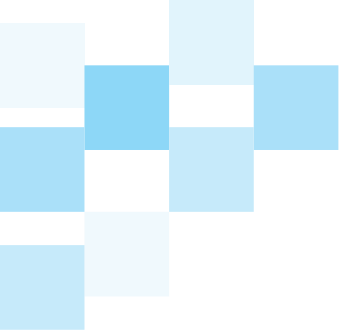




ISOMAG

The friendly magmeter

DATA SHEET

MS501



CE



ISOIL 
I N D U S T R I A

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TECHNICAL DATA

OVERALL FEATURES

Nominal diameter	☐ DN 3 ÷ 20
Minimum conductivity	☐ 5 µS/cm
Humidity Range	☐ 0÷100% (IP 67)
Accuracy	☐ See relevant converter data sheet
CE Certification	☐ Yes

STANDARD FEATURES

Body material	☐ AISI 304
Nominal pressure	☐ 1600 kPa
Process connections	☐ Threaded GAS UNI EN ISO 228-1 ☐ Threaded NTP ☐ Flanged UNI 2278 ☐ Flanged ANSI 150 ☐ Sanitary DIN 11851 ☐ Clamp ISO 2852 ☐ Clamp BS 4825 ☐ SMS ☐ BSPP (Threaded GAS UNI EN ISO 228-1)
Version – protection rating	☐ Compact IP67
Connections material	☐ AISI 316
Lining material	☐ PTFE
Gasket material	☐ FPM
Liquid temperature	☐ -20°C ÷ 100°C comp. (130°C only with ML4F-1) ☐ -20°C ÷ 130°C separate
Vacuum resistance	☐ 20 Kpa absolute at 100 °C
Electrodes material	☐ AISI 316L ☐ Hastelloy C ☐ Platinum – rhodium ☐ Titanium ☐ Tantalum

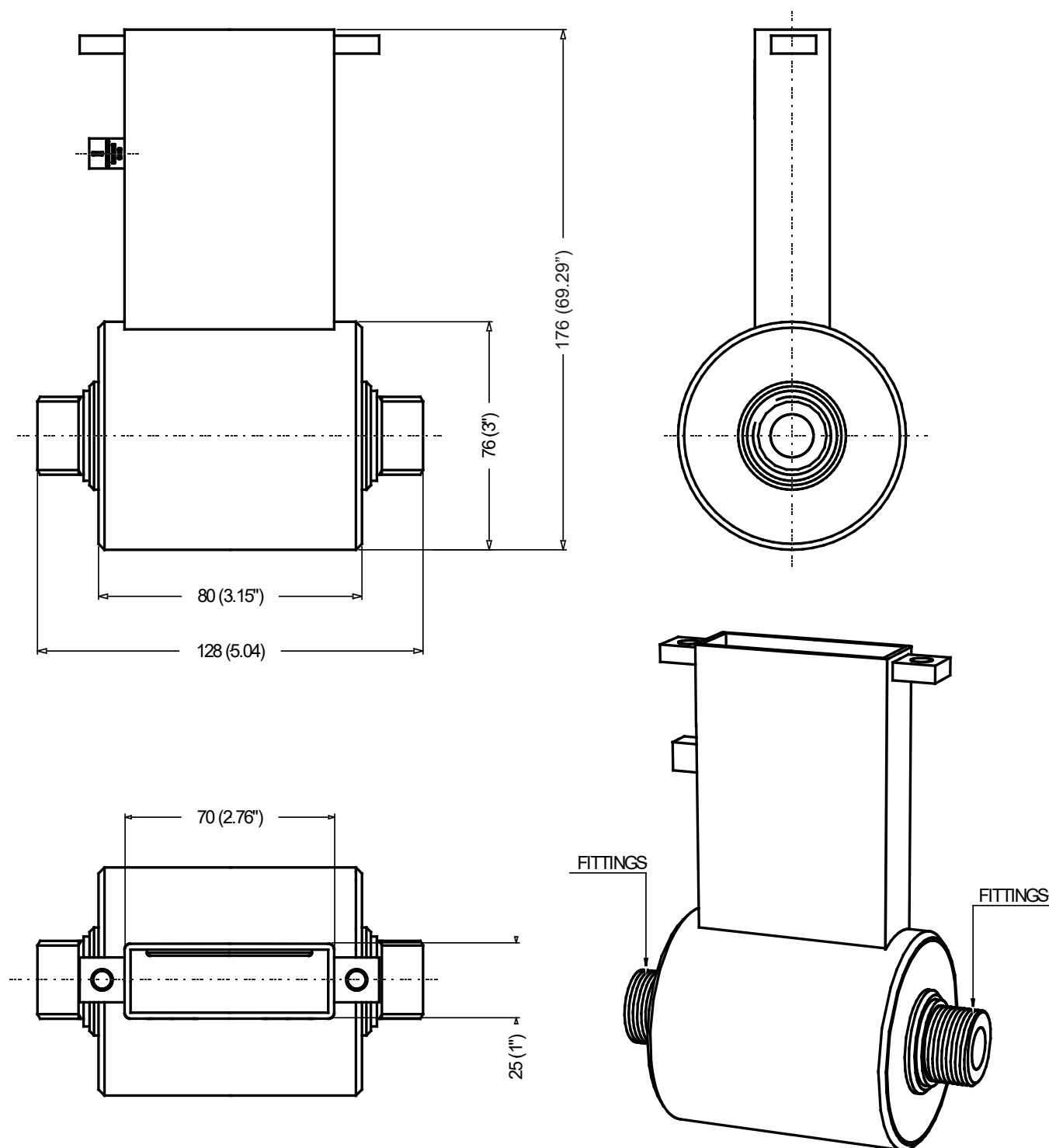
OPTIONAL FEATURES

(CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)

Body material	☐ Stainless steel 316
Gasket material	☐ EPDM
Nominal pressure	☐ 4000kPa
Process connection	☐ Others on request
Connections material	☐ AISI 304 with lining in PTFE ☐ Other on request
Electrodes material	☐ Others On request
Version – protection rating	☐ Separate (max 20m) – IP 68 ☐ Separate (max 500m) with pre-amp IP 67 (IP 68 optional)

