

Электромагнитные расходомеры Proline Promag 55H

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Technical Information

Proline Promag 55H

Electromagnetic Flow Measuring System



The flowmeter for smallest flow rates with integrated solids content diagnostics

Application

- The measuring principle is virtually independent of pressure, density, temperature and viscosity
- For the smallest flow quantities and demanding hygienic applications

Device properties

- Liner made of PFA
- Sensor housing made of stainless steel (3-A, EHEDG)
- Wetted materials CIP, SIP cleanable
- 4-line display with touch control
- Two switch outputs
- HART, PROFIBUS PA/DP, FOUNDATION Fieldbus

Your benefits

- Flexible installation concept – numerous hygienic process connections
- Energy-saving flow measurement – no pressure loss due to cross-section constriction
- Maintenance-free – no moving parts
- Highest performance – with integrated solids measurement for demanding fluids
- Highest safety – integrated electrode cleaning
- Automatic recovery of data for servicing

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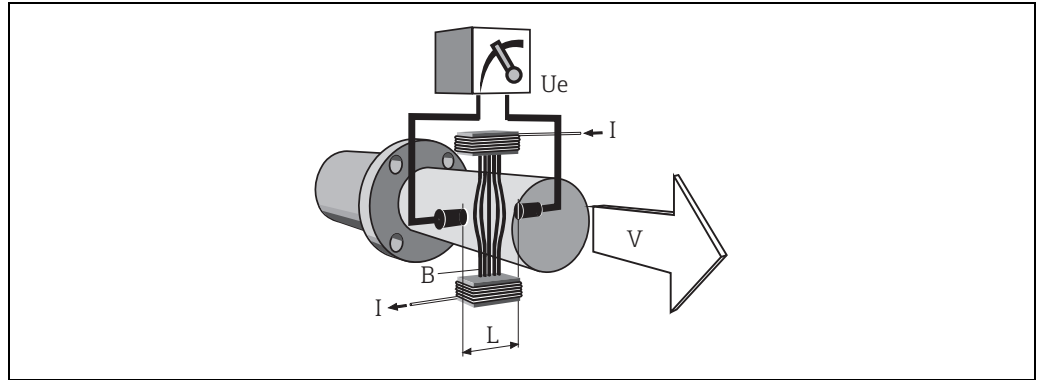
Function and system design

Measuring principle

Following *Faraday's law of magnetic induction*, a voltage is induced in a conductor moving through a magnetic field.

In the electromagnetic measuring principle, the flowing medium is the moving conductor.

The voltage induced is proportional to the flow velocity and is supplied to the amplifier by means of two measuring electrodes. The flow volume is calculated by means of the pipe cross-sectional area. The DC magnetic field is created through a switched direct current of alternating polarity.



$$U_e = B \cdot L \cdot v$$

$$Q = A \cdot v$$

- U_e Induced voltage
- B Magnetic induction (magnetic field)
- L Electrode spacing
- v Flow velocity
- Q Volume flow
- A Pipe cross-section
- I Current strength

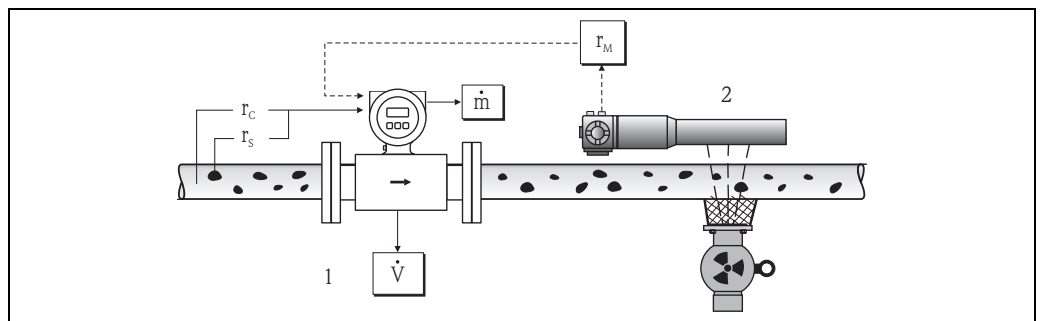
Measuring system

The flow measuring system consists of the following components:

- Promag 55 transmitter
- Promag H sensor (DN 2 to 150 / 1/12 to 6")

Two versions are available:

- Compact version: Transmitter and sensor form a mechanical unit.
- Remote version: Sensor is mounted separate from the transmitter.



Solids content flow measurement (\dot{m}) with the aid of a density and flow measuring device. If the solid density (ρ_s) and the density of the carrier liquid (ρ_c) are also known, they can be used to calculate the solids flow.

- 1 Flow measuring device (Promag 55S) \rightarrow volume flow (\dot{V}). The solid density (ρ_s) and the density of the transport liquid (ρ_c) must be entered in the transmitter.
- 2 Density measuring device (e.g. "Gammapilot M") \rightarrow total fluid density ρ_M (transport liquid and solids)

Input

Measured variable Flow velocity (proportional to induced voltage)

Measuring ranges Measuring ranges for liquids
Typically $v = 0.01$ to 10 m/s (0.03 to 33 ft/s) with the specified accuracy

| Flow characteristic values (SI units) | | | | | |
|---------------------------------------|--------|--|---|-------------------------------------|--|
| Nominal diameter | | Recommended flow rate Min./max. full scale value ($v \sim 0.3$ or 10 m/s) | Factory settings | | |
| [mm] | [inch] | | Full scale value, current output ($v \sim 2.5$ m/s) | Pulse value (~ 2 pulses/s) | Low flow cut off ($v \sim 0.04$ m/s) |
| 2 | 1/12" | 0.06 to 1.8 dm ³ /min | 0.5 dm ³ /min | 0.005 dm ³ | 0.01 dm ³ /min |
| 4 | 1/8" | 0.25 to 7 dm ³ /min | 2 dm ³ /min | 0.025 dm ³ | 0.05 dm ³ /min |
| 8 | 3/8" | 1 to 30 dm ³ /min | 8 dm ³ /min | 0.1 dm ³ | 0.1 dm ³ /min |
| 15 | 1/2" | 4 to 100 dm ³ /min | 25 dm ³ /min | 0.2 dm ³ | 0.5 dm ³ /min |
| 25 | 1" | 9 to 300 dm ³ /min | 75 dm ³ /min | 0.5 dm ³ | 1.00 dm ³ /min |
| 40 | 1 1/2" | 25 to 700 dm ³ /min | 200 dm ³ /min | 1.5 dm ³ | 3.00 dm ³ /min |
| 50 | 2" | 35 to 1100 dm ³ /min | 300 dm ³ /min | 2.5 dm ³ | 5.00 dm ³ /min |
| 65 | – | 60 to 2000 dm ³ /min | 500 dm ³ /min | 5 dm ³ | 8.00 dm ³ /min |
| 80 | 3" | 90 to 3000 dm ³ /min | 750 dm ³ /min | 5 dm ³ | 12.0 dm ³ /min |
| 100 | 4" | 145 to 4700 dm ³ /min | 1200 dm ³ /min | 10 dm ³ | 20.0 dm ³ /min |
| 125 | 5" | 220 to 7500 dm ³ /min | 1850 dm ³ /min | 15 dm ³ | 30 dm ³ /min |
| 150 | 6" | 20 to 600 m ³ /h | 150 m ³ /h | 0.03 m ³ | 2.5 m ³ /h |

| Flow characteristic values (US units) | | | | | |
|---------------------------------------|------|--|---|-------------------------------------|--|
| Nominal diameter | | Recommended flow rate Min./max. full scale value ($v \sim 0.3$ or 10 m/s) | Factory settings | | |
| [inch] | [mm] | | Full scale value, current output ($v \sim 2.5$ m/s) | Pulse value (~ 2 pulses/s) | Low flow cut off ($v \sim 0.04$ m/s) |
| 1/12" | 2 | 0.015 to 0.5 gal/min | 0.1 gal/min | 0.001 gal | 0.002 gal/min |
| 1/8" | 4 | 0.07 to 2 gal/min | 0.5 gal/min | 0.005 gal | 0.008 gal/min |
| 3/8" | 8 | 0.25 to 8 gal/min | 2 gal/min | 0.02 gal | 0.025 gal/min |
| 1/2" | 15 | 1.0 to 27 gal/min | 6 gal/min | 0.05 gal | 0.10 gal/min |
| 1" | 25 | 2.5 to 80 gal/min | 18 gal/min | 0.2 gal | 0.25 gal/min |
| 1 1/2" | 40 | 7 to 190 gal/min | 50 gal/min | 0.5 gal | 0.75 gal/min |
| 2" | 50 | 10 to 300 gal/min | 75 gal/min | 0.5 gal | 1.25 gal/min |
| 3" | 80 | 24 to 800 gal/min | 200 gal/min | 2 gal | 2.5 gal/min |
| 4" | 100 | 40 to 1250 gal/min | 300 gal/min | 2 gal | 4 gal/min |
| 5" | 125 | 60 to 1950 gal/min | 450 gal/min | 5 gal | 7 gal/min |
| 6" | 150 | 90 to 2650 gal/min | 600 gal/min | 5 gal | 12 gal/min |

Operable flow range Over 1000 : 1

Input signal**Status input (auxiliary input)**

$U = 3$ to 30 V DC, $R_i = 5$ k Ω , galvanically isolated.
Configurable for: totalizer(s) reset, positive zero return, error-message reset

Status input (auxiliary input) with PROFIBUS DP

$U = 3$ to 30 V DC, $R_i = 3$ k Ω , galvanically isolated.
Switch level: ± 3 to ± 30 V DC, independent of polarity.
Configurable for: positive zero return, error message reset, zero point adjustment start

Current input

Active/passive selectable, galvanically isolated, full scale value adjustable, resolution: 3 μ A,
temperature coefficient: typically 0.005% o.f.s./ $^{\circ}$ C (0.003% o.f.s./ $^{\circ}$ F)

- active: 4 to 20 mA, $R_i \leq 150$ Ω , $U_{out} = 24$ V DC, short-circuit proof
- passive: $0/4$ to 20 mA, $R_i \leq 150$ Ω , $U_{max} = 30$ V DC

Output

Output signal**Current output**

active/passive selectable, galvanically isolated, time constant selectable (0.01 to 100 s),
full scale value adjustable, temperature coefficient: typically 0.005% o.f.s./ $^{\circ}$ C (0.003% o.f.s./ $^{\circ}$ F),
resolution: 0.5 μ A

- active: $0/4$ to 20 mA, $R_L < 700$ Ω (for HART: $R_L \geq 250$ Ω)
- passive: 4 to 20 mA; supply voltage V_S : 18 to 30 V DC; $R_i \geq 150$ Ω

Pulse/frequency output

Active/passive selectable (Ex i version passive only), galvanically isolated

- active: 24 V DC, 25 mA (max. 250 mA during 20 ms), $R_L > 100$ Ω
- passive: open collector, 30 V DC, 250 mA
- Frequency output: end frequency 2 to 10000 Hz ($f_{max} = 12500$ Hz), on/off ratio $1:1$, pulse width max. 10 s
- Pulse output: pulse value and pulse polarity selectable, pulse width configurable (0.05 to 2000 ms)

PROFIBUS DP interface

- Transmission technology (Physical Layer): RS485 according to ANSI/TIA/EIA-485-A: 1998, galvanically isolated
- Profile Version 3.0
- Data transmission rate: 9.6 kBaud to 12 MBaud
- Automatic identification of data transmission rate
- Function blocks: $2 \times$ analog input, $3 \times$ totalizer
- Output data: volume flow, calculated mass flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 35S
- Bus address adjustable via miniature switches or local display (optional) at the measuring device
- Available output combination \rightarrow 7

PROFIBUS PA interface

- Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
- Profile version 3.0
- Current consumption: 11 mA
- Permissible supply voltage: 9 to 32 V
- Bus connection with integrated reverse polarity protection
- Error current FDE (Fault Disconnection Electronic): 0 mA
- Function blocks: 2 × analog input, 3 × totalizer
- Output data: volume flow, calculated mass flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 35S
- Bus address adjustable via miniature switches or local display (optional) at the measuring device

FOUNDATION Fieldbus interface

- FOUNDATION Fieldbus H1
- Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
- ITK version 5.01
- Current consumption: 12 mA
- Inrush current: < 12 mA
- Error current FDE (Fault Disconnection Electronic): 0 mA
- Permissible supply voltage: 9 to 32 V
- Bus connection with integrated reverse polarity protection
- Function blocks:
 - 5 × Analog Input (execution time: 18 ms each)
 - 1 × PID (25 ms)
 - 1 × Digital Output (18 ms)
 - 1 × Signal Characterizer (20 ms)
 - 1 × Input Selector (20 ms)
 - 1 × Arithmetic (20 ms)
 - 1 × Integrator (18 ms)
- Total VCRs: 48
- Total link objects in VFD: 40
- Output data: volume flow, calculated mass flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), reset totalizer
- Link Master (LM) functionality is supported

Signal on alarm**Current output**

Failsafe mode selectable (e.g. according to NAMUR recommendation NE 43)

Pulse/frequency output

Failsafe mode selectable

Relay output

"de-energized" in the event of a fault or power supply failure

PROFIBUS DP/PA

Status and alarm messages in accordance with PROFIBUS Profile Version 3.0

Load

See "output signal"

Low flow cutoff

Switch points for low flow cutoff are selectable.

Galvanic isolation

All circuits for inputs, outputs and power supply are galvanically isolated from each other.

Switching output

Relay output:
Normally closed (NC or break) or normally open (NO or make) contacts available
(default: relay 1 = NO, relay 2 = NC), max. 30 V / 0.5 A AC; 60 V / 0.1 A DC, galvanically isolated.
Configurable for: error messages, empty pipe detection (EPD), direction of flow, limit values.

Power supply

Terminal assignment

| Order version | Terminal No. (inputs / outputs) | | | |
|--|---------------------------------|--------------------|------------------------|-----------------------|
| | 20 (+) / 21 (-) | 22 (+) / 23 (-) | 24 (+) / 25 (-) | 26 (+) / 27 (-) |
| <i>Fixed communication boards (fixed assignment)</i> | | | | |
| 55***_*****A | - | - | Frequency output | Current output HART |
| 55***_*****B | Relay output 2 | Relay output 1 | Frequency output | Current output HART |
| 55***_*****H | | | | PROFIBUS PA |
| 55***_*****J | - | - | +5V (ext. termination) | PROFIBUS DP |
| 55***_*****K | | | | FOUNDATION Fieldbus |
| <i>Flexible communication boards</i> | | | | |
| 55***_*****C | Relay output 2 | Relay output 1 | Frequency output | Current output HART |
| 55***_*****D | Status input | Relay output | Frequency output | Current output HART |
| 55***_*****L | Status input | Relay output 2 | Relay output 1 | Current output HART |
| 55***_*****M | Status input | Frequency output 2 | Frequency output 1 | Current output HART |
| 55***_*****P | Current output | Frequency output | Status input | PROFIBUS DP |
| 55***_*****V | Relay output 2 | Relay output 1 | Status input | PROFIBUS DP |
| 55***_*****2 | Relay output | Current output 2 | Frequency output | Current output 1 HART |
| 55***_*****3 | Current input | Current output 2 | Frequency output | Current output 1 HART |
| 55***_*****4 | Current input | Relay output | Frequency output | Current output HART |
| 55***_*****5 | Status input | Current input | Frequency output | Current output HART |

Electrical connections

20 to 260 V AC, 45 to 65 Hz
20 to 64 V DC

Power consumption

AC: < 45 VA at 260 V AC; < 32 VA at 110 V AC (incl. sensor)
DC: < 19 W (including sensor)

Switch-on current:

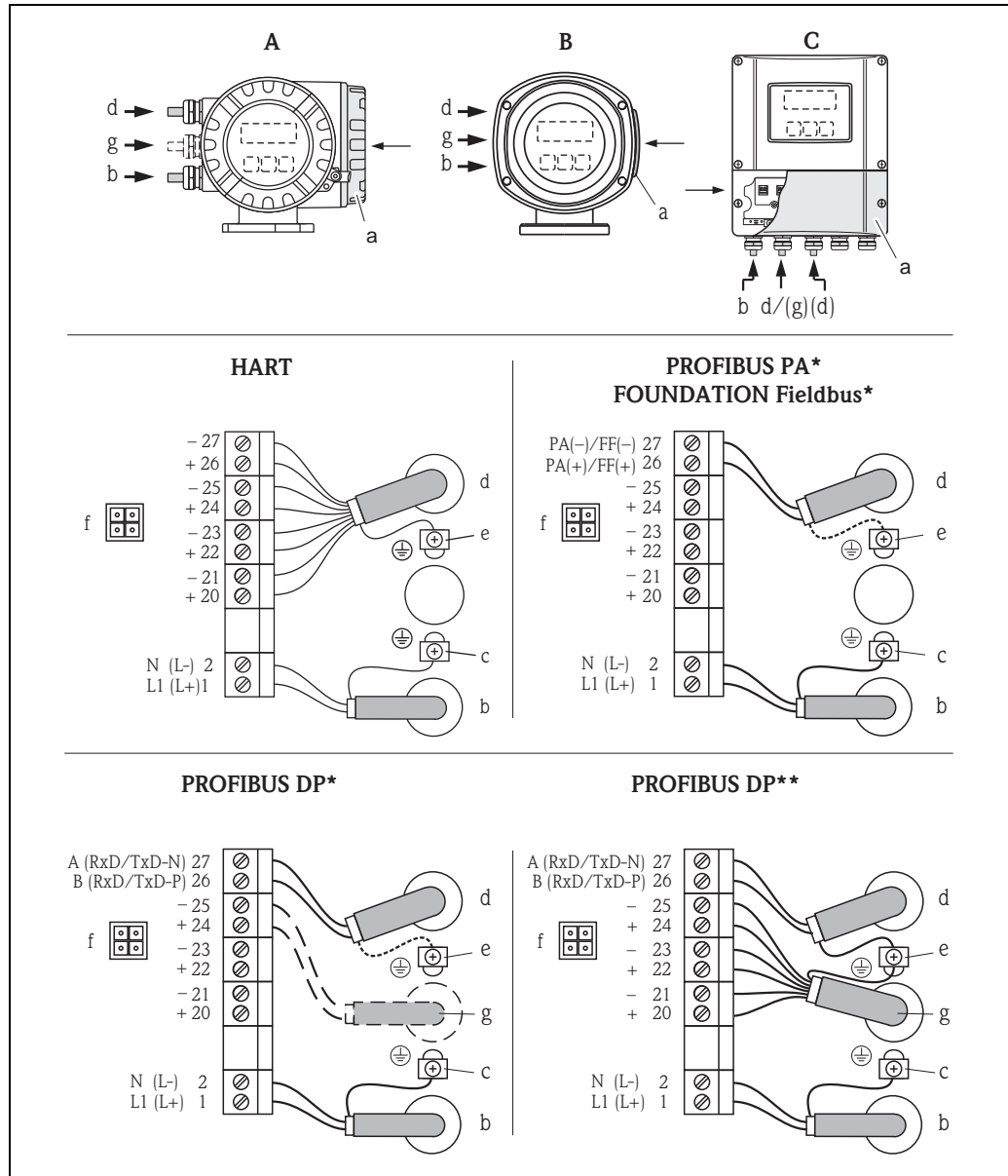
- max. 2.5 A (< 200 ms) at 24 V DC
- max. 2.5 A (< 5 ms) at 110 V AC
- max. 5.5 A (< 5 ms) at 260 V AC

Power supply failure

Lasting min. 1 power cycle:

- EEPROM or HistoROM/T-DAT saves measuring system data if power supply fails
- HistoROM/S-DAT: exchangeable data storage device which stores sensor characteristic data (nominal diameter, serial number, calibration factor, zero point, etc.)

Electrical connection



A0015210

Connecting the transmitter, cable cross-section max. 2.5 mm² (14 AWG)

- A View A (aluminum field housing)
 B View B (stainless steel field housing)
 C View C (wall-mount housing)

*) Fixed communication boards

**) Flexible communication boards

a Connection compartment cover

b Cable for power supply: 20 to 260 V AC / 20 to 64 V DC

Terminal No. 1: L1 for AC, L+ for DC

Terminal No. 2: N for AC, L- for DC

c Ground terminal for protective conductor

d Signal cable: see "Electrical connection terminal assignment"

Fieldbus cable:

- Terminal No. 26: DP (B) / PA (+) / FF (+): with polarity protection

- Terminal No. 27: DP (A) / PA (-) / FF (-): with polarity protection

e Ground terminal for signal cable shield / Fieldbus cable

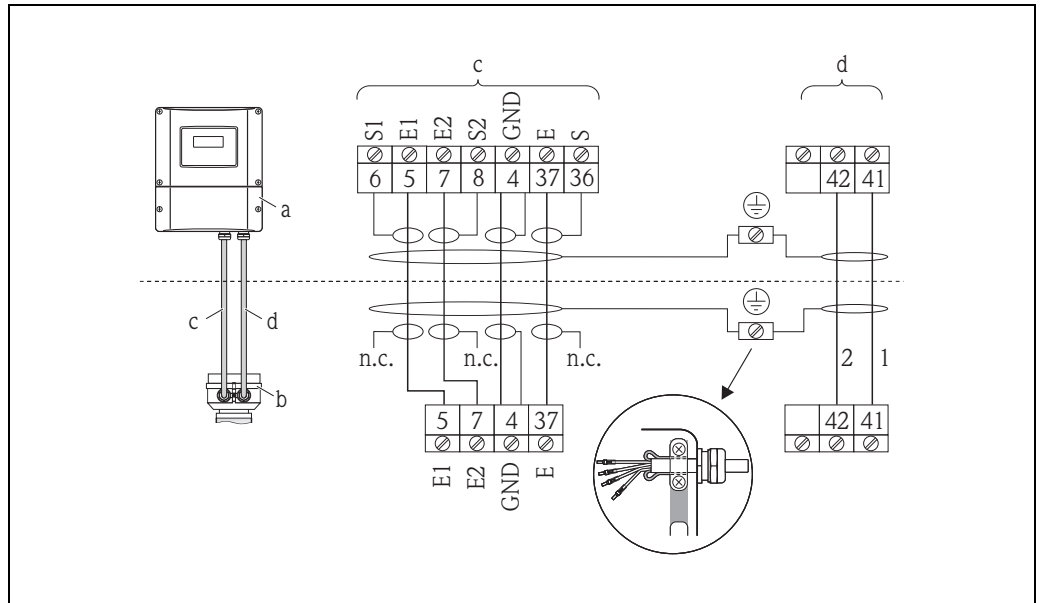
f Service adapter for connecting service interface FXA193 (Fieldcheck, FieldCare)

g Signal cable: see Terminal assignment → 7

Cable for external termination (only for PROFIBUS DP with permanent assignment communication board):

- Terminal No. 24: +5 V

- Terminal No. 25: DGND

**Electrical connection,
remote version***Connecting the remote version*

a Wall-mount housing connection compartment

b Sensor connection housing cover

c Signal cable

d Coil current cable

n.c. Not connected, insulated cable shields

Cable colors/numbers for terminals: 6/5 = brown; 7/8 = white; 4 = green; 36/37 = yellow, 41 =1, 42 =2

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Potential equalization

Perfect measurement is only ensured when the medium and the sensor have the same electrical potential.

Metal process connections

Potential matching usually takes place over the metallic process connection in contact with medium process connections which are directly mounted on the measuring transmitter. This usually means that additional potential matching measures are unnecessary.

