

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	<input type="checkbox"/> DN 3 ÷ 20
Minimum conductivity	<input type="checkbox"/> 5 µS/cm
Humidity Range	<input type="checkbox"/> 0÷100% (IP 67)
Accuracy	<input type="checkbox"/> See relevant converter data sheet
CE Certification	<input type="checkbox"/> Yes

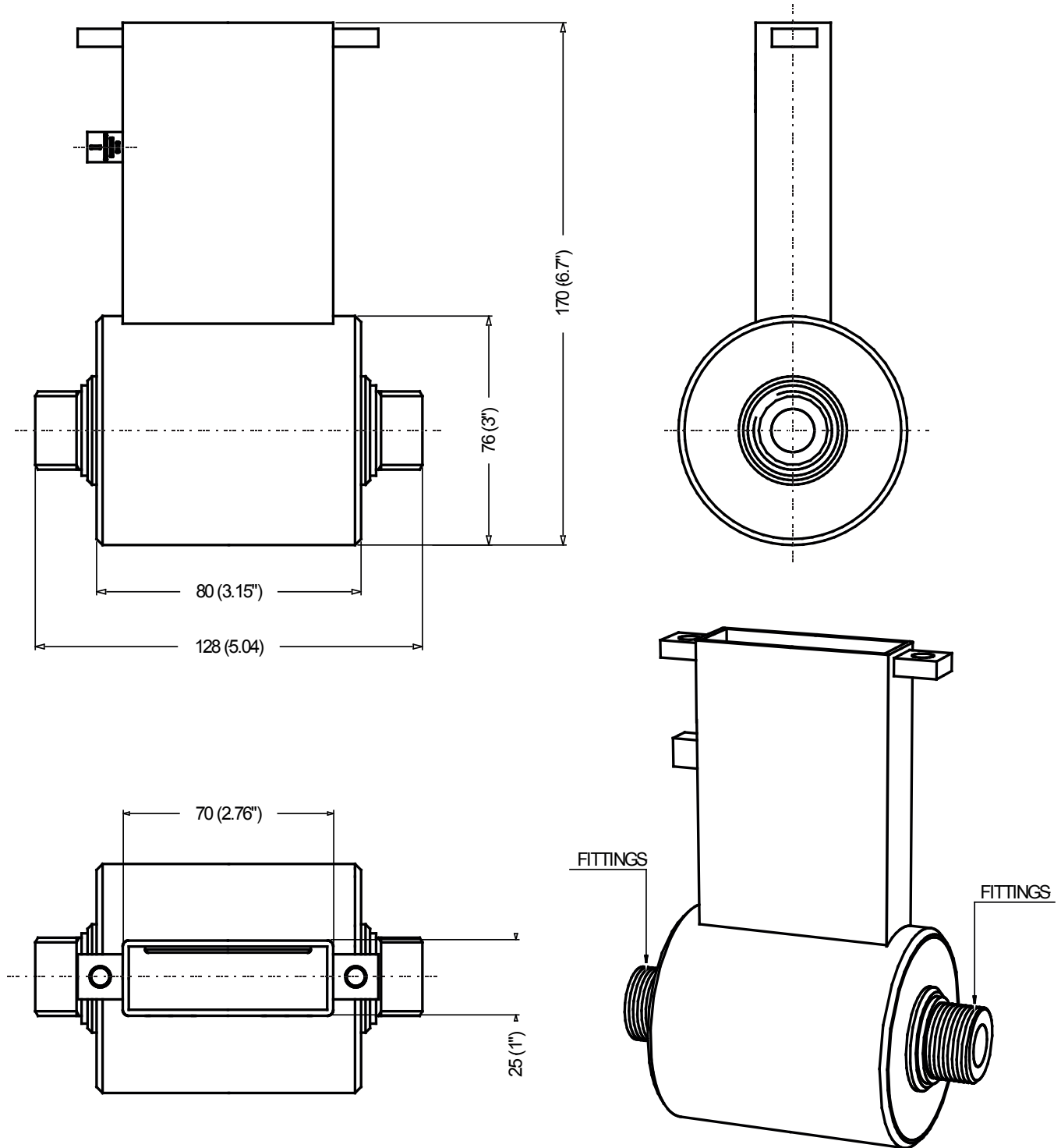
STANDARD FEATURES	
Body material	<input type="checkbox"/> AISI 304
Nominal pressure	<input type="checkbox"/> 1600 kPa
Process connections	<input type="checkbox"/> Threaded UNI 338 <input type="checkbox"/> Threaded NTP <input type="checkbox"/> Flanged UNI 2278 <input type="checkbox"/> Flanged ANSI 150 <input type="checkbox"/> Sanitary DIN 11851 <input type="checkbox"/> Clamp ISO 2852 <input type="checkbox"/> Clamp BS 4825 <input type="checkbox"/> SMS
Version – protection rating	<input type="checkbox"/> Compact IP67
Connections material	<input type="checkbox"/> AISI 316
Lining material	<input type="checkbox"/> PTFE
Gasket material	<input type="checkbox"/> FPM
Liquid temperature	<input type="checkbox"/> -20°C ÷ 100°C comp. (130°C only with ML4F-1) <input type="checkbox"/> -20°C ÷ 130°C separate
Vacuum resistance	<input type="checkbox"/> 20 Kpa absolute at 100 °C
Electrodes material	<input type="checkbox"/> AISI 316L <input type="checkbox"/> Hastelloy C <input type="checkbox"/> Platinum – rhodium <input type="checkbox"/> Titanium <input type="checkbox"/> Tantalum

