

# ISOMAG ™

*The friendly magmeter*

## MS 1000

**WAFER TYPE SENSOR**



**"WAFER" TYPE SENSOR SUITABLE FOR SEVERAL FLANGE TYPES**

**ISOIL**   
INDUSTRIA  
*The solutions that count*

Warranty conditions are available on this website:  
[www.isomag.eu](http://www.isomag.eu) only in English version

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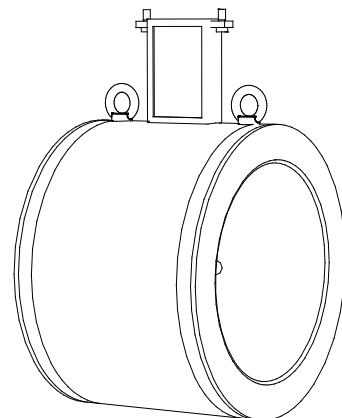
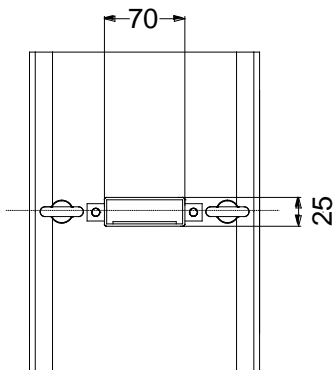
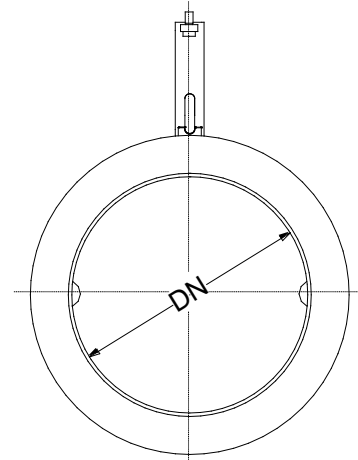
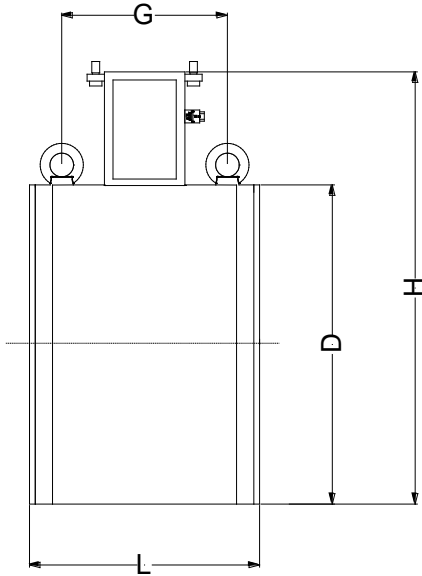
## TECHNICAL DATA

<b>OVERALL FEATURES</b>	
<b>Nominal diameter</b>	<input type="checkbox"/> DN 25 ÷ 400
<b>Minimum conductivity</b>	<input type="checkbox"/> 5 µS/cm
<b>Humidity Range</b>	<input type="checkbox"/> 0÷100% (IP 67)
<b>Accuracy</b>	<input type="checkbox"/> See relevant converter data sheet
<b>CE Certification</b>	<input type="checkbox"/> Yes

<b>STANDARD FEATURES</b>	
<b>Body material</b>	<input type="checkbox"/> Carbon steel painted
<b>Nominal pressure</b>	<input type="checkbox"/> 1600 kPa : all with PP and Ebonite lining <input type="checkbox"/> 4000 kPa : PTFE lining up to DN 150
<b>Process connection</b>	<input type="checkbox"/> Wafer Type
<b>Version – protection rating</b>	<input type="checkbox"/> Compact IP67 (IP68 on request)
<b>Lining material</b>	<input type="checkbox"/> Polypropylene (max PN 16) <input type="checkbox"/> Ebonite (DN 200 – 400) <input type="checkbox"/> PTFE (DN 25 – 200)
<b>Gasket material (ONLY for lining in Polypropylene )</b>	<input type="checkbox"/> FPM
<b>Liquid temperature</b>	<input type="checkbox"/> 0°C ÷ 60°C with PP lining <input type="checkbox"/> -5°C ÷ 80°C with ebonite lining <input type="checkbox"/> -20°C ÷ 100°C with PTFE lining in compact version
<b>Vacuum resistance</b>	<input type="checkbox"/> 20 Kpa (absolute) at 100 °C (60/80°C for PP/Ebonite)
<b>Electrodes material</b>	<input type="checkbox"/> Stainless steel AISI 316 <input type="checkbox"/> Hastelloy C <input type="checkbox"/> Platinum-rhodium <input type="checkbox"/> Titanium <input type="checkbox"/> Tantalum

