

OnAxis™ Redundant Incremental Encoders

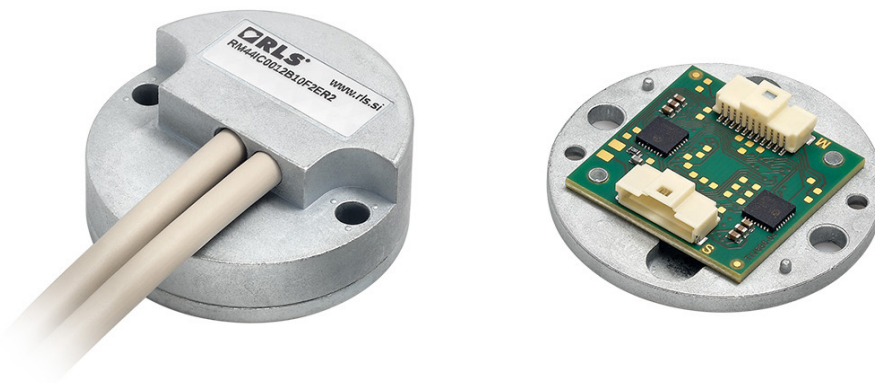
REDUNDANCY

EASY
INSTALLATION

NON-
CONTACT

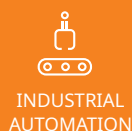
The RM44 and RMF44 redundant are non-contact magnetic encoders with two independent outputs and no common connections between two devices.

Redundancy is implemented only on the sensor and driver side. The encoders are suitable for demanding applications that require a higher level of safety.



Features and benefits

- ▶ Redundancy for safety applications
- ▶ Dual outputs inside one encoder
- ▶ 5 V power supply versions
- ▶ High speed
- ▶ Resolution up to 4,096 cpr
- ▶ Accuracy to $\pm 0.5^\circ$
- ▶ Excellent degree of protection up to IP68



General information

The encoder consists of a diametrically polarised magnet and a separate sensor body (RM) or a sensor on a flange (RMF). The redundancy is realized in the sensor and driver side only. The encoder uses only one magnet ($\varnothing 7 \times 4$ mm).

Designed for direct integration into high-volume OEM applications, the RM/RMF44 encoders can be used in a wide range of applications, including motor control and industrial automation.

RM44 redundant encoder



+

Actuator or magnet

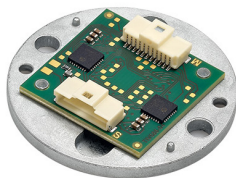


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Encoder system



RMF44 encoder module
on a flange



Product range

RM44 encoder



RMF encoder module



Actuators and magnets



Storage and handling

Operating and storage temperature

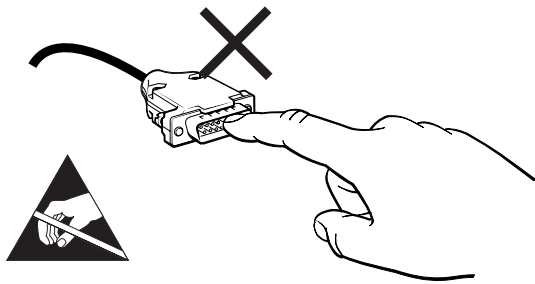


RM44:	RMF44:
-30 °C to +80 (IP68)	-40 °C to +105 °C (limited by connector)
-40 °C to +125 °C (IP64)	-40 °C to +125 °C (soldering pads)

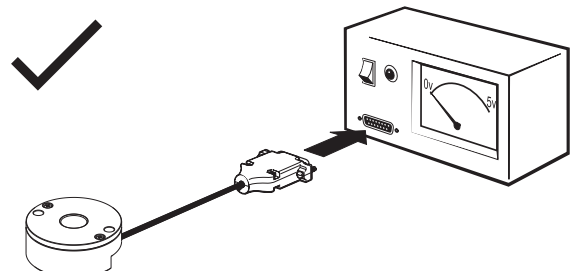
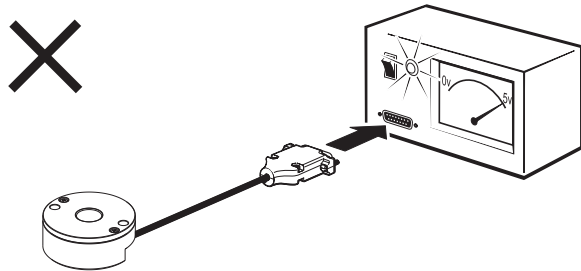
Humidity



RM44: up to IP68
 RMF44: up to 70% non- condensating



The RM44/RMF44 encoders must be powered from a DC SELV supply that meets the basic requirements of EN (IEC) 60950 or similar specification.



