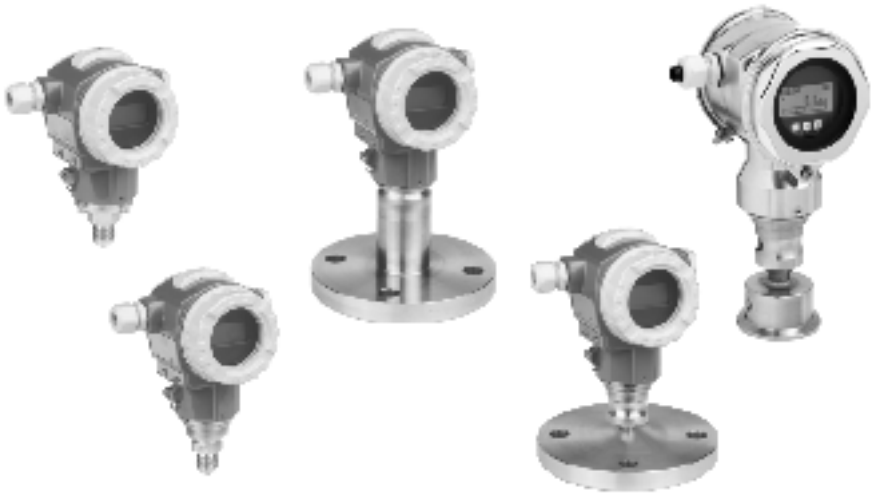
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Cerabar S PMC71, PMP71, PMP75

Pressure transmitter
with ceramic and metal sensors
Overload-resistant and function-monitored; Communication via HART, PROFIBUS PA or FOUNDATION Fieldbus



Application

The Cerabar S pressure transmitter is used for the following measuring tasks:

- Absolute pressure and gauge pressure in gases, steams or liquids in all areas of process engineering and process measurement technology
- Level, volume or mass measurement in liquids
- High process temperature
  - without diaphragm seals up to 150°C (302°F)
  - with typical diaphragm seals up to 400°C (752°F)
- High pressure up to 700 bar
- International usage thanks to a wide range of approvals

Your benefits

- Very good reproducibility and long-term stability
- High reference accuracy: up to ±0.075%, as PLATINUM version: ±0.05%
- Turn down 100:1, higher on request
- Used for process pressure monitoring up to SIL3, certified according to IEC 61508 by TÜV SÜD
- HistoROM®/M-DAT memory module
- Function-monitored from the measuring cell to the electronics
- Continuous modularity for differential pressure, hydrostatic and pressure (Deltabar S – Deltapilot S – Cerabar S), e.g.
  - replaceable display
  - universal electronic
- Quick commissioning thanks to quick setup menu
- Easy and safe menu-guided operation on-site, via 4...20 mA with HART, via PROFIBUS PA or via FOUNDATION Fieldbus
- Extensive diagnostic functions
- Device versions in conformity with ASME-BPE

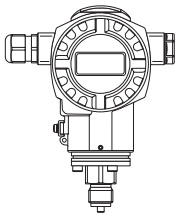
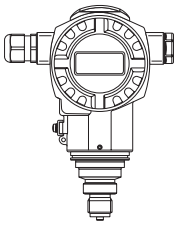
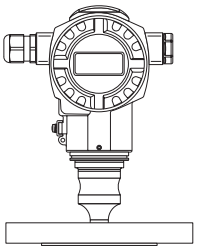
TI383P/00/en/12.07
No. 71060099

Endress+Hauser
People for Process Automation

Table of contents

Function and system design

Device selection

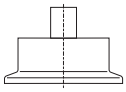
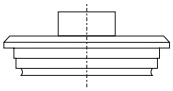
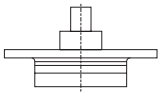
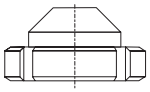
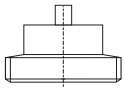
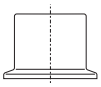
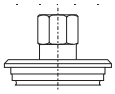
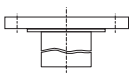
Cerabar S – Product family	**PMC71**  P01-PMC71xxx-16-xx-xx-xx-000 **With capacitive measuring cell and ceramic measuring diaphragm (Ceraphire®)**	**PMP71**  P01-PMP71xxx-16-xx-xx-xx-000 **With piezoresistive measuring cell and metallic welded diaphragm**	**PMP75**  P01-PMP75xxx-16-xx-xx-xx-000 **With diaphragm seal**
Field of application	– Gauge pressure and absolute pressure – Level	– Gauge pressure and absolute pressure – Level	– Gauge pressure and absolute pressure – Level
Process connections	– Diverse thread – DN 32 – DN 80 – ANSI 1 1/2" – 4" – JIS 50 A – 100 A	– Diverse thread – DN 25 – DN 80 – ANSI 1 1/2" – 4" – JIS 25 A – 100 A – Oval flange adapter – Prepared for diaphragm seal mount	– Wide range of diaphragm seals, → see the following section "Overview of diaphragm seal for PMP 75"
Measuring ranges	from –100/0...100 mbar to –1/0...40 bar	from –100/0...100 mbar to –1/0...700 bar	from –400/0...400 mbar to –1/0...400 bar
OPL [1]	max. 60 bar	max. 1050 bar	max. 1050 bar
Process temperature range	–25...+125°C/–20...+150°C [2] (–13...+257°F/–4...+302°F)	–40...+125°C (–40...+257°F)	-70...400°C (-94...+752°F)
Ambient temperature range	–40...+85°C (–40...+185°F)	–40...+85°C (–40...+185°F) [3]	–40...+85°C (–40...+185°F)
Ambient temperature range separate housing	–40 to +60°C (–40 to +140°F)		
Reference accuracy	– Up to ±0.075% of the set span – PLATINUM version: up to ±0.05% of the set span		Up to ±0.075% of the set span
Supply voltage	– For non-hazardous areas: 10.5...45 V DC – EEx ia: 10.5...30 V DC		
Output	4...20 mA with superimposed HART protocol, PROFIBUS PA, FOUNDATION Fieldbus		
Options	– PMP71, PMP75: Gold-Rhodium-coated diaphragm – PMP71, PMP75: NACE-compliant materials – PMC71, PMP71, PMP75: inspection certificate 3.1 – HistoROM®/M-DAT memory module		
Specialities	– Metal-free measurement with PVDF connection – Cleaning of the transmitter for the use in paint shops	– Oil volume-minimised process connections – gas-tight, elastomer-free	– Wide range of diaphragm seals – For high media temperatures – Oil volume-minimised process connections – Completely welded versions

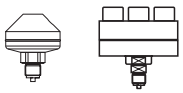
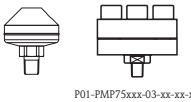
1) OPL = Over pressure limit; dependent on the lowest-rated element, with regard to pressure, of the selected components

2) High temperature version "T" for feature 100 "Additional option 1" or for feature 110 "Additional option 2"

3) lower temperature on request

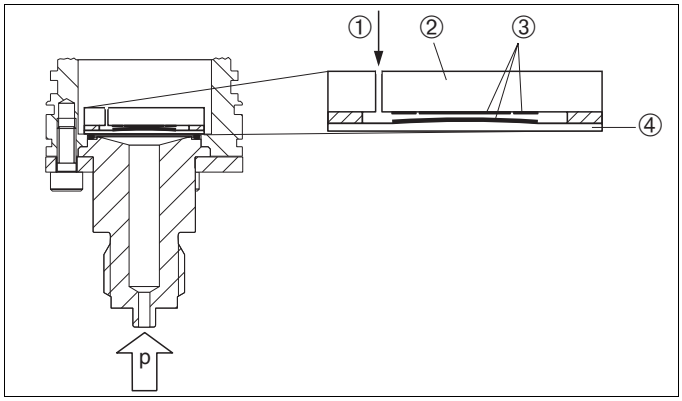
Overview of diaphragm seal for PMP75

Design	Diaphr. seal	Connection	Version	Standard	Nominal diameter	Nom. press./Class
Thread	Membrane diaphragm seal (MDM)	G	 P01-PMP75xxx-03-xx-xx-xx-005	ISO 228	– G 1A – G 1 1/2 A – G 2A	700 bar
		NPT	 P01-PMP75xxx-03-xx-xx-xx-006	ANSI	– 1 MNPT – 1 1/2 MNPT – 2 MNPT	700 bar
Tri-Clamp	Membrane diaphragm seal (MDM)	Clamp	 P01-FMD78xxx-03-xx-xx-xx-005	ISO 2852	– DN 25 (1") – DN 38 (1 1/2") – DN 51 (2") – DN 76.1 (3")	Dependent on the clamp used
	Pipe diaphragm seal (RDM)	Clamp	 P01-FMD78xxx-03-xx-xx-xx-009	ISO 2852	– DN 25 (1") – DN 38 (1 1/2") – DN 51 (2")	Dependent on the clamp used
Hygienic connections	Membrane diaphragm seal (MDM)	Varivent (EHEDG and 3A approval)	 P01-FMD78xxx-03-xx-xx-xx-007		Type N for pipes DN 40 – DN 162	PN 40
		DRD	 P01-FMD78xxx-03-xx-xx-xx-006		DN50 (65 mm)	PN 25
		Taper adapter with coupling nut	 P01-FMD78xxx-03-xx-xx-xx-003	DIN 11851	– DN 50 – DN 65 – DN 80	PN 25
		Threaded adapter	 P01-FMD78xxx-03-xx-xx-xx-004	DIN 11851	– DN 50 – DN 65 – DN 80	PN 25
Versions in conformity with ASME-BPE for use in biotechnical processes; wetted surfaces $R_a \leq 0.4$ µm (15.75 µin; 180 grit), electropolished	Membrane diaphragm seal (MDM)	Clamp	 P01-PMP46xxx-03-xx-xx-xx-005	ISO 2852	– DN 25 (1 1/2") – DN 51 (2")	Dependent on the clamp used
		Varivent (EHEDG and 3A approval)	 P01-PMP46xxx-03-xx-xx-xx-004		– Type N for pipes DN 40 – DN 162	PN 40
Flange	Membrane diaphragm seal (MDM)	EN/DIN flange	 P01-PMP75xxx-03-xx-xx-xx-001	EN 1092-1/ DIN 2527 and DIN 2501-1	– DN 25, DN 50 – DN 32, DN 40 – DN 80 – DN 100	– up to PN 400 – PN 40 – up to PN 100 – PN 100
		ANSI flange		ANSI B 16.5	– 1", 2" – 1 1/2", 3", 4"	– 2500 lbs – 300 lbs
		JIS flange		B 2220	25A, 50A, 80A, 100A	10 K
Flange with extended diaphragm seal	Membrane diaphragm seal (MDM)	EN/DIN flange	 P01-PMP75xxx-03-xx-xx-xx-002	EN 1092-1/ DIN 2527	DN 50/DN 80 + 50/100/200 mm ext. diaphr. seal	PN 10 – PN 40
		ANSI flange		ANSI B 16.5	2"/3"/4" + 2"/4"/6"/ 8" ext. diaphr. seal	Up to 300 lbs

Design	Diaphr. seal	Connection	Version	Standard	Nominal diameter	Nom. press./Class
Threaded connection with separator	Membrane diaphragm seal (MDM)	G	 P01-PMP75xxx-03-xx-xx-xx-004	ISO 228/ EN837	– G 1/2 A – G 1/2 B	– 160 bar – 400 bar
		NPT	 P01-PMP75xxx-03-xx-xx-xx-008	ANSI	– 1/2 MNPT	– 160 bar – 400 bar
		NPT Off line thread	 P01-PMP75xxx-03-xx-xx-xx-009	ANSI	– 1/2 FNPT – 1 FNPT	250 bar

Measuring principle

Ceramic measuring diaphragm used for PMC71 (Ceraphire®)

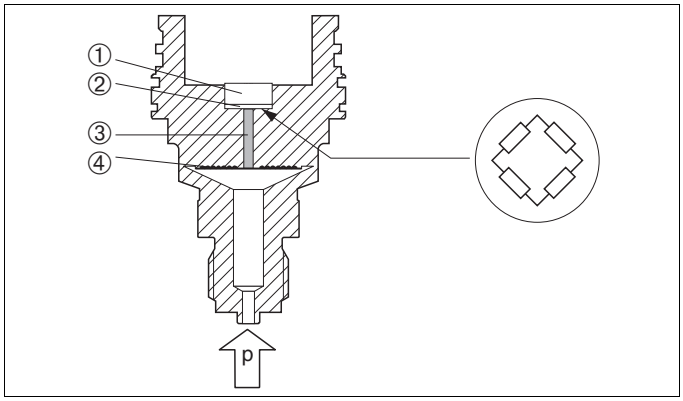


P01-PMC71xxx-03-xx-xx-xx-000

Ceramic sensor

1 Atmospheric vent (gauge pressure only)
2 Ceramic substrate
3 Electrodes
4 Ceramic diaphragm

Metallic measuring diaphragm used for PMP71 and PMP75



P01-PMP7xxxx-03-xx-xx-xx-000

Metal sensor

1 Measuring element
2 Measuring diaphragm with Wheatstone bridge
3 Channel with fill fluid
4 Process diaphragm, Metal separating diaphragm

Ceramic measuring diaphragm used for PMC71 (Ceraphire®)

The ceramic sensor is a dry sensor, i.e. the process pressure acts directly on the robust ceramic diaphragm and deflects it. A pressure-dependent change in capacitance is measured at the electrodes of the ceramic carrier and the diaphragm. The measuring range is determined by the thickness of the ceramic diaphragm.

Advantages:
- Guaranteed overload resistance up to 40 times the nominal pressure
- Thanks to highly-pure 99.9% ceramic (Ceraphire®, see also "www.endress.com/ceraphire")
  - extremely high chemical resistance compared to Alloy
  - less relaxation
  - high mechanical stability
- Suitable for vacuums
- Second process barrier (Secondary Containment) for enhanced integrity
- Process temperature up to 150°C (302°F)

Metallic measuring diaphragm used for PMP71 and PMP75

PMP71

The operating pressure deflects the separating diaphragm and a fill fluid transfers the pressure to a resistance measuring bridge (semi-conductor technology). The pressure-dependent change of the bridge output voltage is measured and evaluated.

Advantages:
- Can be used with process pressures up to 700 bar
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Second process barrier (Secondary Containment) for enhanced integrity
- Significantly less thermal effect compared to diaphragm seal systems

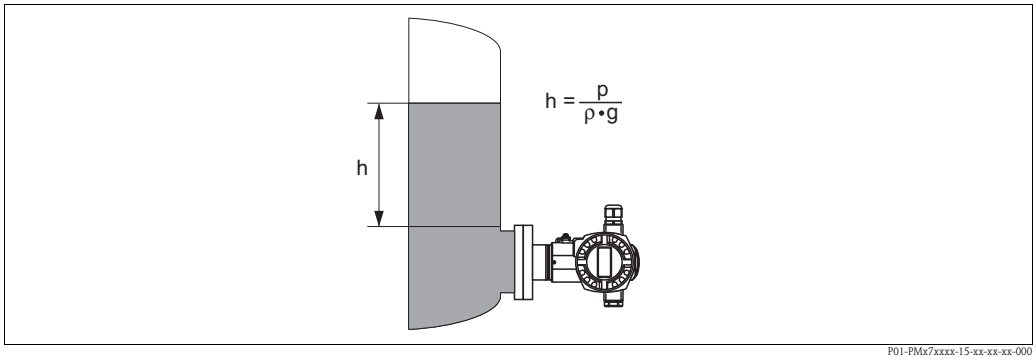
PMP75

The operating pressure acts on the diaphragm of the diaphragm seal and is transferred to the separating diaphragm of the sensor by a diaphragm seal fill fluid. The separating diaphragm is deflected and a fill fluid transfers the pressure to a resistance measuring bridge. The pressure-dependent change of the bridge output voltage is measured and evaluated.

Advantages:
- Can be used with process pressures up to 400 bar
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Second process barrier (Secondary Containment) for enhanced integrity

Level measurement (level, volume and mass)

Design and operation mode



Level measurement with Cerabar S

h *Height (level)*
p *Pressure*
ρ *Density of the medium*
g *Gravitation constant*

Your benefits

- Choice of three level operating modes in the device software
- Volume and mass measurements in any tank shapes by means of a freely programmable characteristic curve
- Choice of diverse level units with automatic unit conversion
- A customised unit can be specified
- Has a wide range of uses, as well
  - in the event of foam formation
  - in tanks with agitators of screen fittings
  - in the event of liquid gases

Communication protocol

- 4...20 mA with HART communication protocol
- PROFIBUS PA
  - The Endress+Hauser devices meet the requirements as per the FISCO model.
  - Due to the low current consumption of 11 mA ± 1 mA
    - up to 9 Cerabar S for EEx ia, CSA IS and FM IS applications
    - up to 32 Cerabar S for all other applications, e.g. in non-hazardous areas, EEx nA, etc.

    can be operated at one bus segment with installation as per FISCO.

  Further information on PROFIBUS PA, such as requirements for bus system components, can be found in the Operating Instructions BA034S "PROFIBUS DP/PA: Guidelines for planning and commissioning" and in the PNO guideline.
- FOUNDATION Fieldbus
  - The Endress+Hauser devices meet the requirements as per the FISCO model.
  - Due to the low current consumption of 14 mA ± 1 mA
    - up to 7 Cerabar S for EEx ia, CSA IS and FM IS applications
    - up to 30 Cerabar S for all other applications, e.g. in non-hazardous areas, EEx nA, etc.

    can be operated at one bus segment with installation as per FISCO.

  Further information on FOUNDATION Fieldbus, such as requirements for bus system components can be found in the Operating Instructions BA013S "FOUNDATION Fieldbus Overview".

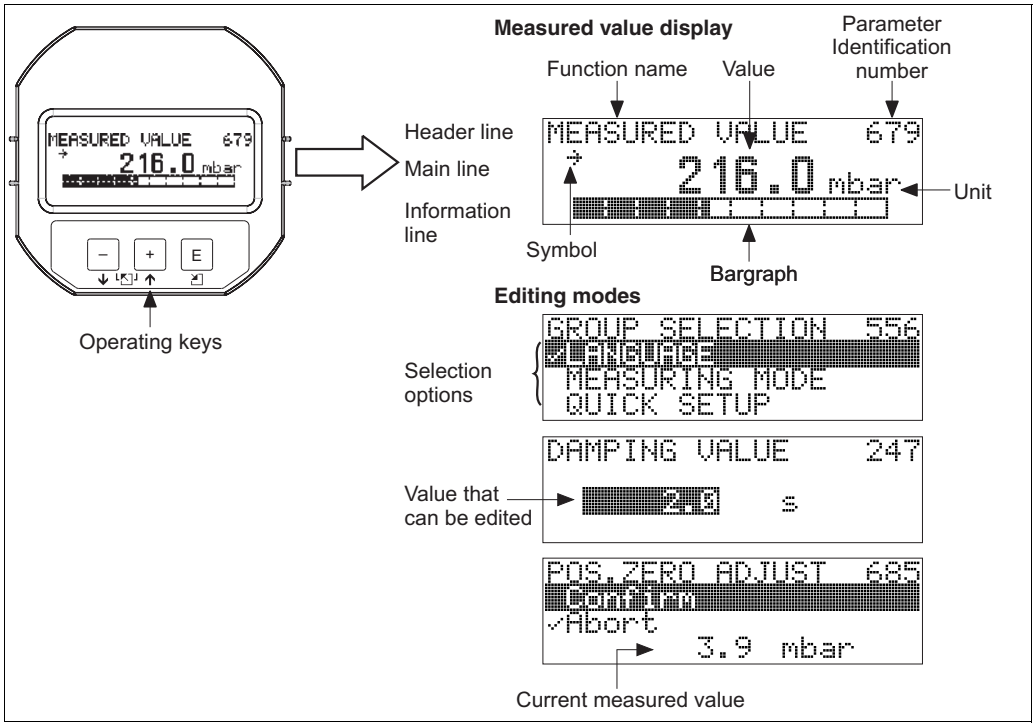
Human interface

On-site display (optional)

A 4-line liquid crystal display (LCD) is used for display and operation. The on-site display shows measured values, dialog text as well as fault and notice messages in plain text, thereby supporting the user in every stage of operation.

4...20 mA HART and PROFIBUS PA

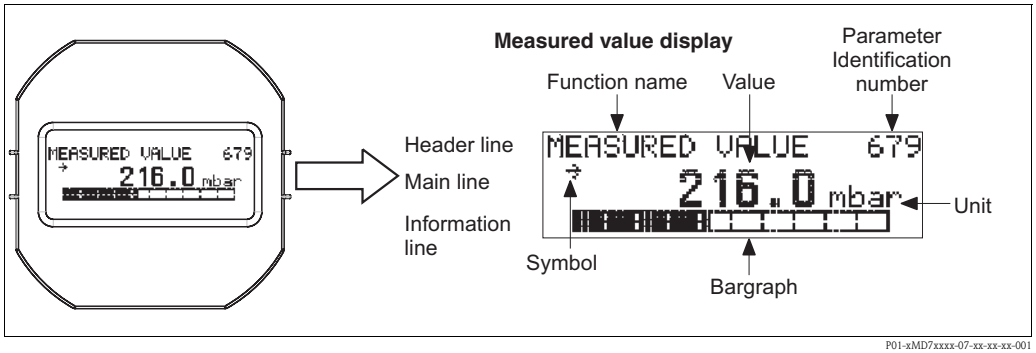
Functions:
- 8-digit measured value display including sign and decimal point, bar graph for 4 to 20 mA HART as current display or for PROFIBUS PA as graphical display of the scaled value of the AI Block
- Simple and complete menu guidance thanks to separation of the parameters into three levels
- Each parameter is given a 3-digit ID number for easy navigation.
- Option for configuring the display according to individual requirements and desires, such as language, alternating display, display of other measured values such as sensor temperature, contrast setting
- Comprehensive diagnostic functions (fault and warning message, peak-hold indicators, etc.)
- Rapid and safe commissioning with the Quick Setup menu



P01-xxxxxxxx-07-xx-xx-en-011

FOUNDATION Fieldbus

Functions:
- 8-digit measured value display including sign and decimal point, bargraph for current display
- Option for configuring the display according to individual requirements and desires, such as language, alternating display, display of other measured values such as sensor temperature, contrast setting
- Comprehensive diagnostic functions (fault and warning message)

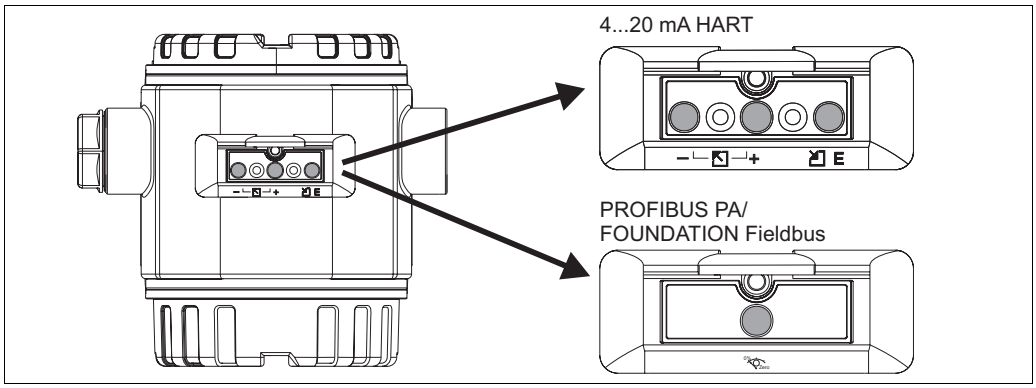


P01-xMD7xxxx-07-xx-xx-xx-001

Operating elements

With regard to T14 housings, the operating keys are located either outside the device under the protection cap or inside on the electronic insert. In T17 housings, the operating keys are always located inside on the electronic insert.
In addition, devices with an on-site display and a 4 to 20 mA HART or PROFIBUS PA electronic insert have operating keys on the on-site display.

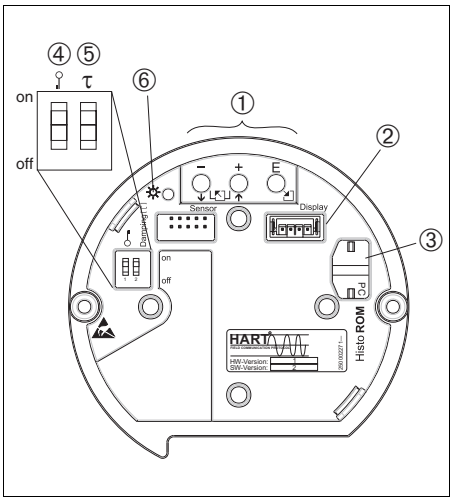
Operating keys on the exterior of the device



P01-PMx7xxxx-19-xx-xx-xx-038

The operating keys located externally on the device work on the Hall sensor principle. As a result, no additional openings are required in the device. This guarantees:
- Complete protection against environmental influences such as moisture and contamination
- Simple operation without any tools
- No wear.

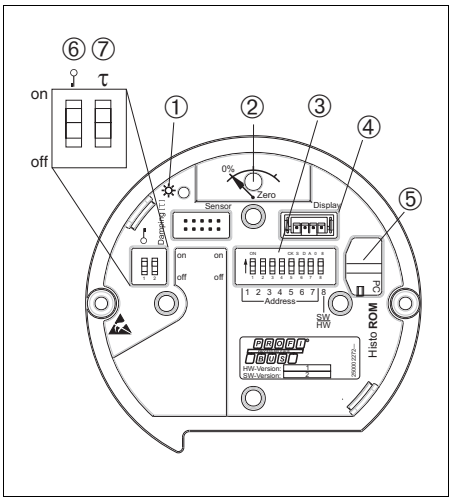
Operating keys and elements located internally on the electronic insert



P01-xxxxxxxx-19-xx-xx-xx-104

Electronic insert HART

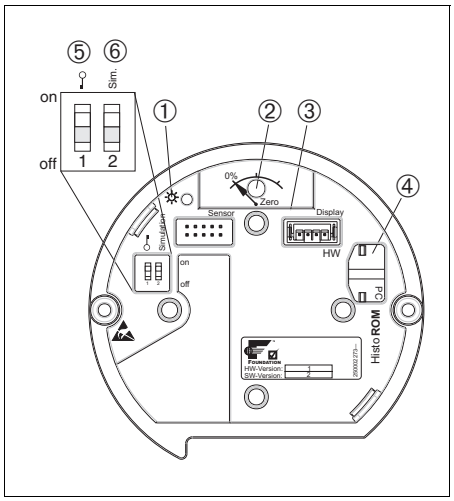
1 Operating keys
2 Slot for optional display
3 Slot for optional HistoROM®/M-DAT
4 DIP-switch for locking/unlocking measured-value-relevant parameters
5 DIP-switch for damping on/off
6 Green LED to indicate value being accepted



P01-xxxxxxxx-19-xx-xx-xx-105

Electronic insert PROFIBUS PA

1 Green LED to indicate value being accepted
2 Key for position calibration and device reset
3 DIP-switch for bus address
4 Slot for optional display
5 Slot for optional HistoROM®/M-DAT
6 DIP-switch for locking/unlocking measured-value-relevant parameters
7 DIP-switch for damping on/off



P01-xxxxxxxx-19-xx-xx-xx-106

Electronic insert FOUNDATION Fieldbus

1 Green LED to indicate value being accepted
2 Key for position calibration
3 Slot for optional display
4 Slot for optional HistoROM®/M-DAT
5 DIP-switch for locking/unlocking measured-value-relevant parameters
6 DIP-switch for simulation mode on/off

HistoROM®/M-DAT (optional)

HistoROM®/M-DAT is a memory module, which is attached to the electronic insert. The HistoROM®/M-DAT can be retrofitted at any stage (Order number: 52027785).

Your benefits

- Quick and safe commissioning of the same measuring points by copying the configuration data of one transmitter to another transmitter
- Reliable process monitoring thanks to cyclical recording of pressure and sensor temperature measured values
- Simple diagnosis by recording diverse events such as alarms, configuration changes, counters for measuring range undershoot and overshoot for pressure and temperature as well as user limit overshoot and undershoot for pressure and temperature etc.
- Analysis and graphic evaluation of the events and process parameters via software (contained in scope of supply).

HistoROM®/M-DAT can be ordered via feature 100 "Additional options 1" or feature 110 "Additional options 2" or as spare parts. → See also page 77 ff. A CD with an Endress+Hauser operating program is also included in the scope of delivery.

You can copy data from one transmitter to another transmitter when operating a FOUNDATION Fieldbus device via an FF configuration program. You need the Endress+Hauser ToF Tool operating program and the Commubox FXA291 service interface and the ToF Adapter FXA291 to be able to access the data and events saved in the HistoROM®/M-DAT.

Functional Safety SIL/ IEC 61508 Declaration of conformity (optional)

The Cerabar S pressure transmitters with 4...20 mA output signal have been developed to IEC 61508 standard and have been certified by TÜV SÜD. These devices can be used for process pressure monitoring up to SIL3.
→ For a detailed description of the safety functions with Cerabar S, settings and characteristic quantities for functional safety, please refer to the "Functional Safety Manual - Cerabar S" SD190P.
→ For devices with SIL2/IEC 61508 declaration of conformity, see page 80 ff, Feature 100 "Additional option 1" and Feature 110 "Additional option 2", version E "SIL2/IEC 61508, Declaration of Conformity".

On-site operation

Functions 4...20 mA HART and PROFIBUS PA

- With on-site display: navigate through the operating menu using three operating keys
- Without on-site display:
  - Position calibration (zero point correction)
  - Setting lower-range value and upper-range value – reference pressure present at device (HART only)
  - Value acceptance indicated by green LED
- Device reset
- Locking and unlocking measured-value-relevant parameters
- Switching damping on and off
- Setting bus address (PROFIBUS PA only)

Functions FOUNDATION Fieldbus

- Position calibration (zero point correction)
- Value acceptance indicated by green LED
- Locking and unlocking measured-value-relevant parameters
- Switching simulation mode on and off

Handheld terminals – HART

With a handheld terminal, all the parameters can be configured anywhere along the 4...20 mA line via menu operation.

Handheld terminal DXR375 – FOUNDATION Fieldbus

With a handheld terminal DXR375, all the parameters can be configured via menu operation.

FieldCare

FieldCare is an Endress+Hauser asset management tool based on FDT technology. With FieldCare, you can configure all Endress+Hauser devices as well as devices from other manufacturers that support the FDT standard. The following operating systems are supported: WinNT4.0, Win2000 and Windows XP.

FieldCare supports the following functions:
- Configuration of transmitters in offline and online operation
- Loading and saving device data (upload/download)
- HistoROM®/M-DAT analysis
- Documentation of the measuring point

Connection options:
- HART via Commubox FXA191 and the RS 232 C serial interface of a computer
- HART via Commubox FXA195 and the USB port on a computer
- PROFIBUS PA via segment coupler and PROFIBUS interface card
- Service interface with adapter Commubox FXA291 and ToF Adapter FXA291 (USB).

Remote operation – FOUNDATION Fieldbus

An FF configuration program is required to integrate a device with "FOUNDATION Fieldbus signal" into an FF network or to set the FF-specific parameters. Please contact your local Endress+Hauser Sales Center for more information.

Commubox FXA291

The Commubox FXA291 connects Endress+Hauser field instruments with CDI interface (= Endress+Hauser Common Data Interface) to the USB interface of a personal computer or a notebook. For details refer to TI405C/07/en.

Note!
For the following Endress+Hauser instruments you need the "ToF Adapter FXA291" as an additional accessory:

- Cerabar S PMC71, PMP7x
- Deltabar S PMD7x, FMD7x
- Deltapilot S FMB70

ToF Adapter FXA291

The ToF Adapter FXA291 connects the Commubox FXA291 via the USB interface of a personal computer or a notebook. For details refer to KA271F/00/a2.