<b>OPTIONAL FEATURES</b> (CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)	
<b>Body material</b>	<input type="checkbox"/> Stainless steel AISI 304 or 316
<b>Gasket material (ONLY for lining in Polypropylene )</b>	<input type="checkbox"/> EPDM
<b>Liquid temperature</b>	<input type="checkbox"/> -20°C ÷ 110°C with PTFE lining in separate version* * Contact the factory for higher temperature
<b>Lining material</b>	<input type="checkbox"/> On request
<b>Electrodes material</b>	<input type="checkbox"/> On request
<b>Grounding electrode</b>	<input type="checkbox"/> On request
<b>Version – protection rating</b>	<input type="checkbox"/> Separate version (max 20m) – IP 68 <input type="checkbox"/> Separate version (max 500 m), with preamplifier – IP 67 <input type="checkbox"/> Separate version (max 500 m), with preamplifier – IP 68

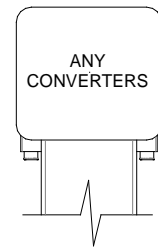
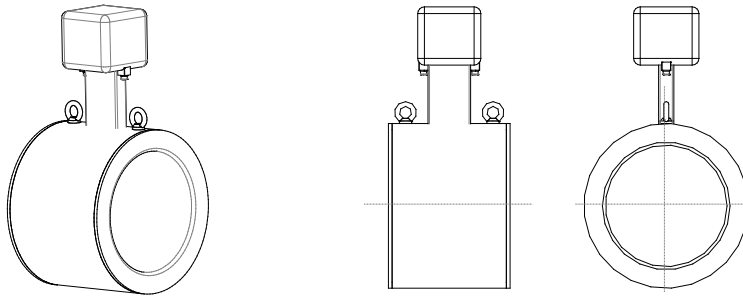
# OVERALL DIMENSIONS



DIMENSIONS mm (inches)	ND													
	25 (1")	32 (1" 1/4)	40 (1" 1/2)	50 (2")	65 (2" 1/2)	80 (3")	100 (4")	125 (5")	150 (6")	200 (8")	250 (10")	300 (12")	350 (14")	400 (16")
<b>L</b>	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -3 (-0.12)	+0 -5 (-0.20)	+0 -5 (-0.20)	+0 -5 (-0.20)	+0 -5 (-0.20)
<b>H</b>	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	150 (5.90)	150 (5.90)	150 (5.90)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	250 (9.84)	300 (11.81)	350 (13.78)
<b>D</b>	147 (5.79)	153 (6.02)	161 (6.34)	177 (6.97)	199 (7.83)	209 (8.23)	235 (9.25)	263 (10.35)	291 (11.46)	362 (14.25)	417 (16.42)	467 (18.39)	527 (20.75)	579 (22.80)
<b>G</b>	62 (2.44)	67 (2.63)	78 (3.07)	92 (3.62)	108 (4.25)	118 (4.65)	144 (5.67)	172 (6.77)	200 (7.87)	271 (10.67)	326 (12.83)	376 (14.80)	436 (17.17)	488 (19.21)
<b>Weight kg (lbs)</b>	-	-	-	-	-	-	-	-	-	144 (5.67)	194 (7.64)	244 (9.60)	294 (11.57)	344 (13.54)
<b>Usable flanges</b>	1.2 (2.64)	1.6 (3.52)	1.8 (3.96)	2 (4.4)	3.6 (7.92)	3.8 (8.36)	5 (11)	7.8 (17.16)	8.2 (18)	18.2 (40)	24 (53)	27 (59)	32 (70)	39 (86)
	PN10, PN16, PN25, PN40, ANSI150, ANSI,300									PN10, PN16, ANSI150				

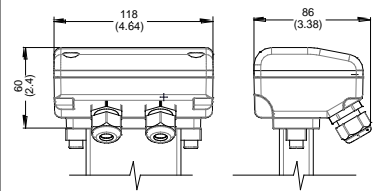
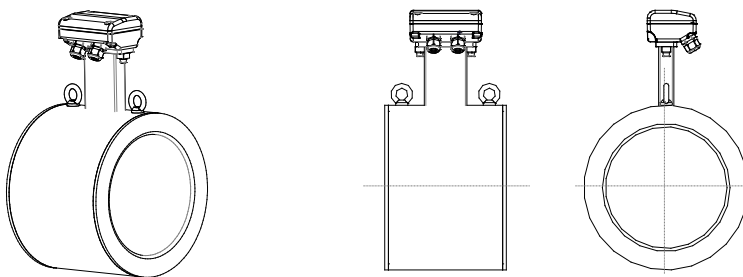
## VERSIONS

