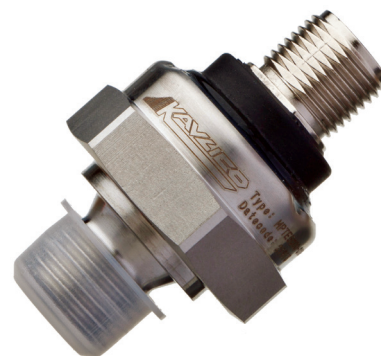


# Data Sheet

## P1E

### Oxygen Service Pressure Sensor



#### Main Features

|                       |                                                |
|-----------------------|------------------------------------------------|
| Pressure Ranges       | 10 bar up to 400 bar (gage)*                   |
| Electrical Connection | M12 - 4 Pole, 18mm connector, 9.4mm connector* |
| Pressure Connection   | G1/4A DIN 3852-A*                              |
| Housing Material      | 304 Stainless Steel (1.4301)                   |
| Output Signal         | 4 - 20 mA*                                     |

\* for more options see How to Order

#### Attributes

- Hermetically Sealed Compact & Light-weight
- Cleanliness in Accordance with ISO 15001
- Wetted Parts Free of Oil and Greas
- Resistant to Chemical Attack
- Superior Long-Term Stability & Repeatability
- No Internal Seal

#### Typical Applications

- Medical Air Plant Sector
- Medical Gas Control Systems.
- Medical Gas Control Manifolds.
- Medical Gas Storage.
- Delivery systems
- Nitrogen and Oxygen Plants

#### Description

Specially designed for oxygen service, supply and transport applications Kavlico's P1E pressure sensor apply ISO15001 cleaning procedures and are delivered with a protection cap on the thread in an individual hermetically sealed packaging. P1E sensors are approved to be used in medical gas service applications such as breathing oxygen and high pressure oxygen service and distribution applications.

The sensor offers a compact, low weight and a hermetically sealed design that incorporates Kavlico's thin film strain gauge technology in a 304 stainless steel housing. Due to the hermetically sealed design the sense element is impervious to almost any media, and does not require an internal seal. The robust design ensures high repeatability and long term stability. P1E sensors are designed for a wide range of liquid and gaseous media and a wide temperature range from -30° C to +100°C (media to 120°C). To ensure a world-wide usage the sensor is cULus listed and CE certified.

## Technical Specifications

### Pressure Ranges

|                |            |     |     |     |     |      |      |
|----------------|------------|-----|-----|-----|-----|------|------|
| from 0 to ...  | bar (gage) | 10  | 16  | 25  | 100 | 250  | 400  |
| Proof pressure | bar (gage) | 20  | 32  | 50  | 200 | 375  | 600  |
| Burst pressure | bar (gage) | 100 | 160 | 200 | 600 | 1000 | 1600 |

### Physical

|                           |                                                                            |
|---------------------------|----------------------------------------------------------------------------|
| Operating Life Cycle      | min. 10 million full pressure cycles over the full range                   |
| Vibration Resistance      | IEC 60068-2-64 (RANDOM) 20 PSD                                             |
| Shock Resistance          | 25 g minimum according to DIN EN 60068-2-27                                |
| Drop Test                 | 1 meter drop on concrete as per SAE J1455 / DIN EN 60068-2-3-1             |
| Weight                    | Approx. 50 grams (without mating connector)                                |
| Ingress Protection        | IP 65 or IP67 - depending on electrical connector                          |
| Medium Temperature        | -30°C to + 120°C                                                           |
| Environmental Temperature | -30°C to + 100°C                                                           |
| Storage Temperature       | -30°C to + 100°C                                                           |
| Media                     | All class II fluids and gases compatible with stainless steel 304 (1.4301) |

### Performance

|                             |                                                             |
|-----------------------------|-------------------------------------------------------------|
| Accuracy <sup>*1</sup>      | ≤ 0.5 % of span <sup>*3</sup>                               |
| Non-linearity <sup>*2</sup> | 0.2 % of span <sup>*3</sup>                                 |
| Non-repeatability           | 0.1 % of span                                               |
| 1-year stability            | 0.2 % of span                                               |
| Temp. Coefficients - Zero   | 0.2 % of span / 10 K within temperature range 0°C to + 80°C |
| Temp. Coefficients - Span   | 0.2 % of span / 10 K within temperature range 0°C to + 80°C |

<sup>\*1</sup> Including non-linearity, hysteresis, non-repeatability, zero point and full scale error (corresponds to error of measurement per IEC 61298-2). Adjusted in vertical mounting position with pressure port down.

