 ... 10 V	X	X	X	X	X	X	X	X
-10 ... 10 V	X	X	X	X	X	X	X	X
0 ... 20 V	X	X	X	X	X	X	X	X
4 ... 20 V	X	X	X	X	X	X	X	X
-20 ... 20 V	X	X	X	X	X	X	X	X
0 ... 24 V	X	X	X	X	X	X	X	X
4.8 ... 24 V	X	X	X	X	X	X	X	X
-24 ... 24 V	X	X	X	X	X	X	X	X
0 ... 30 V	X	X	X	X	X	X	X	X
6 ... 30 V	X	X	X	X	X	X	X	X
-30 ... 30 V	X	X	X	X	X	X	X	X

Analog IN/Analog OUT
3-way signal conditioner





Ex n

NFC

3-way signal conditioner with fixed signal combinations

Ex:

- Highly compact signal conditioner for electrical isolation, conversion, amplification, and filtering of standard analog signals
- Fixed signal combinations
- Plug-in connection system
- Safe 3-way isolation
- Power supply and fault monitoring possible via DIN rail connector
- Status LED

Notes:

Information on MINI Analog Pro accessories can be found from page 101

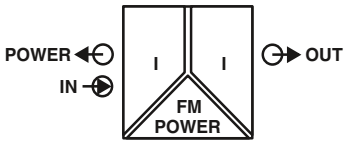
Technical data

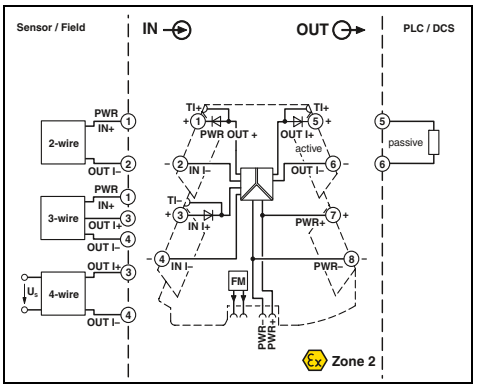
Input data		
Input resistance	U input	I input
	approx. 1 MΩ	approx. 63 Ω (+ 0.7 V for test diode)
Output data	U output	I output
Maximum output signal	11 V	22 mA
No-load voltage		< 17 V
Short-circuit current		< 15 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 10 kΩ)	< 20 mV_{PP} (at 600 Ω)
General data		
Supply voltage U_B	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Typ. current consumption	25 mA (24 V DC)	
Maximum transmission error	0.1 % (of final value)	
Temperature coefficient	0.01 %/K , typ. 0.01 %/K	
Limit frequency (3 dB)	approx. 30 Hz	
Step response (10-90%)	approx. 10 ms	
Degree of protection	IP20	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Ambient temperature (operation)	-40 °C ... 70 °C	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
DNV GL	C, EMC2	

Ordering data

Description	Input signal	Output signal	Type	Order No.	Pcs./ Pkt.
3-way signal conditioner, for electrical isolation of analog signals					
Push-in connection	0 ... 10 V	0 ... 20 mA	**MINI MCR-2-U-I0-PT**	2902023	1
Screw connection	0 ... 10 V	0 ... 20 mA	**MINI MCR-2-U-I0**	2902022	1
Push-in connection	0 ... 10 V	4 ... 20 mA	**MINI MCR-2-U-I4-PT**	2902030	1
Screw connection	0 ... 10 V	4 ... 20 mA	**MINI MCR-2-U-I4**	2902029	1
Push-in connection	0 ... 20 mA	0 ... 10 V	**MINI MCR-2-I0-U-PT**	2902001	1
Screw connection	0 ... 20 mA	0 ... 10 V	**MINI MCR-2-I0-U**	2902000	1
Push-in connection	4 ... 20 mA	0 ... 10 V	**MINI MCR-2-I4-U-PT**	2902003	1
Screw connection	4 ... 20 mA	0 ... 10 V	**MINI MCR-2-I4-U**	2902002	1
Push-in connection	0 ... 20 mA, 4 ... 20 mA	0 ... 20 mA, 4 ... 20 mA	**MINI MCR-2-I-I-PT**	2901999	1
Screw connection	0 ... 20 mA, 4 ... 20 mA	0 ... 20 mA, 4 ... 20 mA	**MINI MCR-2-I-I**	2901998	1
Push-in connection	0 ... 10 V, -10 ... 10 V	0 ... 10 V, -10 ... 10 V	**MINI MCR-2-U-U-PT**	2902043	1
Screw connection	0 ... 10 V, -10 ... 10 V	0 ... 10 V, -10 ... 10 V	**MINI MCR-2-U-U**	2902042	1

Analog IN/Analog OUT
3-way repeater power supply





3-way repeater power supply

Ex:

Housing width 6.2 mm

- Highly compact repeater power supply for electrical isolation, conversion, amplification, and filtering of standard analog signals
- Supply of 2-wire and passive 3-wire sensors
- Can also be used as an isolator without supply
- Plug-in connection system
- Safe 3-way isolation
- Power supply and fault monitoring possible via DIN rail connector
- Status LED

Notes:

Information about power bridging, system cabling, and marking components can be found from page 98

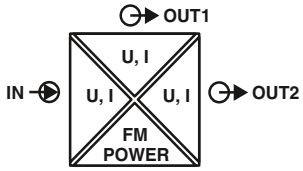
Technical data

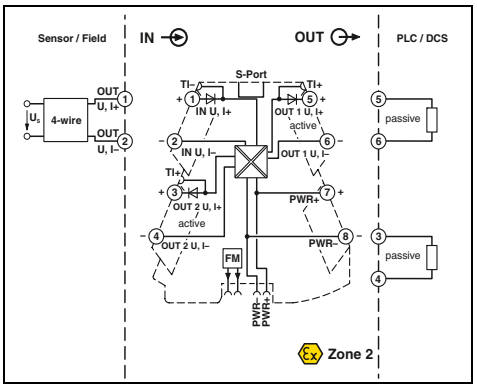
Input data	
Input signal	0 ... 20 mA , isolator operation / 4 ... 20 mA , repeater power supply and isolator operation
Input resistance	approx. 68 Ω (+ 0.7 V for test diode)
Transmitter supply voltage	> 19.5 V
Output data	
Output signal	0 ... 20 mA / 4 ... 20 mA
Maximum output signal	24 mA
No-load voltage	< 20 V
Load R_B	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 600 Ω)
General data	
Supply voltage range	9.6 V DC ... 30 V DC
Nominal supply voltage	24 V DC
Current consumption	25 mA (at 24 V DC and in isolator operation)
Power consumption	≤ 1400 mW (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)
Maximum transmission error	0.1 % (of final value)
Temperature coefficient	0.01 %/K , typ. 0.01 %/K
Limit frequency (3 dB)	> 1.75 kHz (typ.)
Step response (10-90%)	< 200 µs (typ.)
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Mounting	any
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC T5
DNV GL	C, EMC2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
3-way repeater power supply			
Push-in connection	**MINI MCR-2-RPSS-I-I-PT**	2902015	1
Screw connection	**MINI MCR-2-RPSS-I-I**	2902014	1

Analog IN/Analog OUT
4-way signal duplicator





4-way signal duplicator

Ex:

Housing width 6.2 mm

- Universally configurable, highly compact 4-way signal duplicator
- For electrical isolation, conversion, amplification, and filtering of standard signals
- Independently adjustable outputs
- Input side for current signals from 0 to 24 mA or voltage signals from 0 to 12 V
- Supports fault monitoring
- Plug-in connection system
- Safe 4-way isolation
- Standard behavior can be configured via DIP switches
- Freely configurable via software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Technical data

Input data	U input	I input
Input signal (configurable via DIP switch or freely via software)	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 1 V ... 5 V 0 V ... 12 V	0 mA ... 20 mA 4 mA ... 20 mA 0 mA ... 10 mA 20 mA ... 0 mA 0 mA ... 24 mA
Maximum input signal	12 V	24 mA
Input resistance	> 120 kΩ	approx. 50 Ω (+ 0.7 V for test diode)
Output data	U output	I output
Output signal (configurable via DIP switch or freely via software)	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 1 V ... 5 V 0 V ... 10.5 V	0 mA ... 20 mA 4 mA ... 20 mA 0 mA ... 10 mA 20 mA ... 0 mA 0 mA ... 21 mA
Maximum output signal	approx. 12.3 V	24.6 mA
No-load voltage		≤ 18.5 V
Short-circuit current	≤ 25 mA	
Load R_B	≥ 10 kΩ	≤ 600 Ω (per channel)
Ripple	< 20 mV_{PP} (at 600 Ω)	< 20 mV_{PP} (at 600 Ω)
General data	U output	I output
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	55 mA (24 V DC)	110 mA (12 V DC)
Power consumption		1.5 W (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)
Maximum transmission error	0.1 % (of final value)	
Temperature coefficient	0.01 %/K	
Step response (10-90%)	approx. 140 ms (15 Hz sample rate) approx. 45 ms (60 Hz sample rate) approx. 25 ms (240 Hz sample rate)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Mounting	any	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	Ex II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
GL	GL applied for	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
4-way signal duplicator, with independently adjustable outputs				
Standard configuration	Push-in connection	**MINI MCR-2-UNI-UI-2UI-PT**	2905028	1
Standard configuration	Screw connection	**MINI MCR-2-UNI-UI-2UI**	2905026	1
Order configuration	Push-in connection	**MINI MCR-2-UNI-UI-2UI-PT-C**	2905027	1
Order configuration	Screw connection	**MINI MCR-2-UNI-UI-2UI-C**	2905025	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

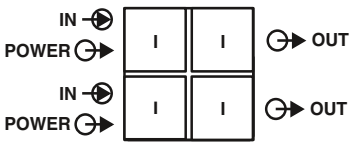
Order key for MINI MCR-2-UNI-UI-2UI(-PT)(-C) 4-way signal duplicators (standard configuration entered as an example)

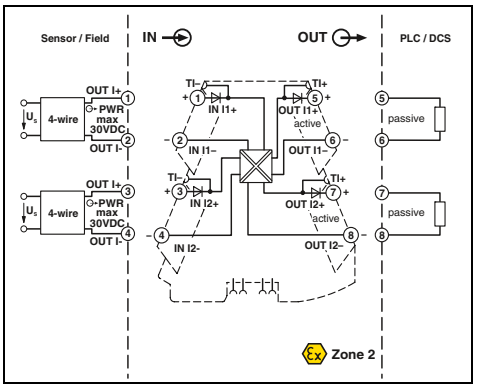
Order No.	Input			Output		Output limitation
	Input signal	Start	End	Output 1	Output 2	
2905025	**I**	**0.0**	**20.0**	**I**	**0.0**	**0**
2905025 ≙ MINI MCR-2-UNI-UI-2UI-C 2905027 ≙ MINI MCR-2-UNI-UI-2UI-PT-C	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	OUT01 ≙ 0 ... 20 mA OUT02 ≙ 4 ... 20 mA OUT03 ≙ 0 ... 10 V OUT04 ≙ 2 ... 10 V OUT05 ≙ 0 ... 5 V OUT06 ≙ 1 ... 5 V OUT16 ≙ 0 ... 10 mA OUT07 ≙ 20 ... 0 mA OUT08 ≙ 20 ... 4 mA	OUT01 ≙ 0 ... 20 mA OUT02 ≙ 4 ... 20 mA OUT03 ≙ 0 ... 10 V OUT04 ≙ 2 ... 10 V OUT05 ≙ 0 ... 5 V OUT06 ≙ 1 ... 5 V OUT16 ≙ 0 ... 10 mA OUT07 ≙ 20 ... 0 mA OUT08 ≙ 20 ... 4 mA	0 ≙ OFF 1 ≙ ON
	Measuring range span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA			Output signal span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA		

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

Analog IN/Analog OUT
2-way passive isolator, input loop-powered

new





Either 1 or 2-channel

Ex:

Housing width 6.2 mm

- Highly compact 2-way repeater power supply
- Input loop-powered
- Does not require any additional auxiliary voltage
- For electrical isolation and filtering of analog signals
- Powered via the current loop of the sensor
- Input signal = output signal 0(4) to 20 mA
- Plug-in connection system
- Status LED

Notes:

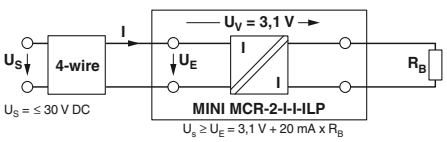
Information on MINI Analog Pro accessories can be found from page 101

Technical data

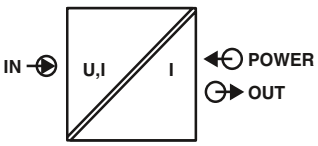
Input data	
Input signal	0 ... 20 mA / 4 ... 20 mA
Input voltage limitation	30 V
Voltage drop	3.1 V (I = 20 mA)
Response current	approx. 200 µA
Output data	
Output signal	0 ... 20 mA / 4 ... 20 mA
Load R_B	< 600 Ω (at I = 20 mA output signal)
Transmission behavior	1:1 to input signal
General data	
Maximum transmission error	≤ 0.1 % (of final value)
Additional error per 100 Ω load	< 0.075 % (of measured value / 100 Ω load)
Temperature coefficient	≤ 0.002 %/K (of measured value / 100 Ω load)
Limit frequency (3 dB)	100 Hz
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Mounting	any
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 24 - 12
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
GL	GL applied for

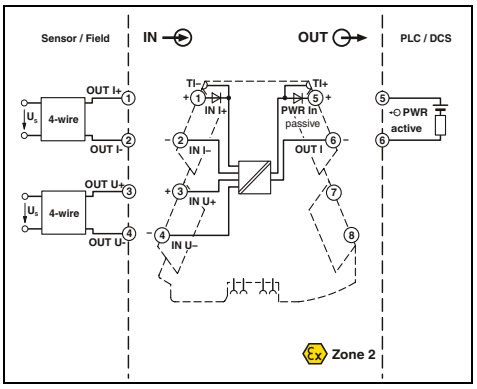
Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Input loop-powered 2-way isolator, for isolating current signals without auxiliary power				
single-channel	Push-in connection	**MINI MCR-2-I-I-ILP-PT**	2901995	1
single-channel	Screw connection	**MINI MCR-2-I-I-ILP**	2901994	1
two-channel	Push-in connection	**MINI MCR-2-2I-2I-ILP-PT**	2901997	1
two-channel	Screw connection	**MINI MCR-2-2I-2I-ILP**	2901996	1



Analog IN/Analog OUT 2-way passive isolator, output loop-powered





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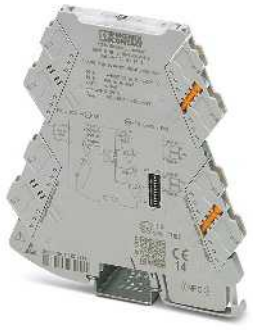


Configurable, up to 74 signal combinations

Ex:

Housing width 6.2 mm

- Highly compact passive isolator for electrical isolation and filtering of standard analog signals
- Safe 2-way isolation
- Output loop-powered
- Does not require any additional auxiliary voltage
- Up to 74 signal combinations can be configured using DIP switches
- Plug-in connection system
- Voltage input from mV voltages up to 30 V
- Current input from 2 to 40 mA
- Status LED

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Information on MINI Analog Pro accessories can be found from page 101

Technical data

	U input	I input
Input data		
Input signal (configurable using the DIP switch)	2 ... 10 V , additional areas can be configured, see table	
Maximum input signal	< 30 V	50 mA (Dielectric strength up to 30 V)
Input resistance	approx. 100 kΩ (At ≤ 1 V, otherwise approximately 1 MΩ)	25 Ω (+ 0.7 V for test diode)
Output data		
Output signal	4 ... 20 mA	
Maximum output signal	32 mA	
Load R_B	(U_B - 8 V) / 22 mA	
Ripple	< 10 mV_{rms} (at 600 Ω)	
General data		
Current consumption	≤ 20 mA	
Maximum transmission error	≤ 0.1 % (of final value)	
Temperature coefficient	0.01 %/K , typ. 0.005 %/K	
Limit frequency (3 dB)	approx. 30 Hz	
Step response (10-90%)	20 ms	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC T5	

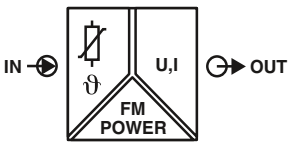
Ordering data

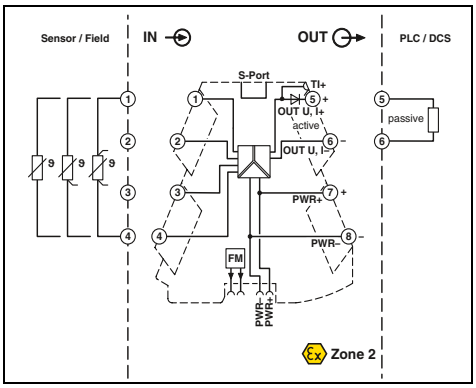
Description		Type	Order No.	Pcs./ Pkt.
Output loop-powered 2-way isolator, for isolating current signals without auxiliary power				
Standard configuration	Push-in connection	**MINI MCR-2-UI-I-OLP-PT**	2902063	1
Standard configuration	Screw connection	**MINI MCR-2-UI-I-OLP**	2902061	1
Order configuration	Push-in connection	**MINI MCR-2-UI-I-OLP-PT-C**	2902062	1
Order configuration	Screw connection	**MINI MCR-2-UI-I-OLP-C**	2902060	1

Order key for MINI MCR-2-UI-I-OLP(-PT)(-C)

Order No.	Input					
2902060	/ 0 mV ... 1000 mV					
2902060 ≙ MINI MCR-2-UI-I-OLP-C	0 mV ... 1000 mV	0 V ... 10 V	-1000 mV ... 1000 mV	-10 V ... 10 V	0 mA ... 40 mA	-2 mA ... 2 mA
	0 mV ... 750 mV	0 V ... 7.5 V	-750 mV ... 750 mV	-7.5 V ... 7.5 V	0 mA ... 30 mA	-3 mA ... 3 mA
	0 mV ... 500 mV	0 V ... 5 V	-500 mV ... 500 mV	-5 V ... 5 V	0 mA ... 20 mA	-10 mA ... 10 mA
	0 mV ... 300 mV	0 V ... 3 V	-300 mV ... 300 mV	-3 V ... 3 V	0 mA ... 12 mA	-15 mA ... 15 mA
2902062 ≙ MINI MCR-2-UI-I-OLP-PT-C	0 mV ... 250 mV	0 V ... 2.5 V	-250 mV ... 250 mV	-2.5 V ... 2.5 V	0 mA ... 10 mA	-20 mA ... 20 mA
	0 mV ... 200 mV	0 V ... 2 V	-200 mV ... 200 mV	-2 V ... 2 V	0 mA ... 8 mA	-30 mA ... 30 mA
	0 mV ... 150 mV	0 V ... 1.5 V	-125 mV ... 125 mV	-1.25 V ... 1.25 V	0 mA ... 7.5 mA	-40 mA ... 40 mA
	0 mV ... 125 mV	0 V ... 1.25 V	-120 mV ... 120 mV	-1.2 V ... 1.2 V	0 mA ... 5 mA	
	0 mV ... 120 mV	0 V ... 1.2 V	-150 mV ... 150 mV	-1.5 V ... 1.5 V	0 mA ... 6 mA	
	0 mV ... 100 mV	0 V ... 30 V	-100 mV ... 100 mV	-30 V ... 30 V	0 mA ... 4 mA	
	0 mV ... 75 mV	0 V ... 25 V	-75 mV ... 75 mV	-25 V ... 25 V	0 mA ... 3 mA	
	0 mV ... 60 mV	0 V ... 20 V	-60 mV ... 60 mV	-20 V ... 20 V	0 mA ... 2.5 mA	
	0 mV ... 50 mV	0 V ... 12.5 V	-50 mV ... 50 mV	-12.5 V ... 12.5 V	0 mA ... 2 mA	
		0 V ... 12 V		-12 V ... 12 V	4 mA ... 20 mA	
		0 V ... 15 V		-15 V ... 15 V	2 mA ... 10 mA	
		2 V ... 10 V		1 V ... 5 V	1 mA ... 5 mA	

Temperature
Temperature transducer
for resistance thermometers





Universal temperature transducer for resistance thermometers

Ex:

Housing width 6.2 mm

- Universally configurable, highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of resistance thermometer and remote resistance-type sensor signals
- For 2, 3 or 4-wire sensors according to IEC 751, JIS, GOST

- Plug-in connection system
- Safe 3-way isolation
- Standard signal combinations configurable via DIP switches
- Freely configurable with software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Technical data

Input data		
Input signal (can be configured using DIP switches)	Pt, Ni, Cu sensors : 2, 3, 4-wire	
Temperature range	-200 °C ... 850 °C (Range depends on sensor type, range can be set freely via software or in increments from -150°C to 850°C via DIP switches)	
Measuring range span	≥ 20 K	
Linear resistance measuring range	0 Ω ... 4000 Ω (Minimum measuring span: 10% of the selected measuring range)	
Output data	U output	I output
Output signal (configurable via DIP switch or freely via software)	0 ... 5 V / 1 ... 5 V	0 ... 20 mA / 4 ... 20 mA
	0 ... 10 V / 10 ... 0 V	20 ... 0 mA / 20 ... 4 mA
Maximum output signal	approx. 12.3 V	24.6 mA
No-load voltage		< 17.5 V
Short-circuit current	< 31.5 mA	
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 10 mV_{rms}	< 10 mV_{rms} (at 600 Ω)
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Current consumption	32 mA (24 V DC)	
Power consumption	≤ 850 mW (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)	
Transmission error	0.1 % * 350 K / set measuring range; 0.1 % > 350 K (Pt/Ni) 0.3 % * 200 K / set measuring range; 0.3 % > 200 K (Cu)	
Temperature coefficient	0.01 %/K	
Step response (0–99%)	typ. 200 ms (2-wire) typ. 500 ms (3-wire) typ. 500 ms (4-wire)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Ambient temperature (operation)	-40 °C ... 70 °C	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
DNV GL	C, EMC2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer for resistance thermometers				
Standard configuration	Push-in connection	**MINI MCR-2-RTD-UI-PT**	2902052	1
Standard configuration	Screw connection	**MINI MCR-2-RTD-UI**	2902049	1
Order configuration	Push-in connection	**MINI MCR-2-RTD-UI-PT-C**	2902051	1
Order configuration	Screw connection	**MINI MCR-2-RTD-UI-C**	2902048	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Order key for MINI MCR-2-RTD-UI(-PT)(-C) temperature transducers (standard configuration entered as example)

Order No.	Sensor type	Connection technology	Measuring range Start	Measuring range End	Measuring unit	Output Output signal	Output Start	Output End
2902048	**PT100**	**3**	**-50**	**150**	**C**	**I**	**4.0**	**20.0**
2902048 ≙ MINI MCR-2-RTD-UI-C 2902051 ≙ MINI MCR-2-RTD-UI-PT-C	PT100 ≙ Pt 100 IEC 751 PT200 ≙ Pt 200 IEC 751 PT500 ≙ Pt 500 IEC 751 PT1000 ≙ Pt 1000 IEC 751 PT100G ≙ Pt 100 GOST 6651-2009 (α = 0.00394) PT1000G ≙ Pt 1000 GOST 6651-2009 (α = 0.00394) PT100J ≙ Pt 100 JIS C1604/1997 PT1000J ≙ Pt 1000 JIS C1604/1997 NI100 ≙ Ni 100 DIN 43760 NI1000 ≙ Ni 1000 DIN 43760 CU50 ≙ Cu 50 GOST 6651-2009 (α = 0.00428) CU100 ≙ Cu 100 GOST 6651-2009 (α = 0.00428) CU53 ≙ Cu 53 GOST 6651-2009 (α = 0.00426)	2 ≙ 2-conductor 3 ≙ 3-conductor 4 ≙ 4-conductor	freely selectable between -200°C ... 850°C (measuring range limits depend on sensor type)	freely selectable between -200°C ... 850°C (measuring range limits depend on sensor type)	C ≙ °C F ≙ °F	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V
			Minimum measuring span 20 K			Output signal span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA		

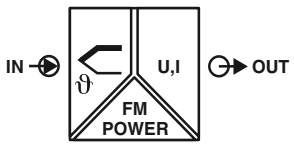
Failure information

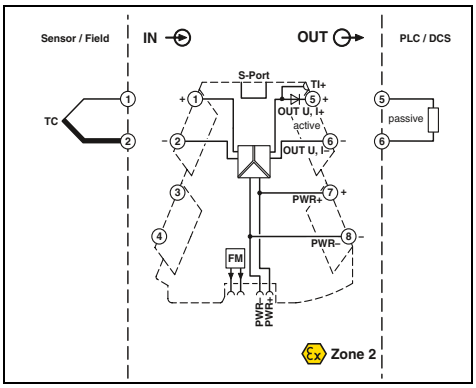
...	Behavior in the event of an error	Open circuit	Short circuit	Measured value overrange	Measured value underrange
	NE43DO	**0.0**	**0.0**	**0.0**	**0.0**
	FD ≙ Freely definable	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)
	Note: Failure information according to NE 43 can only be selected for 4 ... 20 mA output				
	NE43UP ≙ NE 43 upscale	21.5 mA	21.5 mA	21.5 mA	21.5 mA
	NE43DO ≙ NE 43 downscale	3.5 mA	3.5 mA	3.5 mA	3.5 mA
	NE430 ≙ NE 43 0 mA	0 mA	0 mA	0 mA	0 mA
	NE43UD ≙ NE 43 upscale/downscale	3.5 mA	3.5 mA	21.5 mA	21.5 mA

Sensor types and measuring ranges for MINI MCR-2-RTD-UI(-PT)(-C) temperature transducers

Sensor type	Standard	Measuring range	Smallest measuring span	Adjustable using:
Pt 100	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C to +850°C	20 K	DIP switches
Pt 200	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C to +850°C	20 K	DIP switches
Pt 500	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C to +850°C	20 K	Software or smartphone app
Pt 1000	IEC 751 = GOST 6651-2009 (α = 0.00385)	-200°C to +850°C	20 K	Software or smartphone app
Pt 100	GOST 6651-2009 (α = 0.00391)	-200°C to +850°C	20 K	Software or smartphone app
Pt 1000	GOST 6651-2009 (α = 0.00391)	-200°C to +850°C	20 K	Software or smartphone app
Pt 100	JIS C1604-1997	-200°C to +850°C	20 K	Software or smartphone app
Pt 1000	JIS C1604-1997	-200°C to +850°C	20 K	Software or smartphone app
Ni100	DIN 43760	-60°C to +250°C	20 K	Software or smartphone app
Ni 1000	DIN 43760	-60°C to +250°C	20 K	Software or smartphone app
Cu50	GOST 6651-2009 (α = 0.0428)	-180°C to +200°C	20 K	Software or smartphone app
Cu100	GOST 6651-2009 (α = 0.0428)	-180°C to +200°C	20 K	Software or smartphone app
Cu53	GOST 6651-2009 (α = 0.0426)	-50°C to +180°C	20 K	Software or smartphone app
Customer-specific characteristic curves		-200°C to +850°C	20 K	Software or smartphone app

Temperature
Temperature transducer for thermocouples





Universal temperature transducer for thermocouples

Ex:

Housing width 6.2 mm

- Universally configurable, highly compact temperature transducer for electrical isolation, conversion, amplification, and filtering of thermocouple signals
- For thermocouples according to IEC 584 and GOST
- Internal cold junction compensation
- Plug-in connection system
- Safe 3-way isolation
- Standard signal combinations configurable via DIP switches
- Freely configurable with software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Technical data

Input data		
Input signal (can be configured using DIP switches)	B, C, E, J, K, N, R, S, T, L, U, A-1, A-2, A-3, M, L	
Temperature range	-250 °C ... 2500 °C (Range depends on sensor type, range can be set freely via software or in increments from -150°C to 1350°C via DIP switches)	
Measuring range span	min. 50 K	
Output data	U output	I output
Output signal (configurable via DIP switch or freely via software)	0 ... 5 V / 1 ... 5 V	0 ... 20 mA / 4 ... 20 mA
	0 ... 10 V / 10 ... 0 V	20 ... 0 mA / 20 ... 4 mA
Maximum output signal	approx. 12.3 V	24.6 mA
No-load voltage		< 17.5 V
Short-circuit current	< 31.5 mA	
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 10 mV_{rms}	< 10 mV_{rms} (at 600 Ω)
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Current consumption	32.7 mA (24 V DC)	
Power consumption	≤ 850 mW (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)	
Transmission error	0.1% * 600 K / set measuring range; 0.1% > 600 K (C, E, J, K, N, T, L, U, M Gost, L Gost) 0.2 % * 600 K / set measuring range; 0.2 % > 600 K (B, R, S, A1, A2, A3) 0.2% * 600 K / set measuring range; 0.2% > 600 K (E, J, K, N, T, L, U, M Gost, L Gost); Highspeed Mode 0.4% * 600 K / set measuring range; 0.4% > 600 K (B, R, S, A1, A2, A3); Highspeed Mode	
Cold junction errors	- (typ. 2 K (2 K + (0,2 K * ΔT)))	
Temperature coefficient	≤ 0.01 %/K	
Step response (0–99%)	typ. 400 ms (Highspeed Mode: typ. 150 ms)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Ambient temperature (operation)	-40 °C ... 70 °C	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
DNV GL	C, EMC2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer for thermocouples				
Standard configuration	Push-in connection	**MINI MCR-2-TC-UI-PT**	2905249	1
Standard configuration	Screw connection	**MINI MCR-2-TC-UI**	2902055	1
Order configuration	Push-in connection	**MINI MCR-2-TC-UI-PT-C**	2905248	1
Order configuration	Screw connection	**MINI MCR-2-TC-UI-C**	2902053	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Order key for MINI MCR-2-TC-UI(-PT)(-C) temperature transducers (standard configuration entered as an example)

Order No.	Sensor type	Cold junction error compensation	Measuring range Start	Measuring range End	Measuring unit	Output Output signal	Output Start	Output End
2902053	**J**	**1**	**-200**	**1200**	**C**	**I**	**4.0**	**20.0**
2902053 ≙ MINI MCR-2-TC-UI-C 2905248 ≙ MINI MCR-2-TC-UI-PT-C	B ≙ B IEC 584-1 (Pt30Rh-Pt6Rh) E ≙ E IEC 584-1 (NiCr-CuNi) J ≙ J IEC 584-1 (Fe-CuNi) K ≙ K IEC 584-1 (NiCr-Ni) N ≙ N IEC 584-1 (NiCrSi-NiSi) R ≙ R IEC 584-1 (Pt13Rh-Pt) S ≙ S IEC 584-1 (Pt10Rh-Pt) T ≙ T IEC 584-1 (Cu-CuNi) L ≙ L DIN 43760 (Fe-CuNi) U ≙ U DIN 43760 (Cu-CuNi) A1G ≙ A-1 GOST 8.585-2001 A2G ≙ A-2 GOST 8.585-2001 A3G ≙ A-3 GOST 8.585-2001 MG ≙ M GOST 8.585-2001 LG ≙ L GOST 8.585-2001	0 ≙ OFF 1 ≙ ON	freely selectable between -250°C ... 2500°C (measuring range limits depend on sensor type)	freely selectable between -250°C ... 2500°C (measuring range limits depend on sensor type)	C ≙ °C F ≙ °F	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V

Minimum measuring span 50 K

Output signal span at least 0.5 V / 1 mA
Increment 0.1 V / 0.1 mA

Failure information

...	Behavior in the event of an error	Open circuit	Measured value overrange	Measured value underrange
	NE43DO	**0.0**	**0.0**	**0.0**
	FD ≙ Freely definable	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)
	Note: Failure information according to NE 43 can only be selected for 4 ... 20 mA output			
	NE43UP ≙ NE 43 upscale	21.5 mA	21.5 mA	21.5 mA
	NE43DO ≙ NE 43 downscale	3.5 mA	3.5 mA	3.5 mA
	NE430 ≙ NE 43 0 mA	0 mA	0 mA	0 mA
	NE43UD ≙ NE 43 upscale/downscale	3.5 mA	21.5 mA	21.5 mA

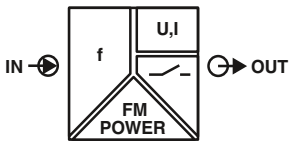
Sensor types and measuring ranges for MINI MCR-2-TC-UI(-PT)(-C) temperature transducers

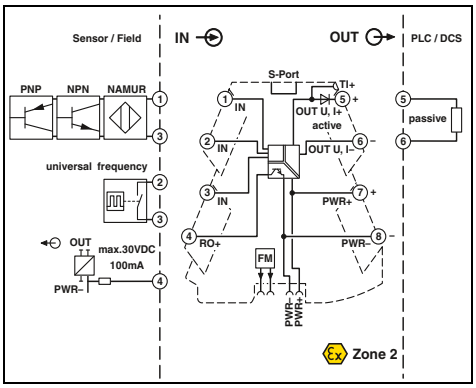
Sensor type	Standard	Measuring range	Smallest measuring span	Adjustable using:
B	IEC 584-1	+500°C ... +1820°C	50 K	Software or smartphone app
E	IEC 584-1	-230°C ... +1000°C	50 K	Software or smartphone app
J	IEC 584-1	-210°C ... +1200°C	50 K	DIP switches
K	IEC 584-1	-250°C ... +1372°C	50 K	DIP switches
N	IEC 584-1	-200°C ... +1300°C	50 K	Software or smartphone app
R	IEC 584-1	-50°C ... +1768°C	50 K	Software or smartphone app
S	IEC 584-1	-50°C ... +1768°C	50 K	Software or smartphone app
T	IEC 584-1	-200°C ... +400°C	50 K	Software or smartphone app
L	DIN 43710	-200°C ... +900°C	50 K	Software or smartphone app
U	DIN 43710	-200°C ... +600°C	50 K	Software or smartphone app
A-1	GOST 8.585	0°C ... +2500°C	50 K	Software or smartphone app
A-2	GOST 8.585	0°C ... +1800°C	50 K	Software or smartphone app
A-3	GOST 8.585	0°C ... +1800°C	50 K	Software or smartphone app
M	GOST 8.585	-200°C ... +100°C	50 K	Software or smartphone app
L	GOST 8.585	-200°C ... +800°C	50 K	Software or smartphone app
Customer-specific characteristic curves		-250°C ... +2500°C	50 K	Software or smartphone app

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

Frequency
Universal frequency transducer

new





Ex n

Configurable,
Universal frequency or PWM input

Housing width 6.2 mm

- Universally configurable, highly compact 3-way isolated frequency transducer with transistor switching output
- Suitable for the connection of NAMUR proximity sensors (IEC 60947-5-6 and EN 50227) as well as for sensors with NPN and PNP outputs that generate a frequency signal
- For electrical isolation, conversion, amplification, and filtering of frequency and PWM signals
- Frequency signals in the range from 0.002 to 200 kHz and PWM signals up to 20 kHz
- Supports fault monitoring
- Plug-in connection system
- Safe 3-way isolation
- Standard behavior can be configured via DIP switches
- Freely configurable via software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Technical data

Input data		
Input sources	NAMUR initiators NPN/PNP transistor outputs Floating contact (dry contact) Frequency generator Incremental encoder (speed only) HTL encoders	
Frequency measuring range	0 Hz ... 200 kHz	
Maximum input signal	30 V (incl. DC voltage)	
PWM (range)	0.002 Hz ... 60 Hz (Duty cycle 2 ... 98 %) 60 Hz ... 300 Hz (Duty cycle 5 ... 95 %) 300 Hz ... 600 Hz (Duty cycle 10 ... 90 %) 600 Hz ... 1000 Hz (Duty cycle 20 ... 80 %)	
Output data	U output	I output
Output signal	0 ... 10 V / 2 ... 10 V 0 ... 5 V / 1 ... 5 V	0 ... 20 mA / 4 ... 20 mA 0 ... 10 mA / 2 ... 10 mA
Maximum output signal	approx. 12.3 V	24.6 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 600 Ω)	< 20 mV_{PP} (at 600 Ω)
Switching output		
Relay output	1 N/O contact	
Max. switching voltage	30 V DC	
Maximum switching current	100 mA (30 V)	
Minimum switching current	100 µA	
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Current consumption	32 mA (24 V DC) 63 mA (12 V DC)	
Power consumption	≤ 1 W (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)	
Maximum transmission error	0.1 % (Frequency) 1 % (PWM signal)	
Temperature coefficient	0.01 %/K , typ. 0.01 %/K	
Step response (0–99%)	< 35 ms (f > 500 Hz)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Ambient temperature (operation)	-40 °C ... 70 °C	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
GL	GL applied for	

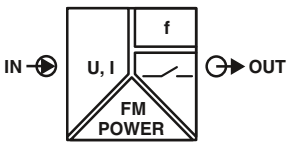
Ordering data

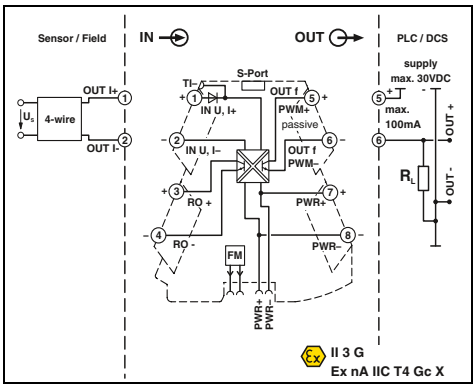
Description	Type	Order No.	Pcs./ Pkt.
MCR frequency transducer			
Push-in connection	**MINI MCR-2-F-UI-PT**	2902058	1
Screw connection	**MINI MCR-2-F-UI**	2902056	1

Accessories

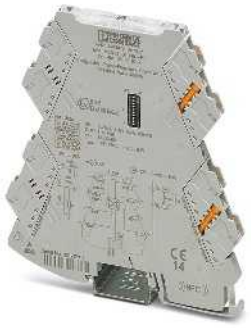
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Frequency
Analog frequency transducer





Ex n



Configurable, frequency, PWM or switching output

Ex:

Housing width 6.2 mm

- Universally configurable highly compact analog-to-frequency measuring transducer for electrical isolation, amplification, conversion and filtering of standard analog signals to frequencies or PWM signals
- Plug-in connection system
- Safe 3-way isolation
- Additional switching output
- Frequency output can be used as second switching output
- Standard signal combinations configurable via DIP switches
- Freely configurable with software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Technical data

Input data		
Input signal (configurable via DIP switch or freely via software)	U input	I input
	0 V ... 10 V	0 mA ... 20 mA
	2 V ... 10 V	4 mA ... 20 mA
	0 V ... 5 V	0 mA ... 10 mA
	1 V ... 5 V	2 mA ... 10 mA
	10 V ... 0 V	20 mA ... 0 mA
	10 V ... 2 V	20 mA ... 4 mA
	5 V ... 0 V	10 mA ... 0 mA
	5 V ... 1 V	10 mA ... 2 mA
	0 V ... 12 V	0 mA ... 24 mA
Maximum input signal	12 V	24 mA
Input resistance	> 120 kΩ	approx. 50 Ω (+ 0.7 V for test diode)
Output data	Frequency output	PWM output
Output signal (configurable via DIP switch or freely via software)	0 Hz ... 10 kHz / 0 Hz ... 5 kHz	15.6 kHz (10 bit) / 1.9 kHz (10 bit)
	0 Hz ... 2.5 kHz / 0 Hz ... 1 kHz	3.9 kHz (12 bit) / 488 Hz (12 bit)
	0 Hz ... 500 Hz / 0 Hz ... 250 Hz	977 Hz (14 bit) / 122 Hz (14 bit)
	0 Hz ... 100 Hz / 0 Hz ... 50 Hz	244 Hz (16 bit) / 31 Hz (16 bit)
Minimum load	4 mA ≤ (U_L / R_L) ≤ 100 mA	12 mA ≤ (U_L / R_L) ≤ 100 mA
Load current maximum	100 mA	
Maximum switching voltage	30 V	
Overrange/underrange	Can be set (via software)	
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	27 mA (12 V DC)	
	13.5 mA (24 V DC)	
Power consumption	≤ 350 mW (9.6 V DC)	
Transmission error, maximum	≤ 0.1 % (> 7 kHz ≤ 0.2 %)	
Temperature coefficient	< 0.01 %/K , typ. 0.01 %/K	
Step response (0–99%)	120 ms (15 Hz sample rate)	
	Further values can be set via software	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
GL	GL applied for	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Analog frequency transducer with limit value function				
Standard configuration	Push-in connection	**MINI MCR-2-UI-FRO-PT**	2902032	1
Standard configuration	Screw connection	**MINI MCR-2-UI-FRO**	2902031	1
Order configuration	Push-in connection	**MINI MCR-2-UI-FRO-PT-C**	2906202	1
Order configuration	Screw connection	**MINI MCR-2-UI-FRO-C**	2906201	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

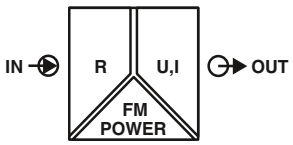
Order key for MINI MCR-2-UI-FRO(-PT)(-C) analog frequency transducers (standard configuration entered as example)

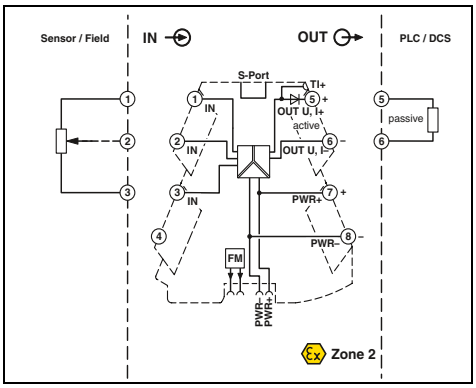
Order No.	Input			Sample rate	Output				Output limitation	
	Input signal	Start	End		Output signal	Carrier frequency	Start	End		
2906201	I	0.0	20.0	15	I	0	0	1000	15	...
2906201 ≙ MINI MCR-2-UI-FRO-C 2906202 ≙ MINI MCR-2-UI-FRO-PT-C	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 24 mA U: freely selectable between 0.0 ... 12 V	15 Hz ≙ 15 Hz 60 Hz ≙ 60 Hz 240 Hz ≙ 240 Hz	f ≙ f PWM ≙ PWM	0 ≙ at frequency output 15.6 k ≙ 15.6 kHz 15.6 kHz (10 bits) 1.9 kHz (10 bits) 7.8 kHz (11 bits) 977 Hz (11 bits) 3.9 kHz (12 bits) 488 Hz (12 bits) 1.9 kHz (13 bits) 244 Hz (13 bits) 977 Hz (14 bits) 122 Hz (14 bits) 488 Hz (15 bits) 61 Hz (15 bits) 244 Hz (16 bits) 31 Hz (16 bits)	0 ≙ 0 Hz f: freely selectable between 0 ... 10 kHz D: freely selectable between 0.0 ... 100%	10000 ≙ 10 kHz f: freely selectable between 0 ... 10 kHz D: freely selectable between 0.0 ... 100%	0 ≙ off 1 ≙ on	
		Measuring range span at least 0.5 V / 1 mA Increment 0.1 V / 0.1 mA					Output signal span at least 10 Hz / 1% Increment 1 Hz / 0.1%			

Failure information

...	Behavior in the event of an error	Open circuit/short circuit	Measured value overrange	Measured value underrange
	FD	0	0	0
	FD ≙ Freely definable Failure information only adjustable for unlimited output	0 ≙ 0 Hz f: freely selectable between 0 ... 11 kHz D: freely selectable between 0.0 and 100% (free definition only for unlimited output) (signal type corresponds to selected output signal)	0 ≙ 0 Hz f: freely selectable between 0 ... 11 kHz D: freely selectable between 0.0 and 100% (free definition only for unlimited output) (signal type corresponds to selected output signal)	0 ≙ 0 Hz f: freely selectable between 0 ... 11 kHz D: freely selectable between 0.0 and 100% (free definition only for unlimited output) (signal type corresponds to selected output signal)

Potentiometer
Potiposition transducer





Potiposition transducer, Configurable

Ex:

Housing width 6.2 mm

- Universally configurable, highly compact potiposition transducer for electrical isolation, conversion, amplification, and filtering of potentiometer signals
- For potentiometers from 100 Ω to 100 kΩ
- Automatic potentiometer detection without manual adjustment
- Plug-in connection system
- Safe 3-way isolation
- Standard signal combinations configurable via DIP switches
- Freely configurable with software or smartphone app
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

To order a product with an order configuration, please enter the desired configuration by referring to the order key.

Technical data

Input data		
Potentiometer	100 Ω ... 100 kΩ	
Output data	U output	I output
Output signal (configurable via DIP switch or freely via software)	1 ... 5 V / 10 ... 0 V	0 ... 20 mA / 4 ... 20 mA
	0 ... 5 V / 0 ... 10 V	20 ... 0 mA / 20 ... 4 mA
Maximum output signal	approx. 12.3 V	24.6 mA
No-load voltage		< 17.5 V
Short-circuit current	< 31.5 mA	
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Ripple	< 20 mV_{PP} (at 10 kΩ)	< 20 mV_{PP}
Behavior in the event of a sensor error	configurable	
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	33 mA (24 V DC)	
Power consumption	≤ 850 mW (at I_{OUT} = 20 mA, 9.6 V DC, 600 Ω load)	
Maximum transmission error	< 0.1 % (R < 240 Ω = < 0,2 %)	
Temperature coefficient	0.01 %/K , typ. 0.01 %/K	
Step response (0–99%)	< 60 ms	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Mounting	any	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC T5	
DNV GL	C, EMC2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Potiposition transducer				
Standard configuration	Push-in connection	**MINI MCR-2-POT-UI-PT**	2902017	1
Standard configuration	Screw connection	**MINI MCR-2-POT-UI**	2902016	1
Order configuration	Push-in connection	**MINI MCR-2-POT-UI-PT-C**	2905006	1
Order configuration	Screw connection	**MINI MCR-2-POT-UI-C**	2905005	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

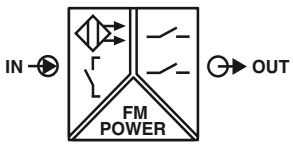
Order key for MINI MCR-2-POT-UI(-PT)(-C) potiposition transducers (standard configuration entered as an example)

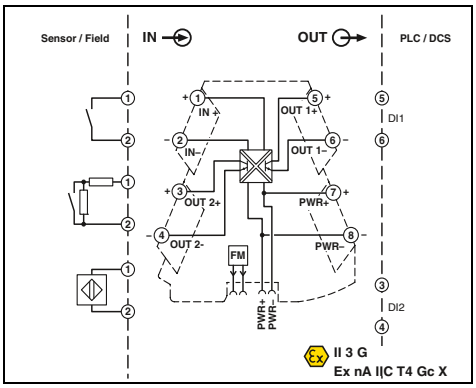
Order No.	Automatic potentiometer detection	Output Output signal	Start	End	Filter	Open circuit detection	
2905005	**AUTO**	**I**	**4.0**	**20.0**	**1**	**ON**	**...**
2905005 ≙ MINI MCR-2-POT-UI-C	AUTO ≙ ON OFF ≙ OFF	I ≙ I U ≙ U	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	20.0 ≙ 20 mA I: freely selectable between 0.0 ... 21 mA U: freely selectable between 0.0 ... 10.5 V	1 2 3 4 5 6 7 8 9 10	ON ≙ ON OFF ≙ OFF	
2905006 ≙ MINI MCR-2-POT-UI-PT-C							

Output signal span at least 0.5 V / 1 mA
Increment 0.1 V / 0.1 mA

...	Failure information Behavior in the event of an error	Open circuit slider	Input open (no potentiometer connected)	Measured value overrange	Measured value underrange
	NE43DO	**0.0**	**0.0**	**0.0**	**0.0**
	FD ≙ Freely definable	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (only if open circuit detection is on) (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)	0.0 ≙ 0 mA I: freely selectable between 0.0 ... 21.5 mA U: freely selectable between 0.0 ... 11 V (signal type corresponds to selected output signal)
	Note: Failure information according to NE 43 can only be selected for 4 ... 20 mA output				
	NE43UP ≙ NE 43 upscale	21.5 mA	21.5 mA	21.5 mA	21.5 mA
	NE43DO ≙ NE 43 downscale	3.5 mA	3.5 mA	3.5 mA	3.5 mA
	NE430 ≙ NE 43 0 mA	0 mA	0 mA	0 mA	0 mA
	NE43UD ≙ NE 43 upscale/downscale	3.5 mA	3.5 mA	21.5 mA	21.5 mA

Digital IN
Signal conditioner





Ex n

Configurable, for NAMUR sensors and floating contacts

Ex:

Housing width 6.2 mm

- Highly compact signal conditioner for electrical isolation, amplification, and duplication of proximity sensor signals
- For proximity sensors in accordance with IEC 60947-5-6 and EN 50227
- Floating contacts and contacts with resistance circuit can be connected
- Plug-in connection system
- Input and output signals can be configured via DIP switches
- Transistor switching contacts on the output
- Second output can be used as a duplicator or error signaling output
- Safe 3-way isolation
- Switchover between operating current and quiescent current (inverted switching behavior)
- Power supply and fault monitoring possible via DIN rail connector
- Status LEDs

Notes:

Information on MINI Analog Pro accessories can be found from page 101

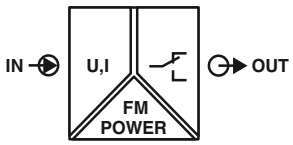
Technical data

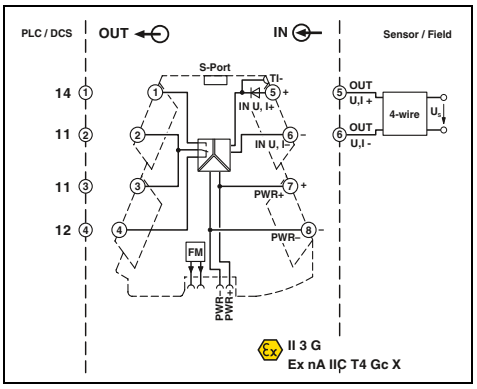
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
Control circuit	
No-load voltage	8.2 V DC ±10 %
Switching points (in acc. with IEC 60947-5-6)	< 1.2 mA (blocking) > 2.1 mA (conductive)
Line fault detection	> 6 mA (in the event of a short-circuit) < 0.35 mA (With wire break)
Switching output	
Transistor output	2 N/O contacts
Max. switching voltage	30 V DC
Max. switching current	50 mA
Switching frequency	5 kHz
General data	
Supply voltage range	9.6 V DC ... 30 V DC
Nominal supply voltage	24 V DC
Current consumption	18 mA (24 V DC) 35 mA (12 V DC)
Power consumption	450 mW (9.6 V DC)
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Mounting	any
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 24 - 12
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
GL	GL applied for

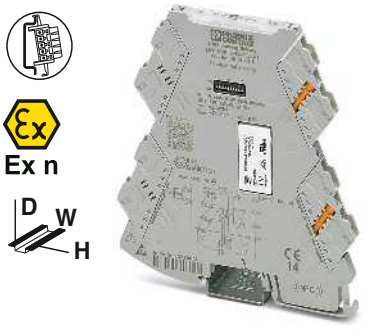
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Push-in connection	**MINI MCR-2-NAM-2RO-PT**	2902005	1
Screw connection	**MINI MCR-2-NAM-2RO**	2902004	1

Limit values
Threshold value switch







Configurable,
with relay PDT output

Ex:
Housing width 6.2 mm

- Universally configurable highly compact threshold value switch for switching analog limit values
- Plug-in connection system
- Safe 3-way isolation
- Standard switching behavior can be configured via DIP switches
- Freely configurable with software or smartphone app
- PDT relay at output
- Limiting continuous current up to 6 A
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Information on MINI Analog Pro accessories can be found from page 101

Technical data

	U input	I input
Input data		
Input signal (configurable using the DIP switch)	0 ... 10 V / 0 ... 12 V	0 ... 20 mA / 0 ... 24 mA
Maximum input signal	12 V	24 mA
Input resistance	> 120 kΩ	approx. 50 Ω (+ 0.7 V for test diode)
Specification of the switching point	Can be set via software or in steps via DIP switches	
Switching output		
Relay output	1 PDT	
Contact material	$AgSnO_2$, hard gold-plated	
Max. switching voltage	250 V AC	
Limiting continuous current	6 A	
Hysteresis (configurable using the DIP switch)	can be set freely via software	
Setting range of the response delay (configurable using the DIP switch)	0 s ... 10 s (can be set freely via software)	
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Nominal supply voltage	24 V DC	
Current consumption	40 mA (12 V DC) 20 mA (24 V DC)	
Power consumption	≤ 0.5 W	
Maximum transmission error	0.1 % (of final value)	
Temperature coefficient	0.01 %/K	
Step response (0–99%)	typ. 140 ms (Can be set via software)	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Mounting	any	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA nC IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, Group IIC T4A	
GL	GL applied for	

Ordering data

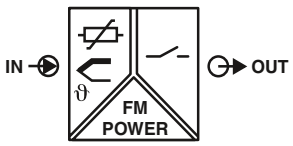
Description	Type	Order No.	Pcs./ Pkt.
Threshold value switch with relay PDT output, standard configuration			
Push-in connection	**MINI MCR-2-UI-REL-PT**	2902035	1
Screw connection	**MINI MCR-2-UI-REL**	2902033	1

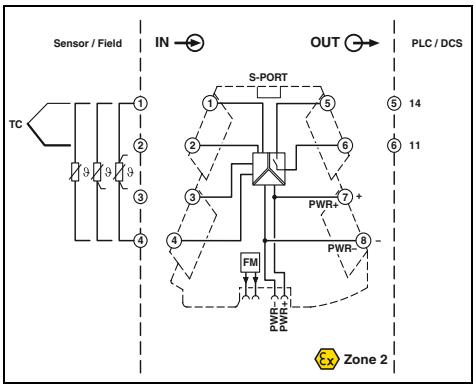
Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

Limit values
Temperature





Configurable, temperature transducer with N/O relay output

Housing width 6.2 mm

- Universally configurable, highly compact temperature limit value switch for switching analog limit values from resistance thermometers and remote resistance-type sensor signals
- For 2, 3 or 4-wire RTD sensors according to IEC 751, JIS, GOST
- For thermocouples according to IEC 584 and GOST
- Internal cold junction compensation
- Plug-in connection system
- Safe 3-way isolation
- Standard behavior can be configured via DIP switches
- Freely configurable via software or smartphone app
- N/O relay output (N/C function can be set via software)
- Limiting continuous current up to 6 A
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Technical data

Input data	
Input signal (can be configured using DIP switches)	Pt, Ni, Cu sensors : 2, 3, 4-wire
Temperature range	-250 °C ... 2500 °C
Measuring range span	min. 20 K
Linear resistance measuring range	0 Ω ... 4000 Ω
Switching output	
Relay output	1 N/O contact
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC
Maximum switching current	6 A (for 250 V AC)
Minimum switching current	100 mA (12 V DC)
Limiting continuous current	6 A
Hysteresis	can be set freely via software
Setting range of the response delay	0 s ... 10 s (can be set freely via software)
General data	
Supply voltage range	9.6 V DC ... 30 V DC
Current consumption	44 mA (12 V DC) 22 mA (24 V DC)
Switching point accuracy	< 0.1 %
Power consumption	570 mW
Temperature coefficient	0.01 %/K
Step response (0–99%)	typ. 300 ms typ. 570 ms typ. 380 ms typ. 300 ms typ. 570 ms
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)
Ambient temperature (operation)	-40 °C ... 70 °C
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, Group IIC T4A
GL	GL applied for

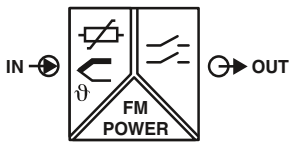
Ordering data

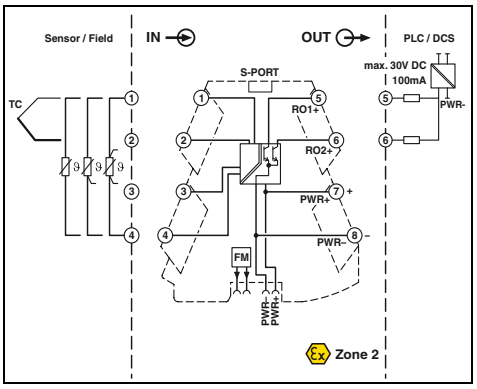
Description	Type	Order No.	Pcs./ Pkt.
Temperature limit value switch			
Push-in connection	**MINI MCR-2-T-REL-PT**	2905633	1
Screw connection	**MINI MCR-2-T-REL**	2905632	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Limit values
Temperature





Ex n

NFC

Configurable, temperature transducer with transistor output

Housing width 6.2 mm

- Universally configurable, highly compact temperature limit value switch for switching analog limit values from resistance thermometers and remote resistance-type sensor signals
- For 2, 3 or 4-wire RTD sensors according to IEC 751, JIS, GOST
- For thermocouples according to IEC 584 and GOST
- Internal cold junction compensation
- Plug-in connection system
- Safe 3-way isolation
- Standard behavior can be configured via DIP switches
- Freely configurable via software or smartphone app
- 2 transistor switching contacts on the output
- Maximum switching current 30 V / 100 mA
- Power supply and fault monitoring possible via DIN rail connector
- Status and error indicator LEDs

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105

Technical data

Input data	
Input signal (can be configured using DIP switches)	Pt, Ni, Cu sensors : 2, 3, 4-wire
Temperature range	-250 °C ... 2500 °C
Measuring range span	min. 20 K
Linear resistance measuring range	0 Ω ... 4000 Ω
Switching output	
Transistor output	2 N/O contacts
Max. switching voltage	30 V DC
Maximum switching current	100 mA (30 V (≤ 50 °C))
General data	
Supply voltage range	9.6 V DC ... 30 V DC
Current consumption	20 mA (12 V DC) 10 mA (24 V DC)
Switching point accuracy	< 0.1 %
Power consumption	350 mW
Temperature coefficient	0.01 %/K
Step response (0–99%)	typ. 300 ms typ. 570 ms typ. 380 ms typ. 300 ms typ. 570 ms
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)
Ambient temperature (operation)	-40 °C ... 70 °C
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 24 - 12
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	Ex II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
GL	GL applied for

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Temperature limit value switch			
Push-in connection	**MINI MCR-2-T-2RO-PT**	2906877	1
Screw connection	**MINI MCR-2-T-2RO**	2906876	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

Safely isolated from field to network. MINI Analog Pro signal conditioners with bus and network connections combine the benefits of safe electrical isolation with those of digital communication. With an overall width of less than 50 mm, you can transmit, free of interference, up to eight field signals to industrial networks, without the need for signal-specific input cards.

Further advantages:

– Gateways for different protocols: Modbus RTU, Modbus TCP, and PROFIBUS DP
– Interference-free signal transmission from the field level to the CPU, thanks to safe electrical isolation
– Fast, fault-free wiring, by bundling the signals in one network cable

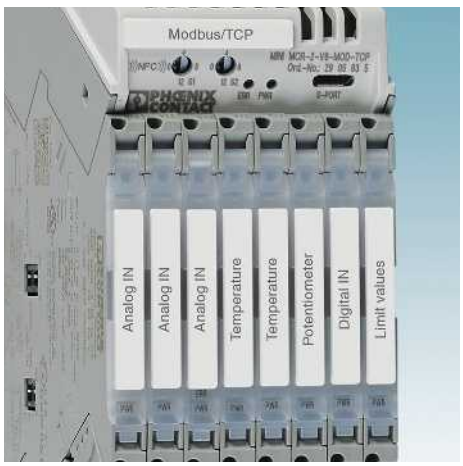
No need for input cards
– Cost and space savings, as signal-specific input cards are no longer needed

Modular and space-saving
– Space-saving network integration of freely combinable signal conditioners by means of plug-in gateways

Flexible configuration
– Quick parameterization via rotary coding switch, software, web server or app

Smart configuration and monitoring
– Carry out on-site configuration and read current values directly off a smartphone with the MINI Analog Pro app

Easy startup and servicing
– Measure current signals during operation, without disconnecting current loops



Easy maintenance
– Large-surface marking areas for standard marking material as well as permanently visible status and error LEDs on each module

MINI Analog Pro gateways

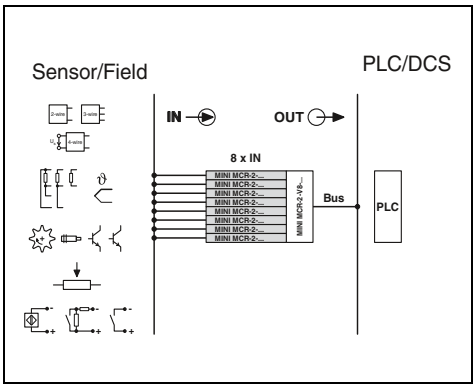
new

- Easy integration of up to eight field signals in the bus systems
- Any combination of signal conditioners is possible (standard signal, temperature, etc.)
- Easy attachment to the output side of MINI Analog Pro modules
- Huge savings in terms of input cards and bus couplers
- Safe channel-to-channel electrical isolation right through to the CPU
- Versions with PROFIBUS DP, Modbus/RTU or Modbus/TCP are available
- Can be configured via software or smartphone app

Notes:

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Information on the programming adapters can be found on page 105



Gateways for bus and network connection

Ex:

Housing width 51.1 mm

Technical data

Input data	
Number of inputs	8
Configurable/programmable	Yes
Current input signal	4 mA ... 20 mA
Maximum input current	24 mA
Input resistance of current input	50 Ω
Maximum input voltage	5 V
Output data	
Number of outputs	1
Data update rate	15 ms
General data	
Nominal supply voltage range	12 V ... 24 V
Supply voltage range	9.6 V ... 30 V
Power consumption	< 1000 mW
Maximum transmission error	0.1 %
Temperature coefficient	0.01 %
Test voltage, input/output/supply	0.5 kV
Ambient temperature (operation)	-40 °C ... 65 °C
Housing material	PBT 7% GF V0
Dimensions W/H/D	51.1 / 104.1 / 56.8 mm
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC T5

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Gateways for bus and network connection			
Modbus/RTU	**MINI MCR-2-V8-MOD-RTU**	2905634	1
Modbus/TCP	**MINI MCR-2-V8-MOD-TCP**	2905635	1
PROFIBUS DP	**MINI MCR-2-V8-PB-DP**	2905636	1

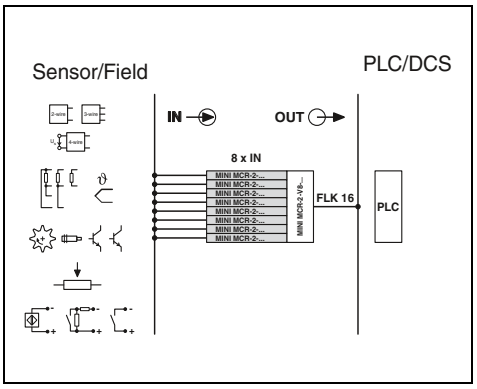
Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	2900013	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	2905872	1

MINI Analog Pro system adapter

new

- Time-saving wiring solution thanks to unique plug-in concept
- System cabling on PLC side
- Plug-and-Play
- For up to eight channels
- Reduced wiring effort and errors
- Easy attachment to the output side of MINI Analog Pro modules
- Especially easy to maintain, thanks to interruption-free current measurement function



Ex n

NFC

System cabling adapter

Ex:

Housing width 51.1 mm

Technical data

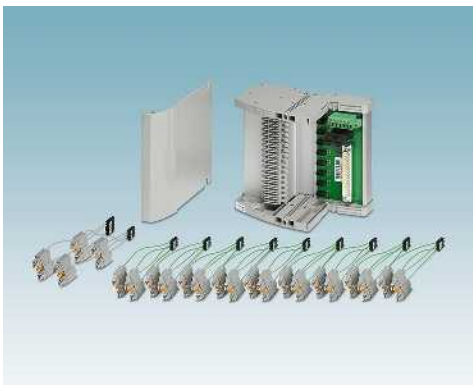
Input data	
Number of inputs	8
Configurable/programmable	no
Maximum input current	4 A (500 mA per ch.)
Maximum input voltage	30 V
Output data	
Number of outputs	8
Connection method	IDC/FLK pin strip
Configurable/programmable	no
General data	
Test voltage input/output	0.5 kV
Rated insulation voltage	50 V_{rms}
Degree of protection	IP20
Overvoltage category / Degree of pollution	II / 2
Ambient temperature (operation)	-40 °C ... 70 °C
Humidity	5 % ... 95 %
Maximum altitude for use above sea level	4000 m
Housing material	PBT 7% GF V0
Dimensions W/H/D	51.1 / 104.1 / 56.8 mm
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC Gc U
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC T5
GL	GL applied for

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
System cabling adapter for MINI Analog Pro modules	**MINI MCR-2-V8-FLK 16**	2901993	1

Termination Carrier for MINI Analog Pro signal conditioner

Select standard DIN rail device



Select module carrier

TC... Termination Carriers are compact solutions for conveniently and smoothly connecting standard DIN rail signal conditioners from the MINI Analog Pro series to input and output cards of automation systems using system cabling.

The most compact signal conditioners combined with the most compact and flexible module carriers on the market enable you to achieve a hitherto unparalleled packing density in your control cabinet together with professional system cabling.

Compact

– The compact design associated with MINI Analog saves up to 65% of space in the control cabinet

Robust and reliable

– Stable, vibration-resistant aluminum carrier device profile
– PCB is completely decoupled from signal conditioners
– PCB without active electronics
– Redundant supply via separate DIN rail module
– Horizontal or vertical DIN rail mounting

Flexible

– Profile sections without pitch markings
– Quick and safe module connection with plug-in cable sets
– Horizontal or vertical DIN rail mounting
– Can be flexibly adapted to suit any controller or higher-level control system
– Solutions tailored to your requirements on request
– Available pre-assembled with modules and wired, or for self-assembly

Select controller-specific front adapter and system cable

Solutions are also available for MACX Analog, MACX Analog Ex, and Safety

Termination Carrier for MINI Analog Pro signal conditioner

The **TC-D37SUB-ADIO16-MP-P-UNI** universal Termination Carrier is a compact solution which connects signal conditioners from the MINI Analog Pro series to analog or binary input and output cards of automation systems.

The **TC-D37SUB-AIO16-MP-PS-UNI** Termination Carrier design, when combined with the MACX MCR-S-MUX HART multiplexer, also enables communication between HART-capable field devices and a management system.

- Connection of up to 16 single-channel signal conditioners
- Universal 1:1 signal routing to a 37-pos. D-SUB connector
- For system cables with D-SUB socket and open ends for universal connection
- Redundant supply and monitoring via separate MINI MCR-2-PTB-PT power terminal and MINI MCR-2-FM-RC-PT fault signaling module

Notes:

Contact us: together, we can develop optimum solutions for your automation system with the Termination Carrier for MINI Analog Pro.

TC-D37SUB-ADIO16-MP-P-UNI (Order No. 2906639) is not a class A product.

Ex:

Housing width 136 mm

Technical data

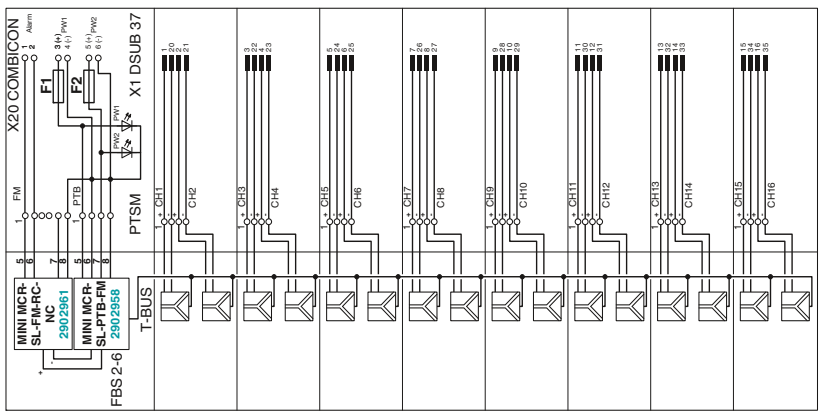
General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Maximum operating voltage	< 30 V DC (Per signal/channel)
Maximum permissible current	23 mA (Signal/channel)
Rated insulation voltage	50 V
Degree of pollution	2
Overvoltage category	II
Rated surge voltage	0.5 kV
Air clearances and creepage distances	DIN EN 50178 (Basic insulation)
Ambient temperature range	-20 °C ... 60 °C (Please observe module specifications)
Shock	15g, according to IEC 60068-2-27
Vibration (operation)	2g, according to IEC 60068-2-6
Dimensions W/H/D	136 / 170 / 160 mm
Power supply via power module	
Input voltage range	19.2 V DC ... 30 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2x 2.5 A on PCB, slow-blow (replaceable)
Status indication	2 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Switching output	1 N/C contact (alarm = open)

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Module carrier for 16 MINI Analog channels, power and feed-through module			
	TC-D37SUB-ADIO16-MP-P-UNI	**2906639**	1
- With connection for MACX MCR-S-MUX HART multiplexer	**TC-D37SUB-AIO16-MP-PS-UNI**	**2906640**	1

Accessories

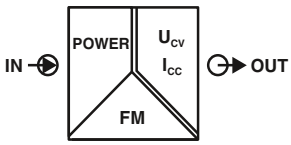
MINI Analog Pro power terminal	**MINI MCR-2-PTB-PT**	**2902067**	1
MINI Analog Pro fault signaling module	**MINI MCR-2-FM-RC-PT**	**2904508**	1
HART multiplexer, 32-chanel, including two 14-wire flat-ribbon cable	**MACX MCR-S-MUX**	**2865599**	1

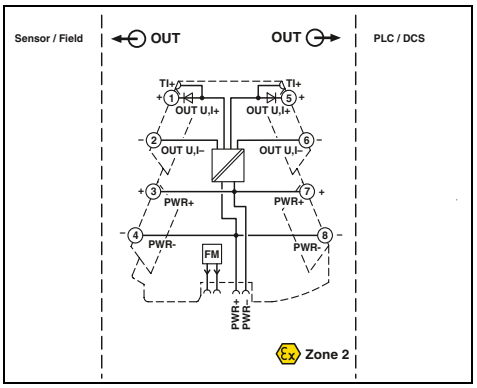


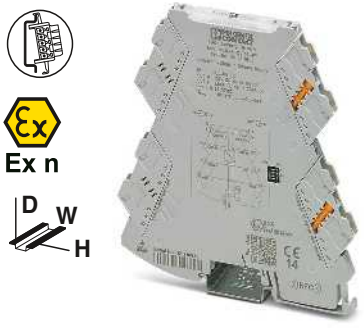
TC-D37SUB-ADIO16-M-P-UNI and TC-D37SUB-AIO16-M-PS-UNI connection scheme

Highly compact signal conditioners with plug-in connection technology – MINI Analog Pro

Accessories
Constant voltage/ constant current source







Output signals, configurable

Ex n

D W H

Ex:

Housing width 6.2 mm

- Constant voltage/constant current source for potentiometers, measuring bridges, encoders, etc.
- Plug-in connection system
- Highly precise
- Output signals can be configured via DIP switches
- Input signal corresponds to power supply
- Input signal and therefore energy supply and fault monitoring via the DIN rail connector
- For voltages up to 10 V and currents up to 20 mA
- Status LED

Technical data

Input data		
Input signal	9.6 ... 30 V	
Output data	U output	I output
Output signal (can be configured using DIP switches)	10 V DC	20 mA
	8.75 V DC	17.5 mA
	7.5 V DC	15 mA
	6.25 V DC	12.5 mA
	5 V DC	10 mA
	3.75 V DC	7.5 mA
	2.5 V DC	5 mA
	1.25 V DC	2.5 mA
Short-circuit current	> 32 mA	
Ripple	< 20 mV_{PP} (at 600 Ω)	
General data		
Supply voltage range	9.6 V DC ... 30 V DC	
Power consumption	< 1.1 W (9.6 V DC)	
Maximum transmission error	≤ 0.1 % (of final value)	
Temperature coefficient	< 0.01 %/K	
Electrical isolation	Reinforced insulation in accordance with IEC 61010-1	
Test voltage, input/output/supply	3 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 70 °C	
Housing material	PBT	
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm	
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 24 - 12	
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 12	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Constant voltage/constant current source			
Push-in connection	**MINI MCR-2-CVCS-PT**	2902065	1
Screw connection	**MINI MCR-2-CVCS**	2902064	1

Accessories

Setpoint potentiometer, to set setpoints individually			
Resistance value 4.7 kΩ	**EMG 30-SP- 4K7LIN**	2940252	10
Resistance value 10 kΩ	**EMG 30-SP-10K LIN**	2942124	10

Accessories
Connector set

– FASTCON Pro connector set
– Consisting of four connectors, one each for every position on the module
– Suitable for all MINI Analog Pro modules
– Four-way coding prevents incorrect insertion into the device
– Screw or Push-in connection technology

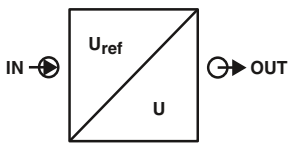
with Push-in connection

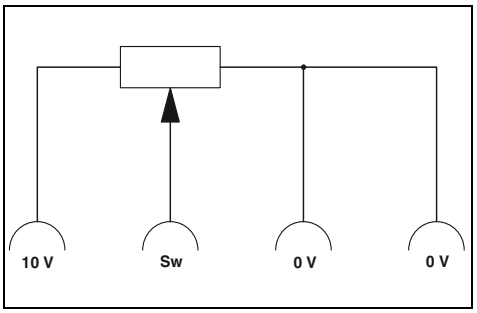
with screw connection

	Technical data	Technical data
Technical data		
Connection data solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 24 - 12	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
FASTCON Pro connector set						
- with Push-in connection	**FASTCON PRO-SET-PT**	2906228	1			
- with screw connection				**FASTCON PRO-SET**	2906227	1

Accessories
Setpoint potentiometers





– For direct setpoint definition in combination with a constant voltage source

	Technical data	
Input data	EMG 30-SP- 4K7LIN	EMG 30-SP-10K LIN
Resistance value	4.7 kΩ ±20 %	10 kΩ ±20 %
Linearity	5 % (of final value)	5 % (of final value)
Load capacity	0.5 W	0.5 W
General data		
Ambient temperature (operation)	0 °C ... 40 °C	
Mounting	any	
Housing material	Polycarbonate fiber reinforced PC-F	
Dimensions W/H/D	30 / 75 / 68 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	

	Ordering data		
Description	Type	Order No.	Pcs./ Pkt.
Setpoint potentiometer, to set setpoints individually			
Resistance value 4.7 kΩ	**EMG 30-SP- 4K7LIN**	2940252	10
Resistance value 10 kΩ	**EMG 30-SP-10K LIN**	2942124	10

Accessories
ME 6,2 TBUS... DIN rail connector

- For bridging the supply voltage
- Reduced wiring effort
- Module replacement without interrupting the supply to the remaining modules (hot swappable)
- One DIN rail connector for two MINI Analog Pro modules
- Only distinguished by color coding

For bridging the supply voltage

For bridging the supply voltage

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
DIN rail connector (TBUS), for bridging the supply voltage, can be snapped onto 35 mm DIN rails according to EN 60715, with UL approval			
Color: green	**ME 6,2 TBUS-2 1,5/5-ST-3,81 GN**	2869728	10

Ordering data

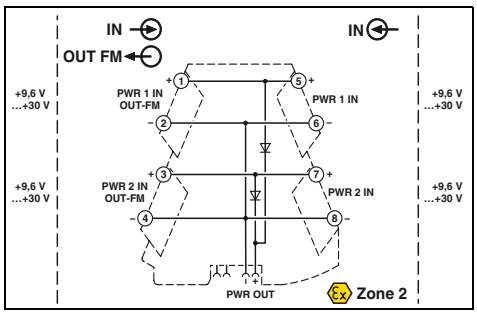
Type	Order No.	Pcs./ Pkt.
ME 6,2 TBUS-2 1,5/5-ST-3,81 GY	2695439	10

Accessories
Power terminals

- Power terminal for supplying the supply voltage to the DIN rail connector
- Plug-in connection system
- Increased output current of 3.2 A
- For up to 115 MINI Analog Pro modules
- Monitoring of supplies in combination with the fault monitoring module
- Flexible redundant supply from one or both module sides
- Status and error indicator LEDs

Notes:

Pay attention to the supply instructions for the MINI and MACX modules.



Redundant supply for existing 24 V

Technical data

Input data/output data	
Input voltage range	9.9 V DC ... 30 V DC
Output voltage	9.6 V DC ... 29.7 V DC
Output current	≤ 3.2 A
General data	
Ambient temperature (operation)	-40 °C ... 70 °C
Housing material	PBT
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
DNV GL	C, EMC2

Ordering data

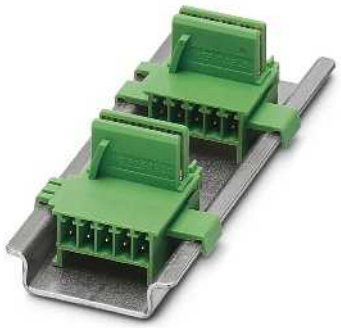
Description	Type	Order No.	Pcs./ Pkt.
MINI Analog Pro power terminal			
Push-in connection	**MINI MCR-2-PTB-PT**	2902067	1
Screw connection	**MINI MCR-2-PTB**	2902066	1

Accessories
ME 17,5 TBUS-... DIN rail connector

– For bridging the supply voltage when using a MINI POWER system power supply

Notes:

If the system power supply is used, two ME 17,5 TBUS DIN rail connectors are required. This allows you to establish the connection to the ME 6,2 TBUS DIN rail connector of the MINI Analog system and provide an effective power supply.

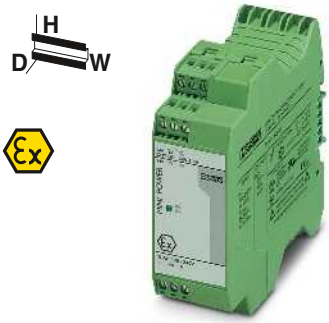


For system power supply

	Ordering data		
Description	Type	Order No.	Pcs./ Pkt.
DIN rail connector, for bridging the supply voltage, can be snapped onto 35 mm DIN rails according to EN 60715, with UL approval, two pieces are required per system power supply	**ME 17,5 TBUS 1,5/ 5-ST-3,81 GN**	2709561	10

Accessories
System power supply

– For supplying the supply voltage via the DIN rail connector where AC voltages are available
– Nominal input voltage range 100 ... 240 V AC
– 24 V DC output voltage
– For up to 60 MINI Analog modules
– For up to 1.5 A, secondary
– Status and error signaling via diagnostic LEDs

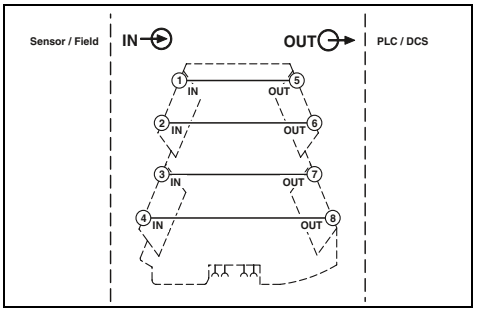


For applications with local voltages of over 100 V

	Ordering data		
Description	Type	Order No.	Pcs./ Pkt.
System power supply, primary-switched, with Zone 2 approval. Further information can be found in Catalog 4, Surge protection and power supplies.	**MINI-PS-100-240AC/24DC/1.5/EX**	2866653	1
System power supply, primary-switched (not for Zone 2) You can find further information in Catalog 4, Surge protection and power supplies.	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1

Accessories
Feed-through terminal blocks

– Feed-through terminal block for 1:1 forwarding of signals that are already electrically isolated in the MINI Analog Pro group
– Plug-in connection system



Ex n

NFC

For signals already electrically isolated

Technical data

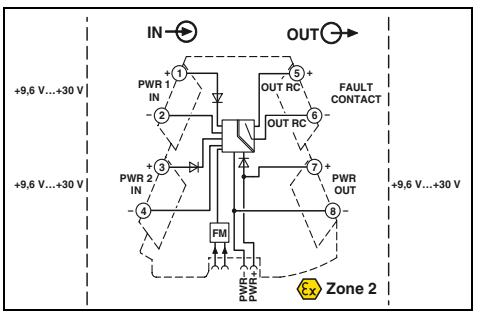
General data	
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Mounting	any
Housing material	PBT
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Screw connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 12
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
DNV GL	C, EMC2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MINI Analog Pro feed-through terminal block			
Screw connection	**MINI MCR-2-TB**	2902068	1

Accessories
Fault signaling modules

– Fault monitoring module for evaluating and reporting group errors from the fault monitoring system
– Monitoring of up to 115 connected MINI Analog Pro modules
– Plug-in connection system
– Monitoring of supply voltages of MINI MCR-2-PTB(-PT) power terminals
– Drawing off the supply is possible
– Fault signaling via an N/C contact
– Status and error indicator LEDs
– CE-compliant



Ex n

D W H

For group error message and supply monitoring

Technical data

Input data/output data	
Input signal	9.9 V DC ... 30 V DC
Output signal	9.6 V DC ... 29.7 V DC
Switching output	
Max. switching voltage	30 V DC
Maximum switching current	50 mA
General data	
Test voltage input/output	1.5 kV AC (50 Hz, 1 min.)
EMC note	Class A product, see page 605
Conformance/Approvals	
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6
DNV GL	C, EMC2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MINI Analog Pro fault signaling module			
Push-in connection	**MINI MCR-2-FM-RC-PT**	2904508	1
Screw connection	**MINI MCR-2-FM-RC**	2904504	1

Accessories
Programming adapters

IFS-USB-PROG-ADAPTER and NFC-USB-PROG-ADAPTER programming adapters for configuring Phoenix Contact INTERFACE modules with S-PORT or NFC interface.

The adapters are used with the FDT/DTM or the ANALOG-CONF software. For programming the MACX Analog, MINI Analog Pro, and MINI Analog.

Technical data

General data	
EMC note	Class A product, see page 605

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	**2811271**	1
Programming adapter for configuring modules with NFC interface	**NFC-USB-PROG-ADAPTER**	**2900013**	1
Bluetooth programming adapter, with USB and S-PORT interface	**IFS-BT-PROG-ADAPTER**	**2905872**	1

Accessories
Marking label for transparent cover

- Snap-in labels and adhesive labels with large area for marking
- For snapping into or sticking onto MINI Analog Pro covers, without overlapping the status and error LEDs
- The sheets can be marked quickly and easily using the BLUEMARK CLED and the THERMOMARK CARD...
- They can also be custom printed according to customer requirements

Unmarked or marked according to customer specifications

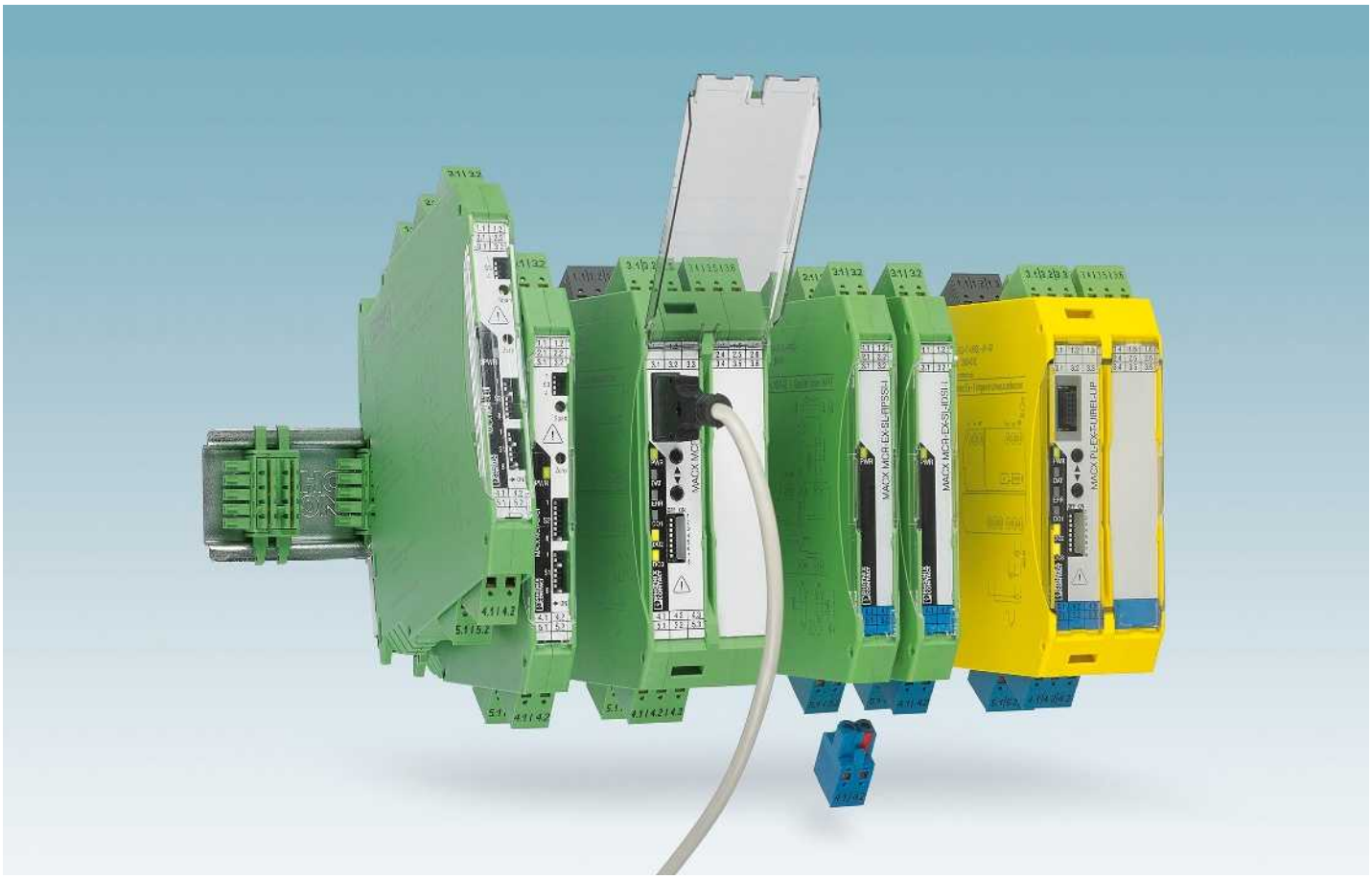
Ordering data

Description	Color	Type	Order No.	Pcs./ Pkt.
UniCard, for marking the CLIPFIX 35-5 end bracket, 24-section, 8 individual labels per strip, lettering field size: 30 x 5 mm				
	white	**UCT-EM (30X5)**	**0801505**	10
Lettering field size: 30 x 5 mm	white	**UCT-EM (30X5) CUS**	**0801589**	1
10-section, lettering field size: 15 x 5 mm	white	**UC-EMLP (15X5)**	**0819301**	10
10-section, lettering field size: 15 x 5 mm	white	**UC-EMLP (15X5) CUS**	**0824550**	1
Continuous labels, can be marked with thermal transfer printer, can be separated with a cutter, pitch as desired, strip length up to 1000 mm				
1 roll = 90 m continuous, height: 5.0 mm, 10 strips	white			

Ordering data

Type	Order No.	Pcs./ Pkt.
SK 5,0 WH:REEL	**0805221**	1

Signal conditioners with functional safety and explosion protection – the MACX ranges



Machine building/process industry
EN ISO 13849-1
EN 62061
IEC 61508
EN 60511

Process industry
IEC 61508
EN 60511

Signal conditioner with PL functional safety
MACX Safety

Ex i signal conditioner with PL functional safety
MACX Safety Ex

Signal conditioner with SIL functional safety
MACX Analog

Ex i signal conditioner with SIL functional safety
MACX Analog Ex

No intrinsic safety

Intrinsic safety
ATEX/IECEx
EN 60079-11

Reliable and safe

Highest safety for your machines and systems.

Phoenix Contact meets the requirements of functional safety according to IEC 61508 in a standardized development process. We take measures for fault avoidance and fault control into consideration, from the development and production of a device up to device operation.

Precise, interference-free signal transmission and long service life

– Patented transmission concept with safe electrical isolation
– Low power consumption and self-heating

Easy configuration and monitoring

– Either via FDT/DTM or alternatively with user-friendly stand-alone software – with integrated monitoring function
– Or without software via DIP switches on the housing front or with the operator interface and display unit

Easy installation, power bridging, and diagnostics

– Flexible supply voltage bridging and the option of redundant, diode-decoupled supply and error indication.
– Plug-in, coded connection terminal blocks with test sockets, optionally with screw connection or with fast Push-in connection technology

Fast and error-free signal connection

– Compact Termination Carriers connect MACX Analog devices to the automation system – Plug and Play

Ex i signal conditioner and PL d-certified signal conditioner

– Single and two-channel signal isolators for intrinsically safe circuits up to Zone 0 and Zone 20
– Integrate analog signals into safety applications according to the Machinery Directive with ease

Facts about explosion protection

The chemical and petrochemical industries involve industrial processes which produce explosive atmospheres. They are caused, for example, by gases, fumes or vapors. Explosive atmospheres are also likely to occur in mills, silos, and sugar and fodder factories due to the dust present there.

Therefore, electrical devices in potentially explosive areas are subject to special directives.

Devices and protective systems in potentially explosive areas

European Parliament directive 94/9/EC of March 23, 1994 (ATEX manufacturer directive) is of particular importance within CENELEC (European Community and Western European EFTA states). It is designed to facilitate the harmonization of legal provisions in the member states of the European Union for devices and protective systems in terms of ensuring correct use in potentially explosive areas. Directive 94/9/EC must be applied to all explosion-protected devices and protective systems placed on the market in the European Union.

The scope of this directive also includes safety, monitoring, and control devices which are used outside of potentially explosive areas, but which are necessary for, or contribute towards, the safe operation of devices and protective systems with respect to explosion hazards.

The term **device** includes machines, equipment, stationary or mobile devices, control components, and system accessories. The directive also covers alarm and protection systems which are meant to be used, either individually or in combination, for the generation, transmission, storage, measurement, control, and conversion of energy as well as for processing materials and which have the potential to ignite and cause an explosion.

Protective systems are devices designed to stop an incipient explosion immediately and/or restrict the area affected by the explosion, and which are placed on the market separately as autonomous systems.

Components are defined as those parts that are necessary for ensuring the safe operation of devices and protective systems, but do not perform an autonomous function in themselves.

European directives are implemented in ordinances or laws at a national level.

Systems in potentially explosive areas

Directive 1999/92/EC (ATEX Operator Directive) was passed in Europe to regulate the operation of systems in potentially explosive areas.

Terminology associated with the Ex area
Explosive atmosphere A mixture of combustible gases, steam, vapors or dust and air in atmospheric conditions that allow the entire mixture to combust once ignited.
Potentially explosive area An area where the atmosphere has the potential to explode due to local or operational conditions ("Ex area").
Electrical equipment The entire set of components, electric circuits or parts of electric circuits that are usually located within a single housing.
Intrinsically safe electrical equipment An electrical device in which all circuits are intrinsically safe. Note: These devices may be used directly in the Ex area.
Associated equipment Electrical devices that contain both intrinsically safe and non-intrinsically-safe circuits and that are designed in such a way that the non-intrinsically-safe circuits cannot influence the intrinsically safe ones. Note: Associated electrical equipment must not be used directly in potentially explosive areas without additional protection defined by a further type of protection.

Classification into groups

The general stipulations of EN 60079-0 divide electrical devices for potentially explosive areas into three groups.

Group I:

Electrical devices for firedamp areas (mines) which are susceptible to pit gases (methane) and/or combustible dusts (coal dust).

Group II:

Electrical devices for operation in areas where explosive gas atmospheres are likely to occur, excluding mines susceptible to firedamp.

These include: devices for the chemical, petrochemical, and pharmaceutical industries as well as for wastewater treatment.

Electrical devices are further divided into subcategories according to the properties of the explosive atmosphere.

In the case of the intrinsic safety type of protection, classification is based on the minimum ignition energy of the gas or vapor.

Designation	Typical gas	Ignition energy/J Intrinsic safety
II A	Propane	> 180
II B	Ethylene	60 ... 180
II C	Hydrogen	< 60

Group III:

Electrical devices for operation in areas where explosive dust atmospheres are likely to occur, excluding mines susceptible to firedamp.

These include: devices for areas associated with the food industry (mills, silos), for example.

Electrical devices are further divided into subcategories according to the properties of the explosive atmosphere.

Designation	Dusts
III A	Combustible flyings
III B	Non-conductive dust
III C	Conductive dust

Classification into temperature classes

Simply dividing the various gases into explosion or gas groups according to their minimum ignition energy is not sufficient to describe the gases adequately with regard to their explosive properties.

A gas may explode either when the ignition energy is exceeded or where there is an excessively high temperature caused by a hot surface. This ignition temperature is, however, not usually linked to the ignition energy, i.e., a gas with a low ignition energy does not necessarily explode at a low temperature. Consequently, devices that are used directly in potentially explosive atmospheres are divided into temperature classes. Temperature classes define the maximum surface temperature even in the event of errors. Parallel to this, the gases are classified according to their different ignition temperatures.

Temperature class	Maximum permissible surface temperature of the equipment °C	Ignition temperatures of combustible substances °C
T 1	450	> 450
T 2	300	> 300 ≤ 450
T 3	200	> 200 ≤ 300
T 4	135	> 135 ≤ 200
T 5	100	> 100 ≤ 135
T 6	85	> 85 ≤ 100

The following table provides an overview of the ignition energies and ignition temperatures for certain gases:

Substance	T_{ign}	Temperature class	E_{min}	Group
Ethoxyethane	170	T 4	190	II B
Ethylene	425	T 2	82	II B
Ammonia	630	T 1	14000	II A
Butane	365	T 2	250	II A
Methane	595	T 1	280	I
Propane	470	T 1	250	II A
Carbon disulfide	95	T 6	9	II C
Hydrogen	560	T 1	16	II C

Zone classification

Potentially explosive areas are divided into zones according to the probability of their occurrence. The EN 60079-10-1 standard defines the zones containing **explosive atmospheres** as follows:

Zone 0:

Area in which an explosive atmosphere is present for continuous or long periods.

These conditions are usually present inside containers, pipelines, apparatus, and tanks.

Zone 1:

Area in which an explosive atmosphere is to be expected only occasionally during normal operation.

This includes the immediate area surrounding Zone 0, as well as areas close to filling and emptying equipment.

Zone 2:

Area in which an explosive atmosphere is not expected during normal operation; however, if it does occur, then it does so only rarely and for a short period.

Zone 2 includes areas that are used exclusively for storage, areas around pipe connections that can be disconnected, and generally the immediate area surrounding Zone 1.

Areas that are potentially explosive as a result of **combustible dusts** are divided into the following zones according to EN 60079-10-2 (formerly: EN 61241-10):

Zone 20:

Area in which an explosive atmosphere is present for continuous, frequent or long periods in the form of an airborne cloud of combustible dust.

Zone 21:

Area in which an explosive atmosphere in the form of an airborne cloud of combustible dust is to be expected only occasionally during normal operation.

Zone 22:

Area in which an explosive atmosphere in the form of an airborne cloud of combustible dust is not expected during normal operation. However, if it does occur, then it does so only for a short period.

Categories

The ATEX directive assigns devices for use in potentially explosive areas to categories. In IEC 60079-0, "Equipment Protection Level (EPL)" is the term used instead of "category".

In the same way that there are different zones, there are also different device categories. These consist of categories M1 and M2 for Group I and categories 1, 2, and 3 for Group II. The categories for **equipment group II** are described in more detail below:

Category 1:

Devices constructed to guarantee a very high degree of safety.

Devices in this category must guarantee the required degree of safety even in the unlikely event of a device failure and therefore be provided with measures to protect against explosion, so that:

– In the event of one integrated protection measure failing, a second, independent protection measure is able to guarantee the necessary safety, or
– In the event of two independent errors, the necessary safety is guaranteed.

Category 2:

Devices constructed to guarantee a very high degree of safety.

The explosion protection measures associated with this category guarantee the required degree of safety, even in the case of frequent device failures or common error states.

Category 3:

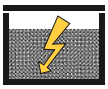
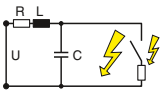
Devices constructed to guarantee a standard degree of safety.

Devices in this category guarantee an adequate degree of safety in normal operation.

The table below shows which categories are assigned to which zones:

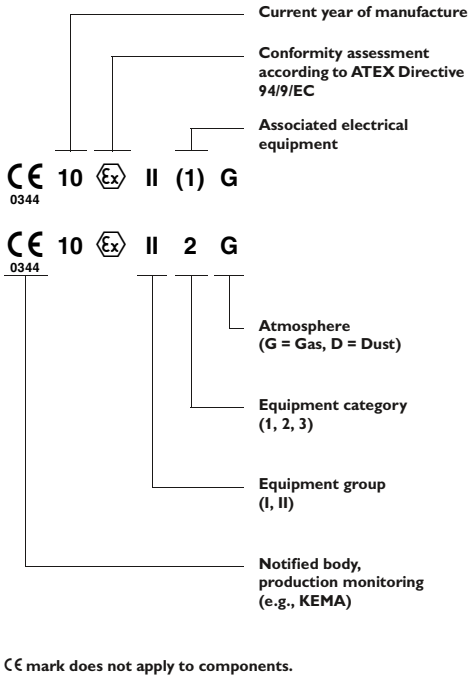
Category	For zone	Also possible
1	0 20	1 and 2 21 and 22
2	1 21	2 22
3	2 22	

Types of protection

Protection principle		Type of protection		Area of application (selection)	Standard
	Isolation	Oil immersion	o	Transformers, relays, startup controls, switching devices	EN 60079-6
		Sand filling	q	Transformers, relays, capacitors	EN 60079-5
		Molded encapsulation	m*	Coils of relays and motors, electronics, solenoid valves, connection systems	EN 60079-18
	Exclusion	Pressurized enclosure	p	Control cabinets, motors, measuring and analysis devices, computers	EN 60079-2
	Special mechanical design	Flameproof enclosure	d	Motors, switching devices, power electronics	EN 60079-1
	Clearance from electrically conductive parts	Increased safety	e	Terminal blocks, housing, lights, motors	EN 60079-7
	Energy limitation	Intrinsic safety		Electronics, MCR	EN 60079-11
		Intrinsically safe systems	i*	Electronic systems	EN 60079-25
		Intrinsically safe fieldbus systems		Fieldbus systems	EN 60079-27
Improved industrial quality nA: non-sparking nC: sparking equipment nR: restricted breathing housing nL: energy-limited nP: simplified pressurized enclosures		Protection type "n"	n**	Motors, housing, lights, electronics	EN 60079-15

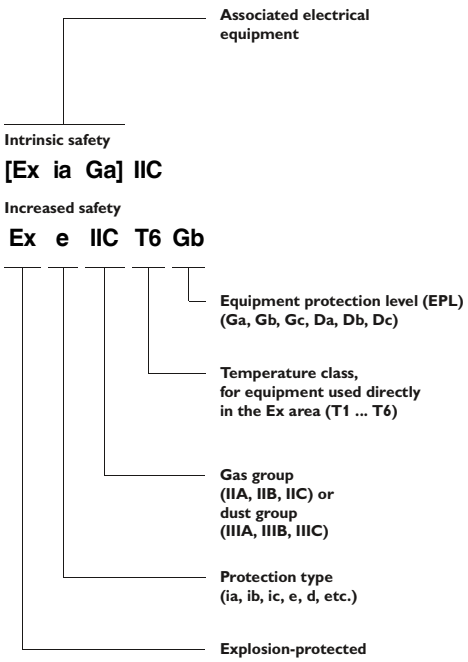
* ia, ma: application in Zone 0, 1, 2 / ib, mb: application in Zone 1, 2 / ic, mc: application in Zone 2 only ** Application in Zone 2 only

Marking according to ATEX directive

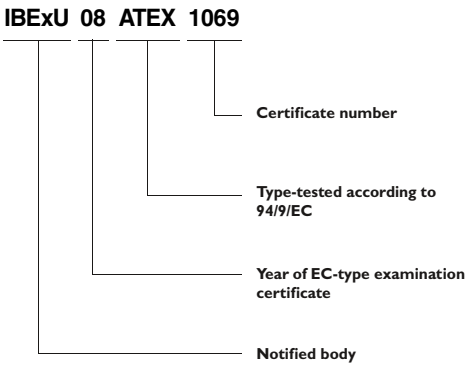


CE mark does not apply to components.

Marking according to EN 60079-0



EC-type examination certificate



Safety-related function for the Ex area

The term SIL (safety integrity level) is becoming more and more significant in the field of process technology. It defines the requirements that a device or a system is expected to fulfill so that the failure probability can be specified. The aim is to achieve maximum possible operational reliability. If a device or system fails, a defined state is attained. Standard-based inspections are carried out to determine statistical probability.

Application of SIL on the basis of IEC 61508 and IEC 61511

The SIL standard is used for a wide range of industries within the process industry, including the chemical industry, refineries, oil and gas production, paper manufacturing, and conventional power generation. In addition to functional safety requirements, systems in potentially explosive areas are also subject to Ex standards EN 60079-0 ff.

IEC 61508: "Functional safety of electrical/electronic/programmable electronic safety-related systems"

This standard describes the requirements that the manufacturer has to bear in mind when producing devices or systems.

IEC 61511: "Functional safety - Safety instrumented systems for the process industry sector"

The IEC 61511 standard describes the requirements for achieving systems with functional safety.

Compliance with the standard is determined by operators, owners, and planners on the basis of safety plans and national regulations. In addition, the standard also describes the requirements for using a device in an application on the basis of its proven effectiveness (proven in use).

SIL marking on devices

The products in the MACX range from Phoenix Contact, which have been developed according to IEC 61508, are marked with the designation SIL 2 or SIL 3. This indicates clearly that the devices may be suitable for safety instrumented functions (SIF).

To determine whether they can actually be used, you need to calculate the sum of the probability failure values for all the devices in the signal circuit. The necessary values for this can be found in the safety manual of each SIL product.

Overview of terms from SIL standards IEC 61508 and IEC 61511

SIL – **Safety Integrity Level**
One of four discrete levels for the specification of requirements for the safety integrity of safety instrumented functions, which are assigned to the E/E/PE safety instrumented systems, where SIL 4 is the highest and SIL 1 the lowest level.

EUC – **Equipment Under Control**
Equipment, machines, devices or systems used in production, materials processing or transport.

MTBF – **Mean Time Between Failures**
The expected mean time between failures.

PFD – **Probability of Failure on Demand**
The probability of a failure on demand.
Describes the probability of a safety instrumented system failing to perform its function when required.

PFDavg – **Average Probability of Failure on Demand**
The average probability of the function failing on demand.

E/E/PES – **Electrical/Electronic/Programmable Electronic Systems**
This term is used for all electrical devices or systems that can be used to execute a safety instrumented function. It includes simple electrical devices and all types of programmable logic controllers (PLCs).

PFH – **Probability of dangerous Failure per Hour**
Describes the probability of a dangerous failure occurring per hour.

SFF – **Safe Failure Fraction**
Describes the proportion of harmless failures. This is the ratio of the rate of safe failures plus the rate of diagnosed or detected faults in relation to the total failure rate of the system.

SIF – **Safety Instrumented Function**
Describes the safety instrumented functions of a system.

SIS – **Safety Instrumented System**
An SIS (safety instrumented system) consists of one or more safety instrumented functions. An SIL requirement is applicable for each of these safety instrumented functions.

SIL inspection

The complete signal path must be taken into account during the SIL inspection. The example shows how the safety integrity level is calculated in a typical safety application using average failure probabilities of individual devices.

Table 2 of the IEC 61508-1 standard describes the relationship between the average failure probability and the attainable SIL. Here, the level required determines the overall budget for the sum of all PFD values.

A system with a single-channel structure with a low demand rate is used as an example; for SIL 2 the average PFD value is between 10^{-3} and < 10^{-2}.

Safety integrity level SIL	Operating mode with a low demand rate (average probability of the specified function failing on demand)
4	≥ 10^{-5} to < 10^{-4}
3	≥ 10^{-4} to < 10^{-3}
2	≥ 10^{-3} to < 10^{-2}
1	≥ 10^{-2} to < 10^{-1}

Safety integrity level: failure limit values for a safety function which is operated in an operating mode with a low demand rate.

Example:

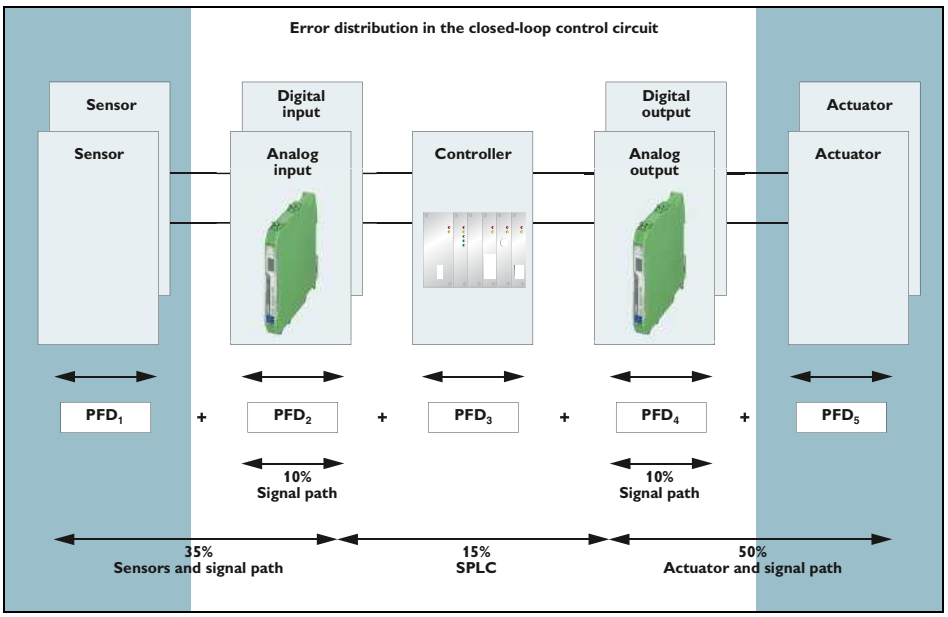
A sensor and actuator are assembled in the field and are exposed to chemical and physical loads (process medium, pressure, temperature, vibration, etc.). Accordingly, these components have a high risk of failure:

– The sensor accounts for 25% of the overall PFD
– The actuator accounts for 40% of the overall PFD

Neither the failsafe controller nor the interface modules come into contact with the process medium and both are usually located in a protected control cabinet:

– The failsafe controller accounts for 15% of the overall PFD
– The interface modules each account for 10% of the overall PFD

Typically, the values form the basis for a calculation.



Functional safety performance level (PL) according to EN ISO 13849-1 and EN 62061

General information

In modern industrial systems, the amount of complex technical equipment used is constantly increasing. The purpose of safety technology is to reduce the risk as far as possible but at least to a reasonable degree. At the same time, the availability of production equipment should not be restricted any more than is absolutely necessary.

The Machinery Directive defines the requirements machinery must meet before it can be placed on the market and operated in the European Economic Area. It also contains essential health and safety requirements for the planning and construction of machinery and safety components.

However, the number of systems subject to the directive that do not belong to classical machine building is increasing continually. These include, for example, wind turbine generators. However, biogas systems, distributed energy generation generally, and other process engineering systems also focus on the statutory requirements.

For this reason, analog signals are increasingly being handled according to the specifications of the Machinery Directive.

Every "machine" or system poses a risk. According to the requirements of the Machinery Directive, a risk assessment must be carried out for every machine. If the risk is greater than the level of risk that can be tolerated, risk reduction must be implemented.

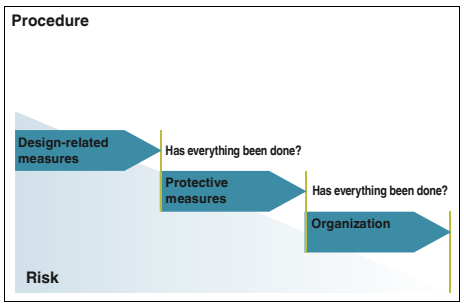


Figure 1:
Risk reduction according to EN ISO 12100

Functional safety

In order to achieve the necessary "functional safety" of a system, it is essential for the safety-related parts of the safety equipment and control devices to operate correctly and, in the event of failure, for the system to remain in the safe state or enter a safe state. The requirements for achieving functional safety are based on the following objectives:

– Avoidance of systematic errors
– Control of systematic errors
– Control of random faults or failures

The EN ISO 13849 (and EN 62061) standard specifies the various safety levels in the form of the Performance Level "PL" (and the Safety Integrity Level "SIL") depending on the extent of the risk and describes the characteristics of the safety functions.

Practical procedure according to EN ISO 13849

In practice, the following steps have proved to be effective:

1. Definition of the safety function
   The information is derived from the risk assessment.
2. Determination of the required Performance Level (PL)
   For each safety function, the required performance level is estimated using the adjacent risk graph (Fig. 3).
3. Technical implementation
   This step involves the technical pre-planning of the safety function, taking possible technologies and components into account.
4. Dividing the safety function into subsystems
   Implementation takes place in block diagrams. As a rule, a safety function consists of a sensor-logic actuator.

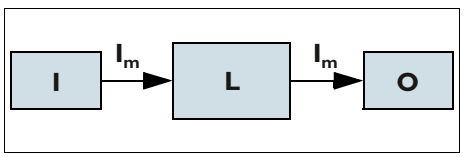


Figure 2:
Safety technology block diagram (according to EN 13849-1)

5. Determination of the achieved PL for each subsystem
   A characteristic value when determining the performance level is the so-called PFHd value, the statistical "probability of a dangerous failure per hour". The safety technology characteristics are given in the product data sheet, the FUNCTIONAL SAFETY CHARACTERISTICS data sheet or the SISTEMA library (Fig. 4).
   Further safety technology characteristic data consists of the category, the DC value, and the MTTFD value (Fig. 5).
6. Determination of the achieved PL
   The manufacturer of subsystems states the category and makes the specifications on the achieved PFHd value and the PL available.
7. Verification of the achieved PL
   Each individual subsystem and the entire safety chain must together meet the requirements of the necessary PL. This includes both the quantitative evaluation and the consideration of systematic aspects, such as proven components and safety principles.
8. Validation
   Finally, it is necessary to check whether the selected measures achieve the required risk reduction and therefore the protection objectives of the risk assessment. The result is included in the final risk assessment.

Definitions:
PFH_D: probability of a dangerous failure occurring per hour.
DC: diagnostic coverage
$MTTF_d$: mean time to dangerous failure

Category:
$B10_d$: number of operating cycles after which 10% of the devices have failed
CCF: Common cause failure

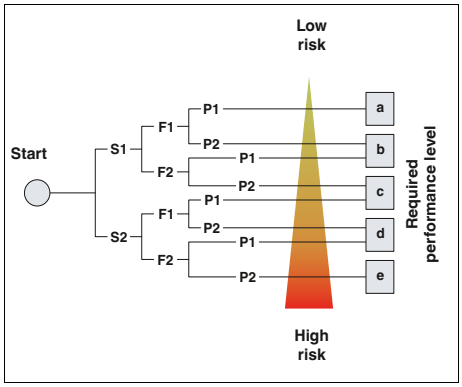


Figure 3: Risk graph

Meaning of individual parameters:
S: Severity of injury
– S1: Slight (reversible) injuries
– S2: Severe (irreversible) injuries
F: Frequency and duration of exposure to the hazard
– F1: Seldom to not very frequent
– F2: Frequent to continually or long
P: Possibility of avoiding or limiting damage
– P1: Possible under certain conditions
– P2: Hardly possible

Phoenix Contact offers a series of services surrounding the topic of functional safety.

It comprises initial planning and startup to the modernization of the safety lifecycle. There is also a training concept. Dates are published on the homepage.

In addition, all questions are answered via the free safety hotline.

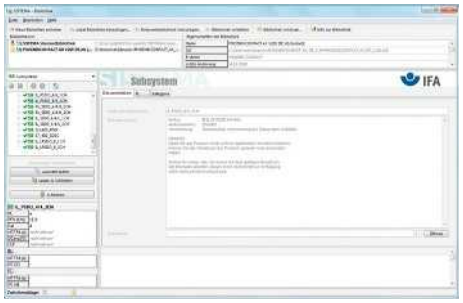


Figure 4: SISTEMA library

SISTEMA is a product library with which safety functions can be easily calculated. The products from MACX Safety and MACX Safety Ex are included in a SISTEMA library. It is available from the product download area on the Phoenix Contact homepage.

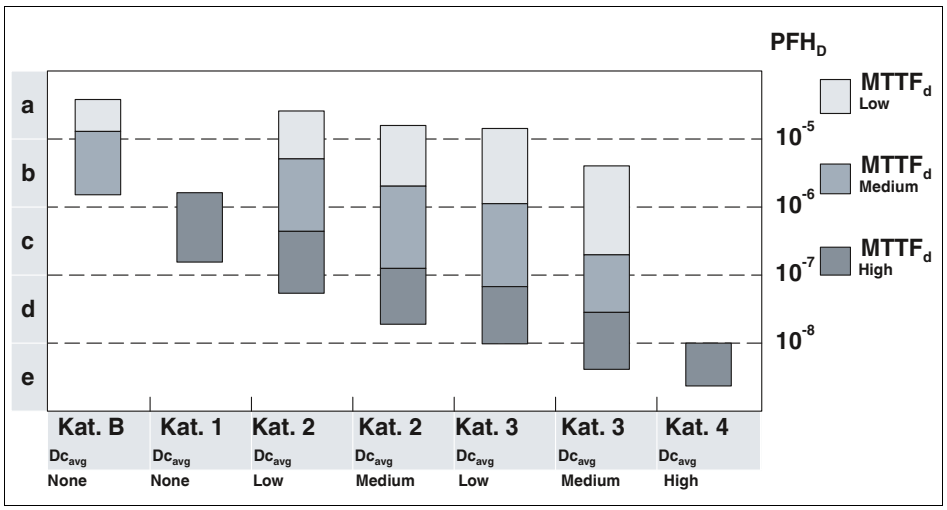
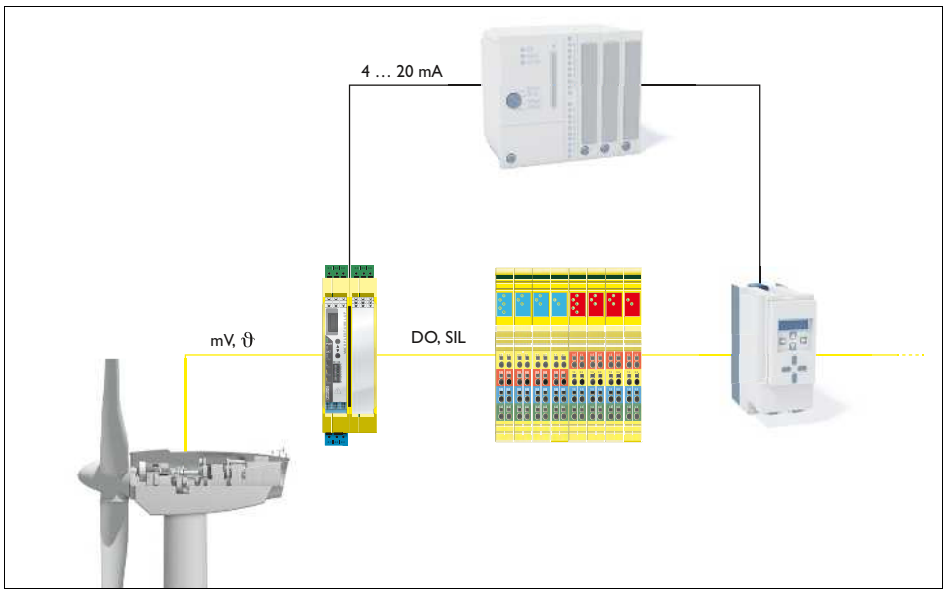
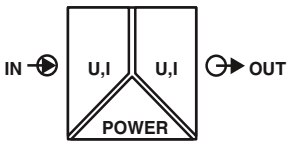


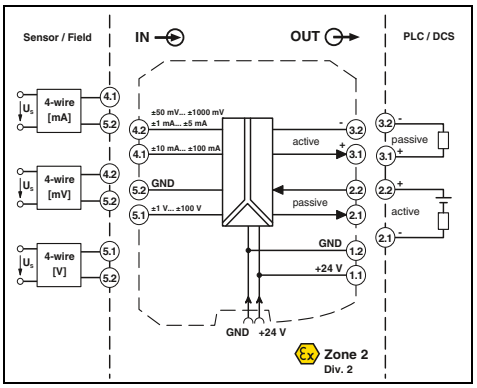
Figure 5:
Relationship between PL, category, DC, and MTTFd (according to EN 13849-1)



Application example:
Safety-related temperature monitoring in a wind turbine generator

Analog IN/Analog OUT
3-way signal conditioner





Universal, more than 1600 signal combinations

Functional Safety
Ex:
Housing width 12.5 mm

Universal signal conditioner for operating 4-conductor measuring transducers.

- Analog signal conditioner for isolating, filtering, amplifying, and converting standard analog signals
- Configurable input and output signals, including bipolar current and voltage signals
- 3-way electrical isolation
- Over 1600 signal conversions can be set via DIP switches on the front
- 10 kHz limit frequency for time-critical applications
- Output active or passive
- Plug-in screw or Push-in connection technology
- Power supply via DIN rail connector possible
- Status indicator for supply voltage
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Technical data

Input data		
Input signal (configurable using the DIP switch)	U input	I input
	0 ... 10 V , please indicate if different setting when ordering	
	0 ... 1 mA , Configurable via DIP switches	
Maximum input signal	± 100 V	± 100 mA
Input resistance	approx. 1 MΩ (± 1 V DC ... ± 100 V DC)	approx. 10 Ω (± 10 mA DC ... ± 100 mA DC)
Output data	U output	I output
Output signal (configurable using the DIP switch)	0 ... 10 V , Configurable via DIP switches	
	0 ... 20 mA , please indicate if different setting when ordering	
Load R_B	≥ 1 kΩ (10 V)	≤ 600 Ω (20 mA; active) passive: ≤ (UB-2 V) / I_{outmax}
General data		
Supply voltage range	12 V DC ... 24 V DC (-20 % / +25 %)	
Power dissipation	< 0.7 W (at 24 V DC / 20 mA)	
Maximum transmission error	≤ 0.1 % (Compared to the final value)	
Temperature coefficient	0.0075 %/K	
ZERO / SPAN adjustment	± 4 % / ± 4 %	
Limit frequency (3 dB)	10 kHz (Can be switched to 30 Hz)	
Step response (10-90%)	35 µs (at 10 kHz) 11 ms (At 30 Hz)	
Electrical isolation		
Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))	
Test voltage, input/output/supply	2.5 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature (operation)	-20 °C ... 70 °C	
Mounting	any	
Housing material	PA 66-FR	
Dimensions W/H/D	12.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc	
IECEx	Ex nA IIC T4 Gc	
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC	
SIL in accordance with IEC 61508	2	

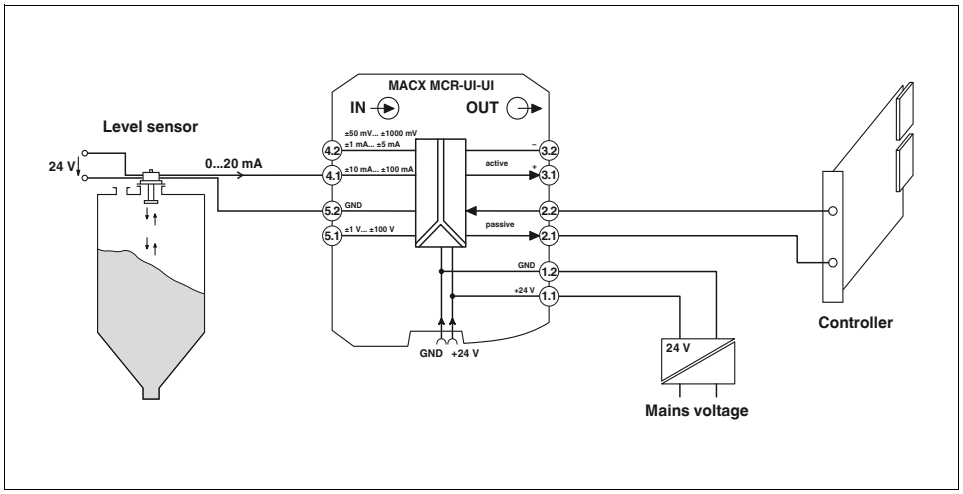
Ordering data

Description		Type	Order No.	Pcs./ Pkt.
3-way signal conditioner, for electrical isolation of analog signals				
Order configuration	Screw connection	**MACX MCR-UI-UI**	2811284	1
Order configuration	Push-in connection	**MACX MCR-UI-UI-SP**	2811572	1
Standard configuration	Screw connection	**MACX MCR-UI-UI-NC**	2811446	1
Standard configuration	Push-in connection	**MACX MCR-UI-UI-SP-NC**	2811556	1

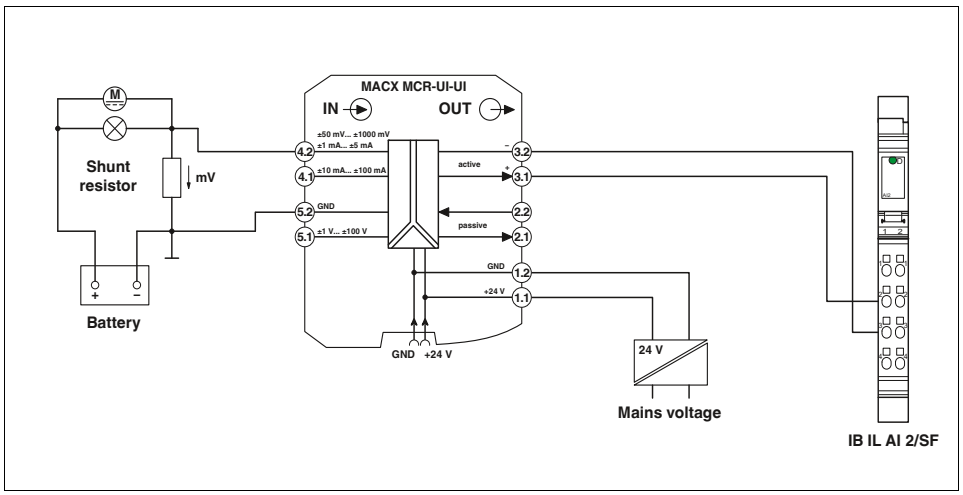
Order key for MACX MCR-UI-UI(-SP) (standard configuration entered as an example)

Order No.	Input			Output		Cut-off frequency	Factory calibration certificate (FCC)
2811284	IN03			OUT01		10K	NONE
2811284 ≙ MACX MCR-UI-UI 2811572 ≙ MACX MCR-UI-UI-SP	IN40 ≙ 0 ... 50 mV IN24 ≙ 0 ... 60 mV IN41 ≙ 0 ... 75 mV IN25 ≙ 0 ... 100 mV IN43 ≙ 0 ... 120 mV IN44 ≙ 0 ... 150 mV IN26 ≙ 0 ... 200 mV IN27 ≙ 0 ... 300 mV IN28 ≙ 0 ... 500 mV IN66 ≙ 0 ... 1000 mV IN29 ≙ 0 ... 1.0 V IN50 ≙ 0 ... 1.5 V IN30 ≙ 0 ... 2.0 V IN52 ≙ 0 ... 3.0 V IN05 ≙ 0 ... 5 V IN03 ≙ 0 ... 10 V IN67 ≙ 0 ... 15 V IN32 ≙ 0 ... 20 V IN39 ≙ 0 ... 30 V IN68 ≙ 0 ... 50 V IN69 ≙ 0 ... 100 V IN06 ≙ 1 ... 5 V IN04 ≙ 2 ... 10 V	IN53 ≙ -50 ... +50 mV IN13 ≙ -60 ... +60 mV IN54 ≙ -75 ... +75 mV IN14 ≙ -100 ... +100 mV IN56 ≙ -120 ... +120 mV IN57 ≙ -150 ... +150 mV IN15 ≙ -200 ... +200 mV IN16 ≙ -300 ... +300 mV IN17 ≙ -500 ... +500 mV IN78 ≙ -1000 ... +1000 mV IN18 ≙ -1.0 ... +1.0 V IN63 ≙ -1.5 ... +1.5 V IN19 ≙ -2.0 ... +2.0 V IN65 ≙ -3.0 ... +3.0 V IN21 ≙ -5 ... +5 V IN22 ≙ -10 ... +10 V IN79 ≙ -15 ... +15 V IN23 ≙ -20 ... +20 V IN80 ≙ -30 ... +30 V IN81 ≙ -50 ... +50 V IN82 ≙ -100 ... +100 V	IN70 ≙ 0 ... 1.0 mA IN71 ≙ 0 ... 1.5 mA IN72 ≙ 0 ... 2.0 mA IN73 ≙ 0 ... 3.0 mA IN36 ≙ 0 ... 5 mA IN37 ≙ 0 ... 10 mA IN74 ≙ 0 ... 15 mA IN01 ≙ 0 ... 20 mA IN75 ≙ 0 ... 30 mA IN76 ≙ 0 ... 50 mA IN77 ≙ 0 ... 100 mA IN83 ≙ -1.0 ... +1.0 mA IN84 ≙ -1.5 ... +1.5 mA IN85 ≙ -2.0 ... +2.0 mA IN86 ≙ -3.0 ... +3.0 mA IN33 ≙ -5 ... +5 mA IN34 ≙ -10 ... +10 mA IN87 ≙ -15 ... +15 mA IN35 ≙ -20 ... +20 mA IN88 ≙ -30 ... +30 mA IN89 ≙ -50 ... +50 mA IN90 ≙ -100 ... +100 mA IN91 ≙ 1 ... 5 mA IN92 ≙ 2 ... 10 mA IN02 ≙ 4 ... 20 mA	OUT19 ≙ 0 ... 2.5 V OUT05 ≙ 0 ... 5 V OUT03 ≙ 0 ... 10 V OUT20 ≙ -2.5 ... +2.5 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V OUT24 ≙ 0.5 ... +2.5 V OUT06 ≙ 1 ... 5 V OUT04 ≙ 2 ... 10 V OUT27 ≙ 2.5 ... 0 V OUT11 ≙ 5 ... 0 V OUT09 ≙ 10 ... 0 V	OUT15 ≙ 0 ... 5 mA OUT16 ≙ 0 ... 10 mA OUT01 ≙ 0 ... 20 mA OUT21 ≙ -5 ... +5 mA OUT22 ≙ -10 ... +10 mA OUT23 ≙ -20 ... +20 mA OUT25 ≙ 1 ... 5 mA OUT26 ≙ 2 ... 10 mA OUT02 ≙ 4 ... 20 mA OUT28 ≙ 5 ... 0 mA OUT29 ≙ 10 ... 0 mA OUT07 ≙ 20 ... 0 mA	30 ≙ 30 Hz 10K ≙ 10 kHz	NONE ≙ Without FCC YES ≙ With FCC (a fee is charged) YESPLUS ≙ FCC with 5 measuring points (a fee is charged)

Application example: Level measurement and active analog input card

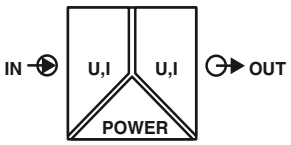


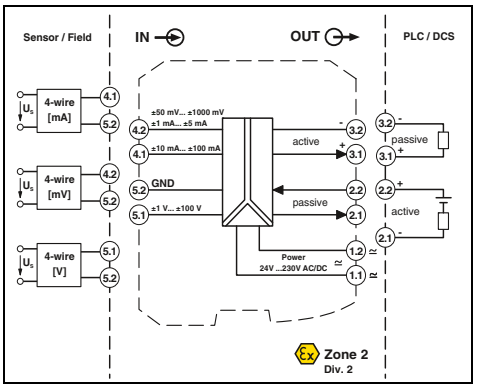
Application example: Shunt measurement and Inline terminal with passive analog input channels within an Inline station



(Information on automation solutions from Phoenix Contact can be found in Catalog 6 or at phoenixcontact.net/products)

Analog IN/Analog OUT
3-way signal conditioner





Universal, more than 1600 signal combinations, wide-range power supply

DNV GL Functional Safety
Ex:
Housing width 12.5 mm

- Analog signal conditioner for isolating, filtering, amplifying, and converting standard analog signals
- Configurable input and output signals, including bipolar current and voltage signals
- 3-way electrical isolation
- Over 1600 signal conversions can be set via DIP switches on the front
- Output active or passive
- Plug-in screw or Push-in connection technology
- Wide-range power supply of 19.2 to 253 V AC/DC
- Status indicator for supply voltage
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

Technical data

Input data		
Input signal (configurable using the DIP switch)	U input	I input
	0 ... 10 V , please indicate if different setting when ordering 0 ... 1 mA , Configurable via DIP switches	
Maximum input signal	± 100 V	± 100 mA
Input resistance	approx. 1 MΩ (± 1 V DC ... ± 100 V DC)	approx. 10 Ω (± 10 mA DC ... ± 100 mA DC)
Output data		
Output signal (configurable using the DIP switch)	U output	I output
	0 ... 10 V , Configurable via DIP switches 0 ... 20 mA , Configurable via DIP switches	
Maximum output signal	15 V	35 mA
Load R_B	≥ 1 kΩ (10 V)	≤ 600 Ω (20 mA; active) passive: ≤ (UB-2 V) / I_{outmax}
General data		
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)	
Power dissipation	< 0.8 W (at 24 V DC / 20 mA) < 0.9 W (At 230 V AC / 20 mA)	
Maximum transmission error	≤ 0.1 % (Compared to the final value)	
Temperature coefficient	0.0075 %/K	
ZERO / SPAN adjustment	± 4 % / ± 4 %	
Electrical isolation		
Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))	
Degree of protection	IP20	
Ambient temperature (operation)	-20 °C ... 70 °C	
Housing material	PA 66-FR	
Dimensions W/H/D	12.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA IIC T4 Gc	
SIL in accordance with IEC 61508	2	

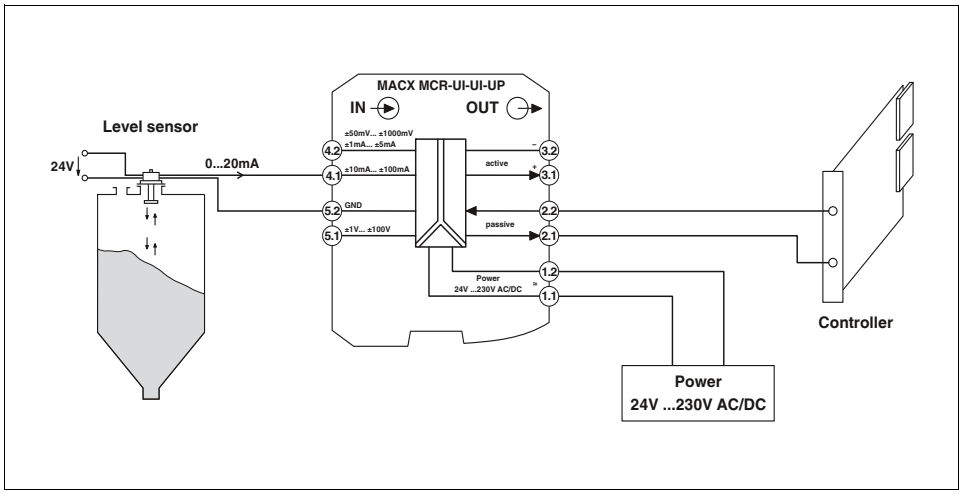
Ordering data

Description		Type	Order No.	Pcs./ Pkt.
3-way signal conditioner, for electrical isolation of analog signals with wide-range power supply				
Order configuration	Screw connection	**MACX MCR-UI-UI-UP**	2811459	1
Order configuration	Push-in connection	**MACX MCR-UI-UI-UP-SP**	2811585	1
Standard configuration	Screw connection	**MACX MCR-UI-UI-UP-NC**	2811297	1
Standard configuration	Push-in connection	**MACX MCR-UI-UI-UP-SP-NC**	2811569	1

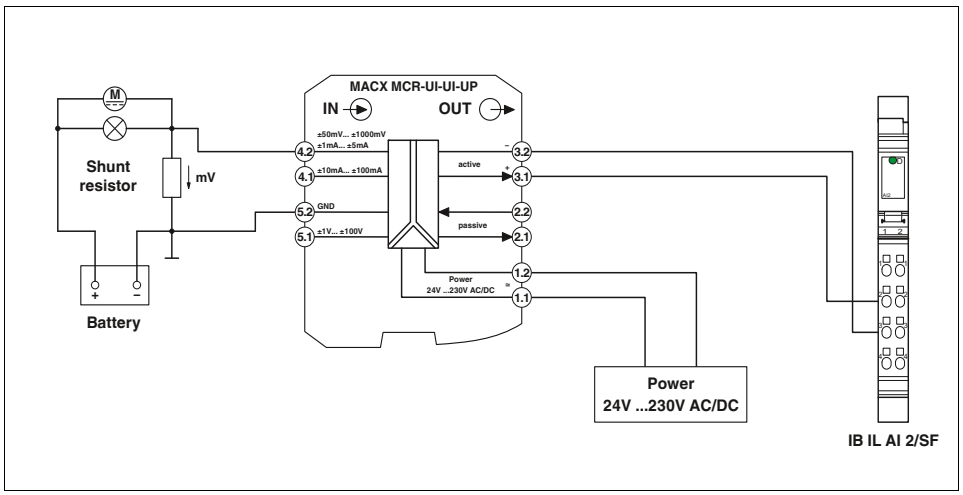
Order key for MACX MCR-UI-UI(-SP) (standard configuration entered as an example)

Order No.	Input			Output		Cut-off frequency	Factory calibration certificate (FCC)
2811459	IN03			OUT01		10K	NONE
2811459 ≙ MACX MCR-UI-UI-UP 2811585 ≙ MACX MCR-UI-UI-UP-SP	IN40 ≙ 0 ... 50 mV IN24 ≙ 0 ... 60 mV IN41 ≙ 0 ... 75 mV IN25 ≙ 0 ... 100 mV IN43 ≙ 0 ... 120 mV IN44 ≙ 0 ... 150 mV IN26 ≙ 0 ... 200 mV IN27 ≙ 0 ... 300 mV IN28 ≙ 0 ... 500 mV IN66 ≙ 0 ... 1000 mV IN29 ≙ 0 ... 1.0 V IN50 ≙ 0 ... 1.5 V IN30 ≙ 0 ... 2.0 V IN52 ≙ 0 ... 3.0 V IN05 ≙ 0 ... 5 V IN03 ≙ 0 ... 10 V IN67 ≙ 0 ... 15 V IN32 ≙ 0 ... 20 V IN39 ≙ 0 ... 30 V IN68 ≙ 0 ... 50 V IN69 ≙ 0 ... 100 V IN06 ≙ 1 ... 5 V IN04 ≙ 2 ... 10 V	IN53 ≙ -50 ... +50 mV IN13 ≙ -60 ... +60 mV IN54 ≙ -75 ... +75 mV IN14 ≙ -100 ... +100 mV IN56 ≙ -120 ... +120 mV IN57 ≙ -150 ... +150 mV IN15 ≙ -200 ... +200 mV IN16 ≙ -300 ... +300 mV IN17 ≙ -500 ... +500 mV IN78 ≙ -1000 ... +1000 mV IN18 ≙ -1.0 ... +1.0 V IN63 ≙ -1.5 ... +1.5 V IN19 ≙ -2.0 ... +2.0 V IN65 ≙ -3.0 ... +3.0 V IN21 ≙ -5 ... +5 V IN22 ≙ -10 ... +10 V IN79 ≙ -15 ... +15 V IN23 ≙ -20 ... +20 V IN80 ≙ -30 ... +30 V IN81 ≙ -50 ... +50 V IN82 ≙ -100 ... +100 V	IN70 ≙ 0 ... 1.0 mA IN71 ≙ 0 ... 1.5 mA IN72 ≙ 0 ... 2.0 mA IN73 ≙ 0 ... 3.0 mA IN36 ≙ 0 ... 5 mA IN37 ≙ 0 ... 10 mA IN74 ≙ 0 ... 15 mA IN01 ≙ 0 ... 20 mA IN75 ≙ 0 ... 30 mA IN76 ≙ 0 ... 50 mA IN77 ≙ 0 ... 100 mA IN83 ≙ -1.0 ... +1.0 mA IN84 ≙ -1.5 ... +1.5 mA IN85 ≙ -2.0 ... +2.0 mA IN86 ≙ -3.0 ... +3.0 mA IN33 ≙ -5 ... +5 mA IN34 ≙ -10 ... +10 mA IN87 ≙ -15 ... +15 mA IN35 ≙ -20 ... +20 mA IN88 ≙ -30 ... +30 mA IN89 ≙ -50 ... +50 mA IN90 ≙ -100 ... +100 mA IN91 ≙ 1 ... 5 mA IN92 ≙ 2 ... 10 mA IN02 ≙ 4 ... 20 mA	OUT19 ≙ 0 ... 2.5 V OUT05 ≙ 0 ... 5 V OUT03 ≙ 0 ... 10 V OUT20 ≙ -2.5 ... +2.5 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V OUT24 ≙ 0.5 ... +2.5 V OUT06 ≙ 1 ... 5 V OUT04 ≙ 2 ... 10 V OUT27 ≙ 2.5 ... 0 V OUT11 ≙ 5 ... 0 V OUT09 ≙ 10 ... 0 V	OUT15 ≙ 0 ... 5 mA OUT16 ≙ 0 ... 10 mA OUT01 ≙ 0 ... 20 mA OUT21 ≙ -5 ... +5 mA OUT22 ≙ -10 ... +10 mA OUT23 ≙ -20 ... +20 mA OUT25 ≙ 1 ... 5 mA OUT26 ≙ 2 ... 10 mA OUT02 ≙ 4 ... 20 mA OUT28 ≙ 5 ... 0 mA OUT29 ≙ 10 ... 0 mA OUT07 ≙ 20 ... 0 mA	30 ≙ 30 Hz 10K ≙ 10 kHz	NONE ≙ Without FCC YES ≙ With FCC (a fee is charged) YESPLUS ≙ FCC with 5 measuring points (a fee is charged)

Application example: Level measurement and active analog input card

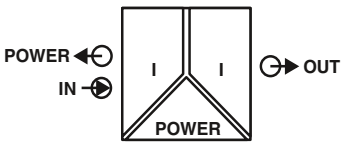


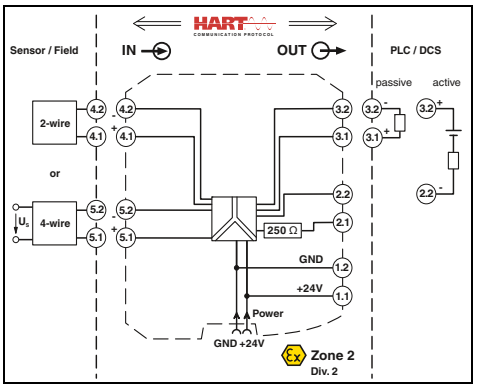
Application example: Shunt measurement and Inline terminal with analog input channels within an Inline station



(Information on automation solutions from Phoenix Contact can be found in Catalog 6 or at phoenixcontact.net/products)

Analog IN / Analog OUT repeater power supplies





Ex n

Repeater power supply and input signal conditioner

Functional Safety

Ex:

Housing width 12.5 mm

Repeater power supply and input signal conditioner for the operation of 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources

- 0/4 to 20 mA input (powered or not powered)
- 0/4 to 20 mA output (active or passive)
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Terminal point with 250 Ω resistor to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

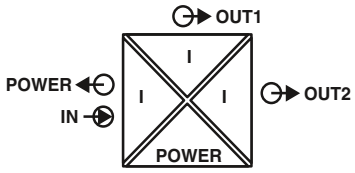
Technical data

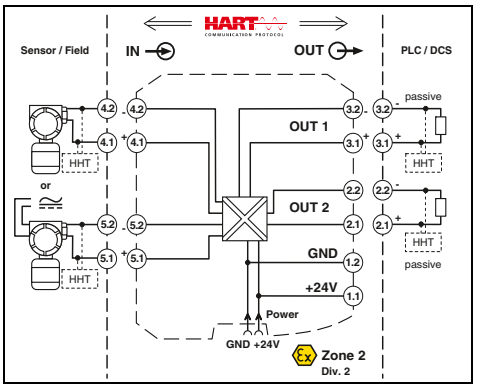
Input data		
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 21.5 V (20 mA)
Voltage drop		< 3.5 V (in input signal conditioner operation)
Output data		
Output signal		4 mA ... 20 mA (active) 4 mA ... 20 mA (14 ... 26 V ext. source voltage)
Load		< 1000 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 76 mA (24 V DC / 20 mA / 1000 Ω) ; < 55 mA (24 V DC / 20 mA / 250 Ω)
Power dissipation		< 1.1 W (24 V DC/ 20 mA) < 0.95 W (24 V DC / 20 mA / 250 Ω) < 1.2 W (24 V DC / 20 mA / 0 Ω)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 200 µs (for jump 4 mA ... 20 mA, load 600)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 112.5 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II 3 G Ex nA II T4 Gc X
UL, USA/Canada		UL 61010 Listed UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, with HART® protocol			
Screw connection	**MACX MCR-SL-RPSSI-I**	2865955	1
Push-in connection	**MACX MCR-SL-RPSSI-I-SP**	2924207	1

Analog IN / Analog OUT repeater power supplies





Ex n

SIL IEC 61508

Repeater power supply and input signal conditioner, with two electrically isolated outputs

Functional Safety

Ex:

Housing width 12.5 mm

Repeater power supply and input signal conditioner for the operation of 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources

- 0/4 to 20 mA input (powered or not powered)
- Two electrically isolated outputs, 0/4 to 20 mA (active)
- Bidirectional transmission of digital HART communication signals (both outputs)
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- 4-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

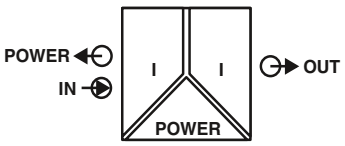
Technical data

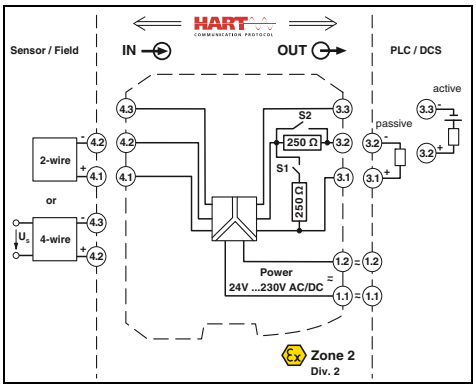
Input data		
Input signal		4 mA ... 20 mA / 0 mA ... 20 mA
Transmitter supply voltage		> 21.5 V (20 mA)
Voltage drop		< 3.9 V (in input signal conditioner operation)
Output data		
Output signal (Per output)		4 mA ... 20 mA (active) 0 mA ... 20 mA
Load		< 450 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 75 mA (24 V DC / 20 mA)
Power dissipation		< 1.45 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		1.3 ms (for jump 4 mA ... 20 mA, typical)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Output 1/output 2	1.5 kV AC (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position) -20 °C ... 70 °C (any mounting position, module distance > 5 mm, MTBF reduction factor 2.5, not assessed by UL)
Status indication		Green LED (PWR supply voltage)
SMART communication (Per output)		Yes
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA IIC T4 Gc X
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, with HART® protocol			
Screw connection	**MACX MCR-SL-RPSSI-2I**	2924825	1
Push-in connection	**MACX MCR-SL-RPSSI-2I-SP**	2924838	1

Analog IN / Analog OUT repeater power supplies





Repeater power supply and input signal conditioner, wide-range power supply

Functional Safety
Ex:
Housing width 17.5 mm

Repeater power supply and input signal conditioner for the operation of 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources

- 0/4 to 20 mA input (powered or not powered)
- 0/4 to 20 mA output (active or passive), 0/1 to 5 V, can be selected via DIP switch
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- 250 Ω resistor that can be activated via DIP switches to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Wide-range power supply of 19.2 to 253 V AC/DC
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

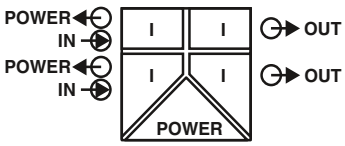
Technical data

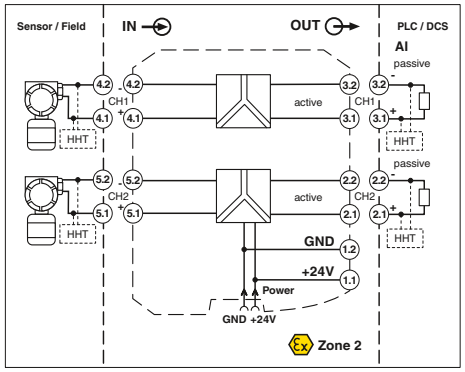
Input data		
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Voltage drop		< 3.5 V (in input signal conditioner operation)
Output data		
Output signal		4 mA ... 20 mA (active) 4 mA ... 20 mA (14 ... 26 V ext. source voltage) 1 V ... 5 V (internal resistance, 250 Ω, 0.1%) Configurable via DIP switches
Load		< 600 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V AC/DC ... 253 V AC/DC (24 V AC/DC … 230 V AC/DC (-20 % … +10 %, 50/60 Hz))
Current consumption		< 80 mA (24 V DC / 20 mA)
Power dissipation		< 1.6 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 600 µs (for 4 mA ... 20 mA step)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, with HART® protocol			
Screw connection	**MACX MCR-SL-RPSSI-I-UP**	2865968	1
Push-in connection	**MACX MCR-SL-RPSSI-I-UP-SP**	2924210	1

Analog IN / Analog OUT repeater power supplies





Ex n

2-channel repeater power supply

Functional Safety
Ex:
Housing width 12.5 mm

Repeater power supply for the operation of 2-wire measuring transducers.

- 2-channel
- Input: 4 to 20 mA (powered)
- Output: 4 to 20 mA (active)
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Safe 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 3 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

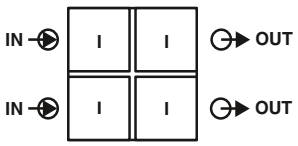
Technical data

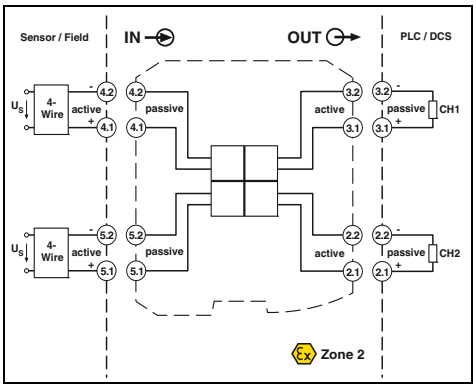
Input data		per channel
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (at 20 mA)
Underload/overload signal range		0 mA ... 24 mA
Output data		per channel
Output signal		4 mA ... 20 mA (active)
Load		≤ 450 Ω (20 mA)
Underload/overload signal range		0 mA ... 24 mA
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 100 mA (24 V / 20 mA)
Power dissipation		< 1.4 W (at 24 V DC / 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 1.3 ms (for 4 mA ... 20 mA step)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Electrical isolation		
	Input/output, power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Output 1/output 2/ power supply	1.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, 2-channel			
Screw connection	**MACX MCR-SL-RPSS-2I-2I**	2904089	1
Push-in connection	**MACX MCR-SL-RPSS-2I-2I-SP**	2904090	1

Analog IN / Analog OUT passive isolators





Ex n

Passive isolator, single and two-channel

Ex:

Housing width 12.5 mm

The single or two-channel input loop-powered 2-way isolator with increased isolation voltage and plug-in connection technology is used for the electrical isolation and filtering of analog signals.

The device allows operation on active sensor technology with a supply voltage of 6 to 30 V DC.

The device is powered via the current loop of the sensor. As a result, no additional power supply is required.

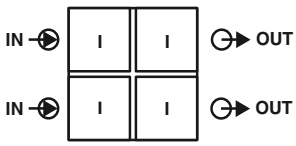
Technical data

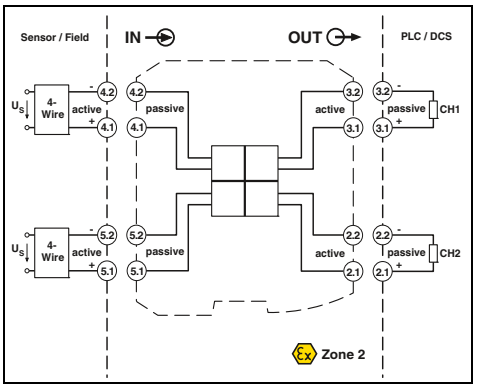
Input data		
Max. voltage input signal		< 30.5 V
Input signal		0 mA ... 20 mA / 4 mA ... 20 mA
Input voltage limitation		30.5 V
Voltage dissipation		2.9 V (I = 20 mA)
Response current		approx. 50 µA
Output data		
Max. voltage output signal		27.5 V
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Residual ripple		< 10 mV_{rms} (500 Ω load)
Transmission behavior		1:1 to input signal
Load		≤ 1375 Ω (I = 20 mA)
General data		
Supply voltage range		no separate supply voltage necessary
Temperature coefficient		≤ 0.002 %/K (of measured value / 100 Ω load)
Maximum transmission error		≤ 0.1 % (of final value)
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-40 °C ... 85 °C
Humidity		5 % ... 95 % (non-condensing)
Degree of protection		IP20
Inflammability class in acc. with UL 94		V0
Housing material		PA 66
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		3

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Passive isolator, single or two-channel				
	Push-in connection	**MACX MCR-SL-I-I-ILP-SP**	2905279	1
	Screw connection	**MACX MCR-SL-I-I-ILP**	2905278	1
	Push-in connection	**MACX MCR-SL-2I-2I-ILP-SP**	2905281	1
	Screw connection	**MACX MCR-SL-2I-2I-ILP**	2905280	1

Analog IN / Analog OUT passive isolators





Ex n

SIL IEC 61508

Passive isolator, single and two-channel 5 kV test voltage

Ex:

Housing width 12.5 mm

The single or two-channel input loop-powered 2-way isolator with increased isolation voltage and plug-in connection technology is used for the electrical isolation and filtering of analog signals.

The device allows operation on active sensor technology with a supply voltage of 6 to 30 V DC.

The device is powered via the current loop of the sensor. As a result, no additional power supply is required.

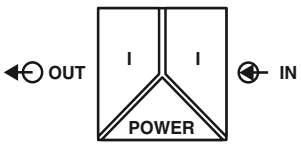
Technical data

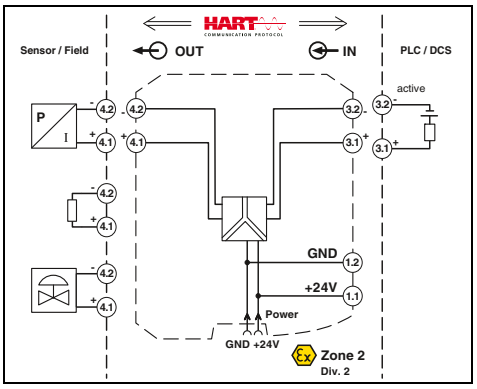
Input data		
Max. voltage input signal		< 30.5 V
Input signal		0 mA ... 20 mA / 4 mA ... 20 mA
Input voltage limitation		30.5 V
Voltage dissipation		2.9 V (I = 20 mA)
Response current		approx. 50 µA
Output data		
Max. voltage output signal		27.5 V
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Residual ripple		< 10 mV_{rms} (500 Ω load)
Transmission behavior		1:1 to input signal
Load		≤ 1375 Ω (I = 20 mA)
General data		
Supply voltage range		no separate supply voltage necessary
Temperature coefficient		≤ 0.002 %/K (of measured value / 100 Ω load)
Maximum transmission error		≤ 0.1 % (of final value)
Electrical isolation		
	Input/output/power supply	600 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-40 °C ... 85 °C
Humidity		5 % ... 95 % (non-condensing)
Degree of protection		IP20
Inflammability class in acc. with UL 94		V0
Housing material		PA 66
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		3

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Passive isolator, single or two-channel				
	Push-in connection	**MACX MCR-SL-I-I-HV-ILP-SP**	2907705	1
	Screw connection	**MACX MCR-SL-I-I-HV-ILP**	2907704	1
	Push-in connection	**MACX MCR-SL-2I-2I-HV-ILP-SP**	2907707	1
	Screw connection	**MACX MCR-SL-2I-2I-HV-ILP**	2907706	1

Analog OUT
Output signal conditioner





Ex n

SIL IEC 61508

DNV GL Functional Safety

Ex:

Housing width 12.5 mm

Output signal conditioner for controlling I/P transducers, control valves, and displays

- 0/4 to 20 mA input
- 0/4 to 20 mA output
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Line fault detection (LF)
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

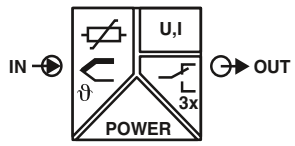
Technical data

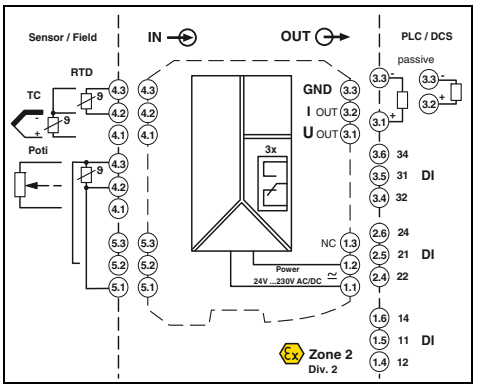
Input data		
Input signal		0 mA ... 20 mA / 4 mA ... 20 mA
Input voltage		5.4 V (at 20 mA)
Input impedance in the event of a cable break at the output		> 100 kΩ (If there is a line fault)
Output data		
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Load		< 800 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 46 mA (24 V DC / 20 mA)
Power dissipation		< 1.1 W (24 V DC / 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 140 µs (for 4 mA ... 20 mA step)
Maximum transmission error		< 0.1 % (of final value)
Electrical isolation		
	Input/output/power supply	1.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage (overvoltage category II, degree of pollution 2))
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		10 % ... 95 % (non-condensing)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		2

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Output signal conditioner				
	Screw connection	**MACX MCR-SL-IDSI-I**	2865971	1
	Push-in connection	**MACX MCR-SL-IDSI-I-SP**	2924223	1

Temperature
Temperature transducer





Ex n

SIL IEC 61508

Universal, with three limit value relays, wide-range power supply

Functional Safety
Ex:
Housing width 35 mm

Universal temperature transducer with freely configurable properties

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Three limit value relays, can be used in combination as a safe limit value relay
- Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in screw or Push-in connection technology
- Cold junction compensation with separate connector
- Wide-range power supply of 19.2 to 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 172

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors		B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor		0 Ω ... 50 kΩ
Potentiometer		0 Ω ... 50 kΩ
Voltage		-1000 mV ... 1000 mV
Output data	U output	I output
Output signal	0 mA ... 20 mA ±10 V (in the case of SIL; further free configuration without SIL)	
Maximum output signal	± 11 V	22 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (at 20 mA)
Behavior in the event of a sensor error	according to NE 43 or freely configurable	
Switching output	**Relay output**	
Contact type	3 PDTs	
Contact material	$AgSnO_2$, hard gold-plated	
Max. switching voltage	250 V AC (250 V DC)	
Maximum switching current	2 A (250 V AC) / 2 A (28 V DC)	
General data		
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)	
Power consumption	< 2.4 W	
Temperature coefficient	0.01 %/K	
Maximum transmission error	0.1 % (e.g. for Pt 100, 300 K span, 4 ... 20 mA)	
Electrical isolation		
Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)	
Input/output	375 V (Peak value in accordance with EN 60079-11)	
Input/power supply	375 V (Peak value in accordance with EN 60079-11)	
Input/switching output	375 V (Peak value in accordance with EN 60079-11)	
Ambient temperature range	-20 °C ... 65 °C	
Humidity	typ. 5 % ... 95 % (non-condensing)	
Inflammability class in acc. with UL 94	V0	
Housing material	PA 66-FR	
Dimensions W/H/D	35 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA nC ic IIC T4 Gc X	
IECEx	Ex nA nC ic IIC T4 Gc X	
UL, USA/Canada	UL 508 Listed Class I, Div. 2, Groups A, B, C, D T6 Class I, Zone 2, Group IIC T6	
SIL in accordance with IEC 61508	2	

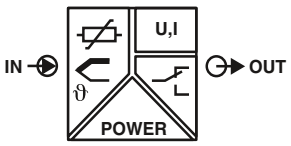
Ordering data

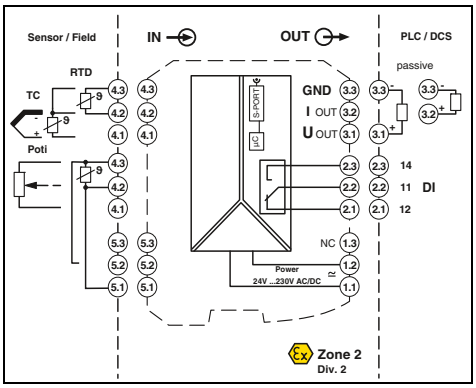
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer				
Standard configuration	Screw connection	**MACX MCR-T-UIREL-UP**	2811378	1
Standard configuration	Push-in connection	**MACX MCR-T-UIREL-UP-SP**	2811828	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Cold junction compensation connector for thermocouples	**MACX MCR-CJC**	2924993	1

Temperature
Temperature transducer





Ex n

SIL IEC 61508

Universal, with switching output, wide-range power supply

Functional Safety

Ex:

Housing width 17.5 mm

Universal temperature transducer with freely configurable properties

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Relay switching output
- Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in screw or Push-in connection technology
- Cold junction compensation with separate connector
- Wide-range power supply of 19.2 to 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 172

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors		B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor		0 Ω ... 50 kΩ
Potentiometer		0 Ω ... 50 kΩ
Voltage		-1000 mV ... 1000 mV
Output data	U output	I output
Output signal	0 mA ... 20 mA ±10 V (in the case of SIL; further free configuration without SIL)	
Maximum output signal	± 11 V	22 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (20 mA)
Behavior in the event of a sensor error	according to NE 43 or freely configurable	
Switching output	Relay output	
Contact type	1 PDT	
Contact material	$AgSnO_2$, hard gold-plated	
Max. switching voltage	30 V AC (30 V DC)	
Maximum switching current	0.5 A (30 V AC) / 1 A (30 V DC)	
General data		
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)	
Power consumption	< 1.5 W	
Temperature coefficient	0.01 %/K	
Transmission error, total	< 0.1 % (e.g., for Pt 100, 300 K span, 4 ... 20 mA)	
Electrical isolation		
Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)	
Input/output	375 V (Peak value in accordance with EN 60079-11)	
Input/power supply	375 V (Peak value in accordance with EN 60079-11)	
Input/switching output	375 V (Peak value in accordance with EN 60079-11)	
Ambient temperature range	-20 °C ... 65 °C	
Humidity	typ. 5 % ... 95 % (non-condensing)	
Inflammability class in acc. with UL 94	V0	
Housing material	PA 66-FR	
Dimensions W/H/D	17.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II 3 G Ex nA nC ic IIC T4 Gc X	
IECEx	Ex nA nC ic IIC T4 Gc X	
SIL in accordance with IEC 61508	2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer				
Standard configuration	Screw connection	**MACX MCR-T-UI-UP**	2811394	1
Standard configuration	Push-in connection	**MACX MCR-T-UI-UP-SP**	2811860	1
Order configuration	Screw connection	**MACX MCR-T-UI-UP-C**	2811873	1
Order configuration	Push-in connection	**MACX MCR-T-UI-UP-SP-C**	2811970	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Cold junction compensation connector for thermocouples	**MACX MCR-CJC**	2924993	1

Order key for MACX MCR-T-UI-UP(-SP)-C temperature transducers (standard configuration entered as an example)

Order No.	Safety Integrity Level (SIL)	Sensor type	Connection technology	Cold junction compensation	Measuring range: Start	Measuring range: End	Measuring unit	Output range	Factory calibration certificate = FCC
2811873	ON	PT100	4	0	-50	150	C	OUT02	NONE
2811873 ≙ MACX MCR-T-UI-UP-C 2811970 ≙ MACX MCR-T-UI-UP-SP-C	ON ≙ Active NONE ≙ Not active ON only with output range = OUT02	See below	2 ≙ 2-conductor 3 ≙ 3-conductor 4 ≙ 4-conductor	0 ≙ Off, e.g., with RTD, R, potentiometer, mV 1 ≙ On, e.g., with TC	See below	See below	C ≙ °C F ≙ °F O ≙ Ω P ≙ % V ≙ mV	OUT15 ≙ 0 ... 5 mA OUT16 ≙ 0 ... 10 mA OUT01 ≙ 0 ... 20 mA OUT15 ≙ 0 ... 5 mA OUT25 ≙ 1 ... 5 mA OUT26 ≙ 2 ... 10 mA OUT02 ≙ 4 ... 20 mA OUT05 ≙ 0 ... 5 V OUT03 ≙ 0 ... 10 V OUT06 ≙ 1 ... 5 V OUT04 ≙ 2 ... 10 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V Others can be freely configured in the software	NONE ≙ Without FCC Yes ≙ With FCC (a fee is charged) YESPLUS ≙ FCC with 5 measuring points (a fee is charged)

			Start	End		Smallest measuring range span
Resistance thermometers (RTD) Others can be selected or freely configured in the software.	PT100	Pt 100 according to IEC 751	-200	850	°C	20 K
	PT200	Pt 200 according to IEC 751	-200	850	°C	20 K
	PT500	Pt 500 according to IEC 751	-200	850	°C	20 K
	PT1000	Pt 1000 according to IEC 751	-200	850	°C	20 K
	PT100S	Pt 100 according to Sama RC21-4-1966	-200	850	°C	20 K
	PT1000S	Pt 1000 according to Sama RC21-4-1966	-200	850	°C	20 K
	PT100G	Pt 100 according to GOST 6651-2009 (α = 0.00385)	-200	850	°C	20 K
	PT1000G	Pt 1000 according to GOST 6651-2009 (α = 0.00385)	-200	850	°C	20 K
	PT100J	Pt 100 according to JIS C1604/1997	-200	850	°C	20 K
	PT1000J	Pt 1000 according to JIS C1604/1997	-200	850	°C	20 K
	NI100	Ni 100 according to DIN 43760/DIN IEC 60751	-60	250	°C	20 K
	NI1000	Ni 1000 according to DIN 43760/DIN IEC 60751	-60	250	°C	20 K
	NI100S	Ni 100 according to Sama RC21-4-1966	-60	180	°C	20 K
	NI1000S	Ni 1000 according to Sama RC21-4-1966	-60	180	°C	20 K
	NI1000L	Ni 1000 (Landis & Gyr)	-50	160	°C	20 K
	CU10	Cu 10 according to Sama RC21-4-1966	-70	500	°C	100 K
	CU50	Cu50 according to GOST 6651-2009 (α = 0.00428)	-50	200	°C	100 K
	CU100	Cu100 according to GOST 6651-2009 (α = 0.00428)	-50	200	°C	100 K
	CU53	Cu53 according to GOST 6651-2009 (α = 0.00426)	-50	180	°C	100 K
	KTY81	KTY81-110 (Philips)	-55	150	°C	20 K
	KTY84	KTY84-130 (Philips)	-40	300	°C	20 K
Thermocouples (TC) Others can be selected in the software.	B	according to IEC 584-1 (Pt30Rh-Pt6Rh)	500	1820	°C	50 K
	E	according to IEC 584-1 (NiCr-CuNi)	-230	1000	°C	50 K
	J	according to IEC 584-1 (Fe-CuNi)	-210	1200	°C	50 K
	K	according to IEC 584-1 (NiCr-Ni)	-250	1372	°C	50 K
	N	according to IEC 584-1 (NiCrSi-NiSi)	-250	1300	°C	50 K
	R	according to IEC 584-1 (Pt13Rh-Pt)	-50	1768	°C	50 K
	S	according to IEC 584-1 (Pt10Rh-Pt)	-50	1768	°C	50 K
	T	according to IEC 584-1 (Cu-CuNi)	-200	400	°C	50 K
	L	according to DIN 43760 (Fe-CuNi)	-200	900	°C	50 K
	U	according to DIN 43760 (Cu-CuNi)	-200	600	°C	50 K
	CA	C ASTM JE988 (2002)	0	2315	°C	50 K
	DA	D ASTM JE988 (2002)	0	2315	°C	50 K
	A1G	A-1 GOST 8.585-2001	0	2500	°C	50 K
	A2G	A-2 GOST 8.585-2001	0	1800	°C	50 K
	A3G	A-3 GOST 8.585-2001	0	1800	°C	50 K
	MG	M GOST 8.585-2001	-200	100	°C	50 K
	LG	L GOST 8.585-2001	-200	800	°C	50 K
Remote resistance-type sensors (R) (2-, 3-, 4-conductor) Others can be selected in the software.	RES03	Resistance 0 ... 150 Ω	0	150	Ω	10% of the selected measuring range
	RES05	Resistance 0 ... 600 Ω	0	600	Ω	
	RES06	Resistance 0 ... 1200 Ω	0	1200	Ω	
	RES09	Resistance 0 ... 6250 Ω	0	6250	Ω	
	RES10	Resistance 0 ... 12,500 Ω	0	12,500	Ω	
	RES12	Resistance 0 ... 50,000 Ω	0	50,000	Ω	
Potentiometers (3-conductor) Others can be selected in the software.	POT03	Potentiometer 0 ... 150 Ω	0	100	%	10% of the selected measuring range
	POT05	Potentiometer 0 ... 600 Ω	0	100	%	
	POT06	Potentiometer 0 ... 1200 Ω	0	100	%	
	POT09	Potentiometer 0 ... 6250 Ω	0	100	%	
	POT10	Potentiometer 0 ... 12,500 Ω	0	100	%	
	POT12	Potentiometer 0 ... 50,000 Ω	0	100	%	
Voltage signals (mV) Others can be selected in the software.	V04	Voltage (mV)	-1000	+1000	mV	10% of nominal span

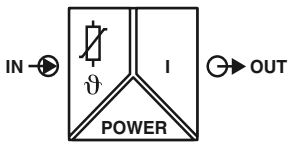
Other setting options can be configured with the IFS-CONF software:

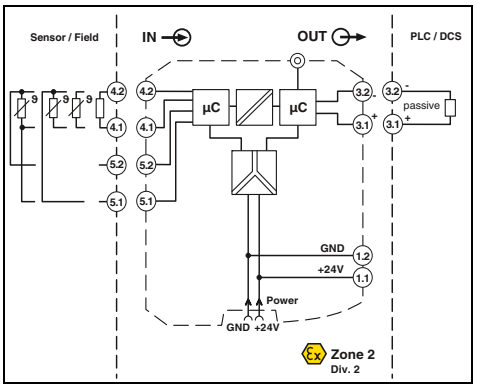
- Freely configurable user characteristic curve with 30 interpolation points
- Output behavior in the event of a short circuit, sensor break or overrange/underrange can be freely configured or set according to NE43 (standard configuration: NE43 upscale)
- Filter setting (standard configuration: 1)
- Restart after failsafe (standard configuration: ON)
- Switching behavior: switching output (limit values, times, etc.) (standard configuration: OFF)

Temperature conversion guide for °C to °F:

$$T\,[°F] = \frac{9}{5} T\,[°C] + 32$$

Temperature
Temperature transducer





For resistance thermometers and resistance-type sensors

DNV GL
Ex:
Housing width 12.5 mm

Programmable temperature transducer for operating resistance thermometers and resistance-type sensors. The measured values are converted into a linear 0 to 20 mA or 4 to 20 mA signal.

- Input for resistance thermometers and resistance-type sensors
- 0 to 20 mA or 4 to 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key provided online (phoenixcontact.net/products).

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

For information on the programming adapter, refer to page 172

Test plugs for test sockets can be found on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Resistor		0 Ω ... 2000 Ω
Cable resistance		50 Ω per line
Sensor input current		200 µA ... 1 mA
Measuring range span		> 50 K
Output data		
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Load		≤ 500 Ω
Behavior in the event of a sensor error		As per NE 43 or can be freely defined
Output ripple		< 50 μA_{PP}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 40 mA (24 V DC)
Power dissipation		< 1 W
Temperature coefficient		0.01 %/K
Step response (0–99%)		typ. 700 ms ≤ 1100 ms
Transmission error, total		0.1 % x 1000 [K]/measuring span
ZERO / SPAN adjustment		± 5 % / ± 5 %
Electrical isolation		
	Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		5 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3G Ex nA ic IIC T4 Gc X
UL, USA/Canada		UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4

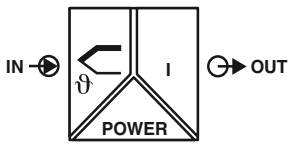
Ordering data

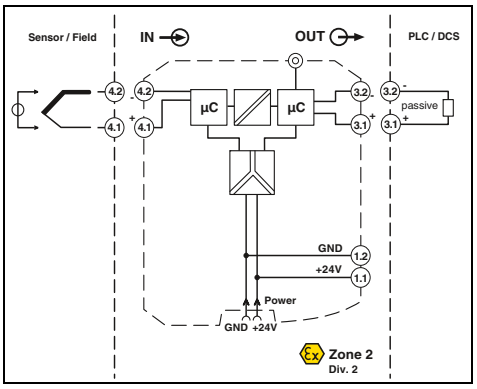
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer				
Order configuration	Screw connection	**MACX MCR-SL-RTD-I**	2865065	1
Order configuration	Push-in connection	**MACX MCR-SL-RTD-I-SP**	2924317	1
Standard configuration	Screw connection	**MACX MCR-SL-RTD-I-NC**	2865078	1
Standard configuration	Push-in connection	**MACX MCR-SL-RTD-I-SP-NC**	2924320	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Temperature
Temperature transducer





Ex n

H
D W

For thermocouples and mV sources

DNV GL
Ex:
Housing width 12.5 mm

Programmable temperature transducer for operating thermocouples and mV sources. The measured values are converted into a linear 0 to 20 mA or 4 to 20 mA signal.

- Input for thermocouples and mV sources
- 0 to 20 mA or 4 to 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key provided online (phoenixcontact.net/products).

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

For information on the programming adapter, refer to page 172

Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

Input data		
Thermocouple sensors		E, J, K, N as per IEC / EN 60584, L as per DIN 43760
Voltage		-20 mV ... 70 mV
Measuring range span		Min. 50 K for thermocouples, 3 mV for mV sources
Output data		
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Load		max. 500 Ω
Behavior in the event of a sensor error		As per NE 43 or can be freely defined
Output ripple		< 50 μA_{PP}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 40 mA (24 V DC)
Power dissipation		< 1 W
Temperature coefficient		0.01 %/K
Step response (0–99%)		typ. 700 ms ≤ 1100 ms
Transmission error, total		0.1 % x 600 [K]/measuring span; 0.1 % > 600 [K]
Cold junction errors		± 1 K
ZERO / SPAN adjustment		± 5 % / ± 5 %
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		5 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3G Ex nA ic IIC T4 Gc X
UL, USA/Canada		UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4

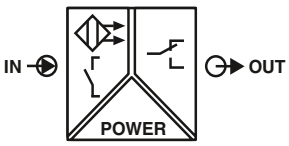
Ordering data

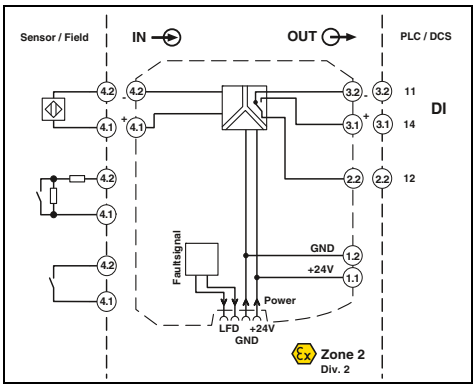
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer				
Order configuration	Screw connection	**MACX MCR-SL-TC-I**	2924333	1
Standard configuration	Screw connection	**MACX MCR-SL-TC-I-NC**	2924346	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Digital IN
NAMUR signal conditioners





Ex n

SIL IEC 61508

Signal output: PDT relay

DNV GL Functional Safety

Ex:

Housing width 12.5 mm

NAMUR signal conditioner for operating proximity sensors and mechanical contacts

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

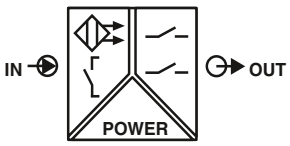
Technical data

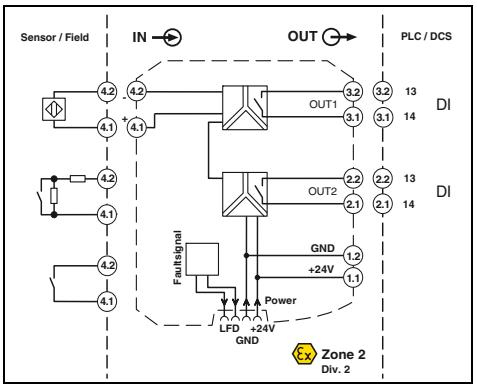
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	**Relay output**
Contact type	1 PDT
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	21 mA (24 V DC)
Power dissipation	< 650 mW
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Output/input, supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326-1
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-NAM-R**	2865997	1
Push-in connection	**MACX MCR-SL-NAM-R-SP**	2924252	1

Digital IN
NAMUR signal conditioners





Ex n

SIL IEC 61508

2 signal outputs: N/O contact relay

DNV GL Functional Safety
Ex:
Housing width 12.5 mm

NAMUR signal conditioner for operating proximity sensors and mechanical contacts

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- 2 relay signal outputs (N/O contact), output 2 can also be used as an error signal output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

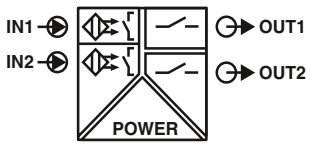
Technical data

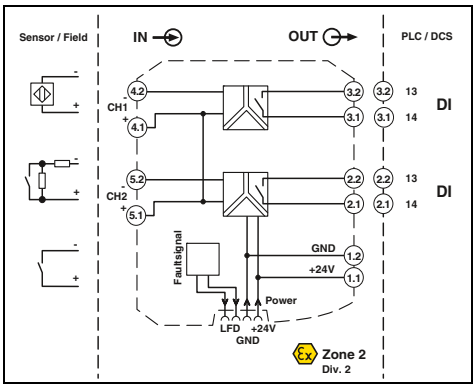
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	**Relay output**
Contact type	2 N/O contacts
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	30 mA (24 V DC)
Power dissipation	< 950 mW
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Output 1/output 2/input, power supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1))
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326-1
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-NAM-2RO**	2865010	1
Push-in connection	**MACX MCR-SL-NAM-2RO-SP**	2924265	1

Digital IN
NAMUR signal conditioners





Ex n

2-channel, signal output: N/O contact relay

DNV GL Functional Safety
Ex:
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (N/O contact)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

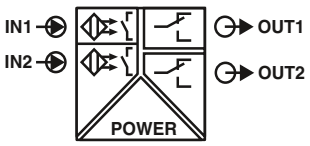
Technical data

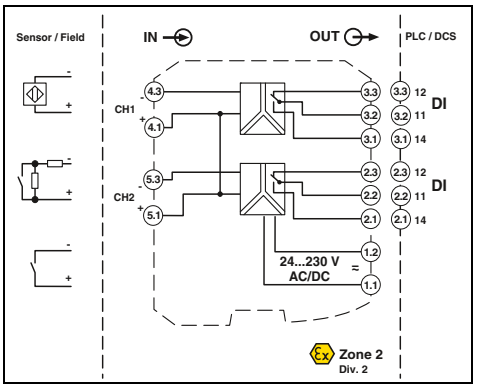
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	**Relay output**
Contact type	1 N/O contact per channel
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	35 mA (24 V DC)
Power dissipation	< 1 W
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	5 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326-1
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-2NAM-RO**	2865049	1
Push-in connection	**MACX MCR-SL-2NAM-RO-SP**	2924294	1

Digital IN
NAMUR signal conditioners





Ex n

SIL IEC 61508

2-channel, signal output: PDT relay, wide-range power supply

Functional Safety
Ex:
Housing width 17.5 mm

NAMUR signal conditioner for operating proximity sensors and mechanical contacts

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Wide-range power supply of 19.2 to 253 V AC/DC
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on resistance circuits and marking material can be found on page 176

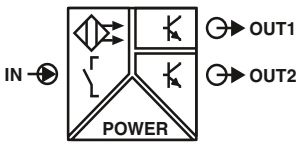
Technical data

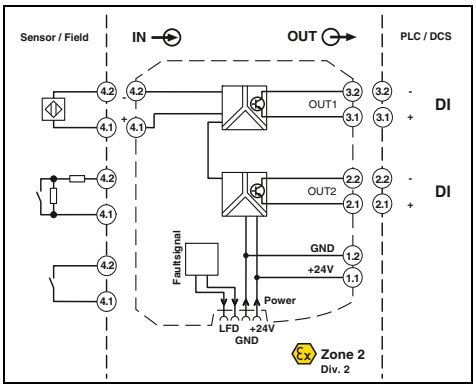
Input data		
Input signal		NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage		~ 8 V DC
Switching points		> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis		approx. 0.2 mA
Line fault detection		Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output		Relay output
Contact type		1 PDT per channel
Contact material		$AgSnO_2$, hard gold-plated
Max. switching voltage		250 V AC (2 A, 60 Hz) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity		500 VA
Recommended minimum load		5 V / 10 mA
Mechanical service life		10^7 cycles
Switching behavior		can be inverted using DIP switch
Maximum switching frequency		≤ 20 Hz (Load-dependent)
General data		
Supply voltage range		19.2 V AC/DC ... 253 V AC/DC (24 V AC/DC … 230 V AC/DC (-20 % … +10 %, 50/60 Hz))
Current consumption		< 80 mA ; < 42 mA (24 V DC)
Power dissipation		≤ 1.3 W
Electrical isolation		
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV AC (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C
Humidity		10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326-1
ATEX		II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada		UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-2NAM-R-UP**	2865052	1
Push-in connection	**MACX MCR-SL-2NAM-R-UP-SP**	2924304	1

Digital IN
NAMUR signal conditioners





Ex n

2 signal outputs: transistor (passive)

DNV GL Functional Safety
Ex:
Housing width 12.5 mm

NAMUR signal conditioner for operating proximity sensors and mechanical contacts

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- 2 signal outputs transistor (passive), up to 5 kHz
- Signal output 2 can also be used as a fault signaling output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and blocking the transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

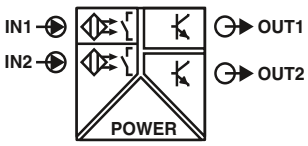
Technical data

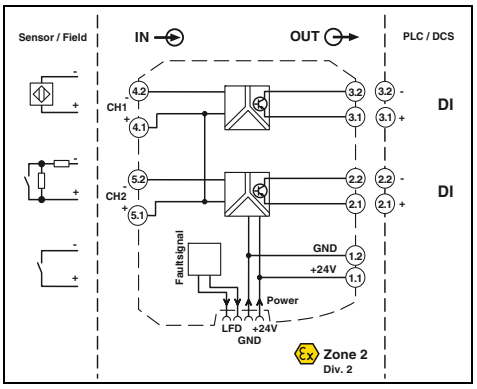
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	2 transistor outputs, passive
Max. switching voltage	30 V DC
Maximum switching current	50 mA (short-circuit-proof)
Drop (ΔU)	< 1.4 V
Switching behavior	can be inverted using DIP switch
Maximum switching frequency	≤ 5 kHz
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	< 28 mA (24 V DC)
Power dissipation	≤ 800 mW
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11)
Output 1/output 2	50 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, basic insulation as per EN 61010-1)) 1 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326-1
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-NAM-2T**	2865023	1
Push-in connection	**MACX MCR-SL-NAM-2T-SP**	2924278	1

Digital IN
NAMUR signal conditioners





Ex n

SIL IEC 61508

2-channel, signal output: transistor (passive)

DNV GL Functional Safety
Ex:
Housing width 12.5 mm

NAMUR signal conditioner for operating proximity sensors and mechanical contacts

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Signal output transistor (passive), up to 5 kHz
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and blocking the transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

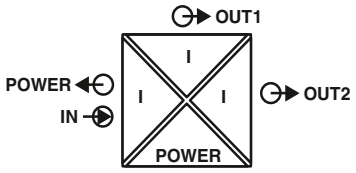
Technical data

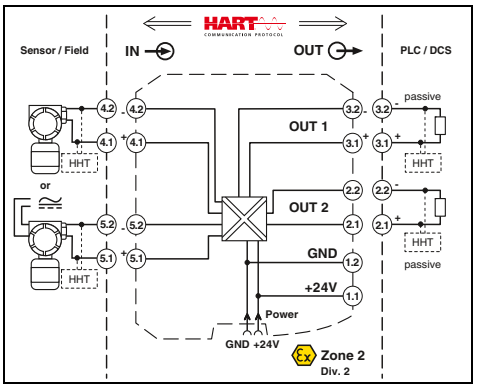
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	1 transistor output, passive (per channel)
Max. switching voltage	30 V DC
Maximum switching current	50 mA (short-circuit-proof)
Drop (ΔU)	< 1.4 V
Switching behavior	can be inverted using DIP switch
Maximum switching frequency	≤ 5 kHz
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	< 34 mA (24 V DC)
Power dissipation	1000 mW
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector Output 1/output 2	375 V (Peak value in accordance with EN 60079-11) 50 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, basic insulation as per EN 61010-1)) 1 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner			
Screw connection	**MACX MCR-SL-2NAM-T**	2865036	1
Push-in connection	**MACX MCR-SL-2NAM-T-SP**	2924281	1

Analog IN
Repeater power supplies





Ex n

PL
EN ISO 13849

Repeater power supply and input signal conditioner, with two electrically isolated outputs

Housing width 12.5 mm

- 4 to 20 mA input, powered and not powered
- Two electrically isolated outputs, 4 to 20 mA (active)
- PL d according to EN ISO 13849-1
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 possible
- Plug-in screw and Push-in connection technology
- 4-way electrical isolation
- Bidirectional HART communication possible
- Power supply via DIN rail connector possible

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

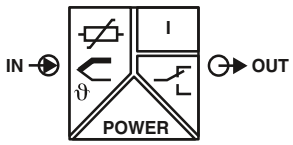
Technical data

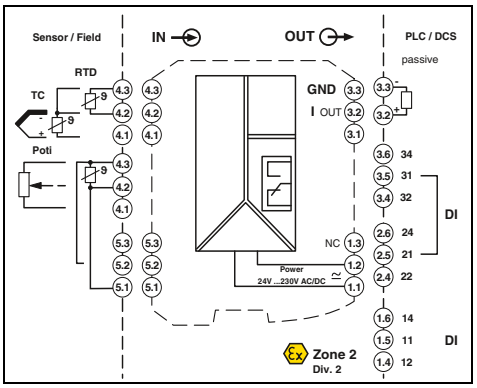
Input data		
Input signal		4 mA ... 20 mA / 4 mA ... 20 mA
Transmitter supply voltage		> 21.5 V (20 mA)
Voltage drop		< 3.9 V (in input signal conditioner operation)
Output data		
Output signal (Per output)		4 mA ... 20 mA (active)
Load		< 450 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 75 mA (24 V DC / 20 mA)
Power dissipation		< 1.45 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		1.3 ms (for jump 4 mA ... 20 mA, typical)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Output 1/output 2	1.5 kV AC (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (PWR supply voltage)
SMART communication (Per output)		Yes
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II 3 G Ex nA IIC T4 Gc X
SIL in accordance with IEC 61508		2
Performance level according to ISO 13849		PLd

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply and input signal conditioner, signal duplicator, with performance level			
Screw connection	**MACX PL-RPSSI-2I**	2904961	1
Push-in connection	**MACX PL-RPSSI-2I-SP**	2904962	1

Temperature
Temperature transducer





Ex n

PL
EN ISO 13849

universal, with limit value relays, wide-range power supply

Ex:
Housing width 35 mm

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources
- A safety-related limit value relay, by bridging two relays
- Differential measurement possible with Pt 100
- An additional limit value relay for non-safety-related function
- PL d according to EN ISO 13849-1
- Up to SIL 2 according to IEC 61508
- Configuration via software (ANALOG-CONF or FDT/DTM)
- Cold junction compensation with separate connector
- Wide range power supply 19.2 to 253 V AC/DC
- Status indicators for supply voltage, cable, sensor, and module errors
- Installation in Zone 2 possible
- Plug-in screw and Push-in connection technology

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 172

Technical data

Input data	
Resistance thermometers	Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors	B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor	0 Ω ... 50 kΩ
Potentiometer	0 Ω ... 50 kΩ
Voltage	-1000 mV ... 1000 mV
Output data	
Output signal	4 mA ... 20 mA
Maximum output signal	22 mA
Load R_B	≤ 600 Ω (at 20 mA)
Behavior in the event of a sensor error	according to NE 43 or freely configurable
Switching output	Relay output
Contact type	2 PDT
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (250 V DC)
Maximum switching current	2 A (250 V AC) / 2 A (28 V DC)
General data	
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)
Power consumption	< 2.4 W
Temperature coefficient	0.01 %/K
Maximum transmission error	0.1 % (e.g. for Pt 100, 300 K span, 4 ... 20 mA)
Electrical isolation	
Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Input/switching output	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range	-20 °C ... 65 °C
Humidity	typ. 5 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	35 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	Ex II 3 G Ex nA nC ic IIC T4 Gc X
IECEx	Ex nA nC ic IIC T4 Gc X
SIL in accordance with IEC 61508	2
Performance level according to ISO 13849	PLd

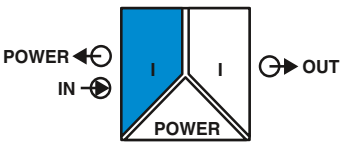
Ordering data

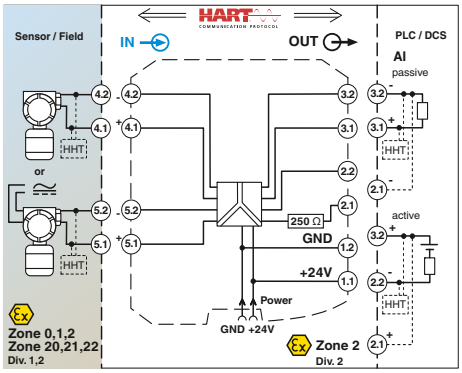
Description	Type	Order No.	Pcs./ Pkt.
Temperature transducer and threshold value switch with performance level			
Screw connection	**MACX PL-T-UIREL-UP**	2904901	1
Push-in connection	**MACX PL-T-UIREL-UP-SP**	2904903	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Connector, for current signals between +20 mA and -20 mA	**MACX MCR-I20**	2905680	1

Analog IN
Repeater power supply, Ex i





Repeater power supply and input signal conditioner

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Repeater power supply and input signal conditioner for the operation of intrinsically safe (Ex i) 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources installed in Ex areas.

- 0/4 to 20 mA input, [Ex ia] (powered or not powered)
- 0/4 to 20 mA output (active or passive)
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Terminal point with 250 Ω resistor to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

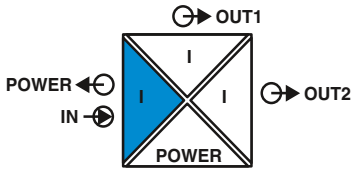
Technical data

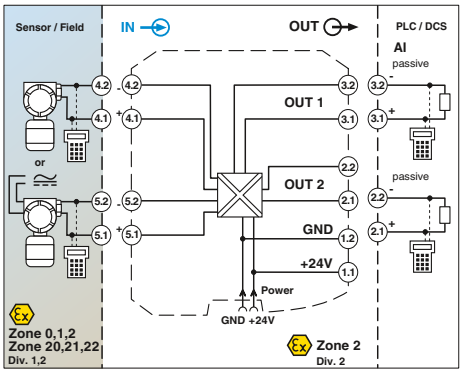
Input data		
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Voltage drop		< 3.5 V (in input signal conditioner operation)
Output data		
Output signal		4 mA ... 20 mA (active) 4 mA ... 20 mA (14 ... 26 V ext. source voltage)
Load		< 1000 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 76 mA (24 V DC / 20 mA / 1000 Ω) ; < 55 mA (24 V DC / 20 mA / 250 Ω)
Power dissipation		< 1.1 W (24 V DC / 20 mA / 1000 Ω) < 0.95 W (24 V DC / 20 mA / 250 Ω) < 1.2 W (24 V DC / 20 mA / 0 Ω)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 200 µs (for jump 4 mA ... 20 mA, load 600)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		10 % ... 95 % (non-condensing)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 112.5 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc I (M1) [Ex ia Ma] I
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA/Canada		UL 61010 Listed Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, smart, intrinsically safe input			
Screw connection	**MACX MCR-EX-SL-RPSSI-I**	2865340	1
Push-in connection	**MACX MCR-EX-SL-RPSSI-I-SP**	2924016	1

Analog IN
Repeater power supply, Ex i





Repeater power supply and input signal conditioner, with two electrically isolated outputs

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Repeater power supply and input signal conditioner for the operation of intrinsically safe (Ex i) 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources installed in Ex areas.

- 0/4 to 20 mA input, [Ex ia] (powered or not powered)
- Two electrically isolated outputs, 0/4 to 20 mA (active)
- Bidirectional transmission of digital HART communication signals (both outputs)
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- 4-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

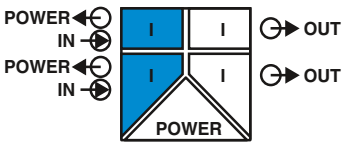
Technical data

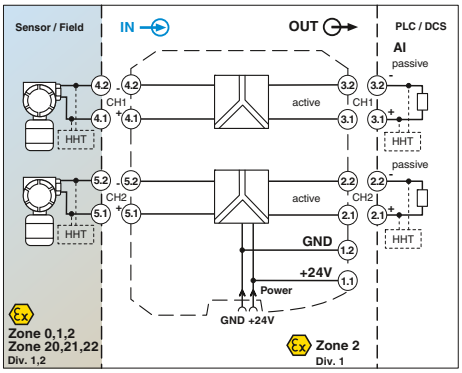
Input data		
Input signal		4 mA ... 20 mA / 0 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Voltage drop		approx. 3.9 V (in input signal conditioner operation)
Output data		
Output signal (Per output)		4 mA ... 20 mA (Output 1 and output 2 active)
Load		< 450 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 75 mA (24 V DC / 20 mA)
Power dissipation		< 1.45 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		1.3 ms (for jump 4 mA ... 20 mA, typical)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Output 1/output 2	1.5 kV AC (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (PWR supply voltage)
SMART communication (Per output)		Yes
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, smart, intrinsically safe input			
Screw connection	**MACX MCR-EX-SL-RPSSI-2I**	2865366	1
Push-in connection	**MACX MCR-EX-SL-RPSSI-2I-SP**	2924236	1
With just one HART-transparent output			
Screw connection	**MACX MCR-EX-SL-RPSSI-2I-1S**	2908855	1
Push-in connection	**MACX MCR-EX-SL-RPSSI-2I-1S-SP**	2908856	1

Analog IN
Repeater power supply, Ex i





2-channel repeater power supply

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Repeater power supply for the operation of intrinsically safe (Ex i) 2-wire measuring transducers installed in the Ex area.

- 2-channel
- 4 to 20 mA input, [Ex ia] (powered)
- 4 to 20 mA output (active)
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Safe 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 3 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

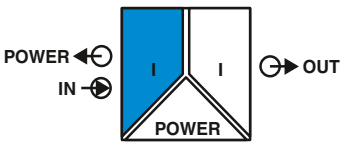
Technical data

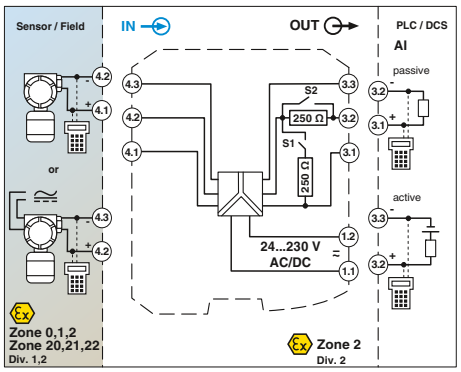
Input data		per channel
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Underload/overload signal range		0 mA ... 24 mA
Output data		per channel
Output signal		4 mA ... 20 mA (active)
Load		≤ 450 Ω (20 mA)
Underload/overload signal range		0 mA ... 24 mA
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 100 mA (24 V / 20 mA)
Power dissipation		< 1.4 W (at 24 V DC / 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 1.3 ms (for 4 mA ... 20 mA step)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Electrical isolation		
	Input/output, power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Output 1/output 2/ power supply	1.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC T4 Gc
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC T4 Gc
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508		3

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, 2-channel, smart, intrinsically safe input			
Screw connection	**MACX MCR-EX-SL-RPSS-2I-2I**	2865382	1
Push-in connection	**MACX MCR-EX-SL-RPSS-2I-2I-SP**	2924676	1

Analog IN
Repeater power supply with wide range power supply, Ex i





Repeater power supply and input signal conditioner, wide-range power supply

Functional Safety
Ex: EAC Ex // Applied for: GL
Housing width 17.5 mm

Repeater power supply and input signal conditioner for the operation of intrinsically safe (Ex i) 2-wire measuring transducers, 4-wire measuring transducers, and mA current sources installed in Ex areas.

- 0/4 to 20 mA input, [Ex ia] (powered or not powered)
- 0/4 to 20 mA output (active or passive), 0/1 to 5 V, can be selected via DIP switch
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- 250 Ω resistor that can be activated via DIP switches to increase the HART impedance in the case of low-impedance systems
- 3-way electrical isolation
- Wide-range power supply of 19.2 to 253 V AC/DC
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on marking material can be found on page 177

Test plugs for test sockets can be found on page 176

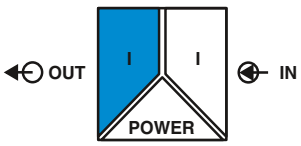
Technical data

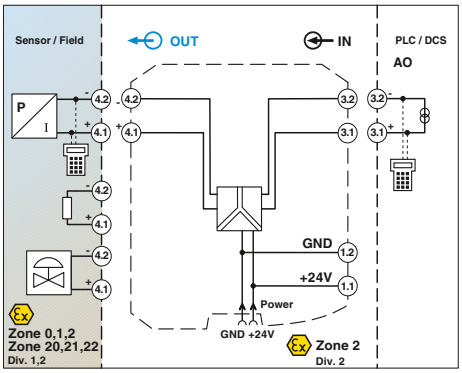
Input data		
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Voltage drop		< 3.5 V (in input signal conditioner operation)
Output data		
Output signal (configurable using the DIP switch)		4 mA ... 20 mA (active) 4 mA ... 20 mA (14 ... 26 V ext. source voltage) 1 V ... 5 V (internal resistance, 250 Ω, 0.1%) Configurable via DIP switches
Load		< 600 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)
Current consumption		< 80 mA (24 V DC / 20 mA)
Power dissipation		< 1.6 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 600 µs (for 4 mA ... 20 mA step)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		10 % ... 95 % (non-condensing)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC/DC (Supply terminals) 253 V AC (Output terminals) 125 V DC (Output terminals)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC/IIB T4 Gc
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508		2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, smart, intrinsically safe input			
Screw connection	**MACX MCR-EX-SL-RPSSI-I-UP**	2865793	1
Push-in connection	**MACX MCR-EX-SL-RPSSI-I-UP-SP**	2924029	1

Analog OUT
Output signal conditioner, Ex i





DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Output signal conditioner for controlling intrinsically safe (Ex i) I/P converters, control valves, and indicators installed in Ex areas.

- 0/4 to 20 mA input
- 0/4 to 20 mA output, [Ex ia] IIC
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or Push-in connection technology, with integrated sockets for HART communicators
- Line fault detection (LF)
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

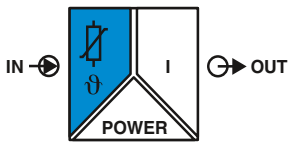
Technical data

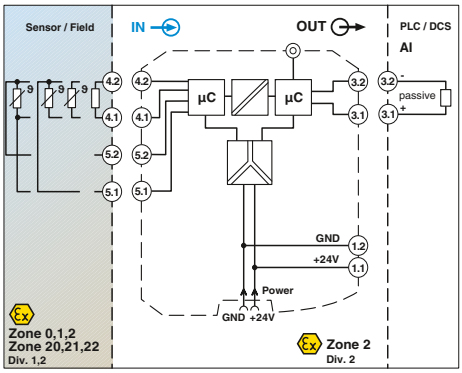
Input data	
Input signal	0 mA ... 20 mA / 4 mA ... 20 mA
Input voltage	5.4 V (at 20 mA)
Input impedance in the event of a cable break at the output	> 100 kΩ (If there is a line fault)
Output data	
Output signal	0 mA ... 20 mA (intrinsically safe) / 4 mA ... 20 mA (intrinsically safe)
Load	< 800 Ω (at 20 mA)
Output ripple	< 20 mV_{rms}
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	< 46 mA (at 24 V DC / 20 mA)
Power dissipation	< 1.1 W (at 24 V DC / 20 mA)
Temperature coefficient	< 0.01 %/K
Step response (10-90%)	< 140 µs (for 4 mA ... 20 mA step)
Maximum transmission error	< 0.1 % (of final value)
Electrical isolation	
Input/output/power supply	1.5 kV (50 Hz, 1 min., test voltage) 300 V_{rms} (Rated insulation voltage (overvoltage category II, degree of pollution 2))
Output/input	375 V (Peak value in accordance with EN 60079-11)
Output/supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage)
SMART communication	Yes
Signal bandwidth	as per HART specifications
Protocols supported	HART
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	27.7 V
Maximum output current Io	92 mA
Maximum output power Po	633 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC/IIB T4 Gc
IECEx	[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Output signal conditioner, smart, output intrinsically safe			
Screw connection	**MACX MCR-EX-SL-IDSI-I**	2865405	1
Push-in connection	**MACX MCR-EX-SL-IDSI-I-SP**	2924032	1

Temperature
Temperature transducer, Ex i





For resistance thermometers and resistance-type sensors

DNV GL
Ex: EAC Ex
Housing width 12.5 mm

Programmable temperature transducer for intrinsically safe operation of resistance thermometers and resistance-type sensors installed in Ex areas. The measured values are converted into a linear 0 to 20 mA or 4 to 20 mA signal.

- Input for resistance thermometers and resistance-type sensors, [Ex ia]
- 0 to 20 mA or 4 to 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key provided online (phoenixcontact.net/products).

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

For information on the programming adapter, refer to page 172

Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

Input data		
Resistance thermometers		Sensors (2-, 3-, 4-wire)
Resistor		0 Ω ... 2000 Ω
Cable resistance		≤ 50 Ω per cable
Sensor input current		200 µA ... 1 mA
Measuring range span		min. 50 K
Output data		
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Load		≤ 500 Ω
Behavior in the event of a sensor error		As per NE 43 or can be freely defined
Output ripple		< 50 μA_{PP}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current draw		≤ 40 mA (at 24 V DC)
Power dissipation		< 1 W
Temperature coefficient		0.01 %/K
Step response (0–99%)		typ. 700 ms ≤ 1100 ms
Transmission error, total		0.1 % x 1000 [K]/measuring span
ZERO / SPAN adjustment		± 5 % / ± 5 %
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		5 % ... 95 % (non-condensing)
Status indication		Green LED (supply voltage, PWR) Red LED, flashing (line, sensor error, ERR) Red LED (module error, ERR)
Inflammability class in acc. with UL 94		V0
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		6 V
Maximum output current Io		6.3 mA
Maximum output power Po		9.4 mW
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA ic [ia Ga] IIC T4 Gc X
IECEx		[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA ic [ia Ga] IIC T4 Gc
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1

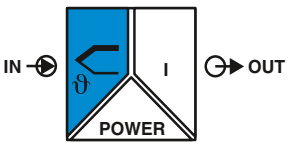
Ordering data

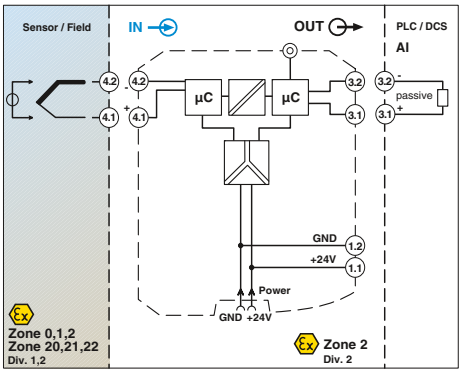
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer for resistance thermometers, intrinsically safe input				
Order configuration	Screw connection	**MACX MCR-EX-SL-RTD-I**	2865939	1
Order configuration	Push-in connection	**MACX MCR-EX-SL-RTD-I-SP**	2924142	1
Standard configuration	Screw connection	**MACX MCR-EX-SL-RTD-I-NC**	2865573	1
Standard configuration	Push-in connection	**MACX MCR-EX-SL-RTD-I-SP-NC**	2924168	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Temperature
Temperature transducer, Ex i





For thermocouples and mV sources

DNV GL
Ex: EAC Ex
Housing width 12.5 mm

Programmable temperature transducer for intrinsically safe operation of thermocouples and mV sources installed in Ex areas. The measured values are converted into a linear 0 to 20 mA or 4 to 20 mA signal.

- Input for thermocouples and mV sources, [Ex ia]
- 0 to 20 mA or 4 to 20 mA output
- Configuration via software (FDT/DTM): Sensor type, connection method, measuring range, measuring unit, filter, alarm signal, and output range
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Status indicator for supply voltage, cable, sensor, and module errors
- 3-way electrical isolation
- Power supply via DIN rail connector possible
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, please enter the desired configuration by referring to the order key provided online (phoenixcontact.net/products).

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

For information on the programming adapter, refer to page 172

Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

Input data		
Thermocouple sensors		E, J, K, N as per IEC / EN 60584, L as per DIN 43760
Voltage		-20 mV ... 70 mV
Measuring range span		Min. 50 K for thermocouples, 3 mV for mV sources
Output data		
Output signal		0 mA ... 20 mA / 4 mA ... 20 mA
Load		≤ 500 Ω
Behavior in the event of a sensor error		As per NE 43 or can be freely defined
Output ripple		< 50 μA_{PP}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 40 mA (24 V DC)
Power dissipation		< 1 W
Temperature coefficient		0.01 %/K
Step response (0–99%)		typ. 700 ms ≤ 1100 ms
Transmission error, total		0.1 % x 600 [K]/measuring span; 0.1 % > 600 [K]
Cold junction errors		± 1 K
ZERO / SPAN adjustment		± 5 % / ± 5 %
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Humidity		5 % ... 95 % (non-condensing)
Status indication		Green LED (supply voltage, PWR) Red LED, flashing (line, sensor error, ERR) Red LED (module error, ERR)
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		6 V
Maximum output current Io		4.7 mA
Maximum output power Po		7 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA ic [ia Ga] IIC T4 Gc X
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA ic [ia Ga] IIC T4 Gc
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1

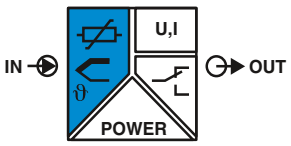
Ordering data

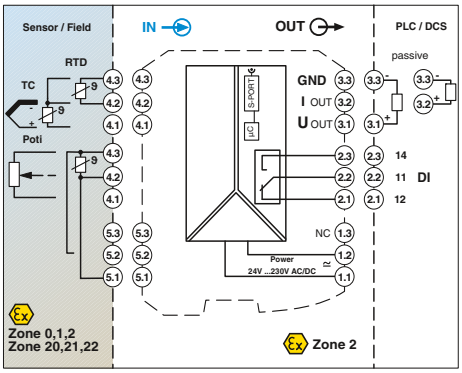
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer for thermocouples, intrinsically safe input				
Order configuration	Screw connection	**MACX MCR-EX-SL-TC-I**	2865942	1
Standard configuration	Screw connection	**MACX MCR-EX-SL-TC-I-NC**	2865586	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Temperature
Temperature transducer, Ex i





Universal, with switching output, wide-range power supply

Functional Safety
Ex: EAC Ex
Housing width 17.5 mm

Universal temperature transducer with freely configurable properties for intrinsically safe operation of resistance thermometers, thermocouples, resistance-type sensors, and potentiometers installed in Ex areas

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources, [Ex ia]
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Relay switching output
- Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in screw or Push-in connection technology
- Cold junction compensation with separate connector
- Wide-range power supply of 19.2 to 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

To order a product with an order configuration, enter the required configuration by referring to the adjacent order key.

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 105

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors		B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor		0 Ω ... 50 kΩ
Potentiometer		0 Ω ... 50 kΩ
Voltage		-1000 mV ... 1000 mV
Output data	U output	I output
Output signal	4 mA ... 20 mA (in the case of SIL; further free configuration without SIL)	
Maximum output signal	± 11 V	22 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (20 mA)
Behavior in the event of a sensor error	according to NE 43 or freely configurable	
Switching output	**Switching output**	
Contact type	1 PDT	
Contact material	$AgSnO_2$, hard gold-plated	
Max. switching voltage	30 V AC (30 V DC)	
Maximum switching current	0.5 A (30 V AC) / 1 A (30 V DC)	
General data		
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)	
Power consumption	< 1.5 W	
Temperature coefficient	0.01 %/K	
Transmission error, total	< 0.1 % (e.g., for Pt 100, 300 K span, 4 ... 20 mA)	
Electrical isolation		
Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage)	
Input/output	375 V (Peak value in accordance with EN 60079-11)	
Input/power supply	375 V (Peak value in accordance with EN 60079-11)	
Input/switching output	375 V (Peak value in accordance with EN 60079-11)	
Output/supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))	
Ambient temperature range	-20 °C ... 65 °C	
Humidity	typ. 5 % ... 95 % (non-condensing)	
Inflammability class in acc. with UL 94	V0	
Housing material	PA 66-FR	
Dimensions W/H/D	17.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Safety data as per ATEX		
Maximum output voltage Uo	6 V	
Maximum output current Io	7.4 mA	
Maximum output power Po	11 mW	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC ic IIC T4 Gc X	
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC ic IIC T4 Gc X	
SIL in accordance with IEC 61508	2	

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer, intrinsically safe input				
Standard configuration	Screw connection	**MACX MCR-EX-T-UI-UP**	2865654	1
Standard configuration	Push-in connection	**MACX MCR-EX-T-UI-UP-SP**	2924689	1
Order configuration	Screw connection	**MACX MCR-EX-T-UI-UP-C**	2811763	1
Order configuration	Push-in connection	**MACX MCR-EX-T-UI-UP-SP-C**	2924692	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Order key for MACX MCR-EX-T-UI-UP(-SP)-C temperature transducers (standard configuration entered as an example)

Order No.	Safety Integrity Level (SIL)	Sensor type	Connection technology	Cold junction compensation	Measuring range: Start	Measuring range: End	Measuring unit	Output range	Factory calibration certificate = FCC
2811763	ON	PT100	4	0	-50	150	C	OUT02	NONE
2811763 ≙ MACX MCR-EX-T-UI-UP-C 2924692 ≙ MACX MCR-EX-T-UI-UP-SP-C	ON ≙ Active NONE ≙ Not active ON only with output range = OUT02	See below	2 ≙ 2-conductor 3 ≙ 3-conductor 4 ≙ 4-conductor	0 ≙ Off, e.g., with RTD, R, potentiometer, mV 1 ≙ On, e.g., with TC	See below	See below	C ≙ °C F ≙ °F O ≙ Ω P ≙ % V ≙ mV	OUT15 ≙ 0 ... 5 mA OUT16 ≙ 0 ... 10 mA OUT01 ≙ 0 ... 20 mA OUT15 ≙ 0 ... 5 mA OUT25 ≙ 1 ... 5 mA OUT26 ≙ 2 ... 10 mA OUT02 ≙ 4 ... 20 mA OUT05 ≙ 0 ... 5 V OUT03 ≙ 0 ... 10 V OUT06 ≙ 1 ... 5 V OUT04 ≙ 2 ... 10 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V Others can be freely configured in the software	NONE ≙ Without FCC YES ≙ With FCC (a fee is charged) YESPLUS ≙ FCC with 5 measuring points (a fee is charged)

					Smallest measuring range span
Resistance thermometers (RTD) Others can be selected or freely configured in the software.	PT100	Pt 100 according to IEC 751	-200	850	°C	20 K
	PT200	Pt 200 according to IEC 751	-200	850	°C	20 K
	PT500	Pt 500 according to IEC 751	-200	850	°C	20 K
	PT1000	Pt 1000 according to IEC 751	-200	850	°C	20 K
	PT100S	Pt 100 according to Sama RC21-4-1966	-200	850	°C	20 K
	PT1000S	Pt 1000 according to Sama RC21-4-1966	-200	850	°C	20 K
	PT100G	Pt 100 according to GOST 6651-2009 (α = 0.00385)	-200	850	°C	20 K
	PT1000G	Pt 1000 according to GOST 6651-2009 (α = 0.00385)	-200	850	°C	20 K
	PT100J	Pt 100 according to JIS C1604/1997	-200	850	°C	20 K
	PT1000J	Pt 1000 according to JIS C1604/1997	-200	850	°C	20 K
	NI100	Ni 100 according to DIN 43760/DIN IEC 60751	-60	250	°C	20 K
	NI1000	Ni 1000 according to DIN 43760/DIN IEC 60751	-60	250	°C	20 K
	NI100S	Ni 100 according to Sama RC21-4-1966	-60	180	°C	20 K
	NI1000S	Ni 1000 according to Sama RC21-4-1966	-60	180	°C	20 K
	NI1000L	Ni 1000 (Landis & Gyr)	-50	160	°C	20 K
	CU10	Cu 10 according to Sama RC21-4-1966	-70	500	°C	100 K
	CU50	Cu 50 according to GOST 6651-2009 (α = 0.00428)	-50	200	°C	100 K
	CU100	Cu 100 according to GOST 6651-20091 (α = 0.00428)	-50	200	°C	100 K
	CU53	Cu 53 according to GOST 6651-2009 (α = 0.00426)	-50	180	°C	100 K
	KTY81	KTY81-110 (Philips)	-55	150	°C	20 K
	KTY84	KTY84-130 (Philips)	-40	300	°C	20 K
Thermocouples (TC) Others can be selected in the software.	B	according to IEC 584-1 (Pt30Rh-Pt6Rh)	500	1820	°C	50 K
	E	according to IEC 584-1 (NiCr-CuNi)	-230	1000	°C	50 K
	J	according to IEC 584-1 (Fe-CuNi)	-210	1200	°C	50 K
	K	according to IEC 584-1 (NiCr-Ni)	-250	1372	°C	50 K
	N	according to IEC 584-1 (NiCrSi-NiSi)	-250	1300	°C	50 K
	R	according to IEC 584-1 (Pt13Rh-Pt)	-50	1768	°C	50 K
	S	according to IEC 584-1 (Pt10Rh-Pt)	-50	1768	°C	50 K
	T	according to IEC 584-1 (Cu-CuNi)	-200	400	°C	50 K
	L	according to DIN 43760 (Fe-CuNi)	-200	900	°C	50 K
	U	according to DIN 43760 (Cu-CuNi)	-200	600	°C	50 K
	CA	C ASTM JE988 (2002)	0	2315	°C	50 K
	DA	D ASTM JE988 (2002)	0	2315	°C	50 K
	A1G	A-1 GOST 8.585-2001	0	2500	°C	50 K
	A2G	A-2 GOST 8.585-2001	0	1800	°C	50 K
	A3G	A-3 GOST 8.585-2001	0	1800	°C	50 K
	MG	M GOST 8.585-2001	-200	100	°C	50 K
	LG	L GOST 8.585-2001	-200	800	°C	50 K
Remote resistance-type sensors (R) (2-, 3-, 4-conductor) Others can be selected in the software.	RES03	Resistance 0 ... 150 Ω	0	150	Ω	10% of the selected measuring range
	RES05	Resistance 0 ... 600 Ω	0	600	Ω	
	RES06	Resistance 0 ... 1200 Ω	0	1200	Ω	
	RES09	Resistance 0 ... 6250 Ω	0	6250	Ω	
	RES10	Resistance 0 ... 12,500 Ω	0	12,500	Ω	
	RES12	Resistance 0 ... 50,000 Ω	0	50,000	Ω	
Potentiometers (3-conductor) Others can be selected in the software.	POT03	Potentiometer 0 ... 150 Ω	0	100	%	10% of the selected measuring range
	POT05	Potentiometer 0 ... 600 Ω	0	100	%	
	POT06	Potentiometer 0 ... 1200 Ω	0	100	%	
	POT09	Potentiometer 0 ... 6250 Ω	0	100	%	
	POT10	Potentiometer 0 ... 12,500 Ω	0	100	%	
	POT12	Potentiometer 0 ... 50,000 Ω	0	100	%	
Voltage signals (mV) Others can be selected in the software.	V04	Voltage (mV)	-1000	+1000	mV	10% of nominal span

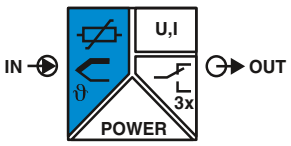
Other setting options can be configured with the IFS-CONF software:

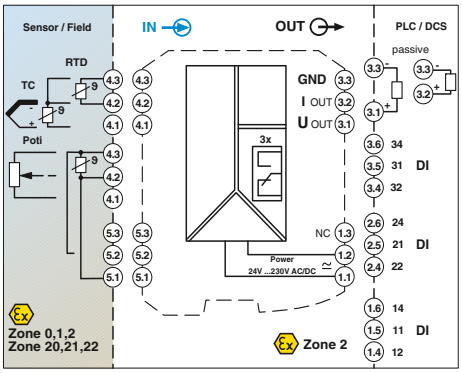
- Freely configurable user characteristic curve with 30 interpolation points
- Output behavior in the event of a short circuit, sensor break or overrange/underrange can be freely configured or set according to NE43 (standard configuration: NE43 upscale)
- Filter setting (standard configuration: 1)
- Restart after failsafe (standard configuration: ON)
- Switching behavior: switching output (limit values, times, etc.) (standard configuration: OFF)

Temperature conversion guide for °C to °F:

$$T\,[°F] = \frac{9}{5} T\,[°C] + 32$$

Temperature
Temperature transducer, Ex i





Universal, with three limit value relays, wide-range power supply

Functional Safety
Ex: EAC Ex
Housing width 35 mm

Universal temperature transducer with freely configurable properties for intrinsically safe operation of resistance thermometers, thermocouples, resistance-type sensors, and potentiometers installed in Ex areas

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources, [Ex ia]
- Measure differential temperatures
- Freely programmable input and output
- Option of inverse output signal ranges
- Three limit value relays, can be used in combination as a safe limit value relay
- Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Plug-in screw or Push-in connection technology
- Cold junction compensation with separate connector
- Wide-range power supply of 19.2 to 253 V AC/DC
- Status indicator for supply voltage, cable, sensor, and module errors
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 172

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors		B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor		0 Ω ... 50 kΩ
Potentiometer		0 Ω ... 50 kΩ
Voltage		-1000 mV ... 1000 mV
Output data	U output	I output
Output signal	0 mA ... 20 mA ±10 V (in the case of SIL; further free configuration without SIL)	
Maximum output signal	± 11 V	22 mA
Load R_B	≥ 10 kΩ	≤ 600 Ω (20 mA)
Behavior in the event of a sensor error	according to NE 43 or freely configurable	
Switching output	Relay output	
Contact type	3 PDTs	
Contact material	$AgSnO_2$, hard gold-plated	
Max. switching voltage	250 V AC (250 V DC)	
Maximum switching current	2 A (250 V AC) / 2 A (28 V DC)	
General data		
Supply voltage range	24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)	
Power consumption	< 2.4 W	
Temperature coefficient	0.01 %/K	
Maximum transmission error	0.1 % (e.g. for Pt 100, 300 K span, 4 ... 20 mA)	
Electrical isolation		
Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage)	
Input/output	375 V (Peak value in accordance with EN 60079-11)	
Input/power supply	375 V (Peak value in accordance with EN 60079-11)	
Input/switching output	375 V (Peak value in accordance with EN 60079-11)	
Output/supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))	
Ambient temperature range	-20 °C ... 65 °C	
Humidity	typ. 5 % ... 95 % (non-condensing)	
Inflammability class in acc. with UL 94	V0	
Housing material	PA 66-FR	
Dimensions W/H/D	35 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
EMC note	Class A product, see page 605	
Safety data as per ATEX		
Maximum output voltage Uo	6 V	
Maximum output current Io	7.4 mA	
Maximum output power Po	11 mW	
Conformance/Approvals		
Conformance	CE-compliant	
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC ic IIC T4 Gc X	
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC ic IIC T4 Gc X	
SIL in accordance with IEC 61508	2	

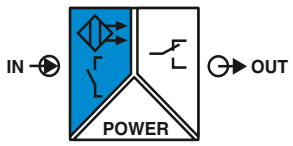
Ordering data

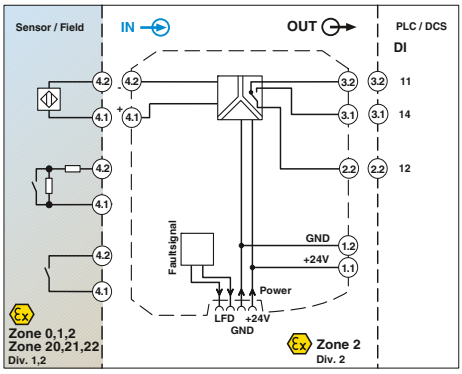
Description		Type	Order No.	Pcs./ Pkt.
Temperature transducer, intrinsically safe input				
Standard configuration	Screw connection	**MACX MCR-EX-T-UIREL-UP**	2865751	1
Standard configuration	Push-in connection	**MACX MCR-EX-T-UIREL-UP-SP**	2924799	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Digital IN
NAMUR signal conditioner, Ex i





Signal output: PDT relay

DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

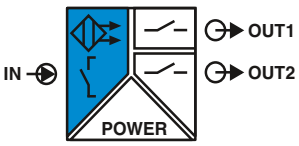
Technical data

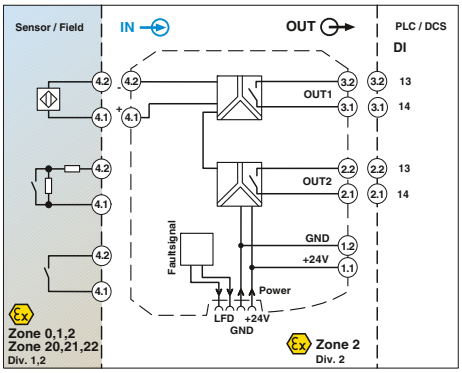
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	**Relay output**
Contact type	1 PDT
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	21 mA (24 V DC)
Power dissipation	< 650 mW
Number of channels	1
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Output/input, supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, 1-channel, input intrinsically safe, output: PDT contact			
Screw connection	**MACX MCR-EX-SL-NAM-R**	2865434	1
Push-in connection	**MACX MCR-EX-SL-NAM-R-SP**	2924045	1

Digital IN
NAMUR signal conditioner, Ex i





2 signal outputs: N/O contact relay

DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- 2 relay signal outputs (N/O contact), output 2 can also be used as an error signal output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

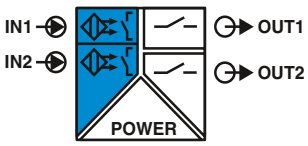
Technical data

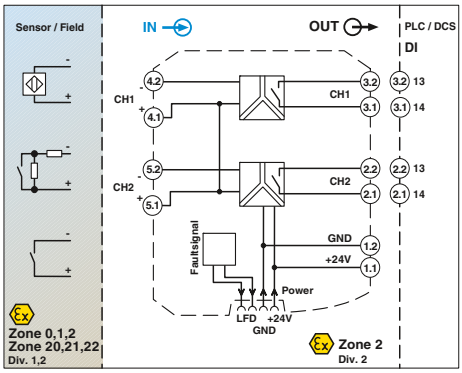
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	**Relay output**
Contact type	2 N/O contacts
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	30 mA (24 V DC)
Power dissipation	< 950 mW
Number of channels	1
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
Output 1/output 2/input, power supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1))
Output 1/output 2/input/power supply, DIN rail connector	2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, 1-channel, input intrinsically safe, output: 2 N/O contacts			
Screw connection	**MACX MCR-EX-SL-NAM-2RO**	2865450	1
Push-in connection	**MACX MCR-EX-SL-NAM-2RO-SP**	2924061	1

Digital IN
NAMUR signal conditioner, Ex i





2-channel, signal output: N/O contact relay

DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (N/O contact)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

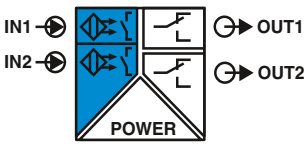
Technical data

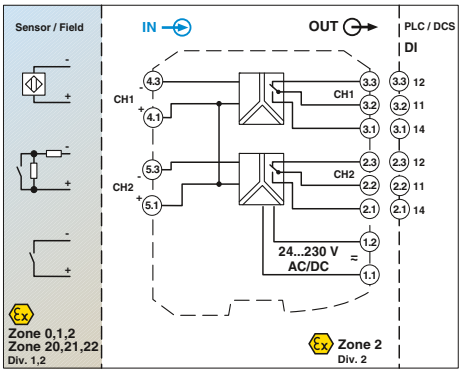
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	Relay output
Contact type	1 N/O contact per channel
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	Can be inverted via slide switch
Maximum switching frequency	≤ 20 Hz (without load)
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	35 mA (24 V DC)
Power dissipation	< 1 W
Number of channels	2
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
Output 1/output 2/input, power supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1))
Output 1/output 2/input/power supply, DIN rail connector	2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	5 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, 2-channel, input intrinsically safe, output: N/O contact			
Screw connection	**MACX MCR-EX-SL-2NAM-RO**	2865476	1
Push-in connection	**MACX MCR-EX-SL-2NAM-RO-SP**	2924087	1

Digital IN
NAMUR signal conditioner, Ex i





2-channel, signal output: PDT relay, wide-range power supply

Functional Safety
Ex: EAC Ex
Housing width 17.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Relay signal output (PDT)
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and de-excitation of the output relay
- Wide-range power supply of 19.2 to 253 V AC/DC
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on resistance circuits and marking material can be found on page 176

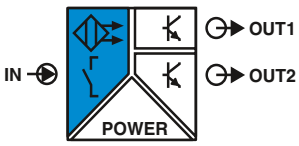
Technical data

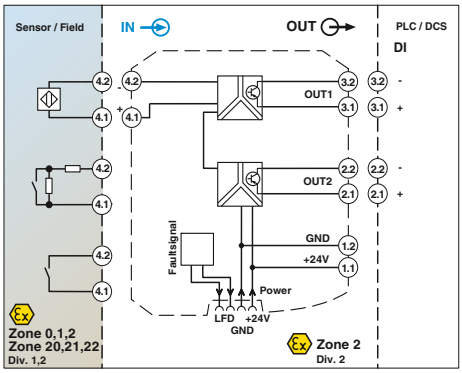
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Switching hysteresis	approx. 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	Relay output
Contact type	1 PDT per channel
Contact material	$AgSnO_2$, hard gold-plated
Max. switching voltage	250 V AC (2 A, 60 Hz) / 120 V DC (0.2 A) / 30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Mechanical service life	10^7 cycles
Switching behavior	can be inverted using DIP switch
Maximum switching frequency	≤ 20 Hz (Load-dependent)
General data	
Supply voltage range	24 V ... 230 V AC/DC (-20 % ... +10 %, 50 Hz ... 60 Hz)
Current consumption	< 80 mA ; < 42 mA (24 V DC)
Power dissipation	≤ 1.3 W
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/power supply	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV AC (50 Hz, 1 min., test voltage)
Output 1/output 2/input, power supply	300 V_{rms} (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C
Humidity	10 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.56 V
Maximum output current Io	10.3 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC/DC (Supply terminals) 250 V AC (Output terminals) 120 V DC (Output terminals)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC [ia Ga] IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, 2-channel, input intrinsically safe, output: changeover contact			
Screw connection	**MACX MCR-EX-SL-2NAM-R-UP**	2865984	1
Push-in connection	**MACX MCR-EX-SL-2NAM-R-UP-SP**	2924249	1

Digital IN
NAMUR signal conditioner, Ex i





2 signal outputs: transistor (passive)

DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- 2 signal outputs transistor (passive), up to 5 kHz
- Signal output 2 can also be used as a fault signaling output
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and blocking the transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 4-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

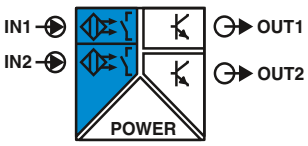
Technical data

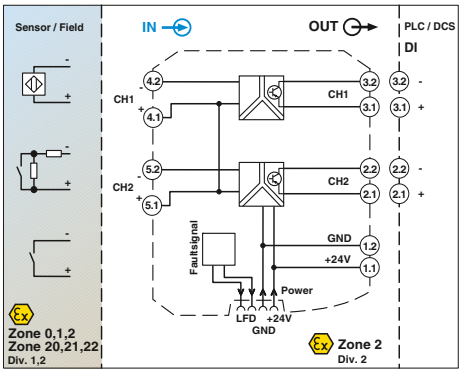
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	2 transistor outputs, passive
Max. switching voltage	30 V DC
Maximum switching current	50 mA (short-circuit-proof)
Drop (ΔU)	< 1.4 V
Switching behavior	can be inverted using DIP switch
Maximum switching frequency	≤ 5 kHz
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	< 28 mA (24 V DC)
Power dissipation	≤ 800 mW
Number of channels	1
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11)
Output 1/output 2	50 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, basic insulation as per EN 61010-1)) 1 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, input intrinsically safe, output: transistor, passive			
Screw connection	**MACX MCR-EX-SL-NAM-2T**	2865463	1
Push-in connection	**MACX MCR-EX-SL-NAM-2T-SP**	2924074	1

Digital IN
NAMUR signal conditioner, Ex i





SIL IEC 61508

2-channel, signal output transistor (passive)

DNV GL Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioner for intrinsically safe operation of proximity sensors and mechanical contacts installed in Ex areas.

