

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 only in English version

INDEX

TECHNICAL DATA 3

 OVERALL FEATURES 3

 STANDARD FEATURES 3

 OPTIONAL FEATURES 3

OVERALL DIMENSIONS 4

VERSIONS 5

TORQUES (Nm) 6

INSTALLATION RECOMMENDATIONS 7

 RECOMMENDED INSTALLATION METHOD 8

 SENSOR GROUNDING 9

 SEPARATE VERSION 10

 PRESSURE LOSS CALCULATION 11

 (CONES 8° ANGLES) 11

HOW TO ORDER 12

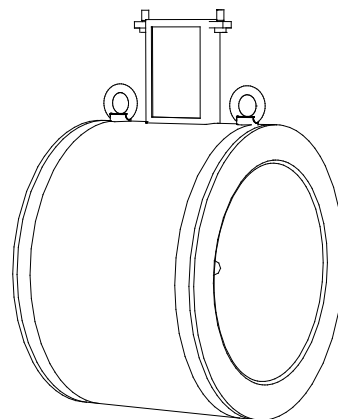
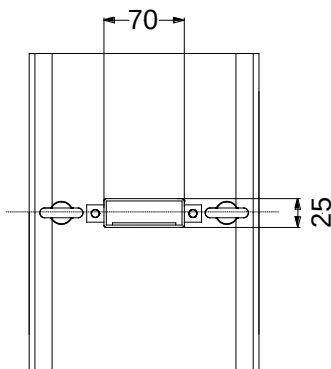
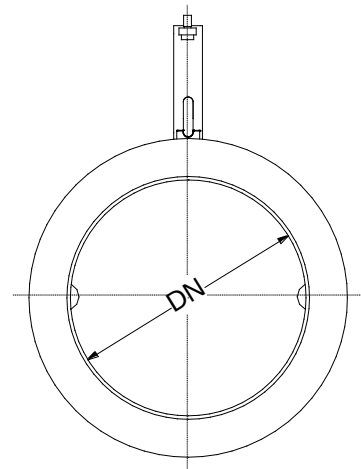
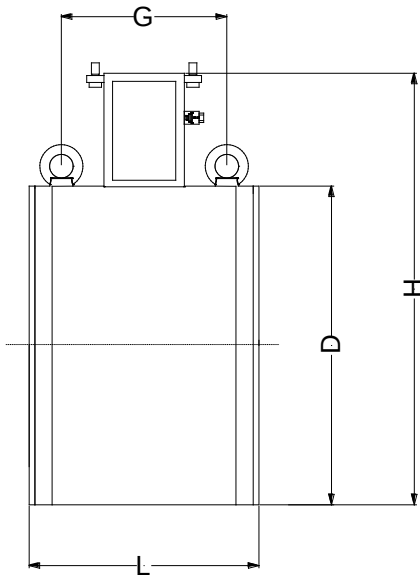
TECHNICAL DATA

OVERALL FEATURES	
Nominal diameter	☐ DN 25 ÷ 400
Minimum conductivity	☐ 5 µS/cm
Humidity Range	☐ 0÷100% (IP 67)
Accuracy	☐ See relevant converter data sheet
CE Certification	☐ Yes

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

OPTIONAL FEATURES (CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)	
Body material	☐ Stainless steel AISI 304 or 316
Gasket material (ONLY for lining in Polypropylene)	☐ EPDM
Liquid temperature	☐ -20°C ÷ 130°C with PTFE lining in separate version* * Contact the factory for higher temperature
Lining material	☐ On request
Electrodes material	☐ On request
Version – protection rating	☐ Separate version (max 20m) – IP 68 ☐ Separate version (max 500 m), with preamplifier – IP 67 ☐ Separate version (max 500 m), with preamplifier – IP 68

