FMC Technologies

*The **Smith Meter Model PA-6 Preamplifier** is designed to be used with the Smith Meter Turbine Meters and D Transmitters (on PD Meters) to convert the 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, edge-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.*

Features

■ **Explosion-Proof Mounting on the Turbine Meter.**

■ **8–29 Vdc Input Power.**

■ **Low Susceptibility to EMI/RFI Interference.**

■ **Pulse Output Multiplication** (0.5, 1, or 2 Times).

■ **Jumper-Selectable Gain** (1, 25, 50).

■ **Easy Installation.**

■ **Longer Distances.**

Applications

Applications for the Model PA-6 Preamplifier include turbine meter installations that require the transmission distance to instrumentation greater than 2,000 feet (610 m). 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.

The PA-6 Preamplifier can be used in applications that are interfacing with other equipment the input voltage to the preamp and the output voltage to the equipment receiving the signal should be checked. If the input to the preamp is less than or equal to 12 Vdc, the output will be 12 Vdc or less. If the input is above 12 Vdc, the output of the PA-6 will be above the 12 Vdc. This application needs to be checked to determine if the receiving instrument can handle a signal higher than 12 Vdc.

Specifications

Electrical Inputs
DC Power[1]

8 to 29 Vdc ± 1.0 Vdc at preamplifier.

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1 DC power available from Smith Meter Electronics Instrumentation.

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 Strap x 50).
150 mVp-p @ 25°C and 20 Hz (Gain Strap x 25).
750 mV @ 25°C and 20 Hz (No Gain Strap x 1).

Input Signal

Sinusoidal, no dc offset, 24 Vp-p maximum, 10 kHz maximum.

Input Impedance

10 kΩ minimum @ 20 Hz.

Temperature

-58°F to 158°F (-50°C to 70°C).

Humidity

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

Electrical Outputs

Output Signal

12 Vdc Input Power Supply:
No Load: 11 ±0.3 Vp-p square wave.
270 Ω Load: 6 ±0.3 Vp-p square wave (minimum).

24 Vdc Input Power Supply:
No Load: 23 ±0.3 Vp-p square wave.
270 Ω Load: 12 ±0.3 Vp-p square wave (minimum).

Current:
Maximum Sink Current: 300 mA @ 29 Vdc.
Maximum Source Current: 80 mA @ 29 Vdc.

Pulse Duration

1.0 to 0.5 Multiplication:

Duty cycle range 30/70 to 70/30. Maximum input frequency not to exceed 5,000 Hz.

2.0 Multiplication:

Nominal off-time is 100 μs. Maximum input frequency not to exceed 2,500 Hz.

Signal Cable

Three-wire shielded for single-channel transmission.

Size	Distance	
#20 AWG	Up to 2,000 ft.	(610 m)[2]
#18 AWG	Up to 3,000 ft.	(915 m)[2]
#16 AWG	Up to 5,000 ft.	(1,525 m)[2]

Gain (Jumper Selectable)