OVERALL DIMENSIONS

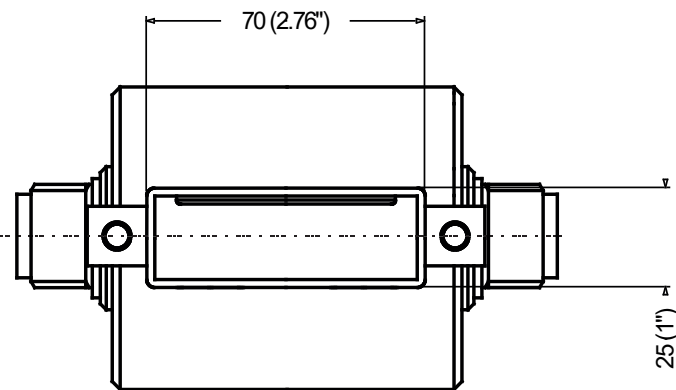
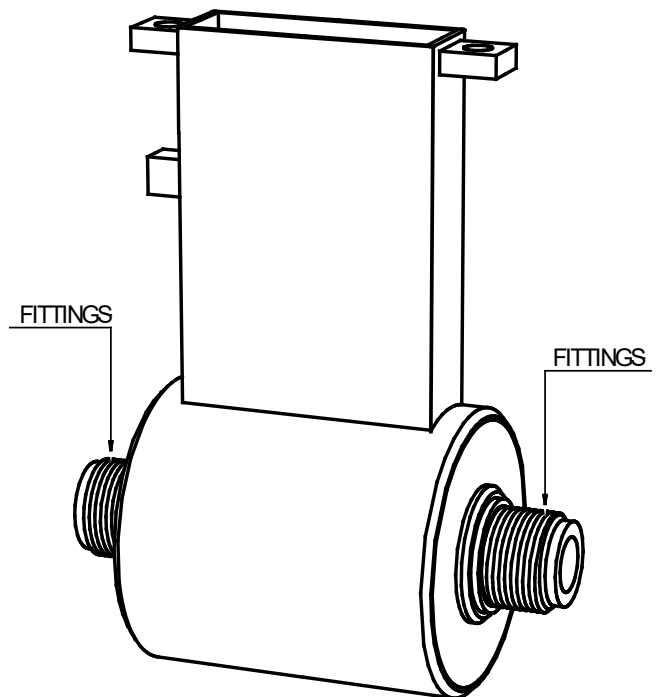
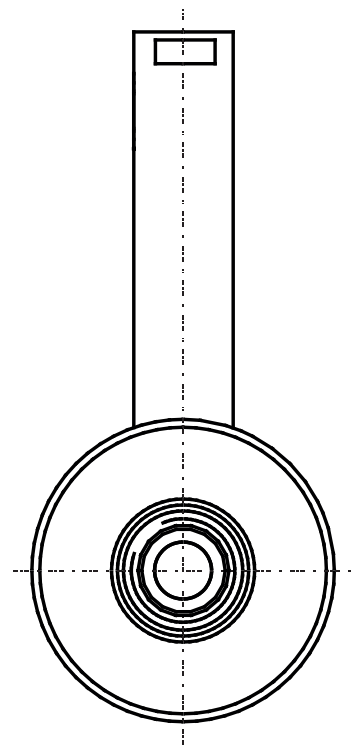
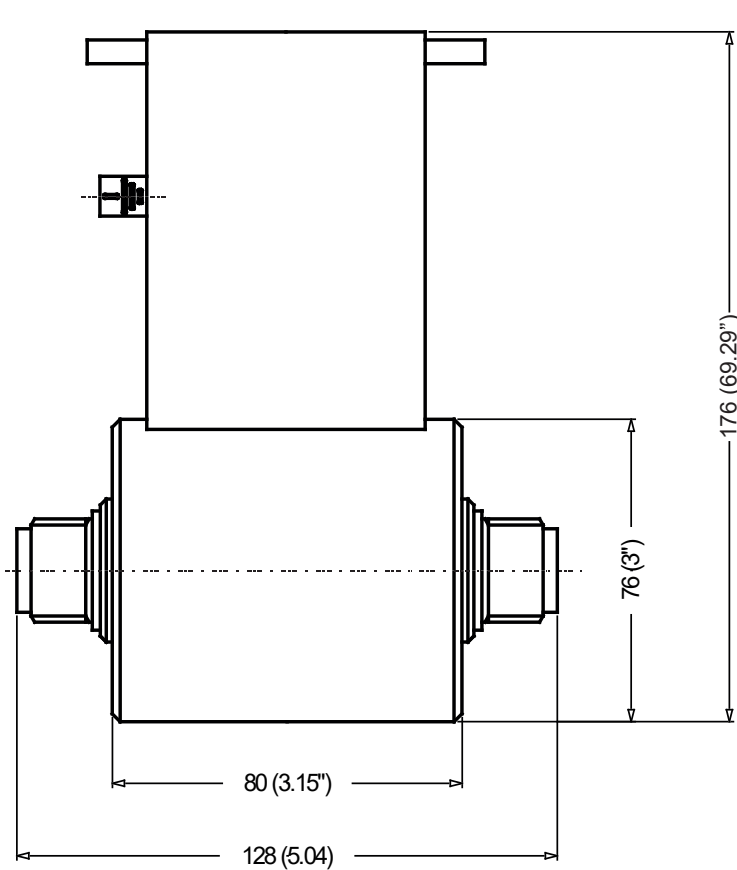
GAS/NPT WITHOUT LINING



CONNECTIONS GAS/NPT (STAINLESS STEEL WITHOUT LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
FITTINGS	1/4"	3/8"	1/2"	3/4"	1"

