

Technical Information

Cerabar S ↓ PMC71, PMP71, PMP75

Process pressure measurement

Pressure transmitter with ceramic and metal sensors



Applications

The device is used for the following measuring tasks:

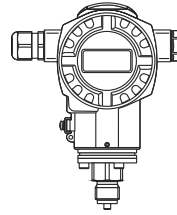
- Absolute pressure and gauge pressure measurement in gases, steams or liquids in all areas of process engineering and process measurement technology
- Level, volume or mass measurements in liquids
- High process temperatures
 - up to 150 °C (302 °F) without diaphragm seal
 - up to 400 °C (752 °F) with typical diaphragm seals
- High pressures up to 700 bar (10 500 psi)
- Low-energy version with voltage output (1-5V DC), e.g. for operation on solar-operated control units (Remote Terminal Unit (RTU))

Your benefits

- Very good reproducibility and long-term stability
- High reference accuracy up to $\pm 0.025\%$
- Turn down up to 100:1, higher on request
- Used for process pressure monitoring up to SIL 3, certified to IEC 61508 by TÜV SÜD
- High level of safety during operation thanks to function monitoring from the measuring cell to the electronics
- Easy electronics replacement guaranteed with HistoROM®/M-DAT

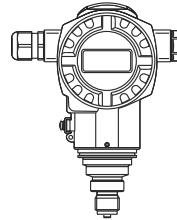
Function and system design

Device features



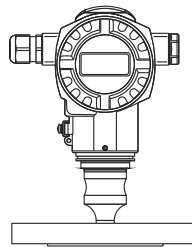
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PMC71 with capacitive measuring cell and ceramic process isolating diaphragm (Ceraphire®)



A0020463

PMP71 with piezoresistive measuring cell and metallic welded process isolating diaphragm



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PMP75 with diaphragm seal

Field of application

- Gauge pressure and absolute pressure
- Level

Process connections

PMC71:

- Thread
- EN flanges DN 25 – DN 80
- ANSI flanges 1" – 4"
- JIS flanges 50 A – 100 A

PMP71:

- Thread
- DN 25 – DN 80
- ASME 1 ½" – 4"
- JIS 25 A – 100 A
- Oval flange adapters
- Prepared for diaphragm seal mount

PMP75:

Wide range of diaphragm seals

Measuring ranges

- PMC71: From –100/0 to 100 mbar (–1.5/0 to 1.5 psi) to –1/0 to 40 bar (–15/0 to 600 psi)
- PMP71: From –400/0 to 400 mbar (–6/0 to 6 psi) to –1/0 to 700 bar (–15/0 to 10500 psi)
- PMP75: From –400/0 to 400 mbar (–6/0 to 6 psi) to –1/0 to 400 bar (–15/0 to 6000 psi)

OPL

- PMC71: max. 60 bar (900 psi)
- PMP71: max. 1050 bar (15 750 psi)
- PMP75: max. 600 bar (9 000 psi)

Process temperature range (temperature at process connection)

- PMC71: -25 to +125 °C (-13 to +257 °F)
-20 to +150 °C (-4 to +302 °F) (High-temperature version, see Product Configurator "Additional option 1" or 110 "Additional option 2" section, option "T")
- PMP71: -40 to +125 °C (-40 to +257 °F)
- PMP75: -70 to +400 °C (-94 to +752 °F)
(depending on the filling oil)

Ambient temperature range

- Without LCD display: up to -60 to +85 °C (-76 to +185 °F)
- With LCD display: -20 to +70 °C (-4 to +158 °F)
(extended temperature application range -60 to +85 °C (-76 to +185 °F) with limitations in optical properties, such as display speed and contrast)
- Separate housing: -20 to +60 °C (-4 to +140 °F)
- PMP75: Diaphragm seal systems depending on the version

Reference accuracy

- PMC71: Up to ±0.05% of the set span
PLATINUM version: up to ±0.025 % of the set span
- PMP71: Up to ±0.05% of the set span
PLATINUM version: up to ±0.025 % of the set span
- PMP75: Up to ±0.075% of the set span

Supply voltage

Supply voltage non-Ex

- 4 to 20 mA HART: 10.5 to 45 V DC
- 1-5V DC: 9 to 35 V DC
- PROFIBUS PA and FOUNDATION Fieldbus: 9 to 32 V DC

Supply voltage Ex ia

10.5 to 30 V DC

Supply voltage Ex d (1-5V DC)

9 to 35 V DC

Output

- 4 to 20 mA with superimposed HART protocol
- 1-5V DC
- PROFIBUS PA
- FOUNDATION Fieldbus

Options

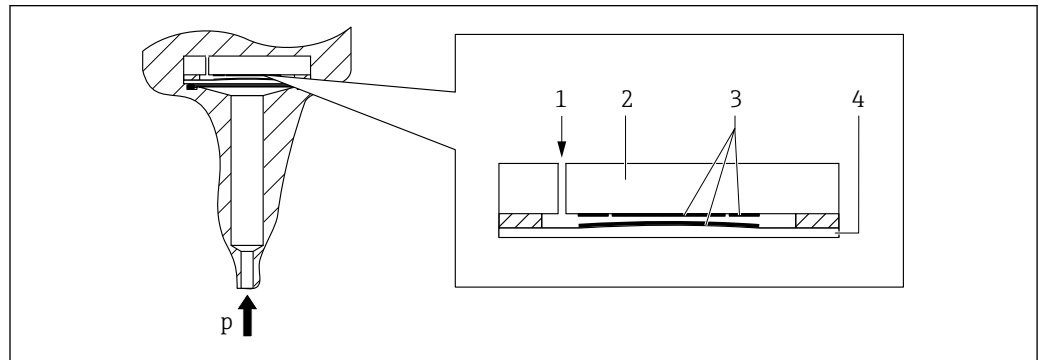
- Inspection certificate 3.1
- HistoROM®/M-DAT memory chip
- Separate housing
- PMP75: gold-coated process isolating diaphragm
- PMP71, PMP75: gold-rhodium coated process isolating diaphragm
- PMP71, PMP75: NACE-compliant materials

Specialties

- PMC71:
 - Metal-free measurement with PVDF connection
 - Special cleaning of the transmitter to remove paint-wetting substances, for use in paint shops
- PMP71:
 - Process connections with minimum oil volume
 - Gas-tight, elastomer-free
- PMP75:
 - Wide range of diaphragm seals
 - For high medium temperatures
 - Process connections with minimum oil volume
 - Completely welded versions

Measuring principle

Devices with ceramic process isolating diaphragm (Ceraphire®)



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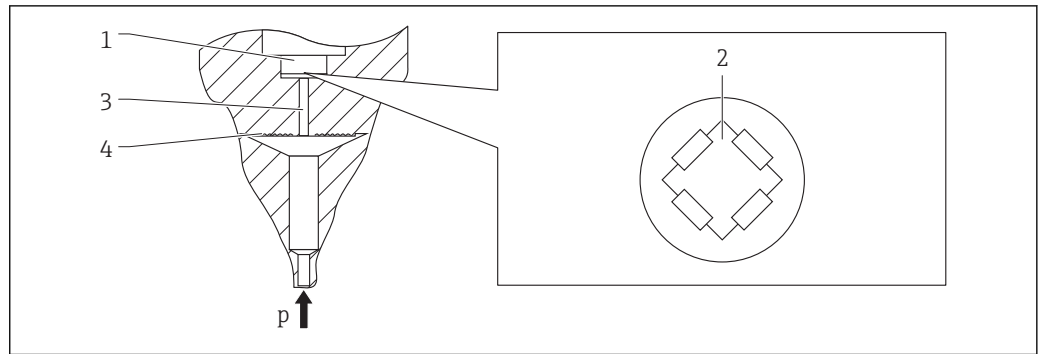
- 1 Air pressure (gauge pressure sensors)
- 2 Ceramic substrate
- 3 Electrodes
- 4 Ceramic process isolating diaphragm

The ceramic sensor is an oil-free sensor, i.e. the process pressure acts directly on the robust ceramic process isolating diaphragm and causes it to deflect. 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 (see "OPL" column in table) → ☺ 13)
- The ultrapure 99.9% ceramic (Ceraphire®, see also "www.endress.com/ceraphire") ensures:
 - Extremely high chemical durability
 - High mechanical durability
- Suitable for vacuums
- Secondary containment for enhanced integrity
- Process temperatures up to 150 °C (302 °F)

Devices with metallic process isolating diaphragm



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

PMP71

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

Advantages:

- Can be used for process pressures up to 700 bar (10 500 psi)
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Secondary containment for enhanced integrity
- Significantly reduced thermal effect e.g. compared to diaphragm seal systems with capillaries

PMP75

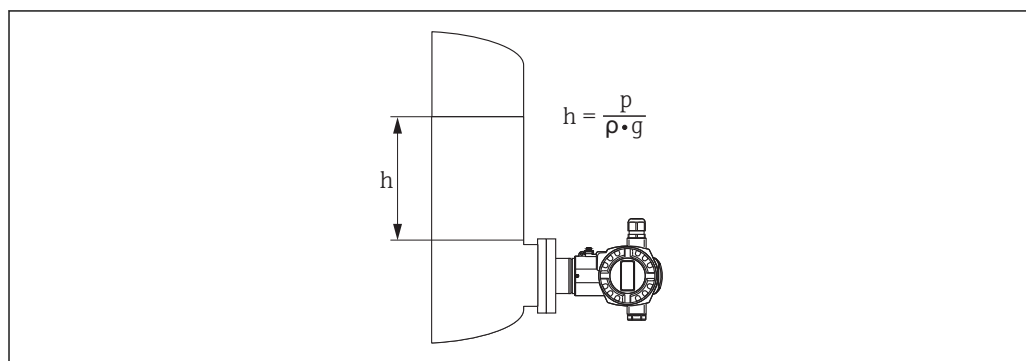
The operating pressure acts on the process isolating diaphragm of the diaphragm seal and is transferred to the process isolating diaphragm of the sensor by a diaphragm seal fill fluid. The process isolating diaphragm is deflected and a fill fluid transfers the pressure to a resistance measuring bridge.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

Advantages:

- Depending on the version, can be used for process pressures up to 400 bar (6 000 psi) and for extreme process temperatures
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Secondary containment for enhanced integrity

Product design

Level measurement (level, volume and mass):



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

Your benefits

- Selection of the level operating mode which is optimum for your application in the device software
- Volume and mass measurements in any vessel shape by means of a freely programmable characteristic curve
- Choice of diverse level units with automatic unit conversion
- A customized unit can be specified.
- Has a wide range of uses, e.g.
 - for foam formation
 - in vessels with agitators or screen fittings
 - for liquid gases

Applications suitable for custody transfer measurement

The Parts Certificate is issued on the basis of the following standards:

- WELMEC guide 8.8 "General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID".
- OIML R117-1 Edition 2007 (E) "Dynamic measuring systems for liquids other than water".
- EN 12405-1/A1 Edition 2006 "Gas meters – Conversion devices – Part 1: Volume conversion".

Communication protocol

- 4 to 20 mA with HART communication protocol
- PROFIBUS PA
 - Endress+Hauser devices meet the requirements specified by the FISCO model.
 - Due to a low current consumption of $13 \text{ mA} \pm 1 \text{ mA}$, the following number of devices can be operated on one bus segment if installing as per FISCO: up to 7 devices for Ex ia, CSA IS and FM IS applications or up to 27 devices 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
 - Endress+Hauser devices meet the requirements specified by the FISCO model.
 - Due to a low current consumption of $15.5 \text{ mA} \pm 1 \text{ mA}$, the following number of devices can be operated on one bus segment if installing as per FISCO: up to 6 devices for Ex ia, CSA IS and FM IS applications or up to 24 devices 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

Measured process variables

- Absolute pressure
- Gauge pressure

Measuring range

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

Sensor	Maximum sensor measuring range		Lowest calibratable span ¹⁾	MWP	OPL	Vacuum resistance	Option ²⁾
	lower (LRL)	upper (URL)					
	[bar (psi)]	[bar (psi)]					
100 mbar (1.5 psi)	-0.1 (-1.5)	+0.1 (+1.5)	0.005 (0.075)	2.7 (40.5)	4 (60)	0.7 (10.5)	1C
250 mbar (3.75 psi)	-0.25 (-3.75)	+0.25 (+3.75)	0.005 (0.075)	3.3 (49.5)	5 (75)	0.5 (7.5)	1E
400 mbar (6 psi)	-0.4 (-6)	+0.4 (+6)	0.005 (0.075)	5.3 (79.5)	8 (120)	0	1F
1 bar (15 psi)	-1 (-15)	+1 (+15)	0.01 (0.15)	6.7 (100.5)	10 (150)	0	1H
2 bar (30 psi)	-1 (-15)	+2 (+30)	0.02 (0.3)	12 (180)	18 (270)	0	1K
4 bar (60 psi)	-1 (-15)	+4 (+60)	0.04 (0.6)	16.7 (250.5)	25 (375)	0	1M
10 bar (150 psi)	-1 (-15)	+10 (+150)	0.1 (1.5)	26.7 (400.5)	40 (600)	0	1P
40 bar (600 psi)	-1 (-15)	+40 (+600)	0.4 (6)	40 (600)	60 (900)	0	1S

- 1) Turndown > 100:1 on request or can be set on device
- 2) Product Configurator, order code for "Sensor range; sensor over pressure limit"

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

Sensor	Maximum sensor measuring range		Lowest calibratable span ¹⁾	MWP	OPL	Vacuum resistance	Option ²⁾
	lower (LRL)	upper (URL)					
	[bar _{abs} (psi _{abs})]	[bar _{abs} (psi _{abs})]					
100 mbar (1.5 psi)	0	+0.1 (+1.5)	0.005 (0.075)	2.7 (40.5)	4 (60)	0	2C
250 mbar (3.75 psi)	0	+0.25 (+3.75)	0.005 (0.075)	3.3 (49.5)	5 (75)	0	2E
400 mbar (6 psi)	0	+0.4 (+6)	0.005 (0.075)	5.3 (79.5)	8 (120)	0	2F
1 bar (15 psi)	0	+1 (+15)	0.01 (0.15)	6.7 (100.5)	10 (150)	0	2H
2 bar (30 psi)	0	+2 (+30)	0.02 (0.3)	12 (180)	18 (270)	0	2K
4 bar (60 psi)	0	+4 (+60)	0.04 (0.6)	16.7 (250.5)	25 (375)	0	2M
10 bar (150 psi)	0	+10 (+150)	0.1 (1.5)	26.7 (400.5)	40 (600)	0	2P
40 bar (600 psi)	0	+40 (+600)	0.4 (6)	40 (600)	60 (900)	0	2S

- 1) Turndown > 100:1 on request or can be set on device
- 2) Product Configurator, order code for "Sensor range; sensor over pressure limit"

PMP71 and PMP75 – metal process isolating diaphragm for gauge pressure

Sensor	Maximum sensor measuring range		Lowest calibratable span ¹⁾	MWP	OPL	Vacuum resistance ²⁾	Option ³⁾
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar (psi)]	[bar (psi)]				[bar _{abs} (psi _{abs})]	
400 mbar (6 psi)	-0.4 (-6)	+0.4 (+6)	0.005 (0.075)	4 (60)	6 (90)	0.01/0.04 (0.15/0.6)	1F
1 bar (15 psi)	-1 (-15)	+1 (+15)	0.01 (0.15)	6.7 (100)	10 (150)		1H
2 bar (30 psi)	-1 (-15)	+2 (+30)	0.02 (0.3)	13.3 (200)	20 (300)		1K
4 bar (60 psi)	-1 (-15)	+4 (+60)	0.04 (0.6)	18.7 (280.5)	28 (420)		1M
10 bar (150 psi)	-1 (-15)	+10 (+150)	0.1 (1.5)	26.7 (400.5)	40 (600)		1P
40 bar (600 psi)	-1 (-15)	+40 (+600)	0.4 (6)	100 (1500)	160 (2400)		1S
100 bar (1500 psi)	-1 (-15)	+100 (+1500)	1.0 (15)	100 (1500)	400 (6000) ⁴⁾		1U
400 bar (6000 psi)	-1 (-15)	+400 (+6000)	4.0 (60)	400 (6000)	600 (9000)		1W
700 bar (10500 psi) ⁵⁾	-1 (-15)	+700 (+10500)	7.0 (105)	700 (10500)	1050 (15750)		1X

- 1) Turn down > 100:1 on request or can be set on device
- 2) The vacuum resistance applies for the measuring cell under reference operating conditions. A ceramic process isolating diaphragm is recommended for applications in the limit range. For type PMP75, the pressure and temperature application limits of the selected filling oil must also be observed → 115.
- 3) Product Configurator, order code for "Sensor range; sensor over pressure limit"
- 4) If the option "JN" is ordered in the order code for "Test, certificate", then the OPL is 160 bar (2400 psi).
- 5) PMP71 only, PMP75 on request

PMP71 and PMP75 – metal process isolating diaphragm for absolute pressure

Sensor	Maximum sensor measuring range ¹⁾		Lowest calibratable span ²⁾	MWP	OPL	Vacuum resistance ³⁾	Option ⁴⁾
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar _{abs} (psi _{abs})]	[bar _{abs} (psi _{abs})]				[bar (psi)]	
400 mbar (6 psi)	0	+0.4 (+6)	0.005 (0.075)	4 (60)	6 (90)	0.01/0.04 (0.15/0.6)	2F
1 bar (15 psi)	0	+1 (+15)	0.01 (0.15)	6.7 (100)	10 (150)		2H
2 bar (30 psi)	0	+2 (+30)	0.02 (0.3)	13.3 (200)	20 (300)		2K
4 bar (60 psi)	0	+4 (+60)	0.04 (0.6)	18.7 (280.5)	28 (420)		2M
10 bar (150 psi)	0	+10 (+150)	0.1 (1.5)	26.7 (400.5)	40 (600)		2P
40 bar (600 psi)	0	+40 (+600)	0.4 (6)	100 (1500)	160 (2400)		2S
100 bar (1500 psi)	0	+100 (+1500)	1.0 (15)	100 (1500)	400 (6000) ⁵⁾		2U
400 bar (6000 psi)	0	+400 (+6000)	4.0 (60)	400 (6000)	600 (9000)		2W
700 bar (10500 psi) ⁶⁾	0	+700 (+10500)	7.0 (105)	700 (10500)	1050 (15750)		2X