<sup>\*2</sup> BFSL according to IEC 61298-2 reference conditions to EN 61298-1

<sup>\*3</sup> Others on request

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## Electrical

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|                             |                                                                     |
|-----------------------------|---------------------------------------------------------------------|
| Output Signal               | 4...20 mA                                                           |
| Operating Supply Signal     | 8-30 VDC                                                            |
| Power Consumption           | ≤ 600 mW                                                            |
| Oversvoltage Protection     | min. 33 VDC                                                         |
| Short-circuit Proofness     | not applicable                                                      |
| Insulation Voltage          | 500 VDC                                                             |
| Reverse Polarity Protection | Yes <sup>*4</sup>                                                   |
| Load                        | ≤ (Vsup-8 VDC)/(0.02 A) [Ω]                                         |
| Response Time               | ≤ 2 ms max. to 63% of full scale pressure with step change on input |

<sup>\*4</sup> for min. 10 seconds on assigned pins

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## Approvals & Certificates

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|                           |                                                                                                                                                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CE Compliance             | Pressure equipment directive 97/23/EC<br>EMC directive 2004/108/EEC, EN 61 326 Emission (Group 1, Class B)<br>and Immunity (industrial locations), EMI, ESD protected |
| Cleanliness specification | In accordance with ISO 15001                                                                                                                                          |
| ROHS                      | 2011/65/EU ROHS Directive                                                                                                                                             |

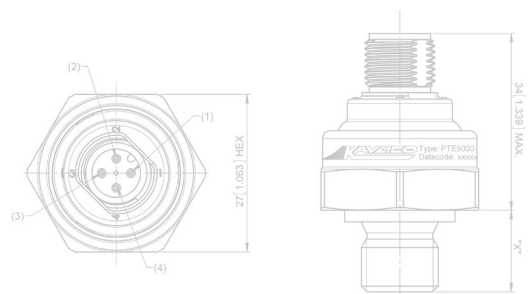
## Dimensions

### Pressure Sensor with Electrical Connection

Dimensions in mm [Inch]

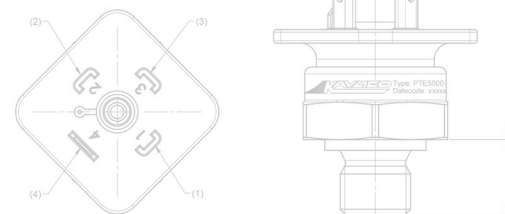
#### M12 Pin Call Outs

| Output  | Pin 1 | Pin 2 | Pin 3 | Pin 4 |
|---------|-------|-------|-------|-------|
| 4-20 mA | Vsup  | ...   | lout  | ...   |



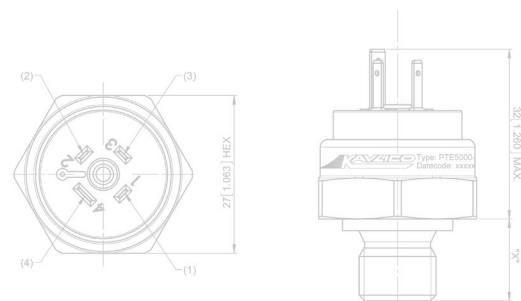
#### 18 mm Pin Call Outs

| Output  | Pin 1 | Pin 2 | Pin 3 | Pin 4 |
|---------|-------|-------|-------|-------|
| 4-20 mA | Vsup  | lout  | ...   | ...   |



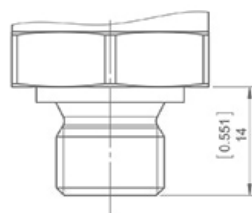
#### 9.4 mm Pin Call Outs

| Output  | Pin 1 | Pin 2 | Pin 3 | Pin 4 |
|---------|-------|-------|-------|-------|
| 4-20 mA | Vsup  | lout  | ...   | ...   |



