

RMC35

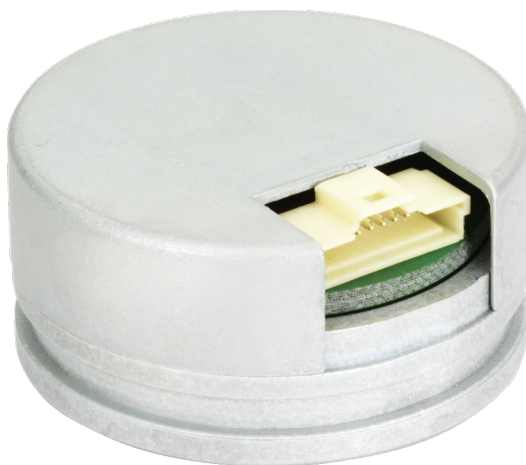
Commutation and Incremental Magnetic Encoder

The RMC35 is a robust non-contact magnetic encoder designed for use in BLDC motor feedback applications requiring both A, B, Z incremental and U, V, W commutation signals. To simplify alignment to the motor rotor, the encoder allows setting of the zero position.

EXCELLENT
PRICE
PERFORMANCE
RATIO

HIGH-SPEED
OPERATIONS

SIMPLE
INSTALLATION
AND SETUP



Features and benefits

- ▶ Incremental resolutions up to 13 bit
- ▶ U, V, W commutation signals with up to 16 poles
- ▶ High speed operation
- ▶ Zeroing function
- ▶ Non-contact, frictionless design
- ▶ Long term reliability
- ▶ Simple installation and setup



INDUSTRIAL AUTOMATION



ASSEMBLY LINES



MOTOR CONTROL



MACHINE TOOLS



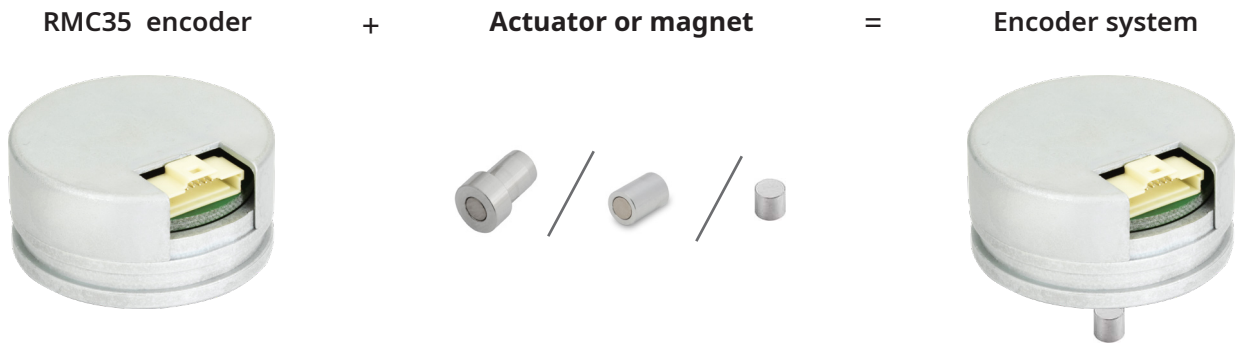
ELECTRIC ACTUATORS

General information

The RMC35 consists of 35mm diameter encoder body and diametrically magnetised magnet or an actuator.

The encoder supports resolutions from 64 to 2,048 pulses per revolution (256 to 8,192 counts per revolution with ×4 evaluation) and delivers U, V, W commutation signals for motors with 1 to 8 pole pairs.

Wide installation tolerances and a wide range of magnetic actuators simplify integration, while the built-in zero-position programming simplifies alignment to the motor rotor.



Product range

IC

Incremental encoder with A, B, Z signals (RS422) and resolutions from 256 to 8,192 cpr (×4 evaluation).

