

VersaFlow Coriolis 6000 Sensor for Mass Flow Specifications

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The Solution for extended temperature applications

A high level of performance, together with a wide operating temperature range up to 400°C / 752°F, makes the VersaFlow Coriolis 6000 the ideal choice for mass flow measurement in a wide variety of applications.

High performance meter designed to meet the requirements of general purpose liquid and gas applications, the extended low temperature range of -200°C/-328°F also makes VersaFlow Coriolis 6000 suitable for Liquid Natural Gas (LNG) and cryogenic applications.

Combined with the power of the TWC 9400, the VersaFlow Coriolis 6000 will provide accurate measurement of volume, mass, density and concentration

Features

- Innovative twin V-tube design
- Temperature range -200°C to +400°C
- Optional insulation / heating jacket
- Compact envelope
- Optimised flow divider for minimum pressure loss
- Modular electronics concept: electronics and sensor are easy to replace
- Self draining when mounted vertically
- Stability with entrained gas, even with gas concentrations 0...100%

Industries

- Water and waste water
- Chemical
- Oil and gas
- Food and beverage
- Pharmaceutical



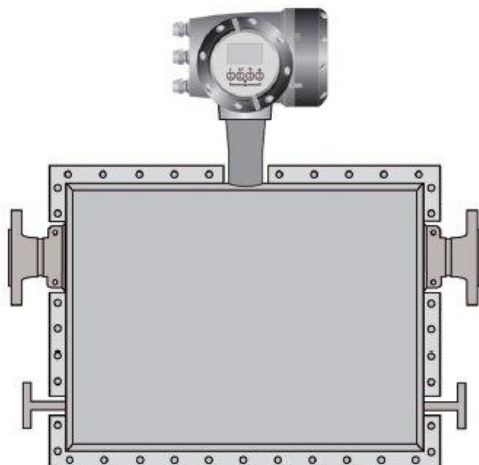
Figure 1 – VersaFlow Coriolis 6000 sensor for mass flow

1. Standard flange process connections available.
2. Modular electronics with a range of output options.
3. Comprehensive diagnostic capabilities.

Applications

- Crystallising, solidifying and cryogenic products
- Tanker loading
- General purpose applications
- CIP and SIP >130°C
- Liquid Natural Gas (LNG)
- Supercritical gases

Features and Options



Features

- Available as compact or remote.
- Nominal flow rates up to 1000000 kg/h / 36743 lb/min.
- Self draining, when mounted vertically.
- With advanced Entrained Gas Management (EGM) the meter maintains operation over a wide range of gas fractions and complex flow conditions.

Connection Options

- Standard flanges with ratings up to 1500 lb / PN160.
- Supports a wide range of industry standard hygienic connections.
- Optional sealing faces.
- NAMUR NE132 flange lengths

Heating Jacket

- For use with temperature dependent products.
- Prevents solidification of process product.
- The heating case can also be used as a cryogenic insulation case.

Purge Port

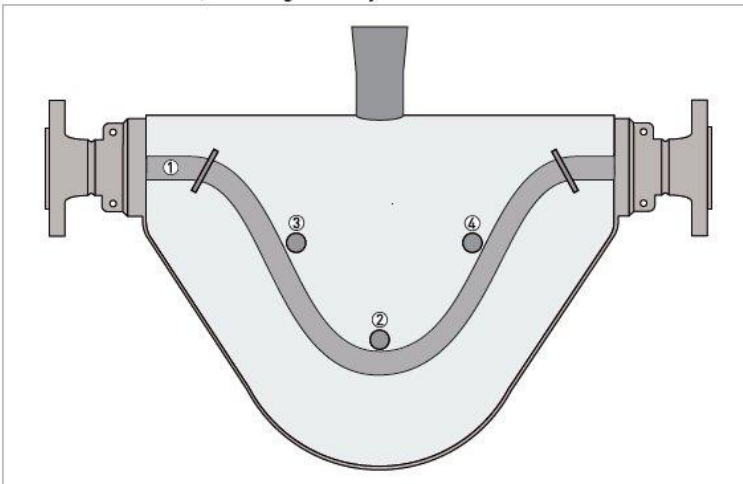
- Allows hazardous chemicals to be drained away safely.

Meter / converter combinations

Converter		
Configuration	Compact	Remote field
VersaFlow Coriolis 6000	TWC 9400C	TWC 9400F

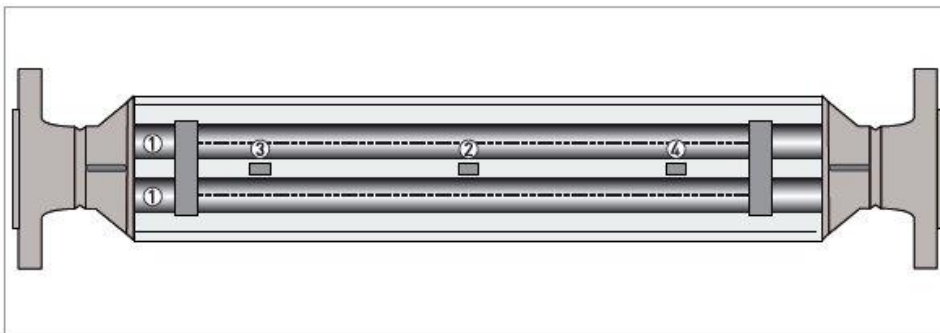
Measuring principle (twin tube)

Meter from side, showing tube layout



1. Measuring tubes
2. Drive coil
3. Sensor 1
4. Sensor 2

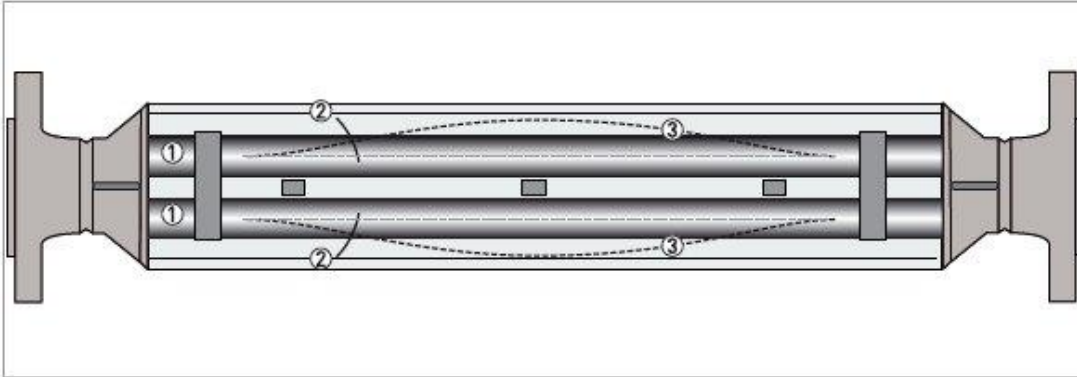
Static meter not energized and with no flow



1. Measuring tubes
2. Drive coil
3. Sensor 1
4. Sensor 2

A Coriolis twin tube mass flowmeter consists of two measuring tubes 1 a drive coil 2 and two sensors (3 and 4) that are positioned either side of the drive coil.

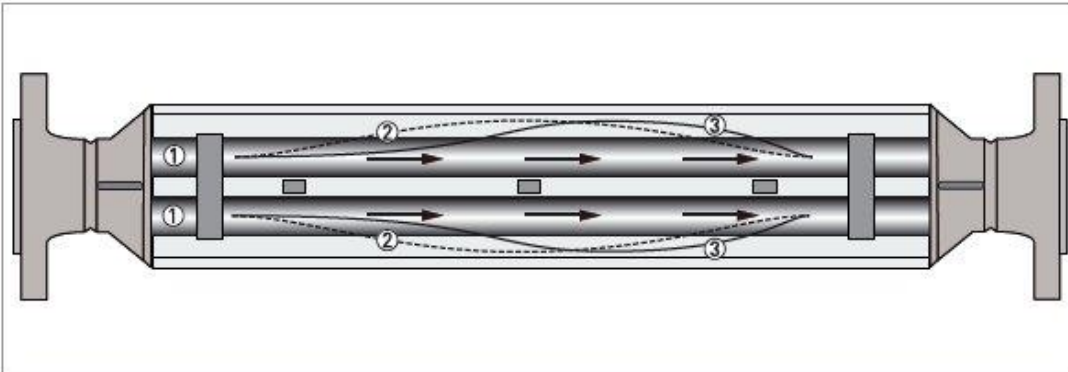
Energized meter



1. Measuring tubes
2. Direction of oscillation
3. Sine wave

When the meter is energized, the drive coil vibrates the measuring tubes causing them to oscillate and produce a sine wave 3. The sine wave is monitored by the two sensors.

Energized meter with process flow



1. Process flow
2. Sine wave
3. Phase shift

When a fluid or gas passes through the tubes, the Coriolis effect causes a phase shift in the sine wave that is detected by the two sensors. This phase shift is directly proportional to the mass flow.

Density measurement is made by evaluation of the frequency of vibration and temperature measurement is made using a Pt500 sensor.

Technical data

The following data is provided for general applications. If you require data that is more relevant to your specific application, please contact us or your local sales office.