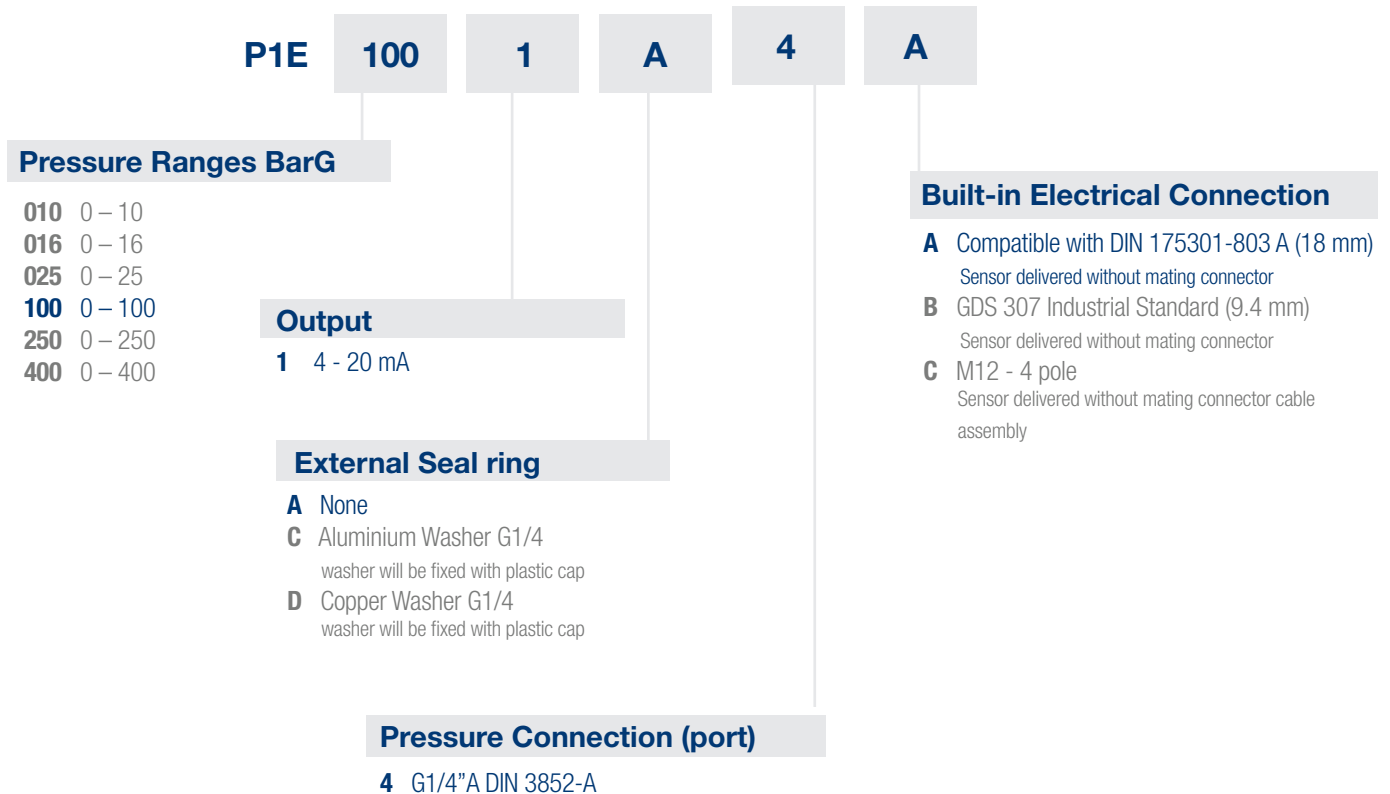
### Pressure Connections and Recommended Installation Torque

Dimensions in mm [Inch]



|        |                  |
|--------|------------------|
| Name   | G1/4A DIN 3852-A |
| Thread | External         |
| Torque | 20 Nm            |

## How to Order



### Example:

P1E-100-1-A-4-A

### Description:

P1E Sensor, 0 - 100 bar Gage, 4...20 mA Electrical Output, no external seal ring, G1/4" A DIN 3582-A Pressure Connection, with Built-in Connector Compatible with DIN175301-803 A (18mm)



Before installation and operation, ensure that the appropriate pressure sensor has been selected in terms of pressure range, design and specific measuring conditions. Non-compliance can result in serious injury and/or damage to the equipment.

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