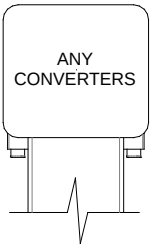
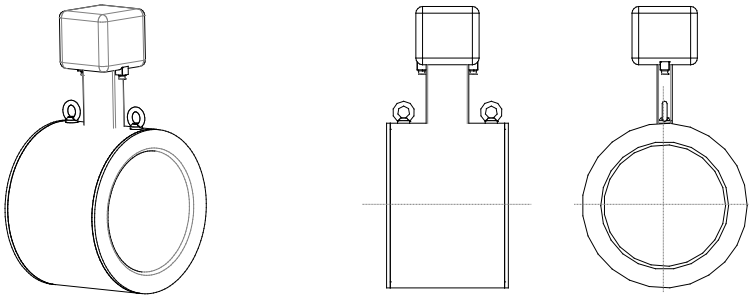
OVERALL DIMENSIONS



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")
L	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₃	⁺⁰ ₋₅	⁺⁰ ₋₅	⁺⁰ ₋₅	⁺⁰ ₋₅
	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.12)	(-0.20)	(-0.20)	(-0.20)	(-0.20)
	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)	200 (7.87)	250 (9.84)	300 (11.81)	350 (13.78)	400 (15.75)
H	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)
D	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)
G	-	-	-	-	-	-	-	-	-	144 (5.67)	194 (7.64)	244 (9.60)	294 (11.57)	344 (13.54)
Weight kg (lbs)	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)
Usable flanges	PN10, PN16, PN25, PN40, ANSI150, ANSI,300										PN10, PN16, ANSI150			

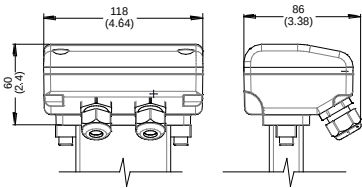
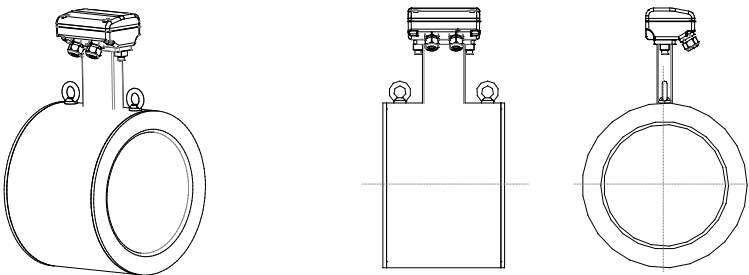
VERSIONS

COMPACT VERSION



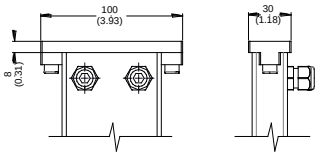
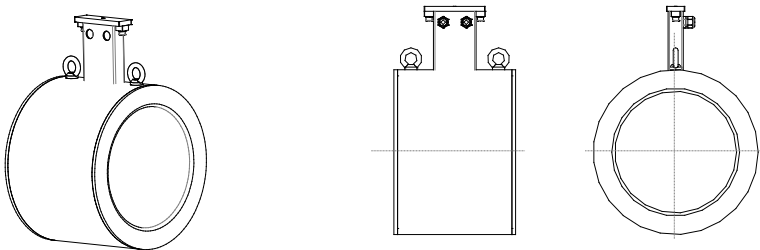
The overall dimension of coverter are showed in the suitable manual

SEPARATE VERSION FOR PAINTED SENSORS



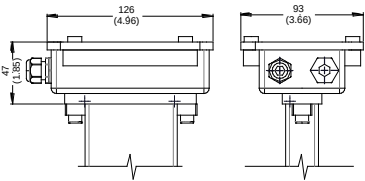
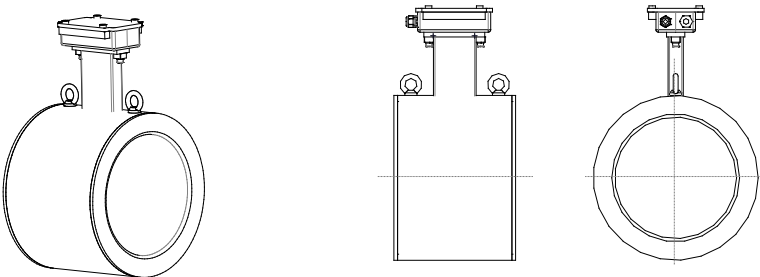
Sensor with junctions box

