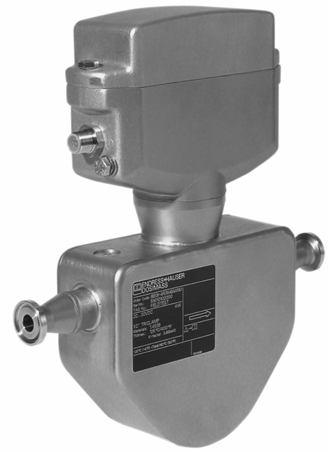
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Technical Information

Dosimass

Coriolis Mass Flow Measuring System
For filling applications



Application
Suitable for use as a mass or volume flowmeter for filling applications.

Liquids with the most diverse properties from the following branches can be measured:
- Food and beverage industry
- Cosmetics industry
- Pharmaceutical industry
- Chemical industry
- Petrochemicals

Your benefits

- Small size meets the requirements for installation on rotary and linear filling machines
- Highly accurate
- Easy operation via the E+H "FieldCare" operating software:
  - Graphic display allows exact analysis and optimisation of the batching process
  - Complete system documentation can be created with device configuration and batching diagram
- 3A-authorized
- CIP, SIP cleaning as well as external cleaning with aggressive media
- No moving parts

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Function and system design

Measuring principle

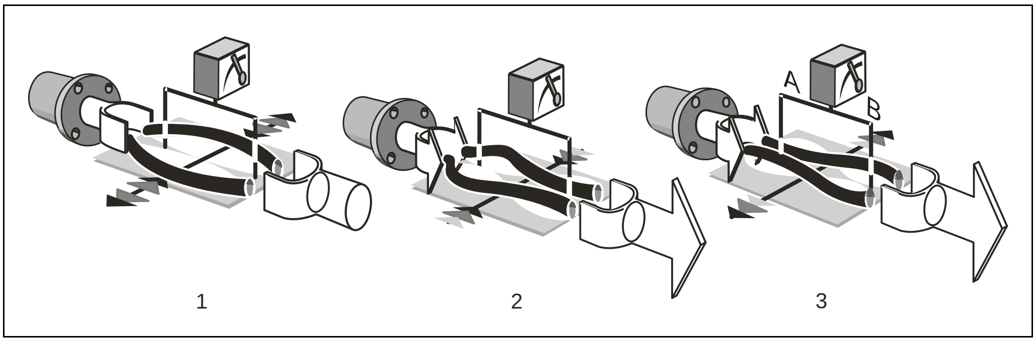
The measuring principle is based on the controlled generation of Coriolis forces. These forces are always present when both translational and rotational movements are superimposed.

$F_C = 2 \cdot \Delta m \; (v \cdot \omega)$
F_C = Coriolis force
Δm = moving mass
ω = rotational velocity
v = radial velocity in rotating or oscillating system

The amplitude of the Coriolis force depends on the moving mass Δm, its velocity v in the system, and thus on the mass flow. Instead of a constant angular velocity ω, the Promass sensor uses oscillation.

In the sensor, two parallel measuring tubes containing flowing fluid oscillate in antiphase, acting like a tuning fork. The Coriolis forces produced at the measuring tubes cause a phase shift in the tube oscillations (see illustration):

- At zero flow, in other words when the fluid is at a standstill, the two tubes oscillate in phase (1).
- Mass flow causes deceleration of the oscillation at the inlet of the tubes (2) and acceleration at the outlet (3).



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The phase difference (A-B) increases with increasing mass flow. Electrodynamic sensors register the tube oscillations at the inlet and outlet.
System balance is ensured by the antiphase oscillation of the two measuring tubes. The measuring principle operates independently of temperature, pressure, viscosity, conductivity and flow profile.

Density measurement
The measuring tubes are continuously excited at their resonance frequency. A change in the mass and thus the density of the oscillating system (comprising measuring tubes and fluid) results in a corresponding, automatic adjustment in the oscillation frequency. Resonance frequency is thus a function of fluid density.
The microprocessor utilises this relationship to obtain a density signal.

Temperature measurement
The temperature of the measuring tubes is determined in order to calculate the compensation factor due to temperature effects. This signal corresponds to the process temperature and is also available as an output.

Measuring system

The measuring system is a compact unit consisting of a sensor and transmitter.

Input

Measured variable

- Mass flow (proportional to the phase difference between two sensors mounted on the measuring tube to register a phase shift in the oscillation)
- Volume flow (calculated from mass flow and density)
- Fluid Density (proportional to resonance frequency of the measuring tube)
- Fluid temperature (measured with temperature sensors)

Measuring range

DN		Range for full scale values (liquids) $\dot{m}_{min}$ to $\dot{m}_{max}$	
[mm]	[inch]	[kg/h]	[lb/min]
08	3/8"	0 to 2000	0 to 74
15	½"	0 to 6500	0 to 239
25	1"	0 to 18000	0 to 662

Select nominal diameter by optimising between required flow range and permissible pressure loss (→ 🗎 15).
- The minimum recommended full scale value is approx. 1/20 of the maximum full scale value.
- In most applications, 20 to 50% of the maximum full scale value can be considered ideal.
- Select a lower full scale value for abrasive substances such as fluids with entrained solids (flow velocity < 1 m/s (3.28 ft/s)).

Operable flow range

Greater than 1000 :1
Flows above the preset full scale value do not overload the amplifier, i.e. totalized flow values are registered correctly.

Output

Output signal

Pulse output:
Passive, max. 30 VDC/25 mA, pulse value and pulse polarity can be selected, pulse width adjustable (0.05 ms to 1 s).

Note!
The device may only be connected to SELV, PELV or CLASS 2 circuits.

Signal on alarm

Pulse output → behaviour can be selected
Transistor status output not conducting in the event of a fault/notice (depending on setting) or if the power supply fails.

Low flow cut off

Switch point for low flow cut off selectable.

Galvanic isolation

The power supply and outputs are galvanically isolated from one another.

Switching output

Status output:
Passive, max. 30 VDC/25 mA

Note!
The device may only be connected to SELV, PELV or CLASS 2 circuits.

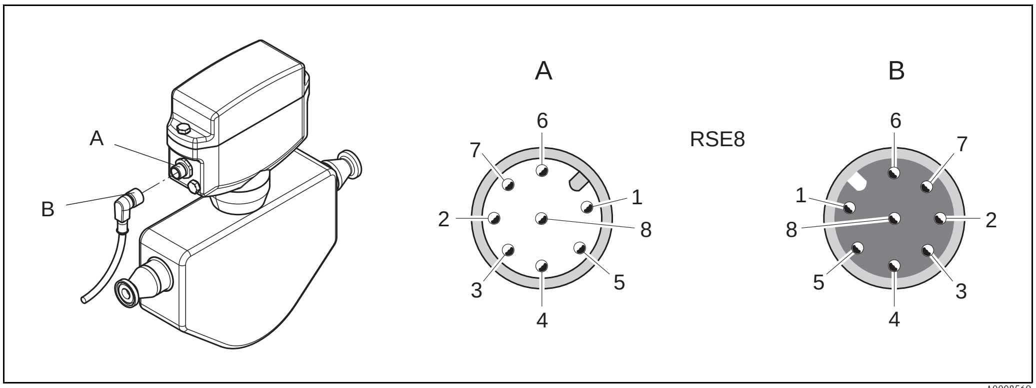
Power supply

Electrical connections

Direct connection without adapter

The direct electrical connection of the device is established using a Lumberg connector (type RSE8, M12 × 1).

Note!
For the direct connection without adapter, an appropriate cable without continuation of the service interface has to be used, e.g. cable RKWTN8-56/5 P92, Lumberg.

