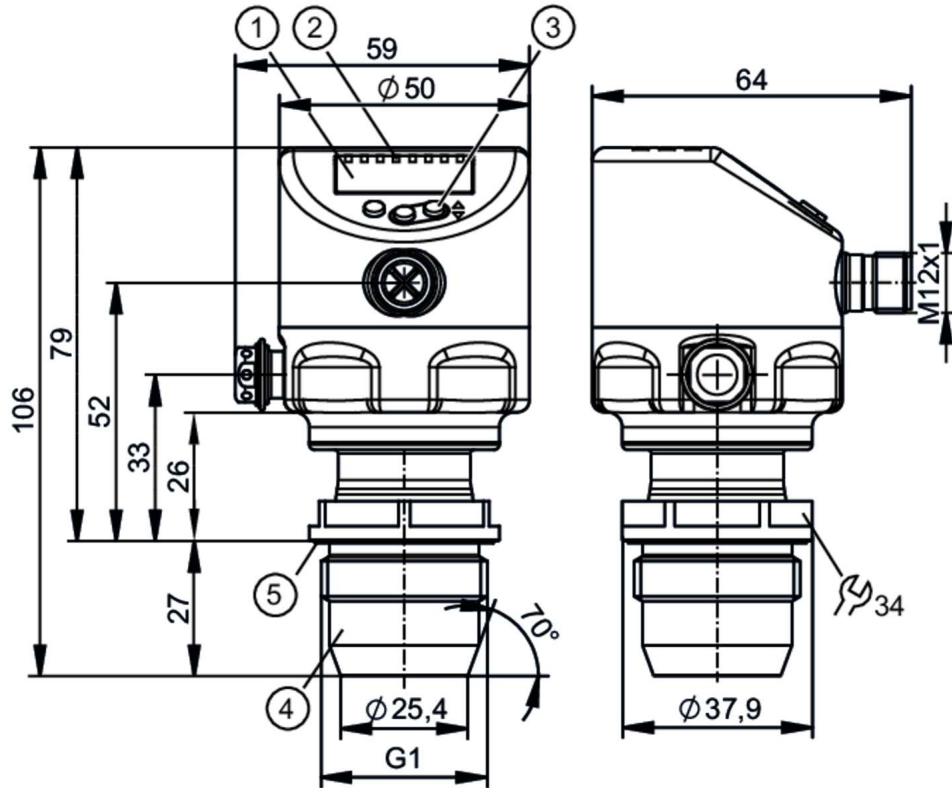




## Flush pressure sensor with display

PI-,10BREA01-MFRKG/US/ /P

When selecting an alternative article and accessories please note that technical data may differ!



- 1 alphanumeric display 4-digit
- 2 status LEDs
- 3 Programming button
- 4 G1 sealing cone external thread  
Attention: The unit must only be installed in a process connection for G1 sealing cone.  
The G1A sealing cone of the unit is only suited for adapters with metal end stop.
- 5 groove with sealing ring



ACS



CRN



us

EC 1935/2004

EHEDG

Tested

FCM

FDA

IO-Link

Reg31

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 sealing cone Attention: The unit must only be installed in a process connection for G1 sealing cone.; The G1A sealing cone of the unit is only suited for adapters with metal end stop. |               |                  |               |

### 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. bursting pressure   | 30000 mbar  | 12044 inH2O | 3000 kPa |
| Pressure rating          | 4000 mbar   | 1606 inH2O  | 400 kPa  |
| Vacuum resistance [mbar] | -1000   |             |          |
| Type of pressure         | relative pressure; vacuum   |             |          |
| No dead space            | yes   |             |          |



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|  |       |   |
|--|-------|---|
| MAWP (for applications according to CRN) | [bar] | 4 |
|--|-------|---|

### Electrical data

|                             |      |                 |
|-----------------------------|------|-----------------|
| Min. insulation resistance  | [MΩ] | 100; (500 V DC) |
| Protection class            |      | III             |
| Reverse polarity protection |      | yes             |
| Integrated watchdog         |      | yes             |

### 2-wire

|                     |      |            |
|---------------------|------|------------|
| Operating voltage   | [V]  | 20...30 DC |
| Current consumption | [mA] | 3.5...21.5 |
| Power-on delay time | [s]  | < 1        |

### 3-wire

|                     |      |                                  |
|---------------------|------|----------------------------------|
| Operating voltage   | [V]  | 18...30 DC                       |
| Current consumption | [mA] | 5...45; (430 bei max. Laststrom) |
| Power-on delay time | [s]  | < 0.5                            |

### Inputs / outputs

|                              |   |  |  |
|------------------------------|---|--|--|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1 |  |  |
|------------------------------|---|--|--|

### Outputs

|                                  |      |  |
|----------------------------------|------|--|
| 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                                      |

