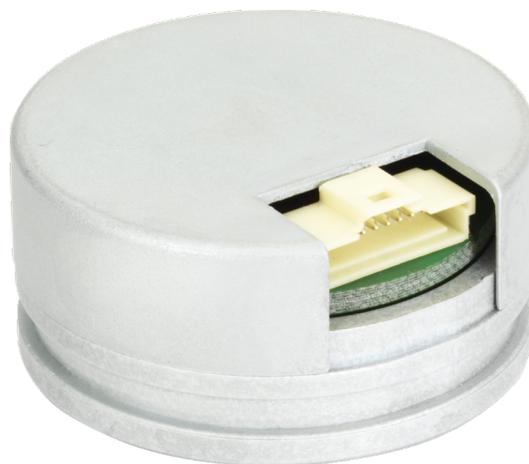


## RMC35 commutation and incremental encoder solution



**The RMC35 is designed for use in motor feedback applications requiring both A, B, Z incremental and U, V, W signals.**

**Robust non-contact OnAxis™ sensor technology provides ultimate long term reliability and with simple installation costs of ownership are minimal.**

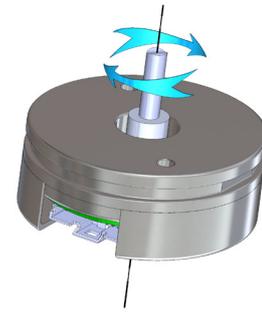
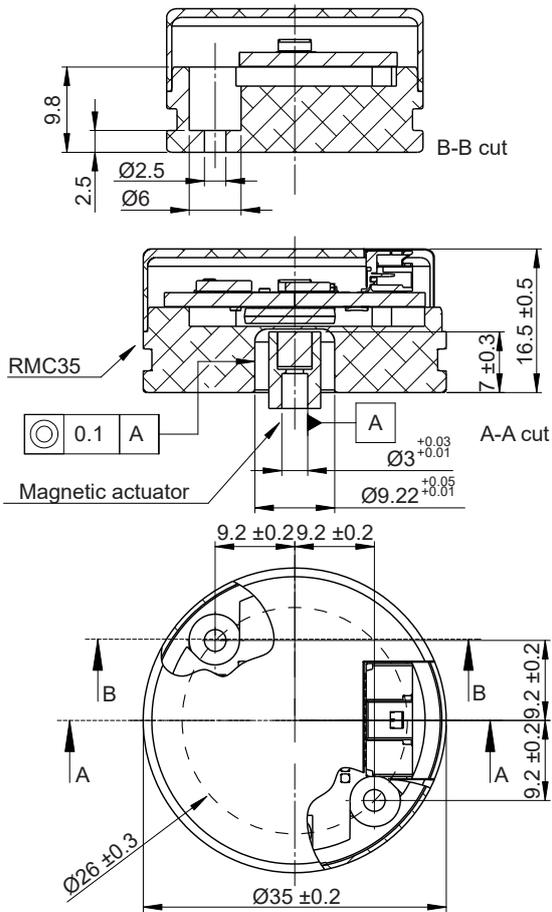
Installation is simplified with a range of magnetic actuators and mounting options for the encoder. A simple one time zero position programming then removes the need for careful adjustment of the encoder.

Resolutions are available from 64 to 2,048 pulses per revolution (256 to 8,192 counts per revolution with  $\times 4$  evaluation). U, V, W commutation signals are simultaneously output with 1 to 8 pole pairs (2 to 16 poles).

- Incremental resolution from 256 cpr to 8,192 cpr
- Simple installation and setup
- U, V, W commutation signals with up to 16 poles ( $\pm 24$  mA output drive)
- Industry standard incremental outputs (RS422)
- Operating speed to 30,000 rpm
- Compact - 35 mm diameter body
- Non-contact, frictionless design
- Low inertia
- IP40

### Installation drawing

Dimensions and tolerances in mm



Clockwise rotation of magnetic actuator.

