



Level



Pressure



Flow



Temperature



Liquid  
Analysis



Registration



Systems  
Components



Services



Solutions

## Technical Information

# Cerabar M PMC51, PMP51, PMP55

Process pressure measurement

Pressure transmitter with ceramic and metallic sensors;

With analog electronics or communication via HART,

PROFIBUS PA or FOUNDATION Fieldbus



### Application

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

- Absolute pressure and gauge pressure measurement in gases, steams or liquids in all areas of process engineering and process measurement technology
- Level, volume or mass measurements in liquids
- High process temperature
  - without diaphragm seals up to 130°C (266°F), for a maximum of 60 minutes 150 °C (302 °F)
  - with diaphragm seals up to 400°C (752°F)
- High pressure up to 400 bar (6000 psi)
- International usage thanks to a wide range of approvals

### Your benefits

- Very good reproducibility and long-term stability
- High reference accuracy: up to  $\pm 0.15\%$ , as PLATINUM version:  $\pm 0.075\%$
- Turn down up to 100:1
- End-to-end modularity for differential pressure, hydrostatics and pressure (Deltabar M – Deltapilot M – Cerabar M), e.g.
  - replaceable display
  - universal electronics
- Easy commissioning without the need for an operating tool
- Easy and safe menu-guided operation
  - on-site via display module
  - via 4 to 20 mA with HART
  - via PROFIBUS PA
  - via FOUNDATION Fieldbus
- Device versions compliant with ASME-BPE
- Used for process pressure monitoring up to SIL2, certified to IEC 61508 Edition 2.0 and IEC 61511 by TÜV NORD

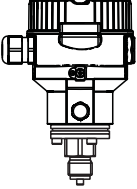
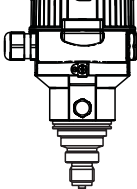
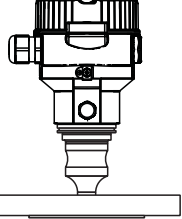
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## Function and system design

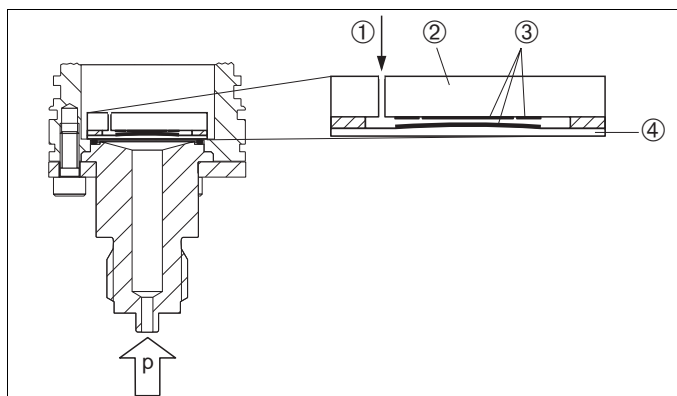
### Device selection

Cerabar M – Product family	PMC51    <small>P01-PMC51xxx-16-xx-xx-xx-000</small>  <b>With capacitive measuring cell and ceramic process isolating diaphragm (Ceraphire®)</b>	PMP51    <small>P01-PMP51xxx-16-xx-xx-xx-000</small>  <b>With piezoresistive measuring cell and metallic welded process isolating diaphragm</b>	PMP55    <small>P01-PMP55xxx-16-xx-xx-xx-000</small>  <b>With diaphragm seal</b>
Field of application	<ul style="list-style-type: none"> <li>– Gauge pressure and absolute pressure</li> <li>– Level</li> </ul>		
Process connections	<ul style="list-style-type: none"> <li>– Thread</li> <li>– EN flanges DN 25 – DN 80</li> <li>– ANSI flanges 1" – 4"</li> <li>– JIS flanges 50 A – 100 A</li> <li>– Flush-mounted hygienic connections</li> </ul>	<ul style="list-style-type: none"> <li>– Thread</li> <li>– EN flanges DN 25 – DN 80</li> <li>– ANSI flanges 1" – 4"</li> <li>– JIS flanges 25 A – 100 A</li> <li>– Prepared for diaphragm seal mount</li> <li>– Flush-mounted hygienic connections</li> </ul>	<ul style="list-style-type: none"> <li>– Wide range of diaphragm seals</li> </ul>
Measuring ranges	From –100/0 to 100 mbar (–1.5/0 to 1.5 psi) to –1/0 to 40 bar (–15/0 to 600 psi)	From –400/0 to 400 mbar (–6/0 to 6 psi) to –1/0 to 400 bar (–15/0 to 6000 psi)	
OPL <sup>1)</sup>	Max. 60 bar (900 psi)	Max. 600 bar (9000 psi)	
Process temperature range	–40 to +130 °C (–40 to +266 °F) For a maximum of 60 minutes: +150 °C (+302 °F)	–40 to +130 °C (–40 to +266 °F) For a maximum of 60 minutes: +150 °C (+302 °F)	–70 to 400 °C (–94 to +752 °F) depending on the filling oil
Ambient temperature range	<ul style="list-style-type: none"> <li>– Without LCD display: –40 to +85 °C (–40 to +185 °F)</li> <li>– With LCD display: –20 to +70 °C (–4 to +158 °F) (extended temperature application range (–40 to 85 °C (–40 to 185 °F)) with restrictions in optical properties such as display speed and contrast)</li> <li>– Separate housing: –20 to +60 °C (–4 to +140 °F)</li> <li>– Diaphragm seal systems depending on the version</li> </ul>		
Reference accuracy	<ul style="list-style-type: none"> <li>– Up to ±0.15% of the set span</li> <li>– PLATINUM version: up to ±0.075% of the set span</li> </ul>		Up to ±0.15% of the set span
Supply voltage	<ul style="list-style-type: none"> <li>– 11.5 to 45 V DC (versions with plug-in connection 35 V DC)</li> <li>– For intrinsically safe device versions: 11.5 to 30 V DC</li> </ul>		
Output	4 to 20 mA, 4 to 20 mA with superimposed HART protocol		
Options	<ul style="list-style-type: none"> <li>– PMP51, PMP55: NACE-compliant materials</li> <li>– PMC51, PMP51, PMP55: inspection certificate 2.2 or 3.1 or other certificates</li> <li>– 3A approval and EHEDG approval</li> <li>– Specific firmware versions</li> <li>– Initial device settings</li> <li>– Separate housing</li> <li>– Broad range of accessories</li> </ul>		
Specialties	<ul style="list-style-type: none"> <li>– Metal-free measurement with PVDF connection</li> <li>– Special cleaning of the transmitter to remove paint-wetting substances, for use in paint shops</li> </ul>	<ul style="list-style-type: none"> <li>– Process connections with minimum oil volume</li> <li>– Gas-tight, elastomer-free</li> </ul>	<ul style="list-style-type: none"> <li>– Wide range of diaphragm seals</li> <li>– For extreme medium temperatures</li> <li>– Process connections with minimum oil volume</li> <li>– Completely welded versions</li> </ul>

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

## Measuring principle

### Ceramic process isolating diaphragm used in PMC51 (Ceraphire®)

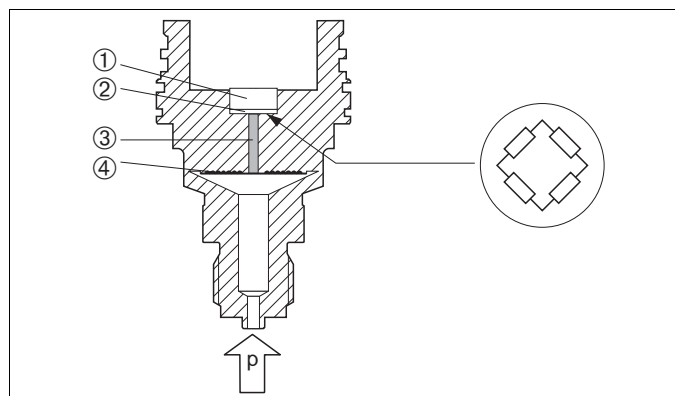


P01-PMC71xxx-03-xx-xx-xx-000

#### Ceramic sensor

- 1 Air pressure (gauge pressure sensors)
- 2 Ceramic substrate
- 3 Electrodes
- 4 Ceramic process isolating diaphragm

### Metallic process isolating diaphragm used in PMP51 and PMP55



P01-PMP7xxx-03-xx-xx-xx-000

#### Metallic sensor

- 1 Silicon measuring element, substrate
- 2 Wheatstone bridge
- 3 Channel with fill fluid
- 4 Metallic process isolating diaphragm

### Ceramic process isolating diaphragm used in PMC51 (Ceraphire®)

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

#### Advantages:

- Guaranteed overload resistance up to 40 times the nominal pressure
- Thanks to ultrapure 99.9% ceramic (Ceraphire®, see also "[www.endress.com/ceraphire](http://www.endress.com/ceraphire)")
  - extremely high chemical stability, comparable with Alloy C
  - less relaxation
  - high mechanical stability
- Can be used in absolute vacuum
- Outstanding surface finish,  $R_a \leq 0.3 \mu\text{m}$  ( $11.8 \mu\text{in}$ )

### Metallic process isolating diaphragm used in PMP51 and PMP55

#### PMP51

The operating pressure deflects the process isolating diaphragm and a fill fluid transfers the pressure to a resistance bridge (semiconductor technology). The pressure-dependent change in the bridge output voltage is measured and evaluated.

#### Advantages:

- Can be used for process pressure up to 400 bar (6000 psi)
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Significantly less thermal effect compared to diaphragm seal systems

#### PMP55

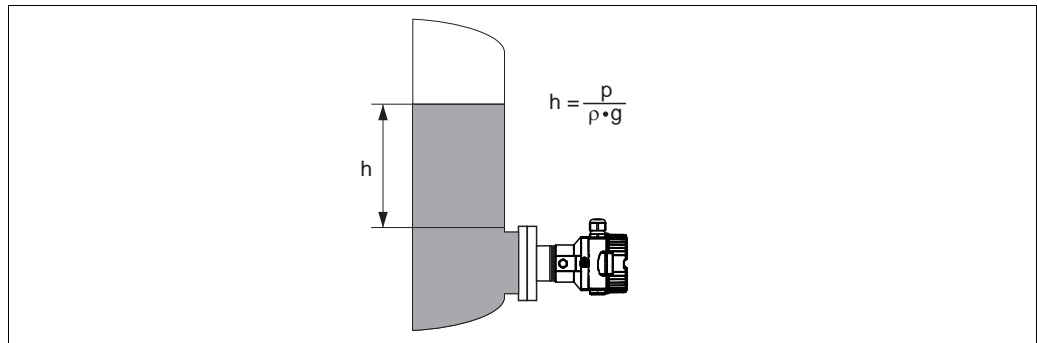
The operating pressure acts on the process isolating diaphragm of the diaphragm seal and is transferred to the process isolating diaphragm of the sensor by a diaphragm seal fill fluid. The process isolating diaphragm is deflected and a fill fluid transfers the pressure to a resistance bridge. The pressure-dependent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

#### Advantages:

- Depending on the version, can be used for process pressure up to 400 bar (6000 psi) and simultaneous extreme process temperatures
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure

## Level measurement (level, volume and mass)

### Function and design



P01-PMx5xxxx-15-xx-xx-xx-000

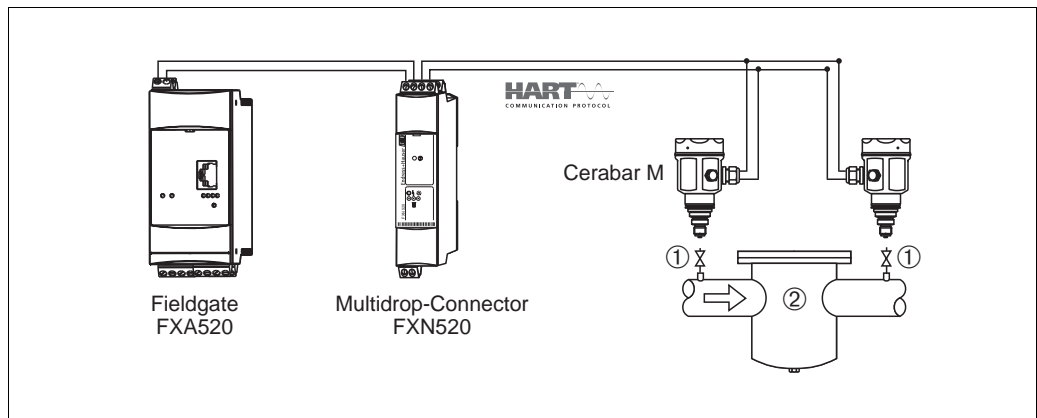
#### Level measurement

$h$	Height (level)
$p$	Pressure
$\rho$	Density of the medium
$g$	Gravitation constant

### Your benefits

- Choice of different level measuring 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
- Has a wide range of uses, even in the following cases:
  - in the event of foam formation
  - in tanks with agitators or screen fittings
  - in the event of liquid gases

## Electrical differential pressure measurement with gauge pressure sensors



P01-PMX51xxx-14-xx-xx-xx-001

- 1 Shut-off valves
- 2 e.g. filter

In the example given, two Cerabar M devices (each with a gauge pressure sensor) are interconnected. The pressure difference can thus be measured using two independent Cerabar M devices.

#### Caution!

If using intrinsically safe devices, strict compliance with the rules for interconnecting intrinsically safe circuits as stipulated in IEC60079-14 (proof of intrinsic safety) is mandatory.

## System integration (except analog electronics)

The device can be fitted with a tag name and a preset bus address, see → 82 ff "Ordering information" feature 895 "Identification:" version "Z1" and "Z2".

---

**Communication protocol**

- 4 to 20 mA without communication protocol (analog electronics)
- 4 to 20 mA with HART communication protocol
- PROFIBUS PA
  - The Endress+Hauser devices meet the requirements of the FISCO model.
  - Due to the low current consumption of  $11 \text{ mA} \pm 1 \text{ mA}$ , the following number of devices can be operated on one bus segment if installing as per FISCO:
    - up to 8 Cerabar M for Ex ia, CSA IS and FM IS applications
    - up to 31 Cerabar M for all other applications, e.g. in non-hazardous areas, Ex nA, etc.

Further information on PROFIBUS PA can be found in Operating Instructions BA00034S "PROFIBUS DP/PA: Guidelines for planning and commissioning" and in the PNO Guideline.
- FOUNDATION Fieldbus
  - The Endress+Hauser devices meet the requirements of the FISCO model.
  - Due to the low current consumption of  $16 \text{ mA} \pm 1 \text{ mA}$ , the following number of devices can be operated on one bus segment if installing as per FISCO:
    - up to 6 Cerabar M for Ex ia, CSA IS and FM IS applications
    - up to 22 Cerabar M for all other applications, e.g. in non-hazardous areas, Ex nA, etc.

Further information on FOUNDATION Fieldbus, such as requirements for bus system components can be found in Operating Instructions BA00013S "FOUNDATION Fieldbus Overview".

## Input

### Measured variable

- Analog electronics: Absolute pressure and gauge pressure
- HART electronics: Absolute pressure and gauge pressure, from which level (level, volume or mass) is derived

### Measuring range

#### PMC51 – with ceramic process isolating diaphragm (Ceraphire®) for gauge pressure

Nominal value	Range limit		Smallest calibratable span (preset at the factory) <sup>1)</sup>	MWP <sup>2)</sup>	OPL <sup>3)</sup>	Vacuum resistance	Version in the order code <sup>4)</sup>
	lower (LRL) [bar (psi)]	upper (URL) [bar (psi)]					
100 mbar (1.5 psi)	-0.1 (-1.5)	+0.1 (+1.5)	0.01 (0.15)	2.7 (40.5)	4 (60)	0.7 (10.5)	1C
250 mbar (3.75 psi)	-0.25 (-3.75)	+0.25 (+3.75)	0.01 (0.15)	3.3 (49.5)	5 (75)	0.5 (7.5)	1E
400 mbar (6 psi)	-0.4 (-6)	+0.4 (+6)	0.02 (0.3)	5.3 (79.5)	8 (120)	0	1F
1 bar (15 psi)	-1 (-15)	+1 (+15)	0.05 (1)	6.7 (100.5)	10 (150)	0	1H
2 bar (30 psi)	-1 (-15)	+2 (+30)	0.1 (1.5)	12 (180)	18 (270)	0	1K
4 bar (60 psi)	-1 (-15)	+4 (+60)	0.2 (3)	16.7 (250.5)	25 (375)	0	1M
10 bar (150 psi)	-1 (-15)	+10 (+150)	0.5 (7.5)	26.7 (400.5)	40 (600)	0	1P
40 bar (600 psi)	-1 (-15)	+40 (+600)	2 (30)	40 (600)	60 (900)	0	1S

#### PMC51 – with ceramic process isolating diaphragm (Ceraphire®) for absolute pressure

Nominal value	Range limit		Smallest calibratable span (preset at the factory) <sup>1)</sup>	MWP <sup>2)</sup>	OPL <sup>3)</sup>	Vacuum resistance	Version in the order code <sup>4)</sup>
	lower (LRL) [bar <sub>abs</sub> (psi <sub>abs</sub> )]	upper (URL) [bar <sub>abs</sub> (psi <sub>abs</sub> )]					
100 mbar (15 psi)	0	+0.1 (+1.5)	0.01 (0.15)	2.7 (40.5)	4 (60)	0	2C
250 mbar (3.75 psi)	0	+0.25 (+3.75)	0.01 (0.15)	3.3 (49.5)	5 (75)	0	2E
400 mbar (6 psi)	0	+0.4 (+6)	0.02 (0.3)	5.3 (79.5)	8 (120)	0	2F
1 bar (15 psi)	0	+1 (+15)	0.05 (1)	6.7 (100.5)	10 (150)	0	2H
2 bar (30 psi)	0	+2 (+30)	0.1 (1.5)	12 (180)	18 (270)	0	2K
4 bar (60 psi)	0	+4 (+60)	0.2 (3)	16.7 (250.5)	25 (375)	0	2M
10 bar (150 psi)	0	+10 (+150)	0.5 (7.5)	26.7 (400.5)	40 (600)	0	2P
40 bar (600 psi)	0	+40 (+600)	2 (30)	40 (600)	60 (900)	0	2S

- 1) Recommended turn down: Max 10:1.  
Factory calibration turn down: Max 20:1, higher on request or configurable in the device.
- 2) The MWP (maximum working pressure) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection (→ 33 ff) has to be taken into consideration in addition to the measuring cell (→ see Table above). Pay attention to the pressure-temperature dependence also. For the appropriate standards and other information, see → 32, "Pressure specifications" section.
- 3) OPL: over pressure limit depends on the lowest-rated element, with regard to pressure, of the selected components
- 4) Version in the order code → see also → 82 ff, feature 70 "Sensor range"



**PMP51 and PMP55 – metallic process isolating diaphragm for gauge pressure**

Nominal value	Range limit		Smallest calibratable span (preset at the factory) <sup>1)</sup>	MWP <sup>2)</sup>	OPL <sup>3)</sup>	Vacuum resistance <sup>4)</sup> Silicone oil/ Inert oil	Version in the order code <sup>5)</sup>
	lower (LRL) [bar (psi)]	upper (URL) [bar (psi)]					
400 mbar (6 psi)	-0.4 (-6)	+0.4 (+6)	0.02 (0.3)	4 (60)	6 (90)	0.01/0.04 (0.15/0.6)	1F
1 bar (15 psi)	-1 (-15)	+1 (+15)	0.05 (1)	6.7 (100)	10 (150)		1H
2 bar (30 psi)	-1 (-15)	+2 (+30)	0.1 (1.5)	13.3 (200)	20 (300)		1K
4 bar (60 psi)	-1 (-15)	+4 (+60)	0.2 (3)	18.7 (280.5)	28 (420)		1M
10 bar (150 psi)	-1 (-15)	+10 (+150)	0.5 (7.5)	26.7 (400.5)	40 (600)		1P
40 bar (600 psi)	-1 (-15)	+40 (+600)	2 (30)	100 (1500)	160 (2400)		1S
100 bar (1500 psi)	-1 (-15)	+100 (+1500)	5 (75)	100 (1500)	400 (6000)		1U
400 bar (6000 psi)	-1 (-15)	+400 (+6000)	20 (300)	400 (6000)	600 (9000)		1W

**PMP51 and PMP55 – metallic process isolating diaphragm for absolute pressure**

Nominal value	Range limit		Smallest calibratable span (preset at the factory) <sup>1)</sup>	MWP <sup>2)</sup>	OPL <sup>3)</sup>	Vacuum resistance <sup>4)</sup> Silicone oil/ Inert oil	Version in the order code <sup>5)</sup>
	lower (LRL) [bar <sub>abs</sub> (psi <sub>abs</sub> )]	upper (URL) [bar <sub>abs</sub> (psi <sub>abs</sub> )]					
400 mbar (6 psi)	0	+0.4 (+6)	0.02 (0.3)	4 (60)	6 (90)	0.01/0.04 (0.15/0.6)	2F
1 bar (15 psi)	0	+1 (+15)	0.05 (1)	6.7 (100)	10 (150)		2H
2 bar (30 psi)	0	+2 (+30)	0.1 (1.5)	13.3 (200)	20 (300)		2K
4 bar (60 psi)	0	+4 (+60)	0.2 (3)	18.7 (280.5)	28 (420)		2M
10 bar (150 psi)	0	+10 (+150)	0.5 (7.5)	26.7 (400.5)	40 (600)		2P
40 bar (600 psi)	0	+40 (+600)	2 (30)	100 (1500)	160 (2400)		2S
100 bar (1500 psi)	0	+100 (+1500)	5 (75)	100 (1500)	400 (6000)		2U
400 bar (6000 psi)	0	+400 (+6000)	20 (300)	400 (6000)	600 (9000)		2W

- 1) Recommended turn down: Max 10:1.  
Factory calibration turn down: Max 20:1, higher on request or configurable in the device.
- 2) The MWP (maximum working pressure) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection (→ 33 ff) has to be taken into consideration in addition to the measuring cell (→ see Table above). Pay attention to the pressure-temperature dependence also. For the appropriate standards and other information, see → 32, "Pressure specifications" section.
- 3) OPL: over pressure limit (= sensor overload limit)
- 4) The vacuum resistance applies to the measuring cell at reference conditions. The pressure and temperature application limits of the selected filling oil must also be observed for the PMP55. → 77, "Diaphragm seal filling oils" section.
- 5) Version in the order code → 82 ff, feature 70 "Sensor range"

**Explanation of terms**

**Explanation of terms: turn down (TD), set span and span based on zero point**

Case 1:

- Lower range value (LRV)  $\leq$  Upper range value (URV)

Example:

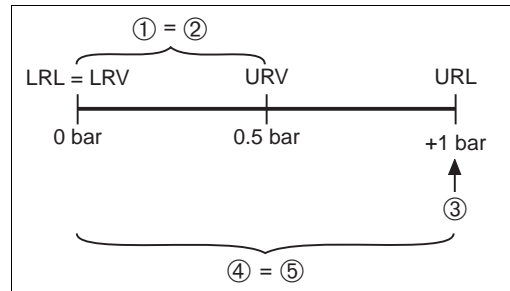
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar (7.5 psi)
- Nominal value (URL) = 1 bar (15 psi)

Turn down:

- $TD = URL / |URV| = 2:1$

Set span:

- $URV - LRV = 0.5 \text{ bar (7.5 psi)}$   
This span is based on the zero point.



P01-PMx7xxxx-05-xx-xx-xx-012

Example: 1 bar (15 psi) measuring cell

Case 2:

- Lower range value (LRV)  $\leq$  Upper range value (URV)

Example:

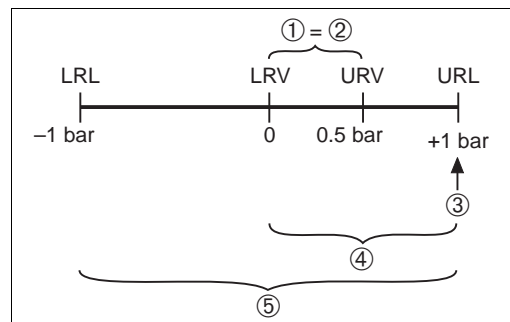
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar (7.5 psi)
- Nominal value (URL) = 1 bar (15 psi)

Turn down:

- $TD = URL / |URV| = 2:1$

Set span:

- $URV - LRV = 0.5 \text{ bar (7.5 psi)}$   
This span is based on the zero point.



P01-PMx7xxxx-05-xx-xx-xx-007

Example: 1 bar (15 psi) measuring cell

Case 3:

- Lower range value (LRV)  $\geq$  Upper range value (URV)

Example:

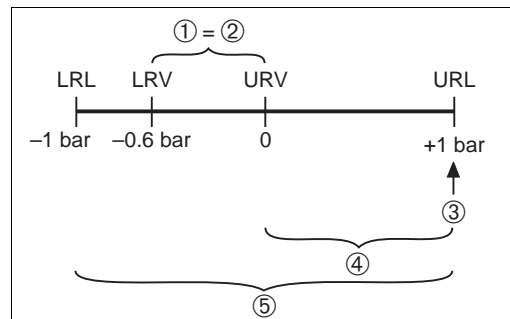
- Lower range value (LRV) = -0.6 bar (-9 psi)
- Upper range value (URV) = 0 bar
- Nominal value (URL) = 1 bar (15 psi)

Turn down:

- $TD = URL / |LRV| = 1.67:1$

Set span:

- $URV - LRV = 0.6 \text{ bar (-9 psi)}$   
This span is based on the zero point.



P01-PMx7xxxx-05-xx-xx-xx-008

Example: 1 bar (15 psi) measuring cell

- 1 Set span
- 2 Span based on zero point
- 3 Nominal value  $\hat{=}$  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 to 20 mA analog, 2-wire
- 4 to 20 mA with superimposed digital communication protocol HART 6.0, 2-wire
- Digital communication signal PROFIBUS PA (Profile 3.02)
- Digital communication signal FOUNDATION Fieldbus

### Signal range

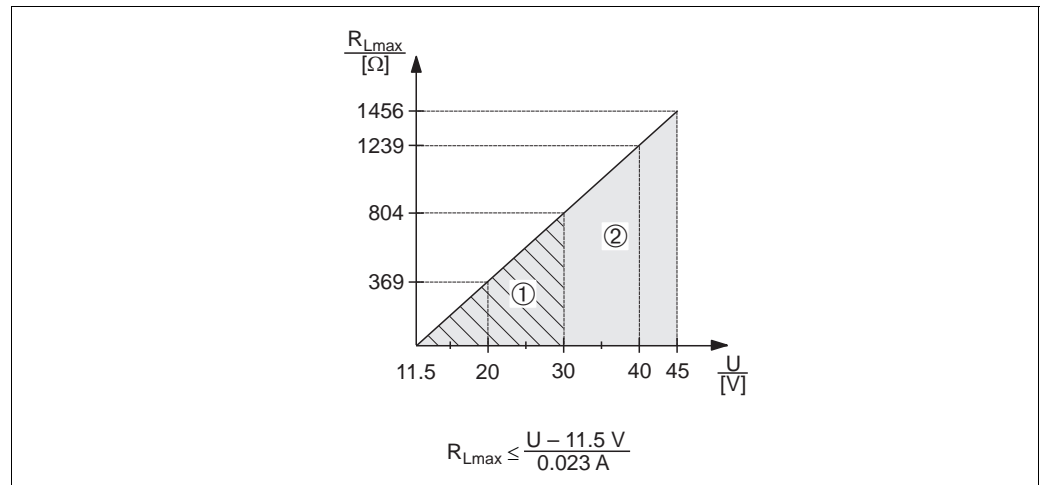
4 to 20 mA analog, 4 to 20 mA HART: 3.8 to 20.5 mA

### Signal on alarm

As per NAMUR NE 43

- 4 to 20 mA Analog:
  - Signal overshoot: > 20.5 mA
  - Signal undershoot: < 3.8 mA
  - Min Alarm (3.6 mA)
- 4 to 20 mA HART
  - Options:
    - Max. alarm: can be set from 21 to 23 mA (factory setting: 22 mA)
    - Hold measured value: last measured value is held
    - Min. alarm: 3.6 mA
- PROFIBUS PA: can be set in the Analog Input block,
  - Options: Last Valid Out Value (factory setting), Fail-safe Value, Status Bad
- FOUNDATION Fieldbus: can be set in the Analog Input block,
  - Options: Last Good Value, Fail-safe Value (factory setting), Wrong Value

### Load - 4 to 20 mA analog and 4 to 20 mA HART



Load diagram

1 Power supply 11.5 to 30 V DC for intrinsically safe device versions

2 Power supply 11.5 to 45 V DC (versions with plug-in connector 35 V DC) for other types of protection and for uncertified device versions

$R_{Lmax}$  Maximum load resistance

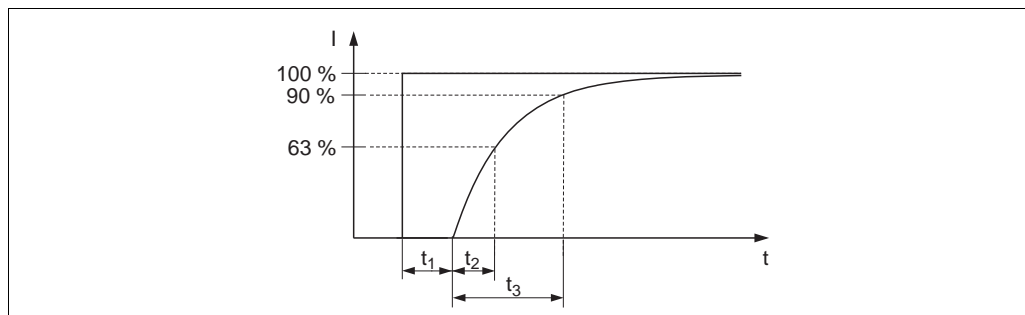
$U$  Supply voltage

#### Note!

When operating via a handheld terminal or via a PC with an operating program, a minimum communication resistance of 250  $\Omega$  must be taken into account.

### Resolution

- Current output: 1  $\mu$ A
- Display HART: can be set (factory setting: presentation of the maximum accuracy of the transmitter)

**Dead time, Time constant**

Presentation of the dead time and the time constant

**Dynamic behavior:  
current output (analog  
electronics)**

	Type	Dead time ( $t_1$ ) [ms]	Time constant T63 (= $t_2$ ) [ms]	Time constant T90 (= $t_3$ ) [ms]
max.	PMC51	60	40	50
max.	PMP51	40	40	50
max.	PMP55	PMP51 + influence of the diaphragm seal		

**Dynamic behavior:  
current output (HART  
electronics)**

	Type	Dead time ( $t_1$ ) [ms]	Time constant T63 (= $t_2$ ) [ms]	Time constant T90 (= $t_3$ ) [ms]
max.	PMC51	50	85	200
max.	PMP51	70	80	185
max.	PMP55	PMP51 + influence of the diaphragm seal		

**Dynamic behavior: digital  
output (HART electronics)**

	Type	Dead time ( $t_1$ ) [ms]	Dead time ( $t_1$ ) [ms] + Time constant T63 (= $t_2$ ) [ms]	Dead time ( $t_1$ ) [ms] + Time constant T90 (= $t_3$ ) [ms]
min.	PMC51	210	295	360
max.		1010	1095	1160
min.	PMP51	210	285	345
max.		1010	1085	1145
max.	PMP55	PMP51 + influence of the diaphragm seal		

**Reading cycle**

- Acyclic: max. 3/s, typical 1/s (depends on command # and number of preambles)
- Cyclic (Burst): max. 3/s, typical 2/s

The Cerabar M commands the BURST MODE function for cyclic value transmission via the HART communication protocol.

**Cycle time (Update time)**

Cyclic (Burst): min. 300 ms

**Response time**

- Acyclic: min. 330 ms, typical 590 ms (depends on command # and number of preambles)
- Cyclic (Burst): min. 160 ms, typical 350 ms (depends on command # and number of preambles)

**Dynamic behavior:  
PROFIBUS PA**

	Type	Dead time (t <sub>1</sub> ) [ms]	Dead time (t <sub>1</sub> ) [ms] + Time constant T63 (= t <sub>2</sub> ) [ms]	Dead time (t <sub>1</sub> ) [ms] + Time constant T90 (= t <sub>3</sub> ) [ms]
min.	PMC51	85	170	235
max.		1185	1270	1335
min.	PMP51	85	160	220
max.		1185	1260	1320
max.	PMP55	PMP51 + influence of the diaphragm seal		

**Reading cycle**

- Cyclic: max. 30/s (dependent on the number and type of function blocks used in a closed-control loop)
- Acyclic: typical 25/s

**Cycle time (update time)**

min. 100 ms

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.

**Response time**

- Cyclic: approx. 8 to 13 ms (depends on Min. Slave Interval)
- Acyclic: approx. 23 to 35 ms (depends on Min. Slave Interval)

**Dynamic behavior:  
FOUNDATION Fieldbus**

	Type	Dead time (t <sub>1</sub> ) [ms]	Dead time (t <sub>1</sub> ) [ms] + Time constant T63 (= t <sub>2</sub> ) [ms]	Dead time (t <sub>1</sub> ) [ms] + Time constant T90 (= t <sub>3</sub> ) [ms]
min.	PMC51	95	180	245
max.		1095	1180	1245
min.	PMP51	95	170	230
max.		1095	1170	1230
max.	PMP55	PMP51 + influence of the diaphragm seal		

**Reading cycle**

- Cyclic: max. 10/s (dependent on the number and type of function blocks used in a closed-control loop)
- Acyclic: typical 5/s

**Cycle time (update time)**

Cyclic: min. 100 ms

**Response time**

- Cyclic: max. 20 ms (for standard bus parameter settings)
- Acyclic: typical 70 ms (for standard bus parameter settings)

**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
- Via DIP-switch on the electronic insert, switch position  
"on" (= set value) and "off" (= damping switched off)
- Factory setting: 2 s

**Data of the FOUNDATION  
Fieldbus interface****Basic data**

Device Type	0x1019
Device Revision	01 (hex)
DD Revision	0x01021
CFF Revision	0x000102
ITK Version	5.2.0
ITK Certification Driver No.	IT067700
Link-Master (LAS) capable	Yes
Link Master / Basic Device selectable	Yes; Factory setting: Basic Device
Number of VCRs	44
Number of Link Objects in VFD	50
Number of FB-Schedule Objects	40

**Virtual communication references (VCRs)**

Permanent Entries	44
Client VCRs	0
Server VCRs	5
Source VCRs	8
Sink VCRs	0
Subscriber VCRs	12
Publisher VCRs	19

**Link settings**

Slot time	4
Min. inter PDU delay	12
Max. response delay	40

**Transducer Blocks**

Block	Content	Output values
TRD1 Block	Contains all parameters related to the measurement	<ul style="list-style-type: none"> <li>■ Pressure or level (channel 1)</li> <li>■ Process temperature (channel 2)</li> <li>■ Measured pressure value (channel 3)</li> <li>■ Max. pressure (channel 4)</li> <li>■ Level before linearization (channel 5)</li> </ul>
Diagnostic Block	Contains diagnostic information	Error code via DI channels (channel 10 to 15)
Display Block	Contains parameters to configure the onsite display	No output values

**Function blocks**

Block	Content	Number of blocks	Execution time	Functionality
Resource Block	The Resource Block contains all the data that uniquely identify the device. It is an electronic version of a nameplate of the device.	1		enhanced
Analog Input Block 1 Analog Input Block 2	The AI Block receives the measuring data from the Sensor Block, (selectable via a channel number) and makes the data available to other function blocks at its output. Enhancement: digital outputs for process alarms, fail safe mode.	2	25 ms	enhanced
Digital Input Block	This block contains the discrete data of the Diagnose Block (selectable via a channel number 10 to 15) and provides them for other blocks at the output.	1	20 ms	standard
Digital Output Block	This block converts the discrete input and thus initiates an action (selectable via a channel number) in the DP Flow Block or in the im TRD1 Block. Channel 20 resets the counter for max. pressure transgressions value and Channel 21 resets the Totalizer.	1	20 ms	standard
PID Block	The PID Block serves as a proportional-integral-derivative controller and is used almost universally for closed-loop-control in the field including cascade and feedforward. Input IN can be indicated on the display. The selection is performed in the Display Block (DISPLAY_MAIN_LINE_CONTENT).	1	40 ms	standard
Arithmetic Block	This block is designed to permit simple use of popular measurement math functions. The user does not have to know how to write equations. The math algorithm is selected by name, chosen by the user for the function to be performed.	1	35 ms	standard
Input Selector Block	The Input Selector Block facilitates the selection of up to four inputs and generates an output based on the configured action. This block normally receives its inputs from AI Blocks. The block performs maximum, minimum, average and 'first good' signal selection. Inputs IN1 to IN4 can be indicated on the display. The selection is performed in the Display Block (DISPLAY_MAIN_LINE_1_CONTENT).	1	30 ms	standard
Signal Characterizer Block	The Signal Characterizer Block has two sections, each with an output that is a non-linear function of the respective input. The non-linear function is generated by a single look-up table with 21 arbitrary x-y pairs.	1	40 ms	standard
Integrator Block	The Integrator Block integrates a variable as a function of the time or accumulates the counts from a Pulse Input Block. The block may be used as a totalizer that counts up until reset or as a batch totalizer that has a setpoint, where the integrated or accumulated value is compared to pre-trip and trip settings, generating a binary signal when the setpoint is reached.	1	35 ms	standard

**Additional function block information:**

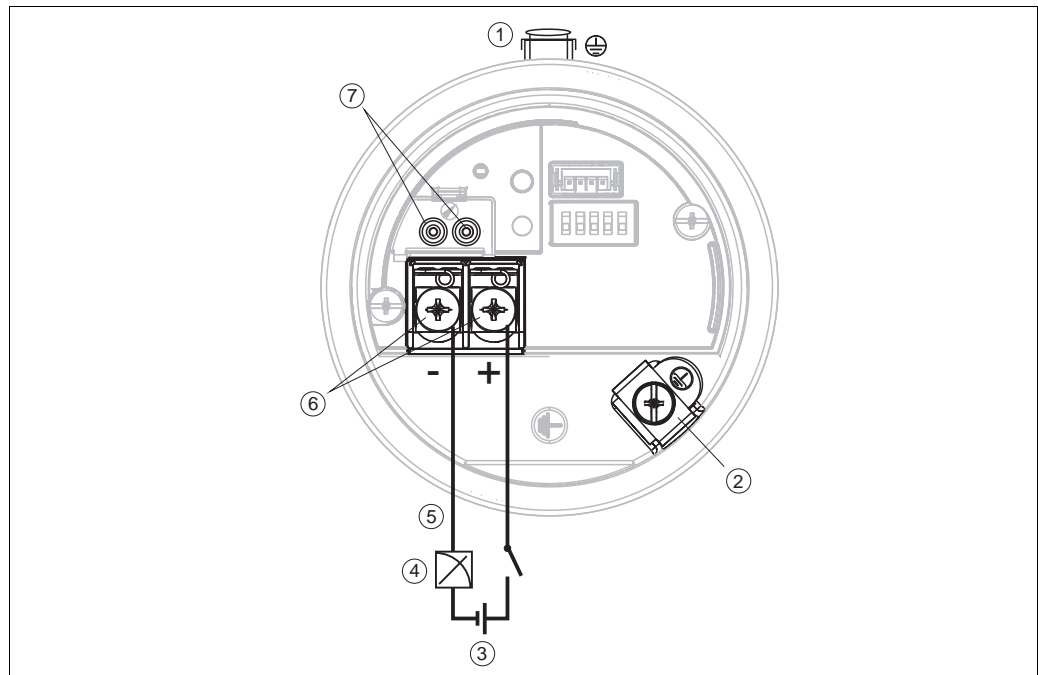
Instantiate Function Block	YES
Number of instantiate blocks	20

## 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.  
→ 98 ff, "Safety Instructions" and "Installation/Control Drawings" sections.
- According to IEC/EN61010 a suitable disconnector has to be installed for the device
- HART: Overvoltage protection HAW569-DA2B for the non-hazardous area, ATEX II 2 (1) Ex ia IIC and IEC Ex ia can be ordered as an option (see "Ordering information" section).
- Protective circuits against reverse polarity, HF influences and overvoltage peaks are installed.
- The digital communication signal is transmitted to the bus via a 2-wire connection. The bus also provides the power supply.



P01-xiMaxxxxx-04-xx-xx-xx-004

*Electrical connection*

- 1 External grounding terminal
- 2 Internal grounding terminal
- 3 Supply voltage → 18
- 4 4...20 mA for HART devices
- 5 For HART and FOUNDATION Fieldbus devices: With a handheld terminal, all the parameters can be configured anywhere along the bus line via menu operation.
- 6 Terminals
- 7 For HART devices: test terminals, see section "Taking 4 to 20 mA test signal"

### 4 to 20 mA Analog, 4 to 20 mA HART

*Taking 4 to 20 mA test signal*

A 4 to 20 mA test signal may be measured via the test terminals without interrupting the measurement.

### PROFIBUS PA

For further information on the network structure and grounding, and for further bus system components such as bus cables, see the relevant documentation, e.g. Operating Instructions BA00034S "PROFIBUS DP/PA: Guidelines for planning and commissioning" and the PNO Guideline.

Cable specifications:

Use a twisted, shielded two-wire cable, preferably cable type A

Note!

For further information on the cable specifications, see Operating Instructions BA00034S "PROFIBUS DP/PA: Guidelines for planning and commissioning", the PNO Guideline 2.092 PROFIBUS PA User and Installation Guideline" and IEC 61158-2 (MBP).



