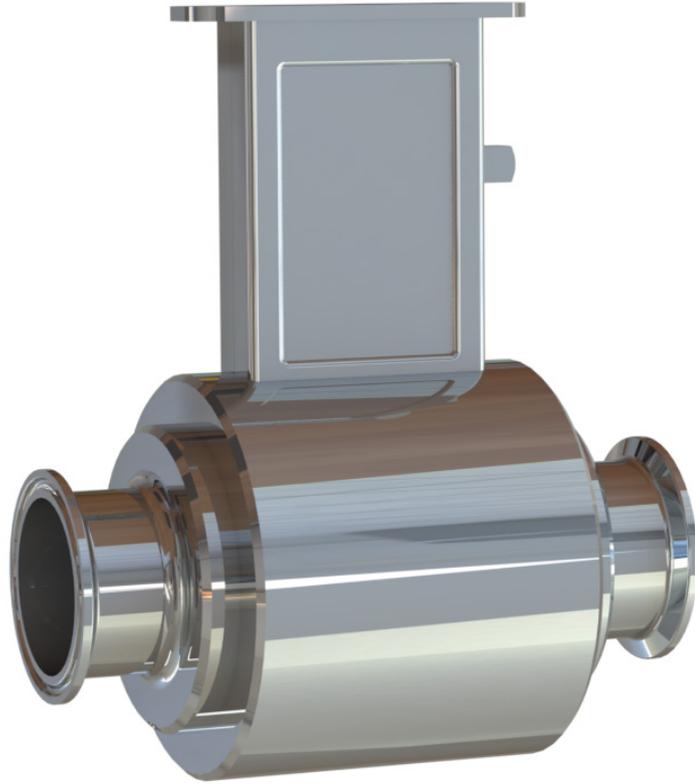




FM170

Sensor

[Data Sheet](#)



Benefits

- Designed with latest food requirements
- Inspectionable seal, gasket
- Flexible process connections:
Clamp-, SMS-, welding process connector
- Hygienic design with FDA conformity
- Straight inner pipe diameter without restrictions

Typical Applications

- Food & Beverages
- CIP
- Dosing
- Filling
- Levelling
- Media transfer

Pressure Measuring Range: PN 0–16 bar (0–232 psi)

Temperature Range: -20°–100°C (-4°–212°F), -20°–150°C (-4°–302°F) remote

Accuracy: $\pm 0.2\%$



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DIN/SMS Fittings	4
Clamp Connections	5
Installation Recommendations	6
Calculation of Pressure Loss (8° Cone Angle)	8
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Technical Data

General Characteristics

Nominal Diameters	<input type="checkbox"/> DN3–DN100
Minimum Conductivity	<input type="checkbox"/> 5 μS/cm
Humidity	<input type="checkbox"/> 0÷100% (IP 67)
Precision	<input type="checkbox"/> Consult converter data sheet
CE Certification	<input type="checkbox"/> Yes

