

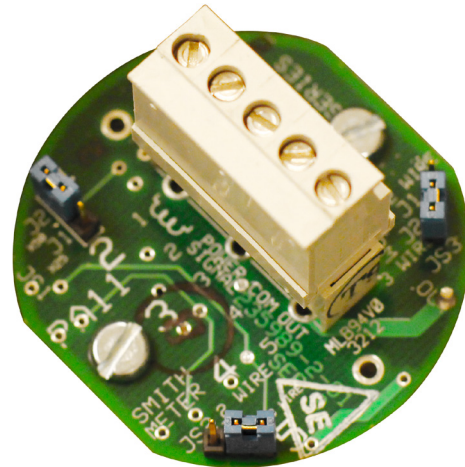
# PA-11 Preamplifier

Bulletin SS02019 Issue/Rev. 0.5 (7/17)

## Smith Meter® Turbine Meters

The **Smith Meter Model PA-11 Preamplifier** is designed to be a replacement for the Waugh PA-11 preamplifier. It can be used with Smith Meter Turbine Meters or can be field mounted. It is used to convert a low voltage sinusoidal signal to a square wave pulse form that can be used to increase the transmission distance of the pulse or convert the pulse form for instruments that require a high speed, edged-triggered input. The preamplifier has also been designed with a jumper-selectable gain that can be used to either increase or decrease the sensitivity of the unit to fit the needs of the application.

The preamplifier has the capacity to operate with either two or three wires. On the two-wire system, the output signal and power are carried on the same two wires.



### FEATURES

- » Two-wire connection from preamplifier to receiver
- » Low susceptibility to EMI/RFI interference
- » Jumper selectable gain (1, 25, 50)
- » Explosion-proof mounting on turbine meters

## Applications

Applications for the Model PA-11 Preamplifier include turbine meter or D Transmitter installations that require a transmission distance to Smith Meter instrumentation greater than 2,000 feet (610m). Additional applications include turbine meter loading rack installations where the interface is the Smith Meter Electronic Preset or pipeline applications where the interface is the Smith Meter Flow Computer.

## Specifications

### Electrical Inputs

DC Power<sup>1</sup>.

8 to 29 Vdc.

**Note:** Must use a Nominal 24 Vdc Input Power Supply when using a two-wire system.

### Input Current

Maximum Operating Current:

40 mA @ 8 Vdc, 50 mA @ 12 Vdc, 120 mA @ 29 Vdc.

Quiescent Current:

10 mA @ 8 Vdc, 15 mA @ 12 Vdc, 20 mA @ 29 Vdc.

### Input Sensitivity

70 mVp-p @ 25°C and 20 Hz (Gain Jumper x 50).

150 mVp-p @ 25°C and 20 Hz (Gain Jumper x 25).

750 mVp-p @ 25°C and 20 Hz (Gain Jumper x 1).

### Input Signal

2-wire and 3-wire modes: Sinusoidal, no DC offset, 20 Vp-p maximum, 5 kHz maximum.

### Input Impedance

10 kΩ minimum @ 20 Hz.

### Temperature

-40°F to 158°F (-40°C to 70°C).

### Humidity

0 to 99% (Condensation is acceptable if it is not conductive and terminals are kept clean.)

<sup>1</sup> DC power available from Smith Meter electronics instrumentation.

## Electrical Outputs

### Output Signal (3-wire mode)

#### 12 Vdc Input Power Supply:

**No load with 1K W pull-up resistor:** 12V 0-pk DC pulse, nominal.

**270 W load with 1K W pull-up resistor:** 2.6V 0-pk DC pulse, nominal.

**Duty Cycle:** 20/80 to 80/20 (On/Off).

#### 24 Vdc Input Power Supply:

**No load with 1K W pull-up resistor:** 24V 0-pk DC pulse, nominal.

**270 W load with 1K W pull-up resistor:** 5V 0-pk DC pulse, nominal.

**Duty Cycle:** 20/80 to 80/20 (On/Off).

### Output Signal (2-wire mode)

#### 24 Vdc Input Power Supply:

**No load with 1K W pull-up resistor:** 11V 0-pk DC pulse, nominal.

**Note:** Must use a Nominal 24 Vdc Input Power Supply when using a two-wire system.

#### Current

**Maximum Sink Current:** 300 mA @ 29 Vdc.

**Waveform:** Fixed on time of 100 microseconds +/- 20%.

## Signal Cable

Two or three wire shielded for single channel transmission.