Measuring System	
Measuring principle	Coriolis mass flow
Application range	Mass flow and density measurement of fluids, gases and solids
Measured values	Mass, density, temperature
Calculated values	Volume, referred density, concentration, velocity
Sensor model range	
Stainless Steel 316L 08...250	Compact / remote 100 barg @ 20°C / 1450 psig @ 68°F, temp. range-70°C...+230°C / -94°F...+446°F
	Remote only 100 barg @ 20°C / 1450 psig @ 68°F, temp. range-50°C...+400°C / -58°F...+752°F
	Remote only 100 barg @ 20°C / 1450 psig @ 68°F, temp. range -200°C...+40°C / -364°F...+104°F
Hastelloy® 08...80	Compact / remote 200 barg @ 20°C / 2900 psig @ 68°F, temp. range-70°C...+230°C / -58°F...+446°F
Duplex Stainless Steel 100...200	Compact / remote 200 barg @ 20°C / 2900 psig @ 68°F, temp. range-50°C...+230°C / -58°F...+446°F
Design	
Basic	System consists of a measuring sensor and a converter to process the output signal
Features	Fully welded maintenance free sensor with dual-straight measuring tube
Variants	
Compact version	Integral converter
Remote version	Available with field, wall or 19" rack mount versions of the converter

Measuring Accuracy

Mass (standard)	
Liquid	±0.1% of actual measured flow rate
Liquid	±zero stability (see zero stability below)
Gas	±0.35% of actual measured flow rate + zero stability
Mass (optional)1	
Liquid (≥ 10:1 of nominal flow rate)	±0.05% of actual measured flow rate
Liquid (< 10:1 of nominal flow rate)	± zero stability (see zero stability below)
Repeatability	
Liquid	Better than 0.05% plus zero stability (includes the combined effects of repeatability, linearity and hysteresis)
Gas	Better than 0.2% plus zero stability (includes the combined effects of repeatability, linearity and hysteresis)

Zero stability		
Meter size	Standard temperature	High temperature
08	< 0.03 kg/h	< 0.05 kg/h
10	< 0.06 kg/h	< 0.10 kg/h
15	< 0.19 kg/h	< 0.30 kg/h
25	< 0.95 kg/h	< 1.52 kg/h
50	< 1.8 kg/h	< 2.8 kg/h
80	< 3.9 kg/h	< 6.24 kg/h
100	< 8.8 kg/h	< 14.0 kg/h
150	< 16.0 kg/h	< 25.6 kg/h
200	< 30.0 kg/h	< 44.0 kg/h
250	< 50.0 kg/h	< 80.0 kg/h
Reference conditions		
Product	Water	
Temperature	+20°C / +68°F	
Operating pressure	1 barg / 14.5 psig	
Effect on sensor zero point caused by a shift in process temperature		
Standard temperature range		
All materials sizes 08...10	0.0010% of nominal flow per 1°C / 0.00056% of nominal flow per 1°F	
All materials sizes 15...250	0.00075% of nominal flow per 1°C / 0.00042% of nominal flow per 1°F	
High temperature range		
All materials sizes 08...250	0.008% of nominal flow per 1°C / 0.0044% of nominal flow per 1°F	
Pressure effect on mass flow rate		
All materials sizes 08...50	0.005% per 1 barg / 0.00034 % per 1 psig	
All materials sizes 80...100	0.0055% per 1 barg / 0.00038 % per 1 psig	
All materials sizes 150...250	0.008% per 1 barg / 0.00055 % per 1 psig	
Density		
Measuring range	100...3000 kg/m ³ / 6...187 lb/ft ³	
Accuracy	±1 kg/m ³ / ±0.06 lb/ft ³	
On site calibration	±0.2 kg/m ³ / ±0.012 lb/ft ³	
Process temperature effect	0.015 g/l per 1°C / 0.0083 g/l per 1°F	
Temperature		
Accuracy	± 0.5°C / ±0.9°F (± 0.5% of reading)	

Operating Conditions

Nominal flow rates (1 barg / 14.5 psig pressure drop)	
08	600 kg/h / 22 lb/min
10	1200 kg/h / 44 lb/min
15	3800 kg/h / 139 lb/min
25	19000 kg/h / 698 lb/min
50	35000 kg/h / 1286 lb/min
80	78000 kg/h / 2866 lb/min
100	175000 kg/h / 6430 lb/min
150	320000 kg/h / 11758 lb/min
200	550000 kg/h / 20209 lb/min
250	1000000 kg/h / 36743 lb/min
	Assumes operating density 1000 kg/m ³ / 62.4 lb/ft ³ . For Hastelloy® meters, assume a pressure drop of 1.15 barg
Maximum flow rates	
All meters	150% of nominal flow rate

Environmental

Ambient temperature		
Compact meter	Standard converter	SIL capable converter (Pending)
Aluminium converter	-40...+65°C / -40...+149°F	-40...+55°C / -40...+131°F
Stainless Steel converter	-40...+55°C / -40...+131°F	-40...+55°C / -40...+131°F
Remote versions	Standard converter	SIL capable converter
Standard temperature range	-40...+65°C / -40...+149°F	-40...+55°C / -40...+131°F
Cryogenic temperature range	-20...+65°C / -4...+149°F	-40...+55°C / -40...+131°F
Hazardous Area versions	Refer to temperature limits	
Protection category (Acc. to EN 60529)	IP 67, NEMA 4X	
Vibration (acc IEC 60068-2-6)	10-150-10 Hz with 0.15 mm for 10...60 Hz, 20 m/s ² for 60...150 Hz	
Process temperature		
Standard temperature range (flange connections)	Extended stem	Short stem
Safe area	-70...+230°C / -94...+446°F	-70...+150°C / -94...+302°F
Hazardous area	-50...+230°C / -58...+446°F	-50...+150°C / -58...+302°F
High temperature range	-50...+400°C / -58...+752°F	N/A
Cryogenic temperature range	200...+40°C / -328...+104°F	-200...+40°C / -328...+104°F
Standard temperature range (hygienic connections)	Extended stem	Short stem
Safe area	-70...+150°C / -94...+302°F	-70...+150°C / -94...+302°F
Hazardous area	-50...+150°C / -58...+302°F	-50...+150°C / -58...+302°F

Nominal pressure at 20°C / 68°F		
Measuring tube	SS 316 / 316L	Hastelloy® C22 / S31803
FM / PED	-1...100 barg / -14.5...1450 psig	-1...200 barg / -14.5...2900 psig
CRN / ASME B31.3	-1...100 barg / -14.5...1450 psig	Pending
Outer casing burst pressureOuter casing burst pressureOuter casing burst pressure 2		
08	≈ 100 barg	
10		
15		
25		
50	≈ 70 barg	
80		
100	≈ 10 barg	
150		
200		
250		
If the process temperature is higher than 20°C / 68°F, the burst pressure will be lower. For more information please contact the manufacturer.		
Fluid properties		
Permissible physical condition	Liquids, gases, slurries	
Permissible gas content (volume)	Contact manufacturer for information.	
Permissible solid content (volume)	Contact manufacturer for information.	
Installation conditions		
Inlet runs / Outlet runs	None required	

Materials

Stainless Steel (316 / 316L) meter	
Measuring tubes / Flanges	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Spigot	Stainless Steel CF3M (1.4409)
Bridge	Stainless Steel AISI 304 / 304L (1.4301 / 1.4307) dual certified or AISI 316 / 316L (1.4401 / 1.4404) dual certified
Outer casing	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Stainless Steel (S31803) meter	
Measuring tubes / Flanges	Stainless Steel UNS 31803 (1.4462)
Spigot	Stainless Steel J92205 (1.4470)
Bridge	Stainless Steel AISI 304 / 304L (1.4301 / 1.4307) dual certified or AISI 316 / 316L (1.4401 / 1.4404) dual certified
Outer casing	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Hastelloy® C22 meter	
Measuring tubes / raised face	Hastelloy® C22
Backing flanges	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Bridge	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Outer casing	Stainless Steel AISI 316L (1.404) dual certified

Heating jacket version	
Heating loop and insulation jacket	Stainless Steel AISI 316 (1.4401)
All versions	
Junction box (remote version)	Die cast Aluminium (polyurethane coating)
	Optional Stainless Steel 316 (1.4401)

Process Connections

Flange	
DIN (EN 1092-1 2007)	DN10...300 / PN16...160
ASME (B616.5)	4...12" / ASME 150...1500
JIS (2220 2001)	0A...300A / 10...20K (10K maximum allowable temperature 300°C / 572°F)
Hygienic	
Tri-clover	¾...4"
Tri-clamp DIN 32676	DN15..100
Tri-clamp ISO 2852	1...4"
DIN 11864-2 Form A (female)	DN15...100
Male thread DIN 11851 (threaded sanitary connection)	DN15...100
Male thread SMS	25...100 mm / 1...4"

Electrical Connections

Electrical connections	For full details, including: power supply, power consumption etc., see technical data for the relevant converter.
I/O	For full details of I/O options, including data streams and protocols, see technical data for the relevant converter.

Approvals

Mechanical	
CE	The device fulfils the statutory requirements of the CE directive. The manufacturer certifies that these requirements have been met by applying the CE mark.
CRN	acc to: ASME B31.3 (most recent and up to date version)
NACE	MR0175 / ISO 15156 ("Sulphide Stress Corrosion Cracking Resistant Metallic Materials for Oil Field Equipment") and MR0103 ("Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments") (most recent and up to date versions)
Custody Transfer (pending)	Measuring Instruments Directive (MID) MI 002 and MI 005 (most recent and up to date version)
	OIML R117-1
	OIML R137
	Compliant with API and AGA

ATEX (most recent and up to date version)	
Coriolis 6000 with TWC 9400C non Ex i signal outputs	
Ex d connection compartment	II 1/2 G Ex d ia IIC T6....T1 Ga/Gb
	II 2 D Ex t IIIC T270°C Db
Ex e connection compartment	II 1/2 G Ex de ia IIC T6....T1 Ga/Gb
	II 2 D Ex t IIIC T270°C Db
Coriolis 6000 with TWC 9400C Ex i signal outputs	
Ex d connection compartment	II 1/2(1) G Ex d ia [ia Ga] IIC T6....T1 Ga/Gb
	II 2(1) D Ex t [ia Da] IIIC T270°C Db
Ex e connection compartment	II 1/2(1) G Ex de ia [ia Ga] IIC T6....T1 Ga/Gb
	II 2(1) D Ex t [ia Da] IIIC T270°C Db
Coriolis 6000 with TWC 9400F	II 1 G Ex ia IIC T6...T1 Ga
	II 1 D Ex ia IIIC T270°C Da
	II 1 D Ex ia IIIC T440°C Da

1 This option is not available when the converter is being used in SIL mode

2 For information only. Secondary pressure containment is NOT supplied on this meter

ATEX temperature limits				
	Ambient temp. T_{amb} °C	Max. medium temp. T_m °C	Temp. class	Max. surface temp. °C
Coriolis 6000 with or without heating jacket / insulation	-40...40	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...55	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...65	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
Cryogenic version	-20...65	-200...40	T6-T1	T80
Coriolis 6000 with TWC 9400C, Aluminium converter housing - with or without heating jacket / insulation	-40...40	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...50	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...65	-50...65	T4-T1	T105
Cryogenic version	-40...65	-200...40	T6-T1	T80
Coriolis 6000 with TWC 9400C Stainless Steel converter housing - with or without heating jacket / insulation	-40...40	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...50	-50...40	T6	T80
		-50...150	T3	T190
		-50...230	T2-T1	T270
	-40...60	50...60	T4-T1	T100
Cryogenic version	-25...+60	-200...40	T6-T1	T80

(1) depending on I/O option. Please call for more information.

