Piezoresistive Pressure Transducers

vented gauge and absolute pressure

Series 6 S
Series 6 M

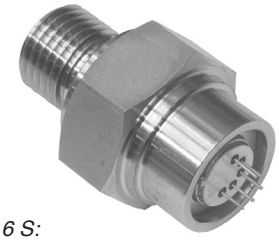
These piezoresistive pressure transmitter-heads are produced on the new KELLER automatic brazing lines, making possible the mass production of high quality pressure transmitters at low cost. This new technology allows the crevice-free construction of the pressure port without using seals or O-rings. In the brass sensor line (Series 6 M), a steel insert and a nickel diaphragm are brazed into a brass housing. In the steel version (Series 6 S), all parts are of stainless steel (AISI 316 L). The header with the silicon pressure sensor and the glass feed-through pins are welded to the steel insert underneath the oil filling.

These transducers are the ideal basis for pressure transmitters, pressure switches or digital pressure instruments. The transducer heads come in 3 basic versions:

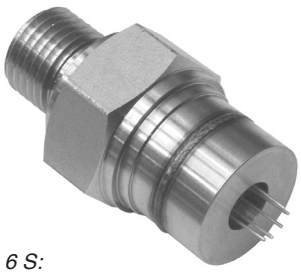
6 M: Version in brass, lowest price, accuracy 1 %FS. Ranges 5…200 bar
6 S: Stainless steel, highest performance, accuracy 0,5 %FS. Ranges: 0,3…1000 bar

Series 6 S and 6 M are low cost sensors for OEM use, tested for function only, with no calibration data supplied. Series 6 ST is supplied tested, with calibration certificate: Linearity, sensitivity, zero point, temperature coefficients 0…50 °C and compensation resistor values (resistors not supplied).

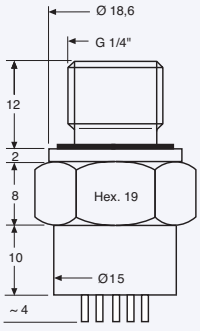
Series 6 S / 6 M:
Ranges 5…200 bar (Compact-Version)



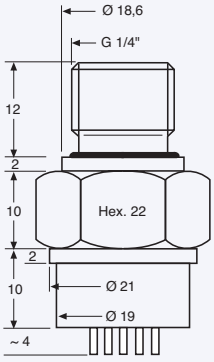
Series 6 S:
Ranges 0,3…200 bar



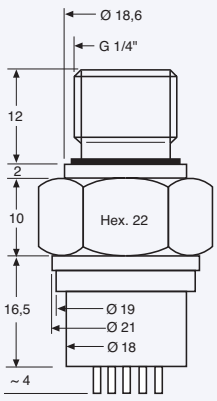
Series 6 S:
Ranges 400…600 bar



6 S / 6 M: 5…200 bar
(Compact Version)

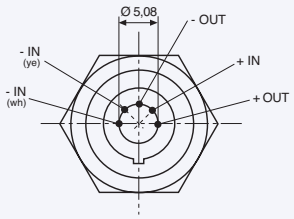


6 S: 0,3…200 bar



6 S: 400…1000 bar

Electrical Connections



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KELLER

Specifications Excitation I = 1 mA

Pressure Ranges (FS) and Overpressure in Bar. Signal Output in mV.

PR-6	-1	-0,5	-0,3	0,3	0,5	1	2	5	10	20					
PAA-6				0,3	0,5	1	2	5	10	20					
PA-6	-1					1	2	5	10	20	50	100	200	400	600
Signal Output typ. [1]				50	60	100	140	200	225	225	225	225	225	225	225
Overpressure				2,5	2,5	2,5	3	10	20	40	100	200	300	600	900

PAA: Absolute. Zero at vacuum PA: Sealed Gauge. Zero at atmospheric pressure (at calibration day) PR: Vented Gauge. Zero at atmospheric pressure [1] ± 40%

Bridge Resistance @ 25 °C	Ω	3500	± 20%
Offset @ 25 °C 1 mA	mV	≤ 5 mV typ. (compensatable with R3…R5)	≤ 20 mV max.
Constant Current Supply	mA	1 nominal	5 max.
Insulation @ 500 VCC	MΩ	≥ 100	
Operating Temperature	°C	-20…80	
Compensated Range	°C	0…50	
Storage Temperature	°C	-40…120	
Vibration (5 to 2000 Hz)	g	10, axes X/Y/Z	
Shock	g	20 sinus 11 ms	
Endurance (FS @ 25 °C)	Cycles	> 100 x 10^6 FS	
Housing and Diaphragm			
Pressure Connection		G 1/4", Viton seal	
Oil Filling		Silicone oil	
Weight			
Dead Volume Change @ 25 °C			
Electrical Wires (optional)		0,09 mm², 12 x Ø 0,1 mm, silicone sheathed, aØ 1,2 mm, Length 7 cm[(1)]	

		6 S	**6 M**
Accuracy*	%FS	0,5	1
Temp. Coefficients**			
– of zero, 0…50 °C	mV / °C	0,025	0,05
– of gain, 0…50 °C	% / °C	0,02	0,03
Long term stability	%FS	0,2	0,5
Natural Frequency (Resonance)	kHz	> 30	

* Including linearity, hysteresis and repeatability. Linearity calculated as best straight line through zero.

** Only with R1/R2

Options

– Threads in NPT-/UNF
– Oil fillings
– Leads attached

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PA-6ST/10 bar/80247.XX[(a)]

[(b)] Temp [°C]	[(c)] Zero [mV]	[(d)] +1000 [mV]	[(e)] Comp [mV]	[(f)] dZero [mV]
-0.5	-9.1	-12.1	-0.4	-0.2
24.7	-8.5	-11.9	-0.2	0.0
51.0	-8.1	-11.9	-0.2	0.0

---------- L1

COMP R1 1000 kOhm [(g)] R4 47.0 Ohm [(g)]
ZERO -0.2 mV [(h)] P_atm 970 mbar [(i)]
SENS 11.98 mV/bar at 1.000 mA [(j)]
SENS 47.94 mV/bar at 4.000 mA [(j)]

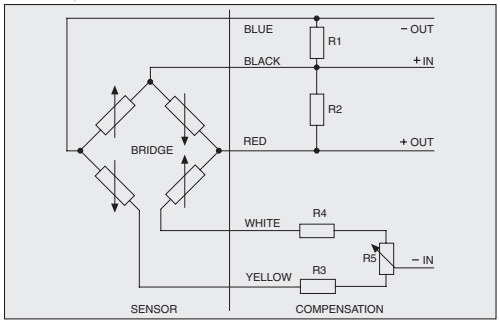
LIN		[(m)] Lnorm	[(n)] Lbfsl
[(k)] [bar]	[(l)] [mV]	[%Fs]	[%Fs]
0.000	0.0	0.00	-0.05
5.000	60.0	0.06	0.05
10.000	119.8	-0.06	-0.05

Long Term Stability Ok [(o)]
Lot 3.4012.00 [(p)]
Test 500 Volt Ok [(q)]
Supply 1.000 mA [(r)]
07.06.06 [(s)] ---------- PH02.H03CtK [(s)]

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

(a) Type (PA-6ST) and range (10 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 resistors
(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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