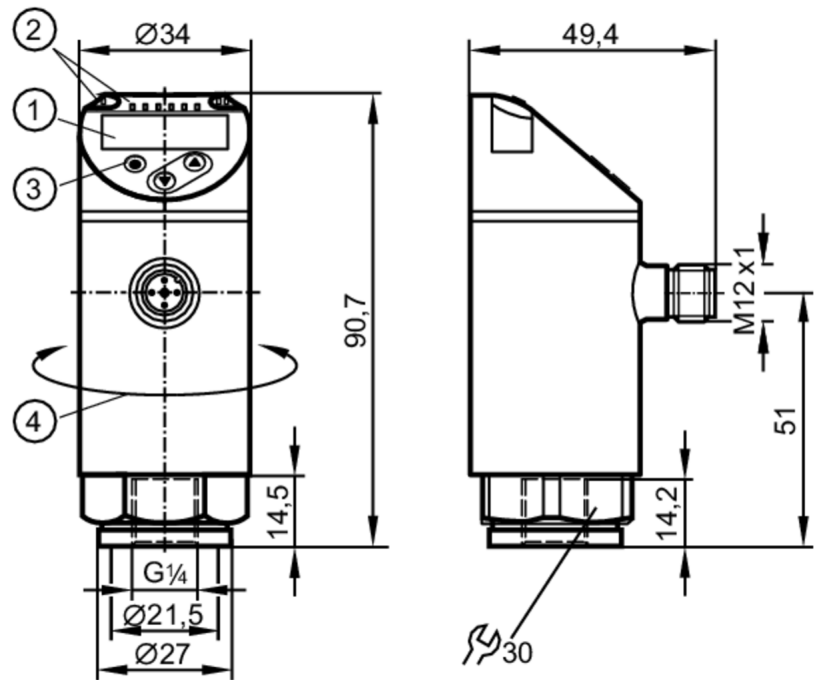


PN2070



Pressure sensor with display

PN-400-SER14-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°



Product characteristics

|                              |                                                               |              |            |
|------------------------------|---------------------------------------------------------------|--------------|------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analog outputs: 1     |              |            |
| Measuring range              | 0...400 bar                                                   | 0...5800 psi | 0...40 MPa |
| Process connection           | threaded connection G 1/4 Internal thread (DIN EN ISO 1179-2) |              |            |

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  | 1700 bar                    | 24650 psi | 170 MPa |
| Pressure rating         | 800 bar                     | 11580 psi | 80 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                        |  |  |



## Pressure sensor with display

PN-400-SER14-MFRKG/US/ /V

|                                                      |                                                                                                          |                 |                  |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------|------------------|
| 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...400 bar                                                                                              | 0...5800 psi    | 0...40 MPa       |
| Analog start point                                   | 0...320 bar                                                                                              | 0...4640 psi    | 0...32 MPa       |
| Analog end point                                     | 80...400 bar                                                                                             | 1160...5800 psi | 8...40 MPa       |
| Factory setting / CMPT = 2                           |                                                                                                          |                 |                  |
| Set point SP                                         | 2.5...400 bar                                                                                            | 40...5800 psi   | 0.25...40 MPa    |
| Reset point rP                                       | 1...398.5 bar                                                                                            | 10...5780 psi   | 0.1...39.85 MPa  |
| Min. difference between SP and rP                    | 2 bar                                                                                                    | 30 psi          | 0.2 MPa          |
| In steps of                                          | 0.5 bar                                                                                                  | 10 psi          | 0.05 MPa         |
| Status_B High Resolution / CMPT = 3                  |                                                                                                          |                 |                  |
| Set point SP                                         | 2.5...400 bar                                                                                            | 37...5802 psi   | 0.25...40 MPa    |
| Reset point rP                                       | 0.9...398.4 bar                                                                                          | 13...5778 psi   | 0.09...39.84 MPa |
| Min. difference between SP and rP                    | 1.7 bar                                                                                                  | 24 psi          | 0.17 MPa         |
| In steps of                                          | 0.1 bar                                                                                                  | 1 psi           | 0.01 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) |                 |                  |
| Hysteresis deviation [% of the span]                 | < ± 0,1; (Turn down 1:1)                                                                                 |                 |                  |



## Pressure sensor with display

PN-400-SER14-MFRKG/US/ /V

|                                                              |                                                                                                                         |            |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------|
| 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; (-25...80 °C)                                                                                                      |            |
| Temperature coefficient span<br>[% 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                                          | Type of operation                                                                                                       | DeviceID   |
|                                                              | Factory setting / CMPT = 2                                                                                              | 459        |
|                                                              | Status_B High Resolution / CMPT = 3                                                                                     | 638        |
| 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)                              | 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                                                                                                                       |            |
| IO-Link resolution pressure [bar]                            | 0.2                                                                                                                     |            |

# PN2070



## Pressure sensor with display

PN-400-SER14-MFRKG/US/ /V

| IO-Link process data<br>(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]                                                                               | 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]  | 238.5                                                                                            |
| Housing                       |      | tubular                                                                                          |
| Dimensions                    | [mm] | Ø 34 / L = 90.7                                                                                  |
| Material                      |      | stainless steel (630/1.4542/17-4 PH); stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC |
| Materials (wetted parts)      |      | stainless steel (630/1.4542/17-4 PH)                                                             |
| 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 Internal thread (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. |
|---------------|--------|

### Electrical connection

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



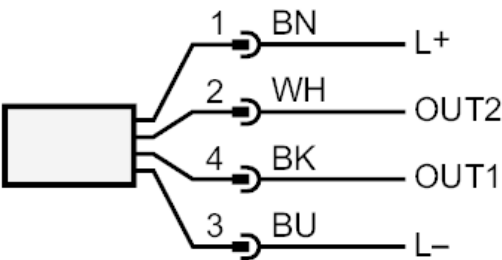
# PN2070



## Pressure sensor with display

PN-400-SER14-MFRKG/US/ /V

### Connection



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