OPTIMASS 5000

Technical Datasheet

Sensor for mass flow

- The new general purpose Coriolis meter
- Process temperature up to 180°C
- Lightweight and easy to install

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

1.1 The new standard Coriolis meter

A general purpose meter, together with an extended temperature range up to 180°C / 356°F, makes the OPTIMASS 5000 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.

Combined with the power of the MFC 400 or MFC 020, the OPTIMASS 5000 will provide accurate measurement of volume, mass, density and concentration.

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

① Remote terminal box

Features:

- Innovative twin tube design with shallow bend
- Compact envelope
- Temperature range -50°C to +180°C
- 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:

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

Applications:

- General purpose applications
- Tanker loading
- CIP and SIP >130°C

1.2 Features and options

Features

- Available as compact or remote.
- Nominal flow rates up to 125000 kg/h / 4593 lb/min.
- Self draining, when mounted vertically.
- With advanced Entrained Gas Management (EGM^{TM}) the meter maintains operation over a wide range of gas fractions and complex flow conditions.

Connection options

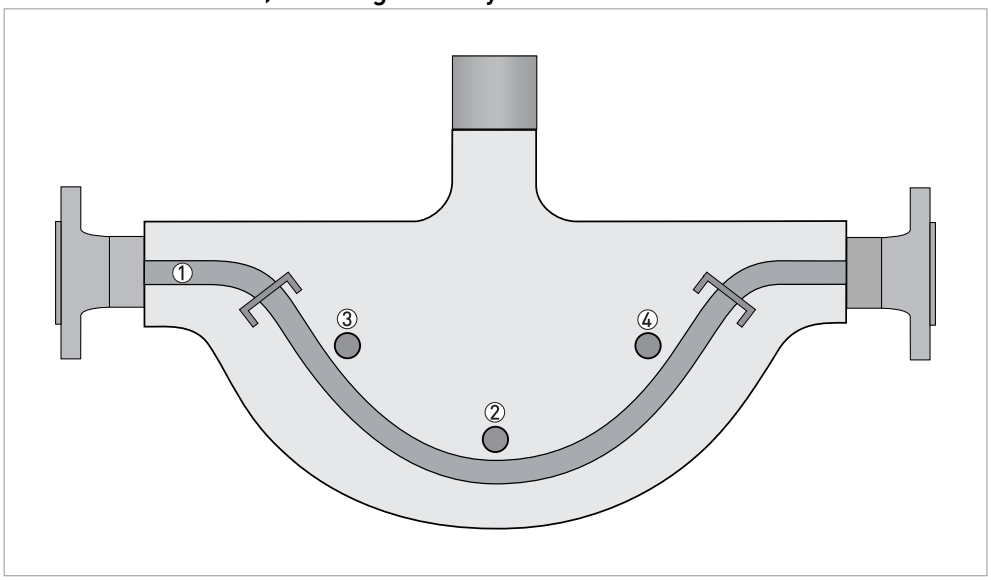
- Standard flanges with ratings up to 600 lb / PN100.
- Supports a wide range of industry standard hygienic connections.
- Optional sealing faces.
- NAMUR NE132 flange lengths

1.3 Meter / converter combinations

Converter	MFC020	MFC 400	
Configuration	Compact	Compact	Remote field
OPTIMASS 5000	5020C	5400C	5000F

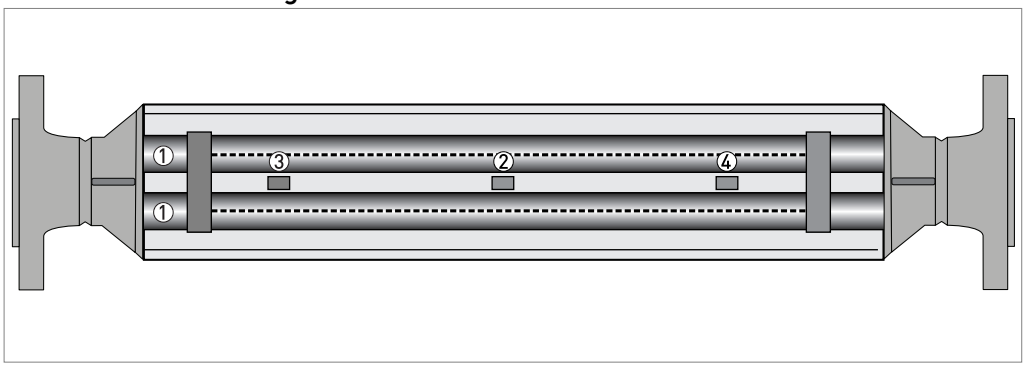
2.1 Measuring principle (twin tube)

Meter from the side, showing tube layout



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

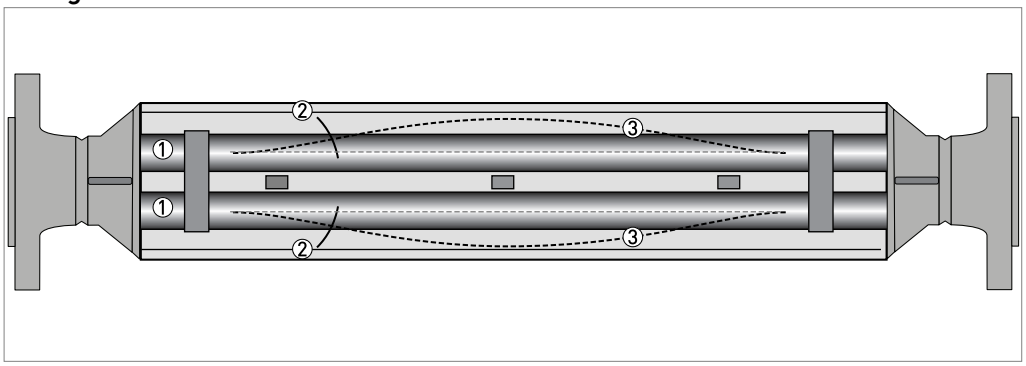
Static meter not energised and with no flow



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.

