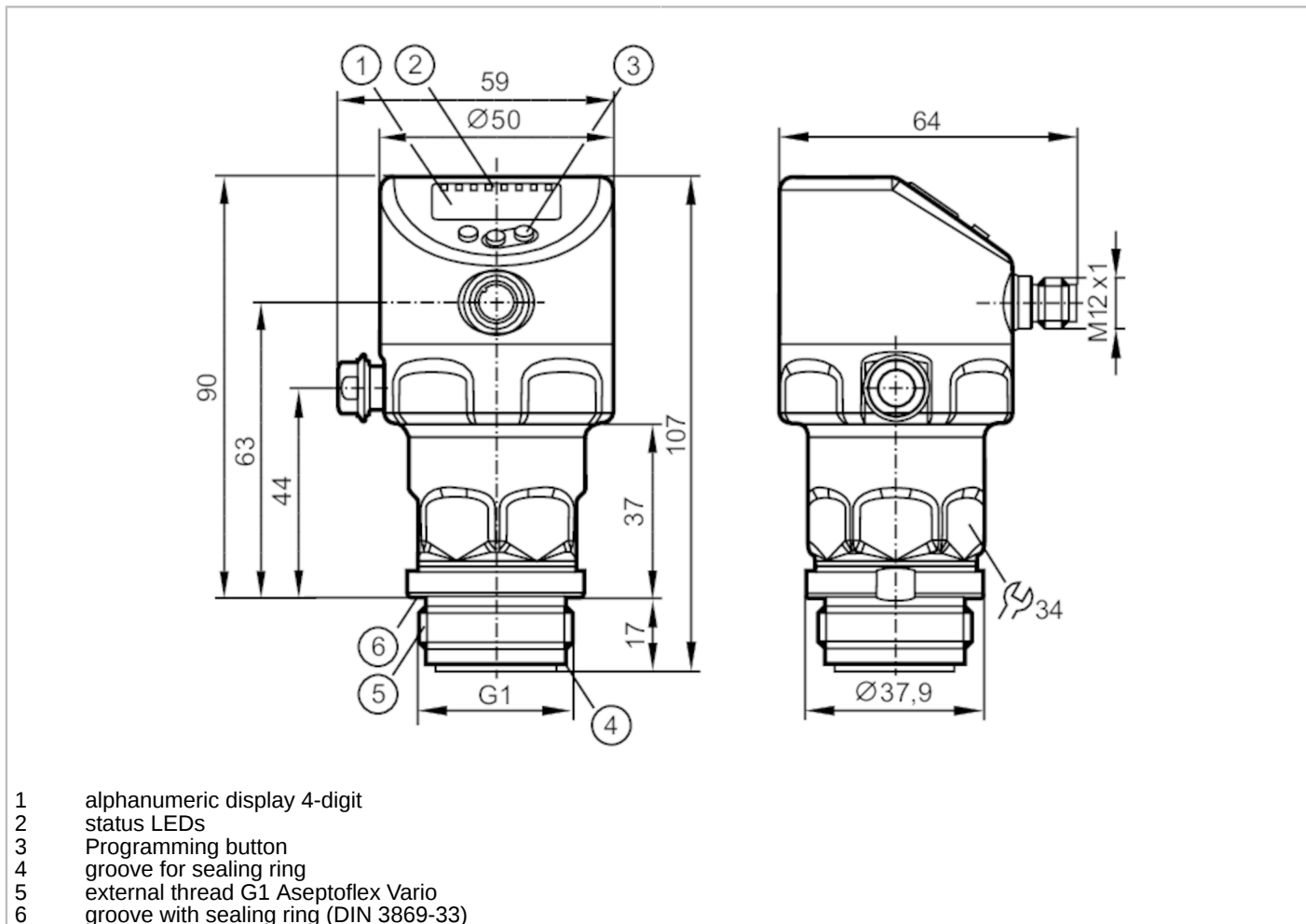


# PI1789



## Flush pressure sensor with display

PI-,10BREA01-MFRKG/US/ IP



ACS
 CE
 CRN
 UL LISTED
 EC 1935/2004
 EHEDG Certified
 FCM
 FDA
 IO-Link
 NSF Reg31

TSDP/TÜV
 UK CA

Product characteristics	
Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1
Measuring range	-0.005...0.1 bar    -5...100 mbar    -2...40.15 inH2O    -0.5...10 kPa
Process connection	threaded connection G 1 external thread mit Dichtkontur Aseptoflex Vario
Note	G1 Gewinde nach ISO 228. Alternativ dichtend über rückwärtige Dichtkontur mit Dichtung in Anlehnung an DIN EN ISO 1179-2.
Application	
System	gold-plated contacts
Application	flush mountable for the food and beverage industry
Media	viscous media and liquids with suspended particles; liquids and gases
Medium temperature [°C]	-25...150
Min. burst pressure	30000 mbar    12044 inH2O    3000 kPa
Pressure rating	4000 mbar    1606 inH2O    400 kPa
Vacuum resistance	-1000 mbar    -0.1 MPa
Type of pressure	relative pressure; vacuum
No dead space	yes

