

ISOMAG

The friendly magmeter

MS 2410

SANITARY SENSOR



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

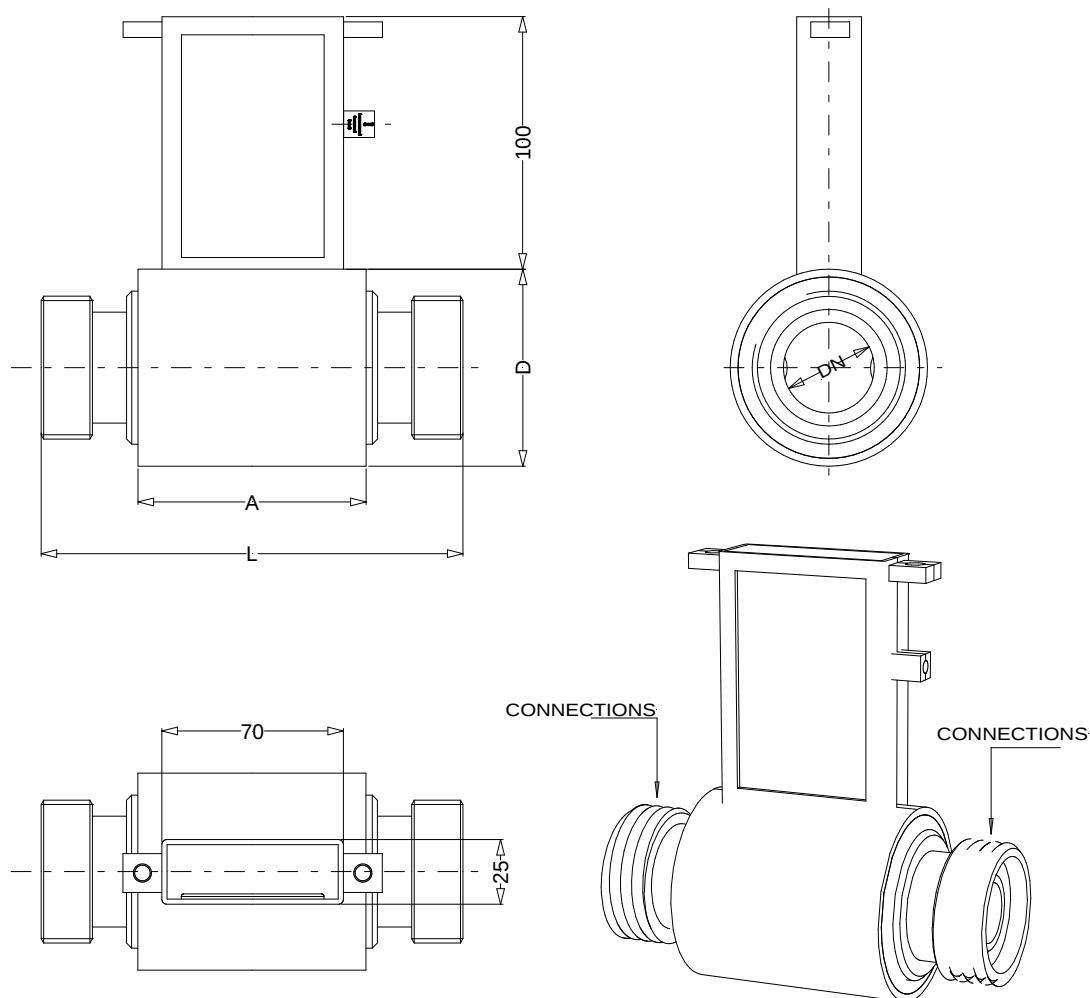
Warranty conditions are available on this website:
www.isomag.eu only in English version