### COMPACT VERSION



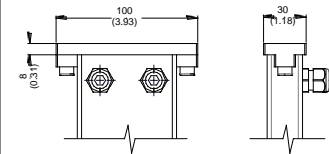
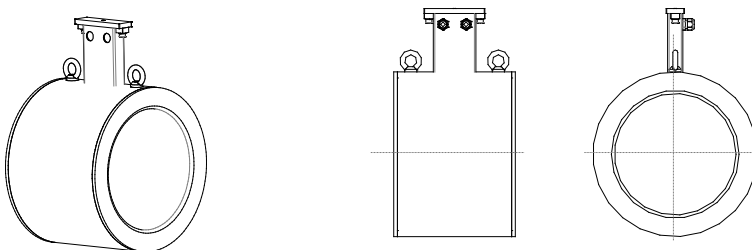
The overall dimension of coverter are showed in the suitable manual

### SEPARATE VERSION FOR PAINTED SENSORS



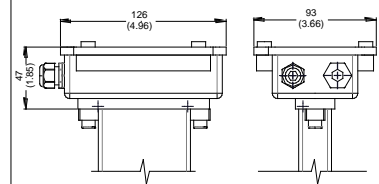
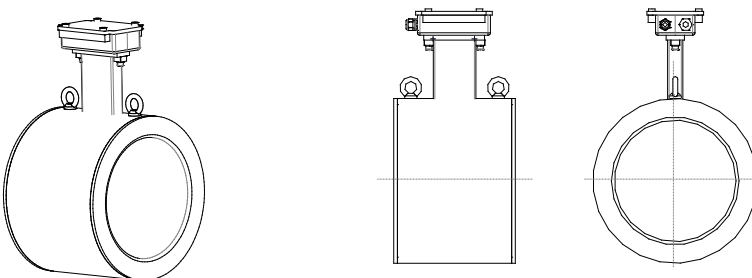
Sensor with junctions box

### SEPARATE VERSION FOR STAINLESS STEEL SENSORS



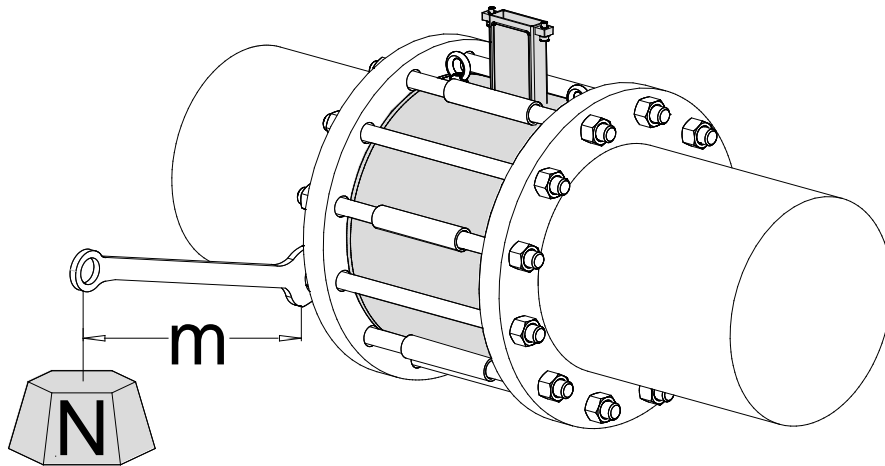
Sensor with cover

### SEPARATE VERSION FOR SENSOR WITH PREAMPLIFIER



Sensor with preamplifier

## TORQUES (Nm)

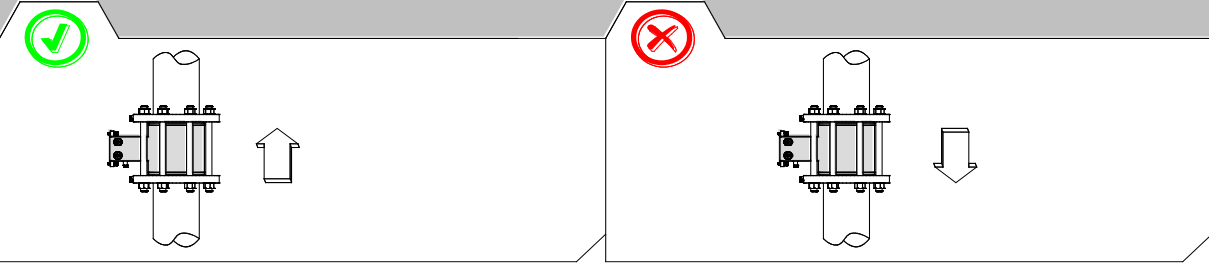


		OPERATING PRESSURE								
Kpa	1000	1600			2500		4000		6400	
psi	140	260			350		600		1000	
DN	PTFE	EBON.	PTFE	EBON.	PP	PTFE	EBON.	PTFE	EBON.	EBON.
25			25		19	25		25		39
32			43		28	43		43		53
40			53		36	53		53		72
50			68		52	68		68		81
65			90		75	45		45		58
80			53		41	53		53		62
100			59		56	83		83		87
125			77		71	112		112		148
150			108		106	135		135		217
200	148	123		82			112		149	233
250	123	103		117			170		223	321
300	142	119		146			168		232	317
350	172	143		171			270		352	481
400	217	181		235			355		516	623

