

RTB28

High-Resolution Rotary Encoder Module

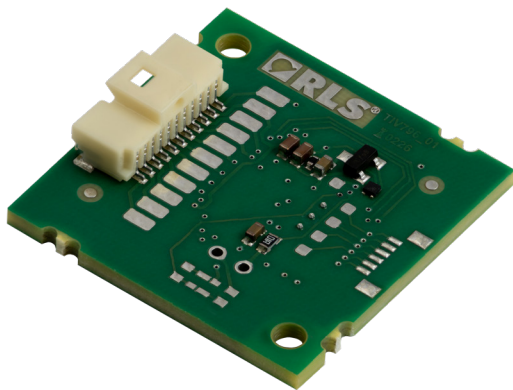
18 BITS
RESOLUTION

SIMPLE
INSTALLATION

ZEROING
OPTION

The RTB28 magnetic encoder module features 18-bit resolution, delivering exceptional precision in the smallest footprint.

To simplify alignment to the motor rotor, the encoder allows setting of the zero position and is offered with UVW outputs for commutation up to 256 pole pairs. Its compact, lightweight design makes it ideal for applications such as motor control, printing, and industrial automation.



Features and benefits

- ▶ Based on TMR sensor
- ▶ Incremental resolution up to 18 bit
- ▶ UVW signals for commutation up to 256 pole pairs
- ▶ Zeroing function
- ▶ Simple and fast installation
- ▶ Non-contact, frictionless design
- ▶ Long-term reliability
- ▶ No hysteresis



INDUSTRIAL AUTOMATION



MOTOR CONTROL



MEDICAL



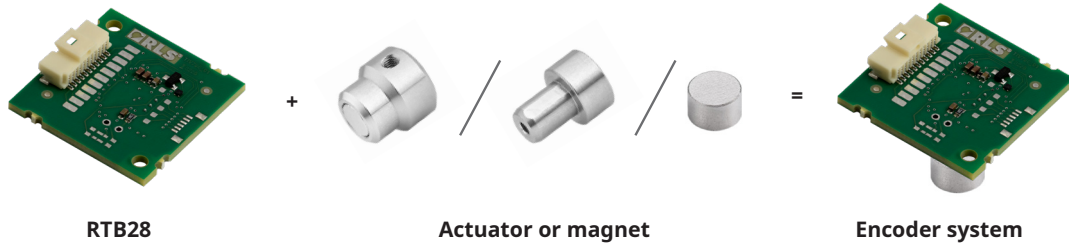
AGRICULTURE



PACKAGING

General information

The encoder module consists of a magnetic actuator and a separate sensor board. The rotation of the magnetic actuator is detected and processed by a custom encoder chip mounted on the sensor board to obtain the desired output format.



Product range

IC

Incremental encoder with A, B, Z signals (RS422) and resolutions up to 18 bit (262,144 cpr).

Ux

Commutation encoder with single-ended U, V, W signals for up to 256 pole pairs and incremental A, B, Z signals (RS422) with resolutions up to 18 bit (262,144 cpr).

Storage and handling

Operating and storage temperature

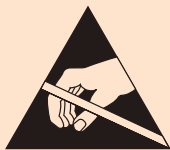


–40 °C to +125 °C
–40 °C to +105 °C (with connector)

Humidity



Up to 70 % non-condensing



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

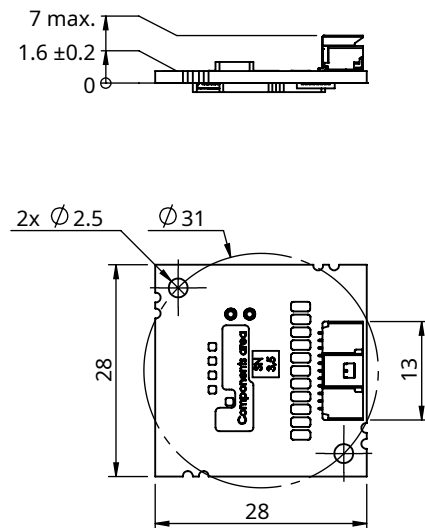
Less than 20 products are packed individually in an antistatic box. If the order quantity is 20 systems and larger, the parts are packed in antistatic plastic trays. Magnets and readheads are packed separately.

Dimension drawings

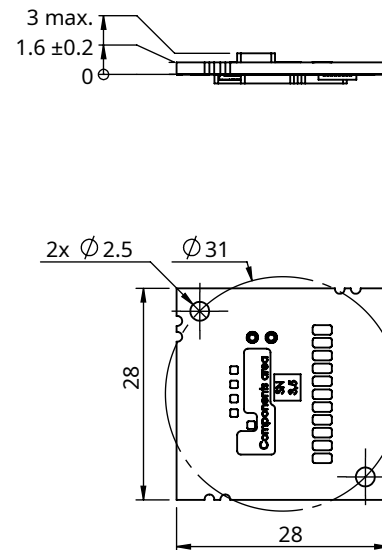
Dimensions and tolerances are in mm. Dimensions without tolerance values are in accordance with ISO 2768-m.