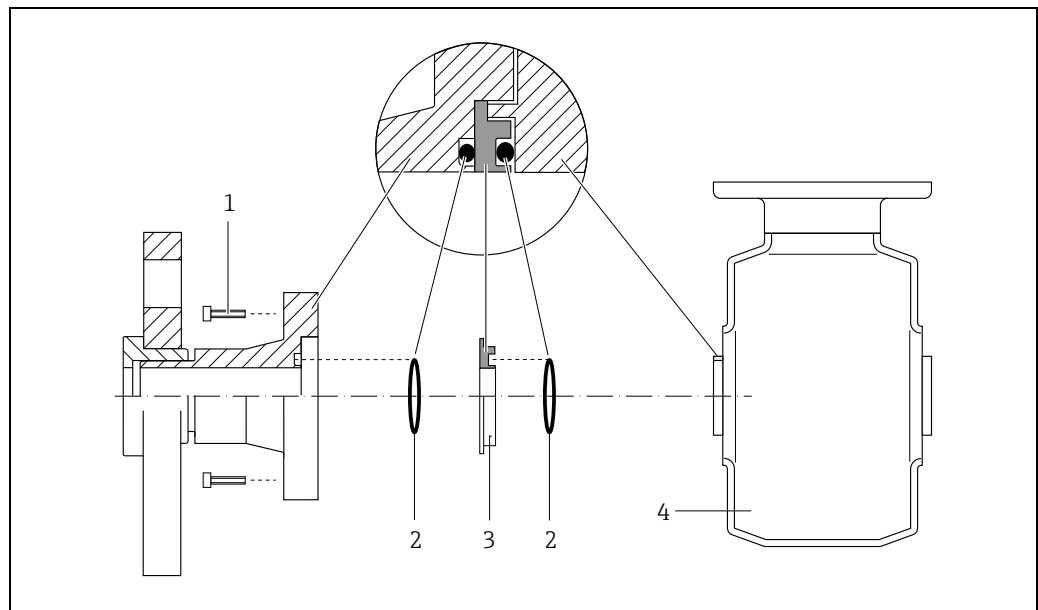
Plastic process connections (DN 2 to 25)

If the process connections are made of a synthetic material, additional ground rings or process connections with an integrated ground electrode must be used to ensure the potential between the sensor and fluid is matched. No potential matching can affect the accuracy of the measurements or cause the destruction of the sensor through the electrochemical decomposition of the electrodes.

When using ground rings, note the following points:

- Depending on the option ordered, plastic washers may be installed at the process connections instead of ground rings. These plastic washers serve only as spacers and have no potential equalization function. In addition, they provide a sealing function at the interface between the sensor and process connection. For this reason, with process connections without ground rings, these plastic washers/seals must not be removed, or must always be installed.
- Ground rings can be ordered separately from Eas as an accessory.
Also make sure that the ground rings are compatible with the electrode material. Otherwise the danger exists that the electrodes could be destroyed by electrochemical corrosion.
You can find material data on → 50.
- Ground rings, incl. seals, are mounted inside the process connection. This has no influence on the installation length. You can find the dimensions of ground rings on → 38.

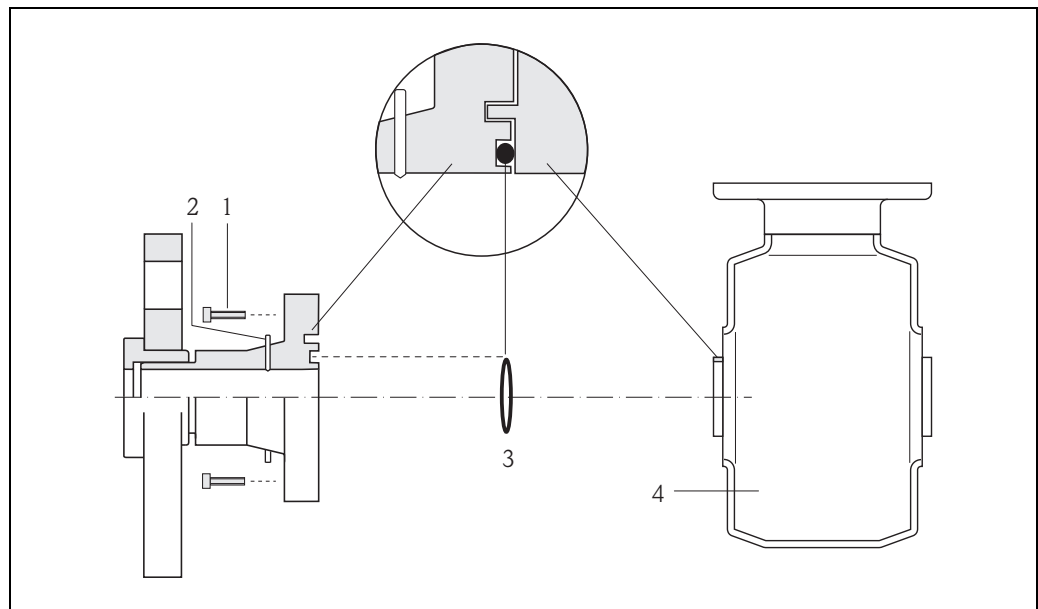
Potential equalization via additional ground ring



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- 1 Allen screw (process connection)
- 2 O-ring seals
- 3 Plastic washer (spacer) or ground ring
- 4 Sensor

Potential equalization via ground electrodes on process connection



A0017293

- 1 Allen screw (process connection)
- 2 Integrated ground electrodes
- 3 O-ring seal
- 4 Sensor

Cable entries

Power supply and signal cables (inputs/outputs)

- Cable gland M20 × 1.5 (8 to 12 mm / 0.31 to 0.47")
- Cable entries for thread ½" NPT, G ½"

Fieldbus cable

- Fieldbus connector for PROFIBUS PA, M12 × 1 / PG 13.5 plus adapter PG 13.5 / M20.5
- Fieldbus connector for FOUNDATION Fieldbus, 7/8-16 UNC × M20

Connecting cable for remote version

- Cable gland M20 × 1.5 (8 to 12 mm / 0.31 to 0.47")
- Cable entries for thread ½" NPT, G ½"

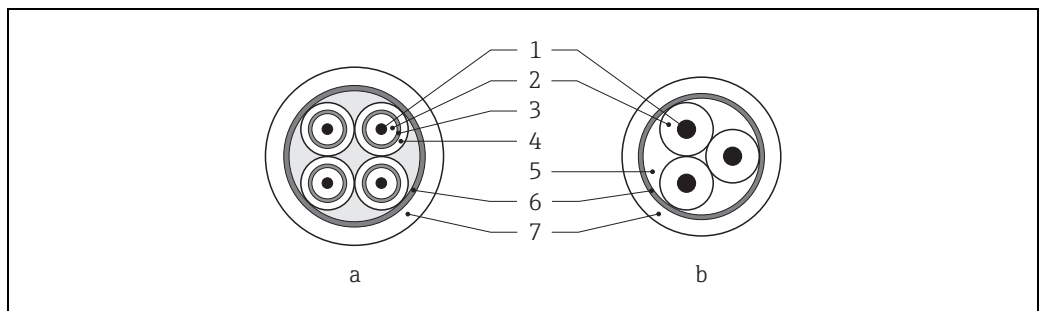
Remote version cable specifications

Coil cable

- 2 × 0.75 mm² (18 AWG) PVC cable with common, braided copper shield (∅ ~ 7 mm / 0.28")
- Conductor resistance: ≤ 37 Ω/km (≤ 0.011 Ω/ft)
- Capacitance: core/core, shield grounded: ≤ 120 pF/m (≤ 37 pF/ft)
- Operating temperature:
 - Cable not permanently routed: -20 to +80 °C (-4 to +176 °F)
 - Cable permanently routed: -40 to +80 °C (-40 to +176 °F)
- Cable cross-section: max. 2.5 mm² (14 AWG)

Signal cable

- 3 × 0.38 mm² (20 AWG) PVC cable with common, braided copper shield (∅ ~ 7 mm / 0.28") and individually shielded cores
- With Empty Pipe Detection (EPD): 4 × 0.38 mm² (20 AWG) PVC cable with common, braided copper shield (∅ ~ 7 mm / 0.28") and individually shielded cores
- Conductor resistance: ≤ 50 Ω/km (≤ 0.015 Ω/ft)
- Capacitance: core/shield: ≤ 420 pF/m (≤ 128 pF/ft)
- Operating temperature:
 - Cable not permanently routed: -20 to +80 °C (-4 to +176 °F)
 - Cable permanently routed: -40 to +80 °C (-40 to +176 °F)
- Cable cross-section: max. 2.5 mm² (14 AWG)



- a Signal cable
- b Coil current cable
- 1 Core
- 2 Core insulation
- 3 Core shield
- 4 Core jacket
- 5 Core reinforcement
- 6 Cable shield
- 7 Outer jacket

A0003194

Operation in zones of severe electrical interference

The measuring device complies with the general safety requirements in accordance with EN 61010-1, the EMC requirements of IEC/EN 61326 and NAMUR recommendation NE 21.



Caution!

Grounding of the shield is by means of the ground terminals provided for the purpose inside the connection housing. Ensure that the stripped and twisted lengths of cable shield to the ground terminal are as short as possible.

Performance characteristics

Reference operating conditions

As per DIN EN 29104

- Medium temperature: $(+28 \pm 2) ^\circ\text{C}$ / $(+82 \pm 4) ^\circ\text{F}$
- Ambient temperature: $(+22 \pm 2) ^\circ\text{C}$ / $(+72 \pm 4) ^\circ\text{F}$
- Warm-up period: 30 minutes

Installation conditions

- Inlet run $> 10 \times \text{DN}$
- Outlet run $> 5 \times \text{DN}$
- Sensor and transmitter grounded.
- The sensor is centered in the pipe.

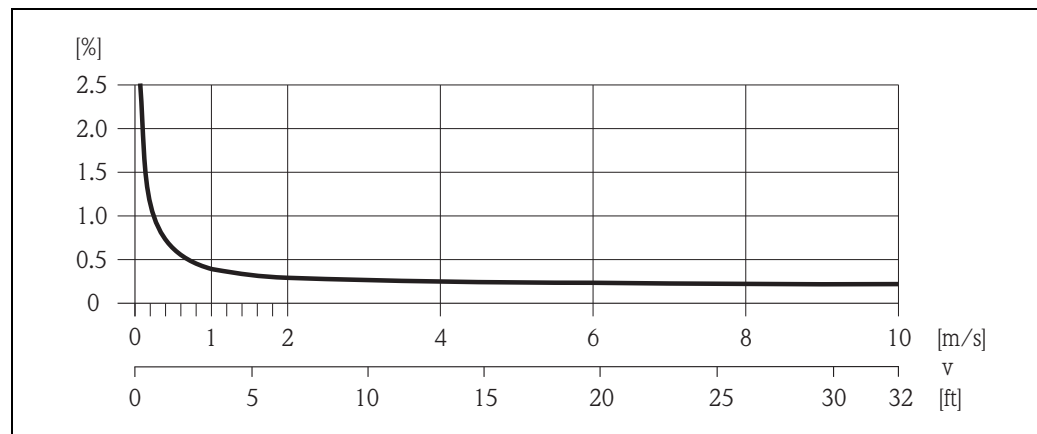
Maximum measured error

- Pulse output: standard $\pm 0.2\%$ o.r. $\pm 2 \text{ mm/s}$
- Current output: also typically $\pm 5 \mu\text{A}$



Note!

Fluctuations in the supply voltage do not have any effect within the specified range.



Max. measured error in % of reading

A0004456

Repeatability

Standard: max. $\pm 0.1\%$ o.r. $\pm 0.5 \text{ mm/s}$

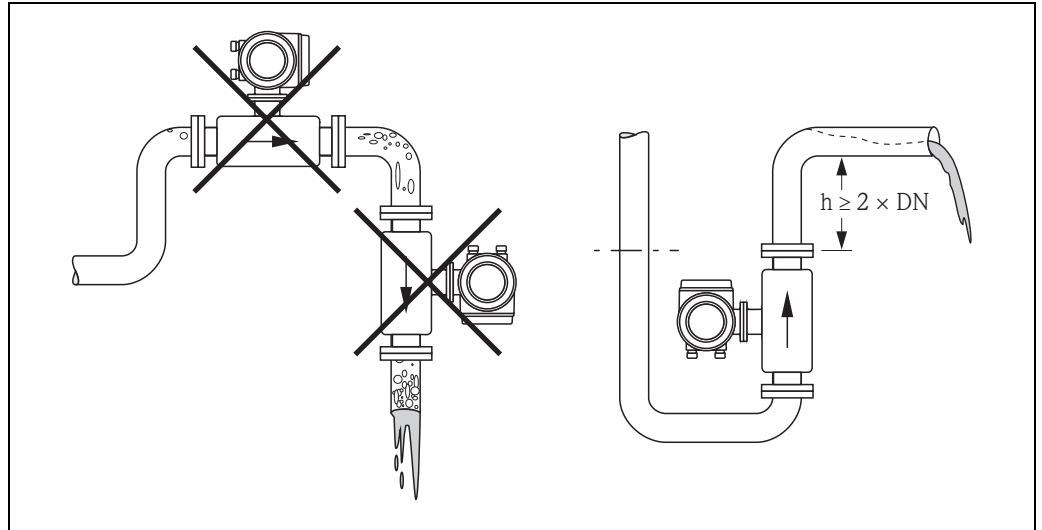
Installation

Mounting location

Entrained air or gas bubble formation in the measuring tube can result in an increase in measuring errors.

Avoid the following installation locations in the pipe:

- Highest point of a pipeline. Risk of air accumulating!
- Directly upstream from a free pipe outlet in a vertical pipeline.

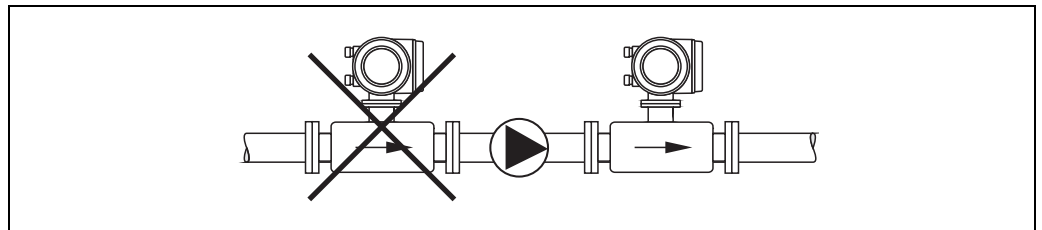


Mounting location

Installation of pumps

Sensors may not be installed on the pump suction side. This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. Information on the pressure tightness of the measuring tube lining → 21, Section "Pressure tightness".

It might be necessary to install pulse dampers in systems incorporating reciprocating, diaphragm or peristaltic pumps. Information on the shock and vibration resistance of the measuring system → 19, Section "Shock and vibration resistance".



Installation of pumps

Partially filled pipes

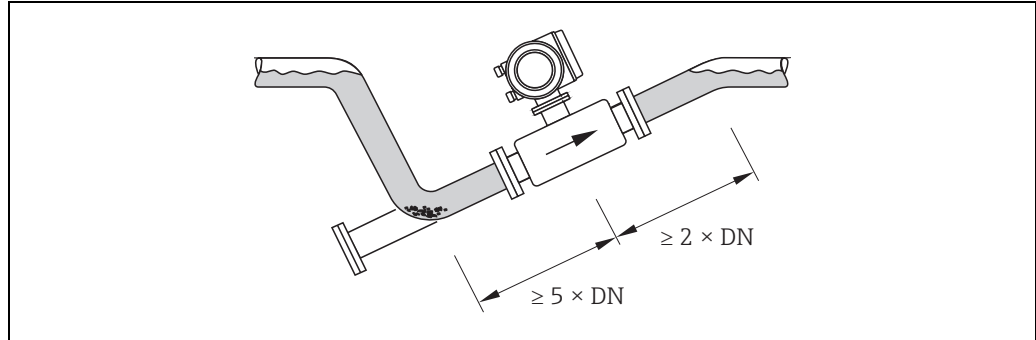
Partially filled pipes with gradients necessitate a drain-type configuration.

The empty pipe detection function (EPD) provides additional security in detecting empty or partially filled pipes.



Caution!

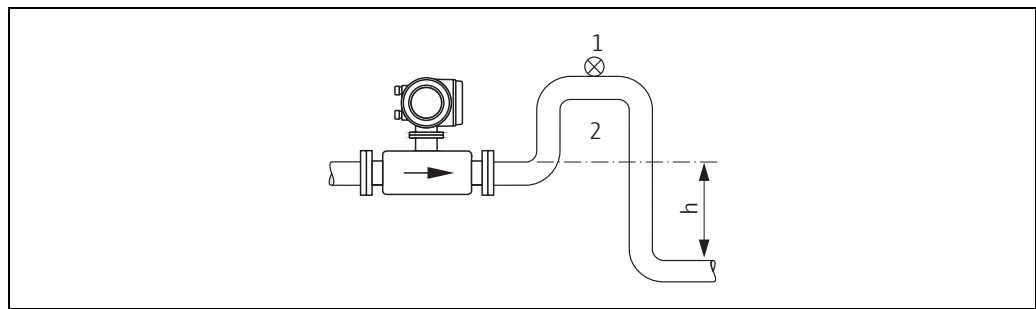
Risk of solids accumulating. Do not install the sensor at the lowest point in the drain. It is advisable to install a cleaning valve.



Installation with partially filled pipes

Down pipes

Install a siphon or a vent valve downstream of the sensor in down pipes $h \geq 5$ m (16.4 ft). This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. This measure also prevents the liquid current stopping in the pipe which could cause air locks. Information on the pressure tightness of the measuring tube lining → 21, Section "Pressure tightness".



Installation measures for vertical pipes

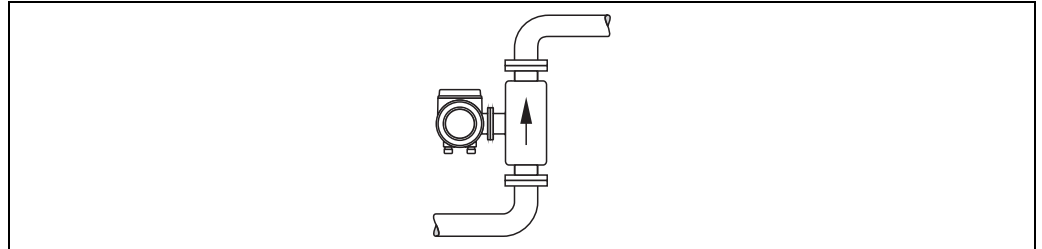
- 1 Vent valve
- 2 Pipe siphon
- h Length of the down pipe

Orientation

An optimum orientation position helps avoid gas and air accumulations and deposits in the measuring tube. The measuring device also offers the additional empty pipe detection function (EPD) for the detection of partially filled measuring tubes, e.g. in the case of degassing fluids or varying process pressures.

Vertical orientation

This is the ideal orientation for self-emptying piping systems and for use in conjunction with empty pipe detection.



A0011903

Vertical orientation

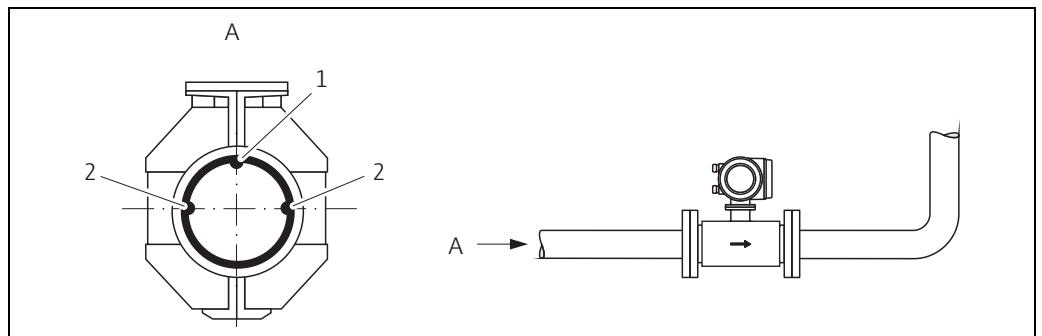
Horizontal orientation

The measuring electrode axis should be horizontal. This prevents brief insulation of the two measuring electrodes by entrained air bubbles.



Caution!

Empty pipe detection only works correctly with horizontal orientation if the transmitter housing is facing upwards. Otherwise there is no guarantee that empty pipe detection will respond if the measuring tube is only partially filled or empty.



A0012953

Horizontal orientation

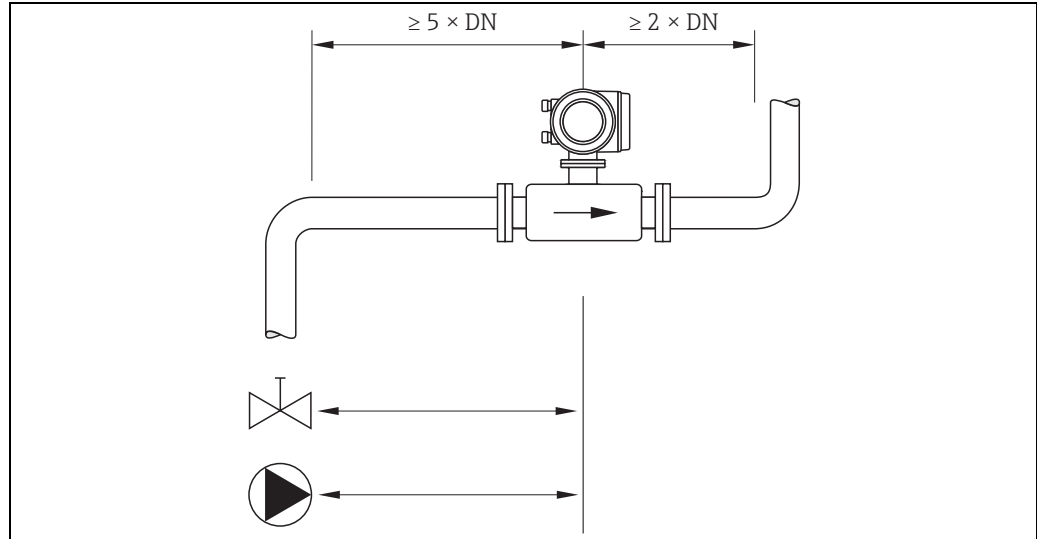
- 1 EPD electrode for empty pipe detection (not for DN 2 to 15 / 1/12 to 1/2")
- 2 Measuring electrodes for signal detection

Inlet and outlet runs

If possible, install the sensor well clear of assemblies such as valves, T-pieces, elbows etc.

