

# ISOMAG ™

*The friendly magmeter*

## MS 2410

**SANITARY SENSOR**



**CERTIFIED SENSOR "SANITARY". SPECIFIC FOR THE USE IN ALIMENTARY AND PHARMACEUTICAL APPLICATIONS**

## **FLOAB**

**FLÖDESPRODUKTER AB**

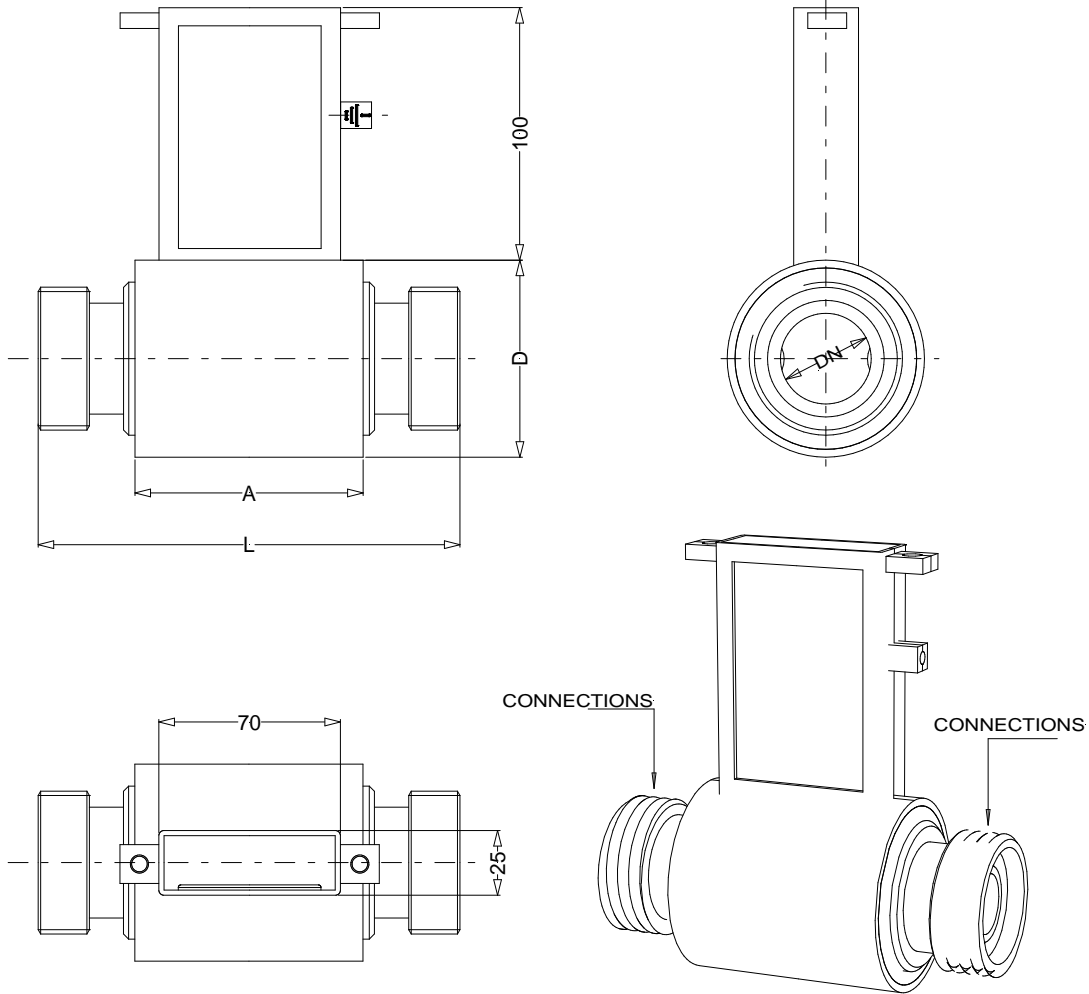
**FLOAB Flödesprodukter AB**

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## TECHNICAL DATA

<b>Body material</b>	<input type="checkbox"/> <b>Stainless steel AISI 304</b> <input type="checkbox"/> <b>Stainless steel AISI 316 (opt.)</b>
<b>Nominal diameter</b>	<input type="checkbox"/> <b>DN 3 ÷ 100</b>
<b>Nominal pressure</b>	<input type="checkbox"/> <b>PN 16</b>
<b>Process connection</b>	<input type="checkbox"/> <b>Sanitary DIN 11851</b> <input type="checkbox"/> <b>Tri-clamp®</b> <input type="checkbox"/> <b>Tri-clover®</b> <input type="checkbox"/> <b>SMS</b> <input type="checkbox"/> <b>Other on request</b>
<b>Vacuum resistance</b>	<input type="checkbox"/> <b>20 Kpa at 100 °C</b>
<b>Connection material</b>	<input type="checkbox"/> <b>Stainless steel AISI 316</b>
<b>Liquid temperature</b>	<input type="checkbox"/> <b>-20 °C ÷ +100 °C comp. version. ( 130 °C only with ML4F-1 )</b> <input type="checkbox"/> <b>-20 °C ÷ + 150 °C separate version.</b>
<b>Lining material</b>	<input type="checkbox"/> <b>PTFE</b>
<b>Gasket material</b>	<input type="checkbox"/> <b>FPM ( FDA approved )</b> <input type="checkbox"/> <b>EPDM ( FDA approved )</b>
<b>Electrode material</b>	<input type="checkbox"/> <b>Stainless steel AISI 316</b> <input type="checkbox"/> <b>Other on request</b>
<b>Version – protection rating</b>	<input type="checkbox"/> <b>Compact version – IP 67</b> <input type="checkbox"/> <b>Separate version (max 20m) – IP 68</b> <input type="checkbox"/> <b>Separate version (max 500 m), with preamplifier – IP 67 (OPT. IP 68)</b>
<b>Accuracy</b>	<input type="checkbox"/> <b>See table below</b>

