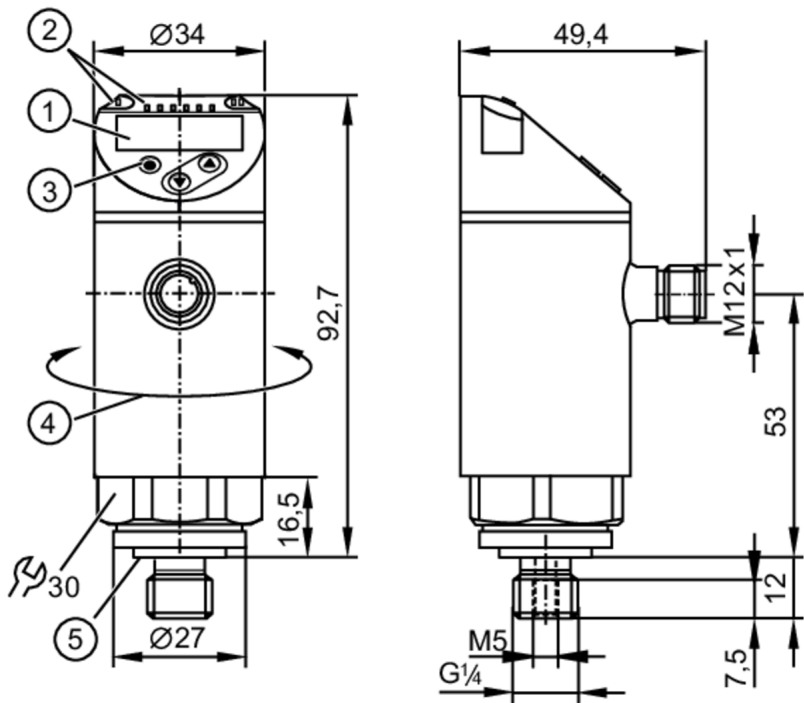


# PN2593



## Pressure sensor with display

PN-025-REG14-MFRKG/US/ /V



- 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°
- 5 sealing



### Product characteristics

|                              |                                                                                   |                   |                |
|------------------------------|-----------------------------------------------------------------------------------|-------------------|----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1                         |                   |                |
| Measuring range              | -1...25 bar                                                                       | -14.5...362.5 psi | -0.1...2.5 MPa |
| Process connection           | threaded connection G 1/4 external thread (DIN EN ISO 1179-2); Internal thread:M5 |                   |                |

### Application

|                         |                                            |          |          |
|-------------------------|--------------------------------------------|----------|----------|
| System                  | gold-plated contacts                       |          |          |
| Measuring element       | ceramic-capacitive pressure measuring cell |          |          |
| Application             | for industrial applications                |          |          |
| Media                   | liquids and gases                          |          |          |
| Medium temperature [°C] | -25...80                                   |          |          |
| Min. burst pressure     | 350 bar                                    | 5075 psi | 35 MPa   |
| Pressure rating         | 150 bar                                    | 2175 psi | 15 MPa   |
| Vacuum resistance       | -1000 mbar                                 |          | -0.1 MPa |
| Type of pressure        | relative pressure; vacuum                  |          |          |

### 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                        |  |  |
| Reverse polarity protection     | yes                        |  |  |

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

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

### Measuring/setting range

|                    |             |                   |                |
|--------------------|-------------|-------------------|----------------|
| Measuring range    | -1...25 bar | -14.5...362.5 psi | -0.1...2.5 MPa |
| Analog start point | -1...20 bar | -14.5...290 psi   | -0.1...2 MPa   |
| Analog 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     | [% of the span] | < ± 0,4; (Turn down 1:1)                                                                                 |
| Repeatability             | [% of the span] | < ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)                                           |
| Characteristics deviation | [% of the span] | < ± 0,25 (BFSL) / < ± 0,5 (LS); (Turn down 1:1; BFSL = Best Fit Straight Line; LS = limit value setting) |



## Pressure sensor with display

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|                                                              |                                                                     |
|--------------------------------------------------------------|---------------------------------------------------------------------|
| Hysteresis deviation<br>[% of the span]                      | < ± 0,1; (Turn down 1:1)                                            |
| Long-term stability<br>[% of the span]                       | < ± 0,05; (Turn down 1:1; per 6 months)                             |
| Temperature coefficient zero point<br>[% of the span / 10 K] | < ± 0,2; (-0...80 °C)                                               |
| Temperature coefficient span<br>[% 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% |

