

Series 21PY

Piezoresistive miniature pressure transmitters

Features

- Very compact and lightweight design with only 14 mm diameter
- Compensated over the entire temperature range
- Robust stainless steel housing
- High long term stability

Technology

- Piezoresistive pressure sensor chip, encapsulated insulated
- Fully welded design with no internal seals
- Miniaturised compensation electronics
- Direct analog signal path with high bandwidth

Typical applications

- Motorsport
- Industrial applications
- Automation technology
- Robotics

Accuracy

± 0,5 %FS

Total error band

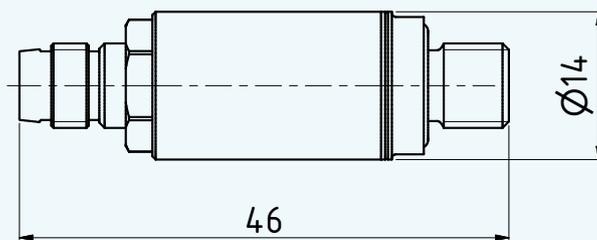
± 1,5 %FS @ -10...80 °C

Pressure ranges

0...10 to 0...600 bar



Serie 21PY



Series 21PY – Specifications

Standard pressure ranges

| Absolute pressure PAA | Absolute pressure PA | Proof pressure |
|---|-------------------------------------|--------------------------------|
| 0...10 | 0...10 | 30 |
| 0...16 | 0...16 | 48 |
| 0...25 | 0...25 | 75 |
| 0...40 | 0...40 | 120 |
| 0...60 | 0...60 | 180 |
| | 0...100 | 300 |
| | 0...160 | |
| | 0...250 | 500 |
| | 0...400 | 700 |
| | 0...600 | |
| bar abs. | bar | bar |
| Reference pressure at 0 bar abs. (vacuum) | Reference pressure at 1 bar abs. | Based on reference pressure |

Performance

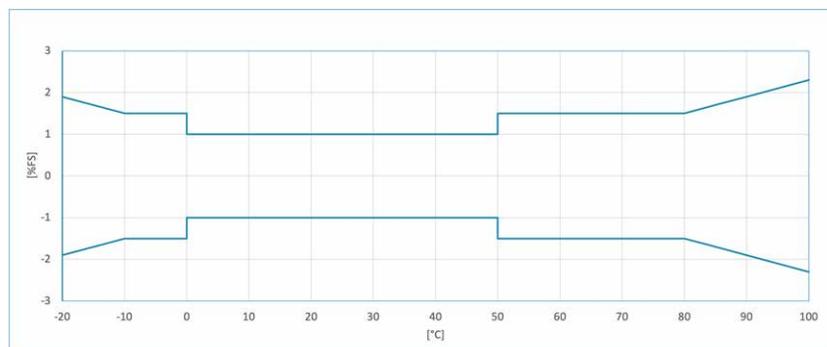
| | | |
|-------------------------------|---------------------|---|
| Accuracy @ RT (20...25 °C) | $\leq \pm 0,5$ %FS | Non-linearity (best fitted straight line BFSL), pressure hysteresis, non-repeatability |
| Total error band 0...50 °C | $\leq \pm 1,0$ %FS | Maximum deviation within the specified pressure and temperature range. |
| Total error band -10...80 °C | $\leq \pm 1,5$ %FS | |
| Compensated temperature range | -10...80 °C | |
| Long term stability | $\leq \pm 0,3$ %FS | Per year under reference conditions. |
| Position dependency | $\leq \pm 1,5$ mbar | Calibrated in vertical installation position with pressure connection facing downwards. |

Total error band

This graph shows the maximum deviation over the entire medium temperature range (-20...100 °C) of the 21PY series.

Within the specified pressure and temperature range, the maximum total error has a constant value of $\pm 1,0$ %FS (0...50 °C) or $\pm 1,5$ %FS (-10...80 °C).

Experience shows that outside the specified temperature range, the total error increases linearly 0,04 %FS/K.



