

## 11DM Series Differential Pressure Transmitter



The 11DM Series Differential Pressure Transmitter measures differential pressure with spans up to 14 MPa  $\Delta P$ , 2000 psi  $\Delta P$ , or 140 bar  $\Delta P$  and transmits a standard pneumatic signal to receivers which may be several hundred metres or yards away.

### WIDE RANGEABILITY

Spans are fully adjustable up to a 10:1 ratio to provide wide rangeability in a single transmitter. The 11DM Series also provide broad suppressed-zero and elevated-zero range capabilities within the range limits for each series. Fewer stand-by transmitters are required.

### PROVEN DEPENDABILITY

These transmitters use the same proven Foxboro d/p Cell Transmitter design which has been the standard of the

process industries ever since Foxboro developed it nearly 40 years ago. Many thousands of successful trouble-free installations have demonstrated the exceptional dependability of this outstanding mechanism.

### ON-LINE CALIBRATION

Vernier span setting allows the transmitters to be calibrated on-line by "dialing in" pre-calibrated vernier reference settings. No additional calibration hardware is needed.

**FUNCTIONAL SPECIFICATIONS**

**Span, Range, and Static Pressure Limits**

Capsule	Span Limits			Range Limits <sup>(a)(b)</sup>			Maximum Static Pressure		
	MPa ΔP	psi ΔP	bar ΔP	MPa ΔP	psi ΔP	bar ΔP	MPa	psi	bar
B	0.14 and 1.4	20 and 200	1.4 and 14.0	-1.54 and +2.4	-220 and +350	-15.4 and +24	2.4	350	24
C	0.3 and 2.8	40 and 400	3.0 and 28.0	-3.1 and +5.0	-440 and +750	-31 and +50	5.0	750	50
D	0.7 and 7.0	100 and 1000	7.0 and 70.0	-7.7 and +10.0	-1100 and +1500	-77 and +100	10.0	1500	100
E	1.4 and 14.0	200 and 2000	14.0 and 140	-14.0 and +20.0	-2000 and +3000	-140 and +200	14.0	2000	140

<sup>(a)</sup>Negative values indicate that the higher of the two measured pressures is on the normal "low side" (body side) of the transmitter. Positive values indicate higher pressure on the normal "high side" (connection block side).

<sup>(b)</sup>Nonzero based ranges require optional zero elevation or suppression kits. Upper and lower range values must not exceed the range limits of the capsules.

**Operating Conditions**

Influence	Reference Operating Conditions	Normal Operating Conditions	Operative Limits
Ambient Temperature	24 ± 2°C (75 ± 3°F)	-40 to +120°C (-40 to +250°F)	-45 and +140°C (-50 and +280°F)
Process Temperature	24 ± 2°C (75 ± 3°F)	-40 to +120°C (-40 to +250°F)	-45 and +190°C* (-50 and +375°F)
Supply Pressure	140 ± 1.4 kPa, 20 ± 0.2 psi, or 1.4 ± 0.014 bar	120 to 150 kPa, 18.0 to 22.0 psi, or 1.2 to 1.5 bar	240 kPa, 35 psi, or 2.4 bar

\*Topworks temperature must not exceed 120°C (250°F).

**Mounting** May be mounted in any position. A bracket is provided for mounting on a vertical or horizontal DN 50 or 2 in pipe.

**Air Connections** The supply and output connections are tapped for 1/4 NPT.

**Air Consumption** 0.42 m<sup>3</sup>/h (0.25 cfm) at standard conditions.

**Process Connections** Refer to "Model Code."

**Elevated- and Suppressed-Zero Ranges** The optional kits (Model Code Suffix-L or -R) allow adjustment of the measured pressure range to as much as 1100% of the minimum span for each capsule. Upper and lower range values must not exceed the range limits of the capsule.

**Note**

The built-in ZERO screw permits adjustment of the lower range values up to ± 10% of actual span.

**PERFORMANCE SPECIFICATIONS**

(Under Reference Operating Conditions unless otherwise specified)

**Accuracy** ± 0.5% of span

**Repeatability** 0.10% of span

**Hysteresis**

**B, C, D Capsules** 0.10% of span

**E Capsule** 0.20% of span

**Dead Band** 0.10% of span

**Ambient Temperature Effect** May be a zero shift, positive or negative, for a given transmitter [per 50°C (100°F) change]

**Supply Pressure Effect** These transmitters are designed to operate at 140 kPa, 20 psi, or 1.4 bar supply pressure. There will be a zero shift of less than 0.2% of span for each 5% change in supply pressure within the supply pressure limits stated under "Functional Specifications."

**Static Pressure Effect** The maximum static error is 0.5% per 3.5 MPa (500 psi) change in static pressure or the error is a maximum of 1.0% up to the maximum static rating of the capsule. Maximum static errors occur at minimum span settings for each capsule.

**Position Effect** For a 90° tilt, the maximum zero shift may be up to 25% of span, depending on the capsule used. This error can be corrected with the zero adjustment screw.