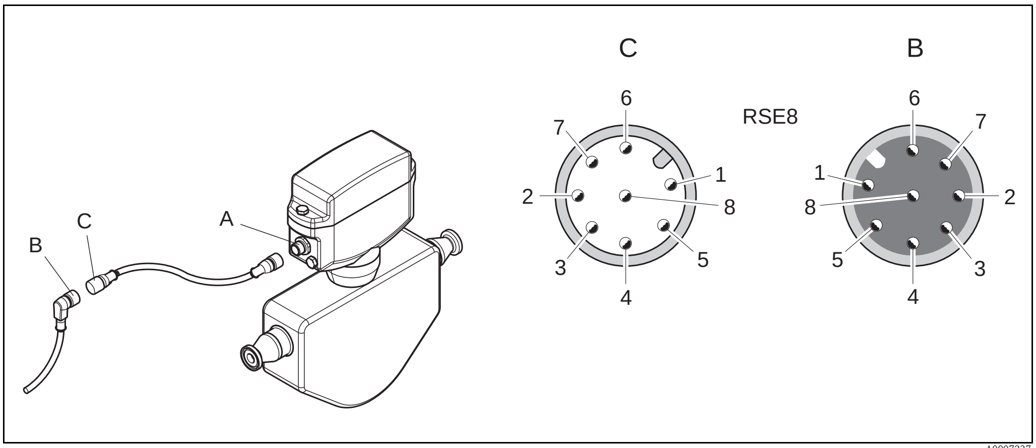


Wiring diagram of the direct connection without adapter

A Socket at device
B Cable connector

1 (+), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
2 (–), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
3 (+), pulse, status output (max. 30 V)
4 (–), pulse output (max. 25 mA)
5 (–), status output (max. 25 mA)
6 Service interface (may not be connected during normal operation)
7 Service interface (may not be connected during normal operation)
8 Service interface (may not be connected during normal operation)

Connection with adapter 8 → 8pole (power supply, pulse output, status output)



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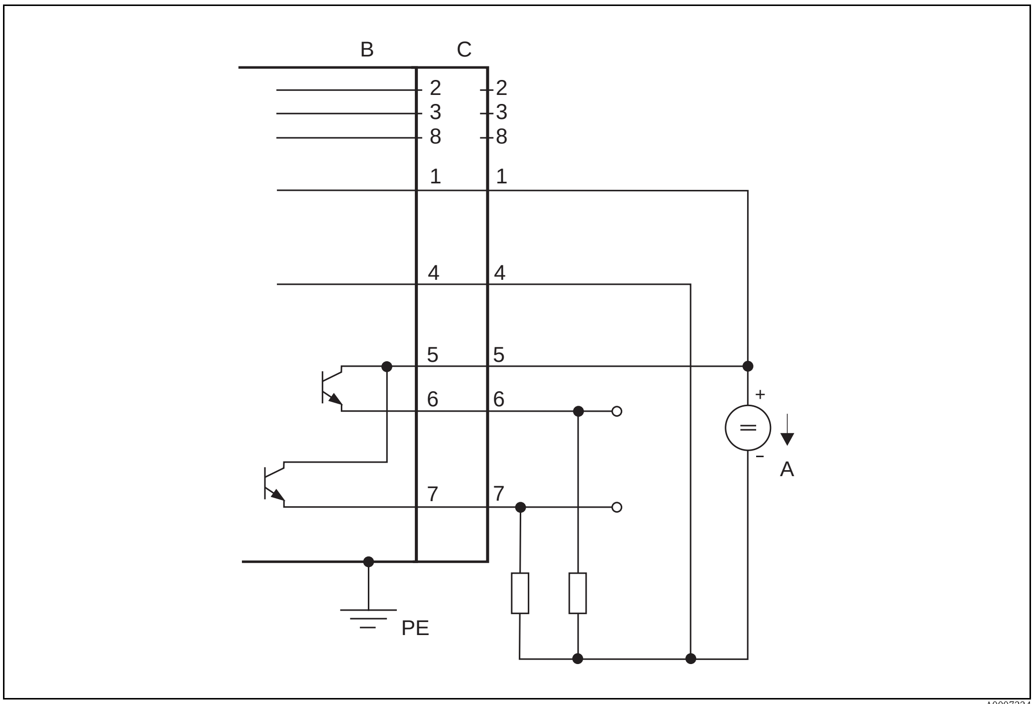
Wiring diagram with adapter 8 → 8pole

A Socket at device
B Cable connector
C Adapter

1 (+), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
2 (–), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
3 (+), pulse, status output (max. 30 V)
4 (–), pulse output (max. 25 mA)
5 (–), status output (max. 25 mA)
6 Unconnected
7 Unconnected
8 Unconnected



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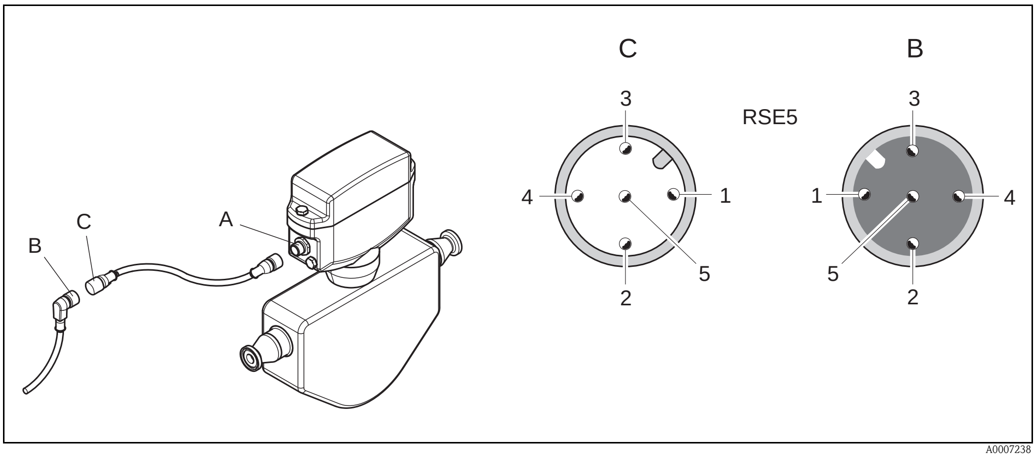
Connection example with adapter 8 → 8pole (Adapter RSE8, 50107169)

A PELV or SELV power supply
B Housing
C Adapter

Contact assignment → Wiring diagram with adapter 8 → 8pole

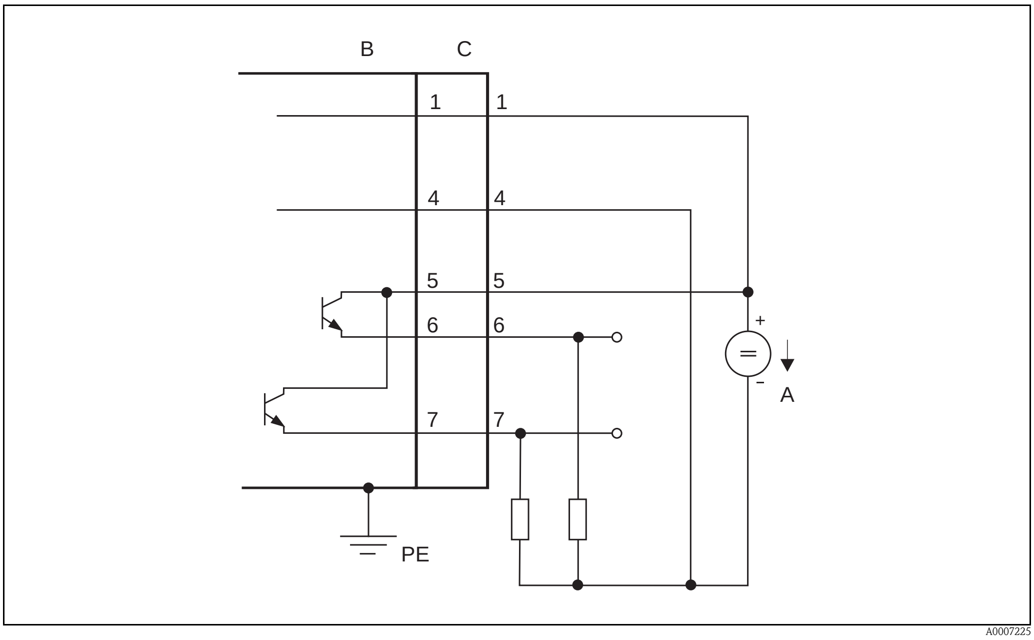
Connection with adapter 8 → 5pole (power supply, pulse output, status output)



Wiring diagram with adapter 8 → 5pole

A *Socket at device*
B *Cable connector*
C *Adapter*

1 *(+), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)*
2 *(–), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)*
3 *(+), pulse, status output (max. 30 V)*
4 *(–), pulse output (max. 25 mA)*
5 *(–), status output (max. 25 mA)*

