



OPTIMASS 6000

Technical Datasheet

Sensor for mass flow

- The high performance meter for process industries
- Cryogenic, high temperature and high pressure options
- Supreme liquid and gas performance with CT approval



The documentation is only complete when used in combination with the relevant documentation for the signal converter.

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1.1 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 OPTIMASS 6000 the ideal choice for mass flow measurement in a wide variety of applications.

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

Combined with the power of the MFC 400, the OPTIMASS 6000 will provide accurate measurement of volume, mass, density and concentration.



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



- ① Remote terminal box

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

Applications:

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

1.2 Features and options

Features



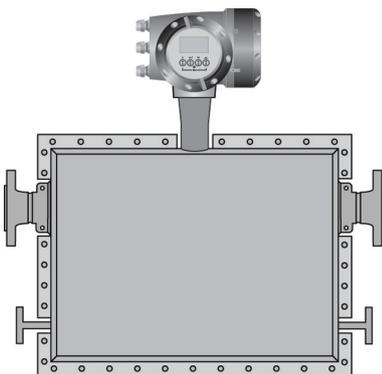
- Available as compact or remote.
- Nominal flow rates up to 550000 kg/h / 20209 lb/min.
- Self draining, when mounted vertically.
- With advanced Entrained Gas Management (EGM™) the meter maintains operation over a wide range of gas fractions and complex flow conditions.

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 and purge port



Heating jacket

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

Purge port

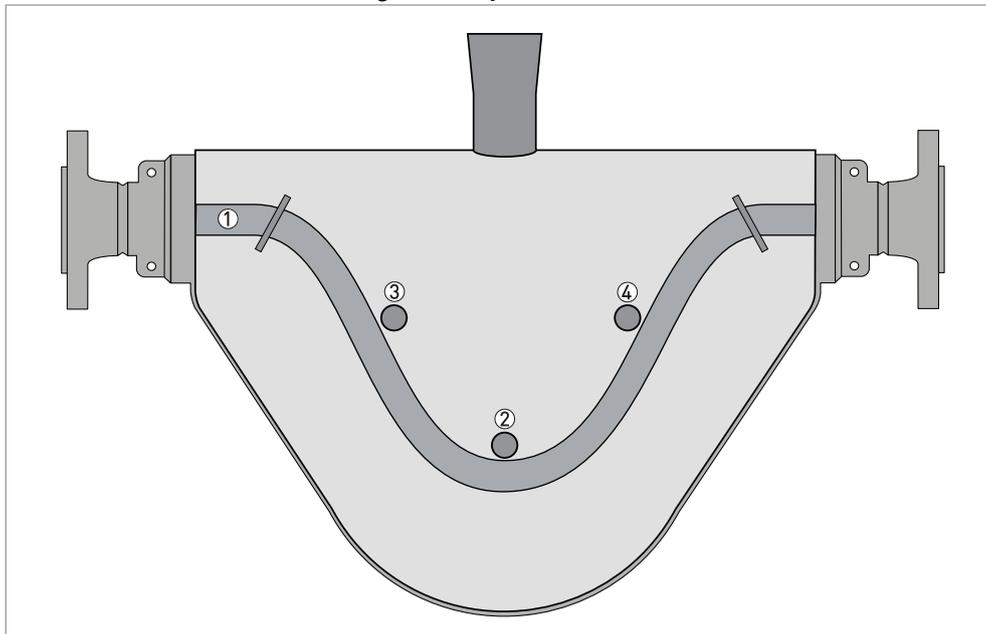
- Allows hazardous chemicals to be drained away safely.

1.3 Meter / converter combinations

Converter	MFC 400	
Configuration	Compact	Remote field
OPTIMASS 6000	6400C	6400F

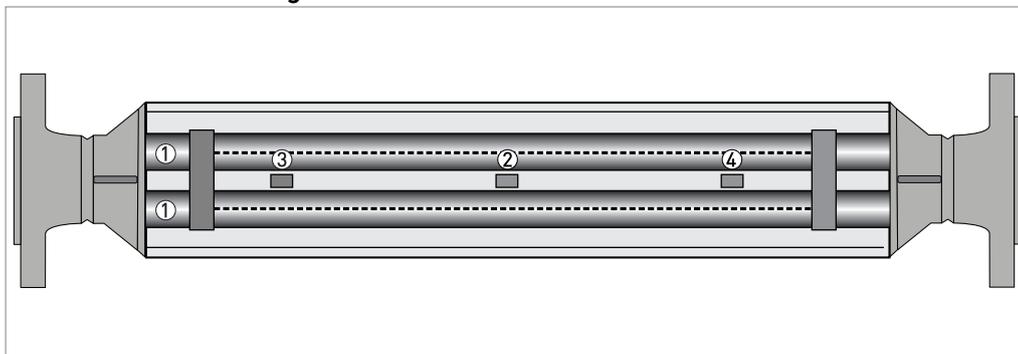
2.1 Measuring principle (twin tube)

Meter from the side, showing tube layout



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

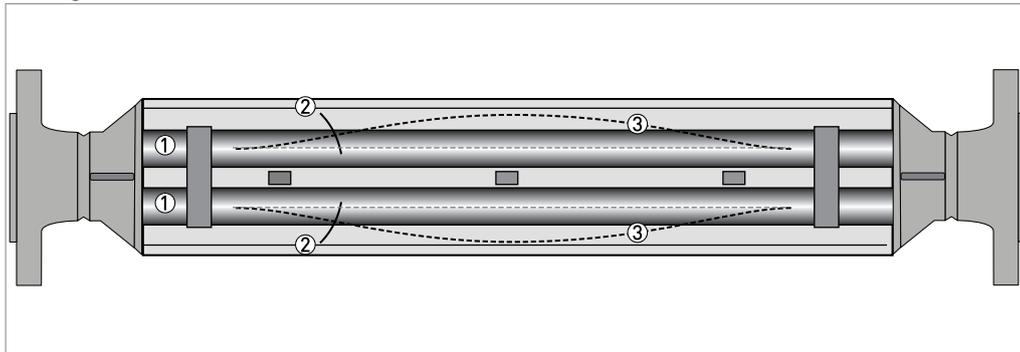
Static meter not energised and with no flow



- 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.

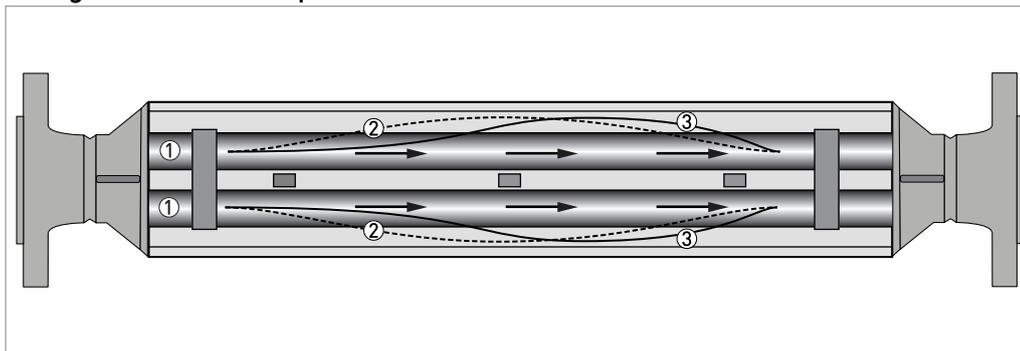
Energised meter



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

When the meter is energised, 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.

Energised 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.

2.2 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.
- Additional information (certificates, special tools, software,...) and complete product documentation can be downloaded free of charge from the website (Downloadcenter).

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...200	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
	Compact / remote 100 barg @ 20°C / 1450 psig @ 68°F, temp. range -200°C...+40°C / -328°F...+104°F
Hastelloy® 08...80	Compact / remote 200 barg @ 20°C / 2900 psig @ 68°F, temp. range -70°C...+400°C / -94°F...+752°F
	Compact / remote 200 barg @ 20°C / 2900 psig @ 68°F, temp. range -50°C...+400°C / -58°F...+752°F
	Remote only 200 barg @ 20°C / 2900 psig @ 68°F, temp. range -196°C...+40°C / -321°F...+104°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 twin V-shaped measuring tube
Variants	
Compact version	Integral converter
Remote version	Available with a field version of the converter

Performance specification

Reference conditions	
Calibration fluid	Water
Calibration temperature	+20°C / +68°F (± 5°C)
Calibration pressure	1...6 barg / 14.5...87 psig
Calibration rig	Accreditation satisfies the requirements of BS EN ISO / IEC 17025
Mass flow (standard)	
Liquid flow rate ≥ zero stability × 1000	
Maximum permissible error	±0.1% of actual measured flow rate
Repeatability	Better than 0.05% of measured flow rate
Liquid flow rate < zero stability × 1000	

Maximum permissible error	±zero stability (see zero stability below)	
Repeatability	Better than zero stability × 0.5	
Gas		
Maximum permissible error	±0.35% of actual measured flow rate ± zero stability	
Repeatability	Better than 0.2% of actual measured flow rate plus zero stability (includes the combined effects of repeatability, linearity and hysteresis)	
Mass flow (optional)		
Liquid flow rate ≥ zero stability × 2000		
Maximum permissible error	±0.05% of measured flow rate	
Repeatability	Better than 0.025% of measured flow rate	
Liquid flow rate < zero stability × 2000		
Maximum permissible error	±zero stability (see zero stability below)	
Repeatability	Better than zero stability × 0.5	
Mass flow (high temperature range)		
Liquid flow rate		
Maximum permissible error	±0.1% of actual measured flow rate ± zero stability	
Repeatability	Better than 0.05% of actual measured flow rate	
Maximum permissible error on mass flow rate caused by a deviation in process temperature (high temperature and cryogenic applications) from reference calibration temperature		
All materials sizes 08...200	±0.002% of measured value per 1°C / ±0.00112% of measured value per 1°F	
Zero stability		
Meter size	Standard temperature	High temperature
08	< 0.03 kg/h	< 0.06 kg/h
10	< 0.06 kg/h	< 0.12 kg/h
15	< 0.19 kg/h	< 0.38 kg/h
25	< 0.95 kg/h	< 1.9 kg/h
50	< 1.75 kg/h	< 3.5 kg/h
80	< 3.90 kg/h	< 7.8 kg/h
100	< 8.75 kg/h	< 17.5 kg/h
150	< 16.00 kg/h	< 32.0 kg/h
200	< 27.50 kg/h	< 55.0 kg/h
Maximum permissible error on sensor zero point caused by a deviation in process temperature from zero calibration 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...200	0.00075% of nominal flow per 1°C / 0.00042% of nominal flow per 1°F	
High temperature range		
All materials sizes 08...200	±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% of reading per 1 barg / -0.00034 % per 1 psig	
All materials sizes 80...100	-0.0055% of reading per 1 barg / -0.00038 % per 1 psig	
All materials sizes 150...200	-0.008% of reading per 1 barg / -0.00055 % per 1 psig	
Density		
Measuring range	100...3000 kg/m ³ / 6...187 lb/ft ³	
Base accuracy	±1 kg/m ³ / ±0.06 lb/ft ³	

