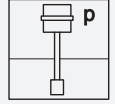


Pressure Transmitter

PPC-M51



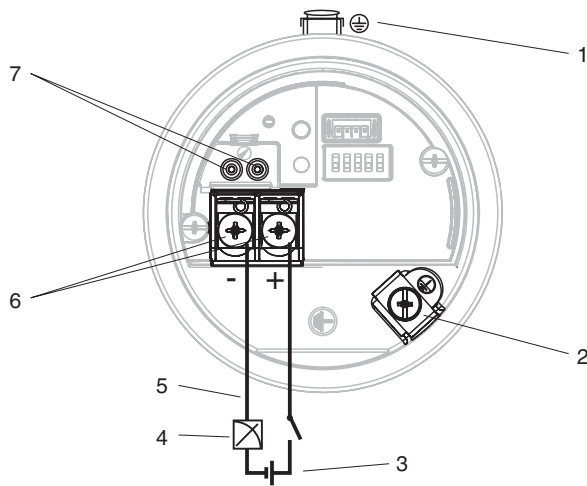
- Device for absolute pressure and gauge pressure measurement in gases, steams or liquids
- Large selection of process connections: universal use
- Temperature range up to 130 °C (266 °F)
- Pressure range up to 40 bar (600 psi)
- Easy commissioning without the need for an operating tool
- Configurable by PACTware



Function

The device is used for absolute pressure and gauge pressure measurement in gases, steams or liquids. The device has a capacitive measuring cell and a ceramic process isolating diaphragm. The ceramic sensor is a dry sensor. The process pressure acts directly on the robust ceramic process isolating diaphragm and deflects it. A pressuredependent 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. The data is transmitted to the control via analog signal, HART protocol or PROFIBUS PA. The device is easily configured by the use of keypad or with the PACTware configuration software. The device is designed modular and offers a variety of process connections, a replaceable display and a universal electronics.

Connection



- 1 External grounding terminal
- 2 Internal grounding terminal
- 3 Supply voltage
- 4 4 mA to 20 mA for HART devices
- 5 For HART devices: With a handheld terminal, all the parameters can be configured anywhere along the bus line via menu operation.
- 6 Terminals
- 7 Test terminals for HART devices

Technical Data

General specifications	
Construction type	sensor: ceramic sensor ceramic diaphragm
Series	PPC-M51
Supply	
Rated voltage	U_r versions for safe area: 11.5 ... 45 V DC, 2-wire 11.5 ... 35 V DC, HART, 2-wire 9 ... 32 V DC, PROFIBUS PA version for hazardous area see safety information (SI)
Input	
Measured variable	absolute or relative pressure