Packaging

RM44:

Packed individually in antistatic bags.

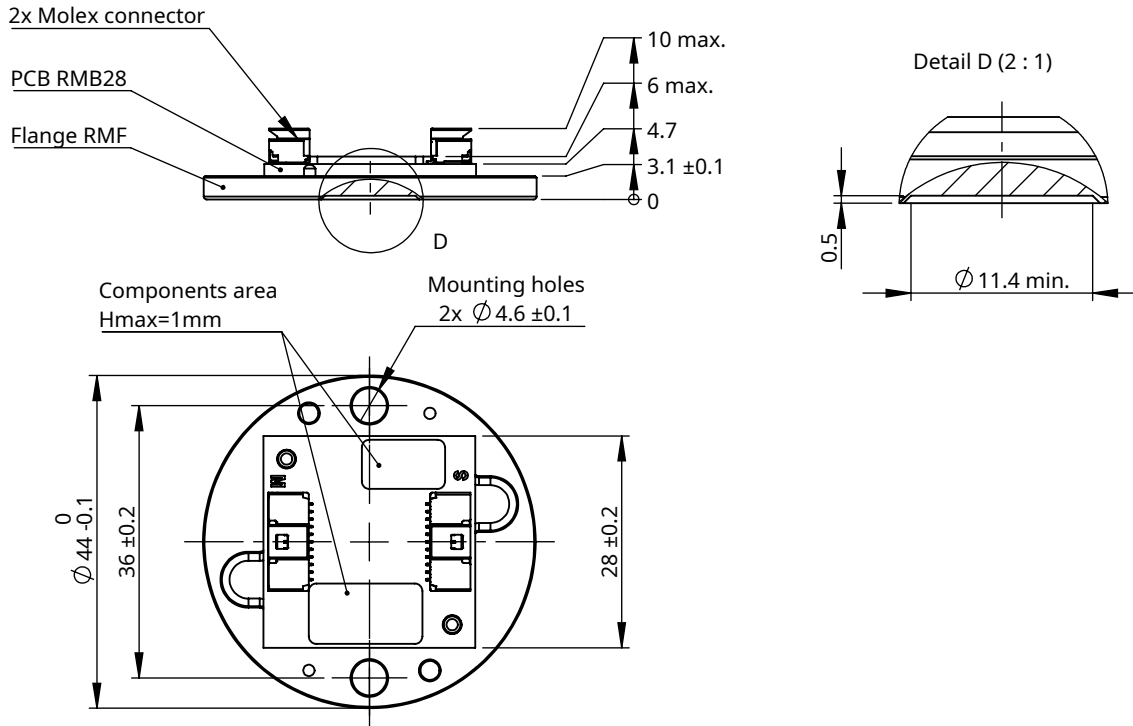
RMF44:

Less than 20 products are packed individually in an antistatic box. If more than 20 systems are ordered, the parts are packed in antistatic plastic trays. Magnets and readheads are packed separately.

