Model 101B(a19G)
Pressure Sensors for General Purpose

Description

The 101B(a19G) pressure sensor is developed for general purpose. it can operate with aggressive media in hostile environments. This model is based on BCM's piezoresistive sensor die. The sensor die is packaged in a stainless steel housing. Oil filled in the housing is isolated from measured media by a stainless steel diaphragm.

The pressure types of the sensor include gauge (relative), absolute, and sealed gauge pressure. For gauge pressure measurement, negative pressure range is available as an option.

The output of 101B(a19G) can be configured to 10%~90%Vs ratiometric, 4~20mA, I^2C, or SPI by integrated the electronics.

The 101B(a19G) can be either temperature compensated or not. 0~50°C is the standard compensated temperature range.

The fitting method for the sensor can be either face welding or O-ring fitting, which allows this model to be used in various integration systems.

Features

- pressure types & ranges:
  gauge: -1, ..., 25 bar
  absolute: 0.35, ..., 16 bar
  sealed gauge: 10, ..., 600 bar
- accuracy up to 0.25%fs
- rugged, isolated stainless steel package
- either with or without temperature compensation
- outstanding sensitivity and reliability
- excited by either current or voltage

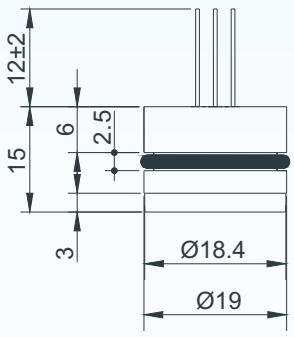
Applications

- process control systems
- industrial controls
- pneumatic and hydraulic controls
- pressure transducers and transmitters
- pressure calibrators

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

Dimensions



Note: All dimensions are in mm.

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Technical Data

Parameters		Units	Specifications	Notes
pressure medium			compatible with pressure diaphragm	
pressure types & ranges	gauge	bar	-1~0, 0~0.1, ~0.35, ~0.7, ~1, ~1.6, ~2.5, ~4, ~6, ~10, ~16, ~25	1
	absolute	bar	0~0.35, ~0.7, ~1, ~1.6, ~2.5, ~4, ~6, ~10, ~16	
	sealed gauge	bar	0~10, ~16, ~25, ~60, ~100, ~160, ~250, ~400, ~600	
overload pressure		%fs	250 (< 35bar), 150 (≥ 35bar)	2
output signal		mV	≥ 60, ≥ 40 in case of 0.1bar range, option: 10%~90%Vs ratiometric, I^2C, SPI	3 & 4
excitation	voltage	Vdc	5 (max. 10)	
	current	mA	1.5 (max. 2)	
zero offset		mV	≤ ±3	4
accuracy		%fs	±0.25 (standard), ±0.5	5
long-term stability		%fs/year	≤ ±0.1	
input resistance		kΩ	4±1	
output resistance		kΩ	3±1	
insulation resistance		MΩ	≥ 500 @100Vdc	
compensated temperature range		°C	0 ~ 50 (standard)	
operating temperature range		°C	-40 ~ +125	
storage temperature range		°C	-40 ~ +125	
temperature coefficient of zero offset		%fso/°C	≤ ±0.02	6
temperature coefficient of span		%fso/°C	≤ ±0.02	6
life time		cycles	10^8	
response time		ms	≤ 1	7
process sealing			O-ring (fluorine rubber)	
electrical interface			4 colored flying wires, silicone rubber, 100mm (standard)	
			5 gold-plated copper pins, Φ0.5mm, 12mm	
pressure diaphragm			316L SS (standard), Hastelloy-C, Tantalum	
wetted parts material			316L SS (standard), Hastelloy-C, Tantalum	
filling oil			silicone oil	
net weight		gram	~16.5 (≤ 100bar), ~25 (≥ 200bar)	

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. For customized pressure ranges, consult BCM.
2. "fs" refers to full scale pressure.
3. Measured at fs, i.e. full scale pressure.
4. Measured at 5Vdc excitation.
5. Accuracy = sqrt (non-linearity^2 + hysteresis^2 + repeatability^2).
6. Calculated as a rate of output change between 0°C and 50°C, and normalized by the output at 25°C, for the sensor which is temperature compensated.
7. Response time for a 0 bar to fs step change, 10% to 90% rise time.

