

ISOMAG ™

The friendly magmeter

MS 2500

FLANGED SENSOR



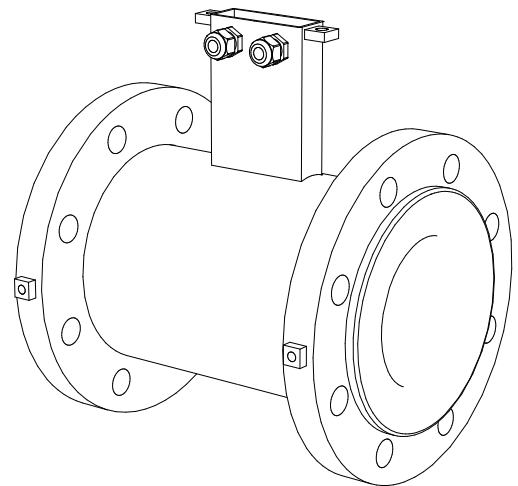
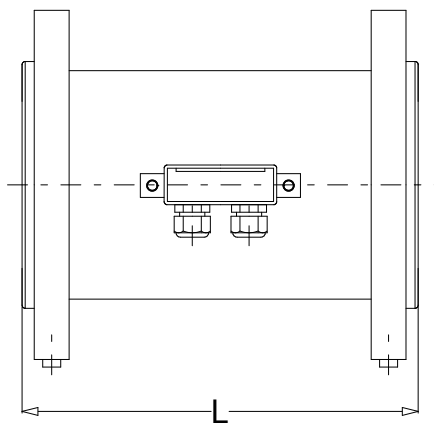
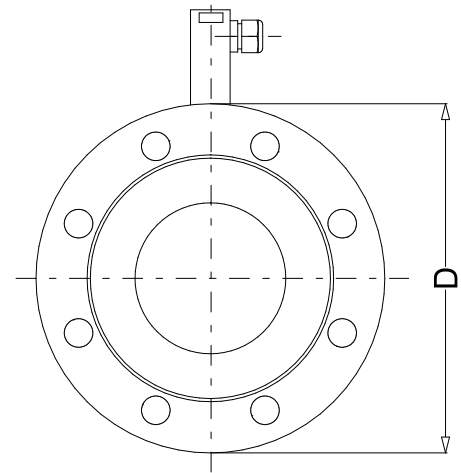
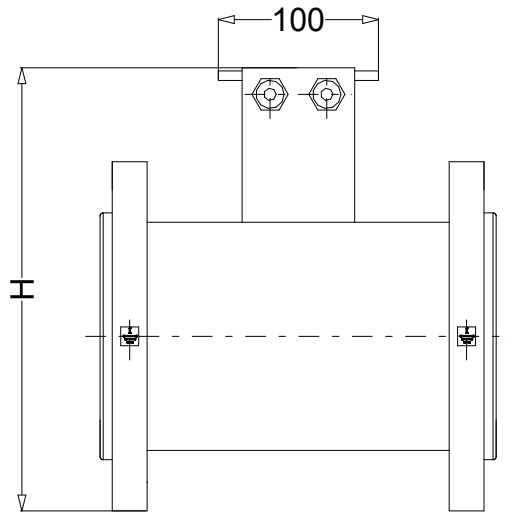
FLANGED SENSOR WITH A WIDE RANGE OF FLANGE SIZES

Warranty conditions are available on this website:
www.isomag.eu only in English version

ISOIL 
INDUSTRIA
The solutions that count

TECHNICAL DATA

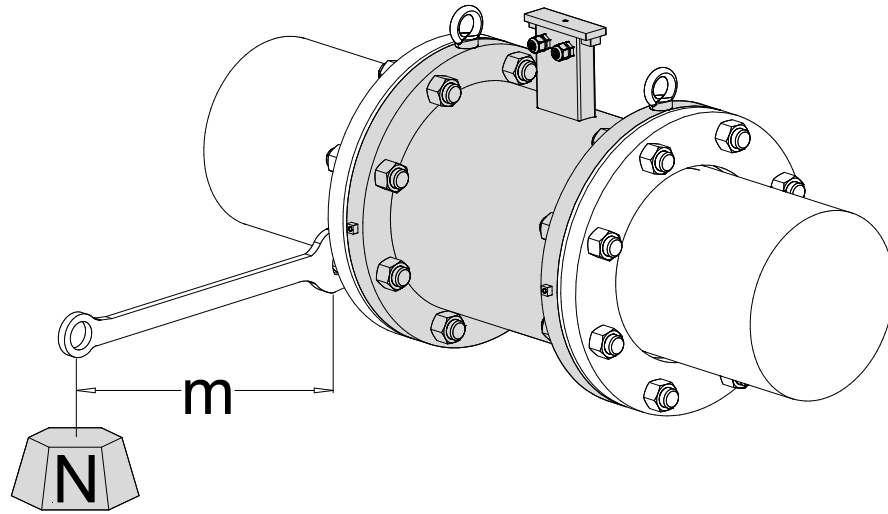
Body material	<input type="checkbox"/> Carbon steel painted <input type="checkbox"/> Stainless steel AISI 304/316 (opt.)
Nominal diameter	<input type="checkbox"/> DN 25 ÷ 2000
Nominal pressure	<input type="checkbox"/> 1600 kPa <input type="checkbox"/> Other on request
Process connection	<input type="checkbox"/> Flanges: UNI, ANSI, DIN, JIS <input type="checkbox"/> Other on request
Flanges material	<input type="checkbox"/> Carbon steel <input type="checkbox"/> Stainless steel AISI 304- AISI316 (opt.)
Liquid temperature	<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 <input type="checkbox"/> -20°C ÷ 130°C with PTFE lining in separate version* * Contact the factory for higher temperature
Vacuum resistance	<input type="checkbox"/> 20 Kpa (absolute) at 100 °C (60/80°C for PP/Ebonite)
Lining material	<input type="checkbox"/> Polypropylene (max. PN 16) <input type="checkbox"/> Ebonite <input type="checkbox"/> PTFE <input type="checkbox"/> Others on request
Gasket material	<input type="checkbox"/> Without gasket with lining PTFE and EBONITE <input type="checkbox"/> FPM or EPDM with lining in Polypropylene
Electrodes material	<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 <input type="checkbox"/> Others on request
Version – protection rating	<input type="checkbox"/> Compact version – IP 67 <input type="checkbox"/> Separate version (max 20m) – IP 68 <input type="checkbox"/> Separate version (max 500 m), with preamplifier – IP 67 (OPT. IP 68)
Accuracy	<input type="checkbox"/> See table below