- 2-channel
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Signal output transistor (passive), up to 5 kHz
- Reversible direction of action (operating current or closed-circuit current behavior)
- Line fault detection (LFD) can be activated and deactivated, error indicated by red flashing LED and blocking the transistor output
- Power supply and error indication possible via the DIN rail connector
- LED displays for indicating supply voltage, circuit state, and malfunctions to NAMUR NE 44
- 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Information about resistance circuits is given on page 176

Information on “Plug and play” connection using system cabling can be found from page 164

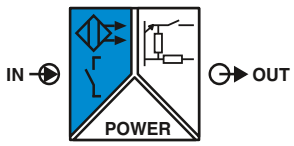
Technical data

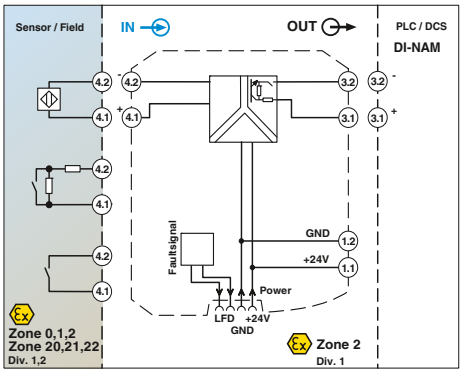
Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
No-load voltage	~ 8 V DC
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	1 transistor output, passive (per channel)
Max. switching voltage	30 V DC
Maximum switching current	50 mA (short-circuit-proof)
Drop (ΔU)	< 1.4 V
Switching behavior	can be inverted using DIP switch
Maximum switching frequency	≤ 5 kHz
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption	< 34 mA (24 V DC)
Power dissipation	≤ 1000 mW
Number of channels	2
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11)
Output 1/output 2	50 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, basic insulation as per EN 61010-1)) 1 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC (125 V DC)
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	Ex II (1) G [Ex ia Ga] IIC Ex II (1) D [Ex ia Da] IIIC Ex II 3 G Ex nA IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, 2-channel, input intrinsically safe, output: transistor, passive			
Screw connection	**MACX MCR-EX-SL-2NAM-T**	2865489	1
Push-in connection	**MACX MCR-EX-SL-2NAM-T-SP**	2924090	1

Digital IN
NAMUR signal conditioner, Ex i





With line fault transparency

Ex: EAC Ex
Housing width 12.5 mm

NAMUR signal conditioners for the intrinsically safe operation of proximity sensors or mechanical contacts installed in the Ex area.

- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia]
- Signal output with resistive behavior (transistor)
- Signal output with line fault transparency: line fault indicated directly via output to PLC or PCS. The output responds in accordance with EN 60947-5-6.
- Up to 5 kHz
- Direction of operation can be selected
- Line fault detection can be activated and deactivated
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or Push-in connection technology
- Safe 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found from page 174

Information about resistance circuits is given on page 176

Technical data

Input data	
Input signal	NAMUR proximity sensors (EN 60947-5-6) open circuit switch contacts Switch contacts with resistance circuit
No-load voltage	8 V DC ±10 %
Switching points	> 2.1 mA (conductive) / < 1.2 mA (blocking)
Line fault detection	Break 0.05 mA < IIN < 0.35 mA Short circuit 100 Ω < RSensor < 360 Ω
Switching output	Resistive (transistor, passive)
Switching voltage	8.2 V DC ±10 % (according to EN 60947-5-6)
Switching frequency	≤ 5 kHz (Ohmic load)
Impedance 0-signal	11 kΩ ±5 %
Impedance 1-signal	1.4 kΩ ±5 %
Impedance fault	> 100 kΩ
Switching behavior	can be inverted using DIP switch
General data	
Supply voltage range	9.6 V DC ... 30 V DC (12 V DC … 24 V DC (-20 % … +25 %))
Current draw	25 mA (24 V DC)
Power dissipation	< 0.6 W
Electrical isolation	
Input/output	375 V (Peak value in accordance with EN 60079-11)
Input/output/supply, DIN rail connector	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Input/supply, DIN rail connector	375 V (Peak value in accordance with EN 60079-11)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	9.6 V
Maximum output current Io	10 mA
Maximum output power Po	25 mW
Maximum voltage U_m	253 V AC/DC
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	Ex II (1) G [Ex ia Ga] IIC Ex II (1) D [Ex ia Da] IIIC Ex II 3G Ex nA IIC T4 Gc X
IECEx	[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA IIC T4 Gc
SIL in accordance with IEC 61508	2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
NAMUR signal conditioner, intrinsically safe input, output with line fault transparency			
Screw connection	**MACX MCR-EX-SL-NAM-NAM**	2866006	1
Push-in connection	**MACX MCR-EX-SL-NAM-NAM-SP**	2924883	1
Specifically for Yokogawa systems			
Screw connection	**MACX MCR-EX-SL-NAM-YO**	2905723	1
Push-in connection	**MACX MCR-EX-SL-NAM-YO-SP**	2905724	1
Specifically for Honeywell systems			
Screw connection	**MACX MCR-EX-SL-NAM-HO**	2907404	1
Push-in connection	**MACX MCR-EX-SL-NAM-HO-SP**	2907405	1

Solenoid drivers for controlling solenoid valves

In order to control intrinsically safe Ex i solenoid valves, you have to have an intrinsically safe control circuit. This is provided by the solenoid drivers that are available from Phoenix Contact.

The following must be taken into account when dimensioning your intrinsically safe control circuit:

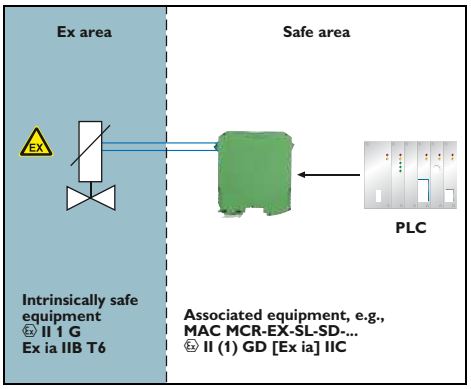
– Valve
– Cable with corresponding resistance
– Solenoid driver

As a result, it may be the case that not all valves are compatible with the solenoid drivers.

Below is an extract from a table showing possible combinations of valves and solenoid drivers.

A complete and updated list (along with details of the technical data for suitable valves, the maximum cable lengths, and the maximum cable resistances of the individual combinations) can be found on the Internet at: phoenixcontact.net/products

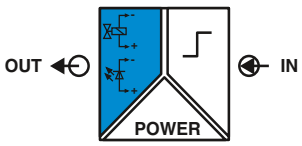
Example of a circuit

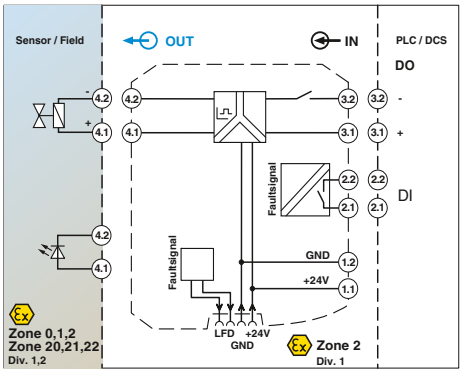


Valves overview

					MACX Analog Ex solenoid drivers			
Manufacturer	**Type designation**		**Ex certificate**	**Condition**	**MACX MCR-EX-SL-SD-21-25-LP**	**MACX MCR-EX-SL-SD-21-40-LP**	**MACX MCR-EX-SL-SD-24-48-LP**	**MACX MCR-EX-SL-SD-21-60-LP**
ASCO	Coil	195	LCIE 08 ATEX 6083			✓	✓	
	Coil	302 (12 V)	INERIS 03 ATEX 0249X				✓	✓
	Coil	302 (24 V)	INERIS 03 ATEX 0249X					✓
Bürkert	Coil	AC 10, standard	PTB 01 ATEX 2101			✓	✓	
	Coil	AC 10, high-resistance	PTB 01 ATEX 2101			✓	✓	
	Coil	AC 21, standard	PTB 01 ATEX 2175	700 mW / 65°C		✓	✓	
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	700 mW / 65°C		✓	✓	
	Coil	AC 21, standard	PTB 01 ATEX 2175	900 mW / 45°C		✓	✓	
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	900 mW / 45°C		✓	✓	
	Coil	AC 21, standard	PTB 01 ATEX 2175	900 mW / 60°C		✓	✓	
	Coil	AC 21, high-resistance	PTB 01 ATEX 2175	900 mW / 60°C		✓	✓	
	Coil	G1 642735, standard		600 mW / 50°C		✓		
	Coil	G1 642735, high-resistance		600 mW / 50°C		✓		
	Coil	G1 642735, standard	PTB 01 ATEX 2173	800 mW / 40°C		✓	✓	
	Coil	G1 642735, high-resistance	PTB 01 ATEX 2173	800 mW / 40°C		✓	✓	
	Coil	G1 642735, standard	PTB 01 ATEX 2173	1000 mW / 40°C		✓	✓	
	Coil	G1 642735, high-resistance	PTB 01 ATEX 2173	1000 mW / 40°C		✓	✓	
FESTO	Coil	MFH-...IA-SA-EX GBXE022AIAD03	PTB 03 ATEX 2097				✓	✓
	Coil	(J)MFH-...BIA-SA-EX GBXE022AIAD03	PTB 03 ATEX 2097				✓	✓
Norgren Herion	Coil	2050	PTB 07 ATEX 2019			✓	✓	✓
	Coil	2051	PTB 07 ATEX 2019			✓	✓	✓
	Coil	2052	PTB 07 ATEX 2019			✓	✓	✓
	Coil	2053	PTB 07 ATEX 2019				✓	✓
	Coil	2085	PTB 06 ATEX 2001 U		✓			
	Coil	2086	PTB 06 ATEX 2001 U		✓	✓	✓	✓
	Coil	3039	PTB 03 ATEX 2134				✓	
	Coil	2003	PTB 04 ATEX 2010				✓	
Hörbiger	Piezo	P8 38x RF-Nx-SPN65	DMT 01 ATEX E026X	30 V type	✓	✓		
	Piezo	P20 381RF-NG-CPN61	DMT 01 ATEX E025X	30 V type	✓	✓		
Parker	Coil VZ07	488650.01	LCIE 02 ATEX 6024X			✓	✓	
	Coil VZ33	494035.10	LCIE 02 ATEX 6024X			✓	✓	
	Coil VZ08	488660.01	LCIE 02 ATEX 6024X			✓	✓	
	Coil VZ09	488670.01	LCIE 02 ATEX 6024X			✓	✓	
	Coil VZ95	482160.01	LCIE 02 ATEX 6024X	EEx ia IIB T6		✓	✓	✓
	Coil VZ23	482870.01	LCIE 02 ATEX 6024X			✓	✓	
Samson	Coil	3701-11 (6 V)	PTB 02 ATEX 2178		✓			
	Coil	3701-12 (12 V)	PTB 02 ATEX 2178		✓	✓	✓	
	Coil	3701-13 (24 V)	PTB 02 ATEX 2178		✓	✓	✓	
	Coil	3963-11 (6 V)	PTB 01 ATEX 2085		✓			
	Coil	3963-12 (12 V)	PTB 01 ATEX 2085		✓	✓	✓	
	Coil	3963-13 (24 V)	PTB 01 ATEX 2085		✓	✓	✓	
	Coil	3964-11 (6 V)	PTB 02 ATEX 2047		✓			
	Coil	3964-12 (12 V)	PTB 02 ATEX 2047		✓	✓	✓	
	Coil	3964-13 (24 V)	PTB 02 ATEX 2047		✓	✓	✓	
	Coil	3965-11 (6 V)	PTB 05 ATEX 2044X		✓			
	Coil	3965-12 (12 V)	PTB 05 ATEX 2044X		✓	✓	✓	
	Coil	3965-13 (24 V)	PTB 05 ATEX 2044X		✓	✓	✓	
	Coil	3967-11 (6 V)	PTB 06 ATEX 2027		✓			
	Coil	3967-12 (12 V)	PTB 06 ATEX 2027		✓	✓	✓	
	Coil	3967-13 (24 V)	PTB 06 ATEX 2027		✓	✓	✓	
Seitz	Pilot valve	PV 12F73 Ci oH	PTB 99 ATEX 2146		✓	✓	✓	
	Pilot valve	PV 12F73 Xi oH	PTB 00 ATEX 2030		✓	✓	✓	
	Pilot valve	PV 12F73 Xi oH-2	PTB 00 ATEX 2030		✓	✓	✓	
	Solenoid	11 G 52	PTB 01 ATEX 2020				✓	

Digital OUT
Solenoid driver, Ex i





Current limitation 48 mA, with line fault detection

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Solenoid driver for the intrinsically safe control of Ex i solenoid valves, alarm transmitters or indicators installed in the Ex area.

- Input: logic (low/high signal)
- Output: 48 mA current limitation at 9.5 V, [Ex ia]
- Line fault detection (can be activated and deactivated)
  - Directly via signal channel
  - Or via switching output
- Transparent for test pulses
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or Push-in connection technology
- Safe 3-way electrical isolation
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 permitted

Notes:

Information on the supply and error evaluation module, DIN rail connectors, system cabling, and marking material can be found from page 174

Technical data

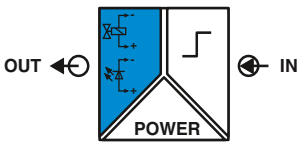
Input data	
Switching level 0 signal ("L")	0 V DC ... 5 V DC (Open)
Switching level 1 signal ("H")	15 V DC ... 30 V DC
Current input signal	< 12 mA
Input impedance in the event of a line fault at the output	3 MΩ (High resistance (Mega Ω))
Transparent for test pulses	Yes
Output data	
Output voltage	≥ 9.36 V DC (At 48 mA)
Current limitation	> 48 mA (With line fault detection)
No-load voltage	> 22.5 V DC
Internal resistance	≥ 269 Ω (Internal resistance R_i)
Immunity to short-circuiting	yes
Response time t_A	< 30 ms
Line fault detection	< 50 Ω (short circuit on the line) > 10 kΩ (line break)
Error message output	
Switch contact	N/C contact
Max. switching voltage	30 V DC
Maximum switching current	50 mA
Short-circuit-proof	yes
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current draw	< 90 mA (24 V DC)
Power dissipation	< 1.8 W
Electrical isolation	
Output/input, error message output	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Degree of protection	IP20
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 112.5 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	25.3 V
Maximum output current Io	94 mA
Maximum output power Po	595 mW
Maximum voltage U_m	253 V AC/DC
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC T4 Gc X
IECEx	[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC T4 Gc
SIL in accordance with IEC 61508	3

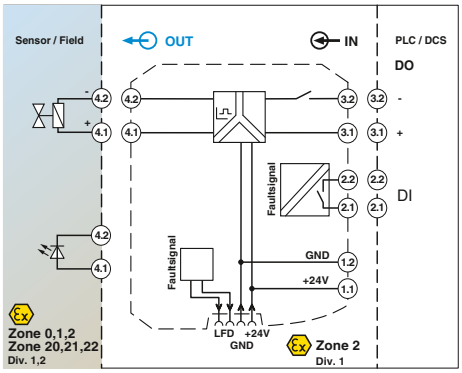
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Solenoid driver, logic input, intrinsically safe output, line fault detection			
Screw connection	**MACX MCR-EX-SL-SD-23-48-LFD**	2924867	1
Push-in connection	**MACX MCR-EX-SL-SD-23-48-LFD-SP**	2924870	1

Digital OUT
Solenoid driver, Ex i

new





25.1 mA current limitation with line fault detection

Functional Safety
Ex:
Housing width 12.5 mm

Solenoid driver for the intrinsically safe control of Ex i solenoid valves, alarm transmitters or indicators installed in the Ex area.

- Input: logic (low/high signal)
- Output: 25.1 mA current limitation at 4.64 V, [Ex ia]
- Line fault detection (can be activated and deactivated)
  - Directly via signal channel
  - Or via switching output
- Transparent for test pulses
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or Push-in connection technology
- Safe 3-way electrical isolation
- Up to SIL 3 according to IEC/EN 61508
- Installation in Zone 2 permitted

Notes:

A list of suitable valves and notes for calculating a valve circuit are available from the download center at phoenixcontact.net/products.

Information on marking material can be found on page 177

Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

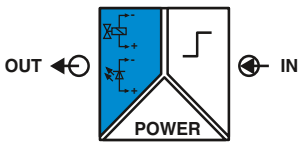
Input data	
Switching level 0 signal ("L")	0 V DC ... 5 V DC (Open)
Switching level 1 signal ("H")	15 V DC ... 30 V DC
Current input signal	< 12 mA
Input impedance in the event of a line fault at the output	3 MΩ (High resistance (Mega Ω))
Transparent for test pulses	Yes
Output data	
Output voltage	≥ 4.64 V DC (at 25.1 mA)
Current limitation	> 25.1 mA (With line fault detection)
No-load voltage	> 21.1 V DC
Internal resistance	≥ 641 Ω (Internal resistance R_i)
Immunity to short-circuiting	yes
Response time t_A	< 30 ms
Line fault detection	< 50 Ω (short circuit on the line) > 10 kΩ (line break)
Error message output	
Switch contact	N/C contact
Max. switching voltage	30 V DC
Maximum switching current	50 mA
Short-circuit-proof	yes
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current draw	< 50 mA (24 V DC)
Power dissipation	< 0.8 W
Electrical isolation	
Output/input, error message output	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Degree of protection	IP20
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 112.5 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	23.98 V
Maximum output current Io	37.4 mA
Maximum output power Po	224 mW
Maximum voltage U_m	253 V AC/DC
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC T4 Gc X
IECEx	[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC T4 Gc
SIL in accordance with IEC 61508	3

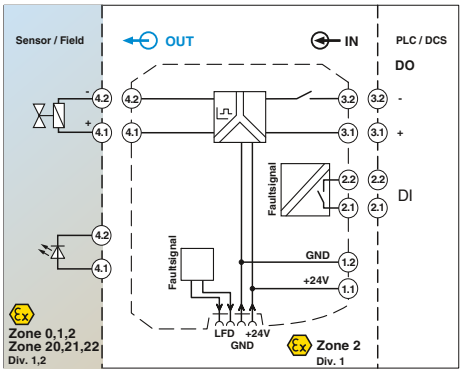
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Solenoid driver, logic input, intrinsically safe output, line fault detection			
Screw connection	**MACX MCR-EX-SL-SD-21-25-LFD**	2905669	1
Push-in connection	**MACX MCR-EX-SL-SD-21-25-LFD-SP**	2905674	1

Digital OUT
Solenoid driver, Ex i

new





48 mA current limitation with line fault detection

Functional Safety
Ex:
Housing width 12.5 mm

Solenoid driver for the intrinsically safe control of Ex i solenoid valves, alarm transmitters or indicators installed in the Ex area.

- Input: logic (low/high signal)
- Output: 48 mA current limitation at 9.7 V, [Ex ia]
- Line fault detection (can be activated and deactivated)
  - Directly via signal channel
  - Or via switching output
- Transparent for test pulses
- Power supply and error indication possible via the DIN rail connector
- LED indicators for supply voltage, status, and fault according to NAMUR NE 44
- Plug-in screw or Push-in connection technology
- Safe 3-way electrical isolation
- Up to SIL 3 according to IEC/EN 61508
- Installation in Zone 2 permitted

Notes:

A list of suitable valves and notes for calculating a valve circuit are available from the download center at phoenixcontact.net/products.

Information on marking material can be found on page 177

Information on “Plug and play” connection using system cabling can be found from page 164

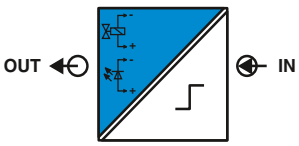
Technical data

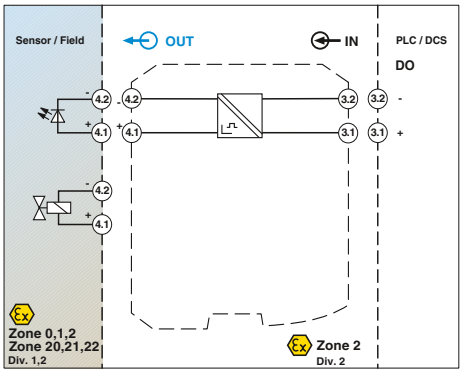
Input data	
Switching level 0 signal ("L")	0 V DC ... 5 V DC (Open)
Switching level 1 signal ("H")	15 V DC ... 30 V DC
Current input signal	< 12 mA
Input impedance in the event of a line fault at the output	3 MΩ (High resistance (Mega Ω))
Transparent for test pulses	Yes
Output data	
Output voltage	≥ 9.7 V DC (At 48 mA)
Current limitation	> 48 mA (With line fault detection)
No-load voltage	> 24.3 V DC
Internal resistance	≥ 297 Ω (Internal resistance R_i)
Immunity to short-circuiting	yes
Response time t_A	< 30 ms
Line fault detection	< 50 Ω (short circuit on the line) > 10 kΩ (line break)
Error message output	
Switch contact	N/C contact
Max. switching voltage	30 V DC
Maximum switching current	50 mA
Short-circuit-proof	yes
General data	
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current draw	< 90 mA (24 V DC)
Power dissipation	< 1.62 W
Electrical isolation	
Output/input, error message output	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	10 % ... 95 % (non-condensing)
Status indication	Green LED (supply voltage) Yellow LED (switching state) Red LED (line fault)
Degree of protection	IP20
Inflammability class in acc. with UL 94	V0
Housing material	PA 66-FR
Dimensions W/H/D	12.5 / 112.5 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Safety data as per ATEX	
Maximum output voltage Uo	27.06 V
Maximum output current Io	91.11 mA
Maximum output power Po	616 mW
Maximum voltage U_m	253 V AC/DC
Conformance/Approvals	
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC T4 Gc X
IECEx	[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC T4 Gc
SIL in accordance with IEC 61508	3

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Solenoid driver, logic input, intrinsically safe output, line fault detection			
Screw connection	**MACX MCR-EX-SL-SD-24-48-LFD**	2906155	1
Push-in connection	**MACX MCR-EX-SL-SD-24-48-LFD-SP**	2906156	1

Digital OUT
Solenoid drivers, Ex i





Current limitation 25 mA

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Solenoid drivers for controlling intrinsically safe solenoid valves, alarm transmitters, and indicators installed in Ex areas.

- 20 to 30 V DC input
- Output [Ex ia]
- Various output characteristic curves compatible with the commercial solenoid valves
- Loop-powered: the required power is supplied via the control signal on the input side.
- Mechanically compatible with DIN rail connector
- 2-way electrical isolation
- Up to SIL 3 according to EN 61508
- Installation in Zone 2 permitted

Notes:

A list of suitable valves and notes for calculating a valve circuit are available from the download center at phoenixcontact.net/products.

Information on marking material can be found on page 177

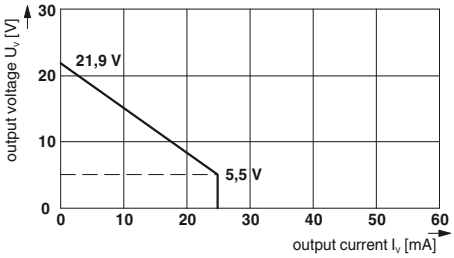
Information on “Plug and play” connection using system cabling can be found from page 164

Technical data

Input data		
Input signal		20 V DC ... 30 V DC (24 V DC -16.7 %...+25 %)
Input current		10 mA ... 70 mA (45 mA for U_e = 24 V DC)
Output data		
Output voltage		5.5 V DC (At 25 mA)
Current limitation		25 mA
No-load voltage		21.9 V DC
Internal resistance		641 Ω (Internal resistance R_i)
Immunity to short-circuiting		yes
Response time t_A		20 ms
General data		
Power dissipation		< 1 W
Temperature coefficient		0.01 %/K
Electrical isolation		
	Output/input	375 V (Peak value in accordance with EN 60079-11) 300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Yellow LED (switching state / status, lights up when output circuit is active)
Degree of protection		IP20
Inflammability class in acc. with UL 94		V0
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.1 V
Maximum output current Io		39 mA
Maximum output power Po		245 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II 3 G Ex nA IIC T4 Gc X II (1) G [Ex ia Ga] IIC/IIB/IIA II (1) D [Ex ia Da] IIIC
IECEx		[Ex ia Ga] IIC/IIB/IIA , [Ex ia Da] IIIC , Ex nA IIC T4 Gc X
UL, USA/Canada		Class I Div 2; IS for Class I, II, III Div 1
SIL in accordance with IEC 61508		3

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Solenoid driver, loop-powered, output intrinsically safe			
Screw connection	**MACX MCR-EX-SL-SD-21-25-LP**	2865492	1
Push-in connection	**MACX MCR-EX-SL-SD-21-25-LP-SP**	2924113	1



Current limitation 40 mA

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Technical data

20 V DC ... 30 V DC (24 V DC -16.7 %...+25 %)
10 mA ... 95 mA (65 mA for U_e = 24 V DC)

10 V DC (At 40 mA)
40 mA
21.9 V DC
287 Ω (Internal resistance R_i)
yes
20 ms

< 1.2 W
0.01 %/K

375 V (Peak value in accordance with EN 60079-11)
300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
2.5 kV (50 Hz, 1 min., test voltage)

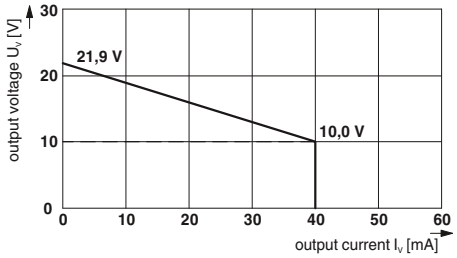
-20 °C ... 60 °C (Any mounting position)
Yellow LED (switching state / status, lights up when output circuit is active)
IP20
V0
12.5 / 99 / 114.5 mm
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Class A product, see page 605

25.1 V
87 mA
550 mW
253 V AC (125 V DC)

CE-compliant, additionally EN 61326
II 3 G Ex nA IIC T4 Gc X
II (1) G [Ex ia Ga] IIC/IIB/IIA
II (1) D [Ex ia Da] IIIC
[Ex ia Ga] IIC/IIB/IIA
Class I Div 2; IS for Class I, II, III Div 1
3

Ordering data

Type	Order No.	Pcs./ Pkt.
MACX MCR-EX-SL-SD-21-40-LP	**2865764**	1
MACX MCR-EX-SL-SD-21-40-LP-SP	**2924139**	1



Current limitation 48 mA

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Technical data

20 V DC ... 30 V DC (24 V DC -16.7 %...+25 %)
10 mA ... 95 mA (75 mA for U_e = 24 V DC)

10.5 V DC (At 48 mA)
48 mA
24 V DC
276 Ω (Internal resistance R_i)
yes
30 ms

< 1.4 W
0.01 %/K

375 V (Peak value in accordance with EN 60079-11)
300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
2.5 kV (50 Hz, 1 min., test voltage)

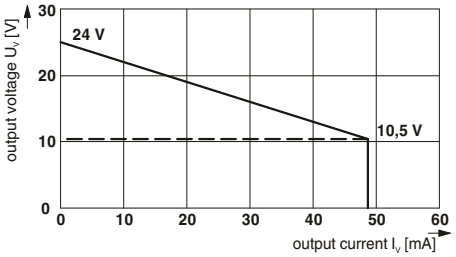
-20 °C ... 60 °C (Any mounting position)
Yellow LED (switching state / status, lights up when output circuit is active)
IP20
V0
12.5 / 99 / 114.5 mm
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Class A product, see page 605

27.7 V
101 mA
697 mW
253 V AC (125 V DC)

CE-compliant, additionally EN 61326
II 3 G Ex nA IIC T4 Gc X
II (1) G [Ex ia Ga] IIC/IIB/IIA
II (1) D [Ex ia Da] IIIC
[Ex ia Ga] IIC/IIB/IIA
Class I Div 2; IS for Class I, II, III Div 1
3

Ordering data

Type	Order No.	Pcs./ Pkt.
MACX MCR-EX-SL-SD-24-48-LP	**2865609**	1
MACX MCR-EX-SL-SD-24-48-LP-SP	**2924126**	1



Current limitation 58 mA, [Ex ia] IIB

Functional Safety
Ex: EAC Ex
Housing width 12.5 mm

Technical data

20 V DC ... 30 V DC (24 V DC -16.7 %...+25 %)
10 mA ... 105 mA (95 mA for U_e = 24 V DC)

12.9 V DC (At 58 mA)
58 mA
21.9 V DC
133 Ω (Internal resistance R_i)
yes
30 ms

< 1.4 W
0.01 %/K

375 V (Peak value in accordance with EN 60079-11)
300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
2.5 kV (50 Hz, 1 min., test voltage)

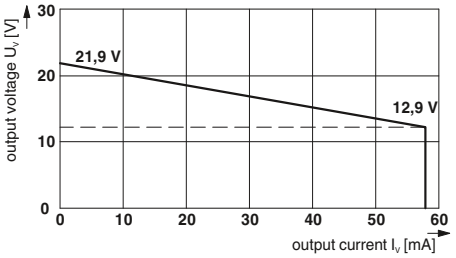
-20 °C ... 60 °C (Any mounting position)
Yellow LED (switching state / status, lights up when output circuit is active)
IP20
V0
12.5 / 99 / 114.5 mm
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Class A product, see page 605

25.1 V
188 mA
1.18 W
253 V AC (125 V DC)

CE-compliant, additionally EN 61326
II 3 G Ex nA IIC T4 Gc X
II (1) G [Ex ia Ga] IIB/IIA
II (1) D [Ex ia Da] IIIC
[Ex ia Ga] IIB/IIA
Class I Div 2; IS for Class I, II, III Div 1
3

Ordering data

Type	Order No.	Pcs./ Pkt.
MACX MCR-EX-SL-SD-21-60-LP	**2865515**	1
MACX MCR-EX-SL-SD-21-60-LP-SP	**2924100**	1



Termination Carrier for MACX Analog Ex signal conditioners

Select standard DIN rail device

Select module carrier

TC... Termination Carriers are compact solutions for quickly and smoothly connecting DIN rail devices from the MACX Analog Ex series to input and output cards of automation systems using system cabling.

The Termination Carriers combine the advantages of modular DIN rail devices with those offered by plug and play rapid cabling solutions to provide a consistent solution for system technology.

Compact
– Space savings of up to 30%, thanks to compact design

Robust and reliable
– Stable, vibration-resistant aluminum carrier device profile
– PCB is completely decoupled from modules
– PCB without active components
– Redundant supply and monitoring in separate DIN rail module

Easy maintenance
– Use of standard DIN rail devices
– Easy access to connection points
– Quick and safe module connection with plug-in and coded cable sets

Flexible
– Horizontal or vertical DIN rail mounting
– Profile section without pitch markings for I/O cards with specific number of channels
– Can be specifically adapted for I/O cards of various automation systems with different system plug types

Select controller-specific front adapter and system cable

Solutions are also available for MINI Analog, MACX Analog Ex, and Safety

Termination Carrier for MACX Analog Ex signal conditioners

The **TC-D37SUB-ADIO16-EX-P-UNI** universal Termination Carrier is a compact solution which connects signal conditioners from the MACX Analog Ex series to analog or binary input/output cards of automation systems.

The **TC-D37SUB-AIO16-EX-PS-UNI** Termination Carrier design, when combined with the MACX MCR-S-MUX HART multiplexer, also enables communication between HART-capable field devices and a management system.

The **TC-D37SUB-ADIO16-2EX-P-UNI** universal Termination Carrier is a compact solution which connects two-channel signal conditioners from the MACX Analog Ex series to analog or binary input and output cards of automation systems.

- Connection of up to 16 single-channel (Ex i) signal conditioners
- Universal 1:1 signal routing to a 37-pos. D-SUB connector
- For system cables with D-SUB socket and open ends for universal connection
- Redundant supply and monitoring in separate DIN rail module

Notes:

Contact us: specific Termination Carrier designs for I/O modules of various automation systems are available, planned or can be implemented according to your specification.

Ex:

Housing width 242 mm

Technical data

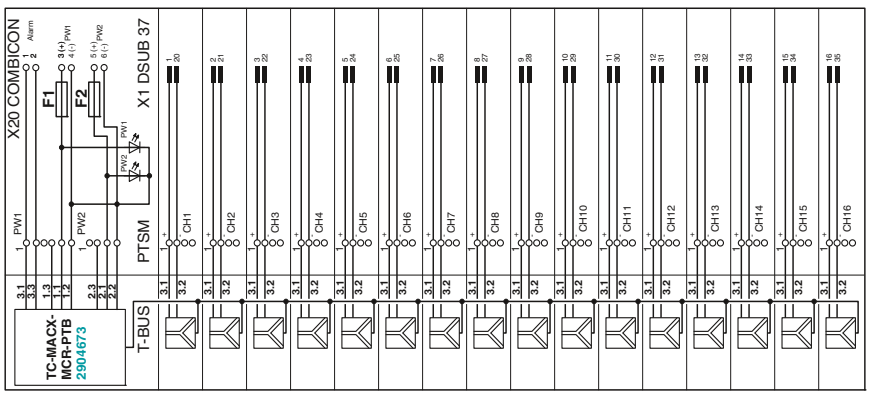
General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Maximum operating voltage	< 30 V DC (Per signal/channel)
Maximum permissible current	23 mA (Signal/channel)
Rated insulation voltage	50 V
Degree of pollution	2
Overvoltage category	II
Rated surge voltage	0.5 kV
Air clearances and creepage distances	DIN EN 50178 (Basic insulation)
Ambient temperature range	-20 °C ... 60 °C (Please observe module specifications)
Shock	15g, according to IEC 60068-2-27
Vibration (operation)	2g, according to IEC 60068-2-6
Dimensions W/H/D	242 / 170 / 160 mm
EMC note	Class A product, see page 605
Power supply via power module	
Input voltage range	19.2 V DC ... 30 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2x 2.5 A on PCB, slow-blow (replaceable)
Status indication	1 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Switching output	1 N/C contact (alarm = open)
Maximum switching voltage	50 V DC (0.3 A) / 30 V DC (2 A) / 33 V AC (2 A)

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Universal Termination Carrier for 16 single-channel MACX MCR-EX isolators			
	TC-D37SUB-ADIO16-EX-P-UNI	**2924854**	1
- With connection for multiplexer	**TC-D37SUB-AIO16-EX-PS-UNI**	**2902932**	1
Universal Termination Carrier for 16 two-channel MACX MCR-EX isolators			
	TC-2D37SUB-ADIO32-2EX-P-UNI	**2904684**	1

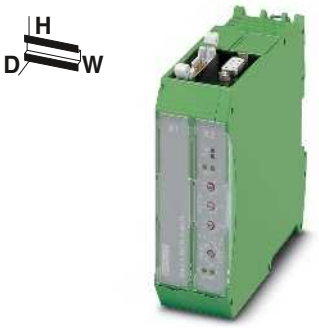
Accessories

Power and fault signaling module	**TC-MACX-MCR-PTB**	**2904673**	1
HART multiplexer, 32-channel	**MACX MCR-S-MUX**	**2865599**	1



TC-D37SUB-ADIO16-EX-P-UNI and TC-D37SUB-AIO16-EX-PS-UNI connection scheme

Multiplexer for HART signals



Multiplexer for digital connection of HART-capable field devices (such as measuring transducers or control valves) to a PC or management system.

- Supports online configuration and diagnostics for the connected HART-capable field devices
- Constant documentation of process variables and states
- 32 HART channels per multiplexer
- Up to 128 HART multiplexers at one PC interface
- Communication via software tool (e.g. HART OPC Server) using RS-485 interface
- Electrical isolation between auxiliary energy, RS-485 bus, and the HART channels
- HART field devices are accessed at the same time that the measurement signal is transmitted without affecting measured value processing
- HART field devices connected via universal HART connection boards; direct connection if processing non-Ex signals, with separate Ex i signal isolator connected upstream if processing Ex signals
- Power supplied via HART connection board

EAC

Housing width 35.2 mm

Technical data

Field devices interface (HART)	
Channels	16 or 32; adjustable using a switch
Connection method	Flat-ribbon cable, 14-pos. (inclusive)
Signal	HART FSK
HART specification	HART Field Communication Protocol Rev. 6.0 (downward compatible up to Rev 4.0); FSK Physical Layer Specification (Rev. 8.1)
Data transmission display	Two yellow "Tx" and "Rx" "HART" LEDs
Display error	Red "ERR" LED (flashes in case of an error in the HART bus)
RS-485 interface	
Connection method	D-SUB-9 socket
Signal	RS-485
Data flow control/protocols	Compatible with OPC HART server, PDM, PRM, and FDT/DTM
Number of HART multiplexers per bus segment	Max 31
Address setting	0...127; using a rotary switch at the front
Data rate	9600 / 19200 / 38400 / 57600 [bps]; via rotary switch at the front
Transmission length	≤ 1200 m
Display	Two yellow "Tx" and "Rx" "RS-485" LEDs
General data	
Supply voltage range	18 V ... 31.2 V
Nominal supply voltage	24 V DC
Current consumption	55 mA
Power consumption	1.35 W
Operating voltage display	Green "PWR" LED
Undervoltage monitoring	Yes (no faulty devices / output states)
Electrical isolation of HART signal/RS-485	350 V AC
Electrical isolation of HART signals between each other	100 V DC (Capacitive)
Electrical isolation of HART signal/supply	350 V AC
Electrical isolation of RS-485/supply	350 V AC
Error monitoring	Processor error: The "PWR" LED flashes; error in the HART communication: the "ERR" LED flashes
Ambient temperature range	-20 °C ... 60 °C
Humidity	≤ 95 % (non-condensing)
Dimensions W/H/D	35.2 / 99 / 114.5 mm
Conformance/Approvals	
Conformance	CE-compliant

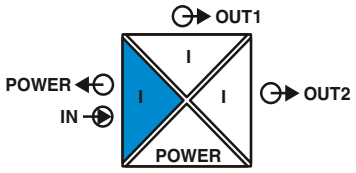
Ordering data

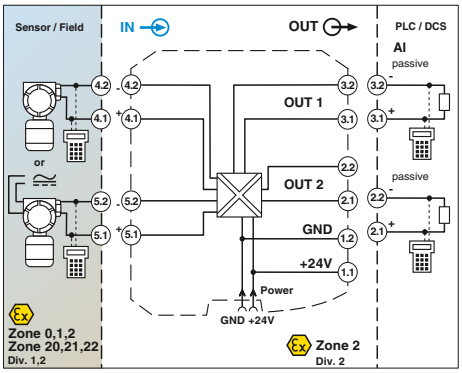
Description	Type	Order No.	Pcs./ Pkt.
HART multiplexer, 32-chanel, including two 14-wire flat-ribbon cables	**MACX MCR-S-MUX**	2865599	1

Accessories

Universal Termination Carrier for 16 single-channel MACX MCR-EX isolators - With connection for multiplexer	**TC-D37SUB-AIO16-EX-PS-UNI**	2902932	1
Module carrier for 16 MINI Analog channels, power and feed-through module - With connection for MACX MCR-S-MUX HART multiplexer	**TC-D37SUB-AIO16-M-PS-UNI**	2902934	1
HART connection board	**MACX MCR-S-MUX-TB**	2308124	1
Interface converter	**PSM-ME-RS232/RS485-P**	2744416	1
Repeater, for electrical isolation and increased range	**PSM-ME-RS485/RS485-P**	2744429	1

Analog IN
Repeater power supply, Ex i





Repeater power supply and input signal conditioner, with two electrically isolated outputs

Ex:
Housing width 12.5 mm

- 4 to 20 mA input, [Ex ia], powered and not powered
- Two electrically isolated outputs, 4 to 20 mA (active)
- PL d according to EN ISO 13849-1
- Up to SIL 2 according to IEC 61508
- Installation in Zone 2 possible
- Plug-in screw and Push-in connection technology
- 4-way electrical isolation
- Bidirectional HART communication possible
- Power supply via DIN rail connector possible

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

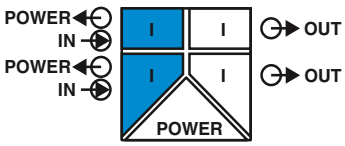
Technical data

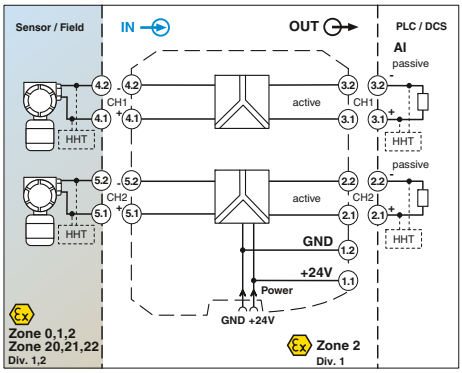
Input data		
Input signal		4 mA ... 20 mA / 4 mA ... 20 mA
Transmitter supply voltage		> 16 V (20 mA)
Voltage drop		approx. 3.9 V
Output data		
Output signal (Per output)		4 mA ... 20 mA (active)
Load		< 450 Ω (20 mA)
Output ripple		< 20 mV_{rms}
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 75 mA (24 V DC / 20 mA)
Power dissipation		< 1.45 W (24 V DC/ 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		1.3 ms (for jump 4 mA ... 20 mA, typical)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Under-/overload range		according to NE 43
Electrical isolation		
	Input/output/power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Output 1/output 2	1.5 kV AC (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (PWR supply voltage)
SMART communication (Per output)		Yes
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm^2 / 0.2 ... 1.5 mm^2 / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3 (1)G Ex nA [ia Ga] IIC/IIB T4 Gc
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC/IIB T4 Gc
SIL in accordance with IEC 61508		2
Performance level according to ISO 13849		PLd

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply and input signal conditioner, signal duplicator, with performance level, intrinsically safe input			
Screw connection	**MACX PL-EX-RPSSI-2I**	2904959	1
Push-in connection	**MACX PL-EX-RPSSI-2I-SP**	2904960	1

Analog IN
Repeater power supply, Ex i





2-channel repeater power supply

Functional Safety
Ex:
Housing width 12.5 mm

- 2-channel
- 4 to 20 mA input, [Ex ia], powered
- 4 to 20 mA output (active)
- PL d according to EN ISO 13849-1
- Up to SIL 3 according to IEC 61508
- Installation in Zone 2 possible
- Plug-in screw and Push-in connection technology
- 3-way electrical isolation, per channel
- Bidirectional HART communication possible
- Power supply via DIN rail connector possible

Notes:

Information about the supply and error evaluation module as well as about the DIN rail connectors and marking material can be found from page 174

Test plugs for test sockets can be found on page 176

Information on "Plug and play" connection using system cabling can be found from page 164

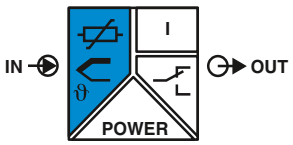
Technical data

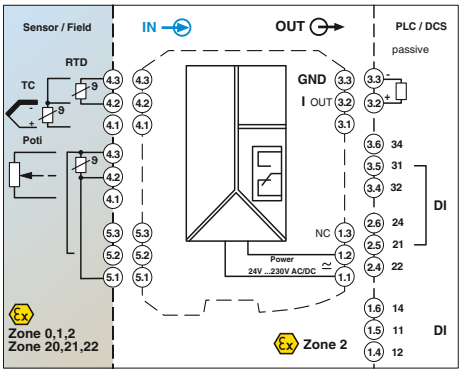
Input data		per channel
Input signal		4 mA ... 20 mA
Transmitter supply voltage		> 16 V (at 20 mA)
Underload/overload signal range		0 mA ... 24 mA
Output data		per channel
Output signal		4 mA ... 20 mA (active)
Load		≤ 450 Ω (20 mA)
Underload/overload signal range		0 mA ... 24 mA
General data		
Supply voltage range		19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Current consumption		< 100 mA (24 V / 20 mA)
Power dissipation		< 1.4 W (at 24 V DC / 20 mA)
Temperature coefficient		< 0.01 %/K
Step response (10-90%)		< 1.3 ms (for 4 mA ... 20 mA step)
Transmission error, typical		< 0.05 % (of final value)
Maximum transmission error		< 0.1 % (of final value)
Electrical isolation		
	Input/output, power supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Output 1/output 2/ power supply	1.5 kV (50 Hz, 1 min., test voltage)
Ambient temperature range		-20 °C ... 60 °C (Any mounting position)
Status indication		Green LED (supply voltage)
SMART communication		Yes
Signal bandwidth		as per HART specifications
Protocols supported		HART
Housing material		PA 66-FR
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		25.2 V
Maximum output current Io		93 mA
Maximum output power Po		587 mW
Maximum voltage U_m		253 V AC (125 V DC)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
ATEX		II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3(1) G Ex nA [ia Ga] IIC T4 Gc
IECEx		[Ex ia Ga] IIC/IIB , [Ex ia Da] IIIC , Ex nA [ia Ga] IIC T4 Gc
SIL in accordance with IEC 61508		3
Performance level according to ISO 13849		PLd

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Repeater power supply, two-channel, with performance level, intrinsically safe input			
Screw connection	**MACX PL-EX-RPSS-2I-2I**	2904963	1
Push-in connection	**MACX PL-EX-RPSS-2I-2I-SP**	2904964	1

Temperature
Temperature transducer, Ex i





universal, with limit value relays, wide-range power supply

Ex: EAC Ex

Housing width 35 mm

- Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, mV sources, [Ex ia]
- Differential measurement possible with Pt 100
- A safety-related limit value relay, by bridging two relays
- An additional limit value relay for non-safety-related function
- PL d according to EN ISO 13849-1
- Up to SIL 2 according to IEC 61508
- Configuration via software (ANALOG-CONF or FDT/DTM)
- Cold junction compensation with separate connector
- Wide range power supply 19.2 to 253 V AC/DC
- Status indicators for supply voltage, cable, sensor, and module errors
- Installation in Zone 2 possible
- Plug-in screw and Push-in connection technology

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Information on the IFS-OP-UNIT operating and display unit and the associated IFS-OP-CRADLE DIN rail cradle can be found on page 171

For information on the programming adapter, refer to page 172

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire
Thermocouple sensors		B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Resistor		0 Ω ... 50 kΩ
Potentiometer		0 Ω ... 50 kΩ
Voltage		-1000 mV ... 1000 mV
Output data		
Output signal		4 mA ... 20 mA
Maximum output signal		22 mA
Load R_B		≤ 600 Ω (20 mA)
Behavior in the event of a sensor error		according to NE 43 or freely configurable
Switching output		Relay output
Contact type		2 PDT
Contact material		$AgSnO_2$, hard gold-plated
Max. switching voltage		250 V AC (250 V DC)
Maximum switching current		2 A (250 V AC) / 2 A (28 V DC)
General data		
Supply voltage range		24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz)
Power consumption		< 2.4 W
Temperature coefficient		0.01 %/K
Maximum transmission error		0.1 % (e.g. for Pt 100, 300 K span, 4 ... 20 mA)
Electrical isolation		
	Input/output/power supply	2.5 kV (50 Hz, 1 min., test voltage)
	Input/output	375 V (Peak value in accordance with EN 60079-11)
	Input/power supply	375 V (Peak value in accordance with EN 60079-11)
	Input/switching output	375 V (Peak value in accordance with EN 60079-11)
	Output/supply	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
Ambient temperature range		-20 °C ... 65 °C
Humidity		typ. 5 % ... 95 % (non-condensing)
Inflammability class in acc. with UL 94		V0
Housing material		PA 66-FR
Dimensions W/H/D		35 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note		Class A product, see page 605
Safety data as per ATEX		
Maximum output voltage Uo		6 V
Maximum output current Io		7.4 mA
Maximum output power Po		11 mW
Conformance/Approvals		
Conformance		CE-compliant
ATEX		II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC II 3 G Ex nA nC ic IIC T4 Gc X
IECEx		[Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex nA nC ic IIC T4 Gc X
SIL in accordance with IEC 61508		2
Performance level according to ISO 13849		PLd

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Temperature transducer with threshold value switch, with performance level, intrinsically safe input			
Screw connection	**MACX PL-EX-T-UIREL-UP**	2904910	1
Push-in connection	**MACX PL-EX-T-UIREL-UP-SP**	2904912	1

Accessories

Programming adapter for configuring modules with S-PORT interface	**IFS-USB-PROG-ADAPTER**	2811271	1

Accessories, operating and display unit

- Local display of actual values
- Copy function
- Easy guided operation
- Easy configuration without PC software
- Operating and display unit can be snapped directly onto compatible devices with a housing width of 35 mm
- DIN rail mounting possible for thinner devices in conjunction with cradle unit
- Backlighting
- Installation in Zone 2 permitted

Ex n

Can be snapped directly onto compatible 35 mm devices

Technical data

General data		
Ambient temperature range		-20 °C ... 65 °C (-4 °F...149 °F)
Humidity		90 % (at 25 °C, non-condensing)
Housing material		PA 6.6
Dimensions W/H/D		35 / 99 / 20 mm
Connection method	PC side	S-PORT (socket)
	Measuring transducer side	S-PORT (connector)
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant
ATEX		Ⓔx II 3G Ex nA ic IIC T4 Gc X
IECEx		Ex nA ic IIC T4 Gc

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Operating and display unit	**IFS-OP-UNIT**	**2811899**	1

Accessories, cradle unit

- For snapping onto the DIN rail
- For control cabinet mounting of the operating and display unit

Ex n

Cradle for operating and display unit

Technical data

General data		
Ambient temperature range		-20 °C ... 65 °C (-4 °F...149 °F)
Humidity		90 % (at 25 °C, non-condensing)
Housing material		PA 6.6
Dimensions W/H/D		35.2 / 29 / 99 mm
Connection method	IFS-OP-UNIT operator interface	S-PORT (socket)
	Measuring transducer side	S-PORT (connector)
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant
ATEX		Ⓔx II 3G Ex nA ic IIC T4 Gc X
IECEx		Ex nA ic IIC T4 Gc

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Cradle unit, for snapping the operating and display unit onto the DIN rail	**IFS-OP-CRADLE**	**2811886**	1

Accessories

Programming adapter

The IFS-USB-PROG-ADAPTER programming adapter is used for configuring Phoenix Contact Interface modules with S-PORT interface.

The adapter is used with FDT/DTM software or ANALOG-CONF software. For programming the MACX Analog, MINI Analog Pro, and MINI Analog.

Description	Ordering data		
	Type	Order No.	Pcs./ Pkt.
Programming adapter for configuring modules with S-PORT interface	IFS-USB-PROG-ADAPTER	2811271	1

Accessories

Shield fast connection

– For connecting cable shielding to cable terminal points
– Can be connected to PLUGTRAB PT
– Easy assembly

Description	Ordering data		
	Type	Order No.	Pcs./ Pkt.
Shield fast connection, for connection to PLUGTRAB PT			
For Ø 3-6 mm	SSA 3-6	2839295	10
For Ø 5-10 mm	SSA 5-10	2839512	10

Accessories

ME 6,2 TBUS... DIN rail connector

DIN rail connector (5-pos.) for bridging the supply voltage of 12.5 mm wide MACX analog modules

– Reduced wiring effort
– System can be extended or module replaced even while process is active
– Inter-extendable

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
DIN rail connector (TBUS), for bridging the supply voltage, can be snapped onto 35 mm DIN rails according to EN 60715, with UL approval Color: green	**ME 6,2 TBUS-2 1,5/5-ST-3,81 GN**	**2869728**	10

Accessories

Dummy - MACX MCR-EX-DUMMY-ISOLATOR

Dummy module with no function for connecting unused intrinsically safe signal cables, with plug-in connection terminal blocks.

Ordering data

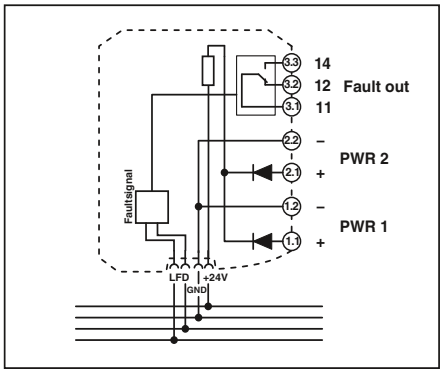
Description	Type	Order No.	Pcs./ Pkt.
Dummy module with no function			
with screw connection	**MACX MCR-EX-DUMMY-ISOLATOR**	**2904970**	1
with Push-in connection	**MACX MCR-EX-DUMMY-ISOLATOR-SP**	**2905846**	1

Accessories

Power and fault signaling module

Power and fault signaling module for feeding the 24 V supply voltage to the DIN rail connectors and signaling line faults and power supply failures.

– One-time or redundant supply, decoupled from diode, protected against polarization
– Supply current up to 3.75 A
– Relay output (PDT) and flashing LED for error messages
– Error message in the event of a power supply failure or fuse fault
– Bus cable fault message for MACX MCR-...(2)NAM... devices connected via DIN rail connectors
– Replaceable fuse
– Installation in Zone 2 permitted



Ex n

DNV GL

Ex:

Housing width 17.5 mm

Technical data

Input data	
Input signal	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Output data	
Maximum output signal	3.75 A
Output voltage	Input voltage - max 0.8 V at 3.75 A
Switching output	Relay
Contact type	1 PDT
Contact material	Gold (Au)
Max. switching voltage	50 V AC (50 V DC (0.3 A) / 50 V DC (2 A) / 33 V AC (2 A))
General data	
Ambient temperature range	-20 °C ... 60 °C (Any mounting position)
Humidity	5 % ... 95 % (non-condensing)
Fuse	5 A (replaceable), slow-blow 250 V AC
Status indication	1 x red LED (error) 2 x green LEDs (PWR1 and PWR2)
Inflammability class in acc. with UL 94	V0
Housing material	Polyamide (PA 6.6)
Dimensions W/H/D	17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X
IECEx	Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Power and fault signaling module, including the relevant DIN rail connector ME 17,5 TBUS 1,5/5-ST-3,81 GN			
Screw connection	**MACX MCR-PTB**	2865625	1
Push-in connection	**MACX MCR-PTB-SP**	2924184	1

Accessories

Power and fault signaling module

Power and fault signaling module for supplying the 24 V supply voltage to the DIN rail connectors of the MACX Analog Ex Termination Carriers and signaling line faults and power supply failures.

- One-time or redundant supply, decoupled from diode, protected against polarization
- Feed-in current up to 2 A protected by Termination Carrier PCB
- Relay output (PDT) and flashing LED for error messages
- Error message in the event of a power supply failure or fuse fault
- Bus cable fault message for MACX MCR-...(2)NAM... devices connected via DIN rail connectors
- Installation in Zone 2 possible

Ex:
Housing width 17.5 mm

Technical data

Input data	
Input signal	19.2 V DC ... 30 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Output data	
Maximum output signal	2 A (Redundancy range)
Output voltage	Input voltage - 0.7 V
Switching output	Relay
Contact type	1 PDT
Contact material	Gold (Au)
Max. switching voltage	50 V AC/DC (33 V AC (2 A) / 50 V DC (0.3 A) / 30 V DC (2 A))
General data	
Ambient temperature range	-20 °C ... 60 °C (only on Termination Carrier)
Humidity	5 % ... 95 % (non-condensing)
Status indication	1 x red LED (error) 2 x green LEDs (PWR1 and PWR2)
Inflammability class in acc. with UL 94	V0
Housing material	Polyamide (PA 6.6)
Dimensions W/H/D	17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Push-in connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X
IECEx	Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T5 Class I, Zone 2, Group IIC

Ordering data

Description		Type	Order No.	Pcs./ Pkt.
Power and fault signaling module without integrated fuse	Screw connection	**TC-MACX-MCR-PTB**	2904673	1

Accessories

Resistance circuit

Double-level terminal block with resistance circuit according to NAMUR for line fault detection in the case of mechanical contacts

Important:

– For intrinsically safe circuits, only in combination with D-UKK 3/5 cover

Description	Color	Ordering data: Type	Order No.	Pcs./ Pkt.
Double-level terminal block, with pre-assembled resistors				
with screw connection	gray	**UKK 5-2R/NAMUR**	2941662	50
Cover, width 2.5 mm				
	gray	**D-UKK 3/5**	2770024	50
	blue	**D-UKK 3/5 BU**	2770105	50

Accessories

Test plug

Description	Color	Ordering data: Type	Order No.	Pcs./ Pkt.
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and	silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part	red	**MPS-IH RD**	0201676	10
	black	**MPS-IH BK**	0201731	10
	gray	**MPS-IH GY**	0201728	10
	green	**MPS-IH GN**	0201702	10
	yellow	**MPS-IH YE**	0201692	10
	blue	**MPS-IH BU**	0201689	10
	white	**MPS-IH WH**	0201663	10

Accessories

Marking material for device marking

– For device marking inside the control cabinet and in the field
– Self-adhesive with high adhesive strength
– Large temperature range

Description	Color	Ordering data		
		Type	Order No.	Pcs./ Pkt.
UniCard, with self-adhesive plastic labels				
10-part, lettering field size: 11 x 9 mm	white	**UC-EMLP (11X9)**	0819291	10
UniCard, with self-adhesive plastic labels, **marked according to customer specifications** For ordering details, see Catalog 3 or phoenixcontact.net/product.				
10-part, lettering field size: 11 x 9 mm	white	**UC-EMLP (11X9) CUS**	0824547	1

The Field Analog process indicators allow you to monitor and display analog and temperature signals as well as control them via digital and analog inputs and outputs.

Further advantages:

– 2-conductor sensors are powered by the integrated measuring transducer supply
– International use, thanks to UL and CSA approvals

Universal use

Field Analog process indicators are available for field and control panel installation. The universal inputs allow you to record current, voltage, RTDs, and TCs.

Everything at a glance

Current process values are easy to read on the five-digit backlit displays. The bar graph also provides you with a quick overview. You can recognize alarm statuses easily from a distance by their changing color.

Easy installation and startup

Thanks to the standardized housing dimensions and plug-in connection terminal blocks, the indicators are easy to install. The devices are easy to configure via the keypad on the front or via FDT/DTM software.

Intrinsic safety Zone 0, Zone 20

Also for intrinsically safe circuits in the Ex area: versions with ATEX, CSA, and FM approval.

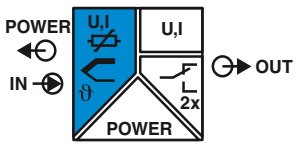
Distributed control cabinet installation

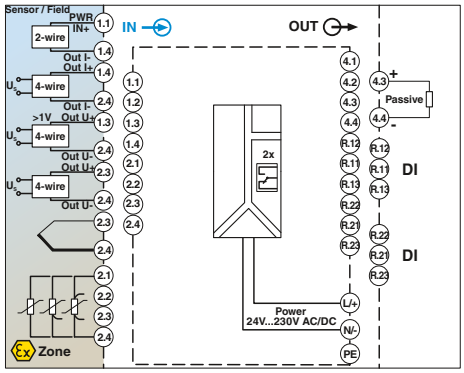
MCR temperature transducers for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors are also available for control cabinet installation.

Head-mounted transducer

With head-mounted transducers you can record temperatures directly in the field and convert them into standard signals.

Multifunctional process indicator





Multifunctional process indicator for installation in the control cabinet

DNV GL
Housing width 96 mm

For installation in the control cabinet

- Multifunctional process indicator, in control panel component housing for monitoring and displaying analog measurement data
- Supply of 2-conductor sensors
- Safe 4-way isolation
- Configurable via software or hardware keypad on the front
- Universal inputs for connection of current, voltage, RTDs, and TCs
- Limit value monitoring with two relay outputs
- Process signal transmission via analog output
- Display changes color in the event of an error

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Technical data

Input data	U input	I input
Input signal	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 0 V ... 1 V 1 V ... 5 V -1 V ... 1 V -10 V ... 10 V -30 V ... 30 V -100 mV ... 100 mV	0 mA ... 20 mA +10 % 4 mA ... 20 mA +10 %
Input data	RTD	TC
Sensor types that can be used	Pt, Ni, Cu sensors	J, K, T, N, B, S, R, U. L, C, D
Connection method	2, 3, 4-wire	-
Measuring rate	200 ms	200 ms
Temperature measuring range	-200 °C ... 1100 °C (Range depends on sensor type, adjustable)	-200 °C ... 2495 °C (Range depends on sensor type, adjustable)
Input resistance	-	10 Ω
Output data	U output	I output
Output signal	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 1 V ... 5 V	0 mA ... 20 mA 4 mA ... 20 mA
Display	7-segment LC display, with backlight, dot matrix for text/bar graph	
Number of the displayed positions	5	
Switching output	Transistor output, active Open collector output	
Number of outputs	1	
Switching output	Relay output	
Contact type	2 PDT	
Max. switching voltage	30 V DC (3 A) / 230 V AC (3 A)	
Maximum switching current	3 A	
Minimum switching current	10 mA	
General data		
Supply voltage range	24 V DC ... 230 V DC	
Degree of protection	IP65 from the front	
Ambient temperature (operation)	-20 °C ... 60 °C	
Housing material	PC-GF10	
Dimensions W/H/D	96 / 48 / 151.8 mm	
Control panel cutout	92 x 45 mm	
Screw connection solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16	
Conformance/Approvals	FA MCR-D-TUI-UI-2REL-UP	FA MCR-EX-D-TUI-UI-2REL-UP
Conformance	CE-compliant	CE-compliant
ATEX	-	II (1) G [Ex ia Ga] IIC
UL, USA/Canada	UL 61010 Recognized	UL 61010 Recognized
FM approval	-	AIS, NI/I/2/ABCDEFG/T4
CSA	CSA GP	AIS, NI/I/2/ABCDEFG/T4
GL	GL EMC 1 C	EMC1 C

Ordering data

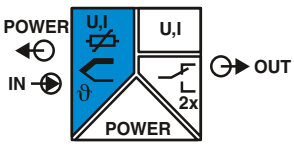
Description	Type	Order No.	Pcs./ Pkt.
Multifunctional process indicator, in control panel component housing for monitoring and displaying analog measurement data	**FA MCR-D-TUI-UI-2REL-UP**	2907064	1
	FA MCR-EX-D-TUI-UI-2REL-UP	2907216	1

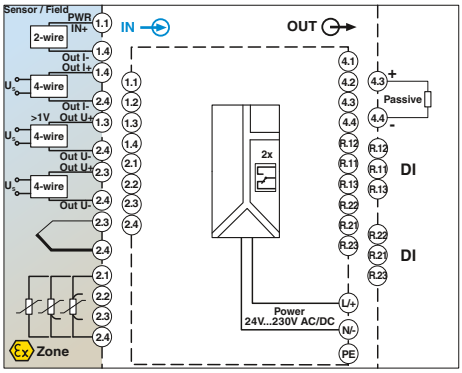
Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1

Multifunctional process indicator

new





Multifunctional process indicator in field housing

Housing width 199 mm

Field housing

- Multifunctional process indicator, in control panel component housing for monitoring and displaying analog measurement data
- Supply of 2-conductor sensors
- Safe 4-way isolation
- Configurable via software or hardware keypad on the front
- Universal inputs for connection of current, voltage, RTDs, and TCs
- Limit value monitoring with two relay outputs
- Process signal transmission via analog output
- Display changes color in the event of an error

Notes:

The configuration software can be downloaded from the Internet (phoenixcontact.net/products).

Technical data

Input data	U input	I input
Input signal	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 0 V ... 1 V 1 V ... 5 V -1 V ... 1 V -10 V ... 10 V -30 V ... 30 V -100 mV ... 100 mV	0 mA ... 20 mA +10 % 4 mA ... 20 mA +10 %
Input data	RTD	TC
Sensor types that can be used	Pt, Ni, Cu sensors	J, K, T, N, B, S, R, U. L, C, D
Connection method	2, 3, 4-wire	-
Measuring rate	200 ms	200 ms
Temperature measuring range	-200 °C ... 1100 °C (Range depends on sensor type, adjustable)	-200 °C ... 2495 °C (Range depends on sensor type, adjustable)
Input resistance	-	10 Ω
Output data	U output	I output
Output signal	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 1 V ... 5 V	0 mA ... 20 mA 4 mA ... 20 mA
Display	7-segment LC display, with backlight, dot matrix for text/bar graph	
Number of the displayed positions	5	
Switching output	Transistor output, active	
	Open collector output	
Number of outputs	1	
Switching output	Relay output	
Contact type	2 PDT	
Max. switching voltage	30 V DC (3 A) / 230 V AC (3 A)	
Maximum switching current	3 A	
Minimum switching current	10 mA	
General data		
Supply voltage range	24 V DC ... 230 V DC	
Degree of protection	IP67	
Ambient temperature (operation)	-40 °C ... 50 °C (The readability of the display is no longer guaranteed at temperatures below -30 °C (-22 °F).)	
Housing material	PBT GF30	
Dimensions W/H/D	199 / 160 / 96 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance/Approvals	FA MCR-FD-TUI-UI-2REL-UP	FA MCR-EX-FD-TUI-UI-2REL-UP
Conformance	CE-compliant	CE-compliant
ATEX	-	Ⓔx II (1) G [Ex ia Ga] IIC
UL, USA/Canada	UL 61010 Recognized	UL 61010 Recognized
FM approval	-	AIS / I / 1 / ABCDEFG
CSA	CSA GP	Associated Apparatus

Ordering data

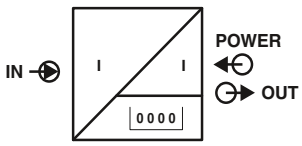
Description	Type	Order No.	Pcs./ Pkt.
Multifunctional process indicator, in field housing for monitoring and displaying analog measurement data			
	FA MCR-FD-TUI-UI-2REL-UP	2907780	1
	FA MCR-EX-FD-TUI-UI-2REL-UP	2907781	1

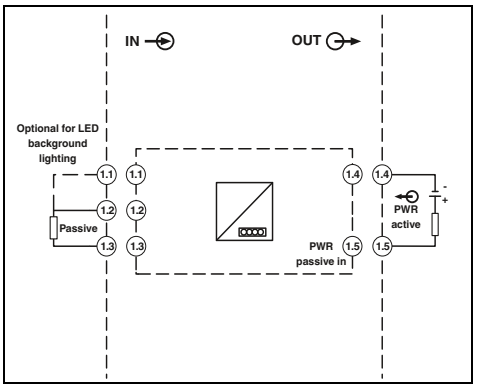
Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1
Pipe or wall mounting set, for use with multi-functional process indicator in field housing	**FA MCR-FD-PM**	2908739	1

Loop-powered process indicator

new





Loop-powered process indicator with HART communication for installation in the control cabinet

Housing width 96 mm

For installation in the control cabinet

- Loop-powered
- Display of 4 to 20 mA or HART signals
- Low voltage drop
- 5-digit 7-segment display
- Display value can be scaled
- Low installation depth
- Configurable via front keypad
- SIL-impact-free according to EN61508

Technical data

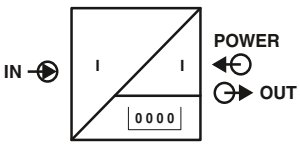
Input data		
Input signal	I	HART
Maximum input signal	4 mA ... 20 mA	up to 4x HART signals
Voltage drop	200 mA	-
	≤ 1 V	≤ 1.9 V
	≤ 3.9 V (with display lighting)	≤ 4.8 V (with display lighting)
Input impedance	approx. 50 Ω	R_x = 40 Ω / C_x = 2.3 nF
Output data		
Display	7-segment LC display, with backlight, dot matrix for text/bar graph	
Number of the displayed positions	5	
General data		
Supply voltage range	loop-powered, no external supply necessary	
Resolution A/D	> 13 bit	
Degree of protection	IP65 (Front) IP20 (On the rear)	
Ambient temperature (operation)	-40 °C ... 60 °C	
Housing material	Aluminum / polycarbonate	
Dimensions W/H/D	96 / 48 / 41.5 mm	
Control panel cutout	92 x 45 mm	
Screw connection solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16	
Conformance/Approvals		
Conformance	CE-compliant	

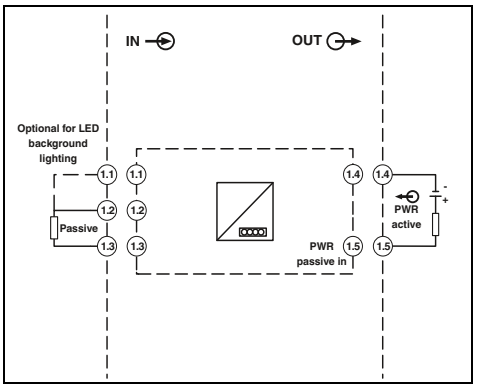
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Output loop-powered process indicator inside the control panel housing for representing current or HART signals	**FA MCR-DS-I-I-OLP**	2908781	1

Loop-powered process indicator

new





Loop-powered process indicator with HART communication in field housing

Housing width 131 mm

Field housing

– Loop-powered
– Display of 4 to 20 mA or HART signals
– Low voltage drop
– 5-digit 7-segment display
– Display value can be scaled
– Low installation depth
– Configurable via front keypad
– SIL-impact-free according to EN61508

Technical data

Input data	I	HART
Input signal	4 mA ... 20 mA	up to 4x HART signals
Maximum input signal	200 mA	-
Voltage drop	≤ 1 V	≤ 1.9 V
	≤ 3.9 V (with display lighting)	≤ 4.8 V (with display lighting)
Input impedance	approx. 50 Ω	R_x = 40 Ω / C_x = 2.3 nF
Output data		
Display	7-segment LC display, with backlight, dot matrix for text/bar graph	
Number of the displayed positions	5	
General data		
Supply voltage range	loop-powered, no external supply necessary	
Resolution A/D	> 13 bit	
Degree of protection	IP66/IP67 NEMA 4X	
Ambient temperature (operation)	-40 °C ... 60 °C	
Housing material	Aluminum	
Dimensions W/H/D	131 / 81.5 / 55.5 mm	
Screw connection solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16	
Conformance/Approvals		
Conformance	CE-compliant	

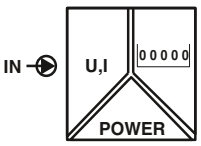
Ordering data

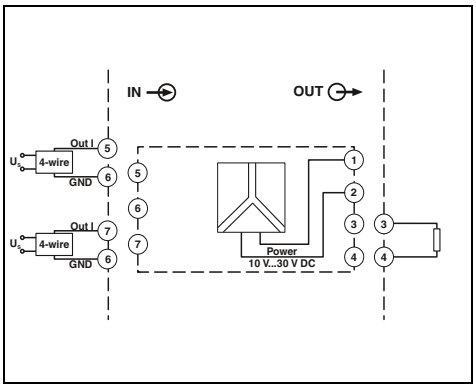
Description	Type	Order No.	Pcs./ Pkt.
Output loop-powered process indicator inside field housing for representing current or HART signals	**FA MCR-FDS-I-I-OLP**	2908782	1

Accessories

Pipe or wall mounting set, for use with output loop-powered process indicator in field housing	**FA MCR-FDS-PM**	2908783	1

Displays
Standard signals





for standard analog signals, configurable

- For 0 to 10 V and 0(4) to 20 mA standard analog signals
- Configurable
- 5 positions displayed
- 8 mm LED, 7-segment
- Electrical isolation
- Minimum/maximum value storage
- Latch/hold function for storing the display value
- Display 48 x 24 mm

Housing width 48 mm

Technical data

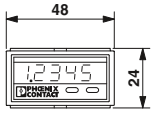
Input data			
Input signal		U input	I input
Maximum input signal		0 ... 10 V	0 ... 20 mA / 4 ... 20 mA
Input resistance		30 V DC	50 mA
		> 1 MΩ	approx. 100 Ω with 5 mA / approx. 70 Ω with 20 mA
Resolution		1 mV	2 µA
Measuring rate		0.5 to 2 measurements/second	
Input latch signal		Display stop	
Switching level	1 signal ("H")	4 V DC ... 30 V DC	
	0 signal ("L")	0 V DC ... 2 V DC	
Output data			
Display		7-segment LED; 8 mm; red	
Number of the displayed positions		5	
Accuracy		< 0.1 % ±1 digit (At an ambient temperature of 20°C)	
General data			
Supply voltage range		10 V DC ... 30 V DC	
Current consumption		50 mA	
Mass storage		EEPROM 1 mil. memory cycles or 10 years	
Resolution A/D		14 bit	
System hum suppression		Digital filtering 50/60 Hz	
Test voltage input/power supply		500 V_{rms} (50/60 Hz, 1 min.)	
Degree of protection		IP65 from the front	
Ambient temperature (operation)		-10 °C ... 50 °C	
Housing material		Macrolon 2405	
Dimensions W/H/D		48 / 24 / 68 mm	
Control panel cutout		22(+0.6)x45(+0.8) mm	
Screw connection solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
Conformance/Approvals			
Conformance		CE-compliant	
UL, USA/Canada		UL 508 Recognized	

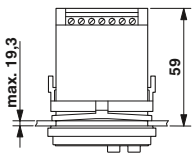
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR process display, for measuring and displaying standard signals	**MCR-SL-D-U-I**	2864011	1

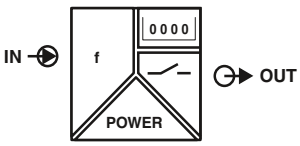
Accessories

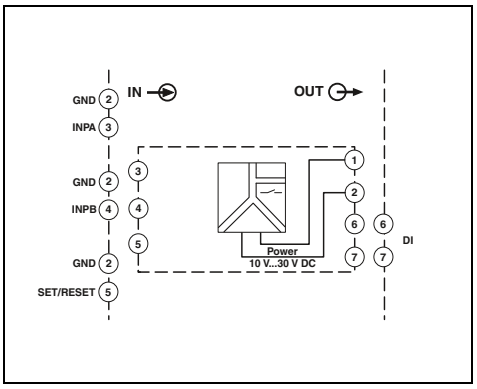
MCR DIN rail adapter for digital displays in a 24 x 48 mm housing	**MCR-SL-D-RA**	2810081	1





Displays
Frequency





Programmable digital display for frequencies, pulses, and times

– For frequency signals up to max. 60 kHz
– Configurable
– 6 positions displayed
– LED 8 mm, 7 segment
– 48 x 24 mm display

Housing width 48 mm

Technical data

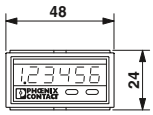
Input data		
Maximum input signal		60 kHz
Input resistance		10 kΩ
Switching level	1 signal ("H")	4 V DC ... 30 V DC
	0 signal ("L")	0 V DC ... 2 V DC
Output data		
Display		7-segment LED; 8 mm; red
Number of the displayed positions		6
Switching output		1 NPN optocoupler
Max. switching voltage		30 V DC
Maximum switching current		10 mA
General data		
Supply voltage range		10 V DC ... 30 V DC
Current consumption		max. 40 mA
Mass storage		EEPROM 1 mil. memory cycles or 10 years
Degree of protection		IP65 from the front
Ambient temperature (operation)		-20 °C ... 65 °C
Housing material		Macrolon 2405
Dimensions W/H/D		48 / 24 / 68 mm
Control panel cutout		22(+0.6)x45(+0.8) mm
Screw connection solid/stranded/AWG		0.14 ... 1 mm² / 0.14 ... 1.5 mm² / 26 - 16
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		UL 508 Recognized

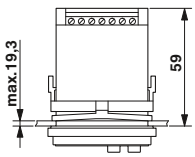
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR digital display, for measurement and display of frequencies, pulses, and times	**MCR-SL-D-FIT**	2864024	1

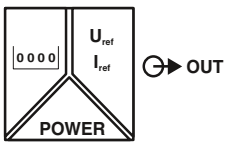
Accessories

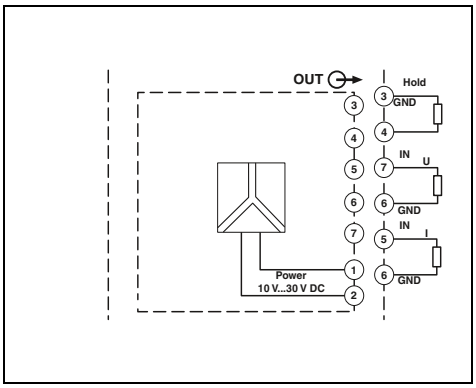
MCR DIN rail adapter for digital displays in a 24 x 48 mm housing	**MCR-SL-D-RA**	2810081	1





Displays
Setpoint adjuster





With manual and automatic ramp function

- Manual setpoint definition with incremental adjustment
- Manual setpoint definition via direct input
- Automatic setpoint definition with hold function and 20 interpolation points
- Flexible, adjustable signal ranges of 0 to 12 V or 0 to 24 mA
- Data backup in the event of power failure
- Display value parameterization
- Electrical isolation between output and supply

Housing width 48 mm

Technical data

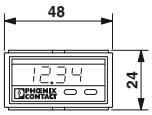
Input data		
Display		7-segment, 8 mm, red
Number of the displayed positions		4
Switching level	1 signal ("H")	4 V DC ... 30 V DC
	0 signal ("L")	0 V DC ... 2 V DC
Output data	U output	I output
Output signal	0 ... 12 V	0 ... 24 mA
Length of step	10 mV	10 µA
Load R_B	≥ 2 kΩ	≤ 500 Ω (Up to 20 mA) ≤ 400 Ω (> 20 mA)
Ripple	≤ 10 mV_{PP}	
General data		
Supply voltage range	10 V DC ... 30 V DC	
Power consumption	1 W (With 24 mA/12 V)	
Maximum transmission error	< 0.2 % ((full-scale) at rated voltage)	
Test voltage output/power supply	500 V AC (50 Hz, 1 min.)	
Degree of protection	IP65 from the front	
Ambient temperature (operation)	-20 °C ... 65 °C	
Housing material	Macrolon 2405	
Dimensions W/H/D	48 / 24 / 68 mm	
Control panel cutout	45(+0.6)x22.2(+0.3) mm	
Screw connection solid/stranded/AWG	0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
Conformance/Approvals		
Conformance	CE-compliant	
UL, USA/Canada	UL 508 Recognized	

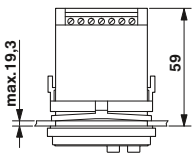
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR digital setpoint adjuster, for presetting current and voltage signals	**MCR-SL-D-SPA-UI**	2710314	1

Accessories

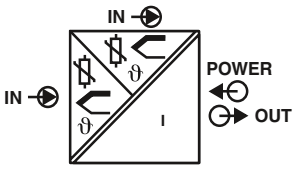
MCR DIN rail adapter for digital displays in a 24 x 48 mm housing	**MCR-SL-D-RA**	2810081	1

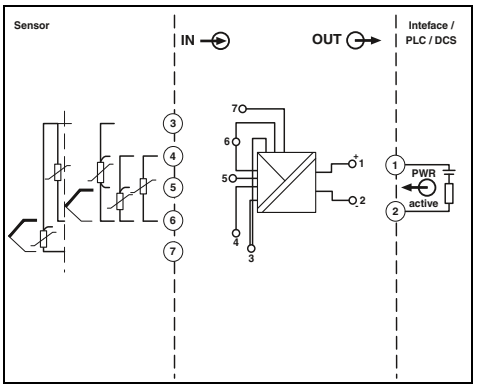




new

Temperature
Head-mounted temperature transducer





Block diagram for FA MCR-HT-TS-I-OLP-PT

SIL IEC 61508

Loop-powered head-mounted temperature transducer

- Output loop-powered head-mounted temperature transducer
- 2 universal inputs for RTD, TC, resistance-type sensors, and voltage sensors (mV)
- 4 to 20 mA output
- HART communication
- Freely configurable
- SIL 2/3
- For mounting in the connecting head, form B

Technical data

Input data		
Resistance thermometers		Pt, Ni, Cu sensors: 2, 3, 4-wire : -
Thermocouple sensors		A, B, C, D, E, J, K, L, N, R, S, T, U
Resistor		10 Ω ... 2000 Ω (Minimum measuring span: 10 Ω)
Input voltage range		-20 mV ... 100 mV
Output data		
Output signal		4 ... 20 mA , HART / 20 ... 4 mA
Maximum output signal		22.5 mA
Load R_B		(U_L - 11 V) / 0.023 A
Switch-on delay		approx. 10 s (HART) approx. 28 s (Measured value)
General data		
Supply voltage range		-12 V DC ... 42 V DC
Current consumption		23.5 mA
Step response (0–99%)		0.8 s (TC)
Electrical isolation		
	Input/output	2 kV AC
Degree of protection		IP33 (upon installation in field housing IP66/67, NEMA 4X)
Ambient temperature (operation)		-40 °C ... 85 °C
Screw connection solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Conformance/Approvals		
Conformance		CE-compliant
ATEX		Ⓔx II 3G Ex nA IIC T6 Gc

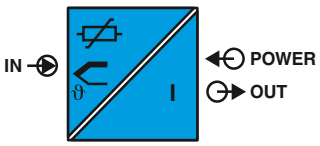
Ordering data

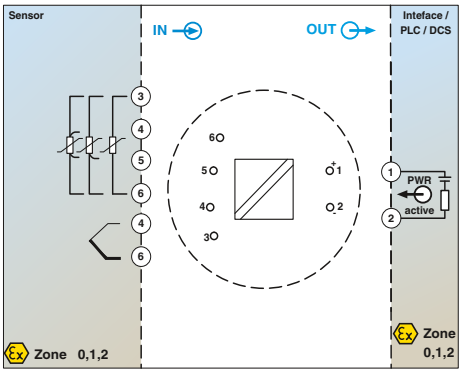
Description	Type	Order No.	Pcs./ Pkt.
Output loop-powered head-mounted temperature transducer, for RTD, TC, resistance-type sensors, and voltage sensors (mV)	**FA MCR-HT-TS-I-OLP-PT**	2908742	1

Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1
	FA MCR-HT-D	2908735	1

Temperature
Head-mounted temperature transducer





Loop-powered, programmable

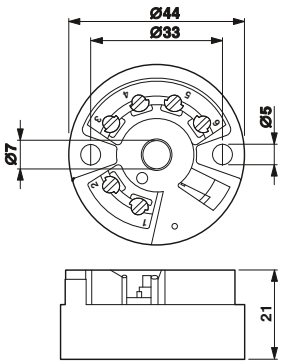
Ex:

- 1-channel
- Loop-powered
- Input for resistance thermometers, thermocouples, and linear mV signals, Ex ia IIC
- 4 to 20 mA / 20 to 4 mA output
- Can be installed in Zone 0
- 2-way electrical isolation
- HART-compatible

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

To configure the MCR-FL-TS-LPI-EX HART-capable device, you need a HART modem.



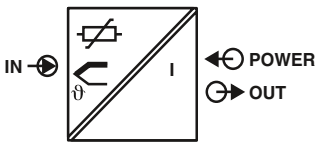
Technical data

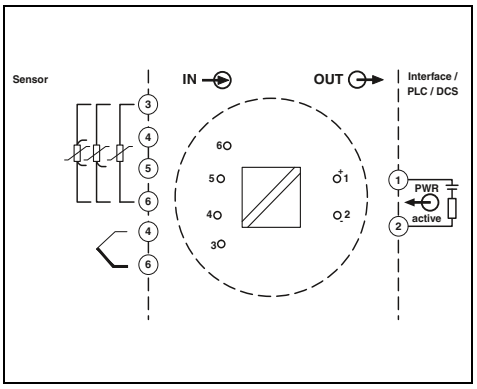
Measuring input		
Resistance thermometers		Pt, Ni (100, 500, 1000); min. measurement range 10 K
Thermocouple sensors		B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K
Resistor		10 Ω ... 400 Ω (min. measurement range 10 Ω) 10 Ω ... 2000 Ω (min. measurement range 100 Ω)
Voltage		-10 mV ... 75 mV (min. measurement range 5 mV)
Configuration		Yes, programmable
Measuring output		
Output signal range		4 mA ... 20 mA / 20 mA ... 4 mA
Maximum output signal		≤ 23 mA
Load		≤ 630 Ω (At UV = 24 V; U_{supply} - 10 V / 0.023 A)
Line monitoring		NE 43
Short-circuit current		≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)
Output current with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Output current, measuring range overrange/underrange		3.8 mA ... 20.5 mA (linear increase/decrease)
General data		
Supply voltage range		12 V DC ... 30 V DC
Current consumption		< 3.5 mA
Step response (10-90%)		< 2 s
Transmission error	Resistance thermometers	0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)
	Thermocouple sensors	typ. 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)
	Resistance-type sensors	± 0.1 Ω (10...400 Ω), ± 1.5 Ω (10...2000 Ω)
	Voltage sensor	± 20 µV (-10...75 mV)
Test voltage input/output		2 kV AC (50 Hz, 1 min.)
Switch-on delay		6 s
Degree of protection		IP00, IP66 (integrated in the connecting head)
Mounting position		Connecting head in acc. with DIN 43729 form B
Connection		Installation in connection head according to DIN 43729 form B
Standards/regulations		NAMUR recommendation NE 21
Housing material		Polycarbonate, PC
Inflammability class in acc. with UL 94		V0
Screw connection solid/stranded/AWG		0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15
Safety data as per ATEX		
Maximum voltage Ui		30 V
Maximum current Ii		100 mA
Maximum power Pi		750 mW
Maximum voltage Uo		5 V DC
Maximum current Io		5.4 mA
Maximum power Po		6.6 mW
Gas group		IIA IIB IIC
- Maximum external inductance Lo	[mH]	100 100 100
- Maximum external capacitance Co	[µF]	9.9 9.9 2
Maximum ambient temperature		Category 1: T4 = 60°C, T5 = 50°C, T6 = 40°C Category 2: T4 = 85°C, T5 = 70°C, T6 = 55°C
Conformance/Approvals		
Conformance		CE-compliant
ATEX		II 1 G and II 2 G Ex ia IIC T6/T5/T4
UL, USA/Canada		cULus
Functional Safety (SIL)		SIL 2

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, smart, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors	**MCR-FL-HT-TS-I-EX**	2864545	1

Temperature
Head-mounted temperature transducer





Loop-powered, programmable

Ex:

- Output loop-powered head-mounted temperature transducer
- Freely configurable
- Software available free of charge on the Internet
- For mounting in the connecting head, form B

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Technical data

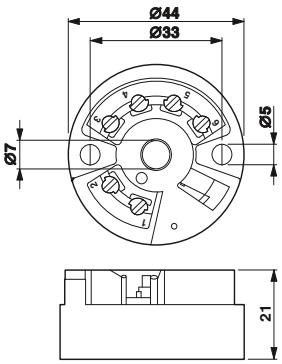
Input data		
Resistance thermometers		Pt, Ni (100, 500, 1000); minimum measurement range 10 K : 2, 3, 4-wire
Thermocouple sensors		B, C, D, E, J, K, L, N, R, S, T, U; minimum measurement range 50 K/500 K
Resistor		Resistance-type sensor from 10 Ω to 400 Ω and from 10 Ω to 2000 Ω; minimum measurement range 10 Ω/100 Ω
Voltage		-10 mV ... 75 mV (min. measurement range 5 mV)
Output data		
Output signal		4 ... 20 mA / 20 ... 4 mA
Load R_B		Max (V_{supply} - 8 V) / 0.025 A (current output)
Output signal with short-circuit		≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)
Output signal with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Measuring range overrange/underrange		≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)
General data		
Supply voltage range		8 V DC ... 35 V DC
Current consumption		< 3.5 mA
Transmission error	Resistance thermometers	0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)
	Thermocouple sensors	typ. 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)
	Resistance-type sensors	± 0.1 Ω (10...400 Ω), ± 1.5 Ω (10...2000 Ω)
	Voltage sensor	± 20 µV (-10...100 mV)
Step response (10-90%)		< 2 s
Switch-on delay		6 s
Test voltage input/output		2 kV (50 Hz, 1 min.)
Degree of protection		IP00, IP66 (integrated in the connecting head)
Ambient temperature (operation)		-40 °C ... 85 °C
Mounting		any
Housing material		Polycarbonate, PC
Screw connection solid/stranded/AWG		0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D

Ordering data

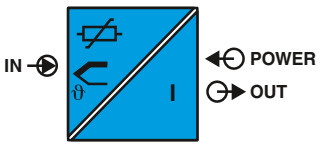
Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors	**MCR-FL-HT-T-I**	2864529	1

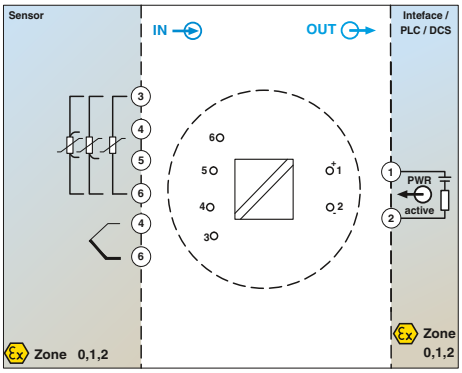
Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1



Temperature
Head-mounted temperature transducer





Loop-powered, programmable

- 1-channel
- Loop-powered
- Input for resistance thermometers, thermocouples, and linear mV signals, Ex ia IIC
- 4 to 20 mA / 20 to 4 mA output
- Can be installed in Zone 0
- 2-way electrical isolation
- Configuration using software

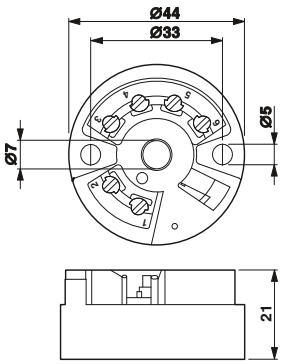
Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Technical data

Measuring input		
Resistance thermometers		Pt, Ni (100, 500, 1000); min. measurement range 10 K
Thermocouple sensors		B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K
Resistor		10 Ω ... 400 Ω (min. measurement range 10 Ω) 10 Ω ... 2000 Ω (min. measurement range 100 Ω)
Voltage		-10 mV ... 100 mV (min. measurement range 5 mV)
Configuration		Yes, programmable
Measuring output		
Output signal range		4 mA ... 20 mA / 20 mA ... 4 mA
Maximum output signal		≤ 25 mA
Load		≤ 720 Ω (For U_V = 24 V; U_{supply} - 8 V / 0.025 A)
Line monitoring		NE 43
Short-circuit current		≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)
Output current with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Output current, measuring range overrange/underrange		3.8 mA ... 20.5 mA (linear increase/decrease)
General data		
Supply voltage range		8 V DC ... 30 V DC
Current consumption		< 3.5 mA
Step response (10-90%)		< 2 s
Transmission error	Resistance thermometers	0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)
	Thermocouple sensors	typ. 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)
	Resistance-type sensors	± 0.1 Ω (10...400 Ω), ± 1.5 Ω (10...2000 Ω)
	Voltage sensor	± 20 µV (-10...100 mV)
Test voltage input/output		2 kV AC (50 Hz, 1 min.)
Switch-on delay		6 s
Degree of protection		IP00, IP66 (integrated in the connecting head)
Mounting position		Connecting head in acc. with DIN 43729 form B
Connection		Installation in connection head according to DIN 43729 form B
Standards/regulations		NAMUR recommendation NE 21
Housing material		Polycarbonate, PC
Inflammability class in acc. with UL 94		V0
Screw connection solid/stranded/AWG		0.2 ... 1.75 mm² / 0.2 ... 1.75 mm² / 24 - 15
Safety data as per ATEX		
Maximum voltage Ui		30 V
Maximum current Ii		100 mA
Maximum power Pi		750 mW
Maximum voltage Uo		8.2 V DC
Maximum current Io		4.6 mA
Maximum power Po		9.35 mW
Gas group		IIB IIC
- Maximum external inductance Lo	[mH]	8.5 4.5
- Maximum external capacitance Co	[µF]	1.9 0.974
Maximum ambient temperature		Category 1: T4 = 60°C, T5 = 50°C, T6 = 40°C Category 2: T4 = 85°C, T5 = 70°C, T6 = 55°C
Conformance/Approvals		
Conformance		CE-compliant
ATEX		Ⓔx II 1 G Ex ia IIC T6/T5/T4
UL, USA/Canada		cULus



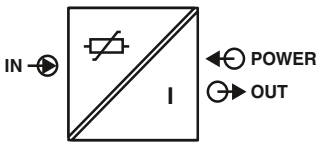
Ordering data

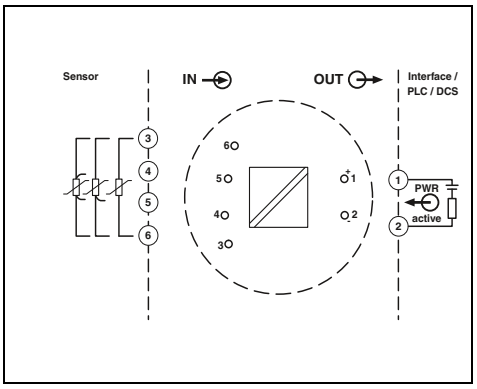
Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors	MCR-FL-HT-T-I-EX	2864532	1

Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	MCR-PAC-T-USB	2309000	1

Temperature
Head-mounted temperature transducer





Loop-powered, programmable

Ex:

- Output loop-powered head-mounted temperature transducer for Pt 100 sensors
- Freely configurable
- Software available free of charge on the Internet
- For mounting in the connecting head, form B

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Technical data

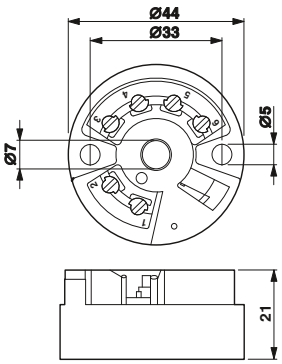
Input data		
Resistance thermometers		Pt 100 ; minimum measurement range 10 K : 2, 3, 4-wire
Output data		
Output signal		4 ... 20 mA / 20 ... 4 mA
Load R_B		Max (V_{supply} - 10 V) / 0.023 A (current output)
Output signal with short-circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Output signal with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Measuring range overrange/underrange		≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)
General data		
Supply voltage range		10 V DC ... 35 V DC
Current consumption		< 3.5 mA
Transmission error	Resistance thermometers	0.2 K
Step response (10-90%)		< 2 s
Switch-on delay		4 s
Degree of protection		IP00, IP54 (integrated in the connecting head)
Ambient temperature (operation)		-40 °C ... 85 °C
Mounting		any
Housing material		Polycarbonate, PC
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR head-mounted temperature transducer, loop-powered for Pt 100 resistance thermometer	**MCR-SL-HT-PT 100-I**	2864516	1

Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1



Accessories for head-mounted transducers

new

– 2 cable entries
– Aluminum with polyester coating
– For use with head-mounted transducers
– Display window in cover

Field housing for head-mounted transducers

Technical data

General data	
Housing material	Aluminum

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Field housing for head-mounted transducers, with display window and two cable entries	**FA MCR-HT-FH**	2908736	1

Accessories

Wall fastening for FA MCR-HT-FH field housing	**FA MCR-HT-FH-WM**	2908737	1
Pipe fastening for FA MCR-HT-FH field housing	**FA MCR-HT-FH-PM**	2908738	1

Accessories for head-mounted transducers

new

– For snapping onto the DIN rail
– For control cabinet installation of head-mounted transducers

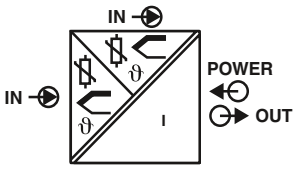
Adapter for DIN rail mounting of head-mounted transducers

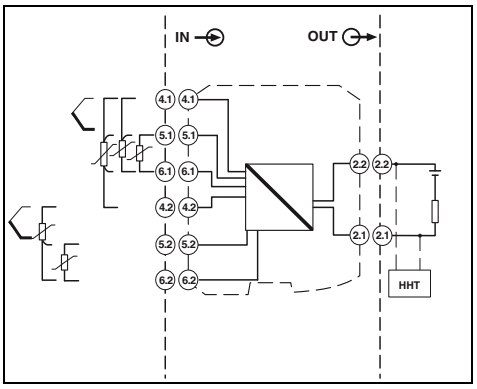
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Adapter for control cabinet installation of head-mounted transducers	**MCR-DIN-RAIL-ADAPTER HT**	**2864671**	1

Temperature
Temperature transducer

new





Output loop-powered temperature transducer

Housing width 12.5 mm

- Loop-powered temperature transducer
- 2 universal inputs for RTD, TC, resistance-type sensors, and voltage sensors (mV)
- 4 to 20 mA output
- HART communication
- Freely configurable
- SIL 2/3
- For DIN rail mounting

Technical data

Input data	
Input signal (can be configured using DIP switches)	Pt, Ni, Cu sensors: 2, 3, 4-wire : -
Input signal (can be configured using DIP switches)	A, B, C, D, E, J, K, L, N, R, S, T, U
Temperature range	-250 °C ... 2500 °C (Range depending on the sensor type)
Linear resistance measuring range	10 Ω ... 2000 Ω (Minimum measuring span: 10 Ω)
Input voltage range	-20 mV ... 100 mV
Output data	
Output signal	4 ... 20 mA / 20 ... 4 mA
Maximum output signal	22.5 mA
Load R_B	(U_L - 11 V) / 0.023 A
General data	
Supply voltage range	12 V DC ... 42 V DC
Current consumption	3.5 mA
Step response (0–99%)	0.8 s (TC)
Electrical isolation of input/output	2 kV AC
Ambient temperature (operation)	-40 °C ... 85 °C
Dimensions W/H/D	12.5 / 99 / 114.5 mm
Push-in connection solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance/Approvals	
Conformance	CE-compliant

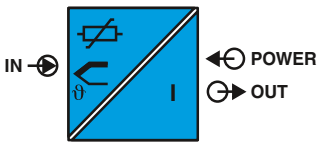
Ordering data

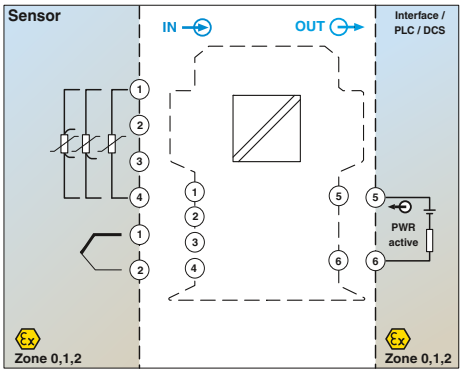
Description	Type	Order No.	Pcs./ Pkt.
Output loop-powered temperature transducer, for RTD, TC, resistance-type sensors, and voltage sensors (mV)			
Screw connection	**MACX MCR-TS-I-OLP**	**2908662**	1
Push-in connection	**MACX MCR-TS-I-OLP-SP**	**2908664**	1

Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	**2309000**	1

Temperature
Temperature transducer





Loop-powered, programmable

- 1-channel
- Loop-powered
- Input for resistance thermometers, thermocouples, and linear mV signals, Ex ia IIC
- 4 to 20 mA / 20 to 4 mA output
- Can be installed in Zone 1
- 2-way electrical isolation
- HART-capable (MCR-FL-TS-LP-I-EX)
- Configuration using software

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

To configure the MCR-FL-TS-LPI-EX HART-capable device (2864587), you need a HART modem.

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

EAC
Ex:
Housing width 12.5 mm

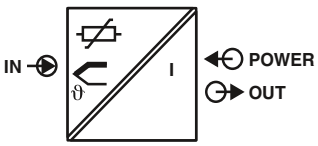
Technical data

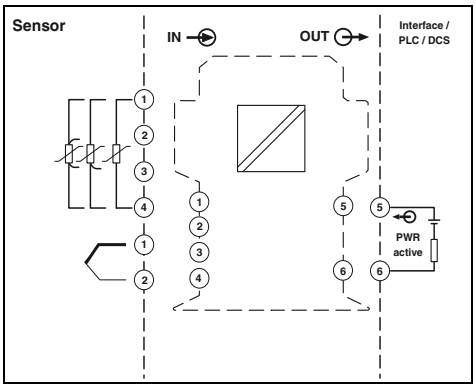
Measuring input				
Resistance thermometers				Pt, Ni (100, 500, 1000); min. measurement range 10 K
Thermocouple sensors				B, C, D, E, J, K, L, N, R, S, T, U; min. measurement range 50 K/500 K
Resistor				10 Ω ... 400 Ω (min. measurement range 10 Ω) 10 Ω ... 2000 Ω (min. measurement range 100 Ω)
Voltage				-10 mV ... 100 mV (min. measurement range 5 mV)
Configuration				Yes, programmable
Measuring output				
Output signal range				4 mA ... 20 mA / 20 mA ... 4 mA
Maximum output signal				≤ 23 mA
Load				≤ 520 Ω (At U_V = 24 V; U_{supply} - 12 V / 0.023 A)
Line monitoring				NE 43
Short-circuit current				≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)
Output current with open circuit				≤ 3.6 mA or ≥ 21 mA (adjustable)
Output current, measuring range overrange/underrange				3.8 mA ... 20.5 mA
General data				
Supply voltage range				12 V DC ... 30 V DC
Current consumption				< 3.5 mA
Step response (10-90%)				< 2 s
Transmission error	Resistance thermometers			0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)
	Thermocouple sensors			typ. 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)
	Resistance-type sensors			± 0.1 Ω (10...400 Ω), ± 1.5 Ω (10...2000 Ω)
	Voltage sensor			± 20 µV (-10...100 mV)
Test voltage input/output				2 kV AC (50 Hz, 1 min.)
Switch-on delay				4 s
Standards/regulations				NAMUR recommendation NE 21
Housing material				Polyamide PA non-reinforced
Inflammability class in acc. with UL 94				V0
Dimensions W/H/D				12.5 / 99 / 114.5 mm
Connection method				Screw connection
Screw connection solid/stranded/AWG				0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Safety data as per ATEX			MCR-FL-TS-LP-I-EX	MCR-FL-T-LP-I-EX
Maximum voltage Ui			30 V	30 V
Maximum current Ii			100 mA	100 mA
Maximum power Pi			750 mW	750 mW
Maximum voltage Uo			5 V DC	4.4 V DC
Maximum current Io			5.9 mA	9.6 mA
Maximum power Po			7.2 mW	10.6 mW
Gas group			IIA IIB IIC	IIA IIB IIC
- Maximum external inductance Lo		[mH]	100 100 100	100 100 100
- Maximum external capacitance Co		[µF]	10 10 2	12 12 2.4
Maximum ambient temperature			T4 = 85 °C, T5 = 70 °C, T6 = 55 °C	T4 = 85 °C, T5 = 65 °C, T6 = 50 °C
Conformance/Approvals				
Conformance			CE-compliant	CE-compliant
ATEX			Ⓔx II 2(1) G Ex ia IIC T6	Ⓔx II 2(1) G Ex ia IIC T4...T6
UL, USA/Canada			cULus	cULus
Functional Safety (SIL)			SIL 2	-

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors			
HART-compatible	**MCR-FL-TS-LP-I-EX**	2864587	1
	MCR-FL-T-LP-I-EX	2864574	1

Temperature
Temperature transducer





Loop-powered, programmable

- Output loop-powered temperature transducer
- Freely configurable
- Software available free of charge on the Internet

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

The configuration software can be downloaded from the Internet: phoenixcontact.net/products.

Ex:

Housing width 12.5 mm

Technical data

Input data		
Resistance thermometers		Pt, Ni (100, 500, 1000); minimum measurement range 10 K : 2, 3, 4-wire
Thermocouple sensors		B, C, D, E, J, K, L, N, R, S, T, U; minimum measurement range 50 K/500 K
Resistor		Resistance-type sensor from 10 Ω to 400 Ω and from 10 Ω to 2000 Ω; minimum measurement range 10 Ω/100 Ω
Voltage		-10 mV ... 100 mV (min. measurement range 5 mV)
Output data		
Output signal		4 ... 20 mA / 20 ... 4 mA
Load R_B		Max (V_{supply} -12 V) / 0.023 A (current output)
Output signal with short-circuit		≤ 3.6 mA or ≥ 21 mA (adjustable, not for thermocouples)
Output signal with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Measuring range overrange/underrange		≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)
General data		
Supply voltage range		12 V DC ... 35 V DC
Current consumption		< 3.5 mA
Transmission error	Resistance thermometers	0.2 K (Pt 100, Ni 100), 0.5 K (Pt 500, Ni 500), 0.3 K (Pt 1000, Ni 1000)
	Thermocouple sensors	typ. 0.5 K (K, J, T, E, L, U), 1.0 K (N, C, D), 2.0 K (S, B, R)
	Resistance-type sensors	± 0.1 Ω (10...400 Ω), ± 1.5 Ω (10...2000 Ω)
	Voltage sensor	± 20 µV (-10...100 mV)
Step response (10-90%)		< 2 s
Switch-on delay		4 s
Test voltage input/output		2 kV (50 Hz, 1 min.)
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 85 °C
Mounting		any
Housing material		Polyamide PA non-reinforced
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D

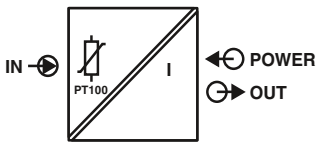
Ordering data

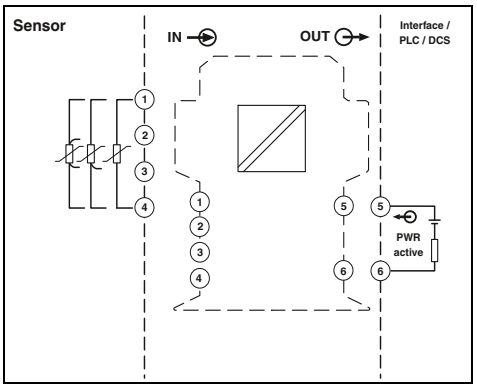
Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, loop-powered for resistance thermometers, thermocouples, resistance-type sensors, and voltage sensors	**MCR-FL-T-LP-I**	2864561	1
	MCR-FL-T-LP-I-EX	2864574	1

Accessories

Software adapter cable, 2.4 m long, with USB connection, for programming	**MCR-PAC-T-USB**	2309000	1

Temperature
Temperature transducer





Loop-powered, programmable

Ex:

Housing width 12.5 mm

- Two-wire transmitter for Pt 100 resistance thermometers
- Freely programmable via MCR/PI-CONF-WIN

Notes:

The devices are supplied with the standard configuration: Pt100 sensor, 0 to 100°C measuring range, 3-conductor connection.

You can implement your own measuring range settings, linearization, and characteristic curve adjustments. To do so, you need the MCR-PAC-T-USB programming adapter as well as the MCR/PI-CONF-WIN configuration software.

Technical data

Input data		
Resistance thermometers		Pt 100 ; minimum measurement range 10 K : 2, 3, 4-wire
Output data		
Output signal		4 ... 20 mA / 20 ... 4 mA
Load R_B		Max (V_{supply} -12 V) / 0.023 A (current output)
Output signal with short-circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Output signal with open circuit		≤ 3.6 mA or ≥ 21 mA (adjustable)
Measuring range overrange/underrange		≤ 20.5 mA / ≥ 3.8 mA (linear increase/decrease)
General data		
Supply voltage range		12 V DC ... 35 V DC
Current consumption		< 3.5 mA
Transmission error	Resistance thermometers	0.2 K
Step response (10-90%)		< 2 s
Switch-on delay		4 s
Test voltage input/output		2 kV (50 Hz, 1 min.)
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 85 °C
Mounting		any
Housing material		Polyamide PA non-reinforced
Dimensions W/H/D		12.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 24
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR temperature transducer, loop-powered for Pt 100 resistance thermometer	**MCR-SL-PT100-LP-I**	2864558	1

PHOENIX CONTACT
EMpro
1-2 690.3 V
U 2-3 689.6
3-1 688.9
F 50.00 Hz
[00002 17683 kWh
100 100 100
50 50 50
10 10 10
I1 I2 I3
I °C U F P PF MAX AVG H E
/ TEST
OK
PROG

Serial No. 9N1XNB0005

Monitoring

Energy and power measurement

EMpro energy meters measure, analyze, and communicate electrical system parameters.

Monitoring software ensures efficient energy and power measurement.

Stand-alone data loggers are the complete package for decentralized data acquisition.

PSK sensors acquire the operating pressure of gaseous media.

PSK meters record compressed air consumption.

Current measurement

PACT current transformers convert currents up to 4000 A into secondary currents of 1 and 5 A.

MCR current transducers convert currents into standard analog signals.

Monitoring and diagnostics

The SOLARCHECK modular monitoring system is used for string monitoring in photovoltaic systems.

EV Charge Control is the charging controller used to charge electric vehicles on the AC mains according to IEC 61851-1.

EMD monitoring relays detect and indicate deviations in important system parameters at an early stage.

ETD time relays are used for straightforward time control functions.

Diode modules, lamp testing modules, and EMG display modules allow industrial use of simple components such as diodes - with professional housing and connection technology.

Product range overview

Product overview	**200**
Energy and power measurement	**202**
EMpro energy meters	**208**
EMpro function and communication modules	**210**
Accessories	**213**
Software for usage data acquisition	**214**
Complete packages for data logging	**215**
Pressure sensor and compressed air meters	**216**
Current measurement	
Current transformers	**220**
Current transformer selection guide	**222**
PACT current transformers	**223**
Accessories for PACT current transformers	**233**
PACT RCP current transformers for retrofitting	**234**
Current transducers	**240**
Accessories for current transducers	**251**
Monitoring and diagnostics	
Solar system monitoring	**252**
EMD electronic monitoring relays	**260**
ETD electronic time relays	**272**
Diode modules, lamp testing modules, EMG display modules	**280**

Energy and power measurement

EMpro energy meters for front-panel installation Page 208

EMpro energy meters for DIN rail mounting Page 209

Function and communication modules for EMpro Page 210

DIN rail adapters for EMpro Page 213

Current transformers

PACT busbar current transformers Page 222

PACT window-type current transformers Page 224

PACT winding current transformers Page 232

Mounting accessories, shock protection Page 233

Voltage measurement

MCR voltage transducers for AC and DC voltages up to 660 V Page 250

Accessories
Configuration software and USB adapter cable Page 251

Solar system monitoring

SOLARCHECK photovoltaic panel shutdown Page 252

SOLARCHECK
Photovoltaic string monitoring Page 256

Time relays

ETD-BL
Ultra-narrow time relays Page 276

ETD
Multifunctional time relays Page 278

Function modules

EMG
Diode modules, lamp testing modules, display modules Page 280

Lightning monitoring system

Lightning monitoring system
See Catalog 4

Software for usage data acquisition
Page 214

Complete packages for data logging
Page 215

Compressed air meters
Page 216

Pressure sensor with IO-Link
Page 218

Current measurement

PACT RCP... current transformers for retrofitting
Page 236

MCR current transducers for AC/DC and distorted currents
Page 240

MCR current transducer for sinusoidal and distorted AC currents
Page 246
Passive, up to 5 A
Page 248

MCR current protector for AC currents, sinusoidal up to 16 A
Page 249

Charging technology for E-Mobility

AC charging controllers for private and commercial applications
See Catalog 2

Locking release module for mains failure
See Catalog 2

Monitoring relays

EMD-BL
Compact monitoring relays
Page 262

HMIs

HMIs
See Catalog 6

Signal towers

Signal towers
See Catalog 6

Energy costs at a glance

Within industry, energy is viewed as a variable cost factor. As a result, lower energy costs are becoming increasingly important in terms of providing companies with a major competitive advantage in the areas of production, process, and industrial engineering.

Alongside energy consumption, the quality of the energy supplied, the reliability of supply, and effective system utilization also play an important role in ensuring profitability. This calls for continuous measurement and analysis of all sources of energy.

Advantages of energy data acquisition

Continuously recorded energy flow provides the basis for a target-oriented energy management system.

Access comprehensive information regarding the characteristic electrical data of your machinery and benefit from the advantages of this:

– Reduce your energy costs by identifying potential energy savings.
– Optimize your system capacity: through intelligent switching of system parts, uniform network load, and reduced harmonics.
– Reduce peak loads using forward-looking trend calculation and load management.
– Safeguard your production processes and minimize downtimes by continuously monitoring important system parameters.

Measurement – monitoring – communication

Efficient energy management – network-capable EMpro energy meters can be used to acquire and monitor the characteristic electrical data of your machines and systems.

They can be freely extended with communication modules and function modules, enabling your energy meters to keep pace with your growing requirements. Future-proof planning and investment is therefore ensured.

The communication expert

The EMpro MA600 is capable of performing all measurement tasks associated with power supply applications up to 700 V AC.

– From simple current and power measurement to detection of harmonics including spectral analysis
– Flexible integration into Ethernet, PROFIBUS or RS-485 networks
– Remote access via web server
– Optional DIN rail adapter for DIN rail mounting
– Can be extended with communication modules and function modules

The universal solution on the front panel

The EMpro MA400 performs standard measuring tasks up to 519 V AC.

– Optional DIN rail adapter for DIN rail mounting
– Communication module for integration into RS-485 networks (Modbus/RTU)
– Function module for pulse or alarm output

The measuring device with RS-485 communication

The EMpro MA250 performs standard measuring tasks up to 519 V AC.

– DIN rail device
– With pulse or alarm output
– Integrated RS-485 communication (Modbus/RTU)

The measuring device with pulse output

The EMpro MA200 is ideal for simple measuring tasks up to 519 V AC.

– DIN rail device
– With pulse or alarm output

Controller solution for usage data acquisition

The EMlog software provides an efficient solution for recording energy data relating to heat, cold, air, and electricity when used in conjunction with the ILC 191 ME/AN modular Inline controller. This allows you to keep an eye on your resources and manage the consumption levels of your machines and systems.

Sensors and meters

Use of resources at a glance - determine all relevant states using sensors and meters.

– Detailed procurement measurement, thanks to precise sensor and meter technology
– Intelligent sensor communication, thanks to IO-Link technology

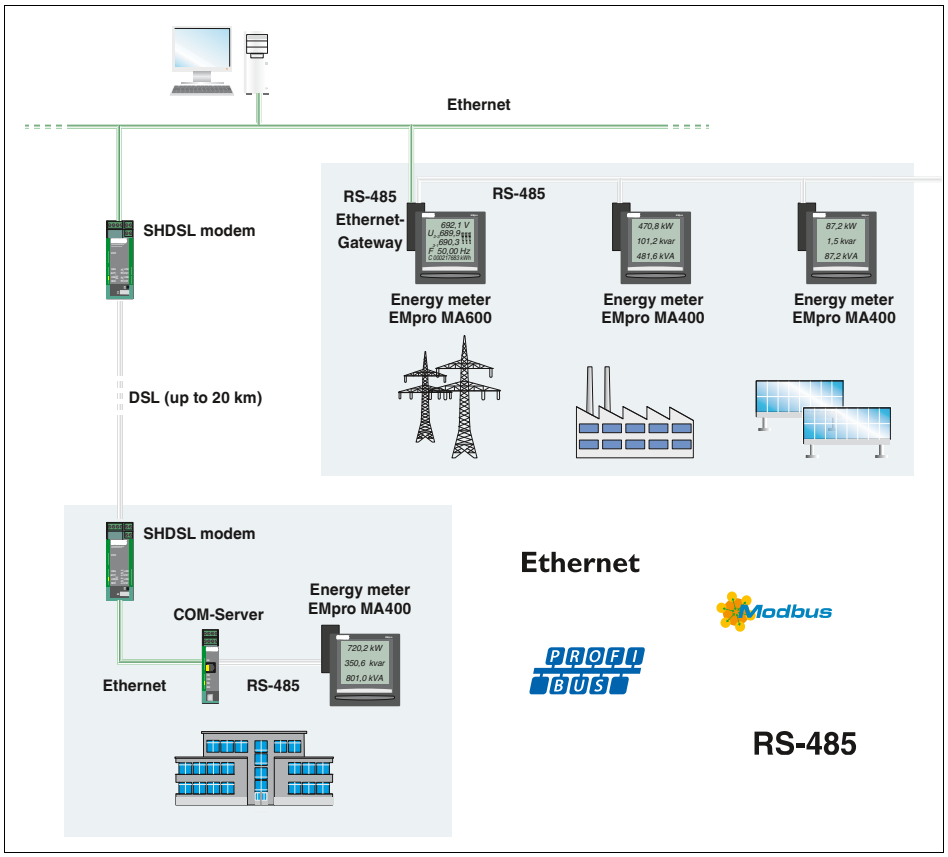
Inline power measurement terminal

The Inline power measurement terminal enables analysis of AC networks.

– For measuring current, voltage, and power, as well as identifying distortion and harmonics

The power measurement terminal can be found in Catalog 6, Control technology, I/O systems, and network structure.

Energy meters



Measurement – monitoring – communication

In order to achieve efficient energy management, all energy data that has been determined is recorded and analyzed centrally in the control center.

For data transmission, integrate the EMpro measuring devices flexibly into your network structures.

The network components from Phoenix Contact offer interference-free and high-performance communication of energy data, even in harsh industrial environments:

– Copper-based and fiber optic data transmission
– Ethernet and modem communication
– Industrial wireless transmission

Direct access to measured values

Analyze your system parameters quickly on site. At the touch of a button, you can access precisely those measured values that are of relevance.

You can also use the user-friendly web server function to request measured values directly from the control center.

Planning reliability and investment security

Stay flexible. EMpro extension modules, function modules, and communication modules enable you extend your EMpro measuring devices at any time:

– Digital inputs and outputs
– Pulse outputs
– Analog outputs
– Communication interfaces
– Measured data storage

Remote access to multiple measuring devices - with just one IP address

The web server that has been integrated into the Ethernet communication modules allows you to conveniently configure key parameters online. It also allows remote access to key electrical characteristics such as current, voltage, power, energy, and harmonics.

Selection guide

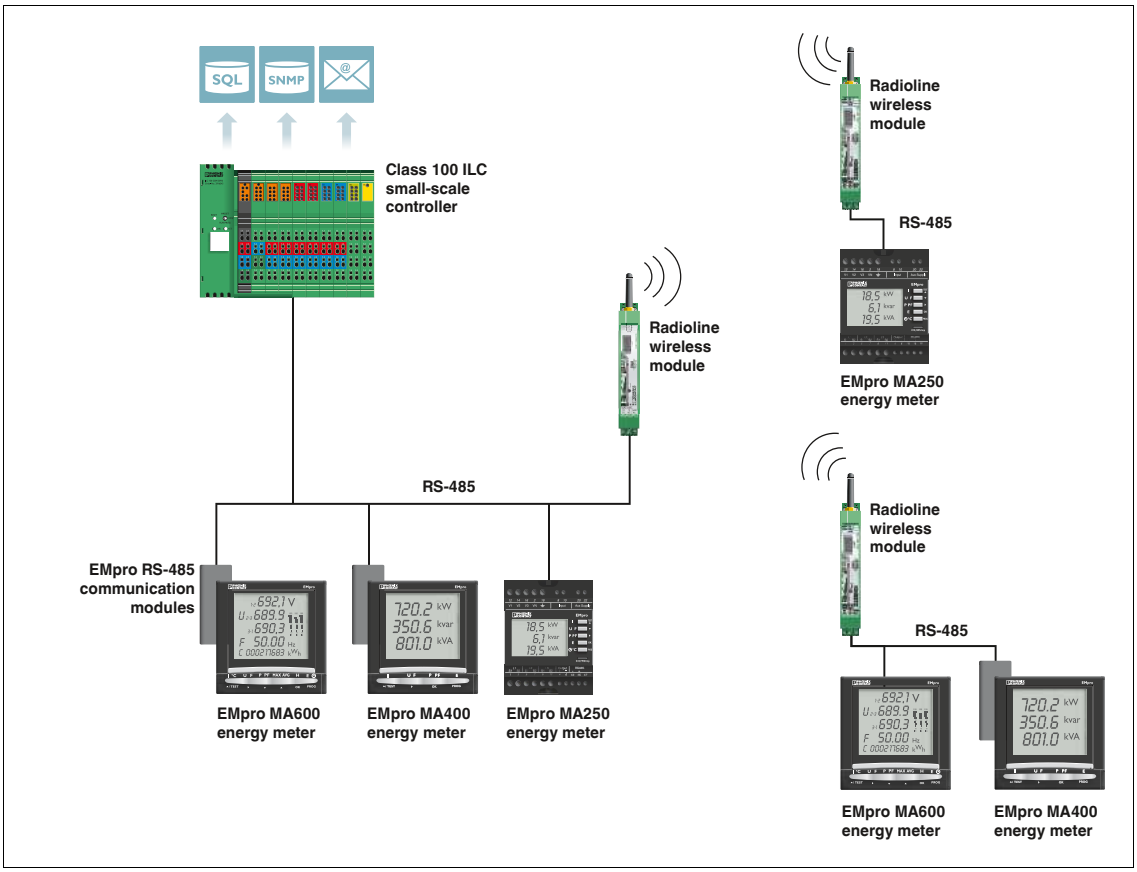
You can easily select the right device for your application by referring to the table below:

Product type	EMpro MA600	EMpro MA400	EMpro MA200/250
	2901366 EEM-MA600	2901364 EEM-MA400	2901362 EEM-MA200
	2902352 EEM-MA600-24DC		2901363 EEM-MA250
Voltages			
Voltage measurement direct	Up to 700 V	Up to 519 V	Up to 519 V
Voltage transducers	Up to 500 kV		
Voltages U12, U23, U31, V1, V2, V3	•	•	•
Maximum mean value	•		
Mean value	•		
Currents			
Current measurement	Direct up to 6 A or current transformer	Current transformers	Current transformers
Currents I1, I2, I3	•	•	•
Neutral conductor current IN (calculation)	•	•	•
Maximum mean value	•	•	•
Mean value	•		
Frequency			
F	•	•	•
Maximum mean value	•		•
Mean value	•		
Power			
Real power, reactive power, apparent power: ΣP (+/-), ΣQ (+/-), ΣS (+/-)	•	•	•
P, Q, S per phase	•	•	•
Maximum mean value	•	•	•
Mean value	•		
Trend performances	•		
Power factor			
ΣPF	•	•	•
PF per phase	•	•	•
Metering			
Real energy (kWh)	kWh+/kWh-	kWh+	kWh+
Reactive energy (kvarh)	kvarh+/kvarh-	kvarh+	kvarh+
Apparent energy (kVAh)	kVAh		
Multi-tariff meter			2
Operating hours	•	•	•
Accuracy class (EN62053-22)	0.5 S	0.5 S	0.5 S
Harmonics analysis			
Distortion factor THD I/U/V	Up to 63rd	Up to 51st	Up to 51st
Spectral analysis	Up to 63rd		
Functions			
Temperature recording			•
Digital input			•
Function modules (optional)			
1 pulse or alarm output		2904314 EEM-IMP-MA400	Integrated
2 pulse outputs	2904313 EEM-IMP-MA600		
2 digital inputs, 2 digital outputs	2901371 EEM-2DIO-MA600		
2 analog outputs	2901475 EEM-2AO-MA600		
Memory	2901370 EEM-MEMO-MA600		
Communication modules (optional)			
RS-485 (Modbus/RTU)	2901367 EEM-RS485-MA600	2901365 EEM-RS485-MA400	Integrated (MA250 only)
D-SUB (PROFIBUS)	2901418 EEM-PB12-MA600		
Ethernet gateway (Modbus/TCP/RTU) with integrated web server	2901374 EEM-ETH-RS485-MA600		
Ethernet (Modbus/TCP) with integrated web server	2901373 EEM-ETH-MA600		

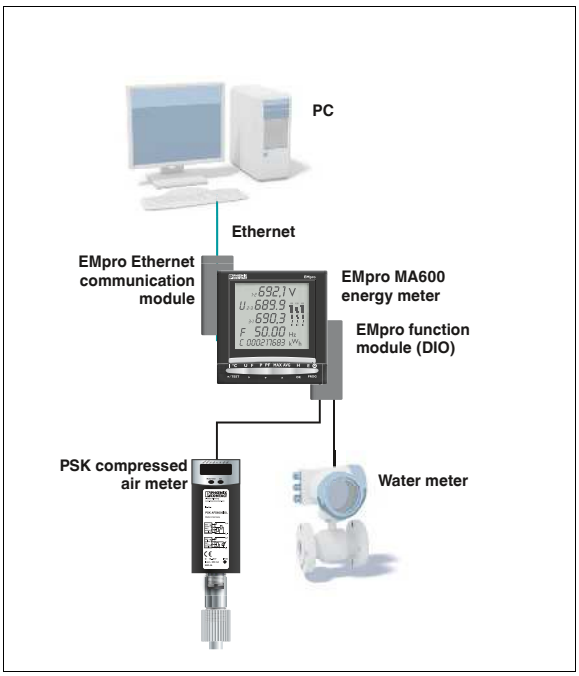
Key

I1, I2, I3	Conductor currents	**P**	Real power	**THD**	Total harmonic distortion
IN	Neutral conductor current	**Q**	Reactive power	**Σ**	Total values
U12, U23, U31	Phase conductor voltages	**S**	Apparent power		
V1, V2, V3	Phase/N conductor voltages	**PF**	Power factor		

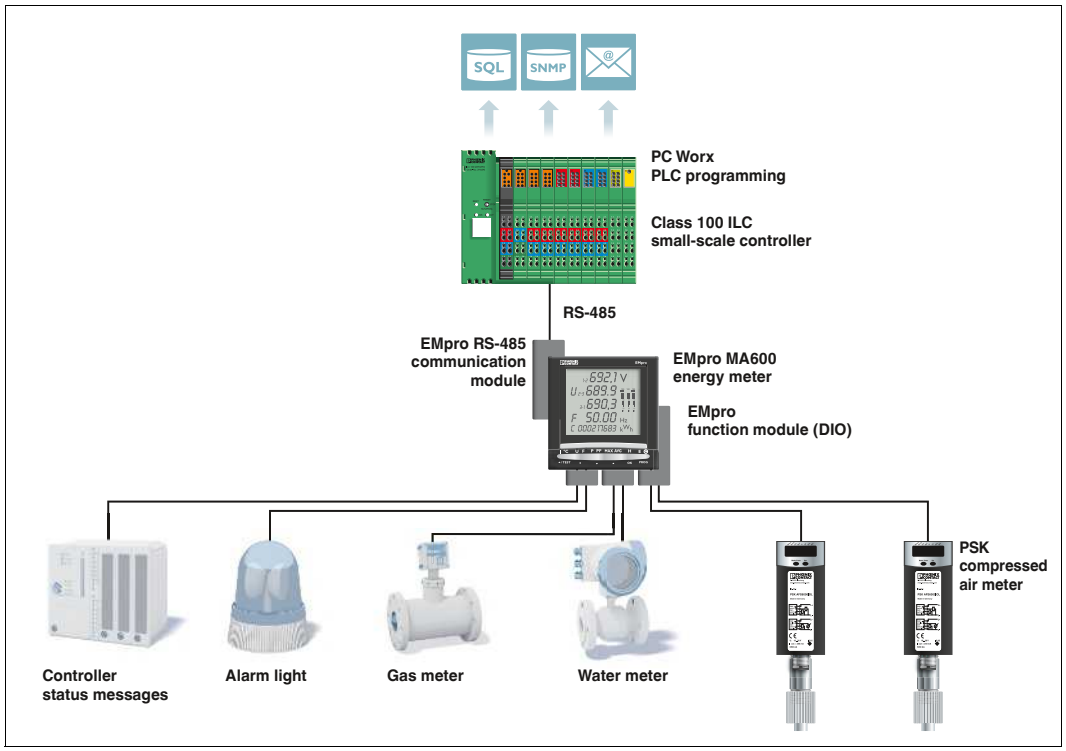
Transmit electrical characteristics wirelessly and easily



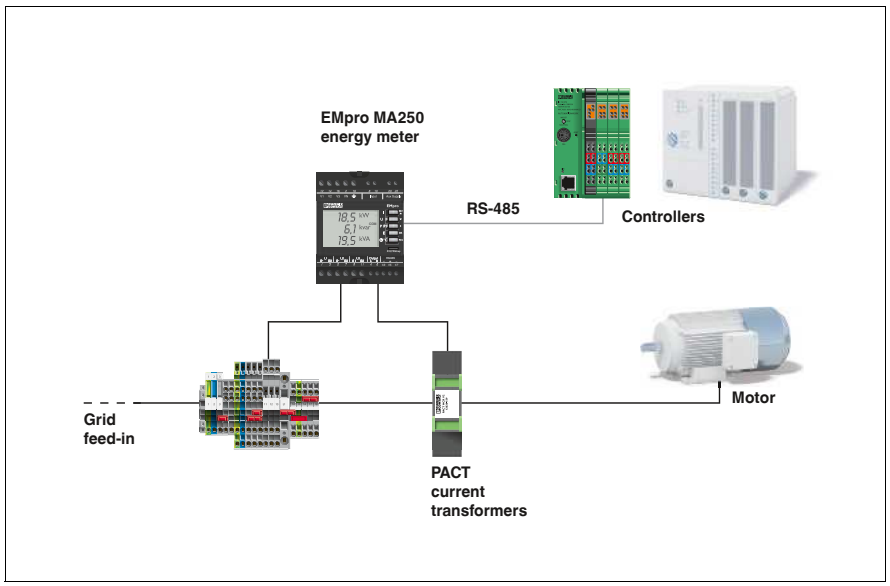
Direct connection from the PC to the EMpro MA600



Connect up to six external meters to one EMpro MA600



Easy machine monitoring - communicate electrical characteristics via Modbus/RTU



Energy meters

EMpro energy meters are capable of acquiring, monitoring, and displaying all electrical system and machine parameters locally.

EEM-MA600
– Can be extended with function and communication modules
– Remote access via web server, integrated into Ethernet communication module
– Acquisition of individual harmonic components up to 63rd order
– Trend calculation for active and reactive power

EEM-MA400
– Can be extended with output module
– Can be extended with RS-485 communication module (JBUS/MODBUS)
– Acquisition of total harmonic content up to harmonic of 51st order

EEM-MA250
– Two-tariff measurement via digital input
– Pulse or alarm output
– RS-485 interface (JBUS/MODBUS)

EEM-MA200
– Two-tariff measurement via digital input
– Pulse or alarm output

EEM-MKT-DRA
– DIN rail adapter for the EEM-MA600 and EEM-MA400 front panel devices see page 213.

Notes:

The EEM-MA600-24DC energy meter (Order No. 2902352) is not CE-compliant.

Measuring voltage up to 700 V AC, can be extended with function and communication modules

Technical data

Input data	
Measuring principle	True r.m.s. value measurement
Acquisition of harmonics	up to 63rd harmonic
Measured value	AC sine (50/60 Hz)
Voltage measuring input V1, V2, V3	
Input voltage range	18 V AC ... 700 V AC (Phase/Phase) 11 V AC ... 404 V AC (Phase/neutral conductor) 500 kV AC (Primary, via external voltage transducers) Secondary: 60, 100, 110, 115, 120, 173, 190 V AC
Accuracy	0.2 %
Current measuring input I1, I2, I3	
Input current range (Via external transformers)	9999 A (primary) 1 A and 5 A, secondary
Overload capacity	6 A (Permanent)
Operate threshold	10 mA
Accuracy	0.2 %
Power measurement	
Measuring range	0 MW ... 8000 MW / 0 Mvar ... 8000 Mvar / 0 MVA ... 8000 MVA
Accuracy	0.5 %
Active energy (IEC 62053-22)	Class 0.5 S
Reactive power (IEC 62053-23)	Class 2
Digital input	
Voltage input signal	Via function module
Switching output	
Output description	Via function module
Maximum switching voltage	-
Current carrying capacity	-
Serial port	
Output description	Via communication module
Serial transmission speed	-
Display	
Type	LCD display, backlighting
Measuring rate	1 s
General data	
Supply voltage range	110 V AC ... 400 V AC ±10 % 120 V DC ... 350 V DC (± 20 %)
Nominal power consumption	10 VA 20 VA (with max. number of extension modules)
Degree of protection	IP52 (front), IP30 (back)
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
Dimensions W/H/D	96 / 96 / 82 mm
Installation depth with extension module	80 mm
Connection cross section (solid / stranded / AWG)	
Voltage and other connections	0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14
Current connection	0.5 ... 6 mm² / 0.5 ... 6 mm² / 20 - 8
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Energy meter, for installation in front panel	**EEM-MA600**	**2901366**	1
Energy meter, for front-panel installation, 24 V DC	**EEM-MA600-24DC**	**2902352**	1
Energy meter, for mounting on a DIN rail			

Measuring voltage up to 519 V AC, can be extended with RS-485 interface and output module

Measuring voltage up to 519 V AC, DIN rail installation, also with RS-485 interface

Technical data

True r.m.s. value measurement up to 51st harmonic AC sine (50/60 Hz)	
50 V AC ... 500 V AC (Phase/Phase) 28 V AC ... 289 V AC (Phase/neutral conductor) -	
0.2 %	
9999 A (primary) 5 A (secondary) 6 A (Permanent) 5 mA 0.2 %	
0 MW ... 11 MW / 0 Mvar ... 11 Mvar / 0 MVA ... 11 MVA	
0.5 % Class 0.5 S Class 2	
-	
Via function module - -	
Via communication module -	
LCD display, backlighting 1 s	
110 V AC ... 400 V AC ±10 % 120 V DC ... 350 V DC (± 20 %) 5 VA 10 VA (with max. number of extension modules) IP52 (front), IP30 (back) -10 °C ... 55 °C (14 °F to 131 °F) 96 / 96 / 82 mm 80 mm	
0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14 0.5 ... 6 mm² / 0.5 ... 6 mm² / 20 - 8 Class A product, see page 605	
CE-compliant	

Ordering data

Type	Order No.	Pcs./ Pkt.
EEM-MA400	**2901364**	1

Technical data

True r.m.s. value measurement up to 51st harmonic AC sine (50/60 Hz)	
50 V AC ... 519 V AC (Phase/Phase) 28 V AC ... 300 V AC (Phase/neutral conductor) -	
0.2 %	
9999 A (primary) 5 A (secondary) 6 A (Permanent) 5 mA 0.2 %	
0 kW ... 9999 kW / 0 kvar ... 9999 kvar / 0 kVA ... 9999 kVA	
0.5 % Class 0.5 S Class 2	
230 V AC ±10 % (Tariff switchover: e.g., day/nighttime tariff)	
Transistor output, active 30 V DC 27 mA	
EEM-MA250	EEM-MA200
Modbus RTU/JBUS RS-485	None
2.4 ... 38.4 kbps	
LCD display, backlighting 1 s	
110 V AC ... 277 V AC -10 % ... +15 % 5 VA IP51 (front), IP20 (back) -10 °C ... 55 °C (14 °F to 131 °F) 72 / 90 / 64 mm	
0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14 0.5 ... 4 mm² / 0.5 ... 4 mm² / 20 - 10 Class A product, see page 605	
CE-compliant	

Ordering data

Type	Order No.	Pcs./ Pkt.
EEM-MA250	**2901363**	1
EEM-MA200	**2901362**	1

Function modules

Plug-in function modules for the EEM-MA600 energy meter.

EEM-2DIO-MA600
– Two digital inputs and outputs
– Configurable threshold values

EEM-2AO-MA600
– Two analog outputs
0 to 20 mA/4 to 20 mA, configurable

Two digital inputs, two digital outputs

Two analog outputs

Technical data	
Digital input	
Voltage input signal	10 V DC ... 30 V DC
Input pulse length	10 ms
Output	
Output description	Relay output
Maximum switching voltage	250 V AC/DC
General data	
Supply voltage	9 V (via EEM-MA600)
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010-1

Technical data	
Digital input	
Voltage input signal	-
Input pulse length	-
Output	
Output description	Current output
Maximum switching voltage	-
General data	
Supply voltage	9 V (via EEM-MA600)
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010-1

Ordering data			
Description	Type	Order No.	Pcs./ Pkt.
Function module (for EEM-MA600)	**EEM-2DIO-MA600**	2901371	1

Ordering data			
	Type	Order No.	Pcs./ Pkt.
	EEM-2AO-MA600	2901475	1

Function module

Plug-in function module for the EEM-MA600 energy meter

EEM-MEMO-MA600
– Stores P (+/-) and Q (+/-) with an internal or external synchronization pulse of 5, 8, 10, 20, 30 or 60 minutes, e.g., synchronization pulse of 15 minutes over 45 days
– Stores the last ten alarms with time stamp (2DIO function module necessary)
– Stores the last smallest and largest instantaneous values for voltages, currents, frequency, actual power, reactive power, entire harmonic distortion
– Stores the mean values of the cable voltage, line to line voltage and frequency (maximum 60 days)
– Stores undervoltage, surge voltage, and phase failure
– Cannot be combined with PROFIBUS communication module

Memory module

Technical data	
Digital input	
Voltage input signal	10 V DC ... 30 V DC
General data	
Supply voltage	9 V (via EEM-MA600)
Memory size	512 kByte
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010-1

Ordering data			
Description	Type	Order No.	Pcs./ Pkt.
Function module (for EEM-MA600) Memory module	**EEM-MEMO-MA600**	2901370	1

Communication modules

EEM-PB 12-MA600
– PROFIBUS DP, with transmission speeds of 12 Mbps

EEM-RS485-MA...
– JBUS / Modbus/RTU

Modbus/RTU (RS-485)

PROFIBUS

	Technical data	Technical data
Serial port		
Output description	Modbus RTU/JBUS RS-485	PROFIBUS DP
Serial transmission speed	2.4 ... 38.4 kbps	12 Mbps
General data		
Supply voltage	9 V (Via EEM-MA600/EEM-MA400)	9 V (via EEM-MA600)
Degree of protection	IP20	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)	-10 °C ... 55 °C (14 °F to 131 °F)
EMC note	Class A product, see page 605	Class A product, see page 605
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL 61010-1	UL 61010-1

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Communication module (for EEM-MA400) RS-485 (JBUS/Modbus/RTU)	**EEM-RS485-MA400**	2901365	1			
Communication module (for EEM-MA600) RS-485 (JBUS/Modbus/RTU) D-SUB (PROFIBUS DP)	**EEM-RS485-MA600**	2901367	1	**EEM-PB 12-MA600**	2901418	1

Communication modules

EEM-ETH-MA600
– Ethernet
– Modbus/TCP
– Integrated web server

EEM-ETH-RS485-MA600
– Ethernet gateway to RS-485
– Modbus/TCP / Modbus/RTU
– Integrated web server

Ethernet with integrated web server

Ethernet gateway with integrated web server

	Technical data	Technical data
Serial port		
Output description	Modbus/TCP Ethernet (RJ45)	Modbus/TCP Ethernet (RJ45)
Serial transmission speed	10/100 Mbps	10/100 Mbps
General data		
Supply voltage	9 V (via EEM-MA600)	9 V (via EEM-MA600)
Degree of protection	IP20	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)	-10 °C ... 55 °C (14 °F to 131 °F)
EMC note	Class A product, see page 605	Class A product, see page 605
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL 61010-1	UL 61010-1

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Communication module (for EEM-MA600) Ethernet Ethernet gateway	**EEM-ETH-MA600**	2901373	1	**EEM-ETH-RS485-MA600**	2901374	1

Function module

Plug-in function module for the EEM-MA400 energy meter.

EEM-IMP-MA400

– One configurable pulse output or one configurable threshold value

Pulse module

Technical data

Output	
Output description	Relay output
Maximum switching voltage	100 V DC
General data	
Supply voltage	9 V (via EEM-MA400)
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010-1

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Function module (for EEM-MA400) with one pulse or alarm output	**EEM-IMP-MA400**	2904314	1

Function module

Plug-in function module for the EEM-MA600 energy meter

EEM-IMP-MA600

– Two configurable pulse outputs

Pulse module

Technical data

Output	
Output description	Relay output
Maximum switching voltage	100 V DC
General data	
Supply voltage	9 V (via EEM-MA600)
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 55 °C (14 °F to 131 °F)
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 61010-1

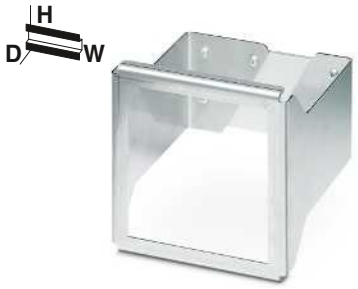
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Function module (for EEM-MA600) with two configurable pulse outputs	**EEM-IMP-MA600**	2904313	1

Accessories

DIN rail adapter

– For mounting the EEM-MA600 or EEM-MA400 energy meters on a 35 mm DIN rail according to EN 60715



For mounting on DIN rails

EAC

Technical data

General data	
Vibration resistance	57 Hz ... 150 Hz (2 g)
DIN rail clip material	Aluminum, natural anodized
Fixing sheet material	Stainless steel VA
Dimensions W/H/D	116 / 112 / 115 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
DIN rail adapter for EEM-MA600 and EEM-MA400	**EEM-MKT-DRA**	2902078	1

Controller solution for usage data acquisition

The EMlog software from Phoenix Contact provides an efficient solution for recording energy data relating to heat, cold, air, and electricity when used in conjunction with the ILC 191 ME/AN modular Inline controller. This allows you to keep an eye on your resources and manage the consumption levels of your machines and systems.

Your advantages:

– Easy startup without programming knowledge
– Easy parameterization, thanks to web-based interface
– Direct parameterization of predefined sensors
– Existing configurations can be reused

Solution for usage data acquisition

Technical data

Interfaces		
INTERBUS local bus (master)		Inline data jumper
Ethernet		2 x RJ45 socket
Parameterization/operation/diagnostics		1 x 6-pos. MINI DIN socket (PS/2)
INTERBUS master		
Number of devices with parameter channel		max. 24
Number of supported devices		max. 128
Amount of process data		max. 4096 Bit (INTERBUS) max. 32768 Bit (internal Modbus /TCP client)
Digital inputs/outputs		
Number of inputs		8
Number of outputs		4
Analog inputs/outputs		
Number of inputs		2
Number of outputs		2
IEC-61131 runtime system		
Programming tool		PC WORX / PC WORX EXPRESS
Processor		Altera Nios II 64 MHz
Program memory		1 Mbyte
Mass storage		1 Mbyte
Retentive mass storage		48 kByte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		8
Real-time clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		310 mA
General data		
Dimensions	W / H / D	164 mm / 136.8 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 605

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Compact controller, complete with accessories (connector and marking field) - Analog inputs/outputs	**ILC 191 ME/AN**	2700074	1
Program and configuration memory, plug-in, 2 GB with license key and user program for reading from measuring devices	**SD FLASH 2GB EMLOG**	2403484	1

Accessories

Programming cable	**COM CAB MINI DIN**	2400127	1

Complete packages for data logging

The PSK RTU 50 is a multifunctional RTU (Remote Telemetry Unit), which combines the functions of a data logger, gateway, and alarm manager. The PSK RTU 50 offers various communication options, was developed with low power technology and allows independent operation, e.g., with batteries or solar cells.

Your advantages:
– GSM/GPRS modem
– Ethernet interface
– IEC 60870-5-101
– IEC 60870-5-104
– Modbus/RTU

Multifunctional data logger

Technical data

Interfaces	
Interfaces	RS-232 RS-232/-485 Serial Ethernet
Digital inputs/outputs	
Number of inputs	4
Number of outputs	2 (Relay output)
Analog inputs	
Number of inputs	2
IEC-61131 runtime system	
Program memory	832 kByte
Retentive mass storage	1 Mbyte
Real-time clock	Yes (battery-backed)
Power supply	
Supply voltage	24 V DC
Typical current consumption	5 mA
General data	
Weight	475 g
Width	210 mm
Height	110 mm
Depth	45 mm
Degree of protection	IP20
Ambient temperature (operation)	-20 °C ... 65 °C

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Multifunctional data logger			
	PSK RTU 50	2400018	1

Compressed air meters

Use meters from Phoenix Contact to monitor the use of compressed air, an expensive production resource. By using compressed air efficiently, you can decrease compressor usage and therefore reduce energy costs. The calorimetric measuring procedure records even the smallest consumption rates. You can therefore detect wear or leaks based on the amount of air consumed.

Use compressed air meters to acquire the following values:

– The current volumetric flow according to ISO 2533 and DIN 1343
– The total volume used
– The temperature of the compressed air in the monitored operating processes

The compressed air meters impress thanks to their:

– Detailed reference measurement with flow rate, total volume, and temperature display
– Intelligent sensor communication, thanks to IO-Link technology
– A measuring range from 0.06 to 700.0 Nm³/h
– Flexible use, thanks to IP65 protection: resistant to dust and splash water

IO-Link

Compressed air meter up to 75 Nm³/h

Technical data

	PSK AFS6050IOL	PSK AFS6000IOL
Flow monitoring		
Measuring range	0.20 Nm³/h ... 75 Nm³/h	
Display area	0.00 Nm³/h ... 90 Nm³/h	
Repeatability	±1.5% of the measured value	
Response time	< 0.1 s ((dAP = 0))	
Measured value error	±15 % of the measured value +1.5 % of the measuring range final value	Depending on the air quality: ±3% of the measured value + 0.3% of the measuring range final value; ±6% of the measured value + 0.6% of the measuring range final value
Temperature monitoring		
Measuring range	0 °C ... 60 °C	
Display area	-12 °C ... 72 °C	
Response time	30 s (Q > 0.1 Nm³/h)	
Resolution	0.5 °C	
Accuracy	± 2.5 °C (Q > 0.1 Nm³/h)	
Supply for module electronics		
Connection method	M12 connector	
No. of pos.	4	
Supply voltage range	19 V DC ... 30 V DC	
Current draw	< 100 mA	
Digital outputs		
Pulse value	0.0010 m³ ... 1000000 m³	
Pulse length	min. 0.04 s	
Delay time	0.5 s (Operational readiness)	
Analog outputs		
Type of protection	Short-circuit protection, polarity reversal protection	
Current output signal	4 mA ... 20 mA	
Load/output load current output	≤ 500 Ω	
General data		
Weight	581 g	961 g
Width	45 mm	
Height	111 mm	300 mm
Depth	79.5 mm	76.8 mm
Degree of protection	IP65	
Protection class	III	
Ambient temperature (operation)	0 °C ... 60 °C	
Ambient temperature (storage/transport)	-20 °C ... 85 °C	
Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6	5g (55 ... 2000 Hz)	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Compressed air meter: G1/2 process connection, measuring range up to 75 Nm³/h	PSK AFS6050IOL	2700704	1
Compressed air meter: G1/2 process connection, measuring range up to 75 Nm³/h	PSK AFS6000IOL	2700707	1
Compressed air meter: R1/4 process connection, measuring range up to 15 Nm³/h			
Compressed air meter: R1 process connection, measuring range up to 225 Nm³/h			
Compressed air meter: R2 process connection, measuring range up to 700 Nm³/h			

IO-Link

Compressed air meter up to 15 Nm³/h

Technical data

	0.04 Nm³/h ... 15 Nm³/h 0.00 Nm³/h ... 18 Nm³/h
	±1.5% of the measured value
	< 0.1 s ((dAP = 0))
	Depending on the air quality: ±3% of the measured value + 0.3% of the measuring range final value; ±6% of the measured value + 0.6% of the measuring range final value
	0 °C ... 60 °C -12 °C ... 72 °C
	30 s (Q > 0.1 Nm³/h)
	0.5 °C
	± 2.5 °C (Q > 0.1 Nm³/h)
	M12 connector
	4
	19 V DC ... 30 V DC
	< 100 mA
	0.0010 m³ ... 1000000 m³
	min. 0.2 s
	0.5 s (Operational readiness)
	Short-circuit protection, polarity reversal protection
	4 mA ... 20 mA
	≤ 500 Ω
	887 g
	45 mm
	193.3 mm
	74.5 mm
	IP65
	III
	0 °C ... 60 °C
	-20 °C ... 85 °C
	5g (55 ... 2000 Hz)

Ordering data

Type	Order No.	Pcs./ Pkt.
PSK AFS5000IOL	2700705	1

IO-Link

Compressed air meter up to 225 Nm³/h

Technical data

	0.70 Nm³/h ... 225 Nm³/h 0.00 Nm³/h ... 270 Nm³/h
	±1.5% of the measured value
	< 0.1 s ((dAP = 0))
	Depending on the air quality: ±3% of the measured value + 0.3% of the measuring range final value; ±6% of the measured value + 0.6% of the measuring range final value
	0 °C ... 60 °C -12 °C ... 72 °C
	30 s (Q > 0.1 Nm³/h)
	0.5 °C
	± 2.5 °C (Q > 0.1 Nm³/h)
	M12 connector
	4
	19 V DC ... 30 V DC
	< 100 mA
	0.0030 m³ ... 3000000 m³
	min. 0.02 s
	1 s (Operational readiness)
	Short-circuit protection, polarity reversal protection
	4 mA ... 20 mA
	≤ 500 Ω
	2.053 kg
	45 mm
	475 mm
	88.5 mm
	IP65
	III
	0 °C ... 60 °C
	-20 °C ... 85 °C
	5g (55 ... 2000 Hz)

Ordering data

Type	Order No.	Pcs./ Pkt.
PSK AFS8000IOL	2700708	1

IO-Link

Compressed air meter up to 700 Nm³/h

Technical data

	2.30 Nm³/h ... 700 Nm³/h 0.00 Nm³/h ... 840 Nm³/h
	±1.5% of the measured value
	< 0.1 s ((dAP = 0))
	Depending on the air quality: ± 3% of the measured value + 0.3% of the measuring range final value; ± 6% of the measured value + 0.6% of the measuring range final value
	0 °C ... 60 °C -12 °C ... 72 °C
	30 s (Q > 0.1 Nm³/h)
	0.5 °C
	± 2.5 °C (Q > 0.1 Nm³/h)
	M12 connector
	4
	19 V DC ... 30 V DC
	< 100 mA
	0.0100 m³ ... 4000000 m³
	min. 0.043 s
	0.5 s (Operational readiness)
	Short-circuit protection, polarity reversal protection
	4 mA ... 20 mA
	≤ 500 Ω
	4.332 kg
	133 mm
	475 mm
	-
	IP65
	III
	0 °C ... 60 °C
	-20 °C ... 85 °C
	5g (55 ... 2000 Hz)

Ordering data

Type	Order No.	Pcs./ Pkt.
PSK AFS2000IOL	2700709	1

Pressure sensor

Pressure sensor with IO-Link

Pressure sensors from Phoenix Contact detect the operating pressure of gas media in a range from -1 to 10 bar. The overload-proof ceramic measuring cell is designed for in excess of 100 million cycles and enables a high switching point accuracy. The pressure switch offers the option of using the set switching points via two switching outputs or reading all process data via the IO-Link interface.

Your advantages:

– IO-Link communication
– Parameterization, diagnostics, and process value monitoring via IO-Link
– Programmable function
– 4-character alphanumeric display

IO-Link

Pressure sensor up to 10 bar

Technical data

Pressure monitoring	
Measuring range	-1 bar ... 10 bar (Minimum burst pressure 150 bar)
Pressure resistance	75 bar
Process connection	G1/4 I
Supply for module electronics	
Connection method	M12 connector
No. of pos.	4
Supply voltage range	18 V DC ... 36 V DC
Current draw	< 35 mA
Digital outputs	
Number of outputs	2 (OUT1 = switching output, OUT2 = switching output or diagnostic output)
Connection method	M12 connectors, assigned four times
Delay time	0.3 s (Operational readiness)
IO-Link	
Specification	V1.1
Transmission speed	38.4 kbaud
General data	
Weight	263 g
Width	34 mm
Height	91.5 mm
Depth	48 mm
Degree of protection	IP65
Protection class	III
Ambient temperature (operation)	-25 °C ... 80 °C
Ambient temperature (storage/transport)	-40 °C ... 100 °C
Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6	20g (10 Hz ... 2000 Hz)

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Pressure sensor with indicator, G1/4 I process connection, IO-Link communication	**PSK APS7004IOL**	2700710	1

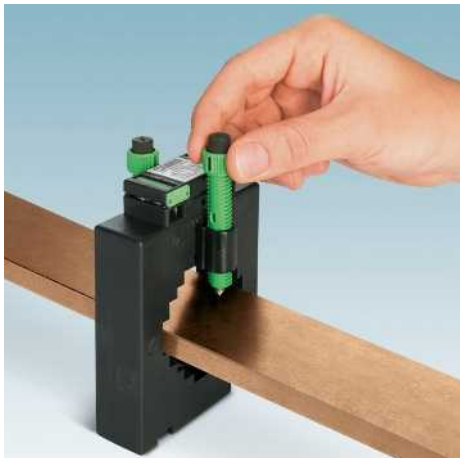
Extremely versatile

PACT current transformers offer a complete product range for converting alternating currents up to 4000 A into secondary currents of 1 A and 5 A. Depending on requirements, busbar, plug-in, and winding current transformers are available. PACT current transformers are available in different transformation ratios, accuracy classes, and rated powers - in 3000 versions, for your current measurement requirements.

Also available for higher accuracy classes

For standard applications, such as in machine building or systems manufacturing, Phoenix Contact offers current transformers with accuracy classes 0.5 and 1 in a version that cannot be calibrated.

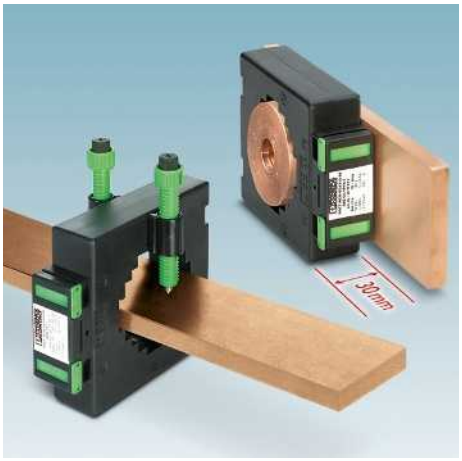
For higher accuracy or for billing purposes in energy supply, type-tested transformers that can be calibrated as well as calibrated transformers are available - with classes 0.2/0.2S/0.5 and 0.5S.



Fast and secure installation

The current transformer quick-action mechanism offers the following advantages:

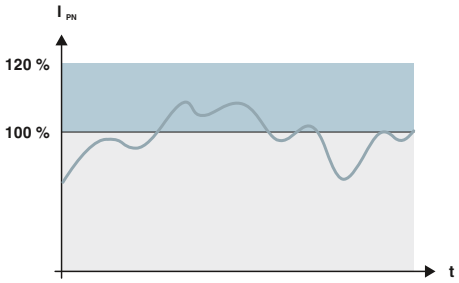
– Tool-free mounting
– Considerable reduction in installation time
– Easy handling and secure fastening by pressing with finger
– Current transformers align themselves – no need for subsequent alignment



Variable and space-saving mounting

In addition to the vertical and horizontal mounting position, the optional accessories offer further installation options such as mounting on the DIN rail or on the control cabinet panel.

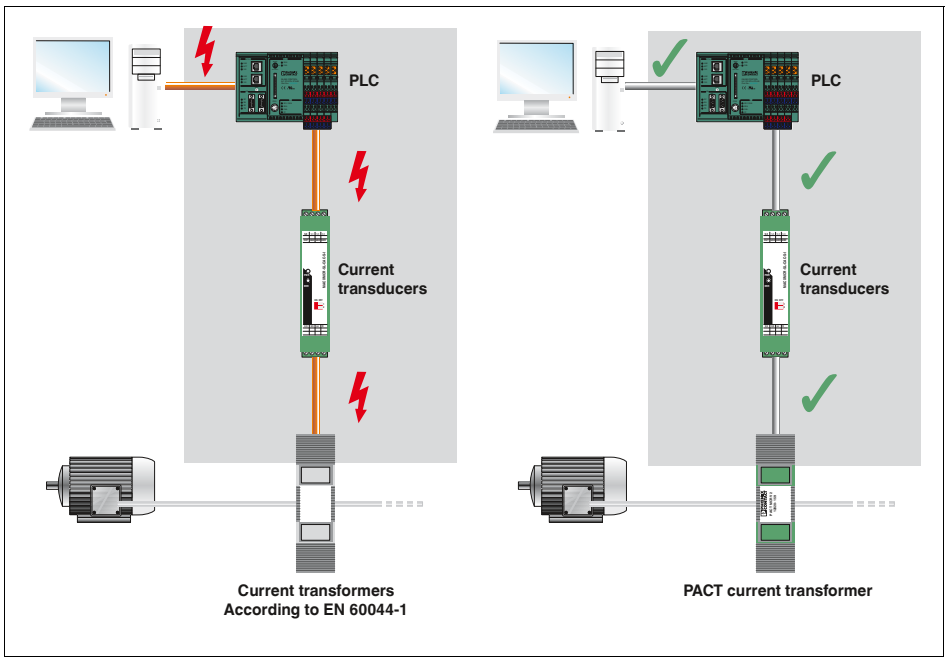
All PACT current transformers are just 30 mm wide. This saves space – for example with flat mounting when measuring branch outlets.



Safely detecting current peaks

PACT current transformers can be used to safely detect current peaks greater than the rated nominal current strength – without resulting in any damage. The transformers are designed for a thermal nominal continuous current of 120% of the primary rated current strength.

Example: a PACT transformer with a specified rated power of 10 VA actually delivers 14.4 VA on a continual basis.



Safe isolation

PACT current transformers are manufactured according to EN 50178. This is relevant for electronic equipment for use in power installations.

EN 50178 differs considerably from EN 60044, the usual standard for transformers, with regard to safety.

Your advantages:

– PACT current transformers offer safe isolation, thanks to greater air clearances and creepage distances.
– PACT current transformers ensure that there is no sparkover on the secondary side of the transformer and human life is protected inside and outside the control cabinet.
– Up to 1000 V (L-N) operating voltage possible
– Routine testing with 12 kV (1.2/50 µs)
– Meets overvoltage category 3

Current transformer selection guide

- Complete range consisting of winding, busbar, and window-type current transformers
- Popular types available from stock; alternatively, order key can be used for custom dimensioning
- Versions available to support official calibration

Selection

- Select your transformer in accordance with the dimensions of the copper rail
- Specify the four electrical characteristics of the transformer:
  1.The primary rated current strength I_{pn} - the maximum amperage occurring in the path to be measured
  2.The secondary rated current I_{sn} - supplied to the downstream measuring devices
  3. Class - accuracy for adherence to the specified tolerances
  4. Rated power S_n [VA] - takes account of all the loads occurring in the measuring circuit

Technical data

Input data	
Thermal rated short-time current	$I_{th} = 60 * I_n$
Rated surge current	$I_{dyn} = 2.5 * I_{th}$
Rated frequency	50 Hz ... 60 Hz 50 Hz
Surge current limitation factor	FS 5
General data	
Rated insulation voltage	1 kV (Phase/neutral conductor)
Impulse withstand voltage	12 kV (1.2/50 µs)
Insulating material class	E
Connection capacity of secondary terminals	2 x (2.5 x 4) mm
Ambient temperature (operation)	-25 °C ... 40 °C
Standards/regulations	EN 50178 , EN 61869
Housing material	WELLAMID 6600-PA66-GV 20 HWV0CP

Calculation guide

Determination of the secondary side rated power S_n

All the occurring loads must be added:
- Calculate the power requirement of the copper wire (forward and return line)
- Take into account the power requirement of the connected devices (measuring devices)
- Add a reserve requirement

S_n total = S_n copper wire + S_n measuring device + S_n reserve

Power requirement of copper wires with a different diameter

Conductor cross section in mm²	Rated power in VA/m (consider the forward and return line)	
	Secondary current I_{sn} 5 A	Secondary current I_{sn} 1 A
1.5	0.2917	0.0117
2.5	0.1750	0.0070
4	0.1094	0.0044
6	0.0729	0.0029

Example:
S_n copper wire = cable length x 2 x rated power
S_n copper wire = 10 m x 2 x 0.1750 VA/m = 3.50 VA

S_n measuring device = 2 VA

S_n reserve < 0.5 x (S_n copper wire + S_n measuring device)
S_n reserve = 2 VA

S_n total = S_n copper wire + S_n measuring device + S_n reserve
S_n total = 3.5 VA + 2 VA + 2 VA = 7.5 VA

Order key - example for PACT MCR-V2-3015-60

Preferred types that can be ordered directly are marked in green in the selection table.

Order No.	Primary current I_{pn}	Secondary current I_{sn}	Class	Rated power S_n
2277271	**IP02000**	**IS05**	**C10**	**P750**
	IP00600 ≙ 60 A	IS01 ≙ 1 A	C02 ≙ 0.2	P125 ≙ 1.25 VA
	IP00750 ≙ 75 A	**IS05 ≙ 5 A**	C05 ≙ 0.5	P250 ≙ 2.5 VA
	IP00800 ≙ 80 A		**C10 ≙ 1**	P375 ≙ 3.75 VA
	IP01000 ≙ 100 A			P500 ≙ 5.0 VA
	IP01250 ≙ 125 A			**P750 ≙ 7.5 VA**
	IP02000 ≙ 200 A			P1000 ≙ 10 VA
	IP02500 ≙ 250 A			

1. 2. 3. 4.

Selection table (extract)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 60	75	80	100	125	150	200	250
1 A	0.5				1.25	2.5	2.5	2.5 3.75	2.5 5
	1	1.25	2.5	2.5	2.5	2.5 3.75	2.5 5	2.5 5	2.5 5 7.5
5 A	0.5							2.5 3.75	2.5 5
	1	1.25	1.25 1.5	1.25 2	2.5	2.5 3.75	2.5 3.75	2.5 5	2.5 5 7,5 10

Rated power S_n [VA]

Current transformers

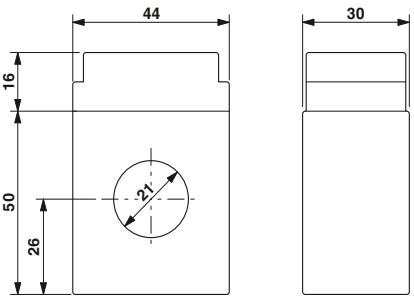
PACT MCR-V1-21-44

– Primary rated current I_{pn}: 0...(50...500) A
– Circular conductor dimensions: Ø 21 mm

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Busbar curr. transf., official calibration as an option

EAC

Ordering data

Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:				
- 50 A	1.25 VA	**PACT MCR-V1-21-44- 50-5A-1**	2277019	1
- 75 A	2.5 VA	**PACT MCR-V1-21-44- 75-5A-1**	2277611	1
- 100 A	2.5 VA	**PACT MCR-V1-21-44-100-5A-1**	2277022	1
- 125 A	3.75 VA	**PACT MCR-V1-21-44-125-5A-1**	2277763	1
- 150 A	5 VA	**PACT MCR-V1-21-44-150-5A-1**	2277035	1
- 200 A	5 VA	**PACT MCR-V1-21-44-200-5A-1**	2277776	1
- 250 A	5 VA	**PACT MCR-V1-21-44-250-5A-1**	2277048	1
- 300 A	10 VA	**PACT MCR-V1-21-44-300-5A-1**	2277789	1
- 400 A	5 VA	**PACT MCR-V1-21-44-400-5A-1**	2277051	1
- 500 A	10 VA	**PACT MCR-V1-21-44-500-5A-1**	2277792	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V1-21-44**	2277268	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V1C-21-44**	2277420	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277268	/	IP05000	/	IS01	/	C05	/	P1000

Selection table PACT MCR-V1-21-44 (Order No.: 2277268)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]												
		50	60	75	80	100	125	150	200	250	300	400	500	
IS01 ≙ 1 A	C05 ≙ 0.5					1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	Rated power S_n [VA]
								3.75	5	5	5	5	5	
										7.5		7.5	10	
	C10 ≙ 1	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
							3.75	5	5	5	5	5	5	
										7.5		7.5	10	
IS05 ≙ 5 A	C05 ≙ 0.5					1.25	1.25	1.25	2.5	2.5	2.5	2.5	2.5	
						1.5	2.0	2.5	3.75	5	5	5	5	
										7.5	10	7.5	7.5	
	C10 ≙ 1	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
			1.5				3.75	5	5	5	5	5	5	
									7.5	7.5	10	7.5	10	

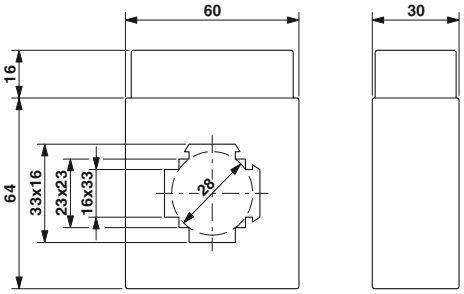
PACT MCR-V2-3015-60

– Primary rated current I_{pn}:
  0...(50...750) A
– Circular conductor dimensions: Ø 28 mm
– Rail dimensions:
  30x15 mm, 20x20 mm

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Window-type curr. transformer, official calibration as an option

EAC

Ordering data

Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:				
- 60 A	1.25 VA	**PACT MCR-V2-3015- 60- 60-5A-1**	2277815	1
- 75 A	1.25 VA	**PACT MCR-V2-3015- 60- 75-5A-1**	2277828	1
- 75 A	1.5 VA	**PACT MCR-V2- 3015- 60- 75-5A-1**	2276502	1
- 80 A	1.25 VA	**PACT MCR-V2-3015- 60- 80-5A-1**	2277831	1
- 100 A	2.5 VA	**PACT MCR-V2-3015- 60- 100-5A-1**	2277064	1
- 125 A	3.75 VA	**PACT MCR-V2-3015- 60- 125-5A-1**	2277624	1
- 150 A	3.75 VA	**PACT MCR-V2-3015- 60- 150-5A-1**	2277844	1
- 150 A	5 VA	**PACT MCR-V2- 3015- 60-150-5A-1**	2277077	1
- 200 A	5 VA	**PACT MCR-V2-3015- 60- 200-5A-1**	2277637	1
- 200 A	7.5 VA	**PACT MCR-V2-3015- 60- 200-5A-1**	2277857	1
- 250 A	5 VA	**PACT MCR-V2- 3015- 60-250-5A-1**	2276544	1
- 250 A	7.5 VA	**PACT MCR-V2-3015- 60- 250-5A-1**	2277860	1
- 250 A	10 VA	**PACT MCR-V2- 3015- 60-250-5A-1**	2277080	1
- 300 A	7.5 VA	**PACT MCR-V2-3015- 60- 300-5A-1**	2277640	1
- 400 A	10 VA	**PACT MCR-V2- 3015- 60-400-5A-1**	2277093	1
- 500 A	10 VA	**PACT MCR-V2-3015- 60- 500-5A-1**	2277653	1
- 600 A	10 VA	**PACT MCR-V2-3015- 60- 600-5A-1**	2277103	1
- 750 A	10 VA	**PACT MCR-V2-3015- 60- 750-5A-1**	2277666	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2- 3015- 60**	2277271	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C- 3015- 60**	2277433	1

Accessories

Quick-action mechanism				
Fixing pin length 40 mm		**PACT-FAST-MNT-W16-L40**	2276638	1
Fixing pin length 65 mm		**PACT-FAST-MNT-W16-L65**	2276641	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277271	/	IP07500	/	IS01	/	C05	/	P1500

Selection table PACT MCR-V2-3015-60 (Order No.: 2277271)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 50	60	75	80	100	125	150	200	250	300	400	500	600	750	Rated power S_n [VA]
IS01 ≙ 1 A	C05 ≙ 0.5					1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
									3.75	5	5	5	5	5	5	
											7.5	10	10	10	10	
														15	15	
	C10 ≙ 1	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	
							3.75	5	5	5	5	5	5	5	10	
										7.5	10	10	10	10	15	
														15	20	
IS05 ≙ 5 A	C05 ≙ 0.5								2.5	2.5	2.5	2.5	2.5	2.5	2.5	
									3.75	5	5	5	5	5	5	
											7.5	10	10	10	10	
	C10 ≙ 1		1.25	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
				1.5	2		3.75	3.75	5	5	5	5	5	5	5	
								5	7.5	7.5	7.5	10	10	10	10	
										10	10	15			15	

Current transformers

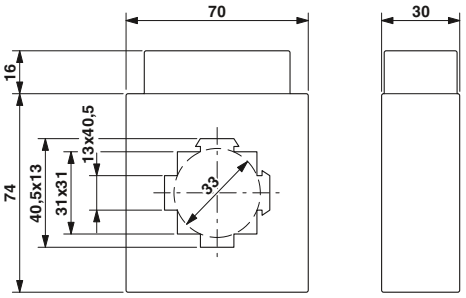
PACT MCR-V2-4012-70

– Primary rated current I_{pn}: 0...(75...1000) A
– Circular conductor dimensions: Ø 33 mm
– Rail dimensions: 40x12 mm, 2x 30x10 mm

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Window-type curr. transformer, official calibration as an option

EAC

Ordering data

Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:				
- 250 A	5 VA	**PACT MCR-V2-4012- 70- 250-5A-1**	2277116	1
- 300 A	7.5 VA	**PACT MCR-V2-4012- 70- 300-5A-1**	2277679	1
- 400 A	7.5 VA	**PACT MCR-V2-4012- 70- 400-5A-1**	2277129	1
- 500 A	10 VA	**PACT MCR-V2-4012- 70- 500-5A-1**	2277682	1
- 600 A	10 VA	**PACT MCR-V2-4012- 70- 600-5A-1**	2277132	1
- 750 A	10 VA	**PACT MCR-V2-4012- 70- 750-5A-1**	2277695	1
- 800 A	10 VA	**PACT MCR-V2-4012- 70- 800-5A-1**	2277145	1
- 1000 A	10 VA	**PACT MCR-V2-4012- 70-1000-5A-1**	2277158	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2- 4012- 70**	2277284	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C- 4012- 70**	2277446	1

Accessories

Quick-action mechanism			
Fixing pin length 40 mm	**PACT-FAST-MNT-W13-L40**	2276612	1
Fixing pin length 65 mm	**PACT-FAST-MNT-W13-L65**	2276625	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277284	/	IP010000	/	IS05	/	C10	/	P250

Selection table PACT MCR-V2-4012-70 (Order No.: 2277284)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]														Rated power S_n [VA]
		75	80	100	125	150	200	250	300	400	500	600	750	800	1000	
IS01 ≙ 1 A	C05 ≙ 0.5				1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
							3.75	5	5	5	5	5	5	5	5	
										7.5	10	10	10	10	10	
														15		
	C10 ≙ 1	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
					3.75	5	5	5	5	5	5	5	5	5	5	
								7.5	10	10	10	10	10	10	10	
													15	15		
IS05 ≙ 5 A	C05 ≙ 0.5				1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
							3.75	5	5	5	5	5	5	5	5	
										7.5	10	10	10	10	10	
														15		
	C10 ≙ 1	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
					3.75	5	5	5	5	5	5	5	5	5	5	
								7.5	7.5	7.5	10	10	10	10	10	
													15	15		

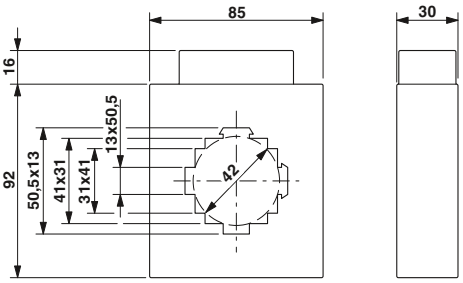
PACT MCR-V2-5012-85

– Primary rated current I_{pn}:
  0...(100...1500) A
– Circular conductor dimensions: Ø 42 mm
– Rail dimensions:
  50x12 mm, 2x 40x10 mm

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Window-type curr. transformer, official calibration as an option

EAC

Ordering data

Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:				
- 150 A	3.75 VA	**PACT MCR-V2-5012- 85- 150-5A-1**	2276117	1
- 200 A	5 VA	**PACT MCR-V2-5012- 85- 200-5A-1**	2276120	1
- 250 A	7.5 VA	**PACT MCR-V2-5012- 85- 250-5A-1**	2276133	1
- 300 A	10 VA	**PACT MCR-V2-5012- 85- 300-5A-1**	2276146	1
- 400 A	10 VA	**PACT MCR-V2-5012- 85- 400-5A-1**	2277161	1
- 500 A	15 VA	**PACT MCR-V2-5012- 85- 500-5A-1**	2276159	1
- 600 A	10 VA	**PACT MCR-V2-5012- 85- 600-5A-1**	2277174	1
- 600 A	15 VA	**PACT MCR-V2-5012- 85- 600-5A-1**	2276162	1
- 750 A	10 VA	**PACT MCR-V2-5012- 85- 750-5A-1**	2276175	1
- 800 A	10 VA	**PACT MCR-V2-5012- 85- 800-5A-1**	2277187	1
- 1000 A	10 VA	**PACT MCR-V2-5012- 85-1000-5A-1**	2276463	1
- 1000 A	15 VA	**PACT MCR-V2-5012- 85-1000-5A-1**	2277190	1
- 1250 A	15 VA	**PACT MCR-V2-5012- 85-1250-5A-1**	2277200	1
- 1500 A	15 VA	**PACT MCR-V2-5012- 85-1500-5A-1**	2276188	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2- 5012- 85**	2277297	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C- 5012- 85**	2277459	1

Accessories

Quick-action mechanism				
Fixing pin length 40 mm		**PACT-FAST-MNT-W13-L40**	2276612	1
Fixing pin length 65 mm		**PACT-FAST-MNT-W13-L65**	2276625	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277297	/	IP02500	/	IS01	/	C10	/	P750

Selection table PACT MCR-V2-5012-85 (Order No.: 2277297)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 100	125	150	200	250	300	400	500	600	750	800	1000	1250	1500	Rated power S_n [VA]
IS01 ≙ 1 A				1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	C05 ≙ 0.5				5	5	5	5	5	5	5	5	5	5	5	
							7.5	10	10	10	10	10	10	10	10	
								15	15	15			15	15	15	
		1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	
	C10 ≙ 1			3.75	5	5	5	5	5	5	5	5	10	10	10	
					7.5	**7.5**	10	10	10	10	10	10	15	15	15	
						10		15	20	20		15	20	20	30	
IS05 ≙ 5 A				1.25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	C05 ≙ 0.5				5	5	5	5	5	5	5	5	5	5	5	
							7.5	10	10	20	10	10	10	10	10	
								15	15	15			15	15	15	
		1.25	2.5	2.5	2.5	2.5	2.5	2.5	5	5	2.5	2.5	5	5	5	
	C10 ≙ 1			3.75	5	5	5	5	10	10	5	5	10	10	10	
					7.5	7.5	10	10	15	15	10	10	15	15	15	
						10		15	20	20		15	20	20	20	

Current transformers

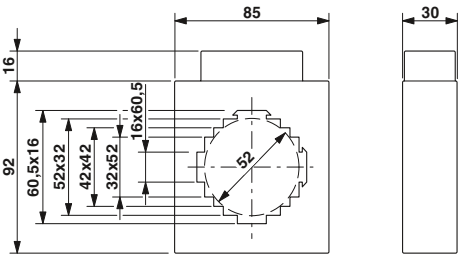
PACT MCR-V2-6015-85

– Primary rated current I_{pn}:
  0...(200...1600) A
– Circular conductor dimensions: Ø 52 mm
– Rail dimensions:
  60x15 mm, 2x 50x10 mm, 40x40 mm

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Window-type curr. transformer, official calibration as an option

EAC

Ordering data

Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:				
- 200 A	2.5 VA	**PACT MCR-V2-6015- 85- 200-5A-1**	2277873	1
- 250 A	2.5 VA	**PACT MCR-V2-6015- 85- 250-5A-1**	2277886	1
- 300 A	2.5 VA	**PACT MCR-V2-6015- 85- 300-5A-1**	2277899	1
- 400 A	2.5 VA	**PACT MCR-V2-6015- 85- 400-5A-1**	2277909	1
- 500 A	5 VA	**PACT MCR-V2-6015- 85- 500-5A-1**	2277912	1
- 600 A	10 VA	**PACT MCR-V2-6015- 85- 600-5A-1**	2277925	1
- 750 A	10 VA	**PACT MCR-V2-6015- 85- 750-5A-1**	2277938	1
- 800 A	10 VA	**PACT MCR-V2-6015- 85- 800-5A-1**	2277941	1
- 1000 A	15 VA	**PACT MCR-V2-6015- 85-1000-5A-1**	2277954	1
- 1250 A	15 VA	**PACT MCR-V2-6015- 85-1250-5A-1**	2277967	1
- 1600 A	15 VA	**PACT MCR-V2-6015- 85-1600-5A-1**	2277983	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2- 6015- 85**	2277336	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C- 6015- 85**	2277462	1

Accessories

Quick-action mechanism				
Fixing pin length 40 mm		**PACT-FAST-MNT-W16-L40**	2276638	1
Fixing pin length 65 mm		**PACT-FAST-MNT-W16-L65**	2276641	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277336	/	IP05000	/	IS01	/	C10	/	P375

Selection table PACT MCR-V2-6015-85 (Order No.: 2277336)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]												
		200	250	300	400	500	600	750	800	1000	1250	1500	1600	
IS01 ≙ 1 A	C05 ≙ 0.5		1.25	1.25	1.25	2.5	2.5	2.5	2.5	2.5	2.5			Rated power S_n [VA]
								5			5			
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			
						3.75		5	3.75	3.75	5			
IS05 ≙ 5 A	C05 ≙ 0.5		1.25	1.25	1.25	2.5	2.5	2.5	2.5	2.5	5	5	5	
					2.5	5	5	5	5	5	10	10	10	
							10	10	10	10	15	15	15	
									15	15	20	20		
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	
						5	5	5	5	10	10	10	10	
							10	10	10	15	15	15	15	
									15		20	30		

Current transformers

PACT MCR-V2-6315-95

– Primary rated current I_{pn}:
  0...(200...2500) A
– Circular conductor dimensions: Ø 53 mm
– Rail dimensions:
  63x15 mm
  2x 50x10 mm
  40x40 mm

Window-type curr. transformer, official calibration as an option

PACT MCR-V2-6040-96

– Primary rated current I_{pn}:
  0...(200...2000) A
– Circular conductor dimensions: Ø 61 mm
– Rail dimensions:
  60x40 mm, 50x50 mm

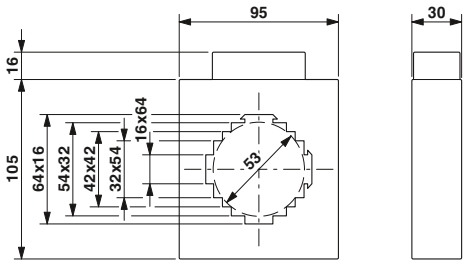
Window-type curr. transformer, official calibration as an option

Notes:

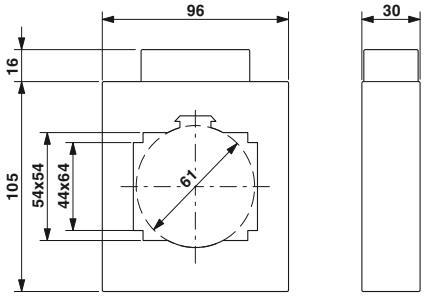
Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233

EAC



EAC



Description	Rated power S_n	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
		Ordering data			**Ordering data**		
Primary rated current I_{pn}:							
- 600 A	10 VA				PACT MCR-V2-6040- 96- 600-5A-1	2276191	1
- 750 A	10 VA				PACT MCR-V2-6040- 96- 750-5A-1	2276201	1
- 800 A	10 VA	PACT MCR-V2-6315- 95- 800-5A-1	2277213	1	PACT MCR-V2-6040- 96- 800-5A-1	2276214	1
- 1000 A	10 VA	PACT MCR-V2-6315- 95-1000-5A-1	2277226	1	PACT MCR-V2-6040- 96-1000-5A-1	2277705	1
- 1250 A	10 VA	PACT MCR-V2-6315- 95-1250-5A-1	2277239	1			
- 1250 A	15 VA				PACT MCR-V2-6040- 96-1250-5A-1	2276227	1
- 1500 A	10 VA	PACT MCR-V2-6315- 95-1500-5A-1	2277242	1	PACT MCR-V2-6040- 96-1500-5A-1	2277718	1
- 1600 A	10 VA	PACT MCR-V2-6315- 95-1600-5A-1	2277255	1			
- 1600 A	15 VA				PACT MCR-V2-6040- 96-1600-5A-1	2276230	1
- 2000 A	15 VA				PACT MCR-V2-6040- 96-2000-5A-1	2276243	1
Current transformers, to determine the desired current transformer type, refer to the order key below		PACT MCR-V2- 6315- 95	2277307	1	PACT MCR-V2- 6040- 96	2277349	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		PACT MCR-V2C- 6315- 95	2277475	1	PACT MCR-V2C- 6040- 96	2277488	1
		Accessories			**Accessories**		
Quick-action mechanism							
Fixing pin length 40 mm		PACT-FAST-MNT-W16-L40	2276638	1	PACT-FAST-MNT-W16-L40	2276638	1
Fixing pin length 65 mm		PACT-FAST-MNT-W16-L65	2276641	1	PACT-FAST-MNT-W16-L65	2276641	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277307	/	IP25000	/	IS05	/	C05	/	P500

Selection table PACT MCR-V2-6315-95 (Order No.: 2277307)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 200	250	300	400	500	600	750	800	1000	1250	1500	1600	2000	2500	Rated power S_n [VA]
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	5		
				5	5	5	5	10	10	10	10	10	10	10		
					7.5	10	10	15	15			15	15	15		
														20		
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	10		
		3.75	5	5	5	5	5	10	10	10	10	10	10	15		
				7.5	10	10	10	15	15			15	15	20		
							15		20							
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	5	5	
			3.75	5	5	5	5	10	10	10	10	10	10	10	10	
				7.5	10	10	10	15	15	15	15	15	15	15	15	
						15	15	20	20	30	20	30	30	30	30	
	C10 ≙ 1	2.5	2.5	2.5	2.5	5	5	5	5	10	5	5	10	10	10	
		3.75	5	5	5	10	10	10	10	15	10	10	15	15	15	
				10	10	15	15	15	15	30	15	15	30	30	30	
					15	20	20	30	30		30	30				

Selection table PACT MCR-V2-6040-96 (Order No.: 2277349)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 200	250	300	400	500	600	750	800	1000	1250	1500	1600	2000	Rated power S_n [VA]
IS01 ≙ 1 A	C05 ≙ 0.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			
					5	5	5	5	5	5					
						7.5		7.5	7.5	10	10				
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5			
		3.75	5	5	5	5	5	5	5	5	5	5			
					7.5	7.5		7.5	7.5	10	10				
IS05 ≙ 5 A	C05 ≙ 0.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	
					5	5	5	5	5	5	5	5	5	10	
						7.5	7.5	10	10	7.5	10	10	10	15	
													15		
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	2.5	5	5	
		3.75	3.75	5	5	5	5	5	5	5	10	5	10	10	
					7.5	7.5	10	10	10	10	15	10	15	15	
									15						

Current transformers

PACT MCR-V2-8015-105

– Primary rated current I_{pn}: 0...(400...2500) A
– Circular conductor dimensions: Ø 61 mm
– Rail dimensions: 80x15 mm, 2x 60x10 mm, 3x 50x10 mm

PACT MCR-V2-8020-105

– Primary rated current I_{pn}: 0...(500...2000) A
– Circular conductor dimensions: Ø 70 mm
– Rail dimensions: 2x 80x10 mm, 60x60 mm

Window-type curr. transformer, official calibration as an option

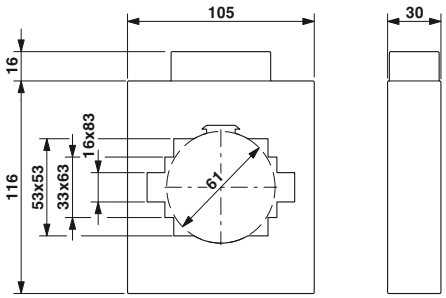
Window-type curr. transformer, official calibration as an option

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233

EAC



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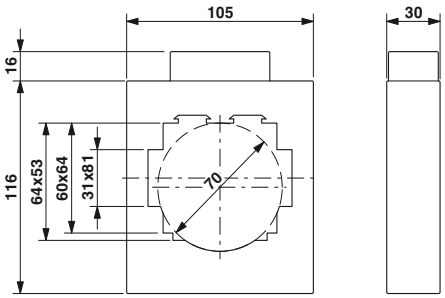


Description	Rated power S_n	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:							
- 400 A	7.5 VA	**PACT MCR-V2-8015-105- 400-5A-1**	2276256	1			
- 500 A	10 VA	**PACT MCR-V2-8015-105- 500-5A-1**	2276269	1			
- 600 A	10 VA	**PACT MCR-V2-8015-105- 600-5A-1**	2276272	1			
- 750 A	10 VA	**PACT MCR-V2-8015-105- 750-5A-1**	2276285	1			
- 800 A	15 VA	**PACT MCR-V2-8015-105- 800-5A-1**	2276298	1			
- 1000 A	10 VA	**PACT MCR-V2-8015-105-1000-5A-1**	2277721	1	**PACT MCR-V2-8020-105-1000-5A-1**	2277747	1
- 1000 A	15 VA	**PACT MCR-V2-8015-105-1000-5A-1**	2276308	1			
- 1250 A	10 VA	**PACT MCR-V2-8015-105-1250-5A-1**	2276311	1			
- 1500 A	15 VA	**PACT MCR-V2-8015-105-1500-5A-1**	2277734	1	**PACT MCR-V2-8020-105-1500-5A-1**	2277750	1
- 1600 A	15 VA	**PACT MCR-V2-8015-105-1600-5A-1**	2276324	1			
- 2000 A	10 VA				**PACT MCR-V2-8020-105-2000-5A-1**	2276382	1
- 2000 A	20 VA	**PACT MCR-V2-8015-105-2000-5A-1**	2276337	1			
- 2500 A	20 VA	**PACT MCR-V2-8015-105-2500-5A-1**	2276340	1			
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2- 8015-105**	2277352	1	**PACT MCR-V2- 8020-105**	2277365	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C- 8015-105**	2277491	1	**PACT MCR-V2C- 8020-105**	2277501	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.	/	Primary current I_{pn}	/	Secondary current I_{sn}	Class	/	Rated power S_n
2277352	/	IP25000	/	IS05	C10	/	P3000

Selection table PACT MCR-V2-8015-105 (Order No.: 2277352)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 400	500	600	750	800	1000	1250	1500	1600	2000	2500	Rated power S_n [VA]
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5		
			5	5	5	5	5	5	5	5	10		
				10		10	7.5	10	10	10	15		
									15	15	20		
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	10		
		5	5	5	5	5	5	5	10	10	15		
		7.5	10	10	10	10	10	10	15	15	20		
							15	15	20	20	25		
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	5	2.5	2.5	2.5	2.5	5	
		5	5	5	5	5	10	5	5	5	5	10	
				10	10	10	15	10	10	10	10	15	
					15	15	20			15	15	20	
	C10 ≙ 1	2.5	2.5	2.5	2.5	5	5	2.5	2.5	5	5	10	
		5	5	5	5	10	10	5	5	10	10	15	
		7.5	10	10	10	15	15	10	10	15	15	20	
					15		20		15		20	30	

Selection table PACT MCR-V2-8020-105 (Order No.: 2277365)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A] 500	600	750	800	1000	1250	1500	1600	2000	Rated power S_n [VA]
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
			5	5	5	5		5	5		
						10					
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
		5	5	5	5	5	5	5	5		
			7.5	7.5	7.5	10					
						15					
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
		5	5	5	5	5	5	5	5	5	
			7.5	7.5	7.5	10	10	10	10	10	
									15		
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	
		5	5	5	5	5	5	5	10	10	
			7.5	7.5	10	10	10	10	15		
								15			

Current transformers

PACT MCR-V2-10020-129

– Primary rated current I_{pn}:
  0...(400...4000) A
– Circular conductor dimensions: Ø 85 mm
– Rail dimensions:
  2x100x10 mm, 80x64 mm

PACT MCR-V2-10036-129

– Primary rated current I_{pn}:
  0...(400...4000) A
– Rail dimensions:
  3x 100x12 mm

Window-type curr. transformer, official calibration as an option

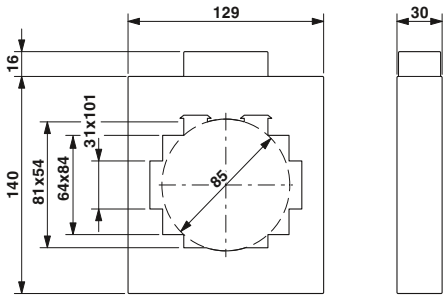
Window-type curr. transformer, official calibration as an option

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233

EAC



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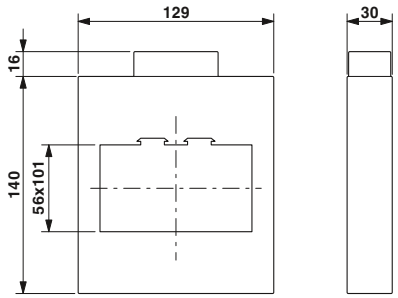


Description	Rated power S_n	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Primary rated current I_{pn}:							
- 2500 A	15 VA	**PACT MCR-V2-10020-129-2500-5A**	2276395	1			
- 3000 A	15 VA				**PACT MCR-V2-10036-129-3000-5A**	2276405	1
Current transformers, to determine the desired current transformer type, refer to the order key below		**PACT MCR-V2-10020-129**	2277378	1	**PACT MCR-V2-10036-129**	2277381	1
Current transformers that support official calibration: To specify the type of current transformer you require, please refer to the order key (see notes)		**PACT MCR-V2C-10020-129**	2277514	1	**PACT MCR-V2C-10036-129**	2277527	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.	Primary current I_{pn}	Secondary current I_{sn}	Class	Rated power S_n
2277378	IP40000	IS05	C05	P2500

Selection table PACT MCR-V2-10020-129 (Order No.: 2277378)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]													Rated power S_n [VA]
		400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
IS01 ≙ 1 A	C05 ≙ 0.5		2.5	5	5	5	5	5	5	5	5	5	5		
			5	10	10	10	10	10	10	10	10	10	10		
								15	15	15	15	15	15		
												20	20		
	C10 ≙ 1	2.5	2.5	5	5	5	5	5	5	5	5	5	5		
		5	5	10	10	10	10	10	10	10	10	10	10		
								15	15	15	15	15	15		
												25	30		
IS05 ≙ 5 A	C05 ≙ 0.5		2.5	2.5	5	5	5	5	5	5	5	5	5	5	
			5	5	10	10	10	10	10	10	10	10	10	10	
								15	15	15	15	15	15	15	
											20	20	25	25	
	C10 ≙ 1	2.5	2.5	5	5	5	5	5	5	5	5	5	5	5	
		5	5	10	10	10	10	10	10	10	10	10	10	10	
							15	15	15	15	15	15	15	15	
										20	25	30	30	30	

Selection table PACT MCR-V2-10036-129 (Order No.: 2277381)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]													Rated power S_n [VA]
		400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
IS01 ≙ 1 A	C05 ≙ 0.5		2.5	5	5	5	5	5	5	5	5	5	5		
			5	10	10	10	10	10	10	10	10	10	10		
								15	15	15	15	15	15		
												20	20		
	C10 ≙ 1	2.5	2.5	5	5	5	5	5	5	5	5	5	5		
		5	5	10	10	10	10	10	10	10	10	10	10		
								15	15	15	15	15	15		
												25	30		
IS05 ≙ 5 A	C05 ≙ 0.5		2.5	2.5	5	5	5	5	5	5	5	5	5	5	
			5	5	10	10	10	10	10	10	10	10	10	10	
								15	15	15	15	15	15	15	
											20	20	25	25	
	C10 ≙ 1	2.5	2.5	5	5	5	5	5	5	5	5	5	5	5	
		5	5	10	10	10	10	10	10	10	10	10	10	10	
							15	15	15	15	15	15	15	15	
											20	25	30	30	30

Current transformers

PACT MCR-V2-12020-159

– Primary rated current I_{pn}:
  0...(400...4000) A
– Circular conductor dimensions: Ø 96 mm
– Rail dimensions:
  2x 120x10 mm, 3x 100x10 mm,
  80x80 mm

PACT MCR-V2-12040-159

– Primary rated current I_{pn}:
  0...(400...4000) A
– Rail dimensions:
  4x 120x10 mm

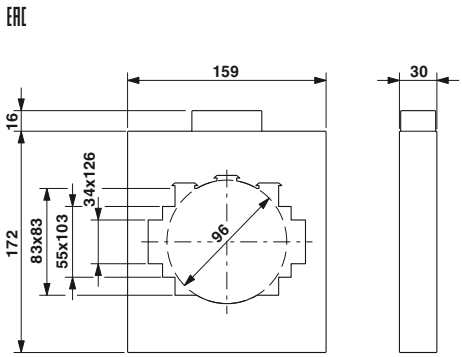
Window-type current transformer

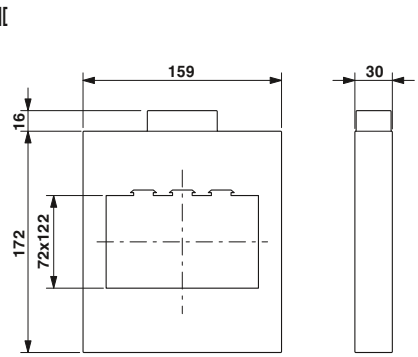
Window-type current transformer

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233





Description	Rated power S_n
Primary rated current I_{pn}:	
- 4000 A	15 VA
Current transformers, to determine the desired current transformer type, refer to the order key below	

Ordering data

Type	Order No.	Pcs./ Pkt.
PACT MCR-V2-12020-159	2277394	1

Ordering data

Type	Order No.	Pcs./ Pkt.
PACT MCR-V2-12040-159-4000-5A	2276418	1
PACT MCR-V2-12040-159	2277404	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.	Primary current I_{pn}	Secondary current I_{sn}	Class	Rated power
2277404	IP08000	IS01	C05	P250

Selection table PACT MCR-V2-12020-159 (Order No.: 2277394)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]													Rated power S_n [VA]
		400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	10	
		5	5	5	5	5	5	10	10	10	10	10	10	15	
		10	10	10	10	10	10	15	15	15	15	15	15	30	
							15	20	30	30	30	30	30	45	
	C10 ≙ 1	2.5	5	5	2.5	2.5	5	5	5	5	5	5	10	10	
		5	10	10	5	5	10	10	10	10	10	10	15	15	
		10	15	15	10	10	15	15	15	15	15	15	30	30	
		15	20	20		15	20	30	30	30	30	30	45	45	
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	5	5	10	5	5	5	10	10	
		5	5	5	5	5	10	10	15	10	10	10	15	15	
		10	10	10	10	10	15	15	30	15	15	15	30	30	
					15	15	30	30	45	30	30	30	45	45	
	C10 ≙ 1	2.5	5	5	5	5	5	5	10	5	5	10	10	10	
		5	10	10	10	10	10	10	15	10	10	15	15	15	
		10	15	15	15	15	15	15	30	15	15	30	30	30	
		15	20	20	20	30	30	30	45	30	30	45	45	45	

Selection table PACT MCR-V2-12040-159 (Order No.: 2277404)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]													Rated power S_n [VA]
		400	500	600	750	800	1000	1250	1500	1600	2000	2500	3000	4000	
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	5	5	5	5	10	
		5	5	5	5	5	5	10	10	10	10	10	10	15	
							10	15	15	15	15	15	15	30	
	C10 ≙ 1	2.5	5	5	2.5	2.5	5	5	5	5	5	5	10	10	
		5	10	10	5	5	10	10	10	10	10	10	15	15	
		10	15	15		10	15	15	15	15	15	15	30	30	
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	5	5	10	5	5	5	10	10	
		5	5	5	5	5	10	10	15	10	10	10	15	15	
					10	10	15	15	30	15	15	15	30	30	
	C10 ≙ 1	2.5	5	5	5	5	5	5	10	5	5	10	10	10	
		5	10	10	10	10	10	10	15	10	10	15	15	15	
		10	15	15	15	15	15	15	30	15	15	30	30	30	

PACT MCR-V3-60

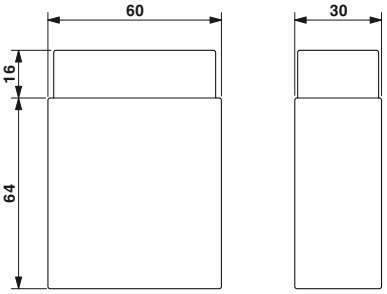
– Primary rated current I_{pn}: 0...(1...40) A

– Current-carrying copper lines connected directly to the screw terminal blocks on the primary side

Notes:

Our configurator, which is available at phoenixcontact.net/products, makes ordering easy.

The relevant installation accessories can be found on page 233



Winding current transformer

EAC

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Current transformers, to determine the desired current transformer type, refer to the order key below			
	PACT MCR-V3-60	2277417	1

Add **order key** from the selection table (ordering example marked in orange)

Order No.		Primary current I_{pn}		Secondary current I_{sn}		Class		Rated power S_n
2277417	/	IP00025	/	IS01	/	C10	/	P250

Selection table PACT MCR-V3-60 (Order No.: 2277417)

I_{sn}	Cl.	Primary rated current strength I_{pn} [A]														Rated power S_n [VA]
		1	2	2.5	4	5	6	7.5	10	12.5	15	20	25	30	40	
IS01 ≙ 1 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
		5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
		5	5	5	5	5	5	5	5	5	5	5	5	5	5	
IS05 ≙ 5 A	C05 ≙ 0.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
		5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	C10 ≙ 1	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
		5	5	5	5	5	5	5	5	5	5	5	5	5	5	

Accessories

Quick-action mechanism for PACT current transformers

– No tools necessary for mounting
– Extremely easy handling, thanks to secure fastening by pressing with finger
– Set consisting of two fixing pins and a holding latch

Notes:

The 16 mm wide quick-action mechanism can also be used for larger current transformers if the length of the fixing pins is sufficient.

for: ...-V2-4012-70..., ...-V2-5012-85...

for: ...-V2-3015-60..., ...-V2-6015-85..., ...-V2-6315-95...

	Technical data	Technical data
General data		
Ambient temperature (operation)	-25 °C ... 120 °C	-25 °C ... 120 °C
Width of the retaining bracket [mm]	13	16

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Quick-action mechanism						
Fixing pin length 65 mm	**PACT-FAST-MNT-W13-L65**	2276625	1			
Fixing pin length 40 mm	**PACT-FAST-MNT-W13-L40**	2276612	1			
Quick-action mechanism						
Fixing pin length 65 mm				**PACT-FAST-MNT-W16-L65**	2276641	1
Fixing pin length 40 mm				**PACT-FAST-MNT-W16-L40**	2276638	1

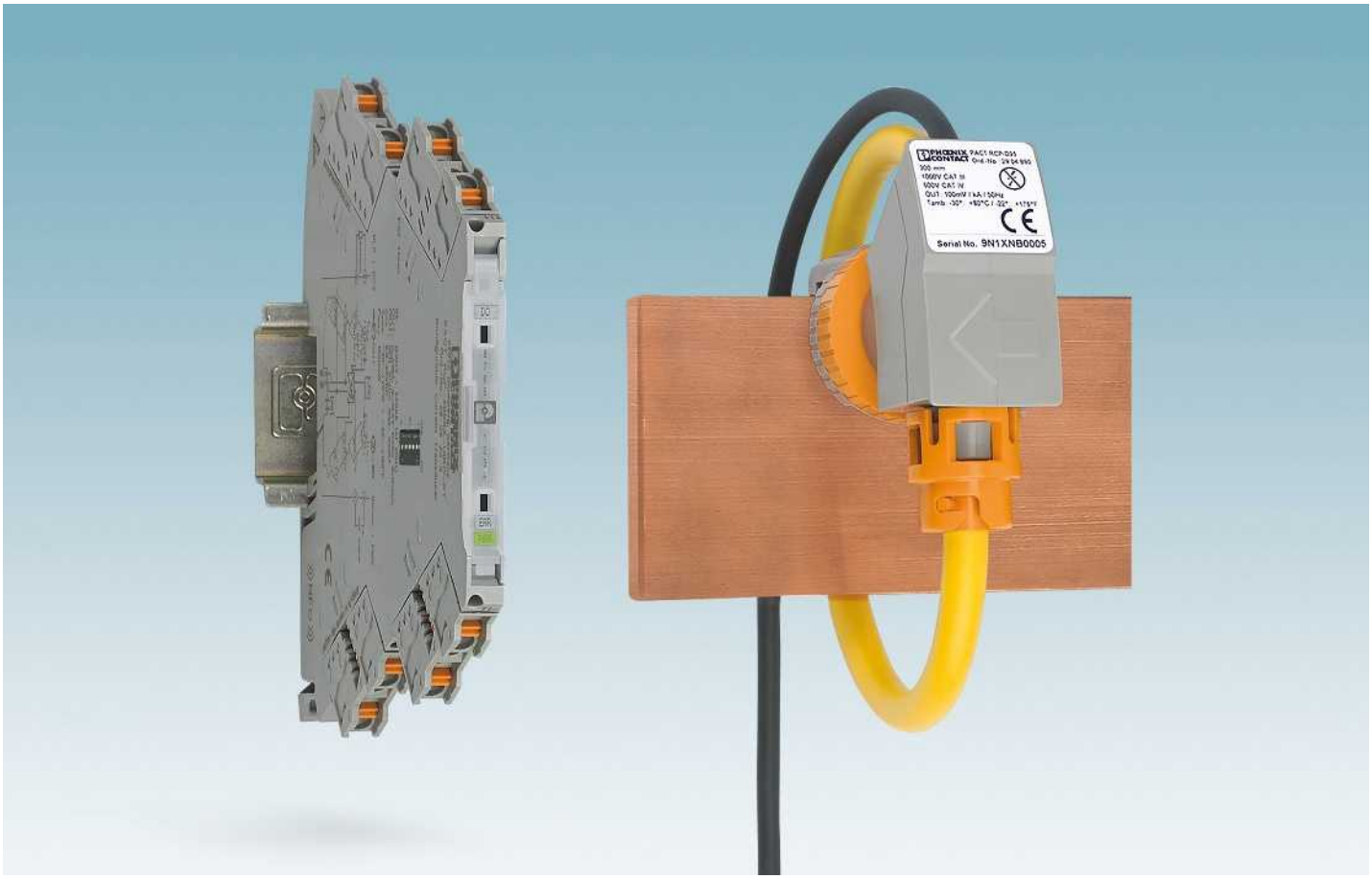
Accessories

– Copper sleeves
– DIN rail adapter
– Secondary terminal cover
– Insulating caps

Copper sleeves
DIN rail adapter

Secondary terminal cover
Insulating caps

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Copper sleeves, for establishing a conductive connection during the horizontal assembly of PACT analog current transformers. The size of the copper sleeve depends on the diameter of the inner hole of the current transformer.						
- for PACT MCR-V1-21-44-... Ø 21/8 mm	**PACT MCR-CB-21- 8**	2277569	1			
- for PACT MCR-V1-21-44-... Ø 21/12 mm	**PACT MCR-CB-21-12**	2277556	1			
- for PACT MCR-V2-3015-60-... Ø 28/12 mm	**PACT MCR-CB-28-12**	2277543	1			
- for PACT MCR-V2-5012-85-... Ø 42/12 mm	**PACT MCR-CB-42-12**	2277530	1			
DIN rail adapter	**PACT MCR-RA**	2277598	12			
Secondary terminal cover, for increasing the clearances and creepage distances						
Length: 60 mm				**PACT MCR-ETC-60**	2277572	9
Length: 75 mm				**PACT MCR-ETC-75**	2277585	9
Insulating caps, for protection against unintended contact with mounting screws of the primary rail				**PACT MCR-ICAP**	2277608	18



Fast installation in a confined space

PACT RCP current transformers for retrofitting can be conveniently mounted where there is not enough space for split core current transformers. System downtimes are reduced as system parts do not have to be removed for installation.

Your advantages:

– High system availability due to reduced downtimes: fast installation without removing system parts
– Safe installation and operation: no dangerous open circuit voltages
– No magnetic saturation
– High linearity, even at high currents
– Responds to fast current changes
– The coil is protected against electromagnetic interference
– The current can rise up to the short-circuit current without necessarily destroying the coil
– High nominal isolation voltage

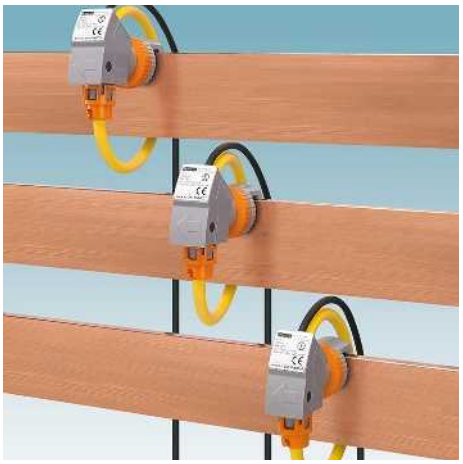
Professional holding device for busbars

The PACT RCP-CLAMP holding device offers the following advantages:

– Suitable for industrial applications
– Steel bracket ensures permanent fixed seating at high busbar temperatures
– Designed for rails with a thickness of 10 to 15 mm
– Rogowski coil is snapped onto the fixing element
– Rogowski coil has a safe and defined place on the busbar
– Rogowski coil can be rotated in 15° increments for optimum alignment.
– PACT RCP avoids direct contact of the measuring coil with its own or adjacent busbar
– This allows installations on warm busbars to remain under control

Easy and safe installation

Simply place the handy Rogowski coil quickly around busbars and circular conductors. The measuring transducer connected downstream supplies the same typical secondary currents as a standard current transformer.



Fast installation in a confined space

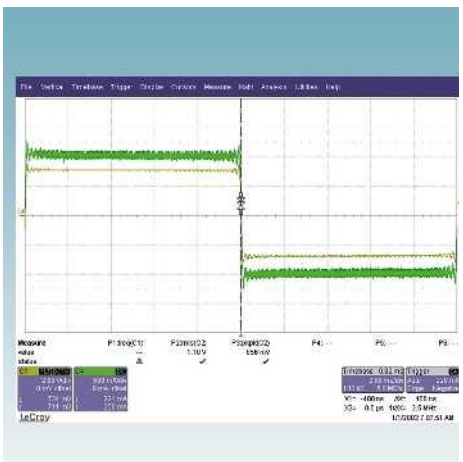
PACT RCP current transformers save space and are handy as the size and weight of the Rogowski coil are not dependent on the amperage and unlike split core current transformers, remain the same.

One measuring system for all amperages

Acquire alternating currents up to 4000 A using a single coil type. Rogowski coils are available in three different lengths for optimum adjustment to the busbar and circular conductor dimensions.

Eight current measuring ranges

The measuring transducer connected downstream supplies the same typical secondary currents as a standard current transformer. Choose between eight different current measuring ranges via DIP switches. For optimum measuring accuracy, compensate for the different coil lengths by simply using a potentiometer.



Detect harmonics and transients

PACT RCP current transformers for retrofitting cover a large frequency range from 10 to 5000 Hz. You can therefore measure harmonics and transients with phase accuracy.

Safe seating

The optional holding device ensures safe seating and optimal alignment of the coil even on very hot busbars. If the gap between the busbars is very small, simply turn the coil diagonally to avoid touching other rails.

PACT RCP

– Practical handling due to the flexible measuring coil for opening
– Universal application possibilities thanks to 8 different current measuring ranges in one device: (0 ... 100/ ... / ... /4000 A)
– The large bandwidth from 10 to 5000 Hz enables harmonics and transients to be detected
– It is not possible for dangerous open circuit voltages to occur
– The bracket ensures optimum alignment of the measuring coil to the busbar
– Low space requirement in the control cabinet

Current transformer for subsequent installation in the field

Technical data

Measuring coil input data	
Frequency range	40 Hz ... 20000 Hz
Position error	< 1 %
Measuring coil signal output	
Output signal (at 50 Hz)	100 mV (no load, at 1,000 A)
General data, measuring coil	
Length of signal cable	3000 mm
Rated insulation voltage	1000 V AC (rms CAT III) 600 V AC (rms CAT IV)
Test voltage	10.45 kV (DC / 1 min.)
Ambient temperature (operation)	-30 °C ... 80 °C (Measuring coil)
Ambient temperature (storage/transport)	-40 °C ... 80 °C (Measuring coil)
Measuring transducer input data	
Measuring ranges (current) via DIP switch	100 A , 250 A , 400 A , 630 A , 1000 A , 1500 A , 2000 A , 4000 A
Phase angle	< 1 °
Measuring transducer signal input	
Input signal (at 50 Hz)	100 mV (1000 A)
Measuring transducer signal output	
Current output signal	0 A AC ... 1 A
Miscellaneous data for measuring transducer	
Nominal supply voltage	24 V DC -20 % ... +25 %
Nominal supply voltage range	19.2 V DC ... 30 V DC
Transmission error, maximum	≤ 0.5 % (From the range end value)
Linearity error	< 0.5 % (From the range end value)
Frequency range	45 Hz ... 65 Hz
Degree of protection	IP20
Test voltage	1.5 kV AC (Supply/input and output: 50 Hz, 1 min)
Dimensions W/H/D	22.5 / 70.4 / 85 mm
Ambient temperature (operation)	-20 °C ... 70 °C (Measuring transducer)
Ambient temperature (storage/transport)	-25 °C ... 85 °C (Measuring transducer)
General data for the set	
Altitude	< 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Approvals/conformities	
Standards/specifications	IEC 61010-1 IEC 61010-2-032

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Current transformer for retrofitting, set consisting of Rogowski coil and measuring transducer, output signal: 1 A AC (effective for sine)			
Length of measuring coil 300 mm	**PACT RCP-4000A-1A-D95**	2904921	1
Length of measuring coil 450 mm	**PACT RCP-4000A-1A-D140**	2904922	1
Length of measuring coil 600 mm	**PACT RCP-4000A-1A-D190**	2904923	1

Accessories

Holding device for busbar			
for busbar thicknesses of 5 to 10 mm	**PACT RCP-CLAMP-5-10**	2907888	1
for busbar thicknesses of 10 to 15 mm	**PACT RCP-CLAMP**	2904895	1

Recommendations for the use of coil lengths and busbar dimensions

Busbar [mm x mm]	Diameter/ coil length [mm]	1 busbar per phase	2 busbars per phase	3 busbars per phase
30 x 10	95/300	X	X	
40 x 10	95/300	X	X	
40 x 10	140/450			X
50 x 10	95/300	X		
50 x 10	140/450		X	X
60 x 10	95/300	X		
60 x 10	140/450		X	X
60 x 10	140/450	X	X	X
100 x 10	140/450	X	X	
100 x 10	190/600			X
120 x 10	140/450	X		
120 x 10	190/600		X	X
160 x 10	190/600	X	X	X

Current transformers for retrofitting

PACT RCP

- Universal application possibilities thanks to 8 different current measuring ranges in one device: (0 ... 100/ ... / ... /4000 A)
- Detection of harmonics and transients in the frequency range from 16 to 1000 Hz
- Large number of different standard signals on output side
- Freely configurable 4-way signal conditioner with switching output
- FASTCON Pro plug-in connection system
- Overall width of just 6.2 mm
- Easy configuration e.g., via DIP switches, programmable software, via smartphone app or FDT/DTM

Current transformer for subsequent installation in the field

Technical data

Measuring coil input data	
Frequency range	40 Hz ... 20000 Hz
Position error	< 1 %
Measuring coil signal output	
Output signal (at 50 Hz)	100 mV (no load, at 1,000 A)
General data, measuring coil	
Length of signal cable	3000 mm
Rated insulation voltage	1000 V AC (rms CAT III) 600 V AC (rms CAT IV)
Test voltage	10.45 kV (DC / 1 min.)
Ambient temperature (operation)	-30 °C ... 80 °C (Measuring coil)
Measuring transducer input data	
Measuring ranges (current) via DIP switch	100 A , 250 A , 400 A , 630 A , 1000 A , 1500 A , 2000 A , 4000 A
Measuring transducer signal input	
Input signal (at 50 Hz)	100 mV (1000 A)
Measuring transducer signal output	
Current output signal	0 mA ... 20 mA (via DIP switch) 4 mA ... 20 mA (via DIP switch) 0 mA ... 10 mA (via DIP switch) 2 mA ... 10 mA (via DIP switch) 0 mA ... 21 mA (Can be set via software)
Output signal Voltage	0 V ... 10 V (via DIP switch) 2 V ... 10 V (via DIP switch) 0 V ... 5 V (via DIP switch) 1 V ... 5 V (via DIP switch) 0 V ... 10.5 V (Can be set via software)
Miscellaneous data for measuring transducer	
Nominal supply voltage	24 V DC
Nominal supply voltage range	9.6 V DC ... 30 V DC
Transmission error, maximum	≤ 0.5 % (From the range end value)
Frequency range	16 Hz ... 1000 Hz
Degree of protection	IP20
Test voltage	3 kV (50 Hz, 1 min.)
Dimensions W/H/D	6.2 / 110.5 / 120.5 mm
Ambient temperature (operation)	-40 °C ... 70 °C (Measuring transducer)
General data for the set	
Altitude	> 4000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Approvals/conformities	
Standards/specifications	IEC 61010-1 IEC 61010-2-032

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Current transformer with screw connection for retrofitting, set consisting of Rogowski coil and 4-way signal conditioner with switching output			
Length of measuring coil 300 mm	**PACT RCP-4000A-UIRO-D95**	2906231	1
Length of measuring coil 450 mm	**PACT RCP-4000A-UIRO-D140**	2906232	1
Length of measuring coil 600 mm	**PACT RCP-4000A-UIRO-D190**	2906233	1
Current transformer with Push-in connection for retrofitting, set consisting of Rogowski coil and 4-way signal conditioner with switching output			
Length of measuring coil 300 mm	**PACT RCP-4000A-UIRO-PT-D95**	2906234	1
Length of measuring coil 450 mm	**PACT RCP-4000A-UIRO-PT-D140**	2906235	1
Length of measuring coil 600 mm	**PACT RCP-4000A-UIRO-PT-D190**	2906236	1

Accessories

Holding device for busbar			
for busbar thicknesses of 5 to 10 mm	**PACT RCP-CLAMP-5-10**	2907888	1
for busbar thicknesses of 10 to 15 mm	**PACT RCP-CLAMP**	2904895	1

With flexible power supply – current transducers up to 12 A AC

Active current transducers convert sinusoidal alternating currents up to 12 A. The integrated wide-range power supply unit enables use in various different countries.

With hinged Rogowski sensor – current transducers up to 200 A AC

The AC current transducers measure sinusoidal and non-sinusoidal alternating currents up to 200 A. The hinged Rogowski sensor ensures very easy installation, as cables that are to be measured do not have to be isolated. This enables mounting to be carried out without interruptions.

Limit value monitoring with the current protector

At the current protector, a desired amperage is specified at which a PDT contact switches a load on or off.

Flexible signal conditioning – current transducers up to 55 A AC/DC

Current transducers up to 55 A offer an infinitely adjustable measuring range. This range is mapped over the entire output signal range. This ensures extremely accurate resolution of measured values. Basic configuration can be performed quickly via the DIP switches. Additional useful device functions can be set via the software.

For high currents – current transducers up to 600 A AC/DC

The universal current transducers are the ideal solution for measuring high currents with any waveform up to 600 A AC/DC. The product range offers various different devices in graded measuring ranges with current or voltage output.

For sinusoidal alternating currents up to 12 A
– 3-way electrical isolation
– Wide-range version from 19.2 to 253 V AC/DC
– Voltage bridging with DIN rail connector
– Input and output can be configured via DIP switches
– Suitable for potentially explosive areas, thanks to ATEX approval for Ex Zone 2

For sinusoidal and non-sinusoidal alternating currents up to 200 A
– Distorted alternating currents up to 6000 Hz can be also acquired, thanks to true r.m.s. value measurement (RMS)
– Uninterrupted installation and lossless current measurement thanks to hinged Rogowski sensor
– Measuring range selection with slide switch

Limit value monitoring
The current protector converts sinusoidal alternating currents to binary switching signals.
– Switching point can be freely selected in the measuring range from 0 to 16 A AC
– Relay PDT output
– Adjustable switch hysteresis
– 3-way isolation
– Settable operating current / quiescent current behavior

With flexible measuring ranges for all waveforms up to 55 A
– Lossless true r.m.s. value measurement without shunt via Hall sensor (TRMS)
– Optimum mapping of the measuring range up to 55 A, thanks to software-programmable upper and lower limits
– Limit value alarm in the event of threshold value overrange or underrange up to 55 A – via relay or transistor output

For high currents – current transducers up to 600 A AC/DC
– Lossless true r.m.s. value measurement without shunt via Hall sensor (TRMS)
– Compact dimensions also enable distributed use
– Variable mounting on DIN rail and mounting plate
– COMBICON plug-in connection terminal blocks
– 3-way isolation
– For a conductor diameter of up to 32 mm

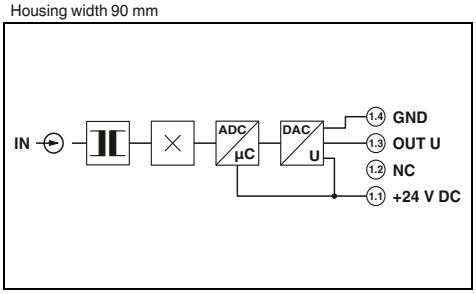
Current transducers for AC, DC, and distorted currents

The **MCR-SL-CUC-...** current transducers measure DC, AC, and distorted currents from 0 to 600 A.