ISOIL 
INDUSTRIA
The solutions that count

TECHNICAL DATA

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

OVERALL DIMENSIONS DIN/SMS CONNECTIONS



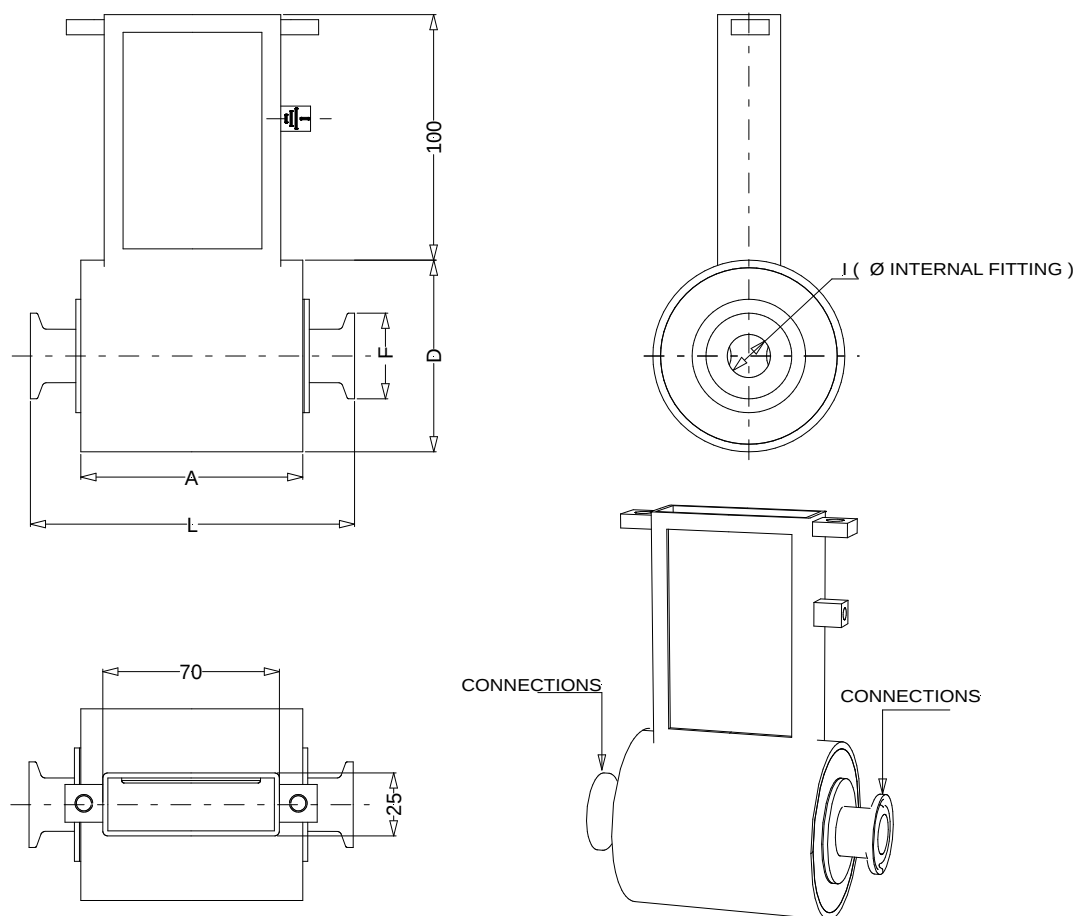
DIN 11851

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")
A	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)
L	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)
D	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)
CONNECTIONS	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)									
	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")
A	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)
L	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)
D	76 (3)	76 (3)	76 (3)	76 (3)	89 (3.50)	114 (4.49)	140 (5.51)	140 (5.51)	168 (6.61)
CONNECTIONS	DN 25	DN 25	DN 25	DN25	DN 38	DN 51	DN 63	DN 76	DN 104

CLAMP CONNECTIONS



CLAMP ISO 2852

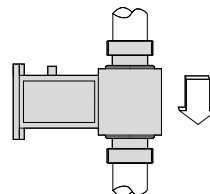
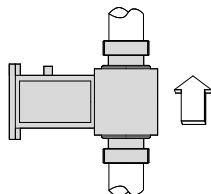
DIMENSIONS mm (inches)	DN										
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	40 (1 1/2)	50 (2")	65 (2 1/2)	80 (3")	100 (4")
A	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
L	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
D	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)
I	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)
F	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

