

Model 500G Mono-Block Pressure Sensors

Description

The 500G pressure sensor employs a 17-4PH stainless steel mono-block structure, and is designed for high pressure applications. As the sensor features mono-block structure, it prevents pressure medium from leakage to the backside of the sensor. In addition, there is no any O-ring needed inside the sensor structure for sealing purpose.

On the pressure diaphragm of the 500G-series pressure sensors, the Wheatstone bridge circuit is built with BCM semiconductor strain gauges via glass-bonding technology, resulting in a creep free behavior of the sensors. Compared to the 664F-series pressure sensors which are based on metal foil strain gauge technology, the 500G-series sensors offer higher output sensitivity (5mV/V) and higher overload (200%fs) and burst (300%fs) pressures.

The 500G is mostly used for pressure transmitter applications for high pressure measurement.



500G with temperature compensation



500G without temperature compensation

Features

- rugged and mono-block structure
- glass bonding strain gauge
- accuracy up to 0.25%fs
- measuring ranges: 5bar, ..., 8000bar
- proof pressure: 200%fs
- burst pressure: 300%fs
- either with or without temperature compensation
- compensated temperature range: -20~+85 °C

Applications

- industrial controls
- hydraulic systems
- compressors
- food industry
- process control systems

Environmental Specifications

- position effect: < 0.1% of zero offset shift in any direction
- vibration effect: no change at 10 g (RMS), 20~2000 Hz
- shock: 100 g, for 10 millisecond

Model 500G

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Technical Data

Parameters	Units	Specifications	Notes
pressure medium		gases or dilute fluids	1
measuring ranges	bar	0~5, ~10, ~15, ~25, ~40, ~60, ~100, ~160, ~250, ~400, ~600, ~1000, ~2000, ~3000, ~4000, ~5000, ~6000, ~8000	2
pressure reference		gauge	
proof pressure	%fs	200, for ranges > 3000bar, refer to note 4	3 & 4
burst pressure	%fs	300, for ranges > 3000bar, refer to note 5	5
output sensitivity	mV/V	≥ 10, ≥ 5 (for range ≥ 1000bar)	6
excitation	Vdc	3, ..., 10	
zero offset	mV	≤ ±1	
accuracy	%fs	≤ ±0.25 (for ranges ≥ 10bar), ≤ ±0.5 (standard)	7
non-linearity	%fs	≤ ±0.2, ≤ ±0.3 (for ranges ≤ 25bar or ranges ≥ 2000bar)	
hysteresis	%fs	≤ ±0.2	
repeatability	%fs	≤ ±0.1, ≤ ±0.2 (for ranges ≤ 25bar or ranges ≥ 2000bar)	
long-term stability	%fs/year	≤ ±0.2	
input resistance	kΩ	6±1	
output resistance	kΩ	4±1	
insulation resistance	MΩ	500 @100Vdc	
compensated temperature range	°C	-20 ~ +85	
operating temperature range	°C	-40 ~ +125	
storage temperature range	°C	-40 ~ +125	
temperature coefficient of zero offset	%fso/°C	≤ ±0.03	8
temperature coefficient of span	%fso/°C	≤ ±0.03	8
life time	cycles	10 ⁸	
response time	ms	≤ 1	9
process sealing		O-ring (fluorine rubber)	
mechanical interface		G1/4 male, G1/2 male, M20x1.5, M22x1.5	10
electrical interface		solder pads (standard for output of mV/V)	
		4 colored silicone flexible wires, 100mm	
		4 pins (standard for amplified output, e.g., 4~20mA, 0.5~4.5V)	
pressure diaphragm		17-4PH	
wetted parts material		17-4PH	
net weight	gram	~60	

General conditions for measurements: media temp. = 25°C ±1°C, ambient temp. = 25°C ±1°C, humidity = 50%RH ±5%RH, barometric pressure: 860~1060 mbar, max. vibration = 0.1 g (i.e. 0.98m/s/s).

- Notes:
1. The pressure medium should be compatible with wetted parts material and pressure diaphragm.
 2. For customized pressure ranges, consult BCM.
 3. "fs" refers to full scale pressure or rated pressure.
 4. Proof pressure of 150%fs is for 4000bar and 5000bar ranges, 120%fs is for 6000bar, and 106%fs is for 8000bar.
 5. Bust pressure of 200%fs is for 4000bar and 5000bar ranges, 150%fs is for 6000bar, and 120%fs is for 8000bar.