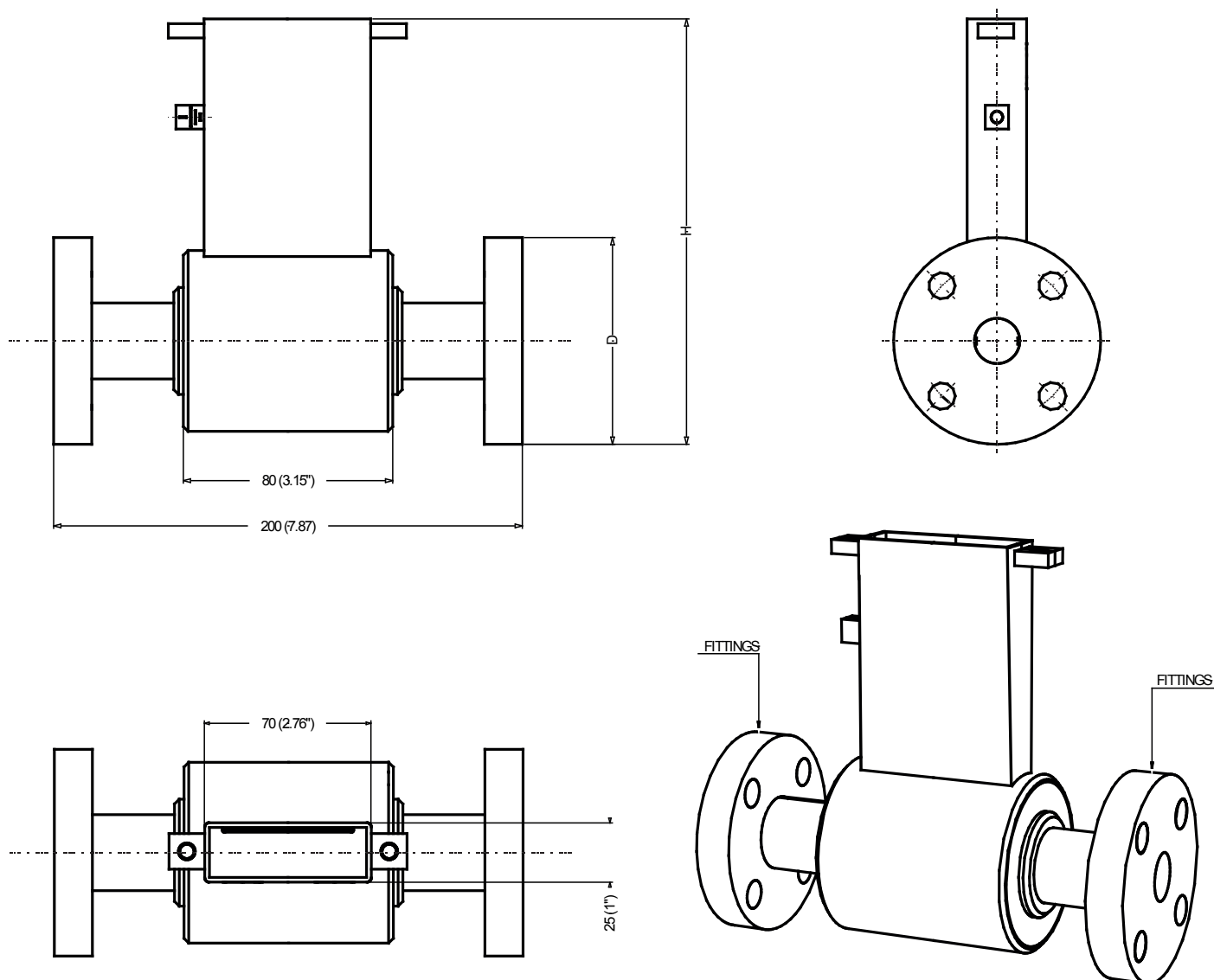
GAS/NPT WITH LINING



CONNECTIONS GAS/NPT (STAINLESS STEEL LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
FITTINGS	1/2"	1/2"	3/4"	1"	1"1/4

FLANGED WITHOUT LINING



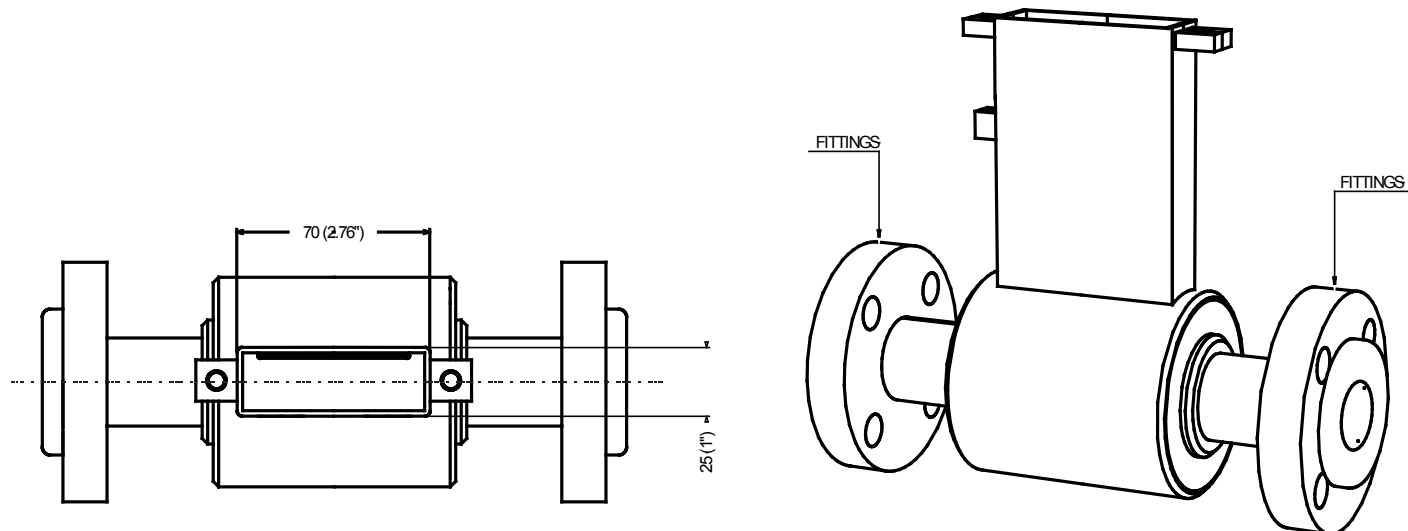
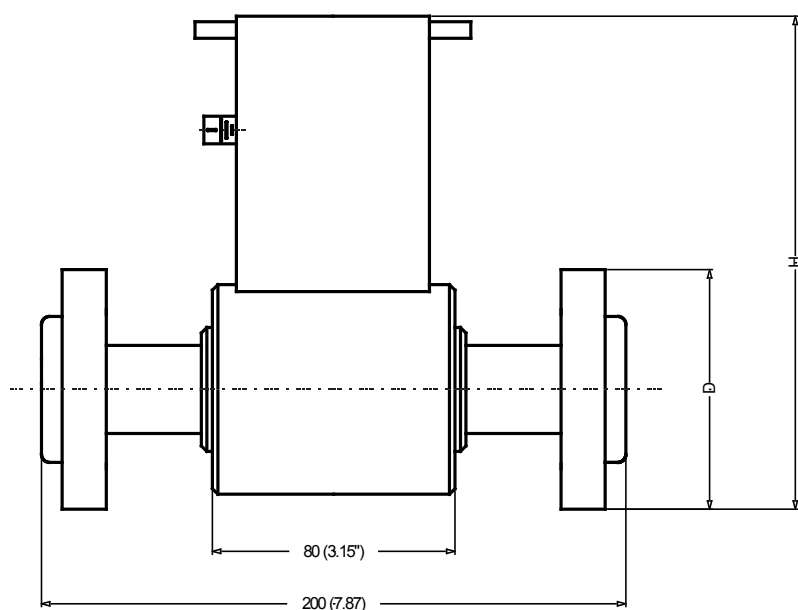
FLANGES CONNECTIONS UNI (STAINLESS STEEL WITHOUT LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	90 (3.54)	90 (3.54)	90 (3.54)	95 (3.74)	105 (4.13)
H	183 (7.20)	183 (7.20)	183 (7.20)	186 (7.30)	191 (7.5)
FITTINGS	DN 10	DN 10	DN 10	DN 15	DN 20

FLANGES CONNECTIONS ANSI (STAINLESS STEEL WITHOUT LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	88.9 (3.5)	88.9 (3.5)	88.9 (3.5)	88.9 (3.5)	98.4 (3.87)
H	183 (7.20)	183 (7.20)	183 (7.20)	183 (7.20)	188 (7.37)
FITTINGS	1/2"	1/2"	1/2"	1/2"	3/4"