Note the following inlet and outlet runs to comply with measuring accuracy specifications:

- Inlet run: $\geq 5 \times \text{DN}$
- Outlet run: $\geq 2 \times \text{DN}$



A0011905

Inlet and outlet runs

Adapters

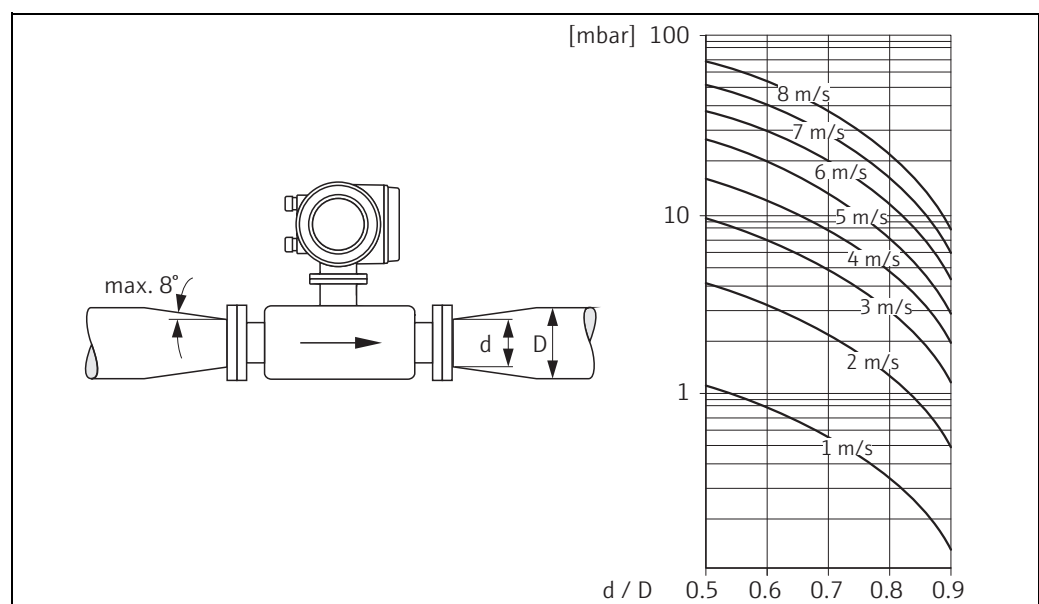
Suitable adapters to DIN EN 545 (double-flange reducers) can be used to install the sensor in larger-diameter pipes. The resultant increase in the rate of flow improves measuring accuracy with very slow-moving fluids. The nomogram shown here can be used to calculate the pressure loss caused by reducers and expanders.



Note!

The nomogram only applies to liquids of viscosity similar to water.

1. Calculate the ratio of the diameters d/D .
2. From the nomogram read off the pressure loss as a function of flow velocity (downstream from the reduction) and the d/D ratio.



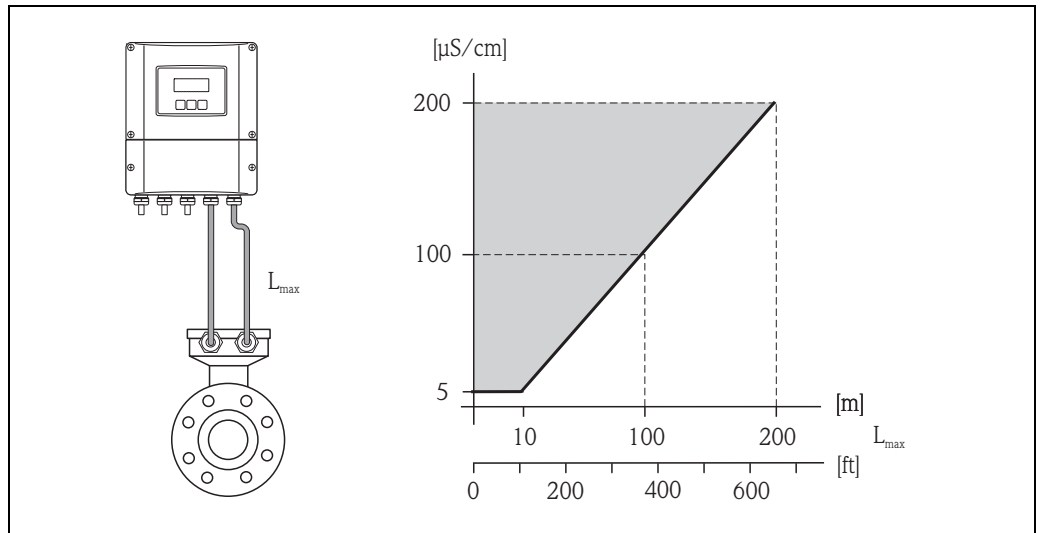
A0011907

Pressure loss due to adapters

Length of connecting cable

When mounting the remote version, please note the following to achieve correct measuring results:

- Fix cable run or lay in armored conduit. Cable movements can falsify the measuring signal especially in the case of low fluid conductivities.
- Route the cable well clear of electrical machines and switching elements.
- If necessary, ensure potential equalization between sensor and transmitter.
- The permitted cable length L_{max} is determined by the fluid conductivity. A minimum conductivity of 20 $\mu\text{S}/\text{cm}$ is required for measuring demineralized water.
- When the empty pipe detection function is switched on (EPD), the maximum connecting cable length is 10 m (33 ft).



A0010734

Permitted length of connecting cable for remote version

Area marked in gray = permitted range; L_{max} = length of connecting cable in [m] ([ft]); fluid conductivity in $\mu\text{S}/\text{cm}$

Mounting wall-mount housing



Caution!

- Make sure that the ambient temperature does not exceed the permitted range.
- Always install the wall-mount housing in such a way that the cable entries point downwards.

Mounted directly on the wall

35 (1.38) mm (inch)

90 (3.54)

192 (7.56)

81.5 (3.2)

1. Connection compartment
2. Securing screws M6 (max. \varnothing 6.5 mm / 0.26"); screw head max. \varnothing 10.5 mm (0.41")
3. Housing bores for securing screws

A0007542

Pipe mounting

Ø 20...70
(Ø 0.79...2.75)

~155 (~ 6.1)

Caution!
Danger of overheating!
If the device is mounted on a warm pipe, make sure that the housing temperature does not exceed +60 °C (+140 °F) which is the maximum temperature permitted.

A0007543

Panel mounting

210 (8.27)

245 (9.65)

~110 (~4.33)

+0.5 (+0.019)
-0.5 (-0.019)

+0.5 (+0.019)
-0.5 (-0.019)

mm (inch)

A0007544

Environment

Ambient temperature range

Transmitter

- Standard:
 - Compact version: -20 to $+50$ °C (-4 to $+122$ °F)
 - Remote version: -20 to $+60$ °C (-4 to $+140$ °F)
- Optional:
 - Compact version: -40 to $+50$ °C (-40 to $+122$ °F)
 - Remote version: -40 to $+60$ °C (-40 to $+140$ °F)



Note!

At ambient temperatures below -20 °C (-4 °F), the readability of the display may be impaired.

Sensor

- -40 to $+60$ °C (-40 to $+140$ °F)



Caution!

Do not exceed the min. and max. temperatures for the lining of the measuring tube (→ "Medium temperature range").

Note the following points:

- Install the device at a shady location. Avoid direct sunlight, particularly in warm climatic regions.
- If both fluid and ambient temperatures are high, install the transmitter at a remote location from the sensor (→ "Medium temperature range").

Storage temperature

- The storage temperature corresponds to the operating temperature range of the measuring transmitter and the appropriate measuring sensors.
- The measuring device must be protected against direct sunlight during storage in order to avoid unacceptably high surface temperatures.
- A storage location must be selected where moisture does not collect in the measuring device. This will help prevent fungus and bacteria infestation which can damage the liner.
- If protecting caps or protective covers are mounted, these must not be removed before mounting the device.

Degree of protection

- Standard: IP 67 (NEMA 4X) for transmitter and sensor

Shock and vibration resistance

Acceleration up to 2 g following IEC 68-2-6

Interior cleaning

- CIP cleaning
- SIP cleaning

Electromagnetic compatibility (EMC)

- As per IEC/EN 61326 and NAMUR recommendation NE 21
- Emission: to limit value for industry EN 55011

Process

Medium temperature range

The permissible medium temperature depends on the sensor and the sealing material:

Sensor:

- DN 2 to 150 (1/12 to 6"): -20 to +150 °C (-4 to +302 °F)

Seals:

- EPDM: -20 to +150 °C (-4 to 302 °F)
- Viton (FKM): -20 to +150 °C (-4 to 302 °F)
- Silicone (VMQ): -20 to +150 °C (-4 to 302 °F)
- Kalrez: -20 to +150 °C (-4 to 302 °F)

Conductivity



The minimum conductivity is:

- $\geq 5 \mu\text{S/cm}$ for all fluids (incl. demineralized water)

Note!

In the remote version, the necessary minimum conductivity also depends on the cable length
(→ 17, Section "Length of connecting cable").

Medium pressure range (nominal pressure)

The permitted nominal pressure depends on the process connection, the seal and the nominal diameter:

Process connections DN 2 to 25 (1/12 to 1") with O-ring seal

| Nominal diameter | [mm] | 2 | 4 | 8 | 15 | 25 |
|---|--------|--|------|------|------|----|
| | [inch] | 1/12" | 1/8" | 3/8" | 1/2" | 1" |
| Welding nipples: DIN EN ISO 1127, ODT/SMS | | 1.4404/316L: PN 40 (580 psi) | | | | |
| Couplings: ISO 228/DIN 2999, NPT | | 1.4404/316L: PN 40 (580 psi), PVDF: PN 16 (232 psi) | | | | |
| Flange: EN 1092-1 (DIN 2501) | | 1.4404/316L, PVDF: Class 150 | | | | |
| Flange: ANSI B16.5 | | 1.4404/316L: 20 K, PVDF: 10 K | | | | |
| Hose connection | | 1.4404/316L: PN 16 (232 psi) | | | | |
| PVC adhesive fitting | | PVC: PN 16 (232 psi) | | | | |

Process connections DN 2 to 25 (1/12 to 1") with aseptic gasket seal

| Nominal diameter | [mm] | 2 | 4 | 8 | 15 | 25 |
|--|--------|------------------------------|------|------|------|----|
| | [inch] | 1/12" | 1/8" | 3/8" | 1/2" | 1" |
| Welding nipple: EN 10357 (DIN 11850), ODT/SMS | | 1.4404/316L: PN 16 (232 psi) | | | | |
| Couplings: SC DIN 11851, DIN 11864-1, SMS 1145 | | 1.4404/316L: PN 16 (232 psi) | | | | |
| Clamp: ISO 2852/Fig. 2, DIN 32676, L14 AM7 | | 1.4404/316L: PN 16 (232 psi) | | | | |
| Flange: DIN 11864-2 | | 1.4404/316L: PN 16 (232 psi) | | | | |

Process connections DN 40 to 150 (1½ to 6") with aseptic gasket seal (1.44404/316L)

| Nominal diameter | [mm] | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
|---|-------------------|-------------------|----|----|----|-----------------|-----------------|-----|
| | [inch] | 1½" | 2" | - | 3" | 4" | 5" | 6" |
| Welding nipple: ODT/SMS | PN 16 (232 psi) | | | | | | | |
| Welding nipple: EN 10357 (DIN 11850) | PN 16 (232 psi) | | | | | | | |
| - For order codes with suffixes +CA/+CB | PN 40 (580 psi) | PN 25 (362.5 psi) | | | | PN 16 (232 psi) | | |
| Welding nipple: ISO 2037 | PN 40 (580 psi) | PN 25 (362.5 psi) | | | | PN16 (232 psi) | | |
| Welding nipple: ASME BPE | PN 40 (580 psi) | PN 25 (362.5 psi) | | | | - | PN 16 (232 psi) | |
| Clamp: ISO 2852, DIN 32676, L14 AM7 | PN 16 (232 psi) | | | | | | PN 10 (145 psi) | |
| Coupling: SC DIN 11851 | PN 16 (232 psi) | | | | | | | |
| - For order codes with suffixes +CA/+CB | PN 40 (580 psi) | PN 25 (362.5 psi) | | | | PN 16 (232 psi) | | |
| Coupling: SMS 1145 | PN 16 (232 psi) | | | | | | | |
| Coupling: DIN 11864-1, ISO 2853 | PN 16 (232 psi) | | | | | | | |
| - For order codes with suffixes +CA/+CB | PN 40 (580 psi) | PN 25 (362.5 psi) | | | | - | | |
| Flange: DIN 11864-2 | PN 16 (232 psi) | | | | | | | |
| - For order codes with suffixes +CA/+CB | PN 25 (362.5 psi) | PN 16 (232 psi) | | | | PN 10 (145 psi) | | |

Pressure tightness

Measuring tube lining: PFA

| Nominal diameter | | Limit values for abs. pressure [mbar] ([psi]) at fluid temperatures: | | | | |
|------------------|------------|--|----------------|-----------------|-----------------|-----------------|
| [mm] | [inch] | 25 °C (77 °F) | 80 °C (176 °F) | 100 °C (212 °F) | 130 °C (266 °F) | 150 °C (302 °F) |
| 2 to 150 | 1/12 to 6" | 0 | 0 | 0 | 0 | 0 |

Limiting flow

The diameter of the pipe and the flow rate determine the nominal diameter of the sensor. The optimum flow velocity is between 2 to 3 m/s (6.5 to 9.8 ft/s). The velocity of flow (v), moreover, has to be matched to the physical properties of the fluid:

- v < 2 m/s (6.5 ft/s): for small conductivities
- v > 2 m/s (6.5 ft/s): for fluids causing build-up such as high-fat milk etc.

Pressure loss

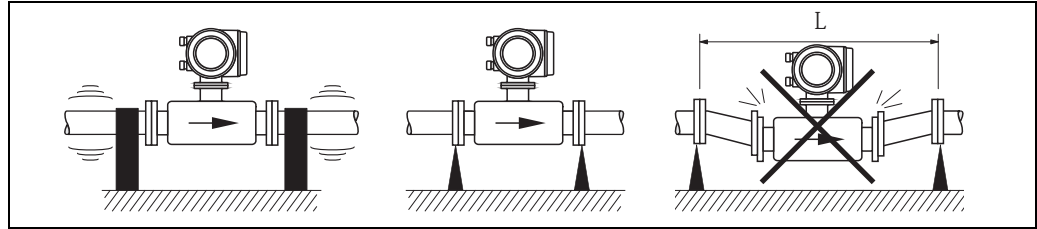
- With nominal diameters from DN 8 (3/8") no pressure loss if the sensor is installed in a pipe with the same nominal diameter.
- Pressure losses for configurations incorporating adapters according to DIN EN 545 (→ 16, Section "Adapters").

Vibrations

Secure the piping and the sensor if vibration is severe.

Caution!

- If vibrations are too severe, we recommend the sensor and transmitter be mounted separately. Information on the permitted shock and vibration resistance → 19, Section "Shock and vibration resistance".
- The sensor might require support or additional attachments, depending on the application and the length of the piping run. When plastic process connections are used, the sensor must be additionally supported mechanically. A wall-mounting kit can be ordered separately from an accessory.



Measures to prevent vibration of the measuring device

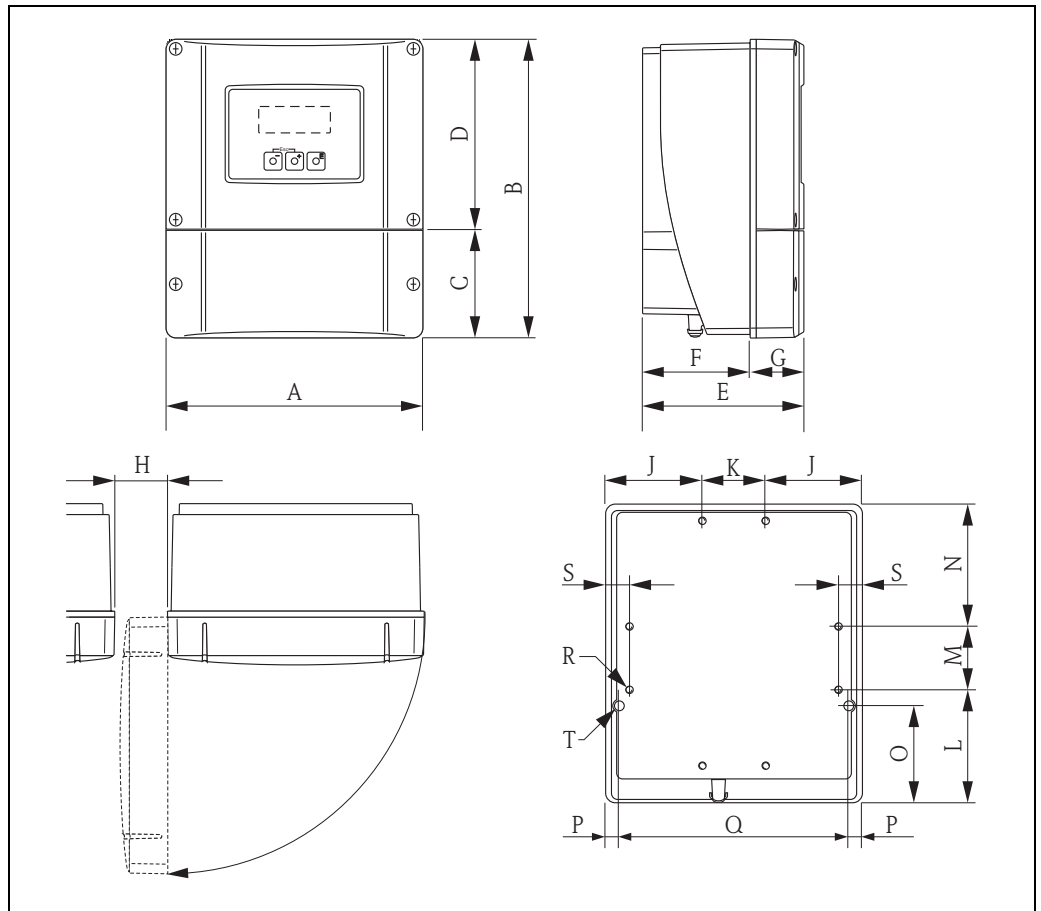
L > 10 m (33 ft)

A0011906

Mechanical construction

Design, dimensions

Transmitter remote version, wall-mount housing (non Ex-zone and II3G/Zone 2)



A0001150

Dimensions (SI units)

| A | B | C | D | E | F | G | H | J | K |
|-----|-----|------|-------|------|-----|--------|------|-----------------|----|
| 215 | 250 | 90.5 | 159.5 | 135 | 90 | 45 | > 50 | 81 | 53 |
| L | M | N | O | P | Q | R | S | T ¹⁾ | |
| 95 | 53 | 102 | 81.5 | 11.5 | 192 | 8 × M5 | 20 | 2 × ∅ 6,5 | |

¹⁾ Securing screw for wall mounting: M6 (screw head max. 10.5 mm)
All dimensions in [mm]

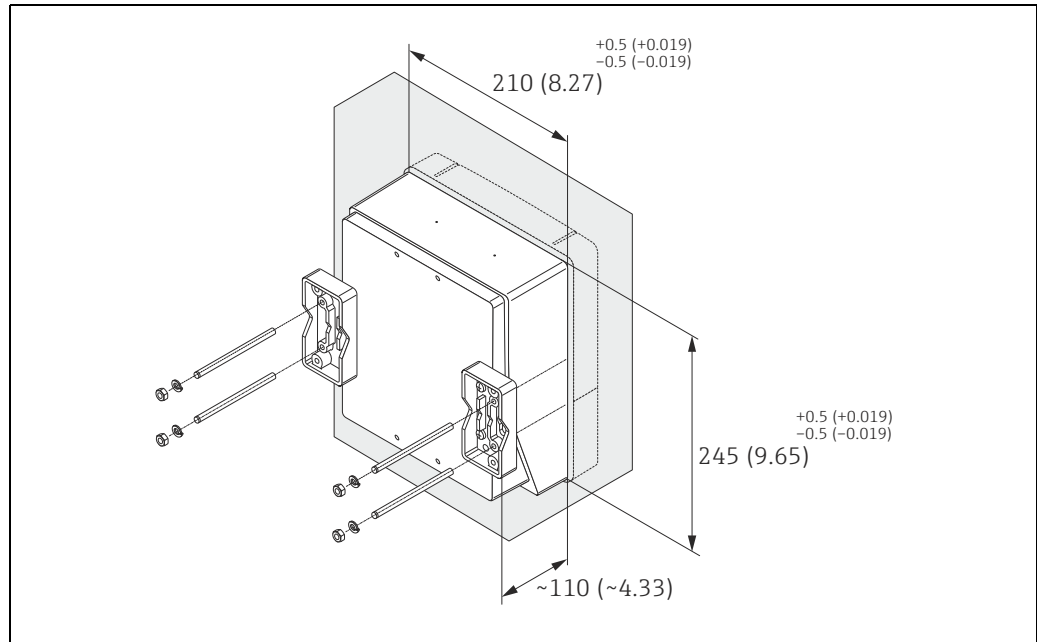
Dimensions (US units)

| A | B | C | D | E | F | G | H | J | K |
|------|------|------|------|------|------|--------|--------|-----------------|------|
| 8.46 | 9.84 | 3.56 | 6.27 | 5.31 | 3.54 | 1.77 | > 1.97 | 3.18 | 2.08 |
| L | M | N | O | P | Q | R | S | T ¹⁾ | |
| 3.74 | 2.08 | 4.01 | 3.20 | 0.45 | 7.55 | 8 × M5 | 0.79 | 2 × ∅ 0,26 | |

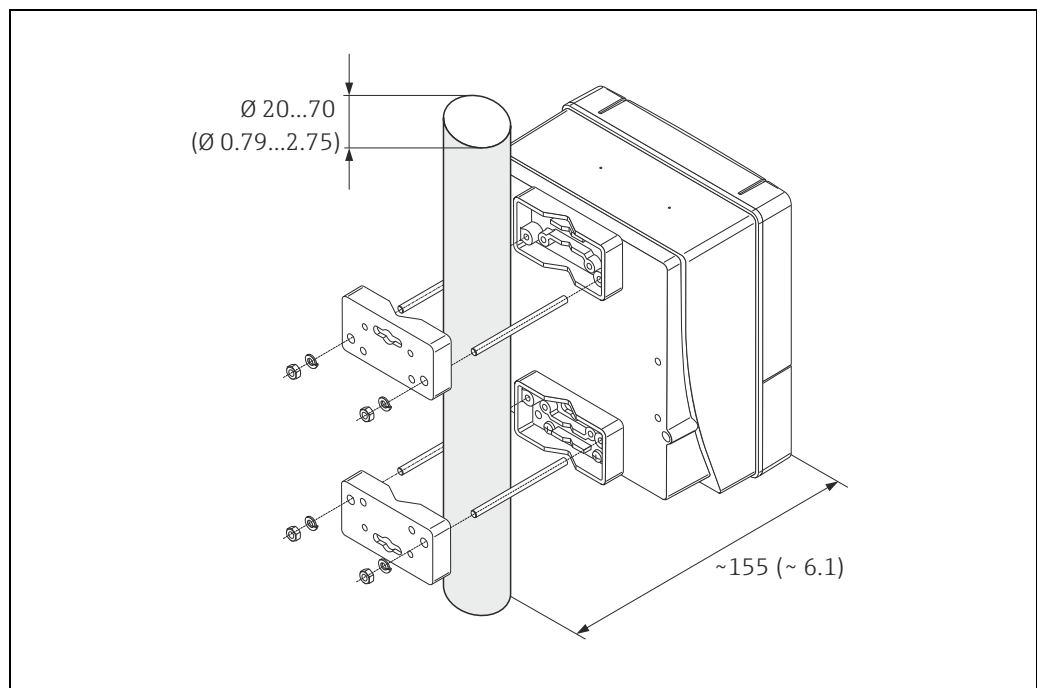
¹⁾ Securing screw for wall mounting: M6 (screw head max. 0.41")
All dimensions in [inch]

