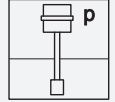


# Pressure Transmitter

## LHC-M51



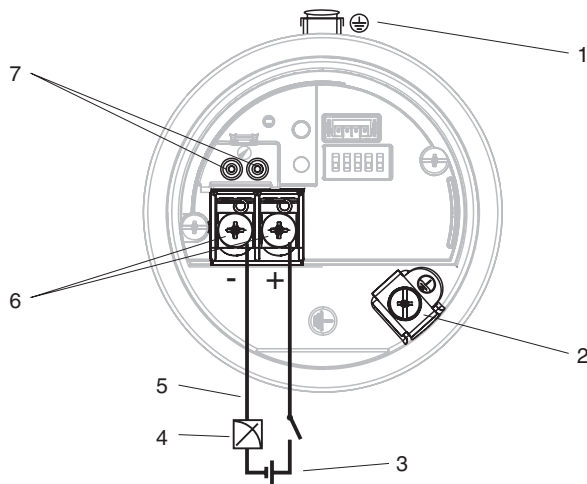
- Device for absolute pressure and gauge pressure measurement in gases, steams or liquids
- Large selection of process connections: universal use
- Temperature range up to 130 °C (266 °F)
- Pressure range up to 400 bar (6000 psi)
- Easy commissioning without the need for an operating tool
- Configurable by PACTware



### Function

The device is used for absolute pressure and gauge pressure measurement in gases, steams or liquids. The device has a piezoresistive measuring cell and a metallic welded process isolating diaphragm. The operating pressure deflects the process isolating diaphragm. A fill fluid transfers the pressure to a resistance bridge (semiconductor technology). The pressure-dependent change in the bridge output voltage is measured and evaluated. 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: silicium sensor metall diaphragm
Series	LHC-M51
Supply	
Rated voltage	U <sub>r</sub> 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

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

Measurement range	0.4 ... 400 bar max. turn down: 100:1
<b>Output</b>	
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)
<b>Directive conformity</b>	
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
<b>Conformity</b>	
Degree of protection	IEC 60529:2001
<b>Measurement accuracy</b>	
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
<b>Operating conditions</b>	
Process conditions	
Process temperature	-40 ... 125 °C (-40 ... 257 °F) hygienic versions: -40 ... 130 °C (-40 ... 266 °F), 150 °C/1h (302 °F/1h)
<b>Ambient conditions</b>	
Ambient temperature	-40 ... 85 °C (-40 ... 185 °F) with display : -20 ... 70 °C (-4 ... 158 °F)
<b>Mechanical specifications</b>	
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 : 316L, Alloy C, rhodium>gold housing: - die-cast aluminum with protective powder-coating on polyester base, housing F31 - stainless steel AISI 316L (1.4404), housing F15 measuring cell seal: no, welded measuring cell
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
<b>Data for application in connection with hazardous areas</b>	
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
<b>International approvals</b>	
FM approval	see instruction manuals (SI)
CSA approval	see instruction manuals (SI)
IECEx approval	see instruction manuals (SI)
<b>Certificates and approvals</b>	
Drinking water approval	NSF61 approval
<b>General information</b>	
Supplementary documentation	technical information (TI) manuals, brief instructions (BA, KA) instruction manuals (SI) control drawings (ZD) approval (ZE)

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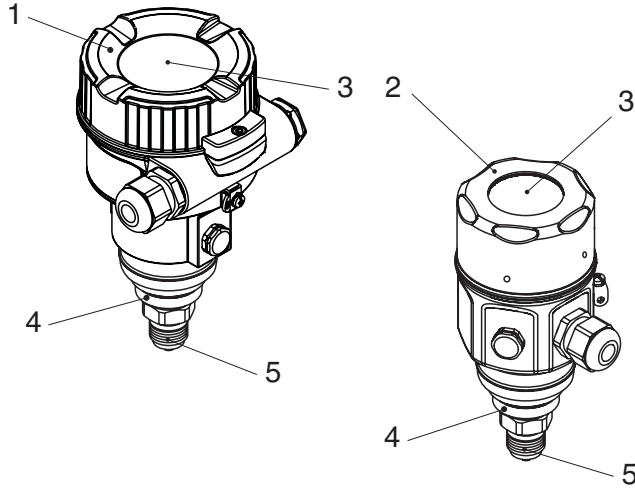
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**Technical Data**

Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .
<b>Accessories</b>	
Designation	see technical information (TI)

**Assembly**



- 1 Aluminum housing
- 2 Stainless steel housing
- 3 Cover with viewing window
- 4 Metallic 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.

