

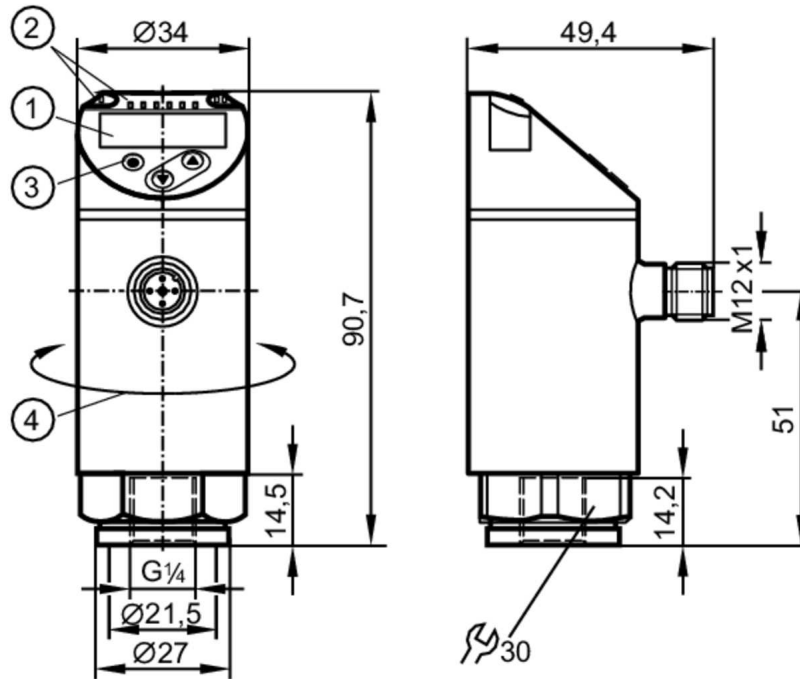
# PN2160



## Pressure sensor with display

PN-600-SER14-MFRKG/US/ IV

When selecting an alternative article and accessories please note that technical data may differ!



- 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 analog outputs: 1 |              |            |
| Measuring range              | 0...600 bar   | 0...8700 psi | 0...60 MPa |
| Process connection           | threaded connection G 1/4 Internal thread                 |              |            |

### Application

|                          |                             |           |         |
|--------------------------|-----------------------------|-----------|---------|
| System                   | gold-plated contacts        |           |         |
| Measuring element        | metallic thin film cell     |           |         |
| Application              | for industrial applications |           |         |
| Media                    | liquids and gases           |           |         |
| Medium temperature [°C]  | -25...80                    |           |         |
| Min. bursting pressure   | 2500 bar                    | 36250 psi | 250 MPa |
| Pressure rating          | 800 bar                     | 11580 psi | 80 MPa  |
| Vacuum resistance [mbar] | -1000                       |           |         |
| Type of pressure         | relative pressure           |           |         |

### 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 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]            | 2  |
| Permanent current rating of switching output DC [mA] | 250  |
| Switching frequency DC [Hz]                          | < 500  |
| Number of analog outputs                             | 1  |
| Analog current output [mA]                           | 4...20; (scalable 1:5)                                   |
| Max. load [Ω]  | 500  |
| Analog voltage output [V]                            | 0...10; (scalable 1:5)                                   |
| Min. load resistance [Ω]                             | 2000   |
| Short-circuit protection                             | yes  |
| Type of short-circuit protection                     | yes (non-latching)                                       |
| Overload protection                                  | yes  |

### Measuring/setting range

|                    |               |                 |             |
|--------------------|---------------|-----------------|-------------|
| Measuring range    | 0...600 bar   | 0...8700 psi    | 0...60 MPa  |
| Analog start point | 0...480 bar   | 0...6960 psi    | 0...48 MPa  |
| Analog end point   | 120...600 bar | 1740...8700 psi | 12...60 MPa |

#### Factory setting / CMPT = 2

|                                   |             |               |                |
|-----------------------------------|-------------|---------------|----------------|
| Set point SP                      | 4...600 bar | 60...8700 psi | 0.4...60 MPa   |
| Reset point rP                    | 1...597 bar | 20...8660 psi | 0.1...59.7 MPa |
| Min. difference between SP and rP | 3 bar       | 40 psi        | 0.3 MPa        |
| In steps of                       | 1 bar       | 20 psi        | 0.1 MPa        |

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

|                                   |             |               |            |
|-----------------------------------|-------------|---------------|------------|
| Set point SP                      | 4...600 bar | 55...8702 psi | 0...60 MPa |
| Reset point rP                    | 1...597 bar | 19...8666 psi | 0...60 MPa |
| Min. difference between SP and rP | 3 bar       | 37 psi        | 1 MPa      |
| In steps of                       | 1 bar       | 1 psi         | 1 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             | < ± 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; (-25...80 °C)  |
| Temperature coefficient span       | [% of the span / 10 K] | 0,2; (-25...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 border="1"> <thead> <tr> <th>Type of operation</th> <th>DeviceID</th> </tr> </thead> <tbody> <tr> <td>Factory setting / CMPT = 2</td> <td>458</td> </tr> <tr> <td>Status_B High Resolution / CMPT = 3</td> <td>637</td> </tr> </tbody> </table> | Type of operation | DeviceID | Factory setting / CMPT = 2 | 458 | Status_B High Resolution / CMPT = 3 | 637 |
| Type of operation                   | DeviceID   |                   |          |                            |     |                                     |     |
| Factory setting / CMPT = 2          | 458  |                   |          |                            |     |                                     |     |
| Status_B High Resolution / CMPT = 3 | 637  |                   |          |                            |     |                                     |     |
| Note                                | For further information please see the IODD PDF file at "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] 0.1   |          |            |          |    |                              |   |
| 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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|                                   |                              |                   |
|-----------------------------------|------------------------------|-------------------|
| IO-Link resolution pressure [bar] | 0.2                          |                   |
| IO-Link process data (cyclical)   | <b>Function</b>              | <b>bit length</b> |
|                                   | pressure                     | 16                |
|                                   | device status                | 4                 |
| IO-Link functions (acyclical)     | binary switching information | 2                 |
|                                   | 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]                 |   | 129                 |
| UL approval                  | UL approval number  | J014                |
| Pressure equipment directive | sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                     |

| Mechanical data               |  |       |
|-------------------------------|--|-------|
| Weight [g]                    |  | 233.5 |
| Material                      | 1.4542 (17-4 PH / 630); stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC         |       |
| Materials (wetted parts)      | 1.4542 (17-4 PH / 630)   |       |
| Min. pressure cycles          | 100 million  |       |
| Tightening torque [Nm]        | 30...50; (recommended tightening torque; Depends on lubrication, seal and pressure rating) |       |
| Process connection            | threaded connection G 1/4 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



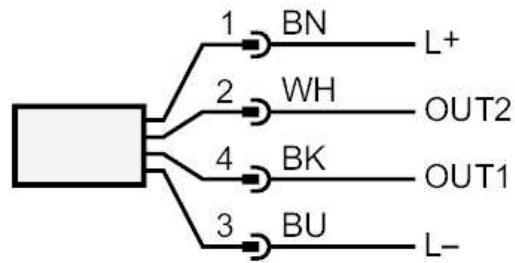
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### Connection



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