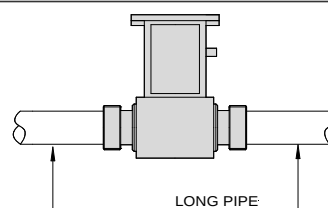
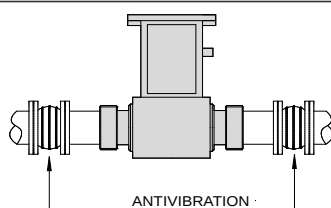
DIMENSIONS mm (inches)	DN										
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")	25 (1")	40 (1 1/2)	50 (2")	65 (2 1/2)	80 (3")	100 (4")
A	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)	100 (3.94)
L	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	180 (7.09)	180 (7.09)	180 (7.09)	180 (7.09)	200 (7.87)	200 (7.87)
D	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)
I	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)
F	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

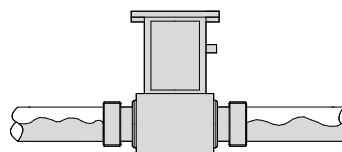
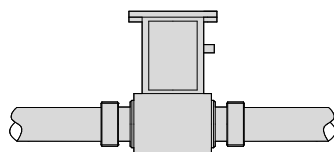
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



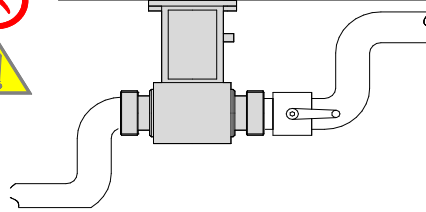
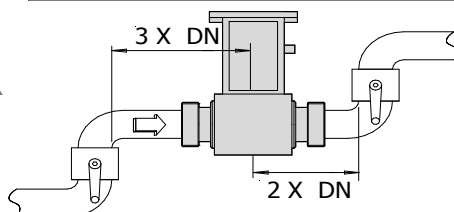
For installations in long pipe lines, please use anti vibration joints



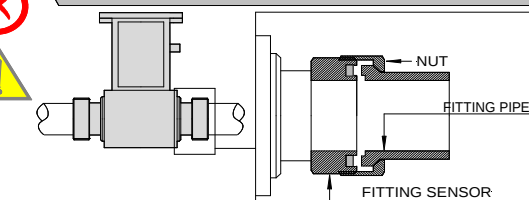
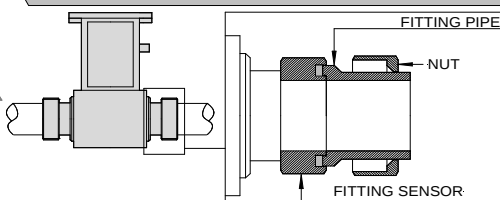
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



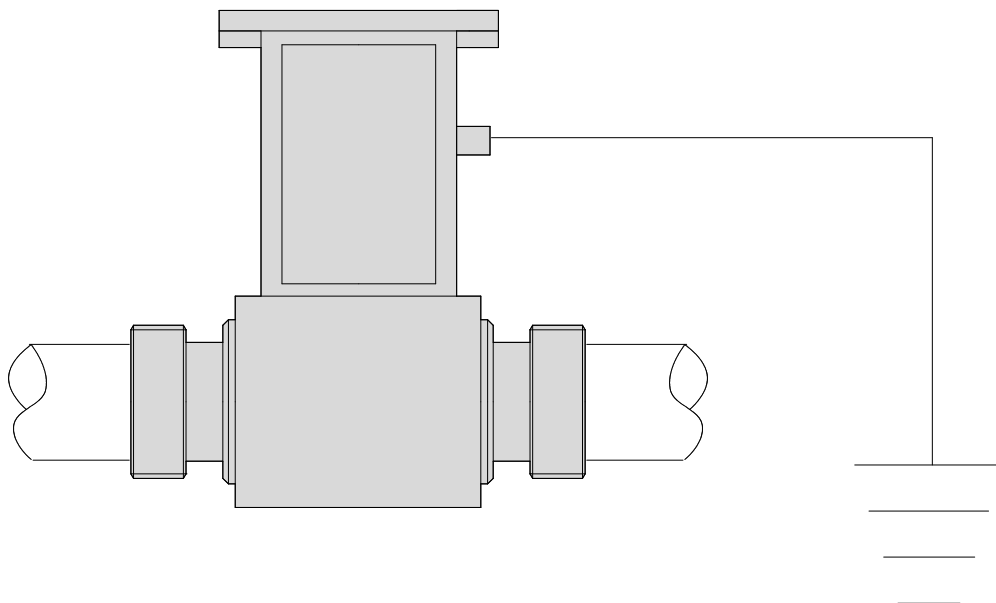
Install the sensor away from bends and hydraulic accessories



Avoid positioning fittings by tightening the clamps.

