

## 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

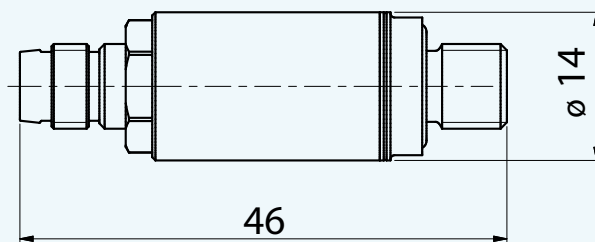
± 1,5 %FS @ -10...80 °C

#### Pressure ranges

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



Serie 21PY



## Series 21PY – Specifications

### Standard pressure ranges

| Absolute pressure<br>PAA                        | Absolute pressure<br>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<br>at 0 bar abs.<br>(vacuum) | Reference pressure<br>at 1 bar abs. | Based on<br>reference pressure |

### Performance

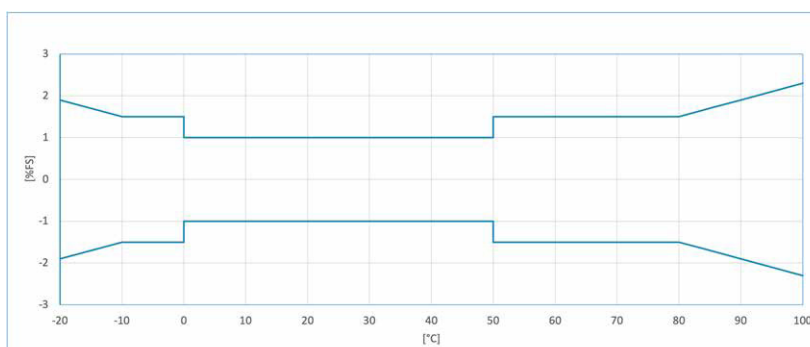
|                               |                     |                                                                                         |
|-------------------------------|---------------------|-----------------------------------------------------------------------------------------|
| Accuracy @ RT (20...25 °C)    | $\leq \pm 0,5 \%FS$ | Non-linearity (best fitted straight line BFS), 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,<br>A-coded, 3-pin |
| Cable                  | ø 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 <sup>2</sup> ),<br>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 /<br>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

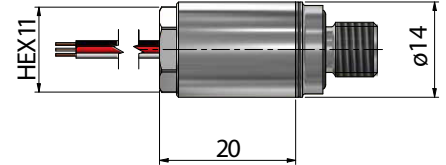
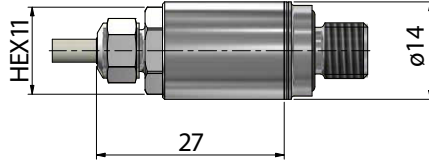
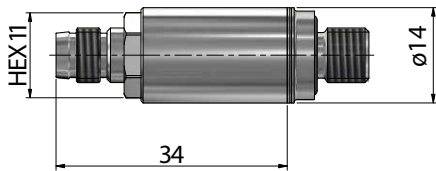
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|-------------------------------|-------------------------|-----------------------------|---------------------------------------------|
| Pressure connection           | M8 x 1                  | See Dimensions and variants |                                             |
|                               | 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                    |                                             |

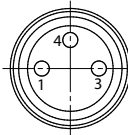
### Environmental conditions

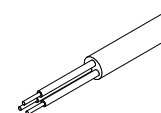
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|-------------------------------|-------------------------------------------------------------------------------------------------|----------------------|-------------------------------------|
| Medium temperature range      | -20...100 °C                                                                                    | 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. |

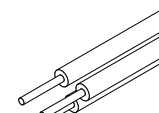
## Series 21PY – Dimensions and variants

### Electrical connections

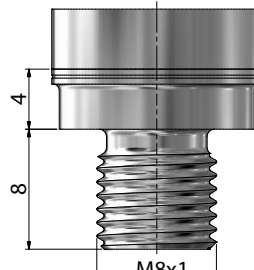
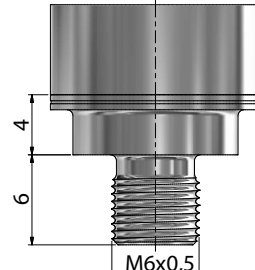


| Round plug                                                                        | 3-wire      |
|-----------------------------------------------------------------------------------|-------------|
| M8 × 1                                                                            | 0,5...4,5 V |
|  | 1 +Vs       |
|                                                                                   | 3 GND       |
|                                                                                   | 4 +OUT      |
|                                                                                   |             |

| Cable gland                                                                       | 3-wire      |
|-----------------------------------------------------------------------------------|-------------|
| Cable Ø 3,3                                                                       | 0,5...4,5 V |
|  | BN +Vs      |
|                                                                                   | GN GND      |
|                                                                                   | WH +OUT     |
|                                                                                   |             |

| Wires                                                                               | 3-wire      |
|-------------------------------------------------------------------------------------|-------------|
| L = 50 mm                                                                           | 0,5...4,5 V |
|  | 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 I<sup>2</sup>C interface

## Series 21PY – Accessories

### Accessories

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