SEPARATE VERSION FOR STAINLESS STEEL SENSORS



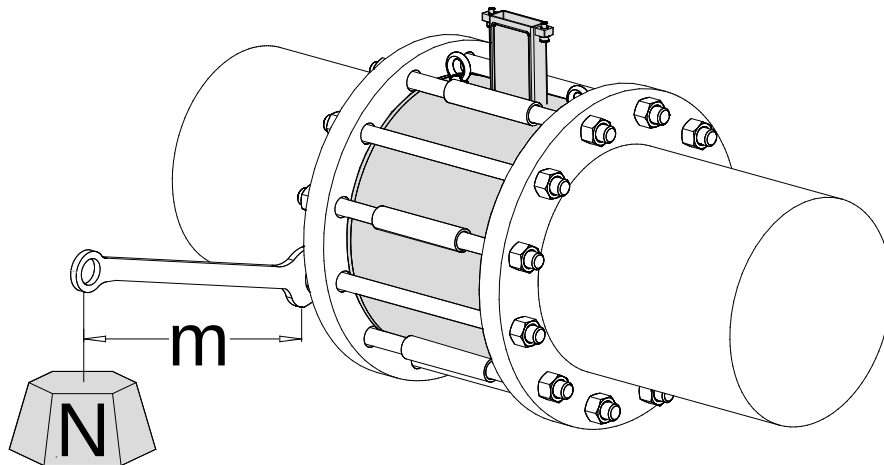
Sensor with cover

SEPARATE VERSION FOR SENSOR WITH PREAMPLIFIER



Sensor with preamplifier

TORQUES (Nm)

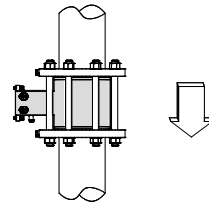
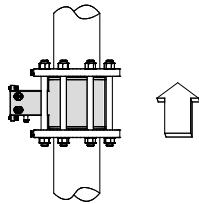


OPERATING PRESSURE										
Kpa	1000		1600			2500		4000		6400
psi	140		260			350		600		1000
DN	PTFE	EBON.	PTFE	EBON.	PP	PTFE	EBON.	PTFE	EBON.	EBON.
25			25		19	25		25		39
32			43		28	43		43		53
40			53		36	53		53		72
50			68		52	68		68		81
65			90		75	45		45		58
80			53		41	53		53		62
100			59		56	83		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

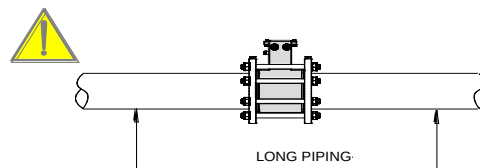
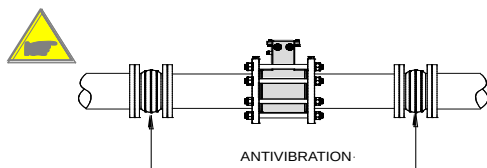
- Tighten uniformly in diagonally opposite sequence
- The torque listed in the tab is applicable to the following flanges types:
EN1092-1, DIN 2501, BS 4504, ANSI B16.5 , JIS
- The use of gaskets DIN 2690 is recommended

INSTALLATION RECOMMENDATIONS

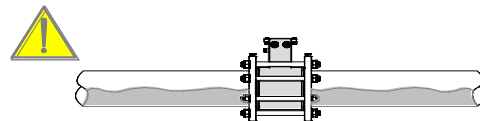
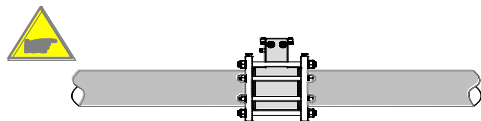
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



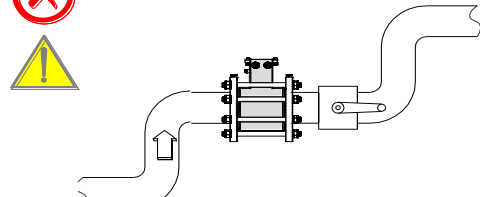
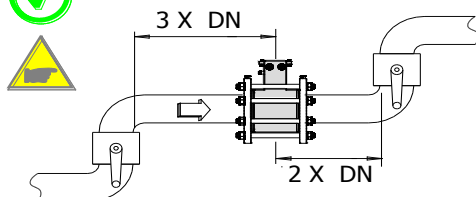
For installations in long pipe lines, please use anti vibration joints