– Universal current measurement, no shunt required
– Compact dimensions also enable distributed use
– Variable mounting on DIN rail and mounting plate
– Simple connection method thanks to COMBICON plug-in connection terminal blocks
– 3-way isolation

For DC, AC, and distorted currents of 0 ... 300 A, voltage output

Housing width 90 mm



Technical data

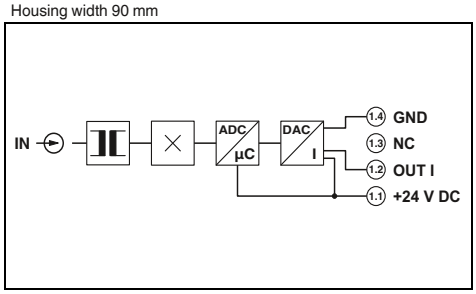
Input data	
Frequency range	20 Hz ... 6000 Hz (0 Hz)
Curve type	AC, DC or distorted currents
Connection method	Cable design: 32 mm diameter
Output data	
Output signal	0 ... 10 V
Maximum output signal	
Load R_B	≥ 10 kΩ
General data	
Supply voltage U_B	20 V DC ... 30 V DC
Maximum transmission error	<± 1 % (of final value)
Temperature coefficient	typ. 0.02 %/K (0 ... 60°C) 0.04 %/K (-40 ... 65 °C)
Step response (10-90%)	150 ms
Safe isolation	acc. to EN 61010
Rated insulation voltage	300 V AC
Surge voltage category/degree of pollution	III / 2
Degree of protection	IP20
Ambient temperature range	-40 °C ... 65 °C
Dimensions W/H/D	90 / 33.8 / 85 mm
Spring-cage connection (solid/stranded/AWG)	0.25 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508

Ordering data

Description	Overload capacity	Type	Order No.	Pcs./ Pkt.
Universal current transducer				
Input current range: 0 ... 100 A	6 x I_{IN}	**MCR-SL-CUC-100-U**	2308108	1
Input current range: 0 ... 200 A	3 x I_{IN}	**MCR-SL-CUC-200-U**	2308205	1
Input current range: 0 ... 300 A	3.33 x I_{IN}	**MCR-SL-CUC-300-U**	2308302	1
Input current range: 0 ... 400 A	2.5 x I_{IN}			
Universal current transducer without UL approval				
Input current range: 0 ... 500 A	3.6 x I_{IN}			
Input current range: 0 ... 600 A	3 x I_{IN}			

For DC, AC, and distorted currents of 0 ... 600 A, current output

Housing width 90 mm



Technical data

	20 Hz ... 6000 Hz (0 Hz)
	AC, DC or distorted currents
	Cable design: 32 mm diameter
	4 ... 20 mA
	< 25 mA
	< 300 Ω
	20 V DC ... 30 V DC
	<± 1 % (of final value)
	typ. 0.02 %/K (0 ... 60°C) 0.04 %/K (-40 ... 65 °C)
	150 ms
	acc. to EN 61010
	300 V AC
	III / 2
	IP20
	-40 °C ... 65 °C
	90 / 33.8 / 85 mm
	0.25 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
	CE-compliant
	UL/C-UL listed UL 508

Ordering data

Type	Order No.	Pcs./ Pkt.
MCR-SL-CUC-100-I	**2308027**	1
MCR-SL-CUC-200-I	**2308030**	1
MCR-SL-CUC-300-I	**2308043**	1
MCR-SL-CUC-400-I	**2308072**	1
MCR-SL-CUC-500-I	**2308085**	1
MCR-SL-CUC-600-I	**2308098**	1

Current transducers for AC, DC, and distorted currents

The **MCR-S-...-UI(-SW)-DCI** current transducers measure direct, alternating, and distorted currents.

– Device can be set via DIP switches or MCR/PI-CONF-WIN configuration software
– True r.m.s. value measurement
– 3-way isolation
– With optional relay and transistor output

Notes:

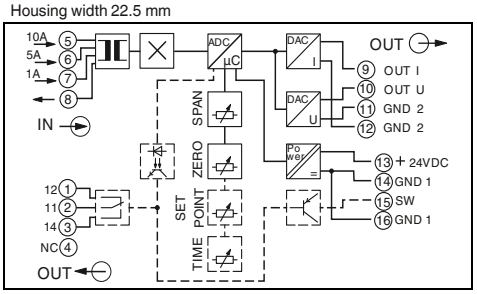
To order a configurable product, please enter the desired configuration using the order key, see page 244

Further information about the configuration software can be found on page 251

For DC, AC, and distorted currents
0 ... 11 A

Ex:

Housing width 22.5 mm



Technical data

Input data		
Input current		0 A ... 11 A (AC/DC)
Operate threshold		2 % (of measuring range nominal value 1/5/10 A)
Frequency range		15 Hz ... 400 Hz
Curve type		AC, DC or distorted currents
Overload capacity		2 x I_N (continuous)
Surge strength		20 x I_N (1 s)
Connection method		Screw connection
Output data		U output / I output
Output signal (normal and inverse)		0 ... 5 V / 1 ... 5 V / 0 ... 10 V / 2 ... 10 V / -5 ... 5 V / -10 ... 10 V / 0 ... 20 mA / 4 ... 20 mA
Load R_B		> 10 kΩ / < 500 Ω
Switching output		
Relay output	Contact material	1 PDT / AgSnO, hard gold-plated
	Maximum switching current	50 mA (for gold layer, 30 V AC/ 36 V DC) 2 A (in case of a destroyed gold layer, 250 V AC)
Transistor output pnp	Output voltage	19 V ... 29 V (supply voltage - 1 V)
	Continuous load current	80 mA (Not short-circuit-proof)
Setting range of the threshold value		1 % ... 110 %
Response delay		0.1 s ... 20 s
Status indication		Yellow LED
General data		
Supply voltage U_B		20 V DC ... 30 V DC
Current consumption		< 50 mA (without load)
Maximum transmission error		< 0.5 % (of nominal range value under nominal conditions)
Temperature coefficient		typ. < 0.025 %/K
Step response (10-90%)		330 ms (with AC) 40 ms (with DC)
Safe isolation		acc. to EN 50178, EN 61010
Rated insulation voltage		300 V AC (to ground)
Surge voltage category/degree of pollution		III / 2
Test voltage input/output		4 kV (50 Hz, 1 min.)
Test voltage input/power supply		4 kV (50 Hz, 1 min.)
Test voltage output/power supply		500 V (50 Hz, 1 min.)
Degree of protection		IP20
Dimensions W/H/D		22.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
EMC note		Class A product, see page 605
Conformance/Approvals		
Conformance		CE-compliant
UL, USA/Canada		Class I, Zone 2, AEx nA nC IIC T4, Ex nA nC IIC T4 Gc X

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR current transducer for measuring AC, DC, and distorted currents with relay and transistor switching output			
Configurable product	**MCR-S-1-5-UI-SW-DCI**	**2814650**	1
Standard product	**MCR-S-1-5-UI-SW-DCI-NC**	**2814731**	1
Configurable product, without switching output	**MCR-S-1-5-UI-DCI**	**2814634**	1
Standard product, without switching output	**MCR-S-1-5-UI-DCI-NC**	**2814715**	1

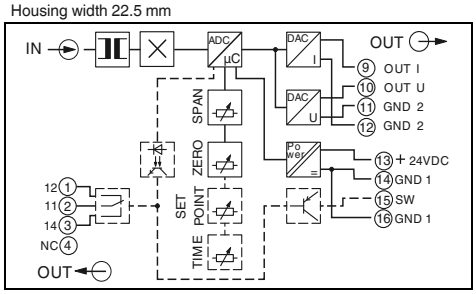
new

For DC, AC, and distorted currents
0 ... 55 A

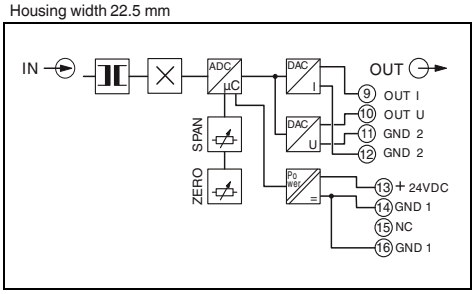
For DC, AC, and distorted currents
0 to 100 A

Ex:

Housing width 22.5 mm



Housing width 22.5 mm



Technical data

0 A ... 55 A (AC/DC)	
1 % (of measuring range nominal value 50 A)	
15 Hz ... 400 Hz	
AC, DC or distorted currents	
Depending on through connected conductor	
Depending on through connected conductor	
Through connection, diameter 10.5 mm	
U output	I output
0 ... 5 V / 1 ... 5 V / 0 ... 10 V	0 ... 20 mA / 4 ... 20 mA
2 ... 10 V / -5 ... 5 V / -10 ... 10 V	
> 10 kΩ	< 500 Ω
1 PDT / AgSnO, hard gold-plated	
50 mA (for gold layer, 30 V AC/ 36 V DC) 2 A (in case of a destroyed gold layer, 250 V AC)	
19 V ... 29 V (supply voltage - 1 V)	
80 mA (Not short-circuit-proof)	
1 % ... 110 %	
0.1 s ... 20 s	
Yellow LED	
20 V DC ... 30 V DC	
< 50 mA (without load)	
< 0.5 % (of nominal range value under nominal conditions)	
typ. < 0.025 %/K	
330 ms (with AC) 40 ms (with DC)	
acc. to EN 50178, EN 61010	
300 V AC (to ground)	
III / 2	
4 kV (50 Hz, 1 min.)	
4 kV (50 Hz, 1 min.)	
500 V (50 Hz, 1 min.)	
IP20	
22.5 / 99 / 114.5 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Class A product, see page 605	
CE-compliant	
Class I, Zone 2, AEx nA nC IIC T4, Ex nA nC IIC T4 Gc X	

Ordering data

Type	Order No.	Pcs./ Pkt.
MCR-S-10-50-UI-SW-DCI	**2814663**	1
MCR-S10-50-UI-SW-DCI-NC	**2814744**	1
MCR-S-10-50-UI-DCI	**2814647**	1
MCR-S10-50-UI-DCI-NC	**2814728**	1

Technical data

-100 A ... 100 A (AC/DC)	
1 % (of measuring range nominal value 100 A)	
15 Hz ... 400 Hz	
AC, DC or distorted currents	
Depending on through connected conductor	
Depending on through connected conductor	
Through connection, diameter 10.5 mm	
U output	I output
0 ... 5 V / 1 ... 5 V / 0 ... 10 V	0 ... 20 mA / 4 ... 20 mA
2 ... 10 V / -5 ... 5 V / -10 ... 10 V	
> 10 kΩ	< 500 Ω
- / -	
-	
-	
-	
-	
-	
-	
20 V DC ... 30 V DC	
< 40 mA (without load)	
< 0.5 % (of nominal range value under nominal conditions)	
typ. < 0.025 %/K	
330 ms (AC) 40 ms (DC)	
acc. to EN 50178, EN 61010	
300 V AC (to ground)	
III / 2	
4 kV (50 Hz, 1 min.)	
4 kV (50 Hz, 1 min.)	
500 V (50 Hz, 1 min.)	
IP20	
22.5 / 99 / 114.5 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Class A product, see page 605	
CE-compliant	
Class I, Zone 2, AEx nA nC IIC T4, Ex nA nC IIC T4 Gc X	

Ordering data

Type	Order No.	Pcs./ Pkt.
MCR-S-20-100-UI-DCI	**2908798**	1

Current measurement

Order key for current transducers (standard configuration entered as an example)

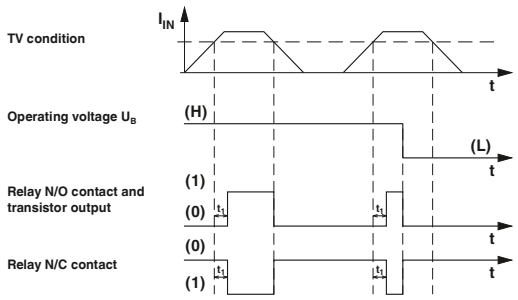
Order No.	Measuring range: Start	Measuring range: End	Output	Threshold value	Suppression time	Switching behavior of relay and transistor	
2814634	0.00	5.00	OUT01				
2814650	**0.00**	**5.00**	**OUT01**	**50**	**3.0**	**A**	**O**
2814634 ≙ MCR-S-1-5-UI-DCI 2814650 ≙ MCR-S-1-5-UI-SW-DCI	Measuring range initial value between 0.00 ... 7.50 A 0.00 ≙ 0.00 A	Measuring range final value between 0.2 ... 11 A 5.00 ≙ 5.00 A	OUT01 ≙ 0 ... 20 mA OUT02 ≙ 4 ... 20 mA OUT03 ≙ 0 ... 10 V OUT04 ≙ 2 ... 10 V OUT05 ≙ 0 ... 5 V OUT06 ≙ 1 ... 5 V OUT07 ≙ 20 ... 0 mA OUT08 ≙ 20 ... 4 mA OUT09 ≙ 10 ... 0 V OUT10 ≙ 10 ... 2 V OUT11 ≙ 5 ... 0 V OUT12 ≙ 5 ... 1 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V OUT17 ≙ +10 ... -10 V OUT18 ≙ +5 ... -5 V	Switching threshold between 1 ... 110% 50 ≙ 50% of the set measuring range final value (here 2.5 A)	between 0.1 ... 20 s 3.0 ≙ 3 s	A ≙ Operating-current-controlled R ≙ Closed-circuit-current-controlled	O ≙ Overrange U ≙ Underrange

Order No.	Measuring range: Start	Measuring range: End	Output	Threshold value	Suppression time	Switching behavior of relay and transistor	
2814647	0.0	50.0	OUT01				
2814663	**0.0**	**50.0**	**OUT01**	**50**	**3.0**	**A**	**O**
2814647 ≙ MCR-S-10-50-UI-DCI 2814663 ≙ MCR-S-10-50-UI-SW-DCI	Measuring range initial value between 0.0 ... 37.5 A 0.0 ≙ 0.0 A	Measuring range final value between 9.5 ... 55 A 50.0 ≙ 50.0 A	OUT01 ≙ 0 ... 20 mA OUT02 ≙ 4 ... 20 mA OUT03 ≙ 0 ... 10 V OUT04 ≙ 2 ... 10 V OUT05 ≙ 0 ... 5 V OUT06 ≙ 1 ... 5 V OUT07 ≙ 20 ... 0 mA OUT08 ≙ 20 ... 4 mA OUT09 ≙ 10 ... 0 V OUT10 ≙ 10 ... 2 V OUT11 ≙ 5 ... 0 V OUT12 ≙ 5 ... 1 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V OUT17 ≙ +10 ... -10 V OUT18 ≙ +5 ... -5 V	Switching threshold between 1 ... 110% 50 ≙ 50% of the set measuring range final value (here 25 A)	between 0.1 ... 20 s 3.0 ≙ 3 s	A ≙ Operating-current-controlled R ≙ Closed-circuit-current-controlled	O ≙ Overrange U ≙ Underrange

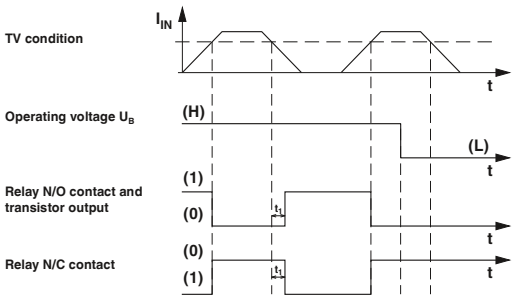
Order No.	Measuring range: Start	Measuring range: End	Output
2908798	0.0	100.0	OUT01
2908798 ≙ MCR-S-20-100-UI-DCI	Measuring range initial value between 0.0 ... 75 A 0.0 ≙ 0.0 A	Measuring range final value between 19 ... 110 A 100 ≙ 100 A	OUT01 ≙ 0 ... 20 mA OUT02 ≙ 4 ... 20 mA OUT03 ≙ 0 ... 10 V OUT04 ≙ 2 ... 10 V OUT05 ≙ 0 ... 5 V OUT06 ≙ 1 ... 5 V OUT07 ≙ 20 ... 0 mA OUT08 ≙ 20 ... 4 mA OUT09 ≙ 10 ... 0 V OUT10 ≙ 10 ... 2 V OUT11 ≙ 5 ... 0 V OUT12 ≙ 5 ... 1 V OUT13 ≙ -5 ... +5 V OUT14 ≙ -10 ... +10 V OUT17 ≙ +10 ... -10 V OUT18 ≙ +5 ... -5 V

Function chart: switching behavior of relay and transistor output:

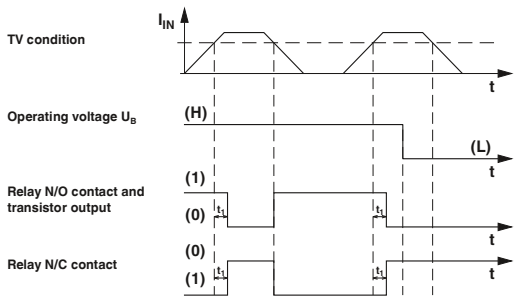
1) Operating-current-controlled when above the threshold value (TV)



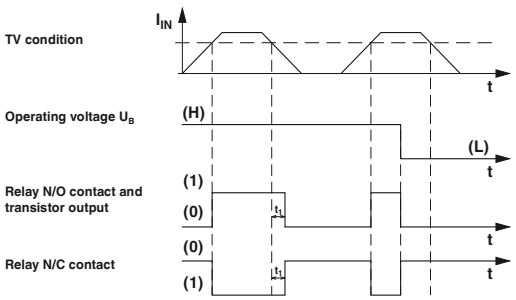
2) Operating-current-controlled when below the threshold value (TV)



3) Closed-circuit-current-controlled when above the threshold value (TV)



4) Closed-circuit-current-controlled when below the threshold value (TV)

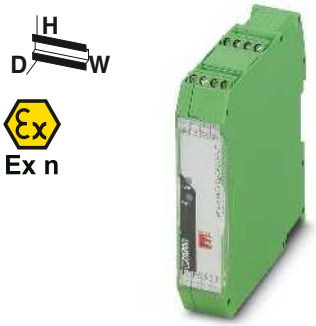


(0) ≙ N/O contact and transistor open / N/C contact closed
(1) ≙ N/O contact and transistor closed / N/C contact open

AC current transducers, sinusoidal

The **MCR-SL-CAC-...** current transducers measure sinusoidal alternating currents from 0 to 1/5/12 A.

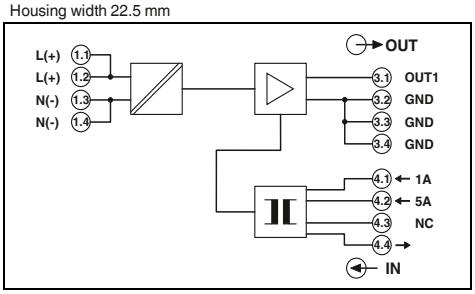
– Wide range version from 19.2 to 253 V AC/DC
– 3-way isolation
– Input and output can be configured via DIP switches



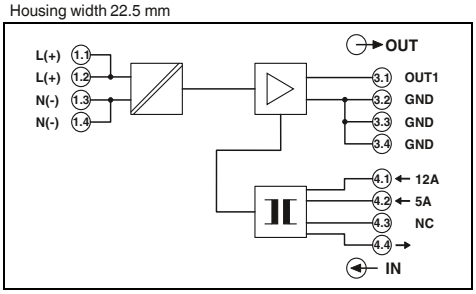
For sinusoidal alternating currents 0 ... 1 A/0 ... 5 A

For sinusoidal alternating currents 0 ... 5 A/0 ... 12 A

Ex:
Housing width 22.5 mm



Ex:
Housing width 22.5 mm



Technical data

Input data		
Input current (configurable)	0 A AC ... 1 A (configurable) / 0 A AC ... 5 A (configurable)	0 A AC ... 5 A (configurable) / 0 A AC ... 12 A (configurable)
Nominal frequency	50 Hz	50 Hz
Frequency range	45 Hz ... 65 Hz	45 Hz ... 65 Hz
Curve type	Sine	Sine
Overload capacity	2 x I_N (continuous)	1 x I_N (continuous)
Surge strength	20 x I_N (1 s)	8 x I_N (1 s)
Connection method	Screw terminal block	Screw terminal block
Output data		
Output signal (configurable)	0 ... 20 mA / 4 ... 20 mA	0 ... 20 mA / 4 ... 20 mA
Maximum output signal	25 mA	25 mA
Load R_B	< 500 Ω (at 20 mA)	< 500 Ω (at 20 mA)
Ripple	< 10 mV_{PP} (for 500 Ω at 20 mA)	< 10 mV_{PP} (for 500 Ω at 20 mA)
General data	MACX MCR-SL-CAC- 5-I / MACX MCR-SL-CAC- 5-I-UP	MACX MCR-SL-CAC-12-I-UP
Supply voltage U_B	19.2 V DC ... 30 V DC / 19.2 V AC/DC ... 253 V AC/DC	19.2 V AC/DC ... 253 V AC/DC
Current consumption	< 32 mA (at U_B=24 V DC, I_{OUT}=20 mA) / < 30 mA (at U_B=24 V DC, I_{OUT}=20 mA)	< 33 mA (at 24 V DC)
Maximum transmission error	≤ 0.5 % (of nominal range value under nominal conditions) / ≤ 0.5 % (of nominal range value under nominal conditions)	≤ 0.5 % (of nominal range value under nominal conditions)
Temperature coefficient	< 0.02 %/K / < 0.02 %/K	< 0.02 %/K
Step response (10-90%)	max. 300 ms typ. 200 ms / max. 300 ms typ. 200 ms	< 300 ms
Safe isolation	acc. to EN 61010 / acc. to EN 61010	acc. to EN 61010
Rated insulation voltage	- / -	300 V AC (to ground)
Overvoltage category Input/output	- / -	III
Degree of pollution	2 / 2	2
Test voltage input/output	4 kV (50 Hz, 1 min.) / 4 kV (50 Hz, 1 min.)	4 kV (50 Hz, 1 min.)
Test voltage output/power supply	1.5 kV (50 Hz, 1 min.) / 2 kV (50 Hz, 1 min.)	2 kV (50 Hz, 1 min.)
Degree of protection	IP20 / IP20	IP20
Ambient temperature range	-20 °C ... 65 °C (-4 °F...149 °F) / -20 °C ... 65 °C (-4 °F...149 °F)	-20 °C ... 65 °C (-4 °F...149 °F)
Dimensions W/H/D	22.5 / 104 / 114.5 mm / 22.5 / 104 / 114.5 mm	22.5 / 104 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14 / 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
ATEX	Ex II 3 G Ex nA IIC T4 Gc X	Ex II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada	UL 508 Recognized	-

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR current transducer for sinusoidal alternating currents			
Supply voltage 19.2 ... 30 V DC	**MACX MCR-SL-CAC- 5-I**	2810612	1
Supply voltage 19.2 ... 253 V AC/DC	**MACX MCR-SL-CAC- 5-I-UP**	2810625	1

Accessories

DIN rail connector, for bridging the supply voltage (19.2...30 V DC), can be snapped on to 35 mm DIN rails according to EN 60715	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50

Ordering data

Type	Order No.	Pcs./ Pkt.
MACX MCR-SL-CAC-12-I-UP	2810638	1

Accessories

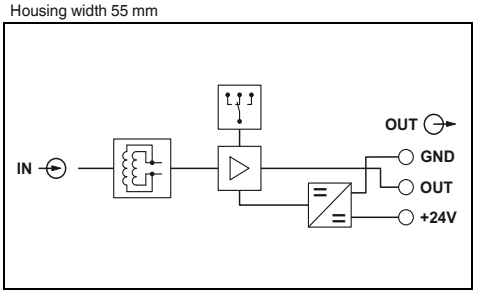
AC current transducers, sinusoidal and distorted

The **MCR-SL-S-...00-...** current transducers measure sinusoidal and non-sinusoidal alternating currents within the range from 0 to 200 A.

– 30 to 6000 Hz true r.m.s. value measurement
– Measuring range selection with slide switch
– Loop-powered
– Can be retrofitted with the open-up Rogowski coil

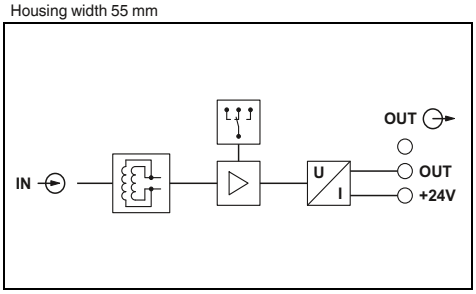
For sinusoidal and non-sinusoidal alternating currents, 0 ... 200 A, voltage output

Ex:
Housing width 55 mm



For sinusoidal and non-sinusoidal alternating currents, 0 ... 200 A, current output (loop-powered)

Ex:
Housing width 55 mm



Technical data

Input data	...-S-100-U	...-S-200-U
Input current (configurable)	0 A ... 100 A (0...50/75/100 A)	0 A ... 200 A (0..100/150/200 A)
Operate threshold	1 % (of final value)	
Frequency range	30 Hz ... 6000 Hz	
Curve type	Sinusoidal and non-sinusoidal	
Overload capacity	Depending on laid conductor	
Surge strength	Depending on through connected conductor	
Connection method	Clamp-on cable design, diameter 18.5 mm	
Output data		
Output signal	0 ... 5 V / 0 ... 10 V	
Maximum output signal	(0 V ... 10 V) 14 V, (0 V ... 5 V) 7 V	
Load R_B	≥ 10 kΩ	
General data		
Supply voltage U_B	20 V DC ... 30 V DC	
Current consumption	< 30 mA	
Maximum transmission error	< 1 % (of final value)	
Cable position error	< 0.63 %	
Temperature coefficient	< 0.035 %/K	
Step response (10-90%)	< 340 ms	
Safe isolation	As per IEC 61010-1 and IEC 61326	
Rated insulation voltage	300 V AC (to ground)	
Surge voltage category/degree of pollution	III / 2	
Test voltage input/output	5 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature range	-20 °C ... 60 °C	
Dimensions W/H/D	55 / 85 / 70.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance/Approvals		
Conformance	CE-compliant	
UL, USA/Canada	cULus	

Technical data

Input data	...-S-100-I-LP	...-S-200-I-LP
Input current (configurable)	0 A ... 100 A (0...50/75/100 A)	0 A ... 200 A (0...100/150/200 A)
Operate threshold	1 % (of final value)	
Frequency range	30 Hz ... 6000 Hz	
Curve type	Sinusoidal and non-sinusoidal	
Overload capacity	Depending on laid conductor	
Surge strength	Depending on through connected conductor	
Connection method	Clamp-on cable design, diameter 18.5 mm	
Output data		
Output signal	4 ... 20 mA	
Maximum output signal	< 25 mA	
Load R_B	(U_B - 12 V) x 350 / 12 A	
General data		
Supply voltage U_B	20 V DC ... 30 V DC	
Current consumption		
Maximum transmission error	< 1 % (of final value)	
Cable position error	< 0.63 %	
Temperature coefficient	< 0.025 %/K	
Step response (10-90%)	< 340 ms	
Safe isolation	As per IEC 61010-1 and IEC 61326	
Rated insulation voltage	300 V AC (to ground)	
Surge voltage category/degree of pollution	III / 2	
Test voltage input/output	5 kV (50 Hz, 1 min.)	
Degree of protection	IP20	
Ambient temperature range	-20 °C ... 60 °C	
Dimensions W/H/D	55 / 85 / 70.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance/Approvals		
Conformance	CE-compliant	
UL, USA/Canada	cULus	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR current transducer for sinusoidal and non-sinusoidal alternating currents			
Input current range: 0...50/75/100 A	**MCR-SL-S-100-U**	2813457	1
Input current range: 0...100/150/200 A	**MCR-SL-S-200-U**	2813460	1

Ordering data

Type	Order No.	Pcs./ Pkt.
MCR-SL-S-100-I-LP	2813486	1
MCR-SL-S-200-I-LP	2813499	1

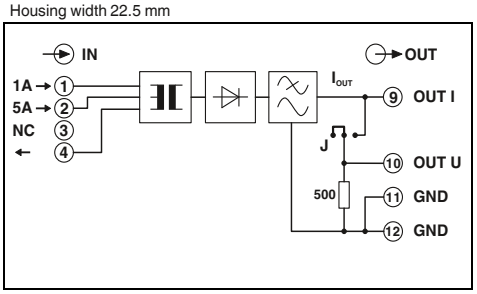
Passive AC current transducers, sinusoidal

The **MCR-SLP-1-5-UI-0** passive current transducer measures sinusoidal alternating currents within the range from 0 to 1 A/0 to 5 A.

– Loop-powered
– Measuring ranges 1 and 5 A AC reconnectable

For sinusoidal alternating currents 0 ... 1 A/0 ... 5 A

Housing width 22.5 mm



Technical data

Input data	1 A input	5 A input
Input current	0 A AC ... 1 A	0 A AC ... 5 A
Frequency range	45 Hz ... 60 Hz	45 Hz ... 60 Hz
Curve type	Sine	Sine
Overload capacity	2 x I_N (5 min. at 60°C ambient temperature)	2 x I_N (5 min. at 60°C ambient temperature)
Surge strength	50 A (1 s)	100 A (1 s)
Permissible output range	1.2 x I_N	1.2 x I_N
Connection method	Screw connection	Screw connection
Output data	U output	I output
Output signal	0 ... 10 V	0 ... 20 mA
Maximum output signal	20 V	30 mA
Load R_B	> 100 kΩ	< 750 Ω < 250 Ω (when current and voltage outputs are used simultaneously)
Ripple	< 50 mV_{PP}	< 50 mV_{PP}
General data		
Maximum transmission error	< 0.5 % (of final value)	
Temperature coefficient	< 0.015 %/K	
Step response (10-90%)	< 200 ms	
Safe isolation	acc. to EN 50178, EN 61010	
Rated insulation voltage	300 V AC (to ground)	
Surge voltage category/degree of pollution	III / 2	
Degree of protection	IP20	
Ambient temperature range	-25 °C ... 60 °C	
Dimensions W/H/D	22.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm^2 / 0.2 ... 2.5 mm^2 / 24 - 14	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR passive current transducer for sinusoidal alternating currents	**MCR-SLP-1-5-UI-0**	**2814359**	1

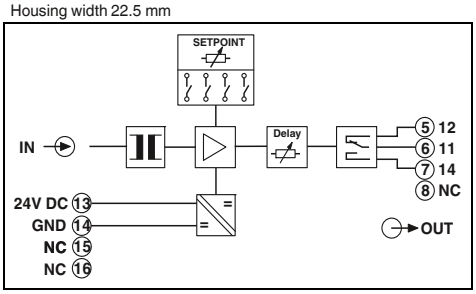
AC current protector, sinusoidal

The **MCR-SL-S-16-SP-24** current protector converts sinusoidal 50 Hz/60 Hz alternating currents into binary switching signals.

– Switching point can be freely selected in the measuring range of 0 to 16 A AC
– Relay PDT output
– Adjustable switch hysteresis
– 3-way isolation
– Adjustable operating current / quiescent current behavior

For sinusoidal alternating currents, 0 ... 16 A AC

cULus EAC
Housing width 22.5 mm

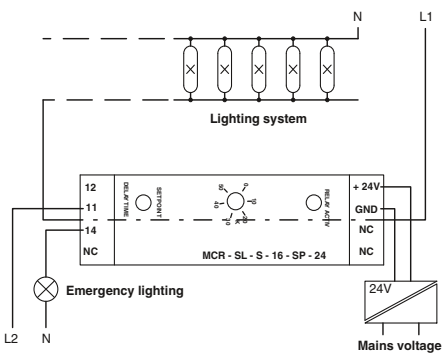


Technical data

Input data	
Input current	0 A AC ... 16 A
Frequency range	45 Hz ... 65 Hz
Curve type	Sine
Overload capacity	2 x $I_{N\,I}$ continuous)
Connection method	Through connection, diameter 4.2 mm
Switching output	Relay output
Contact type	1 PDT
Contact material	AgSnO, hard gold-plated
Max. switching current	50 mA (for gold layer, 30 V AC/ 36 V DC) 2 A (in case of a destroyed gold layer, 250 V AC)
Switching hysteresis	Adjustable using a DIP switch (0.5 %, 5 %, 10 %, 15 %)
Response delay	typ. 0.1 s ... 10 s (Adjustable using a potentiometer)
Operating and closed circuit current behavior	Adjustable using a DIP switch
Relay status display	Yellow LED (relay active)
General data	
Supply voltage U_B	20 V DC ... 30 V DC
Current consumption	< 30 mA
Setting accuracy	< 0.5 %
Temperature coefficient	< 0.02 %/K
Step response (10-90%)	40 ms
Safe isolation	acc. to EN 50178, EN 61010-1
Rated insulation voltage	300 V AC (to ground)
Surge voltage category/degree of pollution	III / 2
Test voltage input/output	4 kV (50 Hz, 1 min.)
Test voltage input/power supply	4 kV (50 Hz, 1 min.)
Degree of protection	IP20
Ambient temperature range	-20 °C ... 65 °C
Dimensions W/H/D	22.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR current protector for sinusoidal alternating currents			
	MCR-SL-S- 16-SP- 24	2864464	1



Lighting system with emergency lighting

Voltage transducers

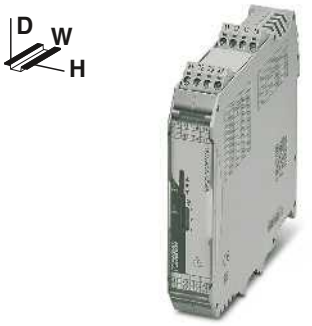
The MACX MCR-VDC voltage transducer measures DC voltages within the range of 0 to ±660 V DC. The MACX MCR-VAC module measures sinusoidal AC voltages from 0 to 660 V AC.

– Bidirectional output signals
– 9 voltage measuring ranges
– Voltage measuring ranges can be freely adjusted
– ZERO/SPAN adjustment ±20%
– 3-way isolation

new

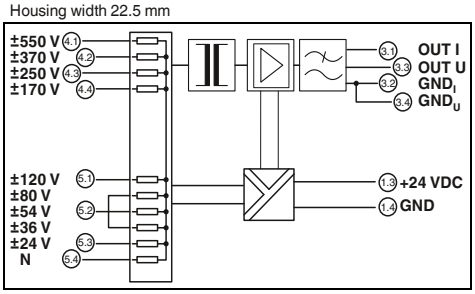
For DC voltages from 0 to ±660 V DC

new

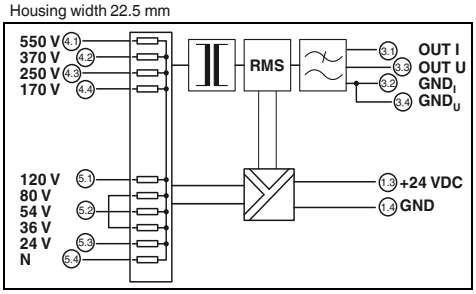


For sinusoidal AC voltages 0 ... 660 V AC

Housing width 22.5 mm



Housing width 22.5 mm



Technical data

Input data		
Input voltage range / resistor	-550 V DC ... 550 V DC	5500 kΩ
	-370 V DC ... 370 V DC	3700 kΩ
	-250 V DC ... 250 V DC	2500 kΩ
	-170 V DC ... 170 V DC	1700 kΩ
	-120 V DC ... 120 V DC	1200 kΩ
	-80 V DC ... 80 V DC	800 kΩ
	-54 V DC ... 54 V DC	540 kΩ
	-36 V DC ... 36 V DC	540 kΩ
	-24 V DC ... 24 V DC	540 kΩ
ZERO / SPAN adjustment	± 20 % / ± 20 %	
Frequency range	-	
Maximum input voltage	± 660 V DC	
Output data	**U output**	**I output**
Output signal	-10 ... 10 V	-20 ... 20 mA
Maximum output signal	≤ 11 V	≤ 22 mA
Load R_B	> 10 kΩ	< 500 Ω
Ripple	50 mV	50 mV
General data		
Supply voltage U_B	19.2 V DC ... 30 V DC	
Current consumption	< 60 mA	
Maximum transmission error	< 1 % (of measuring range end value)	
Temperature coefficient	< 0.015 %/K	
Step response (10-90%)	< 16 ms	
Safe isolation	according to IEC 61010-1	
Rated insulation voltage	300 V DC	
Surge voltage category/degree of pollution	- / 2	
Degree of protection	IP20	
Dimensions W/H/D	22.5 / 99 / 114.5 mm	
Connection data solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
UL, USA/Canada	UL 61010 Listed	

Technical data

Input data		
Input voltage range / resistor	0 V ... 550 V AC	5500 kΩ
	0 V ... 370 V AC	3700 kΩ
	0 V ... 250 V AC	2500 kΩ
	0 V ... 170 V AC	1700 kΩ
	0 V ... 120 V AC	1200 kΩ
	0 V ... 80 V AC	800 kΩ
	0 V ... 54 V AC	800 kΩ
	0 V ... 36 V AC	800 kΩ
	0 V ... 24 V AC	240 kΩ
ZERO / SPAN adjustment	± 20 % / ± 20 %	
Frequency range	45 Hz ... 405 Hz	
Maximum input voltage	+ 660 V AC	
Output data	**U output**	**I output**
Output signal	0 ... 10 V / 2 ... 10 V	0 ... 20 mA / 4 ... 20 mA
Maximum output signal	≤ 11 V	≤ 22 mA
Load R_B	> 10 kΩ	< 500 Ω
Ripple	50 mV	50 mV
General data		
Supply voltage U_B	19.2 V DC ... 30 V DC	
Current consumption	< 45 mA	
Maximum transmission error	< 1 % (from a measuring range final value, 45 ... 65 Hz)	
Temperature coefficient	< 0.015 %/K	
Step response (10-90%)	< 180 ms	
Safe isolation	acc. to EN 50178	
Rated insulation voltage	300 V DC	
Surge voltage category/degree of pollution	- / 2	
Degree of protection	IP20	
Dimensions W/H/D	22.5 / 99 / 114.5 mm	
Connection data solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	
UL, USA/Canada	UL 61010 Listed	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
MCR voltage transducer, for DC voltages from 0 ... ±20 V DC to 0 ... ±660 V DC			
- with screw connection	**MACX MCR-VDC**	2906242	1
- with Push-in connection	**MACX MCR-VDC-PT**	2906243	1
MCR voltage transducer, for sinusoidal AC voltages from 0 ... 20 V AC to 0 ... 660 V AC			
- with screw connection	**MACX MCR-VAC**	2906239	1
- with Push-in connection	**MACX MCR-VAC-PT**	2906244	1

Accessories
Configuration software package

The **MCR/PI-CONF-WIN configuration software package** is used to configure and visualize all parameters for the programmable MCR measuring transducers.
– Straightforward menu interface
– Rapid programming

Notes:
The software runs under the following operating systems: Windows NT™, 2000™, and XP™.

For MCR-S-... current transducer

Description	Ordering data		
	Type	Order No.	Pcs./ Pkt.
MCR configuration software, for programming MCR-T-...-, MCR-...-LP-...-, MCR-...-HT-...-, MCR-S-...-, MCR-F-..., and MCR-PSP-... modules, CD-ROM	**MCR/PI-CONF-WIN**	2814799	1
	Accessories		
Labels, for marking MCR-T and MCR-S modules, four sheets DIN A4 marking labels (112 pcs.)	**MCR-ET 38X35 WH**	2814317	1

USB adapter cable
Software adapter cable

The following adapter cables are available for programming the MCR-S... current transducers:
– USB adapter cable
– Software adapter cable

For MCR-S-... current transducer

Description	Ordering data		
	Type	Order No.	Pcs./ Pkt.
USB adapter cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	**CM-KBL-RS232/USB**	2881078	1
Software adapter cable (stereo jack plug/25-pos. D-SUB), 1.2 m long, for programming MCR-T-..., MCR-S-..., and MCR-F-... modules	**MCR-TTL-RS232-E**	2814388	1
	Accessories		
Adapter cable, flexible, 9-pos. D-SUB socket to 25-pos. D-SUB pin	**PSM-KAD 9 SUB 25/BS**	2761295	1

Electrical safety in photovoltaic systems with SOLARCHECK RSD

The series connection of photovoltaic panels to strings generates system voltages of up to 1000 V DC. Note: voltages as low as 120 V DC can be fatal.

Potential risks for people:

– Electric shock due to contact with defective panels and cables
– Electric shock due to current bridges between exposed parts of the system and extinguishing water or flooding
– Burns due to the electric arc

Centrally installed load-break switches merely interrupt the flow of current in the string. However to disconnect the DC side of a PV system so it is in the protective extra-low voltage range, the individual PV panels must be shut down.

System description:

The SOLARCHECK Rapid Shutdown system consists of shutdown units for shutting down the individual PV panels and central startup units that restart the system. Shutdown occurs in emergencies and every time the inverter is switched off. When the SOLARCHECK Rapid Shutdown system is used, the PV system is thus always in the protective extra-low voltage range when the inverter is disabled.

The startup unit analyzes the behavior of the inverter. It automatically restarts the connected PV panels if a safe system environment is present.

The startup unit analyzes the behavior of the inverter. It automatically restarts the connected PV panels if a safe system environment is present.

Topology:

One SCK-RSD startup unit and, depending on the system variant, multiple shutdown units are necessary per string in the PV system. The startup unit is installed in the vicinity of the inverter, and the shutdown units are installed directly on the corresponding PV panels. In the event of a fault, they disconnect the PV panels from the string.

The shutdown PV panels thus no longer contribute to the system voltage.

You can set up the SOLARCHECK Rapid Shutdown system in four different topologies:

– Autonomous
(with SCK-RSD-400, Order No. 2905030)
– Autonomous with signaling
(with SCK-RSD-600, Order No. 2906273)
– Externally powered
(with SCK-RSD-600, Order No. 2906273)
– Externally powered with signaling
(with SCK-RSD-600, Order No. 2906273)

After shutdown, the autonomous topologies have at most the voltage of a single panel.

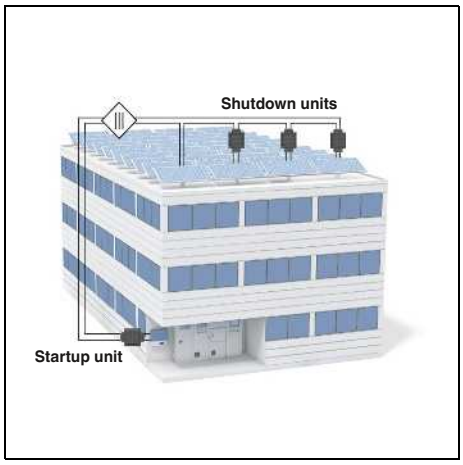
You can ensure complete absence of voltage after shutdown with the externally powered topologies.

Extinguish fires and carry out rescue operations safely

In dangerous situations, such as fires and flooding, maximum possible safety is provided for emergency personnel. The fire department can act immediately, safely rescue people, and minimize structural damage considerably.

Protect personnel

With SOLARCHECK RSD, each operator can shut down his or her system for cleaning and maintenance purposes. In doing so, the operator is taking responsibility for the safety of his/her personnel.

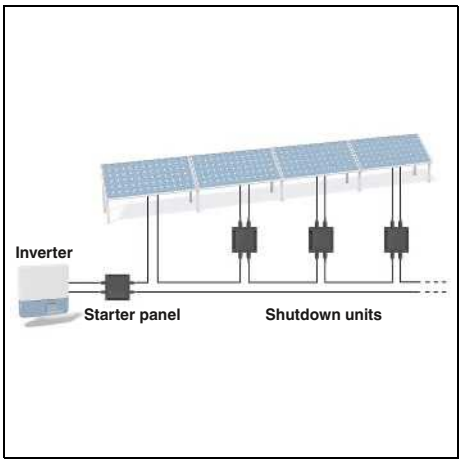


Protective extra-low voltage in the PV system

Only panel-based shutdown provides sufficient safety by disconnecting every single PV panel from the string. As a result, after the switching operation the maximum system voltage is in the protective extra-low voltage range.

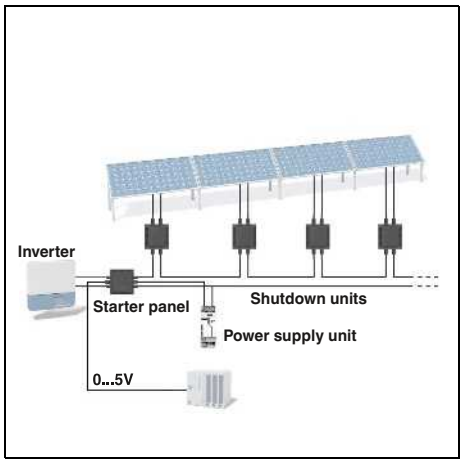
Your advantages:

– Safety as a result of patented error detection and safe photovoltaic panel shutdown
– Controlled restart via safe autostart



Autonomous topology:

Shutdown is carried out automatically. System startup is powered by one of the PV system panels, which is not shut down. At the same time, this supply panel provides information about the irradiation intensity and thereby ensures that the system is started up at the start of the day.



Externally powered topology:

Shutdown is carried out automatically. All PV panels in the system are shut down. This ensures residual voltages are < 30 DC after shutdown. System startup is powered by a separate power supply. Separate signaling of the switching state of the system is also possible.

Electrical safety in photovoltaic systems SOLARCHECK RSD

SOLARCHECK RSD consists of units for shutting down the individual photovoltaic panels and startup units, which are used to restart the system. Each shutdown unit disconnects the corresponding photovoltaic panel from the string group. The disconnection takes place automatically in the event of a fault and each time the inverter is shut down.

At most, the entire DC voltage side of the photovoltaic system is at the maximum off-load voltage of a panel, i.e., in the protective extra-low voltage range. There is no risk of an electric shock.

One SCK-RSD startup unit and, depending on the system variant, multiple shutdown units are necessary per string in the PV system. The startup unit is installed in the vicinity of the inverter, and the shutdown units are installed directly on the corresponding PV panels. In the event of a fault, they disconnect the PV panels from the string.

The shutdown PV panels thus no longer contribute to the system voltage.

You can set up the SOLARCHECK Rapid Shutdown system in four different topologies:

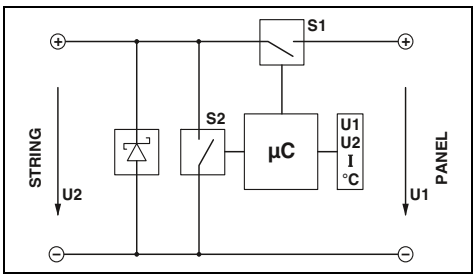
– Autonomous
  (with SCK-RSD-400, Order No. 2905030)
– Autonomous with signaling
  (with SCK-RSD-600, Order No. 2906273)
– Externally powered
  (with SCK-RSD-600, Order No. 2906273)
– Externally powered with signaling
  (with SCK-RSD-600, Order No. 2906273)

After shutdown, the autonomous topologies have at most the voltage of a single panel.

You can ensure complete absence of voltage after shutdown with the externally powered topologies.

SOLARCHECK RSD has been tested using a multitude of commercial types of inverters. You can find a list of these demonstrably compatible devices at phoenixcontact.com.

Unit for automatic shutdown of PV panels



Technical data

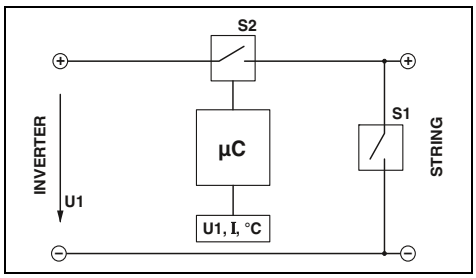
Input data	
Input voltage range	-
System voltage	≤ 1000 V DC
Input current range	0 A ... 8 A (of PV panel)
Rated current	8 A DC
Output data	
Current output signal	-
Voltage output signal	-
General data	
Nominal supply voltage	-
Power consumption (with external supply)	-
Power consumption	< 1.5 W
Number of PV panels that can be connected	1
Enabling	via SCK-RSD-400 / SCK-RSD-600 startup unit
Rated surge voltage	12 kV
Overvoltage category	III
Degree of pollution	3
Ambient temperature (operation)	-40 °C ... 85 °C
Humidity	10 % ... 95 %
Altitude	≤ 4000 m
Connection method	PV connector
EMC note	

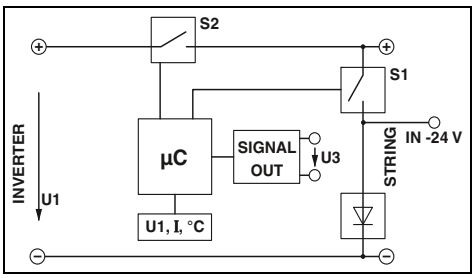
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
SOLARCHECK Rapid Shutdown system consists of shutdown units (SCK-RSD-100) for shutting down the individual photovoltaic panels and central startup units (SCK-RSD-400 and SCK-RSD-600), which are used to restart the system.	**SCK-RSD-100**	2905029	1

PV-powered startup unit

Externally powered startup unit, incl. signal output





Technical data

-	
≤ 1000 V DC	
0 A ... 8 A (of PV panel)	
8 A DC	
-	
-	
-	
PV	
< 4 W	
20	
Auto-RSD	
12 kV	
III	
3	
-40 °C ... 75 °C	
10 % ... 95 %	
≤ 4000 m	
PV connector	

Technical data

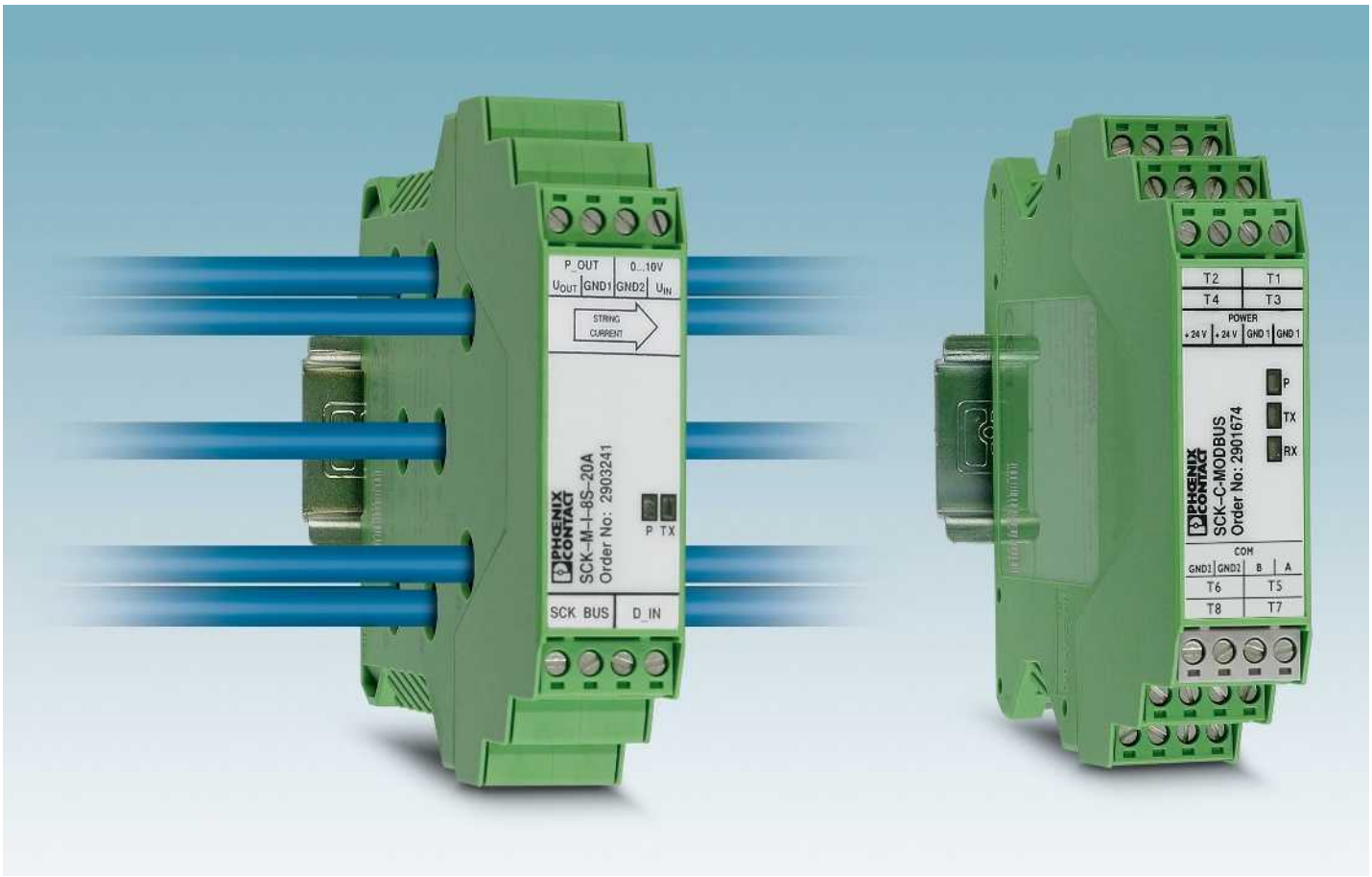
-	
≤ 1000 V DC	
0 A ... 8 A (of PV panel)	
8 A DC	
≤ 10 mA	
5 V	
24 V DC ±20 %	
1 A	
< 4 W	
20	
Auto-RSD	
12 kV	
III	
3	
-40 °C ... 75 °C	
10 % ... 95 %	
≤ 4000 m	
PV connector	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
SCK-RSD-400	2905030	1

Ordering data

Type	Order No.	Pcs./ Pkt.
SCK-RSD-600	2906273	1



Utilize solar electricity efficiently

Detect errors – increase efficiency: photovoltaic systems should achieve maximum energy yield within the shortest possible time.

SOLARCHECK provides reliable information regarding the performance of your photovoltaic system. It can be used to detect faults, which may be caused by damaged panels, defective contacts or damage in the cabling. This allows you to implement countermeasures quickly, thereby increasing the efficiency of your system.

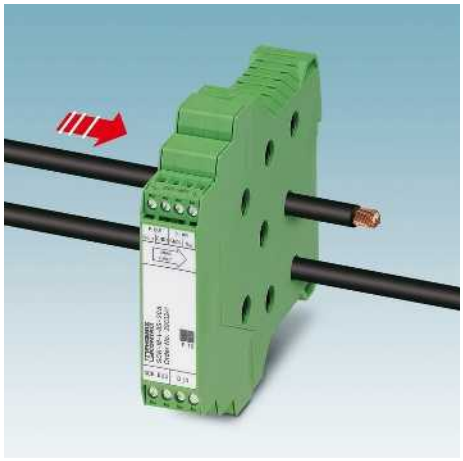
Current topic: reliable monitoring

Whether a small roof-top system on a family home or a megawatt outdoor system: for reliable operation, the photovoltaic market requires monitoring systems where status information is continuously available and visualization is easy. Phoenix Contact offers a comprehensive portfolio of hardware and software products specifically designed for this purpose.

Energy of the future

From installation to monitoring. In the "Components and systems for photovoltaics" brochure you will find further innovative solutions for your photovoltaic system, such as:

– Connection technology
– Surge protection
– Hardware and software solutions
– Generator connection boxes
– Tools and marking



Contact-free current measurement

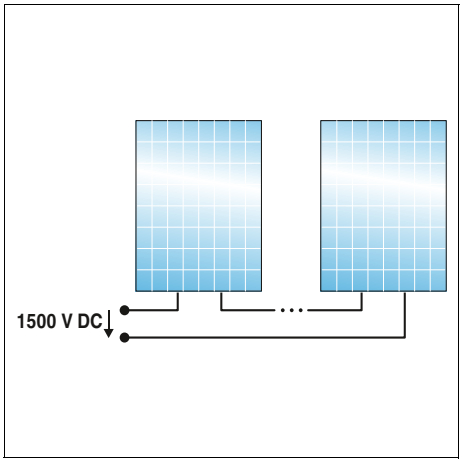
Contact-free measurement using Hall sensors offers many advantages:

– Safe isolation is already ensured by the cable insulation.
– No contact resistance due to additional contact points.
– Reliable current transfer, as there is no direct intervention in the string circuit.

Space-saving installation without an additional power supply

With a width of just 22.5 mm, the narrow measuring module bundles the cables in a confined space.

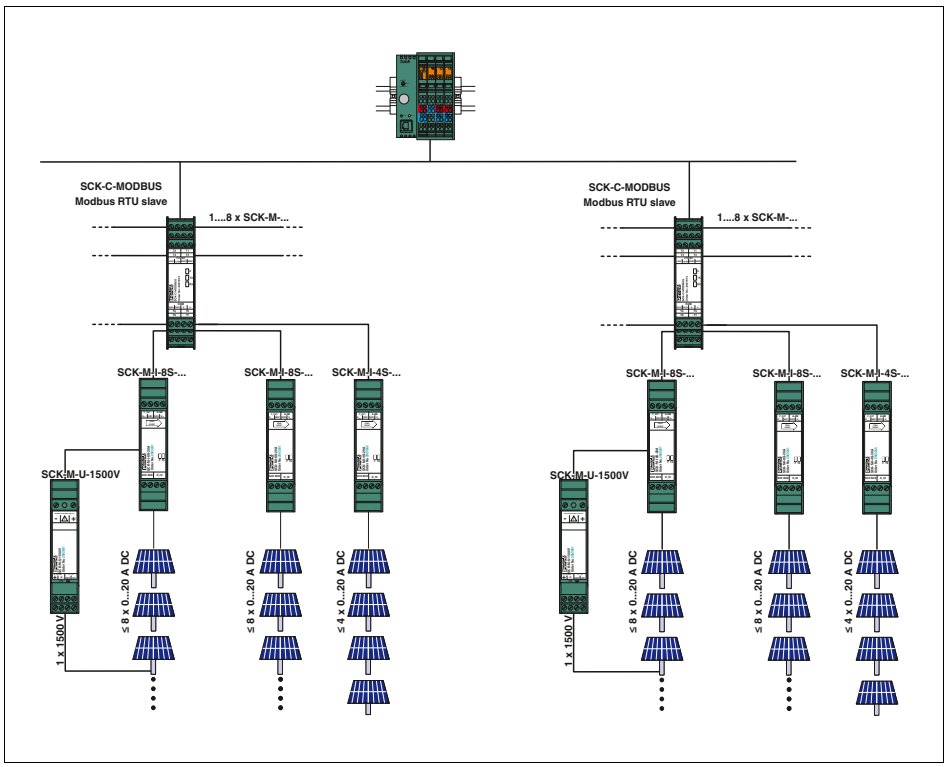
– The 2-conductor communication cable is also used to supply the measuring modules.
– This means that one communication module supplies up to eight measuring modules – without an additional power supply.



Flexible expansion

Optional extension of voltage measurement up to 1500 V DC

– Also suitable for grounded systems.
– Suitable for PV systems with extra high system voltages
– Flexible use, even outside the SOLARCHECK system



Easy integration in monitoring systems

The modular SOLARCHECK monitoring system consists of various measuring modules for current and voltage measurement and an associated communication module.

The communication module collects the measured values from the current measuring modules and forwards them to a higher-level controller. You can acquire up to eight or four string currents with one current measuring module each. A maximum of eight current measuring modules of any type can be connected to one communication module. The 2-conductor communication cable is also used to supply the measuring modules with power. This means that no additional power supply is required in the field.

The voltage measuring module is connected to and also supplied via the analog input provided on the 8-channel current measuring modules.

PV string monitoring
SOLARCHECK

The modular SOLARCHECK monitoring system consists of various devices for current and voltage measurement and an associated communication module.

Communication module:

– For connecting and collecting measured values from up to eight measuring modules
– Provision of data for transfer to higher-level controllers

Current measuring modules:

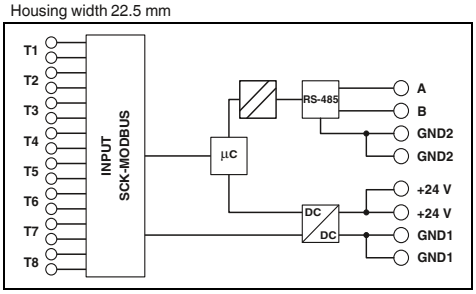
– 8-channel current measurement up to 20 A DC
– Detection of reverse currents up to -1 A
– 4-channel extension modules for 20 A DC
– Internal temperature monitoring
– Digital input for monitoring, e.g., the remote indication contacts of surge protection modules
– Supply via the communication module

Voltage measuring module

– Voltage measurement up to 1500 V DC in any grounded PV system
– Connection and supply is usually via the analog input (0 to 10 V) provided on the 8-channel SOLARCHECK current measuring module
– Voltage measurement is output as an analog signal 2 to 10 V
– As an option, can also be removed from the SOLARCHECK group and used separately

Communication module RS-485 (Modbus RTU)

Housing width 22.5 mm

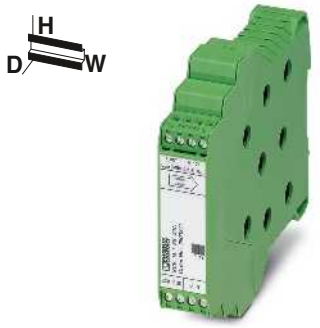


Technical data

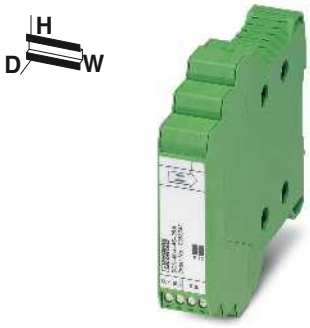
Supply	
Supply voltage	24 V DC -10 % ... +25 %
Own current consumption	22 mA (typical)
Measuring input	
Current measuring range	-
Transmission error, maximum	-
Temperature coefficient	-
Reverse current detection	-
Number of measuring channels	-
Voltage measuring range	-
Connection method	-
Digital input	
Controlled by external floating contact	-
Analog input	
Input voltage range	-
Analog output	
Output voltage range	-
SCK-C-MODBUS data interface	
Cable length (for 0.15 mm²)	-
Communication protocol	Proprietary
Serial port	RS-485
Serial transmission speed	9.6/14.4/19.2/38.4 kbps
Cable length	≤ 1200 m
Communication protocol	Modbus/RTU
General data	
Degree of protection	IP20
Ambient temperature range	-20 °C ... 70 °C
Dimensions W/H/D	22.5 / 102 / 106 mm
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA	1741 Recognized
UL, USA/Canada	508 Listed

Ordering data

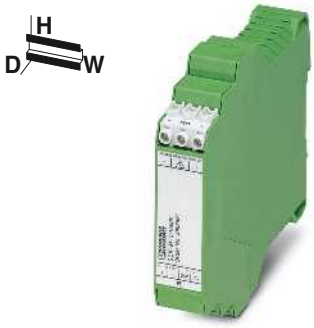
Description	Type	Order No.	Pcs./ Pkt.
Communication module	**SCK-C-MODBUS**	2901674	1
Current measuring module, 8-channel			
Current measuring module, 4-channel for extension			
Voltage measuring module			



Current measuring module, 20 A DC, 8-channel

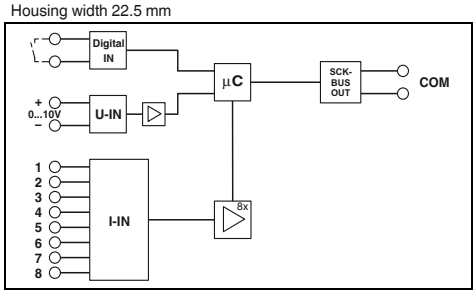


Extension module, 4-channel Current measurement 20 A DC

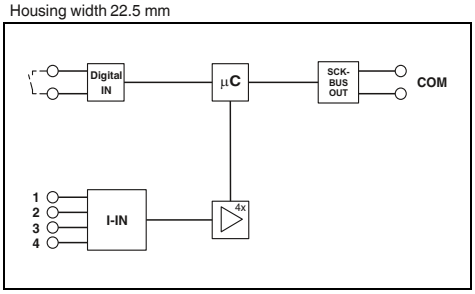


Voltage measuring module, 0...1500 V DC

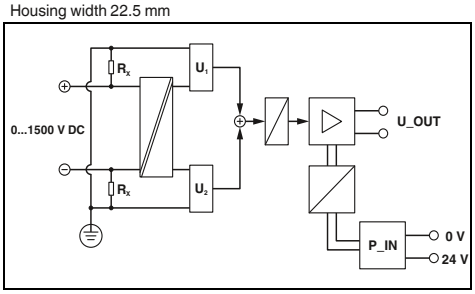
Housing width 22.5 mm



Housing width 22.5 mm



Housing width 22.5 mm



Technical data

Via SCK-C-MODBUS	
43 mA (typical)	
0 A DC ... 20 A (UL: 0 A DC...25 A DC) ± 1 % (From the measuring range final value)	
0.02 %/K (T_{K20}) -1 A DC ... 0 mA 8 - Through connection, 9.5 mm diameter	
Floating switch contacts	
0 V ... 10 V	
-	
≤ 300 m (0.14 mm²) Proprietary	
- - -	
IP20 -20 °C ... 70 °C 22.5 / 102 / 128.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12 Class A product, see page 605	
CE-compliant 1741 Recognized 508 Listed	

Ordering data

Type	Order No.	Pcs./ Pkt.
SCK-M-I-8S-20A	2903241	1

Technical data

Via SCK-C-MODBUS	
43 mA (typical)	
0 A DC ... 20 A (UL: 0 A DC...25 A DC) ± 1 % (From the measuring range final value)	
0.02 %/K (T_{K20}) -1 A DC ... 0 mA 4 - Through connection, 9.5 mm diameter	
Floating switch contacts	
-	
-	
≤ 300 m (0.14 mm²) Proprietary	
- - -	
IP20 -20 °C ... 70 °C 22.5 / 102 / 128.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12 Class A product, see page 605	
CE-compliant 1741 Recognized 508 Listed	

Ordering data

Type	Order No.	Pcs./ Pkt.
SCK-M-I-4S-20A	2903242	1

Technical data

24 V DC -10 % ... +25 % (or via SSCK-M-I-8S-20A)	
8 mA (typical)	
- ± 1 % (after additional tuning (valid for 100 - 1500 V DC))	
< 0.01 %/K - 1 0 V DC ... 1500 V DC Screw connection	
-	
-	
2 V DC ... 10 V DC	
- -	
- - -	
IP20 -20 °C ... 70 °C 22.5 / 102 / 128.5 mm 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12 Class A product, see page 605	
CE-compliant 1741 Recognized 508 Listed	

Ordering data

Type	Order No.	Pcs./ Pkt.
SCK-M-U-1500V	2903591	1

For high system availability

EMD monitoring relays can be used to detect deviations in important system parameters at an early stage. These can be indicated or system parts can be shut down selectively. EMD monitoring relays ensure error-free and cost-effective operation of your system. They are an inexpensive solution for numerous monitoring functions.

– Surge voltage and undervoltage
– Overcurrent and undercurrent
– Phase failure, phase sequence, and phase asymmetry
– Power factor and real power
– Motor winding temperature
– Levels

For system monitoring, choose from two product ranges: compact or multifunctional monitoring relays.

Perfect timing

ETD time relays ensure optimum time sequences.

The modules are the cost-effective alternative to a PLC: with easy configuration and fast wiring.

Choose from two product ranges for your ideal time control application:

– Ultra-narrow time relays each with one time range and one function
– Multifunctional time relays with selectable time ranges and functions

Professionally packaged components

Function modules with professional housing and connection technology can be used to integrate electronic components in your system. They can be used to perform a variety of tasks:

– Diode modules provide protection against polarity reversal. In addition, they decouple messages in fault reporting systems.
– Lamp testing modules decouple signals in isolation in the field of fault reporting technology.
– Display modules simplify troubleshooting and provide help for monitoring processes.

Compact monitoring relays

Ideal for simple monitoring tasks – from series production to building installation.

– Compact installation housing
– Quick and tool-free wiring with Push-in technology
– Parameters can be adjusted easily using rotary switches
– Clear diagnostics, thanks to color status LED

Multifunctional monitoring relays

– Parameters can be adjusted easily using rotary switches
– Fast error detection, thanks to fine tuning and short response times
– Worldwide use, thanks to wide-range power supply unit or plug-in transformer
– Space saving, with two PDT outputs in 22.5 mm wide housing
– Electrically isolated measuring and supply circuits
– Clear diagnostics, thanks to color status LEDs

Ultra-narrow time relays

The space-saving and inexpensive solution for simple time control applications.

– Each with one time range and one function
– Overall width of just 6.2 mm - saves up to 70% space compared to conventional time relays
– Precise time setting using the illuminated thumbwheel
– Fast wiring through the use of plug-in bridges

Multifunctional time relays

For universal use thanks to wide range of functions.

– Just three versions for all conventional time control applications
– Two floating PDT outputs on an overall width of just 22.5 mm
– Supply voltage via wide-range power supply unit
– Optimum setting of times ranging from milliseconds to several days

Function modules

Function modules transform components such as diodes into a shock-proof and dust-proof electronics module.

– Easy installation, thanks to electronics housing with IP20 protection that can be installed in a control cabinet
– Fast mounting on DIN rails, thanks to the foot catch
– User-friendly wiring, thanks to practical connection technology

Monitoring relays

Single-phase current monitoring

The **EMD-BL-C-10** monitors AC currents from 0 to 10 A.

– Adjustable response delay
– 0 to 5 A or 0 to 10 A measuring range
– Adjustable via rotary switch on the front

Single-phase voltage monitoring

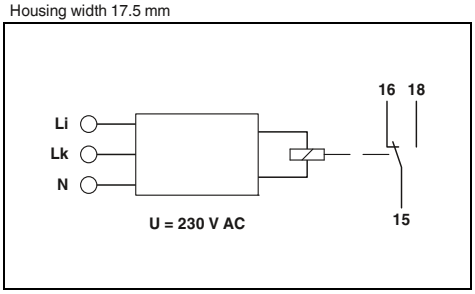
The **EMD-BL-V-230** monitors DC and AC voltages.

– 24 V AC/DC or 230 V AC
– Separately adjustable response delay
– Adjustable monitoring range
– Adjustable via potentiometer on front

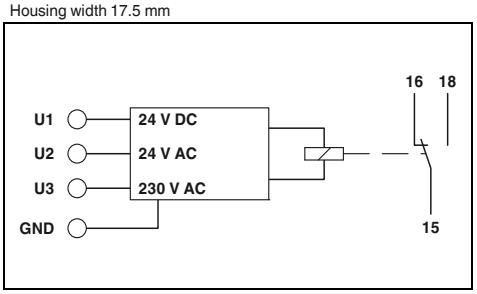
Current monitoring, 1-phase
Overcurrent, undercurrent, window

Voltage monitoring, 1-phase
Undervoltage, window

Housing width 17.5 mm



Housing width 17.5 mm



	Technical data	Technical data
Functions		
	Overcurrent, undercurrent, window	Undervoltage, window
Input		
Input ranges		0 V DC ... 24 V DC (connection terminal blocks: U1 and GND) 0 V AC ... 24 V AC (connection terminal blocks: U2 and GND) 0 V AC ... 230 V AC (connection terminal blocks: U3 and GND)
Input ranges	0 A ... 5 A 0 A ... 10 A Configurable via rotary switches	-
Input resistance	3 mΩ	-
Minimum setting range	5 % ... 95 % (From I_N)	75 % ... 115 % (From U_N)
Maximum setting range	10 % ... 100 % (From I_N)	80 % ... 120 % (From U_N)
Setting range for response delay	0.1 s ... 10 s	0.1 s ... 10 s
Basic accuracy	≤ 5 % (of the nominal value)	≤ 5 % (of scale end value)
Setting accuracy	± 5 % (of the nominal value)	± 5 % (of scale end value)
Repeat accuracy	≤ 2 %	≤ 2 %
Relay output		
Contact type	1 floating PDT	1 floating PDT
Switching capacity	1250 VA (5 A/250 V AC)	1250 VA (5 A/250 V AC)
Electrical service life	1 x 10^5 cycles	1 x 10^5 cycles
Mechanical service life	15 x 10^6 cycles	15 x 10^6 cycles
Output fuse	5 A (fast-blow)	5 A (fast-blow)
General data		
Supply voltage	230 V AC ±15 %	-25 % ... +20 % (= measuring voltage)
Nominal power consumption	5 VA (0.8 W)	10 VA (At 230 V AC (0.6 W)) 1.3 VA (At 24 V AC (0.8 W)) 0.6 W (at 24 V DC)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C
Dimensions W/H/D	17.5 / 88 / 65.5 mm	17.5 / 88 / 65.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14	0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508	UL/C-UL listed UL 508

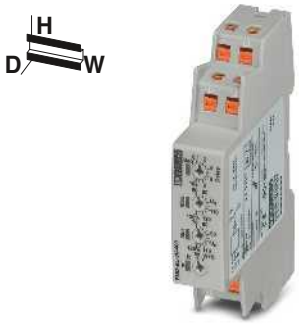
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Compact monitoring relay with Push-in connection						
	EMD-BL-C-10-PT	2903522	1	**EMD-BL-V-230-PT**	2903524	1
Compact monitoring relay with screw connection						
	EMD-BL-C-10	2903521	1	**EMD-BL-V-230**	2903523	1

Monitoring relays

Three-phase voltage monitoring

The **EMD-BL-3V-400** monitors three-phase AC voltages.

– 3~ 400 V AC/230 V AC ±30%
– Separately adjustable response delay
– Adjustable monitoring range
– Adjustable via potentiometer on front
– Supply from the measuring circuit

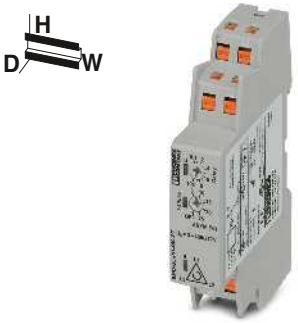


Voltage monitoring, 3-phase
Window, phase sequence

Phase monitoring

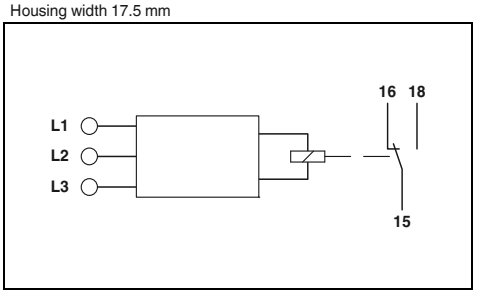
The **EMD-BL-PH-400** monitors three-phase AC voltages.

– 3~ 208 to 480 V AC / 120 to 277 V AC
– Adjustable response delay
– Adjustable asymmetry: 5 to 25% / OFF
– Adjustable via potentiometer on front
– Supply from the measuring circuit

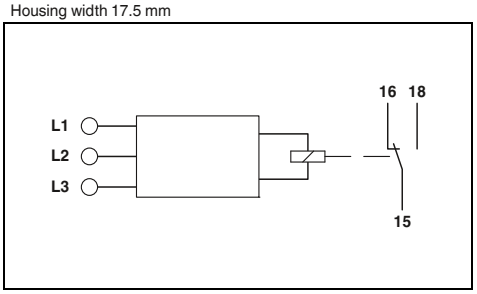


Phase monitoring
Phase sequence, phase failure, asymmetry

Housing width 17.5 mm



Housing width 17.5 mm



	Technical data	Technical data
Functions		
	Window, phase sequence	Phase sequence, phase failure, asymmetry
Input		
Monitoring range	280 V AC ... 519 V AC	187 V AC ... 519 V AC
Input ranges	3~ 400/230 V	3~ 208 ... 480 V/120 ... 277 V
Minimum setting range	70 % ... 120 % (From U_N)	-
Maximum setting range	80 % ... 130 % (From U_N)	-
Setting range for response delay	0.1 s ... 10 s	0.1 s ... 10 s
Asymmetry	-	5 % ... 25% / OFF
Basic accuracy	≤ 5 % (of the nominal value)	≤ 5 % (of scale end value)
Setting accuracy	± 5 % (of scale end value)	± 5 % (of scale end value)
Repeat accuracy	≤ 2 %	≤ 2 %
Relay output		
Contact type	1 floating PDT	1 floating PDT
Switching capacity	1250 VA (5 A/250 V AC)	1250 VA (5 A/250 V AC)
Electrical service life	1 x 10^5 cycles	1 x 10^5 cycles
Mechanical service life	15 x 10^6 cycles	15 x 10^6 cycles
Output fuse	5 A (fast-blow)	5 A (fast-blow)
General data		
Supply voltage	±30 % (= measuring voltage)	±10 % (= measuring voltage)
Nominal power consumption	10 VA (1 W)	10 VA ((1 W) at 400 V/50 Hz) 16 VA ((1.5 W) at 480 V/60 Hz)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C
Dimensions W/H/D	17.5 / 88 / 65.5 mm	17.5 / 88 / 65.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14	0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508	UL/C-UL listed UL 508

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Compact monitoring relay with Push-in connection						
	EMD-BL-3V-400-PT	2903526	1	**EMD-BL-PH-480-PT**	2903528	1
Compact monitoring relay with screw connection						
	EMD-BL-3V-400	2903525	1	**EMD-BL-PH-480**	2903527	1

new

Thermistor monitoring

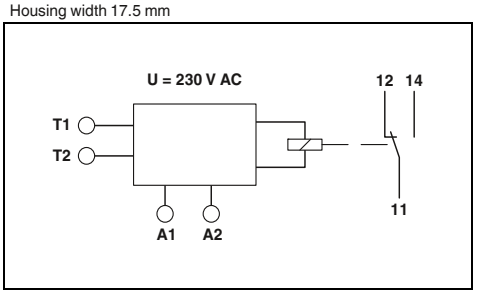
The EMD-SL-PTC monitors the temperature of motor windings.

– Operate value ≥ 3.6 kΩ
– Release value ≤ 1.6 kΩ
– DIN 44081/DIN 44082-compliant
– Sensors can be connected in series

Temperature monitoring (motor windings)

EAC

Housing width 17.5 mm



Technical data

Functions	
	Winding temperature monitoring
Input	
Total cold resistance	≤ 1.5 kΩ
Response value	≥ 3.6 kΩ (Relay drops out)
Release value	≤ 1.6 kΩ (Relay picks up)
Basic accuracy	± 10 % (of scale end value)
Relay output	
Contact type	1 floating PDT
Switching capacity	1250 VA (5 A/250 V AC)
Electrical service life	1 x 10^5 cycles
Mechanical service life	15 x 10^6 cycles
Output fuse	5 A (fast-blow)
General data	
Supply voltage	230 V AC (-15 % ... +10 %)
Nominal power consumption	3.5 VA (0.5 W)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)	-25 °C ... 55 °C
Dimensions W/H/D	17.5 / 88 / 65.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Conformance/Approvals	
Conformance	CE-compliant

Ordering data

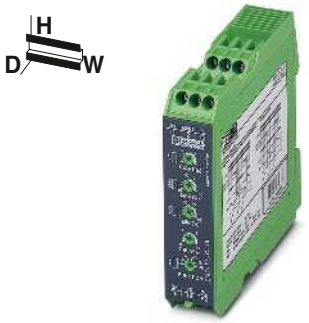
Description	Type	Order No.	Pcs./ Pkt.
Compact monitoring relay			
with Push-in connection	**EMD-BL-PTC-PT**	**2906253**	1
with screw connection	**EMD-BL-PTC**	**2906252**	1

Monitoring relays

Single-phase current monitoring

EMD-...C... monitoring relays monitor DC and AC currents within the range of 0 to 10 A.

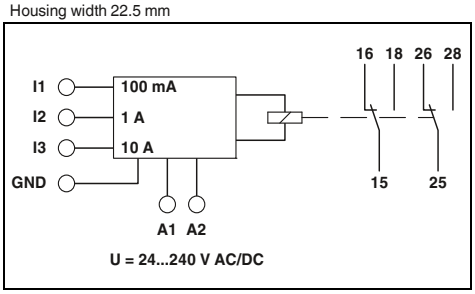
– Separately adjustable startup and release delays
– Variable supply voltage range
– Adjustable via potentiometer on front



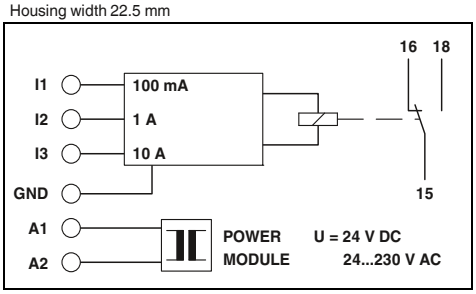
Overcurrent and undercurrent monitoring

Over or undercurrent monitoring

Housing width 22.5 mm



Housing width 22.5 mm



	Technical data	Technical data	
Functions		EMD-SL-C-OC-10	EMD-SL-C-UC-10
	Overcurrent, undercurrent, window, error memory	Overcurrent	Undercurrent
Input			
Input ranges	0 mA ... 100 mA (Connection terminals: I1 and GND) 0 A ... 1 A (Connection terminals: I2 and GND) 0 A ... 10 A (Connection terminals: I3 and GND)	0 mA ... 100 mA (Connection terminals: I1 and GND) 0 A ... 1 A (Connection terminals: I2 and GND) 0 A ... 10 A (Connection terminals: I3 and GND)	
Input resistance	470 mΩ (at I_N = 100 mA) ; 47 mΩ (at I_N = 1 A) ; 5 mΩ (at I_N = 10 A)	470 mΩ (at I_N = 100 mA) ; 47 mΩ (at I_N = 1 A) ; 5 mΩ (at I_N = 10 A)	
Minimum setting range	5 % ... 95 % (From I_N)	5 % ... 95 % (From I_N)	
Maximum setting range	10 % ... 100 % (From I_N)	10 % ... 100 % (From I_N)	
Setting range for response delay	0.1 s ... 10 s	0.2 s ... 10 s	
Setting range for starting delay	0 s ... 10 s	-	
Basic accuracy	± 5 % (of scale end value)	± 5 % (of scale end value)	
Setting accuracy	≤ 5 % (of scale end value)	≤ 5 % (of scale end value)	
Repeat accuracy	≤ 2 %	≤ 2 %	
Relay output			
Contact type	2 floating PDT contacts	1 floating PDT	
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	
Electrical service life	2 x 10^5 cycles at ohmic load, 1000 VA	2 x 10^5 cycles at ohmic load, 1000 VA	
Mechanical service life	Approx. 2x 10^7 cycles	Approx. 2x 10^7 cycles	
Output fuse	5 A (fast-blow)	5 A (fast-blow)	
General data			
Supply voltage range	24 V AC ... 240 V AC -15 % ... +10 % 24 V DC ... 240 V DC -20 % ... +25 %	24 V AC ... 230 V AC (see Power modules) 24 V DC (see Power modules)	
Nominal power consumption	4.5 VA (1.5 W)	2 VA (1.5 W)	
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)	
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C	
Dimensions W/H/D	22.5 / 90 / 113 mm	22.5 / 90 / 113 mm	
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14	
EMC note	Class A product, see page 605		
Conformance/Approvals			
Conformance	CE-compliant	CE-compliant	
UL, USA/Canada	UL/C-UL listed UL 508	UL/C-UL listed UL 508	

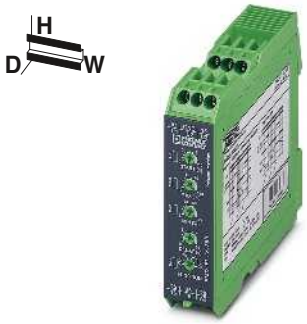
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Electronic monitoring relay						
	EMD-FL-C-10	2866022	1	**EMD-SL-C-OC-10**	2866019	1
				EMD-SL-C-UC-10	2867937	1
Power module, plug-in, please order at the same time!						
Supply voltage 20 ... 30 V DC				**EMD-SL-PS- 24DC**	2885359	1
Supply voltage 20.2 ... 26.4 V AC				**EMD-SL-PS- 24AC**	2866103	1
Supply voltage 88 ... 121 V AC				**EMD-SL-PS-110AC**	2866116	1
Supply voltage 108 ... 132 V AC				**EMD-SL-PS-120AC**	2885731	1
Supply voltage 195 ... 264 V AC				**EMD-SL-PS-230AC**	2866129	1

Monitoring relays

Single-phase voltage monitoring

EMD-...V... monitoring relays monitor DC and AC voltages within the range 0 to 300 V.

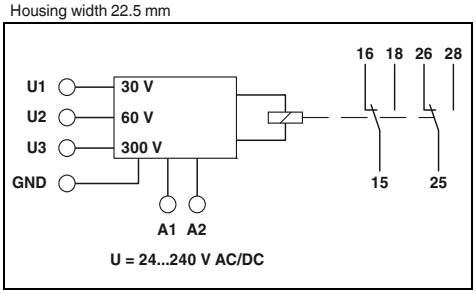
– Separately adjustable startup and release delays
– Variable supply voltage range
– Adjustable via potentiometer on front



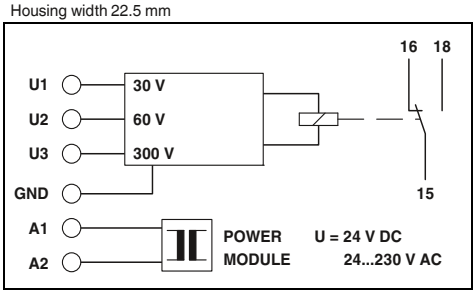
Undervoltage and overvoltage monitoring

Undervoltage monitoring

Housing width 22.5 mm



Housing width 22.5 mm



	Technical data	Technical data
Functions		
	Undervoltage, overvoltage, window, error memory	Undervoltage
Input		
Input ranges	0 V ... 30 V AC/DC (connection terminal blocks: U1 and GND) 0 V ... 60 V AC/DC (connection terminal blocks: U2 and GND) 0 V ... 300 V AC/DC (connection terminal blocks: U3 and GND)	0 V ... 30 V AC/DC (connection terminal blocks: U1 and GND) 0 V ... 60 V AC/DC (connection terminal blocks: U2 and GND) 0 V ... 300 V AC/DC (connection terminal blocks: U3 and GND)
Input resistance	47 kΩ (connection terminal blocks: U1 and GND) 100 kΩ (connection terminal blocks: U2 and GND) 470 kΩ (connection terminal blocks: U3 and GND)	47 kΩ (connection terminal blocks: U1 and GND) 100 kΩ (connection terminal blocks: U2 and GND) 470 kΩ (connection terminal blocks: U3 and GND)
Minimum setting range	5 % ... 95 % (From U_N)	5 % ... 95 % (From U_N)
Maximum setting range	10 % ... 100 % (From U_N)	10 % ... 100 % (From U_N)
Setting range for response delay	0.1 s ... 10 s	0.2 s ... 10 s
Setting range for starting delay	0 s ... 10 s	-
Basic accuracy	± 5 % (of scale end value)	± 5 % (of scale end value)
Setting accuracy	≤ 5 % (of scale end value)	≤ 5 % (of scale end value)
Repeat accuracy	≤ 2 %	≤ 2 %
Relay output		
Contact type	2 floating PDT contacts	1 floating PDT
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Electrical service life	2 x 10^5 cycles at ohmic load, 1000 VA	2 x 10^5 cycles at ohmic load, 1000 VA
Mechanical service life	Approx. 2x 10^7 cycles	Approx. 2x 10^7 cycles
Output fuse	5 A (fast-blow)	5 A (fast-blow)
General data		
Supply voltage range	24 V AC ... 240 V AC -15 % ... +10 % 24 V DC ... 240 V DC -20 % ... +25 %	24 V AC ... 230 V AC (see Power modules) 24 V DC (see Power modules)
Nominal power consumption	4.5 VA (1.5 W)	2 VA (1.5 W)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C
Dimensions W/H/D	22.5 / 90 / 113 mm	22.5 / 90 / 113 mm
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508	UL/C-UL listed UL 508

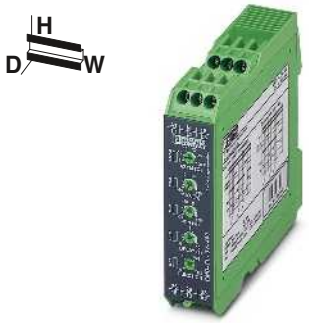
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Electronic monitoring relay						
	EMD-FL-V-300	2866048	1	**EMD-SL-V-UV-300**	2866035	1
Power module, plug-in, please order at the same time!						
Supply voltage 20 ... 30 V DC				**EMD-SL-PS- 24DC**	2885359	1
Supply voltage 20.2 ... 26.4 V AC				**EMD-SL-PS- 24AC**	2866103	1
Supply voltage 88 ... 121 V AC				**EMD-SL-PS-110AC**	2866116	1
Supply voltage 108 ... 132 V AC				**EMD-SL-PS-120AC**	2885731	1
Supply voltage 195 ... 264 V AC				**EMD-SL-PS-230AC**	2866129	1

Monitoring relays

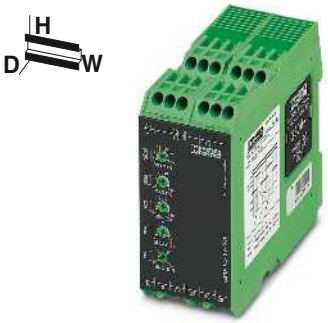
Three-phase voltage monitoring

EMD-...-3V... monitoring relays monitor three-phase AC voltages of 160 to 897 V AC (depending on the device concerned).

– Adjustable response delay
– Variable supply voltage range
– Adjustable via potentiometer on front
– Adjustable asymmetry

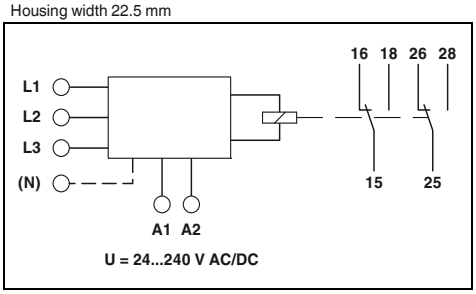


Undervoltage and phase monitoring, 400 V or 230 V

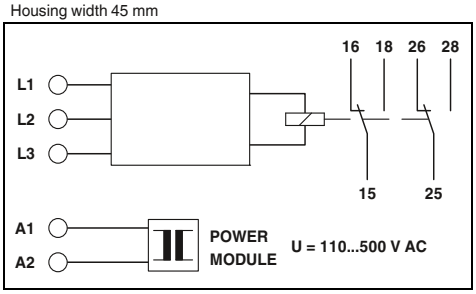


Undervoltage and phase monitoring, 500 V or 690 V

Housing width 22.5 mm



Housing width 45 mm



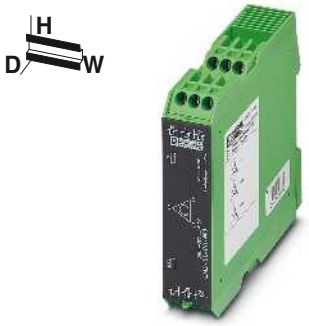
Technical data

Functions	EMD-FL-3V-400	EMD-FL-3V-230	EMD-FL-3V-690	EMD-FL-3V-500
	Undervoltage, window, asymmetry, phase sequence, phase failure	Undervoltage, window, asymmetry, phase sequence, phase failure	Undervoltage, window, asymmetry, phase sequence, phase failure	Undervoltage, window, asymmetry, phase sequence, phase failure
Input				
Monitoring range	280 V AC ... 520 V AC	161 V AC ... 299 V AC	483 V AC ... 897 V AC	350 V AC ... 650 V AC
Input ranges	3 N ~ 400/230 V	3 N ~ 230/132 V	3 ~ 690 V	3 ~ 500 V
Input resistance	1 MΩ	470 kΩ	1 MΩ	1 MΩ
Minimum setting range	-30 % ... 20 % (From U_N)		-30 % ... 20 % (From U_N)	
Maximum setting range	-20 % ... 30 % (From U_N)		-20 % ... 30 % (From U_N)	
Setting range for response delay	0.1 s ... 10 s		0.1 s ... 10 s	
Asymmetry	5 % ... 25% / OFF	5 % ... 25% / OFF	5 % ... 25% / OFF	5 % ... 25% / OFF
Basic accuracy	± 5 % (of scale end value)		± 5 % (of scale end value)	
Setting accuracy	≤ 5 % (of scale end value)		≤ 5 % (of scale end value)	
Repeat accuracy	≤ 2 %		≤ 2 %	
Relay output				
Contact type	2 floating PDT contacts		2 floating PDT contacts	
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)		750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	
Electrical service life	2 x 10^5 cycles at ohmic load, 1000 VA		2 x 10^5 cycles at ohmic load, 1000 VA	
Mechanical service life	Approx. 2x 10^7 cycles		Approx. 2x 10^7 cycles	
Output fuse	5 A (fast-blow)		5 A (fast-blow)	
General data				
Supply voltage				
Supply voltage range	24 V AC ... 240 V AC -15 % ... +10 % 24 V DC ... 240 V DC -20 % ... +25 %		110 V AC ... 500 V AC (see Power modules)	
Nominal power consumption	4.5 VA (1.5 W)		4.5 VA (1.5 W)	
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)		IP40 (housing) / IP20 (connection terminal blocks)	
Ambient temperature (operation)	-25 °C ... 55 °C		-25 °C ... 55 °C	
Dimensions W/H/D	22.5 / 90 / 113 mm		45 / 90 / 113 mm	
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14		0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14	
EMC note	Class A product, see page 605			
Conformance/Approvals				
Conformance	CE-compliant		CE-compliant	
UL, USA/Canada	UL/C-UL listed UL 508		UL/C-UL listed UL 508	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Electronic monitoring relay						
	EMD-FL-3V-400	2866064	1	**EMD-FL-3V-690**	2885249	1
	EMD-FL-3V-230	2885773	1	**EMD-FL-3V-500**	2867979	1
Power module, plug-in, please order at the same time!						
Supply voltage 20 ... 30 V DC						
Supply voltage 20.2 ... 26.4 V AC						
Supply voltage 88 ... 121 V AC				**EMD-SL-PS45-110AC**	2885281	1
Supply voltage 108 ... 132 V AC				**EMD-SL-PS45-120AC**	2885744	1
Supply voltage 195 ... 264 V AC				**EMD-SL-PS45-230AC**	2885294	1
Supply voltage 323 ... 456 V AC				**EMD-SL-PS45-400AC**	2885304	1

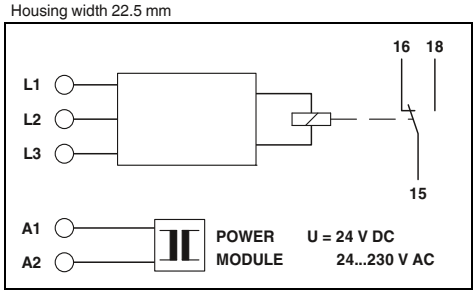
Undervoltage/overvoltage monitoring, 400 V with/without neutral conductor



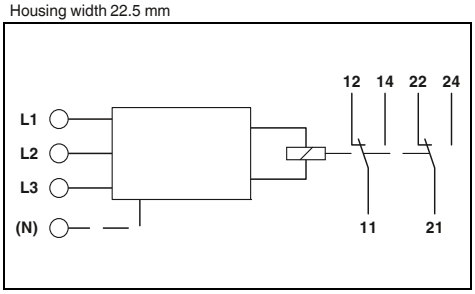
Phase monitoring, 400 V

Phase monitoring, 690 V

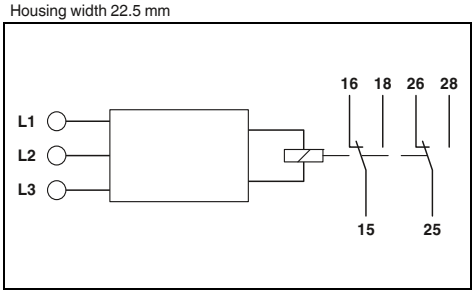
Housing width 22.5 mm



Housing width 22.5 mm



Housing width 22.5 mm



Technical data

EMD-SL-3V-400	EMD-SL-3V-400-N
Window, without neutral conductor connection	Window, with neutral conductor connection
280 V AC ... 520 V AC	280 V AC ... 520 V AC
3 ~ 400 V	3 N ~ 400/230 V
1 MΩ	1 MΩ
-30 % ... 20 % (From U_N)	
-20 % ... 30 % (From U_N)	
0.2 s ... 10 s	
± 5 % (of scale end value)	
≤ 5 % (of scale end value)	
≤ 2 %	
1 floating PDT	
750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing)	
1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	
2 x 10^5 cycles at ohmic load, 1000 VA	
Approx. 2x 10^7 cycles	
5 A (fast-blow)	
24 V AC ... 230 V AC (see Power modules)	
24 V DC (see Power modules)	
2 VA (1.5 W)	
IP40 (housing) / IP20 (connection terminal blocks)	
-25 °C ... 55 °C	
22.5 / 90 / 113 mm	
0.5 ... 2.5 mm^2 / 0.25 ... 2.5 mm^2 / 20 - 14	
CE-compliant	
UL/C-UL listed UL 508	

Ordering data

Type	Order No.	Pcs./ Pkt.
EMD-SL-3V-400	2866051	1
EMD-SL-3V-400-N	2885278	1
EMD-SL-PS- 24DC	2885359	1
EMD-SL-PS- 24AC	2866103	1
EMD-SL-PS-110AC	2866116	1
EMD-SL-PS-120AC	2885731	1
EMD-SL-PS-230AC	2866129	1

Technical data

Phase sequence, phase failure, asymmetry
342 V AC ... 457 V AC
3 N ~ 400/230 V
15 kΩ
-
-
≤ 350 ms (fixed setting)
Fixed, approx. 30 %
-
-
-
2 floating PDT contacts
750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing)
1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
2 x 10^5 cycles at ohmic load, 1000 VA
Approx. 2x 10^7 cycles
5 A (fast-blow)
From the measured voltage
-
9 VA
IP40 (housing) / IP20 (connection terminal blocks)
-25 °C ... 55 °C
22.5 / 90 / 113 mm
0.5 ... 2.5 mm^2 / 0.25 ... 2.5 mm^2 / 20 - 14
CE-compliant
UL/C-UL listed UL 508

Ordering data

Type	Order No.	Pcs./ Pkt.
EMD-SL-PH-400	2866077	1

Technical data

Undervoltage, phase sequence, phase failure
177 V AC ... 794 V AC
3~ 208 V ... 690 V
-
-
-
0.1 s ... 10 s
25 %
≤ 3 % (of scale end value)
≤ 5 % (of scale end value)
≤ 2 %
2 floating PDT contacts
1250 VA (5 A/250 V AC at +55 °C)
150 VA (5 A/30 V DC at +55°C)
2 x 10^5 cycles
20 x 10^6 cycles
5 A (fast-blow)
±15 % (= measuring voltage)
±15 % (= measuring voltage)
2 VA (1.2 W)
IP40 (housing) / IP20 (connection terminal blocks)
-25 °C ... 70 °C (C300)
22.5 / 90 / 113 mm
0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
CE-compliant
UL/C-UL listed UL 508

Ordering data

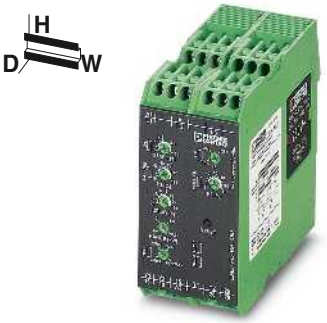
Type	Order No.	Pcs./ Pkt.
EMD-SL-PH-690	2905597	1

Monitoring relays

Real power monitoring

The real power in single and three-phase networks is monitored with the **EMD-FL-RP-480** real power monitoring relay.

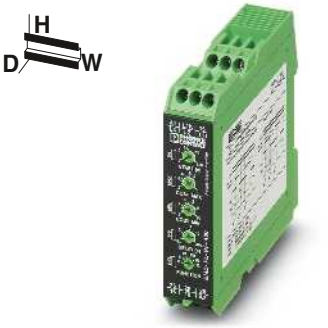
– Monitoring range up to 7.2 kW
– Separately adjustable startup and release delays
– Temperature monitoring of the motor winding
– Variable supply voltage range
– Detection of switched off loads



Real power monitoring

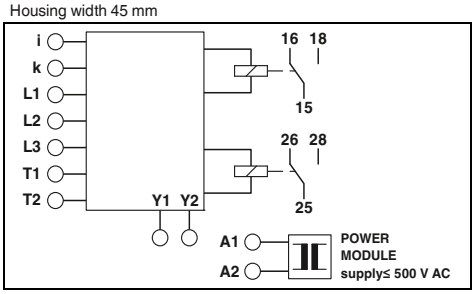
Load monitoring (cos ϕ)

The **EMD-FL-PF-400** monitoring relay is a cos ϕ monitor for load monitoring in single or three-phase networks.

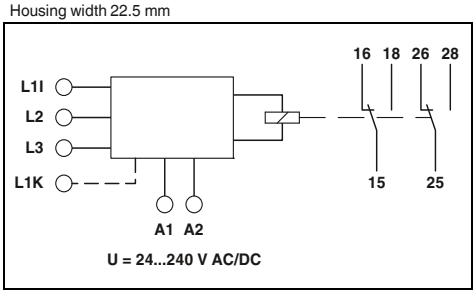


Load monitoring (cos ϕ)

EAC
Housing width 45 mm



EAC
Housing width 22.5 mm



		Technical data	Technical data
Functions			
		Underload, overload, window, winding temperature monitoring	Underload, overload, window
Input			
Description of the input		Voltage input	-
Measured value		AC sine (10 Hz ... 400 Hz)	AC sine (10 ... 100 Hz)
Measuring ranges P_N		Can be switched between 0.75 kW, 1.5 kW, 3 kW and 6 kW	-
Nominal input voltage U_N		480 V (3 N ~ 480/277 V)	3 N ~ 415/240 V
Input ranges		0 V AC ... 480 V AC (1(N) ~, single-phase load) 0 V AC ... 480 V AC (3(N) ~, 3-phase load)	40 V AC ... 415 V AC (1(N) ~, single-phase load) 40 V AC ... 415 V AC (3(N) ~, 3-phase load)
Input ranges		0.15 A ... 6 A (Range: 0.75 kW and 1.5 kW) 0.3 A ... 12 A (Range: 3 kW and 6 kW)	0.5 A ... 10 A (Connection terminal blocks: L1i and L1k)
Minimum setting range		5 % ... 110 % (of P_N)	-
Maximum setting range		10 % ... 120 % (of P_N)	-
Switching threshold cos ϕ	Min.	-	0.1 ... 0.99
	Max.	-	0.2 ... 1
Relay output			
Contact type		2 floating PDT contacts	2 floating PDT contacts
Switching capacity		750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Electrical service life		2 x 10^5 cycles at ohmic load, 1000 VA	2 x 10^5 cycles at ohmic load, 1000 VA
Mechanical service life		Approx. 2x 10^7 cycles	Approx. 2x 10^7 cycles
Output fuse		5 A (fast-blow)	5 A (fast-blow)
General data			
Supply voltage range		110 V AC ... 500 V AC (see Power modules)	24 V AC ... 240 V AC -15 % ... +10 % 24 V DC ... 240 V DC (-20 % ... +25 %)
Nominal power consumption		3.5 VA (3 W)	4.5 VA (1.5 W)
Rated insulation voltage		300 V (According to EN 50178)	300 V (According to EN 50178)
Degree of protection		IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)		-25 °C ... 55 °C	-25 °C ... 55 °C
Dimensions W/H/D		45 / 90 / 113 mm	22.5 / 90 / 113 mm
Screw connection solid/stranded/AWG		0.5 ... 2.5 mm^2 / 0.25 ... 2.5 mm^2 / 20 - 14	0.5 ... 2.5 mm^2 / 0.25 ... 2.5 mm^2 / 20 - 14
EMC note			Class A product, see page 605
Conformance/Approvals			
Conformance		CE-compliant	CE-compliant
UL, USA/Canada		UL applied for	UL/C-UL listed UL 508

Description	Ordering data Type	Order No.	Pcs./ Pkt.	Ordering data Type	Order No.	Pcs./ Pkt.
Electronic monitoring relay						
	EMD-FL-RP-480	2900177	1	**EMD-FL-PF-400**	2885809	1
Power module, plug-in, please order at the same time!						
Supply voltage 88 ... 121 V AC	**EMD-SL-PS45-110AC**	2885281	1			
Supply voltage 108 ... 132 V AC	**EMD-SL-PS45-120AC**	2885744	1			
Supply voltage 195 ... 264 V AC	**EMD-SL-PS45-230AC**	2885294	1			
Supply voltage 323 ... 456 V AC	**EMD-SL-PS45-400AC**	2885304	1			
Supply voltage 425 ... 550 V AC	**EMD-SL-PS45-500AC**	2885317	1			

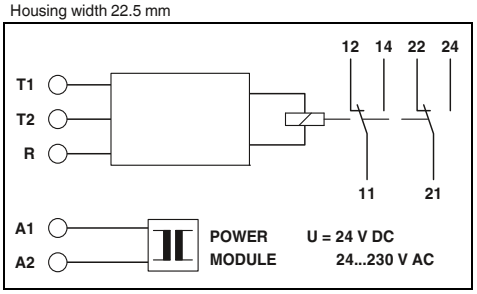
Level monitoring

The **EMD-SL-LL-...** monitoring relay monitors the level of electrically conductive liquids with the help of conductive probes (not supplied as standard).
– Adjustable response delay
– Adjustable via potentiometer on front

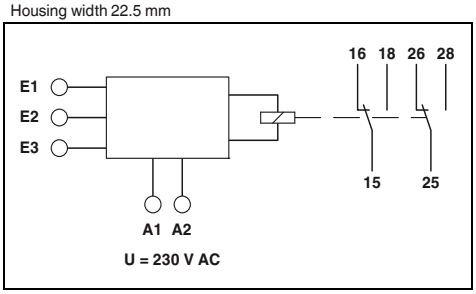
Temperature monitoring (motor windings)

Level monitoring

Housing width 22.5 mm



Housing width 22.5 mm



	Technical data	Technical data
Functions		
	Winding temperature monitoring	Pumping up (minimum monitoring), pumping down (maximum monitoring)
Input		
Total cold resistance	< 1.5 kΩ	-
Response value	≥ 3.6 kΩ (Relay drops out)	-
Release value	≤ 1.8 kΩ (Relay picks up)	-
Basic accuracy	± 10 % (of scale end value)	-
Repeat accuracy	≤ 2 %	-
Measuring input	-	Conductive probe, type: SK1, SK2, SK3
Maximum probe voltage	-	16 V AC
Maximum probe current	-	7 mA
Length of probe cable	-	< 1000 m (Line capacity 100 nF/km; set value < 50%) < 100 m (Line capacity 100 nF/km; set value 100%)
Switching threshold	-	0.25 kΩ ... 100 kΩ (4 mS ... 1 µS)
Relay output		
Contact type	2 floating PDT contacts	2 floating PDT contacts
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Electrical service life	2 x 10^5 cycles at ohmic load, 1000 VA	2 x 10^5 cycles at ohmic load, 1000 VA
Mechanical service life	Approx. 2x 10^7 cycles	Approx. 2x 10^7 cycles
Output fuse	5 A (fast-blow)	5 A (fast-blow)
General data		EMD-SL-LL-230 / EMD-SL-LL-110
Supply voltage		230 V AC -15 % ... +15 % AC / 110 V AC -10 % ... +15% AC
Supply voltage range	24 V AC ... 230 V AC (see Power modules) 24 V DC (see Power modules)	
Nominal power consumption	2 VA (1.5 W)	2 VA (1.5 W)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C
Dimensions W/H/D	22.5 / 90 / 113 mm	22.5 / 90 / 113 mm
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14	0.5 ... 2.5 mm² / 0.25 ... 2.5 mm² / 20 - 14
EMC note	Class A product, see page 605	
Conformance/Approvals		
Conformance	CE-compliant	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508	UL/C-UL listed UL 508

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Electronic monitoring relay						
	EMD-SL-PTC	2866093	1	**EMD-SL-LL-230**	2885906	1
				EMD-SL-LL-110	2901137	1
Power module, plug-in, please order at the same time!						
Supply voltage 20 ... 30 V DC	**EMD-SL-PS- 24DC**	2885359	1			
Supply voltage 20.2 ... 26.4 V AC	**EMD-SL-PS- 24AC**	2866103	1			
Supply voltage 88 ... 121 V AC	**EMD-SL-PS-110AC**	2866116	1			
Supply voltage 108 ... 132 V AC	**EMD-SL-PS-120AC**	2885731	1			
Supply voltage 195 ... 264 V AC	**EMD-SL-PS-230AC**	2866129	1			

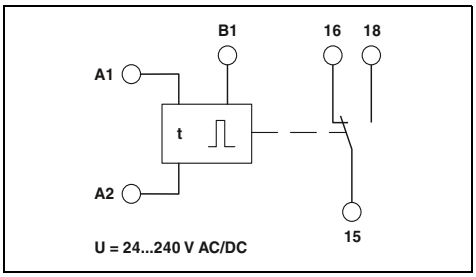
Compact time relay

The multifunctional time relay offers universal use thanks to a variety of functions and various time settings. The rotary switches on the front of the housing allow easy parameterization. The compact design also allows flexible use.

Main features:

– Adjustable time
– Time range: 50 ms to 1 h
– Non-floating control input
– Delay functions
– Wiper functions
– Output: one floating changeover contact
– Clear diagnostics via status LED

Multifunctional time relay



Technical data

Functions	
	E: With switch-on delay R: With release delay and control contact Es: With switch-on delay and control contact Ws: With single shot leading edge and control contact
Control contact	
Connection	Non-floating, terminals A1-B1
Control pulse length	≥ 50 ms (DC)
Relay output	
Contact type	1 floating PDT
Switching capacity	1250 VA (5 A/250 V AC)
Mechanical service life	15 x 10^6 cycles
General data	
Supply voltage	24 V DC ... 240 V DC -20 % ... +25 %
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature range	-25 °C ... 55 °C
Dimensions W/H/D	17.5 / 88 / 65.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL 508 Listed

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Compact time relay, multifunctional, with screw connection	**ETD-BL-1T-230**	2905813	1
Compact time relay, multifunctional, with Push-in connection	**ETD-BL-1T-230-PT**	2905814	1

Compact time relay

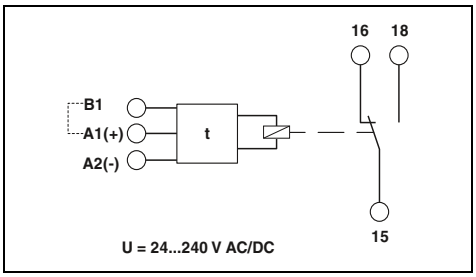
new

As an impulse encoder with adjustable times, the ETD-BL-2T-I-230 offers a range of flashing functions. The rotary switches on the front of the housing allow easy parameterization. The compact design also allows flexible use.

Main features:

– Two adjustable times
– Time ranges: 50 ms to 100 h
– Flashing function
– Wide-range power supply unit
– Output: two floating changeover contacts
– Clear diagnostics via status LED

Impulse encoder, adjustable pulse and pause times



Technical data

Functions	
	Ip: Switched-mode beginning with the pause Ii: Switched-mode beginning with the pulse
Time ranges	
Setting range	50 ms ... 100 h (7 time end ranges)
Control contact	
Connection	Non-floating, terminals A1-B1
Control pulse length	≥ 50 ms (DC)
Relay output	
Contact type	1 floating PDT
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Mechanical service life	Approx. 2x 10^7 cycles
General data	
Supply voltage	24 V DC ... 240 V DC -10 % ... +15 %
Nominal power consumption	2.5 VA (1 W)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature range	-25 °C ... 55 °C
Dimensions W/H/D	17.5 / 88 / 65.5 mm
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Conformance/Approvals	
Conformance	CE-compliant

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Compact time relay, impulse encoder			
- with Push-in connection	**ETD-BL-2T-I-230-PT**	2907714	1
- with screw connection	**ETD-BL-2T-I-230**	2907713	1

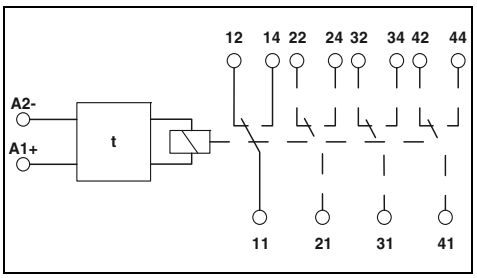
Plug-in timer module for RIF-1, RIF-2, RIF-3, and RIF-4

The multifunctional plug-in timer module transforms a relay module into a time relay. RIF-1 to RIF-4 bases can be equipped with this module. Using DIP switches, three time functions and four time ranges can be selected. Detailed time settings are made using a potentiometer. Relays can be operated with an input voltage of 12 or 24 V AC/DC.

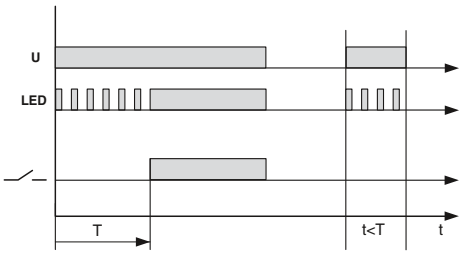
The time functions:
– With switch-on delay
– With passing make contact
– Pulse generator

Time ranges:
– 0.5 to 10 s
– 5 to 100 s
– 0.5 to 10 min
– 5 to 100 min

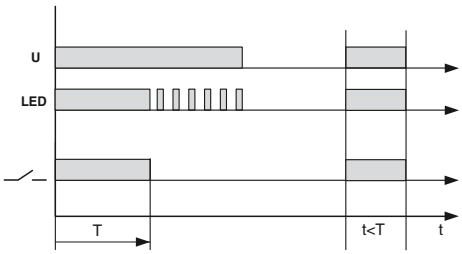
Timer module for RIF-1 to RIF-4 relay modules for 12 to 24 V AC/DC input voltage



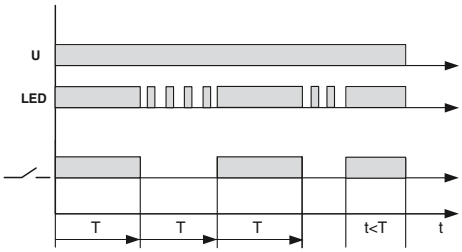
With switch-on delay



Passing make contact



Pulse generator



Technical data

Input data	
Nominal input voltage U_N	24 V DC (AC operation only permitted for RIF-1)
Nominal input voltage range with reference to U_N	0.4 ... 1.2
Input circuit	Varistor , Yellow LED
Output data	
Limiting continuous current	≤ 250 mA (Relay coil current)
General data	
Mounting position	any
Repeat accuracy	1 %
Ambient temperature (operation)	-25 °C ... 50 °C (RIF-1, AC coil, 2 PDTs at 6 A) -25 °C ... 50 °C (RIF-1, DC coil, 2 PDTs at 5 A) -25 °C ... 40 °C (RIF-2, DC coil, 2 PDTs at 8 A) -25 °C ... 40 °C (RIF-2, DC coil, 4 PDTs at 5 A) -25 °C ... 40 °C (RIF-3, DC coil, 3 PDTs at 6.75 A) -25 °C ... 40 °C (RIF-3, DC coil, 2 PDTs at 8 A) -25 °C ... 35 °C (RIF-4, DC coil, 3 PDTs at 8 A) -25 °C ... 25 °C (RIF-4, DC coil, 3 N/O contacts at 8 A)
Standards/specifications	DIN EN 50178
Rated insulation voltage	50 V DC
Rated surge voltage	0.4 kV

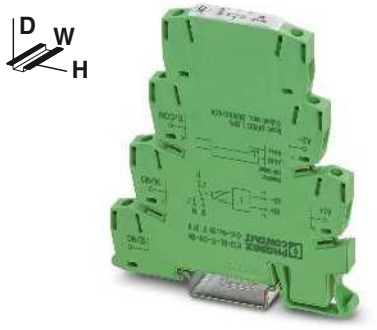
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Timer module, for mounting on RIF-1 to RIF-4, with LED status indicator for extending a relay module to create a time relay with an input voltage of 24 V AC/DC	**RIF-T3-24UC**	2902647	1

Ultra-narrow time relays

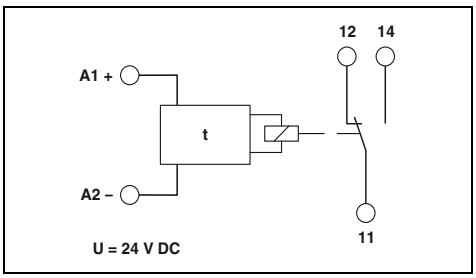
The **ETD-BL-1T-...** ultra-narrow time relays show their strengths in applications that involve set parameters for functionality and time range.

– Purposeful device selection: one function, one time range
– High level of setting accuracy thanks to labeled and illuminated thumb wheel
– Overall width of just 6.2 mm



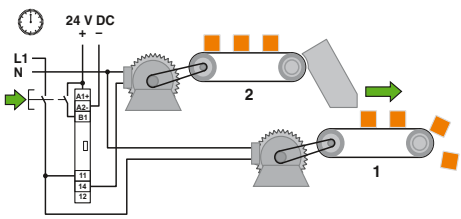
Time relay with switch-on delay, voltage controlled

Ex:

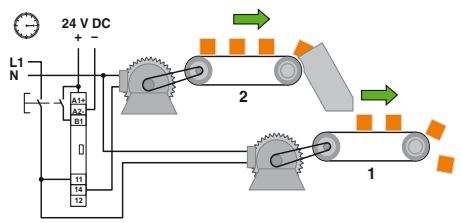


Technical data

Functions	
	ON: With switch-on delay
Control contact	
Connection	-
Control pulse length	min. 50 ms
Relay output	
Contact type	1 floating PDT
Switching capacity	1500 VA (6 A / 250 V AC)
Mechanical service life	Approx. 2x 10^7 cycles
General data	
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)
Typical nominal current	15 mA (Relay ON) 7 mA (Relay OFF)
Impulse withstand voltage	6 kV (According to EN 50178)
Degree of protection	IP20
Ambient temperature range	-20 °C ... 65 °C
Dimensions W/H/D	6.2 / 80 / 86 mm
Screw connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 30 - 12
Push-in connection solid/stranded/AWG	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Conformance/Approvals	
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	UL/C-UL listed UL 508



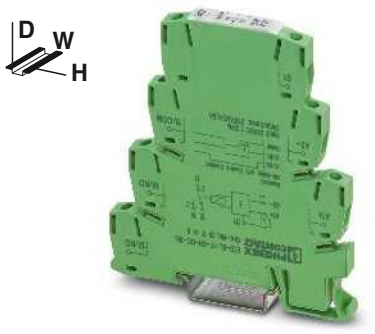
Conveyor belt 1 starts immediately



Conveyor belt 2 starts with a time delay

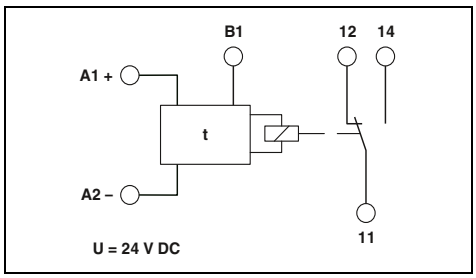
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Compact time relay, with screw connection			
Time range 0.1...10 s	**ETD-BL-1T-ON- 10S**	2917379	1
Time range 3...300 s	**ETD-BL-1T-ON-300S**	2917382	1
Time range 0.3...30 min	**ETD-BL-1T-ON- 30MIN**	2917395	1
Time range 3...300 min	**ETD-BL-1T-ON-300MIN**	2917405	1
Compact time relay, with Push-in connection			
Time range 0.1...10 s	**ETD-BL-1T-ON- 10S-PT**	2901476	1
Time range 3...300 s	**ETD-BL-1T-ON-300S-PT**	2901477	1
Time range 0.3...30 min	**ETD-BL-1T-ON- 30MIN-PT**	2901478	1
Time range 3...300 min	**ETD-BL-1T-ON-300MIN-PT**	2901479	1



Time relay with switch-on delay, with control contact

Ex:



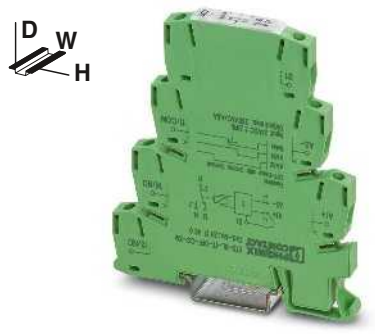
Technical data

ON-CC: With switch-on delay with control contact

	Non-floating, terminals A1-B1
	min. 50 ms
	1 floating PDT
	1500 VA (6 A / 250 V AC)
	Approx. 2x 10^7 cycles
	24 V DC (19.2 V DC ... 30 V DC)
	15 mA (Relay ON)
	7 mA (Relay OFF)
	6 kV (According to EN 50178)
	IP20
	-20 °C ... 65 °C
	6.2 / 80 / 86 mm
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 30 - 12
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
	CE-compliant
	Ex II 3 G Ex nA nC IIC T4 Gc X
	UL/C-UL listed UL 508

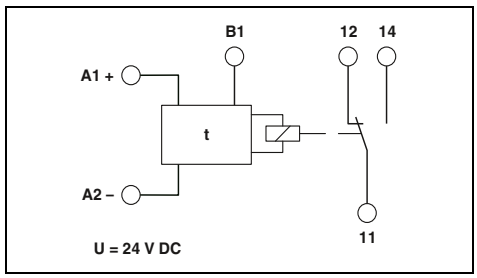
Ordering data

Type	Order No.	Pcs./ Pkt.
ETD-BL-1T-ON-CC- 10S	2917418	1
ETD-BL-1T-ON-CC-300S	2917421	1
ETD-BL-1T-ON-CC- 30MIN	2917434	1
ETD-BL-1T-ON-CC-300MIN	2917447	1
ETD-BL-1T-ON-CC- 10S-PT	2901480	1
ETD-BL-1T-ON-CC-300S-PT	2901481	1
ETD-BL-1T-ON-CC- 30MIN-PT	2901483	1
ETD-BL-1T-ON-CC-300MIN-PT	2901484	1



Time relay with off delay, with control contact

Ex:



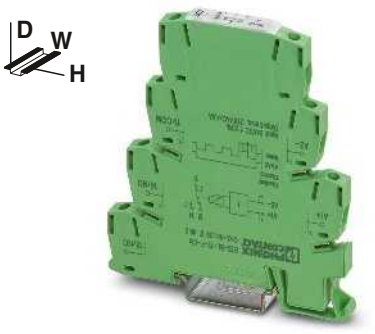
Technical data

OFF-CC: Off delay with control contact

	Non-floating, terminals A1-B1
	min. 50 ms
	1 floating PDT
	1500 VA (6 A / 250 V AC)
	Approx. 2x 10^7 cycles
	24 V DC (19.2 V DC ... 30 V DC)
	15 mA (Relay ON)
	7 mA (Relay OFF)
	6 kV (According to EN 50178)
	IP20
	-20 °C ... 65 °C
	6.2 / 80 / 86 mm
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 30 - 12
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
	CE-compliant
	Ex II 3 G Ex nA nC IIC T4 Gc X
	UL/C-UL listed UL 508

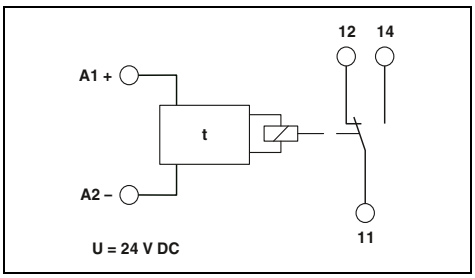
Ordering data

Type	Order No.	Pcs./ Pkt.
ETD-BL-1T-OFF-CC- 10S	2917450	1
ETD-BL-1T-OFF-CC-300S	2917463	1
ETD-BL-1T-OFF-CC- 30MIN	2917467	1
ETD-BL-1T-OFF-CC-300MIN	2917489	1
ETD-BL-1T-OFF-CC- 10S-PT	2901485	1
ETD-BL-1T-OFF-CC-300S-PT	2901486	1
ETD-BL-1T-OFF-CC- 30MIN-PT	2901487	1
ETD-BL-1T-OFF-CC-300MIN-PT	2901488	1



Time relay with flashing indic. function, beginning with the pulse

Ex:



Technical data

F: Flashing beginning with pulse

	-
	min. 50 ms
	1 floating PDT
	1500 VA (6 A / 250 V AC)
	Approx. 2x 10^7 cycles
	24 V DC (19.2 V DC ... 30 V DC)
	15 mA (Relay ON)
	7 mA (Relay OFF)
	6 kV (According to EN 50178)
	IP20
	-20 °C ... 65 °C
	6.2 / 80 / 86 mm
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 30 - 12
	0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14
	CE-compliant
	Ex II 3 G Ex nA nC IIC T4 Gc X
	UL/C-UL listed UL 508

Ordering data

Type	Order No.	Pcs./ Pkt.
ETD-BL-1T-F- 10S	2917492	1
ETD-BL-1T-F-300S	2917502	1
ETD-BL-1T-F- 30MIN	2917515	1
ETD-BL-1T-F-300MIN	2917528	1
ETD-BL-1T-F- 10S-PT	2901489	1
ETD-BL-1T-F-300S-PT	2901490	1
ETD-BL-1T-F- 30MIN-PT	2901491	1
ETD-BL-1T-F-300MIN-PT	2901492	1

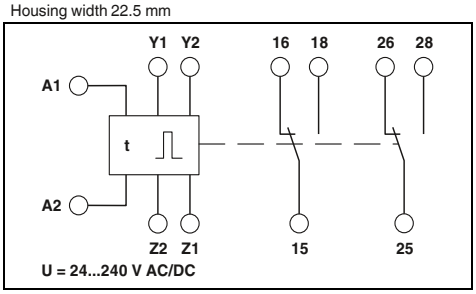
Multifunctional time relays

The full range of conventional applications can be accommodated by the three versions of the **ETD** multifunctional time relay.

– Suitable for universal use thanks to varied functions and selectable time ranges
– Time ranges from a few milliseconds to several days
– Variable supply voltage range
– 2 floating PDT outputs

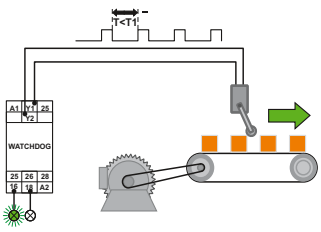
Multifunctional time relay, two adjustable times

Housing width 22.5 mm

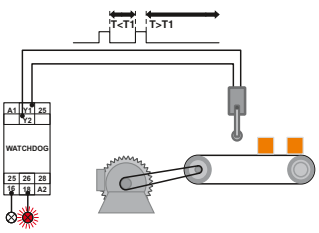


Technical data

Functions	
	lp: Switched-mode beginning with the pause li: Switched-mode beginning with the pulse ER: With switch-on and release delay with control contact EWu: With switch-on delay and single shot leading edge, voltage controlled EWs: With switch-on delay and single shot leading edge with control contact WsWa: With single shot leading edge and single shot trailing edge with control contact Wt: Pulse sequence evaluation (retriggerable release delay)
Time ranges	
Setting range	50 ms ... 10 h (10 time end ranges)
Control contact	
Connection	Floating, basic isolation between connection and input/output/bridge Y1-Y2
Load capacity	Cannot carry load
Cable length	< 10 m
Control pulse length	min. 50 ms (Only with Wt function: > 7 ms)
Relay output	
Contact type	2 floating PDT contacts
Switching capacity	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Mechanical service life	Approx. 2x 10^7 cycles
General data	
Supply voltage	24 V DC ... 240 V DC -20 % ... +25 % 24 V AC ... 240 V AC -15 % ... +10 %
Nominal power consumption	2.5 VA (1 W)
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Ambient temperature range	-25 °C ... 55 °C
Housing material	Polyamide PA, self-extinguishing
Dimensions W/H/D	22.5 / 90 / 113 mm
Screw connection solid/stranded/AWG	0.5 ... 2.5 mm² / 0.5 ... 2.5 mm² / 20 - 14
EMC note	Class A product, see page 605
Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL/C-UL listed UL 508



Function: Pulse sequence evaluation



Message for incorrect pulse

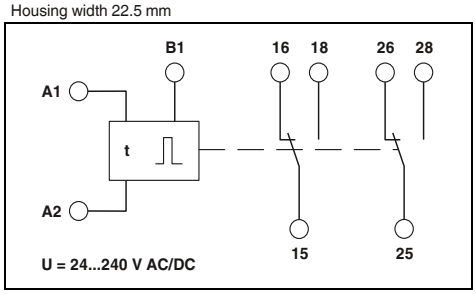
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Electronic time relay with adjustable functions and times	**ETD-FL-2T-DTI**	2866187	1

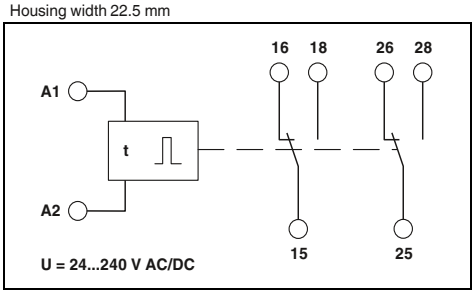
Multifunctional time relay, one adjustable time

Impulse encoder, adjustable pulse and pause times

Housing width 22.5 mm



Housing width 22.5 mm



Technical data

E: With switch-on delay
R: With release delay and control contact
Es: With switch-on delay and control contact
Wu: With single shot leading edge, voltage controlled
Ws: With single shot leading edge and control contact
Wa: With single shot trailing edge and control contact
Bi: Flashing beginning with pulse
Bp: Flashing beginning with pause

50 ms ... 100 h (7 time end ranges)

Non-floating, terminals A1-B1

Parallel switched minimum load current 1 VA (0.5 W), terminals A2-B1

< 10 m
min. 70 ms

2 floating PDT contacts
750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing)
1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

Approx. 2x 10^7 cycles

24 V DC ... 240 V DC -20 % ... +25 %
24 V AC ... 240 V AC -15 % ... +10 %
2.5 VA (1 W)
IP40 (housing) / IP20 (connection terminal blocks)

-25 °C ... 55 °C
Polyamide PA, self-extinguishing
22.5 / 90 / 113 mm
0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Class A product, see page 605

CE-compliant
UL/C-UL listed UL 508

Ordering data

Type	Order No.	Pcs./ Pkt.
ETD-SL-1T-DTF	2866161	1

Technical data

lp: Switched-mode beginning with the pause
li: Switched-mode beginning with the pulse

50 ms ... 100 h (7 time end ranges)

-

-

-
-

2 floating PDT contacts
750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing)
1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)

Approx. 2x 10^7 cycles

24 V DC ... 240 V DC -20 % ... +25 %
24 V AC ... 240 V AC -15 % ... +10 %
2.5 VA (1 W)
IP40 (housing) / IP20 (connection terminal blocks)

-25 °C ... 55 °C
Polyamide PA, self-extinguishing
22.5 / 90 / 113 mm
0.5 ... 2.5 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 14
Class A product, see page 605

CE-compliant
UL/C-UL listed UL 508

Ordering data

Type	Order No.	Pcs./ Pkt.
ETD-SL-2T-I	2866174	1

Diode module

Diode circuits perform various tasks in electrical control systems, particularly in electronic ones:

– Electrical decoupling of messages in fault signaling systems
– Spark-suppression diodes for limiting surge voltages of inductive loads, (solenoid valves, DC relays or similar)
– Can be supplied as “diode gates” combined with anode or cathode or as freely assignable diodes

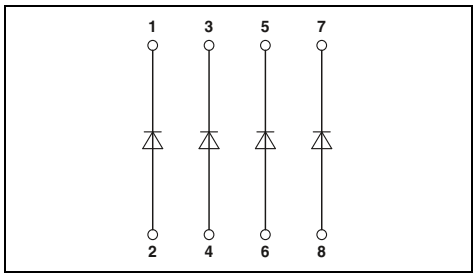
Notes:

Further circuit diagrams can be found in the data sheet at phoenixcontact.net/products.

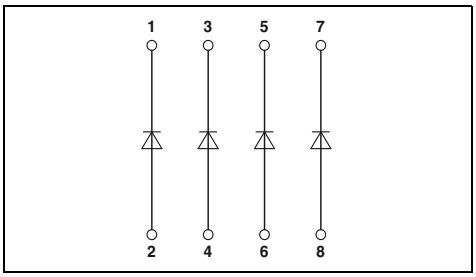
with diode type 1 N 4007

with diode type 1 N 5408

EAC



EAC



Technical data

Diodes	4E / 8E / 17E / 7P / 7M	14P / 14M / 32P / 32M
Max. operating voltage U_{max}	250 V AC	250 V AC
Peak reverse voltage per diode	1300 V	1300 V
Reverse current per diode	5 µA	5 µA
Conducting state voltage per diode	approx. 0.8 V	approx. 0.8 V
Conducting state current per diode		
with single load	0.7 A	0.7 A
with simultaneous loads	0.5 A	0.2 A
General data		
Ambient temperature range	-20 °C ... 50 °C	
Rated insulation voltage	300 V (According to EN 50178)	
Degree of pollution / Overvoltage category	III, basic insulation (as per EN 50178)	
Degree of pollution / Overvoltage category	2 (according to EN 50178)	
Mounting position	any	
Mounting	In rows with zero spacing	
Dimensions H / D	75 / 55 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Conformance/Approvals		
Conformance	CE-compliant	

Technical data

Diodes	4E-... / 4P-... / 4M-... / 8E-...	8P-... / 8M-...
Max. operating voltage U_{max}	250 V AC	250 V AC
Peak reverse voltage per diode	1000 V	1000 V
Reverse current per diode	10 µA	10 µA
Conducting state voltage per diode	approx. 0.8 V	approx. 0.8 V
Conducting state current per diode		
with single load	1.5 A	1.5 A
with simultaneous loads	1 A	0.3 A
General data		
Ambient temperature range	-20 °C ... 50 °C	
Rated insulation voltage		
Degree of pollution / Overvoltage category	III, basic insulation (as per EN 50178)	
Degree of pollution / Overvoltage category	2 (according to EN 50178)	
Mounting position	any	
Mounting	In rows with zero spacing	
Dimensions H / D	75 / 55 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Conformance/Approvals		
Conformance	CE-compliant	

Ordering data

Description	Housing width	Type	Order No.	Pcs./ Pkt.
Diode module, can be individually wired				
4 diodes	22.5 mm	**EMG 22-DIO 4E**	2950048	10
8 diodes	45 mm	**EMG 45-DIO 8E**	2950103	5
17 diodes	90 mm	**EMG 90-DIO 17E**	2954895	5
Diode module, with P polarity (common cathode)				
4 diodes	22.5 mm			
7 diodes	22.5 mm	**EMG 22-DIO 7P**	2950064	10
8 diodes	45 mm			
14 diodes	45 mm	**EMG 45-DIO14P**	2950116	5
32 diodes	90 mm	**EMG 90-DIO 32P**	2954918	5
Diode module, with M polarity (common anode)				
4 diodes	22.5 mm			
7 diodes	22.5 mm	**EMG 22-DIO 7M**	2950077	10
8 diodes	45 mm			
14 diodes	45 mm	**EMG 45-DIO14M**	2950129	5
32 diodes	90 mm	**EMG 90-DIO 32M**	2954934	5

Accessories

Equipment marker	**EMG-GKS 12**	2947035	50

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 22-DIO 4E-1N5408	2952790	10
EMG 45-DIO 8E-1N5408	2949389	5
EMG 22-DIO 4P-1N5408	2952198	10
EMG 45-DIO 8P-1N5408	2954879	5
EMG 22-DIO 4M-1N5408	2952211	10
EMG 45-DIO 8M-1N5408	2954882	5

Accessories

EMG-GKS 12	2947035	50

Lamp testing modules

Lamp testing modules for checking lamps that are installed and ready for operation:

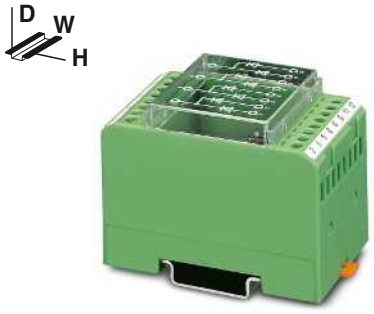
– Individual checking of separate lamps (EMG...-E/LP)
– Centrally controlled checking of lamps (EMG...-M/LP)

Display modules

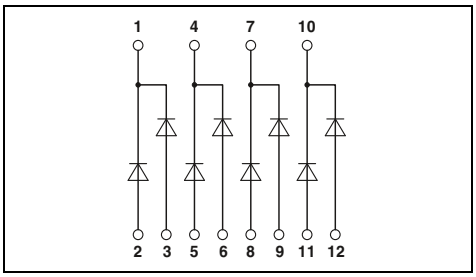
– Light indicator modules facilitate the monitoring of processes on electronic control systems during troubleshooting

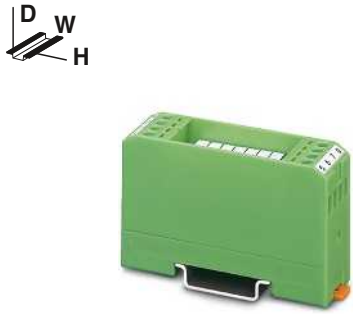
Notes:

Further circuit diagrams can be found in the data sheet at phoenixcontact.net/products.

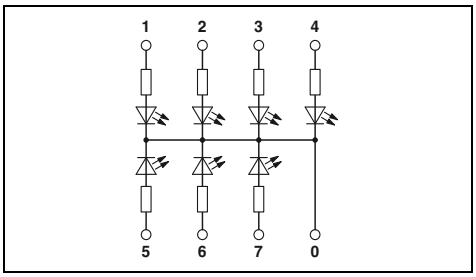


Lamp testing module, groups of 2 diodes with common cathode





Light indicator module, with common return line



Technical data

Diodes	8E/16E	14M/32M
Max. operating voltage U_{max}	250 V AC	250 V AC
Peak reverse voltage per diode	1300 V	1300 V
Reverse current per diode	≤ 5 µA	≤ 5 µA
Conducting state voltage per diode	approx. 0.8 V	approx. 0.8 V
Conducting state current per diode		
with single load	0.7 A	0.7 A
with simultaneous loads	0.4 A	0.2 A
Input		
Current required per light indicator		
General data		
Ambient temperature range	-20 °C ... 50 °C	
Rated insulation voltage	300 V (According to EN 50178)	
Degree of pollution / Overvoltage category	III, basic insulation (as per EN 50178)	
Degree of pollution / Overvoltage category	2 (according to EN 50178)	
Mounting position	any	
Mounting	In rows with zero spacing	
Dimensions H / D	75 / 55 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Conformance/Approvals		
Conformance	CE-compliant	

Technical data

LA 7S	LED 7S/LED 14S	
approx. 1 mA	approx. 3 mA	
-20 °C ... 45 °C		
III, basic insulation (as per EN 50178)		
2 (according to EN 50178)		
any		
In rows with zero spacing		
75 / 47.5 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
CE-compliant		

Ordering data

Description	Housing width	Type	Order No.	Pcs./ Pkt.
Lamp testing module, for individual wiring				
4-pair	45 mm	**EMG 45-DIO 8E/LP**	2954798	5
8-pair	90 mm	**EMG 90-DIO 16E/LP**	2954808	5
Lamp testing module, with common control				
7-pair	45 mm	**EMG 45-DIO14M/LP**	2950132	5
16-pair	90 mm	**EMG 90-DIO 32M/LP**	2954785	5
Light indicator module, 110 ... 230 V AC input voltage				
7 glow lamps	22.5 mm			
Light indicator module, 24 V DC input voltage				
7 LEDs	22.5 mm			
14 LEDs	45 mm			

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 22-LA 7S/230	2949677	10
EMG 22-LED 7S/24	2952305	10
EMG 45-LED 14S/24	2952334	5

Accessories

Equipment marker	**EMG-GKS 12**	2947035	50

Accessories

EMG-GKS 12	2947035	50

K1 K2 K3 K4
K9
K10
PHOENIX CONTACT
EMD-BL-PH-480-PT
EMD-BL-C-10-PT

Relay modules

The importance of the reliability of industrial automation equipment is growing with the increase in use of electronic modules.

Modern relays or solid-state relay interfaces perform a wide range of tasks. No matter what the field – production technology, electrical equipment for machines, control engineering for power distribution, building automation, or process engineering – the aim is to ensure signal exchange between process peripherals and the higher-level central control systems. And this exchange must be reliable, floating, and electrically unambiguous. Safe electrical interface modules that meet the requirements of modern system concepts must include the following features:

– Coupling of different signal levels
– Safe electrical isolation between input and output
– High resistance to interference

In practice, a relay interface is used in applications that require a flexible interface configuration with a large switching capacity range and the possibility of combining different types of contact. Further important features of relay interfaces are:

– Electrical isolation between open contacts
– Switching of independent switching current types
– High short-term overload resistance in the event of a short circuit or voltage peaks
– Practically impervious to electromagnetic fields
– Easy handling

Solid-state relay modules are used when an interface between the process peripherals and electronics is subject to the following requirements:

– Low control power
– High switching frequencies
– Wear-resistant and bounce-free switching
– Resistance to vibrations and shocks
– Long service life

Product range overview

Product overview	**284**
Basics of relay technology	**286**
Basics of solid-state relay technology	**290**
Sensor/actuator configuration aids and handling of interference signals	**292**
Industrial relay system - RIFLINE complete	**294**
Highly compact relay modules - PLC-INTERFACE	**368**
Programmable logic relay system - PLC logic	**426**
Relay modules in terminal block design - DEK series	**436**
Special relay and solid-state relay modules	**442**
Relay modules with force-guided contacts	**456**
Relay modules for potentially explosive areas (Zone 2)	**458**

Product overview

RIFLINE complete

RIF-0 for relays and solid-state relays
Page 296

RIF-1 for relays and solid-state relays
Page 302

RIF-2 for industrial relays
Page 312

RIF-3 for octal relays
Page 318

PLC-INTERFACE

With relay/solid-state relay
Page 372
As sensor/actuator version
Page 378

For high inrush/continuous currents
Page 386
Resistant to interference currents/voltages
Page 388

With switch
Page 404
For railway applications
Page 415

For NAMUR initiators
Page 420
Types of electronics
Page 421

DEK series

With miniature relay
Page 437

Actuator series with miniature relays
Page 439

Sensor series with miniature relays
Page 439

With solid-state relay
Page 440

Relay modules with force-guided contacts

Relay modules with force-guided contacts
Page 456

Relay modules for potentially explosive areas (Zone 2)

Relay modules for potentially explosive areas (Zone 2)
Page 458

RIF-4 for high-power relays
Page 324

Accessories
Page 330

PLC logic

Programmable logic relay system - PLC logic
Page 426

Special relay and solid-state relay modules

Relay terminal blocks with switch
Page 443

Interference-free relays and solid-state relays
Page 444

Relays for switching lamp loads
Page 447

Solid-state power relays with 400 V AC/3 A output
Page 448

Safety devices

Safety devices
See Catalog 6

Monitoring relays

Monitoring relays
Page 262

Time relays

Time relays
Page 276

General information

Electromechanical relays are used as interface modules between the process I/O devices, on the one hand, and the open-loop/closed-loop control and signaling equipment, on the other, for level and power adjustment purposes.

Essentially, electromechanical relays can be divided into two main groups: monostable and bistable relays.

With monostable DC or AC relays, the contacts automatically return to the release state as soon as they are de-energized.

In the case of bistable relays, the contacts remain in their present switch position when the excitation current is switched off.

The documented relay data is based on test conditions and design criteria according to IEC 61810. Data may vary or be limited when mounting relays on DIN rail bases or on PCBs. Numerous parameters, such as:

– Operating time
– Load current
– Input voltage
– Dense mounting arrangement
– Heat dissipation into the environment and the layout for PCB applications ultimately determine the data for the overall arrangement.

The Phoenix Contact supply range features numerous ready-mounted relay combinations and base combinations, including some with additional input plug-in modules. These are tested under worst case conditions. The documented data then applies to the combinations.

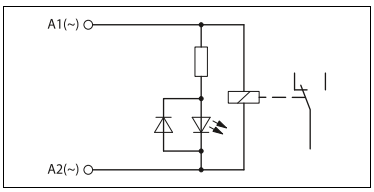
Coil side

Input circuits and voltage types

There are various kinds of input circuit depending on the type of relay used and the nature of the control voltage.

If pure AC relays are used (AC input), the input circuit is generally nothing more than a visual switching status indicator.

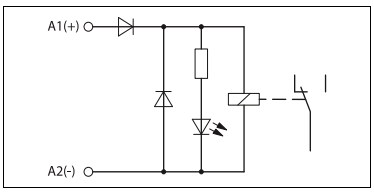
Unless otherwise specified, the frequency of the control voltage is 50/60 Hz.



Basic structure of a relay with AC input

In the case of a pure DC input, the most important addition to the circuit is a freewheeling diode. This limits the voltages induced on the coil on circuit interruption to a value of approximately 0.7 V, which does not pose a danger to any connected control electronics.

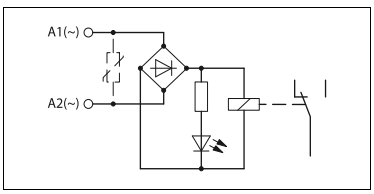
As the freewheeling diode can only perform its required function if the polarity of the voltage connection is correct, a polarity protection diode is also integrated into the input circuit.



Basic structure of a relay with DC input

To allow DC or AC voltage operation, a bridge rectifier is connected in the input circuit. The diodes are simultaneously responsible for performing rectification, freewheeling, and polarity reversal protection functions. The interrupting voltage of the coil is limited to approximately 1.4 V.

To protect the input circuit against overvoltages, a varistor is also connected (depending on the type) upstream of the bridge rectifier.

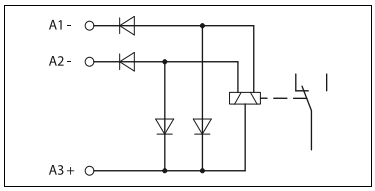


Basic structure of a relay with AC/DC input

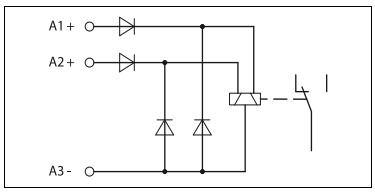
Bistable latching relays with a double winding are only ever operated with DC voltage.

With these types of relay, there are three coil connections on the coil side. In addition to the common connection, there are separate connections for "setting" and "resetting"; these are controlled by short pulses only. As a result, the relays hardly heat up at all. Simultaneous control of both control inputs is not permitted.

A distinction is made between negative switching (M) and positive switching (P) types, depending on the polarity of the freewheeling and polarity protection diodes.



Basic structure of a bistable relay, negative switching type



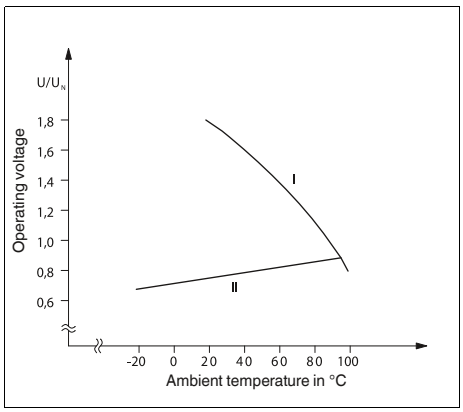
Basic structure of a bistable relay, positive switching type

Operating voltage range

The ambient temperature prevailing at the location of use has a major impact on certain relay operating parameters.

As the ambient temperature increases, the coil winding heats up, causing the operate and release voltages to rise. At the same time, the maximum permissible coil voltage decreases, which means that the usable working range becomes restricted as a result.

The diagram below illustrates how the operating voltage behaves as a function of the ambient temperature.



Basic curve of a relay operating voltage

I: Maximum permissible voltage with 100% operating time (OT) and compliance with the coil temperature limit
II: Minimum response voltage

Interference voltages and interference currents on the coil side

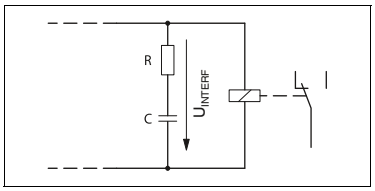
When inductive or capacitive interference voltages are coupled into the long supply lines of a relay, this can prevent the relay from operating safely.

If the coupled-in voltage exceeds the release voltage required by the IEC 61810-1 "relay standard", in extreme cases the relay may fail to release. In the case of DC relays,

this release voltage is ≥ 0.05 x U_N and for purely AC relays, it is ≥ 0.15 x U_N.

The same disturbances can occur when a relay with a low input power is controlled by an electronics module with an AC voltage output featuring an RC circuit. The typical leakage current from RC elements of this kind (generally in the region of several mA) provides sufficient control power to prevent the downstream relay from releasing or even enough power to excite it.

The disturbance level of any interference voltages that are present can be reduced by connecting an RC element in parallel to the relay coil. This measure also subjects the interference voltage to a capacitive load, causing it to collapse.



External RC interference suppressor to prevent interference voltage coupling

The following values are recommended for the purpose of dimensioning the RC element:
– R = 100 to 220 Ω
– C = 220 to 470 nF

The SO46 series has been developed to provide even higher levels of immunity to interference. These products already contain an integrated RCZ filter. See, for example, PLC...SO46.

Contact side, contact materials

Given the wide variety of potential applications in the different industrial sectors, the relays used must be matched to the various tasks that need to be performed by selecting the right kind of contact material.

The voltage, current, and power values play an important role when determining the suitability of contact materials. Other criteria include:
– Contact resistance
– Erosion resistance
– Material migration
– Welding tendency
– Chemical influences

In this way, the various contact materials (generally noble metal alloys) can be matched to the relevant areas of application.

The adjacent table provides details of some of the key materials.

Contact material	Typical properties	Typical applications	Guide values for the area of application*
Gold Au	Largely insensitive to industrial atmospheres, low and constant contact resistances in the range of small switching capacities with nickel (AuNi) or silver (AuAg) alloys.	Dry measuring and switching circuits, control inputs	µA ... 0.2 A µV ... 30 V
Silver Ag	High electrical conductivity, sensitive to sulfur, therefore often gold-flashed (approximately. 0.2 µm) as protection; nickel (AgNi) or copper (AgCu) alloys increase the mechanical resistance and erosion resistance and reduce the welding tendency.	Universal, suitable for medium loads; nickel alloys (AgNi 0.15) for DC circuits with medium to large loads	≥ 12 V ≥ 10 mA
Silver, hard gold-plated Ag + Au	Properties similar to gold Au, when switching loads > 30 V/0.2 A, the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the Ag contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA
Tungsten W	Highest melting point, very high erosion resistance, greater contact resistances, very low welding tendency, susceptible to corrosion, often used as lead contact.	Loads with very high inrush currents, e.g., glow lamps, fluorescent lamps.	≥ 60 V ≥ 1 A
Silver nickel AgNi	High erosion resistance, low welding tendency, higher contact resistances than with pure silver.	Universal, suitable for medium to high loads, DC circuits, and inductive loads.	≥ 12 V ≥ 10 mA
Silver nickel AgNi + Au	Properties similar to gold Au, when switching loads > 30 V/0.2 A, the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the AgNi contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA
Silver tin oxide AgSnO	Low welding tendency, very high erosion resistance for high switching capacities, low material migration	Application depends heavily on the relay type, switching circuits with high make and break loads, e.g., glow lamps and fluorescent lamps, AC and DC circuits. Due to different alloys and production procedures, partly also suitable for smaller loads.	≥ 12 V ≥ 100 mA (≥ 10 mA)
Silver tin oxide, hard gold-plated AgSnO + Au	Properties similar to gold Au, when switching loads > 30 V/0.2 A the hard gold plating (5 - 10 µm) is destroyed and the values and properties of the AgSnO contact are applicable. However, a reduction in the service life is then to be expected.	Suitable for control inputs and other small loads.	≥ 100 mV ≥ 1 mA

* Values depend on the relay used and on further operating conditions.

Contact protection circuit

Every electrical consumer constitutes a mixed load with ohmic, capacitive, and inductive components.

When these loads are switched, the switching contact is in turn subjected to a load, to either a lesser or greater extent. This load can be reduced by including a suitable contact protection circuit.

In view of the fact that consumers with a large inductive component are predominantly used in practice (e.g., contactors, solenoid valves, motors, etc.), these application scenarios are worth considering in more detail.

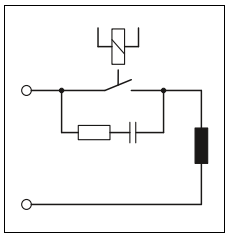
On interruption, voltage peaks with values of up to several thousand volts occur due to the energy stored in the coil.

These high voltages cause an electric arc on the switching contact which can destroy the contact due to material vaporization and material migration. The electrical service life is reduced considerably as a result. In extreme cases, the relay may fail in the very first switching cycle with DC voltage and a static electric arc.

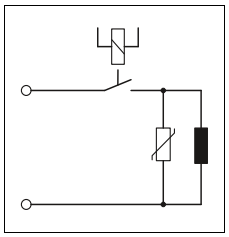
A protective circuit must be used to suppress the formation of an electric arc. With optimum dimensioning, almost the same number of switching cycles can be achieved as with an ohmic load.

In principle, there are a number of possible ways of achieving an effective circuit:

1. Wiring the contact
2. Wiring the consumer
3. Combination of both wiring methods



Wiring the contact



Wiring the inductive consumer

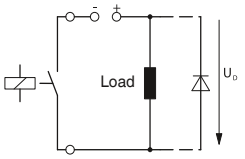
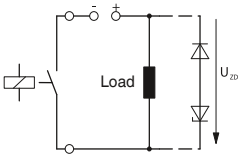
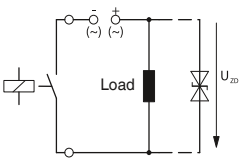
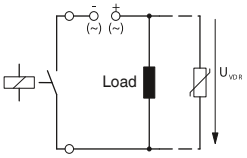
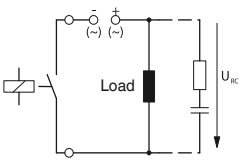
In principle, protective measures should intervene directly at the source of the interference.

Wiring a consumer should therefore be given priority over wiring the contact.

The following points are advantageous for the consumer circuit (image on right):

1. The circuit is only loaded with the induction voltage during interruption. By contrast, the sum of the operating voltage and the induction voltage is applied to the contact circuit.
2. When the contact is open, the load is electrically isolated from the operating voltage.
3. It is not possible for the load to be activated or to "stick" due to undesired operating currents, e.g., from RC elements.
4. Cut-off peaks of the load cannot be coupled into parallel control lines.

Nowadays, solenoid valves are usually connected using valve connectors that are also supplied with LEDs and components that limit the induction voltage. Valve connectors with an RC element, varistor or Zener diode often do not quench the arc and only serve to comply with legislation governing EMC. Only valve connectors with an integrated 1N4007 freewheeling diode quench the arc quickly and safely, thereby increasing the service life of the relay by a factor of 5 to 10. Valve connectors with LED, integrated 1N4007, and free cable end can be supplied on request as part of the SAC range.

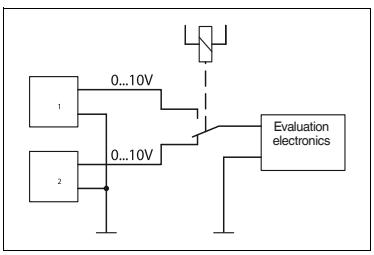
Load wiring	Additional dropout delay	Defined induction voltage limitation	Effective bipolar attenuation	Advantages and disadvantages
Diode 	Large	Yes (U_D)	No	**Advantages:** • Good effect in terms of extending the service life of the contacts • Easy implementation • Inexpensive • Reliable • Dimensioning not critical • Low induction voltage **Disadvantages:** • Attenuation only via load resistor • Long dropout delay
Series connection diode/Zener diode 	Medium to small	Yes (U_{ZD})	No	**Advantages:** • Dimensioning not critical **Disadvantages:** • Attenuation only above U_{ZD} • Minimal effect in terms of extending the service life of the contacts
Suppressor diode 	Medium to small	Yes (U_{ZD})	Yes	**Advantages:** • Inexpensive • Dimensioning not critical • Limitation of positive peaks • Suitable for AC voltage **Disadvantages:** • Attenuation only above U_{ZD} • Minimal effect in terms of extending the service life of the contacts
Varistor 	Medium to small	Yes (U_{VDR})	Yes	**Advantages:** • High energy absorption • Dimensioning not critical • Suitable for AC voltage **Disadvantages:** • Attenuation only above U_{VDR} • Minimal effect in terms of extending the service life of the contacts
R/C combination 	Medium to small	No	Yes	**Advantages:** • HF attenuation due to energy storage • Suitable for AC voltage • Level-independent attenuation **Disadvantages:** • Precise dimensioning required • High inrush current surge • Minimal effect in terms of extending the service life of the contacts

Switching small loads

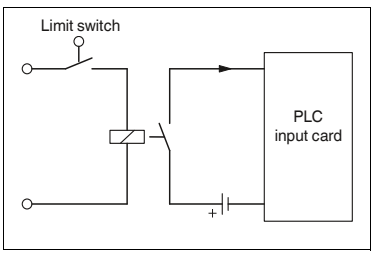
Small loads have to be processed mainly in applications where signals have to be forwarded to control inputs (e.g., of a PLC).

With these loads, no switching sparks (electric arcs) occur on the contacts in the small load range.

In addition to the constant cleaning effect due to contact friction, this switching spark assumes the function of penetrating non-conductive contamination layers that are formed on the contact surfaces of power contacts.



Application example: Measurement point changeover



Application example: PLC input signal

These contamination layers are usually oxidation or sulfidation products of the contact materials silver (Ag) or silver alloys such as silver nickel (AgNi) or silver tin oxide (AgSnO). As a result, the contact resistance may rise so considerably within a short time that reliable switching is no longer possible in the case of small loads.

Due to these properties, the power contact materials mentioned are not suitable for small load applications.

Gold (Au) has become accepted as the contact material of choice for these areas of application mainly on account of its low and constant contact resistances even with small loads and its insensitivity to sulfurous atmospheres.

For the smallest of loads and even greater contact reliability, double contact relays with gold contacts are used.

The slotted contact spring in this design provides two parallel contact points with even lower contact resistances and considerably higher contact reliability.

Switching large loads

A few important points also need to be considered with regard to switching operations in the large load range that involve power contacts made of either silver (Ag) or silver tin oxide (AgSnO).

A basic distinction must be made between switching DC and AC loads.

Switching large AC loads

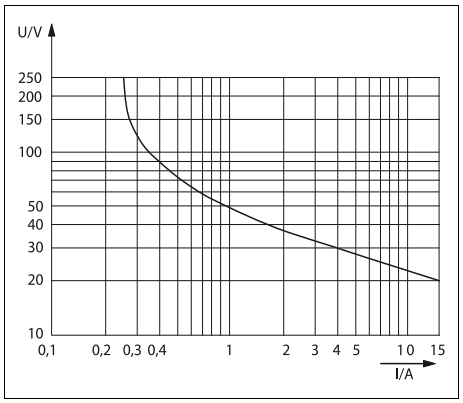
When switching large AC loads, the relay can be operated up to the corresponding maximum values for switching voltage, current, and power. The electric arc that occurs during interruption depends on the current, voltage, and phase relation. This cut-off arc usually disappears automatically the next time the load current passes through zero.

In applications with an inductive load, an effective protective circuit must be provided, otherwise the service life of the system will be reduced considerably.

Switching large DC loads

Conventional switching relays can only switch off relatively small direct currents (which contrasts with their ability to switch off the maximum permissible AC current), since there is no zero crossing to extinguish the arc automatically. This maximum DC value is also dependent to a large extent on the switching voltage and is determined, among other things, by constructional features such as contact spacing and contact opening speed.

The corresponding current and voltage values are documented by relay manufacturers in electric arc or load limit curves.



Example of a load limit curve (dependent on the type)

A non-attenuated inductive DC load further reduces the values given for switchable currents. The energy stored in the inductance can cause an electric arc to occur, which forwards the current through the open contacts.

With an effective contact protection circuit, preferably type 1N4007 freewheeling diodes, the service life can be increased by a factor of 5 to 10 compared with unprotected or poorly protected inductive loads (see also "Contact protection circuit" section).

If higher DC loads than those documented are to be switched or if the electrical service life is to be increased, several contacts of a relay can be connected in series. See, for example, REL-IR... industrial relays.

Alternatively, solid-state relays with DC voltage output can also be used.

Switching lamps and capacitive loads

Regardless of the type of voltage, all kinds of lamps and loads with a capacitive component impose extreme requirements on the switching contacts. The moment it is switched on, in other words precisely in the dynamic chattering phase of the relay, extremely powerful current peaks occur. These are often in the region of several tens of amps, and not infrequently are known to exceed 100 A, which results in welding of the contact. This can be remedied by using specially optimized "lamp load relays" that can cope with these inrush peaks. See, for example, PLC...IC type.

Switching capacity according to utilization categories AC15 and DC13 (IEC 60947)

In practice, both the maximum interrupting rating for AC loads and the DC interruption values taken from the load limit curves provide only a rough guide for the choice of relay. In reality, this is insufficient, since real loads in the vast majority of industrial applications have inductive or capacitive components and the wiring of the loads can be totally different. As already described, this sometimes leads to considerable variations in terms of service life.

The IEC 60947 contactor standard seeks to avoid these disadvantages by dividing the loads into various utilization categories (DC13, AC15, etc.). This standard is also partly applied to relays. However, users must be aware of the fact that these values are only applicable in practice to a limited extent as well, since all DC13 and AC15 test loads are highly inductive and are also operated without any protective circuit at all (see "Contact protection circuit" section). Moreover, the switching capacity test according to IEC 60947 only requires 6060 switching cycles to be performed by way of a minimum requirement.

A much more reliable way to determine the switching capacity and the anticipated service life is to refer to the specific application data. Using a comprehensive data bank, the service life can be accurately estimated for most applications and, if necessary, suggestions for improvement can be made. In the case of critical applications, the user is advised to gather service life information based on empirical data.

Control side

Solid-state relays for various voltage and power levels are available from Phoenix Contact for use as interface modules designed to match process I/O devices to control, signaling, and regulating devices. The solid-state relay element which is actually located in the module is limited to one defined voltage range by virtue of its design. The current consumption on the input side fluctuates depending on the circuit architecture and voltage level.

To accommodate all voltages required for industrial applications between 5 V and 230 V, an input circuit is provided. The inputs for DC voltage and AC voltage must always be differentiated.

DC input

Adjustments are made in accordance with the various voltage levels by adding electronics which have been specially adapted to the desired voltage range. In the case of most modules, a polarity protection diode provides reliable protection against destruction in the event of a control voltage being connected incorrectly. Specially coordinated filters reliably suppress possible high-frequency noise emissions.

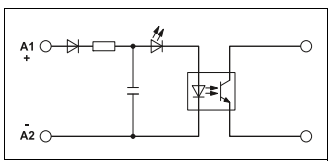


Figure 1: Block diagram for DC input

AC input

The solid-state relay element requires a stable control voltage to ensure reliable operation. In the case of the AC input, this is achieved by connecting a rectifier and filter capacitor upstream. The rectification is followed, in principle, by the same circuit architecture as the DC input.

The switching frequency always lies below half the mains frequency. Due to the filter capacitor, a higher switching frequency cannot be achieved. This results in continuous through-switching.

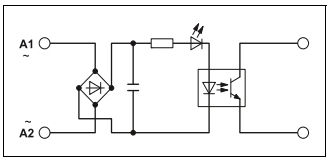


Figure 2: Block diagram for AC input

Load side

Depending on the application and the type of load, the solid-state relay output must meet various requirements. The following are crucial:

– Power amplification
– Matching the switching voltage and the switching current (AC/DC)
– Short-circuit protection

For these different applications, the solid-state relay element must also be processed using additional electronics on the output side.

DC output

In order to achieve the necessary output power, the solid-state relay element is supplemented by one or more semiconductor components.

The on-site user should nevertheless simply regard the connection terminal blocks of the output as conventional switch connections. Observing the specified polarity is the only essential requirement.

For practical reasons, the following criteria should be taken into account when selecting a suitable solid-state relay:

1. Operating voltage range
   (e.g., 12 ... 60 V DC)
   This determines the minimum or maximum voltage to be switched. The lower value must be observed in order to ensure reliable operation. In order to protect the output transistor, the upper value must not be exceeded.
2. Maximum continuous current (e.g., 1 A)
   This value indicates the maximum continuous current. If this value is exceeded continuously, the output semiconductor will be destroyed. The dependence of the output current on the ambient temperature of the solid-state relay should also be taken into consideration. A derating curve is therefore generally specified for solid-state power relays. This shows the maximum load current as a function of the ambient temperature.
3. Output circuit
   The 2-conductor output is similar to a mechanical contact. Only the polarity of the connections is specified and must be observed.

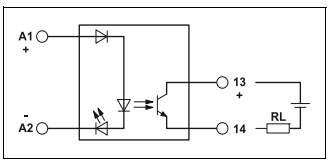


Figure 3: 2-conductor output

The 3-conductor output is non-isolated and requires both potentials from the voltage source on the output side to be connected if it is to operate reliably.

When switched off, a permanent reference to ground (negative potential) is established. In addition, this output circuit offers the advantage of an almost constant internal resistance.

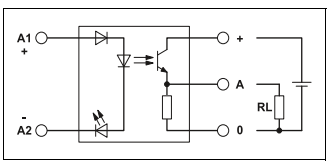


Figure 4: 3-conductor output

AC output

In order to control the switching and control devices for AC voltage, a semiconductor for AC voltage (TRIAC or thyristor) is connected downstream of the solid-state relay element.

As with the DC output, it is particularly important to consider the maximum operating voltage range and the maximum continuous load current as a function of the ambient temperature.

In addition, the maximum peak reverse voltage of the TRIAC (e.g., 600 V) is crucial with AC outputs. This must not be exceeded even in the case of voltage fluctuations or interference voltage peaks in order to prevent destruction. That is why the AC outputs of all solid-state relays from Phoenix Contact have an internal RC protective circuit to protect against interference voltage peaks.

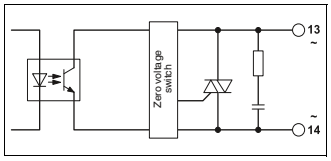


Figure 5: Basic circuit diagram of AC output

Protective circuits

The moment inductive loads (contactors, solenoid valves, motors) are switched off, surge voltages occur and these can reach very high amplitudes. Electronic components and switching elements are particularly susceptible to these. A protective circuit should therefore always be provided to prevent destruction.

A parallel connection to the load effectively reduces the switching surge voltage to a harmless level. Depending on the solid-state relay output and load type,
– a freewheeling diode/suppressor diode (DC only),
– a varistor (AC and DC)
– or an RC element (AC only)
can provide the necessary protection.

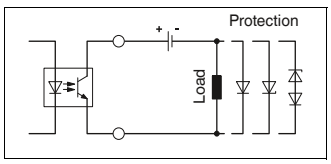


Figure 6: Protective circuit with DC voltage output

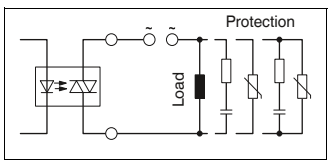


Figure 7: Protective circuit with AC voltage output

Application notes

Input solid-state relays acting in the direction from the I/O devices to the controller (signaling, controlling, monitoring)

Plug-in version:
– PLC-O...

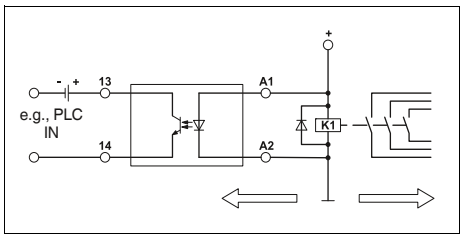
Modular version:
– DEK-OE...
– EMG 10-OE...
– SIM-EI...
– OPT...

Output (power) solid-state relays acting in the direction from the controller to the I/O devices (switching, amplifying, controlling)

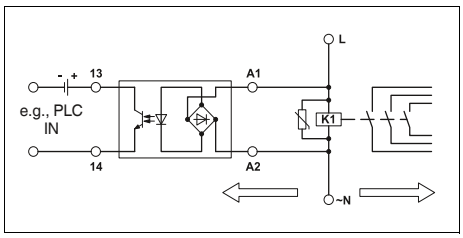
Plug-in version:
– PLC-O...

Modular version:
– DEK-OV...
– EMG 10-OV
– EMG 12-OV
– EMG 17-OV
– OV...
– OPT...

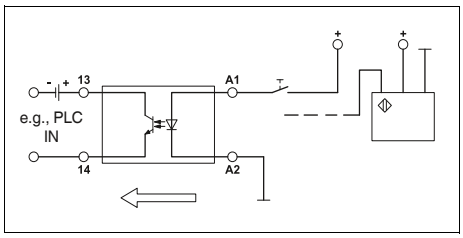
e.g., load protection monitoring (DC contactor)



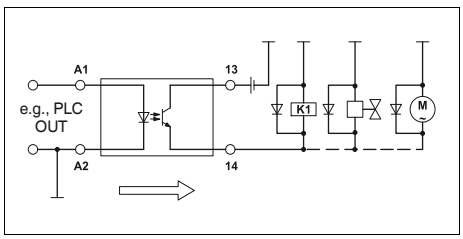
e.g., load protection monitoring (AC contactor)



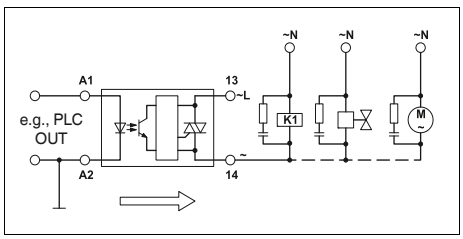
e.g., position indication with limit stop contact or initiator



e.g., switching the contactor, solenoid valve or motor (DC load)



e.g., switching the contactor, solenoid valve or motor (AC load)



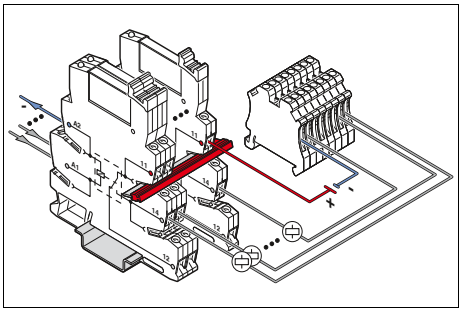
Remarks:

[1]) Ground (negative) potential from the input and output of the solid-state relay must not be connected.
[2]) DC loads must be provided with an effective protective circuit (e.g., diode).
[3]) AC loads must be protected with a varistor or an RC element.

Configuration aid for connecting sensors and actuators

Electromechanical relays or solid-state relays are used as the coupling element between the controller and the sensors or actuators in the field. This interface ensures appropriate signal conditioning with respect to current and voltage between the controller and field level.

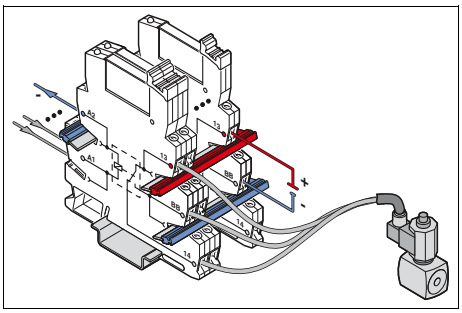
Conventional connection of actuators



If actuators such as solenoid valves are connected to the controller via a universal relay with changeover contact, an additional terminal block strip must be used for the common load return line. The positive potential of the loads is applied to connection terminal block 11 (changeover contact) at the relay modules. This can be distributed over all relay modules using plug-in bridges. This means that direct connection of the potential to only one relay is necessary. The loads are connected to connection terminal block 14 (N/O contact). The negative potential required is supplied at a terminal block. This then distributed to further terminal blocks by means of plug-in bridges. However, load return lines for the individual actuators are applied to every terminal block. This results in a common load return line potential for all actuators via the additional terminal block.

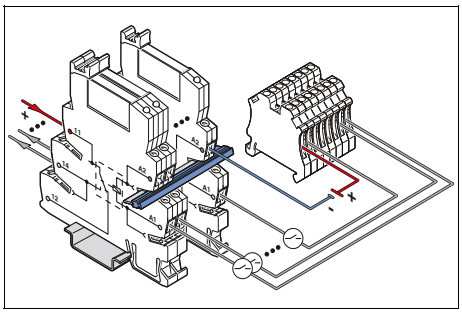
Because of increased space requirements and additional wiring to the terminal block, the use of additional terminal blocks for potential distribution is extremely time-consuming.

Easy wiring of actuators



The PLC...ACT relay modules enable fast and easy connection of actuators. The positive potential of the loads is applied to connection terminal block 13. This can be distributed over all relay modules using plug-in bridges. This only makes direct connection to one module necessary. The actuators are connected to contact 14 (N/O contact). In the case of PLC...ACT relay modules, an N/C contact is not required. Instead, the BB connection serves as an option for connecting the load return line. Here the common negative potential is supplied and distributed by means of plug-in bridges. The terminal block for conventional wiring is not necessary due to the direct connection of the load return line potential to the relay module. This means that no additional space is required in the control cabinet and simpler wiring minimizes the risk of error.

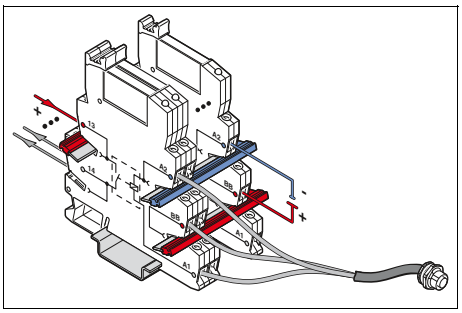
Conventional connection of sensors



If sensors such as proximity switches are connected via a universal relay to a controller with a changeover contact, an additional terminal block strip must be used for the common sensor supply voltage. It is also important to note that either the wiring in the control cabinet must be implemented the other way round since control of the relay now takes place from the field level and not via the controller, or the relay module must be installed into the control cabinet rotated at 180°. The negative potential of the sensors is applied at connection terminal block A2 on the relay module. This can be distributed over all relay modules using plug-in bridges. This means that direct connection to only one relay is necessary. The sensors are connected to connection terminal block A1. The necessary positive potential is supplied to a terminal block and distributed to further terminal blocks by means of plug-in bridges. However, the supply for the individual sensors is applied to every terminal block. This results in a common supply signal for all sensors via the additional terminal blocks.

Because of increased space requirements and additional wiring to the terminal block, the use of additional terminal blocks for potential distribution is extremely time-consuming.

Easy wiring of sensors

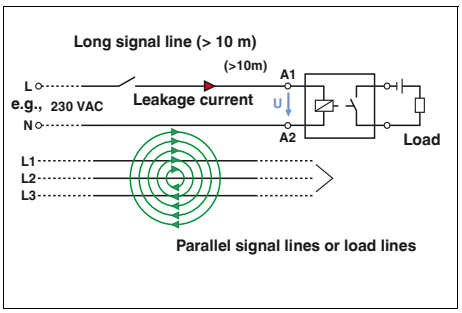


Sensors can be efficiently coupled with the controller with the PLC...SEN relay modules. The input and output side on the module are already interchanged so that the the signal direction from the field to the controller can be ideally represented. Therefore, three connection terminal blocks (A1, A2, and BB) are located on the control side of the relay. The common negative potential of the sensors is connected to A2 and distributed to further relay modules by means of plug-in bridges. The sensors are connected directly to the A1 connections. Connection BB is used for the common supply potential of the sensors. The potential is distributed to all connected sensors by means of the plug-in bridges. However, only connections 13 and 14 for the N/O contact are located on the contact side. Signal feedback to the controller takes place via this. The terminal block for conventional wiring is not necessary due to direct connection of the sensor supply voltage to the relay module. This means that no additional space is required in the control cabinet and simpler wiring minimizes the risk of error.

Configuration aid for handling interference signals

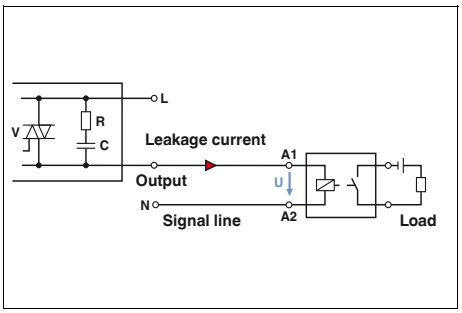
According to IEC 61810-1, the standard release voltage of a relay is 5% of the nominal voltage for DC coils and 15% for AC coils. That means that a relay with a nominal voltage of 230 V AC is only switched off when the control voltage is ≤ 0.15 x 230 V AC = 34.5 V AC. If interference signals occur on the control side of a relay that are greater that the release voltage, defined switch-off is no longer possible. In the worst case, the interference is large enough to energize the relay. The application is still switched on although no signal is issued by the controller. There can be various reasons for this.

Coupling of interference signals from parallel lines



If the control lines to the relay are very long, interference can occur from parallel-running cables. These influence the actual control line and couple the signals to it. This interference voltage can be measured on the control side, even if no signal is issued by the controller.

Leakage current with AC voltage output card

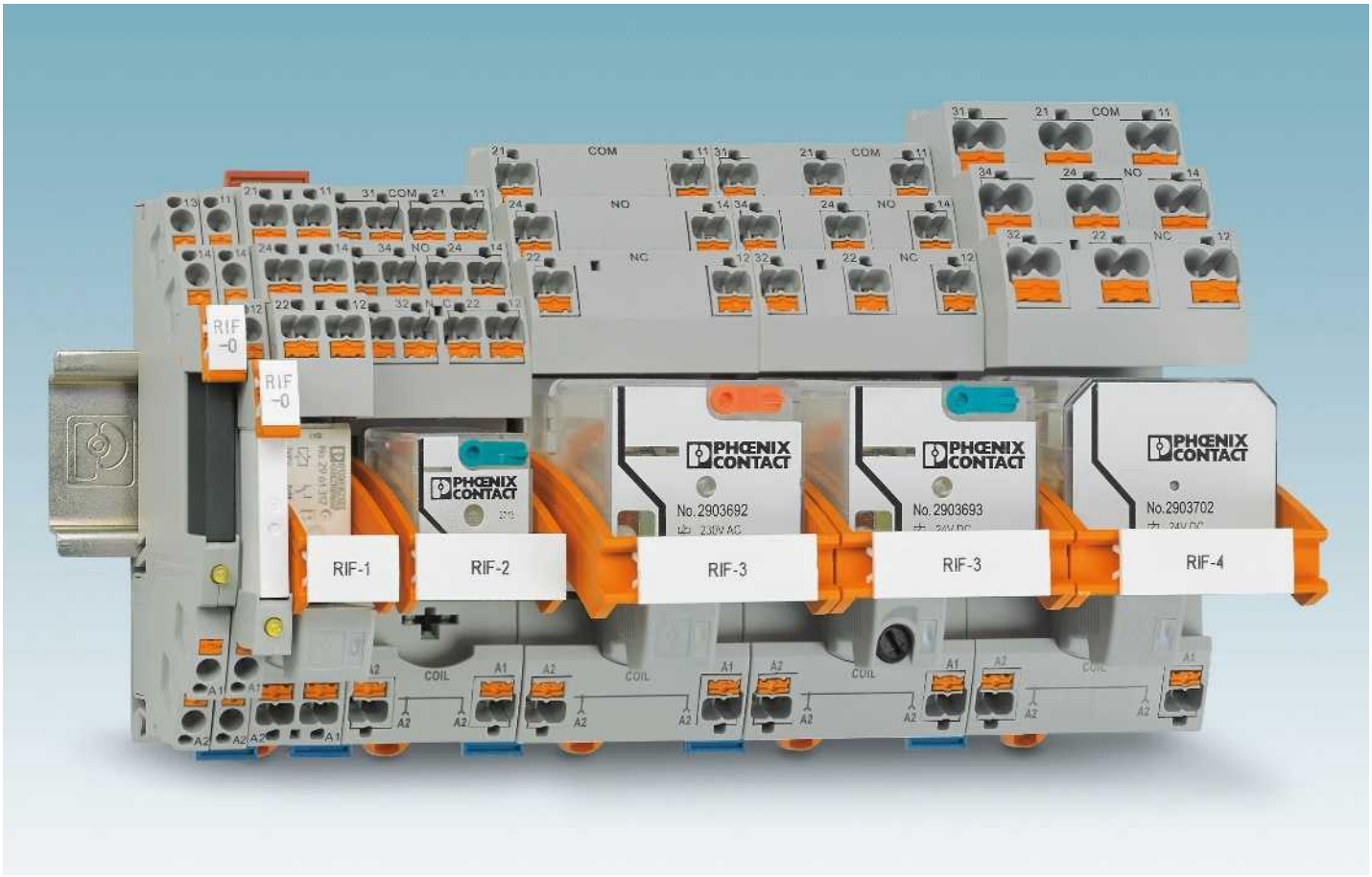


Leakage current on the signal line occurs if control of a relay takes place via an output card with AC voltage. This is caused by the RC wiring of the AC voltage output. Typically, the leakage current has a control power that is large enough not to switch off the relay reliably.

Safe shutdown even with interference signals

The PLC...SO46 series is equipped with RCZ wiring in the base. The release voltage of the relay is increased by this circuit of resistor, capacitor, and Zener diode so that the relay is resistant to interference voltages. In the case of a 230 V AC relay, the standard release voltage is 34.5 V AC. The PLC...230UC...SO46 modules have a release voltage of 80 V AC. This enables the relay to switch off reliably at interference voltages of ≤ 80 V AC. The PLC...SO46 bases are also available with further voltages. They can be fitted with both electromechanical relays or solid-state relays. Screw connection or Push-in connection is available as the connection technology.

Industrial relay system - RIFLINE complete



RIFLINE complete is an inexpensive relay system with various accessories. It consists of DIN rail bases, electromechanical or solid-state relays, plug-in interference suppression modules, marking material, and bridging material. The range of accessories is rounded off with a timer module. This is used to transform a basic relay into a time relay with three different functions.

The RIFLINE complete relay range consists of seven different base versions from RIF-0 to RIF-4 – these range from one N/O contact up to four PDT contacts. The field of application of this product group ranges from coupling relay applications with switching currents of one milliamp to replacement for miniature contactors with currents up to 16 A.

The relay bases feature Push-in or screw connection technology. Push-in connection technology enables quick and tool-free conductor contacting. The RIF-1 to RIF-4 bases offer double the contact options on both the input and output side.

On the input side of all bases, the negative potential (A2) can be bridged – regardless of the base size. On the output side, the grouped contact (11) can be bridged within the RIF-0 base version. This connection can also be bridged within the RIF-1 base size.

To offer diverse marking options, the engagement lever can be fitted with a zack marker strip. In addition, marker carriers can be mounted on the bases so that additional marking surfaces are available.

RIFLINE complete can be extended using many elements from the CLIPLINE complete accessories range. This includes marking material, bridges, and test adapters.

To make ordering and management easier, RIFLINE complete modules are provided in the most popular voltages as complete modules with relay and interference suppression module. For individual assembly, tailored to the requirements of the application, additional voltage levels are offered in the modular system.

RIF-0

The 6.2 mm narrow RIF-0 base series is suitable for a 1-PDT relay. Switching currents up to 6 A are implemented here. Two base versions are available: 1 N/O contact and 1 changeover contact. RIF-0 is therefore a good choice for all coupling applications.

RIF-1

The 16 mm narrow RIF-1 base series is suitable for a 2-PDT relay. Currents up to 13 A can be switched when using the FBS 2-8 plug-in bridge. This relay is ideal for power switching and signal duplication.

RIF-2

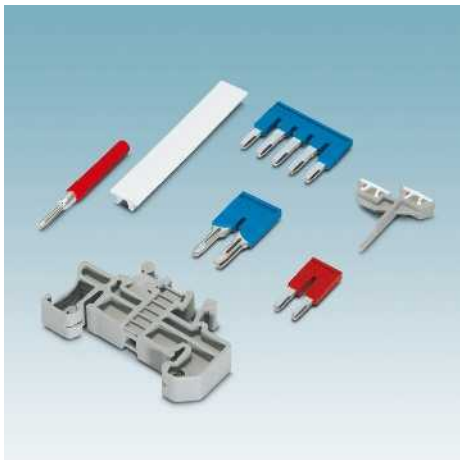
The 31 mm wide RIF-2 base series is designed for industrial relays with up to 4 contacts. Currents up to 12 A are no problem for these bases. This relay is ideal for applications that require power and signal multiplication.

RIF-3

The 40 mm wide RIF-3 base series is designed for octal relays with up to 3 contacts. Switching currents up to 10 A are implemented here. Two base versions are available: 2 changeover contacts and 3 changeover contacts. RIF-3 bases are ideal for all applications that require power and signal multiplication.

RIF-4

The 43 mm wide RIF-4 base series is designed for power relays with up to 3 contacts. Currents up to 16 A can be switched. RIF-4 bases are a good choice for applications that require power and signal multiplication, e.g., in miniature contactor applications.



Accessories

A wide range of accessories are available for the RIFLINE complete relay system that round off the range. These include bridges, professional marking material, function modules, test plugs, and end brackets.

Modular RIF-0 relay base

Relay base for assembly with miniature power relays or solid-state relays with a nominal voltage of 12 to 24 V DC.

The advantages:

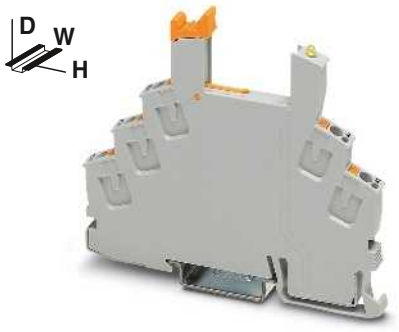
– Integrated freewheeling diode for input circuit and interference suppression circuit
– LED for status display
– Safe isolation according to DIN EN 50178 between coil and contact
– Professional marking material
– Holders for test plugs
– Professional bridging of adjacent modules saves wiring time (A2 and 11/13)
– FBS 2-6 plug-in bridges for the input and output side

Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.



1-PDT relay base with Push-in connection technology

Technical data

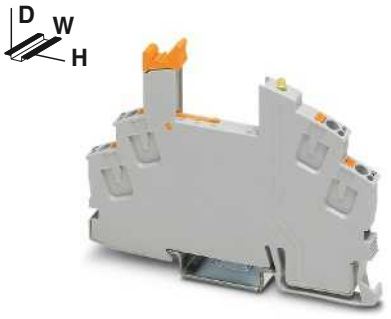
Nominal voltage U_N	250 V AC/DC (Contact side)
Nominal current at U_N	max. 8 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Maximum tightening torque	-
Dimensions	
Width	6.2 mm
Depth	78 mm
Height	93 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-0 relay base, PDT version, safe isolation I/O with Push-in connection	**RIF-0-BPT/21**	2900958	10
RIF-0 relay base, N/O contact version, safe isolation I/O with Push-in connection			
RIF-0 relay base, PDT version, safe isolation I/O with screw connection			
RIF-0 relay base, N/O contact version, safe isolation I/O with screw connection			
RIF-0 relay base, negative switching, PDT version, safe isolation I/O with Push-in connection	**RIF-0-BPT-M/ 21**	2907468	10

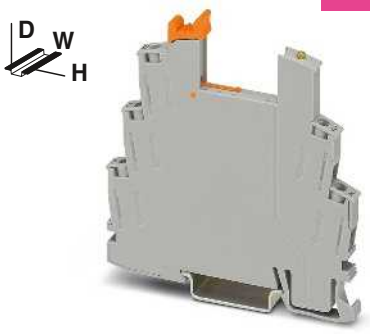
Accessories

Plug-in bridge			
2-pos. red, 24 A	**FBSR 2-6**	3033715	50
2-pos. red, 32 A	**FBS 2-6**	3030336	50
2-pos. blue, 32 A	**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A	**FBS 2-6 GY**	3032237	50
3-pos. red, 24 A	**FBSR 3-6**	3001594	50
4-pos. red, 24 A	**FBSR 4-6**	3001595	50
5-pos. red, 24 A	**FBSR 5-6**	3001596	50
5-pos. red, 32 A	**FBS 5-6**	3030349	50
10-pos. red, 32 A	**FBS 10-6**	3030271	10
20-pos. red, 32 A	**FBS 20-6**	3030365	10
50-pos. red, 32 A	**FBS 50-6**	3032224	10
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...	**CLIPFIX 35**	3022218	50
Test plug, consisting of:			
Metal part for 2.3 mm Ø socket hole and silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part red	**MPS-IH RD**	0201676	10
white	**MPS-IH WH**	0201663	10
blue	**MPS-IH BU**	0201689	10
yellow	**MPS-IH YE**	0201692	10
green	**MPS-IH GN**	0201702	10
gray	**MPS-IH GY**	0201728	10
black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted, 10-section: each pack contains enough to mark 100 terminal blocks			
10-section	**ZB 6:UNBEDRUCKT**	1051003	10



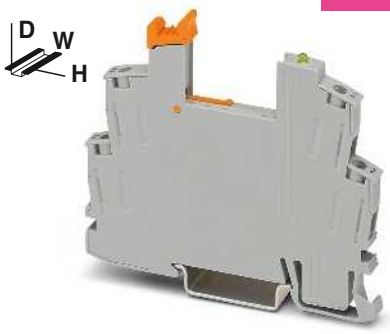
1-N/O relay base for miniature power relay

new



1-PDT relay base with screw connection technology

new



1-N/O relay base with screw connection technology

Technical data

250 V AC/DC (Contact side) max. 8 A (Depends on application/assembly)	250 V AC/DC (Contact side) max. 8 A (Depends on application/assembly)	250 V AC/DC (Contact side) max. 8 A (Depends on application/assembly)
-40 °C ... 85 °C (Depends on application/assembly)	-40 °C ... 85 °C (Depends on application/assembly)	-40 °C ... 85 °C (Depends on application/assembly)
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 -	0.5 ... 4 mm² / 0.5 ... 2.5 mm² / 20 - 12 0.5 Nm	0.5 ... 4 mm² / 0.5 ... 2.5 mm² / 20 - 12 0.5 Nm
6.2 mm 66 mm 93 mm	6.2 mm 82 mm 84 mm	6.2 mm 68 mm 84 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-0-BPT/1	2901873	10

Type	Order No.	Pcs./ Pkt.
RIF-0-BSC/21	2900957	10

Type	Order No.	Pcs./ Pkt.
RIF-0-BSC/ 1	2901872	10

Accessories

FBSR 2-6	3033715	50
FBS 2-6	3030336	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
FBSR 3-6	3001594	50
FBSR 4-6	3001595	50
FBSR 5-6	3001596	50
FBS 5-6	3030349	50
FBS 10-6	3030271	10
FBS 20-6	3030365	10
FBS 50-6	3032224	10
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 6:UNBEDRUCKT	1051003	10

FBSR 2-6	3033715	50
FBS 2-6	3030336	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
FBSR 3-6	3001594	50
FBSR 4-6	3001595	50
FBSR 5-6	3001596	50
FBS 5-6	3030349	50
FBS 10-6	3030271	10
FBS 20-6	3030365	10
FBS 50-6	3032224	10
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 6:UNBEDRUCKT	1051003	10

FBSR 2-6	3033715	50
FBS 2-6	3030336	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
FBSR 3-6	3001594	50
FBSR 4-6	3001595	50
FBSR 5-6	3001596	50
FBS 5-6	3030349	50
FBS 10-6	3030271	10
FBS 20-6	3030365	10
FBS 50-6	3032224	10
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 6:UNBEDRUCKT	1051003	10

Plug-in miniature power relays

new

Plug-in 1-PDT relays suitable for RIF-0 and PLC-INTERFACE relay bases.

The advantages:

– Power contacts up to 6 A
– Multi-layer gold contact or power contact
– High degree of protection, RT III (wash-proof), or RT II for 1-PDT relay with manual operation
– Safe isolation according to DIN EN 50178 between coil and contact
– Can be soldered on PCB

1-PDT relay, max. 6 A

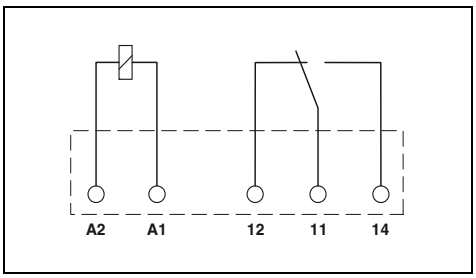
1-PDT relay with manual operation, max. 6 A

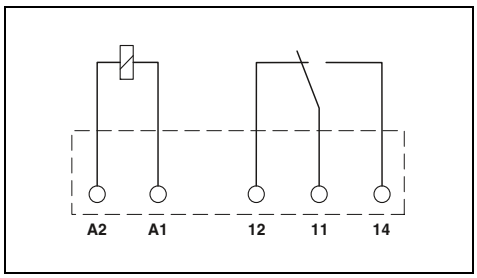
Notes:

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For dimensional drawings and perforations for assembly, see page 398

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.





Technical data

Input data		①	②
Permissible range (with reference to U_N)		see diagram	
Typical input current at U_N	[mA]	14	7
Typical response time at U_N	[ms]	5	5
Typical release time at U_N	[ms]	2.5	2.5
Output data			
Contact type		1 PDT	1 PDT
Contact material		AgSnO	AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current		6 A	50 mA
Maximum switch-on current		10 A (4 s)	50 mA
Minimum switching current		10 mA (at 12 V)	1 mA (at 24 V)
General data			
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)	
Ambient temperature (operation)		-40 °C ... 85 °C	
Nominal operating mode		100% operating factor	
Mechanical service life		2 x 10^7 cycles	
Standards/regulations		IEC 60664 , EN 50178 , EN 61810-1	
Mounting position/mounting		any / In rows with zero spacing	
Dimensions	W / H / D	5 mm / 28 mm / 15 mm	

Technical data

		①	②
see diagram			
14		7	
5		5	
2.5		2.5	
1 PDT		1 PDT	
AgSnO		AgSnO, hard gold-plated	
250 V AC/DC		30 V AC / 36 V DC	
5 V (at 100 mA)		100 mV (at 10 mA)	
6 A		50 mA	
10 A (4 s)		50 mA	
10 mA (at 12 V)		1 mA (at 24 V)	
4 kV AC (50 Hz, 1 min.)			
-40 °C ... 85 °C			
100% operating factor			
1 x 10^7 cycles			
IEC 60664 , EN 50178 , EN 61810-1			
any / In rows with zero spacing			
5 mm / 28 mm / 16 mm			

Ordering data

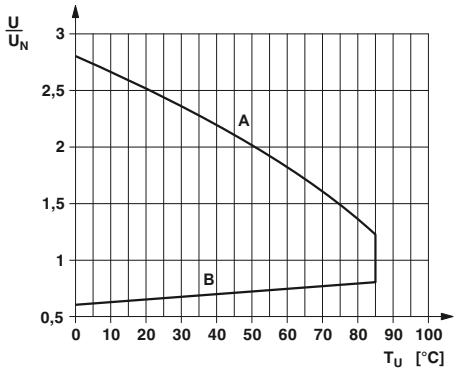
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in miniature power relays, with power contacts				
①	12 V DC	**REL-MR- 12DC/21**	2961150	10
②	24 V DC	**REL-MR- 24DC/21**	2961105	10
Plug-in miniature power relays, with multi-layer gold contacts				
①	12 V DC	**REL-MR- 12DC/21AU**	2961163	10
②	24 V DC	**REL-MR- 24DC/21AU**	2961121	10

Ordering data

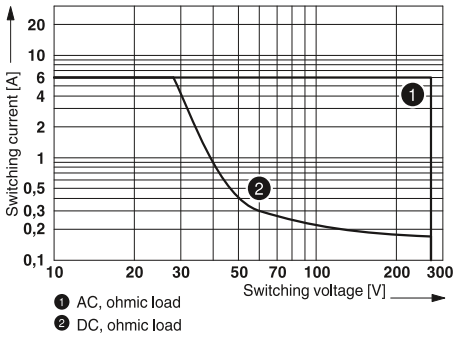
Type	Order No.	Pcs./ Pkt.
REL-MR- 12DC/21/MS	2909641	10
REL-MR- 24DC/21/MS	2909642	10
REL-MR- 12DC/21AU/MS	2909644	10
REL-MR- 24DC/21AU/MS	2909645	10

REL-MR-.../21... (1-PDT)

Input voltage range

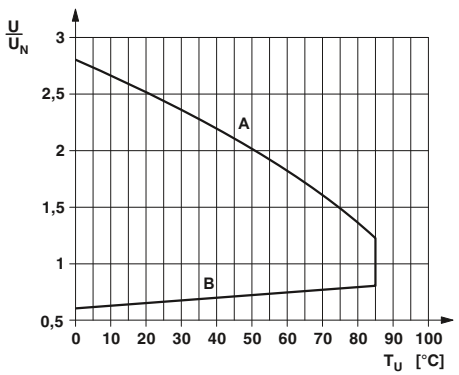


Interrupting rating

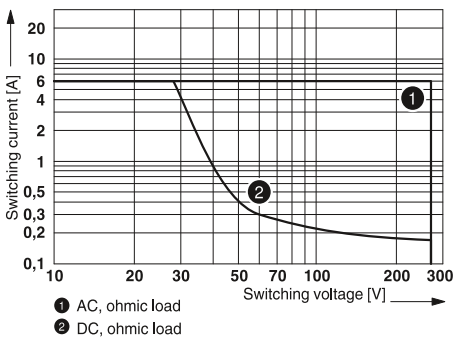


REL-MR-.../21.../MS (1-PDT)

Input voltage range



Interrupting rating



Plug-in solid-state relays

Plug-in solid-state relays suitable for RIF-0 and PLC-INTERFACE relay bases.

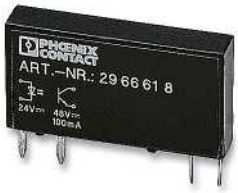
The advantages:

– Switching current of up to 3 A
– RT III-proof (wash-proof)
– Vibration and shock-resistant
– Wear-free and long-lasting
– Zero voltage switch at AC output
– Can be soldered on PCB

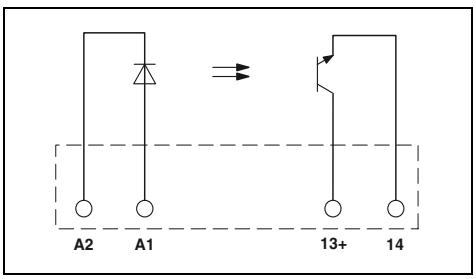
Notes:

For dimensional drawings and perforations for assembly, see page 399

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.



Solid-state relay, DC output max. 3 A



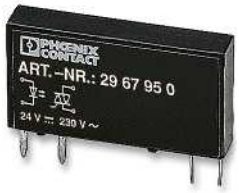
Technical data

Input data		①
Permissible range (with reference to U_N)		0.8 - 1.2
Switching level	1 signal ("H") [V DC] ≥	16
	0 signal ("L") [V DC] ≤	10
Typical input current at U_N	[mA]	7
Typical switch-on time at U_N	[µs]	20
Typical switch-off time at U_N	[µs]	300
Transmission frequency f_{limit}	[Hz]	300
Output data		
Max. switching voltage		33 V DC
Minimum switching voltage		3 V DC
Limiting continuous current		3 A (see derating curve)
Minimum load current		-
Maximum switch-on current		15 A (10 ms)
Leakage current in off state		-
Phase angle (cos ϕ)		-
Output circuit		2-wire, floating
Max. load value		-
Output protection		Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		≤ 150 mV
General data		
Rated surge voltage		Basic insulation
Test voltage input/output		2.5 kV (50 Hz, 1 min.)
Ambient temperature (operation)		-25 °C ... 60 °C
Nominal operating mode		100% operating factor
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		any / In rows with zero spacing
Dimensions	W / H / D	5 mm / 28 mm / 15 mm

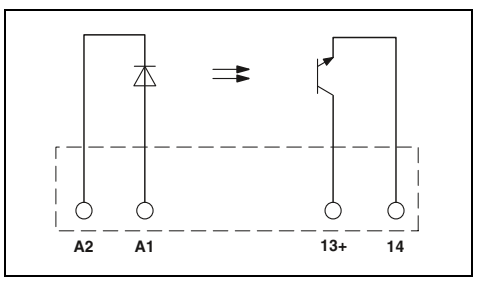
Ordering data

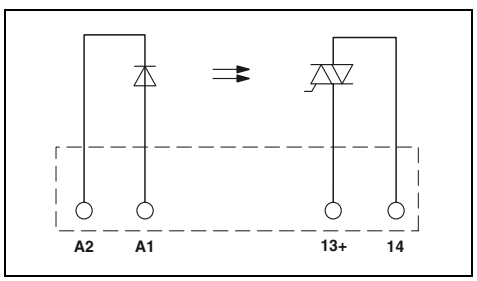
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in solid-state relays					
Solid-state power relays	①	24 V DC	**OPT-24DC/ 24DC/ 2**	2966595	10
Plug-in solid-state relays					
Solid-state input relays	①	24 V DC			

Solid-state relay, DC output max. 100 mA

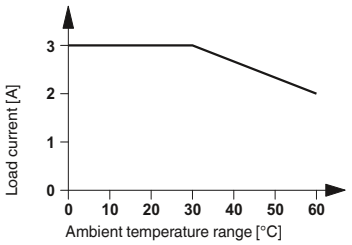


Solid-state relay, AC output max. 750 mA

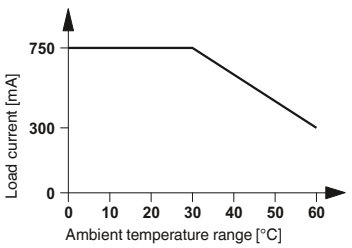




Derating curve for OPT...DC/24DC/2 and PLC-OS.../24DC/2 solid-state relays



Derating curve for OPT...DC/230AC/1 and PLC-OS.../230AC/1 solid-state relays



Technical data	
①	
0.8 -	0.8 -
1.2	1.2
16	10
10	5
7	3
20	6000
300	500
300	10
48 V DC	253 V AC
3 V DC	24 V AC
100 mA	0.75 A (see derating curve)
-	10 mA
-	30 A (10 ms)
-	< 1 mA
-	0.5
2-wire, floating	2-conductor floating, zero voltage switch
-	4.5 A^2s
Reverse polarity protection, surge protection	RCV circuit
≤ 1 V	< 1 V
Basic insulation	Basic insulation
2.5 kV (50 Hz, 1 min.)	2.5 kV (50 Hz, 1 min.)
-25 °C ... 60 °C	-25 °C ... 60 °C
100% operating factor	100% operating factor
IEC 60664 , EN 50178	IEC 60664 , EN 50178
2 / III	2 / III
any / In rows with zero spacing	any / In rows with zero spacing
5 mm / 28 mm / 15 mm	5 mm / 28 mm / 15 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
OPT-24DC/ 48DC/100	2966618	10

Ordering data

Type	Order No.	Pcs./ Pkt.
OPT-24DC/230AC/ 1	2967950	10

Modular RIF-1 relay base

Relay base for assembly with 1 or 2-PDT relays or solid-state relays.

Range of accessories includes:

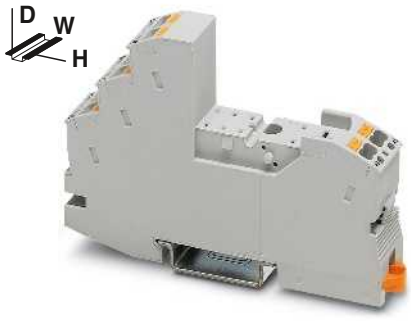
– Plug-in interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)
– FBS 2-8 plug-in bridges for the output side (11/21)

Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See "General" section in "Basics of relay technology" on page 286.



2-PDT relay base with Push-in connection technology

Technical data

Nominal voltage U_N	250 V AC/DC
Nominal current at U_N	max. 13 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Dimensions	
Width	16 mm
Depth with retaining bracket	75 mm
Height	96 mm

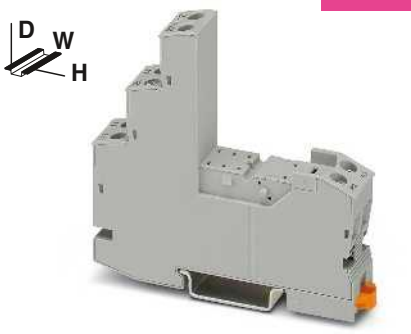
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-1 relay base, plug-in option for interference suppression module, safe isolation I/O with Push-in connection	**RIF-1-BPT/2X21**	2900931	10
RIF-1 relay base, plug-in option for interference suppression module, safe isolation I/O with screw connection			
Relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-1 relay base			
- for 16 mm high miniature power and solid-state relays			
- for 25 mm high miniature power relays			
Relay retaining bracket, wire model, suitable for RIF-1 relay base			
- for 16 mm high miniature power and solid-state relays			
- for 25 mm high miniature power relays			

Accessories

Plug-in bridge				
2-pos. red, 32 A		**FBS 2-6**	3030336	50
2-pos. red, 24 A		**FBSR 2-6**	3033715	50
2-pos. red, 32 A		**FBSR 2-8**	3033808	10
2-pos. blue, 32 A		**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A		**FBS 2-6 GY**	3032237	50
2-pos. red, 41 A		**FBS 2-8**	3030284	10
2-pos. blue, 41 A		**FBS 2-8 BU**	3032567	10
2-pos. gray, 41 A		**FBS 2-8 GY** 7042	3032541	10
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...		**CLIPFIX 35**	3022218	50
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and	silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part	red	**MPS-IH RD**	0201676	10
	white	**MPS-IH WH**	0201663	10
	blue	**MPS-IH BU**	0201689	10
	yellow	**MPS-IH YE**	0201692	10
	green	**MPS-IH GN**	0201702	10
	gray	**MPS-IH GY**	0201728	10
	black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted				
10-section		**ZB 5 :UNBEDRUCKT**	1050004	10
5-section		**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5		**STP 5-2**	0800967	100

new



2-PDT relay base with screw connection technology

Plastic relay retaining bracket for RIF-1 base

Metal wire relay retaining bracket for RIF-1 base

Technical data	Technical data	Technical data
250 V AC/DC	-	-
max. 15.5 A (Depends on application/assembly)	-	-
-40 °C ... 85 °C (Depends on application/assembly)	-	-
0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10	-	-
16 mm	-	-
75 mm	-	-
89 mm	-	-

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-1-BSC/2X21	2900930	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-RH-1	2900953	10
RIF-RH-1-H	2904468	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-RHM-1	2905986	10
RIF-RHM-1-H	2905985	10

Accessories

FBS 2-6	3030336	50
FBSR 2-6	3033715	50
FBSR 2-8	3033808	10
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
FBS 2-8	3030284	10
FBS 2-8 BU	3032567	10
FBS 2-8 GY 7042	3032541	10
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 5 :UNBEDRUCKT	1050004	10
ZB 15:UNBEDRUCKT	0811972	10
STP 5-2	0800967	100

Accessories

Accessories

Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 changeover contacts, suitable for the RIF-1 and PLC-INTERFACE relay bases.

The advantages:

– Power contacts up to 16 A
– Multi-layer gold contact or power contact
– High degree of protection up to RT III depending on type (wash-proof)

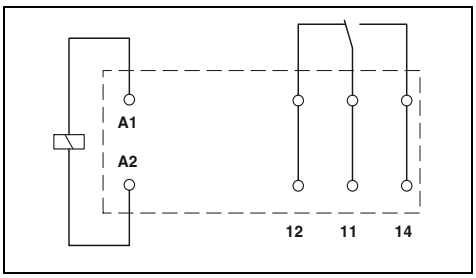
Notes:

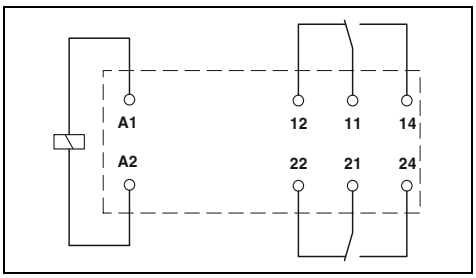
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

1-PDT relay, max. 16 A

2-PDT relay, max. 2 x 8 A





Technical data

Input data		①	②	③	④	⑤	⑥	⑦	⑧
Permissible range (with reference to U_N)		see diagram							
Typical input current at U_N	[mA]	33	17	8.7	8.2	4.1	32	7	3
Typical response time at U_N	[ms]	7	7	7	7	7			
Typical response time at U_N (depending on phase relation)	[ms]						3 - 12	3 - 12	3 - 12
Typical release time at U_N	[ms]	3	3	3	3	3			
Typical release time at U_N (depending on phase relation)	[ms]						2 - 9	2 - 9	2 - 9

Output data		
Contact type	1 PDT	1 PDT
Contact material	AgNi	AgNi, hard gold-plated
Max. switching voltage	250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage	12 V (at 10 mA)	100 mV (at 10 mA)
Limiting continuous current	16 A	50 mA
Maximum switch-on current AC	25 A (20 ms)	50 mA
Maximum switch-on current DC	50 A (20 ms)	50 mA
Minimum switching current	10 mA (at 12 V)	1 mA (at 24 V)

General data	
Test voltage (winding / contact)	5 kV AC (50 Hz, 1 min.)
Test voltage (contact/contact)	-
Ambient temperature (operation), AC	-40 °C ... 85 °C
Ambient temperature (operation), DC	-40 °C ... 85 °C
Mechanical service life, AC	1 x 10^7 cycles
Mechanical service life, DC	3 x 10^7 cycles
Standards/regulations	IEC 60664 , EN 50178 , EN 61810-1

Technical data

Input data		①	②	③	④	⑤	⑥	⑦	⑧
Permissible range (with reference to U_N)		see diagram							
Typical input current at U_N	[mA]	33	17	8.7	8.2	4.1	32	7	3
Typical response time at U_N	[ms]	7	7	7	7	7			
Typical response time at U_N (depending on phase relation)	[ms]						3 - 12	3 - 12	3 - 12
Typical release time at U_N	[ms]	3	3	3	3	3			
Typical release time at U_N (depending on phase relation)	[ms]						2 - 9	2 - 9	2 - 9

Output data		
Contact type	2 PDT	2 PDT
Contact material	AgNi	AgNi, hard gold-plated
Max. switching voltage	250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage	5 V (at 10 mA)	100 mV (at 10 mA)
Limiting continuous current	8 A	50 mA
Maximum switch-on current AC	12 A (20 ms)	50 mA
Maximum switch-on current DC	25 A (20 ms)	50 mA
Minimum switching current	10 mA (At 5 V)	1 mA (at 24 V)

General data	
Test voltage (winding / contact)	5 kV AC (50 Hz, 1 min.)
Test voltage (contact/contact)	2.5 kV AC (50 Hz, 1 min.)
Ambient temperature (operation), AC	-40 °C ... 85 °C
Ambient temperature (operation), DC	-40 °C ... 85 °C
Mechanical service life, AC	1 x 10^7 cycles
Mechanical service life, DC	3 x 10^7 cycles
Standards/regulations	IEC 60664 , EN 50178 , EN 61810-1

Ordering data

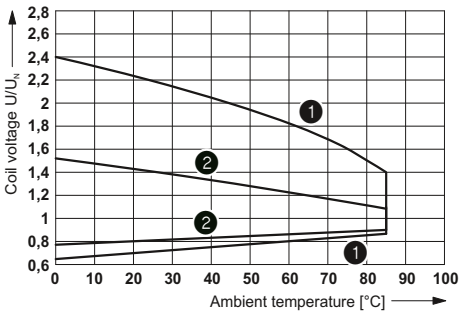
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in miniature power relays, with power contacts					
	①	12 V DC	**REL-MR- 12DC/21HC**	2961309	10
	②	24 V DC	**REL-MR- 24DC/21HC**	2961312	10
	③	48 V DC	**REL-MR- 48DC/21HC**	2834821	10
	④	60 V DC	**REL-MR- 60DC/21HC**	2961325	10
	⑤	110 V DC	**REL-MR-110DC/21HC**	2961338	10
	⑥	24 V AC	**REL-MR- 24AC/21HC**	2961406	10
	⑦	120 V AC	**REL-MR-120AC/21HC**	2961419	10
	⑧	230 V AC	**REL-MR-230AC/21HC**	2961422	10
Plug-in miniature power relays, with multi-layer gold contacts					
	①	12 V DC	**REL-MR- 12DC/21HC AU**	2961532	10
	②	24 V DC	**REL-MR- 24DC/21HC AU**	2961545	10
	⑤	110 V DC	**REL-MR-110DC/21HC AU**	2961561	10
	⑥	24 V AC	**REL-MR- 24AC/21HC AU**	2961503	10
	⑦	120 V AC	**REL-MR-120AC/21HC AU**	2961516	10
	⑧	230 V AC	**REL-MR-230AC/21HC AU**	2961529	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-MR- 12DC/21-21	2961257	10
REL-MR- 24DC/21-21	2961192	10
REL-MR- 48DC/21-21	2834834	10
REL-MR- 60DC/21-21	2961273	10
REL-MR-110DC/21-21	2961202	10
REL-MR- 24AC/21-21	2961435	10
REL-MR-120AC/21-21	2961448	10
REL-MR-230AC/21-21	2961451	10
REL-MR- 12DC/21-21AU	2961299	10
REL-MR- 24DC/21-21AU	2961215	10
REL-MR- 48DC/21-21AU	2834847	10
REL-MR- 60DC/21-21AU	2961286	10
REL-MR-110DC/21-21AU	2961228	10
REL-MR- 24AC/21-21AU	2961464	10
REL-MR-120AC/21-21AU	2961477	10
REL-MR-230AC/21-21AU	2961480	10

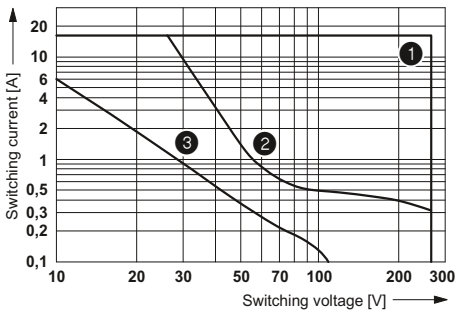
REL-MR...21HC... (1-PDT)

Operating voltage range



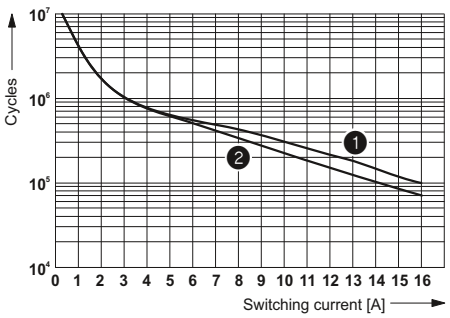
❶ DC coils
❷ AC coils

Interrupting rating



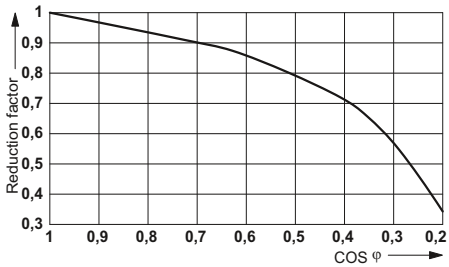
❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Electrical service life



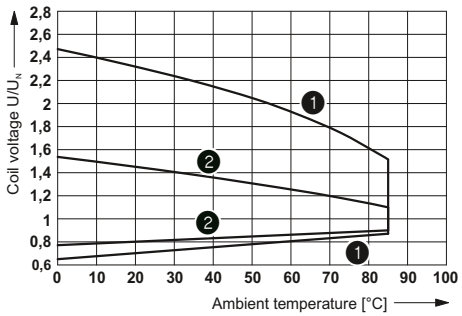
❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi



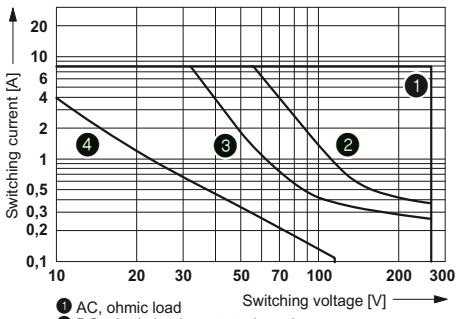
REL-MR...21-21... (2-PDT)

Operating voltage range



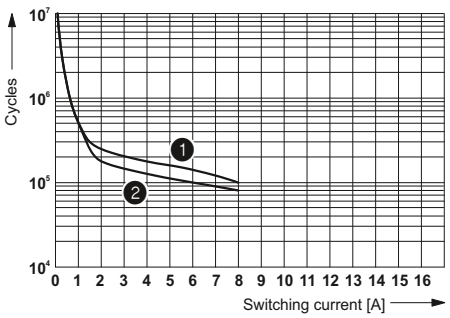
❶ DC coils
❷ AC coils

Interrupting rating



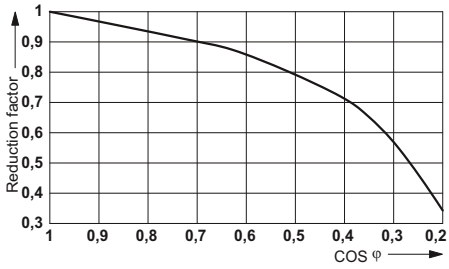
❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Electrical service life



❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

Service life reduction factor with various cos phi



Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 changeover contacts, suitable for the RIF-1 relay base.

The advantages:

– Switching current of up to 16 A
– With lockable manual operation
– Mechanical switch position indicator
– Integrated status LED
– Multi-layer gold contact or power contact
– DC types with integrated freewheeling diode
– Can be soldered on PCB

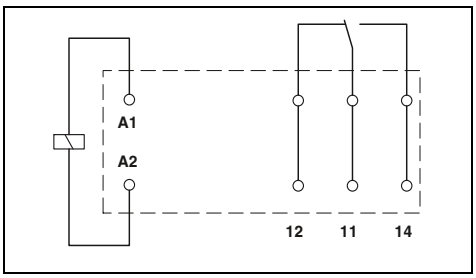
1-PDT relay with manual operation, 16 A, maximum

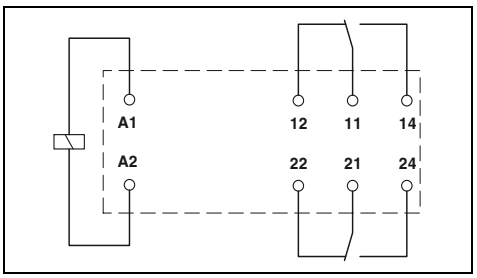
2-PDT relay with manual operation, 2 x 8 A, maximum

Notes:

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.