Input

Measured variable

Absolute pressure and gauge pressure, from which level (level, volume or mass) is derived

Measuring range

PMC71 – with ceramic measuring diaphragm (Ceraphire®) for gauge pressure

Nominal value	Measurement limit		Smallest calibratable Span [4]	MWP [1]	OPL [2]	Vacuum resistance	Versions in the order code [3]
	lower (LRL) [bar]	upper (URL) [bar]	[bar]	[bar]	[bar]	[bar_{abs}]	
100 mbar	–0.1	+0.1	0.005	2.7	4	0.7	1C
250 mbar	–0.25	+0.25	0.005	3.3	5	0.5	1E
400 mbar	–0.4	+0.4	0.005	5.3	8	0	1F
1 bar	–1	+1	0.01	6.7	10	0	1H
2 bar	–1	+2	0.02	12	18	0	1K
4 bar	–1	+4	0.04	16.7	25	0	1M
10 bar	–1	+10	0.1	26.7	40	0	1P
40 bar	–1	+40	0.4	40	60	0	1S

PMC71 – with ceramic measuring diaphragm (Ceraphire®) for absolute pressure

Nominal value	Measurement limit		Smallest calibratable Span [4]	MWP [1]	OPL [2]	Versions in the order code [3]
	lower (LRL) [bar_{abs}]	upper (URL) [bar_{abs}]	[bar]	[bar_{abs}]	[bar_{abs}]	
100 mbar	0	+0.1	0.005	2,7	4	2C
250 mbar	0	+0.25	0.005	3,3	5	2E
400 mbar	0	+0.4	0.005	5,3	8	2F
1 bar	0	+1	0.01	6.7	10	2H
2 bar	0	+2	0.02	12	18	2K
4 bar	0	+4	0.04	16.7	25	2M
10 bar	0	+10	0.1	26.7	40	2P
40 bar	0	+40	0.4	40	60	2S

1) The MWP (maximum working pressure) for the measuring device depends on the weakest element of the components selected with regard to pressure, i.e. the process connection (→ see page 37 ff) has to taken into consideration in addition to the sensor (→ see Table above). Pay attention to the pressure-temperature dependence also. For the appropriate standards and further information, see page 36, "Pressure specification".
2) OPL: Over Pressure Limit; depends on the weakest link in terms of pressure of the selected components.
3) Versions in the order code → See also page 78 ff, feature 40 "Sensor range; Sensor overload limit (= OPL)"
4) Turn down > 100:1 on request or can be set at the device

PMP71 and PMP75 – with metallic measuring diaphragm for gauge pressure

Nominal value	Measurement limits		Smallest calibratable Span [5]	MWP [1]	OPL [2]	Vacuum resistance [3]	Versions in the order code [4]
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar]	[bar]	[bar]	[bar_{rel}]	[bar_{rel}]	[bar_{abs}]	
100 mbar [6]	–0.1	+0.1	0.005	2.7	4	0.01/0.04	1C
250 mbar [6]	–0.25	+0.25	0.005	2.7	4	0.01/0.04	1E
400 mbar	–0.4	+0.4	0.005	4	6	0.01/0.04	1F
1 bar	–1	+1	0.01	6.7	10	0.01/0.04	1H
2 bar	–1	+2	0.02	13.3	20	0.01/0.04	1K
4 bar	–1	+4	0.04	18.7	28	0.01/0.04	1M
10 bar	–1	+10	0.1	26.7	40	0.01/0.04	1P
40 bar	–1	+40	0.4	100	160	0.01/0.04	1S
100 bar	–1	+100	1.0	100	400	0.01/0.04	1U
400 bar	–1	+400	4.0	400	600	0.01/0.04	1W
700 bar [6]	–1	+700	7.0	700	1050	0.01/0.04	1X

PMP71 and PMP75 – with metallic measuring diaphragm for absolute pressure

Nominal value	Measurement limits		Smallest calibratable Span [5]	MWP [1]	OPL [2]	Vacuum resistance [3]	Versions in the order code [4]
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar_{abs}]	[bar_{abs}]	[bar]	[bar_{abs}]	[bar_{abs}]	[bar_{abs}]	
100 mbar [6]	0	+0.1	0.005	2.7	4	0.01/0.04	2C
250 mbar [6]	0	+0.25	0.005	2.7	4	0.01/0.04	2E
400 mbar	0	+0.4	0.005	4	6	0.01/0.04	2F
1 bar	0	+1	0.01	6.7	10	0.01/0.04	2H
2 bar	0	+2	0.02	13.3	20	0.01/0.04	2K
4 bar	0	+4	0.04	18.7	28	0.01/0.04	2M
10 bar	0	+10	0.1	26.7	40	0.01/0.04	2P
40 bar	0	+40	0.4	100	160	0.01/0.04	2S
100 bar	0	+100	1.0	100	400	0.01/0.04	2U
400 bar	0	+400	4.0	400	600	0.01/0.04	2W
700 bar [6]	0	+700	7.0	700	1050	0.01/0.04	2X

1) The MWP (maximum working pressure) for the measuring device depends on the weakest element of the components selected with regard to pressure, i.e. the process connection (→ see page 37 ff) has to taken into consideration in addition to the sensor (→ see Table above). Pay attention to the pressure-temperature dependence also. Pay attention to the pressure-temperature dependence also. For the appropriate standards and further information, see Page 36, "Pressure specification".
2) OPL: Over pressure limit (= Sensor overload limit)
3) The vacuum resistance applies to the measuring cell at a reference conditions. The pressure and temperature application limits of the selected filling oil must also be observed for the PMP75. → See also page 69, section "Diaphragm seal filling oils".
4) Versions in the order code → See also page 77 ff, feature 40 "Sensor range; Sensor Overload limit (= OPL)"
5) Turn down > 100:1 on request or can be set at the device
6) PMP71 only, PMP75 on request

Explanation of terms

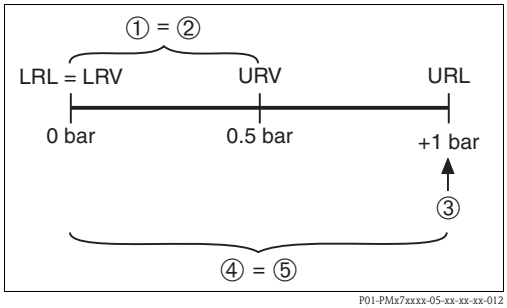
Explanation of terms: Turn down (TD), set span and on zero based span

Case 1:
- |Lower range value (LRV)| ≤ |Upper range value (URV)|

Example:
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / |URV| = 2:1

set span:
- URV – LRV = 0.5 bar
  This span is based on the zero point.



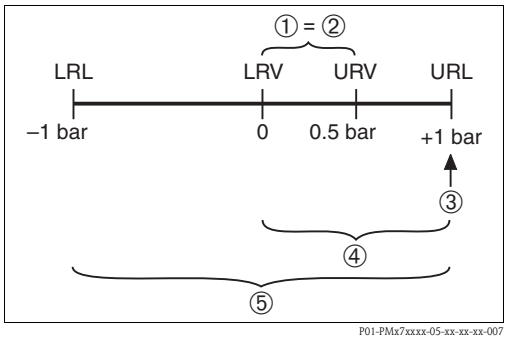
Example: 1 bar measuring cell

Case 2:
- |Lower range value (LRV)| ≤ |Upper range value (URV)|

Example:
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / |URV| = 2:1

set span:
- URV – LRV = 0.5 bar
  This span is based on the zero point.



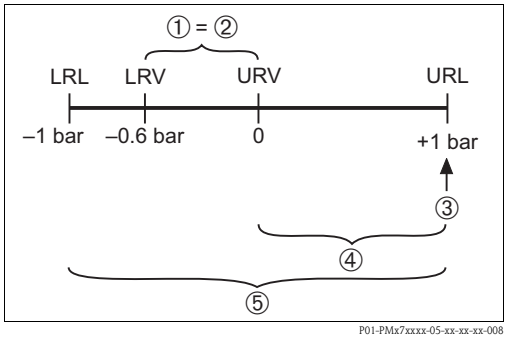
Example: 1 bar measuring cell

Case 3:
- |Lower range value| ≥ |Upper range value|

Example:
- Lower range value (LRV) = –0.6 bar
- Upper range value (URV) = 0 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / |LRV| = 1,67:1

set span:
- URV – LRV = 0.6 bar
  This span is based on the zero point.



Example: 1 bar measuring cell

1 Set span
2 Zero based span
3 Nominal value ≙ Upper range limit (URL)
4 Nominal measuring range
5 Sensor measuring range
LRL Lower range limit
URL Upper range limit
LRV Lower range value
URV Upper range value

Output

Output signal

- 4...20 mA with superimposed digital communication protocol HART 5.0, 2-wire
- Digital communication signal PROFIBUS PA (Profile 3.0), 2-wire
- Digital communication signal FOUNDATION Fieldbus, 2-wire

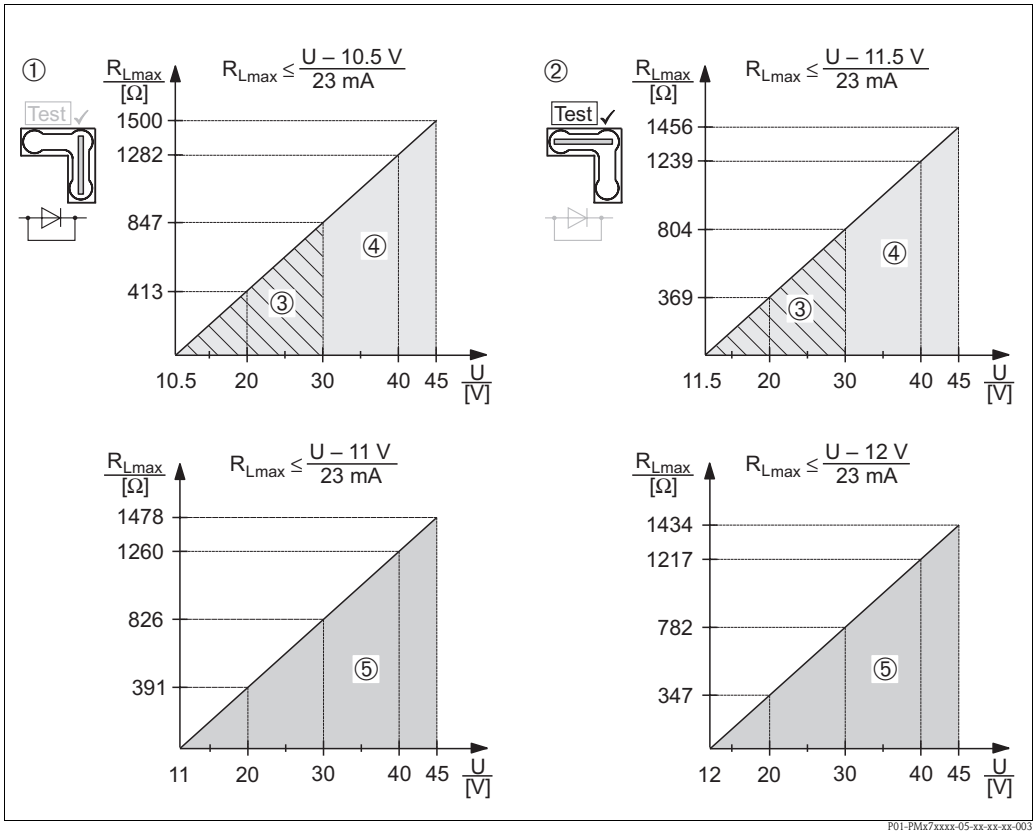
Signal range – 4...20 mA HART

3.8 mA to 20.5 mA

Signal on alarm

- 4...20 mA HART
  Options:
  – Max. alarm*: can be set from 21...23 mA
  – Keep measured value: last measured value is kept
  – Min. alarm: 3.6 mA
  * Factory setting: 22 mA
- PROFIBUS PA: can be set in the Analog Input block,
  options: Last Valid Out Value, Fsafe Value (factory setting), Status bad
- FOUNDATION Fieldbus: can be set,
  options: Last good Value, Fail Safe Value (factory setting), Wrong Value

Load – 4...20 mA HART



Load diagram, observe the position of the jumper and the explosion protection. (→ See also page 22, section "Taking 4...20 mA test signal" .)

1 Jumper for the 4...20 mA test signal inserted in "Non-test" position
2 Jumper for the 4...20 mA test signal inserted in "Test" position
3 Supply voltage 10.5 (11.5)...30 V DC for 1/2 G, 1 GD, 1/2 GD, FM IS, CSA IS, IECEx ia, NEPSI Ex ia
4 Supply voltage10.5 (11.5)...45 V DC for devices for non-hazardous areas, 1/2 D, 1/3 D, 2 G EEx d, 3 G EEx nA, FM XP, FM DIP, FM NI, CSA XP, CSA Dust-Ex, NEPSI Ex d
5 Supply voltage 11 (12)...45 V DC for PMC71, EEx d[ia], NEPSI Ex d[ia]
R_{Lmax} Maximum load resistance
U Supply voltage

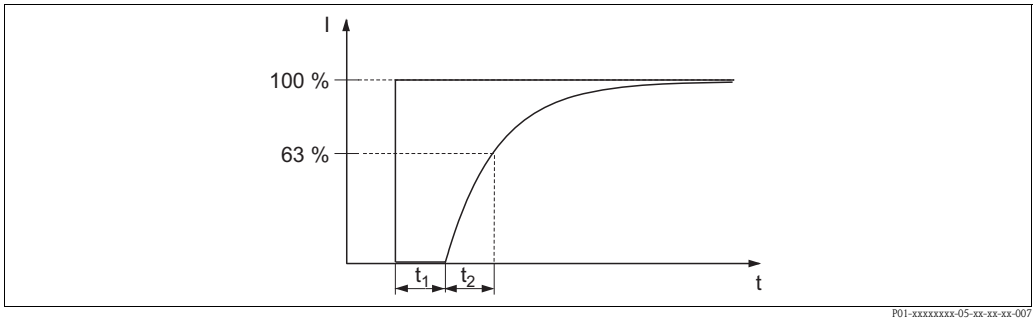
Note!
When operating via a handheld terminal or via PC with an operating program, a minimum communication resistance of 250 Ω must exist within the loop.

Resolution

- Current output: 1 μA
- Display: can be set (setting at the factory: presentation of the maximum accuracy of the transmitter)

Dynamic behavior current output

Dead time, Time constant (T63)



Presentation of the dead time and the time constant

Type	Dead time t_1	Time constant (T63), t_2
PMC71	90 ms	120 ms
PMP71	45 ms	■ 100 mbar, 250 mbar, 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Dynamic behavior HART

Dead time, Time constant (T63)

A typical cyclic parametrization for the PLC of 20 values per second results in the following total dead time:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	90 ms	120 ms
PMP71	45 ms	■ 100 mbar, 250 mbar, 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Reading cycle

- HART commands: on average 3 to 4 per second

Cycle time (Update time)

On average 250...330 ms.

Response time

≤ 250 ms

Dynamic behavior PROFIBUS PA

Dead time, Time constant (T63)

A typical cyclic parametrization for the PLC of 20 values per second results in the following total dead time:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	340 ms	120 ms
PMP71	295 ms	■ 100 mbar, 250 mbar, 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Reading cycle

cyclic:
- max.: 100/s
- typical value: 20/s

acyclic:
- max.: 20/s
- typical value: 10/s

Cycle time (Update time)

- The cycle time in a bus segment in cyclic data communication depends on the number of devices, on the segment coupler used and on the internal PLC cycle time.
- The minimum cycle time is approx. 20 ms per device.

Response time

- cyclic: approx. 10 ms per request
- acyclic: < 50 ms

All values are typical values.

Dynamic behavior FOUNDATION Fieldbus

Dead time, Time constant (T63)

If the macro cycle time (of the PLC) is set to a typical value of 250 ms, the following total dead time results:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	340 ms	120 ms
PMP71	295 ms	■ 100 mbar, 250 mbar, 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Reading cycle

- cyclic: up to 5/s, dependent on the number and type of function blocks used in a closed-control loop
- acyclic: 10/s

Cycle time (Update time)

250 ms

Response time

- cyclic: < 80 ms
- acyclic: < 40 ms

All values are typical values.

Damping

A damping affects all outputs (output signal, display).

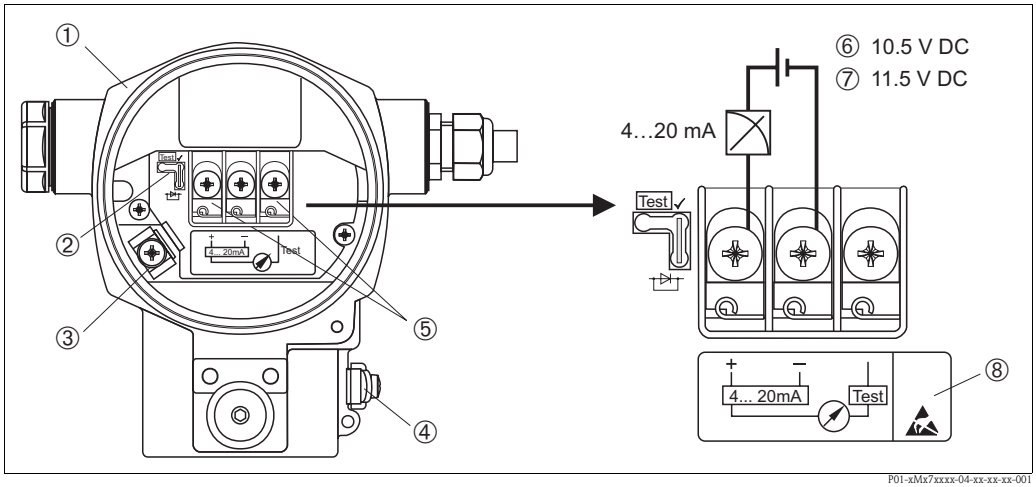
- Via on-site display, handheld terminal or PC with operating program, continuous from 0...999 s
- Additionally for HART and PROFIBUS PA: via DIP-switch on the electronic insert, switch position "on" = set value and "off"
- Factory setting: 2 s

Power supply

Electrical connection

Note!
- When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings. → See also page 67 ff, sections "Safety Instructions" and "Installation/Control Drawings".
- Devices with integrated overvoltage protection must be earthed. → See also page 34.
- Protective circuits against reverse polarity, HF influences and overvoltage peaks are installed.

4...20 mA HART



Electrical connection 4...20 mA HART

1 Housing
2 Jumper for 4...20 mA test signal
→ See also page 22, section "Taking 4...20 mA test signal".
3 Internal earth terminal
4 External earth terminal
5 4...20 mA test signal between plus and test terminal
6 Minimum supply voltage 10.5 V DC, if the jumper is inserted in accordance with the illustration.
7 Minimum supply voltage 11.5 V DC, if the jumper is inserted in "Test" position.
8 Devices with integrated overvoltage protection are labelled OVP (overvoltage protection) here (→ see also page 34).

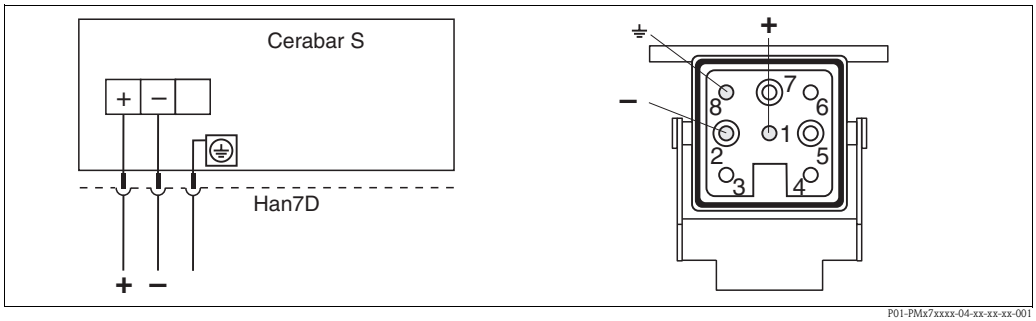
PROFIBUS PA

The two-wire cable must be connected to the "PA+" and "PA–" terminals.

FOUNDATION Fieldbus

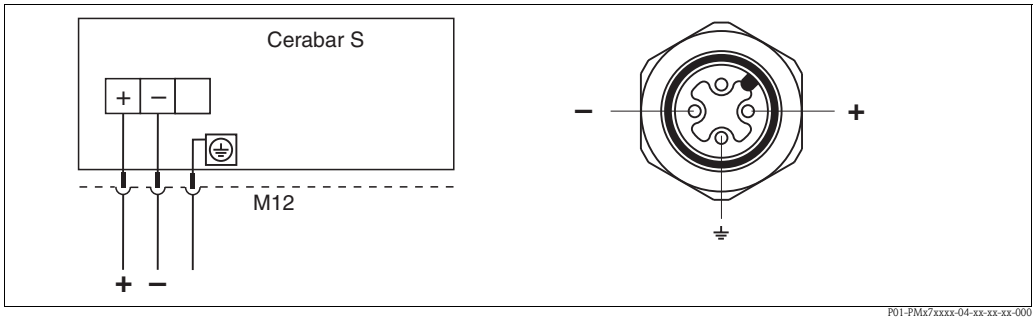
The two-wire cable must be connected to the "FF+" and "FF–" terminals.

Devices with Harting plug Han7D



Left: electrical connection for devices with Harting plug Han7D
Right: view of the plug connector at the device

Devices with M12 plug



Left: electrical connection for devices with M12 plug
Right: view of the plug at the device

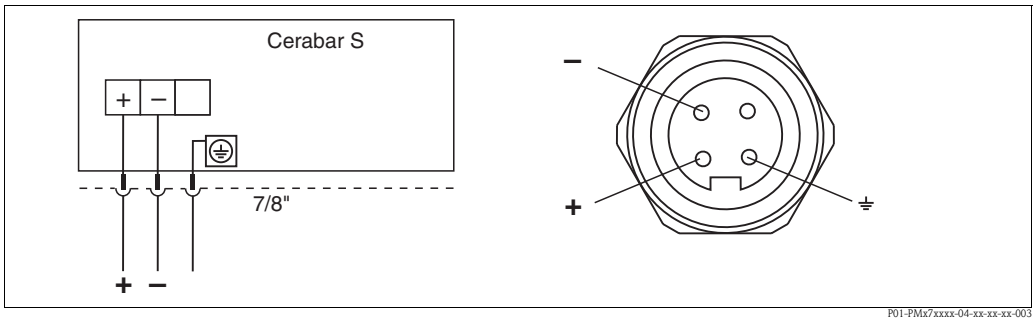
Endress+Hauser offers for devices with M12 plug the following accessories:

Plug-in jack M 12x1, straight
- Material: Body PA; coupling nut CuZn, nickel-plated
- Degree of protection (fully locked): IP67
- Order number: 52006263

Plug-in jack M 12x1, elbowed
- Material: Body PBT/PA; coupling nut GD-Zn, nickel-plated
- Degree of protection (fully locked): IP67
- Order number: 51006327

Cable 4x0.34 mm^2 with M12 socket, elbowed, screw plug, 5 m length
- Material: Body PUR; coupling nut CuSn/Ni; cable PVC
- Degree of protection (fully locked): IP67
- Order number: 52010285

Devices with 7/8" plug



Left: electrical connection for devices with 7/8" plug
Right: view of the plug at the device

Taking 4...20 mA test signal

A 4...20 mA signal may be measured via the positive and test terminal without interrupting the measurement. The minimum supply voltage of the device can be reduced by simply changing the position of the jumper. As a result, operation is also possible with lower voltage sources. Observe the position of the jumper in accordance with the following table.

Jumper position for test signal	Description
	– Taking 4...20 mA test signal via plus and test terminal: possible. (Thus, the output current can be measured without interruption via the diode.) – Delivery status – minimum supply voltage: 11.5 V DC
	– Taking 4...20 mA test signal via plus and test terminal: not possible. – minimum supply voltage: 10.5 V DC

Supply voltage

Note!
- When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.
- All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas. → See also page 91 ff sections "Safety Instructions" and "Installation/Control Drawings".

4...20 mA HART

- Version for non-hazardous areas, jumper for 4...20 mA test signal in "Test" position (delivery status): 11.5...45 V DC
- Version for non-hazardous areas, jumper for 4...20 mA test signal in "Non-test" position: 10.5...45 V DC

PROFIBUS PA

- Version for non-hazardous areas: 9...32 V DC

FOUNDATION Fieldbus

- Version for non-hazardous areas: 9...32 V DC

Current consumption

- PROFIBUS PA: 11 mA ± 1 mA, switch-on current corresponds to IEC 61158-2, Clause 21
- FOUNDATION Fieldbus: 14 mA ± 1 mA, switch-on current corresponds to IEC 61158-2, Clause 21

Cable entry

→ See also page 77 ff, feature 30 "Housing, Cable entry, Protection".

Cable specification

- Endress+Hauser recommends using shielded, twisted-pair two-wire cables.
- Terminals for wire cross-sections 0.5...2.5 mm^2
- Cable external diameter: 5...9 mm

Residual ripple

Without influence on 4...20 mA signal up to ± 5% residual ripple within the permitted voltage range [according to HART hardware specification HCF_SPEC-54 (DIN IEC 60381-1)]

Influence of power supply

≤ 0.0006% of URL/1 V

Performance characteristics – general

Reference operating conditions

- As per IEC 60770
- Ambient temperature T_U = constant, in the range of: +21...+33°C (+69.8...+91.4°F)
- Humidity φ = constant, in the range of: 5...80 % r.H
- Ambient pressure p_U = constant, in the range of: 860...1060 mbar
- Position of the measuring cell: constant, in the range of: ±1°
- Input of LOW SENSOR TRIM and HIGH SENSOR TRIM for lower range value and upper range value
- Zero based span
- Membrane material PMC71: Al_2O_3 (Aluminium oxide ceramic)
- Membrane material PMP71 and PMP75: AISI 316L/1.4435
- Filling oil PMP71 and PMP75: silicone oil
- Supply voltage: 24 V DC ± 3 V DC
- Load with HART: 250 Ω

Uncertainty of measurement for small absolute pressure ranges

The smallest extended uncertainty of measurement that can be returned by our standards is:
- 0.4% of the set span in the range of 1...30 mbar and
- 1% of the set span in the range < 1 mbar.

Long-term stability

PMC71/PMP71/PMP75:
- For measuring ranges ≥ 1 bar: ± 0,05 % of URL/year

PMC71:
- 100 mbar ... 40 bar: ±0,2 % of URL/10 years
- 100 mbar ... 40 bar (absolute pressure sensor): ±0,3 % of URL/10 years

PMP71:
- 1 bar ... 10 bar: ±0,175 % of URL/5 years
- 40 bar: ±0,2 % of URL/5 years
- 40 bar: ±0,4 % of URL/10 years
- 100 bar: ±0,2 % of URL/10 years
- 400 bar: ±1 % of URL/10 years

Influence of the installation position

- PMC71 [1]: ≤ 0.18 mbar
- PMP71 [1, 2]
  - Process connections thread G 1 A, G 1 1/2, G 2, 1 1/2 MNPT, 2 MNPT, M 44x1.25, EN/DIN, ANSI and JIS flanges: ≤ 10 mbar
  - Process connections thread: G 1/2, 1/2 MNPT, JIS G 1/2, JIS R 1/2, M20x1.5: ≤ 4 mbar

1) Device rotated 180°, process connection pointing upwards.
2) This value is doubled for devices with inert oil.

Position-dependent zero shift can be corrected. → See also page 29, section "General installation instructions" and page 73 ff section "Installation instructions, Diaphragm seal systems".

Performance characteristics – ceramic diaphragm

Reference accuracy – PMC71

The reference accuracy comprises the non-linearity according to limit point setting, hysteresis and non-reproducibility as per IEC 60770.

PMC71 – Gauge pressure sensors

100 mbar measuring cell:
- TD 1:1: to TD 10:1 ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

250 mbar, 400 mbar, 1bar, 2 bar, 4 bar, 10 bar measuring cell:
- TD 1:1: to TD 15:1 ±0.075% of the set span
- TD > 15:1: ±0.005% of the set span x TD

40 bar measuring cell:
- TD 1:1 to TD 10:1: ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

Platinum version,
1 bar, 2 bar, 4 bar, 10 bar measuring cell:
- TD 1:1: ±0.05% of the set span

PMC71 – Absolute pressure sensors

100 mbar measuring cell:
- TD 1:1: to TD 5:1: ±0.075% of the set span
- TD > 5:1: ±0.015% of the set span x TD

250 mbar measuring cell:
- TD 1:1: to TD 10:1: ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

400 mbar, 1 bar, 2 bar, 4 bar, 10 bar measuring cell:
- TD 1:1: to TD 15:1: ±0.075% of the set span
- TD > 15:1: ±0.005% of the set span x TD

40 bar measuring cell:
- TD 1:1 to TD 10:1: ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

Platinum version,
1 bar, 2 bar, 4 bar, 10 bar measuring cell:
- TD 1:1: ±0.05% of the set span

Total performance – PMC71

The "Total performance" specification comprises the non-linearity including hysteresis, non-reproducibility as well as the thermal change of the zero point.
All specifications apply to the temperature range –10...+60°C (+14...+140°F).

PMC71

100 mbar, 250 mbar, 400 mbar measuring cell:
- ±0.2% of URL

1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell:
- ±0.15 % of URL

PMC71 High temperature version

all measuring cells:
- ±0.46% of URL

Total Error - PMC71

The total error comprises the long-term stability and the total performance:

PMC71:
- 100 mbar, 250 mbar, 400 mbar measuring cell: ±0,25 % of URL/year
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±0,2 % of URL/year

PMC71 High temperature version:
- all measuring cells: ±0,51 % of URL/year

Warm-up period – PMC71

- 4...20 mA HART : < 10 s
- PROFIBUS PA: 6 s
- FOUNDATION Fieldbus: 50 s

Thermal change of the zero output and the output span – PMC71

PMC71

–10...+60°C (+14...+140 °F):
- 100 mbar, 250 mbar, 400 mbar measuring cell: ±(0.088 x TD + 0.088)% of the set span
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±(0.088 x TD + 0.04)% of the set span

–20...–10°C, +60...+125°C (–4...+14°F, +140...+257°F)
- 100 mbar, 250 mbar, 400 mbar, measuring cell: ±(0.138 x TD + 0.138)% of the set span
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±(0.175 x TD + 0.075)% of the set span

PMC71 High temperature version

–10...+60°C (+14...+140 °F):
- 100 mbar, 250 mbar, 400 mbar measuring cell: ±(0.088 x TD + 0.088)% of the set span
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±(0.088 x TD + 0.04)% of the set span

–20...–10°C, +60...+150°C (–4...+14°F, +140...+302°F):
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell:: ±(0,50 x TD)% of the set span
- 100 mbar measuring cell (Absolute pressure sensor): ±(1,25 x TD)% of the set span
- 250 mbar, 400 mbar, 1 bar, 2 bar, 4 bar, 10 bar measuring cell (Absolute pressure sensor): ±(0,75)% of the set span
- 40 bar measuring cell (Absolute pressure sensor): ±(0,50)% of the set span

Performance characteristics – metallic diaphragm

Reference accuracy – PMP71, PMP75

The reference accuracy comprises the non-linearity according to limit point setting, hysteresis and non-reproducibility as per IEC 60770.

PMP71 and PMP75 without capillary

100 mbar, 400 mbar measuring cell:
- TD 1:1: to TD 2:1 ±0.15% of the set span

250 mbar measuring cell:
- TD 1:1: to TD 2.5:1 ±0.15% of the set span

400 mbar measuring cell:
- TD 1:1: ±0.15% of the set span
- TD > 1:1: ±0.15% of the set span x TD

1 bar measuring cell:
- TD 1:1 to TD 2.5:1: ±0.075% of the set span
- TD > 2.5:1: ±0.03% of the set span x TD

2 bar measuring cell:
- TD 1:1 to TD 5:1: ±0.075% of the set span
- TD > 5:1: ±0.015% of the set span x TD

4 bar measuring cell:
- TD 1:1 to TD 10:1: ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

10 bar, 40 bar measuring cell:
- TD 1:1 to TD 15:1: ±0.075% of the set span
- TD > 15:1: ±0.005% of the set span x TD

100 bar measuring cell:
- TD 1:1 to TD 10:1: ±0.075% of the set span
- TD > 10:1: ±0.0075% of the set span x TD

400 bar measuring cell:
- TD 1:1 to TD 5:1: ±0.15% of the set span
- TD > 5:1: ±0.03% of the set span x TD

700 bar measuring cell:
- TD 1:1 to TD 2:1: ±0.2% of the set span
- TD > 2:1: ±0.1% of the set span x TD

Platinum version,
2 bar, 4bar, 10 bar, 40 bar measuring cell:
- TD 1:1: ±0.05% of the set span

PMP75 with capillary

1 and 2 bar measuring cell:
- TD 1:1 to TD 2,5:1: ±0,1% of the set span
- TD > 2,5:1: ±0,04% of the set span x TD

1 bar measuring cell (Absolute pressure sensor):
- TD 1:1 to TD 2,5:1: ±0,1% of the set span
- TD > 2,5:1: ±0,04% of the set span x TD

2 bar measuring cell (Absolute pressure sensor):
- TD 1:1 to TD 5:1: ±0,075% of the set span
- TD > 5:1: ±0,015% of the set span x TD

Total performance – PMP71

The "Total performance" specification comprises the non-linearity including hysteresis, non-reproducibility as well as the thermal change of the zero point.

All specifications apply to the temperature range –10...+60°C (+14...+140°F).

PMP71

100 mbar measuring cell:
- ±0.35% of URL

250 mbar measuring cell:
- ±0.3% of URL

400 mbar measuring cell:
- ±0.25% of URL

1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell:
- ±0.15% of URL

100 bar measuring cell:
- ±0.25% of URL

400 bar measuring cell:
- ±0.3% of URL

700 bar measuring cell:
- ±0.4% of URL

PMP71 with Gold-Rhodium-coated membrane

400 mbar measuring cell:
- ±1.25% of URL

1 bar measuring cell:
- ±0.75% of URL

2 bar measuring cell:
- ±0.45% of URL

4 bar measuring cell:
- ±0.3% of URL

10 bar and 40 bar measuring cell:
- ±0.15% of URL

100 bar measuring cell:
- ±0.25% of URL

400 bar measuring cell:
- ±0.3% of URL

700 bar measuring cell:
- ±0.4% of URL

Total Error - PMP71

The total error comprises the long-term stability and the total performance:

- 100 mbar measuring cell: ±0,4 % of URL/year
- 250 mbar measuring cell: ±0,35 % of URL/year
- 400 mbar measuring cell: ±0,3 % of URL/year
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±0,2 % of URL/year
- 100 bar measuring cell: ±0,3 % of URL/year
- 400 bar measuring cell: ±0,35 % of URL/year
- 700 bar measuring cell: ±0,45 % of URL/year

Warm-up period – PMP71, PMP75

- 4...20 mA HART : < 10 s
- PROFIBUS PA: 6 s
- FOUNDATION Fieldbus: 50 s

Thermal change of the zero output and the output span – PMP71 and PMP75

PMP71 and PMP75 (basic device)

–10...+60°C (+14...+140°F):
- 100 mbar measuring cell: ±(0.3 x TD + 0.02)% of the set span
- 250 mbar measuring cell: ±(0.25 x TD + 0.02)% of the set span
- 400 mbar measuring cell: ±(0.2 x TD + 0.015)% of the set span
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±(0.1 x TD + 0.01)% of the set span
- 100 bar measuring cell: ±(0.2 x TD + 0.015)% of the set span
- 400 bar measuring cell: ±(0.35 x TD + 0.02)% of the set span
- 700 bar measuring cell: ±(0.4 x TD + 0.03)% of the set span

–40...–10°C, +60...+85°C (–40...+14°F, +140...+185°F):
- 100 mbar measuring cell: ±(0.6 x TD + 0.04)% of the set span
- 250 mbar measuring cell: ±(0.5 x TD + 0.04)% of the set span
- 400 mbar measuring cell: ±(0.4 x TD + 0.03)% of the set span
- 1 bar, 2 bar, 4 bar, 10 bar, 40 bar measuring cell: ±(0.4 x TD + 0.02)% of the set span
- 100 bar measuring cell: ±(0.4 x TD + 0.03)% of the set span
- 400 bar measuring cell: ±(0.7 x TD + 0.04)% of the set span
- 700 bar measuring cell: ±(0.75 x TD + 0.06)% of the set span

Note!
When using a PMP75, the influence from the respective diaphragm seal must be taken into account.
(→ See also page 68 ff "Planning instructions, diaphragm seal systems" and page 52 ff "Process connections PMP75 (with metallic measuring diaphragm)").