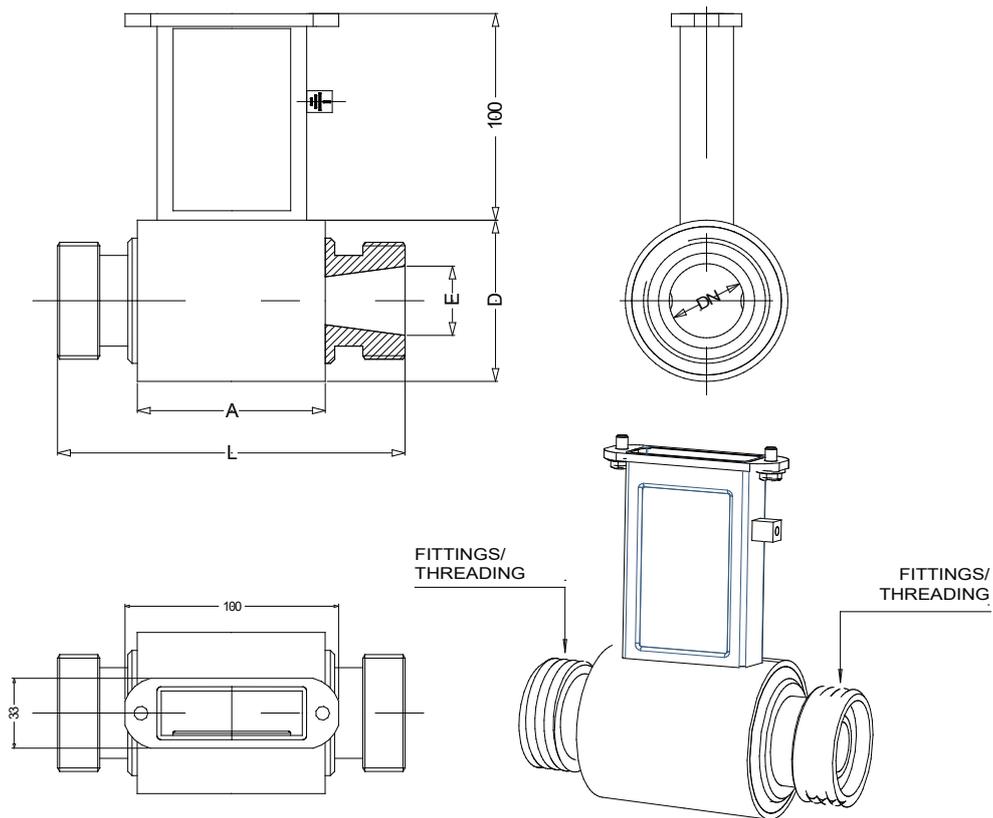
Standard Configurations

Body Material	<input type="checkbox"/> AISI 304 Stainless Steel
Nominal Pressure	<input type="checkbox"/> 16 bar (1600 kPa, 232 psi)
Process Connections	<input type="checkbox"/> DIN 11851 <input type="checkbox"/> Tri-clamp® <input type="checkbox"/> Tri-clover® <input type="checkbox"/> SMS 1146 <input type="checkbox"/> Others on Request
Version – Protection Class	<input type="checkbox"/> Compact IP67
Flange Material	<input type="checkbox"/> AISI316 (1.4404)
Lining Material	<input type="checkbox"/> PTFE
Gasket Material	<input type="checkbox"/> FKM
Liquid Temperature	<input type="checkbox"/> -20°C – 110°C (-4°F – 230°F) compact <input type="checkbox"/> -20°C – 150°C (-4°F – 302°F) separate
Vacuum Resistance	<input type="checkbox"/> 0.2 bar absolute (20 kPa, 14.5psi)
Electrode Material	<input type="checkbox"/> AISI316 (1.4404)

Optional Configurations (For more details, see 'How to Order' on the last page)

Body Material	<input type="checkbox"/> AISI316 (1.4404)
Gasket Material	<input type="checkbox"/> EPDM
Process Connection	<input type="checkbox"/> Others on request
Electrode Material	<input type="checkbox"/> On request
Version – Protection Class	<input type="checkbox"/> Separate version max. 20m (787inch)cable length / IP68 <input type="checkbox"/> Separate version max. 500m (19685inch) cable length / IP68