- 1) PMP75: Within the sensor measuring range, the minimum upper range value of 80 mbar_{abs} (1.16 psi_{abs}) must be observed.
- 2) Turn down > 100:1 on request or can be set on device
- 3) The vacuum resistance applies for the measuring cell under reference operating conditions. A ceramic process isolating diaphragm is recommended for applications in the limit range. For type PMP75, the pressure and temperature application limits of the selected filling oil must also be observed → 115.
- 4) Product Configurator, order code for "Sensor range; sensor over pressure limit"
- 5) If the option "JN" is ordered in the order code for "Test, certificate", then the OPL is 160 bar (2400 psi).
- 6) PMP71 only, PMP75 on request

PMP71 - metallic process isolating diaphragms for absolute pressure with MID parts certificate

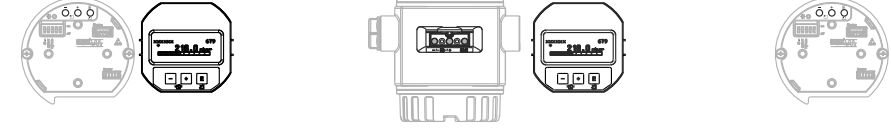
Sensor	Maximum sensor measuring range		Min. WP for gas applications suitable for custody transfer measurement	Min. WP for liquid applications suitable for custody transfer measurement	MWP	OPL	Vacuum resistance ¹⁾	Option ²⁾
	lower (LRL) ³⁾	upper (URL) ⁴⁾					Silicone oil/ Inert oil	
[bar (psi)]	[bar _{abs} (psi _{abs})]	[bar _{abs} (psi _{abs})]	[bar (psi)]	[bar (psi)]	[bar _{abs} (psi _{abs})]	[bar _{abs} (psi _{abs})]	[bar (psi)]	
10 (150)	0	+10 (150)	0.5 (7.5)	0.5 (7.5)	26.7 (400.5)	40 (600)	0.01/0.04 (0.15/1)	MP
50 (750)	0	+50 (750)	10 (150)	2.5 (37.5)	100 (1500)	400 (6000)	0.01/0.04 (0.15/1)	MT
100 (1500)	0	+100 (1500)	5 (75)	5 (75)	100 (1500)	400 (6000)	0.01/0.04 (0.15/1)	MU

- 1) The vacuum resistance applies to the measuring cell under reference operating conditions
- 2) Product Configurator, order code for "Sensor range; sensor over pressure limit"
- 3) By default, the device is set to a lower sensor measuring range of 0 bar. Please specify when ordering if the lower sensor measuring range is to be set to a different default value.
- 4) Max. WP (working pressure) for gas and liquid applications suitable for calibration to regulatory standards

Output

Output signal

- 4 to 20 mA with superimposed digital communication protocol HART, 2-wire
- 1-5V DC, 3-wire
- Digital communication signal PROFIBUS PA (Profile 3.0), 2-wire
 - Signal coding: Manchester Bus Powered (MBP): Manchester II
 - Transmission rate: 31.25 KBit/s voltage mode
- Digital communication signal FOUNDATION Fieldbus, 2-wire
 - Signal coding: Manchester Bus Powered (MBP): Manchester II
 - Transmission rate: 31.25 KBit/s voltage mode

Output	Internal + LCD	External + LCD	Internal
			
	Option ¹⁾		
4 to 20mA HART	B	A	C
4 to 20mA HART, Li=0	E	D	F
1-5V DC	H	G	-
PROFIBUS PA	N	M	O
FOUNDATION Fieldbus	Q	P	R

1) Product Configurator, order code for "Display, operation:"

Signal range

- 4 to 20 mA**
3.8 mA to 20.5 mA
- 1-5V DC**
0.95 to 5.125 V

Signal on alarm

- 4 to 20 mA HART**
As per NAMUR NE43.
- 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
- 1-5V DC**
- Max. alarm: can be set from 5.25 to 5.75 V
 - Min. Alarm: 0.9 V
- PROFIBUS PA**
As per NAMUR NE43.
Can be set in the Analog Input Block.
- Options:
- Last Valid Out Value (factory setting)
 - Fail Safe Value
 - Status bad
- FOUNDATION Fieldbus**
As per NAMUR NE43.
Can be set in the Analog Input Block.

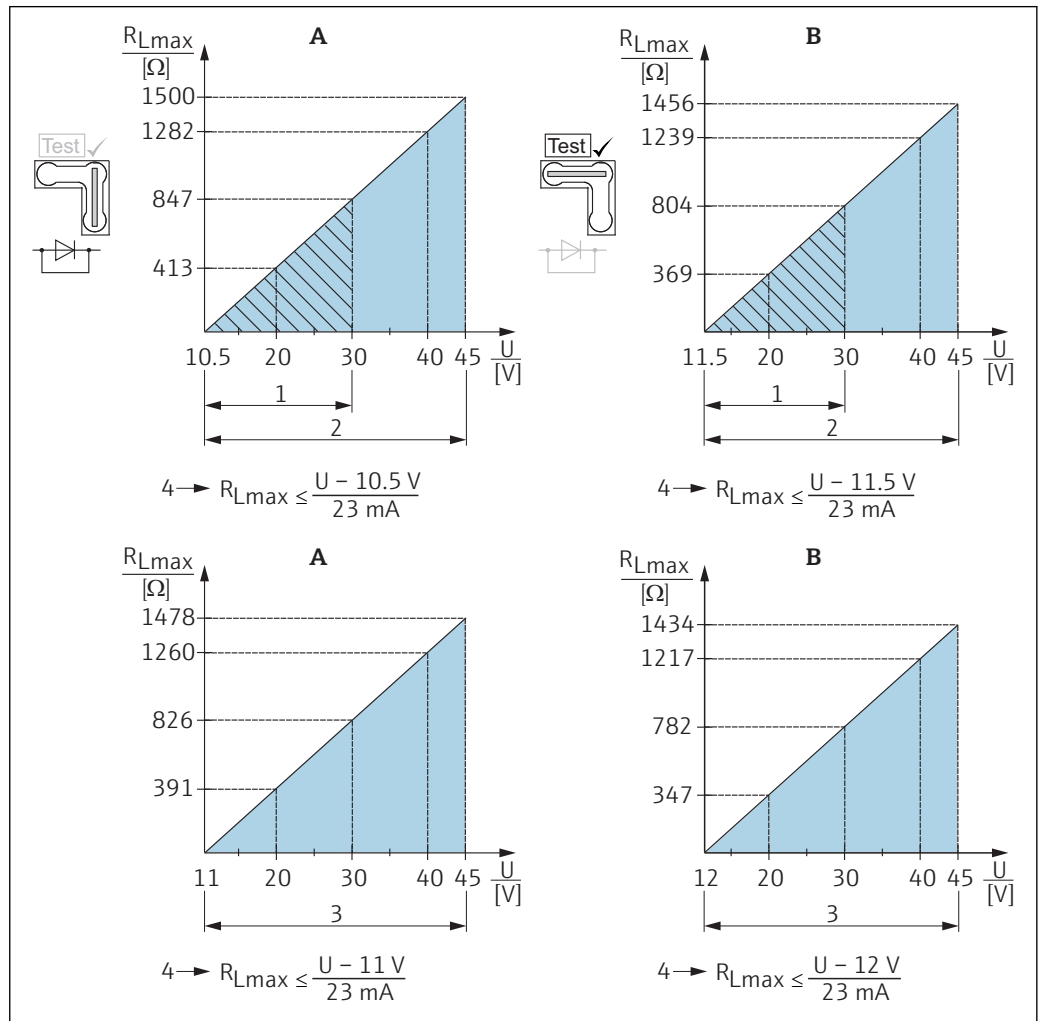
Options:

- Last Good Value
- Fail Safe Value (factory setting)
- Wrong Value

Load

4 to 20 mA HART

In order to guarantee sufficient terminal voltage in two-wire devices, a maximum load resistance R (including line resistance) must not be exceeded depending on the supply voltage U₀ of the supply unit. In the following load diagrams, observe the position of the jumper and the explosion protection:



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- A Jumper for 4 to 20 mA test signal set to "Non-test" position
- B Jumper for 4 to 20 mA test signal set to "Test" position
- 1 Power supply 10.5 (11.5) to 30 V DC for 1/2 G, 1 GD, 1/2 GD, FM IS, CSA IS, IECEx ia, NEPSI Ex ia
- 2 Power supply 10.5 (11.5) to 45 V DC for devices for non-hazardous areas, 1/2 D, 1/3 D, 2 G Ex d, 3 G Ex nA, FM XP, FM DIP, FM NI, CSA XP, CSA dust ignition-proof, NEPSI Ex d
- 3 Power supply 11 (12) to 45 V DC for PMC71, Ex d[ia], NEPSI Ex d[ia]
- 4 R_{Lmax} maximum load resistance
- U Supply voltage

i When operating via a handheld terminal or via a PC with an operating program, a minimum communication resistor of 250 Ω must be taken into account.

1-5V DC

The load must be at least 100 k Ω .

Damping

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

- via local display, handheld terminal or PC (handheld terminal or PC not for 1-5V DC) with operating program, continuous from 0 to 999 s
- Also for HART and PROFIBUS PA: Via DIP switch on the electronic insert, switch position "on" = set value and "off"
- 1-5V DC: via DIP switch on electronic insert switch position "on" = set value and "off"
- Factory setting: 2 s

Alarm current

Designation	Option ¹⁾
Min alarm current	J
HART burst mode PV	J
Min alarm current + HART burst mode PV	J

1) Product Configurator, order code for "Additional options 1" and "Additional options 2"

Firmware version

Designation	Option ¹⁾
02.20.zz, HART 7, DevRev22	72
02.11.zz, HART 5, DevRev21	73
04.00.zz, FF, DevRev07	74
04.01.zz, PROFIBUS PA, DevRev03	75
02.10.zz, HART 5, DevRev21	76
03.00.zz, FF, DevRev06	77
04.00.zz, PROFIBUS PA	78
02.30.zz, HART 7	71

1) Product Configurator, order code for "Firmware version"

Protocol-specific data HART

Manufacturer ID	17 (11 hex)
Device type ID	24 (18 hex)
Device revision	<ul style="list-style-type: none"> ■ 21 (15 hex) - SW version 02.1y.zz - HART specification 5 ■ 22 (16 hex) - SW version 02.2y.zz - HART specification 7
HART specification	<ul style="list-style-type: none"> ■ 5 ■ 7
DD revision	<ul style="list-style-type: none"> ■ 4 (Russian in language selection) for device revision 21 ■ 3 (Dutch in language selection) for device revision 21 ■ 1 for device revision 22
Device description files (DTM, DD)	Information and files under: <ul style="list-style-type: none"> ■ www.endress.com ■ www.fieldcommgroup.org
HART load	Min. 250 Ω

HART device variables	<p>The measured values are assigned to the device variables as follows:</p> <p>Measured values for PV (primary variable)</p> <ul style="list-style-type: none"> ▪ Pressure ▪ Level ▪ Tank content <p>Measured values for SV, TV (second and third variable)</p> <p>Pressure</p> <p>Measured values for QV (fourth variable)</p> <p>Temperature</p>
Supported functions	<ul style="list-style-type: none"> ▪ Burst mode ▪ Additional transmitter status ▪ Device locking ▪ Alternative measuring modes

Wireless HART data

Minimum starting voltage	11.5 V (default) or 10.5 V if jumper not set to "Test" position ¹⁾
Start-up current	12 mA
Starting time	10 s
Minimum operating voltage	11.5 V (default) or 10.5 V if jumper not set to "Test" position ¹⁾
Multidrop current	4 mA
Time for connection setup	1 s

1) Or higher if operating near the ambient temperature limits (-40 to +85 °C (-40 to +185))

**Protocol-specific data
PROFIBUS PA**

Manufacturer ID	17 (11 hex)
Identification number	1541 hex
Profile version	<p>3.0</p> <ul style="list-style-type: none"> ▪ SW version 03.00.zz ▪ SW version 04.00.zz <p>3.02</p> <p>SW version 04.01.zz (device revision 3)</p> <p>Compatibility with SW version 03.00.zz and higher.</p>
GSD revision	<ul style="list-style-type: none"> ▪ 4 (SW version 3.00.zz and 4.00.zz) ▪ 5 (device revision 3)
DD revision	<ul style="list-style-type: none"> ▪ 1 (SW version 3.00.zz and 4.00.zz) ▪ 1 (device revision 3)
GSD file	Information and files under:
DD files	<ul style="list-style-type: none"> ▪ www.endress.com ▪ www.profibus.org
Output values	<p>Measured values for PV (via Analog Input Function Block)</p> <ul style="list-style-type: none"> ▪ Pressure ▪ Level ▪ Tank content <p>Measured values for SV</p> <ul style="list-style-type: none"> ▪ Pressure ▪ Temperature

Input values	Input value sent from PLC, can be shown on display
Supported functions	<ul style="list-style-type: none"> ▪ Identification & maintenance, simplest device identifier on the control system and nameplate ▪ Condensed status (only with Profile Version 3.02) ▪ Automatic ID number adjustment and switchable to the following ID numbers (only with Profile Version 3.02): <ul style="list-style-type: none"> ▪ 9700: Profile-specific transmitter identification number with the "Classic" or "Condensed" status. ▪ 1501: Compatibility mode for the old Cerabar S generation (PMC731, PMP731, PMC631, PMP635). ▪ 1541: Identification number of the new Cerabar S generation (PMC71, PMP71, PMP75). ▪ Device locking: The device can be locked by hardware or software.

**Protocol-specific data
FOUNDATION Fieldbus**

Manufacturer ID	452B48 hex
Device type	1007 hex
Device revision	<ul style="list-style-type: none"> ▪ 6 - SW version 03.00.zz ▪ 7 - SW version 04.00.zz (FF-912)
DD revision	<ul style="list-style-type: none"> ▪ 3 (device revision 6) ▪ 2 (device revision 7)
CFF revision	<ul style="list-style-type: none"> ▪ 4 (device revision 6) ▪ 1 (device revision 7)
DD files	Information and files under:
CFF files	<ul style="list-style-type: none"> ▪ www.endress.com ▪ www.fieldcommgroup.org
Device tester version (ITK version)	<ul style="list-style-type: none"> ▪ 5.0 (device revision 6) ▪ 6.01 (device revision 7)
Number of ITK test campaign	<ul style="list-style-type: none"> ▪ IT054600 (Device Revision 6) ▪ IT085500 (Device Revision 7)
Link-Master (LAS) capable	Yes
Choice of "Link Master" and "Basic Device"	Yes; Factory setting: Basic Device
Node address	Factory setting: 247 (F7 hex)
Supported functions	<p>Field diagnostics profile (only with FF912)</p> <p>The following methods are supported:</p> <ul style="list-style-type: none"> ▪ Reboot ▪ Configure error as warning or alarm ▪ HistoROM ▪ Peakhold ▪ Alarm info ▪ Sensor trim
Number of VCRs	<ul style="list-style-type: none"> ▪ 44 (device revision 6) ▪ 24 (device revision 7)
Number of Link Objects in VFD	50

Virtual communication references (VCRs)

	Device revision 6	Device revision 7
Permanent Entries	44	1
Client VCRs	0	0
Server VCRs	5	10
Source VCRs	8	43
Sink VCRs	0	0
Subscriber VCRs	12	43
Publisher VCRs	19	43

Link settings

	Device revision 6	Device revision 7
Slot time	4	4
Min. Inter PDU delay	12	10
Max. response delay	10	10

Transducer Blocks

Block	Contents	Output values
TRD1 Block	Contains all parameters related to the measurement	<ul style="list-style-type: none"> ■ Pressure or level (channel 1) ■ Process temperature (channel 2)
Service Block	Contains service information	<ul style="list-style-type: none"> ■ Pressure after damping (channel 3) ■ Pressure peakhold indicator (channel 4) ■ Counter for max. pressure transgressions (channel 5)
Diagnostic block	Contains diagnostic information	Error code via DI channels (channel 0 to 16)
Display block	Contains parameters to configure the onsite display	No output values

Function blocks

Block	Contents	Number Blocks	Execution time		Functionality	
			Device Revision 6	Device Revision 7	Device Revision 6	Device Revision 7
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	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	45 ms	45 ms (without trend and alarm reports)	enhanced	enhanced
Digital Input Block	This block contains the discrete data of the Diagnose Block (selectable via a channel number 0 to 16) and provides them for other blocks at the output.	1	40 ms	30 ms	standard	enhanced
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 Service Block. Channel 1 resets the counter for max. pressure transgressions.	1	60 ms	40 ms	standard	enhanced
PID Block	This block is used as a proportional-integral-derivative controller and can be used universally for closed-loop-control in the field. It enables cascade mode and feedforward control. Input IN can be indicated on the display. The selection is performed in the Display Block (DISPLAY_MAIN_LINE_CONTENT).	1	120 ms	70 ms	standard	enhanced
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	50 ms	40 ms	standard	enhanced
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 enables the selection of maximum, minimum, average and 'first good' values. Inputs IN1 to IN4 can be shown on the display. The selection is performed in the Display Block (DISPLAY_MAIN_LINE_CONTENT).	1	35 ms	35 ms	standard	enhanced
Signal Characterizer Block	The Signal Characterizer Block has two sections, each with an output value that is a non-linear function of the input value. The non-linear function is generated by a single look-up table with 21 arbitrary x-y pairs.	1	30 ms	40 ms	standard	enhanced
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	40 ms	standard	enhanced
Analog Alarm Block	This block contains all process alarm conditions (working like a comparator) and represents them at the output.	1	35 ms	35 ms	standard	enhanced

Additional function block information:

Instantiate Function Block	JA	JA
Number of additional instantiatable function blocks	11	5

Power supply

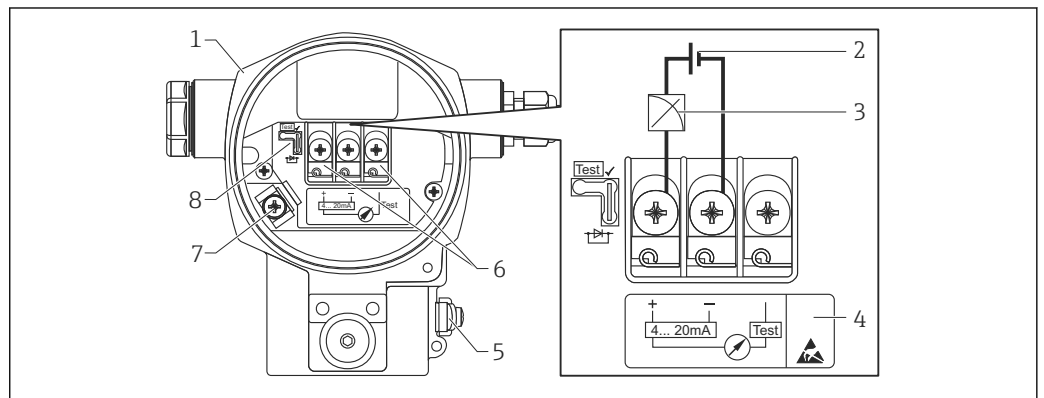
⚠ WARNING

Electrical safety is compromised by an incorrect connection!

