

# PM1704



## Flush pressure sensor

PM-010-REA01-E-ZVG/US



- 1 groove with sealing ring (DIN EN ISO 1179-2)
- 2 external thread G1 (Aseptoflex Vario)
- 3 groove for sealing ring



ACS



CRN



EC 1935/2004

EHEDG

Certified

FCM

FDA

IO-Link

Reg31

UK

CA

### Product characteristics

|                              |                                                           |                 |                 |              |
|------------------------------|-----------------------------------------------------------|-----------------|-----------------|--------------|
| Number of inputs and outputs | Number of digital outputs: 1; Number of analog outputs: 1 |                 |                 |              |
| Measuring range              | -1...10 bar                                               | -14.5...145 psi | -100...1000 kPa | -0.1...1 MPa |
| Process connection           | threaded connection G 1 external thread Aseptoflex Vario  |                 |                 |              |

### Application

|                                                |                                                                       |          |        |
|------------------------------------------------|-----------------------------------------------------------------------|----------|--------|
| System                                         | gold-plated contacts                                                  |          |        |
| Measuring element                              | ceramic-capacitive pressure measuring cell                            |          |        |
| Temperature monitoring                         | no                                                                    |          |        |
| 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                                                                    |          |        |

### Electrical data

|                       |            |
|-----------------------|------------|
| Operating voltage [V] | 18...30 DC |
|-----------------------|------------|



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|                                        |                                                     |                                                                                                    |
|----------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Min. insulation resistance             | [MΩ]                                                | 100; (500 V DC)                                                                                    |
| Protection class                       |                                                     | III                                                                                                |
| Reverse polarity protection            |                                                     | yes                                                                                                |
| Integrated watchdog                    |                                                     | yes                                                                                                |
| 2-wire                                 |                                                     |                                                                                                    |
| Current consumption                    | [mA]                                                | 3.5...21.5                                                                                         |
| Power-on delay time                    | [s]                                                 | 1                                                                                                  |
| 3-wire                                 |                                                     |                                                                                                    |
| Current consumption                    | [mA]                                                | < 45                                                                                               |
| Power-on delay time                    | [s]                                                 | 0.5                                                                                                |
| Inputs / outputs                       |                                                     |                                                                                                    |
| Number of inputs and outputs           |                                                     | Number of digital outputs: 1; Number of analog outputs: 1                                          |
| Outputs                                |                                                     |                                                                                                    |
| Total number of outputs                |                                                     | 2                                                                                                  |
| Output signal                          |                                                     | analog signal; IO-Link; (configurable)                                                             |
| Number of digital outputs              |                                                     | 1; (IO-Link)                                                                                       |
| Number of analog outputs               |                                                     | 1                                                                                                  |
| Analog current output                  | [mA]                                                | 4...20; (scalable)                                                                                 |
| Max. load                              | [Ω]                                                 | 700; (U <sub>b</sub> = 24 V; (U <sub>b</sub> - 9 V) / 21.5 mA)                                     |
| Short-circuit proof                    |                                                     | yes                                                                                                |
| Overload protection                    |                                                     | yes                                                                                                |
| Measuring/setting range                |                                                     |                                                                                                    |
| Measuring range                        | -1...10 bar                                         | -14.5...145 psi    -100...1000 kPa    -0.1...1 MPa                                                 |
| Analog start point                     | -1...8 bar                                          | -14.5...116 psi    -0.1...0.8 MPa                                                                  |
| Analog end point                       | 1...10 bar                                          | 14.5...145 psi    0.1...1 MPa                                                                      |
| In steps of                            | 0.005 bar                                           | 0.1 psi    0.0005 MPa                                                                              |
| Factory setting                        | ASP = 0.0 bar                                       | AEP = 10.0 bar                                                                                     |
| Accuracy / deviations                  |                                                     |                                                                                                    |
| Repeatability                          | [% of the span]                                     | < ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)                                     |
| Characteristics deviation              | [% of the span]                                     | < ± 0,2; (linearity incl. hysteresis and repeatability, limit value setting to DIN EN IEC 62828-1) |
| Linearity deviation                    | [% of the span]                                     | < ± 0,15; (Turn down 1:1)                                                                          |
| Hysteresis deviation                   | [% of the span]                                     | < ± 0,15; (Turn down 1:1)                                                                          |
| Long-term stability                    | [% 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 |                                                                                                    |

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| Reaction times                    |                                                                                                                           |                     |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------|
| Damping for the analog output dAA | [s]                                                                                                                       | 0...4               |
| 2-wire                            |                                                                                                                           |                     |
| Step response time analog output  | [ms]                                                                                                                      | 30                  |
| 3-wire                            |                                                                                                                           |                     |
| Step response time analog output  | [ms]                                                                                                                      | 7                   |
| Interfaces                        |                                                                                                                           |                     |
| Communication interface           | IO-Link                                                                                                                   |                     |
| Transmission type                 | COM2 (38,4 kBaud)                                                                                                         |                     |
| IO-Link revision                  | 1.1                                                                                                                       |                     |
| SDCI standard                     | IEC 61131-9                                                                                                               |                     |
| Profiles                          | Digital Measuring Sensor (0x000A), Identification and Diagnosis (0x4000)                                                  |                     |
| SIO mode                          | no                                                                                                                        |                     |
| Required master port class        | A                                                                                                                         |                     |
| Process data analog               | 3                                                                                                                         |                     |
| Min. process cycle time           | [ms]                                                                                                                      | 3.2                 |
| IO-Link resolution pressure       | [bar]                                                                                                                     | 0.002               |
| IO-Link process data (cyclical)   | Function                                                                                                                  | bit length          |
|                                   | pressure                                                                                                                  | 16                  |
|                                   | device status                                                                                                             | 4                   |
| IO-Link functions (acyclical)     | application specific tag; internal temperature                                                                            |                     |
| Supported DeviceIDs               | Type of operation                                                                                                         | DeviceID            |
|                                   | default                                                                                                                   | 662                 |
| Operating conditions              |                                                                                                                           |                     |
| Ambient temperature               | [°C]                                                                                                                      | -25...80            |
| Storage temperature               | [°C]                                                                                                                      | -40...100           |
| Protection                        | IP 67; IP 68; IP 69K                                                                                                      |                     |
| Tests / approvals                 |                                                                                                                           |                     |
| EMC                               | DIN EN 61000-6-2                                                                                                          |                     |
|                                   | DIN EN 61000-6-3                                                                                                          |                     |
| 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]                                                                                                                   | 323                 |
| 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                                                                                                        | J021                |
| Mechanical data                   |                                                                                                                           |                     |
| Weight                            | [g]                                                                                                                       | 307.75              |
| Housing                           | tubular                                                                                                                   |                     |
| Dimensions                        | [mm]                                                                                                                      | Ø 30.2 / L = 111    |
| Material                          | stainless steel (1.4404 / 316L); PBT                                                                                      |                     |
| 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                                                                                                               |                     |

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|                    |                                                          |        |
|--------------------|----------------------------------------------------------|--------|
| Tightening torque  | [Nm]                                                     | 35     |
| Process connection | threaded connection G 1 external thread Aseptoflex Vario |        |
| Remarks            |                                                          |        |
| Pack quantity      |                                                          | 1 pcs. |

Electrical connection

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



Connection



- 1
- connection for 2-wire operation ( analog )
- 2
- connection for 3-wire operation ( analog / IO-Link )
- OUT1 : IO-Link
- OUT2 : analog output



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### Diagrams and graphs

ambient temperature influence on the accuracy



X temperature  
Y total deviation