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

Endress+Hauser
People for Process Automation

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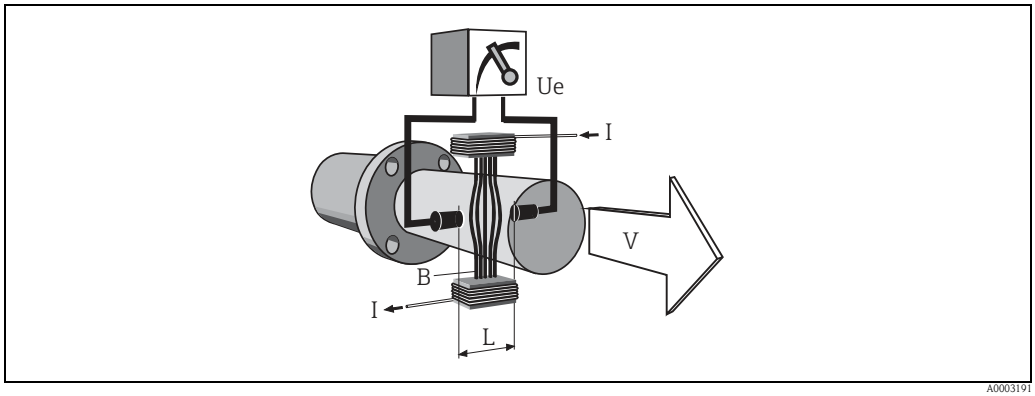
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Function and system design

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.



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$Ue = B \cdot L \cdot v$
$Q = A \cdot v$

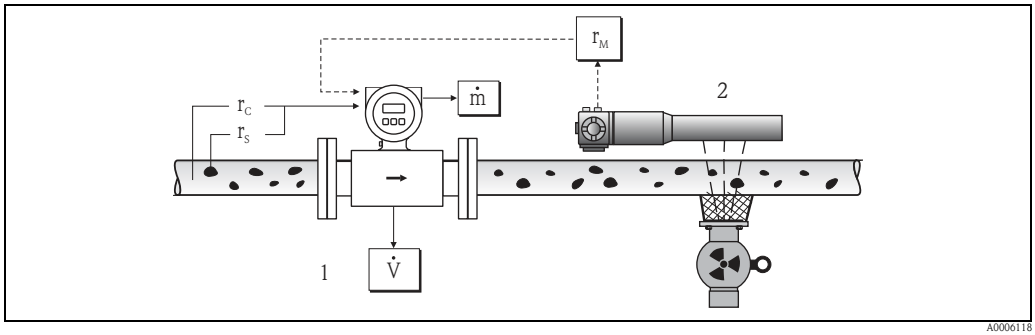
Ue *Induced voltage*
B *Magnetic induction (magnetic field)*
L *Electrode spacing*
v *Flow velocity*
Q *Volume flow*
A *Pipe cross-section*
I *Current strength*

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.

Measurement of solids flow rates
In combination with a density meter, e.g. with "Gammapilot M" from Endress+Hauser, Promag 55H also determines the throughput of solids in mass, volume or percentage rates.
The following order specifications are required for this: order option for software function "Solids content flow" (F-CHIP) and order option for a current input.



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Solids content flow measurement (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) → volume flow (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") → 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	Factory settings		
[mm]	[inch]	Min./max. full scale value (v ~ 0.3 or 10 m/s)	Full scale value, current output (v ~ 2.5 m/s)	Pulse value (~ 2 pulses/s)	Low flow cut off (v ~ 0.04 m/s)
2	1/12"	0.06 to 1.8 dm³/min	0.5 dm³/min	0.005 dm³	0.01 dm³/min
4	1/8"	0.25 to 7 dm³/min	2 dm³/min	0.025 dm³	0.05 dm³/min
8	3/8"	1 to 30 dm³/min	8 dm³/min	0.1 dm³	0.1 dm³/min
15	½"	4 to 100 dm³/min	25 dm³/min	0.2 dm³	0.5 dm³/min
25	1"	9 to 300 dm³/min	75 dm³/min	0.5 dm³	1.00 dm³/min
40	1½"	25 to 700 dm³/min	200 dm³/min	1.5 dm³	3.00 dm³/min
50	2"	35 to 1100 dm³/min	300 dm³/min	2.5 dm³	5.00 dm³/min
65	–	60 to 2000 dm³/min	500 dm³/min	5 dm³	8.00 dm³/min
80	3"	90 to 3000 dm³/min	750 dm³/min	5 dm³	12.0 dm³/min
100	4"	145 to 4700 dm³/min	1200 dm³/min	10 dm³	20.0 dm³/min
125	5"	220 to 7500 dm³/min	1850 dm³/min	15 dm³	30 dm³/min
150	6"	20 to 600 m³/h	150 m³/h	0.03 m³	2.5 m³/h

Flow characteristic values (US units)

Nominal diameter		Recommended flow rate	Factory settings		
[inch]	[mm]	Min./max. full scale value (v ~ 0.3 or 10 m/s)	Full scale value, current output (v ~ 2.5 m/s)	Pulse value (~ 2 pulses/s)	Low flow cut off (v ~ 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
½"	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
1½"	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 kΩ, 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 kΩ, 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 µA, temperature coefficient: typically 0.005% o.f.s./°C (0.003% o.f.s./°F)
- active: 4 to 20 mA, $R_i \leq 150\ \Omega$, U_{out} = 24 V DC, short-circuit proof
- passive: 0/4 to 20 mA, $R_i \leq 150\ \Omega$, 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./°C (0.003 % o.f.s./°F), resolution: 0.5 µA

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

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), $R_L > 100\ \Omega$
- 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 × 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
- Available output combination → 🖹 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 (–)
Fixed communication boards (fixed assignment)				
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
Flexible communication boards				
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

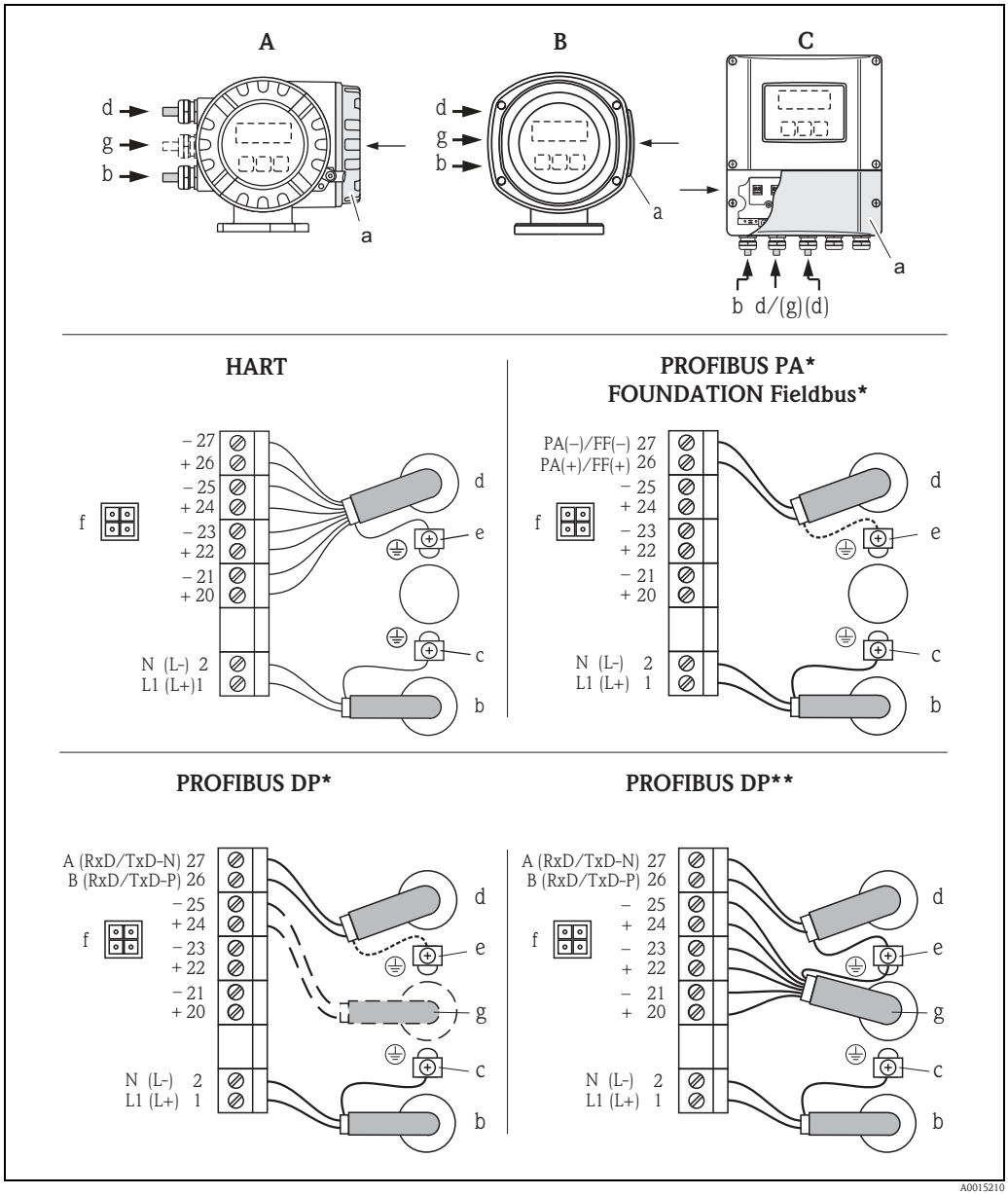
AC: < 45 VA at 260 V AC; < 32 VA at 110 V AC (incl. sensor)
DC: < 19 W (including sensor)

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

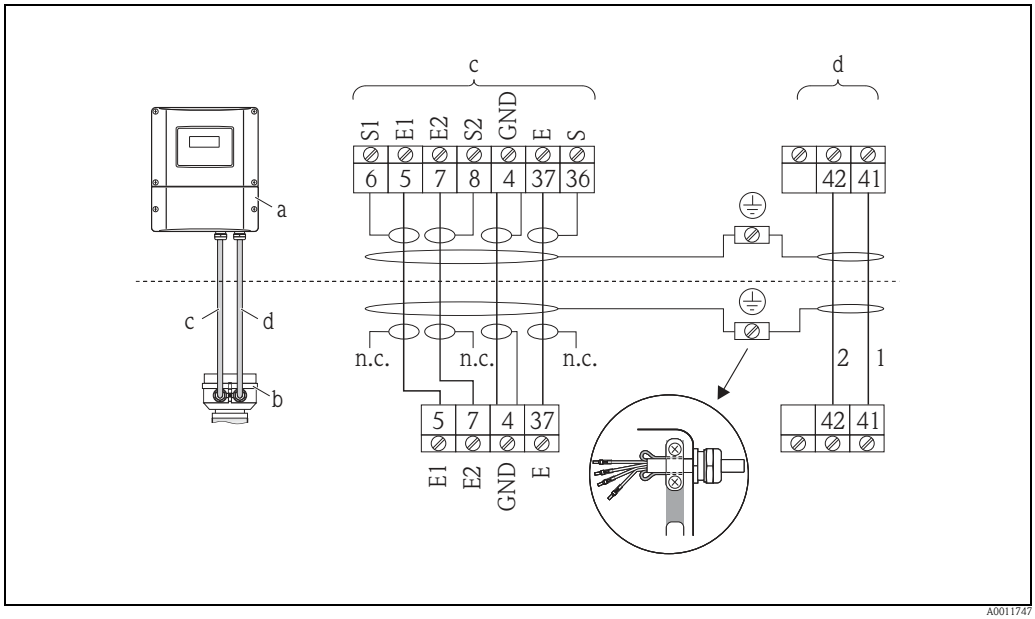


Connecting the transmitter, cable cross-section max. 2.5 mm² (14 AWG)

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

Potential equalization

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

Metal process connections

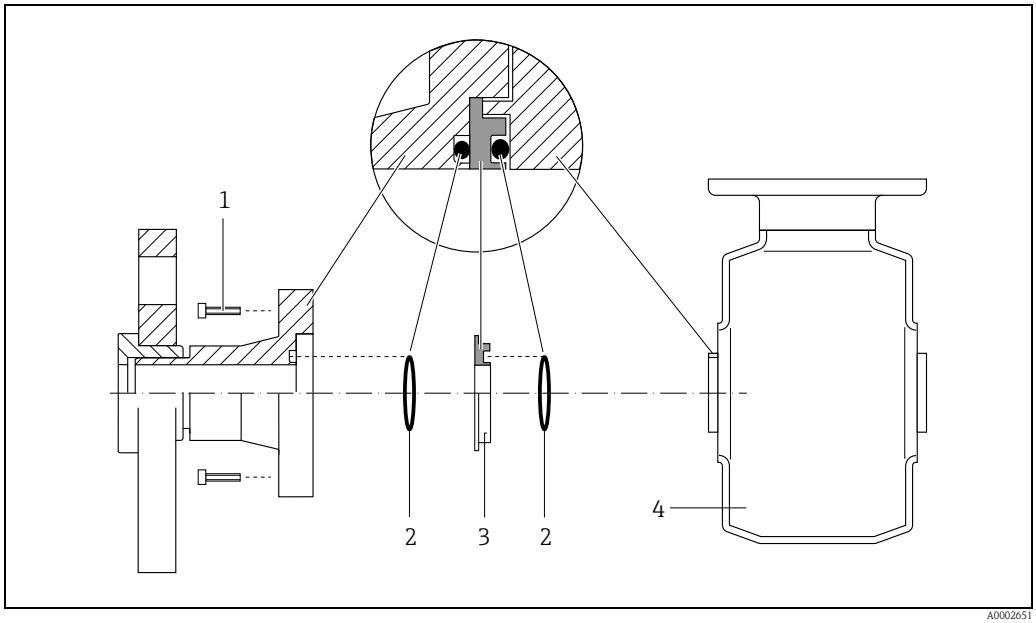
Potential matching usually takes place over the metallic process connection in contact with medium process connections which are directly mounted on the measuring transmitter. This usually means that additional potential matching measures are unnecessary.

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.

