

Bristol® 2808-16B

Low Power Flush Diaphragm Transmitter

Emerson Process Management offers the best solution to your process measurement and control needs. The low power Bristol® Series 2808 Transmitter provides the ease of installation, use, and external field calibration adjustments. Model 2808-16B is a reliable, compact pressure transmitter designed to accurately measure and provide a fast response to gauge pressure. The 16B is a compact, self-contained unit that measures the pressure and levels of liquids such as waste water and eliminates the need for a separate diaphragm seal. This approach is not only cost effective, but the independent design eliminates the temperature errors associated with remote seal and capillary systems.

The low power 16A is user-configurable for a 1-5V or 4-20mA output proportional to input pressure. For battery and solar powered systems, the 16B produces a 1-5V output drawing only 2.2 mA with an operating voltage as low as 6 Vdc. In the current mode, a 4-20mA output will drive a 250 ohm load with only a 12Vdc power source. This low power feature is especially ideal for low power RTUs such as the 3530 Solar Power TeleRTU. For other applications, the output signal can be supplied to the input of a recorder, indicator or similar device.

With adjustable ranges covering 17 inH₂O to 3000 psig, the 16B is factory calibrated to a specific measurement range. The uniquely designed circuitry along with external fine offset and gain adjustments make field calibrations simpler than the competition. Internal coarse settings allow the user to determine the coarse span and zero elevation/suppression range capability.

Direct Mounting to Process

Because of its compact size and lightweight, the 2808-16B transmitter is installed directly on, and supported by, the process piping. The sensing diaphragm of the transmitter is flush to the end of a one inch NPT process connection which allows the transmitter to be directly mounted to pipes or tanks.



This eliminates the need for pipe stands and mounting brackets, thus reducing the cost of installation and making replacement easy.

Protection against EMI, and Electrical Surges

All transmitters in the 2808 family are protected against electromagnetic interference (EMI), and in plant electrical surges up to 1000 watts for one millisecond. This surge protection prevents amplifier board failures and improves the reliability of the transmitter.

Features

- Excellent accuracy
- Adjustable ranges with 6:1 turndown
- Wetted parts of 316 SS
- Suitable for pressure and level applications
- Explosion-proof electronics housing
- Optional digital indicator – 4 ½ digit LCD display
- Low power consumption
- Fast response

Functional Specifications

Input Ranges

Min. - Max. Span	Max. Working Pressure
0-17 to 0-100 inH ₂ O	300 inH ₂ O
0-50 to 0-300 inH ₂ O	900 inH ₂ O
0-67 to 0-400 inH ₂ O	1200 inH ₂ O
0-4 to 0-25 psi	75 psi
0-8 to 0-50 psi	150 psi
0-17 to 0-100 psi	300 psi
0-50 to 0-300 psi	900 psi
0-83 to 0-500 psi	1500 psi
0-167 to 0-1000 psi	3000 psi
0-500 to 0-3000 psi	4500 psi

Current Loop Mode

- Supply Voltage:
24 Vdc nominal
6.0 Vdc minimum at transmitter
8 Vdc minimum with Local Digital Indicator option
42.5 Vdc maximum at transmitter
Reverse polarity protected
- Output:
Two wire analog, 4-20 mA proportional to pressure or level
Current limited: 24 mA maximum
Minimum current: 2 mA

The maximum loop resistance can be determined as follows:

$$R\text{-loop maximum} = \frac{V_{\text{supply}} - 6}{0.02} \text{ ohms}$$

The maximum load capacitance is at least 0.1uF

Voltage Mode

- Supply Voltage:
6-42.5 Vdc
Reverse polarity protected to 90 Vdc
- Supply Current:
2.2 mA nominal
- Output into resistive load. (maximum cap. load 5 nf):
- 1-5 Vdc (3-wire)

Calibration Adjustments

- Span Adjustment:
Adj. range is 16 to 100% URL (6:1 turndown)
Coarse Span set by Rotary switch package
Fine Span set by 15-turn potentiometer.
- Zero Adjustment:
Adj. range is -600 to 600% LRL for elevation and suppression.
Coarse Zero provided by DIP switch selections.
Fine Zero set via 15-turn potentiometer.