## OVERALL DIMENSIONS DIN/SMS CONNECTIONS



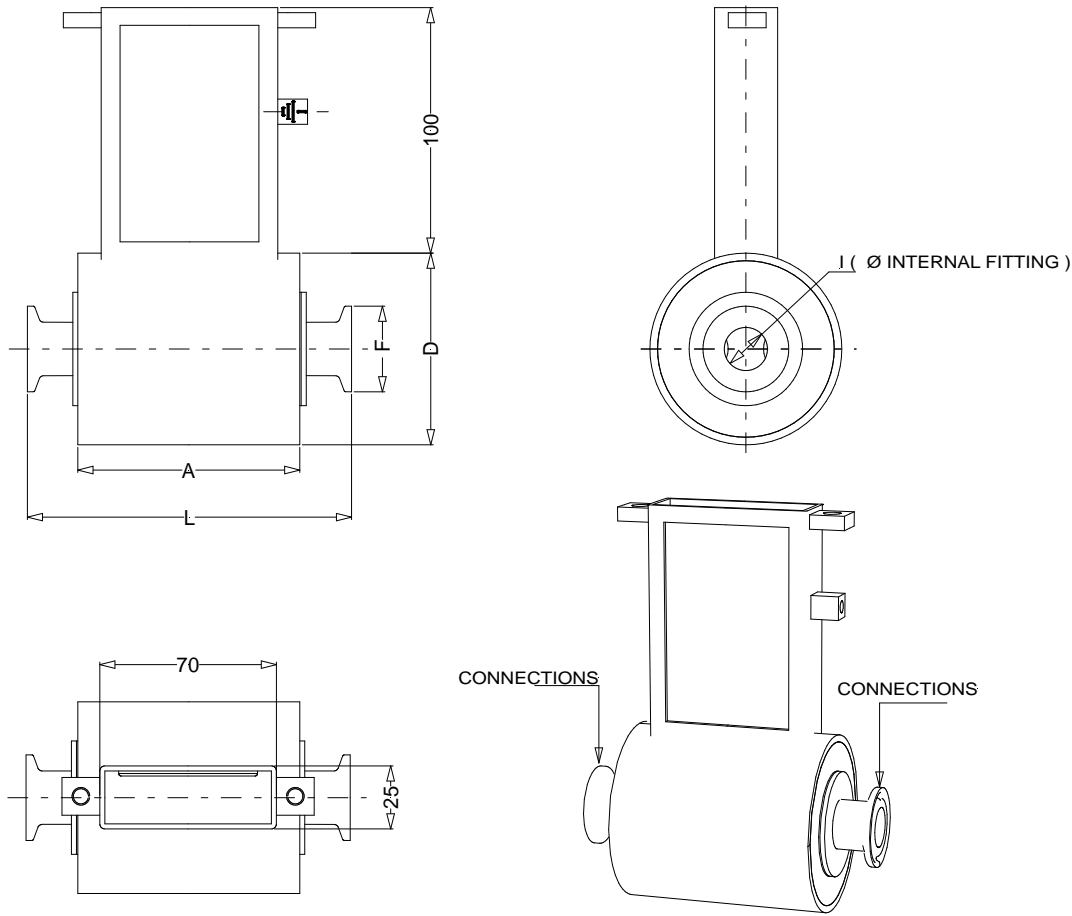
**DIN 11851**

DIMENSIONS mm (inches)	DN											
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	32 (1 1/4)	40 (1 1/2)	50 (2")	65 (2 1/2)	80 (3")	100 (4")
<b>A</b>	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
<b>L</b>	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
<b>D</b>	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	89 (3.50)	89 (3.50)	114 (4.49)	140 (5.51)	140 (5.51)	168 (6.61)
<b>CONNECTIONS</b>	DN 10	DN 10	DN 10	DN 15	DN 20	DN25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100

**SMS**

DIMENSIONS mm (inches)	DN								
	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	40 (1 1/2)	50 (2")	65 (2 1/2)	80 (3")	100 (4")
<b>A</b>	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
<b>L</b>	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
<b>D</b>	76 (3)	76 (3)	76 (3)	76 (3)	89 (3.50)	114 (4.49)	140 (5.51)	140 (5.51)	168 (6.61)
<b>CONNECTIONS</b>	DN 25	DN 25	DN 25	DN25	DN 38	DN 51	DN 63	DN 76	DN 104

**CLAMP CONNECTIONS**



**CLAMP ISO 2852**

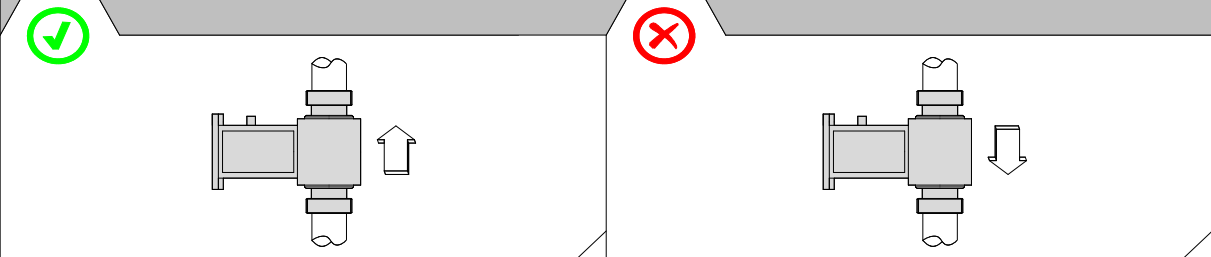
DIMENSIONS mm (inches)	DN										
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	40 (1"1/2)	50 (2")	65 (2"1/2)	80 (3")	100 (4")
