PFMH

Fully welded pressure sensor with hygienic connection and touch screen

PFMH-##.####.#####.###0#.##0#

Overview

- Flush membrane with 3-A sanitary standards (FDA-compliant) and EHEDG
- Resistant to all common CIP cleaning media and SIP-capable (150 °C max, < 60 min)
- Versions available for high media temperatures (200 °C)
- Built in graphical display (CombiView DFON optional) and programmable by touch screen or with FlexProgrammer 9701
- Optionally available with additional relays and 4 ... 20 mA with HART
- Available with optional ATEX approval (4 ... 20 mA output signal)

Technical data

Performance characteristics	
Pressure type	Absolute Relative (gauged)
Compensated temperature range	-40 … 85 °C
Long term stability	≤ 0.1 % FSR/a , IEC 770 6.3.2
Max. measuring error	± 0.1 % FSR , up to 2:1 turndown ratio ± 0.25 % FSR , up to 4:1 turndown ratio Including zero-point and span error, non-linearity (by terminal base line), hysteresis and non-repeatability (EN 61298-2) For turndown, multiply this value by the applied turndown ratio
Max. measuring span	69 bar
Max. turndown ratio	10 : 1
Measuring range	-1 … 68 bar
Standard error of measurement (BFSL)	± 0.04 % FSR , up to 2:1 turndown ratio ± 0.1 % FSR , up to 4:1 turndown ratio Including non-linearity, hysteresis and non-repeatability according BFSL For turndown, multiply this value by the applied turndown ratio
Min. measuring span	0.05 bar
Power-up time	< 10 s
Rise time (10 ... 90 %)	≤ 0.3 s
Sample time	≤ 0.3 s
Temperature coefficient	≤ 0.05 % FSR/10 K , measuring span ≤ 0.05 % FSR/10 K , zero point
Process conditions	
Process temperature	-40 … 125 °C , without cooling neck -40 … 200 °C , with cooling neck
Process pressure	Refer to section "Operating conditions"

Process conditions	
SIP/CIP compatibility	< 60 min, without cooling neck @ medium temperature up to 150 °C Permanent, with cooling neck @ medium temperature up to 200 °C
Process connection	
Connection variants	Refer to section "Dimensional drawings"
Wetted parts material, process connection	AISI 316L (1.4404)
Wetted parts material, membrane	AISI 316L (1.4435)
Wetted parts material, gasket	EPDM, optional EPDM O-rings are conform to 3-A Sanitary Standard 18-03 Class II, EPDM gaskets are conform to 3-A Sanitary Standard 18-03 Class I (8% milk fat max.)
Surface roughness (in contact with medium)	
Membrane	Ra ≤ 0.4 µm
Process connection Baumer Hygienic Connection	Ra ≤ 0.4 µm
Process connection Tri-Clamp	Ra ≤ 0.4 µm
Process connection Varivent®	Ra ≤ 0.8 µm Ra ≤ 0.4 µm, optional
Weld joint	Ra ≤ 0.8 µm
Ambient conditions	
Operating temperature range	-30 … 80 °C , with DFON touch screen -40 … 85 °C , without DFON touch screen
Storage temperature range	-30 … 80 °C , with DFON touch screen -40 … 85 °C , without DFON touch screen
Degree of protection (EN 60529)	IP67 , with cable gland IP69K , with connector M12
Humidity	< 98 % RH , condensing