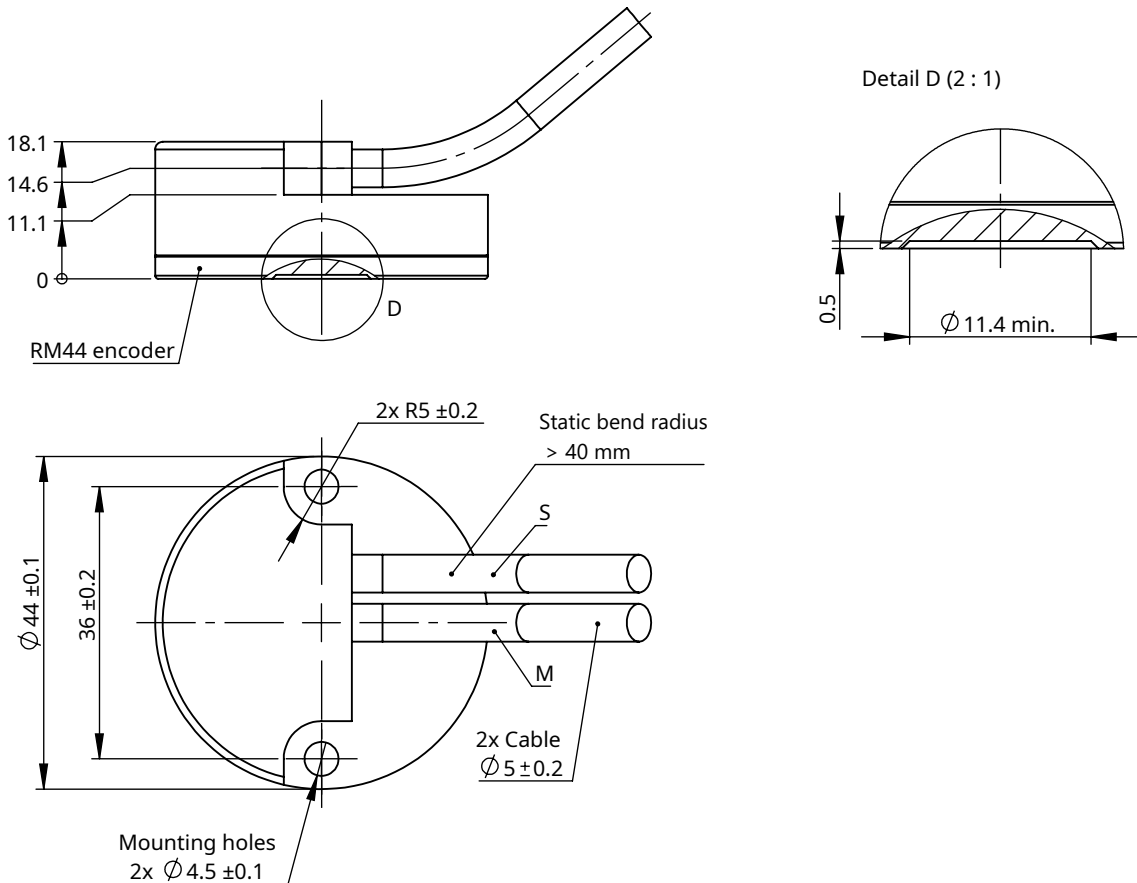
Dimensions and installation drawings

Dimensions and tolerances are in mm.

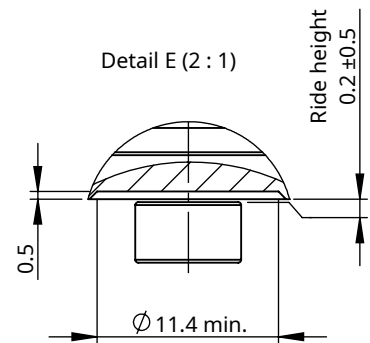
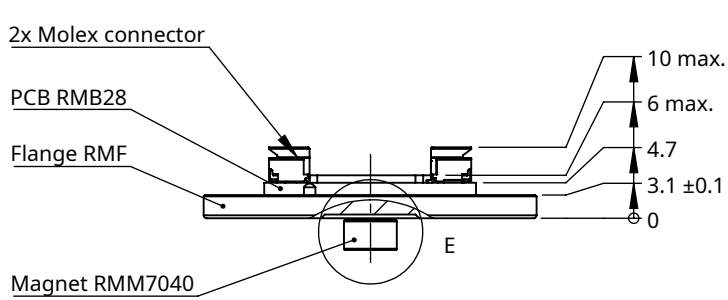
RMF44 dimensions



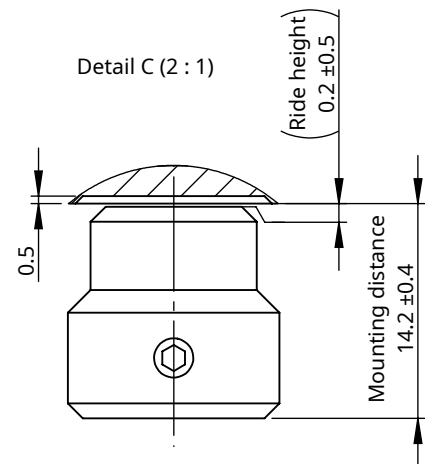
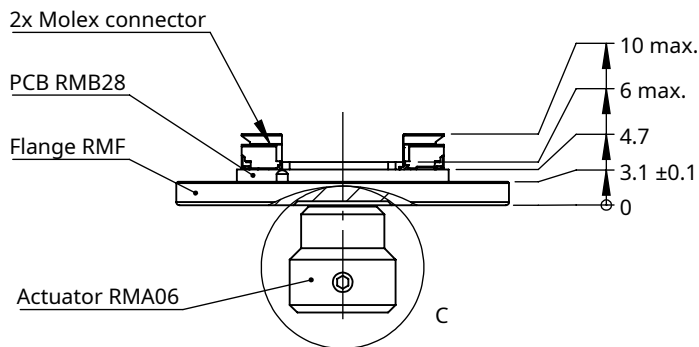
RM44 dimensions