Technical data

Input data		①	②	③	④
Permissible range (with reference to U_N)		see diagram			
Typical input current at U_N	[mA]	18	32	7	3.5
Typical response time at U_N	[ms]	9			
Typical response time at U_N (depending on phase relation)	[ms]		3 - 12	3 - 12	
Typical release time at U_N	[ms]	6			
Typical release time at U_N (depending on phase relation)	[ms]		2 - 8	2 - 8	2 - 8

Output data				
Contact type	1 PDT	1 PDT	2 PDT	2 PDT
Contact material	AgNi	AgNi, hard gold-plated	AgNi	AgNi, hard gold-plated
Max. switching voltage	250 V AC/DC	30 V AC / 36 V DC	250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage	12 V (at 10 mA)	12 V (At 1 mA)	12 V (at 10 mA)	12 V (At 1 mA)
Limiting continuous current	16 A	50 mA	8 A	50 mA
Maximum switch-on current AC	32 A (20 ms)	50 mA	16 A (20 ms)	50 mA
Maximum switch-on current DC	32 A (20 ms)	50 mA	16 A (20 ms)	50 mA
Minimum switching current	10 mA (at 12 V)	1 mA (at 12 V)	10 mA (at 12 V)	1 mA (at 12 V)

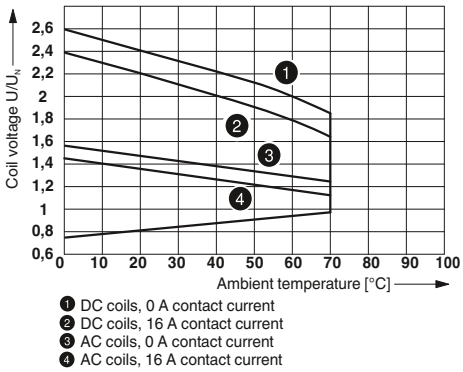
General data		
Test voltage (winding / contact)	5 kV AC (50 Hz, 1 min.)	5 kV AC (50 Hz, 1 min.)
Test voltage (contact/contact)	-	5 kV AC (50 Hz, 1 min.)
Ambient temperature (operation), AC	-40 °C ... 70 °C	-40 °C ... 70 °C
Ambient temperature (operation), DC	-40 °C ... 70 °C	-40 °C ... 70 °C
Mechanical service life, AC	5 x 10^6 cycles	5 x 10^6 cycles
Mechanical service life, DC	5 x 10^6 cycles	5 x 10^6 cycles
Standards/regulations	EN 61810-1 , VDE 0435-201 , EN 50178	EN 61810-1 , VDE 0435-201 , EN 50178

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Plug-in miniature power relays, with power contacts								
- Status LED, freewheeling diode A1+, A2-	①	24 V DC	**REL-MR- 24DC/21HC/MS**	2987888	10	**REL-MR- 24DC/21-21/MS**	2987943	10
- Status LED	②	24 V AC	**REL-MR- 24AC/21HC/MS**	2987891	10	**REL-MR- 24AC/21-21/MS**	2987956	10
- Status LED	③	120 V AC	**REL-MR-120AC/21HC/MS**	2987901	10	**REL-MR-120AC/21-21/MS**	2987969	10
- Status LED	④	230 V AC	**REL-MR-230AC/21HC/MS**	2987914	10	**REL-MR-230AC/21-21/MS**	2987972	10
Plug-in miniature power relays, with multi-layer gold contacts, with manual operation, mechanical switch position indicator								
- Status LED, freewheeling diode A1+, A2-	①	24 V DC	**REL-MR- 24DC/21HC AU/MS**	2987927	10	**REL-MR- 24DC/21-21AU/MS**	2987985	10
- Status LED	⑤	230 V AC	**REL-MR-230AC/21HC AU/MS**	2987930	10	**REL-MR-230AC/21-21AU/MS**	2987998	10

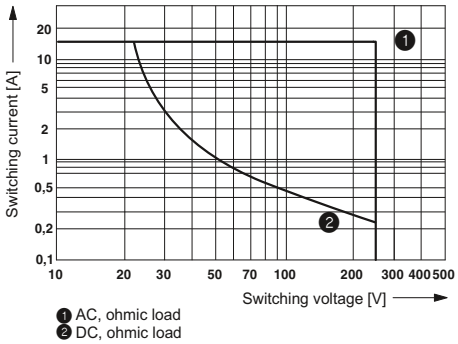
REL-MR...21HC...MS (1-PDT)

Operating voltage range



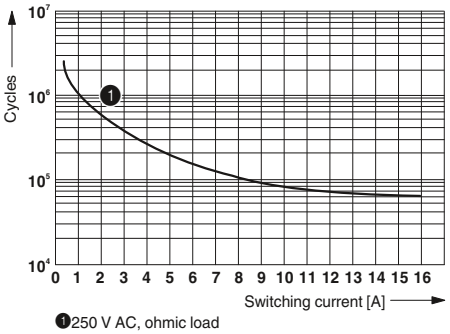
1 DC coils, 0 A contact current
2 DC coils, 16 A contact current
3 AC coils, 0 A contact current
4 AC coils, 16 A contact current

Interrupting rating



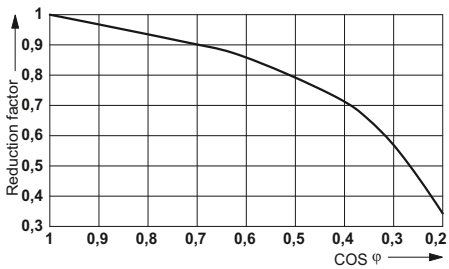
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



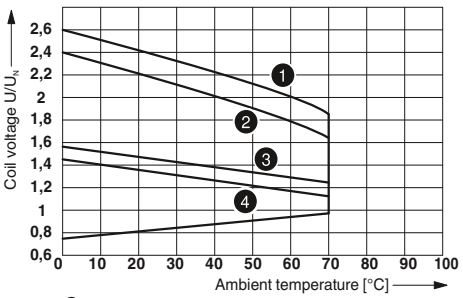
1 250 V AC, ohmic load

Service life reduction factor with various cos phi



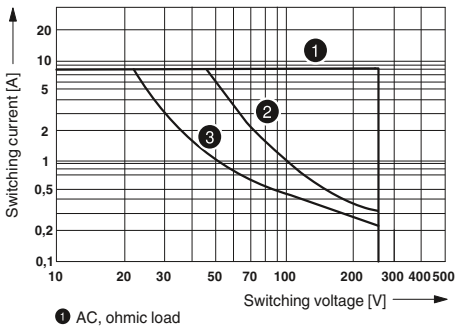
REL-MR...21-21...MS (2-PDT)

Operating voltage range



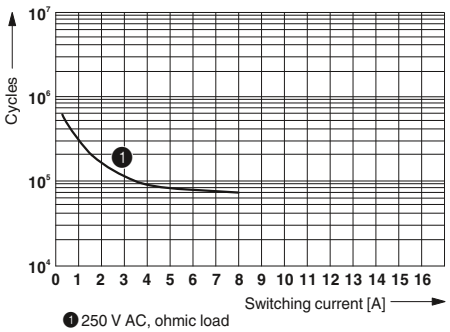
1 DC coils, 0 A contact current
2 DC coils, 8 A contact current
3 AC coils, 0 A contact current
4 AC coils, 8 A contact current

Interrupting rating



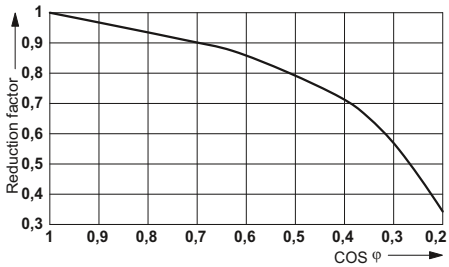
1 AC, ohmic load
2 DC, ohmic load, contacts in series
3 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor with various cos phi



Bipolar, plug-in miniature power relays

new

new

Bipolar, plug-in miniature power relays with 1 or 2 changeover contacts, suitable for the RIF-1 relay base.

The advantages:

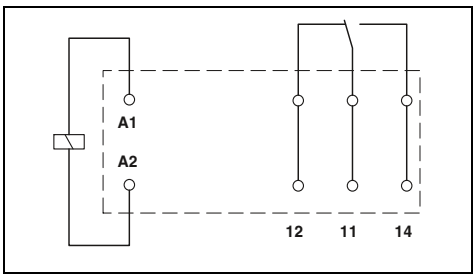
– Switching current of up to 16 A
– With detectable manual operation
– Mechanical switch position indicator
– Multi-layer power contact
– Can be soldered on PCB
– Special voltages (100 and 200 V AC)

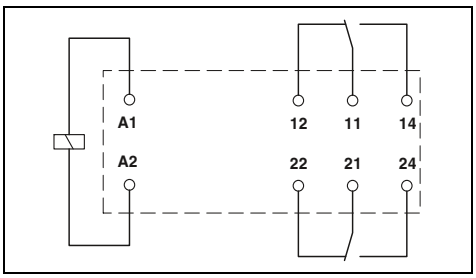
Notes:

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

1-PDT relay (bipolar) with manual operation, max. 16 A

2-PDT relay (bipolar) with manual operation, max. 2 x 8 A





Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	17	8	4
Typical response time at U_N	[ms]	9		
Typical response time at U_N (depending on phase relation)	[ms]		3 - 12	3 - 12
Typical release time at U_N	[ms]	6		
Typical release time at U_N (depending on phase relation)	[ms]		2 - 8	2 - 8
Output data				
Contact type		1 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		12 V (at 10 mA)		
Limiting continuous current		16 A		
Maximum switch-on current AC		32 A (20 ms)		
Maximum switch-on current DC		32 A (20 ms)		
Minimum switching current		10 mA (at 12 V)		
General data				
Test voltage (winding / contact)		5 kV AC (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 70 °C		
Ambient temperature (operation), DC		-40 °C ... 70 °C		
Mechanical service life, AC		5 x 10^6 cycles		
Mechanical service life, DC		5 x 10^6 cycles		
Standards/regulations		IEC 61810 , IEC 60664		

Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	17	8	4
Typical response time at U_N	[ms]	9		
Typical response time at U_N (depending on phase relation)	[ms]		3 - 12	3 - 12
Typical release time at U_N	[ms]	6		
Typical release time at U_N (depending on phase relation)	[ms]		2 - 8	2 - 8
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		12 V (at 10 mA)		
Limiting continuous current		8 A		
Maximum switch-on current AC		16 A (20 ms)		
Maximum switch-on current DC		16 A (20 ms)		
Minimum switching current		10 mA (at 12 V)		
General data				
Test voltage (winding / contact)		5 kV AC (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 70 °C		
Ambient temperature (operation), DC		-40 °C ... 70 °C		
Mechanical service life, AC		5 x 10^6 cycles		
Mechanical service life, DC		5 x 10^6 cycles		
Standards/regulations		IEC 61810 , IEC 60664		

Ordering data

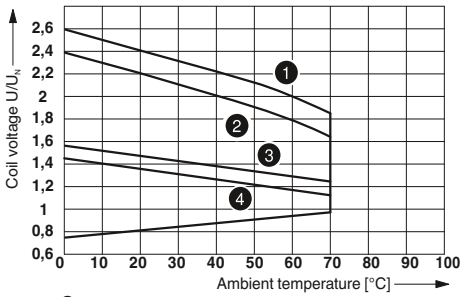
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Bipolar, plug-in miniature power relays, with power contacts				
①	24 V DC	**REL-MR-BL-24DC/21HC/MS**	2908180	10
②	100 V AC	**REL-MR-BL-100AC/21HC/MS**	2908179	10
③	200 V AC	**REL-MR-BL-200AC/21HC/MS**	2908178	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-MR-BL-24DC/21-21/MS	2908181	10
REL-MR-BL-100AC/21-21/MS	2908183	10
REL-MR-BL-200AC/21-21/MS	2908182	10

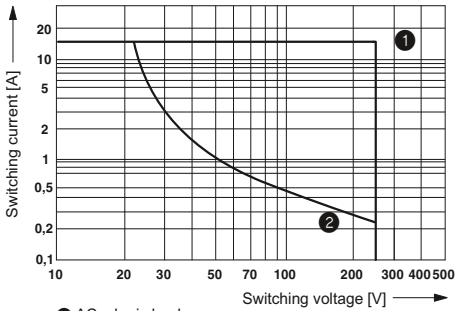
REL-MR-BL...21HC/MS (1-PDT)

Operating voltage range



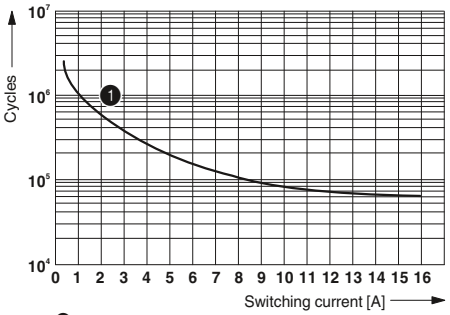
1 DC coils, 0 A contact current
2 DC coils, 16 A contact current
3 AC coils, 0 A contact current
4 AC coils, 16 A contact current

Interrupting rating



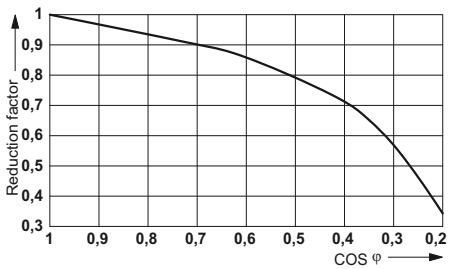
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



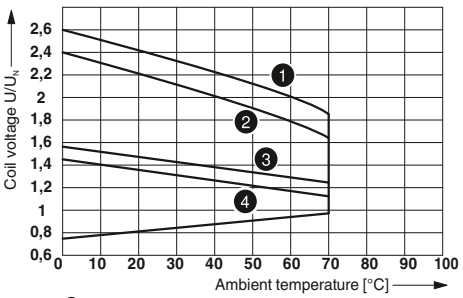
1 250 V AC, ohmic load

Service life reduction factor with various cos phi



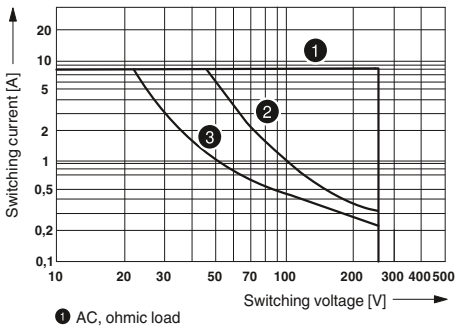
REL-MR-BL...21-21/MS (2-PDT)

Operating voltage range



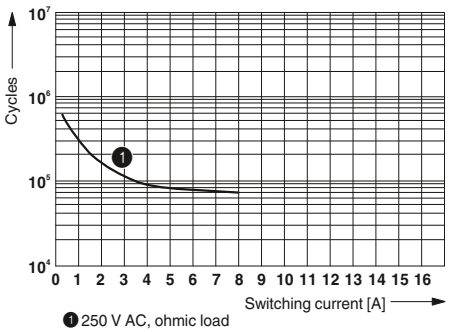
1 DC coils, 0 A contact current
2 DC coils, 8 A contact current
3 AC coils, 0 A contact current
4 AC coils, 8 A contact current

Interrupting rating



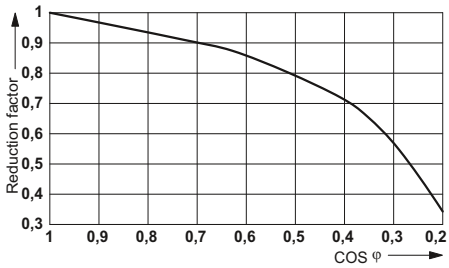
1 AC, ohmic load
2 DC, ohmic load, contacts in series
3 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor with various cos phi



Plug-in solid-state relays

Plug-in solid-state relays are suitable for both relay bases RIF-1 and PLC-INTERFACE.

The advantages:

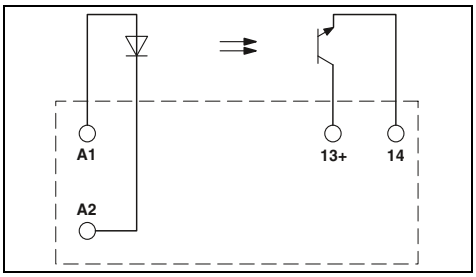
– Switching current of up to 5 A
– RT III-proof (wash-proof)
– Vibration and shock-resistant
– Wear-free and long-lasting
– Zero voltage switch at AC output
– Can be soldered on PCB

Notes:

For dimensional drawings and perforations for assembly, see page 399

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

Solid-state relay, DC output max. 5 A



Technical data

		①	②	③
Input data				
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2	0.9 - 1.1
Switching level	1 signal ("H") [V DC] ≥	2.5	16	35
	0 signal ("L") [V DC] ≤	0.8	10	20
Typical input current at U_N	[mA]	9	7	3
Typical switch-on time at U_N	[µs]	10	20	25
Typical switch-off time at U_N	[µs]	400	400	400
Transmission frequency f_{limit}	[Hz]	300	300	300

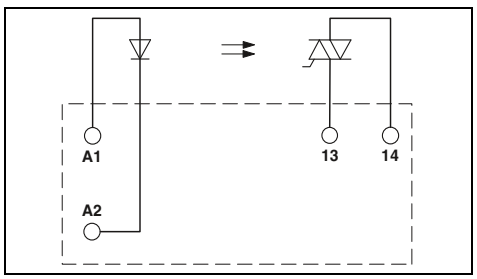
Output data	
Max. switching voltage	33 V DC
Minimum switching voltage	3 V DC
Limiting continuous current	5 A (see derating curve)
Minimum load current	-
Maximum switch-on current	15 A (10 ms)
Leakage current in off state	-
Output circuit	2-wire, floating
Max. load value	-
Output protection	Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current	≤ 200 mV

General data	
Rated surge voltage	Basic insulation
Test voltage input/output	2.5 kV (50 Hz, 1 min.)
Ambient temperature (operation)	-25 °C ... 60 °C
Nominal operating mode	100% operating factor
Standards/regulations	IEC 60664 , EN 50178
Degree of pollution/surge voltage category	2 / III
Mounting position/mounting	any / In rows with zero spacing
Dimensions W / H / D	12.7 mm / 29 mm / 15.7 mm

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in solid-state relays					
Solid-state power relays	①	5 V DC	**OPT- 5DC/ 24DC/ 5**	2982113	10
Solid-state power relays	②	24 V DC	**OPT-24DC/ 24DC/ 5**	2982100	10
Solid-state power relays	③	60 V DC	**OPT-60DC/ 24DC/ 5**	2982126	10

**Solid-state relay,
AC output max. 2 A**



Technical data

①	②
0.8 -	0.8 -
1.2	1.2
3	18
1	8.4
15	7
10000	10000
10000	10000
10	10

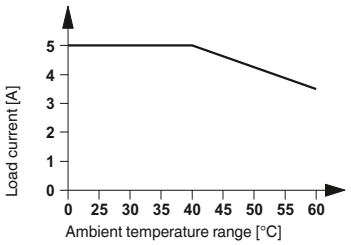
253 V AC
24 V AC
2 A (see derating curve)
25 mA
30 A (10 ms)
< 1 mA
2-conductor floating, zero voltage switch
4 A²s (tp = 10 ms, at 25 °C)
Surge protection
≤ 1 V

Basic insulation
2.5 kV (50 Hz, 1 min.)
-25 °C ... 60 °C
100% operating factor
IEC 60664 , EN 50178
2 / III
any / See derating curve
12.7 mm / 29 mm / 15.7 mm

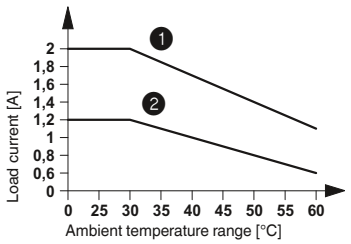
Ordering data

Type	Order No.	Pcs./ Pkt.
OPT- 5DC/230AC/ 2	**2982168**	10
OPT-24DC/230AC/ 2	**2982171**	10

Derating curve for OPT...DC/24DC/5 solid-state relays



Derating curve for OPT...DC/230AC/2 solid-state relays



❶ Aligned with > 10 mm spacing
❷ Aligned without spacing

Modular RIF-2 relay base

Relay base for assembly with 2 or 4-PDT industrial relay.

Range of accessories includes:

– Plug-in interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)

Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See "General" section in "Basics of relay technology" on page 286.

4-PDT relay base with Push-in connection technology for industrial relays

Technical data

Nominal voltage U_N	250 V AC/DC
Nominal current at U_N	max. 12 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Dimensions	
Width	31 mm
Depth with retaining bracket	75 mm
Height	96 mm

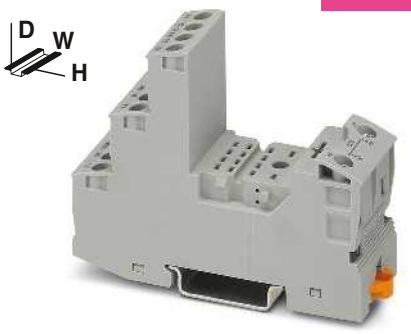
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-2 relay base, plug-in option for interference suppression module, safe isolation I/O with Push-in connection	**RIF-2-BPT/4X21**	2900934	10
RIF-2 relay base, plug-in option for interference suppression module, safe isolation I/O with screw connection			
Plastic relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-2 relay base			
Reinforced plastic relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-2 relay base			
Relay retaining bracket, wire model, suitable for RIF-2 relay base			

Accessories

Plug-in bridge				
2-pos. red, 32 A		**FBS 2-6**	3030336	50
2-pos. red, 24 A		**FBSR 2-6**	3033715	50
2-pos. blue, 32 A		**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A		**FBS 2-6 GY**	3032237	50
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...		**CLIPFIX 35**	3022218	50
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and	silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part	red	**MPS-IH RD**	0201676	10
	white	**MPS-IH WH**	0201663	10
	blue	**MPS-IH BU**	0201689	10
	yellow	**MPS-IH YE**	0201692	10
	green	**MPS-IH GN**	0201702	10
	gray	**MPS-IH GY**	0201728	10
	black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted				
10-section		**ZB 5 :UNBEDRUCKT**	1050004	10
5-section		**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5		**STP 5-2**	0800967	100

new



4-PDT relay base with screw connection technology for industrial relays

Plastic relay retaining bracket for RIF-2 base

Metal wire relay retaining bracket for RIF-2 base

Technical data

250 V AC/DC	-	-
max. 12 A (Depends on application/assembly)	-	-
-40 °C ... 85 °C (Depends on application/assembly)	-	-
0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10	-	-
27 mm	-	-
75 mm	-	-
89 mm	-	-

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-2-BSC/4X21	2900932	10

Type	Order No.	Pcs./ Pkt.
RIF-RH-2	2900954	10
RIF-RHS-2	2908043	10

Type	Order No.	Pcs./ Pkt.
RIF-RHM-2	2905984	10

Accessories

FBS 2-6	3030336	50
FBSR 2-6	3033715	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 5 :UNBEDRUCKT	1050004	10
ZB 15:UNBEDRUCKT	0811972	10
STP 5-2	0800967	100

Plug-in industrial relays

Plug-in industrial relays with 2 or 4 changeover contacts, suitable for RIF-2 relay base.

The advantages:

– With detectable manual operation
– Mechanical switch position indicator
– Integrated status LED
– Multi-layer gold contact or power contact
– DC types with integrated freewheeling diode

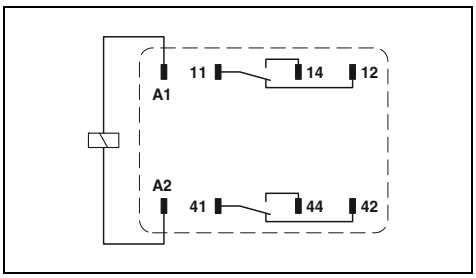
Notes:

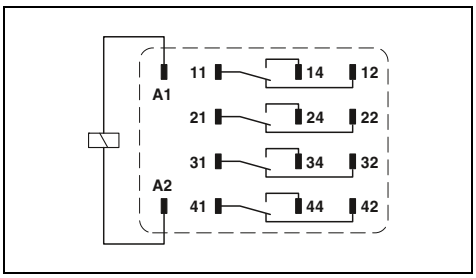
For other voltages, see phoenixcontact.net/products

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

2-PDT industrial relay with manual operation, max. 2 x 12 A

4-PDT industrial relay with manual operation, max. 4 x 6 A





Technical data

Input data		①	②	③	④	⑤	⑥	⑦	⑧
Permissible range (with reference to U_N)		see diagram							
Typical input current at U_N	[mA]	78	42	8	7.7	4	66	13	6.5
Typical response time at U_N	[ms]	13	13	13	13	13			
Typical response time at U_N (depending on phase relation)	[ms]						5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	14	14	14	14	14			
Typical release time at U_N (depending on phase relation)	[ms]						5 - 20	5 - 20	5 - 20
Output data									
Contact type		2 PDT							
Contact material		AgNi							
Max. switching voltage		250 V AC/DC							
Minimum switching voltage		5 V (At 24 mA)							
Limiting continuous current		12 A							
Maximum switch-on current AC		30 A (20 ms, N/O contact)							
Maximum switch-on current DC		30 A (20 ms, N/O contact)							
Minimum switching current		5 mA (at 24 V)							
General data									
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)							
Ambient temperature (operation), AC		-40 °C ... 55 °C							
Ambient temperature (operation), DC		-40 °C ... 70 °C							
Mechanical service life, AC		Approx. 2x 10^7 cycles							
Mechanical service life, DC		Approx. 2x 10^7 cycles							
Standards/regulations		IEC 60664 , IEC 61810							

Technical data

Input data		①	②	③	④	⑤	⑥	⑦	⑧
Permissible range (with reference to U_N)		see diagram							
Typical input current at U_N	[mA]	78	42	8	7.7	4	66	13	6.5
Typical response time at U_N	[ms]	13	13	13	13	13			
Typical response time at U_N (depending on phase relation)	[ms]						5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	14	14	14	14	14			
Typical release time at U_N (depending on phase relation)	[ms]						5 - 20	5 - 20	5 - 20
Output data									
Contact type		4 PDT				4 PDT			
Contact material		AgNi				AgNi, hard gold-plated			
Max. switching voltage		250 V AC/DC				30 V AC / 36 V DC			
Minimum switching voltage		5 V (At 24 mA)				5 V (At 24 mA)			
Limiting continuous current		6 A				50 mA			
Maximum switch-on current AC		16 A (20 ms, N/O contact)				50 mA			
Maximum switch-on current DC		16 A (20 ms, N/O contact)				50 mA			
Minimum switching current		5 mA (at 24 V)				-			
General data									
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)							
Ambient temperature (operation), AC		-40 °C ... 55 °C							
Ambient temperature (operation), DC		-40 °C ... 70 °C							
Mechanical service life, AC		Approx. 2x 10^7 cycles							
Mechanical service life, DC		Approx. 2x 10^7 cycles							
Standards/regulations		IEC 60664 , IEC 61810							

Ordering data

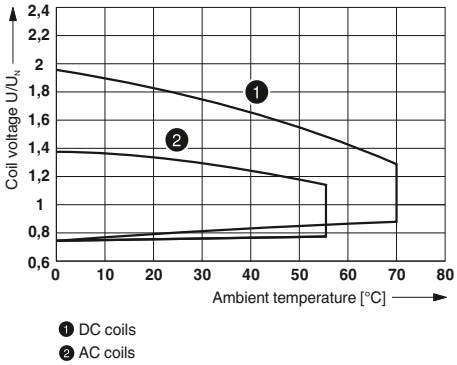
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in industrial relays, with power contacts					
With freewheeling diode	①	12 V DC	REL-IR2/LDP- 12DC/2X21	2903659	10
With freewheeling diode	②	24 V DC	REL-IR2/LDP- 24DC/2X21	2903660	10
With freewheeling diode	③	110 V DC	REL-IR2/LDP-110DC/2X21	2903663	10
With freewheeling diode	④	125 V DC	REL-IR2/LDP-125DC/2X21	2903664	10
With freewheeling diode	⑤	220 V DC	REL-IR2/LDP-220DC/2X21	2903665	10
	⑥	24 V AC	REL-IR2/L- 24AC/2X21	2903666	10
	⑦	120 V AC	REL-IR2/L-120AC/2X21	2903667	10
	⑧	230 V AC	REL-IR2/L-230AC/2X21	2903668	10
Plug-in industrial relays, with multi-layer gold contacts					
With freewheeling diode	①	12 V DC			
With freewheeling diode	②	24 V DC			
With freewheeling diode	③	110 V DC			
With freewheeling diode	④	125 V DC			
With freewheeling diode	⑤	220 V DC			
	⑥	24 V AC			
	⑦	120 V AC			
	⑧	230 V AC			

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in industrial relays, with power contacts					
With freewheeling diode	①	12 V DC	REL-IR4/LDP- 12DC/4X21	2903676	10
With freewheeling diode	②	24 V DC	REL-IR4/LDP- 24DC/4X21	2903677	10
With freewheeling diode	③	110 V DC	REL-IR4/LDP-110DC/4X21	2903680	10
With freewheeling diode	④	125 V DC	REL-IR4/LDP-125DC/4X21	2903681	10
With freewheeling diode	⑤	220 V DC	REL-IR4/LDP-220DC/4X21	2903682	10
	⑥	24 V AC	REL-IR4/L- 24AC/4X21	2903686	10
	⑦	120 V AC	REL-IR4/L-120AC/4X21	2903687	10
	⑧	230 V AC	REL-IR4/L-230AC/4X21	2903688	10
Plug-in industrial relays, with multi-layer gold contacts					
With freewheeling diode	①	12 V DC	REL-IR4/LDP- 12DC/4X21AU	2903669	10
With freewheeling diode	②	24 V DC	REL-IR4/LDP- 24DC/4X21AU	2903670	10
With freewheeling diode	③	110 V DC	REL-IR4/LDP-110DC/4X21AU	2903673	10
With freewheeling diode	④	125 V DC	REL-IR4/LDP-125DC/4X21AU	2903674	10
With freewheeling diode	⑤	220 V DC	REL-IR4/LDP-220DC/4X21AU	2903675	10
	⑥	24 V AC	REL-IR4/L- 24AC/4X21AU	2903683	10
	⑦	120 V AC	REL-IR4/L-120AC/4X21AU	2903684	10
	⑧	230 V AC	REL-IR4/L-230AC/4X21AU	2903685	10

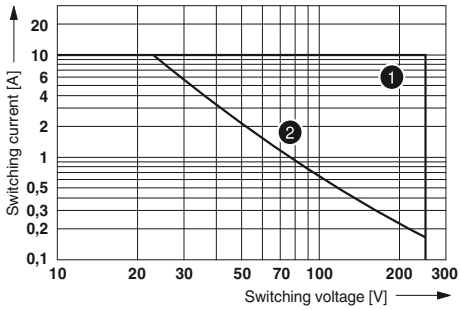
REL-IR2... (2-PDT)

Operating voltage range



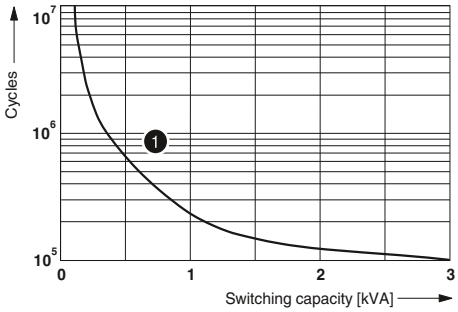
1 DC coils
2 AC coils

Interrupting rating



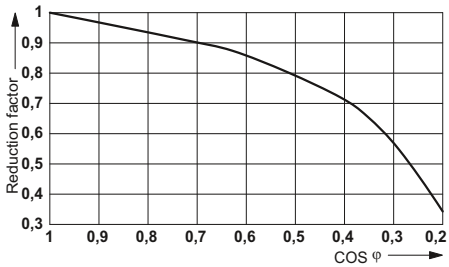
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



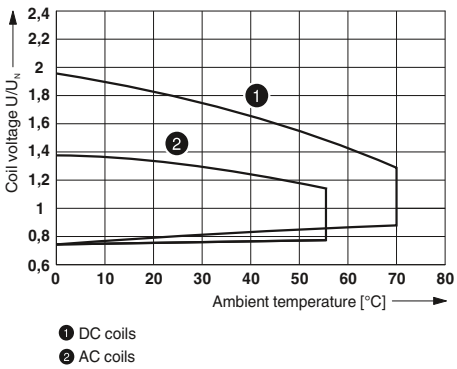
1 250 V AC, ohmic load

Service life reduction factor



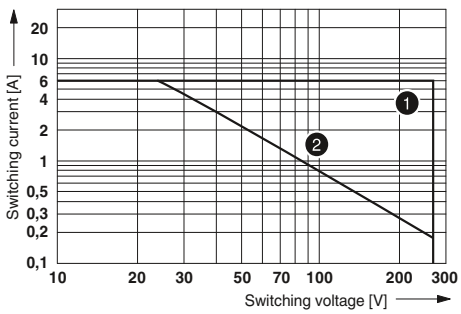
REL-IR4... (4-PDT)

Operating voltage range



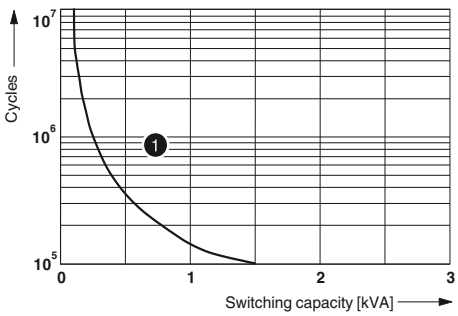
1 DC coils
2 AC coils

Interrupting rating



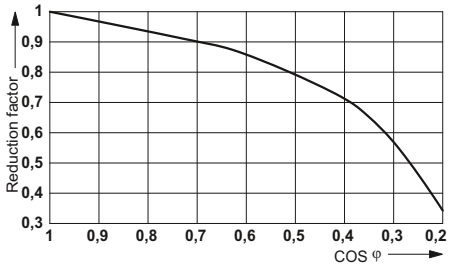
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Bipolar, plug-in industrial relays

new

new

Bipolar, plug-in industrial relays with 2 or 4 changeover contacts, suitable for the RIF-2 relay base.

The advantages:

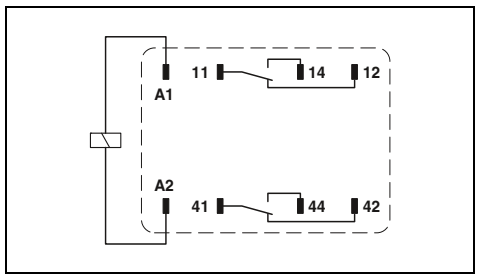
– Switching current of up to 12 A
– With detectable manual operation
– Mechanical switch position indicator
– Special voltages (100 and 200 V AC)

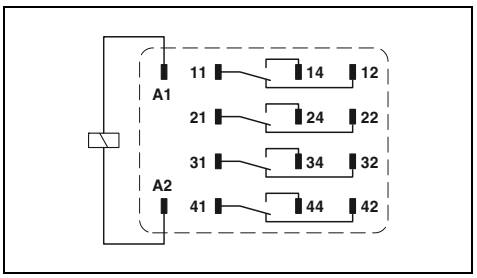
Notes:

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

2-PDT industrial relay (bipolar) with manual operation, max. 2 x 12 A

4-PDT industrial relay (bipolar) with manual operation, max. 4 x 6 A





Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	38	14.8	7.1
Typical response time at U_N	[ms]	13		
Typical response time at U_N (depending on phase relation)	[ms]		5 - 15	5 - 15
Typical release time at U_N	[ms]	3		
Typical release time at U_N (depending on phase relation)	[ms]		5 - 20	5 - 20
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		5 V (At 24 mA)		
Limiting continuous current		12 A		
Maximum switch-on current AC		30 A (20 ms, N/O contact)		
Maximum switch-on current DC		30 A (20 ms, N/O contact)		
Minimum switching current		5 mA (at 24 V)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 55 °C		
Ambient temperature (operation), DC		-40 °C ... 70 °C		
Mechanical service life, AC		Approx. 2x 10^7 cycles		
Mechanical service life, DC		Approx. 2x 10^7 cycles		
Standards/regulations		IEC 60664 , IEC 61810		

Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	38	14.8	7.1
Typical response time at U_N	[ms]	13		
Typical response time at U_N (depending on phase relation)	[ms]		5 - 15	5 - 15
Typical release time at U_N	[ms]	3		
Typical release time at U_N (depending on phase relation)	[ms]		5 - 20	5 - 20
Output data				
Contact type		4 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		5 V (At 24 mA)		
Limiting continuous current		6 A		
Maximum switch-on current AC		16 A (20 ms, N/O contact)		
Maximum switch-on current DC		16 A (20 ms, N/O contact)		
Minimum switching current		5 mA (at 24 V)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 55 °C		
Ambient temperature (operation), DC		-40 °C ... 70 °C		
Mechanical service life, AC		1x 10^7 cycles, approximately		
Mechanical service life, DC		1x 10^7 cycles, approximately		
Standards/regulations		IEC 60664 , IEC 61810		

Ordering data

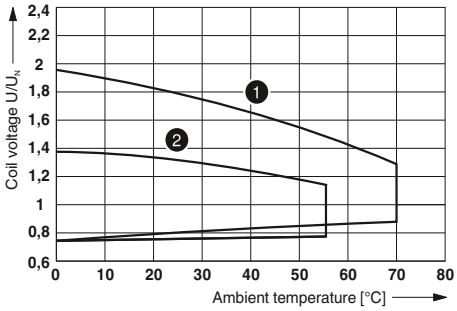
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Bipolar, plug-in industrial relays, with power contacts					
	①	24 V DC	**REL-IR2/24DC/2X21**	2907051	10
	②	100 V AC	**REL-IR2/100AC/2X21**	2907052	10
	③	200 V AC	**REL-IR2/200AC/2X21**	2907053	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-IR4/24DC/4X21	2907054	10
REL-IR4/100AC/4X21	2907055	10
REL-IR4/200AC/4X21	2907056	10

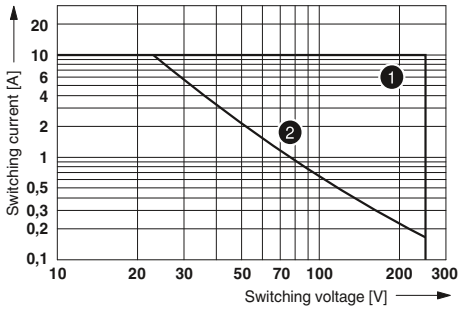
REL-IR2... (2-PDT)

Operating voltage range



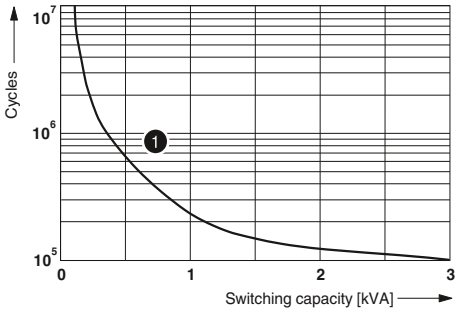
1 DC coils
2 AC coils

Interrupting rating



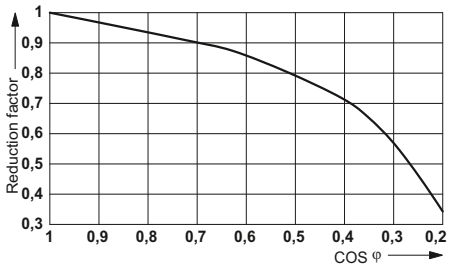
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



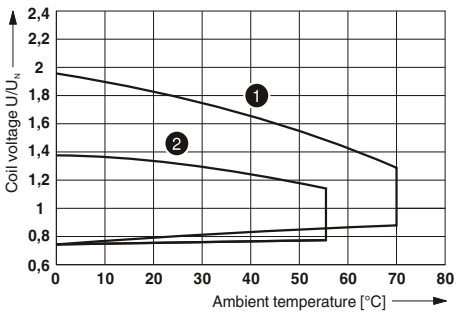
1 250 V AC, ohmic load

Service life reduction factor



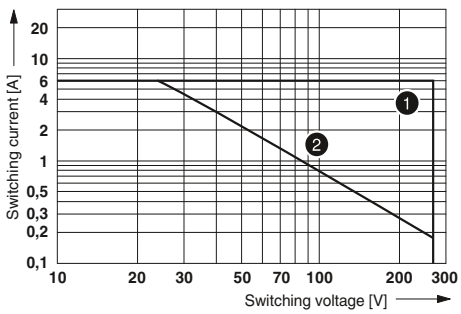
REL-IR4... (4-PDT)

Operating voltage range



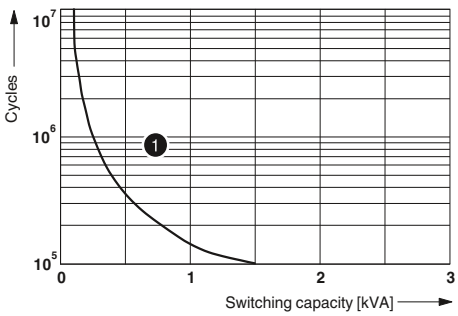
1 DC coils
2 AC coils

Interrupting rating



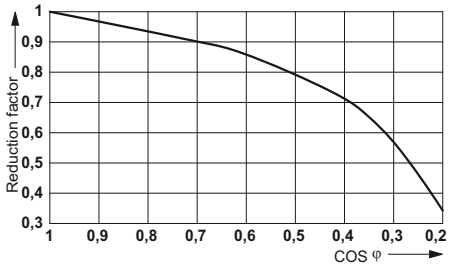
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Modular RIF-3 relay base

Relay base for assembly with 2 or 3-PDT relays.

Range of accessories includes:

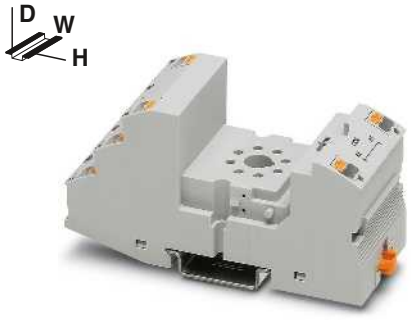
– Plug-in interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)

Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.



2-PDT relay base with Push-in connection technology for octal relays

Technical data

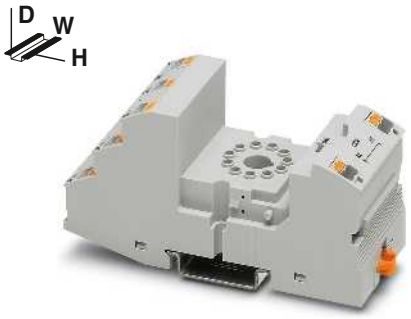
Nominal voltage U_N	250 V AC/DC
Nominal current at U_N	max. 12 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Dimensions	
Width	40 mm
Depth with retaining bracket	90 mm
Height	103 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-3 relay base, 2-PDT version, plug-in option for interference suppression module, safe isolation I/O with Push-in connection	**RIF-3-BPT/2X21**	2900937	10
RIF-3 relay base, 3-PDT version, plug-in option for interference suppression module, safe isolation I/O with Push-in connection			
Plastic relay retaining bracket, with holder for marking material, suitable for RIF-3 relay base			
Relay retaining bracket, wire model, suitable for RIF-3 relay base			

Accessories

Plug-in bridge			
2-pos. red, 32 A	**FBS 2-6**	3030336	50
2-pos. red, 24 A	**FBSR 2-6**	3033715	50
2-pos. blue, 32 A	**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A	**FBS 2-6 GY**	3032237	50
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...	**CLIPFIX 35**	3022218	50
Test plug, consisting of:			
Metal part for 2.3 mm Ø socket hole and silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part red	**MPS-IH RD**	0201676	10
white	**MPS-IH WH**	0201663	10
blue	**MPS-IH BU**	0201689	10
yellow	**MPS-IH YE**	0201692	10
green	**MPS-IH GN**	0201702	10
gray	**MPS-IH GY**	0201728	10
black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted			
10-section	**ZB 5 :UNBEDRUCKT**	1050004	10
5-section	**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5	**STP 5-2**	0800967	100



3-PDT relay base with Push-in connection technology for octal relays

Plastic relay retaining bracket for RIF-3 base

Metal wire relay retaining bracket for RIF-3 base

Technical data

250 V AC/DC	
max. 12 A (Depends on application/assembly)	
-40 °C ... 85 °C (Depends on application/assembly)	
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16	
40 mm	
90 mm	
103 mm	

Technical data

-	
-	
-	
-	
-	
-	
-	

Technical data

-	
-	
-	
-	
-	
-	
-	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-3-BPT/3X21	2900938	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-RH-3	2900955	10

Ordering data

Type	Order No.	Pcs./ Pkt.
EL3-M52	2833628	10

Accessories

FBS 2-6	3030336	50
FBSR 2-6	3033715	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 5 :UNBEDRUCKT	1050004	10
ZB 15:UNBEDRUCKT	0811972	10
STP 5-2	0800967	100

Accessories

Accessories

Modular RIF-3 relay base

Relay base for assembly with 2 or 3-PDT octal relay.

Range of accessories includes:

– Plug-in interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)

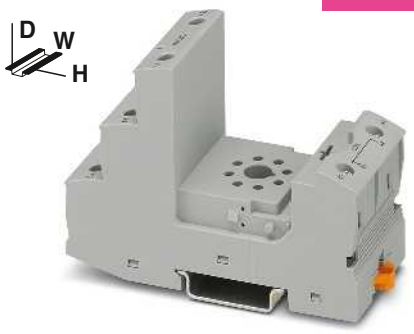
Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

new



2-PDT relay base with screw connection technology for octal relays

Technical data

Nominal voltage U_N	250 V AC/DC
Nominal current at U_N	max. 12.5 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10
Dimensions	
Width	40 mm
Depth with retaining bracket	90 mm
Height	96 mm

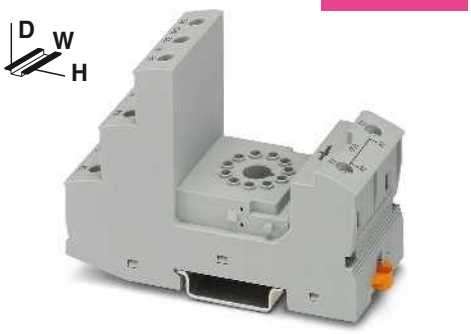
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-3 relay base, 2-PDT version, plug-in option for interference suppression module, safe isolation I/O with screw connection	**RIF-3-BSC/2X21**	2900935	10
RIF-3 relay base, 3-PDT version, plug-in option for interference suppression module, safe isolation I/O with screw connection			
Plastic relay retaining bracket, with holder for marking material, suitable for RIF-3 relay base			
Relay retaining bracket, wire model, suitable for RIF-3 relay base			

Accessories

Plug-in bridge			
2-pos. red, 32 A	**FBS 2-6**	3030336	50
2-pos. red, 24 A	**FBSR 2-6**	3033715	50
2-pos. blue, 32 A	**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A	**FBS 2-6 GY**	3032237	50
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...	**CLIPFIX 35**	3022218	50
Test plug, consisting of:			
Metal part for 2.3 mm Ø socket hole and silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part red	**MPS-IH RD**	0201676	10
white	**MPS-IH WH**	0201663	10
blue	**MPS-IH BU**	0201689	10
yellow	**MPS-IH YE**	0201692	10
green	**MPS-IH GN**	0201702	10
gray	**MPS-IH GY**	0201728	10
black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted			
10-section	**ZB 5 :UNBEDRUCKT**	1050004	10
5-section	**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5	**STP 5-2**	0800967	100

new



3-PDT relay base with screw connection technology for octal relays

Plastic relay retaining bracket for RIF-3 base

Metal wire relay retaining bracket for RIF-3 base

Technical data

250 V AC/DC	-	-
max. 10.5 A (Depends on application/assembly)	-	-
-40 °C ... 85 °C (Depends on application/assembly)	-	-
0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10	-	-
40 mm	-	-
90 mm	-	-
96 mm	-	-

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-3-BSC/3X21	2900936	10

Type	Order No.	Pcs./ Pkt.
RIF-RH-3	2900955	10

Type	Order No.	Pcs./ Pkt.
EL3-M52	2833628	10

Accessories

FBS 2-6	3030336	50
FBSR 2-6	3033715	50
FBS 2-6 BU	3036932	50
FBS 2-6 GY	3032237	50
CLIPFIX 35	3022218	50
MPS-MT	0201744	10
MPS-IH RD	0201676	10
MPS-IH WH	0201663	10
MPS-IH BU	0201689	10
MPS-IH YE	0201692	10
MPS-IH GN	0201702	10
MPS-IH GY	0201728	10
MPS-IH BK	0201731	10
ZB 5 :UNBEDRUCKT	1050004	10
ZB 15:UNBEDRUCKT	0811972	10
STP 5-2	0800967	100

Plug-in octal relays

Plug-in octal relays with 2 or 3 changeover contacts, suitable for RIF-3 relay base.

The advantages:

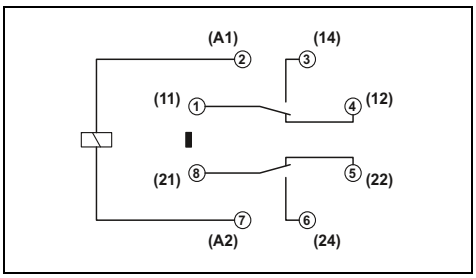
– With detectable manual operation
– Mechanical switch position indicator
– Integrated status LED
– DC types with integrated freewheeling diode

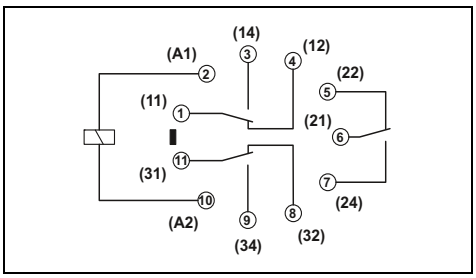
Notes:

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

2-PDT octal relay with manual operation, max. 2 x 10 A

3-PDT octal relay with manual operation, max. 3 x 10 A





Technical data

Input data		①	④	⑤	⑥	⑦
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	60	8	108	23	13
Typical response time at U_N	[ms]	18	18			
Typical response time at U_N (depending on phase relation)	[ms]			5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	20	7			
Typical release time at U_N (depending on phase relation)	[ms]			5 - 20	5 - 20	5 - 20
Output data						
Contact type		2 PDT				
Contact material		AgNi				
Max. switching voltage		250 V AC/DC				
Minimum switching voltage		10 V (At 24 mA)				
Limiting continuous current		10 A				
Maximum switch-on current AC		30 A (20 ms, N/O contact)				
Maximum switch-on current DC		30 A (20 ms, N/O contact)				
Minimum switching current		10 mA (at 24 V)				
General data						
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)				
Ambient temperature (operation), AC		-40 °C ... 55 °C				
Ambient temperature (operation), DC		-40 °C ... 70 °C				
Nominal operating mode		100% operating factor				
Mechanical service life, AC		Approx. 2x 10^7 cycles				
Mechanical service life, DC		Approx. 2x 10^7 cycles				
Standards/regulations		IEC 60664 , IEC 61810				
Mounting position/mounting		any				
Dimensions	W / H / D	35 mm / 54.4 mm / 35 mm				

Technical data

Input data		①	②	③	④	⑤	⑥	⑦
Permissible range (with reference to U_N)		see diagram						
Typical input current at U_N	[mA]	60			8	108	23	13
Typical response time at U_N	[ms]	18	18	18	18			
Typical response time at U_N (depending on phase relation)	[ms]					5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	20	20	20	7			
Typical release time at U_N (depending on phase relation)	[ms]					5 - 20	5 - 20	5 - 20
Output data								
Contact type		3 PDT						
Contact material		AgNi						
Max. switching voltage		250 V AC/DC						
Minimum switching voltage		10 V (At 24 mA)						
Limiting continuous current		10 A						
Maximum switch-on current AC		30 A (20 ms, N/O contact)						
Maximum switch-on current DC		30 A (20 ms, N/O contact)						
Minimum switching current		10 mA (at 24 V)						
General data								
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)						
Ambient temperature (operation), AC		-40 °C ... 55 °C						
Ambient temperature (operation), DC		-40 °C ... 70 °C						
Nominal operating mode		100% operating factor						
Mechanical service life, AC		Approx. 2x 10^7 cycles						
Mechanical service life, DC		Approx. 2x 10^7 cycles						
Standards/regulations		IEC 60664 , IEC 61810						
Mounting position/mounting		any						
Dimensions	W / H / D	35 mm / 54.4 mm / 35 mm						

Ordering data

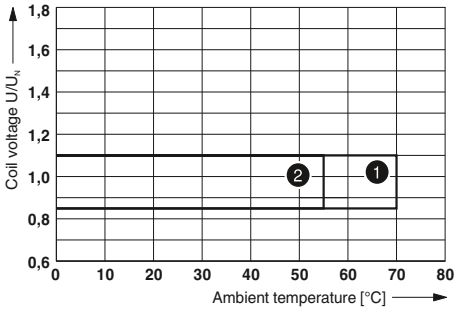
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in octal relays, with power contacts					
With freewheeling diode	①	24 V DC	**REL-OR2/LDP- 24DC/2X21**	2903689	10
	②	48 V DC			
	③	110 V DC			
	④	220 V DC	**REL-OR2/LDP-220DC/2X21**	2907026	10
	⑤	24 V AC	**REL-OR2/L- 24AC/2X21**	2903690	10
	⑥	120 V AC	**REL-OR2/L-120AC/2X21**	2903691	10
	⑦	230 V AC	**REL-OR2/L-230AC/2X21**	2903692	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-OR3/LDP-24DC/3X21	2903693	10
REL-OR3/LDP-48DC/3X21	2908897	10
REL-OR3/LDP-110DC/3X21	2908898	10
REL-OR3/LDP-220DC/3X21	2907027	10
REL-OR3/L- 24AC/3X21	2903694	10
REL-OR3/L-120AC/3X21	2903695	10
REL-OR3/L-230AC/3X21	2903696	10

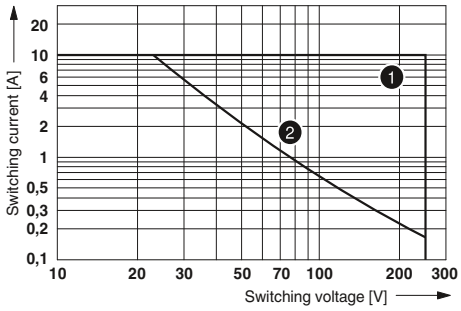
REL-OR2... (2-PDT)

Operating voltage range



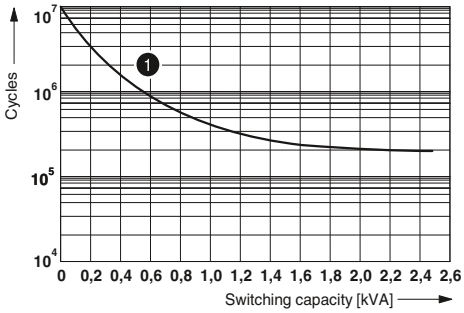
1 DC coils
2 AC coils

Interrupting rating



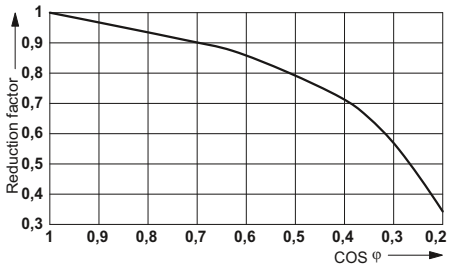
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



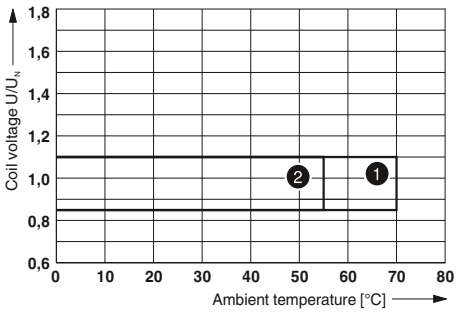
1 250 V AC, ohmic load

Service life reduction factor



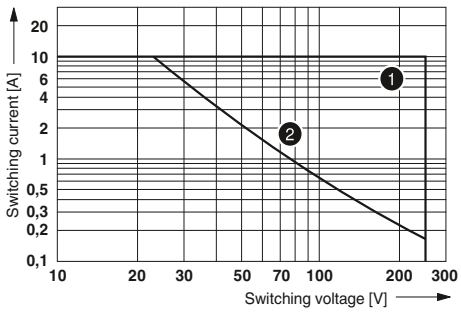
REL-OR3... (3-PDT)

Operating voltage range



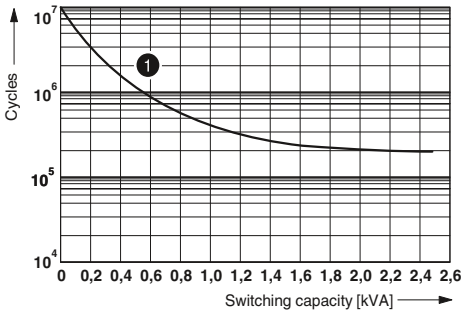
1 DC coils
2 AC coils

Interrupting rating



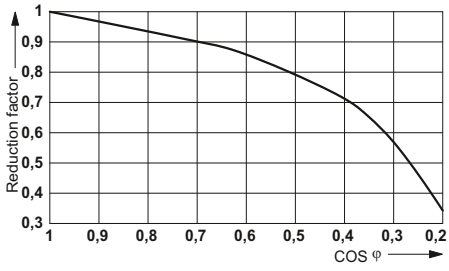
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Modular RIF-4 relay base

Relay base for assembly with 2 or 3-PDT relays or 3-N/O relays.

Range of accessories includes:

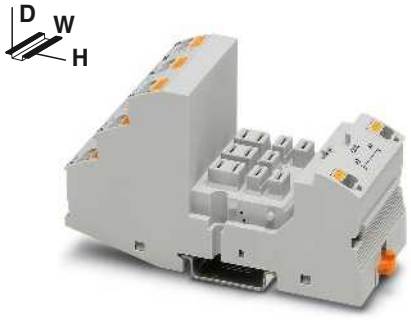
– Plug-in interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)

Notes:

Type of insulating housing:
Polyamide PA, non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 3.

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.



3-PDT relay base with Push-in connection technology for high-power relays

Technical data

Nominal voltage U_N	440 V AC
Nominal current at U_N	max. 16 A (Depends on application/assembly)
General data	
Ambient temperature (operation)	-40 °C ... 85 °C (Depends on application/assembly)
Connection data solid/stranded/AWG	
Input side	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Output side	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	
Width	43 mm
Depth with retaining bracket	90 mm
Height	111 mm

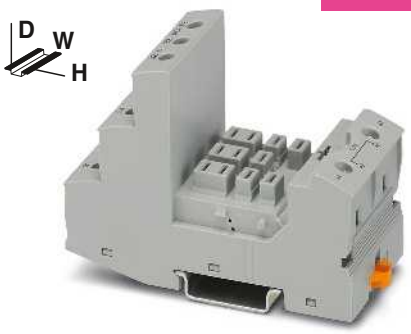
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
RIF-4 relay base, plug-in option for interference suppression module, safe isolation I/O with Push-in connection	**RIF-4-BPT/3X21**	2900961	10
RIF-4 relay base, plug-in option for interference suppression module, safe isolation I/O with screw connection			
Relay retaining bracket, with holder for marking material, suitable for RIF-4 relay base			
Relay retaining bracket, wire model, suitable for RIF-4 relay base			

Accessories

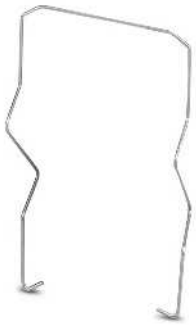
Plug-in bridge				
2-pos. red, 32 A		**FBS 2-6**	3030336	50
2-pos. red, 24 A		**FBSR 2-6**	3033715	50
2-pos. blue, 32 A		**FBS 2-6 BU**	3036932	50
2-pos. gray, 32 A		**FBS 2-6 GY**	3032237	50
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...		**CLIPFIX 35**	3022218	50
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and	silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part	red	**MPS-IH RD**	0201676	10
	white	**MPS-IH WH**	0201663	10
	blue	**MPS-IH BU**	0201689	10
	yellow	**MPS-IH YE**	0201692	10
	green	**MPS-IH GN**	0201702	10
	gray	**MPS-IH GY**	0201728	10
	black	**MPS-IH BK**	0201731	10
Zack marker strip, unprinted				
10-section		**ZB 5 :UNBEDRUCKT**	1050004	10
5-section		**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5		**STP 5-2**	0800967	100

new



3-PDT relay base with screw connection technology for high-power relays

Plastic relay retaining bracket for RIF-4 base



Metal wire relay retaining bracket for RIF-4 base

Technical data

440 V AC	-	-
max. 13 A (Depends on application/assembly)	-	-
-40 °C ... 85 °C (Depends on application/assembly)	-	-
0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10	-	-
0.14 ... 6 mm² / 0.14 ... 4 mm² / 26 - 10	-	-
44 mm	-	-
91 mm	-	-
96 mm	-	-

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-4-BSC/3X21	2900960	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-RH-4	2900956	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-RHM-4	2905983	10

Accessories

Accessories

Accessories

Plug-in high-power relays

Plug-in high-power relays with 2 or 3 changeover contacts for the RIF-4 relay base.

The advantages:

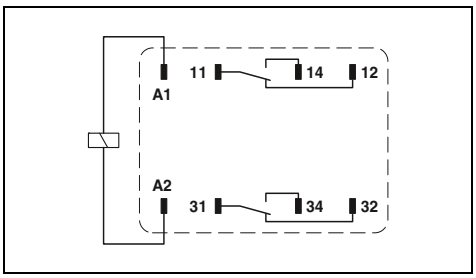
– Use in miniature contactor applications
– Switching current of up to 16 A
– Up to 440 V AC switching voltage

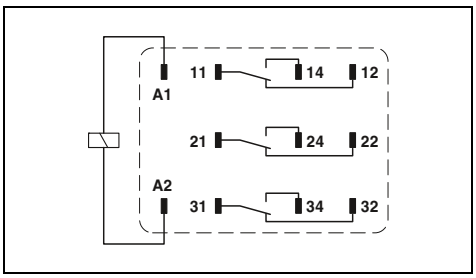
Notes:

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See "General" section in "Basics of relay technology" on page 286.

2-PDT high-power relay, max. 2 x 16 A

3-PDT high-power relay, max. 3 x 16 A





Technical data

Input data		①	②	③	④
Permissible range (with reference to U_N)		see diagram			
Typical input current at U_N	[mA]	56	116	23	12
Typical response time at U_N	[ms]	20			
Typical response time at U_N (depending on phase relation)	[ms]		5 - 25	5 - 25	5 - 25
Typical release time at U_N	[ms]	15			
Typical release time at U_N (depending on phase relation)	[ms]		5 - 20	5 - 20	5 - 20
Output data					
Contact type		2 PDT			
Contact material		AgNi			
Max. switching voltage		440 V AC / 250 V DC			
Minimum switching voltage		10 V (At 24 mA)			
Limiting continuous current		16 A			
Maximum switch-on current AC		50 A (20 ms, N/O contact)			
Maximum switch-on current DC		50 A (20 ms, N/O contact)			
Minimum switching current		10 mA (at 24 V)			
Maximum interrupting rating, ohmic load					
	250 V AC	4000 VA			
	440 V AC	4000 VA			
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor)			
General data					
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)			
Ambient temperature (operation), AC		-40 °C ... 55 °C			
Ambient temperature (operation), DC		-40 °C ... 70 °C			
Nominal operating mode		100% operating factor			
Mechanical service life, AC		Approx. 10^7 cycles			
Mechanical service life, DC		Approx. 10^7 cycles			
Standards/regulations		IEC 60664 , IEC 61810			
Mounting position/mounting		any			
Dimensions	W / H / D	38.6 mm / 45.5 mm / 36.1 mm			

Technical data

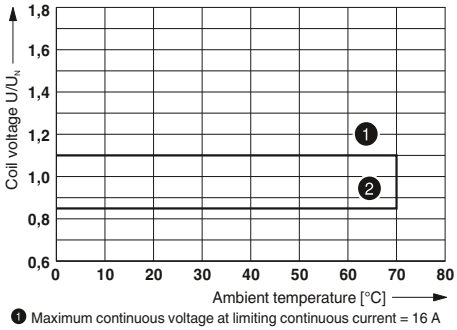
Input data		①	②	③	④	⑤
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	56		116	23	12
Typical response time at U_N	[ms]	20	20			
Typical response time at U_N (depending on phase relation)	[ms]			5 - 25	5 - 25	5 - 25
Typical release time at U_N	[ms]	15	15			
Typical release time at U_N (depending on phase relation)	[ms]			5 - 20	5 - 20	5 - 20
Output data						
Contact type		3 PDT				
Contact material		AgNi				
Max. switching voltage		440 V AC / 250 V DC				
Minimum switching voltage		10 V (At 24 mA)				
Limiting continuous current		16 A				
Maximum switch-on current AC		50 A (20 ms, N/O contact)				
Maximum switch-on current DC		50 A (20 ms, N/O contact)				
Minimum switching current		10 mA (at 24 V)				
Maximum interrupting rating, ohmic load						
	250 V AC	4000 VA				
	440 V AC	4000 VA				
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)				
General data						
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)				
Ambient temperature (operation), AC		-40 °C ... 55 °C				
Ambient temperature (operation), DC		-40 °C ... 70 °C				
Nominal operating mode		100% operating factor				
Mechanical service life, AC		Approx. 10^7 cycles				
Mechanical service life, DC		Approx. 10^7 cycles				
Standards/regulations		IEC 60664 , IEC 61810				
Mounting position/mounting		any				
Dimensions	W / H / D	38.6 mm / 45.5 mm / 36.1 mm				

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in high-power relays, 2 changeover contacts with power contacts				
①	24 V DC	**REL-PR2- 24DC/2X21**	2903698	1
②	24 V AC	**REL-PR2- 24AC/2X21**	2903699	1
③	120 V AC	**REL-PR2-120AC/2X21**	2903700	1
④	230 V AC	**REL-PR2-230AC/2X21**	2903701	1
Plug-in high-power relays, 3 changeover contacts with power contacts				
①	24 V DC	**REL-PR3- 24DC/3X21**	2903702	1
②	110 V DC	**REL-PR3-110DC/3X21**	2908893	1
③	24 V AC	**REL-PR3- 24AC/3X21**	2903703	1
④	120 V AC	**REL-PR3-120AC/3X21**	2903704	1
⑤	230 V AC	**REL-PR3-230AC/3X21**	2903705	1

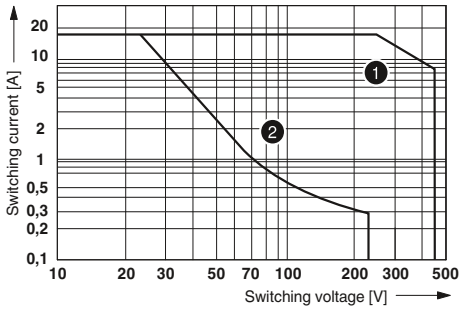
REL-PR2... (2-PDT)

Operating voltage range



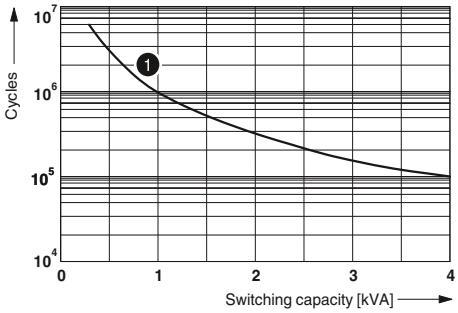
1 Maximum continuous voltage at limiting continuous current = 16 A
2 Minimum operate voltage
For pre-excitation with UN and limiting continuous current = 16 A

Interrupting rating



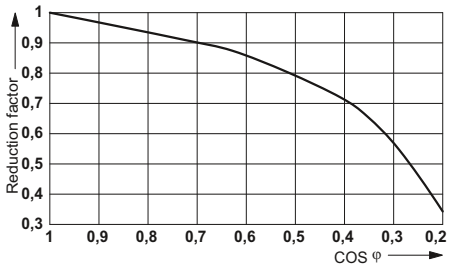
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



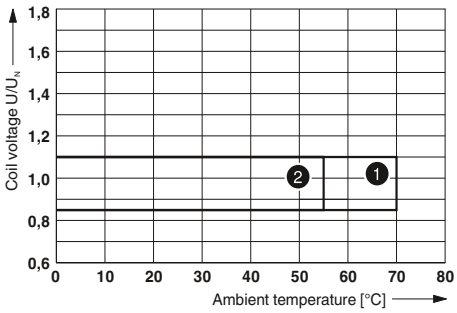
1 250 V AC, ohmic load

Service life reduction factor



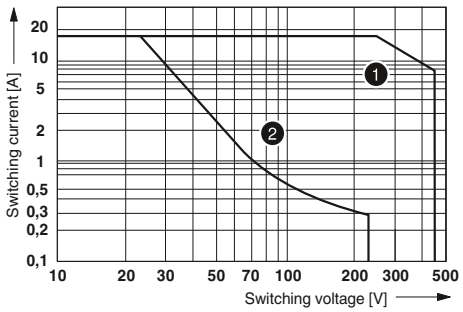
REL-PR3... (3-PDT)

Operating voltage range



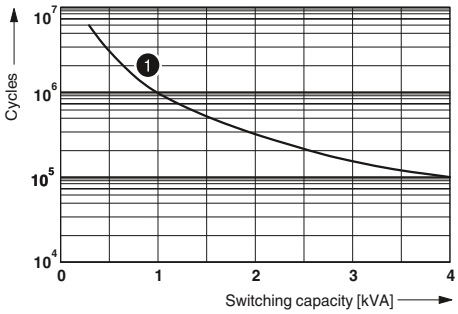
1 DC coils
2 AC coils

Interrupting rating



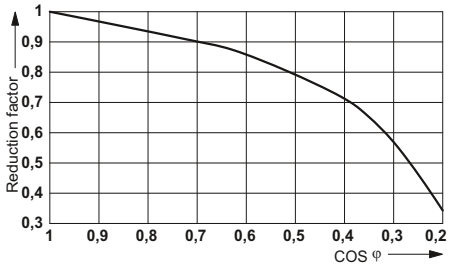
1 AC, ohmic load
2 DC, ohmic load

Electrical service life



1 250 V AC, ohmic load

Service life reduction factor



Plug-in high-power relays

new

Plug-in high-power relays with 3 N/O contacts suitable for the RIF-4 relay base.

The advantages:

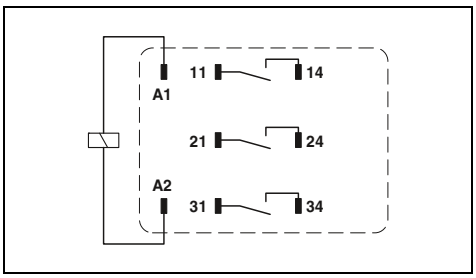
– Use in miniature contactor applications
– Switching current of up to 16 A
– Up to 440 V AC switching voltage
– Full shutdown by means of ≥ 3 mm contact opening

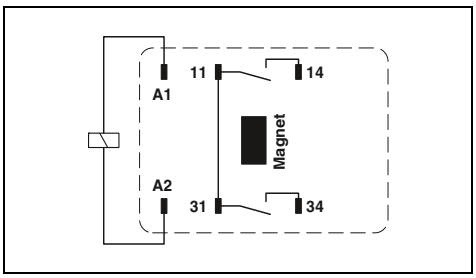
Notes:

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See "General" section in "Basics of relay technology" on page 286.

3-N/O high-power relay, max. 3 x 16 A

1-N/O high-power relay with blowout magnet for switching high DC loads





Technical data

Input data		①	②	③	④
Permissible range (with reference to U_N)		see diagram			
Typical input current at U_N	[mA]	70	116	23	12
Typical response time at U_N	[ms]	20			
Typical response time at U_N (depending on phase relation)	[ms]		5 - 25	5 - 25	5 - 25
Typical release time at U_N	[ms]	15			
Typical release time at U_N (depending on phase relation)	[ms]		5 - 20	5 - 20	5 - 20
Output data					
Contact type		3 N/O contacts			
Contact material		AgNi			
Max. switching voltage		440 V AC / 250 V DC			
Minimum switching voltage		10 V (At 24 mA)			
Limiting continuous current		16 A			
Maximum switch-on current AC		50 A (20 ms, N/O contact)			
Maximum switch-on current DC		50 A (20 ms, N/O contact)			
Minimum switching current		10 mA (at 24 V)			
Maximum interrupting rating, ohmic load					
	250 V AC	4000 VA			
	440 V AC	4000 VA			
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)			
General data					
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)			
Ambient temperature (operation), AC		-40 °C ... 55 °C			
Ambient temperature (operation), DC		-40 °C ... 70 °C			
Nominal operating mode		100% operating factor			
Mechanical service life, AC		Approx. 10^7 cycles			
Mechanical service life, DC		Approx. 10^7 cycles			
Standards/regulations		IEC 60664 , IEC 61810			
Mounting position/mounting		any			
Dimensions	W / H / D	38.6 mm / 45.5 mm / 36.1 mm			

Technical data

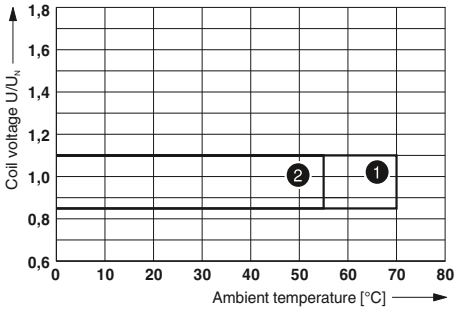
Input data		①	②	③	④
Permissible range (with reference to U_N)		see diagram			
Typical input current at U_N	[mA]	70	15	7.3	12
Typical response time at U_N	[ms]	20	20	20	
Typical response time at U_N (depending on phase relation)	[ms]				5 - 25
Typical release time at U_N	[ms]	15	15	15	
Typical release time at U_N (depending on phase relation)	[ms]				5 - 18
Output data					
Contact type		1 N/O contact			
Contact material		AgNi			
Max. switching voltage		440 V AC / 350 V DC			
Minimum switching voltage		5 V (At 24 mA)			
Limiting continuous current		16 A			
Maximum switch-on current AC		50 A (20 ms)			
Maximum switch-on current DC		50 A (20 ms)			
Minimum switching current		5 mA (at 24 V)			
Maximum interrupting rating, ohmic load					
	250 V AC	4000 VA			
	440 V AC	-			
General data					
Test voltage (winding / contact)		2.5 kV			
Ambient temperature (operation), AC		-40 °C ... 70 °C			
Ambient temperature (operation), DC		-40 °C ... 70 °C			
Nominal operating mode		100% operating factor			
Mechanical service life, AC		Approx. 2x 10^7 cycles			
Mechanical service life, DC		Approx. 2x 10^7 cycles			
Standards/regulations		IEC 60664 , IEC 61810			
Mounting position/mounting		any			
Dimensions	W / H / D	38.6 mm / 45.5 mm / 36.1 mm			

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in high-power relays, 3 N/O contacts with power contacts					
	①	24 V DC	**REL-PR3- 24DC/3X1**	2903706	1
	②	24 V AC	**REL-PR3- 24AC/3X1**	2903707	1
	③	120 V AC	**REL-PR3-120AC/3X1**	2903708	1
	④	230 V AC	**REL-PR3-230AC/3X1**	2903709	1
Plug-in high-power relays, 1 N/O contact with blow magnet and power contacts					
	①	24 V DC	**REL-PR1-24DC/1/MB**	2908040	1
	②	110 V DC	**REL-PR1-110DC/1/MB**	2908044	1
	③	220 V DC	**REL-PR1-220DC/1/MB**	2908046	1
	④	230 V AC	**REL-PR1-230AC/1/MB**	2908047	1

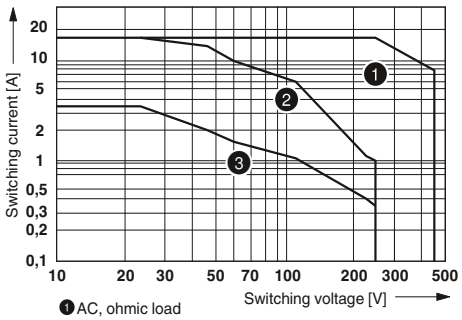
REL-PR3... (3 N/O contacts)

Operating voltage range



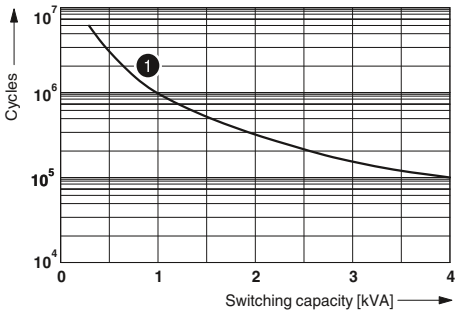
❶ DC coils
❷ AC coils

Interrupting rating



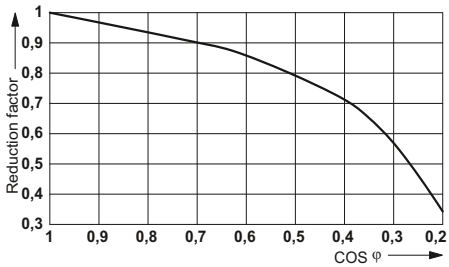
❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Electrical service life



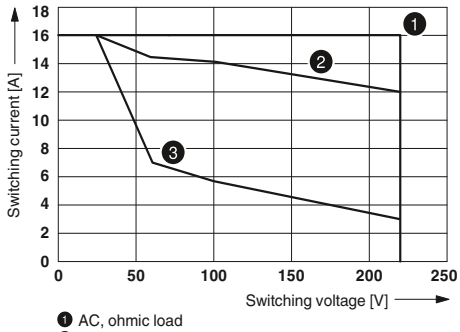
❶ 250 V AC, ohmic load

Service life reduction factor



REL-PR1... (1 N/O contact with blow magnet)

Interrupting rating



❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Plug-in interference suppression modules for RIF-1, RIF-2, RIF-3, and RIF-4

Plug-in interference suppression modules for optional assembly of RIF-1 to RIF-4 relay bases.

The advantages:

– Attenuation of reverse voltage induced in coil
– Mechanical coding to protect against incorrect connection

Interference suppression modules for RIF-1 to RIF-4

Description	Type	Order No.	Pcs./ Pkt.
		Ordering data	
Plug-in module, **with LED status indicator and freewheeling diode** to effectively limit the coil induction voltage, polarity: **A1+, A2-**, input voltage:			
- 12-24 V DC ±20%	**RIF-LDP-12-24 DC**	**2900939**	10
- 48-60 V DC ±20%	**RIF-LDP-48-60 DC**	**2900940**	10
- 110 V DC ±20%	**RIF-LDP-110 DC**	**2900941**	10
Plug-in module, **with LED status indicator and varistor** to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (30 V varistor)	**RIF-LV-12-24 UC**	**2900942**	10
- 48-60 V AC/DC ±20% (75 V varistor)	**RIF-LV-48-60 UC**	**2900943**	10
- 120-230 V AC/110 V DC ±20% (275 V varistor)	**RIF-LV-120-230 AC/110 DC**	**2900944**	10
Plug-in module, **with varistor** to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (30 V varistor)	**RIF-V-12-24 UC**	**2900945**	10
- 48-60 V AC/DC ±20% (75 V varistor)	**RIF-V-48-60 UC**	**2900947**	10
- 120-230 V AC/DC ±20% (275 V varistor)	**RIF-V-120-230 UC**	**2900948**	10
Plug-in module, **with RC element** to limit the coil induction voltage and/or external interference peaks, input voltage:			
- 12-24 V AC/DC ±20% (220 nF/100 Ω)	**RIF-RC-12-24 UC**	**2900949**	10
- 48-60 V AC/DC ±20% (220 nF/220 Ω)	**RIF-RC-48-60 UC**	**2900950**	10
- 120 - 230 V AC/DC ±20% (100 nF/470 Ω)	**RIF-RC-120-230 UC**	**2900951**	10
Plug-in module, **with bridge rectifier** for controlling electromechanical DC voltage relay, Input voltage:			
- 12 ... 230 V AC	**RIF-BR-12-230 AC**	**2907060**	10
Plug-in module, with LED status indicator and freewheeling diode to effectively limit the coil induction voltage, polarity: **A1-, A2+**, Input voltage:			
- 12-24 V DC ±20%	**RIF-LDM-12-24 DC**	**2907057**	10
Plug-in module, **with LED status indicator and varistor** to limit the coil induction voltage and/or external interference peaks, polarity **A1-, A2+,** Input voltage:			
- 120-230 V AC/110 V DC ±20% (275 V varistor)	**RIF-LVM-100-200 AC/110 DC**	**2907058**	10

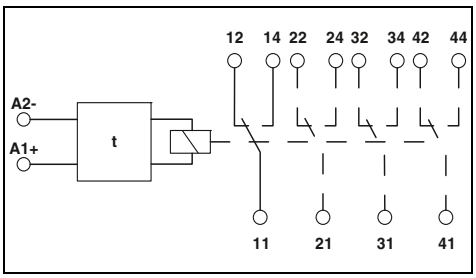
Plug-in timer module for RIF-1, RIF-2, RIF-3, and RIF-4

The multifunctional plug-in timer module transforms a relay module into a time relay. RIF-1 to RIF-4 bases can be equipped with this module. Using DIP switches, three time functions and four time ranges can be selected. Detailed time settings are made using a potentiometer. Relays can be operated with an input voltage of 12 or 24 V AC/DC.

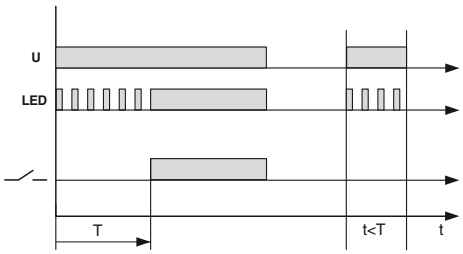
The time functions:
– With switch-on delay
– With passing make contact
– Pulse generator

Time ranges:
– 0.5 to 10 s
– 5 to 100 s
– 0.5 to 10 min
– 5 to 100 min

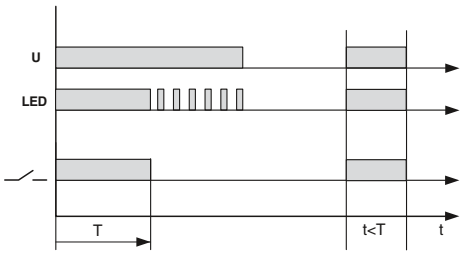
Timer module for RIF-1 to RIF-4 relay modules for 12 to 24 V AC/DC input voltage



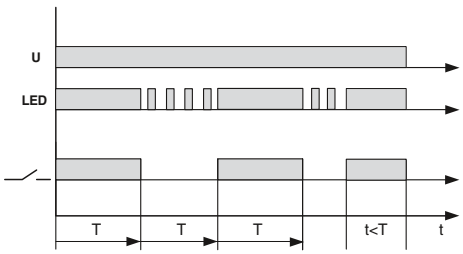
With switch-on delay



Passing make contact



Pulse generator



Technical data

Input data	
Nominal input voltage U_N	24 V DC (AC operation only permitted for RIF-1)
Nominal input voltage range with reference to U_N	0.4 ... 1.2
Input circuit	Varistor , Yellow LED
Output data	
Limiting continuous current	≤ 250 mA (Relay coil current)
General data	
Mounting position	any
Repeat accuracy	1 %
Ambient temperature (operation)	-25 °C ... 50 °C (RIF-1, AC coil, 2 PDTs at 6 A) -25 °C ... 50 °C (RIF-1, DC coil, 2 PDTs at 5 A) -25 °C ... 40 °C (RIF-2, DC coil, 2 PDTs at 8 A) -25 °C ... 40 °C (RIF-2, DC coil, 4 PDTs at 5 A) -25 °C ... 40 °C (RIF-3, DC coil, 3 PDTs at 6.75 A) -25 °C ... 40 °C (RIF-3, DC coil, 2 PDTs at 8 A) -25 °C ... 35 °C (RIF-4, DC coil, 3 PDTs at 8 A) -25 °C ... 25 °C (RIF-4, DC coil, 3 N/O contacts at 8 A)
Standards/specifications	DIN EN 50178
Rated insulation voltage	50 V DC
Rated surge voltage	0.4 kV

Ordering data

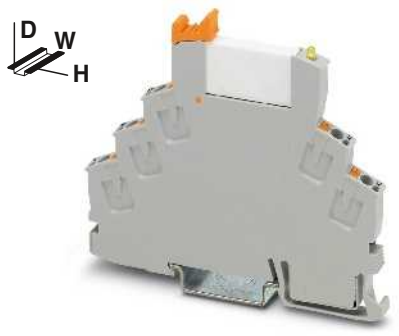
Description	Type	Order No.	Pcs./ Pkt.
Timer module, for mounting on RIF-1 to RIF-4, with LED status indicator for extending a relay module to create a time relay with an input voltage of 24 V AC/DC	**RIF-T3-24UC**	2902647	1

Fully mounted RIF-0 relay modules

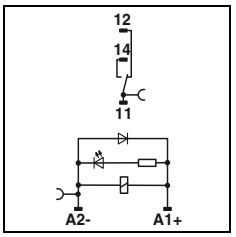
Fully mounted RIF-0 relay modules, consisting of:
– Relay base with Push-in connection
– 1-N/O or 1-PDT relay
– Relay ejector lever on the housing

The advantages:
– Status LED integrated in the relay base
– Operational reliability thanks to sealed relay
– Safe isolation between coil and contact side
– Professional bridging of adjacent modules saves wiring time

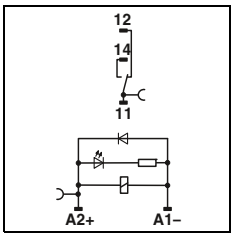
– For FBS 2-6 plug-in bridges for the input and output side, see page 366.



1-PDT relay module with Push-in connection



DC coils



DC coil negative switching

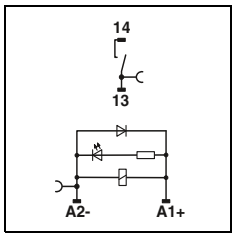
Technical data

		①	②
Input data			
Permissible range (with reference to U_N)		see diagram	
Typical input current at U_N	[mA]	16	9
Typical response time at U_N	[ms]	5	5
Typical release time at U_N	[ms]	8	8
Input protection:		Yellow LED , Damping diode	
Output data			
Contact type		1 PDT	1 PDT
Contact material		AgSnO	AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current		6 A	50 mA
Minimum switching current		10 mA (at 12 V)	1 mA
General data			
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)	
Ambient temperature (operation)		-40 °C ... 60 °C	
Nominal operating mode		100% operating factor	
Mechanical service life		Approx. 2x 10^7 cycles	
Standards/regulations		DIN EN 50178	
Degree of pollution/surge voltage category		2 / III	
Mounting position/mounting		any / In rows with zero spacing	
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
Dimensions	W / H / D	6.2 mm / 93 mm / 78 mm	
EMC note		Class A product, see page 605	

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay and Push-in connection					
	①	12 V DC	**RIF-0-RPT-12DC/21**	2903371	10
	②	24 V DC	**RIF-0-RPT-24DC/21**	2903370	10
Coupling relay modules with multi-layer gold contact relay, with Push-in connection					
	①	12 V DC	**RIF-0-RPT-12DC/21AU**	2903369	10
	②	24 V DC	**RIF-0-RPT-24DC/21AU**	2903368	10
Coupling relay modules with power contact relay and Push-in connection, negative switching					
	②	24 V DC	**RIF-0-RPT-M-24DC/21**	2908327	10

1-N/O relay module with Push-in connection



DC coils

Technical data

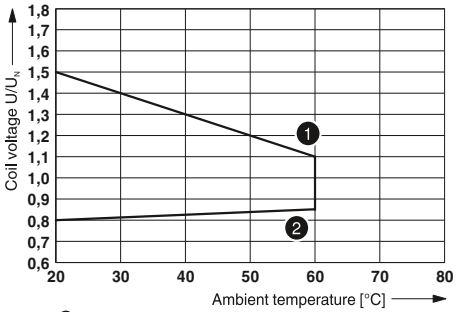
①	②
see diagram	
16	9
5	5
8	8
Yellow LED , Damping diode	
1 N/O contact	1 N/O contact
AgSnO	AgSnO, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 100 mA)	100 mV (at 10 mA)
6 A	50 mA
10 mA (at 12 V)	1 mA (at 12 V)
4 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 60 °C	
100% operating factor	
Approx. 2x 10^7 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
6.2 mm / 93 mm / 66 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-0-RPT-12DC/ 1	2903362	10
RIF-0-RPT-24DC/ 1	2903361	10
RIF-0-RPT-12DC/ 1AU	2903360	10
RIF-0-RPT-24DC/ 1AU	2903359	10

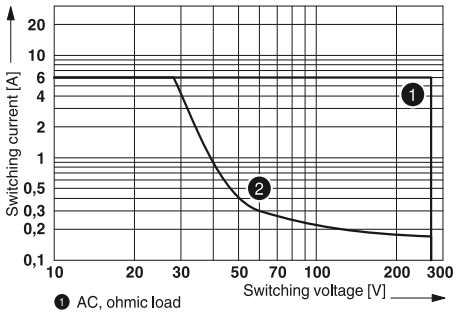
RIF-0-RPT.../21... (1-PDT)

Operating voltage range



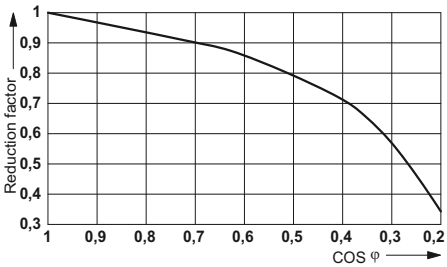
1 Maximum continuous voltage at limiting continuous current = 6 A
2 Minimum operate voltage
For pre-excitation with U_N and limiting continuous current = 6 A

Interrupting rating

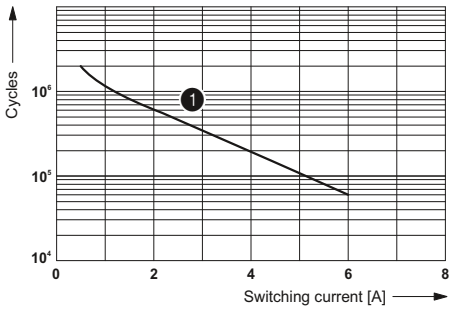


1 AC, ohmic load
2 DC, ohmic load

Service life reduction factor



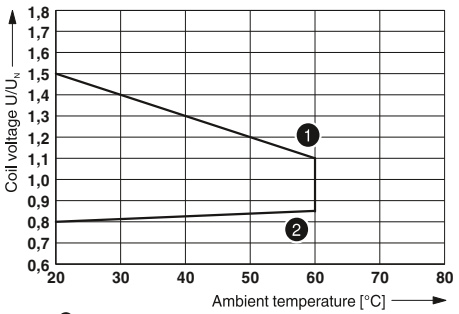
Electrical service life



1 250 V AC, ohmic load

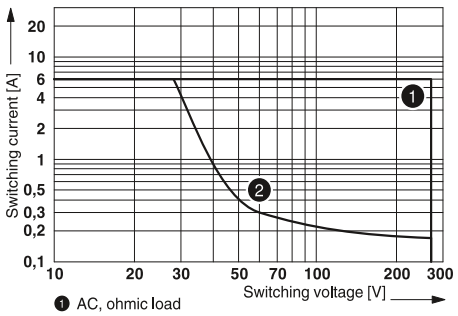
RIF-0-RPT.../1... (1-N/O)

Operating voltage range



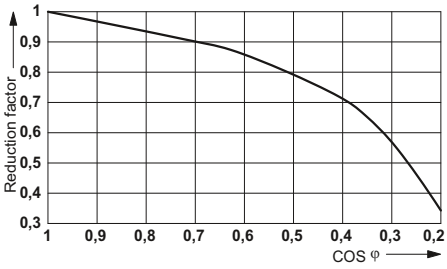
1 Maximum continuous voltage at limiting continuous current = 6 A
2 Minimum operate voltage
For pre-excitation with U_N and limiting continuous current = 6 A

Interrupting rating

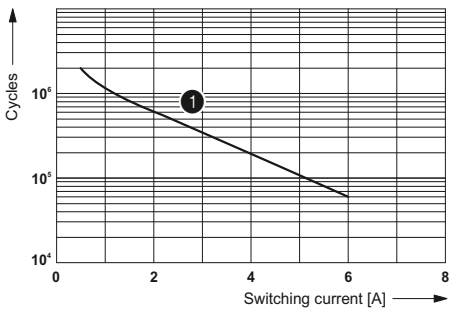


1 AC, ohmic load
2 DC, ohmic load

Service life reduction factor



Electrical service life



1 250 V AC, ohmic load

Fully mounted RIF-0 relay modules

Fully mounted RIF-0 relay modules, consisting of:
– Relay base with screw connection
– 1-PDT or 1-N/O relay
– Relay ejector lever on the housing

The advantages:
– Status LED integrated in the relay base
– Operational reliability thanks to sealed relay
– Safe isolation between coil and contact side
– Professional bridging of adjacent modules saves wiring time

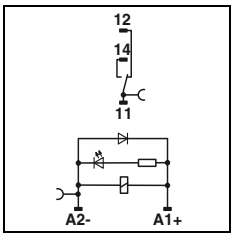
– For FBS 2-6 plug-in bridges for the input and output side, see page 366.

Notes:

General conditions:
Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

new

1-PDT relay module with screw connection



DC coils

Technical data

Input data		①	②
Permissible range (with reference to U_N)		see diagram	
Typical input current at U_N	[mA]	16	9
Typical response time at U_N	[ms]	5	5
Typical release time at U_N	[ms]	8	8
Input protection:		Yellow LED , Damping diode	
Output data			
Contact type		1 PDT	1 PDT
Contact material		AgSnO	AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current		6 A	50 mA
Minimum switching current		10 mA (at 12 V)	1 mA (at 12 V)
General data			
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)	
Ambient temperature (operation)		-40 °C ... 60 °C	
Nominal operating mode		100% operating factor	
Mechanical service life		Approx. 2x 10^7 cycles	
Standards/regulations		DIN EN 50178	
Degree of pollution/surge voltage category		2 / III	
Mounting position/mounting		any / In rows with zero spacing	
Connection data solid/stranded/AWG		0.5 ... 4 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 12	
Maximum tightening torque		0.5 Nm	
Dimensions	W / H / D	6.2 mm / 84 mm / 82 mm	

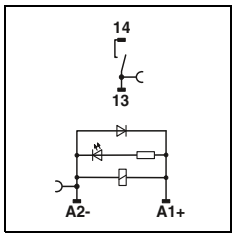
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay and screw connection					
	①	12 V DC	**RIF-0-RSC-12DC/21**	2903375	10
	②	24 V DC	**RIF-0-RSC-24DC/21**	2903374	10
Coupling relay modules with multi-layer gold contact relay, with screw connection					
	①	12 V DC	**RIF-0-RSC-12DC/21AU**	2903373	10
	②	24 V DC	**RIF-0-RSC-24DC/21AU**	2903372	10

new

D W H

1-N/O relay module with screw connection



DC coils

Technical data

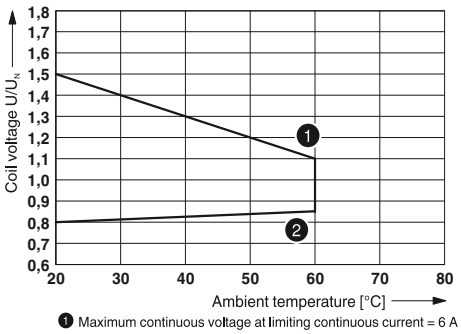
①	②
see diagram	
16	9
5	5
8	8
Yellow LED , Damping diode	
1 N/O contact	1 N/O contact
AgSnO	AgSnO, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 100 mA)	100 mV (at 10 mA)
6 A	50 mA
10 mA (at 12 V)	1 mA (at 12 V)
4 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 60 °C	
100% operating factor	
Approx. 2x 10^7 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.5 ... 4 mm^2 / 0.5 ... 2.5 mm^2 / 20 - 12	
0.5 Nm	
6.2 mm / 84 mm / 68 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-0-RSC-12DC/ 1	**2903367**	10
RIF-0-RSC-24DC/ 1	**2903366**	10
RIF-0-RSC-12DC/ 1AU	**2903365**	10
RIF-0-RSC-24DC/ 1AU	**2903364**	10

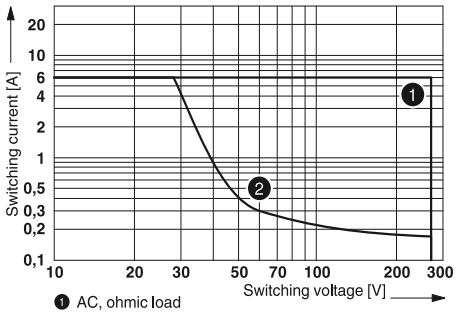
RIF-0-RSC.../21... (1-PDT)

Operating voltage range



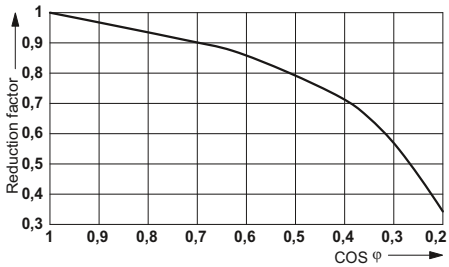
1 Maximum continuous voltage at limiting continuous current = 6 A
2 Minimum operate voltage
For pre-excitation with U_N and limiting continuous current = 6 A

Interrupting rating

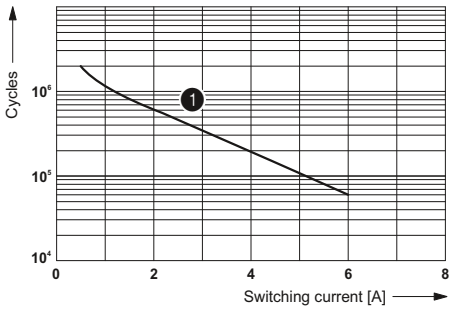


1 AC, ohmic load
2 DC, ohmic load

Service life reduction factor with various cos phi



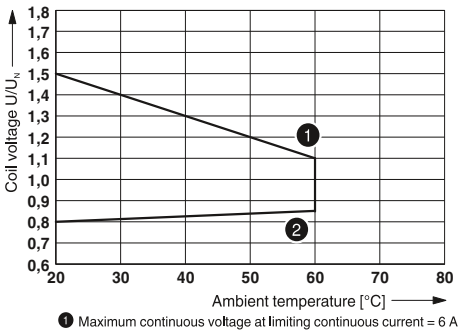
Electrical service life



1 250 V AC, ohmic load

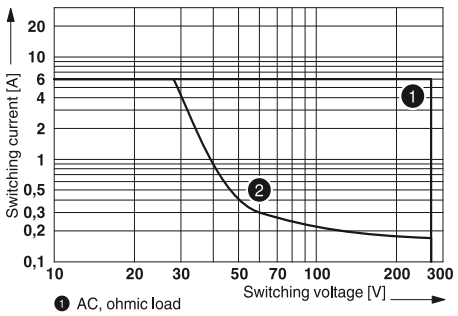
RIF-0-RSC.../1... (1-N/O)

Operating voltage range



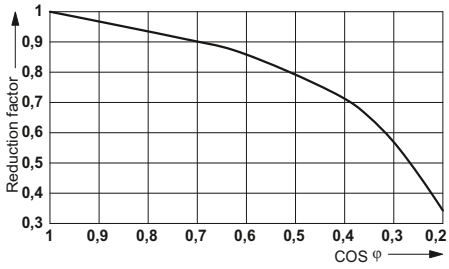
1 Maximum continuous voltage at limiting continuous current = 6 A
2 Minimum operate voltage
For pre-excitation with U_N and limiting continuous current = 6 A

Interrupting rating

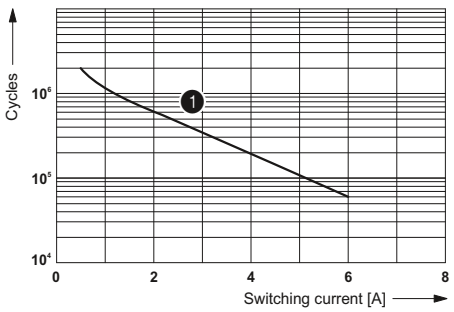


1 AC, ohmic load
2 DC, ohmic load

Service life reduction factor



Electrical service life

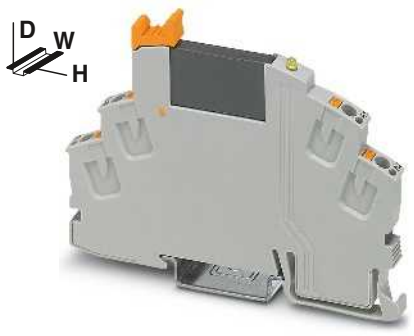


1 250 V AC, ohmic load

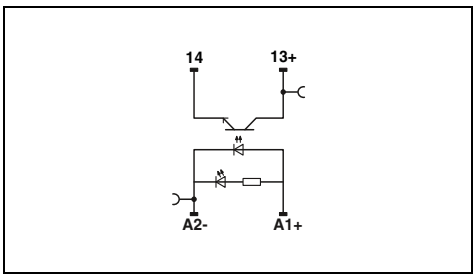
Fully mounted RIF-0 relay modules

Fully mounted RIF-0 relay modules, consisting of:
– Relay base with Push-in connection
– Solid-state relays
– Relay ejector lever on the housing

The advantages:
– Status LED integrated into the base
– RTIII sealed solid-state relay
– Zero voltage switch at AC output
– Professional bridging of adjacent modules saves wiring time

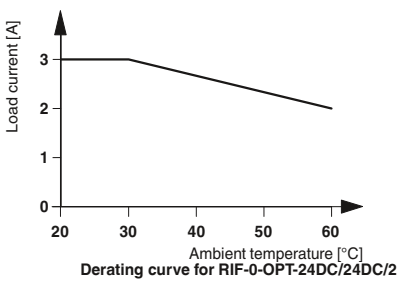


Solid-state relay module with Push-in connection, DC output max. 3 A

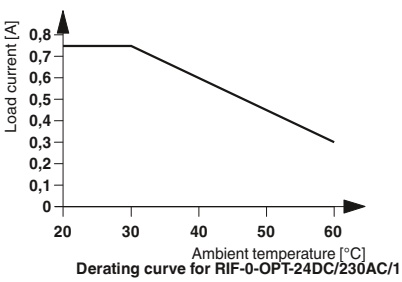


Technical data

Input data		①
Rated actuating voltage range with reference to U_C		0.8 - 1.2
Rated actuating current I_C	[mA]	8.5
Switching level (with reference to U_C)	1 signal ("H")	> 0.8
	0 signal ("L")	< 0.4
Typical switch-on time at U_N	[ms]	0.02
Typical switch-off time at U_N	[ms]	0.3
Transmission frequency f_{limit}	[Hz]	300
Input circuit DC		Yellow LED , Freewheeling diode
Output data		
Max. switching voltage		33 V DC
Minimum switching voltage		3 V DC
Maximum switch-on current		15 A (10 ms)
Minimum/maximum switching current		- / 3 A (see derating curve)
Output protection		Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		< 200 mV
Leakage current in off state		-
Phase angle (cos ϕ)		-
Max. load value		-
General data		
Test voltage input/output		2.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		DIN EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
Dimensions	W / H / D	6.2 mm / 93 mm / 66 mm
EMC note		Class A product, see page 605



Derating curve for RIF-0-OPT-24DC/24DC/2



Derating curve for RIF-0-OPT-24DC/230AC/1

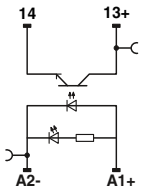
Ordering data

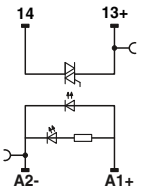
Description	Rated actuating voltage U_C	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with solid-state relay and Push-in connection ①	24 V DC	**RIF-0-OPT-24DC/24DC/2**	2905293	10

Solid-state relay module with Push-in connection, DC output max. 100 mA

Solid-state relay module with Push-in connection, AC output max. 750 mA

EAC





Technical data

①	
0.8 -	0.8 -
1.2	1.2
8.5	8
> 0.8	> 0.8
< 0.4	< 0.4
0.02	10
0.3	10
300	10
Yellow LED , Freewheeling diode	Yellow LED , Freewheeling diode
48 V DC	253 V AC
3 V DC	24 V AC
-	30 A (10 ms)
- / 100 mA	10 mA / 0.75 A (see derating curve)
Reverse polarity protection, surge protection	RCV circuit
< 1 V	< 1 V
-	1 mA (in off state)
-	0.5
-	4.5 A²s (tp = 10 ms, at 25 °C)
2.5 kV_{rms} (50 Hz, 1 min.)	2.5 kV_{rms} (50 Hz, 1 min.)
-25 °C ... 60 °C	-25 °C ... 60 °C
DIN EN 50178	DIN EN 50178
2 / III	2 / III
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
6.2 mm / 93 mm / 66 mm	6.2 mm / 93 mm / 66 mm
Class A product, see page 605	Class A product, see page 605

Ordering data

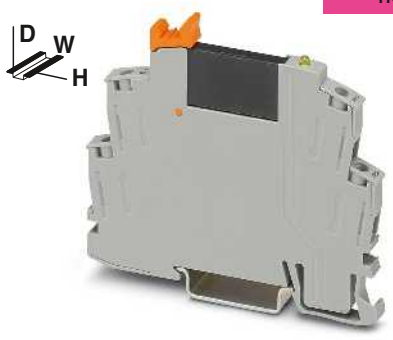
Type	Order No.	Pcs./ Pkt.
RIF-0-OPT-24DC/48DC/100	2905294	10

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-0-OPT-24DC/230AC/1	2905295	10

Fully mounted RIF-0 relay modules

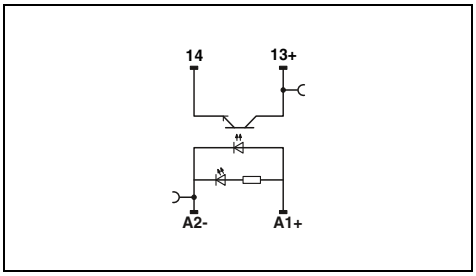
new



Solid-state relay module with screw connection, DC output max. 3 A

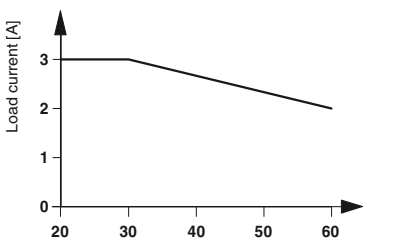
Fully mounted RIF-0 relay modules, consisting of:
– Relay base with screw connection
– Solid-state relays
– Relay ejector lever on the housing

The advantages:
– Status LED integrated into the base
– RTIII sealed solid-state relay
– Zero voltage switch at AC output
– Professional bridging of adjacent modules saves wiring time

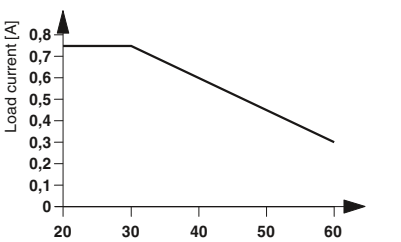


Technical data

Input data		①
Rated actuating voltage range with reference to U_C		0.8 - 1.2
Rated actuating current I_C	[mA]	8.5
Switching level (with reference to U_C)	1 signal ("H")	> 0.8
	0 signal ("L")	< 0.4
Typical switch-on time at U_N	[ms]	0.02
Typical switch-off time at U_N	[ms]	0.3
Transmission frequency f_{limit}	[Hz]	300
Input circuit DC		Yellow LED , Freewheeling diode
Output data		
Max. switching voltage		33 V DC
Minimum switching voltage		3 V DC
Maximum switch-on current		15 A (10 ms)
Minimum/maximum switching current		- / 3 A (see derating curve)
Output protection		Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		< 200 mV
Leakage current in off state		-
Phase angle (cos ϕ)		-
Max. load value		-
General data		
Test voltage input/output		2.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		DIN EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.5 - 4 mm² / 0.5 - 2.5 mm² / 20 - 12
Maximum tightening torque		0.5 Nm
Dimensions	W / H / D	6.2 mm / 84 mm / 68 mm



Derating curve for RIF-0-OSC-24DC/24DC/2

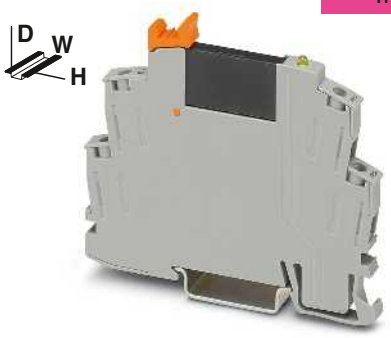


Derating curve for RIF-0-OSC-24DC/230AC/1

Ordering data

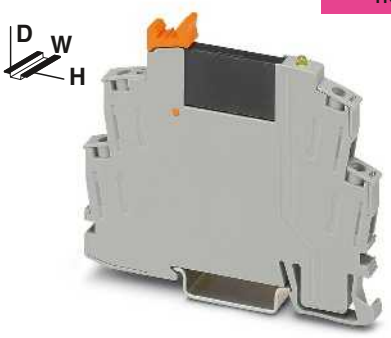
Description	Rated actuating voltage U_C	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with solid-state relay and screw connection				
①	24 V DC	**RIF-0-OSC-24DC/24DC/2**	2905657	10

new

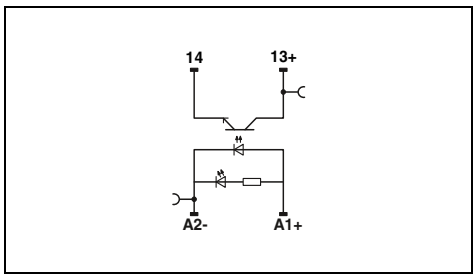


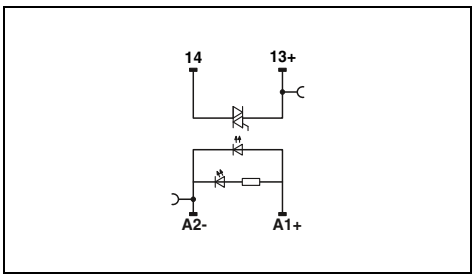
Solid-state relay module with screw connection, DC output max. 100 mA

new



Solid-state relay module with screw connection, AC output max. 750 mA





Technical data

①	
0.8 -	0.8 -
1.2	1.2
8.5	8
> 0.8	> 0.8
< 0.4	< 0.4
0.02	10
0.3	10
300	10
Yellow LED , Freewheeling diode	Yellow LED , Freewheeling diode
48 V DC	253 V AC
3 V DC	24 V AC
-	30 A (10 ms)
- / 100 mA	10 mA / 0.75 A (see derating curve)
Reverse polarity protection, surge protection	RCV circuit
< 1 V	< 1 V
-	1 mA (in off state)
-	0.5
-	4.5 A²s (tp = 10 ms, at 25 °C)
2.5 kV_{rms} (50 Hz, 1 min.)	2.5 kV_{rms} (50 Hz, 1 min.)
-25 °C ... 60 °C	-25 °C ... 60 °C
DIN EN 50178	DIN EN 50178
2 / III	2 / III
0.5 - 4 mm² / 0.5 - 2.5 mm² / 20 - 12	0.5 - 4 mm² / 0.5 - 2.5 mm² / 20 - 12
0.5 Nm	0.5 Nm
6.2 mm / 84 mm / 68 mm	6.2 mm / 84 mm / 68 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-0-OSC-24DC/48DC/100	2905658	10

Ordering data

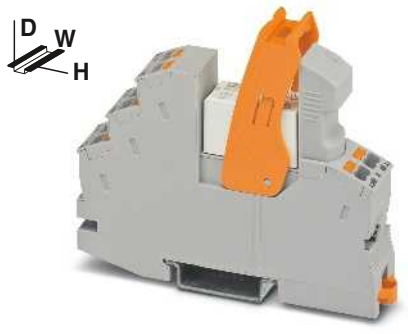
Type	Order No.	Pcs./ Pkt.
RIF-0-OSC-24DC/230AC/1	2905656	10

Fully mounted RIF-1 relay modules

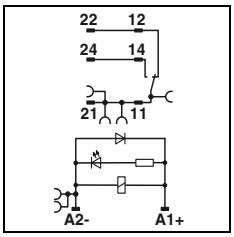
Fully mounted RIF-1 relay modules, consisting of:
– Relay base with Push-in connection
– 1 or 2-PDT relays
– Relay retaining bracket
– Interference suppression module

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Operational reliability thanks to sealed relay
– Safe isolation between coil and contact side
– Professional bridging of adjacent modules saves wiring time

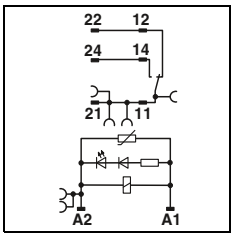
– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.
– For FBS 2-8 plug-in bridges for the output side (11/21), see page 366.



1-PDT relay module with Push-in connection



DC coils



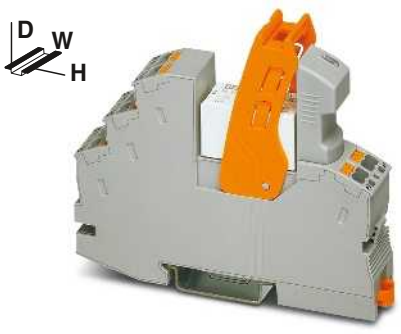
AC coils

Technical data

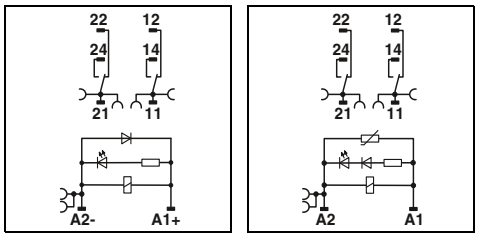
Input data		①	②	③	④	⑤
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	33	18	33	8	6
Typical response time at U_N	[ms]	8	8	3 - 12	3 - 12	3 - 12
Typical release time at U_N	[ms]	10	10	3 - 20	3 - 20	3 - 20
Input circuit AC		Yellow LED , Varistor				
Input circuit DC		Yellow LED , Damping diode				
Output data						
Contact type		1 PDT				1 PDT
Contact material		AgNi				AgNi, hard gold-plated
Max. switching voltage		250 V AC/DC				30 V AC / 36 V DC
Minimum switching voltage		12 V (at 10 mA)				100 mV (at 10 mA)
Limiting continuous current		11 A (see diagram)				50 mA
Maximum switch-on current AC		25 A (20 ms, N/O contact)				50 mA
Maximum switch-on current DC		50 A (20 ms, N/O contact)				50 mA
Minimum switching current		10 mA (at 12 V)				1 mA (at 24 V)
General data						
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)				
Ambient temperature (operation), AC		-40 °C ... 50 °C				
Ambient temperature (operation), DC		-40 °C ... 70 °C				
Nominal operating mode		100% operating factor				
Mechanical service life, AC		Approx. 10^7 cycles				
Mechanical service life, DC		approx. 3x 10^7 cycles				
Standards/regulations		DIN EN 50178				
Degree of pollution/surge voltage category		2 / III				
Mounting position/mounting		any / In rows with zero spacing				
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16				
Dimensions	W / H / D	16 mm / 93 mm / 75 mm				
EMC note		Class A product, see page 605				

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay and Push-in connection					
	①	12 V DC	**RIF-1-RPT-LDP-12DC/1X21**	2906224	10
	②	24 V DC	**RIF-1-RPT-LDP-24DC/1X21**	2903342	10
	③	24 V AC	**RIF-1-RPT-LV-24AC/1X21**	2903341	10
	④	120 V AC	**RIF-1-RPT-LV-120AC/1X21**	2903340	10
	⑤	230 V AC	**RIF-1-RPT-LV-230AC/1X21**	2903339	10
Coupling relay modules with multi-layer gold contact relay, with Push-in connection					
	①	24 V DC	**RIF-1-RPT-LDP-24DC/1X21AU**	2903338	10
	②	24 V AC	**RIF-1-RPT-LV-24AC/1X21AU**	2903337	10
	③	120 V AC	**RIF-1-RPT-LV-120AC/1X21AU**	2903336	10
	④	230 V AC	**RIF-1-RPT-LV-230AC/1X21AU**	2903335	10



2-PDT relay module with Push-in connection



DC coils AC coils

Technical data

①	②	③	④	⑤
see diagram				
33	18	33	8	6
8	8	3 - 12	3 - 12	3 - 12
10	10	3 - 20	3 - 20	3 - 20
Yellow LED , Varistor				
Yellow LED , Damping diode				

2 PDT	2 PDT
AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 10 mA)	100 mV (at 10 mA)
8 A (see diagram)	50 mA
12 A (20 ms, N/O contact)	50 mA
25 A (20 ms, N/O contact)	50 mA
10 mA (At 5 V)	1 mA (at 24 V)

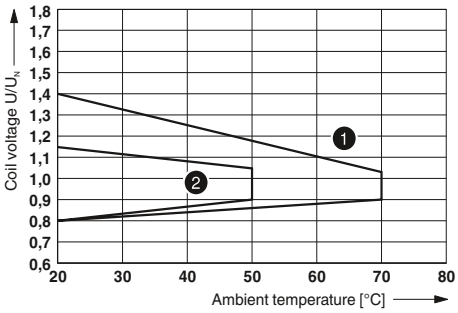
4 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 50 °C
-40 °C ... 70 °C
100% operating factor
Approx. 10^7 cycles
approx. 3x 10^7 cycles
DIN EN 50178
2 / III
any / In rows with zero spacing
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16
16 mm / 93 mm / 75 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-1-RPT-LDP-12DC/2X21	2906223	10
RIF-1-RPT-LDP-24DC/2X21	2903334	10
RIF-1-RPT-LV-24AC/2X21	2903333	10
RIF-1-RPT-LV-120AC/2X21	2903332	10
RIF-1-RPT-LV-230AC/2X21	2903331	10
RIF-1-RPT-LDP-24DC/2X21AU	2903330	10
RIF-1-RPT-LV-24AC/2X21AU	2903329	10
RIF-1-RPT-LV-120AC/2X21AU	2903328	10
RIF-1-RPT-LV-230AC/2X21AU	2903327	10

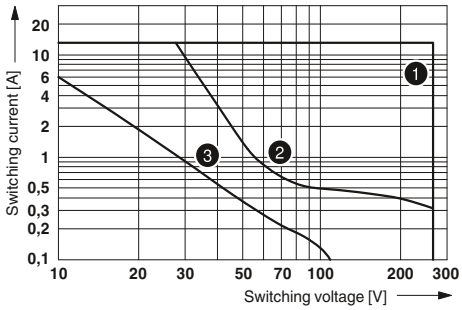
RIF-1-RPT.../1X21... (1-PDT)

Operating voltage range



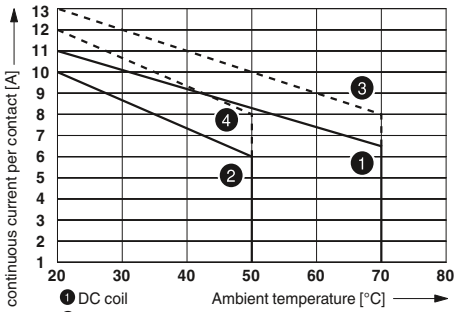
❶ DC coils
❷ AC coils

Interrupting rating



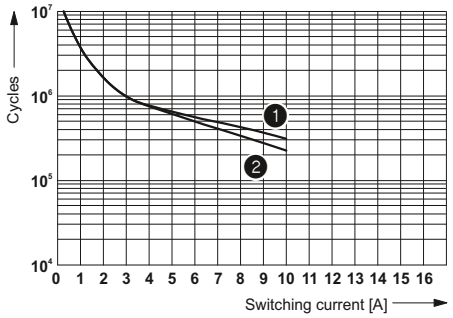
❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil
❸ DC coil, jumper between 11 and 21
❹ AC coil, jumper between 11 and 21

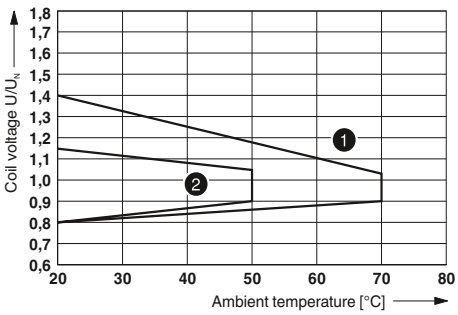
Electrical service life



❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

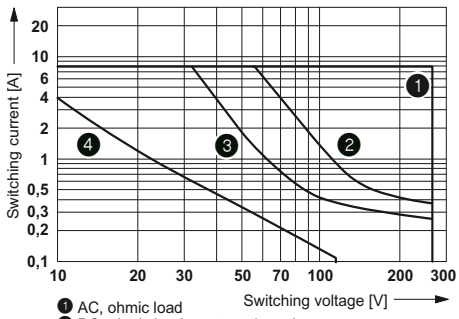
RIF-1-RPT.../2X21... (2-PDT)

Operating voltage range



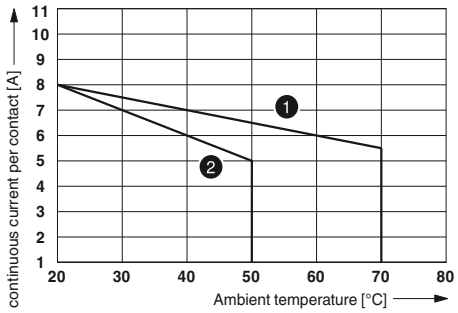
❶ DC coils
❷ AC coils

Interrupting rating



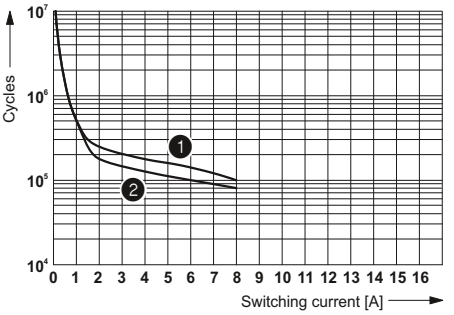
❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

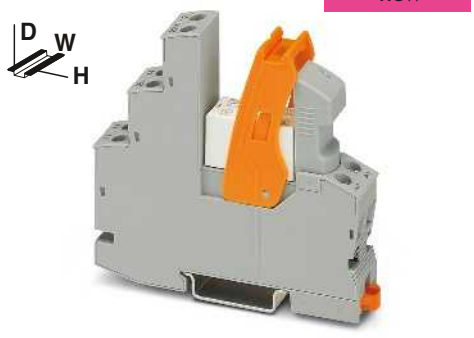
Fully mounted RIF-1 relay modules

new

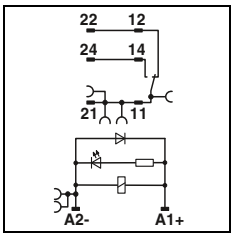
Fully mounted RIF-1 relay modules, consisting of:
– Relay base with screw connection
– 1 or 2-PDT relays
– Relay retaining bracket
– Interference suppression module

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Operational reliability thanks to sealed relay
– Safe isolation between coil and contact side
– Professional bridging of adjacent modules saves wiring time

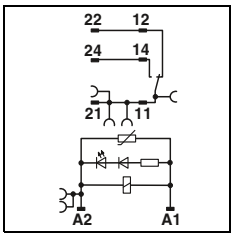
– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.
– For FBS 2-8 plug-in bridges for the output side (11/21), see page 366.



1-PDT relay module with screw connection



DC coils



AC coils

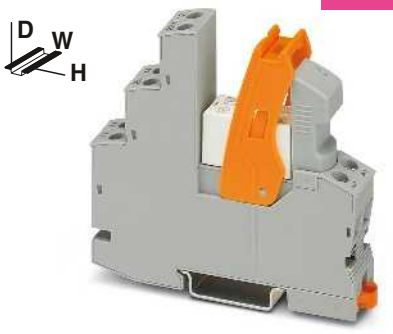
Technical data

		①	②	③	④	⑤
Input data						
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	33	18	33	8	6
Typical response time at U_N	[ms]	8	8	3 - 12	3 - 12	3 - 12
Typical release time at U_N	[ms]	10	10	3 - 20	3 - 20	3 - 20
Input circuit AC		Yellow LED , Varistor				
Input circuit DC		Yellow LED , Damping diode				
Output data						
Contact type		1 PDT				1 PDT
Contact material		AgNi				AgNi, hard gold-plated
Max. switching voltage		250 V AC/DC				30 V AC / 36 V DC
Minimum switching voltage		12 V (at 10 mA)				100 mV (at 10 mA)
Limiting continuous current		11 A (see diagram)				50 mA
Maximum switch-on current AC		25 A (20 ms, N/O contact)				25 A (20 ms, N/O contact)
Maximum switch-on current DC		50 A (20 ms, N/O contact)				50 mA
Minimum switching current		10 mA (at 12 V)				1 mA (at 24 V)
General data						
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)				
Ambient temperature (operation), AC		-40 °C ... 50 °C				
Ambient temperature (operation), DC		-40 °C ... 70 °C				
Nominal operating mode		100% operating factor				
Mechanical service life, AC		Approx. 10^7 cycles				
Mechanical service life, DC		approx. 3x 10^7 cycles				
Standards/regulations		DIN EN 50178				
Degree of pollution/surge voltage category		2 / III				
Mounting position/mounting		any / In rows with zero spacing				
Connection data solid/stranded/AWG		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10				
Dimensions	W / H / D	16 mm / 89 mm / 75 mm				
EMC note		Class A product, see page 605				

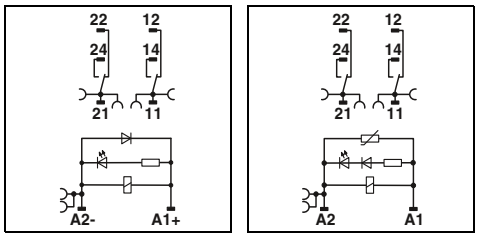
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay and screw connection					
	①	12 V DC	**RIF-1-RSC-LDP-12DC/1X21**	2908500	10
	②	24 V DC	**RIF-1-RSC-LDP-24DC/1X21**	2903358	10
	③	24 V AC	**RIF-1-RSC-LV-24AC/1X21**	2903357	10
	④	120 V AC	**RIF-1-RSC-LV-120AC/1X21**	2903356	10
	⑤	230 V AC	**RIF-1-RSC-LV-230AC/1X21**	2903355	10
Coupling relay modules with multi-layer gold contact relay, with screw connection					
	①	24 V DC	**RIF-1-RSC-LDP-24DC/1X21AU**	2903354	10
	②	24 V AC	**RIF-1-RSC-LV-24AC/1X21AU**	2903353	10
	③	120 V AC	**RIF-1-RSC-LV-120AC/1X21AU**	2903352	10
	④	230 V AC	**RIF-1-RSC-LV-230AC/1X21AU**	2903351	10

new



2-PDT relay module with screw connection



DC coils AC coils

Technical data

①	②	③	④	⑤
see diagram				
33	18	33	8	6
8	8	3 - 12	3 - 12	3 - 12
10	10	3 - 20	3 - 20	3 - 20
Yellow LED , Varistor				
Yellow LED , Damping diode				

2 PDT	2 PDT
AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 10 mA)	100 mV (at 10 mA)
8 A (see diagram)	50 mA
12 A (20 ms, N/O contact)	50 mA
25 A (20 ms, N/O contact)	50 mA
10 mA (At 5 V)	1 mA (at 24 V)

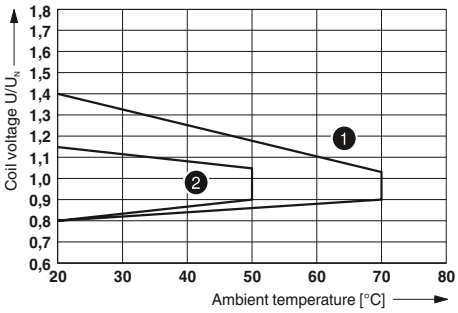
4 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 50 °C
-40 °C ... 70 °C
100% operating factor
Approx. 10^7 cycles
approx. 3x 10^7 cycles
DIN EN 50178
2 / III
any / In rows with zero spacing
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10
16 mm / 89 mm / 75 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-1-RSC-LDP-12DC/2X21	2908501	10
RIF-1-RSC-LDP-24DC/2X21	2903350	10
RIF-1-RSC-LV-24AC/2X21	2903349	10
RIF-1-RSC-LV-120AC/2X21	2903348	10
RIF-1-RSC-LV-230AC/2X21	2903347	10
RIF-1-RSC-LDP-24DC/2X21AU	2903346	10
RIF-1-RSC-LV-24AC/2X21AU	2903345	10
RIF-1-RSC-LV-120AC/2X21AU	2903344	10
RIF-1-RSC-LV-230AC/2X21AU	2903343	10

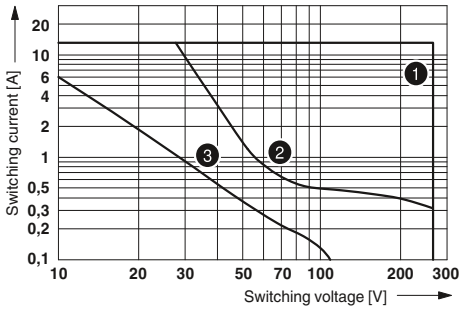
RIF-1-RPT.../1X21... (1-PDT)

Operating voltage range



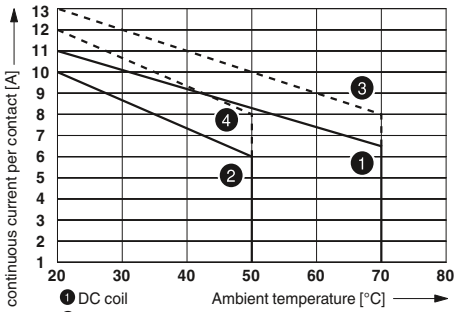
❶ DC coils
❷ AC coils

Interrupting rating



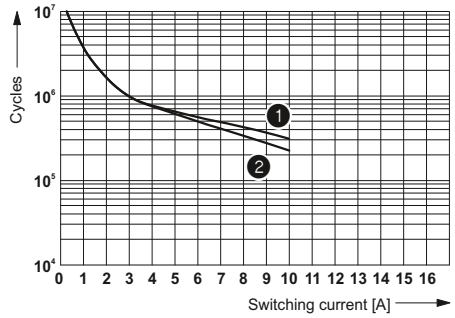
❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil
❸ DC coil, jumper between 11 and 21
❹ AC coil, jumper between 11 and 21

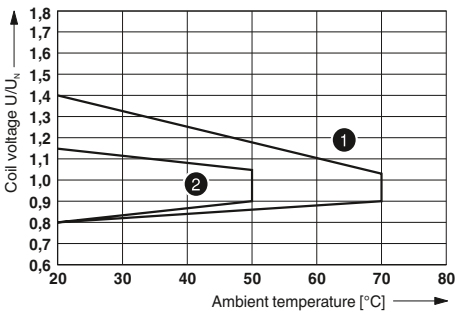
Electrical service life



❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

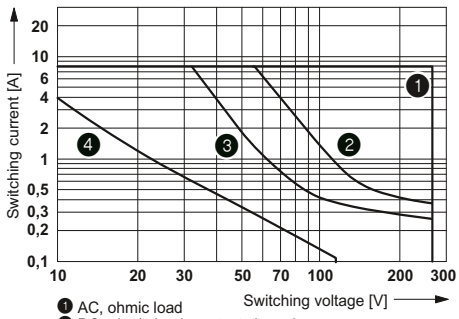
RIF-1-RSC.../2X21... (2-PDT)

Operating voltage range



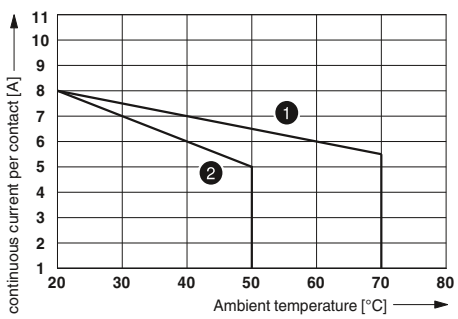
❶ DC coils
❷ AC coils

Interrupting rating



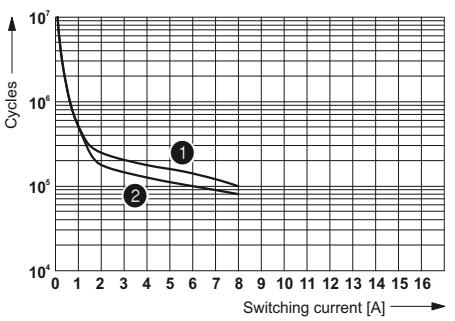
❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil

Electrical service life

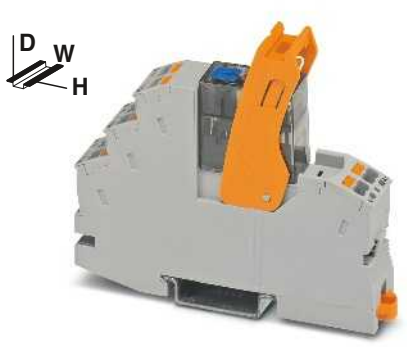


❶ 250 V AC, ohmic load (DC coils)
❷ 250 V AC, ohmic load (AC coils)

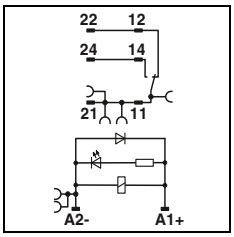
Fully mounted RIF-1 relay modules

Fully mounted RIF-1 relay modules, consisting of:
– Relay base with Push-in connection
– 1 or 2-PDT relays with detectable manual operation
– Relay retaining bracket
– Interference suppression module (AC types only)

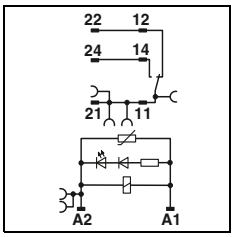
The advantages:
– Relay with lockable manual operation and status LED
– With DC types, freewheeling diode is integrated into relay
– Mechanical switch position indicator
– Professional bridging of adjacent modules saves wiring time



1-PDT relay module with Push-in connection and manual operation



DC coils



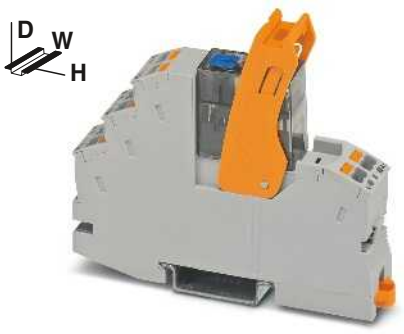
AC coils

Technical data

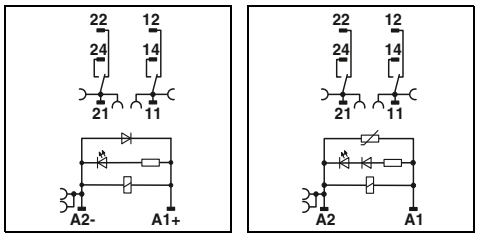
		①	②	③
Input data				
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	18	7	3.5
Typical response time at U_N	[ms]	9	4 - 10	4 - 10
Typical release time at U_N	[ms]	10	3 - 20	3 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		1 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		12 V (at 10 mA)		
Limiting continuous current		see diagram		
Maximum switch-on current AC		32 A (20 ms, N/O contact)		
Maximum switch-on current DC		24 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 12 V)		
General data				
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 50 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life		Approx. 5 x 10^6 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16		
Dimensions	W / H / D	16 mm / 93 mm / 75 mm		
EMC note		Class A product, see page 605		

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay with manual operation and Push-in connection					
	①	24 V DC	**RIF-1-RPT-LDP-24DC/1X21MS**	2905289	10
	②	120 V AC	**RIF-1-RPT-LV-120AC/1X21MS**	2909776	10
	③	230 V AC	**RIF-1-RPT-LV-230AC/1X21MS**	2905290	10



2-PDT relay module with Push-in connection and manual operation



DC coils AC coils

Technical data

①	②	③
see diagram		
18	7	3.5
9	4 - 10	4 - 10
10	3 - 20	3 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

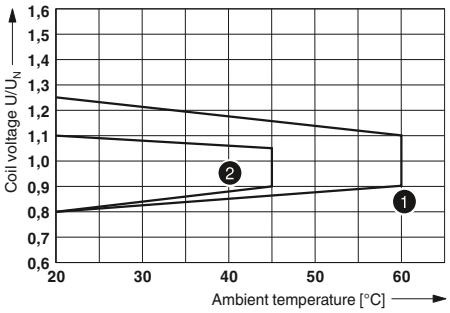
2 PDT	
AgNi	
250 V AC/DC	
12 V (at 10 mA)	
see diagram	
16 A (20 ms, N/O contact)	
12 A (20 ms, N/O contact)	
10 mA (at 12 V)	
4 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 45 °C	
-40 °C ... 60 °C	
100% operating factor	
Approx. 5 x 10^6 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
16 mm / 93 mm / 75 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-1-RPT-LDP-24DC/2X21MS	2905291	10
RIF-1-RPT-LV-120AC/2X21MS	2909775	10
RIF-1-RPT-LV-230AC/2X21MS	2905292	10

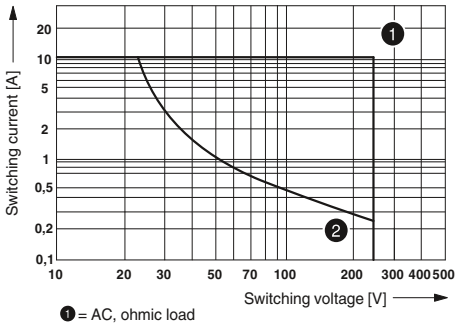
RIF-1-RPT.../1X21... (1-PDT)

Operating voltage range



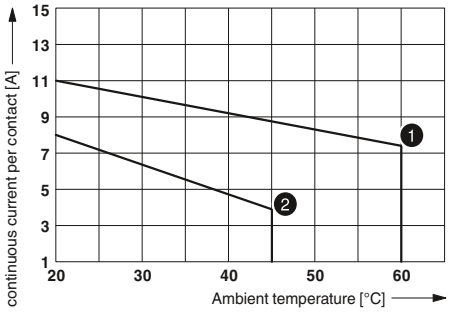
❶ DC coils
❷ AC coils

Interrupting rating



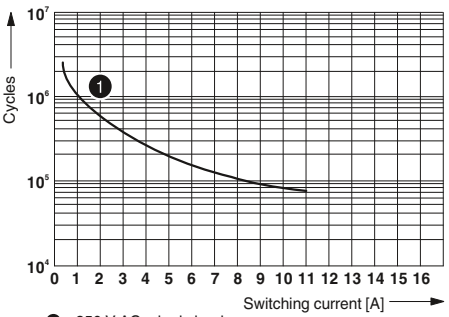
❶ = AC, ohmic load
❷ = DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

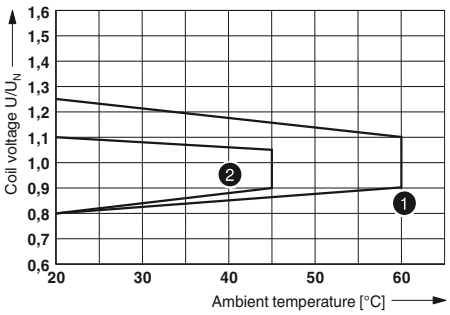
Electrical service life



❶ = 250 V AC, ohmic load

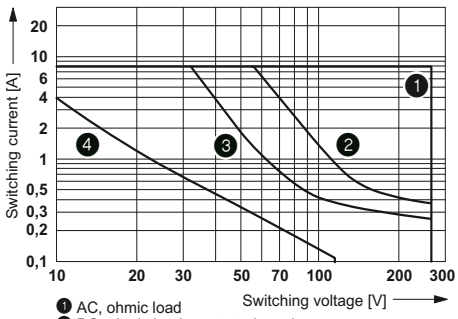
RIF-1-RPT.../2X21... (2-PDT)

Operating voltage range



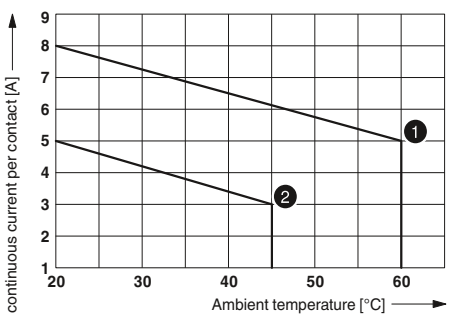
❶ DC coils
❷ AC coils

Interrupting rating



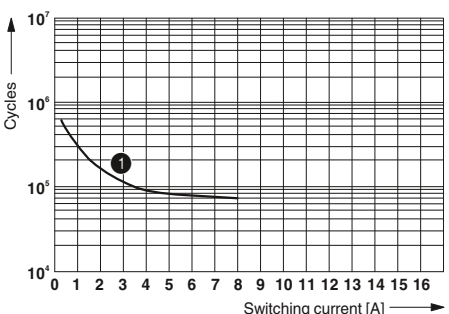
❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



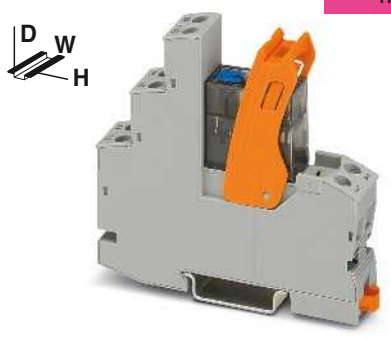
❶ 250 V AC, ohmic load

Fully mounted RIF-1 relay modules

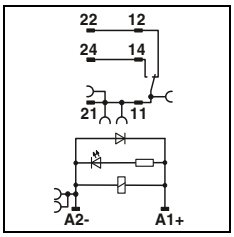
new

Fully mounted RIF-1 relay modules, consisting of:
– Relay base with screw connection
– 1 or 2-PDT relays with detectable manual operation
– Relay retaining bracket
– Interference suppression module (AC types only)

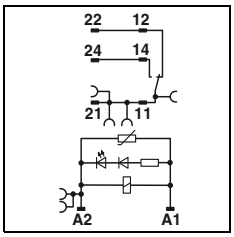
The advantages:
– Relay with lockable manual operation and status LED
– With DC types, freewheeling diode is integrated into relay
– Mechanical switch position indicator
– Professional bridging of adjacent modules saves wiring time



1-PDT relay module with screw connection and manual operation



DC coils



AC coils

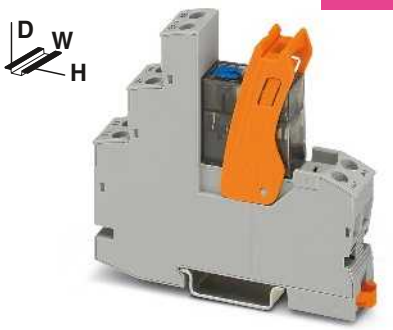
Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	18	7	4.5
Typical response time at U_N	[ms]	9	4 - 10	4 - 12
Typical release time at U_N	[ms]	10	3 - 20	4 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		1 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		12 V (at 10 mA)		
Limiting continuous current		see diagram		
Maximum switch-on current AC		32 A (20 ms, N/O contact)		
Maximum switch-on current DC		24 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 12 V)		
General data				
Test voltage (winding / contact)		4 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 50 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life		Approx. 5 x 10^6 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Dimensions	W / H / D	16 mm / 89 mm / 75 mm		
EMC note		Class A product, see page 605		

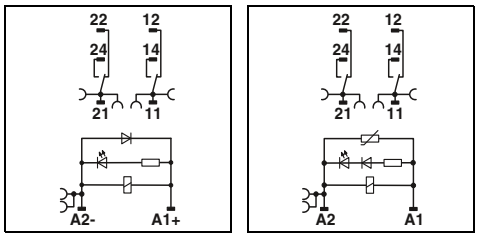
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules with power contact relay with manual operation and screw connection					
	①	24 V DC	**RIF-1-RSC-LDP-24DC/1X21MS**	2905659	10
	②	120 V AC	**RIF-1-RSC-LV-120AC/1X21MS**	2909774	10
	③	230 V AC	**RIF-1-RSC-LV-230AC/1X21MS**	2905661	10

new



2-PDT relay module with screw connection and manual operation



DC coils AC coils

Technical data

①	②	③
see diagram		
18	7	4.5
9	4 - 10	4 - 12
10	3 - 20	4 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

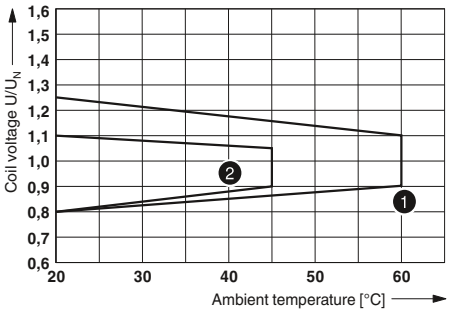
2 PDT	
AgNi	
250 V AC/DC	
12 V (at 10 mA)	
see diagram	
16 A (20 ms, N/O contact)	
12 A (20 ms, N/O contact)	
10 mA (at 12 V)	
4 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 45 °C	
-40 °C ... 60 °C	
100% operating factor	
Approx. 5 x 10^6 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10	
16 mm / 89 mm / 75 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-1-RSC-LDP-24DC/2X21MS	2905660	10
RIF-1-RSC-LV-120AC/2X21MS	2909773	10
RIF-1-RSC-LV-230AC/2X21MS	2905662	10

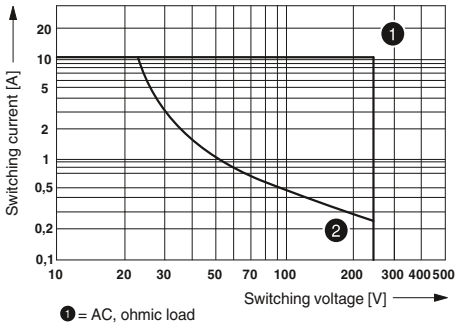
RIF-1-RPT.../1X21... (1-PDT)

Operating voltage range



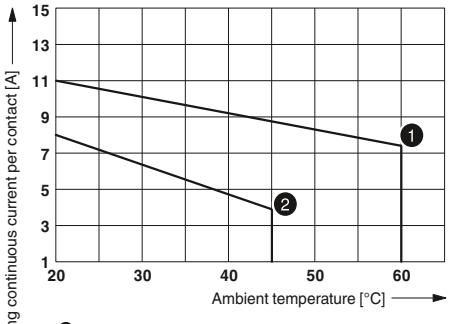
❶ DC coils
❷ AC coils

Interrupting rating



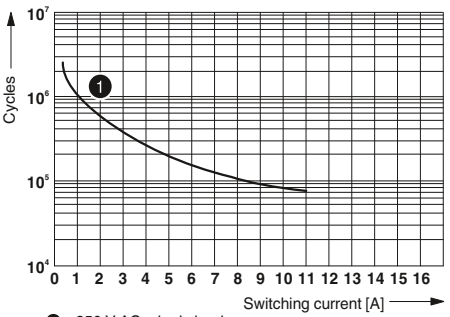
❶ = AC, ohmic load
❷ = DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

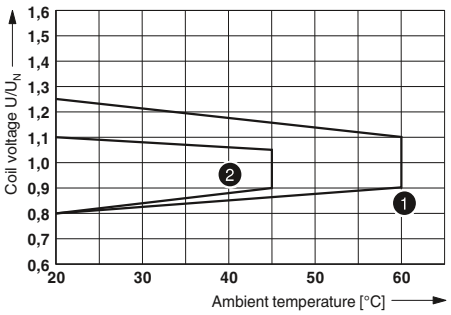
Electrical service life



❶ = 250 V AC, ohmic load

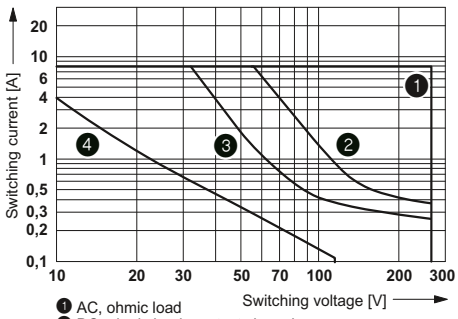
RIF-1-RSC.../2X21... (2-PDT)

Operating voltage range



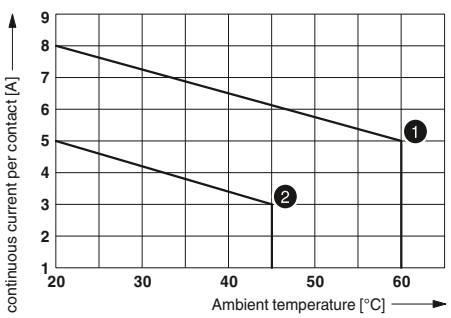
❶ DC coils
❷ AC coils

Interrupting rating



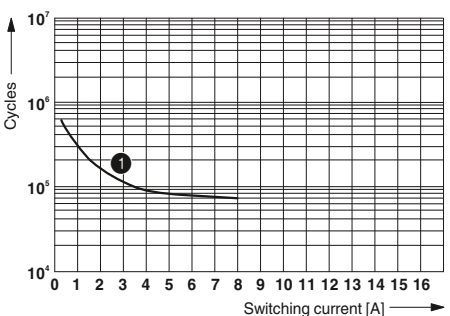
❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



❶ 250 V AC, ohmic load

Fully mounted RIF-1 relay modules

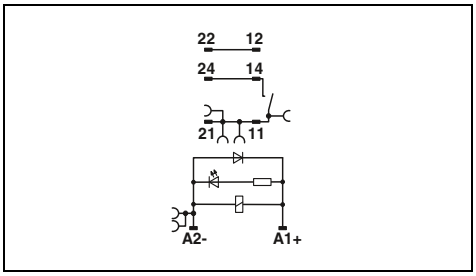
new

1-N/O relay module with Push-in and screw connection

Fully mounted RIF-1 relay modules, consisting of:
- Relay base with Push-in connection
- 1-N/O relay
- Relay retaining bracket

The advantages:
- Maximum inrush current up to 130 A
- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 366.
- For FBS 2-8 plug-in bridges for the output side (11/21), see page 366.



Technical data

Input data		①
Permissible range (with reference to U_N)		see diagram
Typical input current at U_N	[mA]	18
Typical response time at U_N	[ms]	8
Typical release time at U_N	[ms]	10
Input circuit DC		Yellow LED , Polarity protection diode , Damping diode
Output data		
Contact type		1 N/O contact
Contact material		AgSnO
Max. switching voltage		250 V AC/DC
Minimum switching voltage		12 V AC/DC (at 100 mA)
Limiting continuous current		6 A
Maximum switch-on current DC		80 A (for 20 ms) / 130 A (peak, at capacitive load, 230 V AC, 24 µF)
Minimum switching current		100 mA (at 12 V DC)
General data		
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)
Ambient temperature (operation), DC		-40 °C ... 70 °C
Nominal operating mode		100% operating factor
Mechanical service life, DC		3 x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		any / In rows with zero spacing
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16
Dimensions	W / H / D	16 mm / 93 mm / 75 mm
EMC note		Class A product, see page 605

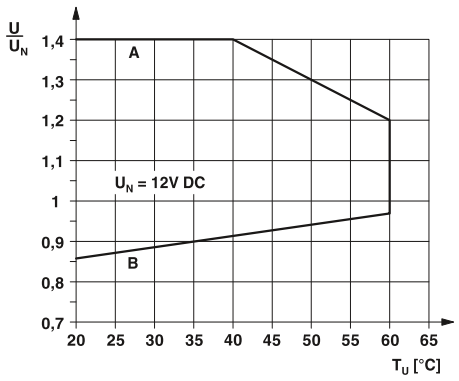
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay modules for high inrush currents					
with Push-in connection	①	24 V DC	**RIF-1-RPT-LDP-24DC/1IC**	2909884	10
with screw connection	②	24 V DC	**RIF-1-RSC-LDP-24DC/1IC**	2909885	10

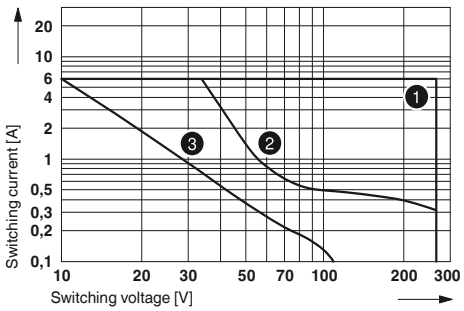
Operating voltage range

Curve A
Maximum permissible continuous voltage U_{max} with limiting continuous current on the contact side (see relevant technical data).

Curve B
Minimum permitted pick-up voltage U_{op} after pre-excitation (see relevant technical data).



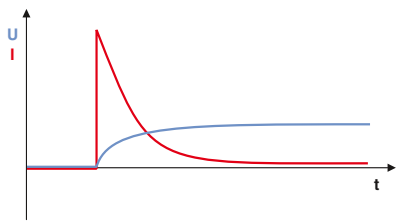
Interrupting rating



1 AC, ohmic load
2 DC, ohmic load
3 DC, L/R = 40 ms

Basic behavior of capacitive loads:

- Very high input current
- Voltage increases with an e-function

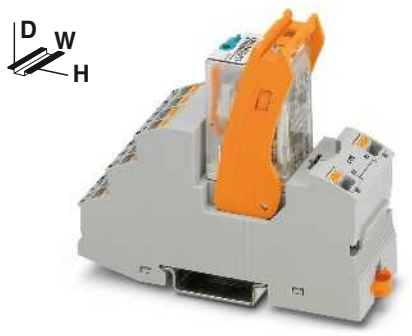


Fully mounted RIF-2 relay modules

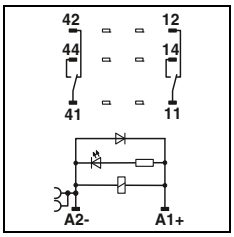
Fully mounted RIF-2 relay modules, consisting of:
– Relay base with Push-in connection
– 2 or 4-PDT industrial relay
– Relay retaining bracket
– Varistor interference suppression module (AC types only)

The advantages:
– Relay with lockable manual operation and status LED
– With DC types, freewheeling diode is integrated into relay
– Mechanical switch position indicator
– Logical contact arrangement thanks to 1/3-level relay base
– Professional bridging of adjacent modules saves wiring time

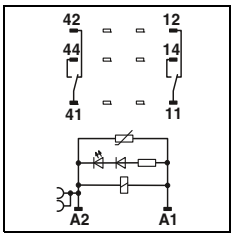
– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



2-PDT industrial relay module with Push-in connection and manual operation



DC coils



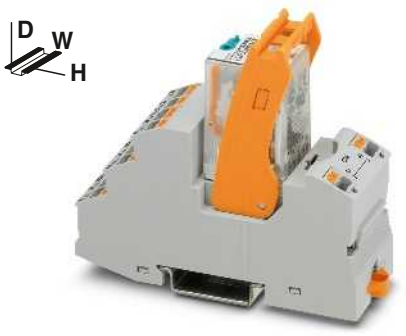
AC coils

Technical data

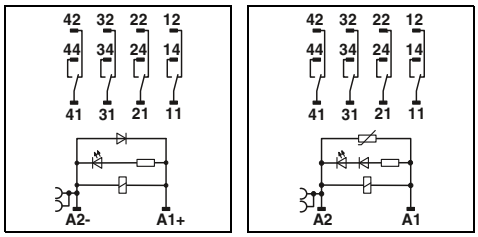
		①	②	③	④
Input data					
Permissible range (with reference to U_N)		see diagram			
Typical input current at U_N	[mA]	42	66	13	6.5
Typical response time at U_N	[ms]	13	5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	14	5 - 20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor			
Input circuit DC		Yellow LED , Damping diode			
Output data					
Contact type		2 PDT			
Contact material		AgNi			
Max. switching voltage		250 V AC/DC			
Minimum switching voltage		5 V (At 24 mA)			
Limiting continuous current		10 A (see diagram)			
Maximum switch-on current AC		30 A (20 ms, N/O contact)			
Maximum switch-on current DC		30 A (20 ms, N/O contact)			
Minimum switching current		5 mA (at 24 V)			
General data					
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)			
Ambient temperature (operation), AC		-40 °C ... 50 °C			
Ambient temperature (operation), DC		-40 °C ... 60 °C			
Nominal operating mode		100% operating factor			
Mechanical service life, AC		Approx. 2x 10^7 cycles			
Mechanical service life, DC		Approx. 2x 10^7 cycles			
Standards/regulations		DIN EN 50178			
Degree of pollution/surge voltage category		2 / III			
Mounting position/mounting		any / In rows with zero spacing			
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16			
Dimensions	W / H / D	31 mm / 96 mm / 75 mm			
EMC note		Class A product, see page 605			

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and Push-in connection					
	①	24 V DC	**RIF-2-RPT-LDP-24DC/2X21**	2903315	10
	②	24 V AC	**RIF-2-RPT-LV-24AC/2X21**	2903313	10
	③	120 V AC	**RIF-2-RPT-LV-120AC/2X21**	2903311	10
	④	230 V AC	**RIF-2-RPT-LV-230AC/2X21**	2903310	10



4-PDT industrial relay module with Push-in connection and manual operation



DC coils AC coils

Technical data

①	②	③	④
see diagram			
42	66	13	6.5
13	5 - 15	5 - 15	5 - 15
14	5 - 20	5 - 20	5 - 20

Yellow LED , Varistor
Yellow LED , Damping diode

4 PDT
AgNi
250 V AC/DC
5 V (At 24 mA)
6 A (see diagram)
16 A (20 ms, N/O contact)
16 A (20 ms, N/O contact)
5 mA (at 24 V)

2.5 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 50 °C
-40 °C ... 60 °C
100% operating factor
Approx. 2x 10^7 cycles
Approx. 2x 10^7 cycles
DIN EN 50178
2 / II

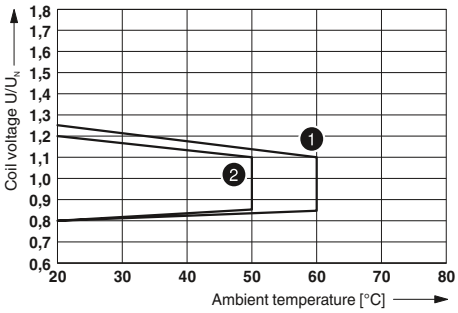
any / In rows with zero spacing
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16
31 mm / 96 mm / 75 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-2-RPT-LDP-24DC/4X21	2903308	10
RIF-2-RPT-LV-24AC/4X21	2903306	10
RIF-2-RPT-LV-120AC/4X21	2903305	10
RIF-2-RPT-LV-230AC/4X21	2903304	10

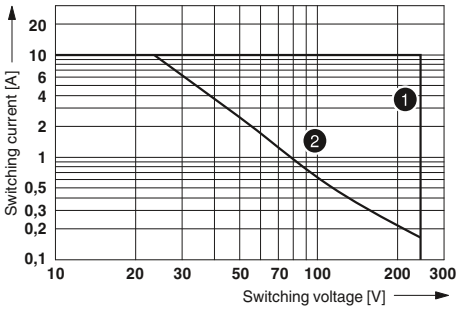
RIF-2-RPT.../2X21 (2-PDT)

Operating voltage range



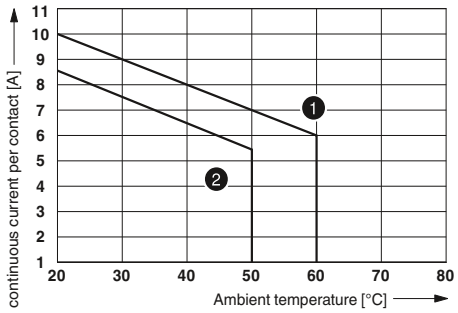
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



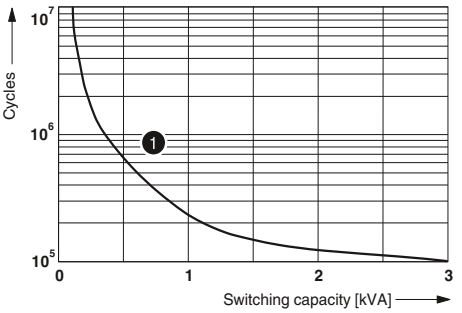
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

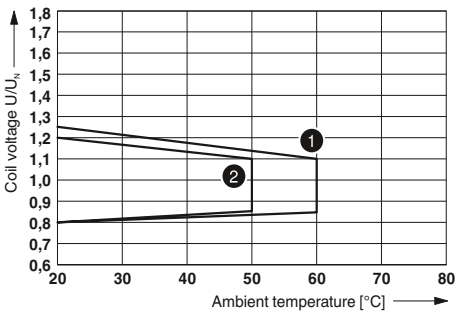
Electrical service life



❶ 250 V AC, ohmic load

RIF-2-RPT.../4X21 (4-PDT)

Operating voltage range

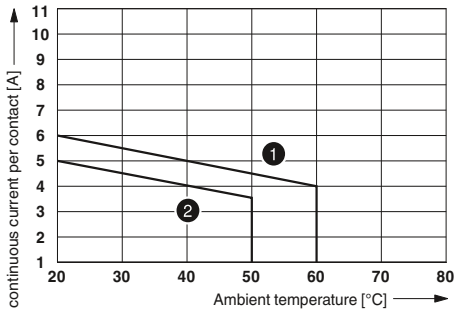


❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating

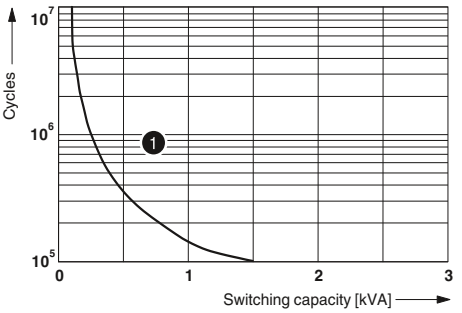
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



❶ 250 V AC, ohmic load

Fully mounted RIF-2 relay modules

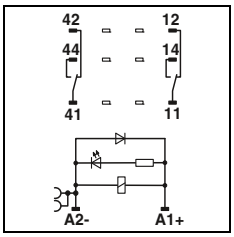
new

2-PDT industrial relay module with screw connection and manual operation

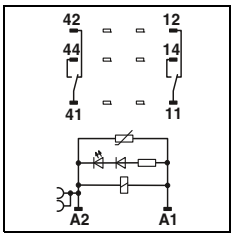
Fully mounted RIF-2 relay modules, consisting of:
- Relay base with screw connection
- 2 or 4-PDT relay
- Relay retaining bracket
- Interference suppression module (AC types only)

The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



DC coils



AC coils

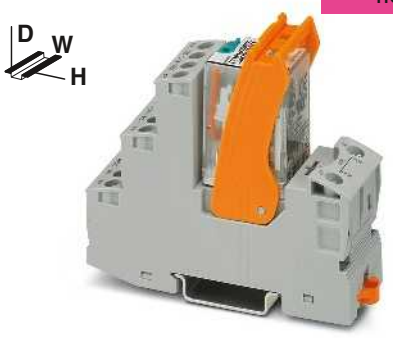
Technical data

		①	②	③	④	⑤
Input data						
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	42	7.5	66	13	6.5
Typical response time at U_N	[ms]	13	13	5 - 15	5 - 15	5 - 15
Typical release time at U_N	[ms]	14	14	5 - 20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor				
Input circuit DC		Yellow LED , Damping diode				
Output data						
Contact type		2 PDT				
Contact material		AgNi				
Max. switching voltage		250 V AC/DC				
Minimum switching voltage		5 V (At 24 mA)				
Limiting continuous current		10 A (see diagram)				
Maximum switch-on current AC		30 A (20 ms, N/O contact)				
Maximum switch-on current DC		30 A (20 ms, N/O contact)				
Minimum switching current		5 mA (at 24 V)				
General data						
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)				
Ambient temperature (operation), AC		-40 °C ... 50 °C				
Ambient temperature (operation), DC		-40 °C ... 60 °C				
Nominal operating mode		100% operating factor				
Mechanical service life, AC		Approx. 2x 10^7 cycles				
Mechanical service life, DC		Approx. 2x 10^7 cycles				
Standards/regulations		DIN EN 50178				
Degree of pollution/surge voltage category		2 / III				
Mounting position/mounting		any / In rows with zero spacing				
Connection data solid/stranded/AWG		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10				
Dimensions	W / H / D	27 mm / 89 mm / 75 mm				

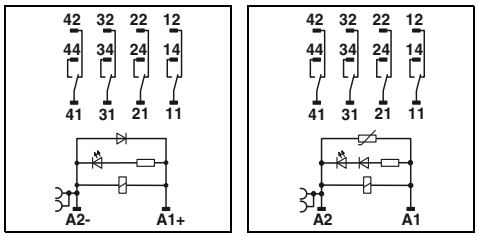
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and screw connection					
	①	24 V DC	**RIF-2-RSC-LDP-24DC/2X21**	2903326	10
	②	125 V DC	**RIF-2-RSC-LDP-125DC/2X21**	2903324	10
	③	24 V AC	**RIF-2-RSC-LV-24AC/2X21**	2903323	10
	④	120 V AC	**RIF-2-RSC-LV-120AC/2X21**	2903322	10
	⑤	230 V AC	**RIF-2-RSC-LV-230AC/2X21**	2903321	10

new



4-PDT industrial relay module with screw connection and manual operation



DC coils AC coils

Technical data

①	②	③	④	⑤
see diagram				
42	7.5	66	13	6.5
13	13	5 - 15	5 - 15	5 - 15
14	14	5 - 20	5 - 20	5 - 20
Yellow LED , Varistor				
Yellow LED , Damping diode				

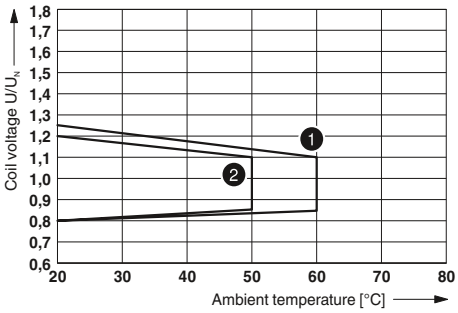
4 PDT	
AgNi	
250 V AC/DC	
5 V (At 24 mA)	
6 A (see diagram)	
16 A (20 ms, N/O contact)	
16 A (20 ms, N/O contact)	
5 mA (at 24 V)	
2.5 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 50 °C	
-40 °C ... 60 °C	
100% operating factor	
Approx. 2x 10^7 cycles	
Approx. 2x 10^7 cycles	
DIN EN 50178	
2 / II	
any / In rows with zero spacing	
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10	
27 mm / 89 mm / 75 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-2-RSC-LDP-24DC/4X21	**2903320**	10
RIF-2-RSC-LDP-125DC/4X21	**2903319**	10
RIF-2-RSC-LV-24AC/4X21	**2903318**	10
RIF-2-RSC-LV-120AC/4X21	**2903317**	10
RIF-2-RSC-LV-230AC/4X21	**2903316**	10

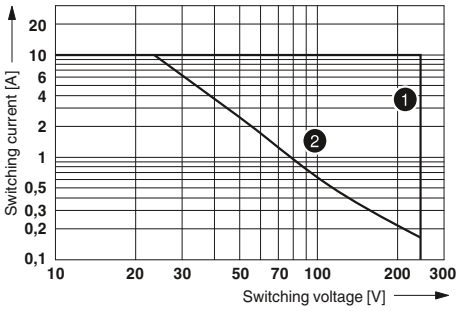
RIF-2-RSC.../2X21 (2-PDT)

Operating voltage range



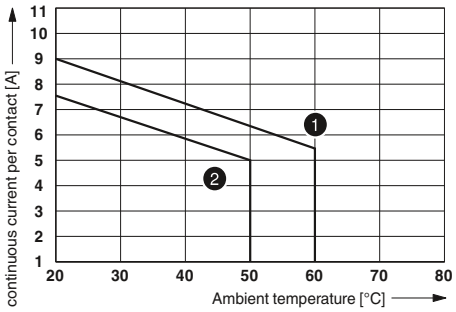
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



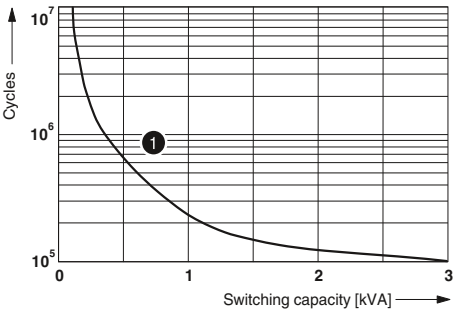
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

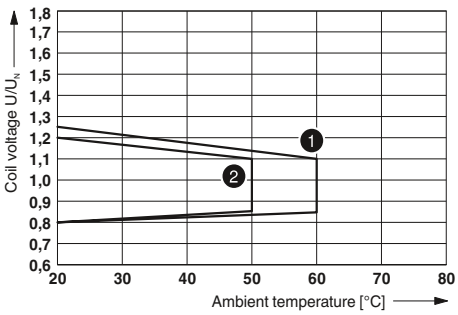
Electrical service life



❶ 250 V AC, ohmic load

RIF-2-RSC.../4X21 (4-PDT)

Operating voltage range

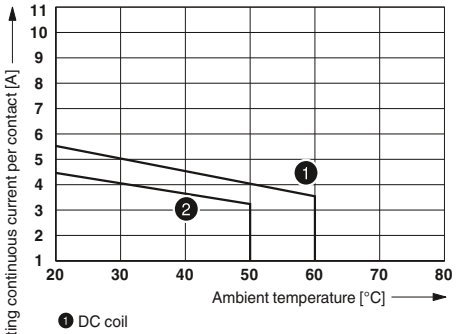


❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating

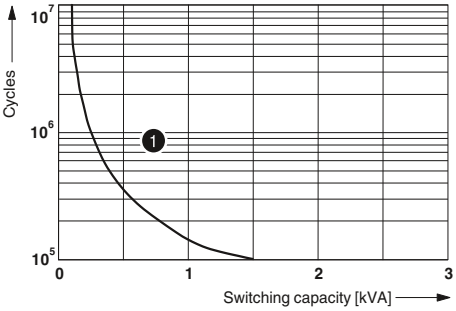
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



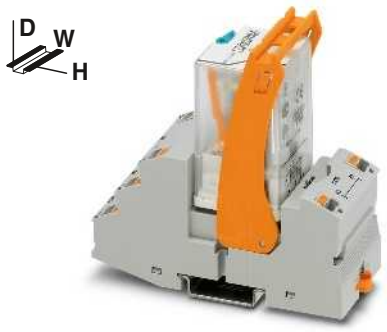
❶ 250 V AC, ohmic load

Fully mounted RIF-3 relay modules

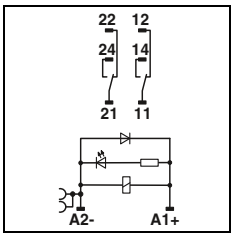
Fully mounted RIF-3 relay modules, consisting of:
– Relay base with Push-in connection
– 2 or 3-PDT octal relay
– Relay retaining bracket
– Interference suppression module (AC types only)

The advantages:
– Relay with lockable manual operation and status LED
– With DC types, freewheeling diode is integrated into relay
– Mechanical switch position indicator
– Logical contact arrangement thanks to 1/3-level relay base
– Professional bridging of adjacent modules saves wiring time

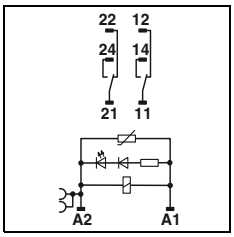
– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



2-PDT octal relay module with Push-in connection and manual operation



DC coils



AC coils

Technical data

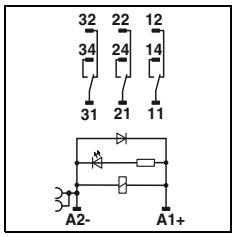
Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	60	23	13
Typical response time at U_N	[ms]	18	5 - 15	5 - 15
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		10 A (see diagram)		
Maximum switch-on current AC		30 A (20 ms, N/O contact)		
Maximum switch-on current DC		30 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 50 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 2x 10^7 cycles		
Mechanical service life, DC		Approx. 2x 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16		
Dimensions	W / H / D	40 mm / 103 mm / 90 mm		
EMC note		Class A product, see page 605		

Ordering data

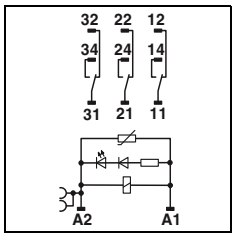
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and Push-in connection					
	①	24 V DC	**RIF-3-RPT-LDP-24DC/2X21**	2903297	5
	②	120 V AC	**RIF-3-RPT-LV-120AC/2X21**	2903296	5
	③	230 V AC	**RIF-3-RPT-LV-230AC/2X21**	2903295	5

D W H

3-PDT octal relay module with Push-in connection and manual operation



DC coils



AC coils

Technical data

①	②	③
see diagram		
60	23	13
18	5 - 15	5 - 15
20	5 - 20	5 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

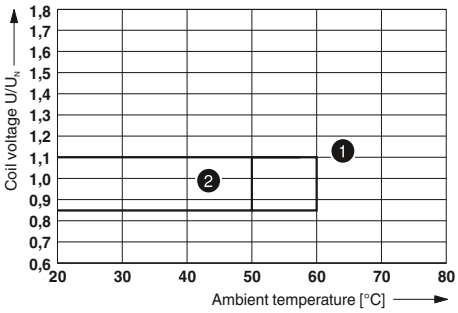
3 PDT
AgNi
250 V AC/DC
10 V (At 24 mA)
8.5 A (see diagram)
30 A (20 ms, N/O contact)
30 A (20 ms, N/O contact)
10 mA (at 24 V)
2.5 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 50 °C
-40 °C ... 60 °C
100% operating factor
Approx. 2x 10^7 cycles
Approx. 2x 10^7 cycles
DIN EN 50178
2 / III
any / In rows with zero spacing
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16
40 mm / 103 mm / 90 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-3-RPT-LDP-24DC/3X21	2903294	5
RIF-3-RPT-LV-120AC/3X21	2903293	5
RIF-3-RPT-LV-230AC/3X21	2903292	5

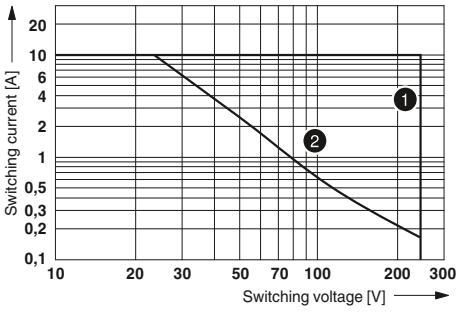
RIF-3-RPT.../2X21 (2-PDT)

Operating voltage range



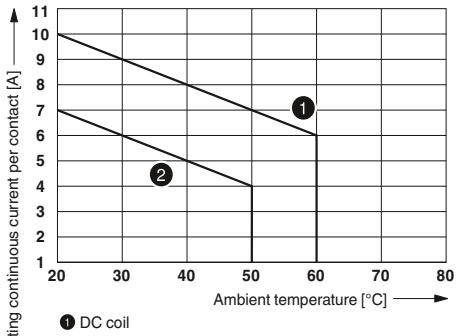
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



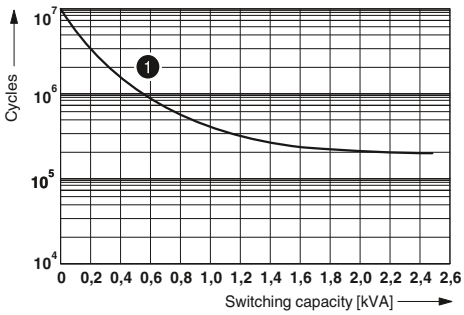
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

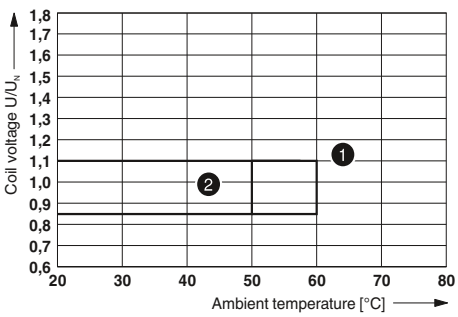
Electrical service life



❶ 250 V AC, ohmic load

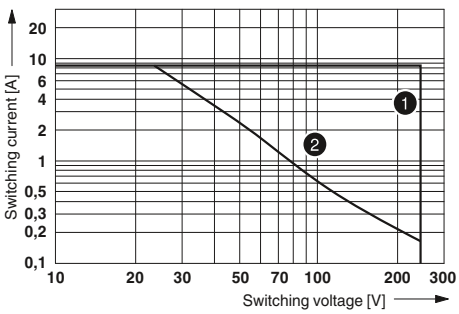
RIF-3-RPT.../3X21 (3-PDT)

Operating voltage range



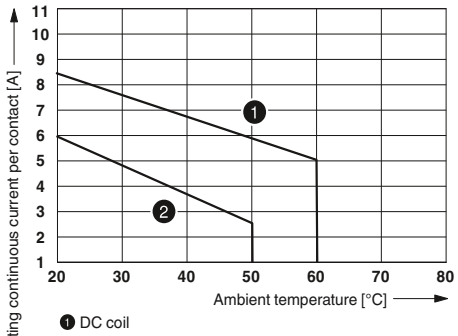
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



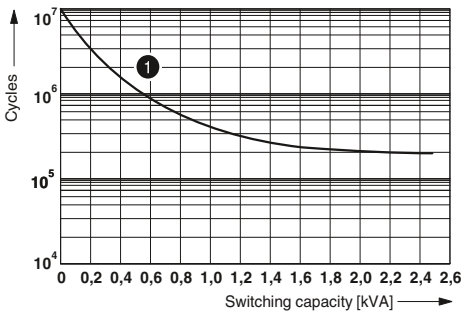
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



❶ 250 V AC, ohmic load

Fully mounted RIF-3 relay modules

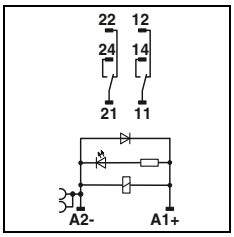
new

2-PDT octal relay module with screw connection and manual operation

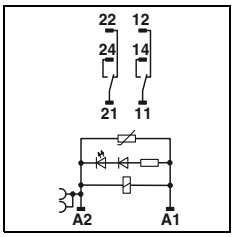
Fully mounted RIF-3 relay modules, consisting of:
- Relay base with screw connection
- 2 or 3-PDT octal relay
- Relay retaining bracket
- Varistor interference suppression module (AC types only)

The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



DC coils



AC coils

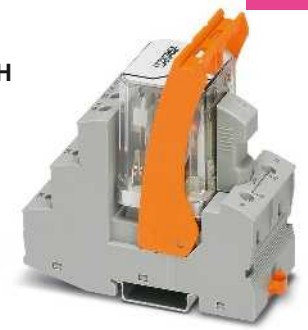
Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	60	23	13
Typical response time at U_N	[ms]	18	5 - 15	5 - 15
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		10 A (see diagram)		
Maximum switch-on current AC		30 A (20 ms, N/O contact)		
Maximum switch-on current DC		30 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 50 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 2x 10^7 cycles		
Mechanical service life, DC		Approx. 2x 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Dimensions	W / H / D	40 mm / 96 mm / 90 mm		
EMC note		Class A product, see page 605		

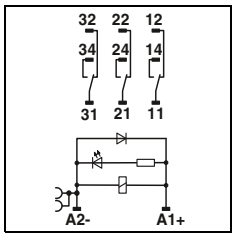
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and screw connection					
	①	24 V DC	**RIF-3-RSC-LDP-24DC/2X21**	2903303	5
	②	120 V AC	**RIF-3-RSC-LV-120AC/2X21**	2903302	5
	③	230 V AC	**RIF-3-RSC-LV-230AC/2X21**	2903301	5

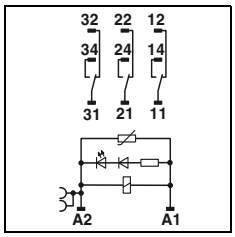
new



3-PDT octal relay module with screw connection and manual operation



DC coils



AC coils

Technical data

①	②	③
see diagram		
60	23	13
18	5 - 15	5 - 15
20	5 - 20	5 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

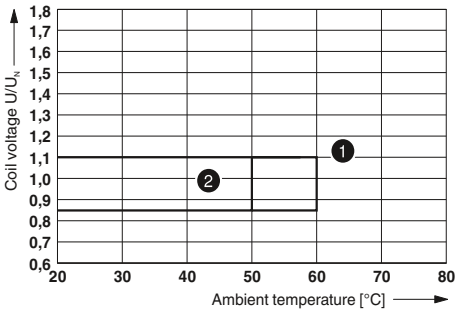
3 PDT
AgNi
250 V AC/DC
10 V (At 24 mA)
8.5 A (see diagram)
30 A (20 ms, N/O contact)
30 A (20 ms, N/O contact)
10 mA (at 24 V)
2.5 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 50 °C
-40 °C ... 60 °C
100% operating factor
Approx. 2x 10^7 cycles
Approx. 2x 10^7 cycles
DIN EN 50178
2 / III
any / In rows with zero spacing
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10
40 mm / 96 mm / 90 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-3-RSC-LDP-24DC/3X21	2903300	5
RIF-3-RSC-LV-120AC/3X21	2903299	5
RIF-3-RSC-LV-230AC/3X21	2903298	5

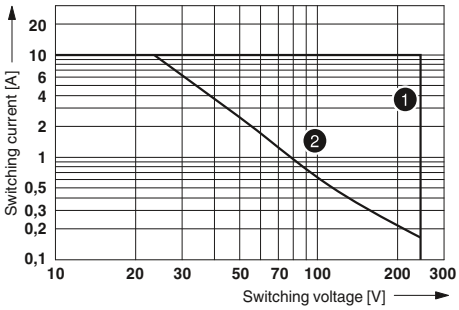
RIF-3-RSC.../2X21 (2-PDT)

Operating voltage range



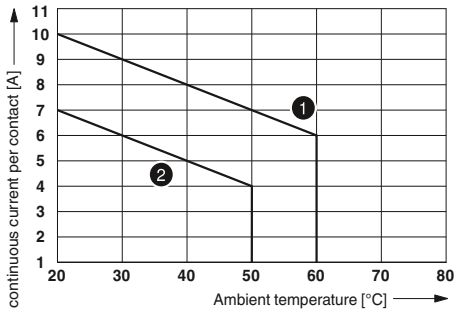
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



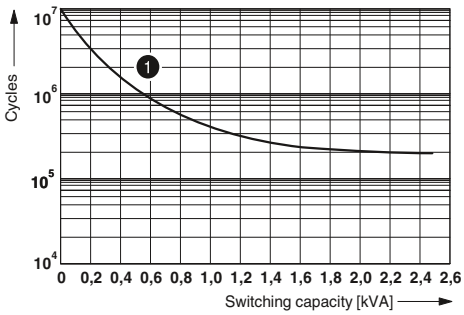
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

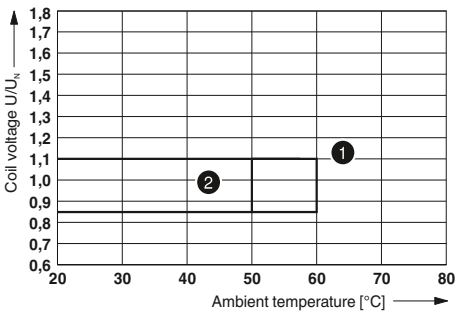
Electrical service life



❶ 250 V AC, ohmic load

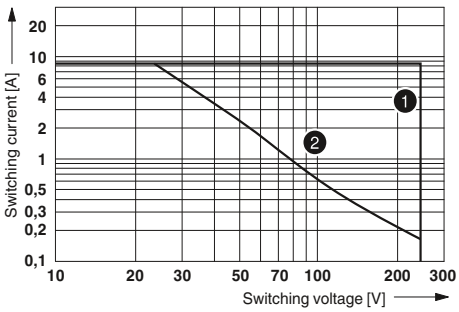
RIF-3-RSC.../3X21 (3-PDT)

Operating voltage range



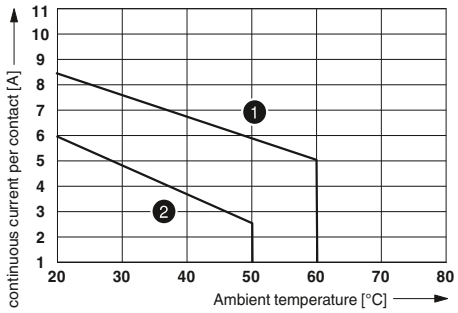
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



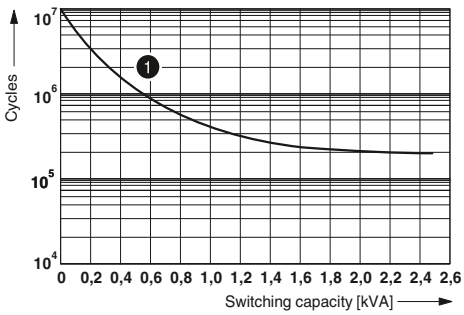
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



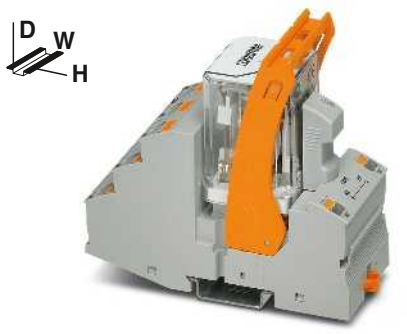
❶ 250 V AC, ohmic load

Fully mounted RIF-4 relay modules

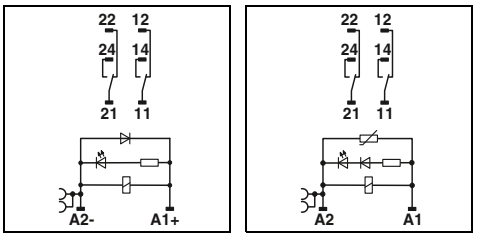
Fully mounted RIF-4 relay modules, consisting of:
– Relay base with Push-in connection
– 2 or 3-PDT high-power relay
– Relay retaining bracket
– Varistor interference suppression module (AC types only)

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Professional bridging of adjacent modules saves wiring time

– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



2-PDT high-power relay module with Push-in connection



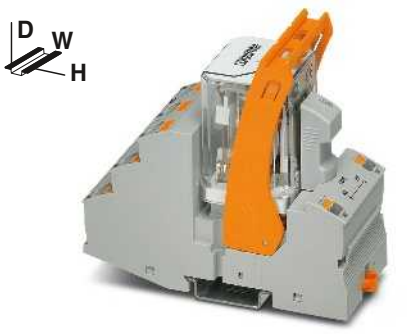
DC coils | AC coils

Technical data

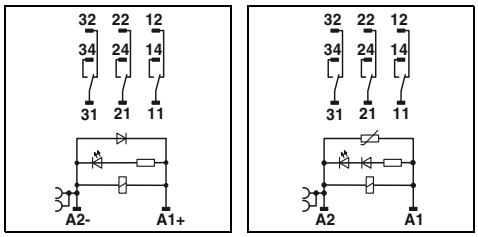
Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	56	24	14
Typical response time at U_N	[ms]	20	5 - 25	5 - 25
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		440 V AC / 250 V DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		11 A (see diagram)		
Maximum switch-on current AC		50 A (20 ms, N/O contact)		
Maximum switch-on current DC		50 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
Maximum interrupting rating, ohmic load				
	250 V AC	2500 VA		
	440 V AC	4000 VA		
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 40 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 10^7 cycles		
Mechanical service life, DC		Approx. 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG				
Input side		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16		
Output side		0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14		
Dimensions	W / H / D	43 mm / 111 mm / 90 mm		
EMC note		Class A product, see page 605		

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and Push-in connection					
	①	24 V DC	**RIF-4-RPT-LDP-24DC/2X21**	2903281	5
	②	120 V AC	**RIF-4-RPT-LV-120AC/2X21**	2903280	5
	③	230 V AC	**RIF-4-RPT-LV-230AC/2X21**	2903279	5



3-PDT high-power relay module with Push-in connection



DC coils AC coils

Technical data

①	②	③
see diagram		
56	24	14
20	5 - 25	5 - 25
20	5 - 20	5 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

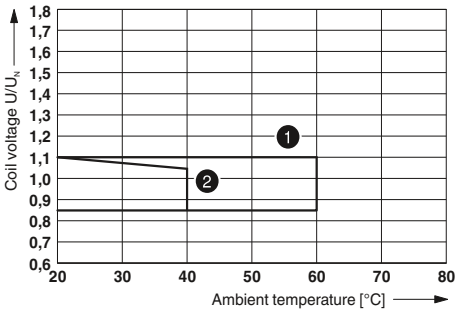
3 PDT	
AgNi	
440 V AC / 250 V DC	
10 V (At 24 mA)	
10 A (see diagram)	
50 A (20 ms, N/O contact)	
50 A (20 ms, N/O contact)	
10 mA (at 24 V)	
2500 VA	
4000 VA	
1/3 HP, 120 V AC (single-phase AC motor)	
1/2 HP, 240 V AC (single-phase AC motor)	
1/2 HP, 240 V AC (three-phase induction motor)	
2.5 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 40 °C	
-40 °C ... 60 °C	
100% operating factor	
Approx. 10^7 cycles	
Approx. 10^7 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16	
0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14	
43 mm / 111 mm / 90 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
RIF-4-RPT-LDP-24DC/3X21	2903278	5
RIF-4-RPT-LV-120AC/3X21	2903277	5
RIF-4-RPT-LV-230AC/3X21	2903276	5

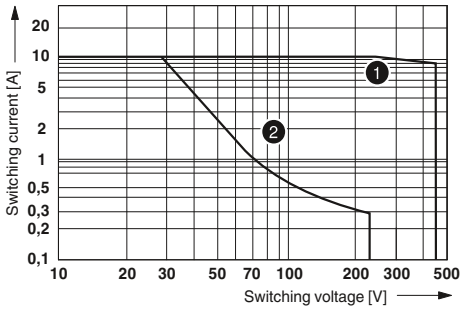
RIF-4-RPT.../2X21 (2-PDT)

Operating voltage range



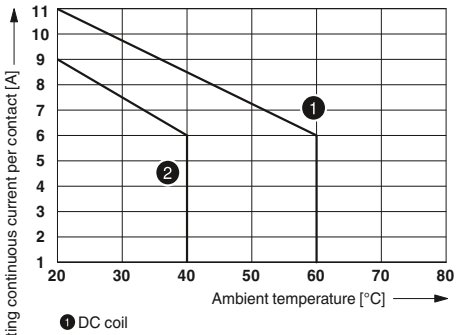
1 DC coil (observe contact derating)
2 AC coil (observe contact derating)

Interrupting rating



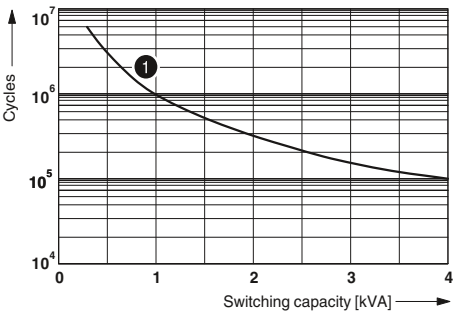
1 AC, ohmic load
2 DC, ohmic load

Contact derating



1 DC coil
2 AC coil

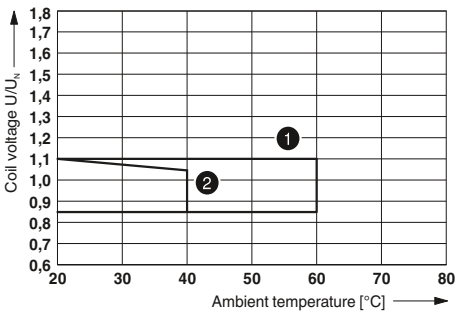
Electrical service life



1 250 V AC, ohmic load

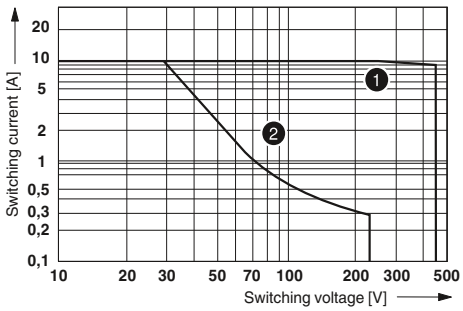
RIF-4-RPT.../3X21 (3-PDT)

Operating voltage range



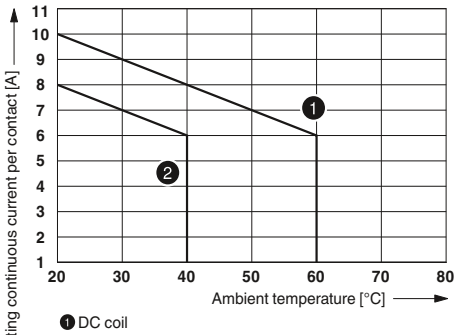
1 DC coil (observe contact derating)
2 AC coil (observe contact derating)

Interrupting rating



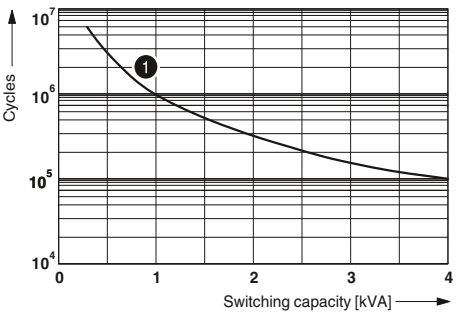
1 AC, ohmic load
2 DC, ohmic load

Contact derating



1 DC coil
2 AC coil

Electrical service life



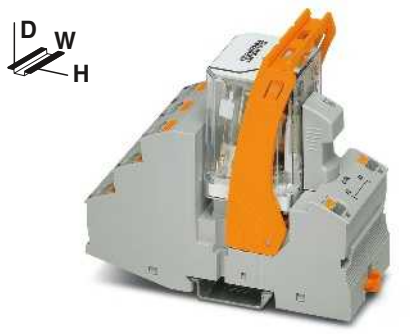
1 250 V AC, ohmic load

Fully mounted RIF-4 relay modules

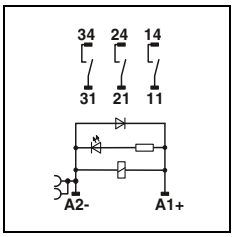
Fully mounted RIF-4 relay modules, consisting of:
– Relay base with Push-in connection
– 3-N/O high-power relay
– Relay retaining bracket
– Varistor interference suppression module (AC types only)

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Full shutdown by means of ≥ 3 mm contact opening
– Professional bridging of adjacent modules saves wiring time

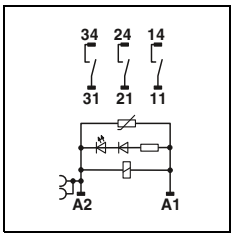
– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



3-N/O high-power relay module with Push-in connection



DC coils



AC coils

Technical data

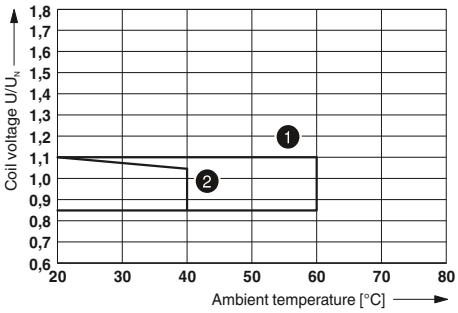
		①	②	③
Input data				
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	70	24	14
Typical response time at U_N	[ms]	20	5 - 25	5 - 25
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		3 N/O contacts		
Contact material		AgNi		
Max. switching voltage		440 V AC / 250 V DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		10 A (see diagram)		
Maximum switch-on current AC		50 A (20 ms, N/O contact)		
Maximum switch-on current DC		50 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
Maximum interrupting rating, ohmic load				
	250 V AC	2500 VA		
	440 V AC	4000 VA		
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 40 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 10^7 cycles		
Mechanical service life, DC		Approx. 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG				
Input side		0.14 ... 1.5 mm^2 / 0.14 ... 1.5 mm^2 / 26 - 16		
Output side		0.14 ... 2.5 mm^2 / 0.14 ... 2.5 mm^2 / 26 - 14		
Dimensions	W / H / D	43 mm / 111 mm / 90 mm		
EMC note		Class A product, see page 605		

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and Push-in connection					
	①	24 V DC	**RIF-4-RPT-LDP-24DC/3X1**	2903275	5
	②	120 V AC	**RIF-4-RPT-LV-120AC/3X1**	2903274	5
	③	230 V AC	**RIF-4-RPT-LV-230AC/3X1**	2903273	5

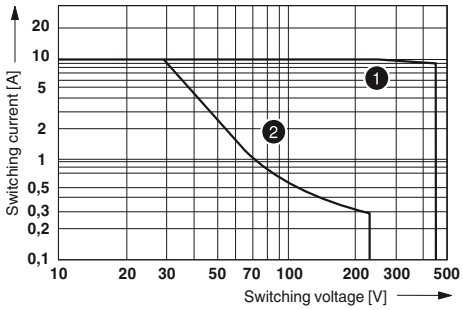
RIF-4-RPT.../3X1 (3-N/O)

Operating voltage range



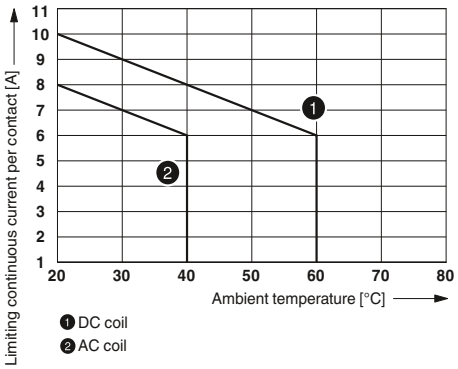
1 DC coil (observe contact derating)
2 AC coil (observe contact derating)

Interrupting rating



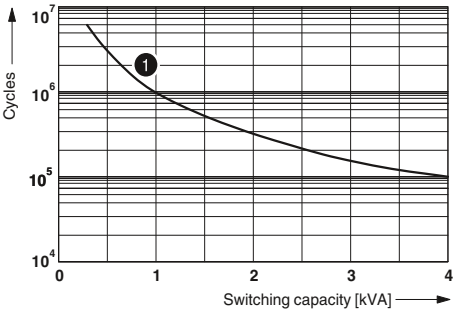
1 AC, ohmic load
2 DC, ohmic load

Contact derating



1 DC coil
2 AC coil

Electrical service life



1 250 V AC, ohmic load

Fully mounted RIF-4 relay modules

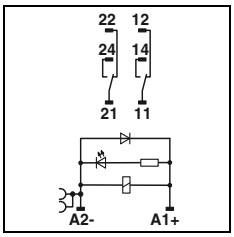
new

2-PDT high-power relay module with screw connection

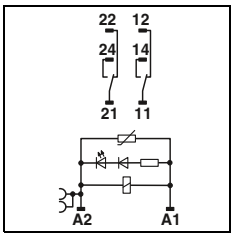
Fully mounted RIF-4 relay modules, consisting of:
– Relay base with screw connection
– 3-PDT high-power relay
– Relay retaining bracket
– Varistor interference suppression module (AC types only)

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Professional bridging of adjacent modules saves wiring time

– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



DC coils



AC coils

Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	56	24	14
Typical response time at U_N	[ms]	20	5 - 25	5 - 25
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		2 PDT		
Contact material		AgNi		
Max. switching voltage		440 V AC / 250 V DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		11 A (see diagram)		
Maximum switch-on current AC		50 A (20 ms, N/O contact)		
Maximum switch-on current DC		50 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
Maximum interrupting rating, ohmic load				
	250 V AC	2500 VA		
	440 V AC	4000 VA		
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 40 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 10^7 cycles		
Mechanical service life, DC		Approx. 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG				
Input side		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Output side		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Dimensions	W / H / D	44 mm / 96 mm / 91 mm		
EMC note		Class A product, see page 605		

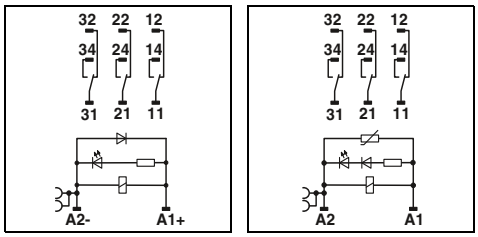
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and screw connection					
	①	24 V DC	**RIF-4-RSC-LDP-24DC/2X21**	2903291	5
	②	120 V AC	**RIF-4-RSC-LV-120AC/2X21**	2903290	5
	③	230 V AC	**RIF-4-RSC-LV-230AC/2X21**	2903289	5

new

3-PDT high-power relay module with screw connection

RIF-4-RSC.../2X21 (2-PDT)



DC coils AC coils

Technical data

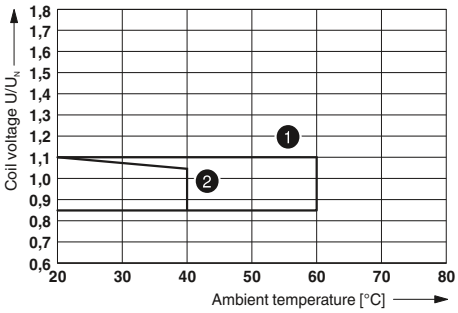
①	②	③
see diagram		
56	24	14
20	5 - 25	5 - 25
20	5 - 20	5 - 20
Yellow LED , Varistor		
Yellow LED , Damping diode		

3 PDT	
AgNi	
440 V AC / 250 V DC	
10 V (At 24 mA)	
10 A (see diagram)	
50 A (20 ms, N/O contact)	
50 A (20 ms, N/O contact)	
10 mA (at 24 V)	
2500 VA	
4000 VA	
1/3 HP, 120 V AC (single-phase AC motor)	
1/2 HP, 240 V AC (single-phase AC motor)	
1/2 HP, 240 V AC (three-phase induction motor)	
2.5 kV_{rms} (50 Hz, 1 min.)	
-40 °C ... 40 °C	
-40 °C ... 60 °C	
100% operating factor	
Approx. 10^7 cycles	
Approx. 10^7 cycles	
DIN EN 50178	
2 / III	
any / In rows with zero spacing	
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10	
0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10	
44 mm / 96 mm / 91 mm	
Class A product, see page 605	

Ordering data

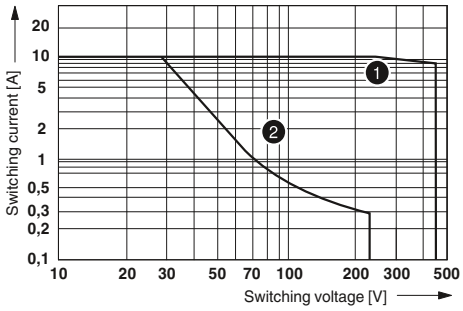
Type	Order No.	Pcs./ Pkt.
RIF-4-RSC-LDP-24DC/3X21	2903288	5
RIF-4-RSC-LV-120AC/3X21	2903287	5
RIF-4-RSC-LV-230AC/3X21	2903285	5

Operating voltage range



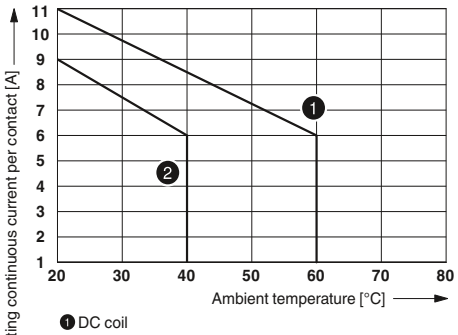
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



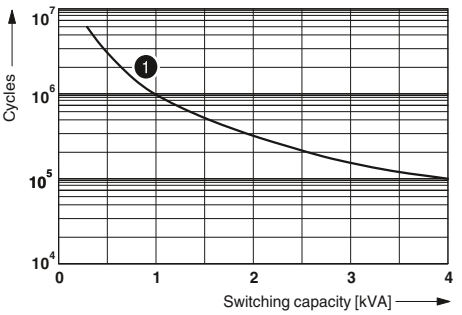
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

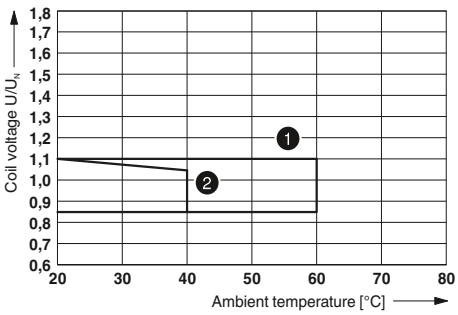
Electrical service life



❶ 250 V AC, ohmic load

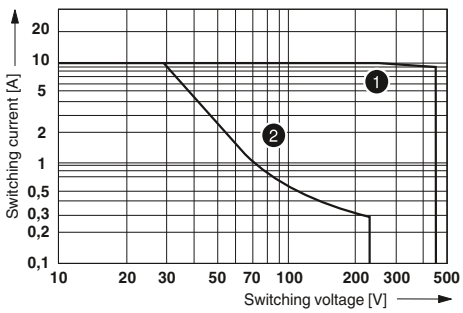
RIF-4-RSC.../3X21 (3-PDT)

Operating voltage range



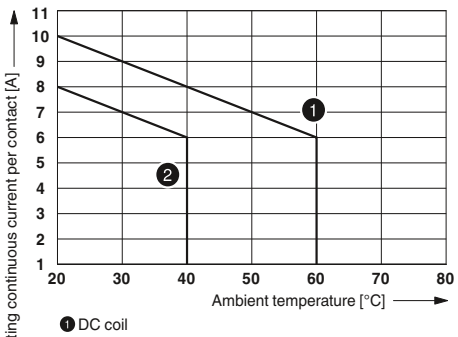
❶ DC coil (observe contact derating)
❷ AC coil (observe contact derating)

Interrupting rating



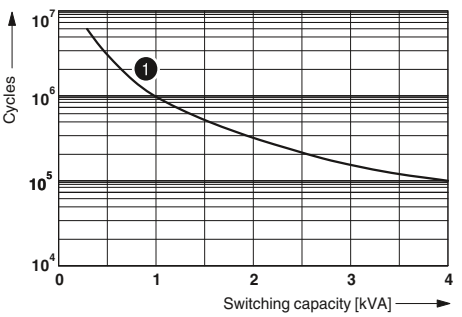
❶ AC, ohmic load
❷ DC, ohmic load

Contact derating



❶ DC coil
❷ AC coil

Electrical service life



❶ 250 V AC, ohmic load

Fully mounted RIF-4 relay modules

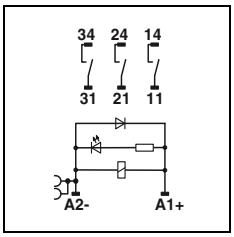
new

3-N/O high-power relay module with screw connection

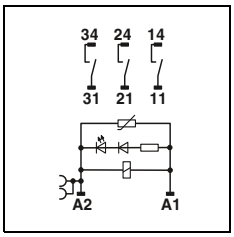
Fully mounted RIF-4 relay modules, consisting of:
– Relay base with screw connection
– 3-N/O high-power relay
– Relay retaining bracket
– Varistor interference suppression module (AC types only)

The advantages:
– Logical contact arrangement thanks to 1/3-level relay base
– Full shutdown by means of ≥ 3 mm contact opening
– Professional bridging of adjacent modules saves wiring time

– For FBS 2-6 plug-in bridges for the input side (A2), see page 366.



DC coils



AC coils

Technical data

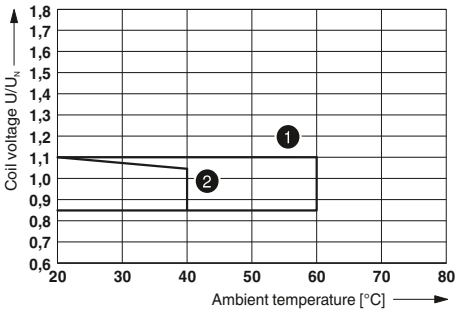
Input data		①	②	③
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	70	24	14
Typical response time at U_N	[ms]	20	5 - 25	5 - 25
Typical release time at U_N	[ms]	20	5 - 20	5 - 20
Input circuit AC		Yellow LED , Varistor		
Input circuit DC		Yellow LED , Damping diode		
Output data				
Contact type		3 N/O contacts		
Contact material		AgNi		
Max. switching voltage		440 V AC / 250 V DC		
Minimum switching voltage		10 V (At 24 mA)		
Limiting continuous current		10 A (see diagram)		
Maximum switch-on current AC		50 A (20 ms, N/O contact)		
Maximum switch-on current DC		50 A (20 ms, N/O contact)		
Minimum switching current		10 mA (at 24 V)		
Maximum interrupting rating, ohmic load				
	250 V AC	2500 VA		
	440 V AC	4000 VA		
Motor load according to UL 508		1/3 HP, 120 V AC (single-phase AC motor) 1/2 HP, 240 V AC (single-phase AC motor) 1/2 HP, 240 V AC (three-phase induction motor)		
General data				
Test voltage (winding / contact)		2.5 kV_{rms} (50 Hz, 1 min.)		
Ambient temperature (operation), AC		-40 °C ... 40 °C		
Ambient temperature (operation), DC		-40 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Mechanical service life, AC		Approx. 10^7 cycles		
Mechanical service life, DC		Approx. 10^7 cycles		
Standards/regulations		DIN EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Connection data solid/stranded/AWG				
Input side		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Output side		0.14 ... 6 mm^2 / 0.14 ... 4 mm^2 / 26 - 10		
Dimensions	W / H / D	44 mm / 96 mm / 91 mm		
EMC note		Class A product, see page 605		

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Pre-assembled coupling relay modules with power contact relay and screw connection					
	①	24 V DC	**RIF-4-RSC-LDP-24DC/3X1**	2903284	5
	②	120 V AC	**RIF-4-RSC-LV-120AC/3X1**	2903283	5
	③	230 V AC	**RIF-4-RSC-LV-230AC/3X1**	2903282	5

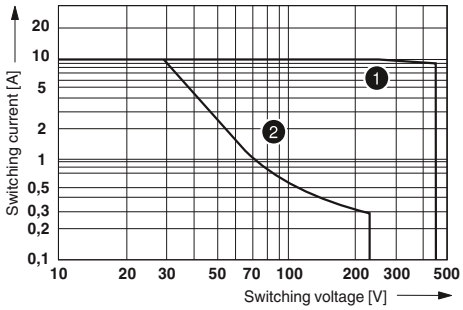
RIF-4-RSC.../3X1 (3-N/O)

Operating voltage range



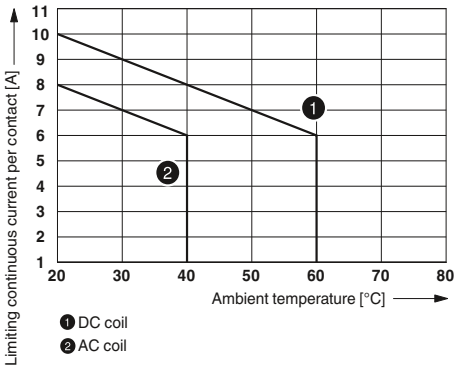
1 DC coil (observe contact derating)
2 AC coil (observe contact derating)

Interrupting rating



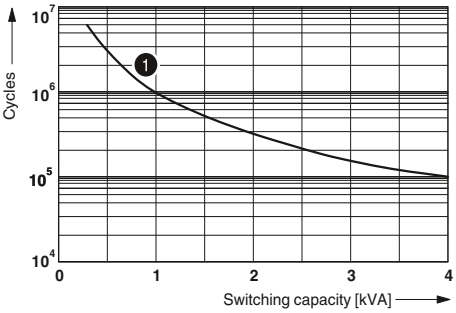
1 AC, ohmic load
2 DC, ohmic load

Contact derating



1 DC coil
2 AC coil

Electrical service life



1 250 V AC, ohmic load

RIFLINE complete accessories
Plug-in bridges

The plug-in bridges can be used for simple potential distribution via all relay bases.

The end bracket is used for safe isolation between adjacent modules and to visually separate the various function groups.

Description	Color	Ordering data: Type		Order No.	Pcs./ Pkt.
Plug-in bridge					
2-pos. red, 32 A		**FBS 2-6**		3030336	50
2-pos. blue, 32 A		**FBS 2-6 BU**		3036932	50
2-pos. gray, 32 A		**FBS 2-6 GY**		3032237	50
5-pos. red, 32 A		**FBS 5-6**		3030349	50
10-pos. red, 32 A		**FBS 10-6**		3030271	10
20-pos. red, 32 A		**FBS 20-6**		3030365	10
50-pos. red, 32 A		**FBS 50-6**		3032224	10
2-pos. red, 41 A		**FBS 2-8**		3030284	10
2-pos. blue, 41 A		**FBS 2-8 BU**		3032567	10
2-pos. gray, 41 A		**FBS 2-8 GY**	7042	3032541	10
End bracket, for snapping onto NS 35, 9.5 mm wide, can be marked with ZB 6, ZB 8/27, KLM...					

Ordering data: Type	Order No.	Pcs./ Pkt.
CLIPFIX 35	3022218	50

RIFLINE complete accessories
Marking material

The ZB zack marker strip system offers numerous marking options that can be attached directly to the relay retaining brackets. In addition, further markings can be fixed to the relay base by means of double marker carriers.

5.2 mm, 6.2 mm, and 15.2 mm wide

Double marker carrier

Description	Color	Ordering data: Type	Order No.	Pcs./ Pkt.
Zack marker strip, unprinted				
10-section	white	**ZB 5 :UNBEDRUCKT**	1050004	10
10-section	white	**ZB 6:UNBEDRUCKT**	1051003	10
5-section	white	**ZB 15:UNBEDRUCKT**	0811972	10
Double marker carrier for ZB 5	gray			

Ordering data: Type	Order No.	Pcs./ Pkt.
STP 5-2	0800967	100

RIFLINE complete accessories
Test plugs

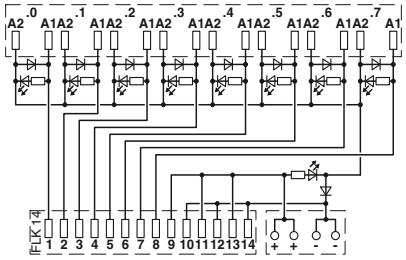
The two-piece test plug offers individual plug color combinations. It is inserted directly in the function shaft of the Push-in connection.

Ordering data

Description	Color	Type	Order No.	Pcs./ Pkt.
Test plug, consisting of:				
Metal part for 2.3 mm Ø socket hole and	silver	**MPS-MT**	0201744	10
Insulating sleeve, for MPS metal part	red	**MPS-IH RD**	0201676	10
	white	**MPS-IH WH**	0201663	10
	blue	**MPS-IH BU**	0201689	10
	yellow	**MPS-IH YE**	0201692	10
	green	**MPS-IH GN**	0201702	10
	gray	**MPS-IH GY**	0201728	10
	black	**MPS-IH BK**	0201731	10

Adapter for RIFLINE complete RF-1

RIF-1-V8... is the VARIOFACE adapter which connects the RIF-1 relay module with the VARIOFACE system cabling. This allows easy connection of eight relay modules to a controller.



VARIOFACE adapter for RIFLINE complete RIF-1

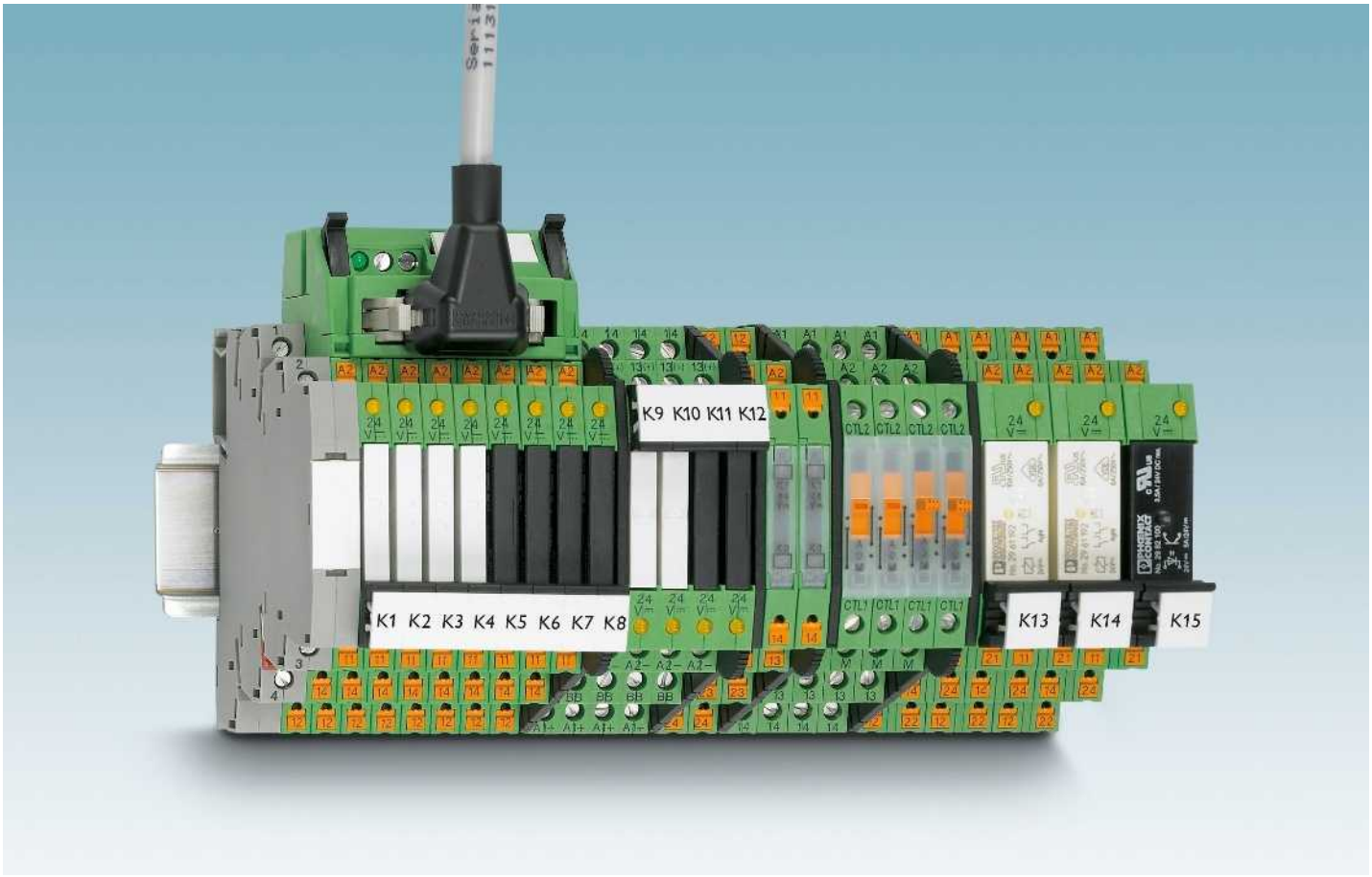
Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A (per signal path)
Maximum total current (voltage supply)		3 A
Rated surge voltage		0.6 kV (Functional insulation)
Ambient temperature (operation)		-40 °C ... 60 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Controller level	IDC/FLK pin strip
	Supply	Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Dimensions	H / D	101 mm / 75 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
V8 adapter, for eight RIF-1 relay modules, with IDC/FLK pin strip for PLC system cabling, **positive switching**					
	14	128 mm	**RIF-1-V8/PT/FLK14/OUT**	2905195	1

Highly compact relay modules - PLC-INTERFACE



The PLC-INTERFACE relay system is the interface between the controller and system I/O devices.

The universal design is compact and space-saving. While the narrow 6.2 mm module has one contact, the 14 mm version is available with two contacts. The modules can be equipped with either an electromechanical or a solid-state relay.

They are protected against environmental influences by RTIII (IP67). The relays also offer safe isolation according to DIN EN 50178 (VDE 0160).

PLC-INTERFACE is available in three connection technologies. Depending on the area of application, screw or Push-in connection can be selected.

In addition to the universal types, PLC-INTERFACE is also available in numerous special versions. These include:

– Sensor and actuator modules that can accommodate all connections directly on the interface
– Modules for high inrush or continuous currents
– Railway modules, which meet specific railway requirements
– Filter modules, which filter out interference on the input side

Plug-in bridges are available for all modules for simple potential distribution. In addition, solutions from system cabling applications offer easy connection to the plant control system. VARIOFACE adapters can be used to reduce wiring effort considerably. Installation is simplified significantly thanks to the integrated input and protective circuit.

Standard marking material for CLIPLINE complete terminal blocks can be used to mark PLC-INTERFACE.

Universal modules

PLC-R... and PLC-O... relay and solid-state relay modules with PDT or N/O contact, designed for universal use. Available in an overall width of 6.2 mm with one contact or in 14 mm with two contacts.

Available with either screw or Push-in connection.

Sensors/actuators

PLC...SEN and PLC...ACT offer space-saving sensor and actuator wiring without additional supply or output terminal blocks. The sensor or actuator connections are incorporated directly at the relay module.

Available with either screw or Push-in connection.

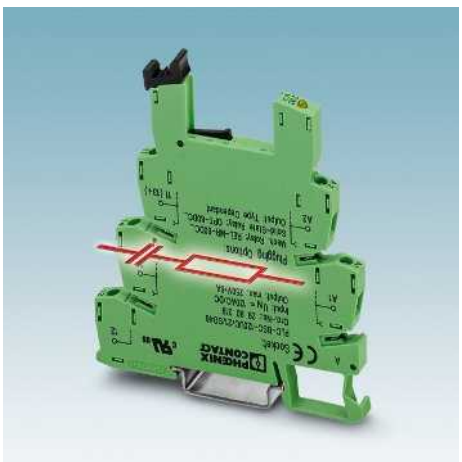
High currents

PLC...IC is particularly suitable for applications with high inrush currents, e.g. from lamp loads. The PLC...HC relay modules are designed for applications with high continuous currents.

Available with either screw or Push-in connection.

Railway applications

PLC...RW relay or solid-state relay modules are suitable for railway requirements. These cover, for example, the extended temperature and input voltage range of railway applications.



Interference signals on the input side

PLC-B...SO46 basic terminal blocks are used for filtering interference currents and interference voltages on the input side.

Available with either screw or Push-in connection.

Accessories

The entire PLC-INTERFACE system can be extended by a range of accessories such as power terminals, adapters for system cabling or plug-in bridges for potential distribution.

Highly compact relay modules - PLC-INTERFACE

Product overview

Highly compact relay modules - special versions and accessories

			Page	Web code
Actuator series		**PLC-R.../1/ACT** Assembled with a plug-in power contact relay	378	#0618
		PLC-R-.../1IC/ACT Assembled with a plug-in miniature relay for high inrush currents	386	
		PLC-O.../24DC/2/ACT Assembled with a plug-in solid-state power relay	380	
		PLC-OSC.../230AC/1/ACT Assembled with a plug-in solid-state power relay	381	
Sensor series		**PLC-R.../1AU/SEN** Assembled with a plug-in relay for small switching capacities, with gold-plated multi-layer contact	384	#0617
		PLC-O.../48DC/100/SEN Assembled with a plug-in solid-state input relay	385	
Filter series		**PLC-B...UC/21/SO46** For assembly with electromechanical or solid-state relays	388	#0689
		PLC-B...UC/1/SEN/SO46 For assembly with electromechanical or solid-state relays	389	
		PLC-BSC...UC/21-21/SO46 For assembly with relays	389	
		PLC-BSC...UC/21/HC/SO46 For assembly with relays	389	
Switch modules		**PLC-RS...-24UC/1/S...** Relay and switch integrated	404	#0898
		PLC-S...-S/... Switch integrated	405	
Solid-state relays		**PLC-O.../24DC/...** Optocoupler modules for universal use	376	#0899
		PLC-O.../230AC/... Switching capacity up to 230 V AC and 2.4 A in 6.2 mm	408	
		PLC-O.../300DC/... DC voltage output up to 300 V DC	406	
Ex relays		**PLC-R.../21/EX** 1 changeover contact with power contact	458	#0690
		PLC-R.../21-21/EX 2 changeover contacts with power contact	458	
		PLC-R.../21/HC/EX 1 changeover contact up to 10 A	459	
		PLC-O...C1D2 DC voltage output	459	

Hybrid solid-state relays	PLC-INTERFACE for railway applications	PLC-INTERFACE for high inrush currents	Reversing load relays
PLC-H...24DC/230AC/10 Hybrid solid-state relay with AC voltage output, max. 10 A **Page: 409** **Web code: #0691**	**PLC…/RW** Relay modules with extended input voltage and temperature range, specifically designed for use in railway applications **Page: 415** **Web code: #0900**	**PLC...1IC/ACT** Max. switch-on current of 130 A, suitable for capacitive loads, available with screw and Push-in connection technology **Page: 386** **Web code: #0901**	**PLC-S...-ELR W 1/2-24DC** Electronic reversing load relay for motors up to 24 V DC/2 A **Page: 421** **Web code: #0693**

Accessories

Web code: #0692
Page: 424

	Continuous plug-in bridge 500 mm long, insulated, can be cut to length, for potential distribution with PLC-INTERFACE	**Plug-in bridge** 2-pos., 6 mm long, bridges potentials of neighboring PLC-INTERFACEs	**Plug-in bridge** 2-pos., 8 mm long, bridges potentials of neighboring PLC-INTERFACEs with partition plate
Plug-in bridge 2-pos., for connecting adjacent connections on a 14 mm PLC-INTERFACE	**Partition plate** 2 mm thick, required at the start and end of every PLC terminal strip	**Passive feed-through bridge** Can be inserted instead of a relay or solid-state relay, bridges terminal points A1 and 14	**Power terminal** For supplying up to four potentials

Logic modules

Web code: #0694
Page: 428

	PLC-V8C…/SAM **Stand-alone module** With 16 I/Os, cannot be extended, connection to PC via micro USB socket. Integrated real-time clock, accommodates external IFS-CONFSTICK memory module.	**PLC-V8C…/BM** **Basic module** With 16 I/Os, can be extended up to a maximum of 48 I/Os. Connection to PC via micro USB socket. Integrated real-time clock. Accommodates external IFS-CONFSTICK memory module. Optional connection to IFS gateways.	**PLC-V8C…/EM** **Extension module** With 16 I/Os, for extending the basic module. A maximum of two extension modules can be connected to each basic module.