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Technical data

Ambient conditions	
Vibration	DNV high vibration strain, class B
Vibration (sinusoidal) (EN 60068-2-6)	1.6 mm p-p (2 … 25 Hz), 4 g (25 … 100 Hz), 1 octave / min.
Output signal	
Current output	4 … 20 mA 4 … 20 mA , + HART® 20 … 4 mA , programmable
Load resistance	RQ = (Usupply - 10 V)/20 mA
Insulation resistance	> 100 MΩ , 500 V DC
Sensor failure	20 … 23 mA , programmable 3.6 … 4 mA , programmable
Housing	
Style	Bottom process connection Rear process connection
Overall size	Refer to section "Dimensional drawings"
Material	AISI 304 (1.4301)
Electrical connection	
Connector	M12-A, 5-pin, stainless steel M12-A, 8-pin, stainless steel
Cable gland	M16x1.5, plastic M16x1.5, stainless steel M20x1.5, plastic M20x1.5, stainless steel
Power supply	
Voltage supply range	10 … 35 V DC
Factory settings	
Output lower limit	3.7 mA
Output upper limit	23 mA
Damping	0 s
Output at sensor fault	3.5 mA
ATEX II 1G Ex ia IIC T5	
Maximum values for barrier selection, Ui	30 V DC , max.
ATEX II 1G Ex ia IIC T5	
Maximum values for barrier selection, Ii	100 mA
Maximum values for barrier selection, Pi	750 mW
Internal capacitance, Ci	< 15 nF
Internal inductance, Li	< 10 µH
Temperature class, T1 ... T5	-20 < Tamb < 60 °C Zone 0 and 20 -40 < Tamb < 65 °C Zone 1/2 and 21/22
ATEX II 1D Ex ia IIIC T100 °C Da	
Maximum values for barrier selection, Ui	30 V DC , max.
Maximum values for barrier selection, Ii	100 mA
Maximum values for barrier selection, Pi	750 mW
Internal capacitance, Ci	< 15 nF
Internal inductance, Li	< 10 µH
Temperature class T100 °C	-20 < Tamb < 60 °C Zone 0 and 20 -40 < Tamb < 65 °C Zone 1/2 and 21/22
ATEX II 3G Ex ec IIC T5	
Voltage supply range	10 … 35 V DC
Current rating, In	100 mA
Temperature class, T1 ... T5	-30 < Tamb < 65 °C
Compliance and approvals	
EMC	EN 61000-6-2 EN 61000-6-3
Hygiene	3-A (74-07) EHEDG EL Class I FDA
Safety	cULus listed, E527512
Explosion protection	ATEX II 1D Ex ia IIIC T100 °C Da ATEX II 1G Ex ia IIC T5 ATEX II 3 G Ex ec IIC T5

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Display

General information

Panel type	FSTN Graphical LCD
Display range	-9999 … 99999
Max. digit height	22 mm
Material	Polycarbonate

Ambient conditions

Optimal readability temperature range	-10 … 70 °C
Operating temperature range	-30 … 80 °C
Degree of protection (EN 60529)	IP67 IP69K

Input signal

Input signal from transmitter	Digital, 2-way for communication between transmitter and display
Update time	1 s , max. 0.3 s , typ.

User configurable data

Error- / Warning-indication	Individually configurable display and backlight indication in white, green or red colour, steady or flashing light. Configurable limits over the range
Measuring unit	bar mbar Psi KPa MPa atm Kg/cm2 mH2O mmH2O 'H2O "H2O mmHg "Hg
User defined measuring unit	8 × 20 pixel matrix

Relays

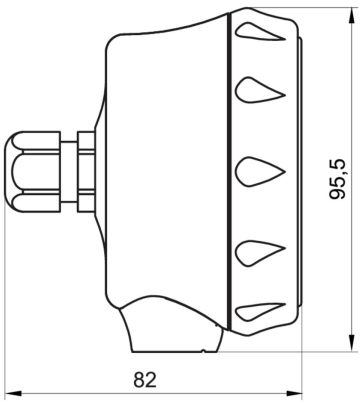
Contacts	2 x solid state relays
Max. load current	75 mA
Max. switching voltage	60 V

Operating conditions

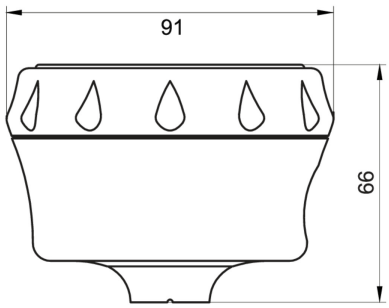
Measuring range (bar)	Proof pressure (bar)	Burst Pressure (bar)
0 … 0.345	1	2
-1 … 1	3	6
-1 … 5	15	30
-1 … 20	60	120
-1 … 34	70	140
-1 … 68	135	270