Operating conditions (installation)

General installation instructions

- For PMP75: See page 52 ff, "Installation instructions, Diaphragm seal systems" section.
- The position-dependent zero shift can be corrected directly at the device via operating key, for devices with external operation even in hazardous areas. Diaphragm seals also shift the zero point, depending on the installation position.
  (→ See also page 73 ff, section "Installation instructions, Diaphragm seal systems").
- The housing of the Cerabar S can be rotated up to 380°. → See also page 31, section "Turn the housing".
- Endress+Hauser offers a mounting bracket for installing on pipes or walls. → See also page 30, section "Wall and pipe-mounting".

Installation instructions for devices without diaphragm seal – PMC71 and PMP71

Cerabar S transmitters without diaphragm seal are mounted as per the norms for a manometer (DIN EN 839-2). We recommend the use of shut-off devices and siphons. The orientation depends on the measuring application.

Pressure measurement in gases

- Mount Cerabar S with shut-off device above the tapping point so that condensate can flow into the process.

Pressure measurement in steams

- Mount Cerabar S with siphon above the tapping point.
  The siphon reduces the temperature to almost ambient temperature.
- Fill the siphon with fluid before commissioning.

Pressure measurement in liquids

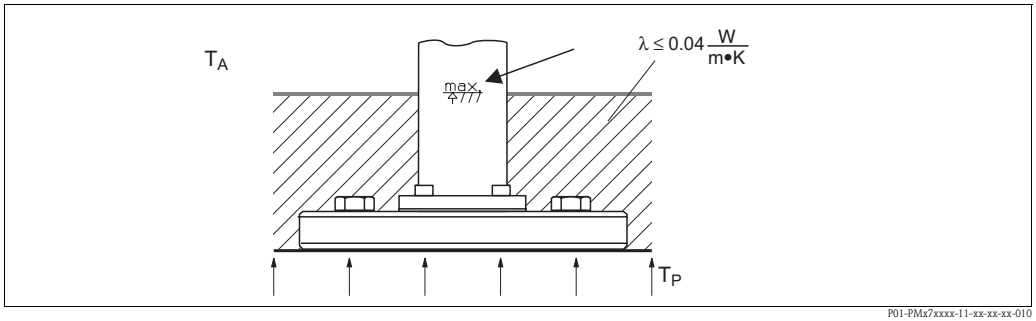
- Mount Cerabar S with shut-off device below or at the same level as the tapping point.

Level measurement

- Mount Cerabar S below the lowest measuring point.
- Do not mount the device at the following positions:
  In the fill flow, in the tank outlet or at a point in the container which could be affected by pressure pulses from an agitator or a pump.
- The calibration and functional test can be carried out more easily if you mount the device after a shut-off device.

Heat insulation – PMC71 high temperature version and PMP75

The PMC71 high temperature version and the PMP75 must only be insulated up to a certain height. The maximum permitted insulation height is labelled on the devices and applies to an insulation material with a heat conductivity ≤ 0.04 W/(m x K) and to the maximum permitted ambient and process temperature (→ see table below). The data were determined under the most critical application "quiescent air".

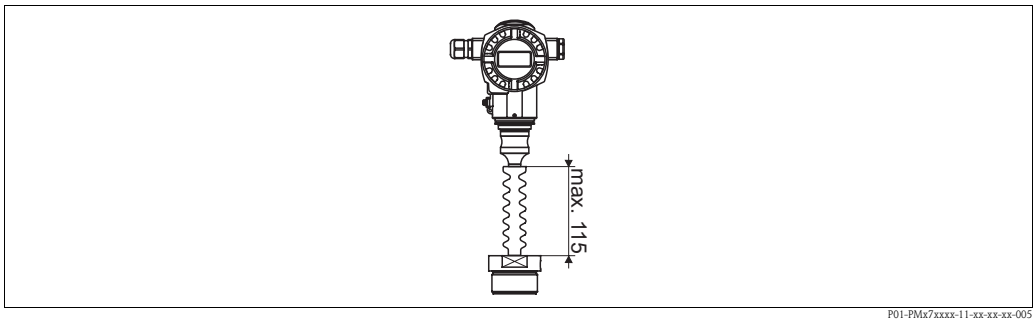


Maximum insulation height, here e.g. PMC71 with flange

	PMC71 high temperature version	PMP75
Ambient temperature (T_A)	≤ 70°C (158°F)	≤ 70°C (158°F)
Process temperature (T_P)	≤ 150°C (302°F)	max. 350°C (662°F), depending on the diaphragm seal filling oil used (→ see page 69)

Mounting with temperature isolator

Endress+Hauser recommends the use of temperature isolators in the event of constant extreme fluid temperatures which lead to the maximum permissible ambient temperature of +85°C (+185°F) being exceeded.
Depending on the filling oil used, Cerabar S devices with temperature isolators can be used for maximum temperatures of up to 260°C (+500°F). → For the temperature application limits of filling oils, see page 69, "Diaphragm seal filling oil" section.
To minimise the influence of rising heat, Endress+Hauser recommends the device be mounted horizontally or with the housing pointing downwards.
The additional installation height also brings about a zero point shift of maximum 21 mbar due to the hydrostatic columns in the temperature isolator. The position-dependent zero shift can be corrected.

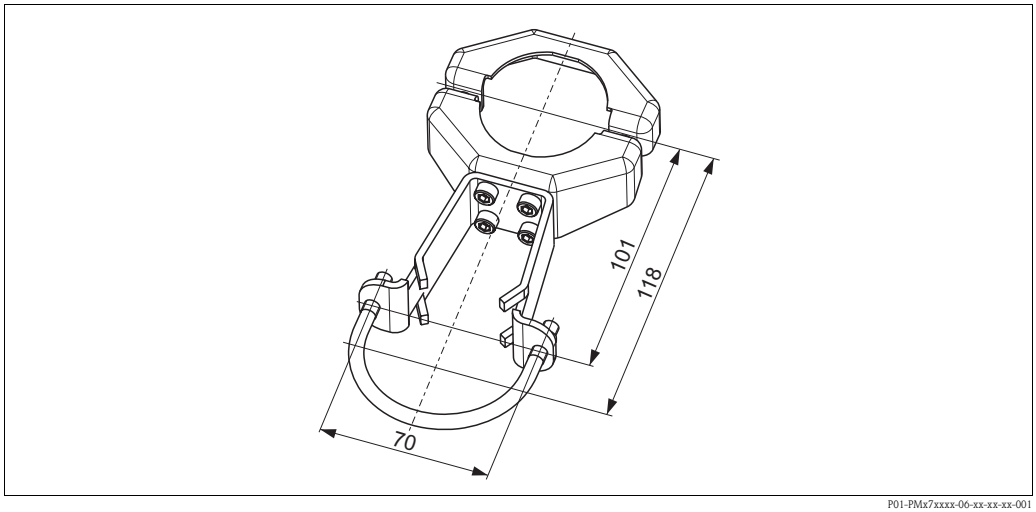


P01-PMx7xxxx-11-xx-xx-xx-005

PMP75 with temperature isolator

Wall and pipe-mounting

Endress+Hauser offers a mounting bracket for installing the device on pipes or walls. → See also page 77 ff, feature 110, "Additional options 2".



P01-PMx7xxxx-06-xx-xx-xx-001

"Separate housing" version

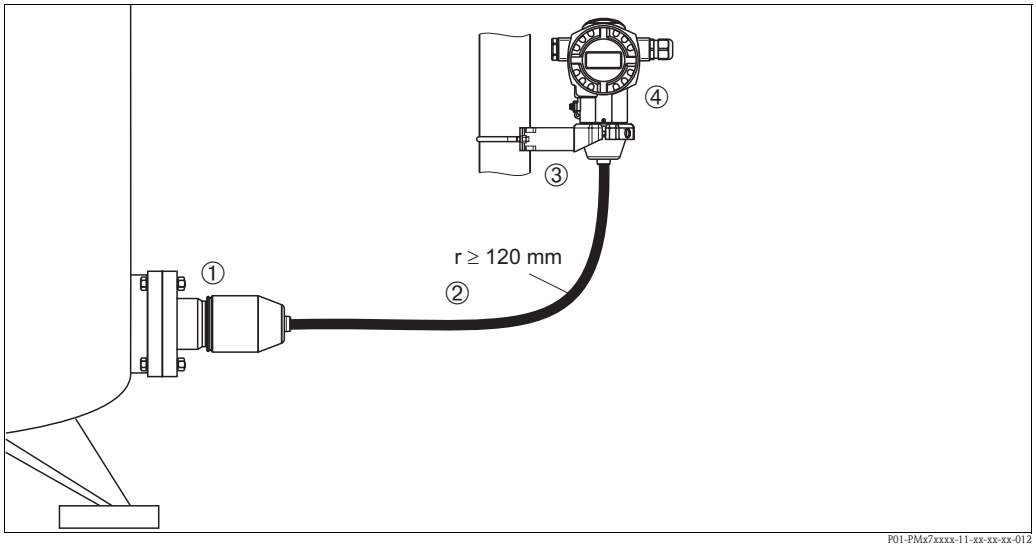
With the "separate housing" version, you are able to mount the housing with the electronics insert at a distance from the measuring point. This facilitates zero-interference measurement:
- Under particularly difficult measuring conditions (at installation locations that are cramped or difficult to access)
- If rapid cleaning of the measuring point is required
- If the measuring point is exposed to vibrations.

IP 69K applies for the process connection with sensor if FEP cable are used.

You can choose between different cable versions:
- PE (2 m, 5 m and 10 m)
- FEP (5 m).

→ See also Page 84 ff, Feature 110, "Additional options 2", Version "G".

→ For the dimensions, see Page 65.



P01-PMx7xxxx-11-xx-xx-xx-012

In the case of the "separate housing" version, the sensor is delivered with the process connection and cable ready mounted. The housing and a mounting bracket are enclosed as separate units. The cable is provided with a socket at both ends. These sockets are simply connected to the housing and the sensor.

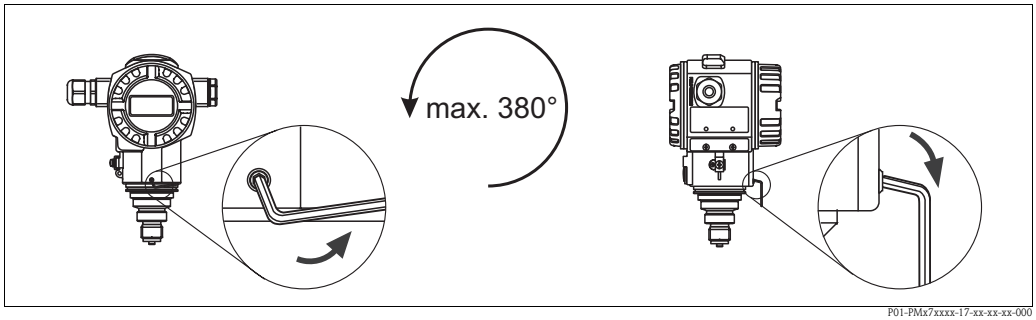
1 Process connection with sensor
2 Cable, both ends are fitted with a socket
3 Mounting bracket provided, suitable for pipe and wall mounting
4 Housing with electronic insert

Technical data of the PE and FEP cable:
- Minimum bending radius: 120 mm (4.72 inch)
- Cable extraction force: max. 450 N
- Resistance to UV light

Turn the housing

The housing can be rotated up to 380° after loosening the Allen screw.

Your benefits
- Simple mounting by optimally aligning the housing
- Good, accessible device operation
- Optimum readability of the on-site display (optional).



Align the housing by loosening the Allen screw.
T14 housing: 2 mm Allen key; T17 housing: 3 mm Allen key

Oxygen applications

Oxygen and other gases can react explosively to oils, grease and plastics, such that, among other things, the following precautions must be taken:
– All components of the system, such as measuring devices, must be cleaned in accordance with the BAM (DIN 19247) requirements.
– Dependent on the materials used, a certain maximum temperature and a maximum pressure for oxygen applications must not be exceeded.

The devices suitable for gaseous oxygen applications are listed in the following table with the specification p_{max}.

Order code for devices cleaned for oxygen applications	**p_{max} for oxygen applications**	**T_{max} for oxygen applications**
PMC71 – * * * ** * ** 2 * *, Devices with sensors, nominal value < 10 bar	Overpressure limit (OPL) of sensor[1, 2]	60°C (140°F)
PMC71 – * * * ** * ** 2 * *, Devices with sensors, nominal value ≥ 10 bar	30 bar	60°C (140°F)
PMP71 – * * * ** * * ** N * *	Depends on the weakest link in terms of pressure of the selected components: over pressure limit (OPL) of sensor[1] or process connection (1.5 x PN) or filling fluid (160 bar)	85°C (185°F)
PMP75 – * * * ** * * * ** N * *	Depends on the weakest link in terms of pressure of the selected components: over pressure limit (OPL) of sensor[1] or process connection (1.5 x PN) or filling fluid (160 bar)	85°C (185°F)

1) → See page 77 ff "Ordering information", feature 40 "Sensor range; sensor overload limit (= OPL)"

2) PMC71 with PVDF thread or flange p_{max} = 15 bar (225 psi)

LABS-free applications

Cleaning of the transmitter for the use e.g. in paint shops.

Ultra pure gas applications

Endress+Hauser also offers the degreased device for special applications, such as ultra pure gas.
No special restrictions regarding the process conditions apply to this device.

→ See also page 79, "Ordering information PMC71", feature 80 "Seal" or page 83, "Ordering information PMP71", feature 90 "Fill fluid".

Diaphragm seals for materials with hydrogen build-up (Gold-Rhodium coating)

With regard to materials in which hydrogen build-up takes place, hydrogen atoms can diffuse through the metal diaphragms. This can result in incorrect measurement results.
Endress+Hauser offers diaphragms with Gold-Rhodium coating for this application.

→ See also page 82 "Ordering information PMP71" and page 86 "Ordering information PMP75", feature 60 "Membrane material" version "6".

Operating conditions (environment)

Ambient temperature limits

- PMC71:
  - –40...+85°C (–40...+185°F)
  - High temperature version: –20...+70°C (–4...+158°F)
    (Version "T" for feature 100 "Additional options 1" or feature 110 "Additional options 2"),
    → For the maximum insulation height see page 30.
- PMP71: –40...+85°C (–40...+185°F)
  devices for lower temperatures on request
- PMP75: –40...+85°C (–40...+185°F)
  devices for lower temperatures on request
  → For the maximum insulation height see page 30.
- On-site display: –20...+70°C (–4...+158°F)
  Extended temperature application range with restrictions in optical properties such as display speed and contrast: –40...+85°C (–40...+185°F)
- Separate housing: –40 to +60°C (–40 to +140°F)

Note!
For high-temperature applications, either a PMP75 with a temperature isolator or with a capillary can be used. If vibrations also occur in the application, Endress+Hauser recommends you use a PMP75 with a capillary. If a PMP75 with a temperature isolator or capillary is used, we recommend a suitable retaining unit for mounting (see "Wall and pipe-mounting" Section on page 30).

For devices for use in hazardous areas, see Safety instructions, Installation or Control Drawing. (→ See also page 91, sections "Safety Instructions" and "Installation/Control Drawings".)

The device can be used in this temperature range. The values of the specification, such as thermal change, may be exceeded. → See also DIN 16086.

Storage temperature range

- –40...+100°C (–40...+212°F)
- On-site display: –40...+85°C (–40...+185°F)
- Separate housing: –40 to +60°C (–40 to +140°F)

Degree of protection

- → See page 77 ff, feature 30 "Housing, Cable entry, Protection".
- Degree of protection IP 68 for T17 housing: 1.83 mH_2O for 24 h
- Degree of protection IP 69K for process connection with sensor with separate housing and FEP cable.

Climate class

Class 4K4H (air temperature: –20...55°C/–4...+131°F, relative humidity: 4...100%) fulfilled as per DIN EN 60721-3-4 (condensation possible)

1) With PMC71, avoid condensate in the device (avoid moisture collecting in the device).

Vibration resistance

Device/Additional option	Test standard	Vibration resistance
PMC71 [1]	GL	guaranteed for 3...25 Hz: ±16 mm; 25...100 Hz: 4 g in all 3 planes
PMP71		
PMP75 [2, 3]		
with mounting bracket	IEC 61298-3	guaranteed for 10...60 Hz: ±0.15 mm; 60...500 Hz: 2 g in all 3 planes

1) not for high temperature version with EEx d[ia], CSA XP or FM XP

2) with aluminium T14 housing only

3) For applications with high temperatures, either a PMP75 with a temperature isolator or with a capillary can be used. If vibrations also occur in the application, Endress+Hauser recommends using a PMP75 with a capillary. If a PMP75 with a temperature isolator or capillary is used, it must be mounted with a mounting bracket. (→ see also page 30).

Electromagnetic compatibility

- Electromagnetic compatibility to EN 61326 and NAMUR recommendation EMC (NE21). For details refer to the declaration of conformity.
- With enhanced immunity against electromagnetic fields as per EN 61000-4-3: 30 V/m with closed cover [1]
- Maximum deviation: < 0.5% of span
- All EMC measurements were performed with a turn down (TD) = 2:1.

1) for devices with T14 housing

Overvoltage protection

- Overvoltage protection:
  - Nominal functioning DC voltage: 600 V
  - Nominal discharge current: 10 kA
- Surge current check $\hat{i}$ = 20 kA as per DIN EN 60079-14: 8/20 µs satisfied
- Arrester AC current check I = 10 A satisfied

→ See also page 80 ff, feature 100 "Additional options 1" and feature 110 "Additional options 2", version "M Overvoltage protection".

Note!
Devices with integrated overvoltage protection must be earthed.

Operating conditions (Process)

Process temperature limits

PMC71 (with ceramic measuring diaphragm)

- –25...+125°C (–13...+257°F)
- High temperature version: –20...+150°C (–4...+302°F)
  → See also page 80, feature 100 "Additional options 1", Version "T".
- Observe the process temperature range of the seal. See also the following section "Process temperature range, seals".

Extreme jumps in temperature can result in temporary measuring errors. Temperature compensation takes effect after several minutes. Internal temperature compensation is faster the smaller the temperature jump and the longer the time interval.

PMP71 (with metallic measuring diaphragm)

Description	Temperature operating range
Process connections with internal diaphragm	–40...+125°C (–40...+257°F) (+150 °C/302°F for max. one hour)
Process connections with flush-mounted diaphragm, G 1 A, G 1 1/2 A, G 2 A, 1 NPT, 1 1/2 NPT, 2 NPT, M 44 x 1.25, EN/DIN, ANSI and JIS flanges	–40...+100°C (–40...+212°F)
Process connections with flush-mounted diaphragm, G 1/2 A, M 20	–20...+85°C (–4...+185°F)

Lower temperatures on request.

PMP75 (with metallic measuring diaphragm)

- depending on the diaphragm seal and filling oil from -70°C (-94°F) up to +400°C (+752°F). Observe the temperature application limits of the diaphragm seal oil. → See also page 69, section "Diaphragm seal filling oils".

Note!
- Do not use diaphragm seals with 0.09 mm PTFE foil on AISI 316L (1.4435/1.4405) for vacuum applications, upper temperature limit +204°C (+400°F).
- For oxygen applications, observe page 32, section "Oxygen applications".

Process temperature range, seals

PMC71 (with ceramic measuring diaphragm)

Version for feature 80 in the order code	Seal	Process temperature range
A, L	FKM Viton	–25...+125°C/150°C [1] (–4...+257°F/302°F)
B [2], [3]	EPDM (FDA 21CFR177.2600; 3A Class II; USP Class VI) DVGW (KTW, W270, W534), WRAS, ACS, NSF61	–20...+125°C/150 °C [1] (–4...+257°F/302°F)
B [3]	EPDM	–20...+125°C (–4...+257°F)
D, M	Kalrez, Compound 4079	+5...+125°C/150°C [1] (+41...+257°F/302°F)
E	Chemraz, Compound 505	–10...+125°C/150°C [1] (14...+257°F/302°F)
F [2, 4]	HNBR (FDA 21CFR177.2600; 3A Class II; KTW; AFNOR; BAM)	–25...+125°C (–4...+257°F)
F [4]	NBR	–10...+100°C (14...+212°F)
1	FKM Viton, cleaned from oil and greace	–10...+125°C (+14...+257°F)
2	FKM Viton, cleaned for oxygen service	–10...+60 °C (+14...+140°F)
The process temperature ranges specified here refer to permanent application of the PMC71. They may be exceeded for a short time (e.g. for cleaning).		

1) +150°C (+302°F): for high temperature version
→ See also page 80, feature 100 "Additional options 1" and feature 110 "Additional options 2", Version "T".

2) These seals are used for devices with 3A-approved process connections.

3) With applications of saturated steam a Cerabar S with metallic diaphragm seal is to be used.

4) For devices with NBR or HNBR seals, the values for "Toatal Performance" (→ see page 24) and "Thermal change" (→ see page 25) must be multiplied by the factor 3.

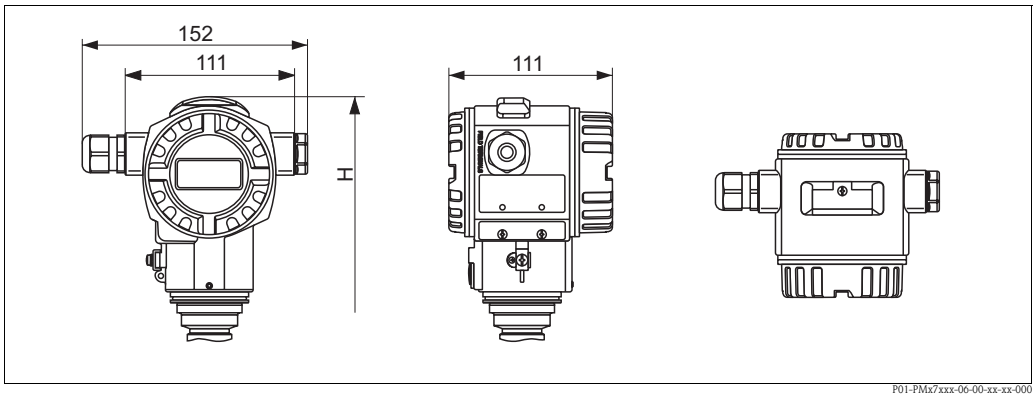
Pressure specifications

- The maximum pressure for the measuring device is dependent on the lowest-rated element with regard to pressure, see the following sections for this:
  – → page 13 ff, section "Measuring range"
  – → chapter "Mechanical construction".
  The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of 20°C (68°F) or 100°F for ANSI flanges and may be applied to the device for an unlimited time. Observe temperature dependency.
- The pressure values permitted at higher temperatures can be found in the following standards:
  – EN 1092-1: 2001 Tab. 18 [1]
  – ASME B 16.5a – 1998 Tab. 2-2.2 F316
  – ASME B 16.5a – 1998 Tab. 2.3.8 N10276
  – JIS B 2220.
- The test pressure corresponds to the over pressure limit of the measuring instrument (Over Pressure Limits OPL = 1.5 x MWP [2]) and may fit only temporally limited, so that no permanent damage develops.
- The Pressure Equipment Directive (EC Directive 97/23/EC) uses the abbreviation "PS". The abbreviation "PS" corresponds to the MWP (maximum working pressure) of the measuring device.
- In the case of sensor range and process connections where the OPL (Over pressure limit) of the pressure connection is smaller than the nominal value of the sensor, the device is set at the factory, at the very maximum, to the OPL value of the process connection. If you want to use the entire sensor range, select a process connection with a higher OPL value (1.5 x PN; PN = MWP).
- In oxygen applications, the values for "p_{max} and T_{max} for oxygen applications" as per page 32, "Oxygen applications" may not be exceeded.

1) With regard to its stability property, the material 1.4435 is identical to 1.4404 which is grouped under 13EO in EN 1092-1 Tab. 18. The chemical composition of the two materials can be identical.
2) The equation does not apply for PMP71 and PMP75 with a 40 bar or 100 bar measuring cell.

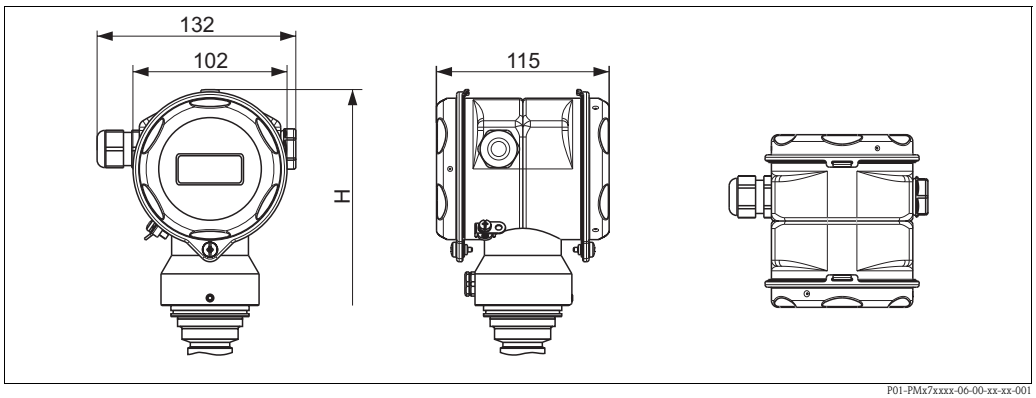
Mechanical construction

Housing dimensions T14



Front view, left-hand side view, top view
→ See the process connection in question for installation height. Housing weight see page 66.

Housing dimensions T17

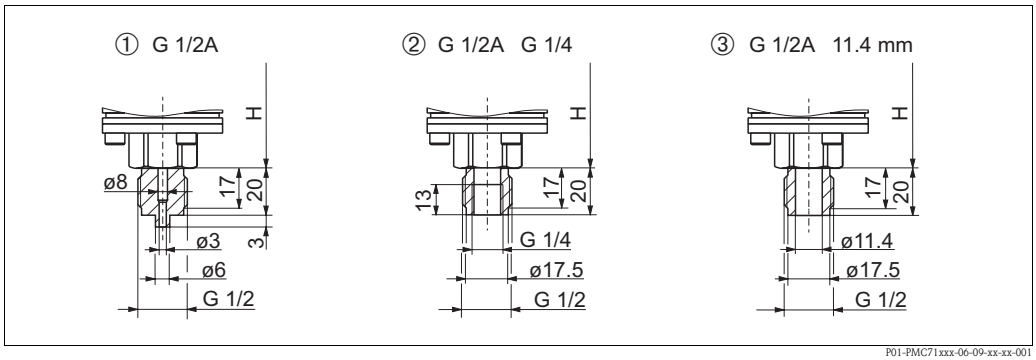


Front view, left-hand side view, top view
→ See the process connection in question for installation height. Housing weight see page 66.

Process connections PMC71 (with ceramic measuring diaphragm)

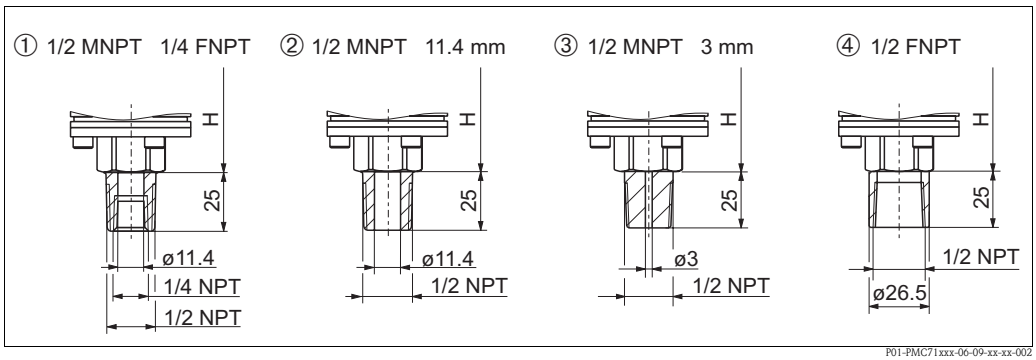
Note!
Some device versions have CRN approval. For a CRN-approved device, a CRN-approved process connection (→ see page 79, feature 70 "Process connection") has to be ordered with a CSA approval (→ see page 77, feature 10 "Approval"). These devices are fitted with a separate plate bearing the registration number 0F10525.5C.

Thread, internal diaphragm



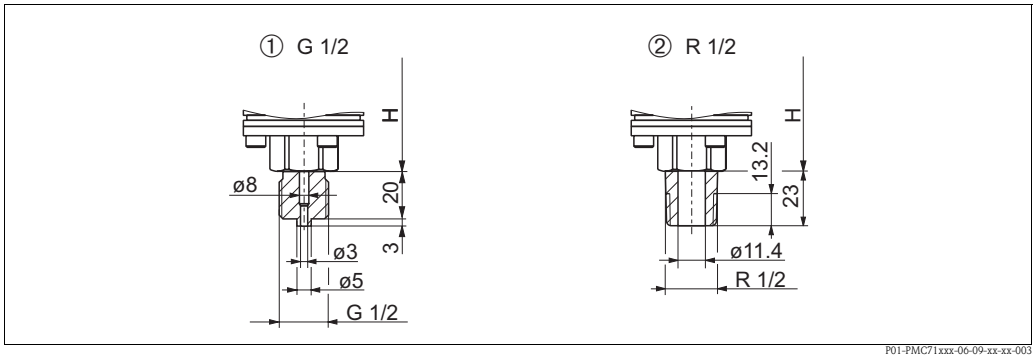
Process connections PMC71, thread ISO 228
→ Installation height see page 39.

1 Thread ISO 228 G 1/2 A EN 837;
Material version GA: AISI 316L/1.4435, version GB: Alloy C276/2.4819, version GC: Monel,
Version GD: PVDF (max.: 15 bar/225 psi, max.: –10...+60°C/+14...+140°F); mount version "GD" with a mounting bracket only (→ see also page 30); Weight: 0,63 kg
2 Thread ISO 228 G 1/2 A G 1/4 (female);
Material version GE: AISI 316L/1.4435, version GF: Alloy C276/2.4819, version GG: Monel; Weight: 0,63 kg
3 Thread ISO 228 G 1/2 A hole 11.4 mm;
Material version GH: AISI 316L/1.4435, version GJ: Alloy C276/2.4819, version GK: Monel; Weight: 0,63 kg



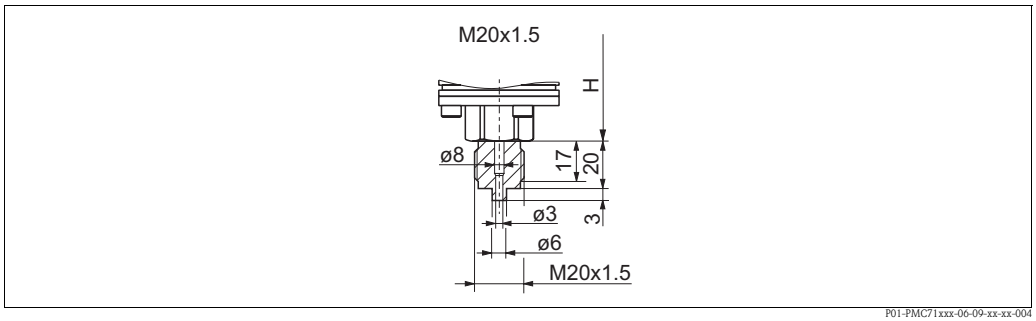
Process connections PMC71, thread ANSI
→ Installation height see page 39.

1 Thread ANSI 1/2 MNPT 1/4 FNPT;
Material version RA: AISI 316L/1.4435, version RB: Alloy C276/2.4819, version RC: Monel; Weight: 0,63 kg
2 Thread ANSI 1/2 MNPT hole 11.4;
Material version RD: AISI 316L/1.4435, version RE: Alloy C276/2.4819, version RF: Monel; Weight: 0,63 kg
3 Thread ANSI 1/2 MNPT hole 3 mm;
Material version RG: PVDF(max.: 15 bar/225 psi, max.: –10...+60°C/+14...+140°F),
mount with mounting bracket only (→ see also page 30); Weight: 0,63 kg
4 Thread ANSI 1/2 FNPT;
Material version RH: AISI 316L/1.4435, version RJ: Alloy C276/2.4819, version RK: Monel; Weight: 0,63 kg



Process connections PMC71, thread JIS
→ Installation height see page 39.

1 Version GL: thread JIS B0202 G 1/2 (male), material: AISI 316L/1.4435; Weight: 0,63 kg
2 Version RL: thread JIS B0203 R 1/2 (male), material: AISI 316L/1.4435; Weight: 0,63 kg



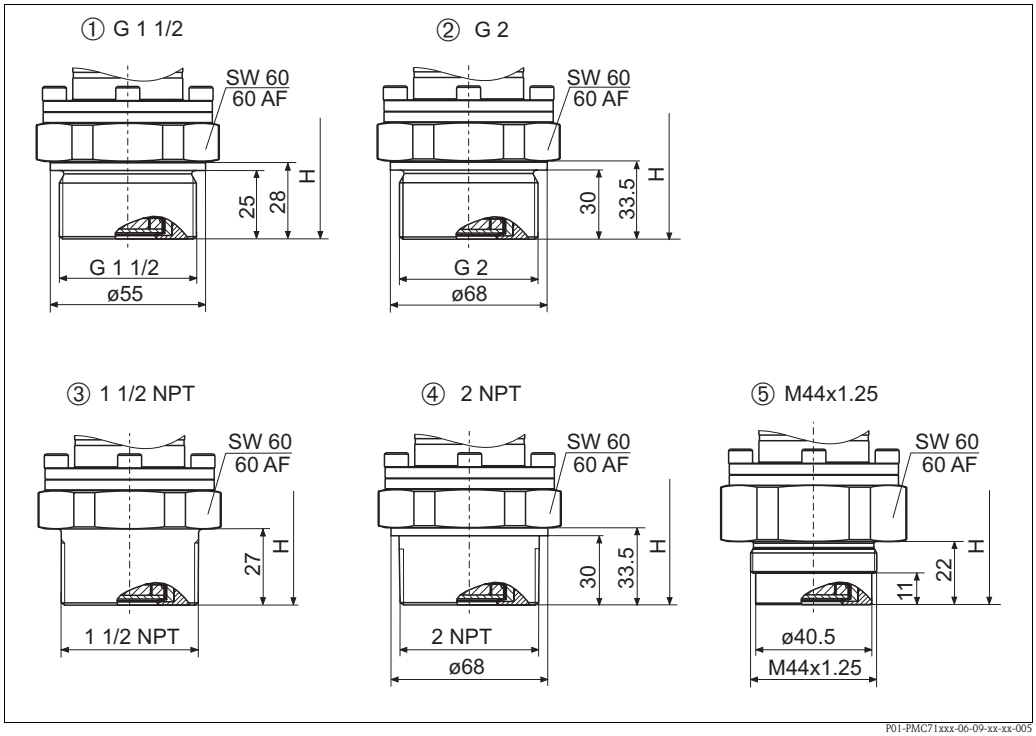
Process connections PMC71 thread DIN 13 M 20x1.5 hole 3 mm
Material version GP: AISI 316L/1.4435, version GQ: Alloy C276/2.4819
→ Installation height see page 39; Weight: 0,63 kg.