Response Time & Damping

- Time Constant:
(Time required for 63% change in output with a 100% input change)

<u>Damping Out</u>	<u>Damping In</u>
10 ms	50 ms
- Recovery:
Time to steady output after application of 24 volt supply with constant pressure is 100 ms maximum (With No Damping):
10 ms max
- Damping:
User selectable by jumper circuit
Damping OFF = approx. 10 ms max
Damping ON = .05 sec ±25% time constant

- Reverse Pressure
On low-range models, full vacuum can represent an appreciable percentage of URL. If on those models, calibration contains 50% of zero elevation, non-linearity errors can be as high as $\pm 1\%$.
- Overpressure Effect
 $\pm 0.2\%$ URL at maximum operating pressure

Performance Specifications

- Accuracy
 $\pm 0.15\%$ of calibrated span.
Includes the combined effects of independent linearity, hysteresis, and repeatability.
- Stability
At constant conditions. $\pm 0.1\%$ of URL/yr typical; $\pm 0.25\%$ of URL/yr max
- Temperature Effect – Total (Includes Zero and Span)
 $\pm 0.015\%$ of URL per $^{\circ}\text{F}$ from -25 to 75°F
 $\pm 0.010\%$ of URL per $^{\circ}\text{F}$ from 75 to 185°F
 $\pm 0.020\%$ of URL per $^{\circ}\text{F}$ on $100 \text{ inH}_2\text{O}$ only
- Power Supply Effect
 $\pm 0.005\%$ of upper range limit per volt change
- Ripple and Noise
In accordance with ISA 50.1, Section 4.6
- Mounting Position Effect on Transmitter Accuracy
 $\pm 2 \text{ inH}_2\text{O}$ which can be corrected by calibration

Environmental Specifications

Temperature Limits

- Wet End:
 -40° to 220°F (-40° to 104°C)

- Amplifier:
 -25° to 185°F (-32° to 85°C)
- Storage:
 -40° to 212°F (-40° to 100°C)

*The maximum permissible temperature inside the enclosure (irrespective of sensor temperature) is 185°F (85°C) for the amplifier board.

Optional Local Indication

- Operating: -30°C to $+80^{\circ}\text{C}$
- Storage: -40°C to $+80^{\circ}\text{C}$

Humidity Limits (cover in place)

- 15 to 95% RH @ 185°F (85°C)

EMI Effect

- $\pm 0.1\%$ of upper range limit @ 3V/M from 20 to 1000 MHz
- Meets /SAMA PMC-33-1C with transmitter cover in place and all wiring contained in grounded conduit.

Surge Protection

- Bipolar, differential surge
- 1000 watts for 1 ms – without local indicator
- May be used with purchased surge protector for additional protection (for non-hazardous, non-approved installations only).

Vibration Effect:

- Less than $\pm 0.1\%$ of URL for 10 to 500 Hz at 1 g on any axis.
- Meets SAMA PMC-31-1.

Hazardous Locations:

- Explosion-proof for Class 1, Division 1, Groups C & D without conduit seals
- Class 1, Division 2 non-incendive

Physical Specifications

- Diaphragm and Connection Materials
316 Stainless Steel or Hastelloy C
- Process Connection
1 inch NPT male
- Electrical Connection
½ inch NPT conduit connection with internal field wiring terminals
- Fill Medium
DC 200 Silicone
- Electronics Housing Material and Rating
Low copper aluminum, epoxy finish. NEMA 4X
- Optional Local Indication
4-1/2 Digit User-Configurable LCD Meter:
Linear (0 to 100%), or in engineering units
Zero: Can be adjusted approx. 20% of span
Polarity: Automatic (-) displayed
- Weight
Standard: 2.4 lbs.
With meter option: 2.5 lbs.