Size	Distance
#20 AWG	Up to 2000 ft (610 m)
#18 AWG	Up to 3000 ft (915 m)
#16 AWG	Up to 5000 ft (1525 m)

**Note:** All cable recommendations in the table above are sized to drive a low impedance load ( $\approx 270 \Omega$  with a trip point for receiving instrumentation pulse circuitry of at least 9.5 Vdc).

## Approvals

### Electrical

**UL/CUL, Listed 557 N (Model PA-11-XP option only)** – UL File E23545); Class I Groups C and D; Class I, Zone I, Group IIB; Class I, Zone I, AExd IIB T6 IP66; UNL-UL ENCL. 4, CNL-CSA ENCL. 4; Tamb -50°C to 70°C.

**ATEX / IEC Ex (Model PA-11-XC option only)**

**PTB 10 ATEX 1039X / IEC Ex PTB 10.0052X** – Ex d IIC T6 Tamb -40°C to 70°C IP66.

### Essential Health and Safety Requirements (by council directive 2014/34/EU)

**EN/IEC 60079-0:** Electrical apparatus for potentially explosive atmospheres – General requirements.

**EN/IEC 60079-1:** Electrical apparatus for potentially explosive atmospheres – Flameproof enclosures 'd'.

**EN 60529:** Degrees of protection provided by enclosures (IP code).

**EMC Compliance:** (by Council Directive 2014/30/EU)

**EN 61326-1:** Electrical equipment for measurement control and laboratory use.

## Gain (Jumper Selectable)

A factory-installed jumper is placed in jumper position 1 (J1) (x 25 gain) of jumper location JS1 which provides an input sensitivity of 150 mVp-p at 25°C and 20 Hz. If the installed PA-11 is too sensitive and is picking up stray pulses from noise, etc., the gain can be changed by removing the jumper plug, which is gain x 1. If the PA-11 is not sensitive enough for the application, the unit can be made more sensitive by moving the jumper to position J2, which is gain x 50. In all cases, it must be verified that all pulses provided by product flowing through the meter are counted. For more information, see the "Jumper Positions" table at the top of the next page.

## Service

If the preamplifier malfunctions, it should be removed and its signal input and its output checked with a scope. Refer to the Output Signal section in this bulletin for proper signal output values.

## Jumper Positions

Jumper Number	Description	No Jumper	J1 Position	J2 Position
JS1	Gain	x 1	x 25	x 50
JS2	2 or 3 wire	N/A	2 wire	3 wire
JS3	2 or 3 wire	N/A	2 wire	3 wire

