13A Pneumatic d/p Cell® Transmitter

Product Specifications

PSS 2B-1C1 A-AS
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THE AUTOMATION SERVICE™ BRAND MODEL 13A PNEUMATIC D/P CELL TRANSMITTER MEASURES DIFFERENTIAL PRESSURE AND TRANSMITS A STANDARD PNEUMATIC SIGNAL TO RECEIVERS WHICH MAY BE SEVERAL HUNDRED YARDS AWAY.

PROVEN DEPENDABILITY

13A d/p cell transmitters have been the standard of the process industry for more than 30 years. Many thousands of successful, trouble-free installations have demonstrated the exceptional dependability of these outstanding transmitters.

APPLICATION VERSATILITY

These transmitters are used in flow, liquid level, density, and low pressure measurement applications. They offer wide span adjustability and broad zero suppression, and zero elevation capabilities within the range limits of the transmitter. They are ideal for the most demanding applications.

EASE OF MAINTENANCE

The simple design of the topworks and the field replaceable capsule makes servicing these transmitters exceptionally easy and economical. Interchangeability of most of the topworks parts with other Automation Service pneumatic force balance transmitters provides further savings to the user by minimizing spare parts inventory.

FUNCTIONAL SPECIFICATIONS

Span, Range, and Static Pressure Limits

Model	Span Limit Code	Span Limits			Range Limits[a]			Static Pressure Limit		
		kPa ΔP	inH2O ΔP	mbar ΔP	kPa ΔP	inH_2O ΔP	mbar ΔP	MPa	psi	bar or kg/cm^2
13A	M	0-5 and 0-62	0-20 and 0-250	0-50 and 0-620	±62	±250	±620	14	2000	140
	H	0-50 and 0-210	0-200 and 0-850	0-500 and 0-2100	±210	±850	±2100			

[a] Nonzero-based ranges require an optional zero elevation or suppression kit. See Suppressed-Zero and Elevated-Zero Ranges. Upper and lower range values must not exceed range limits. Negative numbers indicate a higher pressure on the normal "low side" of the transmitter.

Mounting

Transmitter mounts direct to the process piping or onto a nominal DN 50 or 2 in pipe. A bracket for pipe mounting is always supplied.

Air Connections

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

Output Signal

20 to 100 kPa, 3 to 15 psi, or 0.2 to 1.0 bar or kg/cm^2, as specified.

Air Consumption Under Normal Operation

0.42 m^3/h (0.25 cfm) at standard conditions.

Suppressed-Zero and Elevated-Zero Ranges

The optional zero elevation or zero suppression kits (Model Code Optional Selections -L or -R) allow adjustment of the measured pressure range within the full range limits of the capsule. These kits may be added in the field. Refer to Figure 1 and Figure 2 for examples of suppressed-zero and elevated-zero ranges.

Figure 1. Zero Suppression

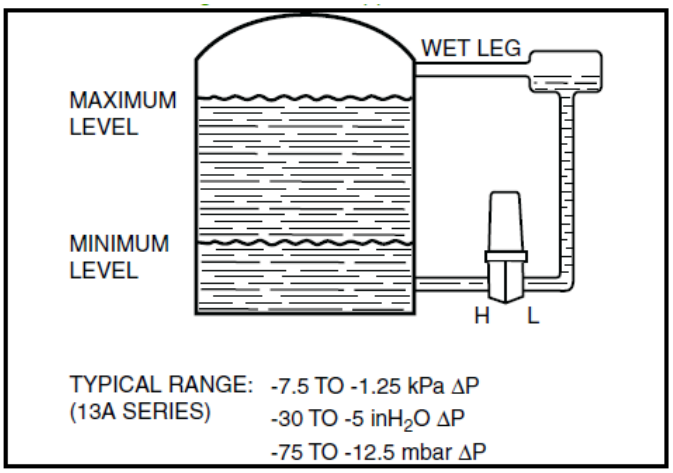
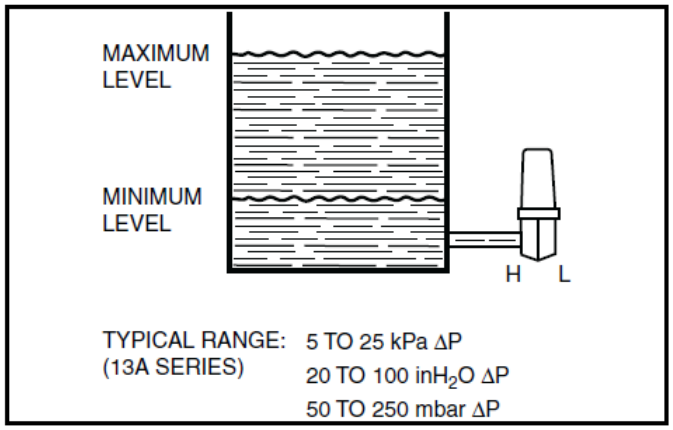


