

Magnetic Rings LM-2 / RMT-2



High rotational speed



High IP



Shock/vibration resistant



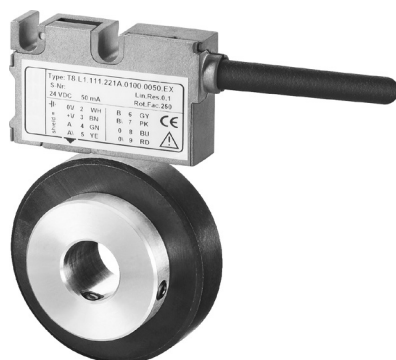
Reverse polarity protection

Robust

- **Increased ability to withstand vibrations and rough installation:** Eliminates machine downtime and repairs. High shock and vibration resistance, thanks to non-contact technology.
- **Stays sealed even when subjected to harsh everyday use. Offers security against failures in the field:** Potted housing with up to IP67 protection.

Compact

- Installation depth only 16 mm, width of magnetic ring 10 mm



Compact (cont.)

- Large hollow shaft up to 30 mm. Can be used even where space is very tight.

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Simple Installation

- **Fast start-up of the measuring system:** Easy fixing of the magnetic ring and the sensor head
- **Easy mounting with large tolerances possible:** Distance of sensor head to magnetic ring from 0.1-1.0 mm
- Tolerates lateral misalignment +1 mm
- Warning signal when magnetic field is too weak (LED)

Technical Data Magnetic Sensor LM-2:

Output Circuit [Key Code]:	Push-Pull [2R]	RS422 [4K]
Supply voltage:	4.8-30 VDC	4.8-26 VDC
Load/channel, max. cable length:	±20 mA, max. 30 m	120 Ohm, RS422 standard
Current consumption (without load):	typ. 25 mA, max. 60 mA	
Short-circuit protection:	yes	yes ¹⁾
Min. pulse interval:	1 µs (edge interval) corresp. to 4 µs/period (see signal figures at right)	
Output signal:	A, \bar{A} , B, \bar{B} , I, \bar{I}	
Reference signal:	Index periodical	
Accuracy:		
System accuracy:	typ. ±0.3° with shaft tolerance g6	
Repeat accuracy:	±1 increment	
Admissible Alignment Tolerance:		
Gap sensor / magnetic ring:	0.1-1.0 mm (recommended 0.4 mm)	
Offset:	max. ±1 mm	
Tilting:	max. 3°	
Torsion:	max. 3°	
Environmental Conditions:		
Working temperature:	-4 to +176 °F (-20 to +80 °C)	
Vibration resistance:	30 g (300 m/s ²), 10-2000 Hz	
Shock resistance:	500 g (5000 m/s ²), 1 ms	
Protection class:	IP67, IP68/IP69K according to DIN 60529 (housing)	
Humidity:	100%, condensation possible	
Housing:	Zinc die-cast	
General Data:		
Cable:	2 m, PUR 8 x 0.14 mm ² , shielded, may be used in flexing cable installations	
Status-LED:	Green: Pulse-index; Red: Error, revs too high or magnetic field too weak (for LM-2-*.020 and LM-2-*.050)	
RoHS compliant acc. to EU guideline 2011/65/EU		

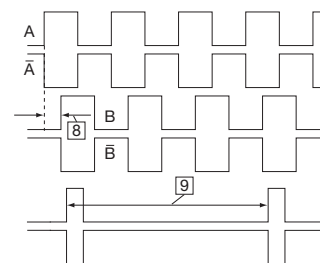
¹⁾ A max. of one channel only may be short-circuited: (when +V = 5 V, a short-circuit to another channel, 0 V, or +V is permissible). (When +V = 5-30 V, a short-circuit to another channel or to 0 V is permissible.)