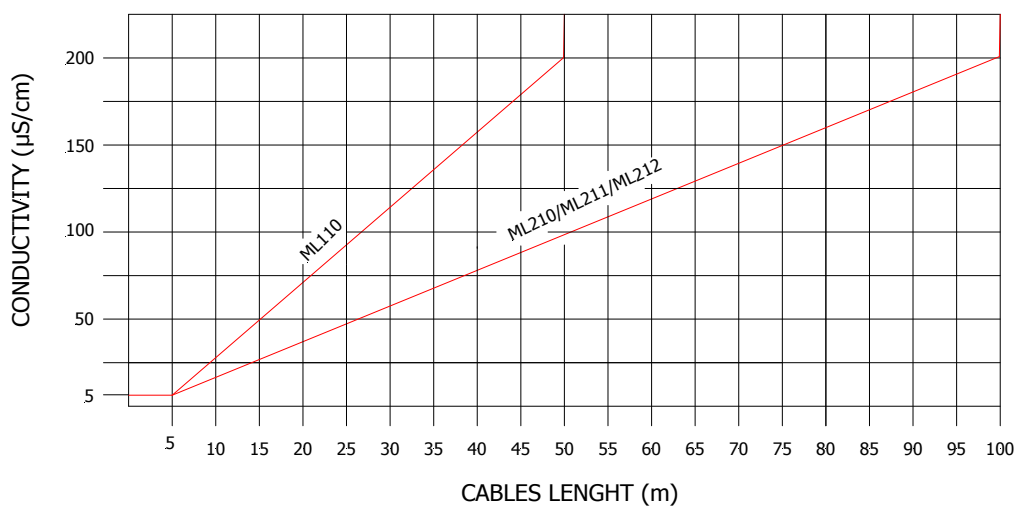
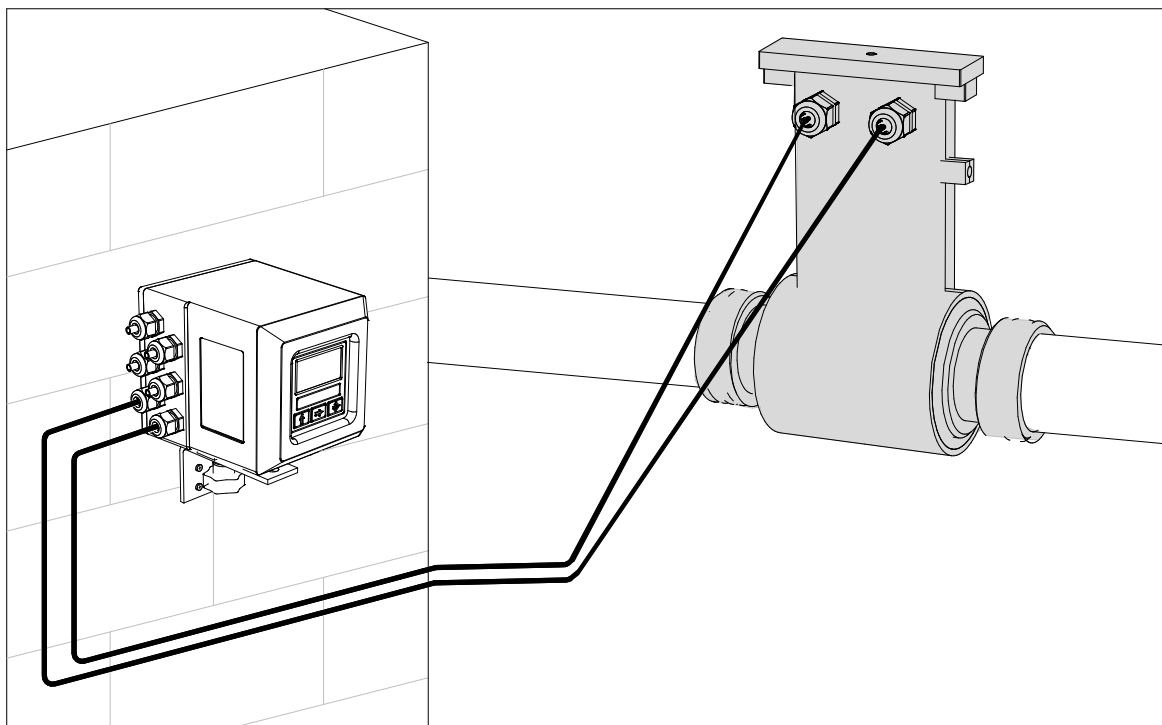