#### Connector type

Molex 501568-1107

**Mating connector** (Not provided)

Molex 501330-1100 (crimp terminal 501334-xxxx)

### Installation procedure

#### 1. Install the magnetic actuator

Use glue to fix the magnetic actuator to the shaft (recommended LOCTITE 648 or LOCTITE 2701). Actuator should protrude by 7 mm.

#### 2. Install the flange with the encoder module on the mounting surface

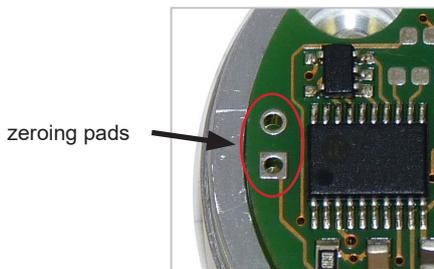
Screw the flange to the mounting surface using 2 screws (not provided).

#### 3. Turn the power on

Plug in the mating connector and turn on the power

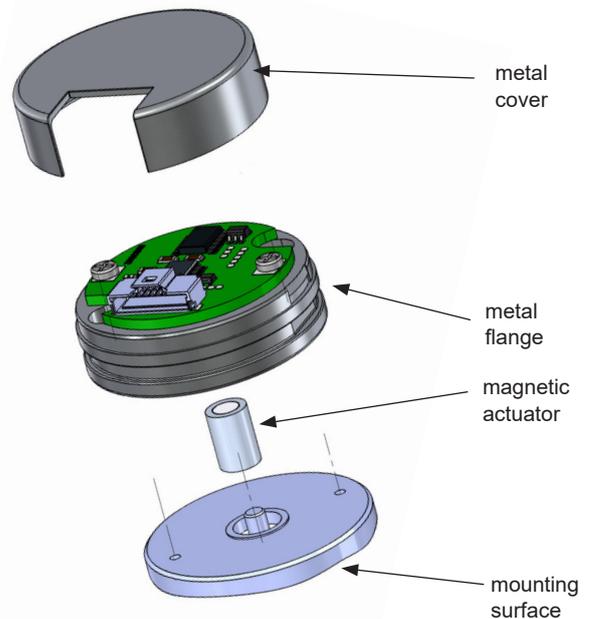
#### 4. Zero the UVW signals

Move the motor to the required zero UVW position. Short together the two zeroing pads.



#### 5. Cover the encoder with the metal cover

Place the metal cover over the encoder and gently press it in position. Be sure to align the opening with the connector.

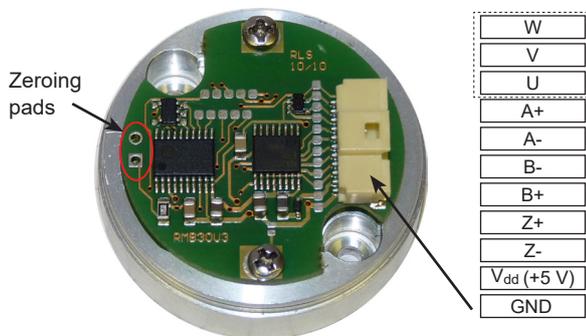


## Product specification

<b>Power supply</b>	5 V ± 10 %
<b>Power consumption</b>	40 mA (not loaded)
<b>Accuracy</b>	±0.5°
<b>Hysteresis</b>	0.17° typ.
<b>Incremental outputs</b>	A, B, Z, A-, B-, Z- (RS422)
<b>Incremental resolution</b>	256, 320, 400, 500, 512, 800, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192 cpr
<b>Commutation outputs</b>	U, V, W (±24 mA output drive)
<b>Number of poles for commutation outputs</b>	2, 4, 6, 8, 10, 12, 14, 16
<b>Operating temperature</b>	-40 °C to +105 °C (Limited by connector. All other components used are specified for operation from -40 °C to +125 °C.)
<b>Weight</b>	45 g

Incremental resolution (cpr)	Maximum speed (rpm)
8,192	4,000
4,096	8,000
2,048, 2,000	16,000
1,600	20,000
All other resolutions	30,000

