KELLER

# Piezoresistive OEM Pressure Transducers

# Series 8

## Absolute and sealed gauge pressure

The Series 8 pressure sensors are extremely durable, even when exposed to fast pressure peaks. They have been developed especially for the measurement of high pressures. The Series 8 sensor for ranges 400…1000 bar uses a thicker glass feed through and a wire-bonded measuring cell.

A high-sensitivity piezoresistive silicon chip is used for pressure sensing. The chip is protected against ambient influences by a stainless steel housing sealed with a concentrically corrugated diaphragm. The housing is filled with silicone oil for the transfer of the pressure from the diaphragm to the sensing component.

All metal parts in contact with the pressure media are made of stainless steel AISI 316 L. The fully welded housing is vacuum-tight. The connecting pins allow direct PCB mounting or can be used for connecting cables.

Typical applications: Industrial processes, aviation electronics, servo controls,oil industry, robotics…

*Series 8*
*Low Pressure*

### A Rugged Pressure Transducer

The piezoresistive chip immersed in silicone oil is welded into a housing made of stainless steel AISI 316 L.

### High Sensitivity

A nominal signal of 200 mV is obtained at a supply current of 1 mA for all standard pressure ranges.

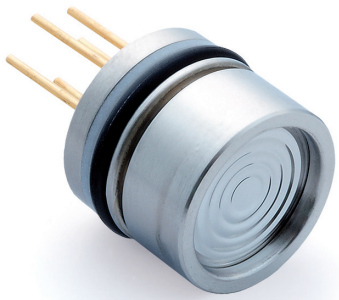
### Flexibility

Versions: Absolute and sealed gauge pressure. 9 nominal measurement ranges from 10 to 1000 bar. Different materials and oil fillings (see options verso).

### Quality

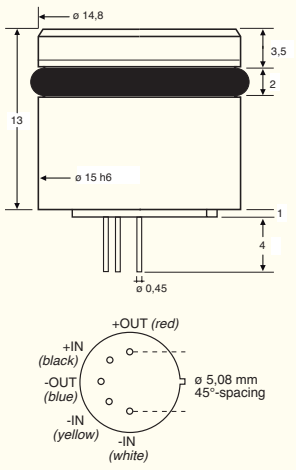
Each pressure transducer is subjected to comprehensive tests for its pressure response and temperature characteristics, and is delivered with an individual calibration certificate stating the characteristics as well as the results of all tests which were performed. Special testing is available if demanded by the customer.

As an alternative, KELLER offers Series 7 L (HP) and 7 LI with a laser welded stainless steel diaphragm. The technique for laser welding further improves the resistancy against crevice corrosion and still retains all the traditional performance, stability and quality for which KELLER is renowned.

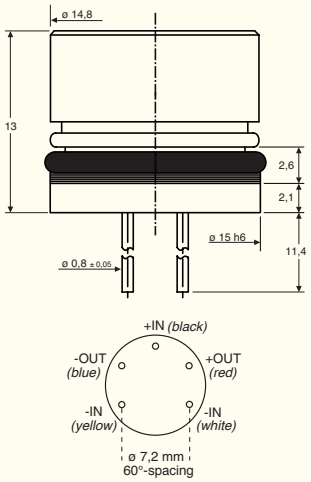


*Series 8*
*High Pressure*

**Series 8 Low Pressure** (10…200 bar)




**Series 8 High Pressure** (> 200…1000 bar)




Subject to alterations

06/2016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Companies approved to ISO 9001

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## Specifications

| | Standard Pressure Ranges (FS) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PAA-8 | 10 | 20 | | | | | | | bar |
| PA-8 | 10 | 20 | 50 | 100 | 200 | 400 | 600 | 1000 | bar |
| Signal Output typ.* @ Supply 1 mA | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | mV |
| Overpressure | 20 | 40 | 100 | 200 | 300 | 600 | 900 | 1100 | bar |

PAA: Absolute. Zero at vacuum  PA: Sealed Gauge. Zero at atmospheric pressure (at calibration day)  * ± 40%

| | | |
|---|---|---|
| Bridge Resistance @ 25 °C | 3,5 kΩ | ± 20% |
| Constant Current Supply | 1 mA nominal | 3 mA max. |
| Isolation @ 500 VDC | 100 MΩ | |
| Storage-/Operating Temperature | -20…100 °C | optional -55...150 °C |
| Compensated Range | -10…80 °C (1) | |
| Vibration (20 up to 5000 Hz) | 20 g | |
| Endurance @ 25 °C | > 10 Mio. FS Cycles | |
| Housing and Diaphragm | Stainless Steel AISI 316 L | |
| Seal Ring | Viton® (1) Ø 12 x 1,5 mm | |
| Support Ring High Pressure | PTFE (1) Ø 15 x 12,8 x 0,75 mm | |
| Oil Filling | Silicone Oil (1) | |
| Weight | 13 g | |
| Dead Volume Change @ 25 °C | < 0,1 mm³ / FS | |
| Electrical Wires (optional) | 0,09 mm² (12 x Ø 0,1 mm), silicone sheathed Ø 1,2 mm, Length: 7 cm (1) | |
| Accuracy (2) | 0,5 %FS typ. (1) 1 %FS max. | |
| Offset at 25 °C | < 5 mV (compensatable with R5 of 20 Ω (3)) | |
| **Temperature Coefficient** | **0...50 °C** | **-10…80 °C** | **-55…150 °C** |
| - Zero max. | 0,025 mV/°C | 0,05 mV/°C | 0,075 mV/°C |
| - Sensitivity typ. (4) | 0,02 %/°C | 0,05 %/°C | 0,07 %/°C |
| Long Term Stability typ. | 0,5 mV | 0,75 mV | 1,25 mV |
| Natural Frequency (Resonance) | > 30 kHz | | |