Installation height H for devices with thread connection and internal diaphragm

Description	Housing T14	Housing T17
PMC71	155 mm	171 mm
PMC71 with EEx d[ia], CSA XP or FM XP	225 mm	241 mm (Ex d = 311 mm)
PMC71 High temperature version [1]	235 mm	251 mm
PMC 71 High temperature version [1] with EEx d[ia], CSA XP or FM XP	305 mm	321 mm (Ex d = 391 mm)

1) High temperature version, see also page 80, feature 100 "Additional options 1" and feature 110 "Additional options 2", versions "T"

Thread, flush-mounted diaphragm



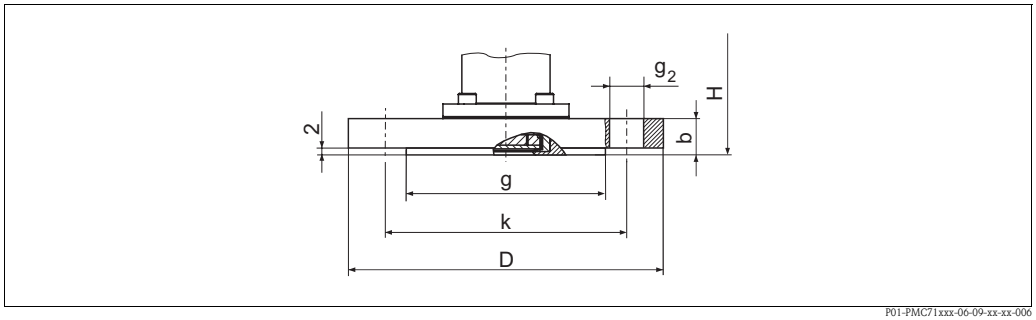
Process connections PMC71,
→ Installation height see table below.

1 Thread ISO 228 G 1 1/2 A;
Material version 1G: AISI 316L/1.4435, version 1H: Alloy C276/2.4819, version 1J: Monel; Weight: 0,63 kg
2 Thread ISO 228 G 2 A;
Material version 1K: AISI 316L/1.4435, version 1L: Alloy C276/2.4819, version 1M: Monel; Weight: 0,63 kg
3 Thread ANSI 1 1/2 MNPT;
Material version 2D: AISI 316L/1.4435, version 2E: Alloy C276/2.4819, version 2F: Monel; Weight: 0,63 kg
4 Thread ANSI 2 MNPT;
Material version 2G: AISI 316L/1.4435, version 2H: Alloy C276/2.4819, version 2J: Monel; Weight: 0,63 kg
5 Thread DIN 13 M 44x1.25;
Material version 1R: AISI 316L/1.4435, version 1S: Alloy C276/2.4819; Weight: 0,63 kg

Installation height H for devices with thread connection and flush-mounted diaphragm

Description	Housing T14	Housing T17
PMC71	215 mm	231 mm
PMC71 with EEx d[ia], CSA XP or FM XP	280 mm	296 mm

EN/DIN flanges, connection dimensions as per EN 1092-1/DIN 2527



Process connection PMC71, EN/DIN flange with raised face (flush-mounted diaphragm)
→ Installation height see page 43.

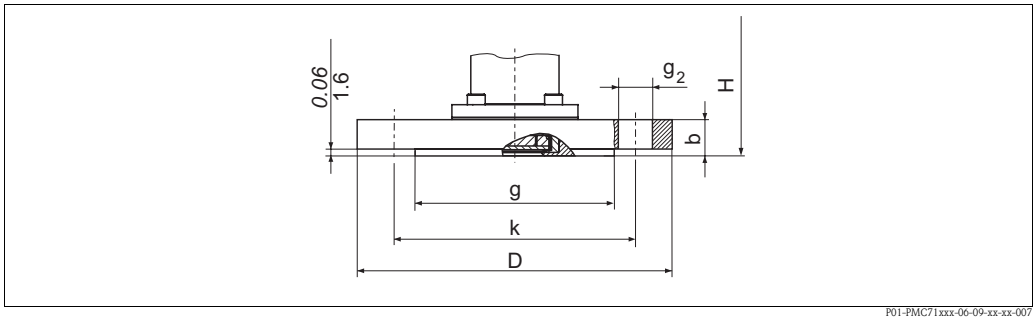
	Flange							Boltholes			
Version	**Material**	**Nominal diameter**	**Nominal pressure**	**Shape** [1]	**Diameter** **D** [mm]	**Thick-ness** **b** [mm]	**Raised face** **g** [mm]	**Quantity**	**Diameter** **g_2** [mm]	**Hole circle** **k** [mm]	**Flange weight** [2] [kg]
CP	AISI 316L	DN 32	PN 10-40	B1 (D)	140	18	77	4	18	100	1.9
CQ	AISI 316L	DN 40	PN 10-40	B1 (D)	150	18	87	4	18	110	2.2
BR	PVDF [3]	DN 50	PN 10-16	B1 (D)	165	21.4	102	4	18	125	0.6
B3	AISI 316L	DN 50	PN 10-40	B1 (D)	165	20	102	4	18	125	3.0
C3	AISI 316L	DN 50	PN 63	B2 (D)	180	26	108	4	22	135	4.6
BS	PVDF [3]	DN 80	PN 10/16	B1 (D)	200	21.4	138	8	18	160	1.0
B4	AISI 316L	DN 80	PN 10-40	B1 (D)	200	24	138	8	18	160	5.4

1) Designation in brackets as per DIN 2527

2) Housing weight see page 66

3) Max.: 15 bar (225 psi), max.: –10...+60°C (+14...+140°F)

ANSI flange, connection dimensions as per ANSI B 16.5, raised face RF



Process connection PMC71, ANSI flange with raised face (flush-mounted diaphragm)
→ Installation height see page 43.

	Flange						Boltholes			
Version	**Material**	**Nominal diameter**	**Class**	**Diameter** **D**	**Thickness** **b**	**Raised face** **g**	**Quantity**	**Diameter** **g_2**	**Hole circle** **k**	**Flange weight** [1]
		[in]	[lb./sq.in]	[in] *[mm]*	[in] *[mm]*	[in] *[mm]*		[in] *[mm]*	[in] *[mm]*	[kg]
AE	AISI 316/ 316L [2]	1 1/2	150	5 *127*	0.69 *17.5*	2.88 *73.2*	4	0.62 *15.7*	3.88 *98.6*	1.0
AQ	AISI 316/ 316L [2]	1 1/2	300	6.12 *155.4*	0.81 *20.6*	2.88 *73.2*	4	0.88 *22.4*	4.5 *114.3*	2.6
AF	AISI 316/ 316L [2]	2	150	6 *152.4*	0.75 *19.1*	3.62 *91.9*	4	0.75 *19.1*	4.75 *120.7*	2.4
JR	ECTFE [3]	2	150	6 *152.4*	0.75 *19.1*	3.62 *91.9*	4	0.75 *19.1*	4.75 *120.7*	2.4
A3	PVDF [4]	2	150	6 *152.4*	0.75 *19.1*	3.62 *91.9*	4	0.75 *19.1*	4.75 *120.7*	0.5
AR	AISI 316/ 316L [2]	2	300	6.5 *165.1*	0.88 *22.4*	3.62 *91.9*	8	0.75 *19.1*	5 *127*	3.2
AG	AISI 316/ 316L [2]	3	150	7.5 *190.5*	0.94 *23.9*	5 *127*	4	0.75 *19.1*	6 *152.4*	4.9
JS	ECTFE [3]	3	150	7.5 *190.5*	0.94 *23.9*	5 *127*	4	0.75 *19.1*	6 *152.4*	4.9
A4	PVDF [4]	3	150	7.5 *190.5*	0.94 *23.9*	5 *127*	4	0.75 *19.1*	6 *152.4*	0.9
AS	AISI 316/ 316L [2]	3	300	8.25 *209.5*	1.12 *28.4*	5 *127*	8	0.88 *22.4*	6.62 *168.1*	6.8
AH	AISI 316/ 316L [2]	4	150	9 *228.6*	0.94 *23.9*	6.19 *157.2*	8	0.75 *19.1*	7.5 *190.5*	7.1
JT	ECTFE [3]	4	150	9 *228.6*	0.94 *23.9*	6.19 *157.2*	8	0.75 *19.1*	7.5 *190.5*	7.1
AT	AISI 316/ 316L [2]	4	300	10 *254*	1.25 *31.8*	6.19 *157.2*	8	0.88 *22.4*	7.88 *200.2*	11.6

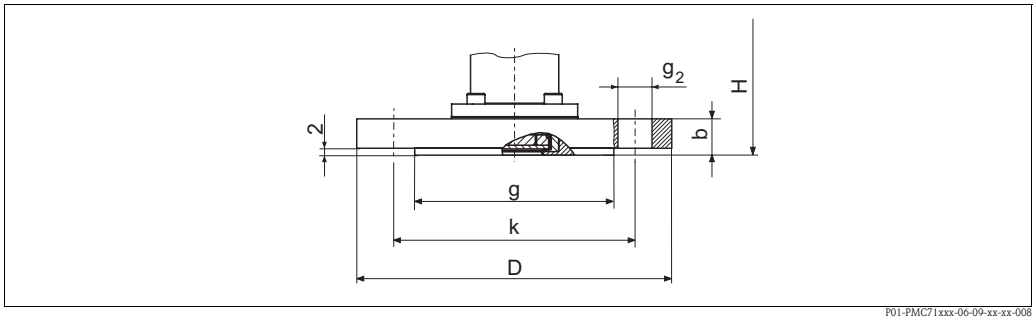
1) Housing weight see page 66

2) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)

3) ECTFE coating on AISI 316L/1.4435
When operating in hazardous area, avoid electrostatic charge of the plastic surface.

4) max.: 15 bar (225 psi), max.: –10...+60°C (+14...+140°F)

JIS flange, connection dimensions as per JIS B 2220, raised face RF



Process connection PMC71, JIS flange with raised face RF (flush-mounted diaphragm), AISI 316L/1.4435
→ Installation height see table below.

	Flange					Boltholes			
Versions	**Nominal dimension**	**Nominal pressure**	**Diameter** **D** [mm]	**Thickness** **b** [mm]	**Raised face** **g** [mm]	**Quantity**	**Diameter** **g_2** [mm]	**Hole circle** **k** [mm]	**Flange weight** [1] [kg]
KF	50 A	10 K	155	16	96	4	19	120	2.0
KL	80 A	10 K	185	18	127	8	19	150	3.3
KH	100 A	10 K	210	18	151	8	19	175	4.4

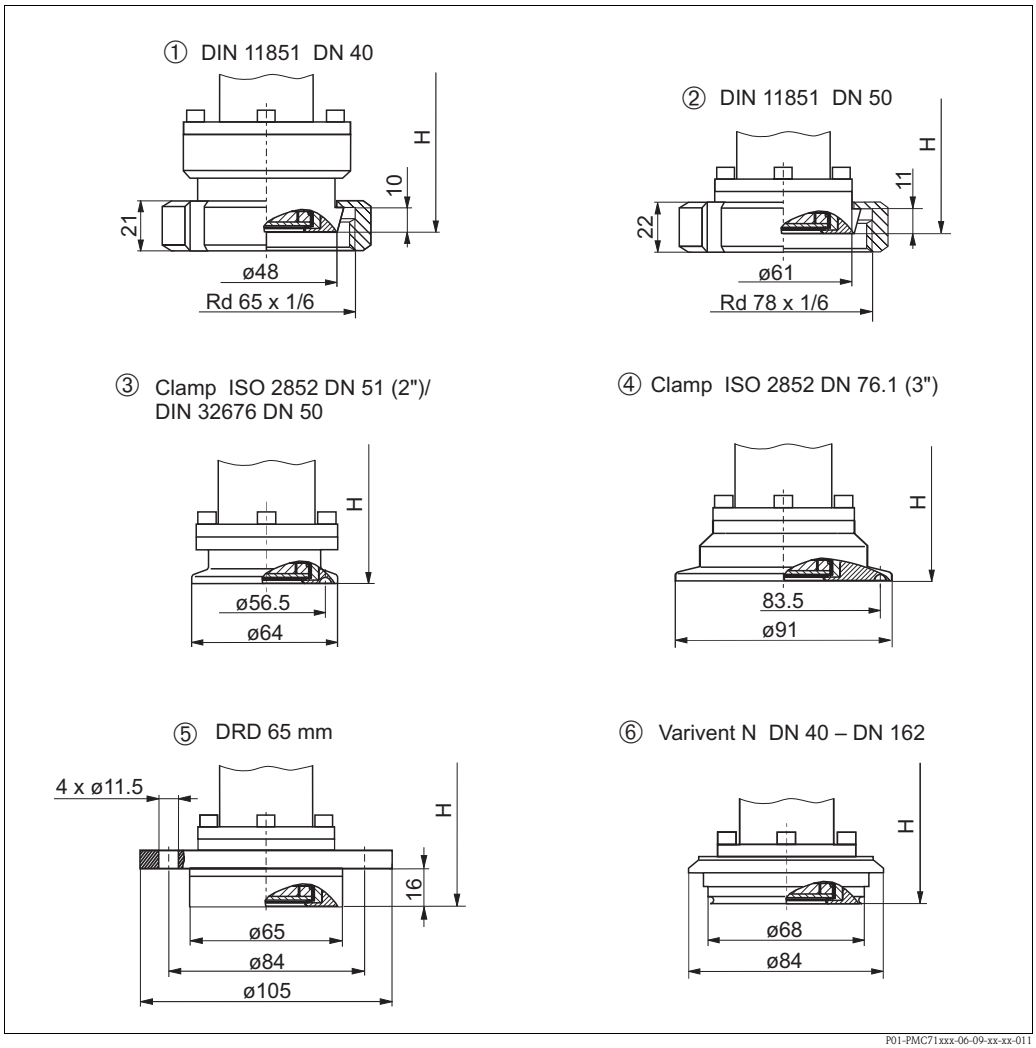
1) Housing weight see page 66

Installation height H for devices with flange

Description	T14 housing	T17 housing
PMC71	215 mm	231 mm
PMC71 with EEx d[ia], CSA XP or FM XP	280 mm	296 mm

Hygienic connections, flush-mounted diaphragm

Note!
Many process connections with an EPDM or HNBR seal are in accordance with the 3A-sanitary standard approved for PMC71. This means that a 3A-approved process connection in combination with an EPDM or HNBR seal must be selected when ordering for the 3A approval for the PMC71 version to be valid. → For ordering information on EPDM or HNBR seals, see page 79 "Ordering information PMC71", feature 80 "Sensor seal", version B or F.



Process connections PMC71, Hygienic connections, material AISI 316L/1.4435
surface roughness of the surfaces in contact with the medium ≤ 0.8 µm as standard. Lower surface roughness on request.

1 Version MP: DIN 11851 DN 40 PN 25, 3A with HNBR or EPDM seal
2 Version MR: DIN 11851 DN 50 PN 25, 3A with HNBR or EPDM seal
3 Version TD: Tri-Clamp ISO 2852 (2"), DIN 32675 DN 50, 3A with HNBR or EPDM seal
4 Version TF: Tri-Clamp ISO 2852 (3"), 3A with HNBR or EPDM seal
5 Version TK: DRD DN50 (65 mm) PN 25, 3A with HNBR or EPDM seal
6 Version TR: Varivent Type N for pipes 40 – 162, PN 40, 3A with HNBR or EPDM seal

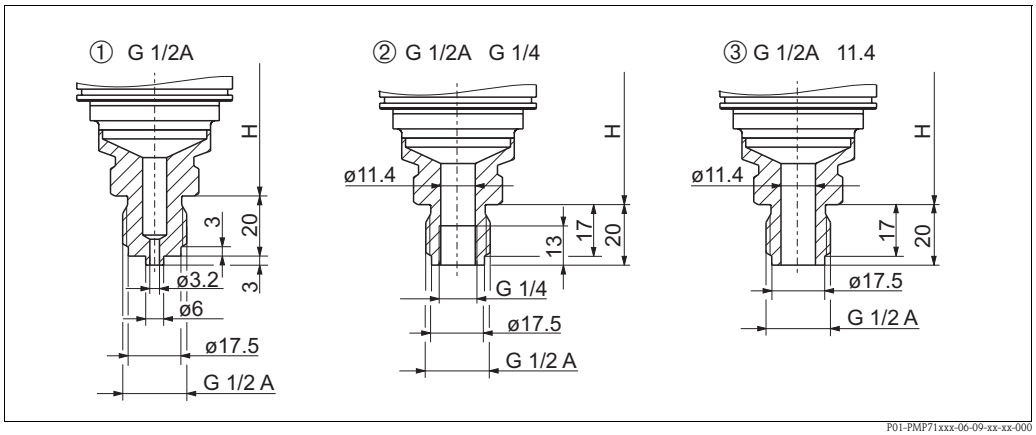
Installation height H for devices with hygienic connection and flush-mounted diaphragm

Description	T14 housing	T17 housing
PMC71	215 mm	231 mm
PMC71 with EEx d[ia], CSA XP or FM XP	280 mm	296 mm

Process connections PMP71 (with metallic measuring diaphragm)

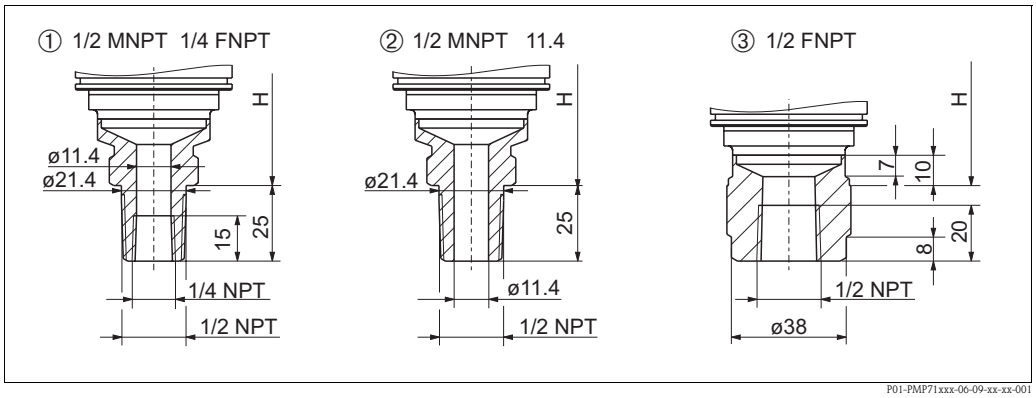
Note!
Some device versions have CRN approval. For a CRN-approved device, a CRN-approved process connection (→ see page 78, feature 70 "Process connection") has to be ordered with a CSA approval (→ see page 77, feature 10 "Approval"). These devices are fitted with a separate plate bearing the registration number 0F10525.5C.

Thread, internal diaphragm



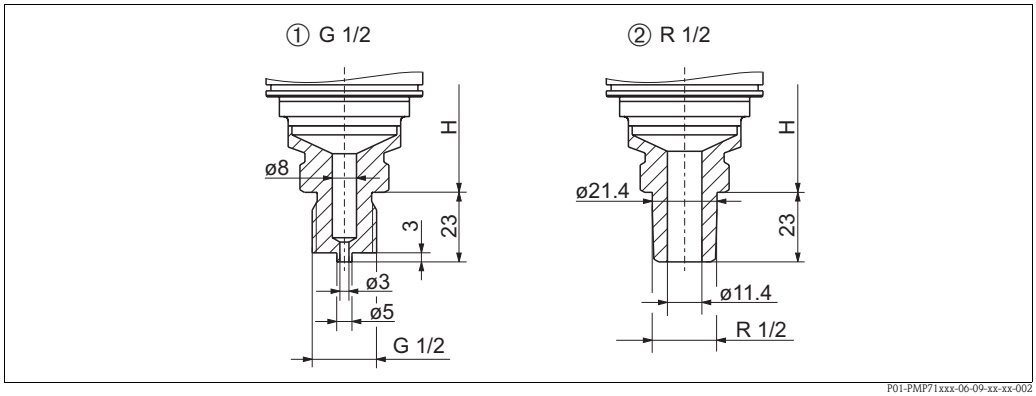
Process connections PMP71, thread ISO 228
→ Installation height H see page 46.

1 Thread ISO 228 G 1/2 A EN 837;
Material version GA: AISI 316L/1.4435, version GB: Alloy C276/2.4819; Weight: 0,6 kg
2 Thread ISO 228 G 1/2 A G 1/4 (female);
Material version GE: AISI 316L/1.4435, version GF: Alloy C276/2.4819; Weight: 0,6 kg
3 Thread ISO 228 G 1/2 A hole 11.4 mm;
Material version GH: AISI 316L/1.4435, version GJ: Alloy C276/2.4819; Weight: 0,6 kg



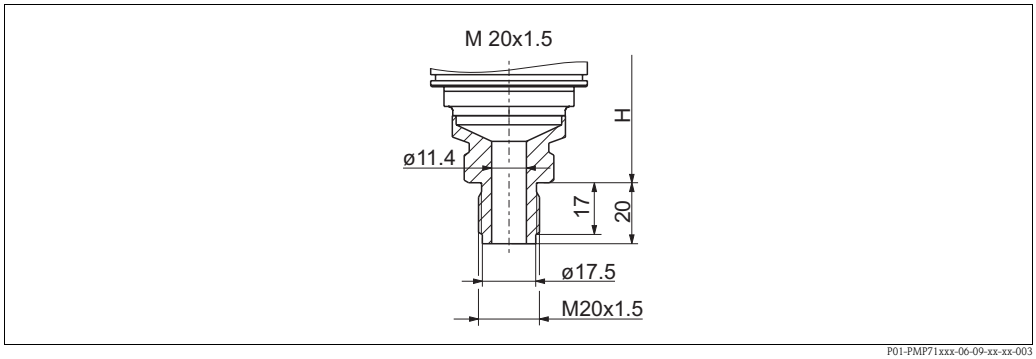
Process connections PMP71, thread ANSI
→ Installation height see page 46.

1 Thread ANSI 1/2 MNPT 1/4 FNPT;
Material version RA: AISI 316L/1.4435, version RB: Alloy C276/2.4819; Weight: 0,6 kg
2 Thread ANSI 1/2 MNPT hole 11.4;
Material version RD: AISI 316L/1.4435, version RE: Alloy C276/2.4819; Weight: 0,6 kg
3 Thread ANSI 1/2 FNPT;
Material version RH: AISI 316L/1.4435, version RJ: Alloy C276/2.4819; Weight: 0,7 kg



Process connections PMP71, thread JIS
→ Installation height H see table, below.

1 Version GL: thread JIS B0202 G 1/2 (male), material: AISI 316L/1.4435; Weight: 0,6 kg
2 Version RL: thread JIS B0203 R 1/2 (male), material: AISI 316L/1.4435; Weight: 0,6 kg

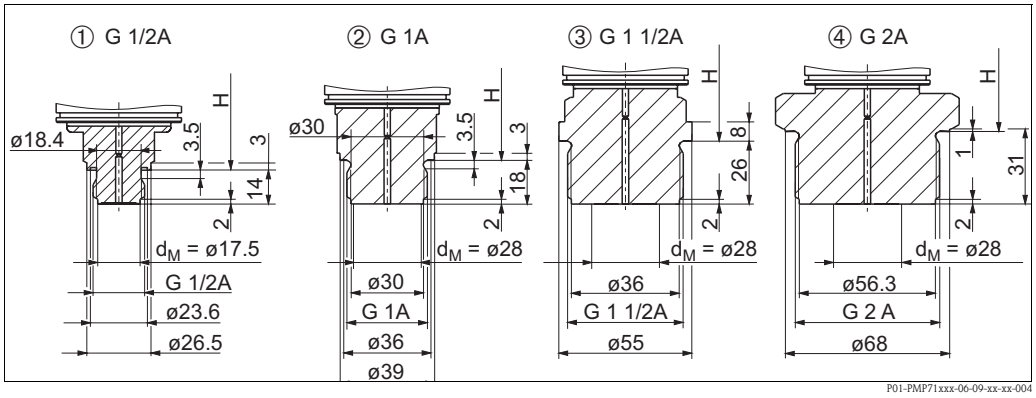


Process connections PMP71 thread DIN 13 M 20x1.5 hole 11.4 mm
Material version GP: AISI 316L/1.4435, version GQ: Alloy C276/2.4819; Weight: 0,6 kg
→ Installation height H see table, below.

Installation height H for devices with thread connection and internal flush-mounted diaphragm

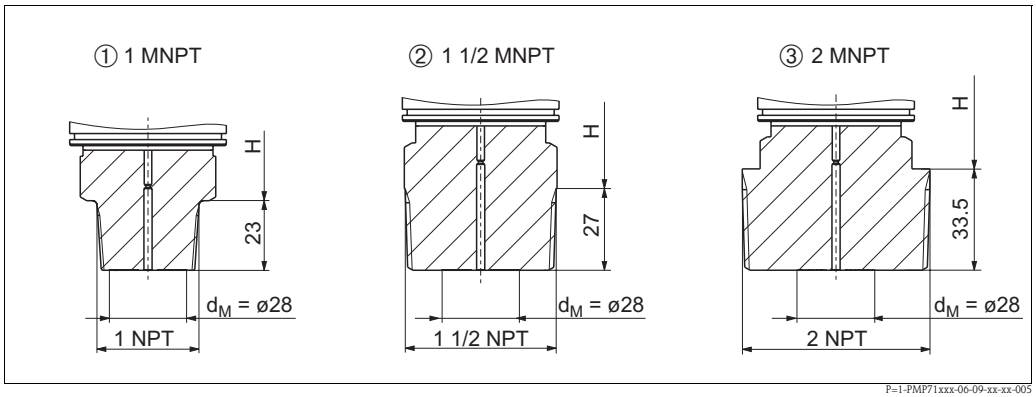
	T14 housing	**T17 housing**
Height H	165 mm	181 mm
	Note! The versions with 700 bar sensor are approx. 20 mm (0.79 inch) higher.	

Thread, flush-mounted diaphragm



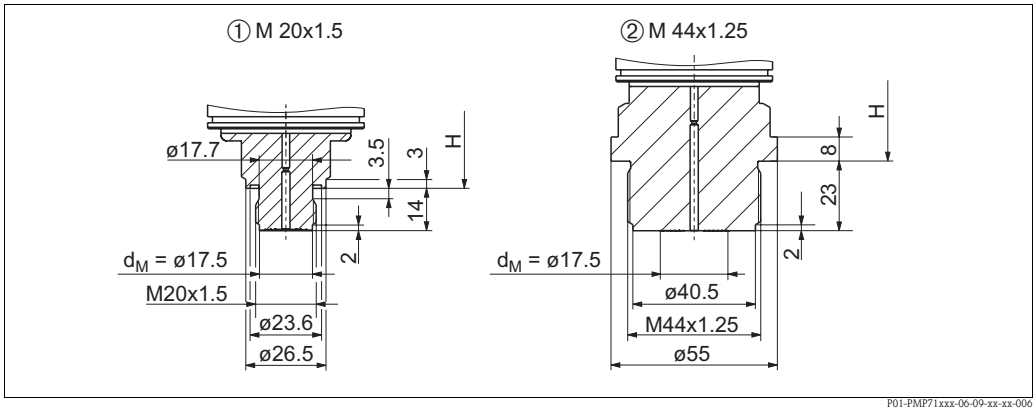
Process connections PMP71, thread ISO 228
→ Installation height see page 48.

1 Thread ISO 228 G 1/2 A DIN 3852;
Material version 1A: AISI 316L/1.4435, version 1B: Alloy C276/2.4819; Weight: 0,4 kg
2 Thread ISO 228 G 1 A;
Material version 1D: AISI 316L/1.4435, version 1E: Alloy C276/2.4819; Weight: 0,7 kg
3 Thread ISO 228 G 1 1/2 A
Material version 1G: AISI 316L/1.4435, version 1H: Alloy C276/2.4819; Weight: 1,1 kg
4 Thread ISO 228 G 2 A
Material version 1K: AISI 316L/1.4435, version 1L: Alloy C276/2.4819; Weight: 1,5 kg



Process connections PMP71, thread ANSI
→ Installation height see page 48.

1 Thread ANSI 1 MNPT;
Material version 2A: AISI 316L/1.4435, version 2B: Alloy C276/2.4819; Weight: 0,7 kg
2 Thread ANSI 1 1/2 MNPT;
Material version 2D: AISI 316L/1.4435, version 2E: Alloy C276/2.4819; Weight: 1,0 kg
3 Thread ANSI 2 MNPT
Material version 2G: AISI 316L/1.4435, version 2H: Alloy C276/2.4819; Weight: 1,3 kg



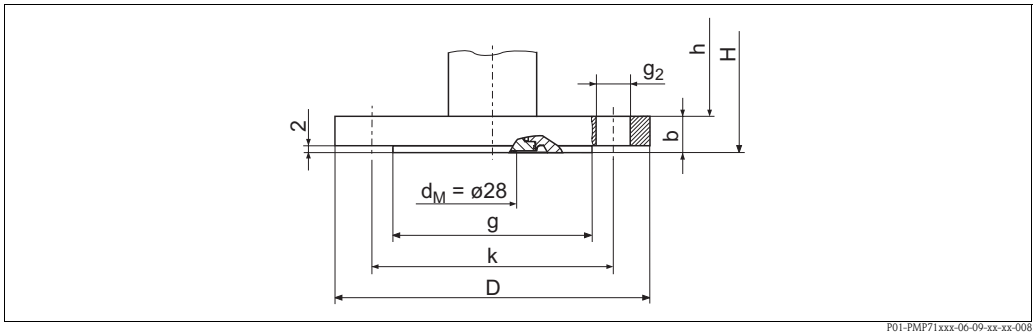
Process connections PMP71, thread DIN
→ Installation height see table, below.

1 Thread DIN 16288 M20;
Material version 1N: AISI 316L/1.4435, version 1P: Alloy C276/2.4819; Weight: 0,4 kg
2 Thread DIN 13 M 44 x 1.25;
Material version 1R: AISI 316L/1.4435, version 1S: Alloy C276/2.4819; Weight: 1,1 kg

Installation height H for devices with thread connection and flush-mounted diaphragm

Description	Housing T14	Housing T17
G 1/2	163 mm	179 mm
G 1	167 mm	183 mm
G 1 1/2 A	163 mm	179 mm
G 2 A	162 mm	178 mm
1 MNPT	162 mm	178 mm
1 1/2 MNPT	165 mm	181 mm
2 MNPT	159 mm	175 mm
M 20x1.5	163 mm	179 mm
M 44x1.25	170 mm	186 mm

EN/DIN flanges, connection dimensions as per EN 1092-1/DIN 2527



Process connection PMP71, EN/DIN flange with raised face, material AISI 316L

H: device height = height of device without flange h + flange thickness b
→ Height h see page 51.

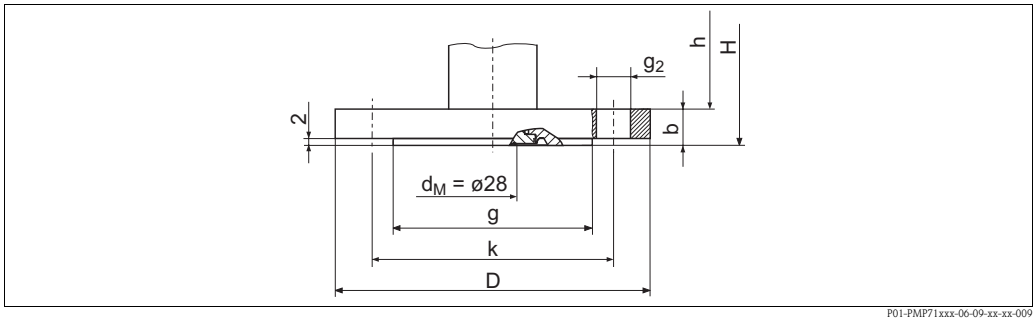
	Flange						Boltholes			
Version	**Nominal diameter**	**Nominal pressure**	**Shape** [1]	**Diameter** **D** [mm]	**Thickness** **b** [mm]	**Raised face** **g** [mm]	**Quantity**	**Diameter** **g_2** [mm]	**Hole circle** **k** [mm]	**Flange weight** [2] [kg]
CN	DN 25	PN 10-40	B1 (D)	115	18	66 [3]	4	14	85	1.2
CP	DN 32	PN 10-40	B1 (D)	140	18	77 [3]	4	18	100	1.9
CQ	DN 40	PN 10-40	B1 (D)	150	18	87 [3]	4	18	110	2.2
B3	DN 50	PN 10-40	B1 (D)	165	20	102	4	18	125	3.0
B4	DN 80	PN 10-40	B1 (D)	200	24	138	8	18	160	5.3

1) Designation as per DIN 2527 in brackets

2) Housing weight see page 66

3) With these process connections the sealing surface is smaller than described in the standard. To achieve sufficient sealing, a flat seal with a thickness < 2mm has to be selected. For further information please contact your local Endress+Hauser Sales Center.

