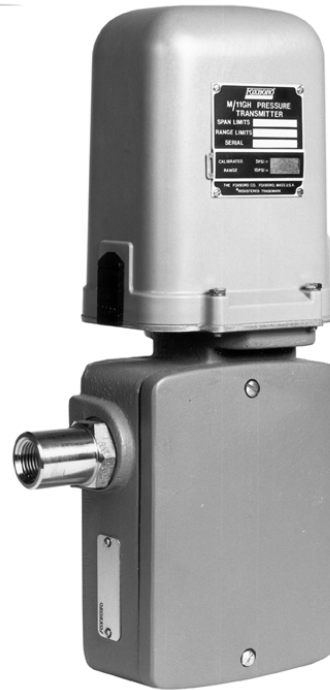


Models 11GM and 11GH Pneumatic Transmitters for Gauge Pressure Measurement



11GM TRANSMITTER



11GH TRANSMITTER

The Foxboro® brand Models 11GM and 11GH Transmitters accurately measure gauge pressure and transmit a proportional pneumatic output signal to receivers which may be several hundred metres or yards away.

WIDE RANGEABILITY

Spans are fully adjustable up to a 10:1 ratio, providing wide rangeability in a single instrument. Fewer stand-by transmitters are required.

PROVEN DEPENDABILITY

The Models 11GM and 11GH Transmitters use the same topworks as other Foxboro Pneumatic d/p Cell® Transmitters. This mechanism has been the standard for differential pressure measurement since Foxboro introduced it over 50 years ago. Many thousands of successful, trouble-free installations have demonstrated the exceptional dependability of these outstanding transmitters.

ON-LINE CALIBRATION

These transmitters are equipped with a vernier range adjustment which allows the operator to select one of several predetermined ranges without removing the transmitter from the process. No other calibration apparatus is required for the predetermined ranges.

PRECISE MEASUREMENT

Since accuracy is a function of calibrated span, precision is retained even with highly elevated- or suppressed-zero ranges.

EASE OF MAINTENANCE AND COMMONALITY OF PARTS

The simple design of the topworks and the field-replaceable sensing capsules make servicing these transmitters exceptionally easy and economical. In

addition, the topworks mechanism of these transmitters is virtually identical to that used in Foxboro pneumatic transmitters, minimizing spare parts inventories and simplifying maintenance routines.

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			
▶ Model 11GM	▶ 24 ±2°C (75 ±3°F)	▶ -40 to +120°C (-40 to +250°F)	▶ -45 and +190°C (a) (-50 and +357°F) (a)
▶ Model 11GH	▶ 24 ±2°C (75 ±3°F)	▶ -40 to +120°C (-40 to +250°F)	▶ -45 and +120°C (-50 and +250°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

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

FUNCTIONAL SPECIFICATIONS

Span, Range, and Overrange Limits

See Table 1.

Table 1. Span, Range, and Overrange Limits

Model	Capsule Code	Span Limits(a)		Range Limits (a,b)		Maximum Overrange Pressure Limit	
		MPa	psi	MPa	psi	MPa	psi
11GM	A	0.07 and 0.56	10 and 80	-0.1 and +0.6	-15 and +90	0.7	100
	B	0.14 and 1.4	20 and 200	-0.1 and +2.4	-15 and +350	3.5	500
	C	0.3 and 2.8	40 and 400	-0.1 and +5	-15 and +750	7	1,000
	D	0.7 and 7	100 and 1,000	-0.1 and +10	-15 and +1,500	14	2,000
	E	1.4 and 14	200 and 2,000	-0.1 and +20	-15 and +3,000	28(c)	4,000(c)
11GH	K	7 and 40	1,000 and 6,000	-0.1 and +40	-15 and +6,000	62	9,000
	N	14 and 80	2,000 and 12,000	-0.1 and +80	-15 and +12,000	124	18,000

(a) For values in bar or kg/cm², multiply MPa values by 10.

