13DMP and 13DEMP d/p Cell Transmitters with Matched Pressure Seals

Product Specifications

PSS 2B-1C1 B-AS
07.22.25

www.AutomationService.com

These pneumatic d/p Cell transmitters with matched pressure seals measure differential pressure in many ranges at static pressures from full vacuum up to flange rating. They transmit a standard proportional pneumatic signal to receivers which may be several hundred meters or yards distant.

PROVEN DEPENDABILITY

Ever since being developed more than 40 years ago, d/p Cell transmitters have been the standard of the process industries. Special body and seal design and filling technique result in a marked reduction in ambient temperature effects over other filled systems while retaining the basic accuracy of the d/p Cell transmitters. Many successful, trouble-free installations have demonstrated the exceptional dependability of these outstanding transmitters.

EASE OF MAINTENANCE

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

REMOTE PRESSURE SEALS

These pressure seals permit operation up to 150°C (300°F) [options to 300°C (580°F)] at the flange while eliminating the need for wet or dry legs with their associated seal liquid, condensate, and purging problems. Pressure repeaters are eliminated, allowing static pressure limits to the applicable flange ratings. The selection of Hastelloy C wetted parts allows use on most corrosive applications.

EXCELLENT REPRODUCIBILITY

Reproducibility of better than 0.15 % of span makes these transmitters ideal for demanding control applications.

PERFORMANCE SPECIFICATIONS

Under Reference Operating Conditions Unless Otherwise Specified

Accuracy
The combined effect of linearity, hysteresis, and repeatability

Capsule Code	Span (Head of Water)	Accuracy
M	Up to 5.1 m or 200 in	±0.5%
	5.1 through 6.4 m or 200 through 250 in	±0.75%
H	Up to 13.3 m or 525 in	±0.5%
	13.3 through 21.6 m or 525 through 850 in	±1 .0%

Dead Band
0.05 % of span

Repeatability
0.1 % of span

Hysteresis
0.20% of span or 1.27 mm H20 (0.05 inH20), whichever is larger

Reproducibility
(Includes effects of hysteresis, repeatability, dead band, and drift over a one-hour period)
0.15 % of span

Static Pressure Effect
(Maximum zero shift for full static pressure change in head of water.)

For spans of 1.3 m or 50 in and above
0.5 % of span.

For spans below 1.3 m or 50 in
2.0 % of span.

Supply Pressure Effect
For spans of 50 inH2O and above, zero shift is 0.03% of span per 1 kPa, 0.01 bar or kg/cm2 change in supply pressure. Zero shift of 0.2% of span per 1 psi change in supply pressure.

Vibration Effect
Zero shift is less than 1.5% of span for vibrations at frequencies between 1 and 100 Hz with double amplitudes up to 6 mm (0.25 in) or for constant acceleration up to 30 m/s2 (3 " g"), whichever is smaller.

Temperature Effect
(Zero shift in percent of span) For 8 m (26 ft) of capillary per 55°C (100° F) change in process or ambient temperature.

Capsule Code	Span (Head of Water)		Process (Seals)	Ambient
	m	in	% of Span	% of Span
M	6.4	250	0.75	1.5
	1.3	50	1.0	2.5
	0.6	25	2.5	3.5
H	10.2	400	3.0	2.0
	5.1	200	3.5	3.5

Position Effect
With the transmitter tilted 90° from the vertical with the capsule in the vertical plane, the maximum zero shift is 3 % of span which may be zeroed out.

Typical Frequency Response
For a ± 5% sinusoidal signal change at 50% signal level.

Capsule Code	Magnitude Ratio	Frequency (Hz)
M	0.707 (- 3 dB)	0.1
H	0.707 (- 3 dB)	0.3

FUNCTIONAL SPECIFICATIONS

Span and Range Limits

Capsule Code	Span Limits (Head of Water)		Range Limits (Head of Water)(a)	
	m	in	m	in
M	0.51 and 6.4	20 and 250	-6.4 and +6.4	-250 and +250
H	5.1 and 21.6	200 and 850	-21.6 and +21.6	-850 and +850

(a)Upper and lower range values must not exceed range limits. Negative numbers indicate a higher pressure on the normal " Low Side" of the transmitter.

Temperature Limits

For Process Pressures at Atmospheric or Higher Pressure

Fill Liquid	Process Temperature		Ambient Temperature	
	°C	°F	°C	°F
Wide Temperature Silicone(b)(c)	-40 and + 230	- 40 and + 450	-40 and +80	- 40 and + 180
Fluorinert (b)	- 60 and + 80	- 75 and + 180	-40 and +80	- 40 and + 180
Silicone, DC200(a)	- 37 and+ 150	-35 and + 300	-37 and +80	- 35 and + 180
Silicone, DC704(b)(c)	0 and 305	32 and 580	0 and 80	32 and 180

(a) Standard Fill Liquid.
(b) Optional Fill Liquid.
(c) Not used with tantalum pressure seals.

