

# PS01VR-504-LI2UPN8X-H1141/3GD

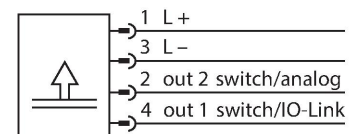
## Pressure Sensor (Rotatable) – With Analog Output and PNP/NPN Transistor Switching Output Output 2 Reprogrammable as Switching Output



### Features

- Housing is rotatable after plugging the process connection
- Reading of adjusted values without tool
- Recessed pushbutton and keylock for secure programming
- Permanent indication of pressure (bar, psi, kPa, MPa, misc)
- Peak pressure memory
- Pressure range -1...0 bar rel.
- ATEX category II 3 G, Ex zone 2
- ATEX category II 3 D, Ex zone 22

### Wiring diagram



### Technical data

|                                           |                                  |
|-------------------------------------------|----------------------------------|
| Type                                      | PS01VR-504-LI2UPN8X-H1141/3GD    |
| ID                                        | 6834011                          |
| Pressure type                             | Relative pressure                |
| Pressure range                            | -1...0 bar                       |
|                                           | -14.5...0 psi                    |
|                                           | -0.1...0 MPa                     |
| Admissible overpressure                   | ≤ 5.5 bar                        |
| Burst pressure                            | ≥ 5.5 bar                        |
| Response time                             | < 3 ms                           |
| <b>Power supply</b>                       |                                  |
| Operating voltage $U_B$                   | 18...30 VDC                      |
| Current consumption                       | ≤ 50 mA                          |
| Voltage drop at $I_B$                     | ≤ 2 V                            |
| Protective measure                        | SELV; PELV according to EN 50178 |
| Short-circuit/reverse polarity protection | yes / yes                        |
| Protection class                          | IP67<br>IP69K                    |
| Insulation class                          | III                              |
| <b>Outputs</b>                            |                                  |
| Output 1                                  | Switching output or IO-Link mode |
| Output 2                                  | Analog or switching output       |
| <b>Switching output</b>                   |                                  |
| Communication protocol                    | IO-Link                          |
| Output function                           | NO/NC, PNP/NPN                   |

### Functional principle

The pressure sensors in the PS product series operate with ceramic measuring cells. As a result of the pressure acting on the ceramic substrate, a signal that is proportional to the pressure is generated and processed electronically. The processed signal is available either as a switching or an analog output signal, depending on the sensor type used. Maximum flexibility thanks to a rigid or rotatable sensor body, a variety of thread types, front-flush or dead-space-free pressure membranes and an accuracy of 0.5 % of full scale guarantee a safe connection to the process.

