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 0~15 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: 0~15 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 312 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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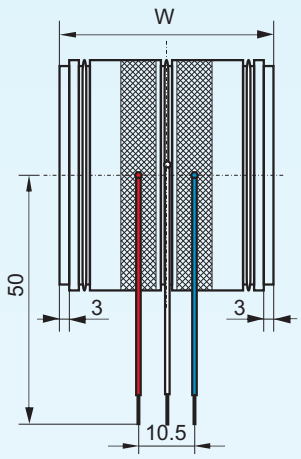
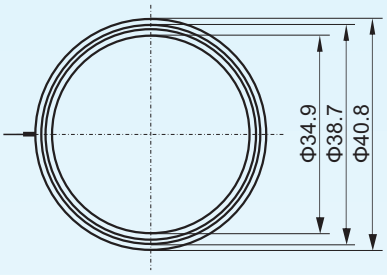
Dimensions



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



the red wire: high pressure side
the blue wire: low pressure side
the white wire: GND

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	mbar, D	0~15; ~75; ~374; ~1,868; ~6,900; ~20,700	~374; ~1,868; ~6,900; ~20,700; ~68,900		1
static pressure	bar	150	312		
differential overload pressure	bar	150	312		
gauge pressure (G) ranges	bar, G	0~0.075; ~0.374; ~1.9; ~6.9; ~20.7; ~68.9	0~206.8	0~413.7	
absolute pressure (A) ranges	bar, A	0~0.374; ~1.9; ~6.9; ~20.7; ~68.9			
overload pressure for G & A pressures	bar	150	420	520	
full scale output	pF	90 ±20 if the high pressure is at “H” side. 300 ±40 if the high pressure is at “L” side.			
output option (with extra SSC circuit)		4~20mA			2
zero offset	pF	120 ±40 for pressure ranges ⩽ 0~1,868 mbar; 140 ± 40 for other pressure ranges			
accuracy	%fs	±0.2, ±0.5 (standard)			3
zero variation caused by static pressure	%fso	0.5 for diff. pressure range 0~15mbar 0.25 for other pressure ranges			4
span variation caused by static pressure	%fso	-1.5 ±0.25 for pressure ranges ⩽ 0~75 mbar -1 ±0.25 for other pressure ranges			4
operating temperature range	°C	-40 ~ +105 (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 ~ +60			
temperature coefficient of zero	%fso/°C	⩽ ±0.0045			
temperature coefficient of span	%fso/°C	⩽ ±0.009			
long-terms stability	%fs/year	⩽ ±0.25			
insulation resistance	MΩ	> 500 @100Vdc			
electrical interface	wires	3 colored flying wires with PVC insulation, length = 50mm (standard)			
diaphragm material		316L SS (standard); option: Hastelloy-C, Tantalum, or Monel			
weight	g	~280			

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

Notes:
1. The range of 0~15mbar is available only when the extra SSC circuit is applied, i.e., the output signal is 4~20mA.
2. The sensor will be equipped with the extra SSC (sensor signal conditioning) circuit to realize 4~20mA output.
3. If the output signal of 4~20mA is required, the best accuracy will be 0.5%fs.
4. 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.

The listed specifications are subject to change without prior notice.

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Ordering Information

example: 115C(DP)-V-150-S-0.5%fs-TA-12-(*)

pressure types
115C(vDP) is for pressure range I only
115C(DP) 115C for DP applications
115C(hDP) refers to high static pressure of 312bar
115C(AP) 115C for absolute pressure applications
115C(GP) 115C for gauge (relative) pressure applications

pressure ranges & types vs static (overload) pressure	
I = 0~15 mbarD (only for 4~20mA output)	vs 150bar
II = 0~75 mbarD or G	vs 150bar
III = 0~374 mbarD, G, or A	vs 150bar or 312bar
IV = 0~1,868 mbarD, G, or A	vs 150bar or 312bar
V = 0~6.9 barD, G, or A	vs 150bar or 312bar
VI = 0~20.7 barD, G, or A	vs 150bar or 312bar
VII = 0~68.9 barD, G, or A	vs 150bar or 312bar
VIII = 0~206.8 barG	vs 420bar
IX = 0~413.7 barG	vs 520bar

static (overload) pressure
150 = 150bar for DP ranges I~VI, G ranges I~VI, or A ranges III~VII
312 = 312bar for DP ranges III~VII
420 = 420bar for G range VIII
520 = 520bar for G range IX

output signal
S = diff. capacitive signal & signal from temperature sensor (standard)
C = 4~20 mA

accuracy	
0.2%fs	0.5%fs (standard)
other accuracies on request	

operating temperature range
TA = -40 ~ +105°C (standard)
TB = -40 ~ +130°C
TC = -40 ~ +130°C

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-150-S-0.5%fs-12-TA

- customized sensor:

  115C(vDP)-I-150-C-1.5%fs-12-TA-(*)

  (*): Customized accuracy = 1.5%fs.

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