- ▶ When using the measuring device in hazardous areas, the relevant national standards and regulations as well as the Safety Instructions or Installation or Control Drawings must be observed → 129.
- ▶ All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all Ex-systems → 129.
- ▶ Devices with integrated overvoltage protection must be grounded → 28.
- ▶ Protective circuits against reverse polarity, HF influences and overvoltage peaks are integrated.

Terminal assignment

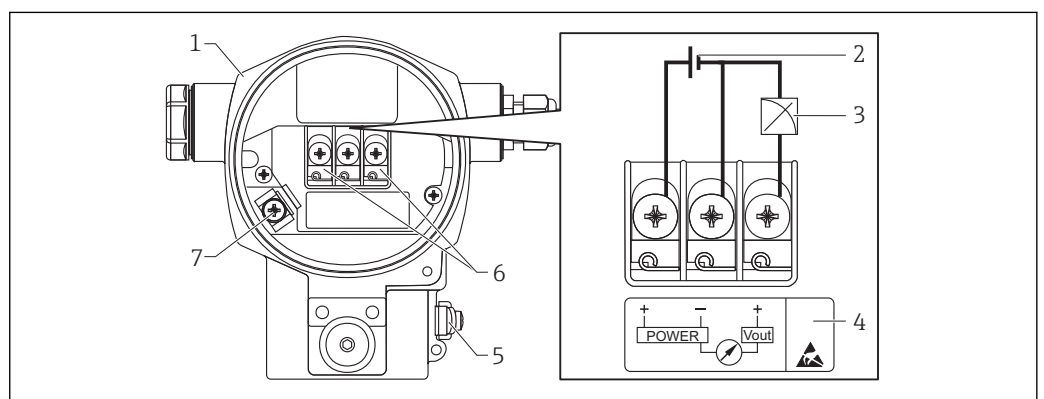
4 to 20 mA HART



A0019989

- 1 Housing
- 2 Supply voltage
- 3 4 to 20 mA
- 4 Devices with integrated overvoltage protection are labeled "OVP" (overvoltage protection) here.
- 5 External ground terminal
- 6 4 to 20 mA test signal between positive and test terminal
- 7 Internal ground terminal
- 8 Jumper for 4 to 20 mA test signal → 24

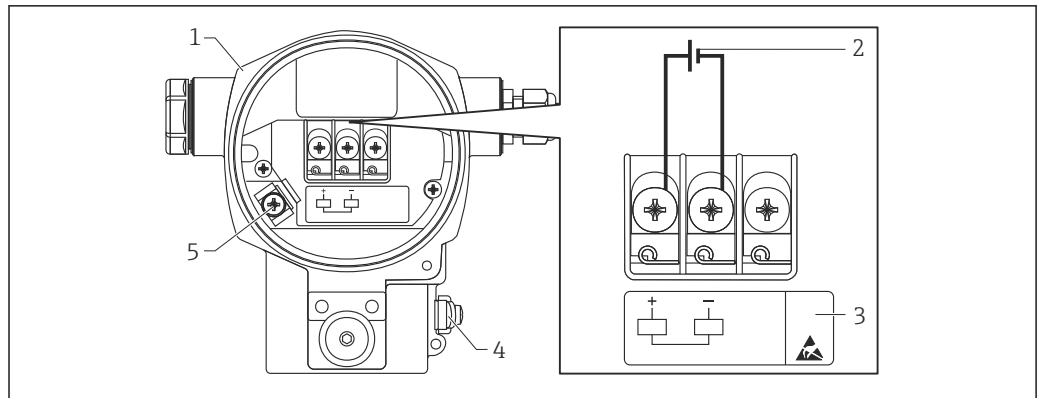
1-5V DC



A0031676

- 1 Housing
- 2 Supply voltage
- 3 1-5V DC
- 4 Overvoltage protection (OVP) marking
- 5 External ground terminal
- 6 Terminals
- 7 Internal ground terminal

PROFIBUS PA and FOUNDATION Fieldbus



A0020158

- 1 Housing
- 2 Supply voltage
- 3 Devices with integrated overvoltage protection are labeled "OVP" (overvoltage protection) here.
- 4 External ground terminal
- 5 Internal ground terminal

Supply voltage

4 to 20 mA HART

Electronic version	Jumper for 4 to 20 mA test signal in "Test" position (delivery status)	Jumper for 4 to 20 mA test signal in "Non-test" position
Version for non-hazardous area	11.5 to 45 V DC	10.5 to 45 V DC
Intrinsically safe	11.5 to 30 V DC	10.5 to 30 V DC
<ul style="list-style-type: none"> ▪ Other types of protection ▪ Devices without certificate 	11.5 to 45 V DC (versions with 35 V DC plug-in connection)	10.5 to 45 V DC (versions with 35 V DC plug-in connection)

Measuring a 4 to 20 mA test signal

Jumper position for test signal	Description
<p style="text-align: right; font-size: small;">A0019992</p>	<ul style="list-style-type: none"> ▪ Measurement of 4-20 mA test signal via the positive and test terminal: Possible. (Thus, the output current can be measured without interruption via the diode.) ▪ As-delivered state ▪ Minimum supply voltage: 11.5 V DC
<p style="text-align: right; font-size: small;">A0019993</p>	<ul style="list-style-type: none"> ▪ Measurement of 4-20 mA test signal via positive and test terminal: Not possible. ▪ Minimum supply voltage: 10.5 V DC

1-5V DC

- Non-hazardous area: 9 to 35 V DC
- Ex-d: 9 to 35 V DC

PROFIBUS PA

- Version for non-hazardous areas: 9 to 32 V DC
- Ex ia: 10.5 to 30 V DC

FOUNDATION Fieldbus

- Version for non-hazardous areas: 9 to 32 V DC
- Ex ia: 10.5 to 30 V DC

Current consumption

- 1-5V DC:
9 V = 1.8 mA
35 V = 0.8 mA
- PROFIBUS PA: 13 mA ±1 mA, switch-on current corresponds to IEC 61158-2, Clause 21
- FOUNDATION Fieldbus: 15.5 mA ±1 mA, switch-on current corresponds to IEC 61158-2, Clause 21

Electrical connection

PROFIBUS PA

The digital communication signal is transmitted to the bus via a two-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 BA00034S "PROFIBUS DP/PA: Guidelines for planning and commissioning" and the PNO Guideline.

FOUNDATION Fieldbus

The digital communication signal is transmitted to the bus via a two-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.

Terminals

- Supply voltage and internal ground terminal: 0.5 to 2.5 mm² (20 to 14 AWG)
- External ground terminal: 0.5 to 4 mm² (20 to 12 AWG)

Cable entries

Approval	Cable gland	Clamping range
Standard, II 1/2 G Ex ia, IS	Plastic M20x1.5	5 to 10 mm (0.2 to 0.39 in)
ATEX II 1/2 D, II 1/3 D, II 1/2 GD Ex ia, II 1 GD Ex ia, II 3 G Ex nA	Metal M20x1.5 (Ex e)	7 to 10.5 mm (0.28 to 0.41 in)

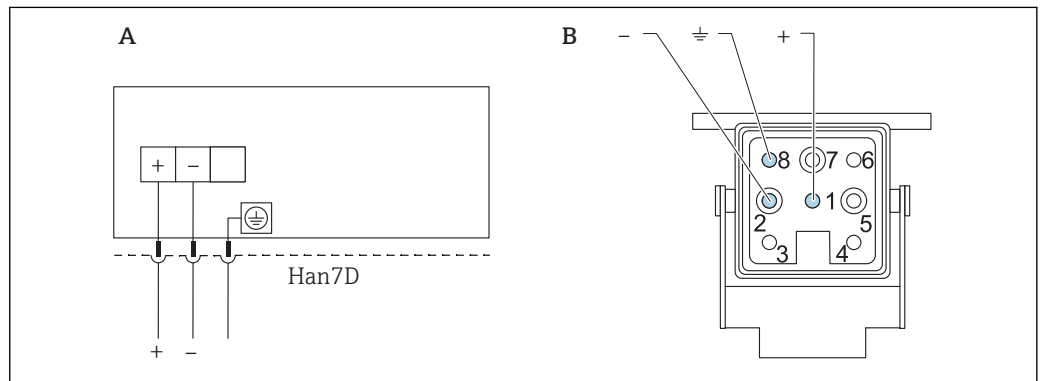
1-5V DC

The cable entries have a 1/2 FNPT thread. The connection on the customer's side is protected by a plastic connector. A cable gland is not envisaged.

For additional technical data, see section on housing → 54

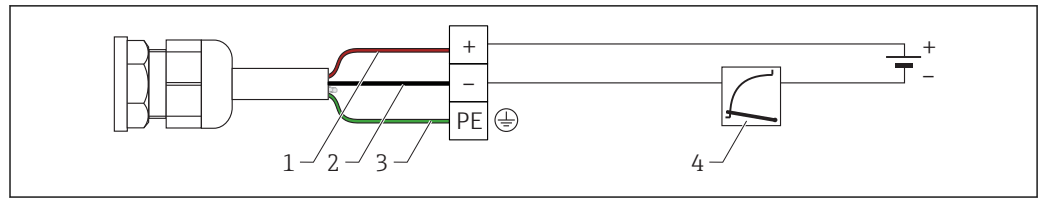
Device plugs

Connection of devices with Harting plug Han7D



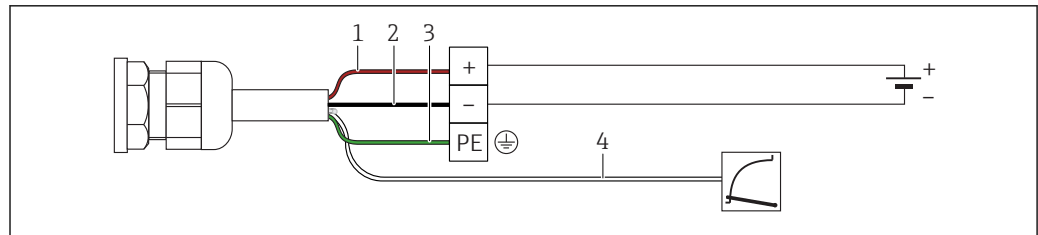
A Electrical connection for devices with Harting plug Han7D
 B View of the plug-in connection on the device

Material: CuZn, contacts for plug-in jack and connector are gold-plated

Cable version connection

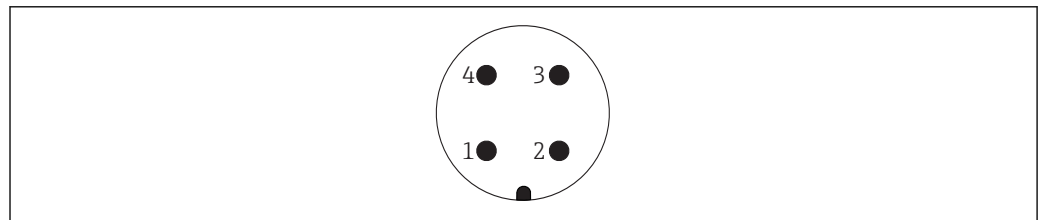
A0019991

- 1 *rd = red*
- 2 *bk = black*
- 3 *gnye = green*
- 4 *4 to 20 mA*

Connection via cable version 1-5V DC

A0032269

- 1 *rd = red*
- 2 *bk = black*
- 3 *gnye = green*
- 4 *1-5V DC*

Connection of devices with M12 plug

A0011175

- 1 *Signal +*
- 2 *Not assigned*
- 3 *Signal -*
- 4 *Ground*

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): IP67
- Order number: 52006263

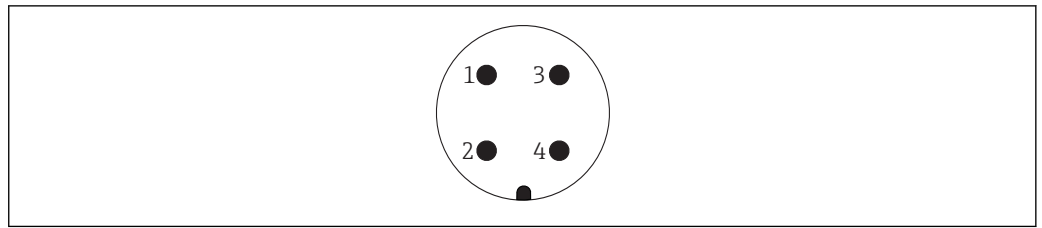
Plug-in jack M 12x1, elbowed

- Material: body PBT/PA; coupling nut GD-Zn, nickel-plated
- Degree of protection (fully locked): IP67
- Order number: 71114212

Cable 4x0.34 mm² (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): IP67
- Order number: 52010285

Connection of devices with 7/8" plug



A001176

- 1 Signal -
- 2 Signal +
- 3 Shielding
- 4 Not assigned

External thread: 7/8 - 16 UNC
 ■ Material: 316L (1.4401)
 ■ Degree of protection: IP68

Cable specification

HART

- Endress+Hauser recommends using shielded, twisted-pair two-wire cables.
- Cable outer diameter: 5 to 9 mm (0.2 to 0.35 in) depending on the cable entry used → 25

1-5V DC

- Endress+Hauser recommends using a shielded cable.
- Cable outer diameter: 5 to 9 mm (0.2 to 0.35 in) depending on the cable entry used → 25


Maximum cable length

The following table shows the tolerance of the voltage output for a representative cable with a length of up to 100 m (328 ft), a resistance of 18 Ohm/km and specification 18 AWG (cable cross-section 0.8 mm²).

Tolerance of voltage output at cable end	Length
0.5 mV	25 m (82 ft)
1 mV	50 m (164 ft)
1.5 mV	75 m (246 ft)
2 mV	100 m (328 ft)

PROFIBUS PA

Use a twisted, shielded twin-core cable, preferably cable type A.

-  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

Use a twisted, shielded twin-core cable, preferably cable type A.

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

Start-up current 12 mA

Residual ripple Without 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)].

**Overvoltage protection
(optionally for HART,
PROFIBUS PA and
FOUNDATION Fieldbus)**

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

Ordering information: Product Configurator, order code for "Additional options 1" or Additional options 2", option "M"

NOTICE**Device could be destroyed!**

- ▶ Devices with integrated overvoltage protection must be grounded.

Influence of power supply

≤ 0.0006 % of URL/1 V

Oxygen applications

Oxygen and other gases can react explosively to oils, grease and plastics, such that, among other things, the following precautions must be taken:

- All components of the system, such as measuring devices, must be cleaned in accordance with the BAM requirements.
- Depending on the materials used, a certain maximum temperature and a 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} .

HB = Cleaned for oxygen service

Order code for devices ¹⁾ , cleaned for oxygen applications	p_{max} for oxygen applications	T_{max} for oxygen applications
PMC71 – * * * * * 2 * * or PMC71 – * * * * * A * * HB, Devices with sensors, nominal value < 10 bar (150 psi)	Over pressure limit (OPL) ^{2) 3)} of sensor	60 °C (140 °F)
PMC71 – * * * * * 2 * *, PMC71 – * * * * * A * * HB, Devices with sensors, nominal value ≥ 10 bar (150 psi)	60 bar (900 psi)	60 °C (140 °F)
PMP71 – * * * * * N * * or PMP71 – * * * * * F * * HB	Depends on the lowest-rated element, with regard to pressure, of the selected components: over pressure limit (OPL) of the sensor, process connection (1.5 x PN) or fill fluid (80 bar (1 200 psi))	60 °C (140 °F)
PMP75 – * * * * * N * * or PMP75 – * * * * * F * * HB	Depends on the lowest-rated element, with regard to pressure, of the selected components: over pressure limit (OPL) of the sensor, process connection (1.5 x PN) or fill fluid (80 bar (1 200 psi))	60 °C (140 °F)

- 1) Devices only, not accessories or enclosed accessories.
- 2) Product Configurator, order code for "Sensor range; sensor over pressure limit (= OPL)"
- 3) PMC71 with PVDF threaded connection or PVDF flange: Only mount with the enclosed mounting bracket. MWP 10 bar (150 psi), OPL max. 15 bar (225 psi). Process temperature range -10 to +60 °C (+14 to +140 °F)

PWIS-free applications

Special cleaning of the transmitter to remove paint-wetting substances, for use in paint shops, for instance.

Ordering information:

Product Configurator, order code for "Seal", option "L" or "M".

Ultrapure gas applications

Endress+Hauser also offers devices for special applications, such as ultrapure gas, cleaned from oil and grease. No special restrictions regarding the process conditions apply to these devices.

Ordering information:

- Product Configurator, order code for "Seal" or
- Product Configurator, order code for "Fill fluid".

Hydrogen applications

A **ceramic** process isolating diaphragm or a **gold-coated** metal process isolating diaphragm offers universal protection against hydrogen diffusion, both in gas applications and in applications with aqueous solutions.

Applications with hydrogen in aqueous solutions

A **gold/rhodium-coated** metal process isolating diaphragm (AU/Rh) offers effective protection against hydrogen diffusion.

Operation in very corrosive environment

PMP75:

For corrosive environments (e.g. maritime environment / coastal areas), Endress+Hauser recommends the use of a PVC or PTFE armor for the capillaries (→ 103).

Process

Process temperature limits For oxygen applications →  49

PMC71 (with ceramic process isolating diaphragm)

- -25 to +125 °C (-13 to +257 °F)
- High-temperature version: -25 to +150 °C (-13 to +302 °F); Product Configurator, order code for "Additional options 1", version "T".
- For saturated steam applications, use a device with a metal process isolating diaphragm, or provide a siphon for temperature isolation when installing.
- Observe the process temperature range of the seal in the following table.