Repeatability / on site calibration	$\pm 0.3 \text{ kg/m}^3 / \pm 0.015 \text{ lb/ft}^3$
Maximum permissible error on density caused by a deviation in process temperature from density calibration temperature	
All materials / meter sizes	$\pm 0.015 \text{ g/l per } 1^\circ\text{C} / \pm 0.0083 \text{ g/l per } 1^\circ\text{F}$
Pressure effect on density of deviation from calibration pressure (based on reference density = 1000 kg/m^3)	
All materials size 08	$+0.038 \text{ kg/m}^3 \text{ per bar}$
All materials sizes 10...15	$+0.026 \text{ kg/m}^3 \text{ per bar}$
All materials sizes 25...200	$+0.020 \text{ kg/m}^3 \text{ per bar}$
Volume flow	
Measurement error and repeatability calculations satisfy the requirements of BS ISO 10790 (most recent and up to date version)	
Temperature	
Measurement error	$\pm 0.5^\circ\text{C} \pm 0.5\% \text{ of reading} / \pm 0.9^\circ\text{F} \pm 0.5\% \text{ of reading}$

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
Assumes operating density $1000 \text{ kg/m}^3 / 62.4 \text{ lb/ft}^3$	
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
Aluminium converter	$-40...+65^\circ\text{C} / -40...+149^\circ\text{F}$	$-40...+55^\circ\text{C} / -40...+131^\circ\text{F}$
Stainless Steel converter	$-40...+60^\circ\text{C} / -40...+140^\circ\text{F}$	$-40...+55^\circ\text{C} / -40...+131^\circ\text{F}$
Remote meter	Standard converter	SIL capable converter
Standard temperature range	$-40...+65^\circ\text{C} / -40...+149^\circ\text{F}$	$-40...+55^\circ\text{C} / -40...+131^\circ\text{F}$
Cryogenic temperature range	$-20...+65^\circ\text{C} / -4...+149^\circ\text{F}$	$-40...+55^\circ\text{C} / -40...+131^\circ\text{F}$
Hazardous Area versions	Refer to temperature limits	
Protection category (Acc. to EN 60529)	IP 66 / 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 temperatures		
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°C...+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 pressure ①		
08	≈ 100 barg	
10		
15		
25		
50	≈ 70 barg	
80		
100	≈ 10 barg	
150		
200		
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 / outlet runs	None required	

Materials

Stainless Steel (316 / 316L) meter	
Measuring tubes / Flanges	Stainless Steel AISI 316 / 316L (1.4401 / 1.4404) dual certified
Spigots	Stainless Steel CF3M (1.4409)
Bridge	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)
Spigots	Stainless Steel J92205 (1.4470)
Bridge	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 316 / 316L (1.4401 / 1.4404) 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	DN10...200 / PN16...160
ASME	½...8" / ASME 150...1500
JIS	10A...100A / 10...20K (10K maximum allowable temperature 300°C / 572°F)
Hygienic	
Tri-clover	½...4"
Tri-clamp DIN 32676	DN15..100
Tri-clamp ISO 2852	1...4"
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])	DN15...100
Male thread DIN 11851	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 signal converter.
I/O	For full details of I/O options, including data streams and protocols, see technical data for the relevant signal converter.

Approvals

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.
cFMus	Compact and converter
	Class I, Div 1, Groups A,B,C and D (US)
	Class I, Div 1, Groups C and D.(Canada)
	Class II, Div 1, Groups E, F and G
	Class III Div 1 T6...T1
	Class I, Div 2 Groups A,B,C and D
	Remote (sensor only)
	Class I Div 1 Groups A,B,C and D
	Class I Div 2 Groups A,B,C and D
	Class II Div 1 Groups E,F and G
Class III Div 1 T6...T1	
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	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
Functional safety	SIL2 / SIL3 (acc to: IEC 61508)
Hazardous area markings	
OPTIMASS 6400C	
Gas, Ex e connection compartment	
II 1/2 G	Ex db eb ia IIC T6...T1 Ga/Gb
Gas, Ex d connection compartment	
II 1/2G	Ex db ia IIC T6...T1 Ga/Gb
OPTIMASS 6400C (150°C)	
Dust	
II 2D/1G	Ex tb ia IIIC T190°C Db/Ga
OPTIMASS 6400C (230°C)	
Dust	
II 2D/1G	Ex tb ia IIIC T270°C Db/Ga
OPTIMASS 6400F (all temperatures)	
Gas	
II 1 G	Ex ia IIC T6...T1 Ga
OPTIMASS 6400F (150°C)	
Dust	
II 2D/1G	Ex ia IIIC T190°C Db/Ga
OPTIMASS 6400F (230°C)	
II 2D/1G	Ex ia IIIC T270°C Db/Ga
OPTIMASS 6400F (400°C)	
II 2D/1G	Ex ia IIIC T440°C Db/Ga

① For information only. Secondary pressure containment is NOT supplied on this meter

2.3 ATEX temperature limits

2.3.1 OPTIMASS 6000F / 6400C +150°C

OPTIMASS 6000F

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+55	55	T6 - T1	T80
	150	T3 - T1	T190
-40...+60	145	T3 - T1	T170
-40...+65	70	T5 - T1	T95
	105	T4 - T1	T130
	135	T3 - T1	T175
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-1:

OPTIMASS 6400C with aluminium converter housing

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+40	40	T6 - T1	T80
-40...+45	150	T3 - T1	T190
-40...+50	145	T3 - T1	T185
-40...+55	55	T5 - T1	T95
	120	T3 - T1	T160
-40...+60	90	T4 - T1	T130
-40...+65	65	T4 - T1	T105
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-2:

OPTIMASS 6400C with Stainless Steel converter housing

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+30	150	T3 - T1	T190
-40...+35	145	T3 - T1	T185
-40...+40	40	T6 - T1	T80
	125	T3 - T1	T165
-40...+45	110	T3 - T1	T150
-40...+50	90	T4 - T1	T130
-40...+55	55	T5 - T1	T95
	75	T4 - T1	T115
-40...+60	60	T4 - T1	T100
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-3:

2.3.2 OPTIMASS 6000F / 6400C +230°C

OPTIMASS 6000F

Ambient temp. T_{amb} °C	Max.process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+50	230	T2 - T1	T270
-40...+55	55	T6 - T1	T80
	225	T2 - T1	T250
-40...+60	200	T2 - T1	T225
-40...+65	70	T5 - T1	T95
	105	T4 - T1	T130
	170	T3 - T1	T195
	175	T2 - T1	T200
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-4:

OPTIMASS 6400C with aluminium converter housing

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+40	40	T6 - T1	T80
	230	T2 - T1	T270
-40...+45	155	T3 - T1	T195
	225	T2 - T1	T265
-40...+50	185	T2 - T1	T225
-40...+55	55	T5 - T1	T95
	145	T3 - T1	T185
-40...+60	90	T4 - T1	T130
	105	T3 - T1	T145
-40...+65	65	T4 - T1	T105
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-5:

OPTIMASS 6400C with Stainless Steel converter housing

Ambient temp. T_{amb} °C	Max process temp. T_m °C	Temp. class	Max. surface temp. °C
-40...+30	230	T2 - T1	T270
-40...+35	210	T2 - T1	T250
-40...+40	40	T6 - T1	T80
	155	T3 - T1	T195
	180	T2 - T1	T220
-40...+45	150	T3 - T1	T190
-40...+50	120	T3 - T1	T160
-40...+55	55	T5 - T1	T95
	90	T4 - T1	T130
-40...+60	60	T4 - T1	T100
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

Table 2-6:

2.3.3 OPTIMASS 6000F / 6400C cryogenic

OPTIMASS 6000F cryogenic with insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-30...+65	-120
-25...+65	-160
-20...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-4	

OPTIMASS 6000F cryogenic without insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-25...+65	-100
-20...+65	-120
-10...+65	-160
0...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-4	

OPTIMASS 6400C cryogenic with aluminium converter housing, without insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-35...+65	-80
-30...+65	-120
-25...+65	-160
-20...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-5	

OPTIMASS 6400C cryogenic with aluminium converter housing, with insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-35...+65	-140
-30...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-5	

OPTIMASS 6400C cryogenic with Stainless Steel converter housing, without insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-35...+60	-70
-30...+60	-100
-20...+60	-160
-15...+60	-180
-10...+60	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-6	

OPTIMASS 6400C cryogenic with Stainless Steel converter housing, with insulation

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-35...+60	-120
-30...+60	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-6	

2.3.4 OPTIMASS 6000F / 6400C cryogenic short stem

OPTIMASS 6000F cryogenic short stem

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-30...+65	-60
-20...+65	-80
-10...+65	-100
0...+65	-120
10...+65	-140
20...+65	-160
30...+65	-180
40...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-1	

OPTIMASS 6400C cryogenic short stem with aluminium converter housing

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-30...+65	-90
-25...+65	-100
-20...+65	-140
-15...+65	-170
-10...+65	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-2	

OPTIMASS 6400C cryogenic short stem with Stainless Steel converter housing

Ambient temp. T_{amb} °C	Min. process temp. T_m °C
-30...+60	-70
-20...+60	-105
-10...+60	-140
-5...+60	-160
0...+60	-170
+10...+60	-200
For max. process temperature, temp. class and max. surface temperature, see table 2-3	

2.3.5 OPTIMASS 6000F +400°C

OPTIMASS 6000F +400°C with aluminium junction box

Ambient temp. T_{amb} °C	Max.process temp. T_m °C	Temp. class	Max. Surface temp. °C
-40...+55	55	T6 - T1	T80
-40...+60	400	T1	T440
-40...+65	70	T5 - T1	T95
	105	T4 - T1	T130
	170	T3 - T1	T195
	265	T2 - T1	T290
	375	T1	T400
	400 ①	T1	T440
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

① Use high temperature accessory cable or suitable alternative as specified.

OPTIMASS 6000F +400°C with Stainless Steel junction box

Ambient temp. T_{amb} °C	Max.process temp. T_m °C	Temp. class	Max. Surface temp. °C
-40...+55	55	T6 - T1	T80
	400	T1	T440
-40...+60	375	T1	T440
-40...+65	70	T5 - T1	T95
	105	T4 - T1	T130
	170	T3 - T1	T195
	265	T2 - T1	T290
	315	T1	T340
	400 ①	T1	T440
Minimum process temperature: $T_{amb} \geq -35^\circ\text{C}$ $T_m = -50^\circ\text{C}$, $T_{amb} < -35^\circ\text{C}$ $T_m = -40^\circ\text{C}$			

① Use high temperature accessory cable or suitable alternative as specified.

2.4 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.