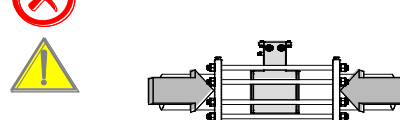
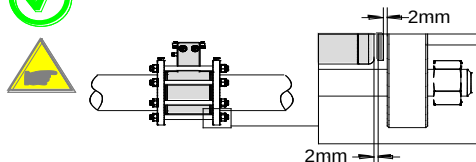
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



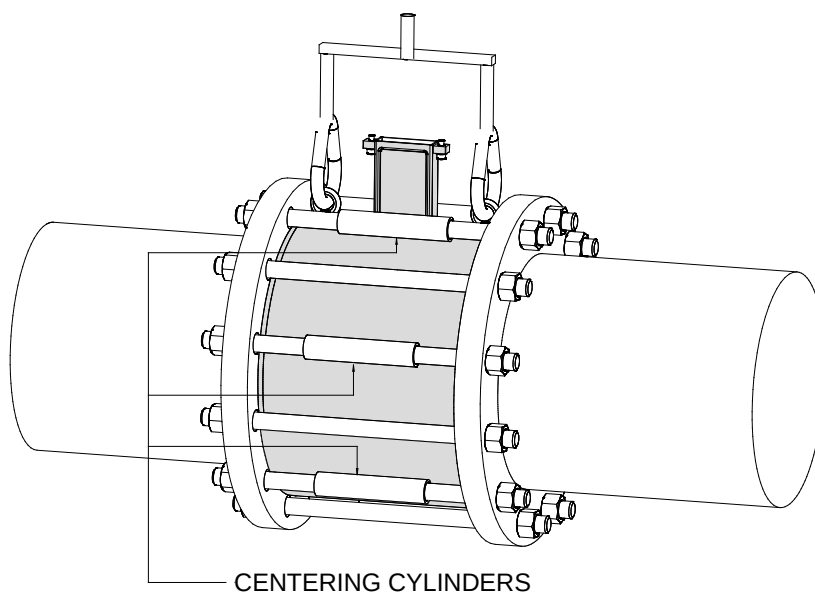
Install the sensor away from bends and hydraulic accessories



Avoid positioning flange and counter flanges by tightening the nuts.



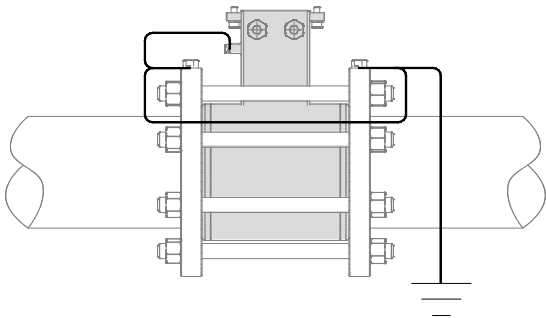
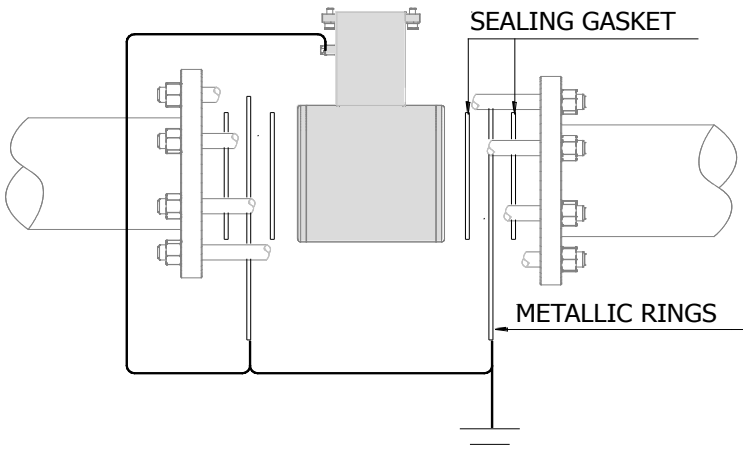
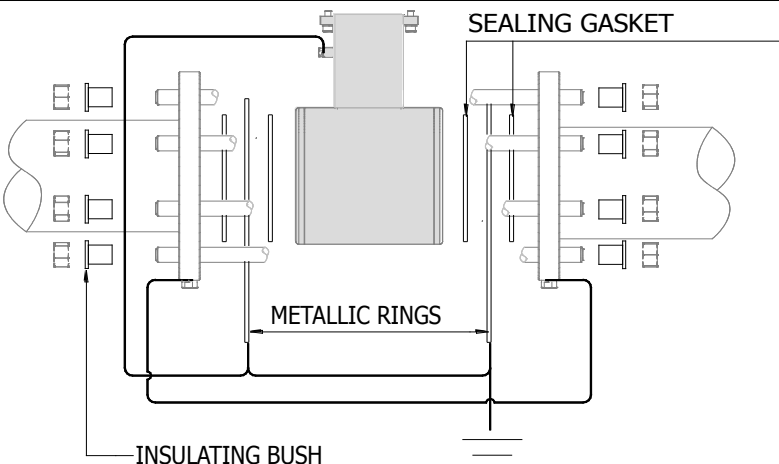
RECOMMENDED INSTALLATION METHOD