Figure 2. Zero Elevation



OPERATING CONDITIONS

Influence	Reference Operating Conditions	Normal Operating Condition Limits	Operative Limits
Body Temperature	24 ± 2°C (75 ± 3°F)	–40 and +120°C (–40 and +250°F)	–45 and +175°C [a] [b] (–50 and +350°F)
Ambient Temperature	24 ± 2°C (75 ± 3°F)	–40 and +120°C (–40 and +250°F)	–45 and +140°C (–50 and +280°F)
Supply Pressure	140 ± 1.4 kPa 20 ± 0.2 psi 1.4 ± 0.014 bar or kg/cm^2	120 and 150 kPa 18 and 22 psi 1.2 and 1.5 bar or kg/cm^2	Up to 240 kPa Up to 35 psi Up to 2.4 bar or kg/cm^2

[a] See "Optional Features" on page 6 for higher limits.

[b] Topworks temperature cannot exceed 120°C (250°F).

PERFORMANCE SPECIFICATIONS

Under Reference Operating Conditions Unless Otherwise Specified

Accuracy

Includes linearity, hysteresis, and repeatability

- For spans between 5 and 130 kPa, 20 and 525 inH_2O, or 50 and 1300 mbar differential pressure (ΔP): ±0.5% of span
- For spans between 130 and 210 kPa, 525 and 850 inH_2O, or 1300 and 2100 mbar ΔP: ±0.75% of span

Dead Band

0.05% of span

Repeatability

0.1% of span

Hysteresis

0.12 kPa, 0.05 inH_2O, or 0.12 mbar ΔP; or 0.10% of span, whichever is greater

Reproducibility

Includes effects of hysteresis, repeatability, dead band, and drift over a one-hour period

0.15% of span

Vibration Effect

The zero shift is less than 1.5% of span for peak-to-peak displacement of 6.4 mm (0.25 in) between 1 and 9 Hz, or constant acceleration of 10 m/s^2 (1 "g") from 9 to 100 Hz.

Supply Pressure Effect

The maximum zero shift is 0.05% of span for 1 kPa (0.01 bar or kg/cm^2) change in supply pressure. A 1 psi change in supply pressure results in a maximum zero shift of 0.35% of span.

Position Effect

The 13A series may be mounted up to 90° from vertical and the zero shift may be corrected with the zero adjustment screw.

PERFORMANCE SPECIFICATIONS (CONTINUED)

Ambient Temperature Effect

Model	Ambient Temperature Effect[a]
13A	Span Limit Code M: For Spans from 12.5 to 62 kPa, (50 to 250 inH_2O, 125 to 620 mbar) ΔP span. =1% of span For Spans from 6.2 to 12.5 kPa, (25 to 50 inH_2O, 62 to 125 mbar) ΔP span. =2.5% of span Span Limit Code H: =2% for all spans

[a] Maximum zero shift in % of span for a temperature change of 55°C (100°F) within Normal Operating Condition limits.