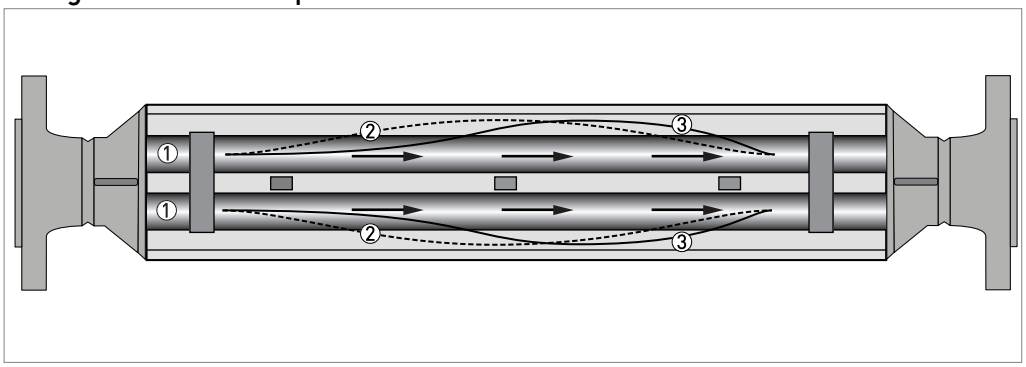
Energised meter



① Measuring tubes
② Direction of oscilation
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 (Download Center).*

Measuring system

Measuring principle	Coriolis mass flow
Application range	Mass flow and density measurement of fluids, gases and suspended solids
Measured values	Mass, density, temperature
Calculated values	Volume, referred density, concentration, velocity

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 tubes
Variants	
Compact version	Integral converter (MFC400, MFC020)
Remote version	Available with a field version of the converter (MFC400)

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 ≥ 10% of nominal flow)	
Maximum permissible error	±0.15% of actual measured flow rate
Repeatability	Better than 0.075% of actual measured flow rate
Liquid (flow rate <10% of nominal flow)	
Maximum permissible error	±zero stability x 1.5
Repeatability	Better than 0.0075% of nominal flow rate
Mass flow (optional)	
Liquid (flow rate ≥ 10% of nominal flow)	
Maximum permissible error	±0.1% of actual measured flow rate
Repeatability	Better than 0.05% of measured flow rate
Liquid (flow rate < 10% of nominal flow)	
Maximum permissible error	±zero stability
Repeatability	Better than 0.005% of nominal flow rate
Mass flow (gases)	
Gas (flow rate ≥ 5% of nominal flow)	
Maximum permissible error	±0.5% of actual measured flow rate

Repeatability	Better than 0.25% of measured flow rate
Gas (flow rate < 5% of nominal flow)	
Maximum permissible error	±zero stability x 2.5
Repeatability	Better than 0.0125% of nominal flow rate
Zero stability	
Meter size	
10	0.12 kg/h / 0.0044 lb/min
15	0.45 kg/h / 0.0165 lb/min
25	1.2 kg/h / 0.0441 lb/min
40	2.5 kg/h / 0.0919 lb/min
50	5.0 kg/h / 0.1837 lb/min
80	12.5 kg/h / 0.4593 lb/min
Maximum permissible error on sensor zero point caused by a deviation in process temperature from zero calibration temperature	
All meter sizes	±0.0015% of nominal flow per 1°C / 0.00083% per 1°F
Maximum permissible error on mass flow caused by a deviation in process temperature from calibration temperature	
All meter sizes	±0.005% of actual measured flow rate per 1°C / 0.00278% per 1°F
Pressure effect on mass flow rate caused by deviation in process pressure from calibration pressure	
Sizes 10...25	Not applicable
Size 40	0.0024% of reading per bar / 0.00017% of reading per 1 psi
Size 50	0.0084% of reading per bar / 0.00058% of reading per 1 psi
Size 80	0.025% of reading per bar / 0.0017% of reading per 1 psi
Density (measuring range 400...2500 kg/m^3 / 25.0...156.1 lb/ft^3)	
Maximum permissible measurement error	
0.1% calibration option	±1.6 kg/m^3 / 0.1 lb/ft^3
0.15% calibration option	±2.0 kg/m^3 / 0.125 lb/ft^3
Repeatability / on site calibration	Better than 0.5 kg/m^3 / 0.03 lb/ft^3
Density (measuring range <400kg/m^3 / 25.0 lb/ft^3)	
Maximum permissible measurement error	±8.0 kg/m^3 / 0.5 lb/ft^3
Repeatability / on site calibration	Better than 4 kg/m^3 / 0.25 lb/ft^3
Maximum permissible error on density caused by a deviation in process temperature from calibration temperature	
All meter sizes	±0.05 kg/m^3 per 1°C / 0.0017 lb/ft^3 per 1°F
Pressure effect on density caused by deviation in process pressure from calibration pressure	
Size 10	0.014 kg/m^{3}per bar / 0.00006 lb/ft^3 per psi
Size 15	0.032 kg/m^{3}per bar / 0.00014 lb/ft^3 per psi
Size 25	0.027 kg/m^{3}per bar / 0.00012 lb/ft^3 per psi
Size 40	0.107 kg/m^{3}per bar / 0.00046 lb/ft^3 per psi
Size 50	0.148 kg/m^{3}per bar / 0.00064 lb/ft^3 per psi
Size 80	0.300 kg/m^{3}per bar / 0.00129 lb/ft^3 per psi