### 2-wire

|           |     |     |
|-----------|-----|-----|
| Max. load | [Ω] | 300 |
|-----------|-----|-----|

### 3-wire

|   |      |  |
|---|------|--|
| 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) |

### Measuring/setting range

|                    |                    |                 |                     |                 |
|--------------------|--------------------|-----------------|---------------------|-----------------|
| 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    |



## Flush pressure sensor with display

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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    |          |
| <b>Temperature monitoring</b>                     |   |   |                |          |
| Measuring range                                   | -25...150 °C  |   | -13...302 °F   |          |
| <b>Accuracy / deviations</b>                      |   |   |                |          |
| Switch point accuracy<br>[% 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<br>[% 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<br>[% of the span]            | < ± 0,25; (Turn down 1:1)   |   |                |          |
| Hysteresis deviation<br>[% of the span]           | < ± 0,2; (Turn down 1:1)  |   |                |          |
| Long-term stability<br>[% 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   |   |                |          |
| <b>Temperature monitoring</b>                     |   |   |                |          |
| Accuracy [K]                                      | ± 2,5+ (0,08 x ( Umgebungstemperatur - Mediumtemperatur ))  |   |                |          |
| Repeatability [K]                                 | ± 0,2   |   |                |          |
| Resolution [K]                                    | 0.2   |   |                |          |
| <b>Reaction times</b>                             |   |   |                |          |
| Damping process value dAP [s]                     | 0...99.99   |   |                |          |
| Damping for the analog output dAA [s]             | 0...99.99   |   |                |          |
| <b>2-wire</b>                                     |   |   |                |          |
| Step response time analog output [ms]             | 30  |   |                |          |
| <b>3-wire</b>                                     |   |   |                |          |
| Min. response time of switching output (dAP) [ms] | 3   |   |                |          |
| Step response time analog output [ms]             | 7   |   |                |          |
| <b>Temperature monitoring</b>                     |   |   |                |          |
| Dynamic response T05 / T09 [s]                    | < 35 / < 135; (DIN EN 60751 water ; > 0,9 m/s)  |   |                |          |



## Flush pressure sensor with display

PI-,10BREA01-MFRKG/US/ /P

| Interfaces                         |   |                     |
|------------------------------------|---|---------------------|
| Communication interface            | IO-Link   |                     |
| Transmission type                  | COM2 (38,4 kBaud)   |                     |
| IO-Link revision                   | 1.1   |                     |
| SDCI standard                      | IEC 61131-9   |                     |
| Profiles                           | Identification and Diagnosis (0x4000), Measurement Data Channel (0x800A)  |                     |
| 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  |                     |
| Supported DeviceIDs                | <b>Type of operation</b>  | <b>DeviceID</b>     |
|                                    | default   | 1158                |
| Operating conditions               |   |                     |
| Ambient temperature [°C]           | -25...80  |                     |
| Storage temperature [°C]           | -40...100   |                     |
| Protection                         | IP 67; IP 68; IP 69K  |                     |
| Tests / approvals                  |   |                     |
| 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   |                     |
| Note on approval                   | Factory certificate available as download at <a href="http://www.factory-certificate.ifm">www.factory-certificate.ifm</a>   |                     |
| UL approval                        | UL approval number  | J049                |
|                                    | File number UL  | E174189             |
| Mechanical data                    |   |                     |
| Weight [g]                         | 384.8   |                     |
| Material                           | stainless steel (1.4404 / 316L); FKM; PTFE; PBT; PEI; PFA   |                     |
| Materials (wetted parts)           | ceramics (99.9 % Al <sub>2</sub> O <sub>3</sub> ); stainless steel (1.4435 / 316L); surface characteristics: Ra < 0,4 / Rz 4; PTFE  |                     |
| Min. pressure cycles               | 100 million   |                     |
| Tightening torque [Nm]             | 20  |                     |
| Process connection                 | threaded connection G 1 external thread sealing cone Attention: The unit must only be installed in a process connection for G1 sealing cone.; The G1A sealing cone of the unit is only suited for adapters with metal end stop. |                     |