Release date: 2023-09-11 Date of issue: 2023-09-11 Filename: 255113_eng.pdf

Technical Data

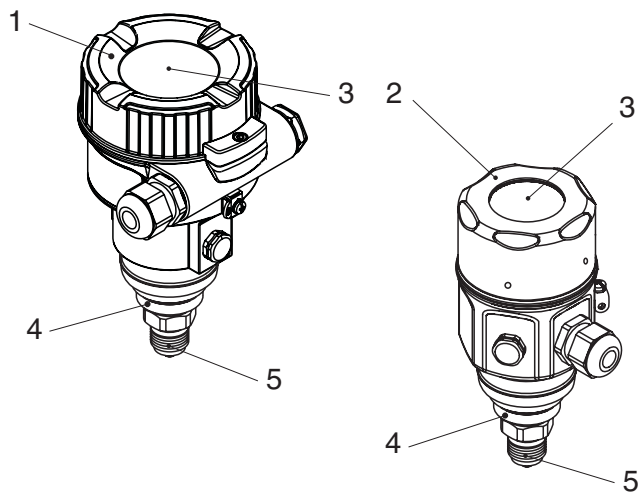
Measurement range	0.1 ... 40 bar max. turn down: 100:1
Output	
Output signal	4 ... 20 mA , analog , 2-wire 4 ... 20 mA with superimposed digital communication protocol HART 6.0, 2-wire digital communication signal PROFIBUS PA (Profile 3.02)
Communication	4 ... 20 mA HART (standard) PROFIBUS PA (option)
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2006 , EN 61326-2-3:2006 , EN 61326-2-5:2006
Low voltage	
Directive 2014/35/EU	EN 61010-1:2010
Conformity	
Degree of protection	IEC 60529:2001
Measurement accuracy	
Accuracy	reference accuracy: $\pm 0.15\%$ (standard), $\pm 0.075\%$ (platinum) The reference accuracy comprises the non-linearity according to limit point setting, hysteresis and non-reproducibility acc. to IEC 60770. The data refer to the calibrated span.
Long-term drift	up to $\pm 0.1\%$ of upper range limit (URL)/year
Operating conditions	
Process conditions	
Process temperature	-40 ... 100 °C (-40 ... 212 °F) hygienic versions: -40 ... 130 °C (-40 ... 266 °F), 150 °C/1h (302 °F/1h)
Ambient conditions	
Ambient temperature	-40 ... 85 °C (-40 ... 185 °F) with display : -20 ... 70 °C (-4 ... 158 °F)
Mechanical specifications	
Degree of protection	IP66, NEMA 4X IP68, NEMA 6P (24 hours in water 1.83 m (6 ft) deep) IP69K (with separate housing and FEP cable)
Connection	gland M20 thread M20, G1/2, NPT1/2 device plug M12 HAN7D Harting connector, angled valve connector acc. ISO 4400, cable 5 m
Material	materials in contact with process : Al ₂ O ₃ ceramic (ultrapure 99.9 %) housing: - die-cast aluminum with protective powder-coating on polyester base, housing F31 - stainless steel AISI 316L (1.4404), housing F15 measuring cell seal: Viton, EPDM, NBR, Kalrez
Process connection	threads ISO 228: G1/2, G1, G1-1/2, G2 threads ANSI: NPT1/2, NPT1, NPT1-1/2, NPT2 hygienic process connections: Clamp, Varivent, DRD, DIN 11851, DIN 11864, NEUMO, APV, uni adapter flanges: EN 1092-1: DN 25 ... DN 80, ANSI 16.5: 1 ... 4 inch, JIS B2220
Data for application in connection with hazardous areas	
EU-type examination certificate	see instruction manuals (SI)
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-31:2009
International approvals	
FM approval	see instruction manuals (SI)
CSA approval	see instruction manuals (SI)
IECEx approval	see instruction manuals (SI)
Certificates and approvals	
Drinking water approval	NSF61 approval
General information	
Supplementary documentation	technical information (TI) manuals, brief instructions (BA, KA) instruction manuals (SI) control drawings (ZD) approval (ZE)

Technical Data

Supplementary information EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Accessories
 Designation see technical information (TI)

Assembly



- 1 Aluminum housing
- 2 Stainless steel housing
- 3 Cover with viewing window
- 4 Ceramic process isolating diaphragm
- 5 Process connection (thread)

Type Code

This overview does not mark options which are mutually exclusive.
 Option with * = on request/in preparation.
 Option with ** = multiple options can be selected.

P	P	C	-	M	5	1	(1)	(2)	(3)	(4)	-	(5)	(6)	(7)	(8)	(9)	-	(10)	+	(11)
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PPC-M51	Device
PPC-M51	Pressure transmitter with metallic welded process isolating diaphragm