### FOUNDATION Fieldbus

The digital communication signal is transmitted to the bus via a 2-wire connection. The bus also provides the power supply. For further information on the network structure and grounding and for further bus system components such as bus cables, see the relevant documentation, e.g. Operating Instructions BA00013S "FOUNDATION Fieldbus Overview" and the FOUNDATION Fieldbus Guideline.

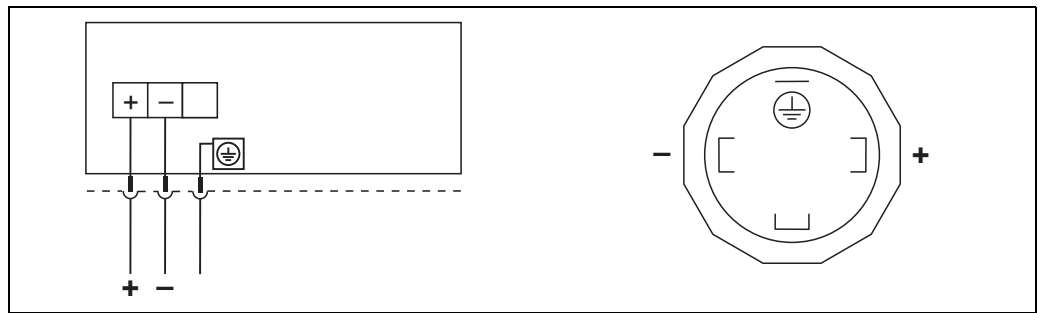
Cable specifications:

Use a twisted, shielded two-wire cable, preferably cable type A

Note!

For further information on the cable specifications, see Operating Instructions BA00013S "FOUNDATION Fieldbus Overview", FOUNDATION Fieldbus Guideline and IEC 61158-2 (MBP).

### Devices with valve connector



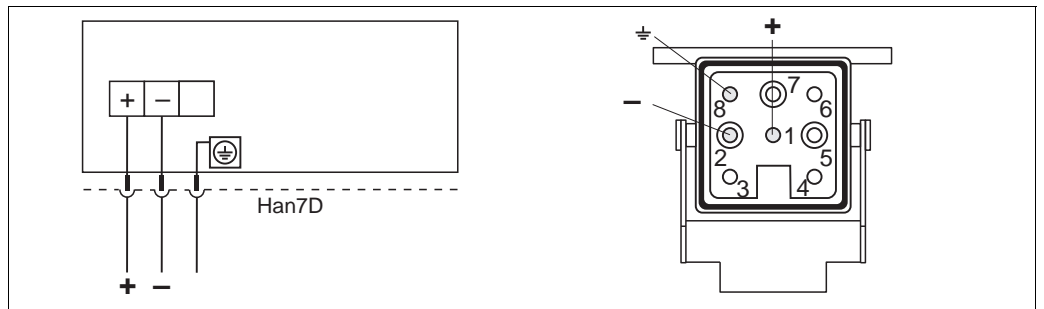
P01-xMx5xxxx-04-xx-xx-xx-005

Left: electrical connection for devices with a valve connector

Right: view of the connector at the device

Material: PA 6.6

### Devices with Harting plug Han7D



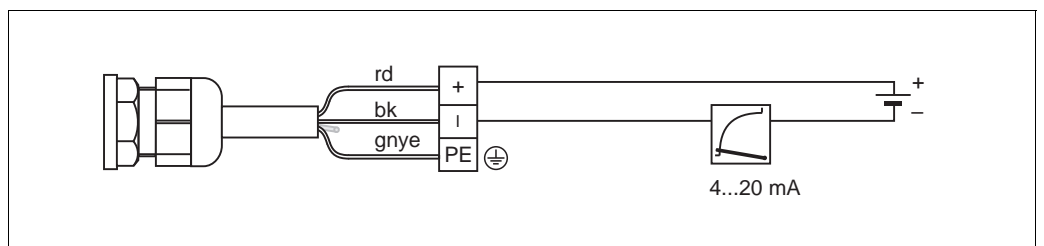
P01-xMD7xxxx-04-xx-xx-xx-000

Left: electrical connection for devices with Harting plug Han7D

Right: view of the plug connector at the device

Material: CuZn

### Connecting the cable version

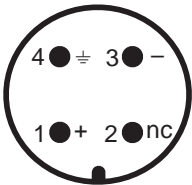


P01-PMx4xxxx-04-xx-xx-xx-010

rd = red, bk = black, gnye = green-yellow

### Devices with M12 plug

*PIN assignment for M12 connector*

	PIN	Meaning
	1	Signal +
	2	Not assigned
	3	Signal -
	4	Earth

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

Plug-in jack M 12x1, straight

- Material: body PA; coupling nut CuZn, nickel-plated
- Degree of protection (fully locked): IP66/67
- Order number: 52006263

Plug-in jack M 12x1, elbowed

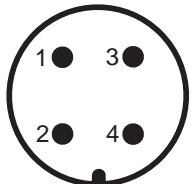
- Material: body PBT/PA; coupling nut GD-Zn, nickel-plated
- Degree of protection (fully locked): IP66/67
- Order number: 71114212

Cable 4x0.34 mm<sup>2</sup> (20 AWG) with M12 socket, elbowed, screw plug, length 5 m (16 ft)

- Material: body PUR; coupling nut CuSn/Ni; cable PVC
- Degree of protection (fully locked): IP66/67
- Order number: 52010285

### Devices with 7/8" plug

*PIN assignment for 7/8" connector*

	PIN	Meaning
	1	Signal -
	2	Signal +
	3	Shield
	4	Not assigned

External thread: 7/8 - 16 UNC

- Material: housing / body CuZn, nickel-plated
- Protection: IP66/68

### Cable gland

Approval	Type	Clamping area
Standard, II1/2G Exia, IS	Plastic M20x1.5	5 to 10 mm (0.2 to 0.39 in)
ATEX II1/2D, II1/2GD Exia, II3G Ex nA	Metal M20x1.5 (Ex e)	7 to 10.5 mm (0.28 to 0.41 in)

### Terminals

For wire cross-sections of 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG).

### 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. → 98 ff, "Safety Instructions" and "Installation/Control Drawings" sections.

**4 to 20 mA, 4 to 20 mA HART**



Type of protection	Supply voltage
<ul style="list-style-type: none"> <li>■ Intrinsically safe</li> </ul>	11.5 ... 30 V DC
<ul style="list-style-type: none"> <li>■ Other types of protection</li> <li>■ Devices without certificate</li> </ul>	11.5 ... 45 V DC (Versions with plug-in connection 35 V DC)

**PROFIBUS PA**

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

**FOUNDATION Fieldbus**

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

<b>Start-up current HART</b>	12 mA or 22 mA (selectable)
<b>Current consumption</b>	<ul style="list-style-type: none"> <li>■ PROFIBUS PA: 11 mA ± 1 mA, switch-on current corresponds to IEC 61158-2, Clause 21</li> <li>■ FOUNDATION Fieldbus: 16 mA ± 1 mA, switch-on current corresponds to IEC 61158-2, Clause 21</li> </ul>
<b>Cable entry</b>	→  82 ff, feature 50 "Electrical connection".
<b>Cable specification</b>	<ul style="list-style-type: none"> <li>■ Endress+Hauser recommends using twisted, shielded two-wire cables.</li> <li>■ Terminals for wire cross-sections 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG)</li> <li>■ Cable outer diameter: 5 to 9 mm (0.2 to 0.35 in) depends on the used cable gland (→  18)</li> </ul>
<b>Residual ripple</b>	No influence on 4 to 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)]
<b>Influence of power supply</b>	≤ 0.001% of URL/1 V

**Performance characteristics – general**

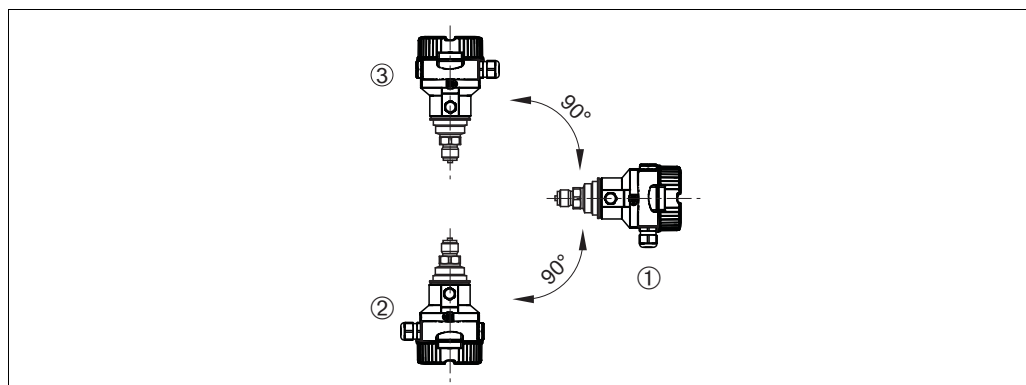
<b>Reference operating conditions</b>	<ul style="list-style-type: none"> <li>■ As per IEC 60770</li> <li>■ Ambient temperature <math>T_A</math> = constant, in the range of: +21 to +33°C (+70 to +91°F)</li> <li>■ Humidity <math>\phi</math> = constant, in the range of: 5 to 80 % RH</li> <li>■ Ambient pressure <math>p_A</math> = constant, in the range of: 860 to 1060 mbar (12.47 to 15.37 psi)</li> <li>■ Position of the measuring cell: constant, in range: ±1° horizontally</li> <li>■ Input of LOW SENSOR TRIM and HIGH SENSOR TRIM for lower range value and upper range value</li> <li>■ Span based on zero point</li> <li>■ Material of the process isolating diaphragm PMC51: Al<sub>2</sub>O<sub>3</sub> (aluminum-oxide ceramic, Ceraphire®)</li> <li>■ Material of the process isolating diaphragm PMP51 and PMP55: AISI 316L</li> <li>■ Filling oil PMP51 and PMP55: silicone oil</li> <li>■ Supply voltage: 24 V DC ± 3 V DC</li> <li>■ Load with HART: 250 Ω</li> </ul>
<b>Uncertainty of measurement for small absolute pressure ranges</b>	<p>The smallest expanded uncertainty of measurement that can be returned by our standards is:</p> <ul style="list-style-type: none"> <li>■ 0.4% of the measured value in the range of 1 to 30 mbar</li> <li>■ 1% of the measured value in the range &lt; 1 mbar.</li> </ul>

**Long-term stability**

PMC51	Measuring range	Long-term stability of URL / 1 year
PMC51 with thread or flange	≤ 1 bar (15 psi)	±0.2 %
	> 1 bar (15 psi)	±0.1 %
PMC51 with hygienic process connection	≤ 1 bar (15 psi)	±0.35 %
	> 1 bar (15 psi)	±0.2 %

PMP51	Long-term stability of URL / 1 year
<b>Measuring range</b>	
≤ 1 bar (15 psi)	±0.25 %
> 1 bar to 10 bar (15 to 150 psi)	±0.1 %
40 bar (600 psi)	±0.1 %
100 bar (1500 psi)	±0.1 %
400 bar (6000 psi)	±0.1 %

**Influence of orientation**



P01-PMD55xxx-17-xx-xx-xx-001

Measuring error in mbar (psi)

	① Axis of the diaphragm perpendicular	② Diaphragm points up	③ Diaphragm points down
PMC51	Calibration position, no measuring error	< +0.2 mbar (0.003 psi)	< -0.2 mbar (0.003 psi)
PMP51 with process connections 1/2" thread and silicone oil		< +4 mbar (0.06 psi)	< -4 mbar (0.06 psi)
PMP51 with process connections > thread 1/2" and flanges		< +10 mbar (0.145 psi) This value is doubled for inert oil.	< -10 mbar (0.145 psi) This value is doubled for inert oil.

Note!

Position-dependent zero point shift can be corrected at the device. → 26, "General installation instructions" section and → 78 ff, "Installation instructions" section.

**Warm-up period**

- 4 to 20 mA analog: ≤1.5 s
- 4 to 20 mA HART: ≤5 s
- PROFIBUS PA: ≤8 s
- FOUNDATION Fieldbus: ≤20 s (after a TOTAL-reset ≤45 s)

## Performance characteristics – ceramic process isolating diaphragm

### Reference accuracy – PMC51

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

Gauge pressure sensors		
Measuring cell	Standard reference accuracy	Platinum reference accuracy
100 mbar (1.5 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.0075 x TD</li> </ul>
250 mbar (3.75 psi), 400 mbar (6 psi), 1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.1 %</li> </ul>
40 bar (600 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.0075 x TD</li> </ul>

Absolute pressure sensors		
Measuring cell	Standard reference accuracy	Platinum reference accuracy
100 mbar (1.5 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.0015 x TD</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.075 %</li> <li>■ TD &gt; 5:1 to TD 20:1 = ±0.015 x TD</li> </ul>
250 mbar (3.75 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 13:1 = ±0.1 %</li> </ul>
400 mbar (6 psi), 1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.1 %</li> </ul>
40 bar (600 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = 0.15 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = 0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to ≤ TD 10:1 = ±0.075 %</li> <li>■ TD &gt; 10:1 to TD 20:1 = ±0.0075 x TD</li> </ul>

### Total performance – PMC51

The "Total performance" specification comprises the non-linearity including hysteresis, non-reproducibility as well as the thermal change in the zero point. All specifications apply to the temperature range -10 to +60°C (+14 to +140°F) and Turndown 1:1.

Signal output	Measuring cell	% URL
HART, PROFIBUS PA, FOUNDATION Field- bus	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	±0.575
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	±0.5
Analog (4 to 20 mA)	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	±0.775
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	±0.7

**Total error - PMC51**

The total error comprises the long-term stability and the total performance. All specifications apply to the temperature range  $-10$  to  $+60^{\circ}\text{C}$  ( $+14$  to  $+140^{\circ}\text{F}$ ) and Turndown 1:1.

	Signal output	Measuring cell	% URL
			1 year
PMC51 with thread or flange	HART, PROFIBUS PA, FOUNDATION Fieldbus	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm 0.55$
		1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0.47$
	Analog (4 to 20 mA)	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm 0.75$
		1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0.67$
PMC51 with hygienic process connection	HART, PROFIBUS PA, FOUNDATION Fieldbus	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm 0.925$
		1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0.7$
	Analog (4 to 20 mA)	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm 1.125$
		1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0.9$

**Thermal change in the zero output and the output span – PMC51**
**PMC51 with thread or flange**

Signal output	Measuring cell	% of the calibrated measuring span		
		$-40$ to $-20^{\circ}\text{C}$ ( $-40$ to $-4^{\circ}\text{F}$ )	$-10$ to $+60^{\circ}\text{C}$ ( $+14$ to $+140^{\circ}\text{F}$ )	$-20$ to $+100^{\circ}\text{C}$ ( $-4$ to $+212^{\circ}\text{F}$ )
HART, PROFIBUS PA, FOUNDATION Fieldbus	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm(0,6 + 0,45 \times \text{TD})$	$\pm 0,2 + 0,275 \times \text{TD}$	$\pm(0,4 + 0,425 \times \text{TD})$
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0,5 + 0,35 \times \text{TD}$	$\pm 0,1 + 0,15 \times \text{TD}$	$\pm(0,225 + 0,525 \times \text{TD})$
Analog (4 to 20 mA)	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm(0,6 + 0,45 \times \text{TD})$	$\pm 0,4 + 0,275 \times \text{TD}$	$\pm 0,7 + 0,425 \times \text{TD}$
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm 0,5 + 0,35 \times \text{TD}$	$\pm 0,3 + 0,15 \times \text{TD}$	$\pm 0,525 + 0,525 \times \text{TD}$

**PMC51 with hygienic process connection**

Signal output	Measuring cell	% of the calibrated measuring span	
		$-10$ to $+60^{\circ}\text{C}$ ( $+14$ to $+140^{\circ}\text{F}$ )	$-20$ to $+130^{\circ}\text{C}$ ( $-4$ to $+266^{\circ}\text{F}$ )
HART, PROFIBUS PA, FOUNDATION Fieldbus	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm(0,4 + 0,275 \times \text{TD})$	$\pm(0,7 + 0,425 \times \text{TD})$
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm(0,3 + 0,15 \times \text{TD})$	$\pm(0,525 + 0,525 \times \text{TD})$
Analog (4 to 20 mA)	100 mbar (1.5 psi), 250 mbar (3.75 psi), 400 mbar (6 psi)	$\pm(0,4 + 0,275 \times \text{TD})$	$\pm(0,7 + 0,425 \times \text{TD})$
	1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	$\pm(0,3 + 0,15 \times \text{TD})$	$\pm(0,525 + 0,525 \times \text{TD})$

## Performance characteristics – metallic process isolating diaphragm

### Reference accuracy – PMP51, PMP55

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

#### Gauge pressure sensors/absolute pressure sensors

Measuring cell	PMP51 and PMP55 without capillary	
	Standard reference accuracy	Platinum reference accuracy <sup>1)</sup>
400 mbar (6 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.15 %</li> <li>■ TD &gt;1:1 to TD 20:1 = ±0.15 % x TD</li> </ul>	Not available
	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.3 %</li> <li>■ TD &gt;1:1 to TD 10:1 = ±0.3 % x TD</li> </ul>	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.2 %</li> <li>■ TD &gt;1:1 to TD 10:1 = ±0.2 % x TD</li> </ul>
1 bar (15 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.15 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±0.03 % x TD</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 2.5:1 = ±0.075 %</li> <li>■ TD &gt;2.5:1 to TD 20:1 = ±0.03 % x TD</li> </ul>
	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.3 %</li> <li>■ TD &gt;1:1 to TD 10:1 = ±0.3 % x TD</li> </ul>	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.2 %</li> <li>■ TD &gt;1:1 to TD 10:1 = ±0.2 % x TD</li> </ul>
2 bar (30 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.015 % x TD</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.075 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±0.015 % x TD</li> </ul>
	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤5:1: 0.15 %</li> <li>■ TD &gt;5:1 to TD ≤10:1: 0.2 %</li> </ul>	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤5:1: 0.075 %</li> <li>■ TD &gt;5:1 to TD ≤10:1: 0.1 %</li> </ul>
4 bar (60 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.0075 % x TD</li> </ul>
	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤10:1: 0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1: ±0.2 %</li> </ul>	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤10:1: 0.075 %</li> <li>■ TD &gt;5:1 to TD 20:1: ±0.1 %</li> </ul>
10 bar (150 psi), 40 bar (600 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.1 %</li> </ul>
	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤10:1: 0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1: ±0.2 %</li> </ul>	PMP51 with hygienic process connection: <ul style="list-style-type: none"> <li>■ TD 1:1 to TD ≤10:1: 0.075 %</li> <li>■ TD &gt;5:1 to TD 20:1: ±0.1 %</li> </ul>
100 bar (1500 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.0075 %</li> </ul>
400 bar (6000 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.15 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±(0.03 % x TD)</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.15 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±(0.03 % x TD)</li> </ul>

1) Only PMP51, PMP55 with direct diaphragm seal mounting

**Gauge pressure sensors/absolute pressure sensors**

Measuring cell	PMP55 with capillary	
	Standard reference accuracy	Platinum reference accuracy <sup>1)</sup>
400 mbar (6 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 = ±0.15 %</li> <li>■ TD &gt;1:1 to TD 20:1 = ±0.15 % x TD</li> </ul>	Not available
1 bar (15 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 3.75:1 = ±0.15 %</li> <li>■ TD &gt;3.75:1 to TD 20:1 = ±0.04 % x TD</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 2:1 = ±0.1 %</li> <li>■ TD &gt;2:1 to TD 20:1 = ±0.04 % x TD</li> </ul>
2 bar (30 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 3.75:1 = ±0.15 %</li> <li>■ TD &gt;3.75:1 to TD 20:1 = ±0.04 % x TD</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 2.5:1 = ±0.1 %</li> <li>■ TD &gt;2.5:1 to TD 20:1 = ±0.04 % x TD</li> </ul>
4 bar (60 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.0075 % x TD</li> </ul>
10 bar (150 psi), 40 bar (600 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.1 %</li> </ul>
100 bar (1500 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.15 %</li> <li>■ TD &gt;10:1 to TD 20:1 = ±0.20 %</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 10:1 = ±0.075 %</li> <li>■ TD 10:1 to TD 20:1 = ±0.0075 % x TD</li> </ul>
400 bar (6000 psi)	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.15 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±(0.03 % x TD)</li> </ul>	<ul style="list-style-type: none"> <li>■ TD 1:1 to TD 5:1 = ±0.15 %</li> <li>■ TD &gt;5:1 to TD 20:1 = ±(0.03 % x TD)</li> </ul>

1) Only PMP51, PMP55 with direct diaphragm seal mounting

**Total performance – PMP51**

The "Total performance" specification comprises the non-linearity including hysteresis, non-reproducibility as well as the thermal change in the zero point. All specifications apply to the temperature range -10 to +60°C (+14 to +140°F) and Turndown 1:1.

Signal output	Measuring cell	PMP51	PMP51 with hygienic process connection	PMP51 with gold/rhodium-coated process isolating diaphragm
		% of URL		
HART, PROFIBUS PA, FOUNDATION Fieldbus	400 mbar (6 psi)	±0.34	±0.34	±1.25
	1 bar (15 psi)		±0.25	±0.75
	2 bar (30 psi)		±0.25	±0.45
	4 bar (60 psi)	±0.30	±0.25	±0.3
	10 bar (150 psi), 40 bar (600 psi)	±0.25	±0.25	±0.25
	100 bar (1500 psi)	±0.25	-	±0.25
	400 bar (6000 psi)	±0.4	-	±0.4
Analog (4 to 20 mA)	400 mbar (6 psi)	±0.34	±0.54	±1.25
	1 bar (15 psi)		±0.54	±0.75
	2 bar (30 psi)		±0.45	±0.45
	4 bar (60 psi)	±0.30	±0.45	±0.3
	10 bar (150 psi), 40 bar (600 psi)	±0.25	±0.45	±0.25
	100 bar (1500 psi)	±0.25	-	±0.25
	400 bar (6000 psi)	±0.4	-	±0.4



**Total error - PMP51**

The total error comprises the long-term stability and the total performance. All specifications apply to the temperature range -10 to +60°C (+14 to +140°F) and Turndown 1:1.

Signal output	Measuring cell	% of URL/year
HART, PROFIBUS PA, FOUNDATION Fieldbus	400 mbar (6 psi)	±0.59
	≥1 bar to 40 bar (15 psi to 600 psi)	±0.35
	≥40 bar to 100 bar (600 psi to 1500 psi)	±0.35
	400 bar (6000 psi)	±0.5
Analog (4 to 20 mA)	400 mbar (6 psi)	±0.79
	≥1 bar to 40 bar (15 psi to 600 psi)	±0.55
	≥40 bar to 100 bar (600 psi to 1500 psi)	±0.55
	400 bar (6000 psi)	±0.5

**Thermal change in the zero output and the output span – PMP51 and PMP55**

Note!  
When using a PMP55, the influence from the respective diaphragm seal must also be taken into account (→ 76 ff "Planning instructions for diaphragm seal systems").

**PMP51 and PMP55 (basic device)**

Measuring cell	-10 to +60 °C (+14 to +140°F)	-40 to -10°C, +60 to +85°C (-40 to +14°F, +140 to +185°F)
	% of the calibrated measuring span	
400 mbar (6 psi), 1 bar (15 psi), 2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi), 100 bar (1500 psi)	±(0.34 + 0.15 x TD)	±(0.4 + 0.25 x TD)
400 bar (6000 psi)	±(0.3 + 0.35 x TD)	±(0.3 + 0.7 x TD)

**PMP51 with hygienic process connection**

Signal output	Measuring cell	-10 to +60 °C (+14 to +140°F)	-40 to -10°C, +60 to +125°C (-40 to +14°F, +140 to +257°F)
		% of the calibrated measuring span	
HART, PROFIBUS PA, FOUNDATION Fieldbus	Clamp ½" / 400 mbar (6 psi)	±(0.1 + 0.4 x TD)	±(0.8 + 1.5 x TD)
	400 mbar (6 psi), 1 bar (15 psi)	±(0.1 + 0.25 x TD)	±(0.1 + 1.1 x TD)
	2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	±(0.1 + 0.2 x TD)	±(0.1 + 0.5 x TD)
Analog (4 to 20 mA)	Clamp ½" / 400 mbar (6 psi)	±(0.3 + 0.4 x TD)	±(1.1 + 1.5 x TD)
	400 mbar (6 psi), 1 bar (15 psi)	±(0.3 + 0.25 x TD)	±(0.4 + 1.1 x TD)
	2 bar (30 psi), 4 bar (60 psi), 10 bar (150 psi), 40 bar (600 psi)	±(0.3 + 0.2 x TD)	±(0.4 + 0.5 x TD)

## Operating conditions (installation)

### General installation instructions

- The position-dependent zero point shift can be corrected:
  - directly at the device via operating keys on the electronic insert
  - directly at the device via operating keys on the display (except analog electronics)
  - via digital communication if the cover is not open (except analog electronics)

Note!

In hazardous areas, comply strictly with the safety instructions when the housing cover is closed and open.

- Endress+Hauser offers a mounting bracket for installing the device on pipes or walls. See also → [Fig 26](#), "Wall and pipe mounting" section.
- Use flushing rings for flange and cell diaphragm seals if medium buildup or clogging can be expected at the diaphragm seal connection. The flushing ring can be inserted between the process connection and the diaphragm seal. Thanks to the two lateral flushing bore holes, material buildup in front of the process isolating diaphragm can be rinsed away and the pressure chamber can be ventilated.
- To guarantee the leak-tightness of the transmitter, Endress+Hauser recommends that only genuine cable glands be used (also available as spare parts).

### Measuring arrangement for devices without diaphragm seal – PMC51, PMP51

Cerabar M transmitters without diaphragm seals are mounted as per the norms for a manometer (DIN EN 837-2). We recommend the use of shutoff devices and siphons. The orientation depends on the measuring application.

#### Pressure measurement in gases

- Mount Cerabar M with shutoff device above the tapping point so that any condensate can flow into the process.

#### Pressure measurement in steams

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

#### Pressure measurement in liquids

- Mount Cerabar M with shutoff device below or at the same level as the tapping point.

#### Level measurement

- Mount Cerabar M below the lowest measuring point (zero point of the measurement).
- Do not mount the device at the following positions: In the filling curtain, 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 downstream of a shutoff device.

### Measuring arrangement for devices with diaphragm seal – PMP55

- → [Fig 76](#), "Planning instructions for diaphragm seal systems" section.

### Wall and pipe mounting

For installing the device on pipes or walls, Endress+Hauser provides a mounting bracket which is included in the scope of supply or can be ordered as a separate accessory (part no. 71102216). For the dimensions, see → [Fig 66](#).

**"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 version allows for trouble-free measurement:

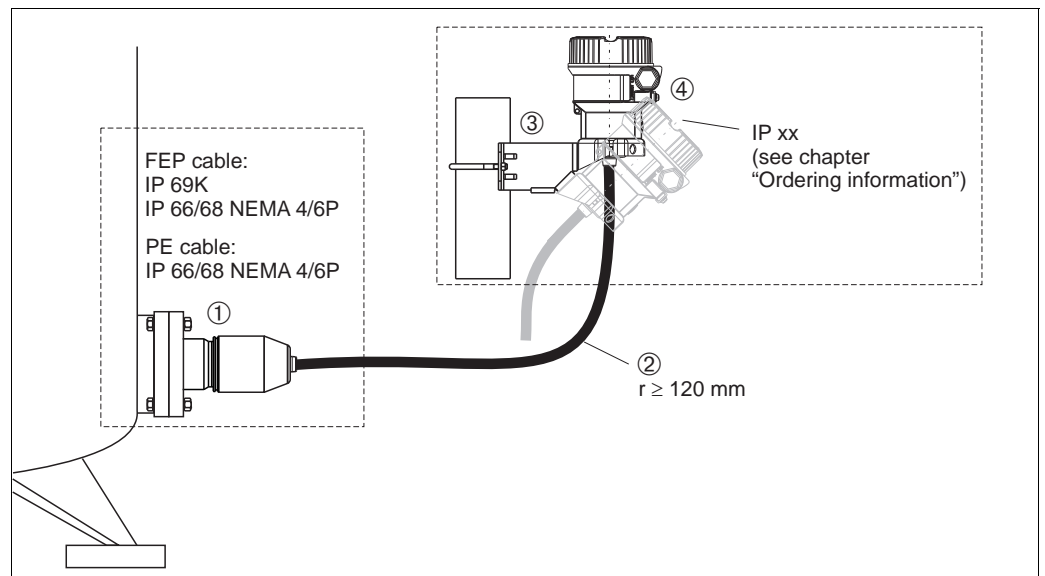
- Under particularly difficult measuring conditions (at installation locations that are cramped or difficult to access)
- If extreme cleaning of the measuring point is required
- If the measuring point is exposed to vibrations
- For space-saving installations

You can choose between different cable versions:

- PE (2 m (6.6 ft), 5 m (16 ft) and 10 m (33 ft))
- FEP (5 m (16 ft)).

→ 82 ff, feature 600, "Separate housing".

For the dimensions, → 66.



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 (for pipes from 1 1/4" up to 2" diameter)
- 4 Housing with electronic insert

Degree of protection for the process connection and sensor with the use of

- FEP cable:
  - IP 69K
  - IP 66 NEMA 4/6P
  - IP 68 (1.83 mH<sub>2</sub>O for 24 h) NEMA 4/6P
- PE cable:
  - IP 66 NEMA 4/6P
  - IP 68 (1.83 mH<sub>2</sub>O for 24 h) NEMA 4/6P

Technical data of the PE and FEP cable:

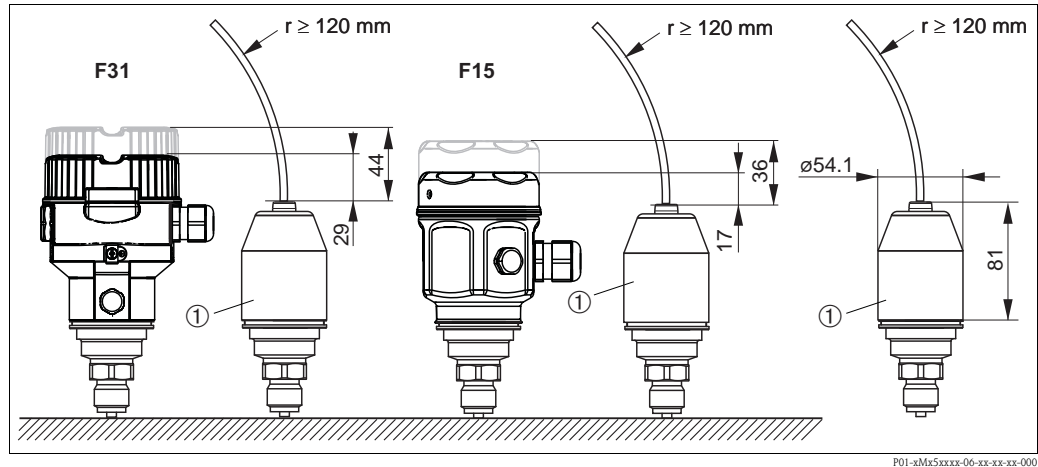
- Minimum bending radius: 120 mm (4.72 in)
- Cable extraction force: max. 450 N (101 lbf)
- Resistance to UV light

Use in hazardous area:

- Intrinsically safe installations (Ex ia/IS)
- FM/CSA IS: for Div.1 installation only

**Reduction in installation height**

If the separate housing is used, the mounting height of the process connection is reduced compared to the dimensions of the standard version (see graphic).



**Oxygen applications**

Oxygen and other gases can react explosively to oils, grease and plastics. As a result, the following are some of the precautions that must be taken:

- All components of the system, such as measuring devices, must be cleaned in accordance with the BAM (DIN 19247) requirements.
- Depending on the materials used, a certain maximum temperature and maximum pressure must not be exceeded for oxygen applications.

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

Ordering code for devices <sup>1)</sup> cleaned for oxygen applications	$p_{max}$ for oxygen applications	$T_{max}$ for oxygen applications
PMC51 <sup>2)</sup> – devices with sensors, nominal value < 10 bar (150 psi)	Over pressure limit (OPL) of sensor <sup>3), 4)</sup>	60°C (140°F)
PMC51 <sup>2)</sup> – devices with sensors, nominal value ≥ 10 bar (150 psi)	40 bar (600 psi)	60°C (140°F)
PMP51 PMP55 <sup>2)</sup>	Depends on the lowest-rated element, with regard to pressure, of the selected components: over pressure limit (OPL) of sensor <sup>3)</sup> , process connection (1.5 x PN) or fill fluid (160 bar (2320 psi))	85°C (185°F)

- 1) Only device, not accessory or enclosed accessory
- 2) Feature 570 "Service" version "HB"
- 3) → 82 ff "Ordering information", feature 70 "Sensor range"
- 4) PMC51 with PVDF thread or PVDF flange  $p_{max} = 15$  bar (225 psi)

**PWIS cleaning**

Special cleaning of the transmitter to remove paint-wetting substances, for use in paint shops  
 → 85 feature 570 "Service", version "HC".

**Ultrapure gas applications**

Endress+Hauser also provides devices which have been cleaned of oil and grease for special applications, such as for ultrapure gas. No special restrictions regarding the process conditions apply to these devices.

- 82 ff, "Ordering information PMC51", feature 570 "Service" version "HA".
- 88 ff, "Ordering information PMP51", feature 570 "Service" version "HA".

**Applications with hydrogen**

With regard to materials in which hydrogen formation takes place, hydrogen atoms can diffuse through the metallic process isolating diaphragm. This can result in incorrect measurement results. Endress+Hauser offers process isolating diaphragms with a gold/rhodium coating for such instances.

- 87 ff "Ordering information PMP51" and
- 92 ff "Ordering information PMP55", feature 170 "Membrane Material" version "M".

## Operating conditions (environment)

### Ambient temperature range

Version	PMC51	PMP51	PMP55
Without LCD display	-40°C to +85°C (-40°F to +185°F)		
With LCD display <sup>1)</sup>	-20°C to +70°C (-4°F to +158°F)		
With M12 plug , elbowed	-25°C to +85°C (-13°F to +185°F)		
With separate housing	-20°C to +60°C (-4°F to +140°F) (installation without insulation)		—
Diaphragm seal systems	—	—	→ 76

1) Extended temperature application range (-40°C to +85°C (-40°F to +185°F)) with restrictions in optical properties such as display speed and contrast

#### Note!

For high-temperature applications, either a PMP55 with a temperature isolator or with a capillary can be used. If vibrations also occur in the application, Endress+Hauser recommends you use a PMP55 with a capillary. If a PMP55 with a temperature isolator or capillary is used, we recommend a suitable bracket for mounting (see "Wall and pipe mounting" section on → 26).

For devices for use in hazardous areas, see Safety Instructions, Installation or Control Drawing. (→ 98 ff, "Safety Instructions" and "Installation/Control Drawings" sections)

### Storage temperature range

Version	PMC51	PMP51	PMP55
Without LCD display	-40°C to +90°C (-40°F to +194°F)		
With LCD display	-40°C to +85°C (-40°F to +185°F)		
With M12 plug , elbowed	-25°C to +85°C (-13°F to +185°F)		
With separate housing	-40°C to +60°C (-40°F to +140°F)		—
Diaphragm seal systems	—	—	→ 76

### Degree of protection

- → 82 ff, feature 50 "Electrical connection".
- Separate housing (→ 27)

### Climate class

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

**Vibration resistance**

Device/Additional option	Test standard	Vibration resistance
Devices without mounting bracket	GL VI-7-2 <ul style="list-style-type: none"> <li>Part 7: Guidelines for the Performance of Type Approvals</li> <li>Chapter 2: Test Requirements for Electrical / Electronic Equipment and Systems</li> </ul>	guaranteed for 5 to 25 Hz: ±1.6 mm (0.06 in); 25 to 100 Hz: 4 g in all 3 planes
	IEC 61298-3 IEC 60068-2-6	guaranteed for 10 to 60 Hz: ±0.35 mm (0.01 in); 60 to 2000 Hz: 2 g in all 3 planes
Devices with mounting bracket	IEC 61298-3 IEC 60068-2-6	guaranteed for 10 to 60 Hz: ±0.15 mm (0.01 in); 60 to 500 Hz: 2 g in all 3 planes

**Note!**

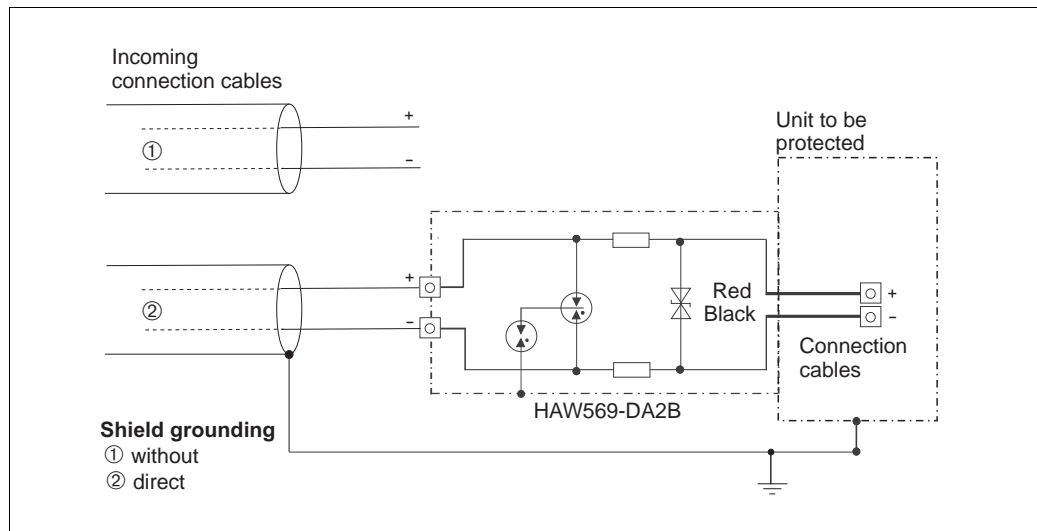
For high-vibration applications, either a PMC51/PMP51 with a separate housing or a PMP55 with a capillary can be used. We recommend a suitable bracket for mounting (see "Wall and pipe mounting" section on → 26).

**Electromagnetic compatibility**

- Electromagnetic compatibility as per all the relevant requirements of the EN 61326 series and NAMUR Recommendation EMC (NE21). Details can be found in the Declaration of Conformity (in the Download area of "www.de.endress.com", "search area - Approvals and Certificates", "Manufact. Declaration").
- Maximum deviation: < 0.5 % of span

**Overvoltage protection (optional)**

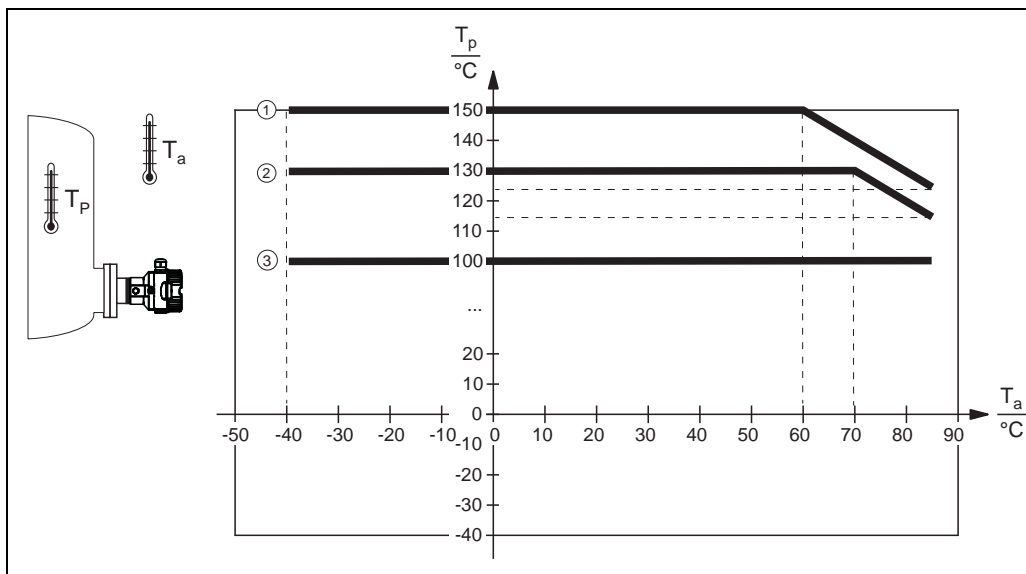
The device can be fitted with overvoltage protection, see → 82 ff "Ordering information" feature 610 "Accessory mounted:" version "NA". The overvoltage protection is mounted at the factory on the housing thread (M20x1.5) for the cable gland and is approx. 70 mm (2.76 in) in length (take additional length into account when installing). The device is connected as illustrated in the following graphic. For details refer to TI001013KEN, XA01003KA3 and BA00304KA2.



P01-x1x5xxxx-04-xx-xx-en-006

## Operating conditions (process)

**Process temperature range  
PMC51**



$T_a$  = Ambient temperature;  $T_p$  = Process temperature; ①, ② and ③ see following chapter.

**Process temperature limits**

**PMC51 (with ceramic process isolating diaphragm)**

- ③: -40 to +100°C (-40 to +212°F) for threaded process connections or flange process connections
- ②: -40 to +130°C (-40 to +266°F) for hygienic process connections
- ①: For a maximum of 60 minutes: +150 °C (+302 °F)
- Observe the process temperature range of the seal. See also the following table.