- Panel mounting
- Pipe mounting

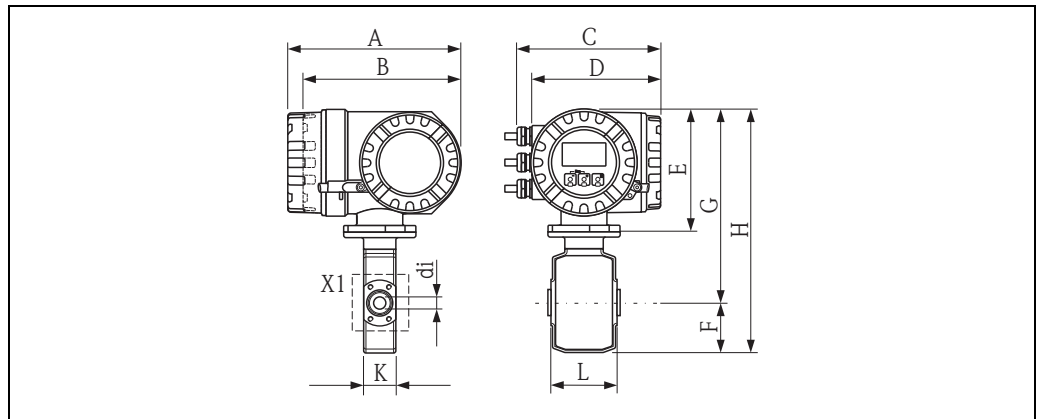
Panel mounting



Pipe mounting



Compact version, aluminum field housing DN 2 to 25 (1/12 to 1")



A0005426

Dimensions in SI units

| DN | L | A | B | C | D | E | F | G | H | K | X1 | di |
|----|----|-----|-----|-----|-----|-----|----|-----|-----|----|--------|------|
| 2 | 86 | 227 | 207 | 187 | 168 | 160 | 48 | 245 | 293 | 43 | M6 × 4 | 2.25 |
| 4 | | | | | | | | | | 43 | | 4.5 |
| 8 | | | | | | | | | | 43 | | 9 |
| 15 | | | | | | | | | | 43 | | 16 |
| 25 | | | | | | | | | | 52 | | 249 |

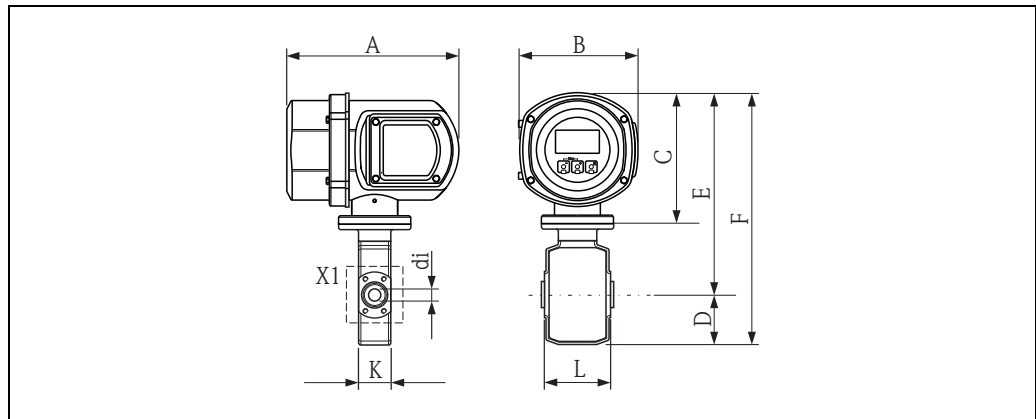
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

| DN | L | A | B | C | D | E | F | G | H | K | X1 | di |
|-------|------|------|------|------|------|------|------|------|------|------|--------|------|
| 1/12" | 3.39 | 8.94 | 8.15 | 7.36 | 6.61 | 6.30 | 1.88 | 9.62 | 11.5 | 1.69 | M6 × 4 | 0.09 |
| 1/8" | | | | | | | | | | 1.69 | | 0.18 |
| 3/8" | | | | | | | | | | 1.69 | | 0.35 |
| 1/2" | | | | | | | | | | 1.69 | | 0.63 |
| 1" | | | | | | | | | | 2.04 | | 9.76 |

Total length depends on the process connections.
All dimensions in [inch]

Compact version, stainless steel field housing DN 2 to 25 (1/12 to 1")



A0005427

Dimensions in SI units

| DN | L | A | B | C | D | E | F | K | X1 | di |
|----|----|-----|-----|-----|----|-----|-----|----|--------|------|
| 2 | 86 | 225 | 153 | 168 | 48 | 254 | 302 | 43 | M6 × 4 | 2.25 |
| 4 | | | | | | | | 43 | | 4.5 |
| 8 | | | | | | | | 43 | | 9 |
| 15 | | | | | 43 | 16 | | | | |
| 25 | | | | | 52 | 258 | 310 | 53 | | 26 |

Total length depends on the process connections.

All dimensions in [mm]

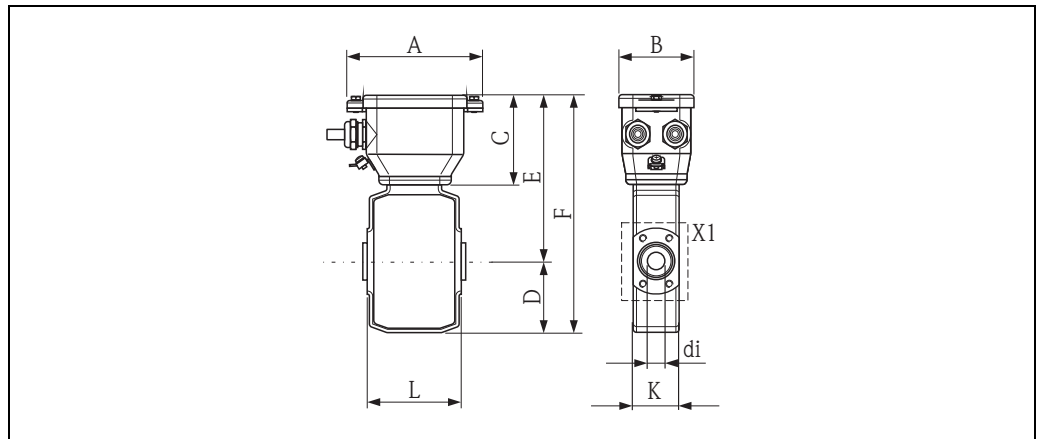
Dimensions in US units

| DN | L | A | B | C | D | E | F | K | X1 | di |
|-------|------|------|------|------|------|-------|-------|------|--------|------|
| 1/12" | 3.39 | 8.86 | 6.02 | 6.61 | 1.88 | 9.96 | 11.84 | 1.69 | M6 × 4 | 0.09 |
| 1/8" | | | | | | | | 1.69 | | 0.18 |
| 3/8" | | | | | | | | 1.69 | | 0.35 |
| 1/2" | | | | | 1.69 | 0.63 | | | | |
| 1" | | | | | 2.04 | 10.11 | 12.15 | 2.07 | | 0.89 |

Total length depends on the process connections.

All dimensions in [inch]

Sensor, remote version DN 2 to 25 (1/12 to 1")



A0005536

Dimensions in SI units

| DN | L | A | B | C | D | E | F | K | X1 | di |
|----|----|-----|----|----|----|-----|-----|----|--------|------|
| 2 | 86 | 127 | 70 | 75 | 48 | 129 | 177 | 43 | M6 × 4 | 2.25 |
| 4 | | | | | | | | 43 | | 4.5 |
| 8 | | | | | | | | 43 | | 9.0 |
| 15 | | | | | | | | 43 | | 16.0 |
| 25 | | | | | 52 | 133 | 185 | 53 | | 26.0 |

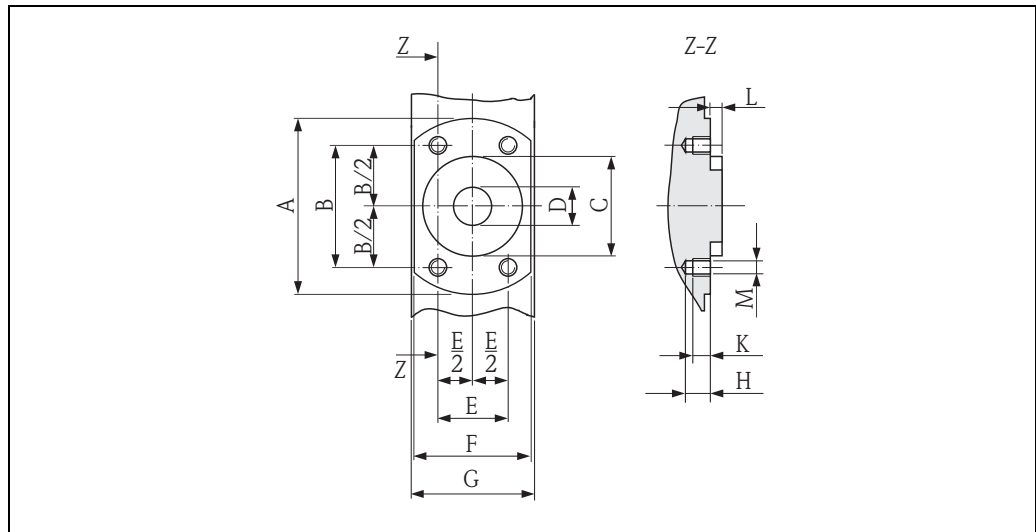
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

| DN | L | A | B | C | D | E | F | K | X1 | di |
|-------|------|------|------|------|------|------|------|------|--------|------|
| 1/12" | 3.39 | 5.00 | 2.76 | 2.95 | 1.88 | 5.06 | 6.94 | 1.69 | M6 × 4 | 0.09 |
| 1/8" | | | | | | | | 1.69 | | 0.18 |
| 3/8" | | | | | | | | 1.69 | | 0.35 |
| 1/2" | | | | | | | | 1.69 | | 0.63 |
| 1" | | | | | 2.04 | 5.21 | 7.25 | 2.07 | | 0.89 |

Total length depends on the process connections.
All dimensions in [inch]

Sensor, front view (without process connections) DN 2 to 25 (1/12 to 1")



A0008190

Dimensions in SI units

| DN | A | B | C | D | E | F | G | H | K | L | M |
|----|----|------|----|----|----|----|----|-----|---|---|----|
| 2 | 62 | 41.6 | 34 | 9 | 24 | 42 | 43 | 8.5 | 6 | 4 | M6 |
| 4 | | | | 9 | | | | | | | |
| 8 | | | | 9 | | | | | | | |
| 15 | | | | 16 | | | | | | | |
| 25 | 72 | 50.2 | 44 | 26 | 29 | 55 | 56 | | | | |

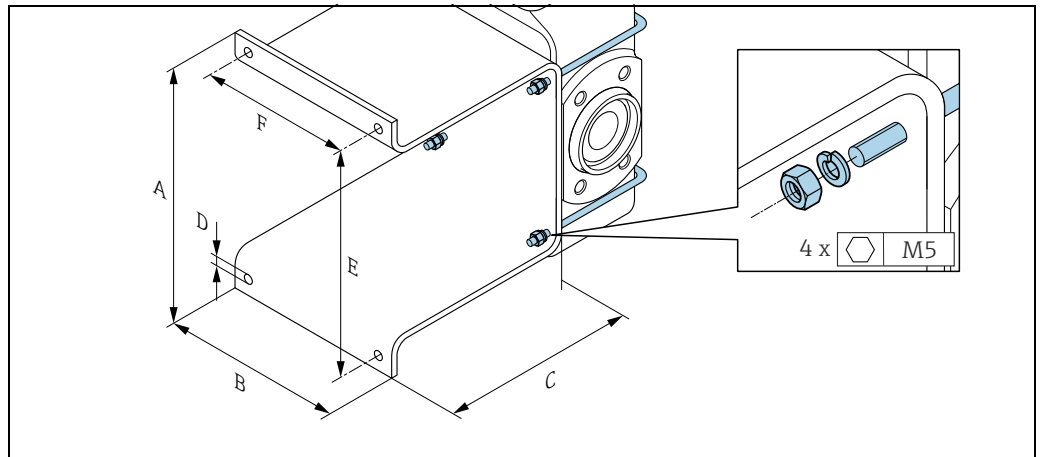
All dimensions in [mm]

Dimensions in US units

| DN | A | B | C | D | E | F | G | H | K | L | M |
|-------|------|------|------|------|------|------|------|------|------|------|----|
| 1/12" | 2.44 | 1.64 | 1.34 | 0.35 | 0.94 | 1.65 | 1.69 | 0.33 | 0.24 | 0.16 | M6 |
| 1/8" | | | | 0.35 | | | | | | | |
| 3/8" | | | | 0.35 | | | | | | | |
| 1/2" | | | | 0.63 | | | | | | | |
| 1" | 2.83 | 1.98 | 1.73 | 0.89 | 1.14 | 2.17 | 2.20 | | | | |

All dimensions in [inch]

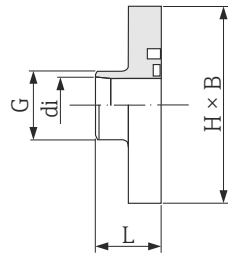
Sensor, wall mounting kit DN 2 to 25 (1/12 to 1")



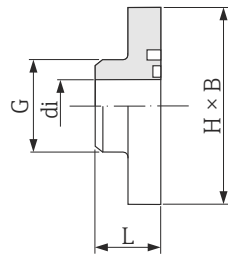
Dimensions in mm (inch)

| A | B | C | Ø D | E | F |
|-------------|------------|-------------|-----------|-------------|-------------|
| 125 (4.92") | 88 (3.46") | 120 (4.72") | 7 (0.28") | 110 (4.33") | 140 (5.51") |

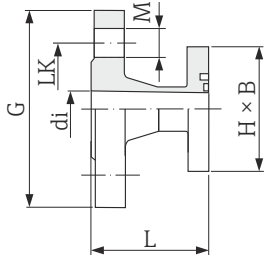
Process connections DN 2 to 25 (1/12 to 1") with O-ring seal

| Welding nipple for DIN EN ISO 1127, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|--|-----------|-----------------|------|------|------|---------|
| 5*H**-B***** | [mm] | DIN EN ISO 1127 | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | 13.5 × 1.6 | 10.3 | 13.5 | 20.3 | 62 × 42 |
| | 15 | 21.3 × 1.6 | 18.1 | 21.3 | 20.3 | 62 × 42 |
| | 25 (DIN) | 33.7 × 2.0 | 29.7 | 33.7 | 20.3 | 62 × 52 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | | |

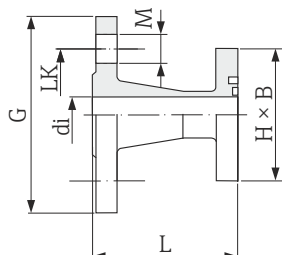
A0005547

| Welding nipple for ODT/SMS, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|--|-----------|----------------|------|------|------|---------|
| 5*H**-C***** | [mm] | ODT/SMS 1127 | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | 13.5 × 2.3 | 9.0 | 13.5 | 20.3 | 62 × 42 |
| | 15 | 21.3 × 2.65 | 16.0 | 21.3 | 20.3 | 62 × 42 |
| | 25 (DIN) | 33.7 × 3.25 | 27.2 | 33.7 | 20.3 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | | |

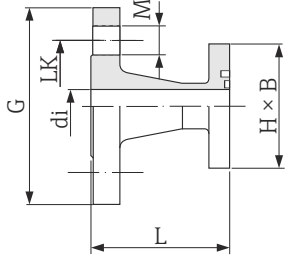
A0005548

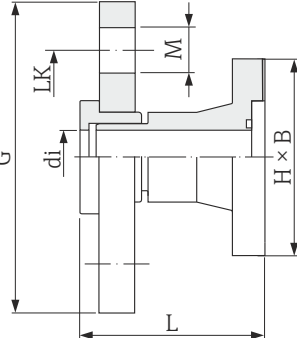
| Flange for EN 1092-1 (DIN 2501), Form B, 1.4404/316L, PN 40 | Sensor DN | Fits to flange ¹⁾ | di | G | L | LK | M | H × B |
|--|-----------|------------------------------|------|------|------|------|------|---------|
| 5*H**-D***** | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | DN 15 | 17.3 | 95 | 56.2 | 65 | 14 | 62 × 42 |
| | 15 | DN 15 | 17.3 | 95 | 56.2 | 65 | 14 | 62 × 42 |
| | 25 (DIN) | DN 25 | 28.5 | 115 | 56.2 | 85 | 14 | 72 × 55 |
| ¹⁾ EN 1092-1 (DIN 2501) <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ Fitting length to DVGW (200 mm) | | | | | | | | |

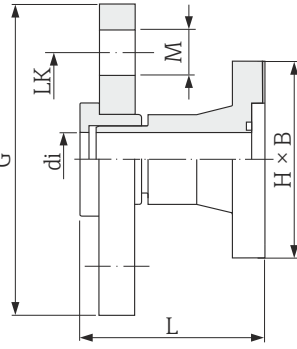
A0005549

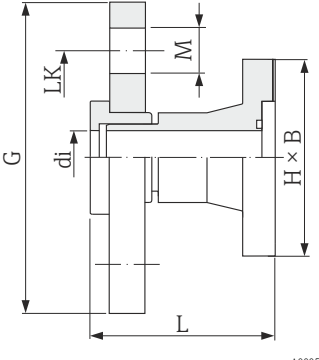
| Flange for ANSI B16.5, 1.4404/316L, Cl. 150 | Sensor DN | Fits to flange ¹⁾ | di | G | L | LK | M | H × B |
|---|--------------|------------------------------|------|------|------|------|------|---------|
| 5*H**-E***** | [mm] | [inch] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | ½" | 15.7 | 89 | 66.0 | 60.5 | 15.7 | 62 × 42 |
| | 15 | ½" | 16.0 | 89 | 66.0 | 60.5 | 15.7 | 62 × 42 |
| | 25 (1" ANSI) | 1" | 26.7 | 108 | 71.8 | 79.2 | 15.7 | 72 × 55 |
| ¹⁾ ANSI B16.5 <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | | | | |

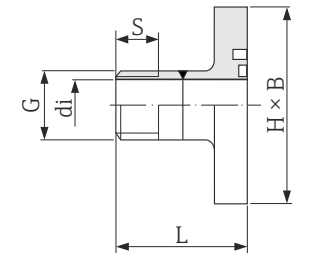
A0005550

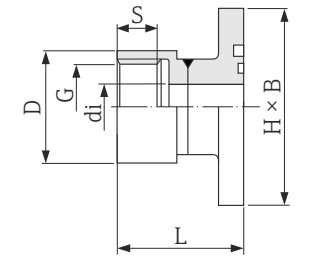
| Flange for JIS B2220, 1.4404/316L, 20K | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|--|-----------|----------------|------|------|------|------|------|---------|
| 5*H**-F***** | [mm] | B2220 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | ND 15 | 15 | 95 | 67 | 70 | 15 | 62 × 42 |
| | 15 | ND 15 | 16 | 95 | 67 | 70 | 15 | 62 × 42 |
| | 25 (DIN) | ND 25 | 26 | 125 | 67 | 90 | 19 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm | | | | | | | | |

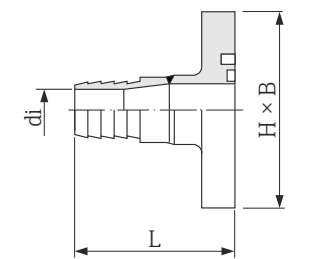
| Flange for EN 1092-1 (DIN2501), PVDF, PN16 | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|---|-----------|----------------------|------|------|------|------|------|---------|
| 5*H**-G***** | [mm] | EN 1092-1 (DIN 2501) | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | DN 15 | 16 | 95 | 57 | 65 | 14 | 62 × 42 |
| | 15 | DN 15 | 16 | 95 | 57 | 65 | 14 | 62 × 42 |
| | 25 (DIN) | DN 25 | 27.2 | 115 | 57 | 85 | 14 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm Fitting length to DVGW (200 mm) The requisite ground rings can be ordered as accessories (Order No. DK5HR-****). | | | | | | | | |

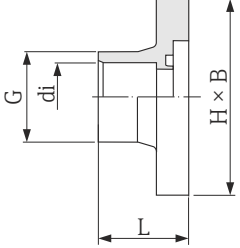
| Flange for ANSI B16.5, PVDF, Cl. 150 | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|--|-----------|----------------|------|------|------|------|------|---------|
| 5*H**-H***** | [mm] | ANSI B16.5 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | ½" | 16 | 95 | 57 | 60 | 16 | 62 × 42 |
| | 15 | ½" | 16 | 95 | 57 | 60 | 16 | 62 × 42 |
| | 25 (DIN) | 1" | 27.2 | 115 | 57 | 79 | 16 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm The requisite ground rings can be ordered as accessories (Order No. DK5HR-****). | | | | | | | | |

| Flange JIS B2220, PVDF, 10K | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|--|-----------|----------------|------|------|------|------|------|---------|
| 5*H**~J***** | [mm] | B2220 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  <p style="text-align: right; font-size: small;">A0005567</p> | 2 to 8 | ND 15 | 16 | 95 | 57 | 70 | 15 | 62 × 42 |
| | 15 | ND 15 | 16 | 95 | 57 | 70 | 15 | 62 × 42 |
| | 25 (DIN) | ND 25 | 27.2 | 125 | 57 | 90 | 19 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ The requisite ground rings can be ordered as accessories (Order No. DK5HR-****). | | | | | | | | |

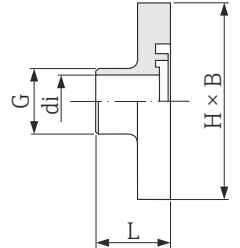
| External pipe thread, ISO 228/DIN 2999, 1.4404/316L | Sensor DN | Fits to internal thread | di | G | L | S | H × B | |
|---|--------------|-------------------------|------|--------|------|------|---------|--|
| 5*H**~K***** | [mm] | [inch] | [mm] | [inch] | [mm] | [mm] | [mm] | |
|  <p style="text-align: right; font-size: small;">A0005563</p> | 2 to 8 | R 3/8" | 10 | 3/8" | 40 | 10.1 | 62 × 42 | |
| | 15 | R 1/2" | 16 | 1/2" | 40 | 13.2 | 62 × 42 | |
| | 25 (1" ANSI) | R 1" | 25 | 1" | 42 | 16.5 | 72 × 55 | |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | | | | |

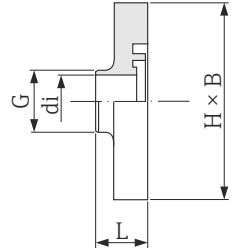
| Internal pipe thread, ISO 228/DIN 2999, 1.4404/316L | Sensor DN | Fits to external thread | di | G | D | L | S | H × B |
|--|--------------|-------------------------|------|--------|------|------|------|---------|
| 5*H**~L***** | [mm] | [inch] | [mm] | [inch] | [mm] | [mm] | [mm] | [mm] |
|  <p style="text-align: right; font-size: small;">A0005565</p> | 2 to 8 | Rp 3/8" | 9 | 3/8" | 22 | 45 | 13 | 62 × 42 |
| | 15 | Rp 1/2" | 16 | 1/2" | 27 | 45 | 14 | 62 × 42 |
| | 25 (1" ANSI) | Rp 1" | 27.2 | 1" | 40 | 51 | 17 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | | | | |

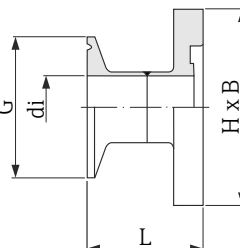
| Hose connection 1.4404/316L | Sensor DN | Fits to inside diameter | di | L | H × B |
|--|-----------|-------------------------|------|------|---------|
| 5*H**~M/N/P***** | [mm] | [mm] | [mm] | [mm] | [mm] |
|  <p style="text-align: right; font-size: small;">A0005562</p> | 2 to 8 | 13 | 10.0 | 49 | 62 × 42 |
| | 15 | 16 | 12.6 | 49 | 62 × 42 |
| | 15 | 19 | 16.0 | 49 | 62 × 42 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm | | | | | |

