

ifm electronic



Temperature sensors from ifm. A selection guide.

Temperature sensors
www.ifm.com



Systems for temperature monitoring. The optimum solution for every requirement.

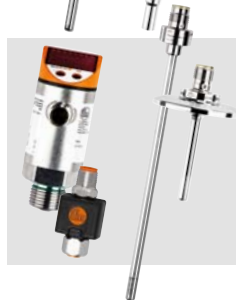
Temperature sensors in
contact with the medium



Compact temperature
sensors for
industrial applications



Compact temperature
sensors for
hygienic applications



Temperature sensors –
the modular concept for
industrial and
hygienic applications



Accessories

Non-contact
temperature sensors



Infrared temperature
sensors for hot objects



	Sensor type	Max. measuring range [°C]	Max installation depth [mm]	Display	Sensor with integrated evaluation	Separate control monitor	PT100 with process connection	PT100 / PT1000 probe	PT100 / PT1000 cable sensor	
TA	-50...150	150	✓						4 - 5	Industrial applications
TN	-40...150	45	✓	✓						
TK	-25...140	270		✓						
TA	-50...200	150		✓					6 - 7	Hygienic applications
TD	-50...150	350	✓	✓						
TAD	-25...160	87.5		✓						
TR	-40...300		✓		✓				8 - 11	The modular concept
TP	-50...300				✓					
TM	-40...150	250				✓				
TS	-50...250	45					✓			
TT	-40...150	560				✓				
									12 - 13	Accessories
TW Detecting system	50...1350		✓	✓					14 - 15	Infrared
TW Measuring system	0...2500		✓	✓						



For industrial applications

Compact:

Sensor and evaluation in one unit.

Versatile:

Compact sensors with and without display.

Robust:

High pressure resistance up to 400 bar.

Simple:

Setting via setting ring, setting menu or IO-Link.

Precise:

High accuracy thanks to use of PT elements of accuracy class A.

Flexible:

Different process connections and installation depths.



Type TK temperature sensor

Easy adjustment via two setting rings allowing optimum read-out.
Different process connections and installation depths.
Mechanical lock to prevent accidental adjustment.
T05 / T09: 1 / 3 s.
Pressure-resistant up to 300 bar.



Process connection	Installation depth [mm]	Output function	Order no.
Measuring range [°C]			-25...140
G 1/4	39	NO / NC complementary	TK6130
G 1/4	39	2 x NO	TK7130
G 1/2	267	1 x NO / 1 x NC	TK7480

Type TN temperature sensor

Easy setting via display and pushbuttons on the unit.
Scalable analogue output 4...20 mA / 0...10 V.
Freely configurable switching output.
IO-Link.
T05 / T09: 1 / 3 s.
Pressure-resistant up to 300 bar.



PT100 / PT1000 sensors
pages 8 - 11

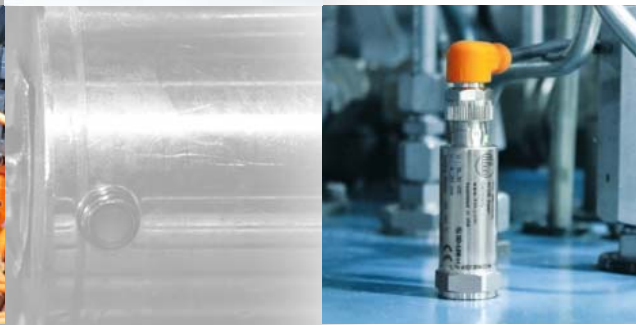
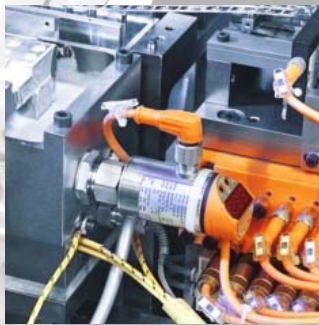


Accessories
Process adapters,
thermowells
pages 12 - 13



The compact units. Temperature sensors for industrial applications.