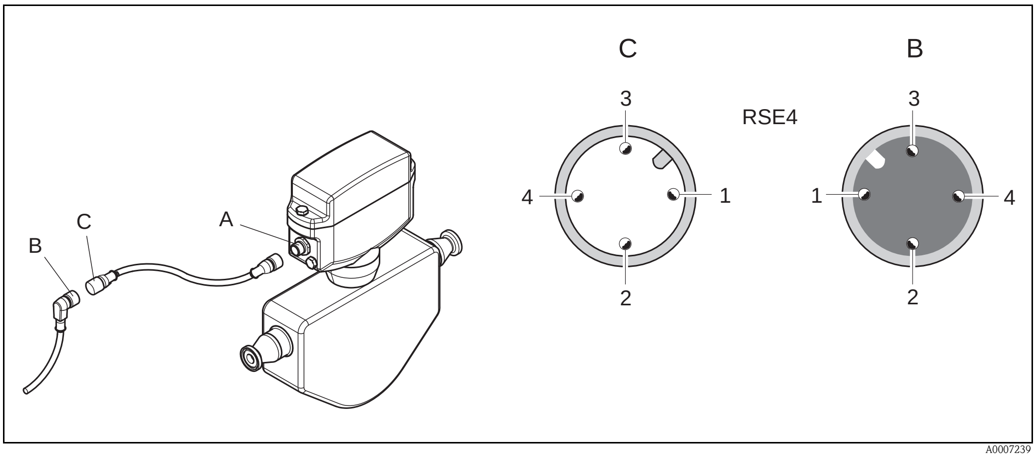


Connection example with adapter 8 → 5pole (Adapter RSE5, 50107168)

A *PELV or SELV power supply*
B *Housing*
C *Adapter*

Contact assignment → Wiring diagram with adapter 8 → 5pole

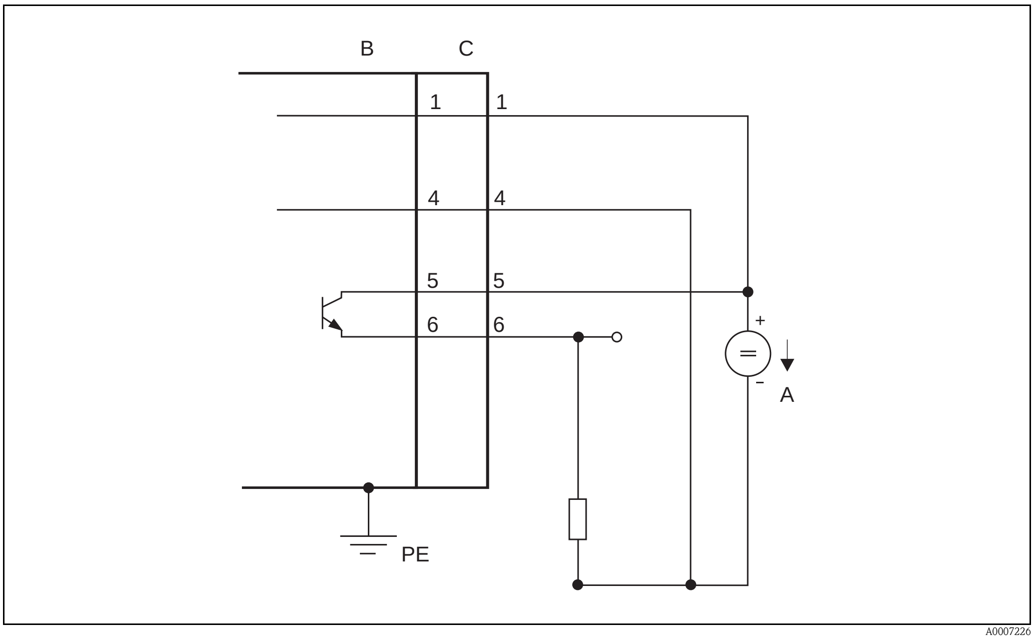
Connection with adapter 8 → 4pole (power supply, pulse output)



Wiring diagram with adapter 8 → 4pole

A Socket at device
B Cable connector
C Adapter

1 (+), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
2 (–), power supply (24 VDC nominal voltage (20 to 30 VDC), 4.3 W)
3 (+), pulse, status output (max. 30 V)
4 (–), pulse output (max. 25 mA)



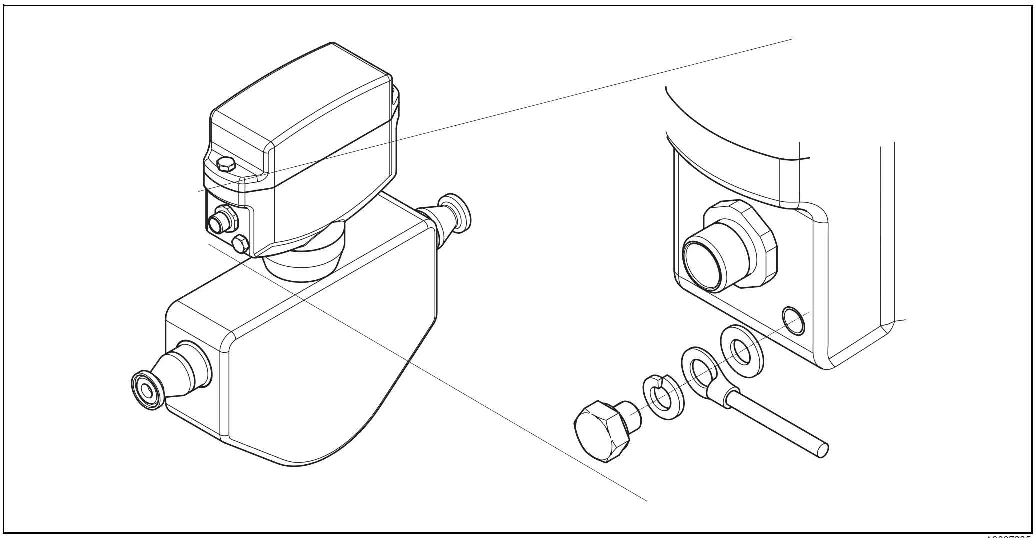
Connection example with adapter 8 → 4pole (Adapter RSE4, 50107167)

A PELV or SELV power supply
B Housing
C Adapter

Contact assignment → Wiring diagram with adapter 8 → 4pole

Ground connection

The ground connection is established via a cable lug.



Dosimass ground connection

Supply voltage	24 VDC nominal voltage (20 to 30 VDC) ✎ Note! ▪ The power supply may not exceed a maximum short-circuit current of 50 A. ▪ The device may only be connected to SELV, PELV or CLASS 2 circuits.
Power consumption	max. 4.3 W Switch-on current: max. 1 A (< 6 ms)
Power supply failure	Lasting min. 20 ms: all sensor and measuring point data remain in the DAT memory module
Potential equalisation	No special measures for potential equalization are required. For instruments for use in hazardous areas, observe the corresponding guidelines in the specific Ex documentation.
Cable connection	Lumberg plug (RSE8, M12 × 1) for power supply and signal outputs
Cable specification	Every suitable cable with a temperature specification at least 20 °C (68 °F) higher than the ambient temperature in the application. We recommend you use a cable with a temperature specification of +80 °C (+176 °F).

Performance characteristics

Reference operating conditions

- Error limits following ISO/DIS 11631
- Water with +15 to +45 °C (+59 to +113 °F) at 2 to 6 bar (29 to 87 psi)
- Specifications as per calibration protocol ±5 °C (±9 °F) and ±2 bar (±29 psi)
- Accuracy based on accredited calibration rigs that are traced to ISO 17025

Maximum measured error

o.r. = of reading; 1 g/cm^3 = 1 kg/l

Mass flow (depends on the calibration):
±0.15% o.r. (1 to 4 m/s (3.28 to 13.1 ft/s))
or
±0.3% ± [(zero point stability : measured value) · 100]% o.r.
or
±5% ± [(zero point stability : measured value) · 100]% o.r.

Density (liquids):

Reference conditions
- ±0.0005 g/cm^3

Field density calibration [(1)]
- ±0.0005 g/cm^3

Standard density calibration [(2)]
- ±0.02 g/cm^3

(1) After on-site field density calibration under process reference conditions
(2) Performed on all sensors, valid over entire medium temperature and density range (→ 14)

Zero point stability:

DN		Max. full scale value		Zero point stability	
[mm]	[inch]	[kg/h]	[lb/min]	[kg/h]	[lb/min]
08	3/8"	2000	74	0.20	0.0074
15	½"	6500	239	0.65	0.0239
25	1"	18000	662	1.8	0.0662

Calculation example:
Give that: Dosimass DN 15, flow = 1300 kg/h (47.8 lb/min)
Measured error: ±0.3% ± [(zero point stability : measured value) · 100]% o.r.

Measured error: ±0.3% ± (0,65 kg/h : 1300 kg/h) · 100% = ±0.35%
±0.3% ± (0,0239 lb/min : 47,8 lb/min) · 100% = ±0.35%

Repeatability

Dosing time [s]	Standard deviation [%]
≥ 0.75	0.2
≥ 1.5	0.1
≥ 3.0	0.05

Density (liquids): ±0.00025 g/cm^3

Influence of medium temperature

When there is a difference between the temperature for zero point adjustment and the process temperature, the typical measured error is ±0.0003% of the full scale value/°C.

