

# PN7012



## Pressure sensor with display

PN-160-SER14-QFRKG/US/ IV



| Product characteristics         |  |              |            |
|---------------------------------|--|--------------|------------|
| Number of inputs and outputs    | Number of digital outputs: 2                       |              |            |
| Measuring range                 | 0...160 bar  | 0...2322 psi | 0...16 MPa |
| Process connection              | threaded connection G 1/4 internal thread          |              |            |
| Application                     |  |              |            |
| Special feature                 | Gold-plated contacts                               |              |            |
| Measuring element               | ceramic-capacitive pressure measuring cell         |              |            |
| Application                     | for industrial applications                        |              |            |
| Media                           | liquids and gases                                  |              |            |
| Conditionally suitable for      | use in gases at pressures > 25 bar only on request |              |            |
| Medium temperature [°C]         | -25...80   |              |            |
| Min. burst pressure             | 750 bar  | 10900 psi    | 75 MPa     |
| Pressure rating                 | 350 bar  | 5100 psi     | 35 MPa     |
| Vacuum resistance               | -1000 mbar   |              | -0.1 MPa   |
| 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  |              |            |
| Reverse polarity protection     | yes  |              |            |
| Power-on delay time [s]         | < 0.3  |              |            |

# PN7012



## Pressure sensor with display

PN-160-SER14-QFRKG/US/ IV

|   |   |               |                  |
|---|---|---------------|------------------|
| Integrated watchdog                                       | yes   |               |                  |
| <b>Inputs / outputs</b>                                   |   |               |                  |
| Number of inputs and outputs                              | Number of digital outputs: 2  |               |                  |
| <b>Outputs</b>  |   |               |                  |
| Total number of outputs                                   | 2   |               |                  |
| Output signal   | switching 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]                 | 2.5   |               |                  |
| Permanent current rating of switching output DC [mA]      | 150; (200 (...60 °C) 250 (...40 °C))  |               |                  |
| Switching frequency DC [Hz]                               | < 170   |               |                  |
| Short-circuit protection                                  | yes   |               |                  |
| Type of short-circuit protection                          | pulsed  |               |                  |
| Overload protection                                       | yes   |               |                  |
| <b>Measuring/setting range</b>                            |   |               |                  |
| Measuring range   | 0...160 bar   | 0...2322 psi  | 0...16 MPa       |
| Set point SP  | 1.3...160 bar   | 19...2321 psi | 0.13...16 MPa    |
| Reset point rP  | 0.5...159.2 bar   | 7...2309 psi  | 0.05...15.92 MPa |
| Min. difference between SP and rP                         | 0.8 bar   | 12 psi        | 0.08 MPa         |
| In steps of   | 0.1 bar   | 1 psi         | 0.01 MPa         |
| <b>Accuracy / deviations</b>                              |   |               |                  |
| Switch point accuracy [% of the span]                     | < ± 0,5   |               |                  |
| Repeatability [% of the span]                             | < ± 0,1; (with temperature fluctuations < 10 K)   |               |                  |
| Characteristics deviation [% of the span]                 | < ± 0,25 (BFSL) / < ± 0,5 (LS); (BFSL = Best Fit Straight Line; LS = limit value setting) |               |                  |
| Hysteresis deviation [% of the span]                      | < ± 0,25  |               |                  |
| Long-term stability [% of the span]                       | < ± 0,05; (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)  |               |                  |
| <b>Response times</b>                                     |   |               |                  |
| Response time [ms]  | < 3   |               |                  |
| Delay time programmable dS, dr [s]                        | 0...50  |               |                  |
| Damping process value dAP [s]                             | 0...4   |               |                  |