FLANGED WITH PTFE LINING



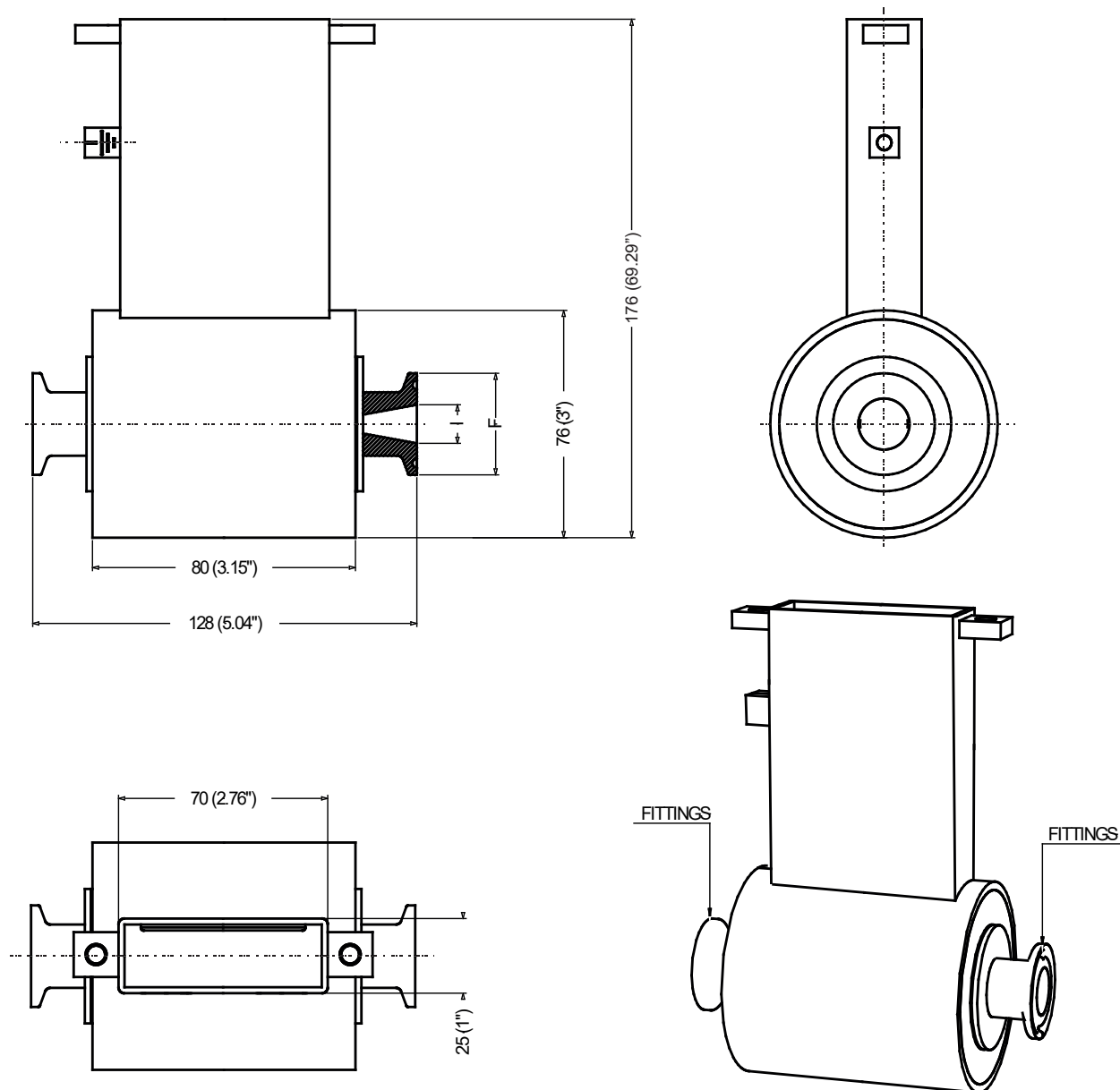
UNI FLANGES CONNECTIONS (PTFE LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	90 (3.54)	90 (3.54)	90 (3.54)	95 (3.74)	105 (4.13)
H	183 (7.20)	183 (7.20)	183 (7.20)	186 (7.30)	191 (7.5)
FITTINGS	DN 10	DN 10	DN 10	DN 15	DN 20

ANSI FLANGES CONNECTIONS (PTFE LINING)

DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	88.9 (3.5)	88.9 (3.5)	88.9 (3.5)	88.9 (3.5)	98.4 (3.87)
H	183 (7.20)	183 (7.20)	183 (7.20)	183 (7.20)	188 (7.37)
FITTINGS	1/2"	1/2"	1/2"	1/2"	3/4"

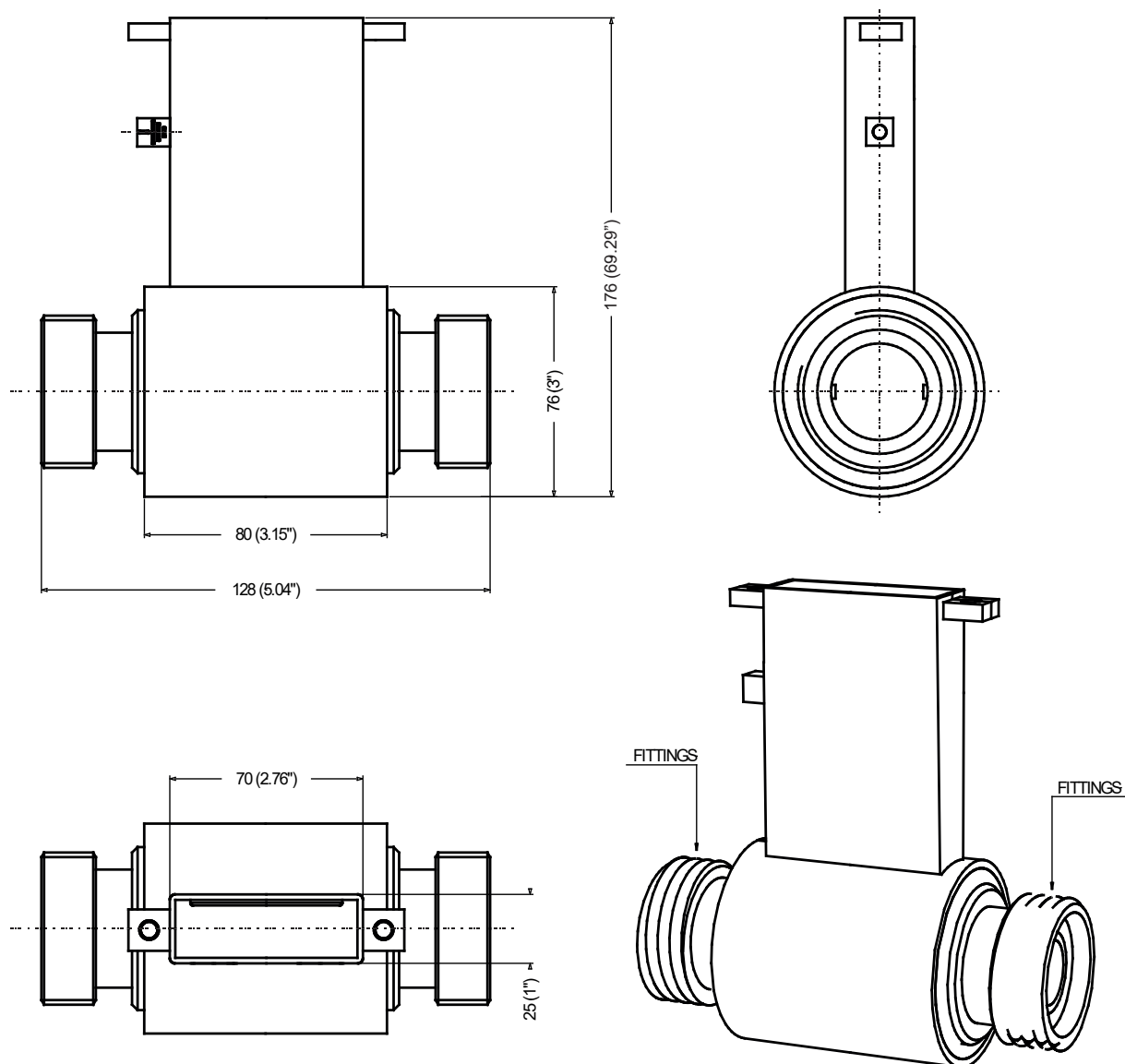
SANITARY CLAMP CONNECTIONS



CLAMP ISO 2852					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
I	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)	17.2 (0.68) 17.2(0.68)	21.3 (0.84)
F	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)