(1)	Sensor range
Sensors for gauge pressure	
R1A	100 mbar/10 kPa/1.5 psi/relative/14 m H ₂ O/3 foot H ₂ O/40 inch H ₂ O
R1C	250 mbar/25 kPa/3.75 psi/relative/2,5 m H ₂ O/7.5 foot H ₂ O/100 inch H ₂ O
R1D	400 mbar/40 kPa/6 psi/relative/4 m H ₂ O/13 foot H ₂ O/160 inch H ₂ O
R2A	1 bar/100 kPa/15 psi/relative/10 m H ₂ O/33 foot H ₂ O/400 inch H ₂ O
R2C	2 bar/200 kPa/30 psi/relative/20 m H ₂ O/67 foot H ₂ O/800 inch H ₂ O
R2D	4 bar/400 kPa/60 psi/relative/40 m H ₂ O/133 foot H ₂ O/1600 inch H ₂ O
R3A	10 bar/1 Mpa/150 psi/relative/100 m H ₂ O/333 foot H ₂ O/4000 inch H ₂ O
R3D	40 bar/4 Mpa/600 psi/relative/400 m H ₂ O/1334 foot H ₂ O/16000 inch H ₂ O
Sensors for absolute pressure	
A1A	100 mbar/10 kPa/1.5 psi/absolute/1 m H ₂ O/3 foot H ₂ O/40 inch H ₂ O
A1C	250 mbar/25 kPa/3.75 psi/absolute/2,5 m H ₂ O/7.5 foot H ₂ O/100 inch H ₂ O
A1D	400 mbar/40 kPa/6 psi/absolute/4 m H ₂ O/13 foot H ₂ O/160 inch H ₂ O
A2A	1 bar/100 kPa/15 psi/absolute/10 m H ₂ O/33 foot H ₂ O/400 inch H ₂ O
A2C	2 bar/200 kPa/30 psi/absolute/20 m H ₂ O/67 foot H ₂ O/800 inch H ₂ O
A2D	4 bar/400 kPa/60 psi/absolute/40 m H ₂ O/133 foot H ₂ O/1600 inch H ₂ O
A3A	10 bar/1 Mpa/150 psi/absolute/100 m H ₂ O/333 foot H ₂ O/4000 inch H ₂ O
A3D	40 bar/4 Mpa/600 psi/absolute/400 m H ₂ O/1334 foot H ₂ O/16000 inch H ₂ O
XXX	Special version

Release date: 2023-09-11 Date of issue: 2023-09-11 Filename: 255113_eng.pdf

Type Code

(2)	Calibration, unit
1	Sensor range in mbar/bar
2	Sensor range in kPa/MPa
3	Sensor range in mm/m H ₂ O
4	Sensor range in inch H ₂ O/foot H ₂ O
5	Sensor range in psi
A	Sensor range in %
J	Customized pressure unit (see additional specification)
K	Customized level unit (see additional specification)
Y	Special version

(3)	Reference accuracy
D	Platinum
G	Standard
Y	Special version

(4)	Process connection
A31	1 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A32	1 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A51	1-1/2 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A52	1-1/2 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A61	2 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A62	2 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A6H	2 inch, 150 lbs, ETFE > 316/316L, flange ANSI B16.
A6V	2 inch, 150 lbs RF, PVDF, flange ANSI B16.5
A81	3 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A82	3 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A8H	3 inch, 150 lbs, ETFE > 316/316L, flange ANSI B16.5
A8V	3 inch, 150 lbs RF, PVDF, flange ANSI B16.5
A91	4 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A92	4 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A9H	4 inch, 150 lbs, ETFE > 316/316L, flange ANSI B16.5
DR1	* DRD DN50 65 mm PN25, 316L
F45	DN25 PN10-40 B1, 316L, flange EN 1092-1
F55	DN32 PN10-40 B1, 316L, flange EN 1092-1
F62	* DN40 PN10/16 B1, PVDF, flange EN 1092-1
F65	DN40 PN10-40 B1, 316L, flange EN 1092-1
F6H	DN40 PN10-40, ETFE > 316L, flange EN 1092-1
F72	DN50 PN10/16 B1, PVDF, flange EN 1092-1
F75	DN50 PN10-40 B1, 316L, flange EN 1092-1
F7H	DN50 PN25/40, ETFE > 316L, flange EN 1092-1
F95	DN80 PN10-40 B1, 316L, flange EN 1092-1
F9H	DN80 PN25/40, ETFE > 316L, flange EN 1092-1
G11	Thread ISO228 G1/2, 316L
G13	Thread ISO228 G1/2 G1/4 female, AlloyC
G14	Thread ISO228 G1/2 G1/4 female, 316L
G1C	Thread ISO228 G1/2, AlloyC
G1M	Thread ISO228 G1/2 hole 11.4 mm, 316L
G1N	Thread ISO228 G1/2 hole 11.4 mm, AlloyC
G1V	Thread ISO228 G1/2, PVDF
G44	Thread DIN 13 M44x1,25, 316L, flush-mounted
G51	Thread ISO228 G1-1/2, 316L, flush-mounted
G61	Thread ISO228 G2, 316L, flush-mounted
J16	10K 50A RF, 316L, flange JIS B2220
J17	10K 80A RF, 316L, flange JIS B2220
J19	10K 100A RF, 316L, flange JIS B2220
J31	Thread JIS B0202 G1/2 male, 316L
J32	Thread JIS B0203 R1/2 male, 316L
M56	* DIN 11851 DN50 PN25 cap-nut, 316L, EHEDG, 3A
M58	* DIN 11851 DN40 PN25 cap-nut, 316L, EHEDG, 3A
M64	DIN 11864-1 A DN40 PN16 pipe DIN 11866-A, cap-nut, 316L, EHEDG, 3A with seal FDA
M65	DIN 11864-1 A DN50 PN16 pipe DIN 11866-A, cap-nut, 316L, EHEDG, 3A with seal FDA
N51	Thread ANSI MNPT1-1/2, 316L, flush-mounted
N61	Thread ANSI MNPT2, 316L, flush-mounted
R1C	Thread ANSI FNPT1/2, AlloyC
R1J	Thread ANSI FNPT1/2, 316L

