

Model 315T

Smart Differential Pressure Transmitters



Description

Model 315T smart pressure transmitters are developed from model 115C capacitive pressure sensors from BCM SENSOR. With advanced electronics, the 315T transmitter has 4~20mA output with HART protocol and can have its zero and span easily adjusted on site.

Thanks to the unique structure of metal capacitive working principle, the 315T transmitter can measure low differential pressure down to 0~2mbar and sustain high static pressure up to 320bar. And Tantalum, Hastelloy-C, or Monel diaphragms are available on request for more corrosive media applications in case 316L stainless steel is no longer applicable.

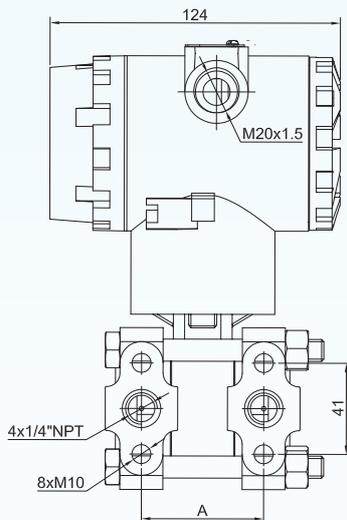
Last but not least, different types of fill fluid are available for this model for different applications. The fill fluid can be the standard type-a fluid for common industry of general purpose, the type-b fluid suitable for oxygen industry, or the type-c fluid suitable for tobacco industry.



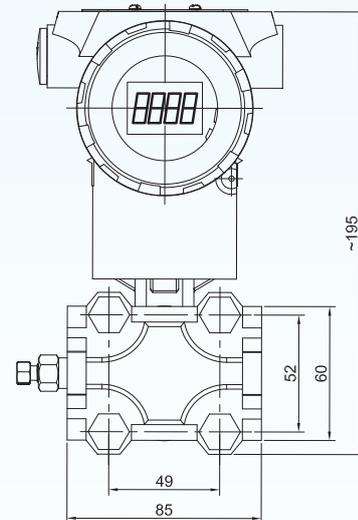
Features

- pressure range: down to 0~2mbarD
- static pressure: up to 510bar
- output signal: 4~20 mA with HART protocol
- accuracy: up to 0.1%fs
- construction: rigid, welded encapsulation
- materials: diaphragm 316L, Hastelloy-C, or Tantalum
- sensor housing: 304
- electronics housing: aluminum alloy
- flange: 304, 316, Hastelloy-C, or Tantalum
- O-ring material: fluororubber
- vibration effect: 0.05%fso/g/200Hz (any directions)
- explosion proof available on request
- environment protection: IP65
- 4½ digit LCD display with green backlight

Dimensions



Pressure Range (bar)	A (mm)
0~0.016, ..., ~2	54
0~10	55.4
0~25	55.8
0~100	57.4
0~200, ~410	60



Note: all dimensions are in mm.

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Technical Data

Parameters	Units	Specifications							Notes
pressure medium		gas, dilute liquid, paste, viscous fluid or fluid with grains, as long as it is compatible with the materials of 315M wetted parts							
differential pressure (D) ranges	bar, D	0~0.016	~0.06	~0.4, ~2, ~10	~25	~100			1
static pressure	bar	20	40	100 (STD), 250, 320	125	200			2
differential overload pressure	bar	20	40	100 (STD), 250, 320	125	200			2
gauge pressure (G) ranges	bar, G	0~0.016	~0.06	~0.4, ~2, ~10	~25	~100	~200	~410	1
absolute pressure (A) ranges	bar, A	-	-	0~2, ~10	~25	~100	~200	-	1
minimum adjustable ranges		0~0.002	~0.016	~0.06, ~0.4, ~1.8	~8	~20	~80	~180	3
overload for G & A pressures	bar	20	40	100 (STD), 250, 320	125	200	250 (STD), 520	520	2
output signal		4~20mA with HART protocol							
accuracy	%fs	better than ± 0.1 , ± 0.2 (standard), ± 0.5							4 & 5
long-terms stability	%fs/year	$\leq \pm 0.25$; $\leq \pm 0.5$ in case of 0.016barD/G, or 200barG/A							
supply voltage (Vs)	Vs	12, ..., 30							
load resistance	Ω	$\leq (Vs - 12V) / 0.02A$							
zero variation caused by static pressure	%fso	$\leq \pm 0.5$							
span variation caused by static pressure	%fso	$\leq \pm 0.5$							
operating temperature range	$^{\circ}C$	-40 ~ +85							
storage temperature range	$^{\circ}C$	-40 ~ +85							
temperature coefficient of zero	%fso/ $^{\circ}C$	$\leq \pm 0.01$, $\leq \pm 0.025$ in case of 0.016barD/G							
temperature coefficient of span	%fso/ $^{\circ}C$	$\leq \pm 0.01$, $\leq \pm 0.025$ in case of 0.016barD/G							
insulation resistance	M Ω	$\geq 500 @ 100Vdc$							
response time	ms	≤ 100 in case of ranges $> 0.06bar$; ≤ 400 in case of 0~0.06bar range							
diaphragm material		316L SS (standard); option: Hastelloy-C, or Tantalum							
sensor housing material		304 SS							
electronics housing material		cast aluminum alloy							
flange material		304 SS (standard); option: 316 SS, Hastelloy-C, or Tantalum							
O-ring material		fluorine rubber							
process connection		1/4" NPT female thread, others are available on request							
electrical interface		M20x1.5 female thread, others are available on request							
environment protection		IP65							
explosion proof (option)		Exd IIC T6 Gb, Exia IIC T6 Ga							
field display		4½ digit black LCD display with green backlight							

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

Notes: 1. The listed D/G/A ranges refer to the designed ranges.