## Modeling Code

PA-11 — KL

### Basic Model Designation

PA-11

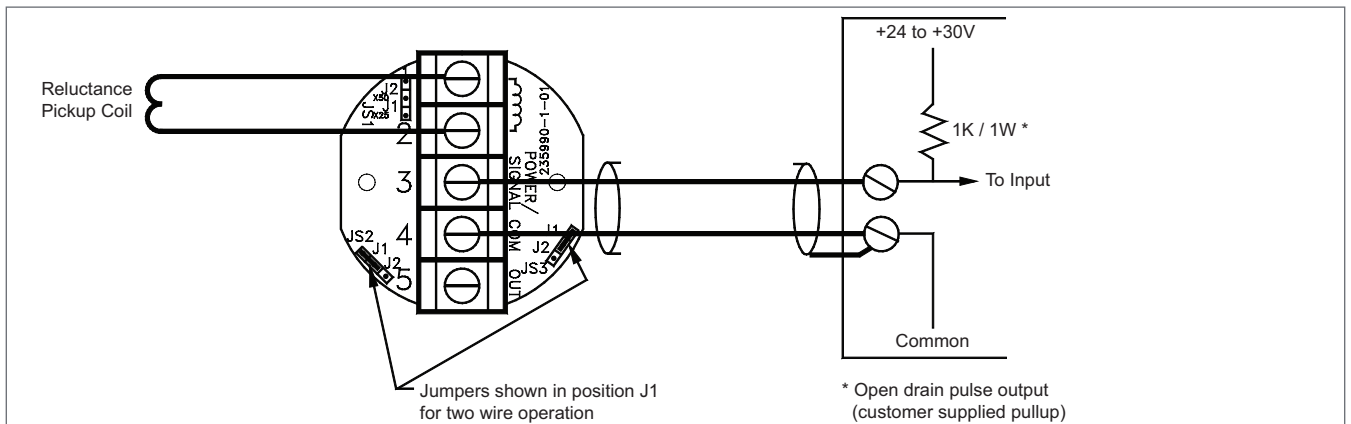
### Enclosed Option

KL - Class I Div 1 Housing, no third party listings

XP - UL/CUL Listed

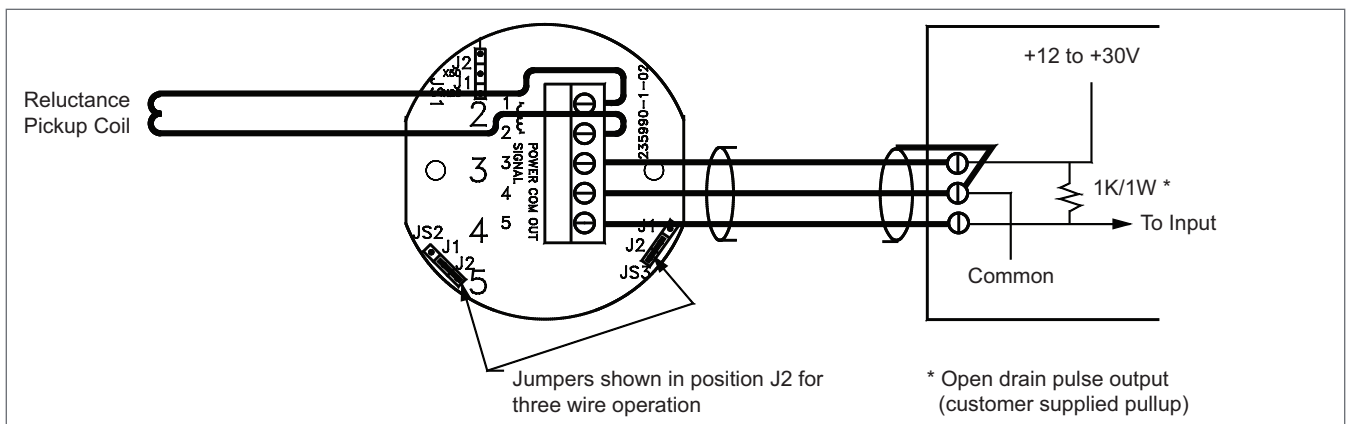
XC - ATEX / IEC Ex Certified

## Wiring



**Figure 1. Two-Wire Output**

**Note:** Also applies to the -02 version shown in Figure 2.



**Figure 2. Three-Wire Output**

**Note:** Also applies to the -01 version shown in Figure 1.

## Dimensions

Inches (mm)

**Note:** Dimensions – Inches to the nearest tenth (millimetres to the nearest whole mm), each independently dimensioned from respective engineering drawings.