Technical Data Magnetic Ring RMT-2:

Pole gap:	2 mm from pole to pole
Temperature ranges:	Working temperature: -4 to +185 °F (-20 to +80 °C) Storage temperature: -4 to +185 °F (-20 to +80 °C)
Mounting:	Screwed on shaft typ. +0.3° (at 77 °F, 25 °C)
System accuracy:	Sensor/Magnetic ring distance 0.5 mm and drive shaft tolerance g6 in accordance with ISO 286-2

Signal Figures:

With rotation of the magnetic ring in the CW-direction (see "permissible mounting tolerances")



8 Min. pulse interval: pay attention to the instructions in the technical data

9 Periodic index signal (every 2 mm) the logical assignment A, B and I-signal can change

Magnetic Rings LM-2 / RMT-2

Part Number Key: LM-2

A		B		C	D		E
LM-2	-	P10	-	2R	005	-	C

A	Type
LM-2	Linear Magnetic

B	Housing
P10	10 mm, IP68/IP69K
Q10	10 mm, IP67

C	Voltage Supply and Output Type
2R	4.8-30 VDC, Push-Pull
4K	4.8-26 VDC, RS422

D	Code ¹⁾
005	
016	
020	
050	

¹⁾ See selection guide

E	Type of Connection
C	Cable (2 m PUR)
C*M-RSS8T	Cable w/ *m M12 euromast ® Connector

* Not available > 2 m

Part Number Key: RMT-2

A		B		C
RMT-2	-	031		8

A	Type
RMT-2	16 mm Rotary Magnetic Ring, 2 mm Pole Gap

B	Ring Diameter
031	∅ 31 mm
041	∅ 41.2 mm
045	∅ 45 mm

C	Ring Bore		
8	8 mm	25	25 mm ¹⁾
10	10 mm	30	30 mm ¹⁾
12	12 mm	A1	3/8 in.
15	15 mm	A4	5/8"
18	18 mm	A6	1" ¹⁾
20	20 mm		

¹⁾ Only available with ring diameter '045'

Accessories:

- See page G1, Accessories, for mounting attachments and couplings

Selection Guide: Magnetic Sensor LM-2/Magnetic Ring RMT-2

Pulses/ppr	Part Number for Magnetic Sensor LM-2	Part Number for Magnetic Ring RMT-2 ¹⁾	Max. rpm
250	LM-2-*10-*005-C	RMT-2-031-*	12,000
1000	LM-2-*10-*020-C	RMT-2-031-*	2,400
2500	LM-2-*10-*050-C	RMT-2-031-*	3,900
1024	LM-2-*10-*016-C	RMT-2-041-*	7,000
360	LM-2-*10-*005-C	RMT-2-045-*	12,000
3600	LM-2-*10-*050-C	RMT-2-045-*	2,700

¹⁾At the listed rotational speed, the min. pulse interval is 1 µs; This corresponds to 250 kHz. For the maximum rotational speed range, a counter with a count input frequency of no less than 250 kHz should be provided.

Standard Wiring:

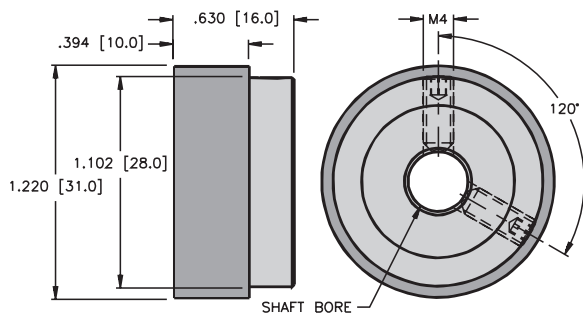
Connect Type	0 V, GND	+V	A	\bar{A}	B	\bar{B}	I	\bar{I}
Cable	WH	BN	GN	YE	GY	PK	BU	RD