For Process Pressures Below Atmospheric Pressure

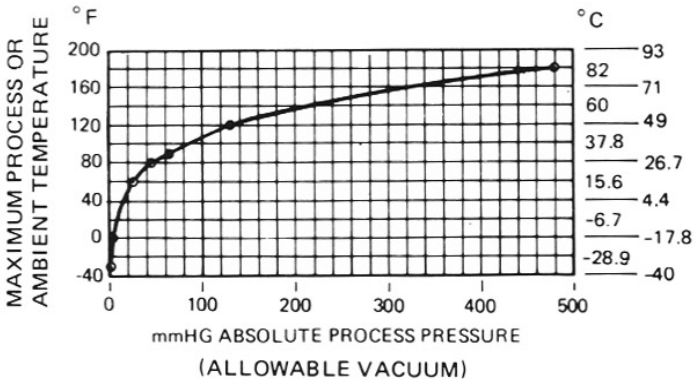
Fill Liquid	Process Temperature		Ambient Temperature	
	°C	°F	°C	°F
Wide Temperature Silicone(b)(c)(d)	-40 and + 205	- 40 and + 400	-40 and +50	- 40 and + 120
Fluorinert (b)	See graph below		See graph below	
Silicone, DC200(a)(c)	- 37 and+ 150	-35 and + 300	-37 and +50	- 35 and + 120
Silicone, DC704(b)(c) (d)	0 and 205	32 and 400	0 and 50	32 and 120

(a) Standard Fill Liquid.
(b) Optional Fill Liquid.
(c) For temperature limits at process pressures below 25 mmHg abs, refer to manufacturer.
(d) Not used with tantalum pressure seals.

FUNCTIONAL SPECIFICATIONS (continued)

Temperature Limits for Fluorinert Fill Liquid

Refer to the graph below for a transmitter with Fluorinert fill liquid when the process pressure is below the atmospheric pressure. The graph shows the maximum temperature (process or ambient) versus the process pressure.



Static Pressure Limits

From 25 mmHg absolute (0.50 psia) to pressure limit of flange. Flange pressure ratings per ANSI Standard B16.5 - 1981.

Air Supply Pressure

120 to 150 kPa, 18 to 22 psi, or 1.2 to 1.5 bar or kg/cm2.

Position

Transmitter may be mounted in any orientation and elevation relative to the seals. On vacuum applications, however, transmitter must be mounted below the lower seal (high-pressure seal).

Air Connections

Tapped for 1/4 NPT.

Air Consumption Under Normal Operation

0.4 2 m3 /h (0.25 cfm) at standard conditions.

Output Signal

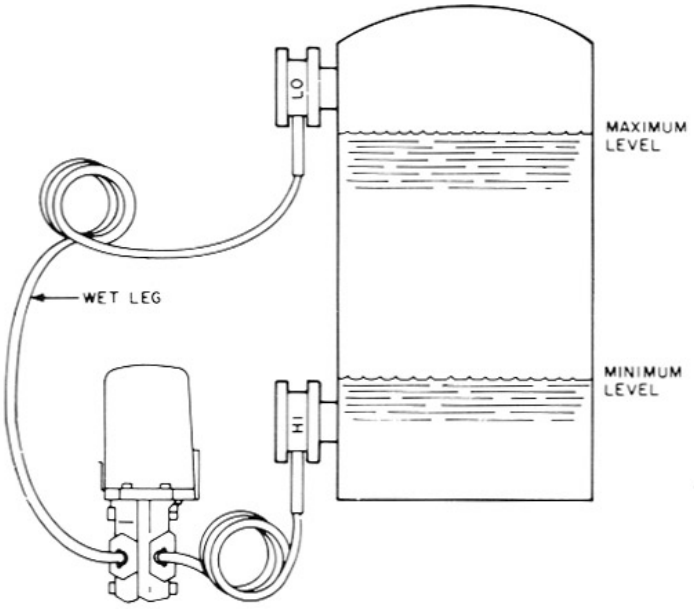
20 to 100 kPa, 3 to 15 psi, or 0.2 to 1.0 bar or kg/cm2, as specified

Mounting

Mounting of transmitter is with a bracket for a DN 50 or 2 in horizontal or vertical pipe. Flanges with pressure seals are mounted direct to process.

Zero Elevation

Due to the wet leg effect of the fill liquid [relative density (specific gravity) is 0. 89] in the capillary, zero elevation is normally required in liquid level applications. Therefore, a zero elevation kit is included in the transmitter. See illustration below.