Seal	Notes	Process temperature range	Option ¹⁾
FKM Viton	—	-25 to +125 °C (-13 to +257 °F)/ 150 °C (302 °F) ²⁾	A, L
EPDM 70	FDA 21CFR177.2600	-40 to +125 °C (-40 to +257 °F)/ 150 °C (302 °F) ²⁾	B
EPDM 331	FDA 21CFR177.2600; 3A Class II; USP Class VI DVGW (UBA "KTW", W270), NSF61	-20 to +125 °C (-4 to +257 °F)/ 150 °C (302 °F) ²⁾	B ³⁾
FFKM Perlast G75LT	—	-20 to +125 °C (-4 to +257 °F)/ 150 °C (302 °F) ²⁾	C
Kalrez, Compound 4079	—	+5 to +125 °C (+41 to +257 °F)/ 150 °C (302 °F) ²⁾	D, M
Chemraz, Compound 505	—	-10 to +125 °C (+14 to +257 °F)/ 150 °C (302 °F) ²⁾	E
HNBR	FDA 21CFR177.2600; 3A Class II; KTW; AFNOR; BAM	-25 to +125 °C (-13 to +257 °F)	F ⁴⁾
NBR	—	-10 to +100 °C (+14 to +212 °F)	F
FKM Viton	FDA 21CFR177.2600	-5 to +125 °C (+23 to +257 °F)	G
FKM Viton	cleaned of oil and grease	-10 to +125 °C (+14 to +257 °F)/ 150 °C (302 °F) ²⁾	1
FKM Viton	cleaned for oxygen service	-10 to +60 °C (+14 to +140 °F)	2 or A ⁵⁾
The process temperature ranges specified here refer to permanent application of the PMC71. They may be exceeded for a short time (e.g. for cleaning).			

- 1) Product Configurator, order code for "Seal"
- 2) 150 °C (302 °F) for high-temperature version
- 3) In combination with order code for "Additional options 1" option "F" or with order code for "Process connection" option "MP", "MR", "TD", "TF", "TK" or "TR"
- 4) These seals are used for devices with 3A-approved process connections.
- 5) With option "HB", see Product Configurator, order code for "Service"

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.

PMP71 (with metal process isolating diaphragm)

Designation	Limits
Process connections with internal process isolating diaphragm	-40 to +125 °C (-40 to +257 °F) (150 °C (302 °F) for max. one hour)
Process connections with flush mount process isolating diaphragm ¹⁾	-40 to +100 °C (-40 to +212 °F)

1) Process connection thread ISO 228 G ½" A, DIN 3852: supplied seal for process temperature to -20 °C (-4 °F)

PMP71 (with metal process isolating diaphragm) with MID parts certificate

-25 to +55 °C (-13 to +131 °F)

PMP75 (with diaphragm seal)

- Depending on the design and depending on the diaphragm seal and filling oil: -70 °C (-94 °F) up to +400 °C (+752 °F). Observe temperature application limits of diaphragm seal oil → 115.
- Please observe the maximum gauge pressure and maximum temperature.

Devices with PTFE-coated process isolating diaphragm

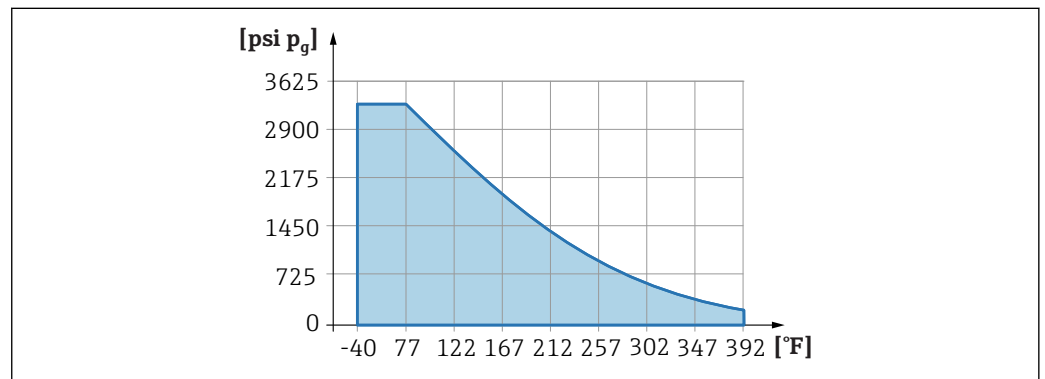
The non-stick coating has excellent gliding properties and is used to protect the process isolating diaphragm against abrasive media.

NOTICE

Incorrect use of the PTFE foil will destroy the device!

- ▶ The PTFE foil used is designed to protect the unit against abrasion. It does not provide protection against corrosive media.

For the range of application of the 0.25 mm (0.01 in) PTFE foil on an AISI 316L (1.4404/1.4435) process isolating diaphragm, see the following diagram:

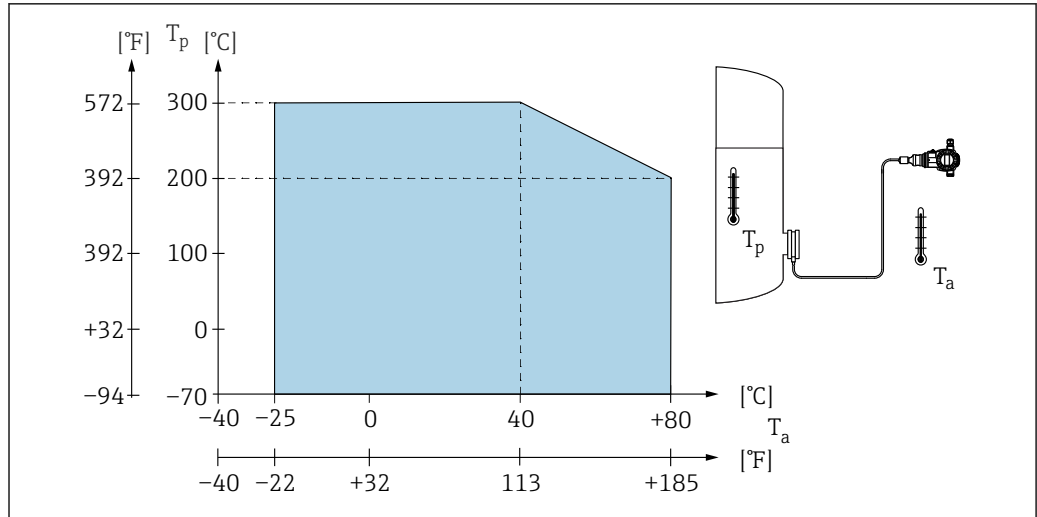


A0026949-EN

i For vacuum applications: $p_{abs} \leq 1 \text{ bar (14.5 psi)}$ to $0.05 \text{ bar (0.725 psi)}$ up to max. +150 °C (302 °F).

Process temperature limits of capillary armoring: PMP75

- 316L: No restrictions
- PTFE: No restrictions
- PVC: See the following diagram



Pressure specifications

⚠ WARNING

The maximum pressure for the measuring device depends on the lowest-rated element with regard to pressure.

- ▶ For pressure specifications, see the "Measuring range" section and the "Mechanical construction" section.
- ▶ The measuring device must be operated only within the specified limits!
- ▶ MWP (maximum working pressure): The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of +20 °C (+68 °F) and may be applied to the device for an unlimited time. Observe the temperature dependency of the MWP. For the pressure values permitted at higher temperatures for flanges, please refer to standards EN 1092-1 (with regard to their stability-temperature property, the materials 1.4435 and 1.4404 are grouped together under EN 1092-1; the chemical composition of the two materials can be identical.), ASME B 16.5a, JIS B 2220 (the latest version of the standard applies in each case).
- ▶ The test pressure corresponds to the over pressure limit of the individual sensors (OPL = 1.5 x MWP (formula does not apply to the PMP71 or PMP75 with a 40 bar (600 psi) or 100 bar (1500 psi) measuring cell)) and may be applied only for a limited period of time to prevent any lasting damage.
- ▶ The Pressure Equipment Directive (2014/68/EU) uses the abbreviation "PS". The abbreviation "PS" corresponds to the MWP (maximum working pressure) of the measuring device.
- ▶ In the case of sensor range and process connections where the over pressure limit (OPL) 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; MWP = PN)
- ▶ In oxygen applications, the values for p_{max} and T_{max} for oxygen applications must not be exceeded → 49.
- ▶ Devices with ceramic process isolating diaphragm: Avoid steam hammering! Steam hammering can cause zero point drifts. Recommendation: Residue (water droplets or condensation) may remain on the process isolating diaphragm following SIP cleaning and can result in local steam hammering the next time steam cleaning takes place. 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.

Burst pressure

Device	Measuring range	Burst pressure
PMP71 ¹⁾	400 mbar (6 psi)...10 bar (150 psi)	100 bar (1 450 psi)
	40 bar (600 psi)	250 bar (3 625 psi)
	100 bar (1 500 psi)	1 000 bar (14 500 psi)
	400 bar (6 000 psi)	2 000 bar (29 000 psi)
	700 bar (10 500 psi)	2 800 bar (40 600 psi)

1) Excluding PMP75 with mounted diaphragm seal system, PMC71 with ceramic membrane, and the universal adapter process connection.

Mechanical construction



For the dimensions, see the Product Configurator: www.endress.com

Search for product → click "Configuration" to the right of the product image → after configuration click "CAD"

The following dimensions are rounded values. For this reason, they may deviate slightly from the dimensions given on www.endress.com.

Device height

The device height is calculated from

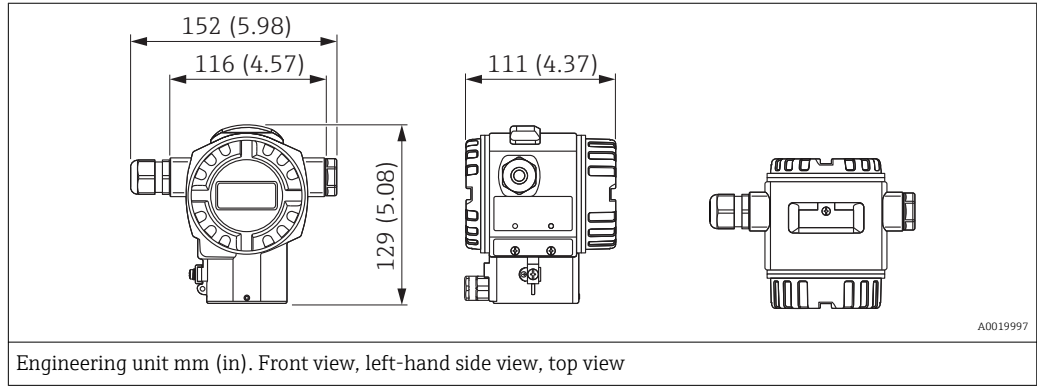
- the height of the housing
- the height of optional mounted parts such as temperature isolators or capillaries
- the height of the relevant process connection.

The individual heights of the components can be found in the following sections. To calculate the device height, simply add up the individual heights of the components. If necessary, the installation space (the space used to install the device) must also be taken into account. You can use the following table for this:

Section	Page	Elevation	Example
Height of housing	→ 54 ff.	(A)	
Optional mounted parts	→ 77	(B)	
Process connections	→ 56	(H)	
Installation space	-	(I)	
Device height			

A0021437

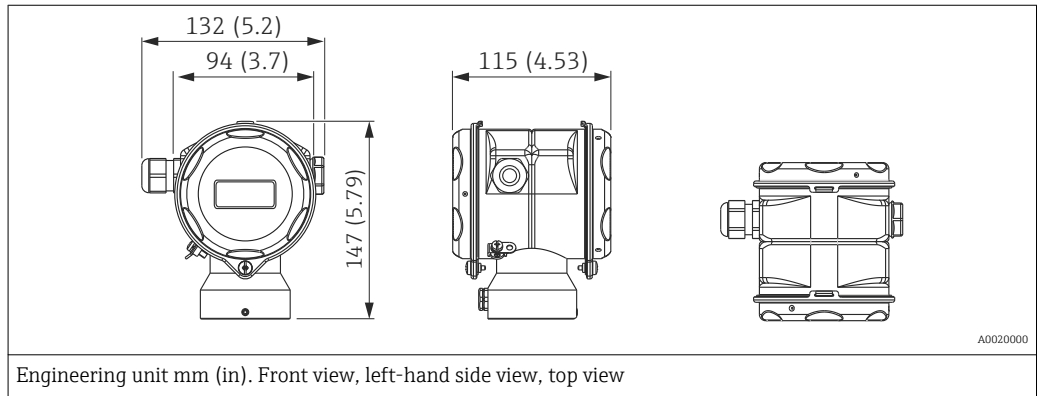
T14 housing, optional display on the side



Material		Degree of protection	Cable entry	Weight in kg (lb)		Option ¹⁾
Housing	Cover seal			with display	without display	
Aluminum	EPDM	IP66/67 NEMA 6P	M20 gland	1.2 (2.65)	1.1 (2.43)	A
		IP66/67 NEMA 6P	G ½" thread			B
		IP66/67 NEMA 6P	NPT ½" thread			C
		IP66/67 NEMA 6P	M12 plug			D
		IP66/67 NEMA 6P	7/8" plug			E
		IP65 NEMA 4	HAN7D plug 90 degrees			F
	FVMQ	IP66/67 NEMA 6P	M20 gland			G
	FVMQ	IP66/67 NEMA 6P	NPT ½" thread			H
316L	EPDM	IP66/67 NEMA 6P	M20 gland	2.1 (4.63)	2.0 (4.41)	1
		IP66/67 NEMA 6P	G ½" thread			2
		IP66/67 NEMA 6P	NPT ½" thread			3
		IP66/67 NEMA 6P	M12 plug			4
		IP66/67 NEMA 6P	7/8" plug			5
		IP65 NEMA 4	HAN7D plug 90 degrees			6
	FVMQ	IP66/67 NEMA 6P	M20 gland			7
	FVMQ	IP66/67 NEMA 6P	NPT ½" thread			8

1) Product Configurator, order code for "Housing, cover seal, cable entry, degree of protection"

T17 housing (hygienic), optional display on the side



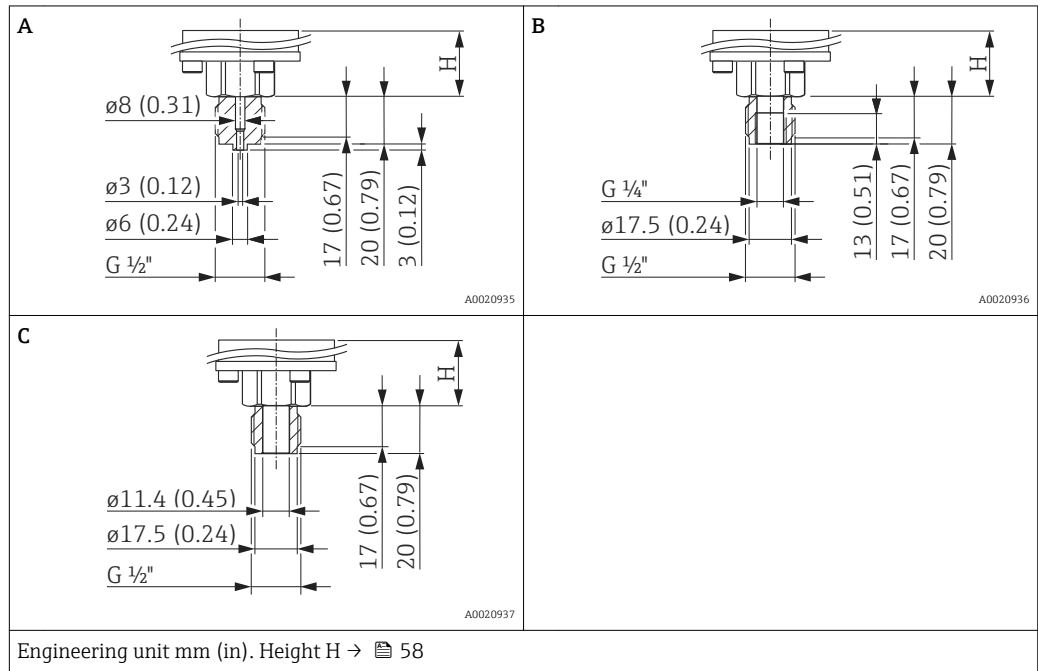
Material		Degree of protection ¹⁾	Cable entry	Weight in kg (lb)		Option ²⁾
Housing	Cover seal			with display	without display	
316L	EPDM	IP66/68 NEMA 6P	M20 gland	1.2 (2.65)	1.1 (2.43)	R
		IP66/68 NEMA 6P	G ½" thread			S
		IP66/68 NEMA 6P	NPT ½" thread			T
		IP66/68 NEMA 6P	M12 plug			U
		IP66/68 NEMA 6P	7/8" plug			V

1) Degree of protection IP 68: 1.83 mH₂O for 24 h

2) Product Configurator, order code for "Housing, cover seal, cable entry, degree of protection"

Process connections for
PMC71 with internal process
isolating diaphragm

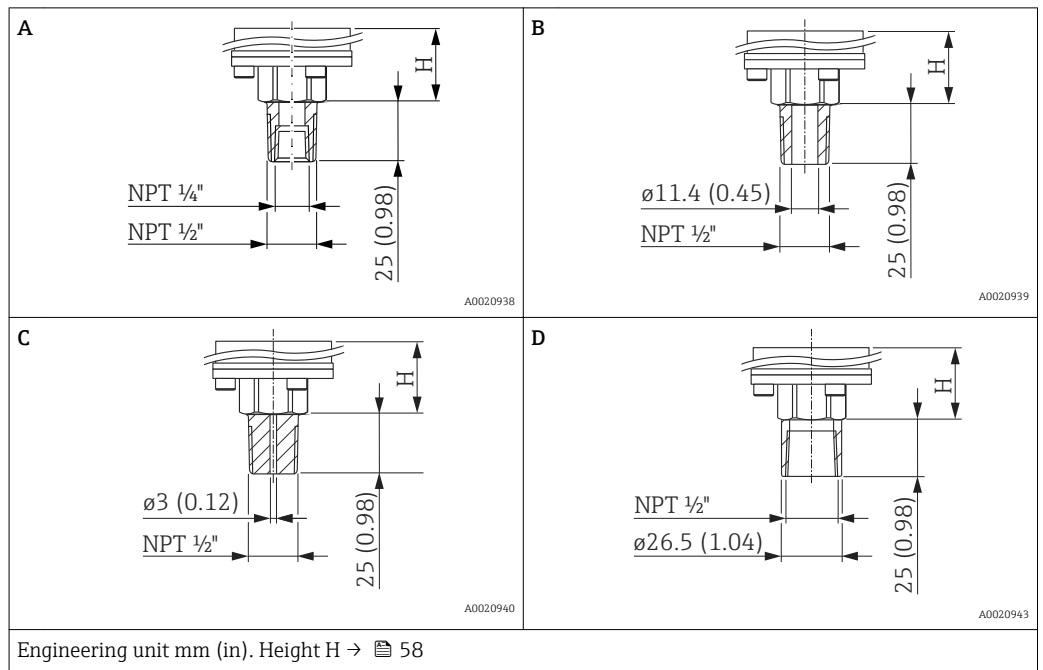
Threaded connection ISO 228 G



Item	Description	Material	Weight	Approval ¹⁾	Option ²⁾
			kg (lb)		
A	Thread ISO 228 G 1/2" A EN 837	AISI 316L	0.63 (1.39)	CRN	GA
		Alloy C276 (2.4819)		CRN	GB
		Monel (2.4360)		-	GC
		PVDF <ul style="list-style-type: none"> ■ Only mount with a mounting bracket (included) ■ MWP 10 bar (150 psi), OPL max. 15 bar (225 psi) ■ Process temperature range: -10 to +60 °C (+14 to +140 °F) 		-	GD
B	Thread ISO 228 G 1/2" A, G 1/4" (internal)	AISI 316L	0.63 (1.39)	CRN	GE
		Alloy C276 (2.4819)		CRN	GF
		Monel (2.4360)		-	GG
C	Thread ISO 228 G 1/2" A, Hole 11.4 mm (0.45 in)	AISI 316L	0.63 (1.39)	CRN	GH
		Alloy C276 (2.4819)		CRN	GJ
		Monel (2.4360)		-	GK