Version for feature 190 in the order code	Seal	Notes	Process temperature range	
			Thread or flange	Hygienic process connection
A	FKM Viton	-	-20 to +100°C (-4 to +212°F)	-
A <sup>1)</sup>	FKM Viton	cleaned for O2 application	-5 to +60°C (+23 to +140°F)	-
B	FKM Viton	FDA <sup>2)</sup> , 3A Class I, USP Class VI	-5 to +100°C (+23 to +212°F)	-5 to +150 °C (+23 to +302°F)
F	NBR	FDA <sup>2)</sup>	-10 to +100°C (-14 to +212°F)	-
H	NBR, Low temperature	-	-40 to +100°C (-40 to +212°F)	-
G	HNBR	FDA <sup>2)</sup> , 3A Class I, KTW, AFNOR, BAM	-25 to +100°C (-13 to +212°F)	-20 to +125 °C (-4 to +257°F)
J	EPDM 70	FDA <sup>2)</sup>	-40 to +100°C (-40 to +212°F)	-
K	EPDM 291	FDA <sup>2)</sup> , 3A Class II, USP Class VI, DVGW, KTW, W270, WRAS, ACS, NSF61	-	-15 to +150 °C (+5 to +302°F)
L	FFKM Kalrez 6375	-	+5 to +100°C (+41 to +212°F)	-
M	FFKM Kalrez 7075	-	+5 to +100°C (+41 to +212°F)	-
N	FFKM Kalrez 6221	FDA <sup>2)</sup> , USP Class VI	-5 to +100°C (+23 to +212°F)	-5 to +150 °C (+23 to +302°F)
P	Fluoroprene XP40	FDA <sup>2)</sup> , USP Class VI, 3A Class I	+5 to +100°C (+41 to +212°F)	+5 to +150 °C (+41 to +302°F)
S	VMQ Silicone	FDA <sup>2)</sup>	-35 to +85°C (-31 to +185°F)	-20 to +85 °C (-4 to +185°F)

1) With feature 570 "Service", version "HB - Cleaned for oxygen service"

2) Suitable for foods FDA 21 CFR 177.2600

*Applications with jumps in temperature*

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 jump in temperature and the longer the time interval involved.

For further information please contact your local Endress+Hauser Sales Center.

**PMP51 (with metallic process isolating diaphragm)**

Description	Temperature operating range
Process connections with internal process isolating diaphragm	-40 to +125°C (-40 to +257°F)
Process connections with flush-mounted process isolating 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 to +100°C (-40 to +212°F)
Process connections with flush-mounted process isolating diaphragm, G 1/2 A, M 20x1.5	-20 to +85°C (-4 to +185°F)
Hygienic process connections	-40 to +130 °C (-40 to +266 °F) For a maximum of 60 minutes: +150 °C (+302 °F)

**PMP55 (with diaphragm seal)**

- Depending on the diaphragm seal and filling oil from -70°C (-94°F) up to +400°C (+752°F). Observe the temperature application limits → [76](#).

Note!

- The PTFE foil used is designed to protect the unit against abrasion. It does not provide protection against corrosive media.
- Do not use diaphragm seals with 0.25 mm (0.01 in) PTFE foil on AISI 316L (1.4435/1.4404) for vacuum applications, upper temperature limit +204 °C (+399 °F).
- For oxygen applications, observe → [28](#), "Oxygen applications" section.

**Pressure specifications**

- The maximum pressure for the measuring device depends on the lowest-rated element with regard to pressure.  
See the following sections:
  - → [8 ff](#), "Measuring range" section
  - "Mechanical construction" section.
 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 (38°C) for ANSI flanges, and may be applied to the device for an unlimited time. Observe temperature dependency of the MWP.
- The pressure values permitted at higher temperatures can be found in the following standards:
  - EN 1092-1: 2001 Tab. 18<sup>1</sup>
  - 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 device (over pressure limit OPL = 1.5 x MWP<sup>2</sup>) and may be applied for only a limited time period in order to avoid permanent damage.
- 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 connection combinations where the OPL (over pressure limit) of the process 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<sub>max</sub> and T<sub>max</sub> for oxygen applications" as per → [28](#), "Oxygen applications" may not be exceeded.
- Avoid steam hammering! Steam hammering can cause zero point drift.  
Recommendation:  
Residue (such as condensation or drops of water) can remain at the process isolating diaphragm after CIP cleaning and lead to local steam hammering if immediately steam is introduced. In practice, drying the process isolating diaphragm (e.g. by blowing off excess moisture) has proven to be a successful way of avoiding steam hammering.

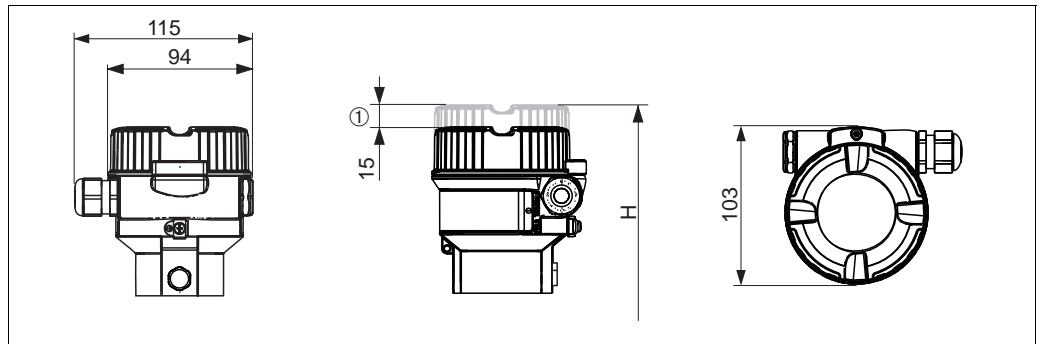
1) With regard to their stability-temperature property, the materials 1.4435 and 1.4404 are grouped together under 13EO in EN 1092-1 Tab. 18. The chemical composition of the two materials can be identical.

2) The equation does not apply for PMP51 and PMP55 with a 40 bar (600 psi) - or a 100 bar (1500 psi) - measuring cell.



## Mechanical construction

### F31 aluminum housing dimensions



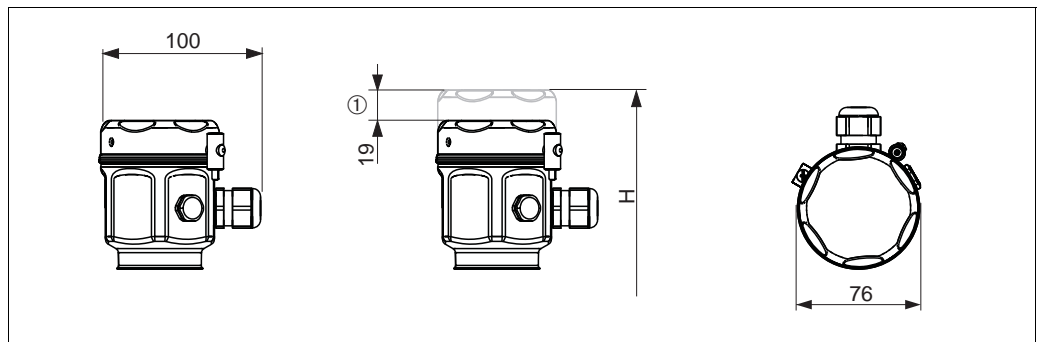
Front view, left-hand side view, top view

① The cover with viewing window is 15 mm (0.59 in) higher than the cover without viewing window.

→ For installation height *H* for housing with viewing window, see the specific process connection. Housing weight

→ 66

### F15 stainless steel housing dimensions (hygienic)



Front view, top view.

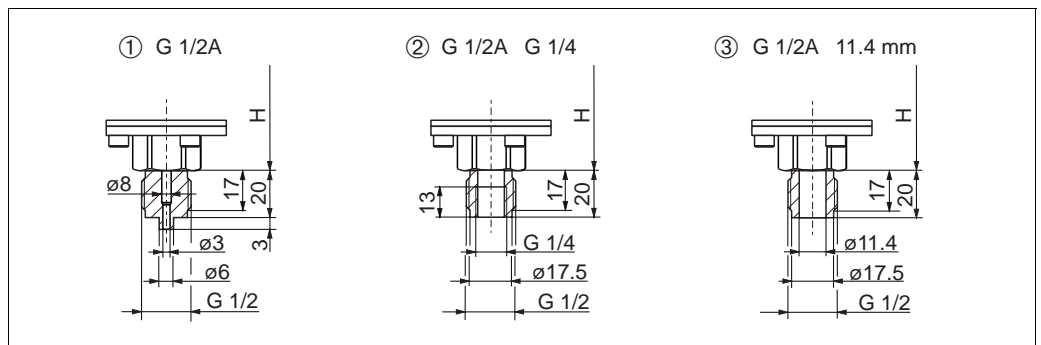
① The cover with viewing window is 19 mm (0.75 in) higher than the cover without viewing window.

→ For installation height *H* for housing with viewing window, see the specific process connection. Housing weight

→ 66

### Process connections PMC51 (with ceramic process isolating diaphragm)

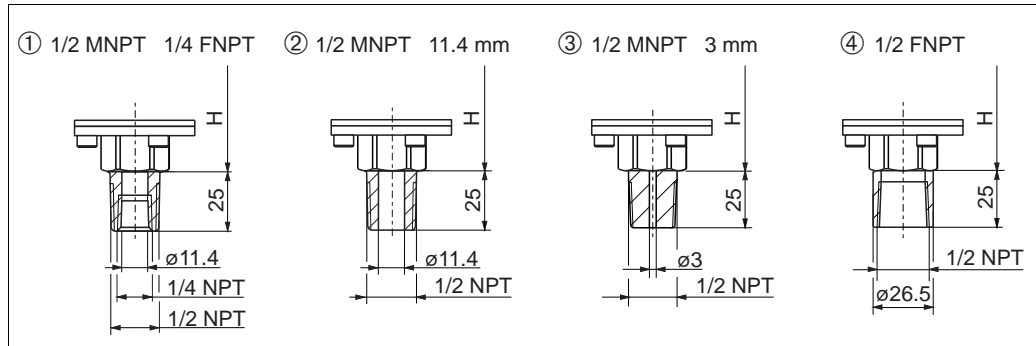
### Thread, internal process isolating diaphragm



Process connections PMC51, thread ISO 228

Installation height *H* → 34.

- 1 Thread ISO 228 G 1/2 A EN 837;  
Material version GCJ: AISI 316L, version GCC: Alloy C276  
Version GCF: PVDF (max.: 15 bar (217.5 psi), -10 to +60 °C (+14 to +140 °F)), mount version "GCF" with a mounting bracket only (→ 26); weight: 0.63 kg (1.39 lbs)
- 2 Thread ISO 228 G 1/2 A G 1/4 (female);  
Material version GLJ: AISI 316L, version GLC: Alloy C276; weight: 0.63 kg (1.39 lbs)
- 3 Thread ISO 228 G 1/2 A hole 11.4 mm (0.45 in);  
Material version GMJ: AISI 316L, version GMC: Alloy C276; weight: 0.63 kg (1.39 lbs)

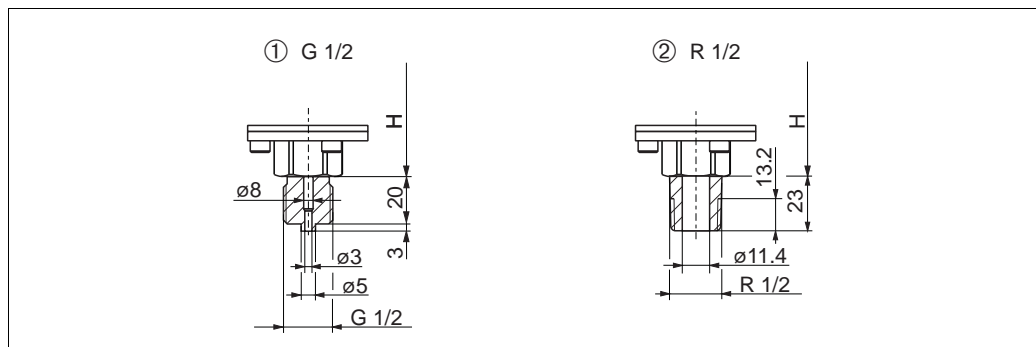


P01-PMC71xxx-06-09-xx-xx-002

Process connections PMC51, thread ANSI

Installation height H → 34.

- 1 Thread ANSI 1/2 MNPT 1/4 FNPT;  
Material version RLJ: AISI 316L, version RLC: Alloy C276; weight: 0.63 kg (1.39 lbs)
- 2 Thread ANSI 1/2 MNPT hole 11.4 (0.45 in);  
Material version RKJ: AISI 316L; version RKC: Alloy C276; weight: 0.63 kg (1.39 lbs)
- 3 Thread ANSI 1/2 MNPT hole 3 mm (0.12 in);  
Material version RJF: PVDF (max.: 15 bar (225 psi), -10 to +60 °C (+14 to +140 °F)) mount with mounting bracket only (→ 26); weight: 0.63 kg (1.39 lbs)
- 4 Thread ANSI FNPT 1/2  
Material version RIJ: AISI 316L, version RIC: Alloy C276; weight: 0.63 kg (1.39 lbs)



P01-PMC71xxx-06-09-xx-xx-003

Process connections PMC51, thread JIS

Installation height H → 34.

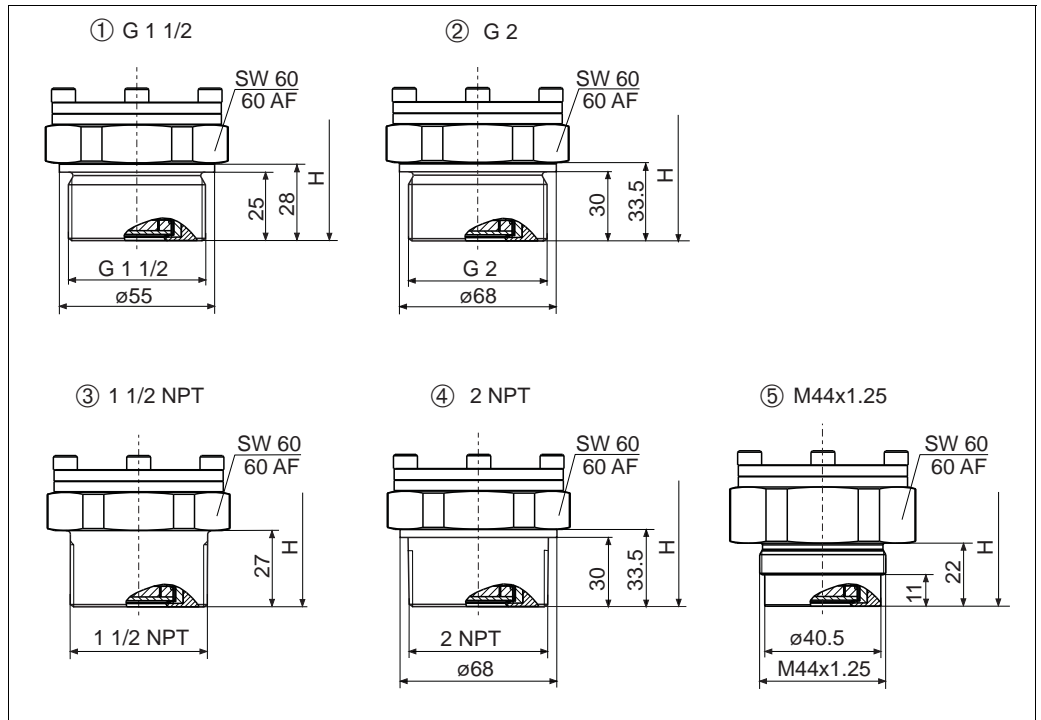
- 1 Version GNJ: thread JIS B0202 G 1/2 (male), material: AISI 316L; weight: 0.63 kg (1.39 lbs)
- 2 Version GOJ: thread JIS B0203 R 1/2 (male), material: AISI 316L; Weight: 0.63 kg (1.39 lbs)

**Installation height H for devices with threaded connection and internal process isolating diaphragm**

F31 housing	F15 housing
154 mm (6.06 in)	146 mm (5.75 in)

**Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued**

**Thread, flush-mounted process isolating diaphragm**



P01-PMC71xxx-06-09-xx-xx-005

Process connections PMC51,  
→ Installation height, see table below.

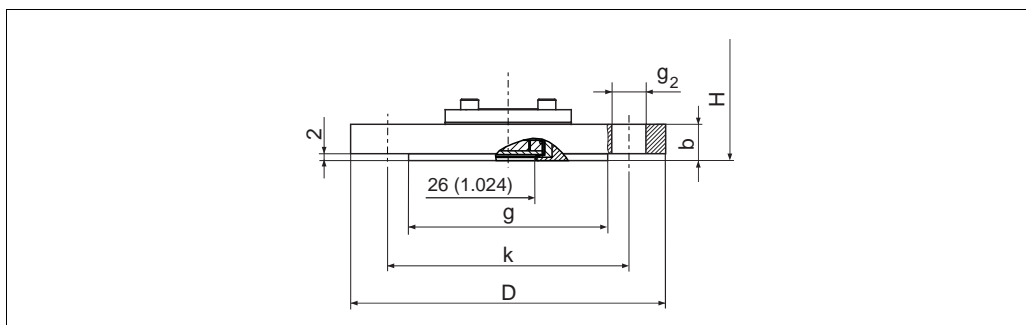
- 1 Thread ISO 228 G 1 1/2 A;  
Material version GVJ: AISI 316L; weight: 0.63 kg (1.39 lbs)
- 2 Thread ISO 228 G 2 A;  
Material version GWJ: AISI 316L; weight: 0.63 kg (1.39 lbs)
- 3 Thread ANSI 1 1/2 MNPT;  
Material version U7J: AISI 316L; weight: 0.63 kg (1.39 lbs)
- 4 Thread ANSI 2 MNPT;  
Material version U8J: AISI 316L; weight: 0.63 kg (1.39 lbs)
- 5 Thread DIN 13 M 44x1.25;  
Material version G4J: AISI 316L; weight: 0.63 kg (1.39 lbs)

**Installation height H for devices with threaded connection and flush-mounted process isolating diaphragm**

F31 housing	F15 housing
201 mm (7.91 in)	193 mm (7.6 in)

Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued

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



P01-PMC71xxx-06-09-xx-xx-006

Process connection PMC51, EN/DIN flange with raised face (flush-mounted process isolating diaphragm)  
Installation height  $H \rightarrow$  38.

Version	Flange							Boltholes			
	Material	Nominal diameter	Nominal pressure	Shape <sup>1)</sup>	Diameter	Thickness	Raised face	Quantity	Diameter	Hole circle	Flange weight <sup>2)</sup>
					D [mm]	b [mm]	g [mm]		g <sub>2</sub> [mm]	k [mm]	
CNJ	AISI 316L	DN 25	PN 10-40	B1 (D)	115	18	68	4	14	85	1.4
CPJ	AISI 316L	DN 32	PN 10-40	B1 (D)	140	18	78	4	18	100	2.0
CQJ	AISI 316L	DN 40	PN 10-40	B1 (D)	150	18	88	4	18	110	2.4
CQP	ECTFE <sup>4)</sup>	DN 40	PN 10-40	B1 (D)	150	21	88	4	18	110	2,6
CXJ	AISI 316L	DN 50	PN 10-40	B1 (D)	165	20	102	4	18	125	3.2
CFF	PVDF <sup>3)</sup>	DN 50	PN 10-16	B1 (D)	165	18	102	4	18	125	2.9
CRP	ECTFE <sup>4)</sup>	DN 50	PN 25-40	B1 (D)	165	20	102	4	18	125	3.2
CZJ	AISI 316L	DN 80	PN 10-40	B1 (D)	200	24	138	8	18	160	5.5
CSP	ECTFE <sup>4)</sup>	DN 80	PN 25-40	B1 (D)	200	24	138	8	18	160	5.5

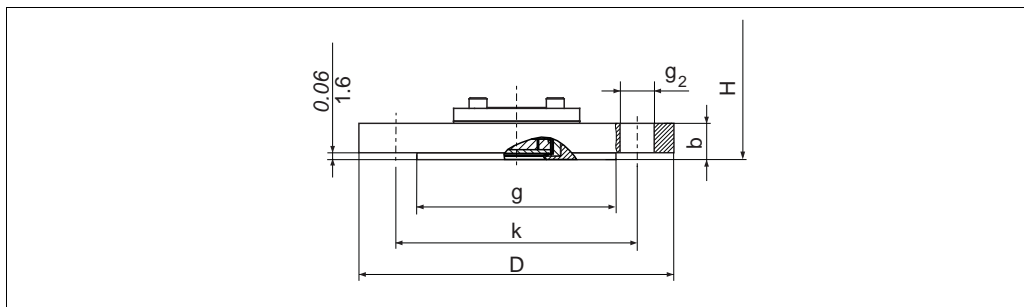
1) Designation as per DIN 2527 in brackets

2) Housing weight  $\rightarrow$  66

3) OPL: 15 bar (225 psi)  
Process temperature range: -10 to +60 °C (+14 to +140 °F)

4) ECTFE coating on AISI 316L (1.4404). When operating in hazardous areas, avoid electrostatic charging of the plastic surfaces.

**Process connections PMC51 (with ceramic process isolating diaphragm) - continued**      **ANSI flanges, connection dimensions as per ANSI B 16.5, raised face RF**



P01-PMC71xxx-06-09-xx-xx-007

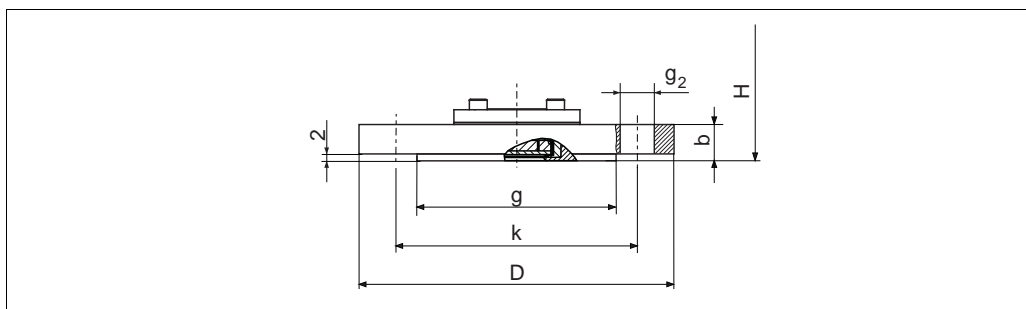
Process connection PMC51, ANSI flange with raised face RF (flush-mounted process isolating diaphragm)  
Installation height H → 38.

Ver- sion	Flange						Boltholes			Flange weight <sup>1)</sup> [kg]
	Material	Nominal diameter	Class	Diameter D	Thickness b	Raised face g	Quantity	Diameter g <sub>2</sub>	Hole circle k	
ACJ	AISI 316/316L <sup>2)</sup>	1	150	4.25 / 108	0.56 / 14.2	2 / 50.8	4	0.62 / 15.7	3.12 / 79.2	0.9
ANJ	AISI 316/316L <sup>2)</sup>	1	300	4.88 / 123.9	0.69 / 17.2	2 / 50.8	4	0.75 / 19	3.5 / 88.9	1.4
AEJ	AISI 316/316L <sup>2)</sup>	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
AOJ	AISI 316/316L <sup>2)</sup>	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
AFJ	AISI 316/316L <sup>2)</sup>	2	150	6 / 152.4	0.75 / 19.1	3.62 / 91.9	4	0.75 / 19.1	4.75 / 120.7	2.4
AFN	ECTFE <sup>3)</sup>	2	150	6 / 152.4	0.75 / 19.1	3.62 / 91.9	4	0.75 / 19.1	4.75 / 120.7	2.4
AFF	PVDF <sup>4)</sup>	2	150	6 / 152.4	0.75 / 19.1	3.62 / 91.9	4	0.75 / 19.1	4.75 / 120.7	0.5
ARJ	AISI 316/316L <sup>2)</sup>	2	300	6.5 / 165.1	0.88 / 22.4	3.62 / 91.9	8	0.75 / 19.1	5 / 127	3.2
AGJ	AISI 316/316L <sup>2)</sup>	3	150	7.5 / 190.5	0.94 / 23.9	5 / 127	4	0.75 / 19.1	6 / 152.4	4.9
AGN	ECTFE <sup>3)</sup>	3	150	7.5 / 190.5	0.94 / 23.9	5 / 127	4	0.75 / 19.1	6 / 152.4	4.9
AGF	PVDF <sup>4)</sup>	3	150	7.5 / 190.5	0.94 / 23.9	5 / 127	4	0.75 / 19.1	6 / 152.4	0.9
ASJ	AISI 316/316L <sup>2)</sup>	3	300	8.25 / 209.5	1.12 / 28.6	5 / 127	8	0.88 / 22.4	6.62 / 168.1	6.8
AHJ	AISI 316/316L <sup>2)</sup>	4	150	9 / 228.6	0.94 / 23.9	6.19 / 157.2	8	0.75 / 19.1	7.5 / 190.5	7.1
AHN	ECTFE <sup>3)</sup>	4	150	9 / 228.6	0.94 / 23.9	6.19 / 157.2	8	0.75 / 19.1	7.5 / 190.5	7.1
ATJ	AISI 316/316L <sup>2)</sup>	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 → 66
- 2) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)
- 3) ECTFE coating on AISI 316/316L (1.4404/1.4435). When operating in hazardous areas, avoid electrostatic charging of the plastic surfaces.
- 4) OPL.: 15 bar (225 psi)  
Process temperature range: -10 to +60 °C (+14 to +140 °F)

Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued

JIS flanges, connection dimensions as per JIS B 2220 BL, raised face RF



P01-PMC71xxx-06-09-xx-xx-008

Process connection PMC51, JIS flange with raised face RF (flush-mounted process isolating diaphragm), material: AISI 316L → Installation height H, see table below.

Version	Flange					Boltholes			Flange weight <sup>1)</sup> [kg]
	Nominal diameter	Nominal pressure	Diameter D [mm]	Thickness b [mm]	Raised face g [mm]	Quantity	Diameter g <sub>2</sub> [mm]	Hole circle k [mm]	
KFJ	50 A	10 K	155	16	96	4	19	120	2.0
KGJ	80 A	10 K	185	18	127	8	19	150	3.3
KHJ	100 A	10 K	210	18	151	8	19	175	4.4

1) Housing weight, see → 66

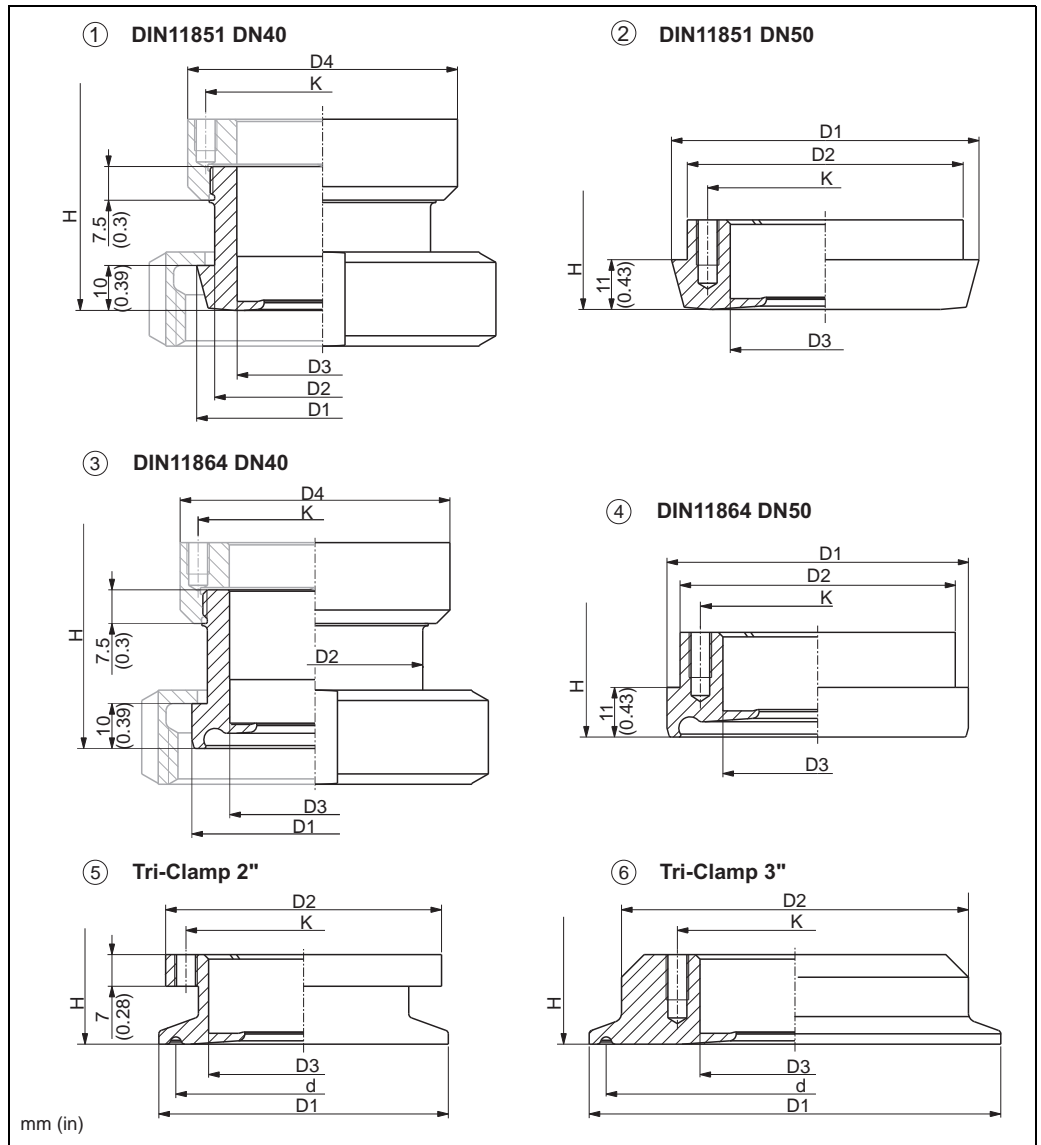
Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued

Installation height H for devices with flange

F31 housing	F15 housing
201 mm (7.91 in)	193 mm (7.6 in)

Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued

Hygienic process connection, flush-mounted process isolating diaphragm



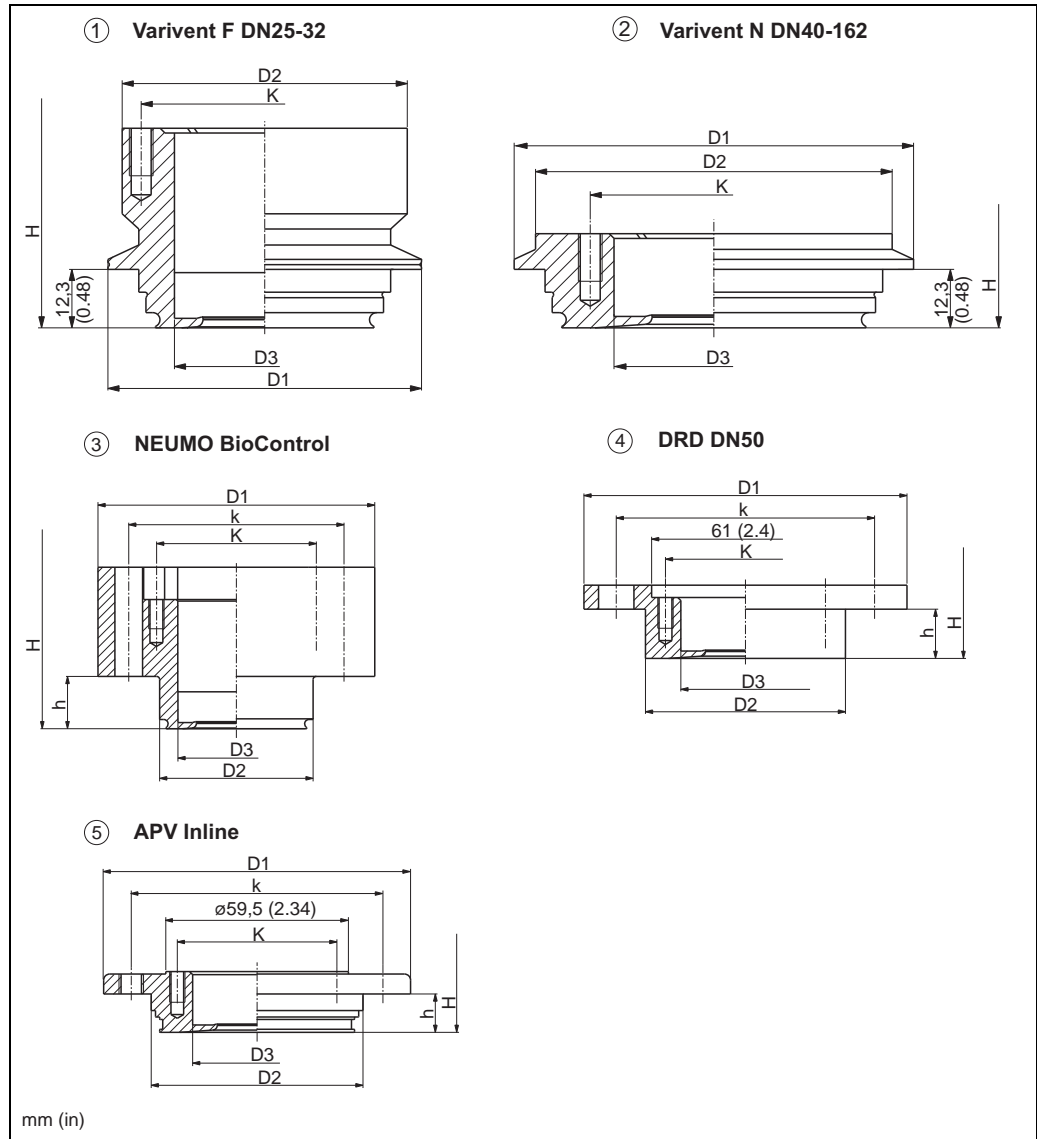
P01-PMC51 xxx-06-00-00-xx-000

Hygienic process connections, material: AISI 316L (1.4435); Delta ferrite content <1 %  
Surface roughness of the surfaces in contact with the medium  $R_a$  0.76  $\mu\text{m}$  (30  $\mu\text{in}$ ). Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a$  0.38  $\mu\text{m}$  (15  $\mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code.

Pos.	Version	Nominal pressure PN	Outer- $\varnothing$ D1	Outer- $\varnothing$ D2	Internal- $\varnothing$ D3	Outer- $\varnothing$ D4	Seal- $\varnothing$ d	Hole circle K <sup>1)</sup>	Height H	Weight [kg/lbs]
1	MZJ	25	56 (2.2)	48 (1.89)	38 (1.5)	60 (2.36)	-	52 (2.05)	max. 220 (8.66)	0.652 (1.44)
2	MRJ	25	68 (2.68)	61 (2.4)	42 (1.65)	-	-	52 (2.05)		0.276 (0.61)
3	NCJ	16	54.9 (2.16)	48 (1.89)	38 (1.5)	60 (2.36)	-	52 (2.05)		0.656 (1.45)
4	NDJ	16	66.8 (2.63)	61 (2.4)	42 (1.65)	-	-	52 (2.05)		0.288 (0.64)
5	TDJ	40	64 (2.52)	61 (2.4)	42 (1.65)	-	56.5 (2.22)	52 (2.05)		0.171 (0.38)
6	TFJ	40	91 (3.58)	76.7 (3.02)	42 (1.65)	-	83.5 (3.29)	52 (2.05)		0.539 (1.19)

mm (in)

1) 4 x M5 thread



P01-PMC51xxx-00-00-00-xx-001

Hygienic process connections, material: AISI 316L (1.4435); Delta ferrite content <1 %  
 Surface roughness of the surfaces in contact with the medium  $R_a$  0.76  $\mu\text{m}$  (30  $\mu\text{in}$ ). Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a$  0.38  $\mu\text{m}$  (15  $\mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code.

Pos.	Version	Nominal pressure PN	Outer-Ø D1	Outer-Ø D2	Internal-Ø D3	Hole circle K	Hole circle k <sup>1)</sup>	Height H	Height h	Weight [kg/lbs]
1	TQJ	40	66 (2.6)	60 (2.36)	38 (1.5)	52 (2.05) <sup>2)</sup>	-	max. 220 (8.66)	-	0.459 (1.01)
2	TRJ	40	84 (3.31)	75 (2.95)	42 (1.65)	52 (2.05) <sup>2)</sup>	-		-	0.426 (0.94)
3	S4J	40	90 (3.54)	49.9 (1.96)	38 (1.5)	52 (2.05) <sup>2)</sup>	90 (3.54) <sup>3)</sup>		17 (0.67)	1.34 (2.95)
4	TIJ	25	105 (4.13)	65 (2.56)	42 (1.65)	52 (2.05) <sup>2)</sup>	84 (3.31) <sup>4)</sup>		16 (0.63)	0.619 (1.36)
5	TMJ	40	100 (3.94)	69 (2.72)	42 (1.65)	52 (2.05) <sup>2)</sup>	82 (3.23) <sup>5)</sup>		12.5 (0.49)	0.519 (1.14)

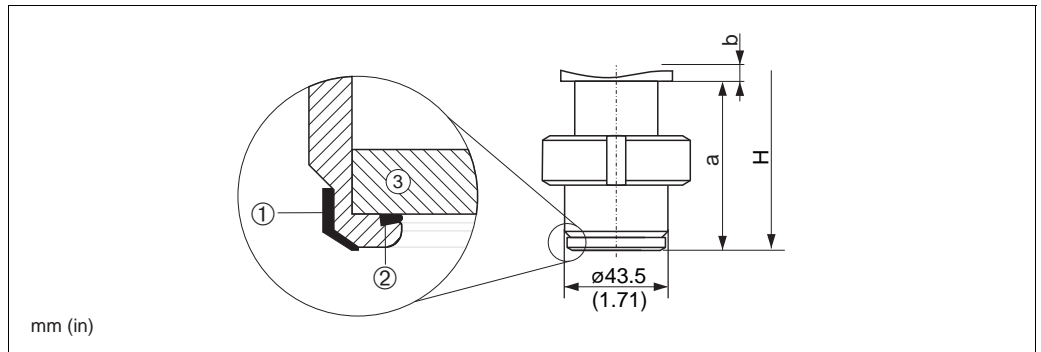
mm (in)

- 1) 4 x M5 thread
- 2) 4 x M5 thread
- 3) 4 x Ø9 (0.35); 4 screws DIN912 M8 x 45 are enclosed (material (A4-80))
- 4) 4 x Ø11.5 (0.45)
- 5) 6 x Ø8.6 (0.34) + 2 x M8 thread; 8 x 45° (=360)



**Process connections PMC51  
(with ceramic process  
isolating diaphragm) -  
continued**

**Universal adapter**



Material: b = top section AISI 316L (1.4404), a = bottom section AISI 316L (1.4435); Endress+Hauser supplies the slotted nut in stainless steel AISI 304 (DIN/EN material number 1.4301) or in AISI 304L (DIN/EN material number 1.4307).

Surface roughness of the surfaces in contact with the medium  $R_a$  0.76  $\mu\text{m}$  (30  $\mu\text{in}$ ). Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a$  0.38  $\mu\text{m}$  (15  $\mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code.