Shield is on the housing

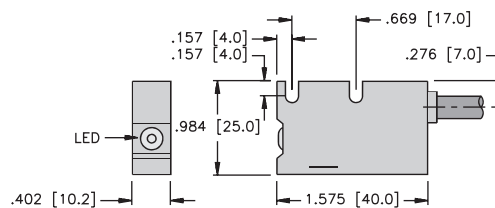
Magnetic Rings RMT-2 / LM-2

Dimensions: RMT-2 Magnetic Ring

RMT-2-031-*, Ø 31 mm

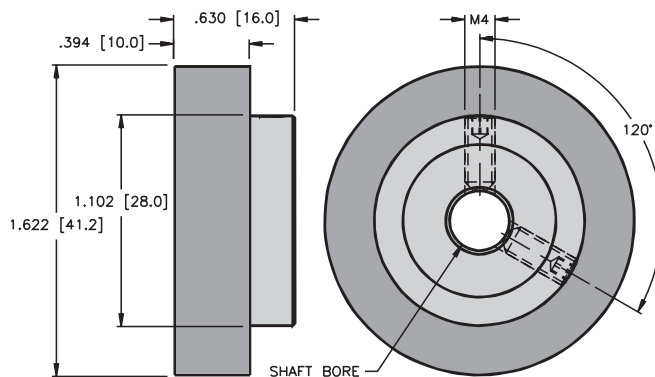


Dimensions: Magnetic Sensor LM-2



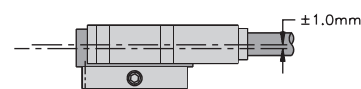
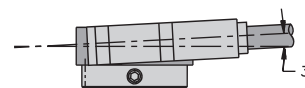
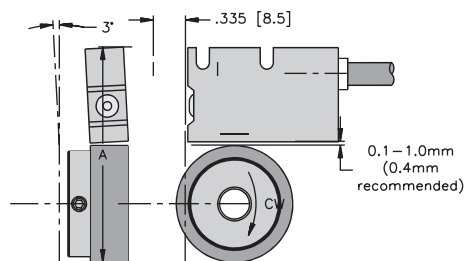
Dimensions: RMT-2 Magnetic Ring

RMT-2-041-*, Ø 41.2 mm

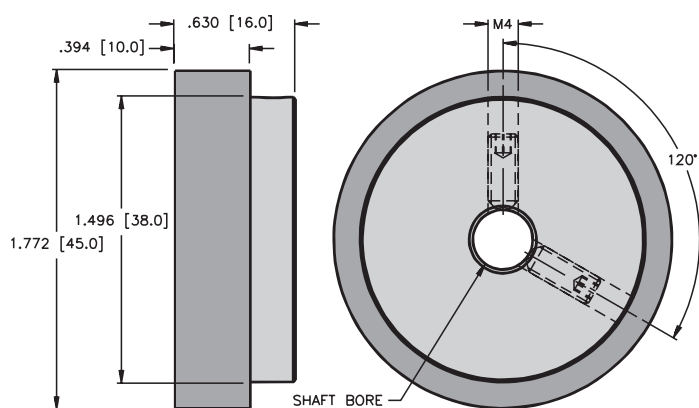


Permissible Mounting Tolerances:

RMT-2 and Linear Read Head



RMT-2-045-*, Ø 45 mm



Part Number	Dimension A
RMT-2-031-*	56.4 ¹⁾
RMT-2-041-*	66.6 ¹⁾
RMT-2-045-*	70.4 ¹⁾

1) Distance calculated with 0.4 mm between the sensor and magnetic ring

Recommended tolerance of the drive shaft diameter: g6 in accordance with ISO 286-2

Magnetic Rings LM-5 / RMT-5



High rotational speed



High IP



Shock/vibration resistant



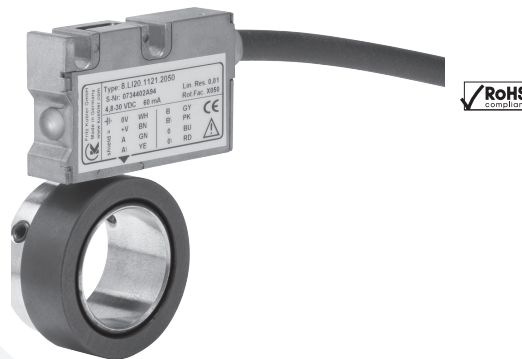
Reverse polarity protection

Robust

- **Increased ability to withstand vibrations and rough installation.** Eliminates machine downtime and repairs. High shock and vibration resistance, thanks to non-contact technology.
- **Stays sealed even when subjected to harsh everyday use. Offers security against failures in the field.** Potted housing with up to IP67 protection.