- 1) CSA approval: Product Configurator, order code for "Approval"
- 2) Product Configurator, order code for "Process connection"

Threaded connection ANSI

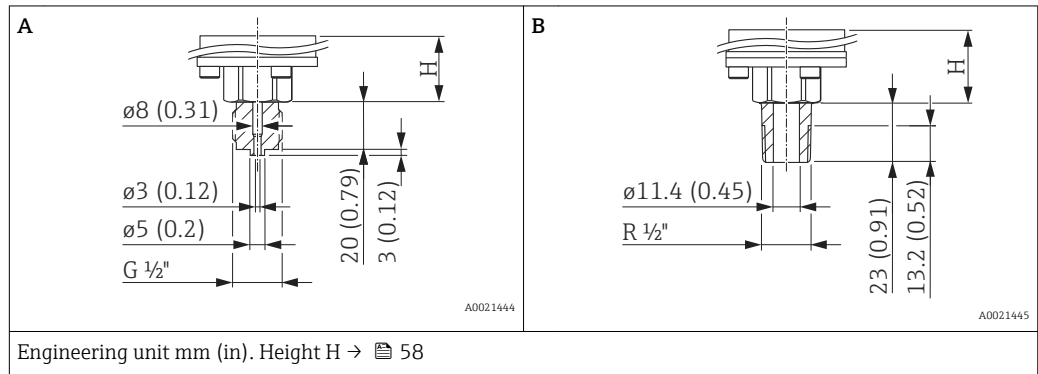


Item	Description	Material	Weight	Approval ¹⁾	Option ²⁾
			kg (lb)		
A	ANSI 1/2" MNPT, 1/4" FNPT	AISI 316L	0.63 (1.39)	CRN	RA
		Alloy C276 (2.4819)		CRN	RB
		Monel (2.4360)		-	RC
B	ANSI 1/2" MNPT, Hole 11.4 mm (0.45 in)	AISI 316L		CRN	RD
		Alloy C276 (2.4819)		CRN	RE
		Monel (2.4360)		-	RF
C	ANSI 1/2" MNPT, Hole 3 mm (0.12 in)	PVDF <ul style="list-style-type: none"> ■ Only mount with a mounting bracket (included) ■ MWP 10 bar (150 psi), OPL max. 15 bar (225 psi) ■ Process temperature range: +10 to +60 °C (+14 to +140 °F) 		-	RG
D	ANSI 1/2" FNPT Hole 11.4 mm (0.45 in)	AISI 316L	CRN	RH	
		Alloy C276 (2.4819)	CRN	RJ	
		Monel (2.4360)	-	RK	

1) CSA approval: Product Configurator, order code for "Approval"
 2) Product Configurator, order code for "Process connection"

Process connections for
PMC71 with internal process
isolating diaphragm

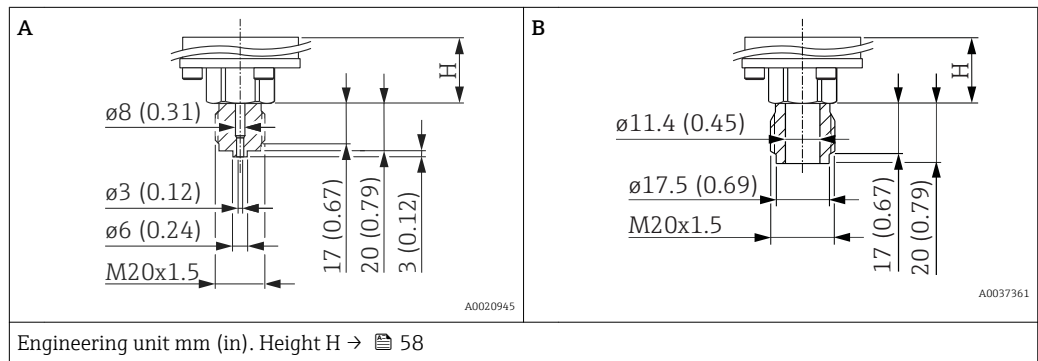
Threaded connection JIS



Item	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	JIS B0202 G 1/2" (male)	AISI 316L	0.63 (1.39)	GL
B	JIS B0203 R 1/2" (male)			RL

1) Product Configurator, order code for "Process connection"

Threaded connection DIN 13



Item	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	DIN 13 M20 x 1.5, EN 837 3 mm (0.12 in)	AISI 316L	0.63 (1.39)	GP
		Alloy C276 (2.4819)		GQ
B	DIN 13 M20 x 1.5 11.4 mm (0.45 in)	AISI 316L		GR

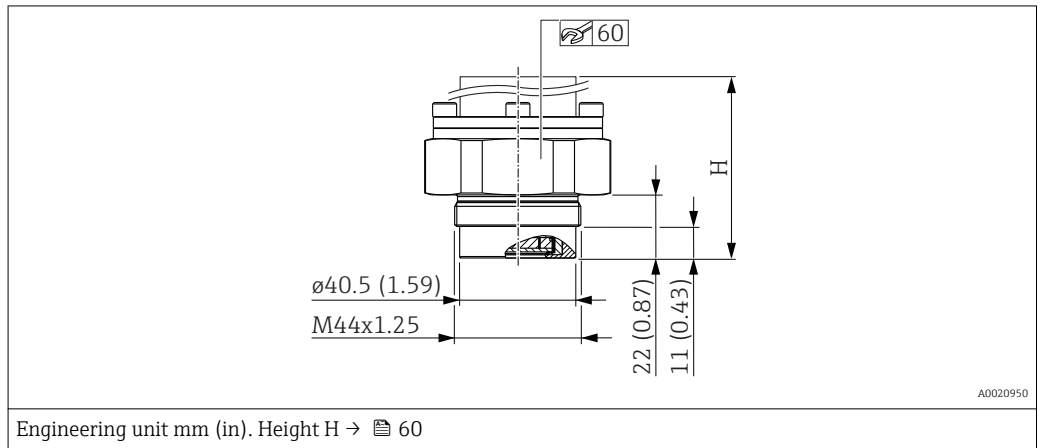
1) Product Configurator, order code for "Process connection"

Process connections for
PMC71 with internal process
isolating diaphragm -
height H

Description	Height H
Standard height	26 mm (1.02 in)
Device with Ex d[ia], CSA XP or FM XP	96 mm (3.78 in)
High-temperature version	106 mm (4.17 in)
High-temperature version with Ex d[ia], CSA XP or FM XP	176 mm (6.93 in)

Process connections for
PMC71 with flush-mounted
process isolating diaphragm

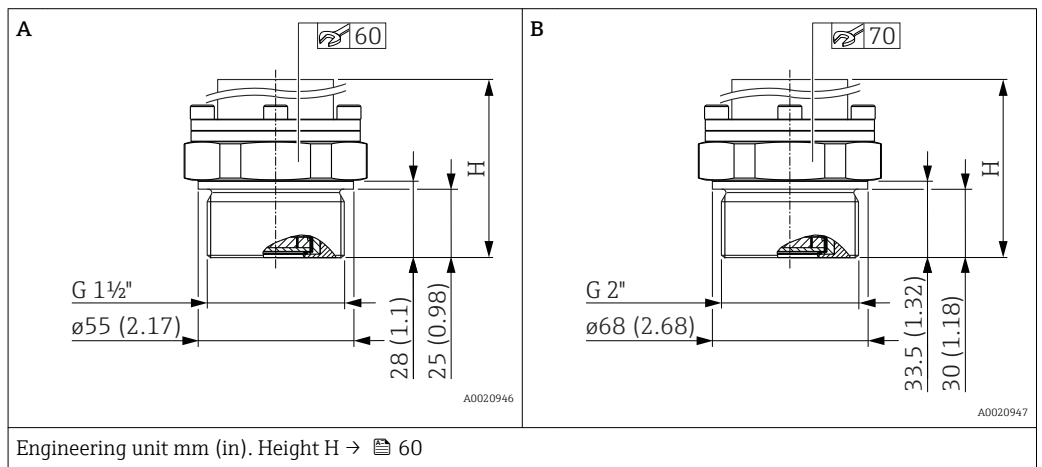
Threaded connection DIN 13



Designation	Material	Weight	Option ¹⁾
		kg (lb)	
DIN 13 M44 x 1.25	AISI 316L	0.63 (1.39)	1R
	Alloy C276 (2.4819)		1S

1) Product Configurator, order code for "Process connection"

Threaded connection ISO 228 G

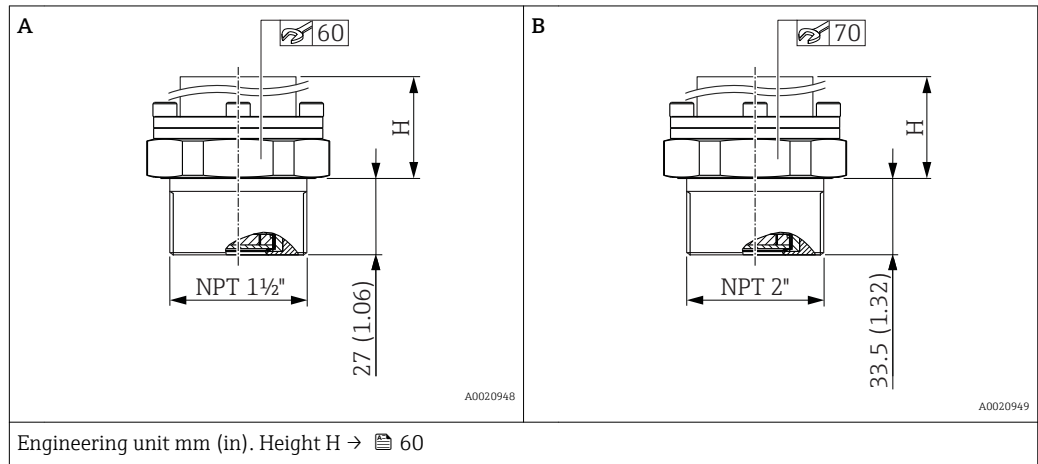


Item	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	Thread ISO 228 G 1 1/2" A	AISI 316L	0.63 (1.39)	1G
		Alloy C276 (2.4819)		1H
		Monel (2.4360)		1J
B	Thread ISO 228 G 2" A	AISI 316L		1K
		Alloy C276 (2.4819)		1L
		Monel (2.4360)		1M

1) Product Configurator, order code for "Process connection"

Process connections for
PMC71 with flush-mounted
process isolating diaphragm

Threaded connection ANSI



Item	Designation	Material	Weight	Approval ¹⁾	Option ²⁾
			kg (lb)		
A	ANSI 1 1/2" MNPT	AISI 316L (CRN)	0.63 (1.39)	CRN	2D
		Alloy C276 (2.4819) (CRN)		CRN	2E
		Monel (2.4360)		CRN	2F
B	ANSI 2" MNPT	AISI 316L (CRN)		CRN	2G
		Alloy C276 (2.4819) (CRN)		CRN	2H
		Monel (2.4360)		-	2J

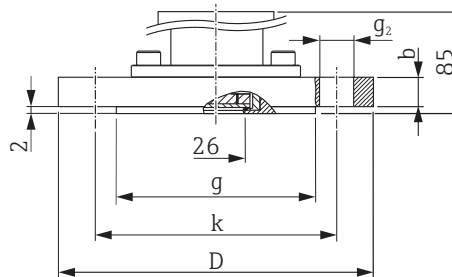
- 1) CSA approval: Product Configurator, order code for "Approval"
- 2) Product Configurator, order code for "Process connection"

Process connections for
PMC71 with flush-mounted
process isolating diaphragm
- height H

Description	Height H
High-temperature version and standard version	86 mm (3.39 in)
Version with Ex d[ia], CSA XP or FM XP	151 mm (5.94 in)

Process connections for
PMC71 with flush-mounted
process isolating diaphragm

EN/DIN flanges, connection dimensions in accordance with EN 1092-1/DIN 2527



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D Diameter of flange
b Thickness
g Raised face
k Hole circle
g₂ Diameter of hole

Engineering unit mm

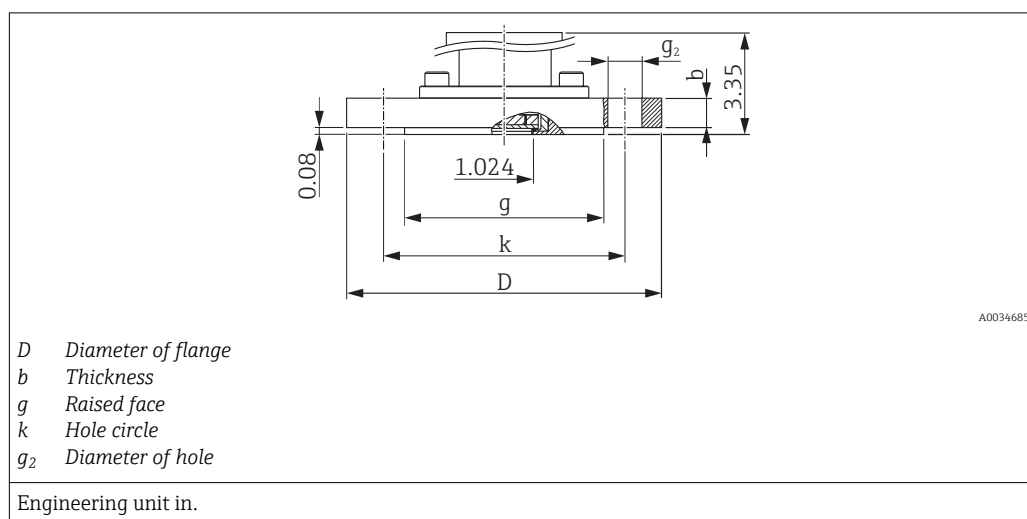
Flange				Boltholes						Weight	Option ¹⁾
Material	Nominal diameter	Nominal pressure	Shape ²⁾	D	b	g	Number	g ₂	k		
				mm	mm	mm		mm	mm	kg (lb)	
AISI 316L	DN 25	PN 10-40	B1 (D)	115	18	68	4	14	85	1.4 (3.09)	BA
AISI 316L	DN 32	PN 10-40	B1 (D)	140	18	78	4	18	100	2.0 (4.41)	CP
AISI 316L	DN 40	PN 10-40	B1 (D)	150	18	88	4	18	110	2.4 (5.29)	CQ
AISI 316L	DN 50	PN 10-40	B1 (D)	165	20	102	4	18	125	3.2 (7.06)	B3
PVDF ³⁾	DN 50	PN 10-16	B1 (D)	165	21.4	102	4	18	125	0.6 (1.32)	BR
AISI 316L	DN 50	PN 63	B2 (E)	180	26	102	4	22	135	4.6 (10.14)	C3
PVDF ³⁾	DN 80	PN 10-16	B1 (D)	200	21.4	138	8	18	160	1.0 (2.21)	BS
AISI 316L	DN 80	PN 10-40	B1 (D)	200	24	138	8	18	160	5.4 (11.91)	B4

1) Product Configurator, order code for "Process connection"

2) Description as per DIN 2527 provided in brackets

3) MWP 10 bar (150 psi), OPL max. 15 bar (225 psi); process temperature range: -10 to +60 °C (+14 to +140 °F)

ASME flanges, connection dimensions in accordance with ASME B 16.5, raised face RF



Flange						Boltholes			Weight	Approval ¹⁾	Option ²⁾
Material	Nominal diameter	Class	D	b	g	Number	g ₂	k			
	[in]	[lb./sq.in]	[in]	[in]	[in]		[in]	[in]	[kg (lb)]		
AISI 316/316L ³⁾	1	150	4.25	1.18	2	4	0.62	3.12	0.9 (1.98)	-	AA ⁴⁾
AISI 316/316L ³⁾	1	300	4.88	1.18	2	4	0.75	3.5	1.4 (3.09)	-	AB ⁴⁾
AISI 316/316L ³⁾	1 ½	150	5	0.69	2.88	4	0.62	3.88	1.0 (2.21)	CRN	AE
AISI 316/316L ³⁾	1 ½	300	6.12	0.81	2.88	4	0.88	4.5	2.6 (5.73)	CRN	AQ
AISI 316/316L ³⁾	2	150	6	0.75	3.62	4	0.75	4.75	2.4 (5.29)	CRN	AF
ECTFE ⁵⁾	2	150	6	0.75	3.62	4	0.75	4.75	2.4 (5.29)	-	JR
PVDF ⁶⁾	2	150	6	0.75	3.62	4	0.75	4.75	0.5 (1.1)	-	A3
AISI 316/316L ³⁾	2	300	6.5	0.88	3.62	8	0.75	5	3.2 (7.06)	CRN	AR
AISI 316/316L ³⁾	3	150	7.5	0.94	5	4	0.75	6	4.9 (10.8)	CRN	AG
ECTFE ⁵⁾	3	150	7.5	0.94	5	4	0.75	6	4.9 (10.8)	-	JS
PVDF ⁶⁾	3	150	7.5	0.94	5	4	0.75	6	0.9 (1.98)	-	A4
AISI 316/316L ³⁾	3	300	8.25	1.12	5	8	0.88	6.62	6.8 (14.99)	CRN	AS
AISI 316/316L ³⁾	4	150	9	0.94	6.19	8	0.75	7.5	7.1 (15.66)	CRN	AH
ECTFE ⁵⁾	4	150	9	0.94	6.19	8	0.75	7.5	7.1 (15.66)	-	JT
AISI 316/316L ³⁾	4	300	10	1.25	6.19	8	0.88	7.88	11.6 (25.58)	CRN	AT

1) CSA approval: Product Configurator, order code for "Approval"

2) Product Configurator, order code for "Process connection"

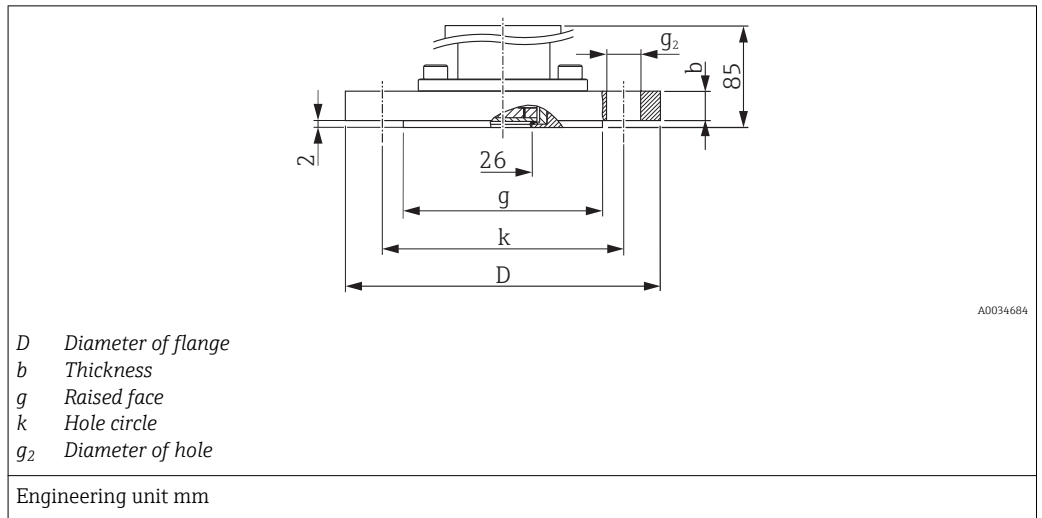
3) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)

4) Screws must be 15 mm (0.59 in) longer than the standard flange screws

5) ECTFE coating on AISI 316/316L. When operating in hazardous areas, avoid electrostatic charge on the plastic surfaces.