ANSI flanges, connection dimensions as per ANSI B 16.5, raised face RF
JIS flanges, connection dimensions as per B 2220, Raised face RF



Process connection PMP71, ANSI flange or JIS flange with raised face RF; material

H: device height = height of device without flange h + flange thickness b. For the height h see page 51.

	Flange							Boltholes			
Version	**Material**	**Nominal diameter**	**Class/ Nominal pressure**	**Diameter** **D** [in] *[mm]*	**Thickness** **b** [in] *[mm]*	**Diameter raised face** **g** [in] *[mm]*	**Height raised face** **f** [in] *[mm]*	**Quantity**	**Diameter** **g_2** [in] *[mm]*	**Hole circle** **k** [in] *[mm]*	**Flange weight** [1] [kg]
ANSI flange											
AN	AISI 316/ 316L [2]	1 in	300 lb./sq.in	4.88 *124*	0.69 *17.5*	2 [3] *50,8*	0.06 *1.6*	4	0.75 *19.1*	3.5 *88.9*	1.3
AE	AISI 316/ 316L [2]	1 1/2 in	150 lb./sq.in	5 *127*	0.69 *17.5*	2,88 [3] *73,2*	0.06 *1.6*	4	0.62 *15.7*	3.88 *98.6*	1.5
AQ	AISI 316/ 316L [2]	1 1/2 in	300 lb./sq.in	6.12 *155.4*	0.81 *20.6*	2.88 [3] *73,2*	0.06 *1.6*	4	0.88 *22.4*	4.5 *114.3*	2.6
AF	AISI 316/ 316L [2]	2 in	150 lb./sq.in	6 *152.4*	0.75 *19.1*	3.62 *91.9*	0.06 *1.6*	4	0.75 *19.1*	4.75 *120.7*	2.4
AR	AISI 316/ 316L [2]	2 in	300 lb./sq.in	7.5 *190.5*	0.88 *22.3*	3.62 *91.9*	0.06 *1.6*	8	0.75 *19.1*	5 *127*	3.2
AG	AISI 316/ 316L [2]	3 in	150 lb./sq.in	7.5 *190.5*	0.94 *23.9*	5 *127*	0.06 *1.6*	4	0.75 *19.1*	6 *152.4*	4.9
AS	AISI 316/ 316L [2]	3 in	300 lb./sq.in	8.25 *209.5*	1.12 *28.4*	5 *127*	0.06 *1.6*	8	0.88 *22.4*	6.62 *168.1*	6.7
AH	AISI 316/ 316L [2]	4 in	150 lb./sq.in	9 *228.6*	0.94 *23.9*	6.19 *157.2*	0.06 *1.6*	8	0.75 *19.1*	7.5 *190.5*	7.1
AT	AISI 316/ 316L [2]	4 in	300 lb./sq.in	10 *254*	1.25 *31.8*	6.19 *157.2*	0.06 *1.6*	8	0.88 *22.4*	7.88 *200.2*	11.6
JIS flange											
KA	AISI 316L [4]	25 A	20 K	*125*	*16*	*67*	*1*	4	*19*	*90*	1.5
KF	AISI 316L [3]	50 A	10 K	*155*	*16*	*96*	*2*	4	*19*	*120*	2.0
KL	AISI 316L [3]	80 A	10 K	*185*	*18*	*127*	*2*	8	*19*	*150*	3.3
KH	AISI 316L [3]	100 A	10 K	*210*	*18*	*151*	*2*	8	*19*	*175*	4.4

1) Housing weight see page 66

2) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)

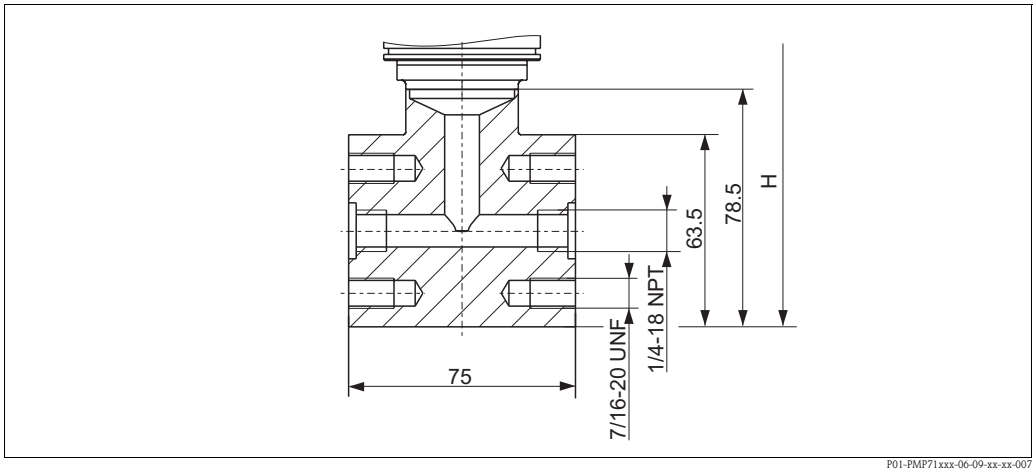
3) With these process connections the sealing surface is smaller than described in the standard. To achieve sufficient sealing, a flat seal with a thickness < 2mm has to be selected. For further information please contact your local Endress+Hauser Sales Center.

4) AISI 316L/1.4435

Height h for devices with flange

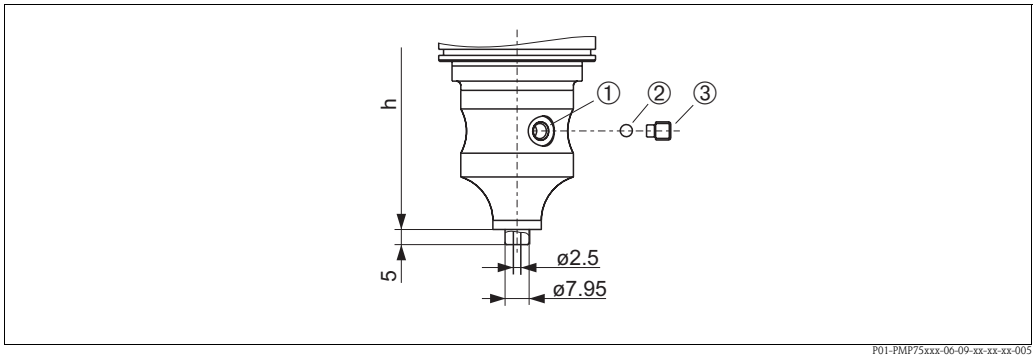
	T14 housing	T17 housing
Height h	165 mm	181 mm

Oval flange



Version UR: oval flange adapter 1/4-18 NPT according to IEC 61518, mounting: 7/16-20 UNF; Weight: 1,9 kg

Prepared for diaphragm seal mount

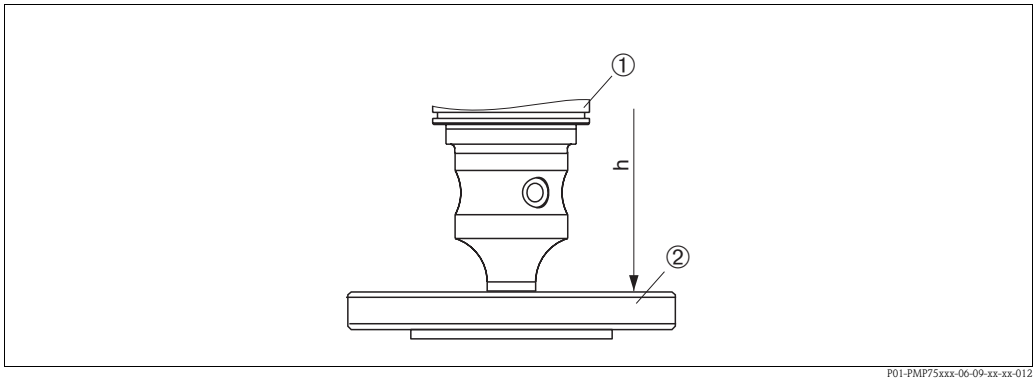


Version U1: prepared for diaphragm seal mount

1 Hole for filling fluid
2 Bearing
3 Threaded pin with an internal hexagon 4 mm

	T14 housing	T17 housing
Height h	190 mm	204 mm

PMP75 Basic unit



P01-PMP75xxx-06-09-xx-xx-012

PMP75 Basic unit with diaphragm seal

1 PMP75 Basic unit
2 Diaphragm seal, here e.g. flange diaphragm seal

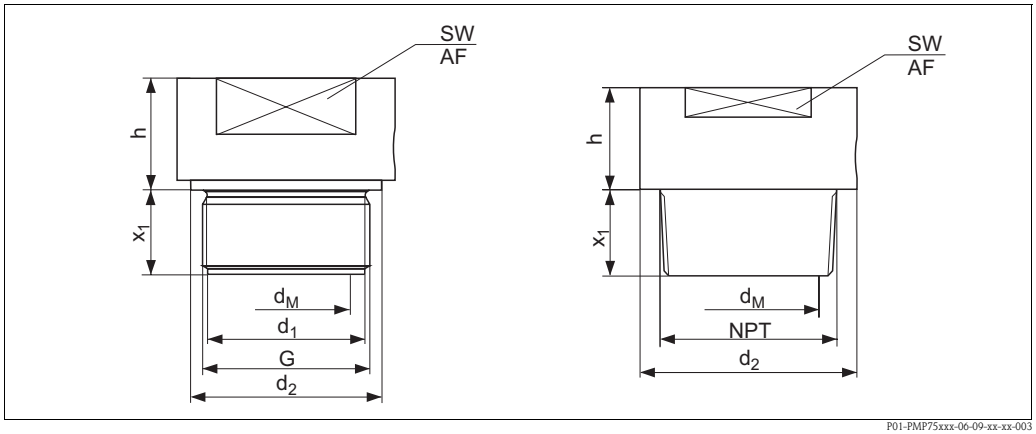
	T14 housing	**T17 housing**
Height	190 mm	204 mm

Process connections PMP75 (with metallic measuring diaphragm)

Note!

- Some device versions have CRN approval. For a CRN-approved device, a CRN-approved process connection (→ see page 86, feature 70 "Process connection") has to be ordered with a CSA approval (→ see page 85, feature 10 "Approval"). Devices with capillary are not CRN-approved. These devices are fitted with a separate plate bearing the registration number 0F10525.5C.
- Specifications for the "T_K Process" are listed in the following tables. These are typical values. The temperature coefficients apply to silicone oil and the membrane material AISI 316L/1.4435. For other filling oils, this temperature coefficient must be multiplied by the T_K correction factor of the corresponding filling oil. For the T_K correction factors, see page 69, section "Diaphragm seal filling oils".
- With regard to the temperature coefficient "T_K Ambient", devices with a temperature isolator behave like devices with the same process connection with 0,1 m capillary.
- In addition, the temperature coefficient "T_K Ambient" is listed in relation to the capillary length for the diaphragm seal versions which can be supplied with capillaries as standard. This information is found on page 69 ff, section "Influence of the temperature on the zero point".
- The weights of the diaphragm seals are given in the tables. See page 66 for the weight of the housing.
- The following drawings are drawings that illustrate how the system works in principle. In other words, the dimensions of a diaphragm seal supplied can deviate from the dimensions given in this document.

Thread, flush-mounted diaphragm



Process connections PMP75, left: thread ISO 228, right: thread ANSI

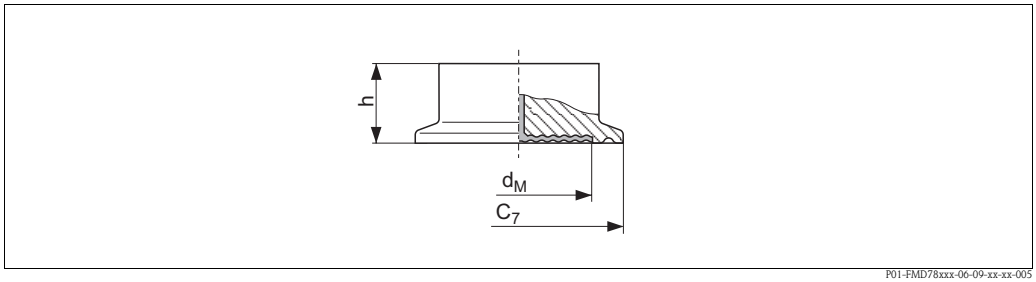
Threaded connection								Diaphragm seal					
Version	**Material** [1]	**Thread**	**Nominal pressure**	**Diameter**	**Diameter**	**Screw-in length**	**Across flats**	**max. Diaphragm diameter**	**T_K Ambient ≤ 40 bar**	**T_K Ambient > 40 bar**	**T_K Process**	**Height**	**Diaphragm seal weight**
			PN	**d_1**	**d_2**	**x_1**	**SW/AF**	**d_M**				**h**	
				[mm]	[mm]	[mm]		[mm]	[mbar/10 K]			[mm]	[kg]
1D	AISI 316L	G 1 A	400	30	39	21 [2]	41	30	+16.03	+24.33	+4.70	19	0.4
1E	Alloy C276								–	–	–		0.5
1G	AISI 316L	G 1 1/2 A	400	44	55	30	50	42	+5.4	+8.18	+3.50	20	0.9
1H	Alloy C276								–	–	–		1.0
1K	AISI 316L	G 2	400	56	68	30	65	50	+1.76	+2.68	+1.60	20	1.9
1L	Alloy C276								–	–	–		2.1
2A	AISI 316L	1 MNPT	400	–	48	28	41	24	+15.66	+24.42	+8.50	37	0.6
2B	Alloy C276								–	–	–		0.7
2D	AISI 316L	1 1/2 MNPT	400	–	52	30	46	36	+8.14	+12.39	+3.90	20	0.9
2E	Alloy C276								–	–	–		1.0
2G	AISI 316L	2 MNPT	400	–	78	30	65	38	+5.4	+8.18	+2.59	35	1.8
2H	Alloy C276								–	–	–		2,0

1) AISI 316L/1.4435; Alloy C276/2.4819

2) 28 mm in conjucntion with high temperature oil

Note!
With the use of high temperature oils the design can deviate strongly.
For further information please contact your local Endress+Hauser Sales Center.

Tri-Clamp ISO 2852

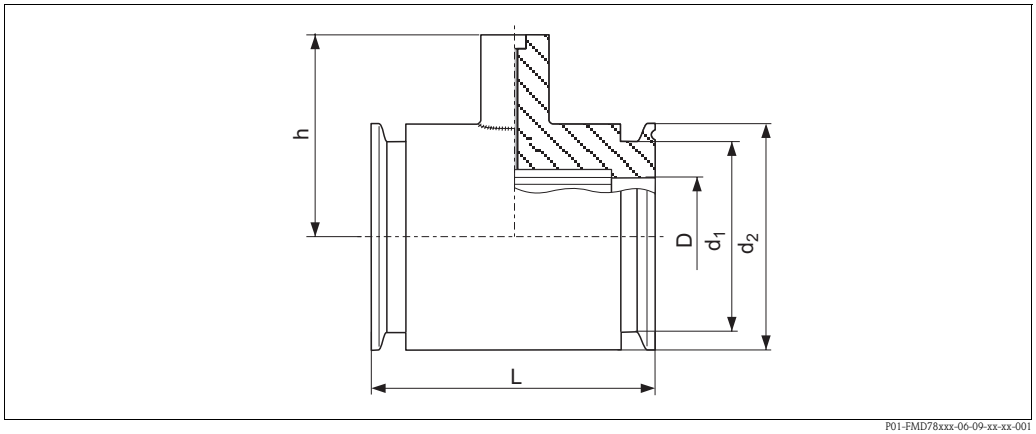


Process connection PMP75, material: AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Nominal diameter ISO 2852	Nominal diameter DIN 32676	Nominal diameter	Diameter C_7	max. Diaphragm diameter d_M	Height h	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	Diaphragm seal weight
			[in]	[mm]	[mm]	[mm]	[mbar/10 K]			[kg]
TB	DN 25	DN 25	1	50.5	24	37	+15.33	+24.0	+4.25	0.32
TC [1]	DN 38	DN 40	1 1/2	50.5	34	30	+8.14	+12.39	+1.91	1.0
TD [1]	DN 51	DN 50	2	64	48	30	+3.45	+4.81	+1.25	1.1
TF	DN 76.1	–	3	91	73	30	+0.3	+0.35	+0.18	1.2

1) Diaphragm seal versions in conformity with ASME-BPE for use in biochemical processes, wetted surfaces $R_a \leq 0.4$ µm (15.75 µin; 180 grit), electropolished; to be ordered using feature 60 "Additional option", version "P" in the order code

Tri-Clamp pipe diaphragm seal ISO 2852

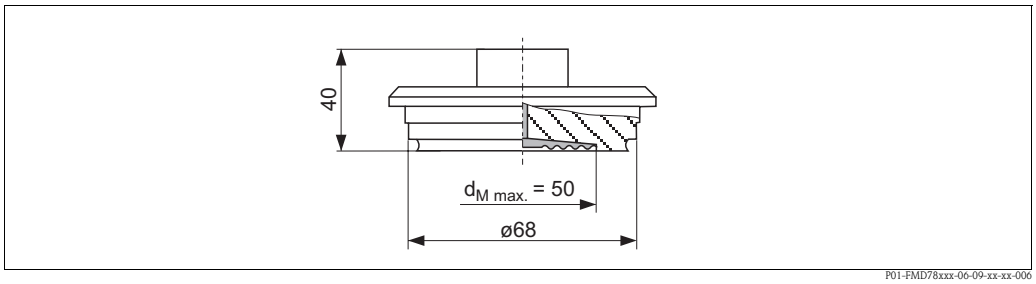


Process connection PMP75, material AISI 316L, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Nominal diameter ISO 2852	Nominal diameter	Diameter D [in]	Diameter d_1 [mm]	Diameter d_2 [mm]	Height h [mm]	Face-to-face-length L [mm]	T_K Ambient ≤ 40 bar [mbar/10 K]	T_K Ambient > 40 bar [mbar/10 K]	T_K Process [mbar/10 K]	Diaphragm seal weight [kg]
SB	DN 25	1	22.5	43.5	50.5	67	126	+7.75	+8.69	+4.49	1.7
SC [1]	DN 38	1 1/2	35.5	43.5	50.5	67	126	+5.17	+5.69	+3.46	1.0
SD [1]	DN 51	2	48.6	56.5	64	79	100	+3.56	+3.91	+2.69	1.7

1) Including 3.1 and pressure test as per Pressure Equipment Directive, category II

Varivent N for pipes DN 40 – DN 162

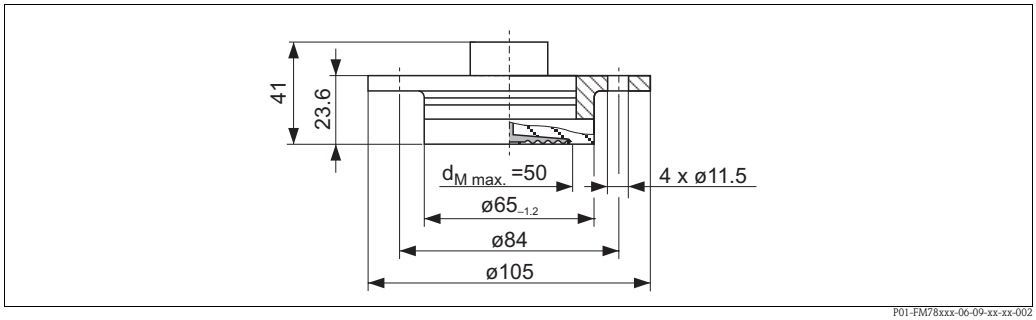


Process connection PMP75, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Material	Nominal pressure	T_K Ambient ≤ 40 bar [mbar/10 K]	T_K Ambient > 40 bar [mbar/10 K]	T_K Process [mbar/10 K]	Diaphragm seal weight [kg]
TR [1]	AISI 316L/ 1.4435	PN 40	+2.26	+3.11	+1.65	1.3

1) Diaphragm seal versions in conformity with ASME-BPE for use in biochemical processes, wetted surfaces $R_a \leq 0.4$ µm (15.75 µin; 180 grit), electropolished; to be ordered using feature 60 "Additional option", version "P" in the order code

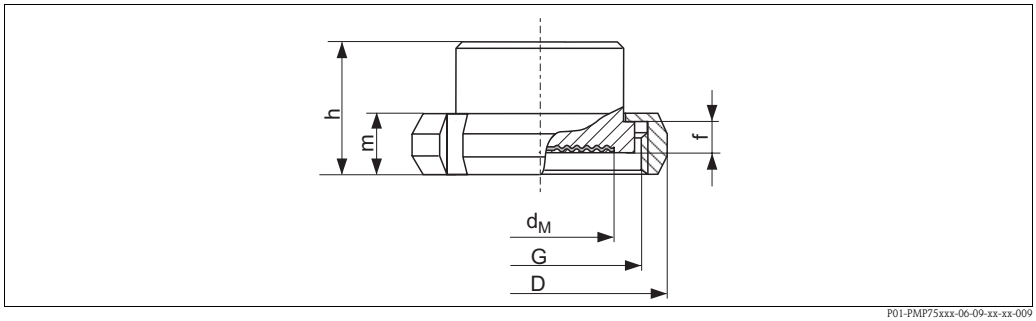
DRD DN50 (65 mm)



Process connection PMP75, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Material	Nominal pressure	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	Diaphragm seal weight
			[mbar/10 K]			[kg]
TK	AISI 316L/ 1.4435	PN 25	+2.26	+3.11	+1.65	0,75

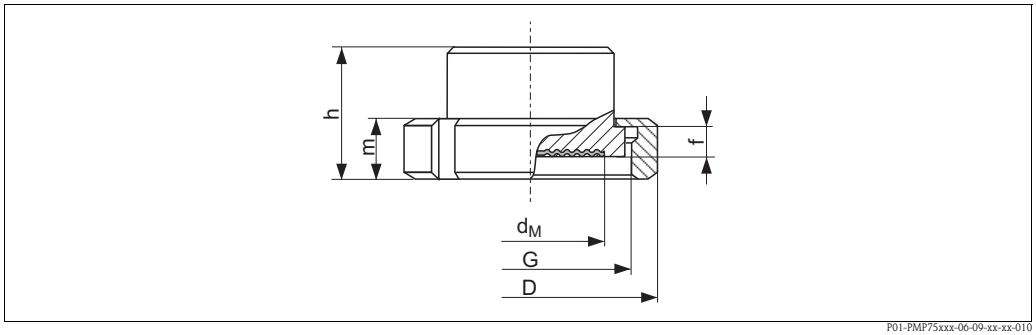
SMS nozzles with coupling nut



Process connection PMP75, material AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Nominal diameter	Nominal pressure	Dia-meter	Adapter height	Thread	Height	Height	max. dia-phragm diameter	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	Weight dia-phragm seal
			D	f	G	m	h	d_M				
	[inch]	[bar]	[mm]	[mm]		[mm]	[mm]	[mm]		[mbar/10 K]		[kg]
TG	1	PN 25	54	3,5	Rd 40 – 1/6	20	42.5	24	+15.66	+24.22	+7.25	0.25
TH	1 1/2	PN 25	74	4	Rd 60 – 1/6	25	57	36	+8.18	+12.39	+2.59	0.65
TI	2	PN 25	84	4	Rd 70 – 1/6	26	62	48	+5.4	+8.18	+1.10	1.05

APV-RJT nozzles with coupling nut

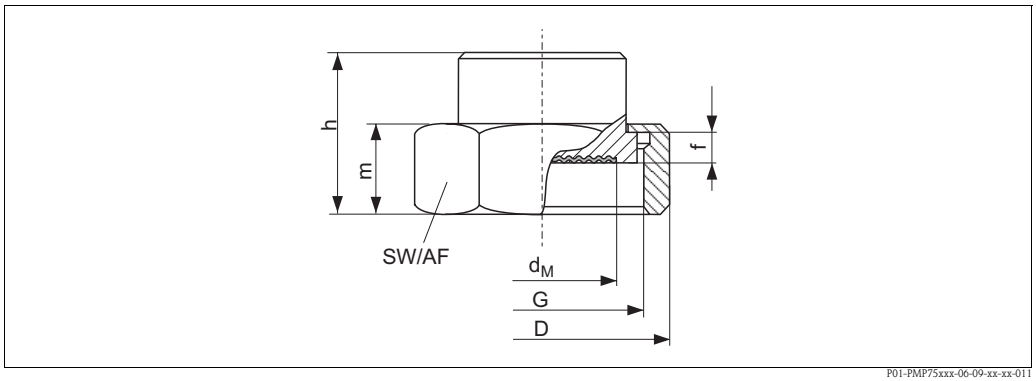


P01-PMP75xxx-06-09-xx-xx-010

Process connection PMP75, material AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Height	max. diaphragm diameter	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	Weight diaphragm seal
		PN	D	f	G	m	h	d_M				
	[inch]	[bar]	[mm]	[mm]		[mm]	[mm]	[mm]	[mbar/10 K]			[kg]
TL	1	PN 40	77	6.5	1 13/16 – 1/8"	22	42.6	21	+15.66	+24.42	+4.21	0.45
TM	1 1/2	PN 40	72	6.4	2 5/16 – 1/8"	22	42.6	28	+8.18	+12.39	+2.59	0.75
TN	2	PN 40	86	6.4	2 7/8 – 1/8"	22	42.6	38	+5.4	+8.18	+1.76	1.2

APV-ISS nozzles with coupling nut

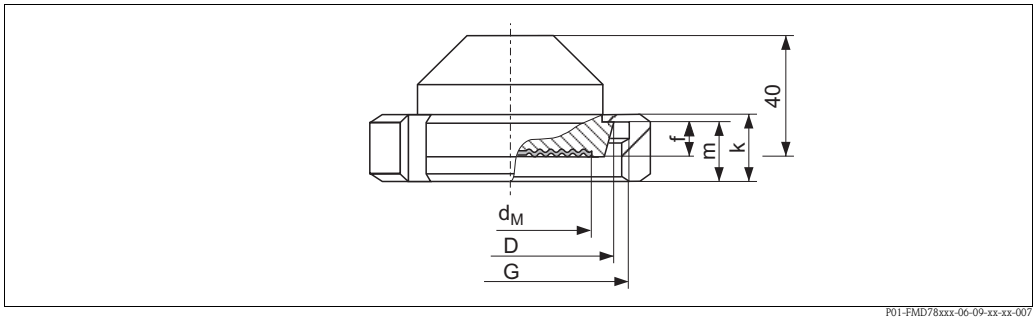


P01-PMP75xxx-06-09-xx-xx-011

Process connection PMP75, material AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

Version	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Across flat	Height	max. diaphragm seal	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	Weight Diaphragm seal
			D	f	G	m	AF	h	d_M				
	[inch]	[bar]	[mm]	[mm]		[mm]		[mm]	[mm]	[mbar/10 K]			[kg]
TP	1	PN 40	54.1	4	1 1/2" – 1/8"	30	46.8	50	24	+15.66	+24.42	+4.21	0.4
TQ	1 1/2	PN 40	72	4	2" – 1/8"	30	62	50	34	+8.14	+12.39	+2.59	0.6
TS	2	PN 40	89	4	2 1/2" – 1/8"	30	77	50	45	+5.4	+8.18	+1.76	1.1

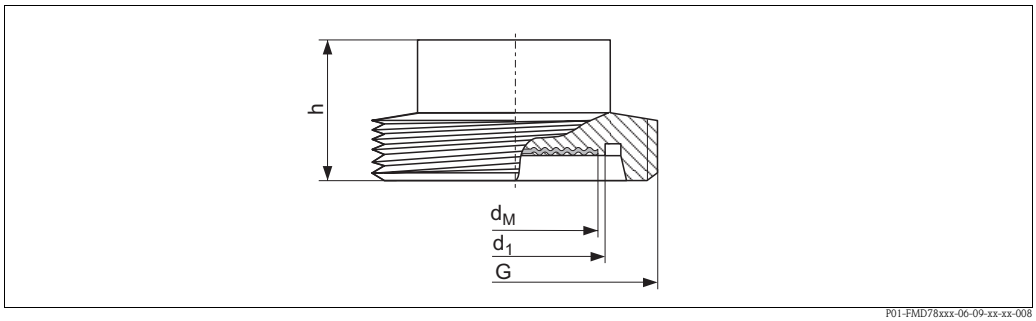
Taper adapter with coupling nut, DIN 11851



Process connection PMP75, material AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

	Taper adapter				Slotted nut			Diaphragm seal				
Version	**Nominal diameter**	**Nominal pressure**	**Diameter** **D** [mm]	**Adapter height** **f** [mm]	**Thread** **G**	**Height** **k** [mm]	**Height** **m** [mm]	**max. Diaphragm diameter** d_M [mm]	T_K **Ambient ≤ 40 bar** [mbar/10 K]	T_K **Ambient > 40 bar** [mbar/10 K]	T_K **Process** [mbar/10 K]	**Diaphragm seal weight** [kg]
MR	DN 50	PN 25	68.5	11	Rd 78 x 1/6"	22	19	52	+2.21	+3.02	+1.40	1.1
MS	DN 65	PN 25	86	12	Rd 95 x 1/6"	35	21	66	+1.6	+2.1	+0.60	2.0
MT	DN 80	PN 25	100	12	Rd 110 x 1/4"	30	26	81	+0.66	+0.81	+0.40	2.55

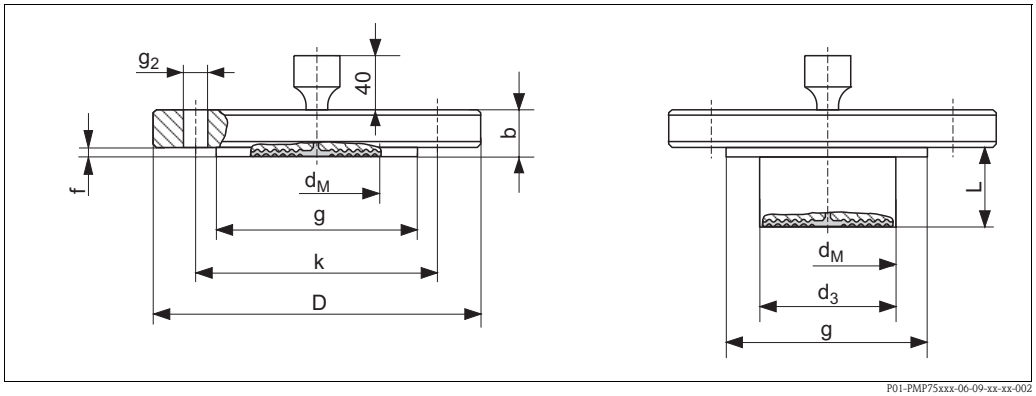
Threaded adapter, DIN 11851



Process connection PMP75, material AISI 316L/1.4435, surface roughness of the surfaces in contact with the medium $R_a \leq 0.8$ µm as standard. Lower surface roughness on request.

