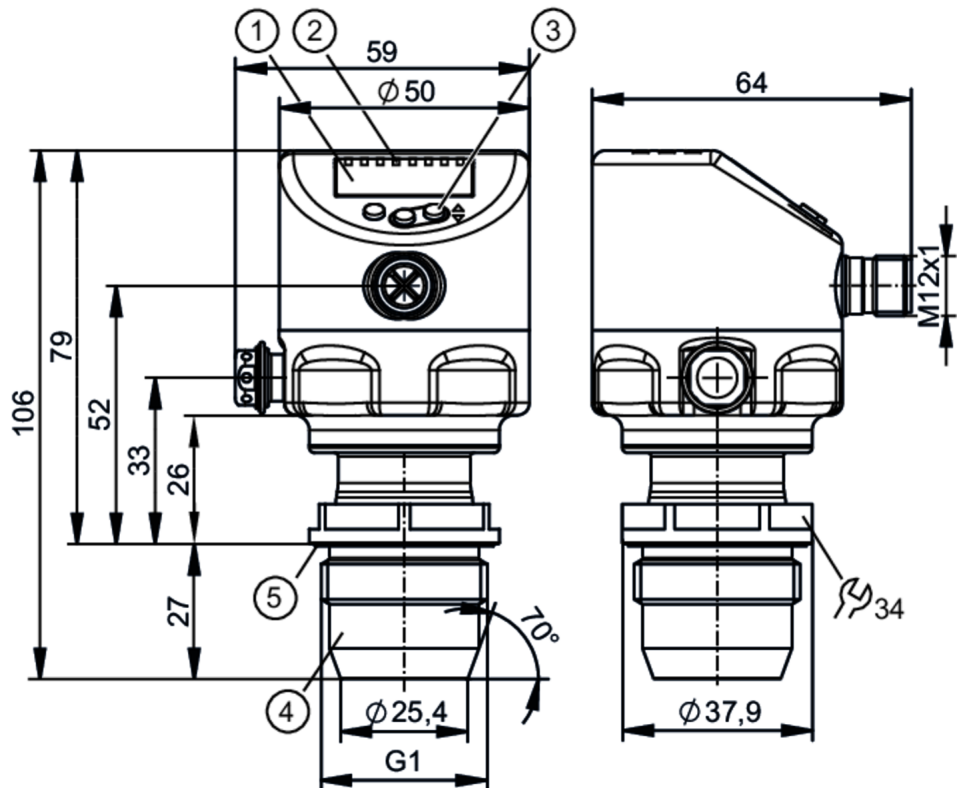


# PI1804



## Flush pressure sensor with display

PI-010-REA01-MFRKG/US/ /P



- 1 alphanumeric display 4-digit
  - 2 status LEDs
  - 3 programming button
  - 4 G1 sealing cone external thread
  - 5 groove with sealing ring
- 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.



### Product characteristics

|                              |                                                                                                                                                                                                                                 |                 |              |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1                                                                                                                                                                     |                 |              |
| Measuring range              | -1...10 bar                                                                                                                                                                                                                     | -14.6...145 psi | -0.1...1 MPa |
| 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                         | 150 bar                                                               | 2175 psi | 15 MPa |
| Pressure rating                                | 50 bar                                                                | 725 psi  | 5 MPa  |
| Vacuum resistance [mbar]                       | -1000                                                                 |          |        |
| Type of pressure                               | relative pressure; vacuum                                             |          |        |
| No dead space                                  | yes                                                                   |          |        |
| MAWP (for applications according to CRN) [bar] | 50                                                                    |          |        |



## Flush pressure sensor with display

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| 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]            | (Ub - 10 V) / 21,5 mA; 650 Ω (Ub = 24 V)                    |                  |
| Measuring/setting range                         |                |                                                             |                  |
| Measuring range                                 | -1...10 bar    | -14.6...145 psi                                             | -0.1...1 MPa     |
| Set point SP                                    | -0.99...10 bar | -14.3...145 psi                                             | -0.099...1 MPa   |
| Reset point rP                                  | -1...9.99 bar  | -14.5...144.8 psi                                           | -0.1...0.999 MPa |
| Analogue start point                            | -1...8 bar     | -14.5...116 psi                                             | -0.1...0.8 MPa   |
| Analogue end point                              | 1...10 bar     | 14.5...145 psi                                              | 0.1...1 MPa      |
| Min. difference between SP and rP               | 0.02 bar       | 0.3 psi                                                     | 0.002 MPa        |
| In steps of                                     | 0.01 bar       | 0.1 psi                                                     | 0.001 MPa        |



## Flush pressure sensor with display

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|                 |                |                 |
|-----------------|----------------|-----------------|
| Factory setting | SP1 = 2.50 bar | rP1 = 2.30 bar  |
|                 | SP2 = 7.50 bar | rP2 = 7.30 bar  |
|                 | ASP = 0.00 bar | AEP = 10.00 bar |
|                 | dAP = 0.06 s   | dAA = 0.06 s    |

### Temperature monitoring

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

### Accuracy / deviations

|                           |       |                                                                                                         |
|---------------------------|-------|---------------------------------------------------------------------------------------------------------|
| Switch point accuracy     | [X21] | < ± 0,2; (DIN EN IEC 62828-1; Turn down 1:1)                                                            |
| Repeatability             | [X21] | < ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)                                          |
| Characteristics deviation | [X21] | < ± 0,2; (DIN IEC EN 62828-1 incl. zero point and span error, non-linearity, hysteresis; Turn down 1:1) |
| Linearity deviation       | [X21] | < ± 0,15; (Turn down 1:1)                                                                               |
| Hysteresis deviation      | [X21] | < ± 0,15; (Turn down 1:1)                                                                               |
| Long-term stability       | [X21] | < ± 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) |
|----------------------------|-----|------------------------------------------------|

### 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                                                                      |



## Flush pressure sensor with display

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|                                    |                                                                                                                          |                   |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------|
| Required master port type          | A                                                                                                                        |                   |
| Min. process cycle time [ms]       | 5.6                                                                                                                      |                   |
| IO-Link resolution pressure [bar]  | 0.0005                                                                                                                   |                   |
| 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                                                                                                                  | 1156              |

| 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 [ANN]           | 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]               | 385.2                                                                                                                                                                                                                           |  |
| Materials                | stainless steel (316L/1.4404); FKM; PTFE; PBT; PEI; PFA                                                                                                                                                                         |  |
| Materials (wetted parts) | ceramics (99.9 % Al <sub>2</sub> O <sub>3</sub> ); stainless steel (316L/1.4435); 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. |  |

| 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                  | bar; psi; MPa    |                               |

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



## Flush pressure sensor with display

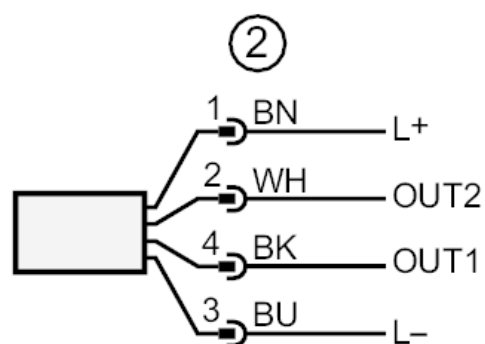
PI-010-REA01-MFRKG/US/ /P

### Electrical connection

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



### 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-010-REA01-MFRKG/US/ IP

### Diagrams and graphs

ambient temperature influence on the accuracy



X temperature  
Y total deviation