Volume flow	
Measurement error and repeatability calculations satisfy the requirements of BS ISO 10790 (most recent and up to date version)	
Temperature	
Maximum permissible error	±0.5°C ±0.5% / ±0.9°F ±0.5% of reading

Operating conditions

Nominal flow rates (1 barg / 14.5 psig pressure drop)	
Meter size	
10	1200 kg/h / 44.1 lb/min
15	4500 kg/h / 165.3 lb/min
25	12000 kg/h / 440.9 lb/min
40	25000 kg/h / 918.6 lb/min
50	50000 kg/h / 1837.2 lb/min
80	125000 kg/h / 4593.0 lb/min
Maximum flow rates	
All meters	150% of nominal flow rate

Environmental

Ambient temperature	
Compact version with Aluminium converter (MFC400)	-40°C...+60°C / -40°F...+140°F
Compact version with Stainless Steel converter (MFC400)	-40°C...+60°C / -40°F...+140°F
Compact version with Stainless Steel converter (MFC020)	-40°C...+60°C / -40°F...+140°F
Remote version	-40°C...+65°C / -40°F...149°F
Hazardous Area versions	Refer to temperature limits in hazardous areas documentation
Storage conditions	-40°C...+70°C / 40°F...+158°F
Other conditions	
Protection category	IP 66 / 67 (EN 60529), 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	
Temperature range	-50°C...+180°C / -58°F...356°F
Nominal pressure at 20°C / 68°F	
Measuring tube	-1...100 barg / -14.5...1450 psig
Outer casing typical burst pressure	> 200 barg @ 20°C / 2900 psig @ 68°F
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

Measuring tubes / flanges	Stainless Steel AISI 316/316L (1.4401 / 1.4404) dual certified
Spigots	Meter size 10, and all hygienic meters, Stainless Steel AISI 316/316L (1.4401 / 1.4404) dual certified
	Meter sizes 15...80 Stainless Steel CF3M (1.4409)
Outer casing	Stainless Steel AISI 316/316L (1.4401 / 1.4404) dual certified
Junction box (remote version)	Die cast Aluminium (polyurethane coating)
	Optional Stainless Steel 316 (1.4401)

Process connections

Flange	
DIN	DN10...100 / PN16...100
ASME	½...4" / ASME 150...600
JIS	10...100A / 10...20K
Hygienic	
Tri-clamp ASME BPE	½...4"
Triclamp to DIN32676 Shape B	DN10...100
Triclamp to ISO 2037 (ISO 2852 equivalent)	½...4"
DIN 11864-1 Form A threaded ferrule (male)	DN10...100
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])	DN10...100
DIN11851 threaded ferrule Shape SC (male)	DN10...100

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

Declaration of conformity	This device fulfills the statutory requirements of the relevant directives and regulations. The manufacturer certifies successful testing of the product by applying the conformity mark.
	For further information on directives, regulations, standards and certifications, please refer to the declaration of conformity which you can download from the manufacturer's website
CE / UKCA	The device fulfils the statutory requirements of the relevant CE directives and UK designated standards. The manufacturer certifies that these requirements have been met by applying the CE and UKCA marks.
cFMus	Class I, Div 1 groups A, B, C, D (US)
	Class I, Div 1 groups C, D (Canada)
	Class II, Div 1 groups E, F, G
	Class III, Div 1 hazardous areas
	Class I, Div 2 groups A, B, C, D
	Class II, Div 2 groups F, G
	Class III, Div 2 hazardous areas

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") (most recent and up to date version)
Hazardous area markings	
OPTIMASS 5400C	
Gas, Ex e connection compartment	
II 1/2 G	Ex db eb ia IIC T6 - T1 Ga/Gb
Gas, Ex d connection compartment	
II 1/2 G	Ex db ia IIC T6 - T1 Ga/Gb
Dust	
II 2D/1G	Ex tb ia IIIC T220°C Db/Ga
OPTIMASS 5000F	
Gas	
II 1 G	Ex ia IIC T6-T1 Ga
Dust	
II 2D/1G	Ex ia IIIC T220°C Db/Ga

2.3 Atex temperature limits

OPTIMASS 5000F

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class (gas)	Max. surface temp. °C (dust)
-40...+50	50	T6 - T1	T85
-40...+65	65	T5 - T1	T100
	100	T4 - T1	T135
	165	T3 - T1	T200
	180	T2 - T1	T220
Minimum process temperature: $T_{amb} \geq$ -35°C T_m = -50°C, T_{amb} <-35°C T_m = -40°C			

OPTIMASS 5400C with aluminium converter housing

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class (gas)	Max. surface temp. °C (dust)
-40...+50	50	T6 - T1	T80
-40...+65	65	T5 - T1	T95
-40...+60	100	T4 - T1	T130
-40...+55	165	T3 - T1	T200
	180	T2 - T1	T220
Minimum process temperature: $T_{amb} \geq$ -35°C T_m = -50°C, T_{amb} <-35°C T_m = -40°C			

OPTIMASS 5400C with Stainless Steel converter housing

Ambient temp. T_{amb} °C	Max. process temp. T_m °C	Temp. class (gas)	Max. surface temp. °C (dust)
-40...+50	50	T6 - T1	T80
-40...+60	60	T5 - T1	T95
-40...+55	100	T4 - T1	T130
-40...+50	165	T3 - T1	T200
	180	T2 - T1	T220
Minimum process temperature: $T_{amb} \geq$ -35°C T_m = -50°C, T_{amb} <-35°C T_m = -40°C			

2.4 Guidelines for maximum operating pressure

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

Pressure / temperature de-rating (metric).

