

RVIT 15-60 & 15-120i – Rotary Variable Inductance Transducers



- DC operation
- Non-contact electrical design
- Infinite resolution
- Up to 120 degree sensing range
- $\pm 3\text{VDC}$ ratiometric or 4-20mA output
- $\pm 0.25\%$ linearity
- Size 15 servo or flange mount
- Anodized aluminum housing

DESCRIPTION

The **RVIT 15-60** and **RVIT 15-120i** are DC operated, non-contact, angular position sensors featuring MEAS proprietary RVIT (Rotary Variable Inductance Transducer) technology. Operating from a single rail DC voltage supply, they provide either a $\pm 3\text{VDC}$ (RVIT 15-60) or 4-20mA (RVIT 15-120i) output, over a 120 degree angular sensing range.

The RVIT design utilizes a set of four printed circuit coils and a light-weight conductive spoiler to achieve superior performance with a low moment of inertia. During operation, the light weight spoiler rotates with the transducer shaft, differentially altering the inductance of the printed circuit planar coils. The resulting unbalance is precisely measured using a patented autoplex circuit. This signal is then converted to a linear DC output voltage, proportional to the angle of the rotor shaft. The digital circuit is extremely resistant to environmental disturbances such as EMI and RFI, and is compatible for use with most analog position feedback systems.

The RVIT 15-60 and RVIT 15-120i offer exceptional performance at a competitive price along with the interfacing flexibility of the $\pm 3\text{VDC}$ and 4-20 mA outputs. The RVIT 15-60 emulates a potentiometer in that the output voltage is ratiometric to the supply voltage, within the limits of the specification. Other standard features include a wide operating temperature range, infinite resolution, and an extremely long rotational life. For higher volume applications, specialized options include **special angular sensing ranges, and custom unipolar or bipolar output voltage scaling**.

Also see our other DC operated, angular position sensor models, **R60D** (bipolar DC operation, servo size 11 RVIT), **R120LC** (5VDC operation, low cost RVIT) and **R30D** (bipolar DC operated RVDT).

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

- Extremely long rotational life
- Internal voltage regulation
- Shielded ABEC 3 precision bearings
- Rugged aluminum housing
- Flange mount with shaft seal (optional)

APPLICATIONS

- Ball valve position
- Throttle level feedback
- Rotary actuator feedback
- Dancer arm position
- Reeler / Dereeler

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PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS | | |
|----------------------------|---|---|
| Parameter | RVIT 15-60 | RVIT 15-120i |
| Angular range | ±60 degrees | 0 to 120 degrees |
| Input voltage | 4.0 to 5.5VDC | 10 to 28VDC (<i>not to exceed 30VDC</i>) |
| Input current | 14mA | 41mA |
| Sensitivity (*) | 10 mV/V/degree | 0.133 mA/degree |
| Output at range ends (*) | ±3.0VDC | 1 to 5VDC (<i>with 250 Ohm loop resistor</i>) |
| Output current | 2mA | 4 to 20mA |
| Output impedance | 1Ω maximum | 250Ω maximum |
| Temp coefficient of output | ±0.02% of FSO per °F [0.036% of FSO per °C], over operating temperature range | |
| Non-linearity | ±0.25% of FR | |
| Repeatability & hysteresis | 0.1% of FRO maximum | |
| Frequency response | 25Hz @ -3dB | |

| ENVIRONMENTAL AND MECHANICAL SPECIFICATIONS | |
|---|--|
| Temperature range | 0°F to +170°F [-18°C to 77°C] Operating; -67°F to +257°F [-55°C to 125°C] Storage |
| Mechanical angular range | 360 degrees (no stops) |
| Bearings | ABEC 3 precision, matched and preloaded |
| Shaft diameter | 3/16 inch [4.76mm] |
| Housing material | Aluminum, black anodize |
| Mounting | Size 15 servo mount BU-ORD (standard) or Flange mount with shaft seal (with accessory) |
| Maximum torque | 0.12 inch.ounce-force [8.6 gram-force.cm] |
| Shaft load capability | 10 lb [4.5Kg] Axial and Radial |
| Electrical connection | 3 conductor cable, AWG 26, under PVC jacket, 12 inches [30cm] long |
| Weight | 2.5 oz [70grams] |
| IEC 60529 rating | IP60 |

Notes:

All values are nominal unless otherwise noted

FR (Full Range) is the angular range, end to end; $2A^\circ$ for $\pm A^\circ$ angular range, A° for a 0 to A° range

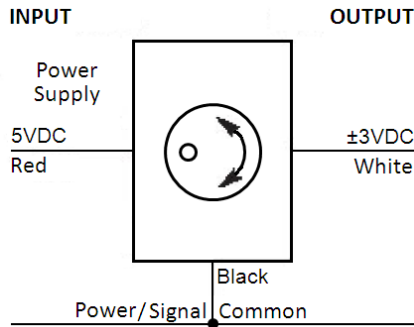
FSO (Full Scale Output): Largest absolute value of the outputs measured at the ends of the range

