

Model 115C

Metal Capacitive Differential Pressure Sensors

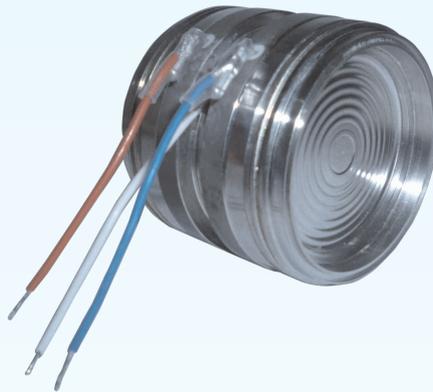


Description

The model 115C is a capacitive differential pressure sensor, based on the BCM metal capacitor technology. The sensing element is composed of two stationary capacitor plates and one movable sensing diaphragm. The sensing diaphragm is located between the two capacitor plates, and it forms two separated chambers together with each capacitor plate. The whole sensing element is packaged in a 316L SS (stainless steel) housing which is filled with silicone oil. Through the filling oil, measured pressures can be transferred from two 316L SS isolating diaphragms to the sensing element. If these two pressures are different, the sensing plate will be forced to move closer to one of the capacitor plates. As a result, the electrical output signal can be created by means of the capacitance change between the sensing plate and the two capacitor plates.

For different applications, there are different types of fill fluid available for this model. The sensor can be filled with the standard type-A fluid for common industry of general purpose, with the type-B fluid suitable for oxygen industry, or with the type-C fluid suitable for tobacco industry.

The 115C is designed to have a wide variety of pressure ranges from 0~75 mbar differential (D) pressure to 0~413.7 bar gauge (G) pressure with an accuracy up to 0.2%fs (full scale). Owing to the large diameter diaphragm, the sensor is enabled to measure viscous fluids or fluids with particles, and it is also compatible with corrosive media. Tantalum, Hastelloy-C, or Monel diaphragms are available on request for stronger corrosive media applications. The 115C which can be sealed by O-rings features wetted parts with a diameter of 40.8mm.



Features

- pressure ranges & types:
 - D: 0~75 mbar, ... , 0~68.9 bar
 - G: 0~75 mbar, ... , 0~413.7 bar
 - A: 0~374 mbar, ... , 0~68.9 bar
- static pressure: up to 320 bar for diff. pressure applications
- overload pressure: up to 520 bar for gauge pressure applications
- accuracy up to 0.2%fs
- 100% stainless steel construction
- material of diaphragm: 316L stainless steel (SS)
 - option: Hastelloy-C, Tantalum, or Monel

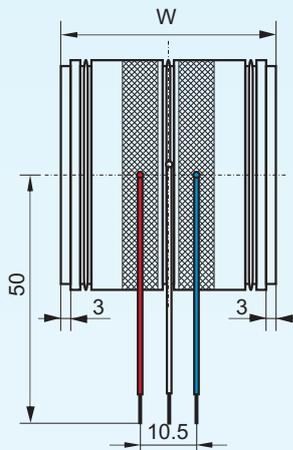
Applications

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

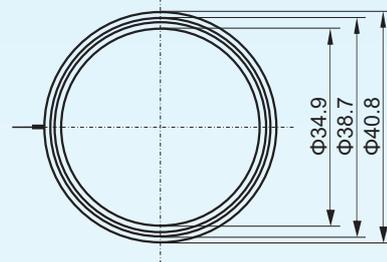
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Dimensions



W < 35.1 (for ranges II, III)
W ≥ 35.1 (for ranges IV, ..., IX)



the red wire: high pressure side
the blue wire: low pressure side
the white wire: sensor housing