Ux

Commutation encoder with single-ended U, V, W signals up to 16 poles and incremental A, B, Z signals (RS422) with resolutions from 256 to 8192 cpr (×4 evaluation).

Storage and handling

Operating and storage temperature range



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

Humidity



IP40



Readhead is ESD sensitive - handle with care.

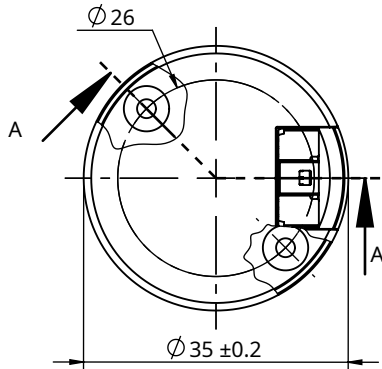
Do not touch electronic circuit, wires or sensor area without proper ESD protection or outside of ESD controlled environment.

Packaging

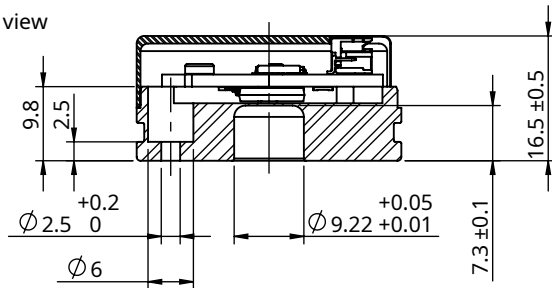
Less than 20 products are packed individually in an antistatic box or an antistatic bag. If the order quantity is 20 systems or more, the products are packed in antistatic plastic trays. Magnets and readheads are packed separately.

Dimension drawing

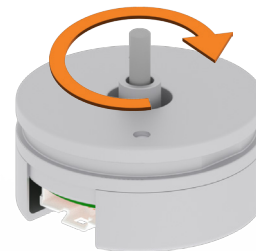
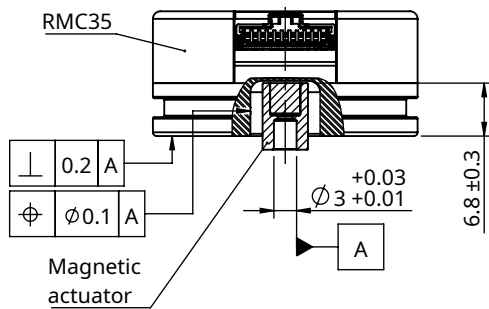
Dimensions and tolerances are in mm. Dimensions without tolerance values are in accordance with ISO 2768-m.



A-A
section view



Installation drawing



Clockwise rotation of magnetic actuator. Position increases for clockwise (CW) rotation of magnetic actuator.

Installation instructions

1. Install the magnetic actuator

Fix the magnetic actuator to the shaft using adhesive (recommended: LOCTITE® 648 or LOCTITE® 2701). Ensure the actuator is centered on the shaft and aligned coaxially. The actuator must protrude 6.8 mm from the mounting surface. Allow the adhesive to fully cure according to the manufacturer’s specifications before proceeding.

2. Install the flange with the encoder module

Mount the flange to the mounting surface using two screws (not provided). Handle the encoder module using appropriate ESD precautions.