	Threaded adapter					Diaphragm seal				
Version	**Nominal diameter**	**Nominal pressure**	**Diameter** d_1 [mm]	**Thread** **G**	**Height** **h** [mm]	**max. Diaphragm diameter** d_M [mm]	T_K **Ambient ≤ 40 bar** [mbar/10 K]	T_K **Ambient > 40 bar** [mbar/10 K]	T_K **Process** [mbar/10 K]	**Diaphragm seal weight** [kg]
M3	DN 50	PN 25	54	Rd 78 x 1/6"	35	52	+2.21	+3.02	+0.88	0.9
M4	DN 65	PN 25	71	Rd 95 x 1/6"	40	66	+1.6	+2.1	+0.60	1.7
M5	DN 80	PN 25	85	Rd 110 x 1/4"	40	81	+0.66	+0.81	+0.40	2.0

EN/DIN flanges, connection dimensions as per EN 1092-1/DIN 2527 and DIN 2501-1



Process connection PMP75, EN/DIN flange with flush-mounted diaphragm, material AISI 316L

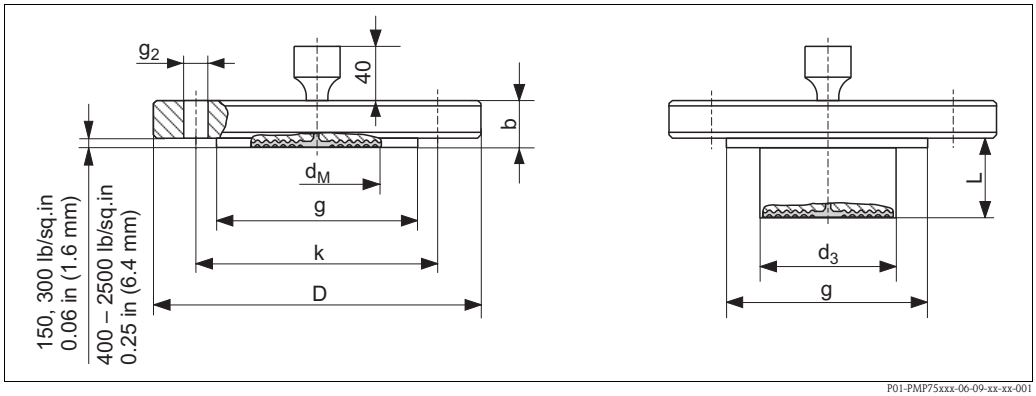
	Flange							Boltholes			Diaphragm seal				
Version	**Nominal diameter**	**Nominal pressure**	**Shape** [1]	**Diameter** D [mm]	**Thickness** b [mm]	**Raised face** g [mm]	**Raised face** f [mm]	**Quantity**	**Diameter** g_2 [mm]	**Hole circle** k [mm]	**max. Diaphragm diameter** d_M [mm]	T_K Ambient ≤ 40 bar [mbar/10 K]	T_K Ambient > 40 bar [mbar/10 K]	T_K Process [mbar/10 K]	**Diaphragm seal weight** [kg]
CN	DN 25	PN 10-40	B1 (D)	115	18	66	3	4	14	85	32	+16.03	+24.33	+3.20	2.1
DN	DN 25	PN 63-160	E	140	24	68	2	4	18	100	28	+16.03	+24.33	+3.20	2.5
EN	DN 25	PN 250	E	150	28	68	2	4	22	105	28	+16.03	+24.33	+5.17	3.7
E1	DN 25	PN 400	E	180	38	68	2	4	26	130	28	+16.03	+24.33	+5.17	7.0
CP	DN 32	PN 10-40	B1 (D)	140	18	77	2.6	4	18	100	34	+8.14	+12.39	+2.59	1.9
CQ	DN 40	PN 10-40	B1 (D)	150	18	87	2.6	4	18	110	48	+5.40	+8.18	+2.15	2.2
B3	DN 50	PN 10-40	B1 (D)	165	26	102	3	4	18	125	59	+2.21	+3.02	+1.50	3.0
C3	DN 50	PN 63	B2 (E)	180	26	102	3	4	22	135	59	+2.21	+3.02	+1.00	4.6
EF	DN 50	PN 100/ 160	E	195	30	102	3	4	26	145	59	+2.21	+3.02	+1.00	6.2
ER	DN 50	PN 250	E	200	38	102	3	8	26	150	59	+2.21	+3.02	+1.15	7.7
E3	DN 50	PN 400	E	235	52	102	3	8	30	180	59	+2.21	+3.02	+1.15	14.7
B4	DN 80	PN 10-40	B1 (D)	200	24	138	3.5	8	18	160	89	+0.19	+0.25	+0.20	5.3
C4	DN 80	PN 100	B2 (E)	230	32	138	4	8	24	180	89	+0.19	+0.25	+0.35	8.9
C5	DN 100	PN 100	B2 (E)	265	36	175	5	8	30	210	89	+0.19	+0.25	+0.11	13.7
D3 [2]	DN 50	PN 10-40	B1 (D)	165	20	102	3	4	18	125	47	+3.45	+4.81	+1.67	[2]
D4 [2]	DN 80	PN 10-40	B1 (D)	200	24	138	3.5	8	18	160	72	+0.19	+0.25	+0.70	[2]

1) Designation as per DIN 2527 in brackets

2) 50 mm, 100 mm or 200 mm extension selectable, for extension diameter and weight see the following table

Version	**Nominal diameter**	**Nominal pressure**	**Extension length** [mm]	**Extension diameter** [mm] d3	**Diaphragm seal weight** [kg]
D3	DN 50	PN 10-40	50 / 100 / 200	48.3	3.2 / 3.8 / 4.4
D4	DN 80	PN 10-40	50 /100 / 200	76	6.2 / 6.7 / 7.8

ANSI flanges B 16.5 RF



Process connection PMP75, ANSI flange B 16.5 RF with and without extended diaphragm seal

	Flange						Boltholes			Diaphragm seal				
Version	**Material**	**Nominal diameter**	**Class**	**Diameter**	**Thickness**	**Raised face**	**Quantity**	**Diameter**	**Hole circle**	**max. Diaphragm diameter**	**T_K Ambient**		**T_K Process**	**Diaphragm seal weight**
				D	**b**	**g**		**g_2**	**k**	**d_M**	**≤ 40 bar**	**> 40 bar**		
		[in]	[lb./ sq.in]	[in] *[mm]*	[in] *[mm]*	[in] *[mm]*		[in] *[mm]*	[in] *[mm]*	[in] *[mm]*	[mbar/10 K]			[kg]
AC	AISI 316/ 316L [1]	1	150	4.25 *108*	0.56 *14.2*	2 *50.8*	4	0.62 *15.7*	3.12 *79.2*	1.26 *32*	+16.03	+24.33	+3.65	1.2
AN	AISI 316/ 316L [1]	1	300	4.88 *124*	0.69 *17.5*	2 *50.8*	4	0.75 *19.1*	3.5 *88.9*	1.26 *32*	+16.03	+24.33	+3,65	1.3
HC	AISI 316/ 316L [1]	1	400/ 600	4.88 *124*	0.69 *17.5*	2 *50.8*	4	0.75 *19.1*	3.5 *88.9*	1.26 *32*	+16.03	+24.33	+5.17	1.4
HN	AISI 316/ 316L [1]	1	900/ 1500	5.88 *149.4*	1.12 *28.4*	2 *50.8*	4	1 *25.4*	4 *101.6*	1.26 *32*	+16.03	+24.33	+5.17	3.2
HO	AISI 316/ 316L [1]	1	2500	6.25 *158.8*	1.38 *35.1*	2 *50.8*	4	1 *25.4*	4.25 *108*	1.26 *32*	+16.03	+24.33	+5.17	4.6
AE	AISI 316/ 316L [1]	1 1/2	150	5 *127*	0.69 *17.5*	2.88 *73.2*	4	0.62 *15.7*	3.88 *96.6*	1.89 *48*	+8.14	+12.39	+1.90	1.5
AQ	AISI 316/ 316L [1]	1 1/2	300	6.12 *155.4*	0.81 *20.6*	2.88 *73.2*	4	0.88 *22.4*	4.5 *114.3*	1.89 *48*	+8.14	+12.39	+2.59	2.6
AF	AISI 316/ 316L [1]	2	150	6 *152.4*	0.75 *19.1*	3.62 *91.9*	4	0.75 *19.1*	4.75 *120.7*	2.32 *59*	+2.21	+3.02	+1.60	2.2
J3 [2]	AISI 316/ 316L [1]	2	150	6 *152.4*	0.75 *19.1*	3.62 *91.9*	4	0.75 *19.1*	4.75 *120.7*	1.85 *47*	+3.45	+4.81	+1.67	[2]
AR	AISI 316/ 316L [1]	2	300	6.5 *165.1*	0.88 *22.4*	3.62 *91.9*	8	0.75 *19.1*	5 *127*	2.32 *59*	+2.21	+3.02	+0.85	3.4
HF	AISI 316/ 316L [1]	2	400/ 600	6.5 *165.1*	1 *25.4*	3.62 *91.9*	8	0.75 *19.1*	5 *127*	2.32 *59*	+2.21	+3.02	+0.85	4.3
HR	AISI 316/ 316L [1]	2	900/ 1500	8.5 *215.9*	1.5 *38.1*	3.62 *91.9*	8	1 *25.4*	6.5 *165.1*	2.32 *59*	+2.21	+3.02	+0.75	10.3
H3	AISI 316/ 316L [1]	2	2500	9.25 *235*	2 *50.8*	3.62 *91.9*	8	1.12 *28.4*	6.75 *171.5*	2.32 *59*	+2.21	+3.02	+0.75	15.8
AG	AISI 316/ 316L [1]	3	150	7.5 *190.5*	0.94 *23.9*	5 *127*	4	0.75 *19.1*	6 *152.4*	3.50 *89*	+0.19	+0.25	+0.18	5.1
AS	AISI 316/ 316L [1]	3	300	8.25 *209.5*	1.12 *28.4*	5 *127*	8	0.75 *19.1*	6 *152.4*	3.5 *89*	+0.19	+0.25	+0.11	7.0

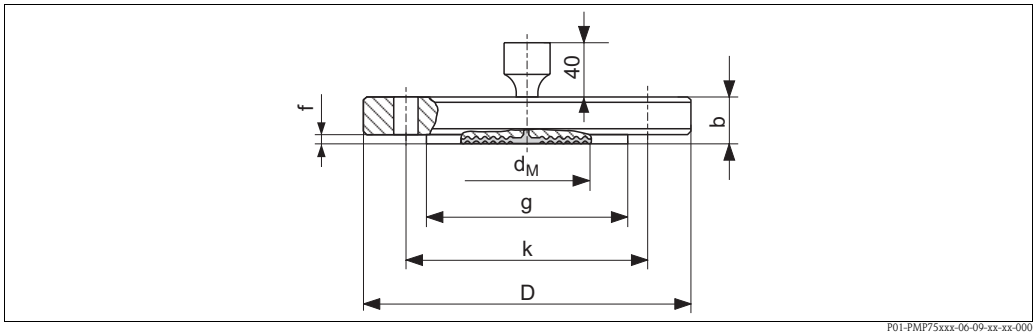
	Flange						Boltholes			Diaphragm seal				
Version	**Material**	**Nominal diameter**	**Class**	**Diameter** **D**	**Thickness** **b**	**Raised face** **g**	**Quantity**	**Diameter** g_2	**Hole circle** **k**	**max. Diaphragm diameter** d_M	T_K Ambient ≤ 40 bar	T_K Ambient > 40 bar	T_K Process	**Diaphragm seal weight**
		[in]	[lb./sq.in]	[in] *[mm]*	[in] *[mm]*	[in] *[mm]*		[in] *[mm]*	[in] *[mm]*	[in] *[mm]*	[mbar/10 K]			[kg]
J4 [3]	AISI 316/ 316L [1]	3	150	7.5 *190.5*	0.94 *23.9*	5 *127*	4	0.75 *19.1*	6 *152.4*	2.83 *72*	+0.19	+0.25	+0.70	[2]
J7 [3]	AISI 316/ 316L [1]	3	300	8.25 *209.5*	1.12 *28.4*	5 *127*	8	0.88 *22.4*	6.62 *168.1*	2.83 *72*	+0.19	+0.25	+0.70	[2]
AH	AISI 316/ 316L [1]	4	150	9 *228.6*	0.94 *23.9*	6.19 *157.2*	8	0.75 *19.1*	7.5 *190.5*	3.50 *89*	+0.19	+0.25	+0.33	7.2
AT	AISI 316/ 316L [1]	4	300	10 *254*	1.25 *31.8*	6.19 *157.2*	8	0.88 *22.4*	7.88 *200.2*	3.50 *89*	+0.19	+0.25	+0.11	11.7
J5 [3]	AISI 316/ 316L [1]	4	150	9 *228.6*	0.94 *23.9*	6.19 *157.2*	8	0.75 *19.1*	7.5 *190.5*	3.50 *89*	+0.19	+0.25	+0.11	[2]
J8 [3]	AISI 316/ 316L [1]	4	300	10 *254*	1.25 *31.8*	6.19 *157.2*	8	0.88 *22.4*	7.88 *200.2*	3.50 *89*	+0.19	+0.25	+0.11	[2]

1) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)

2) 2", 4", 6" or 8" extension selectable, for extension diameter and weight see the following table

Version	**Nominal diameter** [in]	**Class** [lb./sq.in]	**Extension length (L)** [in] *[(mm)]*	**Extension diameter** [in] *[(mm)]*	**Diaphragm seal weight** [kg]
J3	2	150	– 2 *(50.8)* – 4 (101.6) – 6 *(152.4)* – 8 *(203.2)*	1.9 *(48.3)*	– 3.0 – 3.4 – 3.9 – 4.4
J4	3	150	– 2 *(50.8)* – 4 (101.6) – 6 *(152.4)* – 8 *(203.2)*	2.99 *(75.9)*	– 6.0 – 6.6 – 7.1 – 7.8
J7	3	300	– 2 *(50.8)* – 4 (101.6) – 6 *(152.4)* – 8 *(203.2)*	2.99 *(75.9)*	– 7.9 – 8.5 – 9.0 – 9.6
J5	4	150	– 2 *(50.8)* – 4 (101.6) – 6 *(152.4)* – 8 *(203.2)*	3.7 *(94)*	– 8.6 – 9.9 – 11.2 – 12.4
J8	4	300	– 2 *(50.8)* – 4 (101.6) – 6 *(152.4)* – 8 *(203.2)*	3.7 *(94)*	– 13.1 – 14.4 – 15.7 – 16.9

JIS flange B 2220

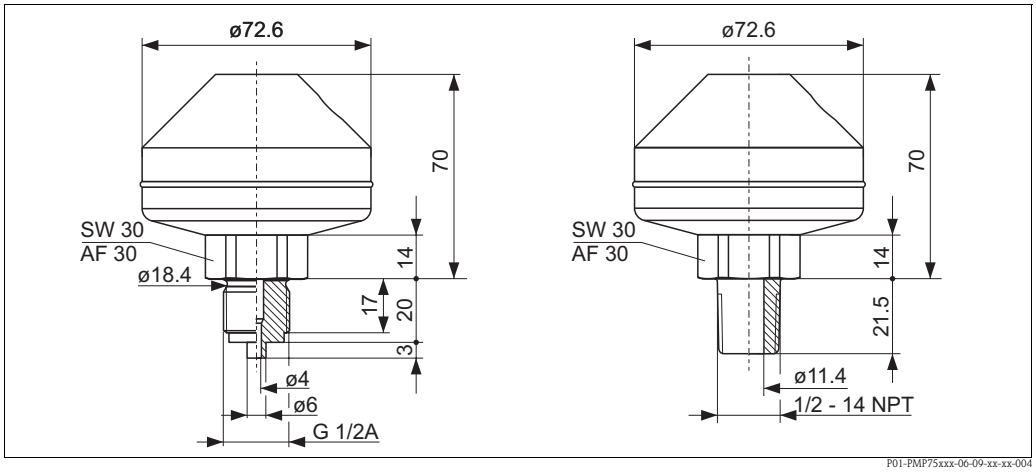


Process connection PMP75, JIS flange, material AISI 316L

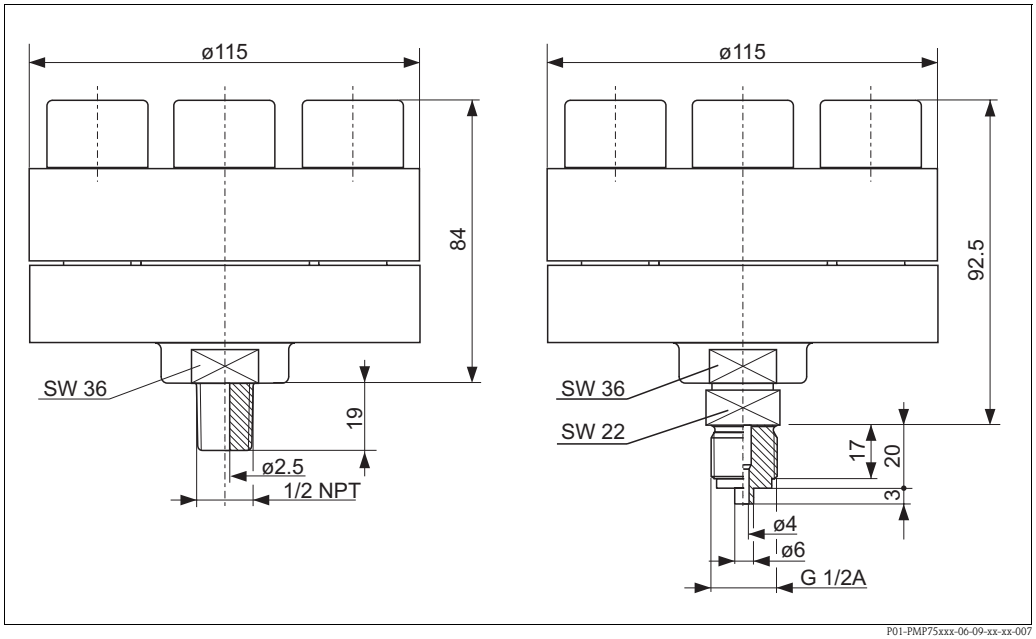
	Flange						Boltholes			Diaphragm seal				
Version	**Nominal diameter**	**Nominal pressure**	**Diameter** **D** [mm]	**Thickness** **b** [mm]	**Diameter raised face** **g** [mm]	**Height raised face** **f** [mm]	**Quantity**	**Diameter** **g_2** [mm]	**Hole circle** **k** [mm]	**max. Diaphragm diameter** **d_M** [mm]	**T_K Ambient** ≤ 40 bar [mbar/10 K]	**T_K Ambient** > 40 bar [mbar/10 K]	**T_K Process** [mbar/10 K]	**Diaphragm seal weight** [1] [kg]
KC	25 A	10 K	125	14	67	1	4	19	90	32	+16.03	+24.33	+5.17	1.5
KF	50 A	10 K	155	16	96	2	4	19	120	59	+2.21	+3.02	+1.00	2.3
KL	80 A	10 K	185	18	127	2	8	19	150	89	+0.19	+0.25	+0.11	3.3
KH	100 A	10 K	210	18	151	2	8	19	175	89	+0.19	+0.25	+0.11	4.4

1) Housing weight see page 66

Thread ISO 228 G 1/2 A and ANSI 1/2 MNPT, seperator



Process connection PMP75, versions "UA" and "UB", welded, material AISI 316L

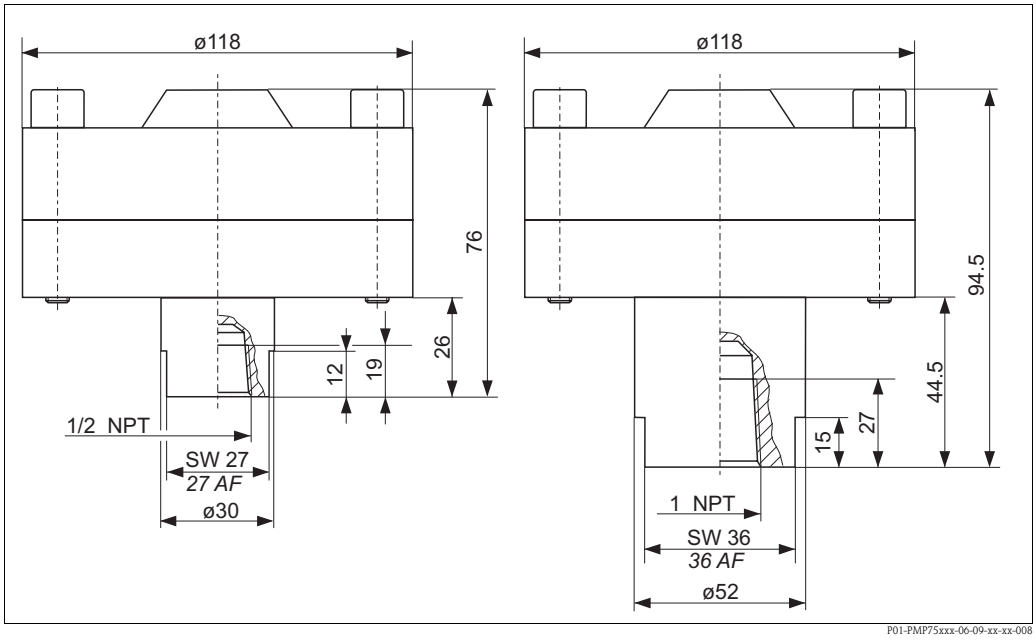


Process connection PMP75, versions "UC" and "UD", screwed, with integrated sealing lip, material AISI 316L

Version	Description	Nominal pressure	T_K Ambient	T_K Process	Diaphragm seal weight
			[mbar/10 K]		[kg]
UA	ISO 228 G 1/2 A	PN 160	+0.9	+0.30	1.43
UB	ANSI 1/2 MNPT	PN 160	+0.9	+0.30	1.43
UC	ISO 228 G 1/2 B	PN 400	+3.45	+1.28	4.75
DU	ANSI 1/2 MNPT	PN 400	+3.45	+1.28	4.75

Note!
With the use of high temperature oils the design can deviate strongly.
For further information please contact your local Endress+Hauser Sales Center.

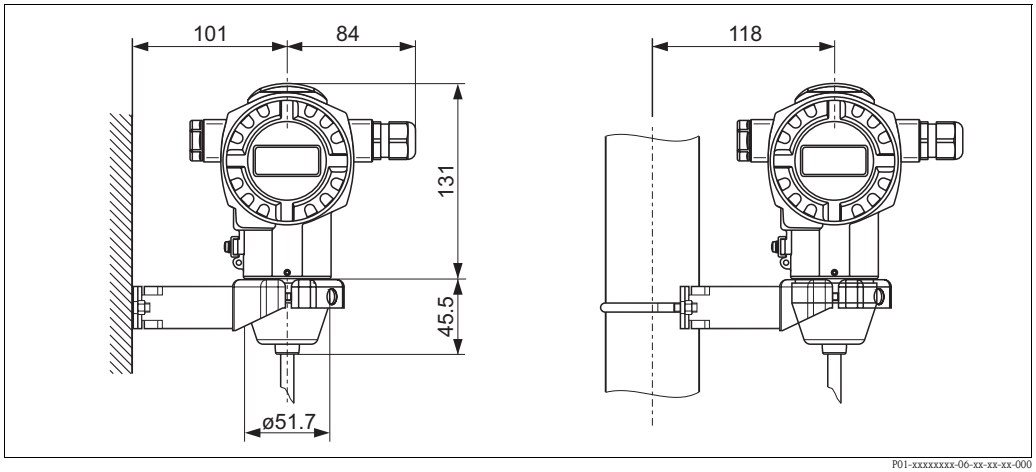
Thread 1/2 NPT und 1 NPT, seperator



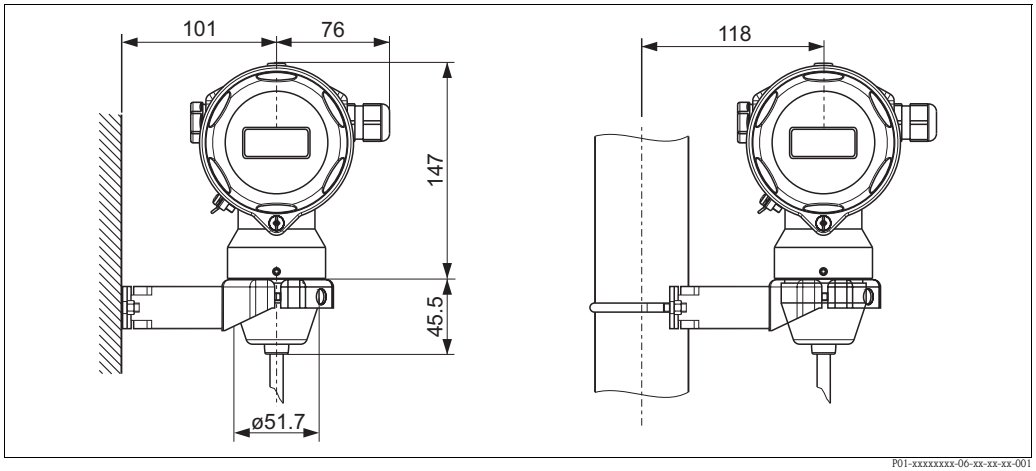
Process connection PMP75, versions "UG" and "UL", screwed, material AISI 316L , seal Viton

Version	**Description**	**Nominal pressure**	**T_K Ambient**	**T_K Process**	**Diaphragm seal weight**
			[mbar/10 K]		[kg]
UG	1/2 NPT	PN 250	+3.45	+1.28	4.75
UH	1 NPT	PN 250	+3.45	+1.28	5.0

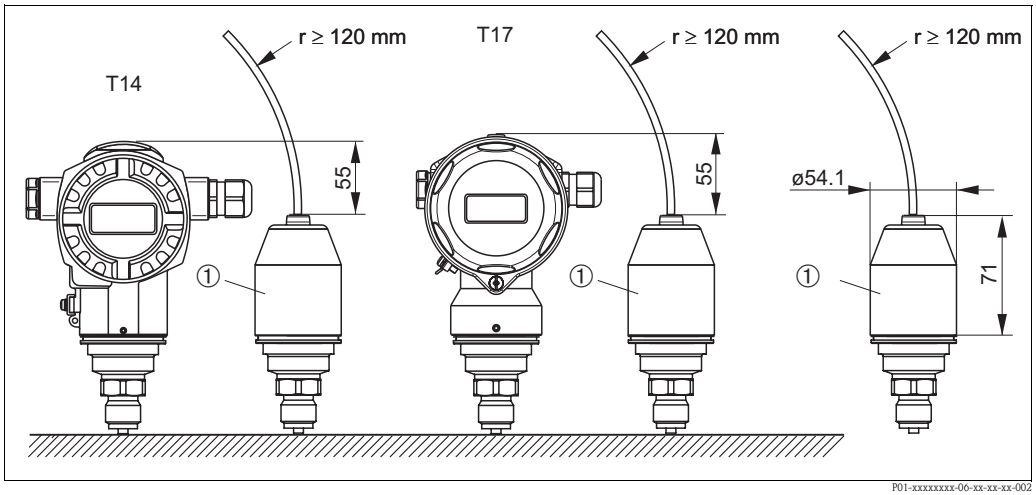
"Separate housing" version



Dimensions T14 housing, optional display on the side. Housing weight see page 66.



Dimensions T17 housing, optional display on the side. Housing weight see page 66.



Reduction of the mounting height of the process connection, for application of the separate housing.
1 Process connection adapter.

If the separate housing is used, the mounting height of the process connection is reduced by approx. 55 mm as compared to the dimensions of the standard version.
The minimum bending radius (r) for the cable is 120 mm (4.7").

Weight

Housing

	T14		T17	Separate housing
	Aluminium	**AISI 316L**	**AISI 316L**	
With electronic insert and on-site display	1.2 kg	2.1 kg	1.2 kg	Weight of housing T14 or T17 + 0,5 kg. Weight of sensor + 0,5 kg.
With electronic insert without on-site display	1.1 kg	2.0 kg	1.1 kg	

Process connections

- Process connections PMC71 (with ceramic measuring diaphragm): from page 38 ff
- Process connections PMP71 (with metallic measuring diaphragm): from page 45 ff
- Process connections PMP75 (with metallic measuring diaphragm): from page 52 ff

Material

T14 housing:
- T14 housing, selectable:
  - Die-cast aluminium with protective powder-coating on polyester basis: RAL 5012 (blue), cover: RAL 7035 (grey)
  - Precision cast stainless steel AISI 316L (1.4435)
- External operation (keys and key covering): Polycarbonate PC-FR, RAL 7035 (grey)
- Sight glass: Mineral glass
- Cable gland: Polyamid (PA)
- Pressure compensation filter: PA6 GF10
- Blind plug: PBT-GF30 FR, for Dust Ex, EEx d, FM XP and CSA XP: AISI 316L (1.4435)
- Seals:
  - Cable and blind plug seal: Silicone (VMQ)
  - Pressure compensation filter o-ring: Silicone (VMQ)
  - Cover: EPDM
  - Sight glass: Silicone (VMQ)
- Nameplates: AISI 304 (1.4301)

T17 housing:
- Housing: Stainless steel AISI 316L (1.4404)
- Sight glass:
  - Version for non-hazardous area, ATEX EEx ia, NEPSI Zone 0/1 Ex ia, IECEx Zone 0/1 Ex ia, FM NI, FM IS, CSA IS: Polycarbonate (PC)
  - ATEX 1/2 D, ATEX 1/3 D, ATEX 1 GD, ATEX 1/2 GD, ATEX 3 G, FM DIP, CSA Dust Ex: Mineral glass
- Cable gland: Polyamid PA, for Dust-Ex: CuZn nickel-plated
- Blind plug: PBT-GF30 FR, for Dust-Ex: AISI 316L (1.4435)
- Pressure compensation filter: PA6 GF10
- Seals:
  - Cable and blind plug seal: Silicone (VMQ)
  - Pressure compensation filter o-ring: Silicone (VMQ)
  - Cover: EPDM
  - Sight glass: EPDM
- Nameplates: lasered

DIN/EN flanges

Endress+Hauser supplies DIN/EN flanges made of stainless steel AISI 316L with the material number 1.4435 or 1.4404. With regard to its stability property, the material 1.4435 is identical to 1.4404 which is grouped under 13EO in EN 1092-1 Tab. 18. The chemical composition of the two materials can be identical.

Cable for separate housing:
- PE cable:
  Slip-resistant cable with strain-relief members made of Dynemo; shielded using aluminium-coated film; insulated with polyethylene (PE-LD), black; copper wires, twisted, UV resistant
- FEP cable:
  Slip-resistant cable; shielded using galvanized steel wire netting; insulated with fluorinated ethylene propylene (FEP), black; copper wires, twisted, UV resistant

Miscellaneous:
- Process diaphragm PMC71: Al_2O_3 Aluminium-oxide-ceramic (FDA 21CFR186.1256, USP Class VI), ultrapure 99.9% (→ See also www.endress.com/ceraphire)
- Mounting accessories: Mounting kit with screws AISI 304 (1.4301)
- Capillary: AISI 316 Ti (1.4571)
- Protective hose for capillary: AISI 304 (1.4301)
- External earth terminal: AISI 304 (1.4301)

→ For process connections, process diaphragms, seals and filling oils see ordering information, page 77 ff.

Planning instructions, diaphragm seal systems

Applications

Diaphragm seal systems should be used if the process media and the device should be separated. Diaphragm seal systems offer clear advantages in the following instances:
- In the case of high process temperatures (→ See also page 35, section "Process temperature limits".)
- For aggressive media
- If good and rapid measuring point cleaning is necessary
- If the measuring point is exposed to vibrations
- For mounting locations that are difficult to access
- For very humid mounting locations

Planning instructions

Diaphragm seals are separating equipment between the measuring system and the process medium.

A diaphragm seal system consists of:
- A diaphragm seal in a one-sided system
- Capillary tube
- Fill fluid and
- A pressure transmitter.

The process pressure acts via the diaphragm seal membrane on the liquid-filled system, which transfers the process pressure via the capillary tube onto the sensor of the pressure transmitter.
Endress+Hauser delivers all diaphragm seal systems as welded versions. The system is hermetically sealed, which ensures the highest reliability.

Note!
The correlations between the individual diaphragm seal components are presented in the following section. For further information and comprehensive diaphragm seal system designs, please contact your local Endress+Hauser Sales Center.

Diaphragm seal

The diaphragm seal determines the application range of the system by
- the diaphragm diameter
- the diaphragms: stiffness and material
- the design (oil volume).

Diaphragm diameter

The larger the diaphragm diameter (less stiffness), the smaller the temperature effect on the measurement result.
Note: To keep the temperature effect in practice-oriented limits, you should select diaphragm seals with a nominal diameter of ≥ DN 80, in as far as the process connection allows for it.

Diaphragm stiffness

The stiffness is dependent on the diaphragm diameter, the material, any available coating and on the diaphragm thickness and shape. The diaphragm thickness and the shape are defined constructively. The stiffness of a diaphragm seal membrane influences the temperature operating range and the measuring error caused by temperature effects.

Capillary

Capillaries with an internal diameter of 1 mm are used as standard.
The capillary tube influences the T_K zero point, the ambient temperature operating range and the response time of a diaphragm seal system as a result of its length and internal diameter.
→ See also page 69 ff, sections "Influence of the temperature on the zero point" and "Ambient temperature range".
→ Observe the installation instructions regarding capillary tubes. See page 73 ff, section "Installation instructions".

Filling oil

When selecting the filling oil, fluid and ambient temperature as well as the operating pressure are of crucial importance. Observe the temperatures and pressures during commissioning and cleaning. A further selection criterion is the compatibility of the filling oil with the requirements of the process medium. For this reason, only filling oils that are harmless to health are used in the food industry, such as vegetable oil or silicone oil
→ See also the following section "Diaphragm seal filling oils" section.
The filling oil used influences the T_K zero point and the temperature operating range of a diaphragm seal system and the response time. → See also page 69 ff, section "Influence of the temperature on the zero point".

Pressure transmitter

The pressure transmitter influences the temperature operating range, the T_K zero point and the response time as a result of its volume change. The volume change is the volume that has to be shifted to pass through the complete measuring range.
Pressure transmitters from Endress+Hauser are optimised with regard to minimum volume change.

Diaphragm seal filling oils

Version [1]	Filling oil	Permissible temperature range [2] at 0.05 bar ≤ p_{abs} ≤ 1 bar	Permissible temperature [2] range at p_{abs} ≥ 1 bar	Density [g/cm³]	Viscosity [cSt at 25°C (77°F)]	Coefficient of thermal expansion [1/K]	T_K correction factor	Note
A, H, 1 or 2	Silicone oil	–40...+180°C (–40...+356°F)	–40...+250°C (–40...+482°F)	0.96	100	0.00096	1	suitable for foods FDA 21 CFR 175.105
G, 3 or 4	High temperature oil	–10...+200°C (+14...+392°F)	–10...+400°C (+14...+752°F)	1.07	37	0.0007	0.72	high temperatures
F or N	Inert oil	–40...+80°C (–40...+176°F)	–40...+175°C (–40...+347°F)	1.87	27	0.000876	0.91	Oil for ultra pure gas and oxygen applications
D, 5 or 6	Vegetable oil	–10...+120°C (+14...+248°F)	–10...+200°C (+14...+392°F)	0.94	9.5	0.00101	1.05	suitable for foods FDA 21 CFR 172.856
7 or 8	Low temperature oil	–70...+80°C –94...+176°F	–70...+180°C –94...+356°F	0,92	4,4	–	–	low temperatures

1) Version for feature 90 in the order code

2) Observe temperature limits of the device (→ Page 33 and Page 35).

Influence of the temperature on the zero point

A temperature change results in a volume change of the filling oil. The volume change is dependent on the coefficient of thermal expansion of the filling oil and on the volume of the filling oil at calibration temperature (constant in the range: +21 to +33°C (+69.8 to 91.4°F)). → See also page 48, "Filling oils, technical data" section.
For example, the filling oil expands in the event of a temperature increase. The additional volume presses against the diaphragm seal membrane. The stiffer a diaphragm is, the greater its return force, which counteracts a volume change and acts on the measuring cell together with the operating pressure, thus shifting the zero point. For the "T_K Process" and "T_K Ambient (for devices without capillary)", see page 52 ff, section "Process connections PMP75".

The following diagrams display the temperature coefficient "T_K Ambient" dependent on the capillary length. The following application is displayed: capillary temperature and transmitter temperature (ambient temperature) change, the process temperature corresponds to the calibration temperature.
The temperature coefficients obtained from the diagrams apply to silicone oil and the membrane material AISI 316L/1.4435. For other filling oils, these temperature coefficients must be multiplied by the T_K correction factor of the corresponding filling oil. For the T_K correction factors, see page 69, section "Diaphragm seal filling oils".
With regard to the temperature coefficient "T_K Ambient", devices with temperature isolator behave like devices with the same process connection and 0,1 m capillary.

