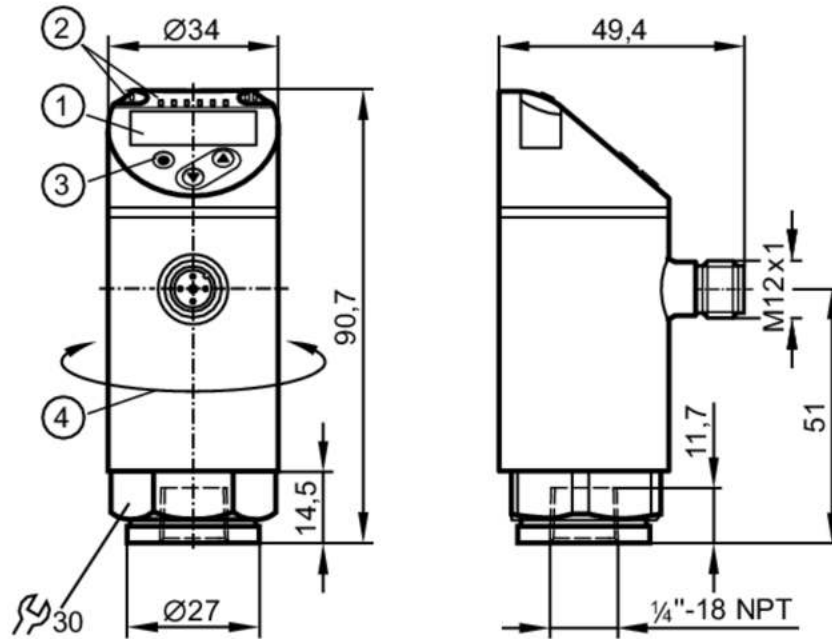


# PN2293



## Pressure sensor with display

PN-025-REN14-MFRKG/US/ IV



- 1 alphanumeric display 4-digit red/green
- 2 LEDs Display unit / switching status
- 3 programming button
- 4 upper part of the housing can be rotated 345°



### Product characteristics

|                              |   |                   |                |
|------------------------------|---|-------------------|----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1 |                   |                |
| Measuring range              | -1...25 bar   | -14.5...362.5 psi | -0.1...2.5 MPa |
| Process connection           | threaded connection 1/4" NPT internal thread                |                   |                |

### Application

|  |  |          |        |
|--|--|----------|--------|
| Special feature                          | Gold-plated contacts                       |          |        |
| Measuring element                        | ceramic-capacitive pressure measuring cell |          |        |
| Application                              | for industrial applications                |          |        |
| Media                                    | liquids and gases                          |          |        |
| Medium temperature [°C]                  | -25...80                                   |          |        |
| Min. bursting pressure                   | 350 bar                                    | 5075 psi | 35 MPa |
| Pressure rating                          | 150 bar                                    | 2175 psi | 15 MPa |
| Vacuum resistance [mbar]                 | -1000                                      |          |        |
| Type of pressure                         | relative pressure; vacuum                  |          |        |
| MAWP (for applications according to CRN) | 70 bar                                     | 1015 psi | 7 MPa  |

### Electrical data

|                                 |                            |  |  |
|---------------------------------|----------------------------|--|--|
| Operating voltage [V]           | 18...30 DC; (to SELV/PELV) |  |  |
| Current consumption [mA]        | < 35                       |  |  |
| Min. insulation resistance [MΩ] | 100; (500 V DC)            |  |  |
| Protection class                | III                        |  |  |

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|                             |     |     |
|-----------------------------|-----|-----|
| Reverse polarity protection |     | yes |
| Power-on delay time         | [s] | 0.3 |
| Integrated watchdog         |     | yes |

### 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; (configurable) |
| Electrical design                               | PNP/NPN  |
| Number of digital outputs                       | 2  |
| Output function                                 | normally open / normally closed; (parameterisable)         |
| Max. voltage drop switching output DC           | [V] 2  |
| Permanent current rating of switching output DC | [mA] 250   |
| Switching frequency DC                          | [Hz] < 500   |
| Number of analogue outputs                      | 1  |
| Analogue current output                         | [mA] 4...20; (scalable 1:5)                                |
| Max. load                                       | [Ω] 500  |
| Analogue voltage output                         | [V] 0...10; (scalable 1:5)                                 |
| Min. load resistance                            | [Ω] 2000   |
| Short-circuit protection                        | yes  |
| Type of short-circuit protection                | pulsed   |
| Overload protection                             | yes  |