3. Power on

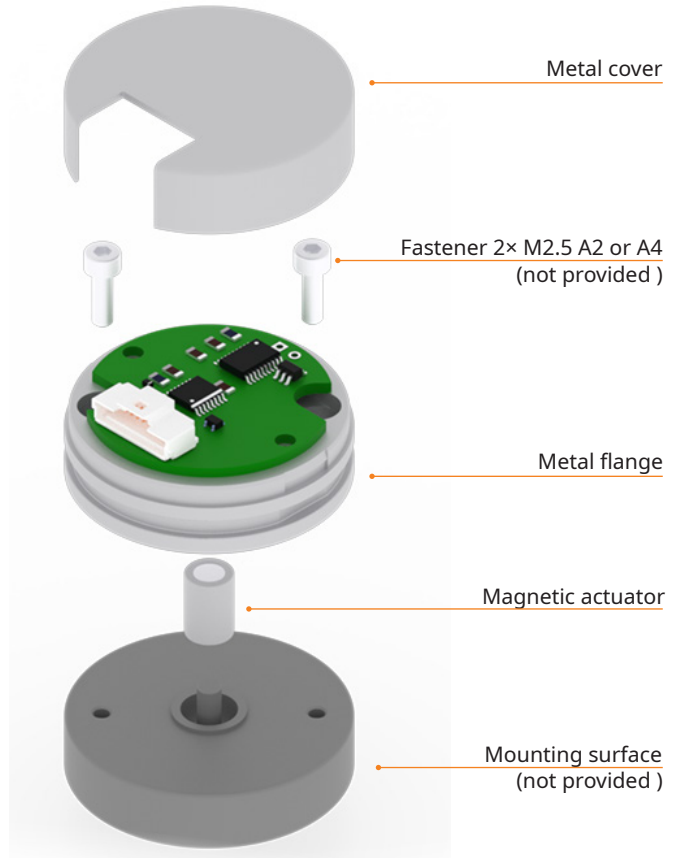
Connect the mating connector and switch on the power supply.

4. Zero the UVW signals

Move the motor to the required zero UVW position. Short together the two zeroing pads to set the zero position. Remove the short after zeroing is completed.

5. Install the metal cover

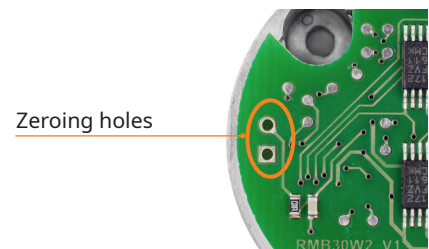
Place the metal cover over the encoder and gently press it into position. Ensure the opening in the cover is aligned with the connector. Do not force the cover or apply stress to the connector.



Zero position setting procedure

Encoder zero position can be easily set by shortening the zeroing pads on the board. After locking the motor at the mechanical zero position short together the two zeroing pads.

The output angle position data can be zeroed at any angle with resolution of 0.0879°. 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.

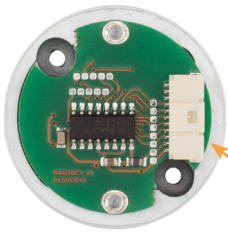


Output types

Incremental, RS422

RMC35IC

Connections



NC
NC
NC
A+
A-
B-
B+
Z+
Z-
V _{dd}
GND

Connector type

Molex 501568-1107

Mating connector (Not provided)

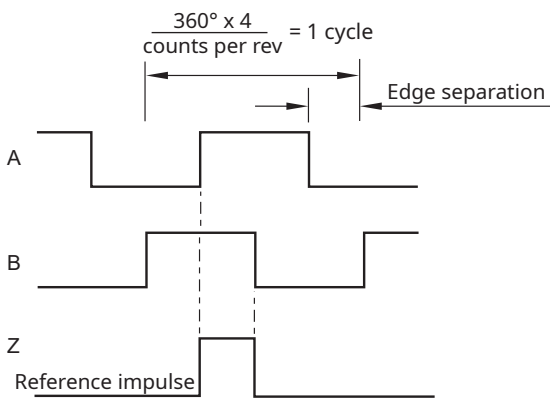
Molex 501330-1100 (crimp terminal 501334-xxxx)

Specifications

Power supply	$V_{dd} = 5\text{ V} \pm 10\%$
Current consumption	Max. 40 mA (not loaded)
Output signals	A+, B+, Z+, A-, B- Z- (RS422)
Accuracy	$\pm 0.5^\circ$
Hysteresis	0.17° typ.
Resolutions	256, 320, 400, 500, 512, 800, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192 cpr
Maximum speed	30,000 rpm
Temperature	-40 °C to +105 °C
Operating and storage	(Limited by connector. All other components used are specified for operation from -40 °C to +125 °C.)