OPTIONAL FEATURES	
<i>(CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)</i>	
Body material	<input type="checkbox"/> Stainless steel 316
Gasket material	<input type="checkbox"/> EPDM
Nominal pressure	<input type="checkbox"/> 4000kPa
Process connection	<input type="checkbox"/> Others on request
Connections material	<input type="checkbox"/> AISI 304 with lining in PTFE <input type="checkbox"/> Other on request
Electrodes material	<input type="checkbox"/> Others On request
Version – protection rating	<input type="checkbox"/> Separate (max 20m) – IP 68 <input type="checkbox"/> Separate (max 500m) with pre-amp IP 67 (IP 68 optional)

OVERALL DIMENSIONS

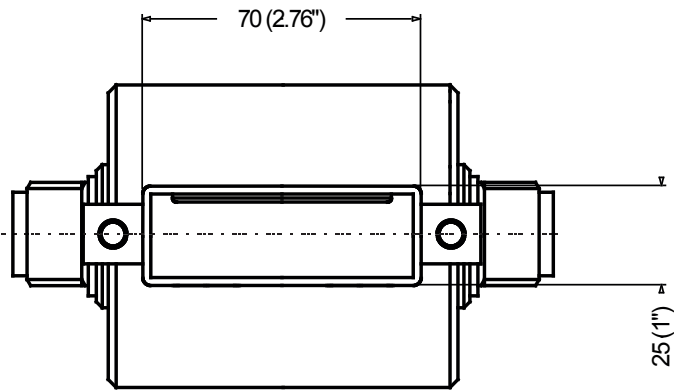
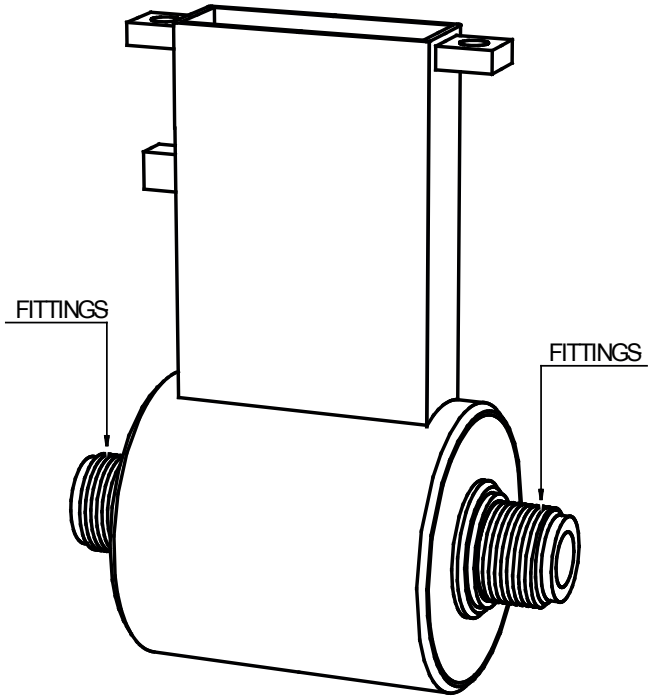
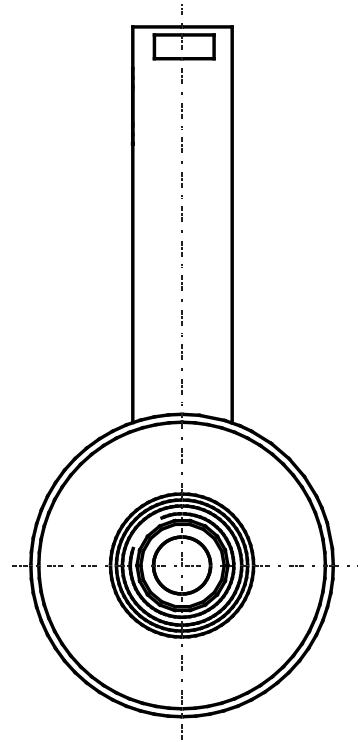
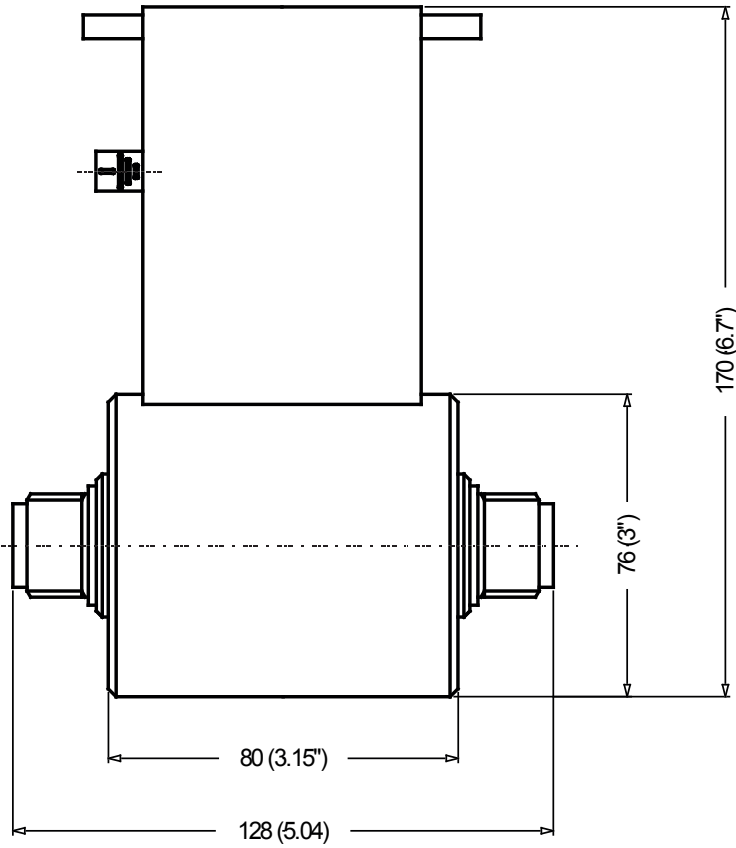
GAS/NPT WITHOUT LINING