Compact

- Installation depth only 16 mm, width of magnetic ring 10 mm



- Large hollow shaft up to 30 mm
Can be used even where space is very tight

Simple Installation

- **Fast start-up of the measuring system**
Easy fixing of the magnetic ring and the sensor head
- **Easy mounting with large tolerances possible**
Distance of sensor head to magnetic ring from 0.1-1.5 mm
- Tolerates lateral misalignment ± 0.5 mm
- Warning signal when magnetic field is too weak (LED)

Technical Data Magnetic Sensor LM-5:

Output Circuit [Key Code]:	Push-Pull [2R]	RS422 [4K]
Supply voltage:	4.8-30 VDC	4.8-26 VDC
Load/channel, max. cable length:	± 20 mA, max. 30 m	120 Ohm, RS422 standard
Current consumption (without load):	typ. 25 mA, max. 60 mA	
Short-circuit protection:	yes	yes ¹⁾
Min. pulse interval:	1 μ s (edge interval) corresp. to 4 μ s/period (see signal figures at right)	
Output signal:	A, \bar{A} , B, \bar{B} , I, \bar{I}	
Reference signal:	Index periodical	
Accuracy:		
System accuracy:	typ. $\pm 0.3^\circ$ with shaft tolerance g6	
Repeat accuracy:	± 1 increment	

Admissible Alignment Tolerance:

Gap sensor / magnetic ring:	0.1-1.0 mm (recommended 0.4 mm)
Offset:	max. ± 1 mm
Tilting:	max. 3°
Torsion:	max. 3°

Environmental Conditions:

Working temperature:	-4 to +185 °F (-20 to +80 °C)
Vibration resistance:	30 g (300 m/s ²), 10-2000 Hz
Shock resistance:	500 g (5000 m/s ²), 1 ms
Protection class:	IP67, IP68/IP69K according to DIN 60529 (housing)
Humidity:	100%, condensation possible
Housing:	Zinc die-cast

General Data:

Cable:	2 m, PUR 8 x 0.14 mm ² , shielded, may be used in flexing cable installations
Status-LED:	Green: Pulse-index; Red: Error, revs too high or magnetic field too weak (for LM-5-*. *050 and LM-5-*. *250)
RoHS compliant acc. to EU guideline 2011/65/EU	

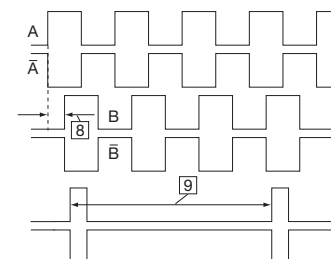
¹⁾ A max. of one channel only may be short-circuited: (when +V = 5 V, a short-circuit to another channel, 0 V, or +V is permissible.) (When +V = 5-30 V, a short-circuit to another channel or to 0 V is permissible.)

Technical Data Magnetic Ring RMT-5:

Pole gap:	5 mm from pole to pole
Temperature ranges:	Working temperature: -4 to +185 °F (-20 to +80 °C) Storage temperature: -4 to +185 °F (-20 to +80 °C)
Mounting:	Screwed on shaft typ. +0.3° (at 77 °F, 25 °C) Sensor/Magnetic ring distance 0.5 mm and drive shaft tolerance g6 in accordance with ISO 286-2
System accuracy:	

Signal Figures:

With rotation of the magnetic ring in the CW-direction (see draft "Permissible Mounting tolerances")



8 Min. pulse interval: pay attention to the instructions in the technical data

9 Periodic index signal (every 5mm) the logical assignment A, B and I-signal can change

Magnetic Rings RMT-5 / LM-5

Part Number Key: LM-5

A		B		C	D		E
LM-5	-	P10	-	2R	050	-	C

A	Type
LM-5	Linear Magnetic

B	Housing
P10	10 mm, IP68/IP69K
Q10	10 mm, IP67

C	Voltage Supply and Type
2R	4.8-30 VDC, Push-Pull
4K	4.8-26 VDC, RS422

D	Code ¹⁾
032	
050	
064	
100	

¹⁾ See selection guide

E	Type of Connection
C	Cable (2 m PUR)
C*M-RSS8T	Cable w/ *m M12 euromast ® Connector