High temperature version					
	Ambient temp. Tamb °C	Max. medium temp. Tm °C	Temp. class	Max. surface temp. °C	
Coriolis 6000 with TWC 9400F- HT with aluminum junction box, heating jacket and insulation	-40...40	-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
	-40...55	-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
	-40...60	-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
	40...65	-50...350	T1	T390	
	Coriolis 6000 with TWC 9400F - HT with SS junction box, heating jacket and insulation	-40...40	-50...40	T6	T80
			-50...230	T2	T270
-50...400			T1	T440	
-40...50		-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
-40...55		-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
-40...60		-50...350	T1	T390	
Coriolis 6000 with TWC 9400F - HT with aluminum junction box, heating jacket and insulation		-40...40	-50...40	T6	T80
			-50...230	T2	T270
	-50...400		T1	T440	
	-40...55	-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	
	40...65	-50...40	T6	T80	
		-50...230	T2	T270	
		-50...400	T1	T440	

Maximum End Loadings

		S08/ S10	S15	S25	S50	S80	S100	S150	S200	S250
Flanges										
20°C	40 barg	15 kN	25 kN	38 kN	48 kN	99 kN	130 kN	250 kN	300 kN	350 kN
	100 barg	12 kN	17 kN	19 kN	15 kN	20 kN	100 kN	120 kN	150 kN	200 kN
230°C	32 barg	7 kN	12 kN	18 kN	25 kN	45 kN	60 kN	50 kN	100 kN	150 kN
	60 barg	5 kN					20kN			
400°C	27.4 barg	5 kN	6 kN	10 kN	12 kN	20 kN	50 kN	80 kN	100 kN	150 kN
	40 barg	4 kN	5 kN				20kN			
Hygienic (all connections)										
150°C	10 barg	5kN	9 kN	12 kN	12 kN	18 kN	21 kN	N/A	N/A	N/A
140°C	40 barg	3 kN	5 kN	5 kN	N/A	N/A	N/A	N/A	N/A	N/A
	25 barg	N/A	N/A	N/A	9 kN	N/A	N/A	N/A	N/A	N/A
	16 barg	N/A	N/A	N/A	N/A	12 kN	12 kN	N/A	N/A	N/A
Heating jacket connections										
1		0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	0 kN

1 All temperature and pressure ranges

Maximum End Loadings (Hastelloy® and Stainless Steel UNS S31803)

		H08/ H 10	H 15	H 25	H 50	H 80	H 100	H 150	H 200	
Flanges (not including CRN)										
20°C	200 barg	12 kN	17 kN	19 kN	15 kN	20 kN	100 kN	120 kN		
230°C	145 barg	5 kN				20 kN				
Flanges (CRN regions)										
20°C	200 barg	12 kN	17 kN	19 kN	15 kN	20 kN	60 kN	30 kN	10 kN	
230°C	145 barg	5 kN				20 kN				
Heating jacket connections										
3		0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	0 kN	

1. D200 limited to 180 barg at 20°C

2. D100 and D150 limited to 120 barg at 230°C. D200 limited to 110 barg at 230°C

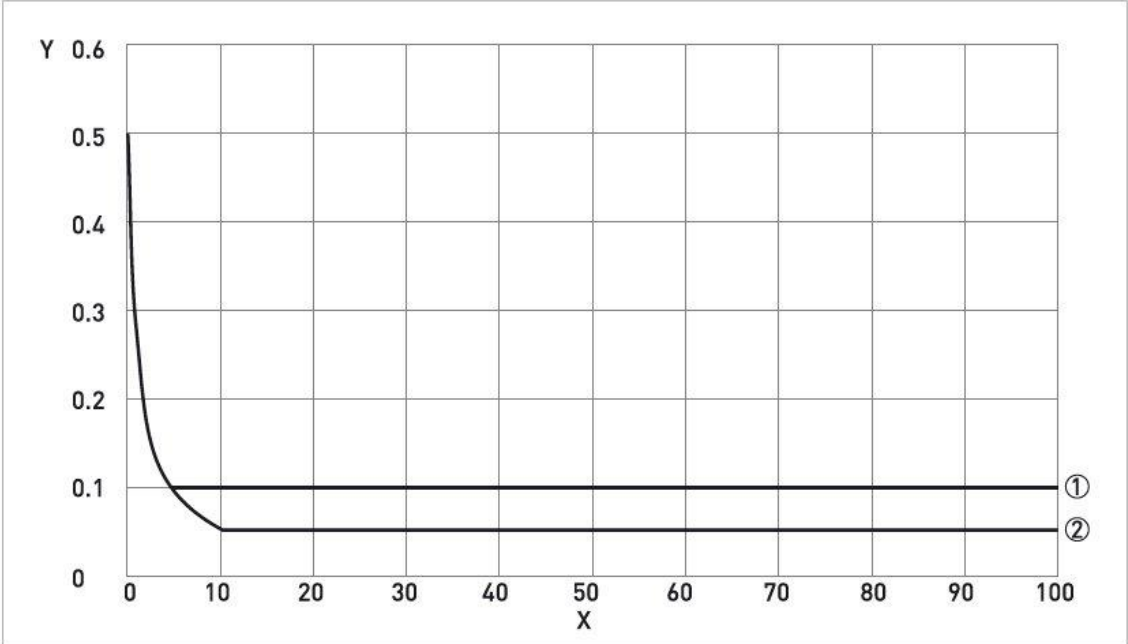
3. All temperature and pressure ranges

DN08...50 (axial) loads have been calculated, based on 316L schedule 40 process pipework, where un-radiographed butt welds have been used in pipe joints.

DN80...250 (axial) loads have been calculated, based on 316L schedule 80 process pipework, where un-radiographed butt welds have been used in pipe joints.

The loads shown are the maximum permitted static load. If loads are cycling (between tension and compression) these loads should be reduced. For advice, consult the manufacturer.

Measuring Accuracy



X nominal flow rate [%]
 Y measuring error [%]
 1 Standard measuring accuracy
 2 Optional measuring accuracy (not available in SIL mode)

Measuring Error

The measuring error is obtained from the combined effects of accuracy and zero stability.

Reference Conditions

Product	Water
Temperature	+20°C / +68°F
Operating pressure	1 barg / 14.5 psig

Guidelines for maximum operating pressure

Always make sure that the meter is used within its operating limits.

Pressure / temperature de-rating (metric) for meters with SS 316 measuring tubes. Standard temperature range.

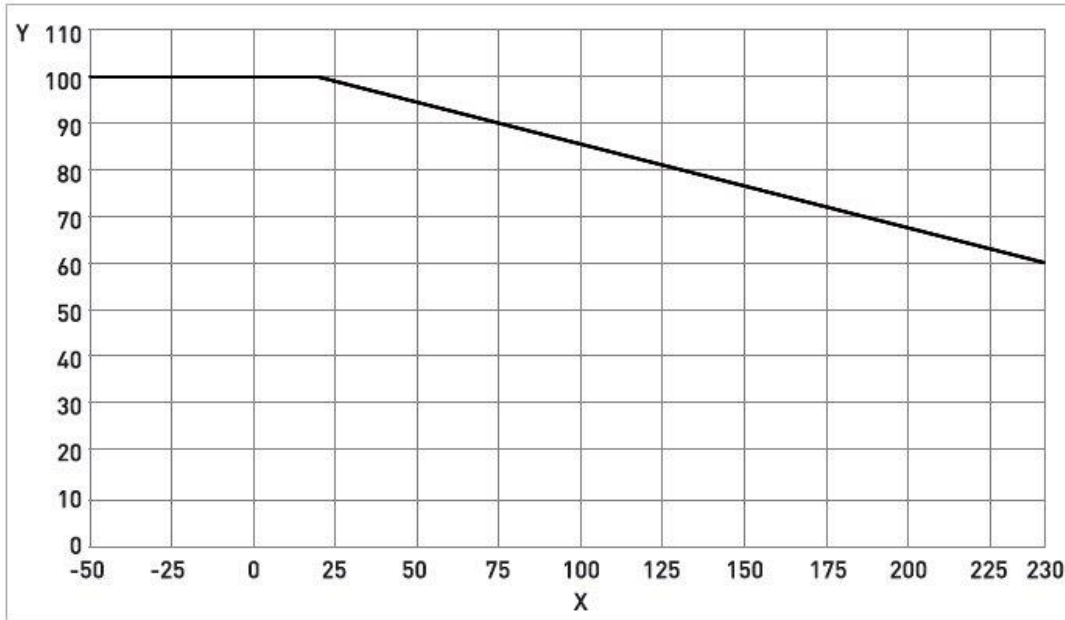


Figure 1: Measuring tube PED certification

X temperature [°C]
Y pressure [barg]

Pressure / temperature de-rating (imperial) for meters with SS 316 measuring tubes. Standard temperature range.