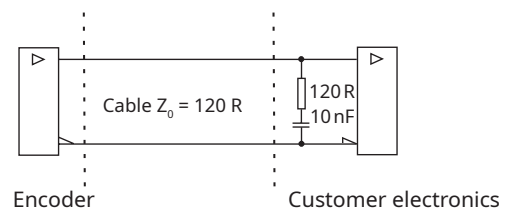
Timing diagram

Complementary signals not shown



B leads A for clockwise rotation of magnetic actuator.

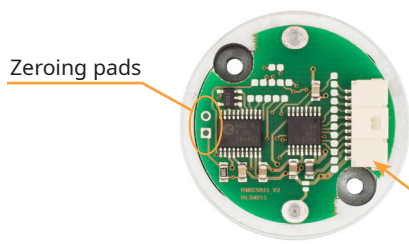
Recommended signal termination



Commutation

RMC35Ux

Connections



W
V
U
A+
A-
B-
B+
Z+
Z-
V _{dd}
GND

Connector type

Molex 501568-1107

Mating connector (Not provided)

Molex 501330-1100 (crimp terminal 501334-xxxx)

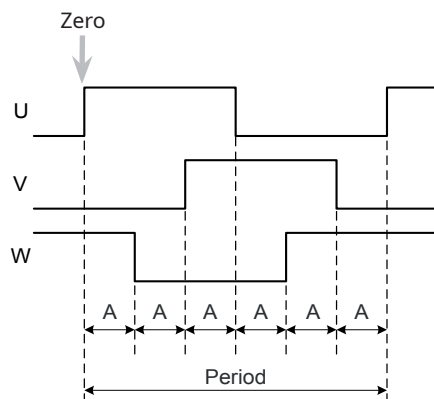
Specifications

Power supply	$V_{dd} = 5 V \pm 10 \%$
Current consumption	Max. 40 mA (not loaded)
Output signals	A+, B+, Z+, A-, B- Z- (RS422)
Accuracy	$\pm 0.5^\circ$
Hysteresis	0.17° typ.
Commutation outputs	U, V, W (± 24 mA output drive)
Number of poles for commutation outputs	2, 4, 6, 8, 10, 12, 14, 16
Resolutions	256, 320, 400, 500, 512, 800, 1,000, 1,024, 1,600, 2,000, 2,048, 4,096, 8,192 cpr
Maximum speed	30,000 rpm
Temperature	-40 °C to +105 °C
Operating and storage	(Limited by connector. All other components used are specified for operation from -40 °C to +125 °C.)

UVW outputs can be output as digital signals. The number of signal periods (P) equals number of pole pairs. The timing diagram shows the signals when the position data is increasing. The U signal always starts at zero position regardless the signal period length.

Timing diagram - Commutation

Complementary signals not shown



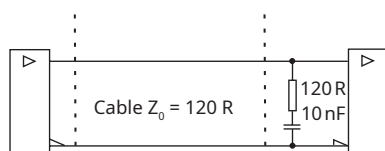
UVW outputs

Pole	A	Period	Pole pairs*
2	60°	360°	1
4	30°	180°	2
6	20°	120°	3
8	15°	90°	4
10	12°	72°	5
12	10°	60°	6
14	8.57°	51.42°	7
16	7.50°	45°	8

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

Recommended signal termination

For complementary signals only



Encoder

Customer electronics

Part numbering

RMC35 UA 12B AA 10

Output type

IC - Incremental, RS422, 5 V

Ux - Commutation single ended + incremental with line driver:

UA - One period per revolution (2 poles) **UE** - Five periods per revolution (10 poles)

UB - Two periods per revolution (4 poles) **UF** - Six periods per revolution (12 poles)