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CONNECTIONS GAS/NPT (STAINLESS STEEL WITHOUT LINING)					
DIMENSIONS mm (inches)	DN				
		3 (1/8'')	6 (1/4'')	10 (3/8'')	15 (1/2'')
FITTINGS	1/4"	3/8"	1/2"	3/4"	1"

GAS/NPT WITH LINING

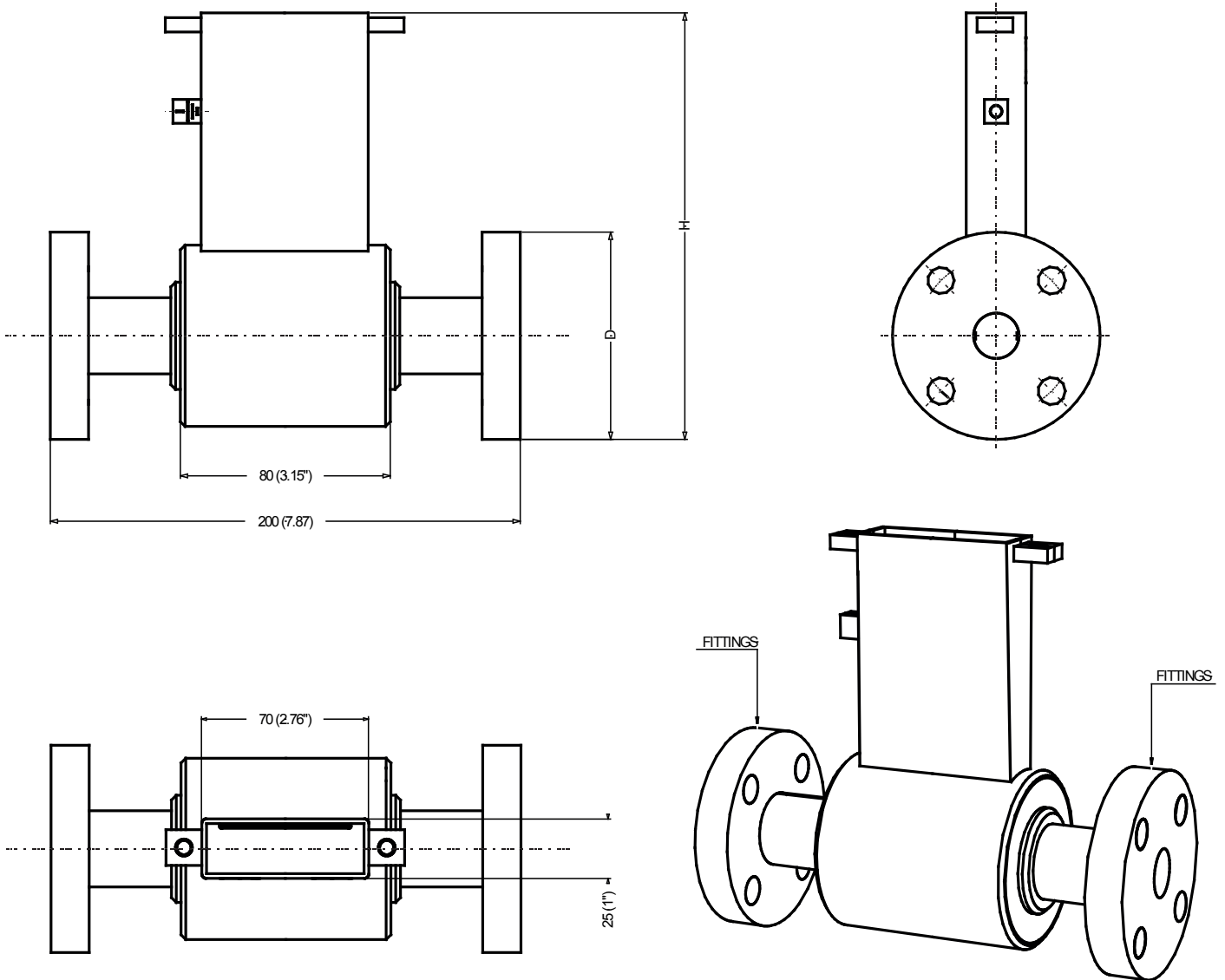


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CONNECTIONS GAS/NPT (STAINLESS STEEL LINING)