CLAMP BS 4825					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
I	9.5 (0.37)	9.5 (0.37)	9.5 (0.37)	15.85 (0.62)	22.2 (0.87)
F	25.4 (1)	25.4 (1)	25.4 (1)	25.4 (1)	50.5 (1.99)

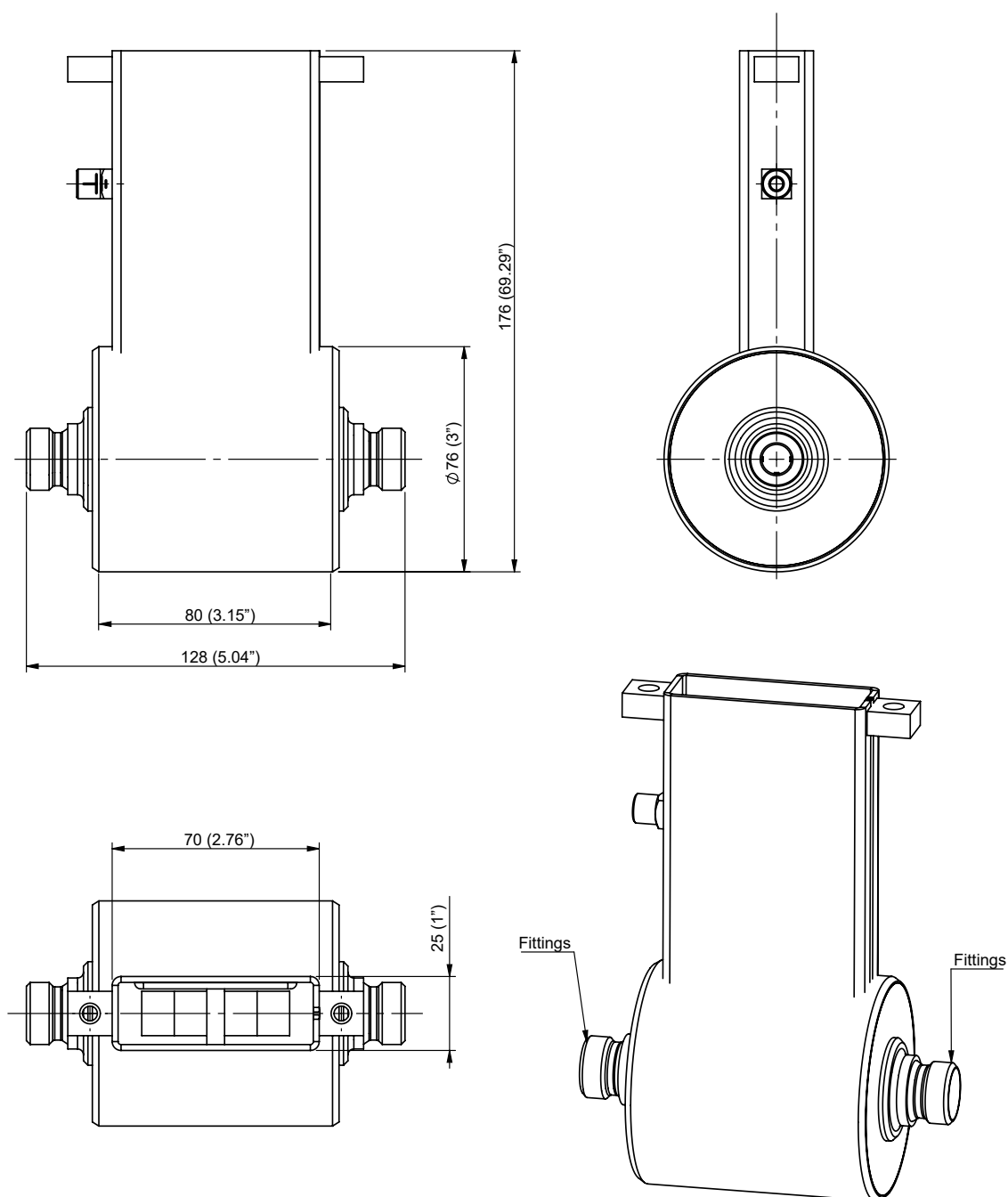
SANITARY DIN/SMS



DIN 11851					
DIMENSIONS	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
FITTINGS	DN 10	DN 10	DN 10	DN 15	DN 20

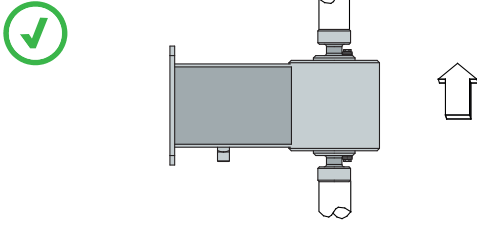
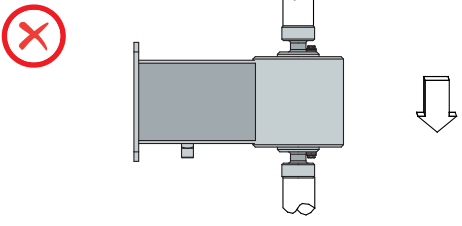
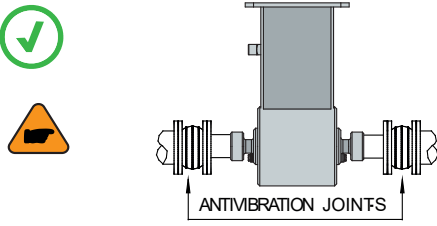
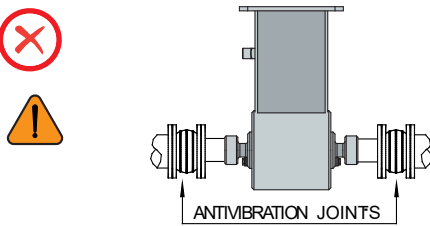
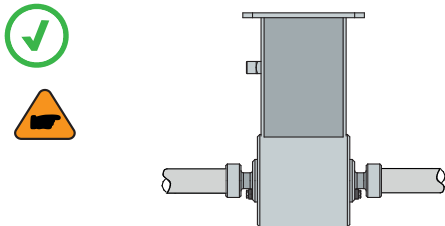
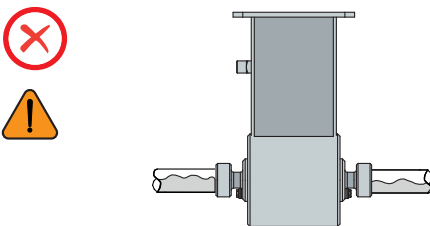
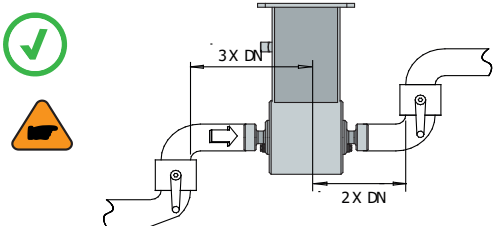
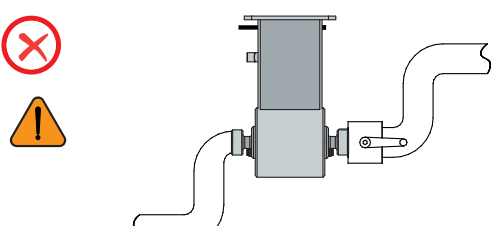
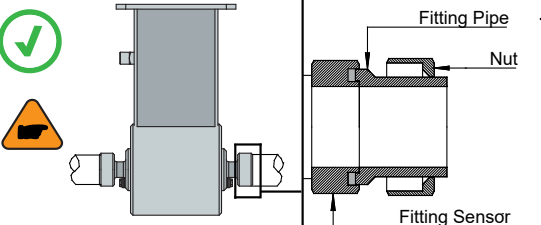
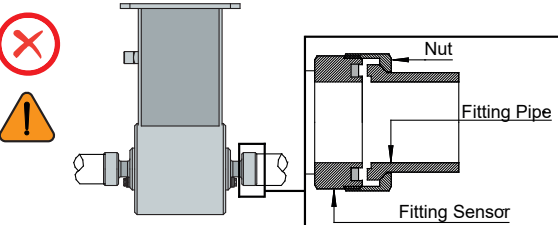
SMS			
DIMENSIONS	DN		
	10 (3/8)	15 (1/2")	20 (3/4")
FITTINGS	DN 25	DN 25	DN 25