Technical data and prices?
at www.ifm.com



Industrial applications

Hygienic applications



Process connection	Installation depth [mm]	Output function	Order no.
Measuring range [°C]			-40...150
Internal thread M18 x 1.5	45	Switching, analogue 4...20 mA or 0...10 V	TN2531
Internal thread M18 x 1.5	45	2 switching outputs	TN7531

Type TA temperature transmitter
Operating status indication via LED.
Scalable analogue output 4...20 mA.
IO-Link.
T05 / T09: 1 / 3 s.
Pressure-resistant up to 400 bar.



Process connection	Installation depth [mm]	Order no.	Order no.
Measuring range [°C]		-50...150	
Factory setting [°C]		-50...150	0...100
G 1/2	30	TA2405	-
	50	TA2415	TA2417
	100	TA2435	TA2437
	150	TA2445	TA2447
G 1/4	25	TA2105	-
	50	TA2115	-
	100	TA2135	-
	150	TA2145	-

The modular concept

Accessories

Infrared



**For hygienic areas
and viscous media**

Compact:

Sensor and transmitter
in one unit.

Hygienic:

Ingress resistance, materials
and approvals comply with
hygiene requirements.

Fast:

Response times ≤ 0.5 s.

Simple:

Preset measuring ranges,
configurable via IO-Link.

Precise:

High accuracy thanks to
use of PT elements of accuracy
class A.

Flexible:

Different process connections
and installation depths.



**Self-monitoring
temperature trans-
mitter type TAD**

Integrated drift
detection.

Free 5-point
calibration
certificate.

Cost savings
possible through
reduced calibra-
tion intervals.

Diagnostic and
backup function.

Scalable
analogue output
4...20 mA.

IO-Link.

T05 / T09: 3 / 6 s.



Process connection	Installation depth [mm]	Order no.
Measuring range [°C]		-25...160
Factory setting [°C]		0...150
G 1/2 with sealing cone	50	TAD091
	87.5	TAD191
	33	TAD991
G1 male Aseptoflex Vario	50	TAD081
	87.5	TAD181
	33	TAD981

**Type TA tempera-
ture transmitter**

Operating status
indication via LED

Scalable
analogue output
4...20 mA.

Hygienic process
connections.

Installation depths
of 25 to 150 mm.

IO-Link.

T05 / T09:
< 0.5 / < 2 s.



Process connection
Measuring range [°C]
Factory setting [°C]
Ø 6 mm
G 1/2 with sealing cone
Tri-clamp 3/4"
Tri-clamp 1.5"



PT100 / PT1000
sensors
pages 8 - 11



Accessories
Process
adapters,
thermowells
pages 12 - 13



Compact units. Temperature sensors for hygienic areas.



Industrial applications

Hygienic applications

Installation depth [mm]	Order no.	Order no.
Measuring range [°C]	-50...200	0...100
Setting [°C]	0...200	-
50	TA2212	-
100	TA2232	-
150	TA2242	-
Flush mount	-	TA3597
30	TA2502	-
50	TA2512	-
100	TA2532	-
150	TA2542	-
25	TA2002	-
60	TA2012	-
30	TA2802	-
50	TA2812	-
100	TA2832	-
150	TA2842	-

Type TD temperature transmitter with display
 4-digit LED display.
 Scalable analogue output 4...20 mA.
 Hygienic process connections.
 Installation depths of 30 to 350 mm.
 IO-Link.
 T05 / T09: 1 / 3 s.



Process connection	Installation depth [mm]	Order no.	Order no.
Measuring range [°C]		-50...150	
Factory setting [°C]		-10...150	0...100
Ø 6 mm	50	TD2211	TD2217
	100	TD2231	TD2237
	150	TD2241	TD2247
	200	TD2251	TD2257
	250	TD2261	TD2267
	300	TD2271	TD2277
G 1/2 with sealing cone	350	TD2291	TD2297
	30	TD2501	TD2507
	50	TD2511	TD2517
	100	TD2531	TD2537
	150	TD2541	TD2547
Clamp 1.5"	30	TD2801	TD2807
	50	TD2811	TD2817
	100	TD2831	TD2837
Tri-clamp 2"	150	TD2841	TD2847
	30	TD2901	TD2907
	50	TD2911	TD2917
	100	TD2931	TD2937
	150	TD2941	TD2947

The modular concept

Accessories

Infrared



For industrial applications



For hygienic areas and viscous media

Individual:

Configure your measurement system according to your requirements.

