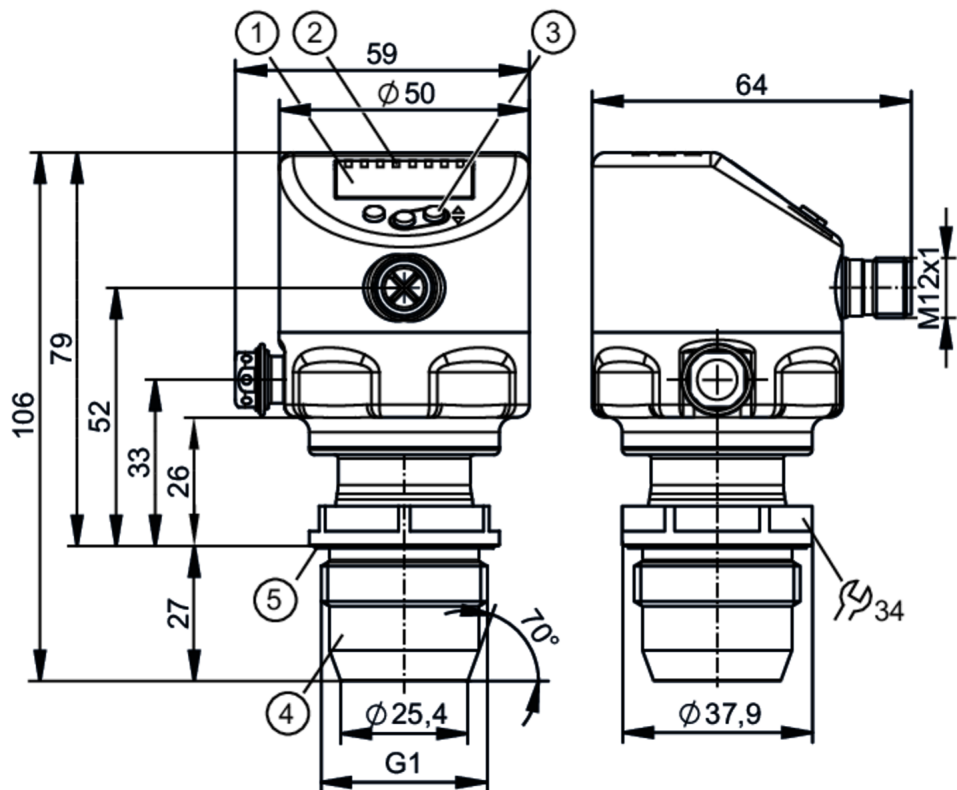




Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P



- 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 EC 1935/2004 FCM FDA Hygienic Cleanable IO-Link NSF Reg31

TSDP/TÜV

| Product characteristics      |                                                                                                                                                                                                                                 |                  |                  |                |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1                                                                                                                                                                       |                  |                  |                |
| Measuring range              | -1000...1000 mbar                                                                                                                                                                                                               | -14.5...14.5 psi | -401...401 inH2O | -100...100 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. burst pressure          | 30000 mbar                                                                                                                                                                                                                      | 435 psi          | 3000 kPa         |                |
| Pressure rating              | 10000 mbar                                                                                                                                                                                                                      | 145 psi          | 1000 kPa         |                |
| Vacuum resistance            | -1000 mbar                                                                                                                                                                                                                      |                  | -0.1 MPa         |                |
| Type of pressure             | relative pressure; vacuum                                                                                                                                                                                                       |                  |                  |                |
| No dead space                | yes                                                                                                                                                                                                                             |                  |                  |                |



## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P

|                                                 |       |                                                           |                   |                  |                 |
|-------------------------------------------------|-------|-----------------------------------------------------------|-------------------|------------------|-----------------|
| MAWP (for applications according to CRN)        | [bar] | 10                                                        |                   |                  |                 |
| 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]   | (Ub - 10 V) / 21,5 mA; 650 Ω (Ub = 24 V)                  |                   |                  |                 |
| Measuring/setting range                         |       |                                                           |                   |                  |                 |
| Measuring range                                 |       | -1000...1000 mbar                                         | -14.5...14.5 psi  | -401...401 inH2O | -100...100 kPa  |
| Set point SP                                    |       | -997...1000 mbar                                          | -14.46...14.5 psi | -400...401 inH2O | -4.9...100 kPa  |
| Reset point rP                                  |       | -1000...997 mbar                                          | -14.5...14.46 psi | -401...400 inH2O | -100...99.7 kPa |
| Analog start point                              |       | -1000...599 mbar                                          | -14.5...8.68 psi  | -401...240 inH2O | -100...59.9 kPa |
| Analog end point                                |       | -599...1000 mbar                                          | -8.68...14.5 psi  | -240...401 inH2O | -59.9...100 kPa |



## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P

|                                   |                  |          |                 |         |
|-----------------------------------|------------------|----------|-----------------|---------|
| Min. difference between SP and rP | 3 mbar           | 0.05 psi | 2 inH2O         | 0.3 kPa |
| In steps of                       | 1 mbar           | 0.01 psi | 1 inH2O         | 0.1 kPa |
| Factory setting                   | SP1 = -500 mbar  |          | rP1 = -540 mbar |         |
|                                   | SP2 = 500 mbar   |          | rP2 = 460 mbar  |         |
|                                   | ASP = -1000 mbar |          | AEP = 1000 mbar |         |
|                                   | dAP = 2.00 s     |          | dAA = 2.00 s    |         |

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

### Accuracy / deviations

|                                              |                                                                                                         |                                                        |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Switch point accuracy<br>[% of the span]     | < ± 0,2; (DIN EN IEC 62828-1; Turn down 1:1)                                                            |                                                        |
| Repeatability<br>[% of the span]             | < ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)                                          |                                                        |
| Characteristics deviation<br>[% of the span] | < ± 0,2; (DIN IEC EN 62828-1 incl. zero point and span error, non-linearity, hysteresis; Turn down 1:1) |                                                        |
| Linearity deviation<br>[% of the span]       | < ± 0,15; (Turn down 1:1)                                                                               |                                                        |
| Zero-point stabilization<br>[% of the span]  | IO-Link, analog output                                                                                  | 0,15; (see operating instructions zero-point behavior) |
|                                              | Display, Switching output                                                                               | 0,2                                                    |
| Hysteresis deviation<br>[% of the span]      | < ± 0,15; (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 ± 0,05 % of the span / 10 K  |
|                                              | 15...80 °C                                                                                              | Characteristics deviation                              |
|                                              | 80...150 °C                                                                                             | Characteristics deviation ± 0,1 % 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 |



## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P

|                                 |                                                                                                                                                              |                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Temperature monitoring          |                                                                                                                                                              |                                                |
| Dynamic response T05 / T09      | [s]                                                                                                                                                          | < 45 / < 200; (DIN EN 60751 water ; > 0,9 m/s) |
| Interfaces                      |                                                                                                                                                              |                                                |
| 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]                                                                                                                                                       | 0.1                                            |
| IO-Link resolution temperature  | [K]                                                                                                                                                          | 0.2                                            |
| IO-Link process data (cyclical) | Function                                                                                                                                                     | bit length                                     |
|                                 | 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             | Type of operation                                                                                                                                            | DeviceID                                       |
|                                 | default                                                                                                                                                      | 1151                                           |
| 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                                            |
| UL approval                     | UL approval number                                                                                                                                           | J049                                           |
|                                 | File number UL                                                                                                                                               | E174189                                        |
| Mechanical data                 |                                                                                                                                                              |                                                |
| Weight                          | [g]                                                                                                                                                          | 384.6                                          |
| Housing                         | tubular                                                                                                                                                      |                                                |
| Dimensions                      | [mm]                                                                                                                                                         | Ø 50 / L = 106                                 |
| 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]                                                                                                                                                         | 20                                             |

PI1809



Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P

|                    |                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Displays / operating elements

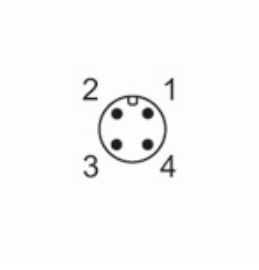
|              |                       |                               |
|--------------|-----------------------|-------------------------------|
| Display      | Display unit          | LED, green                    |
|              | Switching status      | LED, yellow                   |
|              | Function display      | alphanumeric display, 4-digit |
|              | Measured values       | alphanumeric display, 4-digit |
| Display unit | mbar; psi; kPa; inH2O |                               |

Remarks

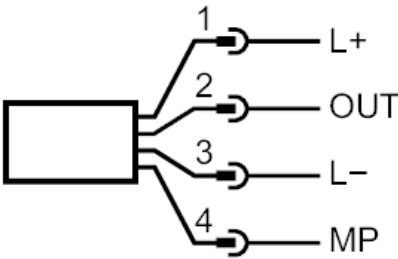
|               |        |
|---------------|--------|
| Pack quantity | 1 pcs. |
|---------------|--------|

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 |



## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/US/ /P

### Diagrams and graphs

ambient temperature influence on the accuracy



X temperature  
Y total deviation