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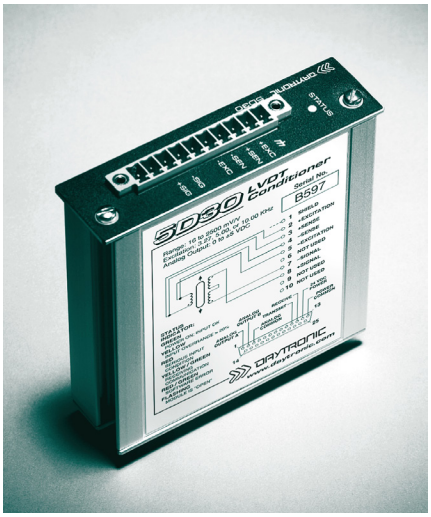
MODEL 5D30/5D30V

LVDT CONDITIONER
[5D SERIES]



HIGHLY-RELIABLE CONDITIONERS FOR MEASUREMENT OF DISPLACEMENT, FORCE, PRESSURE AND OTHER PARAMETERS OBTAINED WITH A LINEAR VARIABLE DIFFERENTIAL TRANSDUCER (LVDT).

The **5D30** delivers filtered analog output of **±5 VDC,** while the **5D30V** produces **±10 VDC**. Based on the synchronous carrier-demodulator principle, both models can handle a remarkably wide range of signals (from 16 to 4000 mV/V, full scale)—with no special "long-stroke" cabling required for high-output sensors. Three selectable operating frequencies are provided to best match the user's specific transducer. Exceptional signal stability and accuracy over the entire input range are achieved through...

- **regulated, remotely sensed AC excitation**
- **precise linearity / symmetry correction and signal phase adjustment via software commands**
- **high-stability amplification**
- **configurable low-pass active filtering**
- **"absolute" and "two-point" software calibration**
- **effective signal isolation & ESD protection**

ADVANCED LINEARITY AND NEGATIVE SYMMETRY CORRECTION FOR TRANSDUCERS THAT MAY REQUIRE IT. LVDT sensors that exhibit typical nonlinearity and/or asymmetry can be easily accommodated. By applying simple software commands, you can fit the output curve to your linear, symmetric "ideal."Two high-level, noise-free analog outputs are provided. For the **5D30** (only), one output may be switched on and off by setting the logic state of an "enable" line (thus eliminating the need for an external multiplexer in multiple-module applications).Powerful low-pass active filtering is independently selectable for each output, for removal of unwanted high-frequency measurement-signal components and the elimination of aliasing errors, if the module's output is subsequently sampled.

INTERNAL "ABSOLUTE" CALIBRATION COUPLED WITH HIGH-ACCURACY "TWOPOINT (DEADWEIGHT)" CALIBRATION. Because of normal cable loading effects, it is a practical necessity to calibrate any LVDT/CABLE/INSTRUMENT system after installation, using a known input standard. The "absolute" calibration provided by the **5D30(V)** normally yields a very good first approximation. Conventional "zero and span" calibration may then be easily performed—with the module fully "in place"—using the Configurator Software supplied with the **5D30(V)**. This procedure includes any necessary phase-shift compensation, symmetry trimming, and midscale linearity adjustments. When calibrated "in place," the **5D30(V)** offers excellent stability and interchangeability of units. As long as an initially calibrated **5D30(V)**'s setup configuration is exactly transferredto the **5D30(V)** that replaces it, no recalibration is usually required to maintain the stated accuracy (see table, below).

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SPECIFICATIONS

Housing: Extruded aluminum casing; mountable to panel, fixture, or DIN-rail

Dimensions: See 5D SERIES Product Bulletin

Power Requirements: 24 VDC ± 10%; 100 mA nom.; 150 mA max.