Static Pressure Effect

Model	Ambient Temperature Effect[a]
13A	For Spans >12.5 kPa, (>50 inH_2O, >125 mbar) ΔP: =0.5% of span For Spans from 5 to 12.5 kPa, (20 to 50 inH_2O, 50 to 125 mbar) ΔP: =1% of span

[a] Zero shift in % of span for any change up to the static pressure limit.

PHYSICAL SPECIFICATIONS

Materials of Construction - Wetted Parts

Item	Transmitter Model
Body	316 ss
Capsule Diaphragm	316L ss
Other Capsule Parts	316 ss
Force Bar	316 ss
Force Bar Steel	Cobalt-Nickel-Chromium (Co-Ni-Cr)
Force Bar Gasket	Silicone Elastomer
Capsule Gaskets	316 ss
Process Connection Gasket	ptfe

Materials of Construction, Non-Wetted Parts

Cover

Blue, high impact, glass-filled polycarbonate

Cover Gasket

Silicone rubber and cork composition

Body Bolts and Nuts

Zinc plated alloy steel per ASTM A 193 grade B7 and ASTM A 194 grade 2H, respectively, or equivalent.

Capsule Fill Material

Dow Corning dimethylsiloxane (DC-200) with viscosity of 500 mm2/s (500 cSt) at 25°C (77°F).

Some options require other fill materials. See Optional Features on page 6.

Environmental Protection

The transmitter housing has the dusttight and weatherproof rating of IP53 as defined by IEC 60529, and provides the raintight protection rating of NEMA 3.

Approximate Mass

8.6 kg (19 lb.)

OPTIONAL FEATURES

(These options are not included in Model Code and must be ordered separately using the AS Reference.)

Miscellaneous Options

Optional Feature	Description	AS Reference
Preparation for Oxygen Service	Transmitter is cleaned, assembled, calibrated, and packaged in a clean room, or using acceptable alternative facilities. Includes Fluorolube fill for capsules. Available for instruments with 316 ss body and capsule material.	OS-FC
Special Degreasing	Transmitter is cleaned and packaged same as above, but the capsule has standard fill. NOT FOR USE ON OXYGEN, CHLORINE, OR OTHER FLUIDS THAT MAY REACT WITH SILICONE OIL.	OS-W
Nuclear Service Cleaning	Transmitter is cleaned, assembled, calibrated, and packaged in a clean room, or using acceptable alternative facilities.	NS-C
High Damping	Low and medium range capsules are available filled with high viscosity silicone fluid which increases the damping. Note: Corner frequency 3 dB down at 0.3 to 0.4 Hz. The damping is greatly increased below 25°C (75°F). The lower ambient temperature limit is -20°C (0°F). Formerly AS Reference D-SSS-2H.	D-SSS-2V4
Optional Output Signal	Output signal is 3 to 27 psi. Air supply is between 29.5 and 30.5 psi	TR 3-27
Reverse Output	100 to 20 kPa, 15 to 30 psi, or 1.0 to 0.2 bar or kg/cm^2, as specified. Accomplished by adding zero elevation kit and reversing high and low process connections.	TR 15-3
High Process Temperature	Glass reinforced process connector gaskets are fitted for operation at process temperatures up to 190°C (375°F). Multiply operating condition effects by 2 for body temperature above 120°C (250°F).	DG-5

OPTIONAL FEATURES

Miscellaneous Options (Continued)