System cabling adapters for PLC-INTERFACE

Web code: #0897
Page: 425

	PLC-V8/FLK14… For 6.2 mm relay, with 14-pos. IDC/FLK pin strip, module width 49.6 mm	**PLC-V8/D15S/…** For 6.2 mm relay, with 15-pos. D-SUB socket strip, module width 49.6 mm	**PLC-V8L/FLK14/…** For 14 mm relay, with 14-pos. IDC/FLK pin strip, module width 112.3 mm

Universal PLC series with PDT relay

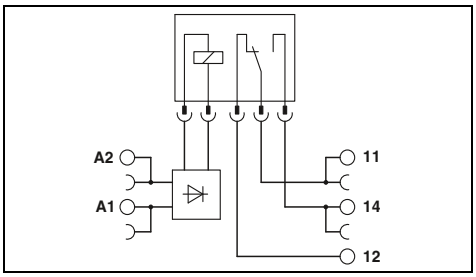
PLC-R... is the relay series that can be used universally and consists of basic terminal blocks and plug-in relays with PDT contacts.

The advantages:

– Slim design
– Screw and Push-in connection technology
– Functional plug-in bridges
– Integrated input and interference suppression circuit
– High degree of protection, RT III (wash-proof), or RT II for 1-PDT relay with manual operation
– Safe isolation according to DIN EN 50178 between coil and contact
– Efficient connection to system cabling using V8 adapter

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
For diagrams of operating voltage ranges, see page 397
Note: for marking material (ZB 6), see “CLIPLINE industrial connection technology, marking material for terminals, conductors, and cables”.
Inflammability class V0 (UL 94)
[1]) 120 and 230 V types up to 55 °C

1-PDT relay module, 6 A, maximum



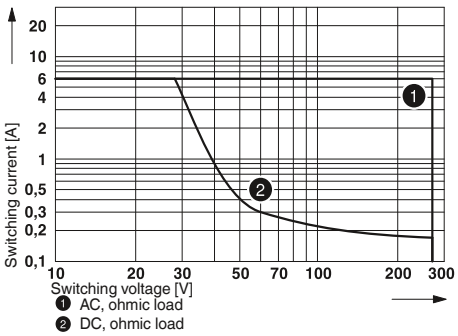
Technical data

Input data		①	②	③	④	⑤	⑥	⑦
Typical input current at U_N	[mA]	15.3	9	11	9.2	4.8	3.5	3.2
Response/release time at U_N	[ms]	5 / 8	5 / 8	6 / 15	5 / 8	5 / 8	6 / 15	7 / 15
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode						
Input circuit AC/DC		Yellow LED, bridge rectifier						
Output data								
Contact material		AgSnO						
Max. switching voltage		250 V AC/DC						
Minimum switching voltage		5 V (at 100 mA)						
Limiting continuous current		6 A						
Maximum switch-on current		10 A (4 s)						
Minimum switching current		10 mA (at 12 V)						
General data								
Test voltage input/output		4 kV AC (50 Hz, 1 min.)						
Ambient temperature (operation)		-40 °C ... 60 °C[1])						
Mechanical service life		2 x 10^7 cycles						
Standards/regulations		IEC 60664 , EN 50178						
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14						
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm						
EMC note		Class A product, see page 605						

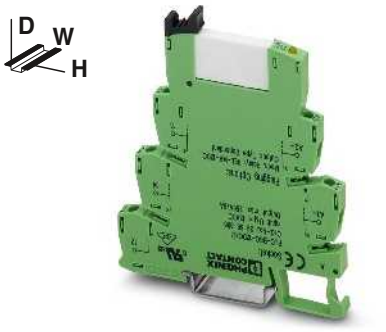
Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	12 V DC	**PLC-RSC- 12DC/21**	2966906	10
②	24 V DC	**PLC-RSC- 24DC/21**	2966171	10
③	24 V AC/DC	**PLC-RSC- 24UC/21**	2966184	10
④	48 V DC	**PLC-RSC- 48DC/21**	2966113	10
⑤	60 V DC	**PLC-RSC- 60DC/21**	2966139	10
⑥	120 V AC / 110 V DC	**PLC-RSC-120UC/21**	2966197	10
⑦	230 V AC / 220 V DC	**PLC-RSC-230UC/21**	2966207	10
PLC-INTERFACE, with **Push-in connection**				
①	12 V DC	**PLC-RPT- 12DC/21**	2900316	10
②	24 V DC	**PLC-RPT- 24DC/21**	2900299	10
③	24 V AC/DC	**PLC-RPT- 24UC/21**	2900300	10
④	48 V DC	**PLC-RPT- 48DC/21**	2900301	10
⑤	60 V DC	**PLC-RPT- 60DC/21**	2900303	10
⑥	120 V AC / 110 V DC	**PLC-RPT-120UC/21**	2900304	10
⑦	230 V AC / 220 V DC	**PLC-RPT-230UC/21**	2900305	10

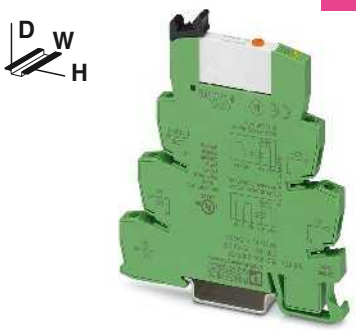
Electrical interrupting rating for PLC...21 with 1-PDT relay



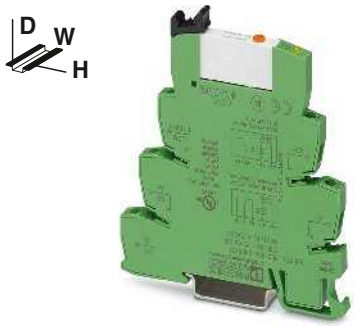
new



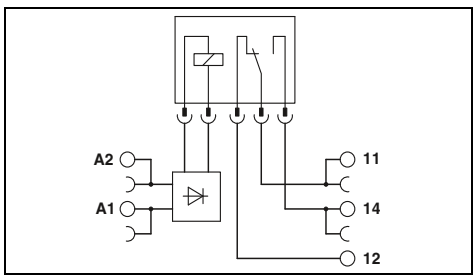
1-PDT relay module, 50 mA, maximum

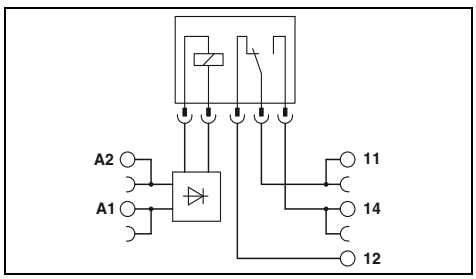


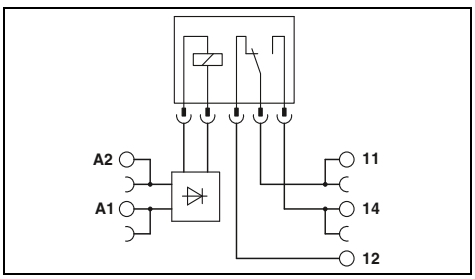
1-PDT relay module with manual operation, max. 6 A



1-PDT relay module with manual operation, max. 50 mA







Technical data

①	②	③	④	⑤	⑥	⑦
15.3	9	11	9.2	4.8	3.5	3.2
5 / 8	5 / 8	6 / 15	5 / 8	5 / 8	6 / 15	7 / 15

Yellow LED, reverse polarity protection, freewheeling diode
Yellow LED, bridge rectifier

AgSnO, hard gold-plated
30 V AC / 36 V DC
100 mV (at 10 mA)
50 mA
50 mA
1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.)
-40 °C ... 60 °C[1])
2 x 10^7 cycles
IEC 60664 , EN 50178
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
6.2 mm / 80 mm / 94 mm
Class A product, see page 605

Technical data

①	②	③	⑥	⑦
15.3	9	11	3.5	3.2
5 / 8	5 / 8	6 / 15	6 / 15	7 / 15

Yellow LED
Yellow LED, bridge rectifier

AgSnO
250 V AC/DC
5 V (at 100 mA)
6 A
10 A (4 s)
10 mA (at 12 V)

4 kV AC (50 Hz, 1 min.)
-40 °C ... 60 °C
1 x 10^7 cycles
IEC 60664 , EN 50178
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
6.2 mm / 80 mm / 94 mm
Class A product, see page 605

Technical data

①	②	③	⑥	⑦
15.3	9	11	3.5	3.2
5 / 8	5 / 8	6 / 15	6 / 15	7 / 15

Yellow LED, reverse polarity protection, freewheeling diode
Yellow LED, bridge rectifier

AgSnO, hard gold-plated
30 V AC / 36 V DC
100 mV (at 10 mA)
50 mA
50 mA
1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.)
-40 °C ... 60 °C
2 x 10^7 cycles
IEC 60664 , EN 50178
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
6.2 mm / 80 mm / 94 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 12DC/21AU	2966919	10
PLC-RSC- 24DC/21AU	2966265	10
PLC-RSC- 24UC/21AU	2966278	10
PLC-RSC- 48DC/21AU	2966126	10
PLC-RSC- 60DC/21AU	2966142	10
PLC-RSC-120UC/21AU	2966281	10
PLC-RSC-230UC/21AU	2966294	10
PLC-RPT- 12DC/21AU	2900317	10
PLC-RPT- 24DC/21AU	2900306	10
PLC-RPT- 24UC/21AU	2900307	10
PLC-RPT- 48DC/21AU	2900308	10
PLC-RPT- 60DC/21AU	2900309	10
PLC-RPT-120UC/21AU	2900310	10
PLC-RPT-230UC/21AU	2900311	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 12DC/21/MS	2909648	10
PLC-RSC- 24DC/21/MS	2909649	10
PLC-RSC- 24UC/21/MS	2909650	10
PLC-RSC-120UC/21/MS	2909651	10
PLC-RSC-230UC/21/MS	2909653	10
PLC-RPT- 12DC/21/MS	2909666	10
PLC-RPT- 24DC/21/MS	2909667	10
PLC-RPT- 24UC/21/MS	2909668	10
PLC-RPT-120UC/21/MS	2909669	10
PLC-RPT-230UC/21/MS	2909670	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 12DC/21AU/MS	2909654	10
PLC-RSC- 24DC/21AU/MS	2909655	10
PLC-RSC- 24UC/21AU/MS	2909656	10
PLC-RSC-120UC/21AU/MS	2909657	10
PLC-RSC-230UC/21AU/MS	2909660	10
PLC-RPT- 12DC/21AU/MS	2909671	10
PLC-RPT- 24DC/21AU/MS	2909672	10
PLC-RPT- 24UC/21AU/MS	2909673	10
PLC-RPT-120UC/21AU/MS	2909674	10
PLC-RPT-230UC/21AU/MS	2909676	10

Universal PLC series with PDT relay

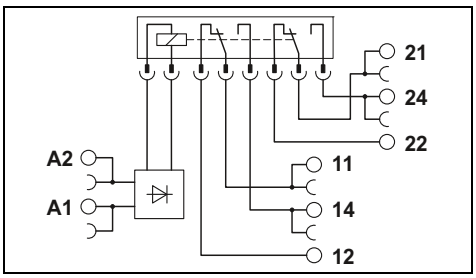
PLC-R... is the relay series that can be used universally and consists of basic terminal blocks and plug-in relays with PDT contacts.

The advantages:

– Slim design
– Screw and Push-in connection technology
– Functional plug-in bridges
– Integrated input and interference suppression circuit
– RT III sealed relay
– Safe isolation according to DIN EN 50178 between coil and contact
– Efficient connection to system cabling using V8 adapter

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397
Note: for marking material (ZB 6), see “CLIPLINE industrial connection technology, marking material for terminals, conductors, and cables”.
Inflammability class V0 (UL 94)
1) 230 V types up to 55 °C
2) If the specified maximum values are exceeded for multi-layer contact relays, the gold layer will be destroyed. During further use, the maximum values of the power contact relays apply. This may then result in a shorter service life than a dedicated power contact.

2-PDT relay module, 2 x 6 A, maximum



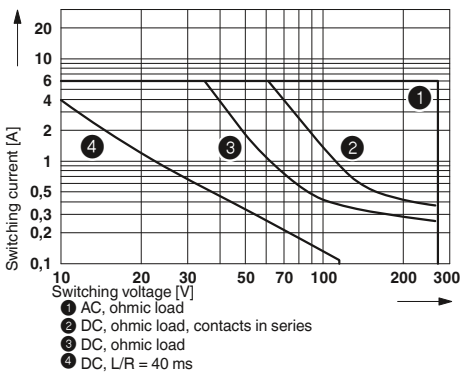
Technical data

Input data		①	②	③	④	⑤	⑥	⑦
Typical input current at U_N	[mA]	33	18	17.5	20	10	4.5	4.5
Response/release time at U_N	[ms]	8 / 10	8 / 10	8 / 10	8 / 10	8 / 10	7 / 10	7 / 10
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode						
Input circuit AC/DC		Yellow LED, bridge rectifier						
Output data								
Contact material		AgNi						
Max. switching voltage		250 V AC/DC						
Minimum switching voltage		5 V AC/DC (at 10 mA)						
Limiting continuous current		6 A						
Maximum switch-on current		15 A (300 ms)						
Minimum switching current		10 mA (At 5 V)						
General data								
Test voltage input/output		4 kV AC (50 Hz, 1 min.)						
Ambient temperature (operation)		-40 °C ... 60 °C1)						
Mechanical service life		3 x 10^7 cycles						
Standards/regulations		IEC 60664 , EN 50178						
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14						
Dimensions	W / H / D	14 mm / 80 mm / 94 mm						
EMC note		Class A product, see page 605						

Ordering data

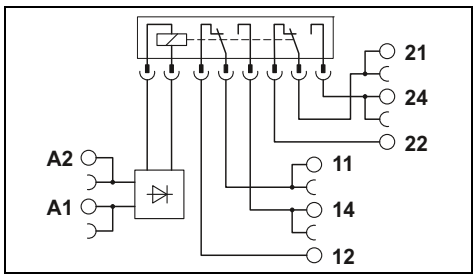
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	12 V DC	**PLC-RSC- 12DC/21-21**	2967235	10
②	24 V DC	**PLC-RSC- 24DC/21-21**	2967060	10
③	24 V AC/DC	**PLC-RSC- 24UC/21-21**	2967073	10
④	48 V DC	**PLC-RSC- 48DC/21-21**	2967248	10
⑤	60 V DC	**PLC-RSC- 60DC/21-21**	2967293	10
⑥	120 V AC / 110 V DC	**PLC-RSC-120UC/21-21**	2967086	10
⑦	230 V AC / 220 V DC	**PLC-RSC-230UC/21-21**	2967099	10
PLC-INTERFACE, with **Push-in connection**				
①	12 V DC	**PLC-RPT- 12DC/21-21**	2900329	10
②	24 V DC	**PLC-RPT- 24DC/21-21**	2900330	10
③	24 V AC/DC	**PLC-RPT- 24UC/21-21**	2900332	10
④	48 V DC	**PLC-RPT- 48DC/21-21**	2900333	10
⑤	60 V DC	**PLC-RPT- 60DC/21-21**	2900334	10
⑥	120 V AC / 110 V DC	**PLC-RPT-120UC/21-21**	2900335	10
⑦	230 V AC / 220 V DC	**PLC-RPT-230UC/21-21**	2900336	10

Electrical interrupting rating for PLC...21-21 with 2-PDT relay



❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

**2-PDT relay module,
2 x 50 mA, maximum**



Technical data

①	②	③	④	⑤	⑥	⑦
33	18	17.5	20	10	4.5	4.5
8 / 10	8 / 10	8 / 10	8 / 10	8 / 10	7 / 10	7 / 10

Yellow LED, reverse polarity protection, freewheeling diode
Yellow LED, bridge rectifier

AgNi, hard gold-plated
30 V AC / 36 V DC
100 mV (at 10 mA)
50 mA[2])
50 mA[2])
1 mA (at 24 V)

4 kV AC (50 Hz, 1 min.)
-40 °C ... 60 °C[1])
3 x 10^7 cycles
IEC 60664 , EN 50178
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
14 mm / 80 mm / 94 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 12DC/21-21AU	**2967277**	10
PLC-RSC- 24DC/21-21AU	**2967125**	10
PLC-RSC- 24UC/21-21AU	**2967112**	10
PLC-RSC- 48DC/21-21AU	**2967280**	10
PLC-RSC- 60DC/21-21AU	**2967303**	10
PLC-RSC-120UC/21-21AU	**2967138**	10
PLC-RSC-230UC/21-21AU	**2967141**	10
PLC-RPT- 12DC/21-21AU	**2900337**	10
PLC-RPT- 24DC/21-21AU	**2900338**	10
PLC-RPT- 24UC/21-21AU	**2900339**	10
PLC-RPT- 48DC/21-21AU	**2900340**	10
PLC-RPT- 60DC/21-21AU	**2900341**	10
PLC-RPT-120UC/21-21AU	**2900342**	10
PLC-RPT-230UC/21-21AU	**2900343**	10

Universal PLC series with solid-state relays

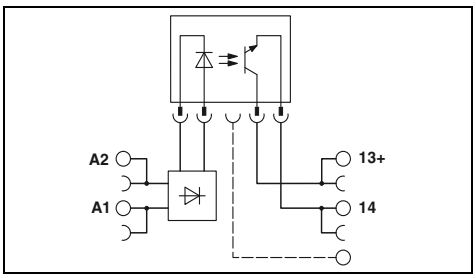
PLC-O... is the solid-state relay series that can be used universally comprising basic terminal blocks and plug-in solid-state relays.

The advantages:

– Slim design
– Screw and Push-in connection technology
– Functional plug-in bridges
– Integrated input circuit
– RT-III sealed solid-state relays
– High switching capacity
– Zero voltage switch at AC output
– Efficient connection to system cabling using V8 adapter

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For derating curves see page 399

Solid-state relay module, DC output max. 100 mA



Technical data

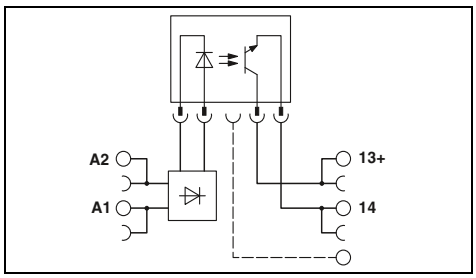
Input data		①	②	③	④	⑤	⑥
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.1	0.9 - 1.1	0.9 - 1.1
Switching level (with reference to U_N)	1 signal ("H")	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.9	≥ 0.8
	0 signal ("L")	≤ 0.4	≤ 0.3	≤ 0.4	≤ 0.4	≤ 0.3	≤ 0.3
Typical input current at U_N	[mA]	8.5	9	5	3	3.5	3.5
Typical switch-on time at U_N	[ms]	0.02	0.03	0.04	1	3	3
Typical switch-off time at U_N	[ms]	0.3	0.3	2	3	4	5
Transmission frequency f_{limit}	[Hz]	300	300	100	50	10	10
Input circuit DC		Yellow LED, reverse polarity protection , freewheeling diode					
Input circuit AC/DC		Yellow LED, bridge rectifier					
Output data							
Max. switching voltage		48 V DC					
Minimum switching voltage		3 V DC					
Maximum switch-on current		-					
Minimum/maximum switching current		- / 100 mA					
Output protection		Reverse polarity protection, surge protection					
Voltage drop at maximum limiting continuous current		≤ 1 V					
Leakage current in off state		-					
Max. load value		-					
General data							
Test voltage input/output		2.5 kV (50 Hz, 1 min.)					
Ambient temperature (operation)		-25 °C ... 60 °C					
Standards/regulations		IEC 60664 , EN 50178					
Degree of pollution/surge voltage category		2 / III					
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14					
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm					
EMC note		Class A product, see page 605					

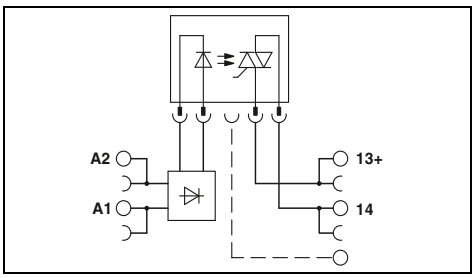
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**					
	①	24 V DC	**PLC-OSC- 24DC/ 48DC/100**	2966728	10
	②	48 V DC	**PLC-OSC- 48DC/ 48DC/100**	2966993	10
	③	60 V DC	**PLC-OSC- 60DC/ 48DC/100**	2967455	10
	④	125 V DC	**PLC-OSC-125DC/ 48DC/100**	2980047	10
	⑤	120 V AC / 110 V DC	**PLC-OSC-120UC/ 48DC/100**	2966744	10
	⑥	230 V AC / 220 V DC	**PLC-OSC-230UC/ 48DC/100**	2966757	10
PLC-INTERFACE, with **Push-in connection**					
	①	24 V DC	**PLC-OPT- 24DC/ 48DC/100**	2900352	10
	②	48 V DC	**PLC-OPT- 48DC/ 48DC/100**	2900353	10
	③	60 V DC	**PLC-OPT- 60DC/ 48DC/100**	2900354	10
	⑤	120 V AC / 110 V DC	**PLC-OPT-120UC/ 48DC/100**	2900355	10
	⑥	230 V AC / 220 V DC	**PLC-OPT-230UC/ 48DC/100**	2900356	10

**Solid-state relay module,
DC output max. 3 A**

**Solid-state relay module,
AC output max. 750 mA**





Technical data

①	②	③	④	⑤	⑥
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.1	0.9 - 1.1	0.9 - 1.1
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.3
8.5	9	5	3	3.5	3.5
0.02	0.03	0.04	0.04	3.5	4
0.3	0.3	0.5	0.6	7	7
300	300	100	100	10	10

Yellow LED, reverse polarity protection , freewheeling diode
Yellow LED, bridge rectifier

33 V DC
3 V DC
15 A (10 ms)
- / 3 A (see derating curve)
Reverse polarity protection, surge protection
≤ 200 mV

-
-

2.5 kV (50 Hz, 1 min.)
-25 °C ... 60 °C
IEC 60664 , EN 50178
2 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
6.2 mm / 80 mm / 94 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 24DC/ 2	2966634	10
PLC-OSC- 48DC/ 24DC/ 2	2967002	10
PLC-OSC- 60DC/ 24DC/ 2	2967468	10
PLC-OSC-125DC/ 24DC/ 2	2980050	10
PLC-OSC-120UC/ 24DC/ 2	2966650	10
PLC-OSC-230UC/ 24DC/ 2	2966663	10
PLC-OPT- 24DC/ 24DC/2	2900364	10
PLC-OPT- 48DC/ 24DC/2	2900365	10
PLC-OPT- 60DC/ 24DC/2	2900366	10
PLC-OPT-120UC/ 24DC/2	2900367	10
PLC-OPT-230UC/ 24DC/2	2900368	10

Technical data

①	②	③	④	⑤	⑥
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.1	0.9 - 1.1	0.8 - 1.1
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.25	≤ 0.25
8	9	6	3.5	4	3.5
10	10	10	10	10	10
10	10	10	10	10	10
10	10	10	10	3	3

Yellow LED, reverse polarity protection, freewheeling diode
Yellow LED, bridge rectifier

253 V AC
24 V AC
30 A (10 ms)
10 mA / 0.75 A (see derating curve)
RCV circuit
< 1 V

< 1 mA (in off state)
4.5 A²s

2.5 kV (50 Hz, 1 min.)
-25 °C ... 60 °C
IEC 60664 , EN 50178
2 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
6.2 mm / 80 mm / 94 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/230AC/ 1	2967840	10
PLC-OSC- 48DC/230AC/ 1	2967853	10
PLC-OSC- 60DC/230AC/ 1	2967866	10
PLC-OSC-125DC/230AC/ 1	2980063	10
PLC-OSC-120UC/230AC/ 1	2967879	10
PLC-OSC-230UC/230AC/ 1	2967882	10
PLC-OPT- 24DC/230AC/1	2900369	10
PLC-OPT- 48DC/230AC/1	2900370	10
PLC-OPT- 60DC/230AC/1	2900371	10
PLC-OPT-120UC/230AC/1	2900372	10
PLC-OPT-230UC/230AC/1	2900374	10

Highly compact relay modules - PLC-INTERFACE

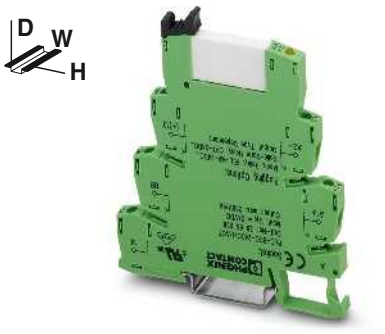
PLC actuator series for output functions

The PLC actuator series couples controllers and actuators such as motors, contactors, and valves.

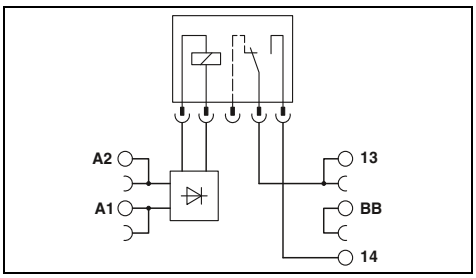
The advantages:

– Direct connection of actuator to relay module including load return line
– No need for additional terminal blocks
– Space savings of up to 80%
– Time savings of up to 60%
– Screw and Push-in connection technology
– Relay modules with safe isolation according to DIN EN 50178 between coil and contact
– Functional plug-in bridges
– Efficient connection to system cabling using V8 adapter

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397
For derating curves see page 399



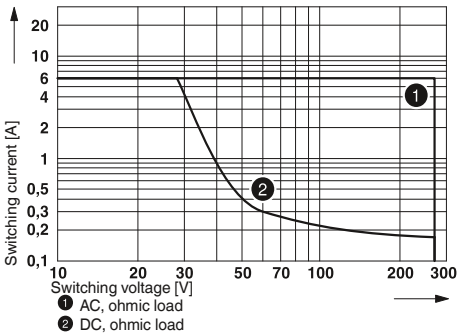
1-N/O relay module with additional floating terminal point



Technical data

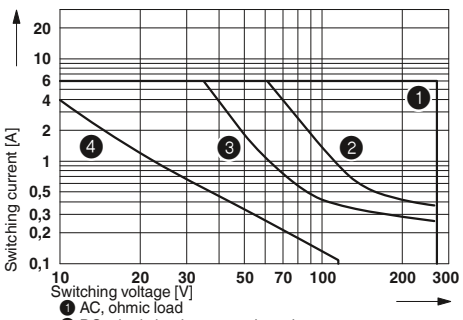
Input data		①
Permissible range (with reference to U_N)		See diagram
Typical input current at U_N	[mA]	9
Typical response time/switch-on time at U_N	[ms]	5
Typical release time/switch-off time at UN	[ms]	8
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Contact material		AgSnO
Max. switching voltage		250 V AC/DC
Minimum switching voltage		5 V (at 100 mA)
Limiting continuous current		6 A
Maximum switch-on current		10 A (4 s)
Minimum switching current		10 mA (at 12 V)
General data		
Test voltage input/output		4 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-40 °C ... 60 °C
Mechanical service life		2 x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		3 / III
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm
EMC note		Class A product, see page 605

Electrical interrupting rating for PLC...24DC/1/ACT with 1-N/O relay



❶ AC, ohmic load
❷ DC, ohmic load

Electrical interrupting rating for PLC...24DC/1-1/ACT with 2-N/O relay



❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

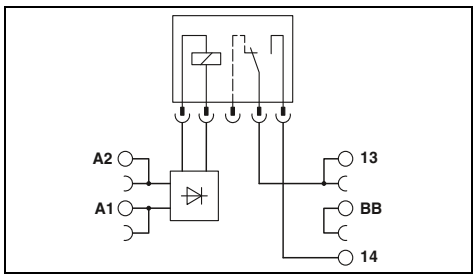
Ordering data

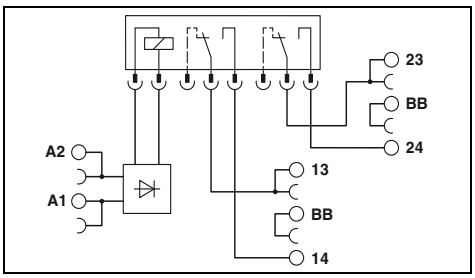
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V DC	**PLC-RSC- 24DC/ 1/ACT**	2966210	10
PLC-INTERFACE, with **Push-in connection**				
①	24 V DC	**PLC-RPT- 24DC/ 1/ACT**	2900312	10

new

1-N/O relay module with manual operation and additional floating terminal point

2-N/O relay module with additional floating terminal points





Technical data

①	
See diagram	
9	
5	
8	
Yellow LED, reverse polarity protection, freewheeling diode	
AgSnO	
250 V AC/DC	
5 V (at 100 mA)	
6 A	
10 A (4 s)	
10 mA (at 12 V)	
4 kV AC (50 Hz, 1 min.)	
-40 °C ... 60 °C	
1 x 10^7 cycles	
IEC 60664 , EN 50178	
3 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 24DC/ 1/MS/ACT	2909661	10
PLC-RPT- 24DC/ 1/MS/ACT	2909677	10

Technical data

①	
See diagram	
18	
8	
10	
Yellow LED, reverse polarity protection, freewheeling diode	
AgNi	
250 V AC/DC	
5 V AC/DC	
6 A	
8 A	
10 mA	
4 kV AC (50 Hz, 1 min.)	
-40 °C ... 60 °C	
3 x 10^7 cycles	
IEC 60664 , EN 50178	
3 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
14 mm / 80 mm / 94 mm	
Class A product, see page 605	

Ordering data

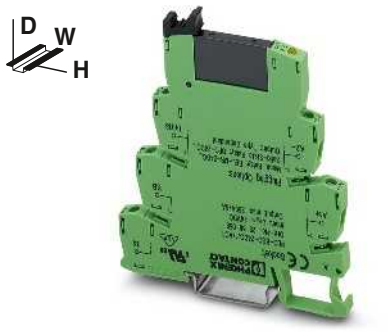
Type	Order No.	Pcs./ Pkt.
PLC-RSC- 24DC/ 1- 1/ACT	2967109	10

PLC actuator series for output functions

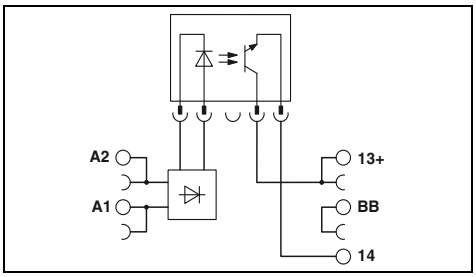
The PLC actuator series couples controllers and actuators such as motors, contactors, and valves.

The advantages:

– Direct connection of actuator to relay module including load return line
– No need for additional terminal blocks
– Space savings of up to 80%
– Time savings of up to 60%
– Screw and Push-in connection technology
– Relay modules with safe isolation according to DIN EN 50178 between coil and contact
– Functional plug-in bridges
– Efficient connection to system cabling using V8 adapter



Solid-state relay module with additional floating terminal point, DC output max. 3 A

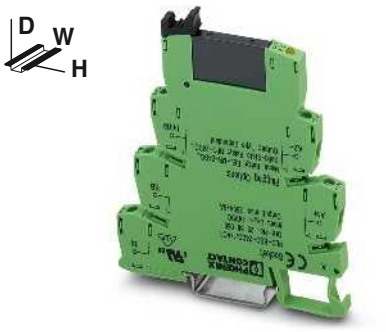


Technical data

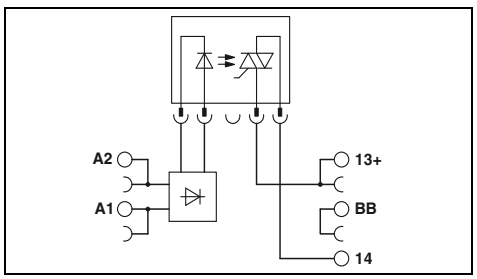
Input data		①	②
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2
Switching level (with reference to U_N)	1 signal ("H")	≥ 0.8	≥ 0.8
	0 signal ("L")	≤ 0.25	≤ 0.4
Typical input current at U_N	[mA]	9.5	8.5
Typical response time/switch-on time at U_N	[ms]	0.02	0.02
Typical release time/switch-off time at UN	[ms]	0.3	0.3
Transmission frequency f_{limit}	[Hz]	300	300
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode	
Output data			
Max. switching voltage		33 V DC	
Minimum switching voltage		3 V DC	
Limiting continuous current		3 A (see derating curve)	
Maximum switch-on current		15 A (10 ms)	
Minimum switching current		-	
Output protection		Reverse polarity protection, surge protection	
Voltage drop at maximum limiting continuous current		≤ 200 mV	
Leakage current in off state		-	
Phase angle (cos ϕ)		-	
Max. load value		-	
General data			
Test voltage input/output		2.5 kV (50 Hz, 1 min.)	
Ambient temperature (operation)		-25 °C ... 60 °C	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution/surge voltage category		2 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	5 V DC	**PLC-OSC- 5DC/ 24DC/ 2/ACT**	2980144	10
②	24 V DC	**PLC-OSC- 24DC/ 24DC/ 2/ACT**	2966676	10
PLC-INTERFACE, with **Push-in connection**				
①	5 V DC	**PLC-OPT- 5DC/ 24DC/2/ACT**	2900375	10
②	24 V DC	**PLC-OPT- 24DC/ 24DC/2/ACT**	2900376	10



Solid-state relay module with additional floating terminal point, AC output max. 750 mA



Technical data

	②
	0.8 -
	1.2
	≥ 0.8
	≤ 0.25
	9
	3
	9
	10
	Yellow LED, reverse polarity protection, freewheeling diode
	253 V AC
	24 V AC
	0.75 A (see derating curve)
	30 A (10 ms)
	10 mA
	RCV circuit
	< 1 V
	< 1 mA (in off state)
	0.5
	4.5 A^2s
	2.5 kV (50 Hz, 1 min.)
	-25 °C ... 60 °C
	IEC 60664 , EN 50178
	2 / III
	0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
	6.2 mm / 80 mm / 94 mm
	Class A product, see page 605

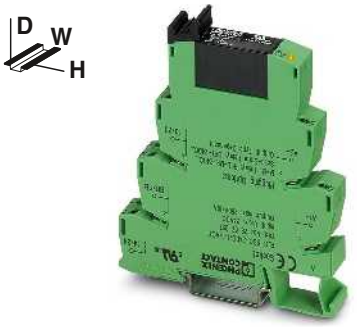
Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/230AC/ 1/ACT	2967947	10

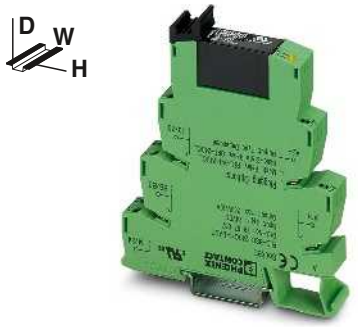
PLC actuator series for output functions

PLC actuator series with solid-state power relays for coupling the controller and actuators, such as motors, contactors, valves, etc.

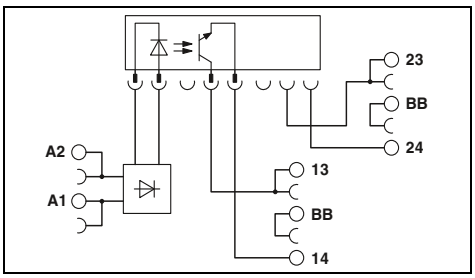
Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For derating curves see page 399

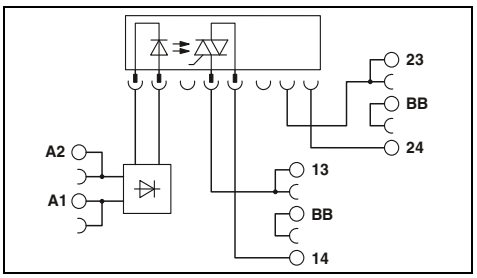


Solid-state relay module with additional floating terminal point, DC output max. 5 A



Solid-state relay module with additional floating terminal point, AC output max. 2 A





Technical data

Input data		①
Permissible range (with reference to U_N)		0.8 - 1.2
Switching level (with reference to U_N)	1 signal ("H") 0 signal ("L")	≥ 0.8 ≤ 0.4
Typical input current at U_N	[mA]	9
Typical switch-on time at U_N	[ms]	0.02
Typical switch-off time at U_N	[ms]	0.4
Transmission frequency f_{limit}	[Hz]	300
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Maximum/minimum switching voltage		33 V DC / 3 V DC
Maximum switch-on current		15 A (10 ms)
Minimum/maximum switching current		- / 5 A (see derating curve)
Output protection		Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		≤ 200 mV
Leakage current in off state		-
Phase angle (cos ϕ)		-
Max. load value		-
General data		
Rated insulation voltage		-
Rated surge voltage		Basic insulation
Ambient temperature (operation)		-20 °C ... 60 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		see derating / In rows with zero spacing
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	14 mm / 80 mm / 94 mm
EMC note		Class A product, see page 605

Technical data

Input data		①
Permissible range (with reference to U_N)		0.8 - 1.2
Switching level (with reference to U_N)	1 signal ("H") 0 signal ("L")	≥ 0.8 ≤ 0.4
Typical input current at U_N	[mA]	9
Typical switch-on time at U_N	[ms]	10
Typical switch-off time at U_N	[ms]	10
Transmission frequency f_{limit}	[Hz]	10
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Maximum/minimum switching voltage		253 V AC / 24 V AC
Maximum switch-on current		30 A (10 ms)
Minimum/maximum switching current		25 mA / 2 A (see derating curve)
Output protection		Surge protection
Voltage drop at maximum limiting continuous current		≤ 1 V
Leakage current in off state		typ. 1 mA
Phase angle (cos ϕ)		0.5
Max. load value		4 A²s (tp = 10 ms, at 25 °C)
General data		
Rated insulation voltage		-
Rated surge voltage		Basic insulation
Ambient temperature (operation)		-20 °C ... 60 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		see derating / In rows with zero spacing
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	14 mm / 80 mm / 94 mm
EMC note		Class A product, see page 605

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V DC	**PLC-OSC- 24DC/ 24DC/ 5/ACT**	2982786	10

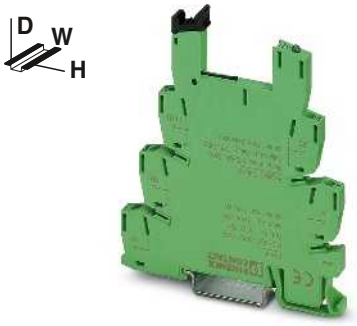
Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/230AC/ 2/ACT	2982760	10

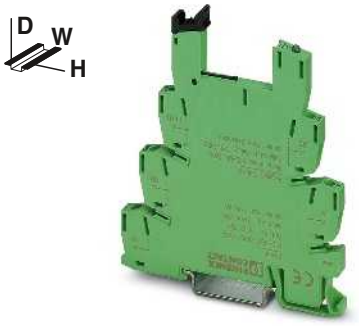
PLC actuator series for output functions

PLC actuator basic terminal blocks that can be fitted with a mechanical or solid-state relay. For coupling the controller and actuators, such as motors, contactors, valves, etc.

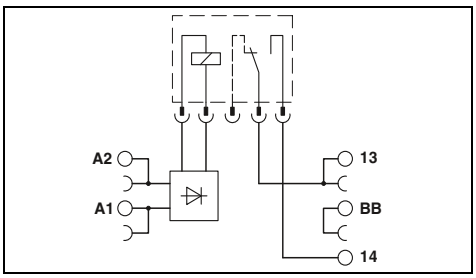
Notes:
Maximum interrupting rating diagrams, see page 400
For derating curves see page 399
When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

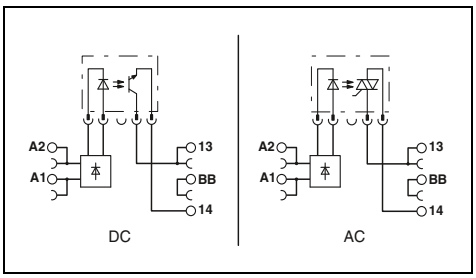


Basic terminal block with additional floating terminal point for assembly with relay



Basic terminal block with additional floating terminal point for assembly with solid-state relay





Technical data

Input data			
Permissible range (with reference to U_N)	0.8 ... 1.2		
Typical input current at U_N (50/60 Hz)	15.6 mA / 8.5 mA		
Typical response time at U_N	5 ms		
Typical release time at U_N	30 ms		
Input circuit	Yellow LED , Bridge rectifier		
Output data with:	REL-MR-24DC/21AU	REL-MR-24DC/21	
Contact type	Single contact, 1 N/O contact	Single contact, 1 N/O contact	
Contact material	AgSnO, hard gold-plated	AgSnO	
Max. switching voltage	30 V AC / 36 V DC	250 V AC/DC	
Minimum switching voltage	100 mV (at 10 mA)	5 V (at 100 mA)	
Limiting continuous current	50 mA	6 A	
Minimum switching current	1 mA (at 24 V)	10 mA (at 12 V)	
Output protection	-	-	
Voltage drop at limiting continuous current	-	-	
Leakage current in off state	-	-	
Max. load value I^2 x t (t = 10 ms)	-	-	
General data			
Rated insulation voltage	250 V AC		
Rated surge voltage/insulation	6 kV / Safe isolation, increased insulation		
Ambient temperature (operation)	-20 °C ... 60 °C		
Air clearances and creepage distances	EN 50178		
Degree of pollution / Overvoltage category	2 / III		
Connection data solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14		
Dimensions W / H / D	6.2 mm / 80 mm / 94 mm		

Technical data

Input data			
Permissible range (with reference to U_N)	0.8 ... 1.2		
Typical input current at U_N (50/60 Hz)	15 mA / 8.3 mA		
Typical response time at U_N	10 ms		
Typical release time at U_N	20 ms		
Input circuit	Yellow LED , Bridge rectifier		
Output data with:	OPT...48DC/...	OPT...24DC/...	OPT...230AC/...
Contact type	-	-	-
Contact material	-	-	-
Max. switching voltage	48 V DC	33 V DC	253 V AC
Minimum switching voltage	3 V DC	3 V DC	24 V AC
Limiting continuous current	100 mA	3 A (see derating curve)	0.75 A (see derating curve)
Minimum switching current			-
Output protection	Reverse polarity protection, surge protection	Reverse polarity protection, surge protection	RCV circuit
Voltage drop at limiting continuous current	≤ 1 V	≤ 150 mV	≤ 1 V
Leakage current in off state	-	-	≤ 1 mA
Max. load value I^2 x t (t = 10 ms)	-	-	4.5 A^2s (tp = 10 ms, at 25 °C)
General data			
Rated insulation voltage	250 V AC		
Rated surge voltage/insulation	6 kV / Safe isolation, increased insulation		
Ambient temperature (operation)	-20 °C ... 60 °C		
Air clearances and creepage distances	EN 50178		
Degree of pollution / Overvoltage category	2 / III		
Connection data solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14		
Dimensions W / H / D	6.2 mm / 80 mm / 94 mm		

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**	24 V AC/DC	**PLC-BSC- 24UC/ 1/ACT**	2982799	10
PLC-INTERFACE, **with Push-in connection**	24 V AC/DC	**PLC-BPT- 24UC/ 1/ACT**	2900450	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-BSC- 24UC/ 1/ACT	2982799	10
PLC-BPT- 24UC/ 1/ACT	2900450	10

Accessories

Plug-in miniature power relays, with multi-layer gold contacts			
	REL-MR- 24DC/21AU	2961121	10
	REL-MR- 24DC/21	2961105	10
Plug-in solid-state relays			
Solid-state input relays			
Solid-state power relays			
Solid-state power relays			

Accessories

	OPT-24DC/ 48DC/100	2966618	10
	OPT-24DC/ 24DC/ 2	2966595	10
	OPT-24DC/230AC/ 1	2967950	10

Highly compact relay modules - PLC-INTERFACE

PLC sensor series for input functions

PLC sensor series for coupling controller and sensors, such as proximity switches, limit switches or auxiliary contacts

The advantages:

– Direct connection of sensor to relay module including sensor supply
– No need for additional terminal blocks
– Space savings of up to 80%
– Time savings of up to 60%
– Screw and Push-in connection technology
– Relay modules with safe isolation according to DIN EN 50178 between coil and contact
– Functional plug-in bridges
– Efficient connection to system cabling using V8 adapter

Notes:

Type of insulating housing:
Polyamide PBT, non-reinforced, color: green.

Marking systems and mounting material
See Catalog 3

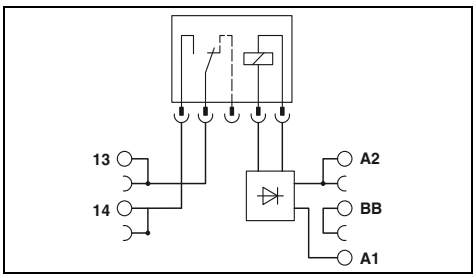
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....

For diagrams of operating voltage ranges, see page 397

[1]) 120 and 230 V types up to 55 °C

[2]) If the specified maximum values are exceeded for multi-layer contact relays, the gold layer will be destroyed. During further use, the maximum values of the power contact relays apply. This may then result in a shorter service life than a dedicated power contact.

1-N/O relay module with additional floating terminal point



Technical data

		①	②	③
Input data				
Permissible range (with reference to U_N)		See diagram		
Switching level (with reference to U_N)	1 signal ("H")			
	0 signal ("L")			
Typical input current at U_N	[mA]	9	3.5	3.2
Typical response time/switch-on time at U_N	[ms]	5	6	7
Typical release time/switch-off time at UN	[ms]	8	15	15
Transmission frequency f_{limit}	[Hz]			
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode		
Input circuit AC/DC		Yellow LED, bridge rectifier		
Output data				
Contact material		AgSnO, hard gold-plated		
Max. switching voltage		30 V AC / 36 V DC		
Minimum switching voltage		100 mV (at 10 mA)		
Limiting continuous current		50 mA		
Maximum switch-on current		50 mA		
Minimum switching current		1 mA (at 24 V)		
Output protection		-		
Voltage drop at maximum limiting continuous current		-		
General data				
Test voltage input/output		4 kV AC (50 Hz, 1 min.)		
Ambient temperature (operation)		-40 °C ... 60 °C[1])		
Mechanical service life		2 x 10^7 cycles		
Standards/regulations		IEC 60664 , EN 50178		
Degree of pollution/surge voltage category		3 / III		
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14		
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm		
EMC note		Class A product, see page 605		

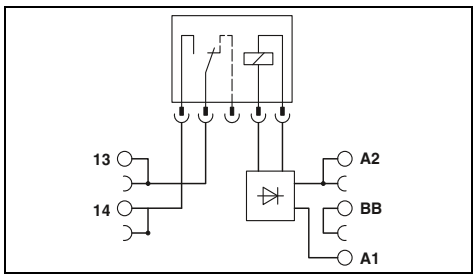
Ordering data

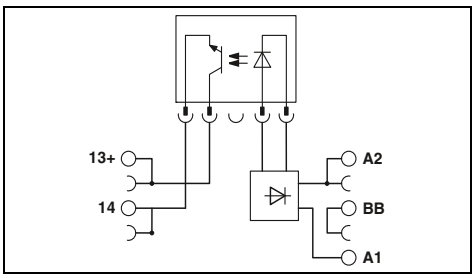
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**					
	①	24 V DC	**PLC-RSC- 24DC/ 1AU/SEN**	2966317	10
	②	120 V AC / 110 V DC	**PLC-RSC-120UC/ 1AU/SEN**	2966320	10
	③	230 V AC / 220 V DC	**PLC-RSC-230UC/ 1AU/SEN**	2966333	10
PLC-INTERFACE, with **Push-in connection**					
	①	24 V DC	**PLC-RPT- 24DC/ 1AU/SEN**	2900313	10
	②	120 V AC / 110 V DC	**PLC-RPT-120UC/ 1AU/SEN**	2900314	10
	③	230 V AC / 220 V DC	**PLC-RPT-230UC/ 1AU/SEN**	2900315	10

new

1-N/O relay module with manual operation and additional floating terminal point

Solid-state relay module with additional floating terminal point, DC output max. 100 mA





Technical data

①	②	③
See diagram		
9	3.5	3.2
5	6	7
8	15	15
Yellow LED, reverse polarity protection, freewheeling diode		
Yellow LED, bridge rectifier		
AgSnO, hard gold-plated		
30 V AC / 36 V DC		
100 mV (at 10 mA)		
50 mA[2])		
50 mA[2])		
1 mA (at 24 V)		
-		
-		
4 kV AC (50 Hz, 1 min.)		
-40 °C ... 60 °C[1])		
1 x 10^7 cycles		
IEC 60664 , EN 50178		
3 / III		
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14		
6.2 mm / 80 mm / 94 mm		
Class A product, see page 605		

Technical data

①	②	③
0.8 - 1.2	0.8 - 1.1	0.8 - 1.1
≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.3	≤ 0.3
8.5	3.5	3.5
0.02	6	3
0.3	10	5
300	10	10
Yellow LED, reverse polarity protection, freewheeling diode		
Yellow LED, bridge rectifier		
-		
48 V DC		
3 V DC		
100 mA		
-		
-		
Reverse polarity protection, surge protection		
≤ 1 V		
2.5 kV (50 Hz, 1 min.)		
-25 °C ... 60 °C		
-		
IEC 60664 , EN 50178		
2 / III		
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14		
6.2 mm / 80 mm / 94 mm		
Class A product, see page 605		

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC- 24DC/ 1AU/MS/SEN	2909663	10
PLC-RSC-120UC/ 1AU/MS/SEN	2909664	10
PLC-RSC-230UC/ 1AU/MS/SEN	2909665	10
PLC-RPT- 24DC/ 1AU/MS/SEN	2909678	10
PLC-RPT-120UC/ 1AU/MS/SEN	2909679	10
PLC-RPT-230UC/ 1AU/MS/SEN	2909680	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 48DC/100/SEN	2966773	10
PLC-OSC-120UC/ 48DC/100/SEN	2966799	10
PLC-OSC-230UC/ 48DC/100/SEN	2966809	10
PLC-OPT- 24DC/ 48DC/100/SEN	2900358	10
PLC-OPT-120UC/ 48DC/100/SEN	2900359	10
PLC-OPT-230UC/ 48DC/100/SEN	2900361	10

PLC-INTERFACE for high inrush currents

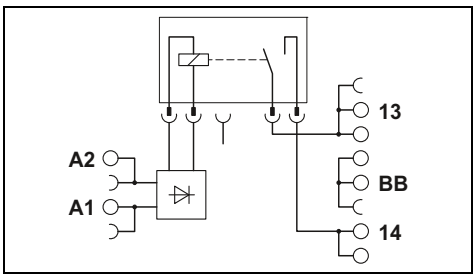
PLC relay modules for high inrush currents due, for example, to capacitive loads.

The advantages:

– Maximum switch-on current 130 A
– Direct connection of load return line thanks to actuator type
– Screw and Push-in connection technology
– Safe isolation according to DIN EN 50178 between coil and contact
– Functional plug-in bridges
– Efficient connection to system cabling using V8 adapter

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397

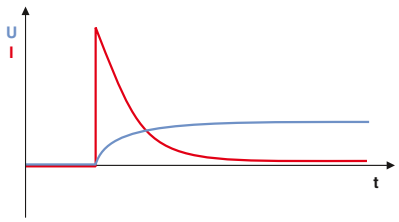
1-N/O relay module with additional floating terminal point, max. 130 A peak



Technical data

Input data		①
Typical input current at U_N	[mA]	18
Response/release time at U_N	[ms]	8 / 10
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Contact material		AgSnO
Max. switching voltage		250 V AC/DC
Minimum switching voltage		12 V AC/DC (at 100 mA)
Maximum switch-on current		80 A (for 20 ms) / 130 A (peak, at capacitive load, 230 V AC, 24 µF)
General data		
Test voltage input/output		4 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-40 °C ... 60 °C
Mechanical service life		3 x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
Dimensions	W / H / D	14 mm / 80 mm / 94 mm
EMC note		Class A product, see page 605

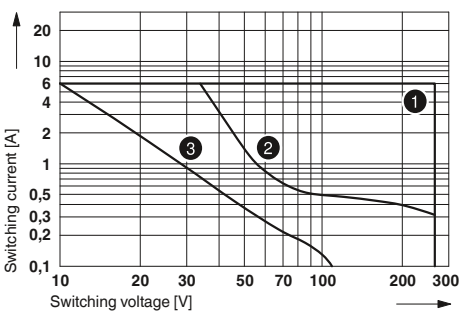
Basic behavior of capacitive loads:
- Very high input current
- Voltage increases with an e-function



Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection** ①	24 V DC	**PLC-RSC- 24DC/ 1IC/ACT**	2967604	10
PLC-INTERFACE, with **Push-in connection** ①	24 V DC	**PLC-RPT- 24DC/ 1IC/ACT**	2900298	10

Maximum interrupting rating



1 AC, ohmic load
2 DC, ohmic load
3 DC, L/R = 40 ms

PLC-INTERFACE for high continuous currents

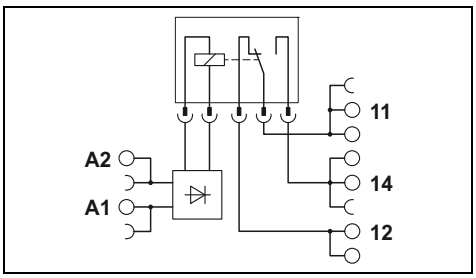
PLC relay modules for high continuous switching currents

The advantages:

– Maximum continuous current 10 A
– Safe isolation according to DIN EN 50178 between coil and contact
– Screw and Push-in connection technology
– Functional plug-in bridges
– Efficient connection to system cabling using V8 adapter
– Long electrical service life thanks to 16 A relay
– All common input voltages of 12 V DC to 230 V AC

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397
[1]) 230 V types up to 55 °C

1-PDT relay module, max. 10 A

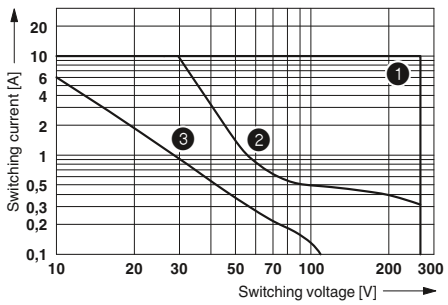


Technical data

		①	②	③	④	⑤	⑥	⑦
Input data								
Typical input current at U_N	[mA]	33	18	17.5	20	10	4.5	4.5
Response/release time at U_N	[ms]	8 / 10	8 / 10	8 / 10	8 / 10	8 / 10	7 / 10	7 / 10
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode						
Input circuit AC/DC		Yellow LED, bridge rectifier						
Output data								
Contact material		AgNi						
Max. switching voltage		250 V AC/DC						
Minimum switching voltage		12 V AC/DC						
Limiting continuous current		10 A						
Maximum switch-on current		30 A (300 ms)						
Minimum switching current		100 mA						
General data								
Test voltage input/output		4 kV AC (50 Hz, 1 min.)						
Ambient temperature (operation)		-40 °C ... 60 °C[1])						
Mechanical service life		3 x 10^7 cycles						
Standards/regulations		IEC 60664 , EN 50178						
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14						
Dimensions	W / H / D	14 mm / 80 mm / 94 mm						
EMC note		Class A product, see page 605						

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	12 V DC	**PLC-RSC- 12DC/21HC**	2967617	10
②	24 V DC	**PLC-RSC- 24DC/21HC**	2967620	10
③	24 V AC/DC	**PLC-RSC- 24UC/21HC**	2967633	10
④	48 V DC	**PLC-RSC- 48DC/21HC**	2967646	10
⑤	60 V DC	**PLC-RSC- 60DC/21HC**	2967659	10
⑥	120 V AC / 110 V DC	**PLC-RSC-120UC/21HC**	2967662	10
⑦	230 V AC / 220 V DC	**PLC-RSC-230UC/21HC**	2967675	10
PLC-INTERFACE, **with Push-in connection**				
①	12 V DC	**PLC-RPT- 12DC/21HC**	2900290	10
②	24 V DC	**PLC-RPT- 24DC/21HC**	2900291	10
③	24 V AC/DC	**PLC-RPT- 24UC/21HC**	2900293	10
④	48 V DC	**PLC-RPT- 48DC/21HC**	2900294	10
⑤	60 V DC	**PLC-RPT- 60DC/21HC**	2900295	10
⑥	120 V AC / 110 V DC	**PLC-RPT-120UC/21HC**	2900296	10
⑦	230 V AC / 220 V DC	**PLC-RPT-230UC/21HC**	2900297	10



❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

Max. interrupting rating

Basic terminal blocks with interference current filter that can be fitted with relays

PLC basic terminal blocks with integrated filter to protect against interference voltages or currents due, for example, to long control lines.

The advantages:

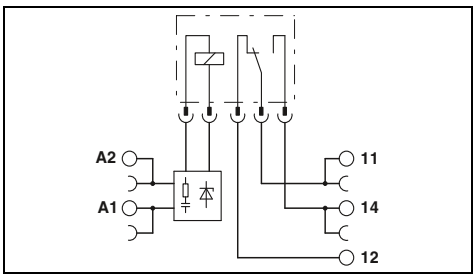
– Resistant to interference currents
– High relay release voltage

Typical applications:

– Applications with long control lines
– Use of AC output boards, resulting in residual AC currents
– Screw and Push-in connection technology

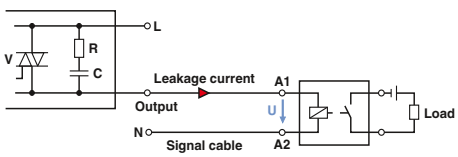
Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397
Maximum interrupting rating diagrams, see page 400
When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

Basic terminal block with Input filter

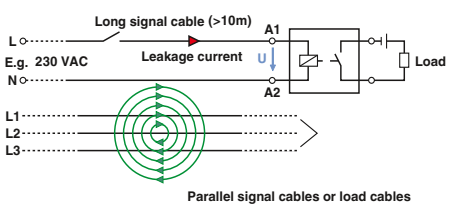


Technical data

Input data			
Nominal input voltage U_N		120 V AC	230 V AC
Permissible range (with reference to U_N)		0.8 ... 1.4	0.78 ... 1.14
Typical release voltage (relay assembly)		50 V AC	80 V AC
Typical input current at U_N (50/60 Hz)		7 mA / 8 mA	8.8 mA / 10 mA
Typical response time at U_N		7 ms	7 ms
Typical release time at U_N		20 ms	20 ms
Input circuit		Yellow LED , Bridge rectifier , Filter	
Output data with:		REL-MR-60DC/21	REL-MR-60DC/21AU
Contact type		Single contact, 1-PDT	Single contact, 1-PDT
Contact material		AgSnO	AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current		6 A	50 mA
Maximum switch-on current		on request	50 mA
Minimum switching current		10 mA (at 12 V)	1 mA (at 24 V)
General data			
Test voltage input/output		4 kV (50 Hz, 1 min.)	
Ambient temperature (operation)		-20 °C ... 55 °C	
Mechanical service life		2 x 10^7 cycles	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution / Overvoltage category		3 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	



Occurrence of interference signals Scenario 1: controller - AC output card



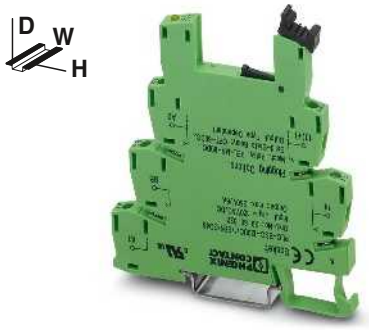
Occurrence of interference signals Scenario 2: long signal cables

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays				
with screw connection	120 V AC	**PLC-BSC-120UC/21/SO46**	2980319	10
with screw connection	230 V AC	**PLC-BSC-230UC/21/SO46**	2980335	10
with Push-in connection	120 V AC	**PLC-BPT-120UC/21/SO46**	2900453	10
with Push-in connection	230 V AC	**PLC-BPT-230UC/21/SO46**	2900455	10

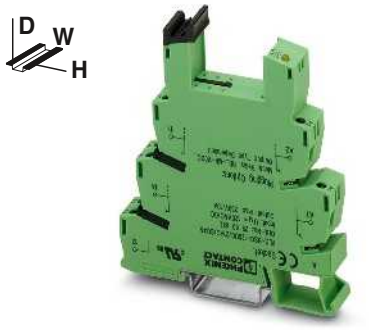
Accessories

Plug-in miniature power relays, with multi-layer gold contacts			
	REL-MR- 60DC/21AU	2961134	10
	REL-MR- 60DC/21	2961118	10

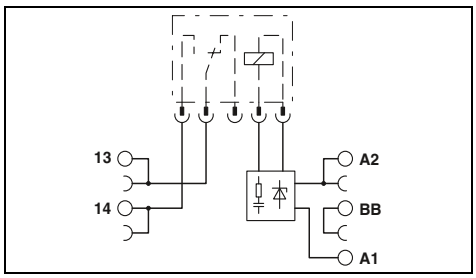


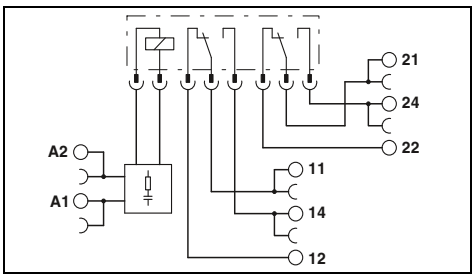
Basic terminal block with additional floating terminal point and Input filter

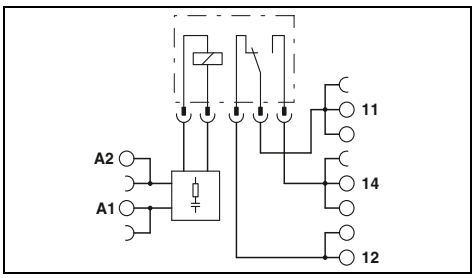
2-PDT basic terminal block with input filter



1-PDT basic terminal block for high continuous currents with input filter







Technical data

120 V AC	230 V AC
0.8 ... 1.4	0.78 ... 1.14
50 V AC	80 V AC
7 mA / 8 mA	8.8 mA / 10 mA
7 ms	7 ms
20 ms	20 ms
Yellow LED , Bridge rectifier , Filter	
REL-MR-60DC/21	REL-MR-60DC/21AU
Single contact, 1 N/O contact	Single contact, 1 N/O contact
AgSnO	AgSnO, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 100 mA)	100 mV (at 10 mA)
6 A	50 mA
on request	50 mA
10 mA (at 12 V)	1 mA (at 24 V)
4 kV (50 Hz, 1 min.)	
-20 °C ... 55 °C	
2 x 10^7 cycles	
IEC 60664 , EN 50178	
3 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-BSC-120UC/ 1/SEN/SO46	2980322	10
PLC-BSC-230UC/ 1/SEN/SO46	2980348	10
PLC-BPT-120UC/ 1/SEN/SO46	2900456	10
PLC-BPT-230UC/ 1/SEN/SO46	2900457	10

Accessories

REL-MR- 60DC/21AU	2961134	10
REL-MR- 60DC/21	2961118	10

Technical data

120 V AC	230 V AC
0.78 ... 1.4	0.78 ... 1.14
16 V AC	70 V AC
6 mA / 7 mA	8.5 mA / 10 mA
7 ms	7 ms
10 ms	10 ms
Yellow LED , Bridge rectifier , Filter	
REL-MR-110DC/21-21	REL-MR-110DC/21-21AU
Single contact, 2-PDT	Single contact, 2-PDT
AgNi	AgNi, + 5 µm Au
250 V AC/DC	30 V AC / 36 V DC
5 V AC/DC	100 mV
6 A	50 mA
15 A (300 ms)	50 mA
10 mA	1 mA
4 kV (50 Hz, 1 min.)	
-20 °C ... 55 °C	
3 x 10^7 cycles	
IEC 60664 , EN 50178	
3 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
14 mm / 80 mm / 94 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-BSC-120UC/21-21/SO46	2980416	10
PLC-BSC-230UC/21-21/SO46	2980429	10

Accessories

REL-MR-110DC/21-21AU	2961228	10
REL-MR-110DC/21-21	2961202	10

Technical data

120 V AC	230 V AC
0.85 ... 1.4	0.78 ... 1.14
16 V AC	70 V AC
6 mA / 7 mA	8.5 mA / 10 mA
7 ms	7 ms
20 ms	20 ms
Yellow LED , Bridge rectifier , Filter	
REL-MR-110DC/21HC	
Single contact, 1-PDT	
AgNi	
250 V AC/DC	
12 V AC/DC	
10 A	
30 A (300 ms)	
100 mA	
4 kV (50 Hz, 1 min.)	
-20 °C ... 55 °C	
3 x 10^7 cycles	
IEC 60664 , EN 50178	
3 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
14 mm / 80 mm / 94 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-BSC-120UC/21HC/SO46	2980432	10
PLC-BSC-230UC/21HC/SO46	2980445	10

Accessories

REL-MR-110DC/21HC	2961338	10

Basic terminal blocks with interference current filter that can be fitted with solid-state relays

PLC basic terminal blocks with integrated filter to protect against interference voltages or currents due, for example, to long control lines.

The advantages:

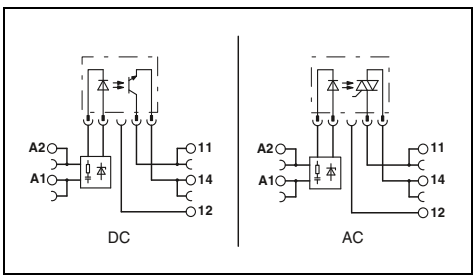
– Resistant to interference currents
– High relay release voltage

Typical applications:

– Applications with long control lines
– Use of AC output boards, resulting in residual AC currents
– Screw and Push-in connection technology

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
For diagrams of operating voltage ranges, see page 397
Maximum interrupting rating diagrams, see page 400
When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

Basic terminal block with Input filter



Technical data

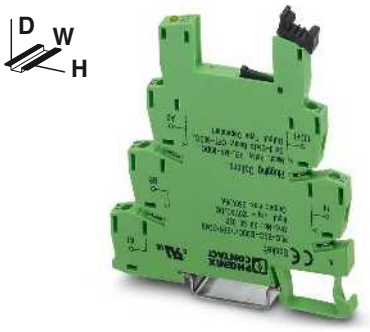
Input data			
Nominal input voltage U_N		120 V AC	230 V AC
Permissible range (with reference to U_N)		0.85 ... 1.1	0.8 ... 1.1
Switching level (with optocoupler) 0 signal ("L")		≤ 0.4	≤ 0.4
Typical input current at U_N (50/60 Hz)		7 mA / 8 mA	8.8 mA / 10 mA
Typical response time/switch-on time at U_N		6 ms	6 ms
Typical switch-off time at U_N		10 ms	10 ms
Input circuit		Yellow LED , Bridge rectifier , Filter	
Output data with:		OPT...48DC/...	OPT...24DC/...	OPT...230AC/...
Max. switching voltage		48 V DC	30 V DC	253 V AC
Minimum switching voltage		3 V DC	3 V DC	24 V AC
Limiting continuous current		100 mA	3 A	0.75 A
Maximum switch-on current			15 A (10 ms)	30 A (10 ms)
Output protection		Reverse polarity protection, surge protection	Reverse polarity protection, surge protection	RCV circuit
Voltage drop at limiting continuous current		< 1 V	< 200 mV	< 1 V
Leakage current in off state		-	-	< 1 mA
Maximum phase shift (inductive consumer)		-	-	0.5
Max. load value I^2 x t (t = 10 ms)		-	-	4.5 A^2s
General data			
Test voltage input/output		2.5 kV (50 Hz, 1 min.)	
Ambient temperature (operation)		-20 °C ... 55 °C	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution / Overvoltage category		2 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	

Ordering data

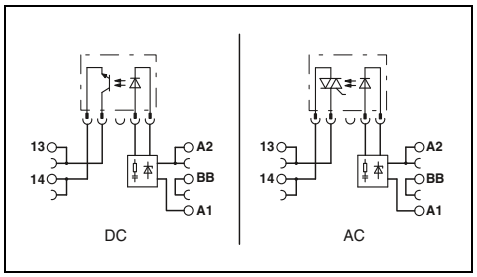
Description	Voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays				
with screw connection	120 V AC	**PLC-BSC-120UC/21/SO46**	2980319	10
with screw connection	230 V AC	**PLC-BSC-230UC/21/SO46**	2980335	10
with Push-in connection	120 V AC	**PLC-BPT-120UC/21/SO46**	2900453	10
with Push-in connection	230 V AC	**PLC-BPT-230UC/21/SO46**	2900455	10

Accessories

Plug-in solid-state relays			
Solid-state input relays	**OPT-60DC/ 48DC/100**	2966621	10
Solid-state power relays	**OPT-60DC/ 24DC/ 2**	2966605	10
Solid-state power relays	**OPT-60DC/230AC/ 1**	2967963	10



Basic terminal block with additional floating terminal point and Input filter



Technical data

120 V AC		230 V AC
0.85 ... 1.1		0.8 ... 1.1
≤ 0.4		≤ 0.4
7 mA / 8 mA		8.8 mA / 10 mA
6 ms		6 ms
10 ms		10 ms
Yellow LED , Bridge rectifier , Filter		
OPT...48DC/...	OPT...24DC/...	OPT...230AC/...
48 V DC	30 V DC	253 V AC
3 V DC	3 V DC	24 V AC
100 mA	3 A	0.75 A
	15 A (10 ms)	30 A (10 ms)
Reverse polarity protection, surge protection	Reverse polarity protection, surge protection	RCV circuit
< 1 V	< 200 mV	< 1 V
-	-	< 1 mA
-	-	0.5
-	-	4.5 A^2s
2.5 kV (50 Hz, 1 min.)		
-20 °C ... 55 °C		
IEC 60664 , EN 50178		
2 / III		
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14		
6.2 mm / 80 mm / 94 mm		
Class A product, see page 605		

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-BSC-120UC/ 1/SEN/SO46	2980322	10
PLC-BSC-230UC/ 1/SEN/SO46	2980348	10
PLC-BPT-120UC/ 1/SEN/SO46	2900456	10
PLC-BPT-230UC/ 1/SEN/SO46	2900457	10

Accessories

OPT-60DC/ 48DC/100	2966621	10
OPT-60DC/ 24DC/ 2	2966605	10
OPT-60DC/230AC/ 1	2967963	10

Plug-in miniature power relays

new

Plug-in miniature power relays are suitable for PLC-INTERFACE and RIF-0 and RIF-1 relay base.

The advantages:

– Power contacts up to 16 A
– Multi-layer gold contact or power contact
– High degree of protection up to RT III depending on type (wash-proof)
– Safe isolation according to DIN EN 50178 between coil and contact

Notes:

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

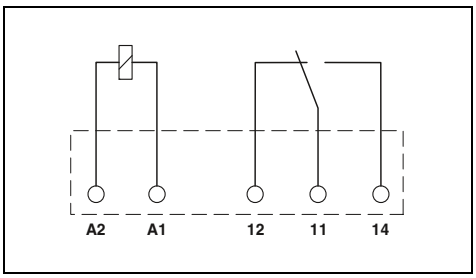
For dimensional drawings and perforations for assembly, see page 398

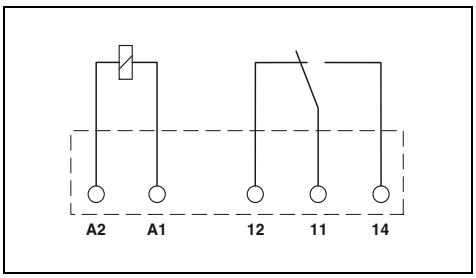
For diagrams of operating voltage ranges, see page 397

When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

1-PDT relay, 6 A, maximum

1-PDT relay with manual operation, max. 6 A





Technical data

		①	②	③	④	⑤
Input data						
Permissible range (with reference to U_N)		see diagram				
Typical input current at U_N	[mA]	38	14	9	7	3
Typical response time at U_N	[ms]	5	5	5	5	5
Typical release time at U_N	[ms]	2.5	2.5	2.5	2.5	2.5
Output data						
Contact type		1 PDT				1 PDT
Contact material		AgSnO				AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC				30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)				100 mV (at 10 mA)
Limiting continuous current		6 A				50 mA
Maximum switch-on current		10 A (4 s)				on request
Minimum switching current		10 mA (at 12 V)				1 mA (at 24 V)
Maximum interrupting rating, ohmic load						
	24 V DC	140 W				1.2 W
	48 V DC	20 W				-
	60 V DC	18 W				-
	110 V DC	23 W				-
	220 V DC	40 W				-
	250 V AC	1500 VA				-
General data						
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)				
Ambient temperature (operation)		-40 °C ... 85 °C				
Nominal operating mode		100% operating factor				
Mechanical service life		2 x 10^7 cycles				
Standards/regulations		IEC 60664 , EN 50178 , EN 61810-1				
Mounting position/mounting		any / In rows with zero spacing				
Dimensions	W / H / D	5 mm / 28 mm / 15 mm				

Technical data

		②	④	⑤
Input data				
Permissible range (with reference to U_N)		see diagram		
Typical input current at U_N	[mA]	14	7	3
Typical response time at U_N	[ms]	5	5	5
Typical release time at U_N	[ms]	2.5	2.5	2.5
Output data				
Contact type		1 PDT		1 PDT
Contact material		AgSnO		AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC		30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)		100 mV (at 10 mA)
Limiting continuous current		6 A		50 mA
Maximum switch-on current		10 A (4 s)		50 mA
Minimum switching current		10 mA (at 12 V)		1 mA (at 24 V)
Maximum interrupting rating, ohmic load				
	24 V DC	140 W		1.2 W
	48 V DC	20 W		-
	60 V DC	18 W		-
	110 V DC	23 W		-
	220 V DC	40 W		-
	250 V AC	1500 VA		-
General data				
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)		
Ambient temperature (operation)		-40 °C ... 85 °C		
Nominal operating mode		100% operating factor		
Mechanical service life		1 x 10^7 cycles		
Standards/regulations		IEC 60664 , EN 50178 , EN 61810-1		
Mounting position/mounting		any / In rows with zero spacing		
Dimensions	W / H / D	5 mm / 28 mm / 16 mm		

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in miniature power relays, with power contacts				
①	4.5 V DC	**REL-MR- 4,5DC/21**	2961367	10
②	12 V DC	**REL-MR- 12DC/21**	2961150	10
③	18 V DC	**REL-MR- 18DC/21**	2961383	10
④	24 V DC	**REL-MR- 24DC/21**	2961105	10
⑤	60 V DC	**REL-MR- 60DC/21**	2961118	10
⑥	110 V DC			
Plug-in miniature power relays, with multi-layer gold contacts				
①	4.5 V DC	**REL-MR 4,5DC/21AU**	2961370	10
②	12 V DC	**REL-MR- 12DC/21AU**	2961163	10
③	18 V DC	**REL-MR- 18DC/21AU**	2961493	10
④	24 V DC	**REL-MR- 24DC/21AU**	2961121	10
⑤	60 V DC	**REL-MR- 60DC/21AU**	2961134	10
⑥	110 V DC			

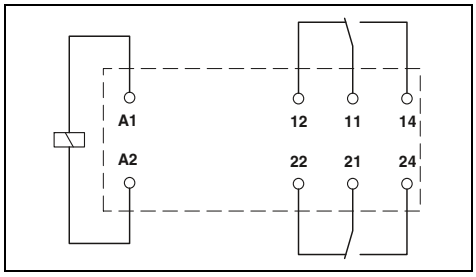
Ordering data

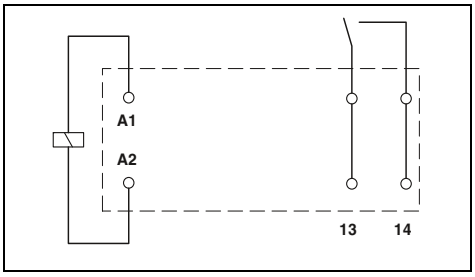
Type	Order No.	Pcs./ Pkt.
REL-MR- 12DC/21/MS	2909641	10
REL-MR- 24DC/21/MS	2909642	10
REL-MR- 60DC/21/MS	2909643	10
REL-MR- 12DC/21AU/MS	2909644	10
REL-MR- 24DC/21AU/MS	2909645	10
REL-MR- 60DC/21AU/MS	2909647	10

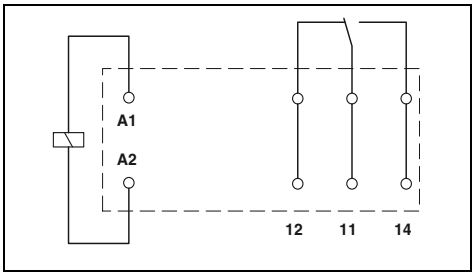
**2-PDT relay,
2 x 8 A, maximum**

**1-N/O relay for
high inrush currents,
max. 130 A peak**

**1-PDT relay for
high continuous currents,
max. 16 A**







Technical data

②	④	⑤	⑥
see diagram			
33	17	8.2	4.1
7	7	7	7
3	3	3	3
2 PDT	2 PDT		
AgNi	AgNi, hard gold-plated		
250 V AC/DC	30 V AC / 36 V DC		
5 V (at 10 mA)	100 mV (at 10 mA)		
8 A	50 mA		
25 A (20 ms)	50 mA		
10 mA (At 5 V)	1 mA (at 24 V)		
190 W	1.2 W		
85 W	-		
60 W	-		
44 W	-		
60 W	-		
2000 VA	-		
5 kV AC (50 Hz, 1 min.)			
-40 °C ... 85 °C			
100% operating factor			
3 x 10^7 cycles			
IEC 60664 , EN 50178 , EN 61810-1			
any / Can be aligned without spacing (> 70 °C ≥ 2.5 mm)			
12.7 mm / 29 mm / 15.7 mm			

Technical data

④
see diagram
17
8
3
1 N/O contact
AgSnO
250 V AC/DC
12 V (at 100 mA)
16 A
80 A (20 ms) / 130 A (peak, at capacitive load, 230 V AC, 24 µF)
100 mA (at 12 V DC)
384 W
58 W
48 W
50 W
80 W
4000 VA
5 kV AC (50 Hz, 1 min.)
-40 °C ... 85 °C
100% operating factor
3 x 10^7 cycles
IEC 60664 , EN 50178
any / Can be aligned without spacing (> 70 °C ≥ 2.5 mm)
12.7 mm / 29 mm / 15.7 mm

Technical data

②	④	⑤	⑥
see diagram			
33	17	8.2	4.1
7	7	7	7
3	3	3	3
1 PDT			
AgNi			
250 V AC/DC			
12 V (at 10 mA)			
16 A			
50 A (20 ms)			
10 mA (at 12 V)			
384 W			
58 W			
48 W			
50 W			
80 W			
4000 VA			
5 kV AC (50 Hz, 1 min.)			
-40 °C ... 85 °C			
100% operating factor			
3 x 10^7 cycles			
IEC 60664 , EN 50178 , EN 61810-1			
any / Can be aligned without spacing (> 70 °C ≥ 2.5 mm)			
12.7 mm / 29 mm / 15.7 mm			

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-MR- 12DC/21-21	2961257	10
REL-MR- 24DC/21-21	2961192	10
REL-MR- 60DC/21-21	2961273	10
REL-MR-110DC/21-21	2961202	10
REL-MR- 12DC/21-21AU	2961299	10
REL-MR- 24DC/21-21AU	2961215	10
REL-MR- 60DC/21-21AU	2961286	10
REL-MR-110DC/21-21AU	2961228	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-MR- 24DC/1IC	2961341	10

Ordering data

Type	Order No.	Pcs./ Pkt.
REL-MR- 12DC/21HC	2961309	10
REL-MR- 24DC/21HC	2961312	10
REL-MR- 60DC/21HC	2961325	10
REL-MR-110DC/21HC	2961338	10

Plug-in solid-state relays

Plug-in solid-state relays are suitable for both PLC-INTERFACE and RIF-0 and RIF-1 relay base.

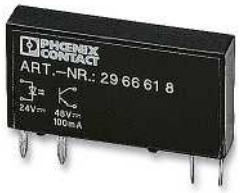
The advantages:

– Switching current of up to 5 A
– RT III-proof (wash-proof)
– Vibration and shock-resistant
– Wear-free and long-lasting
– Zero voltage switch at AC output
– Can be soldered on PCB

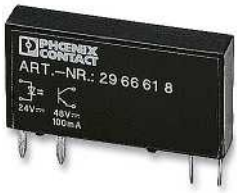
Notes:

For dimensional drawings and perforations for assembly, see page 399

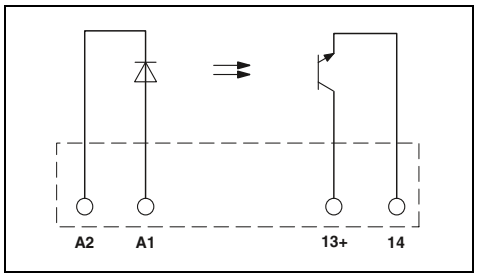
When mounting relays on a DIN rail base or PCB, data may be limited, especially with regard to the limiting continuous current and/or ambient temperature range. See “General” section in “Basics of relay technology” on page 286.

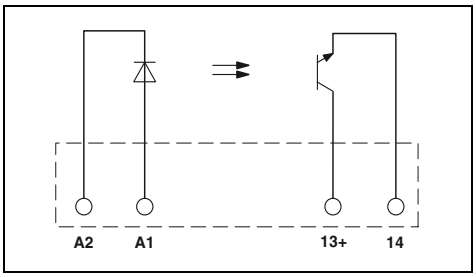


Solid-state relay, DC output max. 3 A



Solid-state relay, DC output max. 100 mA





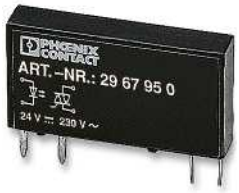
Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
Switching level	1 signal ("H") [V DC] ≥	2.5	16	35
	0 signal ("L") [V DC] ≤	0.8	10	20
Typical input current at U_N	[mA]	9	7	3
Typical switch-on time at U_N	[µs]	20	20	40
Typical switch-off time at U_N	[µs]	300	300	500
Transmission frequency f_{limit}	[Hz]	300	300	300
Output data				
Max. switching voltage		33 V DC		
Minimum switching voltage		3 V DC		
Limiting continuous current		3 A (see derating curve)		
Minimum load current		-		
Maximum switch-on current		15 A (10 ms)		
Leakage current in off state		-		
Phase angle (cos ϕ)		-		
Output circuit		2-wire, floating		
Max. load value		-		
Output protection		Reverse polarity protection, surge protection		
Voltage drop at maximum limiting continuous current		≤ 150 mV		
General data				
Rated surge voltage		Basic insulation		
Test voltage input/output		2.5 kV (50 Hz, 1 min.)		
Ambient temperature (operation)		-25 °C ... 60 °C		
Nominal operating mode		100% operating factor		
Standards/regulations		IEC 60664 , EN 50178		
Degree of pollution/surge voltage category		2 / III		
Mounting position/mounting		any / In rows with zero spacing		
Dimensions	W / H / D	5 mm / 28 mm / 15 mm		

Ordering data

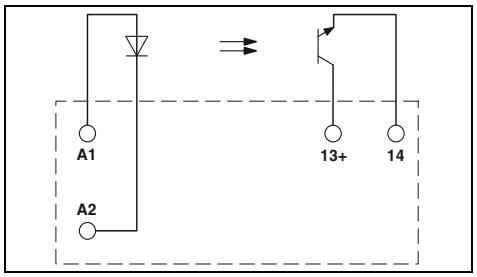
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Plug-in solid-state relays					
Solid-state power relays	①	5 V DC	**OPT- 5DC/ 24DC/ 2**	2967989	10
Solid-state power relays	②	24 V DC	**OPT-24DC/ 24DC/ 2**	2966595	10
Solid-state power relays	③	60 V DC	**OPT-60DC/ 24DC/ 2**	2966605	10
Plug-in solid-state relays					
Solid-state input relays	①	5 V DC	**OPT- 5DC/ 48DC/100**	2967992	10
Solid-state input relays	②	24 V DC	**OPT-24DC/ 48DC/100**	2966618	10
Solid-state input relays	③	60 V DC	**OPT-60DC/ 48DC/100**	2966621	10

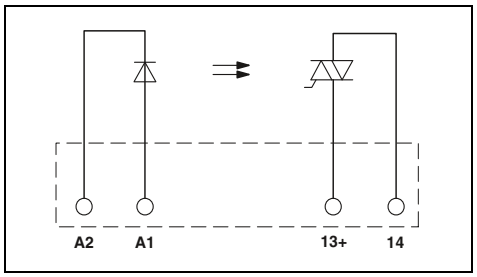
**Solid-state relay,
DC output max. 5 A**

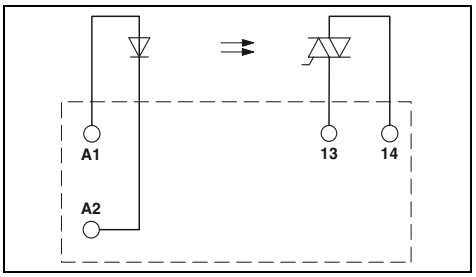


**Solid-state relay,
AC output max. 750 mA**

**Solid-state relay,
AC output max. 2 A**







Technical data

①	②	③
0.8 -	0.8 -	0.9 -
1.2	1.2	1.1
2.5	16	35
0.8	10	20
9	7	3
10	20	25
400	400	400
300	300	300

33 V DC	
3 V DC	
5 A (see derating curve)	
-	
15 A (10 ms)	
-	
-	
2-wire, floating	
-	
Reverse polarity protection, surge protection	
≤ 200 mV	

Basic insulation	
2.5 kV (50 Hz, 1 min.)	
-25 °C ... 60 °C	
100% operating factor	
IEC 60664 , EN 50178	
2 / III	
any / In rows with zero spacing	
12.7 mm / 29 mm / 15.7 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
OPT- 5DC/ 24DC/ 5	2982113	10
OPT-24DC/ 24DC/ 5	2982100	10
OPT-60DC/ 24DC/ 5	2982126	10

Technical data

②	③
0.8 -	0.9 -
1.2	1.1
10	50
5	15
3	3
6000	9000
500	700
10	10

253 V AC	
24 V AC	
0.75 A (see derating curve)	
10 mA	
30 A (10 ms)	
< 1 mA	
0.5	
2-conductor floating, zero voltage switch	
4.5 A^2s	
RCV circuit	
< 1 V	

Basic insulation	
2.5 kV (50 Hz, 1 min.)	
-25 °C ... 60 °C	
100% operating factor	
IEC 60664 , EN 50178	
2 / III	
any / In rows with zero spacing	
5 mm / 28 mm / 15 mm	

Ordering data

Type	Order No.	Pcs./ Pkt.
OPT-24DC/230AC/ 1	2967950	10
OPT-60DC/230AC/ 1	2967963	10

Technical data

①	②	③
0.8 -	0.8 -	0.9 -
1.2	1.2	1.1
3	18	40
1	8.4	20
15	7	2.6
10000	10000	10000
10000	10000	10000
10	10	10

253 V AC	
24 V AC	
2 A (see derating curve)	
25 mA	
30 A (10 ms)	
< 1 mA	
-	
2-conductor floating, zero voltage switch	
4 A^2s (tp = 10 ms, at 25 °C)	
Surge protection	
≤ 1 V	

Basic insulation	
2.5 kV (50 Hz, 1 min.)	
-25 °C ... 60 °C	
100% operating factor	
IEC 60664	
2 / III	
any / See derating curve	
12.7 mm / 29 mm / 15.7 mm	

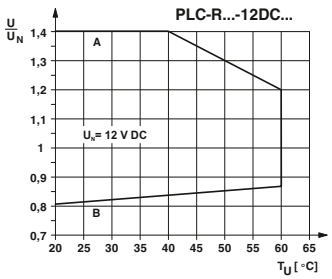
Ordering data

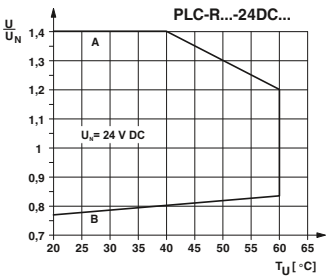
Type	Order No.	Pcs./ Pkt.
OPT- 5DC/230AC/ 2	2982168	10
OPT-24DC/230AC/ 2	2982171	10
OPT-60DC/230AC/ 2	2982184	10

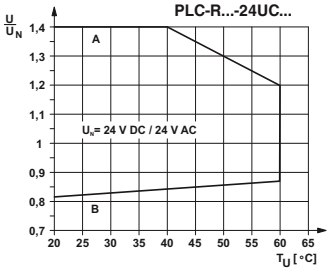
Relay options for PLC basic terminal blocks

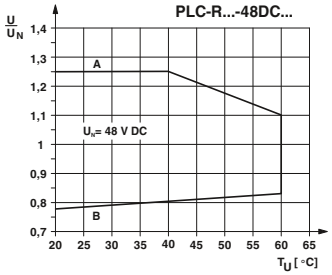
| Relay and solid-state relay options | | Push-in connection | | |

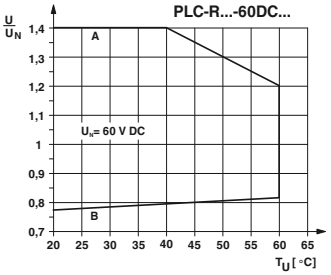
Operating voltage ranges for PLC-INTERFACE, 6.2 mm versions, equipped with relay

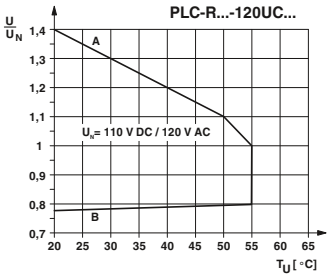


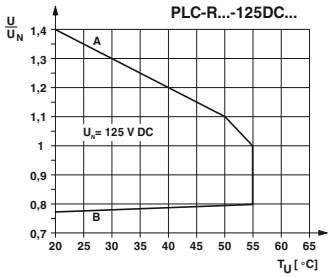


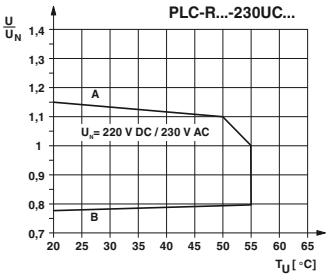




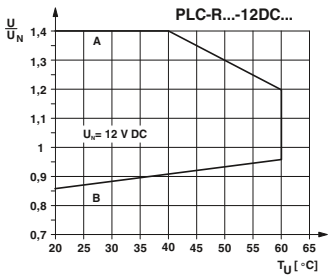


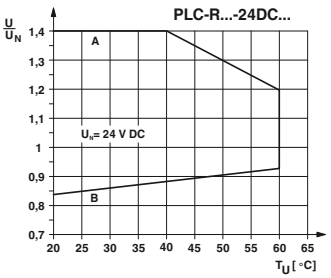


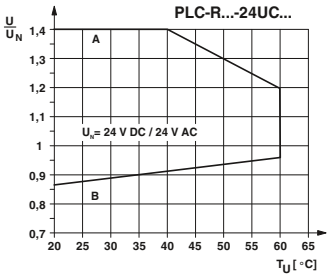


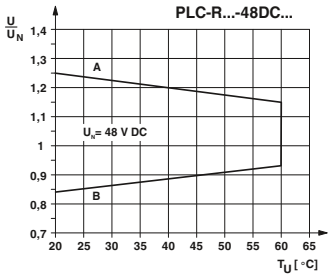


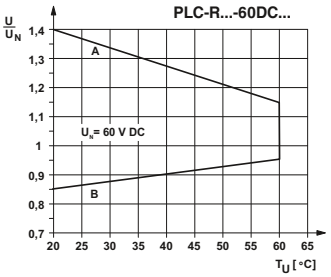
Operating voltage ranges for PLC-INTERFACE, 14 mm versions, equipped with relay

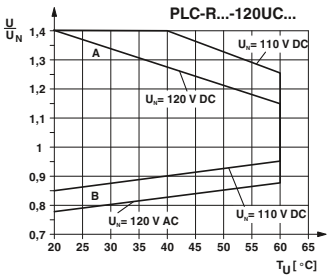


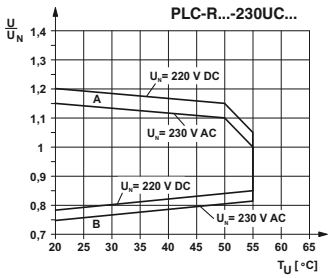












General conditions:
Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Curve A
Maximum permissible continuous voltage U_{max} with limiting continuous current on the contact side (see relevant technical data).

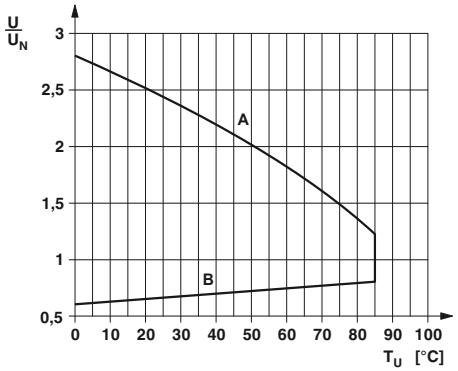
Curve B
Minimum permitted pick-up voltage U_{op} after pre-excitation[1])
(see relevant technical data).

[1]) **Pre-excitation**: relay has been operated in a thermally steady state at the ambient temperature T_A with nominal voltage U_N and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at U_{op}. The U_{op} values for cold coils ($T_{coil} = T_A = 20°C$) indicated by other manufacturers yield better values, but are not practical.

Plug-in 1 and 2-PDT relays

REL-MR...21

Permissible input voltage range for REL-MR...21



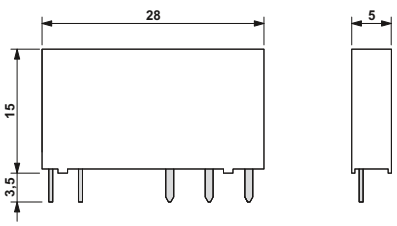
General conditions:
Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Curve A
Maximum permissible continuous voltage U_{max} with limiting continuous current on the contact side (see relevant technical data).

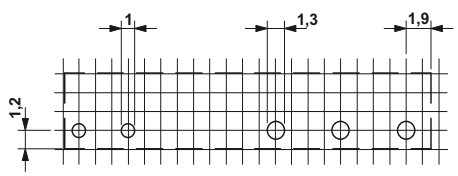
Curve B
Minimum permitted pick-up voltage U_{op} after pre-excitation[1])
(see relevant technical data).

[1]) **Pre-excitation**: relay has been operated in a thermally steady state at the ambient temperature T_A with nominal voltage U_N and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at U_{op}. The U_{op} values for cold coils ($T_{coil} = T_A = 20°C$) indicated by other manufacturers yield better values, but are not practical.

5 mm overall width



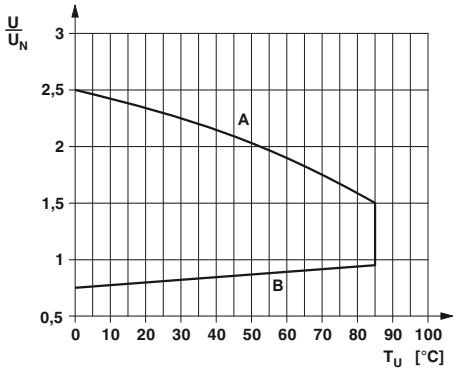
Perforations for assembly: view of the connections



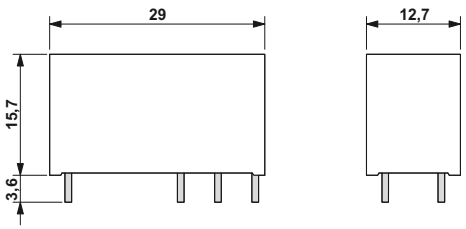
Pitch division: 1.25 mm and 1.27 mm

REL-MR...21-21

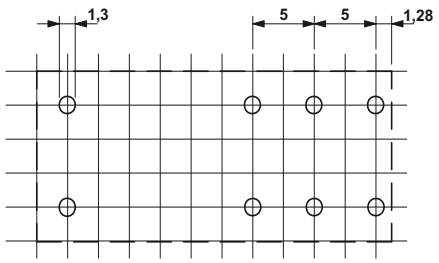
Permissible input voltage range for REL-MR...21-21, REL-MR-24DC/1IC, REL-MR...21HC



12.7 mm overall width



Perforations for assembly: view of the connections

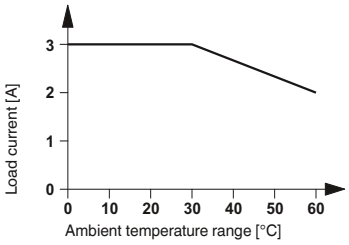


Pitch division: 2.5 mm

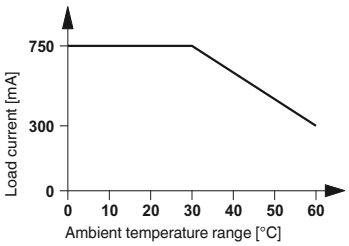
Plug-in solid-state relays

OPT...DC/24DC/2
OPT...DC/230AC/1

Derating curve for OPT...DC/24DC/2 and PLC-OS.../24DC/2 solid-state relays

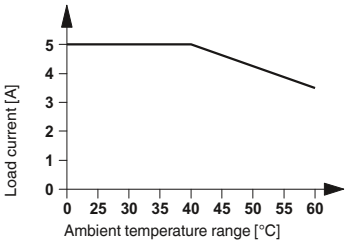


Derating curve for OPT...DC/230AC/1 and PLC-OS.../230AC/1 solid-state relays

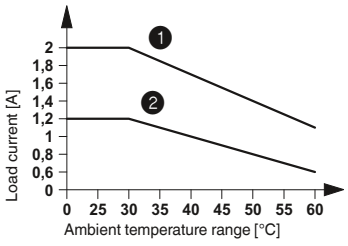


OPT...DC/24DC/5
OPT...DC/230AC/2

Derating curve for OPT...DC/24DC/5 and PLC-OS.../24DC/5/ACT solid-state relays

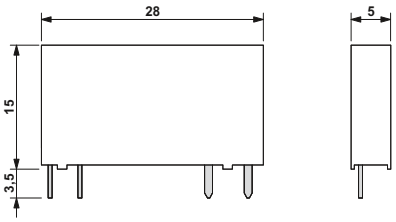


Derating curve for OPT...DC/230AC/2 and PLC-OS.../230AC/2/ACT solid-state relays

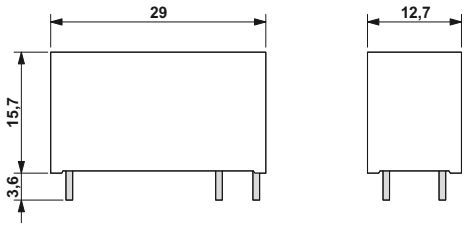


❶ Aligned with > 10 mm spacing
❷ Aligned without spacing

5 mm overall width

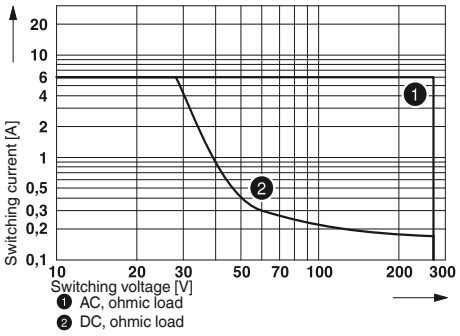


12.7 mm overall width



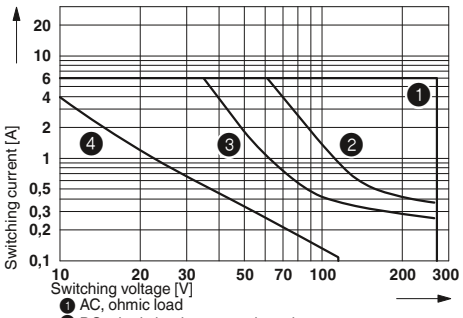
Electrical interrupting rating for PLC-INTERFACE

Electrical interrupting rating for PLC...21 with 1-PDT relay



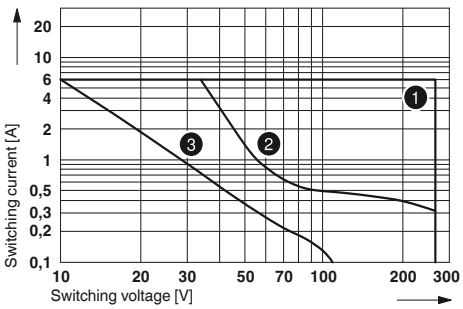
1 AC, ohmic load
2 DC, ohmic load

Electrical interrupting rating for PLC...21-21 with 2-PDT relay



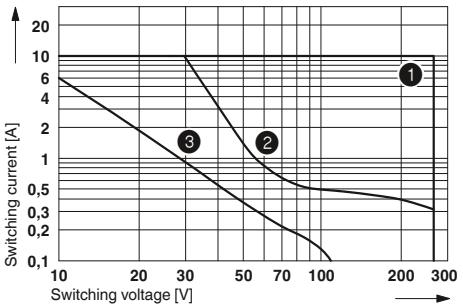
1 AC, ohmic load
2 DC, ohmic load, contacts in series
3 DC, ohmic load
4 DC, L/R = 40 ms

Electrical interrupting rating for PLC...1IC/ACT for high inrush currents



1 AC, ohmic load
2 DC, ohmic load
3 DC, L/R = 40 ms

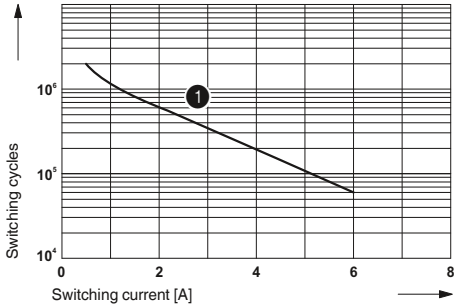
Electrical interrupting rating for PLC...21HC for high continuous currents



1 AC, ohmic load
2 DC, ohmic load
3 DC, L/R = 40 ms

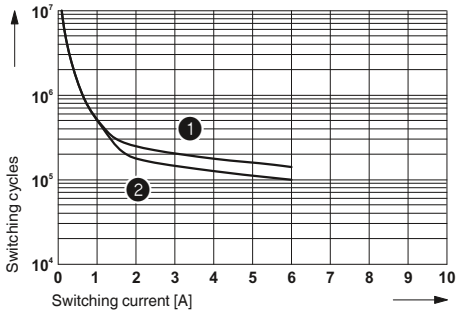
PLC-INTERFACE for railway applications

Electrical service life for PLC-RSP...UC/21RW



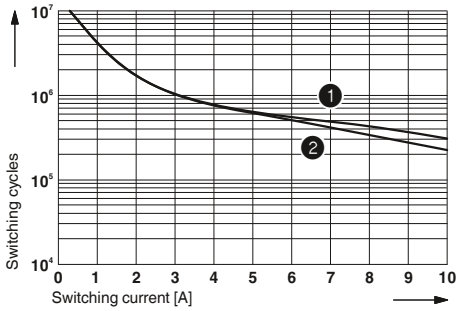
1 250 V AC, ohmic load

Electrical service life for PLC-RSP...UC/21-21/RW



1 250 V AC, ohmic load (DC coils)
2 250 V AC, ohmic load (AC coils)

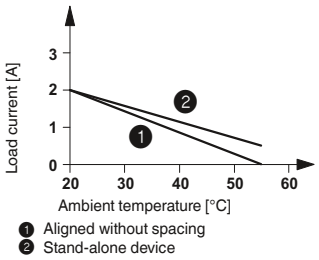
Electrical service life for PLC-RSP...UC/21HC/RW



1 250 V AC, ohmic load (DC coils)
2 250 V AC, ohmic load (AC coils)

EMG-OV solid-state power relays

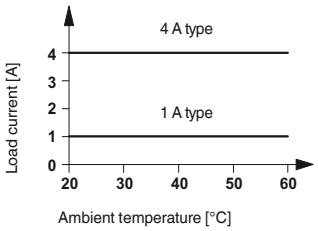
Derating curve for EMG 17-OV...48DC/2



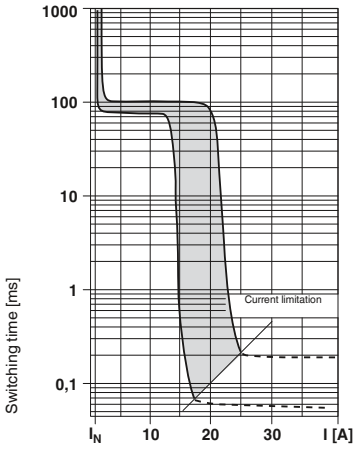
1 Aligned without spacing
2 Stand-alone device

ST-OV 4-24DC/24DC...PRO power circuit breaker solid-state relays with signal logic

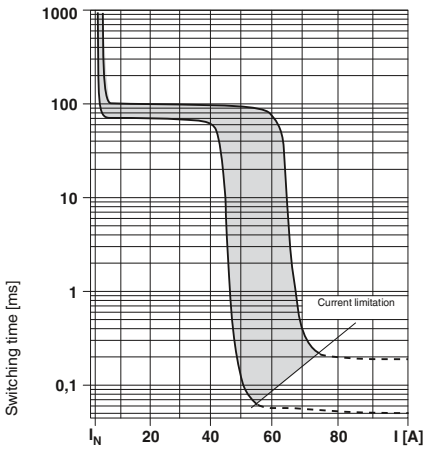
Derating curve for ST-OV 4-24DC/24DC...PRO



Time/current characteristic curve, 1 A version



Time/current characteristic curve, 4 A version



State diagram

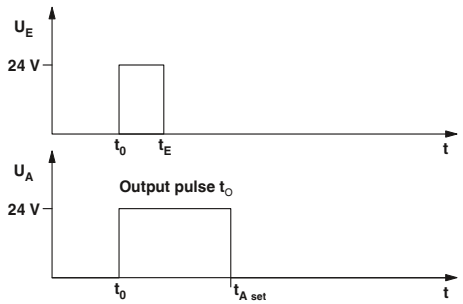
Operating state	Switching level Input	LED display yellow LED	LED display red LED	Signal contact/ CONTROL
Not activated	L	L	L	
Normal operation	H	H	L	
Overload/ short circuit	H	H	H	
Open circuit	L	L	H	

UEGM-OE/AV logic pulse expansion block

Time diagrams for UEGM-OE/AV-24DC/24DC/100

Scenario 1: Input pulse t_I < output pulse $t_{O\ set}$

Operating voltage present



Scenario 2: input pulse $t_I \geq$ output pulse $t_{O\ set}$: $t_I = t_O$

Operating voltage present

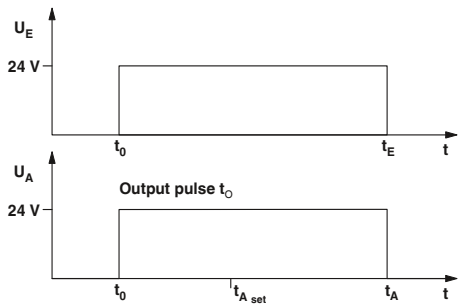


Table of adjustable output pulse lengths

	DIP switches[1]							
	S1	S2	S3	S4	S5	S6	S7	S8
Length of output pulses [ms] (when switch is set to "ON")	10	–	–	–	–	–	–	–
	–	20	–	–	–	–	–	–
	–	–	50	–	–	–	–	–
	–	–	–	100	–	–	–	–
	–	–	–	–	200	–	–	–
	–	–	–	–	–	500	–	–
	–	–	–	–	–	–	1000	–
	–	–	–	–	–	–	–	1500

[1]) If no switch is actuated, the output voltage is not defined.

If the input pulse is longer than the set time, the output is switched off almost simultaneously with the input.

Intermediate values can be obtained by combining several DIP switches according to the following formula:

$$T_{tot} = \frac{1}{\frac{1}{t_1} + \frac{1}{t_2} + \ldots + \frac{1}{t_n}}$$

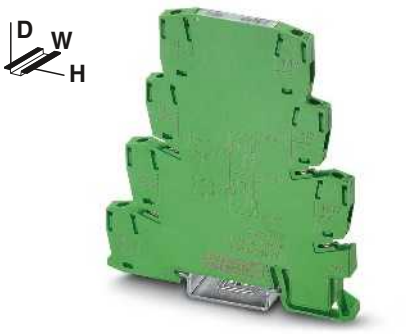
PLC-INTERFACE with two integrated relays

Relay module with two permanently soldered-in power relays

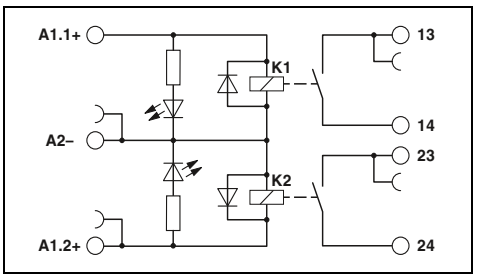
The advantages:

– 100% more channel density than the conventional 6.2 mm relay
– Two switching channels in a 6.2 mm housing
– Screw and Push-in connection technology

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3



Relay module with two integrated, independent relays up to 3.5 A for high channel density



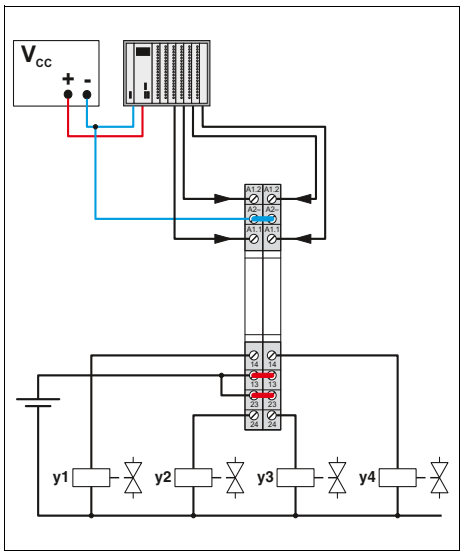
Technical data

Input data		①
Typical input current at U_N	[mA]	7
Response/release time at U_N	[ms]	4 / 6
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Contact material		AgNi
Max. switching voltage		250 V AC / 30 V DC
Minimum switching voltage		24 V AC/DC
Limiting continuous current		3.5 A
Minimum switching current		5 mA
General data		
Test voltage input/output		3 kV AC (50 Hz, 1 min.)
Test voltage output/output		3 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-20 °C ... 60 °C
Mechanical service life		2 x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

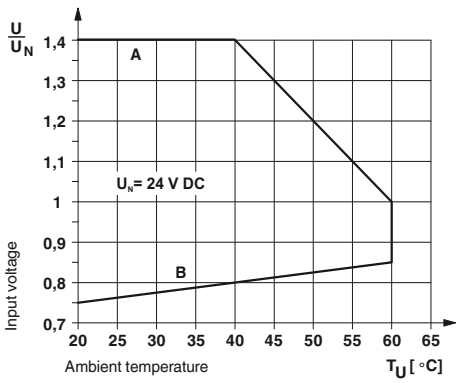
Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V DC	**PLC-2RSC-24DC/ 1**	2987309	10
PLC-INTERFACE, with **Push-in connection**				
①	24 V DC	**PLC-2RPT-24DC/1**	2901639	10

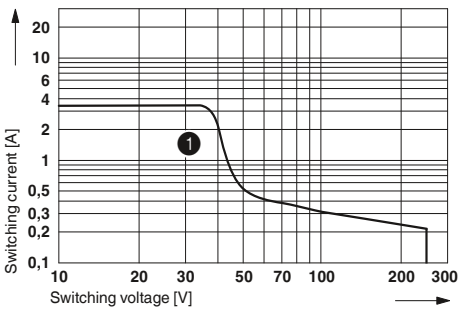
Application example for PLC-2RS...24DC/1



Operating voltage range



Interrupting rating



❶ DC, ohmic load

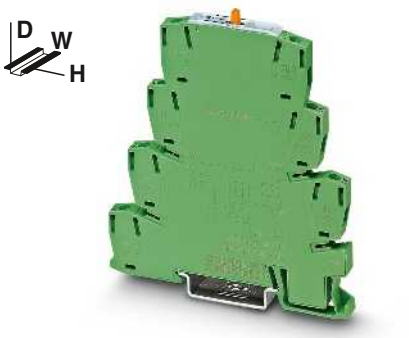
PLC-INTERFACE with manual switch and relay

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

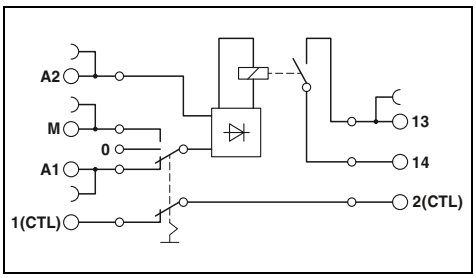
The advantages are:

– Maximum switching current 6 A
– Only 6.2 mm wide
– Floating confirmation contact
– Safe isolation according to DIN EN 50178 between coil and contact
– Screw and Push-in connection technology

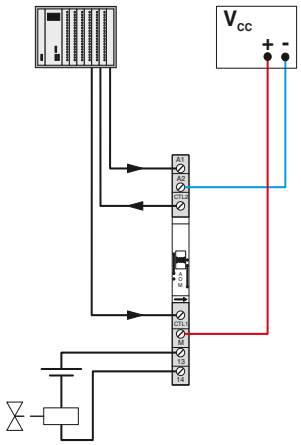
Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
The PLC-ATP partition plate is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
Module height: PLC-...-S/H = 90 mm; PLC-...-S/L: = 86 mm
PLC...**H** - manual operation PLC...**L** - operation using screwdriver



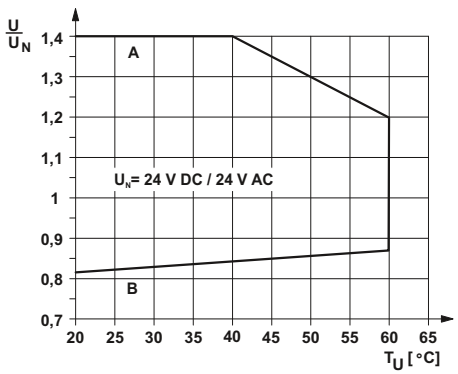
Relay module with manual switch and integrated relay



Application example for PLC-RS...24UC/1/S...



Permissible input voltage range for PLC-RS...24UC/1/S...



Curve A
Maximum continuous voltage when limiting continuous current = 6 A

Curve B
Minimum pick-up voltage for pre-excitation with U_N and limiting continuous current = 6 A

Technical data

		①	②
Input data			
Typical input current at U_N	[mA]	11	11
Response/release time at U_N	[ms]	6 / 15	6 / 15
Input circuit AC/DC		Yellow LED , Bridge rectifier	
Output data			
Contact material		AgSnO	
Max. switching voltage		250 V AC/DC	
Minimum switching voltage		5 V (at 100 mA)	
Limiting continuous current		6 A	
Maximum switch-on current		on request	
Minimum switching current		10 mA (at 12 V)	
Feedback			
Operating mode “Automatic” floating		max. 30 V AC/DC / 50 mA min. 2 V AC/DC / 1 mA	
General data			
Rated insulation voltage		250 V AC	
Rated surge voltage		6 kV	
Ambient temperature (operation)		-20 °C ... 60 °C	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution/surge voltage category		2 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 90 mm	
EMC note		Class A product, see page 605	

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V AC/DC	**PLC-RSC- 24UC/ 1/S/H**	2982236	10
②	24 V AC/DC	**PLC-RSC- 24UC/ 1/S/L**	2834876	10
PLC-INTERFACE, with **Push-in connection**				
①	24 V AC/DC	**PLC-RPT- 24UC/ 1/S/H**	2900328	10
②	24 V AC/DC	**PLC-RPT- 24UC/ 1/S/L**	2900327	10

PLC-INTERFACE with manual switch without relay

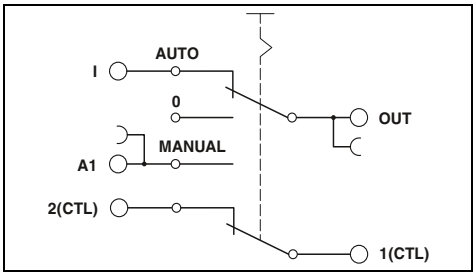
Switching module without relay for manual, zero, and automatic functions

The advantages:

– Only 6.2 mm wide
– Floating confirmation contact
– Screw connection technology

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
The PLC-ATP partition plate is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
Module height: PLC-...-S/H = 90 mm; PLC-...-S/L: = 86 mm
PLC...**H** - manual operation PLC...**L** - operation using screwdriver

Module with manual switch without relay



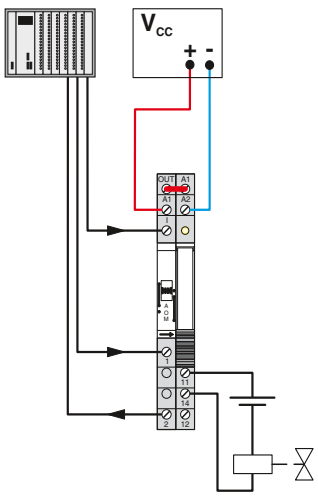
Technical data

Max. switching voltage		72 V DC
Minimum switching voltage		2 V DC
Maximum switch-on current		50 mA
Minimum switching current		1 mA
Switching cycles, max.		100 (At 72 V DC / 50 mA) / 10000 (at 12 V DC / 100 mA)
Feedback		
Operating mode “Automatic” floating		≤ 72 V DC / 50 mA
General data		
Rated insulation voltage		85 V AC
Rated surge voltage		0.5 kV / basic insulation
Ambient temperature (operation)		-20 °C ... 60 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 90 mm

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**			
	PLC-SC-S/H	2980733	10
	PLC-SC-S/L	2980775	10

Application example for PLC-S...S...



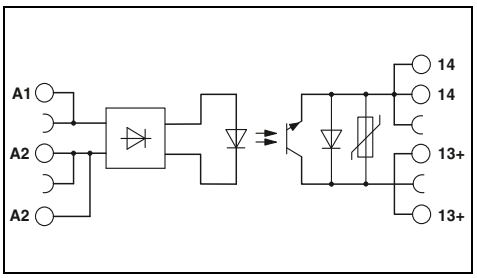
PLC-INTERFACE with an integrated solid-state relay

The slim 6.2 mm PLC housing with integrated electronics in various versions offers the following advantages:

– Option of bridging adjacent modules
– Status display
– Protection circuits in input and output
– Wear-resistant and bounce-free switching
– Integrated protection circuit
– DC outputs of up to 300 V DC/1 A or up to 24 V DC/10 A
– Electronic PDT output of up to 48 V DC/500 mA
– Screw and Push-in connection technology

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
The PLC-ATP partition plate is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
The housings of the following modules are open on one side: - PLC-O...-...-300DC/1 - PLC-O...-24DC/24DC/10/R

Solid-state relay module, DC output max. 300 V DC/1 A

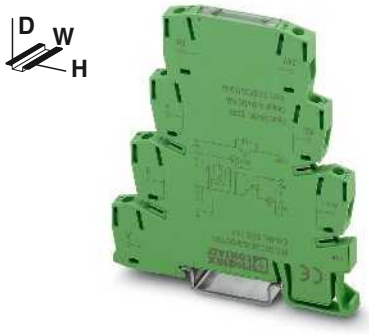


Technical data

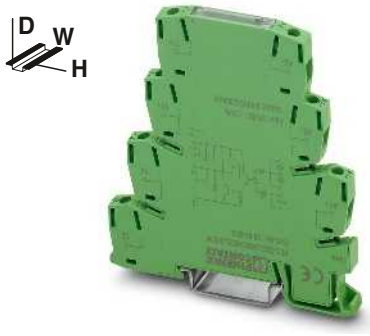
		①	②	③	④	⑤	⑥	⑦	⑧
Input data									
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.1	0.8 - 1.1
Switching level (with reference to U_N)	1 signal ("H")	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
	0 signal ("L")	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
Typical input current at U_N	[mA]	15	6	8	5	5	3	5.6	8.4
Transmission frequency f_{limit}	[Hz]	50	50	50	50	50	50	10	10
Alarm output									
Operating range		- / -							
Output data									
Maximum/minimum switching voltage		300 V DC / 12 V DC							
Limiting continuous current		1 A (see derating curve)							
Voltage drop at maximum limiting continuous current		< 500 mV							
General data									
Rated insulation voltage		300 V							
Rated surge voltage		4 kV / basic insulation							
Ambient temperature (operation)		-25 °C ... 60 °C							
Standards/regulations		IEC 60664 , EN 50178							
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14							
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm							
EMC note		Class A product, see page 605							

Ordering data

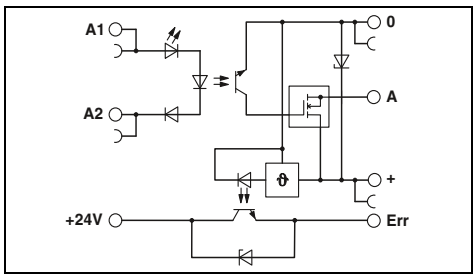
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**					
	①	5 V DC	**PLC-OSC- 5DC/300DC/ 1**	2980652	10
	②	12 V DC	**PLC-OSC- 12DC/300DC/ 1**	2980665	10
	③	24 V DC	**PLC-OSC- 24DC/300DC/ 1**	2980678	10
48 V DC ... 60 V DC	④	60 V DC	**PLC-OSC- 60DC/300DC/ 1**	2980681	10
	⑤	110 V DC	**PLC-OSC-110DC/300DC/ 1**	2980694	10
	⑥	220 V DC	**PLC-OSC-220DC/300DC/ 1**	2980704	10
	⑦	120 V AC	**PLC-OSC-120AC/300DC/ 1**	2980717	10
	⑧	230 V AC	**PLC-OSC-230AC/300DC/ 1**	2980720	10
PLC-INTERFACE, with **Push-in connection**					
	①	5 V DC	**PLC-OPT- 5DC/300DC/1**	2900381	10
	②	12 V DC	**PLC-OPT- 12DC/300DC/1**	2900382	10
	③	24 V DC	**PLC-OPT- 24DC/300DC/1**	2900383	10
48 V DC ... 60 V DC	④	60 V DC	**PLC-OPT- 60DC/300DC/1**	2900384	10
	⑤	110 V DC	**PLC-OPT-110DC/300DC/1**	2900385	10
	⑥	220 V DC	**PLC-OPT-220DC/300DC/1**	2900387	10
	⑦	120 V AC	**PLC-OPT-120AC/300DC/1**	2900388	10
	⑧	230 V AC	**PLC-OPT-230AC/300DC/1**	2900389	10

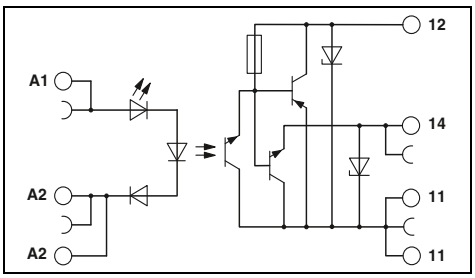


**Solid-state relay module,
short-circuit-proof DC output max. 10 A,
with feedback**

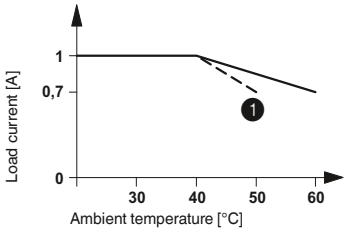


**Solid-state relay module,
DC output max. 500 mA,
with electronic changeover contact**



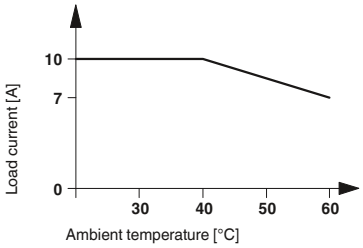


Derating curve for PLC...300DC/1

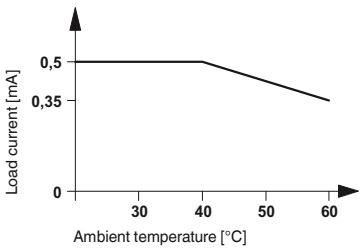


1 For input voltages of 220 V DC and 230 V AC

Derating curve for PLC-...24DC/24DC/10/R



Derating curve for PLC...24DC/48DC/500/W



Technical data

	③
	0.8 - 1.2
	≥ 0.8
	≤ 0.4
	3
	100
	3 V DC ... 33 V DC (High active) / 100 mA
	33 V DC / 5 V DC 10 A (see derating curve) ≤ 50 mV
	300 V 4 kV / basic insulation -25 °C ... 60 °C IEC 60664 , EN 50178 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 86 mm Class A product, see page 605

Technical data

	③
	0.8 - 1.2
	≥ 0.8
	≤ 0.4
	3
	1000
	- / -
	48 V DC / 3 V DC 500 mA (see derating curve) < 1.2 V
	300 V 4 kV / basic insulation -25 °C ... 60 °C IEC 60664 , EN 50178 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 6.2 mm / 80 mm / 86 mm Class A product, see page 605

Ordering data

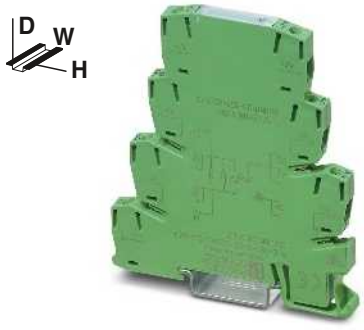
Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 24DC/ 10/R	2982702	10
PLC-OPT- 24DC/ 24DC/10/R	2900398	10

Ordering data

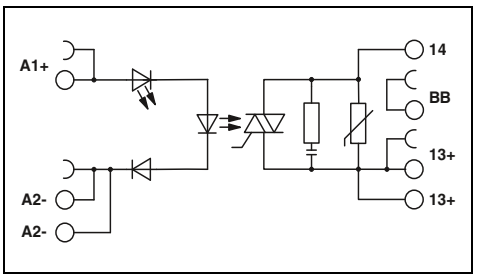
Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 48DC/500/W	2980636	10
PLC-OPT- 24DC/ 48DC/500/W	2900378	10

PLC-INTERFACE with an integrated solid-state relay

6.2 mm narrow solid-state relay for switching AC loads
– Status display
– Protection circuits in input and output
– Wear-free
– Switching capacity up to 230 V AC/2.4 A
– Screw and Push-in connection technology



Solid-state relay module with additional floating terminal point, AC output max. 2.4 A

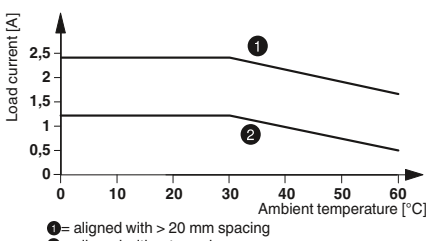


Technical data

Input data		①
Rated actuating voltage range with reference to U_C		0.8 - 1.2
Rated actuating current I_C	[mA]	8
Switching level (with reference to U_C)	1 signal ("H")	> 0.8
	0 signal ("L")	< 0.4
Typical switch-on time at U_N	[ms]	10
Typical switch-off time at U_N	[ms]	10
Transmission frequency f_{limit}	[Hz]	10
Input circuit DC		Yellow LED, reverse polarity protection, surge protection
Output data		
Max. switching voltage		253 V AC
Minimum switching voltage		24 V AC
Maximum switch-on current		250 A (20 ms)
Minimum/maximum switching current		10 mA / 2.4 A (see derating)
Output protection		RCV circuit
Voltage drop at maximum limiting continuous current		< 1 V
Leakage current in off state		< 1 mA
Max. load value		340 A²s (tp = 10 ms, at 25 °C)
General data		
Rated insulation voltage		260 V AC
Rated surge voltage		4 kV
Insulation		Basic insulation
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		DIN EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

Ordering data

Description	Rated actuating voltage U_C	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V DC	**PLC-OSC- 24DC/230AC/2.4/ACT**	2904631	10
PLC-INTERFACE, with **Push-in connection**				
①	24 V DC	**PLC-OPT- 24DC/230AC/2.4/ACT**	2904632	10



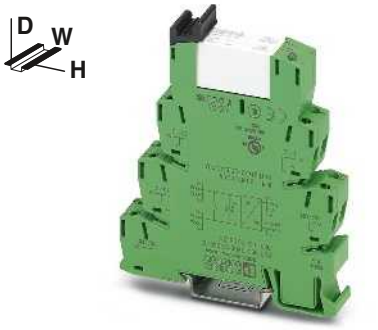
❶= aligned with > 20 mm spacing
❷= aligned without spacing

Load current as a function of the ambient temperature
Operating time: 100% operating factor

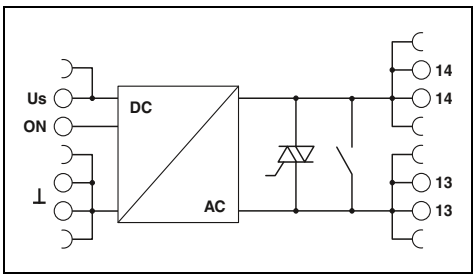
PLC-INTERFACE with hybrid solid-state relay

The solid-state relay, combined with a mechanical relay, offers the following advantages:

– Higher electrical service life
– Lower power dissipation
– Option of bridging adjacent modules
– Status display
– Protection circuits in input and output
– Switching capacity up to 230 V AC/10 A
– Screw and Push-in connection technology



Hybrid solid-state relay, AC output max. 10 A and bypass relay



Technical data

Input data		①
Rated control supply voltage U_S	[V DC]	24
Rated control supply voltage range with reference to U_S		0.8 - 1.2
Rated control supply current I_S		14 mA (Input low, output low) 19 mA (Input high, output high)
Rated actuation voltage U_C ON	[V DC]	24
Rated actuating voltage range with reference to U_C		0.8 - 1.2
Rated actuating current I_C	[mA]	6.8
Input circuit DC		Yellow LED, reverse polarity protection, surge protection
Output data		
Max. switching voltage		253 V AC
Minimum switching voltage		24 V AC
Minimum/maximum switching current		100 mA / 10 A (see derating curve)
Output protection		RCV circuit
Leakage current in off state		< 1 mA
Max. load value		350 A^2s (tp = 10 ms, at 25 °C)
General data		
Rated insulation voltage		260 V AC
Rated surge voltage		6 kV
Insulation		safe isolation
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		DIN EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
Dimensions	W / H / D	14 mm / 80 mm / 94 mm
EMC note		Class A product, see page 605

Ordering data

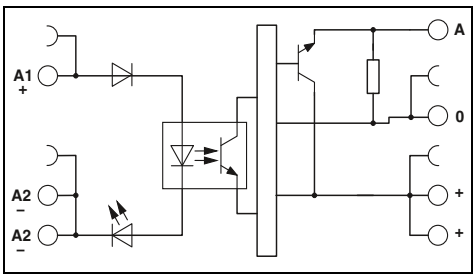
Description	Rated actuating voltage U_C	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	24 V DC	**PLC-HSC-24DC/230AC/10**	2905214	1
PLC-INTERFACE, with **Push-in connection**				
①	24 V DC	**PLC-HPT-24DC/230AC/10**	2905215	1

PLC-INTERFACE
Solid-state relays up to 100 kHz

A solid-state relay for the safe acquisition of short pulses.
– Status display
– Bridging options
– Limit frequency of up to 100 kHz
– Push-pull stage on output side
– Features a capacitor on the input side for interference suppression

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

**Solid-state relay module,
DC output,
transmission frequency of 100 kHz**

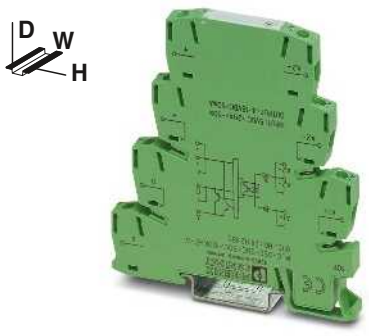


Technical data

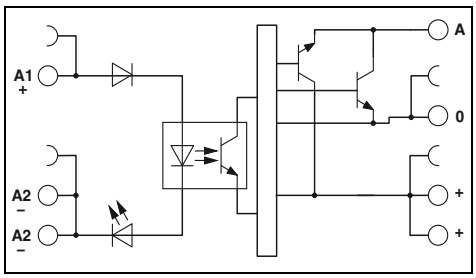
Input data		①	②
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2
Switching level with reference to U_N	1 signal ("H")	> 0.8	> 0.8
	0 signal ("L")	< 0.4	< 0.4
Typical input current at U_N	[mA]	7	6
Typical switch-on time at U_N	[µs]	1.5	1.5
Typical switch-off time at U_N	[µs]	2	2
Transmission frequency f_{limit}	[kHz]	100	100
Input protection:		Yellow LED, reverse polarity protection, surge protection	
Output data			
Operating voltage range		4 V DC ... 30 V DC	
Limiting continuous current		50 mA	
Quiescent current		4.3 mA	
Residual voltage drop at "H"		< 0.5 V	
Output circuit		3-conductor, ground-referenced	
Output protection		Reverse polarity protection, surge protection	
General data			
Test voltage input/output		2.5 kV_{rms} (50 Hz, 1 min.)	
Ambient temperature (operation)		-20 °C ... 60 °C	
Standards/regulations		DIN EN 50178	
Degree of pollution/surge voltage category		2 / II	
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm	
EMC note		Class A product, see page 605	

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Input solid-state relay with screw connection					
	①	5 V DC	**PLC-OSC- 5DC/ 24DC/100KHZ**	2902963	1
	②	24 V DC	**PLC-OSC- 24DC/ 24DC/100KHZ**	2902964	1
Input solid-state relay with Push-in connection					
	①	5 V DC	**PLC-OPT- 5DC/ 24DC/100KHZ**	2902969	1
	②	24 V DC	**PLC-OPT- 24DC/24DC/100KHZ**	2902970	1



**Solid-state relay module,
DC push-pull output,
transmission frequency of 100 kHz**



Technical data

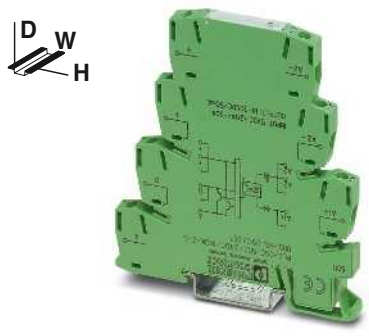
①	②
0.5 -	0.8 -
1.2	1.2
> 0.5	> 0.8
< 0.3	< 0.4
8	8
1	1
2	2
100	100
Yellow LED, reverse polarity protection, surge protection	

4 V DC ... 18 V DC
50 mA
8.5 mA
< 1.2 V
3-conductor push-pull, ground referenced
Reverse polarity protection, surge protection

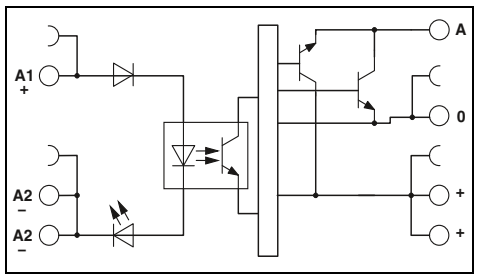
2.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
DIN EN 50178
2 / II
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
6.2 mm / 80 mm / 86 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 5DC/ 5DC/100KHZ-G	**2902965**	1
PLC-OSC- 24DC/ 5DC/100KHZ-G	**2902966**	1
PLC-OPT- 5DC/ 5DC/100KHZ-G	**2902971**	1
PLC-OPT- 24DC/ 5DC/100KHZ-G	**2902972**	1



**Solid-state relay module,
DC push-pull output,
transmission frequency of 100 kHz**



Technical data

①	②
0.5 -	0.8 -
1.2	1.2
> 0.5	> 0.8
< 0.3	< 0.4
8	8
1	1
2	2
100	100
Yellow LED, reverse polarity protection, surge protection	

14 V DC ... 30 V DC
50 mA
15 mA
< 2.2 V
3-conductor push-pull, ground referenced
Reverse polarity protection, surge protection

2.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
DIN EN 50178
2 / II
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
6.2 mm / 80 mm / 86 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 5DC/ 24DC/100KHZ-G	**2902967**	1
PLC-OSC- 24DC/ 24DC/100KHZ-G	**2902968**	1
PLC-OPT- 5DC/24DC/100KHZ-G	**2902973**	1
PLC-OPT- 24DC/24DC/100KHZ-G	**2902974**	1

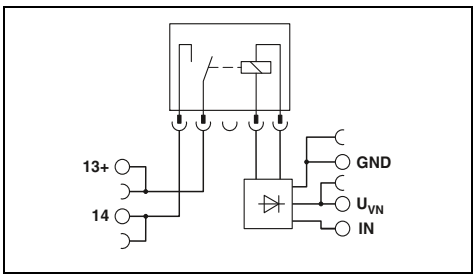
PLC-INTERFACE for the TTL signal at input

The PLC-BS...TTL/1 basic terminal block is controlled with a TTL (5 V) input signal. It is equipped with either a mechanical relay or a solid-state relay. The basic terminal block equipped with a robust miniature relay offers the following advantages:

– Overall width of just 6.2 mm
– Bridging options
– Status display
– RTIII degree of protection
– Safe isolation in accordance with EN 50178 (VDE 0160)
– 4 kV_{rms} electrical isolation between coil and contact
– Screw and Push-in connection technology

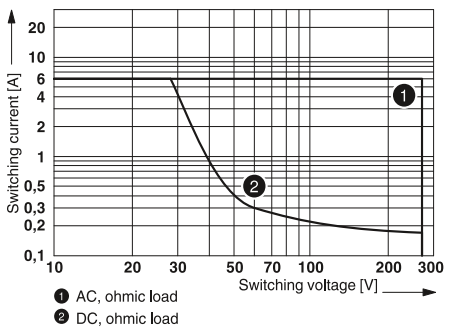
Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

1-N/O basic terminal block for assembly with relay for TTL (5 V)



Technical data

Input data			
Rated control supply voltage U_{VN}		5 V DC	
Rated control supply voltage range with reference to U_{VN}		0.9 ... 1.2	
Rated control supply current I_{VN}		41 mA	
Rated actuating voltage U_c (IN)		5 V DC (TTL)	
Rated actuating voltage range with reference to U_C		0.9 ... 1.2	
Rated actuating current I_C		2.5 mA	
Typical response time at Uc		4.5 ms	
Typical release time at Uc		3.5 ms	
Input circuit		Yellow LED, reverse polarity protection, surge protection	
Output data with:		REL-MR-4,5DC/21 AU	REL-MR-4,5DC/21
Contact type		Single contact, 1 N/O contact	Single contact, 1 N/O contact
Contact material		AgSnO, hard gold-plated	AgSnO
Max. switching voltage		30 V AC / 36 V DC	250 V AC/DC
Minimum switching voltage		100 mV (at 10 mA)	5 V (at 100 mA)
Limiting continuous current		50 mA	6 A
Maximum switch-on current		50 mA	on request
Minimum switching current		1 mA (at 24 V)	10 mA (at 12 V)
General data			
Rated insulation voltage		250 V	
Rated surge voltage/insulation		6 kV	
Ambient temperature (operation)		-20 °C ... 60 °C	
Mechanical service life		2 x 10^7 cycles	
Air clearances and creepage distances between the power circuits		IEC 60664, EN 50178	
Degree of pollution / Overvoltage category		2 / III	
Mounting position / Assembly		any / in rows with zero spacing	
Connection data solid/stranded/AWG		0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	



❶ AC, ohmic load
❷ DC, ohmic load

Max. interrupting rating

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE			
with screw connection	**PLC-BSC-TTL/1**	2982689	10
with Push-in connection	**PLC-BPT-TTL/1**	2900458	10

Accessories

Plug-in miniature power relays, with multi-layer gold contacts			
	REL-MR 4,5DC/21AU	2961370	10
	REL-MR- 4,5DC/21	2961367	10

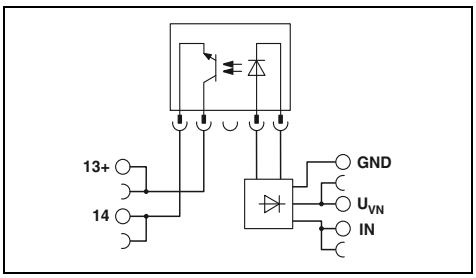
PLC-INTERFACE for the TTL signal at input

The PLC-BS...TTL/1 basic terminal block is controlled with a TTL (5 V) input signal. It is equipped with either a mechanical relay or a solid-state relay. The basic terminal block equipped with a solid-state relay offers the following advantages:

– Overall width of just 6.2 mm
– Bridging options
– Status display
– IP67-protected solid-state relay electronic unit
– Switching capacity of up to 24 V DC/3 A
– Alternative input or power solid-state relay
– Wear-free and bounce-free
– Integrated protective circuit
– 2.5 kV_{rms} electrical isolation between input and output
– Screw and Push-in connection technology

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For derating curves see page 399

Basic terminal block for assembly with solid-state relay for TTL (5 V)



Technical data

Input data			
Rated control supply voltage U_{VN}		5 V DC	
Rated control supply voltage range with reference to U_{VN}		0.9 ... 1.2	
Rated control supply current I_{VN}		11.5 mA	
Rated actuating voltage U_c (IN)		5 V DC (TTL)	
Switching level 1 signal ("H") (TTL signal)		> 2 V DC	
Switching level 0 signal ("L") (TTL signal)		< 0.8 V DC	
Rated actuating current I_C		2.5 mA	
Typical response time/switch-on time at U_c		35 µs	
Typical switch-off time at U_c		320 µs	
Input circuit		Yellow LED, reverse polarity protection, surge protection	
Output data with:		OPT-5DC/48DC/100	OPT-5DC/24DC/2
Max. switching voltage		48 V DC	33 V DC
Minimum switching voltage		3 V DC	3 V DC
Limiting continuous current		100 mA	3 A
Output protection		Reverse polarity protection, Surge protection	Reverse polarity protection, Surge protection
Voltage drop at limiting continuous current		< 1 V	< 200 mV
General data			
Rated insulation voltage		250 V	
Rated surge voltage/insulation		6 kV/Basic isolation	
Ambient temperature (operation)		-20 °C ... 60 °C	
Air clearances and creepage distances between the power circuits		IEC 60664, EN 50178	
Degree of pollution / Overvoltage category		2 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE			
with screw connection	**PLC-BSC-TTL/1**	2982689	10
with Push-in connection	**PLC-BPT-TTL/1**	2900458	10

Accessories

Plug-in solid-state relays			
Solid-state input relays	**OPT- 5DC/ 48DC/100**	2967992	10
Solid-state power relays	**OPT- 5DC/ 24DC/ 2**	2967989	10

PLC-INTERFACE for the TTL signal at output

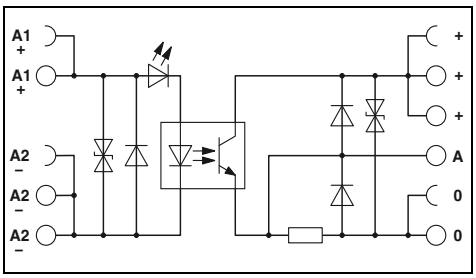
The PLC-OS...24DC/TTL with a built-in solid-state relay can be used for fast and wear-free switching of TTL (5 V) signals.

The module offers the following advantages:

– Switching capacity TTL (5 V), fan out = 1
– Overall width of just 6.2 mm
– Bridging options
– Status display
– Integrated protective circuit
– Screw and Push-in connection technology

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3

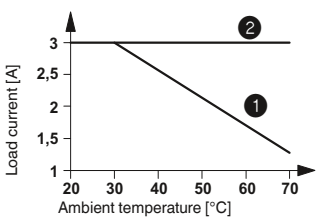
Input solid state relays with TTL (5 V) output



Technical data

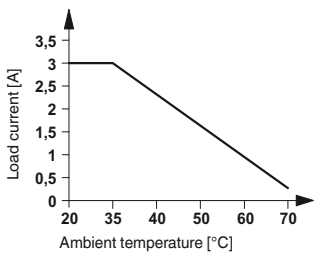
Input data		
Rated actuating voltage U_C		24 V DC
Rated actuating voltage range with reference to U_C		0.8 ... 1.2
Switching level 1 signal ("H")		> 0.8
Switching level 0 signal ("L")		< 0.4
Rated actuating current I_C		3.4 mA
Typical switch-on time at U_c		35 µs
Typical switch-off time at U_c		35 µs
Transmission frequency f_{limit}		1 kHz
Input circuit DC		Yellow LED, reverse polarity protection, surge protection
Output data with:		
Rated control supply voltage U_S		5 V DC
Rated control supply voltage range with reference to U_S		0.9 ... 1.2
Limiting continuous current		A TTL load (Fan out = 1)/50 mA for switching mode
Output protection		Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		< 80 mV
General data		
Rated insulation voltage		250 V DC
Rated surge voltage/insulation		4 kV / basic insulation
Ambient temperature (operation)		-25 °C ... 60 °C
Air clearances and creepage distances between the power circuits		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

Derating curve for PLC-OSP...24DC/3RW



❶ Aligned without spacing
❷ Aligned with ≥ 20 mm spacing

Derating curve for PLC-OSP...110DC/3RW



Ordering data

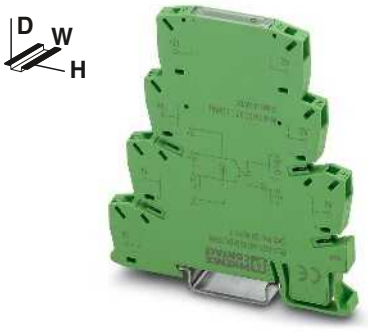
Description	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE			
with screw connection	**PLC-OSC- 24DC/TTL**	2982728	10
with Push-in connection	**PLC-OPT- 24DC/TTL**	2900363	10

PLC-INTERFACE with solid-state relays for railway applications

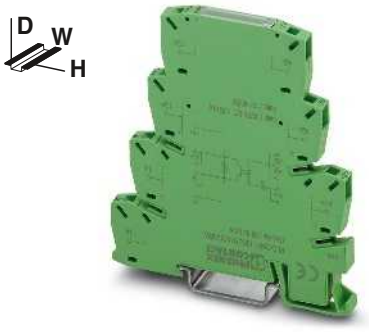
The PLC-OSP...RW interface modules are suitable for use according to DIN EN 50155 (VDE 0115 Part 200) "Railway applications - Electronic equipment used on rolling stock".

The advantages:

– Temperature range -25°C to +70°C
– Input voltage range 0.7-1.25 x U_N
– Shock resistance in acc. with DIN 50155 (requirements in acc. with EN 61373).
– Spring cage and Push-in connection technology

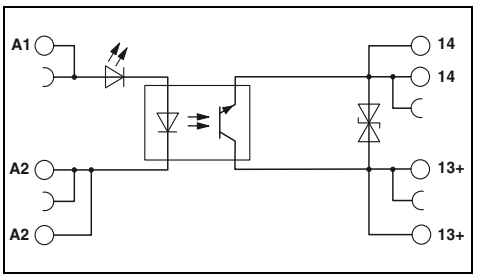


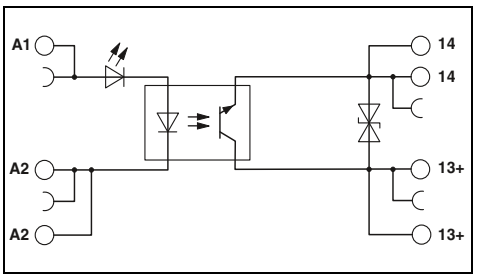
Solid-state relay module, DC output max. 3 A



Solid-state relay module, DC output max. 110 V DC/3 A

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For derating curves see page 414





Technical data

Input data		①	⑥
Permissible range (with reference to U_N)		0.7 - 1.25	0.7 - 1.25
Switching level (with reference to U_N)	1 signal ("H")	≥ 0.6	≥ 0.6
	0 signal ("L")	≤ 0.3	≤ 0.3
Typical input current at U_N	[mA]	8.5	3
Typical switch-on time at U_N	[ms]	0.04	0.08
Typical switch-off time at U_N	[ms]	0.2	0.6
Transmission frequency f_{limit}	[Hz]	300	100
Input circuit DC		Yellow LED, reverse polarity protection	
Output data			
Max. switching voltage		33 V DC	
Minimum switching voltage		3 V DC	
Limiting continuous current		3 A (see derating curve)	
Output protection		Reverse polarity protection, surge protection	
Voltage drop at maximum limiting continuous current		< 200 mV	
General data			
Rated insulation voltage		250 V	
Rated surge voltage		4 kV / basic insulation	
Ambient temperature (operation)		-25 °C ... 70 °C	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution/surge voltage category		2 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm	
EMC note		Class A product, see page 605	

Technical data

Input data		①	②	③	④	⑤	⑥
Permissible range (with reference to U_N)		0.7 - 1.25	0.7 - 1.25	0.7 - 1.25	0.7 - 1.25	0.7 - 1.25	0.7 - 1.25
Switching level (with reference to U_N)	1 signal ("H")	> 0.6	> 0.6	> 0.6	> 0.6	> 0.6	> 0.6
	0 signal ("L")	< 0.4	< 0.4	< 0.3	< 0.3	< 0.3	< 0.3
Typical input current at U_N	[mA]	12	12	5.5	5.5	5.5	5.5
Typical switch-on time at U_N	[ms]	0.4	0.4	0.04	0.04	0.04	0.4
Typical switch-off time at U_N	[ms]	0.2	0.1	0.2	0.2	0.2	0.2
Transmission frequency f_{limit}	[Hz]	50	50	300	300	300	300
Input circuit DC		Yellow LED, reverse polarity protection, surge protection					
Output data							
Max. switching voltage		140 V DC					
Minimum switching voltage		12 V DC					
Limiting continuous current		3 A (see derating curve)					
Output protection		Reverse polarity protection, surge protection					
Voltage drop at maximum limiting continuous current		< 150 mV					
General data							
Rated insulation voltage		160 V DC					
Rated surge voltage		4 kV / basic insulation					
Ambient temperature (operation)		-25 °C ... 70 °C					
Standards/regulations		IEC 60664 , EN 50178					
Degree of pollution/surge voltage category		2 / III					
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14					
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm					
EMC note		Class A product, see page 605					

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **spring-cage connection**				
①	24 V DC	**PLC-OSP- 24DC/ 24DC/ 3RW**	2980513	10
②	36 V DC			
③	48 V DC			
④	72 V DC			
⑤	96 V DC			
⑥	110 V DC	**PLC-OSP-110DC/ 24DC/ 3RW**	2980526	10
PLC-INTERFACE, with **Push-in connection**				
①	24 V DC	**PLC-OPT- 24DC/ 24DC/3RW**	2900379	10
②	36 V DC			
③	48 V DC			
④	72 V DC			
⑤	96 V DC			
⑥	110 V DC	**PLC-OPT-110DC/ 24DC/3RW**	2900380	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSP- 24DC/110DC/ 3RW	2982511	10
PLC-OSP- 36DC/110DC/ 3RW	2982524	10
PLC-OSP- 48DC/110DC/ 3RW	2982537	10
PLC-OSP- 72DC/110DC/ 3RW	2982540	10
PLC-OSP- 96DC/110DC/ 3RW	2982553	10
PLC-OSP-110DC/110DC/ 3RW	2982566	10
PLC-OPT- 24DC/110DC/3RW	2900391	10
PLC-OPT- 36DC/110DC/3RW	2900392	10
PLC-OPT- 48DC/110DC/3RW	2900393	10
PLC-OPT- 72DC/110DC/3RW	2900394	10
PLC-OPT- 96DC/110DC/3RW	2900395	10
PLC-OPT-110DC/110DC/3RW	2900396	10

PLC-INTERFACE for railway applications

Relay modules with extended input voltage and temperature range, specifically for use in railway applications

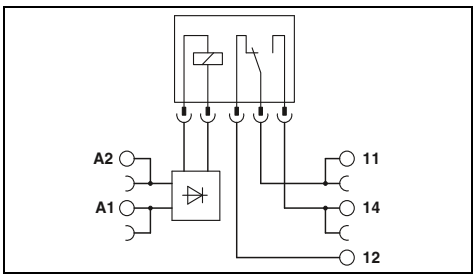
The advantages:

– Temperature range -25°C to +70°C
– Input voltage range 0.7 to 1.25 x U_N
– Vibration and shock resistance according to EN 50155
– Safe isolation according to DIN EN 50178 between coil and contact
– Push-in connection technology

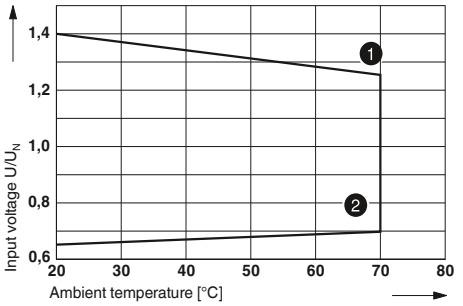
Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

Basic terminal block for assembly with 1-PDT relay up to 6 A

cULus EAC DNV GL

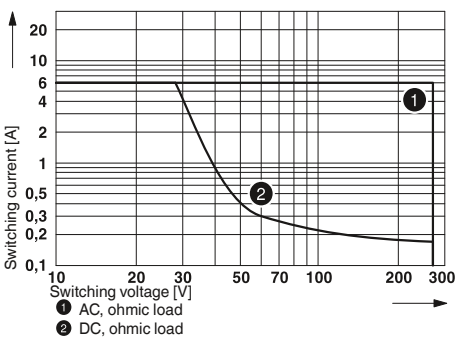


Permissible input voltage range for PLC-BSP-24DC/21RW (with REL-MR-18DC/21... relay)



❶ Maximum continuous voltage when limiting continuous current = 3 A
❷ Minimum pick-up voltage for pre-excitation with U_N and limiting continuous current = 3 A

Electrical interrupting rating for PLC...21 with 1-PDT relay



❶ AC, ohmic load
❷ DC, ohmic load

Technical data

Input data			
Nominal input voltage U_N		24 V DC	
Permissible range (with reference to U_N)		See diagram	
Typical input current at U_N		12 mA	
Typical response time at U_N		5 ms	
Typical release time at U_N		8 ms	
Input circuit		Yellow LED, reverse polarity protection, freewheeling diode	
Output data with:		REL-MR-18DC/21	REL-MR-18DC/21AU
Contact type		Single contact, 1-PDT	Single contact, 1-PDT
Contact material		AgSnO	AgSnO, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage		5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current		3 A	50 mA
Maximum switch-on current		on request	50 mA
Minimum switching current		10 mA (at 12 V)	1 mA (at 24 V)
General data			
Test voltage input/output		4 kV (50 Hz, 1 min.)	
Ambient temperature (operation)		-25 °C ... 70 °C	
Mechanical service life		2 x 10^7 cycles	
Standards/regulations		IEC 60664, EN 50178	
Degree of pollution / Overvoltage category		3 / III	
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm	
EMC note		Class A product, see page 605	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE basic terminal block, for plug-in miniature relay				
with Push-in connection	24 V DC	**PLC-BPT- 24DC/21RW**	2900261	10

Accessories

Plug-in miniature relays		
REL-MR- 18DC/21	2961383	10
REL-MR- 18DC/21AU	2961493	10

PLC-INTERFACE for railway applications

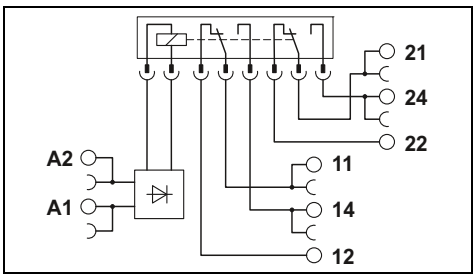
Relay module for input voltages with a nominal frequency of 16.7 Hz

The advantages:

– Input nominal frequency 16.7 Hz
– Vibration and shock resistance according to EN 50155
– Safe isolation according to DIN EN 50178 between coil and contact
– Push-in connection technology

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The values in parentheses then apply for further operation. This can result in a shorter service life than with a pure power contact.

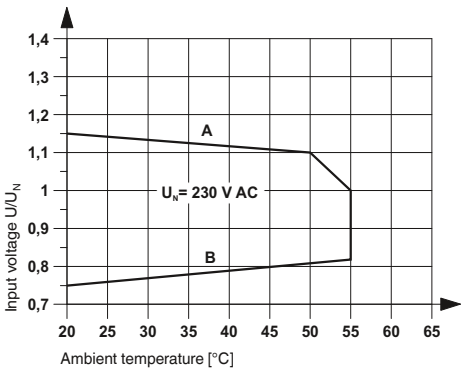
2-PDT relay module for 16.7 Hz input frequency, max. 2 x 6 A



Technical data

Input data		
Nominal input voltage U_N	230 V AC	
Input nominal frequency	16.67 Hz	
Permissible range (with reference to U_N)	see diagram	
Typical response time at U_N	20 ms	
Typical release time at U_N	60 ms	
Input circuit	Yellow LED, bridge rectifier	
Output data		
Contact type	2 PDT	
Contact material	AgNi, hard gold-plated	
Max. switching voltage	30 V AC / 36 V DC	(250 V AC/DC)
Minimum switching voltage	100 mV	(5 V AC/DC)
Limiting continuous current	50 mA	(6 A)
Maximum switch-on current	50 mA	(8 A)
Minimum switching current	1 mA	(10 mA)
General data		
Test voltage input/output	6 kV	
Ambient temperature (operation)	-25 °C ... 55 °C	
Mechanical service life	approx. 3x 10^7 cycles	
Standards/regulations	IEC 60664, EN 50178	
Degree of pollution / Overvoltage category	2 / III	
Connection data solid/stranded/AWG	0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
Dimensions W / H / D	14 mm / 80 mm / 94 mm	
EMC note	Class A product, see page 605	

Permissible input voltage range for PLC-RSP-230UC/21-21AU/RWF



Curve A
Maximum continuous voltage when limiting continuous current = 6 A

Curve B
Minimum pick-up voltage for pre-excitation with U_N and limiting continuous current = 6 A

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE with Push-in connection	230 V AC	**PLC-RPT-230UC/21-21AU/RWF**	2900345	10

PLC-INTERFACE for railway applications

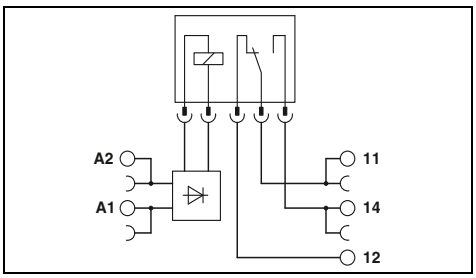
Relay modules with extended input voltage and temperature range, specifically designed for railway applications

The advantages:

– Certified to EN 50155
– Optimum relay operation thanks to wide-range electronics
– Temperature range -40 to +70°C (short-term 85°C)
– Input voltage range 0.7 to 1.25 x U_N (short-term 1.4 x U_N)
– Vibration and shock resistance according to EN 50155
– Safe isolation according to DIN EN 50178 between coil and contact
– Push-in connection technology

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
Electrical service life diagrams, see page 400

1-PDT relay module, 6 A, maximum



Technical data

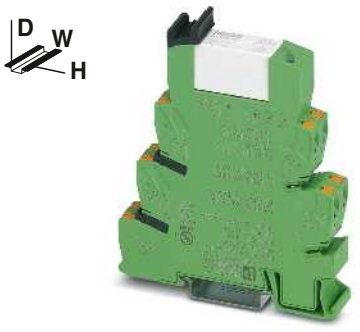
Input data		①	②	③
Permissible range (with reference to U_N)		0.7 - 1.25		0.7 - 1.25
Typical input current at U_N	[mA]	9	3	2
Typical response time at U_N	[ms]	4	4	4
Typical release time at U_N	[ms]	4	4	4
Input protection:		Yellow LED, bridge rectifier, freewheeling diode		

Output data		
Contact type	1 PDT	1 PDT
Contact material	AgSnO	AgSnO, hard gold-plated
Max. switching voltage	250 V AC/DC	30 V AC / 36 V DC
Minimum switching voltage	5 V (at 100 mA)	100 mV (at 10 mA)
Limiting continuous current	6 A	50 mA
Maximum switch-on current	10 A (4 s)	50 mA
Minimum switching current	10 mA (at 12 V)	1 mA (at 24 V)

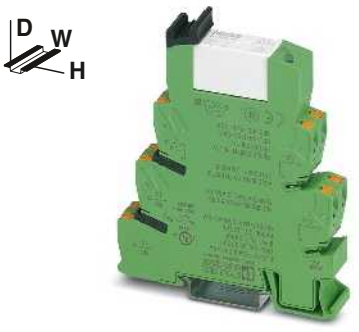
General data	
Test voltage (winding / contact)	4 kV_{rms} (50 Hz, 1 min.)
Ambient temperature (operation)	-40 °C ... 70 °C (Temperature class TX)
Mechanical service life	Approx. 2x 10^7 cycles
Standards/regulations	EN 50155 (VDE 0115 part 200), EN 50178, EN 61373, EN 50121
Connection data solid/stranded/AWG	0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
Dimensions W / H / D	6.2 mm / 80 mm / 94 mm
EMC note	Class A product, see page 605

Ordering data

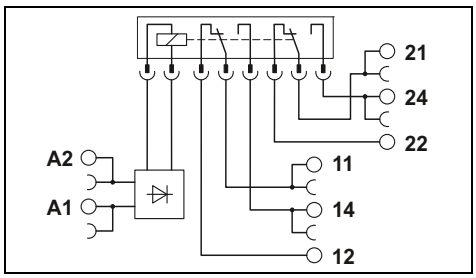
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **power contact**					
with Push-in connection	①	24 V DC	**PLC-RPT- 24UC/21/RW**	**2900318**	10
	②	72 V DC	**PLC-RPT- 72UC/21/RW**	**2900319**	10
	③	110 V DC	**PLC-RPT-110UC/21/RW**	**2900320**	10
PLC-INTERFACE, with **hard gold-plated contact**					
with Push-in connection	①	24 V DC	**PLC-RPT- 24UC/21AU/RW**	**2900321**	10
	②	72 V DC	**PLC-RPT- 72UC/21AU/RW**	**2900322**	10
	③	110 V DC	**PLC-RPT-110UC/21AU/RW**	**2900323**	10

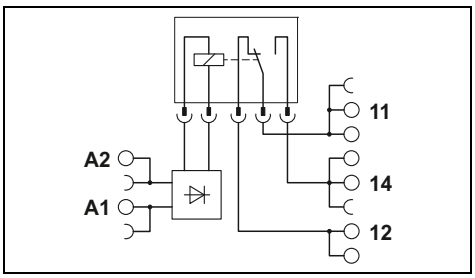


2-PDT relay module,
2 x 6 A, maximum



1-PDT relay module,
max. 10 A





Technical data

①	②	③
0.7 - 1.25		0.7 - 1.25
20	6	4.5
5	5	5
11	11	11

Yellow LED, bridge rectifier, freewheeling diode

2 PDT	2 PDT
AgNi	AgNi, hard gold-plated
250 V AC/DC	30 V AC / 36 V DC
5 V (at 10 mA)	100 mV (at 10 mA)
6 A	50 mA
15 A (300 ms)	50 mA
10 mA (At 5 V)	1 mA (at 24 V)

5 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 70 °C (Temperature class TX)
approx. 3x 10^7 cycles
EN 50155 (VDE 0115 part 200), EN 50178, EN 61373, EN 50121

0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
14 mm / 80 mm / 94 mm
Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RPT- 24UC/21-21/RW	2900346	10
PLC-RPT- 72UC/21-21/RW	2900347	10
PLC-RPT-110UC/21-21/RW	2900348	10
PLC-RPT- 24UC/21-21AU/RW	2900349	10
PLC-RPT- 72UC/21-21AU/RW	2900350	10
PLC-RPT-110UC/21-21AU/RW	2900351	10

Technical data

①	②	③
0.7 - 1.25		0.7 - 1.25
20	6	4.5
5	5	5
11	11	11

Yellow LED, bridge rectifier, freewheeling diode

1 PDT
AgNi
250 V AC/DC
12 V (at 10 mA)
10 A (With inserted bridge 2967691)
30 A (300 ms)
10 mA (At 12 V)

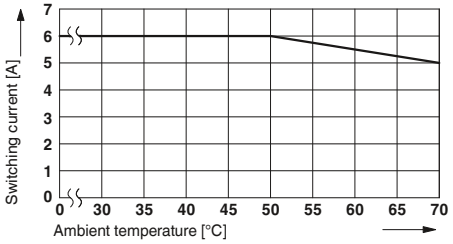
5 kV_{rms} (50 Hz, 1 min.)
-40 °C ... 70 °C (Temperature class TX)
approx. 3x 10^7 cycles
EN 50155 (VDE 0115 part 200), EN 50178, EN 61373, EN 50121

0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14
14 mm / 80 mm / 94 mm
Class A product, see page 605

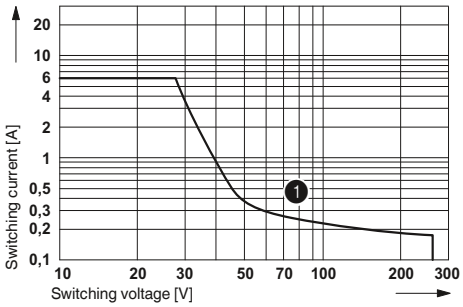
Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RPT- 24UC/21HC/RW	2900324	10
PLC-RPT- 72UC/21HC/RW	2900325	10
PLC-RPT-110UC/21HC/RW	2900326	10

Derating curve for **PLC-RSP...21/RW**
PLC-RSP...21AU/RW
PLC-RSP...21-21/RW
PLC-RSP...21-21AU/RW

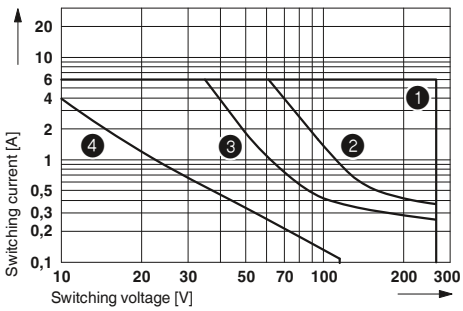


Interrupting rating for PLC-RSP...UC/21RW



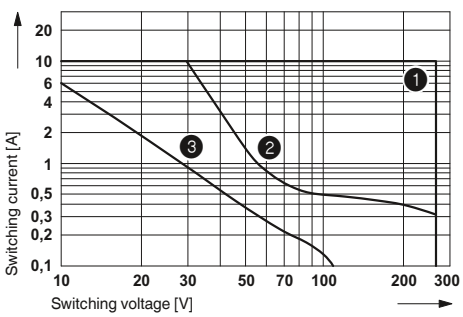
❶ Ohmic load

Interrupting rating for PLC-RSP...UC/21-21/RW



❶ AC, ohmic load
❷ DC, ohmic load, contacts in series
❸ DC, ohmic load
❹ DC, L/R = 40 ms

Interrupting rating for PLC-RSP...UC/21HC/RW



❶ AC, ohmic load
❷ DC, ohmic load
❸ DC, L/R = 40 ms

PLC electronic sensor terminal block for NAMUR proximity sensors

The electronic sensor terminal block, PLC-...-EIK 1-SVN from Phoenix converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

In addition, the electronics monitors the sensor side for a short circuit or open circuit and indicates these errors via an integrated LED.

Due to a corresponding resistance circuit, the PLC-...-EIK 1-SVN can be used to monitor all mechanical switches (N/C contact or N/O contact) for short-circuits and/or wire break.

In addition to a high packing density, this switching amplifier features the following:

– Regulated power supply for the NAMUR proximity switch
– 24 V/50 mA digital output for directly connecting programmable logic controllers
– Connection option for PLC-V8 adapter
– Screw and Push-in connection technology

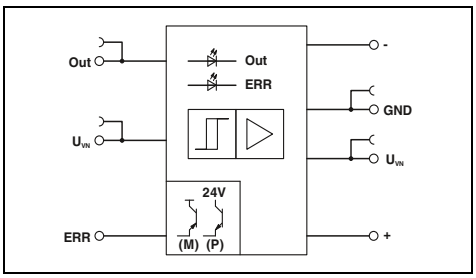
Notes:

Type of insulating housing:
Polyamide PBT, non-reinforced, color: green.

Marking systems and mounting material
See Catalog 3

The PLC-ATP partition plate is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

For inductive proximity sensors acc. to NAMUR, with light indicators for sensor signal and fault



Technical data

Supply		
Input supply nominal voltage U_{VN}		24 V DC
Typical input current at U_{VN}		approx. 14 mA
Transmission frequency f_{limit}		approx. 350 Hz
Input circuit		Green LED, reverse polarity protection, surge protection
Control circuit		
No-load voltage		8.2 V DC ±10 %
Switching points in accordance with EN 60947-5-6:		≥ 2.1 mA (In conductive state) ≤ 1.2 mA (In blocking state) 6.3 mA ... 10 mA (in the event of a short-circuit) 0 mA ... 0.35 mA (In the event of a wire break)
Protective circuit		Surge protection
Alarm output		
Operating voltage range (positive switching)		U_{VN} - U_{Res}
Limiting continuous current		50 mA
Voltage drop at maximum limiting continuous current		≤ 1.5 V (U_R)
Output protection		Red LED, surge protection
Signal output		
Limiting continuous current		50 mA
Voltage drop U_R at maximum limiting continuous current		≤ 1.5 V (U_R)
Output protection		Surge protection
General data		
Rated insulation voltage		50 V DC
Rated surge voltage / insulation		0.4 kV/Basic isolation
Ambient temperature (operation)		-25 °C ... 50 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution / Overvoltage category		2 / I
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 12
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

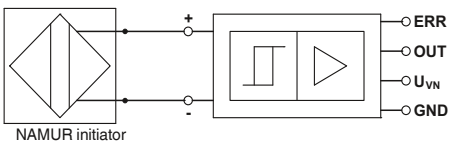
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Switching amplifier electronic terminal block, positive switching			
with screw connection	**PLC-SC-EIK 1-SVN 24P/P**	2982663	10
with Push-in connection	**PLC-PT-EIK 1-SVN 24P/P**	2900397	10

Accessories

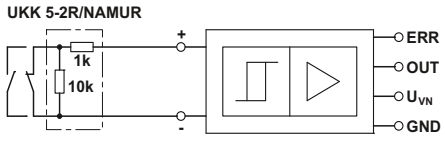
Description	Type	Order No.	Pcs./ Pkt.
Double-level terminal block, with pre-assembled resistors			
with screw connection	**UKK 5-2R/NAMUR**	2941662	50

Application 1



NAMUR initiator

Application 2



Limit switch

Initiator state	Switching level		LED	
	OUT	ERR	Green	Red
Conductive	L	L	OFF	OFF
Blocking	H	L	ON	OFF
Short circuit	L	H	OFF	ON
Open circuit	L	H	OFF	ON

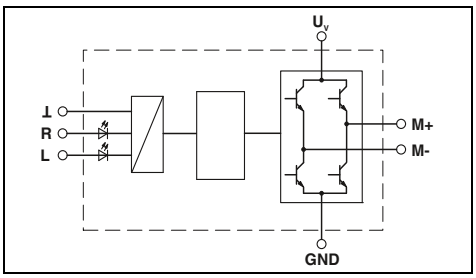
PLC series
Electronic reversing load relay for DC motors

The PLC-S...-ELR W 1/2-24DC electronic reversing load relays are used to switch mechanically commutated DC motors up to 24 V/2 A.

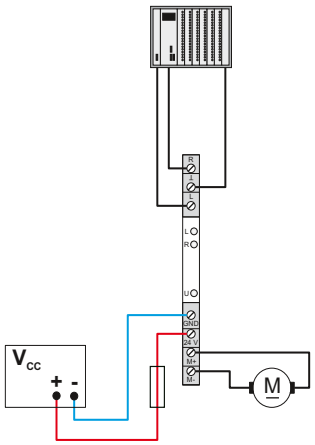
– Wear-free reversing
– Braking by controlling both inputs
– Short-circuit and surge and overload-proof output
– Integrated locking circuit and load wiring
– Screw or spring-cage connection technology

Notes:
Type of housing: Polyester PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
PWM = Pulse Width Modulation

DC reversing load relay with overload and short-circuit-proof output



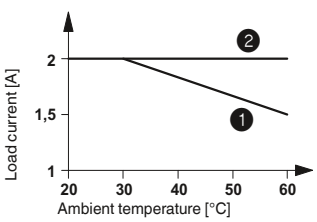
Application example for PLC-S...ELR W 1/2-24DC



Status table

Input		Output	
Right	Left	M +	M –
0	0	High resistance	High resistance
1	0	+ 24 V	GND
0	1	GND	+ 24 V
1	1	GND	GND

Derating curve for PLC-S...ELR W 1/2-24DC



❶ Aligned without spacing
❷ Aligned with > 20 mm spacing

Technical data

Input data		
Control voltage U_{ST} right/left		24 V DC ±20 %
Control input current I_{ST} right/left		approx. 3 mA
Input protection:		Yellow LED, reverse polarity protection, surge protection
PWM option		
Maximum clock frequency of the PWM at the control inputs		1000 Hz
Pulse width repetition rate of the PWM		0 % ... 100 %
Output data		
Supply voltage range U_V		10 V DC ... 30 V DC
Quiescent current		10 mA
Output protection		Green LED, reverse polarity protection, surge protection
Motor switching output		
Continuous current I_A max.		2 A (see derating curve)
Current limitation at short-circuits		15 A (during braking)
General data		
Rated insulation voltage		50 V
Rated surge voltage / insulation		0.5 kV / Basic insulation
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution / Overvoltage category		2 / II
Mounting position		Vertical (horizontal DIN rail)
Mounting		In rows with zero spacing
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

Ordering data

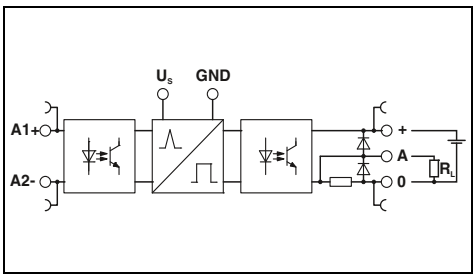
Description	Type	Order No.	Pcs./ Pkt.
Electronic reversing load relays, for driving DC motors, with light indicator and protection circuit			
with screw connection	**PLC-SC-ELR W1/ 2-24DC**	2980539	1
with spring-cage connection	**PLC-SP-ELR W1/ 2-24DC**	2980555	1

PLC-INTERFACE
Pulse expansion module

A solid-state relay for acquiring and extending short pulses.

– Pulse detection can be set from > 0.1 ms or > 2 ms
– Status display
– Delay times of 10 to 2550, can be set via DIP switches
– Bridging options
– Can be retriggered
– Screw and Push-in connection technology

Solid-state relay module for the extension of input pulses, DC output max. 100 mA

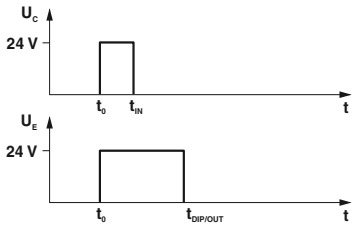


Technical data

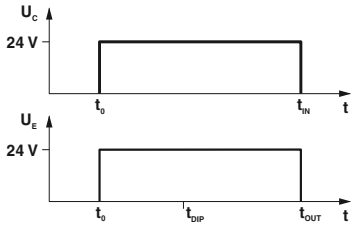
Input data		
Rated control supply voltage U_S		24 V DC
Rated control supply voltage range with reference to U_S		0.8 ... 1.2
Rated control supply current I_S		
- Input low, output low		13 mA
- Input high, output high		19 mA
Rated actuating voltage U_C		24 V DC
Rated actuating current I_C		3 mA
Switching threshold “0” signal in reference to U_C		< 0.4
Switching threshold “1” signal in reference to U_C		> 0.8
Status indication		Yellow LED
Operating voltage display		Green LED
Input circuit		Reverse polarity protection, surge protection
Output data		
Output voltage range U_E		3 V DC ... 48 V DC
Limiting continuous current		100 mA
Voltage drop at maximum limiting continuous current		< 1 V DC
Output circuit		3-conductor, ground-referenced
Output protection		Reverse polarity protection, surge protection, free running
General data		
Rated insulation voltage		50 V DC
Rated surge voltage		0.5 kV
Ambient temperature (operation)		-25 °C ... 60 °C
Standards/regulations		DIN EN 50178
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 86 mm
EMC note		Class A product, see page 605

Ordering data

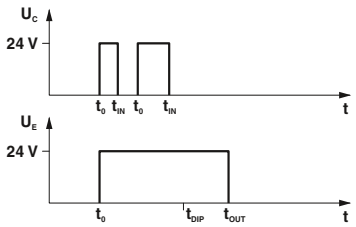
Description	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**	**PLC-OSC-LPE-24DC/48DC/100**	2903171	1
PLC-INTERFACE, with **Push-in connection**	**PLC-OPT-LPE-24DC/48DC/100**	2903173	1



**Input pulse t1 < set output pulse t3
(no restart when triggered again)**



**Input pulse t1 ≥ set output pulse t3 then:
input pulse t1 = output pulse t2
(no restart when triggered again)**



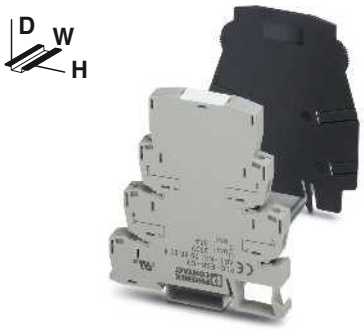
**Input pulse t1 < set output pulse t3
(restart when triggered again)**

DIP							
S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**
10	-	-	-	-	-	-	-
-	20	-	-	-	-	-	-
-	-	40	-	-	-	-	-
-	-	-	80	-	-	-	-
-	-	-	-	160	-	-	-
-	-	-	-	-	320	-	-
-	-	-	-	-	-	640	-
-	-	-	-	-	-	-	1280

Highly compact relay modules - PLC-INTERFACE

PLC accessories

The **PLC-ESK** power terminal is used to supply the bridge potentials, the **PLC-ATP** partition plate is used for the visual separation and safe isolation of adjacent PLC modules. The **PLC-BP (A1-14)** passive feed-through bridge is used instead of a relay and connects the A1 and 14 terminal points.



Power terminal and partition plate

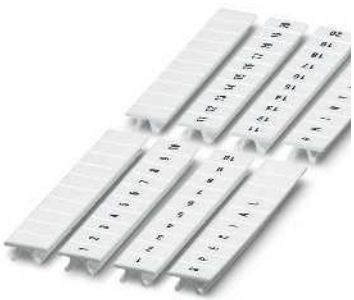
Feed-through bridge

Description	Color	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Power terminal, for supply of up to four potentials, same shape as PLC standard series, max. 32 A/250 V AC	gray	**PLC-ESK GY**	2966508	5			
Partition plate, 2 mm thick, required at the start and end of a PLC terminal strip. It also serves in visual separation of groups, safe isolation of different voltages of neighboring PLC-INTERFACE devices according to DIN EN 50178/VDE0160, separation of neighboring bridges of different potentials, and separation of PLC-INTERFACE devices at voltages > 250 V	black	**PLC-ATP BK**	2966841	25			
Screwdriver Blade: 0.6 x 3.5 x 100 mm, length: 181 mm		**SZF 1-0,6X3,5**	1204517	10			
Passive feed-through bridge, can be plugged in instead of relay or solid-state relay, bridges terminal points A1 and 14	black				**PLC-BP A1-14**	2980283	10

PLC accessories

The color-coded and insulated FBST plug-in bridges can reduce wiring time by up to 70% for PLC-INTERFACE. The 500 mm long **FBST 500-PLC** "continuous bridges" are particularly effective. The **FBST 6** 2-pos. single plug-in bridges are ideal for bridging a smaller number of PLC modules.

Plug-in bridge systems



Marking material

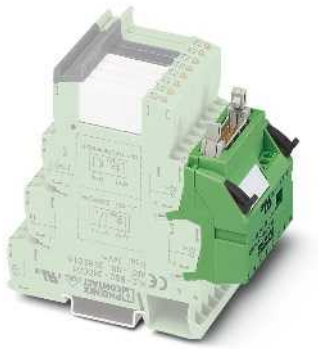
Description	Color	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Cont. plug-in bridge, 500 mm long, insulated, can be cut to length, for potential distribution							
Nominal current: 32 A	red	**FBST 500-PLC RD**	2966786	20			
	blue	**FBST 500-PLC BU**	2966692	20			
	gray	**FBST 500-PLC GY**	2966838	20			
Plug-in bridge, 2-pos., 6 mm long, for potential distribution							
Nominal current: 6 A	red	**FBST 6-PLC RD**	2966236	50			
	blue	**FBST 6-PLC BU**	2966812	50			
	gray	**FBST 6-PLC GY**	2966825	50			
Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate							
Nominal current: 6 A	gray	**FBST 8-PLC GY**	2967688	50			
Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution							
Nominal current: 10 A	black	**FBST 14-PLC BK**	2967691	50			
Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100					**ZB 6,LGS:FORTL.ZAHLEN**	1051016	10

Adapter for PLC-INTERFACE

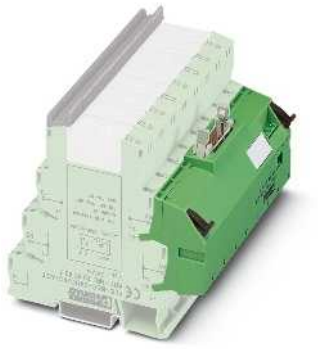
PLC-V8/... are the VARIOFACE adapters which connect the narrow PLC-INTERFACE modules to the VARIOFACE system cabling:

Notes:

Cross-ref. list for matching PLC-INTERFACE modules: page 548



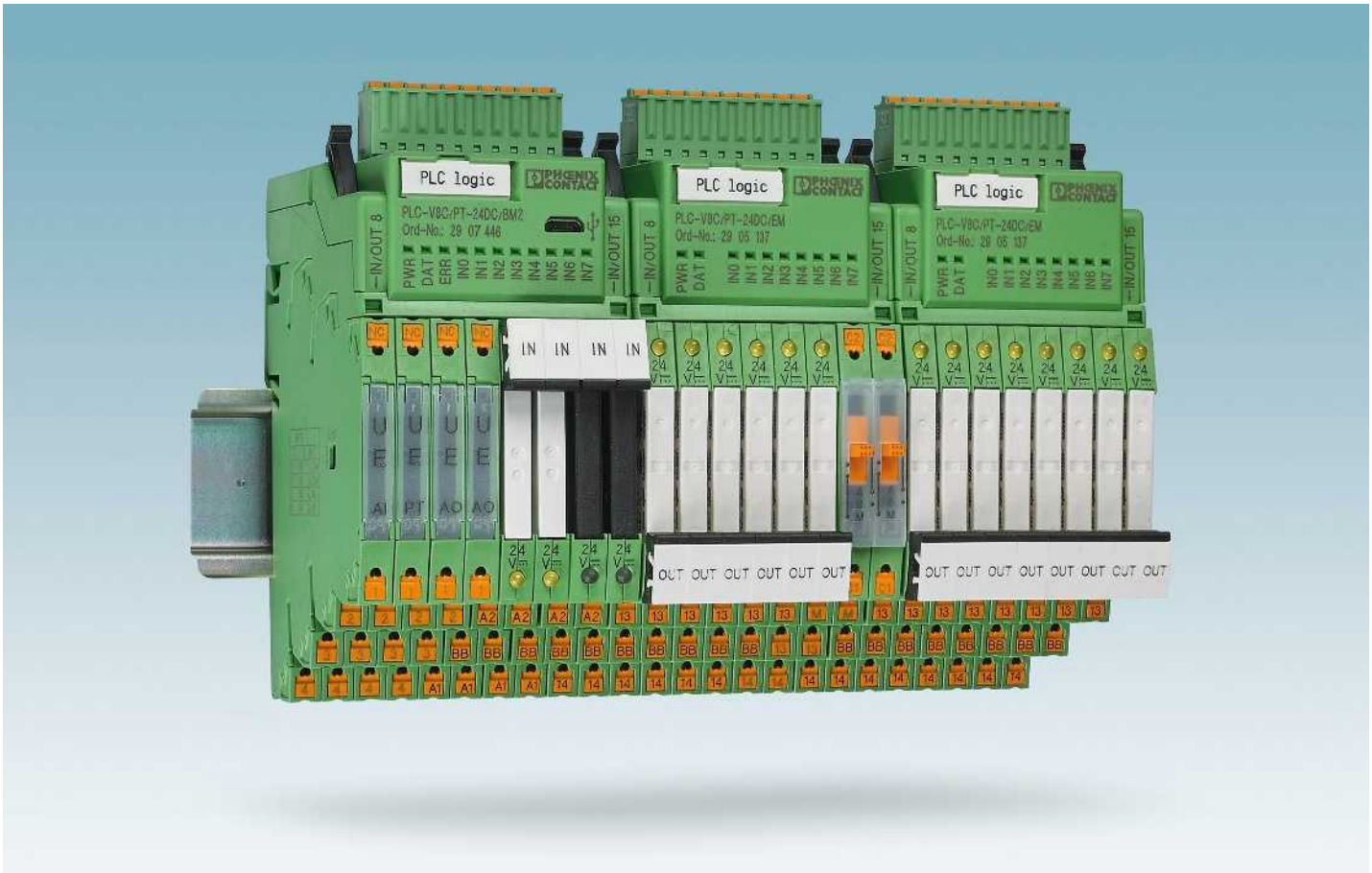
VARIOFACE adapter for 6.2 mm PLC-INTERFACE



VARIOFACE adapter for 14 mm PLC-INTERFACE

		Technical data	Technical data
Maximum permissible operating voltage		30 V DC	30 V DC
Maximum permissible current (per branch)		1 A (per signal path)	1 A (per signal path)
Maximum total current (voltage supply)		3 A	3 A
Ambient temperature (operation)		-40 °C ... 70 °C	-40 °C ... 70 °C
Standards/regulations		IEC 60664 , DIN EN 50178	IEC 60664 , DIN EN 50178
Connection method	Supply	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	100 mm / 94 mm	100 mm / 94 mm

Description	No. of pos.	Module width W	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
V8 adapter, for 8 PLC-INTERFACE devices (6.2 mm), with IDC/FLK pin strip, for PLC system cabling, **positive switching**								
Output	14	49.6 mm	**PLC-V8/FLK14/OUT**	2295554	1			
Input	14	49.6 mm	**PLC-V8/FLK14/IN**	2296553	1			
V8 adapter, for 8 PLC-INTERFACE devices (6.2 mm), with IDC/FLK pin strip, for PLC system cabling, **negative switching**								
Output	14	49.6 mm	**PLC-V8/FLK14/OUT/M**	2304102	1			
Input	14	49.6 mm	**PLC-V8/FLK14/IN/M**	2304115	1			
V8 output adapter, for 8 PLC-INTERFACE devices (6.2 mm), with D-SUB connection								
Pin strip	15	49.6 mm	**PLC-V8/D15S/OUT**	2296058	1			
Socket strip	15	49.6 mm	**PLC-V8/D15B/OUT**	2296061	1			
V8 input adapter, for 8 PLC-INTERFACE devices (6.2 mm), with D-SUB connection								
Pin strip	15	49.6 mm	**PLC-V8/D15S/IN**	2296074	1			
Socket strip	15	49.6 mm	**PLC-V8/D15B/IN**	2296087	1			
V8 adapter, for 8 PLC-INTERFACE devices (14 mm), with IDC/FLK pin strip, for PLC system cabling, **positive switching**								
	14	112.3 mm				**PLC-V8L/FLK14/OUT**	2299660	1
V8 adapter, for 8 PLC-INTERFACE devices (14 mm), with IDC/FLK pin strip, for PLC system cabling, **negative switching**								
	14	112.3 mm				**PLC-V8L/FLK14/OUT/M**	2304306	1



Extremely compact control

The PLC logic programmable logic relay system is the extremely compact way to carry out small automation tasks easily and flexibly. It consists of the PLC-V8C logic modules, the PLC-INTERFACE relay system, and the LOGIC+ software. The logic modules are simply plugged into a row of eight PLC-INTERFACE terminal blocks and combine the logic and interface level in one unit. Depending on the switching requirements, plug-in electromechanical and solid-state relays can be combined in order to flexibly switch and control the I/O signals.

PLC logic processes digital and analog input signals as well as logic functions and timer modules - and replaces conventional switching and control devices. Up to 16 I/O signals can be processed using the stand-alone logic modules - with an overall width of just 50 mm. If more I/O signals are required, a maximum of 48 I/O signals can be linked using the basic and extension modules.

Switching and controlling with plug-in relays

– PLC logic brings together the standard combination of logic module and separate plug-in relay and eliminates the wiring effort and additional switching elements.
– Convenient connections with screw or Push-in connection technology, which also accommodate return conductors, remove the need for separate potential terminal blocks
– Each channel can be freely configured as an input or output and with relay or analog modules

Intuitive programming

Programming is quick and easy with the intuitive LOGIC+ programming software. Ladder (LD) and function block diagrams (FBD) can be created by selecting the relevant functions and their connection using drag & drop. The graphical representation of PLC logic in the hardware editor supports intuitive operation. The programs created can be simulated offline on the PC and tested online during operation. Basic functions, such as AND, OR, NOT, etc. are complemented by special functions, such as counters, seven-day timers, timer modules, and mathematical functions, to name a few.

Logic module with plug-in relays

PLC logic combines a logic module and plug-in relay and eliminates the wiring effort and additional switching elements. Each relay channel can be flexibly equipped with an electromechanical or a solid-state relay. PLC logic processes 16 I/O signals with just one logic module and boasts an extremely compact overall width of just 50 mm.

Intuitive programming with LOGIC+

– Function block diagram or ladder diagram
– Numerous integrated function blocks
– Specific function blocks are available to download
– Hardware view in the program
– Can be downloaded free of charge

Your web code: #0139

Standard programming cable

PLC logic is connected to a PC via a standard micro USB cable. The drivers for PLC logic can be downloaded at phoenixcontact.com.

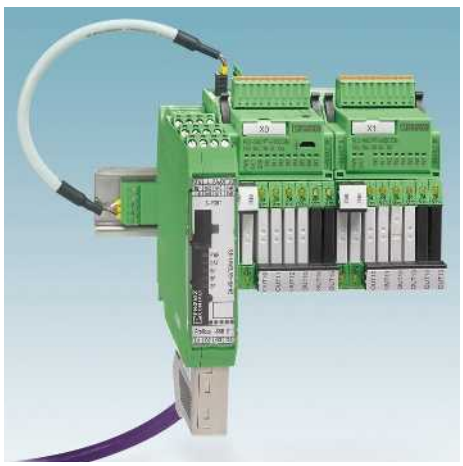
Easily connect extension modules

The basic module and the extension module are connected via integrated connectors - no tools required. A maximum of two extension modules can be connected to a basic module. This means that PLC logic can work with up to 48 I/Os.

Control and monitor via Bluetooth adapter

Together with the PLC logic app, the Bluetooth adapter is available for wireless access to process data between the logic module and the mobile terminal device, and can be used for operation and monitoring purposes.

The Bluetooth connection enables efficient monitoring of multiple logic modules, with just one visualization device.



Integration into common bus systems

PLC logic is integrated into various networks via optional adaptable fieldbus gateways. This enables bidirectional communication with a higher-level controller for remote control as well as diagnostics and visualization.

Gateways are available for transmitting data via PROFIBUS DP, RS-232, RS-485, Modbus/TCP, DeviceNet™, CANopen®, PROFINET, and EtherNet/IP™.

Logic modules

new

PLC-V8C are the plug-in logic modules which form the PLC logic relay system in conjunction with the narrow 6.2 mm PLC-INTERFACE terminal blocks. Eight freely selectable PLC-INTERFACE terminal blocks must be separately ordered for each logic module. You can find an overview of matching PLC-INTERFACE terminal blocks on page 434.

All logic modules feature these properties:

– 8 integrated digital inputs (of which two inputs are configurable as analog inputs), connection via connector with screw or Push-in connection technology
– A further 8 channels can be configured with matching PLC-INTERFACE terminal blocks as inputs or outputs
– Programming with LOGIC+ software

PLC-V8C.../SAM2

– Stand-alone logic module with 16 I/Os, not extendable
– Connection to PC via micro USB socket
– Integrated real-time clock (RTC)
– Accommodates external IFS-CONFSTICK memory module
– Relay and analog modules can be used

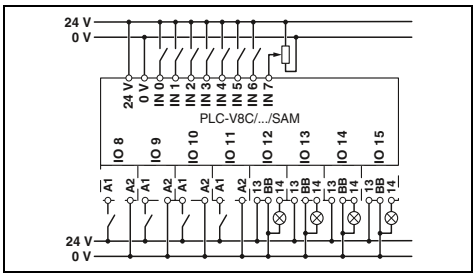
PLC-V8C.../BM2

– Basic logic module with 16 I/Os, can be extended with a maximum of two extension modules (PLC-V8C.../EM) to 48 I/Os
– Connection to PC via micro USB socket
– Integrated real-time clock (RTC)
– Accommodates external IFS-CONFSTICK memory module
– Optional connection to IFS gateways
– Relay and analog modules can be used

PLC-V8C.../EM

– Extension logic module with 16 I/Os, for extending the basic module
– Relay modules can be used

Stand-alone module



Technical data

Supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 26.4 V DC
Maximum input current at U_N	160 mA
Input data (digital)	
Number of inputs	8 (2 configurable as analog)
Input voltage	24 V DC
Description of the input	EN 61131-2, type 3
Input current 0-signal	< 1 mA
Input current 1-signal	typ. 2.5 mA
Input data (analog)	
Number of inputs	2 (IN6 and IN7 are configurable as analog)
Input voltage range	0 V ... 10 V
Input resistance	> 3.5 kΩ
Input data (PLC-INTERFACE)	
Number of inputs	≤ 8
Output data (for controlling PLC-INTERFACE)	
Number of outputs	≤ 8
Nominal voltage	24 V DC
Nominal current	9 mA
Real-time clock (basic module only)	
Buffer time (capacitor)	96 h (Capacitor)
Real-time clock accuracy	±2 s/d
General data	
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Permissible humidity (operation)	95 %
Air clearances and creepage distances between the power circuits	DIN EN 50178
Rated insulation voltage	50 V
Rated surge voltage	0.8 kV
Insulation	Basic insulation
Mounting type	Can be plugged onto 8 x PLC-INTERFACE
Degree of protection	IP20
Screw connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16
Push-in connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16

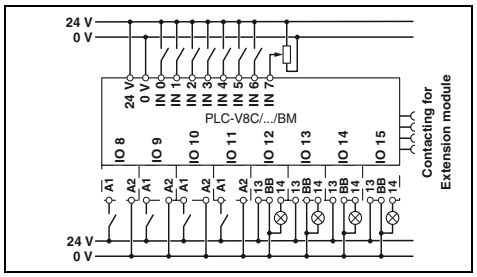
Ordering data

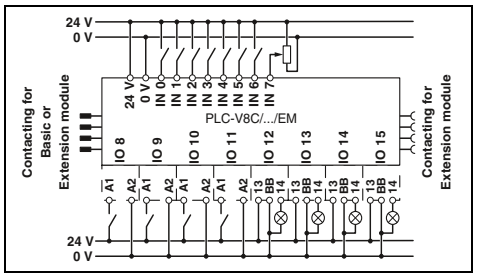
Description	Type	Order No.	Pcs./ Pkt.
PLC-V8C plug-in logic modules			
with screw connection	**PLC-V8C/SC-24DC/SAM2**	2907445	1
with Push-in connection	**PLC-V8C/PT-24DC/SAM2**	2907443	1

new

Basic module
(can be extended)

Extension module





Technical data

24 V DC	24 V DC
19.2 V DC ... 26.4 V DC	19.2 V DC ... 26.4 V DC
160 mA	65 mA
8 (2 configurable as analog)	8 (2 configurable as analog)
24 V DC	24 V DC
EN 61131-2, type 3	EN 61131-2, type 3
< 1 mA	< 1 mA
typ. 2.5 mA	typ. 2.5 mA
2 (IN6 and IN7 are configurable as analog)	2 (IN6 and IN7 are configurable as analog)
0 V ... 10 V	0 V ... 10 V
> 3.5 kΩ	> 3.5 kΩ
≤ 8	≤ 8
≤ 8	≤ 8
24 V DC	24 V DC
9 mA	9 mA
96 h (Capacitor)	-
±2 s/d	-
-20 °C ... 50 °C	-20 °C ... 45 °C
-20 °C ... 70 °C	-20 °C ... 70 °C
95 %	95 %
DIN EN 50178	DIN EN 50178
50 V	50 V
0.8 kV	0.8 kV
Basic insulation	Basic insulation
Can be plugged onto 8 x PLC-INTERFACE	Can be plugged onto 8 x PLC-INTERFACE
IP20	IP20
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-V8C/SC-24DC/BM2	2907447	1
PLC-V8C/PT-24DC/BM2	2907446	1

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-V8C/SC-24DC/EM	2903095	1
PLC-V8C/PT-24DC/EM	2905137	1

Analog modules

Together with the PLC logic logic modules, the analog modules enable standard analog signals to be processed.

The analog modules are connected to PLC logic stand-alone modules or basic modules.

– Screw and Push-in connection technology
– Status indicator for supply voltage and diagnostics
– Standard configuration: 4 to 20 mA or Pt 100

Notes:

The analog modules cannot be operated separately and must only be used in connection with the PLC logic logic modules.

new

Analog input

Analog input

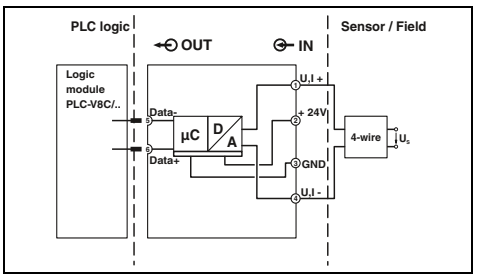
– Available standard signals: 0 to 20 mA, 4 to 20 mA, 0 to 10 V or 2 to 10 V (configurable via DIP switch)

Temperature transducer

– 2-conductor Pt 100 or Pt 1000 (configurable via DIP switch)
– Temperature measuring range: -50 to 200°C

Analog output

– Available standard signals: 0 to 20 mA, 4 to 20 mA, 0 to 10 V or 2 to 10 V (configurable via DIP switch)



Technical data

Supply		
Rated control supply voltage U_S	24 V DC	
Rated control supply voltage range with reference to U_S	0.8 ... 1.1	
Rated control supply current I_S	13 mA	
Operating voltage display	Green LED	
Input signal	Voltage input	Current input
Input signal	0 V ... 10 V 2 V ... 10 V	0 mA ... 20 mA 4 mA ... 20 mA
Input resistance	> 120 kΩ	~ 40 Ω
Output data		
Output signal	-	
Maximum output signal	-	
Load R_B	-	
Ripple	-	
General data		
Ambient temperature (operation)	-20 °C ... 50 °C	
Ambient temperature (storage/transport)	-20 °C ... 70 °C	
Air clearances and creepage distances between the power circuits	DIN EN 50178	
Rated insulation voltage	50 V	
Rated surge voltage	0.5 kV	
Insulation	Basic insulation	
Mounting type	In rows with zero spacing	
Degree of protection	IP20	
Screw connection solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	
Push-in connection solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	

Ordering data

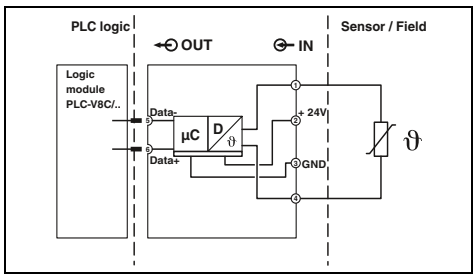
Description	Type	Order No.	Pcs./ Pkt.
Analog input			
with screw connection	**PLC-ASC-UI-IN**	2906916	1
with Push-in connection	**PLC-APT-UI-IN**	2906917	1
Temperature transducer			
with screw connection			
with Push-in connection			
Analog output			
with screw connection			
with Push-in connection			

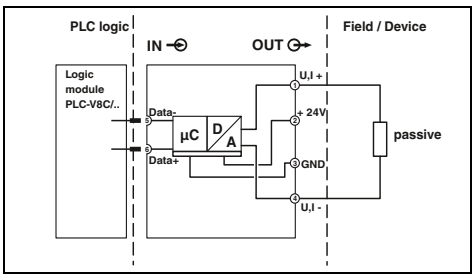
new

Temperature transducer

new

Analog output





Technical data

24 V DC	
0.8 ... 1.1	
14 mA	
Green LED	
Temperature range	
-50 °C ... 200 °C	
-	
	Voltage output / Current output
-	0 V ... 10 V / 0 mA ... 20 mA
	2 V ... 10 V / 4 mA ... 20 mA
-	12.3 V / 24.6 mA
-	10 kΩ / 500 Ω (20 mA)
-	< 20 mV_{PP} / -
-20 °C ... 50 °C	
-20 °C ... 70 °C	
DIN EN 50178	
50 V	
0.5 kV	
Basic insulation	
In rows with zero spacing	
IP20	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-ASC-PT100-IN	2906918	1
PLC-APT-PT100-IN	2906919	1

Technical data

24 V DC	
0.8 ... 1.1	
14 mA (U_{Out} = 10 V)	
Green LED	
-	
-20 °C ... 50 °C	
-20 °C ... 70 °C	
DIN EN 50178	
50 V	
0.5 kV	
Basic insulation	
In rows with zero spacing	
IP20	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-ASC-UI-OUT	2906920	1
PLC-APT-UI-OUT	2906921	1

Accessories
Programming cable and memory module

– The programming cable (MICRO USB B to USB A) is used to connect PLC logic to a PC, length: 2 m
– PLC logic programs are saved by the memory module or can be easily copied to other devices

Cable for programming

Memory module

Technical data	
General data	
EMC note	Class A product, see page 605

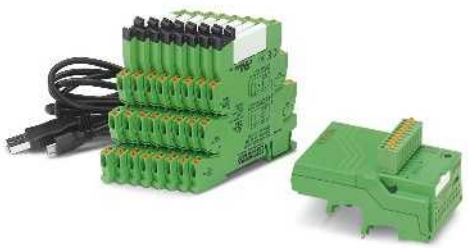
Ordering data

Description	Color	Type	Order No.	Pcs./ Pkt.
Programming cable				
		CAB-USB A/MICRO USB B/2,0M	2701626	1
Multi-functional memory module for the Interface system				
- Flat design		**IFS-CONFSTICK**	2986122	1

new

Accessories
PLC logic starter kit

The PLC logic starter kit with 8 inputs and 8 outputs contains all the components needed to get started quickly and easily with PLC logic with Push-in connection technology.
– PLC-V8C-PT/24DC/SAM2 plug-in logic module
– PLC-RPT-24DC/1/ACT eight relay output terminal blocks
– Micro USB programming cable



Starter kit with stand-alone module

Ordering data

Description	Color	Type	Order No.	Pcs./ Pkt.
PLC logic starter kit 3, consisting of: plug-in stand-alone logic module, eight relay output terminal blocks with Push-in connection (250 V AC/DC, max. 6 A), and micro USB programming cable		**PLC-LOGIC-STARTERKIT3**	2909916	1

Accessories
IFS gateways and Bluetooth adapter

– The gateways are connected to the PLC-V8C.../BM PLC logic basic module via the DIN rail connector and the connecting cable
– The Bluetooth adapter is connected to the logic module via the memory connection

Current values are monitored and controlled via the PLC logic app.

INTERFACE system bus master terminal (IB IL IFS-MA-PAC, 2692720) for connecting PLC logic to an Inline controller, see Catalog 6, Automation

IFS gateways

Bluetooth adapter

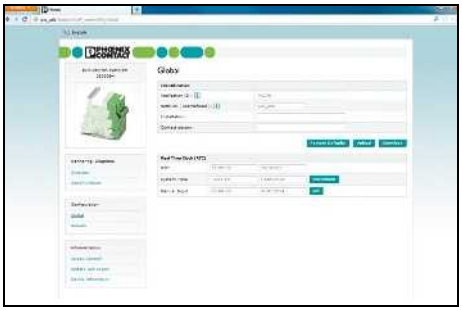
	Technical data	Technical data
General data		
EMC note	Class A product, see page 605	

		Ordering data			Ordering data		
Description	Color	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
IFS gateway for							
PROFIBUS DP	green	**EM-PB-GATEWAY-IFS**	2297620	1			
RS-232	green	**EM-RS232-GATEWAY-IFS**	2901526	1			
RS-485	green	**EM-RS485-GATEWAY-IFS**	2901527	1			
Modbus/TCP	green	**EM-MODBUS-GATEWAY-IFS**	2901528	1			
DeviceNet™	green	**EM-DNET-GATEWAY-IFS**	2901529	1			
CANopen®	green	**EM-CAN-GATEWAY-IFS**	2901504	1			
PROFINET	green	**EM-PNET-GATEWAY-IFS**	2904472	1			
EtherNet/IP™	green	**EM-ETH-GATEWAY-IFS**	2901988	1			
Programming adapter for configuring modules with S-PORT interface Cable length: 3 m		**IFS-USB-DATACABLE**	2320500	1			
DIN rail connector	green	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50			
Connecting cable for connecting PLC logic with the ME 22,5 TBUS DIN rail connector, cable length: 0.3 m		**PLC-V8C/CAB/TBUS/0,3M**	2905263	1			
Bluetooth programming adapter, with USB and S-PORT interface					**IFS-BT-PROG-ADAPTER**	2905872	1

Selection table for PLC-INTERFACE

	Push-in connection		Screw connection	
Relay output	**Type**	**Order No.**	**Type**	**Order No.**
1 changeover contact, output data 6 A, 250 V AC/DC	PLC-RPT-24DC/21	2900299	PLC-RSC-24DC/21	2966171
1 changeover contact, output data 50 mA, 36 V DC, gold contact	PLC-RPT-24DC/21AU	2900306	PLC-RSC-24DC/21AU	2966265
1 N/O contact, output data 6 A, 250 V AC/DC, actuator type	PLC-RPT-24DC/1/ACT	2900312	PLC-RSC-24DC/1/ACT	2966210
1 N/O contact with switch, output data 6 A, 250 V AC/DC	PLC-RPT-24UC/1/S/H	2900328	PLC-RSC-24UC/1/S/H	2982236
Solid-state relay output				
Output data 100 mA, 3 V DC - 48 V DC	PLC-OPT-24DC/48DC/100	2900352	PLC-OSC-24DC/48DC/100	2966728
Output data 3 A, 3 V DC - 33 V DC	PLC-OPT-24DC/24DC/2	2900364	PLC-OSC-24DC/24DC/2	2966634
Output data 750 mA, 24 V AC - 253 V AC	PLC-OPT-24DC/230AC/1	2900369	PLC-OSC-24DC/230AC/1	2967840
Output data 3 A, 3 V DC - 33 V DC, actuator type	PLC-OPT-24DC/24DC/2/ACT	2900376	PLC-OSC-24DC/24DC/2/ACT	2966676
Output data 750 mA, 24 V AC - 253 V AC, actuator type			PLC-OSC-24DC/230AC/1/ACT	2967947
Output data 1 A, 12 V DC - 300 V DC	PLC-OPT-24DC/300DC/1	2900383	PLC-OSC-24DC/300DC/1	2980678
Output data 10 A, 3 V DC - 33 V DC	PLC-OPT-24DC/24 DC/10/R	2900398	PLC-OSC-24DC/24DC/10/R	2982702
Output data 500 mA, 3 V DC - 48 V DC, electronic changeover contact	PLC-OPT-24DC/48DC/500/W	2900378	PLC-OSC-24DC/48DC/500/W	2980636
Output data, TTL, 50 mA, 5 V DC	PLC-OPT-24DC/TTL	2900363	PLC-OSC-24DC/TTL	2982728
Analog output				
Output signal 0 V ... 10 V, 2 V ... 10 V, 0 mA ... 20 mA, 2 mA ... 20 mA	PLC-APT-UI-OUT	2906921	PLC-ASC-UI-OUT	2906920
Relay input				
Input voltage 24 V DC	PLC-RPT-24DC/1AU/SEN	2900313	PLC-RSC-24DC/1AU/SEN	2966317
Input voltage 120 V AC/DC	PLC-RPT-120UC/1AU/SEN	2900314	PLC-RSC-120UC/1AU/SEN	2966320
Input voltage 230 V AC/DC	PLC-RPT-230UC/1AU/SEN	2900315	PLC-RSC-230UC/1AU/SEN	2966333
Input voltage 5 V DC (basic terminal block without relay)			PLC-BSC- 5DC/ 1/SEN	2980267
Relay for 5 V DC basic terminal block			REL-MR-4,5DC/21AU	2961370
Solid-state relay input				
Input voltage 24 V DC	PLC-OPT-24DC/V8C/SEN	2908172	PLC-OSC-24DC/V8C/SEN	2908173
Input voltage 120 V AC/DC	PLC-OPT-120UC/V8C/SEN	2908174	PLC-OSC-120UC/V8C/SEN	2908175
Input voltage 230 V AC/DC	PLC-OPT-230UC/V8C/SEN	2908176	PLC-OSC-230UC/V8C/SEN	2908177
Analog input				
Input signal 0 V ... 10 V, 2 V ... 10 V, 0 mA ... 20 mA, 2 mA ... 20 mA	PLC-APT-UI-IN	2906917	PLC-ASC-UI-IN	2906916
Input signal: Pt 100 or Pt 1000 sensor	PLC-APT-PT100-IN	2906919	PLC-ASC-PT100-IN	2906918
Dummy or reserve				
Basic terminal blocks output	PLC-BPT-24DC/21	2900445	PLC-BSC-24DC/21	2966016
Basic terminal blocks input	PLC-BPT-24DC/1/SEN	2900262	PLC-BSC-24DC/1/SEN	2966061

LOGIC+ programming software



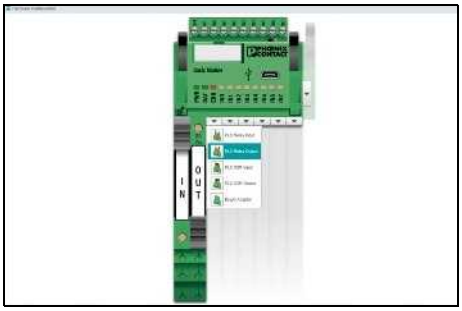
Integrated web server

PLC logic basic settings are easily configured via the integrated web server. The LOGIC+ software does not need to be installed in order to do so.

– Time and date
– Password and access control
– Firmware update
– Status indicators for inputs and outputs
– General device information

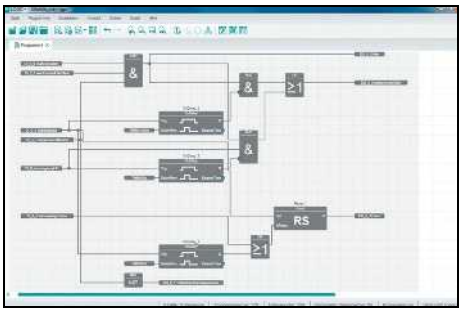
Logic+ user interface

– Clear separation in program editor, toolbox, hardware view, and signaling window
– All elements can be easily placed using drag & drop
– Information and errors are highlighted in color in the program editor



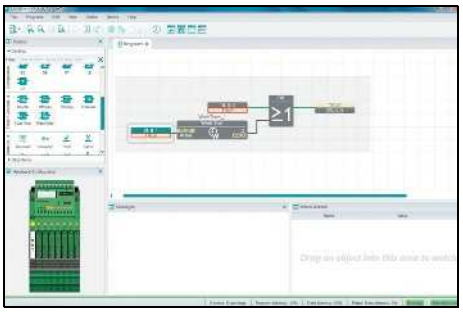
Hardware configurator

– Each channel can be configured as an input or output and with relay or analog modules
– Clear assignment of the inputs and outputs thanks to the graphical representation of the hardware connections



Function blocks

– Basic functions: AND, OR, NOT, XOR
– Mathematical functions: add, divide, multiply, subtract, generate absolute value
– Positive and negative edge detection
– RS and SR flip-flops
– Switch-on and switch-off delay, pulse encoder, pulse stretching, weekly clock timer
– Up and down counter
– Analog and digital comparators
– Special functions, for example, roller shutter control or pulse width modulation are available to download



Simulation and online values

Offline simulation:

– Simulation of the created program directly in LOGIC+
– Virtualization of the values in the program editor, hardware view, and in the observation window

Online values:

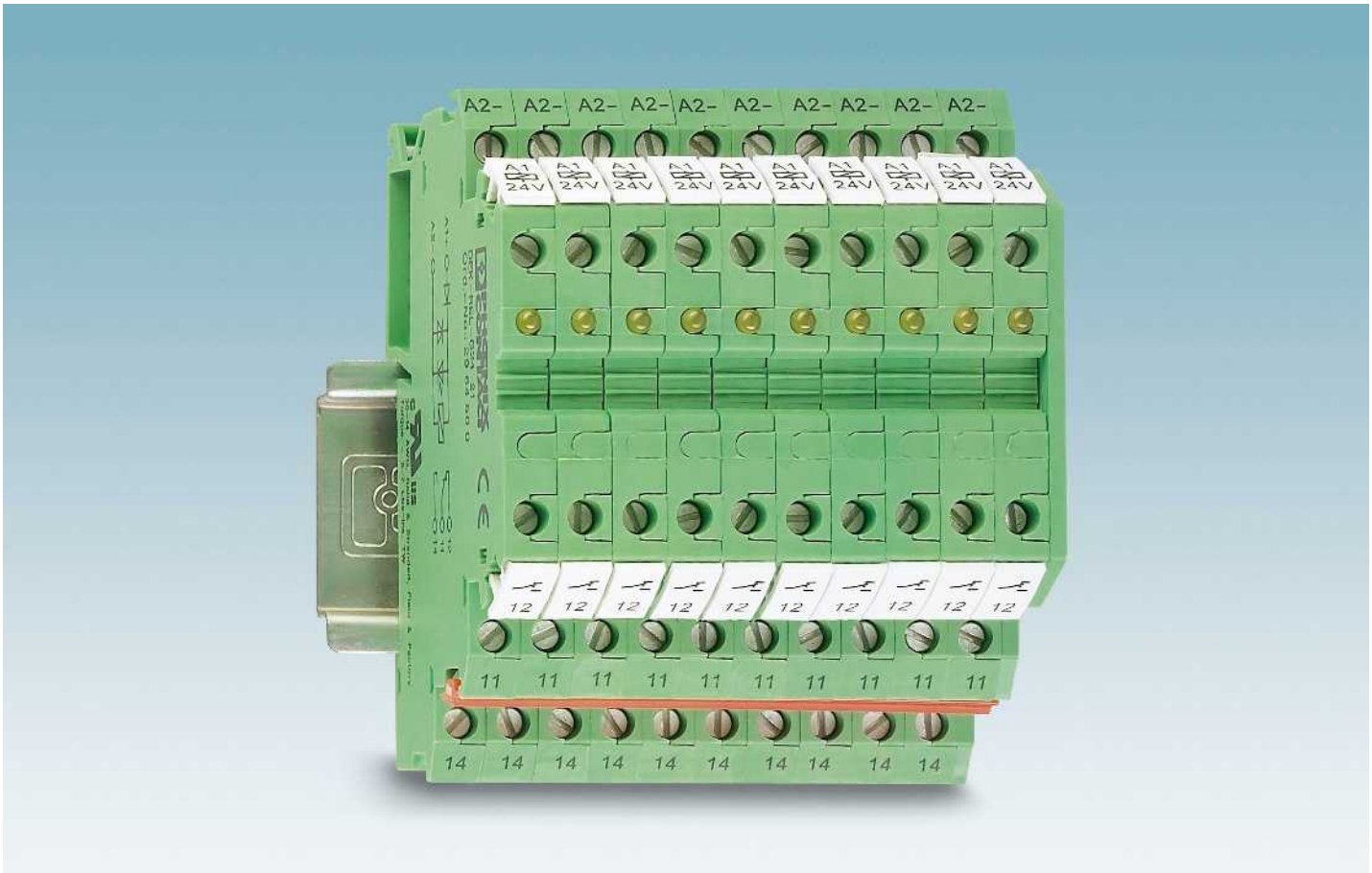
– Representation of the program running on the hardware in LOGIC+ with online values
– Overwriting values from LOGIC+

PLC logic app

Once the app is installed on your smartphone or tablet, it can be used to make parameter adjustments to the logic modules. The visualization view is created via the editor of the web server integrated in the logic modules. The app can be used for operation and monitoring, as it can access all program variables.

– Inputs and outputs (digital, analog)
– Flags
– Numerical values
– Time values

Relay modules in terminal block design - DEK series



The Phoenix Contact DEK interface terminal blocks provide complete interface functions in terminal block housing that is just 6.2 mm wide. In conjunction with standard terminal block accessories, these high-capacity interfaces have not only the design but also the high level of user convenience of terminal blocks.

The main common feature of all Phoenix Contact interface terminal blocks is their width of just 6.2 mm. This saves 60% space in the control cabinet in comparison to conventional 15 mm wide coupling relays from modular systems.

The DEK range offers the best solution for all industrial voltages both for signal input and output.

High switching capacities are a matter of course for the DEK-REL... relay terminal block and the DEK-OV... solid-state relay terminal block.

The wear-free DEK-OV... power solid-state relay terminal block is used for applications that require a greater switching frequency in which electromechanical relays reach the end of their service life in a short time.

Integrated LEDs clearly indicate the switching status of the electronic terminal blocks and provide an excellent overview of the coupling level and the system.

EB-DIK color-coded insertion bridges for the supply and ground signals make it possible to design the circuit simply and effectively.

Integrated protective circuits such as freewheeling diodes, polarity reversal protection diodes, and surge protection elements protect the coupling modules and ensure optimum availability of the system.

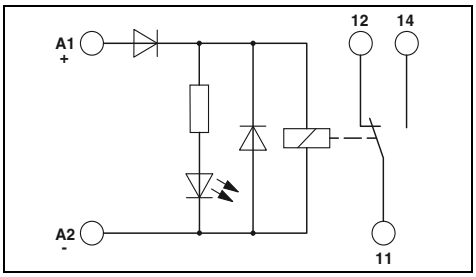
DEK-REL-... relay terminal block

The Phoenix relay terminal block with PDT contact offers the following advantages:

- Width of only 6.2 mm
- High switching capacity of 250 V AC / 6 A
- Less storage, since PDT, N/O or N/C contacts can be wired
- Minimal wiring effort due to the use of EB-DIK insertion bridges
- IP67 protected relay housing
- Cadmium-free relay contacts
- 4 kV electrical isolation of input and output
- Safe isolation in acc. with DIN EN 50178 (VDE 0160)
- Light indicator for signaling the switching state

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.
For additional EB...DIK... insertion bridges, refer to page 443

For medium to large power
1 PDT (21)



Technical data

Input data		①
Permissible range (with reference to U_N)		0.8 - 1.1
Typical input current at U_N	[mA]	9
Response/release time at U_N	[ms]	8 / 5
Input protection:		Yellow LED, reverse polarity protection, freewheeling diode
Output data		
Contact type		1 PDT
Contact material		AgSnO
Max. switching voltage		250 V AC/DC
Minimum switching voltage		12 V AC/DC
Limiting continuous current		6 A
Maximum switch-on current		6 A
Minimum switching current		10 mA
Maximum interrupting rating, ohmic load		
	24 V DC	140 W
	48 V DC	20 W
	60 V DC	18 W
	110 V DC	23 W
	220 V DC	40 W
	250 V AC	1500 VA
General data		
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-20 °C ... 50 °C
Mechanical service life		Approx. 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm
EMC note		Class A product, see page 605

Ordering data

Description		Input voltage U_N	Type		Order No.	Pcs./ Pkt.
Relay terminal block with power relay						
	①	24 V DC	**DEK-REL-G24/21**		2964500	10

Accessories

Cover					
			D-DEK 1,5 GN	2716949	10
Insertion bridge, for middle and lower levels	No. of pos.	Color			
	80	blue	**EB 80- DIK BU**	2715940	1
	80	red	**EB 80- DIK RD**	2715953	1
	80	white	**EB 80- DIK WH**	2715788	1

DEK-REL-24/1/SEN input interface and DEK-REL-24/1/AKT output interface

In addition to the familiar advantages of the DEK-REL... electronic terminal blocks, such as:

– 2-layer contact with hard gold-plating for universal applications from 1 mA to 5 A continuous current
– 2 kV_{rms} electrical isolation of input and output
– Integrated input circuit

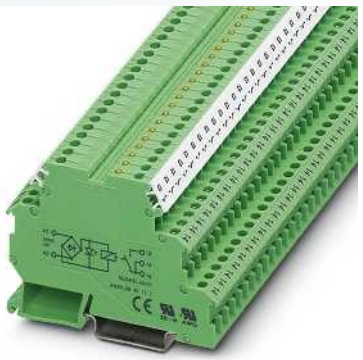
With this terminal block, "ALL" connections for a sensor or actuator are provided in a width of just 6.2 mm.

