

## R30A – AC Operated, Light Weight RVDT



- AC operation
- $\pm 60$  degree angular sensing range
- Light weight
- Non-contact electrical design
- Wide operating temperature range
- Size 11 servo mount
- Anodized aluminum housing

### DESCRIPTION

The **R30A RVDT** (Rotary Variable Differential Transformer) is an angular position sensor that incorporates a proprietary non-contact design which dramatically improves long term reliability when compared to other traditional rotary devices such as synchros, 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 change in the amplitude of the output signal, directly proportional to the shaft angle change, while the phase of this output signal indicates the direction of displacement from the null point. Non-contact electromagnetic coupling of the rotor provides infinite resolution thus enabling absolute measurements to a fraction of a degree.

AC operation eliminates the need for integrated signal conditioning components, thereby offering the user an extremely wide operating temperature range of  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ . Factory calibrated to operate over a  $\pm 30$  degree range, the R30A offers a non-linearity of less than  $\pm 0.25\%$  of full range. Extended range operation up to a maximum of  $\pm 60$  degrees is possible with increased non-linearity. Packaged in a small, size 11 servo mount, aluminum housing with flying lead termination, the R30A is ideal for space restrictive applications.

Also see our other angular position sensor models, **R36AS** (stainless steel housing, MS style connector), **RSYN** (high output, shock and vibration tolerant), **R30D** and **R60D** (bipolar DC operation), and the **RVIT-15 Series** (single ended DC operation, voltage or current output).

Measurement Specialties, Inc. (NASDAQ MEAS) offers many other types of sensors and signal conditioners. Data sheets can be downloaded from our web site at: <http://www.meas-spec.com/datasheets.aspx>

MEAS acquired Schaevitz Sensors and the **Schaevitz™** trademark in 2000.

### FEATURES

- High accuracy
- Infinite resolution
- Long term reliability
- Wide  $-55^{\circ}$  to  $+150^{\circ}\text{C}$  operating temp range
- Rugged anodized aluminum housing
- Shielded ABEC 3 precision bearings

### APPLICATIONS

- Valve position
- Machine tool equipment
- Rotary actuator feedback
- Dancer arm position
- Process control

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## PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS                   |                                                                                                                      |         |         |                         |         |          |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------|---------|-------------------------|---------|----------|
| Parameter                                   | @10kHz Input Frequency <i>(recommended)</i>                                                                          |         |         | @2.5kHz Input Frequency |         |          |
| Angular range, degrees                      | ±30°                                                                                                                 | ±40°    | ±60°    | ±30°                    | ±40°    | ±60°     |
| Non-linearity, % of FR, max.                | ±0.25%                                                                                                               | ±0.5%   | ±2%     | ±0.25%                  | ±0.5%   | ±2%      |
| Output at range ends (*)                    | 87mV/V                                                                                                               | 116mV/V | 174mV/V | 69 mV/V                 | 92 mV/V | 138 mV/V |
| Sensitivity                                 | 2.9 mV/V/degree                                                                                                      |         |         | 2.3 mV/V/degree         |         |          |
| Temp coefficient of sensitivity             | 0.02%/°F [0.036%/°C], 20 to +160°F [-7 to +71°C]                                                                     |         |         | Not specified           |         |          |
| Input / Output impedances                   | 370Ω / 1300Ω                                                                                                         |         |         | 135Ω / 600Ω             |         |          |
| Phase shift                                 | +3°                                                                                                                  |         |         | +35°                    |         |          |
| Input voltage and frequency                 | 3 VRMS @ 2.5 to 10 kHz (10kHz recommended)                                                                           |         |         |                         |         |          |
| Null voltage                                | 0.5% of FRO, maximum                                                                                                 |         |         |                         |         |          |
| ENVIRONMENTAL AND MECHANICAL SPECIFICATIONS |                                                                                                                      |         |         |                         |         |          |
| Operating temperature                       | -67°F to +300°F [-55°C to 150°C]                                                                                     |         |         |                         |         |          |
| Mechanical angular range                    | 360 degrees (no stops)                                                                                               |         |         |                         |         |          |
| Bearings                                    | Shielded ABEC 3 precision                                                                                            |         |         |                         |         |          |
| Shaft diameter                              | 3/16 inch [4.76 mm]                                                                                                  |         |         |                         |         |          |
| Housing material                            | Aluminum, anodized                                                                                                   |         |         |                         |         |          |
| Mounting                                    | Size 11 servo mount per BU-ORD                                                                                       |         |         |                         |         |          |
| Moment of inertia                           | 0.53 x 10 <sup>-6</sup> inch.lb-force.second <sup>2</sup> [0.61 x 10 <sup>-6</sup> Kg-force.cm.second <sup>2</sup> ] |         |         |                         |         |          |
| Maximum torque, unbalance                   | 0.004 inch.ounce-force [0.3 gram-force.cm]                                                                           |         |         |                         |         |          |
| Maximum torque, friction                    | 0.015 inch.ounce-force [1.1 gram-force.cm]                                                                           |         |         |                         |         |          |
| Shaft load capability                       | 10 lb [4.5Kg] Axial; 8 lb [3.6 Kg] Radial                                                                            |         |         |                         |         |          |
| Electrical connection                       | 6 lead wires, AWG 28, PTFE insulation, 12 inches [30cm] long                                                         |         |         |                         |         |          |
| Weight                                      | 1.3 oz [36 Grams]                                                                                                    |         |         |                         |         |          |
| IEC 60529 rating                            | IP60                                                                                                                 |         |         |                         |         |          |