<b>A</b>	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
<b>L</b>	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
<b>D</b>	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	89 (3.50)	114 (4.49)	140 (5.51)	140 (5.51)	168 (6.61)
<b>I</b>	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)	17.2 (0.68)	21.3 (0.84)	22.6 (0.89)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)
<b>F</b>	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)	50.5 (1.99)	50.5 (1.99)	64 (2.52)	77.5 (3.05)	91 (3.58)	119 (4.69)

**CLAMP BS 4825**

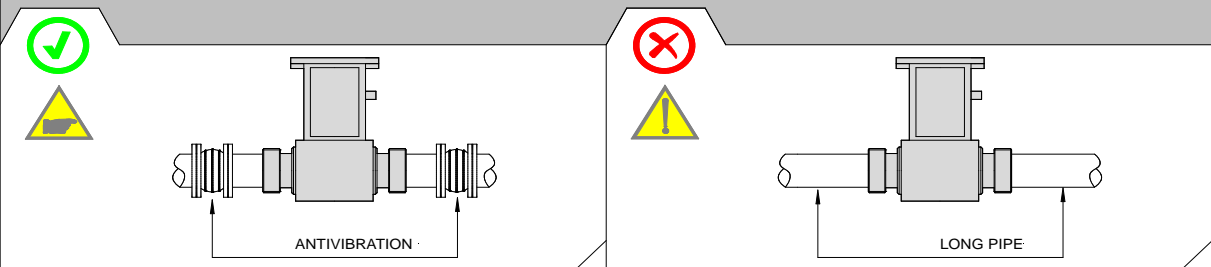
DIMENSIONS mm (inches)	DN										
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	40 (1"1/2)	50 (2")	65 (2"1/2)	80 (3")	100 (4")
<b>A</b>	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
<b>L</b>	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
<b>D</b>	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)	89 (3.50)	114 (4.49)	140 (5.51)	140 (5.51)	168 (6.61)
<b>I</b>	9.5 (0.37)	9.5 (0.37)	9.5 (0.37)	15.85 (0.62)	22.2 (0.87)	22.2 (0.87)	34.9 (1.37)	47.6 (1.87)	60.3 (2.37)	73 (2.87)	97.6 (3.84)
<b>F</b>	25.4 (1)	25.4 (1)	25.4 (1)	25.4 (1)	50.5 (1.99)	50.5 (1.99)	50.5 (1.99)	64 (2.52)	77.5 (3.05)	91 (3.58)	119 (4.69)

