Model 160M
Differential Pressure Transducers for Flow Measurement

Description

Model 160M is a differential pressure transducer which is designed for flow measurement. Thanks to the BCM multi-functional silicon piezoresistive sensor die, BCM SE106, This transducer can measure differential pressure, static pressure, and temperature simultaneously.

The sensor die as a sensing element is packaged in a 316 SS (stainless steel) housing which is filled with oil. Through the filling oil, measured pressure can be transferred from two 316L SS diaphragms to the sensor die of the transducer.

The 160M is designed to have high static pressure of 100bar with low static pressure effect of 0.01%fso/bar. Its pressure ranges span from 0~200 mbar to 0~10 bar with accuracy up to 0.25%fs (full scale). Owing to the large diameter diaphragms, the transducer is able to measure viscous fluids or fluids with particles, and it is also compatible with corrosive media.

On request, the 160M can be equipped with a pair of flanges.

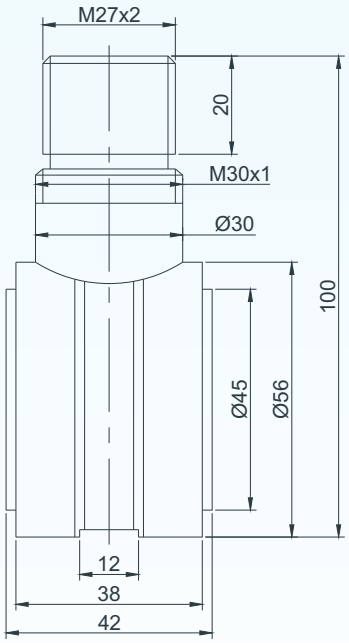
Features

- static pressure up to 100bar
- accuracy up to 0.25 %fs
- current (recommended) or voltage excitation
- easy assembly and wide suitability
- rigid and robust housing

Applications

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

Dimensions



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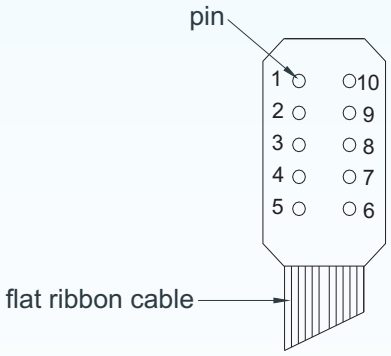
Technical data

Parameters		Units	Specifications	
pressure media			gases, oils or dilute liquids which are compatible with the materials of pressure diaphragm and flange	
diff. pressure ranges		bar	0~0.2, 0~0.4	0~1, 0~4, 0~10
overload pressure		bar	40	100
static pressure		bar	40	100
full scale output*		mV	⩾ 50 (⩾ 25 for 0.2 bar)	⩾ 50
zero offset		mV	⩽ 20 (for diff. pressure measurement), ⩽ 30 (for static pressure measurement)	
accuracy**, ***		%fs	±0.25, ±0.5 (standard)	
static pressure effect on diff. pressure		%fs/bar	⩽ ±0.01	
long-term stability of zero		%fs/year	⩽ ±0.2	
life time		cycle	10^8	
excitation	voltage	Vdc	5 (typical), 1, ..., 10 (standard)	
	current	mA	1 (typical), 0.2, ..., 2	
input resistance		kΩ	3~6 (for diff. pressure measurement), 7~12 (for static pressure measurement)	
output resistance		kΩ	3~6 (for diff. pressure measurement), 7~12 (for static pressure measurement)	
temp. sensor	type		thermal diode	
	temp. range	°C	-45 ~ +125	
	resistance @25°C	kΩ	25 ±6	
	sensitivity		⩾ 15Ω/°C	
	accuracy		Refer to note ****.	
insulation resistance		MΩ@100Vdc	100	
storage temperature range		°C	-40 ~ +90	
operating temperature range^		°C	-30 ~ +80	
temperature coefficient of zero offset		%fso/°C	⩽ ±0.1	
temperature coefficient of span		%fso/°C	⩽ ±0.3	
process connection^^		flange	1/4" NPT female (standard), other thread types available on request	
electrical interface^^^			10 pins, 50 mm flat ribbon cable with 10-terminal connector	
material	membrane		316L SS	
	housing for electronics		316 SS	
	flange		304 SS	
net weight		gram	~ 950 (without flange)	

The listed specifications and dimensions are subject to change without prior notice.
Reference of test conditions: excitation = 5Vdc, temperature = 25°C, humidity = 40%RH.
*: The output signal of diff. and static pressure measurements are mV output with the same magnitude.
When excited by 1mA, the full scale output is ⩾ 40mV (⩾ 20mV for 0.2 bar).
**: The listed accuracies are available for both diff. and static pressure measurement.
***: For diff. pressure range ⩽ 0~0.4 bar, the standard accuracy is 0.5 %fso.
****: This diode is a nonlinear sensing element, which is designed for temperature sensing for purpose of temperature compensation, rather than for metrology purpose.
^: Medium temperature measurement function is available on request.
^^: Flange is available on request.
^^^: The cable length is measured from the top edge of the electronics housing.

Electrical Interface (defined from the pin side of 10-terminal connector)



differential pressure transducer:
excitation (+): pin 5
excitation (-): pin 7
signal (+): pin 6
signal (-): pin 4

static pressure transducer:
excitation (+): pin 3
excitation (-): pin 9
signal (+): pin 8
signal (-): pin 10

temperature sensor:
pin 1, pin 2

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Ordering Information

position (pos.) 1: model	pos. 2: differential pressure ranges and references	pos. 3: output sensitivity of diff. pressure measurement	pos. 4: accuracy of diff. pressure measurement	pos. 5: static pressure	pos. 6: output sensitivity of static pressure measurement	pos. 7: accuracy of static pressure measurement	pos. 8: temperature sensor	pos. 9: process connection	pos. 10: thread type for electronics housing	pos. 11: electrical interface	pos. 12: customized spec.
160M	0/200mbar D 0/400mbar D 0/1bar D 0/4bar D 0/10bar D D: differential pressure	10mV/V	0.25%fs 0.5%fs (standard)	40bar (for diff. ranges: 200mbarD, and 400mbarD) 100bar (for diff. ranges: 1barD, 4barD, and 10barD)	10mV/V	0.5%fs	TD: PN-junction thermal diode	NF: no flange (standard) flange(1/4NPT): flange with 1/4NPT female threads as process connection. Customized threads are available on request.	M27x2 Customized threads are available on request.	10-pinFRC(50mm): 10-pin, flat ribbon cable, cable length = 60mm. Customized cable length is available on request.	"(*)" 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	pos. 11	pos. 12

Examples of Ordering Code

- standard transducer:

  160M-0/4barD-10mV/V-0.5%fs-100bar-10mV/V-0.5%fs-TD-3V-NF-M27x2-10-pinFRC(50mm)

- customized transducer:

  160M-0.5/1barD-10mV/V-0.5%fs-100bar-10mV/V-0.5%fs-TD-3V-flange(1/2NPT)-M27x2-10-pinFRC(50mm)

(*): Customized pressure range = 0.5~1 barD;
Customized threads of process connection on flange = 1/2NPT female threads.

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