OVERALL DIMENSIONS

MS 2500 PN 10/64 - ANSI 150/300 OVERALL DIMENSIONS									
DIMENSIONS mm (inches)		PN							
		PN 10	PN 16	PN 25	PN 40	PN 64	ANSI 150	ANSI 300	
DN	25 (1")	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	185 (7.28)	185 (7.28)	185 (7.28)	185 (7.28)	198 (7.80)	181 (7.13)	190 (7.48)
		D	115 (4.53)	115 (4.53)	115 (4.53)	115 (4.53)	140 (5.51)	108 (4.25)	124 (4.88)
	32 (1"1/4)	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	203 (8)	203 (8)	203 (8)	203 (8)	209 (8.23)	192 (7.56)	199 (7.83)
		D	140 (5.51)	140 (5.51)	140 (5.51)	140 (5.51)	155 (6.10)	118 (4.65)	133 (5.24)
	40 (1"1/2)	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	213 (8.39)	213 (8.39)	213 (8.39)	213 (8.39)	220 (8.66)	207 (8.15)	221 (8.7)
		D	150 (5.90)	150 (5.90)	150 (5.90)	150 (5.90)	170 (6.69)	127 (5)	156 (6.14)
	50 (2")	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	228 (8.98)	228 (8.98)	228 (8.98)	228 (8.98)	233 (9.17)	222 (8.74)	228 (8.98)
		D	165 (6.50)	165 (6.50)	165 (6.50)	165 (6.50)	180 (7.09)	152 (5.98)	165 (6.5)
	65 (2"1/2)	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	248 (9.76)	248 (9.76)	248 (9.76)	248 (9.76)	257 (10.12)	245 (9.65)	251 (9.88)
		D	185 (7.28)	185 (7.28)	185 (7.28)	185 (7.28)	205 (8.07)	178 (7.01)	191 (7.52)
	80 (3")	L	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
		H	263 (10.35)	263 (10.35)	263 (10.35)	263 (10.35)	267 (10.51)	259 (10.2)	268 (10.55)
		D	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	215 (8.46)	191 (7.52)	210 (8.27)
	100 (4")	L	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)
		H	283 (11.14)	283 (11.14)	294 (11.57)	294 (11.57)	297 (11.69)	288 (11.34)	300 (11.81)
		D	220 (8.66)	220 (8.66)	235 (9.25)	235 (9.25)	250 (9.84)	229 (9.02)	254 (10)
	125 (5")	L	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)	250 (9.84)
		H	313 (12.32)	313 (12.32)	325 (12.80)	325 (12.80)	330 (13)	315 (12.4)	328 (12.91)
		D	250 (9.84)	250 (9.84)	270 (10.63)	270 (10.63)	295 (11.61)	254 (10)	279 (10.98)
	150 (6")	L	300 (11.81)	300 (11.81)	300 (11.81)	300 (11.81)	300 (11.81)	300 (11.81)	300 (11.81)
		H	344 (13.54)	344 (13.54)	355 (13.98)	355 (13.98)	377 (14.84)	341 (13.43)	360 (14.17)
		D	285 (11.22)	285 (11.22)	300 (11.81)	300 (11.81)	345 (13.58)	279 (10.98)	318 (12.52)
200 (8")	L	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	
	H	399 (15.71)	399 (15.71)	415 (16.34)	425 (16.73)	435 (17.13)	401 (15.79)	420 (16.54)	
	D	340 (13.39)	340 (13.39)	360 (14.17)	375 (14.76)	415 (16.34)	343 (13.5)	381 (15)	
250 (10)	L	450 (17.72)	450 (17.72)	450 (17.72)	450 (17.72)	450 (17.72)	450 (17.72)	450 (17.72)	
	H	454 (17.87)	460 (18.11)	475 (18.7)	493 (19.41)	491 (19.33)	461 (18.15)	480 (18.9)	
	D	395 (15.55)	405 (15.94)	425 (16.73)	450 (17.72)	470 (18.5)	406 (15.98)	445 (17.52)	
300 (12")	L	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	
	H	504 (19.84)	515 (20.28)	535 (21.06)	558 (21.97)	545 (21.46)	527 (20.75)	546 (21.5)	
	D	445 (17.52)	460 (18.11)	485 (19.09)	515 (20.28)	530 (20.87)	483 (19.02)	521 (20.51)	
350 (14")	L	550 (21.65)	550 (21.65)	550 (21.65)	550 (21.65)	550 (21.65)	550 (21.65)	550 (21.65)	
	H	564 (22.2)	575 (22.64)	598 (23.54)	619 (24.37)	603 (23.74)	582 (22.91)	607 (23.9)	
	D	505 (19.88)	520 (20.47)	555 (21.85)	580 (22.83)	600 (23.62)	533 (20.98)	584 (22.99)	
400 (16")	L	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)	
	H	620 (24.41)	630 (24.8)	659 (25.94)	695 (27.36)	670 (26.38)	639 (25.16)	664 (26.14)	
	D	565 (22.24)	580 (22.83)	62 (2.44)	660 (25.98)	670 (26.38)	597 (23.5)	648 (25.51)	
450 (18")	L	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)		600 (23.62)	600 (23.62)	
	H	670 (26.38)	690 (27.17)	709 (27.91)	720 (28.35)		688 (27.09)	726 (28.58)	
	D	615 (24.21)	640 (25.2)	670 (26.38)	685 (26.97)		635 (25)	711 (27.99)	
500 (20")	L	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)		600 (23.62)	600 (23.62)	
	H	725 (28.54)	758 (29.84)	769 (30.28)	784 (30.87)		751 (29.57)	770 (30.31)	
	D	670 (26.38)	715 (28.15)	730 (28.74)	755 (29.72)		699 (27.52)	775 (30.51)	

