Smith Meter® Turbine Meters

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 highspeed, 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).
- Simple installation.
- Allows greater distance between meter and flow computer.

Specifications

Electrical Inputs
DC Power:
8 to 29 VDC ± 1.0 VDC at preamplifier.

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 mVp-p @ 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.)

1 DC power available from Smith Meter® electronics instrumentation.
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.

<table>
<thead>
<tr>
<th>Size</th>
<th>Distance</th>
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<tbody>
<tr>
<td>#20 AWG</td>
<td>Up to 2,000 ft. (610 m)²</td>
</tr>
<tr>
<td>#18 AWG</td>
<td>Up to 3,000 ft. (915 m)²</td>
</tr>
<tr>
<td>#16 AWG</td>
<td>Up to 5,000 ft. (1,525 m)²</td>
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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 (= 270 Ω with a trip point for the receiving instrumentation pulse circuitry of at least 9.5 VDC.
Wire Connections
Single Channel Transmission

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)

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. 0.5 (2/18):

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.fmctechnologies.com/measurementsolutions and click on the “Contact Us” link in the left-hand column.