Typical Elevated-Zero Range

-2.3 to -0.76 mH2O (-90 to -30 inH2O)

MODEL CODE

Model Code, 13DMP

13DMP = Pneumatic d/p Cell Transmitter with Matched Pressure Seals

Capsule Code - Span Limits (Head of Water)

-M = 0.51 and 6.4 m or 20 and 250 in
-H = 5.1 and 21.6 m or 200 and 850 in

Pressure Seal Material and Tubing Length

CA = Hastelloy C, 1.5 m (5 ft)
CB = Hastelloy C, 4.5 m (15 ft)
CC = Hastelloy C, 8 m (26 ft)
SA= 316 ss(a), 1.5 m (5 ft)
SB= 316 ss, 4.5 m (1 5 ft)
SC= 316 ss, 8 m (26 ft)
TA = Tantalum, 1.5 m (5 ft)
TB = Tantalum, 4.5 m (15 ft)
TC = Tantalum, 8 m (26 ft)

Process Flange Material (Nonprocess Wetted)

S = 316 ss
K = Cadmium-Plated Carbon Steel (cs)

Process Flange Connections

31A = ANSI 3 in, Class 150
33A = ANSI 3 in, Class 300
36A = ANSI 3 in, Class 600
33D = 80 mm, 40 bar

(a)AISI Type 316 stainless steel (316 ss).

Model Code, 13DEMP

13DEMP = Pneumatic d/p Cell Transmitter with Matched Extended Pressure Seals

Capsule Code - Span Limits (Head of Water)

-M = 0.51 and 6.4 m or 20 and 250 in
- H = 5.1 and 21 .6 m or 200 and 850 in

Pressure Seal Material and Tubing Length

CA = Hastelloy C, 1. 5 m (5 ft)
CB = Hastelloy C, 4.5 m (15 ft)
CC = Hastelloy C, 8 m (26 ft)
SA = 316 ss, 1.5 m (5 ft)
SB= 316 ss, 4.5 m (15 ft)
SC = 316 ss, 8 m (26 ft)

Extension Length

2 = 50 mm (2 in)
4 = 100 mm (4 in)
6 = 150 mm (6 in)

Process Flange Connections (Nonprocess Wetted)

K4 1A = cs, ANSI 4 in, Class 150
K43A = cs, ANSI 4 in, Class 300
K46A = cs, ANSI 4 in, Class 600

Example: 13DEMP-MCA4K41A

PHYSICAL SPECIFICATIONS

Materials of Construction, Process-Wetted Parts
316 ss with AISI Type 316L stainless steel (316L ss) diaphragm material, or Hastelloy C with Hastelloy C276 diaphragm material, as specified.

Materials of Construction, Non Process-Wetted Parts

Topworks Cover Blue, high impact, glass-filled polycarbonate

Body Material 316 ss

Body Bolts and Nuts Cadmium-plated alloy steel per ASTM A193 grade B7 and ASTM A194 grade 2H, respectively, or equivalent

Capillary 316 ss with protective armor. Standard lengths of 1.5, 4.5, or 8 m (5, 15, or 26 ft), as specified.

Seal Fill Liquid DC200 Silicone. Relative density (specific gravity) is 0.890 at 24 °C (75 ° F).

Flange Material
13DMP cs or 316 ss, as specified
13DEMP cs

Data Plate Stainless steel data plate fastened to electronics housing allows space for user tag data up to a maximum of 32 characters and spaces. For additional space, see optional user tag.

Environmental Protection The transmitter housing is weatherproof. It is dust-protected as defined by IEC IP53 and, with its constant air purging, provides the environmental protection of NEMA Type 3.

Approximate Mass (with seals)

Transmitter	Mass	Flange Class		
		150	300	600
13DMP	Kg	27	30	50
	Lb	60	67	110
13DEMP	Kg	30	32	52
	Lb	65	72	115

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
Air Supply Sets	Several options available including fixed and adjustable regulators, gauges, and filters.	Refer to Automation Service
Test Tee	Output signal test tee	OTT
High-Temperature Fill Liquid	Silicone, DC704. Relative density (specific gravity) of 1.070 at 24 °C (75 ° F). For temperature limits, see Page 3.	HTF(a)
Low-Temperature Fill Liquid	Fluorinert. Relative density (specific gravity) 1.760 a t 24 °C (75° F). For temperature limits, see Page 3.	LTF
Wide-Temperature Fill Liquid	Wide Temperature Silicone. Relative density (specific gravity) 0.935 at 24 °C (75° F). For temperature limits, see Page 3.	WTF(a)

(a) Not used with tantalum pressure seals.

