

Model 101B(a19L) Short Height Pressure Sensors

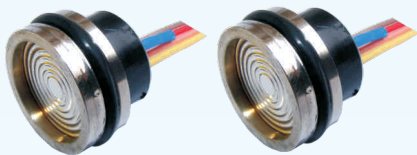
Description

Model 101B(a19L) pressure sensor (PS) is designed with a short height of 7mm of its sensor housing, which is 8mm shorter than that of 101B(a19G) PS and 6mm shorter than that of 101B(a19F). This feature brings the 101B(a19L) PS with advantages when the PS is used in the applications which have space limitation on the height of the sensor, e.g., to constitute 2-D or 3-D sensor arrays of thin thickness.

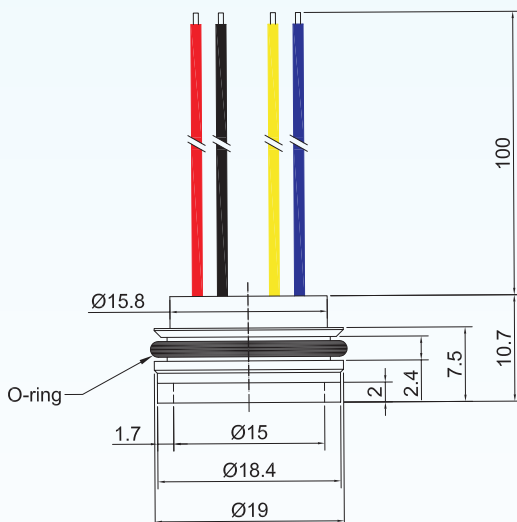
Both its diaphragm and its housing are made from 316L stainless steel. Therefore, the 101B(a19L) PS can measure pressures of corrosive or/and conductive pressure medium as long as the medium is compatible to 316L stainless steel.

The same as 101B(a19G), the 101B(a19L) PS has a piezoresistive pressure sensor die integrated inside the PS and its capsule is filled with un-compressive oil.

A variety of output signals are available, e.g., mV/V signal directly from the Wheatstone bridge circuit, ratiometric signal of 10%~90%Vs, or digital signal of I²C or SPI protocols via an SSC which is fixed at the PS backside.



Dimensions



Note: All dimensions are in mm.

Features

- measuring ranges: -1bar, 0.1bar, ..., 100bar
- accuracy up to 0.25%fs
- either with or without temperature compensation
- compensated temperature range: -10~+70 °C
- outstanding reliability
- excited by either current or voltage

Applications

- process control systems
- liquid level control
- pneumatic and hydraulic systems
- biomedical instruments
- heating, ventilation, and air conditioning controls
- petroleum and chemical industry
- ship and marine systems
- aviation

Environmental Conditions

- 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

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Model 101B(a19L)

Short Height Pressure Sensors



Technical Data

Parameters		Units	Specifications	Notes
pressure medium			compatible with pressure diaphragm	
pressure ranges	gauge	bar	-1~0, 0~0.1, ~0.2, ~0.35, ~0.7, ~1, ~2, ~4, ~6, ~10, ~16, ~20, ~35	1
	absolute	bar	0~1, ~2, ~4, ~6, ~10, ~16, ~20, ~35, ~70, ~100	1
proof pressure		%fs	200	2
burst pressure		%fs	300	
output signal		mV	≥ 60, ≥ 30 in case of 0.1bar gauge	3 & 4
		option	10%~90%Vs ratiometric, I ² C, SPI	5
excitation	voltage	Vdc	5 (max. 10)	
	current	mA	1.5 (max. 2)	
zero offset		mV	≤ ±2	4
accuracy		%fs	±0.25 (standard), ±0.5	6
long-term stability		%fs/year	≤ ±0.1, ≤ ±0.2 in case of ranges < 2bar	
input resistance		kΩ	5±3	
output resistance		kΩ	4.5±1.5	
insulation resistance		MΩ	≥ 100 @250Vdc	
compensated temperature range		°C	0~50 (ranges ≤ 2bar), -10~+70 (ranges > 2bar)	
operating temperature range		°C	-40 ~ +125, -40 ~ +85 in case of option outputs	
storage temperature range		°C	-40 ~ +125, -40 ~ +85 in case of option outputs	
temperature drift of zero offset		%fso	≤ ±1.2 (ranges < 0.35bar), ≤ ±0.8 (0.35bar ≤ ranges ≤ 2bar) ≤ ±0.75 (ranges > 2bar)	4 & 7
temperature drift of span		%fso	≤ ±1.2 (ranges < 0.35bar), ≤ ±0.8 (0.35bar ≤ ranges ≤ 2bar) ≤ ±0.75 (ranges > 2bar)	4 & 7
life time		cycles	10 ⁸	
response time		ms	≤ 1	8
process sealing			O-ring (fluorine rubber)	
electrical interface			colored flying wires, silicone rubber, 100mm (standard)	9
			pins	9 & 10
			flexible flat cable, 15mm (available for ratiometric output)	9
pressure diaphragm			316L SS	
wetted parts material			316L SS	
filling oil			silicone oil	
net weight		gram	~16	