With connector

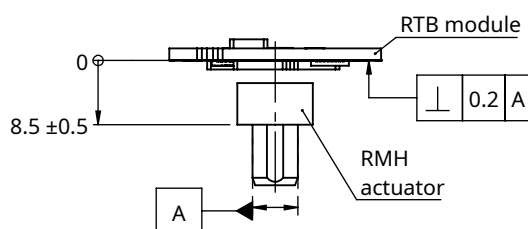
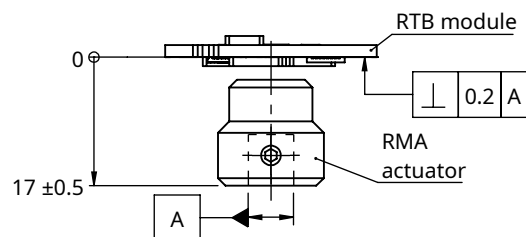
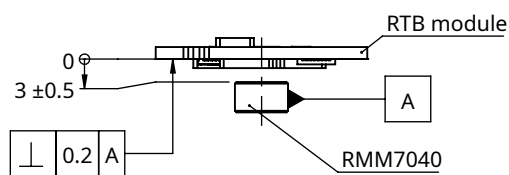


With pads



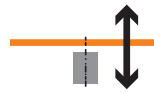
Installation drawings

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

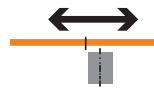


Installation tolerances

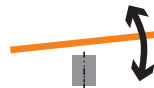
Mounting distance See installation drawings on [page 4](#).



Radial displacement (concentricity) 0.2 mm



Perpendicularity 0.4°



— - Encoder ■ - Magnet

Technical specifications

Mechanical data

Mass	Encoder unit: <20 g Magnet: <2 g
Magnet material	Sm2Co17 with Ni-Cu-Ni protective layer
Actuator material	RMH: Aluminium RMA: Stainless steel

Environmental data

Operating temperature	-40 °C to +125 °C -40 °C to +105 °C (with connector)
EMC compliance	EN 61326
Shock	100 G (6 ms, standard EN 60068-2-27:2009)
Vibration	40 G (55 Hz–2000 Hz, standard EN 60068-2-6:2008)
Temperature drift error	0.003°/°C

Zero position setting procedure

The zero position can be set by shorting the two zeroing holes on the board. After setting the mechanical zero position, keep the holes shorted for at least 3 seconds, then remove the short.

Output types

Incremental, RS422

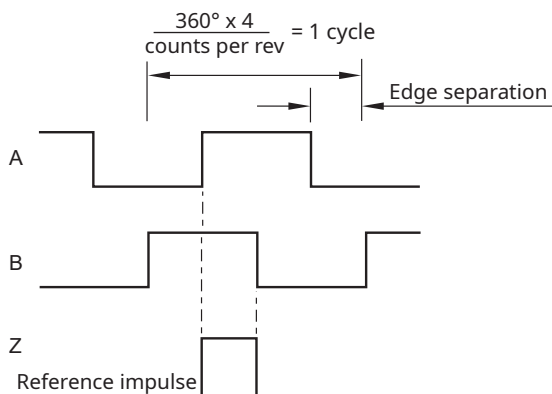
RTB28IC

Specifications

Power supply	$V_{dd} = 5\text{ V} \pm 5\%$
Current consumption	Typ. 40 mA (not loaded)
Maximum speed	For resolutions up to: 16 bit: 30,000 rpm 17 bit: 15,000 rpm 18 bit: 8,000 rpm
Accuracy	Typ. $\pm 0.5^\circ$
Incremental outputs	A, B, Z, A-, B-, Z- (RS422)
Incremental resolutions	Up to 18 bit, decimal to 260k CPR
Operating temperature	-40 °C to +125 °C -40 °C to +105 °C (with connector)
Hysteresis	0

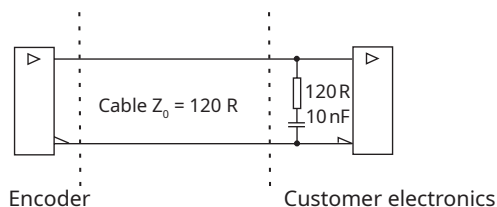
Timing diagram

Complementary signals not shown



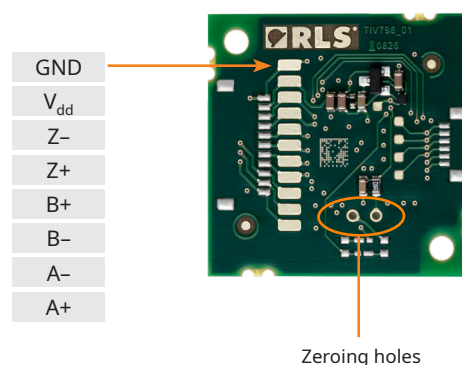
B leads A for clockwise rotation of magnetic actuator.