MS 2500 PN 10/64 - ANSI 150/300 OVERALL DIMENSIONS									
Dimensions	mm(inches)	PN							
		PN 10	PN 16	PN 25	PN 40	PN 64	ANSI 150	ANSI 300	
DN	600 (24")	L	600 (23.62)	600 (23.62)	600 (23.62)	600 (23.62)		600 (23.62)	600 (23.62)
		H	830 (32.68)	879 (34.61)	880 (34.65)	911 (35.87)		866 (34.09)	916 (36.06)
		D	780 (30.71)	840 (33.07)	845 (33.27)	890 (35.04)		813 (32.01)	914 (35.98)
	650 (26")	L						650 (25.59)	650 (25.59)
		H						921 (36.26)	1002 (39.45)
		D						870 (34.25)	972 (38.27)
	700 (28")	L	700 (27.56)	700 (27.56)	700 (27.56)	700 (27.56)		700 (27.56)	
		H	895 (35.24)	949 (37.36)	989 (38.94)	1016 (40)		1016 (40)	
		D	800 (31.5)	910 (35.83)	960 (37.8)	995 (39.17)		927,1 (36,5)	
	750 (30")	L						750 (29.53)	750 (29.53)
		H						1032 (40.63)	1121 (44.13)
		D						984 (38.74)	1092 (42.99)
	800 (32")	L	800 (31.5)	800 (31.5)	800 (31.5)	800 (31.5)		800 (31.5)	
		H	1058 (41.65)	1060 (41.73)	1106 (43.54)	1149 (45.24)		1149 (45.24)	
		D	1015 (39.96)	1025 (40.35)	1085 (42.72)	1114 (43.86)		1060,5 (47,15)	
	850 (34")	L						850 (33.46)	850 (33.46)
		H						1149 (45.24)	1230 (48.43)
		D						1111 (43.74)	1207 (47.52)
	900 (36")	L	900 (35.43)	900 (35.43)	900 (35.43)	900 (35.43)		900 (35.43)	900 (35.43)
		H	1158 (45.59)	1160 (45.67)	1206 (47.48)	1259 (49.57)		1206 (47.48)	1292 (50.87)
		D	1115 (43.9)	1125 (44.29)	1185 (46.65)	1250 (49.21)		1168 (45.98)	1270 (50)
	1000 (40")	L	1000 (39.37)	1000 (39.37)	1000 (39.37)	1000 (39.37)		1000 (39.37)	1000 (39.37)
		H	1269 (49.96)	1284 (50.55)	1329 (52.32)	1369 (53.9)		1381 (54.37)	1467 (57.76)
		D	1230 (48.43)	1255 (49.41)	1320 (51.97)	1360 (53.54)		1346 (52.99)	1448 (57.01)
	1050 (42")	L						1050 (41.3)	
		H						1355.0 (54.00)	
		D						1346.2 (53.00)	
	1100 (44")	L						1100 (43.3)	
		H						1428 (56.25)	
		D						1403.4 (55.25)	
1200 (48")	L	1200 (47.24)	1200 (47.24)				1200 (47.24)		
	H	1498 (59.92)	1518 (59.76)				1530 (60.50)		
	D	1455 (57.28)	1485 (58.46)				1511.3 (59.50)		
1400 (56")	L	1400 (55.18)	1400 (55.18)						
	H	1711 (67.36)	1714 (67.46)						
	D	1675 (65.94)	1685 (66.34)						
1600 (56")	L	1600 (62.99)	1600 (62.99)						
	H	1944 (76.52)	1947 (76.65)						
	D	1915 (75.39)	1930 (75.98)						
1800 (72")	L	1800 (70.87)	1800 (70.87)				1800 (72.00)		
	H	2144 (84.39)	2147 (84.53)				2190 (54.37)		
	D	2115 (83.27)	2130 (75.98)				2197 (86.50)		
2000 (80")	L	2000 (78.74)	2000 (78.74)						
	H	2352 (92.66)	2356 (92.77)						
	D	2325 (91.53)	2345 (92.32)						

TORQUES (Nm)