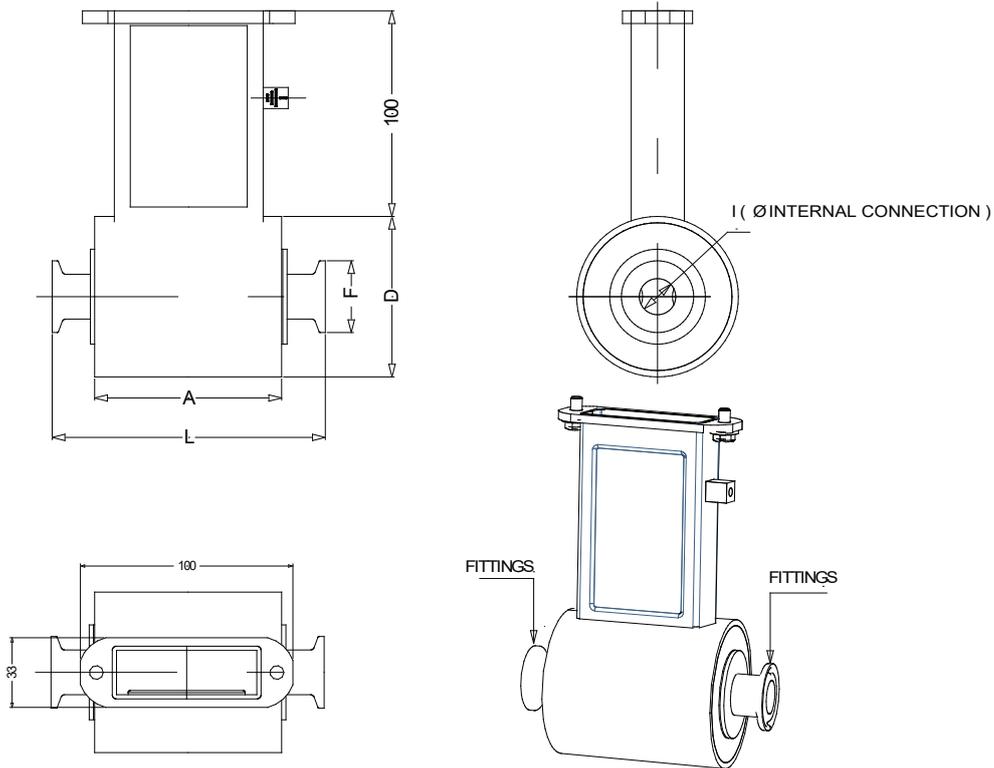
DIN/SMS Connectors



DIN 11851					
Dimensions (inch)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
A	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)
L	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
D	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)
E	10 (0.39)	10 (0.39)	10 (0.39)	16 (0.63)	20 (0.79)
Thread	Rd 28x1/8	Rd 28x1/8	Rd 28x1/8	Rd 34x1/8	Rd 44x1/6
Fittings	DN 10	DN 10	DN 10	DN 15	DN 20

SMS 1146			
Dimensions (inch)	DN		
	10 (3/8)	15 (1/2")	20 (3/4")
A	77 (3.03)	77 (3.03)	77 (3.03)
L	128 (5.04)	128 (5.04)	128 (5.04)
D	76 (3)	76 (3)	76 (3)
E	22.6 (0.89)		
Thread	Rd 40-6		
Fittings	DN 25	DN 25	DN 25

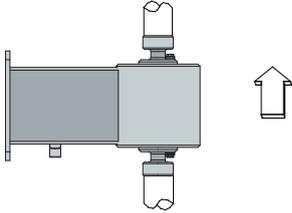
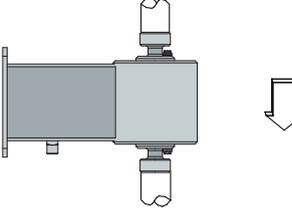
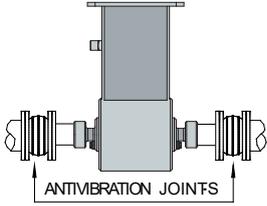
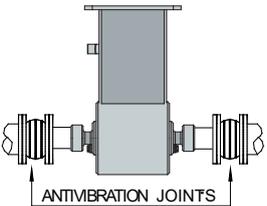
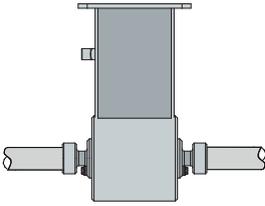
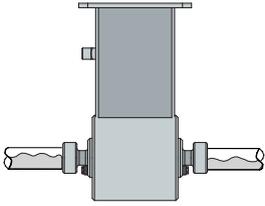
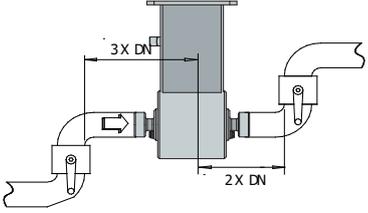
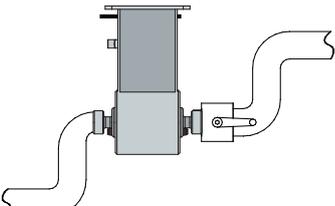
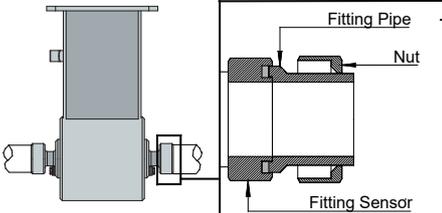
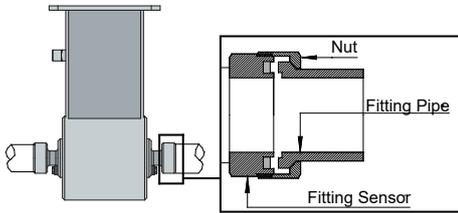
Clamp Connections