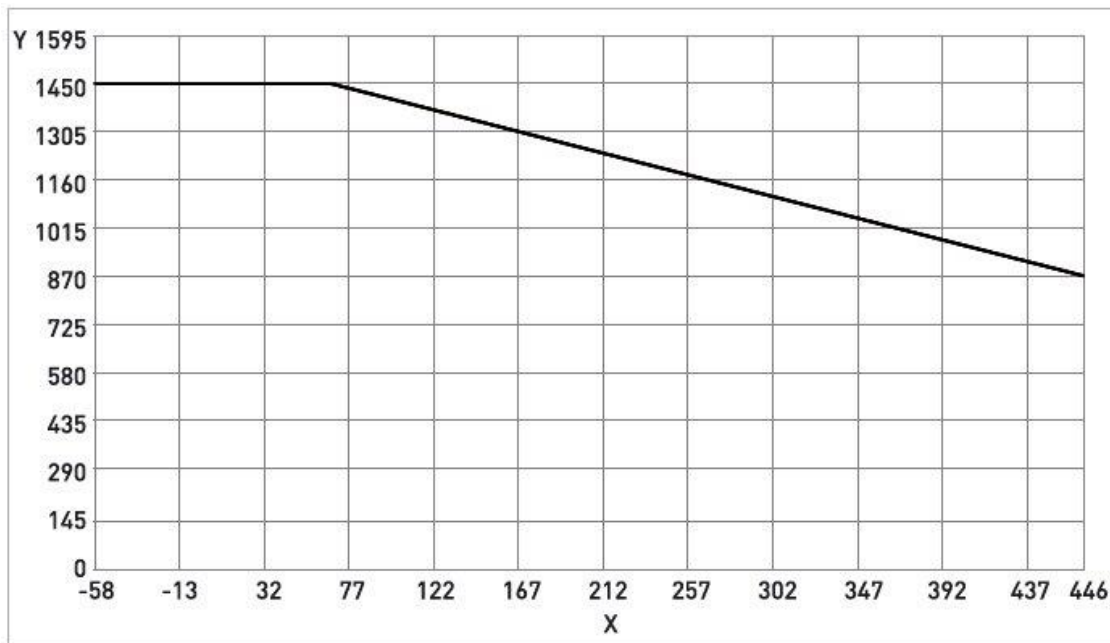
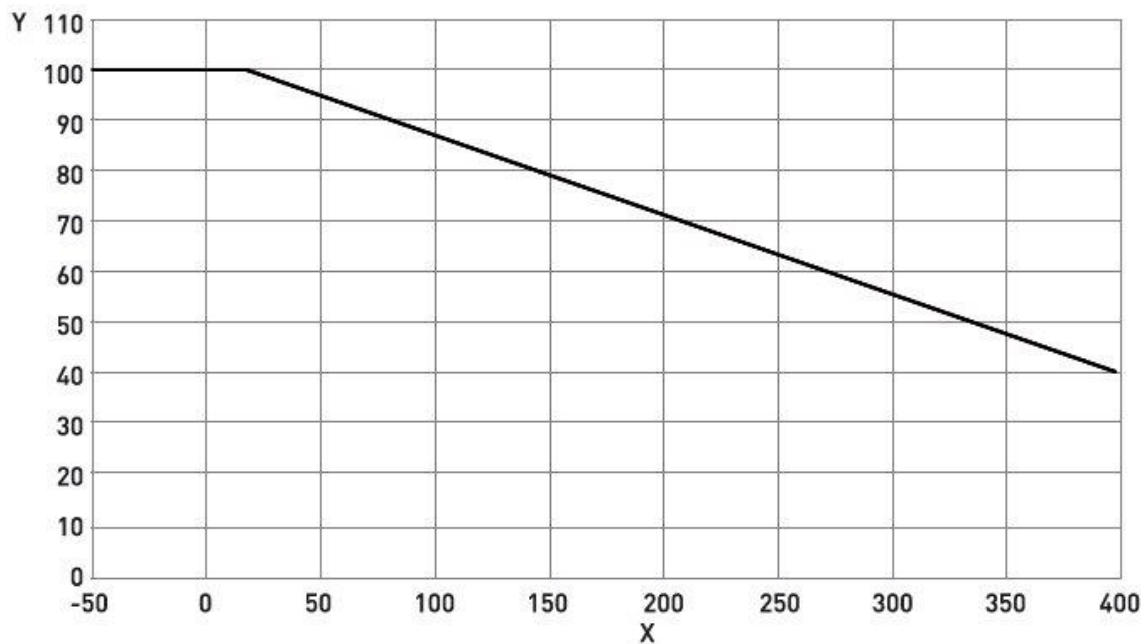


Figure 2: Measuring Tube PED certification

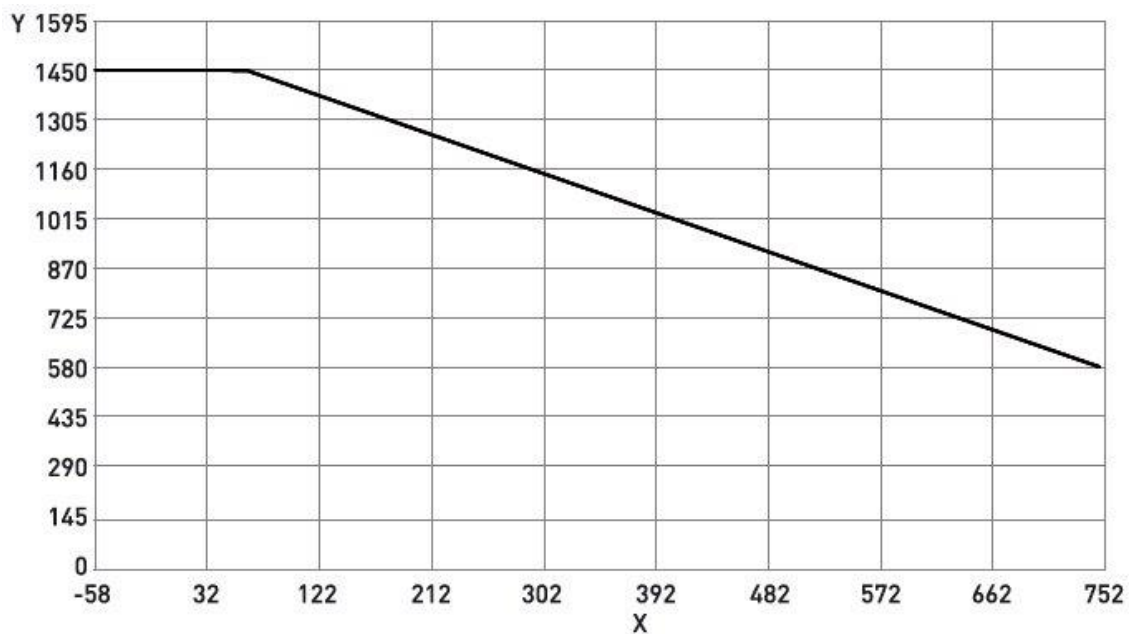
X temperature [°F]
Y pressure [psig]

Pressure / temperature de-rating (metric) for meters with SS 316, PED certified measuring tubes. High temperature range.



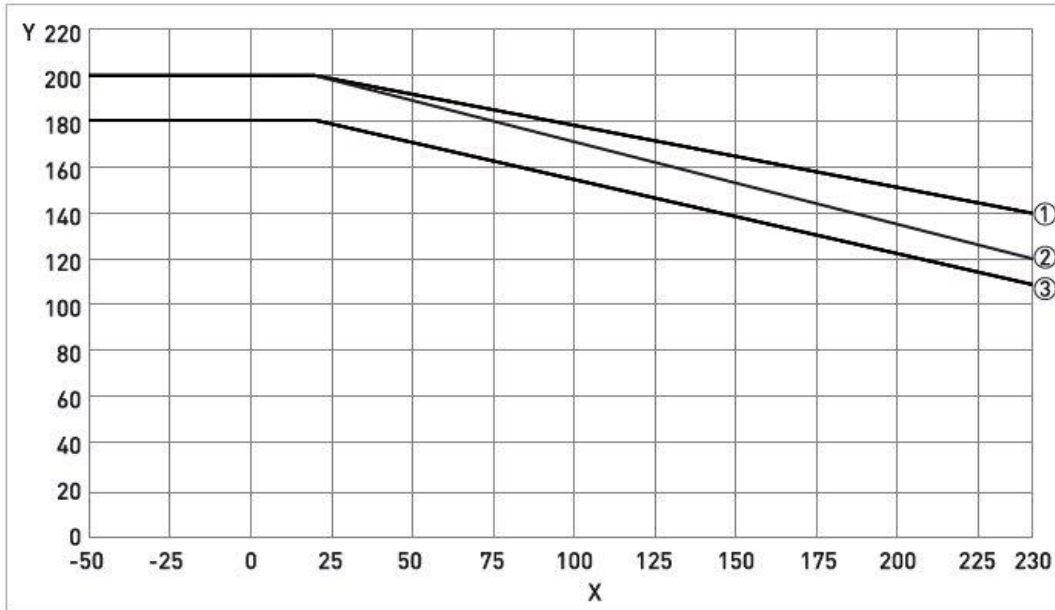
X temperature [°C]
Y pressure [barg]

Pressure / temperature de-rating (imperial) for meters with SS 316, PED certified measuring tubes. High temperature range.



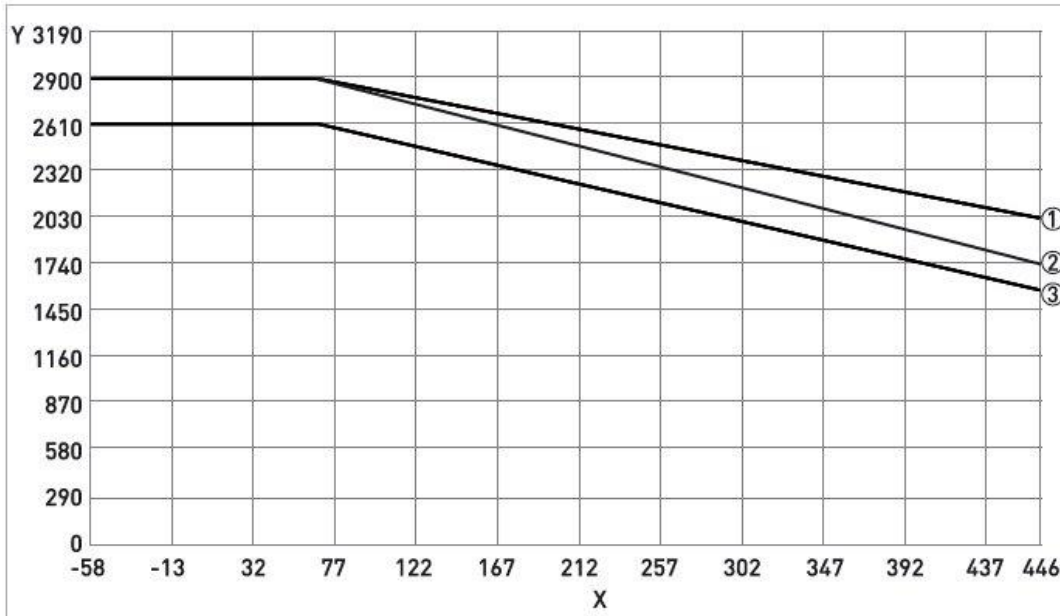
X temperature [°F]
Y pressure [psig]

Pressure / temperature de-rating (metric) for meters with SS 31803 and Hastelloy® C22, PED certified measuring tubes. Standard temperature range.



