The RMB29 encoder module is designed for direct integration to high volume OEM applications. The low cost 29 mm square PCB is provided with a connector for easy installation.

The encoder module consists of a magnetic actuator and a separate sensor board. Rotation of the magnetic actuator is sensed by a custom encoder chip mounted on the sensor board, and processed to give one sine/cosine wave per revolution.

The RMB29 can be used in a wide range of applications including motor control and industrial automation.

- 29 mm square module
- Low cost for OEM integration
- 5 V power supply version
- High speed operation to 60,000 rpm
- Analogue sine/cosine output
- Accuracy to ±0.5°
- RoHS compliant (lead free)
- Conformal coated
- RoHS compliant (lead free) - see Declaration of conformity
When N-pole marks of the magnet actuator and the PCB are aligned, sine output = mid level and cosine output = max. level.

Not supplied. See page 3 for details.

See page 4 for options.
RMB29Ex12BS66 installation drawing

Zero pads

Mating connector

Magnet actuator
Data sheet  
RMB29D01_07

RMB29AC – Analogue sinusoidal

Power supply \( V_{\text{dd}} = 5 \text{ V} \pm 5\% \)

Current consumption 13 mA

Outputs Signal amplitude: 1.1 V \( \pm 0.2 \text{ V} \)

Resolution One sine/cosine wave per revolution

Accuracy Typ. \( \pm 0.5^\circ \)

Hysteresis 0.45°

Maximum speed 60,000 rpm

Operating temperature -40 °C to +105 °C 
( limited by connector) 
All other components used are specified for operation from -40 °C to +125 °C.

Connections

Connector on board: MOLEX 43045-0810

Mating connector:
Shell: MOLEX 43025-0800
8 pin crimp: MOLEX 43030-0010

RMB29Ex - Commutation outputs

Power supply \( 5 \text{ V} \pm 5\% \)

Current consumption 30 mA (not loaded)

Commutation outputs U, V, W

Number of poles for commutation outputs 2, 4, 6, 8, 10, 12, 14, 16

Accuracy Typ. \( \pm 0.5^\circ \)

Maximum speed 30,000 rpm

Operating temperature -40 °C to +105 °C

Connections

Connector on board: MOLEX 43045-0810

Mating connector (not provided):
Shell: MOLEX 43025-0800
8 pin crimp: MOLEX 43030-0010

Timing diagram

UVW outputs

<table>
<thead>
<tr>
<th>Pole</th>
<th>A (°)</th>
<th>Period (°)</th>
<th>Pole pairs*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>60</td>
<td>360</td>
<td>one</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>180</td>
<td>two</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>120</td>
<td>three</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>90</td>
<td>four</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>72</td>
<td>five</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>60</td>
<td>six</td>
</tr>
<tr>
<td>14</td>
<td>8.57</td>
<td>51.42</td>
<td>seven</td>
</tr>
<tr>
<td>16</td>
<td>7.50</td>
<td>45</td>
<td>eight</td>
</tr>
</tbody>
</table>

* Number of pole pairs equals number of periods per revolution.
Part numbering

<table>
<thead>
<tr>
<th>Series</th>
<th>Output type</th>
<th>Resolution</th>
<th>Shape</th>
<th>Special requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMB29</td>
<td>AC</td>
<td>01S</td>
<td>S</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>EA / EB / EC / ED / EE / EF / EG / EH</td>
<td>12B</td>
<td></td>
<td>66 / 6A</td>
</tr>
</tbody>
</table>

- **Output type**
  - AC - Analogue sinusoidal
  - Ex - Commutation outputs
  - EA - one period per rotation (2 poles)
  - EB - two periods per rotation (4 poles)
  - EC - three periods per rotation (6 poles)
  - ED - four periods per rotation (8 poles)
  - EE - five periods per rotation (10 poles)
  - EF - six periods per rotation (12 poles)
  - EG - seven periods per rotation (14 poles)
  - EH - eight periods per rotation (16 poles)

- **Special requirements**
  - 1 - No special requirements (standard) (for AC only)
  - 66 - Push pull UVW, no incremental (with Molex connector and conformal coating) (for Ex only)
  - 6A - Push pull UVW, no incremental (without connector and conformal coating) (for Ex only)

- **Shape**
  - S - Square

- **Resolution**
  - For AC:
    - 01S - one sine/cosine wave per revolution
  - For Ex:
    - 12B - 4,096 counts per revolution