Series 21PY – Specifications

Electrical data

| | |
|---|-------------|
| Connectivity | 3-wire |
| Analog interface | 0,5...4,5 V |
| Signal output limitation | 0,1...4,9 V |
| Voltage supply | 8...28 VDC |
| Power consumption (without communication) | < 4 mA |

| | |
|---|------------------|
| Start-up time (power supply ON) | < 5 ms (0...99%) |
| Overvoltage and reverse polarity protection | ± 28 VDC |
| GND-CASE insulation | > 10MΩ @ 50 VDC |

Analog interface

| | |
|--------------------|--------|
| Load resistance | > 5 kΩ |
| Limiting frequency | 1 kHz |

Electrical connection

| | | | |
|------------------------|---|--------------------|---------------------------------------|
| Plug | Round plug | M8 x 1 | DIN EN 61076-2-101, A-coded, 3-pin |
| Cable | ∅ 3,3 mm, PE-sheath | 3-pin, cable gland | |
| Standard cable lengths | 2 m, 3 m | Others on request | |
| Silicone wires | AWG28 (0,09 mm ²), L = 50 mm | Others on request | |

Electromagnetic compatibility

| | |
|---------------------------------------|--|
| CE-conformity as per 2014/30/EU (EMC) | EN IEC 61326-1 / EN IEC 61326-2-3 / EN IEC 61000-6-1 / EN IEC 61000-6-2 / EN IEC 61000-6-3 / EN IEC 61000-6-4 |
|---------------------------------------|--|

Series 21PY – Specifications

Mechanical data

Materials in contact with media

| | |
|--|-----------------------------------|
| Pressure connection | Stainless steel AISI 329 / 1.4460 |
| Pressure transducer separating diaphragm | Stainless steel AISI 316L |
| Pressure transducer seal (internal) | None |
| Pressure connection seal (external) | FKM (75 Shore, -20...200 °C) |

Other materials

| | |
|---------------------------------|--------------|
| Pressure transducer oil filling | Silicone oil |
|---------------------------------|--------------|

Further details

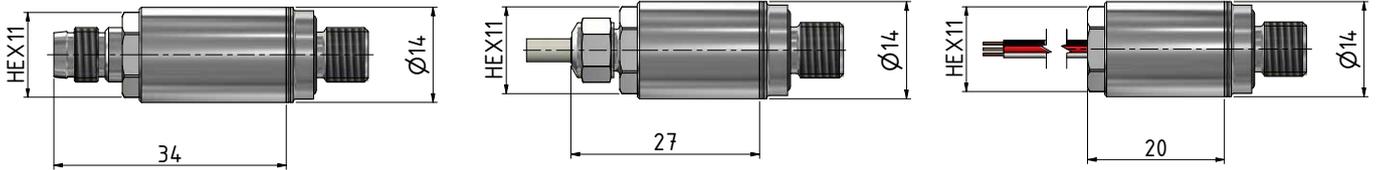
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|-------------------------------|-------------------------|-----------------------------|---|
| Pressure connection | M8 x 1 | See Dimensions and variants | |
| | M6 x 0,5 | | |
| Diameter x length | ø 14 mm x approx. 46 mm | | |
| Weight (excluding cable) | approx. 21 g | | |
| Recommended tightening torque | 8 Nm ± 10% | M8 x 1 | Thread and locating surface non-lubricated. |
| | 4 Nm ± 10% | M6 x 0,5 | |

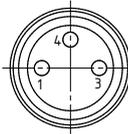
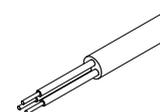
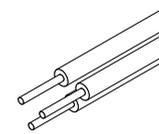
Environmental conditions

| | | | |
|-------------------------------|---|----------------------|-------------------------------------|
| Medium temperature range | -20...100 °C | Icing not permitted. | |
| Ambient temperature range | -20...100 °C | | |
| Storage temperature range | -20...100 °C | | |
| Protection | IP67 | Round plug M8 x 1 | |
| | IP67 | Cable gland | |
| | IP54 | Wires | |
| Notes | Degrees of protection are only valid with the corresponding mating plug in the connected state. | | |
| Vibration resistance | 10 g, 10...2000 Hz, ± 10 mm | IEC 60068-2-6 | |
| Shock resistance | 50 g, 6 ms | IEC 60068-2-27 | |
| Load cycles @ RT (20...25 °C) | > 10 mn. pressure cycles | 0...100 %FS | For pressures > 400 bar on request. |