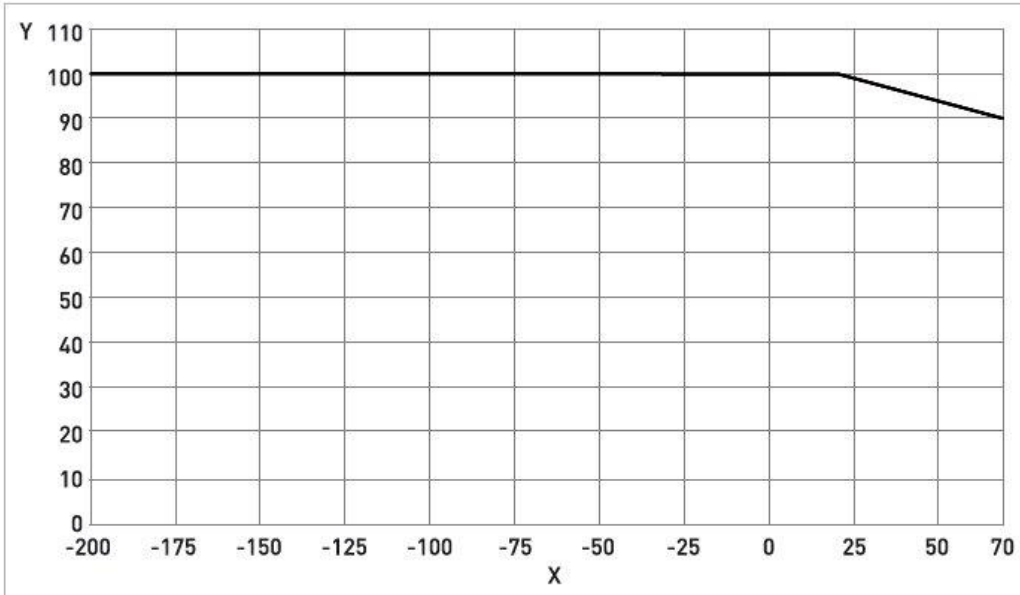
X temperature [°C]
 Y pressure [barg]
 1 PED / CRN H08...80
 2 CRN D100...150
 3 CRN D200

Pressure / temperature de-rating (imperial) for meters with SS 31803 and Hastelloy C22, PED certified measuring tubes. Standard temperature range.



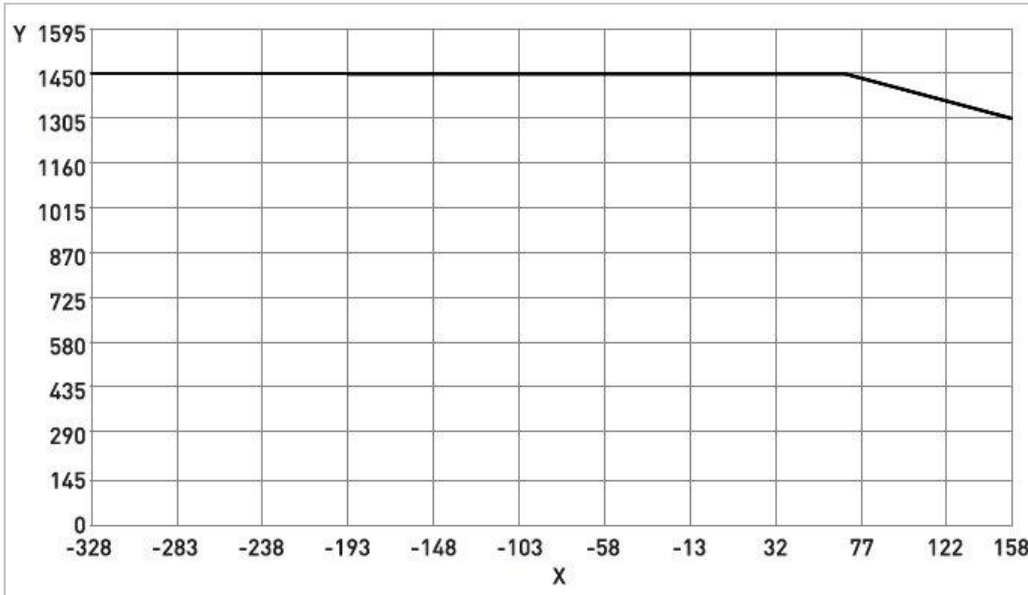
X temperature [°F]
 Y pressure [psig]
 1 PED / CRN H08...80
 2 CRN D100...150
 3 CRN D200

**Pressure / temperature de-rating (metric) for meters with SS 316, PED certified measuring tubes.
Cryogenic temperature range.**



X temperature [°C]
Y pressure [barg]

**Pressure / temperature de-rating (imperial) for meters with SS 316 measuring tubes PED certified.
Cryogenic temperature range.**

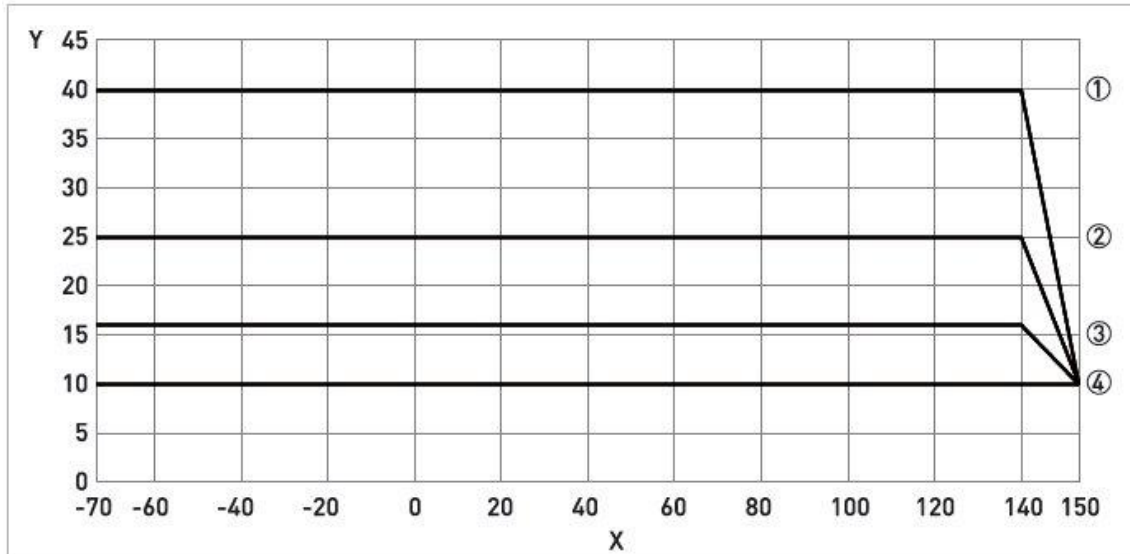


X temperature [°F]
Y pressure [psig]

Flanges

- DIN flange ratings are based on EN 1092-1 2007 table G.4.1 material group 14EO
- ASME flange ratings are based on ASME B16.5 2003 table 2 material group 2.2
- JIS flange ratings are based on JIS 2220: 2001 table 1 division 1 material group 022a
- JIS 10K flanges are limited to a maximum temperature of 300°C / 572°F

Pressure / temperature de-rating (metric) for meters with hygienic connections.



X temperature [°C]

Y pressure [barg]

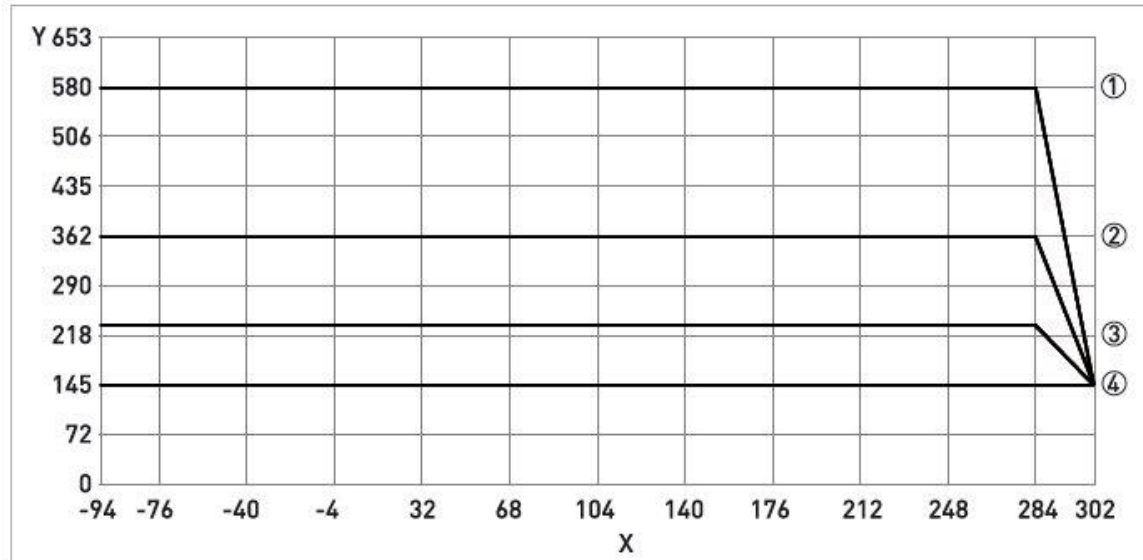
1 SMS 1...1½", DIN 11851 DN10...40

2 SMS 2", Tri-clamp DN10...40, DIN 11864-2 DN10...40, DIN 11851 DN50...65

3 SMS 3", Tri-clamp DN50...65, DIN11864-2, DIN11864-2 DN50...100, DN11851 DN80...100

4 SMS 4", Tri-clamp DN80...100

Pressure / temperature de-rating (imperial) for meters with hygienic connections.



