

SERIES MRR / MRA

Incremental encoded elastomer-based Magnetic Rings



- Magnetic rings in radial (MRR) or axial (MRA) construction
- Suitable for a wide range of ELGO incremental sensors as well as for the battery-powered measuring and display systems of the IZ series
- Bearing-less rotary encoders with non-contact, wear-free scanning
- Three different pole lengths available (2 / 2.5 / 5 mm)
- Thanks to protection class IP68 predestined for outdoor use
- Resistant to thermal, chemical and mechanical influences
- Suitable for difficult environmental conditions

MRR / MRA - Incremental encoded elastomer-based Magnetic Rings

General:

By using magnetic rings, the considerable advantages of the magnetic measuring principle can also be used for rotary movements. Magnetic rings are used wherever movements, speed and direction of rotation as well as acceleration or positions such as angle and circumference of shafts have to be measured, monitored or controlled. The measurement or scanning is contactless and therefore completely wear-free.

The bearing less magnetic rings represent a space saving alternative to optical rotary encoders, which are also insensitive to dirt, dust, liquids, vibrations and shocks.

The ELGO incremental sensors of the LMIX, EMIX, GMIX, KMIX, RMIX product series as well as the battery-powered measuring and display systems of the IZ series can be used to scan the magnetic rings. The magnetic ring encoded with magnetic north/south poles is scanned by the sensor at a defined reading distance.

Special Features:

Due to the use of a steel body, the rings have excellent mechanical tolerances, which allow simple and precise installation. After the two components have been glued together, the ring is written with the magnetic information. The writing process is purely angle-controlled which allows a wide variety of possible patterns. The rings are very resistant and are therefore also suitable for use under demanding environmental conditions as well as for outdoor applications. The manufacturing method also makes it easy to produce application-specific geometries and magnetic patterns.

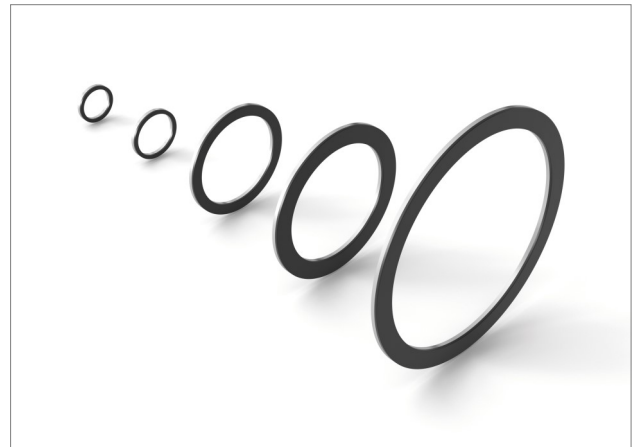
Radial Magnetic Rings MRR:



The radial magnetic rings are designed for mounting on the outside diameter of a shaft or a turned shaft shoulder. They are usually mounted on the shaft by positive locking, e.g. as press fit or thermal fit. Alternatively, the installation can also be performed by gluing with a suitable metal adhesive (e.g. 2-component adhesive).

The magnet sensor scans the magnetic track on the outside of the ring.

Axial Magnetic Rings MRA:



The axial magnetic rings are designed for mounting on the face of a shaft. Installation is performed, e.g. via a turned shaft shoulder which is adapted to the inner ring diameter or via a provided recess on the shaft end face. The magnet ring can either be mounted as press or thermal fit, flanged at the front or glued with a suitable metal adhesive (e.g. 2-component adhesive).

The magnet sensor scans the magnetic track on the ring front side.

Technical Data of MRR / MRA (general):

Magnetic layer material	Elastomer bonded hard ferrite
Carrier material	Ferromagnetic steel 1.4104 (others on request)
Single pitch error	46 [m°]*
Position error	23 [m°]pp*
Peripheral speed	10 [m/s]*
Rotation speed	max. 6000 [rpm]*
Temperature range	-40 ... +85° C
Protection class	IP68
Maximum humidity	95 %, non-condensing

*) Based on a reference diameter of 100 mm

Mounting: See mounting examples ↗ on last page

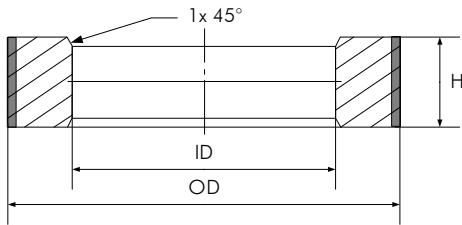
Influence of external magnets:

External magnetic flux density must not exceed 64 mT (field strength lower 52kA/m) on the surface of the magnetic ring because this could damage or destroy the magnetic pattern on the ring. Each external magnetic flux density will reduce the accuracy of the system. Lower flux density than 10 mT (the remanence of normal steel is lower) will have only a weak influence.