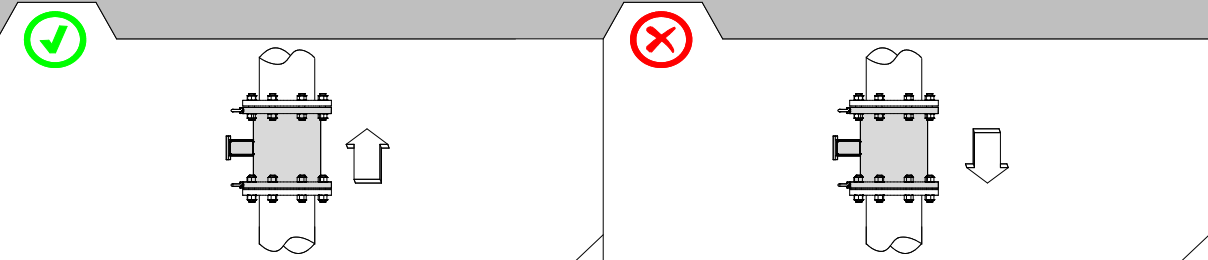


OPERATIVE PRESSURE										
Kpa	1000		1600			2500		4000		6400
psi	140		260			350		600		1000
DN	PTFE	EBON.	PTFE	EBON.	PP	PTFE	EBON.	PTFE	EBON.	EBON.
25			25 (21)		19	25		25 [32]		39 [32]
32			43 (26)		28	43		43 [40]		53 [40]
40			53 (32)		36	53		53 [63]		72 [63]
50			68 (60)		52	68		68 [35]		81 [35]
65			90 (78)		75	45		45 [53]		58 [53]
80			53 (89)		41	53		53 [68]		62 [68]
100			59 (70)		56	83		83 [94]		87 [94]
125			77 (94)		71	112		112 [130]		148 [130]
150			108 (106)		106	135		135 [113]		217 [113]
200	148	123	99 (148)	82 (124)		134	112	178 [178]	149 [148]	233 [178]
250	123	103	140 (156)	117 (130)		204	170	267 [185]	223 [154]	321 [185]
300	142	119	175 (234)	146 (195)		201	168	278 [275]	232 [229]	317 [275]
350	172	143	205 (325)	171 (271)		324	270	422 [318]	352 [265]	481 [318]
400	217	181	282 (312)	235 (260)		426	355	619 [411]	516 [342]	623 [411]
450	194	161	281 (336)	234 (280)				[398]	[332]	
500	224	186	382 (317)	318 (264)				[465]	[387]	
550			(379)	(316)				[608]	[506]	
600	323	269	568 (463)	474 (386)				[774]	[645]	
650			(429)	(357)				[753]	[627]	
700	356	297	421 (503)	351 (420)				[947]	[789]	
750			(451)	(376)				[1105]	[920]	
800	476	400	549	446						
850			(563)	(469)				[1373]	[1144]	
900	450	380	519 (618)	395 (515)				[1408]	[1173]	
1000	582	485	721 (736)	546 (613)				[1598]	[1332]	

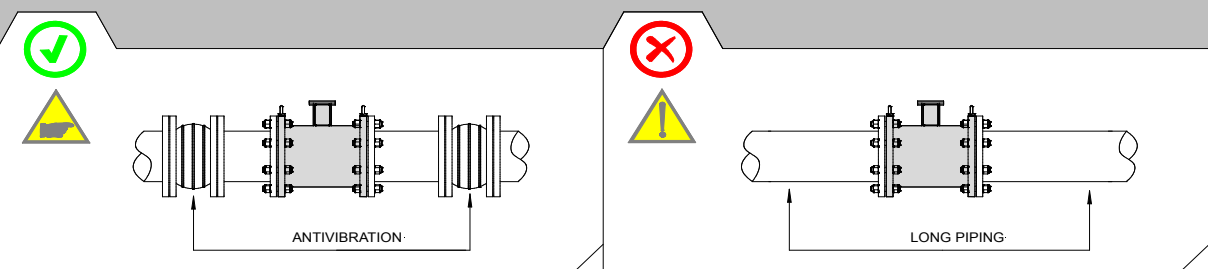
- Tighten uniformly in diagonally opposite sequence
- The torque listed in tab are applicable to flanges: EN1092-1, DIN 2501, BS 4504, ANSI B16.5 , JIS
- The use of DIN 2690 gaskets is recommended
- For DN > 1000 contact the manufacturer
- Value between curved brackets (xxxx)= ANSI 150
- Value between squared brackets [xxxx]= ANSI 300

INSTALLATION RECOMMENDATIONS

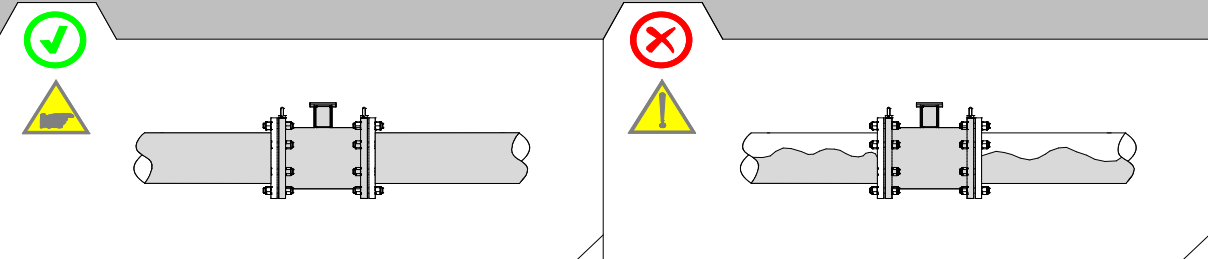
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