This means that 16 outputs take up a total overall width of just 105.4 mm (including the power terminal).

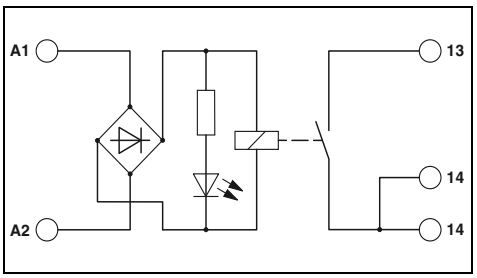
Advantages:

– Lower costs as the N terminal block is no longer required
– Wiring is reduced to a minimum
– Space savings of up to 73%

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.
For additional EB...DIK... insertion bridges, refer to page 443

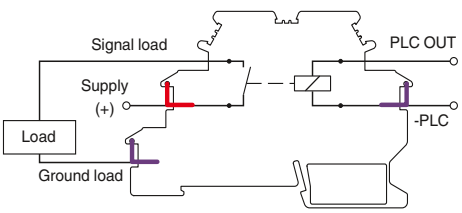


for small to medium loads
1 N/O contact (1)

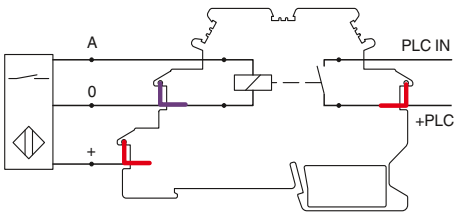


Technical data

Input data		①	②
Permissible range (with reference to U_N)		0.9 - 1.1	0.8 - 1.1
Typical input current at U_N	[mA]	23	6.5
Response/release time at U_N	[ms]	8 / 15	5 / 15
Input protection:		Yellow LED, bridge rectifier	
Output data			
Contact type		1 N/O contact (double contact)	
Contact material		AgNi, hard gold-plated	
Max. switching voltage		250 V AC / 125 V DC	
Minimum switching voltage		0.1 V	
Limiting continuous current		3 A (5 A up to 35°C at 24 V DC)	
Maximum switch-on current		5 A	
Minimum switching current		1 mA	
Maximum interrupting rating, ohmic load			
	24 V DC	72 W	
	48 V DC	60 W	
	60 V DC	50 W	
	110 V DC	50 W	
	250 V AC	750 VA	
General data			
Test voltage (winding / contact)		2 kV AC (50 Hz, 1 min.)	
Ambient temperature (operation)		-20 °C ... 50 °C	
Mechanical service life		Approx. 2x 10^7 cycles	
Standards/regulations		IEC 60664 , EN 50178	
Connection data solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14	
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm	
EMC note		Class A product, see page 605	



Pin configuration, DEK-REL-...AKT



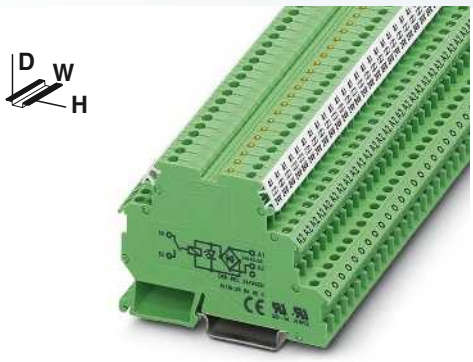
Pin configuration DEK-REL-...SEN

Ordering data

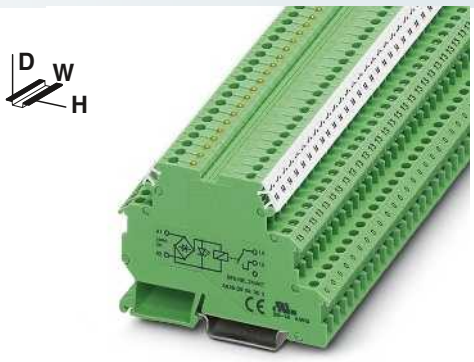
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Relay terminal block with miniature relay					
	①	5 V AC/DC	**DEK-REL- 5/I/1**	2941183	10
	②	24 V AC/DC	**DEK-REL- 24/I/1**	2940171	10

Accessories

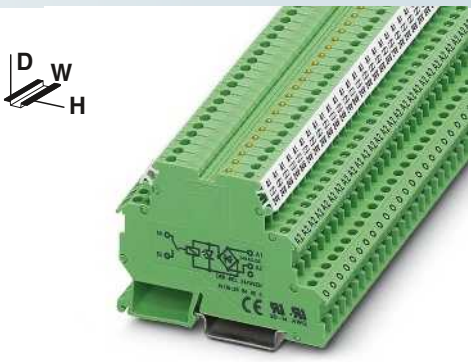
Terminal block, with three through contacts, for mounting on NS 35...					
For busbar supply					
Cover					
			D-DEK 1,5 GN	2716949	10
Insertion bridge, for middle and lower levels	No. of pos.	Color			
	80	blue	**EB 80- DIK BU**	2715940	1
	80	red	**EB 80- DIK RD**	2715953	1
	80	white	**EB 80- DIK WH**	2715788	1



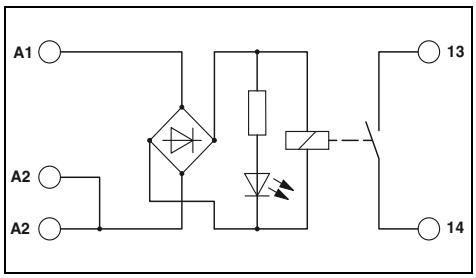
for small to medium loads
1 N/O contact (1)

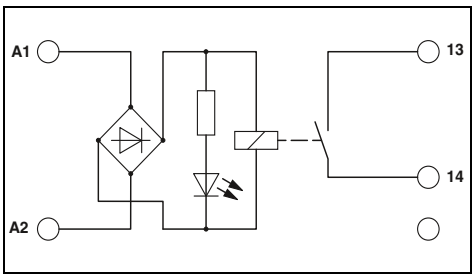


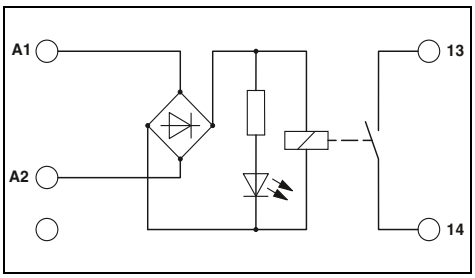
for small to medium loads
1 N/O contact (1)



for small to medium loads
1 N/O contact (1)







Technical data

①	②	
0.9 -	0.8 -	
1.1	1.1	
23	6.5	
8 / 15	5 / 15	
Yellow LED, bridge rectifier		
1 N/O contact (double contact)		
AgNi, hard gold-plated		
250 V AC / 125 V DC		
0.1 V		
3 A (5 A up to 35°C at 24 V DC)		
5 A		
1 mA		
72 W		
60 W		
50 W		
50 W		
750 VA		
2 kV AC (50 Hz, 1 min.)		
-20 °C ... 50 °C		
Approx. 2x 10^7 cycles		
IEC 60664 , EN 50178		
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14		
6.2 mm / 80 mm / 56 mm		
Class A product, see page 605		

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-REL- 5/O/1	2941170	10
DEK-REL- 24/O/1	2941154	10

Accessories

D-DEK 1,5 GN		2716949	10
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

Technical data

②		
0.8 -		
1.1		
6.5		
5 / 15		
Yellow LED, bridge rectifier		
1 N/O contact		
AgNi, hard gold-plated		
250 V AC / 125 V DC		
0.1 V		
3 A (5 A up to 35°C at 24 V DC)		
5 A		
1 mA		
72 W		
60 W		
50 W		
50 W		
750 VA		
2 kV AC (50 Hz, 1 min.)		
-20 °C ... 50 °C		
Approx. 2x 10^7 cycles		
IEC 60664 , EN 50178		
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14		
6.2 mm / 80 mm / 56 mm		
Class A product, see page 605		

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-REL- 24/1/AKT	2964063	10

Accessories

DIKD 1,5		2715979	50
D-DEK 1,5 GN		2716949	10
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

Technical data

②		
0.8 -		
1.1		
6.5		
5 / 15		
Yellow LED, bridge rectifier		
1 N/O contact		
AgNi, hard gold-plated		
250 V AC / 125 V DC		
0.1 V		
3 A (5 A up to 35°C at 24 V DC)		
5 A		
1 mA		
72 W		
60 W		
50 W		
50 W		
750 VA		
2 kV AC (50 Hz, 1 min.)		
-20 °C ... 50 °C		
Approx. 2x 10^7 cycles		
IEC 60664 , EN 50178		
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14		
6.2 mm / 80 mm / 56 mm		
Class A product, see page 605		

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-REL- 24/1/SEN	2964050	10

Accessories

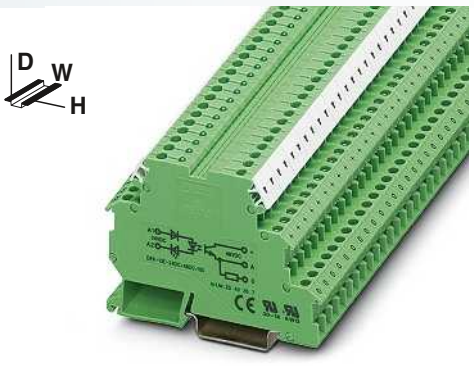
DIKD 1,5		2715979	50
D-DEK 1,5 GN		2716949	10
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

DEK-OE... and DEK-OV... solid-state relay terminal blocks

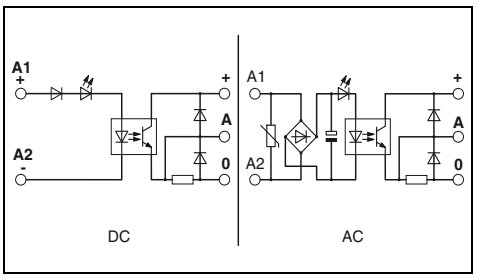
Phoenix Contact DEK-OE and DEK-OV interface terminal blocks are only 6.2 mm wide but still provide a complete input or output interface with:

– Electrical isolation between input and output at up to 2.5 kV_{rms}
– Integrated input circuit
– Status display
– EB-DIK insertion bridges
– Marking and mounting with terminal block convenience
– Wear-free switching up to 24 V DC/10 A and 240 V AC/800 mA
– Integrated output protection circuit
– Zero voltage switch at AC output
– Actuator version available

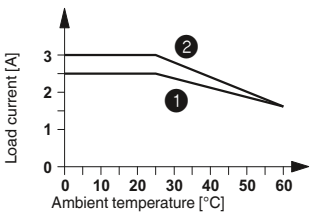
Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
For additional EB...DIK... insertion bridges, refer to page 443



with DC voltage output max. = 100 mA

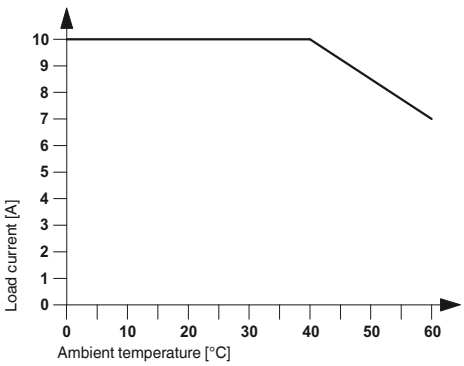


Derating curve for DEK-OV...24DC/3 and DEK-OV-24DC/24DC/3/AKT

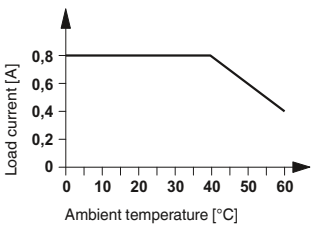


❶ Horizontal mounting
❷ Vertical mounting

Derating curve for DEK-OV-24DC/24DC/10



Derating curve for DEK-OV...240AC/800



Technical data

Input data		①	②	③	④	⑤	⑥
Permissible range (with reference to U_N)		0.9 - 1.1	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.9 - 1.1	0.9 - 1.1
Switching level with reference to U_N	1 signal ("H")	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.9
	0 signal ("L")	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
Typical input current at U_N	[mA]	6.5	11	7	4	3.2	2.5
Transmission frequency f_{limit}	[Hz]	300	300	300	300	3	3
Input circuit AC		Yellow LED, reverse polarity protection, surge protection					
Input circuit DC		Yellow LED, reverse polarity protection					

Output data	
Operating voltage range	3 V DC ... 48 V DC
Periodic peak reverse voltage	-
Limiting continuous current	100 mA
Minimum load current	-
Surge current	-
Leakage current in off state	-
Max. load value	-
Output protection	Reverse polarity protection, freewheeling diode
Voltage drop at maximum limiting continuous current	≤ 0.9 V

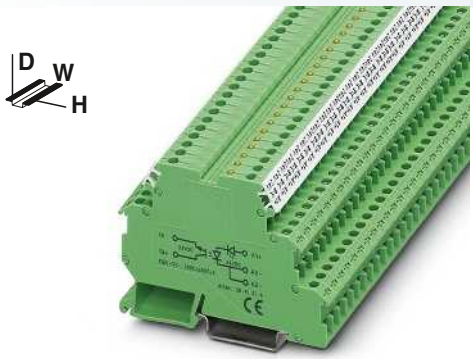
General data	
Test voltage input/output	2.5 kV (50 Hz, 1 min.)
Ambient temperature (operation)	-20 °C ... 60 °C
Standards/regulations	IEC 60664 , EN 50178
Degree of pollution/surge voltage category	2 / III
Connection data solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
Dimensions W / H / D	6.2 mm / 80 mm / 56 mm
EMC note	Class A product, see page 605

Ordering data

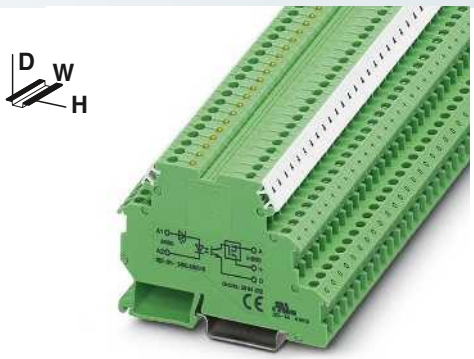
Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Solid-state input relays					
	①	5 V DC	**DEK-OE- 5DC/ 48DC/100**	2940223	10
	②	12 V DC	**DEK-OE- 12DC/ 48DC/100**	2964487	10
	③	24 V DC	**DEK-OE- 24DC/ 48DC/100**	2940207	10
	④	60 V DC	**DEK-OE- 60DC/ 48DC/100**	2941536	10
	⑤	120 V AC	**DEK-OE-120AC/ 48DC/100**	2941659	10
	⑥	230 V AC	**DEK-OE-230AC/ 48DC/100**	2940210	10
Solid-state power relays					
	①	5 V DC			
	②	12 V DC			
	③	24 V DC			
Actuator principle	⑦	24 V DC			

Accessories

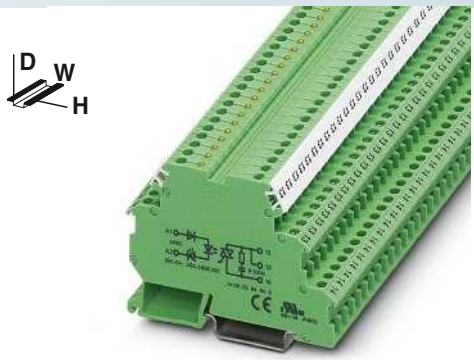
Insertion bridge, for middle and lower levels	No. of pos.	Color				
	80	blue	**EB 80- DIK BU**	26 A	2715940	1
	80	red	**EB 80- DIK RD**	26 A	2715953	1
	80	white	**EB 80- DIK WH**	26 A	2715788	1



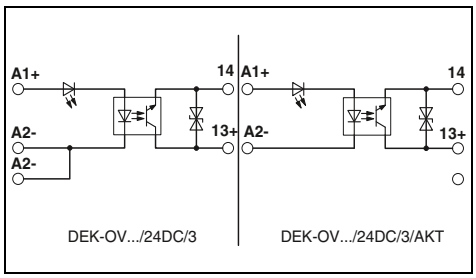
with DC voltage output
max. = 3 A

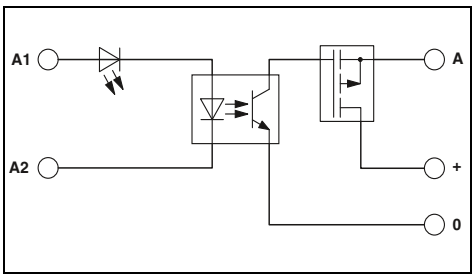


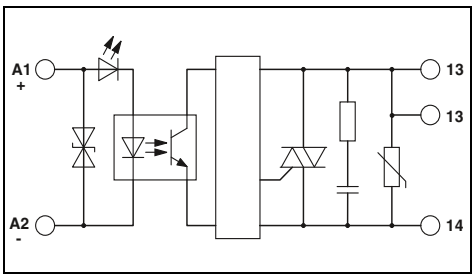
with DC voltage output
max. = 10 A



with AC voltage output
max. = 800 mA







Technical data

①	②	③	⑦
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
≥ 0.8	≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4
11	8.5	7	7
300	300	300	300

Yellow LED, reverse polarity protection

3 V DC ... 30 V DC
-
3 A (see derating curve)
-
-
-
-
Reverse polarity protection, surge protection
≤ 0.2 V

2.5 kV (50 Hz, 1 min.)
-20 °C ... 60 °C
IEC 60664 , EN 50178
2 / III
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
6.2 mm / 80 mm / 56 mm
Class A product, see page 605

Technical data

①	②	③
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4
5.1	4.7	3.5
100	100	100

Yellow LED, reverse polarity protection, surge protection

5 V DC ... 30 V DC
-
10 A (see derating curve)
-
100 A (t = 20 ms)
-
-
Reverse polarity protection, surge protection
< 50 mV

2.5 kV (50 Hz, 1 min.)
-20 °C ... 60 °C
IEC 60664 , EN 50178
2 / III
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
6.2 mm / 80 mm / 56 mm
Class A product, see page 605

Technical data

①	②	③
0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
≥ 0.8	≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.4	≤ 0.4
10.2	10.5	10.7
10	10	10

Yellow LED, reverse polarity protection, surge protection

10 V AC ... 253 V AC (50/60 Hz)
600 V
0.8 A (see derating curve)
10 mA
30 A (t = 10 ms)
1.2 mA
4.5 A²s
RCV circuit
≤ 1 V

2.5 kV (50 Hz, 1 min.)
-20 °C ... 60 °C
IEC 60664 , EN 50178
2 / III
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
6.2 mm / 80 mm / 56 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-OV- 5DC/ 24DC/ 3	2941361	10
DEK-OV- 12DC/ 24DC/ 3	2941387	10
DEK-OV- 24DC/ 24DC/ 3	2941374	10
DEK-OV- 24DC/ 24DC/ 3/AKT	2964296	10

Accessories

EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-OV- 5DC/ 24DC/ 10	2961752	10
DEK-OV- 12DC/ 24DC/ 10	2961749	10
DEK-OV- 24DC/ 24DC/ 10	2964322	10

Accessories

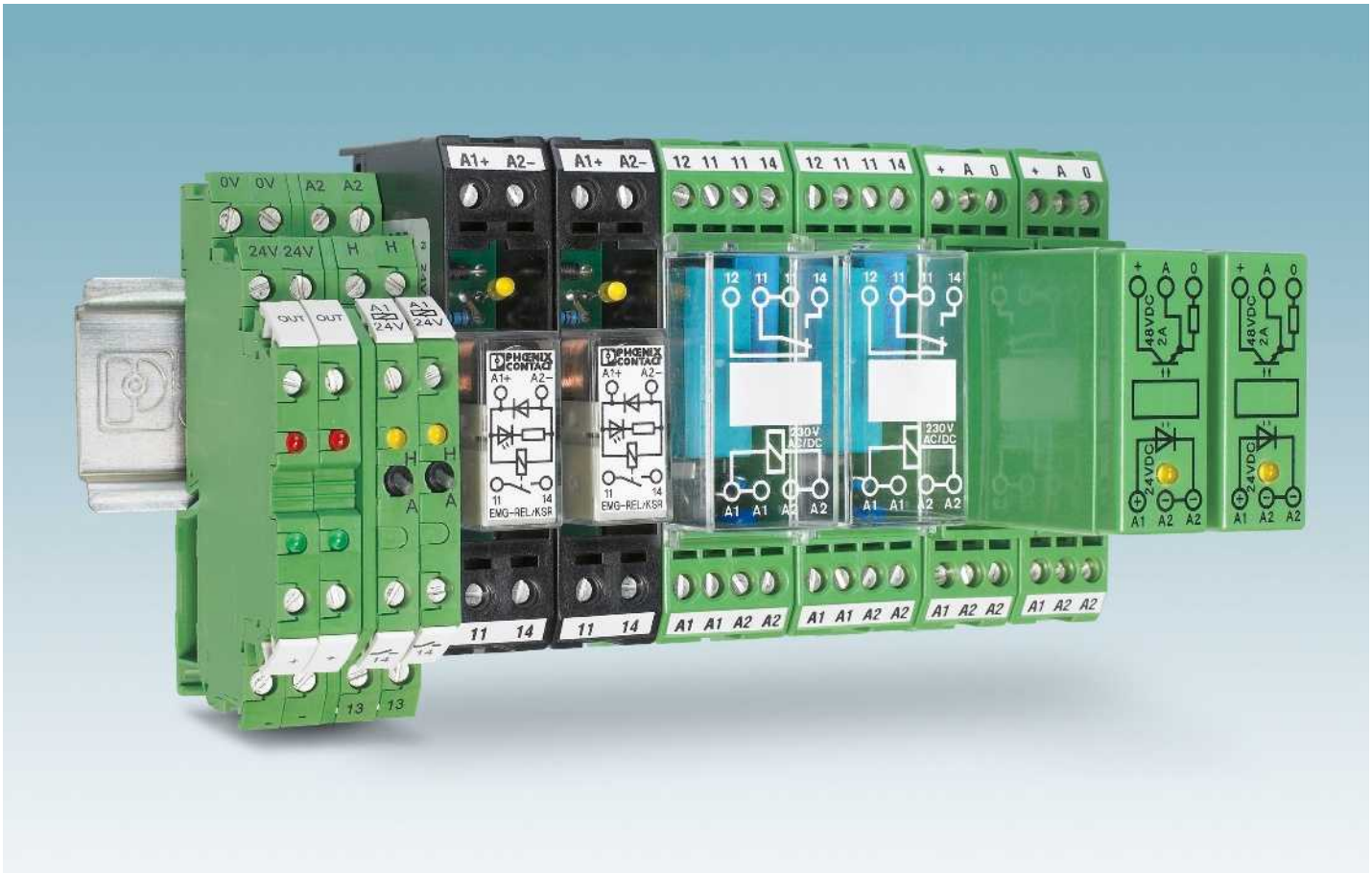
EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-OV- 5DC/240AC/800	2964623	10
DEK-OV- 12DC/240AC/800	2964636	10
DEK-OV- 24DC/240AC/800	2964649	10

Accessories

EB 80- DIK BU	26 A	2715940	1
EB 80- DIK RD	26 A	2715953	1
EB 80- DIK WH	26 A	2715788	1



DEK-REL-24/1/S switch/relay terminal block

The "Manual", "0", and "Automatic" functions are performed in a relay terminal block that is just 6.2 mm wide.

Interference-free relay and solid-state relay interfaces

Coupled interference voltages on the coil lines or leakage currents can cause malfunctions in conventional modules. These special interface modules, equipped with high switching thresholds and/or effective filters, ensure good functioning.

ST-REL... and EMG 17-REL... relay interfaces for switching lamp loads

Lamp loads and capacitive loads produce extremely high inrush currents which weld conventional relay contacts.
To prevent this, Phoenix Contact uses an arc-resistant contact optimized for these applications, which keeps these peaks under control.

ST-OV 3-24DC/400/3 plug-in solid-state power relays

The output of this component, dimensioned with a peak reverse voltage of 800 V, allows, for example, 230 V motors to be driven in simple reversible mode.

Power circuit breaker solid-state relay, with signal logic

These modules combine the features of a short-circuit-proof power solid-state relay and those of a thermomagnetic protection element.

DEK-OE-...100KHZ 100 kHz input solid-state relay

Input solid-state relay for reliable transmission of high-frequency signals, such as those that occur with incremental encoders, for example.

Electronic sensor terminal block for NAMUR proximity sensors

For converting the changeable resistance of a NAMUR sensor into a digital signal that can be read by a PLC.

DEK-TR/INV inverter module

Module for converting NPN outputs to PNP outputs and PNP to NPN.

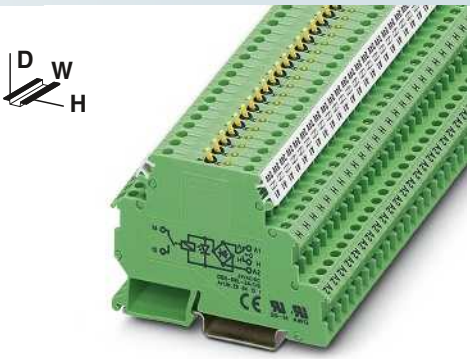
Relay module with manual switch

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

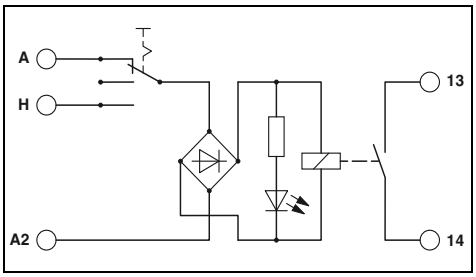
The advantages:

– Maximum switching current of 5 A
– Only 6.2 mm wide
– Increased contact stability thanks to double contact
– Safe isolation according to DIN EN 50178 between coil and contact

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.



Relay module with manual switch and integrated relay



Technical data

Input data		①
Permissible range (with reference to U_N)		0.8 - 1.1
Typical input current at U_N	[mA]	6.5
Response/release time at U_N	[ms]	5 / 15
Input protection:		Yellow LED, bridge rectifier
Output data		
Contact type		1 N/O contact
Contact material		AgNi, hard gold-plated
Max. switching voltage		250 V AC / 125 V DC
Minimum switching voltage		0.1 V
Limiting continuous current		3 A (5 A up to 35°C at 24 V DC)
Maximum switch-on current		5 A
Minimum switching current		1 mA
Maximum interrupting rating, ohmic load		
	24 V DC	72 W
	48 V DC	60 W
	60 V DC	50 W
	110 V DC	50 W
	250 V AC	750 VA
General data		
Test voltage (winding / contact)		2 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-20 °C ... 50 °C
Mechanical service life		Approx. 2x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Connection data solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Dimensions	W / H / D	6.2 mm / 80 mm / 61 mm
EMC note		Class A product, see page 605

Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Relay module with power relay				
①	24 V AC/DC	**DEK-REL- 24/1/S**	2964131	10

Accessories

Cover			**D-DEK 1,5 GN**	2716949	10
Insertion bridge	No. of pos.	Color			
	2	red	**EB 2- DIK RD**	2716693	10
	3	red	**EB 3- DIK RD**	2716745	10
	4	red	**EB 4- DIK RD**	2716758	10
	5	red	**EB 5- DIK RD**	2716761	10
	10	red	**EB 10- DIK RD**	2716774	10
	2	blue	**EB 2- DIK BU**	2716648	10
	3	blue	**EB 3- DIK BU**	2716651	10
	4	blue	**EB 4- DIK BU**	2716664	10
	5	blue	**EB 5- DIK BU**	2716677	10
	10	blue	**EB 10- DIK BU**	2716680	10
	80	blue	**EB 80- DIK BU**	2715940	1
	80	red	**EB 80- DIK RD**	2715953	1

Relay modules with interference current filter

Relay and solid-state relay modules with integrated filter to protect against interference voltages or currents due, for example, to long control lines

The advantages:

– Resistant to interference currents
– High relay release voltage

Typical applications:

– Applications with long control lines
– Use of AC output boards, resulting in residual AC currents

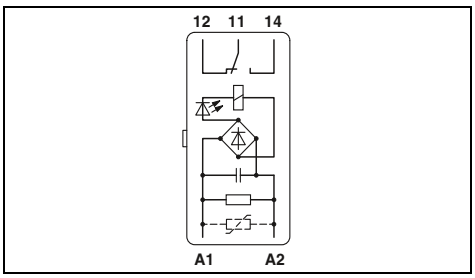
Notes:

Load current diagrams, see page 401

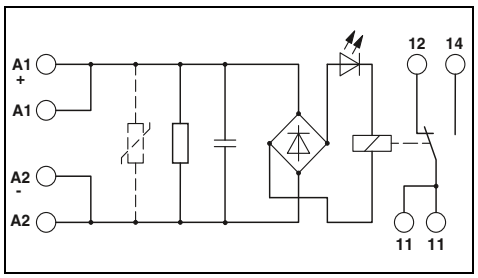
1-PDT plug-in relay

1-PDT soldered-in relay

EAC



EAC



Technical data

Input data		①	②	③
Permissible range (with reference to U_N)		0.9 - 1.1	0.85 - 1.1	0.9 - 1.1
Typical input current at U_N	[mA]	26	19	18
Response/release time at U_N	[ms]	8 / 10	8 / 11	10 / 8
Input protection:		Yellow LED, bridge rectifier, surge protection		

Output data			
Contact type		Single contact, 1-PDT	Double contact, 1-PDT
Contact material		AgNi	Au
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Limiting continuous current		6 A	0.5 A
Maximum switch-on current		8 A	0.2 A
Maximum interrupting rating, ohmic load			
	24 V DC	140 W	5 W
	48 V DC	60 W	-
	60 V DC	45 W	-
	110 V DC	35 W	-
	220 V DC	55 W	-
	250 V AC	1500 VA	-

General data		
Test voltage (winding / contact)		2.5 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-20 °C ... 50 °C
Mechanical service life		Approx. 2x 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Connection data solid/stranded/AWG		- / - / -
Dimensions	W / H / D	20.8 mm / 42.5 mm / 112 mm
EMC note		

Technical data

Input data		③
Permissible range (with reference to U_N)		0.9 - 1.1
Typical input current at U_N	[mA]	18
Response/release time at U_N	[ms]	10 / 8
Input protection:		Yellow LED, bridge rectifier, surge protection

Output data			
Contact type		Single contact, 1-PDT	Double contact, 1-PDT
Contact material		AgNi	AgPd60, hard gold-plated
Max. switching voltage		250 V AC/DC	30 V AC / 36 V DC
Limiting continuous current		6 A	0.5 A
Maximum switch-on current		8 A	0.2 A
Maximum interrupting rating, ohmic load			
	24 V DC	95 W	5 W
	48 V DC	50 W	-
	60 V DC	45 W	-
	110 V DC	35 W	-
	220 V DC	55 W	-
	250 V AC	1500 VA	-

General data	
Test voltage (winding / contact)	2.5 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)	-20 °C ... 40 °C
Mechanical service life	Approx. 2x 10^7 cycles
Standards/regulations	IEC 60664 , EN 50178
Connection data solid/stranded/AWG	0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Dimensions	22.5 mm / 75 mm / 62.5 mm
EMC note	Class A product, see page 605

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Relay module with power contact relay					
	①	24 V AC	**ST-REL3-KG 24/21/SO46**	2826091	10
	②	120 V AC	**ST-REL3-KG120/21/SO46**	2833026	10
	③	230 V AC	**ST-REL3-KG230/21/SO46**	2832027	10
Relay module with multi-layer contact relay					
	①	24 V AC	**ST-REL3-KG 24/21/AU/SO46**	2826981	10
	②	120 V AC	**ST-REL3-KG120/21/AU/SO46**	2829797	10
	③	230 V AC	**ST-REL3-KG230/21/AU/SO46**	2826266	10

Accessories

Basic terminal block, complete with end cover	**URELG 3**	2820136	10
Equipment marker			

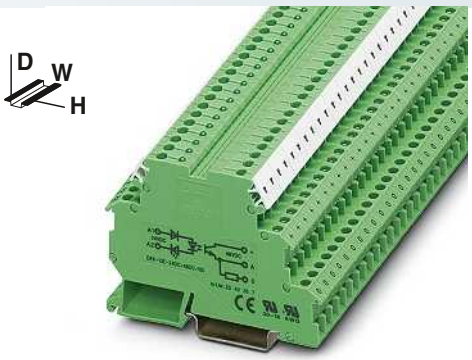
Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 22-REL/KSR-230/21/ SO46	2940760	10
EMG 22-REL/KSR-230/21/AU/SO46	2940061	10

Accessories

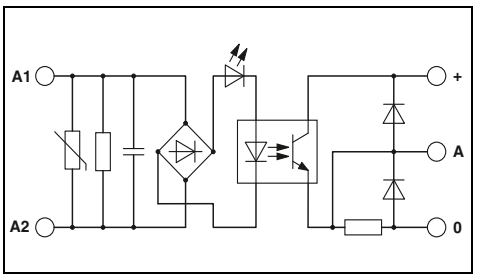
EMG-GKS 12	2947035	50

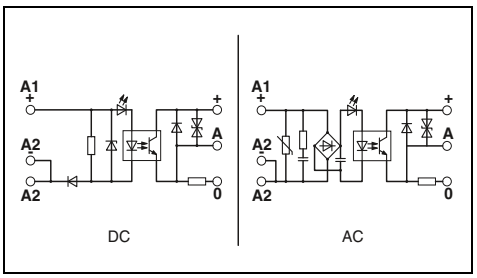
Notes:
Type of housing: **ST-REL:** polyamide PA, non-reinforced, color: bottom part gray, hood green **EMG:** polyamide PA-F, fiber-reinforced, color: green **DEK:** polyamide PA, non-reinforced, color: green
Marking systems and mounting material See Catalog 3
For derating curve, refer to page 399



Solid-state input relay
100 mA, maximum

Solid-state power relay
Max. 2 A





Technical data

Input data		②	①
Permissible range (with reference to U_N)		0.9 - 1.1	0.8 - 1.2
Switching level	1 signal ("H") [V DC] ≥	207	16.8
	0 signal ("L") [V DC] ≤	92	16
Typical input current at U_N	[mA]	2.5	8
Typical switch-on time at U_N	[ms]	4.4	0.02
Typical switch-off time at U_N	[ms]	14	0.2
Transmission frequency f_{limit}	[Hz]	5	300
Input circuit AC		Yellow LED, surge protection, RC element	
Input circuit DC			Reverse polarity protection
Output data			
Max. switching voltage		48 V DC	48 V DC
Minimum switching voltage		3 V DC	12 V DC
Limiting continuous current		100 mA	2 A (see derating curve)
Maximum switch-on current		-	5 A (t = 1 s)
Output circuit		3-conductor, ground-referenced	3-conductor, ground-referenced
Output protection		Reverse polarity protection, free running	Reverse polarity protection, surge protection
Voltage drop at maximum limiting continuous current		≤ 0.9 V	1.1 V
General data			
Test voltage input/output		2.5 kV AC	3.5 kV AC
Ambient temperature (operation)		0 °C ... 50 °C	-10 °C ... 55 °C
Standards/regulations		IEC 60664 , EN 50178	IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III	2 / III
Mounting position/mounting		any / In rows with zero spacing	- / Mounted in rows with zero spacing: Horizontal/not in rows: Any
Connection data solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm	17.5 mm / 75 mm / 102 mm
EMC note			Class A product, see page 605

Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Solid-state power relays					
	①	24 V DC			
	②	230 V AC	**DEK-OE-230AC/ 48DC/100/SO 46**	2964678	10

Accessories

Equipment marker		

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 17-OV- 24DC/ 48DC/2	2942810	10

Accessories

EMG-GKS 12	2947035	50

Relay modules for high inrush currents

The Phoenix Contact relay modules of type SO 38 have been designed for switching electrical equipment with high inrush currents.

Areas of application include:

– Inductive loads (motors, power contactors etc.)
– Inductive/capacitive loads (fluorescent lamps, etc.)
– Ohmic loads (glow lamps, heaters)

The module is based on a relay with a special arc-resistant tungsten lead contact. This takes over the high inrush and interrupting current capacitively. The inductive main contact made of AgCdO takes over the continuous current up to 10 A reliably. With the EMG 17-REL...2E/SO38, this switching capacity is reached using a power relay with a set of silver tin oxide (AgSnO) contacts.

The module is available in two versions:

– Modular EMG housing that can be mounted on a DIN rail, with an overall width of 17.5 mm
– Convenient ST-REL plug-in housing from the Phoenix ST series for mounting on URELG or UDK-RELG basic terminal blocks

Other features include:

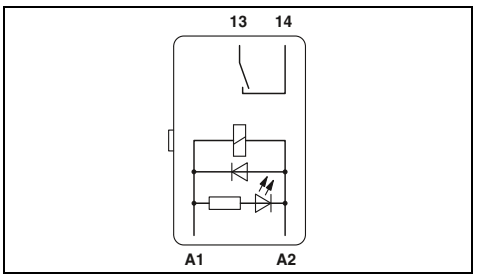
– Snap-on mounting on the common EN DIN rails
– Easy maintenance
– Clear marking of the terminal blocks using Phoenix Contact marking material

Notes:

Type of housing:
Polycarbonate PC-F, fiber-reinforced, color: green or black.

Marking systems and mounting material
See Catalog 3

medium to large powers
1 N/O contact (1)



Technical data

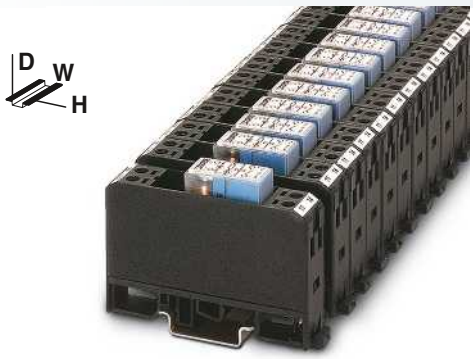
Input data		①
Permissible range (with reference to U_N)		0.85 - 1.1
Typical input current at U_N	[mA]	28
Response/release time at U_N	[ms]	13 / 15
Input protection:		Yellow LED, freewheeling diode
Output data		
Contact type		1 N/O contact with lead contact
Contact material		AgCdO
Max. switching voltage		250 V AC
Limiting continuous current		10 A
Maximum switch-on current		80 A (20 ms)
Maximum interrupting rating, ohmic load		
	24 V DC	-
	48 V DC	-
	60 V DC	-
	110 V DC	-
	220 V DC	-
	250 V AC	2500 VA
General data		
Test voltage (winding / contact)		2.5 kV AC (50 Hz, 1 min.)
Ambient temperature (operation)		-20 °C ... 50 °C
Mechanical service life		Approx. 10^7 cycles
Standards/regulations		IEC 60664 , EN 50178
Mounting position/mounting		- / Horizontal with zero spacing, vertical with spacing
Connection data solid/stranded/AWG		-
Dimensions	W / H / D	20.8 mm / 42.5 mm / 112 mm
EMC note		

Ordering data

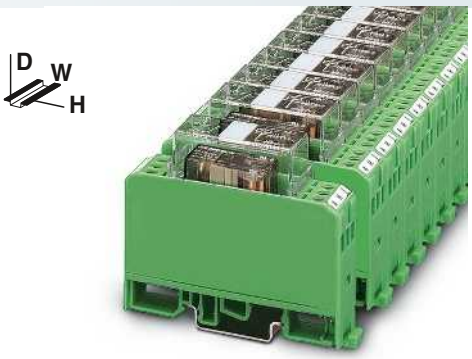
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Relay module with power contact relay + wolfram lead contact				
①	24 V DC	**ST-REL3-KG 24/ 1/SO38**	2829564	10
Relay module with power contact relay, with two inputs for manual, automatic				
①	24 V DC			

Accessories

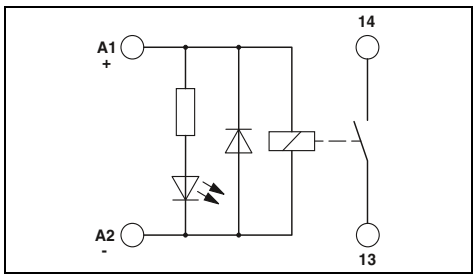
Basic terminal block, complete with end cover	**URELG 3**	2820136	10
Equipment marker			

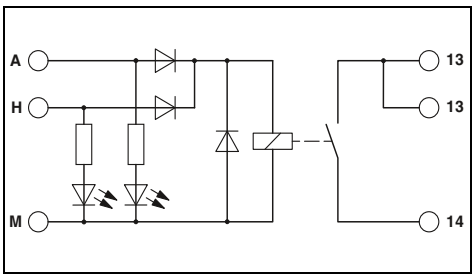


medium to large powers
1 N/O contact (1)



medium to large powers
1 N/O contact (1)





Technical data

①	
0.85 -	0.9 -
1.1	1.1
28	23
13 / 15	9 / 10
Yellow LED, freewheeling diode	Automatic: Yellow LED, Manual: Red LED, freewheeling diode, reverse polarity protection
1 N/O contact with lead contact	Single contact, 1 N/O contact
AgCdO	AgSnO
250 V AC	250 V AC/DC
10 A	10 A
80 A (20 ms)	120 A (20 ms)
-	240 W
-	120 W
-	85 W
-	70 W
-	90 W
2500 VA	2500 VA
4 kV AC (50 Hz, 1 min.)	4 kV AC (50 Hz, 1 min.)
-20 °C ... 50 °C	-20 °C ... 50 °C
Approx. 10^7 cycles	3 x 10^7 cycles
IEC 60664 , EN 50178	IEC 60664 , EN 50178
any	any
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
17.5 mm / 75 mm / 62.5 mm	17.5 mm / 75 mm / 62.5 mm
Class A product, see page 605	Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 17-REL/KSR-G 24/SO38 BK	**2949994**	10

Accessories

EMG-GKS 12	**2947035**	50

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 17-REL/KSR-G 24/2E/SO38	**2941646**	10

Accessories

EMG-GKS 12	**2947035**	50

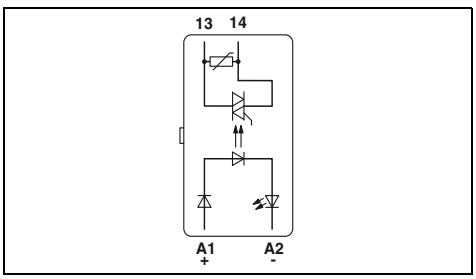
Plug-in solid-state power relays ST-OV 3

The plug-in version of the module provides all the advantages of the ST series, such as:

– Switching of up to 400 V AC/3 A
– Control of 230 V motors in straightforward reversing mode (e.g., synchronous motor in single-phase operation, see illustration)
– Plug-in design

Notes:
Type of insulating housing: polyamide PA, non-reinforced, color: bottom part gray, hood green
Ground (minus) potential from the input and output of the optocoupler should not be connected.
AC loads must be protected with a varistor or an RC element.

with AC voltage output max. = 3 A



Technical data

Input data		①
Switching level with reference to U_N	1 signal ("H")	≥ 0.8
	0 signal ("L")	≤ 0.4
Typical input current at U_N	[mA]	7
Transmission frequency f_{limit}	[Hz]	10
Input protection:		Yellow LED, reverse polarity protection, RC element
Output data		
Operating voltage		400 V AC
Operating voltage range		24 V AC ... 420 V AC
Periodic peak reverse voltage		800 V
Limiting continuous current		3 A (see derating curve)
Minimum load current		50 mA
Surge current		125 A (t = 10 ms)
Residual voltage drop at "H"		≤ 1.2 V
Leakage current in off state		approx. 12 mA
Output protection		Surge protection , RC element
General data		
Test voltage input/output		2.5 kV AC
Ambient temperature (operation)		0 °C ... 60 °C
Standards/regulations		IEC 60664 , EN 50178
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		Horizontal DIN rail / -
Dimensions	W / H / D	20.8 mm / 42.5 mm / 112 mm

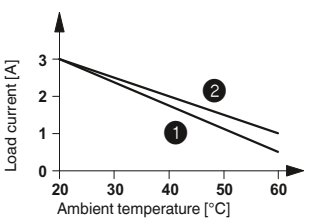
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Solid-state power relays					
	①	24 V DC	**ST-OV3- 24DC/400AC/3**	2905417	10

Accessories

Basic terminal block, complete with end cover	**URELG 3**	2820136	10

Derating curve for ST-OV 3-24DC/400AC/3



❶ Aligned without spacing
❷ Aligned with ≥ 20 mm spacing

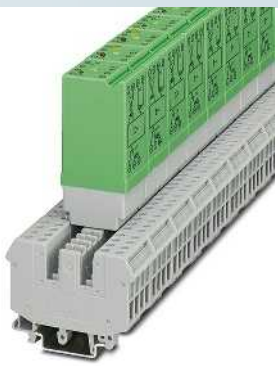
Power circuit breaker solid-state relay with signal logic ST-OV 4-24DC/24DC/...-PRO

The ST-OV 4-...PRO provides protection and monitoring functions that are otherwise only known from thermomagnetic protection elements.

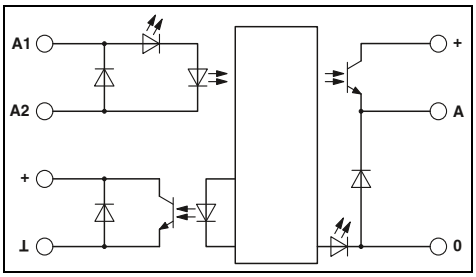
The PROtect modules have the following features:

– Fast short-circuit shutdown and simultaneous current limitation
– Time-dependent overload shutdown for reliable protection against continuous overloads
– Brief inrush peaks are ignored
– After an overload or short circuit has been triggered, a defined reset of the control voltage must be carried out
– Reliable recognition and indication of an open circuit on the load side
– Feedback in the event of an error

Notes:
Type of housing: Polyamide PA, non-reinforced, color: bottom part gray, hood green
Marking systems and mounting material See Catalog 3
For load current diagram, see page 401
Derating curve, time/current characteristic curves, and state diagram, see page 401



with short-circuit-proof DC voltage output max. = 1 A or 4 A



Technical data

Input data		ST-OV4- 24DC/ 24DC/1-PRO	ST-OV4- 24DC/ 24DC/4-PRO
Operating voltage		24 V DC	
Switching level	1 signal ("H")	8.5 V DC	
	0 signal ("L")	5 V DC	
Typical input current at U_N		6.5 mA	
Transmission frequency f_{limit}		100 Hz	
Reset duration after short circuit/overload cut-off		1 ms	
Input circuit		Yellow LED, polarity protection diode	
Output data signaling contact / CONTROL			
Operating voltage range		5 V DC ... 36 V DC	
Limiting continuous current		50 mA	
Residual voltage drop at "H"		≤ 1.5 V	
Output protection		Polarity protection diode	
Output circuit		3-conductor, ground-referenced	
Output data load contact			
Operating voltage range		18 V DC ... 36 V DC	
Limiting continuous current		1 A (see derating curve)	4 A (see derating curve)
Minimum load current		1 mA	
Residual voltage drop at "H"		300 mV	200 mV
Open circuit alarm with load current		< 100 µA	
Overload disconnection (~ 1.4 x continuous current)		≤ 100 ms (See the time-current characteristic curve)	
Short-circuit disconnection		< 200 µs (See the time-current characteristic curve)	
Current limitation at short-circuits		approx. 25 A	approx. 70 A
Switching time t_{in} /t_{out}		300 µs / 700 µs	
Output protection		Red LED , Damping diode	
Output circuit		3-conductor, ground-referenced	
General data			
Test voltage input/output		2.5 kV AC	
Test voltage output/output		2.5 kV AC	
Rated surge voltage		Basic insulation	
Ambient temperature (operation)		0 °C ... 60 °C	
Standards/regulations		IEC 60664 / EN 50178	
Screw connection solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 4 mm² / 24 - 12	
Dimensions	W / H / D	27 mm / 63.5 mm / 114 mm	

Ordering data

Description	Output current	Type	Order No.	Pcs./ Pkt.
Power circuit breaker solid-state relay, with signal logic				
	1 A	**ST-OV4- 24DC/ 24DC/1-PRO**	2905572	10
	4 A	**ST-OV4- 24DC/ 24DC/4-PRO**	2905585	10

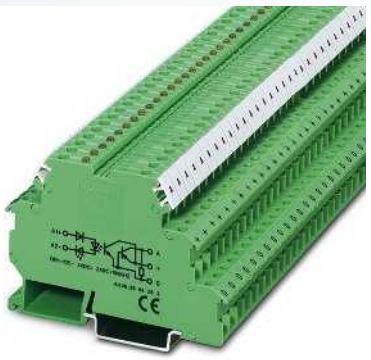
Accessories

Basic terminal block, complete with end cover	**UDK-RELG 4**	2777056	10

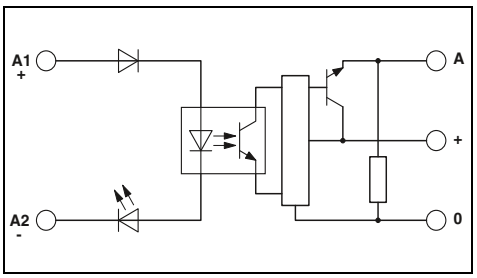
100 kHz input solid-state relay DEK-OE

A solid-state relay for the reliable detection of short pulses
– Limit frequency of up to 100 kHz
– Push-pull stage on output side
– Includes signal inputs on PLC counter boards
– Features a capacitor on the input side for interference suppression

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3



With DC voltage output
Transmission frequency 100 kHz



Technical data

Input data		①	②
Permissible range (with reference to U_N)		0.8 - 1.2	0.8 - 1.2
Switching level with reference to U_N	1 signal ("H")	≥ 0.8	≥ 0.8
	0 signal ("L")	≤ 0.4	≤ 0.4
Typical input current at U_N	[mA]	7	6
Typical switch-on time at U_N	[µs]	1.5	1.5
Typical switch-off time at U_N	[µs]	2	2
Transmission frequency f_{limit}	[kHz]	100	100
Input protection:		Yellow LED, reverse polarity protection, surge protection	
Output data			
Operating voltage range		4 V DC ... 30 V DC	
Limiting continuous current		50 mA	
Quiescent current		4.3 mA	
Residual voltage drop at "H"		≤ 0.5 V DC	
Output circuit		3-conductor, ground-referenced	
Output protection		Surge protection	
General data			
Test voltage input/output		2.5 kV AC	
Ambient temperature (operation)		-20 °C ... 60 °C	
Standards/regulations		IEC 60664 , EN 50178	
Degree of pollution/surge voltage category		2 / II	
Connection data solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm	
EMC note		Class A product, see page 605	

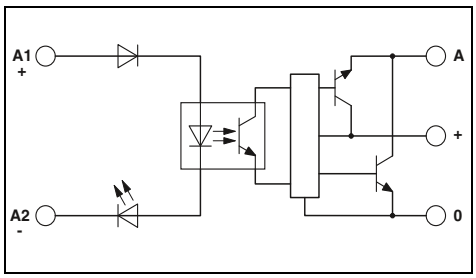
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Solid-state input relays					
	①	5 V DC	**DEK-OE- 5DC/ 24DC/100KHZ**	2964270	10
	②	24 V DC	**DEK-OE- 24DC/ 24DC/100KHZ**	2964283	10

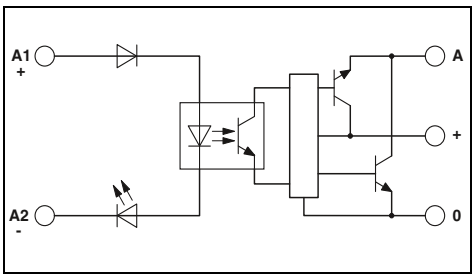
With DC voltage output push-pull
Transmission frequency 100 kHz

With DC voltage output push-pull
Transmission frequency 100 kHz

EAC



EAC



Technical data

①	②
0.5 -	0.8 -
1.2	1.2
≥ 0.5	≥ 0.8
≤ 0.3	≤ 0.4
8	8
1	1
2	2
100	100
Yellow LED, reverse polarity protection, surge protection	

4 V DC ... 18 V DC	
50 mA	
8.5 mA	
≤ 1.2 V DC	
3-conductor push-pull, ground referenced	
Surge protection	

2.5 kV AC	
-20 °C ... 60 °C	
IEC 60664 , EN 50178	
2 / II	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
6.2 mm / 80 mm / 56 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
DEK-OE- 5DC/ 5DC/100KHZ-G	**2964542**	10
DEK-OE- 24DC/ 5DC/100KHZ-G	**2964364**	10

Technical data

①	②
0.5 -	0.8 -
1.2	1.2
≥ 0.5	≥ 0.8
≤ 0.3	≤ 0.4
8	8
1	1
2	2
100	100
Yellow LED, reverse polarity protection, surge protection	

14 V DC ... 30 V DC	
50 mA	
15 mA	
≤ 2.2 V DC	
3-conductor push-pull, ground referenced	
Surge protection	

2.5 kV AC	
-20 °C ... 60 °C	
IEC 60664 , EN 50178	
2 / II	
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	
6.2 mm / 80 mm / 56 mm	
Class A product, see page 605	

Ordering data

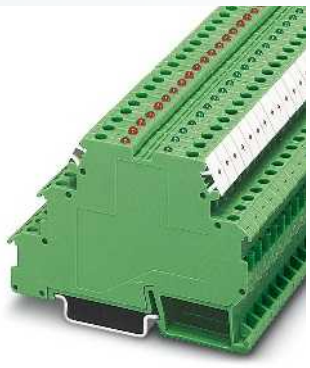
Type	Order No.	Pcs./ Pkt.
DEK-OE- 5DC/ 24DC/100KHZ-G	**2964555**	10
DEK-OE- 24DC/ 24DC/100KHZ-G	**2964348**	10

Electronic sensor terminal block for NAMUR proximity sensors

The EIK 1-SVN 24-P electronic sensor terminal block from Phoenix converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

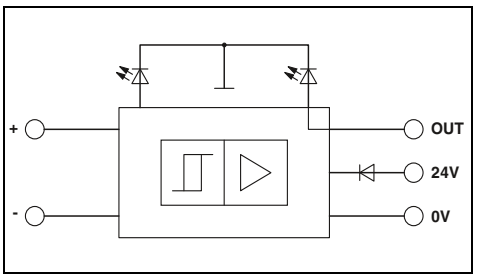
– Monitoring of initiator side for short circuits or strand breaks
– Suitable resistance circuit to enable monitoring of mechanical switches (see application 2)
– LED error display
– Status display (high signal) via green LED
– 24 V/50 mA digital output
– Bridging and marking with standard terminal accessories.

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3



For inductive proximity sensors acc. to NAMUR

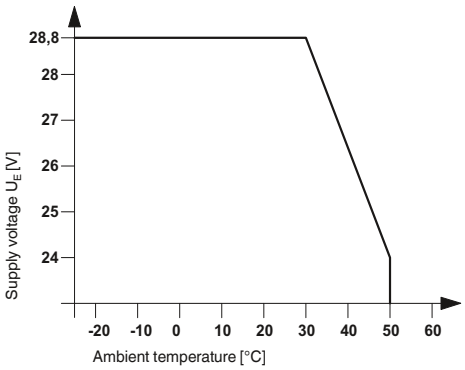
EAC



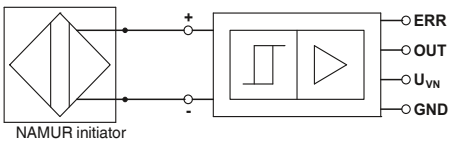
Technical data

Supply		
Input supply nominal voltage U_{VN}		18.5 V DC ... 28.8 V DC (U_{VN}, see derating curve)
Ripple		in acc. with DIN 19240
Current consumption I_{Imax}		70 mA (at 50 mA output current)
Input circuit		Green LED , Polarity protection diode
Control circuit		
Non-load voltage		8.2 V DC ±10 %
Switching points in accordance with EN 60947-5-6:		≥ 2.1 mA (In conductive state) ≤ 1.2 mA (In blocking state) 6.3 mA ... 10 mA (in the event of a short-circuit) 0 mA ... 0.35 mA (In the event of a wire break)
Switching hysteresis		approx. 0.2 mA
Internal resistance		approx. 1 kΩ
Output protection		visual short-circuit and wire break control with LED (red) , 12 V Zener diode
Signal output		
Maximum output current I_{Amax}		50 mA
Residual voltage U_R with I_{Omax}		≤ 1.5 V (U_R)
Output voltage U_O		≤ 100 mV (In conductive state) U_{VN} - U_R;in blocking state
Output protection		36 V Zener diode as freewheeling diode
General data		
Ambient temperature (operation)		-25 °C ... 50 °C
Transmission frequency (INPUT/OUTPUT)		1 kHz
Input pulse length		≥ 0.5 ms
Input pause length		≥ 0.5 ms
Standards/regulations		IEC 60664 , EN 61000-6-2 , EN 61000-6-4
Degree of pollution / Overvoltage category		2 / III
Screw connection solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm
EMC note		Class A product, see page 605

Derating curve for EIK 1-SVN 24 P



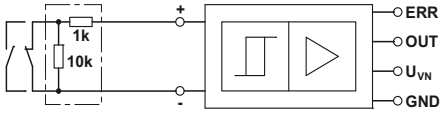
Application 1



NAMUR initiator

Application 2

UKK 5-2R/NAMUR



Limit switch

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Switching amplifier electronic terminal block, for inductive proximity sensors as per NAMUR, with light indicators for sensor signal and faults	**EIK1-SVN-24P**	2940799	10

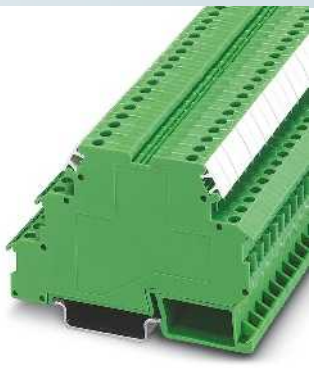
Accessories

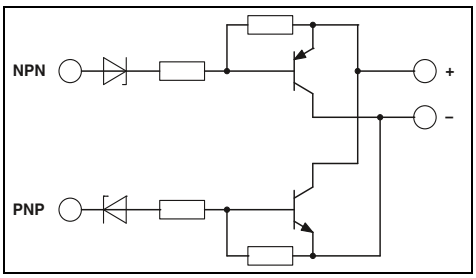
Terminal block, with three through contacts, for mounting on NS 35...	**DIKD 1,5**	2715979	50
Double-level terminal block, with pre-assembled resistors	**UKK 5-2R/NAMUR**	2941662	50
Insertion bridge	**EB...-DIK...** **Ordering data at DEK-REL...**		

DEK-TR/INV inverter module

The DEK-TR/INV inverter module inverts the signals of ground-switching NPN transistor outputs into positive switching PNP outputs, as well as signals from PNP into NPN signals. See application example.

Notes:
Type of housing: Polyamide PA, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3





Technical data

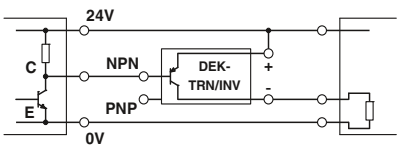
Supply voltage		20 V DC ... 30 V DC (U_V)
Continuous current		200 mA
Residual voltage drop		< 1 V
Leakage current		< 1 mA
Maximum transmission frequency		15 kHz
NPN input/PNP output		
Switch-on threshold		< 5 V (at U_V = 24 V; < (U_V - 19 V))
Switch-off threshold		> 15 V (at U_V = 24 V; > (U_V - 9 V))
Minimum limit values		-2 V
Maximum limit values		26 V (at U_V = 24 V; U_V + 2 V)
Control circuit		
Switch-on threshold		> 19 V
Switch-off threshold		< 9 V
Minimum limit values		-2 V
Maximum limit values		26 V (at U_V = 24 V; U_V + 2 V)
General data		
Ambient temperature (operation)		-20 °C ... 50 °C
Standards/regulations		IEC 60664 Basic insulation
Degree of pollution / Overvoltage category		2 / II
Screw connection solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	W / H / D	6.2 mm / 80 mm / 56 mm

Ordering data

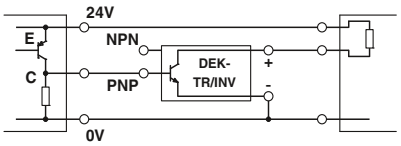
Description	Type	Order No.	Pcs./ Pkt.
Inverter module	**DEK-TR/INV**	**2964319**	10

Connection examples:

NPN output **Load**



PNP output **Load**



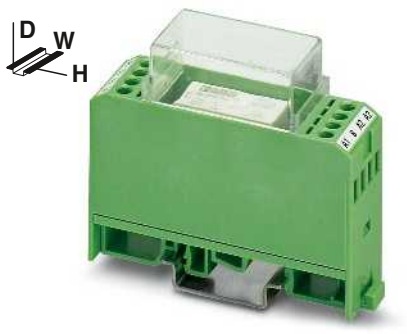
Hybrid relay modules

With its integrated transistor level, the hybrid relay module is able to amplify weak input signals. This serves as the basis for reliable relay operation.

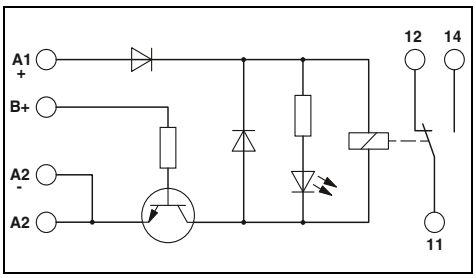
The advantages:

– Low control current (terminal B), type-dependent as of 0.5 mA
– Type-dependent positive or negative control current
– Integrated input and interference suppression circuit
– Safe isolation according to DIN EN 50178 between coil and contact

Notes:
Type of housing: Polycarbonate PC-F, fiber-reinforced, color: green.
Marking systems and mounting material See Catalog 3
For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.



Positive switching hybrid relay



Technical data

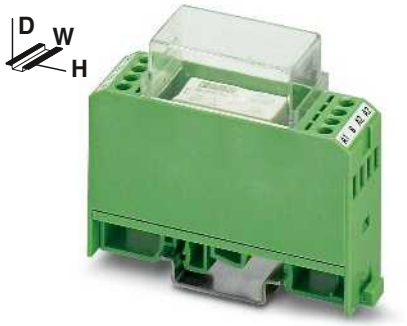
		①	②	③
Input data				
Relay supply voltage U_N ± 10 %	[V DC]	24	24	24
Minimum control voltage	[V DC]	2.7	5	15
Maximum control voltage	[V DC]	5.25	13.2	35
Minimum control current	[mA]	2.6	0.5	0.5
Maximum control current	[mA]	7.7	1	1
Typical input current at U_N	[mA]	21	21	21
Response/release time at U_N	[ms]	9 / 10	9 / 10	9 / 10
Input protection:		Yellow LED, reverse polarity protection, freewheeling diode		
Output data				
Contact type		Single contact, 1-PDT		
Contact material		AgNi		
Max. switching voltage		250 V AC/DC		
Limiting continuous current		5 A		
Maximum switch-on current		8 A		
Maximum interrupting rating, ohmic load				
	24 V DC	120 W		
	48 V DC	60 W		
	60 V DC	50 W		
	110 V DC	50 W		
	220 V DC	80 W		
	250 V AC	1250 VA		
General data				
Test voltage (winding / contact)		4 kV AC (50 Hz, 1 min.)		
Ambient temperature (operation)		-20 °C ... 50 °C		
Mechanical service life		Approx. 5x 10^7 cycles		
Standards/regulations		IEC 60664 , EN 50178		
Degree of pollution/surge voltage category		2 / III		
Connection data solid/stranded/AWG		0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12		
Dimensions	W / H / D	22.5 mm / 75 mm / 62.5 mm		
EMC note		Class A product, see page 605		

Ordering data

Description	Nominal control voltage	Type	Order No.	Pcs./ Pkt.
Relay module with miniature power contact relay with integrated NPN transistor control, for low control currents				
	① 5 V DC	**EMG 22-REL/KSR-G 24/TRN 5**	2949787	10
	② 12 V DC	**EMG 22-REL/KSR-G 24/TRN12**	2952363	10
	③ 24 V DC	**EMG 22-REL/KSR-G 24/TRN35**	2952350	10
Relay module with miniature power contact relay with integrated PNP transistor control, for low control currents				
	① 5 V DC			
	② 12 V DC			
	③ 24 V DC			

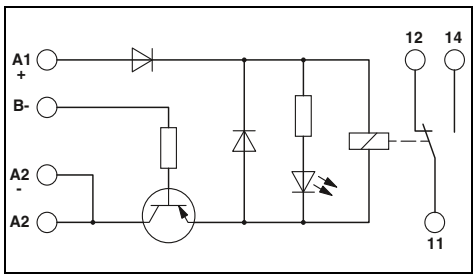
Accessories

Equipment marker	**EMG-GKS 12**	2947035	50



Negative switching hybrid relay

EAC



Technical data

①	②	③
24	24	24
-2.4	-6.9	-17.5
-5.25	-13.2	-38.5
1.2	0.6	0.6
1.7	1	1.4
21	21	21
9 / 10	9 / 10	9 / 10
Yellow LED, reverse polarity protection, freewheeling diode		

Single contact, 1-PDT	
AgNi	
250 V AC/DC	
5 A	
8 A	
120 W	
60 W	
50 W	
50 W	
80 W	
1250 VA	
4 kV AC (50 Hz, 1 min.)	
-20 °C ... 50 °C	
Approx. 5x 10^7 cycles	
IEC 60664 , EN 50178	
2 / III	
0.2 - 4 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
22.5 mm / 75 mm / 62.5 mm	
Class A product, see page 605	

Ordering data

Type	Order No.	Pcs./ Pkt.
EMG 22-REL/KSR-G 24/TRP 5	**2949790**	10
EMG 22-REL/KSR-G 24/TRP12	**2952156**	10
EMG 22-REL/KSR-G 24/TRP35	**2952169**	10

Accessories

EMG-GKS 12	**2947035**	50

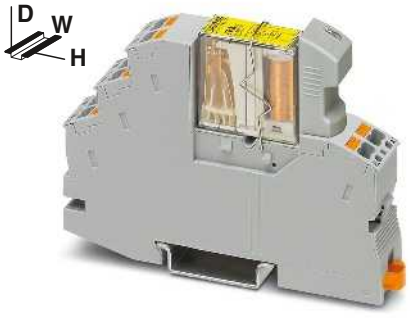
Fully assembled RIF-1 coupling relay module with force-guided contacts

Fully assembled RIF-1 coupling relay module with force-guided contacts, consisting of:
– Relay base with Push-in connection
– 2-PDT relay with force-guided contacts according to EN 50205
– Relay retaining bracket
– Interference suppression module

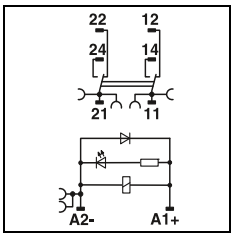
The advantages:
– Switching current of up to 2x 6 A
– Single-channel control
– Force-guided contacts according to EN 50205
– Professional bridging of adjacent modules saves wiring time
– Integrated status LED and freewheeling diode

Notes:
Further voltage variants on request

new



2-PDT relay module with with force-guided contacts, max. 2 x 6 A



Technical data

Input data		①
Permissible range (with reference to U_N)		see diagram
Typical input current at U_N	[mA]	30
Typical response time at U_N	[ms]	10
Typical release time at U_N	[ms]	10
Input circuit DC		Yellow LED, damping diode
Output data		
Contact type		2 PDT, force-guided
Contact material		AgNi
Max. switching voltage		250 V AC/DC
Minimum switching voltage		15 V AC/DC
Limiting continuous current		6 A
Maximum switch-on current		6 A
Minimum switching current		10 mA
General data		
Ambient temperature (operation)		-20 °C ... 50 °C
Nominal operating mode		100% operating factor
Mechanical service life		Approx. 10^7 cycles
Standards/regulations		DIN EN 50178/VDE 0160 , EN 50205
Degree of pollution/surge voltage category		2 / III
Mounting position/mounting		any / in rows with zero spacing
Connection data solid/stranded/AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
Dimensions	W / H / D	16 mm / 93 mm / 70 mm
EMC note		Class A product, see page 605

Ordering data

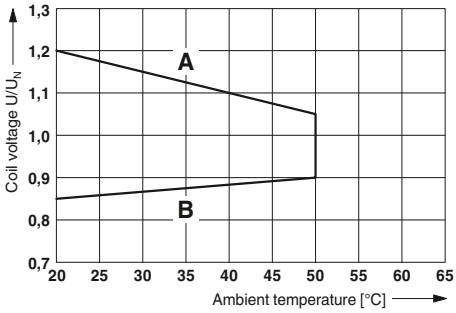
Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Coupling relay module with power contact relay and force-guided contacts, Push-in connection				
①	24 V DC	**RIF-1-RPT-LDP-24DC/2X21/FG**	2908215	10
Force-guided coupling relay with power contacts				
①	24 V DC			

new

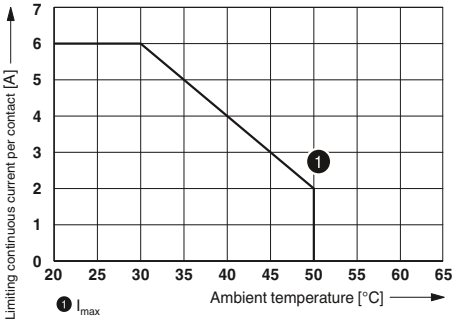
RIF-1-RPT-LDP-24DC/2X21/FG

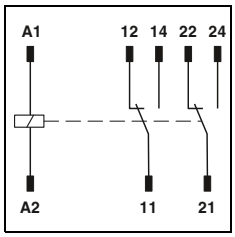
2-PDT relay with with force-guided contacts, max. 2 x 6 A

Operating voltage range



Contact derating





Technical data

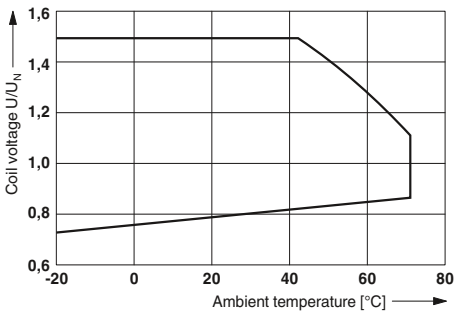
①	
	see diagram
	29
	10
	4
	2 PDT
	AgNi
	250 V AC/DC
	15 V
	6 A
	6 A
	10 mA
	-25 °C ... 70 °C
	100% operating factor
	Approx. 10^7 cycles
	DIN EN 50178 , IEC 60664-1
	2 / III
	-
	- ... - / - ... - / -
	12.6 mm / 29 mm / 25.5 mm

Ordering data

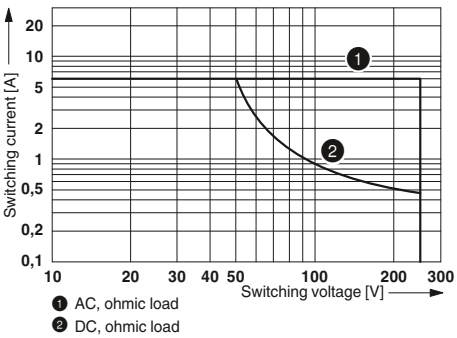
Type	Order No.	Pcs./ Pkt.
REL-SR- 24DC/2X21/FG	**2908777**	20

REL-SR- 24DC/2X21/FG

Operating voltage range



Interrupting rating



Relay modules for potentially explosive areas (Zone 2)

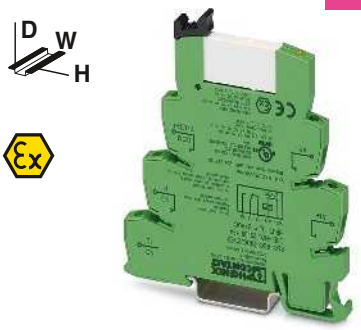
PLC-INTERFACE for hazardous areas

Relay modules with ATEX, IECEx, and Class 1, Division 2 approval for potentially explosive applications as well as solid-state relays with Class 1, Division 2 approval.

The advantages:

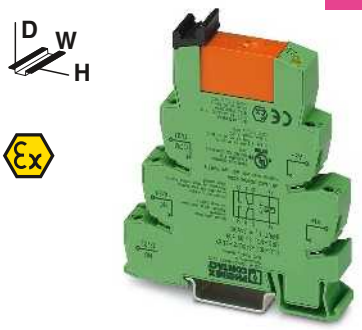
– Slim design
– Functional plug-in bridges
– Integrated input and interference suppression circuit
– RTIII-sealed relays
– Safe isolation according to DIN EN 50178 between coil and contact

new



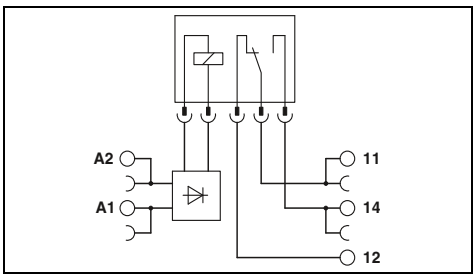
1-PDT relay module, 6 A, maximum

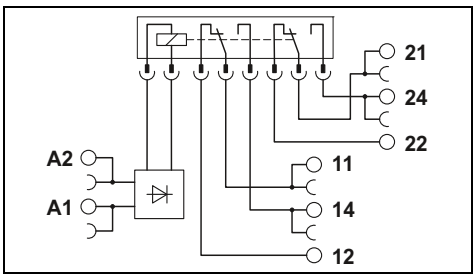
new



2-PDT relay module, 2 x 6 A, maximum

Notes:
Type of insulating housing: Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material See Catalog 3
The PLC-ATP partition plate must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....
[1]) Ambient temperature (operation): -40°C ... 55°C (ATEX / IECEx)





Technical data

Input data		①	②	③	④
Permissible range (with reference to U_N)		See diagram			
Switching level (with reference to U_N)	1 signal ("H") 0 signal ("L")				
Typical input current at U_N	[mA]	15.3	9	3.5	3.2
Typical response time/switch-on time at U_N	[ms]	5	5	6	7
Typical release time/switch-off time at UN	[ms]	8	8	15	15
Transmission frequency f_{limit}	[Hz]				
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode			
Input circuit AC/DC		Yellow LED, bridge rectifier			
Output data					
Contact material		AgSnO			
Max. switching voltage		250 V AC/DC			
Minimum switching voltage		5 V (at 100 mA)			
Limiting continuous current		6 A			
Maximum switch-on current		10 A (4 s)			
Minimum switching current		10 mA (at 12 V)			
Output protection		-			
Voltage drop at maximum limiting continuous current		-			
General data					
Test voltage input/output		4 kV AC (50 Hz, 1 min.)			
Ambient temperature (operation)		-20 °C ... 60 °C (UL) , -40 °C ... 60 °C (ATEX / IECEx)			
Mechanical service life		2 x 10^7 cycles			
Standards/regulations		IEC 60664 , EN 50178 , EN 60079-0, -7, -15			
Degree of pollution/surge voltage category		3 / III			
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14			
Dimensions	W / H / D	6.2 mm / 80 mm / 94 mm			
EMC note					
Conformance/Approvals					
Conformance		CE-compliant			
ATEX		Ⓔx II 3G Ex ec nC IIC T4 Gc (IBExU16ATEXB015 X)			
IECEx		Ex ec nC IIC T4 Gc (IECEx IBE 16.0029X)			
UL, USA		Class I, Zone 2, AEx nA nC IIC T6			
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D			
UL, Canada		Class I, Zone 2, Ex nA nC IIC Gc T6 X			

Technical data

Input data		①	②	③	④
Permissible range (with reference to U_N)		See diagram			
Switching level (with reference to U_N)	1 signal ("H") 0 signal ("L")				
Typical input current at U_N	[mA]	33	18	4.5	4.5
Typical response time/switch-on time at U_N	[ms]	8	8	7	7
Typical release time/switch-off time at UN	[ms]	10	10	10	10
Transmission frequency f_{limit}	[Hz]				
Input circuit DC		Yellow LED, reverse polarity protection, freewheeling diode			
Input circuit AC/DC		Yellow LED, bridge rectifier			
Output data					
Contact material		AgNi			
Max. switching voltage		250 V AC/DC			
Minimum switching voltage		5 V AC/DC (at 10 mA)			
Limiting continuous current		6 A			
Maximum switch-on current		15 A (300 ms)			
Minimum switching current		10 mA (At 5 V)			
Output protection		-			
Voltage drop at maximum limiting continuous current		-			
General data					
Test voltage input/output		4 kV AC (50 Hz, 1 min.)			
Ambient temperature (operation)		-20 °C ... 60 °C (UL) , -40 °C ... 60 °C (ATEX / IECEx)			
Mechanical service life		3 x 10^7 cycles			
Standards/regulations		IEC 60664 , EN 50178 , EN 60079-0, -7, -15			
Degree of pollution/surge voltage category		2 / III			
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14			
Dimensions	W / H / D	14 mm / 80 mm / 94 mm			
EMC note					
Conformance/Approvals					
Conformance		CE-compliant			
ATEX		Ⓔx II 3G Ex ec nC IIC T4 Gc (IBExU16ATEXB015 X)			
IECEx		Ex ec nC IIC T4 Gc (IECEx IBE 16.0029X)			
UL, USA		Class I, Zone 2, AEx nA nC IIC T6			
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D			
UL, Canada		Class I, Zone 2, Ex nA nC IIC Gc T6 X			

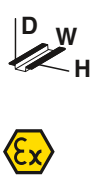
Ordering data

Description	Input voltage U_N	Type	Order No.	Pcs./ Pkt.
PLC-INTERFACE, with **screw connection**				
①	12 V DC	**PLC-RSC-12DC/21/EX**	2909522	10
②	24 V DC	**PLC-RSC-24DC/21/EX**	2909524	10
③	120 V AC / 110 V DC	**PLC-RSC-120UC/21/EX**	2909525	10
④	230 V AC / 220 V DC	**PLC-RSC-230UC/21/EX[1])**	2909526	10
PLC-INTERFACE, with **Push-in connection**				
①	12 V DC	**PLC-RPT-12DC/21/EX**	2909527	10
③	24 V DC	**PLC-RPT-24DC/21/EX**	2909528	10
④	120 V AC / 110 V DC	**PLC-RPT-120UC/21/EX**	2909529	10
⑤	230 V AC / 220 V DC	**PLC-RPT-230UC/21/EX[1])**	2909530	10

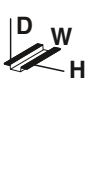
Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC-12DC/21-21/EX	2909517	10
PLC-RSC- 24DC/21-21/EX	2909509	10
PLC-RSC-120UC/21-21/EX	2909511	10
PLC-RSC-230UC/21-21/EX[1])	2909512	10
PLC-RPT-12DC/21-21/EX	2909513	10
PLC-RPT- 24DC/21-21/EX	2909514	10
PLC-RPT-120UC/21-21/EX	2909515	10
PLC-RPT-230UC/21-21/EX[1])	2909516	10

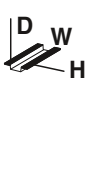
new



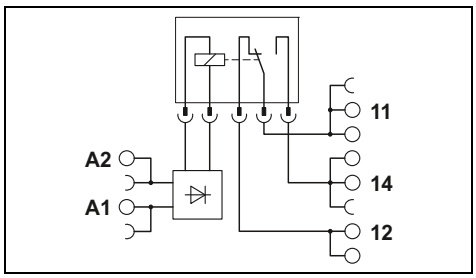
1-PDT relay module,
max. 10 A



Solid-state relay module,
DC output max. 3 A



Solid-state relay module,
DC output max. 100 mA



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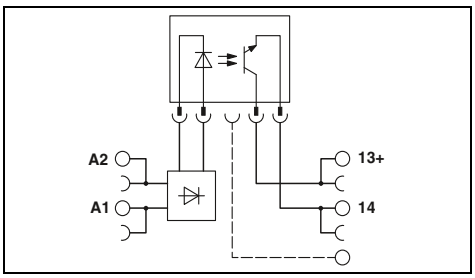

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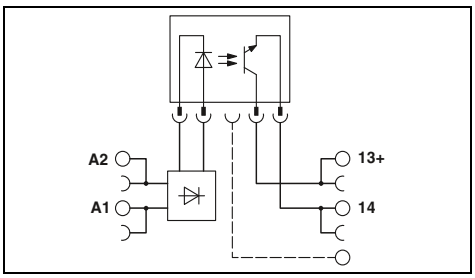


Technical data

①	②	③	④
See diagram			
33	18	4.5	4.5
8	8	7	7
10	10	10	10
Yellow LED, reverse polarity protection, freewheeling diode			
Yellow LED, bridge rectifier			
AgNi			
250 V AC/DC			
12 V AC/DC			
10 A			
30 A (300 ms)			
100 mA			
-			
-			
4 kV AC (50 Hz, 1 min.)			
-20 °C ... 60 °C (UL) , -40 °C ... 60 °C (ATEX / IECEx)			
3 x 10^7 cycles			
IEC 60664 , EN 50178 , EN 60079-0, -7, -15			
2 / III			
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14			
14 mm / 80 mm / 94 mm			
CE-compliant			
Ex II 3G Ex ec nC IIC T4 Gc (IBExU16ATEXB015 X)			
Ex ec nC IIC T4 Gc (IECEx IBE 16.0029X)			
Class I, Zone 2, AEx nA nC IIC T6			
Class I, Div. 2, Groups A, B, C, D			
Class I, Zone 2, Ex nA nC IIC Gc T6 X			

Technical data

②	③
0.8 - 1.2	0.9 - 1.1
≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.3
8.5	3.5
0.02	3.5
0.3	7
300	10
Yellow LED, reverse polarity protection, freewheeling diode	
Yellow LED, bridge rectifier	
-	
33 V DC	
3 V DC	
3 A	
15 A (10 ms)	
-	
Reverse polarity protection, surge protection	
≤ 200 mV	
2.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
-	
IEC 60664 , EN 50178	
2 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	
CE-compliant	
-	
-	
Class I, Zone 2, AEx nA nC IIC T6	
Class I, Div. 2, Groups A, B, C, D	
Class I, Zone 2, Ex nA nC IIC Gc T6 X	

Technical data

②	③
0.8 - 1.2	0.9 - 1.1
≥ 0.8	≥ 0.9
≤ 0.4	≤ 0.3
8.5	3.5
0.02	3
0.3	4
300	10
Yellow LED, reverse polarity protection, freewheeling diode	
Yellow LED, bridge rectifier	
-	
48 V DC	
3 V DC	
100 mA	
-	
-	
Reverse polarity protection, surge protection	
≤ 1 V	
2.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
-	
IEC 60664 , EN 50178	
2 / III	
0.14 - 2.5 mm^2 / 0.14 - 2.5 mm^2 / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	
CE-compliant	
-	
-	
Class I, Zone 2, AEx nA nC IIC T6	
Class I, Div. 2, Groups A, B, C, D	
Class I, Zone 2, Ex nA nC IIC Gc T6 X	

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-RSC-12DC/21HC/EX	2909518	10
PLC-RSC-24DC/21HC/EX	2909519	10
PLC-RSC-120UC/21HC/EX	2909520	10
PLC-RSC-230UC/21HC/EX[1])	2909521	10
PLC-RPT-12DC/21HC/EX	2909531	10
PLC-RPT-24DC/21HC/EX	2909532	10
PLC-RPT-120UC/21HC/EX	2909533	10
PLC-RPT-230UC/21HC/EX[1])	2909534	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 24DC/ 2/C1D2	5603260	10
PLC-OSC-120UC/ 24DC/ 2/C1D2	5603262	10

Ordering data

Type	Order No.	Pcs./ Pkt.
PLC-OSC- 24DC/ 48DC/100/C1D2	5603261	10
PLC-OSC-120UC/ 48DC/100/C1D2	5603263	10

Y.182
Y.183

System cabling for controllers

Wiring I/O modules with individual wires is an extremely time-consuming process. Wiring errors and tedious troubleshooting cannot be ruled out.

VARIOFACE system components reduce assembly costs by using plug-in components to carry out wiring quickly, clearly, and without errors.

In the case of **controller-specific system cabling**, front adapters, system cables, and modules are specially matched to each other. Individual solutions exist for the following controllers:

- **ABB**
- **Allen Bradley**
- **Emerson**
- **Honeywell**
- **GE Fanuc**
- **Phoenix Contact**
- **Mitsubishi Electric**
- **OMRON**
- **Schneider Electric**
- **Siemens**
- **Yokogawa**

If automation components with high-pos. connectors such as D-SUB are in the control cabinet, **universal modules** and cables are suitable for signal connection. The 1:1 connection is characteristic for these universal all-purpose modules. The modules allow orderly connection of field signals to screw, spring-cage or Push-in technology.

Universal cables connect the control and signal level quickly and without errors.

A wide variety of **potential distributors** are available for splitting the control and operating voltage. The different potential levels and the connection terminal blocks support flexible use.

Individual application requirements can be implemented with customer-specific products (see page 468).

Product range overview

Introduction	**462**
Product overview	**464**
Customer-specific products	**468**

Controller-specific system cabling

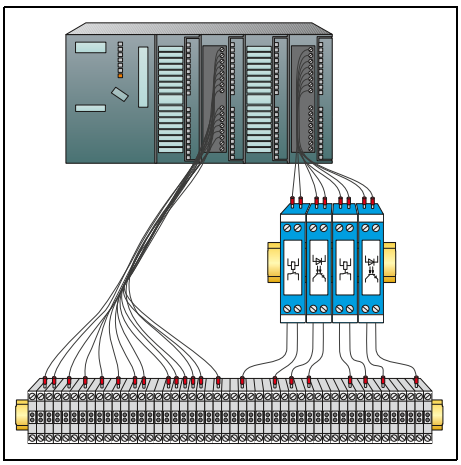
For ABB S800 I/O	**470**
For Allen Bradley, ControlLogix, SLC 500, and PlantScape	**472**
For Emerson DeltaV	**480**
For GE Fanuc RX3i and Series 90-30	**484**
For Honeywell C300 Series CI/O and PlantScape	**486**
For Mitsubishi A1S and Q, Melsec L, Honeywell ML 200	**488**
For Omron CJ1, CS1, and C200H	**490**
For Phoenix Contact Axioline and Inline	**491**
For Schneider Electric Modicon	**493**
For Siemens SIMATIC® S7-300	**496**
For Siemens SIMATIC® S7-1500	**510**
For Siemens SIMATIC® S7-400	**514**
For Yokogawa CENTUM VP, ProSafe-RS	**516**
Termination Carriers for Yokogawa CENTUM VP and ProSafe-RS	**524**
Passive modules	**526**
Active modules	**536**
V8 adapters for PLC-INTERFACE	**544**
System and splitting cables	**551**
VIP I/O-Marshalling universal platform	**552**
Retrofit and modernization components	**558**

Universal modules

With IDC/FLK connectors	**566**
With D-SUB connectors	**570**
With high-density D-SUB connectors	**576**
With RJ45 connectors	**577**
With ELCO connectors	**578**

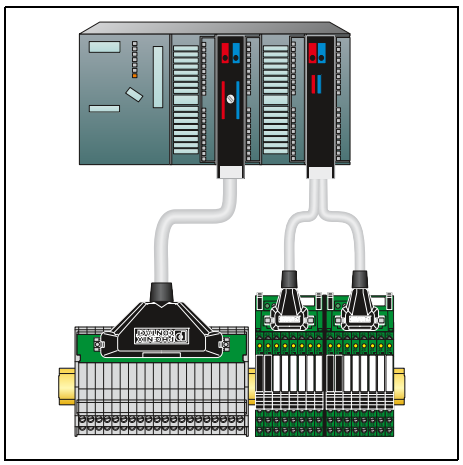
Universal cables

With IDC/FLK connectors	**582**
With D-SUB connectors	**592**
Potential distributors	**598**



Wiring with single wires

– Time-consuming
– Confusing wiring
– Risk of mixing wires
– Time-consuming troubleshooting



Wiring with the controller-specific system cabling:

– Fast, fault-free wiring
– Plug and Play solution
– Orderly structure
– Considerable time savings

The matching components are selected with the help of the "system cabling for controllers" online configurator:
– Front adapter
– System cables
– Module

For the online configurator, use the web code:

Your web code: #0007

Simply enter "#0007" into the search field on our website.

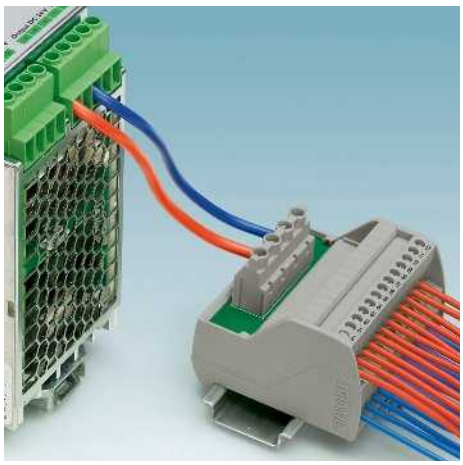
Front adapter
– Tailored to controller-specific I/O modules
– Plug-in components
– Connection via system cables

8 and 32-channel modules
– Passive modules
– Relay modules
– Controller-specific layout
– Screw or Push-in connection technology

PLC-V8 adapter
– Connection of 8 channels via the "PLC series"
– Feasible functions: relay, solid-state relay or feed-through
– Individual function selection per channel
– Screw or Push-in connection technology

Universal modules
– Connector: IDC/FLK, D-SUB, ELCO or DIN
– 1:1 connection
– Screw or Push-in connection technology
– Optional status indicator

Universal cables
– With IDC/FLK connector
– With D-SUB connector
– Optionally with open end



Potential distributors
– Up to 30 A/250 V
– Two, three or six potential levels
– Screw or Push-in connection technology

Controller-specific system cabling

System component	Version	Controller								
		ABB	Allen Bradley		Emerson	GE Fanuc		Honeywell		Mitsubishi
		S800 I/O	Control Logix	SLC 500	DeltaV	RX3i	90-30	C300 Series CI/O ML 200	PlantScape	MELSEC A, A1S, Q, L
		Page	Page	Page	Page	Page	Page	Page	Page	Page
Front adapter		not required	472	476	not required	484	485	486	472	not required
System cable	Standard	592	550	550	588	550	550	592	550	
	Controller-specific	471		478	480			489		488
Termination boards	Passive Standard	526	526	526	526	526	526	487	526	526
	Passive Controller-specific	470	474	477	481					
	Active Standard	536	536	536	536	536	536	536	536	536
	V8 adapter	544	544	544	544	544	544	544	544	544
	Relay/ optocoupler	368	368	368	368	368	368	368	368	368
	MINI Analog Pro system adapter									
	MINI Analog Pro									

	OMRON CJ1	Phoenix Contact	Schneider		Siemens				Yokogawa	
	CS1, CQM1, C200H	Axioline Inline	TSX Quantum™	M340	S7 1500	S7 300	S7 400	Implementation S5 to S7	CENTUM VP	ProSafe RS
	Page	Page	Page	Page	Page	Page	Page	Page	Page	Page
	not required	492	493	494	510	500	514	560	not required	not required
		550	550	550	550	550	550			
	490			495		505			516	516
	526	526	526	526	526	526	526			
			474		510	508	508		520	522
	536	536	536	536	536	536	536			
	544	544	544	544	544	544	544		544	
	368	368	368	368	368	368	368		368	
						97			97	
						68			68	

Product overview

Controller-specific system cabling

System component	Version	VIP I/O-Marshalling universal platform
		Page
Base module		552
Plug-in module	Feed-through	554
	Analog	555
	Digital	555
	Relay	556
Cables		596

Universal modules and cables

Device series	Passive modules (connection technology)			
	IDC/FLK strip	D-SUB strip	ELCO strip	Potential distributors
	Page	Page	Page	Page
VIP Line	566	570 576		598
Standard Line			580	
Slim Line		574		
Feed-through modules		575		
Cables	582	592		

From the enquiry to the product

We develop your product from the idea to series production.

Concept phase

– Realization test according to your specifications
– Personal consultation
– Tendering including draft drawing

Realization phase

– Development according to product creation process
– Circuit diagram and PCB layout
– Component selection
– Creation of functional samples
– Creation of prototypes
– Tests in every phase of development
– EC conformance
– Preparation and implementation of approval procedures
– Environmental tests according to standards
– Documentation

Series phase

– Production according to IPC-A-610 Class 2
– 100% end test with automated test systems
– Lifecycle management

Directives and standards

– Low-voltage directive
– EMC directive
– IEC 60664-1
  Insulation coordination for electrical equipment within low-voltage systems
– EN 50178
  Electronic equipment for use in power installations
– EN 61000-6
  Electromagnetic compatibility
– IPC A-600
  Acceptance criteria for PCBs
– IPC-A-610
  Acceptance criteria for electronic modules

Components used

We use connection technology and housings from the comprehensive Phoenix Contact portfolio.

Here you find all common market technologies:

– Screw and spring-cage connection
– Push-in spring connection
– Knife disconnection
– Modular component housing
– Building installation housings
– Profile module carriers

Furthermore, we use components, connectors, cables as well as PCBs from qualified and certified suppliers.

Product range

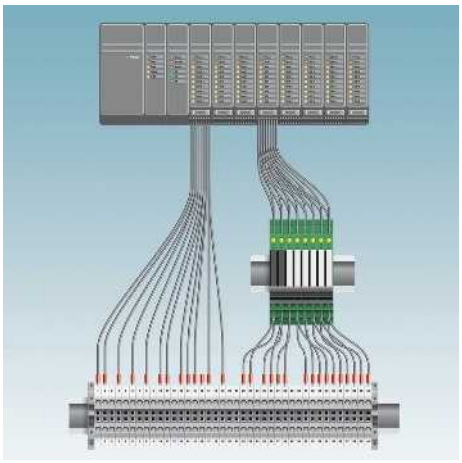
We create versions from catalog production for you or new products according to your specifications from the following portfolio:

– Function modules such as diode gates
– Relay and optocoupler modules
– 1:1 installation modules (connector on terminal block)
– Potential distributors
– System cables with high-pos. connectors
– System adapters for controllers and control systems
– Transfer modules for use between controller and field level
– Output modules with electrical isolation
– Module carrier for system cabling of signal conditioners or safe coupling relays

Your direct line to us

Do you have a specific question? Talk to us about it.

Simplification of installation
Objectives
– Reduce assembly costs
– Minimize installation time
– Optimize space in the control cabinet
Implementation
– Analysis of the application
– Draft of concept
Result
– Tailor-made solution from system components (standard and customer-specific)
– Fault-free wiring



Retrofitting systems
Task
– Extension
– Retrofitting
Objectives
– System availability
– Fulfillment of statutory specifications
Solution
– Use adaptation solutions and high-pos. system cables
Result
– Minimum downtimes

Pre-assembled system cables
With high-position connectors
– D-SUB strips
– IDC/FLK pin strips (2.54 mm)
– Pre-assembled at one or both ends
Cables
– Shielded, unshielded, halogen-free
– 0.14 mm²/26 AWG and 0.25 mm²/24 AWG
Quality
– Continuity and dielectric test
Other versions available on request.

Installation modules
– 1:1 marshalling terminal to high-pos. connector (D-SUB, HE10, ELCO...)
– Passive transfer modules with system connection
– Potential distributors
– Fuse modules
– Diode modules
– Other modules on request

Relay and optocoupler modules
– With electromechanical relays
– With solid-state relays
– Multi-channel
– With system connection
– N/O contact or PDT contact
– LED status display
– Freewheeling diode
– Reverse polarity protection
– Redundant power supply

Termination Carrier module carrier
The compact Termination Carrier connects
– Signal conditioners
– Signal conditioners for Ex i circuits
– Signal conditioners for SIL applications
– Safe coupling relays
easily with the automation system via system cables.
The advantages are clear:
– Quick startup
– Fault minimization

ABB S800 I/O
Termination boards with knife disconnection

The ABB S800 I/O system can be used to install the process wiring via D-SUB connectors. The ABB TU 812 Compact MTU is available for this purpose.

The FLKM-D25SUB/B/KDS3-MT/... modules are connected to the I/O modules via assembled D-SUB cables (see page 592).

In addition to screw connection with knife disconnection for every channel and ABB S800-specific marking, the modules have the following features:

– Eight negative terminals with knife disconnection (TU810)
– Eight positive terminals with knife disconnection (TU810/P)
– For each channel, there is a positive and negative terminal with knife disconnection (TU830)

Passive termination boards can also be used for signal transmission (e.g., VIP-3/SC/D25SUB/F, 2315188), see page 571.

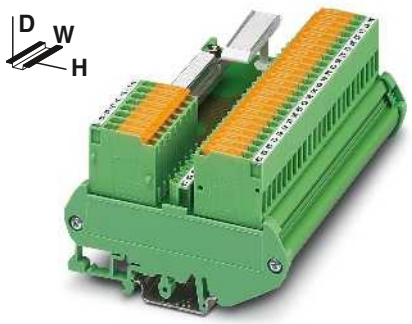
Web code for the online configurator

Your web code: #0007

Connectable I/O modules

Card type	FLKM-D25SUB...		
	...TU810	...TU810/P	...TU830
Digital input		DI 810	DI 810
		DI 811	DI 811
	DI 814		DI 814
		DI 818	DI 818
		DI 830	DI 830
		DI 831	DI 831
		DI 840	DI 840
		DI 885	DI 885
Digital output	DO 810		DO 810
		DO 814	DO 814
	DO 818		DO 818
	DO 840		DO 840
Analog input	AI 810	AI 810	AI 810
	AI 815	AI 815	AI 815
	AI 820		AI 820
	AI 830		AI 830
	AI 835		AI 835
	AI 845	AI 845	AI 845
Analog output	AO 810		AO 810
	AO 815		AO 815
	AO 820		AO 820
	AO 845		AO 845
Miscellaneous	DP 820		DP 820

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply



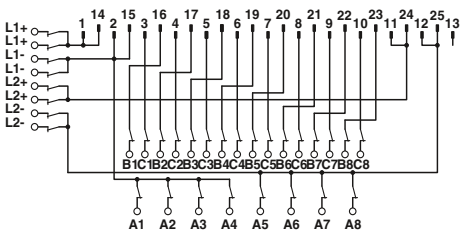
Termination board with knife disconnect terminal blocks

Technical data

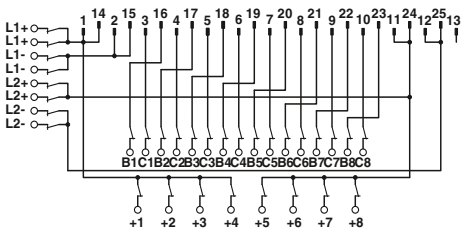
Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible current (per branch)		2 A
Maximum total current (voltage supply)		4 A (8 A L1-/L2-)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Field level	Screw connection with disconnect knife
	Controller level	D-SUB socket strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	90 mm / 61 mm

Ordering data

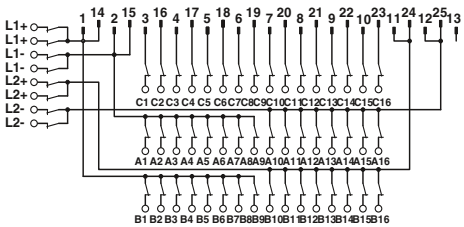
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with knife disconnect terminal blocks in ABB-specific marking:					
- with 8 negative terminal blocks	25	126.5 mm	**FLKM-D25 SUB/B/KDS3-MT/TU810**	2304513	1
- with 8 positive terminal blocks	25	126.5 mm	**FLKM-D25 SUB/B/KDS3-MT/TU810/P**	2304539	1
- each with 16 positive and negative terminal blocks	25	247.5 mm	**FLKM-D25 SUB/B/KDS3-MT/TU830**	2304526	1



FLKM-D25 SUB/B/KDS3-MT/TU810 connection scheme



FLKM-D25 SUB/B/KDS3-MT/TU810/P connection scheme



FLKM-D25 SUB/B/KDS3-MT/TU830 connection scheme

ABB S800 I/O
System cable

The ABB S800 I/O system can be used to install the process wiring via D-SUB connectors. The ABB TU 812 Compact MTU is available for this purpose.

The CABLE-D25SUB/B/2X14/.../TU812 system cables convert digital signals from a D-SUB socket strip to two IDC/FLK socket strips. Therefore, all 8-channel termination boards of the system cabling are connected to S800 I/O modules. Two termination boards are used per module.

System cable

Technical data

Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current carrying capacity per path	1 A
Ambient temperature (operation)	-20 °C ... 50 °C
Assembly	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated
Outside diameter 25-pos.	6.3 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
VARIOFACE system cable, for S800 I/O, with a 25-pos. D-SUB socket strip and two 14-pos. IDC/FLK socket strips, in standard lengths					
	25	1 m	**CABLE-D25SUB/B/2X14/100/TU812**	2304649	1
	25	2 m	**CABLE-D25SUB/B/2X14/200/TU812**	2304652	1
	25	3 m	**CABLE-D25SUB/B/2X14/300/TU812**	2304665	1
	25	5 m	**CABLE-D25SUB/B/2X14/500/TU812**	2304678	1
VARIOFACE system cable, for S800 I/O, with a 25-pos. D-SUB socket strip and two 14-pos. IDC/FLK socket strips, in variable lengths					
	25		**CABLE-D25SUB/B/2X14/TU812/...**	2304681	1

Color code and pin assignment CABLE-D25SUB/B/2X14...TU812

D-SUB connector 25-pos.	FLK 14 1st connector	FLK 14 2nd connector	Wire color
1	9		Gray
2	10		White
3	1		Black
4	3		Red
5	5		Yellow
6	7		Blue
7		1	Black
8		3	Red
9		5	Yellow
10		7	Blue
11		9	Orange
12		10	White
13	NC	NC	–
14	11		White-black
15	12		White-brown
16	2		Brown
17	4		Orange
18	6		Green
19	8		Violet
20		2	Brown
21		4	Orange
22		6	Green
23		8	Violet
24		11	White-black
25		12	White-brown

Ordering example for system cable**:**

– Cable for ABB S800, 12.75 m long

Quantity	Order No.	Length [m] [1]
1	2304681	/ 12.75

[1]) min. 0.20 m

Allen Bradley ControlLogix, Honeywell PlantScape Front adapter

I/O modules with 32 channels or of this type

The front adapters are pushed into the tall 1756-TBE covers (not supplied as standard, original accessories must be ordered directly from manufacturer) of the controller. A 50-pos. system cable can connect a maximum of 32 channels to the field level.

Tailor-made VARIOFACE termination boards round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Front adapters can also be used without cover.
Controller-specific modules from page 474
Standard modules from page 526
For system cables, see page 550

32-channel front adapter with 50-pos. FLK strip

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Standards/regulations	DIN EN 50178 / IEC 60664

Ordering data

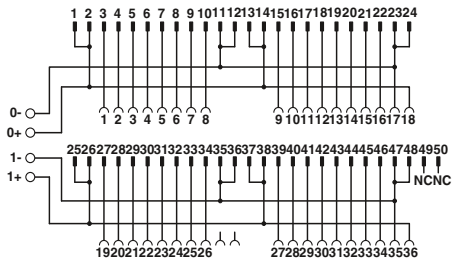
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapters, for ControlLogix:				
- A maximum of 1 x 32 channels can be connected	50	**FLKM 50-PA-AB/1756/EXTC**	2302735	1
- IB 32 input board	50	**FLKM 50-PA-AB/1756/IN/EXTC**	2302748	1

Front adapters for I/O modules of the Allen Bradley ControlLogix and Honeywell PlantScape automation devices

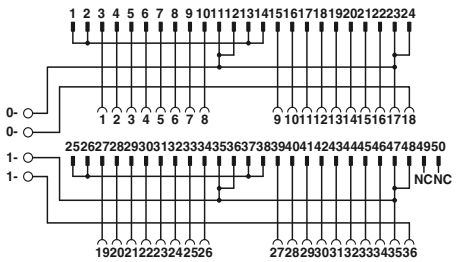
Card type	FLKM 50-PA-AB/1756/EXTC
Digital input	1756-IA 16 I* or TC-TDK 161* 1756-IB 16 D* or TC-TDX 161* 1756-IB 16 I* or TC-TDJ 161* 1756-IH 16 I*
Digital output	1756-OB 32 or TC-ODD 321
Analog input	1756-IF 8* 1756-IF 16 I* or TC-IAH 161* 1756-IF 8H* or TC-HAI 081*
Counter	1756-HSC*
Servo	1756-M02 AE*

Card type	FLKM 50-PA-AB/1756/IN/EXTC
Digital input	1756-IB 32 or TC-IDD 321

* Only in conjunction with
VIP-2/SC/FLK50/AB-1756, Order No.: 2322317
VIP-2/PT/FLK50/AB-1756, Order No.: 2904286
There must be no voltage supply at the front adapter. Risk of short circuit!



Connection scheme: FLKM 50-PA-AB/1756/EXTC



Connection scheme: FLKM 50-PA-AB/1756/IN/EXTC

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Allen Bradley ControlLogix, Honeywell PlantScape Front adapter

I/O modules with 16 channels or of this type

The front adapters are pushed into the tall 1756-TBE covers (not supplied as standard, original accessories must be ordered directly from manufacturer) of the controller. Two 14-pos. system cables are used to connect up to 2 x 8 channels to the field level.

Tailor-made VARIOFACE termination boards round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Front adapters can also be used without cover.
Controller-specific modules from page 474
Standard modules from page 526
For system cables, see page 550
1) No UL approval

16-channel front adapter with two 14-pos. FLK strips

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Standards/regulations	DIN EN 50178 / IEC 60664

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapters, for ControlLogix:				
– Up to 2 x 8 channels can be connected	14	**FLKM 14-PA-AB/1756/EXTC**	2302861	1
– IA 16, IB 16, IC 16, IN 16 input card	14	**FLKM 14-PA-AB/1756/IN/EXTC**	2302874	1
– IF6 I input card (only suitable for measuring current; no power terminals on adapter)	14	**FLKM 14-PA-AB/1756/IF6I/EXTC1)**	2901037	1

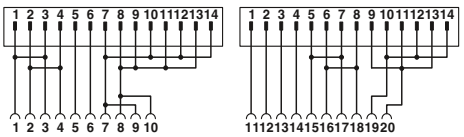
Front adapters for I/O modules of the Allen Bradley ControlLogix and Honeywell PlantScape automation devices

Card type	FLKM 14-PA-AB/1756/EXTC
Digital input	1756-IA 8 D** or TC-IDX 081**
Digital output	1756-OB 16 E
Analog input	1756-IF 6 CIS** 1756-IF 6 I** or TC-IAH 061** 1756-IR 6 I** or TC-IXR 061** 1756-IT 6 I** or TC-IXL 061**
Analog output	1756-OF 4 I** 1756-OF 6 CI** or TC-OAH 061** 1756-OF 6 VI** or TC-OAV 061** 1756-OF 8** or TC-OAV 081** 1756-OF 8 H**
Switch	1756-PLS**

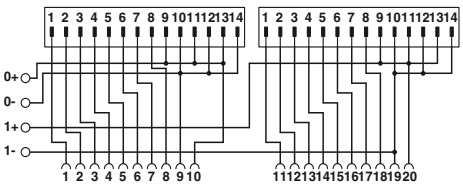
Card type	FLKM 14-PA-AB/1756/IN/EXTC
Digital input	1756-IN 16** 1756-IA 16 or TC-IDA 161** 1756-IB 16 1756-IC 16**

Card type	FLKM 14-PA-AB/1756/IF6I/EXTC
Analog input	IF6I**

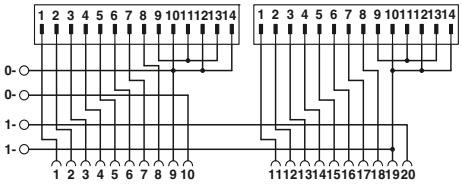
** Only in conjunction with
VIP-2/SC/2FLK14/AB-1756, Order No.: 2322333
VIP-2/PT/2FLK14/AB-1756, Order No.: 2904288
There must be no voltage supply at the front adapter. Risk of short circuit!



Connection scheme: FLKM 14-PA-AB/1756/IF6I/EXTC



Connection scheme: FLKM 14-PA-AB/1756/EXTC



Connection scheme: FLKM 14-PA-AB/1756/IN/EXTC

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

VIP termination boards for Modicon TSX Quantum™ and Allen Bradley ControlLogix

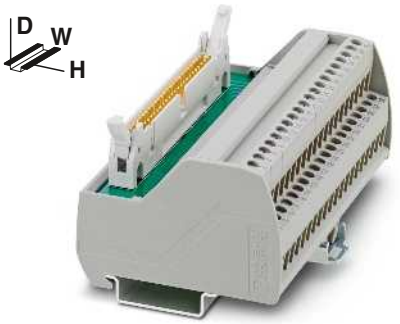
These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters.

Features:

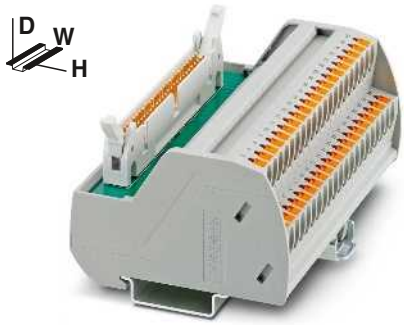
– Specific marking
– Specifically for Modicon TSX Quantum™ or ControlLogix

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards for input/output, with specific marking and screw connection



Passive termination boards for input/output, with specific marking and Push-in connection

Technical data

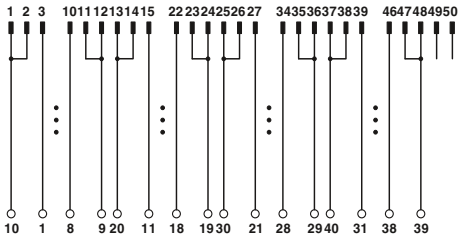
Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Technical data

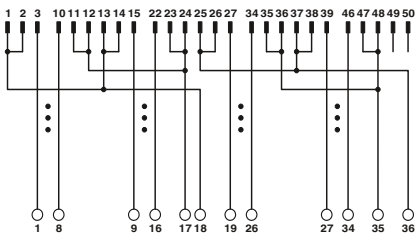
Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, with Modicon® TSX Quantum™-specific marking from 1 to 40					
- with screw connection	50	106.1 mm	VIP-2/SC/FLK50/MODI-TSX/Q	2322304	1
- with Push-in connection	50	107.9 mm	VIP-2/PT/FLK50/MODI-TSX/Q	2904285	1
VARIOFACE termination board, with ControlLogix-specific marking from 1 to 36					
- with screw connection	50	95.9 mm	VIP-2/SC/FLK50/AB-1756	2322317	1
- with Push-in connection	50	97.7 mm	VIP-2/PT/FLK50/AB-1756	2904286	1



Connection scheme VIP-2/.../FLK50/MODI-TSX/Q



Connection scheme VIP-2/.../FLK50/AB-1756

VIP termination boards for Allen Bradley ControlLogix

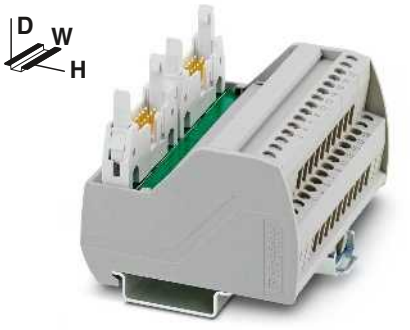
These VIP - VARIOFACE Professional modules are used in combination with two 14-pos. system cables and the relevant front adapters for Allen Bradley.

Features:

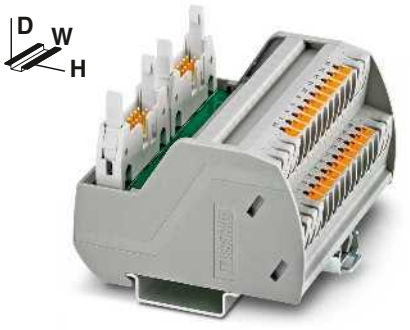
– Numerical marking (1-20)
– Specifically for ControlLogix

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards for Allen Bradley ControlLogix with screw connection



Passive termination boards for Allen Bradley ControlLogix with Push-in connection

Technical data

Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Ordering data

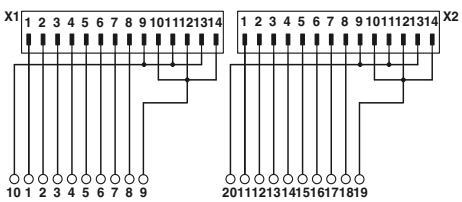
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, with ControlLogix-specific marking from 1 to 20					
- with screw connection	14	80.6 mm	**VIP-2/SC/2FLK14/AB-1756**	2322333	1
- with Push-in connection	14	82.5 mm	**VIP-2/PT/2FLK14/AB-1756**	2904288	1

Technical data

Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/2FLK14/AB-1756	2904288	1



Connection scheme VIP-2/.../2FLK14/AB-1756

Allen Bradley SLC 500 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

– The FLKM 14-PA-SLC500... adapters connect max. 2 x 8 channels via two 14-pos. system cables. Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.
– With the FLKM50-PA-SLC500 OUT/2A front adapters, the FLKM 50/16/SLC500 termination board, and 50-position system cables, the VARIOFACE system cabling can also be coupled to the OA16 and OW16 power output cards.

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

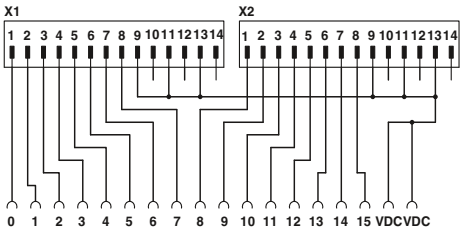
Front adapter for SLC 500 1746, 2 x 8 channels can be connected

Technical data

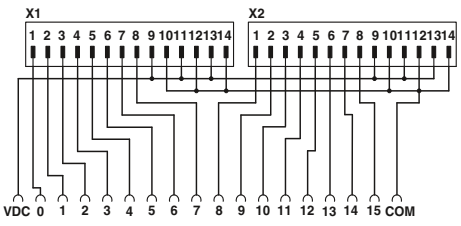
	FLKM 14-PA...	FLKM 50-PA...
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current	1 A (per path)	2 A (per path)
Maximum permissible total current	2 A (per Byte, for supply via connector)	7 A (per Byte, for supply via connector)
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C	-20 °C ... 70 °C
Mounting position	any	any
Standards/regulations	IEC 60664 / DIN EN 50178	IEC 60664 / DIN EN 50178

Ordering data

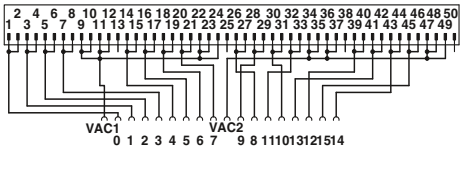
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, 2 x 8 channels can be connected for Allen Bradley SLC 500 for:				
- 1746 OB16, OV16, OG16 and IG16	14	**FLKM 14-PA-SLC500/OUT**	2293459	1
- 1746 IA16, IB16, ITB16 and IN16	14	**FLKM 14-PA-SLC500/IN**	2293462	1
- 1746 IV16 and IVT16	14	**FLKM 14-PA-SLC500/IN/M**	2293475	1
VARIOFACE front adapter, 1 x 16 channels can be connected for Allen Bradley SLC 500 1746 OA16 and OW16	50	**FLKM 50-PA-SLC500/OUT/2A**	2293446	1



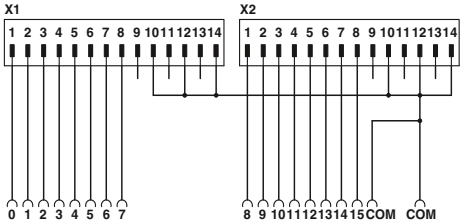
Connection scheme FLKM 14-PA-SLC500/IN/M



Connection scheme FLKM 14-PA-SLC500/OUT



Connection scheme FLKM 50-PA-SLC500/OUT/2A



Connection scheme FLKM 14-PA-SLC500/IN

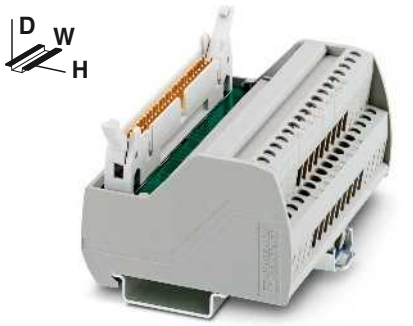
Explanation:
- IDC/FLK strip
- Connection to I/O card
- Screw terminal blocks for separate supply

VIP termination board for Allen Bradley SLC 500, 2 A output cards

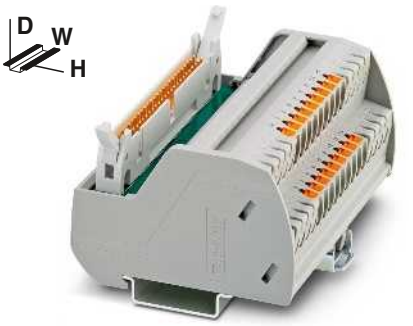
The VIP-2/.../FLK50/16/SLC500 VARIOFACE Professional (VIP) module has been designed specifically for OA16 and OW16 output modules. Together with the FLKM 50-PA-SLC500/OUT/2A front adapter, currents up to 2 A per channel are transferred with the system cabling.

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



VARIOFACE termination board for 16 channels with screw connection



VARIOFACE termination board for 16 channels with Push-in connection

Technical data

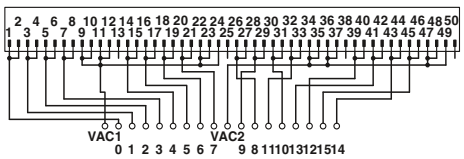
Maximum permissible operating voltage		50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		2 A (per channel)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Technical data

Maximum permissible operating voltage		50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		2 A (per channel)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for transfer of max. 16 channels, only in connection with FLKM 50-PA-SLC500 OUT/2A					
- with screw connection	50	90.8 mm	**VIP-2/SC/FLK50/16/SLC500**	2322320	1
- with Push-in connection	50	92.7 mm	**VIP-2/PT/FLK50/16/SLC500**	2904287	1



Connection scheme VIP-2/.../FLK50/16/SLC500

Allen Bradley SLC 500
System cable for 32 channels

The 32-channel I/O cards of the SLC 500 are connected using 40-pos. connectors (already integrated into the I/O modules). Passive termination boards (-3/SC/FLK40, etc.) are connected to the I/O cards using the **FLK 40/EZ-DR/.../SLC** system cables.

32 channels are split into 4x8 channels using the **FLK 40/4X14/EZ-DR/...** system cables.

The following 8-channel system cabling modules can be coupled:

– OB32 and IB32
  passive and active modules plus
  V8 adapter
– OV32 and IV32
  passive modules without status indicator

Web code for the online configurator

Your web code: #0007

Notes:

Standard modules from page 526

System cable for 32-channel I/O cards of the SLC 500 (OB32, OV32, IB32, IV32)

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current carrying capacity per path	1 A
Ambient temperature (operation)	-20 °C ... 50 °C
Assembly	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated
Outside diameter	10 mm
40-pos.	

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Assembled round cable, with two 40-pos. IDC/FLK socket strips in fixed lengths (50 cm increments) for connection to 32-channel I/O cards of the SLC 500					
	40	0.5 m	**FLK 40/EZ-DR/ 50/SLC**	2294610	1
	40	1 m	**FLK 40/EZ-DR/ 100/SLC**	2294623	1
	40	1.5 m	**FLK 40/EZ-DR/ 150/SLC**	2294636	1
	40	2 m	**FLK 40/EZ-DR/ 200/SLC**	2294649	1
	40	3 m	**FLK 40/EZ-DR/ 300/SLC**	2294652	1
Assembled round cable, for connection to Allen Bradley SLC500, OB32, and IB32, with a 40-pos. IDC/FLK socket strip and four 14-pos. IDC/FLK socket strips, for splitting max. 32 channels into 4 x 8 channels.					
for OB32	40	0.5 m			
	40	1 m			
	40	2 m			
	40	3 m			
for IB32	40	0.5 m			
	40	1 m			
	40	2 m			
	40	3 m			

System cable for splitting max. 32 channels into 4 x 8 channels (OB32, IB32)

Technical data

< 50 V AC / 60 V DC
125 V / -

1 A

-20 °C ... 50 °C
Insulation displacement, IEC 60352-4/DIN EN 60352-4

AWG 26 / 0.14 mm²
7 / Cu tin-plated

7.8 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
FLK 40/4X14/EZ-DR/ 50/OB32	**2296786**	1
FLK 40/4X14/EZ-DR/ 100/OB32	**2298483**	1
FLK 40/4X14/EZ-DR/ 200/OB32	**2298522**	1
FLK 40/4X14/EZ-DR/ 300/OB32	**2298535**	1
FLK 40/4X14/EZ-DR/ 50/IB32	**2296812**	1
FLK 40/4X14/EZ-DR/ 100/IB32	**2296825**	1
FLK 40/4X14/EZ-DR/ 200/IB32	**2296838**	1
FLK 40/4X14/EZ-DR/ 300/IB32	**2296841**	1

Emerson DeltaV
System cable

The DeltaV system can be used to install the process wiring via "mass termination blocks" (MTBs) using IDC/FLK connectors. In addition to the 10, 16, and 20-pos. system cables of system cabling (see page 550), the following system-specific cables are available:

- **FLK 16/14/DV-OUT/...**, for digital assemblies with 16-pos. MTB for connection with PLC-INTERFACE
- **FLK 16/14/DV-IN/...**, for digital modules with 16-pos. MTB for connection to PLC-INTERFACE
- **FLK 20/2FLK14/EZ-DR/...**, for digital assemblies with 40-pos. MTB for connection with PLC-INTERFACE
- **FLK 16/24/DV-AI/EZ-DR/...**, for analog assemblies with 24-pos. MTB
- **FLK 50/2FLK20/EZ-DR/.../DV** system cables are specifically designed for 32-channel I/O modules with 40-pin MTB for the purpose of connecting I/O modules with 32-channel VARIOFACE termination boards

System cable for DeltaV

Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Conductor cross section		AWG 26 / 0.14 mm²
Outside diameter		
	16-pos.	6.8 mm
	20-pos.	7.6 mm
	24-pos.	6.5 mm
	20-pos.	10.3 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
System cable, for 16-pos. "mass termination blocks" with a 16-pos. and a 14-pos. IDC/FLK socket strip for connection with PLC-INTERFACE					
	16	0.3 m	**FLK 16/14/DV-OUT/ 30**	2304348	1
	16	0.5 m	**FLK 16/14/DV-OUT/ 50**	2304351	1
	16	1 m	**FLK 16/14/DV-OUT/100**	2300575	1
	16	2 m	**FLK 16/14/DV-OUT/200**	2300588	1
	16	3 m	**FLK 16/14/DV-OUT/300**	2304364	1
Variable cable length	16		**FLK 16-14-DV-OUT/...**	2304377	1
System cable, for 16-pos. "mass termination blocks" with a 16-pos. and a 14-pos. IDC/FLK socket strip for connection with PLC-INTERFACE					
	16	0.5 m	**FLK 16/14/DV-IN/ 50**	2304393	1
	16	1 m	**FLK 16/14/DV-IN/100**	2300559	1
	16	2 m	**FLK 16/14/DV-IN/200**	2300562	1
	16	3 m	**FLK 16/14/DV-IN/300**	2304403	1
	16	4 m	**FLK 16/14/DV-IN/400**	2305185	1
Variable cable length	16		**FLK 16-14-DV-IN/...**	2304416	1
System cable, for 40-pos. (2 x 20) "mass termination blocks" with a 20-pos. and two 14-pos. IDC/FLK socket strips for connection with PLC-INTERFACE (two cables should be used per 32-channel I/O card)					
	20	1 m	**FLK 20/2FLK14/EZ-DR/100/KONFEK**	2298470	1
	20	2 m	**FLK 20/2FLK14/EZ-DR/200/KONFEK**	2298438	1
	20	3 m	**FLK 20/2FLK14/EZ-DR/300/KONFEK**	2300818	1
Variable cable length	20		**FLK 20/2FLK14/EZ-DR/...**	2304487	1
System cable, for 24-pos. "mass termination blocks" with a 24-pos. and a 16-pos. IDC/FLK socket strip for connection with UM-DELTAV/... modules					
	24	0.3 m	**FLK 16/24/DV-AI/EZ-DR/ 30**	2304319	1
	24	0.5 m	**FLK 16/24/DV-AI/EZ-DR/ 50**	2304296	1
	24	1 m	**FLK 16/24/DV-AI/EZ-DR/100**	2301134	1
	24	2 m	**FLK 16/24/DV-AI/EZ-DR/200**	2301545	1
	24	3 m	**FLK 16/24/DV-AI/EZ-DR/300**	2304322	1
Variable cable length	24		**FLK 16-24-DV-AI-EZ-DR/...**	2304335	1
System cable, for 40-pos. "mass termination blocks" with two 20-pos. and one 50-pos. IDC/FLK socket strip for connection with 32-channel termination boards					
	20	0.5 m	**FLK 50/2FLK20/EZ-DR/ 50/DV**	2304872	1
	20	1 m	**FLK 50/2FLK20/EZ-DR/ 100/DV**	2304898	1
	20	2 m	**FLK 50/2FLK20/EZ-DR/ 200/DV**	2304908	1
	20	3 m	**FLK 50/2FLK20/EZ-DR/ 300/DV**	2304911	1
	20	6 m	**FLK 50/2FLK20/EZ-DR/ 600/DV**	2304937	1
	20	8 m	**FLK 50/2FLK20/EZ-DR/ 800/DV**	2304940	1
	20	10 m	**FLK 50/2FLK20/EZ-DR/1000/DV**	2304953	1
Variable cable length	20		**FLK 50-2FLK20-EZ-DR-DV/...**	2304966	1

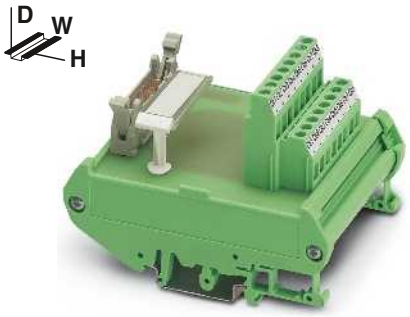
Emerson DeltaV
Termination board for eight channels

These system-specific termination boards for DeltaV modules are used in combination with the relevant system cables. They are connected to 8-channel modules via “mass termination blocks” with IDC/FLK connection.

FLKM 16/DV
– Universal module
– 1:1 connection

FLKM 16/AI/DV
– 1:1 connection
– Separate equipotential terminals per channel

FLKM 16/AO/SI/DV
– 1:1 connection
– 5 x 20, 50 mA T, IEC 60127-2/3 fuse per channel



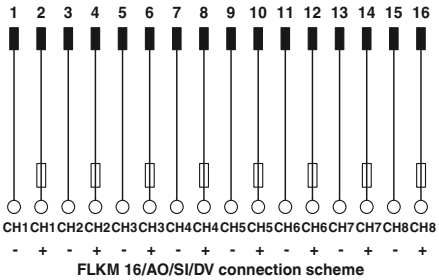
Termination board for 8 channels

Technical data

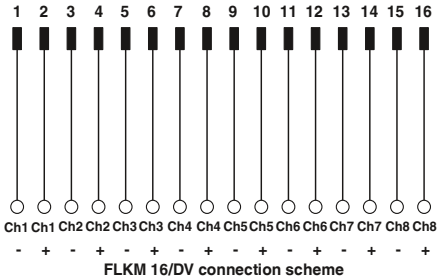
		FLKM 16/.../DV	FLKM 16/.../SI/.../DV
Maximum permissible operating voltage		< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible current (per branch)		1 A (per signal path)	50 mA (In delivered state, with one 50 mA fuse, max. 1 A permitted)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178 , IEC 60664	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	90 mm / 68 mm	

Ordering data

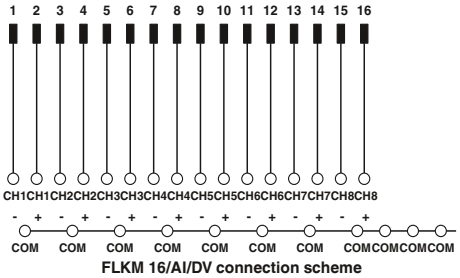
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, with 1:1 connection	16	45 mm	**FLKM 16/DV**	2304432	1
Termination board, with 1:1 connection and separate potential terminal blocks per channel	16	57 mm	**FLKM 16/AI/DV**	2304429	1
Termination board, with fuses per channel	16	90 mm	**FLKM 16/AO/SI/DV**	2304445	1



FLKM 16/AO/SI/DV connection scheme



FLKM 16/DV connection scheme



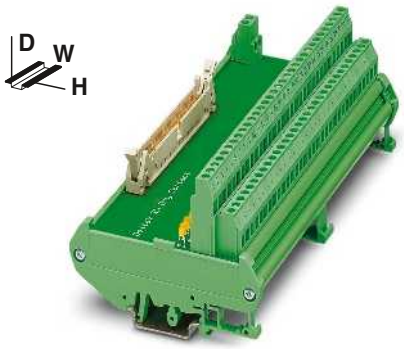
FLKM 16/AI/DV connection scheme

Emerson DeltaV
Termination board for 32 channels

These system-specific termination boards for DeltaV modules are used in combination with FLK 50/2FLK20/EZ-DR/.../DV system cables. They are connected to 32-channel modules via 40-pos. “mass termination blocks” with IDC/FLK connection.

FLKM 50/32M/DV
- Can be used for 32-channel input and output cards
- Two-conductor connection with a separate negative terminal per channel

FLKM 50/32M/IN/LA/DV
- Can be used for 32-channel input modules
- LED status display per channel
- Two-conductor connection with a separate negative terminal per channel (Dry Contact)



Termination board with 2-conductor connection technology for DeltaV

Technical data

		FLKM 50/32M/DV	FLKM 50/32M/IN/LA/DV
Maximum permissible operating voltage		< 50 V AC / 60 V DC	30 V DC
Maximum permissible current (per branch)		1 A	1 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178 , IEC 60664	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	90 mm / 68 mm	

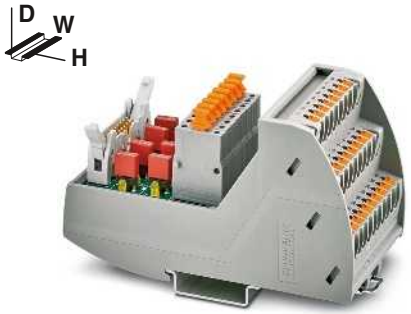
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination boards, for 32-channel I/O modules:					
- Input/Output	50	169 mm	**FLKM 50/32M/DV**	2304869	1
- Input with LED per signal	50	169 mm	**FLKM 50/32M/IN/LA/DV**	2304856	1

Emerson DeltaV
VIP termination board with fuses for 8 channels

System-specific termination board for use in combination with the respective system cables. The termination board is connected to 8-channel modules through 16-position "mass termination blocks" with flat ribbon cable connection.

Features:
- Fuse per channel
- Separate equipotential terminals per channel
- Knife disconnection for each channel
- Push-in connection



Termination board with fuses for 16-pos. mass termination block

Technical data

Maximum permissible operating voltage		24 V DC
Maximum permissible operating voltage UL / CSA		24 V / 24 V
Maximum permissible current (per branch)		63 mA (in as supplied state, with one 63 mA fuse)
Ambient temperature (operation)		-20 °C ... 60 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	109.8 mm / 63 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board for 16-pos. mass termination block					
	16	57.1 mm	**VIP-PT/FLK16/DS/FU/LED/AN/DV**	2903599	1

Emerson DeltaV
Termination boards with fuses for 8 channels

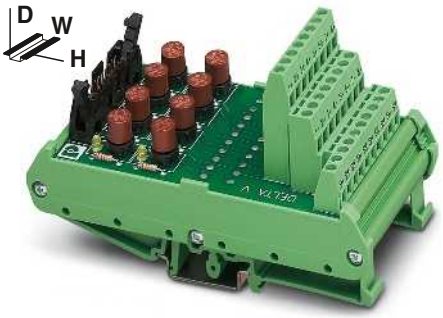
These system-specific termination boards for DeltaV modules are used in combination with the relevant system cables. They are connected to 8-channel modules via 16-pos. or 24-pos. "mass termination blocks" with IDC/FLK connection.

UM-DELTA V/D/SI
– Fuse per channel
– Separate equipotential terminals per channel

UM-DELTA V/D/SI
– Fuse per channel
– Separate equipotential terminals per channel
– Knife disconnection for each channel

UM-DELTA V/D/SI/BFI/TP
– Fuse and LED status indicator per channel
– Separate equipotential terminals per channel

UM-DELTA V/D/SI
– Fuse and LED status indicator per channel
– Separate equipotential terminals per channel
– Knife disconnection for each channel



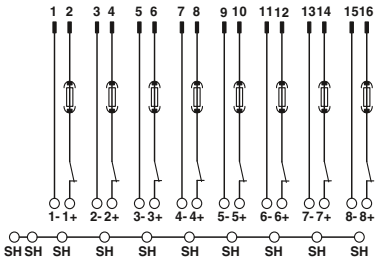
Termination board with fuses for 16-pos. and 24-pos. mass termination blocks

Technical data

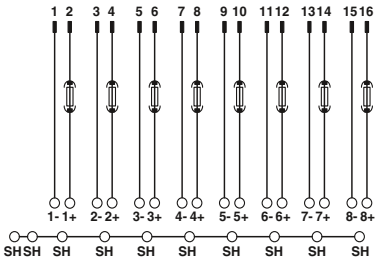
Maximum permissible operating voltage		24 V DC
Maximum permissible operating voltage UL / CSA		24 V / -
Maximum permissible current (per branch)		50 mA (in as-supplied state, with one 50 mAF fuse, max. 1 A permitted)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	126 mm / 71 mm

Ordering data

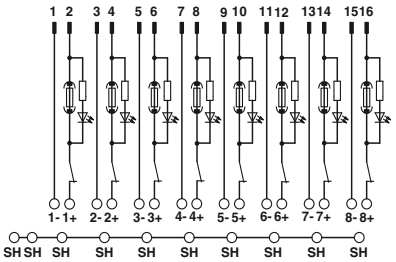
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination boards for 16-pos. and 24-pos. mass termination blocks with:					
- Fuses	16	61 mm	**UM-DELTA V/D/SI**	5603255	1
– Fuses and knife disconnect terminal blocks	16	61 mm	**UM-DELTAV/D/SI/BFI/TP**	5603257	1
– Fuses and fuse failure display	16	61 mm	**UM-DELTAV/A/SI**	5603256	1
- Fuses, fuse failure display, and knife disconnect terminal blocks	16	61 mm	**UM-DELTAV/A/SI/BFI/TP**	5603258	1



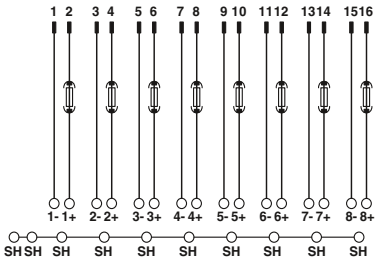
Connection scheme UM-DELTAV/A/SI



Connection scheme UM-DELTAV/D/SI



Connection scheme UM-DELTAV/A/SI/BFI/TP



Connection scheme UM-DELTAV/D/SI/BFI/TP

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

GE Fanuc RX3i
Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

– Transfer of max. 32 channels over one 50-position system cable
– Can be plugged onto I/O modules
– Connection via suitable VARIOFACE termination boards

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

Front adapter for GE Fanuc RX3i

EAC

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	DIN EN 50178 / IEC 60664

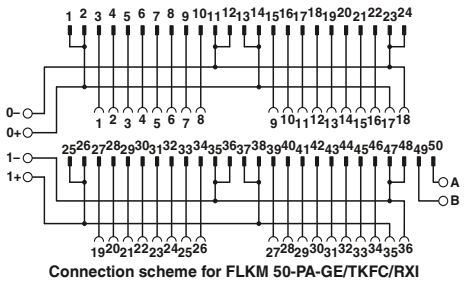
Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for PACSystems RX3i,				
For digital output and analog modules	50	**FLKM 50-PA-GE/TKFC/RXI**	2321473	1
For digital input modules	50	**FLKM 50-PA-GE/TKFC/RXI/IN**	2321486	1

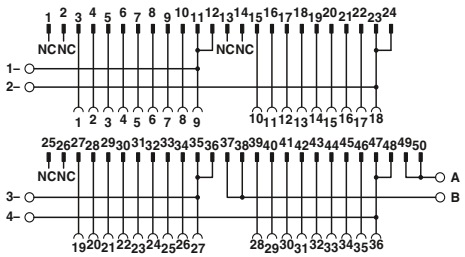
Front adapters for I/O modules of the RX3i series

Card type	FLKM 50-PA/GE/TKFC/RXI
Digital output	IC 694 MDL 754

Card type	FLKM 50-PA/GE/TKFC/RXI/IN
Digital input	IC 694 MDL 660



Connection scheme for FLKM 50-PA-GE/TKFC/RXI



Connection scheme for FLKM 50-PA-GE/TKFC/RXI/IN

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

GE Fanuc, Series 90-30 Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

Up to 2 x 8 channels are connected via two 14-pos. system cables.

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

Front adapter for GE Fanuc Series 90-30

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible current	1 A (per path) 4 A (per connection, supply via separate power supply)
Maximum permissible total current	3 A (per Byte, for supply via connector)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

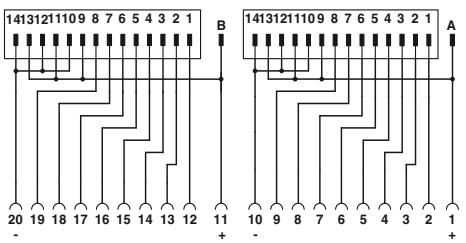
Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for Series 90-30, max. 2 x 8 channels can be connected, digital output	14	**FLKM 14-PA/GE/DO**	2290009	2
VARIOFACE front adapter, for Series 90-30, max. 2 x 8 channels can be connected, digital input	14	**FLKM 14-PA/GE/DI**	2290038	5

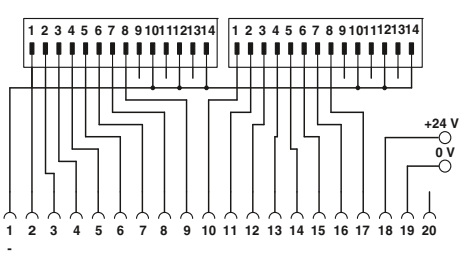
Front adapters for I/O modules of the Series 90-30

Card type	FLKM 14-PA/GE/DO
Digital output	IC 693 MDL 732 IC 693 MDL 733* IC 693 MDL 740 IC 693 MDL 741* IC 693 MDL 742
Analog	IC 693 ALG 220* IC 693 ALG 221* IC 693 ALG 222* IC 693 ALG 223* IC 693 ALG 390* IC 693 ALG 391* IC 693 ALG 392* IC 693 ALG 442*

Card type	FLKM 14-PA/GE/DI
Digital input	IC 693 MDL 241 IC 693 MDL 634 IC 693 MDL 645 IC 693 MDL 646



Connection scheme FLKM 14-PA/GE/DO



Connection scheme FLKM 14-PA/GE/DI

* Only in conjunction with
VIP-2/SC/2FLK14(1-20)/S7, Order No.: 2315230 and
UM 45-2FLK14/ZFKDS/S7, Order No.: 2965156.
All wire bridges (DR) on the adapter must be disconnected.
There must be no voltage supply at the front adapter (flowing via the slip-on connections).

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Honeywell C300, Series C I/O Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

FLKM-PA-D37/HW/DIO/C300
– Front adapter with D-SUB connector
– Connection of a maximum of 16 digital channels
– Specifically for digital I/O cards

FLKM-PA-D37/HW/AN/C300
– Front adapter with D-SUB connector
– Connection of analog modules

FLKM-PA-2D15/HW/.../C300
– Front adapter with two 15-pos. D-SUB connectors
– Connection of a maximum of 2 x 8 digital inputs/outputs per adapter
– Specifically for connecting PLC-V8/D15.../OUT or PLC-V8/D15.../IN

Web code for the online configurator

Your web code: #0007

Front adapters for I/O modules of the C300 and C I/O series

Card type	FLKM-PA-D37/HW/DIO/C300
Digital input	TDIL 11* TDIL 01*
Digital output	TDOB 11* TDOB 01*

Card type	FLKM-PA-D37/HW/AN/C300
Analog input	TAIX 01** TAIX 11**
Analog output	TAOX 01** TAOX 11**

Card type	FLKM-PA-2D15/HW/DO/C300
Digital output	TDOB 01* TDOB 11*

Card type	FLKM-PA-2D15/HW/DI/C300
Digital input	TDIL 01* TDIL 11*

* Two front adapters are required for each module.

** For three-conductor operation (channels 13 - 16) of input modules: only in conjunction with VIP-3/SC/D37SUB/M/HW/C300, Order No.: 2900675.

Explanation:
Connectors
Connection to I/O card
Screw terminal blocks for separate supply

Notes:
Matching system cable fitted with D-SUB socket strip at both ends, see page 593
1) No UL approval

Honeywell C300 front adapter

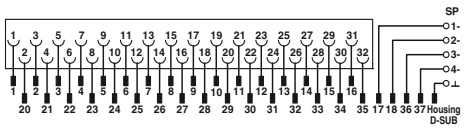
c UL us

Technical data

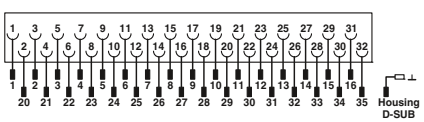
Maximum permissible operating voltage	60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

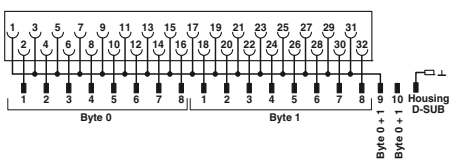
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter for C I/O series, with one D-SUB pin strip				
- For digital I/O modules	37	**FLKM-PA-D37/HW/DIO/C300**	2901423	1
- For analog I/O modules	37	**FLKM-PA-D37/HW/AN/C300**	2900622	1
VARIOFACE front adapter for C I/O series, with two D-SUB pin strips				
- For digital output modules	15	**FLKM-PA-2D15/HW/DO/C300**1)	2900924	1
- For digital input modules	15	**FLKM-PA-2D15/HW/DI/C300**1)	2901879	1



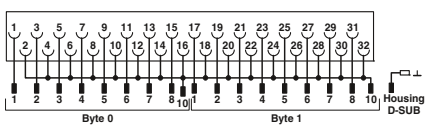
Connection scheme: FLKM-PA-D37/HW/AN/C300



Connection scheme: FLKM-PA-D37/HW/DIO/C300



FLKM-PA-2D15/HW/DI/C300 connection scheme



Connection scheme: FLKM-PA-2D15/HW/DO/C300

Honeywell C300, Series C I/O termination boards

These VIP - VARIOFACE Professional modules are used in combination with 37-pos. D-SUB cables and the relevant front adapters. The three module versions are available with screw or Push-in connection technology.

VIP-2/.../D37SUB/M

– In conjunction with FLKM-PA-D37/HW/C300 or FLKM-PA-D37/HW/AN/C300 front adapter
– Universal module
– Field connection via double-level terminal blocks

VIP-2/.../D37SUB/M/SO

– In conjunction with FLKM-PA-D37/HW/C300 front adapter
– System-specific marking
– Field connection via double-level terminal blocks

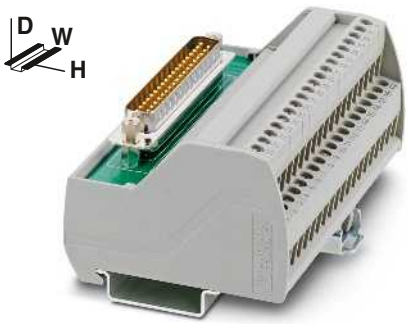
VIP-3/.../D37SUB/M/HW/C300

– In conjunction with FLKM-PA-D37/HW/AN/C300 front adapter
– System-specific marking
– For TAIX01, TAIX11 analog input modules
– Field connection via three-level terminal blocks

Web code for the online configurator

Your web code: #0007

Notes:
For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.
[1]) No UL approval



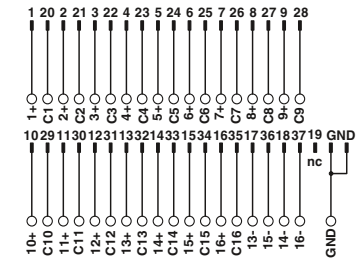
37-pos. with screw or Push-in connection

Technical data

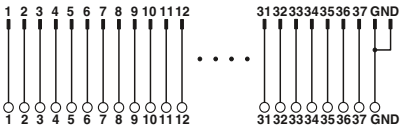
		VIP-2/...	VIP-3/...C300
Maximum permissible operating voltage		25 V AC / 60 V DC	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 105 V	125 V / 105 V
Maximum permissible current (per branch)		2 A	2 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178	
Connection method	Controller level	D-SUB pin strip	D-SUB pin strip
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Push-in connection solid/stranded/AWG		0.14 ... 4 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	72.1 mm / 46.6 mm	75.8 mm / 63 mm

Ordering data

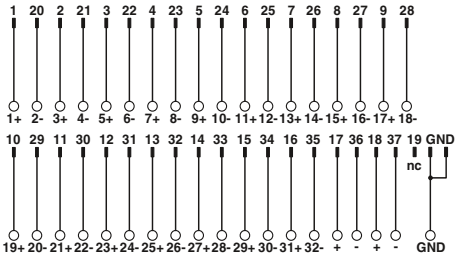
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, with D-SUB pin strip and universal marking,					
- with screw connection	37	101 mm	**VIP-2/SC/D37SUB/M**	2900676	1
- with Push-in connection	37	102.8 mm	**VIP-2/PT/D37SUB/M**	2904277	1
VARIOFACE termination board, with D-SUB pin strip and system-specific marking,					
- with screw connection	37	101 mm	**VIP-2/SC/D37SUB/M/SO[1])**	2900786	1
- with Push-in connection	37	102.8 mm	**VIP-2/PT/D37SUB/M/SO[1])**	2904278	1
VARIOFACE termination board, with D-SUB pin strip for analog input modules,					
- with screw connection	37	88 mm	**VIP-3/SC/D37SUB/M/HW/C300**	2900675	1
- with Push-in connection	37	87.6 mm	**VIP-3/PT/D37SUB/M/HW/C300**	2904276	1



Connection scheme VIP-3/SC/D37SUB/M/HW/C300



Connection scheme VIP-2/SC/D37SUB/M



Connection scheme VIP-2/SC/D37SUB/M/SO

Mitsubishi Electric
MELSEC A, A1S and Q
System cables

For 32/64-channel I/O cards with 37-pos. D-SUB connectors. System cables are available for connecting 1 x 32 channels or 4 x 8 channels.

Web code for the online configurator

Your web code: #0007

**System cable,
D-SUB socket strip to IDC/FLK socket strip,
number of positions: 37 to 50**

**Splitting cable,
D-SUB socket strip to IDC/FLK socket strip,
number of positions: 37 to 4 x 14**

Technical data		Technical data	
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC	
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -	
Maximum permissible current carrying capacity per path	1 A	1 A	
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m	
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C	
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²	
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated	
Outside diameter			
37-pos.	10.5 mm	6.3 mm	

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Round cable for output module MELSEC Q Y81 P, MELSEC A1S Y81, and MELSEC A AY82EP, in standard lengths								
	37	0.5 m	FLK 50/EZ-DR/D37SUB/ 50/Y81P-O	2302599	1	CABLE-D37-M2,5/4X14/ 50/Y81P-O	2302476	1
	37	1 m	FLK 50/EZ-DR/D37SUB/100/Y81P-O	2302609	1	CABLE-D37-M2,5/4X14/100/Y81P-O	2302489	1
	37	2 m	FLK 50/EZ-DR/D37SUB/200/Y81P-O	2302612	1	CABLE-D37-M2,5/4X14/200/Y81P-O	2302492	1
	37	3 m	FLK 50/EZ-DR/D37SUB/300/Y81P-O	2302638	1	CABLE-D37-M2,5/4X14/300/Y81P-O	2302502	1
Round cable, as above, but in variable lengths								
	37		FLK 50-EZ-DR-D37SUB-Y81P-O/...	2302625	1	CABLE-D37-M2,5-4X14-Y81P-O/...	2302696	1
Round cable for input module MELSEC Q X81, MELSEC A1S X81, and MELSEC A AX82, in standard lengths								
	37	0.5 m	FLK 50/EZ-DR/D37SUB/ 50/X81-I	2302641	1	CABLE-D37-M2,5/4X14/ 50/X81-I	2302515	1
	37	1 m	FLK 50/EZ-DR/D37SUB/100/X81-I	2302654	1	CABLE-D37-M2,5/4X14/100/X81-I	2302528	1
	37	2 m	FLK 50/EZ-DR/D37SUB/200/X81-I	2302667	1	CABLE-D37-M2,5/4X14/200/X81-I	2302531	1
	37	3 m	FLK 50/EZ-DR/D37SUB/300/X81-I	2302670	1	CABLE-D37-M2,5/4X14/300/X81-I	2302544	1
Round cable, as above, but in variable lengths								
	37		FLK 50-EZ-DR-D37SUB-X81-I/...	2302683	1	CABLE-D37-M2,5-4X14-X81-I/...	2302706	1

Ordering example for system cable:
– Cable for MELSEC Q Y81P, 12.75 m long

Quantity	Order No.	Length [m][1])
1	2302625	/ 12.75

[1]) min. 0.20 m

Ordering example for splitting cable:
– Cable for MELSEC Q Y81P, 11.00 m long

Quantity	Order No.	Length [m][1])
1	2302696	/ 11.00

[1]) min. 0.20 m

Mitsubishi Electric
MELSEC L/Q and Honeywell ML 200
System cables

These system cables are plugged onto the I/O cards that are connected using Fujitsu connectors.

CABLE-FCN40/1X50/...
– Signal transmission of 32 channels

CABLE-FCN40/4X14/...
– Splitting up 32 channels into 4 x 8 channels

Web code for the online configurator

Your web code: #0007

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 50

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 4 x 14

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Round cable in variable lengths for **Mitsubishi MELSEC L** LX41C4, LX42C4 (common positive connection to B01, B02) LY41NT1P, LY42NT1P, LY41PT1P, LY42PT1P **Mitsubishi MELSEC Q** QX41, QX41-S1, QX42, QX42-S1 QX71 and QX72 (common positive connection to B01, B02) QY41P, QY42P, QY71, QH42P **Honeywell ML 200** 2MLQ-TR4A, 2MLQ-TR8A, 2MLQ-TR4B, 2MLQ-TR8B								
	40	0.5 m	**CABLE-FCN40/1X50/ 0,5M/IM/MEL**	2903468	1			
	40	1 m	**CABLE-FCN40/1X50/ 1,0M/IM/MEL**	2903469	1			
	40	2 m	**CABLE-FCN40/1X50/ 2,0M/IM/MEL**	2903470	1			
	40	3 m	**CABLE-FCN40/1X50/ 3,0M/IM/MEL**	2903471	1			
	40	4 m	**CABLE-FCN40/1X50/ 4,0M/IM/MEL**	2903472	1			
	40	6 m	**CABLE-FCN40/1X50/ 6,0M/IM/MEL**	2903473	1			
	40	8 m	**CABLE-FCN40/1X50/ 8,0M/IM/MEL**	2903474	1			
	40	10 m	**CABLE-FCN40/1X50/10,0M/IM/MEL**	2903475	1			
Round cable in variable lengths for **Mitsubishi MELSEC L** LX41C4 and LX42C4 (common negative connection to B01, B02) **Mitsubishi MELSEC Q** QX71 and QX72 (common negative connection to B01, B02) QX82, QX82-S1 **Honeywell ML 200** 2MLI-D24A, 2MLI-D28B, 2MLF-SOEA (common negative connection to B01, B02)								
	40	0.5 m	**CABLE-FCN40/1X50/ 0,5M/IP/MEL**	2903476	1			
	40	1 m	**CABLE-FCN40/1X50/ 1,0M/IP/MEL**	2903477	1			
	40	2 m	**CABLE-FCN40/1X50/ 2,0M/IP/MEL**	2903478	1			
	40	3 m	**CABLE-FCN40/1X50/ 3,0M/IP/MEL**	2903479	1			
	40	4 m	**CABLE-FCN40/1X50/ 4,0M/IP/MEL**	2903480	1			
	40	6 m	**CABLE-FCN40/1X50/ 6,0M/IP/MEL**	2903481	1			
	40	8 m	**CABLE-FCN40/1X50/ 8,0M/IP/MEL**	2903482	1			
	40	10 m	**CABLE-FCN40/1X50/10,0M/IP/MEL**	2903483	1			
Round cable in variable lengths for **Mitsubishi MELSEC L** LX41C4 and LX42C4 (common positive connection to B01, B02) LY41NT1P, LY42NT1P, LY41PT1P, LY42PT1P **Mitsubishi MELSEC Q** QX41, QX41-S1, QX42, QX42-S1 QY41P (24 V), QY42P (24 V), QH42P (24 V) **Honeywell ML 200** 2MLQ-TR4A, 2MLQ-TR8A, 2MLQ-TR4B, 2MLQ-TR8B								
	40	0.5 m				**CABLE-FCN40/4X14/ 0,5M/IM/MEL**	2903502	1
	40	1 m				**CABLE-FCN40/4X14/ 1,0M/IM/MEL**	2903503	1
	40	2 m				**CABLE-FCN40/4X14/ 2,0M/IM/MEL**	2903504	1
	40	3 m				**CABLE-FCN40/4X14/ 3,0M/IM/MEL**	2903505	1
	40	4 m				**CABLE-FCN40/4X14/ 4,0M/IM/MEL**	2903506	1
	40	6 m				**CABLE-FCN40/4X14/ 6,0M/IM/MEL**	2903507	1
	40	8 m				**CABLE-FCN40/4X14/ 8,0M/IM/MEL**	2903508	1
	40	10 m				**CABLE-FCN40/4X14/10,0M/IM/MEL**	2903509	1

OMRON CJ1, CS1, CQM1 and C200H System cables

These system cables are plugged onto the I/O cards that are connected using Fujitsu connectors.

FLK 50/EZ-DR/...
– Signal transmission of 32 channels

CABLE-FCN40...
– Splitting up 32 channels into 4 x 8 channels

CABLE-FCN24...
– Splitting up 16 channels into 2 x 8 channels

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 50

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 4 x 14 or 24 to 2 x 14

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Round cable in variable lengths for CJ1: OD231, OD261 CS1, C200H: OD218, OD219 CQM1: OD213								
	40	1 m	FLK 50/EZ-DR/FCN40/100/OMR-OUT	2304144	1	CABLE-FCN40/4X14/100/OMR-OUT	2304186	1
	40	2 m	FLK 50/EZ-DR/FCN40/200/OMR-OUT	2304157	1	CABLE-FCN40/4X14/200/OMR-OUT	2304199	1
Round cable, as above, but in variable lengths	40		FLK 50-EZ-DR-FCN40-OMR-OUT/...	2302829	1	CABLE-FCN40-4X14-OMR-OUT/...	2302832	1
Round cable in variable lengths for CJ1: ID231, ID261 CS1 and C200H: ID111, ID216, ID217, CQM1: ID213; ID214;ID112								
	40	1 m	FLK 50/EZ-DR/FCN40/100/OMR-IN	2304160	1	CABLE-FCN40/4X14/100/OMR-IN	2304209	1
	40	2 m	FLK 50/EZ-DR/FCN40/200/OMR-IN	2304173	1	CABLE-FCN40/4X14/200/OMR-IN	2304212	1
Round cable, as above, but in variable lengths	40		FLK 50-EZ-DR-FCN40-OMR-IN/...	2302803	1	CABLE-FCN40-4X14-OMR-IN/...	2302816	1
Round cable in variable lengths for CS1, C200H: OD215, MD115 (only output), MD215 (only output)								
	24	1 m				CABLE-FCN24/2X14/100/OMR-OUT	2304225	1
	24	2 m				CABLE-FCN24/2X14/200/OMR-OUT	2304238	1
Round cable, as above, but in variable lengths	24					CABLE-FCN24-2X14-OMR-OUT/...	2302858	1
Round cable in variable lengths for CS1, C200H: ID215, MD115 (only input), MD215 (only input)								
	24	1 m				CABLE-FCN24/2X14/100/OMR-IN	2304241	1
	24	2 m				CABLE-FCN24/2X14/200/OMR-IN	2304254	1
Round cable, as above, but in variable lengths	24					CABLE-FCN24-2X14-OMR-IN/...	2302845	1

Ordering example for system cable:
– Cable for OMRON CJ1, ID231, 12.75 m long

Quantity	Order No.	Length [m][1])
1	2302803	/ 12.75

[1]) min. 0.20 m

Phoenix Contact Axioline real-time I/O System cables

These cables have been specifically developed for connecting VARIOFACE termination boards to the Axioline real-time I/O system. The Push-in technology on the I/O system ensures rapid connection.

The cables have the following features:

– 1:1 connection
– 14-pos. connector, encapsulated
– 8 pre-assembled open ends, for connection to the Axioline real-time I/O system
– Transmission of groups of 8 channels

Tailor-made VARIOFACE termination boards round off this system concept.

Notes:

The following modules cannot be coupled due to the larger outer contour of the encapsulated connectors:
UM 45-FLK14/ 8IM/ZFKDS/PLC, 2965211
UM 45- 8RM/MR-G24/1/PLC, 2962900

System cable for 8 channels

Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		
	8-pos.	6.4 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Round cable with an open end (8 individual wires)					
	8	0.5 m	**VIP-CAB-FLK14/AXIO/0,14/0,5M**	2901604	1
	8	1 m	**VIP-CAB-FLK14/AXIO/0,14/1,0M**	2901605	1
	8	1.5 m	**VIP-CAB-FLK14/AXIO/0,14/1,5M**	2901606	1
	8	2 m	**VIP-CAB-FLK14/AXIO/0,14/2,0M**	2901607	1
	8	2.5 m	**VIP-CAB-FLK14/AXIO/0,14/2,5M**	2901608	1
	8	3 m	**VIP-CAB-FLK14/AXIO/0,14/3,0M**	2901609	1
	8	4 m	**VIP-CAB-FLK14/AXIO/0,14/4,0M**	2901610	1
	8	6 m	**VIP-CAB-FLK14/AXIO/0,14/6,0M**	2901611	1

Phoenix Contact Inline Front adapters

The front adapters are used to connect pre-assembled system cables directly to Inline. Front adapters are simply plugged into the relevant Inline modules. Three connection options are available:

– Transfer of 8 channels via a 14-pos. system cable
– Transmission of 2 x 8 channels over two 14-position system cables
– Transmission of 4 x 8 channels over four 14-position system cables

Tailor-made VARIOFACE termination boards round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

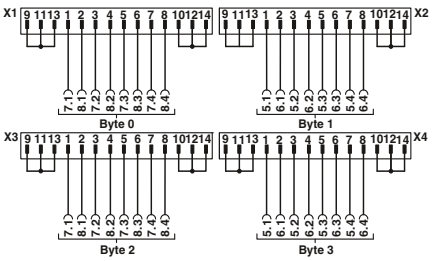
Front adapters for Inline

Technical data

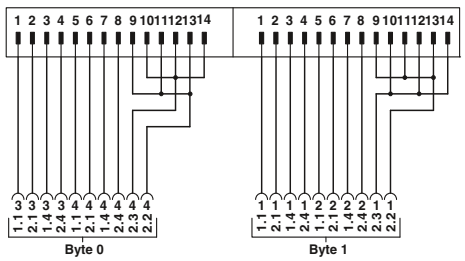
Maximum permissible operating voltage	60 V DC
Maximum permissible current	1 A (per path)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

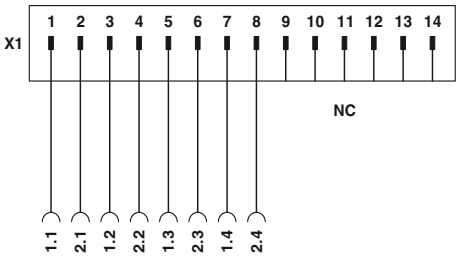
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for 8-channel Inline modules				
Input: IB IL 24 D I8/HD-PAC Output: IB IL 24 DO 8/HD-PAC	14	**FLKM 14-PA-INLINE/DIO8**	2900889	1
VARIOFACE front adapter, for 16-channel Inline modules				
Input: IB IL 24 DI 16-PAC	14	**FLKM 14-PA-INLINE/IN16**	2302751	1
Output: IB IL 24 DO 16-PAC	14	**FLKM 14-PA-INLINE/OUT16**	2302764	1
VARIOFACE front adapter, for 32-channel Inline modules				
Input: IB IL 24 DI 32/HD-PAC and IB IL 24 DI 32/HD-NPN-PAC Output: IB IL 24 DO 32/HD-PAC	14	**FLKM 14-PA-INLINE/32**	2302777	1



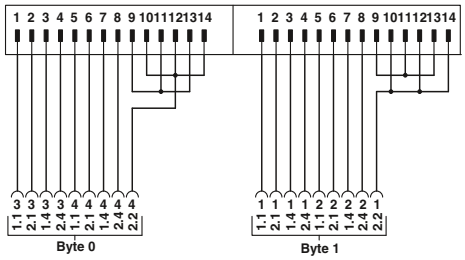
Connection scheme: FLKM 14-PA-INLINE/32



Connection scheme: FLKM 14-PA-INLINE/IN16



Connection scheme for FLKM 14-PA-INLINE/DIO8



Connection scheme: FLKM 14-PA-INLINE/OUT16

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Schneider Electric Modicon TSX Quantum™ Front adapters

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules. Two connection options are available:

– Transfer of max. 32 channels over one 50-position system cable
– Transmission of 4 x 8 channels over four 14-position system cables

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Controller-specific modules from page 474
Standard modules from page 526
For system cables, see page 550

Front adapter for Modicon® TSX Quantum™

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 4 A (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for Modicon® TSX Quantum™, 1 x 32 channels can be connected	50	**FLKM 50-PA-MODI-TSX/Q**	2294306	1
VARIOFACE front adapter, for Modicon® TSX Quantum™, 4 x 8 channels can be connected	14	**FLKM 50/ 4-FLK14/PA-MODI-TSX/Q**	2294416	1

Front adapters for I/O modules of the Modicon TSX Quantum™ automation devices

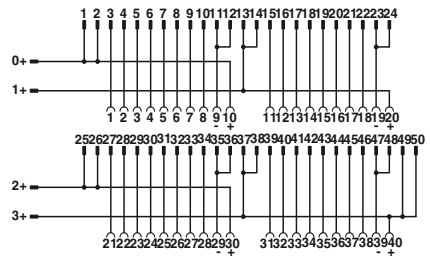
Card type	FLKM 50-PA-MODI-TSX/Q
Digital input	DDI 353 DDI 841* DDI 853 DAI 340* DAI 353** DAI 440* DAI 453**
Digital output	DDO 353
Digital input/output	DDM 390*
Analog input	ACI 030* ACI 040* ATI 030* ARI 030* AVI 030*
Analog output	ACO 020* ACO 130* AVO 020*
Analog input/output	AMM 090*
Counter	ECH 105* EHC 202*

* Only in conjunction with VIP-2/SC/FLK50/MODI-TSX/Q, Order No. 2322304.
** Only in conjunction with passive termination boards without LED.

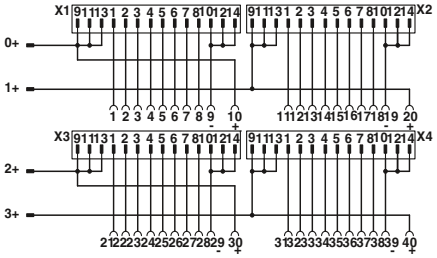
Card type	FLKM 50/4-FLK14/PA-MODI-TSX/Q
Digital input	DDI 353 DDI 853 DAI 353** DAI 453**
Digital output	DDO 353

** Only in conjunction with passive termination boards without LED.

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply



Connection scheme FLKM 50-PA-MODI-TSX/Q



Connection scheme FLKM 50/ 4-FLK14/PA-MODI-TSX/Q

Schneider Electric Modicon M340 Front adapter

Pre-assembled system cables are connected directly to the 16-channel I/O modules using the front adapter. The adapters connect 2 x 8 channels of the controller via two 14-pos. system cables. Tailor-made VARIOFACE termination boards with a variety of functions and connection options are available for connection to field level. They round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

Schneider Electric Modicon M340 front adapter

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	50 V / 50 V
Maximum permissible current	1 A (per path)
Maximum permissible total current	3 A (per system cable when supplying from the module side) 10 A (When supplying via the front adapter)
Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-20 °C ... 60 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

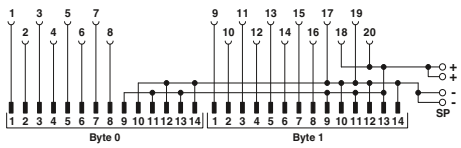
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for Modicon® M340 with two FLK pin strips	14	**FLKM 14-PA-MODI/M340**	2903208	1

Front adapters for I/O modules of the Modicon C340 series

Card type	FLKM 14-PA-MODI/M340
Digital input	BMX DDI1602 BMX DDI1603 BMX DAI1602 BMX DAI1603
Digital output	BMX DDO1602 BMX DDO1612

Assignment table

Contacts, front adapter/ controller	Connector (Byte 0)	Connector (Byte 1)
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9		1
10		2
11		3
12		4
13		5
14		6
15		7
16		8
17	10, 12, 14 (-)	10, 12, 14 (-)
18	9, 11, 13 (+)	9, 11, 13 (+)
19	10, 12, 14 (-)	10, 12, 14 (-)
20	9, 11, 13 (+)	9, 11, 13 (+)



Connection scheme FLKM 14-PA-MODI/M340

Schneider Electric Modicon M340
System cable

These system cables are plugged onto the I/O cards that are connected using Fujitsu connectors.

CABLE-FCN40/1X50/...
– Signal transmission of 32 channels

CABLE-FCN40/4X14/...
– Splitting up 32 channels into 4 x 8 channels

Web code for the online configurator

Your web code: #0007

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 50

Fujitsu FCN connector to IDC/FLK socket strip, number of positions: 40 to 4 x 14

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated

			Ordering data			Ordering data		
Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Round cable in variable lengths for BMX DDI 3202K, BMX DDI 6402K, BMX DD0 3202K, BMX DD0 6402K, BMX DDM 3202K								
	40	0.5 m	CABLE-FCN40/1X50/ 0,5M/M340	2321635	1	CABLE-FCN40/4X14/ 0,5M/M340	2321716	1
	40	1 m	CABLE-FCN40/1X50/ 1,0M/M340	2321648	1	CABLE-FCN40/4X14/ 1,0M/M340	2321729	1
	40	2 m	CABLE-FCN40/1X50/ 2,0M/M340	2321651	1	CABLE-FCN40/4X14/ 2,0M/M340	2321732	1
	40	3 m	CABLE-FCN40/1X50/ 3,0M/M340	2321664	1	CABLE-FCN40/4X14/ 3,0M/M340	2321745	1
	40	4 m	CABLE-FCN40/1X50/ 4,0M/M340	2321677	1	CABLE-FCN40/4X14/ 4,0M/M340	2321758	1
	40	6 m	CABLE-FCN40/1X50/ 6,0M/M340	2321680	1	CABLE-FCN40/4X14/ 6,0M/M340	2321761	1
	40	8 m	CABLE-FCN40/1X50/ 8,0M/M340	2321693	1	CABLE-FCN40/4X14/ 8,0M/M340	2321774	1
	40	10 m	CABLE-FCN40/1X50/10,0M/M340	2321703	1	CABLE-FCN40/4X14/10,0M/M340	2321787	1
	40	15 m	CABLE-FCN40/1X50/15,0M/M340	2903748	1	CABLE-FCN40/4X14/15,0M/M340	2903749	1

VIP – power cabling
Universal front adapters for Siemens SIMATIC® S7-300

Two versions are available:

– Connection of 40-pos. modules via four cables, each with a 10-pos. COMBI connector
– Connection of 20-pos. modules via two cables, each with a 10-pos. COMBI connector

The front adapters have the following features:

– Can be screwed on/snapped in with the I/O module
– Suitable for all common S7-300 modules, up to max. 250 V AC/DC, 6 A
– Universal 1:1 connection
– Numerically marked connectors

Combination example:

A front adapter with attached 10-pos. COMBI connectors is combined with the following terminal blocks for field connection:

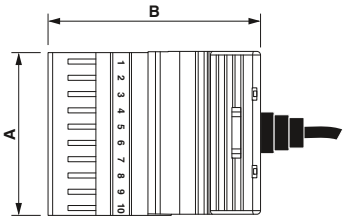
Overall width of 52 mm per connector:

– 3045017 UT 2,5/1P
– 3210033 PT 2,5/1P
– 3040012 ST 2,5/1P
– 3040766 ST 2,5-TWIN-MT/1P

Reduced overall width of 35 mm per connector:

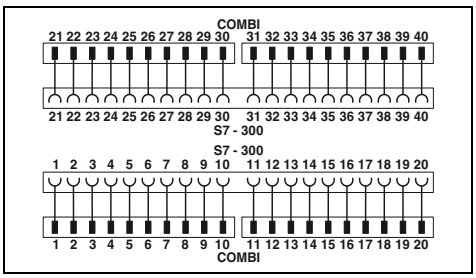
– 3208582 PT 1,5/S/1P
– 3212439 PTTB 1,5/S/2P

You can find further versions, accessories, and combination options in Catalog 1 “Terminal blocks” in the “Plug-in COMBI connection solutions” section or online at phoenixcontact.net/products.



	A	B
...4X10COMBI...	52	70
...2X10COMBI...		
...4X10 PT...	35	62
...2X10 PT...		

Front adapter with punched-on connectors for 40 plug-in terminal blocks



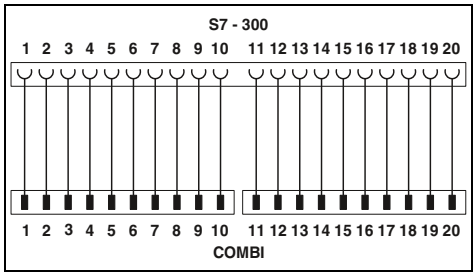
Technical data

Maximum permissible operating voltage		≤ 250 V AC/DC
Maximum permissible operating voltage UL / CSA		250 V / 250 V
Maximum permissible current		6 A (per single wire at 40°C) 4 A (per single wire at 60°C)
Maximum permissible total current		20 A (per cable at 40 °C) 16 A (per cable at 60°C)
Maximum conductor resistance		39 Ω/km
Conductor cross section		AWG 21 / 0.5 mm²
Conductor structure: stranded wires / material		16 / Cu uninsulated
Outside diameter		9 mm
Ambient temperature range		-20 °C ... 60 °C
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Controller level	Plug connection
	Field level	COMBICON connectors

Ordering data

Description	Cable length	Type	Order No.	Pcs./ Pkt.
VIP - power cabling front adapter, for universal connection of the SIMATIC® S7-300, with an overall width of 52 mm per connector				
	0.5 m	VIP-PA-PWR/4X10COMBI/ 0,5M/S7	2904702	1
	1 m	VIP-PA-PWR/4X10COMBI/ 1,0M/S7	2904703	1
	1.5 m	VIP-PA-PWR/4X10COMBI/ 1,5M/S7	2904704	1
	2 m	VIP-PA-PWR/4X10COMBI/ 2,0M/S7	2904705	1
	2.5 m	VIP-PA-PWR/4X10COMBI/ 2,5M/S7	2904706	1
	3 m	VIP-PA-PWR/4X10COMBI/ 3,0M/S7	2904707	1
	4 m	VIP-PA-PWR/4X10COMBI/ 4,0M/S7	2904708	1
	5 m	VIP-PA-PWR/4X10COMBI/ 5,0M/S7	2904709	1
	6 m	VIP-PA-PWR/4X10COMBI/ 6,0M/S7	2904710	1
	8 m	VIP-PA-PWR/4X10COMBI/ 8,0M/S7	2904711	1
	10 m	VIP-PA-PWR/4X10COMBI/10,0M/S7	2904712	1
VIP - power cabling front adapter, for universal connection of the SIMATIC® S7-300, with reduced overall width of 35 mm per connector				
	0.5 m	VIP-PA-PWR/4X10 PT/ 0,5M/S7	2905516	1
	1 m	VIP-PA-PWR/4X10 PT/ 1,0M/S7	2905517	1
	1.5 m	VIP-PA-PWR/4X10 PT/ 1,5M/S7	2905518	1
	2 m	VIP-PA-PWR/4X10 PT/ 2,0M/S7	2905519	1
	2.5 m	VIP-PA-PWR/4X10 PT/ 2,5M/S7	2905520	1
	3 m	VIP-PA-PWR/4X10 PT/ 3,0M/S7	2905521	1
	4 m	VIP-PA-PWR/4X10 PT/ 4,0M/S7	2905522	1
	5 m	VIP-PA-PWR/4X10 PT/ 5,0M/S7	2905523	1
	6 m	VIP-PA-PWR/4X10 PT/ 6,0M/S7	2905524	1
	8 m	VIP-PA-PWR/4X10 PT/ 8,0M/S7	2905525	1
	10 m	VIP-PA-PWR/4X10 PT/10,0M/S7	2905526	1

Front adapter with punched-on connectors for 20 plug-in terminal blocks



Technical data

≤ 250 V AC/DC
250 V / 250 V

6 A (per single wire at 40°C)
4 A (per single wire at 60°C)
20 A (per cable at 40 °C)
16 A (per cable at 60°C)
39 Ω/km
AWG 21 / 0.5 mm²
16 / Cu uninsulated
9 mm
-20 °C ... 60 °C
DIN EN 50178 , IEC 60664
Plug connection
COMBICON connectors

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-PWR/2X10COMBI/ 0,5M/S7	**2904713**	1
VIP-PA-PWR/2X10COMBI/ 1,0M/S7	**2904714**	1
VIP-PA-PWR/2X10COMBI/ 1,5M/S7	**2904715**	1
VIP-PA-PWR/2X10COMBI/ 2,0M/S7	**2904716**	1
VIP-PA-PWR/2X10COMBI/ 2,5M/S7	**2904717**	1
VIP-PA-PWR/2X10COMBI/ 3,0M/S7	**2904718**	1
VIP-PA-PWR/2X10COMBI/ 4,0M/S7	**2904719**	1
VIP-PA-PWR/2X10COMBI/ 5,0M/S7	**2904720**	1
VIP-PA-PWR/2X10COMBI/ 6,0M/S7	**2904721**	1
VIP-PA-PWR/2X10COMBI/ 8,0M/S7	**2904722**	1
VIP-PA-PWR/2X10COMBI/10,0M/S7	**2904723**	1
VIP-PA-PWR/2X10 PT/ 0,5M/S7	**2905528**	1
VIP-PA-PWR/2X10 PT/ 1,0M/S7	**2905529**	1
VIP-PA-PWR/2X10 PT/ 1,5M/S7	**2905531**	1
VIP-PA-PWR/2X10 PT/ 2,0M/S7	**2905532**	1
VIP-PA-PWR/2X10 PT/ 2,5M/S7	**2905533**	1
VIP-PA-PWR/2X10 PT/ 3,0M/S7	**2905534**	1
VIP-PA-PWR/2X10 PT/ 4,0M/S7	**2905535**	1
VIP-PA-PWR/2X10 PT/ 5,0M/S7	**2905536**	1
VIP-PA-PWR/2X10 PT/ 6,0M/S7	**2905537**	1
VIP-PA-PWR/2X10 PT/ 8,0M/S7	**2905538**	1
VIP-PA-PWR/2X10 PT/10,0M/S7	**2905539**	1

VIP – power cabling
Universal front adapters for Siemens SIMATIC® S7-300

Four versions are available:

– Connection of 40-pos. modules via 40 individual wires in rope structure (not assembled), PVC insulation
– Connection of 20-pos. modules via 20 individual wires in rope structure (not assembled), PVC insulation
– Connection of 40-pos. modules via 40 individual wires in rope structure (not assembled), insulation made from halogen-free material
– Connection of 20-pos. modules via 20 individual wires in rope structure (not assembled), insulation made from halogen-free material

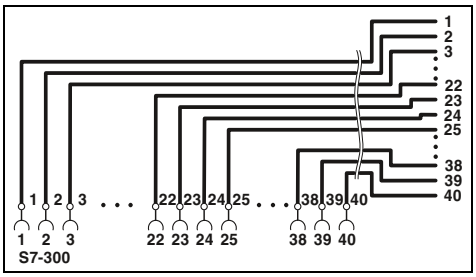
The front adapters have the following features:

– Can be screwed on/snapped in with the I/O module
– Suitable for all common S7-300 modules, up to max. 250 V AC/DC, 6 A
– Universal 1:1 connection
– Numerically marked wires

Additional accessories, such as connection terminal blocks, can be found in Catalog 1 “Terminal blocks” or at phoenixcontact.net/products.

Front adapter with 40 open cable ends, PVC insulation

EAC



Technical data

Maximum permissible operating voltage		≤ 250 V AC/DC
Maximum permissible current		6 A (per single wire at 40°C) 4 A (per single wire at 60°C) 750 mA (per single wire at 75 °C)
Maximum permissible total current		20 A (per cable at 40 °C) 16 A (per cable at 60°C)
Maximum conductor resistance		39 Ω/km
Conductor cross section		AWG 21 / 0.5 mm²
Conductor structure: stranded wires / material		16 / Cu uninsulated
Outside diameter		13 mm
Ambient temperature range		-20 °C ... 60 °C
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Controller level	Plug connection
	Field level	open cable end

Ordering data

Description	Cable length	Type	Order No.	Pcs./ Pkt.
Front adapter with 40 open cable ends for connecting 40-pos. modules				
	1 m	**VIP-PA-PWR/40XOE/ 1,0M/S7**	2904731	1
	2 m	**VIP-PA-PWR/40XOE/ 2,0M/S7**	2904732	1
	3 m	**VIP-PA-PWR/40XOE/ 3,0M/S7**	2904733	1
	4 m	**VIP-PA-PWR/40XOE/ 4,0M/S7**	2904734	1
	6 m	**VIP-PA-PWR/40XOE/ 6,0M/S7**	2904735	1
	8 m	**VIP-PA-PWR/40XOE/ 8,0M/S7**	2904736	1
	10 m	**VIP-PA-PWR/40XOE/10,0M/S7**	2904737	1
Front adapter with 20 open cable ends for connecting 20-pos. modules				
	1 m			
	2 m			
	3 m			
	4 m			
	6 m			
	8 m			
	10 m			

new

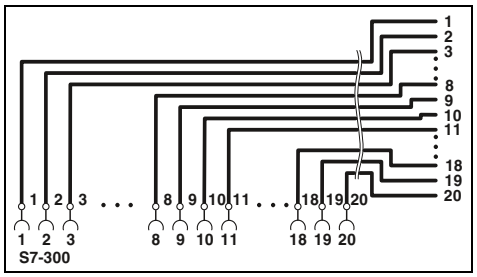
Front adapter with 20 open cable ends, PVC insulation

new

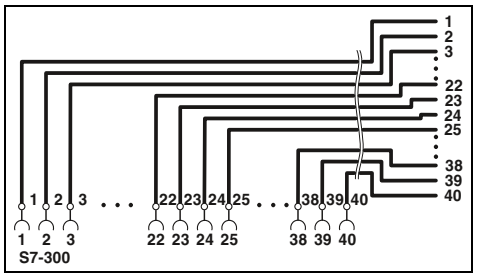
Front adapter with 40 open cable ends, halogen-free

Front adapter with 20 open cable ends, halogen-free

EAC



EAC



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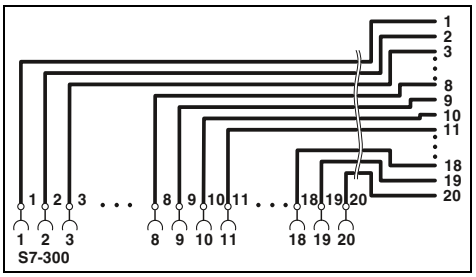


Technical data

≤ 250 V AC/DC
6 A (per single wire at 40°C)
4 A (per single wire at 60°C)
750 mA (per single wire at 75 °C)
20 A (per cable at 40 °C)
16 A (per cable at 60°C)
39 Ω/km
AWG 21 / 0.5 mm²
16 / Cu uninsulated
9 mm
-20 °C ... 60 °C
DIN EN 50178 , IEC 60664
Plug connection
open cable end

Technical data

≤ 250 V AC/DC
6 A (per single wire at 40°C)
4 A (per single wire at 60°C)
750 mA (per single wire at 75 °C)
20 A (per cable at 40 °C)
16 A (per cable at 60°C)
39 Ω/km
AWG 21 / 0.5 mm²
16 / Cu uninsulated
13 mm
-20 °C ... 60 °C
DIN EN 50178 , IEC 60664
Plug connection
open cable end

Technical data

≤ 250 V AC/DC
6 A (per single wire at 40°C)
4 A (per single wire at 60°C)
750 mA (per single wire at 75 °C)
20 A (per cable at 40 °C)
16 A (per cable at 60°C)
39 Ω/km
AWG 21 / 0.5 mm²
16 / Cu uninsulated
9 mm
-20 °C ... 60 °C
DIN EN 50178 , IEC 60664
Plug connection
open cable end

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-PWR/20XOE/ 1,0M/S7	**2904724**	1
VIP-PA-PWR/20XOE/ 2,0M/S7	**2904725**	1
VIP-PA-PWR/20XOE/ 3,0M/S7	**2904726**	1
VIP-PA-PWR/20XOE/ 4,0M/S7	**2904727**	1
VIP-PA-PWR/20XOE/ 6,0M/S7	**2904728**	1
VIP-PA-PWR/20XOE/ 8,0M/S7	**2904729**	1
VIP-PA-PWR/20XOE/10,0M/S7	**2904730**	1

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-PWR/40XOE/HF/ 1,0M/S7	**2908909**	1
VIP-PA-PWR/40XOE/HF/ 2,0M/S7	**2908908**	1
VIP-PA-PWR/40XOE/HF/ 3,0M/S7	**2908907**	1
VIP-PA-PWR/40XOE/HF/ 4,0M/S7	**2908905**	1
VIP-PA-PWR/40XOE/HF/ 6,0M/S7	**2908904**	1
VIP-PA-PWR/40XOE/HF/ 8,0M/S7	**2908903**	1
VIP-PA-PWR/40XOE/HF/10,0M/S7	**2908902**	1

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-PWR/20XOE/HF/ 1,0M/S7	**2908916**	1
VIP-PA-PWR/20XOE/HF/ 2,0M/S7	**2908915**	1
VIP-PA-PWR/20XOE/HF/ 3,0M/S7	**2908914**	1
VIP-PA-PWR/20XOE/HF/ 4,0M/S7	**2908913**	1
VIP-PA-PWR/20XOE/HF/ 6,0M/S7	**2908912**	1
VIP-PA-PWR/20XOE/HF/ 8,0M/S7	**2908911**	1
VIP-PA-PWR/20XOE/HF/10,0M/S7	**2908910**	1

VIP – VARIOFACE Professional Front adapter for Siemens SIMATIC® S7-300

Three connection options are available:

– Transfer of max. 32 channels via two 50-pos. system cables (32-channel cards or this design)
– Transfer of 4 x 8 channels via two 14-pos. system cables (32-channel cards or this design)
– Transfer of 2 x 8 channels via two 14-pos. system cables (16-channel cards or this design)

The front adapters have the following features:

– Can be screwed with I/O module
– Voltage supply via terminal blocks with spring-cage double connection
– Encapsulated IDC/FLK socket strips for module side

Special lengths are configured using separate order numbers.

Ordering example:

A front adapter with a connected 50-pos. system cable (32-channel cards), 12.75 m in length:

1 pcs. 2900885/12,75

Web code for the online configurator

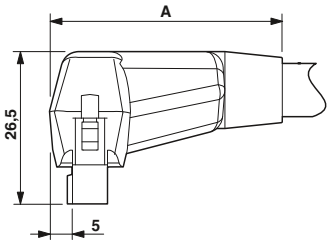
Your web code: #0007

Notes:

The following modules cannot be coupled due to the larger outer contour of the molded connectors:
UM 45-FLK14/ 8IM/ZFKDS/PLC, 2965211
UM 45-FLK50/32IM/ZFKDS/PLC, 2965224
UM 45- 8RM/MR-G24/1/PLC, 2962900
UM 45-16RM/MR-G24/1/PLC, 2962913

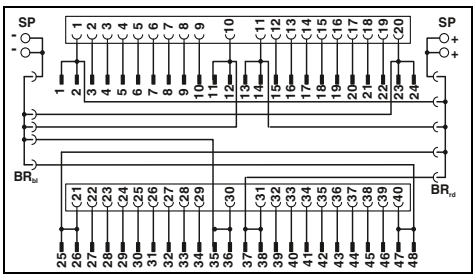
Controller-specific modules from page 508

Standard modules from page 526



	A
...FLK14...	37
...FLK50...	42

Front adapter with system cable 1 x 32 channels can be connected



Technical data

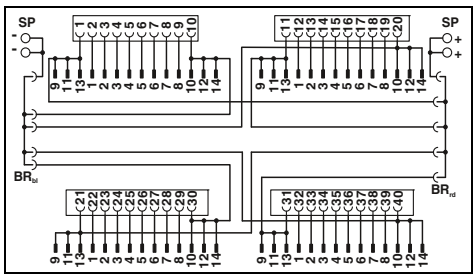
Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		50 V / -
Maximum permissible current		1 A (per path) 8 A (Separate power supply)
Maximum conductor resistance		0.16 Ω/m
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		10.3 mm
Ambient temperature range		-20 °C ... 50 °C
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Control side	Plug connection
	Field level	IDC/FLK socket strip
Connection data solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

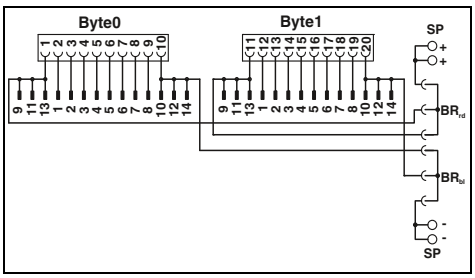
Ordering data

Description	Cable length	Type	Order No.	Pcs./ Pkt.
VIP VARIOFACE front adapter, with connected system cables for SIMATIC® S7-300				
	0.5 m	**VIP-PA-FLK50/ 0,5M/S7**	2322443	1
	1 m	**VIP-PA-FLK50/ 1,0M/S7**	2322456	1
	1.5 m	**VIP-PA-FLK50/ 1,5M/S7**	2322469	1
	2 m	**VIP-PA-FLK50/ 2,0M/S7**	2321800	1
	2.5 m	**VIP-PA-FLK50/ 2,5M/S7**	2322472	1
	3 m	**VIP-PA-FLK50/ 3,0M/S7**	2322485	1
	4 m	**VIP-PA-FLK50/ 4,0M/S7**	2322498	1
	5 m	**VIP-PA-FLK50/ 5,0M/S7**	2322508	1
	6 m	**VIP-PA-FLK50/ 6,0M/S7**	2322511	1
	7 m	**VIP-PA-FLK50/ 7,0M/S7**	2322524	1
	8 m	**VIP-PA-FLK50/ 8,0M/S7**	2322537	1
	10 m	**VIP-PA-FLK50/10,0M/S7**	2322540	1
VIP VARIOFACE front adapter, as above, in variable lengths		**VIP-PA-FLK50-S7/...**	2900885	1

Front adapter with system cable
4 x 8 channels can be connected

Front adapter with system cable
2 x 8 channels can be connected





Technical data

	< 50 V AC / 60 V DC
	50 V / -
	1 A (per path)
	8 A (Separate power supply)
	0.16 Ω/m
	AWG 26 / 0.14 mm²
	7 / Cu tin-plated
	6.4 mm
	-20 °C ... 50 °C
	IEC 60664 , DIN EN 50178
	Plug connection
	IDC/FLK socket strip
	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Technical data

	< 50 V AC / 60 V DC
	50 V / -
	1 A (per path)
	8 A (Separate power supply)
	0.16 Ω/m
	AWG 26 / 0.14 mm²
	7 / Cu tin-plated
	6.4 mm
	-20 °C ... 50 °C
	IEC 60664 , DIN EN 50178
	Plug connection
	IDC/FLK socket strip
	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-FLK50/4X14/ 0,5M/S7	2322553	1
VIP-PA-FLK50/4X14/ 1,0M/S7	2322566	1
VIP-PA-FLK50/4X14/ 1,5M/S7	2322579	1
VIP-PA-FLK50/4X14/ 2,0M/S7	2321910	1
VIP-PA-FLK50/4X14/ 2,5M/S7	2322582	1
VIP-PA-FLK50/4X14/ 3,0M/S7	2322595	1
VIP-PA-FLK50/4X14/ 4,0M/S7	2322605	1
VIP-PA-FLK50/4X14/ 5,0M/S7	2322618	1
VIP-PA-FLK50/4X14/ 6,0M/S7	2322621	1
VIP-PA-FLK50/4X14/ 7,0M/S7	2322634	1
VIP-PA-FLK50/4X14/ 8,0M/S7	2322647	1
VIP-PA-FLK50/4X14/10,0M/S7	2322650	1
VIP-PA-FLK50-4X14-S7/...	2900886	1

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-PA-FLK14/ 0,5M/S7	2322663	1
VIP-PA-FLK14/ 1,0M/S7	2322676	1
VIP-PA-FLK14/ 1,5M/S7	2322689	1
VIP-PA-FLK14/ 2,0M/S7	2321790	1
VIP-PA-FLK14/ 2,5M/S7	2322692	1
VIP-PA-FLK14/ 3,0M/S7	2322702	1
VIP-PA-FLK14/ 4,0M/S7	2322715	1
VIP-PA-FLK14/ 5,0M/S7	2322728	1
VIP-PA-FLK14/ 6,0M/S7	2322731	1
VIP-PA-FLK14/ 7,0M/S7	2322744	1
VIP-PA-FLK14/ 8,0M/S7	2322757	1
VIP-PA-FLK14/10,0M/S7	2322760	1
VIP-PA-FLK14-S7/...	2900887	1

Front adapters for 32-channel cards of the SIMATIC® S7-300

Card type	VIP-PA-FLK50/...M/S7
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
Analog input	6ES7 331-7PF01-0AB0* 6ES7 331-7PF11-0AB0* 6ES7 331-7NF00-0AB0* 6ES7 331-7NF10-0AB0* 6ES7 331-1KF01-0AB0*
Analog output	6ES7 332-5HF00-0AB0*
CPU	312C, 313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP
Other modules	6ES7 350-2AH01-0AE0* 6ES7 357-4AH01-0AE0*

Card type	VIP-PA-FLK50/4X14/...M/S7
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
CPU	313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP

* Only in conjunction with
VIP-2/SC/FLK50 (1-40)/S7, Order No.: 2315243,
VIP-2/PT/FLK50 (1-40)/S7, Order No.: 2903804,
FLKM 50/KDS3-MT/PPA/S7-300, Order No.: 2304490.
All bridges (BR) on the adapter must be removed.

Front adapters for 16-channel cards of the SIMATIC® S7-300

Card type	VIP-PA-FLK14/...M/S7
Digital input	6ES7 321-1BH02-0AA0 6ES7 321-1BH10-0AA0 6ES7 321-1BH50-0AA0* 6ES7 321-7BH01-0AB0*
Digital output	6ES7 322-1BH01-0AA0 6ES7 322-1BH10-0AA0 6ES7 322-8BF00-0AB0*
Digital input/output	6ES7 323-1BH01-0AA0
Analog input	6ES7 331-7KF02-0AB0* 6ES7 331-7HF01-0AB0* 6ES7 331-7KB02-0AB0* 6ES7 331-7TF01-0AB0*
Analog output	6ES7 332-5HD01-0AB0* 6ES7 332-5HB01-0AB0* 6ES7 332-7ND02-0AB0*
Analog input/output	6ES7 334-0CE01-0AA0* 6ES7 334-0KE00-0AB0* 6ES7 335-7HG01-0AB0*
Other modules	6ES7 338-4BC01-0AB0* 6ES7 350-1AH03-0AE0* 6ES7 351-1AH01-0AE0* 6ES7 352-1AH02-0AE0* 6ES7 353-1AH01-0AE0* 6ES7 354-1AH01-0AE0* 6ES7 355-0VH10-0AE0* 6ES7 355-1VH10-0AE0*

* Only in conjunction with
VIP-2/SC/2FLK14 (1-20)/S7, Order No.: 2315230
VIP-2/PT/2FLK14 (1-20)/S7, Order No.: 2903802
FLKM-2FLK14/KDS 3-MT/PPA/S7, Order No.: 2295062
All bridges (BR) on the adapter must be disconnected.

Note:
The front adapters are non-isolated on delivery.
Electrical isolation can be achieved by removing the bridges (in groups of 8).

Explanation:
IDC/FLK strip
Connection to I/O card

SP: Separate power terminals
BR_{bl}: Blue plug-in bridge
BR_{rd}: Red plug-in bridge

Siemens SIMATIC® S7-300 Front adapter

I/O modules with 32 channels or with this design

Two connection options are available:

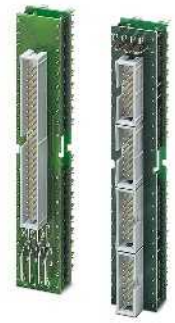
– Transfer of max. 32 channels over one 50-position system cable
– Transmission of 4 x 8 channels over four 14-position system cables

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Controller-specific modules from page 508
Standard modules from page 526
For system cables, see page 550



Front adapter for SIMATIC® S7-300, I/O cards with max. 32 channels

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply (2.8 x 0.8 mm))
Maximum permissible total current	2 A (per Byte, for supply via connector) 8 A (during supply via a separate bridged power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178
Connection method	IDC/FLK pin strip

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapters, for SIMATIC® S7-300				
- 1 x 32 channels can be connected	50	**FLKM 50-PA-S300**	2294445	1
- 4 x 8 channels can be connected	14	**FLKM 50/4-FLK14/PA-S300**	2296281	1

Front adapters for 32-channel cards of the SIMATIC® S7-300

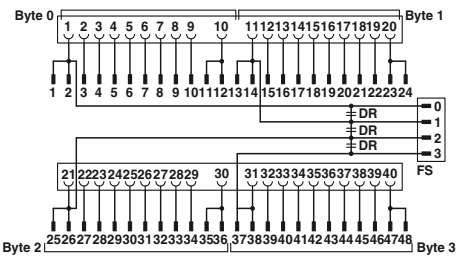
Card type	FLKM 50-PA-S300
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
Analog input	6ES7 331-7PF01-0AB0* 6ES7 331-7PF11-0AB0* 6ES7 331-7NF00-0AB0* 6ES7 331-7NF10-0AB0* 6ES7 331-1KF01-0AB0*
Analog output	6ES7 332-5HF00-0AB0*
CPU	312C, 313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP
Other modules	6ES7 350-2AH01-0AE0* 6ES7 357-4AH01-0AE0*

Card type	FLKM 50/4-FLK14/PA-S300
Digital input	6ES7 321-1BL00-0AA0
Digital output	6ES7 322-1BL00-0AA0
Digital input/output	6ES7 323-1BL00-0AA0
CPU	313C, 314C, 313C-2PtP 313C-2DP, 314C-2DP

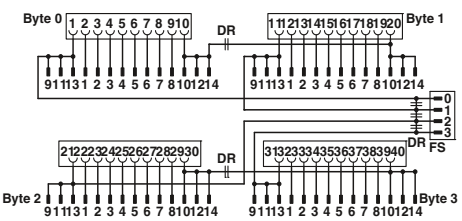
* Only in conjunction with
VIP-2/SC/FLK50(1-40)/S7, Order No.: 2315243,
VIP-2/PT/FLK50(1-40)/S7, Order No.: 2903804,
FLKM 50/KDS3-MT/PPA/S7-300, Order No.: 2304490.
All wire bridges (DR) on the adapter must be disconnected.
There must be no voltage supply at the front adapter (flowing via the slip-on connections).

Note:
The front adapters are non-isolated on delivery.
Electrical isolation is achieved by removing the wire bridges (in groups of 8).

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply



Connection scheme FLKM 50-PA-S300



Connection scheme FLKM 50/4-FLK14/PA-S300

Siemens SIMATIC® S7-300 Front adapter

I/O modules with 16 channels or with this design

– Up to 2 x 8 channels are connected via two 14-position system cables.

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

Web code for the online configurator

Your web code: #0007

Front adapter for SIMATIC® S7-300, I/O cards with max. 16 channels

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply (2.8 x 0.8 mm))
Maximum permissible total current	2 A (per Byte, for supply via connector) 8 A (during supply via a separate bridged power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178
Connection method	IDC/FLK pin strip

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-300				
- 2 x 8 channels can be connected	14	**FLKM 14-PA-S300**	2299770	1

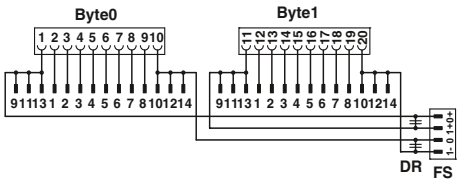
Front adapters for 16-channel cards of the SIMATIC® S7-300

Card type	FLKM 14-PA-S300
Digital input	6ES7 321-1BH02-0AA0 6ES7 321-1BH10-0AA0 6ES7 321-1BH50-0AA0* 6ES7 321-7BH01-0AB0*
Digital output	6ES7 322-1BH01-0AA0 6ES7 322-1BH10-0AA0 6ES7 322-8BF00-0AB0*
Digital input/output	6ES7 323-1BH01-0AA0
Analog input	6ES7 331-7KF02-0AB0* 6ES7 331-7HF01-0AB0* 6ES7 331-7KB02-0AB0* 6ES7 331-7TF01-0AB0*
Analog output	6ES7 332-5HD01-0AB0* 6ES7 332-5HB01-0AB0* 6ES7 332-7ND02-0AB0*
Analog input/output	6ES7 334-0CE01-0AA0* 6ES7 334-0KE00-0AB0* 6ES7 335-7HG01-0AB0*
Other modules	6ES7 338-4BC01-0AB0* 6ES7 350-1AH03-0AE0* 6ES7 351-1AH01-0AE0* 6ES7 352-1AH02-0AE0* 6ES7 353-1AH01-0AE0* 6ES7 354-1AH01-0AE0* 6ES7 355-0VH10-0AE0* 6ES7 355-1VH10-0AE0*

* Only in conjunction with
VIP-2/SC/2FLK14 (1-20)/S7, Order No.: 2315230
VIP-2/PT/2FLK14 (1-20)/S7, Order No.: 2903802
FLKM-2FLK14/KDS 3-MT/PPA/S7, Order No.: 2295062
All wire bridges (DR) on the adapter must be disconnected.
There must be no voltage supply at the front adapter (flowing via the slip-on connections).

Note:
The front adapters are non-isolated on delivery.
Electrical isolation is achieved by removing the wire bridges (in groups of 8).

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply



Connection scheme FLKM 14-PA-S300

Siemens SIMATIC® S7-300 Front adapter for failsafe modules

The front adapters are coupled using 50-pos. system cables. They convert the signals for passive modules.

Notes:
Controller-specific modules from page 508
For system cables, see page 550

Front adapter for SIMATIC® S7-300 for failsafe I/O cards

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible current	1 A (per path)
Maximum permissible total current	2 A
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178
Connection method	IDC/FLK pin strip

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter for failsafe I/O cards 6ES7 326-1BK02-0AB0 6ES7 326-1RF00-0AB0 6ES7 336-1HE00-0AB0	50	**FLKM 50-PA-S300/SO167**	2307662	1
VARIOFACE front adapter for failsafe I/O cards 6ES7 326-2BF01-0AB0	50	**FLKM 50-PA/DO326/S7-300**	2321952	1

Front adapters for I/O modules of the SIMATIC® S7-300

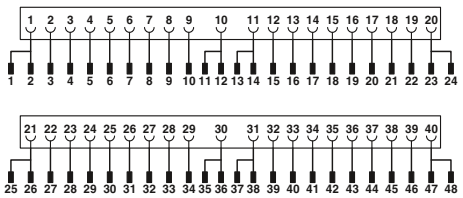
Card type	FLKM 50-PA-S300/SO167
Digital input	6ES7 326-1BK02-0AB0* 6ES7 326-1RF00-0AB0*[1])
Analog input	6ES7 336-1HE00-0AB0*

Card type	FLKM 50-PA/DO326/S7-S300
Digital output	6ES7 326-2BF01-0AB0** 6ES7 326-2BF10-0AB0**

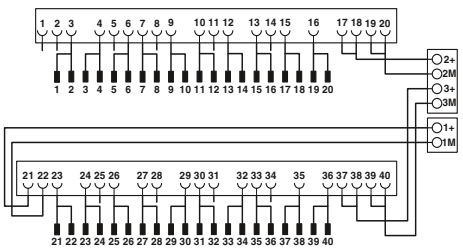
* Only in conjunction with
VIP-2/SC/FLK50 (1-40)/S7, Order No.: 2315243,
VIP-2/PT/FLK50 (1-40)/S7, Order No.: 2903804,
FLKM 50/KDS3-MT/PPA/S7-300, Order No.: 2304490.

** Only in conjunction with
FLKM 50/DO326/S7-300, Order No.: 2321965.

[1]) Not suitable for signals from the Ex area.



Connection scheme FLKM 50-PA-S300/SO167



Connection scheme FLKM 50-PA/DO326/S7-300

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Siemens SIMATIC® S7-300
System cables for 64-channel I/O cards

These system cables are plugged onto the 64-channel (2x32) I/O cards that are directly connected using connectors.

CABLE-FCN40/1X50/...
– Signal transmission of 1x32 channels
– System cable: 40-pos. connector to 50-pos. IDC/FLK socket strip

CABLE-FCN40/4X14/...
– Signal transmission of 4x8 channels
– Splitting cable: 40-pos. connector to four 14-pos. IDC/FLK socket strips

System cable

Splitting cable

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Round cable, for output module 6ES7 322-1BP00-0AA0 and 6ES7 322-1BP50-0AA0 (two cables per module)								
	40	0.5 m	**CABLE-FCN40/1X50/ 0,5M/S7-OUT**	2321017	1	**CABLE-FCN40/4X14/ 0,5M/S7-OUT**	2321172	1
	40	1 m	**CABLE-FCN40/1X50/ 1,0M/S7-OUT**	2321020	1	**CABLE-FCN40/4X14/ 1,0M/S7-OUT**	2321185	1
	40	2 m	**CABLE-FCN40/1X50/ 2,0M/S7-OUT**	2321033	1	**CABLE-FCN40/4X14/ 2,0M/S7-OUT**	2321198	1
	40	3 m	**CABLE-FCN40/1X50/ 3,0M/S7-OUT**	2321046	1	**CABLE-FCN40/4X14/ 3,0M/S7-OUT**	2321208	1
	40	4 m	**CABLE-FCN40/1X50/ 4,0M/S7-OUT**	2321059	1	**CABLE-FCN40/4X14/ 4,0M/S7-OUT**	2321211	1
	40	6 m	**CABLE-FCN40/1X50/ 6,0M/S7-OUT**	2321062	1	**CABLE-FCN40/4X14/ 6,0M/S7-OUT**	2321224	1
	40	8 m	**CABLE-FCN40/1X50/ 8,0M/S7-OUT**	2321075	1	**CABLE-FCN40/4X14/ 8,0M/S7-OUT**	2321237	1
	40	10 m	**CABLE-FCN40/1X50/10,0M/S7-OUT**	2321088	1	**CABLE-FCN40/4X14/10,0M/S7-OUT**	2321240	1
Round cable, for input module 6ES7 321-1BP00-0AA0 (two cables per module). Plus-reading operation (sinking mode) of the module								
	40	0.5 m	**CABLE-FCN40/1X50/ 0,5M/S7-IN**	2321091	1	**CABLE-FCN40/4X14/ 0,5M/S7-IN**	2321253	1
	40	1 m	**CABLE-FCN40/1X50/ 1,0M/S7-IN**	2321101	1	**CABLE-FCN40/4X14/ 1,0M/S7-IN**	2321266	1
	40	2 m	**CABLE-FCN40/1X50/ 2,0M/S7-IN**	2321114	1	**CABLE-FCN40/4X14/ 2,0M/S7-IN**	2321279	1
	40	3 m	**CABLE-FCN40/1X50/ 3,0M/S7-IN**	2321127	1	**CABLE-FCN40/4X14/ 3,0M/S7-IN**	2321282	1
	40	4 m	**CABLE-FCN40/1X50/ 4,0M/S7-IN**	2321130	1	**CABLE-FCN40/4X14/ 4,0M/S7-IN**	2321295	1
	40	6 m	**CABLE-FCN40/1X50/ 6,0M/S7-IN**	2321143	1	**CABLE-FCN40/4X14/ 6,0M/S7-IN**	2321305	1
	40	8 m	**CABLE-FCN40/1X50/ 8,0M/S7-IN**	2321156	1	**CABLE-FCN40/4X14/ 8,0M/S7-IN**	2321318	1
	40	10 m	**CABLE-FCN40/1X50/10,0M/S7-IN**	2321169	1	**CABLE-FCN40/4X14/10,0M/S7-IN**	2321321	1

Siemens SIMATIC® S7-300 Front adapter for MINI Analog Pro

This front adapter is only for connecting the MINI MCR-2-V8-FLK16 adapter and corresponding MINI Analog Pro isolators. With the aid of these components, converted standard analog signals are transmitted.

Notes:

For corresponding isolators, see from page 68

For system cables (FLK16/EZ-DR/...), see page 588

Front adapter for SIMATIC® S7-300, 20-pos. analog I/O cards

Technical data

	FLKM 16-PA-S300/MINI-MCR
Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	30 V / -
Maximum permissible current	50 mA (per path) 500 mA (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

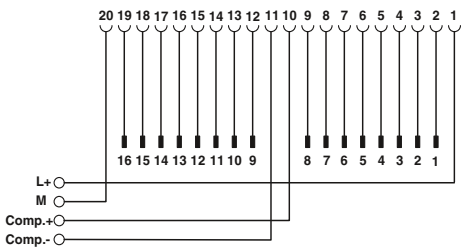
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-300, only in connection with MCR-2-V8-FLK16	16	**FLKM 16-PA-S300/MINI-MCR**	2314749	1

Accessories

Assembled round cable, with two 16-pos. IDC/FLK socket strips	**FLK 16/EZ-DR/ 300/KONFEK**	2299330	1
System cabling adapter for MINI Analog Pro modules	**MINI MCR-2-V8-FLK 16**	2901993	1

Front adapters for analog cards of the SIMATIC® S7-300

Card type	FLKM 16-PA-S300/MINI-MCR
Analog input	6ES7 331-7KF02-0AB0 6ES7 331-7KB02-0AB0 6ES7 331-7KB81-0AB0 6ES7 331-7TF00-0AB0
Analog output	6ES7 332-8TF01-0AB0



FLKM 16-PA-S300/MINI-MCR connection scheme

Explanation:

IDC/FLK strip

Connection to I/O card

Screw terminal blocks for separate supply

Siemens SIMATIC® S7-300 Front adapter for MINI Analog Pro system cabling

The **FLKM 16-PA-331-1KF/I/MINI-MCR** front adapter is used to implement system cabling in conjunction with the MINI Analog system adapter and a 16-pos. system cable.

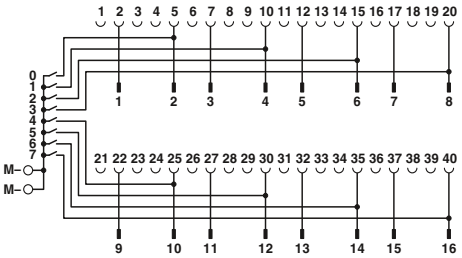
Instead of the conventional front connector, screw terminal blocks are used to snap this component on to the analog module.

The DIP switches can be used to connect "M-" connections to each other and to the central ground of the system.

The front adapter supports **only current signals**.

The front adapter is suitable for the following analog input card:
– 6ES7 331-1KF02-0AB0

Notes:
For corresponding isolators, see from page 68
For system cables (FLK16/EZ-DR/...), see page 588



Connection scheme FLKM 16-PA-331-1KF/I/MINI-MCR

Front adapter for SIMATIC® S7-300, 6ES7 331-1KF02-0AB0 analog I/O card

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	30 V / -
Maximum permissible current	50 mA (per path)
Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-300, only in connection with MCR-2-V8-FLK16	16	**FLKM 16-PA- 331-1KF/I/MINI-MCR**	2318237	1

Siemens SIMATIC® S7-300 Front adapter for MINI Analog Pro system cabling

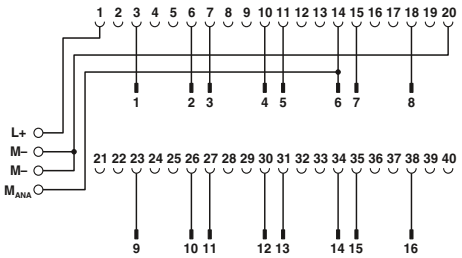
The **FLKM 16-PA-332-5HF/I/MINI-MCR** front adapter is used to implement system cabling in conjunction with the MINI Analog system adapter and a 16-pos. system cable.

Instead of the conventional front connector, screw terminal blocks are used to snap this component on to the analog module.

The front adapter supports **only current signals**.

The front adapter is suitable for the following analog output cards:
– 6ES7 332-5HF00-0AB0

Notes:
For corresponding isolators, see from page 68
For system cables (FLK16/EZ-DR/...), see page 588



Connection scheme FLKM 16-PA-332-5HF/I/MINI-MCR

Front adapter for SIMATIC® S7-300, 6ES7 332-5HF00-0AB0 analog I/O card

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	30 V / -
Maximum permissible current	50 mA (per path) 500 mA (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-300, only in connection with MCR-2-V8-FLK16	16	**FLKM 16-PA- 332-5HF/I/MINI-MCR**	2318240	1

VIP termination boards for Siemens SIMATIC® S7

These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters for S7.

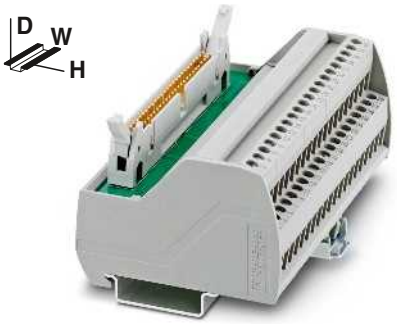
Features:

– Numerical marking
– Specifically for S7-300 or S7-400

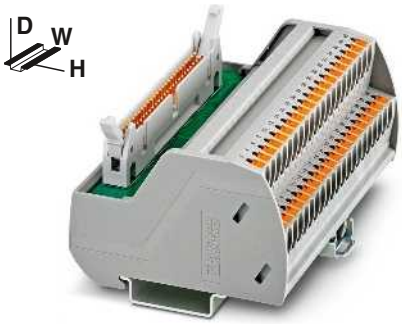
Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.

[1]) No CSA approval



Passive termination boards for input/output, with SIMATIC®-specific marking and screw connection



Passive termination boards for input/output, with SIMATIC®-specific marking and Push-in connection

Technical data

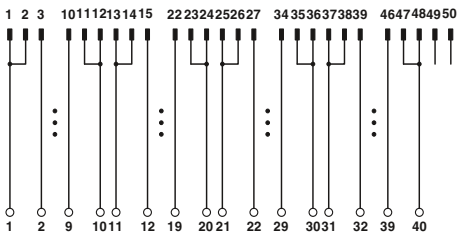
Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Technical data

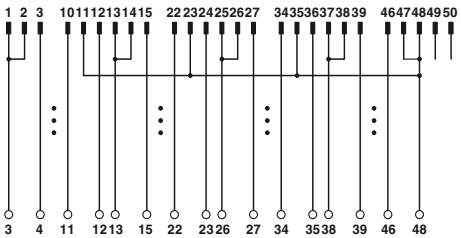
Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, with SIMATIC® S7-300-specific marking from 1 to 40					
- with screw connection	50	106.1 mm	**VIP-2/SC/FLK50 (1-40) /S7**	2315243	1
- with Push-in connection	50	107.9 mm	**VIP-2/PT/FLK50 (1-40) /S7**	2903804	1
VARIOFACE termination board, with SIMATIC® S7-400-specific marking from 3 to 48					
- with screw connection	50	106.1 mm	**VIP-2/SC/FLK50/S7/A-S400[1])**	2322359	1
- with Push-in connection	50	107.9 mm	**VIP-2/PT/FLK50/S7/A-S400**	2904289	1



Connection scheme VIP-2/.../FLK50 (1-40) /S7



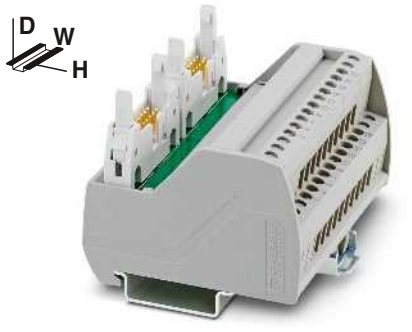
Connection scheme VIP-2/.../FLK50/S7/A-S400

VIP termination boards for Siemens SIMATIC® S7-300

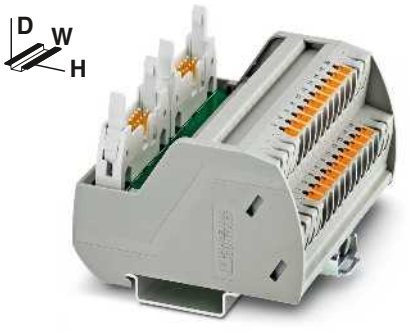
These VIP - VARIOFACE Professional modules are used in combination with two 14-pos. system cables and the relevant front adapters for S7-300.

Features:
– Numerical marking (1-20)
– Specifically for S7-300

Notes:
For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards for SIMATIC® S7-300 with screw connection



Passive termination boards for SIMATIC® S7-300 with Push-in connection

Technical data

Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Ordering data

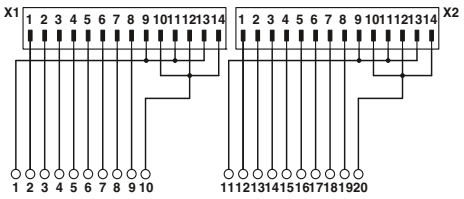
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, with SIMATIC® S7-300-specific marking from 1 to 20					
- with screw connection	14	80.6 mm	**VIP-2/SC/2FLK14 (1-20) /S7**	2315230	1
- with Push-in connection	14	82.5 mm	**VIP-2/PT/2FLK14 (1-20) /S7**	2903802	1

Technical data

Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/2FLK14 (1-20) /S7	2903802	1



Connection diagram: VIP-2/.../2FLK14 (1-20) /S7

Siemens SIMATIC® S7-1500 Front adapter

Digital I/O modules with 32 channels

Two connection options are available:

– Transfer of max. 32 channels over one 50-position system cable
– Transmission of 4 x 8 channels via a 14-position system cable

Digital I/O modules with 16 channels

– Transmission of 2 x 8 channels over two 14-position system cables

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

Web code for the online configurator

Your web code: #0007

Notes:
Standard modules from page 526
For system cables, see page 550

new

Front adapter for SIMATIC® S7-1500 digital I/O cards

EAC

Technical data

Maximum permissible operating voltage	< 50 V DC
Maximum permissible current	1 A (per path)
Maximum permissible total current	2 A (per byte when supplying from the module side) 12 A (When supplying via the front adapter)
Ambient temperature (operation)	-25 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Standards/regulations	IEC 61131-2
Connection method	IDC/FLK pin strip

Ordering data

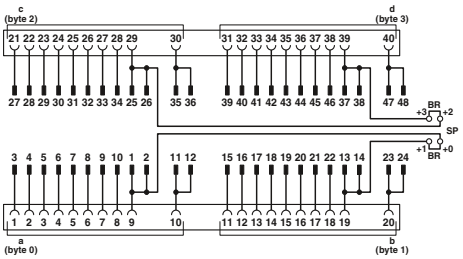
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-1500 digital 35 mm modules, 1 x 32 channels can be connected				
- with screw connection	50	**FLKM 50-PA/SC/DIO/S7-1500**	2907383	1
- with Push-in connection	50	**FLKM 50-PA/PT/DIO/S7-1500**	2907384	1
VARIOFACE front adapter, for SIMATIC® S7-1500 digital 35 mm modules, 4 x 8 or 2 x 8 channels can be connected				
- with screw connection	14	**FLKM 4X14-PA/SC/DIO/S7-1500**	2907381	1
- with Push-in connection	14	**FLKM 4X14-PA/PT/DIO/S7-1500**	2907382	1

Front adapters for 32-channel digital cards of the SIMATIC® S7-1500

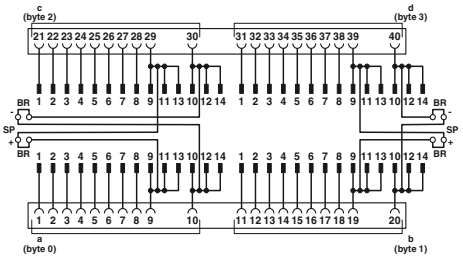
Card type	FLKM 50-PA/.../DIO/S7-1500 FLKM 4X14-PA/.../DIO/S7-1500
Digital input	6ES7 521-1BL00-0AB0
Digital output	6ES7 522-1BL00-0AB0 6ES7 522-1BL01-0AB0

Front adapters for 16-channel digital cards of the SIMATIC® S7-1500

Card type	FLKM 4X14-PA/.../DIO/S7-1500
Digital input	6ES7 521-1BH00-0AB0 6ES7 521-1BH50-0AA0
Digital output	6ES7 522-1BH00-0AB0 6ES7 522-1BH01-0AB0



Connection scheme for FLKM 50-PA/.../DIO/S7-1500



Connection scheme for FLKM 4X14-PA/.../DIO/S7-1500

Note:
The front adapters are non-isolated on delivery.
Electrical isolation is achieved by removing the wire bridges (in groups of 8).

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Siemens SIMATIC® S7-1500 Front adapter

Analog I/O modules with 8 channels

Two connection options are available:
– Transmission of a maximum of 8 channels via a 50-pos. system cable
– Transmission of 4 x 2 channels via a 14-pos. system cable

Analog I/O modules with 4 channels

– Transmission of 2 x 2 channels via two 14-pos. system cables

Web code for the online configurator

Your web code: #0007

Notes:

Controller-specific modules from page 512
For system cables, see page 550

new

Front adapter for SIMATIC® S7-1500 analog I/O cards

Technical data

Maximum permissible operating voltage	< 50 V DC
Maximum permissible current	1 A (per path)
Ambient temperature (operation)	-25 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Standards/regulations	IEC 61131-2
Connection method	IDC/FLK pin strip

Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for SIMATIC® S7-1500 analog 35 mm modules				
- 8 channels can be connected	50	**FLKM 50-PA/AN/S7-1500**	2907386	1
- 4 x 2 or 2 x 2 channels can be connected	14	**FLKM 4X14-PA/AN/S7-1500**	2907385	1

Front adapters for 8-channel analog cards of the SIMATIC® S7-1500 (only one 50-pos. cable is connected)

Card type	FLKM 50-PA/AN/S7-1500
Analog input	6ES7 531-7KF00-0AB0* 6ES7 531-7NF00-0AB0* 6ES7 531-7NF10-0AB0* 6ES7 531-7PF00-0AB0*
Analog output	6ES7 532-5HF00-0AB0*

Front adapters for 8-channel analog cards of the SIMATIC® S7-1500 (four 14-pos. cables are connected)

Card type	FLKM 4X14-PA/AN/S7-1500
Analog input	6ES7 531-7KF00-0AB0** 6ES7 531-7NF00-0AB0** 6ES7 531-7NF10-0AB0** 6ES7 531-7PF00-0AB0**
Analog output	6ES7 532-5HF00-0AB0**

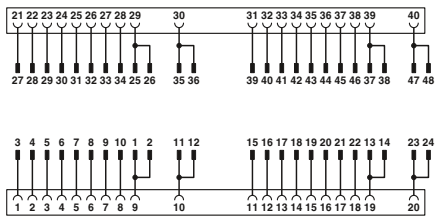
Front adapters for 4-channel analog cards of the SIMATIC® S7-1500 (only two 14-pos. cables are connected)

Card type	FLKM 4X14-PA/AN/S7-1500
Analog output	6ES7 532-5HD00-0AB0*** 6ES7 532-5ND00-0AB0***

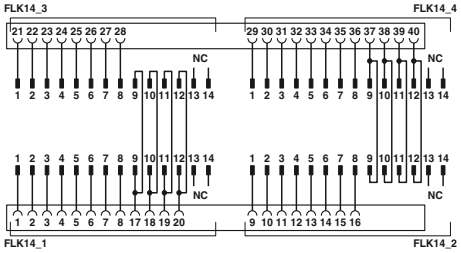
* Only in conjunction with
VIP-3/PT/FLK50/AN/S7-1500, Order No.: 2908496
VIP-3/SC/FLK50/AN/S7-1500, Order No.: 2908495
VIP-3/PT/FLK50/AN/2P/S7-1500, Order No.: 2908499
VIP-3/SC/FLK50/AN/2P/S7-1500, Order No.: 2908497
FLKM 50/KDS3-MT/PPA/S7-1500, Order No.: 2909893

** Only in conjunction with
VIP-3/PT/2FLK14/AN/2P/S7-1500A, Order No.: 2908465
VIP-3/SC/2FLK14/AN/2P/S7-1500A, Order No.: 2908464
VIP-3/PT/2FLK14/AN/2P/S7-1500B, Order No.: 2908846
VIP-3/SC/2FLK14/AN/2P/S7-1500B, Order No.: 2908845
FLKM-2FLK14/KDS3-MT/AN/S7-1500, Order No.: 2909894

***Only in conjunction with
VIP-3/PT/2FLK14/AN/2P/S7-1500A, Order No.: 2908465
VIP-3/SC/2FLK14/AN/2P/S7-1500A, Order No.: 2908464
FLKM-2FLK14/KDS3-MT/AN/S7-1500, Order No.: 2909894



Connection diagram FLKM 50-PA/AN/S7-1500



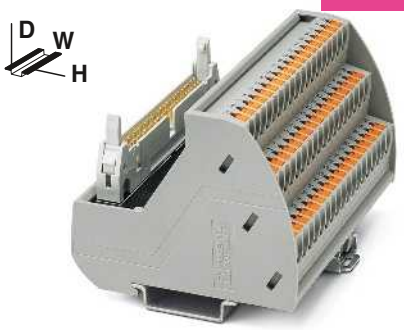
Connection diagram FLKM 4X14-PA/AN/S7-1500

VIP termination boards for analog I/O cards of Siemens SIMATIC® S7-1500

VARIOFACE termination board for Siemens S7-1500 systems with S7-1500-specific marking.