BSPP CONNECTIONS (Threaded GAS UNI EN ISO 228-1)

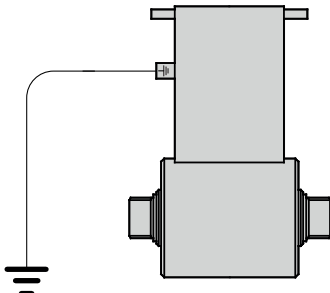
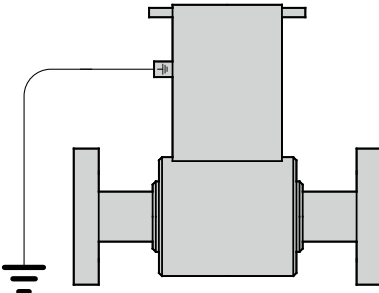
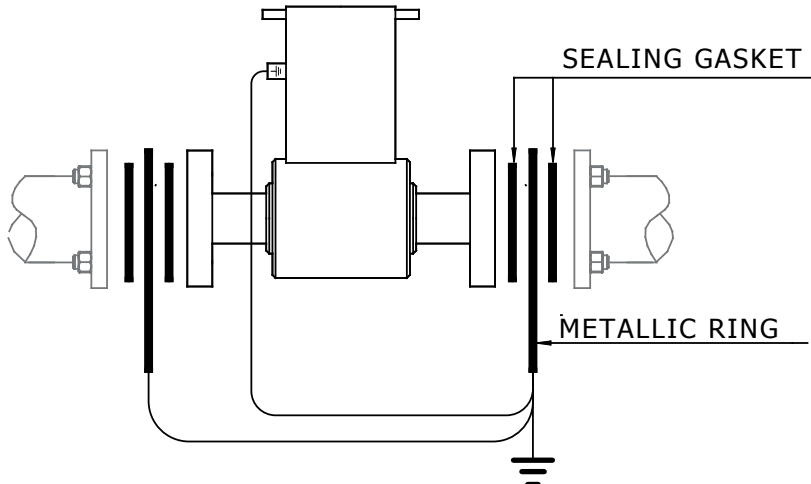
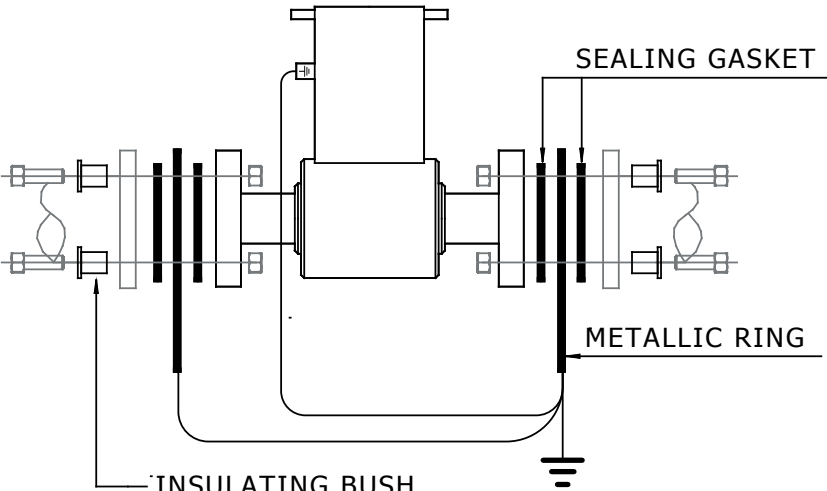


BSPP (Threaded GAS UNI EN ISO 228-1)					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
FITTINGS	1/4"	3/8"	1/2"	3/4"	1"