L	H	C	-	M	5	1	(1)	(2)	(3)	(4)	-	(5)	(6)	(7)	(8)	(9)	(10)	-	(11)	+	(12)
---	---	---	---	---	---	---	-----	-----	-----	-----	---	-----	-----	-----	-----	-----	------	---	------	---	------

LHC-M51	Device
LHC-M51	Pressure transmitter with metallic welded process isolating diaphragm

(1)	Sensor range
Sensors for gauge pressure	
R1D	400 mbar/40 kPa/6 psi/relative/4 m H <sub>2</sub> O/13 foot H <sub>2</sub> O/160 inch H <sub>2</sub> O
R2A	1 bar/100 kPa/15 psi/relative/10 m H <sub>2</sub> O/33 foot H <sub>2</sub> O/400 inch H <sub>2</sub> O
R2C	2 bar/200 kPa/30 psi/relative/20 m H <sub>2</sub> O/67 foot H <sub>2</sub> O/800 inch H <sub>2</sub> O
R2D	4 bar/400 kPa/60 psi/relative/40 m H <sub>2</sub> O/133 foot H <sub>2</sub> O/1600 inch H <sub>2</sub> O
R3A	10 bar/1 Mpa/150 psi/relative/100 m H <sub>2</sub> O/333 foot H <sub>2</sub> O/4000 inch H <sub>2</sub> O
R3D	40 bar/4 Mpa/600 psi/relative/400 m H <sub>2</sub> O/1334 foot H <sub>2</sub> O/16000 inch H <sub>2</sub> O
R4A	100 bar/10 Mpa/1500 psi/relative/1000 m H <sub>2</sub> O/3330 foot H <sub>2</sub> O/40000 inch H <sub>2</sub> O
R4D	400 bar/40 Mpa/6000 psi/relative/4000 m H <sub>2</sub> O/13340 foot H <sub>2</sub> O/160000 inch H <sub>2</sub> O
Sensors for absolute pressure	
A1D	400 mbar/40 kPa/6 psi/absolute/4 m H <sub>2</sub> O/13 foot H <sub>2</sub> O/160 inch H <sub>2</sub> O
A2A	1 bar/100 kPa/15 psi/absolute/10 m H <sub>2</sub> O/33 foot H <sub>2</sub> O/400 inch H <sub>2</sub> O
A2C	2 bar/200 kPa/30 psi/absolute/20 m H <sub>2</sub> O/67 foot H <sub>2</sub> O/800 inch H <sub>2</sub> O
A2D	4 bar/400 kPa/60 psi/absolute/40 m H <sub>2</sub> O/133 foot H <sub>2</sub> O/1600 inch H <sub>2</sub> O
A3A	10 bar/1 Mpa/150 psi/absolute/100 m H <sub>2</sub> O/333 foot H <sub>2</sub> O/4000 inch H <sub>2</sub> O
A3D	40 bar/4 Mpa/600 psi/absolute/400 m H <sub>2</sub> O/1334 foot H <sub>2</sub> O/16000 inch H <sub>2</sub> O
A4A	100 bar/10 Mpa/1500 psi/absolute/1000 m H <sub>2</sub> O/3330 foot H <sub>2</sub> O/40000 inch H <sub>2</sub> O
A4D	400 bar/40 Mpa/6000 psi/absolute/4000 m H <sub>2</sub> O/13340 foot H <sub>2</sub> O/160000 inch H <sub>2</sub> O
XXX	Special version