Influence of medium pressure

The effect of a difference in pressure between the calibration pressure and the process pressure on the measured error for mass flow is negligible.

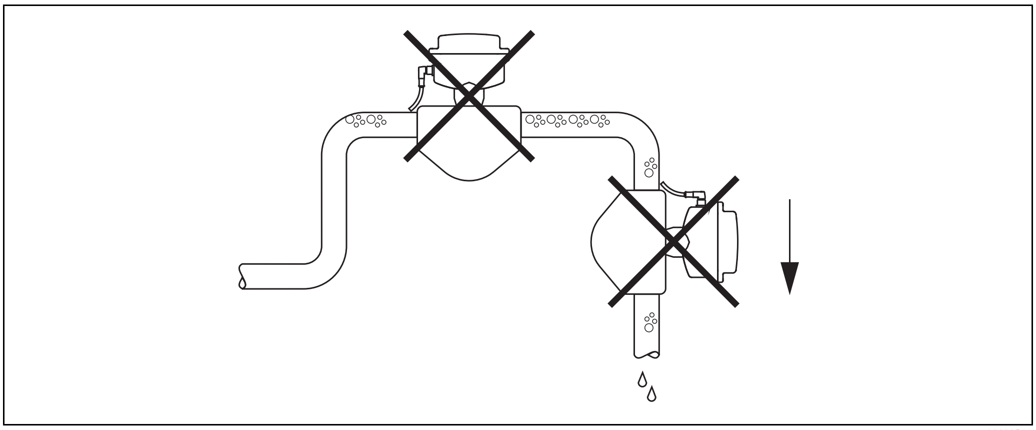
Operating conditions: Installation

Installation instructions

Note the following points:
- No special measures such as supports are necessary. External forces are absorbed by the construction of the instrument.
- The high oscillation frequency of the measuring tubes ensures that the correct operation of the measuring system is not influenced by plant vibrations.
- No special precautions need to be taken for fittings which create turbulence (valves, elbows, Tpieces, etc.), as long as no cavitation occurs.

Mounting location

Correct measurement is only possible if the pipe is filled. **For this reason, avoid** the following mounting locations in the pipe:
- At the highest point of the pipeline. Risk of air accumulating!
- Directly upstream of a free pipe outlet in a down pipe.



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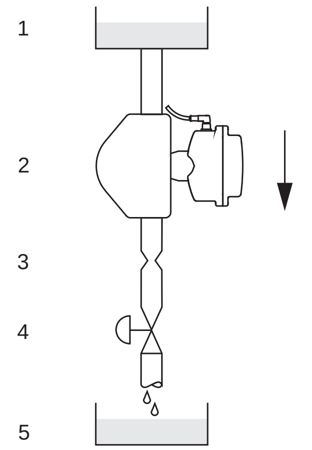
The following proposed installation, however, permits installation in an open down pipe. Pipe restrictors or the use of an orifice with a cross-section smaller than the nominal diameter prevent the pipe from running empty during measurement.



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Installation in a down pipe (e.g. for batching applications)

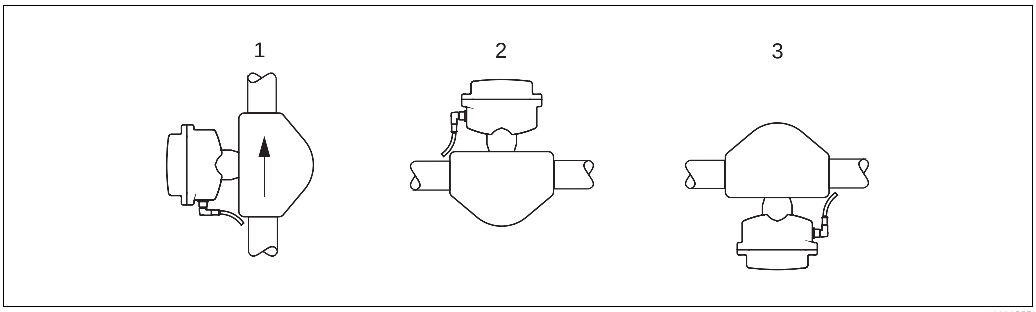
1 = Supply tank, 2 = Sensor, 3 = Orifice plate, pipe restriction, 4 = Valve, 5 = Batching tank

Dosimass / DN	8 (3/8")	15 (½")	25 (1")
Ø Orifice plate, pipe restriction	6 mm (0.24 in)	10 mm (0.39 in)	14 mm (0.55 in)

Orientation

Vertical Orientation (View 1):
Recommended orientation with upward direction of flow. When fluid is not flowing, entrained solids will sink down and gases will rise away from the measuring tube. The measuring tubes can be completely drained and protected against solids build-up.

Horizontal Orientation (View 2, 3):
The measuring tubes of Dosimass must be horizontal and beside each other. When installation is correct, the transmitter housing is above or below the pipe. Always avoid having the transmitter housing in a lateral position.



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Fluid temperature

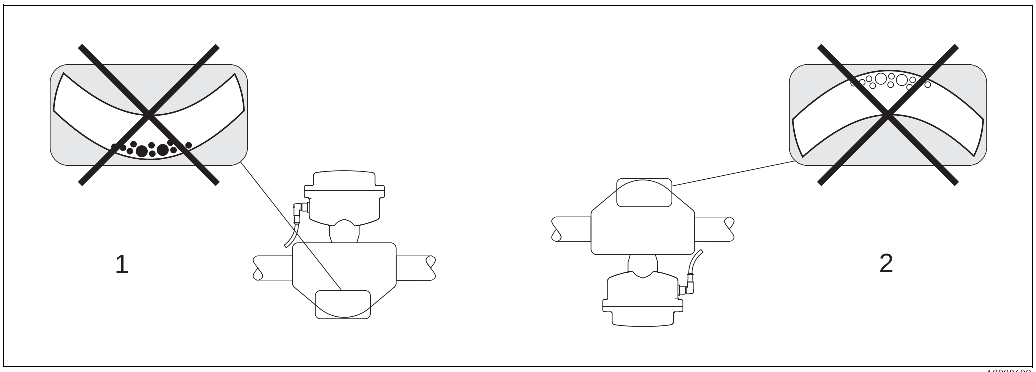
Caution!
Hot surface temperatures can arise at the housing of the device if fluid temperatures are > 70 °C (158 °F).

In order to ensure that the maximum permissible ambient temperature for the transmitter (–20 to +60 °C / –4 to +140 °F) is not exceeded, we recommend the following orientations:

- High fluid temperature
  - Vertical piping: installation in accordance with View 1
  - Horizontal piping: installation in accordance with View 3
- Low fluid temperature
  - Vertical piping: installation in accordance with View 1
  - Horizontal piping: installation in accordance with View 2

Fluid properties

Caution!
The measuring tubes of Dosimass are slightly curved. The position of the sensor, therefore, has to be matched to the fluid properties when the sensor is installed horizontally.



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1 Not suitable for fluids with entrained solids. Risk of solids accumulating.
2 Not suitable for outgassing fluids. Risk of air accumulating.

Heating, heating insulation

Some fluids require suitable measures to avoid loss of heat or heat supply at the sensor.
A wide range of materials can be used to provide the required thermal insulation. Heating can be electric, e.g. with electric band heaters, or by means of hot water or steam pipes made of copper.

Caution!
Risk of electronics overheating!
- Consequently, make sure that the adapter between sensor and transmitter always remains free of insulating material. Note that a certain orientation might be required, depending on the fluid temperature (→ 12).
- For information on the permitted ambient air temperature ranges → 14

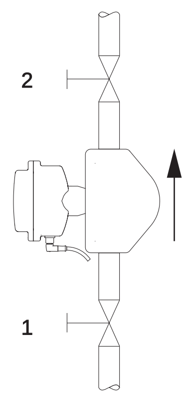
Zero point adjustment

All devices are calibrated to state-of-the-art technology. The zero point determined in this way is imprinted on the nameplate. Calibration takes place under reference conditions → 10.
For this reason, the measure generally does **not** require zero point adjustment!

Experience shows that the zero point adjustment is advisable only in special cases:
- To achieve highest measuring accuracy also with very small flow rates.
- Under extreme process or operating conditions (e.g. very high process temperatures or very high-viscosity fluids).

A zero point adjustment can be performed only with fluids that contain no gas or solid contents.
A zero point adjustment is performed with the measuring tubes completely filled and at zero flow (v = 0 m/s). This can be achieved, for example, with shut-off valves upstream and/or downstream of the sensor or by using existing valves and gates.