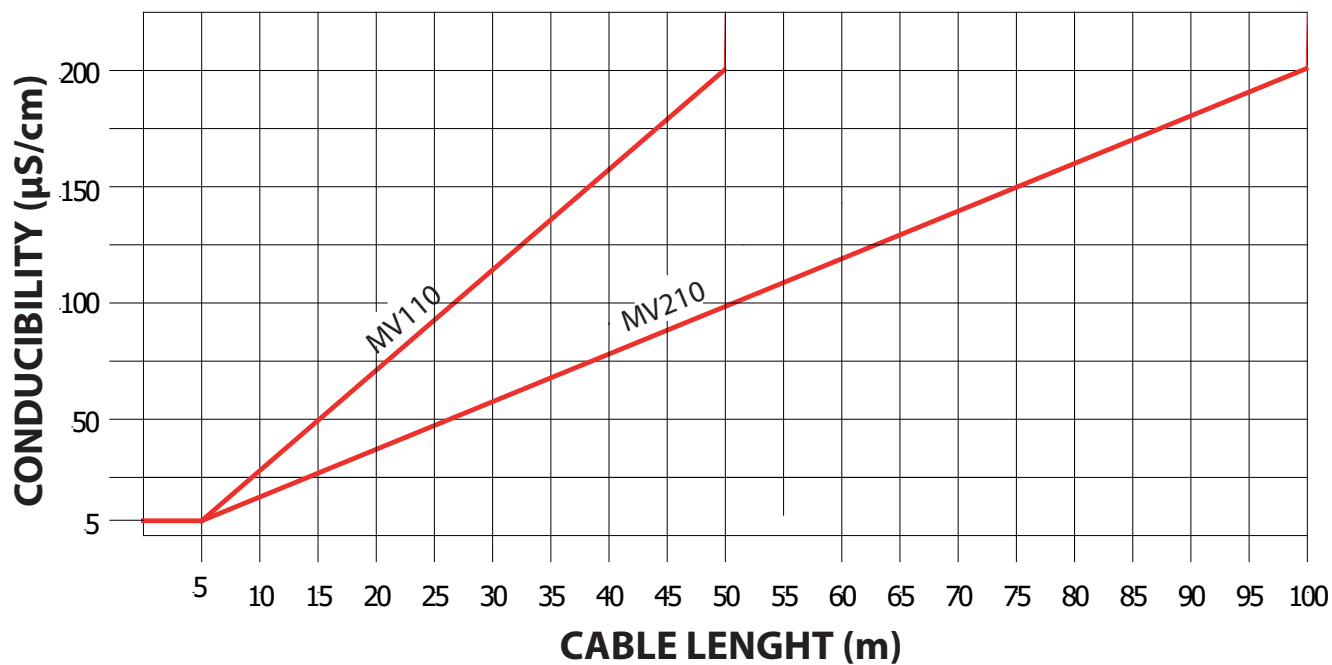
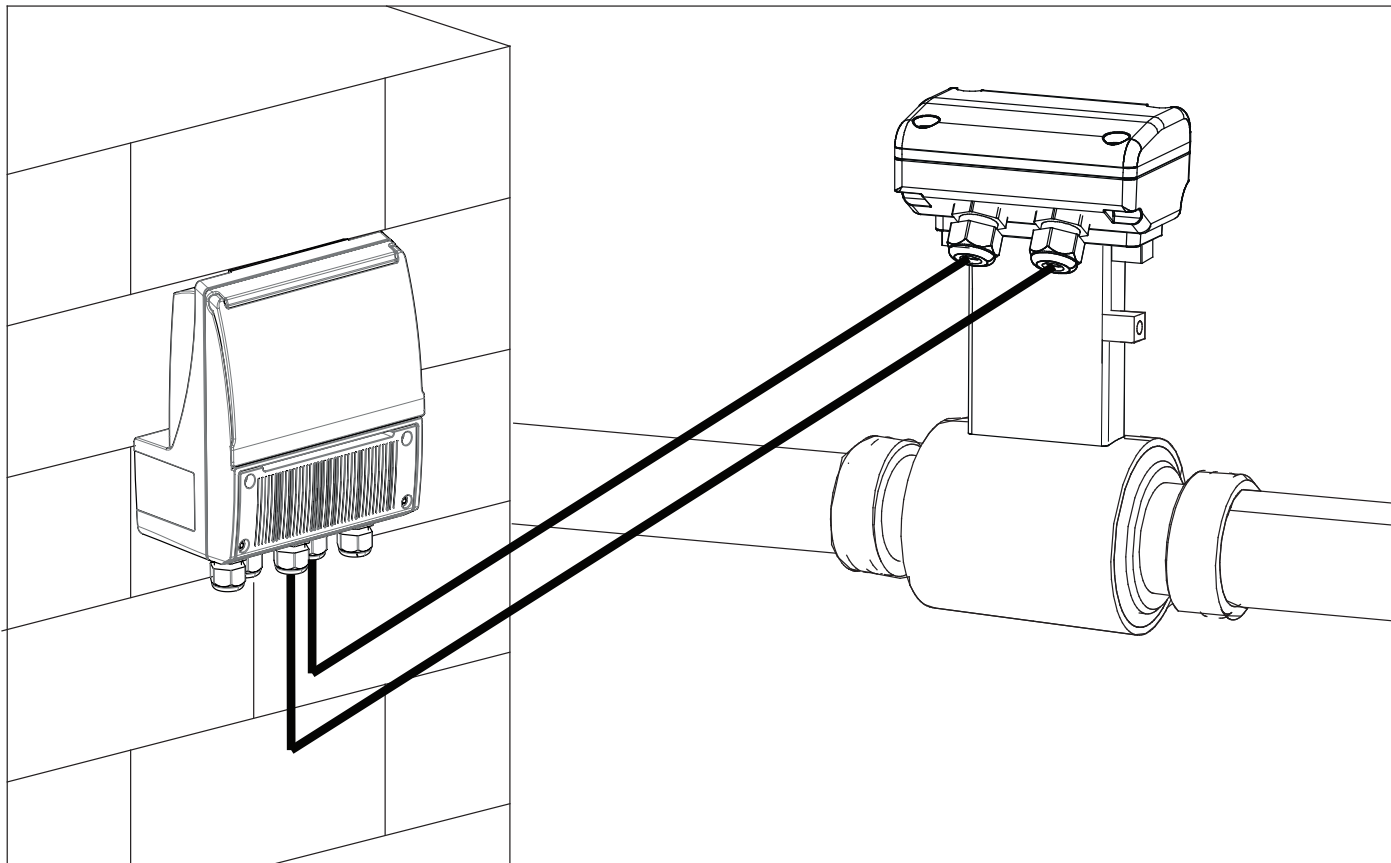
INSTALLATION RECOMMENDATIONS

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.	
	

GROUND CONNECTIONS

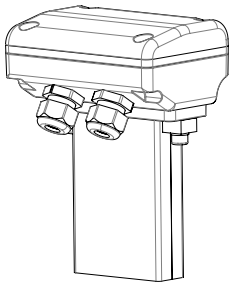
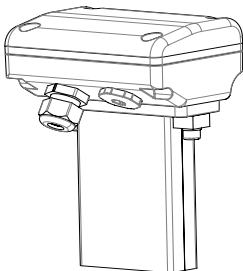
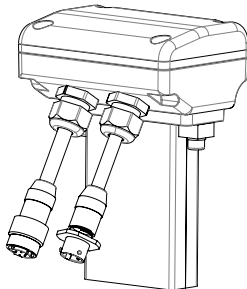
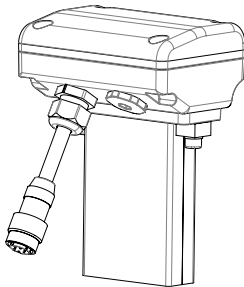
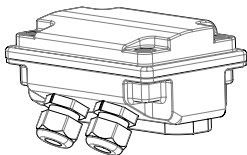
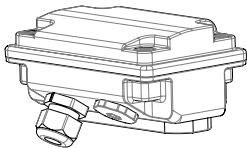
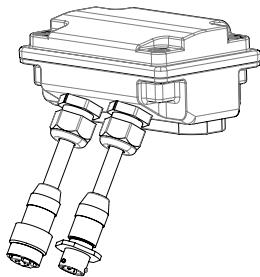
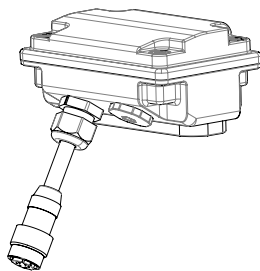
METALLIC PIPE	
THREADED SENSOR 	FLANGED SENSOR 
INSULATED PIPE	
	If the sensor has to be installed in a pipe made of an insulating material, the following are necessary: - Inserting two metallic rings between the sensor flanges and the pipe line counter flanges or: - Using a sensor with the additional 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 gaskets between the rings