# PN7012



## Pressure sensor with display

PN-160-SER14-QFRKG/US/ IV

| Software / programming            |   |  |            |          |      |               |   |                              |   |
|-----------------------------------|---|--|------------|----------|------|---------------|---|------------------------------|---|
| Parameter setting options         | hysteresis / window; normally open / normally closed; switching logic; switch-on/switch-off delay; Damping; Display unit  |  |            |          |      |               |   |                              |   |
| Interfaces                        |   |  |            |          |      |               |   |                              |   |
| Communication interface           | IO-Link   |  |            |          |      |               |   |                              |   |
| Transmission type                 | COM2 (38,4 kBaud)   |  |            |          |      |               |   |                              |   |
| IO-Link revision                  | 1.1   |  |            |          |      |               |   |                              |   |
| SDCI standard                     | IEC 61131-9   |  |            |          |      |               |   |                              |   |
| Profiles                          | Smart Sensor - SSP 3.1<br>Common - I&D  | Measuring Sensor<br>Identification and Diagnosis |            |          |      |               |   |                              |   |
| SIO mode                          | yes   |  |            |          |      |               |   |                              |   |
| Required master port type         | A; (when pin 2 not connected: B)  |  |            |          |      |               |   |                              |   |
| Min. process cycle time [ms]      | 3   |  |            |          |      |               |   |                              |   |
| IO-Link resolution pressure [bar] | 0.05  |  |            |          |      |               |   |                              |   |
| 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>16</td></tr><tr><td>device status</td><td>4</td></tr><tr><td>binary switching information</td><td>2</td></tr></tbody></table> | function   | bit length | pressure | 16   | device status | 4 | binary switching information | 2 |
| function                          | bit length  |  |            |          |      |               |   |                              |   |
| pressure                          | 16  |  |            |          |      |               |   |                              |   |
| device status                     | 4   |  |            |          |      |               |   |                              |   |
| binary switching information      | 2   |  |            |          |      |               |   |                              |   |
| IO-Link functions (acyclical)     | application specific tag  |  |            |          |      |               |   |                              |   |
| Supported DeviceIDs               | <table border="1"><thead><tr><th>Type of operation</th><th>DeviceID</th></tr></thead><tbody><tr><td>default</td><td>1196</td></tr></tbody></table>  | Type of operation                                | DeviceID   | default  | 1196 |               |   |                              |   |
| Type of operation                 | DeviceID  |  |            |          |      |               |   |                              |   |
| default                           | 1196  |  |            |          |      |               |   |                              |   |
| Note                              | For further information please see the IODD PDF file under "Downloads"  |  |            |          |      |               |   |                              |   |
| 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<br>DIN EN 61000-6-3  |  |            |          |      |               |   |                              |   |
| Shock resistance                  | DIN EN 60068-2-27<br>50 g (11 ms)   |  |            |          |      |               |   |                              |   |
| Vibration resistance              | DIN EN 60068-2-6<br>20 g (10...2000 Hz)   |  |            |          |      |               |   |                              |   |
| MTTF [years]                      | 249   |  |            |          |      |               |   |                              |   |
| UL approval                       | UL approval no. J039<br>File number UL E174189  |  |            |          |      |               |   |                              |   |
| Pressure Equipment Directive      | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request   |  |            |          |      |               |   |                              |   |
| Mechanical data                   |   |  |            |          |      |               |   |                              |   |
| Weight [g]                        | 280   |  |            |          |      |               |   |                              |   |
| Housing                           | cylindrical   |  |            |          |      |               |   |                              |   |
| Dimensions [mm]                   | Ø 34 / L = 90.7   |  |            |          |      |               |   |                              |   |
| Materials                         | stainless steel (316L/1.4404); PBT+PC-GF30; PBT-GF20; PC  |  |            |          |      |               |   |                              |   |
| Materials (wetted parts)          | stainless steel (316L/1.4404); Al2O3 (ceramics); FKM  |  |            |          |      |               |   |                              |   |
| Min. pressure cycles              | 100 million   |  |            |          |      |               |   |                              |   |
| Tightening torque [Nm]            | 25...35; (recommended tightening torque; depends on the lubrication, the seal and the pressure load)  |  |            |          |      |               |   |                              |   |
| Process connection                | threaded connection G 1/4 internal thread   |  |            |          |      |               |   |                              |   |

# PN7012



## Pressure sensor with display

PN-160-SER14-QFRKG/US/ IV

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

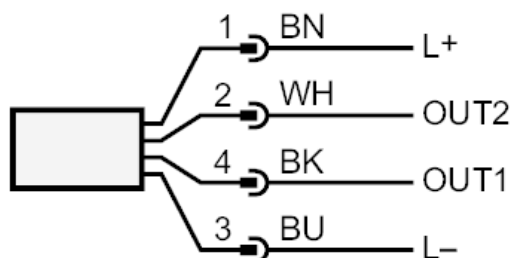
Pack quantity | 1 pcs.

### Electrical connection

Connector: 1 x M12; coding: A; Contacts: 4, gold-plated



### Connection



- OUT1 switching output  
IO-Link
- OUT2 switching output  
colours to DIN EN 60947-5-2  
Core colours :
- BK = black
- BN = brown
- BU = blue
- WH = white