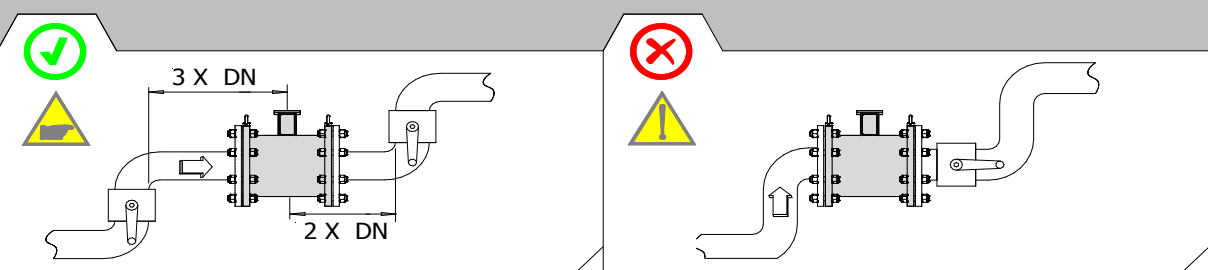
For installations in long pipe lines, please use anti vibration joints



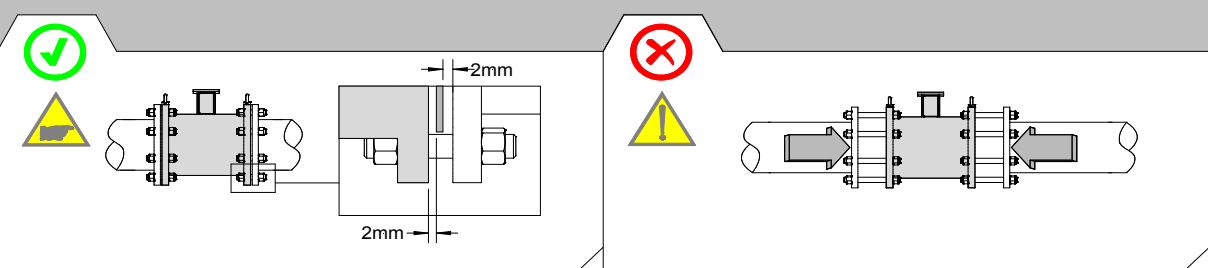
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



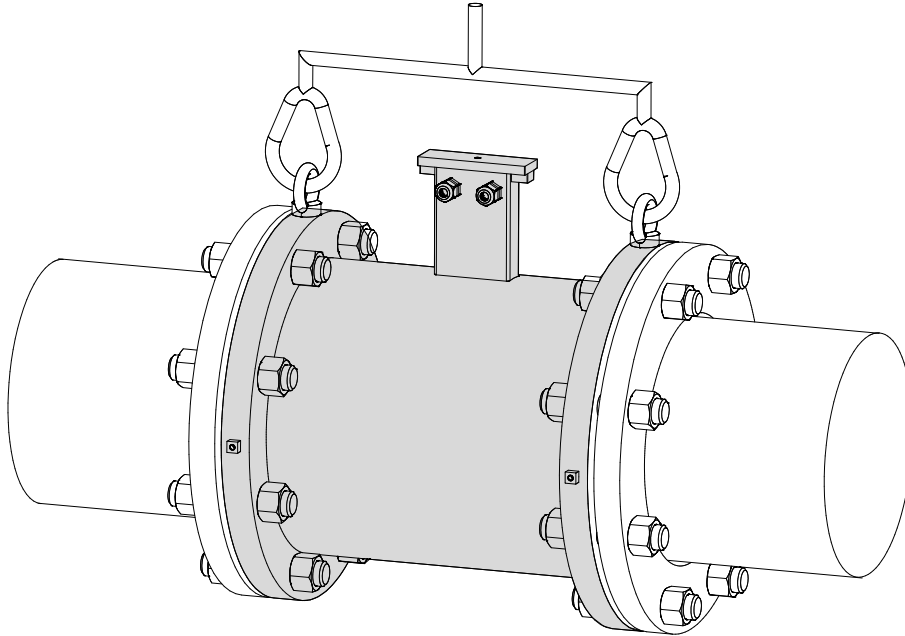
Install the sensor away from bends and hydraulic accessories



Avoid positioning flange and counter flanges by tightening the nuts.



