

Model 101B(a19G) Pressure Sensors



Description

The 101B(a19G) pressure sensor is developed to 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, I²C, 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

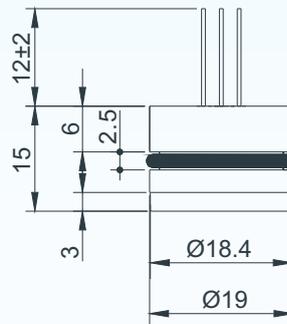
Applications

- 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, 4~20mA, I ² C, 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).

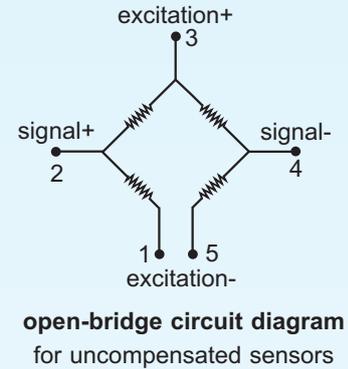
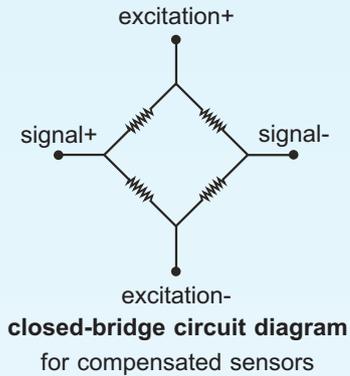
Notes: 1. For customized pressure ranges, consult BCM.

2. "fs" refers to full scale pressure.
3. Measured at fs, i.e. full scale pressure.
4. Measured at 5Vdc excitation.
5. Accuracy = $\sqrt{(\text{non-linearity})^2 + (\text{hysteresis})^2 + (\text{repeatability})^2}$.
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.

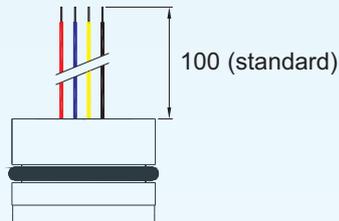
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Circuit Diagram



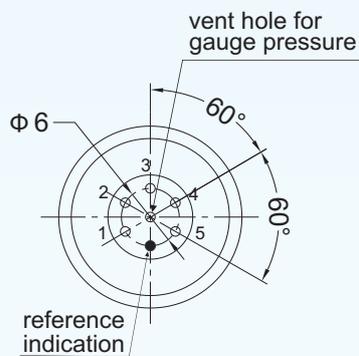
Electrical interface

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.

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 | | | | | | | | | |
| 60mV (standard) | | 10%/90%Vs | | 4/20mA | | I ² C | | 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.