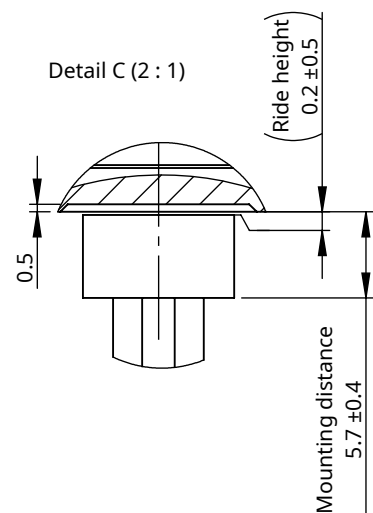
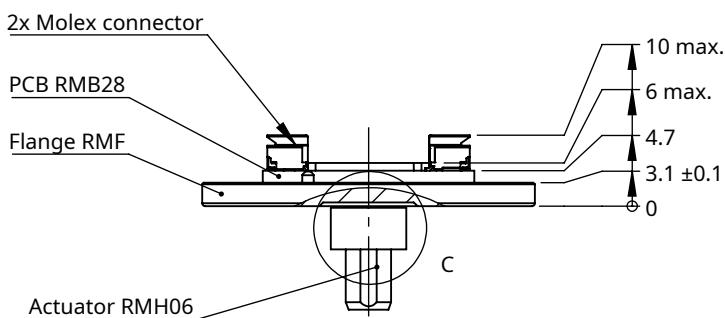
RMF44 with RMM7040 magnet