(b) Non-zero based ranges may require the optional zero elevation kit or suppression kit. See "Elevation and Suppression". Upper and lower range-values must not fall outside the range-limits.

(c) With Monel capsule, maximum overrange pressure limit is reduced to 21 MPa (3,000 psi; 210 bar or kg/cm²).

FUNCTIONAL SPECIFICATIONS (CONT.)

Elevation and Suppression

WITH OPTIONAL KITS

The sum of zero suppression plus calibrated span must not exceed the upper range limits shown in Table 1. Zero may be elevated to provide lower range values down to the lower range limit.

Model 11GM

Zero may be suppressed to a maximum of 900% of minimum span (700% for Capsule Code A).

Model 11GH

Zero may be suppressed to a maximum of 500% of minimum span.

TYPICAL RANGE FOR ZERO SUPPRESSION

0.14 to 0.7 MPa, 20 to 100 psi, or 1.4 to 7 bar or kg/cm².

TYPICAL RANGE FOR ZERO ELEVATION

-0.07 to +0.07 MPa, -10 to +100 psi, -0.7 to +7 bar or kg/cm²

WITHOUT OPTIONAL KITS

Model 11GM

Using the zero adjustment, zero may be elevated or suppressed to 10% of span.

Model 11GH

Zero elevation or zero suppression requires the appropriate optional kit.

Output Signal

20 to 100 kPa, 3 to 15 psi, or 0.2 to 1.0 bar or kg/cm², as specified.

Air Consumption under Normal operation

0.42 m³/h (0.25 cfm) at standard conditions.

Mounting

Bracket for mounting on a vertical or horizontal nominal 50 mm (2 in) diameter pipe.

Mounting Position

These transmitters may be mounted in any position.

Air Connections

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

Process Connections

Refer to Model Codes section.

PERFORMANCE SPECIFICATIONS
(Under Reference Operating Conditions unless otherwise specified.)

Accuracy

MODEL 11GM

±0.5% of span

MODEL 11GH

See Table 2

Dead Band

MODEL 11GM

0.15% of span

MODEL 11GH

0.1% of span

Repeatability

MODEL 11GM

0.1% of span with AISI Type 316 stainless steel capsule. 0.2% of span with Monel capsule.

MODEL 11GH

0.15% of span

Hysteresis

MODEL 11GM

0.1% of span with capsule codes A, B, C, and D.
2% of span with capsule code E.

MODEL 11GH

0.15% of span.

Position Effect

Zero shifts caused by tilting these transmitters about the centerline of the process connection may be corrected with the zero adjustment screw.

Supply Pressure Effect

These transmitters are designed to operate at 140 kPa, 20 psi, or 1.4 bar or kg/cm² supply pressure. There is a zero shift of less than 0.2% of span for each 5% change in supply pressure within normal operating limits.

Ambient Temperature Effect

Zero shift in percent of span per 55°C (100°F) change

Model	Span Adjustment (Percent of Maximum Span)	Maximum Zero Shift (Percent of Span)
11GM	80 to 100	1.0
	50 to 80	1.5
	20 to 50	2.5
	10 to 20	3.0
11GH	up to 100	3.0

Table 2. Model 11GH Accuracy in % of Span

Spans Between						Accuracy (Percent of Span)
Capsule Code K			Capsule Code N			
MPa	psi	bar or kg/cm ²	MPa	psi	bar or kg/cm ²	
7 and 20 20 and 40	1,000 and 3,000 3,000 and 6,000	70 and 200 200 and 400	14 and 40 40 and 80	2,000 and 6,000 6,000 and 12,000	140 and 400 400 and 800	±0.5 ±1.0

PHYSICAL SPECIFICATIONS

Material of Construction - Wetted Parts

Item	Wetted Parts Materials for			
	11GM-(a)S	11GM-(b)M	11GM-(b)D	11GH
Bourdon Tube	–	–	–	Ni-Span C
Capsule	316 ss	Monel 404	Monel 404	Ni-Span C
Connection Block	316 ss	Monel 404	316 ss	316 ss
Connector Gasket	Silicone Elastomer	Viton-A	Viton-A	None

(a) 11GM-A, -B, -C, -D, or -E.