### Measuring/setting range

|                      |             |                   |                |
|----------------------|-------------|-------------------|----------------|
| Measuring range      | -1...25 bar | -14.5...362.5 psi | -0.1...2.5 MPa |
| Analogue start point | -1...20 bar | -14.5...290 psi   | -0.1...2 MPa   |
| Analogue end point   | 4...25 bar  | 58...362.5 psi    | 0.4...2.5 MPa  |

### Factory setting / CMPT = 2

|                                   |                  |                 |                   |
|-----------------------------------|------------------|-----------------|-------------------|
| Set point SP                      | -0.85...25 bar   | -12...362.5 psi | -0.085...2.5 MPa  |
| Reset point rP                    | -0.95...24.9 bar | -13.5...361 psi | -0.095...2.49 MPa |
| Min. difference between SP and rP | 0.15 bar         | 1.5 psi         | 0.015 MPa         |
| In steps of                       | 0.05 bar         | 0.5 psi         | 0.005 MPa         |

### Status\_B High Resolution / CMPT = 3

|                                   |                  |                   |                   |
|-----------------------------------|------------------|-------------------|-------------------|
| Set point SP                      | -0.84...25 bar   | -12.2...362.6 psi | -0.084...2.5 MPa  |
| Reset point rP                    | -0.95...24.9 bar | -13.7...361.1 psi | -0.095...2.49 MPa |
| Min. difference between SP and rP | 0.11 bar         | 1.5 psi           | 0.011 MPa         |
| In steps of                       | 0.01 bar         | 0.1 psi           | 0.001 MPa         |

### Accuracy / deviations

|                           |                 |  |
|---------------------------|-----------------|--|
| Switch point accuracy     |                 | < ± 0,4; (Turn down 1:1)   |
|                           | [% of the span] |  |
| Repeatability             | [% of the span] | < ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)   |
| Characteristics deviation |                 | < ± 0,25 (BFSL) / < ± 0,5 (LS); (Turn down 1:1; BFSL = Best Fit Straight Line; LS = limit value setting) |

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|                                    |                        |   |
|------------------------------------|------------------------|---|
|                                    | [% of the span]        |   |
| Hysteresis deviation               | [% of the span]        | < ± 0,1; (Turn down 1:1)  |
| Long-term stability                | [% of the span]        | < ± 0,05; (Turn down 1:1; per 6 months)                             |
| Temperature coefficient zero point | [% of the span / 10 K] | < ± 0,2; (-0...80 °C)   |
| Temperature coefficient span       | [% of the span / 10 K] | < ± 0,2; (-0...80 °C)   |
| Notes on the accuracy / deviation  |                        | switch point accuracy, linearity error under DNV GL: < ± 1%: < ± 1% |

### Response times

|                                     |      |        |
|-------------------------------------|------|--------|
| Response time                       | [ms] | < 1.5  |
| Delay time programmable dS, dr      | [s]  | 0...50 |
| Damping process value dAP           | [s]  | 0...4  |
| Damping for the analogue output dAA | [s]  | 0...4  |
| Max. response time analogue output  | [ms] | 3      |

### Software / programming

|                           |  |
|---------------------------|--|
| Parameter setting options | hysteresis / window; normally open / normally closed; switch-on/ switch-off delay; Damping; Display unit; current/voltage output |
|---------------------------|--|

### Interfaces

| Communication interface             | IO-Link  |                   |          |                            |     |                                     |     |
|-------------------------------------|--|-------------------|----------|----------------------------|-----|-------------------------------------|-----|
| Transmission type                   | COM2 (38,4 kBaud)  |                   |          |                            |     |                                     |     |
| IO-Link revision                    | 1.1  |                   |          |                            |     |                                     |     |
| SDCI standard                       | IEC 61131-9  |                   |          |                            |     |                                     |     |
| SIO mode                            | yes  |                   |          |                            |     |                                     |     |
| Required master port type           | A; (when pin 2 not connected: B)   |                   |          |                            |     |                                     |     |
| Supported DeviceIDs                 | <table border="1"> <thead> <tr> <th>Type of operation</th> <th>DeviceID</th> </tr> </thead> <tbody> <tr> <td>Factory setting / CMPT = 2</td> <td>472</td> </tr> <tr> <td>Status_B High Resolution / CMPT = 3</td> <td>988</td> </tr> </tbody> </table> | Type of operation | DeviceID | Factory setting / CMPT = 2 | 472 | Status_B High Resolution / CMPT = 3 | 988 |
| Type of operation                   | DeviceID   |                   |          |                            |     |                                     |     |
| Factory setting / CMPT = 2          | 472  |                   |          |                            |     |                                     |     |
| Status_B High Resolution / CMPT = 3 | 988  |                   |          |                            |     |                                     |     |
| Note                                | For further information please see the IODD PDF file under "Downloads"   |                   |          |                            |     |                                     |     |