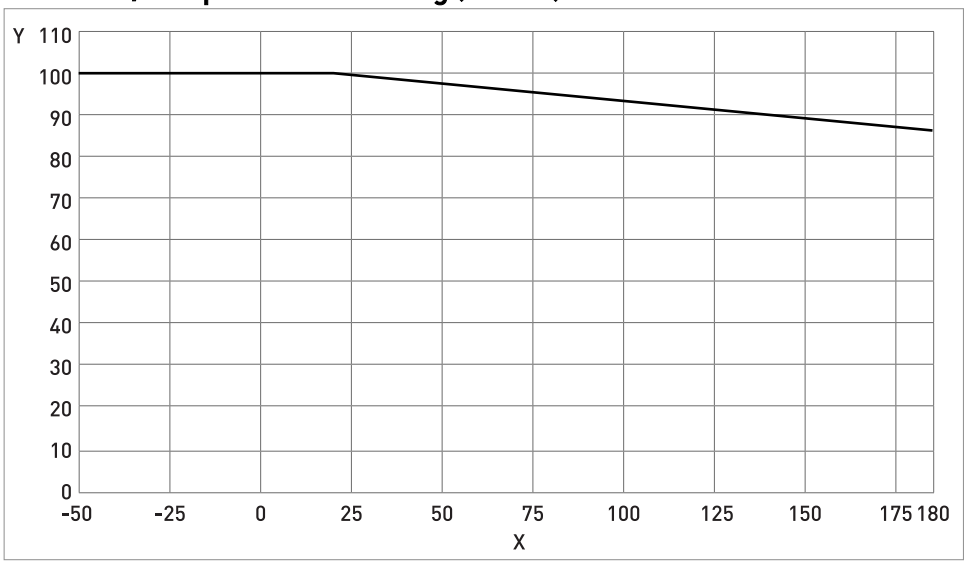


Figure 2-1: Measuring tube PED certification

X temperature [°C]
Y pressure [barg]

Pressure / temperature de-rating (imperial).

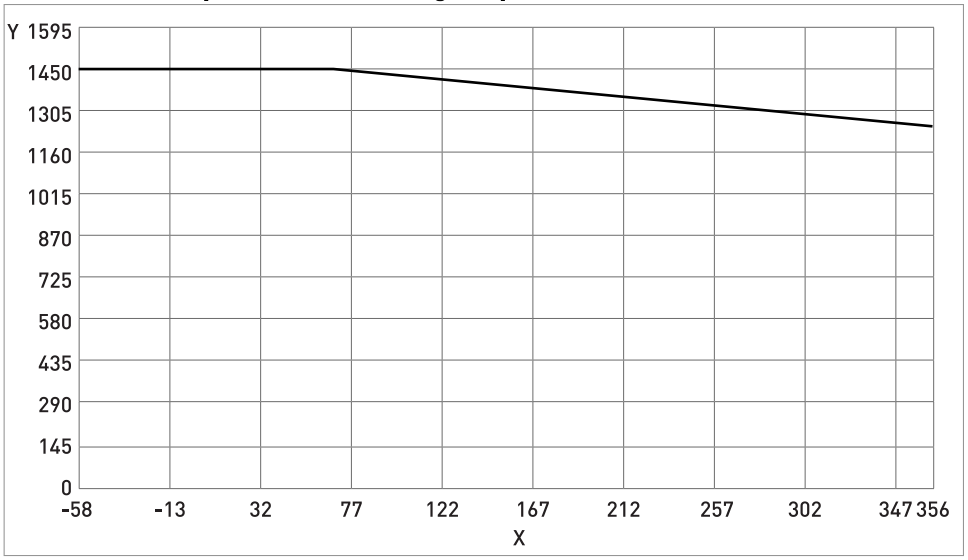


Figure 2-2: Measuring Tube PED certification

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

Notes

- The maximum operating pressure will be either the flange / hygienic connection rating or the measuring tube rating, **WHICHEVER IS THE LOWER!**
- For all connections excluding PN100 acc to EN 1092-1 and ASME B16.5 600 lbs, the lower rating will be the connection rating.
- Refer to the nameplate on the meter for the correct rating.
- For hygienic connections, the manufacturer recommends that the seals are replaced at regular intervals. This will maintain the hygienic integrity of the connection.
- For PN100 and ASME 600 lbs connections, the maximum operating pressures are shown in the tables below:

Metric

	Derating temp. °C	Max. pressure barg	Max. pressure at 180°C
PN100	20	100	86.8
ASME 600	28.6	99.3	73.5

Imperial

	Derating temp. °F	Max. pressure psig	Max. pressure at 356°F
PN100	68	1450.3	1260
ASME 600	83.5	1440.2	1067.1

2.5 Dimensions and weights

2.6 Flanged versions

Meter weights

	kg					
	S10	S15	S25	S40	S50	S80
Compact with Aluminium converter ①	9.2	12.3	14.4	22.3	32.4	51.8
Compact with Stainless Steel converter ①	15.1	18.2	20.3	28.2	38.3	57.7
Compact with Stainless Steel converter ②	7.1	10.2	12.3	20.2	30.3	49.7
Remote with Aluminium converter ①	3.6	6.7	8.9	16.8	26.8	46.3
Remote with Stainless Steel junction box ①	4.4	7.5	9.7	17.6	27.6	47.1

