



Pressure sensor with display

PN-001BREG14-MFRKG/US/ IV



- 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°
- 5 sealing



Product characteristics

|                              |                                                                                   |               |              |               |             |
|------------------------------|-----------------------------------------------------------------------------------|---------------|--------------|---------------|-------------|
| Number of inputs and outputs | Number of digital outputs: 1; Number of analog outputs: 1                         |               |              |               |             |
| Measuring range              | 0...1 bar                                                                         | 0...1000 mbar | 0...14.5 psi | 0...29.5 inHg | 0...100 kPa |
| Process connection           | threaded connection G 1/4 external thread (DIN EN ISO 1179-2); Internal thread:M5 |               |              |               |             |

Application

|                          |                                            |         |          |          |
|--------------------------|--------------------------------------------|---------|----------|----------|
| System                   | gold-plated contacts                       |         |          |          |
| Measuring element        | ceramic-capacitive pressure measuring cell |         |          |          |
| Application              | for industrial applications                |         |          |          |
| Media                    | liquids and gases                          |         |          |          |
| Medium temperature [°C]  | -25...80                                   |         |          |          |
| Min. bursting pressure   | 30000 mbar                                 | 450 psi | 880 inHg | 3000 kPa |
| Pressure rating          | 10000 mbar                                 | 145 psi | 290 inHg | 1000 kPa |
| 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                        |
| Reverse polarity protection     | yes                        |



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|                         |     |
|-------------------------|-----|
| Power-on delay time [s] | 0.3 |
| Integrated watchdog     | yes |

## Inputs / outputs

|                              |                                                           |
|------------------------------|-----------------------------------------------------------|
| Number of inputs and outputs | Number of digital outputs: 1; Number of analog outputs: 1 |
|------------------------------|-----------------------------------------------------------|

## Outputs

|                                                      |                                                          |
|------------------------------------------------------|----------------------------------------------------------|
| Total number of outputs                              | 2                                                        |
| Output signal                                        | switching signal; analog signal; IO-Link; (configurable) |
| Electrical design                                    | PNP                                                      |
| Number of digital outputs                            | 1                                                        |
| Output function                                      | normally open / closed; (configurable)                   |
| 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                                                    |
| Number of analog outputs                             | 1                                                        |
| Analog current output [mA]                           | 4...20                                                   |
| Max. load [Ω]                                        | 500                                                      |
| Analog voltage output [V]                            | 0...10                                                   |
| 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...1 bar | 0...1000 mbar | 0...14.5 psi | 0...29.5 inHg | 0...100 kPa |
|-----------------|-----------|---------------|--------------|---------------|-------------|

## Factory setting / CMPT = 2

|                                   |                |                 |                 |                |
|-----------------------------------|----------------|-----------------|-----------------|----------------|
| Set point SP                      | 10...1000 mbar | 0.1...14.5 psi  | 0.2...29.5 inHg | 1...100 kPa    |
| Reset point rP                    | 5...995 mbar   | 0.05...14.5 psi | 0.1...29.4 inHg | 0.5...99.5 kPa |
| Min. difference between SP and rP | 5 mbar         | 0.1 psi         | 0.2 inHg        | 0.5 kPa        |
| In steps of                       | 5 mbar         | 0.05 psi        | 0.1 inHg        | 0.5 kPa        |

## Status\_B High Resolution / CMPT = 3

|                                   |               |                  |                 |                |
|-----------------------------------|---------------|------------------|-----------------|----------------|
| Set point SP                      | 8...1000 mbar | 0.12...14.5 psi  | 0.2...29.5 inHg | 0.8...100 kPa  |
| Reset point rP                    | 3...995 mbar  | 0.05...14.43 psi | 0.1...29.4 inHg | 0.3...99.5 kPa |
| Min. difference between SP and rP | 5 mbar        | 0.08 psi         | 0.2 inHg        | 0.5 kPa        |
| In steps of                       | 1 mbar        | 0.01 psi         | 0.1 inHg        | 0.1 kPa        |

## Accuracy / deviations

|                                           |                                                                                           |
|-------------------------------------------|-------------------------------------------------------------------------------------------|
| 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                                                                                  |



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|                                                              |                                                                                                                         |            |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------|
| Long-term stability<br>[% of the span]                       | < ± 0,05; (per 6 months)                                                                                                |            |
| 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)                                                                                                   |            |
| Reaction times                                               |                                                                                                                         |            |
| Response time [ms]                                           | < 3                                                                                                                     |            |
| 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                                                                                                                       |            |
| Process data analog                                          | 1                                                                                                                       |            |
| Process data binary                                          | 1                                                                                                                       |            |
| Supported DeviceIDs                                          | Type of operation                                                                                                       | DeviceID   |
|                                                              | Factory setting / CMPT = 2                                                                                              | 433        |
|                                                              | Status_B High Resolution / CMPT = 3                                                                                     | 618        |
| 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 [mbar]                           | 1                                                                                                                       |            |
| IO-Link resolution pressure [MPa]                            | 0.0001                                                                                                                  |            |
| IO-Link process data (cyclical)                              | Function                                                                                                                | bit length |
|                                                              | pressure                                                                                                                | 14         |
|                                                              | binary switching information                                                                                            | 1          |
| 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 [mbar]                           | 0.5                                                                                                                     |            |

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|                                   |                              |                   |
|-----------------------------------|------------------------------|-------------------|
| IO-Link resolution pressure [MPa] | 0.00005                      |                   |
| IO-Link process data (cyclical)   | <b>Function</b>              | <b>bit length</b> |
|                                   | pressure                     | 16                |
|                                   | device status                | 4                 |
|                                   | binary switching information | 1                 |
| 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]                 | 226                                                                                   |                     |
| UL approval                  | UL approval number                                                                    | J004                |
| Pressure equipment directive | sound engineering practice; can be used for group 2 fluids; group 1 fluids on request |                     |

### Mechanical data

|                               |                                                                                            |  |
|-------------------------------|--------------------------------------------------------------------------------------------|--|
| Weight [g]                    | 260                                                                                        |  |
| Material                      | stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC                                 |  |
| Materials (wetted parts)      | stainless steel (1.4404 / 316L); Al2O3 (ceramics); FKM                                     |  |
| 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 external thread (DIN EN ISO 1179-2); Internal thread:M5          |  |
| Process connection sealing    | FKM (DIN EN ISO 1179-2)                                                                    |  |
| Restrictor element integrated | no (can be retrofitted)                                                                    |  |

### Displays / operating elements

|         |                  |                                         |
|---------|------------------|-----------------------------------------|
| Display | Display unit     | 4 x LED, green (mbar, psi, kPa, inHg)   |
|         | Switching status | 1 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

OUT2

BK =

BN =

BU =

WH =
- Switching output

IO-Link

analog output

Core colors :

black

brown

blue

white