* Not available > 2 m

Part Number Key: RMT-5

A		B		C
RMT-5	-	031		6

A	Type
RMT-5	16 mm Rotary Magnetic Ring, 5 mm Pole Gap

B	Ring Diameter
031	Ø 31 mm
048	Ø 48.3 mm
055	Ø 54.7 mm

C	Ring Bore	
6	Ø 6 mm	25 Ø 25 mm
8	Ø 8 mm	30 Ø 30 mm ¹⁾
10	Ø 10 mm	35 Ø 35 mm ²⁾
12	Ø 12 mm	A4 Ø 5/8"
15	Ø 15 mm	A6 Ø 1" ¹⁾
20	Ø 20 mm	

¹⁾ Only available with ring diameters '048' and '055'

²⁾ Only available with ring diameter '055'

Selection Guide: Magnetic Sensor LM-5/Magnetic Ring RMT-5

Pulses/ ppr ¹⁾	Part Number for Magnetic Ring RMT-5	Part Number for Magnetic Sensor LM-5	Max. rpm (electronic ²⁾)	
			without using index signal	using index signal
1000	RMT-5-031-*	LM-5-*10-*050-C	9,000	3,000
2500	RMT-5-031-*	LM-5-*10-*100-C	4,000	3,000
1024	RMT-5-048-*	LM-5-*10-*032-C	9,000	2,000
2048	RMT-5-048-*	LM-5-*10-*064-C	4,000	2,000
3600	RMT-5-055-*	LM-5-*10-*100-C	2,500	1,700

¹⁾ The pulse rate (ppr) results from the combination of the magnetic sensor with the various outer diameters. Other pulse rates available on request

²⁾ With an input frequency of the evaluation unit of 250 kHz

Standard Wiring:

Connection Type	0 V, GND	+V	A	\bar{A}	B	\bar{B}	I	\bar{I}
Cable	WH	BN	GN	YE	GY	PK	BU	RD

Shield is on the housing

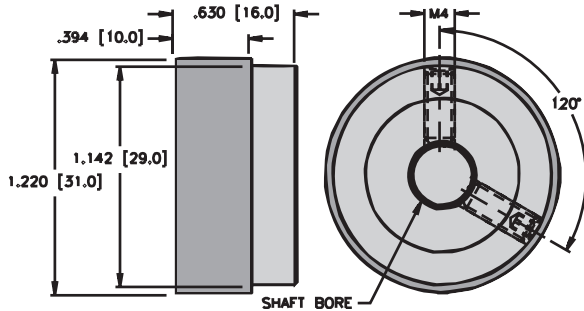
Accessories:

- See page H1, Connectivity, for cables and connectors
- See page G1, Accessories, for mounting attachments and couplings