# INSTALLATION RECOMMENDATIONS

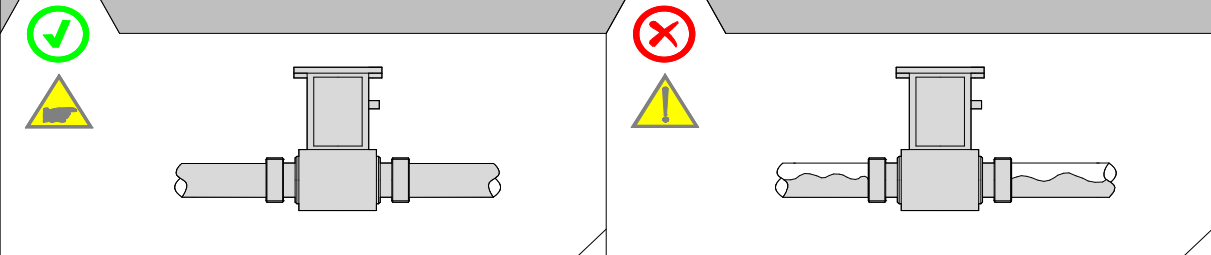
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



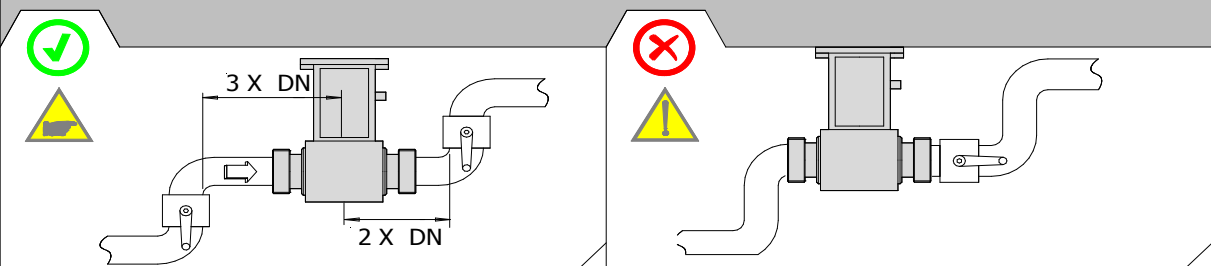
For installations in long pipe lines, please use anti vibration joints



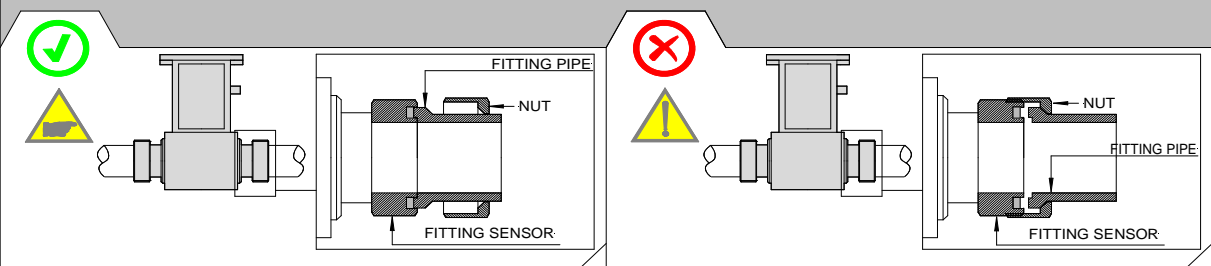
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