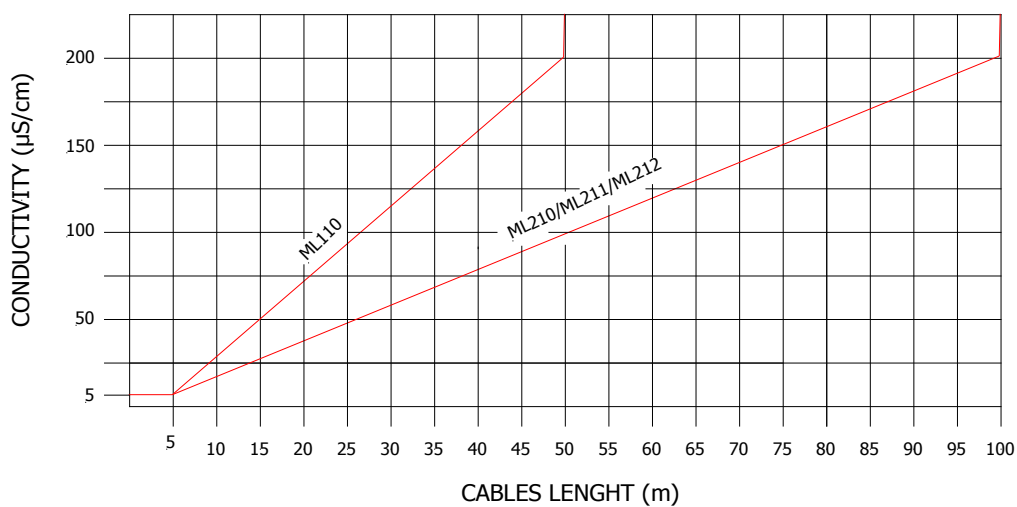
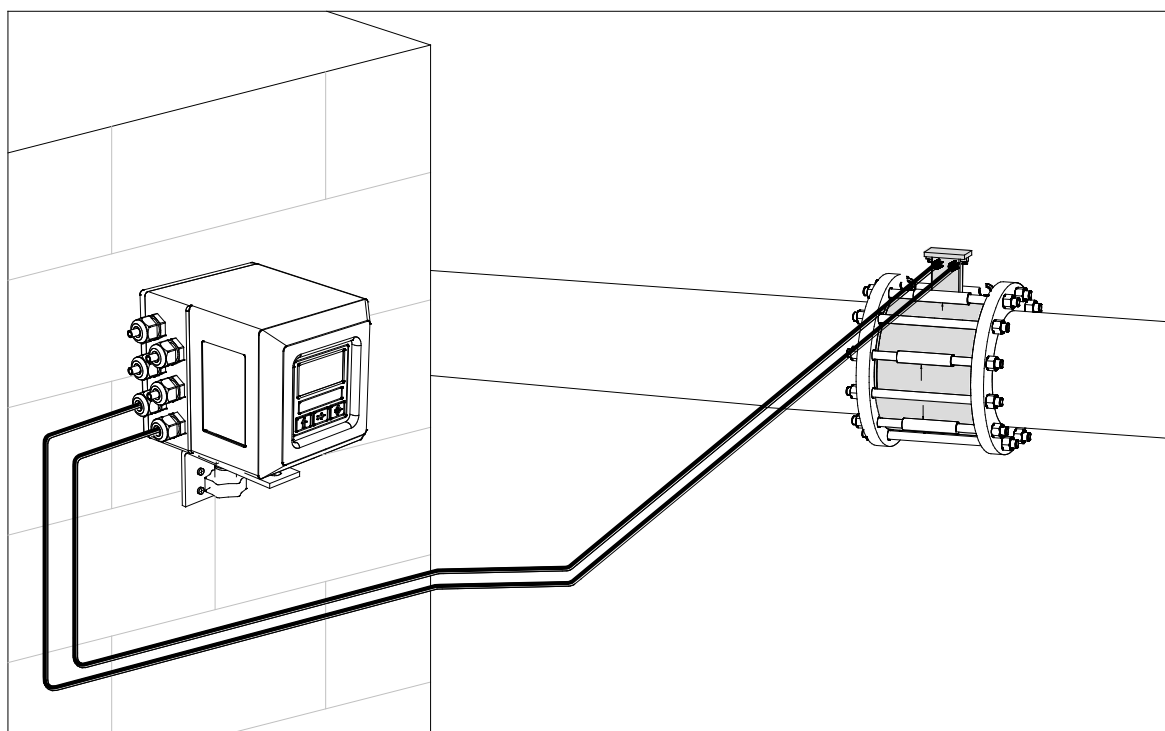
In order to help the installation the DN > 150 they are equipped with appropriate eyebolts to lift the sensor according to the above illustrated method

