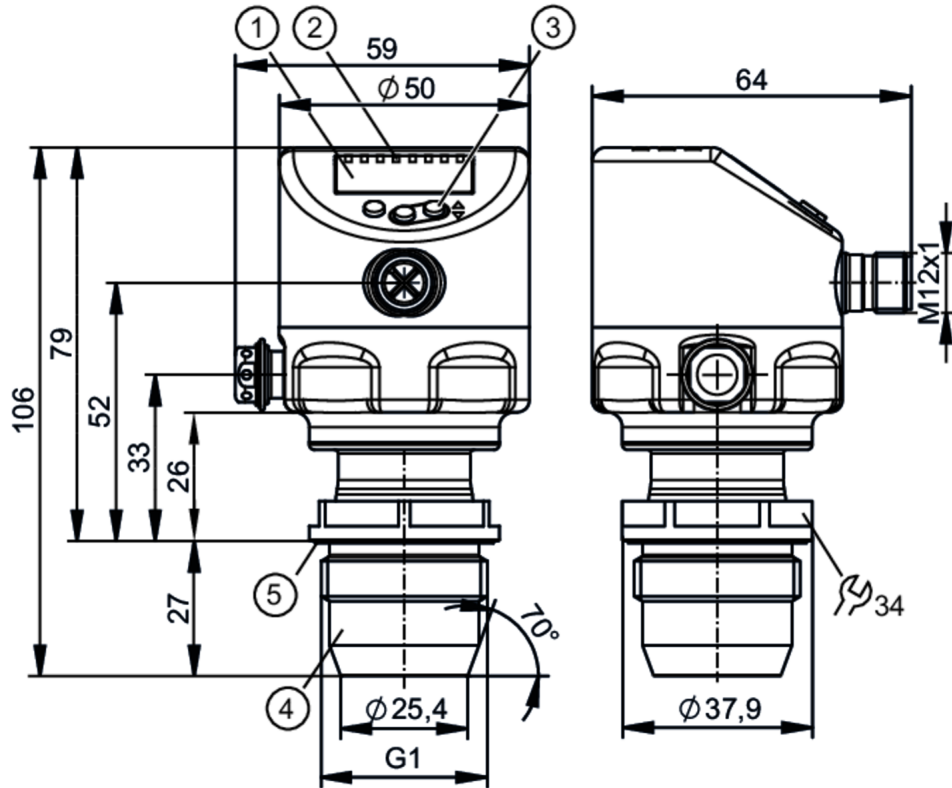




## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/USI/IP

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



CE

CRN



LISTED

us

EC 1935/2004

EHDG

Tested

FCM



FDA



IO-Link

Reg31



UKCA

UK

CA

Reg31

UKCA

UK

CA

Reg31

UKCA

UK

CA

Reg31

UKCA

UK

CA

### Product characteristics

|                              |   |                  |                  |                |
|------------------------------|---|------------------|------------------|----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue 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

|                          |   |         |          |
|--------------------------|---|---------|----------|
| Special feature          | 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  | 435 psi | 3000 kPa |
| Pressure rating          | 10000 mbar  | 145 psi | 1000 kPa |
| Vacuum resistance [mbar] | -1000   |         |          |
| Type of pressure         | relative pressure; vacuum   |         |          |
| No dead space            | yes   |         |          |

# PI1809



## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/USI /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 analogue outputs: 1 |
|------------------------------|--|---|

### Outputs

|                         |  |   |
|-------------------------|--|---|
| Total number of outputs |  | 2 |
|-------------------------|--|---|

|               |  |  |
|---------------|--|--|
| Output signal |  | switching signal; analogue signal; IO-Link |
|---------------|--|--|

|                   |  |         |
|-------------------|--|---------|
| Electrical design |  | PNP/NPN |
|-------------------|--|---------|

|                           |  |   |
|---------------------------|--|---|
| Number of digital outputs |  | 2 |
|---------------------------|--|---|

|                 |  |  |
|-----------------|--|--|
| Output function |  | normally open / normally closed; (parameterisable) |
|-----------------|--|--|

|                            |  |   |
|----------------------------|--|---|
| Number of analogue outputs |  | 1 |
|----------------------------|--|---|

|                         |      |                                |
|-------------------------|------|--------------------------------|
| Analogue current output | [mA] | 4...20, invertible; (scalable) |
|-------------------------|------|--------------------------------|

|                          |  |     |
|--------------------------|--|-----|
| Short-circuit protection |  | yes |
|--------------------------|--|-----|

|                                  |  |        |
|----------------------------------|--|--------|
| Type of short-circuit protection |  | pulsed |
|----------------------------------|--|--------|

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

|                      |                  |                  |                  |                 |
|----------------------|------------------|------------------|------------------|-----------------|
| Analogue start point | -1000...599 mbar | -14.5...8.68 psi | -401...240 inH2O | -100...59.9 kPa |
|----------------------|------------------|------------------|------------------|-----------------|

|                    |                  |                  |                  |                 |
|--------------------|------------------|------------------|------------------|-----------------|
| Analogue end point | -599...1000 mbar | -8.68...14.5 psi | -240...401 inH2O | -59.9...100 kPa |
|--------------------|------------------|------------------|------------------|-----------------|

# PI1809



## 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 [% 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)   |   |
| 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  |  |

