

Model 433S Vacuum Transmitters

Description

Model 433S Vacuum Transmitter is designed for applications of vacuum measuring or monitoring. Its measuring ranges are from 1.5~225 torr through 1.5~525 torr to 1.5~750 torr with the absolute pressure reference, or from -988~0 mbar through -700~0 mbar to -300~0 mbar with the gauge pressure reference.

In fact, the 433S Vacuum Transmitter is developed from 131S Pressure Transmitter, so it works on silicon piezoresistive technology.

In addition to G1/4" thread (male) as its standard process connection, an unique mechanical interface with 1/4" VCR adaptor is specially developed for 433S transmitters to meet requirements for vacuum application. Other mechanical interface is available as option of its process connection. On request, BCM SENSOR can develop customized mechanical interface for this 433S Vacuum Transmitter.



Features

- measuring ranges: 1.5~225 torr, 1.5~525 torr,
1.5~750 torr,
-988~0 mbar, -700~0 mbar,
-300~0 mbar
- pressure reference: absolute or gauge
- selectable output:
4~20mA, 10%~90%Vs ratiometric, SPI and others

Applications

- vacuum measuring or monitoring
- plant and machine engineering
 - pneumatics
 - leak testers
 - suction pumps
 - scientific research

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Vacuum Transmitters



Technical Data

Parameters		Units	Specifications	Notes
pressure medium			gases	1
pressure reference & measuring range	absolute	torr	1.5~225, 1.5~525, 1.5~750	2
	gauge	mbar	-998~0, -700~0, -300~0	
proof pressure		%fs	200	3
burst pressure		%fs	300	
output signal		mA	4~20 (standard)	
		V	10%~90%Vs ratiometric, 0~5, 1~5	
		digital	I ² C, SPI	
accuracy		%fs	±0.5	4
long-term stability		%fs/year	≤ ±0.2	
power supply (Vs)	current loop	Vdc	12, ..., 30	
	voltage output	Vdc	3, ..., 5	
	digital output	Vdc	5	
load resistance	current loop	Ω	≤ (Vs - 10V) / 0.02A - R _{cabl}	
	voltage output	kΩ	> 5	
medium temperature range		°C	-40 ~ +85	
ambient temperature range		°C	-40 ~ +85	
storage temperature range		°C	-40 ~ +85	
compensated temperature range		°C	0~50	
temperature drift of zero		%fs	≤ ±0.75	5
temperature drift of span		%fs	≤ ±0.75	5
vibration resistance (20, ..., 2000 Hz)		g	10	
life time		cycles	10 ⁸	
response time		ms	≤ 1	6
seal			O-ring (fluorine rubber)	
pressure diaphragm			316L SS	
wetted parts material			316 SS	
housing material			304 SS	
filling oil			silicone oil (standard), fluorine oil	7
mechanical interface			Refer to mechanical interface specified in Dimensions.	
electrical interface			Refer to electrical interface specified in Dimensions.	
environment protection			IP65 (standard), IP66 (for detachable cable) IP67 (for fixed cable)	
net weight		gram	~180	

General conditions for measurements: media temp. = 25°C ±1°C, ambient temp. = 25°C ±1°C, humidity = 50%RH ±5%RH, barometric pressure: 860~1060 mbar, max. vibration = 0.1 g (i.e. 0.98m/s/s).

- Notes:
1. The pressure medium should be compatible with wetted parts material and pressure diaphragm.
 2. For customized pressure ranges, consult BCM.
 3. "fs" refers to full scale pressure or rated pressure.
 4. Accuracy = $\sqrt{\text{non-linearity}^2 + \text{hysteresis}^2 + \text{repeatability}^2}$.
 5. Calculated as the maximum change in output over the compensated temperature range, and normalized by the full scale output at 25°C.
E.g., for a transmitter of 6bar and 4~20mA output, its temperature drift of zero is ≤±0.8%fs which refers to ≤±0.13mA (= (20mA - 4mA) * 0.8%).
 6. Response time for a 0 bar to fs step change, 10% to 90% rise time.
 7. Fluorine oil can be used for in food and oxygen industry.