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

FLANGED WITHOUT LINING

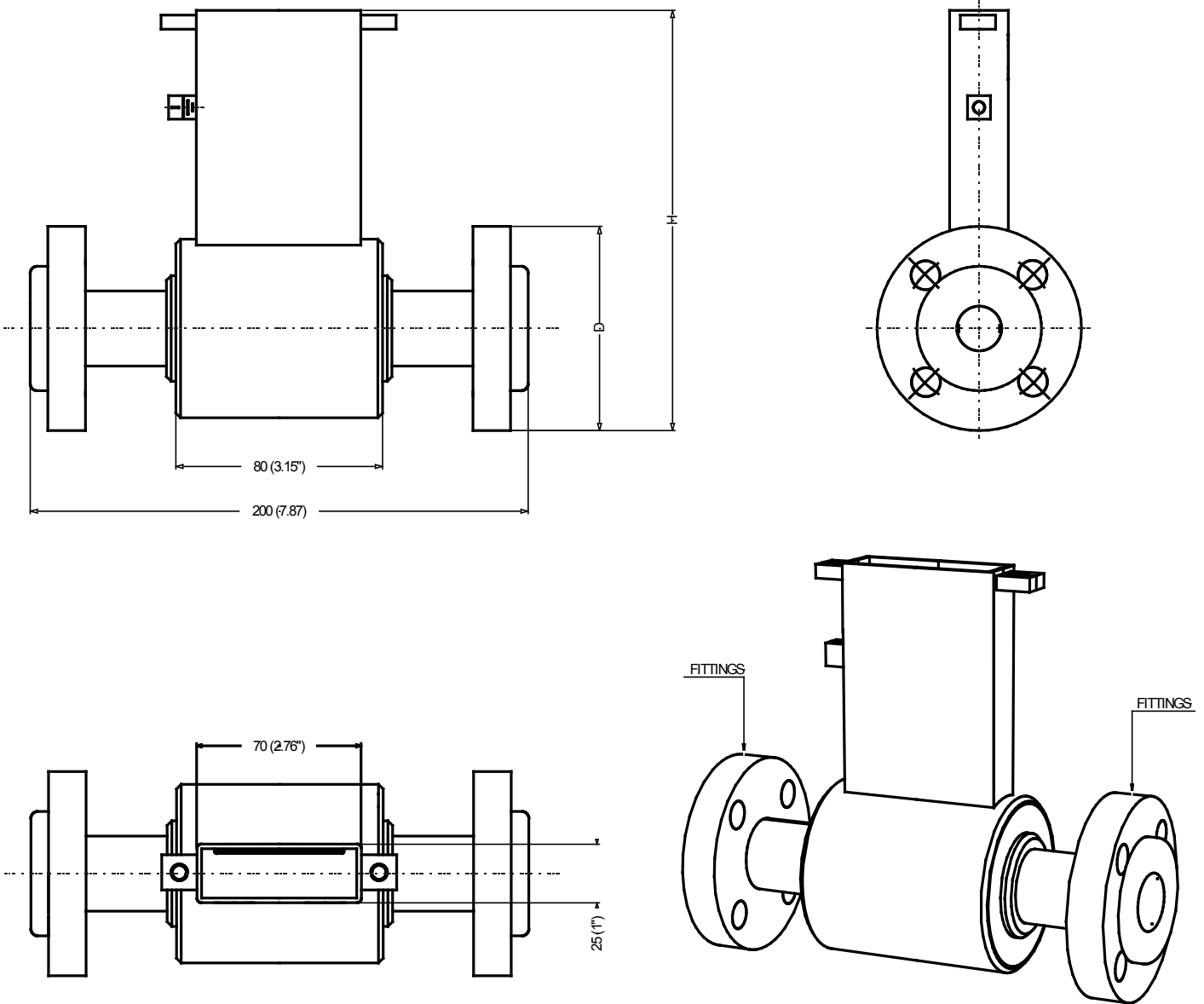


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FLANGES CONNECTIONS UNI (STAINLESS STEEL WITHOUT LINING)					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	90 (3.54)	90 (3.54)	90 (3.54)	95 (3.74)	105 (4.13)
H	183 (7.20)	183 (7.20)	183 (7.20)	186 (7.30)	191 (7.5)
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