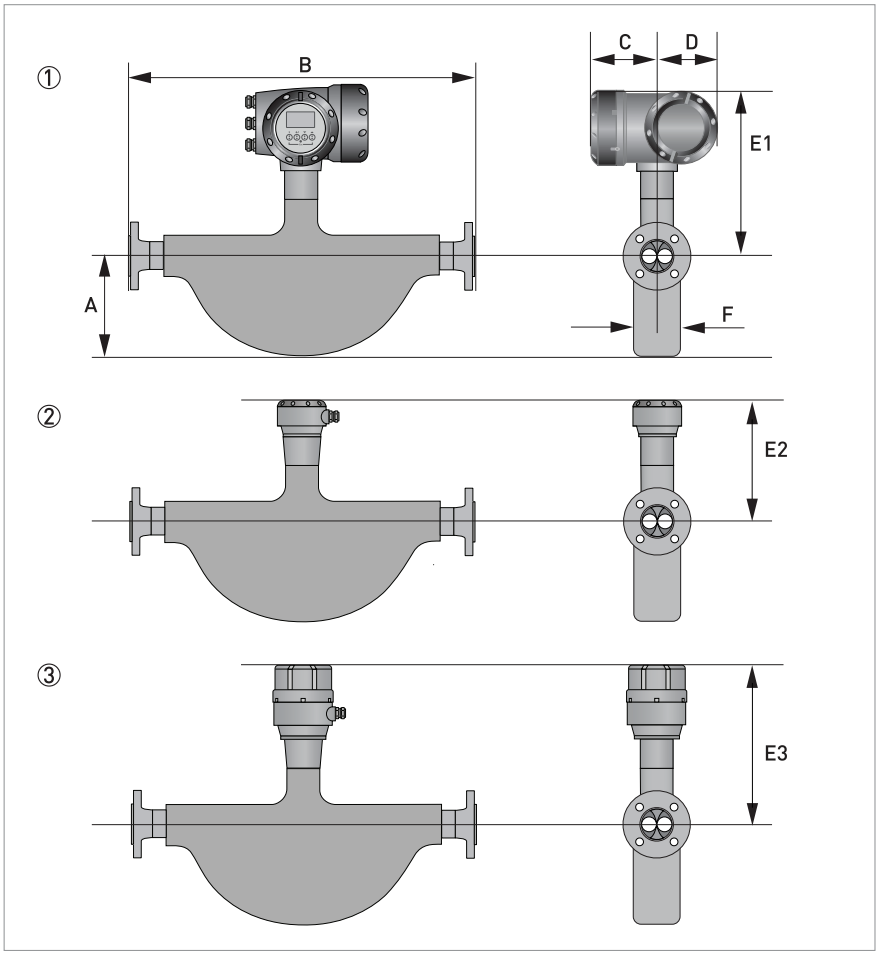
① MFC400
② MFC020

	lbs					
	S10	S15	S25	S40	S50	S80
Compact with Aluminium converter ①	20.3	27.1	31.7	49.2	71.4	114.2
Compact with Stainless Steel converter ①	33.3	40.1	44.8	62.2	84.4	127.2
Compact with Stainless Steel converter ②	15.7	22.5	27.1	44.5	66.8	109.6
Remote with Aluminium converter ①	7.9	14.8	19.6	37.0	59.1	102.1
Remote with Stainless Steel junction box ①	9.7	16.5	21.4	38.8	60.8	103.8

① MFC400
② MFC020

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 with MFC400
② Remote version with MFC400
③ Compact version with MFC020

General dimensions

	mm (±3)					
	S10	**S15**	**S25**	**S40**	**S50**	**S80**
A	103	134	152	204	246	299
C	137					
D	123					
E1	271	287	287	297	309	323
E2	204	220	220	230	242	256
E3	250	266	266	275	286	301
F	57	63	63	83	107	136

	Inches (±0.1)					
	S10	S15	S25	S40	S50	S80
A	4.1	5.3	6.0	8.0	9.7	11.8
C	5.4					
D	4.8					
E1	10.7	11.3	11.3	11.7	12.1	12.7
E2	8.0	8.6	8.6	9.0	9.5	10.1
E3	9.8	10.5	10.5	10.8	11.3	11.9
F	2.2	2.5	2.5	3.3	4.2	5.4

Dimension B

	mm (±5)					
	S10	S15	S25	S40	S50	S80
PN16						
DN50	-	-	-	-	706	-
DN80	-	-	-	-	716	866
DN100	-	-	-	-	-	896
PN40						
DN10	417	-	-	-	-	-
DN15	423	499	-	-	-	-
DN25	-	503	531	-	-	-
DN40	-	-	541	623	-	-
DN50	-	-	-	629	712	-
DN80	-	-	-	-	732	882
DN100	-	-	-	-	-	896
PN100						
DN10	437	-	-	-	-	-
DN15	437	513	-	-	-	-
DN25	-	539	567	-	-	-
DN40	-	-	575	657	-	-
DN50	-	-	-	669	752	-
DN80	-	-	-	-	772	922
DN100	-	-	-	-	-	946
ASME 150 (Raised Face)						
½¨	443	-	-	-	-	-
¾¨	453	529	-	-	-	-
1¨	-	535	563	-	-	-
1½¨	-	-	575	657	-	-
2¨	-	-	-	661	744	-
3¨	-	-	-	-	756	906
4¨	-	-	-	-	-	920

	mm (±5)					
	S10	S15	S25	S40	S50	S80
ASME 300 (Raised Face)						
½"	453	-	-	-	-	-
¾"	463	539	-	-	-	-
1"	-	547	575	-	-	-
1½"	-	-	589	671	-	-
2"	-	-	-	673	756	-
3"	-	-	-	-	776	926
4"	-	-	-	-	-	938
ASME 600 (Raised Face)						
½"	465	-	-	-	-	-
¾"	475	551	-	-	-	-
1"	-	561	589	-	-	-
1½"	-	-	605	687	-	-
2"	-	-	-	693	776	-
3"	-	-	-	-	796	946
4"	-	-	-	-	-	984
JIS 10K						
50A	-	-	-	613	696	-
80A	-	-	-	-	706	856
100A	-	-	-	-	-	856
JIS 20K						
10A	413	-	-	-	-	-
15A	415	491	-	-	-	-
25A	-	499	527	-	-	-
40A	-	-	533	615	-	-
50A	-	-	-	617	700	-
80A	-	-	-	-	718	868
100A	-	-	-	-	-	882