### Notes:

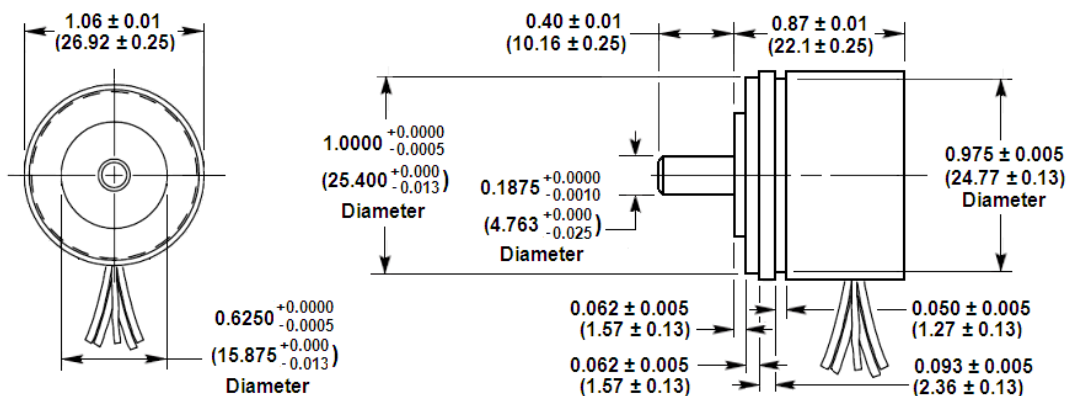
All values are nominal unless otherwise noted

(\*): Unit for output at range ends is millivolt per volt of excitation (input voltage)

FR (Full Range) is the angular range, end to end; 2xA° for ±A° angular range

FRO (Full Range Output): Algebraic difference in outputs measured at the ends of the range

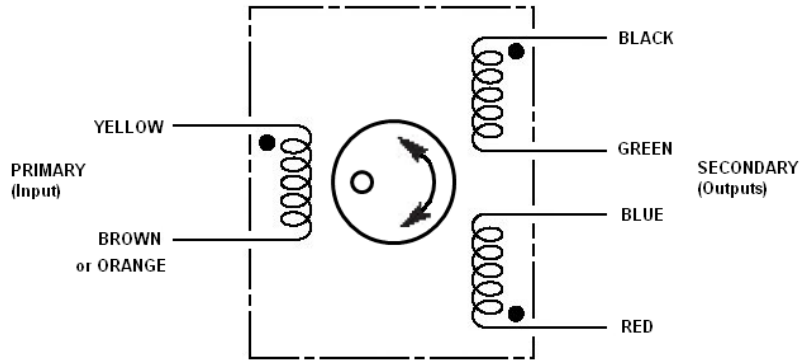
## DIMENSIONS



Dimensions are in inch (mm)

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## WIRING INFORMATION



Connect Green to Blue for differential output

## ORDERING INFORMATION

| Description                                        | Model | Part Number  |
|----------------------------------------------------|-------|--------------|
| RVDT $\pm 30^\circ$ , 10KHz calibration (standard) | R30A  | 02560231-000 |
| <b>OPTIONS</b>                                     |       |              |
| RVDT $\pm 40^\circ$ , 10KHz calibration            |       | 02560231-140 |
| RVDT $\pm 60^\circ$ , 10KHz calibration            |       | 02560231-160 |
| RVDT with 2.5KHz calibration                       |       | 02560231-2XX |
| <b>ACCESSORIES</b>                                 |       |              |
| R-FLEX multipurpose coupling kit                   |       | 66530072-000 |

Refer to our ["RVDT and RVIT Accessories"](#) data sheet for other accessories.

## TECHNICAL CONTACT INFORMATION

| NORTH AMERICA                                                                                                                                                                                                                                                                   | EUROPE                                                                                                                                                                                                                                                               | ASIA                                                                                                                                                                                                                                                                                                                                |
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