

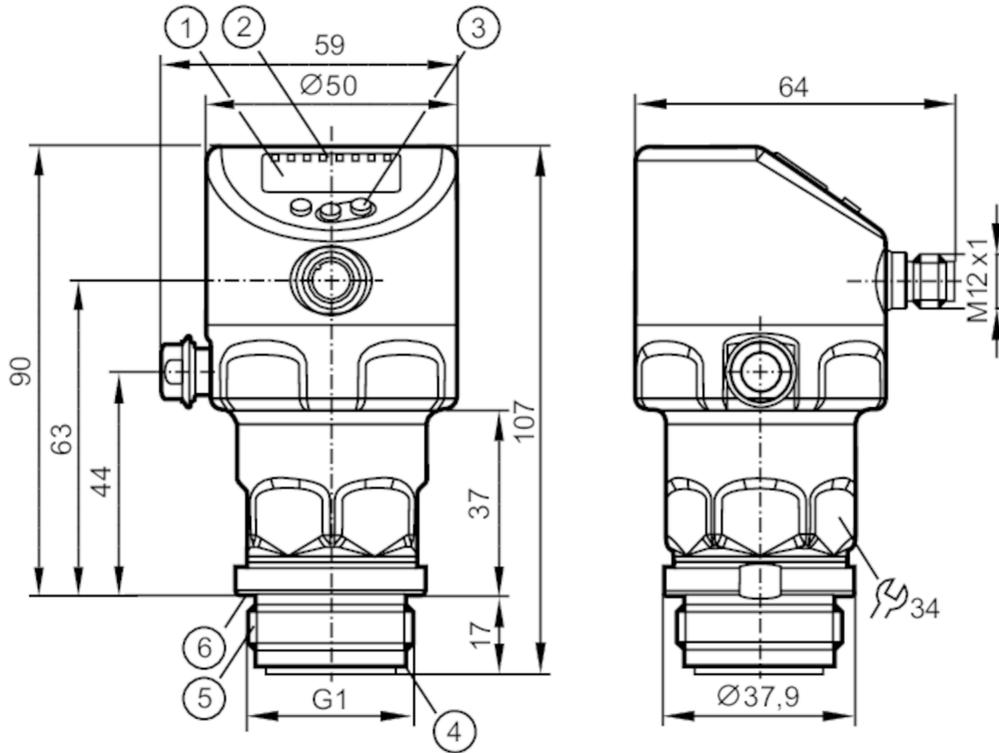
# PI1707



## Flush pressure sensor with display

PI-001BREA01-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 groove for sealing ring
- 5 external thread G1 Aseptoflex Vario
- 6 groove with sealing ring (DIN 3869-33)



ACS



UL LISTED

us

EC 1935/2004

EHDG Certified

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              | -50...1000 mbar   | -0.72...14.5 psi | -20...401.5 inH2O | -5...100 kPa |
| Process connection           | threaded connection G 1 external thread Aseptoflex Vario  |                  |                   |              |

### 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  | 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   |         |          |

### Electrical data

|                                 |                 |
|---------------------------------|-----------------|
| Min. insulation resistance [MΩ] | 100; (500 V DC) |
|---------------------------------|-----------------|

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|                             |     |
|-----------------------------|-----|
| 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]  | ( $U_b - 10\text{ V}$ ) / 21,5 mA; 650 Ω ( $U_b = 24\text{ V}$ ) |

### Measuring/setting range

|                                   |                 |                   |                     |                |
|-----------------------------------|-----------------|-------------------|---------------------|----------------|
| Measuring range                   | -50...1000 mbar | -0.72...14.5 psi  | -20...401.5 inH2O   | -5...100 kPa   |
| Set point SP                      | -49...1000 mbar | -0.7...14.5 psi   | -19.5...401.5 inH2O | -4.9...100 kPa |
| Reset point rP                    | -50...999 mbar  | -0.73...14.48 psi | -20.1...400.9 inH2O | -5...99.9 kPa  |
| Analog start point                | -50...800 mbar  | -0.73...11.6 psi  | -20.1...321.2 inH2O | -5...80 kPa    |
| Analog end point                  | 150...1000 mbar | 2.18...14.5 psi   | 60.2...401.5 inH2O  | 15...100 kPa   |
| Min. difference between SP and rP | 2 mbar          | 0.03 psi          | 0.6 inH2O           | 0.2 kPa        |
| In steps of                       | 1 mbar          | 0.01 psi          | 0.1 inH2O           | 0.1 kPa        |

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|                 |                 |                 |
|-----------------|-----------------|-----------------|
| Factory setting | SP1 = 250 mbar  | rP1 = 230 mbar  |
|                 | SP2 = 750 mbar  | rP2 = 730 mbar  |
|                 | ASP = 0.00 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)   |  |
| 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       | Temperature range   | total deviation                                      |
|  | -25...15 °C   | Characteristics deviation ± 0,05 % der Spanne / 10 K |
|  | 15...80 °C  | Characteristics deviation                            |
|  | 80...150 °C   | Characteristics deviation ± 0,1 % der Spanne / 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 |  |