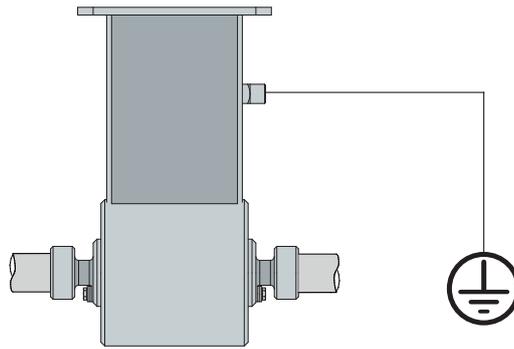
CLAMP ISO 2852					
Dimensions (inch)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
A	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)
L	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
D	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)
I	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)	12.7 (0.5)
F	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)	34 (1.34)

CLAMP BS 4825 Part 3					
Dimensions (inch)	DN				
	3 (1/8")	6 (1/4)	10 (3/8)	15 (1/2")	20 (3/4")
A	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)
L	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
D	76 (3)	76 (3)	76 (3)	76 (3)	76 (3)
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)

Installation Recommendations

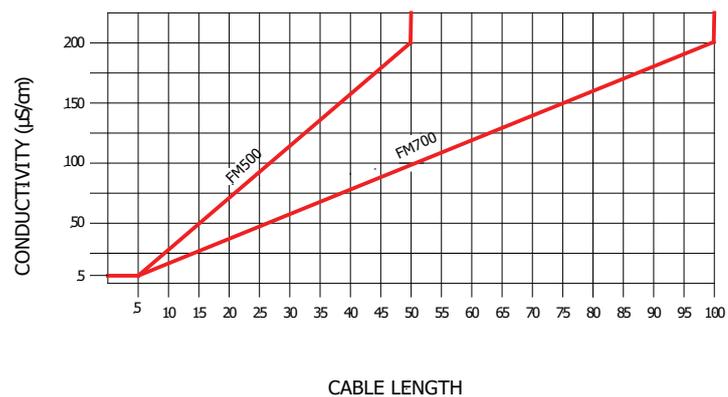
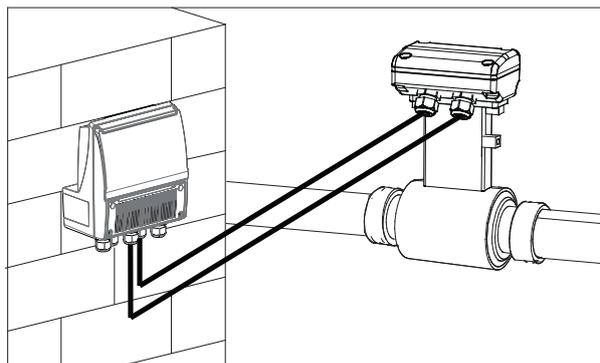
<p>In vertical installations, an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer.</p>	
	
	
<p>For installations in long pipe lines, please use anti-vibration joints.</p>	
	 <p style="text-align: center;">ANTIVIBRATION JOINTS</p>
	 <p style="text-align: center;">ANTIVIBRATION JOINTS</p>
<p>Avoid a partially empty pipe. During operation, the pipe must be either completely full of liquid or completely empty.</p>	
	
	
<p>Install the sensor away from bends and hydraulic accessories.</p>	
	
	
<p>Avoid positioning fittings by tightening the clamps.</p>	
	 <p style="text-align: center;">Fitting Pipe Nut Fitting Sensor</p>
	 <p style="text-align: center;">Nut Fitting Pipe Fitting Sensor</p>

Earth Sensor



For the correct functioning of the instrument, it is NECESSARY that the sensor and the liquid are equipotential, therefore ALWAYS carry out the ground connection of the sensor and the converter according to the indicated methods.

