# Model 101B(a19D)
# Low-Profile Differential Pressure Sensors

## Description

The model 101B(a19D) is a low-profile compensated differential pressure sensor, based on the BCM SE103 piezoresistive silicon sensor die. The sensing element is packaged in a 316L SS (stainless steel) housing where silicone oil is filled. Through the filling oil, measured pressure can be transferred from the 316L SS diaphragm to the sensing element. The 101B(a19D) which can be sealed by an O-ring features wetted parts with a diameter of 19mm.

The 101B(a19D) is designed for differential pressure measurement from 0~0.1bar to 0~20bar with accuracy up to 0.5%fs (full scale). Owing to the flush diaphragm, the sensor is enabled to measure viscous fluids or fluids with particles, and it is also compatible with corrosive media.

## Features

- differential ranges: 0.1bar, ..., 20bar
- accuracy up to 0.5%fs
- temperature compensation by laser trimming
- O-ring sealing method
- isolated construction, suitable for various fluid media
- constant current or constant voltage excitation

## Physical Properties

- diaphragm: 316L SS
- wetted parts: 316L SS
- O-rings: fluorine rubber
- filling fluid: silicon oil
- laser trim board: ceramic
- weight: ~ 46g

## Applications

- process control systems
- hydraulic systems
- liquid level control
- biomedical instruments
- flow measurement
- OEM equipment

## Reference Specifications

- media temperature: 25 ±1 °C
- ambient temperature: 25 ±1 °C
- vibration: 0.1 g (1m/s/s) max
- relative humidity: 50% ±10%
- ambient pressure: 0.86~1.06 bar
- excitation source: 1.5 ±0.0015 mA dc

## Environmental Conditions

- position effect: <0.1% of Zero shift for 90° tilt in any direction
- vibration effect: no influence until 10 g (RMS), 20~2000 Hz
- shock: 100 g, for 10 millisecond
- life time: 100 million cycles


**BCM SENSOR TECHNOLOGIES BVBA**

Industriepark Zone 4, Brechtsebaan 2
B-2900 Schoten - Antwerpen, BELGIUM

Tel.: +32-3-238 6469
Fax: +32-3-238 4171

website: www.bcmsensor.com
email: sales@bcmsensor.com

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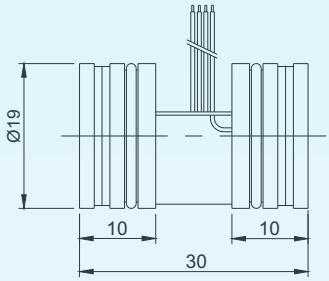
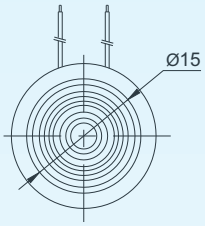
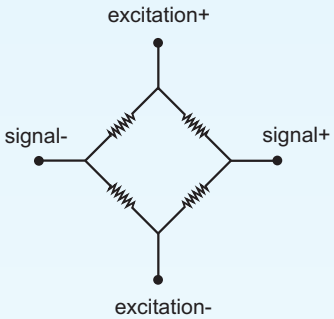
## Dimensions




## Wheatstone Bridge Circuit




## Electrical Interface

(4-colored flexible wires)

| connection | color |
|---|---|
| signal + | blue |
| excitaiton + | red |
| excitation - | yellow |
| signal - | green |

## Technical Data

| Parameters | Units | Specifications |
|---|---|---|
| pressure medium | | compatible to wetted parts |
| pressure ranges | bar | 0~0.1, ~0.2, ~0.35, ~0.7, ~1, ~2, ~3.5, ~7, ~10, ~20 |
| static pressure (or diff. overload) | %fs | 1000 (max. 50 bar) |
| full scale output | mV | ⩾12 @5Vdc |
| zero offset | mV | ⩽±1 |
| accuracy | %fs | ±0.5 (standard), ±1 |
| long-term stability | %fs/year | ⩽±0.3 |
| life time | cycles | $10^8$ |
| response time | ms | ⩽1 (10% ~ 90% of leading edge) |
| input resistance | kΩ | 6~20 (for voltage excitation), 3~6 (for current excitation) |
| output resistance | kΩ | 2.5~6 |
| insulation resistance | MΩ | ⩾100 @100Vdc |
| excitation | Vdc | 3, ..., 10, typically 5Vdc |
| | mA | 1, ..., 2, typically 1.5mA |
| compensated temperature range | °C | 0~50 (for ranges ⩽ 0.2bar); 0~70 (for ranges > 0.2bar) |
| operating temperature range | °C | -20 ~ +80 |
| storage temperature range | °C | -40 ~ +125 |
| temp. coefficient of zero offset | %fso/°C | ⩽±0.03 |
| temp. coefficient of span | %fso/°C | ⩽±0.03 |
| process sealing | | O-ring, welding |
| electrical interface | | 4 colored flying wires, 100mm length |
| diaphragm material | | 316L |
| housing material | | 316L |
| net weight | gram | ~46 |

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

**position (pos.) 1: model**

101B(a19D)

**pos. 2: pressure ranges and references**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0.1bar | D | 0.7bar | D | 3.5bar | D | 20bar | D | D: differential pressure |
| 0.2bar | D | 1bar | D | 7bar | D | | | |
| 0.35bar | D | 2bar | D | 10bar | D | | | |

**pos. 3: output signal**

12mV

**pos. 4: accuracy**

0.5%fs (standard) 1%fs

**pos. 5: static pressure**

1000%fs (for ranges < 7bar) 50bar (for ranges ⩾ 7bar)

**pos. 6: electrical interface**

FW: 4-color flying wires, wire length = 100mm.
The wire length can be customized on request.

**pos. 7: excitation**

v = constant voltage excitation (standard)
c = constant current excitation

**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:

  101B(a19D)-1barD-12mV-0.5%fs-1000%fs-FW-v

- customized sensor:

  101B(a19D)-3.5barD-20mV-1%fs-10bar-FW-c-(*)

  (*): Customized static pressure = 10bar.

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