



Pressure sensor with display

PN-100-SEN14-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 analogue outputs: 1 |              |            |
| Measuring range                                | 0...100 bar                                                 | 0...1450 psi | 0...10 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                                                     |              |            |
| Conditionally suitable for                     | use in gases at pressures > 25 bar only on request          |              |            |
| Medium temperature [°C]                        | -25...80                                                    |              |            |
| Min. bursting pressure                         | 650 bar                                                     | 9400 psi     | 65 MPa     |
| Pressure rating                                | 300 bar                                                     | 4350 psi     | 30 MPa     |
| Vacuum resistance [mbar]                       | -1000                                                       |              |            |
| Vacuum resistance [MPa]                        | -0.1                                                        |              |            |
| Type of pressure                               | relative pressure                                           |              |            |
| MAWP (for applications according to CRN) [bar] | 125                                                         |              |            |
| Electrical data                                |                                                             |              |            |
| Operating voltage [V]                          | 18...30 DC; (to SELV/PELV)                                  |              |            |
| Current consumption [mA]                       | < 35                                                        |              |            |



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|                             |      |                 |
|-----------------------------|------|-----------------|
| Min. insulation resistance  | [MΩ] | 100; (500 V DC) |
| Protection class            |      | III             |
| 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]<br>2                                                   |
| Permanent current rating of switching output DC | [mA]<br>250                                                |
| Switching frequency DC                          | [Hz]<br>< 500                                              |
| Number of analogue outputs                      | 1                                                          |
| Analogue current output                         | [mA]<br>4...20; (scalable 1:5)                             |
| Max. load                                       | [Ω]<br>500                                                 |
| Analogue voltage output                         | [V]<br>0...10; (scalable 1:5)                              |
| Min. load resistance                            | [Ω]<br>2000                                                |
| Short-circuit protection                        | yes                                                        |
| Type of short-circuit protection                | pulsed                                                     |
| Overload protection                             | yes                                                        |

## Measuring/setting range

|                      |              |                |            |
|----------------------|--------------|----------------|------------|
| Measuring range      | 0...100 bar  | 0...1450 psi   | 0...10 MPa |
| Analogue start point | 0...80 bar   | 0...1160 psi   | 0...8 MPa  |
| Analogue end point   | 20...100 bar | 290...1450 psi | 2...10 MPa |

## Factory setting / CMPT = 2

|                                   |                |               |                 |
|-----------------------------------|----------------|---------------|-----------------|
| Set point SP                      | 0.6...100 bar  | 10...1450 psi | 0.06...10 MPa   |
| Reset point rP                    | 0.2...99.6 bar | 4...1444 psi  | 0.02...9.96 MPa |
| Min. difference between SP and rP | 0.6 bar        | 6 psi         | 0.06 MPa        |
| In steps of                       | 0.2 bar        | 2 psi         | 0.02 MPa        |

## Status\_B High Resolution / CMPT = 3

|                                   |                |              |                 |
|-----------------------------------|----------------|--------------|-----------------|
| Set point SP                      | 0.6...100 bar  | 9...1450 psi | 0.06...10 MPa   |
| Reset point rP                    | 0.2...99.6 bar | 3...1444 psi | 0.02...9.96 MPa |
| Min. difference between SP and rP | 0.5 bar        | 6 psi        | 0.05 MPa        |
| In steps of                       | 0.1 bar        | 1 psi        | 0.01 MPa        |

## Accuracy / deviations

|                       |                          |
|-----------------------|--------------------------|
| Switch point accuracy | < ± 0,4; (Turn down 1:1) |
| [% of the span]       |                          |



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|                                                           |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Repeatability [% of the span]                             | $< \pm 0,1$ ; (with temperature fluctuations $< 10$ K; Turn down 1:1)                                            |
| Characteristics deviation [% of the span]                 | $< \pm 0,25$ (BFSL) / $< \pm 0,5$ (LS); (Turn down 1:1; BFSL = Best Fit Straight Line; LS = limit value setting) |
| Hysteresis deviation [% of the span]                      | $< \pm 0,1$ ; (Turn down 1:1)                                                                                    |
| Long-term stability [% of the span]                       | $< \pm 0,05$ ; (Turn down 1:1; per 6 months)                                                                     |
| Temperature coefficient zero point [% of the span / 10 K] | $< \pm 0,2$ ; (-0...80 °C)                                                                                       |
| Temperature coefficient span [% of the span / 10 K]       | $< \pm 0,2$ ; (-0...80 °C)                                                                                       |
| Notes on the accuracy / deviation                         | switch point accuracy, linearity error under DNV GL: $< \pm 1\%$ ; $< \pm 1\%$                                   |

## 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> <tr> <th>Type of operation</th><th>DeviceID</th></tr> <tr> <td>Factory setting / CMPT = 2</td><td>471</td></tr> <tr> <td>Status_B High Resolution / CMPT = 3</td><td>987</td></tr> </table> | Type of operation | DeviceID | Factory setting / CMPT = 2 | 471 | Status_B High Resolution / CMPT = 3 | 987 |
| Type of operation                   | DeviceID                                                                                                                                                                                            |                   |          |                            |     |                                     |     |
| Factory setting / CMPT = 2          | 471                                                                                                                                                                                                 |                   |          |                            |     |                                     |     |
| Status_B High Resolution / CMPT = 3 | 987                                                                                                                                                                                                 |                   |          |                            |     |                                     |     |
| 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] | 0.1                                                                                                                                                              |          |            |          |    |                              |   |
| IO-Link process data (cyclical)   | <table> <tr> <th>function</th><th>bit length</th></tr> <tr> <td>pressure</td><td>14</td></tr> <tr> <td>binary switching information</td><td>2</td></tr> </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                                                                                                                                         |          |            |          |    |                              |   |



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|                                     |                                                                                            |                                         |
|-------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------|
| 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]   | 0.05                                                                                       |                                         |
| 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.                                                                            | J013                                    |
| Pressure Equipment Directive        | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request      |                                         |
| Mechanical data                     |                                                                                            |                                         |
| Weight [g]                          | 261                                                                                        |                                         |
| 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 (96%; ceramics); FKM                                  |                                         |
| Min. pressure cycles                | 100 million                                                                                |                                         |
| Tightening torque [Nm]              | > 50                                                                                       |                                         |
| 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.                                                                                     |                                         |

# PN2292



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### Electrical connection

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



### Connection



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