Solid rotor, variable reluctance, frameless, brushless resolvers for severe applications.

Admotec RO Series Rotasyn variable reluctance frameless resolvers provide high performance in measurement and feedback applications where traditional resolvers fail. Perfect for aerospace, down-hole, nuclear, and other severe applications, these solid-rotor resolvers offer original equipment manufacturers reliable solutions at any quantity—from prototype units all the way up to high-volume production.

The Rotasyn has fewer parts and a solid rotor without windings, making it much simpler than traditional brushless resolvers. Since the solid rotor has no coils and the stator has only half the number of windings of a traditional brushless resolver, reliability is significantly increased. And the solid rotor allows operation with the rotor immersed in hydraulic oil or other liquids.

The Rotasyn resolver is mechanically and electrically compatible with traditional brushless resolvers and can replace them as original equipment or in existing applications. And if our standard products don’t meet your needs, custom versions can be quickly designed for your application.

Admotec—motion and position sensing for original equipment manufacturers.

Typical Applications
- Industrial tachometer
- Motor feedback
- Angle measurement
- Aerospace
- Downhole (oilwell)
- High-speed spindles
- AC and DC servo motors
- Flight control systems
- Hydraulic pumps
- Nuclear environments

Features & Benefits
- No wear or aging
- Tolerates vibration and shock
- Higher speed, lower inertia
- Better noise immunity
- Higher reliability
- Higher performance replacement for obsolete or unavailable devices
- No homing at power up

General Specifications
<table>
<thead>
<tr>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROxxxx-M</td>
</tr>
<tr>
<td>ROxxxx-K</td>
</tr>
<tr>
<td>Shock</td>
</tr>
<tr>
<td>Vibration</td>
</tr>
<tr>
<td>Radial Air Gap</td>
</tr>
<tr>
<td>Excitation Frequency</td>
</tr>
<tr>
<td>Excitation Amplitude</td>
</tr>
<tr>
<td>Transformation Ratio</td>
</tr>
<tr>
<td>Angular Error*</td>
</tr>
<tr>
<td>Insulation Resistance</td>
</tr>
<tr>
<td>Dielectric Strength (Hipot)</td>
</tr>
<tr>
<td>Lead Wire Size</td>
</tr>
<tr>
<td>Lead Length</td>
</tr>
</tbody>
</table>

* Every Rotasyn shipped with an individual accuracy report.
Series RO2010 is a frameless size 8 solid-rotor resolver with a 20mm stator OD and a 10mm airgap diameter. It fits shafts up to 4mm in diameter.

**RO2010 SPECIFICATIONS**

- **Mass (Weight)**: 30 grams
- **Maximum Speed**:
  - RO2010-x-R Models: 150 kRPM
  - RO2010-x-V Models: 160 kRPM
- **Rotor Moment of Inertia**:
  - RO2010-x-R Models: 1 gram•cm²
  - RO2010-x-V Models: 2 gram•cm²
- **Primary DC Resistance**:
  - RO2010-M Models: 11 Ω ±10%
  - RO2010-K Models: 14 Ω ±10%
- **Secondary DC Resistance**:
  - RO2010-M Models: 20 Ω ±10%
  - RO2010-K Models: 24 Ω ±10%

**RO2010 OUTLINE & MOUNTING DIMENSIONS***

![Diagram of RO2010 Outline & Mounting Dimensions]

*All dimensions in mm.

**RO2010 PRINCIPAL CURRENT AND POWER**

![Graph of RO2010 Primary Current and Power]

**RO2010 IMPEDANCES**

![Graph of RO2010 Impedances]

**RO2010 PHASE SHIFT**

![Graph of RO2010 Phase Shift]

**RO2010 TRANSFORMATION RATIO**

![Graph of RO2010 Transformation Ratio]

**RO2010 ORDERING INFORMATION**

- **Stator Construction**
  - M = Standard
  - K = Hi Temp/Hi Rad (Kapton insulation)
- **Custom constructions available**
- **Rotor Bore (mm)**
  - 4 = 4mm (Standard)
  - 20 = 20mm (Standard)
  - 45 = 45mm (Standard)
- **Smaller bores available.**
- **Rotor Construction**
  - R = Standard
  - V = Hi Speed

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**RO2010 Specs**

- **Secondary DC Res.**
  - 0.3 Ω
  - ±60°C

- **Vrms typical**: 1000 V

- **Other windings**: Smaller bores available.