### Factory setting / CMPT = 2

| Profiles                        | Smart Sensor: Process Data Variable; Device Identification, Device Diagnosis  |          |            |          |    |                              |   |
|---------------------------------|---|----------|------------|----------|----|------------------------------|---|
| Min. process cycle time         | [ms] 2.3  |          |            |          |    |                              |   |
| IO-Link resolution pressure     | [bar] 0.01  |          |            |          |    |                              |   |
| IO-Link process data (cyclical) | <table border="1"> <thead> <tr> <th>function</th> <th>bit length</th> </tr> </thead> <tbody> <tr> <td>pressure</td> <td>14</td> </tr> <tr> <td>binary switching information</td> <td>2</td> </tr> </tbody> </table> | function | bit length | pressure | 14 | binary switching information | 2 |
| function                        | bit length  |          |            |          |    |                              |   |
| pressure                        | 14  |          |            |          |    |                              |   |
| binary switching information    | 2   |          |            |          |    |                              |   |
| IO-Link functions (acyclical)   | application specific tag  |          |            |          |    |                              |   |

### Status\_B High Resolution / CMPT = 3

|                         |  |
|-------------------------|--|
| Profiles                | Smart Sensor ED2: Digital Measuring Sensor (0x000A), Identification and Diagnosis (0x4000) |
| Min. process cycle time | [ms] 3   |

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## Pressure sensor with display

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|                                   |                              |            |
|-----------------------------------|------------------------------|------------|
| IO-Link resolution pressure [bar] | 0.01                         |            |
| IO-Link process data (cyclical)   | function                     | bit length |
|                                   | pressure                     | 16         |
|                                   | device status                | 4          |
|                                   | binary switching information | 2          |
| IO-Link functions (acyclical)     | application specific tag     |            |

| Operating conditions     |              |  |
|--------------------------|--------------|--|
| Ambient temperature [°C] | -25...80     |  |
| Storage temperature [°C] | -40...100    |  |
| Protection               | IP 65; IP 67 |  |

| 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]                 | 138   |                     |
| UL approval                  | UL Approval no.   | J012                |
| Pressure Equipment Directive | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                     |

| Mechanical data               |  |  |
|-------------------------------|--|--|
| Weight [g]                    | 223.5  |  |
| Materials                     | stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC                           |  |
| Materials (wetted parts)      | stainless steel (1.4404 / 316L); Al <sub>2</sub> O <sub>3</sub> (96%; ceramics); FKM |  |
| Min. pressure cycles          | 100 million  |  |
| Tightening torque [Nm]        | > 50; (depends on lubrication, seal and pressure rating)                             |  |
| Process connection            | threaded connection 1/4" NPT internal thread   |  |
| Restrictor element integrated | no (can be retrofitted)  |  |

| Displays / operating elements |                  |   |
|-------------------------------|------------------|---|
| Display                       | Display unit     | 3 x LED, green (bar, psi, MPa)          |
|                               | switching status | 2 x LED, yellow                         |
|                               | measured values  | alphanumeric display, red/green 4-digit |

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

### Electrical connection

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



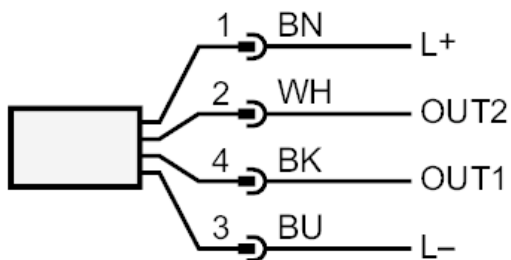
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## Pressure sensor with display

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### Connection



|      |                  |
|------|------------------|
| OUT1 | switching output |
|      | IO-Link          |
| OUT2 | switching output |
|      | analogue output  |
|      | Core colours :   |
| BK = | black            |
| BN = | brown            |
| BU = | blue             |
| WH = | white            |