- Normal operation → valves 1 and 2 open
- Zero point adjustment with pump pressure → valve 1 open / valve 2 closed
- Zero point adjustment without pump pressure → valve 1 closed / valve 2 open



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Inlet and outlet runs

There are no installation requirements regarding inlet and outlet runs.

System pressure

It is important to ensure that cavitation does not occur because it would influence the oscillation of the measuring tube. No special measures need to be taken for fluids which have properties similar to water under normal conditions.
In the case of liquids with a low boiling point (hydrocarbons, solvents, liquefied gases) or in suction lines, it is important to ensure that pressure does not drop below the vapour pressure and that the liquid does not start to boil. It is also important to ensure that the gases that occur naturally in many liquids do not outgas. Such effects can be prevented when system pressure is sufficiently high.

Consequently, it is generally best to install the sensor:
- downstream from pumps (no danger of vacuum),
- at the lowest point in an ascending pipeline.

Operating conditions: Environment

Ambient temperature range	–20 to +60 °C (–4 to +140 °F) (sensor, transmitter) Install the device at a shady location. Avoid direct sunlight, particularly in warm climatic regions.
Storage temperature	–40 to +80 °C (–40 to +176 °F) (preferably +20 °C (+68 °F))
Degree of protection	Standard: IP 67 (NEMA 4X) for transmitter and sensor
Shock resistance	In accordance with IEC 68-2-31
Vibration resistance	Acceleration up to 1 g, 10 to 150 Hz, following IEC 68-2-6
Electromagnetic compatibility (EMC)	To IEC/EN 61326 and NAMUR Recommendation NE 21

Operating conditions: Process

Medium temperature range	Sensor: ▪ –40 to +125 °C (–40 to +257 °F) CIP/SIP cleaning (< 60 min): ▪ +150 °C (+302 °F) Seals: ▪ no internal seals Medium density: ▪ 0 to 5000 kg/m^3 (0 to 312 lb/cf)
Medium pressure range	Max. 100 bar (1450 psi), depending on process connection
Limiting flow	→ 📄 4, measuring range

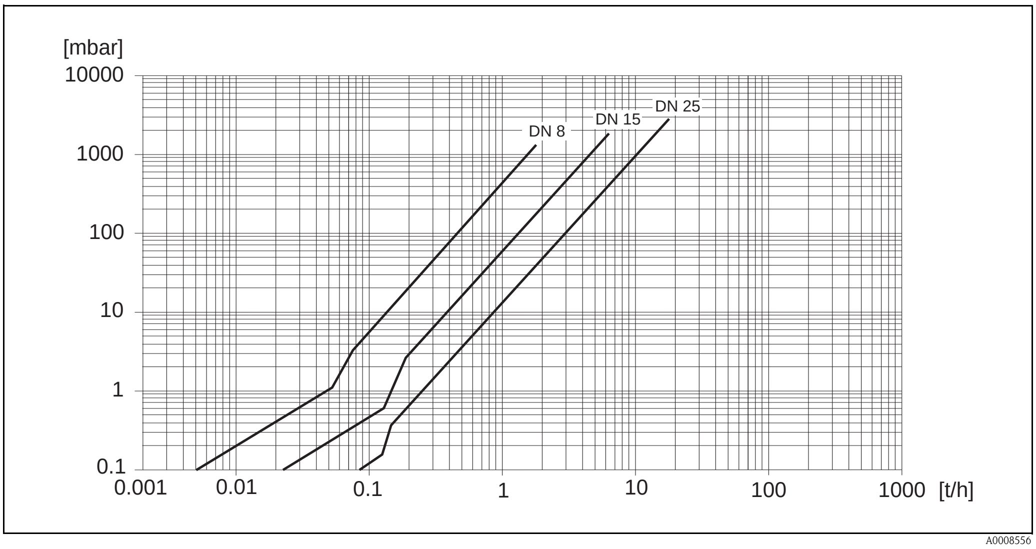
Pressure loss (SI units)

Pressure loss depends on the fluid properties and on the flow rate. The following formulas can be used to approximately calculate the pressure loss:

Reynolds number	$Re = \frac{2 \cdot \dot{m}}{\pi \cdot d \cdot \nu \cdot \rho}$
Re ≥ 2300	$\Delta p = K \cdot \nu^{0.25} \cdot \dot{m}^{1.85} \cdot \rho^{-0.86}$
Re < 2300	$\Delta p = K1 \cdot \nu \cdot \dot{m} + \frac{K2 \cdot \nu^{0.25} \cdot \dot{m}^2}{\rho}$
Δp = pressure loss [mbar] υ = kinematic viscosity [m²/s] ṁ = mass flow [kg/s]	ρ = density [kg/m³] d = inside diameter of measuring tubes [m] K to K2 = constants (depending on nominal diameter)

Pressure loss coefficients:

DN	d [m]	K	K1	K2
8	$5.35 \cdot 10^{-3}$	$5.70 \cdot 10^{7}$	$7.91 \cdot 10^{7}$	$2.10 \cdot 10^{7}$
15	$8.30 \cdot 10^{-3}$	$7.62 \cdot 10^{6}$	$1.73 \cdot 10^{7}$	$2.13 \cdot 10^{6}$
25	$12.00 \cdot 10^{-3}$	$1.89 \cdot 10^{6}$	$4.66 \cdot 10^{6}$	$6.11 \cdot 10^{5}$
Pressure loss data including interface between measuring tubes and piping				



Pressure loss diagram with water

Pressure loss (US units)

Pressure loss ist dependent on fluid properties nominal diameter. Consult Endress+Hauser for Applicator PC software to determine pressure loss in US units. All important instrument data is contained in the Applicator software programm in order to optimize the design of measuring system. The software is used for following calculations:

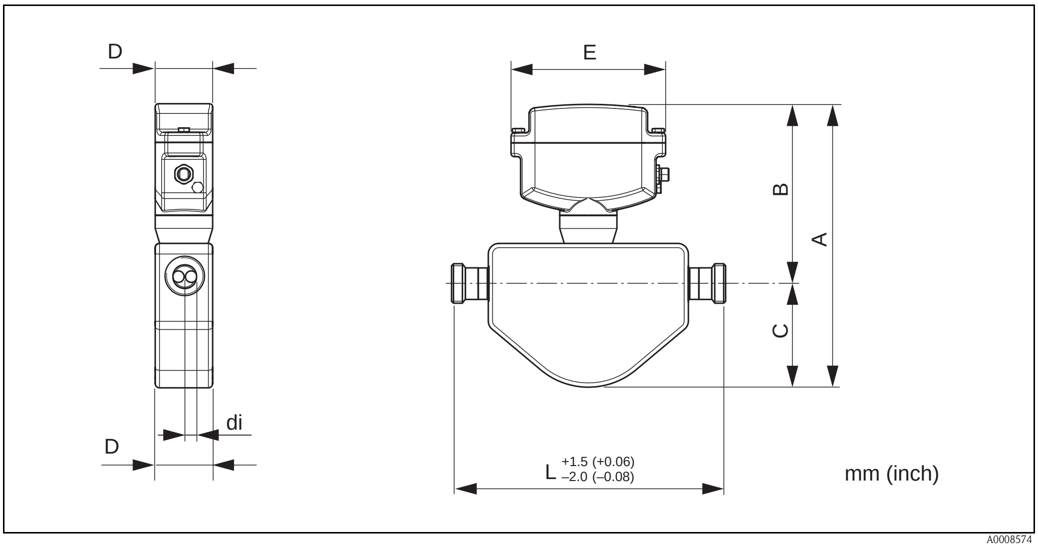
- Nominal diameter of the sensor with fluid characteristics such as viscosity, density, etc.
- Pressure loss downstream ot the measuring point.
- Converting mass flow to volume flow, etc.
- Simultaneous display of various meter size.
- Determining measuring ranges.

The Applicator runs on any IBM compatible PC with windows.