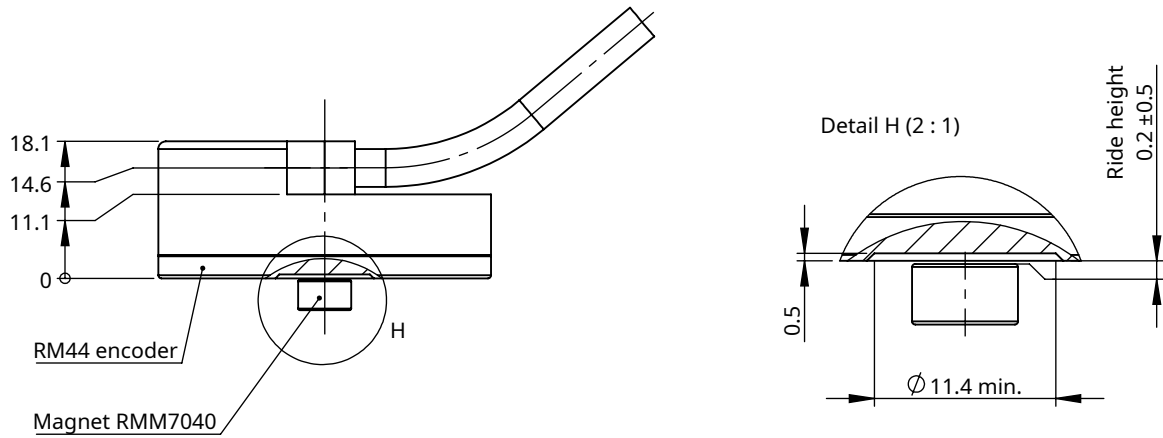
RMF44 with RMA06 actuator



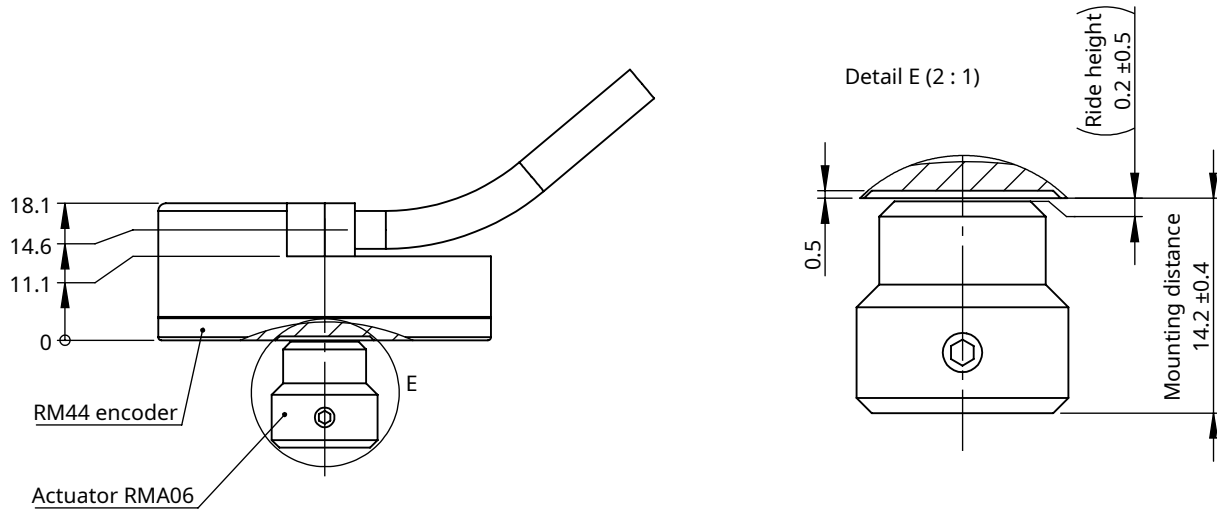
RMF44 with RMH06 actuator



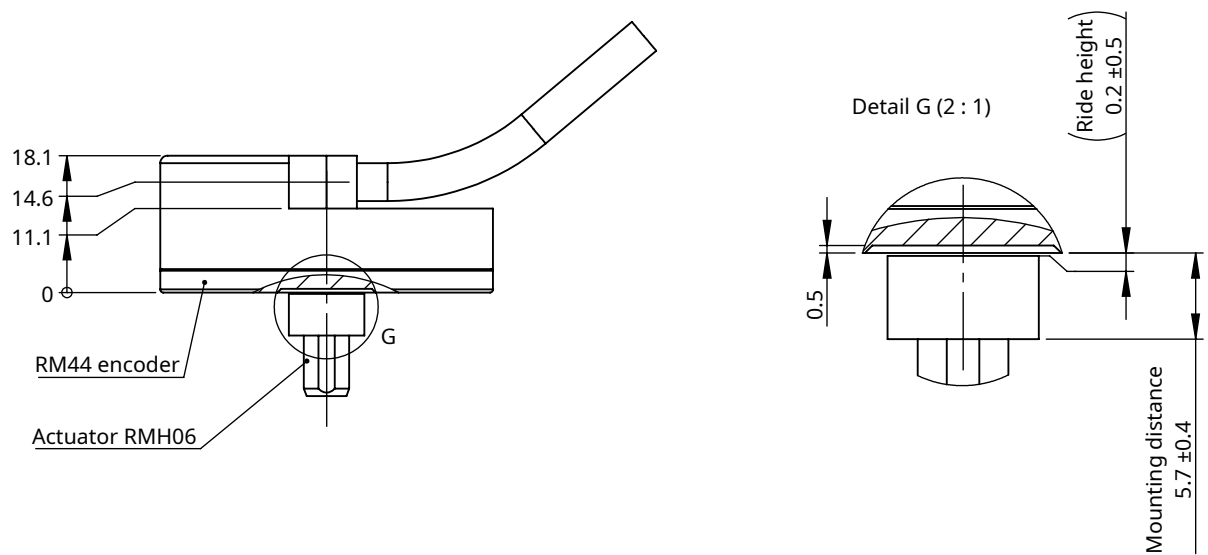
RM44 with RMM7040 magnet



RM44 with RMA06 actuator



RM44 with RMH06 actuator

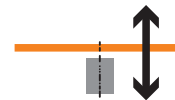


Installation tolerances

Installation tolerances for RM44/RMF44

Mounting distance

See installation drawings of encoder assemblies on [pages 5-6](#).