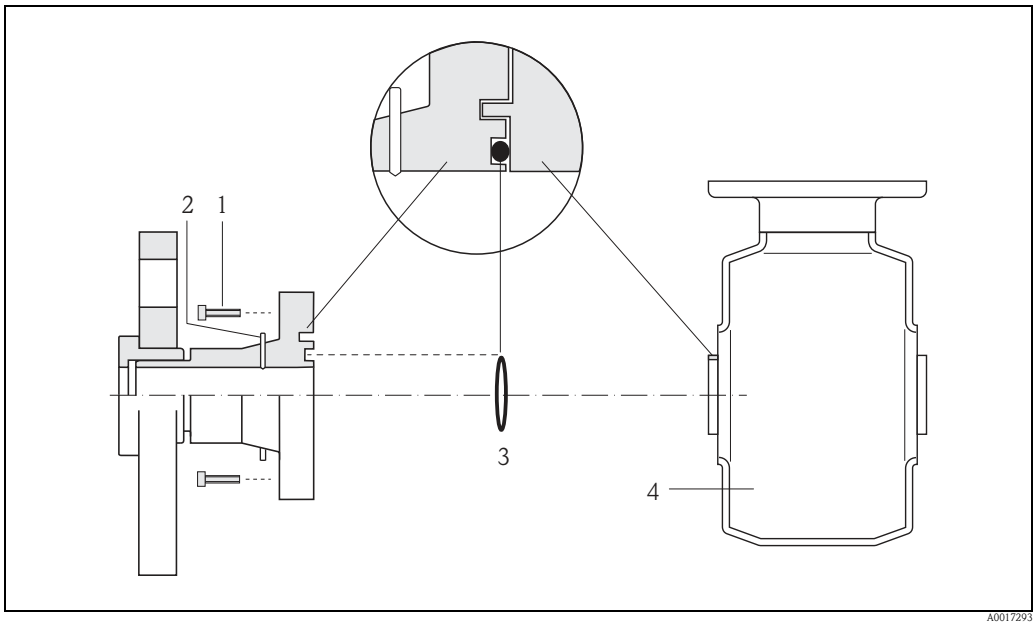
When using ground rings, note the following points:
- Depending on the option ordered, plastic washers may be installed at the process connections instead of ground rings. These plastic washers serve only as spacers and have no potential equalization function. In addition, they provide a sealing function 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 Endress+Hauser 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



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



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"

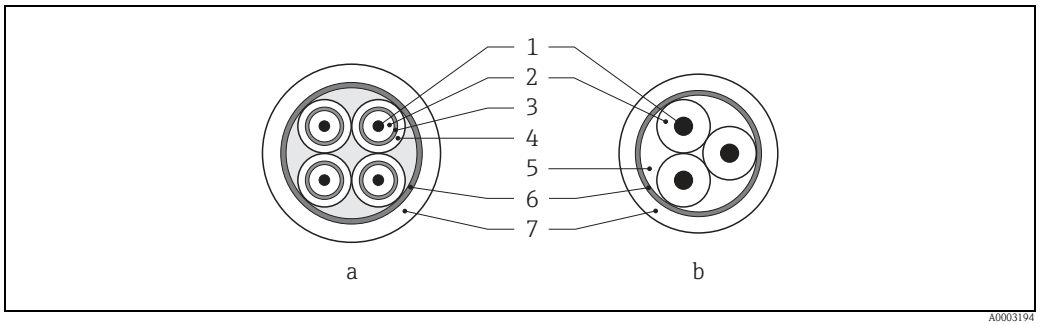
Remote version cable specifications

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)



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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

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 ± 2) °C / (+82 ± 4) °F
- Ambient temperature: (+22 ± 2) °C / (+72 ± 4) °F
- Warm-up period: 30 minutes

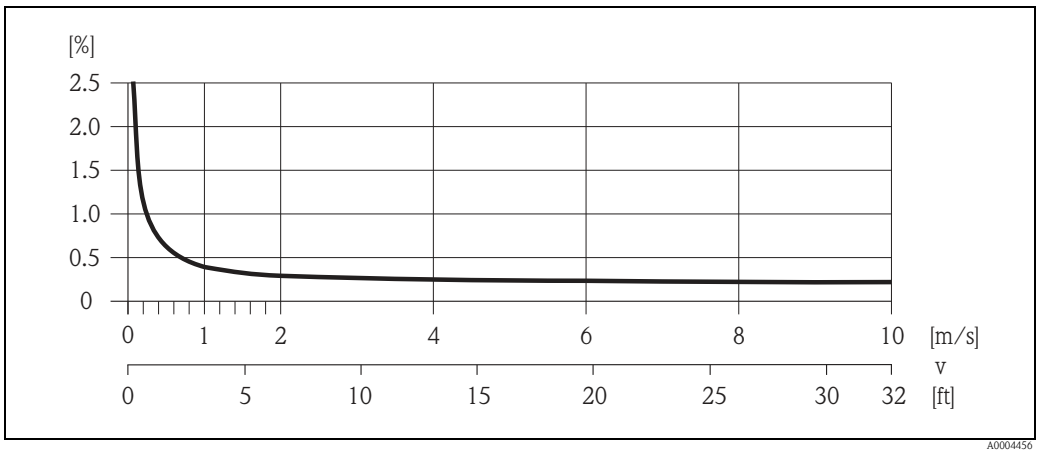
Installation conditions

- Inlet run > 10 × DN
- Outlet run > 5 × DN
- Sensor and transmitter grounded.
- The sensor is centered in the pipe.

Maximum measured error

- Pulse output: standard ±0.2% o.r. ± 2 mm/s
- Current output: also typically ±5 µA

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



Max. measured error in % of reading

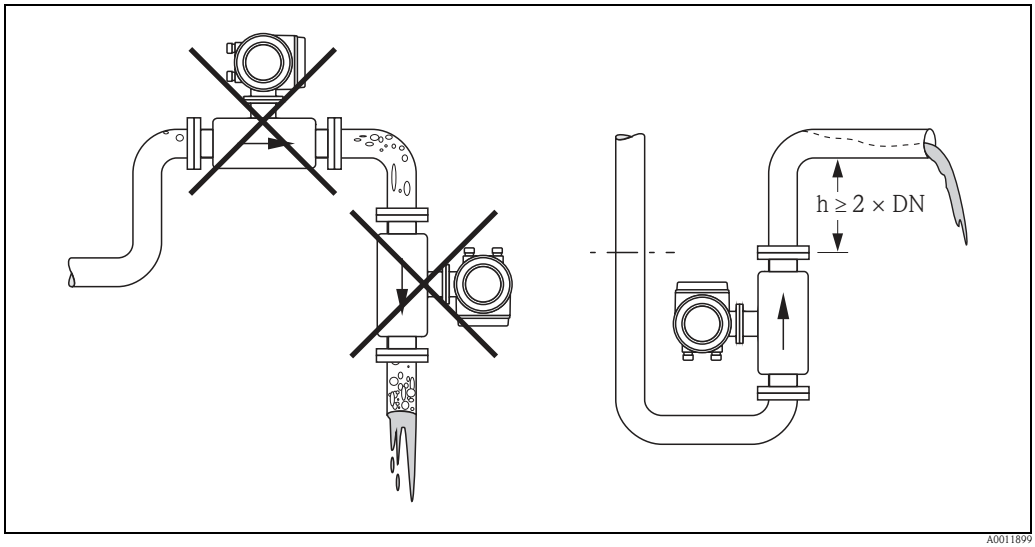
Repeatability

Standard: max. ±0.1% o.r. ± 0.5 mm/s

Installation

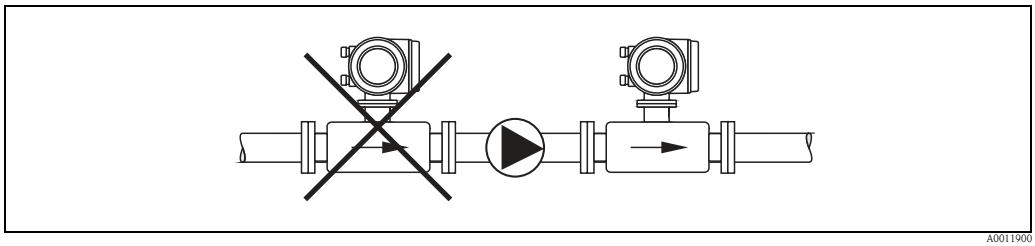
Mounting location

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

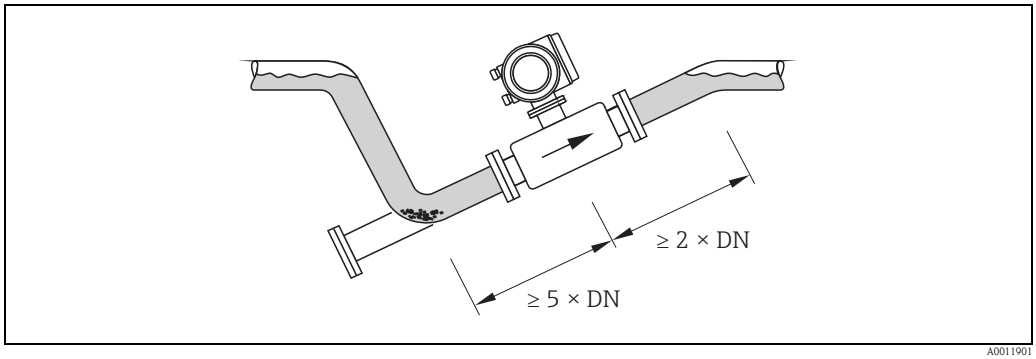
Installation of pumps
Sensors may not be installed on the pump suction side. This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. Information on the pressure tightness of the measuring tube lining → 🖹 21, Section "Pressure tightness".
It might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

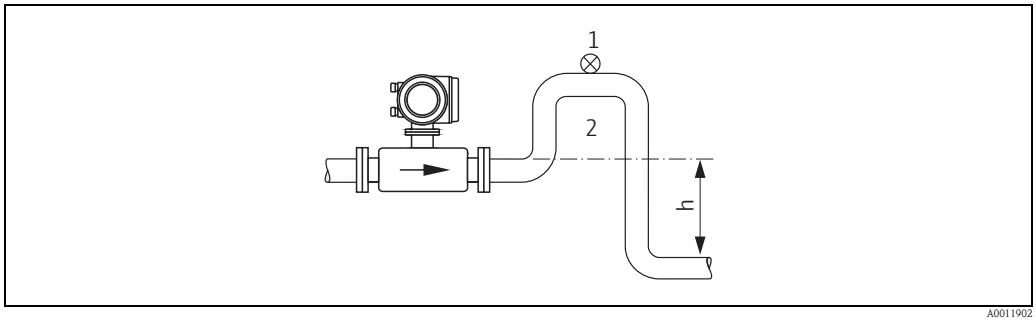
Partially filled pipes
Partially filled pipes with gradients necessitate a drain-type configuration.
The empty pipe detection function (EPD) provides additional security in detecting empty or partially filled pipes.

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 ≥ 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

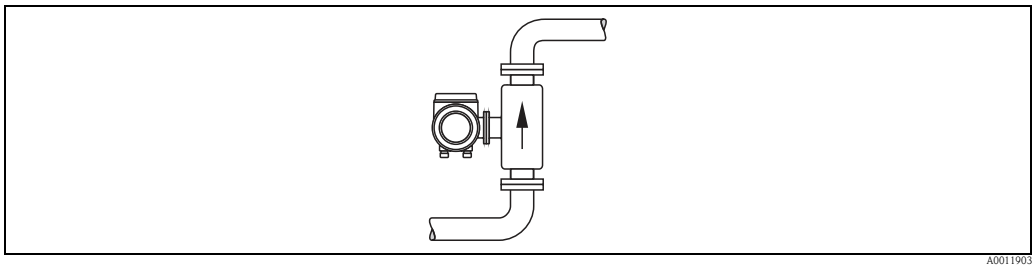
1 Vent valve
2 Pipe siphon
h Length of the down pipe

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.

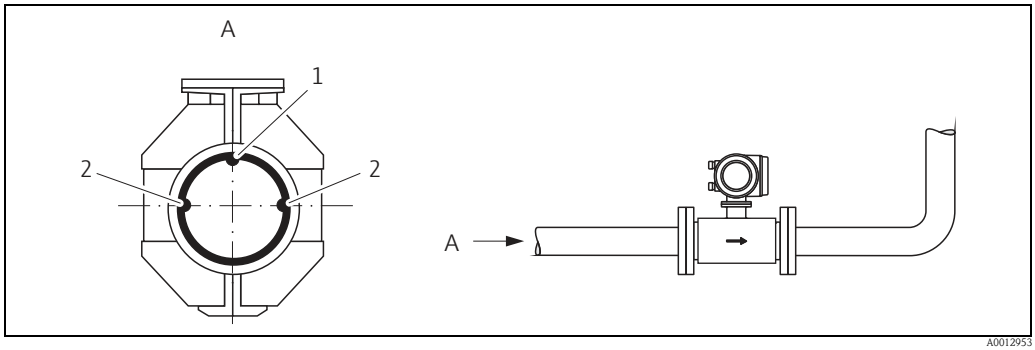


Vertical orientation

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.



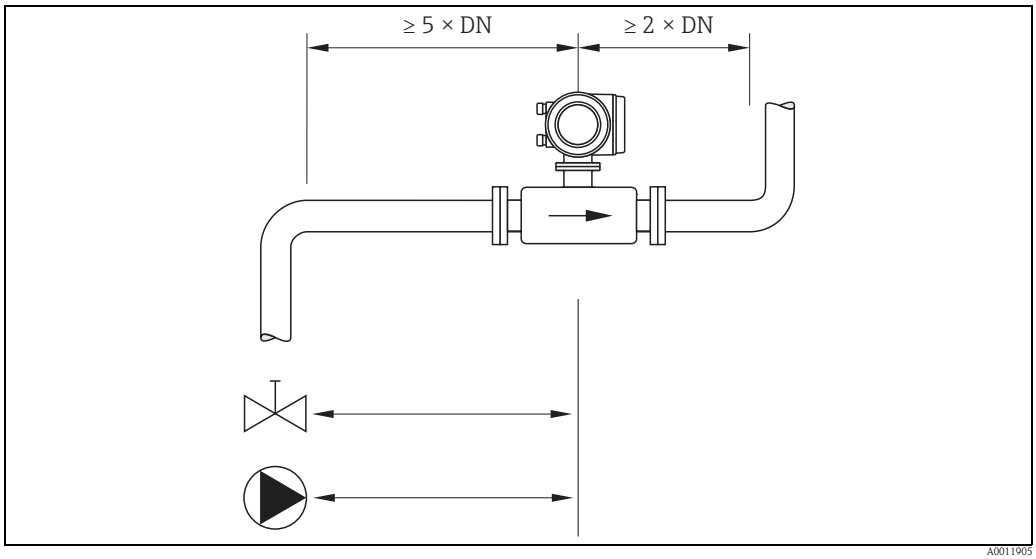
Horizontal orientation

1 EPD electrode for empty pipe detection (not for DN 2 to 15 / 1/12 to ½")
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: ≥ 5 × DN
- Outlet run: ≥ 2 × DN



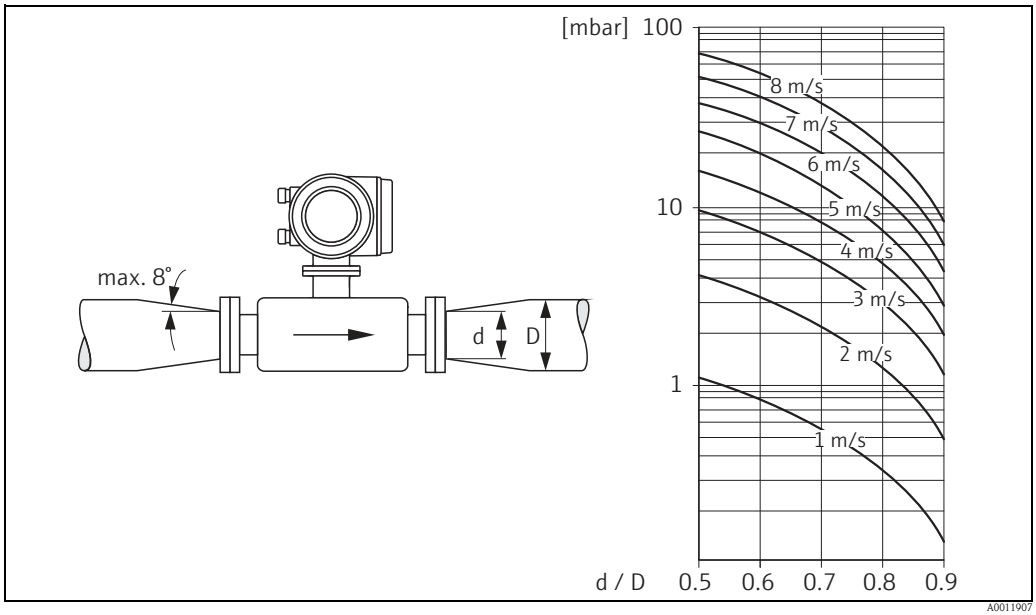
Inlet and outlet runs

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.