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MAWP (for applications according to CRN)	[bar]	4			
<b>Electrical data</b>					
Min. insulation resistance	[MΩ]	100; (500 V DC)			
Protection class		III			
Reverse polarity protection		yes			
Integrated watchdog		yes			
<b>2-wire</b>					
Operating voltage	[V]	20...30 DC			
Current consumption	[mA]	3.5...21.5			
Power-on delay time	[s]	< 1			
<b>3-wire</b>					
Operating voltage	[V]	18...30 DC			
Current consumption	[mA]	5...45; (430 bei max. Laststrom)			
Power-on delay time	[s]	< 0.5			
<b>Inputs / outputs</b>					
Number of inputs and outputs		Number of digital outputs: 2; Number of analog outputs: 1			
<b>Outputs</b>					
Total number of outputs		2			
Output signal		switching signal; analog signal; IO-Link			
Electrical design		PNP/NPN			
Number of digital outputs		2			
Output function		normally open / closed; (configurable)			
Number of analog outputs		1			
Analog current output	[mA]	4...20, invertible; (scalable)			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
<b>2-wire</b>					
Max. load	[Ω]	300			
<b>3-wire</b>					
Max. voltage drop switching output DC	[V]	2			
Permanent current rating of switching output DC	[mA]	100			
Switching frequency DC	[Hz]	125			
Max. load	[Ω]	(U <sub>b</sub> - 10 V) / 21,5 mA; 650 Ω (U <sub>b</sub> = 24 V)			
<b>Measuring/setting range</b>					
Measuring range		-0.005...0.1 bar	-5...100 mbar	-2...40.15 inH2O	-0.5...10 kPa
Set point SP		-0.0049...0.1 bar	-4.9...100 mbar	-1.95...40.15 inH2O	-0.49...10 kPa
Reset point rP		-0.005...0.099 bar	-5...99.9 mbar	-2.01...40.09 inH2O	-0.5...9.99 kPa
Analog start point		-0.005...0.08 bar	-5...80 mbar	-2.01...32.12 inH2O	-0.5...8 kPa
Analog end point		0.015...0.1 bar	15...100 mbar	6.02...40.15 inH2O	1.5...10 kPa



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Min. difference between SP and rP	0.0002 bar	0.2 mbar	0.06 inH2O	0.02 kPa
In steps of	0.0001 bar	0.1 mbar	0.01 inH2O	0.01 kPa
Factory setting	SP1 =25 mbar		rP1 = 23 mbar	
	SP2 = 75 mbar		rP2 = 73 mbar	
	ASP = 0 mbar		AEP = 100 mbar	
	dAP = 2.00 s		dAA =2.00 s	

Temperature monitoring	
Measuring range	-25...150 °C      -13...302 °F

### Accuracy / deviations

Switch point accuracy [% of the span]	< ± 0,5; (DIN EN IEC 62828-1; Turn down 1:1)	
Repeatability      [% of the span]	< ± 0,2; (with temperature fluctuations < 10 K; Turn down 1:1)	
Characteristics deviation [% of the span]	< ± 0,5; (DIN IEC EN 62828-1 incl. zero point and span error, non-linearity, hysteresis; Turn down 1:1)	
Linearity deviation [% of the span]	< ± 0,25; (Turn down 1:1)	
Zero-point stabilization [% of the span]	IO-Link, analog output	0,4; (see operating instructions zero-point behavior)
	Display, Switching output	0,4
Hysteresis deviation [% of the span]	< ± 0,2; (Turn down 1:1)	
Long-term stability [% of the span]	< ± 0,1; (Turn down 1:1; per year)	
Total deviation over temperature range	<b>Temperature range</b>	<b>total deviation</b>
	-25...15 °C	Characteristics deviation ± 0,15 % of the span / 10 K
	15...80 °C	Characteristics deviation
	80...150 °C	Characteristics deviation ± 0,2 % of the span / 10 K
Notes on the accuracy / deviation	for further details see section Diagrams and graphs	

Temperature monitoring	
Accuracy      [K]	± 2,5+ (0,08 x ( Umgebungstemperatur - Mediumtemperatur ))
Repeatability      [K]	± 0,2
Resolution      [K]	0.2

### Reaction times

Damping process value dAP      [s]	0...99.99
Damping for the analog output dAA      [s]	0...99.99

2-wire	
Step response time analog output      [ms]	30

3-wire	
Min. response time of switching output (dAP)      [ms]	3
Step response time analog output      [ms]	7