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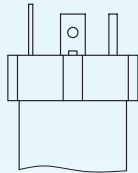
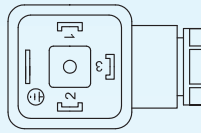
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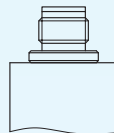
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Dimensions

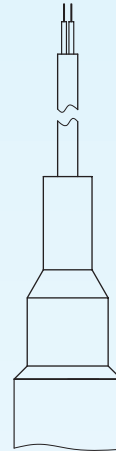
electrical interface



DIN43650 connector
(standard)

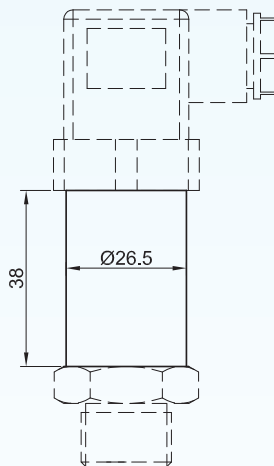


M12 connector with
a detachable shielded PVC cable of
a mating connector:
- for IP rating up to IP66,
- 5-pin or 6-pin depends on output signal,
- cable length (L) should be specified
in ordering information.

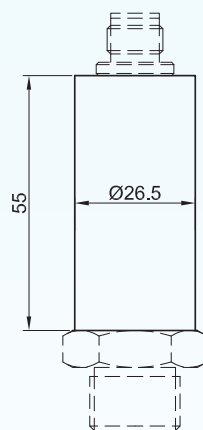


fixed shielded PVC cable:
- for IP rating up to IP67,
- number of wires in the cable varies
according to output signal,
- cable length (L) should be specified
in ordering information.

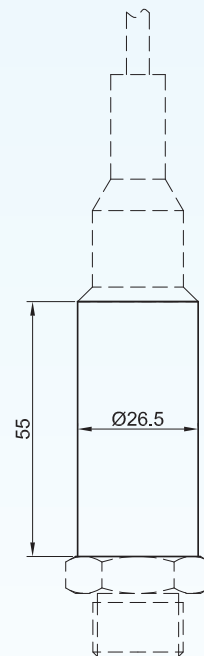
housing



with DIN43650 connector
(standard)



with M12 connector



with fixed cable

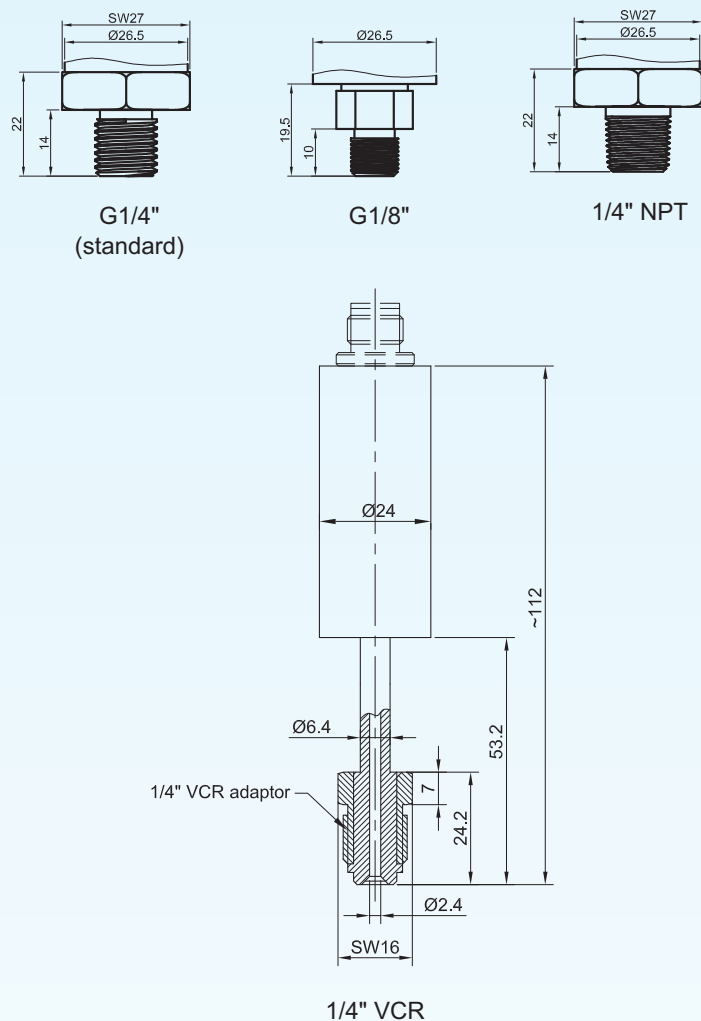
Notes: All dimensions are in mm.