X temperature [°F]

Y pressure [psig]

1 SMS 1...1½", DIN 11851 DN10...40

2 SMS 2", Tri-clamp DN10...40, DIN 11864-2 DN10...40, DIN 11851 DN50...65

3 SMS 3", Tri-clamp DN50...65, DIN11864-2, DIN11864-2 DN50...100, DN11851 DN80...100

4 SMS 4", Tri-clamp DN80...100

Notes

The maximum operating pressure will be either the flange / hygienic connection rating or the measuring tube rating, WHICHEVER IS THE LOWER!

For hygienic applications above 10 bar, connection sizes DN25...100 / 1...4" are limited to the measurement of liquid at the pressures shown in the above table.

The maximum pressure for steam cleaning is 10 bar / 145 psi.

For other applications above 10 bar / 145 psi, please contact the manufacturer.

The manufacturer recommends that the seals are replaced at regular intervals. This will maintain the hygienic integrity of the connection.

Dimensions and Weights

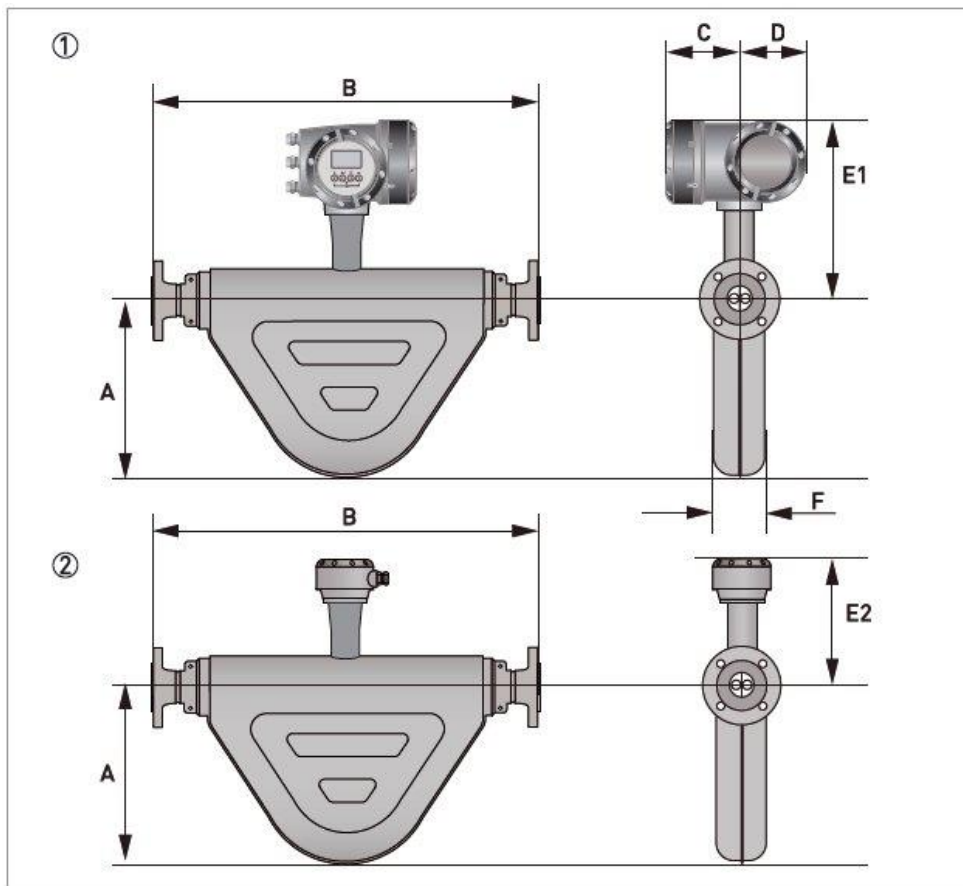
Flanged versions

Meter Weights

	kg									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
Aluminum (compact)	9.3	10.1	12.9	23.5	29.4	58.9	94.3	193.6	443.6	911.2
Stainless Steel (compact)	15.2	16	18.8	29.4	36.3	64.8	100.2	199.5	449.5	917.1
Aluminum (remote)	5.8	6.6	9.4	19.9	25.9	55.4	90.8	190.1	440	907.6
Stainless Steel (remote)	6.6	7.3	10.2	20.7	26.6	56.1	91.5	191.5	440.8	908.4
Heating jacket add	3.1		4.5	7	7.9	12.7	15.7	27.6	N/A	
	lbs									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
Aluminum (compact)	20.5	22.3	28.4	51.8	64.8	129.8	207.9	426.8	978	2008.8
Stainless Steel (compact)	33.5	35.3	41.4	64.8	77.8	142.9	220.9	440.7	991	2021.9
Aluminum (remote)	12.8	14.5	20.7	43.9	57.1	122.1	200.2	419.1	970	2001
Stainless Steel (remote)	14.55	16.1	22.5	45.6	58.6	123.7	201.7	422.2	971.8	2002.7
Heating jacket add	6.8		9.9	15.4	17.4	28	34.6	60.8	N/A	

The weights shown are for meters fitted with PN40 flanges. Smaller or larger flange sizes will affect the overall weight. For further information, please contact the manufacturer.

Meter Dimensions



1. Compact version
2. Remote version

	mm									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A ±3	156		186	282	326	411	450	555	675	805
C	137									
D	123.5									
E1 ±3 (1)	289	290	307	342	369	394	436	512		
E1 ±3 (2)	375	376	393	428	455	480	522	598		
E2 ±3 (3)	209	210	230	262	289	314	356	432		
E2 ±3 (4)	295	296	316	348	375	400	442	518		
E2 ±3 (5)	335	336	353	388	415	440	482	558		
F ±2	81			118	130	188	219	275	355	508

- 1 compact 150°C (short stem)
- 2 compact 230°C (extended stem)
- 3 remote 150°C (short stem)
- 4 remote 230°C (extended stem)
- 5 remote 400°C (extended stem)

	inches									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A ±3	6.14		7.3	11.1	12.8	16.2	17.7	21.8	26.6	31.7
C	4.9									
D	5.4									
E1 ±3 (1)	11.4		11.4	12.0		13.5	14.5	15.5	17.2	20.2
E1 ±3 (2)	14.8		14.8	15.5		16.8	17.9	18.9	20.5	23.5
E2 ±3 (3)	8.2		8.3	9.0		10.3	11.4	12.4	10.0	17.0
E2 ±3 (4)	11.6		11.6	12.4		13.7	14.8	15.7	17.4	20.4
E2 ±3 (5)	13.2		13.2	13.9		15.3	16.3	17.3	19	22
F ±2	3.2			4.6	5.1	7.4	8.6	10.8	14	20

1 compact 302°F (short stem)

2 compact 446°F (extended stem)

3 remote 302°F (short stem)

4 remote 446°F(extended stem)

5 remote 752°F (extended stem)

Dimension B for meters with Stainless Steel measuring tubes

	mm (±5)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
PN16										
DN80							970			
DN100							1000	1154		
DN150								1200	1572	
DN200									1586	
DN250										2100
DN300										2026
PN40										
DN10	335	347								
DN15	341	353	510							
DN25			514	600						
DN40				610	709					
DN50					715	895				
DN80						915	986			
DN100							1000	1180		
DN150								1200	1612	
DN200									1638	
DN250										2080
DN300										2100
PN63										
DN50					743	923				
DN80						943	1014			
DN100							1026	1206		

Dimension B for meters with Hastelloy® and Stainless Steel (UNS S31803) measuring tubes

mm									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
PN40									
DN15	328	353	-	-	-	-	-	-	-
DN25	-	-	510	-	-	-	-	-	-
DN40	-	-	-	600	-	-	-	-	-
DN50	-	-	-	-	715	-	-	-	-
DN80	-	-	-	-	-	915	-	-	-
PN63									
DN50	-	-	-	-	715	-	-	-	-
DN80	-	-	-	-	-	915	-	-	-
PN100									
DN15	328	353	-	-	-	-	-	-	-
DN25	-	-	510	-	-	-	-	-	-
DN40	-	-	-	600	-	-	-	-	-
DN50	-	-	-	-	715	-	-	-	-
DN80	-	-	-	-	-	915	-	-	-
PN160									
DN15	328	353	-	-	-	-	-	-	-
DN25	-	-	510	-	-	-	-	-	-
DN40	-	-	-	600	-	-	-	-	-
DN50	-	-	-	-	715	-	-	-	-
DN80	-	-	-	-	-	915	1042	-	-
DN100	-	-	-	-	-	-	1070	1250	-
DN150	-	-	-	-	-	-	-	1306	1718
DN200	-	-	-	-	-	-	-	-	1742
ASME 150									
½"	328	353	-	-	-	-	-	-	-
1"	-	-	510	-	-	-	-	-	-
1½"	-	-	-	600	-	-	-	-	-
2"	-	-	-	-	715	-	-	-	-