Optional Feature	Description	AS Reference
Lower Differenital Spans	Provides for minimum span of 2.5 kPa, 10 inH_2O, or 25 mbar ΔP. The maximum calibrated spans are reduced by a factor of 2. The performance specifications and operating conditions effects are reduced by factors of up to 3. This option is not available with the Optional Output Signal feature (AS Reference TR 3-27).	LD
Stainless Steel Bolting	Type 17-4 PH stainless steel cap screws for the process connectors, and cap screws and nuts of the same material for the body bolting.	SSB
Stainless Steel Mounting Bracket Bolting	316 ss bolting through mounting brackets to transmitter.	SSB-A
Bypass Manifolds for Integral Mounting	A variety of 1-, 3-, and 5-valve manifolds is available. Some manifold assemblies are not rated to the full MWP of the Model 13H.	Refer to Automation Service
Air Supply Sets	A wide selection of air supply sets is available to provide filtered, regulated air supply to the transmitter.	Refer to Automation Service
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

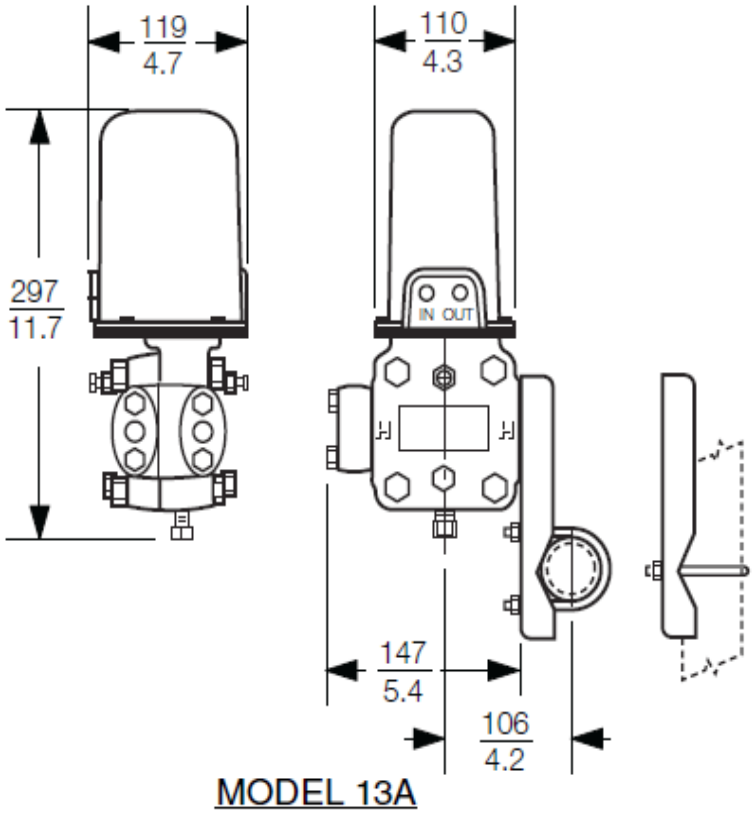
MODEL CODE

Description	Model
Transmitter; 316 ss body	13A
Span Limits	
0-5 and 0-62 kPa (0-20 and 0-250 inH_2O, 0-50 and 0-620 mbar or 0-500 and 0-6350 mmH_2O or 0-0.5 and 0-6.35 mH_2O) ΔP	-M
0-50 and 0-210 kPa (0-200 and 0-850 inH_2O, 0-0.5 and 0-2.1 bar or 0-5.0 and 0-21.6 mH_2O) ΔP	-H
Body Material	
316 ss	S
Process Connectors[(a)]	
Tapped for 1/4 NPT	1
Tapped for 1/2 NPT	2
Tapped for R 1/4	3
Tapped for R 1/2	4
Weld neck for 14 x 21 mm tube (1/2 in Schedule 80 pipe)	6
None. Body tapped for 1/4 NPT	0
Optional Suffix	
Zero Elevation Kit	-L
Zero Suppression Kit	-R
Example: 13A-MS2-L	

[(a)]Body is always tapped for 1/4 NPT.

DIMENSIONS-NOMINAL

mm
in



MODEL 13A

NOTES

ORDERING INSTRUCTIONS

1. Model Code
2. Output Signal
3. Calibrated Differential Pressure Range
4. Optional Features not in Model Code.
   Specify using AS Reference Code.
5. Tag

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