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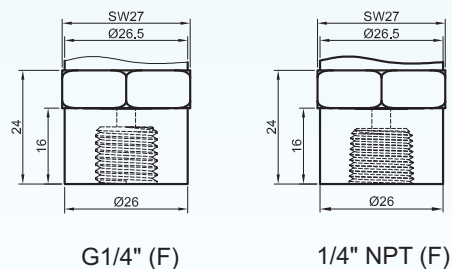
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mechanical interface

1) male threads



2) female threads



Notes: - All dimensions are in mm.

- The mechanical interfaces and the electrical interfaces listed can be combined freely.
- If other types of interfaces are on request, consult BCM.

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Ordering Information

position (pos.) 1: model									
433S									
pos. 2: measuring range vs calibration range(^),								pressure reference	
1.5/225torr A		-988/0mbar G						A: absolute pressure	
1.5/525torr A		-700/0mbar G						G: gauge pressure	
1.5/750torr A		-300/0mbar G							
(^): When a transmitter is purchased, a calibration range has to be clearly indicated in its Ordering Code for this pos. 2. The calibration range is a range of pressures which will be measured or monitored by this transmitter, and therefore must be either within or maximum equal to its measuring range. For example, if one wants to purchase an 433S of 4~20mA output signal in order to measure the pressures from 50torrA to 500torrA, one needs to purchase the 433S of a measuring range of 0/525torrA. To do so, one has to indicate 50/500torrA in the Ordering Code as its calibration range. In this way, this 433S will be delivered with its output signal 4mA corresponding to 50torrA while 20mA corresponding to 500torrA.									
pos. 3: output signal									
4/20mA (standard)		10%/90%Vs (ratiometric)			0/5V		1/5V	I2C	SPI
pos. 4: accuracy									
0.5%fs									
pos. 5: filling oil									
siOil = silicone oil (standard)					fOil = fluorine oil				
pos. 6: pressure diaphragm									
316L = 316L stainless steel									
pos. 7: mechanical interface									
Refer to the drawings of mechanical interface for available options.									
pos. 8: electrical interface									
DIN43650 (standard) = DIN43650 connector of IP65, without cable. DIN43650/5/(#)/PVC/1(&) = DIN43650 connector with a Φ5mm shielded PVC cable of 1m length. M12 = M12 connector of IP66. M12/5/(#)/PVC/1(&) = M12 connector with a Φ5mm shielded PVC cable of 1m length. 5/(#)/PVC/1(&) = Φ5mm shielded PVC cable of 1m length, one end fixed on transmitter, the other end with free wires. 5/(#)/PVC/1(&)/M12 = Φ5mm shielded PVC cable of 1m length, one end fixed on transmitter, the other end with a M12 connector. (#): 2 = 2-color wires suitable for 4/20mA current loop; 3 = 3-color wires suitable for 10%/90%Vs, 0/5V or 1/5V voltage output; 4 = 4-color wires suitable for I2C output; 6 = 6-color wires suitable for SPI output; (&): 1m is standard cable length, but users can define a desired cable length according to his application.									
pos. 9: environment protection									
IP65		IP66			IP67				
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 transmitter:
 433S-1.5/525torrA-4/20mA-0.5%fs-siOil-316L-G1/4-M12/5/2/PVC/5-IP66
 433S-50/500torrA-4/20mA-0.5%fs-siOil-316L-G1/4-M12/5/2/PVC/5-IP66
- customized transmitter:
 433S-1.5/525torrA-4/20mA-0.5%fs-siOil-316L-G1/4-M12/5/2/PVC/5/Molex0430250200-IP66-(*)
 (*): Customized specification = detachable cable of which one end is M12 connector to connector to the transmitter while the other end is Molex connector of part number 0430250200 to connector to user's system.

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

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