Mechanical construction

Design / dimensions

Dosimass dimensions



Dosimass dimensions

Dimensions (SI units)

DN	A	B	C	D	E	L	di
8	253	160	93	54	146	*	5,35
15	267	162	105	54	146	*	8,30
25	273	167	106	54	146	*	12,00

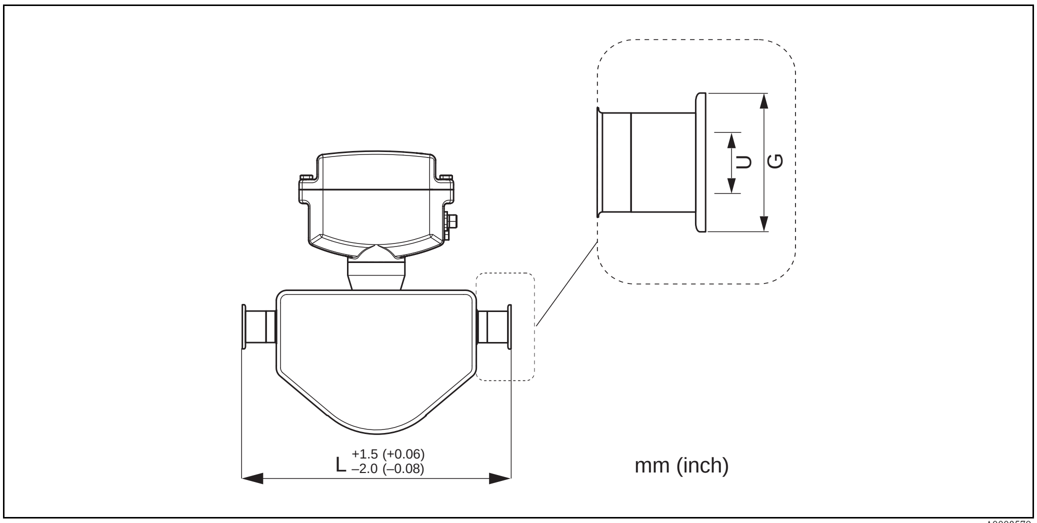
* dependent on respective flange connection
All dimensions in [mm]

Dimensions (US units)

DN	A	B	C	D	E	L	di
3/8"	9.96	6.30	3.66	2.13	5.75	*	0.21
½"	10.5	6.38	4.13	2.13	5.75	*	0.33
1"	10.8	6.57	4.17	2.13	5.75	*	0.47

* dependent on respective flange connection
All dimensions in [inch]

Dosimass dimensions: Tri-Clamp connections



Dosimass dimensions: Tri-Clamp connections

Dimensions (SI units)

½"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
8	½"	25.0	229	9.5
15	½"	25.0	273	9.5

3A-version also available (Ra ≤ 0.8 µm/150 grit or Ra ≤ 0.4 µm/240 grit)
All dimensions in [mm]; other dimensions → 16

¾"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
8	¾"	25.0	229	16
15	¾"	25.0	273	16

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [mm]; other dimensions → 16

1"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
8	1"	50.4	229	22.1
15	1"	50.4	273	22.1
25	1"	50.4	324	22.1

3A-version also available (Ra ≤ 0.8 µm/150 grit or Ra ≤ 0.4 µm/240 grit)
All dimensions in [mm]; other dimensions → 16

Dimensions (US units)

½"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
3/8"	½"	0.98	9.02	0.37
½"	½"	0.98	10.8	0.37

3A-version also available (Ra ≤ 0.8 µm/150 grit or Ra ≤ 0.4 µm/240 grit)
All dimensions in [inch]; other dimensions → 🗎 16

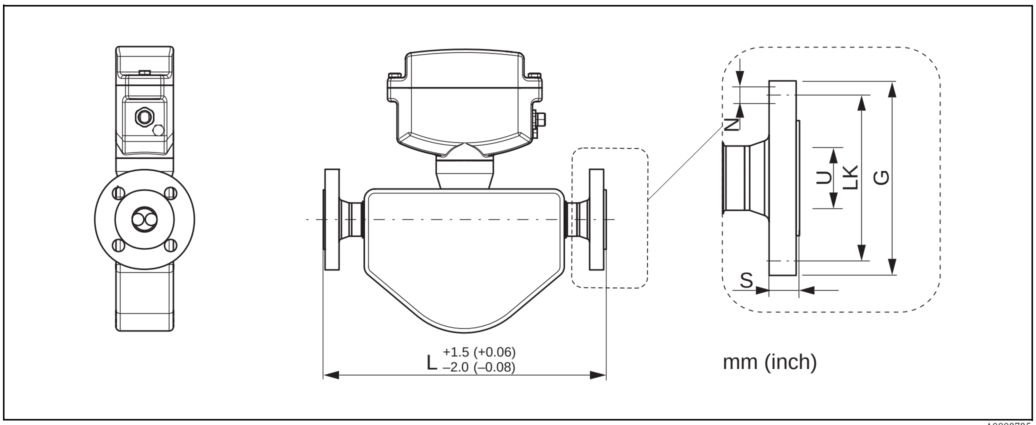
¾"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
3/8"	¾"	0.98	9.02	0.63
½"	¾"	0.98	10.8	0.63

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [inch]; other dimensions → 🗎 16

1"-Tri-Clamp: 1.4404/316L				
DN	Clamp	G	L	U
3/8"	1"	1.98	9.02	0.87
½"	1"	1.98	10.8	0.87
1"	1"	1.98	12.8	0.87

3A-version also available (Ra ≤ 0.8 µm/150 grit or Ra ≤ 0.4 µm/240 grit)
All dimensions in [inch]; other dimensions → 🗎 16

Dosimass dimensions: Flange connections EN (DIN)



Dosimass dimensions: Flange connections

Dimensions (SI units)

Flansch EN 1092-1 (DIN 2512N [1] / PN 40): 1.4404/316L/316						
DN	G	L	N	S	LK	U
8	95	232	4 × ø 14	16	65	17.3
15	95	279	4 × ø 14	16	65	17.3
25	115	329	4 × ø 14	18	85	28.5

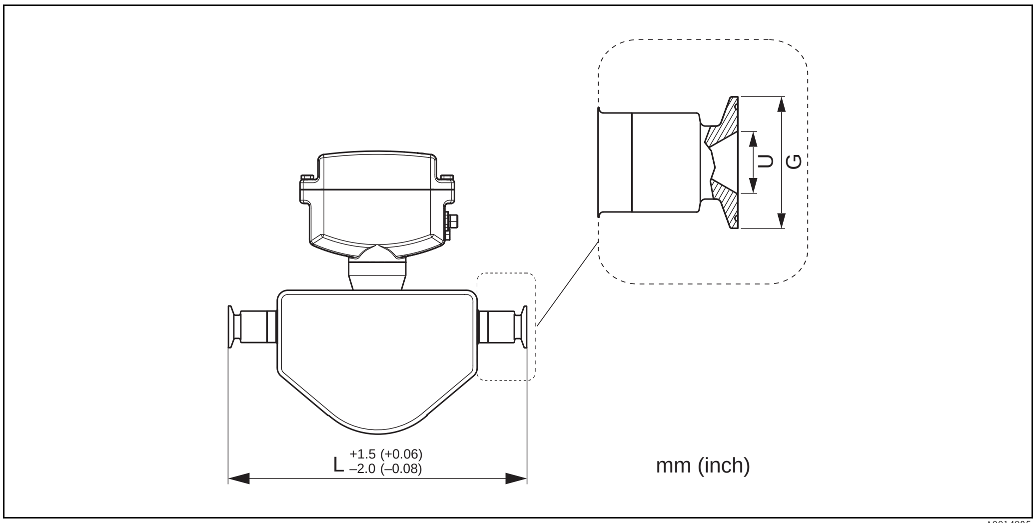
[1] Flange with groove to EN 1092-1 Form D (DIN 2512N) available
All dimensions in [mm]; other dimensions → 🗎 16

Dimensions (US units)

Flansch EN 1092-1 (DIN 2512N [1] / PN 40): 1.4404/316L/316						
DN	G	L	N	S	LK	U
3/8"	3.74	9.13	4 × ø 0.55	0.63	2.56	0.68
½"	3.74	11.0	4 × ø 0.55	0.63	2.56	0.68
1"	4.53	13.0	4 × ø 0.55	0.71	3.35	1.12

[1] Flange with groove to EN 1092-1 Form D (DIN 2512N) available
All dimensions in [inch]; other dimensions → 🗎 16

Dosimass dimensions: DIN 32676 (clamp)



Dosimass dimensions: DIN 32676 (clamp)

Dimensions (SI units)

1" Clamp DIN 32676: 1.4435/316L			
DN	G	L	U
8	34.0	229	16
15	34.0	273	16
25	50.5	324	26