mm									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
3"	-	-	-	-	-	915	-	-	-
ASME 300									
½"	328	353	-	-	-	-	-	-	-
1"	-	-	510	-	-	-	-	-	-
1½"	-	-	-	600	-	-	-	-	-
2"	-	-	-	-	715	-	-	-	-
3"	-	-	-	-	-	915	-	-	-
ASME 600									
½"	328	353	-	-	-	-	-	-	-
1"	-	-	510	-	-	-	-	-	-
1½"	-	-	-	600	-	-	-	-	-
2"	-	-	-	-	715	-	-	-	-
3"	-	-	-	-	-	915	-	-	-
ASME 900									
1½"	-	-	-	600	-	-	-	-	-
2"	-	-	-	-	715	-	-	-	-
3"	-	-	-	-	-	915	1086	-	-
4"	-	-	-	-	-	-	1112	1292	-
6"	-	-	-	-	-	-	-	1342	1754
8"	-	-	-	-	-	-	-	-	1798
ASME 1500									
½"	328	353	-	-	-	-	-	-	-
1"	-	-	510	-	-	-	-	-	-
1½"	-	-	-	600	-	-	-	-	-
2"	-	-	-	-	715	-	-	-	-
3"	-	-	-	-	-	915	1118	-	-
4"	-	-	-	-	-	-	1130	1310	-
6"	-	-	-	-	-	-	-	1406	1818
8"	-	-	-	-	-	-	-	-	1900
JIS 10K									
50A	-	-	-	-	715	-	-	-	-
80A	-	-	-	-	-	915	-	-	-
JIS 20K									
15A	328	353	-	-	-	-	-	-	-
25A	-	-	510	-	-	-	-	-	-
40A	-	-	-	600	-	-	-	-	-
50A	-	-	-	-	715	-	-	-	-
80A	-	-	-	-	-	915	-	-	-

inches									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
PN40									
DN15	12.9	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.6	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36	-	-	-
PN63									
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36	-	-	-
PN100									
DN15	12.9	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.6	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36	-	-	-
PN160									
DN15	12.9	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.6	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36	41	-	-
DN100	-	-	-	-	-	-	42.1	49.2	-
DN150	-	-	-	-	-	-	-	51.4	67.6
DN200	-	-	-	-	-	-	-	-	68.6
ASME 150									
½"	12.9	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.6	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36	-	-	-
ASME 300									
½"	12.9	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.6	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36	-	-	-
ASME 600									
½"	12.9	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.6	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36	-	-	-

inches									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
ASME 900									
1½"	-	-	-	23.6	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36	42.7	-	-
4"	-	-	-	-	-	-	43.7	50.9	-
6"	-	-	-	-	-	-	-	52.7	69
8"	-	-	-	-	-	-	-	-	70.8
ASME 1500									
½"	12.9	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.6	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36	44	-	-
4"	-	-	-	-	-	-	44.5	51.6	-
6"	-	-	-	-	-	-	-	55.3	71.6
8"	-	-	-	-	-	-	-	-	74.8
JIS 10K									
50A	-	-	-	-	28.1	-	-	-	-
80A	-	-	-	-	-	36	-	-	-
JIS 20K									
15A	12.9	13.9	-	-	-	-	-	-	-
25A	-	-	20.1	-	-	-	-	-	-
40A	-	-	-	23.6	-	-	-	-	-
50A	-	-	-	-	28.1	-	-	-	-
80A	-	-	-	-	-	36	-	-	-

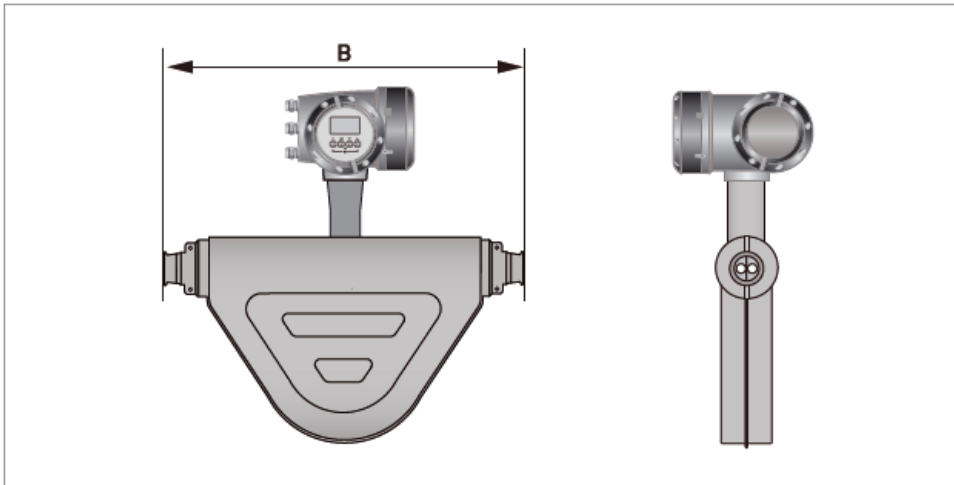
NAMUR dimensions

The following face to face dimensions comply with NAMUR NE132

mm (± 3)							
	S15	S25	S50	S80	S100	S150	S250
PN10							
DN250	-	-	-	-	-	-	2100
PN16							
DN100	-	-	-	-	1000	-	-
DN150	-	-	-	-	-	1200	-
DN200	-	-	-	-	-	-	2100
PN40							
DN 15	510	-	-	-	-	-	-
DN 25	-	600	-	-	-	-	-
DN 50	-	-	715	-	-	-	-
DN 80	-	-	-	915	-	-	-

inches (± 0.12)							
	S15	S25	S50	S80	S100	S150	S250
PN10							
DN250	-	-	-	-	-	-	82.7
PN16							
DN100	-	-	-	-	39.4	-	-
DN150	-	-	-	-	-	47.2	-
DN200	-	-	-	-	-	-	82.7
PN40							
DN 15	20.1	-	-	-	-	-	-
DN 25	-	23.6	-	-	-	-	-
DN 50	-	-	28.1	-	-	-	-
DN 80	-	-	-	36	-	-	-

Hygienic versions



Dimension B for meter sizes 08...100 with polished connections and sizes 08...50 with unpolished connections

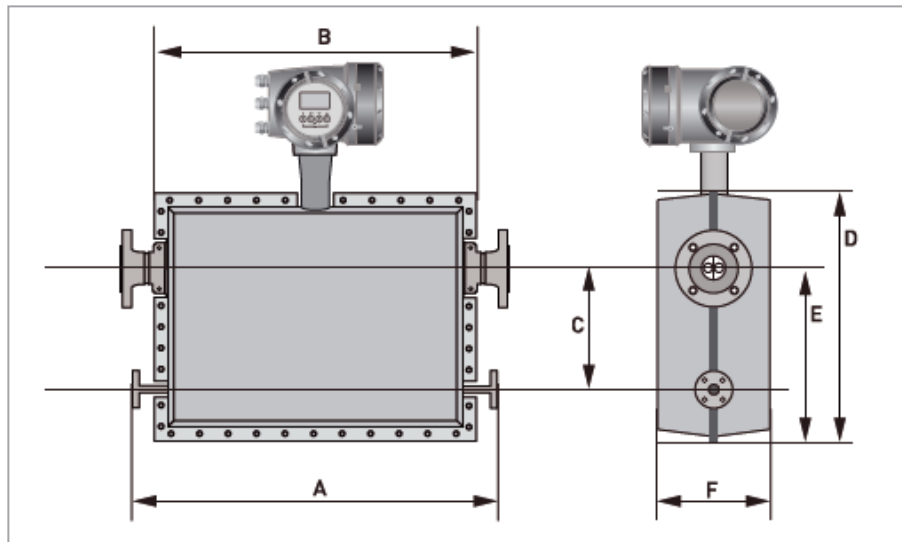
	mm (±5)						
	S08	S10	S15	S25	S50	S80	S100
Tri-clover							
½"	308	320	-	-	-	-	-
1"	-	-	477	-	-	-	-
1½"	-	-	-	601	-	-	-
2"	-	-	-	-	692	-	-
3"	-	-	-	-	-	859	-
4"	-	-	-	-	-	-	930
Tri-clamp DIN 32676							
DN15	301	313	-	-	-	-	-
DN25	-	-	477	-	-	-	-
DN40	-	-	-	582	-	-	-
DN50	-	-	-	-	678	-	-
DN80	-	-	-	-	-	855	-
DN100	-	-	-	-	-	-	926
Tri-clamp ISO 2852							
1"	-	-	477	-	-	-	-
1½"	-	-	-	569	-	-	-
2"	-	-	-	-	668	-	-
3"	-	-	-	-	-	859	-
4"	-	-	-	-	-	-	930
DIN 11864-2 Form A (female)							
DN15	345	357	-	-	-	-	-
DN25	-	-	514	-	-	-	-
DN40	-	-	-	629	-	-	-
DN50	-	-	-	-	725	-	-

	inches (±0.2)						
	S08	S10	S15	S25	S50	S80	S100
DIN 11864-2 Form A (female)							
DN15	13.6	14	-	-	-	-	-
DN25	-	-	20.2	-	-	-	-
DN40	-	-	-	24.8	-	-	-
DN50	-	-	-	-	28.5	-	-
DN80	-	-	-	-	-	36	-
DN100	-	-	-	-	-	-	38.8
Male thread DIN 11851							
DN15	12	12.5	-	-	-	-	-
DN25	-	-	19.4	-	-	-	-
DN40	-	-	-	23	-	-	-
DN50	-	-	-	-	27.1	-	-
DN80	-	-	-	-	-	35	-
DN100	-	-	-	-	-	-	38.5
Male thread SMS							
1"	-	-	18.8	-	-	-	-
1½"	-	-	-	23.8	-	-	-
2"	-	-	-	-	27.4	-	-
3"	-	-	-	-	-	33.8	-
4"	-	-	-	-	-	-	36.6

Dimension B for meter sizes 80...100 with unpolished connections

	mm (±5)		inches (±0.2)	
	S80	S100	S80	S100
Tri-clover				
3"	863	-	34	-
4"	-	913	-	35.9
Tri-clamp DIN 32676				
DN80	867	-	34.1	-
DN100	-	926	-	36.5
Tri-clamp ISO 2852				
3"	863	-	34	-
4"	-	913	-	35.9
DIN 11864-2 Form A (female)				
DN80	928	-	36.5	-
DN100	-	986	-	38.8
Male thread DIN 11851				
DN80	901	-	35.5	-
DN100	-	978	-	38.5