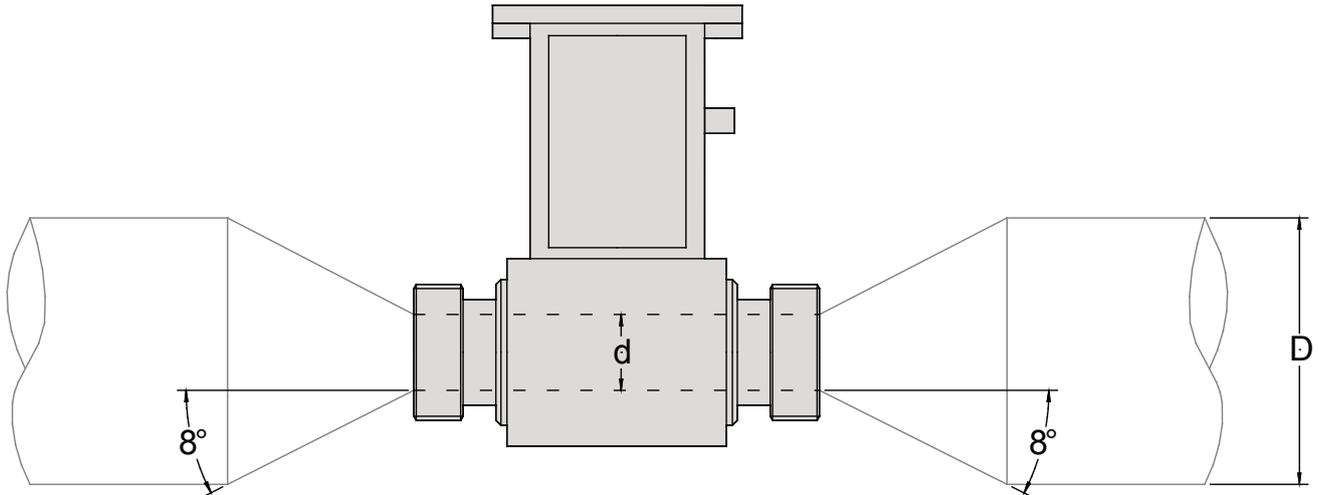
Seperate Version



Note:

- It is recommended to make cable connections away from, or protect them from, electromagnetic disturbances.
- To ensure correct operation of the "empty tube" recognition, the minimum conductivity of the liquid is 20 $\mu\text{S/cm}$.

Calculation of Pressure Loss (8° Cone Angle)



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

Where:

Δp = Pressure drop in [Pa]

ρ = Density of the fluid [kg/m³] Typical value $\rho = 1000$ [kg / m³]

d = Sensor diameter [m]

D = Pipeline diameter (larger than sensor diameter) [m]

u = Average fluid velocity inside the sensor [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	17.0	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 / m³] density of commonly used water (approximate value).
- The “d” parameter indicates the internal diameter of the sensor expressed in meters.
- The equation above expresses a value in [Pa]. The results of the equation in the table are expressed in [mbar].

How to Order

Code Example		Code / Description
Nominal diameter / Measuring range		
T03	T03	DN3 (1/8 "), measuring range 0.. 10.3 / 0...259 l/h (not available for type C connection)
	T06	DN6 (1/4 "), measuring range 0...41.4/0...1037 l/h (not available for type C connection)
	T10	DN10 (3/8 "), measuring range 0..115.2/0...2880 l/h
	T15	DN15 (1/2 "), measuring range 0.. 259.2/0...6480 l/h
	T20	DN20 (3/4"), measuring range 0..460.8/0...11520 l/h
	T25	DN25 (1"), measuring range 0 ... 0.72 / 0 ... 18 m3/h
	T32	DN32 (1 1/4"), measuring range 0 ... 1.6 / 0 ... 29 m3/h (only available for DIN 11851)
	T40	DN40 (1 1/2"), measuring range 0 ... 1.8 / 0 ... 45 m3/h
	T50	DN50 (2"), measuring range 0 ...2.88 / 0 ... 72 m3/h
	T65	DN65 (2 1/2"), measuring range 0 ... 4.8 / 0 ... 120 m3/h
	T80	DN80 (3"), measuring range 0 ... 7.2 / 0 ... 180 m3/h
	T100	DN100 (4"), measuring range 0 ...11.2 / 0 ... 280 m3/h
Gasket material (internal seal)		
2	2	O-Ring: EPDM
	3	O-Ring: FKM (FDA1770)
	9	O-Ring: To be specified
Connection type		
A	A	DIN11851-852 sanitary connection (*)
	B	Clamp Connection, ISO2852
	C	SMS-1146 Connection (**)
	D	Clamp GB special connection
	E	Tri-Clamp Connection, BS 4825 - Part 3
	F	DIN11850-Range 2 welding connection
	Z	Connection: others (***)
Number and material of electrodes		
1	1	AISI316 (1.4404)
	0	Electrode material: to be specified
Version / Protection Rate		
A	A	Compact version, IP67 protection class
	K	Separate version, AISI 304 JB POLISHED VERSION, IP68 protection degree, 1.5 m immersion - (DEFINE THE CABLE - ADD THE COST)
Approvals		
1	0	Any
	1	3A

Complete example code
for ordering



FM170-T03-2A1A

(*) : Use a suitable gasket for the application of cleaning in place (CIP)

(**): With this option the process connection is only suitable for cleaning out of place (COP)

(***) : Not available with 3-A mark

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