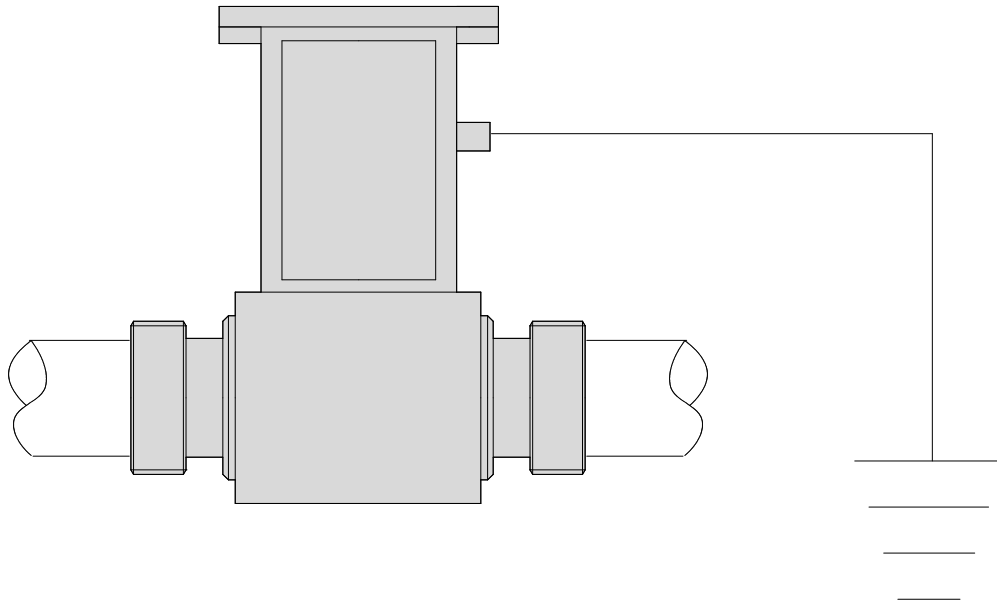
Install the sensor away from bends and hydraulic accessories



Avoid positioning fittings by tightening the clamps.

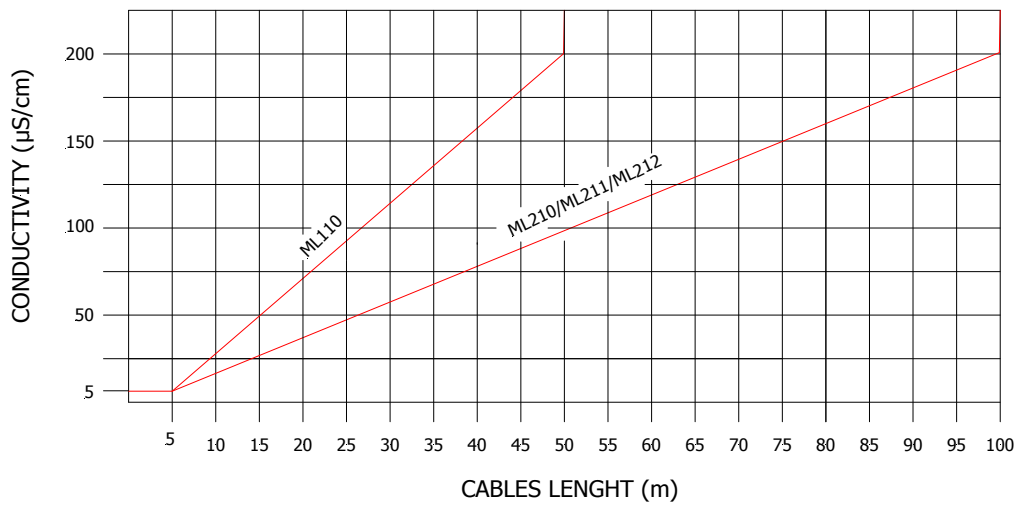
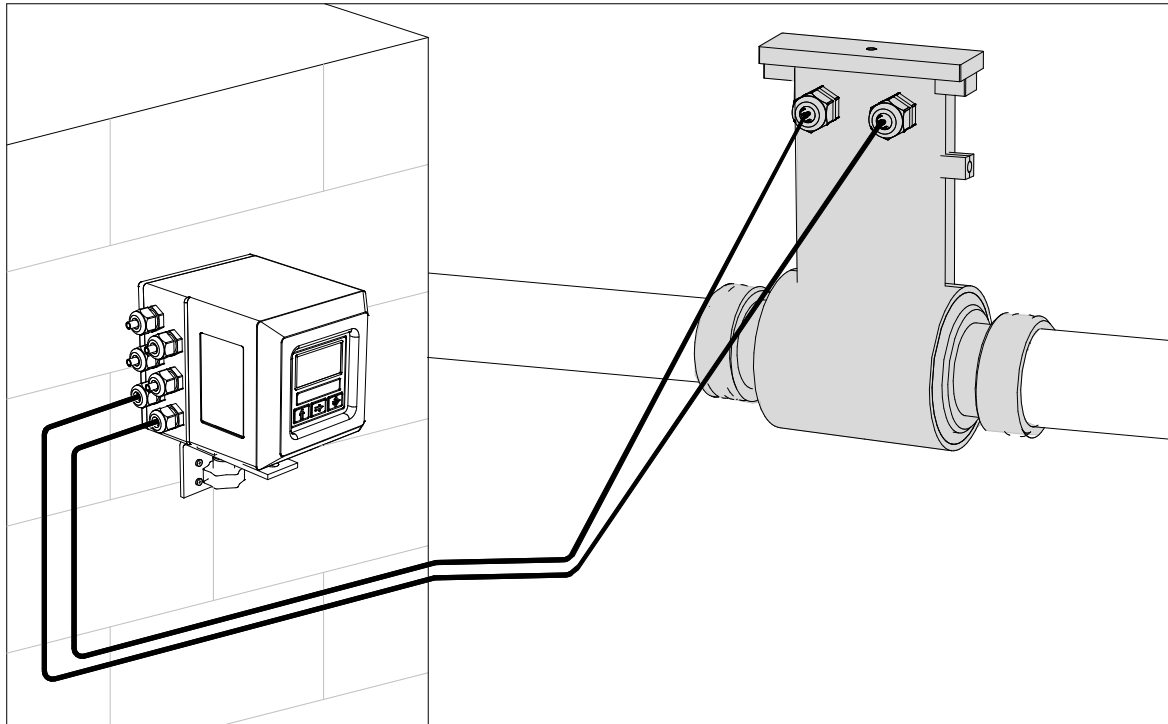