(b) 11GM-B, -C, -D, or -E.

Material of Construction - Nonwetted Parts

BODY (MODEL 11GM)

Forged 316 ss

COVER (TOPWORKS)

Blue, high-impact, glass-filled polycarbonate.

CASE (MODEL 11GH)

Cast iron with die-cast low copper aluminum cover. The finish is green urethane paint.

BOLTING (MODEL 11GM)

Alloy steel per ASTM A193 grade B7 or equivalent. See Optional Features section for 17-4 PH stainless steel bolting.

Environmental Protection

The transmitter has the dust-resistant and weatherproof rating of IP54 as defined by IEC 60529, and, with its constant air purging, provides the environmental protection rating of NEMA 3.

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.

Approximate Mass

MODEL 11GM

4.5 kg (10 lb)

MODEL 11GH

5 kg (11 lb)

OPTIONAL FEATURES

(When ordering an option, add AS Reference to Model Code.
Example: 11GM-CS5-L, AS Reference OS-W)

Optional Feature	Description	AS Reference
Reverse Output	100 to 20 kPa, 15 to 3 psi, or 1.0 to 0.2 bar or kg/cm ² , as specified	TR 15-3
Output Signal	Output signal is 3 to 27 psi. Air supply pressure is between 29.5 and 30.5 psi.	TR 3-27
Oxygen Service Preparation	Transmitter is cleaned, assembled, calibrated, and packaged, in a clean room or using other acceptable alternative facilities.	OS-W
Nuclear Service Cleaning	Transmitter is cleaned, assembled, calibrated, and packaged, same as above.	NS-C
R 1/4 Air Connections	Air connections tapped for R 1/4.	ACR
Air Supply Sets	A wide selection of air supply sets is available to provide filtered, regulated supply air to the transmitter.	Refer to Foxboro
Test Tee	A T-connector tapped for 1/4 NPT and fitted with a shut-off valve is mounted on the transmitter for monitoring the output signal.	OTT
Pressure Seals	Transmitters are available with a variety of field-replaceable filled pressure seal systems.	Refer to PSS 3-2C1 A
Viton-A Process Wetted Gaskets	For Model 11GM only. Capsule and force bar gaskets of Viton-A for chemical resistance.	DG-6
ptfe Process Wetted Gaskets	For Model 11GM only. Capsule and force bar seal gasket of ptfe for corrosion resistance.	DG-7
High Accuracy Calibration	For Model 11GM only. Accuracy of $\pm 0.25\%$ of span.	HAC
Lower Spans	For Model 11GM only. Provides for minimum span of 35 kPa, 5 psi, or 0.35 bar or kg/cm ² . The standard performance specifications and operating condition effects are degraded by factors of up to three. This option cannot be used with the optional Output Signal feature (AS Reference TR 3-27).	LD
Stainless Steel Bolting	For Model 11GM only. Type 17-4 PH stainless steel cap screws and nuts for the process connector.	SSB
Stainless Steel Mounting Bracket Bolting	For Model 11GM only. 316 ss bolting through the mounting brackets to the transmitter.	SSB-A
Ermeto Connectors	Permits connecting 6 m tubing to 1/4 NPT air connections: Brass 316 ss	ERM-A1BR ERM-A1SS
	For Model 11GM only. Permits connecting 6 mm tubing to 1/4 NPT process connections: Carbon Steel 316 ss	ERM-1CS ERM-1SS
	For Model 11GM only. Permits connection 12 mm tubing to 1/2 NPT process connections: Carbon Steel 316 ss	ERM-2CS ERM-2SS

Optional Features table is continued on next page.

OPTIONAL FEATURES (CONT.)