RECOMMENDED INSTALLATION METHOD

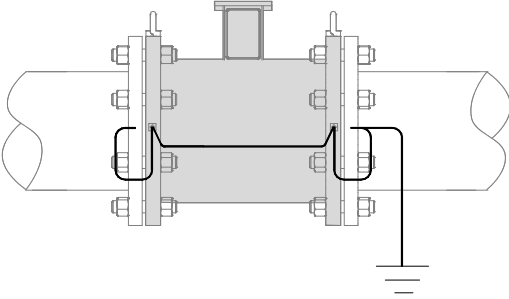
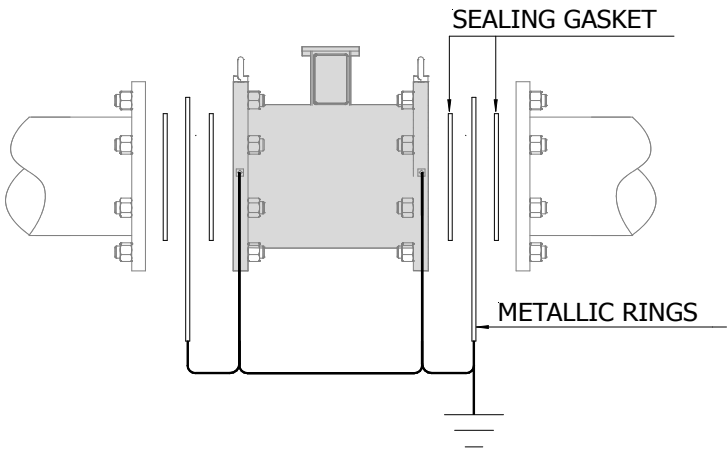
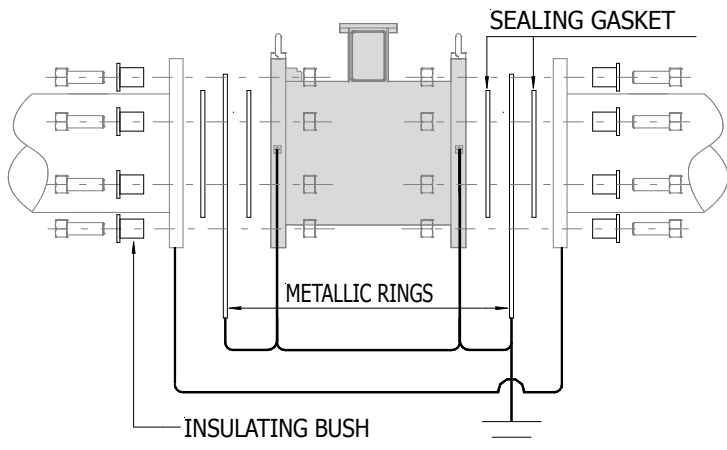


Sensors weighing above 20Kg are equipped of appropriate eyebolts to lift the sensor in to place according to the above illustrated method

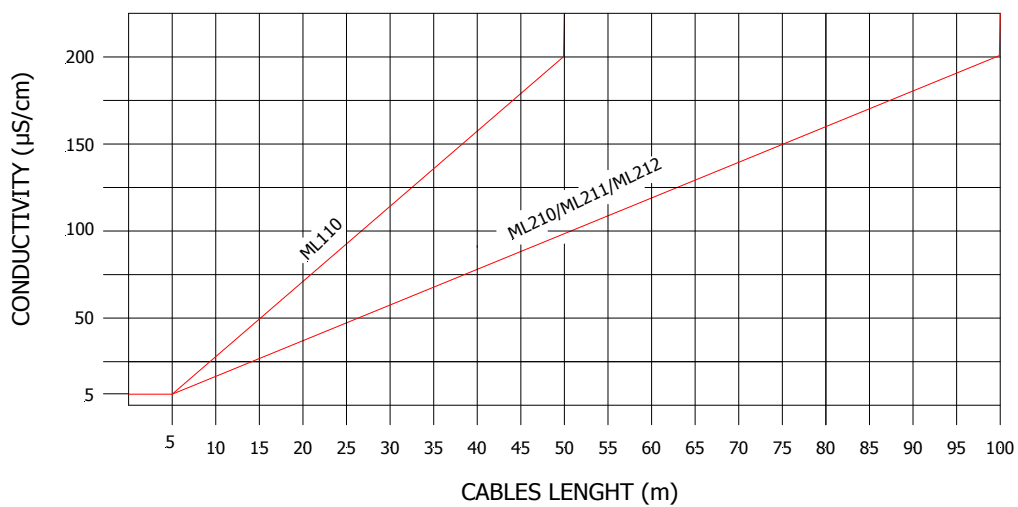
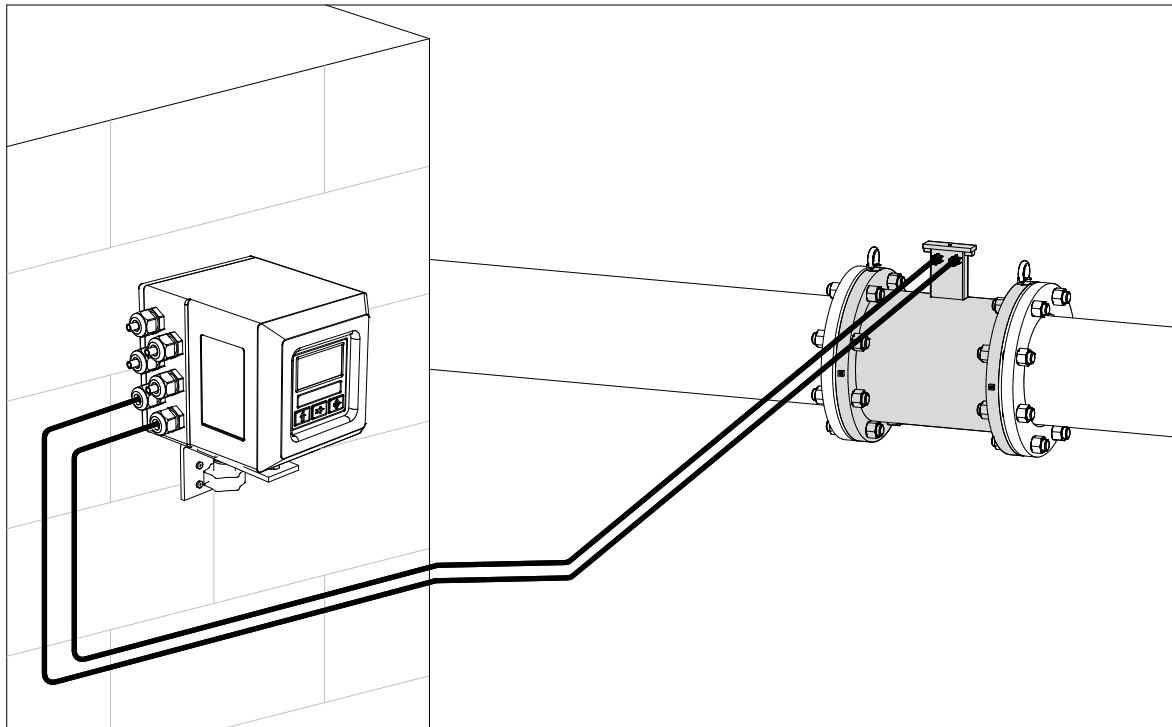
NOTE :

The eyebolts support the only weight of the meter.