Technical Data

Parameters	Units	Specifications		Notes
pressure medium		gas, dilute liquid, paste, viscous fluid or fluid with grains, as long as compatible with the diaphragm material of 115C		
differential pressure (D) ranges	bar, D	0~0.075	0~0.075, ~0.374, ~1.868, ~6.9, ~20.68, ~68.9	
static pressure	bar	69	138, 320	
differential overload pressure	bar	69	138, 320	
gauge pressure (G) ranges	bar, G	0~0.075	0~0.075, ~0.374, ~1.868, ~6.9, ~20.68, ~68.9	0~206.8, 0~413.7
absolute pressure (A) ranges	bar, A	-	0~0.374, ~1.868, ~6.9, ~20.68, ~68.9	-
overload pressure for G & A pressures	bar	69	138, 320	520
full scale output	pF	90±40 measured from high pressure side, i.e., between red and white wires. 280±40 measured from low pressure side, i.e., between blue and white wires.		
zero offset	pF	120±20 in case of pressure range of 1.868bar; 140±40 in case of the other ranges		
accuracy	%fs	±0.2 in case of pressure ranges of 0.374bar, 1.868bar, 6.9bar, 20.68bar; ±0.25 in case of pressure ranges of 0.075bar, 68.9bar, 206.8bar, 413.7bar; ±0.5 (standard)		1 & 2
long-terms stability	%fs/year	≤ ±0.25		
zero variation caused by static pressure	%fso	≤ ±0.5		3
span variation caused by static pressure	%fso	≤ ±0.5		3
operating temperature range	°C	-20 ~ +93 (standard), fill fluid type-A for common industry. -40 ~ +130, fill fluid type-B suitable for oxygen industry. -40 ~ +130, fill fluid type-C suitable for tobacco industry.		
storage temperature range	°C	-40 ~ +105		
temperature coefficient of zero	%fso/°C	≤ ±0.025		
temperature coefficient of span	%fso/°C	≤ ±0.025		
insulation resistance	MΩ	> 500 @100Vdc		
response time	ms	≤ 100 in case of ranges > 0.075bar; ≤ 400 in case of 0~0.075bar range		
electrical interface		3 colored flying wires with FEP (Teflon) insulation, length = 50mm		
diaphragm material		316L SS (standard); option: Hastelloy-C, Tantalum, or Monel		
housing material		3J53 alloy steel		
weight	g	~280		

General conditions for measurements: media temperature = 25°C, ambient temperature = 25°C, humidity = 60%RH.

Notes: 1. "fs" refers to full scale pressure.

2. Accuracy = sqrt (non-linearity² + hysteresis² + repeatability²).

3. The variations of zero and span can be eliminated when the 115C DPS is associated with an electronics circuit which is adjusted to the given static pressure.

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Ordering Information

example: 115C(DP)-V-138-S-0.5%fs-TA-12-(*)

pressure types	
115C(DP) 115C for DP applications	
115C(hDP) refers to DP of high static pressure of 320bar	
115C(AP) 115C for absolute pressure applications	
115C(GP) 115C for gauge (relative) pressure applications	
pressure ranges & types vs static (overload) pressure	
II = 0~75mbarD or G vs 69bar, 138bar, or 320bar	
III = 0~374mbarD, G, or A vs 138bar or 320bar	
IV = 0~1.868barD, G, or A vs 138bar or 320bar	
V = 0~6.9barD, G, or A vs 138bar or 320bar	
VI = 0~20.68barD, G, or A vs 138bar or 320bar	
VII = 0~68.9barD, G, or A vs 138bar or 320bar	
VIII = 0~206.8barG vs 520bar	
IX = 0~413.7barG vs 520bar	
static (overload) pressure	
69 = 69bar in case of DP ranges II	
138 = 138bar in case of ranges II, ..., VII	
320 = 320bar in case of ranges II, ..., VII	
520 = 520bar in case of G ranges VIII or IX	
output signal	
S = differential capacitive signal	
accuracy	
0.2%fs in case of ranges III, IV, V, VI	
0.25%fs in case of ranges II, VII, VIII, IX	
0.5%fs (standard)	
operating temperature range	
TA = -20 ~ +93°C (standard, fill fluid type-A for common industry)	
TB = -40 ~ +130°C (fill fluid type-B for oxygen industry)	
TC = -40 ~ +130°C (fill fluid type-C for tobacco industry)	
diaphragm material	
12 = 316L SS (standard)	
13 = Hastelloy-C	
14 = Tantalum	
15 = Monel	
“(*)” is necessary only if any customized parameter is required, otherwise it is neglectable.	

Examples of Ordering Code

- standard sensor:

115C(DP)-V-138-S-0.5%fs-TA-12

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

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