

# R30D RVDTs

## DC-Operated Rotary Variable Differential Transformers

RVDTs incorporate a proprietary noncontact design that dramatically improves long term reliability when compared to other traditional rotary devices such as syncros, resolvers and potentiometers. This unique design eliminates assemblies that degrade over time, such as slip rings, rotor windings, contact brushes and wipers, without sacrificing accuracy.

High reliability and performance are achieved through the use of a specially shaped rotor and wound coil that together simulates the linear displacement of a Linear Variable Differential Transformer (LVDT). Rotational movement of the rotor shaft results in a linear output signal that shifts  $\pm 60$  (120 total) degrees around a factory preset null position. The phase of this output signal indicates the direction of displacement from the null point. Noncontact electromagnetic coupling of the rotor provides infinite resolution, thus enabling absolute measurements to a fraction of a degree.

Although capable of continuous rotation, most RVDTs are calibrated over a range of  $\pm 30$  degrees, with nominal nonlinearity of less than  $\pm 0.25\%$  of full scale (FS). Extended range operation up to a maximum of  $\pm 90$  degrees is possible with compromised linearity.

### R30D

The R30D RVDT is a DC operated noncontacting rotary transducer. Integrated signal conditioning enables the R30D to operate from a bipolar  $\pm 15$  VDC source with a high level DC output that is proportional to the full range of the device. Calibrated for operation to  $\pm 30$  degrees, the R30D provides a constant scale factor of 125 mVDC/degree. Nonlinearity error of less than  $\pm 0.25\%$  FS is achieved while maintaining superior thermal performance over  $-18^{\circ}\text{C}$  to  $75^{\circ}\text{C}$ .

The DC excitation is internally converted to an AC carrier signal which excites the transducer's primary coil. An integrated demodulator amplifier and filter convert the differential secondary output into a smooth, high level, DC output signal that is linear with the shaft angle position. Resolution is infinite enabling measurements to a fraction of a degree.

The R30D features a rugged aluminum size 11 housing making this rotary transducer ideal for applications where integrated signal conditioning and small size are required. Typical applications include hydraulic pump control, rotary actuator feedback, and throttle lever position feedback.



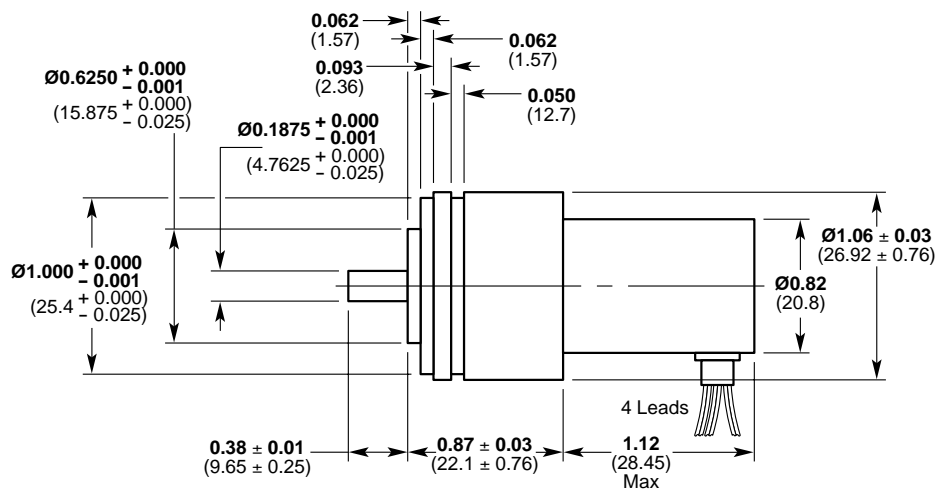
### Specifications

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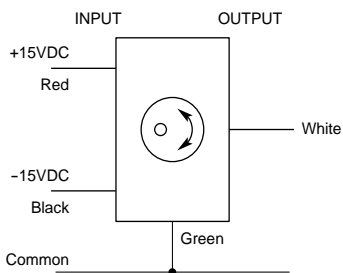
<b>Input Voltage (nom)</b> .....	$\pm 15$ Vin DC
<b>Output Voltage (nom)</b> ...	$\pm 3.75$ VDC
<b>Input Current (max)</b> .....	35 mA
<b>Output Current (max)</b> ...	5 mA
<b>Frequency Response</b> .....	500 Hz @ -3 dB
<b>Linearity Error</b> .....	$\pm 0.25\%$ of full scale output
<b>Storage Temperature</b>	
Range .....	$-65^{\circ}\text{F}$ to $250^{\circ}\text{F}$ ( $-55^{\circ}\text{C}$ to $125^{\circ}\text{C}$ )
<b>Operating Temperature</b>	
Range .....	$0^{\circ}\text{F}$ to $170^{\circ}\text{F}$ ( $-18^{\circ}\text{C}$ to $75^{\circ}\text{C}$ )
<b>Temperature</b>	
Coefficient of FS .....	$\pm 0.02\%$ of FS/ $20^{\circ}\text{F}$ to $160^{\circ}\text{F}$ ( $\pm 0.04\%$ of FS/ $-5^{\circ}\text{C}$ to $70^{\circ}\text{C}$ )
<b>Moment of Inertia</b> .....	$.53 \times 10^{-6}$ lb • in • sec <sup>2</sup>
<b>Lead Wires</b> .....	28 AWG, Teflon® insulation, 4 wire, minimum 12" long
<b>Torque</b> .....	0.015 in-oz (1.08 gm-cm)
<b>Weight</b> .....	1.9 oz (53 gm)
<b>Mounting</b> .....	Size 11 servo mount BU-ORD
<b>Bearings</b> .....	Shielded ABEC 3 precision
<b>Shaft Diameter</b> .....	3/16 in (4.76 mm)
<b>Axial Shaft Bearing</b>	
Load Capability .....	10 lbs (4.54 kg)
<b>Radial Shaft Bearing</b>	
Load Capability .....	8 lbs (3.6 kg)
<b>Casing Material</b> .....	Aluminum

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**Dimensions** in (mm)



**Wiring**



**How to Order**

Specify by model number. R-Flex coupler available separately (see page 144).

Model Number	Size	Range
R30D	11	±30°