Suitable:

Broad range of combination options.

Visual:

Evaluation units with or without LED display.

Flexible:

Different process connections and installation depths.

Far reaching:

Measuring ranges from -50 to 250 °C.

Convenient:

Thermowells allow replacement of the sensors in a live process.



Evaluation unit

Mounting

Direct connection to the process

Want to find a suitable sensor online?
www.ifm.com

Temperature probe



Accessories
Process adapters,
thermowells
pages 12 - 13



The modular concept.

Temperature sensors for industrial and hygienic applications.



Type TR evaluation unit
4-digit LED display.
Scalable analogue output 4...20 mA / 0...10 V.
Freely configurable switching output.
Automatic detection of the temperature probe.



Type TP measured signal converter
Operating status indication via LED.
Scalable analogue output 4...20 mA.
Minimised installation and error sources.
High vibration resistance.



Mounting set



Connection cable up to 30 m

Direct connection to the process



PT100 / PT1000 type TT probe sensor
For industrial and hygienic applications.
Different installation depths up to 560 mm.
Protection rating IP 67.
Measuring probes \varnothing 6 and 10 mm.



PT100 / PT1000 type TS cable sensors
Measuring probes \varnothing 5, 6 and 10 mm.
Screw-in sensors in M5 and M6 sizes.
Bolt-on sensor for M6 and M10 screws.
Temperature probes for the ATEX zone.
Different cable materials.
Protection rating IP 67.



PT100 with process connection type TM
Industrial and hygienic process connections.
Different installation depths up to 250 mm.
High protection IP 68 / IP 69K.
Measuring probe \varnothing 6 mm.
Accuracy class A.
Pressure resistance up to 160 bar.



Industrial applications

Hygienic applications

The modular concept

Accessories

Infrared



For industrial applications



For hygienic areas and viscous media

Need a suitable socket?
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Type TR evaluation unit



Process connection	Measuring range [°C]	Output function	Order no.
G 1/2	-40...300	Analogue output, switching output 4...20 mA or 0...10 V	TR2432
G 1/2	-40...300	2 switching outputs	TR7432



TR evaluation with E30017 mounting set on PT100 / PT1000 probe sensors type TT



Connection cables (selection)

Plug / socket	Cable length [m]	Order no.
Industrial applications		
Straight / angled	1	EVC017
	5	EVC019
Angled / straight	1	EVC027
	5	EVC029
Angled / angled	1	EVC032
	5	EVC034
Straight / straight	1	EVC012
	5	EVC014
Hygienic applications		
Straight / straight, hygienic	1	EVT042
	5	EVT044

More options at www.ifm.com

PT100 / PT1000 type TT probe sensor



Sensor element	Ø probe [mm]	Installation depth [mm]	Order no.
Industrial applications			
Measuring range [°C] -40...150			
PT100	6	50	TT9281
	6	100	TT0281
	6	150	TT1281
	6	250	TT2281
	6	350	TT3281
PT100	10	160	TT1081
	10	260	TT2081
	10	360	TT3081
PT1000	10	560	TT5081
	10	150	TT1050
	10	260	TT2050
	10	360	TT3050
10	650	TT5050	
Hygienic applications			
Measuring range [°C] -40...150			
PT100	6	50	TT9291
	6	100	TT0291
	6	150	TT1291
	6	250	TT2291
	6	350	TT3291

PT100 with process connection type TM





The modular concept.

Temperature sensors for industrial and hygienic applications.