**NOTE:** Not all combinations are valid.
**Magnetic actuator and magnet ordering information**

**Actuator for integration onto shaft**

![Actuator image]

Shaft = Ø*h7  
Fixing: Grub screw provided

**Part numbers:**

For resolutions up to 9 bit absolute (512 cpr incremental)
- RMA04A2A00 – Ø4 mm shaft  
- RMA05A2A00 – Ø5 mm shaft  
- RMA06A2A00 – Ø6 mm shaft  
- RMA08A2A00 – Ø8 mm shaft

For resolutions from 10 bit absolute (800 cpr incremental) and above
- RMA04A3A00 – Ø4 mm shaft  
- RMA05A3A00 – Ø5 mm shaft  
- RMA06A3A00 – Ø6 mm shaft  
- RMA08A3A00 – Ø8 mm shaft

**Actuator for integration into shaft**

![Actuator image]

Hole = Ø6G7  
Fixing: Glue (recommended – LOCTITE 648)

**Part numbers:**

For resolutions up to 9 bit absolute (512 cpr incremental)
- RMH06A2A00

For resolutions from 10 bit absolute (800 cpr incremental) and above
- RMH06A3A00

With N-pole marker scribed to a ± 5° accuracy:

For resolutions up to 9 bit absolute (512 cpr incremental)
- RMH06A2A02

For resolutions from 10 bit absolute (800 cpr incremental) and above
- RMH06A3A02

**Magnet for direct recessing in non-ferrous shafts**

![Magnet image]

Fixing: Glue (recommended – LOCTITE 648)

**Part numbers:**

For resolutions up to 9 bit absolute (512 cpr incremental)
- RMM44A2A00 (individually packed) – for sample quantities only  
- RMM44A2C00 (packed in tubes)

For resolutions from 10 bit absolute (800 cpr incremental) and above
- RMM44A3A00 (individually packed) – for sample quantities only  
- RMM44A3C00 (packed in tubes)
This product is not designed or intended for use outside the environmental limitations and operating parameters expressly stated on the product's datasheet. Products are not designed or intended for use in medical, military, aerospace, automotive or oil & gas applications or any safety-critical applications where a failure of the product could cause severe environmental or property damage, personal injury or death. Any use in such applications must be specifically agreed to by seller in writing, and is subject to such additional terms as the seller may impose in its sole discretion. Use of products in such applications is at buyer’s own risk, and buyer will indemnify and hold harmless seller and its affiliates against any liability, loss, damage or expense arising from such use. Information contained in this datasheet was derived from product testing under controlled laboratory conditions and data reported thereon is subject to the stated tolerances and variations, or if none are stated, then to tolerances and variations consistent with usual trade practices and testing methods. The product's performance outside of laboratory conditions, including when one or more operating parameters is at its maximum range, may not conform to the product’s datasheet. Further, information in the product’s datasheet does not reflect the performance of the product in any application, end-use or operating environment buyer or its customer may put the product to. Seller and its affiliates make no recommendation, warranty or representation as to the suitability of the product for buyer’s application, use, end-product, process or combination with any other product or as to any results buyer or its customer might obtain in their use of the product. Buyer should use its own knowledge, judgment, expertise and testing in selecting the product for buyer’s application, end-use and/or operating environment, and should not rely on any oral or written statement, representation, or samples made by seller or its affiliates for any purpose. EXCEPT FOR THE WARRANTIES EXPRESSLY SET FORTH IN THE SELLER’S TERMS AND CONDITIONS OF SALE, SELLER MAKES NO WARRANTY EXPRESS OR IMPLIED WITH RESPECT TO THE PRODUCT, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, WHICH ARE DISCLAIMED AND EXCLUDED. All sales are subject to seller’s exclusive terms and conditions of sale which, where the seller is (a) RLS merilna tehnika d.o.o., are available at https://www.rls.si/customer-service, (b) Renishaw, Inc., are available at http://www.renishaw.com/Shop/legal/en/42186 or (c) another person, are available on request, and in each case, are incorporated herein by reference, and are the exclusive terms of sale. No other terms and conditions apply. Buyer is not authorized to make any statements or representations that expand upon or extend the environmental limitations and operating parameters of the products, or which imply permitted usage outside of that expressly stated on the datasheet or agreed to in writing by seller.

RLS merilna tehnika d.o.o. has made considerable effort to ensure the content of this document is correct at the date of publication but makes no warranties or representations regarding the content. RLS merilna tehnika d.o.o. excludes liability, howsoever arising, for any inaccuracies in this document.