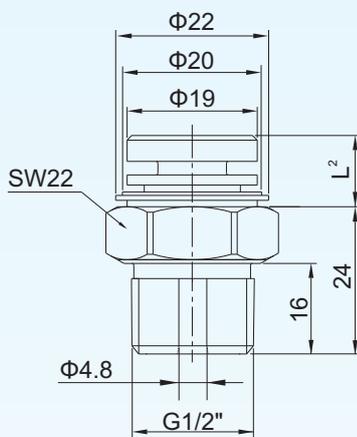
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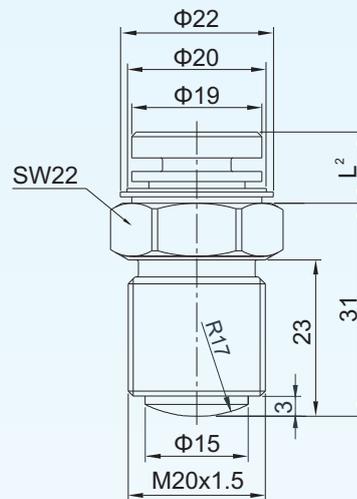


- Notes:
- Options for the output signal: 0.5~4.5 Vdc ratiometric, 4~20 mA, I²C, SPI.
 - Accuracy = $\sqrt{\text{non-linearity}^2 + \text{hysteresis}^2 + \text{repeatability}^2}$.
 - Calculated as a rate of output change between -20°C and +85°C, and normalized by the output at 25°C, for the sensor which is temperature compensated.
 - Response time for a 0 bar to fs step change, 10% to 90% rise time.
 - G1/4 male threads is standard for pressure range \leq 1600bar; G1/2 male threads is standard for pressure > 1600bar. Semi-sphere surface as surface contact seal at process connection is available on request.

Dimensions



Dimensions of 500G with G1/2" threads



Dimensions of 500G \geq 600bar
with M20x1.5 threads and semi-sphere surface

- Notes:
- All dimensions in mm.
 - L = 12.3mm in case the range < 250bar; L = 10.5mm in case the range \geq 250bar.
 - When range \geq 600bar, the semi-sphere surface will be applied as standard. And it is suggested to choose either M20x1.5 or G1/2 threads. For any customized mechanical interface, consult BCM SENSOR.
 - The dimensions of the PCB or SSC circuit are not included in the drawings above. The diameter of the PCB is Φ 19mm, and the height of the PCB will depend on its functionality.

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Ordering Information

position (pos.) 1: model							
500G							
pos. 2: pressure ranges and references							
5bar	G	60bar	G	600bar	G	5000bar	G
10bar	G	100bar	G	1000bar	G	6000bar	G
15bar	G	160bar	G	2000bar	G	8000bar	G
25bar	G	250bar	G	3000bar	G	G: gauge pressure	
40bar	G	400bar	G	4000bar	G		
pos. 3: output signal							
10mV/V, 5mV/V for range \geq 1000bar (standard)							
0.5/4.5V = 0.5~4.5 V (ratiometric)							
4/20mA = 4~20mA							
I ² C							
SPI							
pos. 4: accuracy							
0.25%fs				0.5%fs (standard)			
pos. 5: temperature compensation							
T2 = -20~85 °C (standard)							
NT = no temperature compensation							
pos. 6: mechanical interface							
G1/4: G1/4 male				M20x1.5: M20x1.5 male			
G1/2: G1/2 male				M22x1.5: M22x1.5 male			
pos. 7: electrical interface							
SP: solder pads (standard)							
FW: flying wires, silicone, 100mm							
4P: 4 pins (for amplified output)							
pos. 8: customized specifications							
“(*)” is necessary only if any customized parameter is required, otherwise it is neglectable.							
pos.1	pos. 2	pos. 3	pos. 4	pos. 5	pos. 6	pos. 7	pos. 8

Examples of Ordering Code

- standard sensor:

500G-2000barG-5mV/V-0.5%fs-T2-G1/2-SP

- customized sensor:

500G-60barG-0.5/4.5V-0.5%fs-T2-G1/4-FW-(*)

(*): Customized output = 0.5/4.5V ratiometric.

The listed specifications and dimensions are subject to change without prior notice.

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