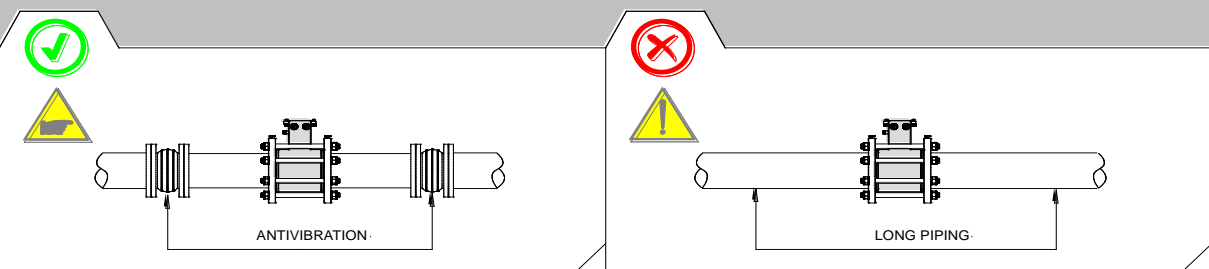
- Tighten uniformly in diagonally opposite sequence
- The torque listed in the tab is applicable to the following flanges types:  
EN1092-1, DIN 2501, BS 4504, ANSI B16.5 , JIS
- The use of gaskets DIN 2690 is recommended

# INSTALLATION RECOMMENDATIONS

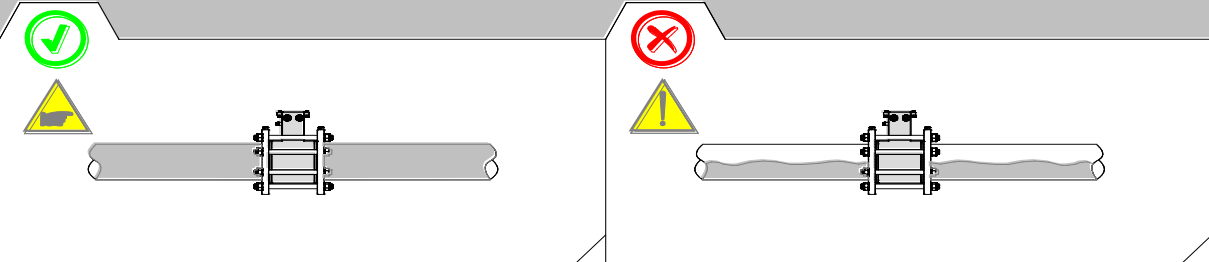
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



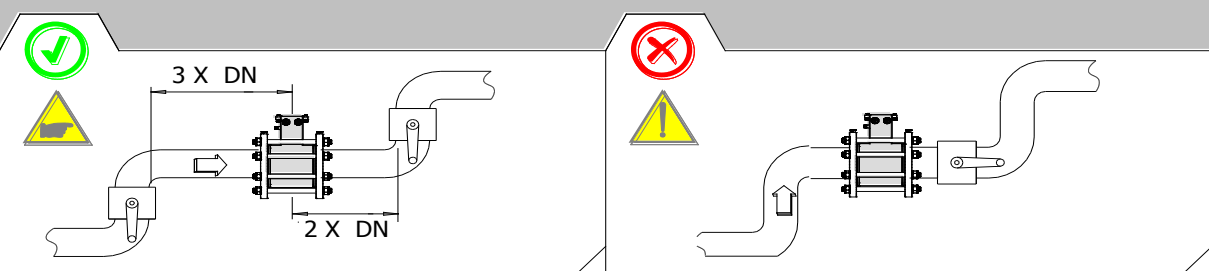
For installations in long pipe lines, please use anti vibration joints



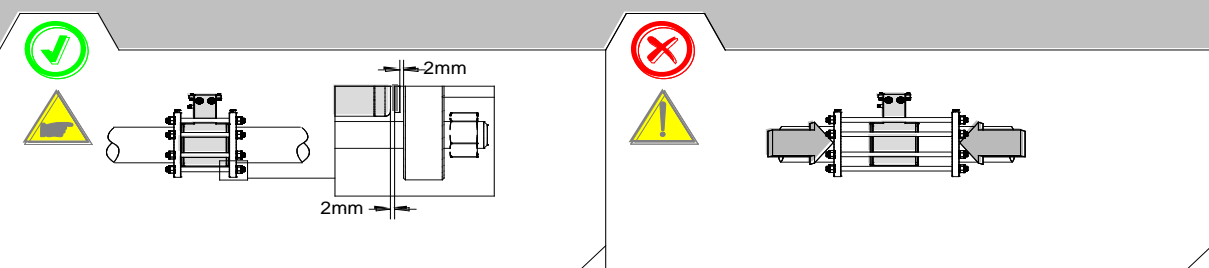
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