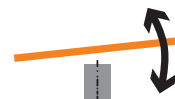
Radial displacement (concentricity)


±0.3 mm



Perpendicularity

±0.3°



 - Encoder  - Magnet

Technical specifications

System data

Accuracy	$\pm 0.5^\circ$
Hysteresis	Typ. 0.18°
Temperature drift error	$0.005^\circ/\text{C}$

Mechanical data

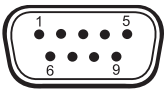
Housing material	ZAMAK
Mass	RM44 < 130 g (with 2×1 m cables) RMF44 < 30 g
Wire thickness	AWG26 (RM44)
Maximum speed	30,000 rpm
Maximum cable length	10 m

Environmental data

Operating and storage temperature	RM44	-30 °C to +80 °C (IP68) -40 °C to +125 °C (IP64)
	RMF44	-40 °C to +105 °C (limited by connector) -40 °C to +125 °C (soldering pads)
Environmental sealing	RM44 RMF44	Up to IP68
Shock	100 G (6 ms, standard EN 60068-2-27:2009)	
Vibration	40 G (55 Hz–2000 Hz, standard EN 60068-2-6:2008)	

Electrical connections

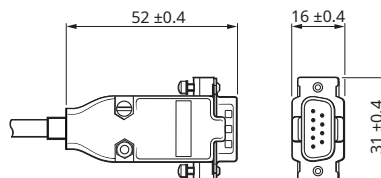
9-way D-type connector (male type)



Output type
IA, IC

Pin Nr.	Function	Wire colour
1	Shield - see connection diagram	
2	Z+	White
3	B+	Green
4	A+	Grey
5	V_{dd}	Red
6	Z-	Brown
7	B-	Yellow
8	A-	Pink
9	GND	Blue

9-way connector pin-out



Output types

Incremental, RS422 line driver

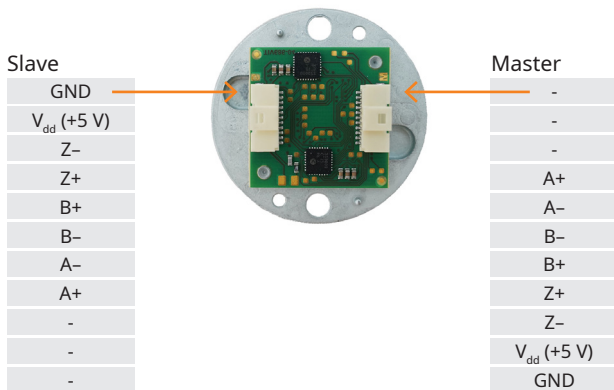
RM44/RMF44 IC

Specifications

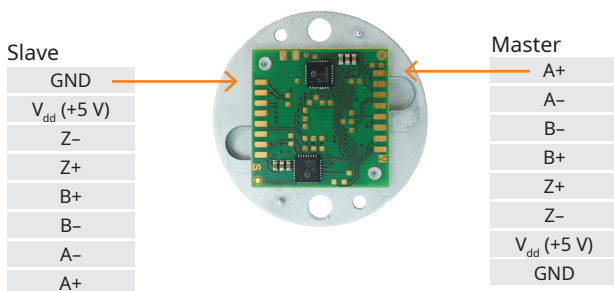
Power supply	$V_{dd} = 5\text{ V} \pm 5\%$
Current consumption	Encoder I: Typ. 30 mA Encoder II: Typ. 30 mA
Output signals	Encoder I: A+, B+, Z+, A-, B- Z- (RS422) Encoder II: A+, B+, Z+, A-, B- Z- (RS422)
Resolution	32, 64, 128, 256, 512, 1024, 2048, 4096 cpr
Short circuits protection	Yes
Reverse polarity protection	Yes

Connections

RMF44 with connectors



RMF44 with soldering pads

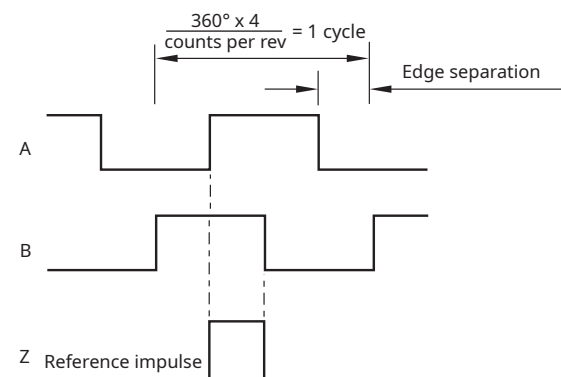


RM44 IC

Wire colour	Master	Slave
White	Z+	Z+
Green	B+	B+
Grey	A+	A+
Red	V_{dd}	V_{dd}
Brown	Z-	Z-
Yellow	B-	B-
Pink	A-	A-
Blue	GND	GND