# PI1889



## Flush pressure sensor with display

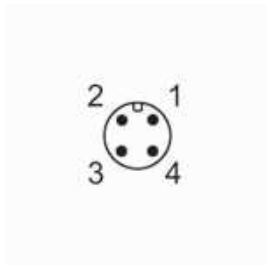
PI-,10BREA01-MFRKG/US/ /P

| 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

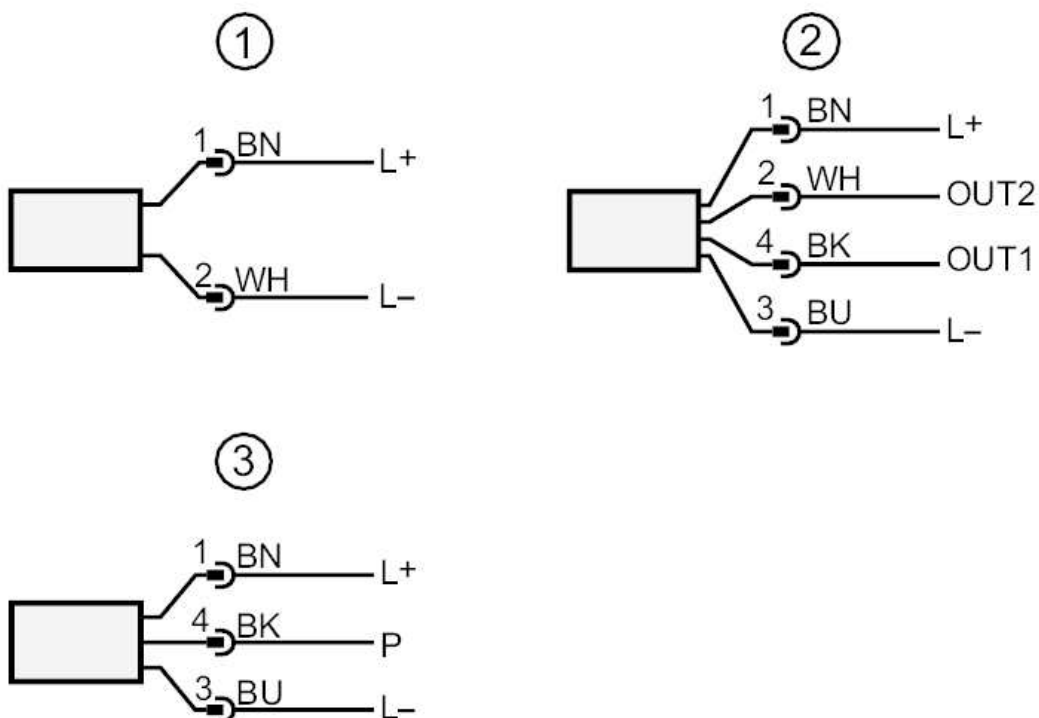




## Flush pressure sensor with display

PI-,10BREA01-MFRKG/US/ /P

### Connection



- 1 connection for 2-wire operation
- 2 connection for 3-wire operation
- OUT1 Switching output / IO-Link
- OUT2 Switching output / analog output
- 3 connection for IO-Link parameter setting (P = communication via IO-Link)

Colors to DIN EN 60947-5-2

Core colors

- BK = black
- BN = brown
- BU = blue
- WH = white

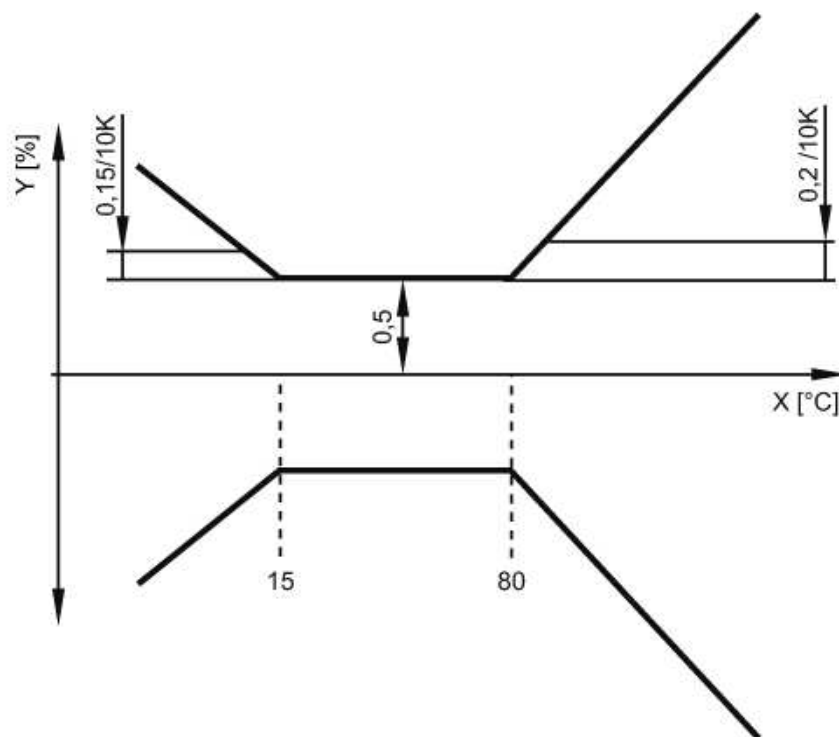
# PI1889



## Flush pressure sensor with display

PI-,10BREA01-MFRKG/US/ IP

### Diagrams and graphs



X temperature  
Y total deviation