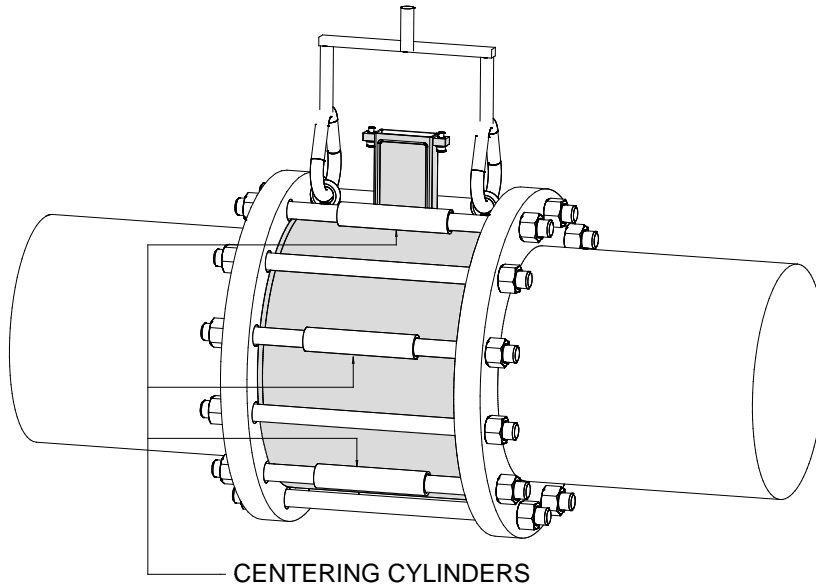
Install the sensor away from bends and hydraulic accessories



Avoid positioning flange and counter flanges by tightening the nuts.



## RECOMMENDED INSTALLATION METHOD

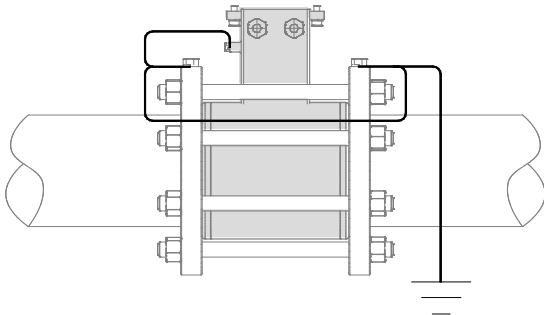
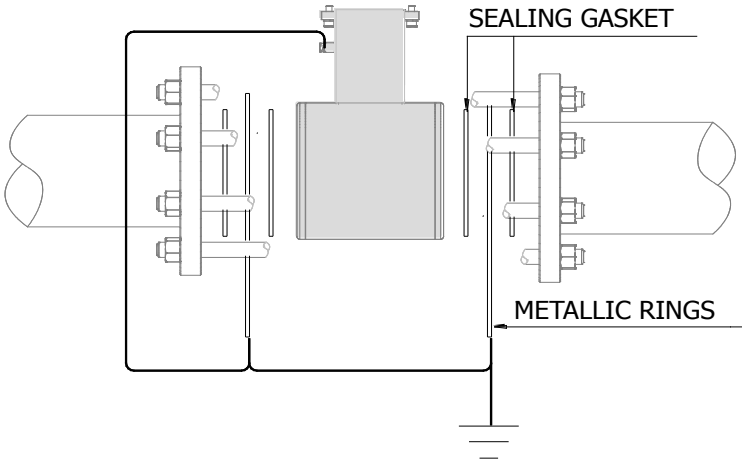
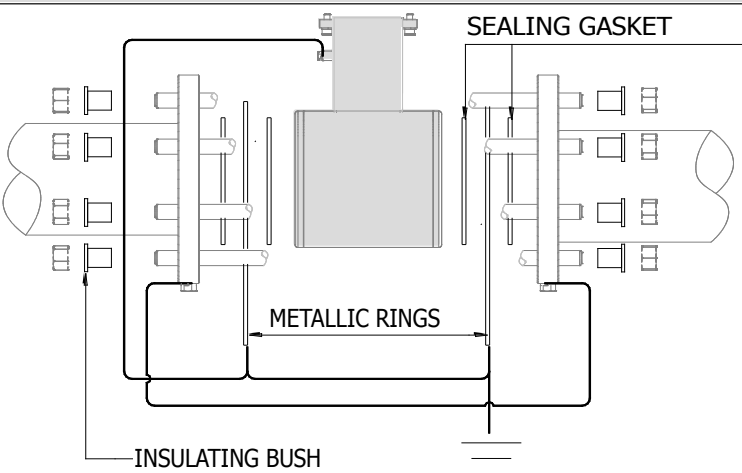