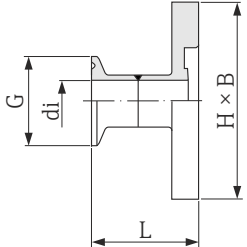
| PVC adhesive fitting | Sensor DN | Fits to pipe | di | G | L | H × B |
|--|-----------|---------------------------|------|------|------|---------|
| 5*H**-R/S***** | [mm] | [mm] / [inch] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | ½" [inch] | 21.5 | 27.3 | 38.5 | 62 × 42 |
| | 2 to 8 | 20 × 2 [mm] (DIN 8062) | 20.2 | 27.0 | 38.5 | 62 × 42 |
| | 15 | 20 × 2 [mm] (DIN 8062) | 20.2 | 27.0 | 28.0 | 62 × 42 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm The requisite ground rings can be ordered as accessories (Order No. DK5HR-****). | | | | | | |

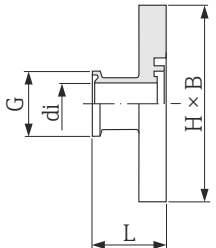
Process connections DN 2 to 25 (1/12 to 1") with aseptic gasket seal

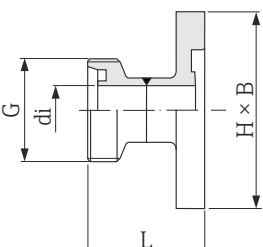
| Welding nipple for DIN, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|-----------|-------------------------|------|------|------|---------|
| 5*H**-U***** | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | 13 × 1.5 | 10 | 13 | 23 | 62 × 42 |
| | 15 | 19 × 1.5 | 16 | 19 | 23 | 62 × 42 |
| | 25 (DIN) | 29 × 1.5 | 26 | 29 | 23 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

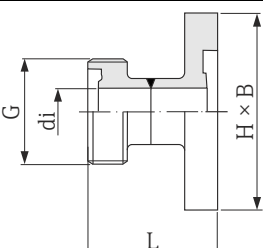
| Welding nipple for ODT/SMS, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|--------------|----------------|------|------|------|---------|
| 5*H**-V***** | [mm] | ODT/SMS | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | 12.7 × 1.65 | 9.0 | 12.7 | 16.1 | 62 × 42 |
| | 15 | 19.1 × 1.65 | 16.0 | 19.1 | 16.1 | 62 × 42 |
| | 25 (1" ANSI) | 25.4 × 1.65 | 22.6 | 25.4 | 16.1 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

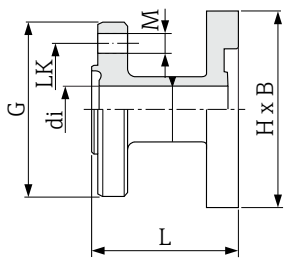
| Clamp ISO 2852, Fig.2, 1.4404/316L | Sensor DN | Fits to piping | Clamp ISO 2852, DN | di | G | L | H × B |
|---|---|-------------------------|--------------------|------|------|------|---------|
| 5*H**-W***** | [mm] | ISO 2037 / BS 4825-1 | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 25 (1" ANSI) | Tube 24.5 × 1.65 | 25 | 22.6 | 50.5 | 44.3 | 72 × 55 |
| | <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

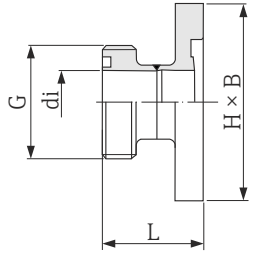
| Clamp DIN 32676, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|-----------|----------------------|------|------|------|---------|
| 5*H**-0***** | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | Tube 14 × 2 (DN 10) | 10 | 34.0 | 41.0 | 62 × 42 |
| | 15 | Tube 20 × 2 (DN 15) | 16 | 34.0 | 41.0 | 62 × 42 |
| | 25 (DIN) | Tube 30 × 2 (DN 25) | 26 | 50.5 | 44.5 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

| Tri-Clamp for L14 AM7, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|--------------|---------------------------|------|------|------|---------|
| 5*H**-1***** | [mm] | OD | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | Tube 12.7 × 1.65 (OD ½") | 9.4 | 25.0 | 28.5 | 62 × 42 |
| | 15 | Tube 19.1 × 1.65 (ODT ¾") | 15.8 | 25.0 | 28.5 | 62 × 42 |
| | 25 (1" ANSI) | Tube 25.4 × 1.65 (ODT 1") | 22.1 | 50.4 | 28.5 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

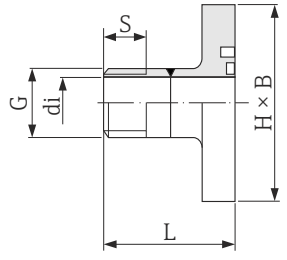
| Coupling SC DIN 11851, threaded adapter, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|-----------|---------------------------------|------|--------------|------|---------|
| 5*H**-2***** | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | Tube 12 × 1 (DN 10) | 10 | Rd 28 × 1/8" | 44 | 62 × 42 |
| | 15 | Tube 18 × 1.5 (DN 15) | 16 | Rd 34 × 1/8" | 44 | 62 × 42 |
| | 25 (DIN) | Tube 28 × 1 or 28 × 1.5 (DN 25) | 26 | Rd 52 × 1/6" | 52 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

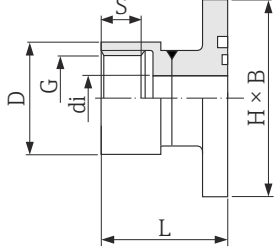
| Coupling DIN 11864-1, aseptic threaded adapter, Form A, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|---|-----------|-----------------------|------|--------------|------|---------|
| 5*H**-3***** | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | Tube 13 × 1.5 (DN 10) | 10 | Rd 28 × 1/8" | 42 | 62 × 42 |
| | 15 | Tube 19 × 1.5 (DN 15) | 16 | Rd 34 × 1/8" | 42 | 62 × 42 |
| | 25 (DIN) | Tube 29 × 1.5 (DN 25) | 26 | Rd 52 × 1/6" | 49 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

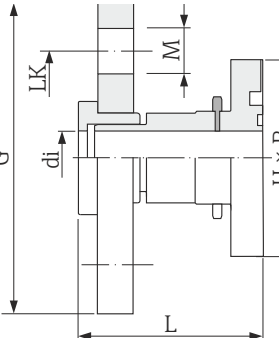
| Flange DIN 11864-2, aseptic grooved flange, Form A, 1.4404/316L | Sensor DN | Fits to piping | di | G | L | LK | M | H × B |
|---|---|-----------------------|------|------|------|------|------|---------|
| 5*H**_4***** | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | Tube 13 × 1.5 (DN 10) | 10 | 54 | 48.5 | 37 | 9 | 62 × 42 |
| | 15 | Tube 19 × 1.5 (DN 15) | 16 | 59 | 48.5 | 42 | 9 | 62 × 42 |
| | 25 (DIN) | Tube 29 × 1.5 (DN 25) | 26 | 70 | 48.5 | 53 | 9 | 72 × 55 |
| | <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | |

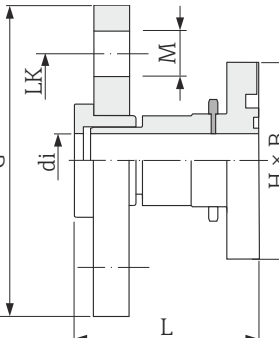
| Coupling SMS 1145, threaded adapter, 1.4404/316L | Sensor DN | Fits to piping | SMS 1145 DN | di | G | L | H × B |
|--|---|----------------|-------------|------|--------------|------|---------|
| 5*H**_5***** | [mm] | OD | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 25 (1" ANSI) | 1" | 25 | 22.6 | Rd 40 × 1/6" | 30.8 | 72 × 55 |
| | <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | |

Process connections orderable only as accessories with O-ring seal (DN 2 to 25 / 1/12 to 1")

| External pipe thread, 1.4404/316L | Sensor DN | Fits to internal thread | di | G | L | S | H × B |
|---|--|-------------------------|------|--------|------|------|---------|
| DKH**_GD** | [mm] | NP | [mm] | [inch] | [mm] | [mm] | [mm] |
|  | 2 to 8 | NPT 3/8" | 10 | 3/8" | 50 | 15.5 | 62 × 42 |
| | 15 | NPT 1/2" | 16 | 1/2" | 50 | 20.0 | 62 × 42 |
| | 25 (1" ANSI) | NPT 1" | 25 | 1" | 55 | 25.0 | 72 × 55 |
| | <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm | | | | | | |

| Internal thread, 1.4404/316L | Sensor DN | Fits to external thread | di | G | D | L | S | H × B |
|--|-----------------|-------------------------|------|--------|------|------|------|---------|
| DKH**-GC** | [mm] | NP | [mm] | [inch] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | NPT 3/8" | 8.9 | 3/8" | 22 | 45 | 13 | 62 × 42 |
| | 15 | NPT 1/2" | 16.0 | 1/2" | 27 | 45 | 14 | 62 × 42 |
| | 25 (1" ANSI) | NPT 1" | 27.2 | 1" | 40 | 51 | 17 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm | | | | | | | | |

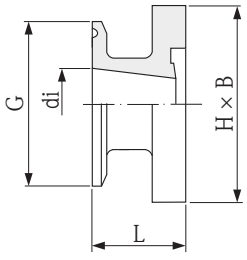
| Flange with ground electrode EN 1092-1 (DIN 2501), PVDF, PN 16 | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|---|-----------|-------------------------|------|------|------|------|------|---------|
| DKH**-FG** | [mm] | EN 1092-1 (DIN 2501) | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | DN 15 | 16 | 95 | 57 | 65 | 14 | 62 × 42 |
| | 15 | DN 15 | 16 | 95 | 57 | 65 | 14 | 62 × 42 |
| | 25 (DIN) | DN 25 | 27.2 | 115 | 57 | 85 | 14 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm Fitting length to DVGW (200 mm) Grounds rings are not required | | | | | | | | |

| Flange with ground electrode ANSI B16.5, PVDF, Cl. 150 | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|--|-----------|----------------|------|------|------|------|------|---------|
| DKH**-FH** | [mm] | ANSI B16.5 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | 2 to 8 | 1/2" | 16 | 95 | 57 | 60 | 16 | 62 × 42 |
| | 15 | 1/2" | 16 | 95 | 57 | 60 | 16 | 62 × 42 |
| | 25 (DIN) | 1" | 27.2 | 115 | 57 | 79 | 16 | 72 × 55 |
| <ul style="list-style-type: none"> Fitting length = (2 × L) + 86 mm Grounds rings are not required | | | | | | | | |

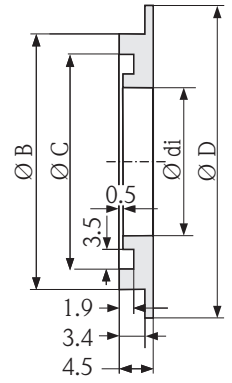
| Flange with ground electrode, JIS B2220, PVDF, 10K | Sensor DN | Fits to flange | di | G | L | LK | M | H × B |
|--|-----------|-------------------|------|------|------|------|------|---------|
| DKH**-FJ** | [mm] | B2220 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| | 2 to 8 | ND 15 | 16 | 95 | 57 | 70 | 15 | 62 × 42 |
| | 15 | ND 15 | 16 | 95 | 57 | 70 | 15 | 62 × 42 |
| | 25 (DIN) | ND 25 | 27.2 | 125 | 57 | 90 | 19 | 72 × 55 |
| <ul style="list-style-type: none"> ■ Fitting length = $(2 \times L) + 86$ mm ■ Grounds rings are not required | | | | | | | | |

A0017292

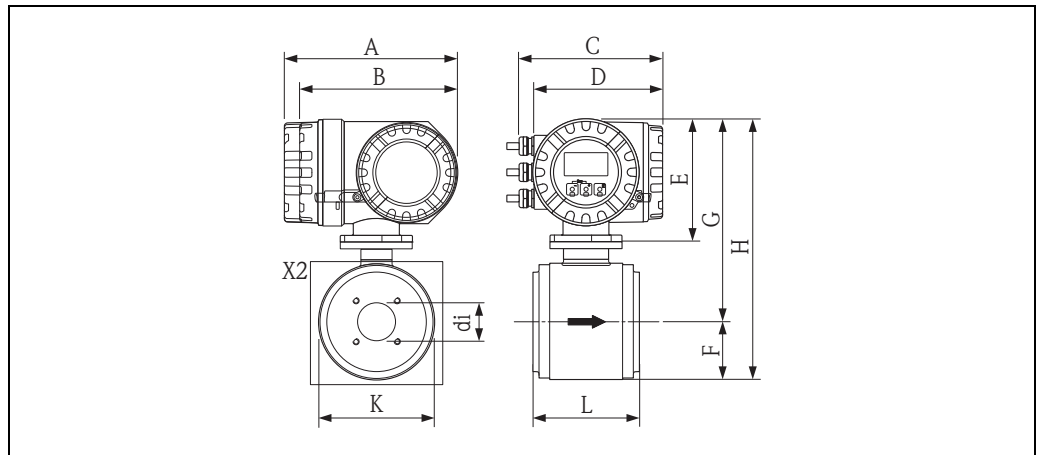
Process connections orderable only as accessories with aseptic gasket seal (DN 15)

| Tri-Clamp L14 AM17 1.4404/316L | Sensor DN | Fits to piping | di | G | L | H × B |
|--|---|------------------------------|------|------|------|---------|
| DKH**-HF** | [mm] | OD | [mm] | [mm] | [mm] | [mm] |
|  <p style="text-align: right; font-size: small;">A0005555</p> | 15 | Tube 25.4 × 1.65 (ODT 1") | 22.1 | 50.4 | 28.5 | 62 × 42 |
| | <ul style="list-style-type: none"> ■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | |

Ground rings (accessories for PVDF flanges / PVC adhesive fitting) (DN 2 to 25 / 1/12 to 1")

| Ground ring 1.4435/316L, Alloy C-22, tantalum | Sensor DN | di | B | C | D |
|---|--------------|------|------|------|------|
| DK5HR – **** | [mm] | [mm] | [mm] | [mm] | [mm] |
|  <p style="text-align: right; font-size: small;">A0005568</p> | 2 to 8 | 9.0 | 22.0 | 17.6 | 33.9 |
| | 15 | 16.0 | 29.0 | 24.6 | 33.9 |
| | 25 (1" ANSI) | 22.6 | 36.5 | 31.2 | 43.9 |
| | 25 (DIN) | 26.0 | 39.0 | 34.6 | 43.9 |
| | | | | | |

Compact version, aluminum field housing DN 40 to 150 (1½ to 6")



A0005425

Dimensions in SI units

| DN | L | A | B | C | D | E | F | G | H | K | X2 | di |
|-----|-----|-----|-----|-----|-----|-----|------|-------|-------|-----|---------|-------|
| 40 | 140 | 227 | 207 | 187 | 168 | 160 | 53.5 | 252 | 305.5 | 107 | M8 × 4 | 34.8 |
| 50 | 140 | | | | | | 60 | 258.5 | 318.5 | 120 | M8 × 4 | 47.5 |
| 65 | 140 | | | | | | 67.5 | 266 | 333.5 | 135 | M8 × 6 | 60.2 |
| 80 | 140 | | | | | | 74 | 272.5 | 346.5 | 148 | M8 × 6 | 72.9 |
| 100 | 140 | | | | | | 87 | 285.5 | 372.5 | 174 | M8 × 6 | 97.4 |
| 125 | 200 | | | | | | 103 | 301.5 | 404.5 | 206 | M10 × 6 | 120.0 |
| 150 | 200 | | | | | | 117 | 315.5 | 432.5 | 234 | M10 × 6 | 146.9 |

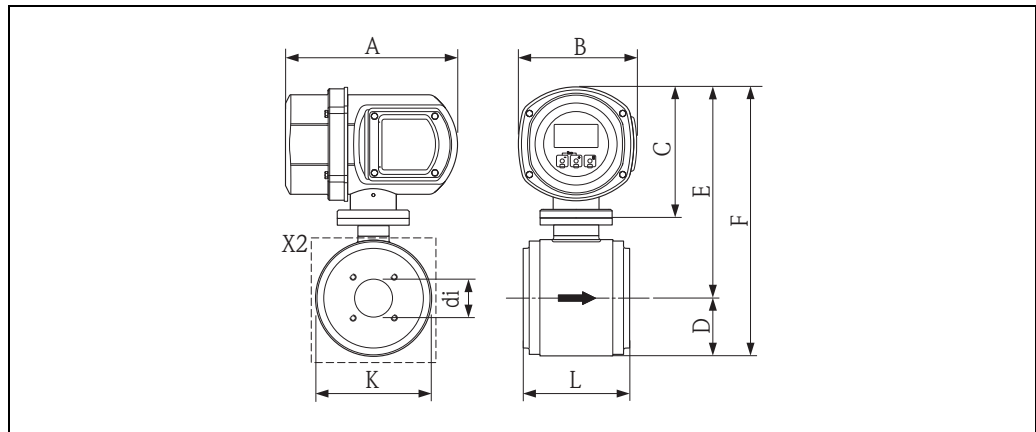
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

| DN | L | A | B | C | D | E | F | G | H | K | X2 | di |
|-----|------|------|------|------|------|------|------|-------|-------|------|---------|------|
| 1½" | 5.51 | 8.94 | 8.15 | 7.36 | 6.61 | 6.30 | 2.11 | 9.92 | 12.36 | 4.21 | M8 × 4 | 1.37 |
| 2" | 5.51 | | | | | | 2.36 | 10.18 | 12.76 | 4.72 | M8 × 4 | 1.87 |
| 3" | 5.51 | | | | | | 2.91 | 10.73 | 13.64 | 5.83 | M8 × 6 | 2.87 |
| 4" | 5.51 | | | | | | 3.43 | 11.24 | 14.67 | 6.85 | M8 × 6 | 3.83 |
| 5" | 7.87 | | | | | | 4.06 | 11.87 | 15.93 | 8.11 | M10 × 6 | 4.72 |
| 6" | 7.87 | | | | | | 4.61 | 12.42 | 17.03 | 9.21 | M10 × 6 | 5.78 |

Total length depends on the process connections.
All dimensions in [inch]

Compact version, stainless steel field housing DN 40 to 150 (1½ to 6")



A0005428

Dimensions in SI units

| DN | L | A | B | C | D | E | F | K | X2 | di |
|-----|-----|-----|-----|-----|------|-------|-----|-----|---------|-------|
| 40 | 140 | 220 | 153 | 171 | 53.5 | 261.5 | 315 | 107 | M8 × 4 | 34.8 |
| 50 | 140 | | | | 60 | 268 | 328 | 120 | M8 × 4 | 47.5 |
| 65 | 140 | | | | 67.5 | 275.5 | 343 | 135 | M8 × 6 | 60.2 |
| 80 | 140 | | | | 74 | 282 | 356 | 148 | M8 × 6 | 72.9 |
| 100 | 140 | | | | 87 | 295 | 382 | 174 | M8 × 6 | 97.4 |
| 125 | 200 | | | | 103 | 311 | 414 | 206 | M10 × 6 | 120.0 |
| 150 | 200 | | | | 117 | 325 | 442 | 234 | M10 × 6 | 146.9 |

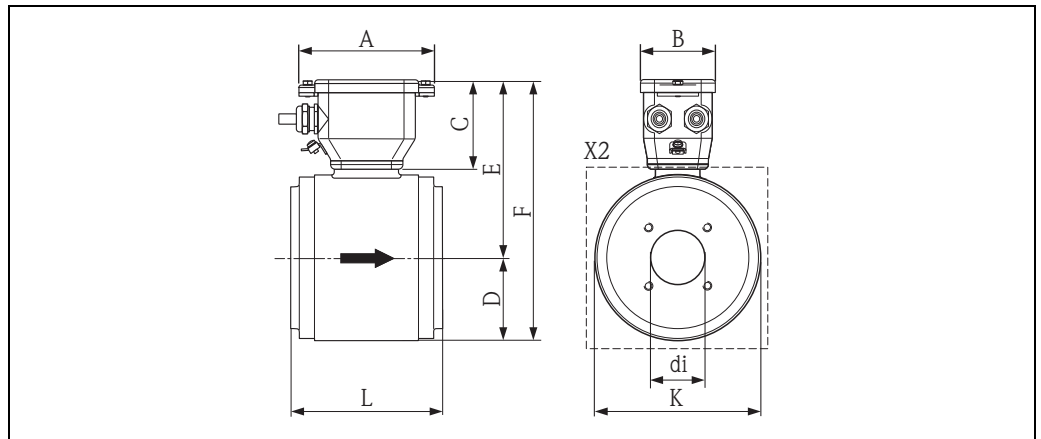
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

| DN | L | A | B | C | D | E | F | K | X2 | di |
|-----|------|------|------|------|------|-------|-------|------|---------|------|
| 1½" | 5.51 | 8.66 | 6.02 | 6.73 | 2.11 | 10.30 | 12.40 | 4.21 | M8 × 4 | 1.37 |
| 2" | 5.51 | | | | 2.36 | 10.55 | 12.91 | 4.72 | M8 × 4 | 1.87 |
| 3" | 5.51 | | | | 2.91 | 11.10 | 14.02 | 5.83 | M8 × 6 | 2.87 |
| 4" | 5.51 | | | | 3.43 | 11.61 | 15.04 | 6.85 | M8 × 6 | 3.83 |
| 5" | 7.87 | | | | 4.06 | 12.24 | 16.30 | 8.11 | M10 × 6 | 4.72 |
| 6" | 7.87 | | | | 4.61 | 12.80 | 17.40 | 9.21 | M10 × 6 | 5.78 |

Total length depends on the process connections.
All dimensions in [inch]

Sensor, remote version DN 40 to 150 (1½ to 6")



A0005535

Dimensions in SI units

| DN | L | A | B | C | D | E | F | K | X2 | di |
|-----|-----|-----|----|----|------|-------|-----|-----|---------|-------|
| 40 | 140 | 125 | 70 | 75 | 53.5 | 138.5 | 192 | 107 | M8 × 4 | 34.8 |
| 50 | 140 | | | | 60 | 145 | 205 | 120 | M8 × 4 | 47.5 |
| 65 | 140 | | | | 67.5 | 152.5 | 220 | 135 | M8 × 6 | 60.2 |
| 80 | 140 | | | | 74 | 159 | 233 | 148 | M8 × 6 | 72.9 |
| 100 | 140 | | | | 87 | 172 | 259 | 174 | M8 × 6 | 97.4 |
| 125 | 200 | | | | 103 | 188 | 291 | 206 | M10 × 6 | 120.0 |
| 150 | 200 | | | | 117 | 202 | 319 | 234 | M10 × 6 | 146.9 |