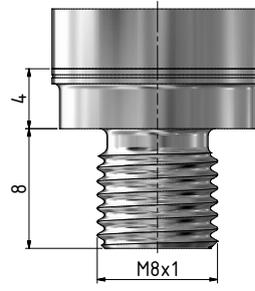
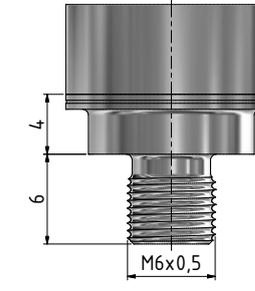
Series 21PY – Dimensions and variants

Electrical connections



| Round plug | 3-wire | Cable gland | 3-wire | Wires | 3-wire | | | | | | | | | | | | | | | | | | |
|---|--|-------------|-------------|-----------|-------------|---|------|---|---|----|-----|----|-----|----|------|---|---|----|-----|----|-----|----|------|
| M8 × 1 | 0,5...4,5 V | Cable ø 3,3 | 0,5...4,5 V | L = 50 mm | 0,5...4,5 V | | | | | | | | | | | | | | | | | | |
|  | <table border="1"> <tr><td>1</td><td>+Vs</td></tr> <tr><td>3</td><td>GND</td></tr> <tr><td>4</td><td>+OUT</td></tr> </table> | 1 | +Vs | 3 | GND | 4 | +OUT |  | <table border="1"> <tr><td>BN</td><td>+Vs</td></tr> <tr><td>GN</td><td>GND</td></tr> <tr><td>WH</td><td>+OUT</td></tr> </table> | BN | +Vs | GN | GND | WH | +OUT |  | <table border="1"> <tr><td>BK</td><td>+Vs</td></tr> <tr><td>WH</td><td>GND</td></tr> <tr><td>RD</td><td>+OUT</td></tr> </table> | BK | +Vs | WH | GND | RD | +OUT |
| 1 | +Vs | | | | | | | | | | | | | | | | | | | | | | |
| 3 | GND | | | | | | | | | | | | | | | | | | | | | | |
| 4 | +OUT | | | | | | | | | | | | | | | | | | | | | | |
| BN | +Vs | | | | | | | | | | | | | | | | | | | | | | |
| GN | GND | | | | | | | | | | | | | | | | | | | | | | |
| WH | +OUT | | | | | | | | | | | | | | | | | | | | | | |
| BK | +Vs | | | | | | | | | | | | | | | | | | | | | | |
| WH | GND | | | | | | | | | | | | | | | | | | | | | | |
| RD | +OUT | | | | | | | | | | | | | | | | | | | | | | |

Available pressure connections

| M8 x 1 | M6 x 0,5 |
|---|---|
|  |  |
| DIN 13-5 | DIN 13-3 |

Customised configurations on request

- Other compensated pressure ranges
- Other electrical connections
- Other pressure connections
- Other electronics: C-Line with ratiometric interface
- Modifications to customer-specific applications

Examples of similar products

- Series 21PHB: Pressure transmitter for dynamic applications with analogue interface
- Series M5HB: Pressure transmitter with miniaturised sensor head for highly dynamic applications with analogue interface
- Series M8coolHB: Pressure transmitter for high operating temperature equipped with cooling channels sensor head with analogue interface
- Series 20PY: Pressure transmitter modules with analogue interface
- Series 20PC: Pressure transmitter modules with miniaturised chip-in-oil technology and analog ratiometric output signal
- Series 20PD: Pressure transmitter modules with miniaturised chip-in-oil technology and I²C interface

Series 21PY – Accessories

Accessories

| Calibration certificate | Mating plug to M8 |
|---|---|
|  |  |
| <p>Issued by KELLER Pressure.</p> | <ul style="list-style-type: none"> • Mating plug to M8, cable 5 m PN 603390.0031 |