In order to help the installation the DN > 150 they are equipped with appropriate eyebolts to lift the sensor according to the above illustrated method

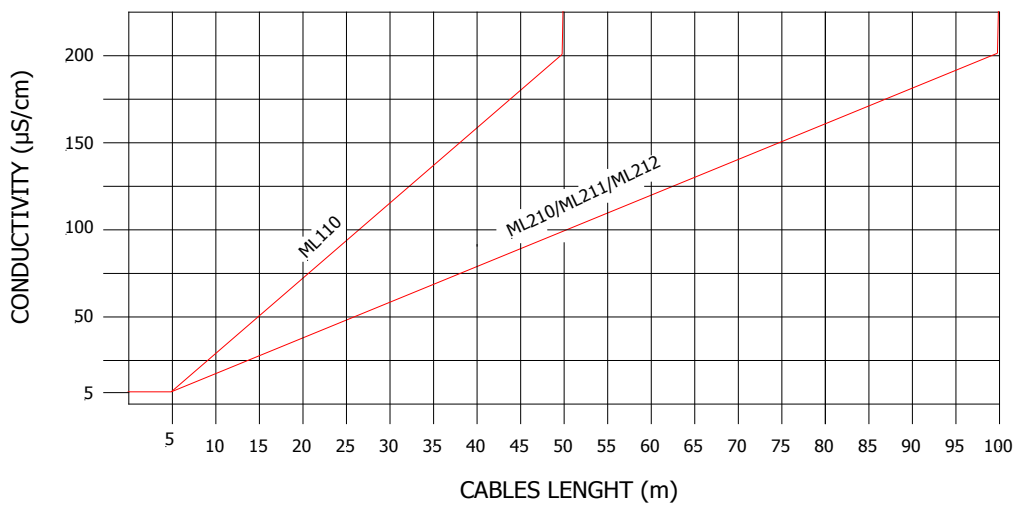
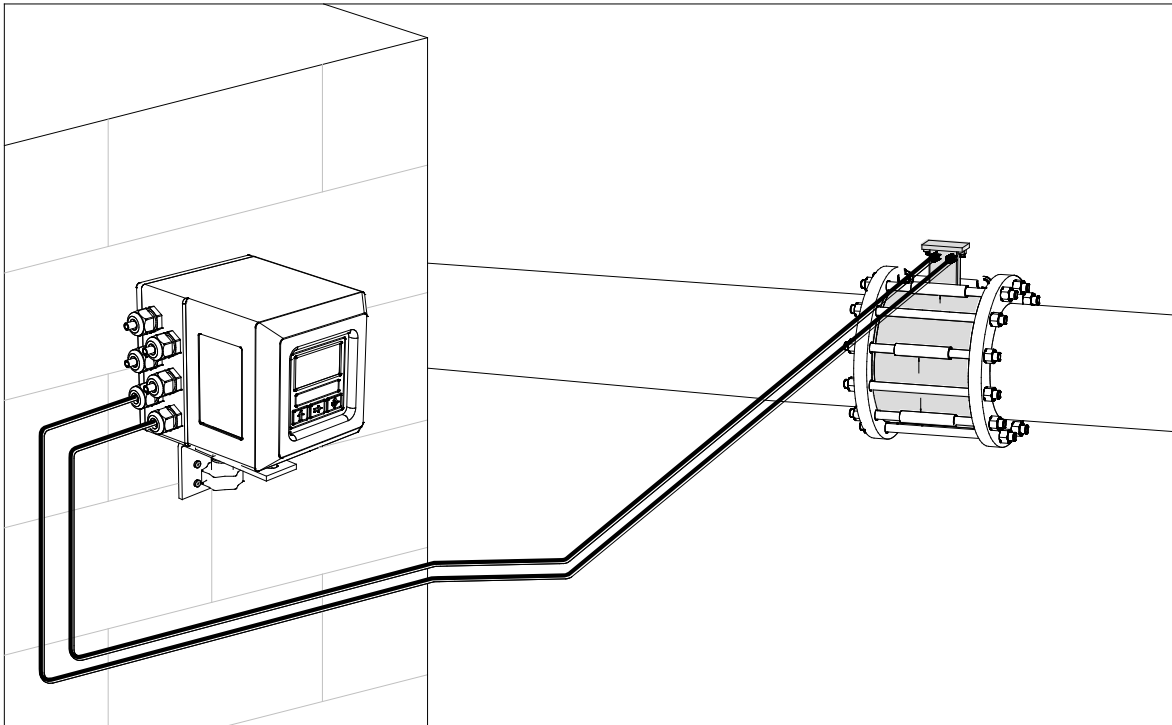
- The eyebolts support the only weight of the meter
- For sensor MS 1000 we recommend the use of centring cylinders