Type Code

(4)	Process connection
RJF	Thread ANSI MNPT1/2 hole 3 mm, PVDF
RKC	Thread ANSI MNPT1/2 hole 11.4 mm, AlloyC
RKJ	Thread ANSI MNPT1/2 hole 11.4 mm, 316L
RLC	Thread ANSI MNPT1/2 FNPT1/4, AlloyC
RLJ	Thread ANSI MNPT1/2 FNPT1/4, 316L
S4J	* NEUMO BioControl D50 PN16, 316L, EHEDG, 3A
SP6	* APV-Inline DN50 PN25, 316L, 3A
T65	* Tri-Clamp ISO2852 DN40-51 (2 inch), 316L, DIN 32676 DN50, EHEDG, 3A, ASME-BPE
T85	Tri-Clamp ISO2852 DN76.1 (3 inch), 316L, EHEDG, 3A with seal FDA
U4E	Universal adapter 44 mm 316L, EPDM molded seal, EHEDG
U4S	Universal adapter 44 mm 316L, silicone molded seal, EHEDG, 3A with seal FDA
V12	* Varivent F pipe DN25-32 PN40, 316L, EHEDG, 3A
V14	* Varivent N pipe DN40-162 PN40, 316L, EHEDG, 3A
XXX	Special version for welded nozzles (only with vegetable oil)

(5)	Seal material
1	FKM Viton
4	EPDM, FDA
B	FKM Viton, FDA, 3A Class I, USP Class VI
F	NBR
G	HNBR, FDA, 3A Class II, KTW, AFNOR, BAM
H	NBR, low temperature
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
X	Special version

(6)	Housing
I	Aluminum housing F31
J	Aluminum housing F31; glass window
Q	Stainless steel housing F15, hygienic version
R	Stainless steel housing F15, hygienic version; glass window
S	Stainless steel housing F15, hygienic version; plastic window
X	Special version

(7)	Output
I2	4 mA to 20 mA analog electronics
IH	4 mA to 20 mA Smart electronics, HART protocol
PA	PROFIBUS-PA electronics P3.0
99	Special version

(8)	Electrical connection
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, IP66/68 NEMA4X/6P
M	Connector 7/8 inch, IP66/68 NEMA4X/6P
P	Connector Han7D, 90deg., IP65
S	PE cable 5 m, IP66/68 NEMA4X/6P and pressure compensation via cable
V	Valve connector ISO4400 M16, IP64
Y	Special version

(9)	Display, operation
1	LCD, push buttons on display electronics
2	W/o LCD, push buttons on electronics
9	Special version

(10)	Approval
CG	CSA General Purpose
CU	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
E1	ATEX II 2G Ex ia IIC T6
E2	ATEX II 3G Ex nA IIC T6