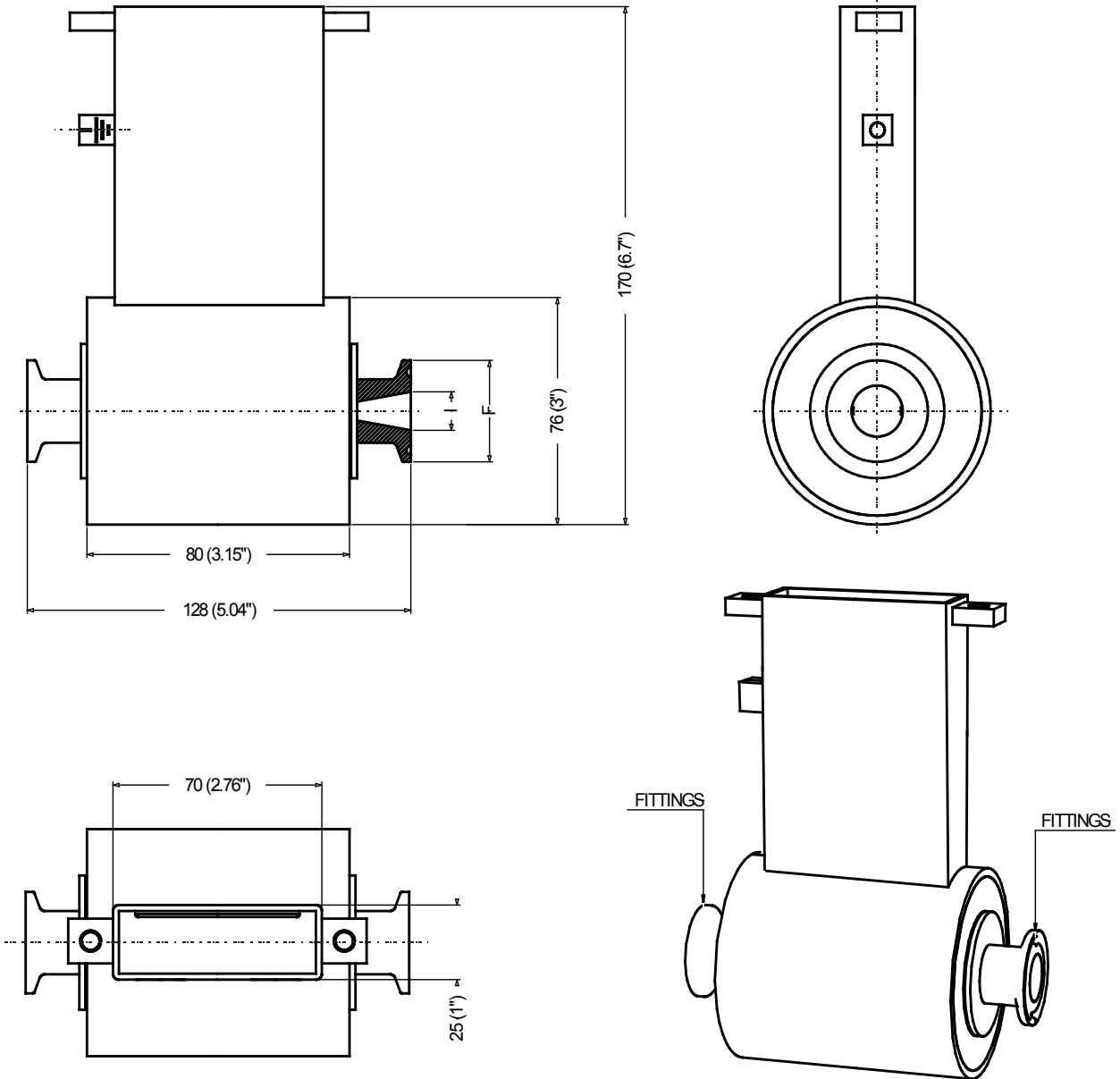


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UNI FLANGES CONNECTIONS (PTFE LINING)					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
D	90 (3.54)	90 (3.54)	90 (3.54)	95 (3.74)	105 (4.13)
H	183 (7.20)	183 (7.20)	183 (7.20)	186 (7.30)	191 (7.5)
FITTINGS	DN 10	DN 10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

