

Model 301B- and 302B-series Mono-block Ceramic Pressure Sensors



Features

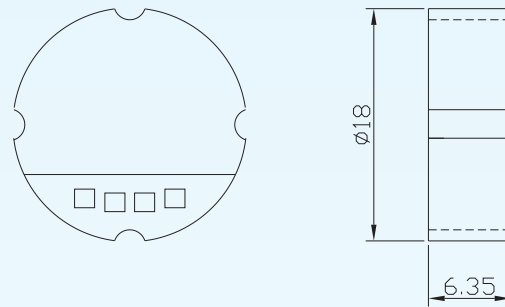
- thick film ceramic (96% Al₂O₃) technology
- high resistance to chemical corrosion of aggressive pressure mediums
- mono-block ceramic construction for gauge pressure measurement
- measuring range from 0~2 bar to 0~400 bar
- output sensitivity 2 mV/V (301B-series), 3 mV/V (302B-series)
- accuracy of 0.35 %fs (301B-series), 0.5%fs (302B-series)
- customer tailored design available on request



Applications

- Process control systems
- Level systems
- Hydraulic systems and valves
- Biomedical instruments

Dimensions



Description

301B- and 302B-series ceramic pressure sensors (PS) are developed and manufactured by means of BCM advanced thick film technology. These ceramic PS's are operated in piezo-resistive working principle.

Both 301B- and 302B-series ceramic PS's feature a mono-block construction which consists of a rigid ceramic chamber as its base and a ceramic diaphragm to measure the pressure of pressure medium. The thickness of the ceramic diaphragm is precisely designed according to the pressure range to be measured, while the outer diameter of the ceramic tube is set to 18 mm as its standard. Imprinted and sintered on the ceramic diaphragm is a Wheatstone bridge circuit which is made up through a number of sophisticated silk-screen printing and sintering processes. The circuit is protected by a passivation glass layer and, on the top of it, covered with a varnish layer to prevent the circuit from mechanical scratches.

As the ceramic material selected is the high quality Al₂O₃ (96%), both the 301B-a18 and 302B-a18 ceramic PS's possess high resistance to chemical corrosion imposed by aggressive pressure medium. In addition, thanks to its outstanding mechanical and thermal characteristics and an excellent match of thermal property between the selected Al₂O₃ ceramic material and the piezoresistive past, both the 301B-a18 and 302B-a18 ceramic PS's produce a rather good signal-to-noise ratio at full scale with a reasonable accuracy in pressure measurement. Compared to the 301B-series, the 302B-series ceramic PS possesses a higher sensitivity thanks to the paste specially developed for the purpose.

Both 301B- and 302B-series ceramic PS can be manufactured in either temperature-compensated version or non-temperature-compensated version (model 301A-a18, and 302A-a18). Both versions are in mass production and have a good cost-to-performance ratio for low-cost application.

301B- and 302B-series ceramic PS's are designed for gauge pressure measurement, having been widely installed in air-co, LPG, automotive, and house appliance industries.

BCM SENSOR TECHNOLOGIES BVBA

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Technical Data

parameters	units	specifications	
model*		301B-a18	302B-a18
pressure ranges	barG	0~2, ~5, ~10, ~20, ~25, ~40, ~60, ~100, ~250, ~400 bar	
	barA	NA**	
	barS	NA	
overload pressure	%fs	200	
burst pressure	%fs	300	
output sensitivity	mV/V	2.0 ± 0.2	3.0 ± 0.3
option: conditioned signal	V	0.5~4.5 V ratiometric (available on request for size order)	
zero offset	mV/V	0.5	1
accuracy ***	%fs	0.35	0.5
long-term stability of zero offset	%fs/1000hrs.	± 0.4 (@70°C)	
excitation	V	5, ..., 25 (5V in case of 0.5~4.5 V ratiometric output)	
bridge resistance	kΩ	11 ± 20%	
insulation resistance	MΩ	≥2000@50 Vdc	
storage temp. range	°C	-40 ~ +135	
operating temp. range	°C	-40 ~ +125	
compensated temp. range	°C	0 ~ 70	
temp. coefficient of sensitivity	%fs/°C	0.02	0.05
temp. coefficient of zero offset	%fs/°C	0.02	0.05
response time	ms	<1	
material of pressure diaphragm		ceramic (96% Al ₂ O ₃)	
electrical interface		SP: solder-pads (standard)	
		PL: plated leads of 16 mm length	
		FR: flat-ribbon cable of 100 mm length	
unit weight	g	~ 3	

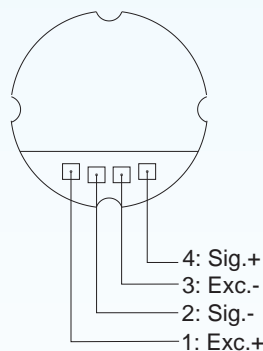
The listed specifications and dimensions are subject to change without prior notice.

*: The corresponding non-compensated models are 301A-a18 and 302A-a18, respectively.

** : NA = not available or not applicable

***: The accuracy comprises the non-linearity (NL), hysteresis (HY) and repeatability (RP): accuracy = $\sqrt{NL^2+HY^2+RP^2}$.

Electrical Connections:



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Ordering Information:

position (pos.) 1: model										
301B-a18		non-compensated model: 301A-a18								
302B-a18		302A-a18								
pos. 2: ranges and types										
2 bar, G		40 bar, G		G: gauge pressure						
5 bar, G		60 bar, G								
10 bar, G		100 bar, G								
20 bar, G		250 bar, G								
25 bar, G		400 bar, G								
pos. 3: output signal										
2 mV/V (for 301B-a18)		option: 0.5–4.5 V (ratiometric), only available for size order								
3 mV/V (for 302B-a18)										
pos. 4: accuracy										
0.35 %fs (for 301B-a18)										
0.5 %fs (for 302B-a18)										
pos. 5: supply power										
5/25V: 5, ..., 25 Vdc (for mV output)		5 V (for o/p = 0.5–4.5 V)								
pos. 6: compensated temperature range										
0/70: 0–70 °C		NA: for non-compensated PS. In case of "NA", pos.6 can be omitted from the ordering code.								
pos. 7: filling fluid										
NA. In case of "NA", pos.6 can be omitted from the ordering code.										
pos. 8: material (diaphragm)										
Ceramic. In case of ceramic PS, pos.8 can be omitted from the ordering code.										
pos. 9: mechanical interface										
NA. In case of "NA", pos.9 can be omitted from the ordering code.										
pos. 10: electrical interface										
SP: solder-pads (standard)										
PL: plated leads of 16 mm length										
FR: flat-ribbon cable of 100 mm length										
pos. 11: customized spec's										
When any customized spec's are required, the customer needs to add "C" as the last parameter in the ordering code, and specifies the wished spec's on his order clearly.										
The customized spec's needs to be confirmed in advance by BCM's sales representative.										
Code "C" can be omitted if no customized spec's are required.										
pos.1	pos. 2	pos. 3	pos. 4	pos. 5	pos. 6	pos. 7	pos. 8	pos. 9	pos. 10	pos. 11

*: NA = not available or not applicable

example: 301B-a18-20barG-2mV/V-0.35%fs-5/25V-0/70C-FR-C
302A-a18-20barG-3mV/V-0.5%fs-5/25V-FR-C



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