Magnetic Rings RMT-5 / LM-5

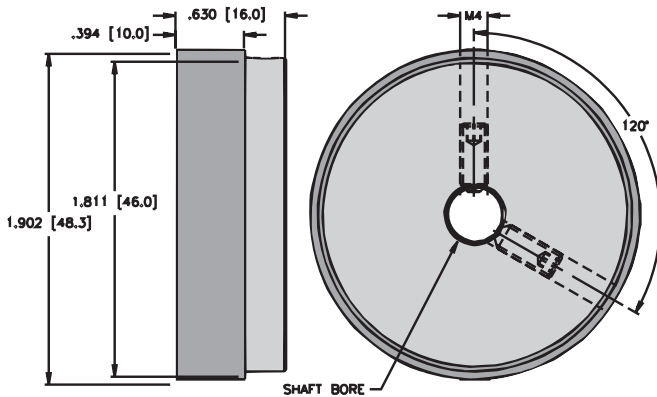
Dimensions: RMT-5 Magnetic Ring

RMT-5-031-*, Ø 31 mm

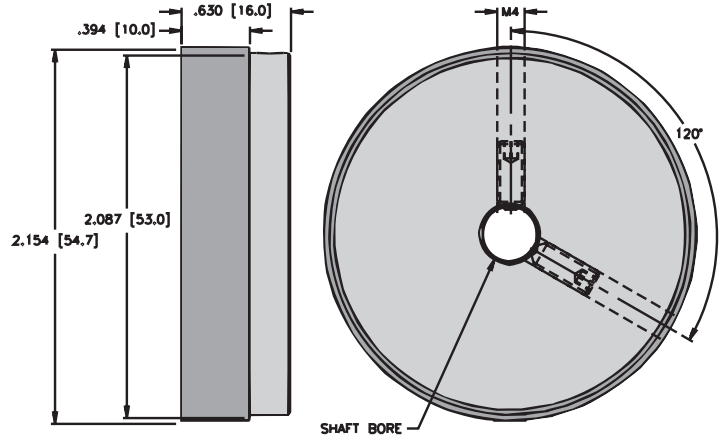


Dimensions: RMT-5 Magnetic Ring

RMT-5-048-*, Ø 48 mm

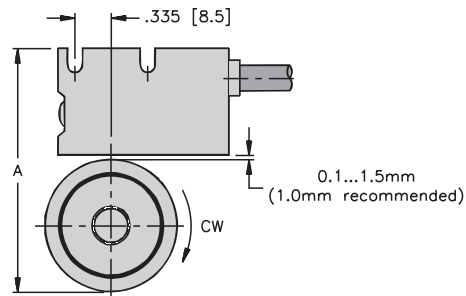


RMT-5-055-*, Ø 55 mm



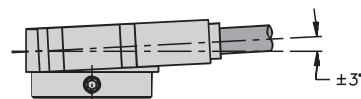
Mounting Orientation and Permissible Mounting Tolerances

Distances

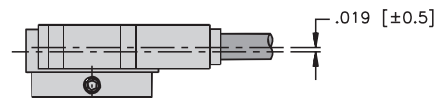


Magnetic Ring	A distance calculated with 1 mm between sensor and magnetic ring
RMT-5-031-*	57.0
RMT-5-048-*	74.3
RMT-5-055-*	80.7

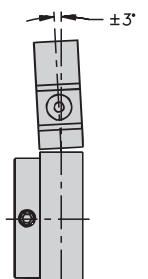
Torsion



Offset



Tilting



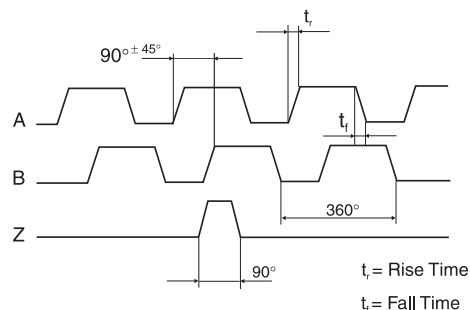
Incremental Encoders

Wave Forms

Outputs

All TURCK encoders come standard with six channels, where A leads B in the clockwise direction and the standard index is gated with A & B. The tolerance of the wave form affects the control and, in some cases, may affect the smoothness of system operation.

Wave Form Tolerances



<p>A leads B when the shaft is turned in the clockwise direction viewing the shaft or collet end.</p> <p>This is TURCK standard. This format applies to the pin key codes listed below.</p>		<p>B leads A when the shaft is rotated in the clockwise direction viewing the shaft or collet end.</p> <p>This format applies to the pin key codes listed below.</p>	
<p>A leads B, Z gated with A & B. This is TURCK standard. Z is 90° wide.</p>		<p>Code N24: B leads A, Z gated with A & B. Z is 90° wide.</p>	
<p>Code N21: A leads B, Z gated with B. Z is 180° wide.</p>		<p>Code N25: B leads A, Z gated with B. Z is 180° wide.</p>	
<p>Code N22: A leads B, Z gated with A. Z is 180° wide.</p>		<p>Code N26: B leads A, Z gated with A. Z is 180° wide.</p>	
<p>Code N23: A leads B, Z ungated. Z is 330° to 360° wide.</p>		<p>Code N27: B leads A, Z is ungated. Z is 330° to 360° wide.</p>	
<p>Code N28: A leads B, Z is 180° wide.</p>		<p>Code N29*: B leads A, Z gated with B-bar. Z is 180° wide.</p>	
<p>Code N33*: A leads B, Z gated with B-bar. Z is 180° wide.</p>		<p>Code N30: B leads A, Z is a negative marker gated with B. Z is 180° wide.</p>	
<p>Code N31: A leads B, Z is a minimum with of 270° (electrical degrees).</p>		<p>Code N32: B leads A. Z has a minimum width of 270°.</p>	

Note: * For RI-10/12/65 encoders, Z is 160° Wide