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

SENSOR GROUNDING

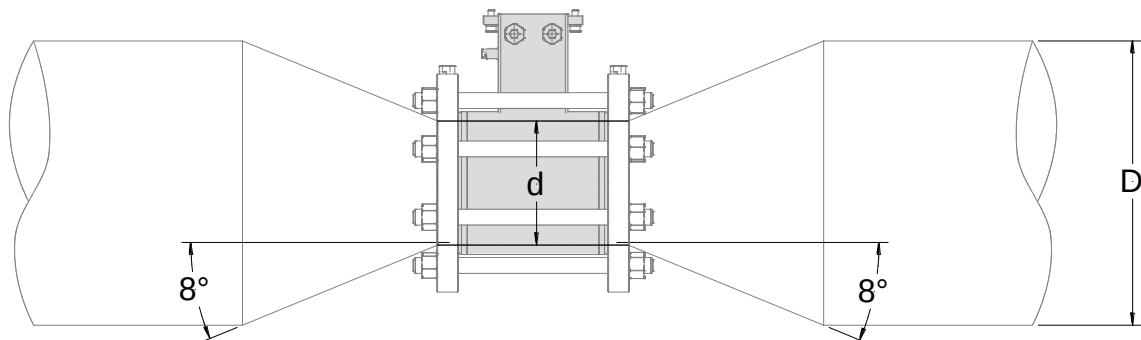
METALLIC PIPE	
	
INSULATED PIPE	
	-If the sensor has to be installed in a pipe made of an insulating material, the following are necessary: - Inserting two metallic rings between the sensor flanges and the pipe line counter flanges or - Using a sensor with the additional grounding electrode
PIPE WITH CATHODIC PROTECTION	
	If the sensor has to be installed in the pipe with a cathodic protection, the following are necessary: - using insulating bushes to isolate the bolts - Metallic grounding rings should be provided to ground the liquid using insulating gasket between the rings

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)



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

Where:

Δp = Pressure loss in [Pa]

ρ = Fluid density [kg/m³] typical value $\rho = 1000 \text{ [kg/m}^3\text{]}$

d = sensor diameter [m]

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

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

Calculation examples Δp [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 :