- **Other bores available**: 045 = 45mm (Standard)

- **Other bores available**:
  - 020 = 20mm (Standard)
  - 04 = 4mm (Standard)

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**RO2010 OUTLINE & MOUNTING DIMENSIONS**

- **Maximum Speed**
  - RO2010 OUTLINE & MOUNTING DIMENSIONS*
  - **Mass (Weight)**: 30 grams
  - **Radial Air Gap**: 0.3 mm
  - **Cos+ red S1**: S1
  - **Cos- black S3**: S3
  - **Sin+ yellow S2**: S2
  - **Sin- blue S4**: S4
  - **2/1/14**: 2
  - **±60°C**: ±60°C

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**RO2010 ORDERING INFORMATION**

- **Stator Construction**
  - M = Standard
  - K = Hi Temp/Hi Rad (Kapton insulation)
- **Custom constructions available**
- **Rotor Bore (mm)**
  - 4 = 4mm (Standard)
  - 20 = 20mm (Standard)
  - 45 = 45mm (Standard)
- **Smaller bores available.**
- **Rotor Construction**
  - R = Standard
  - V = Hi Speed
Series RO3620 is a frameless size 15 solid-rotor resolver with a 36mm stator OD and a 20mm airgap diameter. It fits shafts up to 12mm in diameter.

**RO3620 Specifications**

- **Mass (Weight):** 85 grams
- **Maximum Speed:**
  - RO3620-x-R Models: 100 kRPM
  - RO3620-x-V Models: 110 kRPM
- **Rotor Moment of Inertia:**
  - RO3620-x-R Models: 20 gram\*cm$^2$
  - RO3620-x-V Models: 40 gram\*cm$^2$
- **Primary DC Resistance:** 13 $\Omega$ ±10%
- **Secondary DC Resistance:** 20 $\Omega$ ±10%

**RO3620 Outline & Mounting Dimensions**

*All dimensions in mm.

**RO3620 Primary Current and Power**

**RO3620 Impedances**

**RO3620 Phase Shift**

**RO3620 Transformation Ratio**

**RO3620 Ordering Information**

**Stator Construction**
- $M = $ Standard
- $K = $ Hi Temp/Hi Rad (Kapton insulation)
- Custom constructions available

**Rotor Construction**
- $R = $ Standard
- $V = $ Hi Speed

Custom bores available.

Other bores available.

Other bores available.
Series RO5032 is a frameless size 21 solid-rotor resolver with a 50mm stator OD and a 32mm airgap diameter. It fits shafts up to 20mm diameter.

### RO5032 Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass (Weight)</td>
<td>190 grams</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td></td>
</tr>
<tr>
<td>RO5032-x-R Models</td>
<td>60 kRPM</td>
</tr>
<tr>
<td>RO5032-x-V Models</td>
<td>65 kRPM</td>
</tr>
<tr>
<td>Rotor Moment of Inertia</td>
<td></td>
</tr>
<tr>
<td>RO5032-x-R Models</td>
<td>140 gram•cm²</td>
</tr>
<tr>
<td>RO5032-x-V Models</td>
<td>200 gram•cm²</td>
</tr>
<tr>
<td>Primary DC Resistance</td>
<td>20 Ω ±10%</td>
</tr>
<tr>
<td>Secondary DC Resistance</td>
<td>27 Ω ±10%</td>
</tr>
</tbody>
</table>

### RO5032 Outline & Mounting Dimensions*

*All dimensions in mm.