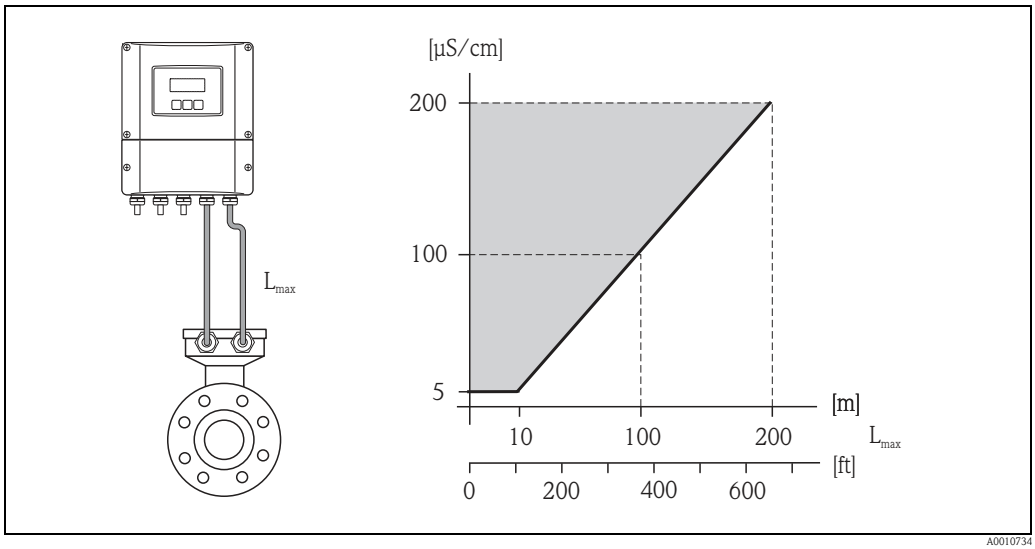


Pressure loss due to adapters

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 µS/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).

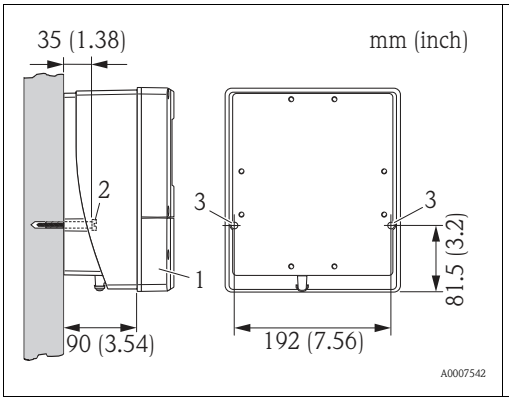


Permitted length of connecting cable for remote version
Area marked in gray = permitted range; L_{max} = length of connecting cable in [m] ([ft]); fluid conductivity in [µS/cm]

Mounting wall-mount housing

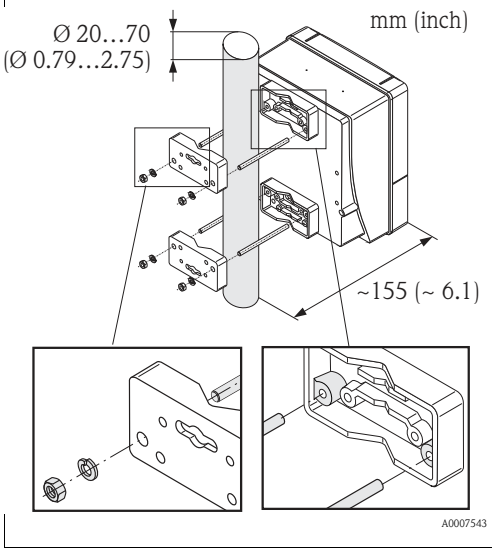
Caution!
- Make sure that the ambient temperature does not exceed the permitted range.
- Always install the wall-mount housing in such a way that the cable entries point downwards.

Mounted directly on the wall



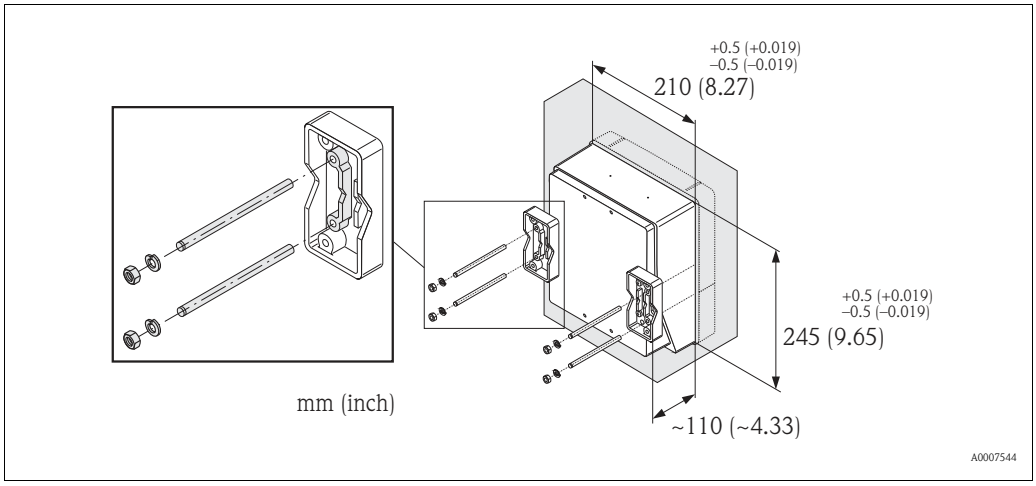
1. Connection compartment
2. Securing screws M6 (max. ø 6.5 mm / 0.26"); screw head max. ø 10.5 mm (0.41")
3. Housing bores for securing screws

Pipe mounting



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.

Panel mounting



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:
- ≥ 5 µS/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"**	**½"**	**1"**
Welding nipples: DIN EN ISO 1127, ODT/SMS		1.4404/316L: PN 40 (580 psi)				
Couplings: ISO 228/DIN 2999, NPT						
Flange: EN 1092-1 (DIN 2501)		1.4404/316L: PN 40 (580 psi), PVDF: PN 16 (232 psi)				
Flange: ANSI B16.5		1.4404/316L, PVDF: Class 150				
Flange: JIS B2220		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"**	**½"**	**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						
Clamp: ISO 2852/Fig. 2, DIN 32676, L14 AM7						
Flange: DIN 11864-2						

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

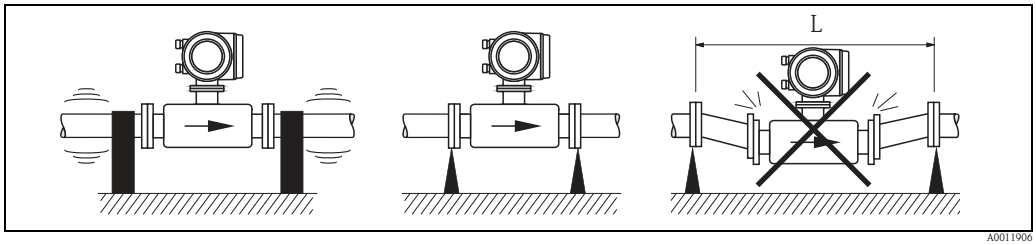
- With nominal diameters from DN 8 (3/8") no pressure loss if the sensor is installed in a pipe with the same nominal diameter.
- Pressure losses for configurations incorporating adapters according to DIN EN 545 (→ 📄 16, Section "Adapters").

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 Endress+Hauser as an accessory.



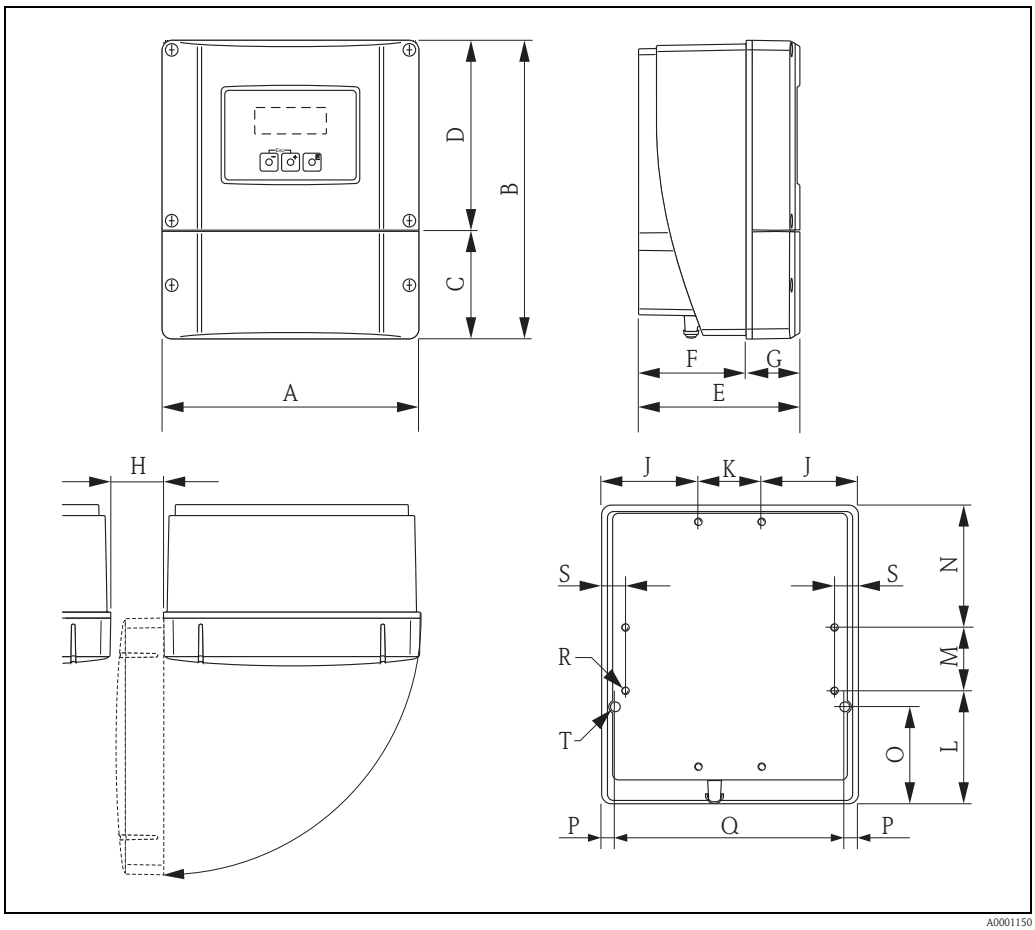
Measures to prevent vibration of the measuring device

L > 10 m (33 ft)

Mechanical construction

Design, dimensions

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



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]

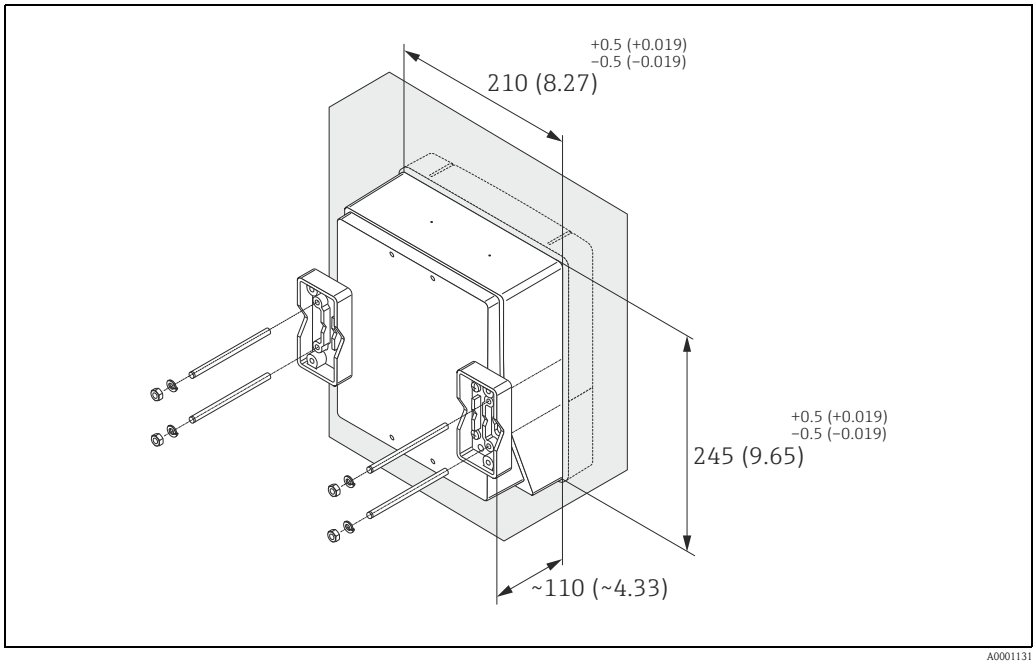
Dimensions (US units)

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]

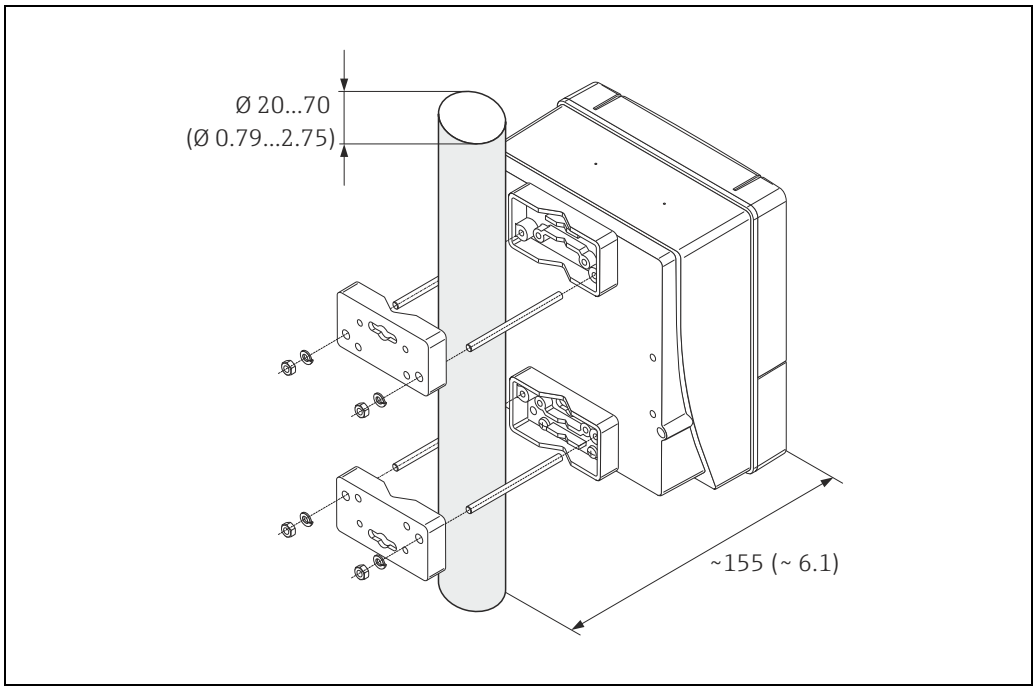
There is a separate mounting kit for the wall-mounted housing. It can be ordered from Endress+Hauser as an accessory. The following installation variants are possible:
- Panel mounting
- Pipe mounting