Type Code

(10)	Approval
E3	ATEX II 3G Ex ic IIC T6
EM	ATEX II 1/2D Ex ia IIIC
ES	ATEX II 1/2D Ex t IIIC
EX	ATEX II 1/2G Ex ia IIC T6
FM	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
FN	FM NI Cl. I Div. 2 Gr. A-D, Zone 2
I1	IEC Ex ia IIC T6 Ga/Gb und Ex ia IIIC Da/Db
IA	IEC Ex ia IIC T6 Ga/Gb
IE	IEC Ex ic IIC T6 Gc
IF	IEC Ex ia IIIC Da/ Db
NA	Version for non-hazardous area
SX	ATEX II 1/2G Ex ia IIC T6 und ATEX II 1/2D Ex iaD

Additional Options

(11)	Additional operation language
A	English
B	German
C	French
D	Spanish
E	Italian
K	Chinese simplified
L	Japanese

(11)	Calibration
1	Factory calibration certificate, 5-point

(11)	Service **
F	Oil and grease removed



(11)	Test, certificate **
3	Material certification, metallic parts in contact with medium, EN 10204-3.1 inspection certificate

(11)	Separate housing **
6	Cable PE, 2 m/80 inch and housing mounting bracket, wall/pipe, 304
7	Cable PE, 5 m/200 inch and housing mounting bracket, wall/pipe, 304
8	Cable PE, 10 m/400 inch and housing mounting bracket, wall/pipe, 304
9	Cable FEP, 5 m/200 inch IP69K and housing mounting bracket, wall/pipe, 304

(11)	Firmware version
M	01.00.zz, PROFIBUS PA, DevRev01
N	01.00.zz, HART, DevRev01

(11)	Marking **
O	Measuring point (TAG), see additional specification
P	Bus address, see additional specification
Q	* Mounting accessory, see additional specification

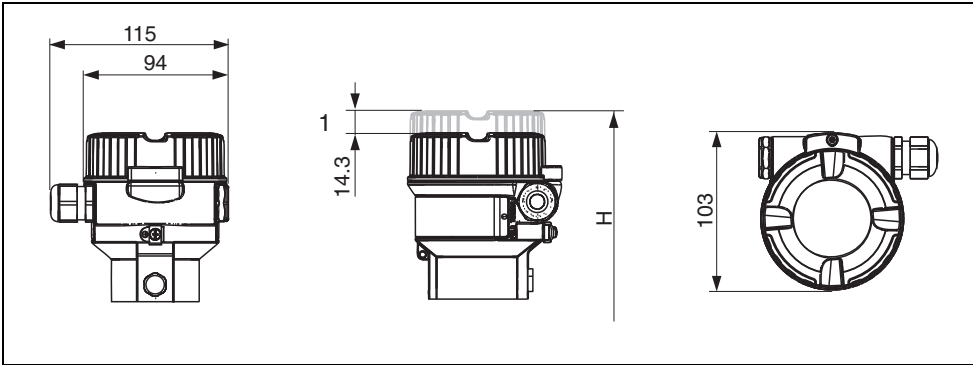
Accessories

	PACTware 5.0	FDT Framework
	DTM Level Control	DTM collection

Dimensions

Housing F31, aluminum (versions I, J)

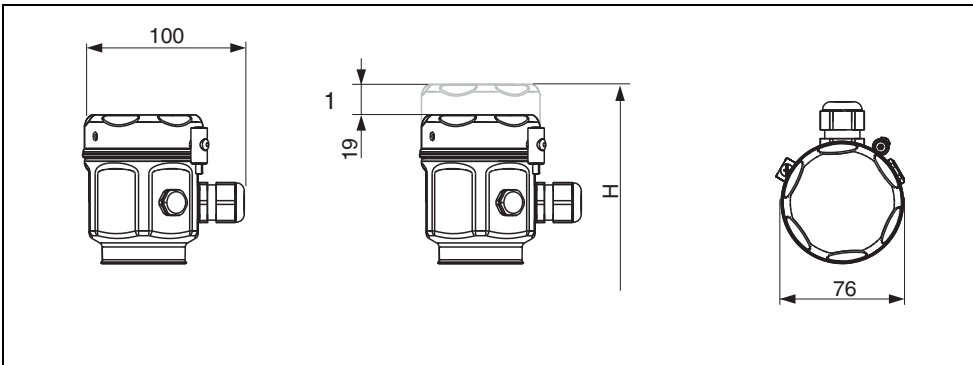
Dimensions in mm (inch)