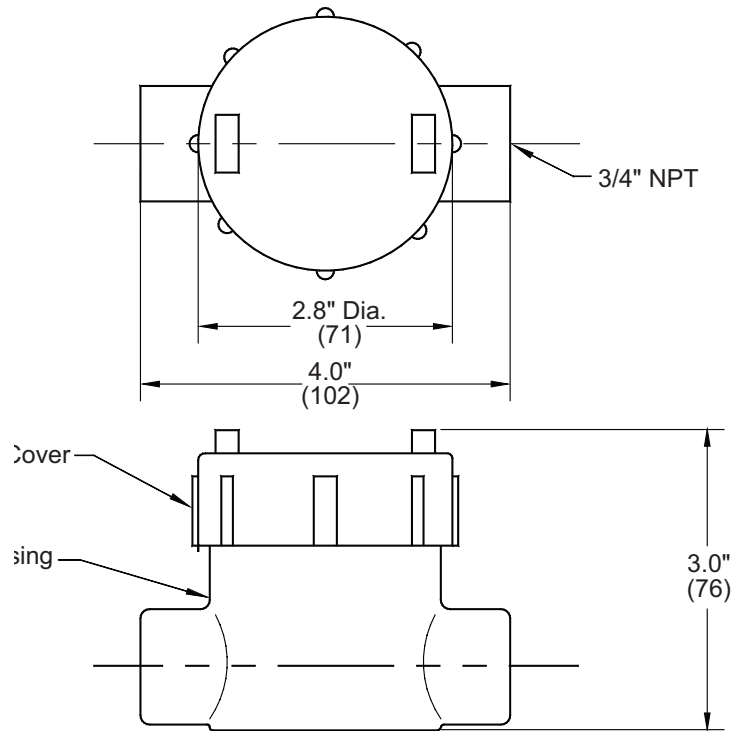


Figure 3. KL Type Housing

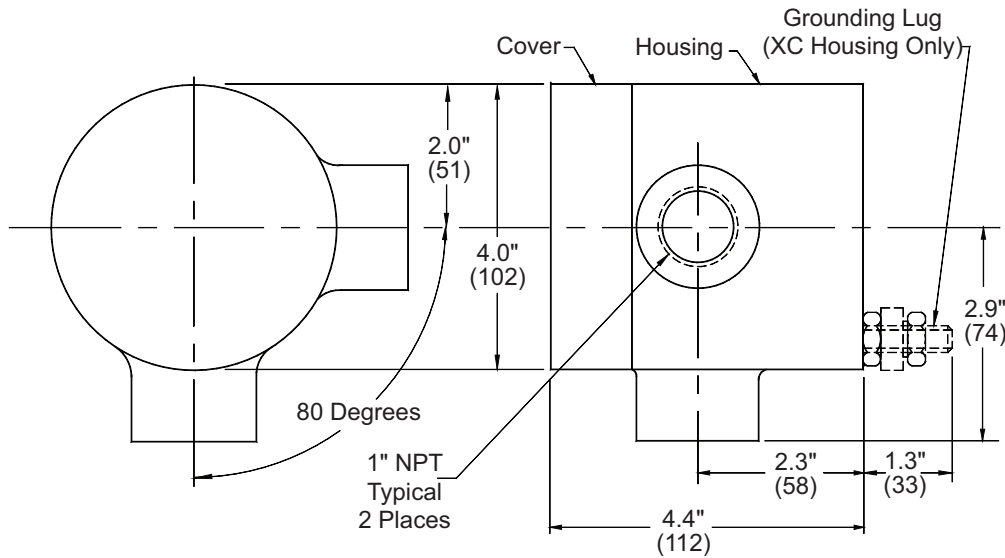


Figure 4. XP and XC Type Housing

### Revisions included in SS02019 Issue/Rev. 0.5 (7/17):

Page 1: Input Sensitivity Specification updated. Page 2: Approvals section updated.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

Contact information is subject to change. For the most current contact information, visit our website at [www.technipfmc.com/](http://www.technipfmc.com/) and click on the "Contact Us" link in the upper right-hand area of the home page.