



## 2135 QUADRATURE ENCODER METER

This Counter Meter accepts the “A” and “B” signals from a conventional shaft encoder to provide a highly accurate, scaled display of position, length, or angle in desired engineering units (such as ft., cm, or degrees).

The A and B quadrature signals are 90° out of phase, and their phase relationship determines whether up counts (+) or down counts (–) are generated. The **2135** totalizes the counts and then scales the total in software for display and control. A zero index signal may be added as a third input to the A and B signals (see below).

One, two, or four transitions may be counted at a maximum combined rate of 250 kHz, and may be mathematically scaled for display in engineering units from -999,999 to +999,999. The **2135's** input circuitry may be jumpered for either single-ended input signals or for balanced linedriver signals. Antijitter circuitry eliminates errors produced by vibration of the encoder.

A ZERO INDEX pulse, if available, is interpreted by the meter as corresponding to an integral number of revolutions of the shaft encoder. It is used to correct for any cumulative pulse-count errors. Special circuitry corrects for width of the zero index pulse. In the event of power failure, the current total may be stored in nonvolatile memory, to be used as the starting point for counting when power resumes. Note that power failure and zero index capabilities are alternative meter setup choices.

The meter's built-in isolated 5, 10, or 24 V-DC excitation supply can power the encoder, thus eliminating the need for an external supply. The following 2000 Series options can be used to upgrade the **2135** from a stand-alone monitor to a system controller (in particular, the meter can provide an isolated 4-20 mA output signal scaled to the display):

- **Isolated Relay Outputs: Dual 10-Amp Contact Relays or Dual Solid-State Relays**
- **Isolated Analog Output: Isolated 0-20 mA and 0-10 mV**
- **RS232 or RS485 Interface: Communication via 4 or 6 conductor phone cable RJ-11**
- **Low AC/DC Power: 9-32 VDC, 8-28 VAC**

In addition, the “EXTENDED COUNTER” option converts the **2135** from a scaled position meter to a scaled rate meter. As such, it can be used, for example, to display the speed of a moving slab in ft./sec.\* Note that the simultaneous display of position and rate will require two separate meters.

# PANEL METER

## QUADRATURE ENCODER

### [2000 SERIES]

## SPECIFICATIONS

**Input Type:** Low-level differential or single-ended 5-V logic level outputs from shaft encoders

**Transitions Monitored:** x1, x2, or x4

**Maximum Pulse Rate:** 250 kHz at x1; 125 kHz at x2; 62.5 kHz at x4

**Position Error:** No error contributed by meter

**Rate Operation:** See General Counter Meter Specifications

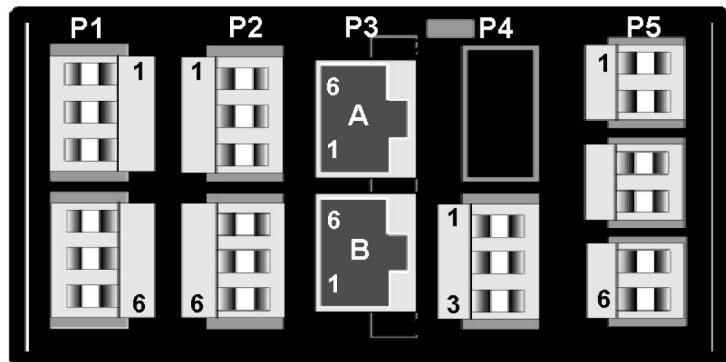
**Time Base Accuracy:** Crystal calibrated to  $\pm 2$  ppm

**Span Temperature Coefficient:**  $\pm 1$  ppm/ $^{\circ}\text{C}$  (typical)

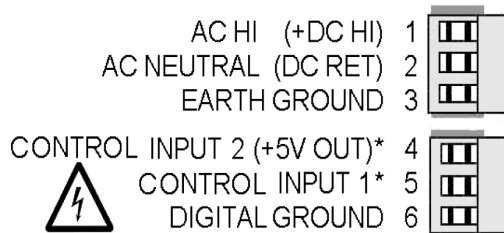
**Long-Term Drift:**  $\pm 5$  ppm/year

## CONNECTORS

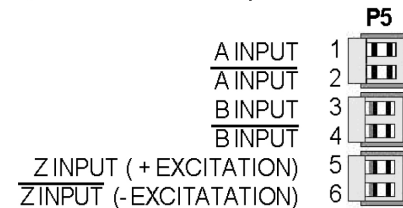
Connectors for signal and power are U/L rated screw-clamp terminal blocks that plug into mating jacks on the printed circuit board. Communication connectors are a single RJ11 plug for RS232, dual RJ11 plugs for RS485, dual RJ45 plugs for RS485 Modbus, and a 30-pin, mass termination connector for parallel BCD.



### P1 - POWER AND DIGITAL CONTROLS



### QUADRATURE INPUT (DIFFERENTIAL)



**Note:** Z input or excitation is jumper selectable

### QUADRATURE INPUT (SINGLE-ENDED)