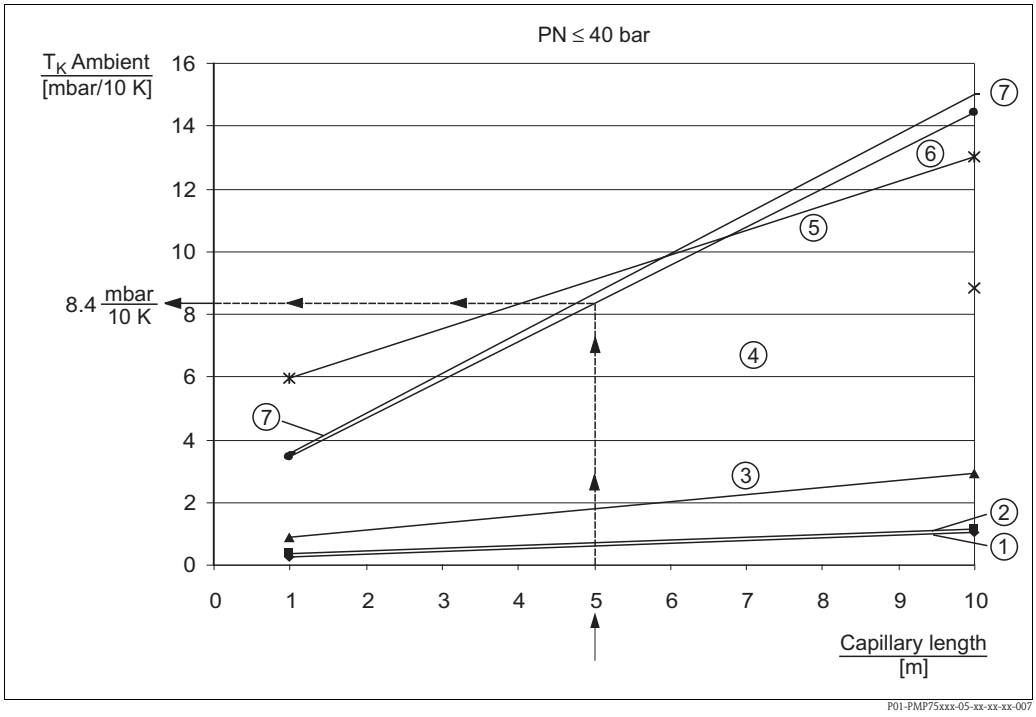


Diagram T_K Ambient dependent on the capillary length for PMP75, PN≤ 40 bar

Example for:
– Diaphragm seal versions "B3, EN/DIN flange DN 50 PN 10-40 B1, AISI 316L"
– Capillary length: 5 m
– Ambient temperature, capillary/transmitter: 45°C
– Filling oil: silicone oil

1. Select characteristic curve type for the diaphragm seal versions "B3" in accordance with the following table.
   Result: characteristic curve type 6
2. Obtain value for T_K Ambient from the diagram.
   Result: 8.4 mbar/10 K
3. $T_{Ambient} - T_{Calibration}$ = 45°C – 25°C = 20°C ⇒ 8.4 mbar/10 K x 20 K = 16.8 mbar

Result: In this application, the zero point is shifted by 16.8 mbar.

Note!
- The influence of temperature on the zero point can be corrected with position calibration.
- The temperature influence can be minimised by using a filling oil with a smaller coefficient of thermal expansion, shorter capillary, diaphragm seal with larger diaphragm diameter or by using a smaller capillary internal diameter.

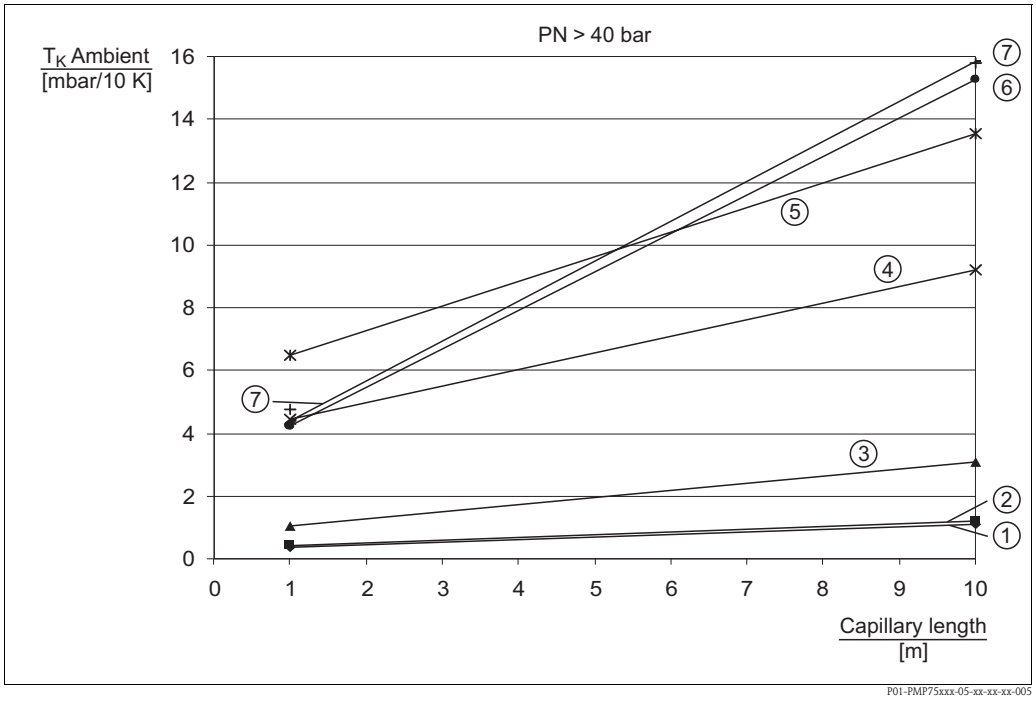


Diagram T_K Ambient dependent on the capillary length for PMP75, PN > 40 bar

Characteristic curve type	Version	Diaphragm seal
1	B4	EN/DIN flange DN 80 PN 10-40 B1, AISI 316L
	C4	EN/DIN flange DN 80 PN 100 B2, AISI 316L
	C5	EN/DIN flange DN 100 PN 100 B2, AISI 316L
	KL	JIS flange 10K 80A RF, AISI 316L
	KH	JIS flange 10K 100A RF, AISI 316L
	D4	EN/DIN flange DN 80, PN 10-40 B1, Extensions: 50 mm/100 mm/200 mm, AISI 316L
	AG	ANSI flange 3" 150 lbs RF, AISI 316/316L
	AS	ANSI flange 3" 300 lbs RF, AISI 316/316L
	AH	ANSI flange 4" 150 lbs RF, AISI 316/316L
	AT	ANSI flange 4" 300 lbs RF, AISI 316/316L
	J4	ANSI flange 3" 150 lbs RF, Extensions: 2"/4"/6"/8", AISI 316/316L
	J7	ANSI flange 3" 300 lbs RF, Extensions: 2"/4"/6"/8", AISI 316/316L
	J5	ANSI flange 4" 150 lbs RF, Extensions: 2"/4"/6"/8", AISI 316/316L
	J8	ANSI flange 4" 300 lbs RF, Extensions: 2"/4"/6"/8", AISI 316/316L
2	TF	Tri-Clamp, ISO 2852 DN 76.1 (3"), AISI 316L/1.4435
3	MT	DIN 11851 DN 80 PN 25, AISI 316L/1.4435
	M5	DIN 11851 DN 80 PN 25 socket, AISI 316L/1.4435
4	SD	Pipe diaphragm seal Tri-Clamp, ISO 2852 DN 51 (2"), AISI 316L
5	SC	Pipe diaphragm seal Tri-Clamp, ISO 2852 DN 38 (1 1/2"), AISI 316L
6	B3	EN/DIN flange DN 50 PN 1040 B1, AISI 316L
	C3	EN/DIN flange DN 50 PN 63 B2, AISI 316L
	EF	EN/DIN flange DN 50 PN 100-160 E, AISI 316L
	ER	EN/DIN flange DN 50 PN 250 E, AISI 316L
	E3	EN/DIN flange DN 50 PN 400 E, AISI 316L
	AF	ANSI flange 2" 150 lbs RF, AISI 316/316L
	AR	ANSI flange 2" 300 lbs RF, AISI 316/316L
	HF	ANSI flange 2" 400/600 lbs RF, AISI 316/316L
	HR	ANSI flange 2" 900/1500 lbs RF, AISI 316/316L
	H3	ANSI flange 2" 2500 lbs RF, AISI 316/316L
	KF	JIS 10K 50A RF, AISI 316L
	MR	DIN 11851 DN 50 PN 25, AISI 316L/1.4435
	MS	DIN 11851 DN 65 PN 25, AISI 316L/1.4435
	M3	DIN 11851 DN 50 PN 25 socket, AISI 316L/1.4435
	M4	DIN 11851 DN 65 PN 25 socket, AISI 316L/1.4435
7	TR	Varivent Type N for tubes DN 40 – DN 162, PN 40, AISI 316L/1.4435
	TK	DRD DN50 (65 mm), PN 25, AISI 316L/1.4435

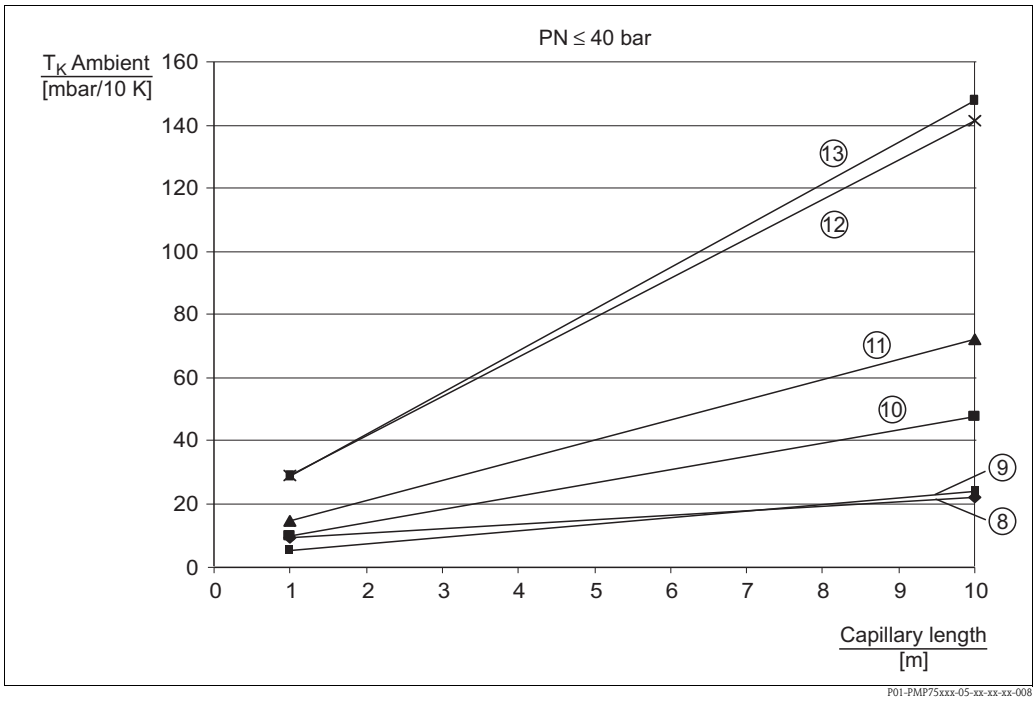


Diagram T_K Ambient dependent on the capillary length for PMP75, PN≤ 40 bar

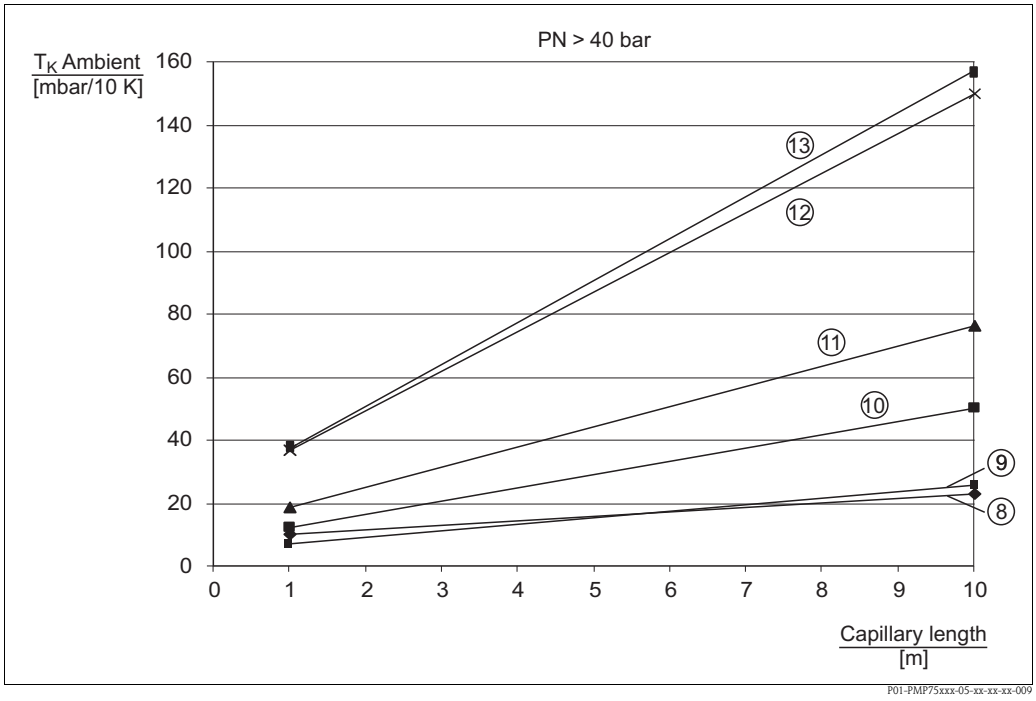


Diagram T_K Ambient dependent on the capillary length for PMP75, PN> 40 bar

Characteristic curve type	Version	Diaphragm seal
8	SB	Pipe diaphragm seal Tri-Clamp, ISO 2852 DN 25 (1"), AISI 316L
9	D3	EN/DIN flange PN10-40 B1, Extensions: 50 mm/100 mm/200 mm, AISI 316L
	J3	ANSI flange 2" 150 lbs, Extensions: 2"/4"/6"/8", AISI 316/316L
	TD	Tri-Clamp, ISO 2852 DN 51 (2"), AISI 316L/1.4435
10	CQ	EN/DIN flange DN 40 PN 10-40 B1, AISI 316L
	TI	SMS 2" PN 25, AISI 316L/1.4435
	TN	APV-RJT 2" PN 40, AISI 316L/1.4435
	TS	APV-ISS 2" PN 40, AISI 316L/1.4435
11	CP	EN/DIN flange DN32 PN 10-40 B1, AISI 316L
	AE	ANSI flange 1 1/2" 150 lbs RF, AISI 316/316L
	AQ	ANSI flange 1 1/2" 300 lbs RF, AISI 316/316L
	TC	Tri-Clamp, ISO 2852 DN 38 (1 1/2"), DIN 32676 DN 40, AISI 316L/1.4435
	TH	SMS 1 1/2" PN 25, AISI 316L/1.4435
	TM	APV-RJT 1 1/2" PN 40, AISI 316L/1.4435
	TS	APV-ISS 1 1/2" PN 40, AISI 316L/1.4435
12	CN	EN/DIN flange PN 10-40 B1, AISI 316L
	DN	EN/DIN flange PN 64-160 E, AISI 316L
	EN	EN/DIN flange PN 250 E, AISI 316L
	E1	EN/DIN flange PN 400 E, AISI 316L
	AC	ANSI flange 1" 150 lbs RF, AISI 316/316L
	AN	ANSI flange 1" 300 lbs RF, AISI 316/316L
	HC	ANSI flange 1" 400/600 lbs RF, AISI 316/316L
	HN	ANSI flange 1" 900/1500 lbs RF, AISI 316/316L
	HO	ANSI flange 1" 2500 lbs RF, AISI 316/316L
	KC	JIS flange 10K 25 A RF, AISI 316L
13	TB	Tri-Clamp, ISO 2852 DN 25 (1"), DIN 32676 DN 25, AISI 316L/1.4435

Ambient temperature range

The filling oil, capillary length, capillary internal diameter, process temperature and the oil volume of the diaphragm seal determine the ambient temperature operating range of the diaphragm seal system.
The operating range can be extended by using a filling oil with a smaller coefficient of expansion and by using shorter capillaries.

Installation instructions

Instructions for diaphragm seal systems

- The diaphragm seal together with the transmitter form a closed, calibrated system, which is filled through ports in the diaphragm seal and in the measurement system of the transmitter. These ports are sealed and must not be opened.
- In the case of devices with diaphragm seals and capillaries, the zero point shift caused by the hydrostatic pressure of the filling liquid column in the capillaries must be taken into account when selecting the measuring cell. If a measuring cell with a small measuring range is selected, a position adjustment can cause an overdrive. See the following diagram and the following example.
- For devices with temperature isolator or capillary a suitable fastening device (mounting bracket) is recommended.
- When using a mounting bracket, sufficient strain relief must be allowed for in order to prevent the capillary bending down (bending radius ≥ 100 mm).

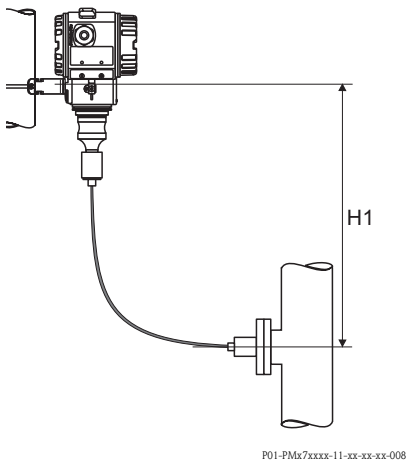
Installation instructions

In order to obtain more precise measurement results and to avoid a defect in the device, mount the capillaries as follows:
- vibration-free (in order to avoid additional pressure fluctuations)
- not in the vicinity of heating or cooling lines
- insulate if the ambient temperature is below ore above the reference temperature
- with a bending radius of ≥ 100 mm.

Vacuum applications

For applications under vacuum, Endress+Hauser recommends mounting the pressure transmitter below the diaphragm seal. A vacuum load of the diaphragm seal caused by the presence of fill fluid in the capillary prevents is hereby prevented.

When the pressure transmitter is mounted above the diaphragm seal, the maximum height difference H1 in accordance with the following illustration on the left must not be exceeded. The maximum height difference is dependent on the density of the filling oil and the smallest ever pressure that is permitted to occur at the diaphragm seal (empty tank), see the following illustration, on the right.



Installation above the diaphragm seal

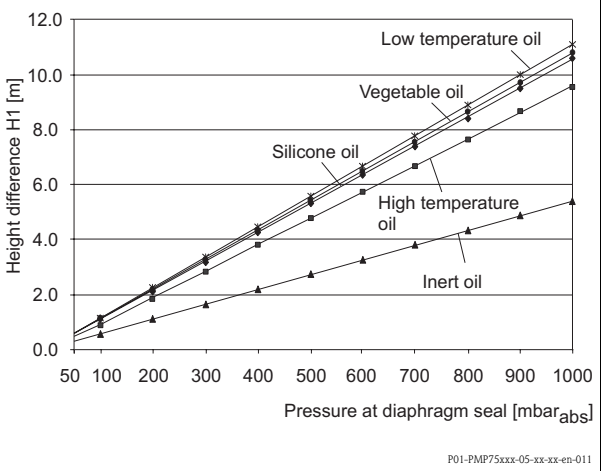


Diagram of maximum installation height above the diaphragm seal for vacuum applications

Certificates and approvals

CE mark

The device meets the legal requirements of the relevant EC directives.
Endress+Hauser confirms that the device has been successfully tested by applying the CE mark.

Ex approvals

- ATEX
- FM
- CSA
- NEPSI
- IECEx
- GOST
- also combinations of different approvals

All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas.
→ See also page 91 ff, sections "Safety Instructions" and "Installation/Control Drawings".

Suitability for hygenic processes

The Cerabar S is suitable for the employment in hygenic processes.
Overview of permitted process connections from page 5.
Many versions meet the requirements of 3A-Sanitary Standard No. 74.
Endress+Hauser confirms this by attaching the 3A symbol.

✎ Note!
The gap-free connections can be cleaned without residue using the usual cleaning methods.

Marine certificate

- GL
- ABS

Overspill protection

WHG

CRN approvals

Some device versions have CRN approval. For a CRN-approved device, a CRN-approved process connection (→ see page 78, feature 70 "Process connection") has to be ordered with a CSA approval (→ see page 77, feature 10 "Approval"). PMP75 devices with capillary are not CRN-approved. These devices are fitted with a separate plate bearing the registration number 0F10525.5C.

Pressure Equipment Directive (PED)

The devices PMC71, PMP71 and PMP75 correspond to Article 3 (3) of the EC directive 97/23/EC (Pressure Equipment Directive) and has been designed and manufactured according to good engineering practice.

Additionally applies:
– PMP71 with threaded connection and internal diaphragm PN > 200 as well as oval flange adapter PN > 200:
  Suitable for stable gases in group 1, category I
– PMP75 with pipe diaphragm seal ≥ 1.5"/PN 40:
  Suitable for stable gases in group 1, category II
– PMP75 with separator PN > 200:
  Suitable for stable gases in group 1, category 1
– PMP75 with threaded connection PN > 200

Standards and guidelines

DIN EN 60770 (IEC 60770):
Transmitters for use in industrial-process control systems
Part 1: Methods for inspection and routine testing

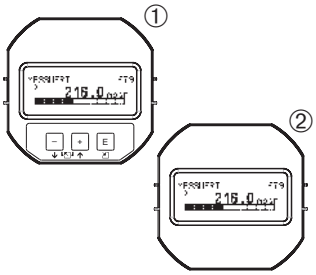
DIN 16086:
Electrical pressure measuring instruments, pressure sensors, pressure transmitters, pressure measuring instruments, concepts, specifications in data sheets

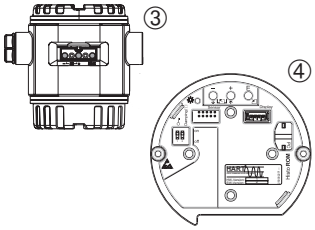
EN 61326-X:
EMC product family standard for electrical equipment for measurement, control and laboratory use.

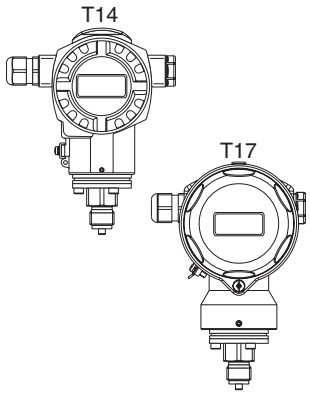
Ordering information

PMC71

This overview does not mark options which are mutually exclusive.







10			Approval:
	A		For non-hazardous areas
	1		ATEX II 1/2 G EEx ia IIC T6
	6		ATEX II 1/2 G EEx ia IIC T6, overspill protection WHG
	2		ATEX II 1/2 D EEx ia IIC T6
	8		ATEX II 1 GD EEx ia IIC T6
	3		ATEX II 1/2 GD EEx ia IIC T6
	5		ATEX II 2 G EEx d[ia] IIC T6
	7		ATEX II 3 G EEx nA II T6
	S		FM IS, Class I, II, III Division 1, Groups A – G; NI Class I Division 2, Groups A – D; AEx ia
	T		FM XP, Class I Division 1, Groups A – D; AEx d
	R		FM NI, Class I, Division 2, Groups A – D
	U		CSA IS, Class I, II, III Division 1, Groups A – G; Class I Division 2, Groups A – D, Ex ia
	V		CSA XP, Class I Division 1, Groups B – D; Ex d
	G		NEPSI Ex d[ia] IIC T4/T6
	H		NEPSI Ex ia IIC T6
	I		IECEx Zone 0/1 Ex ia IIC T6

20			Output; Operation:
	A		4...20 mA HART, operation outside, LCD (→ see Fig. ①, ③)
	B		4...20 mA HART, operation inside, LCD (→ see Fig. ①, ④)
	C		4...20 mA HART, operation inside (→ see Fig. ④)
	M		PROFIBUS PA, operation outside, LCD (→ see Fig. ①, ③)
	N		PROFIBUS PA, operation inside, LCD (→ see Fig. ①, ④)
	O		PROFIBUS PA, operation inside (→ see Fig. ④)
	P		FOUNDATION Fieldbus, operation outside, LCD (→ see Fig. ②, ④)
	Q		FOUNDATION Fieldbus, operation inside, LCD (→ see Fig. ②, ④)
	R		FOUNDATION Fieldbus, operation inside (→ see Fig. ④)

30			Housing; Cable entry; Protection:
	A		Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1,5
	B		Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
	C		Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
	D		Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug
	E		Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
	F		Aluminium T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
	1		AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1,5
	2		AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
	3		AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
	4		AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug
	5		AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
	6		AISI 316L T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
	P		AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Gland M 20x1,5
	S		AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread G 1/2
	T		AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread 1/2 NPT
	U		AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, M 12x1 PA plug
	V		AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, 7/8" FF plug

PMC71											order code

→ For continuation of ordering information for PMC71, see the following page.

PMC71 (continued)

40 Sensor range; Sensor overload limit (= OPL):

Sensors for gauge pressure

Measurement limits: –100 % (–1 bar)...+100 % of sensor nominal range

	Sensor nominal value (URL)	OPL (Over pressure limit)
1C	100 mbar/10 kPa/1.5 psi g	4 bar/400 kPa/60 psi g
1E	250 mbar/25 kPa/3.75 psi g	5 bar/500 kPa/75 psi g
1F	400 mbar/40 kPa/6 psi g	8 bar/800 kPa/120 psi g
1H	1 bar/100 kPa/15 psi g	10 bar/1 MPa/150 psi g
1K	2 bar/200 kPa/30 psi g	18 bar/1,8 MPa/270 psi g
1M	4 bar/400 kPa/60 psi g	25 bar/2,5 MPa/375 psi g
1P	10 bar/1 MPa/150 psi g	40 bar/4 MPa/600 psi g
1S	40 bar/4 MPa/600 psi g	60 bar/6 MPa/900 psi g

Sensors for absolute pressure

	Sensor nominal value (URL)	OPL (Over pressure limit)
2C	100 mbar/10 kPa/1.5 psi abs	4 bar/400 kPa/60 psi abs
2E	250 mbar/25 kPa/3.75 psi abs	5 bar/500 kPa/75 psi abs
2F	400 mbar/40 kPa/6 psi abs	8 bar/800 kPa/120 psi abs
2H	1 bar/100 kPa/15 psi abs	10 bar/1 MPa/150 psi abs
2K	2 bar/200 kPa/30 psi abs	18 bar/1,8 MPa/270 psi abs
2M	4 bar/400 kPa/60 psi abs	25 bar/2,5 MPa/375 psi abs
2P	10 bar/1 MPa/150 psi abs	40 bar/4 MPa/600 psi abs
2S	40 bar/4 MPa/600 psi abs	60 bar/6 MPa/900 psi abs

50 Calibration; Unit:

1	Sensor range; mbar/bar
2	Sensor range; kPa/MPa
3	Sensor range; mmH_2O/mH_2O
4	Sensor range; inH_2O/ftH_2O
6	Sensor range; psi
B	Customised; see additional specification
C	Factory certificate 5-point; see additional specification
D	DKD certificate; see additional specification
K	Platinum; see additional specification
L	Platinum and factory certificate 5-point; see additional specification
M	Platinum and DKD certificate; see additional specification

70 Process connection; Material:

	Thread, internal diaphragm
GA	Thread ISO 228 G 1/2 A EN 837, AISI 316L (CRN)
GB	Thread ISO 228 G 1/2 A EN 837, Alloy C (CRN)
GC	Thread ISO 228 G 1/2 A EN 837, Monel
GD	Thread ISO 228 G 1/2 A EN 837, PVDF (max. 15 bar/225 psi, –10...+60°C/+14...+140°F)
GE	Thread ISO 228 G 1/2 A G 1/4 (female), AISI 316L (CRN)
GF	Thread ISO 228 G 1/2 A G 1/4 (female), Alloy C (CRN)
GG	Thread ISO 228 G 1/2 A G 1/4 (female), Monel
GH	Thread ISO 228 G 1/2 A hole 11.4 mm, AISI 316L (CRN)
GJ	Thread ISO 228 G 1/2 A hole 11.4 mm, Alloy C (CRN)
GK	Thread ISO 228 G 1/2 A hole 11.4 mm, Monel
RA	Thread ANSI 1/2 MNPT 1/4 FNPT, AISI 316L (CRN)
RB	Thread ANSI 1/2 MNPT 1/4 FNPT, Alloy C (CRN)
RC	Thread ANSI 1/2 MNPT 1/4 FNPT, Monel
RD	Thread ANSI 1/2 MNPT, hole 11.4 mm, AISI 316L (CRN)
RE	Thread ANSI 1/2 MNPT, hole 11.4 mm, Alloy C (CRN)
RF	Thread ANSI 1/2 MNPT, hole 11.4 mm, Monel
RG	Thread ANSI 1/2 MNPT hole 3 mm, PVDF (max. 15 bar/225 psi, –10...+60°C/+14...+140°F)
RH	Thread ANSI 1/2 FNPT, AISI 316L (CRN)
RJ	Thread ANSI 1/2 FNPT, Alloy C (CRN)
RK	Thread ANSI 1/2 FNPT, Monel
GL	Thread JIS B0202 G 1/2 (male), AISI 316L
RL	Thread JIS B0203 R 1/2 (male), AISI 316L
GP	Thread DIN 13 M 20x1.5 EN 837 hole 3 mm, AISI 316L
GQ	Thread DIN 13 M 20x1.5 EN 837 hole 3 mm, Alloy C

For continuation "Process connection, Material" see next page.

PMC71											order code

→ For continuation of ordering information for PMC71, see the following page.

PMC71 (continued)

70	Process connection; Material (continued):
	Thread, flush-mounted diaphragm
1G	Thread ISO 228 G 1 1/2 A, AISI 316L
1H	Thread ISO 228 G 1 1/2 A, Alloy C
1J	Thread ISO 228 G 1 1/2 A, Monel
1K	Thread ISO 228 G 2 A, AISI 316L
1L	Thread ISO 228 G 2 A, Alloy C
1M	Thread ISO 228 G 2 A, Monel
2D	Thread ANSI 1 1/2 MNPT, AISI 316L (CRN)
2E	Thread ANSI 1 1/2 MNPT, Alloy C (CRN)
2F	Thread ANSI 1 1/2 MNPT, Monel (CRN)
2G	Thread ANSI 2 MNPT, AISI 316L (CRN)
2H	Thread ANSI 2 MNPT, Alloy C
2J	Thread ANSI 2 MNPT, Monel
1R	Thread DIN 13 M 44x1.25, AISI 316L
1S	Thread DIN 13 M 44x1.25, Alloy C
	EN/DIN flanges, flush-mounted diaphragm
CP	DN 32 PN 10-40 B1, AISI 316L
CQ	DN 40 PN 10-40 B1, AISI 316L
BR	DN 50 PN 10-16 A, PVDF (max. 15 bar/150 psi, –10...+60°C/+14...+140°F)
B3	DN 50 PN 10-40 B1, AISI 316L
C3	DN 50 PN 63 B2, AISI 316L
BS	DN 80 PN 10-16 A, PVDF (max. 15 bar/150 psi, –10...+60°C/+14...+140°F)
B4	DN 80 PN 10-40 B1, AISI 316L
	ANSI flanges, flush-mounted diaphragm
AE	1 1/2" 150 lbs RF, AISI 316/316L (CRN)
AQ	1 1/2" 300 lbs RF, AISI 316/316L (CRN)
AF	2" 150 lbs RF, AISI 316/316L (CRN)
JR	2" 150 lbs RF, AISI 316L with ECTFE-coating
A3	2" 150 lbs RF, PVDF (max. 15 bar/225 psi, –10...+60°C/+14...+140°F)
AR	2" 300 lbs RF, AISI 316/316L (CRN)
AG	3" 150 lbs RF, AISI 316/316L (CRN)
JS	3" 150 lbs RF, AISI 316L with ECTFE-coating
A4	3" 150 lbs RF, PVDF (max. 15 bar/225 psi, –10...+60°C/+14...+140°F)
AS	3" 300 lbs RF, AISI 316/316L (CRN)
AH	4" 150 lbs RF, AISI 316/316L (CRN)
JT	4" 150 lbs RF, AISI 316L with ECTFE-coating
AT	4" 300 lbs RF, AISI 316/316L (CRN)
	JIS flanges, flush-mounted diaphragm
KF	10K 50A RF, AISI 316L
KL	10K 80A RF, AISI 316L
KH	10K 100A RF, AISI 316L
	Hygienic connections, flush-mounted diaphragm
MP	DIN 11851 DN 40 PN 25, AISI 316L, 3A with HNBR/EPDM seal (CRN)
MR	DIN 11851 DN 50 PN 25, AISI 316L, 3A with HNBR/EPDM seal (CRN)
TD	Tri-Clamp ISO 2852 DN 51 (2"), AISI 316L, 3A with HNBR/EPDM seal (CRN)
TF	Tri-Clamp ISO 2852 DN 76.1 (3"), AISI 316L, 3A with HNBR/EPDM seal (CRN)
TK	DRD DN50 (65 mm), PN 25, AISI 316L, 3A with HNBR/EPDM seal
TR	Varivent type N for tubes DN 40 – DN 162, PN 40, AISI 316L, 3A with HNBR/EPDM seal (CRN)

80	Seal:
A	FKM Viton
B	EPDM
D	Kalrez
E	Chemraz
F	NBR/3A: HNBR (FDA)
L	FKM Viton, cleaned for silicone-free service
M	Kalrez, cleaned for silicone-free service
1	FKM Viton, cleaned from oil and greace
2	FKM Viton, oxygen service Note application limits pressure/temp.

PMC71	order code

→ For continuation of ordering information for PMC71, see the following page.