## SENSOR GROUNDING



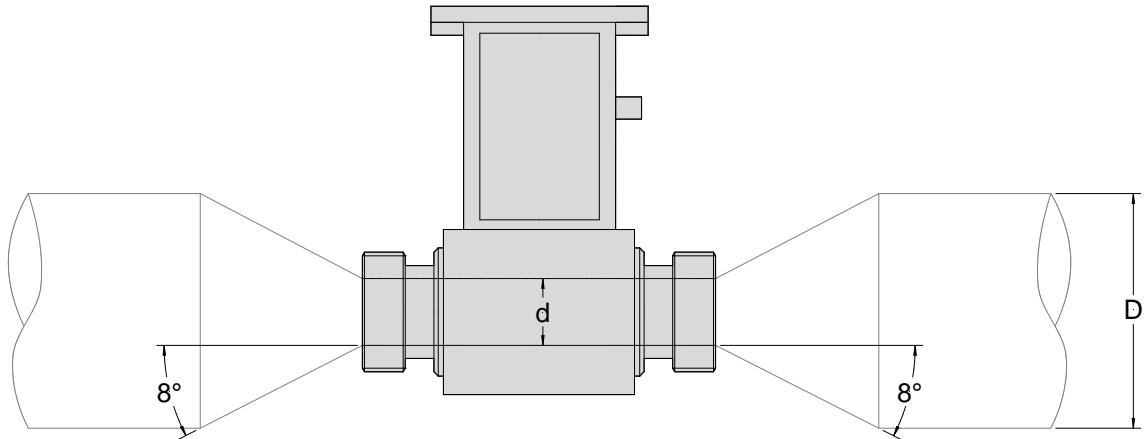
**For the correct operation of the meter the sensor and liquid must be equipotential. ALWAYS connect sensor and converter to the ground.**

## 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:

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

$\rho$  = Fluid density [kg/m<sup>3</sup>] typical value  $\rho = 1000$ [kg / m<sup>3</sup>]

$d$  = sensor diameter [m]