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<b>Temperature monitoring</b>		
Dynamic response T05 / T09	[s]	< 45 / < 200; (DIN EN 60751 water ; > 0,9 m/s)
<b>Interfaces</b>		
Communication interface	IO-Link	
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision	1.1	
SDCI standard	IEC 61131-9	
Profiles	Common - I&D	Identification and Diagnosis
	Function	Measurement data, high resolution
SIO mode	yes	
Required master port class	A	
Min. process cycle time	[ms]	5.6
IO-Link resolution pressure	[mbar]	0.005
IO-Link resolution temperature	[K]	0.2
IO-Link process data (cyclical)	<b>Function</b>	<b>bit length</b>
	pressure	32
	temperature	32
	device status	4
	binary switching information	2
IO-Link functions (acyclical)	application specific tag; internal temperature; operating hours counter; switching cycles counter; Pressure peak counter; measuring cell diagnosis	
Supported DeviceIDs	<b>Type of operation</b>	<b>DeviceID</b>
	default	1158
<b>Operating conditions</b>		
Ambient temperature	[°C]	-25...80
Storage temperature	[°C]	-40...100
Protection	IP 67; IP 68; IP 69K	
<b>Tests / approvals</b>		
EMC	DIN EN 61326-1	
Shock resistance	DIN EN 60068-2-27	50 g (11 ms)
Vibration resistance	DIN EN 60068-2-6	20 g (10...2000 Hz)
MTTF	[years]	214
UL approval	UL approval number	J048
	File number UL	E174189
<b>Mechanical data</b>		
Weight	[g]	357
Housing	tubular	
Dimensions	[mm]	Ø 50 / L = 107
Material	Housing: stainless steel (1.4404 / 316L); Pushbuttons: PBT; sealings: FKM; M12 connector: PEI; Display: PFA; ventilation diaphragm: PTFE	
Materials (wetted parts)	measuring cell: ceramics (99.9 % Al2O3); Process connection: stainless steel (1.4435 / 316L) surface characteristics: Ra < 0,4 µm / Rz = 4 µm; sealing: PTFE	
Min. pressure cycles	100 million	
Tightening torque	[Nm]	35
Process connection	threaded connection G 1 external thread mit Dichtkontur Aseptoflex Vario	

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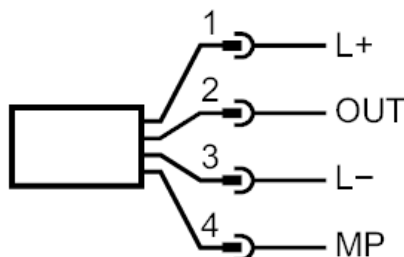
Displays / operating elements		
Display	Display unit	LED, green
	Switching status	LED, yellow
	Function display	alphanumeric display, 4-digit
	Measured values	alphanumeric display, 4-digit
Display unit	mbar; kPa; inH2O	

Remarks	
Pack quantity	1 pcs.

**Electrical connection**  
 Connector: 1 x M12; coding: A; Contacts: gold-plated



### Connection



2-wire			
1	L+		
2	OUT	AO	
3-wire			
1	L+		
2	OUT	DO2 (NO/NC), AO	
3	L-		
4	MP	DO1 (NO/NC), IO-Link	

Parameter setting			
1	L+		
3	L-		
4	MP	IO-Link	

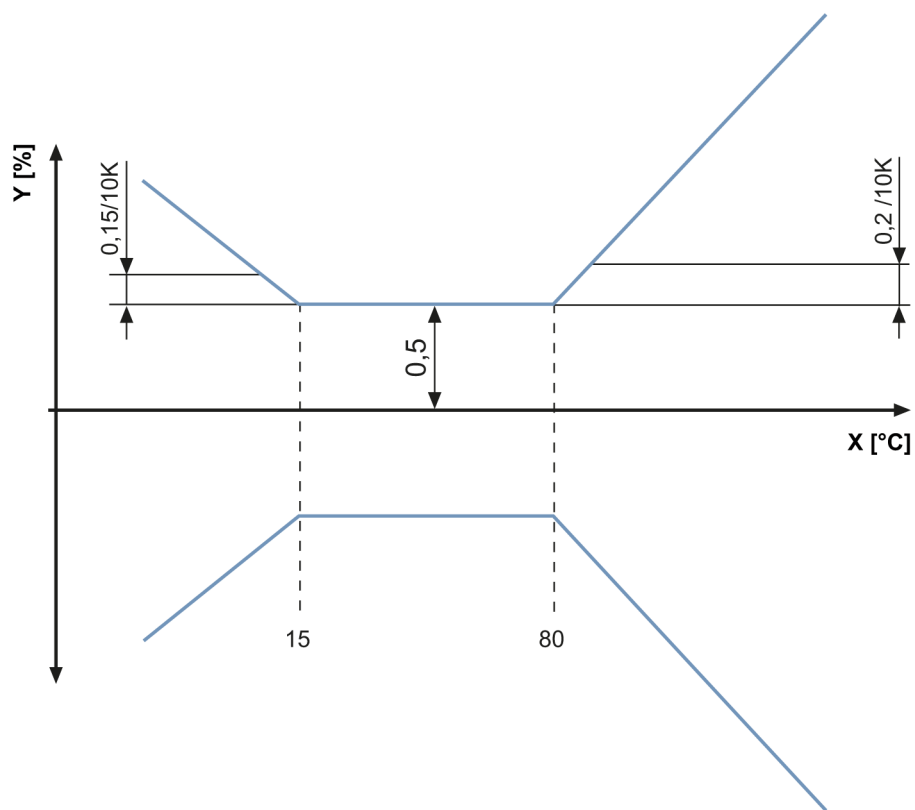
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### Diagrams and graphs



X temperature  
Y total deviation