Input Overvoltage Protection: Up to 240 VAC rms on all Signal and Excitation lines

ESD Protection: Up to 4 kV on all connections

Isolation: 1500 VAC between input and output terminals; 1500 VAC between I/O terminals and power supply / communications terminals

Operating Temperature Range: -10° C to 70° C

(14° F to 158° F)

Operating Relative Humidity: 5% to 95%, noncondensing

Transducer Types: Virtually any variable transformer transducer, including 4-, 5-, and 6-wire LVDT's and 3- and 5-wire Variable Reluctance Transducers1 (see diagram, below, for typical cabling)

Input Ranges (Nominal, Full-Scale): See table; selectable when the 5D30(V) is configured (NOTE: the highest range selection accommodates actual inputs as high as 4000 mV/V)

Amplifier:

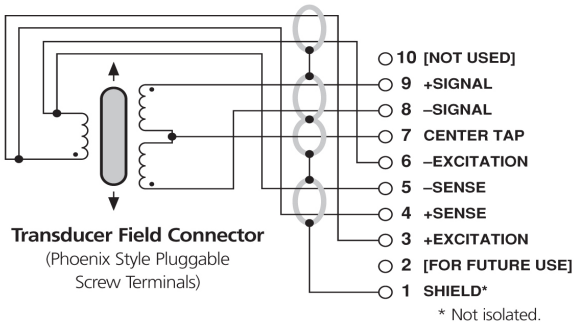
Normal-Mode Range: 15 V rms operating; 240 V rms without damage

Input Impedance (Differential): Greater than 350 kΩ

Offset: Initial: ±0.05% of full scale; vs. temperature: ±25 ppm/°C; vs. time: ±10 ppm/month

Gain Accuracy: ±0.02% of full scale typical, following calibration; see table

Gain Stability: vs. temperature: ±25 ppm/°C; vs. time: ±10 ppm/month



Transducer Field Connector
(Phoenix Style Pluggable Screw Terminals)

Analog Filters: 0.2, 2, 20, 200, or 2000 Hz, independently selectable for each output3

Analog Outputs: Filtered ± 0 to 5 VDC (for the Models 5D30 and 5D30S) or ±0 to 10 VDC (for the Model 5D30V), with linearity maintained for 20% overrange; for the 5D30 (only), Output B is switchable via logic "Enable" line4

Logic Input (Enable)4: Nominal 0 - 5 V, where 5 V = Logic 1 ("true"); ±25 V without damage; noise immunity 1 V; internal pull-up nom. 5 kΩ; input assumes Logic 1 state in the absence of connection

Status Indicator Light: Green/Yellow/Red; indicates module input and communications status (see 5D SERIES Product Bulletin)

Excitation Voltage: Nominal 3 VAC rms

Excitation Frequency: 3.27, 5.00, or 10.00 kHz; selectable when the 5D30(V) is configured

Accuracy: Dependent on range and excitation; see table2

5D30(V) Ranges and Accuracy per Excitation Setting
(Accuracy given as % of full scale overall expected maximum error, following calibration)

	Excitation Frequency (kHz)	
Range (mV/V)	3.27 or 5.00	10.00
16	0.03	0.04
25	0.03	0.04
40	0.02	0.03
64	0.02	0.02
100	0.02	0.02
160	0.02	0.02
250	0.02	0.02
400	0.02	0.02
640	0.02	0.02
1000	0.02	0.02
1600	0.03	0.03
2500	0.05	0.05

1 May require user-supplied half-bridge resistors.

2 The full-scale accuracies given in the table refer to the 5D30(V)'s response to substantially *undistorted* waveform inputs. Any phase shift must be compensated for during calibration. Some gain deviation from LVDT data-sheet specifications is normally to be expected as a result of loading the transducer's finite output impedance with intrinsic cable capacitance. The degree of this error will vary with cable type and length.

3 The value of the highest corner frequency is *dependent on the selected excitation frequency*: for an excitation of 10.00 kHz, it is 2000 Hz; for 5.00 kHz, it is 1400 Hz; and for 3.27 kHz, it is 1100 Hz.

4 "Enable" line not available on the **Models 5D30V and 5D30S** ("S" Option), which provide alternative screw-terminal connection for single-point applications. For these units, both outputs are continuously available.