## Technical data

|                                                    |                                                                                                                                                                               |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy                                           | ± 0.5 % FS BSL                                                                                                                                                                |
| Rated operational current                          | 0.2 A                                                                                                                                                                         |
| Switching frequency                                | ≤ 180 Hz                                                                                                                                                                      |
| Switching point distance                           | ≥ 0.5 %                                                                                                                                                                       |
| Switch point:                                      | (Min. + 0.005 × range)...100 % of full scale                                                                                                                                  |
| Release point(s)                                   | min up to (SP - 0.005 x range)                                                                                                                                                |
| Switching cycles                                   | ≥ 100 mil.                                                                                                                                                                    |
| <b>Analog output</b>                               |                                                                                                                                                                               |
| Current output                                     | 4...20 mA                                                                                                                                                                     |
| Voltage output                                     | 0...10 V                                                                                                                                                                      |
| Load                                               | ≤ 0.5 kΩ                                                                                                                                                                      |
| Accuracy LHR                                       | ± 0.5 % FS BSL                                                                                                                                                                |
| <b>IO-Link</b>                                     |                                                                                                                                                                               |
| IO-Link specification                              | V 1.0                                                                                                                                                                         |
| Programming                                        | FDT / DTM                                                                                                                                                                     |
| Transmission physics                               | corresponds to 3-wire physics (PHY2)                                                                                                                                          |
| Transmission rate                                  | COM 2 / 38.4 kbps                                                                                                                                                             |
| Process data width                                 | 16 bit                                                                                                                                                                        |
| Measured value information                         | 14 bit                                                                                                                                                                        |
| Switchpoint information                            | 2 bit                                                                                                                                                                         |
| Frame type                                         | 2.2                                                                                                                                                                           |
| Accuracy                                           | ± 0.5 % FS BSL                                                                                                                                                                |
| Included in the SIDI GSDML                         | Yes                                                                                                                                                                           |
| <b>Temperature behaviour</b>                       |                                                                                                                                                                               |
| Medium temperature                                 | -40...+85 °C                                                                                                                                                                  |
| Temperature coefficient zero point TK <sub>0</sub> | ± 0.15 % of full scale/10 K                                                                                                                                                   |
| Temperature coefficient range TK <sub>s</sub>      | ± 0.15 % of full scale/10 K                                                                                                                                                   |
| <b>Environmental conditions</b>                    |                                                                                                                                                                               |
| Ambient temperature                                | -40...+70 °C                                                                                                                                                                  |
| Storage temperature                                | -40...+80 °C                                                                                                                                                                  |
| Vibration resistance                               | 20 g (9...2000 Hz), according to IEC 68-2-6                                                                                                                                   |
| Shock resistance                                   | 50 g (11 ms) acc. to IEC 68-2-27                                                                                                                                              |
| EMV                                                | EN 61000-4-2 ESD:4 kV CD / 8 kV AD<br>EN 61000-4-3 HF radiated: 15 V/m<br>EN 61000-4-4 Burst: 2 kV<br>EN 61000-4-5 Surge: 1000 V, 42 Ohm<br>EN 61000-4-6 HF cable bound: 10 V |
| <b>Mechanical data</b>                             |                                                                                                                                                                               |
| Housing material                                   | Stainless-steel/Plastic, 1.4305 (AISI 303)                                                                                                                                    |
| Pressure connection material                       | Stainless steel 1.4305 (AISI 303)                                                                                                                                             |
| Material pressure transducer                       | Ceramic Al <sub>2</sub> O <sub>3</sub>                                                                                                                                        |

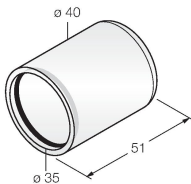
Technical data

|                                                |                                                                                                                                                    |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Sealing material                               | FPM spez.                                                                                                                                          |
| Process connection                             | G 1/4" male thread                                                                                                                                 |
| Wrench size pressure connection / coupling nut | 21/ 30                                                                                                                                             |
| Electrical connection                          | Connector, M12 × 1                                                                                                                                 |
| Max. tightening torque of housing nut          | 35 Nm                                                                                                                                              |
| Reference conditions acc. to IEC 61298-1       |                                                                                                                                                    |
| Temperature                                    | 15...+25 °C                                                                                                                                        |
| Atmospheric pressure                           | 860...1060 hPa abs.                                                                                                                                |
| Humidity                                       | 45...75 % rel.                                                                                                                                     |
| Auxiliary power                                | 24 VDC                                                                                                                                             |
| Display                                        | 4-digit 7-segment display, rotatable by 180°, with switch-off function                                                                             |
| Switching state                                | 2 × LEDs, Yellow                                                                                                                                   |
| Unit display                                   | 5 x LEDs green (bar, psi, kPa, MPa, misc)                                                                                                          |
| Programming options                            | start/end value analog output; switch/release points; PNP/NPN; NO/NC contact; hysteresis/window mode; damping; pressure unit; peak pressure memory |
| Tests/approvals                                |                                                                                                                                                    |
| Approvals                                      | cULus                                                                                                                                              |
| UL registration number                         | E183243                                                                                                                                            |
| MTTF                                           | 439 years acc. to SN 29500 (Ed. 99) 40 °C                                                                                                          |
| Included in delivery                           | NBR70 flat seal (USIT ring, nitrile rubber), 1 pc., SC-M12/3GD                                                                                     |