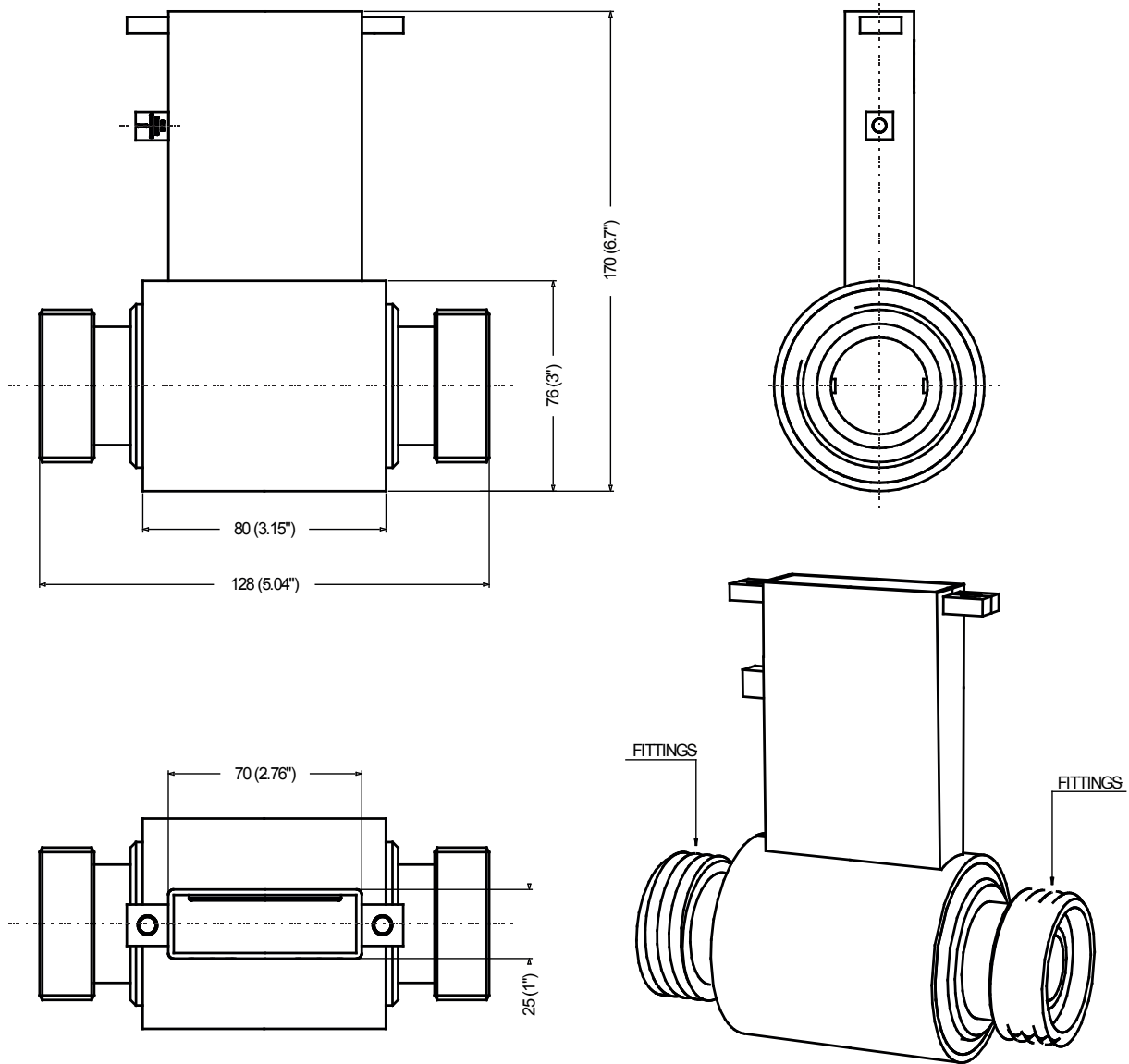


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CLAMP ISO 2852					
DIMENSIONS mm (inches)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
I	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)	17.2 (0.68) 17.2(0.68)	21.3 (0.84)
F	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)

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



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

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

INSTALLATION RECOMMENDATIONS

<p>In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer</p>	
<p>✓</p>	<p>✗</p>
<p>For installations in long pipe lines, please use anti vibration joints</p>	
<p>✓</p>	<p>✗</p>
<p>Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty</p>	
<p>✓</p>	<p>✗</p>
<p>Install the sensor away from bends and hydraulic accessories</p>	
<p>✓</p>	<p>✗</p>
<p>Avoid positioning fittings by tightening the clamps.</p>	
<p>✓</p>	<p>✗</p>

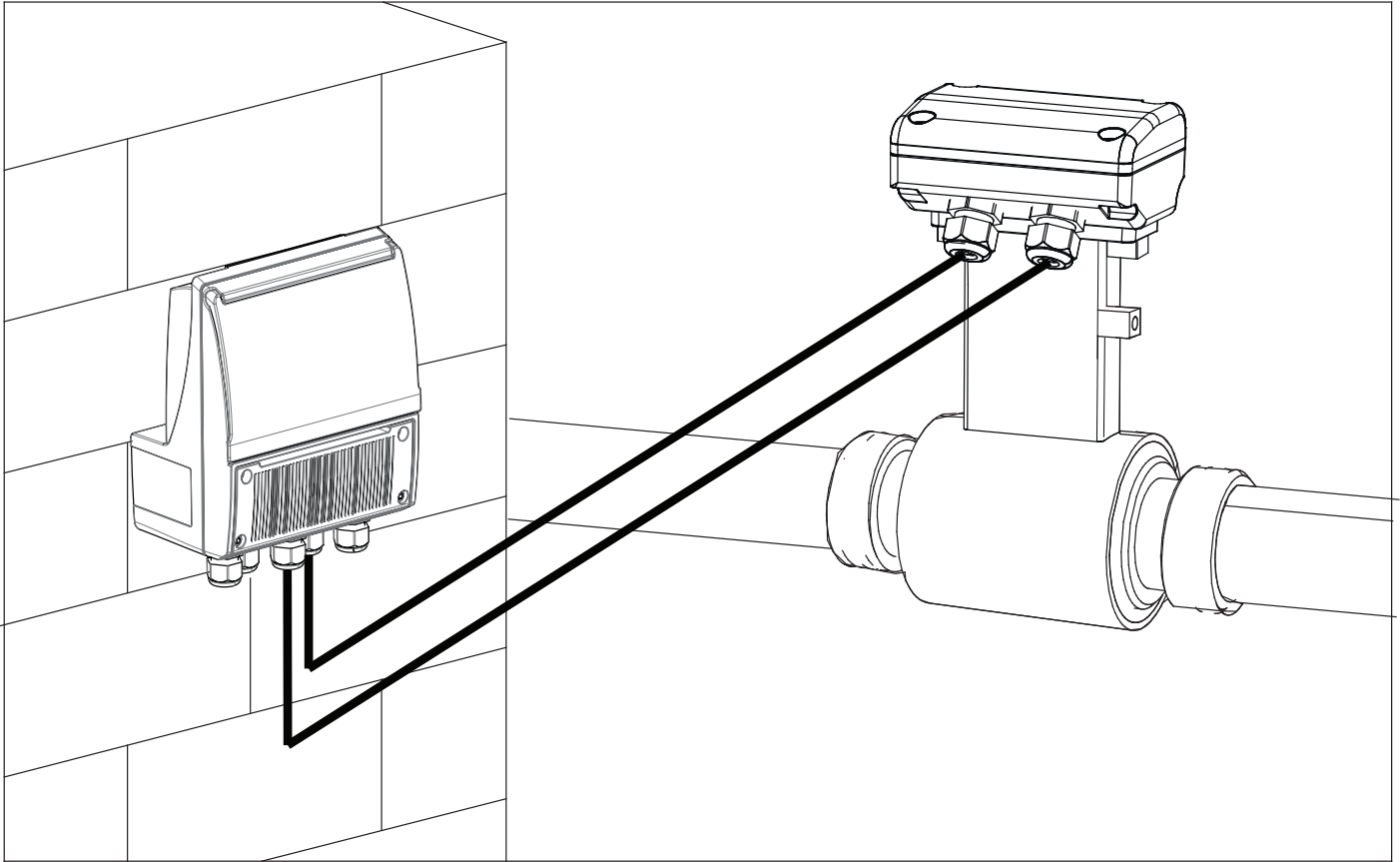
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GROUND CONNECTIONS