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## Type Code

(2)	Calibration, unit
1	Sensor range in mbar/bar
2	Sensor range in kPa/MPa
3	Sensor range in mm/m H <sub>2</sub> O
4	Sensor range in inch H <sub>2</sub> O/foot H <sub>2</sub> 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
A32	1 inch, 300 lbs RF, 316/316L, flange ANSI B16.5
A3H	1-1/2 inch, 150 lbs RF, 316/316 L, flange ANSI B 16.5
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
A81	3 inch, 150 lbs RF, 316/316L, flange ANSI B16.5
A82	3 inch, 300 lbs RF, 316/316L, 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
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
F65	DN40 PN10-40 B1, 316L, flange EN 1092-1
F75	DN50 PN10-40 B1, 316L, flange EN 1092-1
F95	DN80 PN10-40 B1, 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
G1O	Thread ISO228 G1/2, 316L, flush-mounted
G1P	Thread ISO228 G1/2, AlloyC, flush-mounted
G31	Thread ISO228 G1, 316L, flush-mounted
G51	Thread ISO228 G1-1/2, 316L, flush-mounted
G61	Thread ISO228 G2, 316L, flush-mounted
G71	* Thread ISO228 G1 flush-mounted, metal sealing cone, 316L
G72	* Thread ISO228 G1 O-ring seal, 316L
G73	* Thread ISO228 G1/2 O-ring seal, fm = flush-mounted, 316L
G74	Thread DIN 13 M20x1.5, 316L
M55	* DIN 11851 DN32 PN25 cap-nut, 316L, EHEDG, 3A
M56	* DIN 11851 DN50 PN25 cap-nut, 316L, EHEDG, 3A
M57	* DIN 11851 DN25 PN25 cap-nut, 316L, EHEDG, 3A
M58	* DIN 11851 DN40 PN25 cap-nut, 316L, EHEDG, 3A
N21	* Thread ANSI MNPT3/4, 316L, flush-mounted
N31	Thread ANSI MNPT1, 316L, flush-mounted
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
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
S1J	* NEUMO BioControl D25 PN16, 316L, EHEDG, 3A
S4J	* NEUMO BioControl D50 PN16, 316L, EHEDG, 3A
S45	* SMS 1 inch PN25, 316L, EHEDG, 3A
S55	* SMS 1-1/2 inch PN25, 316L, EHEDG, 3A
S65	* SMS 2 inch PN25, 316L, EHEDG, 3A

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## Type Code

(4)	Process connection
SP6	* APV-Inline DN50 PN25, 316L, 3A
T51	* Tri-Clamp ISO2852 DN38 (1-1/2 inch), 316L, DIN 32676 DN40, EHEDG, 3A, ASME-BPE
T55	* Tri-Clamp ISO2852 DN25 (1 inch), 316L, DIN 32676 DN25, EHEDG, 3A, ASME-BPE
T65	* Tri-Clamp ISO2852 DN40-51 (2 inch), 316L, DIN 32676 DN50, EHEDG, 3A, ASME-BPE
TBJ	* Clamp ISO2852 DN12-22 (1/2 inch to 3/4 inch), 316L, DIN 32676 DN10-20, EHEDG, 3A, ASME-BPE
TUJ	* KingGage 1777-2 (short), 316L, 3A
TVJ	* KingGage 1777 (medium), 316L, 3A
TWJ	* KingGage 1777-3 (long), 316L, 3A
V10	* Varivent B pipe DN10-15 PN40, 316L, EHEDG, 3A
V12	* Varivent F pipe DN25-32 PN40, 316L, EHEDG, 3A
V14	* Varivent N pipe DN40-162 PN40, 316L, EHEDG, 3A
XSJ	Prepared for diaphragm seal mount, 316L
XXX	Special version

(5)	Material of the process isolating diaphragm
1	316L
4	AlloyC
A	Rhodium > gold > 316L
X	Special version

(6)	Fill fluid
1	Silicone oil
2	Inert oil
3	Synthetic oil FDA
9	Special version

(7)	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

(8)	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

(9)	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

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

(11)	Approval
C1	CSA C/US IS/XP Cl. I, II Div. 1Gr. A-G/B-G, Zone 1,2
CD	CSA C/US Cl. II, III Div. 1 Gr. E-G, US: Zone 21,22
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
CX	CSA C/US XP Cl. I, II Div. 1 Gr. B-G, Ex d, (conduit seal not required), Zone 1, 2
E1	ATEX II 2G Ex ia IIC T6
E2	ATEX II 3G Ex nA IIC T6
E3	ATEX II 3G Ex ic IIC T6

## Type Code

(11)	Approval
ES	ATEX II 1/2D Ex t IIIC
EX	ATEX II 1/2G Ex ia IIC T6
FD	FM DIP Cl. II, III Div. 1 Gr. E-G, Zone 21,22
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
ID	IEC Ex t IIIC Da/Db
IE	IEC Ex ic IIC T6 Gc
NA	Version for non-hazardous area
SX	ATEX II 1/2G Ex ia IIC T6 und ATEX II 1/2D Ex iaD