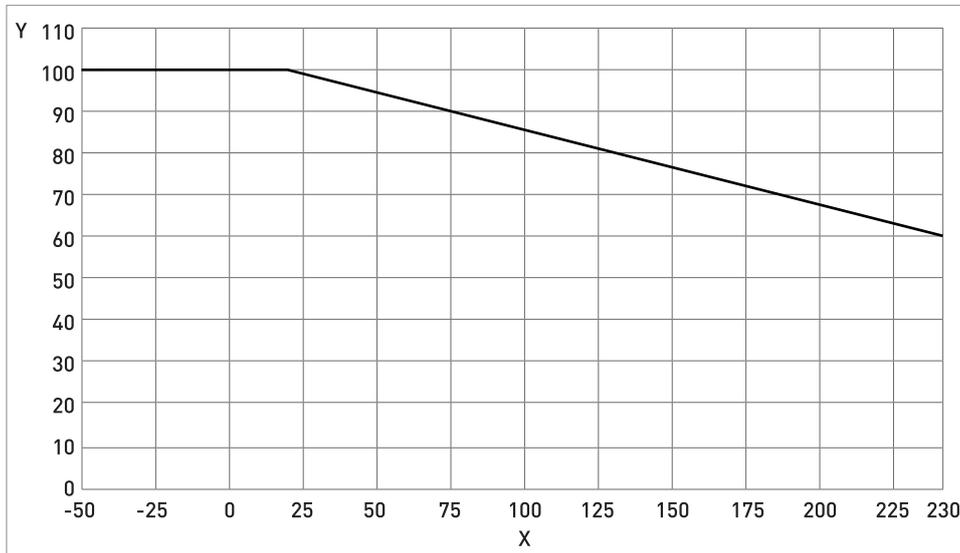


Figure 2-1: Measuring tube PED certification

X temperature [°C]

Y pressure [barg]

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

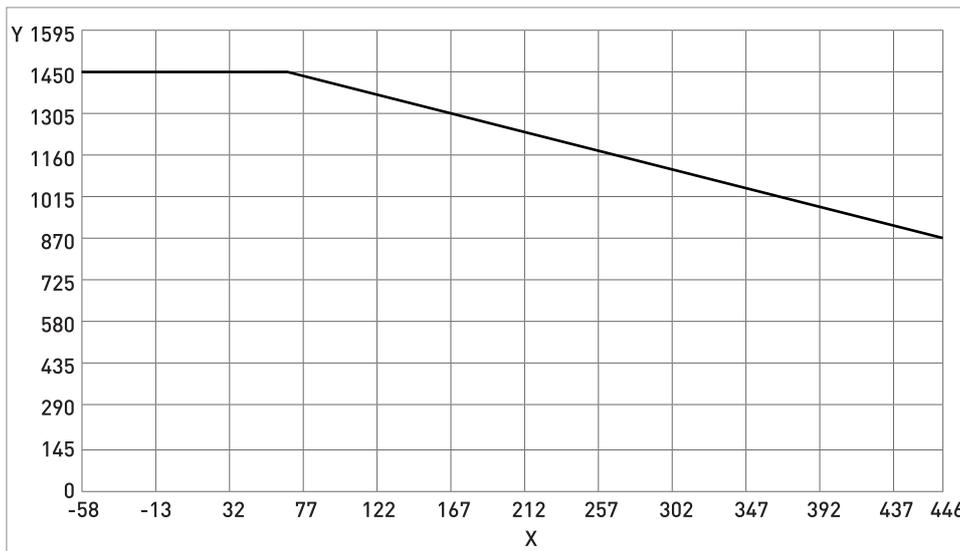
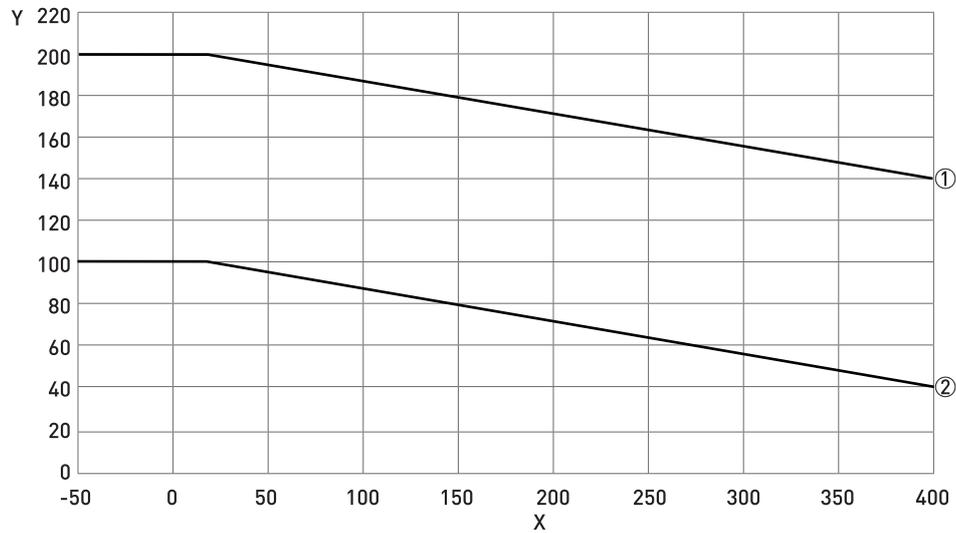


Figure 2-2: Measuring Tube PED certification

X temperature [°F]

Y pressure [psig]

Pressure / temperature de-rating (metric) for meters with SS 316 and Hastelloy®C22, PED certified measuring tubes. High temperature range.



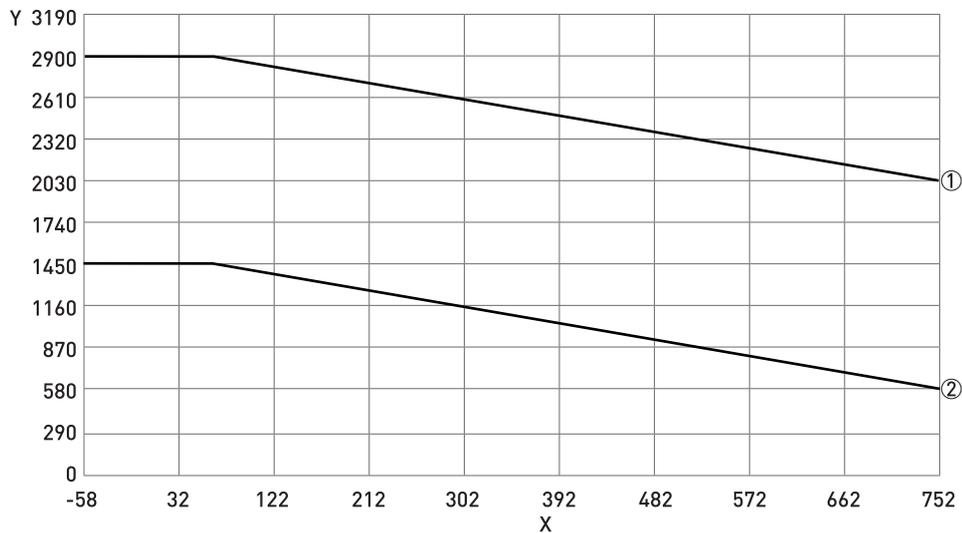
X temperature [°C]

Y pressure [barg]

① Hastelloy® C22 08...80

② Stainless Steel 316 08...200

Pressure / temperature de-rating (imperial) for meters with SS 316 and Hastelloy® C22, PED certified measuring tubes. High temperature range.



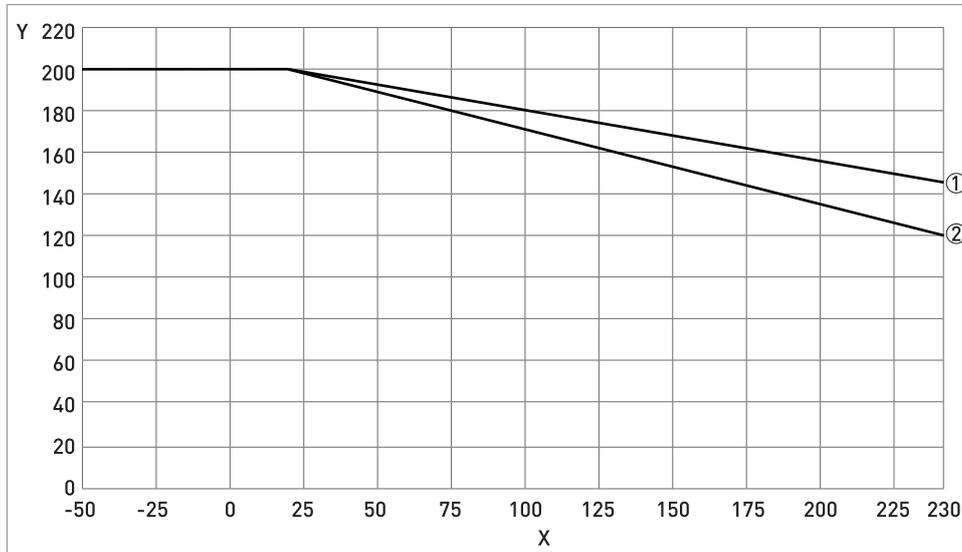
X temperature [°F]

Y pressure [psig]

① Hastelloy® C22 08...80

② Stainless Steel 316 08...200

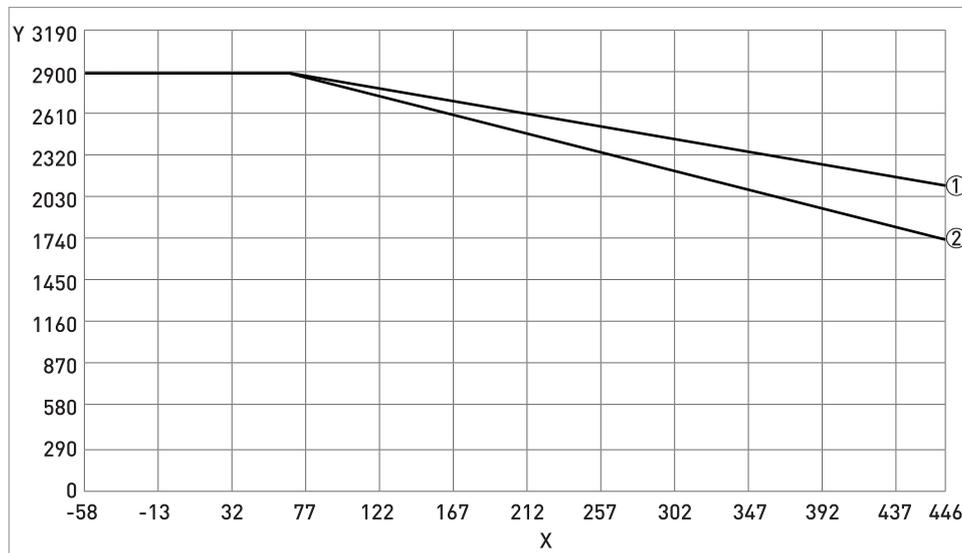
Pressure / temperature de-rating (metric) for meters with SS 31803 and Hastelloy® C22, PED certified measuring tubes. Standard temperature range



X temperature [°C]
Y pressure [barg]

- ① PED / CRN H08...80, D100
- ② CRN D150...200

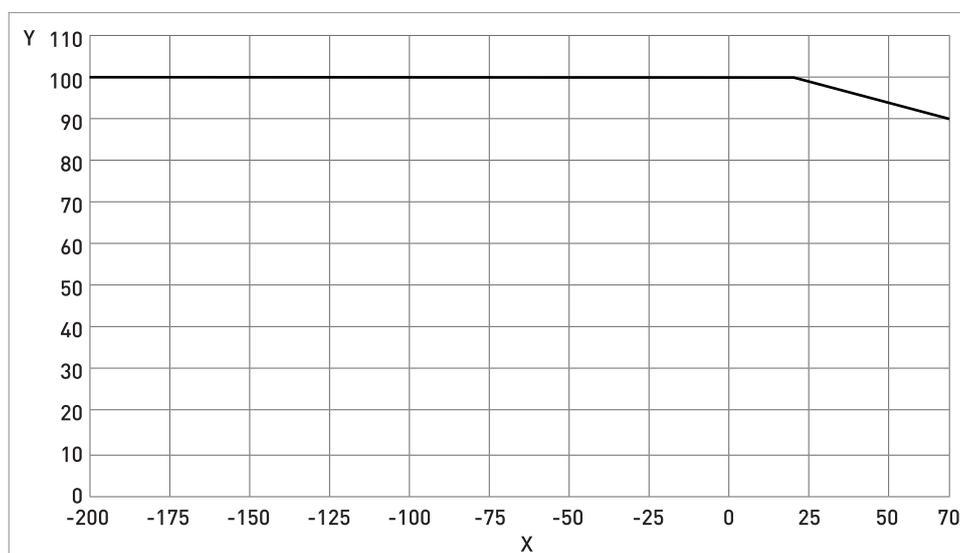
Pressure / temperature de-rating (imperial) for meters with SS 31803 and Hastelloy® C22, PED certified measuring tubes. Standard temperature range.