PMC71 (continued)

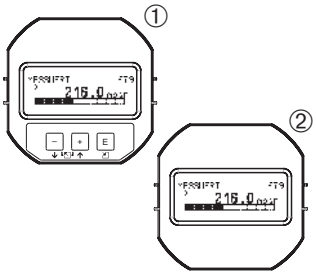
100	Additional option 1:
A	not selected
E	SIL2/IEC 61508 Declaration of conformity
T	High temperature version
B	Material test certificate for wetted parts, inspection certificate as per EN 10204 3.1 acc. to specification 52005759
M	Overvoltage protection
N	HistoROM/M-DAT
S	GL (German Lloyd)/ABS marine certificate
V	Mounting on shut-off valve from above
2	Test report acc. to EN 10204 2.2
3	Routine test with certificate, inspection certificate as per EN 10204 3.1
4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1

110	Additional option 2:
A	not selected
E	SIL2/IEC 61508 Declaration of conformity
G	Separate housing, cable length see additional spec. + mounting bracket, wall/pipe, 316L
T	High temperature version
M	Overvoltage protection
N	HistoROM/M-DAT
S	GL (German Lloyd)/ABS marine certificate
U	Mounting bracket for wall/pipe, AISI 304
2	Test report acc. to EN 10204 2.2
3	Routine test with certificate, inspection certificate as per EN 10204 3.1
4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1
5	Helium leak test EN 1518 with test certificate, inspection certificate as per EN 10204 3.1

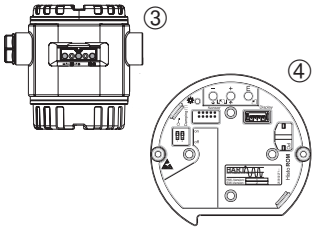
PMC71	complete order code

PMP71

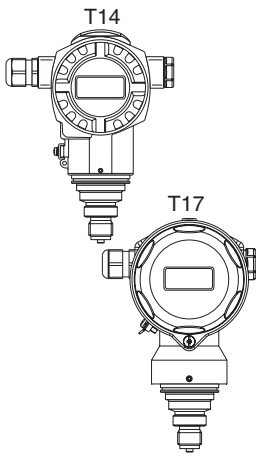
This overview does not mark options which are mutually exclusive.



10	Approval:
A	For non-hazardous areas
1	ATEX II 1/2 G EEx ia IIC T6
6	ATEX II 1/2 G EEx ia IIC T6, overspill protection WHG
2	ATEX II 1/2 D
4	ATEX II 1/3 D
8	ATEX II 1 GD EEx ia IIC T6
3	ATEX II 1/2 GD EEx ia IIC T6
5	ATEX II 2 G EEx d IIC T6
7	ATEX II 3 G EEx nA II T6
S	FM IS, Class I, II, III Division 1, Groups A – G; NI Class I Division 2, Groups A – D; AEx ia
T	FM XP, Class I Division 1, Groups A – D; AEx d
Q	FM DIP, Class II, III Division 1, Groups E – G
R	FM NI, Class I, Division 2, Groups A – D
U	CSA IS, Class I, II, III Division 1, Groups A – G; Class I Division 2, Groups A – D, Ex ia
V	CSA XP, Class I Division 1, Groups B – D; Ex d
W	CSA Class II, III Division 1, Groups E – G (Dust Ex)
G	NEPSI Ex d IIC T6
H	NEPSI Ex ia IIC T6
I	IECEx Zone 0/1 Ex ia IIC T6
B	Combined certificates: ATEX II 1/2 G EEx ia IIC T6 + II 2 G EEx d IIC T6
C	Combined certificates: FM IS and XP Class I Division 1, Groups A – D
D	Combined certificates: CSA IS and XP Class I Division 1, Groups A – D
E	Combined certificates: FM/CSA IS and XP Class I Division 1, Groups A – D
F	Combined certificates: ATEX II EEx ia / EEx d + FM/CSA IS + XP ATEX II 1/2G EEx ia IIC T6+ ATEX II 2G EEx d IIC T6+ FM/CSA IS + XP Cl.I Div.1 Gr.A-D



20		Output; Operation:
A		4...20 mA HART, operation outside, LCD (→ see Fig. ①, ③)
B		4...20 mA HART, operation inside, LCD (→ see Fig. ①, ④)
C		4...20 mA HART, operation inside (→ see Fig. ④)
M		PROFIBUS PA, operation outside, LCD (→ see Fig. ①, ③)
N		PROFIBUS PA, operation inside, LCD (→ see Fig. ①, ④)
O		PROFIBUS PA, operation inside (→ see Fig. ④)
P		FOUNDATION Fieldbus, operation outside, LCD (→ see Fig. ②, ④)
Q		FOUNDATION Fieldbus, operation inside, LCD (→ see Fig. ②, ④)
R		FOUNDATION Fieldbus, operation inside (→ see Fig. ④)



30			Housing; Cable entry; Protection:
A			Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1.5
B			Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
C			Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
D			Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug
E			Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
F			Aluminium T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
1			AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1.5
2			AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
3			AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
4			AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug
5			AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
6			AISI 316L T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
R			AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Gland M 20x1.5
S			AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread G 1/2
T			AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread 1/2 NPT
U			AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, M 12x1 PA plug
V			AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, 7/8" FF plug

PMP71													order code

→ For continuation of ordering information for PMP71, see the following page.

PMP71 (continued)

40 Sensor range; Sensor overload limit (= OPL):

Sensors for gauge pressure

Measurement limits: –100 % (–1 bar)...+100 % of sensor nominal range

	Sensor nominal value (URL)	OPL (Over pressure limit)
1C	100 mbar/10 kPa/1.5 psi g *	4 bar/400 kPa/60 psi g
1E	250 mbar/25 kPa/3.75 psi g *	4 bar/400 kPa/60 psi g
1F	400 mbar/40 kPa/6 psi g	6 bar/600 kPa/90 psi g
1H	1 bar/100 kPa/15 psi g	10 bar/1 MPa/150 psi g
1K	2 bar/200 kPa/30 psi g	20 bar/2 MPa/300 psi g
1M	4 bar/400 kPa/60 psi g	28 bar/2.8 MPa/420 psi g
1P	10 bar/1 MPa/150 psi g	40 bar/4 MPa/600 psi g
1S	40 bar/4 MPa/600 psi g	160 bar/16 MPa/2400 psi g
1U	100 bar/10 MPa/1500 psi g	400 bar/40 MPa/6000 psi g
1W	400 bar/40 MPa/6000 psi g	600 bar/60 MPa/9000 psi g
1X	700 bar/70 MPa/10500 psi g *	1050 bar/105 MPa/15700 psi g

Sensors for absolute pressure

	Sensor nominal value (URL)	OPL (Over pressure limit)
2C	100 mbar/10 kPa/1.5 psi abs *	4 bar/400 kPa/60 psi abs
2E	250 mbar/25 kPa/3.75 psi abs *	4 bar/400 kPa/60 psi abs
2F	400 mbar/40 kPa/6 psi abs	6 bar/600 kPa/90 psi abs
2H	1 bar/100 kPa/15 psi abs	10 bar/1 MPa/150 psi abs
2K	2 bar/200 kPa/30 psi abs	20 bar/2 MPa/300 psi abs
2M	4 bar/400 kPa/60 psi abs	28 bar/2.8 MPa/420 psi abs
2P	10 bar/1 MPa/150 psi abs	40 bar/4 MPa/600 psi abs
2S	40 bar/4 MPa/600 psi abs	160 bar/16 MPa/2400 psi abs
2U	100 bar/10 MPa/1500 psi g	400 bar/40 MPa/6000 psi g
2W	400 bar/40 MPa/6000 psi g	600 bar/60 MPa/9000 psi g
2X	700 bar/70 MPa/10500 psi g *	1050 bar/105 MPa/15700 psi g

50 Calibration; Unit:

1	Sensor range; mbar/bar
2	Sensor range; kPa/MPa
3	Sensor range; mmH_2O/mH_2O
4	Sensor range; inH_2O/ftH_2O
6	Sensor range; psi
B	Customised; see additional specification
C	Factory certificate 5-point; see additional specification
D	DKD certificate; see additional specification
K	Platinum; see additional specification
L	Platinum and factory certificate 5-point; see additional specification
M	Platinum and DKD certificate; see additional specification

60 Membrane material:

1	AISI 316L
2	Alloy C276
6	AISI 316L with Gold-Rhodium coating

70 Process connection; Material:

	Thread, internal diaphragm
GA	Thread ISO 228 G 1/2 A EN 837, AISI 316L
GB	Thread ISO 228 G 1/2 A EN 837, Alloy C
GE	Thread ISO 228 G 1/2 A G 1/4 (female), AISI 316L
GF	Thread ISO 228 G 1/2 A G 1/4 (female), Alloy C
GH	Thread ISO 228 G 1/2 A hole 11.4 mm, AISI 316L
GJ	Thread ISO 228 G 1/2 A hole 11.4 mm, Alloy C
RA	Thread ANSI 1/2 MNPT 1/4 FNPT, AISI 316L (CRN)
RB	Thread ANSI 1/2 MNPT 1/4 FNPT, Alloy C (CRN)
RD	Thread ANSI 1/2 MNPT hole 11.4 mm, AISI 316L (CRN)
RE	Thread ANSI 1/2 MNPT hole 11.4 mm, Alloy C (CRN)
RH	Thread ANSI 1/2 FNPT, AISI 316L
RJ	Thread ANSI 1/2 FNPT, Alloy C
GL	Thread JIS B0202 G 1/2 (male), AISI 316L
RL	Thread JIS B0203 R 1/2 (male), AISI 316L
	For continuation "Process connection; Material", see next page.

PMP71													order code

* in preparation.

→ For continuation of ordering information for PMP71, see the following page.

PMP71 (continued)

70	Process connection; Material (continued):
	Thread, internal diaphragm (continued)
GP	Thread DIN 13 M 20x1.5 EN 837 hole 11.4 mm, AISI 316L
GQ	Thread DIN 13 M 20x1.5 EN 837 hole 11.4 mm, Alloy C
	Thread, flush-mounted diaphragm
1A	Thread ISO 228 G 1/2 A, DIN 3852, AISI 316L
1B	Thread ISO 228 G 1/2 A, DIN 3852, Alloy C
1D	Thread ISO 228 G 1 A, AISI 316L
1E	Thread ISO 228 G 1 A, Alloy C
1G	Thread ISO 228 G 1 1/2 A, AISI 316L
1H	Thread ISO 228 G 1 1/2 A, Alloy C
1K	Thread ISO 228 G 2 A, AISI 316L
1L	Thread ISO 228 G 2 A, Alloy C
2A	Thread ANSI 1 MNPT, AISI 316L (CRN)
2B	Thread ANSI 1 MNPT, Alloy C (CRN)
2D	Thread ANSI 1 1/2 MNPT, AISI 316L (CRN)
2E	Thread ANSI 1 1/2 MNPT, Alloy C (CRN)
2G	Thread ANSI 2 MNPT, AISI 316L (CRN)
2H	Thread ANSI 2 MNPT, Alloy C
1N	Thread DIN 16288 M 20x1.5, AISI 316L
1P	Thread DIN 16288 M 20x1.5, Alloy C
1R	Thread DIN 13 M 44x1.25, AISI 316L
1S	Thread DIN 13 M 44x1.25, Alloy C
	EN/DIN flanges, flush-mounted diaphragm
CN	DN 25 PN 10-40 B1, AISI 316L
CP	DN 32 PN 10-40 B1, AISI 316L
CQ	DN 40 PN 10-40 B1, AISI 316L
B3	DN 50 PN 10-40 B1, AISI 316L
B4	DN 80 PN 10-40 B1, AISI 316L
	ANSI flanges, flush-mounted diaphragm
AN	1" 300 lbs RF, AISI 316/316L (CRN)
AE	1 1/2" 150 lbs RF, AISI 316/316L (CRN)
AQ	1 1/2" 300 lbs RF, AISI 316/316L (CRN)
AF	2" 150 lbs RF, AISI 316/316L (CRN)
AR	2" 300 lbs RF, AISI 316/316L (CRN)
AG	3" 150 lbs RF, AISI 316/316L (CRN)
AS	3" 300 lbs RF, AISI 316/316L (CRN)
AH	4" 150 lbs RF, AISI 316/316L (CRN)
AT	4" 300 lbs RF, AISI 316/316L (CRN)
	JIS flanges, flush-mounted diaphragm
KA	20K 25A RF, AISI 316L
KF	10K 50A RF, AISI 316L
KL	10K 80A RF, AISI 316L
KH	10K 100A RF, AISI 316L
	Other
UR	Ovalflange adapter 1/4-18 NPT, mounting: 7/16-20 UNF, AISI 316L (CRN)
U1	Prepared for diaphragm seal mount, AISI 316L (CRN)

90	Fill fluid:
A	Silicone oil fill
F	Inert oil fill
K	Inert oil fill, cleaned from oil and greace
N	Inert oil fill, cleaned for oxygen services (Note application limits pressure/temperature)

PMP71	order code

→ For continuation of ordering information for PMP71, see the following page.

PMP71 (continued)

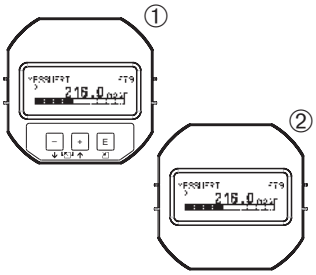
100	Additional option 1:
A	not selected
E	SIL2/IEC 61508 Declaration of conformity
B	Material test certificate for wetted parts, inspection certificate as per EN 10204 3.1 acc. to specification 52005759
C	NACE MR0175 (wetted parts)
D	Material test certificate for wetted parts as per EN 10204 3.1 and NACE MR0175 material, inspection certificate as per EN 10204 acc. to specification 52010806
M	Overvoltage protection
N	HistoROM/M-DAT
S	GL (German Lloyd)/ABS marine certificate
2	Test report acc. to EN10204 2.2
3	Routine test with certificate, inspection certificate as per EN 10204 3.1
4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1

110	Additional option 2:
A	not selected
E	SIL2/IEC 61508 Declaration of conformity
G	Separate housing, cable length see additional spec. + mounting bracket, wall/pipe, 316L
M	Overvoltage protection
N	HistoROM/M-DAT
S	GL (German Lloyd)/ABS marine certificate
U	Mounting bracket for wall/pipe, AISI 304
2	Test report acc. to EN10204 2.2
3	Routine test with certificate, inspection certificate as per EN 10204 3.1
4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1
5	Helium leak test EN 1528 with test certificate, inspection certificate as per EN 10204 3.1

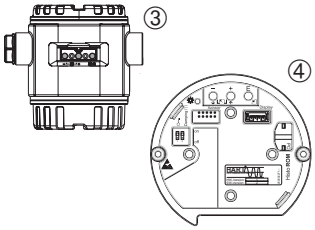
PMP71	complete order code

PMP75

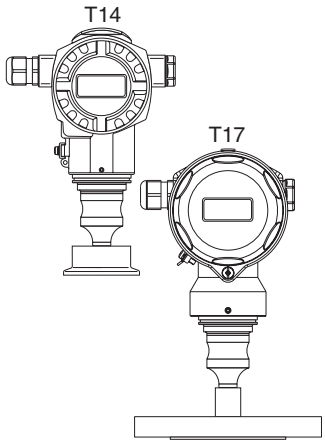
This overview does not mark options which are mutually exclusive.



10	Approval:
A	For non-hazardous areas
1	ATEX II 1/2 G EEx ia IIC T6
6	ATEX II 1/2 G EEx ia IIC T6, overspill protection WHG
2	ATEX II 1/2 D
4	ATEX II 1/3 D
8	ATEX II 1 GD EEx ia IIC T6
3	ATEX II 1/2 GD EEx ia IIC T6
5	ATEX II 2 G EEx d IIC T6
7	ATEX II 3 G EEx nA II T6
S	FM IS, Class I, II, III Division 1, Groups A – G; NI Class I Division 2, Groups A – D; AEx ia
T	FM XP, Class I Division 1, Groups A – D; AEx d
Q	FM DIP, Class II, III Division 1, Groups E – G
R	FM NI, Class I, Division 2, Groups A – D
U	CSA IS, Class I, II, III Division 1, Groups A – G; Class I Division 2, Groups A – D, Ex ia
V	CSA XP, Class I Division 1, Groups B – D; Ex d
W	CSA Class II, III Division 1, Groups E – G (Dust Ex)
G	NEPSI Ex d IIC T6
H	NEPSI Ex ia IIC T6
I	IECEx Zone 0/1 Ex ia IIC T6
B	Combined certificates: ATEX II 1/2 G EEx ia IIC T6 + II 2 G EEx d IIC T6
C	Combined certificates: FM IS and XP Class I Division 1, Groups A – D
D	Combined certificates: CSA IS and XP Class I Division 1, Groups A – D
E	Combined certificates: FM/CSA IS and XP Class I Division 1, Groups A – D
F	Combined certificates: ATEX II EEx ia / EEx d + FM/CSA IS + XP ATEX II 1/2G EEx ia IIC T6+ ATEX II 2G EEx d IIC T6+ FM/CSA IS + XP Cl.I Div.1 Gr.A-D



20	Output; Operation:
A	4...20 mA HART, operation outside, LCD (→ see Fig. ①, ③)
B	4...20 mA HART, operation inside, LCD (→ see Fig. ①, ④)
C	4...20 mA HART, operation inside (→ see Fig. ④)
M	PROFIBUS PA, operation outside, LCD (→ see Fig. ①, ③)
N	PROFIBUS PA, operation inside, LCD (→ see Fig. ①, ④)
O	PROFIBUS PA, operation inside (→ see Fig. ④)
P	FOUNDATION Fieldbus, operation outside, LCD (→ see Fig. ②, ④)
Q	FOUNDATION Fieldbus, operation inside, LCD (→ see Fig. ②, ④)
R	FOUNDATION Fieldbus, operation inside (→ see Fig. ④)



30	Housing; Cable entry; Protection:
A	Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1.5
B	Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
C	Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
D	Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug,
E	Aluminium T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
F	Aluminium T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
1	AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Gland M 20x1.5
2	AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread G 1/2
3	AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, Thread 1/2 NPT
4	AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, M 12x1 PA plug
5	AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 6P, 7/8" FF plug
6	AISI 316L T14 housing, optional display on the side, IP 65/NEMA 4X, Hand 7D plug 90°
R	AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Gland M 20x1.5
S	AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread G 1/2
T	AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, Thread 1/2 NPT
U	AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, M 12x1 PA plug
V	AISI 316L T17 housing, optional display on the side, IP 66/68/NEMA 6P, 7/8" FF plug

PMP75														order code

→ For continuation of ordering information for PMP75, see the following page.

PMP75 (continued)

40	Sensor range; Sensor overload (= OPL):	
	Sensors for gauge pressure	
	Measurement limits: –100 % (–1 bar)...+100 % of sensor nominal range	
	Sensor nominal value (URL)	**OPL (Over pressure limit)**
1F	400 mbar/40 kPa/6 psi	6 bar/600 kPa/90 psi
1H	1 bar/100 kPa/15 psi	10 bar/1 MPa/150 psi
1K	2 bar/200 kPa/30 psi	20 bar/2 MPa/300 psi
1M	4 bar/400 kPa/60 psi	28 bar/2.8 MPa/420 psi
1P	10 bar/1 MPa/150 psi	40 bar/4 MPa/600 psi
1S	40 bar/4 MPa/600 psi	160 bar/16 MPa/2400 psi
1U	100 bar/10 MPa/1500 psi	400 bar/40 MPa/6000 psi
1W	400 bar/40 MPa/6000 psi	600 bar/60 MPa/9000 psi
	Sensors for absolute pressure	
	Sensor nominal value (URL)	**OPL (Over pressure limit)**
2F	400 mbar/40 kPa/6 psi abs	6 bar/600 kPa/90 psi abs
2H	1 bar/100 kPa/15 psi abs	10 bar/1 MPa/150 psi abs
2K	2 bar/200 kPa/30 psi abs	20 bar/2 MPa/300 psi abs
2M	4 bar/400 kPa/60 psi abs	28 bar/2.8 MPa/420 psi abs
2P	10 bar/1 MPa/150 psi abs	40 bar/4 MPa/600 psi abs
2S	40 bar/4 MPa/600 psi abs	160 bar/16 MPa/2400 psi abs
2U	100 bar/10 MPa/1500 psi abs	400 bar/40 MPa/6000 psi abs
2W	400 bar/40 MPa/6000 psi abs	600 bar/60 MPa/9000 psi abs

50	Calibration; Unit:
1	Sensor range; mbar/bar
2	Sensor range; kPa/MPa
3	Sensor range; mmH_2O/mH_2O
4	Sensor range; inH_2O/ftH_2O
6	Sensor range; psi
B	Customised; see additional specification
C	Factory certificate 5-point; see additional specification
D	DKD calibration: see additional specification

60	Membrane material:
1	AISI 316L
2	Alloy C276
3	Monel
5	Tantal
6	AISI 316L with Gold-Rhodium coating
7	AISI 316L with 0.09 mm PTFE foil (not for vacuum applications)
8	AISI 316L with 0.25 mm PTFE foil (not for vacuum applications, only for non-hazardous areas)

70	Process connection, Material:
	Thread, flush-mounted diaphragm
1D	Thread ISO 228 G 1 A, AISI 316L
1E	Thread ISO 228 G 1 A, Alloy C
1G	Thread ISO 228 G 1 1/2 A, AISI 316L
1H	Thread ISO 228 G 1 1/2 A, Alloy C
1K	Thread ISO 228 G 2 A, AISI 316L
1L	Thread ISO 228 G 2 A, Alloy C
2A	Thread ANSI 1 MNPT, AISI 316L
2B	Thread ANSI 1 MNPT, Alloy C (CRN)
2D	Thread ANSI 1 1/2 MNPT, AISI 316L
2E	Thread ANSI 1 1/2 MNPT, Alloy C (CRN)
2G	Thread ANSI 2 MNPT, AISI 316L
2H	Thread ANSI 2 MNPT, Alloy C (CRN)
	Clamp connections
TB	Tri-Clamp, ISO 2852 DN 25 (1"), DIN 32676 DN 25, AISI 316L (CRN)
TC	Tri-Clamp, ISO 2852 DN 38 (1 1/2"), DIN 32676 DN 40, AISI 316L (CRN)
TD	Tri-Clamp, ISO 2852 DN 40 – DN 51 (2")/DN 50, AISI 316L (CRN)
TF	Tri-Clamp, ISO 2852 DN 70 – DN 76.1 (3"), AISI 316L (CRN)

PMP75												order code

→ For continuation of ordering information for PMP75, see the following page.

PMP75 (continued)

70	Process connection; Material (continued):
	Pipe diaphragm seal, Clamp
SB	Tri-Clamp, ISO 2852 DN 25 (1"), AISI 316L (CRN)
SC	Tri-Clamp, ISO 2852 DN 38 (1 1/2"), AISI 316L, 3.1 + Pressure test acc. to PED Cat.II (CRN)
SD	Tri-Clamp, ISO 2852 DN 51 (2"), AISI 316L, 3.1 + Pressure test acc. to PED Cat.II (CRN)
	Hygienic connections
MR	DIN 11851 DN 50 PN 25, AISI 316L
MS	DIN 11851 DN 65 PN 25, AISI 316L
MT	DIN 11851 DN 80 PN 25, AISI 316L
M3	DIN 11851 DN 50 PN 25 thread, AISI 316L
M4	DIN 11851 DN 65 PN 25 thread, AISI 316L
M5	DIN 11851 DN 80 PN 25 thread, AISI 316L
TG	SMS 1" PN 25, AISI 316L
TH	SMS 1 1/2" PN 25, AISI 316L
TI	SMS 2" PN 25, AISI 316L
TL	APV-RJT 1" PN 40, AISI 316L
TM	APV-RJT 1 1/2" PN 40, AISI 316L
TN	APV-RJT 2" PN 40, AISI 316L
TP	APV-ISS 1" PN 40, AISI 316L
TQ	APV-ISS 1 1/2" PN 40, AISI 316L
TS	APV-ISS 2" PN 40, AISI 316L
TK	DRD DN50 (65 mm) PN 25, AISI 316L
TR	Varivent Type N for pipes DN 40 – DN 162 PN 40, AISI 316L
	EN/DIN flanges, flush-mounted diaphragm
CN	DN 25 PN 10-40 B1, AISI 316L
DN	DN 25 PN 63-160 E, AISI 316L
EN	DN 25 PN 250 E, AISI 316L
E1	DN 25 PN 400 E, AISI 316L
CP	DN 32 PN 10-40 B1, AISI 316L
CQ	DN 40 PN 10-40 B1, AISI 316L
B3	DN 50 PN 10-40 B1, AISI 316L
C3	DN 50 PN 63 B2, AISI 316L 2
EF	DN 50 PN 100-160 E, AISI 316L
ER	DN 50 PN 250 E, AISI 316L
E3	DN 50 PN 400 E, AISI 316L
B4	DN 80 PN 10-40 B1, AISI 316L
C4	DN 80 PN 100 B2, AISI 316L
C5	DN 100 PN 100 B2, AISI 316L
	EN/DIN flanges with extended diaphragm seal, flush-mounted diaphragm
D3	DN 50 PN 10-40 B1, Tubus 50 mm/100 mm/200 mm, AISI 316L
D4	DN 80 PN 10-40 B1, Tubus 50 mm/100 mm/200 mm, AISI 316L
	ANSI flanges, flush-mounted diaphragm
AC	1" 150 lbs RF, AISI 316/316L (CRN)
AN	1" 300 lbs RF, AISI 316/316L (CRN)
HC	1" 400/600 lbs RF, AISI 316/316L (CRN)
HN	1" 900/1500 lbs RF, AISI 316/316L (CRN)
H0	1" 2500 lbs RF, AISI 316/316L (CRN)
AE	1 1/2" 150 lbs RF, AISI 316/316L (CRN)
AQ	1 1/2" 300 lbs RF, AISI 316/316L (CRN)
AF	2" 150 lbs RF, AISI 316/316L (CRN)
AR	2" 300 lbs RF, AISI 316/316L (CRN)
HF	2" 400/600 lbs RF, AISI 316/316L (CRN)
HR	2" 900/1500 lbs RF, AISI 316/316L (CRN)
H3	2" 2500 lbs RF, AISI 316/316L
AG	3" 150 lbs RF, AISI 316/316L (CRN)
AS	3" 300 lbs RF, AISI 316/316L (CRN)
AH	4" 150 lbs RF, AISI 316/316L (CRN)
AT	4" 300 lbs RF, AISI 316/316L (CRN)

PMP75	order code

→ For continuation of ordering information for PMP75, see the following page.

PMP75 (continued)

70	Process connection; Material (continued):
	ANSI flanges with extended diaphragm seal
J3	2" 150 lbs RF, Tubus 2"/4"/6"/8", AISI 316/316L (CRN)
J4	3" 150 lbs RF, Tubus 2"/4"/6"/8", AISI 316/316L (CRN)
J7	3" 300 lbs RF, Tubus 2"/4"/6"/8", AISI 316/316L (CRN)
J5	4" 150 lbs RF, Tubus 2"/4"/6"/8", AISI 316/316L (CRN)
J8	4" 300 lbs RF, Tubus 2"/4"/6"/8", AISI 316/316L (CRN)
	JIS flanges, flush-mounted diaphragm
KC	10K 25A RF, AISI 316L
KF	10K 50A RF, AISI 316L
KL	10K 80A RF, AISI 316L
KH	10K 100A RF, AISI 316L
	Other
UA	Thread ISO 228 G 1/2 A PN 160, seperator, EN 837, welded, AISI 316L
UB	Thread ANSI 1/2 MNPT PN 160, seperator, welded, AISI 316L (CRN)
UC	Thread ISO 228 G 1/2 B PN 400, seperator, EN 837, threaded, AISI 316L
UD	Thread ANSI 1/2 MNPT PN 400, seperator, threaded, AISI 316L
UG	Thread 1/2 NPT PN 250, seperator, threaded, AISI 316L
UH	Thread 1 NPT PN 250, seperator, threaded, AISI 316L

90	Fill fluid:
A	Silicone oil
B	...m capillary, inert oil
C	...ft capillary, inert oil
D	Vegetable oil
F	Inert oil
G	High temperature oil, Temp. isolator 100 mm
H	Silicone oil, Temp. isolator 100 mm
K	Inert oil, cleaned from oil and greace
N	Inert oil, cleaned for oxygen services
1	... m capillary, silicone oil
2	... ft capillary, silicone oil
3	... m capillary, high temperature oil
4	... ft capillary, high temperature oil
5	... m capillary, vegetable oil
6	... ft capillary, vegetable oil
7	... m capillary, Low temperature oil
8	... ft capillary, Low temperature oil

100	Additional option 1:
A	not selected
E	SIL2/IEC 61508 Declaration of conformity
B	Material test certificate for wetted parts, inspection certificate as per EN 10204 3.1 acc. to specification 52005759
C	NACE MR0175 (wetted parts)
D	Material test certificate for wetted parts, inspection certificate as per EN 10204 3.1 and NACE MR0175 material, inspection certificate as per EN 10204 acc. to specification 52010806
M	Overvoltage protection
N	HistoROM/M-DAT
S	GL (German Lloyd)/ABS marine certificate
2	Test report acc. to EN 10204 2.2
3	Routine test with certificate, inspection certificate as per EN 10204 3.1
4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1

PMP75	order code

PMP75 (continued)

110											Additional option 2:	
											A	not selected
											E	SIL2/IEC 61508 Declaration of conformity
											G	Separate housing, cable length see additional spec. + mounting bracket, wall/pipe, 316L
											M	Overvoltage protection
											N	HistoROM/M-DAT
											P	EN10204-3.1 material, Ra < 0.4 µm/15.75 µin (240 grit), electropolished, (wetted) inspection certificate (in conjunction with process connection versions "TC", "TD" and "TR")
											S	GL (German Lloyd)/ABS marine certificate
											U	Mounting bracket for wall/pipe, AISI 304
											2	Test report acc. to EN 10204 2.2
											3	Routine test with certificate, inspection certificate as per EN 10204 3.1
											4	Overpressure test with certificate, inspection certificate as per EN 10204 3.1

PMP75												complete order code

Documentation

Innovation	■ For process pressure, differential pressure, flow and level measurement: IN010P/00/en
Field of Activities	■ Pressure measurement, Powerful instruments for process pressure, differential pressure, level and flow: FA004P/00/en
Technical Information	■ Deltabar S: TI382P/00/en ■ Deltapilot S: TI416P/00/en ■ EMC test basic principles TI241F/00/en
Operating Instructions	4...20 mA HART: ■ Cerabar S: BA271P/00/de ■ Description of device functions Cerabar S/Deltabar S/Deltapilot S, Pressure and Differential pressure transmitters: BA274P/00/en PROFIBUS PA: ■ Cerabar S: BA295P/00/de ■ Description of device functions Cerabar S/Deltabar S/Deltapilot S, Pressure and Differential pressure transmitters: BA296P/00/en FOUNDATION Fieldbus: ■ Cerabar S: BA302P/00/de ■ Description of device functions Cerabar S/Deltabar S, Pressure and Differential pressure transmitters: BA303P/00/en
Brief operating instructions	■ 4...20 mA HART, Cerabar S: KA1019P/00/en ■ PROFIBUS PA, Cerabar S: KA1022P/00/en ■ FOUNDATION Fieldbus, Cerabar S: KA1025P/00/en
Manual for Functional Safety (SIL)	■ Cerabar S (4...20 mA): SD190P/00/en

Safety Instructions

Certificate/Type of Protection	Device	Electronic insert	Documentation
ATEX II 1/2 G EEx ia IIC T6	PMC71, PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA244P
ATEX II 1/2 D	PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– XA246P – XA289P
ATEX II 1/2 D EEx ia IIC	PMC71	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– XA247P – XA290P
ATEX II 1/3 D	PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– XA248P – XA291P
ATEX II 2 G EEx d IIC T6	PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA249P
ATEX II 2 G EEx d[ia] IIC T6	PMC71	– 4...20 mA HART, PROFIBUS PA., FOUNDATION Fieldbus	– XA250P
ATEX II 3 G EEx nA II T6	PMC71, PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA251P
ATEX II 1/2 GD EEx ia IIC T6	PMC71, PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA253P
ATEX II 1 GD EEx ia IIC T6	PMC71, PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA276P
ATEX II 1/2 G EEx ia IIC T6 + ATEX II 2 G EEx d IIC T6	PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XA252P
ATEX II EEx ia / EEx d + FM/CSA IS + XP ATEX II 1/2G EEx ia IIC T6+ ATEX II 2G EEx d IIC T6+ FM/CSA IS + XP Cl.I Div.1 Gr.A-D	PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– in preparation

Certificate/Type of Protection	Device	Electronic insert	Documentation
IECEx Zone 0/1 Ex ia IIC T6	PMC71, PMP71, PMP75	– 4...20 mA HART	– XB005P

Certificate/Type of Protection	Device	Electronic insert	Documentation
NEPSI Ex ia IIC T6	PMC71, PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XC003P
NEPSI Ex d IIC T6	PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XC005P
NEPSI Ex d[ia] IIC T6	PMC71	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– XC005P

Installation/Control Drawings

Certificate/Type of Protection	Device	Electronic insert	Documentation
FM IS Class I, II, III, Division 1, Groups A – G; NI, Class I Division 2, Groups A – D; AEx ia	PMC71, PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– ZD147P – ZD188P
CSA IS Class I, II, III, Division 1, Groups A – G; Class I Division 2, Groups A – G	PMC71, PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– ZD148P – ZD189P
FM IS + XP Class I, Division 1, Groups A – D	PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– ZD187P – ZD190P
CSA IS + XP Class I, Division 1, Groups A – D	PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– ZD154P – ZD191P
FM/CSA IS + XP Class I, Division 1, Groups A – D	PMP71, PMP75	– 4...20 mA HART – PROFIBUS PA, FOUNDATION Fieldbus	– ZD154P + ZD187P – ZD190P + ZD191P
ATEX II EEx ia / EEx d + FM/CSA IS + XP ATEX II 1/2G EEx ia IIC T6+ ATEX II 2G EEx d IIC T6+ FM/CSA IS + XP Cl.I Div.1 Gr.A-D	PMP71, PMP75	– 4...20 mA HART, PROFIBUS PA, FOUNDATION Fieldbus	– in preparation

Overspill protection

- WHG: ZE260P/00/de

Instruments International

Endress+Hauser
Instruments International AG
Kaegenstrasse 2
4153 Reinach
Switzerland

Tel. +41 61 715 81 00
Fax +41 61 715 25 00
www.endress.com
info@ii.endress.com

Endress+Hauser
People for Process Automation

TI383P/00/en/12.07
No. 71060099
CCS/FM+SGML 6.0

71060099