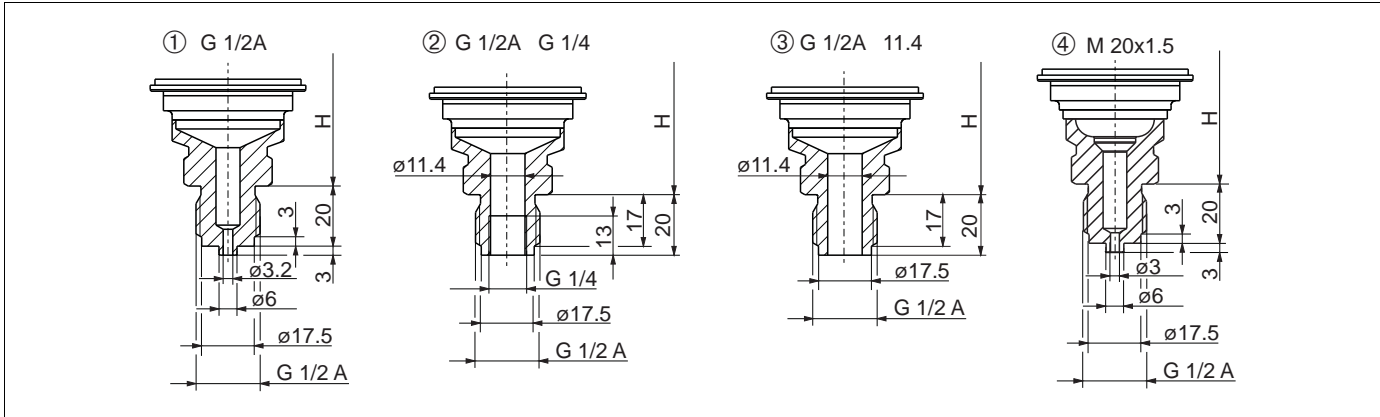
Version	Process connection approval <sup>1)</sup>	Material of the molded seal ① (changeable)	Material of the measuring cell seal ② (not changeable) at the ceramic sensor ③	Measuring cell seal approval	Nominal Pressure PN	Weight [kg/lbs]
UPJ	EHEDG, 3A	Silicone (Spare part order no.: 52023572)	EPDM (Order version "K")	FDA <sup>2)</sup> 3A Class II, USP Class VI. DVGW, KTW, W270, WRAS, ACS, NSF61	10	0.74 (1.63)
UNJ	EHEDG	EPDM (Spare part order no.: 71100719)	EPDM (Order version "J")	FDA <sup>2)</sup>		

- 1) EHEDG or 3A approval only with approved process connection.
- 2) Suitable for foods FDA 21 CFR 177.2600

**Installation height H, devices with universal adapter**

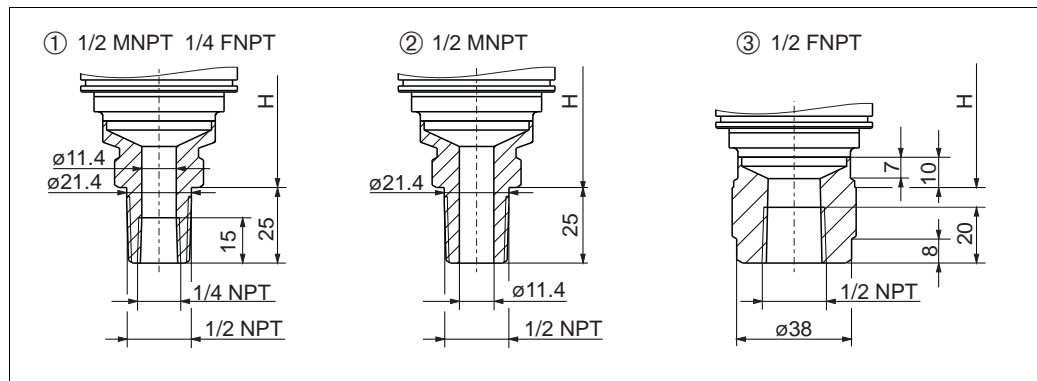
F31 housing	F15 housing
196 mm (7.72 in)	189 mm (7.44 in)

**Process connections PMP51 (with metallic process isolating diaphragm)**      **Thread, internal process isolating diaphragm**



Process connections PMP51, thread ISO and DIN  
Installation height H → 42.

- 1 Thread ISO 228 G 1/2 A EN 837;  
Material version GC: AISI 316L, version GCC: Alloy C276; weight: 0.6 kg (1.32 lbs)
- 2 Thread ISO 228 G 1/2 A G 1/4 (female);  
Material version GLJ: AISI 316L, version GLC: Alloy C276; weight: 0.6 kg (1.32 lbs)
- 3 Thread ISO 228 G 1/2 A hole 11.4 mm (0.45 in);  
Material version GMJ: AISI 316L, version GMC: Alloy C276; weight: 0.6 kg (1.32 lbs)
- 4 Thread DIN13 M20x1.5  
Material version GIJ: AISI 316L; weight 0.4 kg (0.88 lbs)



Process connections PMP51, thread ANSI  
Installation height H → 42.

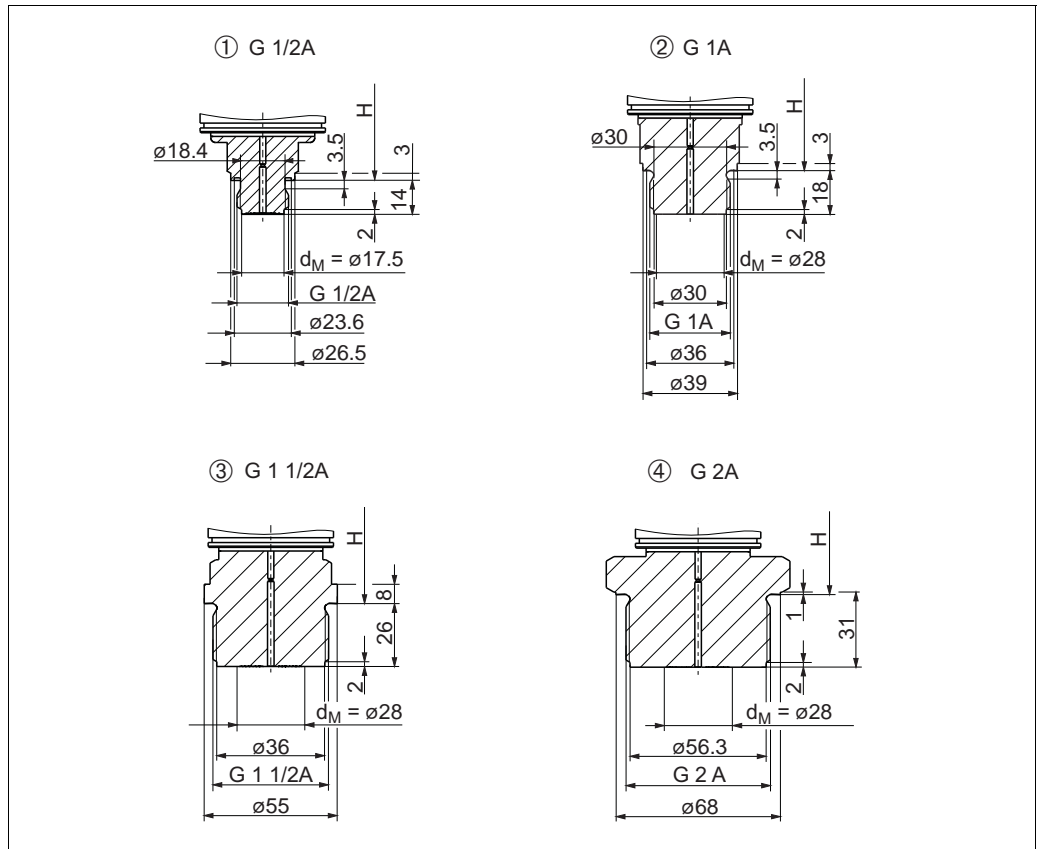
- 1 Thread ANSI 1/2 MNPT 1/4 FNPT;  
Material version RLJ: AISI 316L, version RLC: Alloy C276; weight: 0.6 kg (1.32 lbs)
- 2 Thread ANSI 1/2 MNPT hole: 400 bar (6000 psi) = 11.4 mm (0.45 in)  
Material version RKJ: AISI 316L, version RKC: Alloy C276; weight: 0.6 kg (1.32 lbs)
- 3 Thread ANSI 1/2 FNPT;  
Material version RIJ: AISI 316L, version RIC: Alloy C276/2.4819; Weight: 0.7 kg (1.54 lbs)

**Installation height H for devices with threaded connection and internal process isolating diaphragm**

	F31 housing	F15 housing
Height H	169 mm (6.65 in)	150 mm (5.91 in)

Process connections PMP51  
(with metallic process  
isolating diaphragm) -  
continued

Thread, flush-mounted process isolating diaphragm



P01-PMx5xxxx-06-xx-xx-001-package1

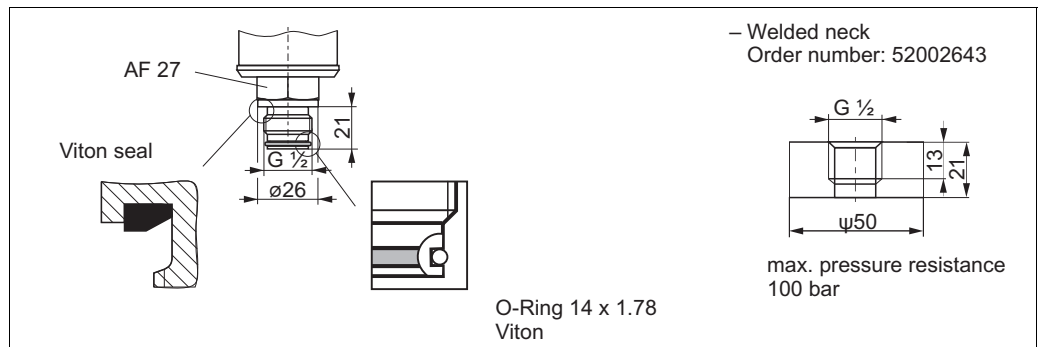
Thread ISO 228

Installation height  $H \rightarrow$  44.

- 1 Thread ISO 228 G 1/2 A DIN 3852 (viton seal included);  
Material version GRJ: AISI 316L, version GRC: : Alloy C276; weight: 0.4 kg (0.88 lbs)
- 2 Thread ISO 228 G 1 A (viton seal included);  
Material version GTJ: AISI 316L; weight: 0.7 kg (1.54 lbs)
- 3 Thread ISO 228 G 1 1/2 A  
Material version GVJ: AISI 316L; weight: 1.1 kg (2.43 lbs)
- 4 Thread ISO 228 G 2 A  
Material version GWJ: AISI 316L; weight: 1.5 kg (3.31 lbs)

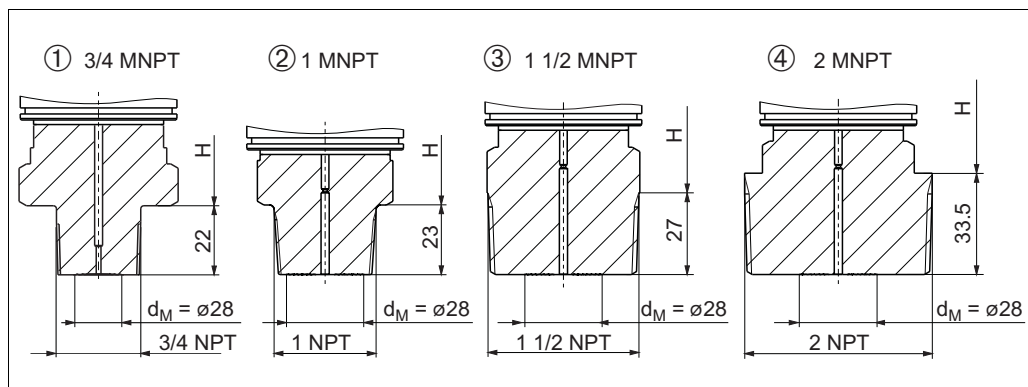
Note!

Endress+Hauser offers a pressure sensor dummy for the welding neck with order number 52002643. Order number for pressure sensor dummy: 52005082



P01-PMx5xxxx-06-xx-xx-en-003

Version G0J: Thread ISO 228 G1/2; weight: 0.4 kg (0.88 lbs)



P01-PMx5xxxx-06-xx-xx-xx-002-package1

Process connections PMP51 thread ANSI

Installation height H see following table.

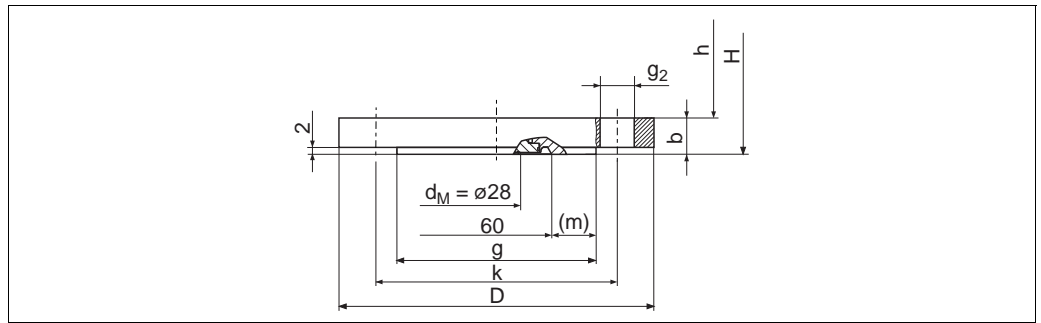
- 1 Thread ANSI 3/4 MNPT;  
Material version U4J: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 2 Thread ANSI 1 MNPT;  
Material version U5J: AISI 316L; weight: 0.7 kg (1.54 lbs)
- 3 Thread ANSI 1 1/2 MNPT;  
Material version U7J: AISI 316L; weight: 1.0 kg (2.21 lbs)
- 4 Thread ANSI 2 MNPT  
Material version U8J: AISI 316L; weight: 1.3 kg (2.86 lbs)

**Installation height H for devices with threaded connection and flush-mounted process isolating diaphragm**

Description	F31 housing	F15 housing
G 1/2	163 mm (6.42 in)	148 mm (5.83 in)
G 1	167 mm (6.57 in)	152 mm (5.98 in)
G 1 1/2 A	163 mm (6.42 in)	148 mm (5.83 in)
G 2 A	162 mm (6.38 in)	147 mm (5.79 in)
3/4 MNPT	165 mm (6.5 in)	150 mm (5.91 in)
1 MNPT	162 mm (6.38 in)	147 mm (5.79 in)
1 1/2 MNPT	169 mm (6.65 in)	150 mm (5.91 in)
2 MNPT	199 mm (7.83 in)	144 mm (5.67 in)
M 20x1.5	163 mm (6.42 in)	148 mm (5.83 in)

**Process connections PMP51  
(with metallic process  
isolating diaphragm) -  
continued**

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



P01-PMP71.xxx-06-09-xx-xx-008

Process connection PMP51, EN/DIN flange with raised face, material AISI 316L

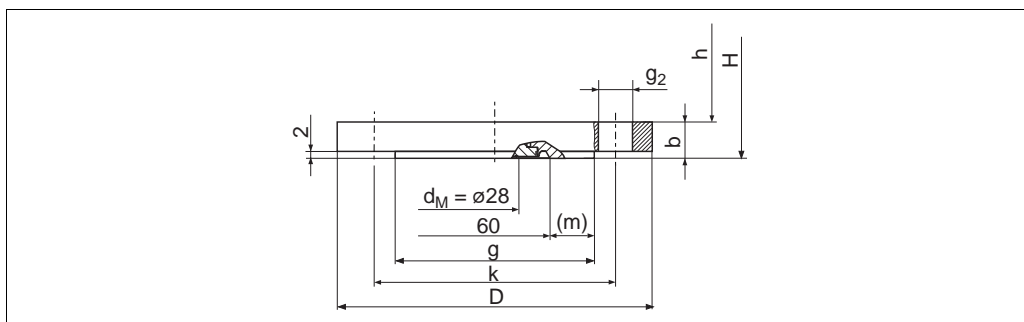
H: device height = height of device without flange h + flange thickness b  
Height H → 46.

Version	Flange <sup>1)</sup>						Boltholes				
	Nominal diameter	Nominal pressure	Shape <sup>2)</sup>	Diameter	Thickness	Raised face	Width of the raised face (m)	Quantity	Diameter	Hole circle k	Flange weight <sup>3)</sup>
				D [mm]	b [mm]	g [mm]			g <sub>2</sub> [mm]		
CNJ	DN 25	PN 10-40	B1 (D)	115	18	68 <sup>4)</sup>	4	4	14	85	1.2
CPJ	DN 32	PN 10-40	B1 (D)	140	18	78 <sup>4)</sup>	9	4	18	100	1.9
CQJ	DN 40	PN 10-40	B1 (D)	150	18	88 <sup>4)</sup>	14	4	18	110	2.2
CXJ	DN 50	PN 25/40	B1 (D)	165	20	102	-	4	18	125	3.0
CZJ	DN 80	PN 10-40	B1 (D)	200	24	138	-	8	18	160	5.5

- 1) The roughness of the surface in contact with the medium is R<sub>a</sub> 0.8 µm (31.5 µin). Lower surface roughness available on request.
- 2) Designation as per DIN 2527 in brackets
- 3) Housing weight → 46
- 4) With these process connections the sealing surface is smaller than described in the standard. Due to a smaller sealing surface a special seal must be used. Contact a seal manufacturer or your local Endress+Hauser Sales Center.

**Process connections PMP51 (with metallic process isolating diaphragm) - continued**

**ANSI flanges, connection dimensions as per ANSI B 16.5, raised face RF**



P01-PMP71xxx-06-09-xx-xx-009

Process connection PMP51, ANSI flange with raised face RF (see table below)

H: device height = height of device without flange h + flange thickness b.. For height H → 46.

Flange <sup>1)</sup>								Boltholes			
Ver- sion	Material	Nominal diameter	Class/ Nominal pressure	Diameter	Thickness	Diameter of raised face	Width of the raised face	Quan- tity	Diameter	Hole circle	Flange weight <sup>2)</sup>
		[in]		D	b	g	(m)		g <sub>2</sub>	k	[kg]
				[in] / [mm]	[in] / [mm]	[in] / [mm]	[in] / [mm]		[in] / [mm]	[in] / [mm]	
<b>ANSI flanges</b>											
ANJ	AISI 316/316L <sup>3)</sup>	1	300 lb./sq.in	4.88 / 124	0.69 / 17.5	2.76 <sup>4)</sup> / 50.8	0.2 / 5	4	0.75 / 19.1	3.5 / 88.9	1.3
AEJ	AISI 316/316L <sup>3)</sup>	1 1/2	150 lb./sq.in	5 / 127	0.69 / 17.5	2.88 <sup>4)</sup> / 73.2	0.52 / 6.6	4	0.62 / 15.7	3.88 / 98.6	1.5
AQJ	AISI 316/316L <sup>3)</sup>	1 1/2	300 lb./sq.in	6.12 / 155.4	0.81 / 20.6	2.88 <sup>4)</sup> / 73.2	0.52 / 6.6	4	0.88 / 22.4	4.5 / 114.3	2.6
AFJ	AISI 316/316L <sup>3)</sup>	2	150 lb./sq.in	6 / 152.4	0.75 / 19.1	3.62 / 91.9	-	4	0.75 / 19.1	4.75 / 120.7	2.4
ARJ	AISI 316/316L <sup>3)</sup>	2	300 lb./sq.in	7.5 / 190.5	0.88 / 22.3	3.62 / 91.9	-	8	0.75 / 19.1	5 / 127	3.2
AGJ	AISI 316/316L <sup>3)</sup>	3	150 lb./sq.in	7.5 / 190.5	0.94 / 23.9	5 / 127	-	4	0.75 / 19.1	6 / 152.4	4.9
ASJ	AISI 316/316L <sup>3)</sup>	3	300 lb./sq.in	8.25 / 209.5	1.12 / 28.6	5 / 127	-	8	0.88 / 22.4	6.62 / 168.1	6.7
AHJ	AISI 316/316L <sup>3)</sup>	4	150 lb./sq.in	9 / 228.6	0.94 / 23.9	6.19 / 157.2	-	8	0.75 / 19.1	7.5 / 190.5	7.1
ATJ	AISI 316/316L <sup>3)</sup>	4	300 lb./sq.in	10 / 254	1.25 / 31.8	6.19 / 157.2	-	8	0.88 / 22.4	7.88 / 200.2	11.6

1) The roughness of the surface in contact with the medium is R<sub>a</sub> 0.8 μm (31.5 μin). Lower surface roughness available on request.

2) Housing weight → 46

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

4) With these process connections the sealing surface is smaller than described in the standard. Due to a smaller sealing surface a special seal must be used. Contact a seal manufacturer or your local Endress+Hauser Sales Center.

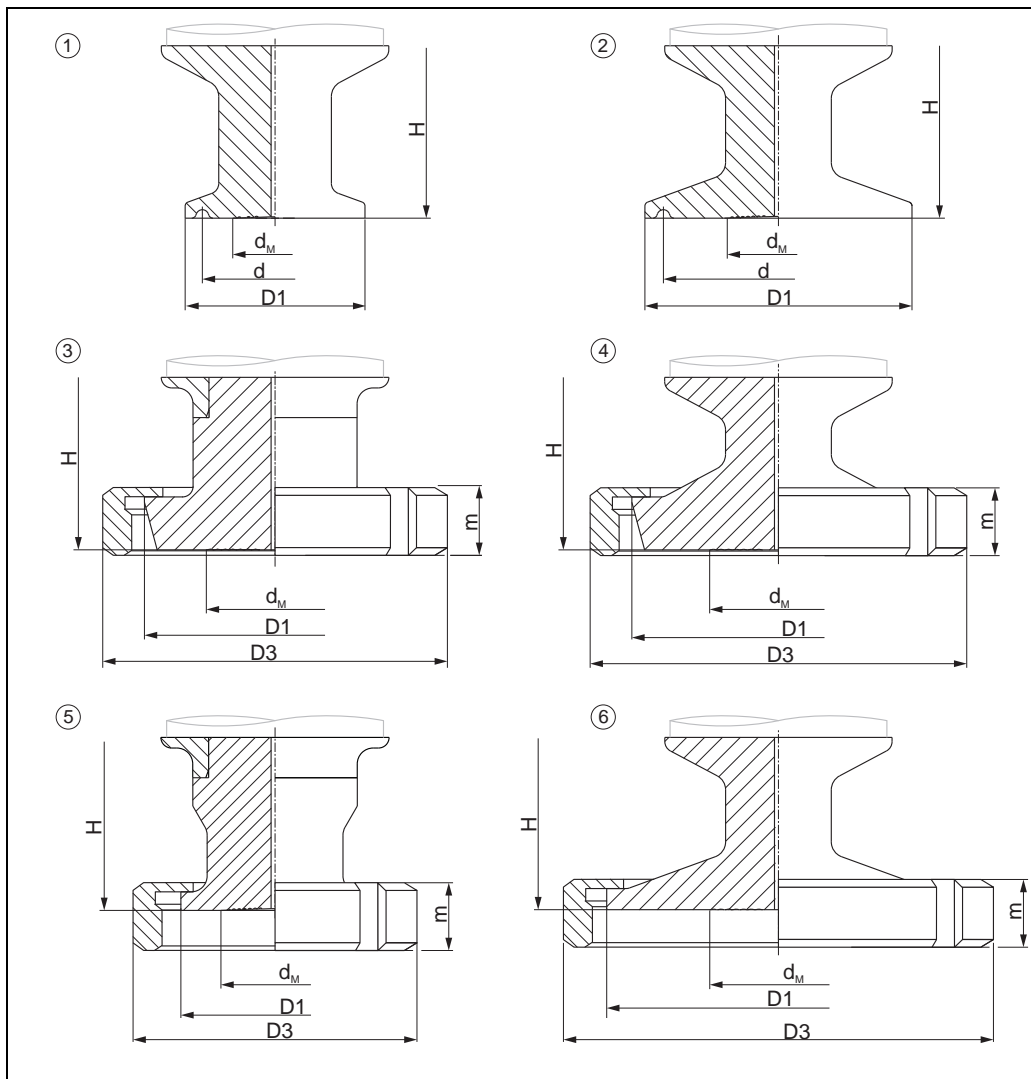
**Process connections PMP51 (with metallic process isolating diaphragm) - continued**

**Height H for devices with flange**

	F31 housing	F15 housing
Height H	165 mm (6.5 in)	150 mm (5.91 in)

**Process connections PMP51  
(with metallic process  
isolating diaphragm) -  
continued**

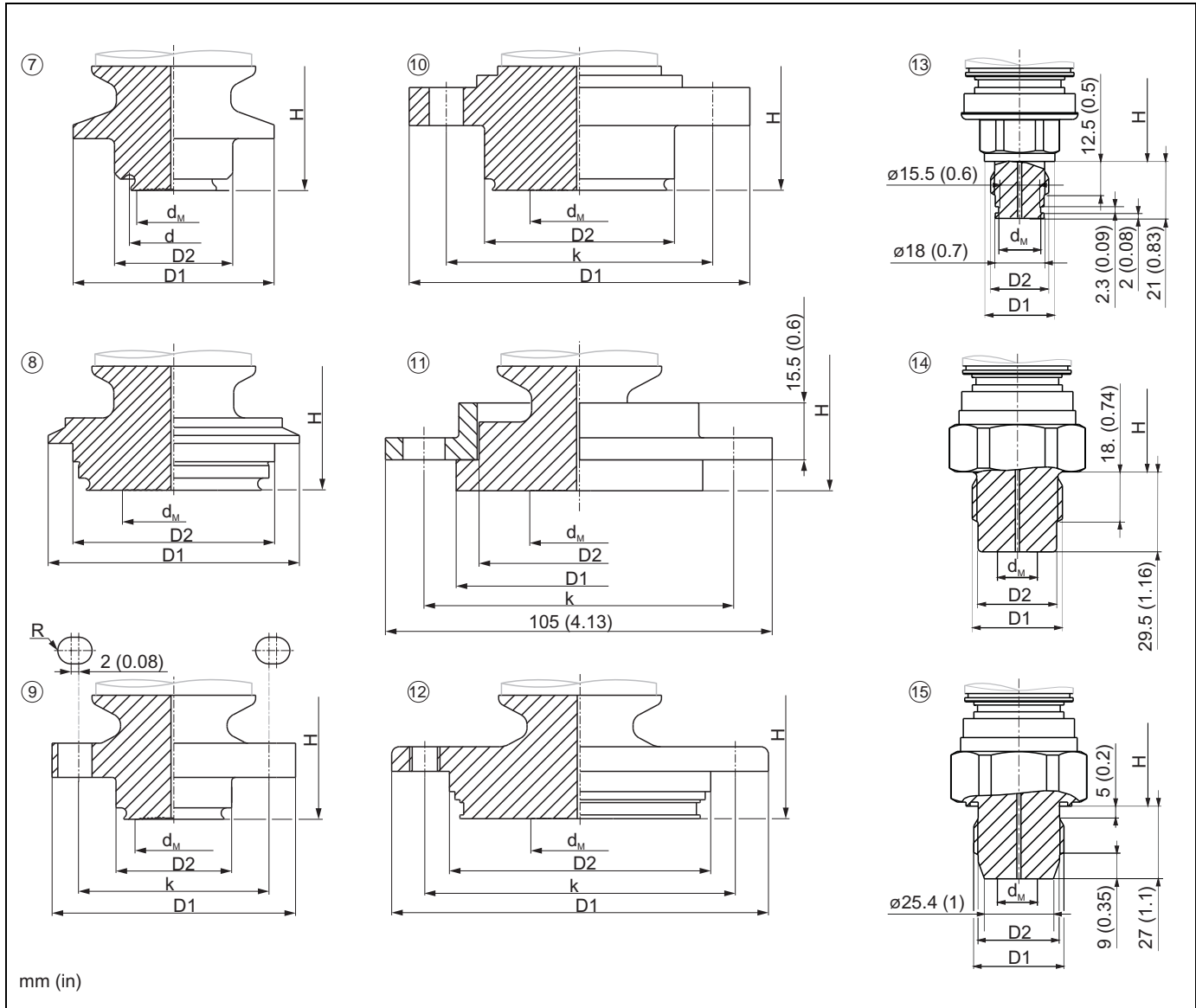
**Hygienic process connection, flush-mounted process isolating diaphragm**



P01-PMC51xxx-06-00-00-xx-000

Hygienic process connections, material: AISI 316L (1.4435)  
Surface roughness of the surfaces in contact with the medium  $R_a$  0.76  $\mu\text{m}$  (30  $\mu\text{in}$ ). Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a$  0.38  $\mu\text{m}$  (15  $\mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code.

Pos.	Version	Nominal pressure PN	Outer-Ø D1	Outer-Ø D3	Seal-Ø d	Membrane-Ø d <sub>M</sub>	Height H	Height m	Weight kg (lbs)	
1	Clamp DN18-22	TBJ	40	34 (1.34)	-	27.5 (1.08)	max. 165 (6.5)	-	0.5 (1.10)	
2	Clamp 1"	TCJ	40	50.5 (1.99)	-	43.5 (1.71)		-	0.6 (1.32)	
	Clamp 1½"	TJJ	40	50.5 (1.99)	-	43.5 (1.71)		-	0.6 (1.32)	
	Clamp 2"	TDJ	40	64 (2.52)	-	56.5 (2.22)		-	0.7 (1.54)	
3	DIN11851 B25	MXJ	40	43.4 (1.71)	63 (2.48)	-		28 (1.10)	21 (0.83)	0.7 (1.54)
	DIN11851 B32	MIJ	40	49.4 (1.94)	70 (2.76)	-		28 (1.10)	21 (0.83)	0.8 (1.76)
4	DIN11851 B40	MZJ	40	55.4 (2.18)	78 (3.07)	-		28 (1.10)	21 (0.83)	0.9 (1.98)
	DIN11851 B50	MRJ	25	67.4 (2.65)	92 (3.62)	-		28 (1.10)	22 (0.87)	1.1 (2.43)
5	SMS 1"	T6J	25	35.5 (1.4)	51 (2.01)	-		21.65 (0.85)	20 (0.79)	0.7 (1.54)
6	SMS 1½"	T7J	25	55 (2.17)	74 (2.91)	-		28 (1.10)	25 (0.98)	0.8 (1.76)
	SMS 2"	TXJ	25	65 (2.56)	84 (3.31)	-	28 (1.10)	26 (1.02)	0.9 (1.98)	



mm (in)

P01-PMC51/xx-06-00-00-xx-001

Hygienic process connections, material: AISI 316L (1.4435)

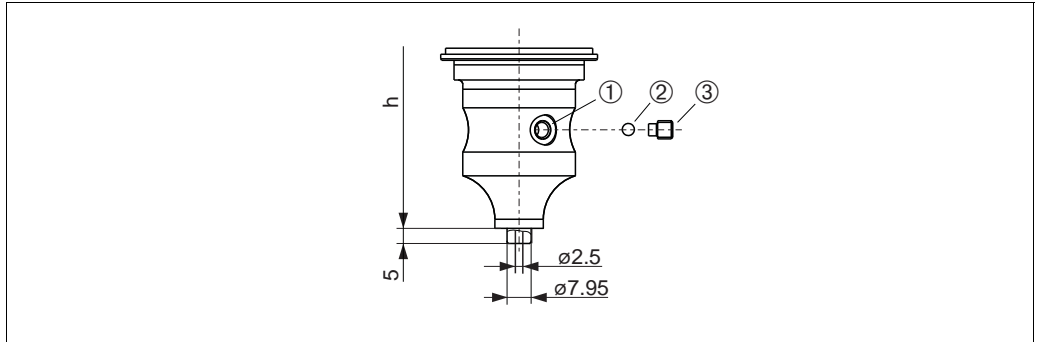
Surface roughness of the surfaces in contact with the medium  $R_a$  0.76  $\mu$ m (30  $\mu$ in). Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a$  0.38  $\mu$ m (15  $\mu$ in), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code.

Pos.	Version	Nominal pressure PN	Outer-Ø D1	Outer-Ø D2	Hole circle-Ø k	Membran-Ø d <sub>M</sub>	Height H	Weight kg (lbs)
7	Varivent B	TPJ	40	52.7 (2.07)	31 (1.22)	-	21.65 (0.85)	0.7 (1.54)
8	Varivent F	TQJ	40	66 (2.6)	53 (2.09)	-	28 (1.10)	0.9 (1.98)
	Varivent N	TRJ	40	84 (3.31)	68 (2.68)	-	28 (1.10)	1.1 (2.43)
9	Neumo D25	S1J	16	64 (2.52)	30.4 (1.2)	50 (1.97); 4 x, R 3,5 mm (0.14 in)	21.65 (0.85)	0.8 (1.76)
10	Neumo D50	S4J	16	89.5 (3.52)	49.9 (1.96)	70 (2.76); 4 x ø 9 mm (0.35 in)	28 (1.10)	1.2 (2.65)
11	DRD	TIJ	25	64.5 (2.54)	52.5 (2.07)	84 (3.31); 4 x ø 11.5 mm (0.45 in)	28 (1.10)	1.0 (2.21)
12	APV Inline	TMJ	10	99.5 (3.92)	69 (2.72)	82 (3.23); 6 x ø 8.6 mm (0.34 in) + 2 x M8	28 (1.10)	1.2 (2.65)
13	G 1/2	G0J	40	26	G 1/2	-	17.5 (0.69)	0.5 (1.1)
14	G 1	GZJ	40	G 1	29	-	17.5 (0.69)	0.8 (1.76)
15	G 1	GXJ	100	G 1	30	-	17.5 (0.69)	0.8 (1.76)



**Process connections PMP51  
(with metallic process  
isolating diaphragm) -  
continued**

**Prepared for diaphragm seal mount**



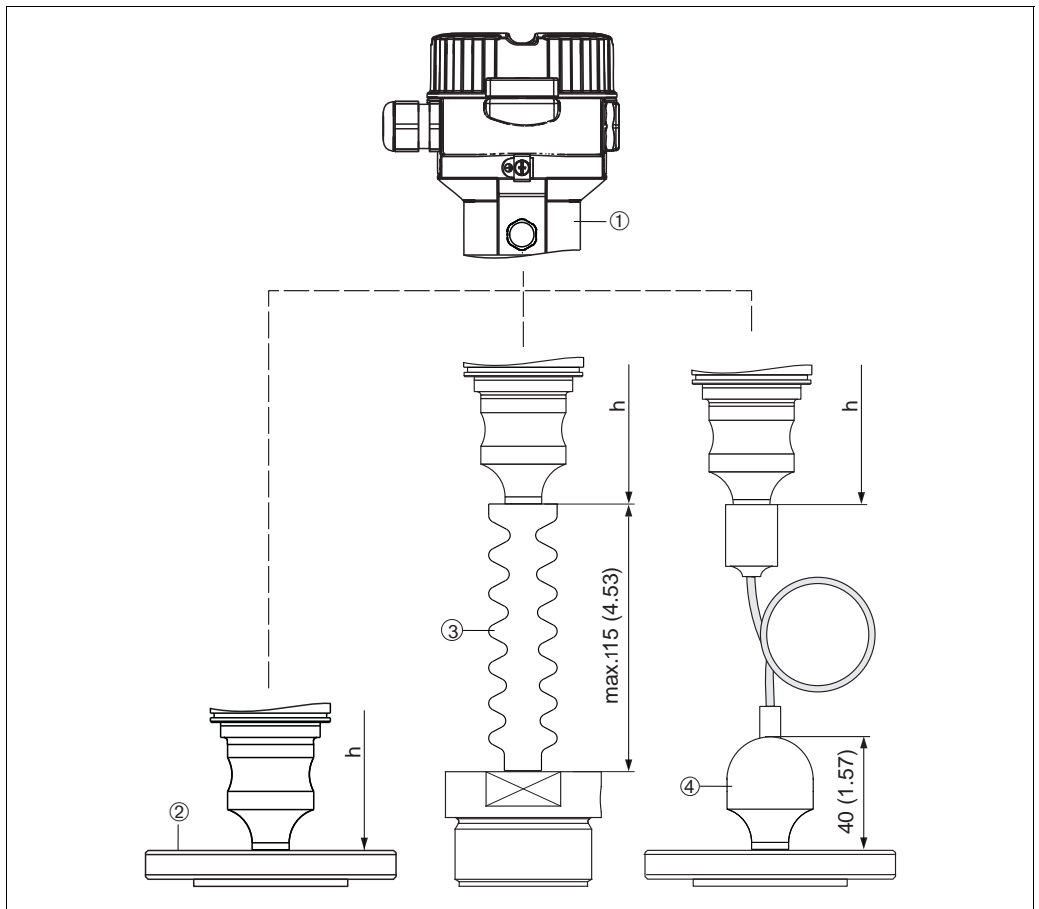
P01-PMP71 xxx-06-09-xx-xx-013

*Version XSJ: prepared for diaphragm seal mount*

- 1 Hole for fill fluid
- 2 Bearing
- 3 Setscrew with a hexagonal recess 4 mm (0.16 in)

	<b>F31 housing</b>	<b>F15 housing</b>
Height H	190 mm (7.48 in)	175 mm (6.89 in)

**PMP55 basic device**



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

*PMP55 basic device with diaphragm seal*

- 1 PMP55 basic device
- 2 Diaphragm seal, here e.g. flange diaphragm seal
- 3 Diaphragm seal with temperature isolator
- 4 Process connections with capillary tubes are 40 mm (1,57 in) higher than process connections without capillary tubes

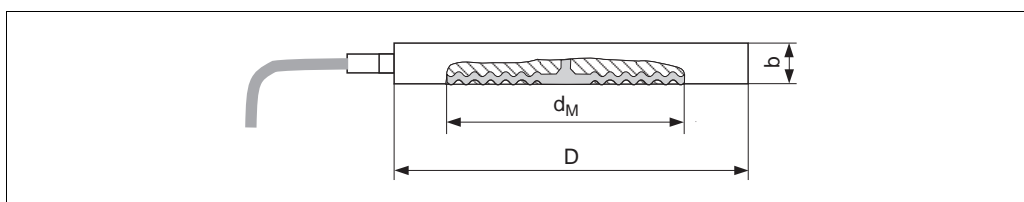
	F31 housing	F15 housing
Height H	190 mm (7.48 in)	175 mm (6.89 in)

Note!

- The weights of the diaphragm seals are given in the following tables. See → 66 for the weight of the housing.
- The following drawings are schematic diagrams. In other words, the dimensions of a diaphragm seal supplied may deviate from the dimensions given in this document.
- When using high-temperature oils the design can deviate significantly.
- Observe the information in the "Planning instructions for diaphragm seal systems" section → 76 ff.
- For further information please contact your local Endress+Hauser Sales Center.

**Process connections PMP55 (with diaphragm seal)**

**Diaphragm seal cell structure (Pancake)**



P01-FMD78xxx-06-09-xx-xx-000

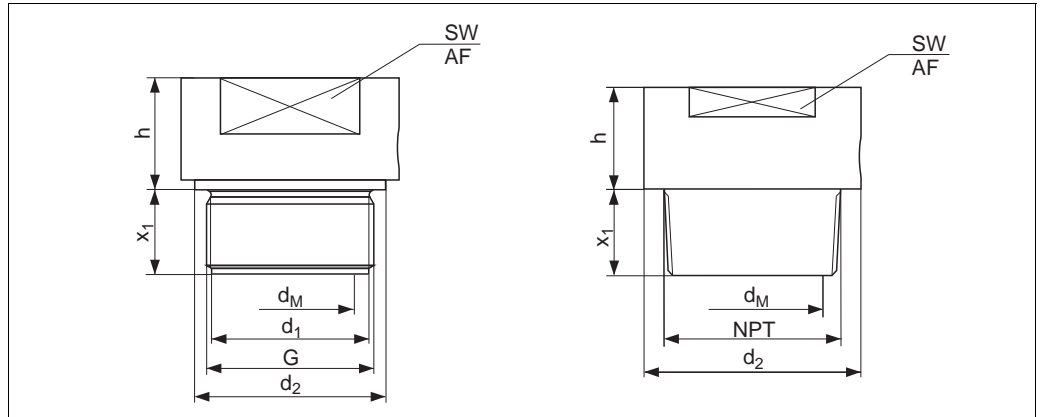
Process connection PMP55, material AISI 316L

Version	Flange				Diaphragm seal	
	Nominal diameter	Nominal pressure <sup>1)</sup>	Max. diameter D [mm]	Thickness b [mm]	Max. diameter of the process isolating diaphragm d <sub>M</sub> [mm]	Weight of two diaphragm seals [kg]
UJ	DN 50	PN 16-400	102	20	59	2.6
UJJ	DN 80	PN 16-400	138	20	89	4.6
UKJ	DN 100	PN 16-400	162	20	89	6.2
	[in]	[lb/sq.in]	[in (mm)]	[in (mm)]	[in (mm)]	[kg]
ULJ	2	150-2500	4.01 (102)	0.79 (20)	2.32 (59)	2.6
UMJ	3	150-2500	5.35 (136)	0.79 (20)	3.50 (89)	4.6
URJ	4	150-2500	6.22 (158)	0.79 (20)	3.50 (89)	6.2

1) The specified nominal pressure applies to the diaphragm seal. The maximum pressure for the measuring device is dependent on the lowest-rated element, with regard to pressure, of the selected components. See also → 32, "Pressure specifications" section.