SENSOR GROUNDING



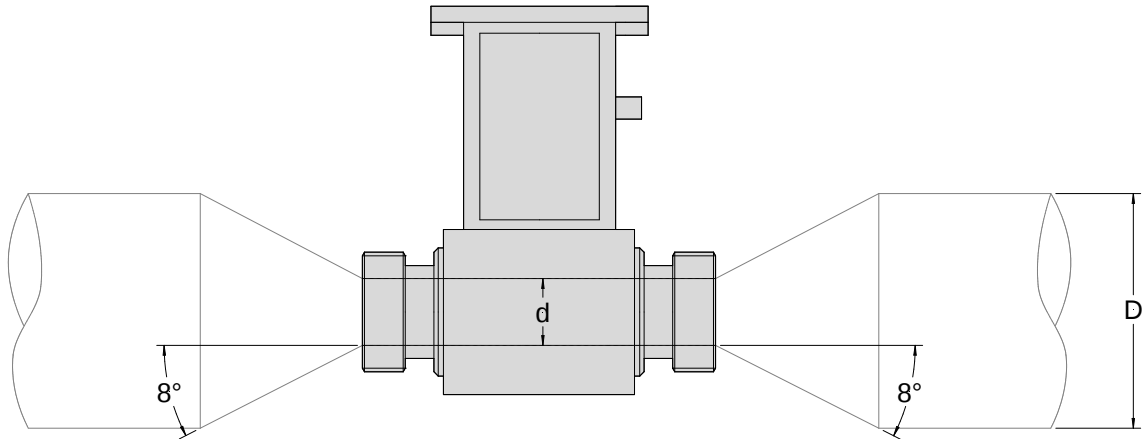
For the correct operation of the meter the sensor and liquid must be equipotential. ALWAYS connect sensor and converter to the ground.

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 $\mu\text{S}/\text{cm}$

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

d = sensor diameter [m]

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

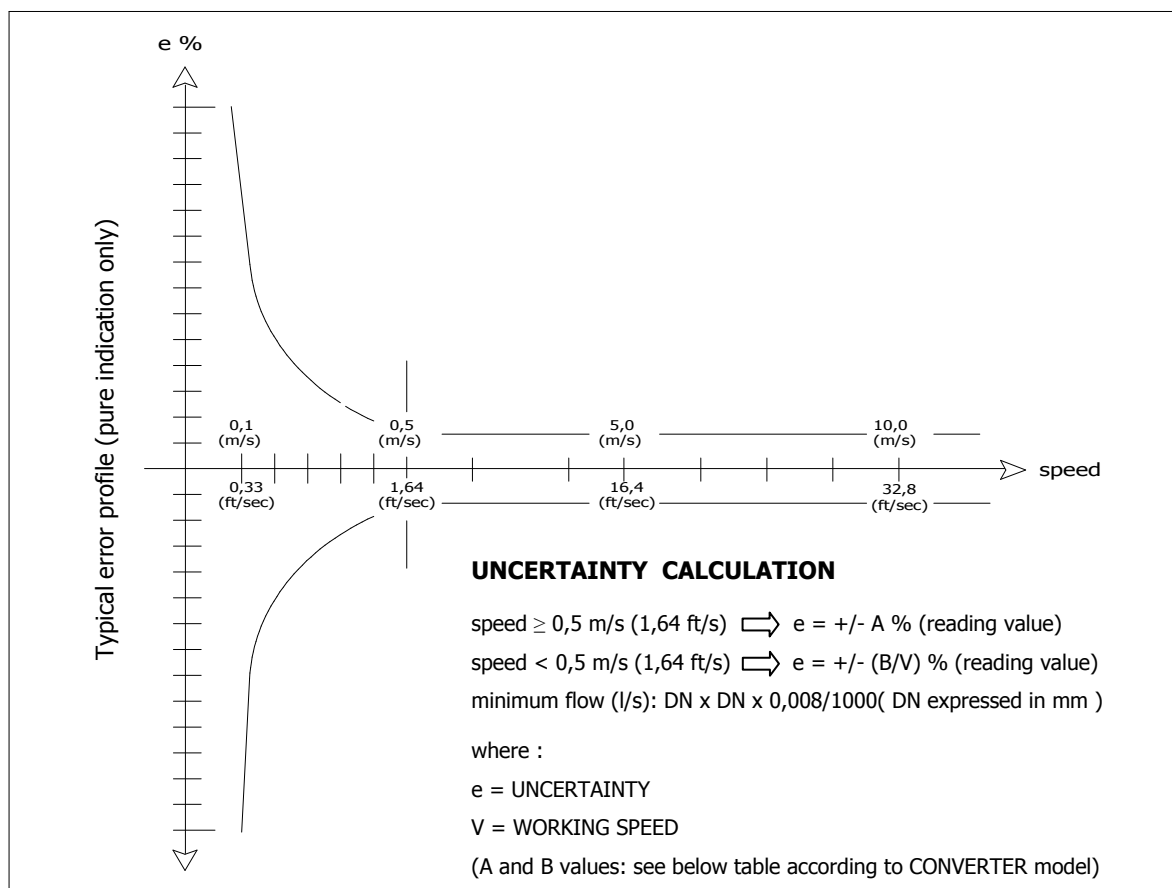
u = Mean flow velocity in sensor diameter [m/s]