6) MWP 10 bar (150 psi), OPL max. 15 bar (225 psi); process temperature range: -10 to +60 °C (+14 to +140 °F)

JIS flanges, connection dimensions in accordance with JIS B 2220 BL, raised face RF

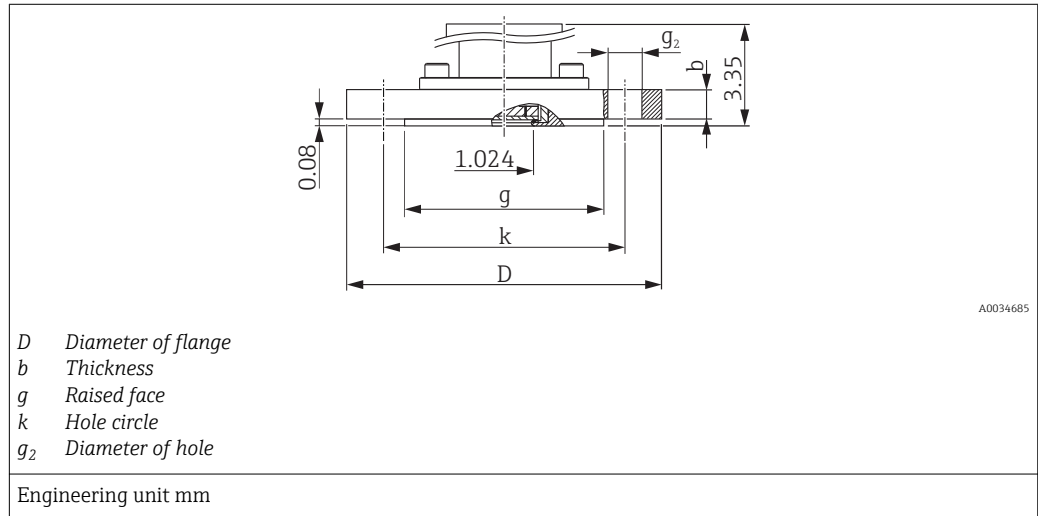


Flange						Boltholes			Weight	Option ¹⁾
Material	Nominal diameter	Nominal pressure	D	b	g	Number	g ₂	k		
			mm	mm	mm			mm	mm	kg (lb)
AISI 316L (1.4435)	50 A	10 K	155	16	96	4	19	120	2.0 (4.41)	CF
	80 A	10 K	185	18	127	8	19	150	3.3 (7.28)	KL
	100 A	10 K	210	18	151	8	19	175	4.4 (9.7)	KH

1) Product Configurator, order code for "Process connection"

Process connections for
PMC71 with flush-mounted
process isolating diaphragm

China standard flanges, connection dimensions HG/T 20592-2009 (DN-flanges) or HG/T 20615-2009 ("-flanges), raised face RF

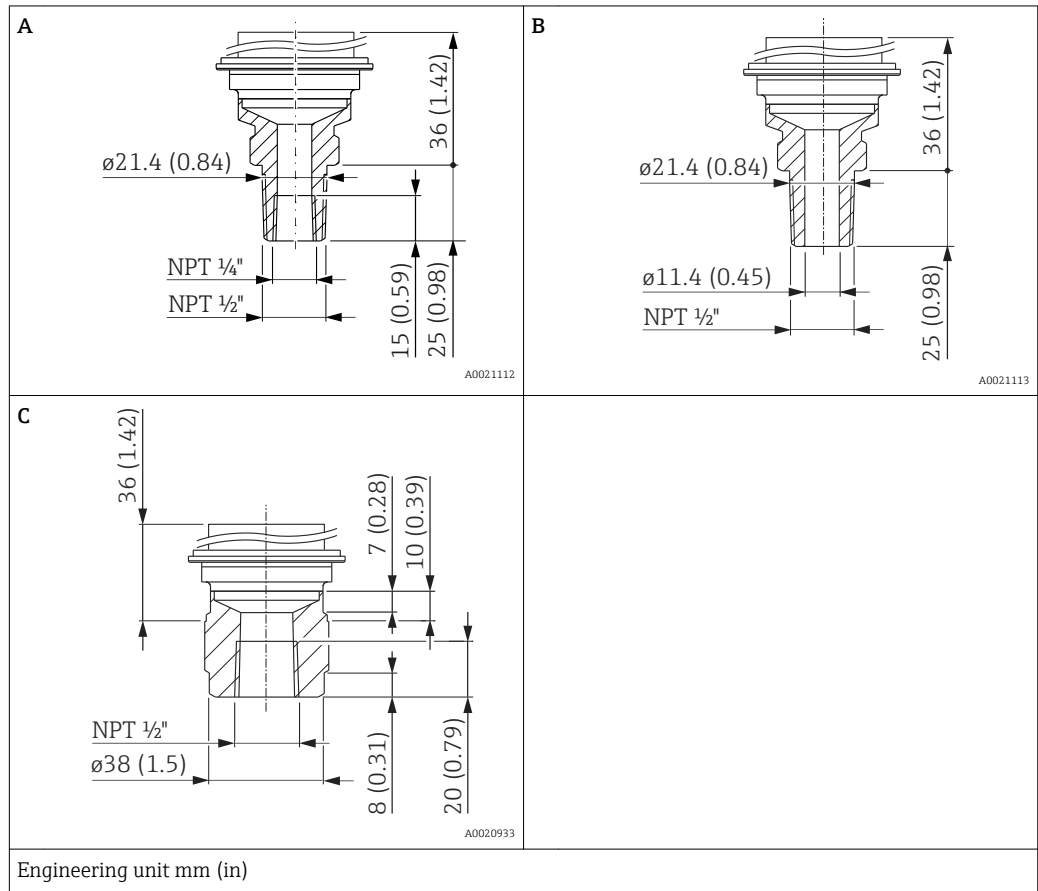


Flange ¹⁾						Boltholes			Weight	Option ²⁾
Nominal diameter	Class/nominal pressure	D	b	g	m	Number	g ₂	k		
		[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg (lb)]
DN										
DN50	40 bar	165	20	102	27.5	4	18	125	3 (6.6)	7H
DN80	40 bar	200	24	138	45.5	8	18	160	5.5 (12.13)	7K
[in]										
2"	150lb./sq.in	150	17.5	92.1	22.55	4	18	120.7	2.2 (4.85)	7P
2"	300 lb./sq.in	165	20.7	92.1	22.55	8	18	127	3 (6.62)	7R
3"	150 lb./sq.in	190	22.3	127	40	4	18	152.4	4.7 (10.36)	7V
3"	300 lb./sq.in	210	27	127	40	8	22	168.3	6.6 (14.55)	7X

- 1) Material: AISI 316L
- 2) Product Configurator, order code for "Process connection"

Process connections for PMP71 with internal process isolating diaphragm

Threaded connection ANSI



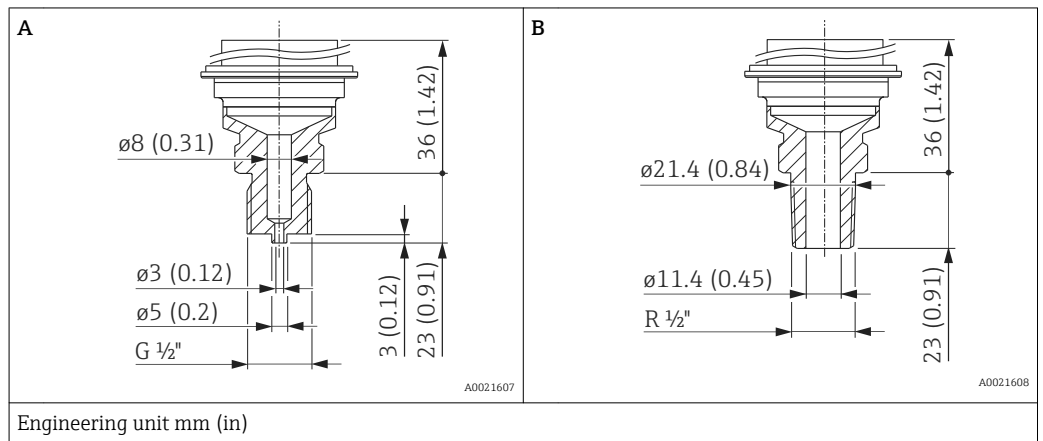
Item	Description	Material	Weight	Approval ¹⁾	Option ²⁾
			kg (lb)		
A	ANSI 1/2" MNPT, 1/4" FNPT	AISI 316L	0.63 (1.39)	CRN	RA
		Alloy C276 (2.4819)		CRN	RB
B	ANSI 1/2" MNPT, Hole 11.4 mm (0.45 in) = 400 bar (6 000 psi) Hole 3.2 mm (0.13 in) = 700 bar (10 500 psi)	AISI 316L		CRN	RD
		Alloy C276 (2.4819)		CRN	RE
C	ANSI 1/2" FNPT	AISI 316L	0.7 (1.54)	CRN	RH
		Alloy C276 (2.4819)		CRN	RJ

1) CSA approval: Product Configurator, order code for "Approval"

2) Product Configurator, order code for "Process connection"

Process connections for PMP71 with internal process isolating diaphragm

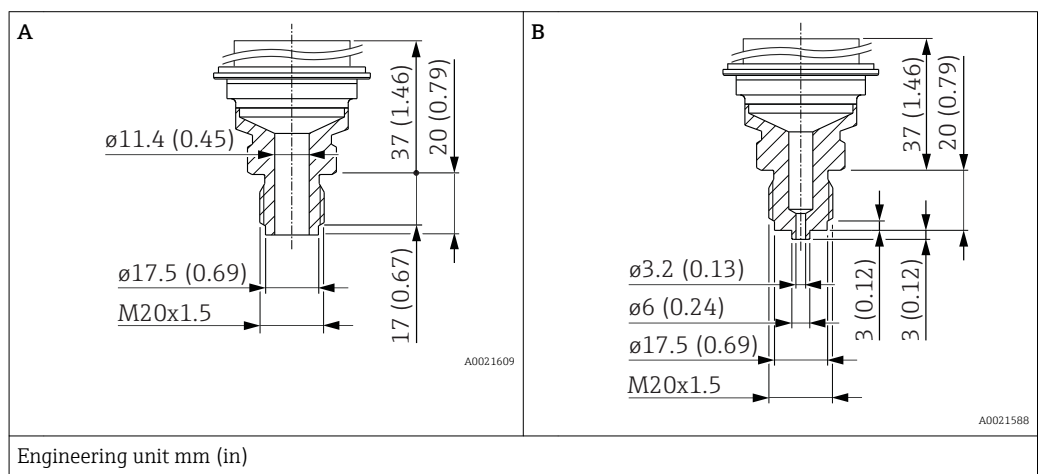
Threaded connection JIS



Position	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	JIS B0202 G 1/2" (male)	AISI 316L	0.6 (1.32)	GL
B	JIS B0203 R 1/2" (male)			RL

1) Product Configurator, order code for "Process connection"

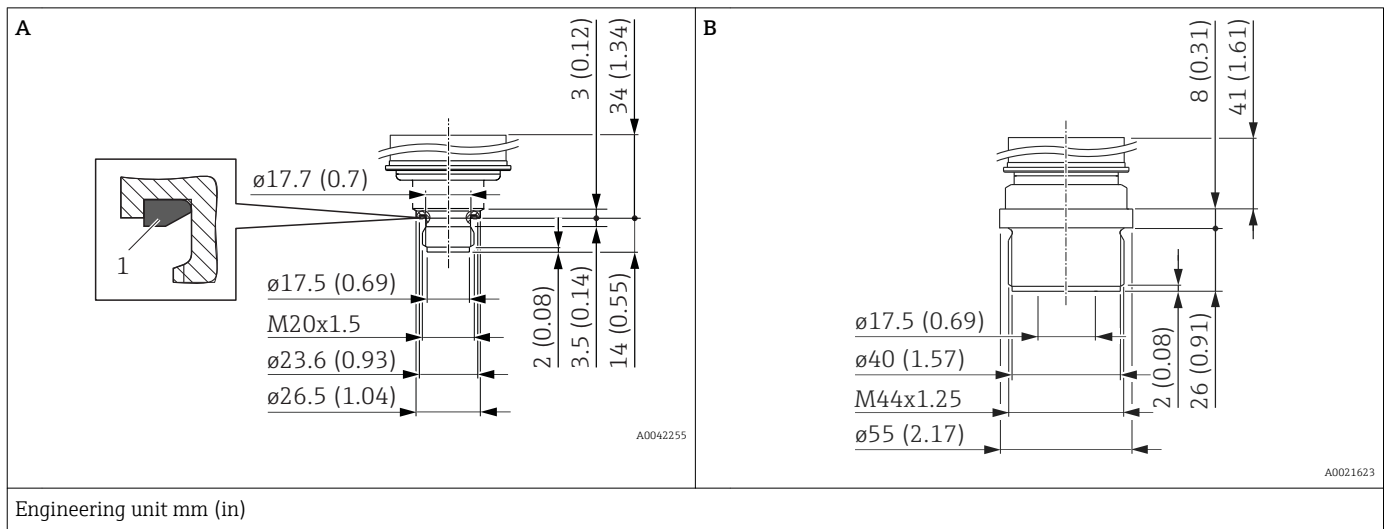
Threaded connection DIN 13



Position	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	DIN 13 M20 x 1.5 11.4 mm (0.45 in)	AISI 316L	0.6 (1.32)	GP
		Alloy C276 (2.4819)		GQ
B	DIN 13 M20 x 1.5, EN 837 3 mm (0.12 in)	AISI 316L		GR
		Alloy C276 (2.4819)		GS

1) Product Configurator, order code for "Process connection"

Threaded connection DIN

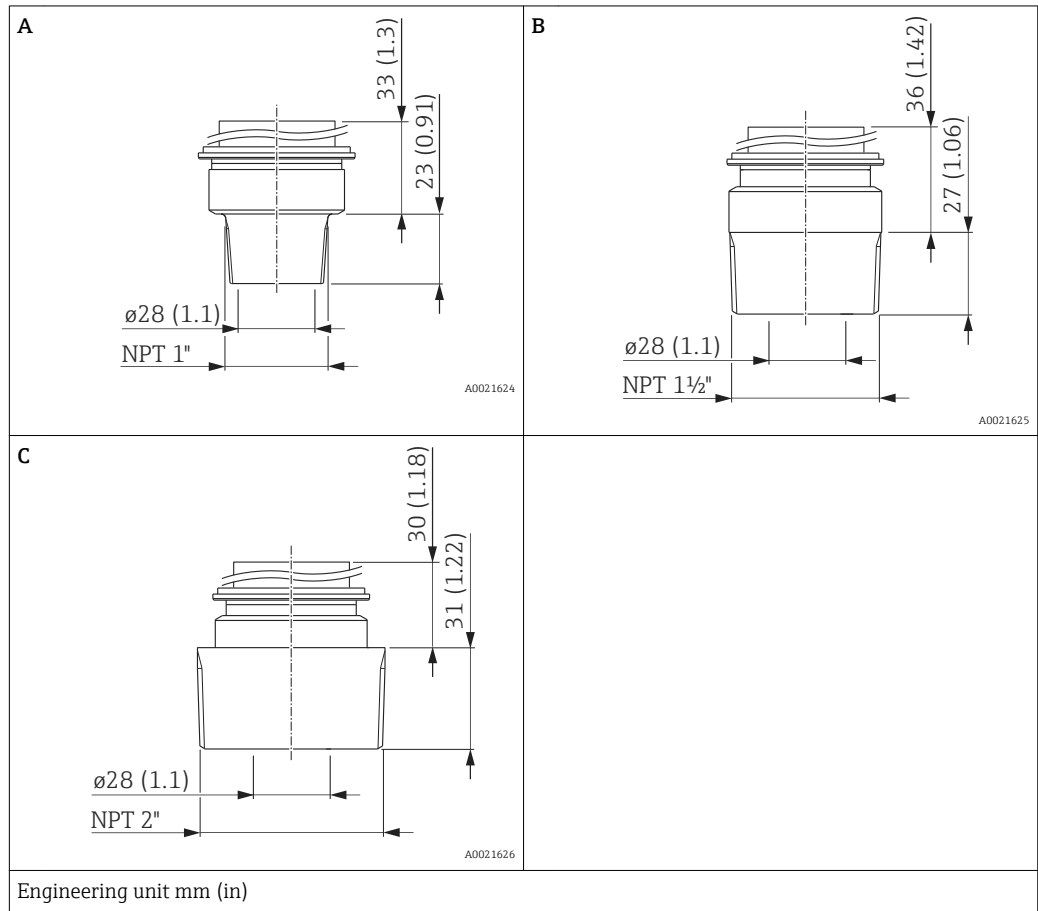


Position	Designation	Material	Weight	Option ¹⁾
			kg (lb)	
A	Thread DIN 16288 M20 FKM 80 flat seal (item 1) pre-installed	AISI 316L	0.4 (0.88)	1N
		Alloy C276 (2.4819)		1P
B	Thread DIN 13 M44 x 1.25	AISI 316L	1.1 (2.43)	1R
		Alloy C276 (2.4819)		1S