X temperature [°F]
Y pressure [psig]

- ① PED / CRN H08...80, D100
- ② CRN D150...200

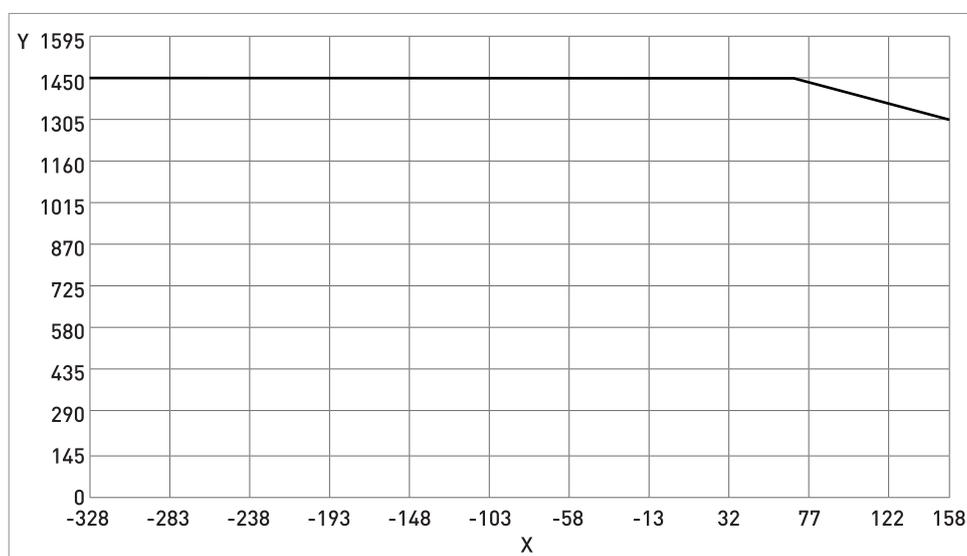
Pressure / temperature de-rating (metric) for meters with SS 316, PED certified measuring tubes. Cryogenic temperature range.



X temperature [°C]

Y pressure [barg]

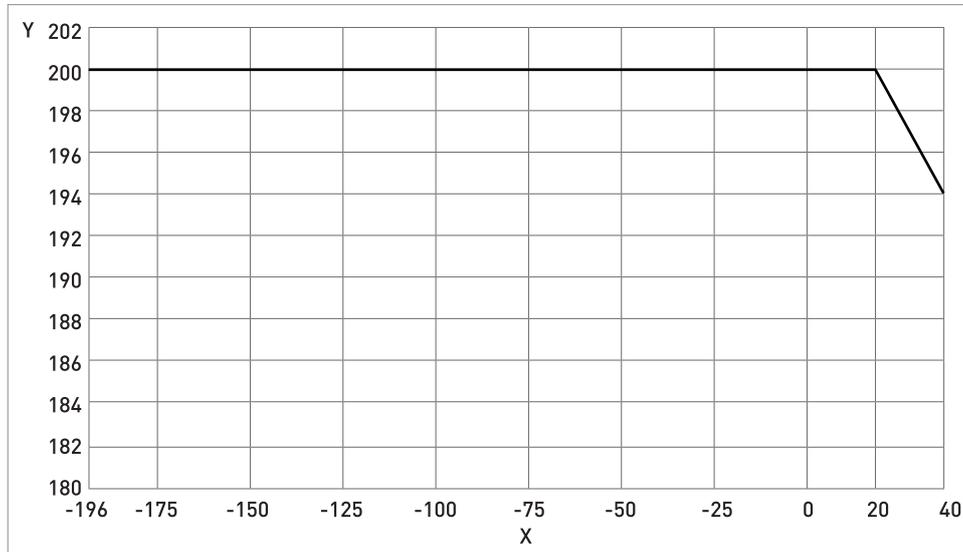
Pressure / temperature de-rating (imperial) for meters with SS 316 measuring tubes PED certified. Cryogenic temperature range.



X temperature [°F]

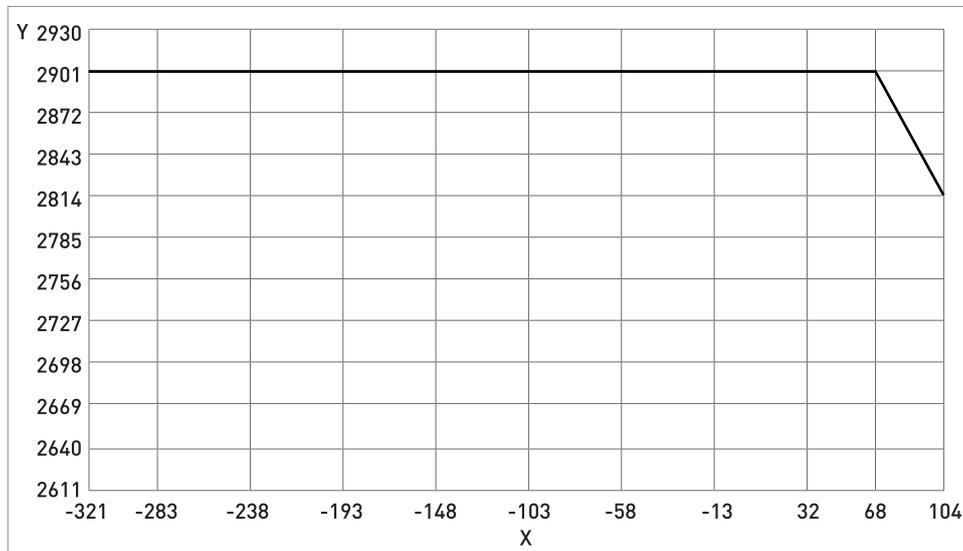
Y pressure [psig]

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



X temperature [°C]
Y pressure [barg]

Pressure / temperature de-rating (imperial) for meters with Hastelloy® C22, PED certified measuring tubes. Cryogenic temperature range.

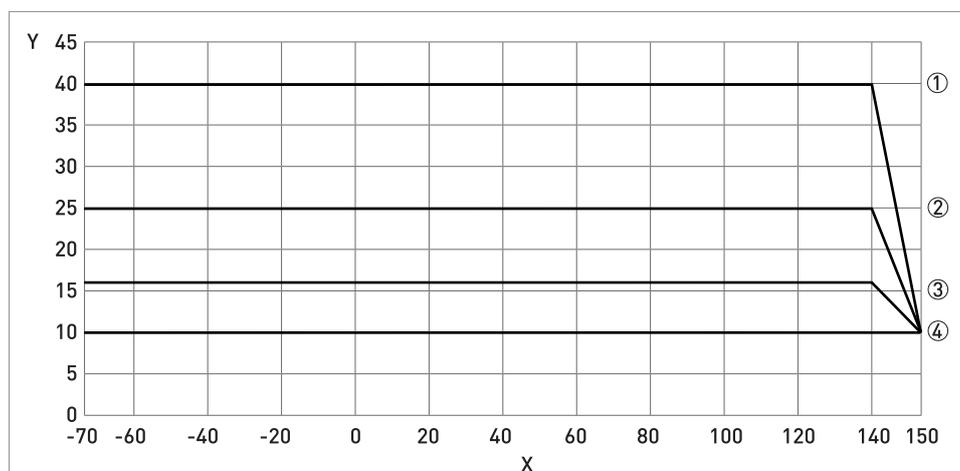


X temperature [°F]
Y pressure [psig]

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.

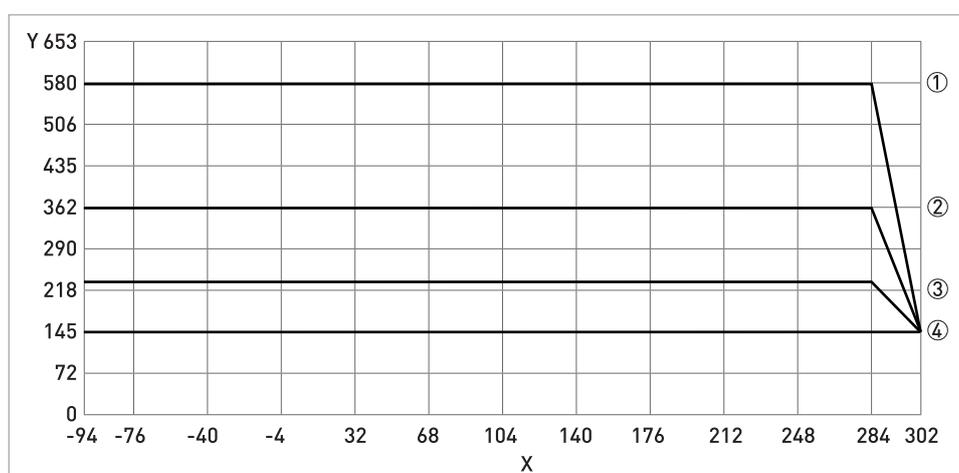


X temperature [°C]

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.