## Reaction times

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

## Software / programming

|                           |                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Parameter setting options | hysteresis / window; normally open / 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 class          | A; (when pin 2 not connected: B)                                                                                                                                                                    |                   |          |                            |     |                                     |     |
| Supported DeviceIDs                 | <table> <tr> <th>Type of operation</th><th>DeviceID</th></tr> <tr> <td>Factory setting / CMPT = 2</td><td>462</td></tr> <tr> <td>Status_B High Resolution / CMPT = 3</td><td>973</td></tr> </table> | Type of operation | DeviceID | Factory setting / CMPT = 2 | 462 | Status_B High Resolution / CMPT = 3 | 973 |
| Type of operation                   | DeviceID                                                                                                                                                                                            |                   |          |                            |     |                                     |     |
| Factory setting / CMPT = 2          | 462                                                                                                                                                                                                 |                   |          |                            |     |                                     |     |
| Status_B High Resolution / CMPT = 3 | 973                                                                                                                                                                                                 |                   |          |                            |     |                                     |     |
| Note                                | For further information please see the IODD PDF file at "Downloads"                                                                                                                                 |                   |          |                            |     |                                     |     |

## Factory setting / CMPT = 2

|                                 |                              |                          |                         |  |
|---------------------------------|------------------------------|--------------------------|-------------------------|--|
| Profiles                        | Smart Sensor - SSP 0         |                          | Generic Profiled Sensor |  |
|                                 | Function                     |                          | Device identification   |  |
|                                 | Function                     |                          | Process data variable   |  |
|                                 | Function                     |                          | Device diagnosis        |  |
| Min. process cycle time         | [ms]                         | 2.3                      |                         |  |
| IO-Link resolution pressure     | [bar]                        | 0.01                     |                         |  |
| IO-Link process data (cyclical) | Function                     |                          | bit length              |  |
|                                 | pressure                     |                          | 14                      |  |
|                                 | binary switching information |                          | 2                       |  |
| IO-Link functions (acyclical)   |                              | application specific tag |                         |  |



## Pressure sensor with display

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|                                     |                                                                                            |                                         |
|-------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------|
| Status_B High Resolution / CMPT = 3 |                                                                                            |                                         |
| Profiles                            | Smart Sensor - SSP 3.1                                                                     | Measuring Sensor                        |
|                                     | Common - I&D                                                                               | Identification and Diagnosis            |
| Min. process cycle time [ms]        | 3                                                                                          |                                         |
| 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 number                                                                         | J012                                    |
| Pressure equipment directive        | sound engineering practice; can be used for group 2 fluids; group 1 fluids on request      |                                         |
| Mechanical data                     |                                                                                            |                                         |
| Weight [g]                          | 263.5                                                                                      |                                         |
| Housing                             | tubular                                                                                    |                                         |
| Dimensions [mm]                     | Ø 34 / L = 92.7                                                                            |                                         |
| Material                            | stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC                                 |                                         |
| Materials (wetted parts)            | stainless steel (1.4404 / 316L); Al2O3 (ceramics); FKM                                     |                                         |
| Min. pressure cycles                | 100 million                                                                                |                                         |
| Tightening torque [Nm]              | 25...35; (recommended tightening torque; Depends on lubrication, seal and pressure rating) |                                         |
| Process connection                  | threaded connection G 1/4 external thread (DIN EN ISO 1179-2); Internal thread:M5          |                                         |
| Process connection sealing          | FKM (DIN EN ISO 1179-2)                                                                    |                                         |
| 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.                                                                                     |                                         |

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## Pressure sensor with display

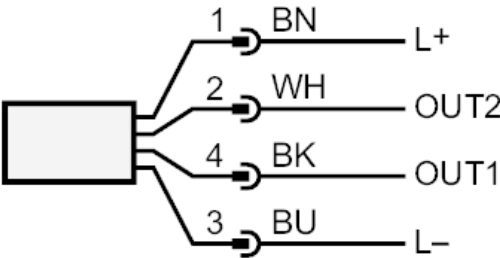
PN-025-REG14-MFRKG/US/ /V

### Electrical connection

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



### Connection



|               |                                   |
|---------------|-----------------------------------|
| OUT1          | Switching output<br>IO-Link       |
| OUT2          | Switching output<br>analog output |
| Core colors : |                                   |
| BK =          | black                             |
| BN =          | brown                             |
| BU =          | blue                              |
| WH =          | white                             |