	Inches (±0.2)					
	S10	S15	S25	S40	S50	S80
PN16						
DN50	-	-	-	-	27.8	-
DN80	-	-	-	-	28.2	34.1
DN100	-	-	-	-	-	35.3
PN40						
DN10	16.4	-	-	-	-	-
DN15	16.7	19.6	-	-	-	-
DN25	-	19.8	20.9	-	-	-
DN40	-	-	21.3	24.5	-	-

	Inches (±0.2)					
	S10	S15	S25	S40	S50	S80
DN50	-	-	-	24.8	28.0	-
DN80	-	-	-	-	28.8	34.7
DN100	-	-	-	-	-	35.3
PN100						
DN10	17.2	-	-	-	-	-
DN15	17.2	20.2	-	-	-	-
DN25	-	21.2	22.3	-	-	-
DN40	-	-	22.6	25.9	-	-
DN50	-	-	-	26.3	29.6	-
DN80	-	-	-	-	30.4	36.3
DN100	-	-	-	-	-	37.2
ASME 150 (Raised Face)						
½¨	17.5	-	-	-	-	-
¾¨	17.8	20.8	-	-	-	-
1¨	-	21.1	22.2	-	-	-
1½¨	-	-	22.6	25.9	-	-
2¨	-	-	-	26.0	29.3	-
3¨	-	-	-	-	29.8	35.7
4¨	-	-	-	-	-	36.2
ASME 300 (Raised Face)						
½¨	17.8	-	-	-	-	-
¾¨	18.2	21.2	-	-	-	-
1¨	-	21.5	22.6	-	-	-
1½¨	-	-	23.2	26.4	-	-
2¨	-	-	-	26.5	29.8	-
3¨	-	-	-	-	30.6	36.5
4¨	-	-	-	-	-	36.9
ASME 600 (Raised Face)						
½¨	18.3	-	-	-	-	-
¾¨	18.7	21.7	-	-	-	-
1¨	-	27.4	23.2	-	-	-
1½¨	-	-	23.8	27.0	-	-
2¨	-	-	-	27.3	30.6	-
3¨	-	-	-	-	31.3	37.2
4¨	-	-	-	-	-	38.7
JIS 10K						
50A	-	-	-	24.1	27.4	-
80A	-	-	-	-	27.8	33.7
100A	-	-	-	-	-	33.7
JIS 20K						
10A	16.3	-	-	-	-	-

	Inches (±0.2)					
	S10	S15	S25	S40	S50	S80
15A	16.3	19.3	-	-	-	-
25A	-	19.6	20.7	-	-	-
40A	-	-	21.0	24.2	-	-
50A	-	-	-	24.3	27.6	-
80A	-	-	-	-	28.3	34.2
100A	-	-	-	-	-	34.7

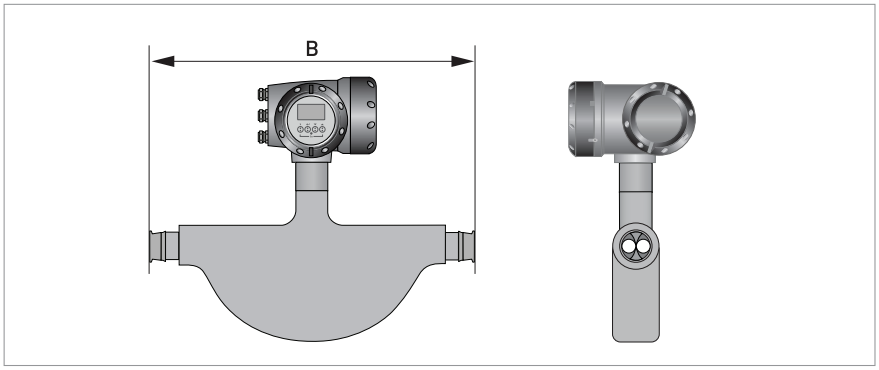
2.6.1 NAMUR dimensions

The following face to face dimensions comply with NAMUR NE132

mm (±3)						
	S10	S15	S25	S40	S50	S80
PN16						
DN100	-	-	-	-	-	1000
PN40						
DN 15	510	510	-	-	-	-
DN 25	-	-	600	-	-	-
DN 50	-	-	-	715	715	-
DN 80	-	-	-	-	-	915

Inches (±0.1)						
	S10	S15	S25	S40	S50	S80
PN16						
DN100	-	-	-	-	-	39.4
PN40						
DN 15	20.1	20.1	-	-	-	-
DN 25	-	-	23.6	-	-	-
DN 50	-	-	-	28.1	28.1	-
DN 80	-	-	-	-	-	36.0