(When ordering an option, add AS Reference to Model Code.
Example: 11GM-CS5-L, AS Reference OS-W)

Optional Feature	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
Compliance to NACE Standard MR-01-75	For Model 11GM with Monel (Code M or D) capsule only. The National Association of Corrosion Engineers (NACE) Standard MR-01-75 (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 or Standard MR-01-75	This option provides non-process wetted bolting in compliance with NACE MR-01-75, Class II.	B7M
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

MODEL CODES

Model 11GM

<u>Description</u>	<u>Model</u>
Transmitter	11GM
<u>Span Limits</u>	
0.07 and 0.56 MPa (10 and 80 psi, 0.7 and 5.6 or kg/cm ²)	-A
0.14 and 1.4 MPa (20 and 200 psi, 1.4 and 14 bar or kg/cm ²)	-B
0.3 and 2.8 MPA (40 and 400 psi, 3 and 28 bar or kg/cm ²)	-C
0.7 and 7 MPa (100 and 1,000 psi, 7 and 70 bar or kg/cm ²)	-D
1.4 and 14 MPa (200 and 2,000 psi, 14 and 140 bar or kg/cm ²)	-E
<u>Capsule Material</u>	
316 ss	S
Monel (Not available with Span Limits Code A)	M
Monel Element with 316 ss Connection Block (Not available with Span Limits Code A)	D
<u>Process Connection</u>	
Tapped for 1/4 NPT	1
Tapped for 1/2 NPT	2
Tapped for R 1/4	3
Tapped for R 1/2	4
Machined for 9/16-18 Aminco fitting (Not available with Span Limits Code -A or Capsule Material Code M)	5
<u>Optional Selections</u>	
Elevated-Zero Range Kit	-L
Suppressed-Zero Range Kit	-R
Example: 11GM-CS5-L	