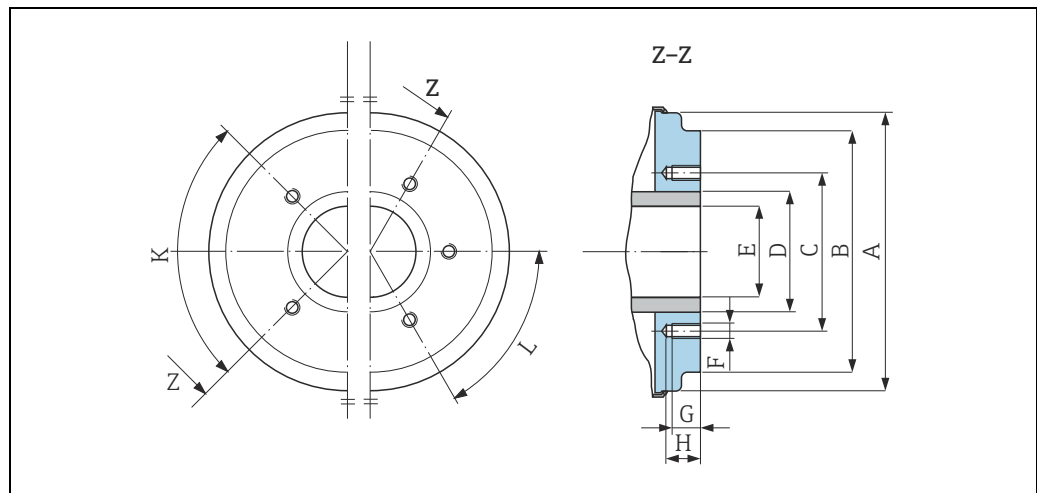
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

| DN | L | A | B | C | D | E | F | K | X2 | di |
|-----|------|------|------|------|------|------|-------|------|---------|------|
| 1½" | 5.51 | 4.92 | 2.76 | 2.95 | 2.11 | 5.45 | 7.56 | 4.21 | M8 × 4 | 1.37 |
| 2" | 5.51 | | | | 2.36 | 5.71 | 8.07 | 4.72 | M8 × 4 | 1.87 |
| 3" | 5.51 | | | | 2.91 | 6.26 | 9.17 | 5.83 | M8 × 6 | 2.87 |
| 4" | 5.51 | | | | 3.43 | 6.77 | 10.20 | 6.85 | M8 × 6 | 3.83 |
| 5" | 7.87 | | | | 4.06 | 7.40 | 11.46 | 8.11 | M10 × 6 | 4.72 |
| 6" | 7.87 | | | | 4.61 | 7.95 | 12.56 | 9.21 | M10 × 6 | 5.78 |

Total length depends on the process connections.
All dimensions in [inch]

Sensor, front view (without process connections) DN 40 to 150 (1½ to 6")



A0005528

Dimensions in SI units

| DN | A | B | C | D | E | F | G | H | Threaded holes | |
|-----|-------|-------|-------|-------|-------|------|----|----|----------------|----------------|
| | | | | | | | | | K 90° ±0.5° | L 60° ±0.5° |
| 40 | 99.7 | 85.8 | 71.0 | 48.3 | 34.8 | M 8 | 12 | 17 | 4 | – |
| 50 | 112.7 | 98.8 | 83.5 | 60.3 | 47.5 | M 8 | 12 | 17 | 4 | – |
| 65 | 127.7 | 114.8 | 100.0 | 76.1 | 60.2 | M 8 | 12 | 17 | – | 6 |
| 80 | 140.7 | 133.5 | 114.0 | 88.9 | 72.9 | M 8 | 12 | 17 | – | 6 |
| 100 | 166.7 | 159.5 | 141.0 | 114.3 | 97.4 | M 8 | 12 | 17 | – | 6 |
| 125 | 198.7 | 191.5 | 171.0 | 139.7 | 120.0 | M 10 | 15 | 20 | – | 6 |
| 150 | 226.7 | 219.5 | 200.0 | 168.3 | 146.9 | M 10 | 15 | 20 | – | 6 |

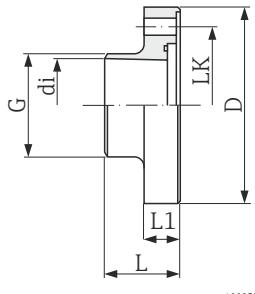
All dimensions in [mm]

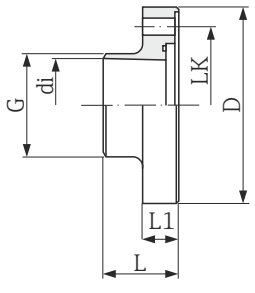
Dimensions in US units

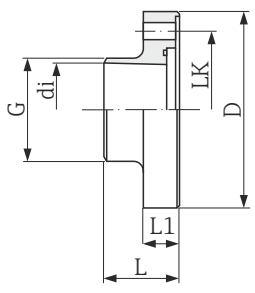
| DN | A | B | C | D | E | F | G | H | Threaded holes | |
|-----|------|------|------|------|------|------|------|------|----------------|----------------|
| | | | | | | | | | K 90° ±0.5° | L 60° ±0.5° |
| 1½" | 3.93 | 3.38 | 2.80 | 1.90 | 1.37 | M 8 | 0.47 | 0.67 | 4 | – |
| 2" | 4.44 | 3.89 | 3.29 | 2.37 | 1.87 | M 8 | 0.47 | 0.67 | 4 | – |
| 3" | 5.54 | 5.26 | 4.49 | 3.50 | 2.87 | M 8 | 0.47 | 0.67 | – | 6 |
| 4" | 6.56 | 6.28 | 5.55 | 4.50 | 3.83 | M 8 | 0.47 | 0.67 | – | 6 |
| 5" | 7.82 | 7.54 | 6.73 | 5.50 | 4.72 | M 10 | 0.59 | 0.79 | – | 6 |
| 6" | 8.93 | 8.64 | 7.87 | 6.63 | 5.78 | M 10 | 0.59 | 0.79 | – | 6 |

All dimensions in [inch]

Process connections DN 40 to 150 (1½ to 6") with aseptic gasket seal

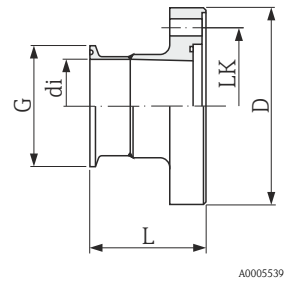
| Welding nipple for DIN, 1.4404/316L | Sensor DN | Fits to piping | di | G | D | L | L1 | LK | L _{tot} ¹⁾ | |
|---|---|----------------------|-------|------|-------|------|------|-------|--------------------------------|--|
|  | [mm] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
| | Order codes: 5*H**-J*****, DKH**-HR** | | | | | | | | | |
| | 40 | 41 × 1.5 | 38 | 43 | 92.0 | 42 | 19 | 71.0 | 220 | |
| | 50 | 53 × 1.5 | 50 | 55 | 105.0 | 42 | 19 | 83.5 | 220 | |
| | 65 | 70 × 2 | 66 | 72 | 121.0 | 42 | 21 | 100.0 | 220 | |
| | 80 | 85 × 2 | 81 | 87 | 140.7 | 73 | 18 | 114.0 | 280 | |
| | 100 | 104 × 2 | 100 | 106 | 166.7 | 73 | 18 | 141.0 | 280 | |
| | 125 | 129 × 2 | 125 | 129 | 198.7 | 53 | 25 | 171.0 | 300 | |
| | 150 | 154 × 2 | 150 | 154 | 226.7 | 53 | 25 | 200.0 | 300 | |
| | Order codes: 5*H**-J*****+CA/+CB, DKH**-HR**+CA/+CB | | | | | | | | | |
| | 40 | 41 × 1.5 | 38.0 | 41 | 99.7 | 43 | 18 | 71.0 | 220 | |
| | 50 | 53 × 1.5 | 50.0 | 53 | 112.7 | 43 | 18 | 83.5 | 220 | |
| | 65 | 70 × 2 | 66.0 | 70 | 127.7 | 43 | 18 | 100.0 | 220 | |
| | 80 | 85 × 2 | 81.0 | 85 | 140.7 | 43 | 18 | 114.0 | 220 | |
| | 100 | 104 × 2 | 100.0 | 104 | 166.7 | 43 | 18 | 141.0 | 220 | |
| 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | | | |

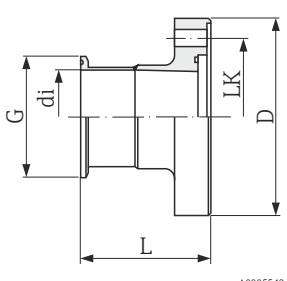
| Welding nipple for ODT/SMS, 1.4404/316L | Sensor DN | Fits to Piping | di | G | D | L | L1 | LK | L _{tot} ¹⁾ | |
|---|---|----------------|------|------|-------|------|------|-------|--------------------------------|--|
|  | [mm] | OD/SMS | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
| | Order codes: 5*H**-V*****, DKH**-HB** | | | | | | | | | |
| | 40 | 38.1 × 1.65 | 35.3 | 40 | 92 | 42 | 19 | 71.0 | 220 | |
| | 50 | 50.8 × 1.65 | 48.1 | 55 | 105 | 42 | 19 | 83.5 | 220 | |
| | 65 | 63.5 × 1.65 | 59.9 | 66 | 121 | 42 | 21 | 100.0 | 220 | |
| | 80 | 76.2 × 1.65 | 72.6 | 79 | 140.7 | 73 | 18 | 114.0 | 280 | |
| | 100 | 101.6 × 1.65 | 97.5 | 104 | 166.7 | 73 | 18 | 141.0 | 280 | |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | | |

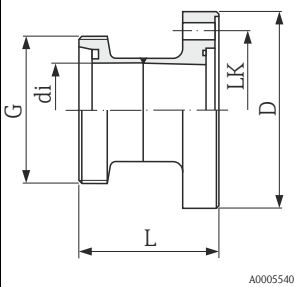
| Welding nipple ASME BPE, 1.4404/316L | Sensor DN | Fits to Piping | di | G | D | L | L1 | LK | L _{tot} ¹⁾ | |
|---|---------------------------------------|----------------|--------------|-------|-------|-------|------|------|--------------------------------|-----|
|  | [mm] | [inch] | ASME BPE | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
| | Order codes: 5*H**-Q*****, DKH**-HN** | | | | | | | | | |
| | 40 | 1½" | 38.1 × 1.65 | 34.8 | 38.1 | 99.7 | 43 | 18 | 71.0 | 220 |
| | 50 | 2" | 50.8 × 1.65 | 47.5 | 50.8 | 112.7 | 43 | 18 | 83.5 | 220 |
| | 65 | - | 63.5 × 1.65 | 60.2 | 63.5 | 127.7 | 43 | 18 | 100.0 | 220 |
| | 80 | 3" | 76.2 × 1.65 | 72.9 | 76.2 | 140.7 | 43 | 18 | 114.0 | 220 |
| | 100 | 4" | 101.6 × 2.11 | 97.4 | 101.6 | 166.7 | 43 | 18 | 141.0 | 220 |
| | 150 | 6" | 152.4 × 2.77 | 149.9 | 152.4 | 226.7 | 53 | 25 | 200.0 | 300 |
| 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | | | |

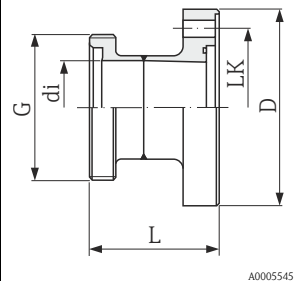
| Welding nipple ISO 2037, 1.4404/316L | | Sensor DN | Fits to Piping | di | G | D | L | L1 | LK | L_{tot}¹⁾ | |
|---|--|---|-----------------------|-----------|----------|----------|----------|-----------|-----------|-------------------------------------|--|
| <p>A0005541</p> | | [mm] | ISO 2037 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
| | | Order codes: 5*H**-T***** , DKH**-HP** | | | | | | | | | |
| | | 40 | 38 × 1.2 | 35.6 | 38 | 99.7 | 43 | 18 | 71.0 | 220 | |
| | | 50 | 51 × 1.2 | 48.6 | 51 | 112.7 | 43 | 18 | 83.5 | 220 | |
| | | 65 | 63.5 × 1.6 | 60.3 | 63.5 | 127.7 | 43 | 18 | 100.0 | 220 | |
| | | 80 | 76.1 × 1.6 | 72.9 | 76.1 | 140.7 | 43 | 18 | 114.0 | 220 | |
| | | 100 | 101.6 × 2 | 97.6 | 101.6 | 166.7 | 43 | 18 | 141.0 | 220 | |
| | | 125 | 139.7 × 2 | 135.7 | 139.7 | 198.7 | 93 | 25 | 171.0 | 380 | |
| | | 150 | 168.3 × 2.6 | 163.1 | 168.3 | 226.7 | 93 | 25 | 200.0 | 380 | |
| | | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | | |

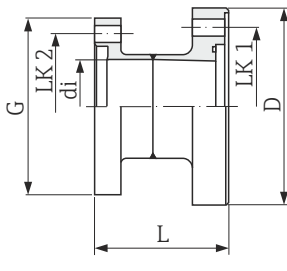
| Clamp ISO 2852, Fig. 2, 1.4404/316L | | Sensor DN | Fits to piping | Clamp ISO 2852 nominal diameter | di | G | D | L | LK | L_{tot}¹⁾ | |
|---|-------------|---|------------------------|--|-----------|----------|----------|----------|-----------|-------------------------------------|--|
| <p>A0005544</p> | | [mm] | ISO 2037/ BS 4825-1 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
| | | Order codes: 5*H**-W***** , DKH**-HC** | | | | | | | | | |
| | | 40 | 38.0 × 1.6 | 38.0 | 35.6 | 50.5 | 92.0 | 68.5 | 71.0 | 273 | |
| | | 50 | 51.0 × 1.6 | 51.0 | 48.6 | 64.0 | 105.0 | 68.5 | 83.5 | 273 | |
| | | 65 | 63.5 × 1.6 | 63.5 | 60.3 | 77.5 | 121.0 | 68.5 | 100.0 | 273 | |
| | | 80 | 76.1 × 1.6 | 76.1 | 72.9 | 91.0 | 140.7 | 99.5 | 114.0 | 333 | |
| | | 100 | 101.6 × 2.0 | 101.6 | 97.6 | 119.0 | 166.7 | 99.5 | 141.0 | 333 | |
| | | 125 | 139.7 × 2.0 | 139.7 | 135.7 | 155.0 | 198.7 | 53.0 | 171.0 | 300 | |
| | | 150 | 168.3 × 2.6 | 168.3 | 163.1 | 183.0 | 226.7 | 53.0 | 200.0 | 300 | |
| | | Order codes: 5*H**-W*****+CA/+CB; DKH**-HC**+CA/+CB | | | | | | | | | |
| 40 | 38.0 × 1.6 | 38.0 | 35.6 | 50.5 | 99.7 | 43 | 71.0 | 220 | | | |
| 50 | 51.0 × 1.6 | 51.0 | 48.6 | 64.0 | 112.7 | 43 | 83.5 | 220 | | | |
| 65 | 63.5 × 1.6 | 63.5 | 60.3 | 77.5 | 127.7 | 43 | 100.0 | 220 | | | |
| 80 | 76.1 × 1.6 | 76.1 | 72.9 | 91.0 | 140.7 | 43 | 114.0 | 220 | | | |
| 100 | 101.6 × 2.0 | 101.6 | 97.6 | 119.0 | 166.7 | 43 | 141.0 | 220 | | | |
| 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | | | | |

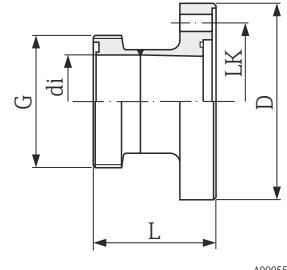
| Clamp DIN 32676, 1.4404/316L | Sensor DN | | Fits to piping | di | G | D | L | LK | L _{tot} ¹⁾ |
|---|---|--------|-------------------------|------|-------|-------|------|-------|--------------------------------|
| | [mm] | [inch] | EN 10357 (DIN 11850) | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | Order codes: 5*H**-0*****, DKH**-HD** | | | | | | | | |
| | 40 | | 41 × 1.5 | 38 | 50.5 | 92.0 | 61.5 | 71.0 | 259 |
| | 50 | | 53 × 1.5 | 50 | 64.0 | 105.0 | 61.5 | 83.5 | 259 |
| | 65 | | 70 × 2 | 66 | 91.0 | 121.0 | 68.0 | 100.0 | 272 |
| | 80 | | 85 × 2 | 81 | 106.0 | 140.7 | 99.0 | 114.0 | 332 |
| | 100 | | 104 × 2 | 100 | 119.0 | 166.7 | 99.0 | 141.0 | 332 |
| | 125 | | 129 × 2 | 125 | 155.0 | 198.7 | 53.0 | 171.0 | 300 |
| | 150 | | 154 × 2 | 150 | 183.0 | 226.7 | 53.0 | 200.0 | 300 |
| | Order codes: 5*H**-0*****+CA/+CB, DKH**-HD**+CA/+CB | | | | | | | | |
| | 40 | | 41 × 1.5 | 38 | 50.5 | 99.7 | 43 | 71.0 | 220 |
| | 50 | | 53 × 1.5 | 50 | 64.0 | 112.7 | 43 | 83.5 | 220 |
| | 65 | | 70 × 2 | 66 | 91.0 | 127.7 | 43 | 100.0 | 220 |
| | 80 | | 85 × 2 | 81 | 106.0 | 140.7 | 43 | 114.0 | 220 |
| | 100 | | 104 × 2 | 100 | 119.0 | 166.7 | 43 | 141.0 | 220 |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

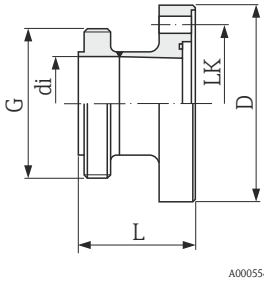
| Tri-Clamp L14 AM7, 1.4404/316L | Sensor DN | | Fits to piping | di | G | D | L | LK | L _{tot} ¹⁾ |
|---|---|--------|----------------|-------|-------|-------|------|-------|--------------------------------|
| | [mm] | [inch] | ASME BPE | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | Order codes: 5*H**-1*****, DKH**-HE** | | | | | | | | |
| | 40 | 1½" | 38.1 × 1.65 | 34.8 | 50.4 | 92.0 | 68.6 | 71.0 | 273.2 |
| | 50 | 2" | 50.8 × 1.65 | 47.5 | 63.9 | 105.0 | 68.6 | 83.5 | 273.2 |
| | 65 | - | 63.5 × 1.65 | 60.2 | 77.4 | 121.0 | 68.6 | 100.0 | 273.2 |
| | 80 | 3" | 76.2 × 1.65 | 72.9 | 90.9 | 140.7 | 99.6 | 114.0 | 333.2 |
| | 100 | 4" | 101.6 × 2.11 | 97.4 | 118.9 | 166.7 | 99.6 | 141.0 | 333.2 |
| | 150 | 6" | 152.4 × 2.77 | 146.9 | 166.9 | 226.7 | 53 | 200.0 | 300 |
| | Order codes: 5*H**-1*****+CA/+CB, DKH**-HE**+CA/+CB | | | | | | | | |
| | 40 | 1½" | 38.1 × 1.65 | 34.8 | 50.4 | 99.7 | 43 | 71.0 | 220 |
| | 50 | 2" | 50.8 × 1.65 | 47.5 | 63.9 | 112.7 | 43 | 83.5 | 220 |
| | 65 | - | 63.5 × 1.65 | 60.2 | 77.4 | 127.7 | 43 | 100.0 | 220 |
| | 80 | 3" | 76.2 × 1.65 | 72.9 | 90.9 | 140.7 | 43 | 114.0 | 220 |
| | 100 | 4" | 101.6 × 1.65 | 97.4 | 118.9 | 166.7 | 43 | 141.0 | 220 |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

| Coupling SC DIN 11851, 1.4404/316L | Sensor DN | Fits to piping | di | G | D | L | LK | L _{tot} ¹⁾ | |
|---|---|----------------|------|---------------|-------|------|-------|--------------------------------|--|
| | [mm] | DN 11850 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
|  | Order codes: 5*H**-2*****, DKH**-HG** | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | Rd 65 × 1/6" | 92.0 | 72 | 71.0 | 280 | |
| | 50 | 54 × 1.5 | 50 | Rd 78 × 1/6" | 105.0 | 74 | 83.5 | 284 | |
| | 65 | 70 × 2 | 66 | Rd 95 × 1/6" | 121.0 | 78 | 100.0 | 292 | |
| | 80 | 85 × 2 | 81 | Rd 110 × 1/4" | 140.7 | 114 | 114.0 | 362 | |
| | 100 | 104 × 2 | 100 | Rd 130 × 1/4" | 166.7 | 123 | 141.0 | 380 | |
| | 125 | 129 × 2 | 125 | Rd 160 × 1/4" | 198.7 | 93 | 171.0 | 380 | |
| | 150 | 154 × 2 | 150 | Rd 160 × 1/4" | 226.7 | 98 | 200.0 | 390 | |
| | Order codes: 5*H**-2*****+CA/+CB, DKH**-HG**+CA/+CB | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | Rd 65 × 1/6" | 99.7 | 63 | 71.0 | 260 | |
| | 50 | 54 × 1.5 | 50 | Rd 78 × 1/6" | 112.7 | 63 | 83.5 | 260 | |
| | 65 | 70 × 2 | 66 | Rd 95 × 1/6" | 127.7 | 68 | 100.0 | 270 | |
| | 80 | 85 × 2 | 81 | Rd 110 × 1/4" | 140.7 | 73 | 114.0 | 280 | |
| | 100 | 104 × 2 | 100 | Rd 130 × 1/4" | 166.7 | 78 | 141.0 | 290 | |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

