

2808-16A

Low Power Flush Diaphragm Transmitter

Bristol Babcock offers the best solution to your process measurement and control needs. The low power *Series 2808 Transmitter* provides the ease of installation, use, and external field calibration adjustments. Model 2808-16A is a reliable, compact pressure transmitter designed to accurately measure and provide a fast response to gauge pressure. The 16A 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 16A produces a 1-5V output drawing only 1.5 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 Bristol Babcock 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 16A 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 2808-16A 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

- $\pm 0.1\%$ 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
- Two year warranty

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:
24V dc nominal
7.0V dc minimum at transmitter
10V dc minimum with Local Digital Indicator option
37V dc maximum at transmitter
42V dc with external load specified
Reverse polarity protected

Output:
Two wire analog, 4-20 mA proportional to pressure or level
Current limited: 28 mA maximum
Minimum current: 2 mA

The maximum loop resistance can be determined as follows:

$$R\text{-loop maximum} = \frac{V_{\text{supply}} - 7 \text{ ohms}}{0.02}$$

The maximum load capacitance is at least 50uF

- Voltage Mode**

Supply Voltage:
6-42 Vdc
Reverse polarity protected to 90 Vdc

Supply Current:
1.5 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 25-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 25-turn potentiometer.

- Response Time & Damping**

Time Constant:

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

Damping Out	Damping In
1 ms	50 ms

Recovery:

Time to steady output after application of 24 volt supply with constant pressure is 100 ms maximum (With No Damping):
5 ms

Damping:

User selectable by jumper circuit
Damping OFF = approx. 1 ms
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 ±1%.

- Overpressure Effect**

±0.2% URL at maximum operating pressure

Performance Specifications

- Accuracy**

±0.1% of calibrated span.
Includes the combined effects of independent linearity, hysteresis, and repeatability.

- Stability**

At constant conditions. ±0.25% of URL/yr

- Temperature Effect – Total (Includes Zero and Span)**

±0.010% of URL per °F from -25 to 75°F
±0.015% of URL per °F from 75 to 185°F
±0.020% of URL per °F on 100 inH₂O only

- Power Supply Effect**

±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**
±2 inH₂O which can be corrected by calibration

Environmental Specifications

- **Temperature Limits**
Wet End:
-40° to 220°F (-40° to 104°C) – DC 200 fill *
0° to 220°F (-17.8° to 104°C) – Fluorolube fill *
Fluorolube fill available via special orders only.
Contact Watertown
Amplifier:
-25° to 185°F (-32° to 85°C) – Standard
Storage:
-40° to 212°F (-40° to 100°C) – Standard

*The maximum permissible temperature inside the enclosure (irrespective of sensor temperature) is 185°F (85°C) for the amplifier board.
- **Optional Local Indication**
Operating: -25°C to +55°C
Storage: -40°C to +85°C
- **Humidity Limits (cover in place)**
15 to 95% RH @ 140°F (60°C)
15 to 50% RH @ 185°F (85°C)
- **EMI Effect**
±1% of upper range limit @ 10V/M from 20 to 500 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 ±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.

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 Media**
DC 200 Silicone
Fluorolube fill available via special orders only.
Contact Watertown
- **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.

MODEL NUMBER SPECIFICATION

2808-16A-AB-C-D-E-F-G-H

AB	Input Range	
	Min. - Max. Span	
	0-17 to 0-100 inH ₂ O	13
	0-50 to 0-300 inH ₂ O	14
	0-67 to 0-400 inH ₂ O	15
	0-4 to 0-25 psi	20
	0-8 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

C	Diaphragm & Connector Material	
	316 Stainless Steel	1

D	Filling Material	
	DC 200 Silicone Fluid	1
	Fluorolube - Contact Watertown	

E	Indication	
	None	0
	Local Indication*	1

F	Mounting Flange	
	Without Flange	0
	3" Class 150 Flange	1
	3" Class 300 Flange	2
	4" Class 150 Flange	3
	4" Class 300 Flange	4

G	Certification	
	UL/ CUL Explosion-proof for Class 1, Division 1, Groups C & D	1
	CENELEC*	2

H	Warning Plate	
	Not Applicable	0
	Russian	1
	(Not available with local indication)	

Accessory:	Part Number
Transient Protector	388630-01-9

*Check with Watertown for availability.

Bristol Babcock

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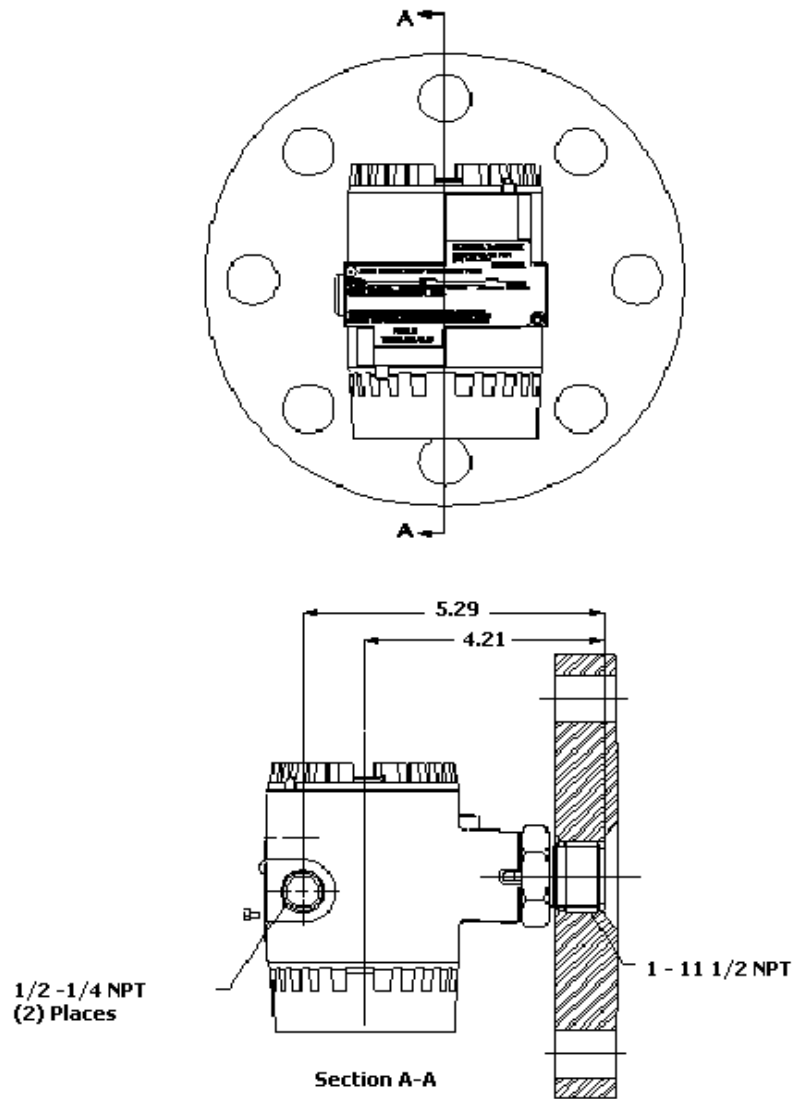
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Low Power Flush
Diaphragm Transmitter

SPECIFICATION SUMMARY

B225-22a

Physical Dimensions



Physical Dimensions