Panel mounting



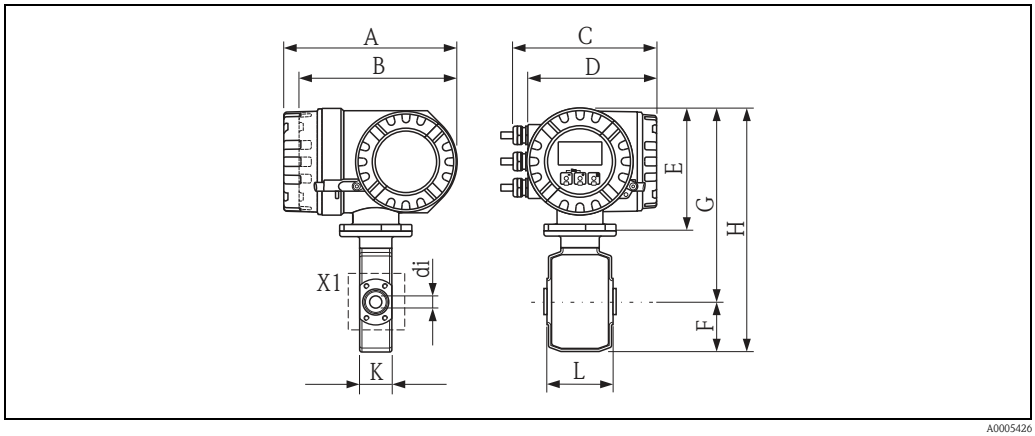
A0001131

Pipe mounting



A0001132

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



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	301	53		26

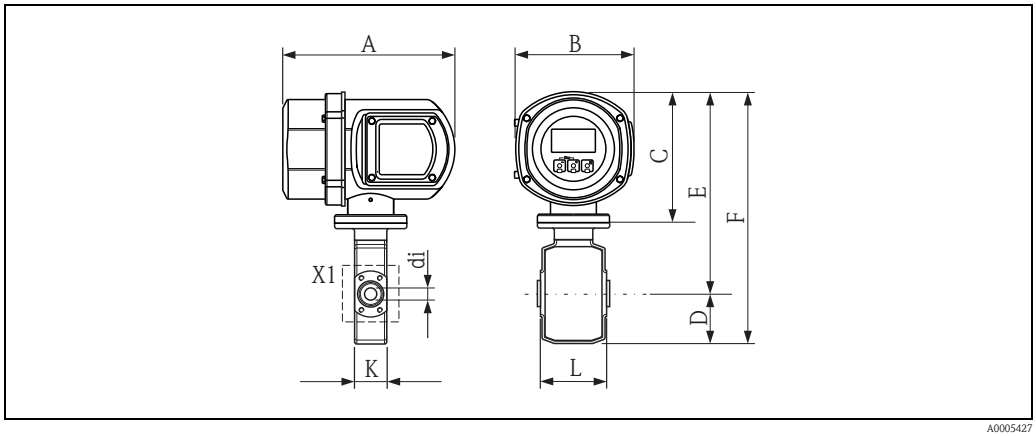
Total length depends on the process connections.
All dimensions in [mm]

Dimensions in US units

DN	L	A	B	C	D	E	F	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
½"										1.69		0.63
1"							2.04	9.76	11.8	2.07		0.89

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

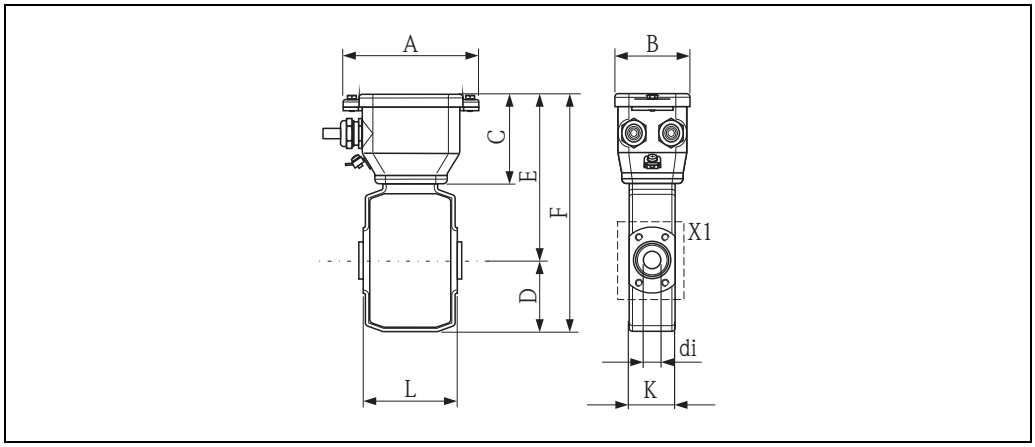
Total length depends on the process connections.
All dimensions in [mm]

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
½"								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

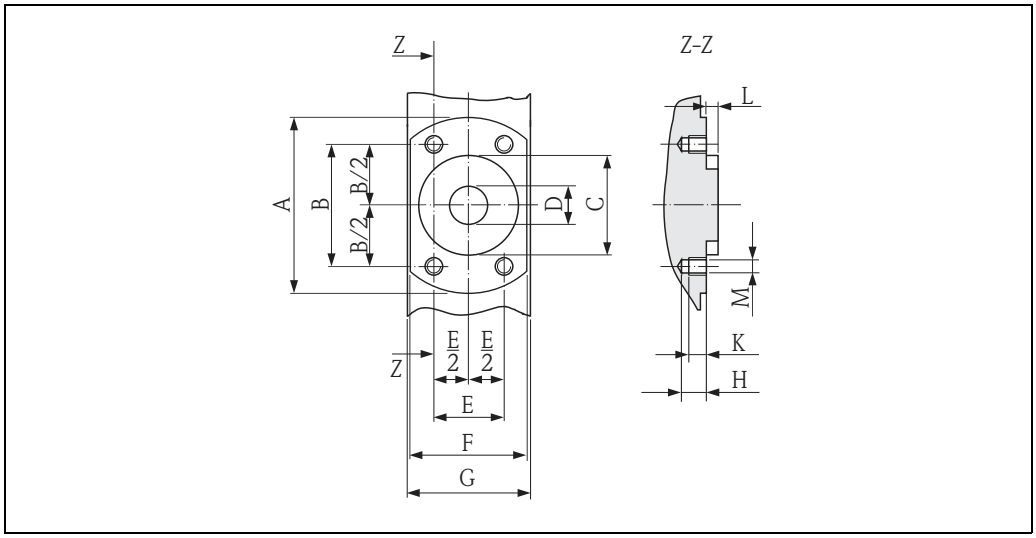
Total length depends on the process connections.
All dimensions in [mm]

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
½"								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				

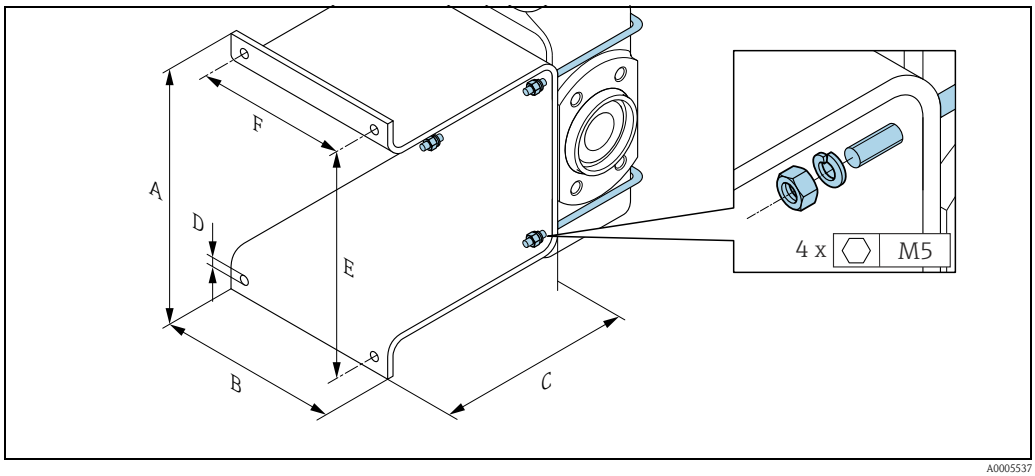
All dimensions in [mm]

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							
½"				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")

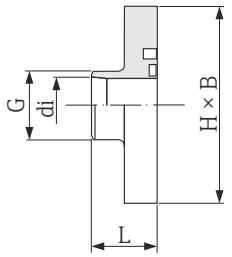


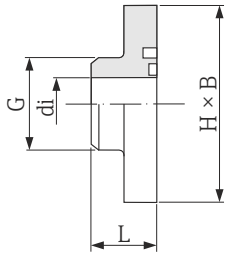
A0005537

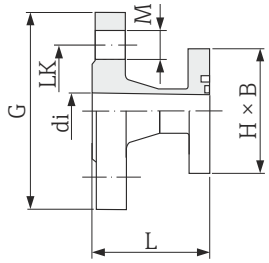
Dimensions in mm (inch)

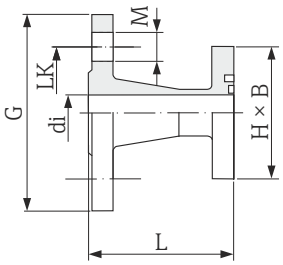
A	B	C	Ø D	E	F
125 (4.92")	88 (3.46")	120 (4.72")	7 (0.28")	110 (4.33")	140 (5.51")

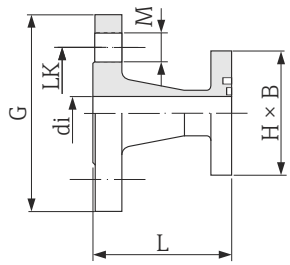
Process connections DN 2 to 25 (1/12 to 1") with O-ring seal

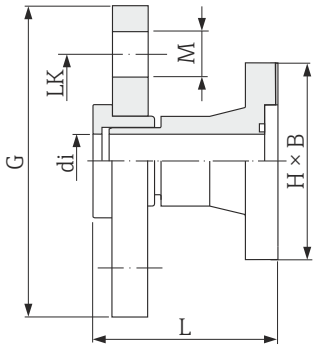
Welding nipple for DIN EN ISO 1127, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-B**********	[mm]	DIN EN ISO 1127	[mm]	[mm]	[mm]	[mm]
 A0005547	2 to 8	13.5 × 1.6	10.3	13.5	20.3	62 × 42
	15	21.3 × 1.6	18.1	21.3	20.3	62 × 42
	25 (DIN)	33.7 × 2.0	29.7	33.7	20.3	62 × 52
	■ Fitting length = (2 × L) + 86 mm					

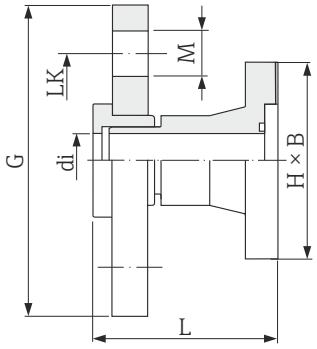
Welding nipple for ODT/SMS, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-C**********	[mm]	ODT/SMS 1127	[mm]	[mm]	[mm]	[mm]
 A0005548	2 to 8	13.5 × 2.3	9.0	13.5	20.3	62 × 42
	15	21.3 × 2.65	16.0	21.3	20.3	62 × 42
	25 (DIN)	33.7 × 3.25	27.2	33.7	20.3	72 × 55
	■ Fitting length = (2 × L) + 86 mm					

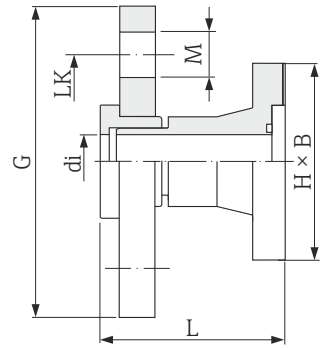
Flange for EN 1092-1 (DIN 2501), Form B, 1.4404/316L, PN 40	Sensor DN	Fits to flange [1]	di	G	L	LK	M	H × B
5*H**-D**********	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
 A0005549	2 to 8	DN 15	17.3	95	56.2	65	14	62 × 42
	15	DN 15	17.3	95	56.2	65	14	62 × 42
	25 (DIN)	DN 25	28.5	115	56.2	85	14	72 × 55
	[1] EN 1092-1 (DIN 2501) ■ Fitting length = (2 × L) + 86 mm ■ Fitting length to DVGW (200 mm)							

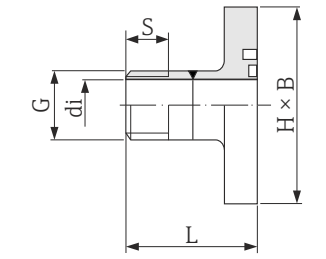
Flange for ANSI B16.5, 1.4404/316L, Cl. 150	Sensor DN	Fits to flange[1]	di	G	L	LK	M	H × B
5*H**-E**********	[mm]	[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
 A0005550	2 to 8	½"	15.7	89	66.0	60.5	15.7	62 × 42
	15	½"	16.0	89	66.0	60.5	15.7	62 × 42
	25 (1" ANSI)	1"	26.7	108	71.8	79.2	15.7	72 × 55
	[1] ANSI B16.5 ■ Fitting length = (2 × L) + 86 mm							

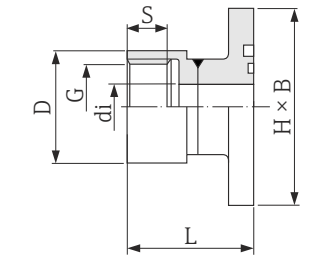
Flange for JIS B2220, 1.4404/316L, 20K	Sensor DN	Fits to flange	di	G	L	LK	M	H × B
5*H**-F**********	[mm]	B2220	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	ND 15	15	95	67	70	15	62 × 42
	15	ND 15	16	95	67	70	15	62 × 42
	25 (DIN)	ND 25	26	125	67	90	19	72 × 55
	■ Fitting length = (2 × L) + 86 mm							

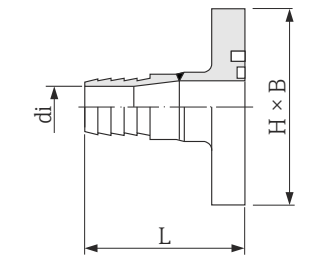
Flange for EN 1092-1 (DIN2501), PVDF, PN16	Sensor DN	Fits to flange	di	G	L	LK	M	H × B
5*H**-G**********	[mm]	EN 1092-1 (DIN 2501)	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	DN 15	16	95	57	65	14	62 × 42
	15	DN 15	16	95	57	65	14	62 × 42
	25 (DIN)	DN 25	27.2	115	57	85	14	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ Fitting length to DVGW (200 mm) ■ The requisite ground rings can be ordered as accessories (Order No. DK5HR-****).							

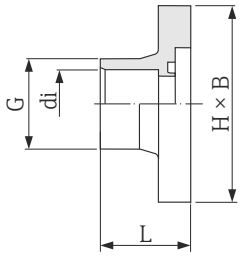
Flange for ANSI B16.5, PVDF, Cl. 150	Sensor DN	Fits to flange	di	G	L	LK	M	H × B
5*H**-H**********	[mm]	ANSI B16.5	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	½"	16	95	57	60	16	62 × 42
	15	½"	16	95	57	60	16	62 × 42
	25 (DIN)	1"	27.2	115	57	79	16	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ The requisite ground 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]
	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
	■ Fitting length = (2 × L) + 86 mm ■ The requisite ground rings can be ordered as accessories (Order No. DK5HR-****).							