### Response times

|   |           |
|---|-----------|
| Damping process value dAP [s]           | 0...99.99 |
| Damping for the analogue output dAA [s] | 0...99.99 |

|   |    |  |
|---|----|--|
| 2-wire  |    |  |
| Step response time analogue output [ms]           | 30 |  |
| 3-wire  |    |  |
| Min. response time of switching output (dAP) [ms] | 3  |  |
| Step response time analogue output [ms]           | 7  |  |

|                                |  |  |
|--------------------------------|--|--|
| Temperature monitoring         |  |  |
| Dynamic response T05 / T09 [s] | < 35 / < 135; (DIN EN 60751 water ; > 0,9 m/s) |  |



## Flush pressure sensor with display

PI-1-1BREA01-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 type          | 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)    | <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   | 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   |                     |
| 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 no.   | J049                |
|                                    | File number UL  | E174189             |
| Mechanical data                    |   |                     |
| Weight [g]                         | 384.6   |                     |
| Materials                          | 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. |                     |

# PI1809



## Flush pressure sensor with display

PI-1-1BREA01-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; psi; kPa; inH2O |                               |

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

### Electrical connection

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

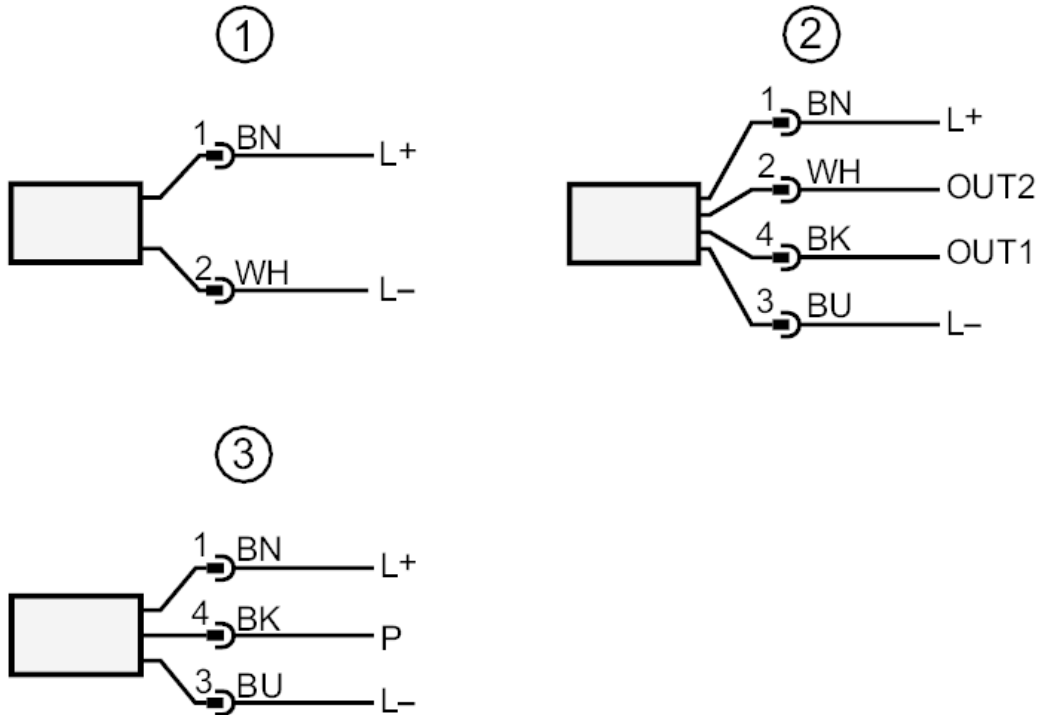




## Flush pressure sensor with display

PI-1-1BREA01-MFRKG/USI/IP

### Connection



- 1 connection for 2-wire operation
- 2 connection for 3-wire operation
- OUT1 switching output / IO-Link
- OUT2 switching output / analogue output
- 3 connection for IO-Link parameter setting (P = communication via IO-Link)
- colours to DIN EN 60947-5-2
- Core colours
- BK = black
- BN = brown
- BU = blue
- WH = white

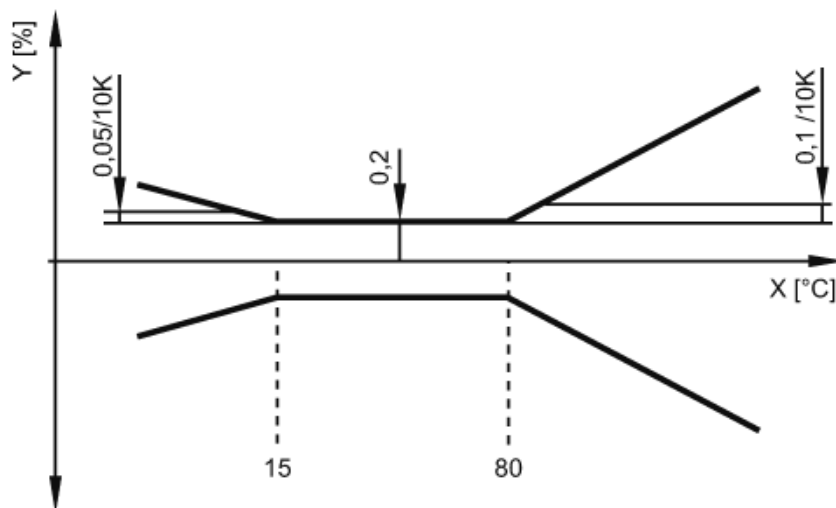


## Flush pressure sensor with display

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

### Diagrams and graphs

ambient temperature influence on the accuracy



X temperature  
Y total deviation