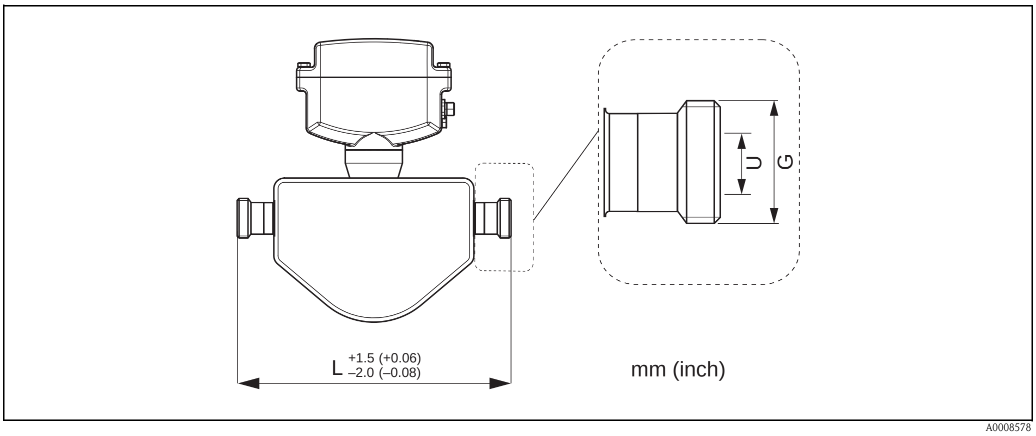
3A-version also available (Ra ≤ 0.4 µm/240 grit)
All dimensions in [mm]; other dimensions → 🗎 16

Dimensions (US units)

1" Clamp DIN 32676: 1.4435/316L			
DN	G	L	U
3/8"	1.34	9.02	0.63
½"	1.34	10.8	0.63
1"	1.99	12.8	1.02

3A-version also available (Ra ≤ 0.4 µm/240 grit)
All dimensions in [inch]; other dimensions → 🗎 16

Dosimass dimensions: DIN 11851 connections (sanitary connection)



Dosimass dimensions : DIN 11851 connections (sanitary connection)

Dimensions (SI units)

Sanitary connection DIN 11851: 1.4404/316L			
DN	G	L	U
8	Rd 34 × 1/8"	229	16
15	Rd 34 × 1/8"	273	16
25	Rd 52 × 1/6"	324	26

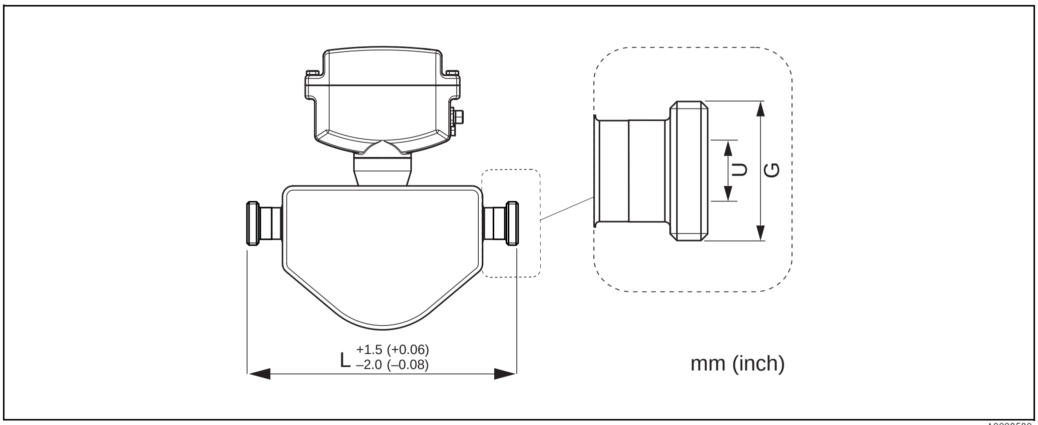
3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [mm]; other dimensions → 🗎 16

Dimensions (US units)

Sanitary connection DIN 11851: 1.4404/316L			
DN	G	L	U
3/8"	Rd 34 × 1/8"	9.02	0.63
½"	Rd 34 × 1/8"	10.8	0.63
1"	Rd 52 × 1/6"	12.8	1.02

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [inch]; other dimensions → 🗎 16

Dosimass dimensions: DIN 11864-1 Form A (threaded joint)



Dosimass dimensions: DIN 11864-1 Form A (threaded joint)

Dimensions (SI units)

Threaded joint DIN 11864-1 Form A: 1.4404/316L			
DN	G	L	U
8	Rd 28 × 1/8"	229	10
15	Rd 34 × 1/8"	273	16
25	Rd 52 × 1/6"	324	26

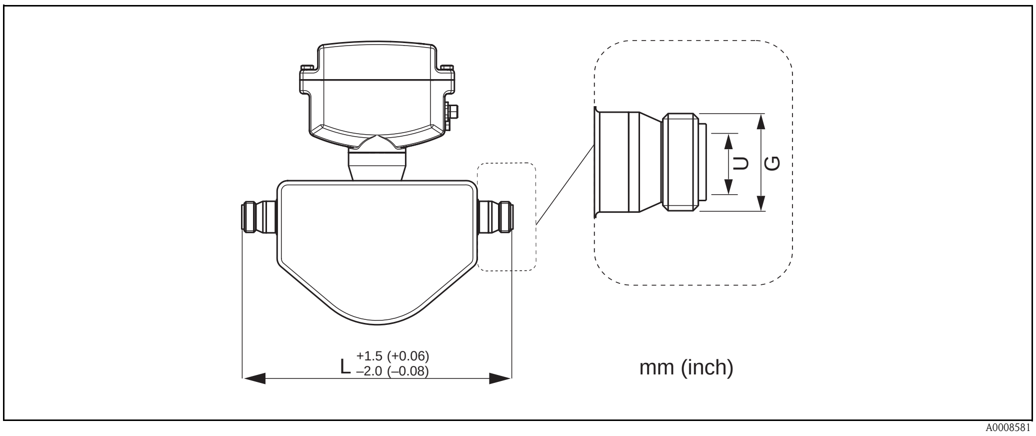
3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [mm]; other dimensions → 🗎 16

Dimensions (US units)

Threaded joint DIN 11864-1 Form A: 1.4404/316L			
DN	G	L	U
3/8"	Rd 28 × 1/8"	9.02	0.39
½"	Rd 34 × 1/8"	10.8	0.63
1"	Rd 52 × 1/6"	12.8	1.02

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [inch]; other dimensions → 🗎 16

Dosimass dimensions : ISO 2853 connections (threaded connection)



Dosimass dimensions: ISO 2853 connections (threaded joint)

Dimensions (SI units)

Threaded joint ISO 2853: 1.4404/316L			
DN	G[1]	L	U
8	37.13	229	22.6
15	37.13	273	22.6
25	37.13	324	22.6

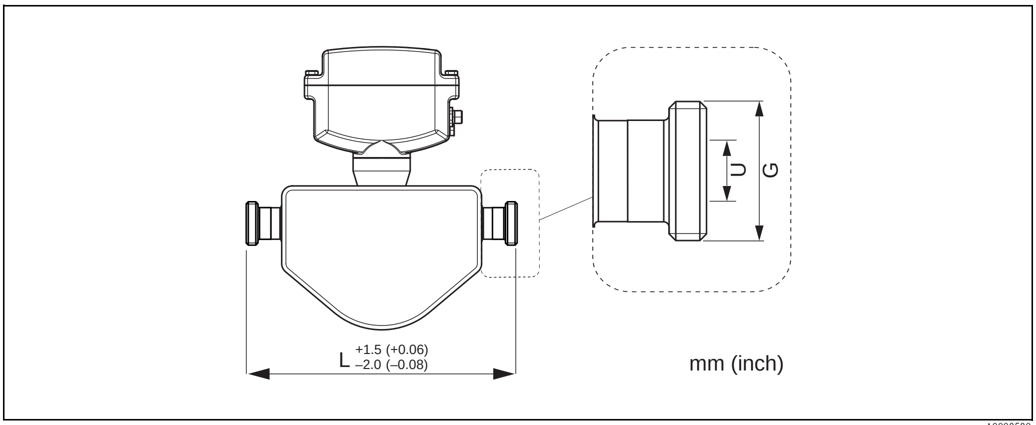
[1] Max. thread diameter to ISO 2853 Annex A
3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [mm]; other dimensions → 16

Dimensions (US units)

Threaded joint ISO 2853: 1.4404/316L			
DN	G[1]	L	U
3/8"	1.46	9.02	0.89
½"	1.46	10.8	0.89
1"	1.46	12.8	0.89

[1] Max. thread diameter to ISO 2853 Annex A
3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [inch]; other dimensions → 16

Dosimass dimensions: SMS 1145 connections (sanitary connection)



Dosimass dimensions : SMS 1145 connections (sanitary connection)

Dimensions (SI units)

Sanitary connection SMS 1145: 1.4404/316L			
DN	G	L	U
8	Rd 40 × 1/6"	229	22.5
15	Rd 40 × 1/6"	273	22.5
25	Rd 40 × 1/6"	324	22.5