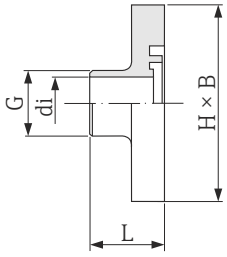
External pipe thread, ISO 228/DIN 2999, 1.4404/316L	Sensor DN	Fits to internal thread	di	G	L	S	H × B
5*H**-K**********	[mm]	[inch]	[mm]	[inch]	[mm]	[mm]	[mm]
	2 to 8	R 3/8"	10	3/8"	40	10.1	62 × 42
	15	R ½"	16	½"	40	13.2	62 × 42
	25 (1" ANSI)	R 1"	25	1"	42	16.5	72 × 55
	■ Fitting length = (2 × L) + 86 mm						

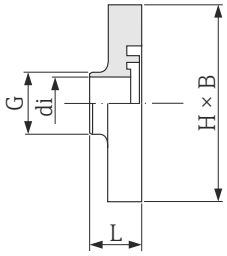
Internal pipe thread, ISO 228/DIN 2999, 1.4404/316L	Sensor DN	Fits to external thread	di	G	D	L	S	H × B
5*H**-L**********	[mm]	[inch]	[mm]	[inch]	[mm]	[mm]	[mm]	[mm]
	2 to 8	Rp 3/8"	9	3/8"	22	45	13	62 × 42
	15	Rp ½"	16	½"	27	45	14	62 × 42
	25 (1" ANSI)	Rp 1"	27.2	1"	40	51	17	72 × 55
	■ Fitting length = (2 × L) + 86 mm							

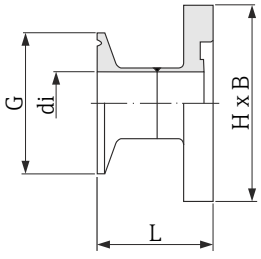
Hose connection 1.4404/316L	Sensor DN	Fits to inside diameter	di	L	H × B
5*H**-M/N/P**********	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	13	10.0	49	62 × 42
	15	16	12.6	49	62 × 42
	15	19	16.0	49	62 × 42
	■ Fitting length = (2 × L) + 86 mm				

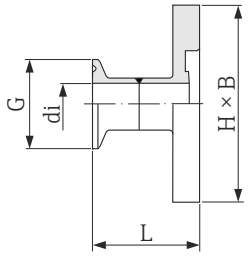
PVC adhesive fitting	Sensor DN	Fits to pipe	di	G	L	H × B
5*H**-R/S**********	[mm]	[mm] /[inch]	[mm]	[mm]	[mm]	[mm]
 A0005566	2 to 8	½" [inch]	21.5	27.3	38.5	62 × 42
	2 to 8	20 × 2 [mm] (DIN 8062)	20.2	27.0	38.5	62 × 42
	15	20 × 2 [mm] (DIN 8062)	20.2	27.0	28.0	62 × 42
	■ Fitting length = (2 × L) + 86 mm ■ The requisite ground rings can be ordered as accessories (Order No. DK5HR-****).					

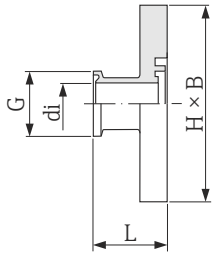
Process connections DN 2 to 25 (1/12 to 1") with aseptic gasket seal

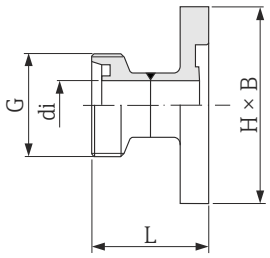
Welding nipple for DIN, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-U**********	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]
 A0003870	2 to 8	13 × 1.5	10	13	23	62 × 42
	15	19 × 1.5	16	19	23	62 × 42
	25 (DIN)	29 × 1.5	26	29	23	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account!					

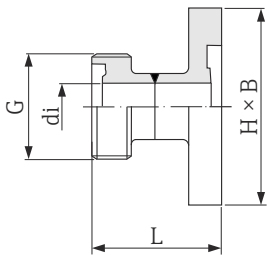
Welding nipple for ODT/SMS, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-V**********	[mm]	ODT/SMS	[mm]	[mm]	[mm]	[mm]
 A0003871	2 to 8	12.7 × 1.65	9.0	12.7	16.1	62 × 42
	15	19.1 × 1.65	16.0	19.1	16.1	62 × 42
	25 (1" ANSI)	25.4 × 1.65	22.6	25.4	16.1	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account!					

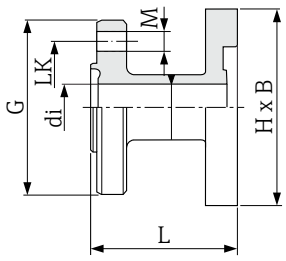
Clamp ISO 2852, Fig.2, 1.4404/316L	Sensor DN	Fits to piping	Clamp ISO 2852, DN	di	G	L	H × B
5*H**-W**********	[mm]	ISO 2037 / BS 4825-1	[mm]	[mm]	[mm]	[mm]	[mm]
 A0005560	25 (1" ANSI)	Tube 24.5 × 1.65	25	22.6	50.5	44.3	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account!						

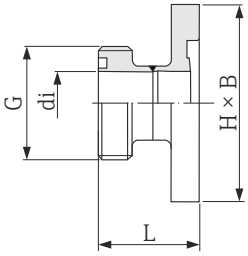
Clamp DIN 32676, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-0**********	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]
	2 to 8	Tube 14 × 2 (DN 10)	10	34.0	41.0	62 × 42
	15	Tube 20 × 2 (DN 15)	16	34.0	41.0	62 × 42
	25 (DIN)	Tube 30 × 2 (DN 25)	26	50.5	44.5	72 × 55
	■ Fitting length = (2 × 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
	■ 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!					

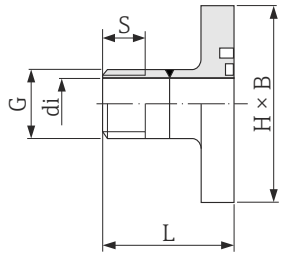
Coupling SC DIN 11851, threaded adapter, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-2**********	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]
	2 to 8	Tube 12 × 1 (DN 10)	10	Rd 28 × 1/8"	44	62 × 42
	15	Tube 18 × 1.5 (DN 15)	16	Rd 34 × 1/8"	44	62 × 42
	25 (DIN)	Tube 28 × 1 or 28 × 1.5 (DN 25)	26	Rd 52 × 1/6"	52	72 × 55
	■ 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!					

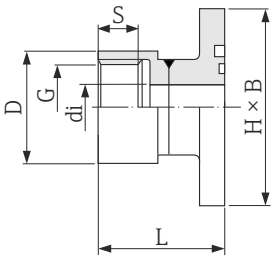
Coupling DIN 11864-1, aseptic threaded adapter, Form A, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	H × B
5*H**-3**********	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]
	2 to 8	Tube 13 × 1.5 (DN 10)	10	Rd 28 × 1/8"	42	62 × 42
	15	Tube 19 × 1.5 (DN 15)	16	Rd 34 × 1/8"	42	62 × 42
	25 (DIN)	Tube 29 × 1.5 (DN 25)	26	Rd 52 × 1/6"	49	72 × 55
	■ 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!					

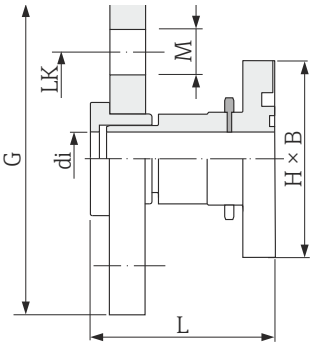
Flange DIN 11864-2, aseptic grooved flange, Form A, 1.4404/316L	Sensor DN	Fits to piping	di	G	L	LK	M	H × B
5*H**-4**********	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	Tube 13 × 1.5 (DN 10)	10	54	48.5	37	9	62 × 42
	15	Tube 19 × 1.5 (DN 15)	16	59	48.5	42	9	62 × 42
	25 (DIN)	Tube 29 × 1.5 (DN 25)	26	70	48.5	53	9	72 × 55
	■ 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!							

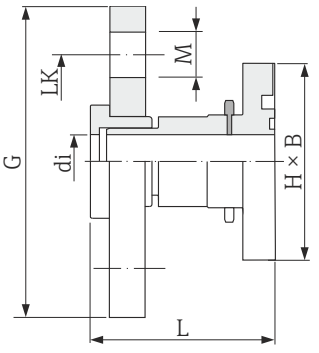
Coupling SMS 1145, threaded adapter, 1.4404/316L	Sensor DN	Fits to piping	SMS 1145 DN	di	G	L	H × B
5*H**-5**********	[mm]	OD	[mm]	[mm]	[mm]	[mm]	[mm]
	25 (1" ANSI)	1"	25	22.6	Rd 40 × 1/6"	30.8	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ If pigs are used for cleaning, it is essential to take the inside diameters of measuring tube and process connection (di) into account!						

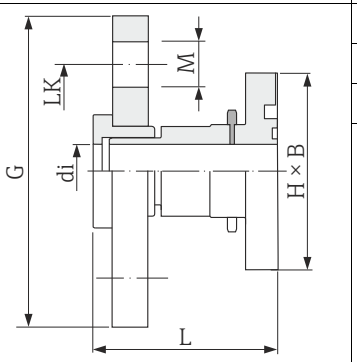
Process connections orderable only as accessories with O-ring seal (DN 2 to 25 / 1/12 to 1")

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 ½"	16	½"	50	20.0	62 × 42
	25 (1" ANSI)	NPT 1"	25	1"	55	25.0	72 × 55
	■ Fitting length = (2 × L) + 86 mm						

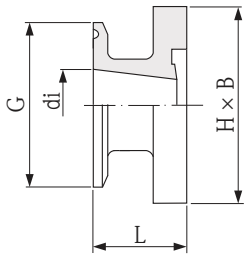
Internal thread, 1.4404/316L	Sensor DN	Fits to external thread	di	G	D	L	S	H × B
DKH**-GC**	[mm]	NP	[mm]	[inch]	[mm]	[mm]	[mm]	[mm]
	2 to 8	NPT 3/8"	8.9	3/8"	22	45	13	62 × 42
	15	NPT ½"	16.0	½"	27	45	14	62 × 42
	25 (1" ANSI)	NPT 1"	27.2	1"	40	51	17	72 × 55
	■ Fitting length = (2 × L) + 86 mm							

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
	■ Fitting length = (2 × L) + 86 mm ■ Fitting length to DVGW (200 mm) ■ Grounds rings are not required							

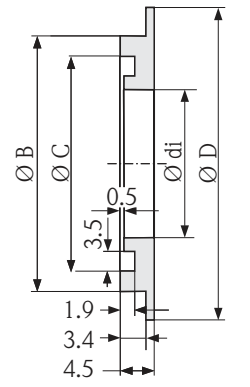
Flange with ground electrode ANSI B16.5, PVDF, Cl. 150	Sensor DN	Fits to flange	di	G	L	LK	M	H × B
DKH**-FH**	[mm]	ANSI B16.5	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	2 to 8	½"	16	95	57	60	16	62 × 42
	15	½"	16	95	57	60	16	62 × 42
	25 (DIN)	1"	27.2	115	57	79	16	72 × 55
	■ Fitting length = (2 × L) + 86 mm ■ Grounds 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
	■ Fitting length = (2 × L) + 86 mm ■ Grounds rings are not required							

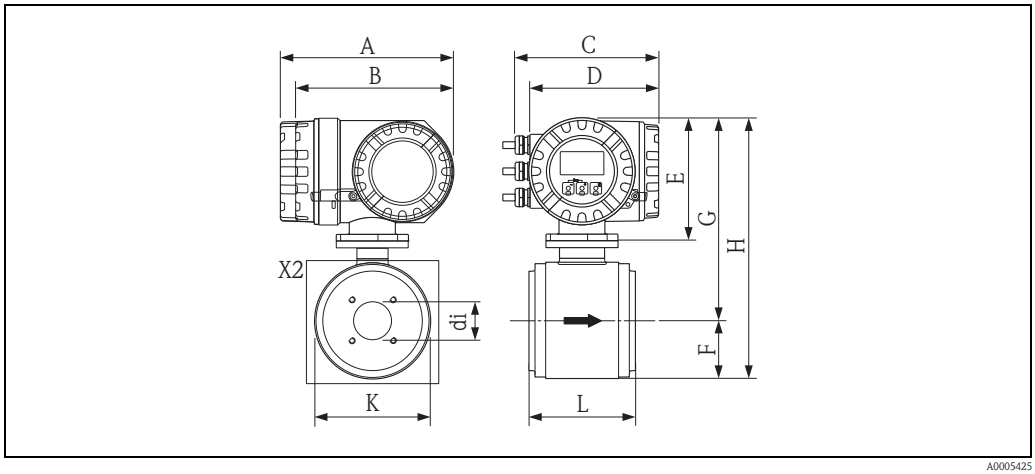
Process connections orderable only as accessories with aseptic gasket seal (DN 15)

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]
	15	Tube 25.4 × 1.65 (ODT 1")	22.1	50.4	28.5	62 × 42
	■ 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]
	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

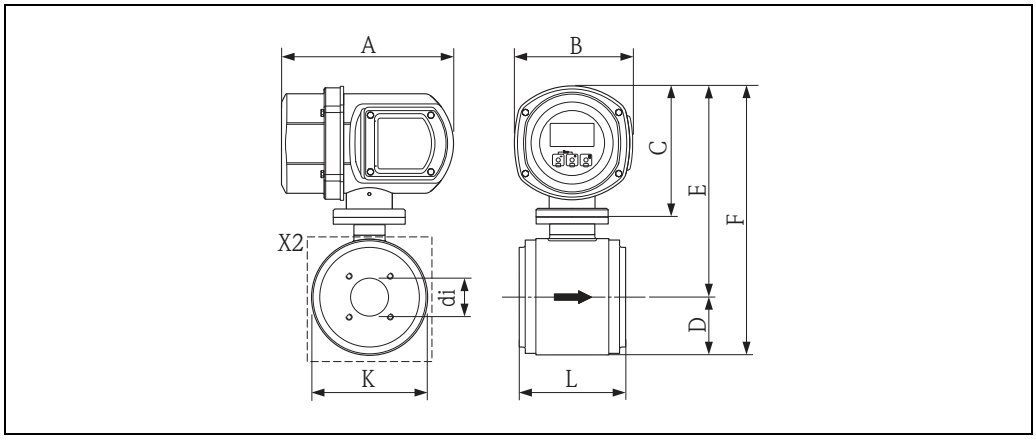
Total length depends on the process connections.
All dimensions in [mm]

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

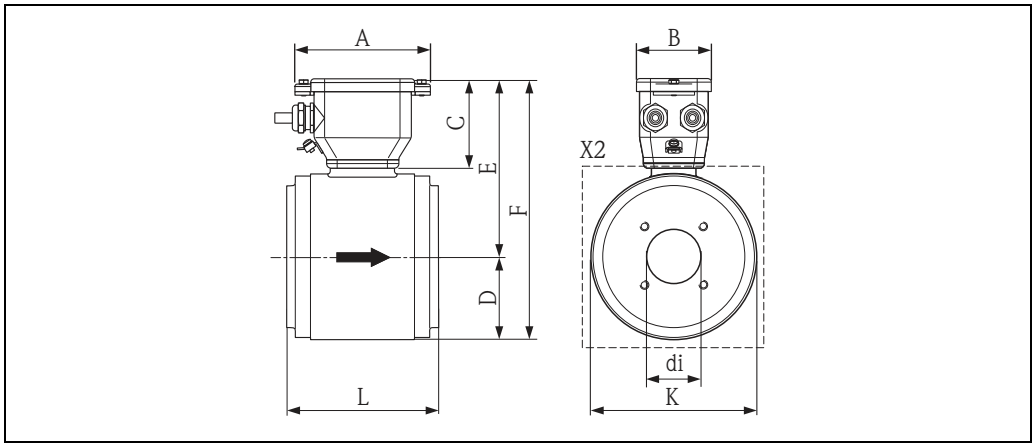
Total length depends on the process connections.
All dimensions in [mm]