2. "STD" refers to standard.

3. The minimum adjustable range refer to the minimum range which can be calibrated by the sensor signal conditioner to the conditioned output from the corresponding designed range under condition of meeting the specifications listed in the table above.
E.g., the designed range of 0~2barD can be calibrated to measure minimum 0~0.4barD which has 4mA output signal related to 0barD while 20mA output signal related to 0.4barD.

4. "fs" refers to full scale pressure.

5. Accuracy = $\sqrt{\text{non-linearity}^2 + \text{hysteresis}^2 + \text{repeatability}^2}$.

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Ordering Information

example: 315T(DP)-0/2-100-4/20mAwithHART-0.5%fs-Ta-F-21-D1-1-LD-NE-(*))

transmitter types & pressure references	
315T(DP):	for differential pressure (DP) applications
315T(hDP):	DP of high static pressure of 250bar or 320bar
315T(AP):	for absolute pressure (AP) applications
315T(GP):	for gauge (relative) pressure (GP) applications

pressure ranges & ref.	examples of selectable ranges(#)	static (overload) pressure
0~2, ..., 16mbar D(*), or G	0/0.016, -0.016/+0.016, -0.002/+0.002	20bar
0~16, ..., 60mbar D(*), or G	0/0.06, -0.06/+0.06, -0.016/+0.016	40bar
0~60, ..., 400mbar D(*), or G	0/0.4, -0.4/+0.4, -0.06/+0.06	100bar (standard), 250bar, or 320bar
0~0.4, ..., 2bar D(*), G, or A	0/2, -2/+2, -0.4/+0.4	100bar (standard), 250bar, or 320bar
0~1.8, ..., 10bar D(*), G, or A	0/10, -10/+10, -1.8/+1.8	100bar (standard), 250bar, or 320bar
0~8, ..., 25bar D(*), G, or A	0/25, -25/+25, -8/+8	125bar
0~20, ..., 100bar D(*), G, or A	0/100, -100/+100, -20/+20	200bar
0~80, ..., 200bar G, or A	0/200, -1/+200, -1/+80	250bar (standard), or 520bar
0~180, ..., 410bar G	0/410, -1/+410, -1/+180	520bar

(*): DP sensors can work with both $DP \leq 0$ and $DP \geq 0$, e.g., 0~2barD = measuring range of both -2~0bar and 0~+2bar.
 (#): The selected range must be between the minimum adjustable range and the designed range as listed above.
 The products will be calibrated according to the selected range before delivery.
 Taking "-2/+2" as example, this range refers to 4mA output signal at -2barD while 20mA output signal at +2barD.

static (overload) pressure
20 = 20bar in case of 16mbarD/G
40 = 40bar in case of 60mbarD/G
100 = 100bar in case of 400mbarD/G, 2barD/G/A, or 10barD/G/A
125 = 125bar in case of 25barD/G/A
200 = 200bar in case of 100barD/G/A
250 = 250bar in case of 400mbarD/G, 2barD/G/A, 10barD/G/A, or 200barG/A
320 = 320bar in case of 400mbarD/G, 2barD/G/A, or 10barD/G/A
520 = 520bar in case of 200barG/A, or 410barG

output signal
4/20mAwithHART (standard) If another output is required, consult BCM.

accuracy
0.1%fs 0.2%fs (standard) 0.5%fs

fill fluid
Ta = fill fluid type-a for common industry (standard) Tb = fill fluid type-b for oxygen industry
Tc = fill fluid type-c for tobacco industry

mechanical interface
F = flange with exhaust valve (standard) F3M = flange with exhaust valve and three-way manifold

mechanical interface materials			
code	diaphragm	sensor housing	flange & exhaust valve & manifold
21 (standard)	316L SS	304 SS	304 SS
22	316L SS	304 SS	316 SS
23	Hastelloy-C	304 SS	316 SS
24	Hastelloy-C	304 SS	Hastelloy-C
25	Tantalum	304 SS	316 SS
26	Tantalum	304 SS	Tantalum

exhaust valve position
D1 = at back of flange (standard) D2 = at upper part of side of flange
D3 = at lower part of side of flange

mounting means
1 = 2" pipe mounting kit 2 = panel mounting kit 3 = 2" pipe flat mounting kit

display
LD = digital, linear, 0~100% scale SD = digital, square root, 0~100% scale

explosion proof
NE = no explosion proof (standard) Exd = Exd IIC T6 Gb Exia = Exia IIC T6 Ga

(**)) is necessary only if any customized parameter is required, otherwise it is neglectable.

- Examples of Ordering Code**
- 315T with standard pressure range:
315T(DP)-0/2barD-100-4/20mAwithHART-0.25%fs-Ta-F-21-D1-1-LD-NE
 - 315T with customized pressure range:
315T(DP)-(-0.5/+1.5)barD-100-4/20mAwithHART-0.25%fs-Ta-F-21-D1-1-LD-NE-(*))
 (*)) Customized pressure range = -0.5~+1.5barD.

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

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