SENSOR GROUNDING

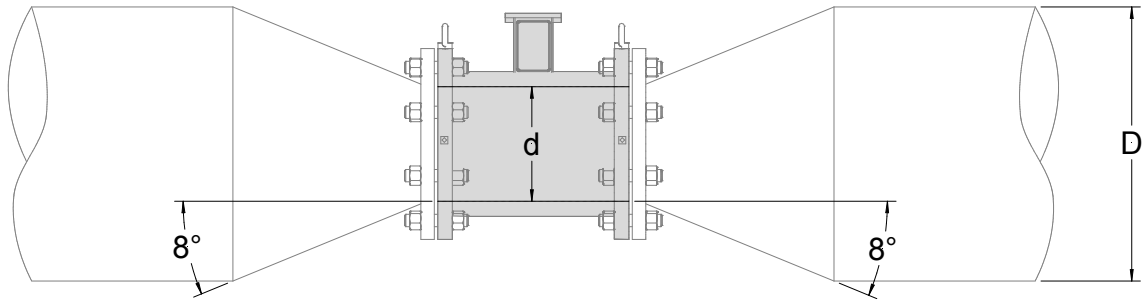
METALLIC PIPE	
	
INSULATED PIPE	
	<p>-If the sensor has to be installed in a pipe made of an insulating material, the following are necessary:</p> <ul style="list-style-type: none"> - Inserting two metallic rings between the sensor flanges and the pipe line counter flanges <p>or</p> <ul style="list-style-type: none"> - Using a sensor with the additional grounding electrode
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"> - 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 µS/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:

Δp = Pressure loss in [Pa]

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

d = sensor diameter [m]

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

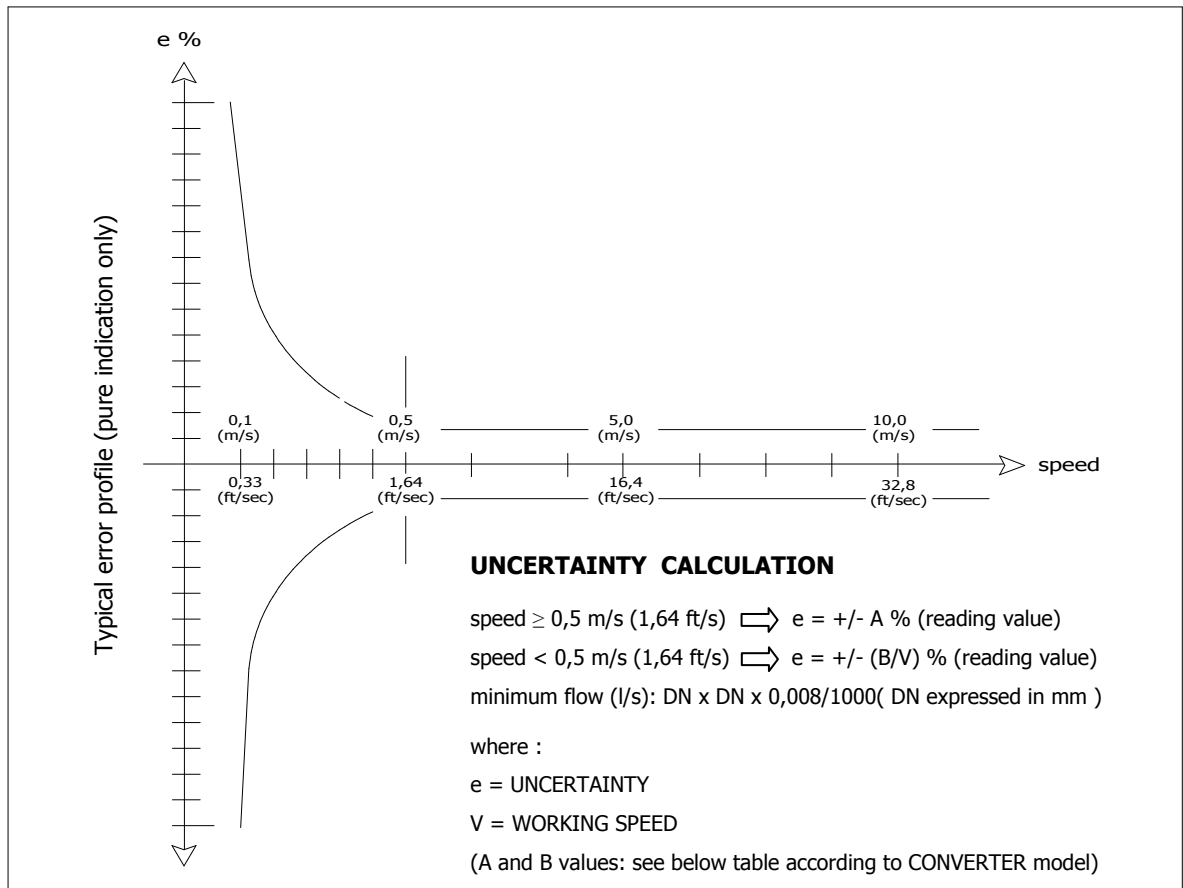
u = Mean flow velocity in sensor diameter [m/s]

Calculation examples 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 :

- $\rho = 1000[\text{kg}/\text{m}^3]$ 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].