Span Setting (Percent of Maximum Span)	Zero Shift (Percent of Span)
Above 80 through 100	1.0
Above 50 through 80	1.5
Above 20 through 50	2.5
Above 10 through 20	3.0

## PHYSICAL SPECIFICATIONS

### Materials of Construction—Wetted Parts

Wetted Part; High-Pressure Side	Materials of Construction	
	Capsule Code S	Capsule Code D
Process Connection Block	AISI Type 316 Stainless Steel (316 ss)	316 ss
Diaphragm Capsule	316 ss	Monel
Gaskets	Silicone Elastomer	Viton-A

Wetted Part; Low-Pressure Side	Materials of Construction	
	Capsule Code S	Capsule Code D
Body	316 ss	316 ss
Force Bar	316 ss	Monel
Force Bar Seal	Cobalt-Nickel- Chrome Alloy	Cobalt-Nickel- Chrome Alloy
Gaskets	Silicone Elastomer	Viton-A

### Materials of Construction—Nonwetted Parts

**Instrument Cover** High impact, blue, glass-filled polycarbonate and seats on a rubber and cork composition gasket.

**Bolting** Cadmium-plated 4142 alloy steel bolts per ASTM A193 Grade B7 and nuts per ASTM A194 Grade 2H.

**Environmental Protection** The transmitter housing is weatherproof. It is dust-protected as defined by IEC IP 53 and, with its constant air purging, provides the raintight protection of NEMA Type 3.

**Mass** 4.5 kg (10 lb)

**Data Plate** Stainless Steel data plate fastened to topworks with tapping screws. Includes space for customer tag data up to a maximum of 67 characters and spaces. For additional space, see optional Customer Tag.

## MODEL CODE

11DM = <u>Differential Pressure Transmitter</u>
<u>Span Limits (<math>\Delta P</math>)</u>
-B = 0.14 and 1.4 MPa (20 and 200 psi or 1.4 and 14 bar)
-C = 0.3 and 2.8 MPa (40 and 400 psi or 3.0 and 28 bar)
-D = 0.7 and 7.0 MPa (100 and 1000 psi or 7.0 and 70 bar)
-E = 1.4 and 14 MPa (200 and 2000 psi or 14 and 140 bar)
<u>Capsule Material</u>
S = 316 ss
D = Monel
<u>Process Connections</u>
1 = Tapped for 1/4 NPT
2 = Tapped for 1/2 NPT
3 = Tapped for R 1/4
4 = Tapped for R 1/2
<u>Optional Suffix</u>
-L = Zero elevation
-R = Zero suppression



## OPTIONAL FEATURES

Optional Features	Description	AS Reference
Air Connection	The air supply and output ports are tapped for R 1/4 thread.	ACR
Aluminum Cover	The topworks cover is cast low copper aluminum alloy per ASTM B85, finished with textured gray vinyl.	ALC
Viton-A Process Wetted Gaskets	Diaphragm and force bar gaskets of Viton-A for chemical resistance.	DG-6
ptfe Process Wetted Gaskets	Diaphragm and force bar gaskets of ptfe for corrosion resistance.	DG-7
Tantalum Force Bar Seal Protection	Tantalum sheath protection over cobalt-nickel-chrome alloy force bar diaphragm.	FBP-T
Air Supply Sets	A wide selection of air supply sets is available to provide filtered, regulated air supply to the transmitter.	Refer to Foxboro
Steam Tracing	One or two hollow studs may be substituted for body bolts. Steam tracing kit is used to heat the transmitter body to maintain process fluids at a temperature up to 120°C (250°F).	ISTR-1 or ISTR-2
Lower Spans	Provides span adjustment as low as 70 kPa $\Delta P$ , 10 psi $\Delta P$ , or 0.7 bar $\Delta P$ . Performance specifications are reduced by a factor of up to three. This option not available with the Optional Output Signal of 3 to 27 psi (AS Reference TR 3-27).	LD
Nuclear Service Cleaning	Transmitter is cleaned, assembled, calibrated, and packaged in a clean room or using acceptable alternative procedures.	NS-C
Special Degreasing	Oxygen service preparation includes transmitter assembly, calibration, and packaging in a clean room or using acceptable alternative procedures.	OS-W
Stainless Steel Body Bolting	Type 17-4 PH stainless steel cap screws and nuts for the process connector.	SSB
Stainless Steel Mounting Bracket Bolting	Mounting bracket bolts are 316 ss.	SSB-A
Output Signal	Output signal is 3 to 27 psi. Air supply is between 29.5 and 30.5 psi. This option not available with the Optional Lower Spans (AS Reference LD).	TR 3-27
Reverse Output	Output signal of 100 to 20 kPa, 15 to 3 psi, or 1.0 to 0.2 bar, as specified. Zero-Elevation Kit is also required for bias. Elevated-zero ranges are not available with this option.	TR 15-3
Test Tee	The transmitter is equipped with an output signal test tee.	OTT
Compliance to NACE Standard MR-01-75	For transmitter with Monel (Code D) Capsule only. The National Association of Corrosion Engineers (NACE) Standard (1980 revision) covers metallic requirements for resistance to sulfide stress cracking. This option includes process wetted parts selected to comply with the standard.	MR-01
Non-Process Wetted Bolting Compliance with Class II of Standard MR-01-75	This option provides non-process wetted bolting in compliance with NACE MR-01-75, Class II.	B7M