Process connections PMP55  
(with diaphragm seal) -  
continued

Thread, flush-mounted process isolating diaphragm



P01-PMP75xxx-06-09-xx-xx-003

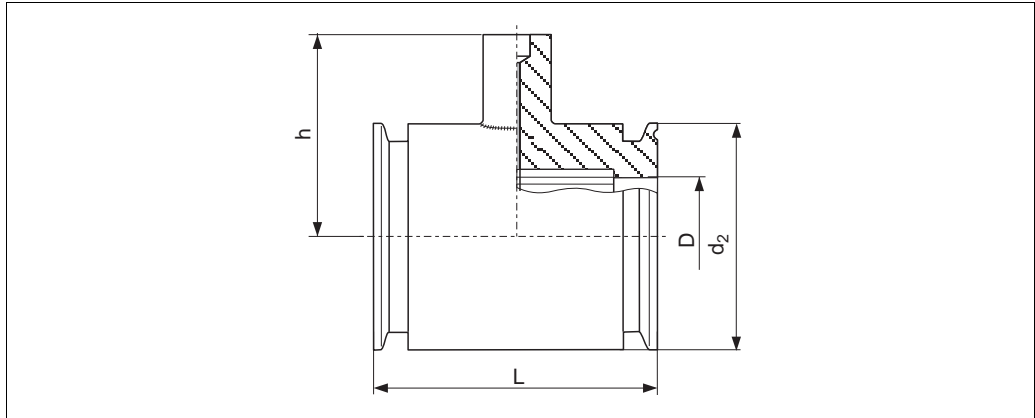
Process connections PMP55, left: thread ISO 228, right: thread ANSI

Threaded connection								Diaphragm seal		
Version	Material	Thread	Nominal pressure	Diameter	Diameter	Screw-in length	Across flats	Max. diaphragm diameter	Height	Diaphragm seal weight
			PN	d <sub>1</sub> [mm]	d <sub>2</sub> [mm]	x <sub>1</sub> [mm]	SW/AF	d <sub>M</sub> [mm]	h [mm]	[kg]
GTJ	316L	G1	400	30	39	21 <sup>1)</sup>	41	30	19	0.4
GTC	Alloy C276									
GVJ	316L	G1 1/2 A	400	44	55	30	50	42	20	0.9
GVC	Alloy C276									
GWJ	316L	G2	400	56	68	30	65	50	20	1.9
GWC	Alloy C276									
U5J	316L	1 MNPT	400	-	48	28	41	24	37	0.6
U7J	316L	1 1/2 MNPT	400	-	60	30	41	36	20	0.9
U8J	316L	2 MNPT	400	-	78	30	65	38	35	1.8

1) 28 mm (1.1 in) in conjunction with high-temperature oil

Process connections PMP55  
(with diaphragm seal) -  
continued

Pipe diaphragm seal (RDM) as per ISO2852



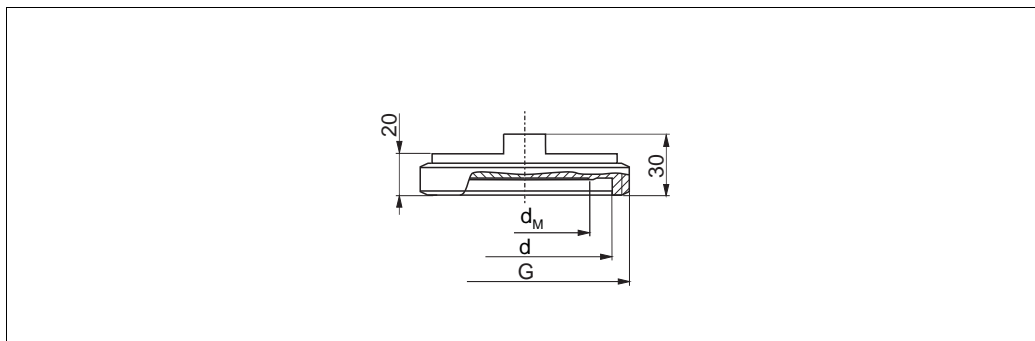
P01-FMD78xxx-06-09-xx-xx-001

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Nominal diameter ISO2852	Nominal pressure	Nominal diameter	Diameter D [in]	Diameter d <sub>2</sub> [mm]	Height h [mm]	Face-to-face length L [mm]	Diaphragm seal weight [kg]
SBJ	DN 25	PN40	1"	22.5	50.5	67	126	1.7
SCJ	DN 38	PN40	1 1/2"	35.5	50.5	67	126	1.0
SDJ	DN 51	PN40	2"	48.6	64	79	100	1.7
SIJ	DN 10	PN40	3/4"	10.3	25	42	138.5	0.6
SJJ	DN 16	PN40	3/4"	15.7	25	67	116	0.9

Process connections PMP55  
(with diaphragm seal) -  
continued

Aseptic screwed union, threaded connection, DIN 11864-1 Form A; pipe DIN 11866-A

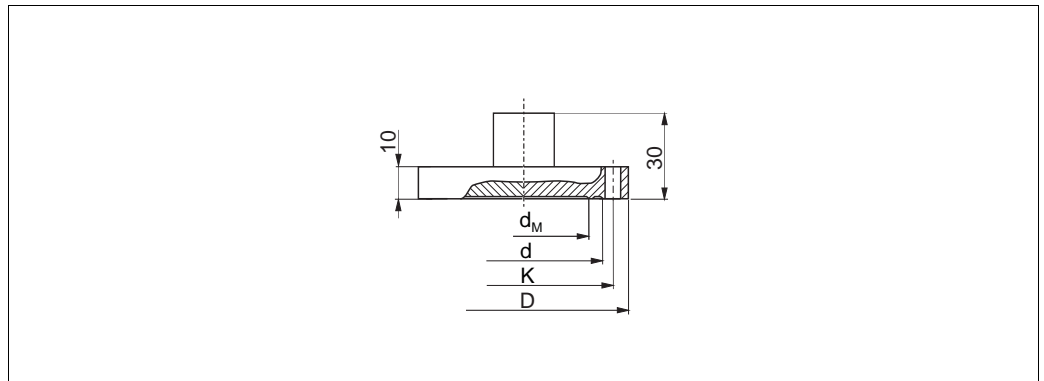


P01-PMP55xxx-06-xx-xx-xx-001

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Threaded adapter				Diaphragm seal	
	Nominal diameter	Nominal pressure	Diameter d [mm]	Thread G	Max. diaphragm diameter d <sub>M</sub> [mm]	Weight Diaphragm seal [kg]
NCJ	DN 40	PN 16	55	Rd 65 x 1/6	35	1.5
NDJ	DN 50		67	Rd 78 x 1/6	45	2.3

**Aseptic flange connection, DIN 11864-2 Form A; pipe DIN 11866-1**

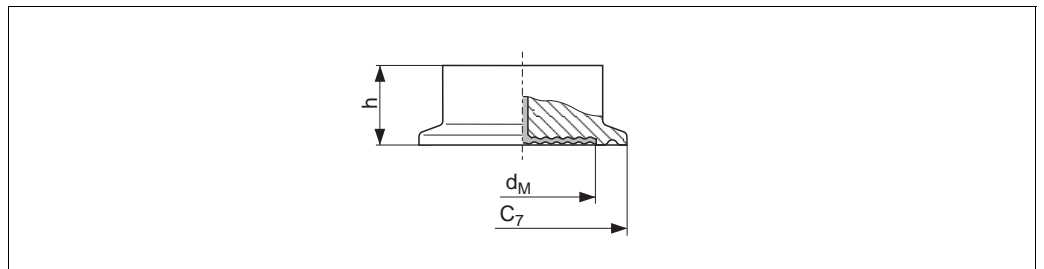


P01-PMP55xxx-06-xx-xx-xx-002

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Collar flange			Diaphragm seal			
	Nominal diameter	Nominal pressure	Hole circle diameter K [mm]	Seal diameter d [mm]	Outer diameter D [mm]	Max. diaphragm diameter $d_M$ [mm]	Diaphragm seal weight [kg]
NFJ	DN 32	PN 16	59	47.7	76	25	1.5
NXJ	DN 40		65	53.7	82	35	1.7
NZJ	DN 50		77	65.7	94	45	2.2

**Tri-Clamp ISO 2852**



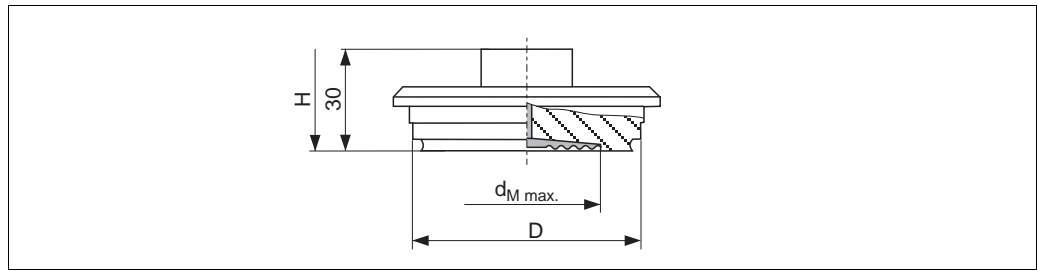
P01-FMD78xxx-06-09-xx-xx-005

Process connection PMP55, material: AISI 316L, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Nominal diameter ISO 2852	Nominal diameter DIN 32676	Nominal diameter [in]	Diameter $C_7$ [mm]	Max. diaphragm diameter $d_M$ [mm]	Height h [mm]	Diaphragm seal weight [kg]
TCJ	DN 25	DN 25	1	50.5	24	37	0.32
TJJ <sup>1)</sup>	DN 38	DN 40	1 1/2	50.5	34	30	1.0
TDJ <sup>1)</sup>	DN 51	DN 50	2	64	48	30	1.1
TFJ	DN 76.1	–	3	91	73	30	1.2

1) Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a \leq 0.38 \mu\text{m}$  ( $15 \mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code. In combination with the order version "electropolished", the wetted parts of the 1-1/2" and 2" Tri-Clamp connections are made of 316L (1.4435) with a delta-ferrite content of < 1% (welding seams excluded).

**Varivent N for pipes**



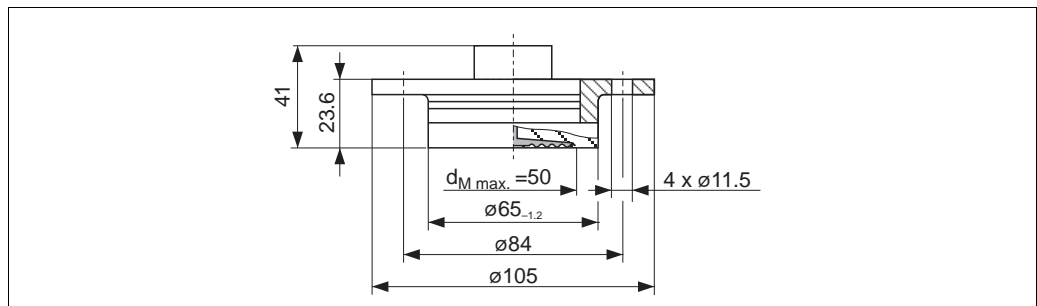
P01-FM5xxxx-06-xx-xx-019

Process connection PMP55, material AISI 316, 3A, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  (31.5  $\mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Description	Nominal pressure	Diameter	Max. diaphragm diameter	Max. installation height	Diaphragm seal weight
		[bar]	D [mm]	d <sub>M</sub> [mm]	H [mm]	[kg]
TQJ	Type F for tubes DN 25 - DN 32	PN 40	50	30	250	0.6
TRJ <sup>1)</sup>	Type N for tubes DN 40 - DN 162		68	64		0.8

1) Diaphragm seal versions optionally in conformity with ASME-BPE for use in biochemical processes, wetted surfaces  $R_a \leq 0.38 \mu\text{m}$  (15  $\mu\text{in}$ ), electropolished; to be ordered using feature 570 "Service", version "HK" in the order code. In combination with the order version "electropolished", the wetted parts of the Varivent connection are made of 316L (1.4435) with a delta-ferrite content of < 1% (welding seams excluded).

**DRD DN50 (65 mm)**

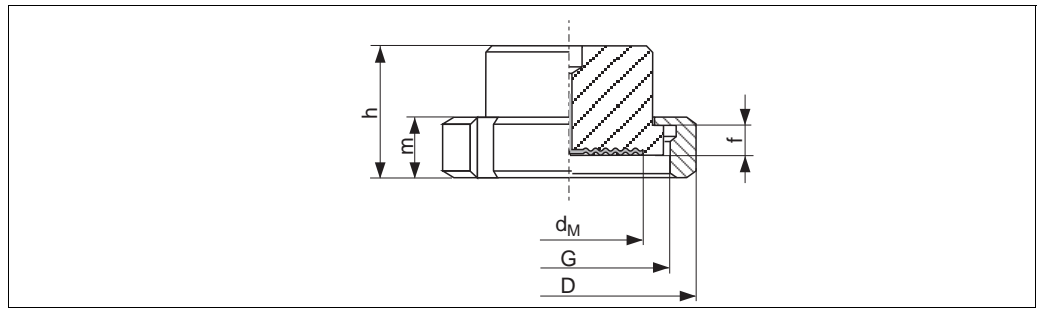


P01-FM78xxx-06-09-xx-xx-002

Process connection PMP55, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  (31.5  $\mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Material	Nominal pressure	Diaphragm seal weight
			[kg]
TIJ	AISI 316L	PN 25	0.75

**SMS nozzles with coupling nut**

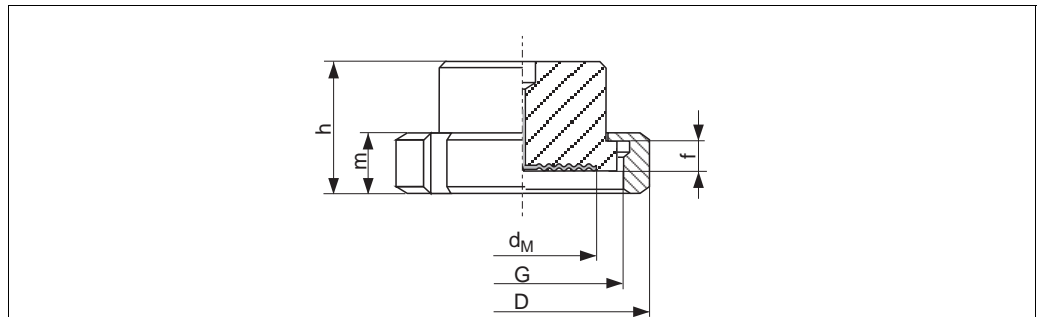


P01-PMP75xxx-06-09-xx-xx-009

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $Ra \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Height	Max. diaphragm diameter	Diaphragm seal weight
	[in]	[bar]	D [mm]	f [mm]	G	m [mm]	h [mm]	$d_M$ [mm]	[kg]
T6J	1	PN 25	54	3.5	Rd 40 – 1/6	20	42.5	24	0.25
T7J	1 1/2	PN 25	74	4	Rd 60 – 1/6	25	57	36	0.65
TXJ	2	PN 25	84	4	Rd 70 – 1/6	26	62	48	1.05

**APV-RJT nozzles with coupling nut**

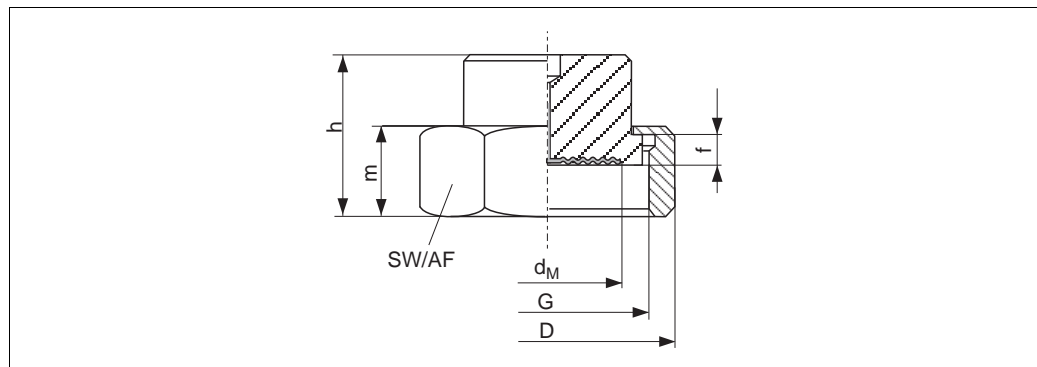


P01-PMP75xxx-06-09-xx-xx-010

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $Ra \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Height	Max. diaphragm diameter	Diaphragm seal weight
	[in]	PN [bar]	D [mm]	f [mm]	G	m [mm]	h [mm]	$d_M$ [mm]	[kg]
TOJ	1	PN 40	77	6.5	1 13/16 – 1/8"	22	42.6	21	0.45
T1J	1 1/2	PN 40	72	6.4	2 5/16 – 1/8"	22	42.6	28	0.75
T2J	2	PN 40	86	6.4	2 7/8 – 1/8"	22	42.6	38	1.2

APV-ISS nozzles with coupling nut

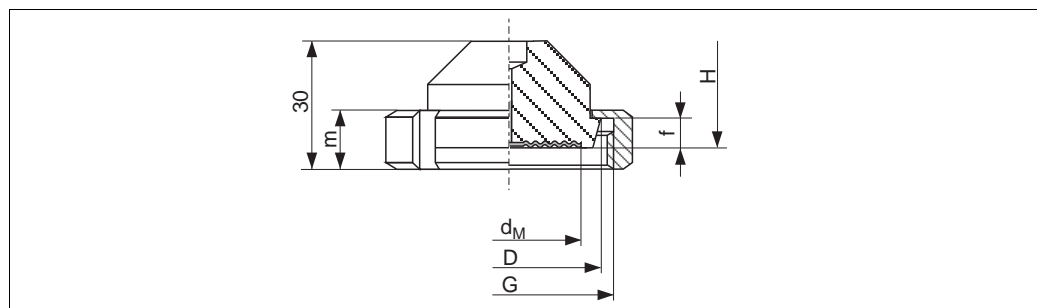


P01-PMP75xxx-06-09-xx-xx-011

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Across flats	Height	Max. diaphragm seal	Diaphragm seal weight
	[in]	[bar]	D [mm]	f [mm]	G	m [mm]	AF	h [mm]	$d_M$ [mm]	[kg]
T3J	1	PN 40	54.1	4	1 1/2" - 1/8"	30	46.8	50	24	0.4
T4J	1 1/2	PN 40	72	4	2" - 1/8"	30	62	50	34	0.6
T5J	2	PN 40	89	4	2 1/2" - 1/8"	30	77	50	45	1.1

Taper adapter with coupling nut, DIN 11851



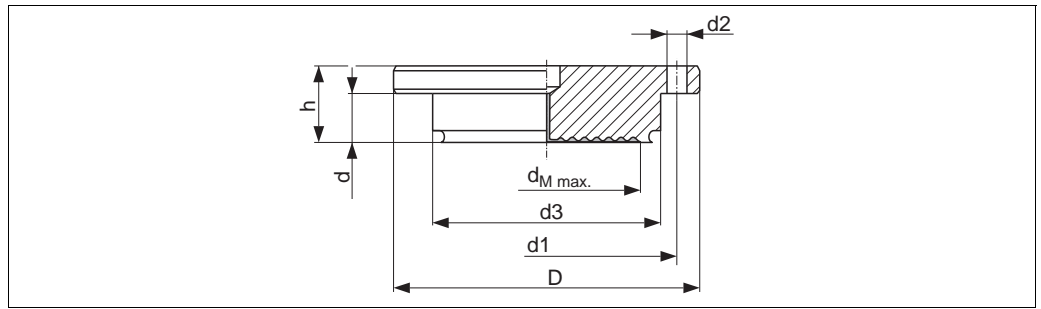
P01-PMa5xxxx-06-xx-xx-xx-020

Process connection PMP55, material AISI 316L, 3A, surface roughness of the surfaces in contact with the medium  $R_a \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Taper adapter				Slotted nut		Diaphragm seal		
	Nominal diameter	Nominal pressure	Diameter	Adapter height	Thread	Height	Max. diaphragm diameter	Max. installation height	Diaphragm seal weight
			D [mm]	f [mm]	G	m [mm]	$d_M$ [mm]	H [mm]	[kg]
MIJ	DN 32	PN 40	50	10	Rd 58 x 1/6"	21	32	250	1.9
MZJ	DN 40	PN 40	56	10	Rd 65 x 1/6"	21	38		2.0
MRJ	DN 50	PN 25	68.5	11	Rd 78 x 1/6"	22	52		1.1
MSJ	DN 65	PN 25	86	12	Rd 95 x 1/6"	35	66		2.0
MTJ	DN 80	PN 25	100	12	Rd 110 x 1/4"	30	81		2.55



NEUMO BioControl



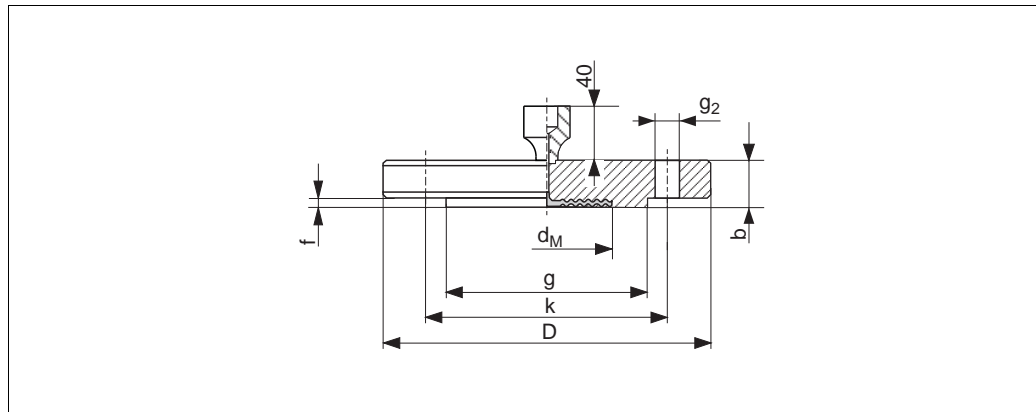
P01-PM5xxxx-06-xx-xx-xx-021

Process connection PMP55, material AISI 316L, surface roughness of the surfaces in contact with the medium  $Ra \leq 0.8 \mu\text{m}$  ( $31.5 \mu\text{in}$ ) as standard. Lower surface roughness, see feature 570 "Service" version HK.

Version	Threaded adapter							Diaphragm seal	
	Nominal diameter	Nominal pressure	Diameter diameter D [mm]	Hole circle $d_1$ [mm]	Diameter $d_2$ [mm]	Diameter $d_3$ [mm]	Height h [mm]	Max. diaphragm diameter $d_M$ [mm]	Diaphragm seal weight [kg]
S4J	DN 50	PN 16	90	70	4 x $\varnothing$ 9	50	27	40	1.1

Process connections PMP55  
(with diaphragm seal) -  
continued

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

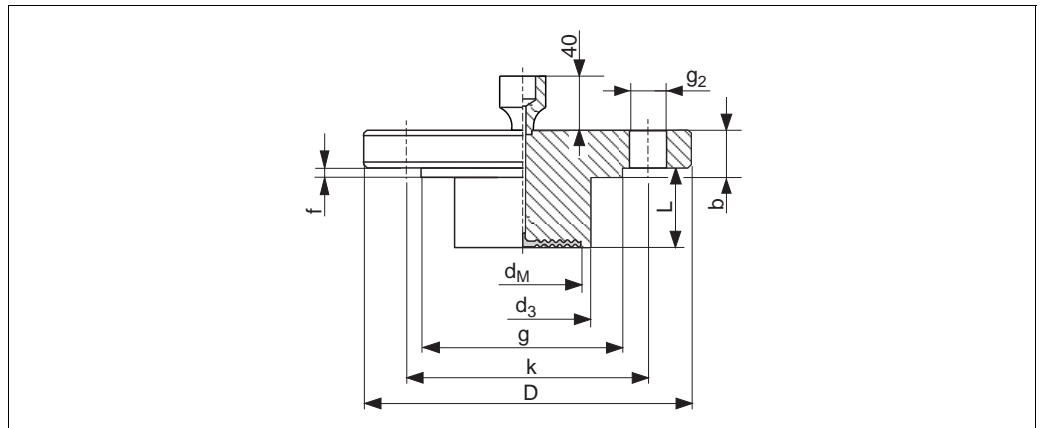


Process connection PMP55, EN/DIN flange with flush-mounted process isolating diaphragm, material AISI 316L

Version	Flanges						Boltholes				Diaphragm seal	
	Nominal diameter	Nominal pressure	Shape <sup>1)</sup>	Diameter	Thickness	Raised face		Quantity	Diameter	Hole circle	Max. diaphragm diameter	Diaphragm seal weight
				D [mm]	b [mm]	g [mm]	f [mm]		g <sub>2</sub> [mm]	k [mm]	d <sub>M</sub> [mm]	
CNJ	DN 25	PN 10-40	B1 (D)	115	18	66	3	4	14	85	32	2.1
QIJ	DN 25	PN 63-160	B2 (E)	140	24	68	2	4	18	100	28	2.5
QJJ	DN 25	PN 250	B2 (E)	150	28	68	2	4	22	105	28	3.7
QSJ	DN 25	PN 400	B2 (E)	180	38	68	2	4	26	130	28	7.0
CPJ	DN 32	PN 10-40	B1 (D)	140	18	77	2.6	4	18	100	34	1.9
CQJ	DN 40	PN 10-40	B1 (D)	150	18	87	2.6	4	18	110	48	2.2
CXJ	DN 50	PN 10-40	B1 (D)	165	20	102	3	4	18	125	59	3.0
PDJ	DN 50	PN 63	B2 (E)	180	26	102	3	4	22	135	59	4.6
QOJ	DN 50	PN 100-160	B2 (E)	195	30	102	3	4	26	145	59	6.2
QMJ	DN 50	PN 250	B2 (E)	200	38	102	3	8	26	150	59	7.7
QVJ	DN 50	PN 400	B2 (E)	235	52	102	3	8	30	180	59	14.7
CZJ	DN 80	PN 10-40	B1 (D)	200	24	138	3.5	8	18	160	89	5.3
PPJ	DN 80	PN 100	B2 (E)	230	32	138	4	8	24	180	89	8.9
PQJ	DN 100	PN 100	B2 (E)	265	36	175	5	8	30	210	89	13.7

1) Designation as per DIN 2527 in brackets

EN/DIN flanges with extended diaphragm seal, connection dimensions as per EN 1092-1/DIN 2527 and DIN 2501-1



Process connection PMP55, EN/DIN flange with flush-mounted process isolating diaphragm, material AISI 316L

Version	Flanges						Boltholes			Diaphragm seal		
	Nominal diameter	Nominal pressure	Shape <sup>1)</sup>	Diameter	Thickness	Raised face		Quantity	Diameter	Hole circle	Max. diaphragm diameter $d_M$	Diaphragm seal weight [kg]
				D [mm]	b [mm]	g [mm]	f [mm]		$g_2$ [mm]	k [mm]		
FDJ <sup>2)</sup>	DN 50	PN 10-40	B1 (D)	165	20	102	3	4	18	125	47	<sup>2)</sup>
FEJ <sup>2)</sup>	DN 80	PN 10-40	B1 (D)	200	24	138	3.5	8	18	160	72	<sup>2)</sup>

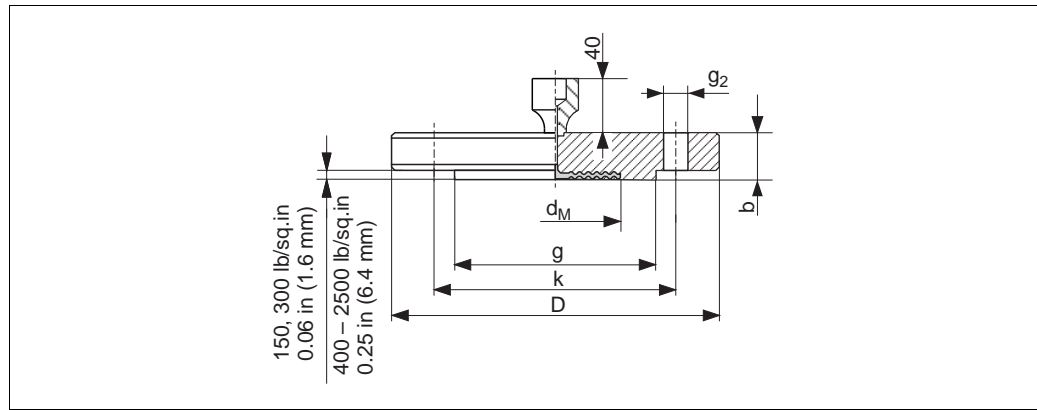
1) Designation as per DIN 2527 in brackets

2) Available with 50 mm (1.97 in), 100 mm (3.94 in) or 200 mm (7.87 in) extended diaphragm seal, for extended diaphragm seal diameter and weight see the following table

Version	Nominal diameter	Nominal pressure	Extended diaphragm seal length (L) [mm]	Extended diaphragm seal diameter $d_3$ [mm]	Diaphragm seal weight [kg]
FDJ	DN 50	PN 10-40	50 / 100 / 200	48.3	3.2 / 3.8 / 4.4
FEJ	DN 80	PN 10-40	50 / 100 / 200	76	6.2 / 6.7 / 7.8

Process connections PMP55  
(with diaphragm seal) -  
continued

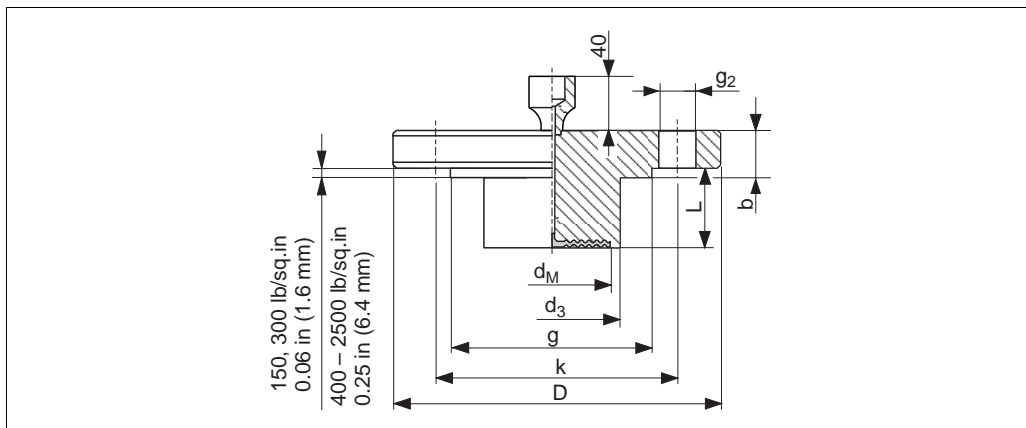
ANSI flanges, connection dimensions as per ANSI B 16.5, raised face RF



Process connection PMP55, ANSI flange, material AISI 316/316L (Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated))

Version	Flange					Boltholes			Diaphragm seal	
	Nominal diameter	Class	Diameter	Thickness	Raised face	Quantity	Diameter	Hole circle	Max. diaphragm diameter	Diaphragm seal weight
	[in]	[lb./sq.in]	D [in] / [mm]	b [in] / [mm]	g [in] / [mm]		g <sub>2</sub> [in] / [mm]	k [in] / [mm]	d <sub>M</sub> [in] / [mm]	[kg]
ACJ	1	150	4.25 / 108	0.56 / 14.2	2 / 50.8	4	0.62 / 15.7	3.12 / 79.2	1.26 / 32	1.2
ANJ	1	300	4.88 / 124	0.69 / 17.5	2 / 50.8	4	0.75 / 19.1	3.5 / 88.9	1.26 / 32	1.3
A0J	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	1.4
A2J	1	900/1500	5.88 / 149.4	1.12 / 28.6	2 / 50.8	4	1 / 25.4	4 / 101.6	1.26 / 32	3.2
A4J	1	2500	6.25 / 158.8	1.38 / 35.1	2 / 50.8	4	1 / 25.4	4.25 / 108	1.26 / 32	4.6
AEJ	1 1/2	150	5 / 127	0.69 / 17.5	2.88 / 73.2	4	0.62 / 15.7	3.88 / 98.6	1.89 / 48	1.5
AQJ	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	2.6
AFJ	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	2.2
ARJ	2	300	6.5 / 165.1	0.88 / 22.4	3.62 / 91.9	8	0.75 / 19.1	5 / 127	2.32 / 59	3.4
A1J	2	400/600	6.5 / 165.1	1 / 25.4	3.62 / 91.9	8	0.75 / 19.1	5 / 127	2.32 / 59	4.3
A3J	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	10.3
A5J	2	2500	9.25 / 235	2 / 50.8	3.62 / 91.9	8	1.12 / 28.6	6.75 / 171.5	2.32 / 59	15.8
AGJ	3	150	7.5 / 190.5	0.94 / 23.9	5 / 127	4	0.75 / 19.1	6 / 152.4	3.50 / 89	5.1
ASJ	3	300	8.25 / 209.5	1.12 / 28.6	5 / 127	8	0.75 / 19.1	6 / 152.4	3.50 / 89	7.0
AHJ	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	7.2
ATJ	4	300	10 / 254	1.25 / 31.8	6.19 / 157.2	8	0.88 / 22.4	7.88 / 200.2	3.50 / 89	11.7

**ANSI flanges with extended diaphragm seal, connection dimensions as per ANSI B 16.5, raised face RF**



P01-PMP75xxx-06-09-xx-xx-016

Process connection PMP55, ANSI flange with extended diaphragm seal, material AISI 316/316L (Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated))

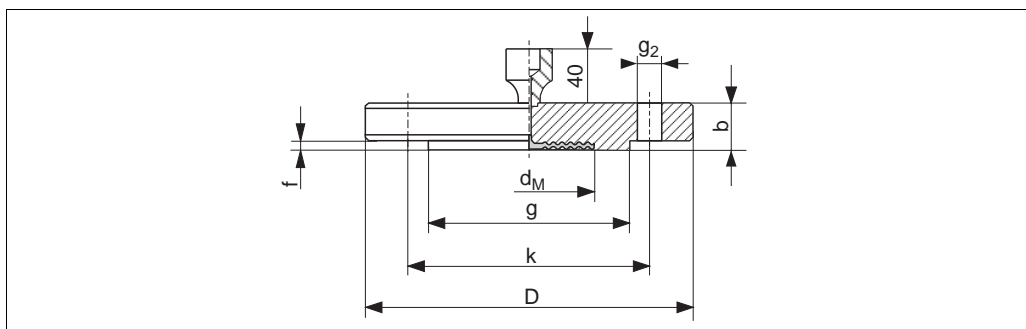
Version	Flange					Boltholes			Diaphragm seal	
	Nominal diameter [in]	Class [lb./sq.in]	Diameter D [in] / [mm]	Thickness b [in] / [mm]	Raised face g [in] / [mm]	Quantity	Diameter g <sub>2</sub> [in] / [mm]	Hole circle k [in] / [mm]	Max. diaphragm diameter d <sub>M</sub> [in] / [mm]	Diaphragm seal weight [kg]
FMJ <sup>1)</sup>	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	<sup>1)</sup>
FNJ <sup>1)</sup>	3	150	7.5 / 190.5	0.94 / 23.9	5 / 127	4	0.75 / 19.1	6 / 152.4	2.83 / 72	<sup>1)</sup>
FWJ <sup>1)</sup>	3	300	8.25 / 209.5	1.12 / 28.6	5 / 127	8	0.88 / 22.4	6.62 / 168.1	2.83 / 72	<sup>1)</sup>
FOJ <sup>1)</sup>	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	<sup>1)</sup>
FXJ <sup>1)</sup>	4	300	10 / 254	1.25 / 31.8	6.19 / 157.2	8	0.88 / 22.4	7.88 / 200.2	3.50 / 89	<sup>1)</sup>

1) Available with 2 in, 4 in, 6 in or 8 in extended diaphragm seal, for extended diaphragm seal diameter and weight see the following table

Version	Nominal diameter [in]	Class [lb./sq.in]	Extended diaphragm seal length (L) in (mm)	Extended diaphragm seal diameter d <sub>3</sub> in (mm)	Diaphragm seal weight [kg]
FMJ	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
FNJ	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
FWJ	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
FOJ	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
FXJ	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

Process connections PMP55  
(with diaphragm seal) -  
continued

JIS flanges, connection dimensions as per JIS B 2220 BL, raised face RF



P01-PMP75xxx-06-09-xx-xx-000

Process connection PMP55, JIS flange with raised face RF, material AISI 316L

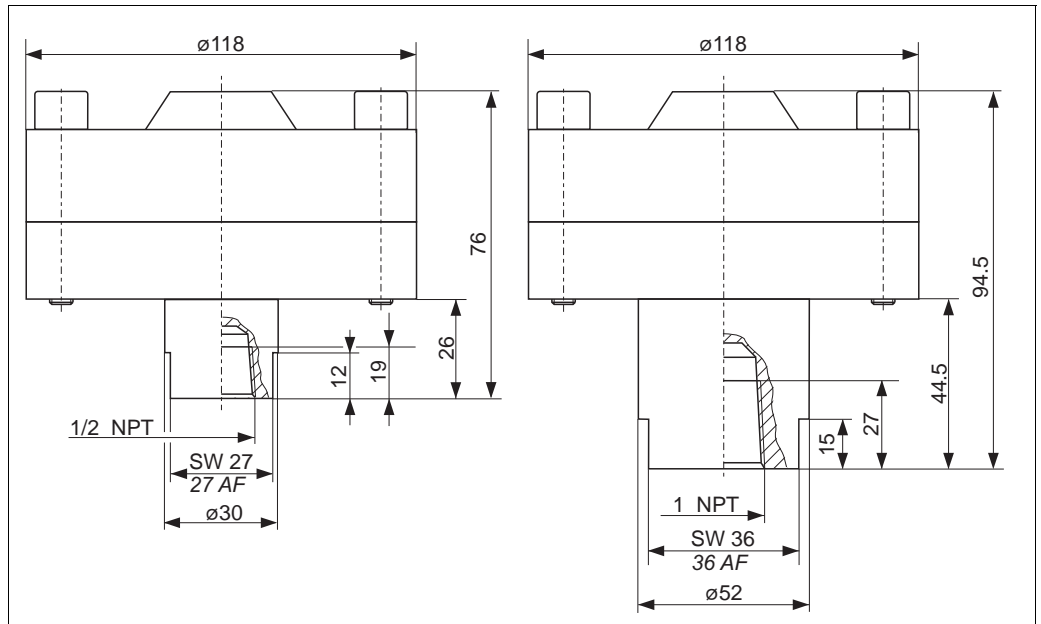
Version	Flange <sup>1)</sup>						Boltholes			Diaphragm seal	
	Nominal diameter	Nominal pressure	Diameter D [mm]	Thickness b [mm]	Diameter of raised face g [mm]	Height of raised face f [mm]	Quantity	Diameter g <sub>2</sub> [mm]	Hole circle k [mm]	Max. diaphragm diameter d <sub>M</sub> [mm]	Diaphragm seal weight <sup>2)</sup> [kg]
KCJ	25 A	10 K	125	14	67	1	4	19	90	32	1.5
KEJ	40 A	10 K	140	16	81	2	4	19	105	48	2.0
KFJ	50 A	10 K	155	16	96	2	4	19	120	59	2.3
KGJ	80 A	10 K	185	18	127	2	8	19	150	89	3.3
KHJ	100 A	10 K	210	18	151	2	8	19	175	89	4.4

1) The roughness of the surface in contact with the medium, including the raised face of the flanges (all standards) made of Hastelloy C, Monel or tantalum, is Ra 0.8 µm. Lower surface roughness available on request.