Type TP
measured signal
converter



Factory setting [°C]	Connection	Output function	Order no.
-50...150	M12 connector	Analogue output 4...20 mA	TP3231
-50...300			TP3232
0...100			TP3237
0...100	M12 connector	Analogue output 0...10 V	TP9237

TR or TP evaluation
with connection cable
on PT100 / PT1000 sensors
types TM, TT or TS

Direct connection
TR or TP evaluation
on PT100 / PT1000
cable sensors type TS

Direct connection
TP evaluation
on PT100 / PT1000
probe sensors type TT
or TM

Industrial applications

Hygienic applications

The modular concept

Accessories

Infrared

Process connection	Measuring range [°C]	Installation depth [mm]	Order no.
Industrial applications			
G 1/4	-40...150	25	TM4101
	-40...150	50	TM4411
G 1/2	-40...150	100	TM4431
	-40...150	150	TM4441
	-40...150	250	TM4461
Internal thread M18 x 1.5	-40...125	60	TM9900
	-40...125	60	TM9950
Hygienic applications			
G 1/2 with sealing cone	-40...150	20	TM4591
	-40...150	30	TM4501
	-40...150	50	TM4511
	-40...150	100	TM4531
	-40...150	150	TM4541
Clamp 1 - 1.5"	-40...150	30	TM4801
	-40...150	50	TM4811
	-40...150	100	TM4831
Clamp 2"	-40...150	150	TM4841
	-40...150	30	TM4901
	-40...150	50	TM4911
G 1/2 with sealing cone	-40...150	100	TM4931
	-40...150	150	TM4941
	-50...140	Flush mount	TM4599

PT100 / PT1000
type TS
cable sensors



Process connection	Measuring range [°C]	Cable / plug length [m]	Order no.
Ø 5 mm ATEX	-20...80	Silicone / - / 3	TS325A
	-40...90	PUR / M12 / 2	TS2289
	-40...90	PUR / M12 / 2.5	TS9289
Ø 6 mm	-40...90	PUR / M12 / 5	TS5289
	-50...250	PTFE / M12 / 0.15	TS9256
	-50...250	PTFE / M12 / 2	TS2256
Ø 10 mm	-40...90	PUR / M12 / 2	TS2089
	-40...90	PUR / M12 / 5	TS5089
	-50...250	PTFE / M12 / 2	TS2056
Contact sensor 12 x 8.7 x 51 mm	-25...90	PUR / M12 / 2	TS2229
Contact sensor 12.5 x 8.7 x 47 mm	-25...90	PUR / - / 2	TS2239
Contact sensor ATEX 10 x 18 x 48 mm	-20...115	Silicone / - / 5	TS502A¹⁾
Contact sensor ATEX 10 x 10 x 42 mm	-20...115	Silicone / - / 5	TS522A
Screw-in sensor M5	-40...90	PUR / M12 / 2	TS2789
	-30...180	Silicone / M12 / 2	TS2759
	-30...180	Silicone / - / 4	TS4759
Screw-in sensor M6	-30...180	Silicone / M12 / 10	TS0759
	-30...180	PUR / M12 / 2	TS2689
Screw-in sensor M6	-40...90	Silicone / M12 / 2	TS2659

¹⁾PT1000 sensor element



For industrial applications



For hygienic areas and viscous media



Progressive ring fitting

①



Clamp fitting

②

No.	Device connection	Process connection	For sensor type				Order no.
Industrial applications							
①	Ø 6 mm	G 1/2	-	-	-	TT	E30047
	Ø 10 mm	1/2" NPT	-	-	-	TT	E30016
		1/2" NPT	-	-	-	TT	E20024
②	6 / 8 / 10 mm	G 1/2	TA	TD	TS	TT	E30016
		1/2" NPT	TA	TD	TS	TT	E30016

No.	Device connection	Process connection	Installation depth [mm]	Order no.	For sensor type			
Industrial applications								
④	G 1/2	G 1/2	27	E37600	TA2415	-	TM4411	TT0281 ¹⁾
			74	E37610	TA2435	-	TM4431	TT1281 ¹⁾
			82	E35010	-	-	-	TT1081 ¹⁾
			124	E37620	TA2445	-	TM4441	TT2281 ¹⁾
			182	E35020	-	-	-	TT2081 ¹⁾
			224	E37640	-	-	TM4461	TT3281 ¹⁾
			282	E35030	-	-	-	TT3081 ¹⁾
			482	E35040	-	-	-	TT5081 ¹⁾
⑤	Ø 6 mm	G 1/2	33	E37603	TA2212	TD221x	-	TT9281
			83	E37613	TA2232	TD223x	-	TT0281
			120	E37623	TA2242	TD224x	-	TT1281
			233	E37643	-	TD226x	-	TT2281
			333	E37663	-	TD229x	-	TT3281
Industrial applications / Hygienic applications								
⑥	1/2 NPS	Ø 38.1 mm	191	E37430	-	TD226x ¹⁾	-	TT3281 ¹⁾
			267	E37450	-	TD229x ¹⁾	-	TT3281 ¹⁾