Accessories

|           |       |
|-----------|-------|
| PTS-COVER | A9350 |
|-----------|-------|

Protective housing



Accessories

| Dimension drawing                                                                   | Type                | ID      |                                                                                                                               |
|-------------------------------------------------------------------------------------|---------------------|---------|-------------------------------------------------------------------------------------------------------------------------------|
|    | WKC4.4T-2/TEL       | 6625025 | Connection cable, M12 female connector, angled, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval         |
|    | RKC4.4T-2/TEL       | 6625013 | Connection cable, M12 female connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval       |
|   | RKC4.4T-2/TXL       | 6625503 | Connection cable, M12 female connector, straight, 4-pin, cable length: 2 m, jacket material: PUR, black; cULus approval       |
|  | WKC4.4T-2/TXL       | 6625515 | Connection cable, M12 female connector, angled, 4-pin, cable length: 2 m, jacket material: PUR, black; cULus approval         |
|  | RKC4.4T-P7X2-10/TXL | 6626184 | Connection cable, M12 female connector, straight, 4-pin, LED, cable length: 10 m, jacket material: PUR, black; cULus approval |

Accessories

| Dimension drawing | Type           | ID      |                                         |
|-------------------|----------------|---------|-----------------------------------------|
|                   | USB-2-IOL-0002 | 6825482 | IO-Link Master with integrated USB port |



|              |         |                                                                                                        |
|--------------|---------|--------------------------------------------------------------------------------------------------------|
| TBEN-S2-4IOL | 6814024 | Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A |
|--------------|---------|--------------------------------------------------------------------------------------------------------|

## Instructions for use

### Intended use

This device fulfills the directive 2014/34/EC and is suited for use in explosion hazardous areas acc. to EN60079-0:2012, EN60079-15:2010 and EN60079-31:2009. In order to ensure correct operation to the intended purpose it is required to observe the national regulations and directives.

### For use in explosion hazardous areas conform to classification

II 3 G and II 3 D (Group II, Category 3 G, electrical equipment for gaseous atmospheres and category 3 D, electrical equipment for dust atmospheres).

### Marking (see device or technical data sheet)

Ⓔ II 3 G Ex nA IIC T5 Gc acc. to EN 60079-0:2012 and EN 60079-15:2010 and Ⓔ II 3 D Ex tc IIIC T90 °C Dc acc. to EN 60079-0:2012 and EN 60079-31:2009

### Local admissible ambient temperature

0...+60 °C

### Installation/Commissioning

These devices may only be installed, connected and operated by trained and qualified staff. Qualified staff must have knowledge of protection classes, directives and regulations concerning electrical equipment designed for use in explosion hazardous areas. Please verify that the classification and the marking on the device comply with the actual application conditions.

### Installation and mounting instructions

Avoid static charging of cables and plastic devices. Please only clean the device with a damp cloth. Do not install the device in a dust flow and avoid build-up of dust deposits on the device. The devices must be protected against strong magnetic fields. The pin configuration and the electrical specifications can be taken from the device marking or the technical data sheet. In order to avoid contamination of the device, please remove possible blanking plugs of the cable glands or connectors only shortly before inserting the cable or opening the cable socket.

### Special conditions for safe operation

Do not disconnect the plug-in connection or cable under voltage. Please attach a warning label permanently in an appropriate fashion in close proximity to the plug-in connection with the following inscription: Nicht unter Spannung trennen / Do not separate when energized. The device must be protected against mechanical damage caused by energy > 4 Joule and harmful UV rays. The IP protection rating of the connectors is given only in combination with a suitable O-ring. Load voltage and operating voltage of this equipment must be supplied from power supplies with safe isolation (IEC 60 364/UL508), to ensure that the rated voltage of the equipment (24 VDC +20% = 28.8 VDC) is never exceeded by more than 40%.

### Service/Maintenance

Repairs are not possible. The approval expires if the device is repaired or modified by a person other than the manufacturer. The most important data from the approval are listed.