

## PIEZORESISTIVE OEM PRESSURE TRANSDUCERS ABSOLUTE- AND SEALED GAUGE PRESSURE

## SERIES 8

The Series 8 pressure sensors incorporate a TAB-bonded measuring cell and 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 316L. 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, robotics...

### A RUGGED PRESSURE TRANSDUCER

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

### HIGH SENSITIVITY

A nominal signal of 900 mV is obtained at a supply current of 4 mA for all standard pressure ranges.

### FLEXIBILITY

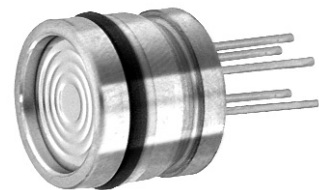
Versions: Absolute and sealed gauge pressure. 9 nominal measurement ranges from 10 to 1000 bar. Different materials and oil fillings (see options).

### QUALITY

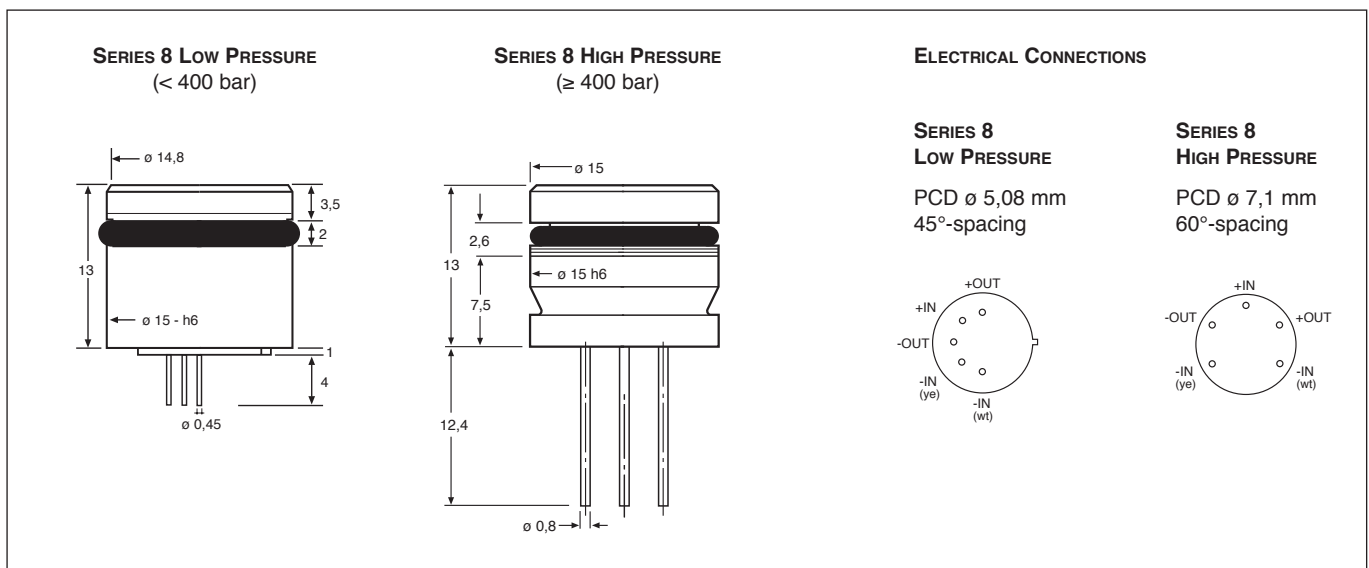
Each pressure transducer is subjected to comprehensive tests for its pressure response and temperature characteristics, and is delivered with an individual calibration certificate stating the characteristics as well as the results of all tests which were performed. Special testing is available if demanded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



**SERIES 8  
LOW PRESSURE**



**SERIES 8  
HIGH PRESSURE**



Subject to alterations

4/99



## SPECIFICATIONS. Excitation I = 4 mA

	PRESSURE RANGES (FS) AND OVERPRESSURE IN BAR. SIGNAL OUTPUT IN mV.							
	10	20	50	100	200	400	600	1000
PAA-8	10	20						
PA-8	10	20	50	100	200	400	600	1000
Signal Output typ.	900	900	900	900	900	900	900	900
Overpressure	20	40	100	200	300	600	900	1100

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

Bridge Resistance @ 25°C	Ω	3500	± 20%
Constant Current Supply	mA	4 nominal	5 max.
Insulation @ 50 VCC	MΩ	100	