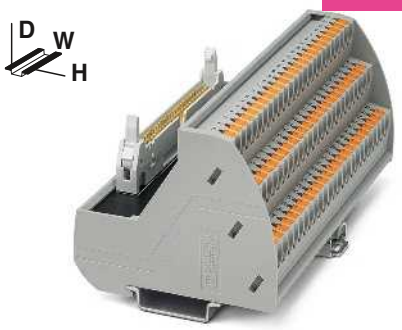
– One 50-pos. IDC/FLK pin strip
– Separate potentials L+ and M
– Printed channel marking

new



50-position IDC/FLK pin strip

new



50-position IDC/FLK pin strip with potentials P1 and P2

Technical data

		VIP-3/PT/FLK50/AN/S7-1500	VIP-3/SC/FLK50/AN/S7-1500
Maximum permissible operating voltage		60 V AC/DC	60 V AC/DC
Maximum permissible operating voltage UL / CSA		60 V / 60 V	60 V / 60 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		7 A	7 A
Ambient temperature (operation)		-20 °C ... 60 °C	-20 °C ... 60 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Push-in connection solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	75.8 mm / 63 mm	68.8 mm / 60.7 mm

Technical data

		VIP-3/PT/FLK50/AN/2P/S7-1500	VIP-3/SC/FLK50/AN/2P/S7-1500
Maximum permissible operating voltage		60 V AC/DC	60 V AC/DC
Maximum permissible operating voltage UL / CSA		60 V / 60 V	60 V / 60 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		7 A	7 A
Ambient temperature (operation)		-20 °C ... 60 °C	-20 °C ... 60 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Push-in connection solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	75.8 mm / 63 mm	68.8 mm / 60.7 mm

Ordering data

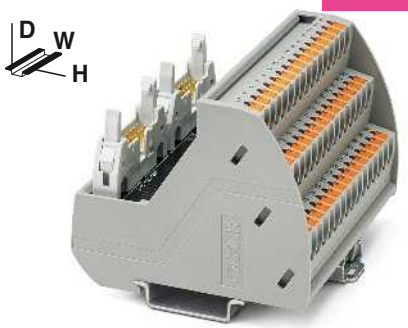
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board for Siemens S7-1500					
- with Push-in connection	50	97.7 mm	**VIP-3/PT/FLK50/AN/S7-1500**	2908496	1
- with screw connection	50	97.7 mm	**VIP-3/SC/FLK50/AN/S7-1500**	2908495	1
VARIOFACE termination board for Siemens S7-1500 marked 1 to 40, with potentials P1 and P2					
- with Push-in connection	50	128.2 mm	**VIP-3/PT/FLK50/AN/2P/S7-1500**	2908499	1
- with screw connection	50	128.2 mm	**VIP-3/SC/FLK50/AN/2P/S7-1500**	2908497	1

VIP termination boards for analog I/O cards of Siemens SIMATIC® S7-1500

VARIOFACE termination board for Siemens S7-1500 systems with S7-1500-specific marking.

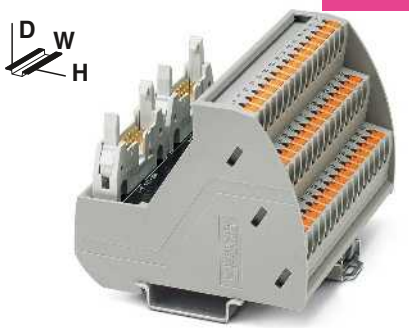
– Two 14-pos. IDC/FLK pin strips
– Separate potentials L+, M, P1, and P2
– Printed channel marking

new



Two 14-position IDC/FLK pin strip marked 1 to 20

new



Two 14-position IDC/FLK pin strip marked 21 to 40

Technical data

		VIP-3/PT/2FLK14/AN/2P/S7-1500A	VIP-3/SC/2FLK14/AN/2P/S7-1500A
Maximum permissible operating voltage		60 V AC/DC	60 V AC/DC
Maximum permissible operating voltage UL / CSA		60 V / 60 V	60 V / 60 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		7 A	7 A
Ambient temperature (operation)		-20 °C ... 60 °C	-20 °C ... 60 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Push-in connection solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	75.8 mm / 63 mm	68.8 mm / 60.7 mm

Technical data

		VIP-3/PT/2FLK14/AN/2P/S7-1500A	VIP-3/SC/2FLK14/AN/2P/S7-1500A
Maximum permissible operating voltage		60 V AC/DC	60 V AC/DC
Maximum permissible operating voltage UL / CSA		60 V / 60 V	60 V / 60 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		7 A	7 A
Ambient temperature (operation)		-20 °C ... 60 °C	-20 °C ... 60 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Push-in connection solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	75.8 mm / 63 mm	68.8 mm / 60.7 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board for Siemens S7-1500 marked 1 to 20					
- with Push-in connection	14	82.5 mm	**VIP-3/PT/2FLK14/AN/2P/S7-1500A**	2908465	1
- with screw connection	14	82.5 mm	**VIP-3/SC/2FLK14/AN/2P/S7-1500A**	2908464	1
VARIOFACE termination board for Siemens S7-1500 marked 21 to 40					
- with Push-in connection	14	82.5 mm	**VIP-3/PT/2FLK14/AN/2P/S7-1500B**	2908846	1
- with screw connection	14	82.5 mm	**VIP-3/SC/2FLK14/AN/2P/S7-1500B**	2908845	1

Siemens SIMATIC® S7-400 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

FLKM 50-PA-S400

– Transmission of max. 32 digital channels over one 50-position system cable.

Web code for the online configurator

Your web code: #0007

Notes:
Controller-specific modules page 508
Standard modules from page 526
For system cables, see page 550

Front adapter for SIMATIC® S7-400

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply)
Maximum permissible total current	2 A (per Byte, for supply via connector) 8 A (during supply via a separate bridged power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

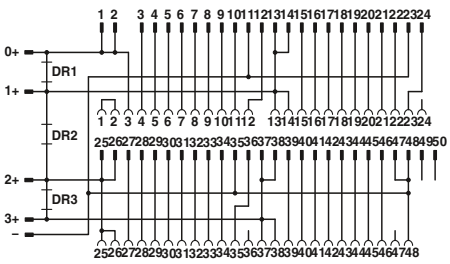
Ordering data

Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for - SIMATIC® S7-400, 1 x 32 channels can be connected	50	**FLKM 50-PA-S400**	2294500	2

Front adapters for I/O modules of the SIMATIC® S7-400 Siemens automation devices

Card type	FLKM 50-PA-S400
Digital input	6ES7 421-1BL01-0AA0 6ES7 421-7BH01-0AB0* 6ES7 421-7DH00-0AB0*
Digital output	6ES7 422-1BL00-0AA0 6ES7 422-7BL00-0AB0

* Only in conjunction with
VIP-2/SC/FLK50/S7/A-S400, Order No.: 2322359
VIP-2/PT/FLK50/S7/A-S400, Order No.: 2904289
All DR wire bridges on the adapter must be disconnected.



Connection scheme FLKM 50-PA-S400

Explanation:
IDC/FLK strip
Connection to I/O card
Screw terminal blocks for separate supply

Siemens SIMATIC® S7-400 Front adapter

The front adapters mean that pre-assembled system cables can be directly connected to I/O modules.

FLKM 50/4-FLK14/PA-S400

– Transmission of max. 32 digital channels via one 14-position system cable.

Tailor-made VARIOFACE termination boards with a variety of functions and connection options round off this system concept.

FLKM 50-PA-S400 (3-48)

– Analog channels are connected via a 50-position system cable.

The 1:1 connection of the adapter means that corresponding 1:1 termination boards are connected here.

Web code for the online configurator

Your web code: #0007

Notes:
Controller-specific modules from page 567
Standard modules from page 526
For system cables, see page 550

Front adapter for SIMATIC® S7-400

EAC

Technical data

	FLKM 50/ 4-FLK14/PA-S400	FLKM 50-PA-S400(3-48)
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible current	1 A (per path) 8 A (per connection, supply via separate power supply)	1 A (per path)
Maximum permissible total current	2 A (per Byte, for supply via connector)	-
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C	-20 °C ... 70 °C
Mounting position	any	any
Standards/regulations	IEC 60664 / DIN EN 50178	IEC 60664 / DIN EN 50178

Ordering data

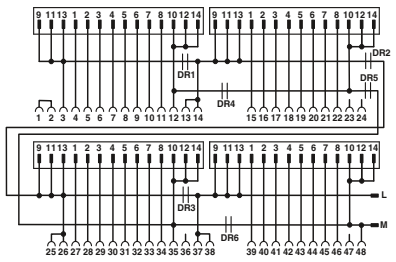
Description	No. of pos.	Type	Order No.	Pcs./ Pkt.
VARIOFACE front adapter, for				
- SIMATIC® S7-400, 4 x 8 channels can be connected	14	**FLKM 50/ 4-FLK14/PA-S400**	2294429	2
- SIMATIC® S7-400, only analog	50	**FLKM 50-PA-S400(3-48)**	2294908	2

Front adapters for I/O modules of the SIMATIC® S7-400 Siemens automation devices

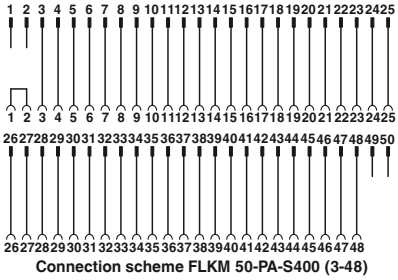
Card type	FLKM 50/4-FLK14/PA-S400
Digital input	6ES7 421-1BL01-0AA0
Digital output	6ES7 422-1BL00-0AA0 6ES7 422-7BL00-0AB0

Card type	FLKM 50-PA-S400 (3-48)
Analog input	6ES7 431-0HH00-0AB0** 6ES7 431-1KF00-0AB0** 6ES7 431-1KF10-0AB0** 6ES7 431-1KF20-0AB0** 6ES7 431-7KF00-0AB0** 6ES7 431-7KF10-0AB0** 6ES7 431-7QH00-0AB0**
Analog output	6ES7 432-1HF00-0AB0**

** Only in conjunction with
VIP-3/SC/FLK50, Order No.: 2315081
VIP-3/PT/FLK50, Order No.: 2903794
FLKM 50/KDS 3-MT/PPA/AN/PLC, Order No.: 2291587



Connection scheme: FLKM 50/4-FLK14/PA-S400



Connection scheme FLKM 50-PA-S400 (3-48)

Explanation:
- IDC/FLK strip
- Connection to I/O card
- Screw terminal blocks for separate supply

Yokogawa CENTUM VP and ProSafe-RS Front adapter

These front adapters for digital (50-pos.) and analog (40-pos.) I/O modules are connected directly to the modules.
Features:
– Molded connector
– Can be screwed on
– Lateral cable outlet of the I/O module
– KS or AKB-compatible connectors on the module side

Shielded

Shielded and halogen-free

		Technical data	Technical data
Maximum permissible operating voltage		30 V DC	30 V DC
Maximum permissible operating voltage UL / CSA		125 V / -	125 V / -
Maximum permissible current carrying capacity per path		500 mA (per path at 70°C)	500 mA (per path at 70°C)
Maximum conductor resistance		0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 70 °C	-20 °C ... 70 °C
Conductor cross section		AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated	7 / Cu tin-plated
Outside diameter			
	50-pos.	11 mm	11 mm
	40-pos.	9.8 mm	9.8 mm

			Ordering data			Ordering data		
Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Front adapter, for digital I/O modules								
	50	1 m	FLK 50-PA/EZ-DR/KS/ 100/YUC	2900991	1	FLK 50-PA/EZ-DR/HF/KS/ 100/YUC	2904739	1
	50	2 m	FLK 50-PA/EZ-DR/KS/ 200/YUC	2314299	1	FLK 50-PA/EZ-DR/HF/KS/ 200/YUC	2904740	1
	50	3 m	FLK 50-PA/EZ-DR/KS/ 300/YUC	2314309	1	FLK 50-PA/EZ-DR/HF/KS/ 300/YUC	2904741	1
	50	4 m	FLK 50-PA/EZ-DR/KS/ 400/YUC	2314312	1	FLK 50-PA/EZ-DR/HF/KS/ 400/YUC	2904742	1
	50	5 m	FLK 50-PA/EZ-DR/KS/ 500/YUC	2321499	1	FLK 50-PA/EZ-DR/HF/KS/ 500/YUC	2904636	1
	50	6 m	FLK 50-PA/EZ-DR/KS/ 600/YUC	2314927	1	FLK 50-PA/EZ-DR/HF/KS/ 600/YUC	2904743	1
	50	7 m	FLK 50-PA/EZ-DR/KS/ 700/YUC	2321509	1	FLK 50-PA/EZ-DR/HF/KS/ 700/YUC	2904744	1
	50	8 m	FLK 50-PA/EZ-DR/KS/ 800/YUC	2314930	1	FLK 50-PA/EZ-DR/HF/KS/ 800/YUC	2904745	1
	50	9 m	FLK 50-PA/EZ-DR/KS/ 900/YUC	2321512	1	FLK 50-PA/EZ-DR/HF/KS/ 900/YUC	2904746	1
	50	10 m	FLK 50-PA/EZ-DR/KS/1000/YUC	2314325	1	FLK 50-PA/EZ-DR/HF/KS/1000/YUC	2904637	1
	50	15 m	FLK 50-PA/EZ-DR/KS/1500/YUC	2314338	1	FLK 50-PA/EZ-DR/HF/KS/1500/YUC	2904638	1
	50	20 m	FLK 50-PA/EZ-DR/KS/2000/YUC	2314503	1	FLK 50-PA/EZ-DR/HF/KS/2000/YUC	2904487	1
	50	25 m	FLK 50-PA/EZ-DR/KS/2500/YUC	2314516	1	FLK 50-PA/EZ-DR/HF/KS/2500/YUC	2904639	1
	50	30 m	FLK 50-PA/EZ-DR/KS/3000/YUC	2314529	1	FLK 50-PA/EZ-DR/HF/KS/3000/YUC	2904640	1
Front adapter, for analog I/O modules								
	40	1 m	FLK 40-PA/EZ-DR/KS/ 100/YUC	2322786	1	FLK 40-PA/EZ-DR/HF/KS/ 100/YUC	2904747	1
	40	2 m	FLK 40-PA/EZ-DR/KS/ 200/YUC	2314341	1	FLK 40-PA/EZ-DR/HF/KS/ 200/YUC	2904748	1
	40	3 m	FLK 40-PA/EZ-DR/KS/ 300/YUC	2314354	1	FLK 40-PA/EZ-DR/HF/KS/ 300/YUC	2904749	1
	40	4 m	FLK 40-PA/EZ-DR/KS/ 400/YUC	2314367	1	FLK 40-PA/EZ-DR/HF/KS/ 400/YUC	2904750	1
	40	5 m	FLK 40-PA/EZ-DR/KS/ 500/YUC	2321570	1	FLK 40-PA/EZ-DR/HF/KS/ 500/YUC	2904645	1
	40	6 m	FLK 40-PA/EZ-DR/KS/ 600/YUC	2314943	1	FLK 40-PA/EZ-DR/HF/KS/ 600/YUC	2904751	1
	40	7 m	FLK 40-PA/EZ-DR/KS/ 700/YUC	2321583	1	FLK 40-PA/EZ-DR/HF/KS/ 700/YUC	2904752	1
	40	8 m	FLK 40-PA/EZ-DR/KS/ 800/YUC	2314956	1	FLK 40-PA/EZ-DR/HF/KS/ 800/YUC	2904753	1
	40	9 m	FLK 40-PA/EZ-DR/KS/ 900/YUC	2321415	1	FLK 40-PA/EZ-DR/HF/KS/ 900/YUC	2904754	1
	40	10 m	FLK 40-PA/EZ-DR/KS/1000/YUC	2314370	1	FLK 40-PA/EZ-DR/HF/KS/1000/YUC	2904646	1
	40	15 m	FLK 40-PA/EZ-DR/KS/1500/YUC	2314383	1	FLK 40-PA/EZ-DR/HF/KS/1500/YUC	2904647	1
	40	20 m	FLK 40-PA/EZ-DR/KS/2000/YUC	2314532	1	FLK 40-PA/EZ-DR/HF/KS/2000/YUC	2904488	1
	40	25 m	FLK 40-PA/EZ-DR/KS/2500/YUC	2314545	1	FLK 40-PA/EZ-DR/HF/KS/2500/YUC	2904648	1
	40	30 m	FLK 40-PA/EZ-DR/KS/3000/YUC	2314558	1	FLK 40-PA/EZ-DR/HF/KS/3000/YUC	2904649	1

Yokogawa CENTUM VP Front adapter

These front adapters for digital I/O modules are connected directly to the modules. Features:
– Lateral cable outlet of the I/O module
– Four 14-pos. connectors on the module side for connection of four 8-channel VARIOFACE modules of the system cabling

Shielded

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current carrying capacity per path		500 mA (per path at 70°C)
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Conductor cross section		AWG 26 / 0.14 mm²
Outside diameter		
	50-pos.	11 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Front adapter for digital I/O modules for coupling four 8-channel VARIOFACE modules					
	50	2 m	**CABLE-50/4FLK14/ 2,0M/YUC**	2314655	1
	50	4 m	**CABLE-50/4FLK14/ 4,0M/YUC**	2314671	1
	50	6 m	**CABLE-50/4FLK14/ 6,0M/YUC**	2318978	1
	50	10 m	**CABLE-50/4FLK14/10,0M/YUC**	2314684	1
	50	15 m	**CABLE-50/4FLK14/15,0M/YUC**	2322773	1
	50	20 m	**CABLE-50/4FLK14/20,0M/YUC**	2314778	1

Yokogawa CENTUM VP Front adapter for MINI Analog system cabling

This front adapter enables 16 MINI Analog modules to be connected to a Yokogawa controller. Together with two MINI MCR-2-V8-FLK 16 MINI Analog system adapters, the Yokogawa system cable is a simple, cost-effective “Plug and Play” solution.

The front adapter is connected directly to the Yokogawa module. Two 16-pos. IDC/FLK socket strips are attached for connecting the module to the MINI Analog system adapters.

Together with **4-conductor measuring transducers**, the front adapter is suitable for the following analog cards:
– AAI 141
– AAI 143

Shielded

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current carrying capacity per path		500 mA (per path at 70°C)
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		
	40-pos.	11 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Front adapter, for analog I/O modules for coupling two 8-channel MINI analog system adapters					
	40	2 m	**CABLE-40/2FLK16/ 2,0M/YUC**	2321334	1
	40	4 m	**CABLE-40/2FLK16/ 4,0M/YUC**	2321347	1
	40	10 m	**CABLE-40/2FLK16/10,0M/YUC**	2321350	1
	40	15 m	**CABLE-40/2FLK16/15,0M/YUC**	2321376	1
	40	20 m	**CABLE-40/2FLK16/20,0M/YUC**	2321363	1

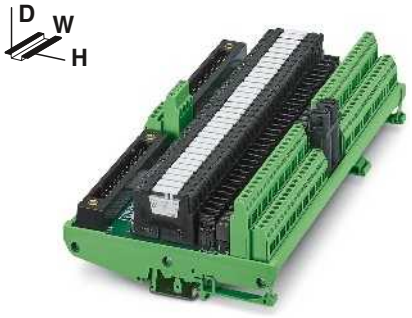
Yokogawa CENTUM VP Termination boards

These modules are connected to the I/O module via the 50-pos. YUC system cable (on page 516).

The advantages:

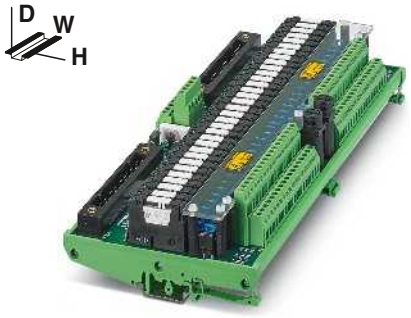
– For digital modules
– Relay with integrated LED display per channel
– Flat-type plug-in fuse per channel
– Jumper option for field-side or module-side voltage supply
– Power supply via fuses with failure indicator

new



24 V DC relay output module

new



230 V AC relay output module

	Technical data	Technical data
Coil side		
Operating voltage U_N	24 V DC	24 V DC
Typical input current at U_N	7 mA	7 mA
Typical response time at U_N	5 ms	5 ms
Typical release time at U_N	6 ms	6 ms
Input circuit	Freewheeling diode	Freewheeling diode
Status indicator per channel	green LED	green LED
Connection method	Screw connection	Screw connection
Connection data solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Contact side		
Contact type	1 N/O contact	1 N/O contact
Contact material	AgSnO	AgSnO
Limiting continuous current	2 A (protected by fuse (2 AT))	2 A (protected by fuse (2 AT))
Connection method	Yokogawa KS-compatible	Yokogawa KS-compatible
No. of pos.	50	50
General data		
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Nominal operating mode	100% operating factor	100% operating factor
Mechanical service life	2 x 10^7 cycles	2 x 10^7 cycles
Standards/regulations	DIN EN 50178 , IEC 60664-1	DIN EN 50178 , IEC 60664-1
Mounting position	any	any
Mounting	In rows with zero spacing	In rows with zero spacing
Dimensions H / D	128 mm / 55 mm	128 mm / 55 mm
EMC note	Class A product, see page 605	Class A product, see page 605

Description	Module width W	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
24 V DC relay module, for digital output modules ADV551, ADV561	218	**UM-2KS50/32R/SI/J/DO24V/YCS**	2908399	1			
230 V AC relay module, for digital output modules ADV551, ADV561	272				**UM-2KS50/32R/SI/J/ADV551/YCS**	2908400	1

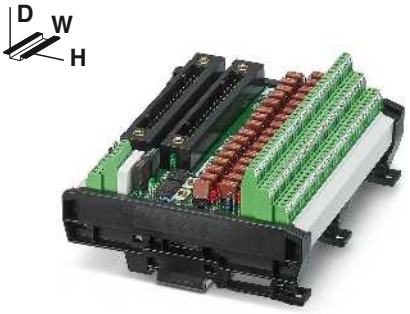
Yokogawa CENTUM VP Termination boards

new

This module is connected to the I/O module via the 50-pos. YUC system cable (on page 516).

The advantages:

– Potential supply terminal blocks per channel
– Reduced overall width, thanks to miniature terminal blocks
– Flat-type plug-in fuse with failure indicator per channel
– Redundant voltage supply with integrated voltage monitoring and signal contact
– Status indicator for the redundant voltage supply



24 V DC input module

Technical data

Maximum permissible operating voltage		24 V DC
Maximum permissible current (per branch)		250 mA (protected by fuse (F 250mA))
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1 mm² / 26 - 16
Dimensions	H / D	128 mm / 61 mm

Ordering data

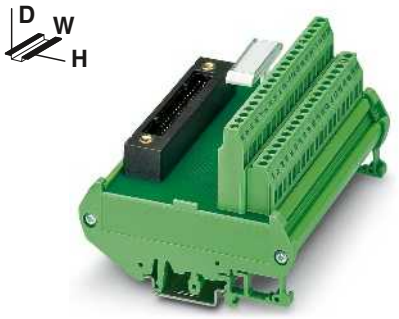
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
24 V DC input module, for digital input modules ADV151, ADV161		135 mm	**UM-2KS50/32IM/SI/BFI/YCS**	2908402	1

Yokogawa CENTUM VP
Termination boards

These modules are connected to the I/O module via the YUC system cable (on page 516).

FLKM-KS40/YCS:
– For analog modules
– Universal termination board with 40 connecting terminal blocks

Further system cabling solutions for Yokogawa at: phoenixcontact.com



Passive termination boards

Technical data

Maximum permissible operating voltage		< 25 V AC / 30 V DC
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	90 mm / 68 mm

Ordering data

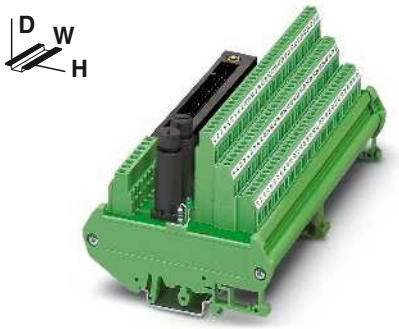
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for analog I/O modules					
	40	112 mm	**FLKM-KS40/YCS**	2314642	1

Yokogawa CENTUM VP
Termination boards

These modules are connected to the I/O module via the YUC system cable (on page 516).

FLKMS-KS50/32IM/YCS:
– For ADV151 and ADV551 digital modules
– Three-conductor connection (signal, plus, minus)
– Redundant voltage supply (fuse IEC 127-2, 5 x 20, 2 A)

Further system cabling solutions for Yokogawa at: phoenixcontact.com



Passive termination boards

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	90 mm / 81 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for ADV151 and ADV551 digital I/O modules					
	50	174 mm	**FLKMS-KS50/32IM/YCS**	2314451	1

Yokogawa CENTUM VP Termination boards

These modules are connected to the analog I/O module via the 40-pos. YUC system cable (on page 516).

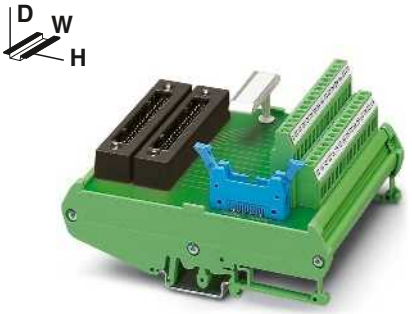
The modules are designed for redundant signal transmission (two connectors parallel). A separate connection to the HART multiplexer is possible.

FLKM-KS40/AO16/YCS
– For AAI543 analog module

FLKMS-KS40/SI/AI16/YCS
– For AAI141 and AAI143 analog modules (module operation in 4-conductor mode)
– Transfer of 16 channels with separate positive and negative connections
– 16 pluggable fuses (IEC 127-2, 5 x 20, 0.1 A) per positive supply and LED status indicator
– Redundant voltage supply (fuse IEC 127-2, 5 x 20, 2 A)

FLKMS-KS40/AI/YCS
– For AAI141 and AAI143 analog modules (module operation in 4-conductor mode)
– Transfer of 16 channels with separate positive and negative connections
– Redundant voltage supply (fuse IEC 127-2, 5 x 20, 2 A)

Further system cabling solutions for Yokogawa at: phoenixcontact.com



Termination boards for analog I/O modules

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		100 mA
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	126 mm / 68 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for AAI543 analog output modules	40	108 mm	**FLKM-KS40/AO16/YCS**	2314260	1
Termination board, with fuses and LED, for AAI141 and AAI143 analog input modules	40	214 mm	**FLKMS-KS40/SI/AI16/YCS**	2314273	1
Termination board, for AAI141 and AAI143 analog input modules, without fuses and LED	40	214 mm	**FLKMS-KS40/AI/YCS**	2314286	1

Yokogawa ProSafe-RS Termination boards

These modules are connected to the I/O module via the 50-pos. YUC system cable (on page 516).

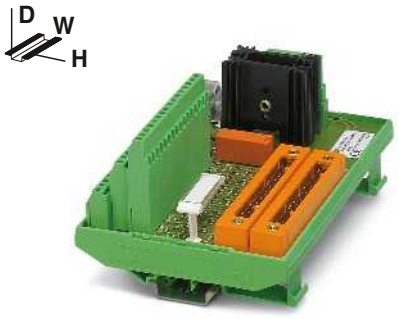
– For SDV144 digital module
– Redundant signal transmission (two parallel connectors)
– 16 channels

UM-2KS50/16DI/RS/MKDS

– Screw connection
– Redundant voltage supply with signaling relay and fuse (IEC 127-2, 5 x 20, 3,15 AT)
– LED status display per channel

UM-2KS50/DI16/RS/K-MT/SO241

– Screw connection with knife disconnection
– Redundant voltage supply with signaling relay and fuse (TR5, 2 AT)
– Plug-in fuses (TR5, 0,1 AT) and LED status indicator per channel



Passive termination boards

Technical data

Maximum permissible operating voltage		24 V DC ±5 %
Maximum permissible current (per branch)		100 mA
Ambient temperature (operation)		-20 °C ... 70 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 14
Dimensions	H / D	112 mm / 80 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for I/O card: SDV144					
- with LED status indicator	50	162 mm	**UM-2KS50/16DI/RS/MKDS**	2900173	1
- with fuse and LED status indicator	50	181 mm	**UM-2KS50/DI16/RS/K-MT/SO241**	2319618	1

Yokogawa ProSafe-RS Termination boards

These modules are connected to the I/O module via the 40-pos. YUC system cable (on page 516).

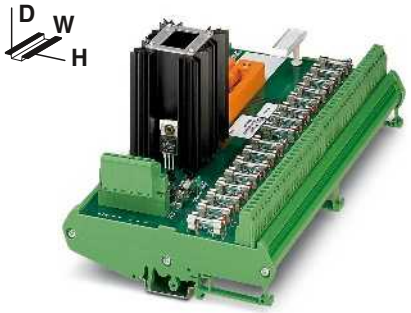
– Redundant signal transmission (two parallel connectors)

UM-2KS40/16AI/SI/RS/SO225

– For SAI143 analog module
– Screw connection
– Redundant voltage supply with signaling relay and fuse (IEC 127-2, 5 x 20, 10 AT)
– Plug-in fuses (IEC 127-2, 5 x 20, 1 AT) and LED status indicator per channel

UM-2KS40/16AIO/RS/SO225

– For SAI143, SAV144, SAI533 analog modules
– Screw connection
– 16 analog inputs or 8 analog outputs



Passive termination boards

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 55 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	126 mm / 96 mm

Ordering data

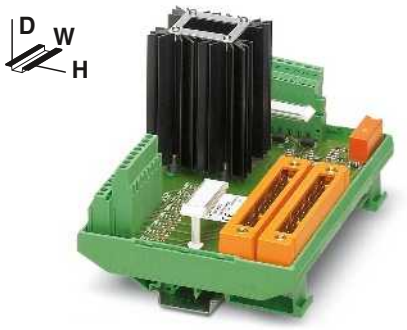
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for I/O card: SAI143					
	50	250 mm	**UM-2KS40/16AI/SI/RS/SO225**	2319841	1
Termination board, for I/O card: SAI143, SAV144, and SAI533					
	50	168 mm	**UM-2KS40/16AIO/RS/SO225**	2319838	1

Yokogawa ProSafe-RS Termination boards

These modules are connected to the I/O module via the 50-pos. YUC system cable (on page 516).

UM-2KS50/8DO/RS/MKDS

– For SDV531 and SDV531L digital modules
– Redundant signal transmission (two parallel connectors)
– Screw terminal blocks
– Redundant voltage supply with signaling relay and fuse (IEC 127-2, 5 x 20, 3,15 AT)
– LED status display per channel



Passive termination boards

Technical data

Maximum permissible operating voltage		24 V DC ±5 %
Maximum permissible current (per branch)		100 mA
Ambient temperature (operation)		-20 °C ... 70 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 14
Dimensions	H / D	112 mm / 80 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for I/O card: SDV531 and SDV531L					
	50	162 mm	**UM-2KS50/ 8DO/RS/MKDS**	2900174	1

Yokogawa ProSafe-RS Termination boards

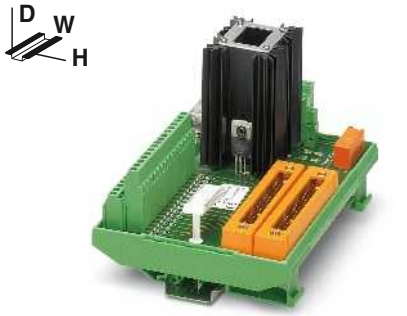
These modules are connected to the I/O module via the 50-pos. YUC system cable (on page 516).
– Redundant signal transmission (two parallel connectors)
– Redundant voltage supply with signaling relay and fuse (IEC 127-2, 5 x 20, 6,3 AT)
– For SDV541 digital modules

UM-2KS50/DO16/RS/K-MT/SO241

– Screw connection with knife disconnection
– Plug-in fuses (TR5, 0,2 AT) and LED status indicator per channel

UM-2KS50/16DO/RS/MKDS

– Screw connection
– LED status display per channel



Passive termination boards

Technical data

Maximum permissible operating voltage		24 V DC ±5 %
Maximum permissible current (per branch)		100 mA
Ambient temperature (operation)		-20 °C ... 70 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Yokogawa KS-compatible
Connection data solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 14
Dimensions	H / D	112 mm / 80 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Termination board, for I/O card: SDV541					
- with LED status indicator	50	162 mm	**UM-2KS50/16DO/RS/MKDS**	2900175	1
- with fuse and LED status indicator	50	215 mm	**UM-2KS50/DO16/RS/K-MT/SO241**	2319595	1

Termination Carriers for Yokogawa CENTUM VP and ProSafe-RS

The Termination Carriers are a compact solution for connecting signal conditioners and coupling relays to the Yokogawa CENTUM VP and ProSafe-RS systems.

– Mechanically decoupled PCB
– Redundant system connection
– Simple or redundant supply (diode decoupling, polarity reversal protection) and monitoring function. Implementation via separate DIN rail module or integrated switching on the PCB

Termination Carriers for MINI Analog signal conditioners

TC-2KS40-AI16-M-PRH-CS
– For AAI141/AAI143 analog I/O modules

TC-2KS40-AO16-M-PRH-CS
– For AAI543 analog I/O module

Termination Carriers for Ex i signal conditioners of the MACX Analog Ex series

TC-2KS50-DI32-2EX-PR-CS
– For ADV151/ADV161 digital I/O modules

TC-2KS50-DO32-EX-PR-CS
– For ADV551/ADV digital I/O modules

TC-2KS40-AO16-EX-PR-CS
– For AAI543 analog I/O module

TC-2KS40-AI16-EX-PR-CS
– For AAI141/AAI143 analog I/O modules

TC-2KS50-DO16-EX-PR-RS
– For SDV541 digital I/O module

TC-2KS50-DI16-EX-PR-RS
– For SDV144 digital I/O modules

TC-2KS40-AI16-EX-PR-RS
– For SAI143 analog I/O module

TC-2KS40-AO8-EX-PR-RS
– For SAI533 analog I/O module

Termination Carriers for coupling relays from the PSR-ETP or PSR-FSP series

TC-2KS50-DO16-F&G-AR-RS
– For SDV541 digital I/O modules

TC-2KS50-DO16-ESD-AR-RS
– For SDV541 digital I/O modules

Termination Carrier for Centum VP system, can be used with signal conditioners of the MINI Analog series

Ex:

Technical data

General data	
Connection to the control system level	Yokogawa KS-compatible
Maximum operating voltage	< 30 V DC (Per signal/channel)
Maximum permissible current	23 mA (Signal/channel)
Degree of pollution/surge voltage category	2 / II
Air clearances and creepage distances	DIN EN 50178 (Basic insulation)
Ambient temperature range	-20 °C ... 60 °C (Please observe module specifications)
Shock	15g, according to IEC 60068-2-27
Vibration (operation)	2g, according to IEC 60068-2-6
Dimensions H / D	170 / 160 mm
EMC note	
Power supply via power module	
Input voltage range	19.2 V DC ... 30 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2x 2.5 A on PCB, slow-blow (replaceable)
Status indication	2 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Switching output	1 N/C contact (alarm = open)

Ordering data

Description	Module width W	Type	Order No.	Pcs./ Pkt.
Termination Carrier for 16 highly compact signal conditioners				
- For AAI141 and AAI143 analog I/O modules	148 mm	**TC-2KS40-AI16-M-PRH-CS**	2905257	1
- For AAI543 analog I/O modules	148 mm	**TC-2KS40-AO16-M-PRH-CS**	2905905	1
Termination Carrier for 16/32 Ex i signal conditioners (SIL 2)				
- For ADV151 and ADV161 digital I/O modules	242 mm			
- For ADV551 and ADV561 digital I/O modules	448 mm			
- For AAI543 analog I/O module	242 mm			
- For AAI141 and AAI143 analog I/O modules	242 mm			
Termination Carrier for 8/16 Ex i signal conditioners (SIL 2)				
- For SDV144 digital I/O modules	242 mm			
- For SDV541 digital I/O modules	242 mm			
- For SAI143 analog I/O module	242 mm			
- For SAI533 analog I/O module	148 mm			
Termination Carrier for 16 PSR-FSP/PSR-ETP relays				
- For SDV541 digital I/O modules (low-demand application)	304 mm			
- For SDV541 digital I/O module (high-demand application)	304 mm			

Accessories

MINI Analog power terminal		**MINI MCR-SL-PTB-FM**	2902958	1
MINI Analog fault signaling module		**MINI MCR-SL-FM-RC-NC**	2902961	1
Power and fault signaling module				
Cable set with 24 V module supply, suitable for PSR-ETP/Order No.: 2986711				
Cable set without use of confirmation contact, suitable for PSR-FSP/Order No.: 2981978				
Cable set with use of confirmation contact, suitable for PSR-FSP/Order No.: 2986960 and 2986575				
Jumper plug for occupying unused module slots, suitable for PSR-FSP/Order No.: 2986960 and 2986575				

Termination Carrier for Centum VP System, can be used with Ex i signal conditioners of the MACX Analog Ex series

Termination Carrier for ProSafe-RS system, can be used with Ex i signal conditioners of the MACX Analog Ex series

Termination Carrier for ProSafe-RS system, can be used with coupling relays from the PSR-ETP or PSR-FSP series

Technical data

Yokogawa KS-compatible
< 30 V DC (Per signal/channel)
1 A (Signal/channel)
2 / II
DIN EN 50178 (Basic insulation)
-20 °C ... 60 °C (Please observe module specifications)

15g, according to IEC 60068-2-27
2g, according to IEC 60068-2-6
170 / 160 mm

19.2 V DC ... 30 V DC
yes, decoupled from diodes
Yes
2x 2.5 A on PCB, slow-blow (replaceable)

1 x red LED (error)
2x green LEDs (PWR1 and PWR2)
1 N/C contact (alarm = open)

Ordering data

Type	Order No.	Pcs./ Pkt.
TC-2KS50-DI32-2EX-PR-CS	2904676	1
TC-2KS50-DO32-EX-PR-CS	2905199	1
TC-2KS40-AO16-EX-PR-CS	2905201	1
TC-2KS40-AI16-EX-PR-CS	2905677	1

Accessories

TC-MACX-MCR-PTB	2904673	1

Technical data

Yokogawa KS-compatible
< 30 V DC (Per signal/channel)
1 A (Signal/channel)
2 / II
DIN EN 50178 (Basic insulation)
-20 °C ... 60 °C (Please observe module specifications)

15g, according to IEC 60068-2-27
2g, according to IEC 60068-2-6
170 / 160 mm

19.2 V DC ... 30 V DC
yes, decoupled from diodes
Yes
2x 2.5 A on PCB, slow-blow (replaceable)

1 x red LED (error)
2x green LEDs (PWR1 and PWR2)
1 N/C contact (alarm = open)

Ordering data

Type	Order No.	Pcs./ Pkt.
TC-2KS50-DI16-EX-PR-RS	2905202	1
TC-2KS50-DO16-EX-PR-RS	2905678	1
TC-2KS40-AI16-EX-PR-RS	2905203	1
TC-2KS40-AO8-EX-PR-RS	2905204	1

Accessories

TC-MACX-MCR-PTB	2904673	1

Technical data

Yokogawa KS-compatible
24 V DC (21.1 V ... 26.4 V)
1 A (Per signal/channel)
2 / II
DIN EN 50178 (Basic insulation)
-20 °C ... 60 °C

15g, according to IEC 60068-2-27
2g, according to IEC 60068-2-6
170 / 160 mm
Class A product, see page 605

21.1 V DC ... 26.4 V DC
yes, decoupled from diodes
Yes
2.5 A on PCB, slow-blow (replaceable)

2 x red LED (error)
2x green LEDs (PWR1 and PWR2)
1 N/C contact (alarm = open)

Ordering data

Type	Order No.	Pcs./ Pkt.
TC-2KS50-DO16-F&G-AR-RS	2904112	1
TC-2KS50-DO16-ESD-AR-RS	2904113	1

Accessories

TC-C-PSR3-SC-A100V+A20000	2903391	16
TC-C-PSR3-SC-A10000A20000	2903389	16
TC-C-PSR3-SC-A10000A23132	2903390	16
TC-C-PTSM-50-00000000J1J1	2903388	8

VIP termination boards for 8 channels

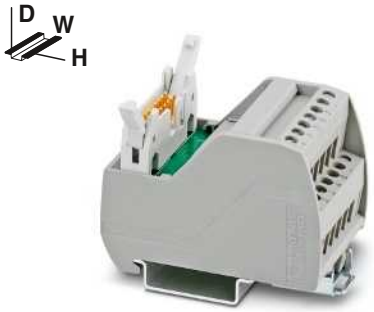
These VIP - VARIOFACE Professional modules are used in combination with 14-pos. system cables and the relevant front adapters.

Features:

– Byte-wise marking
– For digital I/O modules
– With LED as an option

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards for input/output with screw connection

Passive termination boards for input/output with Push-in connection

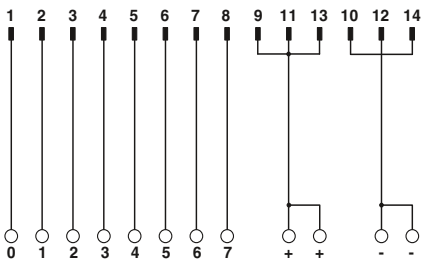
Technical data

		VIP-2/.../FLK14/PLC	VIP-2/.../FLK14/LED/PLC
Maximum permissible operating voltage		60 V AC/DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		3 A	3 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	65.5 mm / 56 mm	

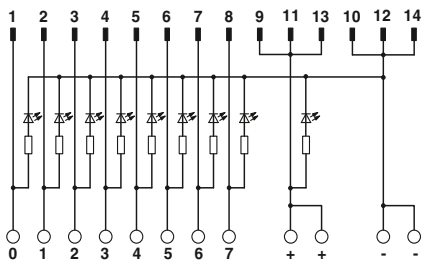
Technical data

		VIP-2/.../FLK14/PLC	VIP-2/.../FLK14/LED/PLC
Maximum permissible operating voltage		60 V AC/DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		3 A	3 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Push-in connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	72.1 mm / 56 mm	

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for eight channels,					
- with screw connection	14	39.8 mm	**VIP-2/SC/FLK14/PLC**	2315214	1
- with Push-in connection	14	41.9 mm	**VIP-2/PT/FLK14/PLC**	2903801	1
VARIOFACE termination board, for eight channels with light indicator,					
- with screw connection	14	39.8 mm	**VIP-2/SC/FLK14/LED/PLC**	2322249	1
- with Push-in connection	14	41.9 mm	**VIP-2/PT/FLK14/LED/PLC**	2904279	1



Connection scheme VIP-2/SC/FLK14/PLC



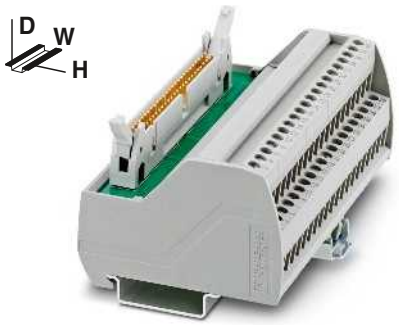
Connection scheme VIP-2/SC/FLK14/LED/PLC

VIP termination boards for 32 channels

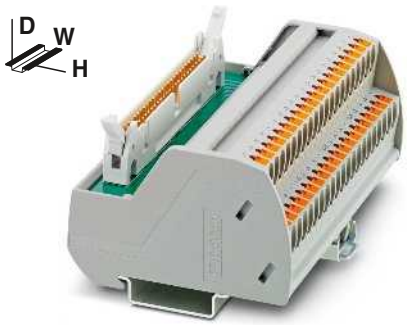
These VIP - VARIOFACE Professional modules are used in combination with 50-pos. system cables and the relevant front adapters.

Features:
– Byte-wise marking
– For digital I/O modules
– With LED as an option

Notes:
For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards for input/output with screw connection



Passive termination boards for input/output with Push-in connection

Technical data

		VIP-2/.../FLK50/PLC	VIP-2/.../FLK50/LED/PLC
Maximum permissible operating voltage		60 V AC/DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		2 A (per byte)	2 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	65.5 mm / 56 mm	

Technical data

		VIP-2/.../FLK50/PLC	VIP-2/.../FLK50/LED/PLC
Maximum permissible operating voltage		60 V AC/DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		2 A (per byte)	2 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Push-in connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	72.1 mm / 56 mm	

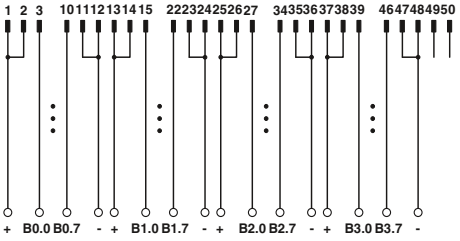
Description	No. of pos.	Module width W
VARIOFACE termination board, for 32 channels,		
- with screw connection	50	106.1 mm
- with Push-in connection	50	107.9 mm
VARIOFACE termination board, for 32 channels with light indicator,		
- with screw connection	50	106.1 mm
- with Push-in connection	50	107.9 mm

Ordering data

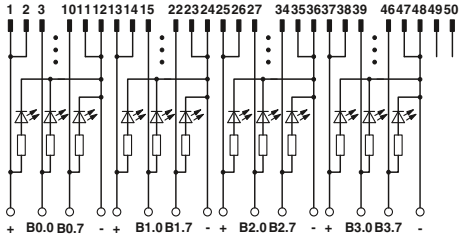
Type	Order No.	Pcs./ Pkt.
VIP-2/SC/FLK50/PLC	2315227	1
VIP-2/SC/FLK50/LED/PLC	2322252	1

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/FLK50/PLC	2903803	1
VIP-2/PT/FLK50/LED/PLC	2904280	1



Connection scheme VIP-2/SC/FLK50/PLC



Connection scheme VIP-2/SC/FLK50/LED/PLC

VIP termination boards in 2-conductor connection technology for 8 channels

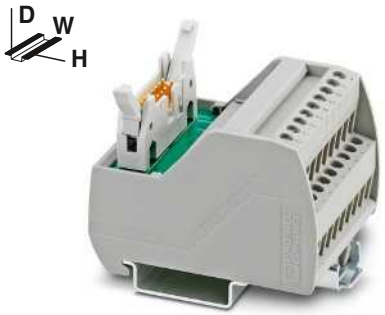
These VIP - VARIOFACE Professional modules are used in combination with 14-pos. system cables and the relevant front adapters.

Features:

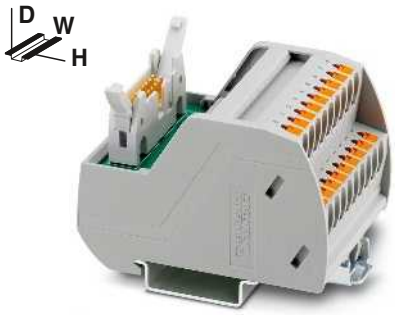
– Byte-wise marking
– For digital I/O modules
– Negative or positive connection per signal.

Notes:

For marking systems (e.g., “ZB 22:UNBEDRUCKT”; Order No. 0811862) and mounting material, see Catalog 3.



Passive termination boards with screw connection



Passive termination boards with Push-in connection

Technical data

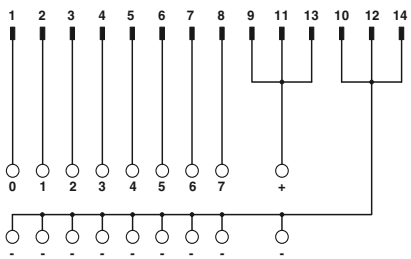
Maximum permissible operating voltage		60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		3 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

Technical data

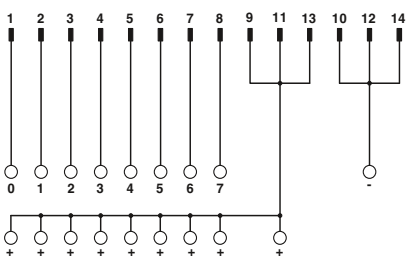
Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		3 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Push-in connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Dimensions	H / D	72.1 mm / 56 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for eight channels, each with an additional terminal block per signal for a common minus potential					
- with screw connection	14	50 mm	**VIP-2/SC/FLK14/8M/PLC**	2322281	1
- with Push-in connection	14	52 mm	**VIP-2/PT/FLK14/8M/PLC**	2904283	1
VARIOFACE termination board, for eight channels, each with an additional terminal block per signal for a common plus potential					
- with screw connection	14	50 mm	**VIP-2/SC/FLK14/8P/PLC**	2322294	1
- with Push-in connection	14	52 mm	**VIP-2/PT/FLK14/8P/PLC**	2904284	1



Connection scheme VIP-2/.../FLK14/8M/PLC



Connection scheme VIP-2/.../FLK14/8P/PLC

Termination boards in 2-conductor connection technology for 32 channels

These VARIOFACE modules are used in combination with 50-pos. system cables and the relevant front adapters.

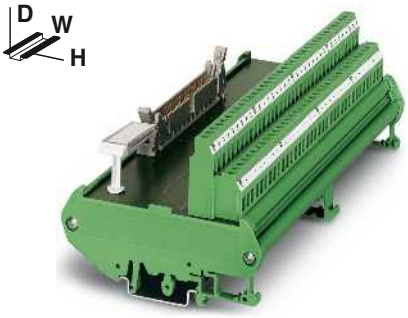
The following module types with 2-conductor connection technology are available:

FLKM 50/32M/PLC

– Byte-wise marking
– For digital I/O modules
– Negative connection per signal.

FLKM 50/32P/PLC

– Byte-wise marking
– For digital I/O modules
– Positive connection per signal.



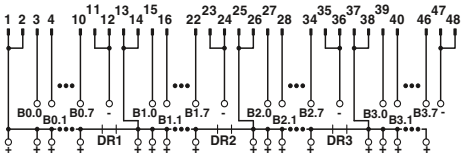
Passive termination boards with screw connection

Technical data

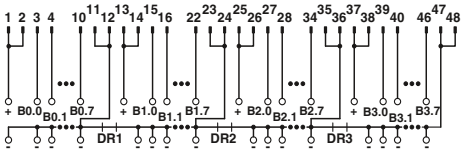
Maximum permissible operating voltage		60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		8 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection method	Field level	Screw connection
	Controller level	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	90 mm / 68 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for 32 channels, each with an additional terminal block per signal for a common minus potential	50	192 mm	**FLKM 50/32M/PLC**	2289719	1
VARIOFACE termination board, for 32 channels, each with an additional terminal block per signal for a common plus potential	50	192 mm	**FLKM 50/32P/PLC**	2291121	1



Connection scheme: FLKM 50/32P/PLC



Connection scheme: FLKM 50/32M/PLC

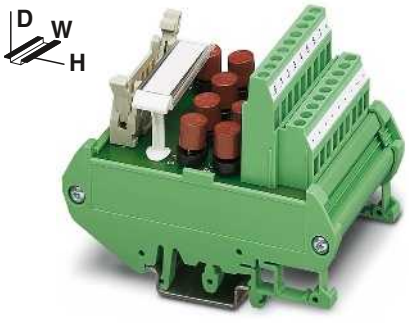
Termination boards with fuses in 2-conductor connection technology

These VARIOFACE modules are used in combination with 14 or 50-pos. system cables and the relevant front adapters.

The following module types with fuses and 2-conductor connection technology are available:

FLKM 14/8M/SI/PLC (for 8 channels)
FLKM 50/32M/SI/PLC (for 32 channels)

– Byte-wise marking
– Can be used for digital I/O modules
– Pluggable fuse (IEC 127-3, 1AF) per signal path (F1)
– Pluggable fuse (IEC 127-3, 2AF) per voltage supply (F2)
– Negative connection per signal.



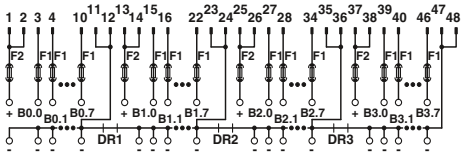
Passive fuse modules for 8 or 32 channels

Technical data

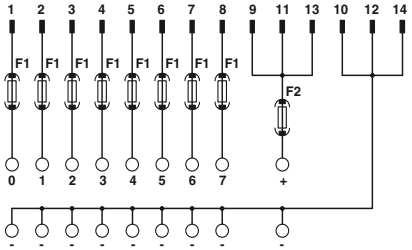
		FLKM 14/8M/SI/PLC	FLKM 50/32M/SI/PLC
Maximum permissible operating voltage		60 V DC	60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -	125 V / -
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		2 A	2 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178 , IEC 60664	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	90 mm / 68 mm	

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, for eight channels, each with an additional terminal block and fuse per signal, (common minus potential)	14	57 mm	**FLKM 14/8M/SI/PLC**	2294487	1
VARIOFACE module, for 32 channels, each with an additional terminal block and fuse per signal, (common minus potential)	50	192 mm	**FLKM 50/32M/SI/PLC**	2294490	1



Connection scheme: FLKM 50/32M/SI/PLC



Connection scheme: FLKM 14/8M/SI/PLC

VIP initiator modules for 8 channels

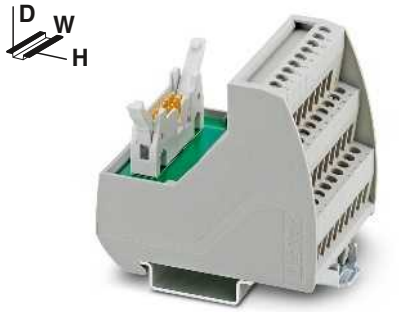
These VIP - VARIOFACE Professional modules are used in combination with 14-pos. system cables and the relevant front adapters.

Features:

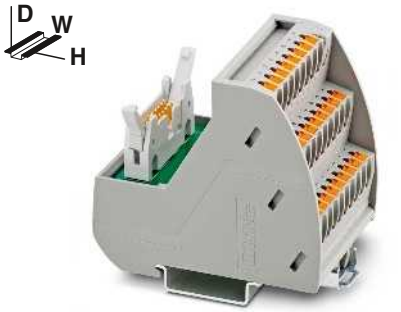
– Byte-wise marking
– For digital I/O modules
– Positive and negative connection per signal
– With LED as an option

Notes:

For marking systems (e.g., “ZB 22:UNBEDRUCKT”; Order No. 0811862) and mounting material, see Catalog 3.



Initiator modules with screw connection



Initiator modules with Push-in connection

Technical data

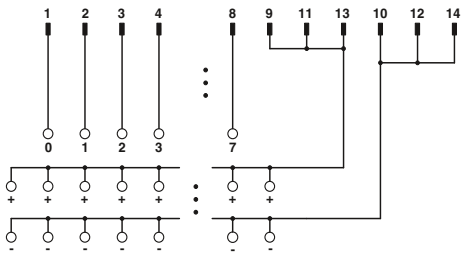
		VIP-3/SC/FLK14/8IM/PLC	VIP-3/SC/FLK14/8IM/LED/PLC
Maximum permissible operating voltage		60 V DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / -	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		3 A	3 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	69 mm / 62 mm	

Technical data

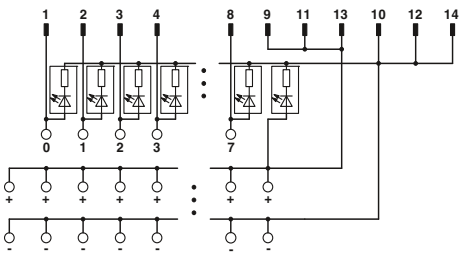
		VIP-3/PT/FLK14/8IM/PLC	VIP-3/PT/FLK14/8IM/LED/PLC
Maximum permissible operating voltage		60 V AC/DC	24 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	24 V / 24 V
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		3 A	3 A
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	
Connection method	Field level	Push-in connection	Push-in connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	
Dimensions	H / D	75.8 mm / 63 mm	

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE initiator module, for connecting 8 PNP initiators, with an additional positive and negative terminal block each per signal					
- with screw connection	14	52.3 mm	**VIP-3/SC/FLK14/8IM/PLC**	2322278	1
- with Push-in connection	14	52 mm	**VIP-3/PT/FLK14/8IM/PLC**	2904282	1
VARIOFACE initiator module with LED, for connecting 8 PNP initiators, with an additional positive and negative terminal block each per signal					
- with screw connection	14	52.3 mm	**VIP-3/SC/FLK14/8IM/LED/PLC**	2322265	1
- with Push-in connection	14	52 mm	**VIP-3/PT/FLK14/8IM/LED/PLC**	2904281	1



Connection scheme VIP-3/.../FLK14/8IM/PLC



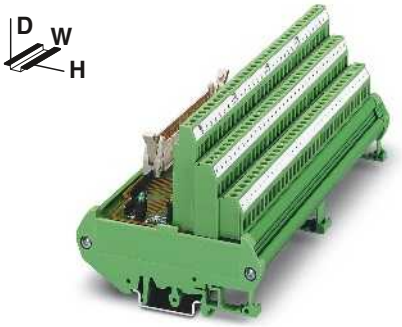
Connection scheme VIP-3/.../FLK14/8IM/LED/PLC

Initiator modules for 32 channels

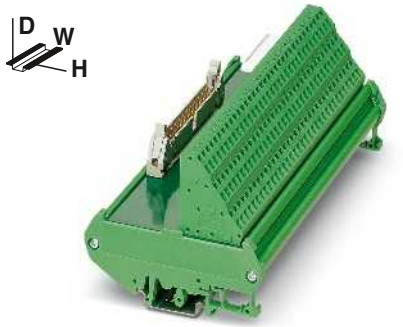
These VARIOFACE modules are used in combination with 50-pos. system cables and the relevant front adapters for digital I/O modules.

Features:

– Byte-wise marking
– Positive and negative connection per signal
– With LED as an option



Initiator modules for 32 channels, with screw connection



Initiator modules for 32 channels, with spring-cage connection

Technical data

		... 50/32 IM	... 50/32 IM/LA
Maximum permissible operating voltage		60 V DC	30 V DC
Maximum permissible operating voltage UL / CSA		125 V / -	24 V / -
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		2 A (per byte)	2 A (per byte)
Status indication		-	LED
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178 , IEC 60664	
Connection method	Field level	Screw connection	Screw connection
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	90 mm / 81 mm	

Technical data

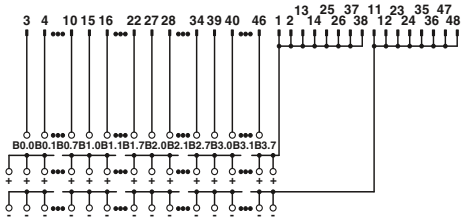
	60 V DC
	- / -
	1 A
	2 A (per byte)
	-
	-20 °C ... 50 °C
	any
	DIN EN 50178 , IEC 60664
	Spring-cage connection
	IDC/FLK pin strip
	0.2 ... 2.5 mm² / 0.2 ... 1.5 mm² / 24 - 12
	90 mm / 73.5 mm

Ordering data

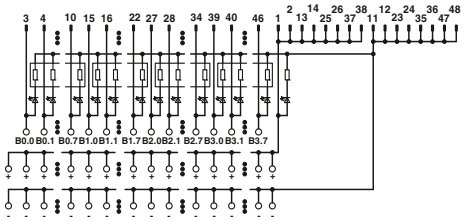
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE initiator module, for connection of 32 PNP initiators	50	180 mm	**FLKMS 50/32IM/PLC**	2284523	1
VARIOFACE initiator module, as above, but with light indicator	50	180 mm	**FLKMS 50/32IM/LA/PLC**	2284510	1
VARIOFACE initiator module, for connection of 32 PNP initiators	50	180 mm			

Ordering data

Type	Order No.	Pcs./ Pkt.
FLKMS 50/32IM/ZFKDS/PLC	2901389	1



Connection scheme: FLKMS 50/32IM/PLC, ...50/32IM/ZFKDS/PLC



FLKMS 50/32IM/LA/PLC connection scheme

Termination boards with knife disconnect terminal blocks

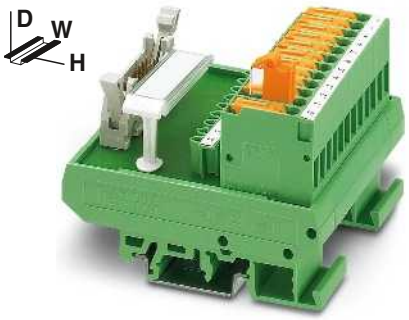
These VARIOFACE modules with knife disconnection and test connection for each signal (2 or 2.3 mm Ø test plug) are used in combination with the respective front adapters.

FLKM14/KDS3-MT/PPA/PLC (for 8 channels)
FLKM 50/KDS3-MT/PPA/PLC (for 32 channels)
– Byte-wise marking
– Can be used for digital I/O modules

FLKM-2FLK14/KDS3-MT/PPA/S7
– Numerical marking (1-20)
– Specifically for S7-300 (in conjunction with the front adapter FLKM 14-PA-S300, Order No. 2299770)

FLKM 50/KDS3-MT/PPA/7-300
– Numerical marking (1-40)
– Specifically for S7-300 (in conjunction with the front adapter FLKM 50-PA-S300, Order No. 2294445)

FLKM 50/KDS3-MT/PPA/AN/PLC
– Numerical marking (1-50)
– Specifically for S7-400 (in conjunction with the front adapter FLKM 50-PA-S400 (3-48) Order No. 2294908)



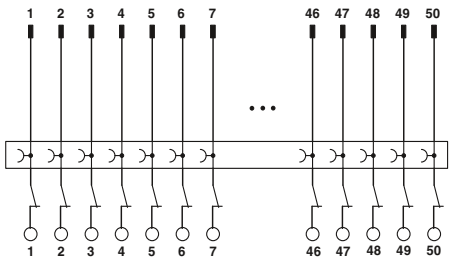
Passive termination boards for 8 or 32 channels with knife disconnect terminal blocks

Technical data

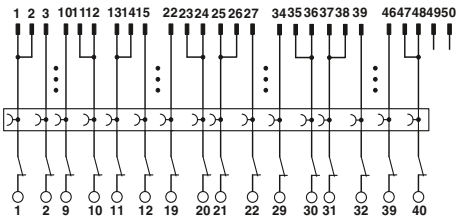
		FLKM...14/KDS 3-MT...	FLKM 50/KDS 3-MT...
Maximum permissible operating voltage		60 V DC	60 V DC
Maximum permissible operating voltage UL / CSA		24 V / -	24 V / -
Maximum permissible current (per branch)		1 A	1 A
Maximum total current (voltage supply)		3 A	2 A (per byte)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		DIN EN 50178 , IEC 60664	
Connection method	Field level	Screw connection with disconnect knife	Screw connection with disconnect knife
	Controller level	IDC/FLK pin strip	IDC/FLK pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions	H / D	77 mm / 61 mm	

Ordering data

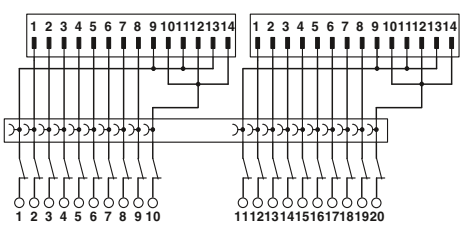
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for eight channels, with knife disconnect terminal blocks and test sockets to the field and the system	14	67 mm	**FLKM 14/KDS3-MT/PPA/PLC**	2290423	1
VARIOFACE termination board, for 32 channels, with knife disconnect terminal blocks and test sockets to the field and the system	50	214 mm	**FLKM 50/KDS3-MT/PPA/PLC**	2290614	1
VARIOFACE termination board, for SIMATIC S7-300 with SIMATIC-specific marking (1-20), knife disconnect terminal blocks, and test sockets to the field and the system	14	113 mm	**FLKM-2FLK14/KDS3-MT/PPA/S7**	2295062	1
VARIOFACE termination board, as above, but with SIMATIC-specific marking (1-40)	50	214 mm	**FLKM 50/KDS3-MT/PPA/S7-300**	2304490	1
VARIOFACE termination board, as above, but for SIMATIC S7-400 with SIMATIC-specific marking (3-48)	50	259 mm	**FLKM 50/KDS3-MT/PPA/AN/PLC**	2291587	1



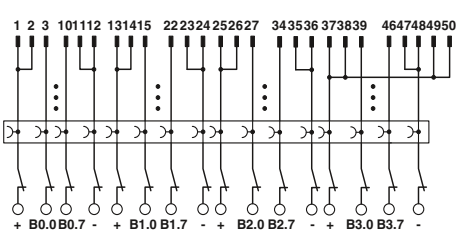
FLKM 50/KDS3-MT/PPA/AN/PLC connection scheme



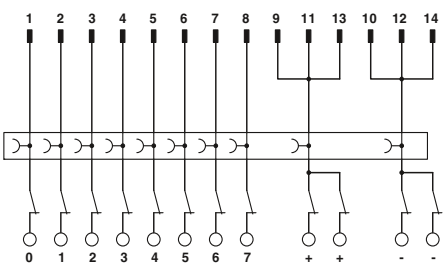
FLKM 50/KDS3-MT/PPA/S7-300 connection scheme



FLKM-2FLK14/KDS3-MT/PPA/S7 connection scheme



FLKM 50/KDS3-MT/PPA/PLC connection scheme



FLKM 14/KDS3-MT/PPA/PLC connection scheme

Simulation module with switches

These VARIOFACE modules enable simple simulation of the control and peripheral hardware for 8 signals.

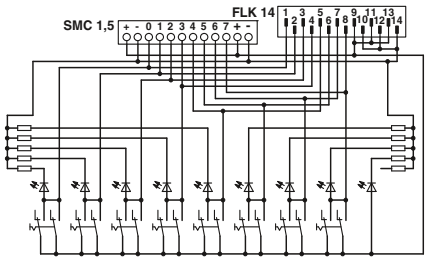
The UM 45-DI/DO/S/LA/SIM8 switch module is equipped with a COMBICON screw connector for single-conductor wiring for signal transmission. Alternatively, connection to the PLC system cabling is possible via a 14-pos. IDC/FLK pin strip. Connection to the front adapters of the PLC system cabling is possible via 14-pos. system cables with IDC/FLK socket strip.

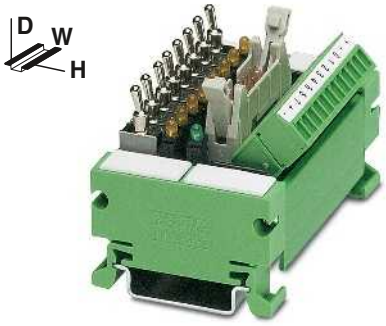
Each signal path is allocated an LED which signals the "high active" signal state. The supply voltage to the modules is signaled via a green LED.

Notes:

Type of housing:
Terminal blocks: polyamide PA, non-reinforced, color: green.
Housing: PVC

Marking systems and mounting material
See Catalog 3





Switch module

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		8 A (+, - terminal block)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection data solid/stranded/AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Dimensions	H / D	45 mm / 51 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE switch module, for simulation		75 mm	**UM 45-DI/DO/S/LA/SIM8**	2968205	1

Simulation module for indication

These VARIOFACE modules enable simple simulation of the control and peripheral hardware for 8 signals.

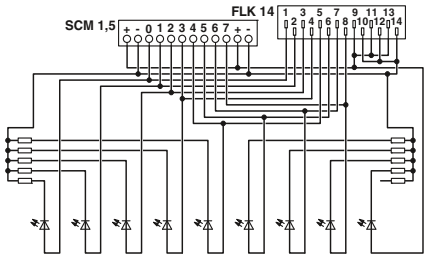
The UM 45-DO/LA/SIM8 indicator module is equipped with a COMBICON screw connector for single-conductor wiring for signal transmission. Alternatively, connection to the PLC system cabling is possible via a 14-pos. IDC/FLK pin strip. Connection to the front adapters of the PLC system cabling is possible via 14-pos. system cables with IDC/FLK socket strip.

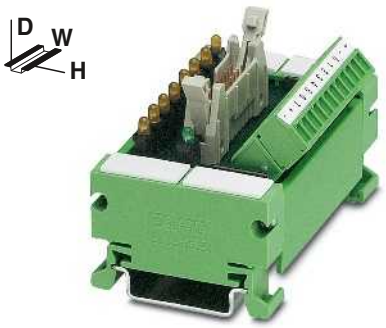
Each signal path is allocated an LED which signals the "high active" signal state. The supply voltage to the modules is signaled via a green LED.

Notes:

Type of housing:
Terminal blocks: polyamide PA, non-reinforced, color: green.
Housing: PVC

Marking systems and mounting material
See Catalog 3





Indicator module

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A
Maximum total current (voltage supply)		8 A (+, - terminal block)
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178 , IEC 60664
Connection data solid/stranded/AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 28 - 16
Dimensions	H / D	45 mm / 51 mm

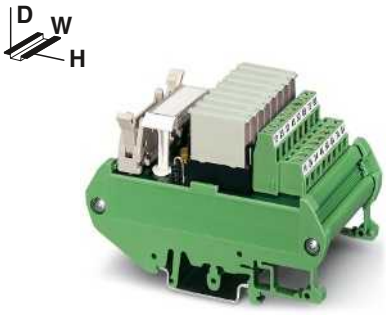
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE indicator module, for simulation		75 mm	**UM 45-DO/LA/SIM8**	2968195	1

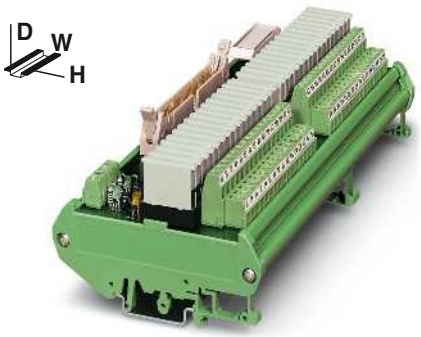
Output modules with relays, one N/O contact

These VARIOFACE output modules are used in combination with the respective front adapters.

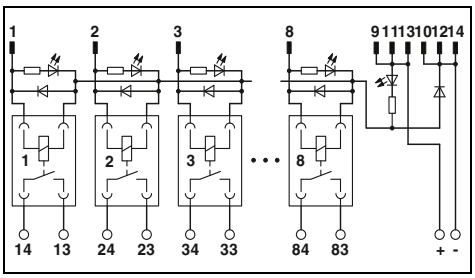
- Plug-in miniature relays, each with an N/O contact
- Universal applications from 1 mA to 3 A continuous current through 2-layer double contact with hard gold plating
- Overall width of just 55 mm (8 channels) or 202 mm (32 channels)
- LED status display for each signal path and supply voltage
- Freewheeling and reverse polarity protection diode for each signal path

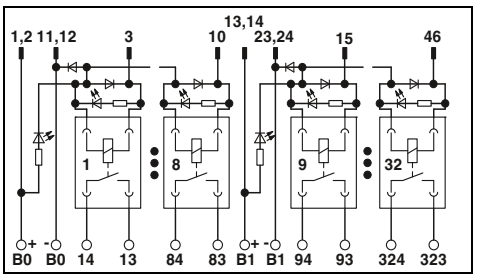


Output module with eight miniature relays, 1 N/O contact



Output module with 32 miniature relays, 1 N/O contact





		Technical data	Technical data
Coil side			
Operating voltage U_N		24 V DC	24 V DC
Typical input current at U_N		6.5 mA	6.5 mA
Typical response time at U_N		5 ms	5 ms
Typical release time at U_N		15 ms	15 ms
Input circuit		Freewheeling diode, reverse polarity protection	Freewheeling diode, reverse polarity protection
Status indicator per channel		Yellow LED	Yellow LED
Connection method		IDC/FLK pin strip	IDC/FLK pin strip
No. of pos.		14	50
Contact side			
Contact type		1 N/O contact (double contact)	1 N/O contact (double contact)
Contact material		AgNi, 5 µm hard gold-plated	AgNi, 5 µm hard gold-plated
Max. switching voltage		250 V AC / 125 V DC	250 V AC / 125 V DC
Minimum switching voltage		5 V	5 V
Maximum switch-on current		5 A	5 A
Limiting continuous current		3 A	3 A
Minimum switching current		1 mA	1 mA
Maximum interrupting rating:	24 V DC	72 W	72 W
	48 V DC	60 W	60 W
	60 V DC	50 W	50 W
	110 V DC	50 W	50 W
	250 V AC	750 VA	750 VA
Connection method		Screw connection	Screw connection
Connection data solid/stranded/AWG		0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 14	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
General data			
Rated insulation voltage		260 V AC	260 V AC
Rated surge voltage		4 kV (basic insulation)	4 kV (basic insulation)
Degree of pollution / Overvoltage category		2 / III	2 / III
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Nominal operating mode		100% operating factor	100% operating factor
Mechanical service life		2 x 10^7 cycles	2 x 10^7 cycles
Standards/regulations		DIN EN 50178 , IEC 60664	DIN EN 50178 , IEC 60664
Mounting position		any	any
Mounting		In rows with zero spacing	In rows with zero spacing
Dimensions	H / D	90 mm / 58 mm	90 mm / 58 mm
EMC note		Class A product, see page 605	Class A product, see page 605

Ordering data

Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE output module, with 8 miniature relays, plugged in, for 24 V DC (including relays)	56	**UMK- 8 RM/MR-G24/ 1/PLC**	2979469	1
VARIOFACE output module, with 32 miniature relays, plugged in, for 24 V DC (including relays)	202	**UMK-32 RM/MR-G24/1/PLC**	2979472	1

Accessories

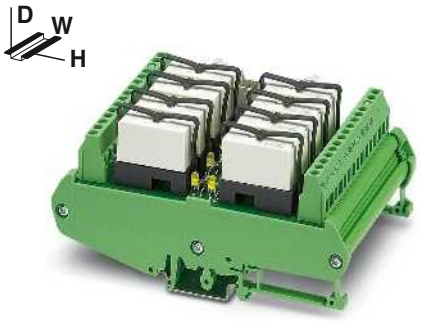
Plug-in miniature relays	**REL-MR-G 24/1**	2961037	8

Output modules with relay, 1 PDT

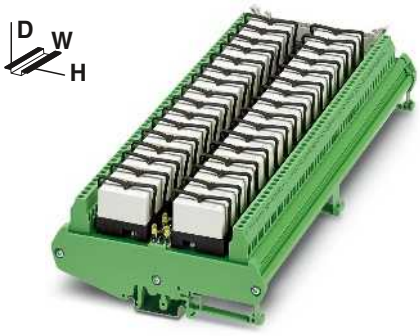
These VARIOFACE output modules are used in combination with the respective front adapters.

Like the front adapters, the modules are connected via 14-pos. or 50-pos. system cables. The following features characterize these relay modules:

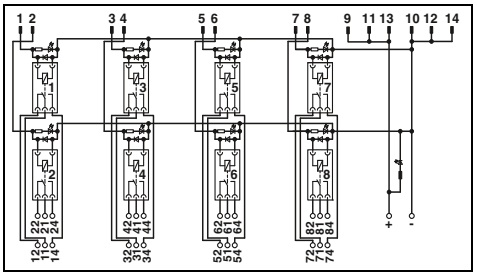
– Plug-in miniature relays, each with a PDT contact
– Overall width of just 80 mm (8 channels) or 271 mm (32 channels)
– LED status display for each signal path and supply voltage
– Freewheeling diode for each signal path

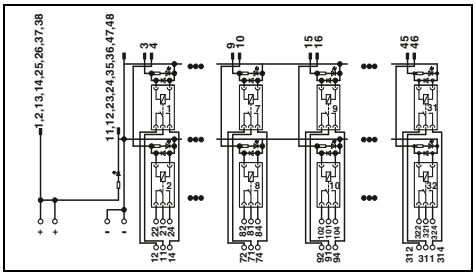


Output module with eight miniature relays, 1 PDT



Output module with 32 miniature relays, 1 PDT





Technical data

Coil side			
Operating voltage U_N		24 V DC	24 V DC
Typical input current at U_N		18 mA	18 mA
Typical response time at U_N		8 ms	8 ms
Typical release time at U_N		10 ms	10 ms
Input circuit		Freewheeling diode	Freewheeling diode
Status indicator per channel		Yellow LED	Yellow LED
Connection method		IDC/FLK pin strip	IDC/FLK pin strip
No. of pos.		14	50
Contact side			
Contact type		Single contact, 1-PDT	Single contact, 1-PDT
Contact material		AgNi	AgNi
Max. switching voltage		250 V AC/DC	250 V AC/DC
Minimum switching voltage		12 V AC/DC	12 V AC/DC
Limiting continuous current		5 A	5 A
Minimum switching current		10 mA	10 mA
Maximum interrupting rating:	24 V DC	120 W	120 W
	48 V DC	58 W	58 W
	60 V DC	48 W	48 W
	110 V DC	50 W	50 W
	220 V DC	80 W	80 W
	250 V AC	1250 VA	1250 VA
Connection method		Screw connection	Screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
General data			
Rated insulation voltage		260 V AC	260 V AC
Rated surge voltage		4 kV (Basic insulation between output contact current paths) 6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)	4 kV (Basic insulation between output contact current paths) 6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)
Degree of pollution / Overvoltage category		2 / III	2 / III
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Nominal operating mode		100% operating factor	100% operating factor
Mechanical service life		3 x 10^7 cycles	3 x 10^7 cycles
Standards/regulations		DIN EN 50178 , IEC 60664	DIN EN 50178 , IEC 60664
Mounting position		any	any
Mounting		In rows with zero spacing	In rows with zero spacing
Dimensions	H / D	123 mm / 68 mm	123 mm / 68 mm
EMC note		Class A product, see page 605	Class A product, see page 605

Ordering data

Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE output module, for 24 V DC (incl. relay)				
- with 8 miniature relays	80	**UM- 8 RM/RT-G24/21/PLC**	2968386	1
- with 32 miniature relays	271	**UM-32 RM/RT-G24/21/PLC**	2968373	1

Accessories

Plug-in miniature power relays, with power contacts	**REL-MR- 24DC/21HC**	2961312	10

Output modules with relay, 1 PDT

These VARIOFACE output modules are used in combination with the respective front adapters.

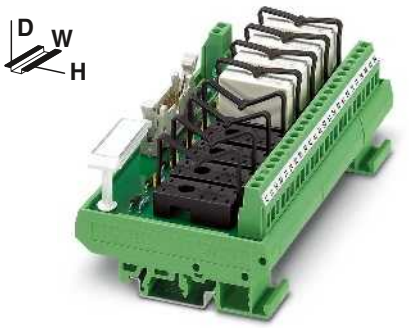
Like the front adapters, the modules are connected via 14-pos. or 50-pos. system cables. The following features characterize these relay modules:

– Plug-in miniature relays, each with a PDT contact
– LED status display for each signal path and supply voltage
– Freewheeling and reverse polarity protection diode for each signal path

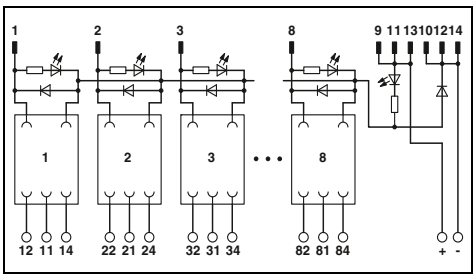
With the 32-channel version, the system cable is connected to the 16-channel UMK-16R.../KSR-G24/21/PLC base modules. The UMK-16R.../KSR-G24/21/E/PLC output extension modules with a further 16 channels are coupled to the base modules via a 20-position flat-ribbon cable (length: 10 cm).

Notes:

The connection cable between the base and the extension modules is delivered with the extension unit.



Output module with eight miniature relays, 1 PDT



Technical data

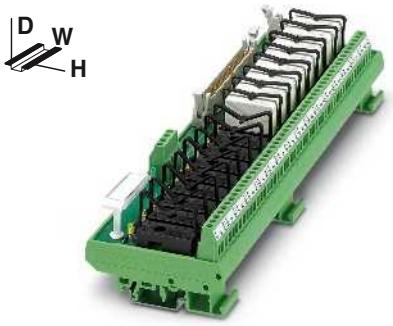
Coil side		
Operating voltage U_N		24 V DC
Input circuit		Freewheeling diode, reverse polarity protection
Operating voltage display		Green LED
Status indicator per channel		Yellow LED
Connection method		IDC/FLK pin strip
No. of pos.		14
Contact side		
Contact type		1 PDT
Max. switching voltage		250 V AC/DC
Limiting continuous current		5 A
Connection method		Screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
General data		
Rated insulation voltage		260 V AC
Rated surge voltage		4 kV (Basic insulation between output contact current paths) 6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)
Degree of pollution / Overvoltage category		2 / III
Ambient temperature (operation)		-20 °C ... 50 °C
Standards/regulations		DIN EN 50178 , IEC 60664
Mounting position		any
Mounting		In rows with zero spacing
Dimensions	H / D	77 mm / 59 mm
EMC note		Class A product, see page 605

Ordering data

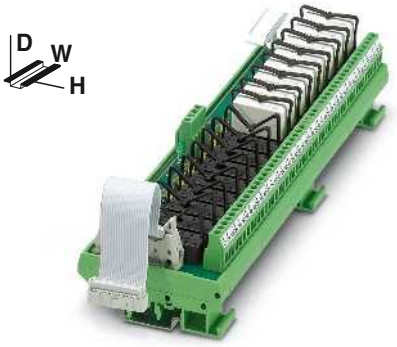
Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE output module, for 24 V DC				
- with 8 plug-in bases including relay	135	**UMK- 8 RM/KSR-G 24/21/PLC**	2979485	1
- with 8 plug-in bases without relay	135	**UMK- 8 RELS/KSR-G24/21/PLC**	2974914	1
VARIOFACE output basic module, for 24 V DC				
- with 16 plug-in bases including relay	259			
- with 16 plug-in bases without relay	259			
VARIOFACE output extension module, for 24 V DC				
- with 16 plug-in bases including relay	259			
- with 16 plug-in bases without relay	259			

Accessories

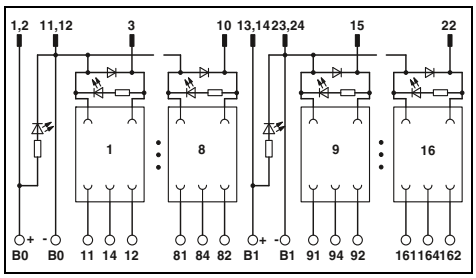
Plug-in miniature power relays, with power contacts	**REL-MR- 24DC/21HC**	2961312	10

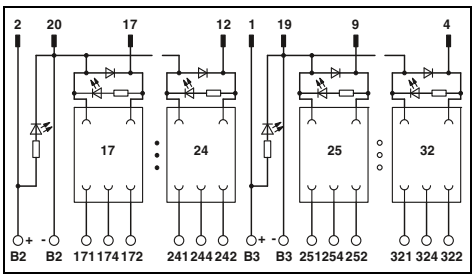


Output base module with 16 miniature relays, 1 PDT



Output extension module with 16 miniature relays, 1 PDT





Technical data

24 V DC	24 V DC
Freewheeling diode, reverse polarity protection	Freewheeling diode, reverse polarity protection
Green LED	Green LED
Yellow LED	Yellow LED
IDC/FLK pin strip	IDC/FLK pin strip
50	20
1 PDT	1 PDT
250 V AC/DC	250 V AC/DC
5 A	5 A
Screw connection	Screw connection
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
260 V AC	260 V AC
4 kV (Basic insulation between output contact current paths)	4 kV (Basic insulation between output contact current paths)
6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)	6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)
2 / III	2 / III
-20 °C ... 50 °C	-20 °C ... 50 °C
DIN EN 50178 , IEC 60664	DIN EN 50178 , IEC 60664
any	any
In rows with zero spacing	In rows with zero spacing
77 mm / 59 mm	77 mm / 59 mm
Class A product, see page 605	Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK-16 RM/KSR-G 24/21/PLC	2979498	1
UMK-16 RELS/KSR-G24/21/PLC	2974901	1

Accessories

REL-MR- 24DC/21HC	2961312	10

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK-16 RM/KSR-G 24/21/E/PLC	2979508	1
UMK-16 RELS/KSR-G24/21/E/PLC	2974891	1

Accessories

REL-MR- 24DC/21HC	2961312	10

Output module for relays
- 2 PDTs
- 1 PDT with disconnect terminal blocks

These VARIOFACE output modules are used in combination with the respective front adapters.

8 channels are controlled via 14-pos. cables. All modules feature the following:

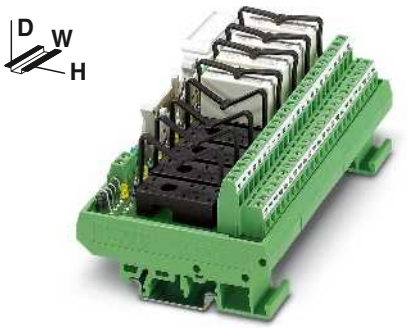
– Plug-in miniature relays
– LED status indicator and freewheeling diode per signal path
– Supply voltage indicator (LED)
– Polarity protection diode

With the 32-channel version (1 PDT with knife disconnect terminal blocks), the 50-pos. system cable is connected to the base module with 16 channels.

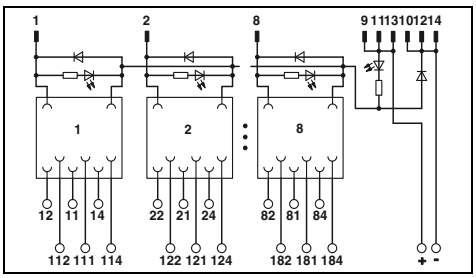
The output extension module with a further 16 channels is coupled to the base module via a 20-pos. flat-ribbon cable (length: 10 cm).

Notes:

The connection cable between the base and the extension modules is delivered with the extension unit.



Output module for 8 miniature relays, 2 PDTs



Technical data

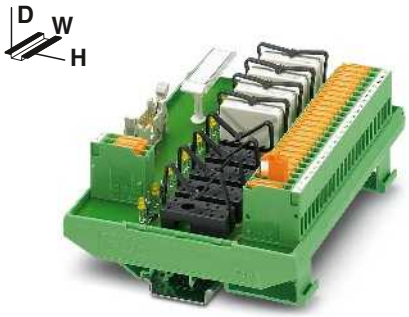
Coil side	
Operating voltage U_N	24 V DC
Input circuit	Freewheeling diode
Operating voltage display	Green LED
Status indicator per channel	Yellow LED
Connection method	IDC/FLK pin strip
No. of pos.	14
Contact side	
Contact type	2 PDT
Max. switching voltage	250 V AC/DC
Limiting continuous current	3 A
Connection method	Screw connection
Connection data solid/stranded/AWG	0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 14
General data	
Rated insulation voltage	260 V AC
Rated surge voltage	4 kV (Basic insulation between output contact current paths) 6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)
Degree of pollution / Overvoltage category	2 / III
Ambient temperature (operation)	-20 °C ... 50 °C
Standards/regulations	DIN EN 50178 , IEC 60664
Mounting position	any
Mounting	In rows with zero spacing
Dimensions H / D	77 mm / 59 mm
EMC note	Class A product, see page 605

Ordering data

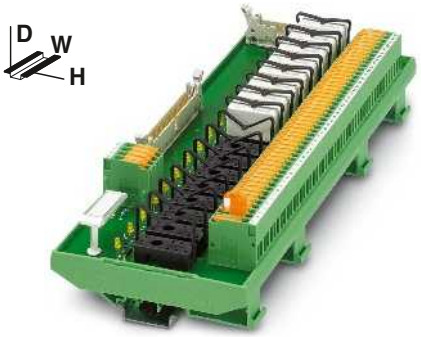
Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE output module, for 24 V DC (2 PDTs)				
- with 8 plug-in bases without relay	135	**UMK- 8 RELS/KSR-G24/21-21/PLC**	2976187	1
VARIOFACE output module with knife disconnect terminal blocks, for 24 V DC (1 PDT)				
- with 8 plug-in bases without relay	145			
VARIOFACE output module with knife disconnect terminal blocks, for 24 V DC (1 PDT)				
- basic module with 16 plug-in bases without relay	285			
- extension module with 16 plug-in bases without relay	285			

Accessories

Plug-in miniature power relays, with power contacts	**REL-MR- 24DC/21-21**	2961192	10

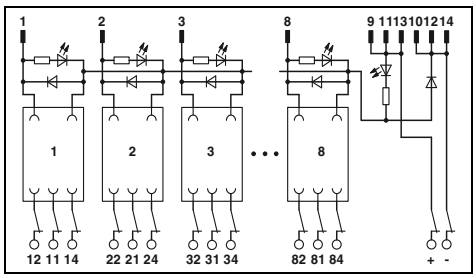


Output module for 8 miniature relays with knife disconnect terminal blocks, 1 PDT

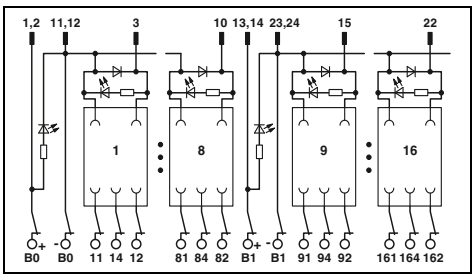


Output module for 16 miniature relays with knife disconnect terminal blocks, 1 PDT

EAC



EAC



Technical data

24 V DC	24 V DC
Freewheeling diode , Reverse polarity protection	Freewheeling diode
Green LED	Green LED
Yellow LED	Yellow LED
IDC/FLK pin strip	IDC/FLK pin strip
14	50
1 PDT	1 PDT
250 V AC/DC	250 V AC/DC
5 A	5 A
Screw connection with disconnect knife	Screw connection with disconnect knife
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
260 V AC	260 V AC
4 kV (Basic insulation between output contact current paths)	4 kV (Basic insulation between output contact current paths)
6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)	6 kV (Safe isolation and reinforced insulation between input circuit and output contact paths)
2 / III	2 / III
-20 °C ... 50 °C	-20 °C ... 50 °C
DIN EN 50178 , IEC 60664	DIN EN 50178 , IEC 60664
any	any
In rows with zero spacing	In rows with zero spacing
111.5 mm / 59 mm	111.5 mm / 59 mm
Class A product, see page 605	Class A product, see page 605

Ordering data

Type	Order No.	Pcs./ Pkt.
UM- 8 RELS/KSR-G24/21/MT/PLC	**2962463**	1

Accessories

REL-MR- 24DC/21HC	**2961312**	10

Ordering data

Type	Order No.	Pcs./ Pkt.
UM-16 RELS/KSR-G24/21/MT/PLC	**2962382**	1
UM-16 RELS/KSR-G24/21/E/MT/PLC	**2962379**	1

Accessories

REL-MR- 24DC/21HC	**2961312**	10

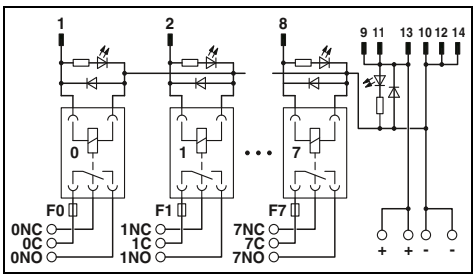
VIP output module

These VIP – VARIOFACE Professional output modules are used in combination with the respective front adapters. Like the front adapters, the modules are connected via 14-pos. system cables.

Features:

– Plug-in miniature relays, each with a PDT contact
– LED status display for each signal path and supply voltage
– Freewheeling diode for each signal path
– Push-in connection

Output module with 8 miniature relays, 1 PDT and fuse per output circuit



Technical data

Coil side		
Operating voltage U_N		24 V DC
Typical input current at U_N		9 mA
Typical response time at U_N		5 ms
Typical release time at U_N		8 ms
Input circuit		Freewheeling diode
Status indicator per channel		Yellow LED
Connection method		IDC/FLK pin strip
No. of pos.		14
Contact side		
Contact type		Single contact, 1-PDT
Contact material		AgSnO
Max. switching voltage		250 V AC/DC
Minimum switching voltage		12 V AC/DC
Limiting continuous current		5 A (observe derating)
Minimum switching current		10 mA
Maximum interrupting rating:	24 V DC	120 W
	48 V DC	20 W
	60 V DC	18 W
	110 V DC	23 W
	220 V DC	40 W
	250 V AC	1250 VA
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
General data		
Ambient temperature (operation)		-20 °C ... 60 °C
Nominal operating mode		100% operating factor
Mechanical service life		2 x 10^7 cycles
Standards/regulations		DIN EN 50178
Mounting position		any
Mounting		In rows with zero spacing
Dimensions	H / D	109.8 mm / 63 mm
EMC note		Class A product, see page 605

Ordering data

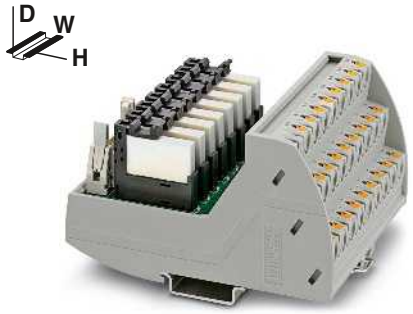
Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE output module, with eight miniature relays, plugged in, for 24 V DC (incl. relays)	87.6	**VIP-8RPT-24DC/21/DO/FU/PLC**	2903601	1

VIP input module

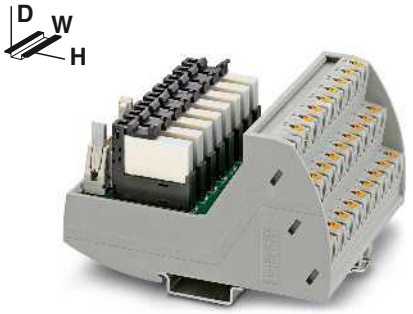
These VIP – VARIOFACE Professional input modules are used in combination with the respective front adapters. Like the front adapters, the modules are connected via 14-pos. system cables.

Features:

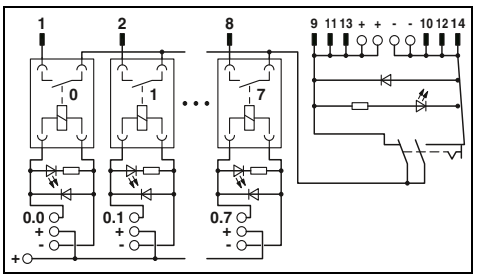
– Plug-in miniature relays, each with an N/O contact
– LED status display for each signal path and supply voltage
– Freewheeling diode for each signal path
– Push-in connection

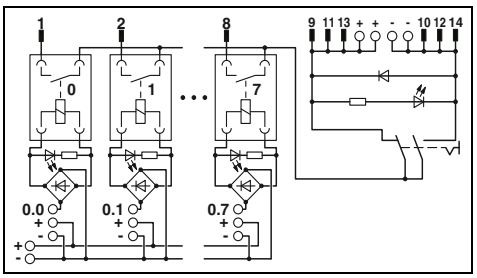


Digital input module with 8 channels for 24 V DC



Digital input module with 8 channels for 120 V AC





Technical data

Coil side			
Operating voltage U_N		24 V DC ±10 % (Supply, 2 A)	120 V AC ±10 % (Supply, 2 A)
Typical input current at U_N		9 mA (per channel)	3.5 mA (per channel)
Typical response time at U_N		5 ms	6 ms
Typical release time at U_N		8 ms	15 ms
Input circuit		Freewheeling diode	Freewheeling diode
Status indicator per channel		Yellow LED	Yellow LED
Connection method		Push-in connection	Push-in connection
Connection data solid/stranded/AWG		0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14	0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
Contact side			
Contact type		1 N/O contact	1 N/O contact
Contact material		AgSnO, hard gold-plated	AgSnO, hard gold-plated
Limiting continuous current		50 mA	50 mA
Connection method		IDC/FLK pin strip	IDC/FLK pin strip
No. of pos.		14	14
General data			
Ambient temperature (operation)		-20 °C ... 60 °C	-20 °C ... 60 °C
Nominal operating mode		100% operating factor	100% operating factor
Mechanical service life		2 x 10^7 cycles	2 x 10^7 cycles
Standards/regulations		DIN EN 50178	DIN EN 50178
Mounting position		any	any
Mounting		In rows with zero spacing	In rows with zero spacing
Dimensions	H / D	109.8 mm / 63 mm	109.8 mm / 63 mm
EMC note		Class A product, see page 605	Class A product, see page 605

Ordering data

Description	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE termination board, for eight channels,				
24 V DC (incl. relays)	92.7	**VIP-8RPT-24DC/1AU/DI/PLC**	2903600	1
120 V AC (incl. relays)	92.7	**VIP-8RPT-120AC/1AU/DI/PLC**	2904576	1

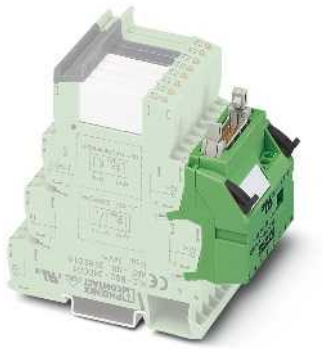
Adapter for PLC-INTERFACE (6.2 mm)

PLC-V8/... are the VARIOFACE adapters connecting the eight slim 6.2 mm PLC-INTERFACE modules to the VARIOFACE system cabling:

– Can be plugged into the bridge shafts of eight aligned PLC-INTERFACE modules
– Freely definable configuration with relays, optocouplers, and passive feed-through terminal blocks
– With D-SUB connection as an option for universal connections

Notes:

Cross-ref. list for matching PLC-INTERFACE modules: page 548



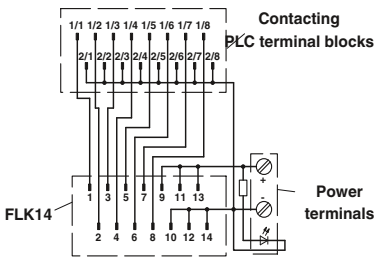
VARIOFACE adapter for 6.2 mm PLC-INTERFACE

Technical data

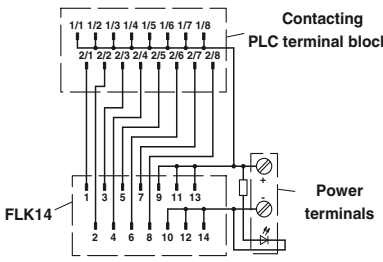
Maximum permissible operating voltage		30 V DC
Maximum permissible operating voltage UL / CSA		24 V / -
Maximum permissible current (per branch)		1 A (per signal path)
Maximum total current (voltage supply)		3 A
Ambient temperature (operation)		-40 °C ... 70 °C
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Controller level	IDC/FLK pin strip
	Supply	Screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	100 mm / 94 mm

Ordering data

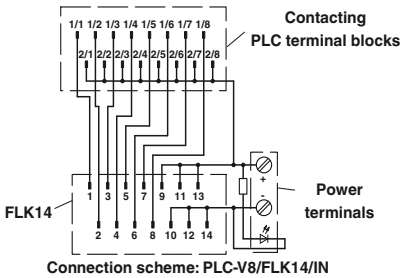
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
V8 adapter, for 8 PLC-INTERFACE devices (6.2 mm), with IDC/FLK pin strip, for PLC system cabling, **positive switching**					
Output	14	49.6 mm	**PLC-V8/FLK14/OUT**	2295554	1
Input	14	49.6 mm	**PLC-V8/FLK14/IN**	2296553	1
V8 adapter, for 8 PLC-INTERFACE devices (6.2 mm), with IDC/FLK pin strip, for PLC system cabling, **negative switching**					
Output	14	49.6 mm	**PLC-V8/FLK14/OUT/M**	2304102	1
Input	14	49.6 mm	**PLC-V8/FLK14/IN/M**	2304115	1
V8 output adapter, for 8 PLC-INTERFACE devices (6.2 mm), with D-SUB connection					
Pin strip	15	49.6 mm	**PLC-V8/D15S/OUT**	2296058	1
Socket strip	15	49.6 mm	**PLC-V8/D15B/OUT**	2296061	1
V8 input adapter, for 8 PLC-INTERFACE devices (6.2 mm), with D-SUB connection					
Pin strip	15	49.6 mm	**PLC-V8/D15S/IN**	2296074	1
Socket strip	15	49.6 mm	**PLC-V8/D15B/IN**	2296087	1



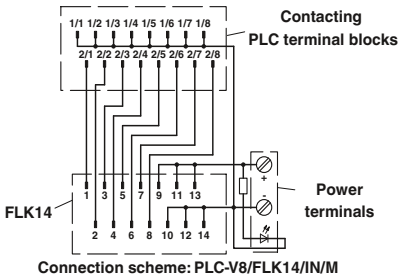
PLC-V8/FLK14/OUT connection scheme



PLC-V8/FLK14/OUT/M connection scheme



Connection scheme: PLC-V8/FLK14/IN



Connection scheme: PLC-V8/FLK14/IN/M

Adapter for PLC-INTERFACE (14 mm)

PLC-V8L/... are the VARIOFACE adapters connecting the eight 14 mm PLC-INTERFACE modules (2 PDT, HC, and IC types) to the system cabling:

– Can be plugged into the bridge shafts of eight aligned PLC-INTERFACE modules
– Freely definable configuration with relays or optocouplers

Notes:

Cross-ref. list for matching PLC-INTERFACE modules: page 548

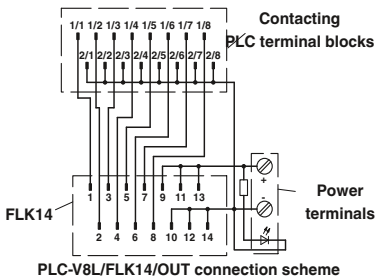
VARIOFACE adapter for 14 mm PLC-INTERFACE

Technical data

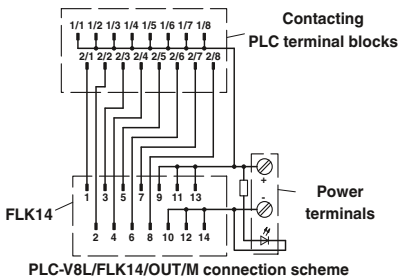
Maximum permissible operating voltage		30 V DC
Maximum permissible operating voltage UL / CSA		24 V / -
Maximum permissible current (per branch)		1 A (per signal path)
Maximum total current (voltage supply)		3 A
Ambient temperature (operation)		-40 °C ... 70 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Controller level	IDC/FLK pin strip
	Supply	Screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	100 mm / 94 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
V8 adapter, for 8 PLC-INTERFACE devices (14 mm), with IDC/FLK pin strip, for PLC system cabling, **positive switching**	14	112.3 mm	**PLC-V8L/FLK14/OUT**	2299660	1
V8 adapter, for 8 PLC-INTERFACE devices (14 mm), with IDC/FLK pin strip, for PLC system cabling, **negative switching**	14	112.3 mm	**PLC-V8L/FLK14/OUT/M**	2304306	1



PLC-V8L/FLK14/OUT connection scheme



PLC-V8L/FLK14/OUT/M connection scheme

Feed-through terminal blocks for PLC-INTERFACE

The VARIOFACE PLC-VT terminals are passive feed-through terminal blocks, with the same shape as the 6.2 mm slim relay and optocoupler interfaces of PLC-INTERFACE. It is thus possible to implement 8-channel interface modules for the system cabling, which can be adapted to a bit for the particular application. For individual requirements, the relay, optocoupler or the PLC-VT terminal blocks for passive signal transmission can be combined as needed.

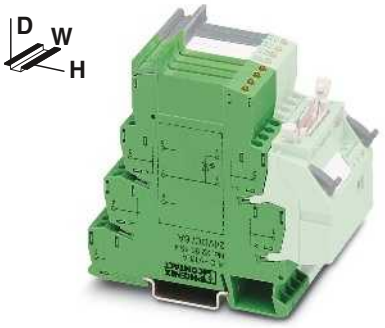
PLC-VT
PLC-VT/LA

– Can be combined with PLC-INTERFACE universal series
– Signal path with additional potential level for free assignment (two-conductor connection)
– With LED as an option

PLC-VT/ACT
PLC-VT/ACT/LA

– Can be combined with PLC-INTERFACE actuator series
– Signal path with two additional potential levels for free assignment (three-conductor connection)
– With LED as an option

The system connection is made via the PLC-V8 adapter.



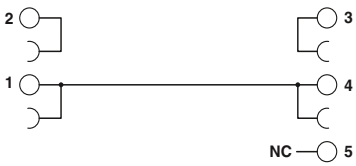
VARIOFACE feed-through terminal blocks for PLC-INTERFACE universal series

Technical data

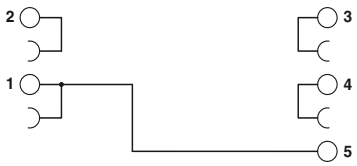
	PLC-VT, PLC-VT/ACT	PLC-VT/LA, PLC-VT/ACT/LA
Maximum permissible operating voltage	250 V AC/DC	30 V DC
Maximum permissible operating voltage UL / CSA	220 V / -	20 V / -
Maximum permissible current (per branch)	6 A (per signal conductor)	6 A (per signal conductor)
Ambient temperature (operation)	-40 °C ... 70 °C	-40 °C ... 70 °C
Mounting position	any	any
Standards/regulations	DIN EN 50178 , IEC 60664	
Connection data solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Dimensions H / D	80 mm / 94 mm	

Ordering data

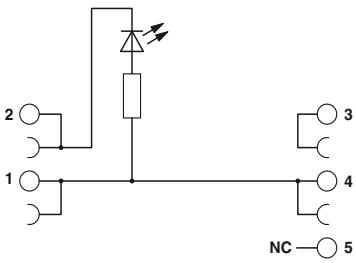
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE feed-through terminal block (two-conductor connection), for PLC-INTERFACE universal series		6.2 mm	**PLC-VT**	2296870	10
VARIOFACE feed-through terminal block, as above, but with 24 V DC light indicator		6.2 mm	**PLC-VT/LA**	2296854	10
VARIOFACE feed-through terminal block (three-conductor connection), for PLC-INTERFACE actuator series		6.2 mm	**PLC-VT/ACT**	2295567	10
VARIOFACE feed-through terminal block, as above, but with 24 V DC light indicator		6.2 mm	**PLC-VT/ACT/LA**	2296867	10



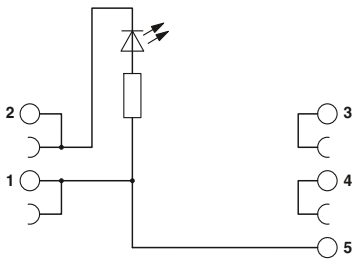
PLC-VT connection scheme



PLC-VT/ACT connection scheme



PLC-VT/LA connection scheme



PLC-VT/ACT/LA connection scheme

Adapter for RIFLINE complete RF-1

RIF-1-V8/... VARIOFACE adapters connect the eight RIF-1 relay modules with the system cabling:
– Can be plugged into eight RIF-1 relay modules in series
– The adapter has one LED indicator and one freewheeling diode per relay

The following RIF-1 relay modules can be connected with the adapters:

With Push-in connection:
– RIF-1-RPT-LDP-24DC/1IC, Order No. 2909884*
– RIF-1-BPT/2X21, Order No. 2900931
– RIF-1-RPT-LDP-24DC/1X21, Order No. 2903342*
– RIF-1-RPT-LDP-24DC/1X21 AU, Order No. 2903338*
– RIF-1-RPT-LDP-24DC/2X21, Order No. 2903334*
– RIF-1-RPT-LDP-24DC/2X21 AU, Order No. 2903330*
– RIF-1-RPT-LDP-24DC/1X21MS, Order No. 2905289
– RIF-1-RPT-LDP-24DC/2X21MS, Order No. 2905291

With screw connection:
– RIF-1-RSC-LDP-24DC/1IC, Order No. 2909885*
– RIF-1-BSC/2X21, Order No. 2900930
– RIF-1-RSC-LDP-24DC/1X21, Order No. 2903358*
– RIF-1-RSC-LDP-24DC/1X21 AU, Order No. AU 2903354*
– RIF-1-RSC-LDP-24DC/2X21, Order No. 2903350*
– RIF-1-RSC-LDP-24DC/2X21 AU, Order No. 2903346*
– RIF-1-RSC-LDP-24DC/2X21 AU, Order No. 2903345*
– RIF-1-RSC-LDP-24DC/2X21MS, Order No. 2905550

* If completely assembled RIF-1 relay modules are used, the indicator/ interference suppression modules must be removed before installation.

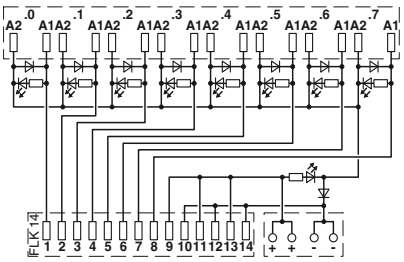
VARIOFACE adapter for RIFLINE complete RIF-1

Technical data

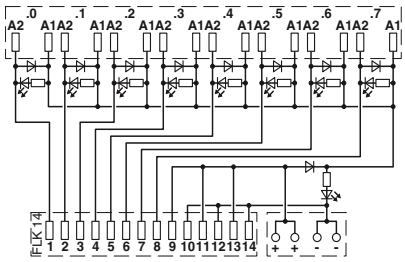
Maximum permissible operating voltage		30 V DC
Maximum permissible operating voltage UL / CSA		24 V / -
Maximum permissible current (per branch)		1 A (per signal path)
Maximum total current (voltage supply)		3 A
Ambient temperature (operation)		-40 °C ... 60 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Controller level	IDC/FLK pin strip
	Supply	Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Dimensions	H / D	101 mm / 75 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
V8 adapter, for eight RIF-1 relay modules, with IDC/FLK pin strip for PLC system cabling, **positive switching**	14	128 mm	**RIF-1-V8/PT/FLK14/OUT**	2905195	1
V8 adapter, for eight RIF-1 relay modules, with IDC/FLK pin strip for PLC system cabling, **negative switching**	14	128 mm	**RIF-1-V8/PT/FLK14/OUT/M**	2906992	1



Connection scheme for RIF-1-V8/PT/FLK14/OUT



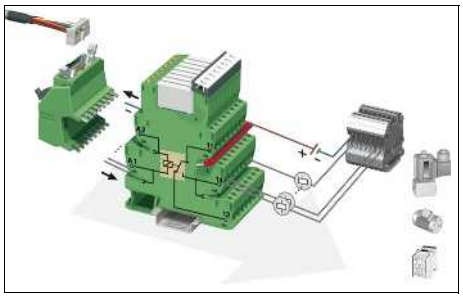
Connection scheme for RIF-1-V8/PT/FLK14/OUT/M

Cross-reference list for PLC-V8 adapters with matching PLC-INTERFACE modules

Series	Function	Contact	Input	Output	Page
Universal	Relay	1 changeover contact	24 V DC	250 V AC/DC / 6 A	372
			24 V DC	250 V AC/DC / 10 A	387
			12 V DC	30 V AC/36 V DC / 50 mA	373
			24 V DC	30 V AC/36 V DC / 50 mA	373
			24 V AC/DC	30 V AC/36 V DC / 50 mA	373
			48 V DC	30 V AC/36 V DC / 50 mA	373
			60 V DC	30 V AC/36 V DC / 50 mA	373
			120 V AC/DC	30 V AC/36 V DC / 50 mA	373
			230 V AC/DC	30 V AC/36 V DC / 50 mA	373
			120 V AC	30 V AC/36 V DC / 50 mA[1]	388
			230 V AC	30 V AC/36 V DC / 50 mA[1]	388
		1 changeover contact with manual operation	24 V DC	250 V AC/DC / 6 A	373
			12 V DC	30 V AC/36 V DC / 50 mA	373
			24 V DC	30 V AC/36 V DC / 50 mA	373
			24 V AC/DC	30 V AC/36 V DC / 50 mA	373
			120 V AC/DC	30 V AC/36 V DC / 50 mA	373
			230 V AC/DC	30 V AC/36 V DC / 50 mA	373
		2 changeover contacts	24 V DC	250 V AC/DC / 6 A	374
			24 V DC	30 V AC/DC / 50 mA	375
	Relay switch	1 N/O contact	24 V AC/DC	250 V AC/DC / 6 A	404
			24 V AC/DC	250 V AC/DC / 6 A	404
	Optocoupler	1 N/O contact, electronic	24 V DC	24 V DC / 3 A	377
			24 V DC	24 V DC / 10 A	407
			24 V DC	250 V AC / 0.75 A	377
			24 V DC	300 V DC / 1 A	406
			24 V DC	48 V DC / 100 mA	376
			48 V DC	48 V DC / 100 mA	376
			60 V DC	48 V DC / 100 mA	376
			120 V AC/DC	48 V DC / 100 mA	376
			230 V AC/DC	48 V DC / 100 mA	376
			NAMUR	24 V DC / 50 mA	420
			120 V AC	48 V DC / 100 mA[2]	388
			230 V AC	48 V DC / 100 mA[2]	388
		1 changeover contact, electronic	24 V DC	48 V DC / 0.5 A	407
	Feed-through	–	250 V AC/DC	250 V AC/DC	546
			24 V DC	24 V DC	546
Actuator	Relay	1 N/O contact	24 V DC	250 V AC/DC / 6 A	378
			24 V DC	250 V AC/DC / 10 A (80 A, 20 ms)	386
		1 N/O contact with manual operation	24 V DC	250 V AC/DC / 6 A	379
		2 N/O contacts	24 V DC	250 V AC/DC / 6 A	379
	Optocoupler	1 N/O contact, electronic	24 V DC	24 V DC / 3 A	380
			24 V DC	24 V DC / 5 A	382
			24 V DC	250 V AC / 0.75 A	381
			24 V DC	250 V AC / 2 A	382
	Feed-through	–	250 V AC/DC	250 V AC/DC	546
			24 V DC	24 V DC	546
Sensor[4]	Relay	1 N/O contact	24 V DC	30 V AC/36 V DC / 50 mA	384
			120 V AC/DC	30 V AC/36 V DC / 50 mA	384
			230 V AC/DC	30 V AC/36 V DC / 50 mA	384
			120 V AC	30 V AC/36 V DC / 50 mA[1]	389
			230 V AC	30 V AC/36 V DC / 50 mA[1]	389
		1 N/O contact with manual operation	24 V DC	30 V AC/36 V DC / 50 mA	385
			120 V AC/DC	30 V AC/36 V DC / 50 mA	385
			230 V AC/DC	30 V AC/36 V DC / 50 mA	385
	Optocoupler	1 N/O contact, electronic	24 V DC	48 V DC / 100 mA	385
			120 V AC/DC	48 V DC / 100 mA	385
			230 V AC/DC	48 V DC / 100 mA	385
			120 V AC	48 V DC / 100 mA[2]	389
			230 V AC	48 V DC / 100 mA[2]	389

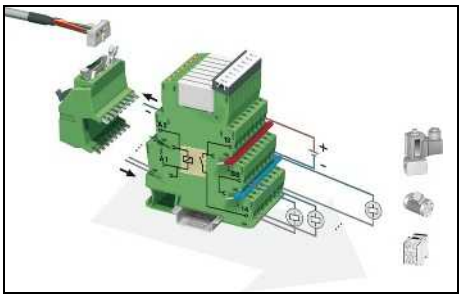
[1] Plug-in miniature relay insert: REL-MR-60DC/21AU, 2961134
[2] Plug-in solid-state relay insert: OPT-60DC/48DC/100, 2966621
[3] PLC-...SO46 is supplied as a basic terminal block with filter, but without relay or solid-state relay.
[4] Cannot be mixed with the universal series (within a byte)

Push-in connection	Order No.	Screw connection	Order No.	PLC-V8...OUT(/M)	PLC-V8...IN(/M)	PLC-V8L...OUT
PLC-RPT-24DC/21	2900299	PLC-RSC-24DC/21	2966171	X		
PLC-RPT-24DC/21HC	2900291	PLC-RSC-24DC/21HC	2967620			X
PLC-RPT-12DC/21AU	2900317	PLC-RSC-12DC/21AU	2966919		X	
PLC-RPT-24DC/21AU	2900306	PLC-RSC-24DC/21AU	2966265	X	X	
PLC-RPT-24UC/21AU	2900307	PLC-RSC-24UC/21AU	2966278	X	X	
PLC-RPT-48DC/21AU	2900308	PLC-RSC-48DC/21AU	2966126		X	
PLC-RPT-60DC/21AU	2900309	PLC-RSC-60DC/21AU	2966142		X	
PLC-RPT-120UC/21AU	2900310	PLC-RSC-120UC/21AU	2966281		X	
PLC-RPT-230UC/21AU	2900311	PLC-RSC-230UC/21AU	2966294		X	
PLC-RPT-120UC/21/SO46	2900453[3])	PLC-BSC-120UC/21/SO46	2980319[3])		X	
PLC-RPT-230UC/21/SO46	2900455[3])	PLC-BSC-230UC/21/SO46	2980335[3])		X	
PLC-RPT- 24DC/21/MS	2909667	PLC-RSC- 24DC/21/MS	2909649	X		
PLC-RPT- 12DC/21AU/MS	2909671	PLC-RSC- 12DC/21AU/MS	2909654		X	
PLC-RPT- 24DC/21AU/MS	2909672	PLC-RSC- 24DC/21AU/MS	2909655	X	X	
PLC-RPT- 24UC/21AU/MS	2909673	PLC-RSC- 24UC/21AU/MS	2909656	X	X	
PLC-RPT-120UC/21AU/MS	2909674	PLC-RSC-120UC/21AU/MS	2909657		X	
PLC-RPT-230UC/21AU/MS	2909676	PLC-RSC-230UC/21AU/MS	2909660		X	
PLC-RPT-24DC/21-21	2900330	PLC-RSC-24DC/21-21	2967060			X
PLC-RPT-24DC/21-21AU	2900338	PLC-RSC-24DC/21-21AU	2967125			X
PLC-RPT-24UC/1/S/H	2900328	PLC-RSC-24UC/1/S/H	2982236	X		
PLC-RPT-24UC/1/S/L	2900327	PLC-RSC-24UC/1/S/L	2834876	X		
PLC-OPT-24DC/24DC/2	2900364	PLC-OSC-24DC/24DC/2	2966634	X		
PLC-OPT-24DC/24DC/10/R	2900398	PLC-OSC-24DC/24DC/10/R	2982702	X		
PLC-OPT-24DC/230AC/1	2900369	PLC-OSC-24DC/230AC/1	2967840	X		
PLC-OPT-24DC/300DC/1	2900383	PLC-OSC-24DC/300DC/1	2980678	X		
PLC-OPT-24DC/48DC/100	2900352	PLC-OSC-24DC/48DC/100	2966728	X	X	
PLC-OPT-48DC/48DC/100	2900353	PLC-OSC-48DC/48DC/100	2966993		X	
PLC-OPT-60DC/48DC/100	2900354	PLC-OSC-60DC/48DC/100	2967455		X	
PLC-OPT-120UC/48DC/100	2900355	PLC-OSC-120UC/48DC/100	2966744		X	
PLC-OPT-230UC/48DC/100	2900356	PLC-OSC-230UC/48DC/100	2966757		X	
PLC-PT-EIK 1-SVN 24P/P	2900397	PLC-SC-EIK 1-SVN 24P/P	2982663		X	
PLC-BPT-120UC/21/SO46	2900453[3])	PLC-BSC-120UC/21/SO46	2980319[3])		X	
PLC-BPT-230UC/21/SO46	2900455[3])	PLC-BSC-230UC/21/SO46	2980335[3])		X	
PLC-OPT-24DC/48DC/500/W	2900378	PLC-OSC-24DC/48DC/500/W	2980636	X		
–		PLC-VT	2296870	X	X	
–		PLC-VT/LA	2296854	X	X	
PLC-RPT-24DC/1/ACT	2900312	PLC-RSC-24DC/1/ACT	2966210	X		
PLC-RPT-24DC/1IC/ACT	2900298	PLC-RSC-24DC/1IC/ACT	2967604			X
PLC-RPT- 24DC/ 1/MS/ACT	2909677	PLC-RSC- 24DC/ 1/MS/ACT	2909661	X		
–		PLC-RSC-24DC/1-1/ACT	2967109			X
PLC-OPT-24DC/24DC/2/ACT	2900376	PLC-OSC-24DC/24DC/2/ACT	2966676	X		
–		PLC-OSC-24DC/24DC/5/ACT	2982786			X
–		PLC-OSC-24DC/230AC/1/ACT	2967947	X		
–		PLC-OSC-24DC/230AC/2/ACT	2982760			X
–		PLC-VT/AKT	2295567	X		
–		PLC-VT/AKT/LA	2296867	X		
PLC-RPT-24DC/1AU/SEN	2900313	PLC-RSC-24DC/1AU/SEN	2966317		X	
PLC-RPT-120UC/1AU/SEN	2900314	PLC-RSC-120UC/1AU/SEN	2966320		X	
PLC-RPT-230UC/1AU/SEN	2900315	PLC-RSC-230UC/1AU/SEN	2966333		X	
PLC-BPT-120UC/1/SEN/SO46	2900456[3])	PLC-BSC-120UC/1/SEN/SO46	2980322[3])		X	
PLC-BPT-230UC/1/SEN/SO46	2900457[3])	PLC-BSC-230UC/1/SEN/SO46	2980348[3])		X	
PLC-RPT- 24DC/ 1AU/MS/SEN	2909678	PLC-RSC- 24DC/ 1AU/MS/SEN	2909663			X
PLC-RPT-120UC/ 1AU/MS/SEN	2909679	PLC-RSC-120UC/ 1AU/MS/SEN	2909664			X
PLC-RPT-230UC/ 1AU/MS/SEN	2909680	PLC-RSC-230UC/ 1AU/MS/SEN	2909665			X
PLC-OPT-24DC/48DC/100/SEN	2900358	PLC-OSC-24DC/48DC/100/SEN	2966773		X	
PLC-OPT-120UC/48DC/100/SEN	2900359	PLC-OSC-120UC/48DC/100/SEN	2966799		X	
PLC-OPT-230UC/48DC/100/SEN	2900361	PLC-OSC-230UC/48DC/100/SEN	2966809		X	
PLC-BPT-120UC/1/SEN/SO46	2900456[3])	PLC-BSC-120UC/1/SEN/SO46	2980322[3])		X	
PLC-BPT-230UC/1/SEN/SO46	2900457[3])	PLC-BSC-230UC/1/SEN/SO46	2980348[3])		X	



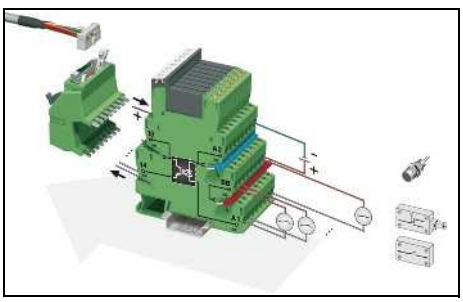
PLC universal series

The universal series can be used as an input or output interface. Each product consists of a basic terminal block with a plug-in miniature relay (changeover contact) or a plug-in solid-state relay.



PLC actuator series

When used as an interface between the PLC and actuators, such as motors, contactors or solenoid valves, only one N/O contact function is normally required. The PLC...ACT output interface is used here. All actuator connections, including the load return line, are connected directly. This eliminates the need for additional output terminal blocks.



PLC sensor series

When used as an interface between the PLC and sensors, such as proximity switches, limit switches or auxiliary contacts, often only one N/O contact function is required. The PLC...SEN input interface is used here. All sensor connections, including the supply voltage for the sensors and switches, are connected directly. This eliminates the need for additional terminal blocks.

System cable with IDC/FLK socket strips

– 1:1 connection
– 14 and 50-pos.
– Connectors as per IEC 60603-13
– Unshielded
– Shielded
– Halogen-free, see page 587
– Special lengths, see page 591

Unshielded

Shield connection at one end

Applied for: cUL / UL

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Shield	-	Tinned copper-braided shield, approx. 85% covering
Assembly	Insulation displacement, IEC 60352-4/DIN EN 60352-4	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated
Outside diameter		
14-pos.	6.4 mm	6.7 mm
50-pos.	10.3 mm	11 mm

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Assembled round cable, with two 14-pos. IDC/FLK socket strips in fixed lengths for transfer of 8 channels								
	14	0.3 m	FLK 14/EZ-DR/ 30/KONFEK	2295729	5			
	14	0.5 m	FLK 14/EZ-DR/ 50/KONFEK	2288901	5	FLK 14/EZ-DR/ 50/KONFEK/S	2296977	1
	14	1 m	FLK 14/EZ-DR/ 100/KONFEK	2288914	1	FLK 14/EZ-DR/ 100/KONFEK/S	2296980	1
	14	1.5 m	FLK 14/EZ-DR/ 150/KONFEK	2288927	1	FLK 14/EZ-DR/ 150/KONFEK/S	2296993	1
	14	2 m	FLK 14/EZ-DR/ 200/KONFEK	2288930	1	FLK 14/EZ-DR/ 200/KONFEK/S	2297002	1
	14	2.5 m	FLK 14/EZ-DR/ 250/KONFEK	2288943	1			
	14	3 m	FLK 14/EZ-DR/ 300/KONFEK	2288956	1	FLK 14/EZ-DR/ 300/KONFEK/S	2299013	1
	14	3.5 m	FLK 14/EZ-DR/ 350/KONFEK	2288969	1			
	14	4 m	FLK 14/EZ-DR/ 400/KONFEK	2288972	1	FLK 14/EZ-DR/ 400/KONFEK/S	2299026	1
	14	4.5 m	FLK 14/EZ-DR/ 450/KONFEK	2290847	1			
	14	5 m	FLK 14/EZ-DR/ 500/KONFEK	2290834	1			
	14	5.5 m	FLK 14/EZ-DR/ 550/KONFEK	2290850	1			
	14	6 m	FLK 14/EZ-DR/ 600/KONFEK	2290863	1	FLK 14/EZ-DR/ 600/KONFEK/S	2299039	1
	14	8 m	FLK 14/EZ-DR/ 800/KONFEK	2299563	1	FLK 14/EZ-DR/ 800/KONFEK/S	2299042	1
	14	10 m	FLK 14/EZ-DR/1000/KONFEK	2299576	1	FLK 14/EZ-DR/1000/KONFEK/S	2299055	1
Assembled round cable, with two 50-pos. IDC/FLK socket strips in fixed lengths for transfer of 32 channels								
	50	0.5 m	FLK 50/EZ-DR/ 50/KONFEK	2289065	5	FLK 50/EZ-DR/ 50/KONFEK/S	2299097	1
	50	1 m	FLK 50/EZ-DR/ 100/KONFEK	2289078	1	FLK 50/EZ-DR/ 100/KONFEK/S	2299107	1
	50	1.5 m	FLK 50/EZ-DR/ 150/KONFEK	2289081	1	FLK 50/EZ-DR/ 150/KONFEK/S	2299110	1
	50	2 m	FLK 50/EZ-DR/ 200/KONFEK	2289094	1	FLK 50/EZ-DR/ 200/KONFEK/S	2299123	1
	50	2.5 m	FLK 50/EZ-DR/ 250/KONFEK	2289104	1			
	50	3 m	FLK 50/EZ-DR/ 300/KONFEK	2289117	1	FLK 50/EZ-DR/ 300/KONFEK/S	2299136	1
	50	3.5 m	FLK 50/EZ-DR/ 350/KONFEK	2289120	1			
	50	4 m	FLK 50/EZ-DR/ 400/KONFEK	2289133	1	FLK 50/EZ-DR/ 400/KONFEK/S	2299149	1
	50	4.5 m	FLK 50/EZ-DR/ 450/KONFEK	2289573	1			
	50	5 m	FLK 50/EZ-DR/ 500/KONFEK	2289586	1			
	50	5.5 m	FLK 50/EZ-DR/ 550/KONFEK	2289599	1			
	50	6 m	FLK 50/EZ-DR/ 600/KONFEK	2289609	1	FLK 50/EZ-DR/ 600/KONFEK/S	2299152	1
	50	6.5 m	FLK 50/EZ-DR/ 650/KONFEK	2289612	1			
	50	7 m	FLK 50/EZ-DR/ 700/KONFEK	2289625	1			
	50	7.5 m	FLK 50/EZ-DR/ 750/KONFEK	2289638	1			
	50	8 m	FLK 50/EZ-DR/ 800/KONFEK	2289641	1	FLK 50/EZ-DR/ 800/KONFEK/S	2299165	1
	50	8.5 m	FLK 50/EZ-DR/ 850/KONFEK	2289654	1			
	50	9 m	FLK 50/EZ-DR/ 900/KONFEK	2289667	1			
	50	9.5 m	FLK 50/EZ-DR/ 950/KONFEK	2289670	1			
	50	10 m	FLK 50/EZ-DR/1000/KONFEK	2289683	1	FLK 50/EZ-DR/1000/KONFEK/S	2299178	1

Splitting cable with IDC/FLK socket strips

– Splitting 32 channels into 4 x 8 channels
– 50-pos. connector at one end
– 4 x 14-pos. connector at one end
– Connectors as per IEC 60603-13
– Unshielded
– Shielded
– Special lengths

Splitting cable unshielded
50 positions to 4 x 14

Splitting cable shielded
50 positions to 4 x 14

Technical data

Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Shield	-	Tinned copper-braided shield, approx. 85% covering
Assembly	Insulation displacement, IEC 60352-4/DIN EN 60352-4	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated
Number of plugs on the module side	4	4
Outside diameter		
50-pos.	6.3 mm	6.3 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Assembled round cable, with a 50-pos. IDC/FLK socket strip and four 14-pos. IDC/FLK socket strips, for splitting 32 channels into 4 x 8 channels.								
	50	0.5 m	**FLK 50/4X14/EZ-DR/ 50/KONFEK**	2296689	1			
	50	1 m	**FLK 50/4X14/EZ-DR/ 100/KONFEK**	2296692	1			
	50	1.5 m	**FLK 50/4X14/EZ-DR/ 150/KONFEK**	2296702	1			
	50	2 m	**FLK 50/4X14/EZ-DR/ 200/KONFEK**	2296715	1			
	50	2.5 m	**FLK 50/4X14/EZ-DR/ 250/KONFEK**	2305402	1			
	50	3 m	**FLK 50/4X14/EZ-DR/ 300/KONFEK**	2296728	1			
	50	4 m	**FLK 50/4X14/EZ-DR/ 400/KONFEK**	2296731	1			
	50	6 m	**FLK 50/4X14/EZ-DR/ 600/KONFEK**	2296744	1			
	50	8 m	**FLK 50/4X14/EZ-DR/ 800/KONFEK**	2296757	1			
	50	10 m	**FLK 50/4X14/EZ-DR/1000/KONFEK**	2296773	1			
Assembled round cable, as above, but in variable lengths								
	50		**FLK 50-4X14-EZ-DR ...**	2302405	1			
Assembled round cable, as above, but shielded and in variable lengths								
	50					**FLK 50-4X14-EZ-DR-S ...**	2302447	1

Ordering example for system cable:
– Unshielded splitting cable 12.75 m long

Quantity	Order No.	Length [m][1])
1	2302405	/ 12.75

[1]) min. 0.30 m

– Shielded splitting cable 11.00 m long

Quantity	Order No.	Length [m][1])
1	2302447	/ 11.00

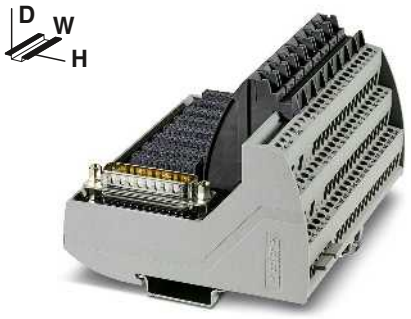
[1]) min. 0.30 m

VIP I/O-Marshalling base, D-SUB

new

VIP base element for use with IOA... plugs.

– Up to 8 channels per base
– D-SUB 25 connection to controller
– 4 connections per channel
– Multiple shield options



8-channel base with screw connection

Technical data

Maximum permissible operating voltage		125 V
Maximum permissible current (per branch)		3 A (field signal)
Maximum total current (voltage supply)		15 A (per module)
Ambient temperature (operation)		-40 °C ... 70 °C
Mounting position		As desired on 35 mm DIN rail in acc. with EN 60715
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	D-SUB pin strip
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	102.7 mm / 72.2 mm

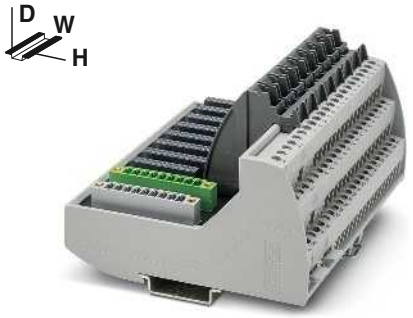
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Base element with D-SUB 25					
- Marked 1 to 8	8	118.1 mm	**VIP/S/D25M/BASE 1-8/L/C/EX**	2906595	1

VIP I/O-Marshalling base, removable plugs

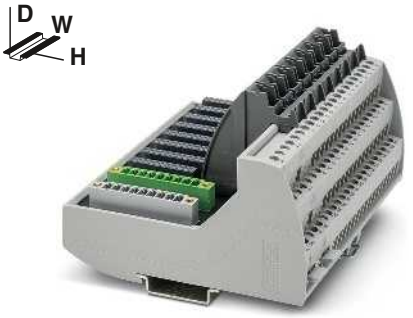
VIP base element for use with IOA... plugs.
– Up to 8 channels per base
– Base elements already marked for channels 1 to 32
– 4 connections per channel
– Multiple shield options
– Color-coded COMBICON connection to controller

new



8-channel base with screw connection

new



8-channel base with screw connection

Ex:

Technical data

Maximum permissible operating voltage		125 V
Maximum permissible current (per branch)		3 A (field signal)
Maximum total current (voltage supply)		15 A (per module)
Ambient temperature (operation)		-40 °C ... 75 °C
Mounting position		As desired on 35 mm DIN rail in acc. with EN 60715
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Plug-in screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	102.7 mm / 72.2 mm

Technical data

Maximum permissible operating voltage		125 V
Maximum permissible current (per branch)		3 A (field signal)
Maximum total current (voltage supply)		15 A (per module)
Ambient temperature (operation)		-40 °C ... 75 °C
Mounting position		As desired on 35 mm DIN rail in acc. with EN 60715
Standards/regulations		IEC 60664 , DIN EN 50178
Connection method	Field level	Screw connection
	Controller level	Plug-in screw connection
Connection data solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions	H / D	102.7 mm / 72.2 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Base element with MCC					
- Marked 1 to 8	8	118.1 mm	**VIP/S/MC/BASE 1-8/L/EX**	2906596	1
- Marked 9 to 16	8	118.1 mm	**VIP/S/MC/BASE 9-16/L/EX**	2906630	1
- Marked 17 to 24	8	118.1 mm	**VIP/S/MC/BASE 17-24/L/EX**	2907024	1
- Marked 25 to 32	8	118.1 mm	**VIP/S/MC/BASE 25-32/L/EX**	2907025	1
Base element with MCC, conformally coated					
- Marked 1 to 8	8	118.1 mm	**VIP/S/MC/BASE 1-8/L/C/EX**	2907186	1
- Marked 9 to 16	8	118.1 mm	**VIP/S/MC/BASE 9-16/L/C/EX**	2907187	1
- Marked 17 to 24	8	118.1 mm	**VIP/S/MC/BASE 17-24/L/C/EX**	2907209	1
- Marked 25 to 32	8	118.1 mm	**VIP/S/MC/BASE 25-32/L/C/EX**	2907210	1

Accessories

Partition plate			
- Base mount	**VIP/S/BASE 3L DIVIDER**	2907715	1
- Rail mount	**VIP/U/RAIL 3L DIVIDER**	2908555	1

Partition plate			
- Base mount	**VIP/S/BASE 3L DIVIDER**	2907715	1
- Rail mount	**VIP/U/RAIL 3L DIVIDER**	2908555	1

Input/output accessory, feed-through

new

IOA plug for VIP base element
– Feed-through plug for single channel
– Two-stage plug release

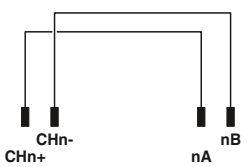
Feed-through plug

Technical data

Maximum permissible operating voltage	24 V DC
Maximum permissible current (per branch)	1 A
Ambient temperature (operation)	-40 °C ... 75 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Dimensions H / D	64.2 mm / 72.9 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Feed-through plug	1	10.3 mm	**IOA FEED-THRU/EX**	2906598	1



Input/output accessory, analog and digital

IOA plug for VIP base element
– Analog and digital input/output plugs for single channel
– 500 mA fuse with blown fuse indication
– Disconnect with test points
– Two-stage plug release

new

Analog protection plug with fuse

new

Digital protection plug with fuse

Description	No. of pos.	Module width W
Analog protection plug		
- 500 mA fuse	1	10.3 mm
Digital protection plug		
- 1 A fuse	1	10.3 mm

Technical data

Maximum permissible operating voltage	24 V DC
Maximum permissible current (per branch)	500 mA (fuse limited)
Ambient temperature (operation)	-40 °C ... 75 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Dimensions H / D	64.2 mm / 72.9 mm

Ordering data

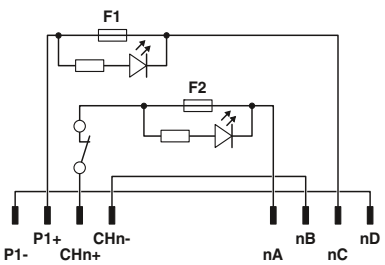
Type	Order No.	Pcs./ Pkt.
IOA AI/AO/BFI/DS/0.5A/EX	2906599	1

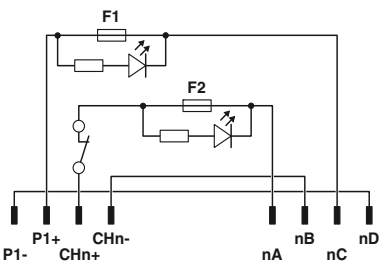
Technical data

Maximum permissible operating voltage	24 V DC
Maximum permissible current (per branch)	1 A (fuse limited)
Ambient temperature (operation)	-40 °C ... 75 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Dimensions H / D	64.2 mm / 72.9 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
IOA DI/DO/BFI/DS/1.0A/EX	2906600	1





Input/output accessory, relay

IOA plug for VIP base element
– Relay input and output plugs for single channel
– Fused with blown fuse indication
– Selectable N/O and N/C output contacts
– Two-stage plug release

new

Relay input plug

new

Relay output plug

Technical data

		①	②
Input data			
Permissible range (with reference to U_N)		0.9 - 1.1	0.9 - 1.1
Typical input current at U_N	[mA]	7	3
Typical response time at U_N	[ms]	5	3
Typical release time at U_N	[ms]	8	4
Input protection:		Yellow LED, polarity protection diode, damping diode	
Output data			
Contact type		1 N/O contact	1 N/O contact
Contact material		AgSnO, hard gold-plated	AgSnO, hard gold-plated
Max. switching voltage		24 V DC	36 V DC
Minimum switching voltage		100 mV (at 10 mA)	-
Limiting continuous current		50 mA	50 mA
Minimum switching current		1 mA (at 24 V)	1 mA (at 24 V)
General data			
Ambient temperature (operation)		-40 °C ... 70 °C	
Nominal operating mode		100% operating factor	
Mechanical service life		2 x 10^7 cycles	
Standards/regulations		IEC 60664 , DIN EN 50178	
Dimensions	W / H / D	10.3 mm / 64.2 mm / 72.9 mm	

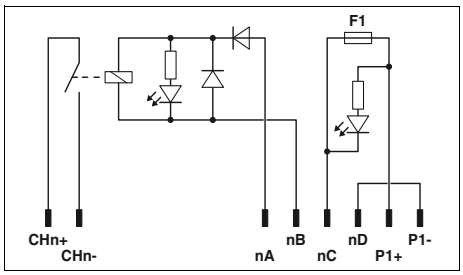
Technical data

		①	②
Input data			
Permissible range (with reference to U_N)		0.9 - 1.1	0.9 - 1.1
Typical input current at U_N	[mA]	13.5	13.5
Typical response time at U_N	[ms]	5	5
Typical release time at U_N	[ms]	8	8
Input protection:		Yellow LED, polarity protection diode, damping diode	
Output data			
Contact type		1 PDT	1 PDT
Contact material		AgSnO	AgSnO
Max. switching voltage		36 V DC	120 V AC / 125 V DC
Minimum switching voltage		5 V (at 100 mA)	-
Limiting continuous current		3 A (fuse limited)	3 A (fuse limited)
Minimum switching current		10 mA (at 12 V)	10 mA (at 12 V)
General data			
Ambient temperature (operation)		-40 °C ... 70 °C	
Nominal operating mode		100% operating factor	
Mechanical service life		2 x 10^7 cycles	
Standards/regulations		IEC 60664 , DIN EN 50178	
Dimensions	W / H / D	10.3 mm / 64.2 mm / 72.9 mm	

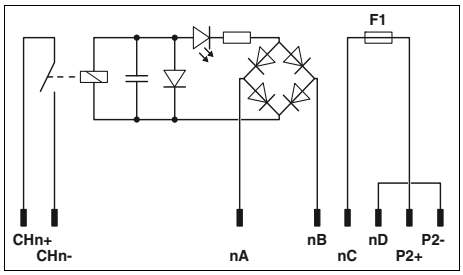
Ordering data

Description		Input voltage U_N	Type	Order No.	Pcs./ Pkt.
Digital relay input plug					
	①	24 V DC	**IOA REL 24V DI/BFI/1.0A/EX**	2910155	10
	②	120 V AC/DC	**IOA REL 120V DI/1.0A/EX**	2910157	10
Digital relay output plug					
	①	24 V DC	**IOA REL 24V DO/BFI/3.0A/EX**	2910153	10
	②	24 V DC	**IOA REL 120V DO/BFI/3.0A/EX**	2910154	10

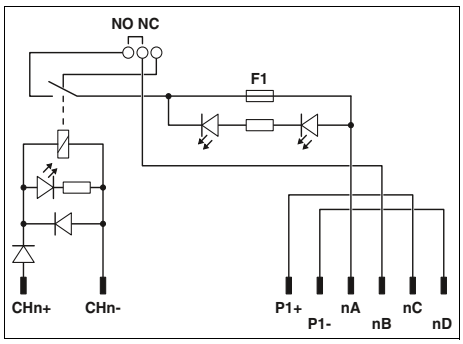
IOA REL 24V DI/BFI/1.0A/EX connection scheme



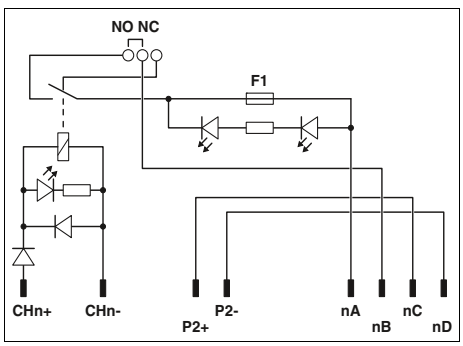
IOA REL 120V DI/1.0A/EX connection scheme



IOA REL 24V DO/BFI/3.0A/EX connection scheme



IOA REL 120V DO/BFI/3.0A/EX connection scheme



Intermediate adapter for SIMATIC® S5 to SIMATIC® S7-400

The S5 connector is plugged directly into the I/O card using the intermediate adapter. A new S7-400 is installed in place of the S5. The existing field wiring is retained.

Conversion adapter from SIMATIC® S5 to SIMATIC® S7-300

Using the adapters, the signals of the S5 front adapter are converted to a 50-pos. strip. The signals are routed to the S7-300 I/O module via a system cable and front adapter.

Startup adapter for test purposes

The universal startup adapters extend all signals of the existing S5 wiring. The open cable end can be connected to different controllers such as S7-400 or S7-300.

Your web code: #0007

Simply enter "#0007" into the search field on our website.

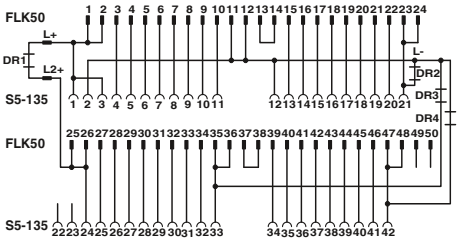
Siemens SIMATIC® S7-300 adapter for conversion from S5-135/155 to S7-300

S5-S7 adapters connect the S5-135 front adapters wired with individual wires to the I/O modules of the S7.

With the aid of the FLKM S135/S7/FLK50 converter module, the signals of the S5-135 front adapter can be converted to a 50-pos. strip. A FLK 50/EZ-DR/.../KONFEK 50-pos. system cable and a front adapter for S7-300 (FLKM 50-PA-S300) connect the signals to the I/O module.

Notes:

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



FLKM S135/S7/FLK50/PLC connection scheme

Converter for SIMATIC® S5-135 to 50-pos. FLK strip

Technical data

Maximum permissible operating voltage	60 V DC
Maximum permissible current	1 A (per path)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

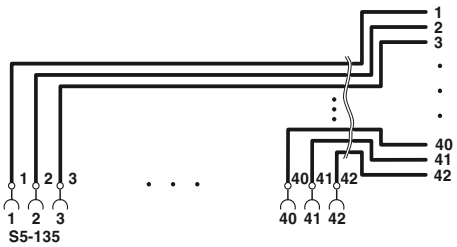
Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Digital IN or OUT 24 V DC from S5-135 to S7-300 **IN** 6ES5 420-4UA14 to 6ES7 321-1BL00-0AA0 6ES5 430-4UA14 to 6ES7 321-1BL00-0AA0 **OUT** 6ES5 441-4UA14 to 6ES7 322-1BL00-0AA0 6ES5 451-4UA14 to 6ES7 322-1BL00-0AA0	**FLKM S135/S7/FLK50/PLC**	2314736	1

Startup adapter for extending the existing S5-135/155 field wiring

All signals of the existing S5-135 wiring 3 or 5 are extended with the help of the universal startup adapters. The open cable end can be connected to various controllers such as S7-400 or S7-300. Thus, the existing field wiring of S5-135 can communicate with the new controller for test purposes. Since the new control unit is temporarily arranged before the control cabinet, the original status of the system can be restored if required.

The S5-135 is replaced once the system operates without errors with the new controller.



Startup adapter for S5-135/155 field wiring

Technical data

Maximum permissible operating voltage	250 V AC/DC
Maximum permissible current	6 A (per path)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Connection of all S5-135 connections (1 to 42) at the open cable end	**FLKM S135/42X0,75/3,0M/OE**	2315007	1
	FLKM S135/42X0,75/5,0M/OE	2318017	1
Connection of all S5-135 connections (1 to 42) without cable	**FLKM S135/42XMKDSN**	2901603	1

Siemens SIMATIC® S7-400 adapter for conversion from S5-135/155 to S7-400

The FLKM S135/... adapters directly connect an S5 connector wired with single wires to the S7-400 basic card.

The S5 connector is plugged directly into an S7-400 I/O card with the aid of the FLKM S135/... intermediate adapter.

A new S7-400 is installed in place of the S5. The existing field wiring is retained.

Note:

The LEDs of the S7-400 module are hidden.

Adapter for digital input modules

Technical data

		...SO120, ...S400, ...SO122	...SO121
Maximum permissible operating voltage		60 V DC	60 V DC
Maximum permissible current		4 A (per path) 4 A (per connection, supply via separate power supply)	2 A (per path) 2 A (during supply via separate power supply)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Connection method	Field level	SIEMENS S5-135 U pin strip	SIEMENS S5-135 U pin strip
Standards/regulations		IEC 60664 / DIN EN 50178	IEC 60664 / DIN EN 50178

Ordering data

Description	Module width W	Type	Order No.	Pcs./ Pkt.
Digital IN 24 V DC				
6ES5 420-4UA14 on 6ES7 421-1BL01-0AA0		**FLKM S135/S400/SO120**	2301723	1
6ES5 430-4UA14 on 6ES7 421-1BL01-0AA0		**FLKM S135/S400/SO121**	2301736	1
6ES5 431-4UA12 to 6ES7 421-7DH00-0AB0		**FLKM S135-431-4UA/S400**	2314846	1
6ES5 432-4UA12 on 6ES7 421-1BL01-0AA0		**FLKM S135/S400/SO122**	2301749	1
Digital OUT 24 V DC				
6ES5 441-4UA12 to 6ES7 422-1BL00-0AA0				
6ES5 451-4UA14 to 6ES7 422-1BL00-0AA0				
Digital OUT 24 V DC / 2 A				
6ES5 453-4UA12 to 6ES7 422-1HH00-0AA0				
6ES5 454-4UA14 to 6ES7 422-1BH11-0AA0				
Analog IN				
Pt 100				
6ES5 465-4UA13 to 6ES7 431-7KF10-0AB0				
Current and voltage measurement				
6ES5 465-4UA13 to 6ES7 431-0HH00-0AB0				
6ES5 465-4UA13 to 6ES7 431-7QH00-0AB0				
Current measurement				
6ES5 460-4UA13 to 6ES7 431-1KF00-0AB0				
Voltage measurement				
6ES5 460-4UA13 to 6ES7 431-1KF00-0AB0				
Analog OUT				
Current output				
6ES5 470-4UA13 to 6ES7 432-1HF00-0AB0				
6ES5 470-4UC13 to 6ES7 432-1HF00-0AB0				
Voltage output				
6ES5 470-4UA13 to 6ES7 432-1HF00-0AB0				
6ES5 470-4UB13 to 6ES7 432-1HF00-0AB0				
6ES5 470-4UC13 to 6ES7 432-1HF00-0AB0				

Adapter for digital output modules

Adapter for analog input modules

Adapter for analog output modules

Technical data

60 V DC
4 A (per path)
4 A (per connection, supply via separate power supply)

-20 °C ... 50 °C
SIEMENS S5-135 U pin strip

IEC 60664 / DIN EN 50178

Technical data

...T/S400
60 V DC
2 A (per path)
2 A (per connection, supply via separate power supply)

...UI/S400, ...I/S400, ...U/S400
60 V DC
4 A (per path)
4 A (per connection, supply via separate power supply)

-20 °C ... 50 °C
SIEMENS S5-135 U pin strip

IEC 60664 / DIN EN 50178

Technical data

60 V DC
4 A (per path)
4 A (per connection, supply via separate power supply)

-20 °C ... 50 °C
SIEMENS S5-135 U pin strip

IEC 60664 / DIN EN 50178

Ordering data

Type	Order No.	Pcs./ Pkt.
FLKM S135/S400/SO125	2301778	1
FLKM S135/S400/SO126	2301781	1
FLKM S135/S400/SO127	2301794	1
FLKM S135-454-4UA/S400	2314859	1

Ordering data

Type	Order No.	Pcs./ Pkt.
FLKM S135-465-4UA/T/S400	2314875	1
FLKM S135-465-4UA/UI/S400	2314888	1
FLKM S135-460-4UA/I/S400	2314613	1
FLKM S135-460-4UA/U/S400	2314862	1

Ordering data

Type	Order No.	Pcs./ Pkt.
FLKM S135-470-4UC/I/S400	2314626	1
FLKM S135-470-4UC/U/S400	2314891	1

Siemens SIMATIC® S7-400 adapter for conversion from S5-115 to S7-400

The FLKM S115/... adapters directly connect an S5 connector wired with single wires to the S7-400 basic card.

The S5 connector is plugged directly into an S7-400 I/O card with the aid of the FLKM S115/... intermediate adapter.

A new S7-400 is installed in place of the S5. The existing field wiring is retained.

Note:

Due to the geometry, it is only possible to use every other slot. The LEDs of the S7-400 module are hidden by the S5-115 adapter.

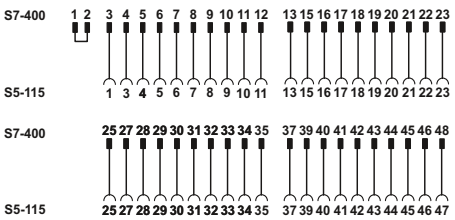
Adapter for SIMATIC® S5-115/S7-400

Technical data

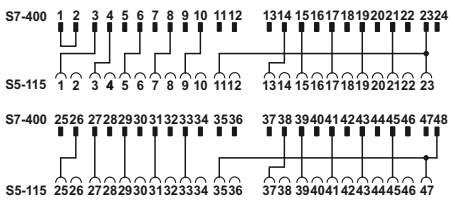
Maximum permissible operating voltage	60 V DC
Maximum permissible current	4 A (per path) 4 A (per connection, supply via separate power supply)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Mounting position	any
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Digital IN or OUT 24 V DC from S5-115 to S7-400			
IN 6ES5 420-7LA11 to 6ES7 421-1BL01-0AA0 6ES5 430-7LA11 to 6ES7 421-1BL01-0AA0 **OUT** 6ES5 441-7LA11 to 6ES7 422-1BL00-0AA0 6ES5 451-7LA11 to 6ES7 422-1BL00-0AA0	**FLKM S115/S400/SO155**	2307248	1
Digital OUT 24 V DC from S5-115 to S7-400			
6ES5 454-7LA12 to 6ES7 422-1BH11-0AA0	**FLKM S115-454-7LA/S400**	2314901	1



Connection scheme: FLKM S115/S400/SO155



FLKM S115-454-7LA/S400 connection scheme

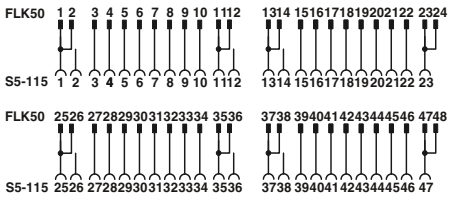
Siemens SIMATIC® S7-300 adapter for conversion from S5-115 to S7-300

S5-S7 adapters connect the S5-115 front adapters wired with individual wires to the I/O modules of S7-300.

With the aid of the FLKM S115/S7/FLK50/SO137 converter module, the signals of the S5-115 front adapter can be converted to a 50-pos. strip. A FLK 50/EZ-DR/.../KONFEK 50-pos. system cable and a front adapter for S7-300 (FLKM 50-PA-S300) connect the signals to the I/O module.

Notes:

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).



Connection scheme: FLKM S115/S7/FLK50/PLC/SO137

Converter for SIMATIC® S5-115 to 50-pos. FLK strip

Technical data

Maximum permissible operating voltage	60 V DC
Maximum permissible current	1 A (per path)
Maximum permissible total current	2 A (per byte)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Standards/regulations	IEC 60664 / DIN EN 50178

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Digital IN or OUT 24 V DC from S5-115 through converters, system cables and front adapters to S7-300			
IN 6ES5 420-7LA11 on 6ES7 321-1BL00-0AA0 6ES5 430-7LA11 on 6ES7 321-1BL00-0AA0 **OUT** 6ES5 441-7LA11 on 6ES7 322-1BL00-0AA0 6ES5 451-7LA11 on 6ES7 322-1BL00-0AA0	**FLKM S115/S7/FLK50/PLC/SO137**	2306294	1

Startup adapters for extending the existing S5-115 field wiring

All signals of the existing S5-115 wiring 3 or 5 are extended with the help of the universal startup adapters. The open cable end can be connected to various controllers such as S7-400 or S7-300. Thus, the existing field wiring of S5-115 can communicate with the new controller for test purposes. Since the new control unit is temporarily arranged before the control cabinet, the original status of the system can be restored if required.

The S5-115 is replaced once the system operates without errors with the new controller.

Startup adapter for S5-115 field wiring

Technical data

Maximum permissible operating voltage	250 V AC/DC
Maximum permissible current	6 A (per path)
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Mounting position	any
Standards/regulations	DIN EN 50178 / IEC 60664

Ordering data

Description	Type	Order No.	Pcs./ Pkt.
Connection of all S5-115 connections (1 to 23, 25 to 47) at the open cable end			
	FLKM S115/47X0,75/3,0M/OE	2314985	1
	FLKM S115/47X0,75/5,0M/OE	2314998	1

Siemens SIMATIC® S7-300 adapter for conversion from S5-95U to S7-300

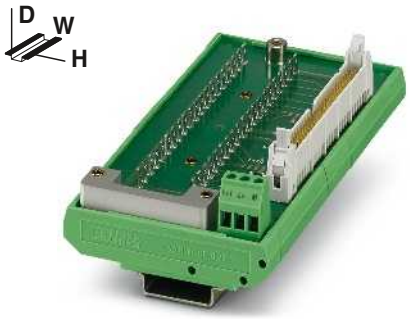
S5-S7 adapters connect the S5-95U front adapters wired with individual wires to the I/O modules of the S7-300.

With the aid of the UM-S95U/S/FLK50/PLC converter module, the signals can be converted to a 50-pos. strip. A FLK 50/EZ-DR/.../KONFEK 50-pos. cable and the front adapter for SIMATIC® S7-300 (FLKM 50-PA-S300) establish a connection to the I/O module.

Notes:

Due to the geometry, it is not possible to couple any molded FLK connectors (e.g., VIP-PA...S7).

new



Converter for SIMATIC® S5-95U to 50-pos. IDC/FLK pin strip

Technical data

Maximum permissible operating voltage		30 V DC
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		DIN EN 50178
Connection method	Field level	Slip-on connection
	Controller level	IDC/FLK pin strip
Dimensions	H / D	77 mm / 49 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
Digital 16 IN/16 OUT, 24 V DC from S5-95U/100U to S7-300 S5-100U: 6ES5 482-8MA13 to 6ES7 323-1BL00-AA0 S5-95U: 6ES5 095-8MA03 to 6ES7 323-1BL00-AA0		135 mm	**UM-S95U/S7/FLK50/PLC**	2907030	1

VIP – VARIOFACE Professional modules with IDC/FLK pin strip

– 1:1 connection
– 10 to 64-pos.
– Screw connection
– Metal foot
– As per IEC 60603-13
– With status indicator as an option
Low and high engagement latches are supplied with all modules.

Notes:

For marking systems (e.g., “ZB 22:UNBEDRUCKT”; Order No. 0811862) and mounting material, see Catalog 3.

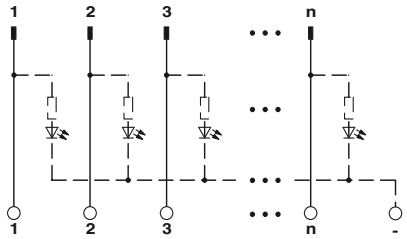
10 to 20 positions with screw connection

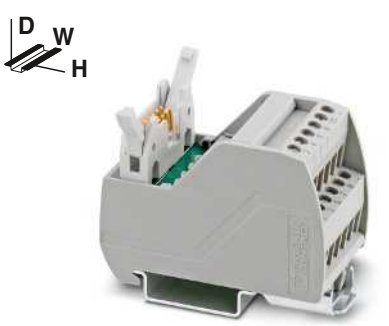
Technical data

Maximum permissible operating voltage		60 V AC/DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 56 mm

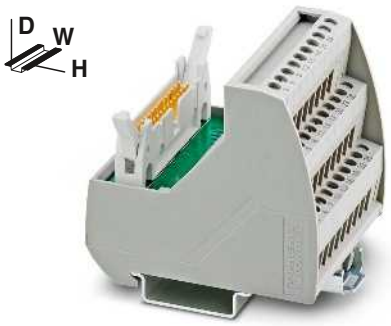
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with pin strip					
	10	34.70	**VIP-2/SC/FLK10**	2315010	1
	14	39.80	**VIP-2/SC/FLK14**	2315023	1
	16	45.00	**VIP-2/SC/FLK16**	2315036	1
	20	55.10	**VIP-2/SC/FLK20**	2315049	1
VARIOFACE module, with pin strip and light indicator					
	10	34.70			
	14	44.90			
	16	50.00			
	20	60.20			
VARIOFACE module, with pin strip					
	26	57.10			
	34	67.30			
	40	77.40			
	50	92.70			
	60	108.00			
	64	118.00			
VARIOFACE module, with pin strip and light indicator					
	26	57.40			
	34	67.60			
	40	77.80			
	50	93.10			
	60	113.50			
	64	118.60			

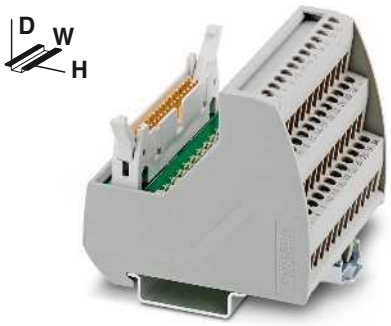




10 to 20 positions
with screw connection and light indicator



26 to 64 positions
with screw connection



26 to 64 positions
with screw connection and light indicator

Technical data

24 V DC
24 V / 24 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
65.5 mm / 56 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/SC/FLK10/LED	2322045	1
VIP-2/SC/FLK14/LED	2322058	1
VIP-2/SC/FLK16/LED	2322061	1
VIP-2/SC/FLK20/LED	2322074	1

Technical data

60 V AC/DC
125 V / 125 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
69 mm / 62 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/SC/FLK26	2315052	1
VIP-3/SC/FLK34	2315065	1
VIP-3/SC/FLK40	2315078	1
VIP-3/SC/FLK50	2315081	1
VIP-3/SC/FLK60	2315094	1
VIP-3/SC/FLK64	2315104	1

Technical data

24 V DC
24 V / 24 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
69 mm / 62 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/SC/FLK26/LED	2322087	1
VIP-3/SC/FLK34/LED	2322090	1
VIP-3/SC/FLK40/LED	2322100	1
VIP-3/SC/FLK50/LED	2322113	1
VIP-3/SC/FLK60/LED	2322126	1
VIP-3/SC/FLK64/LED	2322139	1

VIP – VARIOFACE Professional modules with IDC/FLK pin strip

– 1:1 connection
– 10 to 64-pos.
– Push-in connection
– Metal foot
– As per IEC 60603-13
– With status indicator as an option
Low and high engagement latches are supplied with all modules.

Notes:

For marking systems (e.g., “ZB 22:UNBEDRUCKT”; Order No. 0811862) and mounting material, see Catalog 3.

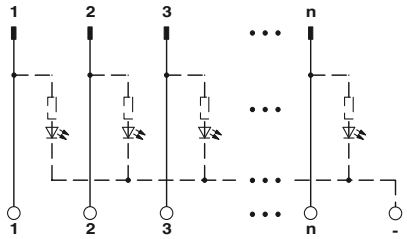
10 to 20 positions with Push-in connection

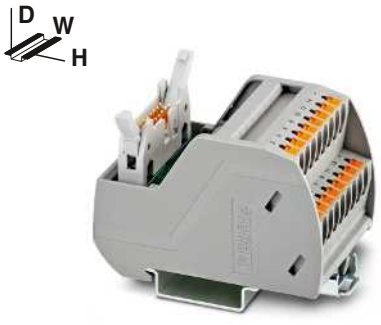
Technical data

Maximum permissible operating voltage	60 V AC/DC
Maximum permissible operating voltage UL / CSA	125 V / 125 V
Maximum permissible current (per branch)	1 A
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions H / D	72.1 mm / 56 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with pin strip					
	10	36.80	**VIP-2/PT/FLK10**	2903787	1
	14	41.90	**VIP-2/PT/FLK14**	2903788	1
	16	46.90	**VIP-2/PT/FLK16**	2903789	1
	20	57.10	**VIP-2/PT/FLK20**	2903790	1
VARIOFACE module, with pin strip and light indicator					
	10	36.80			
	14	41.90			
	16	46.90			
	20	57.10			
VARIOFACE module, with pin strip					
	26	57.10			
	34	67.30			
	40	77.40			
	50	92.70			
	60	107.90			
	64	118.10			
VARIOFACE module, with pin strip and light indicator					
	26	57.10			
	34	67.30			
	40	77.40			
	50	92.70			
	60	107.90			
	64	118.10			





10 to 20 positions
with Push-in connection and light indicator

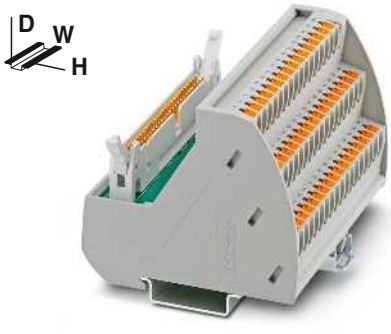
Technical data

24 V DC
24 V / 24 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
72.1 mm / 56 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/FLK10/LED	**2904248**	1
VIP-2/PT/FLK14/LED	**2904249**	1
VIP-2/PT/FLK16/LED	**2904250**	1
VIP-2/PT/FLK20/LED	**2904251**	1



26 to 64 positions
with Push-in connection

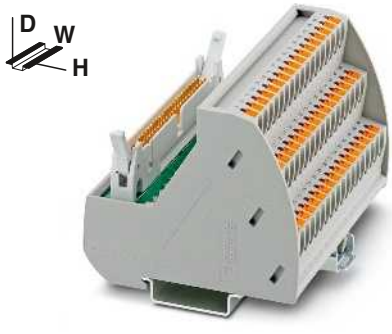
Technical data

60 V AC/DC
125 V / 125 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
75.8 mm / 63 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/PT/FLK26	**2903791**	1
VIP-3/PT/FLK34	**2903792**	1
VIP-3/PT/FLK40	**2903793**	1
VIP-3/PT/FLK50	**2903794**	1
VIP-3/PT/FLK60	**2903795**	1
VIP-3/PT/FLK64	**2903796**	1



26 to 64 positions
with Push-in connection and light indicator

Technical data

24 V DC
24 V / 24 V

1 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
75.8 mm / 63 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/PT/FLK26/LED	**2904252**	1
VIP-3/PT/FLK34/LED	**2904253**	1
VIP-3/PT/FLK40/LED	**2904254**	1
VIP-3/PT/FLK50/LED	**2904255**	1
VIP-3/PT/FLK60/LED	**2904256**	1
VIP-3/PT/FLK64/LED	**2904257**	1

VIP – VARIOFACE Professional Modules with D-SUB connectors

– 1:1 connection
– 9 to 50-pos.
– Screw connection
– Metal foot
– As per IEC 60807-2
– With status indicator as an option
The D-SUB-4-40 UNC threads are led on to a connecting terminal block directly.

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.

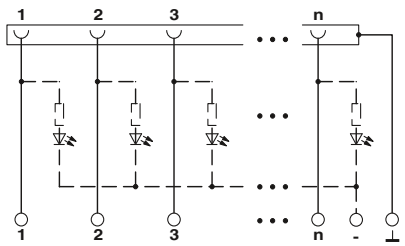
9 to 15 positions with screw connection

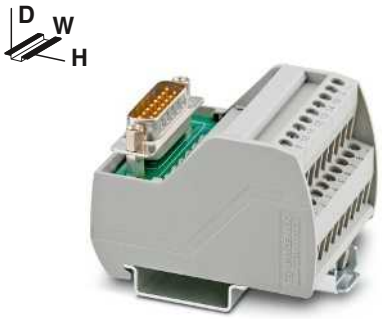
Technical data

Maximum permissible operating voltage		25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 105 V
Maximum permissible current (per branch)		2 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	H / D	65.5 mm / 45.1 mm

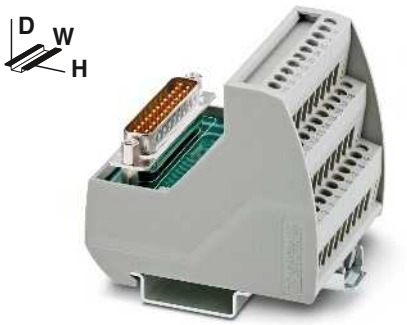
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with D-Subminiature pin strip					
	9	34.70	**VIP-2/SC/D 9SUB/M**	2315117	1
	15	45.00	**VIP-2/SC/D15SUB/M**	2315120	1
VARIOFACE module, with D-Subminiature pin strip and light indicator					
	9	34.70			
	15	50.00			
VARIOFACE module, with D-Subminiature socket strip					
	9	34.70	**VIP-2/SC/D 9SUB/F**	2315162	1
	15	45.00	**VIP-2/SC/D15SUB/F**	2315175	1
VARIOFACE module, with D-Subminiature socket strip and light indicator					
	9	34.70			
	15	50.00			
VARIOFACE module, with D-Subminiature pin strip					
	25	57.40			
	37	72.70			
	50	98.20			
VARIOFACE module, with D-Subminiature pin strip and light indicator					
	25	57.40			
	37	72.70			
	50	98.20			
VARIOFACE module, with D-Subminiature socket strip					
	25	57.40			
	37	72.70			
	50	98.20			
VARIOFACE module, with D-Subminiature socket strip and light indicator					
	25	57.40			
	37	72.70			
	50	98.20			

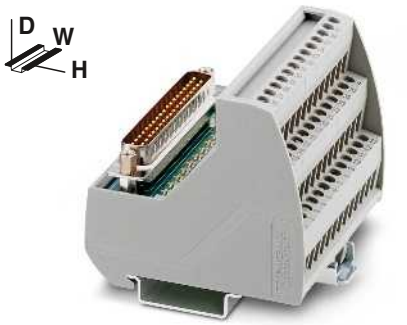




9 to 15 positions
with screw connection and light indicator



25 to 50 positions
with screw connection



25 to 50 positions
with screw connection and light indicator

Technical data

24 V DC
24 V / 24 V

2.5 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
65.5 mm / 45.1 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/SC/D 9SUB/M/LED	2322142	1
VIP-2/SC/D15SUB/M/LED	2322155	1
VIP-2/SC/D 9SUB/F/LED	2322197	1
VIP-2/SC/D15SUB/F/LED	2322207	1

Technical data

25 V AC / 60 V DC
125 V / 105 V

2 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
69 mm / 62 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/SC/D25SUB/M	2315133	1
VIP-3/SC/D37SUB/M	2315146	1
VIP-3/SC/D50SUB/M	2315159	1
VIP-3/SC/D25SUB/F	2315188	1
VIP-3/SC/D37SUB/F	2315191	1
VIP-3/SC/D50SUB/F	2315201	1

Technical data

24 V DC
24 V / 24 V

2.5 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
69 mm / 62 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/SC/D25SUB/M/LED	2322168	1
VIP-3/SC/D37SUB/M/LED	2322171	1
VIP-3/SC/D50SUB/M/LED	2322184	1
VIP-3/SC/D25SUB/F/LED	2322210	1
VIP-3/SC/D37SUB/F/LED	2322223	1
VIP-3/SC/D50SUB/F/LED	2322236	1

VIP – VARIOFACE Professional Modules with D-SUB connectors

– 1:1 connection
– 9 to 50-pos.
– Push-in connection
– Metal foot
– As per IEC 60807-2
– With status indicator as an option
The D-SUB-4-40 UNC threads are led on to a connecting terminal block directly.

Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.

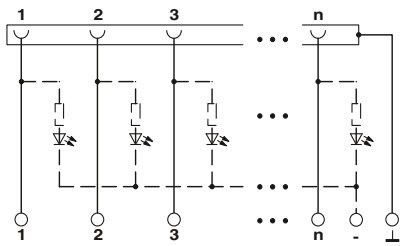
9 to 15 positions with Push-in connection

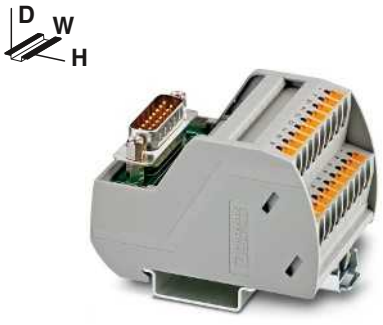
Technical data

Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / 105 V
Maximum permissible current (per branch)	2 A
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions H / D	72.1 mm / 46.6 mm

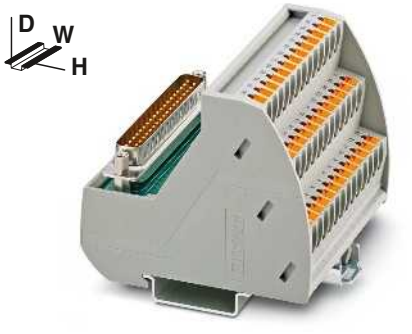
Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with D-Subminiature pin strip					
	9	36.80	**VIP-2/PT/D 9SUB/M**	2903777	1
	15	46.90	**VIP-2/PT/D15SUB/M**	2903779	1
VARIOFACE module, with D-Subminiature pin strip and light indicator					
	9	36.80			
	15	52.00			
VARIOFACE module, with D-Subminiature socket strip					
	9	36.80	**VIP-2/PT/D 9SUB/F**	2903778	1
	15	46.90	**VIP-2/PT/D15SUB/F**	2903780	1
VARIOFACE module, with D-Subminiature socket strip and light indicator					
	9	36.80			
	15	52.00			
VARIOFACE module, with D-Subminiature pin strip					
	25	57.10			
	37	72.30			
	50	97.70			
VARIOFACE module, with D-Subminiature pin strip and light indicator					
	25	57.10			
	37	72.30			
	50	97.70			
VARIOFACE module, with D-Subminiature socket strip					
	25	57.10			
	37	72.30			
	50	97.70			
VARIOFACE module, with D-Subminiature socket strip and light indicator					
	25	57.10			
	37	72.30			
	50	97.70			

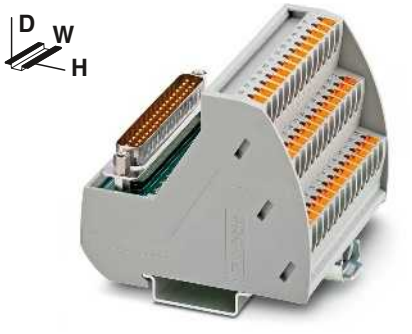




9 to 15 positions
with Push-in connection and light indicator



25 to 50 positions
with Push-in connection



25 to 50 positions
with Push-in connection and light indicator

Technical data

24 V DC
24 V / 24 V

2 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
72.1 mm / 46.6 mm

Technical data

25 V AC / 60 V DC
125 V / 105 V

2 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
75.8 mm / 63 mm

Technical data

24 V DC
24 V / 24 V

2 A
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
75.8 mm / 63 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/D 9SUB/M/LED	2904258	1
VIP-2/PT/D15SUB/M/LED	2904259	1
VIP-2/PT/D 9SUB/F/LED	2904263	1
VIP-2/PT/D15SUB/F/LED	2904264	1

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/PT/D25SUB/M	2903781	1
VIP-3/PT/D37SUB/M	2903783	1
VIP-3/PT/D50SUB/M	2903785	1
VIP-3/PT/D25SUB/F	2903782	1
VIP-3/PT/D37SUB/F	2903784	1
VIP-3/PT/D50SUB/F	2903786	1

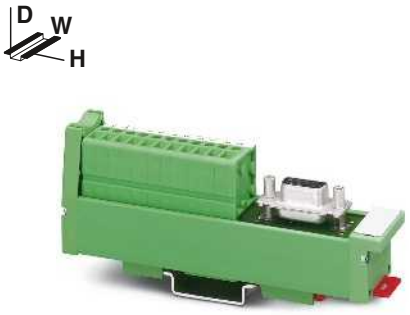
Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-3/PT/D25SUB/M/LED	2904260	1
VIP-3/PT/D37SUB/M/LED	2904261	1
VIP-3/PT/D50SUB/M/LED	2904262	1
VIP-3/PT/D25SUB/F/LED	2904265	1
VIP-3/PT/D37SUB/F/LED	2904266	1
VIP-3/PT/D50SUB/F/LED	2904267	1

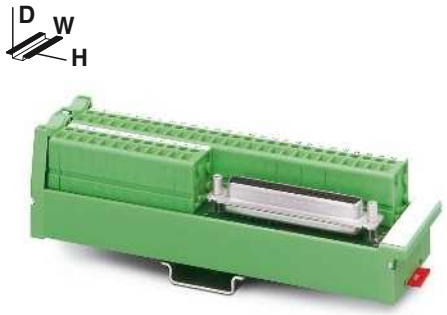
SLIM-LINE modules for D-SUB connectors

These VARIOFACE modules connect D-SUB strips with front connection terminal blocks in accordance with IEC 60807-2/DIN 41652.

To make the ground connection, the metallic plug shell (4-40 UNC thread) makes contact with a connecting terminal block.



9 to 25 positions with screw connection



37 to 50 positions with screw connection

EAC

Technical data

Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible current (per branch)	2.5 A
Ambient temperature (operation)	-10 °C ... 50 °C
Mounting position	any
Standards/regulations	DIN EN 50178 , IEC 60664
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions D / W	45 mm / 25 mm

EAC

Technical data

Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible current (per branch)	2.5 A
Ambient temperature (operation)	-10 °C ... 50 °C
Mounting position	any
Standards/regulations	DIN EN 50178 , IEC 60664
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions D / W	45 mm / 45 mm

Ordering data

Description	No. of pos.	Module height H	Type	Order No.	Pcs./ Pkt.
VARIOFACE-SLIM-LINE module, with D-Subminiature pin strip					
	9	117.00	**UM 25-D 9SUB/S/FRONT/Q**	2959573	1
	15	147.00	**UM 25-D15SUB/S/FRONT/Q**	2959599	1
	25	217.00	**UM 25-D25SUB/S/FRONT/Q**	2959612	1
VARIOFACE-SLIM-LINE module, with D-Subminiature socket strip					
	9	117.00	**UM 25-D 9SUB/B/FRONT/Q**	2959560	1
	15	147.00	**UM 25-D15SUB/B/FRONT/Q**	2959586	1
	25	217.00	**UM 25-D25SUB/B/FRONT/Q**	2959609	1
VARIOFACE-SLIM-LINE module, with D-Subminiature pin strip					
	37	157.00	**UM 45-D37SUB/S/FRONT/Q**	2959638	1
	50	187.00	**UM 45-D50SUB/S/FRONT/Q**	2959654	1
VARIOFACE-SLIM-LINE module, with D-Subminiature socket strip					
	37	157.00	**UM 45-D37SUB/B/FRONT/Q**	2959625	1
	50	187.00	**UM 45-D50SUB/B/FRONT/Q**	2959641	1

Feed-through modules for D-SUB connectors with screw connection

– 1:1 connection
– 9 to 50-pos.
– Screw connection
– As per IEC 60807-2
– D-SUB 4-40 UNC thread
– 9 to 37-pos.: separate ground tap
– 50-pos.: no ground tap

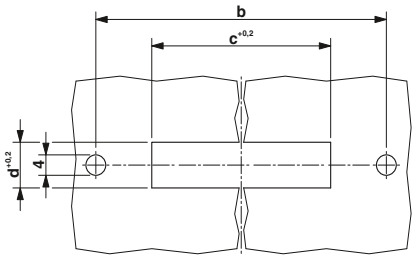
With D-SUB pin strip

With D-SUB socket strip

	Technical data	Technical data
Maximum permissible operating voltage	25 V AC / 60 V DC	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / -	125 V / -
Maximum permissible current (per branch)	2.5 A	2.5 A
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position	any	any
Standards/regulations	IEC 60664 , DIN EN 50178	IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

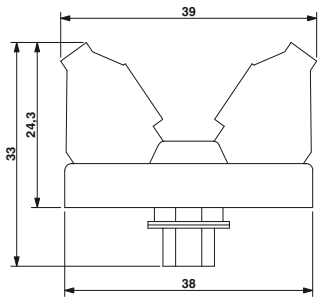
Description	No. of pos.	Module width W	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
VARIOFACE feed-through module, with D-subminiature connector								
	9	39.00	**DFLK-D 9 SUB/S**	2283870	5	**DFLK-D 9 SUB/B**	2287135	5
	15	39.00	**DFLK-D15 SUB/S**	2280297	5	**DFLK-D15 SUB/B**	2280307	5
	25	39.00	**DFLK-D25 SUB/S**	2280310	5	**DFLK-D25 SUB/B**	2280323	5
	37	39.00	**DFLK-D37 SUB/S**	2280336	5	**DFLK-D37 SUB/B**	2280349	5
	50	39.00	**DFLK-D50 SUB/S**	2291286	5	**DFLK-D50 SUB/B**	2287669	5

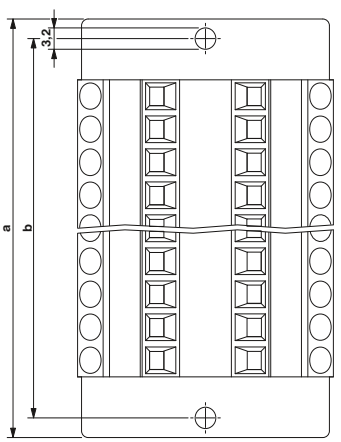
Dimensioning of the housing cutout



Type	a	b	c	d
DFLK-D 9 SUB/S	58.4	52.5	40.2 + 0.2	13 + 0.2
DFLK-D 15 SUB/S	58.4	52.5	40.2 + 0.2	13 + 0.2
DFLK-D 25 SUB/S	83.4	77.5	54.2 + 0.2	13 + 0.2
DFLK-D 37 SUB/S	128.4	122.5	70.6 + 0.2	13 + 0.2
DFLK-D 50 SUB/S	143.4	137.5	67.8 + 0.2	15.8 + 0.2
DFLK-D 9 SUB/B	58.4	52.5	40.2 + 0.2	13 + 0.2
DFLK-D 15 SUB/B	58.4	52.5	40.2 + 0.2	13 + 0.2
DFLK-D 25 SUB/B	83.4	77.5	54.2 + 0.2	13 + 0.2
DFLK-D 37 SUB/B	128.4	122.5	70.6 + 0.2	13 + 0.2
DFLK-D 50 SUB/B	143.4	137.5	67.8 + 0.2	15.8 + 0.2

Dimensional drawing DFLK-D...SUB





VIP – VARIOFACE Professional Modules for high-density D-SUB connectors

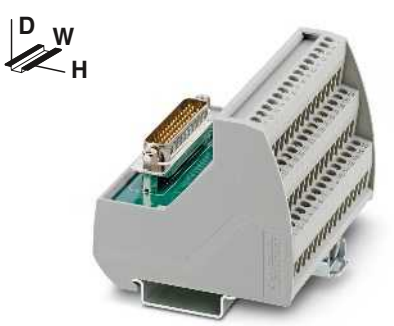
– 1:1 connection
– 15 to 62-pos.
– Screw and Push-in connection
– Metal foot

The D-SUB-4-40 UNC threads are led directly to a connection terminal block.

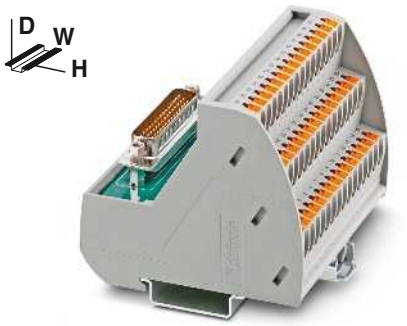
Notes:

For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.

[1]) Module with double-level terminal blocks



15 to 62-pos. with screw connection



15 to 62-pos. with Push-in connection

Technical data

Maximum permissible operating voltage		25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		EN 50178
Connection data solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	H / D	69 mm / 62 mm

Technical data

Maximum permissible operating voltage		25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 105 V
Maximum permissible current (per branch)		1 A
Ambient temperature (operation)		-20 °C ... 50 °C
Mounting position		any
Standards/regulations		EN 50178
Connection data solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	H / D	75.8 mm / 63 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with D-Subminiature pin strip					
with screw connection	26	52.30	**VIP-3/SC/HD26SUB/M**	2322375	1
with screw connection	44	82.90	**VIP-3/SC/HD44SUB/M**	2322388	1
with screw connection	62	113.50	**VIP-3/SC/HD62SUB/M**	2322391	1
with Push-in connection	26	52.00			
with Push-in connection	44	82.50			
with Push-in connection	62	113.00			
VARIOFACE module, with D-Subminiature socket strip					
with screw connection [1])	15	44.90	**VIP-2/SC/HD15SUB/F**	2322401	1
with screw connection	26	52.30	**VIP-3/SC/HD26SUB/F**	2322414	1
with screw connection	44	82.90	**VIP-3/SC/HD44SUB/F**	2322427	1
with screw connection	62	113.50	**VIP-3/SC/HD62SUB/F**	2322430	1
with Push-in connection [1])	15	46.90			
with Push-in connection	26	52.00			
with Push-in connection	44	82.50			
with Push-in connection	62	113.00			

Ordering data

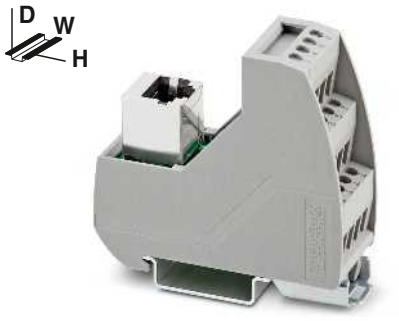
Type	Order No.	Pcs./ Pkt.
VIP-3/PT/HD26SUB/M	2904269	1
VIP-3/PT/HD44SUB/M	2904270	1
VIP-3/PT/HD62SUB/M	2904271	1
VIP-2/PT/HD15SUB/F	2904272	1
VIP-3/PT/HD26SUB/F	2904273	1
VIP-3/PT/HD44SUB/F	2904274	1
VIP-3/PT/HD62SUB/F	2904275	1

Modules with RJ45 connector

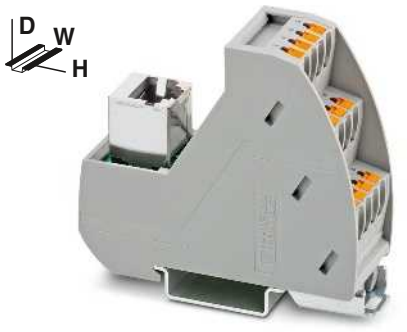
- 1:1 connection
- RJ45 connector, 8-pos.
- Screw or Push-in connection (direct plug-in technology)
- Connector housing led to separate connection terminal blocks

Notes:

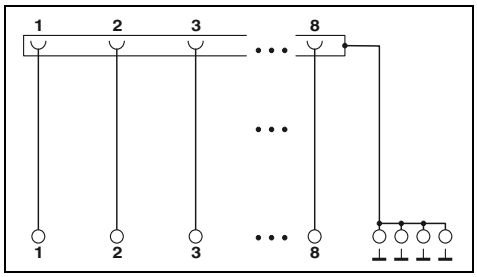
For marking systems (e.g., "ZB 22:UNBEDRUCKT"; Order No. 0811862) and mounting material, see Catalog 3.

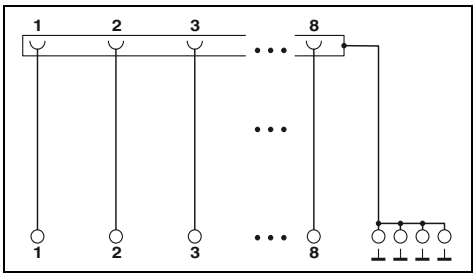


**8-pos.
with srew connection**



**8-pos.
with Push-in connection**





Technical data

Maximum permissible operating voltage	48 V AC/DC
Maximum permissible current (per branch)	1 A
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any
Standards/regulations	DIN EN 50178
Connection data solid/stranded/AWG	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions H / D	69 mm / 62 mm

Technical data

Maximum permissible operating voltage	48 V AC/DC
Maximum permissible current (per branch)	1 A
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any
Standards/regulations	EN 50178
Connection data solid/stranded/AWG	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions H / D	75.8 mm / 63 mm

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with RJ45 connector					
with screw connection	8	26.90	**VIP-3/SC/RJ45**	2900701	1
with Push-in connection	8	26.60	**VIP-3/PT/RJ45**	2904290	1

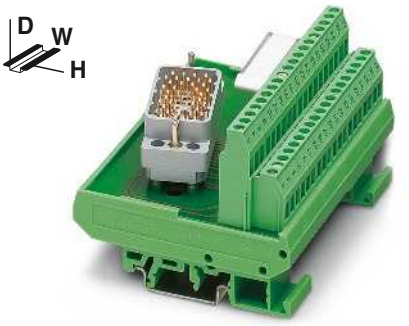
Modules for ELCO connectors

These modules can be used to connect ELCO connectors of the 8016 series to screw connection terminal blocks.

Thanks to the slanted placement of the ELCO connector, the cables which are fed out of the side of the cable housing are led away without affecting the neighboring modules.

Notes:

Dimensional drawings and pin assignments, see page 600



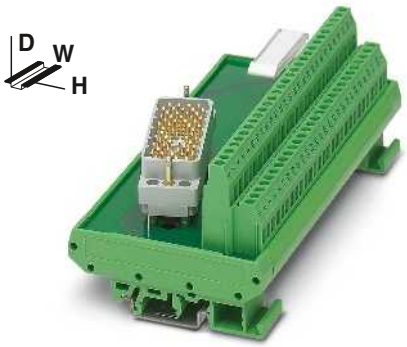
38-pos.

Technical data

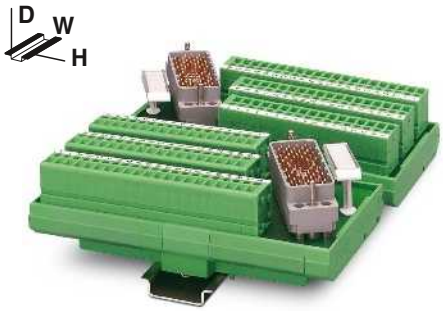
Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible current (per branch)	2 A
Total current	76 A
Ambient temperature (operation)	-20 °C ... 40 °C
Mounting position	any
Standards/regulations	IEC 60664 , DIN EN 50178
Connection data solid/stranded/AWG	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions H / D	77 mm / 58.5 mm

Ordering data

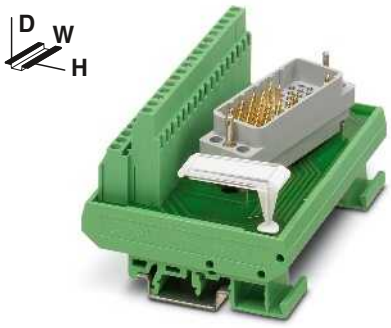
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with:					
- Pin strip 8016 right	38	101.50	**UMK- EC38/38-XOR**	2976297	1
- Pin strip 8016 left	38	101.50	**UMK- EC38/38-XOL**	2976284	1
VARIOFACE module, with:					
- Pin strip 8016 right	56	157.50			
- Pin strip 8016 left	56	157.50			
VARIOFACE module, with:					
- Pin strip 8016 right	56	77.00			
- Pin strip 8016 left	56	77.00			
VARIOFACE module, with:					
- Pin strip 8016 right above	32	101.30			
- Pin strip 8016 right below	32	101.30			
- Pin strip 8016 left above	32	101.30			
- Pin strip 8016 left below	32	101.30			



56-pos.



56-pos.,
with front connection terminal blocks



32-pos.

EAC

Technical data

125 V AC/DC
1.5 A
28 A (56 branches with 0.5 A each)
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
77 mm / 58.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK- EC56/56-XOR	**2975900**	1
UMK- EC56/56-XOL	**2975890**	1

EAC

Technical data

25 V AC / 60 V DC
1.5 A
28 A (56 branches with 0.5 A each)
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 2.5 mm² / 0.2 - 1.5 mm² / 26 - 16
146.3 mm / 47.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK- EC56/FRONT 2,5V/R	**2976161**	1
UMK- EC56/FRONT 2,5V/L	**2976158**	1

EAC

Technical data

25 V AC / 60 V DC
2 A
32 A (32 branches with 1 A each)
-20 °C ... 40 °C
any
IEC 60664 , DIN EN 50178
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
77 mm / 58.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK- EC56/32-XOR	**2975858**	1
UMK- EC56/32-XUR	**2975777**	1
UMK- EC56/32-XOL	**2975764**	1
UMK- EC56/32-XUL	**2975780**	1

Modules for ELCO connectors for use in Ex i circuits

The VARIOFACE modules connect ELCO connectors from the 8016 series to screw connection terminal blocks. The modules for ELCO connectors are regarded as simple electrical equipment according to EN 60079-14 for use in intrinsically safe circuits. They meet the requirements of intrinsic safety protection according to EN 60079-11 (EN 50020) and are also used for various intrinsically safe circuits, taking the pin assignment into account.

The voltage of an intrinsically safe circuit may not exceed 30 V. The voltage difference between two intrinsically safe circuits can be up to 60 V.

For clear identification of intrinsically safe circuits, the modules are assembled with blue screw connection terminal blocks.

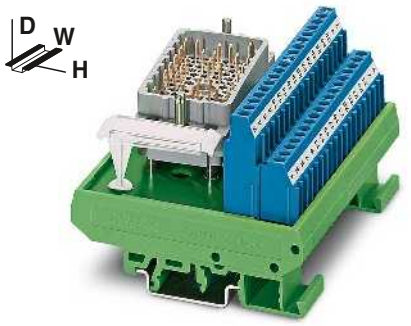
Thanks to the slanted placement of the ELCO connector, the cables which are fed out of the side of the cable housing are led away without affecting the neighboring modules.

For the separation of intrinsically safe and non-intrinsically safe circuits, a distance of at least 50 mm should be maintained between the connection points using partition plates or spaces.

Notes:

Dimensional drawings and pin assignments, see page 601

Facts about explosion protection, see page 108



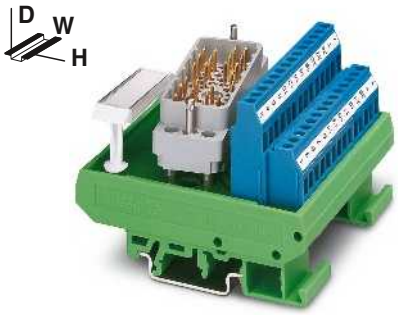
32-pos.

Technical data

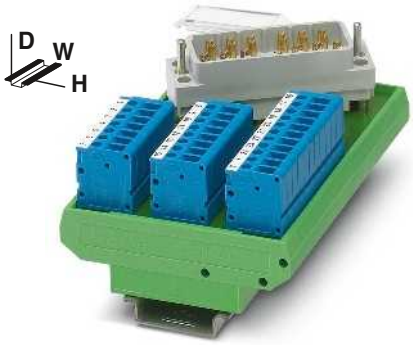
Maximum permissible operating voltage	max. 30 V DC (Max. voltage between two intrinsically safe circuits: 60 V DC)
Maximum permissible current (per branch)	500 mA
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any
Standards/regulations	DIN EN 60079-11
Connection data solid/stranded/AWG	0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions H / D	77 mm / 58.5 mm

Ordering data

Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with:					
- Pin strip 8016 right above	32	101.30	**UMK- EC90/32/EX-XOR**	2900109	1
- Pin strip 8016 right below	32	101.30	**UMK- EC90/32/EX-XUR**	2969068	1
- Pin strip 8016 left above	32	101.30	**UMK- EC90/32/EX-XOL**	2900110	1
- Pin strip 8016 left above	32	101.30	**UMK- EC90/32/EX-XUL**	2969071	1
VARIOFACE module, with:					
- Pin strip 8016 right	25	78.80			
- Pin strip 8016 left	25	78.80			
VARIOFACE module, with:					
- Pin strip 8016 right	25	77.00			
- Pin strip 8016 left	25	77.00			



25-pos.



25-pos.,
with front connection terminal blocks

EAC

Technical data
max. 30 V DC
(Max. voltage between two intrinsically safe circuits: 60 V DC)
500 mA
-20 °C ... 50 °C
any
DIN EN 60079-11
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
77 mm / 58.5 mm

Technical data
max. 30 V DC
(Max. voltage between two intrinsically safe circuits: 60 V DC)
500 mA
-20 °C ... 50 °C
any
DIN EN 60079-11
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
112.5 mm / 52.5 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK- EC56/25/EX -R	2900112	1
UMK- EC56/25/EX -L	2900113	1

Ordering data

Type	Order No.	Pcs./ Pkt.
UMK- EC56/25/EX -FRONT 2,5V/R	2900114	1
UMK- EC56/25/EX -FRONT 2,5V/L	2900115	1

VIP – VARIOFACE Professional System cable with IDC/FLK socket strip

– 1:1 connection
– IDC/FLK connector according to IEC 60603-13
– In the desired lengths
– Individual serial number

Note:

Module designs with UM 45 profile and three-level terminal blocks cannot be connected to the VIP-CAB-FLK... system cable due to the larger outer contour of the connectors.

The VIP-CAB-FLK... system cables are not suitable for front adapters.

Unshielded

Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / -
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²
Outside diameter		
	10-pos.	6.1 mm
	14-pos.	6.4 mm
	40-pos.	9.9 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Round cable, with 2 molded IDC/FLK socket strips					
	10	1 m	**VIP-CAB-FLK10/0,14/1,0M**	2318318	1
	10	2 m	**VIP-CAB-FLK10/0,14/2,0M**	2318334	1
	10	3 m	**VIP-CAB-FLK10/0,14/3,0M**	2318347	1
Round cable, as above, in variable lengths (minimum ordering quantity five pieces)	10		**VIP-CAB-FLK10-0,14/...**	2318376	1
Round cable, with 2 molded IDC/FLK socket strips					
	14	1 m	**VIP-CAB-FLK14/0,14/1,0M**	2318392	1
	14	2 m	**VIP-CAB-FLK14/0,14/2,0M**	2318415	1
	14	3 m	**VIP-CAB-FLK14/0,14/3,0M**	2318428	1
Round cable, as above, in variable lengths (minimum ordering quantity five pieces)	14		**VIP-CAB-FLK14-0,14/...**	2318457	1
Round cable, with 2 molded IDC/FLK socket strips					
	40	1 m	**VIP-CAB-FLK40/0,14/1,0M**	2318790	1
	40	2 m	**VIP-CAB-FLK40/0,14/2,0M**	2318813	1
	40	3 m	**VIP-CAB-FLK40/0,14/3,0M**	2318826	1
Round cable, as above, in variable lengths (minimum ordering quantity five pieces)	40		**VIP-CAB-FLK40-0,14/...**	2318855	1

Ordering example for system cable:

– 10-pos. cable, 7.6 m long

Quantity	Order No.		Length [m]
1	2318376	/	7.6

min.	0.5 m
max.	100.0 m
Increment	0.1 m

System cable with IDC/FLK socket strip and an open end

– 1:1 connection
– 10, 14, and 16-pos.
– IDC/FLK connector according to IEC 60603-13
– Open end at the other end
The individual wires at the open end are marked (1, 2, 3, 4, ...) and fitted with a ferrule.

Encapsulated connectors, unshielded

Unshielded

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / 125 V	125 V / 125 V
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Assembly	Insulation displacement, IEC 60352-4/DIN EN 60352-4	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated
Outside diameter		
10-pos.	6.1 mm	6.1 mm
14-pos.	6.4 mm	6.4 mm
16-pos.	6.5 mm	6.5 mm

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Round cable with an open end								
	10	0.5 m				CABLE-FLK10/OE/0,14/ 0,5M	2904073	1
	10	1 m				CABLE-FLK10/OE/0,14/ 1,0M	2904074	1
	10	1.5 m				CABLE-FLK10/OE/0,14/ 1,5M	2904075	1
	10	2 m				CABLE-FLK10/OE/0,14/ 2,0M	2904076	1
	10	2.5 m				CABLE-FLK10/OE/0,14/ 2,5M	2904077	1
	10	3 m				CABLE-FLK10/OE/0,14/ 3,0M	2904078	1
	10	4 m				CABLE-FLK10/OE/0,14/ 4,0M	2904079	1
	10	6 m				CABLE-FLK10/OE/0,14/ 6,0M	2904080	1
	10	8 m				CABLE-FLK10/OE/0,14/ 8,0M	2904081	1
	10	10 m				CABLE-FLK10/OE/0,14/10,0M	2904082	1
Round cable, as above, but in variable lengths								
	10					CABLE-FLK10-OE-0,14/...	2904331	1
Round cable with an open end								
	14	0.5 m	VIP-CAB-FLK14/FR/OE/0,14/0,5M	2900122	1	CABLE-FLK14/OE/0,14/ 50	2305761	1
	14	1 m	VIP-CAB-FLK14/FR/OE/0,14/1,0M	2900123	1	CABLE-FLK14/OE/0,14/ 100	2305253	1
	14	1.5 m	VIP-CAB-FLK14/FR/OE/0,14/1,5M	2900125	1	CABLE-FLK14/OE/0,14/ 150	2305266	1
	14	2 m	VIP-CAB-FLK14/FR/OE/0,14/2,0M	2900126	1	CABLE-FLK14/OE/0,14/ 200	2305279	1
	14	2.5 m				CABLE-FLK14/OE/0,14/ 250	2305282	1
	14	3 m	VIP-CAB-FLK14/FR/OE/0,14/3,0M	2900127	1	CABLE-FLK14/OE/0,14/ 300	2305295	1
	14	4 m				CABLE-FLK14/OE/0,14/ 400	2305774	1
	14	6 m				CABLE-FLK14/OE/0,14/ 600	2305787	1
	14	8 m				CABLE-FLK14/OE/0,14/ 800	2305790	1
	14	10 m				CABLE-FLK14/OE/0,14/1000	2305800	1
Round cable, as above, but in variable lengths								
	14					CABLE-FLK14/OE/0,14/...	2305732	1
Round cable with an open end								
	16	0.5 m	VIP-CAB-FLK16/FR/OE/0,14/0,5M	2900130	1	CABLE-FLK16/OE/0,14/ 0,5M	2318127	1
	16	1 m	VIP-CAB-FLK16/FR/OE/0,14/1,0M	2900131	1	CABLE-FLK16/OE/0,14/ 1,0M	2318130	1
	16	1.5 m	VIP-CAB-FLK16/FR/OE/0,14/1,5M	2900132	1	CABLE-FLK16/OE/0,14/ 1,5M	2318143	1
	16	2 m	VIP-CAB-FLK16/FR/OE/0,14/2,0M	2900133	1	CABLE-FLK16/OE/0,14/ 2,0M	2318156	1
	16	2.5 m				CABLE-FLK16/OE/0,14/ 2,5M	2318169	1
	16	3 m	VIP-CAB-FLK16/FR/OE/0,14/3,0M	2900134	1	CABLE-FLK16/OE/0,14/ 3,0M	2318172	1
	16	4 m				CABLE-FLK16/OE/0,14/ 4,0M	2318185	1
	16	6 m				CABLE-FLK16/OE/0,14/ 6,0M	2318198	1
	16	8 m				CABLE-FLK16/OE/0,14/ 8,0M	2318208	1
	16	10 m				CABLE-FLK16/OE/0,14/10,0M	2318211	1
Round cable, as above, but in variable lengths								
	16					CABLE-FLK16/OE/0,14/...	2318224	1

System cable with IDC/FLK socket strip and an open end

– 1:1 connection
– 20- and 50-pos.
– IDC/FLK connector according to IEC 60603-13
– Open end at the other end
The individual wires at the open end are marked (1, 2, 3, 4, ...) and fitted with a ferrule.

Encapsulated connectors, unshielded

Unshielded

Technical data

		Encapsulated connectors, unshielded	Unshielded
Maximum permissible operating voltage		< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	125 V / 125 V
Maximum permissible current carrying capacity per path		1 A	1 A
Maximum conductor resistance		0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4	Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated	7 / Cu tin-plated
Outside diameter			
	20-pos.	7.6 mm	7.6 mm
	50-pos.	10.3 mm	10.3 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Round cable with an open end								
	20	0.5 m				**CABLE-FLK20/OE/0,14/ 50**	2305826	1
	20	1 m	**VIP-CAB-FLK20/FR/OE/0,14/1,0M**	2900139	1	**CABLE-FLK20/OE/0,14/ 100**	2305305	1
	20	1.5 m				**CABLE-FLK20/OE/0,14/ 150**	2305318	1
	20	2 m	**VIP-CAB-FLK20/FR/OE/0,14/2,0M**	2900142	1	**CABLE-FLK20/OE/0,14/ 200**	2305321	1
	20	2.5 m				**CABLE-FLK20/OE/0,14/ 250**	2305334	1
	20	3 m	**VIP-CAB-FLK20/FR/OE/0,14/3,0M**	2900143	1	**CABLE-FLK20/OE/0,14/ 300**	2305347	1
	20	4 m				**CABLE-FLK20/OE/0,14/ 400**	2305839	1
	20	6 m				**CABLE-FLK20/OE/0,14/ 600**	2305842	1
	20	8 m				**CABLE-FLK20/OE/0,14/ 800**	2305855	1
	20	10 m				**CABLE-FLK20/OE/0,14/1000**	2305868	1
Round cable, as above, but in variable lengths								
	20					**CABLE-FLK20/OE/0,14/...**	2305745	1
Round cable with an open end								
	50	0.5 m				**CABLE-FLK50/OE/0,14/ 50**	2305871	1
	50	1 m				**CABLE-FLK50/OE/0,14/ 100**	2305350	1
	50	1.5 m				**CABLE-FLK50/OE/0,14/ 150**	2305363	1
	50	2 m				**CABLE-FLK50/OE/0,14/ 200**	2305376	1
	50	2.5 m				**CABLE-FLK50/OE/0,14/ 250**	2305389	1
	50	3 m				**CABLE-FLK50/OE/0,14/ 300**	2305392	1
	50	4 m				**CABLE-FLK50/OE/0,14/ 400**	2305884	1
	50	6 m				**CABLE-FLK50/OE/0,14/ 600**	2305897	1
	50	8 m				**CABLE-FLK50/OE/0,14/ 800**	2305907	1
	50	10 m				**CABLE-FLK50/OE/0,14/1000**	2305910	1
Round cable, as above, but in variable lengths								
	50					**CABLE-FLK50/OE/0,14/...**	2305758	1

System cable with IDC/FLK socket strips

Standard lengths

Round cable sets are used to connect the PLC front adapters to the corresponding VARIOFACE termination boards.

The following versions are available with 14 and 50 positions:

– Unshielded
– Shielded
– Halogen-free

The cables are assembled at both ends with IDC/FLK socket strips according to IEC 60603-13/DIN 41651 (1:1 connection).

In the case of shielded cables, a cable end with a ferrule is additionally provided as a shield connection (length: approx. 0.5 m; cable H05V-K 1 mm², black).

Special lengths are defined using an order key, refer to page 590.

Unshielded

Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Shield		-
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		
	14-pos.	6.4 mm
	50-pos.	10.3 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Assembled round cable[1]), with two 14-pos. IDC/FLK socket strips in fixed lengths, for transfer of 8 channels, for example					
	14	0.3 m	**FLK 14/EZ-DR/ 30/KONFEK**	2295729	5
	14	0.5 m	**FLK 14/EZ-DR/ 50/KONFEK**	2288901	5
	14	1 m	**FLK 14/EZ-DR/ 100/KONFEK**	2288914	1
	14	1.5 m	**FLK 14/EZ-DR/ 150/KONFEK**	2288927	1
	14	2 m	**FLK 14/EZ-DR/ 200/KONFEK**	2288930	1
	14	2.5 m	**FLK 14/EZ-DR/ 250/KONFEK**	2288943	1
	14	3 m	**FLK 14/EZ-DR/ 300/KONFEK**	2288956	1
	14	3.5 m	**FLK 14/EZ-DR/ 350/KONFEK**	2288969	1
	14	4 m	**FLK 14/EZ-DR/ 400/KONFEK**	2288972	1
	14	4.5 m	**FLK 14/EZ-DR/ 450/KONFEK**	2290847	1
	14	5 m	**FLK 14/EZ-DR/ 500/KONFEK**	2290834	1
	14	5.5 m	**FLK 14/EZ-DR/ 550/KONFEK**	2290850	1
	14	6 m	**FLK 14/EZ-DR/ 600/KONFEK**	2290863	1
	14	7 m			
	14	8 m	**FLK 14/EZ-DR/ 800/KONFEK**	2299563	1
	14	10 m	**FLK 14/EZ-DR/1000/KONFEK**	2299576	1
Assembled round cable[2]), with two 50-pos. IDC/FLK socket strips in fixed lengths, for transfer of 32 channels, for example					
	50	0.5 m	**FLK 50/EZ-DR/ 50/KONFEK**	2289065	5
	50	1 m	**FLK 50/EZ-DR/ 100/KONFEK**	2289078	1
	50	1.5 m	**FLK 50/EZ-DR/ 150/KONFEK**	2289081	1
	50	2 m	**FLK 50/EZ-DR/ 200/KONFEK**	2289094	1
	50	2.5 m	**FLK 50/EZ-DR/ 250/KONFEK**	2289104	1
	50	3 m	**FLK 50/EZ-DR/ 300/KONFEK**	2289117	1
	50	3.5 m	**FLK 50/EZ-DR/ 350/KONFEK**	2289120	1
	50	4 m	**FLK 50/EZ-DR/ 400/KONFEK**	2289133	1
	50	4.5 m	**FLK 50/EZ-DR/ 450/KONFEK**	2289573	1
	50	5 m	**FLK 50/EZ-DR/ 500/KONFEK**	2289586	1
	50	5.5 m	**FLK 50/EZ-DR/ 550/KONFEK**	2289599	1
	50	6 m	**FLK 50/EZ-DR/ 600/KONFEK**	2289609	1
	50	6.5 m	**FLK 50/EZ-DR/ 650/KONFEK**	2289612	1
	50	7 m	**FLK 50/EZ-DR/ 700/KONFEK**	2289625	1
	50	7.5 m	**FLK 50/EZ-DR/ 750/KONFEK**	2289638	1
	50	8 m	**FLK 50/EZ-DR/ 800/KONFEK**	2289641	1
	50	8.5 m	**FLK 50/EZ-DR/ 850/KONFEK**	2289654	1
	50	9 m	**FLK 50/EZ-DR/ 900/KONFEK**	2289667	1
	50	9.5 m	**FLK 50/EZ-DR/ 950/KONFEK**	2289670	1
	50	10 m	**FLK 50/EZ-DR/1000/KONFEK**	2289683	1

Shield connection at one end

Applied for: cUL / UL

Technical data

	< 50 V AC / 60 V DC
	125 V / -
	1 A
	0.16 Ω/m
	-20 °C ... 50 °C
	Tinned copper-braided shield, approx. 85% covering
	Insulation displacement, IEC 60352-4/DIN EN 60352-4
	AWG 26 / 0.14 mm²
	7 / Cu tin-plated
	6.7 mm
	11 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
FLK 14/EZ-DR/ 50/KONFEK/S	**2296977**	1
FLK 14/EZ-DR/ 100/KONFEK/S	**2296980**	1
FLK 14/EZ-DR/ 150/KONFEK/S	**2296993**	1
FLK 14/EZ-DR/ 200/KONFEK/S	**2297002**	1
FLK 14/EZ-DR/ 300/KONFEK/S	**2299013**	1
FLK 14/EZ-DR/ 400/KONFEK/S	**2299026**	1
FLK 14/EZ-DR/ 600/KONFEK/S	**2299039**	1
FLK 14/EZ-DR/ 800/KONFEK/S	**2299042**	1
FLK 14/EZ-DR/1000/KONFEK/S	**2299055**	1
FLK 50/EZ-DR/ 50/KONFEK/S	**2299097**	1
FLK 50/EZ-DR/ 100/KONFEK/S	**2299107**	1
FLK 50/EZ-DR/ 150/KONFEK/S	**2299110**	1
FLK 50/EZ-DR/ 200/KONFEK/S	**2299123**	1
FLK 50/EZ-DR/ 300/KONFEK/S	**2299136**	1
FLK 50/EZ-DR/ 400/KONFEK/S	**2299149**	1
FLK 50/EZ-DR/ 600/KONFEK/S	**2299152**	1
FLK 50/EZ-DR/ 800/KONFEK/S	**2299165**	1
FLK 50/EZ-DR/1000/KONFEK/S	**2299178**	1

Halogen-free (only the cable)

Technical data

	< 50 V AC / 60 V DC
	125 V / 125 V
	1 A
	0.16 Ω/m
	-20 °C ... 50 °C
	-
	Insulation displacement, IEC 60352-4/DIN EN 60352-4
	AWG 26 / 0.14 mm²
	7 / Cu tin-plated
	6.4 mm
	10.3 mm

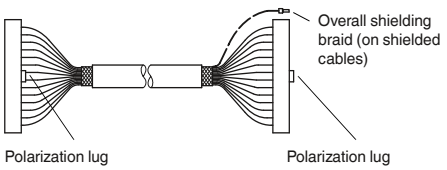
Ordering data

Type	Order No.	Pcs./ Pkt.
FLK 14/EZ-DR/HF/ 50/KONFEK	**2305952**	1
FLK 14/EZ-DR/HF/ 100/KONFEK	**2305965**	1
FLK 14/EZ-DR/HF/ 150/KONFEK	**2305978**	1
FLK 14/EZ-DR/HF/ 200/KONFEK	**2305981**	1
FLK 14/EZ-DR/HF/ 250/KONFEK	**2305994**	1
FLK 14/EZ-DR/HF/ 300/KONFEK	**2304759**	1
FLK 14/EZ-DR/HF/ 400/KONFEK	**2304762**	1
FLK 14/EZ-DR/HF/ 500/KONFEK	**2304717**	1
FLK 14/EZ-DR/HF/ 600/KONFEK	**2306003**	1
FLK 14/EZ-DR/HF/ 700/KONFEK	**2314011**	1
FLK 14/EZ-DR/HF/ 800/KONFEK	**2314024**	1
FLK 14/EZ-DR/HF/1000/KONFEK	**2314037**	1
CABLE-FLK50/0,14/HF/ 0,5M	**2314134**	1
CABLE-FLK50/0,14/HF/ 1,0M	**2314147**	1
CABLE-FLK50/0,14/HF/ 1,5M	**2314150**	1
CABLE-FLK50/0,14/HF/ 2,0M	**2314163**	1
CABLE-FLK50/0,14/HF/ 2,5M	**2314176**	1
CABLE-FLK50/0,14/HF/ 3,0M	**2314189**	1
CABLE-FLK50/0,14/HF/ 4,0M	**2314192**	1
CABLE-FLK50/0,14/HF/ 5,0M	**2314202**	1
CABLE-FLK50/0,14/HF/ 6,0M	**2314215**	1
CABLE-FLK50/0,14/HF/ 7,0M	**2314228**	1
CABLE-FLK50/0,14/HF/ 8,0M	**2314231**	1
CABLE-FLK50/0,14/HF/10,0M	**2314244**	1

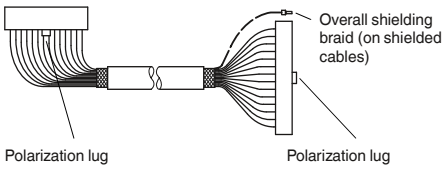
Color code of system cables

Wire No.	Pin	Wire color
	1	Black
	2	Brown
	3	Red
	4	Orange
	5	Yellow
	6	Green
	7	Blue
	8	Violet
	9	Gray
10-pos.	10	White
	11	White-black
	12	White-brown
	13	White-red
14-pos.	14	White-orange
	15	White-yellow
16-pos.	16	White-green
	17	White-blue
	18	White-violet
	19	White-gray
20-pos.	20	Brown-black
	21	Brown-red
	22	Brown-orange
	23	Brown-yellow
	24	Brown-green
	25	Brown-blue
26-pos.	26	Brown-violet
	27	Brown-gray
	28	Brown-white
	29	Green-black
	30	Green-brown
	31	Green-red
	32	Green-orange
	33	Green-blue
34-pos.	34	Green-violet
	35	Green-gray
	36	Green-white
	37	Yellow-black
	38	Yellow-brown
	39	Yellow-red
40-pos.	40	Yellow-orange
	41	Yellow-blue
	42	Yellow-violet
	43	Yellow-gray
	44	Yellow-white
	45	Gray-black
	46	Gray-brown
	47	Gray-red
	48	Gray-orange
	49	Gray-yellow
50-pos.	50	Gray-green

[1]) IDC/FLK socket strip assembled straight at both ends.



[2]) IDC/FLK socket strip assembled straight at one end and angled at the other.



System cable with IDC/FLK socket strips

Standard lengths

Pre-assembled round cables to couple the VARIOFACE termination boards.

The cables are assembled at both ends with IDC/FLK socket strips according to IEC 60603-13/DIN 41651 (1:1 connection).

Special lengths are defined using an order key, refer to page 590.

Unshielded

Applied for: cUL / UL

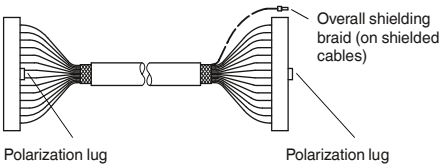
Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		
	10-pos.	6 mm
	16-pos.	6.5 mm
	20-pos.	7.6 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Round cable[1]), with two IDC/FLK socket strips					
	10	0.5 m	**FLK 10/EZ-DR/ 50/KONFEK**	2299204	1
	10	1 m	**FLK 10/EZ-DR/ 100/KONFEK**	2299217	1
	10	1.5 m	**FLK 10/EZ-DR/ 150/KONFEK**	2299220	1
	10	2 m	**FLK 10/EZ-DR/ 200/KONFEK**	2299233	1
	10	3 m	**FLK 10/EZ-DR/ 300/KONFEK**	2299246	1
	10	4 m	**FLK 10/EZ-DR/ 400/KONFEK**	2299259	1
	10	6 m	**FLK 10/EZ-DR/ 600/KONFEK**	2299262	1
	10	8 m	**FLK 10/EZ-DR/ 800/KONFEK**	2299275	1
	10	10 m	**FLK 10/EZ-DR/1000/KONFEK**	2299288	1
Round cable[1]), with two IDC/FLK socket strips					
	16	0.5 m	**FLK 16/EZ-DR/ 50/KONFEK**	2299291	1
	16	1 m	**FLK 16/EZ-DR/ 100/KONFEK**	2299301	1
	16	1.5 m	**FLK 16/EZ-DR/ 150/KONFEK**	2299314	1
	16	2 m	**FLK 16/EZ-DR/ 200/KONFEK**	2299327	1
	16	3 m	**FLK 16/EZ-DR/ 300/KONFEK**	2299330	1
	16	4 m	**FLK 16/EZ-DR/ 400/KONFEK**	2299343	1
	16	6 m	**FLK 16/EZ-DR/ 600/KONFEK**	2299356	1
	16	8 m	**FLK 16/EZ-DR/ 800/KONFEK**	2299369	1
	16	10 m	**FLK 16/EZ-DR/1000/KONFEK**	2299372	1
Round cable[1]), with two IDC/FLK socket strips					
	20	0.5 m	**FLK 20/EZ-DR/ 50KONFEK**	2296391	1
	20	1 m	**FLK 20/EZ-DR/ 100KONFEK**	2296401	1
	20	1.5 m	**FLK 20/EZ-DR/ 150KONFEK**	2296472	1
	20	2 m	**FLK 20/EZ-DR/ 200KONFEK**	2296485	1
	20	3 m	**FLK 20/EZ-DR/ 300KONFEK**	2296498	1
	20	4 m	**FLK 20/EZ-DR/ 400KONFEK**	2296508	1
	20	6 m	**FLK 20/EZ-DR/ 600KONFEK**	2296511	1
	20	8 m	**FLK 20/EZ-DR/ 800KONFEK**	2296524	1
	20	10 m	**FLK 20/EZ-DR/1000KONFEK**	2296537	1

[1]) IDC/FLK socket strip assembled straight at both ends.



System cable with IDC/FLK socket strips

Standard lengths

Pre-assembled round cables to couple the VARIOFACE termination boards.

The cables are assembled at both ends with IDC/FLK socket strips according to IEC 60603-13/DIN 41651 (1:1 connection).

Special lengths are defined using an order key, refer to page 590.