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

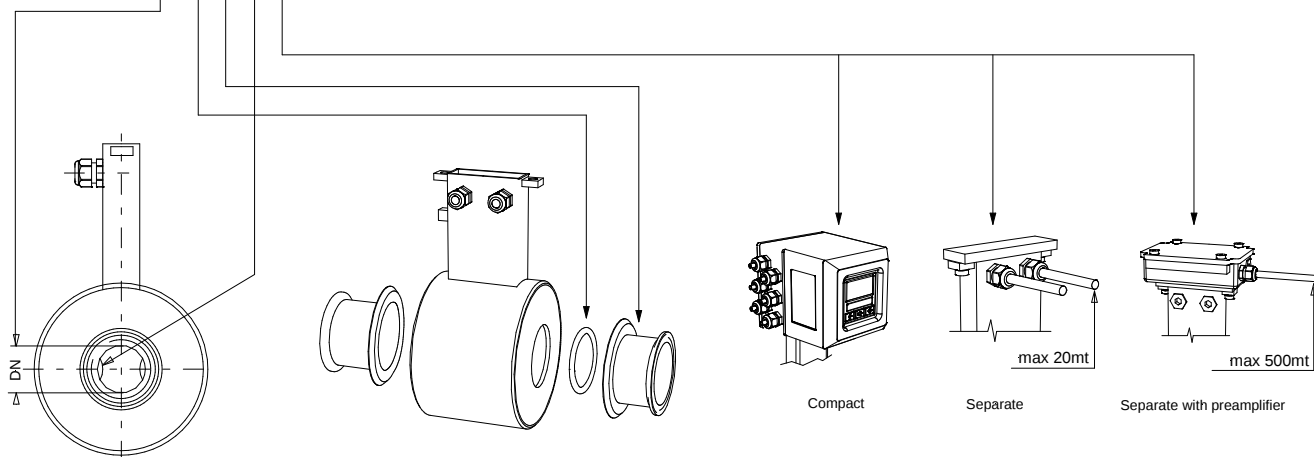
Reference conditions :

- ☐ Constant flow rate during the test
- ☐ Pressure: > 30 Kpa
- ☐ Flow condition : fully developed flow profile
- ☐ Zero stability $\pm 0,005$ %

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
Gasket material (internal tightness)	
2	O-Ring : Epdm
3	O-Ring : FPM (FDA1770)
9	Other O-Ring
Process connection type	
A	DIN11850/11852
B	Clamp ISO2852
C	SMS (da/from DN10)
D	Clamp GB special connections
E	Clamp BS 4825
Z	Other fittings
Number and electrodes material	
1	n. 2 measure electrodes in AISI316
0	Other
Execution - Protection rate	
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.