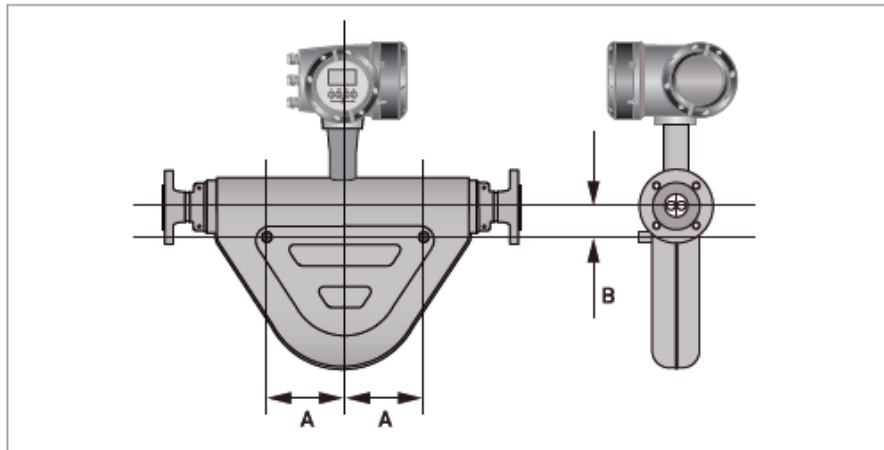
	mm (±5)		inches (±0.2)	
	S80	S100	S80	S100
Male thread SMS				
3"	868	-	34.2	-
4"	-	926	-	36.5

Heating jacket version**General dimensions**

	mm									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
Heating connection size: PN40 DN15 or ASME 150 ½"										
A ±5.0	435	590	692	715	891	956	1139	TBA	TBA	
B ±3.0	283	440	542	565	741	806	989	TBA	TBA	
C ±3.0	100	130	210	230	320	340	450	TBA	TBA	
D ±3.0	315	344	453	499	622	682	844	TBA	TBA	
E ±3.0	198	221	316	356	451	486	617	TBA	TBA	
F ±3.0	232	226	254	266	322	372	428	TBA	TBA	

	inches									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
Heating connection size: PN40 DN15 or ASME 150 ½"										
A ±0.2	17.1	23.2	27.2	28.1	35.1	37.6	44.8	TBA	TBA	
B ±0.12	11.1	17.3	21.3	22.2	29.2	31.7	38.9	TBA	TBA	
C ±0.12	3.9	5.1	8.3	9	12.6	13.4	17.7	TBA	TBA	
D ±0.12	12.4	13.5	17.8	19.6	24.5	26.8	33.2	TBA	TBA	
E ±0.12	7.8	8.7	12.4	14	17.7	19.1	24.3	TBA	TBA	
F ±0.12	9.1	8.9	10	10.5	12.7	14.6	16.8	TBA	TBA	

Purge port option

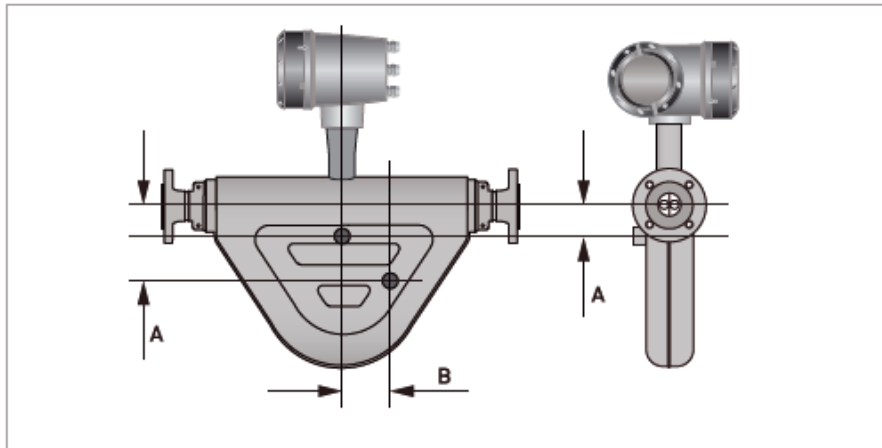


Dimensions

	mm									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A	70		110	145	150	205	220	345	600	800
B	32		45	57	60	85		100	160	140

	inches									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A	2.7		4.3	5.7	5.9	8.1	8.7	13.6	23.6	31.5
B	1.3		1.8	2.2	2.4	3.3		3.9	6.3	5.5

Burst disc option



Dimensions

	mm									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A	76		92	135	57	74		175	160	220
B	38.5		62	0	0	0		0	0	60

	inches									
	S08	S10	S15	S25	S50	S80	S100	S150	S200	S250
A	3.0		3.6	5.3	2.2	2.9		6.9	6.3	8.7
B	1.52		2.4	0	0	0		0	0	2.4

INSTALLATION

Intended use

This mass flowmeter is designed for the direct measurement of mass flow rate, product density and product temperature. Indirectly, it also enables the measurement of parameters like total mass, concentration of dissolved substances and the volume flow. For use in hazardous areas, special codes and regulations are also applicable and these are specified in a separate documentation.

Responsibility for the use of the measuring devices with regard to suitability, intended use and corrosion resistance of the used materials against the measured fluid lies solely with the operator.

This device is a Group 1, Class A device as specified within CISPR11:2009. It is intended for use in industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.

The manufacturer is not liable for any damage resulting from improper use or use for other than the intended purpose.

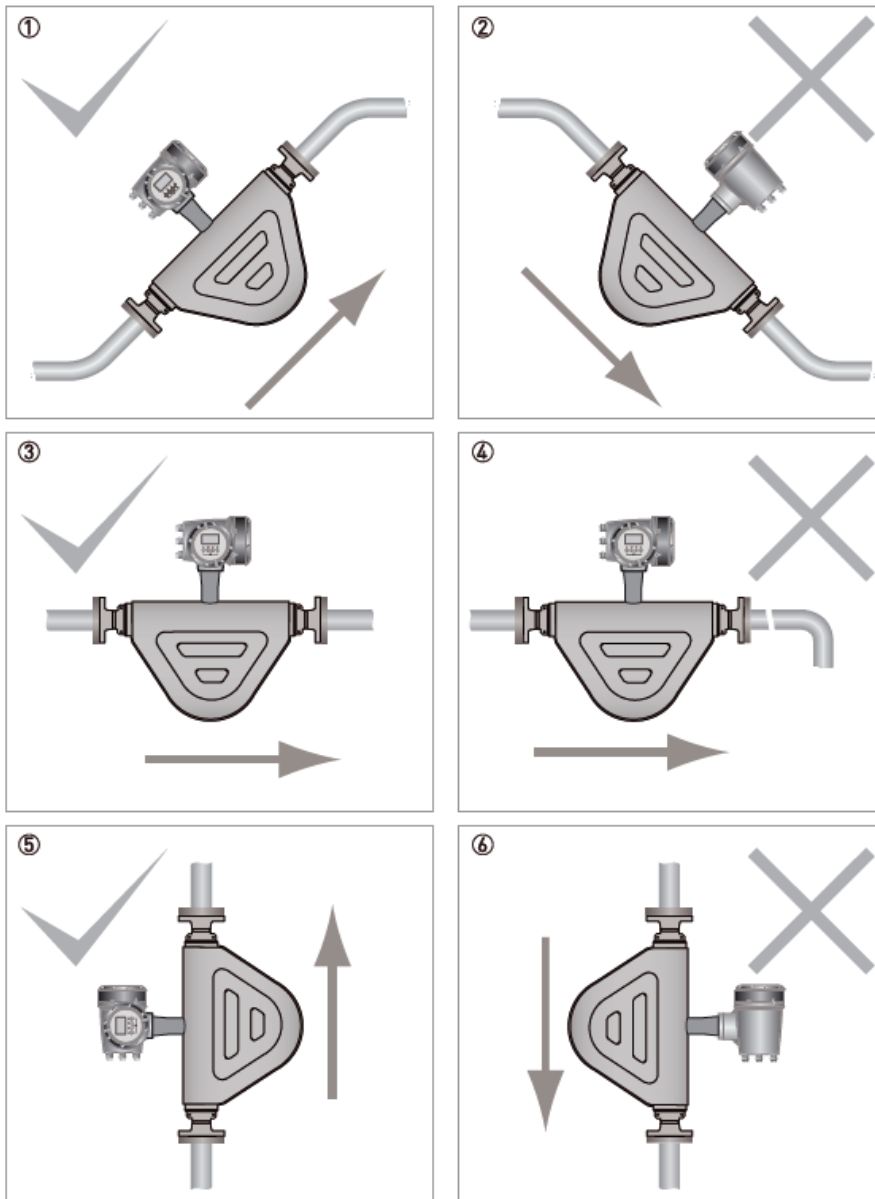
Mounting restrictions

General installation principles

There are no special installation requirements but you should note the following points:

- Support the weight of the meter as close to the meter body as possible.
- Mount the meter in such a way to avoid the build up of gas or liquid in the measuring tube
- Straight runs either side of the meter are not required.
- The use of reducers and other fittings at flanges, including flexible hoses, is allowed but you should take care to avoid cavitation.
- Avoid extreme pipe size reductions.
- Meters are not affected by crosstalk and can be mounted in series or in parallel.
- Avoid mounting the meter at the highest point in the pipeline where air / gas can collect.

Mounting positions



- 1 The meter can be mounted at an angle but it is recommended that the flow is uphill.
- 2 Avoid mounting the meter with the flow running downhill because it can cause siphoning. If the meter has to be mounted with the flow running downhill, install an orifice plate or control valve downstream of the meter to maintain back-pressure.
- 3 Horizontal mounting with flow running left to right.
- 4 Avoid mounting meter with long vertical runs after the meter as it can cause cavitation. Where the installation includes a vertical run after the meter, install an orifice plate or control valve downstream to maintain backpressure.
- 5 The meter can be mounted vertically but it is recommended that the flow is uphill.
- 6 Avoid mounting the meter vertically with the flow running downhill. This can cause siphoning. If the meter has to be installed this way, install an orifice plate or control valve downstream to maintain backpressure.

Comprehensive installation guidance is provided in the Handbook

Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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Specifications are subject to change without notice.

For more information

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