1) Product Configurator, order code for "Process connection"

Process connections for
PMP71 with flush-mounted
process isolating diaphragm

Threaded connection ANSI



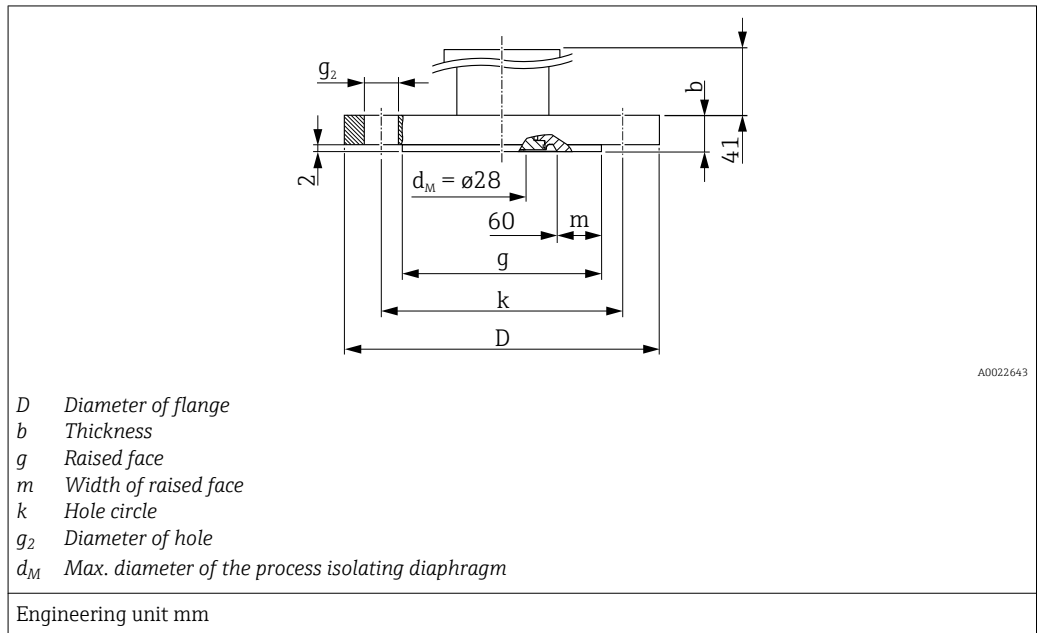
Item	Description	Material	Weight	Approval ¹⁾	Option ²⁾
			kg (lb)		
A	ANSI 1" MNPT	AISI 316L	0.7 (1.54)	CRN	2A
		Alloy C276 (2.4819)			2B
B	ANSI 1 1/2" MNPT	AISI 316L	1 (2.21)	CRN	2D
		Alloy C276 (2.4819)			2E
C	ANSI 2" MNPT	AISI 316L	1.3 (2.87)	CRN	2G
		Alloy C276 (2.4819)			2H

1) CSA approval: Product Configurator, order code for "Approval"

2) Product Configurator, order code for "Process connection"

Process connections for PMP71 with flush-mounted process isolating diaphragm

EN/DIN flanges, connection dimensions in accordance with EN 1092-1/DIN 2527



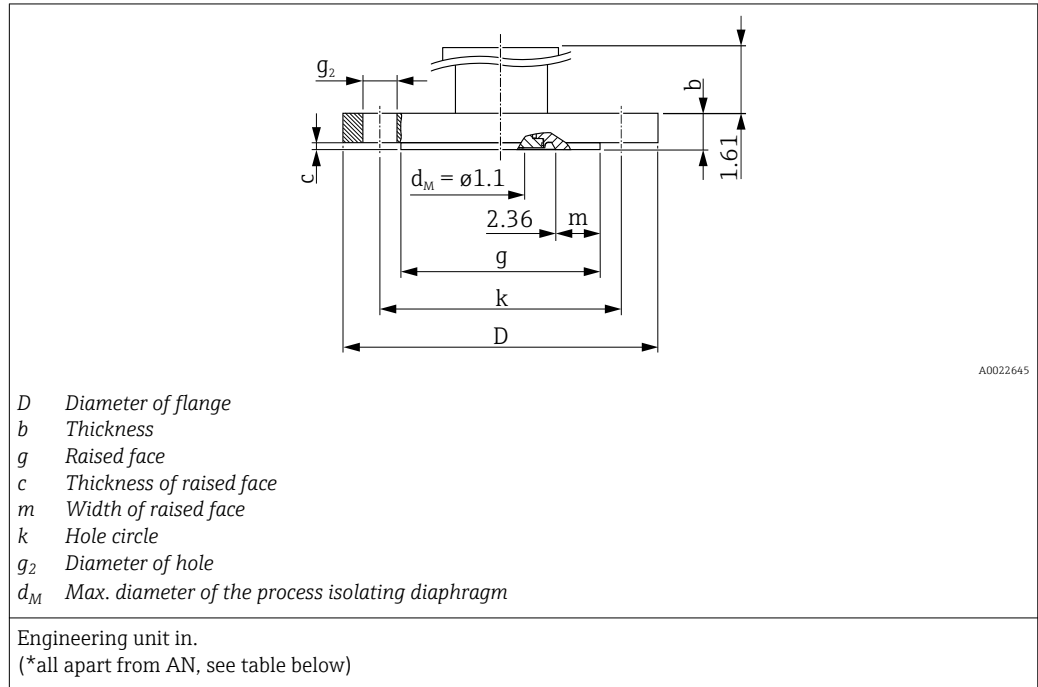
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Flange ¹⁾							Boltholes			Weight Flange	Option ²⁾
Nominal diameter	Nominal pressure	Shape ³⁾	D	b	g	m	Number	g ₂	k		
			[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[kg]
DN 25	PN 10-40	B1 (D)	115	18	68 ⁴⁾	4	4	14	85	1.2 (2.65)	CN
DN 32	PN 10-40	B1 (D)	140	18	78 ⁴⁾	9	4	18	100	1.9 (4.19)	CP
DN 40	PN 10-40	B1 (D)	150	18	88 ⁴⁾	14	4	18	110	2.2 (4.85)	CQ
DN 50	PN 10-40	B1 (D)	165	20	102	-	4	18	125	3.0 (6.62)	B3
DN 80	PN 10-40	B1 (D)	200	24	138	-	8	18	160	5.3 (11.69)	B4

- 1) Material: AISI 316L
- 2) Product Configurator, order code for "Process connection"
- 3) Description as per DIN 2527 provided in brackets
- 4) With these process connections the raised face is smaller than described in the standard. Due to the smaller raised face, a special seal must be used.

Process connections for PMP71 with flush-mounted process isolating diaphragm

ASME flanges, connection dimensions in accordance with ASME B 16.5, raised face RF*

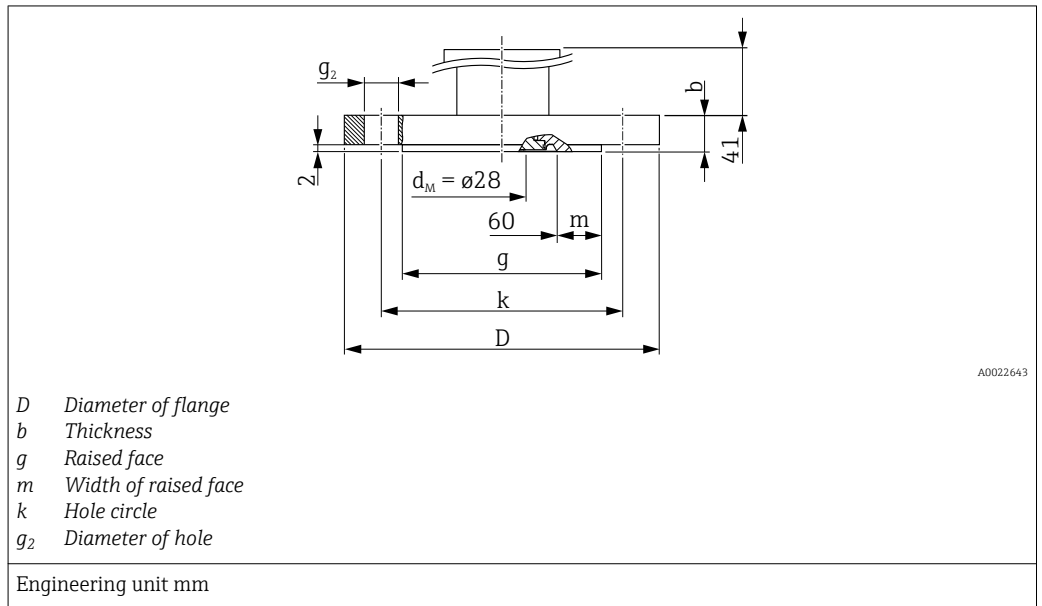


Flange ¹⁾							Boltholes			Weight	Approval ²⁾	Option ³⁾
Nominal diameter	Class/nominal pressure	D	b	g	c	m	Number	g ₂	k			
[in]	lb./sq.in	[in]	[in]	[in]	[in]	[in]		[in]	[in]	[kg]		
1	300	4.88	0.69	2 ⁴⁾	0.06	0.2	4	0.75	3.5	1.3 (2.87)	CRN	AN
1 ½	150	5	0.69	2.88 ⁴⁾	0.08	0.52	4	0.62	3.88	1.5 (3.31)	CRN	AE
1 ½	300	6.12	0.81	2.88 ⁴⁾	0.08	0.52	4	0.88	4.5	2.6 (5.73)	CRN	AQ
2	150	6	0.75	3.62	0.08	-	4	0.75	4.75	2.4 (5.29)	CRN	AF
2	300	6.5	0.88	3.62	0.08	-	8	0.75	5	3.2 (7.06)	CRN	AR
3	150	7.5	0.94	5	0.08	-	4	0.75	6	4.9 (10.8)	CRN	AG
3	300	8.25	1.12	5	0.08	-	8	0.88	6.62	6.7 (14.77)	CRN	AS
4	150	9	0.94	6.19	0.08	-	8	0.75	7.5	7.1 (15.66)	CRN	AH
4	300	10	1.25	6.19	0.08	-	8	0.88	7.88	11.6 (25.88)	CRN	AT

- 1) Material: AISI 316/316L; Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)
- 2) CSA approval: Product Configurator, order code for "Approval"
- 3) Product Configurator, order code for "Process connection"
- 4) With these process connections the raised face is smaller than described in the standard. Due to the smaller raised face, a special seal must be used.

Process connections for PMP71 with flush-mounted process isolating diaphragm

JIS flanges, connection dimensions in accordance with JIS B 2220 BL, raised face RF

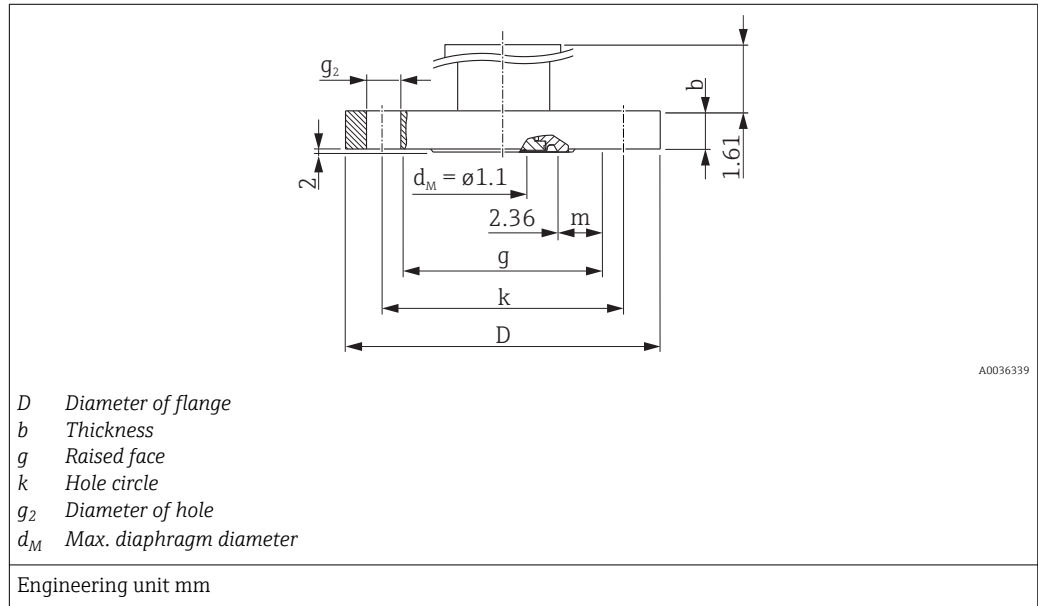


Flange							Boltholes			Weight Flange	Option ¹⁾
Material	Nominal diameter	Class/ Nominal pressure	D	b	g	m	Number	g ₂	k		
			[mm]	[mm]	[mm]	[mm]				[kg]	
AISI 316L	25 A	20 K	125	16	67 ²⁾	3.5	4	19	90	1.5 (3.31)	KA
AISI 316L	50 A	10 K	155	16	96	-	4	19	120	2.0 (4.41)	CF
AISI 316L	80 A	10 K	185	18	127	-	8	19	150	3.3 (7.28)	KL
AISI 316L	100 A	10 K	210	18	151	-	8	19	175	4.4 (9.7)	KH

- 1) Product Configurator, order code for "Process connection"
- 2) With these process connections the raised face is smaller than described in the standard. Due to the smaller raised face, a special seal must be used.

PMP71: process connections with flush-mounted process isolating diaphragm

China standard flanges, connection dimensions HG/T 20592-2009 (DN-flanges) or HG/T 20615-2009 ("-flanges), raised face RF



Flange ¹⁾						Boltholes			Weight	Option ²⁾
Nominal diameter	Class/nominal pressure	D	b	g	m	Number	g ₂	k		
		[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[kg (lb)]	
DN										
DN50	40 bar	165	20	102	27.5	4	18	125	3 (6.6)	7H
DN80	40 bar	200	24	138	45.5	8	18	160	5.5 (12.13)	7K
[in]										
2"	150lb./sq.in	150	17.5	92.1	22.55	4	18	120.7	2.2 (4.85)	7P
2"	300 lb./sq.in	165	20.7	92.1	22.55	8	18	127	3 (6.62)	7R
3"	150 lb./sq.in	190	22.3	127	40	4	18	152.4	4.7 (10.36)	7V
3"	300 lb./sq.in	210	27	127	40	8	22	168.3	6.6 (14.55)	7X

1) Material: AISI 316L

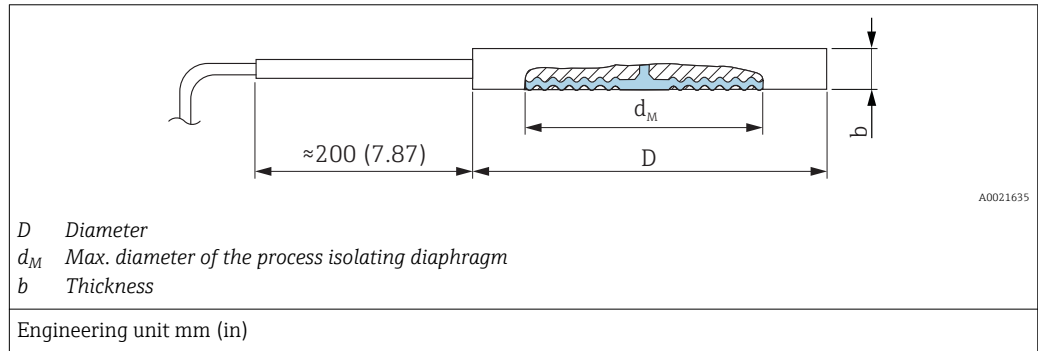
2) Product Configurator, order code for "Process connection"

Process connections for PMP75 with flush-mounted process isolating diaphragm



- The weights of the diaphragm seals are given in the tables. For weight of housing, see → 54
- The following drawings are drawings that illustrate how the system works in principle. In other words, the dimensions of a diaphragm seal supplied can deviate from the dimensions given in this document.
- Observe the information in the "Planning instructions for diaphragm seal systems" section → 112
- For further information please contact your local Endress+Hauser Sales Center.

Diaphragm seal cell structure

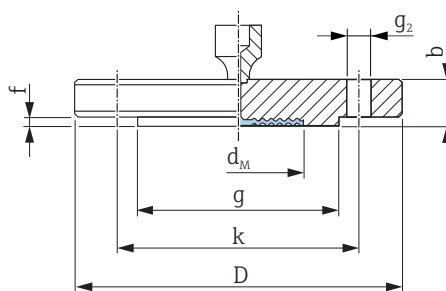


Flange			Diaphragm seal				Approval ¹⁾	Option ²⁾
Material	Nominal diameter	Nominal pressure ³⁾	D	b	d _M	Weight		
			[mm]	[mm]	[mm]	[kg (lb)]		
AISI 316L	DN 50	PN 16-400	102	20	59	1.3 (2.87)	-	UI ⁴⁾
	DN 80	PN 16-400	138	20	89	2.3 (5.07)	-	UJ ⁴⁾
	DN 100	PN 16-400	162	20	89	3.1 (6.84)	-	UK
	[in]	[lb/sq.in]	[in (mm)]	[in (mm)]	[in (mm)]			
	2	150-2500	3.89 (99)	0.79 (20)	2.32 (59)	1.3 (2.87)	CRN	UL ⁴⁾
	3	150-2500	5.00 (127)	0.79 (20)	3.50 (89)	2.3 (5.07)	CRN	UM ⁴⁾
	4	150-2500	6.22 (158)	0.79 (20)	3.50 (89)	3.1 (6.84)	CRN	UR

- 1) CSA approval: Product Configurator, order code for "Approval"
- 2) Product Configurator, order code for "Process connection"
- 3) 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 → 52.
- 4) With TempC Membrane

Process connections for
PMP75 with flush mount
process isolating diaphragm

EN/DIN flanges, connection dimensions in accordance with EN 1092-1/DIN 2527 and DIN 2501-1



A0021680

D Diameter of flange
 b Thickness
 g Raised face
 f Raised face
 k Hole circle
 g_2 Diameter of hole
 d_M Max. diameter of the process isolating diaphragm

Engineering unit mm

Flange ^{1) 2) 3)}						Boltholes			Diaphragm seal		Option ⁴⁾	
Nominal diameter	Nominal pressure	Shape ⁵⁾	D	b	g	f	Number	g ₂	k	d _M		Weight
			[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]		[mm]
DN 25	PN 10-40	B1 (D)	115	18	68	3	4	14	85	32	2.1 (4.63)	CN ^{6) 7)}
DN 25	PN 63-160	B2 (E)	140	24	68	2	4	18	100	28	2.5 (5.51)	DN
DN 25	PN 250	B2 (E)	150	28	68	2	4	22	105	28	3.7 (8.16)	EN
DN 25	PN 400	B2 (E)	180	38	68	2	4	26	130	28	7.0 (15.44)	E1
DN 32	PN 10-40	B1 (D)	140	18	77	2.6	4	18	100	34	1.9 (4.19)	CP
DN 40	PN 10-40	B1 (D)	150	18	87	2.6	4	18	110	48	2.2 (4.85)	CQ
DN 50	PN 10-40	B1 (D)	165	20	102	3	4	18	125	59	3.0 (6.62)	B3 ^{6) 7)}
DN 50	PN 63	B2 (E)	180	26	102	3	4	22	135	59	4.6 (10.14)	C3
DN 50	PN 100-160	B2 (E)	195	30	102	3	4	26	145	59	6.2 (13.67)	EF
DN 50	PN 250	B2 (E)	200	38	102	3	8	26	150	59	7.7 (16.98)	ER
DN 50	PN 400	B2 (E)	235	52	102	3	8	30	180	59	14.7 (32.41)	E3
DN 80	PN 10-40	B1 (D)	200	24	138	3.5	8	18	160	89	5.3 (11.69)	B4 ^{6) 7)}
DN 80	PN 100	B2 (E)	230	32	138	4	8	24	180	89	8.9 (19.62)	C4
DN 100	PN 100	B2 (E)	265	36	175	5	8	30	210	89	13.7 (30.21)	C5

1) Material: AISI 316L

2) The roughness of the surface in contact with the medium including the raised face of the flanges (all standards) made of Alloy C276, Monel, tantalum, gold > 316L or PTFE is $R_a < 0.8 \mu\text{m}$ (31.5 μin). Lower surface roughness on request.