Unshielded

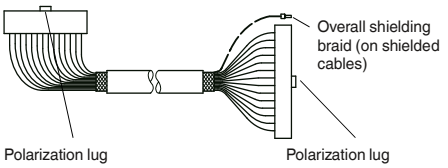
Technical data

Maximum permissible operating voltage		< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current carrying capacity per path		1 A
Maximum conductor resistance		0.16 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Assembly		Insulation displacement, IEC 60352-4/DIN EN 60352-4
Conductor cross section		AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material		7 / Cu tin-plated
Outside diameter		
	26-pos.	7.8 mm
	34-pos.	8.7 mm
	40-pos.	9.9 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Round cable[1]), with two IDC/FLK socket strips					
	26	0.5 m	**FLK 26/EZ-DR/ 50/KONFEK**	2299385	1
	26	1 m	**FLK 26/EZ-DR/ 100/KONFEK**	2299398	1
	26	1.5 m	**FLK 26/EZ-DR/ 150/KONFEK**	2299408	1
	26	2 m	**FLK 26/EZ-DR/ 200/KONFEK**	2299411	1
	26	3 m	**FLK 26/EZ-DR/ 300/KONFEK**	2299424	1
	26	4 m	**FLK 26/EZ-DR/ 400/KONFEK**	2299437	1
	26	6 m	**FLK 26/EZ-DR/ 600/KONFEK**	2299440	1
	26	8 m	**FLK 26/EZ-DR/ 800/KONFEK**	2299453	1
	26	10 m	**FLK 26/EZ-DR/1000/KONFEK**	2299466	1
Round cable[1]), with two IDC/FLK socket strips					
	34	0.5 m	**FLK 34/EZ-DR/ 50/KONFEK**	2299479	1
	34	1 m	**FLK 34/EZ-DR/ 100/KONFEK**	2299482	1
	34	1.5 m	**FLK 34/EZ-DR/ 150/KONFEK**	2299495	1
	34	2 m	**FLK 34/EZ-DR/ 200/KONFEK**	2299505	1
	34	3 m	**FLK 34/EZ-DR/ 300/KONFEK**	2299518	1
	34	4 m	**FLK 34/EZ-DR/ 400/KONFEK**	2299521	1
	34	6 m	**FLK 34/EZ-DR/ 600/KONFEK**	2299534	1
	34	8 m	**FLK 34/EZ-DR/ 800/KONFEK**	2299547	1
	34	10 m	**FLK 34/EZ-DR/1000/KONFEK**	2299550	1
Round cable[2]), with two IDC/FLK socket strips					
	40	0.5 m	**FLK 40/EZ-DR/ 50/KONFEK**	2288985	5
	40	1 m	**FLK 40/EZ-DR/ 100/KONFEK**	2288998	1
	40	1.5 m	**FLK 40/EZ-DR/ 150/KONFEK**	2289007	1
	40	2 m	**FLK 40/EZ-DR/ 200/KONFEK**	2289010	1
	40	2.5 m	**FLK 40/EZ-DR/ 250/KONFEK**	2289023	1
	40	3 m	**FLK 40/EZ-DR/ 300/KONFEK**	2289036	1
	40	3.5 m	**FLK 40/EZ-DR/ 350/KONFEK**	2289049	1
	40	4 m	**FLK 40/EZ-DR/ 400/KONFEK**	2289052	1
	40	6 m	**FLK 40/EZ-DR/ 600/KONFEK**	2299589	1
	40	8 m	**FLK 40/EZ-DR/ 800/KONFEK**	2299592	1
	40	10 m	**FLK 40/EZ-DR/1000/KONFEK**	2299602	1

[2]) IDC/FLK socket strip assembled straight at one end and angled at the other.



System cables with IDC/FLK socket strip

Special lengths

Pre-assembled round cables for connecting, e.g., PLC front adapters to the corresponding VARIOFACE termination boards. The cables are assembled with IDC/FLK socket strips on both ends according to IEC 60603-13/DIN 41651. For shielded cables, a cable end with ferrule is also available as an overall shielding braid (length: approx. 0.5 m; cable: H05V-K 1 mm², black).

The order key for special lengths is described using three features.

The order of the features is as follows:

– Cable type
– Assembly
– Length in meters

There are two order keys, one for unshielded round cables, FLK EZ-DR/.../.../..., and one for shielded round cables, FLK EZ-DR-S/.../.../.... To ensure clear specification when ordering, the features are described in detail below:

Cable type

– This specifies the number of individual cables of the specific cable.

Assembly

– None,
the cable is not assembled at either end,
– 10-pos. IDC/FLK socket strip at both ends, the cable is assembled at both ends with 10-pos. IDC/FLK socket strips (1:1 connection),
– 14-pos. IDC/FLK socket strip at both ends, the cable is assembled at both ends with 14-pos. IDC/FLK socket strips (1:1 connection), etc. to
– 50-pos. IDC/FLK socket strip at both ends, the cable is assembled at both ends with 50-pos. IDC/FLK socket strips (1:1 connection),
– 14-pos. IDC/FLK socket strip at one end, 16-pos. IDC/FLK socket strip at the other end, the cable is assembled with a 14-pos. IDC/FLK socket strip at one end and a 16-pos. IDC/FLK socket strip at the other end (for SIMATIC® S7, no 1:1 connection).

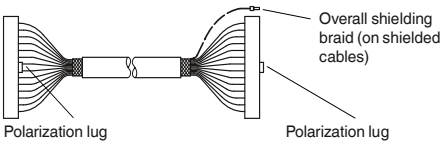
Features of permissible configurations:

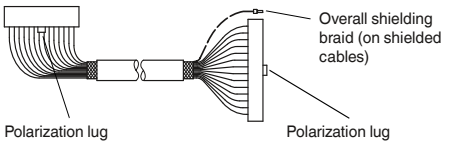
Cable type / Assembly	Unshielded round cables FLK EZ-DR.../.../...								Shielded round cables FLK EZ-DR-S.../.../...			
	10-pos.	14-pos.	16-pos.	20-pos.	26-pos.	34-pos.	40-pos.	50-pos.	14-pos.	16-pos.	40-pos.	50-pos.
No assembly	**10U/C00/...**	**14U/C00/...**	**16U/C00/...**	**20U/C00/...**	**26U/C00/...**	**34U/C00/...**	**40U/C00/...**	**50U/C00/...**	**14S/C00/...**	**16S/C00/....**	**40S/C00/...**	**50S/C00/...**
10-pos. IDC/FLK at both ends	**10U/C55/...**[1]											
14-pos. IDC/FLK at both ends		**14U/C23/...**[1]							**14S/C23/...**[1]			
16-pos. IDC/FLK at both ends			**16U/C58/...**[1]							**16S/C58/...**[1]		
20-pos. IDC/FLK at both ends				**20U/C61/...**[1]								
26-pos. IDC/FLK at both ends					**26U/C63/...**[1]							
34-pos. IDC/FLK at both ends						**34U/C65/...**[1]						
40-pos. IDC/FLK at both ends							**40U/C30/...**[3]				**40S/C30/...**[3]	
50-pos. IDC/FLK at both ends								**50U/C38/...**[2]				**50S/C38/...**[2]
14-pos. IDC/FLK at one end, 16-pos. IDC/FLK at the other end		**14U/C52/...**[1]							**14S/C52/...**[1]			

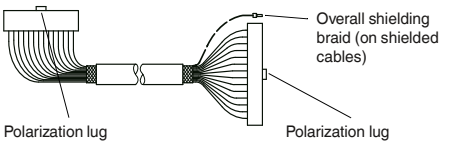
1) IDC/FLK socket strip assembled straight at both ends.

2) IDC/FLK socket strip assembled straight at one end and angled at the other.

3) IDC/FLK socket strip assembled straight at one end and angled at the other.







Ordering example for **unshielded** round cable:

– unshielded 50-pos. round cable, assembled with two 50-pos. IDC/FLK socket strips, 11.5 m long

Quantity	Order No.	Cable type	Assembly	Length [m][4]
1	2295059	50U	C38	11.50

10U ≙ 10-pos. unshielded
14U ≙ 14-pos. unshielded
16U ≙ 16-pos. unshielded
20U ≙ 20-pos. unshielded
26U ≙ 26-pos. unshielded
34U ≙ 34-pos. unshielded
40U ≙ 40-pos. unshielded
50U ≙ 50-pos. unshielded

C00 ≙ No assembly
C55 ≙ 10-pos. IDC/FLK socket strip at both ends
C23 ≙ 14-pos. IDC/FLK socket strip at both ends
C52 ≙ 14-pos. IDC/FLK socket strip at one end, 16-pos. IDC/FLK socket strip at the other end (for S7)
C58 ≙ 16-pos. IDC/FLK socket strip at both ends
C61 ≙ 20-pos. IDC/FLK socket strip at both ends
C63 ≙ 26-pos. IDC/FLK socket strip at both ends
C65 ≙ 34-pos. IDC/FLK socket strip at both ends
C30 ≙ 40-pos. IDC/FLK socket strip at both ends
C38 ≙ 50-pos. IDC/FLK socket strip at both ends

4) min. 0.20 m

Ordering example for **shielded** round cable:

– shielded 14-pos. round cable, assembled with two 14-pos. IDC/FLK socket strips, 12.75 m long

Quantity	Order No.	Cable type	Assembly	Length [m][4]
1	2295046	14S	C23	12.75

14S ≙ 14-pos. shielded
16S ≙ 16-pos. shielded
40S ≙ 40-pos. shielded
50S ≙ 50-pos. shielded

C00 ≙ No assembly
C23 ≙ 14-pos. IDC/FLK socket strip at both ends
C52 ≙ 14-pos. IDC/FLK socket strip at one end, 16-pos. IDC/FLK socket strip at the other end (for S7)
C58 ≙ 16-pos. IDC/FLK socket strip at both ends
C30 ≙ 40-pos. IDC/FLK socket strip at both ends
C38 ≙ 50-pos. IDC/FLK socket strip at both ends

4) min. 0.20 m

Unshielded

Shielded

	Technical data	Technical data
Maximum permissible operating voltage	< 50 V AC / 60 V DC	< 50 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / 125 V	125 V / 125 V
Maximum permissible current carrying capacity per path	1 A	1 A
Maximum conductor resistance	0.16 Ω/m	0.16 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Shield	-	Tinned copper-braided shield, approx. 85% covering
Conductor cross section	AWG 26 / 0.14 mm²	AWG 26 / 0.14 mm²
Conductor structure: stranded wires / material	7 / Cu tin-plated	7 / Cu tin-plated

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Unshielded round cable, as above, but in variable lengths of type **"FLK EZ-DR/14U/C52/..."**								
	10		**FLK EZ-DR.../.../...**	2295059	1	**FLK EZ-DR-S.../.../...**	2295046	1

System cable with D-SUB socket and pin strips

Standard lengths

Shielded round cable sets to connect the control level with the corresponding VARIOFACE termination boards.

Assembly with D-SUB strips as per IEC 60807-2/DIN 41652, (1:1 connection).

– D-SUB socket strip at one end and D-SUB pin strip at the other
– D-SUB socket strips at both ends
– DSUB pin strips at both ends
– Cable exit: straight
– Screw connection: 2 UNC 4-40 screws

Special lengths and assembly versions are defined using an order key, refer to page 594.

Socket strip at one end and pin strip at the other

Technical data

Maximum permissible operating voltage		25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V
Maximum permissible current carrying capacity per path		2 A
Maximum conductor resistance		0.09 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C
Shield		Tinned copper-braided shield, approx. 85% covering
Insertion/withdrawal cycles		> 200
Conductor cross section		AWG 24 / 0.25 mm²
Outside diameter		
	9-pos.	7.5 mm
	15-pos.	9 mm
	25-pos.	10.5 mm
	37-pos.	12.5 mm
	50-pos.	13.5 mm

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Shielded round cable, assembled with two D-SUB strips, various numbers of positions and lengths					
	9	0.5 m	CABLE-D 9SUB/B/S/ 50/KONFEK/S	2299987	1
	9	1 m	CABLE-D 9SUB/B/S/100/KONFEK/S	2299990	1
	9	1.5 m	CABLE-D 9SUB/B/S/150/KONFEK/S	2300009	1
	9	2 m	CABLE-D 9SUB/B/S/200/KONFEK/S	2302010	1
	9	3 m	CABLE-D 9SUB/B/S/300/KONFEK/S	2302023	1
	9	4 m	CABLE-D 9SUB/B/S/400/KONFEK/S	2302036	1
	9	6 m	CABLE-D 9SUB/B/S/600/KONFEK/S	2302049	1
	15	0.5 m	CABLE-D15SUB/B/S/ 50/KONFEK/S	2302052	1
	15	1 m	CABLE-D15SUB/B/S/100/KONFEK/S	2302065	1
	15	1.5 m	CABLE-D15SUB/B/S/150/KONFEK/S	2302078	1
	15	2 m	CABLE-D15SUB/B/S/200/KONFEK/S	2302081	1
	15	3 m	CABLE-D15SUB/B/S/300/KONFEK/S	2302094	1
	15	4 m	CABLE-D15SUB/B/S/400/KONFEK/S	2302104	1
	15	6 m	CABLE-D15SUB/B/S/600/KONFEK/S	2302117	1
	25	0.5 m	CABLE-D25SUB/B/S/ 50/KONFEK/S	2302120	1
	25	1 m	CABLE-D25SUB/B/S/100/KONFEK/S	2302133	1
	25	1.5 m	CABLE-D25SUB/B/S/150/KONFEK/S	2302146	1
	25	2 m	CABLE-D25SUB/B/S/200/KONFEK/S	2302159	1
	25	3 m	CABLE-D25SUB/B/S/300/KONFEK/S	2302162	1
	25	4 m	CABLE-D25SUB/B/S/400/KONFEK/S	2302175	1
	25	6 m	CABLE-D25SUB/B/S/600/KONFEK/S	2302188	1
	37	0.5 m	CABLE-D37SUB/B/S/ 50/KONFEK/S	2302191	1
	37	1 m	CABLE-D37SUB/B/S/100/KONFEK/S	2302201	1
	37	2 m	CABLE-D37SUB/B/S/200/KONFEK/S	2302227	1
	37	3 m	CABLE-D37SUB/B/S/300/KONFEK/S	2302230	1
	37	4 m	CABLE-D37SUB/B/S/400/KONFEK/S	2302243	1
	37	6 m	CABLE-D37SUB/B/S/600/KONFEK/S	2302256	1
	37	8 m			
	37	10 m			
	37	15 m			
	37	20 m			
	50	0.5 m	CABLE-D50SUB/B/S/ 50/KONFEK/S	2302269	1
	50	1 m	CABLE-D50SUB/B/S/100/KONFEK/S	2302272	1
	50	1.5 m	CABLE-D50SUB/B/S/150/KONFEK/S	2302285	1
	50	2 m	CABLE-D50SUB/B/S/200/KONFEK/S	2302298	1
	50	3 m	CABLE-D50SUB/B/S/300/KONFEK/S	2302308	1
	50	4 m	CABLE-D50SUB/B/S/400/KONFEK/S	2302311	1
	50	6 m	CABLE-D50SUB/B/S/600/KONFEK/S	2302324	1

Socket strip at both ends

Pin strip at both ends

Socket strip at both ends
Halogen-free

Technical data

	25 V AC / 60 V DC	25 V AC / 60 V DC
	125 V / 125 V	- / -
	2 A	2 A (50 °C) , 1 A (70°C)
	0.09 Ω/m	0.09 Ω/m
	-20 °C ... 50 °C	-20 °C ... 70 °C
	Tinned copper-braided shield, approx. 85% covering	Tinned copper braided shield
	> 200	-
	AWG 24 / 0.25 mm²	AWG 24 / 0.25 mm²
	7.5 mm	-
	9 mm	-
	10.5 mm	-
	12 mm	12.5 mm
	13.5 mm	-

Ordering data

Type	Order No.	Pcs./ Pkt.
CABLE-D 9SUB/B/B/100/KONFEK/S	2305415	1
CABLE-D 9SUB/B/B/200/KONFEK/S	2305428	1
CABLE-D 9SUB/B/B/300/KONFEK/S	2305431	1
CABLE-D15SUB/B/B/100/KONFEK/S	2305444	1
CABLE-D15SUB/B/B/200/KONFEK/S	2305457	1
CABLE-D15SUB/B/B/300/KONFEK/S	2305460	1
CABLE-D25SUB/B/B/100/KONFEK/S	2305473	1
CABLE-D25SUB/B/B/200/KONFEK/S	2305486	1
CABLE-D25SUB/B/B/300/KONFEK/S	2305499	1
CABLE-D37SUB/B/B/ 100/KONFEK/S	2305509	1
CABLE-D37SUB/B/B/ 200/KONFEK/S	2305512	1
CABLE-D37SUB/B/B/ 300/KONFEK/S	2305525	1
CABLE-D37SUB/B/B/ 400/KONFEK/S	2900759	1
CABLE-D37SUB/B/B/ 600/KONFEK/S	2900760	1
CABLE-D37SUB/B/B/ 800/KONFEK/S	2900761	1
CABLE-D37SUB/B/B/1000/KONFEK/S	2900762	1
CABLE-D37SUB/B/B/1500/KONFEK/S	2900763	1
CABLE-D37SUB/B/B/2000/KONFEK/S	2900764	1
CABLE-D50SUB/B/B/100/KONFEK/S	2305541	1
CABLE-D50SUB/B/B/200/KONFEK/S	2305554	1
CABLE-D50SUB/B/B/300/KONFEK/S	2305567	1

Ordering data

Type	Order No.	Pcs./ Pkt.
CABLE-D 9SUB/S/S/100/KONFEK/S	2305570	1
CABLE-D 9SUB/S/S/200/KONFEK/S	2305583	1
CABLE-D 9SUB/S/S/300/KONFEK/S	2305596	1
CABLE-D15SUB/S/S/100/KONFEK/S	2305606	1
CABLE-D15SUB/S/S/200/KONFEK/S	2305619	1
CABLE-D15SUB/S/S/300/KONFEK/S	2305622	1
CABLE-D25SUB/S/S/100/KONFEK/S	2305635	1
CABLE-D25SUB/S/S/200/KONFEK/S	2305648	1
CABLE-D25SUB/S/S/300/KONFEK/S	2305651	1
CABLE-D37SUB/S/S/100/KONFEK/S	2305664	1
CABLE-D37SUB/S/S/200/KONFEK/S	2305677	1
CABLE-D37SUB/S/S/300/KONFEK/S	2305680	1
CABLE-D50SUB/S/S/100/KONFEK/S	2305693	1
CABLE-D50SUB/S/S/200/KONFEK/S	2305703	1
CABLE-D50SUB/S/S/300/KONFEK/S	2305716	1

Ordering data

Type	Order No.	Pcs./ Pkt.
CABLE-D37SUB/B/B/HF/S/ 1,0M	2908516	1
CABLE-D37SUB/B/B/HF/S/ 2,0M	2908517	1
CABLE-D37SUB/B/B/HF/S/ 3,0M	2908518	1
CABLE-D37SUB/B/B/HF/S/ 4,0M	2908519	1
CABLE-D37SUB/B/B/HF/S/ 6,0M	2908520	1
CABLE-D37SUB/B/B/HF/S/ 8,0M	2908521	1
CABLE-D37SUB/B/B/HF/S/10,0M	2908522	1
CABLE-D37SUB/B/B/HF/S/15,0M	2908523	1
CABLE-D37SUB/B/B/HF/S/20,0M	2908525	1

System cables with D-SUB socket and pin strips

Special lengths

Pre-assembled, shielded **round cables** for connecting VARIOFACE termination boards. The cables are assembled with D-SUB strips according to IEC 60807-2/DIN 41652.

The order key is described using three features.

The order of the features is as follows:
– Cable type
– Assembly
– Length in meters

There are three assembly versions for the shielded round cable:
– CABLE D-SUB-S/.../.../...
D-SUB socket strip at one end and D-SUB pin strip at the other end,
– CABLE D-SUB-B-B-S/.../.../...
D-SUB socket strips at both ends,
– CABLE D-SUB-S-S-S/.../.../...
D-SUB pin strips at both ends

To ensure clear specification when ordering, the features are described in detail below:

Cable type

– This specifies the number of individual cables of the specific cable.

Assembly

– (Example for CABLE D-SUB-S/.../.../...)
– None,
the cable is not assembled at either end,
– 9-pos. D-SUB socket strip at one end, 9-pos. D-SUB pin strip at the other end, the cable connects (1:1) a 9-pos. D-SUB socket and pin strip,
– 15-pos. D-SUB socket strip at one end, 15-pos. D-SUB pin strip at the other end, the cable connects (1:1) a 15-pos. D-SUB socket and pin strip, etc. to
– 50-pos. D-SUB socket strip at one end, 50-pos. D-SUB pin strip at the other end, the cable connects (1:1) a 50-pos. D-SUB socket and pin strip.

Ordering example for round cable assembled with pin strip at one end and socket strip at the other end
– shielded 25-pos. round cable, assembled with a 25-pos. D-SUB socket strip and a 25-pos. D-SUB pin strip, 11.5 mm long

Quantity	Order No.	Cable type		Assembly		Length [m][1]
1	2302340	/ 25S		/ C36		/ 11.50
		09S ≙ 9-pos. shielded **15S** ≙ 15-pos. shielded **25S** ≙ 25-pos. shielded **37S** ≙ 37-pos. shielded **50S** ≙ 50-pos. shielded		**C00** ≙ No assembly **C01** ≙ 9-pos. D-SUB socket strip at one end 9-pos. D-SUB pin strip at the other end **C28** ≙ 15-pos. D-SUB socket strip at one end 15-pos. D-SUB pin strip at the other end **C36** ≙ 25-pos. D-SUB socket strip at one end 25-pos. D-SUB pin strip at the other end **C43** ≙ 37-pos. D-SUB socket strip at one end 37-pos. D-SUB pin strip at the other end **C49** ≙ 50-pos. D-SUB socket strip at one end 50-pos. D-SUB pin strip at the other end		[1] min. 0.20 m

Ordering example for round cable assembled with socket strip at both ends
– shielded 37-pos. round cable, assembled with two D-SUB 37 socket strips, 12.75 m long

Quantity	Order No.	Cable type		Assembly		Length [m][1]
1	2302421	/ 37S		/ C44		/ 12.75
		09S ≙ 9-pos. shielded **15S** ≙ 15-pos. shielded **25S** ≙ 25-pos. shielded **37S** ≙ 37-pos. shielded **50S** ≙ 50-pos. shielded		**C00** ≙ No assembly **C22** ≙ 9-pos. D-SUB socket strip at both ends **C29** ≙ 15-pos. D-SUB socket strip at both ends **C37** ≙ 25-pos. D-SUB socket strip at both ends **C44** ≙ 37-pos. D-SUB socket strip at both ends **C50** ≙ 50-pos. D-SUB socket strip at both ends		[1] min. 0.20 m

Ordering example for round cable assembled with pin strip at both ends
– shielded 15-pos. round cable, assembled with two D-SUB 15 pin strips, 8.5 m long

Quantity	Order No.	Cable type		Assembly		Length [m][1]
1	2302434	/ 15S		/ C71		/ 8.50
		09S ≙ 9-pos. shielded **15S** ≙ 15-pos. shielded **25S** ≙ 25-pos. shielded **37S** ≙ 37-pos. shielded **50S** ≙ 50-pos. shielded		**C00** ≙ No assembly **C70** ≙ 9-pos. D-SUB pin strip at both ends **C71** ≙ 15-pos. D-SUB pin strip at both ends **C72** ≙ 25-pos. D-SUB pin strip at both ends **C73** ≙ 37-pos. D-SUB pin strip at both ends **C74** ≙ 50-pos. D-SUB pin strip at both ends		[1] min. 0.20 m

Shielded

Technical data

Maximum permissible operating voltage	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / 125 V
Maximum permissible current carrying capacity per path	2 A
Maximum conductor resistance	0.09 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C
Shield	Tinned copper-braided shield, approx. 85% covering
Insertion/withdrawal cycles	> 200
Conductor cross section	AWG 24 / 0.25 mm²

Ordering data

Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.
Assembled round cable, in variable lengths, **pin strip at one end** and **socket strip at the other end**	9		**CABLE D-SUB-S/.../.../...**	2302340	1
Assembled round cable, in variable lengths, **socket strip at both ends**	9		**CABLE D-SUB-B-B-S/.../.../...**	2302421	1
Assembled round cable, in variable lengths, **pin strip at both ends**	9		**CABLE D-SUB-S-S-S/.../.../...**	2302434	1

System cable with D-SUB socket strip or pin strip and an open end

- 1:1 connection
- D-SUB socket strip or pin strip at one end
- Connector according to IEC 60807-2/DIN 41652
- Gland: 2 UNC 4-40 screws
- Open end at the other end
- Individual wire marking: 1, 2, 3, 4, etc.
- Individual wires fitted with ferrules
- Shield connection: H05V-K 1 mm² cable, black, 0.5 m in length

Socket strip at one end and open end at the other end

Pin strip at one end and open end at the other end

Technical data		Technical data	
Maximum permissible operating voltage	25 V AC / 60 V DC		25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA	125 V / 125 V		125 V / 125 V
Maximum permissible current carrying capacity per path	2 A		2 A
Maximum conductor resistance	0.09 Ω/m		0.09 Ω/m
Ambient temperature (operation)	-20 °C ... 50 °C		-20 °C ... 50 °C
Shield	Tinned copper-braided shield, approx. 85% covering		Tinned copper-braided shield, approx. 85% covering
Insertion/withdrawal cycles	> 200		> 200
Conductor cross section	AWG 24 / 0.25 mm²		AWG 24 / 0.25 mm²
Outside diameter			
9-pos.	7.5 mm		7.5 mm
15-pos.	9 mm		9 mm
25-pos.	10.5 mm		10.5 mm

Description	No. of pos.	Cable length	Ordering data: Type	Order No.	Pcs./ Pkt.	Ordering data: Type	Order No.	Pcs./ Pkt.
Round cable with an open end								
	9	0.5 m	CABLE-D- 9SUB/F/OE/0,25/S/0,5M	2926014	1	CABLE-D- 9SUB/M/OE/0,25/S/0,5M	2926360	1
	9	1 m	CABLE-D- 9SUB/F/OE/0,25/S/1,0M	2926027	1	CABLE-D- 9SUB/M/OE/0,25/S/1,0M	2926373	1
	9	1.5 m	CABLE-D- 9SUB/F/OE/0,25/S/1,5M	2926030	1	CABLE-D- 9SUB/M/OE/0,25/S/1,5M	2926386	1
	9	2 m	CABLE-D- 9SUB/F/OE/0,25/S/2,0M	2926043	1	CABLE-D- 9SUB/M/OE/0,25/S/2,0M	2926399	1
	9	3 m	CABLE-D- 9SUB/F/OE/0,25/S/3,0M	2926056	1	CABLE-D- 9SUB/M/OE/0,25/S/3,0M	2926409	1
	9	4 m	CABLE-D- 9SUB/F/OE/0,25/S/4,0M	2926069	1	CABLE-D- 9SUB/M/OE/0,25/S/4,0M	2926412	1
	9	6 m	CABLE-D- 9SUB/F/OE/0,25/S/6,0M	2926072	1	CABLE-D- 9SUB/M/OE/0,25/S/6,0M	2926425	1
Round cable, as above, but in variable lengths								
	9		CABLE-D- 9SUB-F-OE-0,25-S/...	2900903	1	CABLE-D- 9SUB-M-OE-0,25-S/...	2900909	1
Round cable with an open end								
	15	0.5 m	CABLE-D-15SUB/F/OE/0,25/S/0,5M	2926085	1	CABLE-D-15SUB/M/OE/0,25/S/0,5M	2926438	1
	15	1 m	CABLE-D-15SUB/F/OE/0,25/S/1,0M	2926098	1	CABLE-D-15SUB/M/OE/0,25/S/1,0M	2926441	1
	15	1.5 m	CABLE-D-15SUB/F/OE/0,25/S/1,5M	2926108	1	CABLE-D-15SUB/M/OE/0,25/S/1,5M	2926454	1
	15	2 m	CABLE-D-15SUB/F/OE/0,25/S/2,0M	2926111	1	CABLE-D-15SUB/M/OE/0,25/S/2,0M	2926467	1
	15	3 m	CABLE-D-15SUB/F/OE/0,25/S/3,0M	2926124	1	CABLE-D-15SUB/M/OE/0,25/S/3,0M	2926470	1
	15	4 m	CABLE-D-15SUB/F/OE/0,25/S/4,0M	2926137	1	CABLE-D-15SUB/M/OE/0,25/S/4,0M	2926483	1
	15	6 m	CABLE-D-15SUB/F/OE/0,25/S/6,0M	2926140	1	CABLE-D-15SUB/M/OE/0,25/S/6,0M	2926496	1
Round cable, as above, but in variable lengths								
	15		CABLE-D-15SUB-F-OE-0,25-S/...	2900905	1	CABLE-D-15SUB-M-OE-0,25-S/...	2900910	1
Round cable with an open end								
	25	0.5 m	CABLE-D-25SUB/F/OE/0,25/S/0,5M	2926153	1	CABLE-D-25SUB/M/OE/0,25/S/0,5M	2926506	1
	25	1 m	CABLE-D-25SUB/F/OE/0,25/S/1,0M	2926166	1	CABLE-D-25SUB/M/OE/0,25/S/1,0M	2926519	1
	25	1.5 m	CABLE-D-25SUB/F/OE/0,25/S/1,5M	2926179	1	CABLE-D-25SUB/M/OE/0,25/S/1,5M	2926522	1
	25	2 m	CABLE-D-25SUB/F/OE/0,25/S/2,0M	2926182	1	CABLE-D-25SUB/M/OE/0,25/S/2,0M	2926535	1
	25	3 m	CABLE-D-25SUB/F/OE/0,25/S/3,0M	2926195	1	CABLE-D-25SUB/M/OE/0,25/S/3,0M	2926548	1
	25	4 m	CABLE-D-25SUB/F/OE/0,25/S/4,0M	2926205	1	CABLE-D-25SUB/M/OE/0,25/S/4,0M	2926551	1
	25	6 m	CABLE-D-25SUB/F/OE/0,25/S/6,0M	2926218	1	CABLE-D-25SUB/M/OE/0,25/S/6,0M	2926564	1
Round cable, as above, but in variable lengths								
	25		CABLE-D-25SUB-F-OE-0,25-S/...	2900906	1	CABLE-D-25SUB-M-OE-0,25-S/...	2900911	1

Special lengths of D-SUB cable with open ends are configured using separate order numbers.

Ordering example:

One system cable assembled with a 37-pos. D-SUB socket strip and an open end, 12.75 m in length:

1 pcs. 2900907/12,75

Socket strip at one end and open end at the other end

Pin strip at one end and open end at the other end

		Technical data	Technical data
Maximum permissible operating voltage		25 V AC / 60 V DC	25 V AC / 60 V DC
Maximum permissible operating voltage UL / CSA		125 V / 125 V	125 V / 125 V
Maximum permissible current carrying capacity per path		2 A	2 A
Maximum conductor resistance		0.09 Ω/m	0.09 Ω/m
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Shield		Tinned copper-braided shield, approx. 85% covering	Tinned copper-braided shield, approx. 85% covering
Insertion/withdrawal cycles		> 200	> 200
Conductor cross section		AWG 24 / 0.25 mm²	AWG 24 / 0.25 mm²
Outside diameter			
	37-pos.	12 mm	12 mm
	50-pos.	13.5 mm	13.5 mm

			Ordering data			Ordering data		
Description	No. of pos.	Cable length	Type	Order No.	Pcs./ Pkt.	Type	Order No.	Pcs./ Pkt.
Round cable with an open end								
	37	0.5 m	CABLE-D-37SUB/F/OE/0,25/S/0,5M	2926221	1	CABLE-D-37SUB/M/OE/0,25/S/0,5M	2926577	1
	37	1 m	CABLE-D-37SUB/F/OE/0,25/S/1,0M	2926234	1	CABLE-D-37SUB/M/OE/0,25/S/1,0M	2926580	1
	37	1.5 m	CABLE-D-37SUB/F/OE/0,25/S/1,5M	2926247	1	CABLE-D-37SUB/M/OE/0,25/S/1,5M	2926593	1
	37	2 m	CABLE-D-37SUB/F/OE/0,25/S/2,0M	2926250	1	CABLE-D-37SUB/M/OE/0,25/S/2,0M	2926603	1
	37	3 m	CABLE-D-37SUB/F/OE/0,25/S/3,0M	2926263	1	CABLE-D-37SUB/M/OE/0,25/S/3,0M	2926616	1
	37	4 m	CABLE-D-37SUB/F/OE/0,25/S/4,0M	2926276	1	CABLE-D-37SUB/M/OE/0,25/S/4,0M	2926629	1
	37	6 m	CABLE-D-37SUB/F/OE/0,25/S/6,0M	2926289	1	CABLE-D-37SUB/M/OE/0,25/S/6,0M	2926632	1
Round cable, as above, but in variable lengths								
	37		CABLE-D-37SUB-F-OE-0,25-S/...	2900907	1	CABLE-D-37SUB-M-OE-0,25-S/...	2900912	1
Round cable with an open end								
	50	0.5 m	CABLE-D-50SUB/F/OE/0,25/S/0,5M	2926292	1	CABLE-D-50SUB/M/OE/0,25/S/0,5M	2926645	1
	50	1 m	CABLE-D-50SUB/F/OE/0,25/S/1,0M	2926302	1	CABLE-D-50SUB/M/OE/0,25/S/1,0M	2926658	1
	50	1.5 m	CABLE-D-50SUB/F/OE/0,25/S/1,5M	2926315	1	CABLE-D-50SUB/M/OE/0,25/S/1,5M	2926661	1
	50	2 m	CABLE-D-50SUB/F/OE/0,25/S/2,0M	2926328	1	CABLE-D-50SUB/M/OE/0,25/S/2,0M	2926674	1
	50	3 m	CABLE-D-50SUB/F/OE/0,25/S/3,0M	2926331	1	CABLE-D-50SUB/M/OE/0,25/S/3,0M	2926687	1
	50	4 m	CABLE-D-50SUB/F/OE/0,25/S/4,0M	2926344	1	CABLE-D-50SUB/M/OE/0,25/S/4,0M	2926690	1
	50	6 m	CABLE-D-50SUB/F/OE/0,25/S/6,0M	2926357	1	CABLE-D-50SUB/M/OE/0,25/S/6,0M	2926700	1
Round cable, as above, but in variable lengths								
	50		CABLE-D-50SUB-F-OE-0,25-S/...	2900908	1	CABLE-D-50SUB-M-OE-0,25-S/...	2900913	1

Modules as compact potential distributors

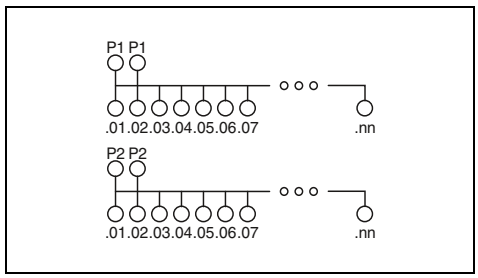
The VIP-2/.../PDM... modules offer the following features:
– Two potential levels
– Separate supply
– Screw or Push-in connection
– Consecutive marking
– With fuse as an option

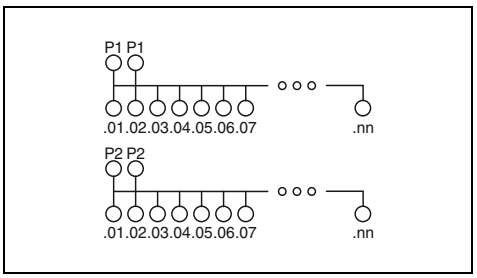
The UMK-PVB and UMK-PVB 6 modules have three or six potential levels.

Notes:
Marking systems and mounting material See Catalog 3
1) No UL approval

With screw connection and 2 potential levels

With Push-in connection and 2 potential levels



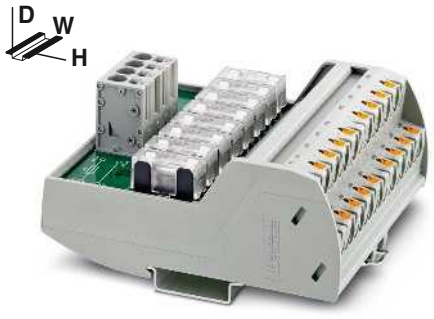


Technical data

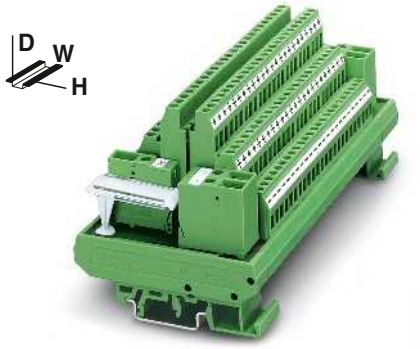
Maximum permissible operating voltage		250 V AC/DC	250 V AC/DC
Maximum permissible operating voltage UL / CSA		250 V / 250 V	250 V / 250 V
Maximum permissible current (per branch)		15 A	15 A
Total current		30 A (per potential)	30 A (per potential)
Ambient temperature (operation)		-20 °C ... 50 °C	-20 °C ... 50 °C
Mounting position		any	any
Standards/regulations		IEC 60664 , DIN EN 50178	IEC 60664 , DIN EN 50178
Supply connection data solid/stranded/AWG		0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10	0.25 - 6 mm² / 0.25 - 4 mm² / 24 - 10
Distribution connection data solid/stranded/AWG		0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions	H / D	65.5 mm / 50 mm	75.8 mm / 63 mm

Ordering data

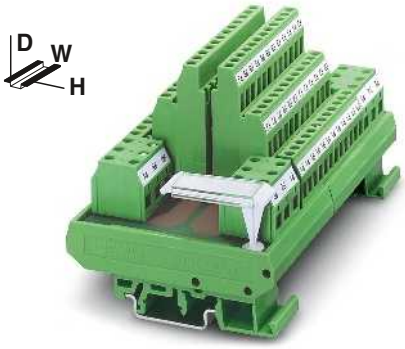
Description	No. of pos.	Module width W	Type	Order No.	Pcs./ Pkt.
VARIOFACE module, with two busbars (P1, P2) for potential distribution, per potential:					
2 power terminals/8 distributor terminal blocks		50.00	**VIP-2/SC/PDM-2/16**	2315256	1
2 power terminals/12 distributor terminal blocks		70.40	**VIP-2/SC/PDM-2/24**	2315269	1
2 power terminals/16 distributor terminal blocks		90.80	**VIP-2/SC/PDM-2/32**	2315272	1
2 power terminals/24 distributor terminal blocks		131.50	**VIP-2/SC/PDM-2/48**[1]	2903717	1
VARIOFACE module, with two busbars (P1, P2) for potential distribution, per potential:					
2 power terminals/8 distributor terminal blocks		41.90	**VIP-3/PT/PDM-2/16**	2903797	1
2 power terminals/12 distributor terminal blocks		57.10	**VIP-3/PT/PDM-2/24**	2903798	1
2 power terminals/16 distributor terminal blocks		67.30	**VIP-3/PT/PDM-2/32**	2903799	1
2 power terminals/24 distributor terminal blocks		97.70	**VIP-3/PT/PDM-2/48**	2903800	1
VARIOFACE module with 2 busbars for potential distribution					
- 2 power terminals/8 distributor blocks		97.70			
VARIOFACE module, with three busbars (+, -, PE) for potential distribution, per potential: (+) 2 power terminals/48 distributor terminal blocks (-) 2 power terminals/24 distributor terminal blocks (PE) 2 power terminals/72 distributor terminal blocks		168.80			
VARIOFACE module, with six busbars (P1 to P6) for potential distribution, per potential:					
2 power terminals/12 distributor terminal blocks		123.80			



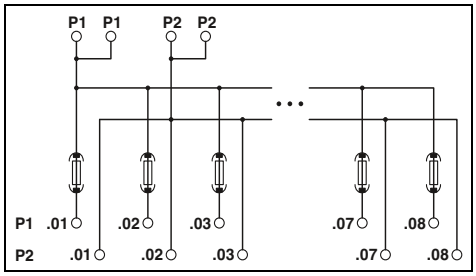
With Push-in connection and
2 potential levels and eight 6.3 A fuses

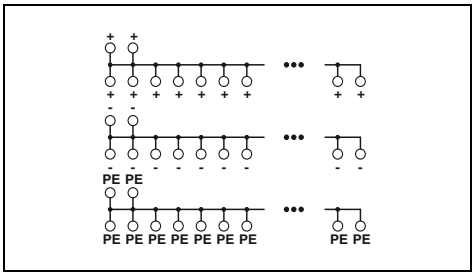


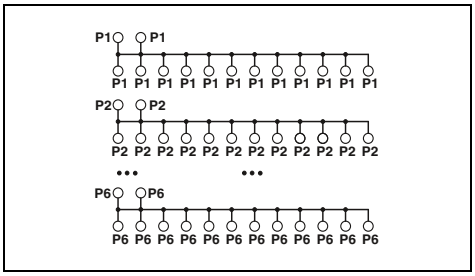
With screw connection and
3 potential levels



With screw connection and
6 potential levels







Technical data

250 V AC/DC
250 V / 250 V

6.3 A (fuse limited)
30 A (per potential)
-20 °C ... 60 °C
any
IEC 60664 , DIN EN 50178
0.2 - 10 mm² / 0.2 - 6 mm² / 24 - 8

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

109.8 mm / 51 mm

Technical data

250 V AC/DC
- / -

16 A
16 A (per potential)
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.5 - 6 mm² / 0.5 - 4 mm² / 20 - 10

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

77 mm / 72 mm

Technical data

250 V AC/DC
- / -

16 A
16 A (per potential)
-20 °C ... 50 °C
any
IEC 60664 , DIN EN 50178
0.2 - 6 mm² / 0.2 - 4 mm² / 24 - 10

0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

77 mm / 72 mm

Ordering data

Type	Order No.	Pcs./ Pkt.
VIP-2/PT/PDM-2/16/FU 6.3A	2903603	1

Ordering data

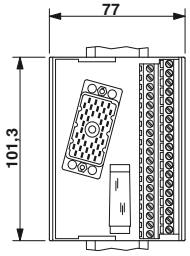
Type	Order No.	Pcs./ Pkt.
UMK- PVB	2971302	1

Ordering data

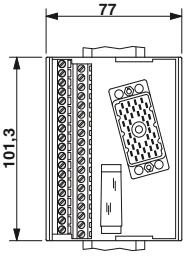
Type	Order No.	Pcs./ Pkt.
UMK- PVB 6	2972136	1

Modules for ELCO connectors

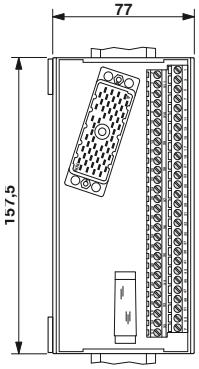
Dimensional drawing for UMK-EC38/38-XOL



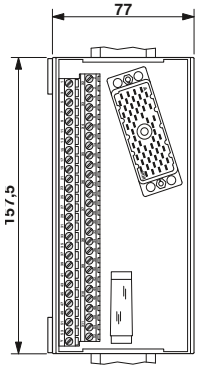
Dimensional drawing for UMK-EC38/38-XOR



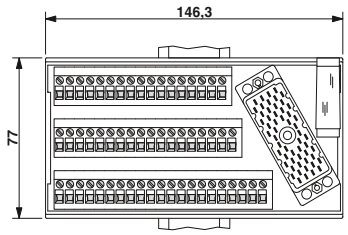
Dimensional drawing for UMK-EC56/56-XOL



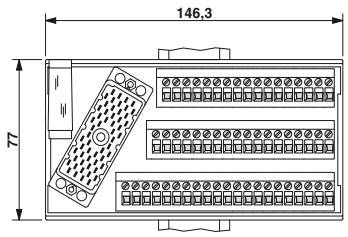
Dimensional drawing for UMK-EC56/56-XOR



Dimensional drawing for UMK-EC56/FRONT 2,5V/R



Dimensional drawing for UMK-EC56/FRONT 2,5V/L



Pin assignment UMK-EC38/38...

Terminal block	Pin strip
1	A
2	B
3	C
4	D
5	E
6	F
7	H
8	J
9	K
10	L
11	M
12	N
13	P
14	R
15	S
16	T
17	U
18	V
19	W
20	X
21	Y
22	Z
23	AA
24	BB
25	DD
26	EE
27	FF
28	HH
29	JJ
30	KK
31	LL
32	MM
33	NN
34	PP
35	RR
36	SS
37	TT
CC	CC

Pin assignment UMK-EC56/56...

Terminal block	Pin strip
Z	Z
1	A
2	B
3	C
4	D
5	E
6	F
7	H
8	J
9	K
10	L
11	M
12	N
13	P
14	R
15	S
16	T
17	U
18	V
19	W
20	X
21	a
22	b
23	c
24	d
25	e
26	f
27	h
28	j
29	k
30	l
31	m
32	n
33	p
34	r
35	s
36	t
37	u
38	v
39	w
40	x
41	y
42	z
43	AA
44	BB
45	CC
46	DD
47	EE
48	FF
49	HH
50	JJ
51	KK
52	LL
53	MM
54	NN
Y	Y (shield)

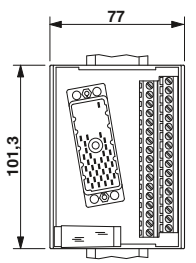
Pin assignment UMK-EC56/FRONT 2,5V/...

Terminal block	ELCO connector
X	N.C.
1	A
2	B
3	C
4	D
5	E
6	F
7	H
8	J
9	K
10	L
11	M
12	N
13	P
14	R
15	S
16	T
17	U
18	V
19	W
20	X
21	a
22	b
23	c
24	d
25	e
26	f
27	h
28	j
29	k
30	l
31	m
32	n
33	p
34	r
35	s
36	t
37	u
38	v
39	w
40	x
41	y
42	z
43	AA
44	BB
45	CC
46	DD
47	EE
48	FF
49	HH
50	JJ
51	KK
52	LL
53	MM
54	NN
Y	Y (shield)

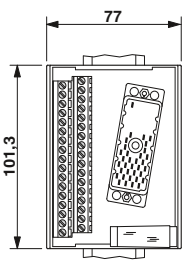
Pin assignment UMK-EC56/32-...

Terminal block	ELCO connector
1	A
2	B
3	C
4	D
5	E
6	F
7	H
8	J
9	K
10	L
11	M
12	N
13	P
14	R
15	S
16	T
17	U
18	V
19	W
20	X
21	Z
22	a
23	b
24	c
25	d
26	e
27	f
28	h
29	j
30	k
31	l
32	m
Y	NN + Y

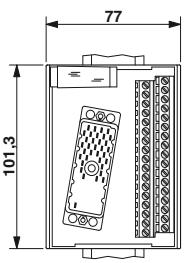
Dimensional drawing for UMK-EC56/32-XOL



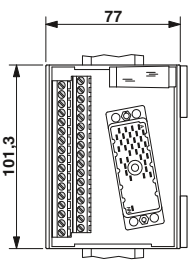
Dimensional drawing for UMK-EC56/32-XOR



Dimensional drawing for UMK-EC56/32-XUL

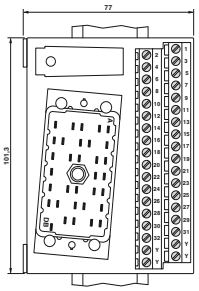


Dimensional drawing for UMK-EC56/32-XUR

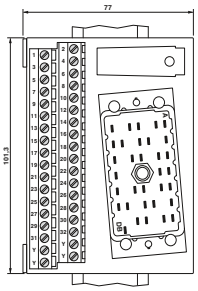


Modules for ELCO connectors with Ex i protection

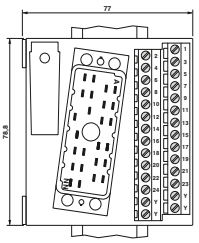
Dimensional drawing for UMK-EC90/32/EX-XUL



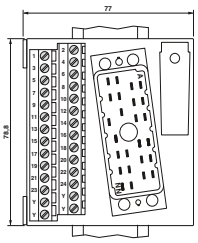
Dimensional drawing for UMK-EC90/32/EX-XUR



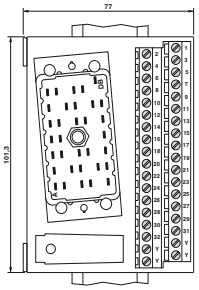
Dimensional drawing for UMK-EC56/25/EX-L



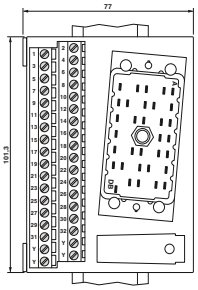
Dimensional drawing for UMK-EC56/25/EX-R



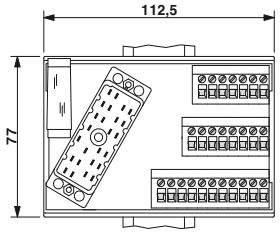
Dimensional drawing for UMK-EC90/32/EX-XOL



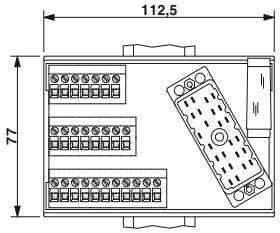
Dimensional drawing for UMK-EC90/32/EX-XOR



Dimensional drawing for UMK-EC 56/25/EX/FRONT 2,5 V/L



Dimensional drawing for UMK-EC 56/25/EX/FRONT 2,5 V/R



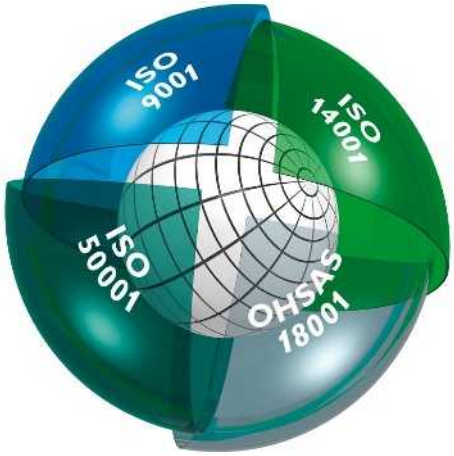
Pin assignment UMK-EC90/32/EX...

Terminal block	Pin strip	Channel
1 2	H J	1
3 4	L M	2
5 6	P X	3
7 8	Z AA	4
9 10	AC AD	5
11 12	AM AN	6
13 14	AR AS	7
15 16	AU BC	8
17 18	AZ BA	9
19 20	BJ BK	10
21 22	BM BN	11
23 24	BR BY	12
25 26	CA CB	13
27 28	CD CE	14
29 30	CN CP	15
31 32	CS CT	16
Y	DB	

Pin assignment UMK-EC 56/25/EX/...

Terminal block	Pin strip	Channel
1 2	C D	1
3 4	E F	2
5 6	N P	3
7 8	R S	4
9 10	a b	5
11 12	d j	6
13 14	k l	7
15 16	s t	8
17 18	u v	9
19 20	BB CC	10
21 22	DD EE	11
23 24	MM NN	12
Y	Y	

Quality in quantity



Integrated management system

The objective of the Phoenix Contact integrated management system is to integrate all requirements pertaining to products, processes, and the organization.

Statutory and regulatory requirements, as well as those of international standards and our customers, are met and, in some cases, even exceeded in all phases of the product lifecycle.

The Phoenix Contact management system is monitored by internationally recognized independent bodies each year to ensure that quality, environmental protection, energy efficiency, and occupational safety have been integrated in conformance with the relevant requirements. Certification in accordance with international standards ISO 9001, ISO 14001, ISO 50001, and BS OHSAS 18001 is the result of our corporate philosophy of meeting the needs of our customers, staff, and environment as best as possible. They serve as the basis for innovative products with the familiar high Phoenix quality standard, actively practiced environmental protection through efficient production and products that conserve resources, and responsibility in the field of occupational health and safety. It goes without saying that we integrate all further requirements of standards, international approvals or special customer requirements into our company processes.

The result of this system is a building block for the success of the Phoenix Contact Group as well as its products and services.

CE marking

CE marking was introduced as an important instrument for the free movement of goods within the European single market. By applying the mark to a product, the manufacturer confirms its compliance with all EU directives applicable to this product. The EU directives describe the product characteristics with regard to device safety and the avoidance of risks. These are legally binding regulations of the European Union (EU), which means that the fulfillment of these requirements is a **legal prerequisite for the marketing of these products within the EU**.

Where applicable, our products currently fall within the scope of the following directives:

– 2014/35/EU
  Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
– 2014/30/EU
  Electromagnetic compatibility (EMC Directive)
– 2014/32/EU
  Measuring instruments
– 2006/42/EC
  Safety of machinery (Machinery Directive)
– 2014/34/EU
  Equipment and protective systems intended for use in potentially explosive atmospheres (ATEX Directive)
– 1999/5/EC
  Radio Equipment and Telecommunications Terminal Equipment Directive (R&TTE)
– 2014/53/EU
  Radio equipment (RED)
– 2011/65/EU
  RoHS Directive

The standards used as the basis for the aforementioned directives have been at the heart of our development standard for some time as a way of ensuring compliance with European directives. The numbers of the directives indicate their version at the time of publication. In the event of changes to directives and/or standards, our products will undergo conformity assessment again in good time and a new declaration of conformity will be issued promptly. The current declarations for each product can also be found in our download area.

Among the aforementioned European directives, the EMC Directive plays a particularly important role. It uses a legally binding directive as the basis for defining electromagnetic compatibility as a fundamental device property. European legislation therefore places great emphasis on the electromagnetic compatibility of devices and systems as a basic prerequisite for the error-free operation of machines and systems. As an international leader in the field of surge protection, Phoenix Contact has extensive expertise in EMC. This expertise and the experience gained over many years in the development and application of industrial interface and communication technology have resulted in an extremely high standard of quality for our products when it comes to electromagnetic compatibility. Our sister company, Phoenix Testlab, was founded in order to share this expertise with other companies. Phoenix Testlab GmbH is an independent, accredited service company, which carries out EMC testing in compliance with the European standards. At Phoenix Testlab, devices are also tested with regard to their electrical safety, mechanical influences, and their behavior in relation to environmental influences. Phoenix Testlab is also a notified body according to EMC Directive 2014/30/EU, R&TTE Directive 1999/5/EC for radio equipment and telecommunications terminal equipment, and Radio Equipment Directive (RED) 2014/53/EU. As a certification body (TCB, FCB, and RCB), Phoenix Testlab is also able to approve these products for the markets in the USA, Canada, and Japan.

Standards and regulations

All relevant standards and regulations are used as the basis for the development and maintenance of our products.

International standards are subject to continuous changes as a result of harmonization and new developments. In line with this process, the current version of all standards that are relevant to our products is documented in the product area on our website at **phoenixcontact.net/products**.

Online product information service on the world wide web

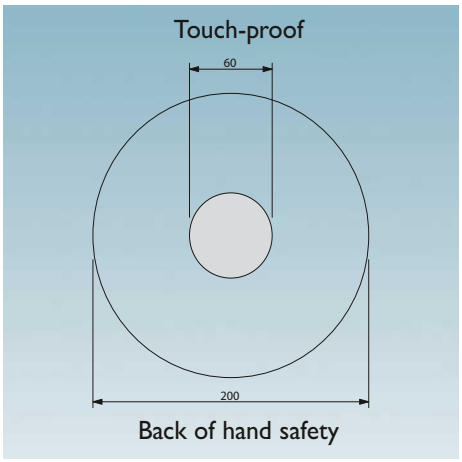
Phoenix Contact is continuously extending its product range.

Within the scope of our product monitoring obligation, all products are subject to an improvement process.

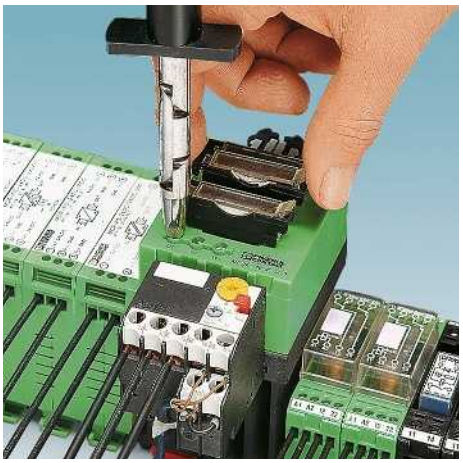
The Internet is an ideal platform to quickly communicate new product developments and improvements to the market.

You can quickly access the relevant Phoenix Contact website for your region via phoenixcontact.com. There you will always find an up-to-date overview of products, solutions, and services from Phoenix Contact. This includes technical documents such as data sheets and user manuals, current driver and demo software, and a direct link to the relevant contact person.

Touch proofness



Example: pressure actuation



Finger safety

Back of hand safety

The accident prevention regulations BGV A 2 issued by the German employer's liability insurance association for precision mechanics and electrical engineering apply to the operators of electrical systems and are aimed at the prevention of electrical accidents by means of special safety requirements.

These regulations contain specifications regarding the safety distances for work, operation, and occasional handling in the proximity of "live parts" in low-voltage systems up to 1000 V ~ or 1500 V –.

– Work with live parts is only permitted once they have been de-energized. Operational activities are only permitted in the vicinity of live parts if these parts are de-energized or are protected against direct contact (§ 6). The following safety measures apply when working in the vicinity of live parts:
– Provision of the de-energized state for the duration of the work
– Ensure shock protection is in place in the form of covers or barriers during the work
– Assurance that proximity limits will not be violated (§ 7)

The term "occasional handling" has been introduced for the operation of elements such as pushbuttons, rocker arms or rotary buttons in the proximity of live parts.

In VDE 0105-1, this is covered by "operation with partial protection against direct contact".

Detailed specifications for "occasional handling" can be found in DIN VDE 0106-100. This specifies to what degree live parts in the proximity of operating elements are to be protected against contact. The basis for this is the definition of a "protection area for occasional handling"; this is the area into which the user must reach in order to handle the machine.

The most important thing is that an area formed by an even envelope curve 30 mm in radius must surround the live parts. This area must be **touch-proof**, i.e., the live parts of the electrical device must not be within reach of the VDE test finger according to IEC 60529/DIN VDE 0470-1 (test finger).

Back of hand safety is specified for the "rest of the area" up to 100 mm around the operating element. **Back of hand safety** means that when a force of 50 N is applied to a ball with a diameter of 50 mm, this does not come into contact with the live parts of the equipment. No special measures for ensuring contact safety are stipulated outside this area.

Note: Systems and equipment that are operated with SELV up to 25 V ~ or 60 V – are considered to be protected against "direct contact".

According to § 5, Subsection 4 of the BGV A 2 regulations, there is no need to test the condition of the system prior to initial startup if the company has confirmation from the manufacturer or installer that the electrical systems and equipment conform to BGV A 2. The confirmation required relates to systems and equipment that have been installed and are ready for operation and can only be issued by the installer or installation company. The manufacturer of the electrical equipment can only issue a confirmation that products have been produced in accordance with the relevant electrotechnical DIN VDE regulations stipulated in BGV A 2. The installer must bear this in mind when selecting the equipment to be used.

In the field of connection technology, Phoenix Contact offers a wide range of products which are touch-proof or can be protected against contact by means of covers. Depending on the conditions, all of this must be taken into account when selecting the individual types of terminal blocks and accessories.

Quality features of insulating housings

Thermoplastics

The majority of our insulating housing is made from thermoplastic materials. Roughly speaking, these can be divided into amorphous and semi-crystalline substances. Thermoplastics are processed using the efficient and environmentally-friendly injection molding process. They have good recycling properties and can be re-used. We use many materials that are modified in different ways to meet the demanding requirements that electrical and electronic modules, devices, and systems have to meet with regard to their mechanical, thermal, and electrical properties.

Behavior of plastics under the influence of temperature (operating temperatures, mechanical influences)

All plastics undergo a process referred to as thermal aging when they are subjected to heat over long periods. This process causes changes in the mechanical and electrical properties of the material. External influences, e.g., radiation, additional mechanical, chemical or electrical stresses, amplify this effect. Special tests on samples can yield characteristic data which provides a good means of drawing comparisons between different plastics. However, applying these characteristics to an evaluation of molded plastic parts is only possible to a limited extent, and can only give the designer a rough guide when it comes to selecting a plastic material. This catalog uses the following assessment criteria: the **RTI value** according to UL746B/ANSI 746 B (elec. based on electric strength) and the **Ti value** according to IEC 60216-1 (based on a 50% reduction in tensile strength after 20,000 hours).

IEC 60947-7-1/EN 60947-7-1 specifies a permissible temperature increase of 45 K for terminal blocks under nominal load. Phoenix Contact terminal blocks fulfill this requirement.

The properties of plastics are not only affected by the influence of heat as described above; they also undergo changes as a result of cold influences. When subjected to cold as well as low levels of humidity, plastics become increasingly brittle with the result that they are no longer capable of withstanding the same mechanical loads. As the table on the right shows, the plastics concerned can be used down to a temperature of -40°C, but only without a mechanical load. As far as the products presented in the catalog are concerned, it is the ambient temperature specified in each case that is to be regarded as definitive for operation. Regardless of the plastics used, this may be subject to further restrictions (e.g., limited to -20°C) as a result of the components used or other restrictive parameters.

At very low temperatures, this means that any form of mechanical load on the plastic components must be avoided (e.g., mounting of products on/removal of products from the DIN rail, actuation of terminal points, locking/ejection of relays from bases, prizing out of jumpers, bending of cables and lines, etc.), as there is always an associated risk of damage. Unless otherwise indicated, it is recommended that you carry out the specified mounting/operational tasks in a temperature range from -10°C to +40°C.

Inflammability characteristics of plastics (UL 94)

The inflammability tests for plastics have been defined by the Underwriters Laboratory (USA) in regulation UL 94. This applies to all areas of application, particularly in electrical engineering. A horizontal or vertical test is carried out at the test laboratory to determine the inflammability of the plastic material with a naked flame. In order of increasing flame-retardant behavior, the evaluation classes are HB, V2, V1, V0, and 5V. Test results are recorded on "yellow cards" and are published annually in the **Recognized Component Directory.**

Thermoplastics: non-reinforced polyamide, PA

We use the modern, semi-crystalline polyamide insulation material, which has now become an essential component in electrical engineering and electronics. It has long occupied a leading position and is authorized for use by the relevant approval authorities such as the CSA, NEMKO, KEMA, PTB, SEV, UL, VDE, etc.

Polyamide has excellent electrical, mechanical, chemical, and other properties even at high operating temperatures. Brief peak temperatures of up to approximately 200°C are permitted as a result of heat aging stabilization. Depending on the type (PA 4.6, 6.6, 6.10, etc.), its melting point is in the region of 215°C to 295°C.

Polyamide absorbs moisture from its surroundings, on average 2.8%. This is not the embedded water of crystallization, however, but rather chemically bound H_2O groups in the molecular structure. This makes the plastic flexible and resistant to breakage, even at temperatures as low as -40°C. PA belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: polyester, PBT

We use the semi-crystalline thermoplastic polyester in non-reinforced and fiberglass-reinforced variants for special applications which require increased dimensional and form stability.

Apart from the high operating temperature, the material is characterized by excellent mechanical strength and hardness. Polyester does not absorb moisture from its surroundings. Therefore, PBT is particularly suitable for strips, for example, that are soldered onto PCBs and are subsequently required to pass a burn-in test where they are subjected to the influence of heat. PBT belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: polycarbonate, PC

Polycarbonate combines many advantages such as rigidity, impact strength, transparency, dimensional stability, good insulation properties, and resistance to heat.

The amorphous material only absorbs moisture to a very limited degree, and is used for items such as large, rigid electronic component housings.

In its transparent form, polycarbonate is particularly suitable for use as a material for cover profiles or marking materials.

PC has good resistance properties against mineral acids, saturated aliphatic hydrocarbons, gasoline, greases, and oils.

This material is not very resistant to solvents, benzene, alkalis, acetone, and ammonia. Strain cracks may result from contact with certain chemicals.

PC belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: polycarbonate fiber-reinforced, PC-F

Compared to non-reinforced materials, fiber-reinforced polycarbonates feature greater rigidity, impact strength, and operating temperature. In other respects, their properties are largely identical to those of non-reinforced polycarbonate.

Thermoplastics: ABS

We use the thermoplastic molding compound ABS for products which must have good impact and notched impact properties in addition to high mechanical stability and rigidity. The products are resistant to chemicals and stress cracking due to their special surface quality and hardness.

The characteristic thermal properties provide good dimensional stability at both low and high temperatures. Products made from ABS can be coated with metallic surfaces, e.g., nickel.

The flammability rating of the molding compound used is HB to V0 according to UL 94.

Properties	Unit/level	Polyamide PA	Polyester PBT	Polycarbonate PC	Polycarbonate PC-F	ABS
Operating temperature RTI */**	°C	≤ 105	≤ 105	≤ 125	≤ 120	≤ 80
Minimum temperature (without mechanical load)	°C	-40	-40	-40	-40	-40
Electric strength IEC 60243-1/DIN VDE 0303-21	kV/cm	600	400	> 300		850
Resistance to creepage IEC 60112/DIN VDE 0303-1	CTI...M	550	225	175		200
	CTI...	600	225	175	175	600
Tropical and termite resistance		Good	Good	Good		
Specific contact resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω cm	10^{12}	10^{16}	> 10^{16}	> 10^{14}	10^{14}
Surface resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω	10^{10}	10^{13}	> 10^{14}		10^{13}
Flammability rating according to UL 94		V2-V0	V0	V2-V0	V0	HB-V0

* According to UL 746 B/ANSI 746 B (elec.) ** Minimum value

Dimensions

Dimensions: Width/**H**eight/**D**epth

The dimensions "**W**idth/**H**eight/**D**epth" are defined as follows for all DIN-rail-mountable products:

– **W**idth: measurement taken along the DIN rail
– **H**eight: measurement taken across the DIN rail
– **D**epth: measurement taken starting from the mounting plate and including the DIN rail NS 35/7.5 (EN 60715)

The width, height, and depth never change, even if the products shown in this catalog happen to be photographed from two different perspectives (horizontal or vertical).

To make things easier for you, one of the two symbols shown above has been included next to each product photo:

EMC: Class A product:

In accordance with statutory regulations, our products are indicated with this footnote if they are intended for use in industrial environments. This means that the permitted limit values for residential applications may be exceeded in the event of conducted and emitted disturbance variables. In such cases, the operator may have to take additional safety measures in order to ensure electromagnetic compatibility in residential applications.

Note:

Subject to changes that serve the purpose of technical progress.

Connection cross section

The rated cross section of terminal blocks must be specified by the manufacturer according to IEC 60947-7-1. The rated cross section is the maximum conductor cross section that can be connected in single, multi or fine-strand versions subject to specific thermal, mechanical, and electrical requirements.

The manufacturer must also specify the **rated connection capacity**, i.e., the area of connectable conductors as well as the number of conductors which can be connected simultaneously and the necessary preparation of the conductor ends. The conductors can be **solid (single or multi-strand)** or flexible **(fine-strand)**.

These values can be found in the product-specific technical data.

The rated connection capacity of Phoenix Contact terminal blocks usually exceeds standard requirements, which specify that it must only be possible to connect one conductor with one of the two next smallest cross sections, excluding the rated cross section (standardized for the cross section range from 0.2 to 35 mm²).

In addition, conductors with a rated cross section can usually be wired with ferrules with plastic sleeve.

Phoenix Contact terminal blocks are designed to allow copper conductors to be connected to them untreated. "Special treatment" or the use of ferrules – both permitted according to IEC 60947-7-1 – are not required. If ferrules are nevertheless used to protect stranded conductors against splicing, the connection capacity of the stranded conductor is generally reduced by one level.

Structure and dimensions of connecting cables

Cross section	Single-stranded		Multi-stranded		Fine-stranded		American Wire Gauge [AWG]							
	Diameter max. dimension	Number of wires	Diameter max. dimension	Number of wires (minimum number)	Diameter max. dimension	Number of wires (guide value)	Gauge no.	Solid wires			Stranded wires			
[mm²]							AWG	[Ø mm]	[circ. mils]	[mm²]	[Ø mm]	[circ. mils]	[mm²]	
0.2	0.5	1	–	–	–	–	24	0.51	404	0.21	–	–	–	
0.5	0.9	1	1.1	7	1.1	16	20	0.81	1022	0.52	0.97	1111	0.56	
0.75	1.0	1	1.2	7	1.3	24	18	1.02	1620	0.82	1.16	1600	0.82	
1	1.2	1	1.4	7	1.5	32	(17)	1.15	2050	1.04	–	–	–	
–	–	–	–	–	–	–	16	1.29	2580	1.31	1.50	2580	1.32	
1.5	1.5	1	1.7	7	1.8	30	(15)	1.45	3260	1.65	–	–	–	
–	–	–	–	–	–	–	14	1.63	4110	2.08	1.85	4100	2.09	
2.5	1.9	1	2.2	7	2.3	50	(13)	1.83	5180	2.63	–	–	–	
–	–	–	–	–	–	–	12	2.05	6530	3.31	2.41	6500	3.32	
4	2.4	1	2.7	7	2.9	56	(11)	2.30	8230	4.17	–	–	–	
–	–	–	–	–	–	–	10	2.59	10380	5.26	2.95	10530	5.37	
6	2.9	1	3.3	7	3.9	84	(9)	2.91	13100	6.63	–	–	–	
–	–	–	–	–	–	–	8	3.26	16510	8.37	3.73	16625	8.48	

Tightening torque of terminal block screws

IEC 60947-1/EN 60947-1, modified, Table 4 specifies tightening torques for screw connections based on the screw size for electrical and mechanical type tests.

Extract from IEC 60947-1/EN 60947-1, Table 4

The torque according to IEC and the recommended torque for Phoenix Contact terminal blocks are specified

Thread	Head screw with slot	
	Torque	Recommended tightening torque
	[Nm]	[Nm]
M2.5 (M2.6)	0.4	0.4 - 0.5
M3	0.5	0.5 - 0.6
M3.5	0.8	0.8 - 1.0
M4	1.2	1.2 - 1.5

Current carrying capacity

Standard IEC 60947-7-1/EN 60947-7-1/ DIN VDE 0611-1 specifies the test currents for the individual conductor cross sections listed in the adjacent table. The corresponding currents are listed with the connection data for the individual terminal blocks. The type tests of terminal blocks are based on this data.

Test currents according to IEC 60947-7-1/EN 60947-7-1, Table 5

Rated cross section	[mm²]	0.2	0.5	0.75	1.0	1.5	2.5	4	6	10	16
Test current	[A]	4	6	9	13.5	17.5	24	32	41	57	76

Certification bodies and safety marks

Certification bodies and approvals		Country code
CB scheme	IECEE CB Scheme (in combination with certifying body)	Interna-tional
CCA	CENELEC Certification Agreement (CCA inspection report) (in combination with certifying body)	EU
	Canadian Standards Association (CSA)	CA
	Canadian Standards Association (CSA) - CSA approval for the USA -	US
	Canadian Standards Association (CSA) Combined logo - CSA approval for Canada and the USA -	CA US
	Underwriters Laboratories Inc. (UL)	US
	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
	INSIEME PER LA QUALITA'E LA SICUREZZA	IT
EAC	Eurasian Conformity	BY KZ RU
KEMA KEUR	DEKRA Certification B.V.	NL
ÖVE	Österreichischer Verband für Elektrotechnik	AT
SEV	electrosuisse SEV Verband für Elektro-, Energie- und Informationstechnik	CH
VDE	Verband Deutscher Elektrotechniker e.V. (VDE) – Approval of drawings – Reports with production monitoring	DE
DGUV TEST	Berufsgenossenschaft (BG) GS Tested safety	DE
Intertek	Intertek ETL Listed - Approval for the USA -	US
Intertek	Intertek ETL Listed - Approval for Canada -	CA
Intertek	Intertek ETL Listed - Approval for the USA and Canada -	US CA
TÜV	TÜV Rheinland Industrie Service GmbH	DE
CCC	China Compulsory Certification	CN
KC	Korea Communications Commission	KR

Explosion protection		Country code
IEC IECEx	International Electrotechnical Commission	Interna-tional
Ex	ATEX Directive	EU
DEKRA	DEKRA Certification B.V.	NL
PTB	Physikalisch-Technische Bundesanstalt	DE
kiwa	KIWA Nederland B.V.	NL
VTT	VTT Expert Services Oy	FI
IBExU	IBExU Institut für Sicherheitstechnik GmbH	DE
UC	TÜV Rheinland do Brasil	BR
TÜV NORD	Technischer Überwachungsverein Nord	DE
DEKRA	DEKRA EXAM GmbH	DE
	Canadian Standards Association (CSA)	CA
	Canadian Standards Association (CSA) - CSA approval for the USA -	US
	Canadian Standards Association (CSA) Combined logo - CSA approval for Canada and the USA -	CA US
	Underwriters Laboratories Inc. (UL)	US
	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
FM APPROVED	FM Approvals	US
EAC Ex	Eurasian Conformity for Ex-products	BY KZ RU

Marine classification societies		Country code
DNV GL	DNV GL - MARITIME	DE
BUREAU VERITAS	Bureau Veritas	FR
GL	Germanischer Lloyd AG	DE
Lloyd's Register	Lloyd's Register of Shipping	GB
ClassNK	Nippon Kaiji Kyokai	JP
DNV	Det Norske Veritas	NO
	Polski Rejestr Statków	PL
	Russian Maritime Register of Shipping	RU
KR KOREAN REGISTER	Korean Register of Shipping	KR
ABS	American Bureau of Shipping	US

Type	Order No.	Page
B		
BRIDGE COVER	2906240	34
BRIDGE- 2	2900746	34
BRIDGE- 2-3M	2901543	35
BRIDGE- 3	2900747	34
BRIDGE- 3-3M	2901656	35
BRIDGE- 4	2900748	34
BRIDGE- 4-3M	2901659	35
BRIDGE- 5	2900749	34
BRIDGE- 5-3M	2901545	35
BRIDGE- 6	2900750	34
BRIDGE- 6-3M	2901697	35
BRIDGE- 7	2900751	34
BRIDGE- 7-3M	2901698	35
BRIDGE- 8	2900752	34
BRIDGE- 8-3M	2901700	35
BRIDGE- 9	2900753	34
BRIDGE- 9-3M	2901701	35
BRIDGE-10	2900754	34
BRIDGE-10-3M	2901702	35
BRIDGE-PT 2	2904490	35
BRIDGE-PT 3	2904491	35
BRIDGE-PT 4	2904492	35
BRIDGE-PT 5	2904493	35
BRIDGE-PT 6	2904494	35
BRIDGE-PT 7	2904495	35
BRIDGE-PT 8	2904496	35
BRIDGE-PT 9	2904497	35
BRIDGE-PT 10	2904498	35
C		
CAB-USB A/MICRO USB B/2,0M	2701626	432
CABLE D-SUB-B-B-S/.../.../...	2302421	595
CABLE D-SUB-S-S-S/.../.../...	2302434	595
CABLE D-SUB-S/.../.../...	2302340	595
CABLE-40/2FLK16/ 2,0M/YUC	2321334	517
CABLE-40/2FLK16/ 4,0M/YUC	2321347	517
CABLE-40/2FLK16/10,0M/YUC	2321350	517
CABLE-40/2FLK16/15,0M/YUC	2321376	517
CABLE-40/2FLK16/20,0M/YUC	2321363	517
CABLE-50/4FLK14/ 2,0M/YUC	2314655	517
CABLE-50/4FLK14/ 4,0M/YUC	2314671	517
CABLE-50/4FLK14/ 6,0M/YUC	2318978	517
CABLE-50/4FLK14/10,0M/YUC	2314684	517
CABLE-50/4FLK14/15,0M/YUC	2322773	517
CABLE-50/4FLK14/20,0M/YUC	2314778	517
CABLE-D 9SUB/B/B/100/KONFEK/S	2305415	593
CABLE-D 9SUB/B/B/200/KONFEK/S	2305428	593
CABLE-D 9SUB/B/B/300/KONFEK/S	2305431	593
CABLE-D 9SUB/B/S/ 50/KONFEK/S	2299987	592
CABLE-D 9SUB/B/S/100/KONFEK/S	2299990	592
CABLE-D 9SUB/B/S/150/KONFEK/S	2300009	592
CABLE-D 9SUB/B/S/200/KONFEK/S	2302010	592
CABLE-D 9SUB/B/S/300/KONFEK/S	2302023	592
CABLE-D 9SUB/B/S/400/KONFEK/S	2302036	592
CABLE-D 9SUB/B/S/600/KONFEK/S	2302049	592
CABLE-D 9SUB/S/S/100/KONFEK/S	2305570	593
CABLE-D 9SUB/S/S/200/KONFEK/S	2305583	593
CABLE-D 9SUB/S/S/300/KONFEK/S	2305596	593
CABLE-D- 9SUB-F-OE-0,25-S/...	2900903	596
CABLE-D- 9SUB-M-OE-0,25-S/...	2900909	596
CABLE-D- 9SUB/F/OE/0,25/S/0,5M	2926014	596
CABLE-D- 9SUB/F/OE/0,25/S/1,0M	2926027	596
CABLE-D- 9SUB/F/OE/0,25/S/1,5M	2926030	596
CABLE-D- 9SUB/F/OE/0,25/S/2,0M	2926043	596
CABLE-D- 9SUB/F/OE/0,25/S/3,0M	2926056	596
CABLE-D- 9SUB/F/OE/0,25/S/4,0M	2926069	596
CABLE-D- 9SUB/F/OE/0,25/S/6,0M	2926072	596
CABLE-D- 9SUB/M/OE/0,25/S/0,5M	2926360	596
CABLE-D- 9SUB/M/OE/0,25/S/1,0M	2926373	596
CABLE-D- 9SUB/M/OE/0,25/S/1,5M	2926386	596
CABLE-D- 9SUB/M/OE/0,25/S/2,0M	2926399	596
CABLE-D- 9SUB/M/OE/0,25/S/3,0M	2926409	596
CABLE-D- 9SUB/M/OE/0,25/S/4,0M	2926412	596
CABLE-D- 9SUB/M/OE/0,25/S/6,0M	2926425	596
CABLE-D-15SUB-F-OE-0,25-S/...	2900905	596
CABLE-D-15SUB-M-OE-0,25-S/...	2900910	596
CABLE-D-15SUB/F/OE/0,25/S/0,5M	2926085	596
CABLE-D-15SUB/F/OE/0,25/S/1,0M	2926098	596
CABLE-D-15SUB/F/OE/0,25/S/1,5M	2926108	596
CABLE-D-15SUB/F/OE/0,25/S/2,0M	2926111	596
CABLE-D-15SUB/F/OE/0,25/S/3,0M	2926124	596
CABLE-D-15SUB/F/OE/0,25/S/4,0M	2926137	596
CABLE-D-15SUB/F/OE/0,25/S/6,0M	2926140	596
CABLE-D-15SUB/M/OE/0,25/S/0,5M	2926438	596
CABLE-D-15SUB/M/OE/0,25/S/1,0M	2926441	596
CABLE-D-15SUB/M/OE/0,25/S/1,5M	2926454	596
CABLE-D-15SUB/M/OE/0,25/S/2,0M	2926467	596
CABLE-D-15SUB/M/OE/0,25/S/3,0M	2926470	596
CABLE-D-15SUB/M/OE/0,25/S/4,0M	2926483	596
CABLE-D-15SUB/M/OE/0,25/S/6,0M	2926496	596
CABLE-D-25SUB-F-OE-0,25-S/...	2900906	596
CABLE-D-25SUB-M-OE-0,25-S/...	2900911	596
CABLE-D-25SUB/F/OE/0,25/S/0,5M	2926153	596
CABLE-D-25SUB/F/OE/0,25/S/1,0M	2926166	596
CABLE-D-25SUB/F/OE/0,25/S/1,5M	2926179	596
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CABLE-D-25SUB/F/OE/0,25/S/4,0M	2926205	596
CABLE-D-25SUB/F/OE/0,25/S/6,0M	2926218	596
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CABLE-D-37SUB/M/OE/0,25/S/6,0M	2926632	597
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CABLE-D-50SUB-M-OE-0,25-S/...	2900913	597
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CABLE-D15SUB/B/B/200/KONFEK/S	2305457	593
CABLE-D15SUB/B/B/300/KONFEK/S	2305460	593
CABLE-D15SUB/B/S/ 50/KONFEK/S	2302052	592
CABLE-D15SUB/B/S/100/KONFEK/S	2302065	592
CABLE-D15SUB/B/S/150/KONFEK/S	2302078	592
CABLE-D15SUB/B/S/200/KONFEK/S	2302081	592
CABLE-D15SUB/B/S/300/KONFEK/S	2302094	592
CABLE-D15SUB/B/S/400/KONFEK/S	2302104	592
CABLE-D15SUB/B/S/600/KONFEK/S	2302117	592
CABLE-D15SUB/S/S/100/KONFEK/S	2305606	593
CABLE-D15SUB/S/S/200/KONFEK/S	2305619	593
CABLE-D15SUB/S/S/300/KONFEK/S	2305622	593
CABLE-D25SUB/B/2X14/100/TU812	2304649	471
CABLE-D25SUB/B/2X14/200/TU812	2304652	471
CABLE-D25SUB/B/2X14/300/TU812	2304665	471
CABLE-D25SUB/B/2X14/500/TU812	2304678	471
CABLE-D25SUB/B/2X14/TU812/...	2304681	471
CABLE-D25SUB/B/B/100/KONFEK/S	2305473	593
CABLE-D25SUB/B/B/200/KONFEK/S	2305486	593
CABLE-D25SUB/B/B/300/KONFEK/S	2305499	593
CABLE-D25SUB/B/S/ 50/KONFEK/S	2302120	592
CABLE-D25SUB/B/S/100/KONFEK/S	2302133	592
CABLE-D25SUB/B/S/150/KONFEK/S	2302146	592
CABLE-D25SUB/B/S/200/KONFEK/S	2302159	592
CABLE-D25SUB/B/S/300/KONFEK/S	2302162	592
CABLE-D25SUB/B/S/400/KONFEK/S	2302175	592
CABLE-D25SUB/B/S/600/KONFEK/S	2302188	592
CABLE-D25SUB/S/S/100/KONFEK/S	2305635	593
CABLE-D25SUB/S/S/200/KONFEK/S	2305648	593
CABLE-D25SUB/S/S/300/KONFEK/S	2305651	593
CABLE-D37-M2,5-4X14-X81-I/...	2302706	488
CABLE-D37-M2,5-4X14-Y81P-O/...	2302696	488
CABLE-D37-M2,5/4X14/ 50/X81-I	2302515	488
CABLE-D37-M2,5/4X14/ 50/Y81P-O	2302476	488
CABLE-D37-M2,5/4X14/100/X81-I	2302528	488
CABLE-D37-M2,5/4X14/100/Y81P-O	2302489	488
CABLE-D37-M2,5/4X14/200/X81-I	2302531	488
CABLE-D37-M2,5/4X14/200/Y81P-O	2302492	488
CABLE-D37-M2,5/4X14/300/X81-I	2302544	488
CABLE-D37-M2,5/4X14/300/Y81P-O	2302502	488
CABLE-D37SUB/B/B/ 100/KONFEK/S	2305509	593
CABLE-D37SUB/B/B/ 200/KONFEK/S	2305512	593
CABLE-D37SUB/B/B/ 300/KONFEK/S	2305525	593
CABLE-D37SUB/B/B/ 400/KONFEK/S	2900759	593
CABLE-D37SUB/B/B/ 600/KONFEK/S	2900760	593
CABLE-D37SUB/B/B/ 800/KONFEK/S	2900761	593
CABLE-D37SUB/B/B/1000/KONFEK/S	2900762	593
CABLE-D37SUB/B/B/1500/KONFEK/S	2900763	593
CABLE-D37SUB/B/B/2000/KONFEK/S	2900764	593
CABLE-D37SUB/B/B/HF/S/ 1,0M	2908516	593
CABLE-D37SUB/B/B/HF/S/ 2,0M	2908517	593
CABLE-D37SUB/B/B/HF/S/ 3,0M	2908518	593
CABLE-D37SUB/B/B/HF/S/ 4,0M	2908519	593
CABLE-D37SUB/B/B/HF/S/ 6,0M	2908520	593
CABLE-D37SUB/B/B/HF/S/ 8,0M	2908521	593
CABLE-D37SUB/B/B/HF/S/10,0M	2908522	593
CABLE-D37SUB/B/B/HF/S/15,0M	2908523	593
CABLE-D37SUB/B/B/HF/S/20,0M	2908525	593
CABLE-D37SUB/B/S/ 50/KONFEK/S	2302191	592
CABLE-D37SUB/B/S/100/KONFEK/S	2302201	592
CABLE-D37SUB/B/S/200/KONFEK/S	2302227	592
CABLE-D37SUB/B/S/300/KONFEK/S	2302230	592
CABLE-D37SUB/B/S/400/KONFEK/S	2302243	592
CABLE-D37SUB/B/S/600/KONFEK/S	2302256	592
CABLE-D37SUB/S/S/100/KONFEK/S	2305664	593
CABLE-D37SUB/S/S/200/KONFEK/S	2305677	593
CABLE-D37SUB/S/S/300/KONFEK/S	2305680	593
CABLE-D50SUB/B/B/100/KONFEK/S	2305541	593
CABLE-D50SUB/B/B/200/KONFEK/S	2305554	593
CABLE-D50SUB/B/B/300/KONFEK/S	2305567	593
CABLE-D50SUB/B/S/ 50/KONFEK/S	2302269	592
CABLE-D50SUB/B/S/100/KONFEK/S	2302272	592
CABLE-D50SUB/B/S/150/KONFEK/S	2302285	592
CABLE-D50SUB/B/S/200/KONFEK/S	2302298	592
CABLE-D50SUB/B/S/300/KONFEK/S	2302308	592
CABLE-D50SUB/B/S/400/KONFEK/S	2302311	592
CABLE-D50SUB/B/S/600/KONFEK/S	2302324	592
CABLE-D50SUB/S/S/100/KONFEK/S	2305693	593
CABLE-D50SUB/S/S/200/KONFEK/S	2305703	593
CABLE-D50SUB/S/S/300/KONFEK/S	2305716	593
CABLE-FCN24-2X14-OMR-IN/...	2302845	490
CABLE-FCN24-2X14-OMR-OUT/...	2302858	490
CABLE-FCN24/2X14/100/OMR-IN	2304241	490
CABLE-FCN24/2X14/100/OMR-OUT	2304225	490
CABLE-FCN24/2X14/200/OMR-IN	2304254	490
CABLE-FCN24/2X14/200/OMR-OUT	2304238	490
CABLE-FCN40-4X14-OMR-IN/...	2302816	490
CABLE-FCN40-4X14-OMR-OUT/...	2302832	490
CABLE-FCN40/1X50/ 0,5M/IM/MEL	2903468	489
CABLE-FCN40/1X50/ 0,5M/IP/MEL	2903476	489
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CABLE-FCN40/1X50/ 0,5M/S7-OUT	2321017	505
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CABLE-FCN40/1X50/ 1,0M/IP/MEL	2903477	489
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CABLE-FCN40/1X50/ 1,0M/S7-IN	2321101	505
CABLE-FCN40/1X50/ 1,0M/S7-OUT	2321020	505
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CABLE-FCN40/1X50/ 2,0M/IP/MEL	2903478	489
CABLE-FCN40/1X50/ 2,0M/M340	2321651	495
CABLE-FCN40/1X50/ 2,0M/S7-IN	2321114	505
CABLE-FCN40/1X50/ 2,0M/S7-OUT	2321033	505
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CABLE-FCN40/1X50/ 3,0M/IP/MEL	2903479	489
CABLE-FCN40/1X50/ 3,0M/M340	2321664	495
CABLE-FCN40/1X50/ 3,0M/S7-IN	2321127	505
CABLE-FCN40/1X50/ 3,0M/S7-OUT	2321046	505
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CABLE-FCN40/1X50/ 4,0M/IP/MEL	2903480	489
CABLE-FCN40/1X50/ 4,0M/M340	2321677	495
CABLE-FCN40/1X50/ 4,0M/S7-IN	2321130	505
CABLE-FCN40/1X50/ 4,0M/S7-OUT	2321059	505
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CABLE-FCN40/1X50/ 6,0M/IP/MEL	2903481	489
CABLE-FCN40/1X50/ 6,0M/M340	2321680	495
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CABLE-FCN40/1X50/ 6,0M/S7-OUT	2321062	505
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CABLE-FCN40/1X50/ 8,0M/IP/MEL	2903482	489
CABLE-FCN40/1X50/ 8,0M/M340	2321693	495
CABLE-FCN40/1X50/ 8,0M/S7-IN	2321156	505
CABLE-FCN40/1X50/ 8,0M/S7-OUT	2321075	505
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CABLE-FCN40/1X50/10,0M/IP/MEL	2903483	489
CABLE-FCN40/1X50/10,0M/M340	2321703	495
CABLE-FCN40/1X50/10,0M/S7-IN	2321169	505
CABLE-FCN40/1X50/10,0M/S7-OUT	2321088	505
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CABLE-FCN40/4X14/ 0,5M/S7-OUT	2321172	505
CABLE-FCN40/4X14/ 1,0M/IM/MEL	2903503	489
CABLE-FCN40/4X14/ 1,0M/M340	2321729	495
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CABLE-FCN40/4X14/ 1,0M/S7-OUT	2321185	505
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CABLE-FCN40/4X14/ 2,0M/M340	2321732	495
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CABLE-FCN40/4X14/ 6,0M/S7-OUT	2321224	505
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CABLE-FCN40/4X14/ 8,0M/S7-OUT	2321237	505
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CABLE-FCN40/4X14/100/OMR-IN	2304209	490
CABLE-FCN40/4X14/100/OMR-OUT	2304186	490
CABLE-FCN40/4X14/15,0M/M340	2903749	495
CABLE-FCN40/4X14/200/OMR-IN	2304212	490
CABLE-FCN40/4X14/200/OMR-OUT	2304199	490
CABLE-FLK10-OE-0,14/...	2904331	584
CABLE-FLK10/OE/0,14/ 0,5M	2904073	584
CABLE-FLK10/OE/0,14/ 1,0M	2904074	584
CABLE-FLK10/OE/0,14/ 1,5M	2904075	584
CABLE-FLK10/OE/0,14/ 2,0M	2904076	584
CABLE-FLK10/OE/0,14/ 2,5M	2904077	584
CABLE-FLK10/OE/0,14/ 3,0M	2904078	584
CABLE-FLK10/OE/0,14/ 4,0M	2904079	584
CABLE-FLK10/OE/0,14/ 6,0M	2904080	584

Type	Order No.	Page
CABLE-FLK10/OE/0,14/ 8,0M	2904081	584
CABLE-FLK10/OE/0,14/10,0M	2904082	584
CABLE-FLK14/OE/0,14/ 50	2305761	584
CABLE-FLK14/OE/0,14/ 100	2305253	584
CABLE-FLK14/OE/0,14/ 150	2305266	584
CABLE-FLK14/OE/0,14/ 200	2305279	584
CABLE-FLK14/OE/0,14/ 250	2305282	584
CABLE-FLK14/OE/0,14/ 300	2305295	584
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CABLE-FLK14/OE/0,14/ 600	2305787	584
CABLE-FLK14/OE/0,14/ 800	2305790	584
CABLE-FLK14/OE/0,14/...	2305732	584
CABLE-FLK14/OE/0,14/1000	2305800	584
CABLE-FLK16/OE/0,14/ 0,5M	2318127	584
CABLE-FLK16/OE/0,14/ 1,0M	2318130	584
CABLE-FLK16/OE/0,14/ 1,5M	2318143	584
CABLE-FLK16/OE/0,14/ 2,0M	2318156	584
CABLE-FLK16/OE/0,14/ 2,5M	2318169	584
CABLE-FLK16/OE/0,14/ 3,0M	2318172	584
CABLE-FLK16/OE/0,14/ 4,0M	2318185	584
CABLE-FLK16/OE/0,14/ 6,0M	2318198	584
CABLE-FLK16/OE/0,14/ 8,0M	2318208	584
CABLE-FLK16/OE/0,14/...	2318224	584
CABLE-FLK16/OE/0,14/10,0M	2318211	584
CABLE-FLK20/OE/0,14/ 50	2305826	585
CABLE-FLK20/OE/0,14/ 100	2305305	585
CABLE-FLK20/OE/0,14/ 150	2305318	585
CABLE-FLK20/OE/0,14/ 200	2305321	585
CABLE-FLK20/OE/0,14/ 250	2305334	585
CABLE-FLK20/OE/0,14/ 300	2305347	585
CABLE-FLK20/OE/0,14/ 400	2305839	585
CABLE-FLK20/OE/0,14/ 600	2305842	585
CABLE-FLK20/OE/0,14/ 800	2305855	585
CABLE-FLK20/OE/0,14/...	2305745	585
CABLE-FLK20/OE/0,14/1000	2305868	585
CABLE-FLK50/0,14/HF/ 0,5M	2314134	587
CABLE-FLK50/0,14/HF/ 1,0M	2314147	587
CABLE-FLK50/0,14/HF/ 1,5M	2314150	587
CABLE-FLK50/0,14/HF/ 2,0M	2314163	587
CABLE-FLK50/0,14/HF/ 2,5M	2314176	587
CABLE-FLK50/0,14/HF/ 3,0M	2314189	587
CABLE-FLK50/0,14/HF/ 4,0M	2314192	587
CABLE-FLK50/0,14/HF/ 5,0M	2314202	587
CABLE-FLK50/0,14/HF/ 6,0M	2314215	587
CABLE-FLK50/0,14/HF/ 7,0M	2314228	587
CABLE-FLK50/0,14/HF/ 8,0M	2314231	587
CABLE-FLK50/0,14/HF/10,0M	2314244	587
CABLE-FLK50/OE/0,14/ 50	2305871	585
CABLE-FLK50/OE/0,14/ 100	2305350	585
CABLE-FLK50/OE/0,14/ 150	2305363	585
CABLE-FLK50/OE/0,14/ 200	2305376	585
CABLE-FLK50/OE/0,14/ 250	2305389	585
CABLE-FLK50/OE/0,14/ 300	2305392	585
CABLE-FLK50/OE/0,14/ 400	2305884	585
CABLE-FLK50/OE/0,14/ 600	2305897	585
CABLE-FLK50/OE/0,14/ 800	2305907	585
CABLE-FLK50/OE/0,14/...	2305758	585
CABLE-FLK50/OE/0,14/1000	2305910	585
CLIPFIX 35	3022218	366
CM-KBL-RS232/USB	2881078	251
COM CAB MINI DIN	2400127	214

D

Type	Order No.	Page
D-DEK 1,5 GN	2716949	437
D-UKK 3/5	2770024	176
D-UKK 3/5 BU	2770105	176
DEK-OE- 5DC/ 5DC/100KHZ-G	2964542	451
DEK-OE- 5DC/ 24DC/100KHZ	2964270	450
DEK-OE- 5DC/ 24DC/100KHZ-G	2964555	451
DEK-OE- 5DC/ 48DC/100	2940223	440
DEK-OE- 12DC/ 48DC/100	2964487	440
DEK-OE- 24DC/ 5DC/100KHZ-G	2964364	451
DEK-OE- 24DC/ 24DC/100KHZ	2964283	450
DEK-OE- 24DC/ 24DC/100KHZ-G	2964348	451
DEK-OE- 24DC/ 48DC/100	2940207	440
DEK-OE- 60DC/ 48DC/100	2941536	440
DEK-OE-120AC/ 48DC/100	2941659	440
DEK-OE-230AC/ 48DC/100	2940210	440
DEK-OE-230AC/ 48DC/100/SO 46	2964678	445
DEK-OV- 5DC/ 24DC/ 3	2941361	441
DEK-OV- 5DC/ 24DC/ 10	2961752	441
DEK-OV- 5DC/240AC/800	2964623	441
DEK-OV- 12DC/ 24DC/ 3	2941387	441
DEK-OV- 12DC/ 24DC/ 10	2961749	441
DEK-OV- 12DC/240AC/800	2964636	441
DEK-OV- 24DC/ 24DC/ 3	2941374	441
DEK-OV- 24DC/ 24DC/ 3/AKT	2964296	441
DEK-OV- 24DC/ 24DC/ 10	2964322	441
DEK-OV- 24DC/240AC/800	2964649	441
DEK-REL- 5/I/1	2941183	438
DEK-REL- 5/O/1	2941170	439
DEK-REL- 24/1/AKT	2964063	439
DEK-REL- 24/1/S	2964131	443
DEK-REL- 24/1/SEN	2964050	439
DEK-REL- 24/I/1	2940171	438
DEK-REL- 24/O/1	2941154	439
DEK-REL-G24/21	2964500	437
DEK-TR/INV	2964319	453
DFLK-D 9 SUB/B	2287135	575
DFLK-D 9 SUB/S	2283870	575
DFLK-D15 SUB/B	2280307	575
DFLK-D15 SUB/S	2280297	575
DFLK-D25 SUB/B	2280323	575
DFLK-D25 SUB/S	2280310	575
DFLK-D37 SUB/B	2280349	575
DFLK-D37 SUB/S	2280336	575
DFLK-D50 SUB/B	2287669	575
DFLK-D50 SUB/S	2291286	575
DIKD 1,5	2715979	439

E

Type	Order No.	Page
EB 2- DIK BU	2716648	443
EB 2- DIK RD	2716693	443
EB 3- DIK BU	2716651	443
EB 3- DIK RD	2716745	443
EB 4- DIK BU	2716664	443
EB 4- DIK RD	2716758	443
EB 5- DIK BU	2716677	443
EB 5- DIK RD	2716761	443
EB 10- DIK BU	2716680	443
EB 10- DIK RD	2716774	443
EB 80- DIK BU	2715940	437
EB 80- DIK RD	2715953	437
EB 80- DIK WH	2715788	437
EEM-2AO-MA600	2901475	210
EEM-2DIO-MA600	2901371	210
EEM-ETH-MA600	2901373	211
EEM-ETH-RS485-MA600	2901374	211
EEM-IMP-MA400	2904314	212
EEM-IMP-MA600	2904313	212
EEM-MA200	2901362	209
EEM-MA250	2901363	209
EEM-MA400	2901364	209
EEM-MA600	2901366	208
EEM-MA600-24DC	2902352	208
EEM-MEMO-MA600	2901370	210
EEM-MKT-DRA	2902078	213
EEM-PB 12-MA600	2901418	211
EEM-RS485-MA400	2901365	211
EEM-RS485-MA600	2901367	211
EIK1-SVN-24P	2940799	452
EL3-M52	2833628	319
ELR 1- 24DC/600AC-20	2297138	48
ELR 1- 24DC/600AC-30	2297154	49
ELR 1- 24DC/600AC-50	2297170	49
ELR 1-230AC/600AC-20	2297141	48
ELR 1-230AC/600AC-30	2297167	49
ELR 1-230AC/600AC-50	2297183	49
ELR 2+1- 24DC/500AC-37	2297277	43
ELR 2+1-230AC/500AC-37	2297280	43
ELR 3- 24DC/500AC- 2	2297196	42
ELR 3- 24DC/500AC- 9	2297219	43
ELR 3- 24DC/500AC-16	2297235	43
ELR 3-230AC/500AC- 2	2297206	42
ELR 3-230AC/500AC- 9	2297222	43
ELR 3-230AC/500AC-16	2297248	43
ELR 5011 IP PN	2700745	50
ELR 5011-2 IP PN	2701007	50
ELR 5030 IP PN	2701006	51
ELR 5030-2 IP PN	2701008	51
ELR H3-I-PT- 24DC/500AC-0,6	2903920	31
ELR H3-I-PT- 24DC/500AC-2	2903922	31
ELR H3-I-PT- 24DC/500AC-9	2903924	31
ELR H3-I-PT-SWD/500AC-06	2905076	29
ELR H3-I-PT-SWD/500AC-3	2905078	29
ELR H3-I-PT-SWD/500AC-9	2905079	29
ELR H3-I-PT/500AC-06-IFS	2905148	27
ELR H3-I-PT/500AC-3-IFS	2905149	27
ELR H3-I-PT/500AC-9-IFS	2905150	27
ELR H3-I-SC- 24DC/500AC-0,6	2900542	31
ELR H3-I-SC- 24DC/500AC-2	2900543	31
ELR H3-I-SC- 24DC/500AC-9	2900545	31
ELR H3-I-SC-230AC/500AC-2	2900544	31
ELR H3-I-SC-230AC/500AC-9	2900546	31
ELR H3-I-SC/500AC-06-IFS	2905162	27
ELR H3-I-SC/500AC-3-IFS	2905163	27
ELR H3-I-SC/500AC-9-IFS	2905164	27
ELR H3-IES-PT- 24DC/500AC-0,6	2903914	30
ELR H3-IES-PT- 24DC/500AC-2	2903916	30
ELR H3-IES-PT- 24DC/500AC-9	2903918	30
ELR H3-IES-PT-SWD/500AC-06	2903936	28
ELR H3-IES-PT-SWD/500AC-3	2903937	28
ELR H3-IES-PT-SWD/500AC-9	2903938	28
ELR H3-IES-PT/500AC-06-IFS	2905141	26
ELR H3-IES-PT/500AC-3-IFS	2905142	26
ELR H3-IES-PT/500AC-3-IOL	2908671	27
ELR H3-IES-PT/500AC-9-IFS	2905143	26
ELR H3-IES-PT/500AC-9-IOL	2908672	27
ELR H3-IES-SC- 24DC/500AC-0,6	2900566	30
ELR H3-IES-SC- 24DC/500AC-2	2900567	30
ELR H3-IES-SC- 24DC/500AC-9	2900569	30
ELR H3-IES-SC-230AC/500AC-2	2900568	30
ELR H3-IES-SC-230AC/500AC-9	2900570	30
ELR H3-IES-SC/500AC-06-IFS	2905154	26
ELR H3-IES-SC/500AC-3-IFS	2905155	26
ELR H3-IES-SC/500AC-9-IFS	2905156	26
ELR H3-SC- 24DC/500AC-9	2900530	31
ELR H3-SC-230AC/500AC-9	2900531	31
ELR H5-I-PT- 24DC/500AC-0,6	2903908	25
ELR H5-I-PT- 24DC/500AC-2	2903910	25
ELR H5-I-PT- 24DC/500AC-9	2903912	25
ELR H5-I-PT-SWD/500AC-06	2905073	23
ELR H5-I-PT-SWD/500AC-3	2905074	23
ELR H5-I-PT-SWD/500AC-9	2905075	23
ELR H5-I-PT/500AC-06-IFS	2905144	21
ELR H5-I-PT/500AC-3-IFS	2905146	21
ELR H5-I-PT/500AC-9-IFS	2905147	21
ELR H5-I-SC- 24DC/500AC-0,6	2900573	25
ELR H5-I-SC- 24DC/500AC-2	2900574	25
ELR H5-I-SC- 24DC/500AC-9	2900576	25
ELR H5-I-SC-230AC/500AC-2	2900575	25
ELR H5-I-SC-230AC/500AC-9	2900578	25
ELR H5-I-SC/500AC-06-IFS	2905157	21
ELR H5-I-SC/500AC-3-IFS	2905159	21
ELR H5-I-SC/500AC-9-IFS	2905160	21
ELR H5-IES-PT- 24DC/500AC-0,6	2903902	24
ELR H5-IES-PT- 24DC/500AC-2	2903904	24
ELR H5-IES-PT- 24DC/500AC-9	2903906	24
ELR H5-IES-PT-SWD/500AC-06	2903933	22
ELR H5-IES-PT-SWD/500AC-3	2903934	22
ELR H5-IES-PT-SWD/500AC-9	2903935	22
ELR H5-IES-PT/500AC-06-IFS	2905138	20
ELR H5-IES-PT/500AC-3-IFS	2905139	20
ELR H5-IES-PT/500AC-3-IOL	2908669	21
ELR H5-IES-PT/500AC-9-IFS	2905140	20
ELR H5-IES-PT/500AC-9-IOL	2908670	21
ELR H5-IES-SC- 24DC/500AC-0,6	2900582	24
ELR H5-IES-SC- 24DC/500AC-2	2900414	24
ELR H5-IES-SC- 24DC/500AC-9	2900421	24
ELR H5-IES-SC-230AC/500AC-2	2900420	24
ELR H5-IES-SC-230AC/500AC-9	2900422	24
ELR H5-IES-SC-06-IFS	2905151	20
ELR H5-IES-SC/500AC-3-IFS	2905152	20
ELR H5-IES-SC/500AC-9-IFS	2905153	20
ELR H5-SC- 24DC/500AC-9	2900538	25
ELR H5-SC-230AC/500AC-9	2900539	25
ELR H51-0.6-DIN-RAIL-SET	2902952	33
ELR H51-2.4-DIN-RAIL-SET	2902953	33
ELR H51-9-DIN-RAIL-SET	2902954	33
ELR H51-IESSC-24DC500AC-06	2902746	33
ELR H51-IESSC-24DC500AC-2	2902744	33
ELR H51-IESSC-24DC500AC-9	2902745	33
ELR W1/ 2-24DC	2963598	46
ELR W1/ 6-24DC	2982090	46
ELR W2+1- 24DC/500AC-37	2297374	41
ELR W2+1-230AC/500AC-37	2297387	41
ELR W3- 24DC/500AC- 2	2297293	40
ELR W3- 24DC/500AC- 9	2297316	41
ELR W3- 24DC/500AC-16	2297332	41
ELR W3-230AC/500AC- 2	2297303	40
ELR W3-230AC/500AC- 9	2297329	41
ELR W3-230AC/500AC-16	2297345	41
ELR W3/ 9-400 S	2963569	44
ELR-H51-0,6-BUSBAR-CLASSIC-SET	2904334	33
ELR-H51-0,6-BUSBAR-COMPACT-SET	2904333	33
ELR-H51-2,4-BUSBAR-CLASSIC-SET	2904336	33
ELR-H51-2,4-BUSBAR-COMPACT-SET	2904335	33
ELR-H51-9-BUSBAR-CLASSIC-SET	2904338	33
ELR-H51-9-BUSBAR-COMPACT-SET	2904337	33
EM RD-ADAPTER	2902747	33
EM RI-ADAPTER CLASSIC	2902831	33
EM RI-ADAPTER COMPACT	2902748	33
EM SWD-ADAPTER	2902776	36
EM-CAN-GATEWAY-IFS	2901504	16
EM-D-8/4-24DC-IFS	2904473	17
EM-DNET-GATEWAY-IFS	2901529	16
EM-ETH-GATEWAY-IFS	2901988	16
EM-MODBUS-GATEWAY-IFS	2901528	16
EM-PB-GATEWAY-IFS	2297620	16
EM-PNET-GATEWAY-IFS	2904472	16
EM-RS232-GATEWAY-IFS	2901526	16
EM-RS485-GATEWAY-IFS	2901527	16
EMD-BL-3V-400	2903525	263
EMD-BL-3V-400-PT	2903526	263
EMD-BL-C-10	2903521	262
EMD-BL-C-10-PT	2903522	262
EMD-BL-PH-480	2903527	263
EMD-BL-PH-480-PT	2903528	263
EMD-BL-PTC	2906252	264
EMD-BL-PTC-PT	2906253	264
EMD-BL-V-230	2903523	262
EMD-BL-V-230-PT	2903524	262
EMD-FL-3V-230	2885773	268
EMD-FL-3V-400	2866064	268
EMD-FL-3V-500	2867979	268
EMD-FL-3V-690	2885249	268
EMD-FL-C-10	2866022	266
EMD-FL-PF-400	2885809	270
EMD-FL-RP-480	2900177	270
EMD-FL-V-300	2866048	267
EMD-SL-3V-400	2866051	269
EMD-SL-3V-400-N	2885278	269
EMD-SL-C-OC-10	2866019	266
EMD-SL-C-UC-10	2867937	266
EMD-SL-LL-110	2901137	271
EMD-SL-LL-230	2885906	271
EMD-SL-PH-400	2866077	269
EMD-SL-PH-690	2905597	269
EMD-SL-PS- 24AC	2866103	266
EMD-SL-PS- 24DC	2885359	266
EMD-SL-PS-110AC	2866116	266
EMD-SL-PS-120AC	2885731	266
EMD-SL-PS-230AC	2866129	266
EMD-SL-PS45-110AC	2885281	268
EMD-SL-PS45-120AC	2885744	268
EMD-SL-PS45-230AC	2885294	268
EMD-SL-PS45-400AC	2885304	268
EMD-SL-PS45-500AC	2885317	270
EMD-SL-PTC	2866093	271
EMD-SL-V-UV-300	2866035	267
EMG 17-OV- 24DC/ 48DC/2	2942810	445

Type	Order No.	Page
EMG 17-REL/KSR-G 24/2E/SO38	2941646	447
EMG 17-REL/KSR-G 24/SO38 BK	2949994	447
EMG 22-DIO 4E	2950048	280
EMG 22-DIO 4E-1N5408	2952790	280
EMG 22-DIO 4M-1N5408	2952211	280
EMG 22-DIO 4P-1N5408	2952198	280
EMG 22-DIO 7M	2950077	280
EMG 22-DIO 7P	2950064	280
EMG 22-LA 7S/230	2949677	281
EMG 22-LED 7S/24	2952305	281
EMG 22-REL/KSR-230/21/ SO46	2940760	444
EMG 22-REL/KSR-230/21/AU/SO46	2940061	444
EMG 22-REL/KSR-G 24/TRN 5	2949787	454
EMG 22-REL/KSR-G 24/TRN12	2952363	454
EMG 22-REL/KSR-G 24/TRN35	2952350	454
EMG 22-REL/KSR-G 24/TRP 5	2949790	455
EMG 22-REL/KSR-G 24/TRP12	2952156	455
EMG 22-REL/KSR-G 24/TRP35	2952169	455
EMG 30-SP- 4K7LIN	2940252	101
EMG 30-SP-10K LIN	2942124	101
EMG 45-DIO 8E	2950103	280
EMG 45-DIO 8E-1N5408	2949389	280
EMG 45-DIO 8E/LP	2954798	281
EMG 45-DIO 8M-1N5408	2954882	280
EMG 45-DIO 8P-1N5408	2954879	280
EMG 45-DIO14M	2950129	280
EMG 45-DIO14M/LP	2950132	281
EMG 45-DIO14P	2950116	280
EMG 45-LED 14S/24	2952334	281
EMG 90-DIO 16E/LP	2954808	281
EMG 90-DIO 17E	2954895	280
EMG 90-DIO 32M	2954934	280
EMG 90-DIO 32M/LP	2954785	281
EMG 90-DIO 32P	2954918	280
EMG-GKS 12	2947035	280
EMM 3- 24DC/500AC-16-IFS	2297523	14
EMM 3- 24DC/500AC-IFS	2297497	14
EMM 3-230AC/500AC-16-IFS	2297536	14
EMM 3-230AC/500AC-IFS	2297507	14
ETD-BL-1T-230	2905813	272
ETD-BL-1T-230-PT	2905814	272
ETD-BL-1T-F- 10S	2917492	277
ETD-BL-1T-F- 10S-PT	2901489	277
ETD-BL-1T-F- 30MIN	2917515	277
ETD-BL-1T-F- 30MIN-PT	2901491	277
ETD-BL-1T-F-300MIN	2917528	277
ETD-BL-1T-F-300MIN-PT	2901492	277
ETD-BL-1T-F-300S	2917502	277
ETD-BL-1T-F-300S-PT	2901490	277
ETD-BL-1T-OFF-CC- 10S	2917450	277
ETD-BL-1T-OFF-CC- 10S-PT	2901485	277
ETD-BL-1T-OFF-CC- 30MIN	2917467	277
ETD-BL-1T-OFF-CC- 30MIN-PT	2901487	277
ETD-BL-1T-OFF-CC-300MIN	2917489	277
ETD-BL-1T-OFF-CC-300MIN-PT	2901488	277
ETD-BL-1T-OFF-CC-300S	2917463	277
ETD-BL-1T-OFF-CC-300S-PT	2901486	277
ETD-BL-1T-ON- 10S	2917379	276
ETD-BL-1T-ON- 10S-PT	2901476	276
ETD-BL-1T-ON- 30MIN	2917395	276
ETD-BL-1T-ON- 30MIN-PT	2901478	276
ETD-BL-1T-ON-300MIN	2917405	276
ETD-BL-1T-ON-300MIN-PT	2901479	276
ETD-BL-1T-ON-300S	2917382	276
ETD-BL-1T-ON-300S-PT	2901477	276
ETD-BL-1T-ON-CC- 10S	2917418	277
ETD-BL-1T-ON-CC- 10S-PT	2901480	277
ETD-BL-1T-ON-CC- 30MIN	2917434	277
ETD-BL-1T-ON-CC- 30MIN-PT	2901483	277
ETD-BL-1T-ON-CC-300MIN	2917447	277
ETD-BL-1T-ON-CC-300MIN-PT	2901484	277
ETD-BL-1T-ON-CC-300S	2917421	277
ETD-BL-1T-ON-CC-300S-PT	2901481	277
ETD-BL-2T-I-230	2907713	273
ETD-BL-2T-I-230-PT	2907714	273
ETD-FL-2T-DTI	2866187	278
ETD-SL-1T-DTF	2866161	279
ETD-SL-2T-I	2866174	279
EU4A-RJ45-USB-CAB1 PXC	2903465	38
EU5C-SWD-CAN PXC	2903098	37
EU5C-SWD-DP PXC	2903100	37
EU5C-SWD-EIP-MODTCP PXC	2903244	37
EU5C-SWD-PF2-1 PXC	2903113	37
EU5E-SWD-2A2A PXC	2903104	37
EU5E-SWD-4D4D PXC	2903101	37
EU5E-SWD-4DX PXC	2903102	37
EU5E-SWD-X8D PXC	2903103	37
FA MCR-D-TUI-UI-2REL-UP	2907064	180
FA MCR-DS-I-I-OLP	2908781	182
FA MCR-EX-D-TUI-UI-2REL-UP	2907216	180
FA MCR-EX-FD-TUI-UI-2REL-UP	2907781	181
FA MCR-FD-PM	2908739	181
FA MCR-FD-TUI-UI-2REL-UP	2907780	181
FA MCR-FDS-I-I-OLP	2908782	183
FA MCR-FDS-PM	2908783	183
FA MCR-HT-D	2908735	187
FA MCR-HT-FH	2908736	192
FA MCR-HT-FH-PM	2908738	192
FA MCR-HT-FH-WM	2908737	192
FA MCR-HT-TS-I-OLP-PT	2908742	187
FASTCON PRO-SET	2906227	101
FASTCON PRO-SET-PT	2906228	101
FBS 2-6	3030336	366
FBS 2-6 BU	3036932	366
FBS 2-6 GY	3032237	366
FBS 2-8	3030284	366
FBS 2-8 BU	3032567	366
FBS 2-8 GY 7042	3032541	366
FBS 5-6	3030349	366
FBS 10-6	3030271	366
FBS 20-6	3030365	366
FBS 50-6	3032224	366
FBSR 2-6	3033715	296
FBSR 2-8	3033808	302
FBSR 3-6	3001594	296
FBSR 4-6	3001595	296
FBSR 5-6	3001596	296
FBST 6-PLC BU	2966812	424
FBST 6-PLC GY	2966825	424
FBST 6-PLC RD	2966236	424
FBST 8-PLC GY	2967688	424
FBST 14-PLC BK	2967691	424
FBST 500-PLC BU	2966692	424
FBST 500-PLC GY	2966838	424
FBST 500-PLC RD	2966786	424
FL CRIMPTOOL	2744869	50
FL PLUG RJ45 GN/2	2744571	50
FL PLUG RJ45 GR/2	2744856	50
FLK 10/EZ-DR/ 50/KONFEK	2299204	588
FLK 10/EZ-DR/ 100/KONFEK	2299217	588
FLK 10/EZ-DR/ 150/KONFEK	2299220	588
FLK 10/EZ-DR/ 200/KONFEK	2299233	588
FLK 10/EZ-DR/ 300/KONFEK	2299246	588
FLK 10/EZ-DR/ 400/KONFEK	2299259	588
FLK 10/EZ-DR/ 600/KONFEK	2299262	588
FLK 10/EZ-DR/ 800/KONFEK	2299275	588
FLK 10/EZ-DR/1000/KONFEK	2299288	588
FLK 14/EZ-DR/ 30/KONFEK	2295729	550
FLK 14/EZ-DR/ 50/KONFEK	2288901	550
FLK 14/EZ-DR/ 50/KONFEK/S	2296977	550
FLK 14/EZ-DR/ 100/KONFEK	2288914	550
FLK 14/EZ-DR/ 100/KONFEK/S	2296980	550
FLK 14/EZ-DR/ 150/KONFEK	2288927	550
FLK 14/EZ-DR/ 150/KONFEK/S	2296993	550
FLK 14/EZ-DR/ 200/KONFEK	2288930	550
FLK 14/EZ-DR/ 200/KONFEK/S	2297002	550
FLK 14/EZ-DR/ 250/KONFEK	2288943	550
FLK 14/EZ-DR/ 300/KONFEK	2288956	550
FLK 14/EZ-DR/ 300/KONFEK/S	2299013	550
FLK 14/EZ-DR/ 350/KONFEK	2288969	550
FLK 14/EZ-DR/ 400/KONFEK	2288972	550
FLK 14/EZ-DR/ 400/KONFEK/S	2299026	550
FLK 14/EZ-DR/ 450/KONFEK	2290847	550
FLK 14/EZ-DR/ 500/KONFEK	2290834	550
FLK 14/EZ-DR/ 550/KONFEK	2290850	550
FLK 14/EZ-DR/ 600/KONFEK	2290863	550
FLK 14/EZ-DR/ 600/KONFEK/S	2299039	550
FLK 14/EZ-DR/ 800/KONFEK	2299563	550
FLK 14/EZ-DR/ 800/KONFEK/S	2299042	550
FLK 14/EZ-DR/1000/KONFEK	2299576	550
FLK 14/EZ-DR/1000/KONFEK/S	2299055	550
FLK 14/EZ-DR/HF/ 50/KONFEK	2305952	587
FLK 14/EZ-DR/HF/ 100/KONFEK	2305965	587
FLK 14/EZ-DR/HF/ 150/KONFEK	2305978	587
FLK 14/EZ-DR/HF/ 200/KONFEK	2305981	587
FLK 14/EZ-DR/HF/ 250/KONFEK	2305994	587
FLK 14/EZ-DR/HF/ 300/KONFEK	2304759	587
FLK 14/EZ-DR/HF/ 400/KONFEK	2304762	587
FLK 14/EZ-DR/HF/ 500/KONFEK	2304717	587
FLK 14/EZ-DR/HF/ 600/KONFEK	2306003	587
FLK 14/EZ-DR/HF/ 700/KONFEK	2314011	587
FLK 14/EZ-DR/HF/ 800/KONFEK	2314024	587
FLK 14/EZ-DR/HF/1000/KONFEK	2314037	587
FLK 16-14-DV-IN/...	2304416	480
FLK 16-14-DV-OUT/...	2304377	480
FLK 16-24-DV-AI-EZ-DR/...	2304335	480
FLK 16/14/DV-IN/ 50	2304393	480
FLK 16/14/DV-IN/100	2300559	480
FLK 16/14/DV-IN/200	2300562	480
FLK 16/14/DV-IN/300	2304403	480
FLK 16/14/DV-IN/400	2305185	480
FLK 16/14/DV-OUT/ 30	2304348	480
FLK 16/14/DV-OUT/ 50	2304351	480
FLK 16/14/DV-OUT/100	2300575	480
FLK 16/14/DV-OUT/200	2300588	480
FLK 16/14/DV-OUT/300	2304364	480
FLK 16/24/DV-AI/EZ-DR/ 30	2304319	480
FLK 16/24/DV-AI/EZ-DR/ 50	2304296	480
FLK 16/24/DV-AI/EZ-DR/100	2301134	480
FLK 16/24/DV-AI/EZ-DR/200	2301545	480
FLK 16/24/DV-AI/EZ-DR/300	2304322	480
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FLK 16/EZ-DR/ 200/KONFEK	2299327	588
FLK 16/EZ-DR/ 300/KONFEK	2299330	588
FLK 16/EZ-DR/ 400/KONFEK	2299343	588
FLK 16/EZ-DR/ 600/KONFEK	2299356	588
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FLK 16/EZ-DR/1000/KONFEK	2299372	588
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FLK 26/EZ-DR/ 400/KONFEK	2299437	589
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FLK 40-PA/EZ-DR/HF/KS/ 800/YUC	2904753	516
FLK 40-PA/EZ-DR/HF/KS/ 900/YUC	2904754	516
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FLK 40-PA/EZ-DR/HF/KS/2000/YUC	2904488	516
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FLK 40-PA/EZ-DR/HF/KS/3000/YUC	2904649	516
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FLK 40-PA/EZ-DR/KS/ 200/YUC	2314341	516
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FLK 40-PA/EZ-DR/KS/ 800/YUC	2314956	516
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FLK 40-PA/EZ-DR/KS/1000/YUC	2314370	516
FLK 40-PA/EZ-DR/KS/1500/YUC	2314383	516
FLK 40-PA/EZ-DR/KS/2000/YUC	2314532	516
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FLK 40-PA/EZ-DR/KS/3000/YUC	2314558	516
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FLK 40/4X14/EZ-DR/ 50/OB32	2296786	479
FLK 40/4X14/EZ-DR/ 100/IB32	2296825	479
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FLK 40/EZ-DR/ 150/KONFEK	2289007	589
FLK 40/EZ-DR/ 150/SLC	2294636	478
FLK 40/EZ-DR/ 200/KONFEK	2289010	589
FLK 40/EZ-DR/ 200/SLC	2294649	478
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FLK 40/EZ-DR/ 300/KONFEK	2289036	589
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FLK 40/EZ-DR/ 800/KONFEK	2299592	589
FLK 40/EZ-DR/1000/KONFEK	2299602	589
FLK 50-2FLK20-EZ-DR-DV/...	2304966	480
FLK 50-4X14-EZ-DR ...	2302405	551
FLK 50-4X14-EZ-DR-S ...	2302447	551
FLK 50-EZ-DR-D37SUB-X81-I/...	2302683	488
FLK 50-EZ-DR-D37SUB-Y81P-O/...	2302625	488
FLK 50-EZ-DR-FCN40-OMR-IN/...	2302803	490
FLK 50-EZ-DR-FCN40-OMR-OUT/...	2302829	490
FLK 50-PA/EZ-DR/HF/KS/ 100/YUC	2904739	516
FLK 50-PA/EZ-DR/HF/KS/ 200/YUC	2904740	516
FLK 50-PA/EZ-DR/HF/KS/ 300/YUC	2904741	516
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FLK 50-PA/EZ-DR/HF/KS/2000/YUC	2904487	516
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FLK 50-PA/EZ-DR/HF/KS/3000/YUC	2904640	516
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FLK 50-PA/EZ-DR/KS/ 500/YUC	2321499	516
FLK 50-PA/EZ-DR/KS/ 600/YUC	2314927	516
FLK 50-PA/EZ-DR/KS/ 700/YUC	2321509	516
FLK 50-PA/EZ-DR/KS/ 800/YUC	2314930	516
FLK 50-PA/EZ-DR/KS/ 900/YUC	2321512	516
FLK 50-PA/EZ-DR/KS/1000/YUC	2314325	516
FLK 50-PA/EZ-DR/KS/1500/YUC	2314338	516

F

Type	Order No.	Page
FLK 50-PA/EZ-DR/KS/2000/YUC	2314503	516
FLK 50-PA/EZ-DR/KS/2500/YUC	2314516	516
FLK 50-PA/EZ-DR/KS/3000/YUC	2314529	516
FLK 50/2FLK20/EZ-DR/ 50/DV	2304872	480
FLK 50/2FLK20/EZ-DR/ 100/DV	2304898	480
FLK 50/2FLK20/EZ-DR/ 200/DV	2304908	480
FLK 50/2FLK20/EZ-DR/ 300/DV	2304911	480
FLK 50/2FLK20/EZ-DR/ 600/DV	2304937	480
FLK 50/2FLK20/EZ-DR/ 800/DV	2304940	480
FLK 50/2FLK20/EZ-DR/1000/DV	2304953	480
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FLK 50/4X14/EZ-DR/ 100/KONFEK	2296692	551
FLK 50/4X14/EZ-DR/ 150/KONFEK	2296702	551
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FLK 50/EZ-DR/D37SUB/ 50/Y81P-O	2302599	488
FLK 50/EZ-DR/D37SUB/100/X81-I	2302654	488
FLK 50/EZ-DR/D37SUB/100/Y81P-O	2302609	488
FLK 50/EZ-DR/D37SUB/200/X81-I	2302667	488
FLK 50/EZ-DR/D37SUB/200/Y81P-O	2302612	488
FLK 50/EZ-DR/D37SUB/300/X81-I	2302670	488
FLK 50/EZ-DR/D37SUB/300/Y81P-O	2302638	488
FLK 50/EZ-DR/FCN40/100/OMR-IN	2304160	490
FLK 50/EZ-DR/FCN40/100/OMR-OUT	2304144	490
FLK 50/EZ-DR/FCN40/200/OMR-IN	2304173	490
FLK 50/EZ-DR/FCN40/200/OMR-OUT	2304157	490
FLK EZ-DR-S.../.../...	2295046	591
FLK EZ-DR.../.../...	2295059	591
FLKM 14-PA-AB/1756/EXTC	2302861	473
FLKM 14-PA-AB/1756/IF6I/EXTC	2901037	473
FLKM 14-PA-AB/1756/IN/EXTC	2302874	473
FLKM 14-PA-INLINE/32	2302777	492
FLKM 14-PA-INLINE/DIO8	2900889	492
FLKM 14-PA-INLINE/IN16	2302751	492
FLKM 14-PA-INLINE/OUT16	2302764	492
FLKM 14-PA-MODI/M340	2903208	494
FLKM 14-PA-S300	2299770	503
FLKM 14-PA-SLC500/IN	2293462	476
FLKM 14-PA-SLC500/IN/M	2293475	476
FLKM 14-PA-SLC500/OUT	2293459	476
FLKM 14-PA/GE/DI	2290038	485
FLKM 14-PA/GE/DO	2290009	485
FLKM 14/8M/SI/PLC	2294487	530
FLKM 14/KDS3-MT/PPA/PLC	2290423	534
FLKM 16-PA- 331-1KF/I/MINI-MCR	2318237	507
FLKM 16-PA- 332-5HF/I/MINI-MCR	2318240	507
FLKM 16-PA-S300/MINI-MCR	2314749	506
FLKM 16/AI/DV	2304429	481
FLKM 16/AO/SI/DV	2304445	481
FLKM 16/DV	2304432	481
FLKM 4X14-PA/AN/S7-1500	2907385	511
FLKM 4X14-PA/PT/DIO/S7-1500	2907382	510
FLKM 4X14-PA/SC/DIO/S7-1500	2907381	510
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FLKM 50-PA-AB/1756/IN/EXTC	2302748	472
FLKM 50-PA-GE/TKFC/RXI	2321473	484
FLKM 50-PA-GE/TKFC/RXI/IN	2321486	484
FLKM 50-PA-MODI-TSX/Q	2294306	493
FLKM 50-PA-S300	2294445	502
FLKM 50-PA-S300/SO167	2307662	504
FLKM 50-PA-S400	2294500	514
FLKM 50-PA-S400(3-48)	2294908	515
FLKM 50-PA-SLC500/OUT/2A	2293446	476
FLKM 50-PA/AN/S7-1500	2907386	511
FLKM 50-PA/DO326/S7-300	2321952	504
FLKM 50-PA/PT/DIO/S7-1500	2907384	510
FLKM 50-PA/SC/DIO/S7-1500	2907383	510
FLKM 50/ 4-FLK14/PA-MODI-TSX/Q	2294416	493
FLKM 50/ 4-FLK14/PA-S400	2294429	515
FLKM 50/32M/DV	2304869	482
FLKM 50/32M/IN/LA/DV	2304856	482
FLKM 50/32M/PLC	2289719	529
FLKM 50/32M/SI/PLC	2294490	530
FLKM 50/32P/PLC	2291121	529
FLKM 50/4-FLK14/PA-S300	2296281	502
FLKM 50/KDS3-MT/PPA/AN/PLC	2291587	534
FLKM 50/KDS3-MT/PPA/PLC	2290614	534
FLKM 50/KDS3-MT/PPA/S7-300	2304490	534
FLKM S115-454-7LA/S400	2314901	562
FLKM S115/47X0,75/3,0M/OE	2314985	563
FLKM S115/47X0,75/5,0M/OE	2314998	563
FLKM S115/S400/SO155	2307248	562
FLKM S115/S7/FLK50/PLC/SO137	2306294	563
FLKM S135-431-4UA/S400	2314846	560
FLKM S135-454-4UA/S400	2314859	561
FLKM S135-460-4UA/I/S400	2314613	561
FLKM S135-460-4UA/U/S400	2314862	561
FLKM S135-465-4UA/T/S400	2314875	561
FLKM S135-465-4UA/UI/S400	2314888	561
FLKM S135-470-4UC/I/S400	2314626	561
FLKM S135-470-4UC/U/S400	2314891	561
FLKM S135/42X0,75/3,0M/OE	2315007	559
FLKM S135/42X0,75/5,0M/OE	2318017	559
FLKM S135/42XMKDSN	2901603	559
FLKM S135/S400/SO120	2301723	560
FLKM S135/S400/SO121	2301736	560
FLKM S135/S400/SO122	2301749	560
FLKM S135/S400/SO125	2301778	561
FLKM S135/S400/SO126	2301781	561
FLKM S135/S400/SO127	2301794	561
FLKM S135/S7/FLK50/PLC	2314736	559
FLKM-2FLK14/KDS3-MT/PPA/S7	2295062	534
FLKM-D25 SUB/B/KDS3-MT/TU810	2304513	470
FLKM-D25 SUB/B/KDS3-MT/TU810/P	2304539	470
FLKM-D25 SUB/B/KDS3-MT/TU830	2304526	470
FLKM-KS40/AO16/YCS	2314260	521
FLKM-KS40/YCS	2314642	520
FLKM-PA-2D15/HW/DI/C300	2901879	486
FLKM-PA-2D15/HW/DO/C300	2900924	486
FLKM-PA-D37/HW/AN/C300	2900622	486
FLKM-PA-D37/HW/DIO/C300	2901423	486
FLKMS 50/32IM/LA/PLC	2284510	532
FLKMS 50/32IM/PLC	2284523	532
FLKMS 50/32IM/ZFKDS/PLC	2901389	532
FLKMS-KS40/AI/YCS	2314286	521
FLKMS-KS40/SI/AI16/YCS	2314273	521
FLKMS-KS50/32IM/YCS	2314451	520
FUSE-10X38-16A-GR	2903126	33
FUSE-10X38-20A-GR	2903384	33
FUSE-10X38-30A-MR	2903119	33
IB IL 24 FLM-PAC	2736903	52
IBS IP 400 MBH -F	2732868	50
IBS PG SET	2836599	50
IBS RBC/F-T/	2740151	52
IFS-BT-PROG-ADAPTER	2905872	105
IFS-CONFSTICK	2986122	432
IFS-CONFSTICK-L	2901103	14
IFS-OP-CRADLE	2811886	171
IFS-OP-UNIT	2811899	171
IFS-USB-DATACABLE	2320500	433
IFS-USB-PROG-ADAPTER	2811271	105
ILC 191 ME/AN	2700074	214
IMC 1,5/ 5-ST-3,81	1857919	14
IOA AI/AO/BFI/DS/0.5A/EX	2906599	555
IOA DI/DO/BFI/DS/1.0A/EX	2906600	555
IOA FEED-THRU/EX	2906598	554
IOA REL 120V DI/1.0A/EX	2910157	556
IOA REL 120V DO/BFI/3.0A/EX	2910154	556
IOA REL 24V DI/BFI/1.0A/EX	2910155	556
IOA REL 24V DO/BFI/3.0A/EX	2910153	556
MACX MCR-CJC	2924993	127
MACX MCR-EX-DUMMY-ISOLATOR	2904970	173
MACX MCR-EX-DUMMY-ISOLATOR-SP	2905846	173
MACX MCR-EX-SL-2NAM-R-UP	2865984	154
MACX MCR-EX-SL-2NAM-R-UP-SP	2924249	154
MACX MCR-EX-SL-2NAM-RO	2865476	153
MACX MCR-EX-SL-2NAM-RO-SP	2924087	153
MACX MCR-EX-SL-2NAM-T	2865489	156
MACX MCR-EX-SL-2NAM-T-SP	2924090	156
MACX MCR-EX-SL-IDSI-I	2865405	144
MACX MCR-EX-SL-IDSI-I-SP	2924032	144
MACX MCR-EX-SL-NAM-2RO	2865450	152
MACX MCR-EX-SL-NAM-2RO-SP	2924061	152
MACX MCR-EX-SL-NAM-2T	2865463	155
MACX MCR-EX-SL-NAM-2T-SP	2924074	155
MACX MCR-EX-SL-NAM-HO	2907404	157
MACX MCR-EX-SL-NAM-HO-SP	2907405	157
MACX MCR-EX-SL-NAM-NAM	2866006	157
MACX MCR-EX-SL-NAM-NAM-SP	2924883	157
MACX MCR-EX-SL-NAM-R	2865434	151
MACX MCR-EX-SL-NAM-R-SP	2924045	151
MACX MCR-EX-SL-NAM-YO	2905723	157
MACX MCR-EX-SL-NAM-YO-SP	2905724	157
MACX MCR-EX-SL-RPSS-2I-2I	2865382	142
MACX MCR-EX-SL-RPSS-2I-2I-SP	2924676	142
MACX MCR-EX-SL-RPSSI-2I	2865366	141
MACX MCR-EX-SL-RPSSI-2I-1S	2908855	141
MACX MCR-EX-SL-RPSSI-2I-1S-SP	2908856	141
MACX MCR-EX-SL-RPSSI-2I-SP	2924236	141
MACX MCR-EX-SL-RPSSI-I	2865340	140
MACX MCR-EX-SL-RPSSI-I-SP	2924016	140
MACX MCR-EX-SL-RPSSI-I-UP	2865793	143
MACX MCR-EX-SL-RPSSI-I-UP-SP	2924029	143
MACX MCR-EX-SL-RTD-I	2865939	145
MACX MCR-EX-SL-RTD-I-NC	2865573	145
MACX MCR-EX-SL-RTD-I-SP	2924142	145
MACX MCR-EX-SL-RTD-I-SP-NC	2924168	145
MACX MCR-EX-SL-SD-21-25-LFD	2905669	160
MACX MCR-EX-SL-SD-21-25-LFD-SP	2905674	160
MACX MCR-EX-SL-SD-21-25-LP	2865492	162
MACX MCR-EX-SL-SD-21-25-LP-SP	2924113	162
MACX MCR-EX-SL-SD-21-40-LP	2865764	163
MACX MCR-EX-SL-SD-21-40-LP-SP	2924139	163
MACX MCR-EX-SL-SD-21-60-LP	2865515	163
MACX MCR-EX-SL-SD-21-60-LP-SP	2924100	163
MACX MCR-EX-SL-SD-23-48-LFD	2924867	159
MACX MCR-EX-SL-SD-23-48-LFD-SP	2924870	159
MACX MCR-EX-SL-SD-24-48-LFD	2906155	161
MACX MCR-EX-SL-SD-24-48-LFD-SP	2906156	161
MACX MCR-EX-SL-SD-24-48-LP	2865609	163
MACX MCR-EX-SL-SD-24-48-LP-SP	2924126	163
MACX MCR-EX-SL-TC-I	2865942	146
MACX MCR-EX-SL-TC-I-NC	2865586	146
MACX MCR-EX-T-UI-UP	2865654	148
MACX MCR-EX-T-UI-UP-C	2811763	148
MACX MCR-EX-T-UI-UP-SP	2924689	148
MACX MCR-EX-T-UI-UP-SP-C	2924692	148
MACX MCR-EX-T-UIREL-UP	2865751	150
MACX MCR-EX-T-UIREL-UP-SP	2924799	150
MACX MCR-I20	2905680	139
MACX MCR-PTB	2865625	174
MACX MCR-PTB-SP	2924184	174
MACX MCR-S-MUX	2865599	166
MACX MCR-S-MUX-TB	2308124	166
MACX MCR-SL-2I-2I-HV-ILP	2907706	125
MACX MCR-SL-2I-2I-HV-ILP-SP	2907707	125
MACX MCR-SL-2I-2I-ILP	2905280	124
MACX MCR-SL-2I-2I-ILP-SP	2905281	124
MACX MCR-SL-2NAM-R-UP	2865052	135
MACX MCR-SL-2NAM-R-UP-SP	2924304	135
MACX MCR-SL-2NAM-RO	2865049	134
MACX MCR-SL-2NAM-RO-SP	2924294	134
MACX MCR-SL-2NAM-T	2865036	137
MACX MCR-SL-2NAM-T-SP	2924281	137
MACX MCR-SL-CAC- 5-I	2810612	246
MACX MCR-SL-CAC- 5-I-UP	2810625	246
MACX MCR-SL-CAC-12-I-UP	2810638	246
MACX MCR-SL-I-I-HV-ILP	2907704	125
MACX MCR-SL-I-I-HV-ILP-SP	2907705	125
MACX MCR-SL-I-I-ILP	2905278	124
MACX MCR-SL-I-I-ILP-SP	2905279	124
MACX MCR-SL-IDSI-I	2865971	126
MACX MCR-SL-IDSI-I-SP	2924223	126
MACX MCR-SL-NAM-2RO	2865010	133
MACX MCR-SL-NAM-2RO-SP	2924265	133
MACX MCR-SL-NAM-2T	2865023	136
MACX MCR-SL-NAM-2T-SP	2924278	136
MACX MCR-SL-NAM-R	2865997	132
MACX MCR-SL-NAM-R-SP	2924252	132
MACX MCR-SL-RPSS-2I-2I	2904089	123
MACX MCR-SL-RPSS-2I-2I-SP	2904090	123
MACX MCR-SL-RPSSI-2I	2924825	121
MACX MCR-SL-RPSSI-2I-SP	2924838	121
MACX MCR-SL-RPSSI-I	2865955	120
MACX MCR-SL-RPSSI-I-SP	2924207	120
MACX MCR-SL-RPSSI-I-UP	2865968	122
MACX MCR-SL-RPSSI-I-UP-SP	2924210	122
MACX MCR-SL-RTD-I	2865065	130
MACX MCR-SL-RTD-I-NC	2865078	130
MACX MCR-SL-RTD-I-SP	2924317	130
MACX MCR-SL-RTD-I-SP-NC	2924320	130
MACX MCR-SL-TC-I	2924333	131
MACX MCR-SL-TC-I-NC	2924346	131
MACX MCR-T-UI-UP	2811394	128
MACX MCR-T-UI-UP-C	2811873	128
MACX MCR-T-UI-UP-SP	2811860	128
MACX MCR-T-UI-UP-SP-C	2811970	128
MACX MCR-T-UIREL-UP	2811378	127
MACX MCR-T-UIREL-UP-SP	2811828	127
MACX MCR-TS-I-OLP	2908662	194
MACX MCR-TS-I-OLP-SP	2908664	194
MACX MCR-UI-UI	2811284	116
MACX MCR-UI-UI-NC	2811446	116
MACX MCR-UI-UI-SP	2811572	116
MACX MCR-UI-UI-SP-NC	2811556	116
MACX MCR-UI-UI-UP	2811459	118
MACX MCR-UI-UI-UP-NC	2811297	118
MACX MCR-UI-UI-UP-SP	2811585	118
MACX MCR-UI-UI-UP-SP-NC	2811569	118
MACX MCR-VAC	2906239	250
MACX MCR-VAC-PT	2906244	250
MACX MCR-VDC	2906242	250
MACX MCR-VDC-PT	2906243	250
MACX PL-EX-RPSS-2I-2I	2904963	169
MACX PL-EX-RPSS-2I-2I-SP	2904964	169
MACX PL-EX-RPSSI-2I	2904959	168
MACX PL-EX-RPSSI-2I-SP	2904960	168
MACX PL-EX-T-UIREL-UP	2904910	170
MACX PL-EX-T-UIREL-UP-SP	2904912	170
MACX PL-RPSSI-2I	2904961	138
MACX PL-RPSSI-2I-SP	2904962	138
MACX PL-T-UIREL-UP	2904901	139

Type	Order No.	Page
MACX PL-T-UIREL-UP-SP	2904903	139
MC 1,5/ 5-ST-3,81	1803604	14
MCR-DIN-RAIL-ADAPTER HT	2864671	193
MCR-ET 38X35 WH	2814317	251
MCR-FL-HT-T-I	2864529	189
MCR-FL-HT-T-I-EX	2864532	190
MCR-FL-HT-TS-I-EX	2864545	188
MCR-FL-T-LP-I	2864561	196
MCR-FL-T-LP-I-EX	2864574	195
MCR-FL-TS-LP-I-EX	2864587	195
MCR-PAC-T-USB	2309000	180
MCR-S-1-5-UI-DCI	2814634	242
MCR-S-1-5-UI-DCI-NC	2814715	242
MCR-S-1-5-UI-SW-DCI	2814650	242
MCR-S-1-5-UI-SW-DCI-NC	2814731	242
MCR-S-10-50-UI-DCI	2814647	243
MCR-S-10-50-UI-SW-DCI	2814663	243
MCR-S-20-100-UI-DCI	2908798	243
MCR-S10-50-UI-DCI-NC	2814728	243
MCR-S10-50-UI-SW-DCI-NC	2814744	243
MCR-SL-CUC-100-I	2308027	241
MCR-SL-CUC-100-U	2308108	240
MCR-SL-CUC-200-I	2308030	241
MCR-SL-CUC-200-U	2308205	240
MCR-SL-CUC-300-I	2308043	241
MCR-SL-CUC-300-U	2308302	240
MCR-SL-CUC-400-I	2308072	241
MCR-SL-CUC-500-I	2308085	241
MCR-SL-CUC-600-I	2308098	241
MCR-SL-D-FIT	2864024	185
MCR-SL-D-RA	2810081	184
MCR-SL-D-SPA-UI	2710314	186
MCR-SL-D-U-I	2864011	184
MCR-SL-HT-PT 100-I	2864516	191
MCR-SL-PT100-LP-I	2864558	197
MCR-SL-S- 16-SP- 24	2864464	249
MCR-SL-S-100-I-LP	2813486	247
MCR-SL-S-100-U	2813457	247
MCR-SL-S-200-I-LP	2813499	247
MCR-SL-S-200-U	2813460	247
MCR-SLP-1-5-UI-0	2814359	248
MCR-TTL-RS232-E	2814388	251
MCR/PI-CONF-WIN	2814799	251
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	103
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	433
ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	102
ME 6,2 TBUS-2 1,5/5-ST-3,81 GY	2695439	102
MINI MCR-2-2I-2I-ILP	2901996	78
MINI MCR-2-2I-2I-ILP-PT	2901997	78
MINI MCR-2-CVCS	2902064	100
MINI MCR-2-CVCS-PT	2902065	100
MINI MCR-2-F-UI	2902056	84
MINI MCR-2-F-UI-PT	2902058	84
MINI MCR-2-FM-RC	2904504	104
MINI MCR-2-FM-RC-PT	2904508	104
MINI MCR-2-I-I	2901998	74
MINI MCR-2-I-I-ILP	2901994	78
MINI MCR-2-I-I-ILP-PT	2901995	78
MINI MCR-2-I-I-PT	2901999	74
MINI MCR-2-I0-U	2902000	74
MINI MCR-2-I0-U-PT	2902001	74
MINI MCR-2-I4-U	2902002	74
MINI MCR-2-I4-U-PT	2902003	74
MINI MCR-2-NAM-2RO	2902004	90
MINI MCR-2-NAM-2RO-PT	2902005	90
MINI MCR-2-POT-UI	2902016	88
MINI MCR-2-POT-UI-C	2905005	88
MINI MCR-2-POT-UI-PT	2902017	88
MINI MCR-2-POT-UI-PT-C	2905006	88
MINI MCR-2-PTB	2902066	102
MINI MCR-2-PTB-PT	2902067	102
MINI MCR-2-RPSS-I-I	2902014	75
MINI MCR-2-RPSS-I-I-PT	2902015	75
MINI MCR-2-RTD-UI	2902049	80
MINI MCR-2-RTD-UI-C	2902048	80
MINI MCR-2-RTD-UI-PT	2902052	80
MINI MCR-2-RTD-UI-PT-C	2902051	80
MINI MCR-2-T-2RO	2906876	93
MINI MCR-2-T-2RO-PT	2906877	93
MINI MCR-2-T-REL	2905632	92
MINI MCR-2-T-REL-PT	2905633	92
MINI MCR-2-TB	2902068	104
MINI MCR-2-TC-UI	2902055	82
MINI MCR-2-TC-UI-C	2902053	82
MINI MCR-2-TC-UI-PT	2905249	82
MINI MCR-2-TC-UI-PT-C	2905248	82
MINI MCR-2-U-I0	2902022	74
MINI MCR-2-U-I0-PT	2902023	74
MINI MCR-2-U-I4	2902029	74
MINI MCR-2-U-I4-PT	2902030	74
MINI MCR-2-U-U	2902042	74
MINI MCR-2-U-U-PT	2902043	74
MINI MCR-2-UI-FRO	2902031	86
MINI MCR-2-UI-FRO-C	2906201	86
MINI MCR-2-UI-FRO-PT	2902032	86
MINI MCR-2-UI-FRO-PT-C	2906202	86
MINI MCR-2-UI-I-OLP	2902061	79
MINI MCR-2-UI-I-OLP-C	2902060	79
MINI MCR-2-UI-I-OLP-PT	2902063	79
MINI MCR-2-UI-I-OLP-PT-C	2902062	79
MINI MCR-2-UI-REL	2902033	91
MINI MCR-2-UI-REL-PT	2902035	91
MINI MCR-2-UI-UI	2902037	72
MINI MCR-2-UI-UI-C	2902036	72
MINI MCR-2-UI-UI-PT	2902040	72
MINI MCR-2-UI-UI-PT-C	2902039	72
MINI MCR-2-UNI-UI-2UI	2905026	76
MINI MCR-2-UNI-UI-2UI-C	2905025	76
MINI MCR-2-UNI-UI-2UI-PT	2905028	76
MINI MCR-2-UNI-UI-2UI-PT-C	2905027	76
MINI MCR-2-UNI-UI-UIRO	2902026	70
MINI MCR-2-UNI-UI-UIRO-C	2902024	70
MINI MCR-2-UNI-UI-UIRO-PT	2902028	70
MINI MCR-2-UNI-UI-UIRO-PT-C	2902027	70
MINI MCR-2-V8-FLK 16	2901993	97
MINI MCR-2-V8-MOD-RTU	2905634	96
MINI MCR-2-V8-MOD-TCP	2905635	96
MINI MCR-2-V8-PB-DP	2905636	96
MINI MCR-SL-FM-RC-NC	2902961	524
MINI MCR-SL-PTB-FM	2902958	524
MINI-PS-100-240AC/24DC/1.5/EX	2866653	103
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	103
MM-CONF-SET	2297992	14
MPS-IH BK	0201731	176
MPS-IH BU	0201689	176
MPS-IH GN	0201702	176
MPS-IH GY	0201728	176
MPS-IH RD	0201676	176
MPS-IH WH	0201663	176
MPS-IH YE	0201692	176
MPS-MT	0201744	176

N

Type	Order No.	Page
NFC-USB-PROG-ADAPTER	2900013	105

O

Type	Order No.	Page
OPT- 5DC/ 24DC/ 2	2967989	394
OPT- 5DC/ 24DC/ 5	2982113	310
OPT- 5DC/ 48DC/100	2967992	394
OPT- 5DC/230AC/ 2	2982168	311
OPT-24DC/ 24DC/ 2	2966595	300
OPT-24DC/ 24DC/ 5	2982100	310
OPT-24DC/ 48DC/100	2966618	301
OPT-24DC/230AC/ 1	2967950	301
OPT-24DC/230AC/ 2	2982171	311
OPT-60DC/ 24DC/ 2	2966605	394
OPT-60DC/ 24DC/ 5	2982126	310
OPT-60DC/ 48DC/100	2966621	394
OPT-60DC/230AC/ 1	2967963	395
OPT-60DC/230AC/ 2	2982184	395

P

Type	Order No.	Page
PACT MCR-CB-21- 8	2277569	233
PACT MCR-CB-21-12	2277556	233
PACT MCR-CB-28-12	2277543	233
PACT MCR-CB-42-12	2277530	233
PACT MCR-ETC-60	2277572	233
PACT MCR-ETC-75	2277585	233
PACT MCR-ICAP	2277608	233
PACT MCR-RA	2277598	233
PACT MCR-V1-21-44	2277268	223
PACT MCR-V1-21-44- 50-5A-1	2277019	223
PACT MCR-V1-21-44- 75-5A-1	2277611	223
PACT MCR-V1-21-44-100-5A-1	2277022	223
PACT MCR-V1-21-44-125-5A-1	2277763	223
PACT MCR-V1-21-44-150-5A-1	2277035	223
PACT MCR-V1-21-44-200-5A-1	2277776	223
PACT MCR-V1-21-44-250-5A-1	2277048	223
PACT MCR-V1-21-44-300-5A-1	2277789	223
PACT MCR-V1-21-44-400-5A-1	2277051	223
PACT MCR-V1-21-44-500-5A-1	2277792	223
PACT MCR-V1C-21-44	2277420	223
PACT MCR-V2- 3015- 60	2277271	224
PACT MCR-V2- 3015- 60- 75-5A-1	2276502	224
PACT MCR-V2- 3015- 60-150-5A-1	2277077	224
PACT MCR-V2- 3015- 60-250-5A-1	2276544	224
PACT MCR-V2- 3015- 60-250-5A-1	2277080	224
PACT MCR-V2- 3015- 60-400-5A-1	2277093	224
PACT MCR-V2- 4012- 70	2277284	225
PACT MCR-V2- 5012- 85	2277297	226
PACT MCR-V2- 6015- 85	2277336	227
PACT MCR-V2- 6040- 96	2277349	228
PACT MCR-V2- 6315- 95	2277307	228
PACT MCR-V2- 8015-105	2277352	229
PACT MCR-V2- 8020-105	2277365	229
PACT MCR-V2-10020-129	2277378	230
PACT MCR-V2-10020-129-2500-5A	2276395	230
PACT MCR-V2-10036-129	2277381	230
PACT MCR-V2-10036-129-3000-5A	2276405	230
PACT MCR-V2-12020-159	2277394	231
PACT MCR-V2-12040-159	2277404	231
PACT MCR-V2-12040-159-4000-5A	2276418	231
PACT MCR-V2-3015- 60- 60-5A-1	2277815	224
PACT MCR-V2-3015- 60- 75-5A-1	2277828	224
PACT MCR-V2-3015- 60- 80-5A-1	2277831	224
PACT MCR-V2-3015- 60- 100-5A-1	2277064	224
PACT MCR-V2-3015- 60- 125-5A-1	2277624	224
PACT MCR-V2-3015- 60- 150-5A-1	2277844	224
PACT MCR-V2-3015- 60- 200-5A-1	2277637	224
PACT MCR-V2-3015- 60- 200-5A-1	2277857	224
PACT MCR-V2-3015- 60- 250-5A-1	2277860	224
PACT MCR-V2-3015- 60- 300-5A-1	2277640	224
PACT MCR-V2-3015- 60- 500-5A-1	2277653	224
PACT MCR-V2-3015- 60- 600-5A-1	2277103	224
PACT MCR-V2-3015- 60- 750-5A-1	2277666	224
PACT MCR-V2-4012- 70- 250-5A-1	2277116	225
PACT MCR-V2-4012- 70- 300-5A-1	2277679	225
PACT MCR-V2-4012- 70- 400-5A-1	2277129	225
PACT MCR-V2-4012- 70- 500-5A-1	2277682	225
PACT MCR-V2-4012- 70- 600-5A-1	2277132	225
PACT MCR-V2-4012- 70- 750-5A-1	2277695	225
PACT MCR-V2-4012- 70- 800-5A-1	2277145	225
PACT MCR-V2-4012- 70-1000-5A-1	2277158	225
PACT MCR-V2-5012- 85- 150-5A-1	2276117	226
PACT MCR-V2-5012- 85- 200-5A-1	2276120	226
PACT MCR-V2-5012- 85- 250-5A-1	2276133	226
PACT MCR-V2-5012- 85- 300-5A-1	2276146	226
PACT MCR-V2-5012- 85- 400-5A-1	2277161	226
PACT MCR-V2-5012- 85- 500-5A-1	2276159	226
PACT MCR-V2-5012- 85- 600-5A-1	2277174	226
PACT MCR-V2-5012- 85- 600-5A-1	2276162	226
PACT MCR-V2-5012- 85- 750-5A-1	2276175	226
PACT MCR-V2-5012- 85- 800-5A-1	2277187	226
PACT MCR-V2-5012- 85-1000-5A-1	2276463	226
PACT MCR-V2-5012- 85-1000-5A-1	2277190	226
PACT MCR-V2-5012- 85-1250-5A-1	2277200	226
PACT MCR-V2-5012- 85-1500-5A-1	2276188	226
PACT MCR-V2-6015- 85- 200-5A-1	2277873	227
PACT MCR-V2-6015- 85- 250-5A-1	2277886	227
PACT MCR-V2-6015- 85- 300-5A-1	2277899	227
PACT MCR-V2-6015- 85- 400-5A-1	2277909	227
PACT MCR-V2-6015- 85- 500-5A-1	2277912	227
PACT MCR-V2-6015- 85- 600-5A-1	2277925	227
PACT MCR-V2-6015- 85- 750-5A-1	2277938	227
PACT MCR-V2-6015- 85- 800-5A-1	2277941	227
PACT MCR-V2-6015- 85-1000-5A-1	2277954	227
PACT MCR-V2-6015- 85-1250-5A-1	2277967	227
PACT MCR-V2-6015- 85-1600-5A-1	2277983	227
PACT MCR-V2-6040- 96- 600-5A-1	2276191	228
PACT MCR-V2-6040- 96- 750-5A-1	2276201	228
PACT MCR-V2-6040- 96- 800-5A-1	2276214	228
PACT MCR-V2-6040- 96-1000-5A-1	2277705	228
PACT MCR-V2-6040- 96-1250-5A-1	2276227	228
PACT MCR-V2-6040- 96-1500-5A-1	2277718	228
PACT MCR-V2-6040- 96-1600-5A-1	2276230	228
PACT MCR-V2-6040- 96-2000-5A-1	2276243	228
PACT MCR-V2-6315- 95- 800-5A-1	2277213	228
PACT MCR-V2-6315- 95-1000-5A-1	2277226	228
PACT MCR-V2-6315- 95-1250-5A-1	2277239	228
PACT MCR-V2-6315- 95-1500-5A-1	2277242	228
PACT MCR-V2-6315- 95-1600-5A-1	2277255	228
PACT MCR-V2-8015-105- 400-5A-1	2276256	229
PACT MCR-V2-8015-105- 500-5A-1	2276269	229
PACT MCR-V2-8015-105- 600-5A-1	2276272	229
PACT MCR-V2-8015-105- 750-5A-1	2276285	229
PACT MCR-V2-8015-105- 800-5A-1	2276298	229
PACT MCR-V2-8015-105-1000-5A-1	2277721	229
PACT MCR-V2-8015-105-1000-5A-1	2276308	229
PACT MCR-V2-8015-105-1250-5A-1	2276311	229
PACT MCR-V2-8015-105-1500-5A-1	2277734	229
PACT MCR-V2-8015-105-1600-5A-1	2276324	229
PACT MCR-V2-8015-105-2000-5A-1	2276337	229
PACT MCR-V2-8015-105-2500-5A-1	2276340	229
PACT MCR-V2-8020-105-1000-5A-1	2277747	229
PACT MCR-V2-8020-105-1500-5A-1	2277750	229
PACT MCR-V2-8020-105-2000-5A-1	2276382	229
PACT MCR-V2C- 3015- 60	2277433	224
PACT MCR-V2C- 4012- 70	2277446	225
PACT MCR-V2C- 5012- 85	2277459	226
PACT MCR-V2C- 6015- 85	2277462	227
PACT MCR-V2C- 6040- 96	2277488	228
PACT MCR-V2C- 6315- 95	2277475	228
PACT MCR-V2C- 8015-105	2277491	229
PACT MCR-V2C- 8020-105	2277501	229
PACT MCR-V2C-10020-129	2277514	230
PACT MCR-V2C-10036-129	2277527	230
PACT MCR-V3-60	2277417	232
PACT RCP-4000A-1A-D140	2904922	236
PACT RCP-4000A-1A-D190	2904923	236
PACT RCP-4000A-1A-D95	2904921	236
PACT RCP-4000A-UIRO-D140	2906232	237
PACT RCP-4000A-UIRO-D190	2906233	237
PACT RCP-4000A-UIRO-D95	2906231	237
PACT RCP-4000A-UIRO-PT-D140	2906235	237
PACT RCP-4000A-UIRO-PT-D190	2906236	237
PACT RCP-4000A-UIRO-PT-D95	2906234	237
PACT RCP-CLAMP	2904895	236
PACT RCP-CLAMP-5-10	2907888	236
PACT-FAST-MNT-W13-L40	2276612	233
PACT-FAST-MNT-W13-L65	2276625	233
PACT-FAST-MNT-W16-L40	2276638	233
PACT-FAST-MNT-W16-L65	2276641	233
PLC-2RPT-24DC/1	2901639	402
PLC-2RSC-24DC/ 1	2987309	402
PLC-APT-PT100-IN	2906919	431
PLC-APT-UI-IN	2906917	430
PLC-APT-UI-OUT	2906921	431
PLC-ASC-PT100-IN	2906918	431
PLC-ASC-UI-IN	2906916	430
PLC-ASC-UI-OUT	2906920	431
PLC-ATP BK	2966841	424
PLC-BP A1-14	2980283	424
PLC-BPT- 24DC/21RW	2900261	416
PLC-BPT- 24UC/ 1/ACT	2900450	383
PLC-BPT-120UC/ 1/SEN/SO46	2900456	389
PLC-BPT-120UC/21/SO46	2900453	388
PLC-BPT-230UC/ 1/SEN/SO46	2900457	389
PLC-BPT-230UC/21/SO46	2900455	388

Type	Order No.	Page
PLC-BPT-TTL/1	2900458	412
PLC-BSC- 24UC/ 1/ACT	2982799	383
PLC-BSC-120UC/ 1/SEN/SO46	2980322	389
PLC-BSC-120UC/21-21/SO46	2980416	389
PLC-BSC-120UC/21/SO46	2980319	388
PLC-BSC-120UC/21HC/SO46	2980432	389
PLC-BSC-230UC/ 1/SEN/SO46	2980348	389
PLC-BSC-230UC/21-21/SO46	2980429	389
PLC-BSC-230UC/21/SO46	2980335	388
PLC-BSC-230UC/21HC/SO46	2980445	389
PLC-BSC-TTL/1	2982689	412
PLC-ESK GY	2966508	424
PLC-HPT-24DC/230AC/10	2905215	409
PLC-HSC-24DC/230AC/10	2905214	409
PLC-LOGIC-STARTERKIT3	2909916	432
PLC-OPT- 5DC/ 24DC/100KHZ	2902969	410
PLC-OPT- 5DC/ 24DC/2/ACT	2900375	380
PLC-OPT- 5DC/ 5DC/100KHZ-G	2902971	411
PLC-OPT- 5DC/24DC/100KHZ-G	2902973	411
PLC-OPT- 5DC/300DC/1	2900381	406
PLC-OPT- 12DC/300DC/1	2900382	406
PLC-OPT- 24DC/ 24DC/10/R	2900398	407
PLC-OPT- 24DC/ 24DC/2	2900364	377
PLC-OPT- 24DC/ 24DC/2/ACT	2900376	380
PLC-OPT- 24DC/ 24DC/3RW	2900379	415
PLC-OPT- 24DC/ 48DC/100	2900352	376
PLC-OPT- 24DC/ 48DC/100/SEN	2900358	385
PLC-OPT- 24DC/ 48DC/500/W	2900378	407
PLC-OPT- 24DC/ 5DC/100KHZ-G	2902972	411
PLC-OPT- 24DC/110DC/3RW	2900391	415
PLC-OPT- 24DC/230AC/1	2900369	377
PLC-OPT- 24DC/230AC/2.4/ACT	2904632	408
PLC-OPT- 24DC/24DC/100KHZ	2902970	410
PLC-OPT- 24DC/24DC/100KHZ-G	2902974	411
PLC-OPT- 24DC/300DC/1	2900383	406
PLC-OPT- 24DC/TTL	2900363	414
PLC-OPT- 36DC/110DC/3RW	2900392	415
PLC-OPT- 48DC/ 24DC/2	2900365	377
PLC-OPT- 48DC/ 48DC/100	2900353	376
PLC-OPT- 48DC/110DC/3RW	2900393	415
PLC-OPT- 48DC/230AC/1	2900370	377
PLC-OPT- 60DC/ 24DC/2	2900366	377
PLC-OPT- 60DC/ 48DC/100	2900354	376
PLC-OPT- 60DC/230AC/1	2900371	377
PLC-OPT- 60DC/300DC/1	2900384	406
PLC-OPT- 72DC/110DC/3RW	2900394	415
PLC-OPT- 96DC/110DC/3RW	2900395	415
PLC-OPT-110DC/ 24DC/3RW	2900380	415
PLC-OPT-110DC/110DC/3RW	2900396	415
PLC-OPT-110DC/300DC/1	2900385	406
PLC-OPT-120AC/300DC/1	2900388	406
PLC-OPT-120UC/ 24DC/2	2900367	377
PLC-OPT-120UC/ 48DC/100	2900355	376
PLC-OPT-120UC/ 48DC/100/SEN	2900359	385
PLC-OPT-120UC/230AC/1	2900372	377
PLC-OPT-220DC/300DC/1	2900387	406
PLC-OPT-230AC/300DC/1	2900389	406
PLC-OPT-230UC/ 24DC/2	2900368	377
PLC-OPT-230UC/ 48DC/100	2900356	376
PLC-OPT-230UC/ 48DC/100/SEN	2900361	385
PLC-OPT-230UC/230AC/1	2900374	377
PLC-OPT-LPE-24DC/48DC/100	2903173	422
PLC-OSC- 5DC/ 5DC/100KHZ-G	2902965	411
PLC-OSC- 5DC/ 24DC/ 2/ACT	2980144	380
PLC-OSC- 5DC/ 24DC/100KHZ	2902963	410
PLC-OSC- 5DC/ 24DC/100KHZ-G	2902967	411
PLC-OSC- 5DC/300DC/ 1	2980652	406
PLC-OSC- 12DC/300DC/ 1	2980665	406
PLC-OSC- 24DC/ 5DC/100KHZ-G	2902966	411
PLC-OSC- 24DC/ 24DC/ 2	2966634	377
PLC-OSC- 24DC/ 24DC/ 2/ACT	2966676	380
PLC-OSC- 24DC/ 24DC/ 5/ACT	2982786	382
PLC-OSC- 24DC/ 24DC/ 10/R	2982702	407
PLC-OSC- 24DC/ 24DC/ 2/C1D2	5603260	459
PLC-OSC- 24DC/ 24DC/100KHZ	2902964	410
PLC-OSC- 24DC/ 24DC/100KHZ-G	2902968	411
PLC-OSC- 24DC/ 48DC/100	2966728	376
PLC-OSC- 24DC/ 48DC/100/C1D2	5603261	459
PLC-OSC- 24DC/ 48DC/100/SEN	2966773	385
PLC-OSC- 24DC/ 48DC/500/W	2980636	407
PLC-OSC- 24DC/230AC/ 1	2967840	377
PLC-OSC- 24DC/230AC/ 1/ACT	2967947	381
PLC-OSC- 24DC/230AC/ 2/ACT	2982760	382
PLC-OSC- 24DC/230AC/2.4/ACT	2904631	408
PLC-OSC- 24DC/300DC/ 1	2980678	406
PLC-OSC- 24DC/TTL	2982728	414
PLC-OSC- 48DC/ 24DC/ 2	2967002	377
PLC-OSC- 48DC/ 48DC/100	2966993	376
PLC-OSC- 48DC/230AC/ 1	2967853	377
PLC-OSC- 60DC/ 24DC/ 2	2967468	377
PLC-OSC- 60DC/ 48DC/100	2967455	376
PLC-OSC- 60DC/230AC/ 1	2967866	377
PLC-OSC- 60DC/300DC/ 1	2980681	406
PLC-OSC-110DC/300DC/ 1	2980694	406
PLC-OSC-120AC/300DC/ 1	2980717	406
PLC-OSC-120UC/ 24DC/ 2	2966650	377
PLC-OSC-120UC/ 24DC/ 2/C1D2	5603262	459
PLC-OSC-120UC/ 48DC/100	2966744	376
PLC-OSC-120UC/ 48DC/100/C1D2	5603263	459
PLC-OSC-120UC/ 48DC/100/SEN	2966799	385
PLC-OSC-120UC/230AC/ 1	2967879	377
PLC-OSC-125DC/ 24DC/ 2	2980050	377
PLC-OSC-125DC/ 48DC/100	2980047	376
PLC-OSC-125DC/230AC/ 1	2980063	377
PLC-OSC-220DC/300DC/ 1	2980704	406
PLC-OSC-230AC/300DC/ 1	2980720	406
PLC-OSC-230UC/ 24DC/ 2	2966663	377
PLC-OSC-230UC/ 48DC/100	2966757	376
PLC-OSC-230UC/ 48DC/100/SEN	2966809	385
PLC-OSC-230UC/230AC/ 1	2967882	377
PLC-OSC-LPE-24DC/48DC/100	2903171	422
PLC-OSP- 24DC/ 24DC/ 3RW	2980513	415
PLC-OSP- 24DC/110DC/ 3RW	2982511	415
PLC-OSP- 36DC/110DC/ 3RW	2982524	415
PLC-OSP- 48DC/110DC/ 3RW	2982537	415
PLC-OSP- 72DC/110DC/ 3RW	2982540	415
PLC-OSP- 96DC/110DC/ 3RW	2982553	415
PLC-OSP-110DC/ 24DC/ 3RW	2980526	415
PLC-OSP-110DC/110DC/ 3RW	2982566	415
PLC-PT-EIK 1-SVN 24P/P	2900397	420
PLC-RPT- 12DC/21	2900316	372
PLC-RPT- 12DC/21-21	2900329	374
PLC-RPT- 12DC/21-21AU	2900337	375
PLC-RPT- 12DC/21/MS	2909666	373
PLC-RPT- 12DC/21AU	2900317	373
PLC-RPT- 12DC/21AU/MS	2909671	373
PLC-RPT- 12DC/21HC	2900290	387
PLC-RPT- 24DC/ 1/ACT	2900312	378
PLC-RPT- 24DC/ 1/MS/ACT	2909677	379
PLC-RPT- 24DC/ 1AU/MS/SEN	2909678	385
PLC-RPT- 24DC/ 1AU/SEN	2900313	384
PLC-RPT- 24DC/ 1IC/ACT	2900298	386
PLC-RPT- 24DC/21	2900299	372
PLC-RPT- 24DC/21-21	2900330	374
PLC-RPT- 24DC/21-21/EX	2909514	458
PLC-RPT- 24DC/21-21AU	2900338	375
PLC-RPT- 24DC/21/MS	2909667	373
PLC-RPT- 24DC/21AU	2900306	373
PLC-RPT- 24DC/21AU/MS	2909672	373
PLC-RPT- 24DC/21HC	2900291	387
PLC-RPT- 24UC/ 1/S/H	2900328	404
PLC-RPT- 24UC/ 1/S/L	2900327	404
PLC-RPT- 24UC/21	2900300	372
PLC-RPT- 24UC/21-21	2900332	374
PLC-RPT- 24UC/21-21/RW	2900346	419
PLC-RPT- 24UC/21-21AU	2900339	375
PLC-RPT- 24UC/21-21AU/RW	2900349	419
PLC-RPT- 24UC/21/MS	2909668	373
PLC-RPT- 24UC/21/RW	2900318	418
PLC-RPT- 24UC/21AU	2900307	373
PLC-RPT- 24UC/21AU/MS	2909673	373
PLC-RPT- 24UC/21AU/RW	2900321	418
PLC-RPT- 24UC/21HC	2900293	387
PLC-RPT- 24UC/21HC/RW	2900324	419
PLC-RPT- 48DC/21	2900301	372
PLC-RPT- 48DC/21-21	2900333	374
PLC-RPT- 48DC/21-21AU	2900340	375
PLC-RPT- 48DC/21AU	2900308	373
PLC-RPT- 48DC/21HC	2900294	387
PLC-RPT- 60DC/21	2900303	372
PLC-RPT- 60DC/21-21	2900334	374
PLC-RPT- 60DC/21-21AU	2900341	375
PLC-RPT- 60DC/21AU	2900309	373
PLC-RPT- 60DC/21HC	2900295	387
PLC-RPT- 72UC/21-21/RW	2900347	419
PLC-RPT- 72UC/21-21AU/RW	2900350	419
PLC-RPT- 72UC/21/RW	2900319	418
PLC-RPT- 72UC/21AU/RW	2900322	418
PLC-RPT- 72UC/21HC/RW	2900325	419
PLC-RPT-110UC/21-21/RW	2900348	419
PLC-RPT-110UC/21-21AU/RW	2900351	419
PLC-RPT-110UC/21/RW	2900320	418
PLC-RPT-110UC/21AU/RW	2900323	418
PLC-RPT-110UC/21HC/RW	2900326	419
PLC-RPT-120UC/ 1AU/MS/SEN	2909679	385
PLC-RPT-120UC/ 1AU/SEN	2900314	384
PLC-RPT-120UC/21	2900304	372
PLC-RPT-120UC/21-21	2900335	374
PLC-RPT-120UC/21-21/EX	2909515	458
PLC-RPT-120UC/21-21AU	2900342	375
PLC-RPT-120UC/21/EX	2909529	458
PLC-RPT-120UC/21/MS	2909669	373
PLC-RPT-120UC/21AU	2900310	373
PLC-RPT-120UC/21AU/MS	2909674	373
PLC-RPT-120UC/21HC	2900296	387
PLC-RPT-120UC/21HC/EX	2909533	459
PLC-RPT-12DC/21-21/EX	2909513	458
PLC-RPT-12DC/21/EX	2909527	458
PLC-RPT-12DC/21HC/EX	2909531	459
PLC-RPT-230UC/ 1AU/MS/SEN	2909680	385
PLC-RPT-230UC/ 1AU/SEN	2900315	384
PLC-RPT-230UC/21	2900305	372
PLC-RPT-230UC/21-21	2900336	374
PLC-RPT-230UC/21-21/EX	2909516	458
PLC-RPT-230UC/21-21AU	2900343	375
PLC-RPT-230UC/21-21AU/RWF	2900345	417
PLC-RPT-230UC/21/EX	2909530	458
PLC-RPT-230UC/21/MS	2909670	373
PLC-RPT-230UC/21AU	2900311	373
PLC-RPT-230UC/21AU/MS	2909676	373
PLC-RPT-230UC/21HC	2900297	387
PLC-RPT-230UC/21HC/EX	2909534	459
PLC-RPT-24DC/21/EX	2909528	458
PLC-RPT-24DC/21HC/EX	2909532	459
PLC-RSC- 12DC/21	2966906	372
PLC-RSC- 12DC/21-21	2967235	374
PLC-RSC- 12DC/21-21AU	2967277	375
PLC-RSC- 12DC/21/MS	2909648	373
PLC-RSC- 12DC/21AU	2966919	373
PLC-RSC- 12DC/21AU/MS	2909654	373
PLC-RSC- 12DC/21HC	2967617	387
PLC-RSC- 24DC/ 1- 1/ACT	2967109	379
PLC-RSC- 24DC/ 1/ACT	2966210	378
PLC-RSC- 24DC/ 1/MS/ACT	2909661	379
PLC-RSC- 24DC/ 1AU/MS/SEN	2909663	385
PLC-RSC- 24DC/ 1AU/SEN	2966317	384
PLC-RSC- 24DC/ 1IC/ACT	2967604	386
PLC-RSC- 24DC/21	2966171	372
PLC-RSC- 24DC/21-21	2967060	374
PLC-RSC- 24DC/21-21/EX	2909509	458
PLC-RSC- 24DC/21-21AU	2967125	375
PLC-RSC- 24DC/21/MS	2909649	373
PLC-RSC- 24DC/21AU	2966265	373
PLC-RSC- 24DC/21AU/MS	2909655	373
PLC-RSC- 24DC/21HC	2967620	387
PLC-RSC- 24UC/ 1/S/H	2982236	404
PLC-RSC- 24UC/ 1/S/L	2834876	404
PLC-RSC- 24UC/21	2966184	372
PLC-RSC- 24UC/21-21	2967073	374
PLC-RSC- 24UC/21-21AU	2967112	375
PLC-RSC- 24UC/21/MS	2909650	373
PLC-RSC- 24UC/21AU	2966278	373
PLC-RSC- 24UC/21AU/MS	2909656	373
PLC-RSC- 24UC/21HC	2967633	387
PLC-RSC- 48DC/21	2966113	372
PLC-RSC- 48DC/21-21	2967248	374
PLC-RSC- 48DC/21-21AU	2967280	375
PLC-RSC- 48DC/21AU	2966126	373
PLC-RSC- 48DC/21HC	2967646	387
PLC-RSC- 60DC/21	2966139	372
PLC-RSC- 60DC/21-21	2967293	374
PLC-RSC- 60DC/21-21AU	2967303	375
PLC-RSC- 60DC/21AU	2966142	373
PLC-RSC- 60DC/21HC	2967659	387
PLC-RSC-120UC/ 1AU/MS/SEN	2909664	385
PLC-RSC-120UC/ 1AU/SEN	2966320	384
PLC-RSC-120UC/21	2966197	372
PLC-RSC-120UC/21-21	2967086	374
PLC-RSC-120UC/21-21/EX	2909511	458
PLC-RSC-120UC/21-21AU	2967138	375
PLC-RSC-120UC/21/EX	2909525	458
PLC-RSC-120UC/21/MS	2909651	373
PLC-RSC-120UC/21AU	2966281	373
PLC-RSC-120UC/21AU/MS	2909657	373
PLC-RSC-120UC/21HC	2967662	387
PLC-RSC-120UC/21HC/EX	2909520	459
PLC-RSC-12DC/21-21/EX	2909517	458
PLC-RSC-12DC/21/EX	2909522	458
PLC-RSC-12DC/21HC/EX	2909518	459
PLC-RSC-230UC/ 1AU/MS/SEN	2909665	385
PLC-RSC-230UC/ 1AU/SEN	2966333	384
PLC-RSC-230UC/21	2966207	372
PLC-RSC-230UC/21-21	2967099	374
PLC-RSC-230UC/21-21/EX	2909512	458
PLC-RSC-230UC/21-21AU	2967141	375
PLC-RSC-230UC/21/EX	2909526	458
PLC-RSC-230UC/21/MS	2909653	373
PLC-RSC-230UC/21AU	2966294	373
PLC-RSC-230UC/21AU/MS	2909660	373
PLC-RSC-230UC/21HC	2967675	387
PLC-RSC-230UC/21HC/EX	2909521	459
PLC-RSC-24DC/21/EX	2909524	458
PLC-RSC-24DC/21HC/EX	2909519	459
PLC-SC-EIK 1-SVN 24P/P	2982663	420
PLC-SC-ELR W1/ 2-24DC	2980539	421
PLC-SC-S/H	2980733	405
PLC-SC-S/L	2980775	405
PLC-SP-ELR W1/ 2-24DC	2980555	421
PLC-V8/D15B/IN	2296087	425
PLC-V8/D15B/OUT	2296061	425
PLC-V8/D15S/IN	2296074	425
PLC-V8/D15S/OUT	2296058	425
PLC-V8/FLK14/IN	2296553	425
PLC-V8/FLK14/IN/M	2304115	425
PLC-V8/FLK14/OUT	2295554	425
PLC-V8/FLK14/OUT/M	2304102	425
PLC-V8C/CAB/TBUS/0,3M	2905263	433
PLC-V8C/PT-24DC/BM2	2907446	429
PLC-V8C/PT-24DC/EM	2905137	429
PLC-V8C/PT-24DC/SAM2	2907443	428
PLC-V8C/SC-24DC/BM2	2907447	429
PLC-V8C/SC-24DC/EM	2903095	429
PLC-V8C/SC-24DC/SAM2	2907445	428
PLC-V8L/FLK14/OUT	2299660	425
PLC-V8L/FLK14/OUT/M	2304306	425
PLC-VT	2296870	546
PLC-VT/ACT	2295567	546
PLC-VT/ACT/LA	2296867	546
PLC-VT/LA	2296854	546
PSK AFS2000IOL	2700709	217
PSK AFS5000IOL	2700705	217
PSK AFS6000IOL	2700707	216
PSK AFS6050IOL	2700704	216
PSK AFS8000IOL	2700708	217
PSK APS7004IOL	2700710	218
PSK RTU 50	2400018	215
PSM-KAD 9 SUB 25/BS	2761295	251
PSM-ME-RS232/RS485-P	2744416	166
PSM-ME-RS485/RS485-P	2744429	166

R

REL-IR2/100AC/2X21	2907052	316
REL-IR2/200AC/2X21	2907053	316
REL-IR2/24DC/2X21	2907051	316
REL-IR2/L- 24AC/2X21	2903666	314

Type	Order No.	Page
REL-IR2/L-120AC/2X21	2903667	314
REL-IR2/L-230AC/2X21	2903668	314
REL-IR2/LDP- 12DC/2X21	2903659	314
REL-IR2/LDP- 24DC/2X21	2903660	314
REL-IR2/LDP-110DC/2X21	2903663	314
REL-IR2/LDP-125DC/2X21	2903664	314
REL-IR2/LDP-220DC/2X21	2903665	314
REL-IR4/100AC/4X21	2907055	316
REL-IR4/200AC/4X21	2907056	316
REL-IR4/24DC/4X21	2907054	316
REL-IR4/L- 24AC/4X21	2903686	314
REL-IR4/L- 24AC/4X21AU	2903683	314
REL-IR4/L-120AC/4X21	2903687	314
REL-IR4/L-120AC/4X21AU	2903684	314
REL-IR4/L-230AC/4X21	2903688	314
REL-IR4/L-230AC/4X21AU	2903685	314
REL-IR4/LDP- 12DC/4X21	2903676	314
REL-IR4/LDP- 12DC/4X21AU	2903669	314
REL-IR4/LDP- 24DC/4X21	2903677	314
REL-IR4/LDP- 24DC/4X21AU	2903670	314
REL-IR4/LDP-110DC/4X21	2903680	314
REL-IR4/LDP-110DC/4X21AU	2903673	314
REL-IR4/LDP-125DC/4X21	2903681	314
REL-IR4/LDP-125DC/4X21AU	2903674	314
REL-IR4/LDP-220DC/4X21	2903682	314
REL-IR4/LDP-220DC/4X21AU	2903675	314
REL-MR 4,5DC/21AU	2961370	392
REL-MR- 4,5DC/21	2961367	392
REL-MR- 12DC/21	2961150	298
REL-MR- 12DC/21-21	2961257	304
REL-MR- 12DC/21-21AU	2961299	304
REL-MR- 12DC/21/MS	2909641	298
REL-MR- 12DC/21AU	2961163	298
REL-MR- 12DC/21AU/MS	2909644	298
REL-MR- 12DC/21HC	2961309	304
REL-MR- 12DC/21HC AU	2961532	304
REL-MR- 18DC/21	2961383	392
REL-MR- 18DC/21AU	2961493	392
REL-MR- 24AC/21-21	2961435	304
REL-MR- 24AC/21-21/MS	2987956	306
REL-MR- 24AC/21-21AU	2961464	304
REL-MR- 24AC/21HC	2961406	304
REL-MR- 24AC/21HC AU	2961503	304
REL-MR- 24AC/21HC/MS	2987891	306
REL-MR- 24DC/1IC	2961341	393
REL-MR- 24DC/21	2961105	298
REL-MR- 24DC/21-21	2961192	304
REL-MR- 24DC/21-21/MS	2987943	306
REL-MR- 24DC/21-21AU	2961215	304
REL-MR- 24DC/21-21AU/MS	2987985	306
REL-MR- 24DC/21/MS	2909642	298
REL-MR- 24DC/21AU	2961121	298
REL-MR- 24DC/21AU/MS	2909645	298
REL-MR- 24DC/21HC	2961312	304
REL-MR- 24DC/21HC AU	2961545	304
REL-MR- 24DC/21HC AU/MS	2987927	306
REL-MR- 24DC/21HC/MS	2987888	306
REL-MR- 48DC/21-21	2834834	304
REL-MR- 48DC/21-21AU	2834847	304
REL-MR- 48DC/21HC	2834821	304
REL-MR- 60DC/21	2961118	392
REL-MR- 60DC/21-21	2961273	304
REL-MR- 60DC/21-21AU	2961286	304
REL-MR- 60DC/21/MS	2909643	392
REL-MR- 60DC/21AU	2961134	392
REL-MR- 60DC/21AU/MS	2909647	392
REL-MR- 60DC/21HC	2961325	304
REL-MR-110DC/21-21	2961202	304
REL-MR-110DC/21-21AU	2961228	304
REL-MR-110DC/21HC	2961338	304
REL-MR-110DC/21HC AU	2961561	304
REL-MR-120AC/21-21	2961448	304
REL-MR-120AC/21-21/MS	2987969	306
REL-MR-120AC/21-21AU	2961477	304
REL-MR-120AC/21HC	2961419	304
REL-MR-120AC/21HC AU	2961516	304
REL-MR-120AC/21HC/MS	2987901	306
REL-MR-230AC/21-21	2961451	304
REL-MR-230AC/21-21/MS	2987972	306
REL-MR-230AC/21-21AU	2961480	304
REL-MR-230AC/21-21AU/MS	2987998	306
REL-MR-230AC/21HC	2961422	304
REL-MR-230AC/21HC AU	2961529	304
REL-MR-230AC/21HC AU/MS	2987930	306
REL-MR-230AC/21HC/MS	2987914	306
REL-MR-BL-100AC/21-21/MS	2908183	308
REL-MR-BL-100AC/21HC/MS	2908179	308
REL-MR-BL-200AC/21-21/MS	2908182	308
REL-MR-BL-200AC/21HC/MS	2908178	308
REL-MR-BL-24DC/21-21/MS	2908181	308
REL-MR-BL-24DC/21HC/MS	2908180	308
REL-MR-G 24/1	2961037	536
REL-OR2/L- 24AC/2X21	2903690	322
REL-OR2/L-120AC/2X21	2903691	322
REL-OR2/L-230AC/2X21	2903692	322
REL-OR2/LDP- 24DC/2X21	2903689	322
REL-OR2/LDP-220DC/2X21	2907026	322
REL-OR3/L- 24AC/3X21	2903694	322
REL-OR3/L-120AC/3X21	2903695	322
REL-OR3/L-230AC/3X21	2903696	322
REL-OR3/LDP-110DC/3X21	2908898	322
REL-OR3/LDP-220DC/3X21	2907027	322
REL-OR3/LDP-24DC/3X21	2903693	322
REL-OR3/LDP-48DC/3X21	2908897	322
REL-PR1-110DC/1/MB	2908044	328
REL-PR1-220DC/1/MB	2908046	328
REL-PR1-230AC/1/MB	2908047	328
REL-PR1-24DC/1/MB	2908040	328
REL-PR2- 24AC/2X21	2903699	326
REL-PR2- 24DC/2X21	2903698	326
REL-PR2-120AC/2X21	2903700	326
REL-PR2-230AC/2X21	2903701	326
REL-PR3- 24AC/3X1	2903707	328
REL-PR3- 24AC/3X21	2903703	326
REL-PR3- 24DC/3X1	2903706	328
REL-PR3- 24DC/3X21	2903702	326
REL-PR3-110DC/3X21	2908893	326
REL-PR3-120AC/3X1	2903708	328
REL-PR3-120AC/3X21	2903704	326
REL-PR3-230AC/3X1	2903709	328
REL-PR3-230AC/3X21	2903705	326
REL-SR- 24DC/2X21/FG	2908777	457
RIF-0-BPT-M/ 21	2907468	296
RIF-0-BPT/1	2901873	297
RIF-0-BPT/21	2900958	296
RIF-0-BSC/ 1	2901872	297
RIF-0-BSC/21	2900957	297
RIF-0-OPT-24DC/230AC/1	2905295	337
RIF-0-OPT-24DC/24DC/2	2905293	336
RIF-0-OPT-24DC/48DC/100	2905294	337
RIF-0-OSC-24DC/230AC/1	2905656	339
RIF-0-OSC-24DC/24DC/2	2905657	338
RIF-0-OSC-24DC/48DC/100	2905658	339
RIF-0-RPT-12DC/ 1	2903362	333
RIF-0-RPT-12DC/ 1AU	2903360	333
RIF-0-RPT-12DC/21	2903371	332
RIF-0-RPT-12DC/21AU	2903369	332
RIF-0-RPT-24DC/ 1	2903361	333
RIF-0-RPT-24DC/ 1AU	2903359	333
RIF-0-RPT-24DC/21	2903370	332
RIF-0-RPT-24DC/21AU	2903368	332
RIF-0-RSC-12DC/ 1	2903367	335
RIF-0-RSC-12DC/ 1AU	2903365	335
RIF-0-RSC-12DC/21	2903375	334
RIF-0-RSC-12DC/21AU	2903373	334
RIF-0-RSC-24DC/ 1	2903366	335
RIF-0-RSC-24DC/ 1AU	2903364	335
RIF-0-RSC-24DC/21	2903374	334
RIF-0-RSC-24DC/21AU	2903372	334
RIF-1-BPT/2X21	2900931	302
RIF-1-BSC/2X21	2900930	303
RIF-1-RPT-LDP-12DC/1X21	2906224	340
RIF-1-RPT-LDP-12DC/2X21	2906223	341
RIF-1-RPT-LDP-24DC/1IC	2909884	348
RIF-1-RPT-LDP-24DC/1X21	2903342	340
RIF-1-RPT-LDP-24DC/1X21AU	2903338	340
RIF-1-RPT-LDP-24DC/1X21MS	2905289	344
RIF-1-RPT-LDP-24DC/2X21	2903334	341
RIF-1-RPT-LDP-24DC/2X21/FG	2908215	456
RIF-1-RPT-LDP-24DC/2X21AU	2903330	341
RIF-1-RPT-LDP-24DC/2X21MS	2905291	345
RIF-1-RPT-LV-120AC/1X21	2903340	340
RIF-1-RPT-LV-120AC/1X21AU	2903336	340
RIF-1-RPT-LV-120AC/1X21MS	2909776	344
RIF-1-RPT-LV-120AC/2X21	2903332	341
RIF-1-RPT-LV-120AC/2X21AU	2903328	341
RIF-1-RPT-LV-120AC/2X21MS	2909775	345
RIF-1-RPT-LV-230AC/1X21	2903339	340
RIF-1-RPT-LV-230AC/1X21AU	2903335	340
RIF-1-RPT-LV-230AC/1X21MS	2905290	344
RIF-1-RPT-LV-230AC/2X21	2903331	341
RIF-1-RPT-LV-230AC/2X21AU	2903327	341
RIF-1-RPT-LV-230AC/2X21MS	2905292	345
RIF-1-RPT-LV-24AC/1X21	2903341	340
RIF-1-RPT-LV-24AC/1X21AU	2903337	340
RIF-1-RPT-LV-24AC/2X21	2903333	341
RIF-1-RPT-LV-24AC/2X21AU	2903329	341
RIF-1-RSC-LDP-12DC/1X21	2908500	342
RIF-1-RSC-LDP-12DC/2X21	2908501	343
RIF-1-RSC-LDP-24DC/1IC	2909885	348
RIF-1-RSC-LDP-24DC/1X21	2903358	342
RIF-1-RSC-LDP-24DC/1X21AU	2903354	342
RIF-1-RSC-LDP-24DC/1X21MS	2905659	346
RIF-1-RSC-LDP-24DC/2X21	2903350	343
RIF-1-RSC-LDP-24DC/2X21AU	2903346	343
RIF-1-RSC-LDP-24DC/2X21MS	2905660	347
RIF-1-RSC-LV-120AC/1X21	2903356	342
RIF-1-RSC-LV-120AC/1X21AU	2903352	342
RIF-1-RSC-LV-120AC/1X21MS	2909774	346
RIF-1-RSC-LV-120AC/2X21	2903348	343
RIF-1-RSC-LV-120AC/2X21AU	2903344	343
RIF-1-RSC-LV-120AC/2X21MS	2909773	347
RIF-1-RSC-LV-230AC/1X21	2903355	342
RIF-1-RSC-LV-230AC/1X21AU	2903351	342
RIF-1-RSC-LV-230AC/1X21MS	2905661	346
RIF-1-RSC-LV-230AC/2X21	2903347	343
RIF-1-RSC-LV-230AC/2X21AU	2903343	343
RIF-1-RSC-LV-230AC/2X21MS	2905662	347
RIF-1-RSC-LV-24AC/1X21	2903357	342
RIF-1-RSC-LV-24AC/1X21AU	2903353	342
RIF-1-RSC-LV-24AC/2X21	2903349	343
RIF-1-RSC-LV-24AC/2X21AU	2903345	343
RIF-1-V8/PT/FLK14/OUT	2905195	367
RIF-1-V8/PT/FLK14/OUT/M	2906992	547
RIF-2-BPT/4X21	2900934	312
RIF-2-BSC/4X21	2900932	313
RIF-2-RPT-LDP-24DC/2X21	2903315	350
RIF-2-RPT-LDP-24DC/4X21	2903308	351
RIF-2-RPT-LV-120AC/2X21	2903311	350
RIF-2-RPT-LV-120AC/4X21	2903305	351
RIF-2-RPT-LV-230AC/2X21	2903310	350
RIF-2-RPT-LV-230AC/4X21	2903304	351
RIF-2-RPT-LV-24AC/2X21	2903313	350
RIF-2-RPT-LV-24AC/4X21	2903306	351
RIF-2-RSC-LDP-125DC/2X21	2903324	352
RIF-2-RSC-LDP-125DC/4X21	2903319	353
RIF-2-RSC-LDP-24DC/2X21	2903326	352
RIF-2-RSC-LDP-24DC/4X21	2903320	353
RIF-2-RSC-LV-120AC/2X21	2903322	352
RIF-2-RSC-LV-120AC/4X21	2903317	353
RIF-2-RSC-LV-230AC/2X21	2903321	352
RIF-2-RSC-LV-230AC/4X21	2903316	353
RIF-2-RSC-LV-24AC/2X21	2903323	352
RIF-2-RSC-LV-24AC/4X21	2903318	353
RIF-3-BPT/2X21	2900937	318
RIF-3-BPT/3X21	2900938	319
RIF-3-BSC/2X21	2900935	320
RIF-3-BSC/3X21	2900936	321
RIF-3-RPT-LDP-24DC/2X21	2903297	354
RIF-3-RPT-LDP-24DC/3X21	2903294	355
RIF-3-RPT-LV-120AC/2X21	2903296	354
RIF-3-RPT-LV-120AC/3X21	2903293	355
RIF-3-RPT-LV-230AC/2X21	2903295	354
RIF-3-RPT-LV-230AC/3X21	2903292	355
RIF-3-RSC-LDP-24DC/2X21	2903303	356
RIF-3-RSC-LDP-24DC/3X21	2903300	357
RIF-3-RSC-LV-120AC/2X21	2903302	356
RIF-3-RSC-LV-120AC/3X21	2903299	357
RIF-3-RSC-LV-230AC/2X21	2903301	356
RIF-3-RSC-LV-230AC/3X21	2903298	357
RIF-4-BPT/3X21	2900961	324
RIF-4-BSC/3X21	2900960	325
RIF-4-RPT-LDP-24DC/2X21	2903281	358
RIF-4-RPT-LDP-24DC/3X1	2903275	360
RIF-4-RPT-LDP-24DC/3X21	2903278	359
RIF-4-RPT-LV-120AC/2X21	2903280	358
RIF-4-RPT-LV-120AC/3X1	2903274	360
RIF-4-RPT-LV-120AC/3X21	2903277	359
RIF-4-RPT-LV-230AC/2X21	2903279	358
RIF-4-RPT-LV-230AC/3X1	2903273	360
RIF-4-RPT-LV-230AC/3X21	2903276	359
RIF-4-RSC-LDP-24DC/2X21	2903291	362
RIF-4-RSC-LDP-24DC/3X1	2903284	364
RIF-4-RSC-LDP-24DC/3X21	2903288	363
RIF-4-RSC-LV-120AC/2X21	2903290	362
RIF-4-RSC-LV-120AC/3X1	2903283	364
RIF-4-RSC-LV-120AC/3X21	2903287	363
RIF-4-RSC-LV-230AC/2X21	2903289	362
RIF-4-RSC-LV-230AC/3X1	2903282	364
RIF-4-RSC-LV-230AC/3X21	2903285	363
RIF-BR-12-230 AC	2907060	330
RIF-LDM-12-24 DC	2907057	330
RIF-LDP-110 DC	2900941	330
RIF-LDP-12-24 DC	2900939	330
RIF-LDP-48-60 DC	2900940	330
RIF-LV-12-24 UC	2900942	330
RIF-LV-120-230 AC/110 DC	2900944	330
RIF-LV-48-60 UC	2900943	330
RIF-LVM-100-200 AC/110 DC	2907058	330
RIF-RC-12-24 UC	2900949	330
RIF-RC-120-230 UC	2900951	330
RIF-RC-48-60 UC	2900950	330
RIF-RH-1	2900953	303
RIF-RH-1-H	2904468	303
RIF-RH-2	2900954	313
RIF-RH-3	2900955	319
RIF-RH-4	2900956	325
RIF-RHM-1	2905986	303
RIF-RHM-1-H	2905985	303
RIF-RHM-2	2905984	313
RIF-RHM-4	2905983	325
RIF-RHS-2	2908043	313
RIF-T3-24UC	2902647	274
RIF-V-12-24 UC	2900945	330
RIF-V-120-230 UC	2900948	330
RIF-V-48-60 UC	2900947	330

S

Type	Order No.	Page
SCK-C-MODBUS	2901674	258
SCK-M-I-4S-20A	2903242	259
SCK-M-I-8S-20A	2903241	259
SCK-M-U-1500V	2903591	259
SCK-RSD-100	2905029	254
SCK-RSD-400	2905030	255
SCK-RSD-600	2906273	255
SD FLASH 2GB EMLOG	2403484	214
SK 5,0 WH:REEL	0805221	105
SSA 3-6	2839295	172
SSA 5-10	2839512	172
ST-OV3- 24DC/400AC/3	2905417	448
ST-OV4- 24DC/ 24DC/1-PRO	2905572	449
ST-OV4- 24DC/ 24DC/4-PRO	2905585	449
ST-REL3-KG 24/ 1/SO38	2829564	446
ST-REL3-KG 24/21/AU/SO46	2826981	444
ST-REL3-KG 24/21/SO46	2826091	444
ST-REL3-KG120/21/AU/SO46	2829797	444
ST-REL3-KG120/21/SO46	2833026	444
ST-REL3-KG230/21/AU/SO46	2826266	444
ST-REL3-KG230/21/SO46	2832027	444
STP 5-2	0800967	366
SWD4-100LF-8-24 PXC	2903111	38
SWD4-3LF8-24-2S PXC	2903112	38
SWD4-8MF2 PXC	2903108	38
SWD4-8SF2-5 PXC	2903107	38
SWD4-8SFF2-5 PXC	2903109	38
SWD4-CRP-1 PXC	2903110	38

Type	Order No.	Page
SWD4-CRP-2 PXC	2903114	38
SWD4-RC8-10 PXC	2903106	38
SZF 1-0,6X3,5	1204517	424
T		
TC-2D37SUB-ADIO32-2EX-P-UNI	2904684	165
TC-2KS40-AI16-EX-PR-CS	2905677	525
TC-2KS40-AI16-EX-PR-RS	2905203	525
TC-2KS40-AI16-M-PRH-CS	2905257	524
TC-2KS40-AO16-EX-PR-CS	2905201	525
TC-2KS40-AO16-M-PRH-CS	2905905	524
TC-2KS40-AO8-EX-PR-RS	2905204	525
TC-2KS50-DI16-EX-PR-RS	2905202	525
TC-2KS50-DI32-2EX-PR-CS	2904676	525
TC-2KS50-DO16-ESD-AR-RS	2904113	525
TC-2KS50-DO16-EX-PR-RS	2905678	525
TC-2KS50-DO16-F&G-AR-RS	2904112	525
TC-2KS50-DO32-EX-PR-CS	2905199	525
TC-C-PSR3-SC-A10000A20000	2903389	525
TC-C-PSR3-SC-A10000A23132	2903390	525
TC-C-PSR3-SC-A100V+A20000	2903391	525
TC-C-PTSM-50-00000000J1J1	2903388	525
TC-D37SUB-ADIO16-EX-P-UNI	2924854	165
TC-D37SUB-ADIO16-MP-P-UNI	2906639	99
TC-D37SUB-AIO16-EX-PS-UNI	2902932	165
TC-D37SUB-AIO16-M-PS-UNI	2902934	166
TC-D37SUB-AIO16-MP-PS-UNI	2906640	99
TC-MACX-MCR-PTB	2904673	175
THERMAL FUSE TF104	2900796	40
U		
UC-EMLP (11X9)	0819291	177
UC-EMLP (11X9) CUS	0824547	177
UC-EMLP (15X5)	0819301	105
UC-EMLP (15X5) CUS	0824550	105
UCT-EM (30X5)	0801505	105
UCT-EM (30X5) CUS	0801589	105
UDK-RELG 4	2777056	449
UKK 5-2R/NAMUR	2941662	176
UM 25-D 9SUB/B/FRONT/Q	2959560	574
UM 25-D 9SUB/S/FRONT/Q	2959573	574
UM 25-D15SUB/B/FRONT/Q	2959586	574
UM 25-D15SUB/S/FRONT/Q	2959599	574
UM 25-D25SUB/B/FRONT/Q	2959609	574
UM 25-D25SUB/S/FRONT/Q	2959612	574
UM 45-D37SUB/B/FRONT/Q	2959625	574
UM 45-D37SUB/S/FRONT/Q	2959638	574
UM 45-D50SUB/B/FRONT/Q	2959641	574
UM 45-D50SUB/S/FRONT/Q	2959654	574
UM 45-DI/DO/S/LA/SIM8	2968205	535
UM 45-DO/LA/SIM8	2968195	535
UM- 8 RELS/KSR-G24/21/MT/PLC	2962463	541
UM- 8 RM/RT-G24/21/PLC	2968386	537
UM-16 RELS/KSR-G24/21/E/MT/PLC	2962379	541
UM-16 RELS/KSR-G24/21/MT/PLC	2962382	541
UM-2KS40/16AI/SI/RS/SO225	2319841	522
UM-2KS40/16AIO/RS/SO225	2319838	522
UM-2KS50/ 8DO/RS/MKDS	2900174	523
UM-2KS50/16DI/RS/MKDS	2900173	522
UM-2KS50/16DO/RS/MKDS	2900175	523
UM-2KS50/32IM/SI/BFI/YCS	2908402	519
UM-2KS50/32R/SI/J/ADV551/YCS	2908400	518
UM-2KS50/32R/SI/J/DO24V/YCS	2908399	518
UM-2KS50/DI16/RS/K-MT/SO241	2319618	522
UM-2KS50/DO16/RS/K-MT/SO241	2319595	523
UM-32 RM/RT-G24/21/PLC	2968373	537
UM-DELTA V/D/SI	5603255	483
UM-DELTAV/A/SI	5603256	483
UM-DELTAV/A/SI/BFI/TP	5603258	483
UM-DELTAV/D/SI/BFI/TP	5603257	483
UM-S95U/S7/FLK50/PLC	2907030	564
UMK- 8 RELS/KSR-G24/21-21/PLC	2976187	540
UMK- 8 RELS/KSR-G24/21/PLC	2974914	538
UMK- 8 RM/KSR-G 24/21/PLC	2979485	538
UMK- 8 RM/MR-G24/ 1/PLC	2979469	536
UMK- EC38/38-XOL	2976284	578
UMK- EC38/38-XOR	2976297	578
UMK- EC56/25/EX -FRONT 2,5V/L	2900115	581
UMK- EC56/25/EX -FRONT 2,5V/R	2900114	581
UMK- EC56/25/EX -L	2900113	581
UMK- EC56/25/EX -R	2900112	581
UMK- EC56/32-XOL	2975764	579
UMK- EC56/32-XOR	2975858	579
UMK- EC56/32-XUL	2975780	579
UMK- EC56/32-XUR	2975777	579
UMK- EC56/56-XOL	2975890	579
UMK- EC56/56-XOR	2975900	579
UMK- EC56/FRONT 2,5V/L	2976158	579
UMK- EC56/FRONT 2,5V/R	2976161	579
UMK- EC90/32/EX-XOL	2900110	580
UMK- EC90/32/EX-XOR	2900109	580
UMK- EC90/32/EX-XUL	2969071	580
UMK- EC90/32/EX-XUR	2969068	580
UMK- PVB	2971302	599
UMK- PVB 6	2972136	599
UMK-16 RELS/KSR-G24/21/E/PLC	2974891	539
UMK-16 RELS/KSR-G24/21/PLC	2974901	539
UMK-16 RM/KSR-G 24/21/E/PLC	2979508	539
UMK-16 RM/KSR-G 24/21/PLC	2979498	539
UMK-32 RM/MR-G24/1/PLC	2979472	536
URELG 3	2820136	444
UT 4-MTD-R/CVC 690/SET	2901667	14
V		
VFD 5007 IL IB	2701054	52
VFD 5015 IL IB	2701055	53
VFD 5022 IL IB	2701057	53
VFD 5040 IL IB	2701058	53
VIP-2/PT/2FLK14 (1-20) /S7	2903802	509
VIP-2/PT/2FLK14/AB-1756	2904288	475
VIP-2/PT/D 9SUB/F	2903778	572
VIP-2/PT/D 9SUB/F/LED	2904263	573
VIP-2/PT/D 9SUB/M	2903777	572
VIP-2/PT/D 9SUB/M/LED	2904258	573
VIP-2/PT/D15SUB/F	2903780	572
VIP-2/PT/D15SUB/F/LED	2904264	573
VIP-2/PT/D15SUB/M	2903779	572
VIP-2/PT/D15SUB/M/LED	2904259	573
VIP-2/PT/D37SUB/M	2904277	487
VIP-2/PT/D37SUB/M/SO	2904278	487
VIP-2/PT/FLK10	2903787	568
VIP-2/PT/FLK10/LED	2904248	569
VIP-2/PT/FLK14	2903788	568
VIP-2/PT/FLK14/8M/PLC	2904283	528
VIP-2/PT/FLK14/8P/PLC	2904284	528
VIP-2/PT/FLK14/LED	2904249	569
VIP-2/PT/FLK14/LED/PLC	2904279	526
VIP-2/PT/FLK14/PLC	2903801	526
VIP-2/PT/FLK16	2903789	568
VIP-2/PT/FLK16/LED	2904250	569
VIP-2/PT/FLK20	2903790	568
VIP-2/PT/FLK20/LED	2904251	569
VIP-2/PT/FLK50 (1-40) /S7	2903804	508
VIP-2/PT/FLK50/16/SLC500	2904287	477
VIP-2/PT/FLK50/AB-1756	2904286	474
VIP-2/PT/FLK50/LED/PLC	2904280	527
VIP-2/PT/FLK50/MODI-TSX/Q	2904285	474
VIP-2/PT/FLK50/PLC	2903803	527
VIP-2/PT/FLK50/S7/A-S400	2904289	508
VIP-2/PT/HD15SUB/F	2904272	576
VIP-2/PT/PDM-2/16/FU 6.3A	2903603	599
VIP-2/SC/2FLK14 (1-20) /S7	2315230	509
VIP-2/SC/2FLK14/AB-1756	2322333	475
VIP-2/SC/D 9SUB/F	2315162	570
VIP-2/SC/D 9SUB/F/LED	2322197	571
VIP-2/SC/D 9SUB/M	2315117	570
VIP-2/SC/D 9SUB/M/LED	2322142	571
VIP-2/SC/D15SUB/F	2315175	570
VIP-2/SC/D15SUB/F/LED	2322207	571
VIP-2/SC/D15SUB/M	2315120	570
VIP-2/SC/D15SUB/M/LED	2322155	571
VIP-2/SC/D37SUB/M	2900676	487
VIP-2/SC/D37SUB/M/SO	2900786	487
VIP-2/SC/FLK10	2315010	566
VIP-2/SC/FLK10/LED	2322045	567
VIP-2/SC/FLK14	2315023	566
VIP-2/SC/FLK14/8M/PLC	2322281	528
VIP-2/SC/FLK14/8P/PLC	2322294	528
VIP-2/SC/FLK14/LED	2322058	567
VIP-2/SC/FLK14/LED/PLC	2322249	526
VIP-2/SC/FLK14/PLC	2315214	526
VIP-2/SC/FLK16	2315036	566
VIP-2/SC/FLK16/LED	2322061	567
VIP-2/SC/FLK20	2315049	566
VIP-2/SC/FLK20/LED	2322074	567
VIP-2/SC/FLK50 (1-40) /S7	2315243	508
VIP-2/SC/FLK50/16/SLC500	2322320	477
VIP-2/SC/FLK50/AB-1756	2322317	474
VIP-2/SC/FLK50/LED/PLC	2322252	527
VIP-2/SC/FLK50/MODI-TSX/Q	2322304	474
VIP-2/SC/FLK50/PLC	2315227	527
VIP-2/SC/FLK50/S7/A-S400	2322359	508
VIP-2/SC/HD15SUB/F	2322401	576
VIP-2/SC/PDM-2/16	2315256	598
VIP-2/SC/PDM-2/24	2315269	598
VIP-2/SC/PDM-2/32	2315272	598
VIP-2/SC/PDM-2/48	2903717	598
VIP-3/PT/2FLK14/AN/2P/S7-1500A	2908465	513
VIP-3/PT/2FLK14/AN/2P/S7-1500B	2908846	513
VIP-3/PT/D25SUB/F	2903782	573
VIP-3/PT/D25SUB/F/LED	2904265	573
VIP-3/PT/D25SUB/M	2903781	573
VIP-3/PT/D25SUB/M/LED	2904260	573
VIP-3/PT/D37SUB/F	2903784	573
VIP-3/PT/D37SUB/F/LED	2904266	573
VIP-3/PT/D37SUB/M	2903783	573
VIP-3/PT/D37SUB/M/HW/C300	2904276	487
VIP-3/PT/D37SUB/M/LED	2904261	573
VIP-3/PT/D50SUB/F	2903786	573
VIP-3/PT/D50SUB/F/LED	2904267	573
VIP-3/PT/D50SUB/M	2903785	573
VIP-3/PT/D50SUB/M/LED	2904262	573
VIP-3/PT/FLK14/8IM/LED/PLC	2904281	531
VIP-3/PT/FLK14/8IM/PLC	2904282	531
VIP-3/PT/FLK26	2903791	569
VIP-3/PT/FLK26/LED	2904252	569
VIP-3/PT/FLK34	2903792	569
VIP-3/PT/FLK34/LED	2904253	569
VIP-3/PT/FLK40	2903793	569
VIP-3/PT/FLK40/LED	2904254	569
VIP-3/PT/FLK50	2903794	569
VIP-3/PT/FLK50/AN/2P/S7-1500	2908499	512
VIP-3/PT/FLK50/AN/S7-1500	2908496	512
VIP-3/PT/FLK50/LED	2904255	569
VIP-3/PT/FLK60	2903795	569
VIP-3/PT/FLK60/LED	2904256	569
VIP-3/PT/FLK64	2903796	569
VIP-3/PT/FLK64/LED	2904257	569
VIP-3/PT/HD26SUB/F	2904273	576
VIP-3/PT/HD26SUB/M	2904269	576
VIP-3/PT/HD44SUB/F	2904274	576
VIP-3/PT/HD44SUB/M	2904270	576
VIP-3/PT/HD62SUB/F	2904275	576
VIP-3/PT/HD62SUB/M	2904271	576
VIP-3/PT/PDM-2/16	2903797	598
VIP-3/PT/PDM-2/24	2903798	598
VIP-3/PT/PDM-2/32	2903799	598
VIP-3/PT/PDM-2/48	2903800	598
VIP-3/PT/RJ45	2904290	577
VIP-3/SC/2FLK14/AN/2P/S7-1500A	2908464	513
VIP-3/SC/2FLK14/AN/2P/S7-1500B	2908845	513
VIP-3/SC/D25SUB/F	2315188	571
VIP-3/SC/D25SUB/F/LED	2322210	571
VIP-3/SC/D25SUB/M	2315133	571
VIP-3/SC/D25SUB/M/LED	2322168	571
VIP-3/SC/D37SUB/F	2315191	571
VIP-3/SC/D37SUB/F/LED	2322223	571
VIP-3/SC/D37SUB/M	2315146	571
VIP-3/SC/D37SUB/M/HW/C300	2900675	487
VIP-3/SC/D37SUB/M/LED	2322171	571
VIP-3/SC/D50SUB/F	2315201	571
VIP-3/SC/D50SUB/F/LED	2322236	571
VIP-3/SC/D50SUB/M	2315159	571
VIP-3/SC/D50SUB/M/LED	2322184	571
VIP-3/SC/FLK14/8IM/LED/PLC	2322265	531
VIP-3/SC/FLK14/8IM/PLC	2322278	531
VIP-3/SC/FLK26	2315052	567
VIP-3/SC/FLK26/LED	2322087	567
VIP-3/SC/FLK34	2315065	567
VIP-3/SC/FLK34/LED	2322090	567
VIP-3/SC/FLK40	2315078	567
VIP-3/SC/FLK40/LED	2322100	567
VIP-3/SC/FLK50	2315081	567
VIP-3/SC/FLK50/AN/2P/S7-1500	2908497	512
VIP-3/SC/FLK50/AN/S7-1500	2908495	512
VIP-3/SC/FLK50/LED	2322113	567
VIP-3/SC/FLK60	2315094	567
VIP-3/SC/FLK60/LED	2322126	567
VIP-3/SC/FLK64	2315104	567
VIP-3/SC/FLK64/LED	2322139	567
VIP-3/SC/HD26SUB/F	2322414	576
VIP-3/SC/HD26SUB/M	2322375	576
VIP-3/SC/HD44SUB/F	2322427	576
VIP-3/SC/HD44SUB/M	2322388	576
VIP-3/SC/HD62SUB/F	2322430	576
VIP-3/SC/HD62SUB/M	2322391	576
VIP-3/SC/RJ45	2900701	577
VIP-8RPT-120AC/1AU/DI/PLC	2904576	543
VIP-8RPT-24DC/1AU/DI/PLC	2903600	543
VIP-8RPT-24DC/21/DO/FU/PLC	2903601	542
VIP-CAB-FLK10-0,14/...	2318376	582
VIP-CAB-FLK10/0,14/1,0M	2318318	582
VIP-CAB-FLK10/0,14/2,0M	2318334	582
VIP-CAB-FLK10/0,14/3,0M	2318347	582
VIP-CAB-FLK14-0,14/...	2318457	582
VIP-CAB-FLK14/0,14/1,0M	2318392	582
VIP-CAB-FLK14/0,14/2,0M	2318415	582
VIP-CAB-FLK14/0,14/3,0M	2318428	582
VIP-CAB-FLK14/AXIO/0,14/0,5M	2901604	491
VIP-CAB-FLK14/AXIO/0,14/1,0M	2901605	491
VIP-CAB-FLK14/AXIO/0,14/1,5M	2901606	491
VIP-CAB-FLK14/AXIO/0,14/2,0M	2901607	491
VIP-CAB-FLK14/AXIO/0,14/2,5M	2901608	491
VIP-CAB-FLK14/AXIO/0,14/3,0M	2901609	491
VIP-CAB-FLK14/AXIO/0,14/4,0M	2901610	491
VIP-CAB-FLK14/AXIO/0,14/6,0M	2901611	491
VIP-CAB-FLK14/FR/OE/0,14/0,5M	2900122	584
VIP-CAB-FLK14/FR/OE/0,14/1,0M	2900123	584
VIP-CAB-FLK14/FR/OE/0,14/1,5M	2900125	584
VIP-CAB-FLK14/FR/OE/0,14/2,0M	2900126	584
VIP-CAB-FLK14/FR/OE/0,14/3,0M	2900127	584
VIP-CAB-FLK16/FR/OE/0,14/0,5M	2900130	584
VIP-CAB-FLK16/FR/OE/0,14/1,0M	2900131	584
VIP-CAB-FLK16/FR/OE/0,14/1,5M	2900132	584
VIP-CAB-FLK16/FR/OE/0,14/2,0M	2900133	584
VIP-CAB-FLK16/FR/OE/0,14/3,0M	2900134	584
VIP-CAB-FLK20/FR/OE/0,14/1,0M	2900139	585
VIP-CAB-FLK20/FR/OE/0,14/2,0M	2900142	585
VIP-CAB-FLK20/FR/OE/0,14/3,0M	2900143	585
VIP-CAB-FLK40-0,14/...	2318855	582
VIP-CAB-FLK40/0,14/1,0M	2318790	582
VIP-CAB-FLK40/0,14/2,0M	2318813	582
VIP-CAB-FLK40/0,14/3,0M	2318826	582
VIP-PA-FLK14-S7/...	2900887	501
VIP-PA-FLK14/ 0,5M/S7	2322663	501
VIP-PA-FLK14/ 1,0M/S7	2322676	501
VIP-PA-FLK14/ 1,5M/S7	2322689	501
VIP-PA-FLK14/ 2,0M/S7	2321790	501
VIP-PA-FLK14/ 2,5M/S7	2322692	501
VIP-PA-FLK14/ 3,0M/S7	2322702	501
VIP-PA-FLK14/ 4,0M/S7	2322715	501
VIP-PA-FLK14/ 5,0M/S7	2322728	501
VIP-PA-FLK14/ 6,0M/S7	2322731	501
VIP-PA-FLK14/ 7,0M/S7	2322744	501
VIP-PA-FLK14/ 8,0M/S7	2322757	501
VIP-PA-FLK14/10,0M/S7	2322760	501
VIP-PA-FLK50-4X14-S7/...	2900886	501
VIP-PA-FLK50-S7/...	2900885	500
VIP-PA-FLK50/ 0,5M/S7	2322443	500
VIP-PA-FLK50/ 1,0M/S7	2322456	500
VIP-PA-FLK50/ 1,5M/S7	2322469	500
VIP-PA-FLK50/ 2,0M/S7	2321800	500

Type	Order No.	Page
VIP-PA-FLK50/ 2,5M/S7	2322472	500
VIP-PA-FLK50/ 3,0M/S7	2322485	500
VIP-PA-FLK50/ 4,0M/S7	2322498	500
VIP-PA-FLK50/ 5,0M/S7	2322508	500
VIP-PA-FLK50/ 6,0M/S7	2322511	500
VIP-PA-FLK50/ 7,0M/S7	2322524	500
VIP-PA-FLK50/ 8,0M/S7	2322537	500
VIP-PA-FLK50/10,0M/S7	2322540	500
VIP-PA-FLK50/4X14/ 0,5M/S7	2322553	501
VIP-PA-FLK50/4X14/ 1,0M/S7	2322566	501
VIP-PA-FLK50/4X14/ 1,5M/S7	2322579	501
VIP-PA-FLK50/4X14/ 2,0M/S7	2321910	501
VIP-PA-FLK50/4X14/ 2,5M/S7	2322582	501
VIP-PA-FLK50/4X14/ 3,0M/S7	2322595	501
VIP-PA-FLK50/4X14/ 4,0M/S7	2322605	501
VIP-PA-FLK50/4X14/ 5,0M/S7	2322618	501
VIP-PA-FLK50/4X14/ 6,0M/S7	2322621	501
VIP-PA-FLK50/4X14/ 7,0M/S7	2322634	501
VIP-PA-FLK50/4X14/ 8,0M/S7	2322647	501
VIP-PA-FLK50/4X14/10,0M/S7	2322650	501
VIP-PA-PWR/20XOE/ 1,0M/S7	2904724	499
VIP-PA-PWR/20XOE/ 2,0M/S7	2904725	499
VIP-PA-PWR/20XOE/ 3,0M/S7	2904726	499
VIP-PA-PWR/20XOE/ 4,0M/S7	2904727	499
VIP-PA-PWR/20XOE/ 6,0M/S7	2904728	499
VIP-PA-PWR/20XOE/ 8,0M/S7	2904729	499
VIP-PA-PWR/20XOE/10,0M/S7	2904730	499
VIP-PA-PWR/20XOE/HF/ 1,0M/S7	2908916	499
VIP-PA-PWR/20XOE/HF/ 2,0M/S7	2908915	499
VIP-PA-PWR/20XOE/HF/ 3,0M/S7	2908914	499
VIP-PA-PWR/20XOE/HF/ 4,0M/S7	2908913	499
VIP-PA-PWR/20XOE/HF/ 6,0M/S7	2908912	499
VIP-PA-PWR/20XOE/HF/ 8,0M/S7	2908911	499
VIP-PA-PWR/20XOE/HF/10,0M/S7	2908910	499
VIP-PA-PWR/2X10 PT/ 0,5M/S7	2905528	497
VIP-PA-PWR/2X10 PT/ 1,0M/S7	2905529	497
VIP-PA-PWR/2X10 PT/ 1,5M/S7	2905531	497
VIP-PA-PWR/2X10 PT/ 2,0M/S7	2905532	497
VIP-PA-PWR/2X10 PT/ 2,5M/S7	2905533	497
VIP-PA-PWR/2X10 PT/ 3,0M/S7	2905534	497
VIP-PA-PWR/2X10 PT/ 4,0M/S7	2905535	497
VIP-PA-PWR/2X10 PT/ 5,0M/S7	2905536	497
VIP-PA-PWR/2X10 PT/ 6,0M/S7	2905537	497
VIP-PA-PWR/2X10 PT/ 8,0M/S7	2905538	497
VIP-PA-PWR/2X10 PT/10,0M/S7	2905539	497
VIP-PA-PWR/2X10COMBI/ 0,5M/S7	2904713	497
VIP-PA-PWR/2X10COMBI/ 1,0M/S7	2904714	497
VIP-PA-PWR/2X10COMBI/ 1,5M/S7	2904715	497
VIP-PA-PWR/2X10COMBI/ 2,0M/S7	2904716	497
VIP-PA-PWR/2X10COMBI/ 2,5M/S7	2904717	497
VIP-PA-PWR/2X10COMBI/ 3,0M/S7	2904718	497
VIP-PA-PWR/2X10COMBI/ 4,0M/S7	2904719	497
VIP-PA-PWR/2X10COMBI/ 5,0M/S7	2904720	497
VIP-PA-PWR/2X10COMBI/ 6,0M/S7	2904721	497
VIP-PA-PWR/2X10COMBI/ 8,0M/S7	2904722	497
VIP-PA-PWR/2X10COMBI/10,0M/S7	2904723	497
VIP-PA-PWR/40XOE/ 1,0M/S7	2904731	498
VIP-PA-PWR/40XOE/ 2,0M/S7	2904732	498
VIP-PA-PWR/40XOE/ 3,0M/S7	2904733	498
VIP-PA-PWR/40XOE/ 4,0M/S7	2904734	498
VIP-PA-PWR/40XOE/ 6,0M/S7	2904735	498
VIP-PA-PWR/40XOE/ 8,0M/S7	2904736	498
VIP-PA-PWR/40XOE/10,0M/S7	2904737	498
VIP-PA-PWR/40XOE/HF/ 1,0M/S7	2908909	499
VIP-PA-PWR/40XOE/HF/ 2,0M/S7	2908908	499
VIP-PA-PWR/40XOE/HF/ 3,0M/S7	2908907	499
VIP-PA-PWR/40XOE/HF/ 4,0M/S7	2908905	499
VIP-PA-PWR/40XOE/HF/ 6,0M/S7	2908904	499
VIP-PA-PWR/40XOE/HF/ 8,0M/S7	2908903	499
VIP-PA-PWR/40XOE/HF/10,0M/S7	2908902	499
VIP-PA-PWR/4X10 PT/ 0,5M/S7	2905516	496
VIP-PA-PWR/4X10 PT/ 1,0M/S7	2905517	496
VIP-PA-PWR/4X10 PT/ 1,5M/S7	2905518	496
VIP-PA-PWR/4X10 PT/ 2,0M/S7	2905519	496
VIP-PA-PWR/4X10 PT/ 2,5M/S7	2905520	496
VIP-PA-PWR/4X10 PT/ 3,0M/S7	2905521	496
VIP-PA-PWR/4X10 PT/ 4,0M/S7	2905522	496
VIP-PA-PWR/4X10 PT/ 5,0M/S7	2905523	496
VIP-PA-PWR/4X10 PT/ 6,0M/S7	2905524	496
VIP-PA-PWR/4X10 PT/ 8,0M/S7	2905525	496
VIP-PA-PWR/4X10 PT/10,0M/S7	2905526	496
VIP-PA-PWR/4X10COMBI/ 0,5M/S7	2904702	496
VIP-PA-PWR/4X10COMBI/ 1,0M/S7	2904703	496
VIP-PA-PWR/4X10COMBI/ 1,5M/S7	2904704	496
VIP-PA-PWR/4X10COMBI/ 2,0M/S7	2904705	496
VIP-PA-PWR/4X10COMBI/ 2,5M/S7	2904706	496
VIP-PA-PWR/4X10COMBI/ 3,0M/S7	2904707	496
VIP-PA-PWR/4X10COMBI/ 4,0M/S7	2904708	496
VIP-PA-PWR/4X10COMBI/ 5,0M/S7	2904709	496
VIP-PA-PWR/4X10COMBI/ 6,0M/S7	2904710	496
VIP-PA-PWR/4X10COMBI/ 8,0M/S7	2904711	496
VIP-PA-PWR/4X10COMBI/10,0M/S7	2904712	496
VIP-PT/FLK16/DS/FU/LED/AN/DV	2903599	482
VIP/S/BASE 3L DIVIDER	2907715	553
VIP/S/D25M/BASE 1-8/L/EX	2906595	552
VIP/S/MC/BASE 1-8/L/C/EX	2907186	553
VIP/S/MC/BASE 1-8/L/EX	2906596	553
VIP/S/MC/BASE 17-24/L/C/EX	2907209	553
VIP/S/MC/BASE 17-24/L/EX	2907024	553
VIP/S/MC/BASE 25-32/L/C/EX	2907210	553
VIP/S/MC/BASE 25-32/L/EX	2907025	553
VIP/S/MC/BASE 9-16/L/C/EX	2907187	553
VIP/S/MC/BASE 9-16/L/EX	2906630	553
VIP/U/RAIL 3L DIVIDER	2908555	553
VS-937/...	1402611	50

Z

Type	Order No.	Page
ZB 15:UNBEDRUCKT	0811972	366
ZB 5 :UNBEDRUCKT	1050004	366
ZB 6,LGS:FORTL.ZAHLEN	1051016	424
ZB 6:UNBEDRUCKT	1051003	366

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Romania
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