Recommended signal termination

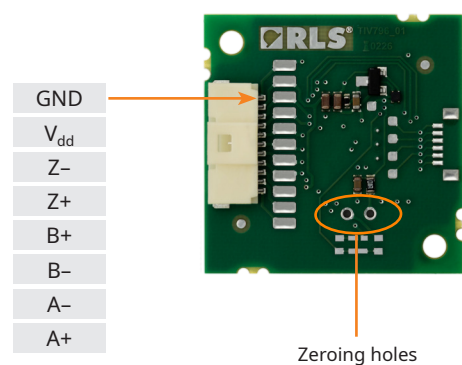


Connections

Board without connector



Board with connector



Connector on board

Molex 501568-1107 (11 pin)

Mating connector (Not provided)

Shell: Molex 501330- 1100 (11 pin)

Commutation single ended + incremental line driver

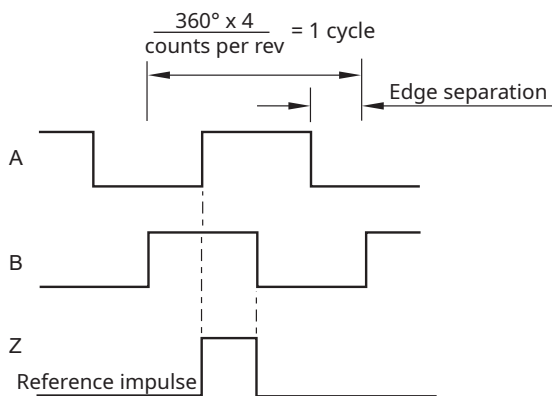
RTB28Ux

Specifications

Power supply	$V_{dd} = 5\text{ V} \pm 5\%$
Current consumption	Typ. 40 mA (not loaded)
Maximum speed	For resolutions up to: 16 bit: 30,000 rpm 17 bit: 15,000 rpm 18 bit: 8,000 rpm
Accuracy	Typ. $\pm 0.5^\circ$
Incremental outputs	A, B, Z, A-, B-, Z- (RS422)
Incremental resolutions	Up to 18 bit, decimal to 260k CPR
Communication outputs	U, V, W single ended
Pole pairs for communication	From 1 to 256
Operating temperature	-40°C to $+105^\circ\text{C}$ (with connector)
Hysteresis	0

Timing diagram

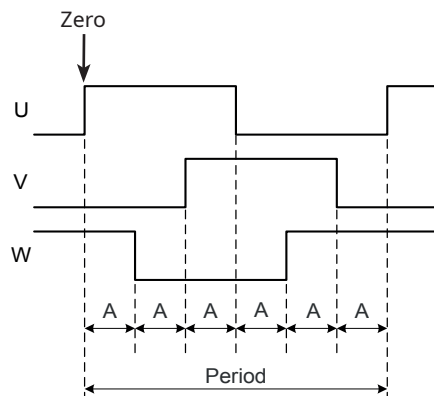
Complementary signals not shown



B leads A for clockwise rotation of magnetic actuator.

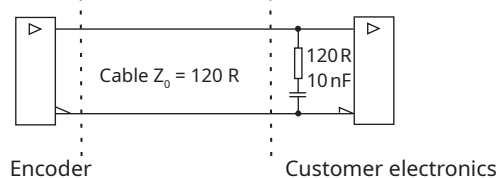
Timing diagram - Commutation

Complementary signals not shown



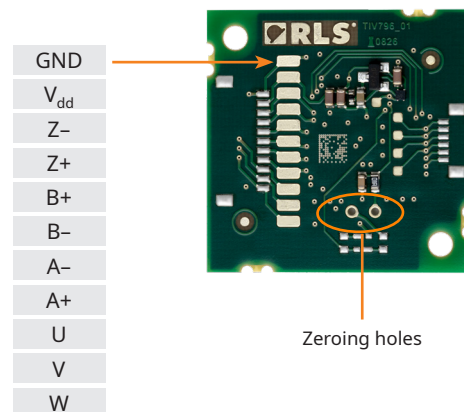
Recommended signal termination

For complementary signals only

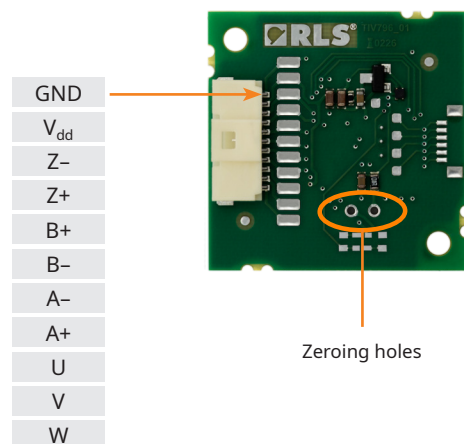


Connections

Board without connector



Board with connector



Connector on board

Molex 501568-1107 (11 pin)