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [mm]; other dimensions → 🗎 16

Dimensions (US units)

Sanitary connection SMS 1145: 1.4404/316L			
DN	G	L	U
3/8"	Rd 40 × 1/6"	9.02	0.89
½"	Rd 40 × 1/6"	10.8	0.89
1"	Rd 40 × 1/6"	12.8	0.89

3A-version also available (Ra ≤ 0.8 µm/150 grit)
All dimensions in [inch]; other dimensions → 🗎 16

Weight

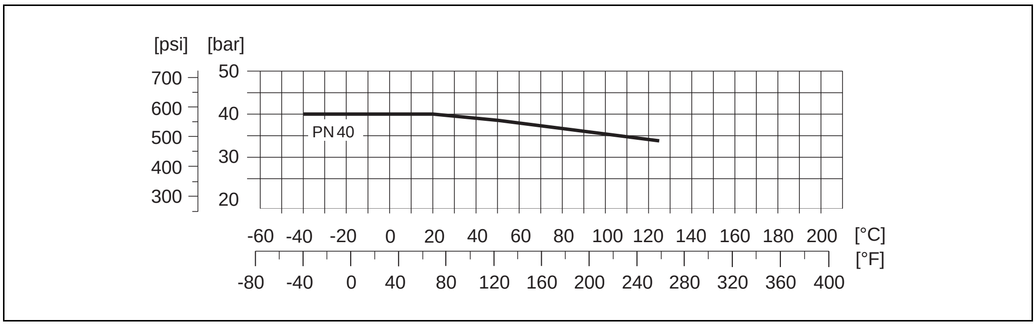
DN in mm (inch)	8 (3/8")	15 (½")	25 (1")
Weight in kg (lbs)	3.5 (7.7)	4.0 (8.8)	4.5 (9.9)

Material

- Transmitter housing: 1.4308/304
- Sensor housing: Acid and alkali-resistant outer surface; stainless steel 1.4301/304
- Housing seal: EPDM
- Process connection:
  - Tri-Clamp → stainless steel 1.4404/316L
  - Flange connections EN (DIN) → stainless steel 1.4404/316L/316
  - DIN 32676 (clamp) → stainless steel 1.4435/316L
  - Sanitary connection DIN 11851 → stainless steel 1.4404/316L
  - Threaded joint DIN 11864-1 → stainless steel 1.4404/316L
  - Threaded joint ISO 2853 → stainless steel 1.4404/316L
  - Sanitary connection SMS 1145 → stainless steel 1.4404/316L
- Measuring tubes: Stainless steel 1.4539/904L
- Seals: Welded process connections without internal seals

Material load diagram

Flange connection EN 1092-1



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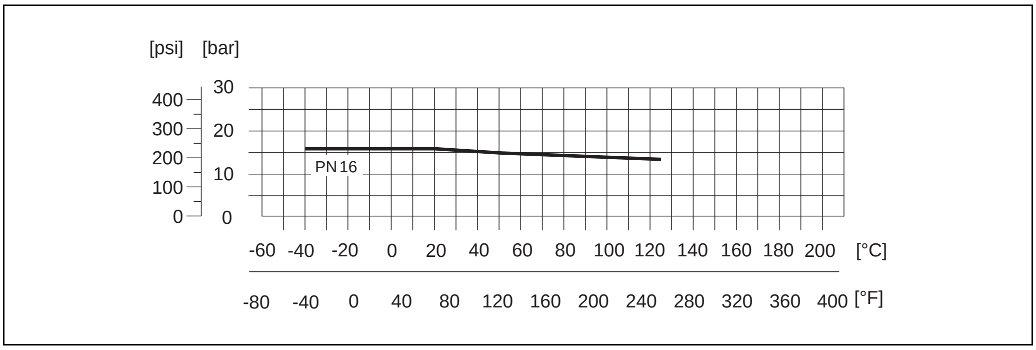
Connection DIN 32676 (Clamp)

PS = 16 bar (232 psi)

The clamp connections are suitable up to a maximum pressure of 16 bar (232 psi) . Please observe the operating limits of the clamp and seal used as they could be under 16 bar (232 psi) . The clamp and seal do not form part of the scope of supply.

Sanitary connection as per DIN 11851 / SMS 1145



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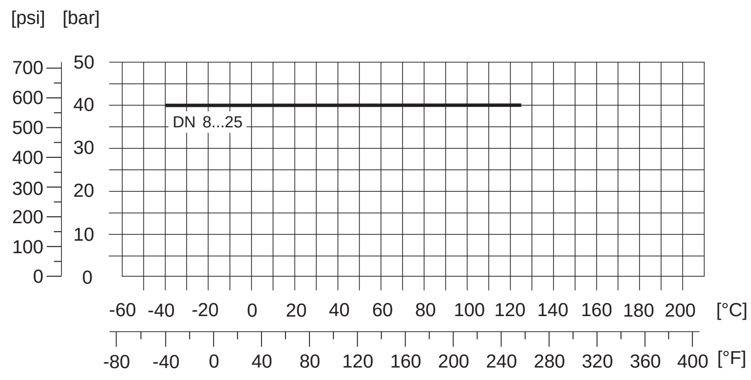
Tri-Clamp process connection

The load limit is defined exclusively by the material properties of the outer clamp used. This clamp is not included in the scope of delivery.

Threaded joint DIN 11864-1



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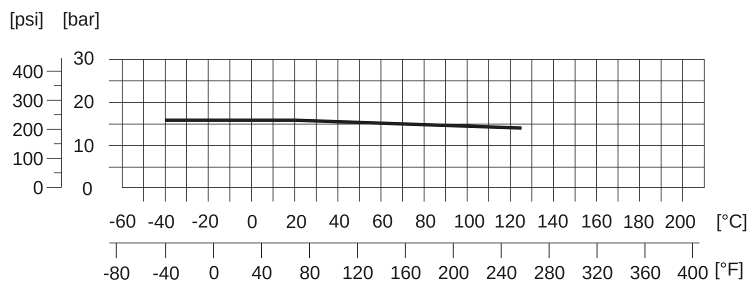
Threaded joint ISO 2853



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Process connection

Sanitary connections:
- Tri-Clamp
- threaded joints (DIN 11851, SMS 1145, ISO 2853, DIN 11864-1)

User interface

Display elements

Dosimass does not have a display or display elements.

Remote operation

Operation takes place via the "FieldCare" configuration and service program from Endress+Hauser. This can be used to configure functions and read off measured values.

Certificates and approvals

CE mark

The measuring system is in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

C-tick mark

The measuring system meets the EMC requirements of the "Australian Communications and Media Authority (ACMA)".

Ex approval

Information about currently available Ex versions (ATEX, FM, CSA, etc.) can be supplied by your Endress+Hauser Sales Centre on request. All explosion protection data are given in a separate documentation which is available upon request.

Sanitary compatibility

3A-authorized

Pressure measuring device approval

The measuring devices can be ordered with or without PED (Pressure Equipment Directive). If a device with PED is required, this must be ordered explicitly. For devices with nominal diameters less than or equal to DN 25 (1"), this is neither possible nor necessary.

- With the identification PED/G1/III on the sensor nameplate, Endress+Hauser confirms conformity with the "Basic safety requirements" of Appendix I of the Pressure Equipment Directive 97/23/EC.
- Devices with this identification (with PED) are suitable for the following types of fluid:
  - Fluids of Group 1 and 2 with a steam pressure of greater or less than 0.5 bar (7.3 psi)
  - Unstable gases
- Devices without this identification (without PED) are designed and manufactured according to good engineering practice. They correspond to the requirements of Art. 3, Section 3 of the Pressure Equipment Directive 97/23/EC. Their application is illustrated in Diagrams 6 to 9 in Appendix II of the Pressure Equipment Directive 97/23/EC.

Other standards and guidelines

- EN 60529
  Degrees of protection by housing (IP code)
- EN 61010-1
  Protection Measures for Electrical Equipment for Measurement, Control, Regulation and Laboratory Procedures
- IEC/EN 61326
  "Emission in accordance with Class A requirements"
  Electromagnetic compatibility (EMC requirements)
- EN 61000-4-3 (IEC 1000-4-3)
  Operating behaviour A with screened connecting cable possible (screening placed as short as possible on both sides), otherwise operating behaviour B
- NAMUR NE 21
  Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment

Ordering information

The E+H service organisation can provide detailed ordering information and information on specific order codes on request.

Accessories/spare parts

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter. The E+H service organisation can provide detailed information on request.

Documentation

- Dosimass Operating Instructions (BA00097D/06/EN)
- Supplementary documentation on Ex-ratings: ATEX

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