2.5 Dimensions and weights

2.5.1 Flanged versions

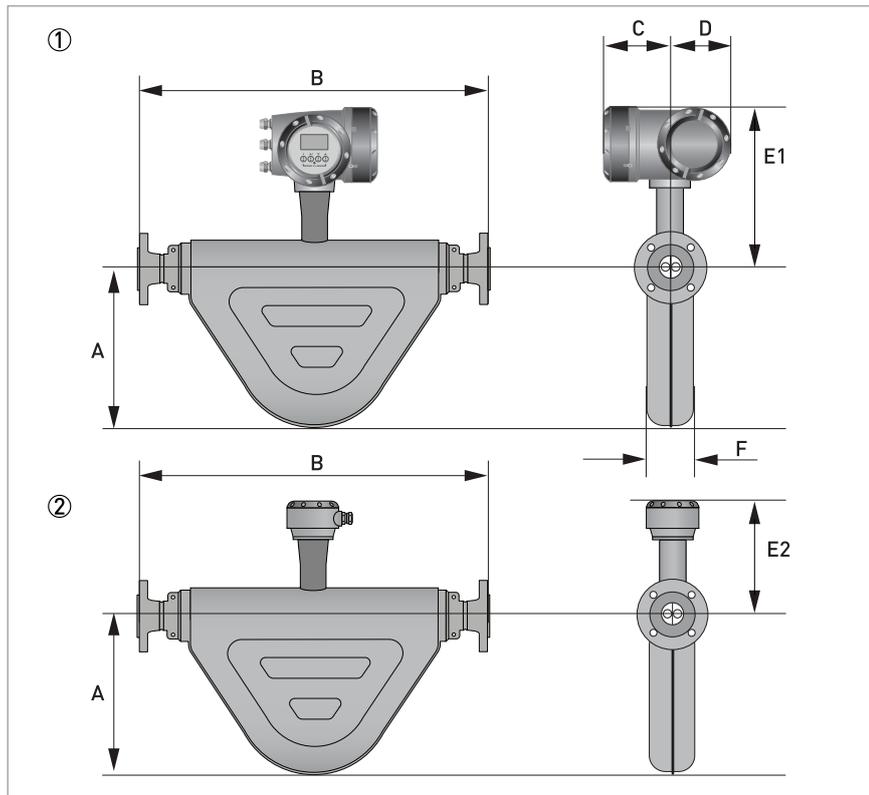
Meter weights

	kg								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
Aluminium (compact)	9.3	10.1	12.9	23.5	29.4	58.9	94.3	193.6	443.6
Stainless Steel (compact)	15.2	16.0	18.8	29.4	35.3	64.8	100.2	199.5	449.5
Aluminium (remote)	5.8	6.6	9.4	19.9	25.9	55.4	90.8	190.1	440.0
Stainless Steel (remote)	6.6	7.3	10.2	20.7	26.6	56.1	91.5	191.5	440.8
Heating jacket add	3.1		4.5	7.0	7.9	12.7	15.7	27.6	N/A

	lbs								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
Aluminium (compact)	20.5	22.3	28.4	51.8	64.8	129.8	207.9	426.8	978.0
Stainless Steel (compact)	33.5	35.3	41.4	64.8	77.8	142.9	220.9	439.8	991.0
Aluminium (remote)	12.8	14.5	20.7	43.9	57.1	122.1	200.2	419.1	970.0
Stainless Steel (remote)	14.6	16.1	22.5	45.6	58.6	123.7	201.7	422.2	971.8
Heating jacket add	6.8		9.9	15.4	17.4	28.0	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

General dimensions

	mm								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
A ±3	156		186	282	321	411	453	555	710
C	137								
D	122								
E1 ±3 ①	279		280	297		333	359	384	426
E1 ±3 ②	365		366	383		419	445	470	512
E2 ±3 ③	222			240		246	302	327	369
E2 ±3 ④	308			326		361	388	413	455
E2 ±3 ⑤	348			366		401	428	453	495
F ±2	81			118	131	196	251	273	356

- 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
A ±0.11	6.1		7.3	11.1	12.6	16.2	17.8	21.9	28.0
C	5.4								
D	4.8								
E1 ±0.12 ①	11.0		11.0	11.7		13.1	14.1	15.1	16.8
E1 ±0.12 ②	14.4		14.4	15.1		16.5	17.5	18.5	20.2
E2 ±0.12 ③	8.7		8.7	9.4		9.7	11.9	12.9	14.5
E2 ±0.12 ④	12.1		12.1	12.8		14.2	15.3	16.3	17.9
E2 ±0.12 ⑤	13.7		13.7	14.4		15.8	16.9	17.8	19.5
F ±0.08	3.2			4.6	5.2	7.7	9.9	10.7	14.0

- 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
PN16									
DN80	-	-	-	-	-	-	970	-	-
DN100	-	-	-	-	-	-	1000	1195	-
DN150	-	-	-	-	-	-	-	1151	1570
DN200	-	-	-	-	-	-	-	-	1534
PN40									
DN10	335	347	-	-	-	-	-	-	-
DN15	341	353	510	-	-	-	-	-	-
DN25	-	-	514	600	-	-	-	-	-
DN40	-	-	-	610	709	-	-	-	-
DN50	-	-	-	-	715	895	-	-	-
DN80	-	-	-	-	-	915	986	-	-
DN100	-	-	-	-	-	-	1000	1205	-
DN150	-	-	-	-	-	-	-	1191	1580
DN200	-	-	-	-	-	-	-	-	1586
PN63									
DN50	-	-	-	-	743	923	-	-	-
DN80	-	-	-	-	-	943	1014	-	-
DN100	-	-	-	-	-	-	1026	1217	-
DN150	-	-	-	-	-	-	-	1231	1600
DN200	-	-	-	-	-	-	-	-	1630
PN100									
DN10	355	367	-	-	-	-	-	-	-

mm (±5)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200
DN15	355	367	524	-	-	-	-	-	-
DN25	-	-	550	636	-	-	-	-	-
DN40	-	-	-	644	743	-	-	-	-
DN50	-	-	-	-	755	935	-	-	-
DN80	-	-	-	-	-	955	1026	-	-
DN100	-	-	-	-	-	-	1050	1221	-
DN150	-	-	-	-	-	-	-	1271	1640
DN200	-	-	-	-	-	-	-	-	1670
ASME 150									
½"	361	373	530	-	-	-	-	-	-
¾"	-	-	540	-	-	-	-	-	-
1"	-	-	546	632	-	-	-	-	-
1½"	-	-	-	644	743	-	-	-	-
2"	-	-	-	-	747	927	-	-	-
3"	-	-	-	-	-	939	1010	-	-
4"	-	-	-	-	-	-	1024	1195	-
6"	-	-	-	-	-	-	-	1219	1588
8"	-	-	-	-	-	-	-	-	1614
ASME 300									
½"	371	383	540	-	-	-	-	-	-
¾"	-	-	550	-	-	-	-	-	-
1"	-	-	558	644	-	-	-	-	-
1½"	-	-	-	658	757	-	-	-	-
2"	-	-	-	-	759	939	-	-	-
3"	-	-	-	-	-	959	1030	-	-
4"	-	-	-	-	-	-	1042	1213	-
6"	-	-	-	-	-	-	-	1239	1608
8"	-	-	-	-	-	-	-	-	1634
ASME 600									
½"	383	395	552	-	-	-	-	-	-
¾"	-	-	562	-	-	-	-	-	-
1"	-	-	572	658	-	-	-	-	-
1½"	-	-	-	674	773	-	-	-	-
2"	-	-	-	-	779	959	-	-	-
3"	-	-	-	-	-	979	1050	-	-
4"	-	-	-	-	-	-	1088	1259	-
6"	-	-	-	-	-	-	-	1289	1658
8"	-	-	-	-	-	-	-	-	1690
JIS 10K									
50A	-	-	-	-	699	879	-	-	-
80A	-	-	-	-	-	889	960	-	-

mm (±5)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200
100A	-	-	-	-	-	-	960	1195	-
150A	-	-	-	-	-	-	-	1147	1570
200A	-	-	-	-	-	-	-	-	1526
JIS 20K									
10A	331	343	-	-	-	-	-	-	-
15A	333	345	502	-	-	-	-	-	-
25A	-	-	510	596	-	-	-	-	-
40A	-	-	-	602	701	-	-	-	-
50A	-	-	-	-	703	883	-	-	-
80A	-	-	-	-	-	901	972	-	-
100A	-	-	-	-	-	-	986	1205	-
150A	-	-	-	-	-	-	-	1187	1580
200A	-	-	-	-	-	-	-	-	1564

inches (±0.2)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200
PN16									
DN80	-	-	-	-	-	-	38.2	-	-
DN100	-	-	-	-	-	-	39.4	47.0	-
DN150	-	-	-	-	-	-	-	45.3	61.8
DN200	-	-	-	-	-	-	-	-	60.4
PN40									
DN10	13.2	13.7	-	-	-	-	-	-	-
DN15	13.4	13.9	20.1	-	-	-	-	-	-
DN25	-	-	20.2	23.6	-	-	-	-	-
DN40	-	-	-	24.0	27.9	-	-	-	-
DN50	-	-	-	-	28.1	35.2	-	-	-
DN80	-	-	-	-	-	36.0	38.8	-	-
DN100	-	-	-	-	-	-	39.4	47.4	-
DN150	-	-	-	-	-	-	-	46.9	62.2
DN200	-	-	-	-	-	-	-	-	62.4
PN63									
DN50	-	-	-	-	29.3	36.3	-	-	-
DN80	-	-	-	-	-	37.1	39.9	-	-
DN100	-	-	-	-	-	-	40.4	47.9	-
DN150	-	-	-	-	-	-	-	48.5	63.0
DN200	-	-	-	-	-	-	-	-	64.2
PN100									
DN10	14.0	14.4	-	-	-	-	-	-	-
DN15	14.0	14.4	20.6	-	-	-	-	-	-

inches (± 0.2)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200
DN25	-	-	21.7	25.0	-	-	-	-	-
DN40	-	-	-	25.4	29.3	-	-	-	-
DN50	-	-	-	-	29.7	36.8	-	-	-
DN80	-	-	-	-	-	37.6	40.4	-	-
DN100	-	-	-	-	-	-	41.3	48.1	-
DN150	-	-	-	-	-	-	-	50.0	64.6
DN200	-	-	-	-	-	-	-	-	65.7
ASME 150									
1/2"	14.2	14.7	20.9	-	-	-	-	-	-
3/4"	-	-	21.3	-	-	-	-	-	-
1"	-	-	21.5	24.9	-	-	-	-	-
1 1/2"	-	-	-	25.4	29.3	-	-	-	-
2"	-	-	-	-	29.4	36.5	-	-	-
3"	-	-	-	-	-	37.0	39.8	-	-
4"	-	-	-	-	-	-	40.3	47.0	-
6"	-	-	-	-	-	-	-	48.0	62.5
8"	-	-	-	-	-	-	-	-	63.5
ASME 300									
1/2"	14.6	15.1	21.3	-	-	-	-	-	-
3/4"	-	-	21.7	-	-	-	-	-	-
1"	-	-	22.0	25.4	-	-	-	-	-
1 1/2"	-	-	-	25.9	29.8	-	-	-	-
2"	-	-	-	-	29.9	37.0	-	-	-
3"	-	-	-	-	-	37.8	40.6	-	-
4"	-	-	-	-	-	-	41.0	47.8	-
6"	-	-	-	-	-	-	-	48.8	62.5
8"	-	-	-	-	-	-	-	-	63.5
ASME 600									
1/2"	15.1	15.6	21.7	-	-	-	-	-	-
3/4"	-	-	22.1	-	-	-	-	-	-
1"	-	-	22.5	25.9	-	-	-	-	-
1 1/2"	-	-	-	26.5	30.4	-	-	-	-
2"	-	-	-	-	30.7	37.8	-	-	-
3"	-	-	-	-	-	38.5	41.3	-	-
4"	-	-	-	-	-	-	42.8	49.6	-
6"	-	-	-	-	-	-	-	50.7	65.3
8"	-	-	-	-	-	-	-	-	66.5
JIS 10K									
50A	-	-	-	-	27.5	34.6	-	-	-
80A	-	-	-	-	-	35.0	37.8	-	-
100A	-	-	-	-	-	-	37.8	47.0	-

inches (±0.2)									
	S08	S10	S15	S25	S50	S80	S100	S150	S200
150A	-	-	-	-	-	-	-	45.2	61.8
200A	-	-	-	-	-	-	-	-	60.1
JIS 20K									
10A	13.0	13.5	-	-	-	-	-	-	-
15A	13.1	13.6	19.8	-	-	-	-	-	-
25A	-	-	20.1	23.5	-	-	-	-	-
40A	-	-	-	23.7	27.6	-	-	-	-
50A	-	-	-	-	27.7	34.8	-	-	-
80A	-	-	-	-	-	35.5	38.3	-	-
100A	-	-	-	-	-	-	38.8	47.4	-
150A	-	-	-	-	-	-	-	46.7	62.2
200A	-	-	-	-	-	-	-	-	61.6