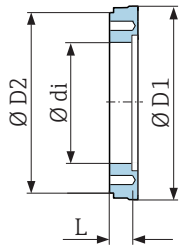
| Coupling DIN 11864-1, Aseptic threaded adapter, Form A, 1.4404/316L | Sensor DN | Fits to piping | di | G | D | L | LK | L _{tot} ¹⁾ | |
|---|---|----------------|------|---------------|-------|------|-------|--------------------------------|--|
| | [mm] | DN 11850 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | |
|  | Order codes: 5*H**-3*****, DKH**-HH** | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | Rd 65 × 1/6" | 92.0 | 71 | 71.0 | 278 | |
| | 50 | 54 × 1.5 | 50 | Rd 78 × 1/6" | 105.0 | 71 | 83.5 | 278 | |
| | 65 | 70 × 2 | 66 | Rd 95 × 1/6" | 121.0 | 76 | 100.0 | 288 | |
| | 80 | 85 × 2 | 81 | Rd 110 × 1/4" | 140.7 | 113 | 114.0 | 360 | |
| | 100 | 104 × 2 | 100 | Rd 130 × 1/4" | 166.7 | 121 | 141.0 | 376 | |
| | Order codes: 5*H**-3*****+CA/+CB, DKH**-HH**+CA/+CB | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | Rd 65 × 1/6" | 99.7 | 61 | 71.0 | 256 | |
| | 50 | 54 × 1.5 | 50 | Rd 78 × 1/6" | 112.7 | 61 | 83.5 | 256 | |
| | 65 | 70 × 2 | 66 | Rd 95 × 1/6" | 127.7 | 66 | 100.0 | 266 | |
| | 80 | 85 × 2 | 81 | Rd 110 × 1/4" | 140.7 | 71 | 114.0 | 276 | |
| | 100 | 104 × 2 | 100 | Rd 130 × 1/4" | 166.7 | 76 | 141.0 | 286 | |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

| Flange DIN 11864-2, Aseptic flat flange, Form A, 1.4404/316L | Sensor DN | Fits to piping | di | G | D | L | LK 1 | LK 2 | L _{tot} ¹⁾ |
|---|---|----------------|------|------|-------|------|-------|------|--------------------------------|
| | [mm] | DN 11850 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  <p>A0005546</p> | Order codes: 5*H**-4*****, DKH**-HJ** | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | 82 | 92.0 | 64 | 71.0 | 65 | 264 |
| | 50 | 54 × 1.5 | 50 | 94 | 105.0 | 64 | 83.5 | 77 | 264 |
| | 65 | 70 × 2 | 66 | 113 | 121.0 | 64 | 100.0 | 95 | 264 |
| | 80 | 85 × 2 | 81 | 133 | 140.7 | 129 | 114.0 | 112 | 392 |
| | 100 | 104 × 2 | 100 | 159 | 166.7 | 129 | 141.0 | 137 | 392 |
| | 125 | 129 × 2 | 125 | 190 | 198.7 | 84 | 171.0 | 161 | 362 |
| | 150 | 154 × 2 | 150 | 220 | 226.7 | 84 | 200.0 | 188 | 362 |
| | Order codes: 5*H**-4*****+CA/+CB, DKH**-HJ**+CA/+CB | | | | | | | | |
| | 40 | 42 × 1.5 | 38 | 82 | 99.7 | 56 | 71.0 | 65 | 246 |
| | 50 | 54 × 1.5 | 50 | 94 | 112.7 | 56 | 83.5 | 77 | 246 |
| | 65 | 70 × 2 | 66 | 113 | 127.7 | 56 | 100.0 | 95 | 246 |
| | 80 | 85 × 2 | 81 | 133 | 140.7 | 68 | 114.0 | 112 | 270 |
| | 100 | 104 × 2 | 100 | 159 | 166.7 | 72 | 141.0 | 137 | 278 |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

| Coupling SMS 1145, threaded adapter, 1.4404/316L | Sensor DN | Fits to piping | SMS 1145 DN | di | G | D | L | LK | L _{tot} ¹⁾ |
|---|---|----------------|-------------|------|---------------|-------|------|-------|--------------------------------|
| | [mm] | OD | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  <p>A0005538</p> | Order codes: 5*H**-5*****, DKH**-HK** | | | | | | | | |
| | 40 | 38.1 × 1.65 | 38.0 | 35.5 | Rd 60 × 1/6" | 92.0 | 63 | 71.0 | 262 |
| | 50 | 50.8 × 1.65 | 51.0 | 48.5 | Rd 70 × 1/6" | 105.0 | 65 | 83.5 | 266 |
| | 65 | 63.5 × 1.65 | 63.5 | 60.5 | Rd 85 × 1/6" | 121.0 | 70 | 100.0 | 276 |
| | 80 | 76.2 × 1.65 | 76.0 | 72.6 | Rd 98 × 1/6" | 140.7 | 106 | 114.0 | 346 |
| | 100 | 101.6 × 1.65 | 101.6 | 97.5 | Rd 132 × 1/6" | 166.7 | 101 | 141.0 | 336 |
| | Order codes: 5*H**-5*****+CA/+CB, DKH**-HK**+CA/+CB | | | | | | | | |
| | 40 | 38.1 × 1.65 | 38.0 | 34.8 | Rd 60 × 1/6" | 99.7 | 61 | 71.0 | 256 |
| | 50 | 50.8 × 1.65 | 51.0 | 47.5 | Rd 70 × 1/6" | 112.7 | 61 | 83.5 | 256 |
| | 65 | 63.5 × 1.65 | 63.5 | 60.2 | Rd 85 × 1/6" | 127.7 | 66 | 100.0 | 266 |
| | 80 | 76.2 × 1.65 | 76.0 | 72.6 | Rd 98 × 1/6" | 140.7 | 71 | 114.0 | 276 |
| | 100 | 101.6 × 1.65 | 101.6 | 97.4 | Rd 132 × 1/6" | 166.7 | 76 | 141.0 | 286 |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

| Coupling ISO 2853, threaded adapter; 1.4404/316L | Sensor DN | Fits to piping | ISO 2853 DN | di | G | D | L | LK | L _{tot} ¹⁾ |
|---|---|----------------------|-------------|------|---------------|-------|------|-------|--------------------------------|
| | [mm] | ISO 2037 / BS 4825-1 | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
|  | Order codes: 5*H**-6*****, DKH**-HL** | | | | | | | | |
| | 40 | 38.0 × 1.6 | 38.0 | 35.6 | Tr 50.5×3.175 | 92.0 | 61.5 | 71.0 | 259 |
| | 50 | 51.0 × 1.6 | 51.0 | 48.6 | Tr 64×3.175 | 105.0 | 61.5 | 83.5 | 259 |
| | 65 | 63.5 × 1.6 | 63.5 | 60.3 | Tr 77.5×3.175 | 121.0 | 61.5 | 100.0 | 259 |
| | 80 | 76.1 × 1.6 | 76.1 | 72.9 | Tr 91×3.175 | 140.7 | 92.5 | 114.0 | 319 |
| | 100 | 101.6 × 2.0 | 101.6 | 97.6 | Tr 118×3.175 | 166.7 | 92.5 | 141.0 | 319 |
| | Order codes: 5*H**-6*****+CA/+CB, DKH**-HL**+CA/+CB | | | | | | | | |
| | 40 | 38.0 × 1.6 | 38.0 | 35.6 | Tr 50.5×3.175 | 99.7 | 61 | 71.0 | 256 |
| | 50 | 51.0 × 1.6 | 51.0 | 48.6 | Tr 64×3.175 | 112.7 | 61 | 83.5 | 256 |
| | 65 | 63.5 × 1.6 | 63.5 | 60.3 | Tr 77.5×3.175 | 127.7 | 66 | 100.0 | 266 |
| | 80 | 76.1 × 1.6 | 76.0 | 72.9 | Tr 91×3.175 | 140.7 | 71 | 114.0 | 276 |
| | 100 | 101.6 × 2.0 | 101.6 | 97.6 | Tr 118×3.175 | 166.7 | 76 | 141.0 | 286 |
| | 1) L _{tot} = fitting length If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account! | | | | | | | | |

Spacer (accessory for DN 80 to 100/3 to 4")

| Spacer, 1.4435/316L | Sensor DN | | di | D1 | D2 | L |
|---|-----------|--------|------|-------|------|------|
| | [mm] | [inch] | [mm] | [mm] | [mm] | [mm] |
|  | 80 | 3" | 72.9 | 140.7 | 141 | 33 |
| | 100 | 4" | 97.4 | 166.7 | 162 | 33 |
| | | | | | | |

Weight

Weight in SI units

| Nominal diameter DN [mm] | Compact version (DIN) | | Remote version (without cable; DIN) | |
|--------------------------------|------------------------|-------------------------------|-------------------------------------|----------------------------------|
| | Aluminum field housing | Stainless steel field housing | Sensor | Transmitter (wall-mount housing) |
| | [kg] | [kg] | [kg] | [kg] |
| 2 | 5.2 | 5.7 | 2.0 | 6 |
| 4 | 5.2 | 5.7 | 2.0 | 6 |
| 8 | 5.3 | 5.8 | 2.0 | 6 |
| 15 | 5.4 | 5.9 | 1.9 | 6 |
| 25 | 5.5 | 6.0 | 2.8 | 6 |
| 40 | 7.1 | 7.6 | 4.1 | 6 |
| 50 | 7.6 | 8.1 | 4.6 | 6 |
| 65 | 8.4 | 8.9 | 5.4 | 6 |
| 80 | 9 | 9.5 | 6.0 | 6 |
| 100 | 10.3 | 10.8 | 7.3 | 6 |
| 125 | 15.7 | 16.2 | 12.7 | 6 |
| 150 | 18.1 | 18.6 | 15.1 | 6 |

- Transmitter (compact version): 3.4 kg
- Weight data valid for standard pressure ratings and without packaging material.

Weight in US units

| Nominal diameter DN [in] | Compact version (DIN) | | Remote version (without cable; DIN) | |
|--------------------------------|------------------------|-------------------------------|-------------------------------------|----------------------------------|
| | Aluminum field housing | Stainless steel field housing | Sensor | Transmitter (wall-mount housing) |
| | [lbs] | [lbs] | [lbs] | [lbs] |
| 1/12" | 11.5 | 12.6 | 4 | 13 |
| 1/8" | 11.5 | 12.6 | 4 | 13 |
| 3/8" | 11.7 | 12.8 | 4 | 13 |
| 1/2" | 11.9 | 13.0 | 4 | 13 |
| 1" | 12.1 | 13.2 | 6 | 13 |
| 1 1/2" | 15.7 | 16.8 | 4.1 | 13 |
| 2" | 16.8 | 17.9 | 4.6 | 13 |
| 3" | 19.8 | 20.9 | 6.0 | 13 |
| 4" | 22.7 | 23.8 | 7.3 | 13 |
| 5" | 34.6 | 35.7 | 12.7 | 13 |
| 6" | 39.9 | 41.0 | 15.1 | 13 |

- Transmitter (compact version): 7.5 lbs
- Weight data valid for standard pressure ratings and without packaging material.

Measuring tube specifications

| Nominal diameter | | Pressure rating ¹⁾ | Internal diameter ²⁾ | |
|------------------|--------|-------------------------------|---------------------------------|--------|
| [mm] | [inch] | EN (DIN) | PFA | |
| | | [bar] | [mm] | [inch] |
| 2 | 1/12" | PN 16 / PN 40 | 2.25 | 0.09 |
| 4 | 1/8" | PN 16 / PN 40 | 4.5 | 0.18 |
| 8 | 3/8" | PN 16 / PN 40 | 9.0 | 0.35 |
| 15 | 1/2" | PN 16 / PN 40 | 16.0 | 0.63 |
| – | 1" | PN 16 / PN 40 | 22.6 | 0.89 |
| 25 | – | PN 16 / PN 40 | 26.0 | 1.02 |
| 40 | 1 1/2" | PN 16 / PN 25 / PN 40 | 35.3 | 1.39 |
| 50 | 2" | PN 16 / PN 25 / PN 40 | 48.1 | 1.89 |
| 65 | – | PN 16 / PN 25 / PN 40 | 59.9 | 2.36 |
| 80 | 3" | PN 16 / PN 25 / PN 40 | 72.6 | 2.86 |
| 100 | 4" | PN 16 / PN 25 / PN 40 | 97.5 | 3.84 |
| 125 | 5" | PN 10 / PN 16 | 120.0 | 4.72 |
| 150 | 6" | PN 10 / PN 16 | 146.5 | 5.77 |

¹⁾ Pressure rating depends on the process connection and the seals used.

²⁾ Internal diameter of process connections.

Material

- Transmitter housing:
 - Compact housing: powder coated die-cast aluminium or stainless-steel field housing (1.4301/304)
 - Wall-mounted housing: powder coated die-cast aluminium
- Window material: glass or polycarbonate
- Sensor housing: stainless steel 1.4301/304
- Wall mounting kit (holder panel): 1.4301/304
- Measuring tube: stainless steel 1.4301/304
- Lining material: PFA (USP Class VI; FDA 21 CFR 177.1550; 3A)
- Flanges:
 - All connections 1.4404/316L
 - Flanges (EN (DIN), ANSI, JIS) made of PVDF
 - Adhesive fitting made of PVC
- Ground rings: 1.4435/316L (optional: Alloy C-22, Tantalum)
- Electrodes:
 - Standard: 1.4435/316L
 - Optional: Alloy C-22, Tantalum, Platinum (up to DN 25 / 1" only)
- Seals:
 - DN 2 to 25 (1/12 to 1"): O-Ring (EPDM, Viton, Kalrez), gasket seal (EPDM*, Viton, Silicone*)
 - DN 40 to 150 (1 1/2 to 6"): gasket seal (EPDM*, Silicone*)

* = USP Class VI; FDA 21 CFR 177.2600; 3A

Material load diagram



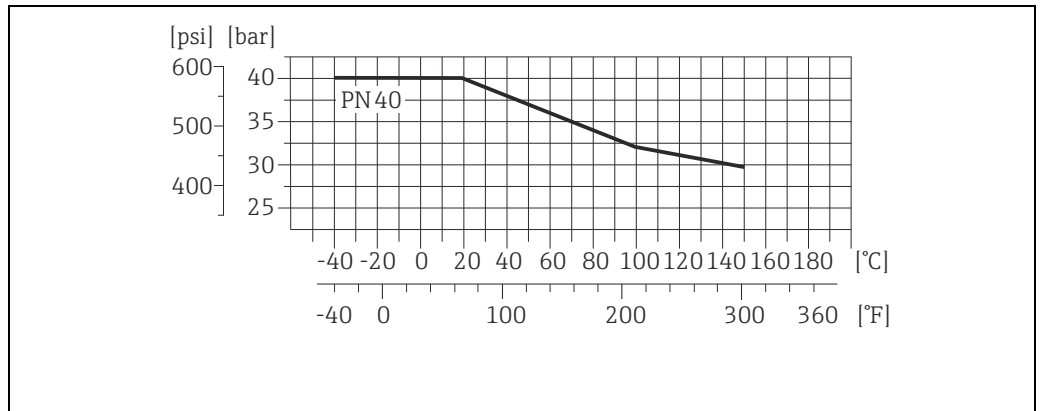
Caution!

The following diagrams contain material load diagrams (reference curves) for flange materials with regard to the medium temperature.

Process connections 2 to 25 (1/12 to 1") with O-ring seal

*Welding nipple to DIN EN ISO 1127, ODT/SMS;
Coupling to ISO 228/DIN 2999, NPT*

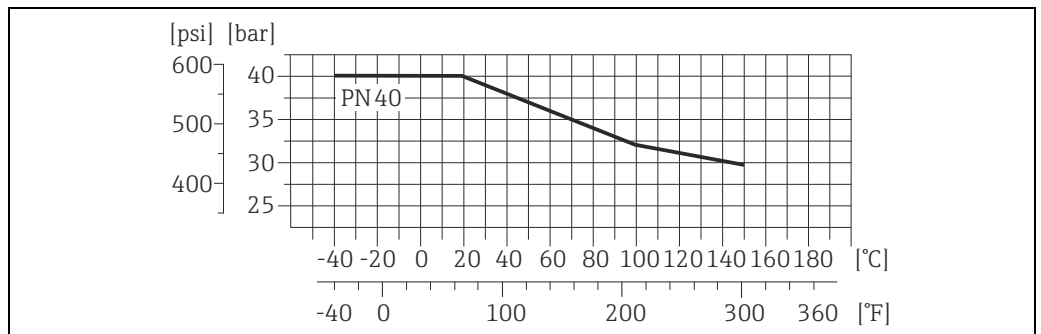
Materials: 1.4404/316L



A0021191-EN

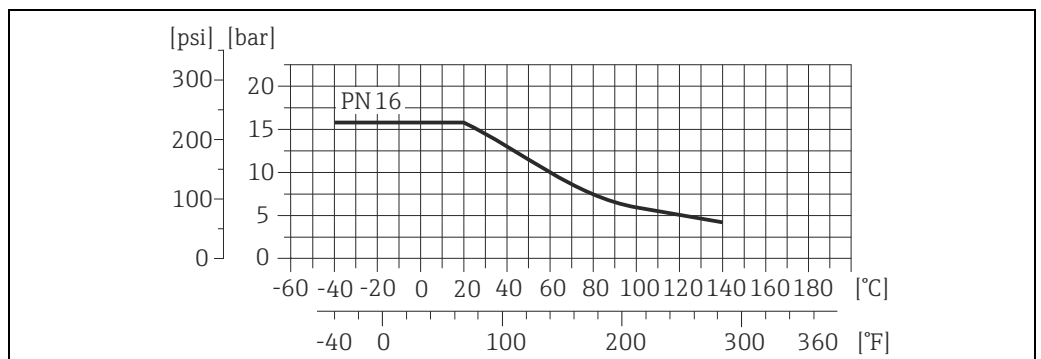
Flange connection to EN 1092-1 (DIN 2501), adhesive fitting

Material: 1.4404/316L



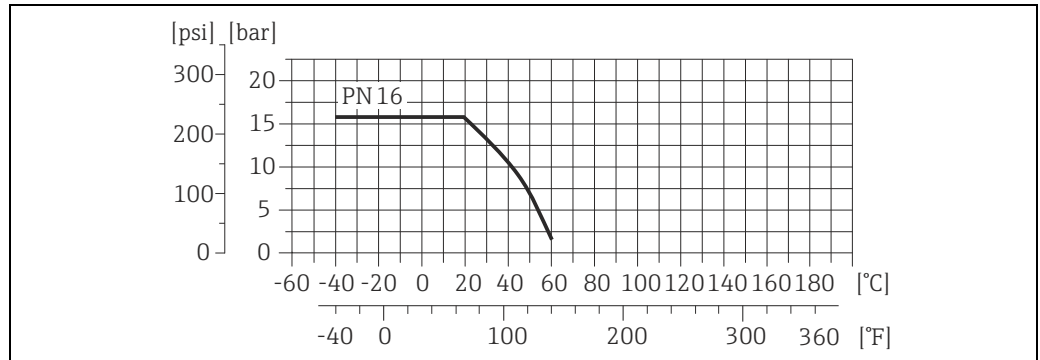
A0021191-EN

Material: PVDF



A0021230-EN

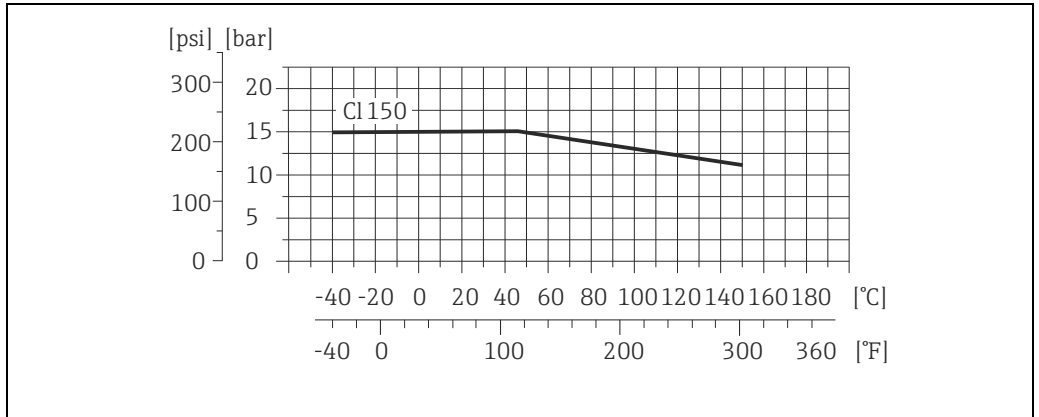
Material: PVC-U



A0021231-EN

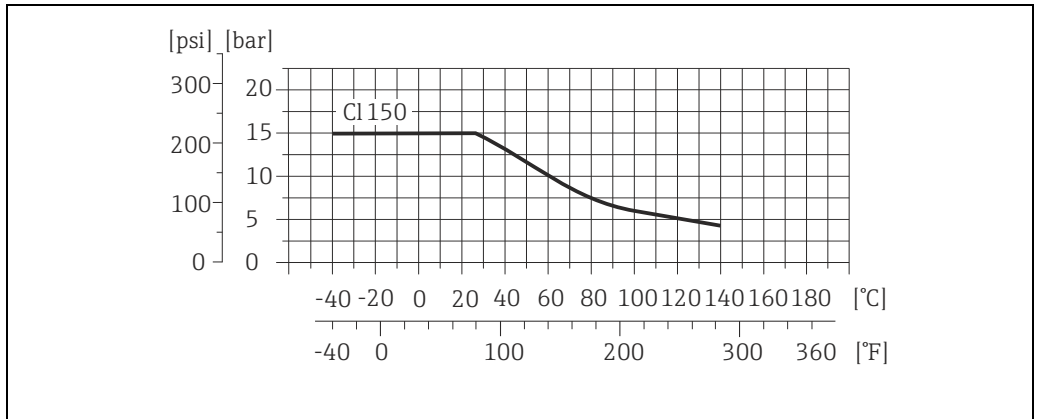
Flange connection to ANSI B16.5

Material: 1.4404/316L



A0021192-EN

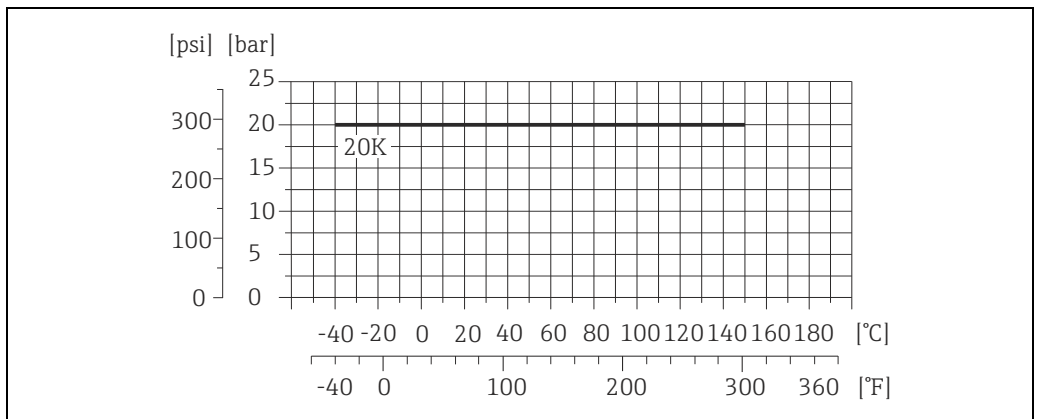
Material: PVDF



A0021232-EN

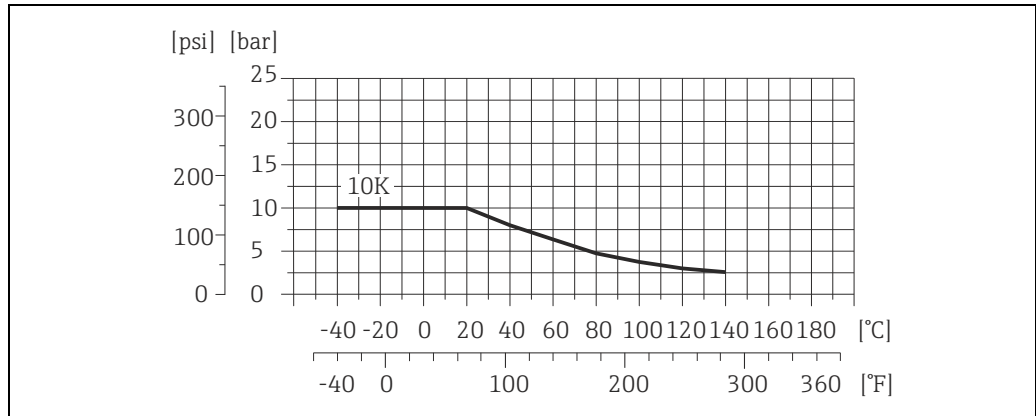
Flange connection to JIS B2220

Material: 1.4404/316L



A0021193-EN

Material: PVDF

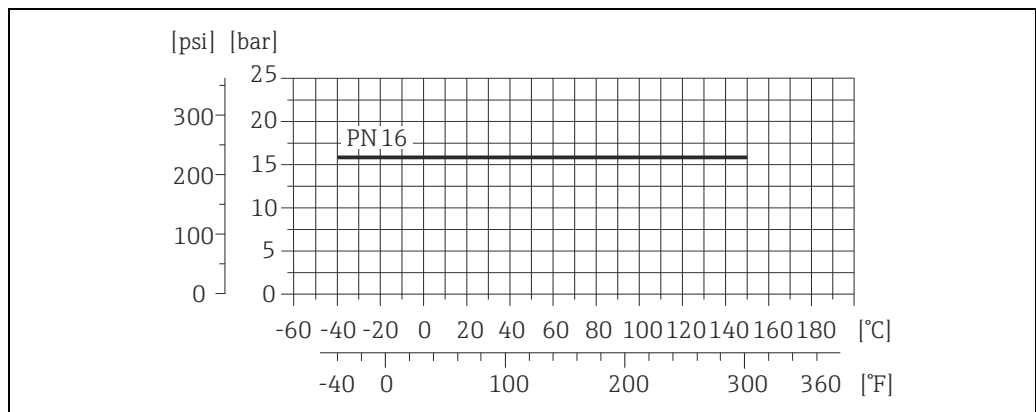


A0021233-EN

Process connections 2 to 25 (1/12 to 1") with aseptic gasket seal

*Welding nipple to EN 10357 (DIN 11850), ODT/SMS;
Coupling to SC DIN 11851, DIN 11864-1, SMS 1145
Clamp to ISO 2852, DIN 32676, L14 AM7
Flange to DIN 11864-2*

