



PIEZORESISTIVE OEM PRESSURE TRANSDUCERS

SERIES 7 S / 9 S

ABSOLUTE- AND GAUGE PRESSURE

The Series 7S / 9S is the latest development in media isolated piezoresistive silicon chip pressure transducers. The new low mass one-piece housing is smaller with a brazed stainless steel diaphragm for lower production cost, giving excellent long-term stability combined with easy installation.

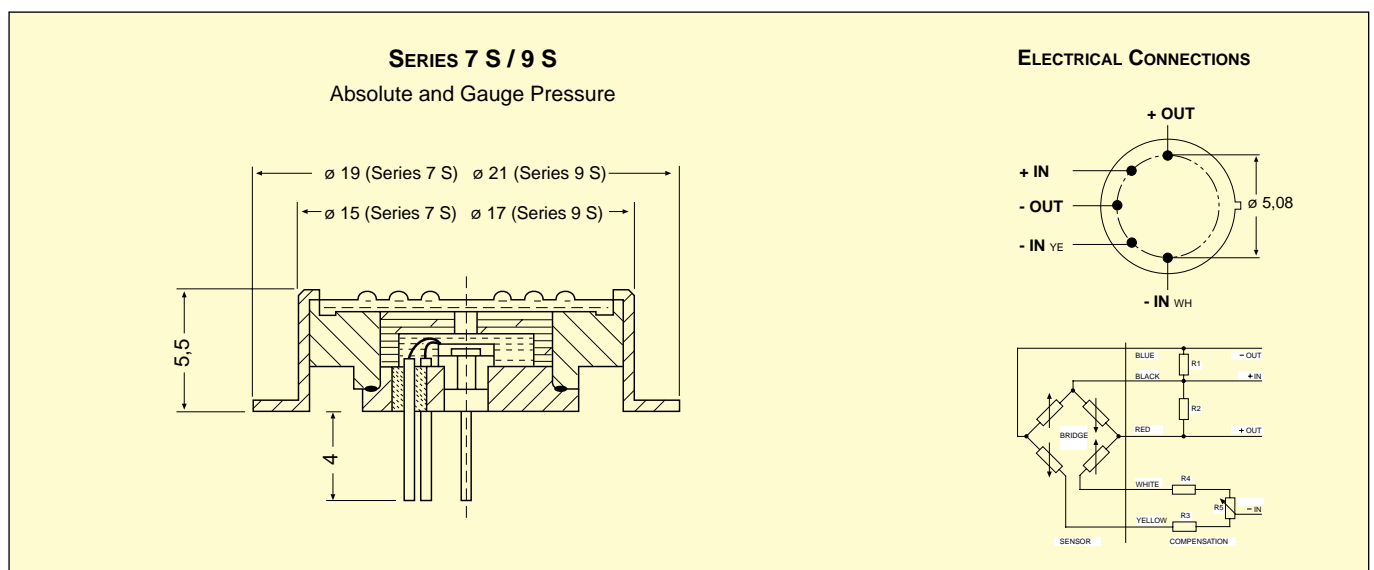
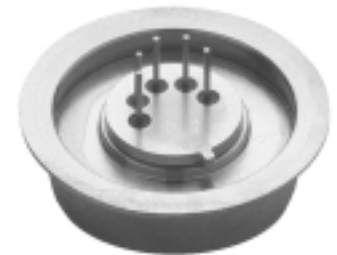
The Series 7S / 9S can be installed into a housing using an O-ring seal, or it can be welded. Welding should only be made to the flange at the rear of the transducer. Performance specifications will remain unaffected by the installation or welding process. The O-ring seal may be fitted directly below the flange, or as a peripheral seal at the front face of the transducer. The rear flange can be modified or machined off completely where space is important.

The thin flange and outer capsule wall ensure that mechanical mounting stresses are not transmitted into the measuring cell. The structure also has good thermal conductance and the sensor closely tracks the process media temperature.

The transducer is constructed from 316L stainless steel, using a high temperature hydrogen brazing technique, the brazed 316L diaphragms are highly resistant to corrosion. Electrical connection is made via a five-pin header. Leadout wires, or a PCB, can be soldered directly to the header pins. Series 7SE / 9SE versions are supplied with PCB fitted.

Every pressure transducer is subjected to comprehensive tests for pressure and temperature characteristics, and is delivered with an individual calibration certificate (except for version 7SE / 9SE). Special testing is available on request from the customer.

Typical applications are, heating pumps, autoclaves and dialysers. Other applications include measurement of altitude, avionics, meteorology, servo controls, robotics, hydraulics, hygienic and pharmaceutical engineering, drift mining, injectors, and many more.