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

mm (±5)									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
PN40									
DN15	329	354	-	-	-	-	-	-	-
DN25	-	-	511	-	-	-	-	-	-
DN40	-	-	-	601	-	-	-	-	-
DN50	-	-	-	-	714	-	-	-	-
DN80	-	-	-	-	-	914	-	-	-
PN63									
DN50	-	-	-	-	714	-	-	-	-
DN80	-	-	-	-	-	914	-	-	-
PN100									
DN15	329	354	-	-	-	-	-	-	-
DN25	-	-	511	-	-	-	-	-	-
DN40	-	-	-	601	-	-	-	-	-
DN50	-	-	-	-	714	-	-	-	-
DN80	-	-	-	-	-	914	-	-	-
PN160									
DN15	329	354	-	-	-	-	-	-	-
DN25	-	-	511	-	-	-	-	-	-
DN40	-	-	-	601	-	-	-	-	-
DN50	-	-	-	-	714	-	-	-	-
DN80	-	-	-	-	-	914	1042	-	-
DN100	-	-	-	-	-	-	1070	1241	-
DN150	-	-	-	-	-	-	-	1297	1666
DN200	-	-	-	-	-	-	-	-	1690

mm (±5)									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
ASME 150									
½"	329	354	-	-	-	-	-	-	-
1"	-	-	511	-	-	-	-	-	-
1½"	-	-	-	601	-	-	-	-	-
2"	-	-	-	-	714	-	-	-	-
3"	-	-	-	-	-	914	-	-	-
ASME 300									
½"	329	354	-	-	-	-	-	-	-
1"	-	-	511	-	-	-	-	-	-
1½"	-	-	-	601	-	-	-	-	-
2"	-	-	-	-	714	-	-	-	-
3"	-	-	-	-	-	914	-	-	-
ASME 600									
½"	336	361	-	-	-	-	-	-	-
1"	-	-	518	-	-	-	-	-	-
1½"	-	-	-	608	-	-	-	-	-
2"	-	-	-	-	721	-	-	-	-
3"	-	-	-	-	-	921	-	-	-
ASME 900									
1½"	-	-	-	608	-	-	-	-	-
2"	-	-	-	-	721	-	-	-	-
3"	-	-	-	-	-	921	1088	-	-
4"	-	-	-	-	-	-	1112	1283	-
6"	-	-	-	-	-	-	-	1335	1704
8"	-	-	-	-	-	-	-	-	1748
ASME 1500									
½"	336	361	-	-	-	-	-	-	-
1"	-	-	518	-	-	-	-	-	-
1½"	-	-	-	608	-	-	-	-	-
2"	-	-	-	-	721	-	-	-	-
3"	-	-	-	-	-	921	1118	-	-
4"	-	-	-	-	-	-	1132	1303	-
6"	-	-	-	-	-	-	-	1397	1766
8"	-	-	-	-	-	-	-	-	1850
JIS 10K									
50A	-	-	-	-	714	-	-	-	-
80A	-	-	-	-	-	914	-	-	-
JIS 20K									
15A	329	354	-	-	-	-	-	-	-
25A	-	-	511	-	-	-	-	-	-
40A	-	-	-	601	-	-	-	-	-

mm (±5)									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
50A	-	-	-	-	714	-	-	-	-
80A	-	-	-	-	-	914	-	-	-

inches (±0.2)									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
PN40									
DN15	13.0	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.7	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36.0	-	-	-
PN63									
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36.0	-	-	-
PN100									
DN15	13.0	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.7	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36.0	-	-	-
PN160									
DN15	13.0	13.9	-	-	-	-	-	-	-
DN25	-	-	20.1	-	-	-	-	-	-
DN40	-	-	-	23.7	-	-	-	-	-
DN50	-	-	-	-	28.1	-	-	-	-
DN80	-	-	-	-	-	36.0	41.0	-	-
DN100	-	-	-	-	-	-	42.1	48.9	-
DN150	-	-	-	-	-	-	-	51.1	65.6
DN200	-	-	-	-	-	-	-	-	66.5
ASME 150									
½"	13.0	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.7	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-
3"	-	-	-	-	-	36.0	-	-	-
ASME 300									
½"	13.0	13.9	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.7	-	-	-	-	-
2"	-	-	-	-	28.1	-	-	-	-

inches (±0.2)									
	H08	H10	H15	H25	H50	H80	D100	D150	D200
3"	-	-	-	-	-	36.0	-	-	-
ASME 600									
½"	13.2	14.2	-	-	-	-	-	-	-
1"	-	-	20.1	-	-	-	-	-	-
1½"	-	-	-	23.9	-	-	-	-	-
2"	-	-	-	-	28.4	-	-	-	-
3"	-	-	-	-	-	36.3	-	-	-
ASME 900									
1½"	-	-	-	23.9	-	-	-	-	-
2"	-	-	-	-	28.4	-	-	-	-
3"	-	-	-	-	-	36.3	42.8	-	-
4"	-	-	-	-	-	-	43.8	50.5	-
6"	-	-	-	-	-	-	-	52.6	67.1
8"	-	-	-	-	-	-	-	-	68.8
ASME 1500									
½"	13.2	14.2	-	-	-	-	-	-	-
1"	-	-	20.4	-	-	-	-	-	-
1½"	-	-	-	23.9	-	-	-	-	-
2"	-	-	-	-	28.4	-	-	-	-
3"	-	-	-	-	-	36.3	44.0	-	-
4"	-	-	-	-	-	-	44.6	51.3	-
6"	-	-	-	-	-	-	-	55.0	69.5
8"	-	-	-	-	-	-	-	-	72.8
JIS 10K									
50A	-	-	-	-	28.1	-	-	-	-
80A	-	-	-	-	-	36.0	-	-	-
JIS 20K									
15A	13.0	13.9	-	-	-	-	-	-	-
25A	-	-	20.1	-	-	-	-	-	-
40A	-	-	-	23.7	-	-	-	-	-
50A	-	-	-	-	28.1	-	-	-	-
80A	-	-	-	-	-	36.0	-	-	-

2.5.2 NAMUR dimensions

The following face to face dimensions comply with NAMUR NE132

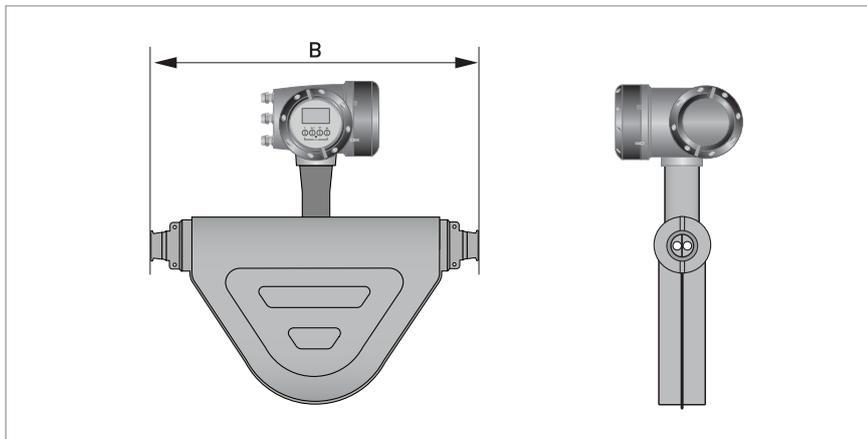
mm (± 3)						
	S15	S25	S50	S80	S100	S150
PN10						
DN250	-	-	-	-	-	-
PN16						
DN100	-	-	-	-	1000	-
DN150	-	-	-	-	-	1200 ①
DN200	-	-	-	-	-	-
PN40						
DN 15	510	-	-	-	-	-
DN 25	-	600	-	-	-	-
DN 50	-	-	715	-	-	-
DN 80	-	-	-	915	-	-
DN100					1000	-
DN150						1200 ①

① Available as special order

inches (± 0.12)						
	S15	S25	S50	S80	S100	S150
PN10						
DN250	-	-	-	-	-	-
PN16						
DN100	-	-	-	-	39.4	-
DN150	-	-	-	-	-	47.2 ①
DN200	-	-	-	-	-	-
PN40						
DN 15	20.1	-	-	-	-	-
DN 25	-	23.6	-	-	-	-
DN 50	-	-	28.1	-	-	-
DN 80	-	-	-	36.0	-	-
DN100					39.4	-
DN150						47.2 ①

① Available as special order

2.5.3 Hygienic versions



Dimension B for meters with Stainless Steel measuring tubes

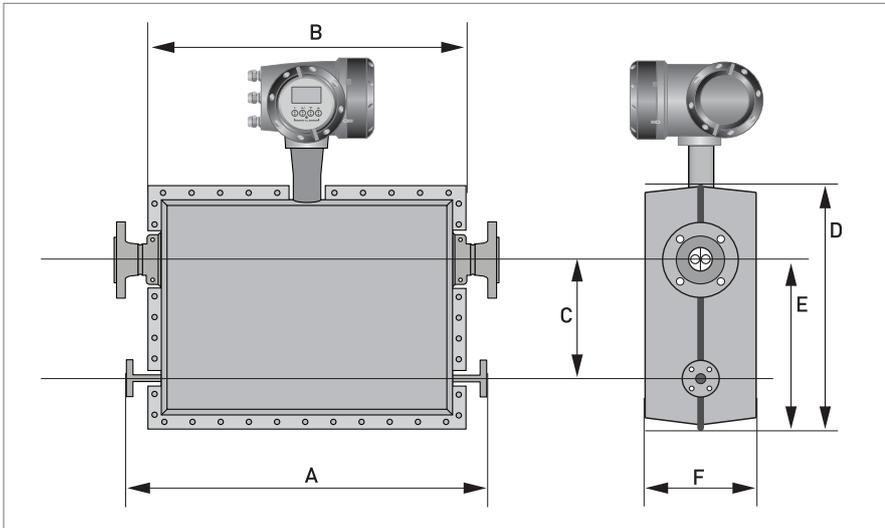
	mm (±5)						
	S08	S10	S15	S25	S50	S80	S100
Tri-clover							
1/2"	312	322	-	-	-	-	-
3/4"	312	322	-	-	-	-	-
1"	-	-	499	-	-	-	-
1 1/2"	-	-	-	603	-	-	-
2"	-	-	-	-	694	-	-
3"	-	-	-	-	-	866	-
4"	-	-	-	-	-	-	916
Tri-clamp DIN 32676							
DN15	305	315	-	-	-	-	-
DN25	-	-	479	-	-	-	-
DN40	-	-	-	584	-	-	-
DN50	-	-	-	-	680	-	-
DN80	-	-	-	-	-	870	-
DN100	-	-	-	-	-	-	929
Tri-clamp ISO 2852							
1"	-	-	485	-	-	-	-
1 1/2"	-	-	-	571	-	-	-
2"	-	-	-	-	670	-	-
3"	-	-	-	-	-	851	-
4"	-	-	-	-	-	-	916
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])							
DN15	352	362	-	-	-	-	-
DN25	-	-	519	-	-	-	-
DN40	-	-	-	631	-	-	-
DN50	-	-	-	-	727	-	-

	mm (±5)						
	S08	S10	S15	S25	S50	S80	S100
DN80	-	-	-	-	-	930	-
DN100	-	-	-	-	-	-	989
Male thread DIN 11851							
DN15	311	321	-	-	-	-	-
DN25	-	-	494	-	-	-	-
DN40	-	-	-	607	-	-	-
DN50	-	-	-	-	707	-	-
DN80	-	-	-	-	-	904	-
DN100	-	-	-	-	-	-	981
Male thread SMS							
1"	-	-	486	-	-	-	-
1½"	-	-	-	606	-	-	-
2"	-	-	-	-	697	-	-
3"	-	-	-	-	-	871	-
4"	-	-	-	-	-	-	929