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

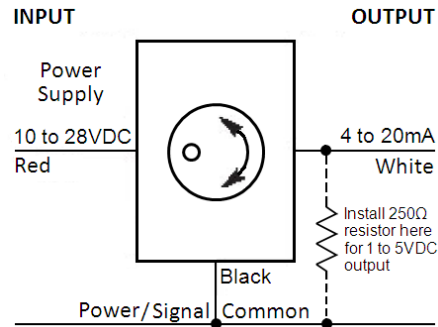
(*) Ratiometric to input voltage

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WIRING INFORMATION

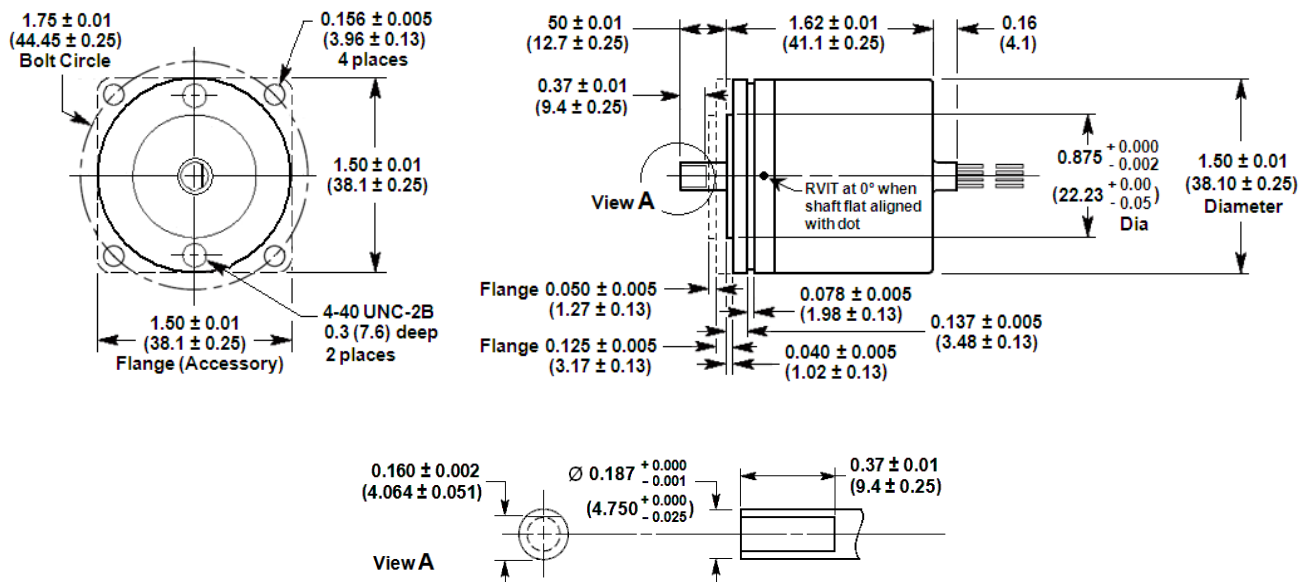


RVIT 15-60



RVIT 15-120i

DIMENSIONS



Dimensions are in inch (mm)

Polarity information:

With the shaft flat aligned with the 0° dot on housing, the output will increase if the shaft is rotated clockwise when viewed from the shaft end.

For RVIT 15-60 (±60°) the 0° position is in the middle of the range. When the shaft is rotated clockwise, the output voltage is positive (increasing). When the shaft is rotated counterclockwise from the 0° position, the output voltage is negative (decreasing).

For RVIT 15-120i (0 to 120°), the 0° position is for the 4mA output. When the shaft is rotated clockwise from the 0° position, the output increases (to 20mA at 120°). For reverse polarity, refer to the custom version in the ordering information section.

RVIT 15-60/15-120i – Rotary Variable Inductance Transducers

ORDERING INFORMATION

| Description, standard | Model | Part Number |
|--|--------------|--------------|
| RVIT ± 60 degree range, ± 3 VDC ratiometric output | RVIT 15-60 | 02180000-060 |
| RVIT 0 to 120 degree range, 4-20mA output | RVIT 15-120i | 02181600-120 |

| Description, custom versions | Model | Part Number |
|--|----------------------------|--------------|
| RVIT 0 to 80 degree range, 4-20mA output | RVIT 15-80i | 03181600-080 |
| RVIT 0 to 80 degree range, 20-4mA output | RVIT 15-80i Negative Slope | 03181700-080 |
| RVIT 0 to 90 degree range, 4-20mA output | RVIT 15-90i | 73180003-000 |

For the above custom versions or others, consult factory for minimum quantity, pricing, and availability.

| ACCESSORIES | | |
|--|-----------|--------------|
| R-FLEX multipurpose coupling kit | R-FLEX | 66530072-000 |
| Flange Mount for RVIT 15 | | 04180029-001 |
| DC power supply (15VDC) for RVIT 15-120i | PSD 40-15 | 02291339-000 |

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

TECHNICAL CONTACT INFORMATION

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|---|--|---|
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