Material: 1.4404/316L

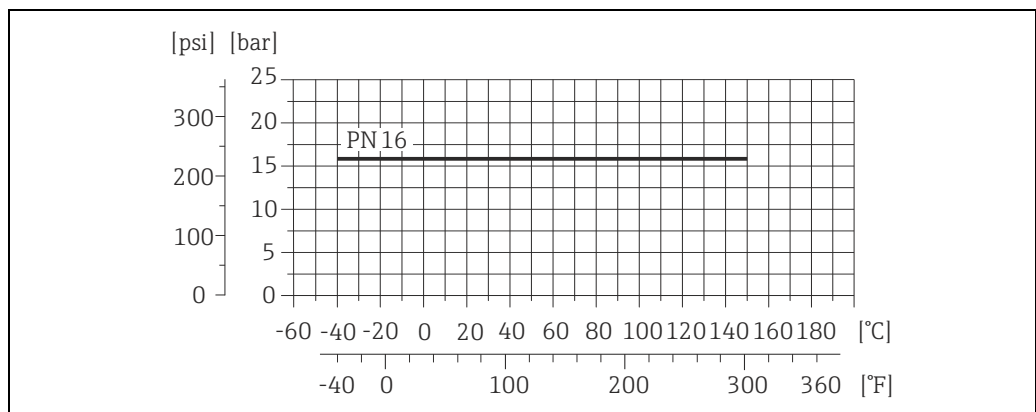


A0021190-EN

Process connections 40 to 150 (1 1/2 to 6") with aseptic gasket seal

*Welding nipple to ODT/SMS
Coupling to SMS 1145*

Material: 1.4404 / 316L

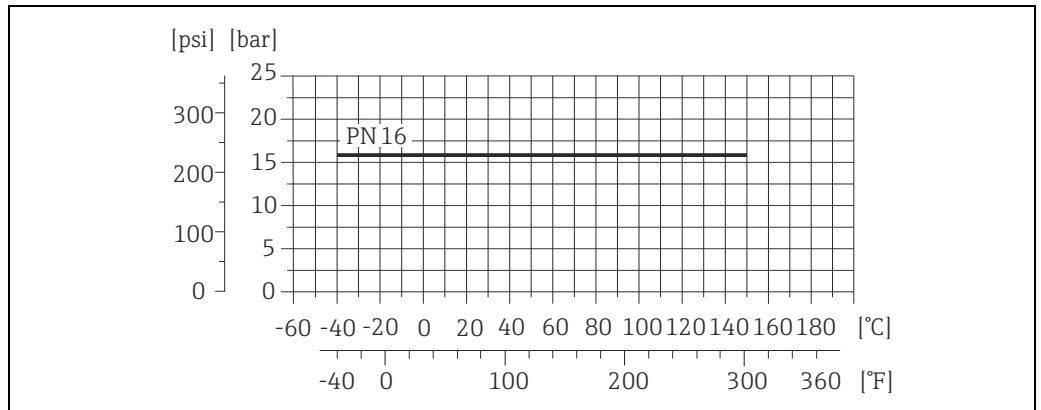


A0021190-EN

Welding nipple to EN 10357 (DIN 11850)

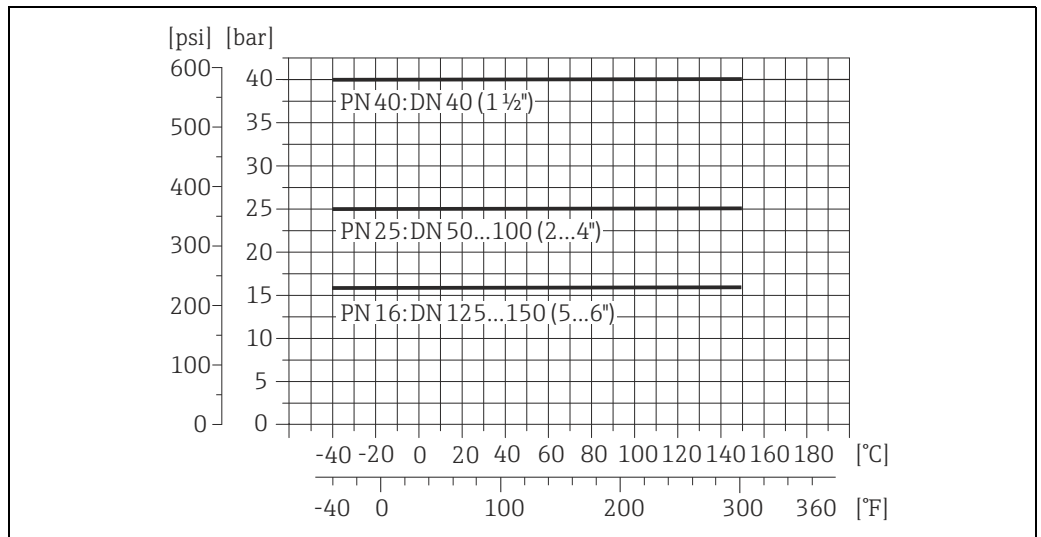
Coupling to SC DIN 11851

Material: 1.4404/316L



A0021195-EN

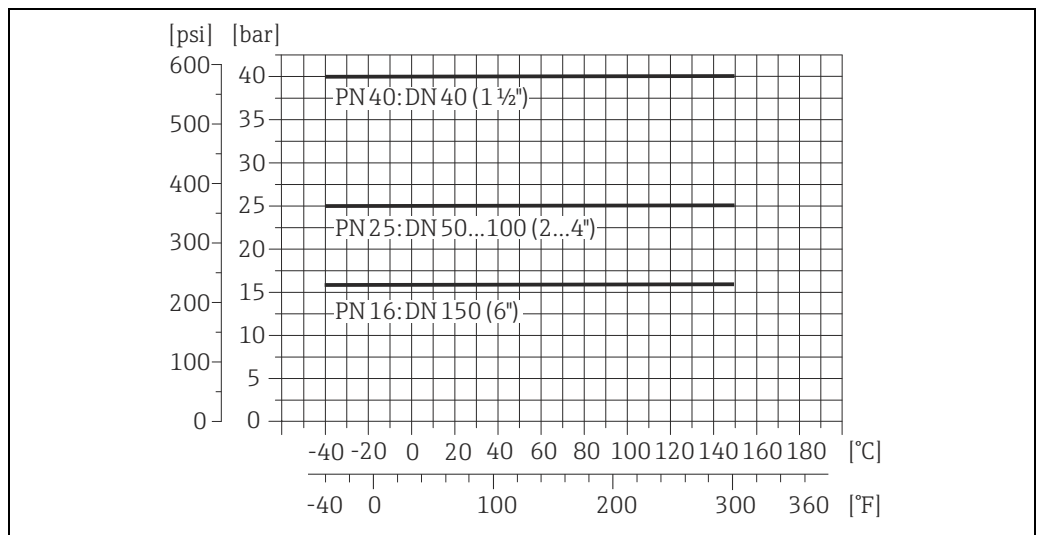
For order codes with suffixes +CA/+CB:



A0021195-EN

Welding nipple to ASME BPE

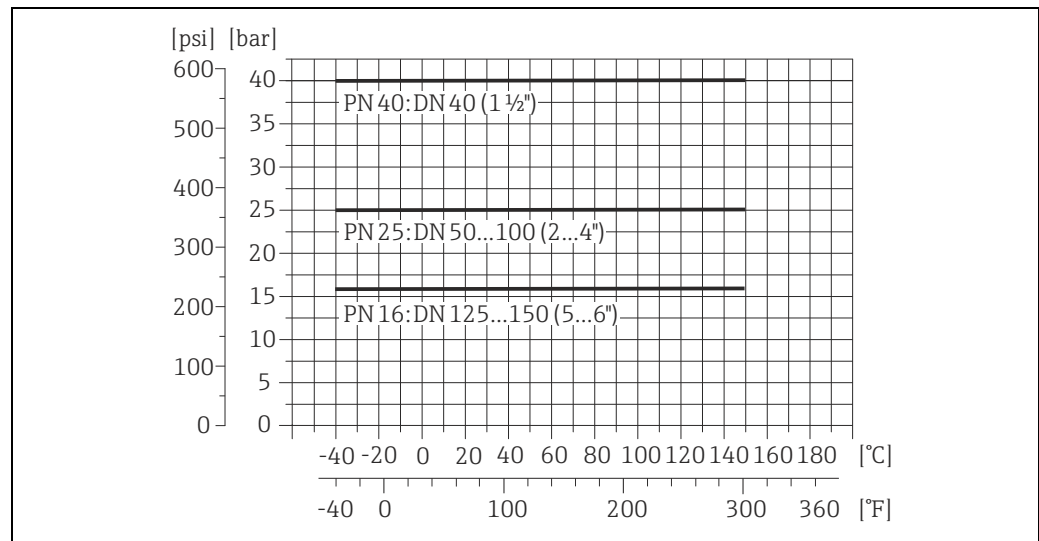
Material: 1.4404/316L



A0021196-EN

Welding nipple to ISO 2037

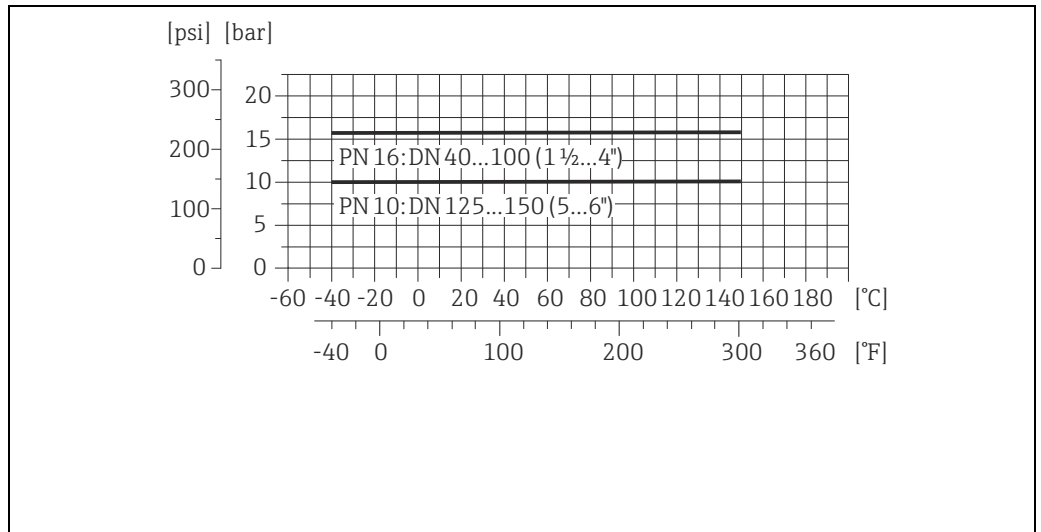
Material: 1.4404 / 316L



A0021195-EN

Clamp to ISO 2852, DIN 32676, L14 AM7

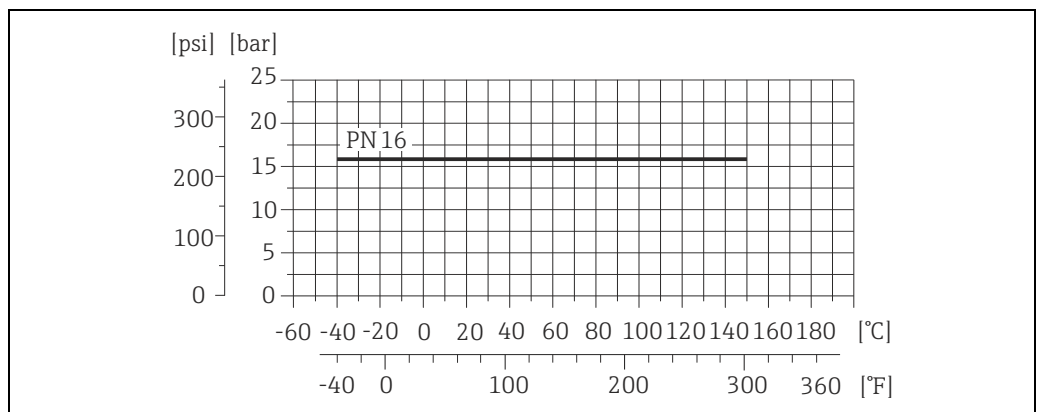
Material: 1.4404/316L



A0021197-EN

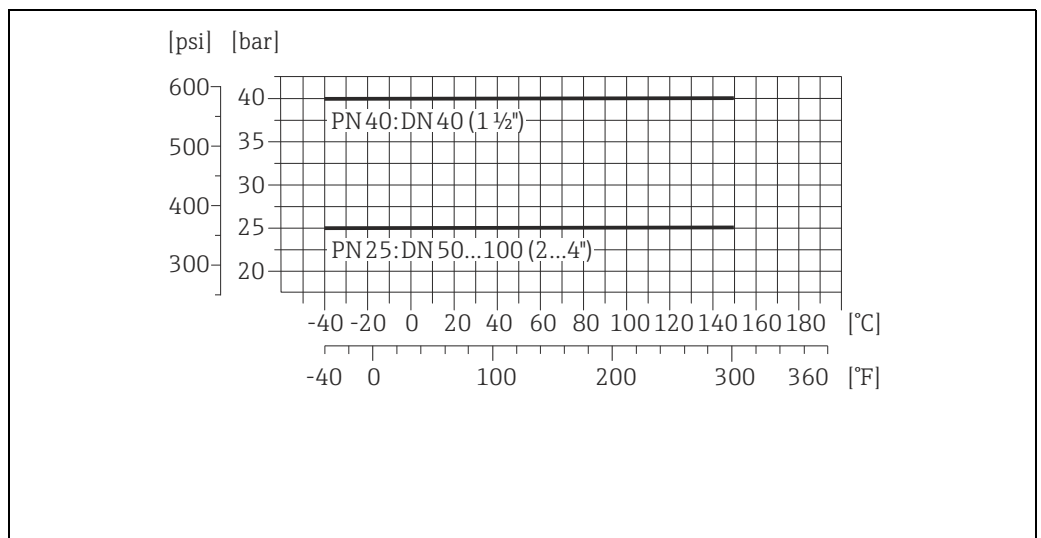
Coupling to DIN 11864-1, ISO 2853

Material: 1.4404/316L



A0021190-EN

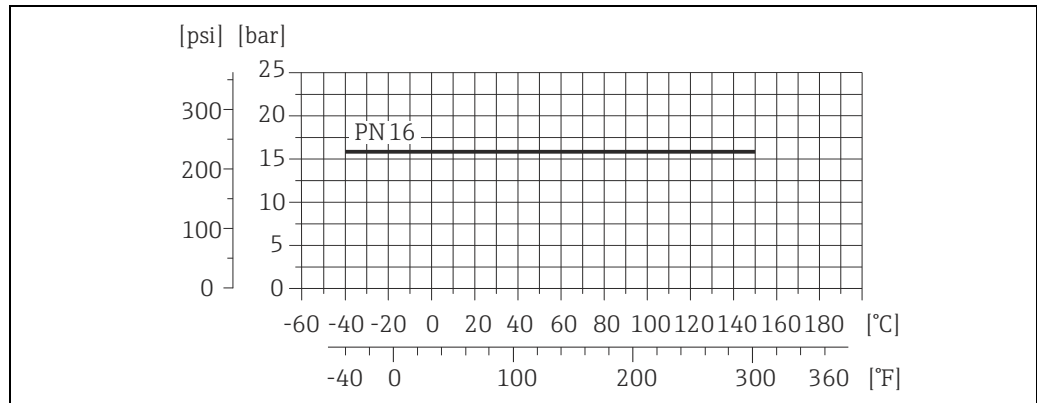
For order codes with suffixes +CA/+CB:



A0021194-EN

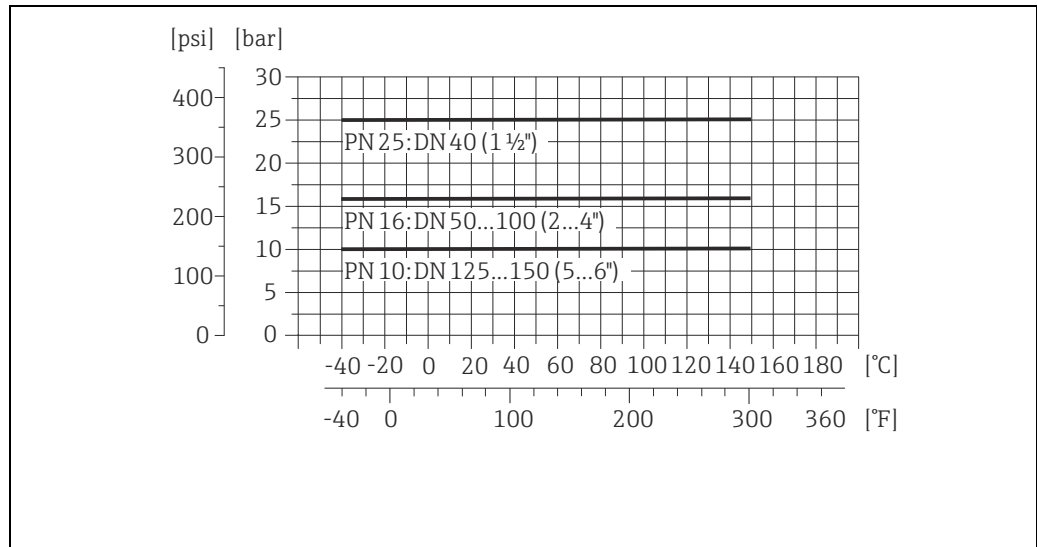
Flange connection to DIN 11864-2

Material: 1.4404/316L



A0021190-EN


For order codes with suffixes +CA/+CB:



A0021198-EN

| | |
|----------------------------|---|
| Fitted electrodes | Measuring electrodes and empty pipe detection electrodes <ul style="list-style-type: none"> ■ Standard with: 1.4435/316L, Alloy C-22, Tantalum, Platinum ■ DN 2 to 15 (1/12 to 1/2"): without empty pipe detection electrode |
| Process connections | With O-ring: <ul style="list-style-type: none"> ■ Welding nipples (DIN EN ISO 1127, ODT/SMS) ■ Flange (EN (DIN), ANSI, JIS) ■ PVDF flange (EN (DIN), ANSI, JIS) ■ External pipe thread ■ Internal pipe thread ■ Hose connection ■ PVC adhesive fittings With gasket seals: <ul style="list-style-type: none"> ■ Welding nipples (EN 10357 (DIN 11850), ODT/SMS, ASME BPE, ISO 2037) ■ Clamps (ISO 2852, DIN 32676, L14 AM7) ■ Coupling (DIN 11851, DIN 11864-1, ISO 2853, SMS 1145) ■ Flange (DIN 11864-2) |
| Surface roughness | (All data refer to parts in contact with medium) <ul style="list-style-type: none"> ■ Measuring tube lining with PFA: $\leq 0.4 \mu\text{m}$ (15 μin) ■ Electrodes: <ul style="list-style-type: none"> – 1.4435/316L, Alloy C-22, Tantalum, Platinum: ≤ 0.3 to $0.5 \mu\text{m}$ (12 to 20 μin) ■ Process connection made of stainless steel: $\leq 0.8 \mu\text{m}$ (31 μin) |

Operability

| | |
|-------------------------|--|
| Local operation | <p>Display elements</p> <ul style="list-style-type: none"> ■ Liquid-crystal display: illuminated, four lines with 16 characters per line ■ Custom configurations for presenting different measured values and status variables ■ 3 totalizers ■ At ambient temperatures below $-20 \text{ }^\circ\text{C}$ ($-4 \text{ }^\circ\text{F}$), the readability of the display may be impaired. <p>Operating elements</p> <ul style="list-style-type: none"> ■ Onsite operation with three optical sensor keys (\square/\square/\square) ■ Application-specific Quick Setup menus for straightforward commissioning |
| Language groups | <p>Language groups available for operation in different countries:</p> <ul style="list-style-type: none"> ■ Western Europe and America (WEA): English, German, Spanish, Italian, French, Dutch, Portuguese ■ Eastern Europe/Scandinavia (EES): English, Russian, Polish, Norwegian, Finnish, Swedish, Czech ■ South and East Asia (SEA): English, Japanese, Indonesian ■ China (CN): English, Chinese <p> Note! You can change the language group via the operating program "FieldCare".</p> |
| Remote operation | Remote operation via HART, PROFIBUS DP/PA, FOUNDATION Fieldbus |

Certificates and approvals

| | |
|--|---|
| CE mark | The measuring system is in conformity with the statutory requirements of the EC Directives. confirms successful testing of the device by affixing to it the CE mark. |
| C-tick symbol | 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) can be supplied by your E Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request. |
| Sanitary compatibility | <ul style="list-style-type: none"> ■ 3A approval and EHEDG-certified ■ Seals → conform to FDA (apart from Kalrez seals) |
| Certification FOUNDATION Fieldbus | <p>The flow device has successfully passed all the test procedures carried out and is certified and registered by the Fieldbus Foundation. The device thus meets all the requirements of the following specifications:</p> <ul style="list-style-type: none"> ■ Certified to FOUNDATION Fieldbus Specification ■ The device meets all the specifications of the FOUNDATION Fieldbus H1. ■ Interoperability Test Kit (ITK), revision status 5.01 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers ■ Physical Layer Conformance Test of the Fieldbus Foundation |
| Certification PROFIBUS DP/PA | <p>The flow device has successfully passed all the test procedures carried out and is certified and registered by the PNO (PROFIBUS User Organisation). The device thus meets all the requirements of the following specifications:</p> <ul style="list-style-type: none"> ■ Certified to PROFIBUS PA, profile version 3.0 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers (interoperability) |
| Pressure equipment directive | <p>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.</p> <ul style="list-style-type: none"> ■ With the identification PED/G1/III on the sensor nameplate, 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: <ul style="list-style-type: none"> – Fluids of Group 1 and 2 with a steam pressure of greater than, or smaller and equal to 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
Safety requirements for electrical equipment for measurement, control and laboratory use.
- IEC/EN 61326
"Emission in accordance with requirements for Class A".
Electromagnetic compatibility (EMC requirements)
- NAMUR NE 21:
Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment.
- NAMUR NE 43:
Standardization of the signal level for the breakdown information of digital transmitters with analog output signal.
- NAMUR NE 53:
Software of field devices and signal-processing devices with digital electronics.
- ANSI/ISA-S82.01
Safety Standard for Electrical and Electronic Test, Measuring, Controlling and related Equipment - General Requirements Pollution degree 2, Installation Category II.
- CAN/CSA-C22.2 No. 1010.1-92
Safety requirements for Electrical Equipment for Measurement and Control and Laboratory Use.
Pollution degree 2, Installation Category II

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