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

Housing F15, stainless steel (versions Q, R, S, hygienic)

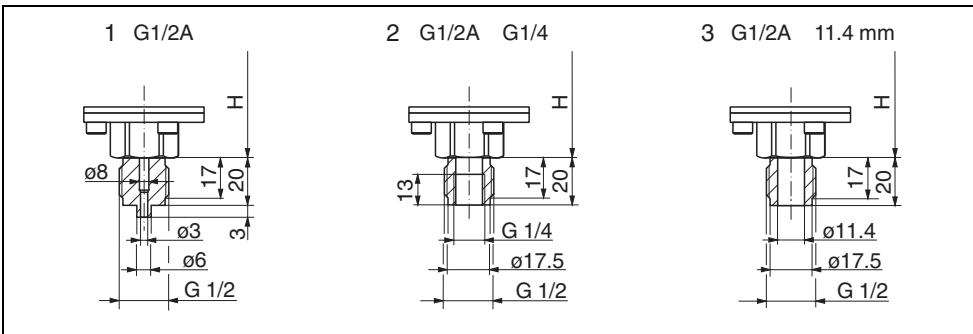
Dimensions in mm (inch)



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

Process connections with thread, internal process isolating diaphragm

Dimensions in mm (inch)



Process connections PPC-M51, thread ISO 228

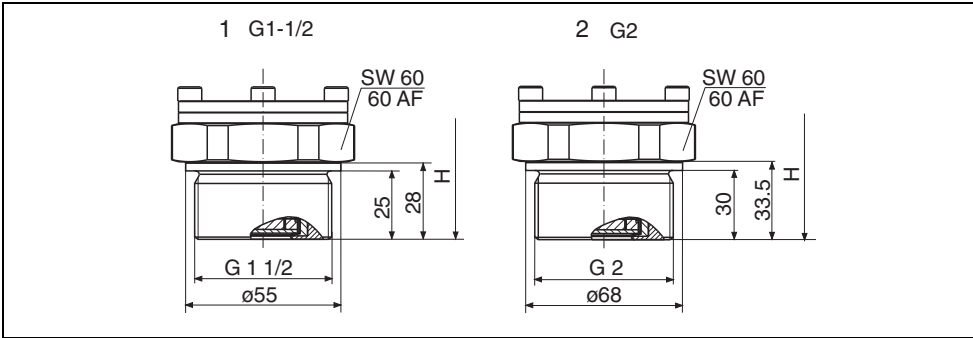
- 1 Thread ISO 228 G1/2 A EN 837; material version G11: AISI 316L, version G1C: Alloy C276, Version G1V: PVDF (max.: 15 bar (217,5 psi), -10 °C to +60 °C (+14 °F to +140 °F)), Version G1V mount version with a mounting bracket only
- 2 Thread ISO 228 G1/2A G1/4 (female); material version G14: AISI 316L, version G13: Alloy C276
- 3 Thread ISO 228 G1/2A hole 11.4 mm (0.45 inch); Material version G1M: AISI 316L, version G1N: Alloy C276

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	154 mm (6.06 inch)	146 mm (5.75 inch)

Release date: 2023-09-11 Date of issue: 2023-09-11 Filename: 255113_eng.pdf

Process connections with thread, flush-mounted process isolating diaphragm

Dimensions in mm (inch)



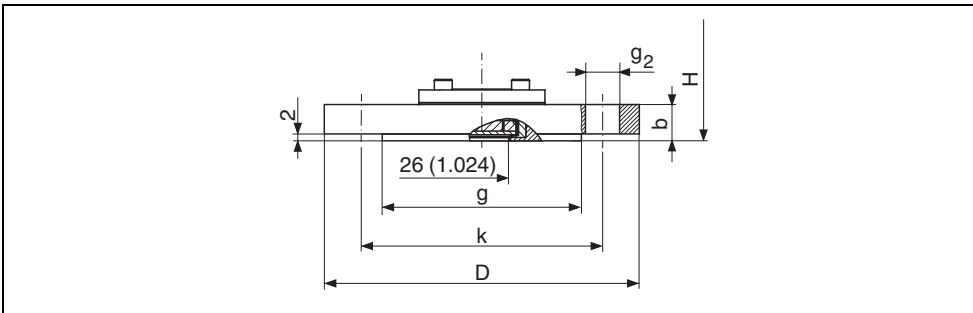
Process connections PPC-M51, thread ISO

- 1 Thread ISO 228 G1-1/2A; material version G51: AISI 316L
- 2 Thread ISO 228 G2A; material version G61: AISI 316L