### Additional Options

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

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

(12)	Service **
F	Oil and grease removed



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

(12)	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

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

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

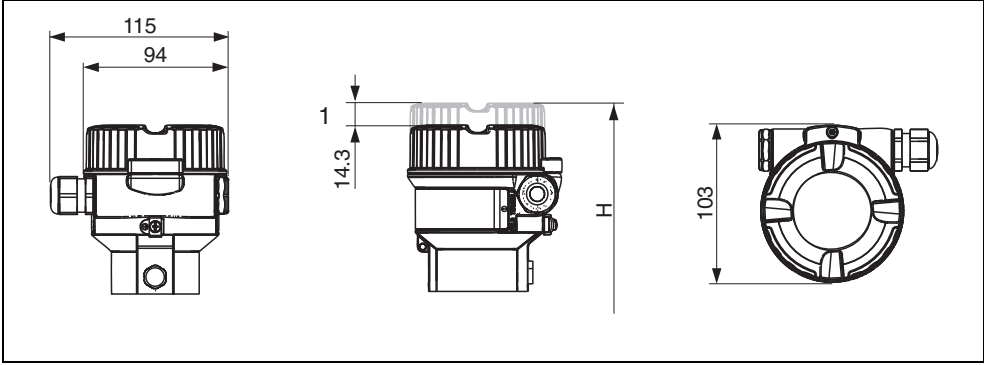
## Accessories

	<b>PACTware 5.0</b>	FDT Framework
	<b>DTM Level Control</b>	DTM collection

**Dimensions**

**Housing F31, aluminum (versions I, J)**

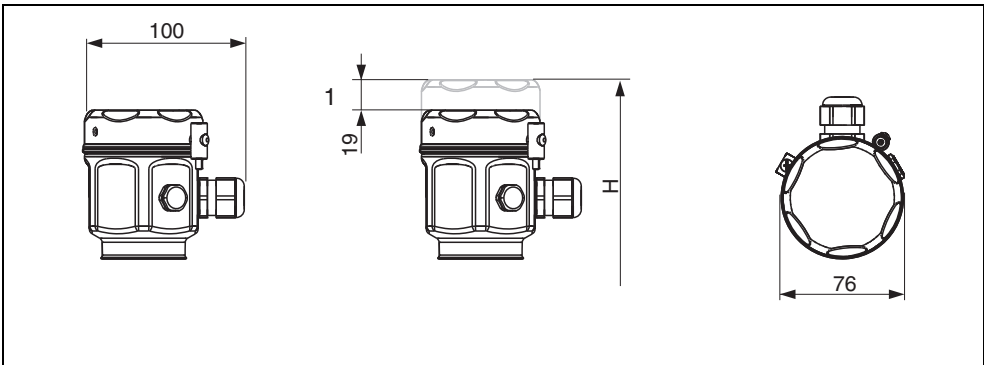
Dimensions in mm (inch)



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)**

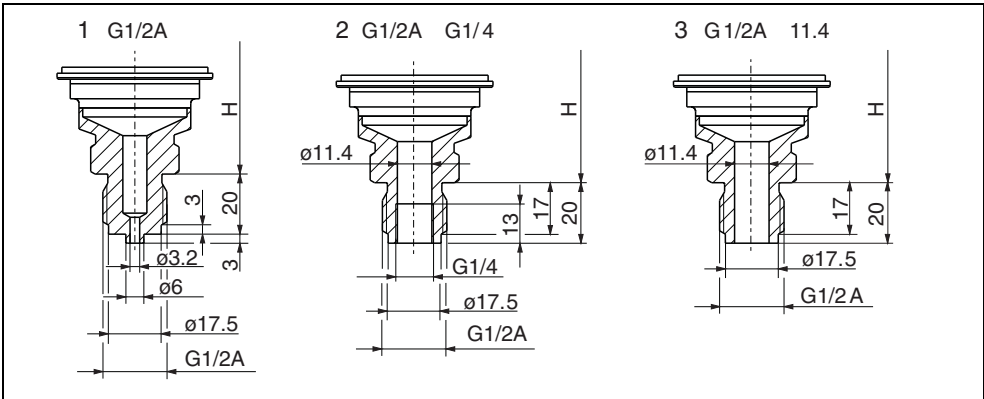
Dimensions in mm (inch)



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 LHC-M51, thread ISO 228 and DIN