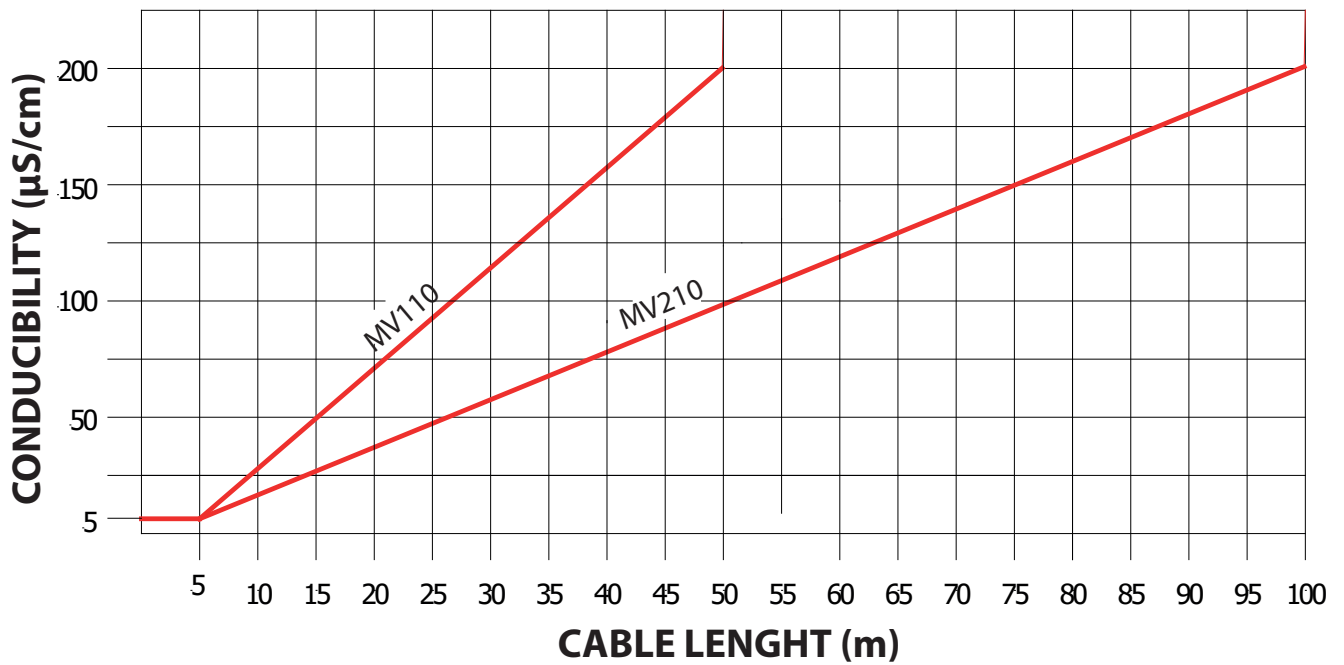
METALLIC PIPE	
THREADED SENSOR	FLANGED SENSOR
INSULATED PIPE	
	<p>If the sensor has to be installed in a pipe made of an insulating material, the following are necessary:</p> <ul style="list-style-type: none"> - Inserting two metallic rings between the sensor flanges and the pipe line counter flanges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

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SEPARATE VERSION



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Notes:

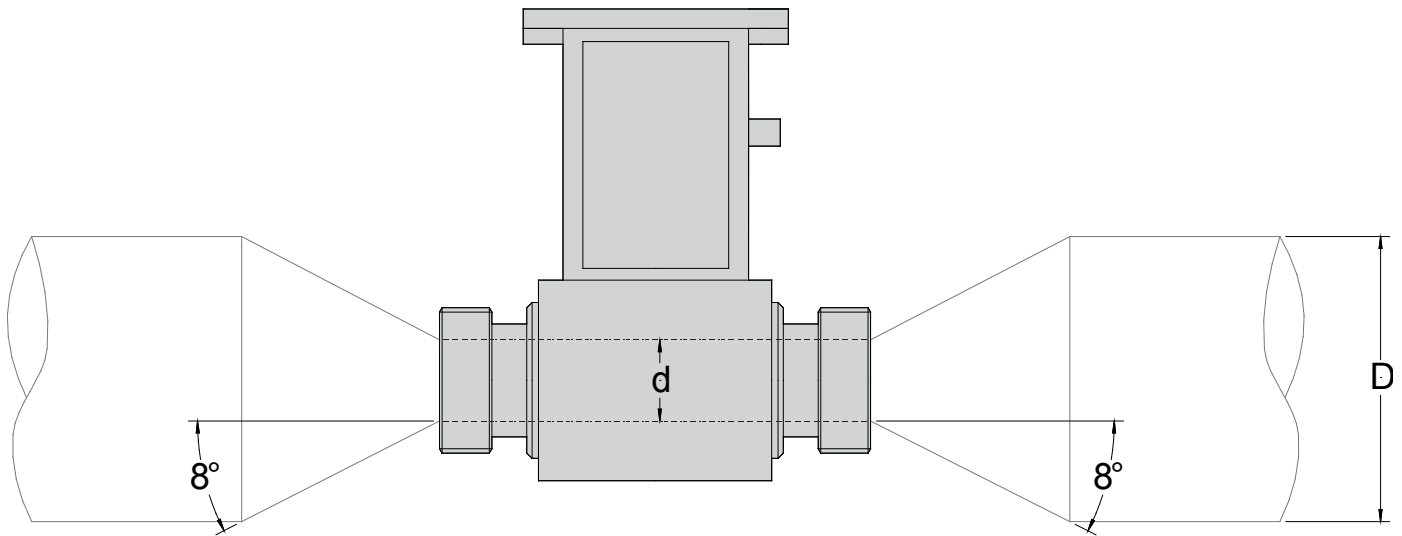
- It is recommended to install the connection cables away from, or protect against sources of electromagnetic noise.
- The minimum conductivity of the liquid medium to ensure correct functionality of the empty pipe detection is 20 µS/cm

	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)

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PRESSURE LOSS CALCULATION (CONES 8° ANGLES)



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

Dove:

- D_p = Pressure loss in [Pa]
 r = Fluid density [kg/m³] typical value $r = 1000$ [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:

- $r = 1000$ [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 (FOR THE DIMENSIONS CONSULT THE OVERALL DIMENSIONS DRAWING)
	2	Male threaded NPT(FOR THE DIMENSIONS CONSULT THE OVERALL DIMENSION DRAWING)
	3	Clamp connection, ISO2852
	4	DIN11851-852 sanitary connection
	5	SMS connection (only for DN10,15,20)
	6	EN1092 flanges connection (FOR THE DIMENSIONS CONSULT THE OVERALL DIMENSION DRAWING)
	7	ANSI 150 flange connection(FOR THE DIMENSIONS CONSULT THE OVERALL DIMENSION DRAWING)
	8	Clamp connection, BS 4825
	9	JIS flanges (10 k)
	0	Connection: other
Connection material		
A	A	Connection material: AISI316
	C	Connection material: AISI304, PTFE internal lining (only connection 1-2-6-7)
	9	Connection material: to be specified
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 version , IP67 protection rate
	B	Separate version, Painted Aluminum JB, protection rate IP68, standing immersion with 1,5 m of head water - (DEFINE THE CABLE LENGHT - ADD THE COST)
	G	Separate version, Painted Aluminum JB, N° 1 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	F	Separate version, Painted Aluminum JB, N° 2 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	N	Separate version, Painted Aluminum JB , PREAMPLIFIER*, protection rate IP67 - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	Q	Separate version, Painted Aluminum JB, PREAMPLIFIER*, N° 1 connectors IP 68 suitable for fast cable connection - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	U	Separate version, AISI 304 JB RAW, protection rate IP68, standing immersion with 1,5 m of head water - (DEFINE THE CABLE LENGHT - ADD THE COST)
	S	Separate version, AISI 304 JB RAW, with N° 1 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	T	Separate version, AISI 304 JB RAW, N° 2 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	P	Separate version, AISI 304 JB RAW, PREAMPLIFIER*, protection rate IP67 - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	R	Separate version, AISI 304 JB RAW, PREAMPLIFIER* N° 1 connectors IP 68 suitable for fast cable connections to - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
	K	Separate version, AISI 304 JB POLISHED, protection rate IP68, standing immersion with 1,5 m of head water - (DEFINE THE CABLE LENGHT - ADD THE COST)
	Y	Separate version, AISI 304 JB POLISHED, with N° 1 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	W	Separate version, AISI 304 JB POLISHED, N° 2 connectors IP 68 suitable for fast cable connections - (DEFINE THE CABLE LENGHT - ADD THE COST)
	V	Separate version, AISI 304 JB POLISHED, PREAMPLIFIER*, protection rate IP67 - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)
J	Separate version, AISI 304 JB POLISHED, PREAMPLIFIER* N° 1 connectors IP 68 suitable for fast cable connections to - (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST)	

Complete code
example for
order



MS501-T03-1A1A1A

ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	SERVICE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 Fax +39 02 6123202 sales@isoil.it	isomagservice@isoil.it

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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