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	201 mm (7.91 inch)	193 mm (7.6 inch)

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

Dimensions in mm (inch)



Process connections PPC-M51, EN/DIN flange with raised face (flush-mounted process isolating diaphragm)

Version	Flange				Boltholes					
	Material	Nominal Diameter	Nominal pressure	Shape ¹	Diameter D [mm]	Thickness b [mm]	Raised face g [mm]	Quantity	Diameter g ₂ [mm]	Hole circle k [mm]
F45	AISI 316L	DN25	PN10-40	B1 (D)	115	18	68	4	14	85
F55	AISI 316L	DN32	PN10-40	B1 (D)	140	18	78	4	18	100
F65	AISI 316L	DN40	PN10-40	B1 (D)	150	18	88	4	18	110
F6H	ETFE ³	DN40	PN10-40	B1 (D)	150	21	88	4	18	110
F75	AISI 316L	DN50	PN10-40	B1 (D)	165	20	102	4	18	125
F72	PVDF ²	DN50	PN10-16	B1 (D)	165	18	102	4	18	125
F7H	ETFE ³	DN50	PN25-40	B1 (D)	165	20	102	4	18	125
F95	AISI 316L	DN80	PN10-40	B1 (D)	200	24	138	8	18	160
F9H	ETFE ³	DN80	PN25-40	B1 (D)	200	24	138	8	18	160

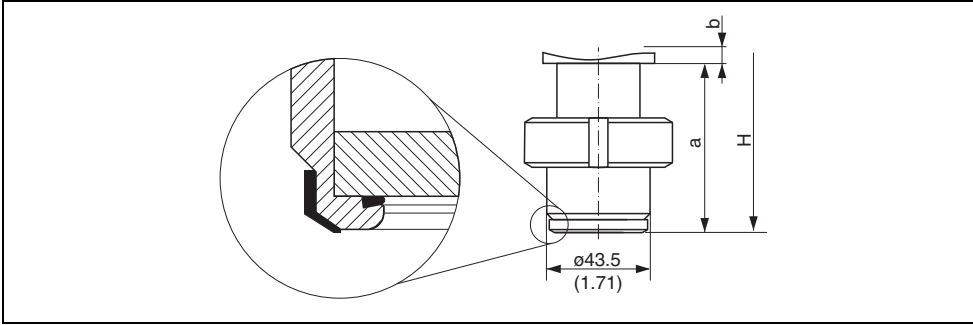
- ¹ Designation as per DIN 2527 in brackets
- ² OPL.: 15 bar (225 psi), Process temperature range: -10 °C to +60 °C (+14 °F to +140 °F)
- ³ ETFE coating on AISI 316L (1.4404). When operating in hazardous areas, avoid electrostatic charging of the plastic surfaces.

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	201 mm (7.91 inch)	193 mm (7.6 inch)

Release date: 2023-09-11 Date of issue: 2023-09-11 Filename: 255113_eng.pdf

Process connections with universal adapter

Dimensions in mm (inch)



Material: b = top section AISI 316L (1.4404), a = bottom section AISI 316L (1.4435); Pepperl+Fuchs 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 Ra 0.76 µm (30 µinch).

Version	Process connection approval ¹	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
U4S	EHEDG, 3A	Silicone	EPDM (order version "K")	FDA ² 3A Class II, USP Class VI. DVGW, KTW, W270, WRAS, ACS, NSF61	10
U4E	EHEDG	EPDM	EPDM (order version "J")	FDA ²	

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

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	196 mm (7.72 inch)	189 mm (7.44 inch)



For further information see technical information.