SEPARATE VERSION



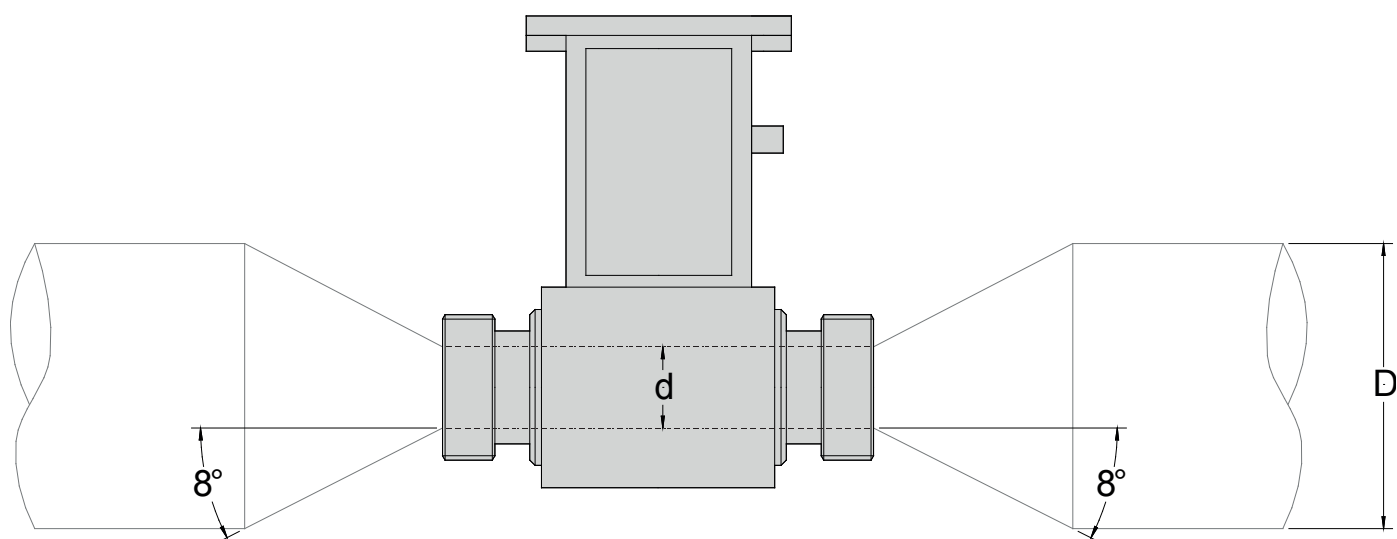
Notes:

- ☐ 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 $\mu\text{S/cm}$

	1	2	3	4
A PAINTED ALUMINIUM				
B AISI 304				

PRICE LIST OPTIONS	JUNCTION BOX TYPE (surface finish)
A	Senza junctions box, convertitore collegato direttamente alla scatola di derivazione del sensore
B	A-1 A-2 only for MV110
G	A-4
F	A-3
N	A-2 with preamplifier
Q	A-4 with preamplifier
U	B-1 (raw) B-2 only for MV110 (raw)
S	B-4 (raw)
T	B-3 (raw)
P	B-2 with preamplifier (raw)
R	B-4 with preamplifier (raw)
K	B-1 (polished) B-2 only for MV110 (raw)
Y	B-4 (polished)
W	B-3 (polished)
V	B-2 with preamplifier (polished)
J	B-4 with preamplifier (polished)

PRESSURE LOSS CALCULATION (CONES 8° ANGLES)



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

Dove:

- Δp = Pressure loss in [Pa]
 ρ = Fluid density [kg/m³] typical value $\rho = 1000$ [kg/m³]
 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]								
d/D \ 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	26.6	38.3	52.1	68
0.6	0.9	3.6	8.2	14.6	22.7	32.7	44.6	58.2
0.7	0.8	3	6.8	12.2	19	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/m³] 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

Code Example	Code/Description	
Nominal Diameter / Lining / Maximum temperature / Measuring range		
T03	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
Flange type		
1	1	O-Ring : FKM
	2	O-Ring : Epdm
	4	O-Ring : FFKM
	9	Gasket material: to be specified
Nominal Pressure		
A	A	Nominal pressure: PN16
	B	Nominal pressure: PN40
	Z	Nominal pressure: others on request
Process connection type		
1	1	Male threaded UNI338
	2	Male threaded NPT
	3	Tri-Clamp connection, ISO2852
	4	DIN11851/ 852 sanitary connection
	5	SMS connection (only for DN10, 15 ,20)
	6	EN1092 flange connection
	7	ANSI 150 flange connection
	8	Clamp connection BS4825
	9	JIS 10K, flange connection
	A	Male threaded standard according to BSPP
	0	Connection: other
Connection material		
A	A	Connection material: AISI316
	C	Connection material: AISI304, PTFE internal lining (only for connections type 1-2-6-7 and 9)
	9	Connection material: others
Number and electrodes material		
1	1	n. 2 measure electrodes in AISI316
	4	n. 4 (2 measure + 2 for ground) electrodes in Hastelloy C
	5	n. 4 (2 measure + 2 for ground) electrodes in Titanium
	6	n. 4 (2 measure + 2 for ground) electrodes in Tantalum
	7	n. 4 (2 measure +2 for ground) electrodes in Platinum
	0	Electrode material: to be specified

Number and electrodes material

A	A	Compact execution, IP67 protection rate
	B	Separate version - Material JB: Alluminium - IP68 - for Cable C014 + C015/16
	F	Separate version - Material JB: Alluminium - IP68 - n.2 MIL connectors for Cable C015/016-CC/CS + CB
	N	Separate version - Material JB: Alluminium - IP67 - with Preamp for Cable C014 + C015/16
	L	Separate version - Material JB: Alluminium - IP68 - with Preamp - n.2 MIL connectors for Cable C015/016-CC/CS + CB
	U	Separate version - Material JB: 304 RAW - IP68 for Cable C014 + C015/16
	T	Separate version - Material JB: 304 RAW - IP68 - n.2 MIL connectors for Cable C015/016-CC/CS + CB
	P	Separate version - Material JB: 304 RAW - IP67 - with Preamp for Cable C014 + C015/16
	M	Separate version - Material JB: 304 RAW - IP68 - with Preamp - n.2 MIL connectors for Cable C015/016-CC/CS + CB
	K	Separate version - Material JB: 304 Polished - IP68 for Cable C014 + C015/16
	W	Separate version - Material JB: 304 Polished - IP68 - n.2 MIL connectors for Cable C015/016-CC/CS + CB
	V	Separate version - Material JB: 304 Polished - IP67 - with Preamp for Cable C014 + C015/16
	J	Separate version - Material JB: 304 Polished - IP68 - with Preamp - n.2 MIL connectors for Cable C015/016-CC/CS + CB

Complete code
example for
order

MS501-T03-1A1A1A

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If you want to find the complete list of our distributors access at the following link:
<http://www.isoil.com/en>



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