

ATE-31 PT Interface Module Hydroelectric Turbine Speed Signal Conditioner

DESCRIPTION

The Model ATE-31 PT Interface Module is a DIN rail mount (23 mm wide) signal conditioner with 2000 VDC isolation between the input and the output. The input accepts a voltage from an instrumentation potential transformer and converts it to a 24 Volt pulse train for use by PLC-based frequency counting equipment. The input amplitude can vary from 0.2 VRMS to 180 VRMS. The input frequency can vary from 6 Hz to 120 Hz.

A 3-pole Butterworth low-pass filter is included in the Model ATE-31. This filter blocks high frequency transients which may be superimposed upon the input signal voltage from passing through to the frequency counting equipment. The small-signal sensitivity of the Model ATE-31 will reliably measure the frequency output of a generator operating at low speed prior to the application of field excitation. The input side of the Model ATE-31 is fully isolated from the output side, so the signal input can be connected either from line to neutral or from line to line of the instrumentation potential transformers.

APPLICATION

The Model ATE-31 PT Interface module is useful in applications where the rotating speed of a generator must be accurately measured without the addition of a conventional slotted disk or gear and magnetic pickups. It is designed with sufficient sensitivity to operate from the voltage produced at low speeds from the residual magnetism in the rotor of the generator. Typically, the residual output of most generators is sufficient for the Model ATE-31 to allow measurement of the generator speed down to and below 10% of the rated speed of the generator as an input to the unit braking system.

Typical generator residual voltage output:

0.2VRMS @ 6Hz and 2.0VRMS at 60 Hz.

STATUS LEDs

The Model ATE-31 utilizes two status LEDs. The green LED indicates that DC power is applied. The yellow LED is illuminated when the input signal has positive polarity from terminal 1 or 2 to 3 or 4. The yellow LED is extinguished when the input signal has negative polarity. At low input frequencies, the yellow LED will flash visibly to indicate the presence of the input signal. At higher input frequencies, the yellow LED will appear to be illuminated at a reduced intensity due to visual averaging of the flashes.

CALIBRATION

No calibration is required for the Model ATE-31.

SPECIFICATIONS

Power

Supply: 18 to 30 VDC
Consumption: 2 W typical

Input

Amplitude Range: 0.2 VRMS to 180 VRMS
Absolute Minimum: 0.015Vrms

Frequency Range: 6 Hz to 120 Hz
Absolute Minimum: DC

Output

Pulse train 24 Volts peak-to-peak (typical)

Mounting

TS32 or TS35 DIN Rail

Terminal Connections

5, 6, 7, 8 & 9, 10, 11 & 12 Shield Bus

1 & 2 (+) Input

3 & 4 (-) Input

13 & 16 Signal Common

Signal Output

15 DC Power (+)

Operating: 0 to 55 °C (5 to 131 °F)

Storage: -25 to 70 °C (-13 to 158 °F)

Temperature Range

Operating: 0 to 55 °C (5 to 131 °F)

Storage: -25 to 70 °C (-13 to 158 °F)

Figure 1: Wiring Diagram for ATE-31