3) The flange raised face is made of the same material as the process isolating diaphragm.

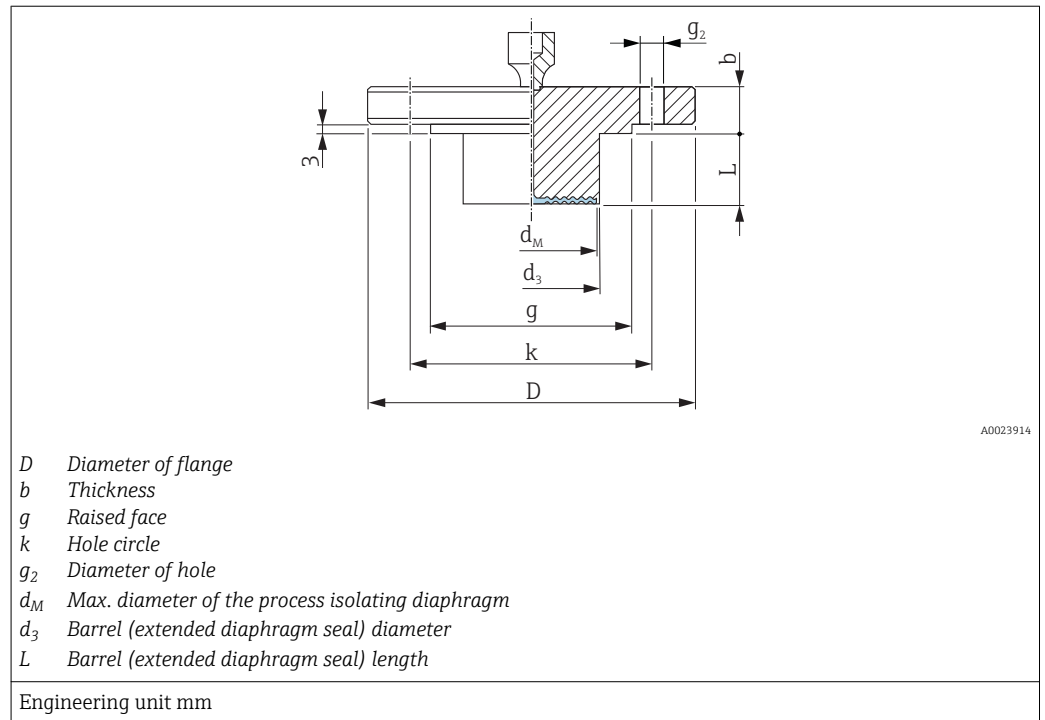
4) Product Configurator, order code for "Process connection"

5) Description as per DIN 2527 provided in brackets

6) Alternatively available with TempC Membrane. Diameter of process isolating diaphragm changes with TempC version: DN25: 28 mm; DN50: 61 mm.

7) Alternatively available with gold-coated TempC Membrane (Product Configurator order code for "Membrane material" option "G").

EN/DIN flanges with barrel (extended diaphragm seal), connection dimensions in accordance with EN 1092-1/DIN 2527 and DIN 2501-1



Flange ^{1) 2)}			Boltholes			Diaphragm seal		Option ³⁾			
Nominal diameter	Nominal pressure	Shape ⁴⁾	D	b	g	Number	g ₂	k	d _M	Weight	
			[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	
DN 50	PN 10-40	B1 (D)	165	20	102	4	18	125	47	⁵⁾	D3 ⁵⁾
DN 80	PN 10-40	B1 (D)	200	24	138	8	18	160	72	⁵⁾	D4 ⁵⁾

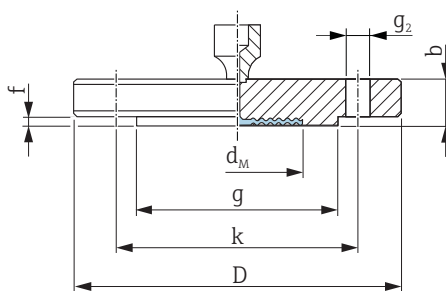
- 1) Material: AISI 316L
- 2) In the case of process isolating diaphragms made of Alloy C276, Monel or tantalum, the raised face of the flange and the barrel pipe are made of 316L
- 3) Product Configurator, order code for "Process connection"
- 4) Description as per DIN 2527 provided in brackets
- 5) Available with 50 mm (1.97 in), 100 mm (3.94 in) and 200 mm (7.87 in) barrel, (extended diaphragm seal), for barrel (extended diaphragm seal) diameter and weight see the following table

Option ¹⁾	Nominal diameter	Nominal pressure	L	d ₃	Weight
			[mm]	[mm]	[kg (lb)]
D3	DN 50	PN 10-40	50 / 100 / 200	48.3	3.2 (7.1) / 3.8 (8.4) / 4.4 (9.7)
D4	DN 80	PN 10-40	50 / 100 / 200	76	6.2 (13.7) / 6.7 (14.8) / 7.8 (17.2)

- 1) Product Configurator, order code for "Process connection"

Process connections for
PMP75 with flush mount
process isolating diaphragm

ASME flanges, in accordance with connection dimensions ASME B 16.5, raised face RF



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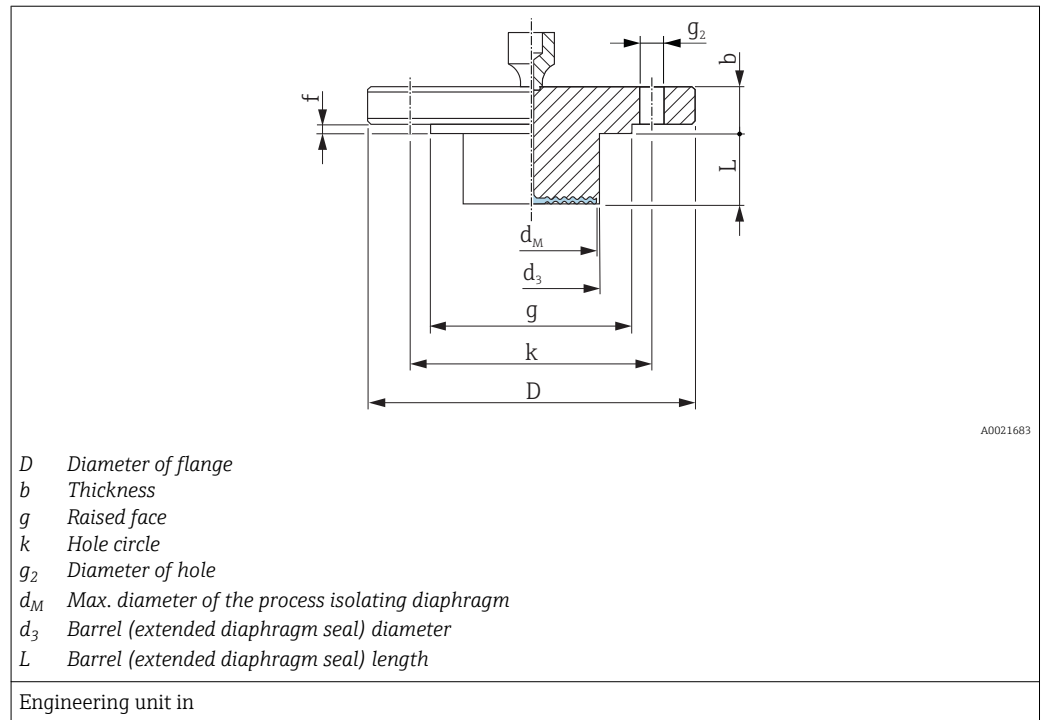
D Diameter of flange
b Thickness
g Raised face
f Raised face
k Hole circle
g₂ Diameter of hole
d_M Max. diaphragm diameter

Engineering unit in

Flange ^{1) 2) 3)}						Boltholes			Diaphragm seal		Approval ⁴⁾	Option ⁵⁾
Nominal diameter	Class	D	b	g	f	Number	g ₂	k	d _M	Weight		
[in]	[lb./sq.in]	[in]	[in]	[in]	[in]		[in]	[in]	[in]	[kg (lb)]		
1	150	4.25	0.56	2	0.08	4	0.62	3.12	1.26	1.2 (2.65)	CRN ⁶⁾	AC ^{7) 8)}
1	300	4.88	0.69	2	0.08	4	0.75	3.5	1.26	1.3 (2.87)	CRN	AN ^{7) 8)}
1	400/600	4.88	0.69	2	0.25	4	0.75	3.5	1.26	1.4 (3.09)	CRN	HC
1	900/1500	5.88	1.12	2	0.25	4	1	4	1.26	3.2 (7.06)	CRN	HN
1	2500	6.25	1.38	2	0.25	4	1	4.25	1.26	4.6 (10.14)	CRN	HO
1 ½	150	5	0.69	2.88	0.06	4	0.62	3.88	1.89	1.5 (3.31)	CRN	AE
1 ½	300	6.12	0.81	2.88	0.06	4	0.88	4.5	1.89	2.6 (5.73)	CRN	AQ
2	150	6	0.75	3.62	0.06	4	0.75	4.75	2.32	2.2 (4.85)	CRN	AF ^{7) 8)}
2	300	6.5	0.88	3.62	0.06	8	0.75	5	2.32	3.4 (7.5)	CRN	AR ^{7) 8)}
2	400/600	6.5	1	3.62	0.25	8	0.75	5	2.32	4.3 (9.48)	CRN	HF
2	900/1500	8.5	1.5	3.62	0.25	8	1	6.5	2.32	10.3 (22.71)	CRN	HR
2	2500	9.25	2	3.62	0.25	8	1.12	6.75	2.32	15.8 (34.84)	-	H3
3	150	7.5	0.94	5	0.06	4	0.75	6	3.5	5.1 (11.25)	CRN	AG ^{7) 8)}
3	300	8.25	1.12	5	0.06	8	0.75	6	3.5	7.0 (15.44)	CRN	AS ^{7) 8)}
4	150	9	0.94	6.19	0.06	8	0.75	7.5	3.5	7.2 (15.88)	CRN	AH
4	300	10	1.25	6.19	0.06	8	0.88	7.88	3.5	11.7 (25.8)	CRN	AT

- 1) Material AISI 316/316L: Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)
- 2) The roughness of the surface in contact with the medium including the raised face of the flanges (all standards) made of Alloy C276, Monel, tantalum, gold or PTFE is $R_a < 0.8 \mu\text{m}$ (31.5 μin). Lower surface roughness on request.
- 3) The flange raised face is made of the same material as the process isolating diaphragm.
- 4) CSA approval: Product Configurator, order code for "Approval"
- 5) Product Configurator, order code for "Process connection"
- 6) CRN approval not for TempC Membrane.
- 7) Alternatively available with TempC Membrane. Diameter of process isolating diaphragm changes with TempC version: nominal diameter 1": 1.1 in; 2": 2.40 in.
- 8) Alternatively available with gold-coated TempC Membrane (Product Configurator order code for "Membrane material" option "G").

ASME flanges with barrel (extended diaphragm seal), connection dimensions in accordance with ASME B 16.5, raised face RF



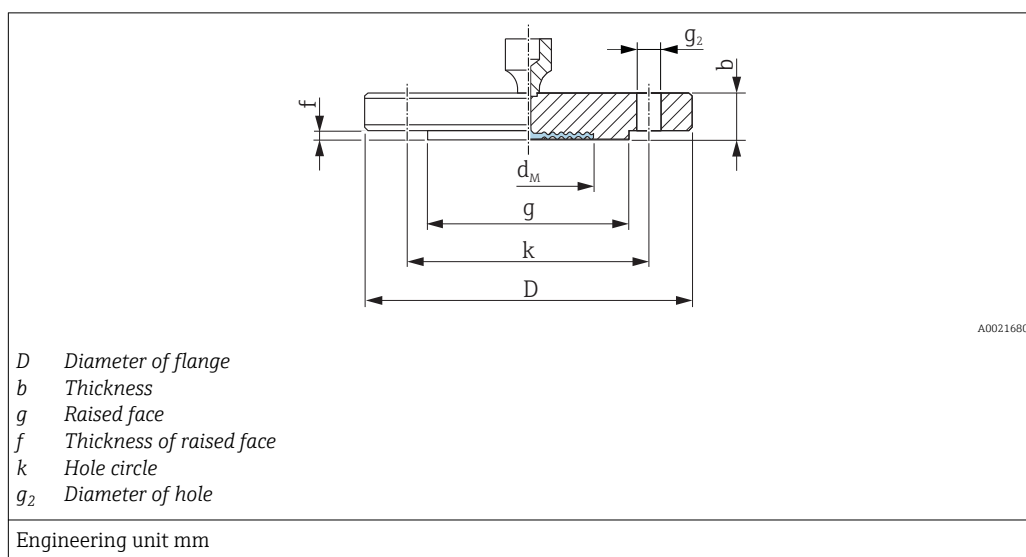
Flange ^{1) 2)}						Boltholes			Diaphragm seal		Approval ³⁾	Option ⁴⁾
Nominal diameter	Class	D	b	g	f	Number	<i>g₂</i>	<i>k</i>	<i>d_M</i>	Weight		
[in]	[lb./sq.in]	[in]	[in]	[in]	[in]		[in]	[in]	[in]	[kg (lb)]		
2	150	6	0.75	3.62	0.06	4	0.75	4.75	1.85	⁵⁾	CRN	J3 ⁵⁾
3	150	7.5	0.94	5	0.06	4	0.75	6	2.83	⁵⁾	CRN	J4 ⁵⁾
3	300	8.25	1.12	5	0.06	8	0.88	6.62	2.83	⁵⁾	CRN	J7 ⁵⁾
4	150	9	0.94	6.19	0.06	8	0.75	7.5	3.5	⁵⁾	CRN	J5 ⁵⁾
4	300	10	1.25	6.19	0.06	8	0.88	7.88	3.5	⁵⁾	CRN	J8 ⁵⁾

- 1) Material: AISI 316/316L. Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)
- 2) In the case of process isolating diaphragms made of Alloy C276, Monel or tantalum, the raised face of the flange and the barrel pipe are made of 316L.
- 3) CSA approval: Product Configurator, order code for "Approval"
- 4) Product Configurator, order code for "Process connection"
- 5) Choice of 2", 4", 6" or 8" barrel (extended diaphragm seal), for diameter and weight of barrel (extended diaphragm seal) see the following table

Option ¹⁾	Nominal diameter	Class	(L)	<i>d₃</i>	Weight
	[in]	[lb./sq.in]	in (mm)	in (mm)	[kg (lb)]
J3	2	150	2 (50.8) / 4 (101.6) / 6 (152.4) / 8 (203.2)	1.9 (48.3)	3.0 (6.6) / 3.4 (7.5) / 3.9 (8.6) / 4.4 (9.7)
J4	3	150	2 (50.8) / 4 (101.6) / 6 (152.4) / 8 (203.2)	2.99 (76)	6.0 (13.2) / 6.6 (14.5) / 7.1 (15.7) / 7.8 (17.2)
J7	3	300	2 (50.8) / 4 (101.6) / 6 (152.4) / 8 (203.2)	2.99 (76)	7.9 (17.4) / 8.5 (18.7) / 9.0 (19.9) / 9.6 (21.2)
J5	4	150	2 (50.8) / 4 (101.6) / 6 (152.4) / 8 (203.2)	3.7 (94)	8.6 (19) / 9.9 (21.8) / 11.2 (24.7) / 12.4 (27.3)
J8	4	300	2 (50.8) / 4 (101.6) / 6 (152.4) / 8 (203.2)	3.7 (94)	13.1 (28.9) / 14.4 (31.6) / 15.7 (34.6) / 16.9 (37.3)

- 1) Product Configurator, order code for "Process connection"

JIS flanges, connection dimensions in accordance with JIS B 2220 BL, raised face RF



Flange ^{1) 2) 3)}						Boltholes			Diaphragm seal		Option ⁴⁾
Nominal diameter	Nominal pressure	D	b	g	f	Number	g ₂	k	d _M	Weight	
		[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	
25 A	10 K	125	14	67	1	4	19	90	32	1.5 (3.31)	KC
50 A	10 K	155	16	96	2	4	19	120	59	2.3 (5.07)	CF
80 A	10 K	185	18	127	2	8	19	150	89	3.3 (7.28)	KL
100 A	10 K	210	18	151	2	8	19	175	89	4.4 (9.7)	KH

- 1) Material: AISI 316L
- 2) The roughness of the surface in contact with the medium including the raised face of the flanges (all standards) made of Alloy C276, Monel, tantalum, gold or PTFE is $R_a < 0.8 \mu\text{m}$ (31.5 μin). Lower surface roughness on request.
- 3) The flange raised face is made of the same material as the process isolating diaphragm.
- 4) Product Configurator, order code for "Process connection"