In connection with: ¹⁾Adapter E30018 / E30047



No.	Design	Device connection	Process connection	Order no.	For sensor type			
⑩	Stainless steel adapter	M18 x 1.5	G 1/2	E30073	-	-	TM	TN
	Titanium adapter	M18 x 1.5	G 1/2	E40114	-	-	TM	TN
	Hastelloy adapter	M18 x 1.5	G 1/2s	E40175	-	-	TM	TN
	Brass adapter	M18 x 1.5	G 1/4	E40097	-	-	TM	TN
	Plastic adapter	M18 x 1.5	Ø 23 mm	E40138	-	-	TM	TN
⑪	Ball 24.7 mm	Ø 6 mm	Clamp adapter	E30108	TA	TD	-	TT
	Ball 25 mm	Ø 6 mm	Clamp adapter	E30407	TA	TD	-	TT





Accessories.

Process adapters and thermowells for temperature sensors in industrial and hygienic applications.

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No.	Device connection	Process connection	For sensor type				Order no.
Hygienic applications							
③	Ø 6 mm	G 1/2	TA	TD	-	TT	E30144



Clamp adapter



⑦
Screw-in thermowell

⑨
Clamp thermowell

No.	Device connection	Process connection	Installation depth [mm]	Order no.	For sensor type			
Hygienic applications								
⑦	G 1/2 with sealing cone	G 1/2 with sealing cone	68	E37511	TA2532	TD253x	TM4531	TT1281 ²⁾
			118	E37521	TA2542	TD254x	TM4541	TT2281 ²⁾
⑧	G 1/2 with sealing cone	Ø 34 mm	49	E37411	TA2512	TD251x	TM4511	TT0291 ²⁾
			99	E37421	TA2532	TD253x	TM4531	TT1291 ²⁾
			149	E37431	TA2542	TD254x	TM4541	TT2291 ²⁾
⑨	1/2" NPS ³⁾	1.5"	64	E37810	TA2435 TA2333	TD224x ¹⁾	TM4431 TM4331	TT1291 ¹⁾
			115	E37820	TA2445 TA2343	TD225x ¹⁾	TM4441 TM4341	TT2291 ¹⁾
			191	E37830	-	TD227x ¹⁾	-	TT3291 ¹⁾
			267	E37850	-	TD229x ¹⁾	-	TT3291 ¹⁾
⑨	1/2" NPS ³⁾	2"	64	E37910	TA2435 TA2333	TD224x ¹⁾	TM4431 TM4331	TT1291 ¹⁾
			115	E37920	TA2445 TA2343	TD225x ¹⁾	TM4441 TM4341	TT2291 ¹⁾
			191	E37930	-	TD227x ¹⁾	-	TT3291 ¹⁾
			267	E37950	-	TD229x ¹⁾	-	TT3291 ¹⁾

In connection with: ¹⁾Adapter E30018 / E30047; ²⁾Adapter E30144; ³⁾suitable for G 1/2 and 1/2" NPT

No.	Design / Device connection	Process connection	Order no.	For sensor type
⑫	Metal-to-metal seal / G1 Aseptoflex Vario	Clamp 1 - 1.5"	E33701	TAD
		DIN 11851 DN32	E33711	TAD
		Varivent DN25	E33721	TAD
		SMS DN40	E33731	TAD
⑫	Sealing by O-ring / G1 Aseptoflex Vario	Clamp 1 - 1.5"	E33201	TAD
		DIN 11851 DN32	E33211	TAD
		Varivent DN25	E33221	TAD
		DN/OD33.7	E33304	TAD
		DRD Flansch	E33242	TAD