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")



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

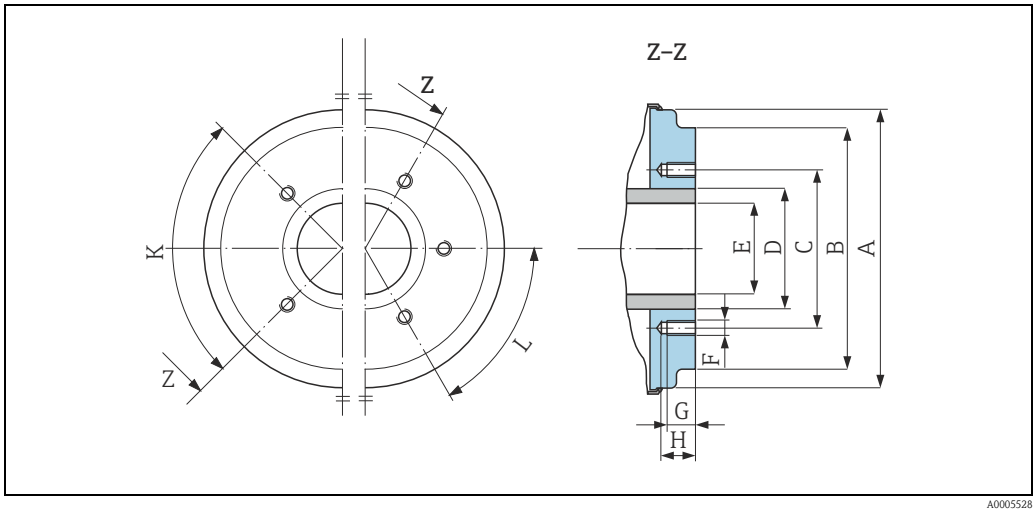
Total length depends on the process connections.
All dimensions in [mm]

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	K 90° ±0.5°	L 60° ±0.5°
									Threaded holes	
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

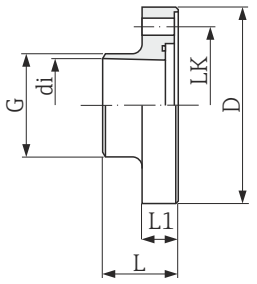
All dimensions in [mm]

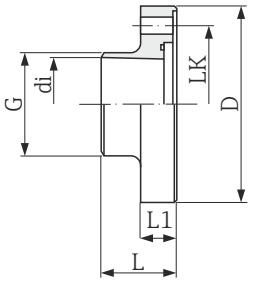
Dimensions in US units

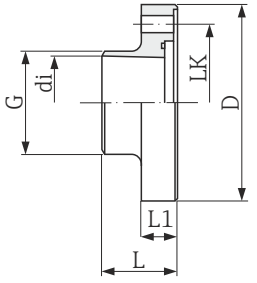
DN	A	B	C	D	E	F	G	H	K 90° ±0.5°	L 60° ±0.5°
									Threaded holes	
1½"	3.93	3.38	2.80	1.90	1.37	M 8	0.47	0.67	4	–
2"	4.44	3.89	3.29	2.37	1.87	M 8	0.47	0.67	4	–
3"	5.54	5.26	4.49	3.50	2.87	M 8	0.47	0.67	–	6
4"	6.56	6.28	5.55	4.50	3.83	M 8	0.47	0.67	–	6
5"	7.82	7.54	6.73	5.50	4.72	M 10	0.59	0.79	–	6
6"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

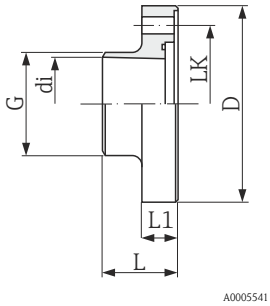
All dimensions in [inch]

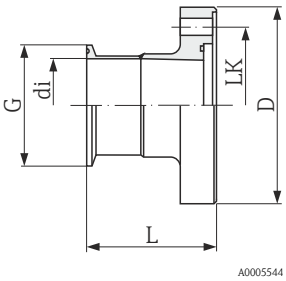
Process connections DN 40 to 150 (1½ to 6") with aseptic gasket seal

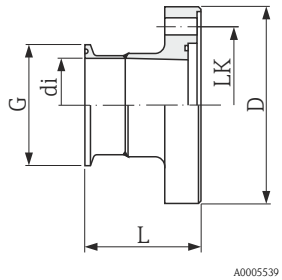
Welding nipple for DIN, 1.4404/316L	Sensor DN	Fits to piping	di	G	D	L	L1	LK	L_{tot} 1)
 A0005541	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-U**********, DKH**-HR**								
	40	41 × 1.5	38	43	92.0	42	19	71.0	220
	50	53 × 1.5	50	55	105.0	42	19	83.5	220
	65	70 × 2	66	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**-U**********+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!								

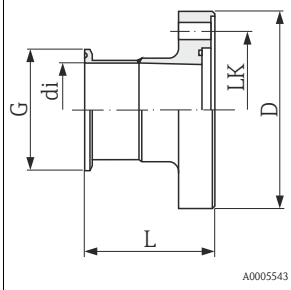
Welding nipple for ODT/SMS, 1.4404/316L	Sensor DN	Fits to Piping	di	G	D	L	L1	LK	L_{tot} 1)
 A0005541	[mm]	OD/SMS	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-V**********, DKH**-HB**								
	40	38.1 × 1.65	35.3	40	92	42	19	71.0	220
	50	50.8 × 1.65	48.1	55	105	42	19	83.5	220
	65	63.5 × 1.65	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!								

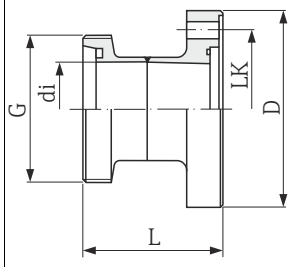
Welding nipple ASME BPE, 1.4404/316L	Sensor DN		Fits to Piping	di	G	D	L	L1	LK	L_{tot} 1)
 A0005541	[mm]	[inch]	ASME BPE	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-Q**********, DKH**-HN**									
	40	1½"	38.1 × 1.65	34.8	38.1	99.7	43	18	71.0	220
	50	2"	50.8 × 1.65	47.5	50.8	112.7	43	18	83.5	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!									

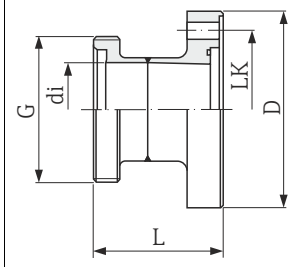
Welding nipple ISO 2037, 1.4404/316L	Sensor DN	Fits to Piping	di	G	D	L	L1	LK	L_{tot} 1)
	[mm]	ISO 2037	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-T**********, DKH**-HP**								
	40	38 × 1.2	35.6	38	99.7	43	18	71.0	220
	50	51 × 1.2	48.6	51	112.7	43	18	83.5	220
	65	63.5 × 1.6	60.3	63.5	127.7	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!								

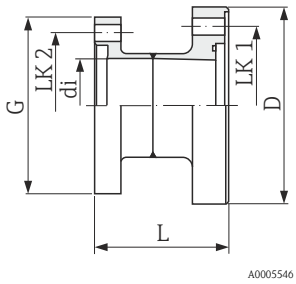
Clamp ISO 2852, Fig. 2, 1.4404/316L	Sensor DN	Fits to piping	Clamp ISO 2852 nominal diameter	di	G	D	L	LK	L_{tot} 1)
	[mm]	ISO 2037/ BS 4825-1	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-W**********, DKH**-HC**								
	40	38.0 × 1.6	38.0	35.6	50.5	92.0	68.5	71.0	273
	50	51.0 × 1.6	51.0	48.6	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!								

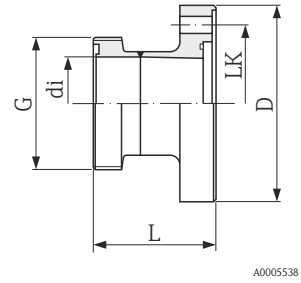
Clamp DIN 32676, 1.4404/316L	Sensor DN	Fits to piping	di	G	D	L	LK	L_{tot} 1)
	[mm]	EN 10357 (DIN 11850)	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-0**********, DKH**-HD**							
	40	41 × 1.5	38	50.5	92.0	61.5	71.0	259
	50	53 × 1.5	50	64.0	105.0	61.5	83.5	259
	65	70 × 2	66	91.0	121.0	68.0	100.0	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!							

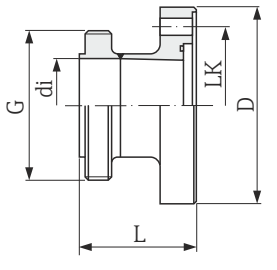
Tri-Clamp L14 AM7, 1.4404/316L	Sensor DN		Fits to piping	di	G	D	L	LK	L_{tot} 1)
	[mm]	[inch]	ASME BPE	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-1**********, DKH**-HE**								
	40	1½"	38.1 × 1.65	34.8	50.4	92.0	68.6	71.0	273.2
	50	2"	50.8 × 1.65	47.5	63.9	105.0	68.6	83.5	273.2
	65	–	63.5 × 1.65	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!							

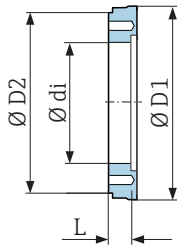
Coupling DIN 11864-1, Aseptic threaded adapter, Form A, 1.4404/316L	Sensor DN	Fits to piping	di	G	D	L	LK	L_{tot} 1)
	[mm]	DN 11850	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	Order codes: 5*H**-3**********, DKH**-HH**							
	40	42 × 1.5	38	Rd 65 × 1/6"	92.0	71	71.0	278
	50	54 × 1.5	50	Rd 78 × 1/6"	105.0	71	83.5	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]
	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]
	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
DK5HB - ****	[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	Compact version (DIN)		Remote version (without cable; DIN)	
DN	Aluminum field housing	Stainless steel field housing	Sensor	Transmitter (wall-mount housing)
[mm]	[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	Compact version (DIN)		Remote version (without cable; DIN)	
DN	Aluminum field housing	Stainless steel field housing	Sensor	Transmitter (wall-mount housing)
[in]	[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
½"	11.9	13.0	4	13
1"	12.1	13.2	6	13
1½"	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] EN (DIN)	Internal diameter[2] PFA	
[mm]	[inch]	[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	½"	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	1½"	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 (1½ to 6"): gasket seal (EPDM*, Silicone*)

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

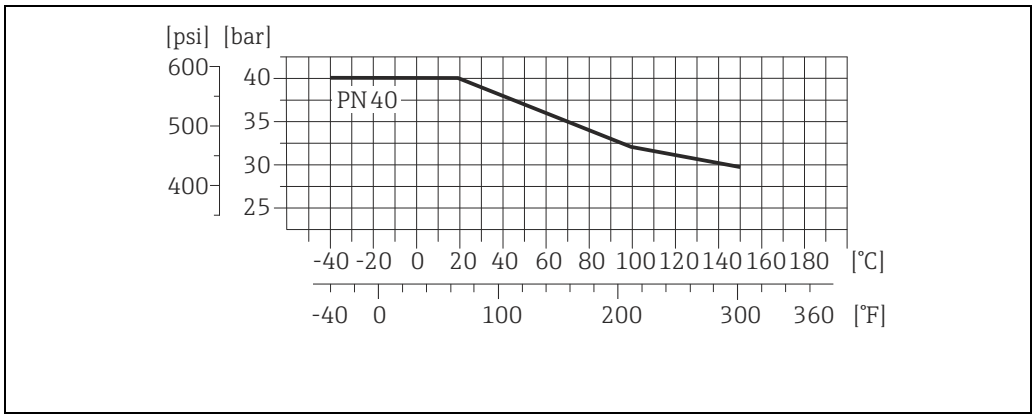
Material load diagram

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

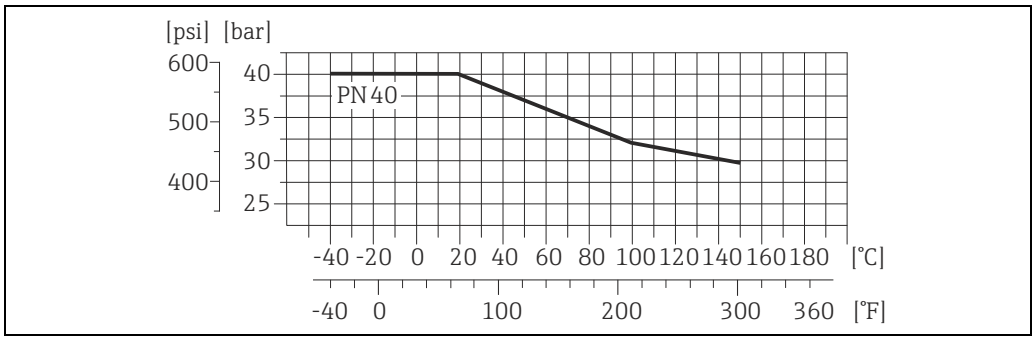
Materials: 1.4404/316L



A0021191-EN

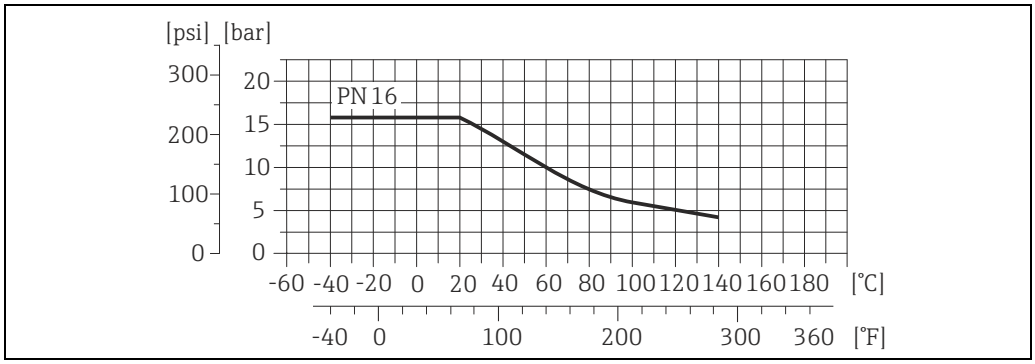
Flange connection to EN 1092-1 (DIN 2501), adhesive fitting