## SENSOR GROUNDING

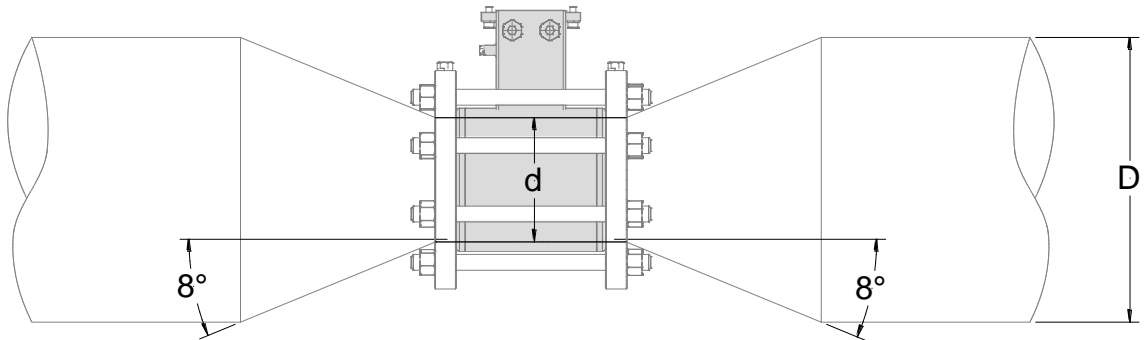
METALLIC PIPE	
	
INSULATED PIPE	
	<p>-If the sensor has to be installed in a pipe made of an insulating material, the following are necessary:</p> <ul style="list-style-type: none"> <li>- Inserting two metallic rings between the sensor flanges and the pipe line counter flanges</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>- Using a sensor with the additional grounding electrode</li> </ul>
PIPE WITH CATHODIC PROTECTION	
	<p>If the sensor has to be installed in the pipe with a cathodic protection, the following are necessary:</p> <ul style="list-style-type: none"> <li>- using insulating bushes to isolate the bolts</li> <li>- Metallic grounding rings should be provided to ground the liquid using insulating gasket between the rings</li> </ul>

## SEPARATE VERSION

**Notes:**

- It is recommended to install the connection cables away from, or protect against sources of electromagnetic noise.
- The minimum conductivity of the liquid medium to ensure correct functionality of the empty pipe detection is  $20 \mu\text{S/cm}$

## PRESSURE LOSS CALCULATION (CONES 8° ANGLES)



$$\Delta p = \left[ 0.10 + 0.20 \left( \left( \frac{d}{D} \right)^{-2} - 1 \right) \left( \frac{d}{D} \right)^4 \right] \left( \rho \frac{u^2}{2} \right)$$

Where:

$\Delta p$  = Pressure loss in [Pa]

$\rho$  = Fluid density [ $\text{kg}/\text{m}^3$ ] typical value  $\rho = 1000[\text{kg}/\text{m}^3]$

$d$  = sensor diameter [m]

$D$  = pipe diameter (greater than sensor diameter) [m]

$u$  = Mean flow velocity in sensor diameter [m/s]

Calculation examples $\Delta p$ [mbar]								
$\frac{d}{D} \backslash u$	1 [m/s]	2 [m/s]	3 [m/s]	4 [m/s]	5 [m/s]	6 [m/s]	7 [m/s]	8 [m/s]
0.5	1.1	4.3	9.6	17.0	26.6	38.3	52.1	68.0
0.6	0.9	3.6	8.2	14.6	22.7	32.7	44.6	58.2
0.7	0.8	3.0	6.8	12.2	19.0	27.4	37.2	48.6
0.8	0.6	2.5	5.7	10.1	15.7	22.7	30.9	40.3
0.9	0.5	2.1	4.8	8.6	13.4	19.3	26.3	34.3

Note :

- $\rho = 1000[\text{kg}/\text{m}^3]$  as goodness approximation of water density in common use.
- Inner diameter of sensor is used for  $d$ , express in meters.
- Indeed pressure loss equation is dimensionally correct in [Pa]. The equation results in table are show in [mbar].