**OPTIONAL FEATURES (continued)**

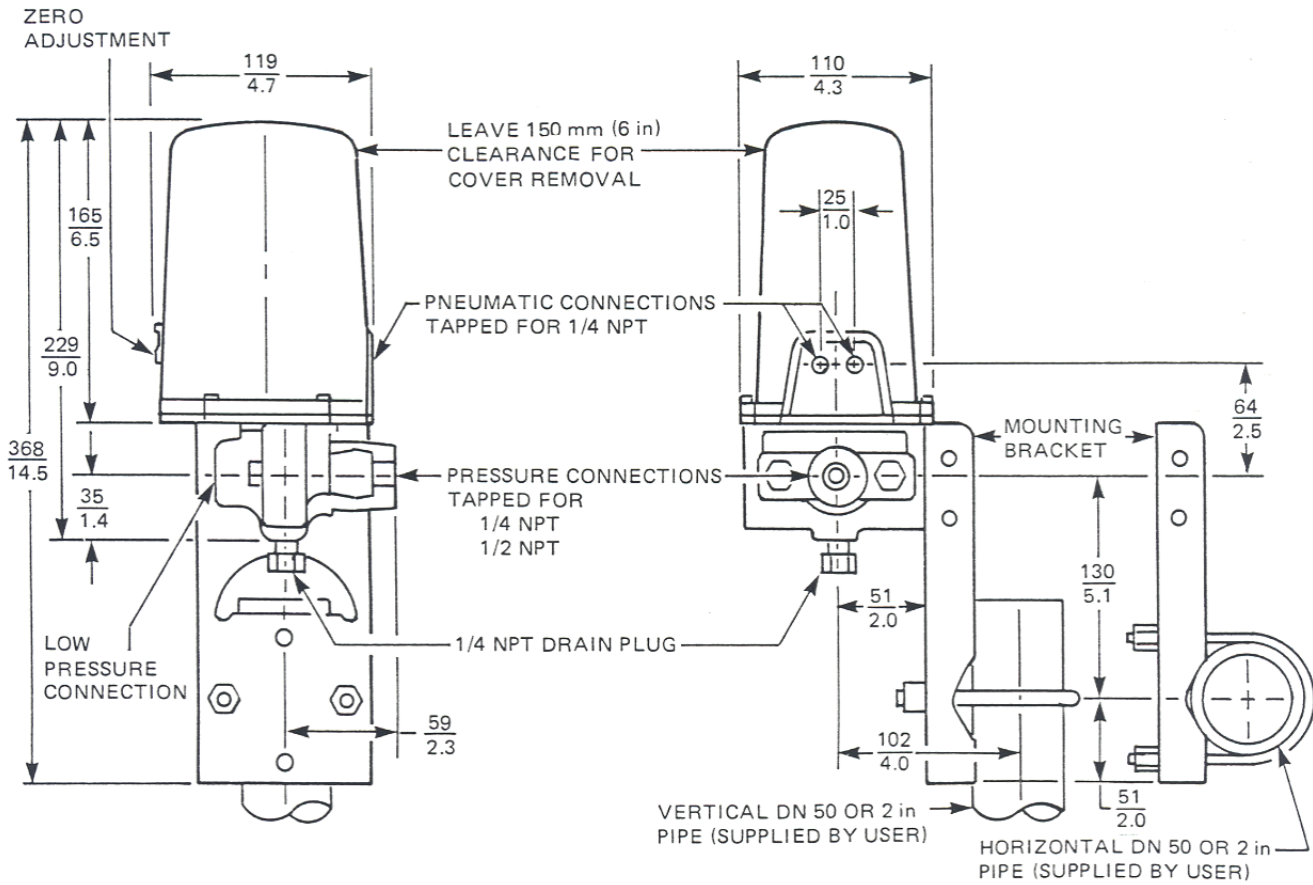
Optional Features	Description	AS Reference
Air Regulator	A wide selection of air supply regulators is available, assembled to the transmitter by Foxboro, to provide filtered, regulated supply air to the transmitter. Suffix letters denote the type (fixed or adjustable) and whether or not the range is included. (Refer to Foxboro.)	IAS-XX
Customer Tag	Stainless steel tag wired to transmitter for customer tag data that doesn't fit on data plate. There can be a maximum of 10 lines of data with 40 characters and spaces per line.	MTS

**ORDERING INSTRUCTIONS**

- 1. Model Number
- 2. Output Signal
- 3. Calibrated Differential Pressure Range
- 4. Optional Features
- 5. Tag

DIMENSIONS—NOMINAL

mm  
in





**The Foxboro Company**  
33 Commercial Street  
Foxboro, MA 02035-2099  
United States of America  
<http://www.foxboro.com>  
Inside U.S.: 1-888-FOXBORO  
(1-888-369-2676)  
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Facsimile (508) 549-4492

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