Operating Temperature	°C	-30...100	-55...150 (optional)
Compensated Range	°C	0...50 <sup>(1)</sup>	-10...80 <sup>(1)</sup>
Storage Temperature	°C	-40...100	-60...150
Vibration (20...5000 Hz)	g	20	
Endurance (FS @ 25°C)	Cycles	>100 x 10 <sup>6</sup> FS	

Housing and Diaphragm	Stainless Steel, Type 316 L
Seal Ring	Viton <sup>(1)</sup> , iØ 12 x 1,5 mm
Oil Filling	Silicone Oil <sup>(1)</sup>
Weight	13 g
Dead Volume Change @ 25°C	<0,1 mm <sup>3</sup> / FS
Electrical Wires (optional)	0,09 mm <sup>2</sup> , 12 x Ø 0,1 mm, Silicone sheathed, Insulation 250V, oØ 1,2 mm, Length 7cm <sup>(1)</sup>

Accuracy <sup>(2)</sup>	% FS	0,5 typ. <sup>(1)</sup>	1 max.
Offset at 25°C	mV	< 20 mV (compensated with R5 of 22Ω <sup>(3)</sup> )	
Temperature Error		<b>0...50 °C</b>	<b>-10...80 °C</b>
- Zero	mV / °C	< 0,10	< 0,20
- Sensitivity	% / °C	< 0,01	< 0,03
Long Term Stability typ.	mV	2	3
Natural Frequency (Resonance)	kHz	> 30	5

(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

- Platinum- or 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 10 and 1000 bar
- All temperature ranges between -55 and +150°C
- Compensation PCB fitted

PA-8/8467-1000 <sup>(1)</sup>		SN CB330 <sup>(2)</sup>		79
<sup>(3)</sup> Temp	<sup>(4)</sup> Zero	<sup>(5)</sup> -100	<sup>(6)</sup> Comp	<sup>(7)</sup> dZero
-6.9	-50.5	53.6	-30.1	-1.4
2.4	-50.8	57.0	-29.7	-1.0
26.2	-52.1	67.4	-28.7	0.0
50.6	-54.4	79.5	-28.1	0.6
80.2	-57.4	97.5	-27.0	1.6
COMP	R2 =	510 kOhm <sup>(8)</sup>	R4 =	27.0 Ohm <sup>(8)</sup>
ZERO		-1.7 mV <sup>(9)</sup>	P_atm	962 mbar <sup>(10)</sup>
SENS.		0.795 mV/bar <sup>(11)</sup>		
<sup>(12)</sup> (bar)	<sup>(13)</sup> (mV)	<sup>(14)</sup> Lnorm	<sup>(15)</sup> LbfsI	
500.000	395.6	-0.23	-0.18	
1000.000	796.7	0.23	0.18	
Long Term Stability OK <sup>(16)</sup>				
Chip 2.5(6.1306.02) <sup>(17)</sup>				
Excitation		4.0 mA <sup>(18)</sup>	500 Volt Test <sup>(19)</sup>	
01.10.97 <sup>(20)</sup>		----- FLOH.LO2F00 <sup>(20)</sup>		

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

1. Type (PA-8), drawing-no. (8467) and range (1000 bar) of sensor
2. Serial number of pressure sensor (engraved on request)
3. Actual test temperatures
4. Uncompensated zero offset in mV
5. Zero offset values, in mV, with test resistance (100 kΩ) (for factory computation only)
6. Zero offset, in mV, with calculated compensation resistor R1 or R2
7. Temp. zero error, in mV, with compensation resistor R1 or R2
8. Compensation resistor values R1 / R2 and R3 / R4
9. Offset with compensation resistors R1/ R2 and R3 / R4 fitted. (fine adjustment of zero with R5 potentiometer)
10. Ambient pressure, zero reference for absolute sensors < 20 bar
11. Sensitivity of pressure sensor
12. Pressure test points
13. Signal at pressure test points
14. Linearity (best straight line through zero)
15. Linearity (best straight line)
16. Results of long term stability
17. Chip-type (on request, identification of silicon chip)
18. Excitation (constant current)
19. Voltage insulation test
20. Date of test ----- Test equipment

## Remarks:

- The indicated specifications only apply for constant current supply; the sensor should be excited between 0,5 and 4 mA. The sensor signal is proportional to the current. When exciting with constant voltage, the zero offset values remain the same, the sensitivity decreases approx. 1% per +5°C.
- 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.