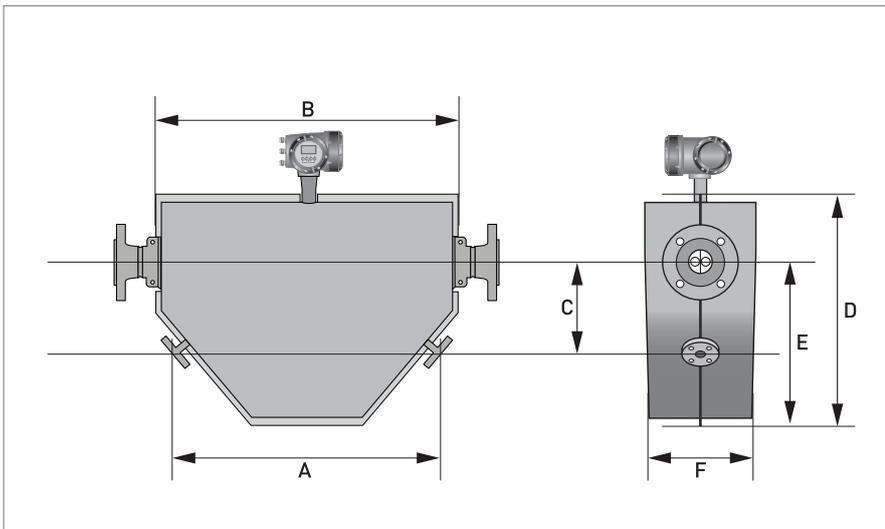
	inches (±0.2)						
	S08	S10	S15	S25	S50	S80	S100
Tri-clover							
1/2"	12.3	12.7	-	-	-	-	-
3/4"	12.3	12.7	-	-	-	-	-
1"	-	-	19.6	-	-	-	-
1 1/2"	-	-	-	23.7	-	-	-
2"	-	-	-	-	27.3	-	-
3"	-	-	-	-	-	34.1	-
4"	-	-	-	-	-	-	36.1
Tri-clamp DIN 32676							
DN15	12.0	12.4	-	-	-	-	-
DN25	-	-	18.9	-	-	-	-
DN40	-	-	-	23.0	-	-	-
DN50	-	-	-	-	26.8	-	-
DN80	-	-	-	-	-	34.3	-
DN100	-	-	-	-	-	-	36.6
Tri-clamp ISO 2852							
1"	-	-	19.1	-	-	-	-
1 1/2"	-	-	-	22.5	-	-	-
2"	-	-	-	-	26.4	-	-
3"	-	-	-	-	-	33.5	-
4"	-	-	-	-	-	-	36.1
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])							
DN15	13.9	14.3	-	-	-	-	-
DN25	-	-	20.4	-	-	-	-
DN40	-	-	-	24.8	-	-	-
DN50	-	-	-	-	28.6	-	-
DN80	-	-	-	-	-	36.6	-
DN100	-	-	-	-	-	-	38.9
Male thread DIN 11851							
DN15	12.2	12.6	-	-	-	-	-
DN25	-	-	19.4	-	-	-	-
DN40	-	-	-	23.9	-	-	-
DN50	-	-	-	-	27.8	-	-
DN80	-	-	-	-	-	35.6	-
DN100	-	-	-	-	-	-	38.6
Male thread SMS							
1"	-	-	19.1	-	-	-	-
1 1/2"	-	-	-	23.9	-	-	-
2"	-	-	-	-	27.4	-	-
3"	-	-	-	-	-	34.3	-
4"	-	-	-	-	-	-	36.6

2.5.4 Heating jacket version

Meter sizes 08...100



Meter sizes 150...200



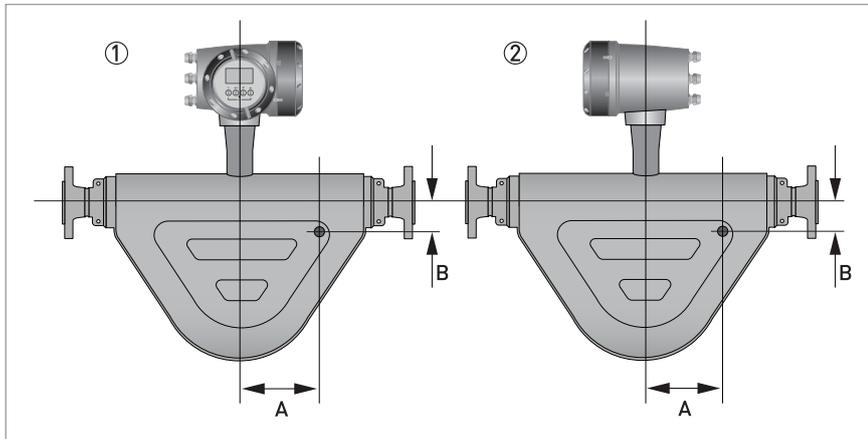
General dimensions

	mm								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
Heating connection size: PN40 DN15 or ASME 150 1/2"									
A ±5.0	435	550	660	685	860	925	847	1135	
B ±3.0	283	440	542	565	741	806	1036	1408	
C ±3.0	100	130	210	230	320	340	493	506	
D ±3.0	315	344	453	499	622	682	918	230	
E ±3.0	198	221	316	356	451	486	688	857	
F ±3.0	232	226	254	266	322	372	414	500	

	inches								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
Heating connection size: PN40 DN15 or ASME 150 ½"									
A ±0.2	17.1	21.7	26.0	27.0	33.9	36.4	33.3	44.7	
B ±0.12	11.1	17.3	21.3	22.2	29.2	31.7	40.8	55.4	
C ±0.12	3.9	5.1	8.3	9.1	12.6	13.4	19.4	19.9	
D ±0.12	12.4	13.5	17.8	19.6	24.5	26.9	36.1	9.1	
E ±0.12	7.8	8.7	12.4	14.0	17.8	19.1	27.1	33.7	
F ±0.12	9.1	8.9	10.0	10.5	12.7	14.6	16.3	19.7	

2.5.5 Purge port option

If the meter has been ordered with purge ports, it will be supplied with two ports: one on the front and one on the rear.



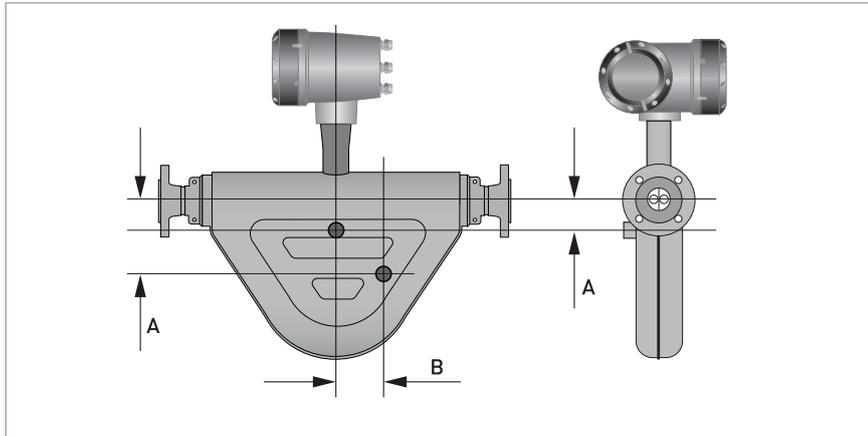
① Front view
② Rear view

Dimensions

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

	inches								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
A	2.8		4.3	5.7	5.9	8.1	8.7	13.6	23.6
B	1.3		1.8	2.2	2.4	3.3		3.9	6.3

2.5.6 Burst disc option



Dimensions

	mm								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
A	76	92	135	57	74	175	195		
B	38.5	62	0	0	0	0	0	0	0

	inches								
	S08	S10	S15	S25	S50	S80	S100	S150	S200
A	3.0	3.6	5.3	2.2	2.9	6.9	7.7		
B	1.52	2.4	0	0	0	0	0	0	0

3.1 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 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. 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.

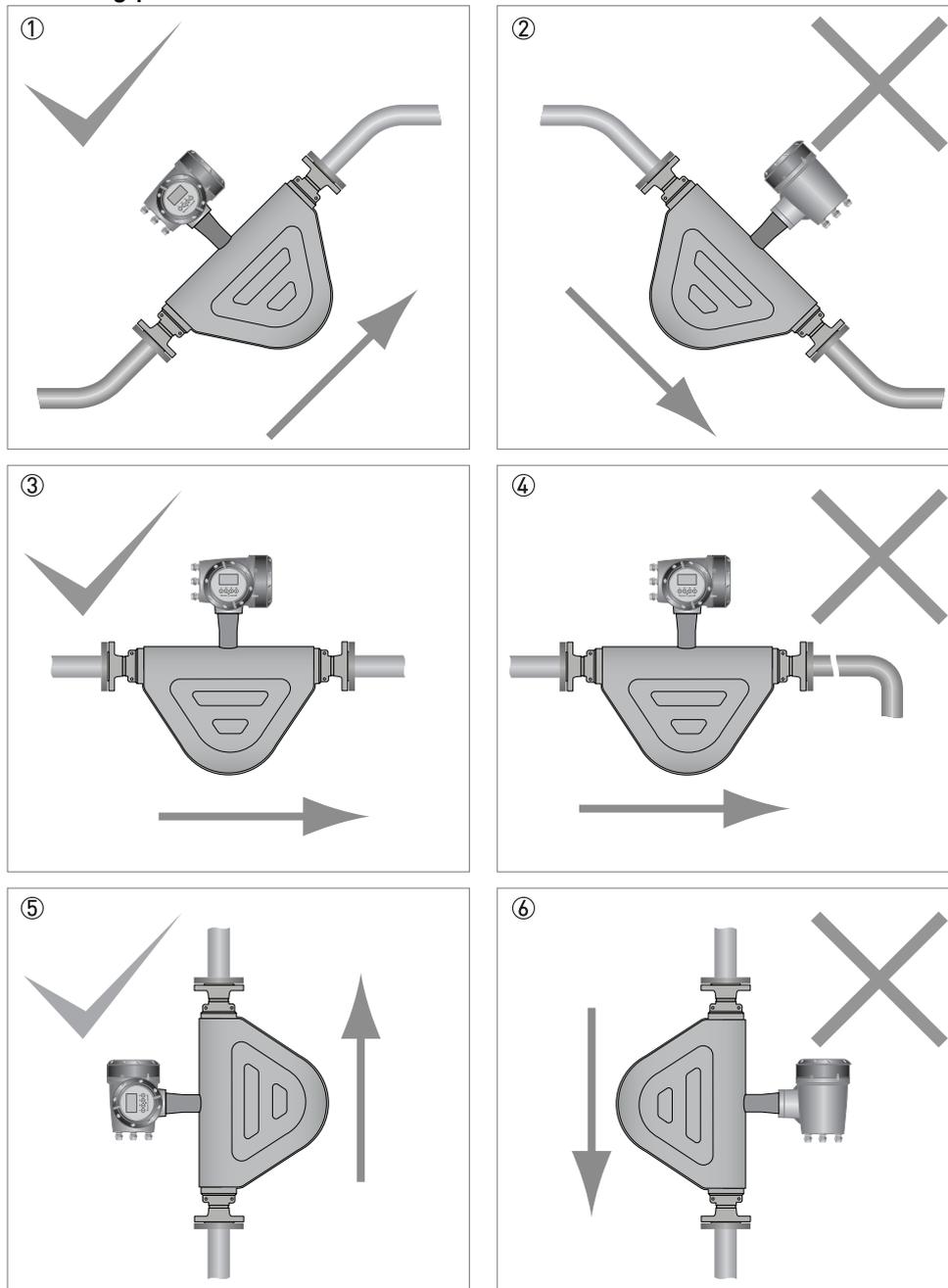
3.2 Mounting restrictions

3.2.1 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.