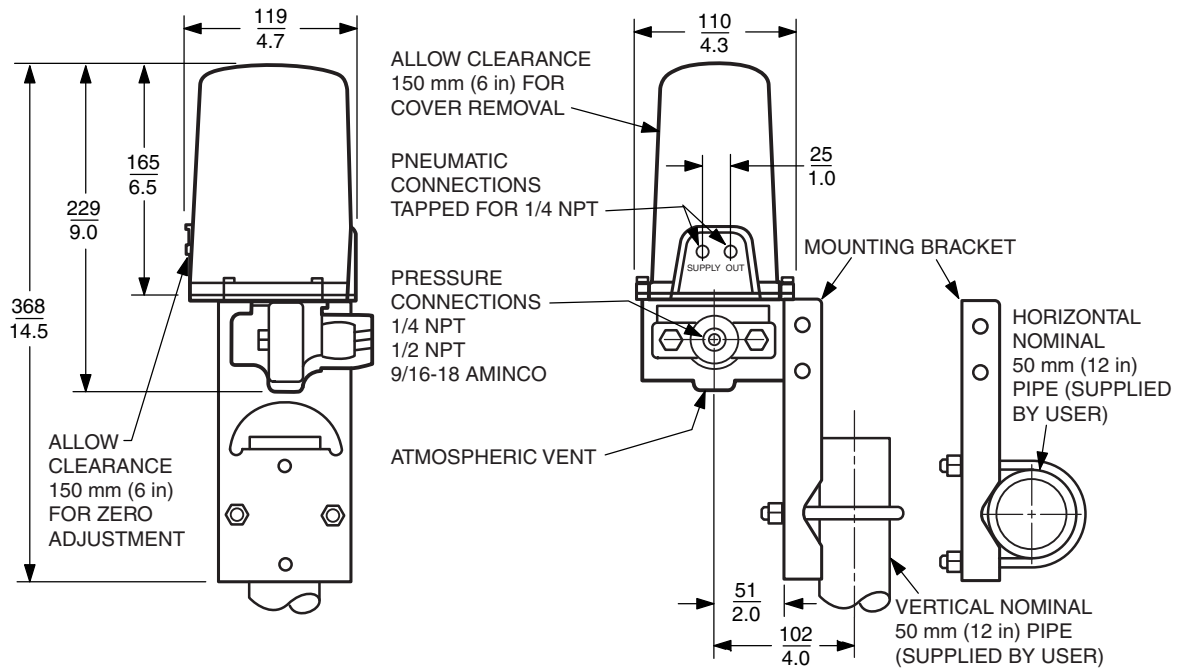
Model 11GH

<u>Description</u>	<u>Model</u>
<u>Capsule Code and Span Limits</u>	
7 and 40 MPa (1000 and 6000 psi, 70 and 400 bar or kg/cm ²)	-K
14 and 80 MPa (2000 and 12 000 psi, 140 and 800 bar or kg/cm ²)	-N
<u>Wetted Parts</u>	
Ni-Span C Element with 316 ss connection	C
<u>Process Connection</u>	
Tapped for 1/2 NPT	2
Tapped for R 1/2	4
Machined for 9/16-18 Aminco Fitting	5
<u>Optional Selections</u>	
Elevated-Zero Range Kit	-L
Suppressed-Zero Range Kit	-R
Example: 11GH-KC2-R	

DIMENSIONS-NOMINAL

$\frac{\text{mm}}{\text{in}}$

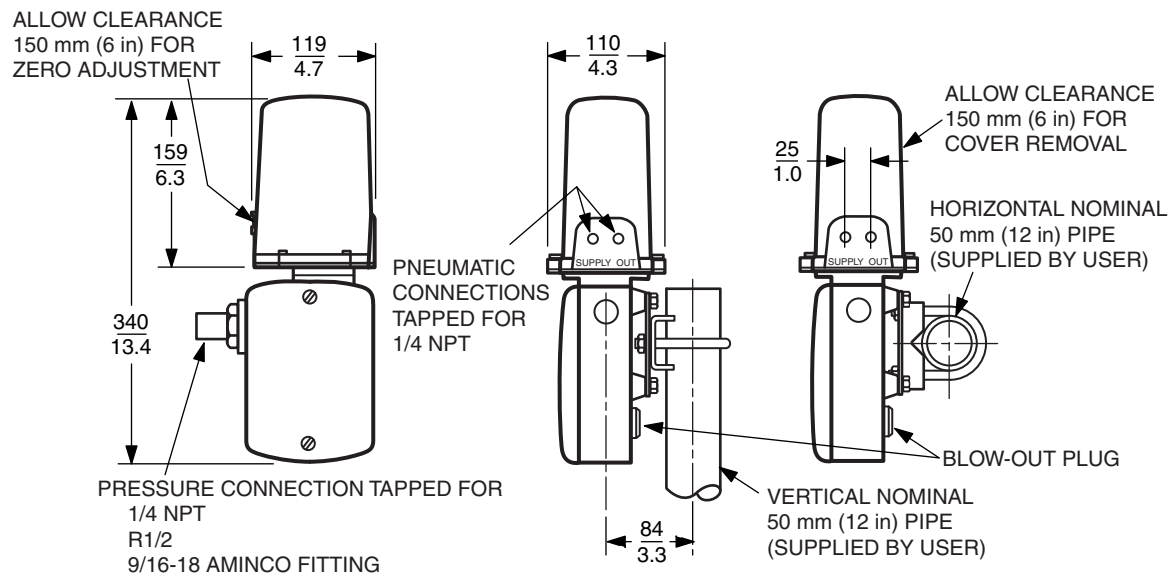
11GM TRANSMITTER



DIMENSIONS-NOMINAL

$\frac{\text{mm}}{\text{in}}$

11GH TRANSMITTER



ORDERING INSTRUCTIONS

1. Model Number
2. Output Signal
3. Calibrated Pressure Range
4. Optional Selections
5. Tag

OTHER M&I PRODUCTS

Foxboro provides a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, positioners, temperature, controlling and recording. For a listing of these offerings, visit the Invensys Operations Management web site at:

www.iom.invensys.com

Invensys Operations Management
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Plano, TX 75024
United States of America
<http://www.iom.invensys.com>

Global Client Support
Inside U.S.: 1-866-746-6477
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your local Invensys representative.
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