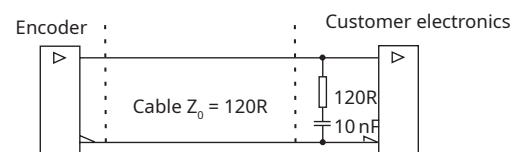
Timing diagram

Complementary signals not shown

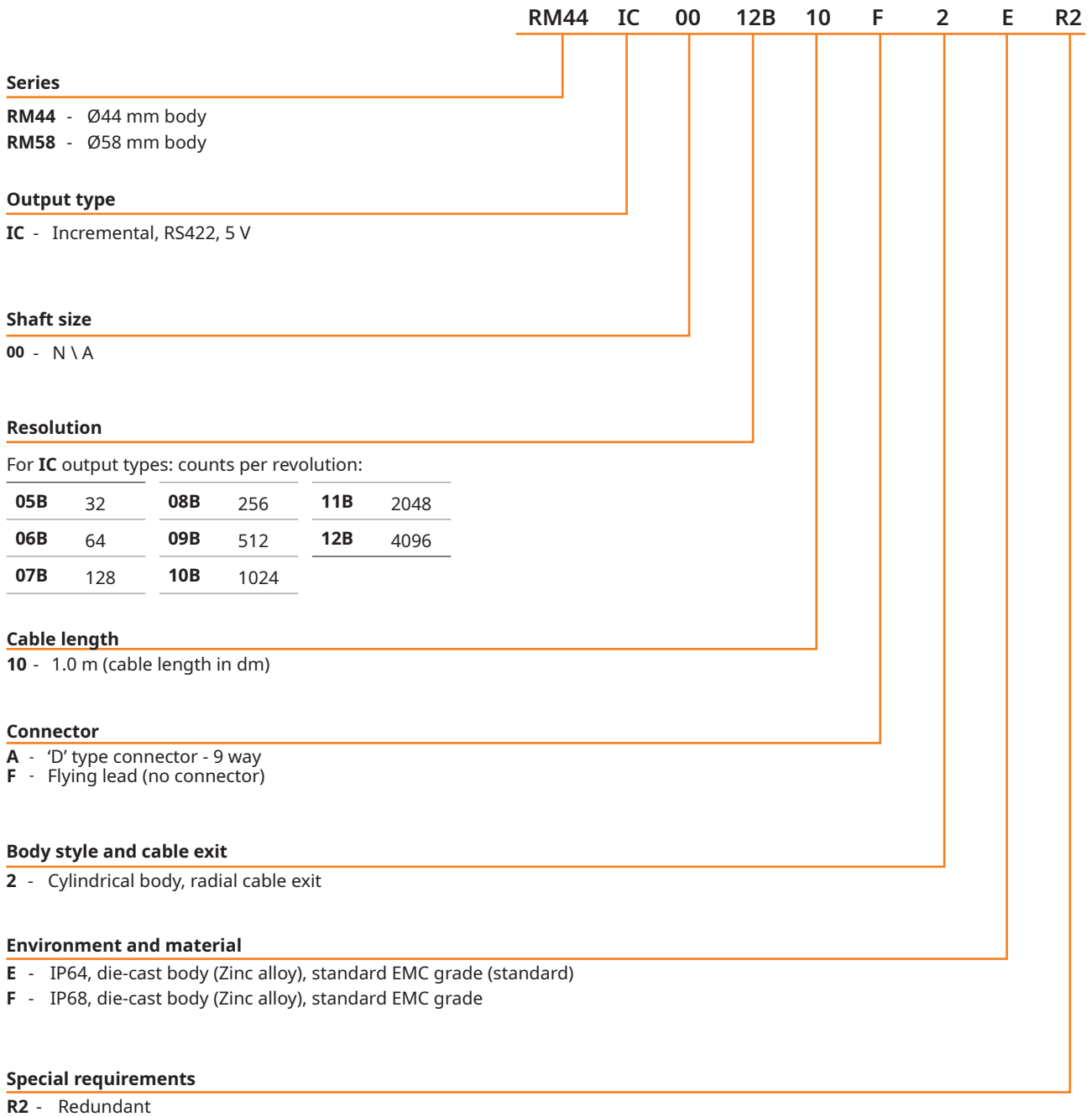


B leads A for clockwise rotation of magnetic actuator.