2) Housing weight → 66

Process connections PMP55  
(with diaphragm seal) -  
continued

Thread 1/2 NPT and 1 NPT, separator

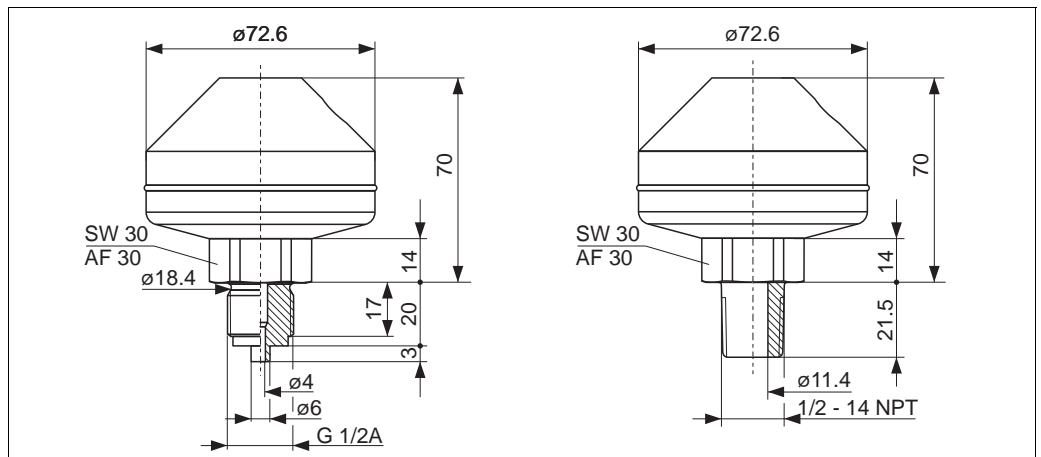


P01-PMP75xxx-06-09-xx-xx-008

Process connection PMP55, version "UGJ" and "UHJ", threaded, material AISI 316L, seal Viton

Version	Measuring range	Description	Nominal pressure	Diaphragm seal weight [kg]
UGJ	≤ 250 bar	1/2 NPT	PN 250	4.75
UHJ	≤ 250 bar	1 NPT	PN 250	5.0

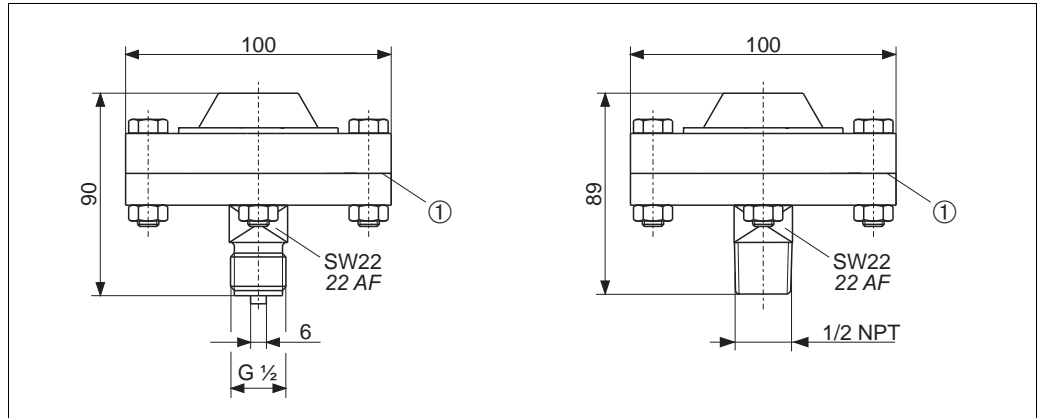
Thread ISO 228 G 1/2 A and ANSI 1/2 MNPT, separator



P01-PMP75xxx-06-09-xx-xx-004

Process connection PMP55, version "UBJ" and "UCJ", welded, material AISI 316L

Version	Measuring range	Description	Nominal pressure	Diaphragm seal weight [kg]
UBJ	≤ 160 bar	ISO 228 G 1/2 A	PN 160	1.43
UCJ	≤ 160 bar	ANSI 1/2 MNPT	PN 160	1.43

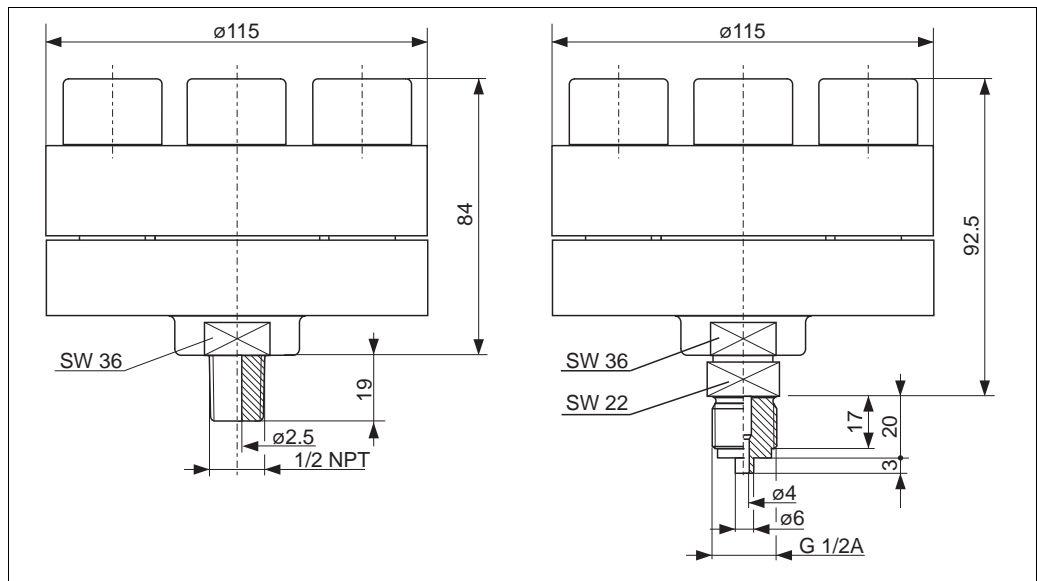


P01-PMP75xxx-06-09-xx-xx-013

Process connection PMP55, left version "UDJ" threaded, with threaded connection ISO 228 G 1/2 B, right version "UEJ" with threaded connection ANSI 1/2 MNPT

1 PTFE seal as standard max. 260°C (500°F) (higher temperatures on request)

Version	Measuring range	Description	Nominal pressure	Diaphragm seal weight [kg]
UDJ	≤ 40 bar	ISO 228 G 1/2 B	PN 40	1.43
UEJ	≤ 40 bar	ANSI 1/2 MNPT	PN 40	1.43



P01-PMP75xxx-06-09-xx-xx-007

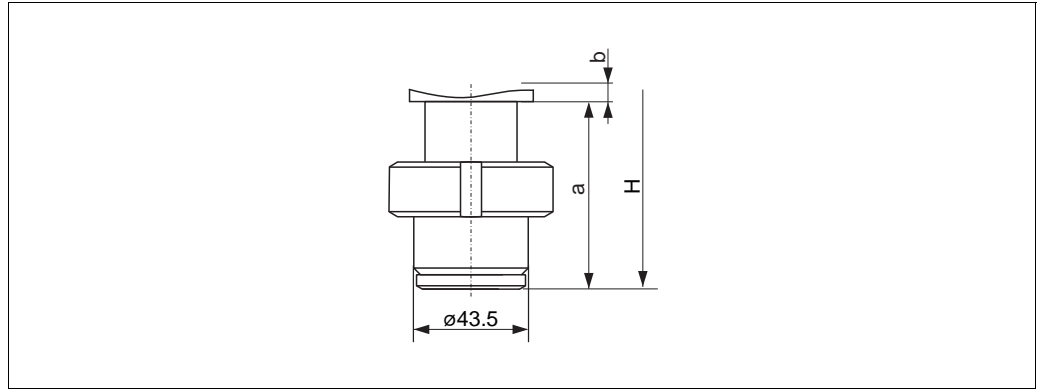
Process connection PMP55, version "UDJ" and "UEJ", threaded, with integrated seal lip, material AISI 316L

Version	Measuring range	Description	Nominal pressure	Diaphragm seal weight [kg]
UDJ	> 40 bar	ISO 228 G 1/2 A	PN 400	4.75
UEJ	> 40 bar	ANSI 1/2 MNPT	PN 400	4.75



**Process connections PMP55  
(with diaphragm seal) -  
continued**

**Universal adapter**



P01-PMP55xxx-00-xx-xx-xx-003

*Material: b = top section AISI 316L (1.4404), a = bottom section AISI 316L (1.4435);  
Surface roughness of the surfaces in contact with the medium  $R_a \leq 0.76 \mu\text{m}$  (30  $\mu\text{in}$ ) as standard. Lower surface roughness available on request.*

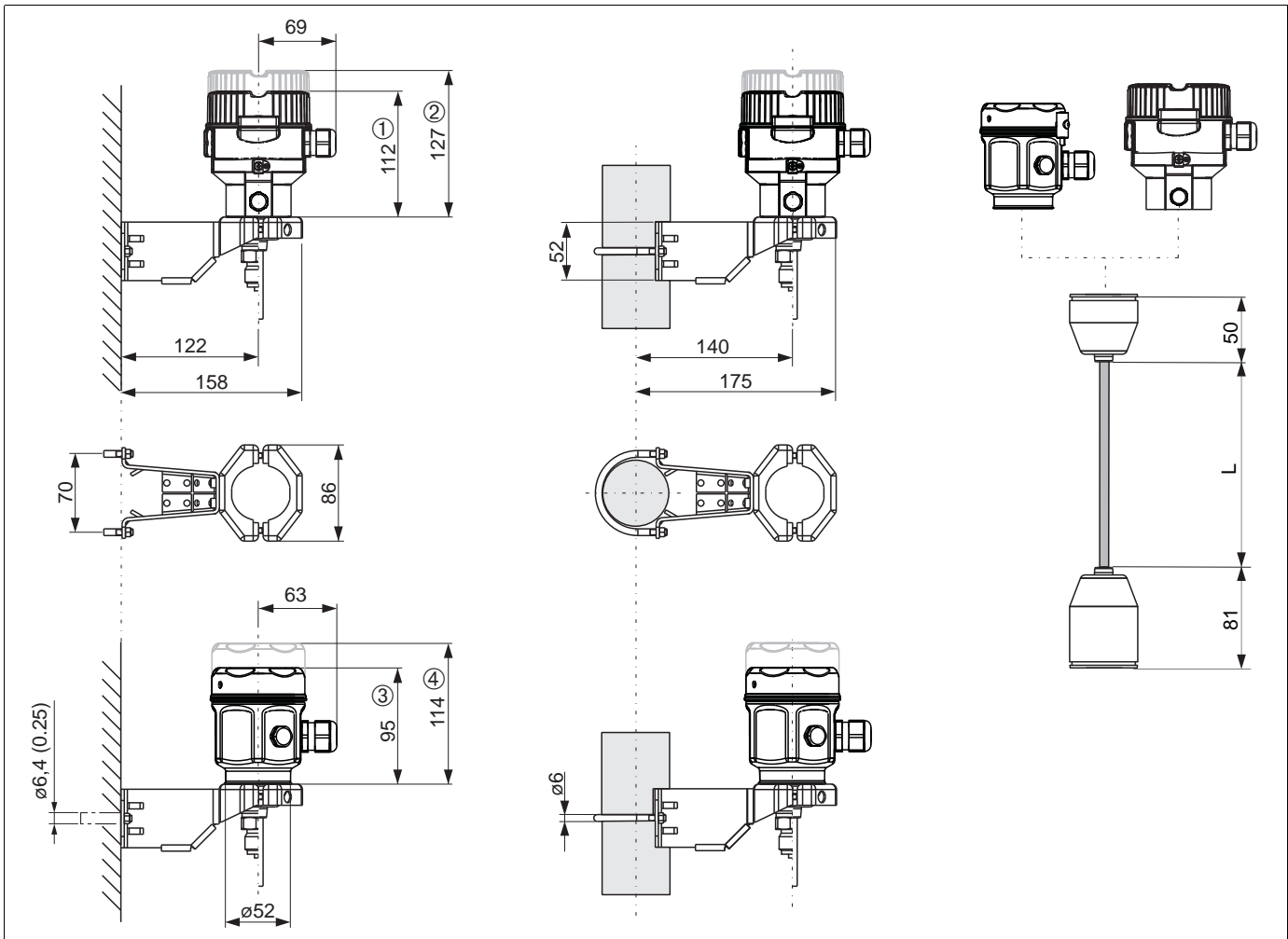
*Process connection PMP55, version UPJ<sup>1)</sup>: universal adapter incl. silicone molded seal, EHEDG, 3A Class I, FDA 21 CFR 177.2600, USP Plastic Class VI-70C; Order no.: 52023572*

**Installation height H, devices with universal adapter**

	<b>F31 housing</b>	<b>F15 housing</b>
Universal adapter	196 mm (7.72 in)	189 mm (7.44 in)

1) Endress+Hauser supplies these slotted nuts in stainless steel AISI 304 (DIN/EN material number 1.4301) or in AISI 304L (DIN/EN material number 1.4307).

Wall and pipe mounting with mounting bracket



L: PE-cable 2 m (6.6 ft), 5 m (16 ft) or 10 m (33 ft). FEP-cable 5m (16 ft).

F31 housing dimensions. Housing weight → 66. ① Cover without viewing window. ② Cover with viewing window.

F15 housing dimensions. Housing weight → 66. ③ Cover without viewing window. ④ Cover with viewing window.

Weight

Housing

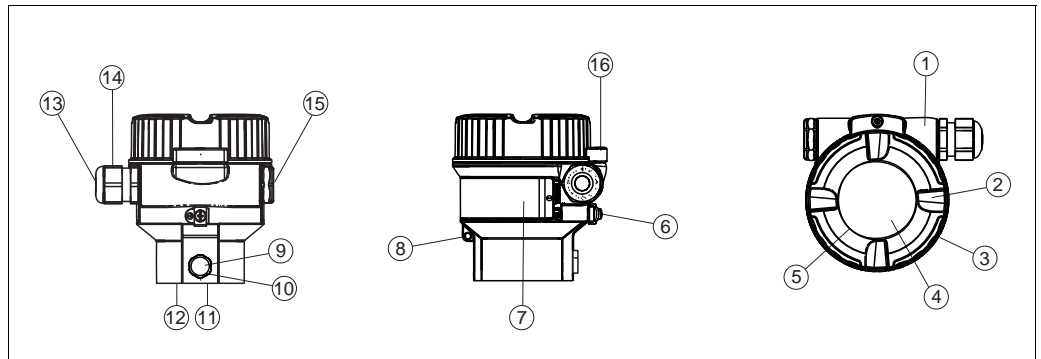
	F31 (aluminum)	F15 (stainless steel)	Separate housing
With electronic insert and local display	1.1 kg (2.43 lbs)	0.8 kg (1.76 lbs)	Weight of housing + 0.5 kg (1.10 lbs). Weight of sensor + 0.5 kg (1.10 lbs).
With electronic insert without local display	1.0 kg (2.21 lbs)	0.7 kg (1.54 lbs)	

Process connections

- Process connections PMC51 (with ceramic process isolating diaphragm): → 33 ff
- Process connections PMP51 (with metallic process isolating diaphragm): → 42 ff
- Process connections PMP55 (with diaphragm seal): → 50 ff

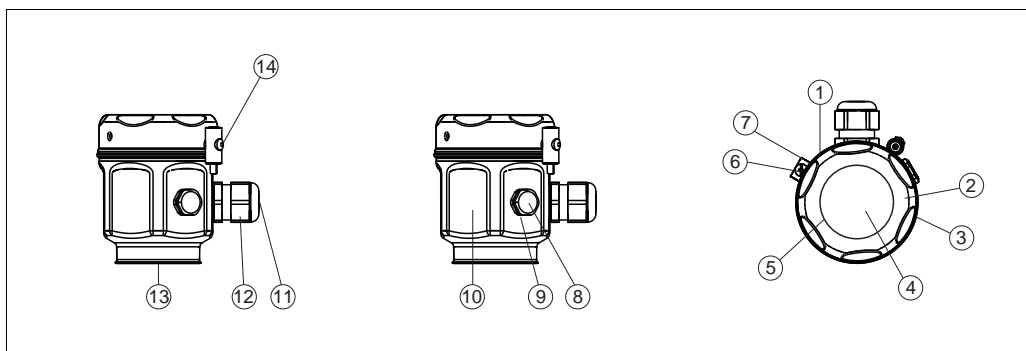
Material (not wetted)

Housing



Front view, left-hand side view, top view

Item number	Component part	Material
1	F31 housing, RAL 5012 (blue)	Die-cast aluminum with protective powder-coating on polyester base
2	Cover, RAL 7035 (gray)	Die-cast aluminum with protective powder-coating on polyester base
3	Cover seal	EPDM
4	Sight glass	Mineral glass
5	Sight glass seal	Silicone (VMQ)
6	External ground terminal	AISI 304 (1.4301)
7	Nameplates	Plastic film
8	Attachement for tie-on label	AISI 304 (1.4301)/ AISI 316 (1.4401)
9	Pressure compensation filter	PA6 GF10
10	Pressure compensation filter, O-ring	Silicone (VMQ)
11	Sealing ring	EPDM
12	Snap ring	PC Plastic
13	Seal of cable gland and blind plug	EPDM/NBR
14	Cable gland	Polyamide (PA) or CuZn nickel-plated
15	Blind plug	PBT-GF30 FR for dust ignition-proof, Ex d, FM XP and CSA XP: AISI 316L (1.4435)
16	Cover clamp	Clamp AISI 316L (1.4435), screw A4

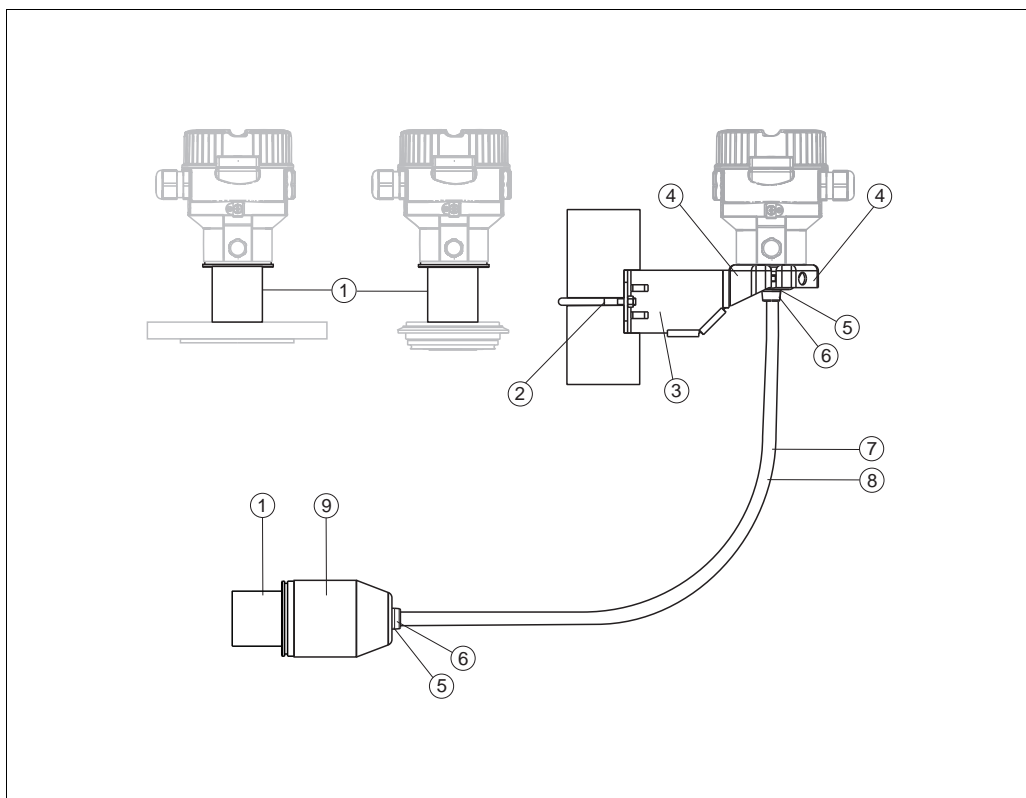


F01-xlMxx3xxx-14-xx-xx-xx-002

Front view, left-hand side view, top view

Item number	Component part	Material
1	F15 housing	AISI 316L (1.4404)
2	Cover	AISI 316L (1.4404)
3	Cover seal	Silicone with PTFE coating
4	Sight glass for non-hazardous area, ATEX Ex ia, NEPSI Zone 0/1 Ex ia, IECEx Zone 0/1 Ex ia, FM NI, FM IS, CSA IS	Polycarbonate (PC)
4	Sight glass for ATEX 1/2 D, ATEX 1/3 D, ATEX 1 GD, ATEX 1/2 GD, ATEX 3 G, FM DIP, CSA dust ignition-proof	Mineral glass
5	Sight glass seal	Silicone (VMQ)
6	External ground terminal	AISI 304 (1.4301)
7	Attachement for tie-on label	AISI 304 (1.4301)/ AISI 316 (1.4401)
8	Pressure compensation filter	PA6 GF10
9	Pressure compensation filter, O-ring	Silicone (VMQ)
10	Nameplates	lasered
11	Cable gland	Polyamide (PA), for dust ignition-proof: CuZn nickel-plated
12	Seal of cable gland and blind plug	NBR/Silicone/EPDM
13	Sealing ring	EPDM
14	Screw	A4-50

**Connecting parts**



P01-PM55xxxx-06-xx-xx-xx-026

Item number	Component part	Material
1	Connection between the housing and process connection	AISI 316L (1.4404)
2	Mounting bracket	Bracket AISI 304 (1.4301), AISI 304L (1.4306)
3		Screw and nuts A2-70
4		Half-shells: AISI 304L (1.4306)
5	Seal for cable from separate housing	FKM, EPDM
6	Gland for cable from separate housing: Screws:	AISI 316L (1.4404) A2 or A4
7	PE cable for separate housing	Abrasion-proof cable with strain-relief Dynema members; shielded using aluminum-coated film; insulated with polyethylene (PE-LD), black; copper wires, twisted, UV-resistant
8	FEP cable for separate housing	Abrasion-proof cable; shielded using galvanized steel wire netting; insulated with fluorinated ethylene propylene (FEP), black; copper wires, twisted, UV-resistant
9	Process connection adapter for separate housing	AISI 316L (1.4404)

**Filling oil**

See "Ordering information" (→ 82)

**Miscellaneous:**

- Diaphragm seal capillary: AISI 316 Ti (1.4571)
- Protective hose for diaphragm seal capillary: AISI 304 (1.4301)

**Material (wetted)**

Note!

The wetted device components are listed in the "Mechanical construction" (→ 33 ff) and "Ordering information" (→ 82 ff) sections.

**TSE Certificate of Suitability (Transmissible Spongiform Encephalopathy)**

The following applies to all process wetted device components:

- They do not contain any materials derived from animals.
- No auxiliaries or operating materials derived from animals are used in production or processing.

**Process connections**

- "Clamp connections" and "Hygienic process connections" (see also "Ordering information" section):  
AISI 316L (DIN/EN material number 1.4435)
- Endress+Hauser supplies process connections with threaded connections and DIN/ EN flanges made of stainless steel as per AISI 316L (DIN/EN material number 1.4404 (AISI 316) or 1.4435). With regard to their stability-temperature property, the materials 1.4404 and 1.4435 are grouped together under 13E0 in EN 1092-1 Tab.18. The chemical composition of the two materials can be identical.
- Some process connections are also available in the material Alloy C276 (DIN/EN material number 2.4819). See the information in the "Mechanical construction" section.

**Process isolating diaphragm**

- PMC51: Al<sub>2</sub>O<sub>3</sub> aluminum-oxide ceramic, Ceraphire® (FDA 21 CFR 186.1256, USP Class VI), ultrapure 99.9 % (→ see also [www.endress.com/ceraphire](http://www.endress.com/ceraphire))
- PMP51:
  - AISI 316L (DIN/EN material number 1.4435)
  - AISI 316L with gold-rhodium coating
  - Alloy C276 (DIN/EN material number 2.4819)
- PMP55:
  - AISI 316L (DIN/EN material number 1.4435)
  - AISI 316L with gold-rhodium coating
  - AISI 316L with 0.09 mm PTFE foil (not for vacuum applications)
  - AISI 316L with 0.25 mm PTFE foil (not for vacuum applications)
  - Alloy C276 (DIN/EN material number 2.4819)
  - Monel
  - Tantalum

**Seals**

See ordering information, → 82 ff

## Human interface

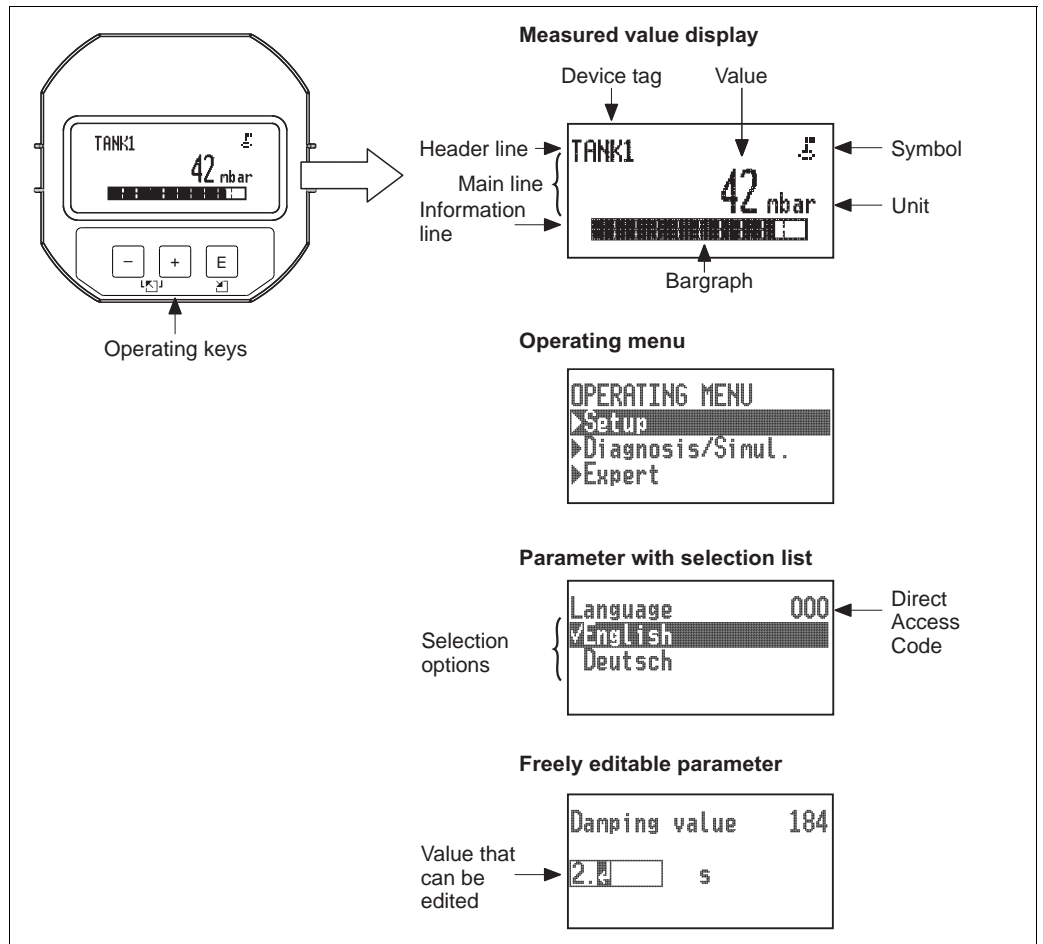
### Operating elements

#### Local display (optional) for devices with HART, PROFIBUS PA or FOUNDATION Fieldbus electronics

A 4-line liquid crystal display (LCD) is used for display and operation. The local display shows measured values, dialog texts as well as fault and notice messages in plain text, thereby supporting the user at every stage of operation. The liquid crystal display of the device can be turned in 90° stages. Depending on the orientation of the device, this makes it easy to operate the device and read the measured values.

#### 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 graphic display of the standardized value of the AI Block; for FOUNDATION Fieldbus as graphic display of the transducer output in relation to the set pressure range.
- Three keys for operation
- Simple and complete menu guidance as parameters are split into several levels and groups
- Each parameter is given a 3-digit ID number for easy navigation
- Possibility of configuring the display to suit individual requirements and preferences, such as language, alternating display, contrast setting, display of other measured values such as sensor temperature etc.
- Comprehensive diagnostic functions (fault and warning message etc.)



P01-Mxxxxxx-07-xx-xx-en-002

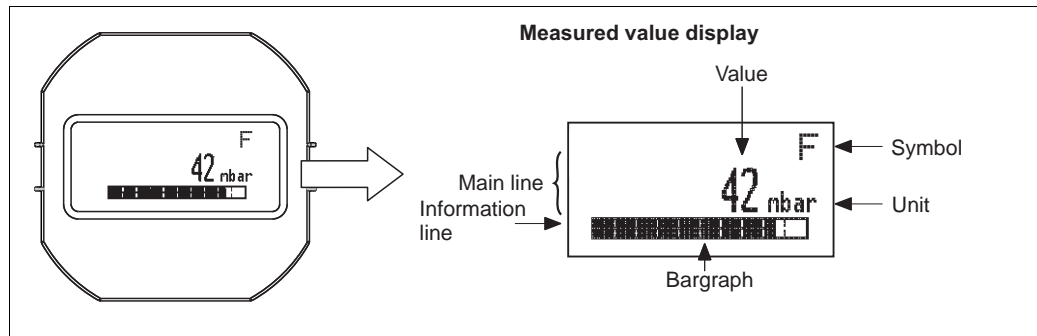
### Local display (optional) for devices with analog electronics

A 4-line liquid crystal display (LCD) is used. The local display shows measured values, fault messages and notice messages. The liquid crystal display of the device can be turned in 90° stages.

Depending on the orientation of the device, this makes it easy to operate the device and read the measured values.

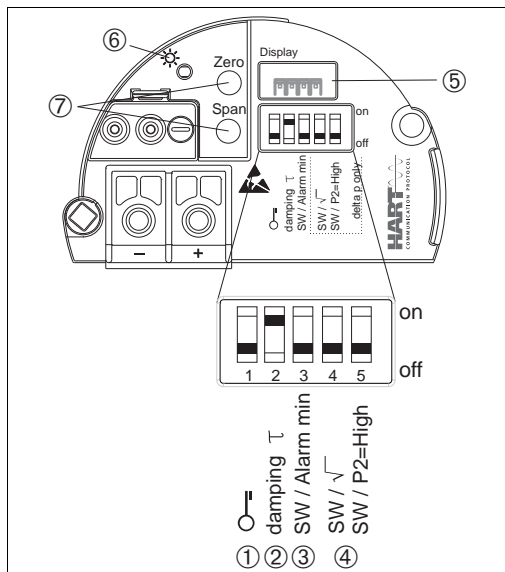
Functions:

- 8-digit measured value display including sign and decimal point, bar graph for 4 to 20 mA as current display.
- Diagnostic functions (fault and warning message etc.)



P01-Mxxxxxxx-07-xx-xx-02

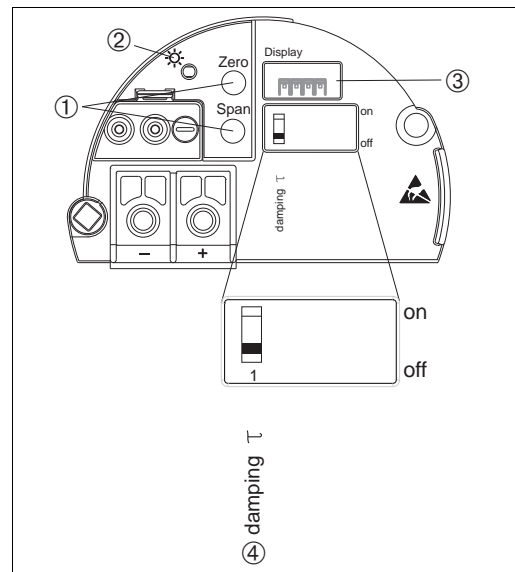
### Operating keys and elements located on the electronic insert



P01-Mxxxxxxx-19-xx-xx-001

#### HART electronic insert

- 1 DIP switch for locking/unlocking parameters relevant to the measured value
- 2 DIP switch for switching damping on/off
- 3 DIP switch for alarm current SW / Alarm Min (3.6 mA)
- 4 DIP switch only for Deltabar M
- 5 Slot for optional local display
- 6 Green LED to indicate successful operation
- 7 Operating keys for lower range value (zero), upper range value (span), position zero adjustment or reset

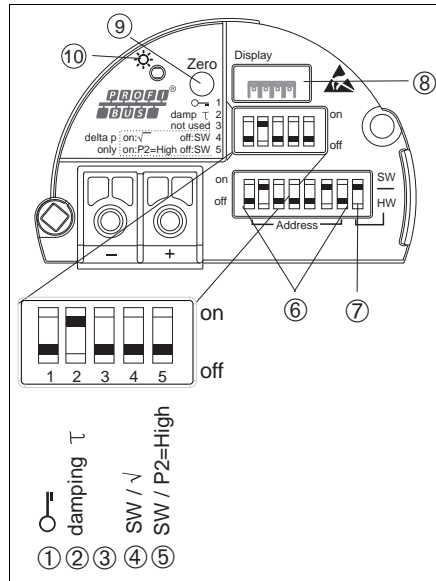


P01-Mxxxxxxx-19-xx-xx-010

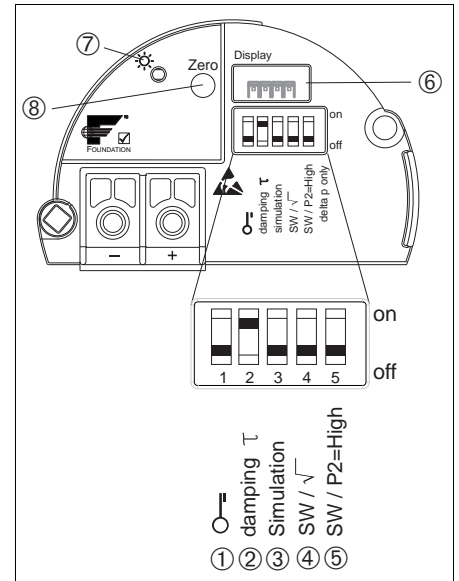
#### Analog electronic insert

- 1 Operating keys for lower range value (zero), upper range value (span), position zero adjustment or reset
- 2 Green LED to indicate successful operation
- 3 Slot for optional local display
- 4 DIP switch for switching damping on/off





P01-Mxxxxxxx-19-xx-xx-xx-013



P01-Mxxxxxxx-19-xx-xx-xx-014

**PROFIBUS PA electronic insert**

- 1 DIP switch for locking/unlocking parameters relevant to the measured value
- 2 DIP switch for switching damping on/off
- 3/4/5 Not used
- 6 DIP-switch for hardware address
- 7 DIP-switch for bus address SW / HW
- 8 Slot for optional local display
- 9 Operating key for position zero adjustment (Zero) or reset
- 10 Green LED to indicate successful operation

**FOUNDATION Fieldbus electronic insert**

- 1 DIP switch for locking/unlocking parameters relevant to the measured value
- 2 DIP switch for switching damping on/off
- 3 DIP-switch for simulation mode
- 4/5 Not used
- 6 Slot for optional local display
- 7 Green LED to indicate successful operation
- 8 Operating key for position zero adjustment (Zero) or reset

**Onsite operation**

Function	Operation without display with operating keys and DIP-switches on the electronic insert			
	Analog electronics	HART	PROFIBUS PA	FOUNDATION Fieldbus
Position adjustment (zero point correction)	X	X	X	X
Setting lower range value and upper range value - reference pressure present at the device	X	X	—	—
Device reset	X	X	X	X
Locking and unlocking parameters relevant to the measured value	—	X	X	X
Value acceptance indicated by the green LED	X	X	X	X
Switching damping on and off	X	X	X	X

Function	Operation via display (option)			
	Analog electronics	HART	PROFIBUS PA	FOUNDATION Fieldbus
Position adjustment (zero point correction)	—	X	X	X
Setting lower range value and upper range value - reference pressure present at the device	—	X	X	X
Device reset	—	X	X	X
Locking and unlocking parameters relevant to the measured value	—	X	X	X
Value acceptance indicated by the green LED	—	—	—	—
Switching damping on and off	—	X	X	X

**Remote operation**

All software parameters are accessible depending on the position of the write protection switch on the device.

**HART**

Remote operation via:

- FieldCare (see "Hardware and software for onsite and remote operation" section → 75 ff) with Commubox FXA195 (see "Hardware and software for onsite and remote operation" section → 75 ff)
- Field Xpert SFX100. Field Xpert is an industrial PDA with integrated 3.5" touchscreen from Endress+Hauser based on Windows Mobile. It communicates via wireless with the optional VIATOR Bluetooth modem connected to a HART device point-to-point or wireless via WiFi and Endress+Hauser's Fieldgate FXA520. Field Xpert also works as a stand-alone device for asset management applications. For details refer to BA00060S/00/EN.

**PROFIBUS PA**

Remote operation via:

- FieldCare (see "Hardware and software for onsite and remote operation" section → 75 ff)
  - Profiboard: For connecting a PC to PROFIBUS
  - Proficard: For connecting a laptop to PROFIBUS

**FOUNDATION Fieldbus**

Remote operation via:

- FieldCare (see "Hardware and software for onsite and remote operation" → 75 ff)
  - NI PCMCIA-FBUS series 2 to connect a laptop to FF.
- Use an FF-configuration program for example NI-FBUS Configurator, to
  - connect devices with "FOUNDATION Fieldbus signal" into an FF-network
  - set FF-specific parameters

Operation with NI-FBUS Configurator:

The NI-FBUS Configurator is an easy-to-use graphical environment for creating linkages, loops, and a schedule based on the fieldbus concepts.

You can use the NI-FBUS Configurator to configure a fieldbus network as follows:

- Set block and device tags
- Set device addresses
- Create and edit function block control strategies (function block applications)
- Configure vendor-defined function and transducer blocks
- Create and edit schedules
- Read and write to function block control strategies (function block applications)
- Invoke Device Description (DD) methods
- Display DD menus
- Download a configuration
- Verify a configuration and compare it to a saved configuration
- Monitor a downloaded configuration
- Replace a virtual device by a real device
- Save and print a configuration

Note!

For further information please contact your local Endress+Hauser Sales Center.

**Hardware and software for onsite and remote operation**

**Commubox FXA195**

For intrinsically safe HART communication with FieldCare via the USB interface. For details refer to TI00404F/00/EN.

**Field Xpert SFX100**

Compact, flexible and robust industry handheld terminal for remote parametrization and measured value inspection via the HART current output (4-20mA).

For details refer to Operating Instructions BA00060S/04/EN.

**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.

FieldCare supports the following functions:

- Configuration of transmitters in offline and online mode
- Loading and saving device data (upload/download)
- Documentation of the measuring point

Connection options:

- HART via Commubox FXA195 and the USB port on a computer
- PROFIBUS PA via segment coupler and PROFIBUS interface card
- FOUNDATION Fieldbus via NI interface card

For further information → [www.endress.com](http://www.endress.com)

## Planning instructions for diaphragm seal systems

Note!

The performance and the permitted applications for a diaphragm seal system depend on the process isolating diaphragm used, the filling oil, the coupling, the design and the process and ambient conditions at the place of operation.

To help you select suitable diaphragm seal systems for your individual application,

Endress+Hauser provides a free "Applicator Sizing Diaphragm Seal" selection tool. This tool is available online at "www.endress.com/applicator", or is available offline on a CD.

The screenshot displays the 'Applicator Sizing Diaphragm Seal' software interface. At the top, it says 'People for Process Automation' and 'Endress+Hauser'. Below that, there are navigation links: 'MyApplicator', 'Contact', 'License', 'Online-Update', 'Terms of use', 'Bug report', 'About', and 'Help'. The main title is 'Applicator Sizing Diaphragm Seal For pressure devices'. There is a dropdown menu for 'Choose Applicator Tool'. Below this, there are several tabs: 'Filtering', 'Checks', 'Table Config', 'Installation-Data', 'Parameters', 'Diaphragm Seal Details', and 'Hints/FAQs'. The 'Parameters' tab is active. It shows 'General parameters' with 'Product' set to 'Cerabar M PMP55'. A note says 'Hint: Use MyApplicator to define different options. More...'. Under 'Transmitter data', 'Concor' is set to '1 COC 200°C', 'Adjusted spa' is '1 COC', 'Monochrome material' is '316L', 'Process connection classes' is '24', 'Diaphragm seal' is 'DN50 Ph. 1.40 E., 316L', 'Transmitter mounting' is 'direct', and 'Fill fluid' is 'Silicone oil'. On the right, 'Measurement accuracy and offset' is set to '% span / 2K' and '1000 / 2K'. Below that, 'Error due to change in ambient temperature' is '0.0%', 'Error due to change in process temperature' is '0.0%', and 'Medium offset at nominal conditions' is '0.0%'. A table for 'Response time Tau (TE3)' shows 'minimum' as '0.2', 'nominal' as '0.2', and 'maximum' as '1.2', with the unit 's'. Below this, 'Diaphragm selection' shows 'minimum' as '-2', 'nominal' as '0', and 'maximum' as '14', with the unit '%'. At the bottom, there are buttons for 'Print', 'Print Settings', 'Save to buffer', and 'Reset'. A 'TAG' field is also present.

Applicator Sizing Diaphragm Seal PMP55-en

For further details, or for information on an optimum diaphragm seal solution, please contact your local Endress+Hauser Sales Center.

### Applications

Diaphragm seal systems should be used if the process and the device need to be separated. Diaphragm seal systems offer clear advantages in the following instances:

- In the case of extreme process temperatures
- For aggressive media
- If extreme measuring point cleaning is necessary, or in the event of very damp mounting locations
- If the measuring point is exposed to severe vibrations
- For mounting locations that are difficult to access

### Function and design

Diaphragm seals separate the measuring system from the process.

A diaphragm seal system consists of:

- A diaphragm seal
- A capillary tube or a temperature isolator if necessary
- Fill fluid
- A pressure transmitter

The process pressure acts via the process isolating diaphragm of a diaphragm seal on the liquid-filled system, which transfers the process pressure to the sensor of the pressure transmitter.

Endress+Hauser delivers all diaphragm seal systems as welded versions. The system is hermetically sealed, which ensures greater reliability.

The diaphragm seal determines the application range of the system on the basis of

- The diameter of the process isolating diaphragm
- The process isolating diaphragm: stiffness and material
- The design (oil volume)

### Diameter of the process isolating diaphragm

The greater the diameter of the process isolating diaphragm (less stiff), the smaller the temperature effect on the measurement result.

### Stiffness of the process isolating diaphragm

The stiffness depends on the diameter of the process isolating diaphragm, the material, any existing coating, the thickness of the process isolating diaphragm and the shape. The thickness of the process isolating diaphragm and the shape are determined by the design. The stiffness of a process isolating diaphragm of a diaphragm seal influences the temperature application range and the measuring error caused by temperature effects.

### Capillary

Capillaries with an internal diameter of 1 mm (0.04 in) are used as standard.

As a result of its length and internal diameter, the capillary tube influences the thermal change, the ambient temperature application range and the response time of a diaphragm seal system.

### Filling oil

When selecting the filling oil, the medium temperature and ambient temperature, as well as the process 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 medium. For example, only filling oils that do not present a health hazard are used in the food industry, e.g. vegetable oil or silicone oil. → See also the following section "Diaphragm seal filling oils".

The filling oil used influences the thermal change, the temperature application range of a diaphragm seal system and the response time. A temperature change results in a volume change in the filling oil. The volume change depends on the thermal expansion coefficient of the filling oil and on the volume of the fill fluid at calibration temperature (constant in the range: +21 to +33°C (+70 to 91°F)).

For example, the filling oil expands in the event of a temperature increase. The additional volume presses against the process isolating diaphragm of a diaphragm seal. The stiffer a process isolating diaphragm is, the greater its return force, which counteracts a volume change and acts together with the process pressure on the measuring cell, thus shifting the zero point.

### Pressure transmitter

The pressure transmitter influences the temperature application range, the thermal change and the response time as a result of its volume change. The volume change is the volume that has to be shifted in order to pass through the complete measuring range.

Pressure transmitters from Endress+Hauser are optimized with regard to minimum volume change.

## Diaphragm seal filling oils

Version <sup>1)</sup>	Filling oil	Permissible temperature range <sup>2)</sup> at 0.05 bar (0.725 psi) $\leq p_{abs} \leq 1 \text{ bar (14.5 psi)}$	Permissible temperature range <sup>2)</sup> at $p_{abs} \geq 1 \text{ bar (14.5 psi)}$	Density [g/cm <sup>3</sup> ] / [SGU]	Viscosity [mm <sup>2</sup> /s] / [cSt] at 25°C (77°F)	Thermal expansion coefficient <sup>3)</sup> [1/K]	Note
1	Silicone oil	-40 to +180°C (-40 to +356°F)	-40 to +250°C (-40 to +482°F)	0.96	100	0.00096	Suitable for foods FDA 21 CFR 175.105
2	Inert oil	-40 to +80°C (-40 to +176°F)	-40 to +175°C (-40 to +347°F)	1.87	27	0.000876	For ultrapure gas and oxygen applications
4	Vegetable oil	-10 to +120°C (+14 to +248°F)	-10 to +200°C (+14 to +392°F)	0.94	9.5	0.00101	Suitable for foods FDA 21 CFR 172.856
5	High-temperature oil <sup>4)</sup>	-10 to +200°C (+14 to +392°F)	-10 to +400°C (+14 to +752°F)	1.07	37	0.0007	High temperatures
6	Low-temperature oil	-70 to +80°C (-94 to +176°F)	-70 to +180°C (-94 to +356°F)	0.92	4.4	0.00108	Low temperatures

1) Version for feature 180 in the order code (→ 92 ff)

2) Observe temperature limits of the device (→ 31) and of the system (→ 76).