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

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

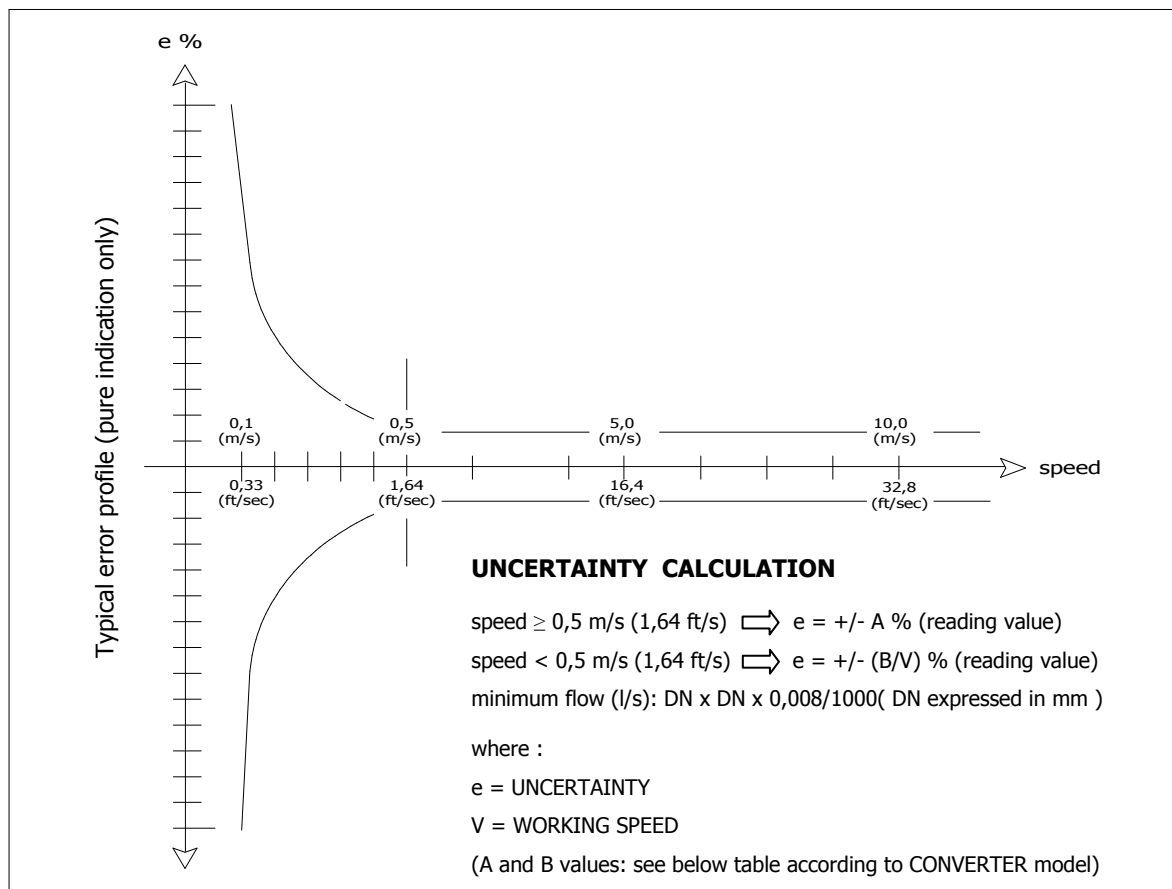
Calculation examples $\Delta p$ [mbar]								
$\frac{d}{D} \backslash u$	1 [m/s]	2 [m/s]	3 [m/s]	4 [m/s]	5 [m/s]	6 [m/s]	7 [m/s]	8 [m/s]
0.5	1.1	4.3	9.6	17.0	26.6	38.3	52.1	68.0
0.6	0.9	3.6	8.2	14.6	22.7	32.7	44.6	58.2
0.7	0.8	3.0	6.8	12.2	19.0	27.4	37.2	48.6
0.8	0.6	2.5	5.7	10.1	15.7	22.7	30.9	40.3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

Note :

- $\rho = 1000$ [kg / m<sup>3</sup>] 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