No.	Design / Device connection	Process connection	Order no.	For sensor type
⑫	Metal-to-metal seal / G 1/2 with sealing cone	Clamp 1 - 1.5"	E33401	TA TAD TD TM
		DIN 11851 DN25	E43304	TA TAD TD TM
		Varivent DN25	E43306	TA TAD TD TM
		SMS G DN25	E33430	TA TAD TD TM
		G 3/4	E43302	TA TAD TD TM
		G1	E43303	TA TAD TD TM
⑪	Metal-to-metal seal / G 1/2 with sealing cone	D35	E30055	TA TD TM TT ²⁾
		D45	E30056	TA TD TM TT ²⁾

In connection with: ²⁾Adapter E30144

More options at www.ifm.com

Industrial applications

Hygienic applications

The modular concept

Accessories

Infrared



For industrial applications

Without contact:

Exact temperature measurement of particularly hot objects or objects which are difficult to access.

Hot:

For object temperatures of 0...2.500 °C.

Informative:

Display of the current object temperature (type TW20xx).

Simple:

The sensors can be set via the display and pushbuttons.

Precise:

Scratch-resistant precision lenses for minimum sensitivity to ambient light.

Convenient:

Triggering of test function on sensor or by external control signal.



Temperature sensor type TW70xx

2 switching outputs.

Easy switch-point setting via display.

3-pushbutton operating concept.



Measuring range [°C]	Wave length range [µm]	Output function	Order no.
----------------------	------------------------	-----------------	-----------

Detecting system			
50...500	8...14	2 binary switching outputs	TW7000
250...1250	1...1.7		TW7001
350...1350	1...1.7		TW7011 ¹⁾

¹⁾Sensor for fibre-optics and measuring head

No.	Design	Order no.
①	Fibre-optics 2 m	E35061
	Fibre-optics 5 m	E35062
②	Measuring head	E35060



Type TW20xx temperature sensor

Scalable analogue output 4...20 mA.

Freely configurable switching output.

Easy emissivity setting via display.

3-pushbutton operating concept.

Local temperature indication.





For hot objects. Infrared temperature sensors, binary or analogue.



Industrial applications

Hygienic applications

Measuring range [°C]	Wave length range [µm]	Output function	Order no.
Measuring system			
0...1000	8...14	Analogue output	TW2000
250...1600	1...1.7	4...20 mA and switching output	TW2001
500...2500	0.78...1.06		TW2002
300...1600	1...1.7		TW2011²⁾

Accessories

No.	Design	Order no.
③	Air purge	E35063
④	Cooling jacket	E35068
⑤	Mounting bracket	E35065
⑥	Protective tube	E35066
⑦	Insulating tube	E35067

The modular concept

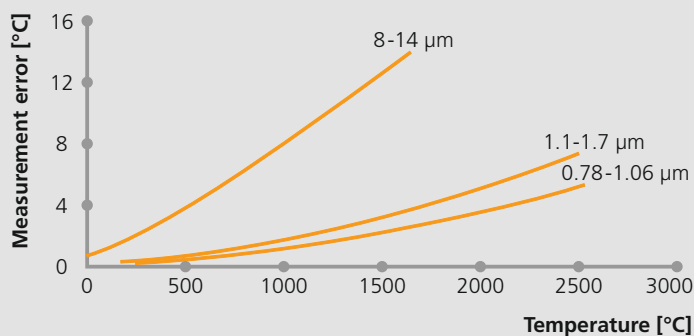
²⁾Sensor incl. fibre-optics and measuring head

Accessories



Infrared

Select the optimum sensor
The optimum sensor is to be as short-wave as possible. The shorter the wavelength and the smaller the spectral range, the lower the impact of changes of the object's emission factor on the measurement.



Temperature measuring error depending on the temperature and the wave length at 1 % change of the degree of emission

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Overview
ifm product range:



Position sensors



**Sensors for
motion control**



Industrial imaging



Safety technology



Process sensors



**Industrial
communication**



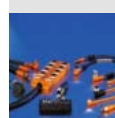
Identification systems



**Condition monitoring
systems**



**Systems for
mobile machines**



**Connection
technology**



Accessories