The sensor characteristics may be influenced by installation conditions. Please follow the installation instructions on our product-specific web pages.

(1) Others on request.

(2) Including linearity, hysteresis and repeatability. Linearity calculated as best straight line through zero.
**Note:** Generally, accuracy and overload is improved by factor of 2 to 4 if the sensor is used in the range of 0…50 %FS.

(3) External compensation, potentiometer not supplied.

(4) On request, a maximal TC Sensitivity can be guaranteed or the value for the compensation resistor (Rp) can be indicated.

## Options

- Platinum- or Hastelloy C-276 diaphragm
  Transducer all Hastelloy C-276
- Oil for low temperatures. Fluorinated oil. Olive oil
- Special characteristics: Linearity, overpressure, lower TC-zero and/or TC-sensitivity
- All pressure ranges between 10 and 1000 bar and 2000 respectively
- Compensation PCB fitted
- Mathematical modelling: See data sheet Series 30 X

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**PA-8/1000 bar/8467.8 (a)** **SN GM307 (b)**

| (c) Temp [°C] | (d) Zero [mV] | (e) +100 [mV] | (f) Comp [mV] | (g) dZero [mV] |
|---|---|---|---|---|
| -9.2 | -1.3 | -27.1 | -1.3 | -0.1 |
| 0.8 | -1.2 | -28.1 | -1.2 | -0.0 |
| 25.8 | -1.2 | -31.1 | -1.2 | 0.0 |
| 51.2 | -1.1 | -34.9 | -1.1 | 0.0 |
| 81.6 | -1.0 | -40.2 | -1.0 | 0.2 |

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COMP R1/R2 open (h) R4 0.0 Ohm (h)
ZERO -1.2 mV (i)
**SENS 0.174 mV/bar at 1.000 mA (j)**

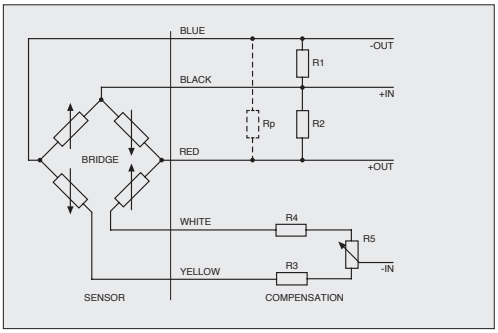
| LIN (k) [bar] | (l) [mV] | (m) Lnorm [%FS] | (n) Lbfsl [%FS] |
|---|---|---|---|
| 0.000 | 0.0 | 0.00 | -0.08 |
| 500.000 | 87.3 | 0.10 | 0.08 |
| 1000.000 | 174.0 | -0.10 | -0.08 |

High Pressure Test Ok (o)
Lot 12062 (p)
Test 500 Volt Ok (q)
**Supply 1.000 mA (r)**
28.05.15 (s) ---------- FLOP.C03IkS (s)

Each sensor is delivered with a calibration sheet with the following data:

(a) Type (PA-8) and range (1000 bar) of pressure sensor
(b) Barcode & serial number of pressure sensor (not standard)
(c) Test temperatures
(d) Uncompensated zero offset in mV
(e) Zero offset values, in mV, with resistance R1 (+) or R2 (-), in kΩ (for factory computation only)
(f) Zero offset, in mV, with calculated compensation resistors
(g) Temp. zero error, in mV, with compensation resistors
(h) Compensation resistor values R1 / R2 and R3 / R4
(i) Offset with compensation resistors R1/ R2 and R3 / R4 fitted. (fine adjustment of zero with R5 potentiometer)
(j) Sensitivity of pressure sensor
(k) Pressure test points
(l) Signal at pressure test points
(m) Linearity (best straight line through zero)
(n) Linearity (best straight line)
(o) Results of long term stability
(p) Lot (on request, identification of silicon chip)
(q) Voltage insulation test
(r) Excitation (constant current)
(s) Date of test --------Test equipment

Remarks:
- The indicated specifications apply only for constant current supply of 1 mA. The sensor must not be supplied more than 3 mA. The output voltage is proportional to the current supply (excitation). By using excitation unlike the calibrated excitation the output signal can deviate from the calibrated values.
- If exposed to extreme temperatures, the compensation resistors should have a temperature coefficient of < 50 ppm/°C.
  Note: Sensor and resistors can be exposed to different temperatures.
– The sensors may be ordered with integrated compensation resistors (surcharge).

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