A factory-installed jumper is placed between Terminals 8 and 9 (Gain Strap x 25) which provides an input sensitivity of 150 mVp-p at 25°C and 20 Hz. When the PA-6 is installed and it is sensitive for the application and is picking up stray pulses from noise, etc., the gain can be changed by removing the jumper which is Gain Strap x 1. If the PA-6 is not sensitive enough for the application, the unit can be made more sensitive by moving the jumper to Terminals 8 and 10 which is Gain Strap x 50. In all cases it must be verified that all pulses provided by the product flowing through the meter are counted.
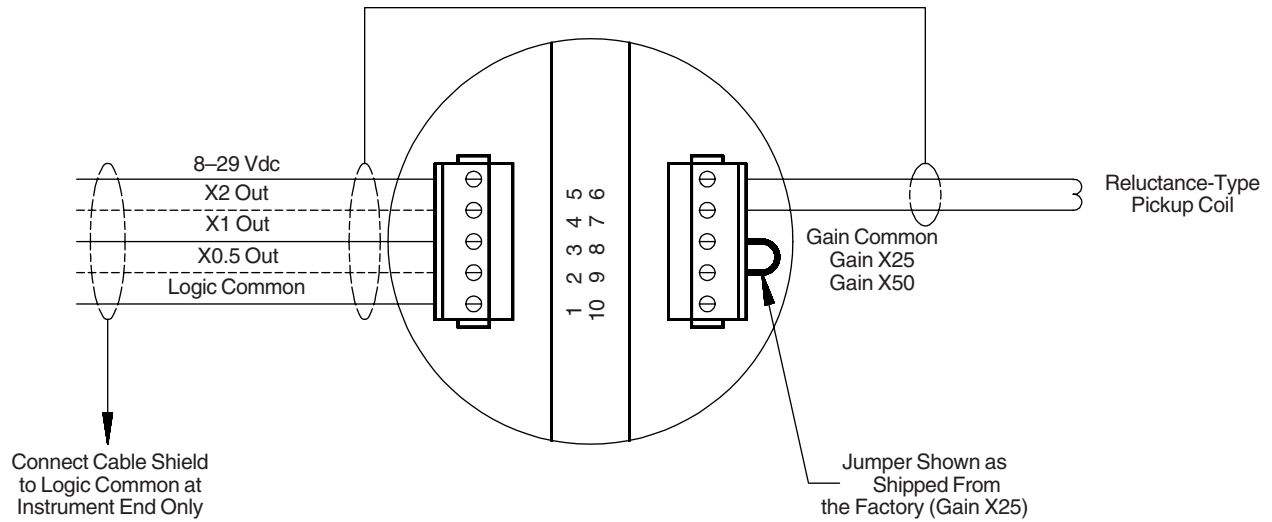
Service

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

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2 *All cable recommendations sized to drive a low impedance load (≈ 270Ω with a trip point for the receiving instrumentation pulse circuitry of at least 9.5 Vdc.*

Wire Connections

Single Channel Transmission

8–29 Vdc
X2 Out
X1 Out
X0.5 Out
Logic Common

1 2 3 4 5
10 9 8 7 6

Reluctance-Type
Pickup Coil

Gain Common
Gain X25
Gain X50

Connect Cable Shield
to Logic Common at
Instrument End Only

Jumper Shown as
Shipped From
the Factory (Gain X25)

Note: *In wiring the Reluctance-Type Pickup Coil, the white wire must be connected to Terminal 6 and the black wire to Terminal 7. This is critical when used for dual pulse input to an electronic instrument.*

Dimensions

Inches (mm)

1 2 3 4 5
10 9 8 7 6

2.6"
(66)

0.9"
(23)

1.8"
(46)
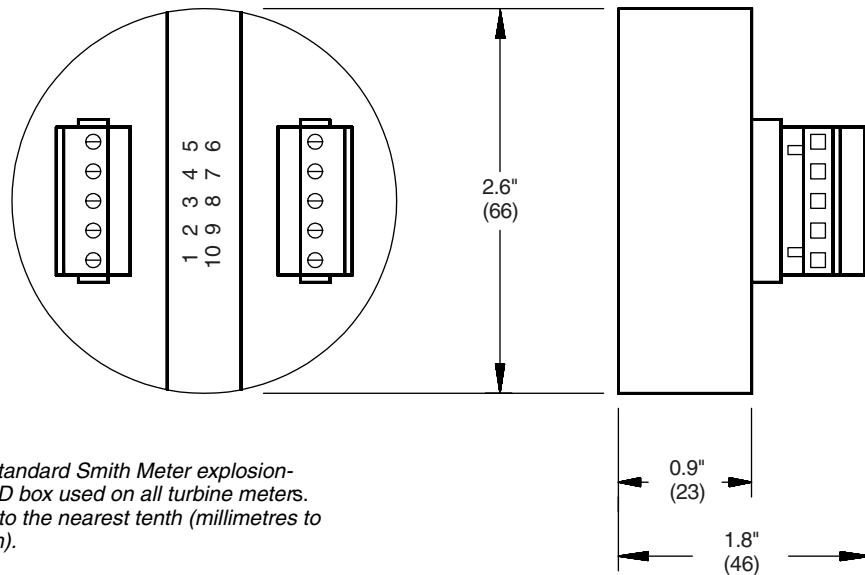
Notes:
1. Mounting – Fits into standard Smith Meter explosion-proof, Class I, Group D box used on all turbine meters.
2. Dimensions – Inches to the nearest tenth (millimetres to the nearest whole mm).

Revisions included in SS02012 Issue/Rev. 0.3 (11/10):
   Page 1: Applications information revised.

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