## Connections



**Please note!**  
For IC output pins 9, 10 and 11 are not connected.

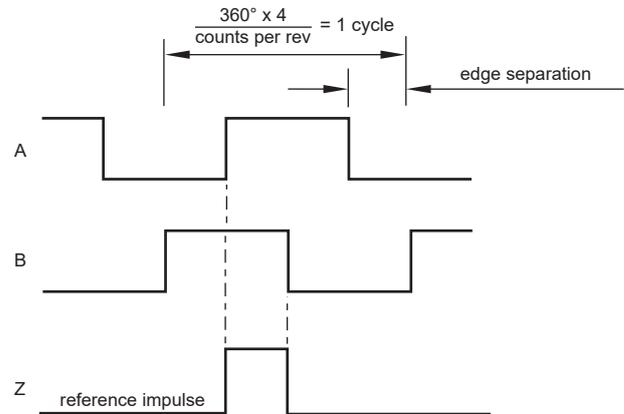
## UVW outputs

Pole	A	Period	Pole pairs*
2	60°	360°	one
4	30°	180°	two
6	20°	120°	three
8	15°	90°	four
10	12°	72°	five
12	10°	60°	six
14	8.57°	51.42°	seven
16	7.50°	45°	eight

\* Number of pole pairs equals number of periods per revolution.

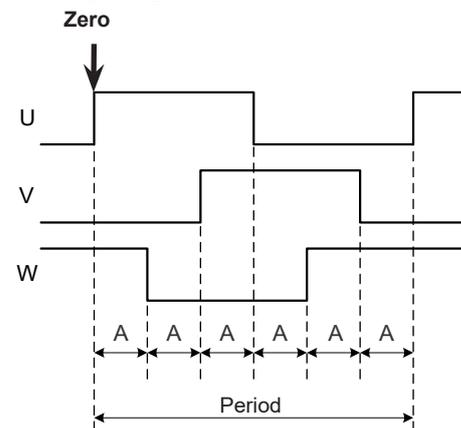
## Timing diagram - Incremental

Complementary signals not shown



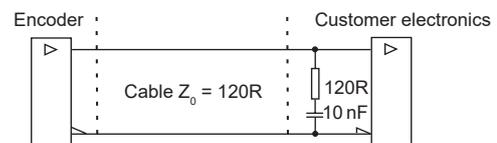
B leads A for clockwise rotation of magnet.

## Timing diagram - Commutation for clockwise rotation



## Recommended signal termination

For complementary signals only



## Zero function

The UVW commutation outputs can be zeroed at any angle with a resolution of 0.0879 degrees. The first rising edge on the U signal will be reset at this point of zeroing. The reference impulse of the incremental signals is not changed by this procedure.

### Part numbering

**RMC35 UA 12B AA 10**

**Output type**

**IC** - Incremental, RS422, 5 V

**Ux** - Commutation single ended + incremental with line driver, 5 V

**Special requirements**  
10 - None (standard)

**Connector type**  
AA - Molex 501568-1107

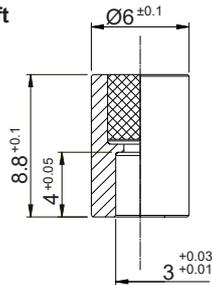
Code	Description	Nr. of poles
<b>UA</b>	one (1) period per revolution	2 poles
<b>UB</b>	two (2) periods per revolution	4 poles
<b>UC</b>	three (3) periods per revolution	6 poles
<b>UD</b>	four (4) periods per revolution	8 poles
<b>UE</b>	five (5) periods per revolution	10 poles
<b>UF</b>	six (6) periods per revolution	12 poles
<b>UG</b>	seven (7) periods per revolution	14 poles
<b>UH</b>	eight (8) periods per revolution	16 poles

**Resolution (counts per revolution)**

Decimal		Binary	
<b>D32</b> - 320	<b>1D0</b> - 1,000	<b>08B</b> - 256	<b>12B</b> - 4,096
<b>D40</b> - 400	<b>1D6</b> - 1,600	<b>09B</b> - 512	<b>13B</b> - 8,192
<b>D50</b> - 500	<b>2D0</b> - 2,000	<b>10B</b> - 1,024	
<b>D80</b> - 800		<b>11B</b> - 2,048	

