

# PN2096



## Pressure sensor with display

PN-2,5-RER14-MFRKG/US/IV



### Product characteristics

|                              |   |                  |                  |                 |
|------------------------------|---|------------------|------------------|-----------------|
| Number of inputs and outputs | Number of digital outputs: 2; Number of analogue outputs: 1 |                  |                  |                 |
| Measuring range              | -0.125...2.5 bar  | -125...2500 mbar | -1.8...36.25 psi | -12.5...250 kPa |
| 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                          |          |          |
| Medium temperature [°C] | -25...80                                   |          |          |
| Min. burst pressure     | 50 bar                                     | 725 psi  | 5000 kPa |
| Pressure rating         | 20 bar                                     | 290 psi  | 2000 kPa |
| 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                        |  |  |
| Integrated watchdog             | yes                        |  |  |



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| 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]            | 2  |                   |                  |                 |
| Permanent current rating of switching output DC [mA] | 250  |                   |                  |                 |
| Switching frequency DC [Hz]                          | < 500  |                   |                  |                 |
| Number of analogue outputs                           | 1  |                   |                  |                 |
| Analogue current output [mA]                         | 4...20; (scalable 1:5)   |                   |                  |                 |
| Max. load [Ω]  | 500  |                   |                  |                 |
| Analogue voltage output [V]                          | 0...10; (scalable 1:5)   |                   |                  |                 |
| Min. load resistance [Ω]                             | 2000   |                   |                  |                 |
| Short-circuit protection                             | yes  |                   |                  |                 |
| Type of short-circuit protection                     | pulsed   |                   |                  |                 |
| Overload protection                                  | yes  |                   |                  |                 |
| Measuring/setting range                              |  |                   |                  |                 |
| Measuring range                                      | -0.125...2.5 bar   | -125...2500 mbar  | -1.8...36.25 psi | -12.5...250 kPa |
| Analogue start point                                 | -0.125...2 bar   | -1.8...29 psi     | -12.5...200 kPa  |                 |
| Analogue end point                                   | 0.375...2.5 bar  | 5.45...36.25 psi  | 37.5...250 kPa   |                 |
| Factory setting / CMPT = 2                           |  |                   |                  |                 |
| Set point SP   | -0.11...2.5 bar  | -1.6...36.25 psi  | -11...250 kPa    |                 |
| Reset point rP                                       | -0.12...2.49 bar   | -1.75...36.1 psi  | -12...249 kPa    |                 |
| Min. difference between SP and rP                    | 0.015 bar  | 0.15 psi          | 1.5 kPa          |                 |
| In steps of  | 0.005 bar  | 0.05 psi          | 0.5 kPa          |                 |
| Status_B High Resolution / CMPT = 3                  |  |                   |                  |                 |
| Set point SP   | -0.109...2.5 bar   | -1.58...36.25 psi | -10.9...250 kPa  |                 |
| Reset point rP                                       | -0.12...2.49 bar   | -1.73...36.11 psi | -12...249 kPa    |                 |
| Min. difference between SP and rP                    | 0.011 bar  | 0.15 psi          | 1.1 kPa          |                 |
| In steps of  | 0.001 bar  | 0.01 psi          | 0.1 kPa          |                 |
| 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)   |                   |                  |                 |
| Long-term stability                                  | < ± 0,05; (Turn down 1:1; per 6 months)  |                   |                  |                 |

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|  |   |
|--|---|
| [% of the span]  |   |
| 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% |

### 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 border="1"> <thead> <tr> <th>Type of operation</th> <th>DeviceID</th> </tr> </thead> <tbody> <tr> <td>Factory setting / CMPT = 2</td> <td>464</td> </tr> <tr> <td>Status_B High Resolution / CMPT = 3</td> <td>975</td> </tr> </tbody> </table> | Type of operation | DeviceID | Factory setting / CMPT = 2 | 464 | Status_B High Resolution / CMPT = 3 | 975 |
| Type of operation                   | DeviceID   |                   |          |                            |     |                                     |     |
| Factory setting / CMPT = 2          | 464  |                   |          |                            |     |                                     |     |
| Status_B High Resolution / CMPT = 3 | 975  |                   |          |                            |     |                                     |     |
| Note                                | For further information please see the IODD PDF file under "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] | 0.005                        |                         |
| IO-Link process data (cyclical)   | <b>function</b>              | <b>bit length</b>       |
|                                   | pressure                     | 14                      |
|                                   | binary switching information | 2                       |
| IO-Link functions (acyclical)     | application specific tag     |                         |

### 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] | 0.001                  |                              |

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| IO-Link process data (cyclical) | function                     | bit length |
|---------------------------------|------------------------------|------------|
|                                 | pressure                     | 16         |
|                                 | device status                | 4          |
|                                 | binary switching information | 2          |

| 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.   | J012                |
| Pressure Equipment Directive | Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                     |

| Mechanical data               |      |  |
|-------------------------------|------|--|
| Weight                        | [g]  | 273.5  |
| 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] | 25...35; (recommended tightening torque; depends on the lubrication, the seal and the pressure load) |
| 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, kPa)          |
|                               | 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



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### Connection



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