DIMENSIONS-NOMINAL

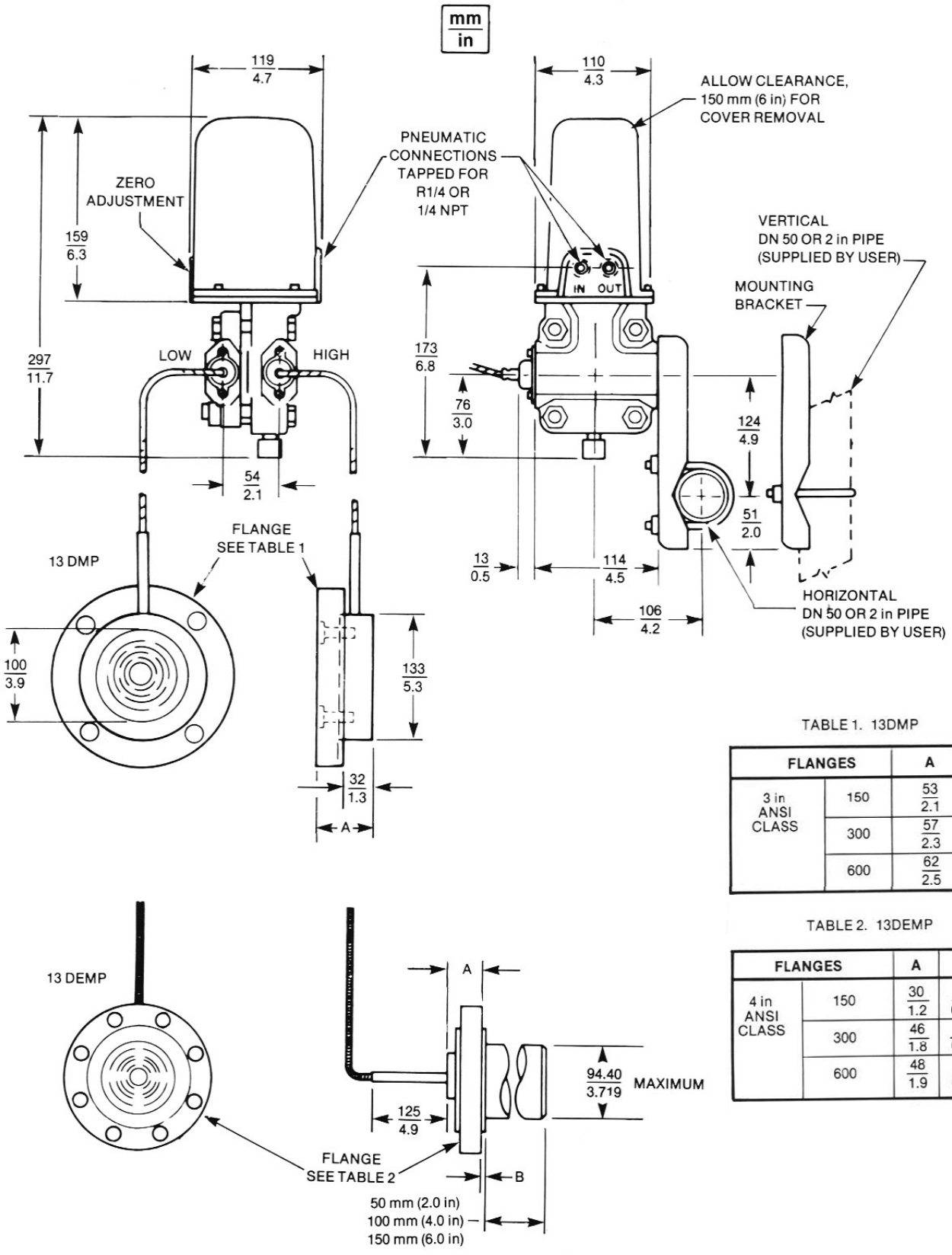


TABLE 1. 13DMP

FLANGES		A
3 in ANSI CLASS	150	53/2.1
	300	57/2.3
	600	62/2.5

TABLE 2. 13DEMP

FLANGES		A	B
4 in ANSI CLASS	150	30/1.2	6/0.25
	300	46/1.8	8/0.31
	600	48/1.9	8/0.31

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 and Application.

OTHER AUTOMATION SERVICE PRODUCTS

Automation Service offers a broad range of new and remanufactured process instrumentation and control valves. To view these products, visit our website at:

www.AutomationService.com

Customer Support:
1-800-325-4808
CSR@AutomationService.com
www.AutomationService.com

Automation Service
13871 Parks Steed Drive
Earth City, MO 63045 USA