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

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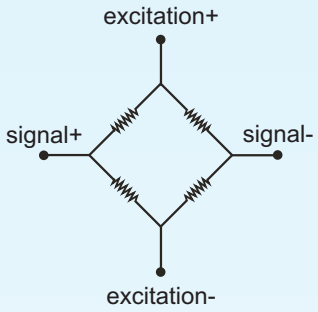
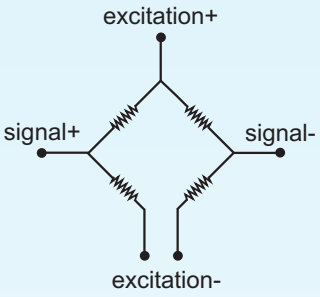
Circuit Diagram



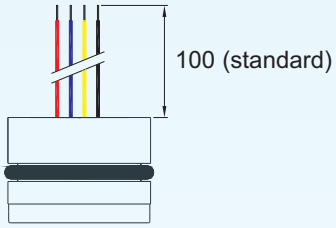
closed-bridge circuit diagram
for compensated sensors



open-bridge circuit diagram
for uncompensated sensors

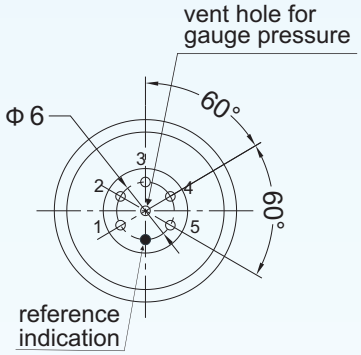
Electrical interface

4-colored flying wires (4F)



wire color	connection
red	excitation +
black	excitation -
yellow	signal +
blue	signal -

5 pins (5P)



compensated sensors (closed-bridge)

pin	connection
1	excitation +
2	signal +
3	excitation -
4	N.C.(1)
5	signal -

uncompensated sensors (open-bridge)

pin	connection
1	excitation +
2	signal +
3	excitation -
4	excitation -
5	signal -

Notes: (1) N.C.: Not connected.
(2) All dimensions are in mm.
(3) In case of alterations, refer to the label on the package.

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Ordering Information

position (pos.) 1: model

101B(a19G)

pos. 2: pressure ranges and references

(-1/0)bar	G	1.6bar	G, A	16bar	G, A, S	250bar	S	G: gauge pressure
0.1bar	G	2.5bar	G, A	25bar	G, S	400bar	S	A: absolute pressure
0.35bar	G, A	4bar	G, A	60bar	S	600bar	S	S: sealed gauge
0.7bar	G, A	6bar	G, A	100bar	S			
1bar	G, A	10bar	G, A, S	160bar	S			

pos. 3: output signal

standard: 40mV for range of 0.1bar; 60mV for other ranges
options: 10%/90%Vs(ratiometric) I^2C SPI

pos. 4: accuracy

0.25%fs (standard) 0.5%fs

pos. 5: compensation

T1 = 0 ~ 50 °C (standard)
NT = no temperature compensation

pos. 6: pressure diaphragm

316LSS = 316L stainless steel (standard) Ha = Hastelloy-C Ta = Tantalum

pos. 7: wetted parts

316L = 316L stainless steel (standard)
Ha = Hastelloy-C
Ta = Tantalum

pos. 8: electrical interface

4F = 4 colored flying silicone rubber wires (standard)
5P = 5 gold-plated copper pins
If the required output signal is not mV, the electrical interface will be adjusted as the way confirmed on request.

pos. 9: excitation

v = 5Vdc (standard) c = 1.5mA

pos. 10: 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	pos. 9	pos. 10

Examples of Ordering Code

- standard sensor:

  101B(a19G)-6barG-60mV-0.25%fs-T1-316L-316L-4F-v

- customized sensor:

  101B(a19G)-100barS-10%/90%Vs-0.25%fs-T1-316L-316L-3F-v-(*)

  (*): - Customized output signal = 10%~90%Vs ratiometric
  - Electrical interface = 3 colored flying wire.

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