Mating connector (Not provided)

Shell: Molex 501330- 1100 (11 pin)

Part numbering

			RTB28		IC	09B		S	10																																																																																																						
Series																																																																																																															
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10 - With Molex connector																																																																																																															
00 - Without connector																																																																																																															

Not all part number combinations are valid. Refer to the table of available combinations below.

Table of available combinations

Series	Output type	Resolution	Shape	Special requirements
RTB28	IC	2D0 / 1D6 / 1D0 / D80 / D50 / D40 / D32 / 13B / 12B / 11B / 10B / 09B / 08B / D36 / 3D6 / 4D0 / 8D0 / 10D / 16D / 14B / 15B / 16B / 17B / 18B	S	00 / 10
	Ux			

Accessories



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

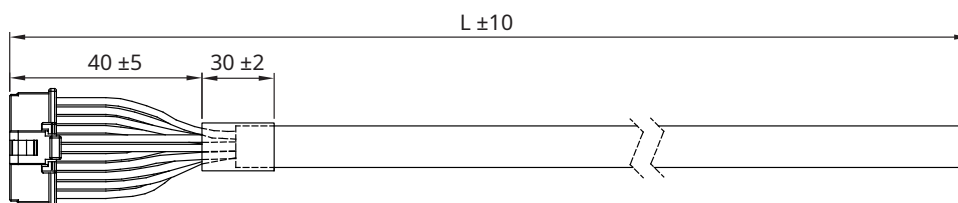
Cable assemblies

Cable specifications

Part numbers	ACC001 (cable length, L: 30 cm) ACC002 (cable length, L: 50 cm) ACC003 (cable length, L: 100 cm)
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

Magnetic actuator and magnet ordering information

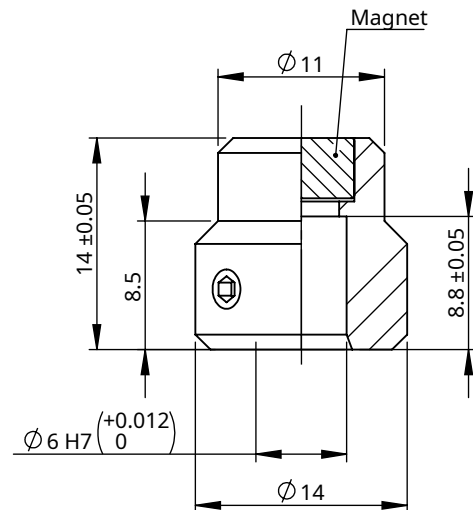
Actuator for integration onto shaft



Part number: RMA06B1A00

Shaft = Ø6 mm × h7

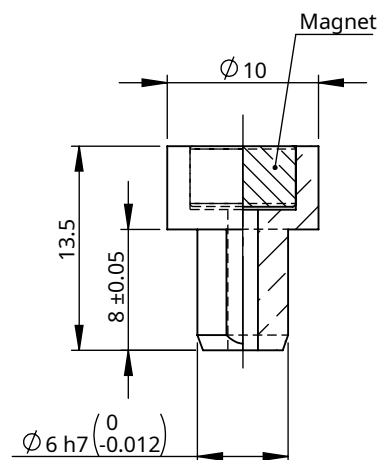
Fixing: Grub screw provided



Actuator for integration into shaft



Part number: RMH06B1A00



Magnet for direct recessing in non-ferrous shafts

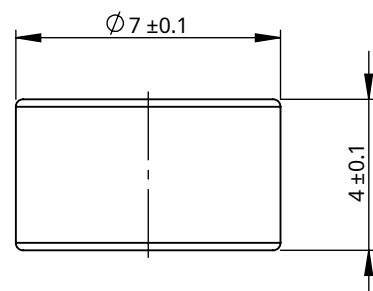


Part numbers:

RMM7040A1A00 (individually packed) – sample quantities only

RMM7040A1B00 (packed in tubes)

Fixing: Adhesive (recommended – LOCTITE 648 or 2701)



Head office

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Global support

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Document issues

Issue	Date	Page	Description
1	3. 7. 2026	-	New document
2	5. 10. 2026	5	New table design for installation tolerances
		8	Corrected table of available combinations

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