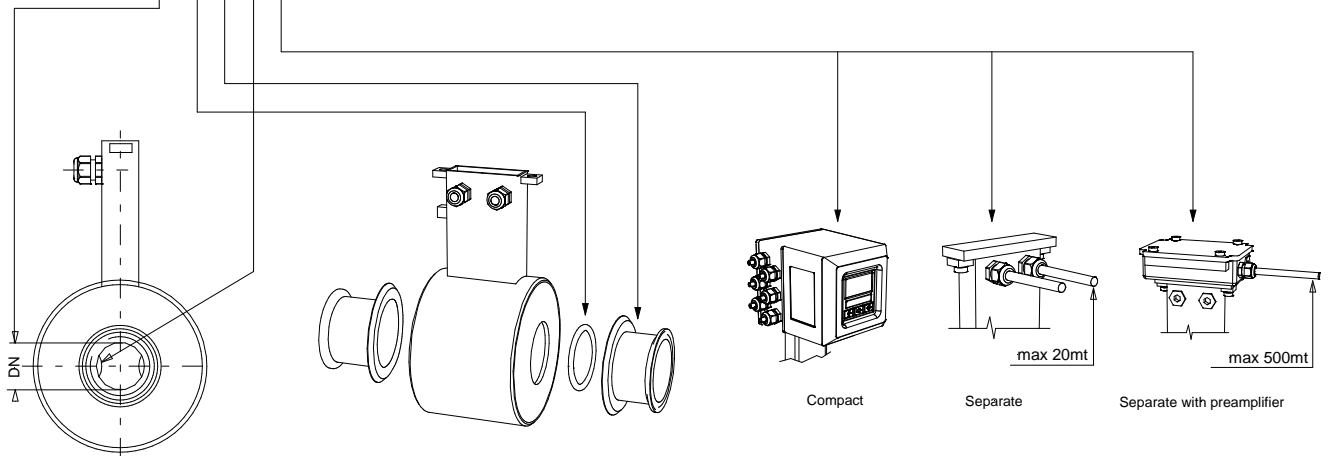
Reference conditions :

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

## HOW TO ORDER

MS 2410	Nominal Diameter - Lining - Measuring range
T03	DN3 ( 1/8 " ), PTFE lining, measuring range 0.. 10 / 0...250 l/h
T06	DN6 ( 1/4 " ), PTFE lining, measuring range 0...40/0...1000 l/h
T10	DN10 ( 3/8 " ), PTFE lining, measuring range 0..120/0...3000 l/h
T15	DN15 ( 1/2 " ), PTFE lining, measuring range 0.. 240/0...6000 l/h
T20	DN20 ( 3/4 " ), PTFE lining, measuring range 0.. 500/0...12500 l/h
T25	DN25 ( 1" ) PTFE lining, measuring range 0 ... 0,72 / 0 ... 18 m3/h
T32	DN32 ( 1 1/4 ), PTFE lining, measuring range 0 ... 1,6 / 0 ... 29 m3/h
T40	DN40 ( 1 1/2 ), PTFE lining, measuring range 0 ... 1,8 / 0 ... 45 m3/h
T50	DN50 ( 2" ), PTFE lining, measuring range 0 ... 2,88 / 0 ... 72 m3/h
T65	DN65 ( 2 1/2 ), PTFE lining, measuring range 0 ... 4,8 / 0 ... 120 m3/h
T80	DN80, ( 3" ), PTFE lining, measuring range 0 ... 7,2 / 0 ... 180 m3/h
T100	DN100, ( 4" ), PTFE lining, measuring range 0 ... 11,2 / 0 ... 280 m3/h
<b>Gasket material (internal tightness)</b>	
2	O-Ring : Epdm
3	O-Ring : FPM ( FDA1770 )
9	Other O-Ring
<b>Process connection type</b>	
A	DIN11850/11852
B	Clamp ISO2852
C	SMS (da/from DN10)
D	Clamp GB special connections
E	Clamp BS 4825
Z	Other fittings
<b>Number and electrodes material</b>	
1	n. 2 measure electrodes in AISI316
0	Other
<b>Execution - Protection rate</b>	
A	Compact version, IP67 protection rate
B	Separate version maximum length see table, remember to added the cables C015+C016 cost, protection rate IP68 (standing immersion with 1,5 m of head water)
D	Separate version (in AISI304), with preamplifier (maximum length 500 m.), remember to added the cable C014 cost, protection rate IP67
E	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 C015/16 for fast cable connections ( max 20 m-ADD THE COST )
G	Separate version with N° 1 connectors IP 68 suitable for C018 for fast cable connections ( max 20 m-ADD THE COST )
I	Sep version with N° 1 connectors IP 68 for C014 fast cable connections TO PRAMPLIFIRE IN AISI 304 VERSION (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 2410 T03 2 A 1 A** EXAMPLE OF ORDER CODE



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

**FLOAB**  
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