General conditions for measurements: media temp. = 25°C ±1°C, ambient temp. = 25°C ±1°C, humidity = 50%RH ±5%RH,
barometric pressure: 860~1060mbar, max. vibration = 0.1 g (i.e. 1m/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. A PCB board will be attached to the sensor.
6. Accuracy = sqrt (non-linearity² + hysteresis² + repeatability²).
7. Calculated as the maximum change of output signal over the compensated temperature range.

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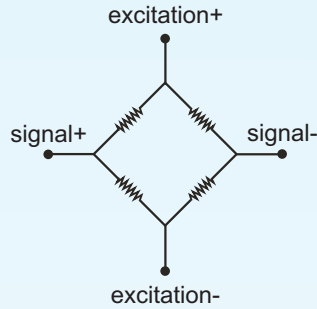
Model 101B(a19L) Short Height Pressure Sensors

Notes: 8. Response time for a 0 bar to fs step change, 10% to 90% rise time.

9. 4 contacts for millivolt output and for I²C and SPI output; 3 contacts for ratiometric and ZACwire output.

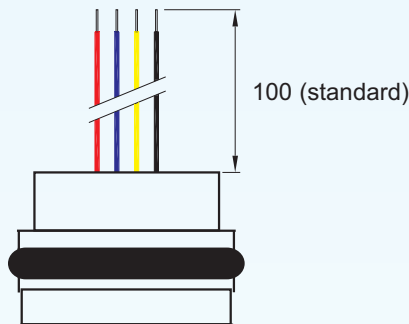
10. In case of millivolt output, the pins are 5 gold-plated copper pins of $\Phi 0.5\text{mm}$ and 13mm length. The configuration and electrical definition of these 5 pins are specified in Electrical Interface.

Circuit Diagram



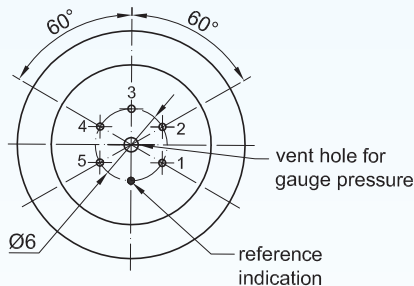
Electrical interface

4-colored flying wires (4F)



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

5 pins (5P)



pin	connection
1	excitation +
2	signal +
3	excitation -
4	N.C. ⁽¹⁾
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(a19L)									
pos. 2: pressure ranges and references									
(-1/0)bar G		1bar G, A		16bar G, A		G: gauge pressure			
0.1bar G		2bar G, A		20bar G, A		A: absolute pressure			
0.2bar G		4bar G, A		35bar G, A					
0.35bar G		6bar G, A		70bar A					
0.7bar G		10bar G, A		100bar A					
pos. 3: output signal									
standard: 30mV for range of 0.1barG; 60mV for other ranges									
options: 10%/90%Vs(ratiometric) I ² C SPI									
pos. 4: accuracy									
0.25%fs (standard)				0.5%fs					
pos. 5: compensation									
T1 = 0~50°C (≤ 2bar), -10~+70°C (> 2bar)									
pos. 6: pressure diaphragm									
316L = 316L stainless steel									
pos. 7: wetted parts									
316L = 316L stainless steel									
pos. 8: electrical interface									
FW (standard): 3 or 4 (#) colored PVC flying wires, length = 100mm (##)									
PI: 3, 4, or 5 (#) pins									
FC (available for ratiometric output): 3-conductor flat cable, length = 15mm (##)									
#: The specific number of conductor refers to note-9 and -10 of Technical Data.									
##: Length can be customized 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(a19L)-6barG-60mV-0.25%fs-T1-316L-316L-FW-v

- customized sensor:

101B(a19L)-10barA-10%/90%Vs-0.25%fs-T1-316L-316L-FW-v(*)

(*): Customized output signal = 10%~90%Vs ratiometric.

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

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