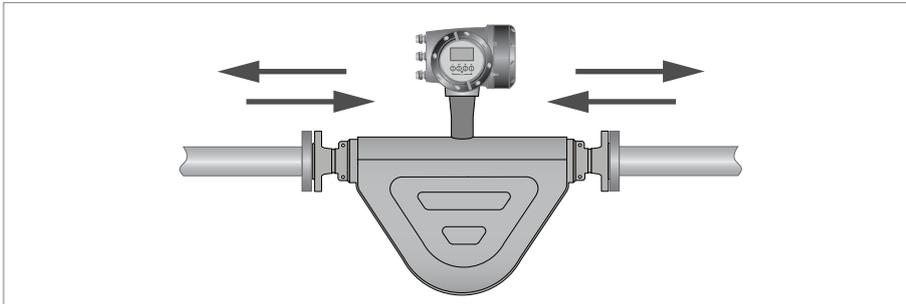
Mounting positions



- 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 backpressure.
- 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

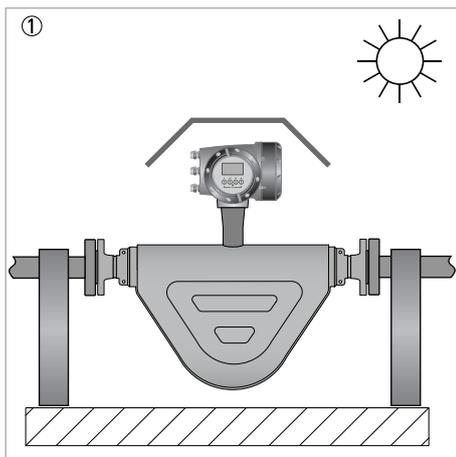
3.2.2 Maximum pipework forces (end loadings)



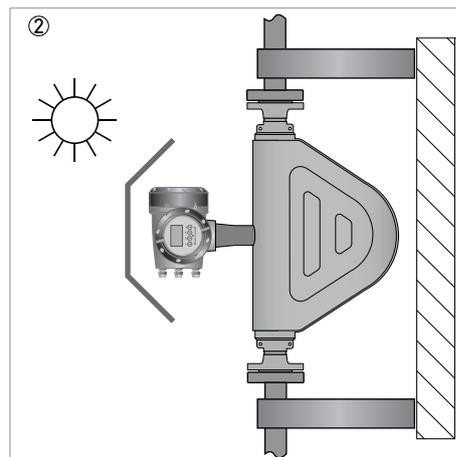
Avoid external forces that apply pressure (negative, positive or rotational) to the ends of the meter. If it is not possible to avoid such forces you **MUST** contact the manufacturer.

3.2.3 Sunshades

The meter **MUST** be protected from strong sunlight.

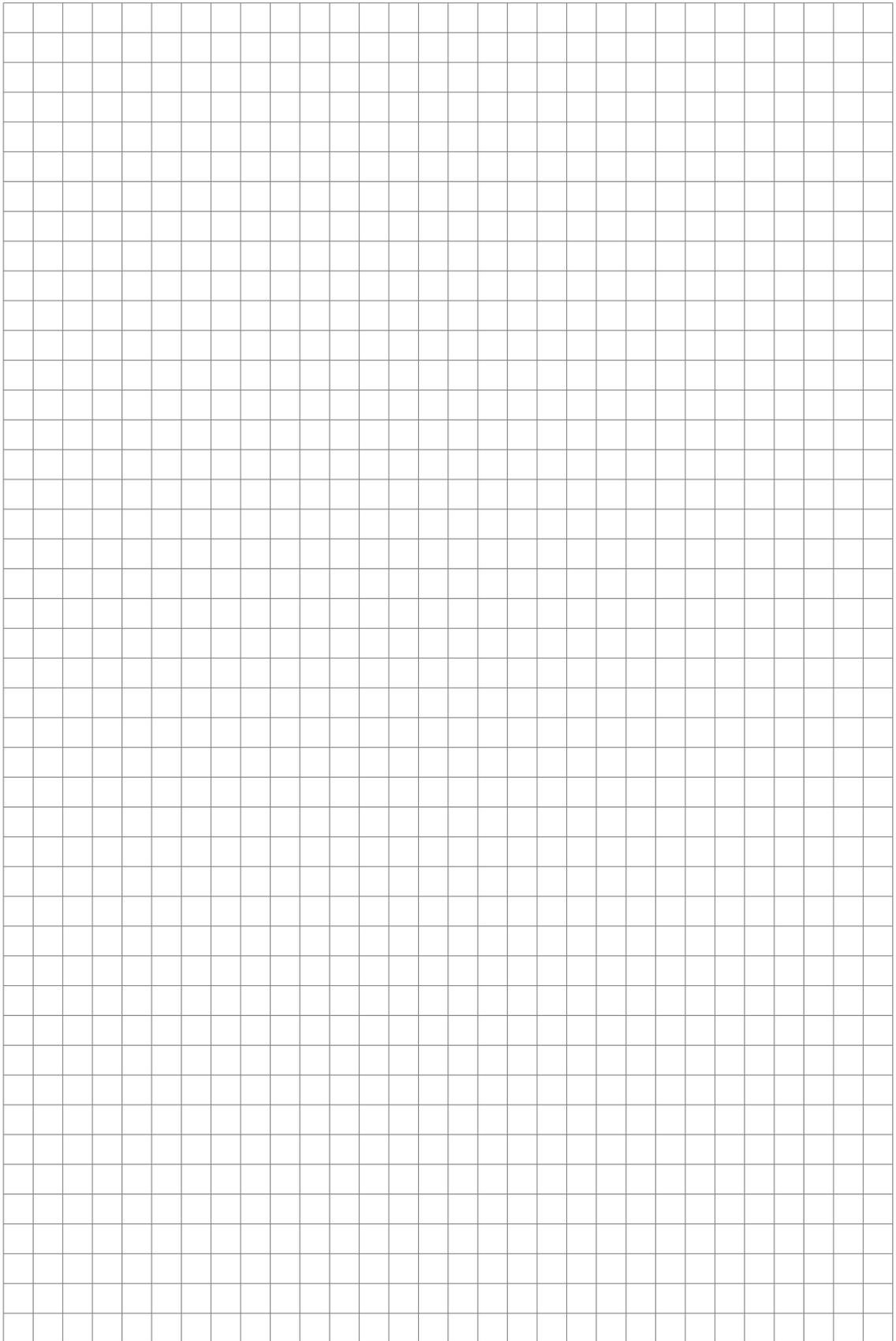


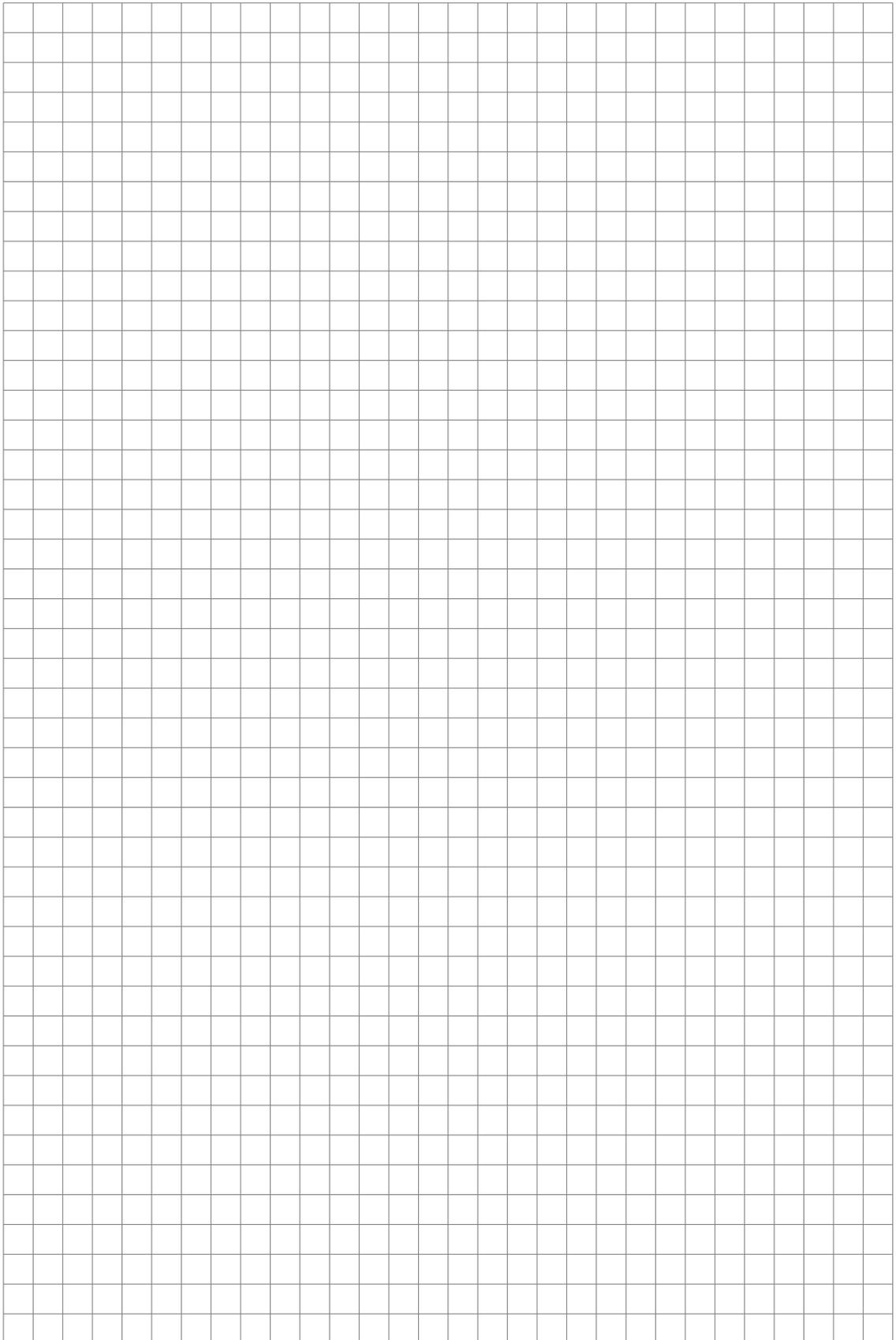
① Horizontal installation



② Vertical installation







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Head Office KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg (Germany)
Tel.: +49 203 301 0
Fax: +49 203 301 10389
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:
www.krohne.com