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

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|                                    |  |            |
|------------------------------------|--|------------|
| 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] | 0.05   |            |
| 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 |            |
| Supported DeviceIDs                | Type of operation  | DeviceID   |
|                                    | default  | 1153d      |

| 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  | J048                |
|                      | File number UL  | E174189             |

| Mechanical data          |  |             |
|--------------------------|--|-------------|
| Weight [g]               |  | 356.9       |
| Material                 | stainless steel (1.4404 / 316L); FKM; PTFE; PBT; PEI; PFA  |             |
| Materials (wetted parts) | ceramics (99.9 % Al2O3); stainless steel (1.4435 / 316L); surface characteristics: Ra < 0,4 / Rz 4; PTFE |             |
| Min. pressure cycles     |  | 100 million |
| Tightening torque [Nm]   |  | 35          |
| Process connection       | threaded connection G 1 external thread Aseptoflex Vario   |             |

| 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. |  |

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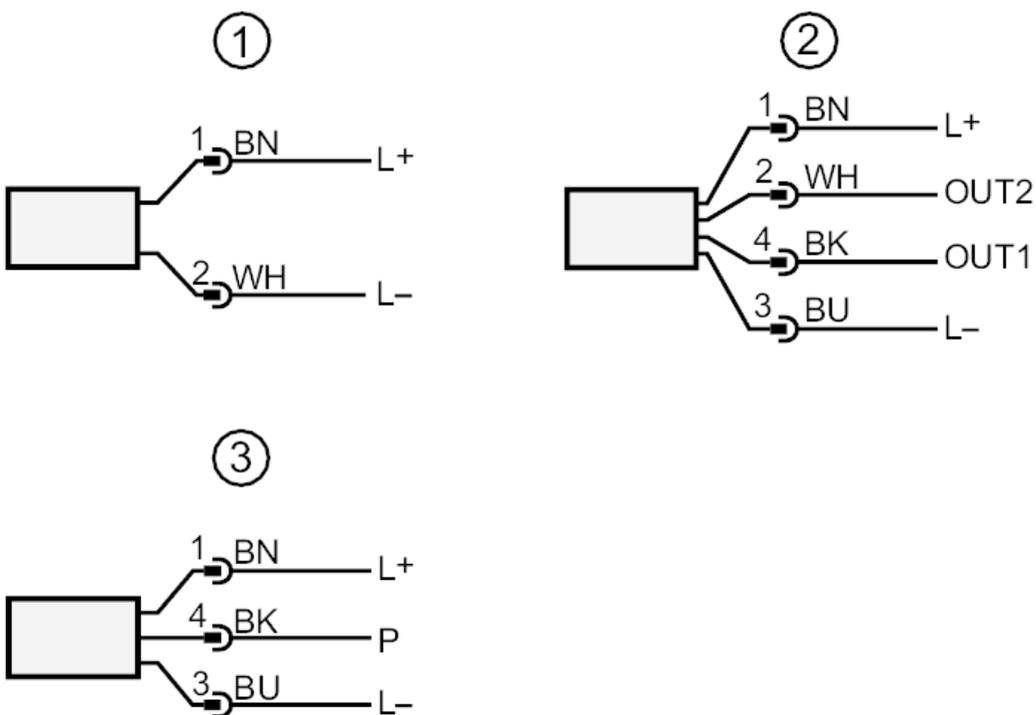
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### Electrical connection

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 / 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

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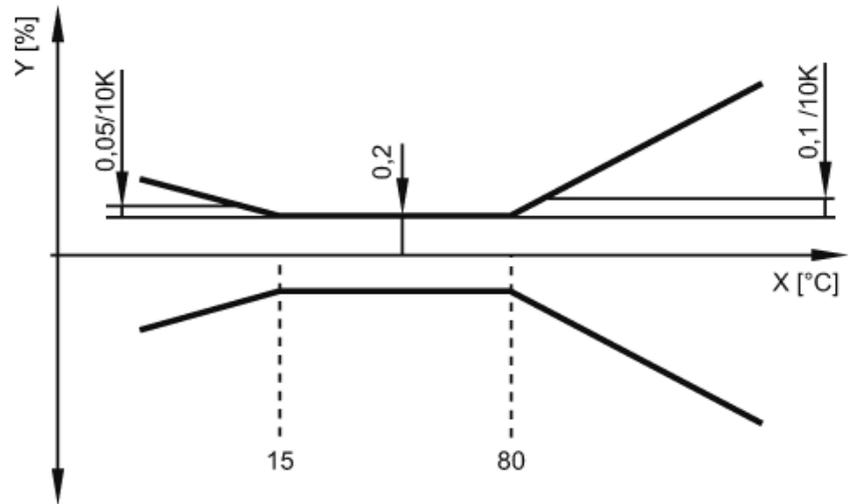


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### Diagrams and graphs

ambient temperature influence on the accuracy



X temperature  
Y total deviation