Dimensional drawings (mm)

Housing



FlexHousing with bottom process connection



FlexHousing with rear process connection

FlexHousing front view

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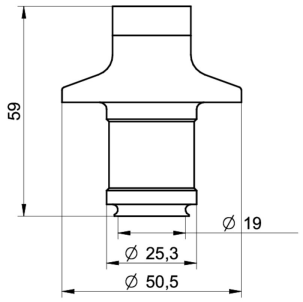
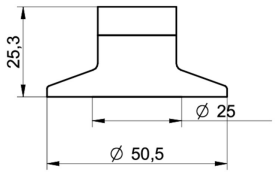
Dimensional drawings (mm)

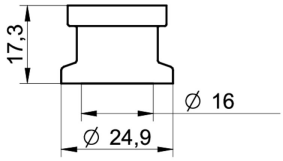
Process connection



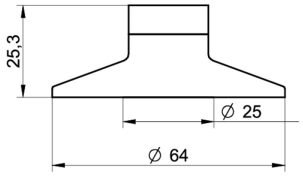
BHC 3A DN 38, membrane Ø 25 mm (BCID: B01)



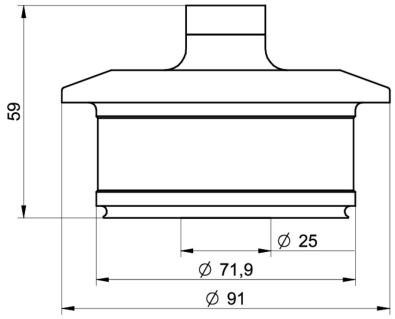
Tri-Clamp Ø 50.5, membrane Ø 25 mm (BCID: C04)



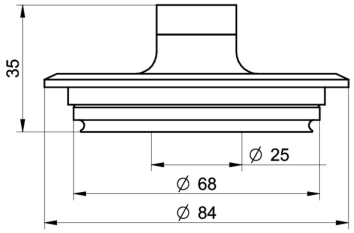
Tri-Clamp Ø 24.9, membrane Ø 16 mm (BCID: C01)



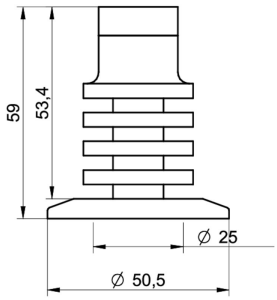
Tri-Clamp Ø 64.0, membrane Ø 25 mm (BCID: C05)



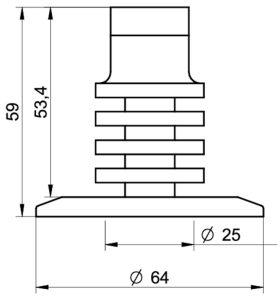
BHC 3A DN 76, membrane Ø 25 mm (BCID: B02)



Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68, membrane Ø 25 mm (BCID: V02)



Tri-Clamp Ø 50.5, membrane Ø 25 mm (BCID: C04) with cooling neck



Tri-Clamp Ø 64.0, membrane Ø 25 mm (BCID: C05) with cooling neck

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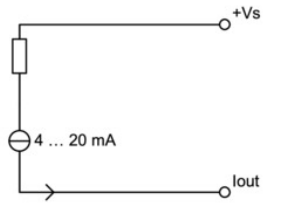
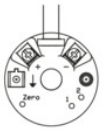
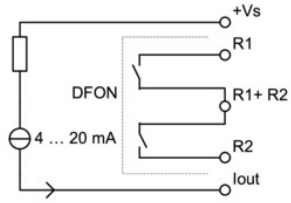
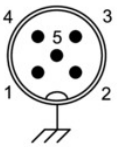
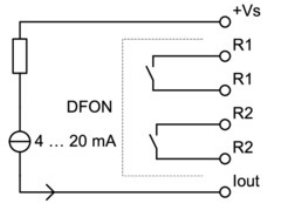
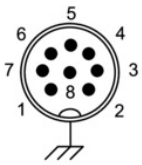
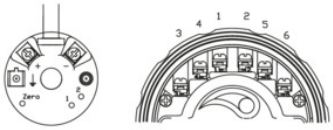
Electrical connection