### RO5032 Impedances

![Graph showing RO5032 Impedances](image)

### RO5032 Phase Shift

![Graph showing RO5032 Phase Shift](image)

### RO5032 Transformation Ratio

![Graph showing RO5032 Transformation Ratio](image)

### RO5032 Primary Current and Power

![Graph showing RO5032 Primary Current and Power](image)

### RO5032 Ordering Information

<table>
<thead>
<tr>
<th>RO5032 -</th>
<th>□</th>
<th>□</th>
<th>□</th>
<th>□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stator Construction</td>
<td>M = Standard</td>
<td>K = Hi Temp/Hi Rad (Kapton insulation)</td>
<td>Custom constructions available</td>
<td></td>
</tr>
<tr>
<td>Rotor Bore (mm)</td>
<td>020 = 20mm (Standard)</td>
<td>Smaller bores available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotor Construction</td>
<td>R = Standard</td>
<td>V = Hi Speed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Admotec Inc.

Advanced Motion Technology
Series RO7557 is a frameless size 30 solid-rotor resolver with a 75mm stator OD and a 57mm airgap diameter. It fits shafts up to 47mm in diameter.

**RO7557 Specifications**

- **Mass (Weight):** 300 grams
- **Maximum Speed:**
  - RO7557-x-R Models: 25 kRPM
  - RO7557-x-V Models: 28 kRPM
- **Rotor Moment of Inertia:**
  - RO7557-x-R Models: 1.1 kg·cm²
  - RO7557-x-V Models: 1.8 kg·cm²
- **Primary DC Resistance:** 20 Ω ±10%
- **Secondary DC Resistance:** 50 Ω ±10%

**RO7557 Outline & Mounting Dimensions**

*All dimensions in mm.*

**RO7557 Primary Current and Power**

**RO7557 Impedances**

**RO7557 Phase Shift**

**RO7557 Transformation Ratio**

**RO7557 Ordering Information**

- **Stator Construction**
  - M = Standard
  - K = Hi Temp/Hi Rad (Kapton insulation)
- **Rotor Bore (mm):**
  - 0.45 = 45mm (Standard)
  - Other bores available (47mm max)
- **Custom constructions available**
- **Rotor Construction**
  - R = Standard
  - V = Hi Speed
**PRINCIPLE OF OPERATION**

Unlike traditional brushless resolvers, the Rotasyn has both primary and secondary windings in the stator and thus no transformer is required—the Rotasyn is intrinsically brushless. The transferred energy remains magnetic from the primary coil through the airgap to the sinusoidally shaped poles of the solid rotor.

The Rotasyn is similar to a rotary variable differential rotary transformer (RVDT) in which the rotor acts as a magnetic valve completing the flux path. The total flux through the gap is constant—the rotor determines the angular position within the stator bore where the coupling occurs, and thus the relative amplitudes of the output signals.

**ELECTRICAL SCHEMATIC**

\[ V_{S1-S3} = V_{R1-R2} \times TR \times \cos(\theta) \]
\[ V_{S2-S4} = V_{R1-R2} \times TR \times \sin(\theta) \]

\( \theta \) increases for CCW rotation when viewed from lead exit end

**TYPICAL APPLICATION**

Rotasyns can be used directly with all commercially available Resolver-to-Digital (R/D) converters to provide digital angle and speed information.

**CUSTOM ROTASYNs**

In addition to the standard versions, Series RO Rotasyn resolvers may be fully customized to your needs. Available customization options include (but are not limited to) those shown below. Contact us with your requirements for customized versions.

- Size 35, 40, 50, and 60 and larger models
- Customized housings for different stator mounting
- Larger airgap (up to 1mm)
- Flooded rotor to eliminate rotating seal
- Different windings for modified electrical characteristics
- Operating temperature down to 4 Kelvin
- Custom lead length and wire specification
- Bipolar winding for electrical redundancy
- Duplex units for complete redundancy
- Aerospace qualification testing
- Multispeed (multipole) design
- Enclosed units with bearings and shaft (Series DG)