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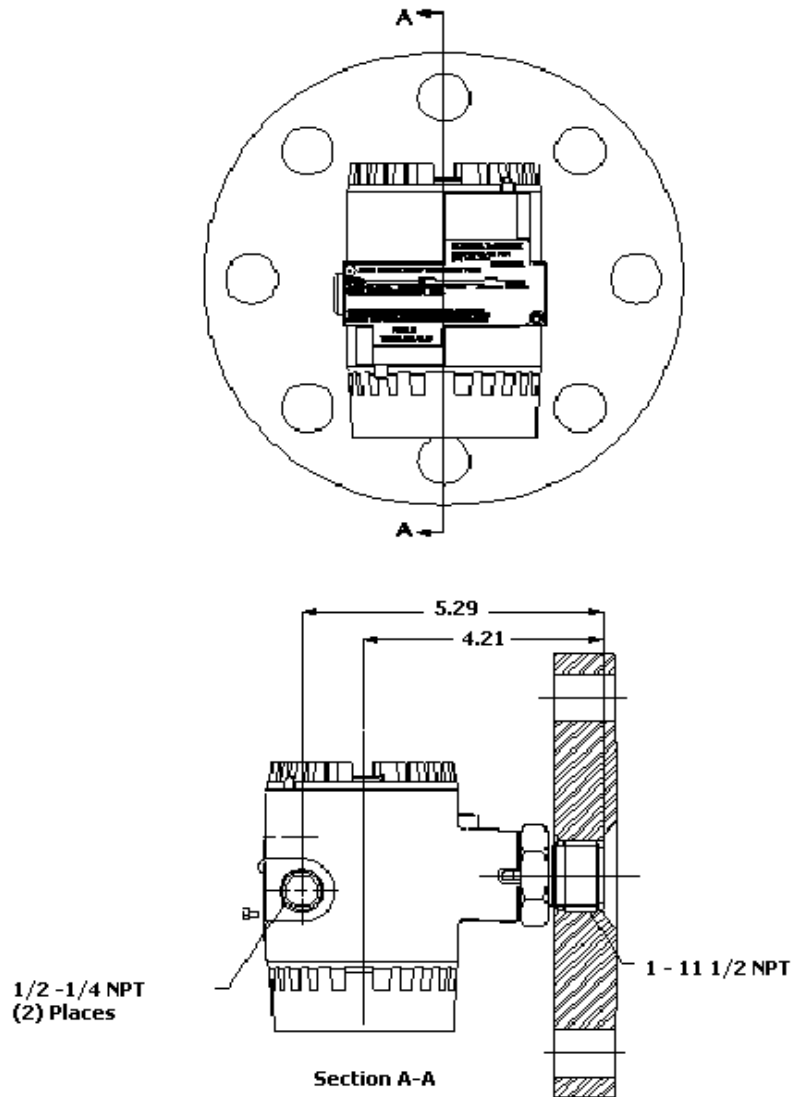


Model Number: 2808-16B - A B - C - D - E - F - G - H

2808-16B

SELECT	DESCRIPTION	CODE
A B	INPUT PRESSURE RANGE	A B
	Min. Span - Max. Span (URL)	280816BASE
(10)	0-17 to 0-100" H ₂ O	13
	0-50 to 0-300" H ₂ O	14
	0-67 to 0-400" H ₂ O	15
	0-4.2 to 0-25 psi	20
	0-8.3 to 0-50 psi	21
	0-17 to 0-100 psi	22
	0-50 to 0-300 psi	23
	0-83 to 0-500 psi	24
	0-167 to 0-1000 psi	25
	0-500 to 0-3000 psi	26
	Add note to configure for 1-5V Output, Default is 4-20mA Output	
C	DIAPHRAGM and CONNECTION MATERIAL	C
(20)	316 Stainless Steel	X2808DIAPH 1
D	FILLING MEDIA	D
(30)	DC 200 Silicone Fluid	XTRANSFILL 1
E	INDICATION	E
(40)	None	XTRANSIN 0
	Local Digital Indication (Linear)	1
F	MOUNTING	F
(50)	Without Flange	X250816MT 0
	3" Class 150 Flange	1
	3" Class 300 Flange	2
	4" Class 150 Flange	3
	4" Class 300 Flange	4
G	CERTIFICATION	G
(60)	UL/CUL	1
	Omega	3
H	WARNING PLATE	H
(70)	Not Applicable	0
	Russian (with indication)	Not Avail. w/Indication 1

Physical Dimensions



Physical Dimensions