3) Please refer to the "Applicator Sizing Diaphragm Seal" tool for the thermal change of the diaphragm seal and other important technical features.

4) When simultaneously applying the diaphragms seal at high process temperatures and low absolute pressures, Endress+Hauser recommends the vacuum service (Feature 570 "Service" version "HG").

**Operating temperature range** The operating temperature range of a diaphragm seal system depends on the fill fluid, capillary length and internal diameter, process temperature and oil volume of the diaphragm seal. The range of application can be extended by using a fill fluid with a smaller expansion coefficient and a shorter capillary.

**Installation instructions**

**Diaphragm seal systems**

- Endress+Hauser offer flushing rings as accessory to clean process isolating diaphragms without taking the transmitters out of process. For further information please contact your local Endress+Hauser Sales Center.
- A diaphragm seal together with the transmitter form a closed, calibrated system, which is filled through openings in the diaphragm seal and in the transmitter's measurement system. These openings 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 range violation.
- For devices with a temperature isolator or capillary, a suitable fastening device (mounting bracket) is recommended.
- When using diaphragm seal systems with a capillary, sufficient strain relief must be ensured in order to prevent the capillary bending down (bending radius  $\geq 100$  mm (3.94 in)).

**Capillary**

In order to obtain more precise measurement results and to avoid a defect in the device, mount the capillaries as follows:

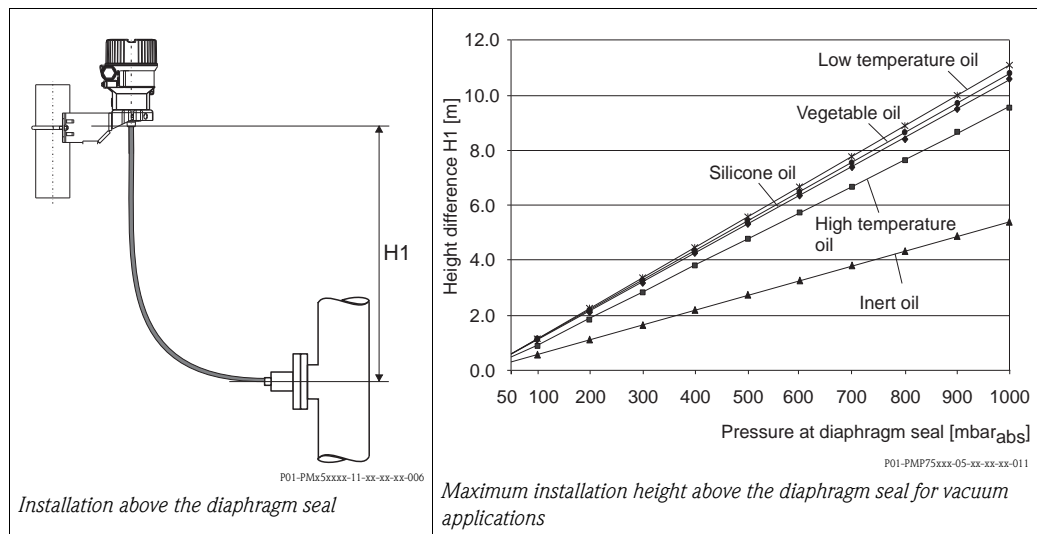
- Vibration-free (in order to avoid additional pressure fluctuations)
- Not in the vicinity of heating or cooling lines
- Insulate if the ambient temperature is below or above the reference temperature
- With a bending radius of  $\geq 100$  mm (3.94 in).

**Vacuum applications**

For applications under vacuum, Endress+Hauser recommends mounting the pressure transmitter below the diaphragm seal. This prevents vacuum loading of the diaphragm seal caused by the presence of fill fluid in the capillary.

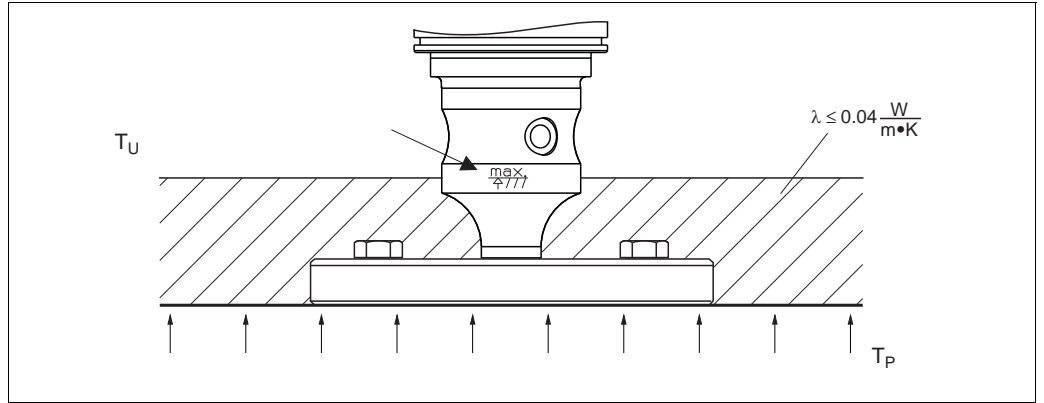
When the pressure transmitter is mounted above the diaphragm seal, the maximum height difference H1 in accordance with the illustration below must not be exceeded. The maximum height difference depends on the density of the filling oil and the smallest ever pressure that is permitted to occur at the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

When simultaneously applying the diaphragm seal systems at high process temperatures and low absolute pressures, Endress+Hauser recommends the vacuum service (Feature 570 "Service" version "HG").



**Thermal insulation**

The PMP55 may only be insulated up to a certain height. The maximum permitted insulation height is indicated on the devices and applies to an insulation material with a heat conductivity  $\leq 0.04 \text{ W}/(\text{m} \times \text{K})$  and to the maximum permitted ambient and process temperature. The data were determined under the most critical application "quiescent air".



Maximum permitted insulation height, here indicated on a PMP55 with a flange

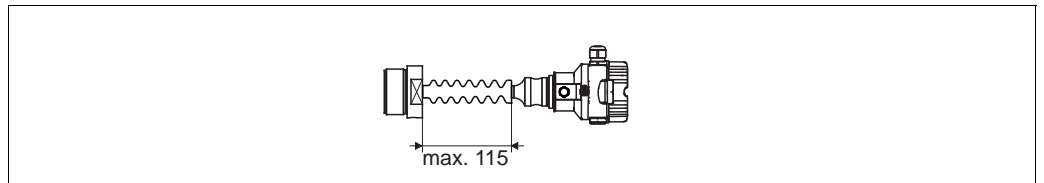
**Mounting with temperature isolator**

Endress+Hauser recommends the use of temperature isolators in the event of constant extreme medium temperatures which lead to the maximum permissible electronics temperature of  $+85^\circ\text{C}$  ( $+185^\circ\text{F}$ ) being exceeded.

Depending on the filling oil used, diaphragm seal systems with temperature isolators can be used for maximum temperatures of up to  $260^\circ\text{C}$  ( $+500^\circ\text{F}$ ). → For the temperature application limits, see → 77, "Diaphragm seal filling oils" section.



To minimize 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 maximum zero point shift of 21 mbar (0.315 psi) due to the hydrostatic column in the temperature isolator. You can correct this zero point shift at the device.



PMP55 with temperature isolator

## Certificates and approvals

<b>CE mark</b>	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.
<b>Ex approvals</b>	<ul style="list-style-type: none"> <li>■ ATEX</li> <li>■ IECE<sub>x</sub></li> <li>■ FM</li> <li>■ CSA</li> <li>■ Also combinations of different approvals</li> </ul> <p>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. → 98 ff, "Safety Instructions" and "Installation/Control Drawings" sections.</p>
<b>Suitability for hygienic processes</b>	<p>The Cerabar M is suitable for use in hygienic processes. Overview of suitable process connections → 33 ff. Many versions meet the requirements of 3A-Sanitary Standard No. 74 and are certified by the EHEDG. Suitable fittings and seals must be used for hygienic design in accordance with 3A and EHEDG specifications. Note! Gap-free connections can be cleaned without residue using the usual cleaning methods.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
<b>Pharma (CoC)</b>	<p><b>Certificate of Compliance (CoC) (according to ASME BPE-2007)</b> See "Ordering information", → 82 ff, feature 590 "Additional Option:", option "LW".</p>
<b>Functional safety SIL</b>	<p>The Cerabar M with 4 to 20 mA output signal has been developed to assessed and certified by TÜV NORD CERT as per IEC 61508 Edition 2.0 and IEC 61511. These devices can be used to monitor the process level and pressure up to SIL 2. For a detailed description of the safety functions with Cerabar M, settings and functional safety data, see the "Functional safety manual - Cerabar M" SD00347P. Ordering Information → 82 ff, feature 590 "Additional Approval:" version LA "SIL".</p>
<b>Marine approval</b>	<ul style="list-style-type: none"> <li>■ DNV (Det Norske Veritas)</li> <li>■ GL (German Lloyd)</li> </ul>
<b>CRN approvals</b>	<p>Some device versions have CRN approval. For a CRN-approved device, a CRN-approved process connection (→ 33 ff, "Process connection") has to be ordered with a CSA approval (→ 82 ff, feature 10 "Approval"). PMP55 devices with a capillary are not CRN-approved. These devices are fitted with a separate plate bearing the registration number 0F10525.5C.</p>
<b>Pressure Equipment Directive (PED)</b>	<p>The devices PMC51, PMP51 and PMP55 correspond to Article 3 (3) of the EC directive 97/23/EC (Pressure Equipment Directive) and have been designed and manufactured according to good engineering practice.</p> <p>The following also applies:</p> <ul style="list-style-type: none"> <li>– PMP51/PMP55 with threaded connection and internal process isolating diaphragm PN &gt; 200: Suitable for stable gases in group 1, category I</li> <li>– PMP55 with pipe diaphragm seal ≥ 1.5"/PN40: Suitable for stable gases in group 1, category II</li> <li>– PMP55 with separators PN400: Suitable for stable gases in group 1, category I</li> </ul>
<b>Drinking water approval</b>	NSF 61 approval



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**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 on data sheets

EN 61326 series:

EMC product family standard for electrical equipment for measurement, control and laboratory use.

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**North-American practice for installation of process seals**

Endress+Hauser instruments are designed according to ANSI/ISA 12.27.01 either as single seal or dual seal devices with annunciation, allowing the user to waive the use and save the cost of installing external secondary process seals in the conduit as required by the process sealing sections of ANSI/NFPA 70 (NEC) and CSA 22.1 (CEC). These instruments comply with the North-American installation practice and provide a very safe and cost-saving installation for pressurized applications with hazardous fluids.

Further information can be found in the control drawings of the relevant devices.

## Ordering information

### PMC51

This overview does not mark options which are mutually exclusive.

<b>10</b>	<b>Approval:</b>	
	AA	For non-hazardous areas
	BA	ATEX II 1/2G Ex ia IIC T6
	BB	ATEX II 1/2D Ex t IIIC
	BD	ATEX II 3G Ex nA IIC T6
	BE	ATEX II 2G Ex ia IIC T6
	BF	ATEX II 1/2D Ex ia IIIC
	BG	ATEX II 3G Ex ic IIC T6
	B1	ATEX II 1/2G Ex ia IIC T6 + ATEX II 1/2D Ex iaD
	8C	ATEX II Ex ia + FM/CSA IS ATEX II 1/2G Ex ia IIC T6+ FM/CSA IS Cl.I Div. 1 Gr. A-D FM/CSA: zone0,1,2
	IA	IEC Ex ia IIC T6 Ga/Gb
	IE	IEC Ex ic IIC T6 Gc
	IF	IEC Ex ia IIIC Da/ Db
	I1	IEC Ex ia IIC T6 Ga/Gb+Ex ia IIIC Da/Db
	NA	NEPSI Ex ia IIC T6
	TA	TIIS Ex ia IIC T4
	CA	CSA C/US IS Cl.I,II,III Div.1 Gr. A-G, CSA C/US IS Cl.I Div.2 Gr. A-D, Ex ia, C: Zone 0, 1, 2/US: Zone 0, 1, 2, 20, 21, 22
	CD	CSA General Purpose
	FA	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia FM NI Cl.I Div.2 Gr.A-D FM IS: Zone 0,1,2,20,21,22/FM NI: Zone 2
	FD	FM NI Cl.I Div.2 Gr.A-D
	99	Special version
<b>20</b>	<b>Output:</b>	
	1	4-20mA Analog
	2	4-20mA HART
	3	PROFIBUS PA
	4	FOUNDATION Fieldbus
	9	Special version
<b>30</b>	<b>Display, operation:</b>	
	1	LCD, push buttons on display electronics
	2	W/o LCD, push buttons on electronics
	9	Special version
<b>40</b>	<b>Housing:</b>	
	I	F31 aluminum
	J	F31 aluminum, glass window
	Q	F15 Stainless Steel Hygiene
	R	F15 Stainless Steel Hygiene, glass window
	S	F15 Stainless Steel Hygiene, plastic window
	Y	Special version
<b>50</b>	<b>Electrical connection:</b>	
	A	Gland M20, IP66/68 NEMA4X/6P
	B	Thread M20, IP66/68 NEMA4X/6P
	C	Thread G1/2, IP66/68 NEMA4X/6P
	D	Thread NPT1/2, IP66/68 NEMA4X/6P
	I	Connector M12, IP66/67, NEMA4X/6P
	M	Connector 7/8", IP66/68, NEMA4X/6P
	P	Connector Han7D, 90deg, IP65
	S	PE Cable 5m, IP66/68 NEMA4X/6P + pressure compensation via cable
	V	Valve connector ISO4400 M16, IP64
	Y	Special version

PMC51 (continued)

70		Sensor range:
1C	100mbar/10kPa/1.5psi relative, 1mH2O/3ftH2O/40inH2O Overload: 4bar/400kPa/60psi	
1E	250mbar/25kPa/3.75psi relative, 2.5mH2O/7.5ftH2O/100inH2O Overload: 5bar/500kPa/75psi	
1F	400mbar/40kPa/6psi relative, 4mH2O/13ftH2O/160inH2O Overload: 8bar/800kPa/120psi	
1H	1bar/100kPa/15psi relative, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi	
1K	2bar/200kPa/30psi relative, 20mH2O/67ftH2O/800inH2O Overload: 18bar/1.8MPa/270psi	
1M	4bar/400kPa/60psi relative, 40mH2O/133ftH2O/1600inH2O Overload: 25bar/2.5MPa/375psi	
1P	10bar/1MPa/150psi relative, 100mH2O/333ftH2O/4000inH2O Overload: 40bar/4MPa/600psi	
1S	40bar/4MPa/600psi relative, 400mH2O/1334ftH2O/16000inH2O Overload: 60bar/6MPa/900psi	
2C	100mbar/10kPa/1.5psi abs, 1mH2O/3ftH2O/40inH2O Overload: 4bar/400kPa/60psi	
2E	250mbar/25kPa/3.75psi abs, 2.5mH2O/7.5ftH2O/100inH2O Overload: 5bar/500kPa/75psi	
2F	400mbar/40kPa/6psi abs, 4mH2O/13ftH2O/160inH2O Overload: 8bar/800kPa/120psi	
2H	1bar/100kPa/15psi abs, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi	
2K	2bar/200kPa/30psi abs, 20mH2O/67ftH2O/800inH2O Overload: 18bar/1.8MPa/270psi	
2M	4bar/400kPa/60psi abs, 40mH2O/133ftH2O/1600inH2O abs Overload: 25bar/2.5MPa/375psi	
2P	10bar/1MPa/150psi abs, 100mH2O/333ftH2O/4000inH2O abs Overload: 40bar/4MPa/600psi	
2S	40bar/4MPa/600psi abs, 400mH2O/1334ftH2O/16000inH2O abs Overload: 60bar/6MPa/900psi	
99	Special version	
80		Reference accuracy:
D	Platinum	
G	Standard	
Y	Special version	
90		Calibration; Unit:
A	Sensor range; %	
B	Sensor range; mbar/bar	
C	Sensor range; kPa/MPa	
D	Sensor range; mm/mH2O	
E	Sensor range; inH2O/ftH2O	
F	Sensor range; psi	
J	Customized pressure; see additional spec.	
K	Customized level; see additional spec.	
Y	Special version	

## PMC51 (continued)

110	Process connection:
	<b>ANSI flanges</b>
ACJ	1" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AEJ	1-1/2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AFF	2" 150lbs RF, PVDF, flange ANSI B16.5
AFJ	2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AFN	2" 150lbs, ECTFE>316/316L, flange ANSI B16.5
AGF	3" 150lbs RF, PVDF, flange ANSI B16.5 (CRN)
AGJ	3" 150lbs RF, 316/316L, flange ANSI B16.5
AGN	3" 150lbs, ECTFE>316/316L, flange ANSI B16.5
AHJ	4" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AHN	4" 150lbs, ECTFE>316/316L, flange ANSI B16.5
ANJ	1" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AQJ	1-1/2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ARJ	2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ASJ	3" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ATJ	4" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
	<b>EN flanges</b>
CNJ	DN25 PN10-40 B1, 316L, flange EN1092-1
CPJ	DN32 PN10-40 B1, 316L, flange EN1092-1
CQJ	DN40 PN10-40 B1, 316L, flange EN1092-1
CXJ	DN50 PN10-40 B1, 316L, flange EN1092-1
CFJ	DN50 PN10/16 B1, PVDF, flange EN1092-1
CEJ	DN40 PN10/16 B1, PVDF, flange EN1092-1
CRJ	DN50 PN25/40, ECTFE>316L, flange EN1092-1
CZJ	DN80 PN10-40 B1, 316L, flange EN1092-1
CSP	DN80 PN25/40, ECTFE>316L, flange EN1092-1
	<b>JIS flanges</b>
KFJ	10K 50 RF, 316L, flange JIS B2220
KGJ	10K 80 RF, 316L, flange JIS B2220
KHJ	10K 100 RF, 316L, flange JIS B2220
	<b>Threaded connection</b>
GCC	Thread ISO228 G1/2, AlloyC (CRN)
GCF	Thread ISO228 G1/2, PVDF
GCJ	Thread ISO228 G1/2, 316L (CRN)
GLC	Thread ISO228 G1/2 G1/4 female, AlloyC (CRN)
GLJ	Thread ISO228 G1/2 G1/4 female, 316L (CRN)
GMC	Thread ISO228 G1/2 hole 11.4mm, AlloyC (CRN)
GMJ	Thread ISO228 G1/2 hole 11.4mm, 316L (CRN)
GOJ	Thread JIS B0203 R1/2 male, 316L
GNJ	Thread JIS B0202 G1/2 male, 316L
GVJ	Thread ISO228 G1-1/2, 316L, flush-mounted (CRN)
GWJ	Thread ISO228 G2, 316L, flush-mounted (CRN)
G4J	Thread DIN13 M44x1.25, 316L, flush-mounted
	<b>Threaded connection as per ANSI</b>
RJF	Thread ANSI MNPT1/2 hole 3mm, PVDF (CRN)
RKC	Thread ANSI MNPT 1/2 hole, 11.4mm, Alloy C (CRN)
RKJ	Thread ANSI MNPT1/2 hole 11.4mm, 316L (CRN)
RLC	Thread ANSI MNPT1/2 FNPT1/4, AlloyC (CRN)
RLJ	Thread ANSI MNPT1/2 FNPT1/4, 316L (CRN)
R1C	Thread ANSI FNPT 1/2, Alloy C (CRN)
R1J	Thread ANSI FNPT 1/2, 316L (CRN)
U7J	Thread ANSI MNPT1-1/2, 316L, flush-mounted (CRN)
U8J	Thread ANSI MNPT2, 316L, flush-mounted (CRN)
	<b>Hygienic process connections</b>
MRJ	DIN11851 DN50 PN25 slotted-nut, 316L, EHEDG, 3A with seal FDA (CRN)
MZJ	DIN11851 DN40 PN25 slotted-nut, 316L, EHEDG, 3A with seal FDA (CRN)
NCJ	DIN11864-1 A DN40 PN16 pipe DIN11866-A, slotted-nut, 316L, EHEDG, 3A with seal FDA
NDJ	DIN11864-1 A DN50 PN16 pipe DIN11866-A, slotted-nut, 316L, EHEDG, 3A with seal FDA
TOJ	Varivent F pipe DN25-32 PN40, 316L, EHEDG, 3A with seal FDA
TRJ	Varivent N pipe DN40-162 PN40, 316L, EHEDG, 3A with seal FDA
S4J	NEUMO BioControl D50 PN16, 316L, EHEDG, 3A with seal FDA
TIJ	DRD DN50 65mm PN25, 316L
TMJ	APV Inline DN50 PN40, 316L, 3A with seal FDA
UPJ	Universaladapter 44mm 316L, incl. silicone molded seal, EHEDG, 3A with seal FDA
UNJ	Universaladapter 44mm 316L, EPDM molded seal, EHEDG
TDJ	Tri-Clamp ISO2852 DN40-51 (2"), 316L, DIN32676 DN50, EHEDG, 3A with seal FDA (CRN)
TFJ	Tri-Clamp ISO2852 DN76.1 (3"), 316L, EHEDG, 3A with seal FDA (CRN)

<b>110</b>	<b>Process connection:</b>
YYY	Special version

**PMC51 (continued)**

<b>190</b>	<b>Seal:</b>
A	FKM Viton
B	FKM Viton, FDA, 3A Class I, USP Class VI
G	HNBR, FDA, 3A Class I, KTW, AFNOR, BAM
F	NBR
H	NBR, Low temperature
J	EPDM, FDA
K	EPDM, FDA, 3A Class II, USP Class VI, DVGW, KTW, W270, WRAS, ACS, NSF61
L	FFKM Kalrez 6375
M	FFKM Kalrez 7075
N	FFKM Kalrez 6221, FDA, USP Class VI
P	Fluoroprene XP40, FDA, USP Class VI, 3A Class I
S	VMQ Silicone, FDA
Y	Special version

**Additional ordering information (optional)**

<b>500</b>	<b>Additional Operating language:</b>
AA	English
AB	German
AC	French
AD	Spanish
AE	Italian
AF	Dutch
AK	Chinese simplified
AL	Japanese

<b>550</b>	<b>Calibration:</b>
F1	Factory calibration certificate, 5-point
F2	DKD/DakkS calibration certificate 10-point

<b>570</b>	<b>Service:</b>
HA	Oil and grease removed <sup>1)</sup>
HB	Cleaned for oxygen service <sup>1)</sup>
HC	Cleaned from PWIS (PWIS = paint wetting impairment substances) <sup>1)</sup>
IA	Configured min alarm current
IB	Configured HART Burst Mode PV
I9	Special version
	<sup>1)</sup> Only device, not accessory or enclosed accessory

<b>580</b>	<b>Test, certificate:</b>
JA	EN10204-3.1 process connection material, inspection certificate
JB	NACE MR0175 process connection
KB	EN10204-3.1 material process conn. +Ra, Ra= surface roughness, dimensional check, inspection certificate
KD	EN10204-3.1 helium leak test, inspection certificate
KE	EN10204-3.1 pressure test, inspection certificate
K9	Special version,

<b>590</b>	<b>Other approvals:</b>
LW	CoC-ASME BPE (CoC = Certificate of Compliance)
LI	DNV marine certificate
LE	GL marine certificate
LA	SIL

<b>600</b>	<b>Separate housing:</b>
MA	Cable PE, 2m/80in + housing mounting bracket, wall/pipe, 304
MB	Cable PE, 5m/200in + housing mounting bracket, wall/pipe, 304
MC	Cable PE, 10m/400in + housing mounting bracket, wall/pipe, 304
MH	Cable FEP, 5m/200in IP69K + housing mounting bracket, wall/pipe, 304

<b>610</b>	<b>Accessory mounted:</b>
NA	Overvoltage protection

<b>620</b>	<b>Accessory enclosed</b>
PA	Mounting bracket, wall/pipe, 304
P2	Shutoff valve (PZAV), see additional spec
-R1A1	PZAV-R1A1 Shutoff valve, G1/2, C22.8
-R1A2	PZAV-R1A2 Shutoff valve, G1/2, 316Ti
-R1D1	PZAV-R1D1 Shutoff valve, NPT1/2, C22.8

620	Accessory enclosed	
	-R1D2	PZAV-R1D2 Shutoff valve, NPT1/2, 316Ti
	-B1A2	PZAV-B1A2 Shutoff valve, G1/2, 316Ti, 3.1
	-B1D2	PZAV-B1D2 Shutoff valve, NPT1/2, 316Ti, 3.1
P4		Siphon (PZW), see additional spec
	-RA21	PZW-RA21 Siphon G1/2 vertical, C22.8 (O-shape)
	-RA22	PZW-RA22 Siphon G1/2 vertical, 316Ti (O-shape)
	-RC11	PZW-RC11 Siphon G1/2 x weld. horiz. C22.8 (U-shape)
	-RD11	PZW-RD11 Siphon NPT1/2 x weld. horiz. C22.8 (U-shape)
	-BB22	PZW-BB22 Siphon NPT1/2 vertical, 316Ti, 3.1 (O-shape)
	-BA22	PZW-BA22 Siphon NPT1/2x weld.vert.316Ti 3.1 (O-shape)
QJ		Welding neck G1-1/2, 316L
QK		Welding neck G1-1/2, 316L, 3.1, EN10204-3.1 material, inspection certificate
QL		Weld-in tool adapter G1-1/2, brass
QP		Weld-in flange DRD DN50 65mm, 316L
QR		Weld-in fl. DRD DN50 65mm, 316L 3.1 EN10204-3.1 material, inspection certificate
QS		Weld-in tool flange DRD DN50 65mm, Brass
QT		Weld-in adapter Uni D65, 316L
QU		Weld-in adapter Uni D65, 316L, 3.1 EN10204-3.1 material, inspection certificate
Q1		Weld-in tool adapter Uni D65/D85, Brass
Q2		Weld-in adapter Uni D85, 316L
Q3		Weld-in adapter Uni D85, 316L, 3.1 EN10204-3.1 material, inspection certificate
RA		Adapter Uni > DIN11851 DN40, 316L, slotted-nut
RB		Adapter Uni > DIN11851 DN50, 316L, slotted-nut
RC		Adapter Uni > DRD DN50 65mm, 316L
RD		Adapter Uni > Clamp 2", 316L
RE		Adapter Uni > Clamp 3", 316L
RF		Adapter Uni > Varivent N, 316L
RH		Adapter Uni > Cherry Burell 2", 316L
R1		Adapter Uni > DIN11851 DN40, 316L, 3.1, slotted-nut, EN10204-3.1 material, inspection certificate
R2		Adapter Uni > DIN11851 DN50, 316L, 3.1, slotted-nut, EN10204-3.1 material, inspection certificate
R3		Adapter Uni > DRD DN50 65mm, 316L, 3.1 EN10204-3.1 material, inspection certificate
R4		Adapter Uni > Clamp 2", 316L, 3.1 EN10204-3.1 material, inspection certificate
R5		Adapter Uni > Clamp 3", 316L, 3.1 EN10204-3.1 material, inspection certificate
R6		Adapter Uni > Varivent, 316L, 3.1 EN10204-3.1 material, inspection certificate
R7		Adapter Uni > Cherry Burell, 316L, 3.1 EN10204-3.1 material, inspection certificate
RL		Plug-in jack M12
RM		Plug-in jack M12, 90deg
RN		Plug-in jack M12, 90deg+5m cable
R9		Special version, TSP-no. to be spec.
850	Firmware version:	
	78	01.00.zz, HART, DevRev01
895	Identification:	
	Z1	Measuring point (TAG), see additional spec.
	Z2	Bus address, see additional spec.

**PMP51**

This overview does not mark options which are mutually exclusive.

<b>10</b>	<b>Approval:</b>
AA	For non-hazardous areas
BA	ATEX II 1/2G Ex ia IIC T6
BB	ATEX II 1/2D Ex t IIIC
BC	ATEX II 2G Ex d IIC T6
BD	ATEX II 3G Ex nA IIC T6
BE	ATEX II 2G Ex ia IIC T6
BG	ATEX II 3G Ex ic IIC T6
B1	ATEX II 1/2G Ex ia IIC T6 + ATEX II 1/2D Ex iaD
B2	ATEX II 1/2G Ex ia IIC T6 + ATEX II 2G Ex d IIC T6
8A	ATEX II Ex ia/Ex d + FM/CSA IS + XP ATEX II 1/2G Ex ia IIC T6+ ATEX II 2G Ex d IIC T6+ FM/CSA IS + XP Cl.I, II Div.1 Gr. A-G/B-G, zone 1,2
8B	FM/CSA IS + XP Cl.I, II Div.1 Gr.A-D/B-G FM IS/FM XP Cl.I, II Div.1 Gr.A-G+ CSA IS/XP Cl.I, II Div.1 Gr.A-G, zone 1,2
IA	IEC Ex ia IIC T6 Ga/Gb
IB	IEC Ex d IIC T6 Gb
ID	IEC Ex t IIIC Da/Db
IE	IEC Ex ic IIC T6 Gc
I1	IEC Ex ia IIC T6 Ga/Gb+Ex ia IIIC Da/Db
NA	NEPSI Ex ia IIC T6
NB	NEPSI Ex d IIC T6
TA	TIIS Ex ia IIC T4
CA	CSA C/US IS Cl.I,II,III Div.1 Gr.A-G, CSA C/US IS Cl.I Div.2 Gr.2 Gr.A-D, Ex ia, zone 0,1,2,20,21,22
CB	CSA C/US XP Cl.I, II Div.1 Gr.B-G, Ex d (Conduit seal not required), zone 1,2
CC	CSA C/US Cl.II, III Div.1 Gr.E-G, US: Zone 21,22
CD	CSA General Purpose
C1	CSA C/US IS/XP Cl.I, II Div.1 Gr.A-G/B-G, Zone 1,2
FA	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia FM NI Cl.I Div.2 Gr.A-D FM IS: Zone 0,1,2,20,21,22/FM NI: Zone 2
FB	FM XP Cl.I, II Div.1 Gr.A-D, AEx d (Factory sealed) zone 1,2
FC	FM DIP Cl.II, III Div.1 Gr.A-D Zone 21,22
FD	FM NI Cl.I Div.2 Gr.A-D, Zone 2
F1	FM IS/XP Cl.I, II Div.1 Gr.A-G, Zone 1,2
99	Special version
<b>20</b>	<b>Output:</b>
1	4-20mA Analog
2	4-20mA HART
3	PROFIBUS PA
4	FOUNDATION Fieldbus
9	Special version
<b>30</b>	<b>Display, operation:</b>
1	LCD, keys on display/electronics
2	Without LCD, keys on electronics
9	Special version
<b>40</b>	<b>Housing:</b>
I	F31 aluminum
J	F31 aluminum, glass window
Q	F15 Stainless Steel Hygiene
R	F15 Stainless Steel Hygiene, glass window
S	F15 Stainless Steel Hygiene, plastic window
Y	Special version
<b>50</b>	<b>Electrical connection:</b>
A	Gland M20, IP66/68 NEMA4X/6P
B	Thread M20, IP66/68 NEMA4X/6P
C	Thread G1/2, IP66/68 NEMA4X/6P
D	Thread NPT1/2, IP66/68 NEMA4X/6P
I	Connector M12, IP66/67, NEMA4X/6P
M	Connector 7/8", IP66/68, NEMA4X/6P
P	Connector Han7D, 90deg, IP65
S	PE Cable 5m, IP66/68 NEMA4X/6P + pressure compensation via cable
V	Valve connector ISO4400 M16, IP64

<b>50</b>	<b>Electrical connection:</b>
Y	Special version

## PMP51 (continued)

<b>70</b>	<b>Sensor range:</b>
1F	400mbar/40kPa/6psi relative, 4mH2O/13ftH2O/160inH2O Overload: 6bar/600kPa/90psi
1H	1bar/100kPa/15psi relative, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi
1K	2bar/200kPa/30psi relative, 20mH2O/67ftH2O/800inH2O Overload: 20bar/2MPa/300psi
1M	4bar/400kPa/60psi relative, 40mH2O/133ftH2O/1600inH2O Overload: 28bar/2.8MPa/420psi
1P	10bar/1MPa/150psi relative, 100mH2O/333ftH2O/4000inH2O Overload: 40bar/4MPa/600psi
1S	40bar/4MPa/600psi relative, 400mH2O/1334ftH2O/16000inH2O Overload: 160bar/16MPa/2400psi
1U	100bar/10MPa/1500psi relative, 1000mH2O/3330ftH2O/40000inH2O Overload: 400bar/40MPa/6000psi
1W	400bar/40MPa/6000psi relative, 4000mH2O/13340ftH2O/160000inH2O Overload: 600bar/60MPa/9000psi
2F	400mbar/40kPa/6psi abs, 4mH2O/13ftH2O/160inH2O Overload: 6bar/600kPa/90psi
2H	1bar/100kPa/15psi abs, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi
2K	2bar/200kPa/30psi abs, 20mH2O/67ftH2O/800inH2O Overload: 10bar/1MPa/150psi
2M	4bar/400kPa/60psi abs, 40mH2O/133ftH2O/1600inH2O abs Overload: 28bar/2.8MPa/420psi
2P	10bar/1MPa/150psi abs, 100mH2O/333ftH2O/4000inH2O abs Overload: 40bar/4MPa/600psi
2S	40bar/4MPa/600psi abs, 400mH2O/1334ftH2O/16000inH2O abs Overload: 160bar/16MPa/2400psi
2U	100bar/10MPa/1500psi abs, 1000mH2O/3330ftH2O/40000inH2O abs Overload: 400bar/40MPa/6000psi
2W	400bar/40MPa/6000psi abs, 4000mH2O/13340ftH2O/160000inH2O abs Overload: 600bar/60MPa/9000psi
99	Special version

<b>80</b>	<b>Reference accuracy:</b>
D	Platinum
G	Standard
Y	Special version

<b>90</b>	<b>Calibration; Unit:</b>
A	Sensor range; %
B	Sensor range; mbar/bar
C	Sensor range; kPa/MPa
D	Sensor range; mm/mH2O
E	Sensor range; inH2O/ftH2O
F	Sensor range; psi
J	Customized pressure; see additional spec.
K	Customized level; see additional spec.
Y	Special version



**PMP51 (continued)**

<b>110</b>	<b>Process connection:</b>
	<p><b>ANSI flanges</b></p> <p>AEJ 1-1/2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>AFJ 2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>AGJ 3" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>AHJ 4" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>ANJ 1" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>AOJ 1-1/2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>ARJ 2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>ASJ 3" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p>ATJ 4" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)</p> <p><b>EN flanges</b></p> <p>CNJ DN25 PN10-40 B1, 316L, flange EN1092-1</p> <p>CPJ DN32 PN10-40 B1, 316L, flange EN1092-1</p> <p>COJ DN40 PN10-40 B1, 316L, flange EN1092-1</p> <p>CXJ DN50 PN25/40 B1, 316L flange EN1092-1</p> <p>CZJ DN80 PN25/40 B1, 316L, flange EN1092-1</p> <p><b>Threaded connection</b></p> <p>GCC Thread ISO228 G1/2, AlloyC</p> <p>G CJ Thread ISO228 G1/2, 316L</p> <p>GLC Thread ISO228 G1/2 G1/4 female, AlloyC</p> <p>GLJ Thread ISO228 G1/2 G1/4 female, 316L</p> <p>GMC Thread ISO228 G1/2 hole 11.4mm, AlloyC</p> <p>GMJ Thread ISO228 G1/2 hole 11.4mm, 316L</p> <p>GRC Thread ISO228 G1/2, AlloyC, flush-mounted</p> <p>GRJ Thread ISO228 G1/2, 316L, flush-mounted</p> <p>GTJ Thread ISO228 G1, 316L, flush-mounted</p> <p>GVJ Thread ISO228 G1-1/2, 316L, flush-mounted</p> <p>GWJ Thread ISO228 G2, 316L, flush-mounted</p> <p>GOJ Thread ISO228 G1/2 seal O-ring, fm= flush-mounted, 316L, adapter 52002643</p> <p>G1J Thread DIN13 M20x1.5, 316L</p> <p><b>Threaded connection as per ANSI</b></p> <p>RKC Thread ANSI MNPT1/2 hole 11.4mm, AlloyC (CRN)</p> <p>RKJ Thread ANSI MNPT1/2 hole 11.4mm, 316L (CRN)</p> <p>RLC Thread ANSI MNPT1/2 FNPT1/4, AlloyC (CRN)</p> <p>RLJ Thread ANSI MNPT1/2 FNPT1/4, 316L (CRN)</p> <p>R1C Thread ANSI FNPT 1/2, Alloy C (CRN)</p> <p>R1J Thread ANSI FNPT 1/2, 316L (CRN)</p> <p>U5J Thread ANSI MNPT1, 316L, flush-mounted (CRN)</p> <p>U7J Thread ANSI MNPT1-1/2, 316L, flush-mounted (CRN)</p> <p>U8J Thread ANSI MNPT2, 316L, flush-mounted (CRN)</p> <p>XSJ Prepared for diaphragm seal mount, 316L (CRN)</p> <p><b>Hygienic connections</b></p> <p>MXJ DIN11851 DN25 PN25 coupling nut, 316L, EHEDG, 3A</p> <p>MIJ DIN11851 DN32 PN25 coupling nut, 316L, EHEDG, 3A</p> <p>MZJ DIN11851 DN40 PN25 coupling nut, 316L, EHEDG, 3A</p> <p>MRJ DIN11851 DN50 PN25 coupling nut, 316L, EHEDG, 3A</p> <p>S1J NEUMO BioControl D25 PN16, 316L, EHEDG, 3A</p> <p>S4J NEUMO BioControl D50 PN16, 316L, EHEDG, 3A</p> <p>TBJ Clamp ISO2852 DN18-22, 316L DIN32676 DN15-20, EHEDG, 3A, ASME-BPE</p> <p>TCJ Tri-Clamp ISO2852 DN25 (1"), 316L, DIN32676 DN25, EHEDG, 3A, ASME-BPE</p> <p>TJJ Tri-Clamp ISO2852 DN38 (1-1/2"), 316L, DIN32676 DN40, EHEDG, 3A, ASME-BPE</p> <p>TDJ Tri-Clamp ISO2852 DN40-51 (2"), 316L, DIN32676 DN50, EHEDG, 3A</p> <p>TIJ DRD DN50 65mm PN25, 316L</p> <p>TMJ APV Inline DN50 PN40, 316L, 3A</p> <p>TPJ Varivent B pipe DN10-15 PN40, 316L, EHEDG, 3A</p> <p>TOJ Varivent F pipe DN25-32 PN40, 316L, EHEDG, 3A</p> <p>TRJ Varivent N pipe DN40-162 PN40, 316L, EHEDG, 3A</p> <p>T6J SMS 1" PN25, 316L, EHEDG, 3A</p> <p>T7J SMS 1-1/2" PN25, 316L, EHEDG, 3A</p> <p>TXJ SMS 2" PN25, 316L, EHEDG, 3A</p> <p>YYY Special version</p>
<b>170</b>	<b>Material of the process isolating diaphragm:</b>
	<p>A 316L</p> <p>B AlloyC</p> <p>M Rhodium&gt;gold&gt;316L</p> <p>Y Special version</p>

180	Fill fluid:	
	1	Silicone oil
	2	Inert oil
	3	Synthetic oil, FDA
	9	Special version

**Additional ordering information (optional)**

500	Additional Operating language:	
	AA	English
	AB	German
	AC	French
	AD	Spanish
	AE	Italian
	AF	Dutch
	AK	Chinese simplified
	AL	Japanese

**PMP51 (continued)**

550	Calibration:	
	F1	Factory calibration certificate, 5-point
	F2	DKD/DakkS calibration certificate 10-point

570	Service:	
	HA	Oil and grease removed <sup>1)</sup>
	HB	Cleaned for oxygen service <sup>1)</sup>
	HC	Cleaned from PWIS (PWIS = paint wetting impairment substances) <sup>1)</sup>
	IA	Configured min alarm current
	IB	Configured HART Burst Mode PV
	I9	Special version
		1) Only device, not accessory or enclosed accessory

580	Test, certificate:	
	JA	EN10204-3.1 wetted material, inspection certificate
	JB	NACE MR0175 wetted
	JF	EN10204-3.1 AD2000 material wetted parts, excepting process membrane inspection certificate
	KB	EN10204-3.1 wetted material + Ra, Ra= surface roughness, dimensional check, inspection certificate
	KD	EN10204-3.1 helium leak test, inspection certificate
	KE	EN10204-3.1 pressure test, inspection certificate
	KG	EN10204-3.1 PMI test* (PMI = positive material identification), inspection certificate
		* Meter body and process isolating diaphragm not included.
	K9	Special version

590	Other approvals:	
	LW	CoC-ASME BPE (CoC = Certificate of Compliance)
	LI	DNV marine certificate
	LE	GL marine certificate
	LA	SIL
	LR	NSF potable water approval

600	Separate housing:	
	MA	Cable PE, 2m/80in + housing mounting bracket, wall/pipe, 304
	MB	Cable PE, 5m/200in + housing mounting bracket, wall/pipe, 304
	MC	Cable PE, 10m/400in + housing mounting bracket, wall/pipe, 304
	MH	Cable FEP, 5m/200in IP69K + housing mounting bracket, wall/pipe, 304

610	Accessory mounted:	
	NA	Overvoltage protection

620	Accessory enclosed	
	PA	Mounting bracket, wall/pipe, 304
	P2	Shutoff valve (PZAV), see additional spec
	-R1A1	PZAV-R1A1 Shutoff valve, G1/2, C22.8 (O-shape)
	-R1A2	PZAV-R1A2 Shutoff valve, G1/2, 316Ti (O-shape)
	-R1D1	PZAV-R1D1 Shutoff valve, NPT1/2, C22.8 (U-shape)
	-R1D2	PZAV-R1D2 Shutoff valve, NPT1/2, 316Ti (U-shape)
	-B1A2	PZAV-B1A2 Shutoff valve, G1/2, 316Ti, 3.1 (O-shape)
	-B1D2	PZAV-B1D2 Shutoff valve, NPT1/2, 316Ti, 3.1 (O-shape)
	P4	Siphon (PZW), see additional spec
	-RA21	PZW-RA21 Siphon G1/2 vertical, C22.8
	-RA22	PZW-RA22 Siphon G1/2 vertical, 316Ti
	-RC11	PZW-RC11 Siphon G1/2 x weld. horiz. C22.8

620		Accessory enclosed	
	-RD11	PZW-RD11 Siphon NPT1/2 x weld. horiz. C22.8	
	-BB22	PZW-BB22 Siphon NPT1/2 vertical, 316Ti, 3.1	
	-BA22	PZW-BA22 Siphon NPT1/2x weld.vert.316Ti 3.1	
QA	Welding neck G1/2, 316L,		
QB	Welding neck G1/2, 316L, 3.1, EN10204-3.1 material, inspection certificate		
QC	Weld-in tool adapter G1/2, brass		
QG	Weld-in tool adapter G1, brass, metallic sealing taper		
QJ	Welding neck G1-1/2, 316L		
QK	Welding neck G1-1/2, 316L, 3.1, EN10204-3.1 material, inspection certificate		
QL	Weld-in tool adapter G1-1/2, brass		
RL	Plug-in jack M12		
RM	Plug-in jack M12, 90deg		
RN	Plug-in jack M12, 90deg+5m cable		
850		Firmware version:	
	78	01.00.zz, HART, DevRev01	
895		Identification:	
	Z1	Measuring point (TAG), see additional spec.	
	Z2	Bus address, see additional spec.	