ACCURACY TABLE



AC/DC POWERED CONVERTERS

ML 51			ML 110 – STD			ML 110 – SA*			ML210/211/212			ML4F1		
A	B (m/s)	B (ft/s)	A	B (m/s)	B (ft/s)	A	B (m/s)	B (ft/s)	A	B (m/s)	B (ft/s)	A	B (m/s)	B (ft/s)
0,5	0,25	0,82	0,8	0,4	1,31	0,4	0,2	0,66	0,2	0,1	0,33	0,2	0,1	0,33

* SPECIAL ACCURACY

FLOWIZ™ BATTERY POWERED CONVERTERS

ML 250			ML 252		
A	B (m/s)	B (ft/s)	A	B (m/s)	B (ft/s)
0,5	0,25	0,82	0,5	0,25	0,82

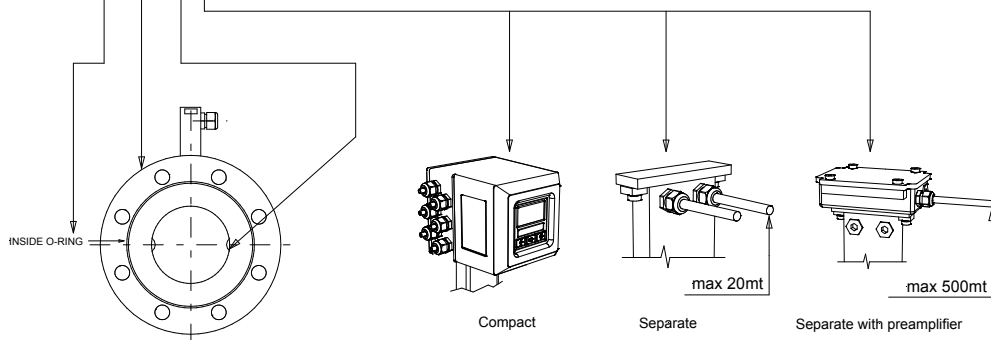
Reference conditions :

- Constant flow rate during the test
- Pressure: >30 Kpa
- Flow condition : fully developed flow profile
- Zero stability +/- 0,005 %

HOW TO ORDER

MS 2500	Nominal Diameter / Lining / Liquid temperature / Measuring range
T25 + T1200	From ND 25 (1") up to ND 1200 (48"), PTFE lining, liquid maximum temperature 130 °C, Measuring range 0...0.72/0...40000 m3/h
P25 + P150	From ND 25 (1") up to ND 150 (6"), Polypropylene lining, liquid maximum temperature 60 °C, Measuring range 0...0.72/0...640 m3/h
E200+E2000	From ND 200 (8") up to ND 2000 (80"), Ebonite lining, liquid maximum temperature 80 °C, Measuring range 0...45.2/0...640 m3/h
Gasket material (internal tightness, only for polypropylene lining)	
A	No O-Ring (ONLY FOR PTFE/EBANITE LINING)
B	O-Ring : FPM
C	O-Ring : Epdm
Z	Other O-Ring
Flanges type	
1	Flanges UNI2223 PN16 (max. with Polypropilene lining)
2	Flanges UNI2223 PN10
3	Flanges UNI2223 PN25
4	Flanges UNI2223 PN40 (standard for DN 25 ...50 with PTFE lining)
5	Flanges UNI2223 PN64
6	Flanges ANSI 150RF
7	Flanges ANSI 300RF
8	Flanges PN6
9	Flanges JIS 10K
0	Flanges: to be specified
Body material	
A	Body and flange in Carbon Steel, RAL6028 painted
B	Body and flange in Stainless Steel (AISI304)
C	Body and flange in Stainless Steel (AISI316)
Z	Body and flange material: other
Number and electrodes material	
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	da specificare/other
Version - Protection rate	
A	Compact version, IP67 protection rate, liquid maximum temperature 100 °C
B	Separate version, maximum length see table liquid maximum temperature 130 °C, protection rate IP68
C	Separate version "L" (in Carbon Steel), with preamplifier (maximum length 500 m), liquid maximum temperature 100 °C, protection rate IP67 (option IP68)
D	Separate version "L" (in AISI304), with preamplifier (maximum length 500 m.), liquid maximum temperature 100 °C, protection rate IP67 (option IP68)
E	Version with neck of the Sensor according to draw. G006 (valid for A-B-C-D versions, add the relative COST)
F	Separate version with N° 2 connectors IP 68 suitable for C015/16 (max 20 m-ADD THE COST)
G	Separate version with N° 1 connectors IP 68 suitable for C018 (max 20 m-ADD THE COST)
H	Separate vers. with N° 1 connectors IP 68 suitable for C014 for fast cable connections TO PREAMP. IN CAR. STEEL(DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
I	Separate vers. with N° 1 connectors IP 68 suitable for C014 for fast cable connections TO PREAMP. IN SS (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
M	Compact version, IP67 protection rate , with the possibility to turn the converter 90°

MS 2500 T25 A 4 A 1 A EXAMPLE OF CODE FOR ORDER



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