Equivalent circuit	Electrical connection	Function	Pin assignment
		+Vs Iout	+ -
		+Vs Iout R1 R2 R1 + R2	1 3 5 4 2
		+Vs Iout R1 R2 n.c.	2 7 5, 6 3, 4 1, 8
		+Vs Iout R1 R2 n.c.	+ - 5, 6 3, 4 1, 2

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Ordering information

Ordering key - Configuration possibilities see website

	PFMH	-	#	#	.	###	#	.	##	##	#	.	##	#	0	#	.	#	#	0	#	####
Product																						
PFMH	PFMH																					
Housing																						
Stainless steel 1.4301 / AISI304 Bottom connection			5																			
Stainless steel 1.4301 / AISI304 Rear connection			6																			
Accuracy																						
±0.25 % FS				4																		
±0.10 % FS				5																		
Pressure range and unit																						
Min. 0.0 / Max 0.345 Bar (not vacuum or absolute)						BC1																
Min. -1.0 / Max 1.0 Bar(0...1 bar abs)						BC2																
Min. -1.0 / Max 5.0 Bar (0...5 bar abs)						BC3																
Min. -1.0 / Max 20.0 Bar (0...20 bar abs)						BC4																
Min. -1.0 / Max 34.0 Bar (0...34 bar abs)						BC5																
Min. -1.0 / Max 68.0 Bar (0...68 bar abs)						BC6																
Kind of pressure																						
Relative (gauged)							R															
Absolute							A															
Output signal																						
4...20 mA									A1													
4...20 mA + HART®									C1													
Output Connection																						
M12-A, 5-pin										15												
M12-A, 8-pin										18												
Cable gland, M16x1.5										55												
Cable gland, M20x1.5										57												
Material of el. connection																						
Plastic											1											
Stainless steel, AISI 304 (1.4301)											3											
Process connection																						
BHC 3A DN 38 (B01)													50									
ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5 (C04)													51									
Tri-Clamp, Ø 24.9 (C01)													52									
ISO 2852 (Tri-Clamp), DN 40; 51, Ø 64.0 (C05)													54									
BHC 3A DN 76 (B02)													56									
Varivent® DN 32 … 125; 1 1/2 … 6 (Type N), Ø 68 (V02)													61									
ISO 2852 (Tri-Clamp), DN 33.7; 38, Ø 50.5 with cooling neck (C04)													81									
ISO 2852 (Tri-Clamp), DN 40; 51, Ø 64.0 with cooling neck (C05)													84									
Wetted parts material																						
Stainless steel 1.4404 / AISI 316L														2								
Stainless steel 1.4435 BN2/AISI 316L, electro-polished, Ra<0.4														F								
Seal																						
None															0							

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Ordering information

Ordering key - Configuration possibilities see website

	PFMH	-	#	#	.	###	#	.	##	##	#	.	##	#	0	#	.	#	#	0	#	####
Oil filling																						
Standard oil																1						
NSF H1 listed (FDA approved)																2						
Display																						
Without display																		1				
With display, no relays activ.																		2				
With display, with activated relays																		4				
ATEX																						
Standard safety																			0			
Ex ec IIC T5 (Gas)																			3			
Ex ia IIC T5 Ga or Ex ia IIIC T100°C Da (Gas or Dust)																			5			
Approvals																						
Standard approvals																				0		
Configuration																						
No configuration																					0	
Configuration of range																					1	
Configuration of range + display																					2	
Configuration of range + display incl. 2 relays																					3	
Option Surface																						
Surface Ra ≤ 0,4 µm																						9059
Surface electropolished																						9060
not selected																						&