Material: 1.4404/316L



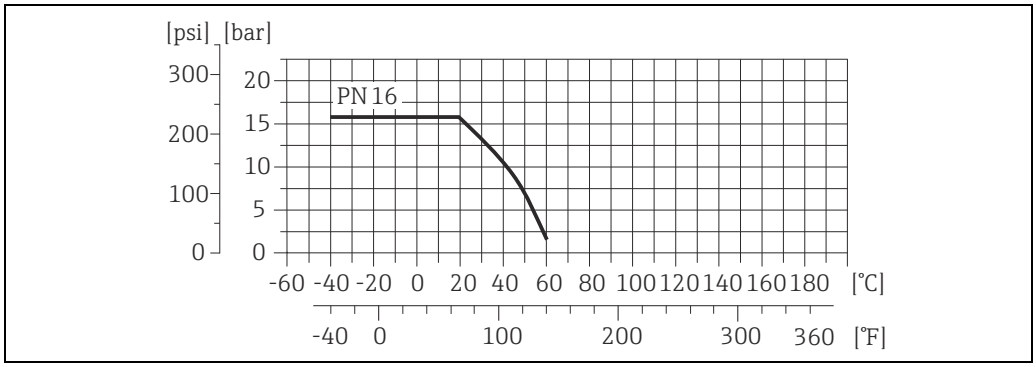
A0021191-EN

Material: PVDF



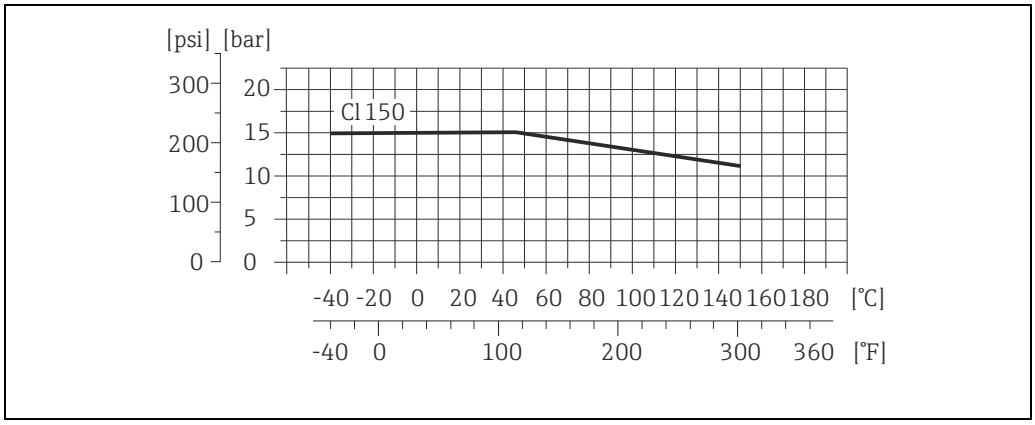
A0021230-EN

Material: PVC-U


[psi]
[bar]
300
200
100
0
20
15
10
5
0
PN 16
-60 -40 -20 0 20 40 60 80 100 120 140 160 180 [°C]
-40 0 100 200 300 360 [°F]
A0021231-EN

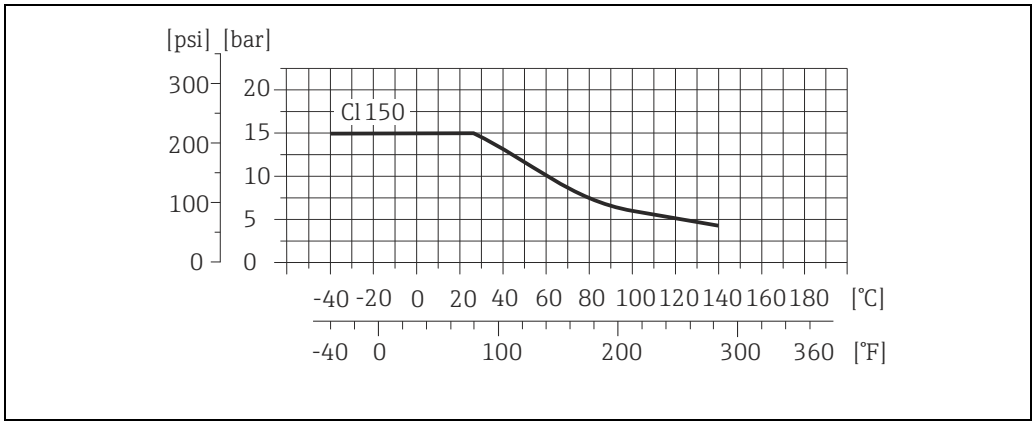
Flange connection to ANSI B16.5

Material: 1.4404/316L



A0021192-EN

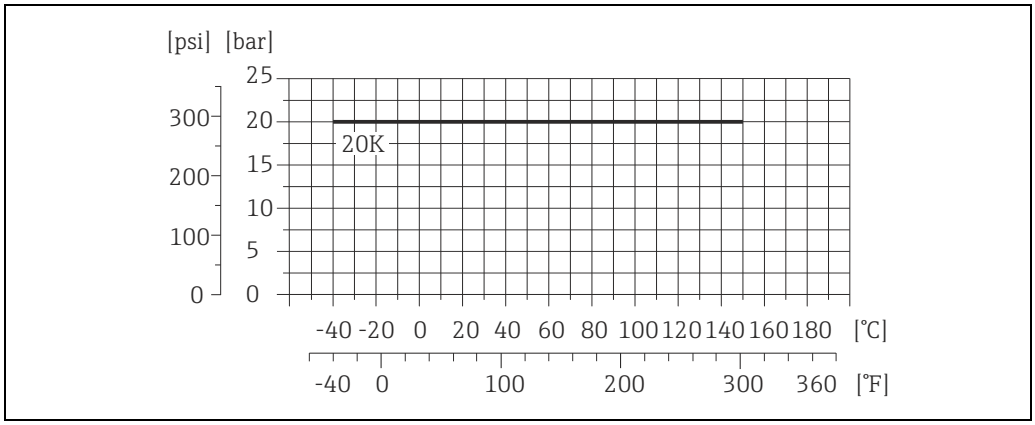
Material: PVDF



A0021232-EN

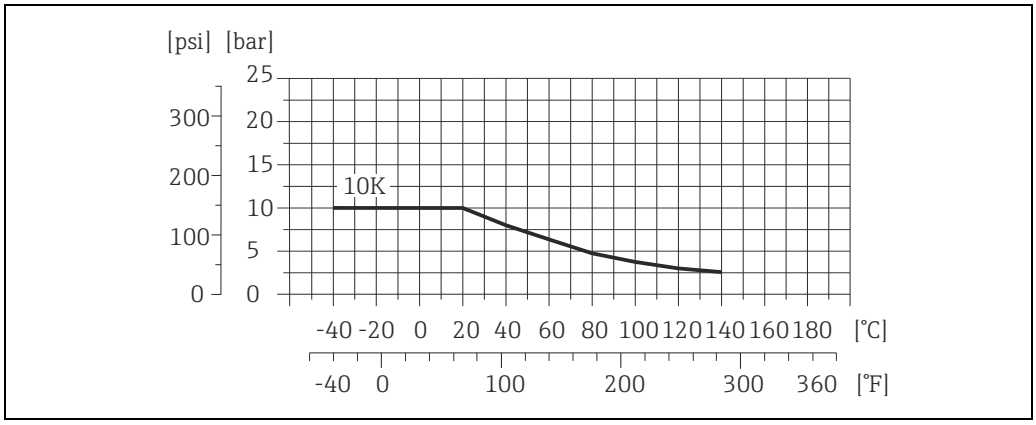
Flange connection to JIS B2220

Material: 1.4404/316L



A0021193-EN

Material: PVDF

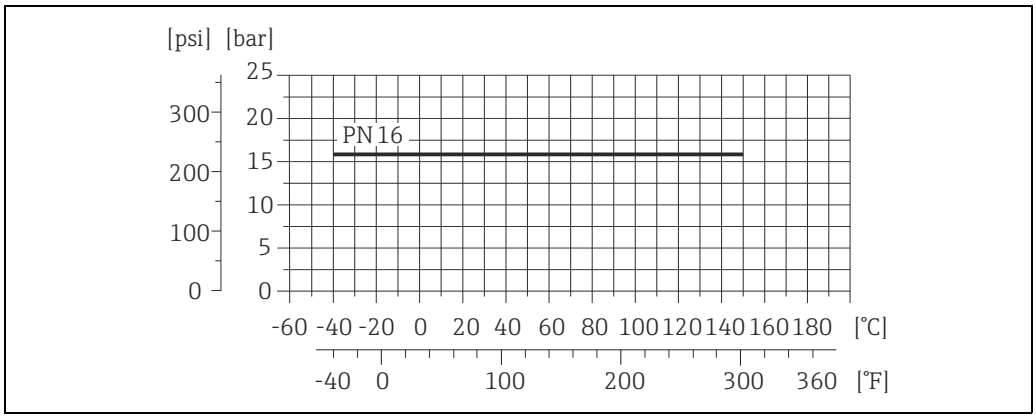


A0021233-EN

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

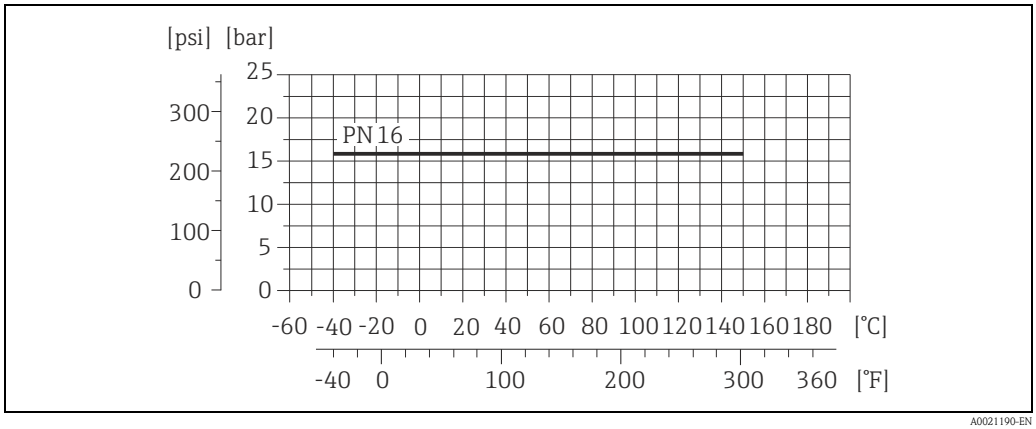


A0021190-EN

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

Welding nipple to ODT/SMS
Coupling to SMS 1145

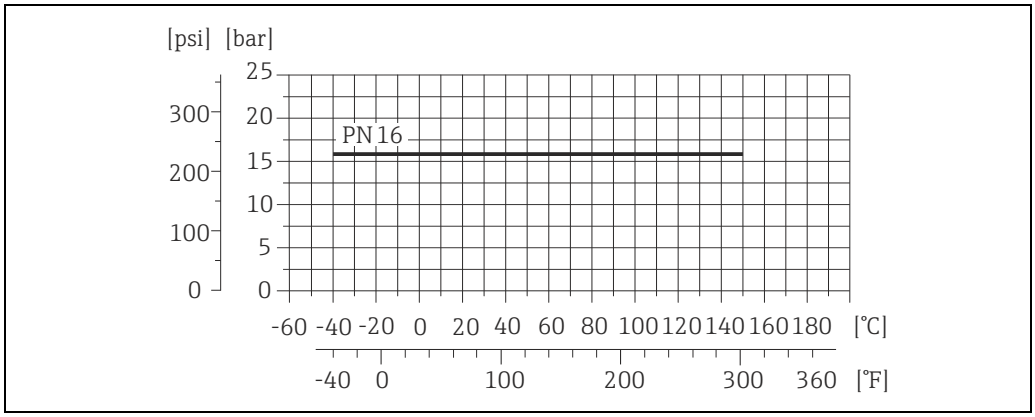
Material: 1.4404 / 316L



A0021190-EN

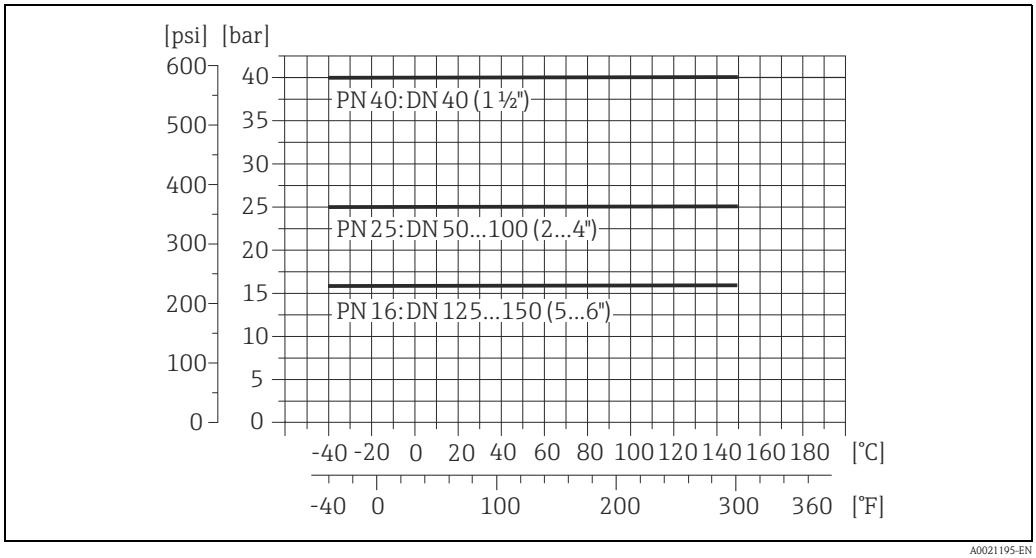
Welding nipple to EN 10357 (DIN 11850)
Coupling to SC DIN 11851

Material: 1.4404/316L



A0021190-EN

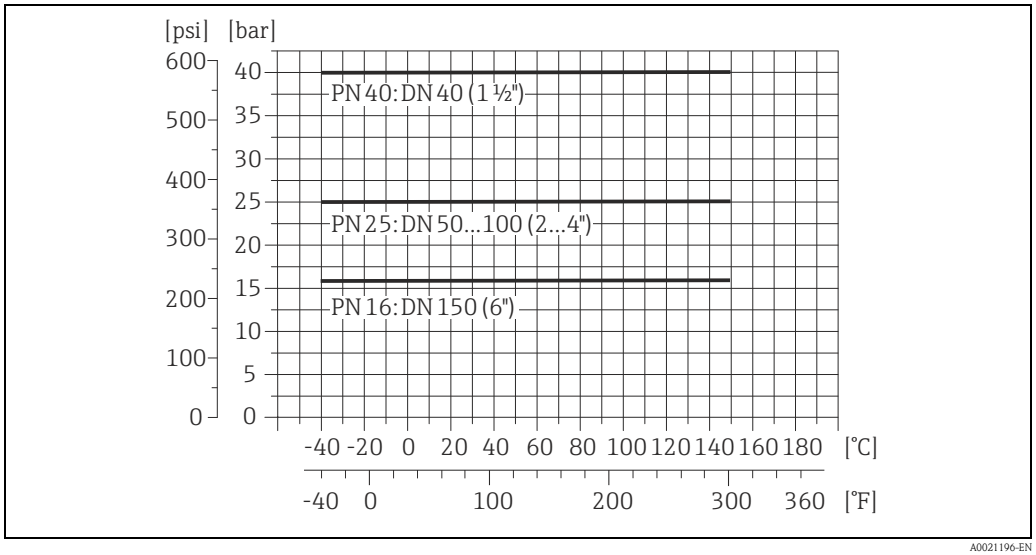
For order codes with suffixes +CA/+CB:



A0021195-EN

Welding nipple to ASME BPE

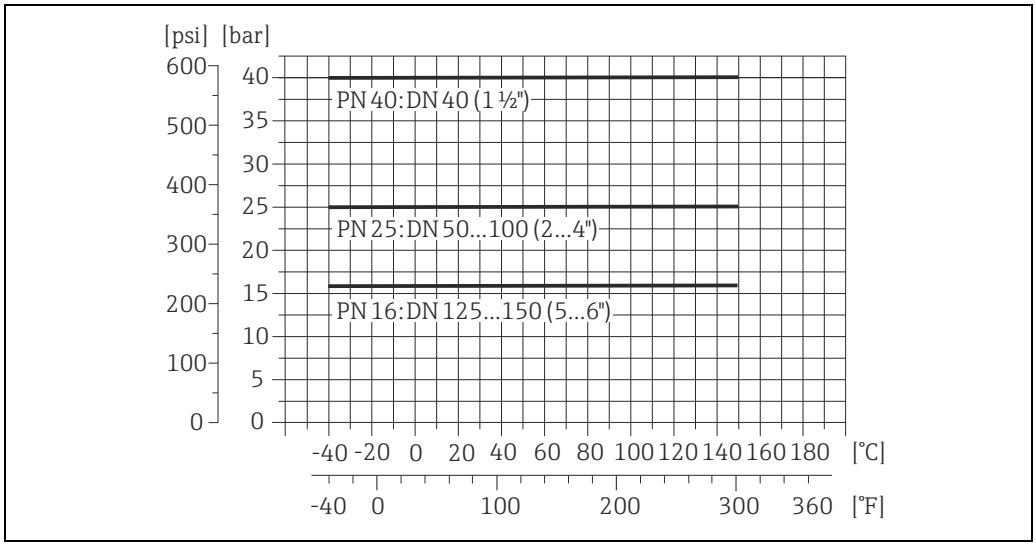
Material: 1.4404/316L



A0021196-EN

Welding nipple to ISO 2037

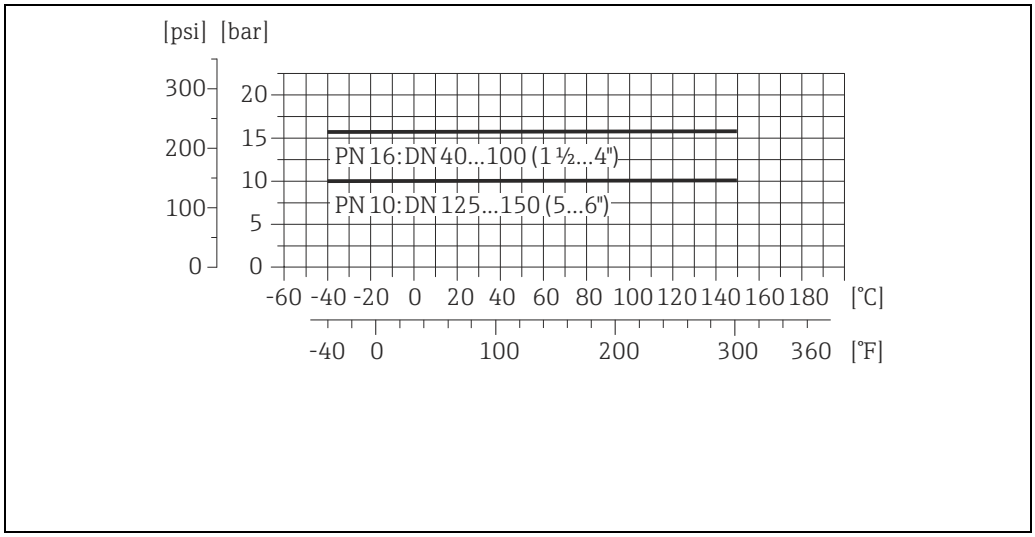
Material: 1.4404 / 316L



A0021195-EN

Clamp to ISO 2852, DIN 32676, L14 AM7

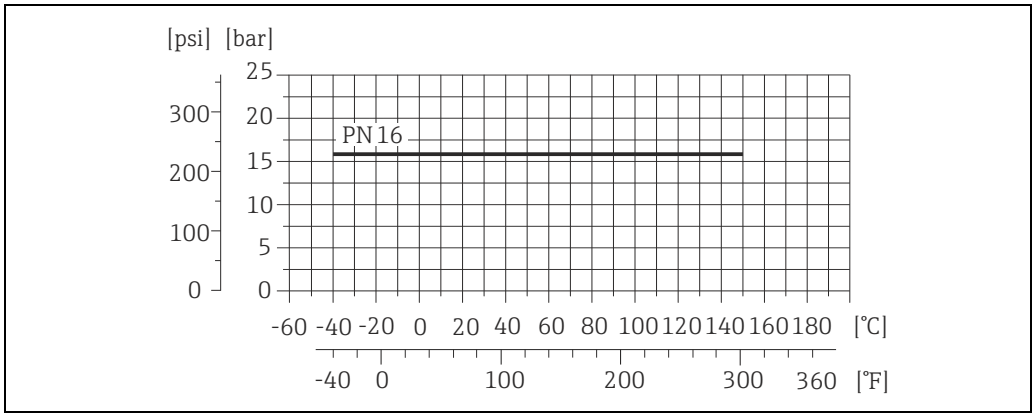
Material: 1.4404/316L



A0021197-EN

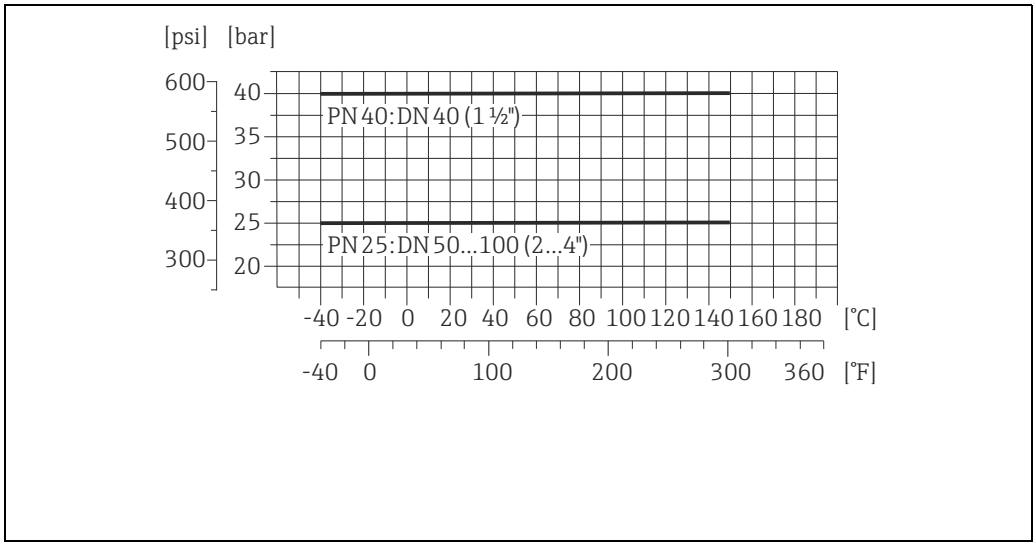
Coupling to DIN 11864-1, ISO 2853

Material: 1.4404/316L



A0021190-EN

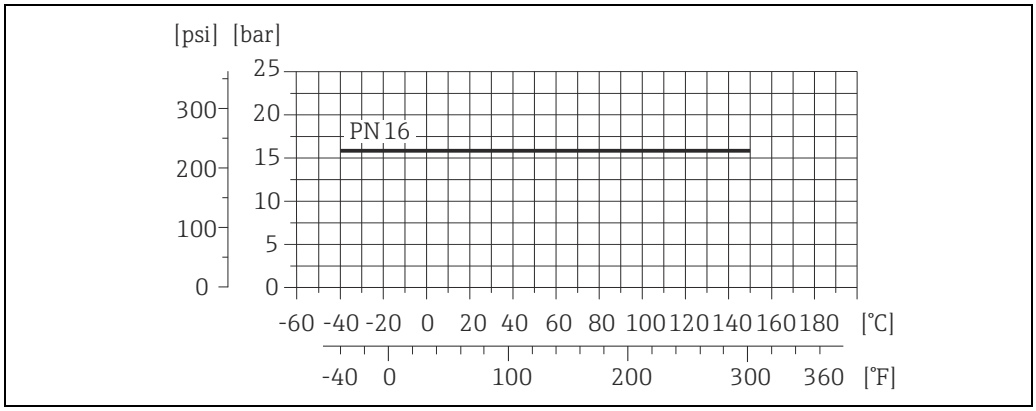
For order codes with suffixes +CA/+CB:



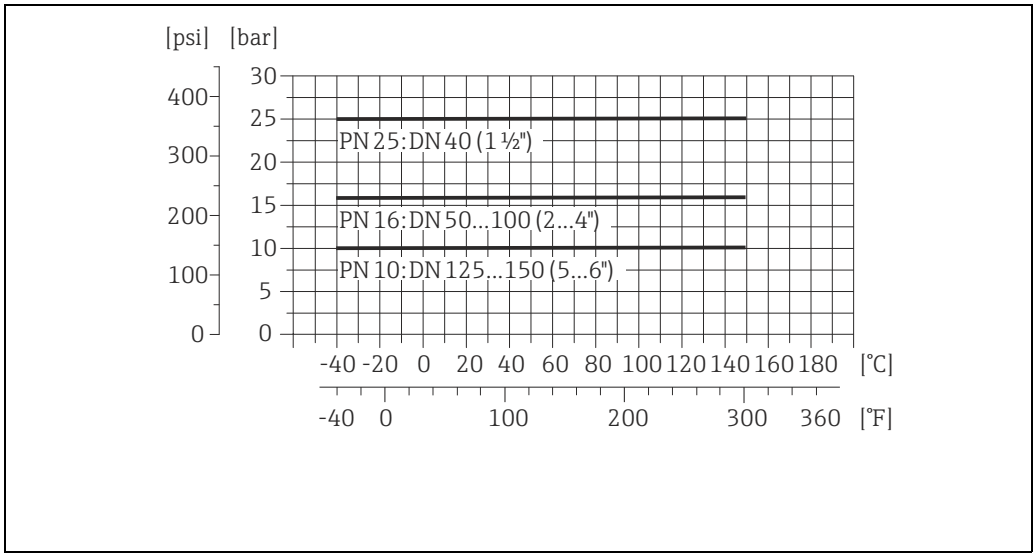
A0021194-EN

Flange connection to DIN 11864-2

Material: 1.4404/316L



For order codes with suffixes +CA/+CB:



Fitted electrodes

Measuring electrodes and empty pipe detection electrodes
- Standard with: 1.4435/316L, Alloy C-22, Tantalum, Platinum
- DN 2 to 15 (1/12 to ½"): without empty pipe detection electrode

Process connections

With O-ring:
- 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:
- 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)
- Measuring tube lining with PFA: ≤ 0.4 µm (15 µin)
- Electrodes:
  – 1.4435/316L, Alloy C-22, Tantalum, Platinum: ≤ 0.3 to 0.5 µm (12 to 20 µin)
- Process connection made of stainless steel: ≤ 0.8 µm (31 µin)

Operability

Local operation

Display elements

- 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 °C (–4 °F), the readability of the display may be impaired.

Operating elements

- Onsite operation with three optical sensor keys (−/+/E)
- Application-specific Quick Setup menus for straightforward commissioning

Language groups

Language groups available for operation in different countries:

- 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

Note!
You can change the language group via the operating program "FieldCare".

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. Endress+Hauser 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 Endress +Hauser Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.

Sanitary compatibility

- 3A approval and EHEDG–certified
- Seals → conform to FDA (apart from Kalrez seals)

Certification FOUNDATION Fieldbus

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:

- 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

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:

- 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

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

- With the identification PED/G1/III on the sensor nameplate, Endress+Hauser confirms conformity with the "Basic safety requirements" of Appendix I of the Pressure Equipment Directive 97/23/EC.
- Devices with this identification (with PED) are suitable for the following types of fluid:
  – Fluids of Group 1 and 2 with a steam pressure of greater 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

Ordering information

Detailed ordering information is available from the following sources:
- In the Product Configurator on the Endress+Hauser website: www.endress.com → Select country → Instruments → Select device → Product page function: Configure this product
- From your Endress+Hauser Sales Center: www.endress.com/worldwide

Product Configurator - the tool for individual product configuration:
- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
  Output format
- Ability to order directly in the Endress+Hauser Online Shop

Accessories

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter and the sensor. Your Endress+Hauser service organization can provide detailed information on the order codes in question.

Device-specific accessories

For the transmitter

Accessory	Description
Promag 55 transmitter	Transmitter for replacement or for stock. Use the order code to define the following specifications: – Approvals – Degree of protection / version – Cable type for the remote version – Cable entries – Display / power supply / operation – Software – Outputs / inputs
Software packages	Software add-ons on F-CHIP, can be ordered individually: – Electrode cleaning (ECC) – Advanced diagnostics – Solids content flow
Mounting kit	Mounting kit for wall-mounted housing (remote version). Suitable for: ■ Wall mounting ■ Pipe mounting ■ Panel mounting Mounting set for aluminum housings. Suitable for: ■ Pipe mounting
Cable for remote version	Coil and signal cables, various lengths. Reinforced cable on request.
Wall mounting kit	Wall mounting kit for Promag H transmitter.

For the sensor

Accessory	Description
Mounting kit	Mounting kit for Promag H, comprising: ■ 2 Process connections ■ Screws ■ Seals
Adapter connection	Adapter connections for installing Promag 55 H instead of Promag 30/33 A or Promag 30/33 H DN 25.
Ground rings:	If the process connections are made of PVC or PVDF, ground rings are necessary to ensure that potential is matched. A set comprises 2 ground rings.
Set of seals	For regular replacement of the seals of the Promag H sensor.
Welding jig	Weld nipples as process connection: Welding jig for installation in pipes.
Spacer	A spacer is required if a sensor of DN 80 to 100 is replaced in an existing installation and the new sensor is shorter.

Communication-specific accessories

Accessory	Description
HART handheld terminal Field Xpert SFX 100	Handheld terminal for remote configuration and for obtaining measured values via the HART current output (4 to 20 mA). Contact your Endress+Hauser representative for more information.
FXA195	The Commubox FXA195 connects intrinsically safe smart transmitters using the HART protocol to the USB port of a personal computer. This enables remote operation of the transmitter with operating software (e.g. FieldCare). Power is supplied to the Commubox via the USB port.

Service-specific accessories

Accessory	Description
Applicator	Software for selecting and configuring flowmeters. Applicator can be downloaded from the Internet or ordered on CD-ROM for installation on a local PC. Contact your Endress+Hauser representative for more information.
Fieldcheck	Tester/simulator for testing flowmeters in the field. When used in conjunction with the "FieldCare" software package, test results can be imported into a database, printed and used for official certification. Contact your Endress+Hauser representative for more information.
FieldCare	FieldCare is Endress+Hauser's FDT-based plant asset management tool. It can configure all smart field units in your system and helps you manage them. By using the status information, it is also a simple but effective way of checking their status and condition.
FXA193	The FXA193 service interface connects the device to the PC for operation via FieldCare.
Memograph M graphic display recorder	The Memograph M graphic display recorder provides information on all the relevant process variables: Measured values are recorded correctly, limit values are monitored and measuring points analyzed. The data are stored in the 256 MB internal memory and also on a SD card or USB stick. The ReadWin® 2000 PC software is part of the standard package and is used for configuring, visualizing and archiving the data captured.

Documentation

- Flow Measurement (FA005D)
- Technical Information
  – Promag 55S (TI00071D)
- Operating Instructions/Description of Device Functions
  – Promag 55 HART (BA00119D/BA00120D)
  – Promag 55 PROFIBUS DP/PA (BA00124D/BA00125D)
  – Promag 55 FOUNDATION Fieldbus (BA00126D/BA00127D)
- Supplementary documentation on Ex-ratings: ATEX, FM, CSA

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