## HOW TO ORDER

MS1000	
EXAMPLE CODE	Diam. Nom. / Rivestimento / Temp. Massima / Campo di misura
T25	<b>P25</b> DN25 (1"), Polypropilene lining, measuring range 0...0,73/0...18 m <sup>3</sup> /h
	<b>T25</b> DN25 (1"), PTFE lining, measuring range 0...0,73/0...18 m <sup>3</sup> /h
	<b>P32</b> DN32 (1 1/4"), Polypropilene lining, measuring range 0...1,20/0...29 m <sup>3</sup> /h
	<b>T32</b> DN32 (1 1/4"), PTFE lining, measuring range 0...1,20/0...29 m <sup>3</sup> /h
	<b>P40</b> DN40 (1 1/2"), Polypropilene lining, measuring range 0...1,87/0...46 m <sup>3</sup> /h
	<b>T40</b> DN40 (1 1/2"), PTFE lining, measuring range 0...1,87/0...46 m <sup>3</sup> /h
	<b>P50</b> DN50 (2"), Polypropilene lining, measuring range 0...2,93/0...72 m <sup>3</sup> /h
	<b>T50</b> DN50 (2"), PTFE lining, measuring range 0...2,93/0...72 m <sup>3</sup> /h
	<b>P65</b> DN65 (2 1/2"), Polypropilene lining, measuring range 0...4,9/0...122 m <sup>3</sup> /h
	<b>T65</b> DN65 (2 1/2"), PTFE lining, measuring range 0...4,9/0...122 m <sup>3</sup> /h
	<b>P80</b> DN80 (3"), Polypropilene lining, measuring range 0...7,5/0...184 m <sup>3</sup> /h
	<b>T80</b> DN80 (3"), PTFE lining, measuring range 0...7,5/0...184 m <sup>3</sup> /h
	<b>P100</b> DN100 (4"), Polypropilene lining, measuring range 0...11,7/0...288 m <sup>3</sup> /h
	<b>T100</b> DN100 (4"), PTFE lining, measuring range 0...11,7/0...288 m <sup>3</sup> /h
	<b>P125</b> DN125 (5"), Polypropilene lining, measuring range 0...18,3/0...450 m <sup>3</sup> /h
	<b>T125</b> DN125 (5"), PTFE lining, measuring range 0...18,3/0...450 m <sup>3</sup> /h
	<b>P150</b> DN150 (6"), Polypropilene lining, measuring range 0...26,3/0...648 m <sup>3</sup> /h
	<b>T150</b> DN150 (6"), PTFE lining, measuring range 0...26,3/0...648 m <sup>3</sup> /h
	<b>E200</b> DN200 (8"), Ebonite lining, measuring range 0...46,8/0...1152 m <sup>3</sup> /h
	<b>T200</b> DN200 (8"), PTFE lining, measuring range 0...46,8/0...1152 m <sup>3</sup> /h
<b>E250</b> DN250 (10"), Ebonite lining, measuring range 0...73,2/0...1800 m <sup>3</sup> /h	
<b>E300</b> DN300 (12"), Ebonite lining, measuring range 0...105,4/0...2592 m <sup>3</sup> /h	
<b>E350</b> DN350 (14"), Ebonite lining, measuring range 0...143,4/0...3528 m <sup>3</sup> /h	
<b>E400</b> DN400 (16"), Ebonite lining, measuring range 0...187,3/0...4608 m <sup>3</sup> /h	
<b>Gasket material ( internal tightness - only PP lining)</b>	
0	0 No O-Ring ( ONLY FOR PTFE/EBANITE LINING )
	1 O-Ring : FKM
	2 O-Ring : Epdm
	9 Gasket material: to be specified
<b>Body material</b>	
A	A Body in Carbon Steel, RAL6028 painted
	B Body in Stainless Steel (AISI304)
	C Body in Stainless Steel (AISI316)
	Z Body material: other
<b>Number and electrodes material</b>	
1	1 n. 2 measure electrodes in AISI316
	2 n. 3 (2 measure + 1 for ground) electrodes in AISI316
	4 n. 3 (2 measure + 1 for ground) electrodes in Hastelloy C
	5 n. 3 (2 measure + 1 for ground) electrodes in Titanium
	6 n. 3 (2 measure + 1 for ground) electrodes in Tantalum; <b>not available with Polypropilene</b>
	7 n. 3 (2 measure + 1 for ground) electrodes in Platinum; <b>not available with Polypropilene</b>
	0 Electrode material: to be specified
<b>Execution / Protection rate</b>	
A	A Compact version , IP67 protection rate
	B Separate version , remember to add the cables , protection rate IP68 (standing immersion with 1,5 m of head water)
	E Separate version with length and position of the neck of the Sensor to define according draw. G006 (valid for A-B-C-D versions, add the relative COST)
	F Separate version with N° 2 connectors IP 68 suitable for fast cable connections
	G Separate version with N° 1 connectors IP 68 suitable for fast cable connections
	M Compact version , IP67 protection rate , with the possibility to turn the converter of 90°
	N Separate version in Aluminum , with JB PREAMPLIFIRE* (maximum len. 500 m.), remember to add the cables ,protection rate IP67
	P Separate version in AISI 304, with JB PREAMPLIFIRE* (maximum length 500 m.), remember to add the cables ,protection rate IP67
	Q Separate version with N° 1 connectors IP 68 suitable for fast cable connection to JB PREAMPLIFIRE* in Aluminum (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST )
	R Separate version with N° 1 connectors IP 68 suitable for fast cable connections to JB PRAMPLIFIRE* IN AISI 304 (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE
	X Separate version with JUNCTION BOX in AISI 304 (Rif. Dis R038)



MS1000-T25-0A1A (Complete code example for order)

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