- $\rho = 1000 \text{ [kg/m}^3\text{]}$ 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	P25	DN25 (1"), Polypropilene lining, measuring range 0...0,73/0...18 m³/h
	T25	DN25 (1"), PTFE lining, measuring range 0...0,73/0...18 m³/h
	P32	DN32 (1 1/4"), Polypropilene lining, measuring range 0...1,20/0...29 m³/h
	T32	DN32 (1 1/4"), PTFE lining, measuring range 0...1,20/0...29 m³/h
	P40	DN40 (1 1/2"), Polypropilene lining, measuring range 0...1,87/0...46 m³/h
	T40	DN40 (1 1/2"), PTFE lining, measuring range 0...1,87/0...46 m³/h
	P50	DN50 (2"), Polypropilene lining, measuring range 0...2,93/0...72 m³/h
	T50	DN50 (2"), PTFE lining, measuring range 0...2,93/0...72 m³/h
	P65	DN65 (2 1/2"), Polypropilene lining, measuring range 0...4,9/0...122 m³/h
	T65	DN65 (2 1/2"), PTFE lining, measuring range 0...4,9/0...122 m³/h
	P80	DN80 (3"), Polypropilene lining, measuring range 0...7,5/0...184 m³/h
	T80	DN80 (3"), PTFE lining, measuring range 0...7,5/0...184 m³/h
	P100	DN100 (4"), Polypropilene lining, measuring range 0...11,7/0...288 m³/h
	T100	DN100 (4"), PTFE lining, measuring range 0...11,7/0...288 m³/h
	P125	DN125 (5"), Polypropilene lining, measuring range 0...18,3/0...450 m³/h
	T125	DN125 (5"), PTFE lining, measuring range 0...18,3/0...450 m³/h
	P150	DN150 (6"), Polypropilene lining, measuring range 0...26,3/0...648 m³/h
	T150	DN150 (6"), PTFE lining, measuring range 0...26,3/0...648 m³/h
	E200	DN200 (8"), Ebonite lining, measuring range 0...46,8/0...1152 m³/h
	T200	DN200 (8"), PTFE lining, measuring range 0...46,8/0...1152 m³/h
	E250	DN250 (10"), Ebonite lining, measuring range 0...73,2/0...1800 m³/h
	E300	DN300 (12"), Ebonite lining, measuring range 0...105,4/0...2592 m³/h
	E350	DN350 (14"), Ebonite lining, measuring range 0...143,4/0...3528 m³/h
	E400	DN400 (16"), Ebonite lining, measuring range 0...187,3/0...4608 m³/h
Gasket material (internal tightness - only PP lining)		
0	0	No O-Ring (ONLY FOR PTFE/EBANITE LINING)
	1	O-Ring : FKM
	2	O-Ring : Epdm
	9	Gasket material: to be specified
Body material		
A	A	Body in Carbon Steel, RAL6028 painted
	B	Body in Stainless Steel (AISI304)
	C	Body in Stainless Steel (AISI316)
	Z	Body material: other
Number and electrodes material		
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; not available with Polypropilene
	7	n. 3 (2 measure + 1 for ground) electrodes in Platinum; not available with Polypropilene
	0	Electrode material: to be specified
Execution / Protection rate		
A	A	Compact execution, IP67 protection rate
	B	Separate execution maximum length 10 m (20m, <u>see note 1</u>), remember to added the cables , protection rate IP68 (standing immersion with 1,5 m of head water)
	C	Separate execution (in Carbon Steel), with preamplifier (maximum length 500 m.), remember to added , protection rate IP67
	D	Separate execution (in AISI304), with preamplifier (maximum length 500 m.), remember to added , protection rate IP67
	E	Execution 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	Execution separate with N° 2 connectors IP 68 suitable for fast cable connections (max 20 m-ADD THE COST)
	G	Execution separate with N° 1 connectors IP 68 suitable for fast cable connections (max 20 m-ADD THE COST)
	H	Execution separate with N° 1 connectors IP 68 suitable for fast cable connections TO PRAMPLIFIRE IN CARBON STEEL VERSION (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	I	Execution separate with N° 1 connectors IP 68 suitable for fast cable connections TO PRAMPLIFIRE IN AISI 304 VERSION (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	M	Compact execution, IP67 protection rate , with the possibility to turn the converter of 90°

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

The manufacturer reserves the right to make design improvements without notice.