UC - Three periods per revolution (6 poles) **UG** - Seven periods per revolution (14 poles)

UD - Four periods per revolution (8 poles) **UH** - Eight periods per revolution (16 poles)

Resolution

For **IC**, **Ux** (counts/positions per revolution):

Decimal	Binary
D32 - 320	07B - 128
D40 - 400	08B - 256
D50 - 500	09B - 512
D80 - 800	10B - 1024
1D0 - 1000	11B - 2048
1D6 - 1600	12B - 4096
2D0 - 2000	13B - 8192

Connector options

AA - Molex 501568-1107

Special requirements

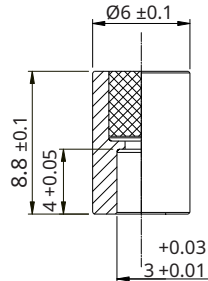
10 - No special requirements

Table of available combinations

Series	Output type	Resolution	Connector options	Special requirements
RMC35	IC UA / UB / UC / UD / UE / UF / UG / UH	D32 / D40 / D50 / D80 / 1D0 / 1D6 / 2D0 / 07B / 08B / 09B / 10B / 11B / 12B / 13B	AA	10

Magnetic actuator and magnet ordering information

Actuator for integration onto shaft

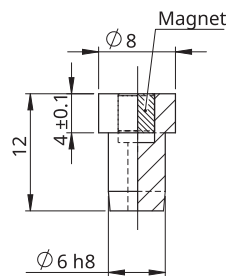


Part numbers:

For resolutions from 10 bit absolute (800 cpr incremental) and above
RMA03A3A07 - ID = $\varnothing 3$ mm shaft

Fixing: Glue (recommended - LOCTITE 648 or LOCTITE 2701)

Actuator for integration into shaft



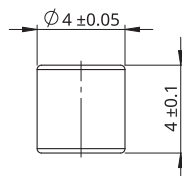
Part numbers:

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

Hole = $\varnothing 6\text{G7}$

Fixing: Adhesive (recommended - LOCTITE 648 or 2701)

Magnet for direct recessing in non-ferrous shafts



Part numbers:

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

Fixing: Adhesive (recommended - LOCTITE 648 or 2701)

Accessories



Cable assembly 11 pin
ACC001 cable assembly 0.3 m
ACC002 cable assembly 0.5 m
ACC003 cable assembly 1 m
ACC026 cable assembly 3 m

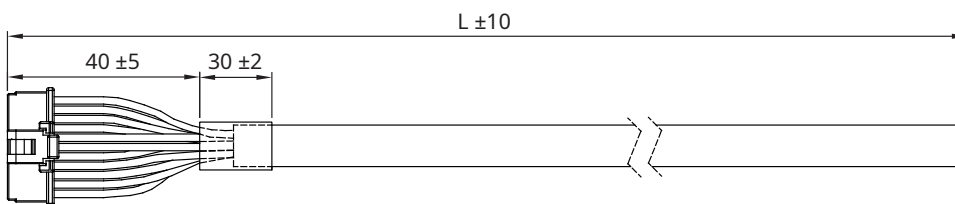
Cable assemblies

Cable specifications for connection of Molex 501330-1100, 12 core

Part numbers	ACC001 (cable length, L: 30 cm) ACC002 (cable length, L: 50 cm) ACC003 (cable length, L: 100 cm) ACC026 (cable length, L: 3 m)
Connector	Molex 501330-1100, 11 pins
Wire diameter	AWG26 (0.14 mm ²)
Sheath color	Grey (RAL7032)
Rated voltage	250 V
Operating temperature	From -30 °C to +125 °C
Environmental conformation	RoHS conform 73/23/EWG-Guideline CE conform Halogen free

Dimensions

Dimensions and tolerances in mm.



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	Description
10	27. 09. 2021	2	Dimensions drawing amended
11	29. 01. 2026	General	New design

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