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SPECIFICATIONS. Excitation I = 4 mA

	PRESSURE RANGES (FS) AND OVERPRESSURE IN BAR.							SIGNAL OUTPUT IN mV.							
	-1	-0,5	-0,2	-0,1	0,1	0,2	0,5	1	2	5	10	20	50	100	200
PR-9 S (PR-7 S: only ≥ 5 bar)															
PAA-9 S (PAA-7 S: only ≥ 5 bar)					0,1	0,2	0,5	1	2	5	10	20			
PA-9 S (PA-7 S: only ≥ 5 bar)								1	2	5	10	20	50	100	200
Signal Output typ. (mV)	400	300	120	60	60	120	300	400	600	900	900	900	900	900	900
Overpressure (bar)	-1	-1	-1	-1	2,5	2,5	2,5	3	4	7	15	30	100	200	300

PAA: Absolute. Zero at vacuum

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

PR: Vented Gauge. Zero at atmospheric pressure

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 ⁽¹⁾	-10...80 ⁽¹⁾
Storage Temperature	°C	-40...100	-60...150
Vibration (20...5000 Hz)	g	20	
Endurance (FS @ 25°C)	Cycles	>100 x 10 ⁶ FS	

Housing and Diaphragm	Stainless Steel, Type 316 L
Brazing Material	Nickel / Chrome / Palladium
Oil Filling	Silicone Oil ⁽¹⁾
Weight	4,5 g (Serie 7 S) 6,5 g (Serie 9 S)
Dead Volume Change @ 25°C	<0,1 mm ³ / FS

Accuracy ⁽²⁾	% FS	0,5 typ. ⁽¹⁾	1 max.	
Offset at 25°C	mV	< 20 mV (compensatable with R5 ⁽³⁾)		
Temperature Error		0...50 °C	-10...80 °C	-55...150 °C
- Zero	mV / °C	< 0,10	< 0,20	< 0,30
- Sensitivity	% / °C	< 0,01	< 0,03	< 0,07
Long Term Stability typ.	mV	2	3	5
Time Constant	ms	< 1 (Resonance > 30 kHz)		

(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.

OPTION: SENSOR WITH ELECTRONICS

SERIES 7 SE / SERIES 9 SE

Print: ø 15 mm (7 SE)
ø 17 mm (9 SE)

Ranges: ≥ 0,5 bar

Output: 4...20 mA
0,5...4,5 V ratiom.
0...100 mV

Supply: 8...28 V
5 V
10 VDC

Accuracy: typ. 0,5% FS (0...50 °C)
typ. 1,0% FS (-10...80 °C)

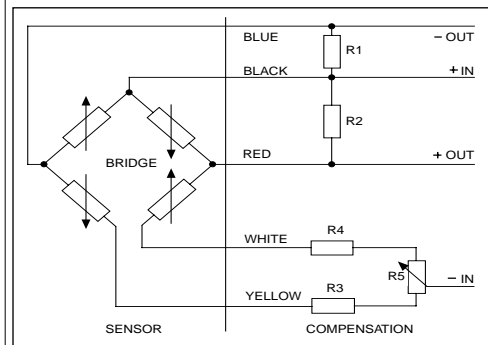


PA-9S/80507-10 ⁽¹⁾		SN 925EQ ⁽²⁾		533 ⁽²⁾
⁽³⁾ Temp	⁽⁴⁾ Zero	⁽⁵⁾ -1000	⁽⁶⁾ Comp	⁽⁷⁾ dZero
2.8	-30.5	-19.0	-8.0	-0.1
25.8	-31.8	-19.6	-7.9	0.0
50.0	-33.5	-20.3	-7.6	0.3
COMP R2 = 510 kOhm ⁽⁸⁾		R3 = 0.0 Ohm ⁽⁸⁾		L1
ZERO -7.9 mV ⁽⁹⁾		P_atm 962 mbar ⁽¹⁰⁾		
SENS. 87.9 mV/bar ⁽¹¹⁾				
⁽¹²⁾ (bar)	⁽¹³⁾ (mV)	⁽¹⁴⁾ Lnorm	⁽¹⁵⁾ Lbfsl	
5.000	443.2	0.42	0.32	
10.000	875.3	-0.42	-0.32	
Long Term Stability OK ⁽¹⁶⁾				
Chip (1020) ⁽¹⁷⁾				
Excitation 4.0 mA ⁽¹⁸⁾		500 Volt Test ⁽¹⁹⁾		
01.10.98 ⁽²⁰⁾		GOLI.V20F00 ⁽²⁰⁾		

- Each sensor is delivered with a calibration sheet with the following data:
1. Type (PA-9S), drawing-no. (80507) and range (10 bar) of sensor
 2. Test location-no. resp. serial-no. (engraved on request) of sensor
 3. Test temperatures
 4. Uncompensated zero offset in mV
 5. Zero offset values, in mV, with test resistance (1000 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.



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