2.7 Hygienic versions



Dimension B

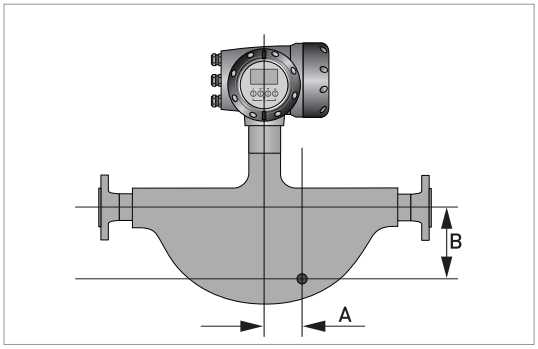
	mm (±5)					
	S10	S15	S25	S40	S50	S80
Tri-clamp ASME BPE						
½"	413	-	-	-	-	-
¾	413	-	-	-	-	-
1"	-	489	-	-	-	-
1½"	-	-	533	-	-	-
2"	-	-	-	608	-	-
3"	-	-	-	-	682	-
4"	-	-	-	-	-	876
Tri-clamp ISO 2037 (ISO 2852 equivalent)						
½"	-	-	-	-	-	-
¾"	-	-	-	-	-	-
1"	-	489	-	-	-	-
1½"	-	-	502	-	-	-
2"	-	-	-	595	-	-
3"	-	-	-	-	667	-
4"	-	-	-	-	-	844
Tri-clamp DIN 32676						
DN10	409	-	-	-	-	-
DN15	413	-	-	-	-	-
DN25	-	468	-	-	-	-
DN40	-	-	515	-	-	-
DN50	-	-	-	594	-	-
DN80	-	-	-	-	686	-
DN100	-	-	-	-	-	824
DIN 11864-1 Form A						
DN10	415	-	-	-	-	-
DN15	413	-	-	-	-	-
DN25	-	489	-	-	-	-

	mm (±5)					
	S10	S15	S25	S40	S50	S80
DN40	-	-	543	-	-	-
DN50	-	-	-	625	-	-
DN80	-	-	-	-	738	-
DN100	-	-	-	-	-	876
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])						
DN10	429	-	-	-	-	-
DN15	413	-	-	-	-	-
DN25	-	508	-	-	-	-
DN40	-	-	562	-	-	-
DN50	-	-	-	641	-	-
DN80	-	-	-	-	746	-
DN100	-	-	-	-	-	884
Male thread DIN 11851						
DN10	421	-	-	-	-	-
DN15	413	-	-	-	-	-
DN25	-	483	-	-	-	-
DN40	-	-	538	-	-	-
DN50	-	-	-	621	-	-
DN80	-	-	-	-	720	-
DN100	-	-	-	-	-	876

	inches (±0.2)					
	S10	S15	S25	S40	S50	S80
Tri-clamp ASME BPE						
½¨	16.3	-	-	-	-	-
¾	16.3	-	-	-	-	-
1¨	-	19.3	-	-	-	-
1½¨	-	-	21.0	-	-	-
2¨	-	-	-	23.9	-	-
3¨	-	-	-	-	26.9	-
4"	-	-	-	-	-	34.5
Tri-clamp ISO 2037 (ISO 2852 equivalent)						
½¨	-	-	-	-	-	-
¾¨	-	-	-	-	-	-
1¨	-	19.3	-	-	-	-
1½¨	-	-	19.8	-	-	-
2¨	-	-	-	23.4	-	-
3¨	-	-	-	-	26.3	-
4"	-	-	-	-	-	33.2

	inches (±0.2)					
	S10	S15	S25	S40	S50	S80
Tri-clamp DIN 32676						
DN10	16.1	-	-	-	-	-
DN15	16.3	-	-	-	-	-
DN25	-	18.4	-	-	-	-
DN40	-	-	20.3	-	-	-
DN50	-	-	-	23.4	-	-
DN80	-	-	-	-	27.0	-
DN100	-	-	-	-	-	32.4
DIN 11864-1 Form A						
DN10	16.4	-	-	-	-	-
DN15	16.3	-	-	-	-	-
DN25	-	19.3	-	-	-	-
DN40	-	-	21.4	-	-	-
DN50	-	-	-	24.6	-	-
DN80	-	-	-	-	29.1	-
DN100	-	-	-	-	-	34.5
DIN 11864-2 Form A, flange with groove (Nutflansch [NF])						
DN10	16.9	-	-	-	-	-
DN15	16.3	-	-	-	-	-
DN25	-	20.0	-	-	-	-
DN40	-	-	22.1	-	-	-
DN50	-	-	-	25.2	-	-
DN80	-	-	-	-	29.4	-
DN100	-	-	-	-	-	34.8
Male thread DIN 11851						
DN10	16.6	-	-	-	-	-
DN15	16.3	-	-	-	-	-
DN25	-	19.0	-	-	-	-
DN40	-	-	21.2	-	-	-
DN50	-	-	-	24.4	-	-
DN80	-	-	-	-	28.3	-
DN100	-	-	-	-	-	34.5

2.8 Burst disc option



Dimensions

	mm					
	S10	S15	S25	S40	S50	S80
A	27	30	32	40		
B	54	83	100	147	172	210

	inches					
	S10	S15	S25	S40	S50	S80
A	1.06	1.18	1.26	1.57		
B	2.13	3.27	3.94	5.79	6.77	8.27

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.