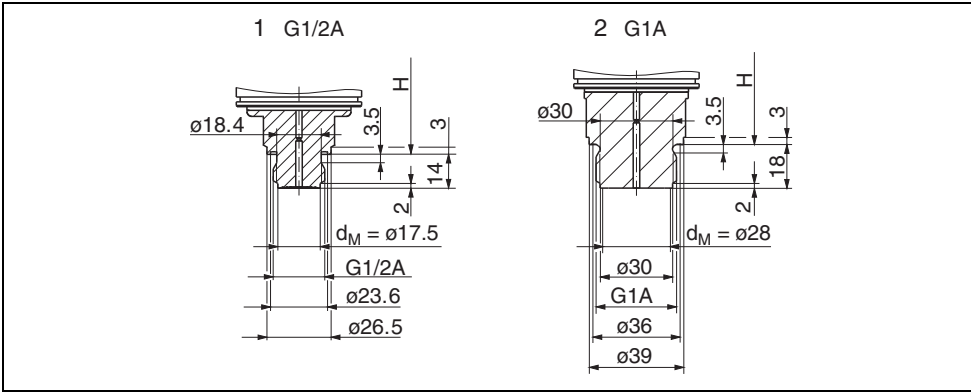
- 1 Thread ISO 228 G1/2A EN 837; material version G11: AISI 316L, version G1C: Alloy C276
- 2 Thread ISO 228 G1/2A, G1/4 (female); material version G14: AISI 316L, version G13: Alloy C276
- 3 Thread ISO 228 G1/2A hole 11.4 mm (0.45 inch); material version G1M: AISI 316L, version G1N: Alloy C276

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	169 mm (6.65 inch)	150 mm (5.91 inch)

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**Process connections with thread, flush-mounted process isolating diaphragm**

Dimensions in mm (inch)



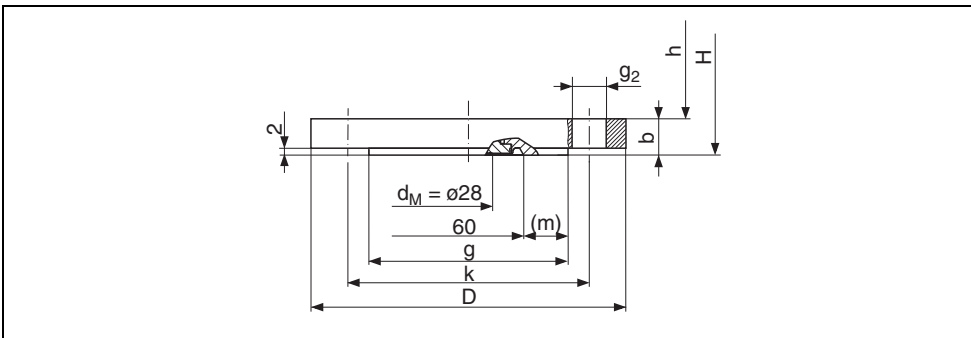
Process connections LHC-M51, thread ISO

- 1 Thread ISO 228 G1/2A DIN 3852 (Viton seal included); material version G1O: AISI 316L, version G1P: Alloy C276
- 2 Thread ISO 228 G1A (Viton seal included); material version G31: AISI 316L

Description	F31 housing (I, J)	F15 housing (Q, R, S)
G1/2	163 mm (6.42 inch)	148 mm (5.83 inch)
G1	167 mm (6.57 inch)	152 mm (5.98 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 <sup>1</sup>	Diameter D [mm]	Thickness b [mm]	Raised face g [mm]	Quantity	Diameter g <sub>2</sub> [mm]	Hole circle k [mm]
CNJ	AISI 316L	DN25	PN10-40	B1 (D)	115	18	68	4	14	85
CPJ	AISI 316L	DN32	PN10-40	B1 (D)	140	18	78	4	18	100
CQJ	AISI 316L	DN40	PN10-40	B1 (D)	150	18	88	4	18	110
CXJ	ECTFE	DN50	PN25/40	B1 (D)	150	20	102	4	18	125
CZJ	AISI 316L	DN80	PN10-40	B1 (D)	165	24	138	8	18	160

<sup>1</sup> Designation as per DIN 2527 in brackets

	F31 housing (I, J)	F15 housing (Q, R, S)
Height H	165 mm (6.5 inch)	150 mm (5.91 inch)



For further information see technical information.

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