KELLER

Piezoresistive OEM Pressure Transducers — Series 7

Absolute- and sealed gauge pressure

The Series 7 pressure sensors are for medium pressure ranges, and are the smallest, lightest isolated OEM-sensors available. They have a diameter of only 15 mm without compromising quality and performance.

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.

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

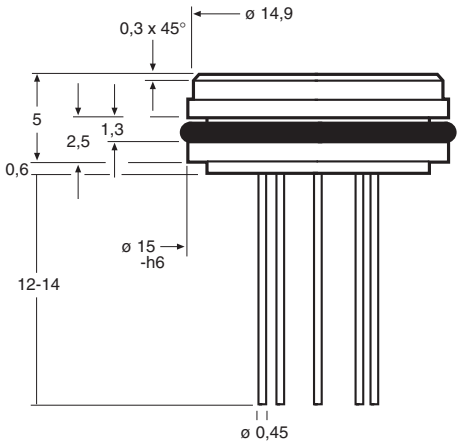
Versions: Absolute and sealed gauge pressure. 6 nominal measurement ranges from 5 to 200 bar. Different materials and oil fillings (see options verso).

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.

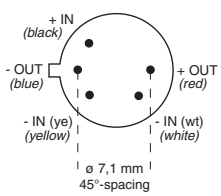
The Series 7 can also be delivered with a laser welded media isolation diaphragm (see data sheet Series 3 L - 10 L). The new technique for laser welding stainless steel diaphragms further improves the resistancy against crevice corrosion and still retains all the traditional performance, stability and quality for which KELLER is renowned.

Series 7

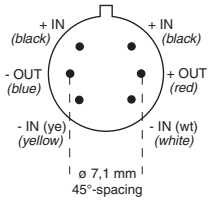


Electrical Connections

Transducer 5 Pin



Transducer 6 Pin



Subject to alterations 02/07

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Specifications Excitation I = 1 mA

	Pressure Ranges (FS) and Overpressure in Bar. Signal Output in mV.					
PAA-7	5	10	20			
PA-7	5	10	20	50	100	200
Signal Output typ.*	200	225	225	225	225	225
Overpressure	10	20	40	100	200	300

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

Bridge Resistance @ 25 °C	Ω	3500	± 20%
Constant Current Supply	mA	1 nominal	5 max.
Insulation @ 500 VCC	MΩ	100	
Operating Temperature	°C	-30…100	
Compensated Range	°C	0…50(1)	-10…80(1)
Storage Temperature	°C	-40…100	
Vibration (20…5000 Hz)	g	20	
Endurance (FS @ 25 °C)	Cycles	> 10 x 10^6 FS	
Housing and Diaphragm		Stainless Steel AISI 316 L	
Seal Ring		Viton(1), iØ 13 x 1 mm	
Oil Filling		Silicone Oil(1)	
Weight		5 g	
Dead Volume Change @ 25 °C		< 0,1 mm^3 / FS	
Electrical Wires (optional)		0,09 mm^2, 12 x Ø 0,1 mm, Silicone sheathed, oØ 1,2 mm, Length 7 cm(1)	
Accuracy(2)	%FS	0,5 typ.(1)	1 max.
Offset at 25 °C	mV	< 5 mV (compensated with R5 von 20 Ω(3))	
Temperature Error		**0...50 °C**	**-10…80 °C**
– Zero	mV / °C	< 0,025	< 0,05
– Sensitivity	% / °C	< 0,03	< 0,05
Long Term Stability typ.	mV	0,5	0,75
Natural Frequency (Resonance)	kHz	> 30	

(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.

Options

– Hastelloy C-276 diaphragm. Gold-plated diaphragm. Transducer all Hastelloy C-276
– Oil for low temperatures. Fluorinated oil. Olive oil
– Special characteristics: Linearity, overpressure, lower TC-zero
– Special tests
– All pressure ranges between 5 and 200 bar
– Other temperature ranges
– Compensation PCB-fitted
– Vented gauge version (PR)

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PA-7/20 bar/8467.2 (a)

(b) Temp [°C]	(c) Zero [mV]	(d) -1000 [mV]	(e) Comp [mV]	(f) dZero [mV]
-10.7	-12.9	-9.8	-0.1	-0.3
-0.4	-12.9	-9.7	0.0	-0.2
24.7	-13.0	-9.5	0.2	0.0
49.7	-13.4	-9.4	0.3	0.1
79.8	-13.9	-9.3	0.5	0.2

COMP R2 = 1000 kOhm (g) R4 = 39.0 Ohm (g)
ZERO 0.2 mV (h) P_atm 964 mbar (i)
SENS 10.66 mV/bar at 1.000 mA (j)
SENS 42.66 mV/bar at 4.000 mA (j)

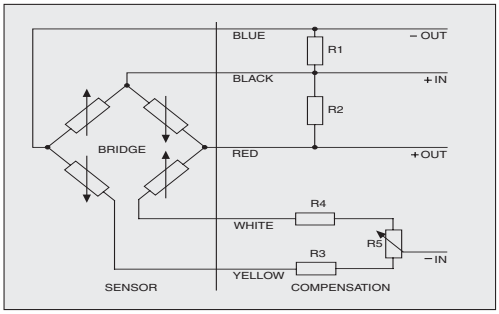
LIN. (k) [bar]	(l) [mV]	(m) Lnorm [%Fs]	(n) Lbfsl [%Fs]
0.000	0.0	0.00	-0.06
10.000	106.8	0.08	0.06
20.000	213.1	-0.08	-0.06

Long Term Stability Ok (o)
Lot 3.2130.00 (p)
Test 500 Volt ok (q)
Supply 1.000 mA (r)
04.01.06 (s) ---------- GOL2.C03CqK (s)

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

(a) Type (PA-7) and range (20 bar) of pressure sensor
(b) Test temperatures
(c) Uncompensated zero offset in mV
(d) Zero offset values, in mV, with resistance R1 (+) or R2 (-), in kΩ (for factory computation only)
(e) Zero offset, in mV, with calculated compensation resistorss
(f) Temp. zero error, in mV, with compensation resistors
(g) Compensation resistor values R1 / R2 and R3 / R4
(h) Offset with compensation resistors R1/ R2 and R3 / R4 fitted (fine adjustment of zero with R5 potentiometer)
(i) Ambient pressure, zero reference for absolute sensors < 20 bar
(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 only apply for constant current supply. The sensor should be excited between 0,5 and 5 mA. The sensor signal is proportional to the current.
– If exposed to extreme temperatures, the compensation resistors should have a temperature coefficient of < 50 ppm/°C. Sensor and resistors can be exposed to different temperatures.
– The sensors may be ordered with integrated compensation resistors (surcharge).



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