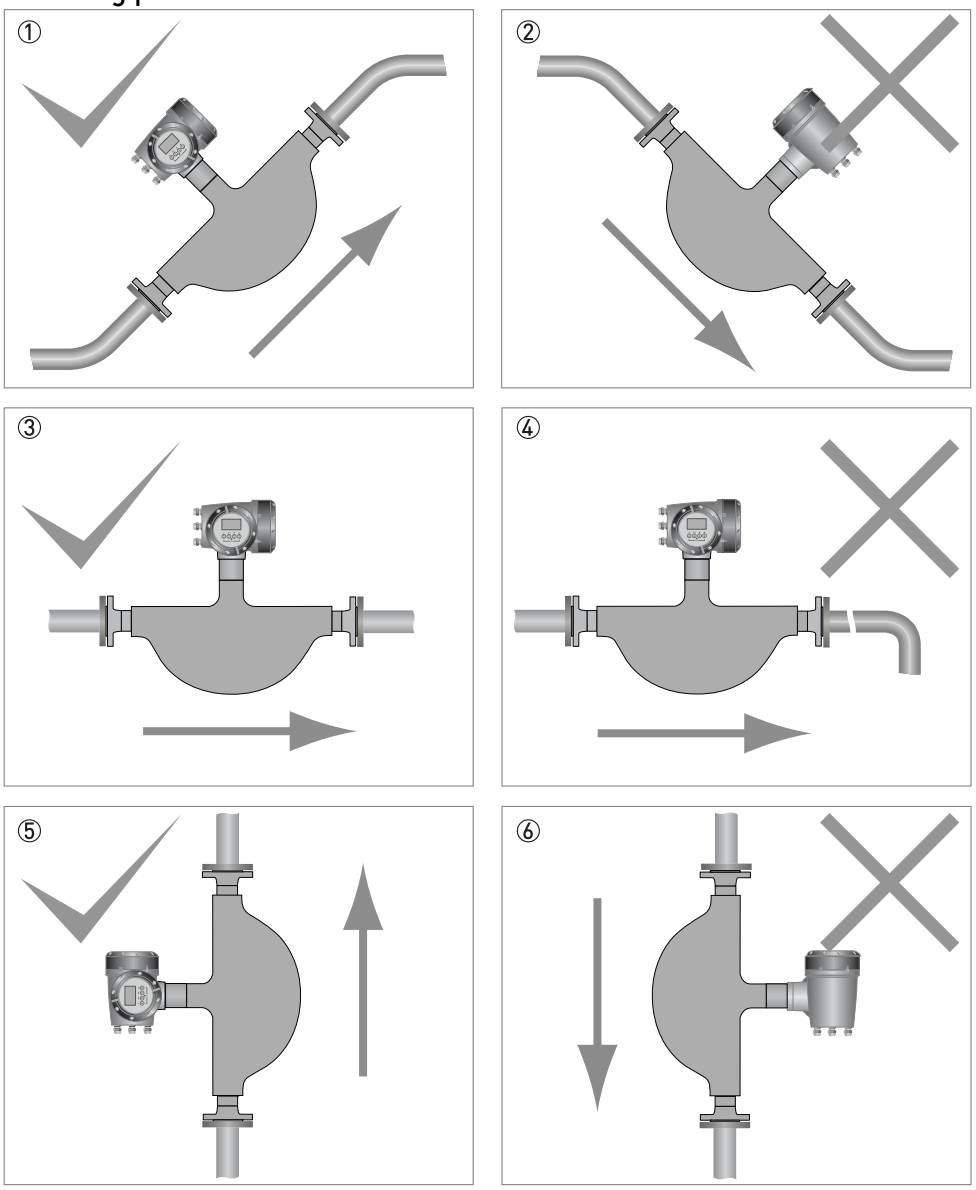
3.2 Mounting restrictions

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.

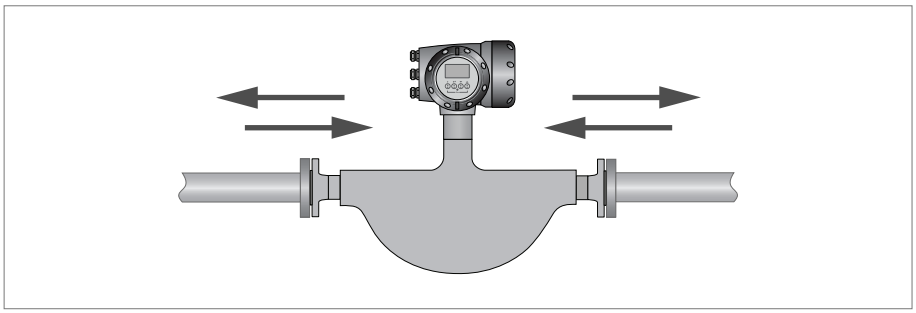
Mounting positions



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

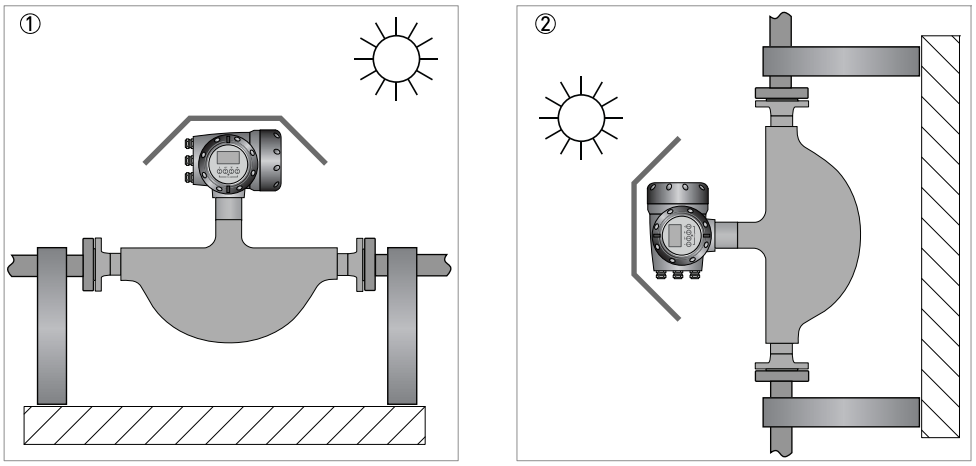
3.2.2 Maximum pipework forces (end loadings)



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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