



PROVEN PANEL METER FOR SIGNAL CONDITIONING OF AC LVDT PROBES AND GAGES - COMBINES SENSOR SIGNAL CONDITIONER (3130) WITH DISPLAY (3230) & LIMIT CONTROL (3330)

The Models **3130**, **3230**, and **3330** LVDT Instruments may be used with any series-opposed 5-, 6-, or 7- wire LVDT sensors or 3-wire variable reluctance transducers that can be operated with a 3-kHz frequency. Optional remote sensing is available for long cables.

The Model **3130** LVDT Conditioner is the basic Form 1 instrument. The Model **3230** LVDT Conditioner/Indicator is the Form 2 instrument, providing vivid front-panel digital indication of measured values. The available scales allow ready calibration over virtually any measurement range, with a wide choice of engineering units. Instrument sensitivity and resolution allow precision to a fraction of a microinch, if required. The Model **3330** LVDT Conditioner/ Indicator/Controller is the Form 3 instrument, and includes HI/LO limit detection. This feature is useful in wide variety of "GO NO GO" dimensional gaging applications. Working on the synchronous carrier-demodulator principle, all three instruments supply amplitude regulated 3-kHz AC excitation to the transducer. Two standard 5-V outputs are produced (see Specifications). Each output is precisely proportional to LVDT core displacement over the full \pm range of the sensor.

Sensitivity is widely adjustable, allowing full-scale output for input displacements as small as ± 0.001 inch (± 0.0254 mm). A unique phase-control circuit automatically and continuously adapts the instrument to any signal phase shift occurring in the transducer or cable. This simplifies setup procedures, and ensures optimum sensitivity and linearity for each type of LVDT sensor employed. Span adjustment is accomplished through 12-turn Coarse and Fine front-panel controls plus 5 internal range multiplier switches. Nominal maximum sensitivity is 10 mV (inphase component) for full-scale input.

3000 Series options applying to the LVDT instruments include:

- Analog Peak Capture (Models 3230 and 3330)
- 4-20 mA Current Output (Models 3130 and 3230)
- 0-10 V-DC Dual Galvanic Isolated Outputs (Models 3130 and 3230)
- Internal Electromechanical Relays (Model 3330)
- Internal Solid-State Relays (Model 3330)
- 12 V-DC Battery-Powered Operation or Nominal 230 V-AC Operation (Models 3130, 3230, and 3330)

3130/3230/3330

AC LVDT PANEL INSTRUMENT
[3000 SERIES]

SPECIFICATIONS

Input Type: Series-opposed 5-, 6-, or 7-wire LVDT sensor or 3-wire variable reluctance transducer capable of 3-kHz operation and having primary impedance greater than 80 Ohm

Input Range (full-scale): ± 0.001 to ± 4.000 inches (± 0.0254 to ± 101.6 mm)

Excitation Supplied: 3 kHz, amplitude regulated

Analog Outputs: Two outputs, each ± 5 V full-scale with 50% overrange, 5 mA max.; low-pass corner frequencies of 2 Hz and 400 Hz, respectively

Analog Filtering: Active low-pass filters provide -60 dB per decade above cutoff frequency ("f"); full-scale slew time is 1.4/f sec

Output Ripple and Noise: 0.15% of full scale (rms) max. for 400-Hz output; 0.02% for 2-Hz output

Accuracy (typical, following calibration): Varies from 0.1% to 1.0% of calibrated range*

Display Resolution (Models 3230 and 3330): 0.02% of full scale

Physical / Environmental

Case: Each unit is housed in a single piece of heavy gage aluminum (1.7" H x 4.41" W x 7.0" D); a simple reassembly procedure allows mounting in the user's precut panel; the Model 3004 Rackmount Adaptor permits secure mounting of up to four units in a standard 19-inch rack

Operating Temperature Range: 0° F to +130° F (-18°C to +55° C); assumes dry, noncondensing ambient atmosphere

Weight: Instrument: approximately 2.0 lb (0.9 kg) maximum;
Shipping: approximately 3.5 lb (1.6 kg) maximum

Power Voltage: 105-135 V-AC; 210-260 V-AC optional (add suffix "F" to model number); any model not employing the solid-state relay ("S") option may be powered by battery (11.5-15 V-DC, 500 mA max.; add suffix "B" to model number)

Frequency: 50-400 Hz

Consumption: 5 W max. (for Form 1 instruments), 8 W max. (for Form 2 instruments), or 9 W max. (for Form 3 instruments) Display (Form 2 and Form 3 instruments only)

Display: Orange LED's, six digits with polarity sign, 0.4" (1.0 cm) height; Most Significant Digit of display is either unlit or reads "1," and in either case contains polarity sign; Least Significant Digit is a dummy zero which may be lit or unlit, as desired

Scaling: Selectable at rear panel; full-scale values of ± 5000 counted by "1's," ± 10000 counted by "2's," or ± 20000 counted by "5's," with selectable decimalpoint locations (along with dummy zero) to give decade multiplier factors of 10, 1.0, 0.1, 0.01, 0.001, or 0.0001

Display Sampling Update Rate: 3 samples per second

Limit Logic Outputs (Form 3 instruments only) Both true and complement available for each limit condition (LOW, OK, HIGH); TTL-compatible, wire-ORable; 10-mA sink, 0.5-mA source (max.); normally nonlatching, but latching outputs are also available

* Depending on the linearity characteristics of the LVDT element itself. The resolution and accuracy of these instruments are considerably in excess of what is generally useful in practical applications. In high-sensitivity LVDT measurement, the ultimate limits of accuracy are not imposed by the instrumentation, but by considerations of dimensional stability that pertain to the transducer, the fixture, and/or the measured object itself. In general, accuracy to 0.0001 inch or better can be achieved only with carefully designed fixtures and under conditions of precise temperature control.