Recommended signal termination



Part numbering



RMF44 IC 09B A R2

Series

RMF44- Ø44 mm diameter flange
 RMF58- Ø58 mm diameter flange

Output type

IC - Incremental, RS422

Resolution

For IC (counts per revolution):

05B	32	09B	512
06B	64	10B	1024
07B	128	11B	2048
08B	256	12B	4096

Shape and connector

A - Standard aluminium flange
 M - Standard aluminium flange, Molex connector

Special requirements

R2 - Redundant

Magnetic actuator and magnet ordering information

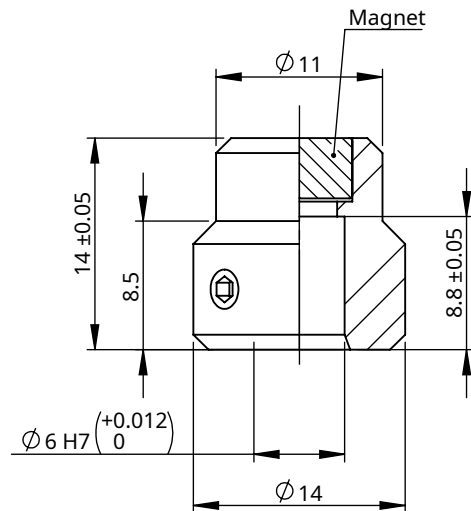
Actuator for integration onto shaft



Part number: RMA06B1A00

Shaft = $\varnothing 6$ mm \times h7

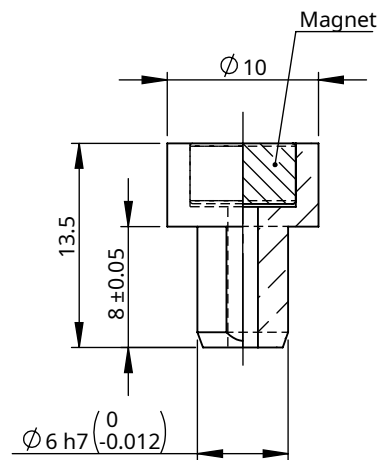
Fixing: Grub screw provided



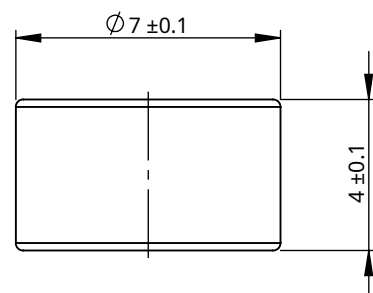
Actuator for integration into shaft



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)

Accessories

Cable assembly

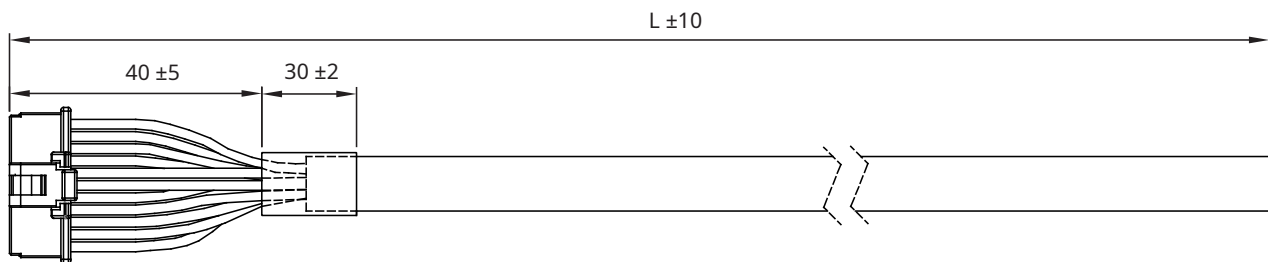


Cable assembly 12 core, 0.3 m, 0.5 m or 1 m
ACC001, ACC002, ACC003

Compatible with RMF44.

Dimensions

Dimensions and tolerances in mm.



Cable	
Length	ACC001: 30 cm ACC002: 50 cm ACC003: 100 cm
Cable specifications	LI12YC12Y
Connector	Molex 501330-1100, 11 pins
Wire diameter	AWG26 (0.14 mm ²)
Sheath color	Grey (RAL7032)
Rated voltage	250 V
Operating temperature range	From -30 °C to +125 °C
Environmental conformation	RoHS conform 73/23/EWG-Guideline CE conform Halogen free

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
1	28. 9. 2023	-	New document
2	10. 4. 2025	8	Electrical connections added, mass amended

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