## PMP55

This overview does not mark options which are mutually exclusive.

<b>10</b>	<b>Approval:</b>
AA	For non-hazardous areas
BA	ATEX II 1/2G Ex ia IIC T6
BB	ATEX II 1/2D Ex t IIIC
BC	ATEX II 2G Ex d IIC T6
BD	ATEX II 3G Ex nA IIC T6
BE	ATEX II 2G Ex ia IIC T6
BG	ATEX II 3G Ex ic IIC T6
B1	ATEX II 1/2G Ex ia IIC T6 + ATEX II 1/2D Ex iaD
B2	ATEX II 1/2G Ex ia IIC T6 + ATEX II 2G Ex d IIC T6
8A	ATEX II Ex ia/Ex d + FM/CSA IS + XP ATEX II 1/2G Ex ia IIC T6+ ATEX II 2G Ex d IIC T6+ FM/CSA IS + XP Cl.I, II Div.1 Gr. A-G/B-G, zone 1,2
8B	FM/CSA IS + XP Cl.I, II Div.1 Gr.A-D/B-G FM IS/FM XP Cl.I, II Div.1 Gr.A-G+ CSA IS/XP Cl.I, II Div.1 Gr.A-G, Zone 1,2
IA	IEC Ex ia IIC T6 Ga/Gb
IB	IEC Ex d IIC T6 Gb
ID	IEC Ex t IIIC Da/Db
IE	IEC Ex ic IIC T6 Gc
I1	IEC Ex ia IIC T6 Ga/Gb+Ex ia IIIC Da/Db
NA	NEPSI Ex ia IIC T6
NB	NEPSI Ex d IIC T6
TA	TIIS Ex ia IIC T4
CA	CSA C/US IS Cl.I,II,III Div.1 Gr.A-G, CSA C/US IS Cl.I Div.2 Gr.2 Gr.A-D, Ex ia, zone 0,1,2,20,21,22
CB	CSA C/US CP Cl.I, II Div.1 Gr.B-G, Ex d (factory sealed) zone 1,2
CC	CSA C/US Cl.II, III Div.1 Gr.E-G, Zone 21,22
CD	CSA General Purpose
C1	CSA C/US IS/XP Cl.I, II Div.1 Gr.A-G/B-G, Zone 1,2
FA	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia FM NI Cl.I Div.2 Gr.A-D FM IS: Zone 0,1,2,20,21,22/FM NI: Zone 2
FB	FM XP Cl.I, II Div.1 Gr.A-G, AEx d (factory sealed) zone 1,2
FC	FM DIP Cl.II, III Div.1 Gr.A-G, zone 21,22
FD	FM NI Cl.I Div.2 Gr.A-D, Zone 2
F1	FM IS/XP Cl.I, II Div.1 Gr.A-G, Zone 1,2
99	Special version
<b>20</b>	<b>Output:</b>
1	4-20mA Analog
2	4-20mA HART
3	PROFIBUS PA
4	FOUNDATION Fieldbus
9	Special version
<b>30</b>	<b>Display, operation:</b>
1	LCD, keys on display/electronics
2	Without LCD, keys on electronics
9	Special version
<b>40</b>	<b>Housing:</b>
I	F31 aluminum
J	F31 aluminum, glass window
Q	F15 Stainless Steel Hygiene
R	F15 Stainless Steel Hygiene, glass window
S	F15 Stainless Steel Hygiene, plastic window
Y	Special version
<b>50</b>	<b>Electrical connection:</b>
A	Gland M20, IP66/68 NEMA4X/6P
B	Thread M20, IP66/68 NEMA4X/6P
C	Thread G1/2, IP66/68 NEMA4X/6P
D	Thread NPT1/2, IP66/68 NEMA4X/6P
I	Connector M12, IP66/67, NEMA4X/6P
M	Connector 7/8", IP66/68, NEMA4X/6P
P	Connector Han7D, 90deg, IP65
S	PE Cable 5m, IP66/68 NEMA4X/6P + pressure compensation via cable
V	Valve connector ISO4400 M16, IP64

<b>50</b>	<b>Electrical connection:</b>
Y	Special version

**PMP55 (continued)**

<b>70</b>	<b>Sensor range:</b>
1F	400mbar/40kPa/6psi relative, 4mH2O/13ftH2O/160inH2O Overload: 6bar/600kPa/90psi
1H	1bar/100kPa/15psi relative, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi
1K	2bar/200kPa/30psi relative, 20mH2O/67ftH2O/800inH2O Overload: 20bar/2MPa/300psi
1M	4bar/400kPa/60psi relative, 40mH2O/133ftH2O/1600inH2O Overload: 28bar/2.8MPa/420psi
1P	10bar/1MPa/150psi relative, 100mH2O/333ftH2O/4000inH2O Overload: 40bar/4MPa/600psi
1S	40bar/4MPa/600psi relative, 400mH2O/1334ftH2O/16000inH2O Overload: 160bar/16MPa/2400psi
1U	100bar/10MPa/1500psi relative, 1000mH2O/3330ftH2O/40000inH2O Overload: 400bar/40MPa/6000psi
1W	400bar/40MPa/6000psi relative, 4000mH2O/13340ftH2O/160000inH2O Overload: 600bar/60MPa/9000psi
2F	400mbar/40kPa/6psi abs, 4mH2O/13ftH2O/160inH2O Overload: 6bar/600kPa/90psi
2H	1bar/100kPa/15psi abs, 10mH2O/33ftH2O/400inH2O Overload: 10bar/1MPa/150psi
2K	2bar/200kPa/30psi abs, 20mH2O/67ftH2O/800inH2O abs Overload: 20bar/2MPa/300psi
2M	4bar/400kPa/60psi abs, 40mH2O/133ftH2O/1600inH2O abs Overload: 28bar/2.8MPa/420psi
2P	10bar/1MPa/150psi abs, 100mH2O/333ftH2O/4000inH2O abs Overload: 40bar/4MPa/600psi
2S	40bar/4MPa/600psi abs, 400mH2O/1334ftH2O/16000inH2O abs Overload: 160bar/16MPa/2400psi
2U	100bar/10MPa/1500psi abs, 1000mH2O/3330ftH2O/40000inH2O abs Overload: 400bar/40MPa/6000psi
2W	400bar/40MPa/6000psi abs, 4000mH2O/13340ftH2O/160000inH2O abs Overload: 600bar/60MPa/9000psi
99	Special version

<b>80</b>	<b>Reference accuracy:</b>
D	Platinum
G	Standard
Y	Special version

<b>90</b>	<b>Calibration; Unit:</b>
A	Sensor range; %
B	Sensor range; mbar/bar
C	Sensor range; kPa/MPa
D	Sensor range; mm/mH2O
E	Sensor range; inH2O/ftH2O
F	Sensor range; psi
J	Customized pressure; see additional spec.
K	Customized level; see additional spec.
Y	Special version

## PMP55 (continued)

110	Process connection:
	<b>ANSI flanges</b>
ACJ	1" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AEJ	1-1/2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AFJ	2" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AGJ	3" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AHJ	4" 150lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ANJ	1" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
AQJ	1-1/2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ARJ	2" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ASJ	3" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
ATJ	4" 300lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A0J	1" 400/600lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A1J	2" 400/600lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A2J	1" 900/1500lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A3J	2" 900/1500lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A4J	1" 2500lbs RF, 316/316L, flange ANSI B16.5 (CRN)
A5J	2" 2500lbs RF, 316/316L, flange ANSI B16.5 (CRN)
FMJ	2" 150lbs RF, 316/316L, 2/4/6/8" extended diaphragm seal, flange ANSI B16.5, see additional spec. (CRN)
FNJ	3" 150lbs RF, 316/316L, 2/4/6/8" extended diaphragm seal, flange ANSI B16.5, see additional spec. (CRN)
FOJ	4" 150lbs RF, 316/316L, 2/4/6/8" extended diaphragm seal, flange ANSI B16.5, see additional spec. (CRN)
FWJ	3" 300lbs RF, 316/316L, 2/4/6/8" extended diaphragm seal, flange ANSI B16.5, see additional spec. (CRN)
FXJ	4" 300lbs RF, 316/316L, 2/4/6/8" extended diaphragm seal, flange ANSI B16.5, see additional spec. (CRN)
	<b>EN flanges</b>
CNJ	DN25 PN10-40 B1, 316L, flange EN1092-1
CPJ	DN32 PN10-40 B1, 316L, flange EN1092-1
CQJ	DN40 PN10-40 B1, 316L, flange EN1092-1
CXJ	DN50 PN10-40 B1, 316L, flange EN1092-1
CZJ	DN80 PN10-40 B1, 316L, flange EN1092-1
	<b>JIS flanges</b>
KCJ	10K 25 RF, 316L, flange JIS B2220
KEJ	10K 40 RF, 316L, flange JIS B2220
KFJ	10K 50 RF, 316L, flange JIS B2220
KGJ	10K 80 RF, 316L, flange JIS B2220
KHJ	10K 100 RF, 316L, flange JIS B2220
	<b>DIN flanges</b>
QIJ	DN25 PN63-160 E, 316L, flange DIN2501
QJJ	DN25 PN250 E, 316L, flange DIN2501
QMJ	DN50 PN250 E, 316L, flange DIN2501
QOJ	DN50 PN100-160 E, 316L, flange DIN2501
QSJ	DN25 PN400 E, 316L, flange DIN2501
QVJ	DN50 PN400 E, 316L, flange DIN2501
FDJ	DN50 PN10-40 B1, 316L, 50/100/200mm extended diaphragm seal, flange EN1092-1, see additional spec.
FEJ	DN80 PN10-40 B1, 316L, 50/100/200mm extended diaphragm seal, flange EN1092-1, see additional spec.
PDJ	DN50 PN63 B2, 316L, flange EN1092-1
PPJ	DN80 PN100 B2, 316L, flange EN1092-1
PQJ	DN100 PN100 B2, 316L, flange EN1092-1
	<b>Threaded connection</b>
GTC	Thread ISO228 G1, AlloyC, flush-mounted
GTJ	Thread ISO228 G1, 316L, flush-mounted
GVC	Thread ISO228 G1-1/2, AlloyC, fm= flush-mounted
GVJ	Thread ISO228 G1-1/2, 316L, flush-mounted
GWC	Thread ISO228 G2, AlloyC, flush-mounted
GWJ	Thread ISO228 G2, 316L, flush-mounted
UBJ	Thread ISO228 G1/2, PN160.316L, separator, EN837, welded
UCJ	Thread ANSI MNPT1/2, PN160.316L, separator, welded (CRN)
UDJ	Thread ISO228 G1/2, 316L, separator, EN837, threaded
UEJ	Thread ANSI MNPT1/2, 316L, separator, threaded
UGJ	Thread FNPT1/2, PN250, 316L, separator, threaded
UHJ	Thread FNPT1, PN250, 316L, separator, threaded
U5C	Thread ANSI MNPT1, AlloyC, flush-mounted (CRN)
U5J	Thread ANSI MNPT1, 316L, flush-mounted (CRN)
U7C	Thread ANSI MNPT1-1/2, AlloyC, fm=flush-mounted (CRN)
U7J	Thread ANSI MNPT1-1/2, 316L, flush-mounted (CRN)
U8C	Thread ANSI MNPT2, AlloyC, flush-mounted (CRN)
U8J	Thread ANSI MNPT2, 316L, flush-mounted (CRN)

**PMP55 (continued)**

<b>110</b>	<b>Process connection:</b>
	<p><b>Diaphragm seal cell structure</b></p> <p>UIJ Pancake (Cell) DN 50 PN 16-400, AISI 316L</p> <p>UJJ Pancake (Cell) DN 80 PN 16-400, AISI 316L</p> <p>UKJ Pancake (Cell) DN 100 PN 16-400, AISI 316L</p> <p>ULJ Pancake (Cell) 2" 150-2500 lbs, AISI 316L</p> <p>UMJ Pancake (Cell) 3" 150-2500 lbs, AISI 316L</p> <p>URJ Pancake (Cell) 4" 150-2500 lbs, AISI 316L</p> <p><b>Pipe diaphragm seal</b></p> <p>SIJ Tri-Clamp ISO2852 DN10 (3/4") RDM, 316L, RDM = pipe diaphragm seal</p> <p>SJJ Tri-Clamp ISO2852 DN16 (3/4") RDM, 316L, RDM = pipe diaphragm seal</p> <p>SBJ Tri-Clamp ISO2852 DN25 (1") RDM, 316L, RDM = pipe diaphragm seal</p> <p>SCJ Tri-Clamp ISO2852 DN38 (1-1/2") RDM, 316L, PED Cat.II, RDM = pipe diaphragm seal 3.1 material + pressure test PED Cat.II</p> <p>SDJ Tri-Clamp ISO2852 DN51 (2") RDM, 316L, PED Cat.II, RDM = pipe diaphragm seal 3.1 material + pressure test PED Cat.II</p> <p><b>Hygienic process connections</b></p> <p>MIJ DIN11851 DN32 PN40 cap-nut, 316L, EHEDG, 3A</p> <p>MRJ DIN11851 DN50 PN25 cap-nut, 316L, EHEDG, 3A</p> <p>MSJ DIN11851 DN65 PN25 cap-nut, 316L, EHEDG, 3A</p> <p>MTJ DIN11851 DN80 PN25 cap-nut, 316L, EHEDG, 3A</p> <p>MZJ DIN11851 DN40 PN40 cap-nut, 316L, EHEDG, 3A</p> <p>NCJ DIN11864-1 A DN40 PN16 tube DIN11866-A, threaded connection, 316L, EHEDG, 3A</p> <p>NDJ DIN11864-1 A DN50 PN16 tube DIN11866-A, threaded connection, 316L, EHEDG, 3A</p> <p>NFJ DIN11864-2 A DN32 PN16 tube DIN11866-A, 316L, EHEDG, 3A</p> <p>NXJ DIN11864-2 A DN40 PN16 tube DIN11866-A, 316L, EHEDG, 3A</p> <p>NZJ DIN11864-2 A DN50 PN16 tube DIN11866-A, 316L, EHEDG, 3A</p> <p>S4J NEUMO BioControl D50 PN16, 316L, EHEDG</p> <p>TCJ Tri-Clamp ISO2852 DN25 (1"), 316L, DIN32676 DN25, EHEDG, 3A, ASME-BPE (CRN)</p> <p>TJJ Tri-Clamp ISO2852 DN38 (1-1/2"), 316L, DIN32676 DN40, EHEDG, 3A, ASME-BPE (CRN)</p> <p>TDJ Tri-Clamp ISO2852 DN51 (2"), 316L, DIN32676 DN50, EHEDG, 3A, ASME-BPE (CRN)</p> <p>TFJ Tri-Clamp ISO2852 DN76.1 (3"), 316L, EHEDG, 3A, ASME-BPE (CRN)</p> <p>TIJ DRD DN50 65mm PN25, 316L</p> <p>TOJ Varivent F pipe DN25-32 PN40, 316L, EHEDG, 3A</p> <p>TRJ Varivent N pipe DN40-162 PN40, 316L, EHEDG, 3A</p> <p>UPJ Universal adapter 44mm 316L, 3A, EHEDG, incl. silicone molded seal</p> <p>TOJ APV-RJT 1" PN40, 316L</p> <p>T1J APV-RJT 1-1/2" PN40, 316L</p> <p>T2J APV-RJT 2" PN40, 316L</p> <p>T3J APV-ISS 1" PN40, 316L</p> <p>T4J APV-ISS 1-1/2" PN40, 316L</p> <p>T5J APV-ISS 2" PN40, 316L</p> <p>T6J SMS 1" PN25, 316L, EHEDG, 3A</p> <p>T7J SMS 1-1/2" PN25, 316L, EHEDG, 3A</p> <p>TXJ SMS 2" PN25, 316L, EHEDG, 3A</p> <p>YYY Special version</p>
<b>170</b>	<b>Material of the process isolating diaphragm:</b>
	<p>A 316L</p> <p>B AlloyC</p> <p>C Monel</p> <p>D Tantalum</p> <p>M Rhodium&gt;gold&gt;316L</p> <p>R 0.09mm PTFE&gt;316L, not for vacuum</p> <p>S 0.25mm PTFE&gt;316L, not for vacuum</p> <p>Y Special version</p>

## PMP55 (continued)

180	Fill fluid:	
	1	Silicone oil
	2	Inert oil
	4	Vegetable oil, FDA
	5	High-temperature oil
	6	Low-temperature oil
	9	Special version
200	Diaphragm seal connection:	
	A	Direct
	B	Temperature isolator
	D	..... m capillary
	E	..... ft capillary
	Y	Special version

## Additional ordering information (optional)

500	Additional Operating language:	
	AA	English
	AB	German
	AC	French
	AD	Spanish
	AE	Italian
	AF	Dutch
	AK	Chinese simplified
	AL	Japanese
550	Calibration:	
	F1	Factory calibration certificate, 5-point
	F2	DKD/DakkS calibration certificate 10-point
570	Service:	
	HA	Oil and grease removed <sup>1)</sup>
	HB	Cleaned for oxygen service <sup>1)</sup>
	HC	Cleaned from PWIS (PWIS = paint wetting impairment substances) <sup>1)</sup>
	HG	Diaphragm seal vacuum service
	HK	Surface quality Ra<0.38um electropolished (wetted)
	IA	Configured min alarm current
	IB	Configured HART Burst Mode PV
	I9	Special version
		1) Only device, not accessory or enclosed accessory
580	Test, certificate:	
	JA	EN10204-3.1 wetted material, inspection certificate
	JB	NACE MR0175 wetted
	JF	EN10204-3.1 AD2000 material wetted parts, excepting process membrane inspection certificate
	KB	EN10204-3.1 wetted material + Ra, (Ra= surface roughness), dimensional check, inspection certificate
	KD	EN10204-3.1 helium leak test, inspection certificate
	KE	EN10204-3.1 pressure test, inspection certificate
	KF	EN10204-3.1 measurement Delta ferrite content, inspection certificate
	KG	EN10204-3.1 PMI test* (PMI = positive material identification), inspection certificate
		* Meter body and process isolating diaphragm not included.
	K9	Special version
590	Other approvals:	
	LW	CoC-ASME BPE (CoC = Certificate of Compliance)
	LI	DNV marine certificate
	LE	GL marine certificate
	LA	SIL
600	Separate housing:	
	MA	Cable PE, 2m/80in + housing mounting bracket, wall/pipe, 304
	MB	Cable PE, 5m/200in + housing mounting bracket, wall/pipe, 304
	MC	Cable PE, 10m/400in + housing mounting bracket, wall/pipe, 304
	MH	Cable FEP, 5m/200in IP69K + housing mounting bracket, wall/pipe, 304
610	Accessory mounted:	
	NA	Overvoltage protection



**PMP55 (continued)**

<b>620</b>	<b>Accessory enclosed</b>
PA	Mounting bracket, wall/pipe, 304
P2	Shutoff valve (PZAV), see additional spec
-R1A1	PZAV-R1A1 Shutoff valve, G1/2, C22.8 (O-shape)
-R1A2	PZAV-R1A2 Shutoff valve, G1/2, 316Ti (O-shape)
-R1D1	PZAV-R1D1 Shutoff valve, NPT1/2, C22.8 (U-shape)
-R1D2	PZAV-R1D2 Shutoff valve, NPT1/2, 316Ti (U-shape)
-B1A2	PZAV-B1A2 Shutoff valve, G1/2, 316Ti, 3.1 (O-shape)
-B1D2	PZAV-B1D2 Shutoff valve, NPT1/2, 316Ti, 3.1 (O-shape)
P4	Siphon (PZW), see additional spec
-RA21	PZW-RA21 Siphon G1/2 vertical, C22.8
-RA22	PZW-RA22 Siphon G1/2 vertical, 316Ti
-RC11	PZW-RC11 Siphon G1/2 x weld. horiz. C22.8
-RD11	PZW-RD11 Siphon NPT1/2 x weld. horiz. C22.8
-BB22	PZW-BB22 Siphon NPT1/2 vertical, 316Ti, 3.1
-BA22	PZW-BA22 Siphon NPT1/2x weld.vert.316Ti 3.1
QA	Welding neck G1/2, 316L,
QB	Welding neck G1/2, 316L, 3.1, EN10204-3.1 material, inspection certificate
QC	Weld-in tool adapter G1/2, brass
QJ	Welding neck G1-1/2, 316L
QK	Welding neck G1-1/2, 316L, 3.1, EN10204-3.1 material, inspection certificate
QL	Weld-in tool adapter G1-1/2, brass
QP	Welding flange DRD DN50 65mm, 316L
QR	Welding fl. DRD DN50 65mm, 316L 3.1, EN10204-3.1 material, inspection certificate
QS	Weld-in tool flange DRD DN50 65mm, brass
RL	Plug-in jack M12
RM	Plug-in jack M12, 90deg
RN	Plug-in jack M12, 90deg+5m cable
<b>850</b>	<b>Firmware version:</b>
78	01.00.zz, HART, DevRev01
<b>895</b>	<b>Identification:</b>
Z1	Measuring point (TAG), see additional spec.
Z2	Bus address, see additional spec.

## Documentation

<b>Technical Information</b>	<ul style="list-style-type: none"> <li>■ EMC test procedures TI00241F/00/EN</li> <li>■ Deltabar M: TI00434P/00/EN</li> <li>■ Deltapilot M: TI00437P/00/EN</li> </ul>
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<b>Operating Instructions</b>	<ul style="list-style-type: none"> <li>■ 4 to 20 mA Analog: BA00385P/00/EN</li> <li>■ 4 to 20 mA HART: BA00382P/00/EN</li> <li>■ PROFIBUS PA: BA00383P/00/EN</li> <li>■ FOUNDATION Fieldbus: BA00384P/00/EN</li> </ul>
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<b>Brief Operating Instructions</b>	<ul style="list-style-type: none"> <li>■ 4 to 20 mA Analog: KA01036P/00/EN</li> <li>■ 4 to 20 mA HART: KA01030P/00/EN</li> <li>■ PROFIBUS PA: KA01031P/00/EN</li> <li>■ FOUNDATION Fieldbus: KA01032P/00/EN</li> </ul>
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<b>Functional safety manual (SIL)</b>	Cerabar M (4 to 20 mA): SD00347P/00/EN
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### Safety Instructions

Authorities	Version in the order code	Approval	Category	Type	Housing		Electronics	Documentation
					F31	F15		
ATEX	BA	Ex ia IIC	II 1/2 G	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00464P/00
	BB	Ex t IIC	II 1/2 D	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00466P/00
	BC	Ex d	II 2 G	PMP51, PMP55	X	—	- 4 to 20 mA HART - PROFIBUS PA - FOUNDATION Fieldbus	- XA00467P/00
	BD	Ex nA	II 3 G	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART - PROFIBUS PA - FOUNDATION Fieldbus	- XA00469P/00
	BE	Ex ia IIC	II 2 G	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00464P/00
	BF	Ex ia IIC	II 1/2 D	PMC51	X	X	- 4 to 20 mA HART	- XA00465P/00
	BG	Ex ic IIC	II 3 G	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00489P/00
	B1	Ex ia Ex ia IIIC	II 1/2 G II 1/2 D	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00468P/00
	B2	Ex ia IIC	II 2 G II 1/2 G	PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00468P/00
8A	Ex d IIC Ex ia IIC	II 2 G II 1/2 G	PMP51, PMP55	X	—	- 4...20 mA HART	- XA00504P/00	

Authorities	Version in the order code	Approval	EPL	Type	Housing		Electronics	Documentation
					F31	F15		
IECEX	IA	Ex ia IIC	Ga/Gb	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00470P/00
	IB	Ex d IIC	Gb	PMP51, PMP55	X	—	- 4 to 20 mA HART - PROFIBUS PA - FOUNDATION Fieldbus	- XA00471P/00
	ID	Ex t IIIC	Da/Db	PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00472P/00
	IE	Ex ic	Gc	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00488P/00
	IF	Ex ia IIIC	Da/Db	PMC51	X	X	- 4 to 20 mA HART	- XA00487P/00
	I1	Ex ia IIC Ex ia IIIC	Ga/Gb Da/Db	PMC51, PMP51, PMP55	X	X	- 4 to 20 mA HART	- XA00473P/00

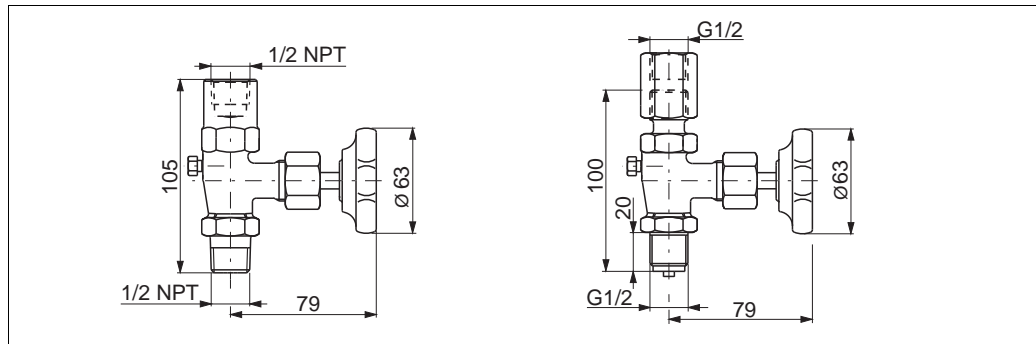
Authorities	Version in the order code	Approval	Housing		Electronics	Documentation
			F31	F15		
NEPSI	NA	Ex ia IIC	X	X	- 4 to 20 mA HART	- XA00533P/00
NEPSI	NB	Ex d IIC	X	—	- 4 to 20 mA HART	- XA00515P/00

**Installation/Control Drawings**

Authorities	Version in the order code	Approval	Type	Housing		Electronics	Documentation
				F31	F15		
FM	FA	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia FM NI Cl.I Div.2 Gr.A-D FM IS: Zone 0,1,2,20,21,22/FM NI: Zone 2	PMC51, PMP51, PMP55	X	X	- 4...20 mA HART - PROFIBUS PA, FOUNDATION Fieldbus	- XA00563P/00 - XA00564P/00
	FB	FM XP Cl.I, II Div.1 Gr.A-D, AEx d (Factory sealed) Zone 1,2	PMP51, PMP55	X	—	- 4...20 mA HART - PROFIBUS PA - FOUNDATION Fieldbus	—
	FC	FM DIP Cl.II, III Div.1 Gr.A-D Zone 21,22	PMP51, PMP55	X	X	- 4 to 20 mA HART	- In preparation
	F1	FM IS/XP Cl.I, II Div.1 Gr.A-G, Zone 1,2	PMP51, PMP55	X		- 4 to 20 mA HART	- XA00567P/00
CSA	CA	C/US IS Cl.I,II,III Div.1 Gr.A-G, C/US IS Cl.I Div.2 Gr.A-D, Ex ia	PMC51, PMP51, PMP55	X	X	- 4...20 mA HART - PROFIBUS PA, FOUNDATION Fieldbus	- XA00556P/00 - XA00558P/00
	CB	CSA C/US CP Cl.I, II Div.1 Gr.B-G, Ex d (factory sealed) Zone 1,2	PMP51, PMP55	X	—	- 4 to 20 mA HART	- ZD00249P/00
	CC	CSA C/US Cl.II, III Div.1 Gr.E-G, Zone 21,22	PMP51, PMP55	X	X	- 4 to 20 mA HART	- In preparation
	C1	CSA C/US IS/XP Cl.I, II Div.1 Gr.A-G/B-G, Zone 1,2	PMP51, PMP55	X	—	- 4...20 mA HART - PROFIBUS PA, FOUNDATION Fieldbus	- XA00577P/00 - XA00561P/00
FM CSA	8B	FM/CSA IS + XP Cl.I, II Div.1 Gr.A-D/B-G FM IS/FM XP Cl.I, II Div.1 Gr.A-G+ CSA IS/XP Cl.I, II Div.1 Gr.A-G, Zone 1,2	PMP55	X	—	- 4 to 20 mA HART	- In preparation

## Accessories

### Shutoff valve

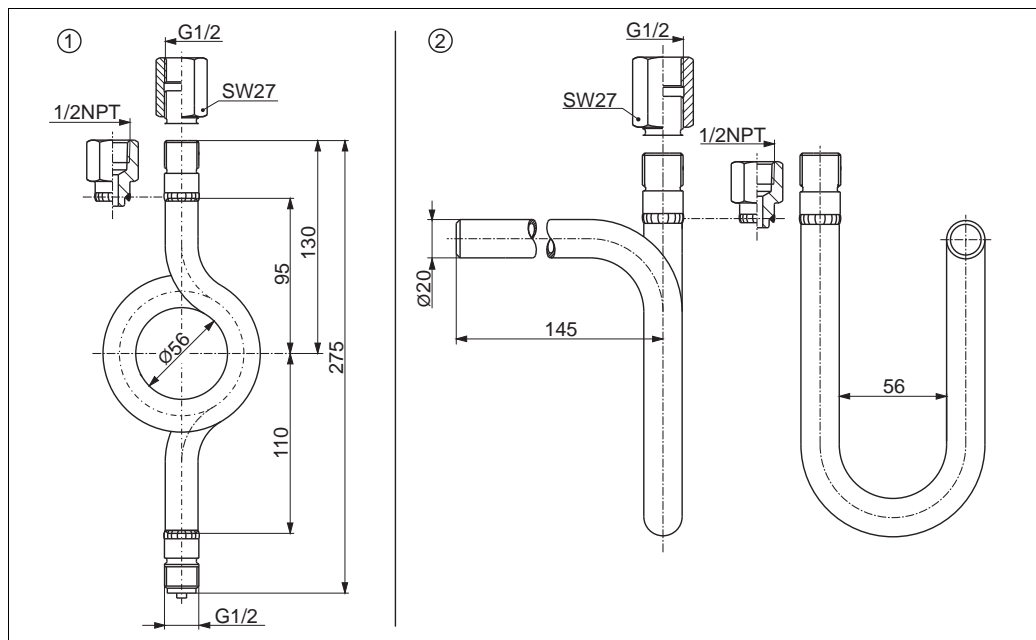


P01-xiMaxxxxx-06-xx-xx-xx-001

Max. working pressure [bar (psi)]	Connection thread [d]	Material	Version in the order code <sup>1)</sup>
400 (5800)	G1/2	C22.8 (1.0460)	R1A1
		316Ti (1.4571)	R1A2, B1A2
	NPT1/2	C22.8 (1.0460)	R1D1
		316Ti (1.4571)	R1D2, B1D2

1) See also → 82 ff, feature 620, "Accessory enclosed", version "P2".

### Siphon



P01-PMMaxxxxx-06-xx-xx-xx-002

Nr	Max. Betriebsdruck [bar (psi)]	Max. operating temperature °C (°F) in front of the siphon (process side)	Connection thread [d]	Material	Version in the order code <sup>1)</sup>
1	<ul style="list-style-type: none"> <li>■ 104 (1508)</li> <li>■ 120 (1740)</li> </ul>	<ul style="list-style-type: none"> <li>■ 400 (752)</li> <li>■ 300 (572)</li> </ul>	G1/2	1.0345	RA21
				316Ti (1.4571)	RA22, BA22
	<ul style="list-style-type: none"> <li>■ 160 (2320)</li> </ul>	<ul style="list-style-type: none"> <li>■ 120 (248)</li> </ul>	NPT1/2	316Ti (1.4571)	BB22
2			G1/2	1.0345	RC11
			NPT1/2	1.0345	RD11

1) See also → 82 ff, feature 620, "Accessory enclosed", version "P4".

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**Welding necks and Weld-in tool flanges**      See technical Information TI00426F/00.

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**Mounting bracket for wall and pipe mounting**      →  26 ff

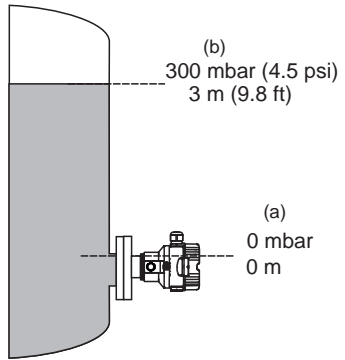
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**M12 connector**      →  18 ff

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## Configuration data sheet (HART, PROFIBUS PA, FOUNDATION Fieldbus electronics)

**Level** The following configuration data sheet has to be filled in and included with the order if the version "K - Customized level" has been selected in feature 90 "Calibration; Unit" in the product structure.

Pressure Engineering Unit		Output Unit (Scaled unit)																																						
<input type="checkbox"/> mbar <input type="checkbox"/> mmH <sub>2</sub> O <input type="checkbox"/> mmHg <input type="checkbox"/> Pa <input type="checkbox"/> bar <input type="checkbox"/> mH <sub>2</sub> O <input type="checkbox"/> kgf/cm <sup>2</sup> <input type="checkbox"/> kPa <input type="checkbox"/> psi <input type="checkbox"/> ftH <sub>2</sub> O <input type="checkbox"/> inH <sub>2</sub> O <input type="checkbox"/> MPa	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr style="border-bottom: 1px solid black;"> <th style="text-align: left; padding: 2px;">Mass</th> <th style="text-align: left; padding: 2px;">Length</th> <th style="text-align: left; padding: 2px;">Volume</th> <th style="text-align: left; padding: 2px;">Volume</th> <th style="text-align: left; padding: 2px;">Percent</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;"><input type="checkbox"/> kg</td> <td style="padding: 2px;"><input type="checkbox"/> m</td> <td style="padding: 2px;"><input type="checkbox"/> l</td> <td style="padding: 2px;"><input type="checkbox"/> gal</td> <td style="padding: 2px;"><input type="checkbox"/> %</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/> t</td> <td style="padding: 2px;"><input type="checkbox"/> dm</td> <td style="padding: 2px;"><input type="checkbox"/> hl</td> <td style="padding: 2px;"><input type="checkbox"/> lgal</td> <td></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/> lb</td> <td style="padding: 2px;"><input type="checkbox"/> cm</td> <td style="padding: 2px;"><input type="checkbox"/> m<sup>3</sup></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="padding: 2px;"><input type="checkbox"/> mm</td> <td style="padding: 2px;"><input type="checkbox"/> ft<sup>3</sup></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="padding: 2px;"><input type="checkbox"/> ft</td> <td style="padding: 2px;"><input type="checkbox"/> in<sup>3</sup></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="padding: 2px;"><input type="checkbox"/> inch</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Mass	Length	Volume	Volume	Percent	<input type="checkbox"/> kg	<input type="checkbox"/> m	<input type="checkbox"/> l	<input type="checkbox"/> gal	<input type="checkbox"/> %	<input type="checkbox"/> t	<input type="checkbox"/> dm	<input type="checkbox"/> hl	<input type="checkbox"/> lgal		<input type="checkbox"/> lb	<input type="checkbox"/> cm	<input type="checkbox"/> m <sup>3</sup>				<input type="checkbox"/> mm	<input type="checkbox"/> ft <sup>3</sup>				<input type="checkbox"/> ft	<input type="checkbox"/> in <sup>3</sup>				<input type="checkbox"/> inch			
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	<input type="checkbox"/> ft	<input type="checkbox"/> in <sup>3</sup>																																						
	<input type="checkbox"/> inch																																							
Empty pressure [a]: Low pressure value (empty) _____ [pres. eng. unit]	<b style="text-align: center;">Example</b> 																																							
Full pressure [b]: High pressure value (full) _____ [pres. eng. unit]	Empty calibration [a]: Low level value (empty) _____ [Scaled Unit]																																							
Full calibration [b]: High level value (full) _____ [Scaled Unit]		Full pressure [b]: High pressure value (full) _____ [pres. eng. unit]			Full calibration [b]: High level value (full) _____ [Scaled Unit]																																			
Display Information																																								
1st Value Display <sup>1)</sup> <input type="checkbox"/> Main Value		2nd Value Display <sup>1)</sup> <input type="checkbox"/> none (Default) <input type="checkbox"/> Main Value [%] <input type="checkbox"/> Pressure <input type="checkbox"/> Current [mA] (HART only) <input type="checkbox"/> Temperature																																						
<sup>1)</sup> Depending on sensor and communication variant																																								
Damping																																								
Damping: _____ sec (Default 2 sec)																																								

**Pressure**

The following configuration data sheet has to be filled in and included with the order if the version "J - Customized pressure" has been selected in feature 90 "Calibration; Unit" in the product structure.

<b>Pressure Engineering Unit</b>	
<input type="checkbox"/> mbar	<input type="checkbox"/> mmH <sub>2</sub> O
<input type="checkbox"/> bar	<input type="checkbox"/> mH <sub>2</sub> O
<input type="checkbox"/> psi	<input type="checkbox"/> inH <sub>2</sub> O
<input type="checkbox"/> mmHg	<input type="checkbox"/> kgf/cm <sup>2</sup>
<input type="checkbox"/> Pa	<input type="checkbox"/> kPa
<input type="checkbox"/> MPa	
<b>Calibration Range / Output</b>	
Low range value (LRV): _____	[pressure engineering unit]
Upper range value (URV): _____	[pressure engineering unit]
<b>Display Information</b>	
1st Value Display <sup>1)</sup>	2nd Value Display <sup>1)</sup>
<input type="checkbox"/> Main Value	<input type="checkbox"/> none (Default)
	<input type="checkbox"/> Main Value [%]
	<input type="checkbox"/> Pressure
	<input type="checkbox"/> Current [mA] (HART only)
	<input type="checkbox"/> Temperature
<sup>1)</sup> Depending on sensor and communication variant	
<b>Damping</b>	
Damping: _____ sec (Default 2 sec)	

Note!  
Smallest calibratable span (preset at the factory) → 8 ff.

## Configuration data sheet (analog electronics)

### Pressure

The following configuration data sheet has to be filled in and included with the order if the version "J - Customized pressure" has been selected in feature 90 "Calibration; Unit" in the product structure.

Pressure Engineering Unit	
<input type="checkbox"/> mbar	<input type="checkbox"/> mmH <sub>2</sub> O
<input type="checkbox"/> bar	<input type="checkbox"/> mH <sub>2</sub> O
<input type="checkbox"/> psi	<input type="checkbox"/> inH <sub>2</sub> O
<input type="checkbox"/> mmHg	<input type="checkbox"/> Pa
<input type="checkbox"/> kgf/cm <sup>2</sup>	<input type="checkbox"/> kPa
	<input type="checkbox"/> MPa
Calibration Range / Output	
Low range value (LRV): _____	[pressure engineering unit]
Upper range value (URV): _____	[pressure engineering unit]
Display	
1st Value Display <sup>1)</sup>	2nd Value Display <sup>1)</sup>
<input type="checkbox"/> Main Value	<input type="checkbox"/> none (Default)
<sup>1)</sup> Depending on sensor and communication variant	
Damping	
Damping: _____ sec (Default 2 sec)	

Note!

Smallest calibratable span (preset at the factory) → 8 ff.









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