### Magnetic actuator and magnet part numbering

**Actuator for integration onto shaft**

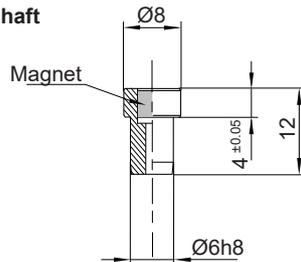


**Fixing:** Glue (recommended – LOCTITE 648 or LOCTITE 2701)

**Part number:**

For resolutions from 10 bit absolute (800 cpr incremental) and above  
**RMA03A3A07** – Ø3 mm shaft

**Actuator for integration into shaft**



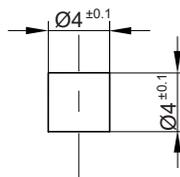
**Hole =** Ø6G7

**Fixing:** Glue (recommended – LOCTITE 648 or LOCTITE 2701)

**Part numbers:**

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

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



**Fixing:** Glue (recommended – LOCTITE 648 or LOCTITE 2701)

**Part numbers:**

For resolutions from 10 bit absolute (800 cpr incremental) and above  
**RMM44A3A00** (individually packed) – for sample quantities only  
**RMM44A3C00** (packed in tubes)

## Accessories part numbering

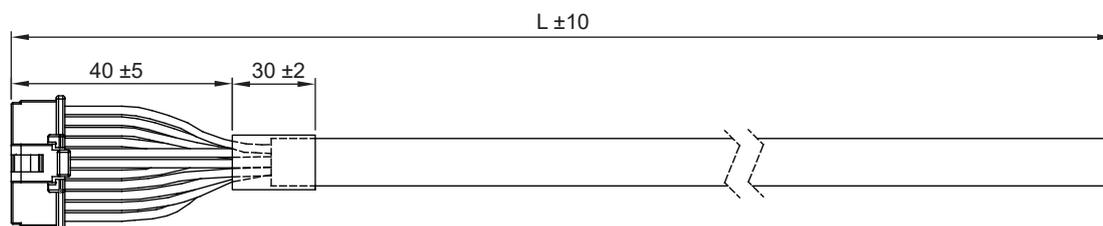


Cable assembly for connection of MOLEX 501330-1100, 12 core

## Cable specifications

<b>Cable specifications</b>	LI12YC12Y
<b>Configuration</b>	12 × 0.14 mm <sup>2</sup>
<b>Sheath color</b>	Grey (RAL7032)
<b>Rated voltage</b>	250 V
<b>Temperature range</b>	Stationary -40 °C to +130 °C Moving -30 °C to +125 °C
<b>Environmental conformation</b>	Conform to RoHS Conform to 73/23/EWG-Guideline CE Halogen free
<b>Chemical resistance</b>	Largely resistant to acids, bases and usual oils. Free from lacquer damaging substances and silicone.

## Dimensions



Part number	Cable length (L)
ACC001	30 cm
ACC002	50 cm
ACC003	100 cm

Pin	Wire color
1	Blue
2	Red
3	Brown
4	White
5	Green
6	Yellow
7	Grey
8	Pink
9	Black
10	Violet
11	Grey/Pink

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## Document issues

Issue	Date	Page	Corrections made
1	21. 4. 2011	-	New document
2	22. 1. 2013	1,3	U, V, W specification added
3	11. 2. 2014	3	Resolution and maximum speed table added
4	24. 4. 2015	2	Changed dimensions and tolerances in installation drawing
		3	Pin out comment added for incremental output
		4	Ordering code updated with the incremental option and a new option of LOCTITE glue added
5	3. 12. 2015	1	New image
		3,4	Temperature from +85 °C to +105 °C
6	26. 3. 2018	5	Accessories part numbering added
7	20. 12. 2018	1	IP protection grade added
8	4. 2. 2019	2	Magnet tolerance in installation drawing amended
9	19. 6. 2019	5	Cable configuration amended, wire color table added
10	27. 9. 2021	2	Dimensions drawing amended

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