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Radial MRR Variants:

Designation	Ø OD	Ø ID	H	Number of Poles	± Pole Pitch
MRR-00-029-020-10-OXXX	29.8 mm	20 mm H7	10 mm	50 / 40 / 20	2 / 2.5 / 5 mm
MRR-00-038-030-10-OXXX	38.7 mm	30 mm H7	10 mm	64 / 52 / 26	2 / 2.5 / 5 mm
MRR-00-048-040-10-OXXX	48.9 mm	40 mm H7	10 mm	80 / 64 / 32	2 / 2.5 / 5 mm
MRR-00-061-050-10-OXXX	61.7 mm	50 mm H7	10 mm	100 / 80 / 40	2 / 2.5 / 5 mm
MRR-00-074-060-10-OXXX	74.4 mm	60 mm H7	10 mm	120 / 96 / 48	2 / 2.5 / 5 mm
MRR-00-079-070-10-OXXX	79.5 mm	70 mm H7	10 mm	128 / 102 / 52	2 / 2.5 / 5 mm
MRR-00-099-080-10-OXXX	99.9 mm	80 mm H7	10 mm	160 / 128 / 64	2 / 2.5 / 5 mm
MRR-00-120-090-10-OXXX	120.2 mm	90 mm H7	10 mm	192 / 156 / 78	2 / 2.5 / 5 mm
MRR-00-131-100-10-OXXX	131.7 mm	100 mm H7	10 mm	210 / 168 / 84	2 / 2.5 / 5 mm
MRR-00-163-140-10-OXXX	163.5 mm	140 mm H7	10 mm	260 / 208 / 104	2 / 2.5 / 5 mm
MRR-00-201-170-10-OXXX	201.7 mm	170 mm H7	10 mm	320 / 256 / 128	2 / 2.5 / 5 mm
MRR-00-329-250-10-OXXX	329.0 mm	250 mm H7	10 mm	520 / 426 / 208	2 / 2.5 / 5 mm
MRR-00-405-275-10-OXXX	405.4 mm	275 mm H7	10 mm	640 / 512 / 256	2 / 2.5 / 5 mm



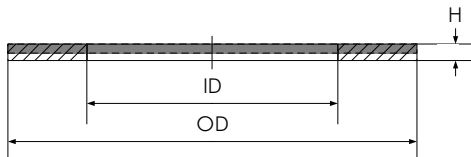
Resolution of the complete system:

The resolution of an MRR or MRA magnetic ring in combination with the measuring system used depends on the following factors:

1. Pole number, pole pitch and circumference of the magnetic ring
2. Interpolation factor and resolution of the measuring system
3. Edge evaluation (1 electrical period $\hat{=}$ up to 4 evaluable edges)

Axial MRA Variants:

Designation	Ø OD	Ø ID	H	Number of Poles	± Pole Pitch
MRA-00-045-035-02-OXXX	45 mm	35 mm H7	2 mm	64 / 52 / 26	2 / 2.5 / 5 mm
MRA-00-061-051-02-OXXX	61.3 mm	51,3 mm H7	2 mm	90 / 72 / 36	2 / 2.5 / 5 mm
MRA-00-080-070-02-OXXX	80 mm	70 mm H7	2 mm	122 / 94 / 48	2 / 2.5 / 5 mm
MRA-00-100-090-04-OXXX	100 mm	90 mm H7	4 mm	152 / 120 / 60	2 / 2.5 / 5 mm
MRA-00-130-120-04-OXXX	130 mm	120 mm H7	4 mm	196 / 158 / 78	2 / 2.5 / 5 mm



Pole Pitches and Sensors:

All magnetic ring variants listed in this data sheet are available in three different pole lengths resp. pole pitches.

Depending on the ELGO measuring system used, different pole pitches are available:

Pole Pitch	Compatible ELGO Measuring Systems
2 mm	EMIX1/2, EMIX23, ESMC1/2 and RMIX2
2,5 mm	IZ14E, IZ15E, IZ16E and IZ17E
5 mm	LMIX1/2, LMIX22, GMIX1A, GMIX2, KMIX2 and LSMC1/2

Type Designation:

MR - - - - -
A - B - C - D - E - F

A Construction

A = axial
R = radial

B Version

00 = standard version
01 = first special version etc.

C Outer-Ø „OD“ (complete)

202 = 202 mm (example)

D Inner-Ø „ID“

170 = 170 mm (example)

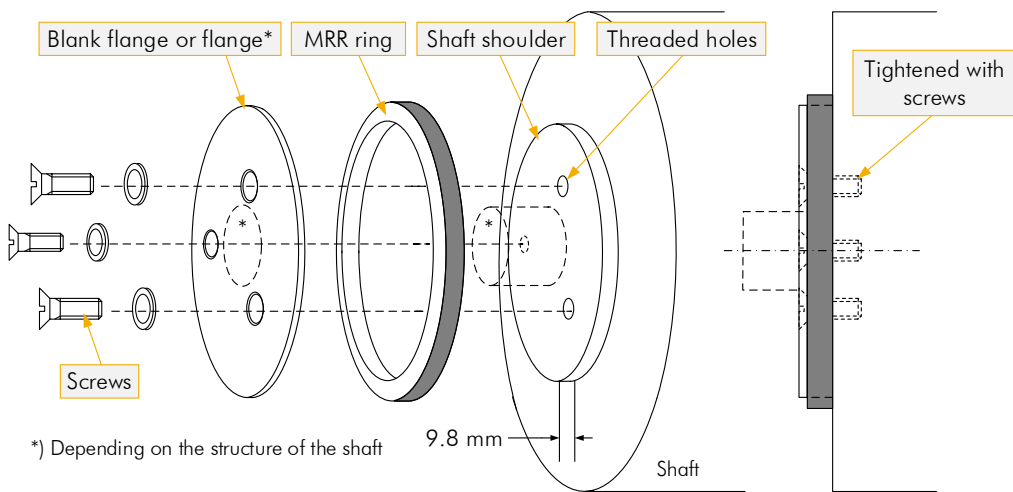
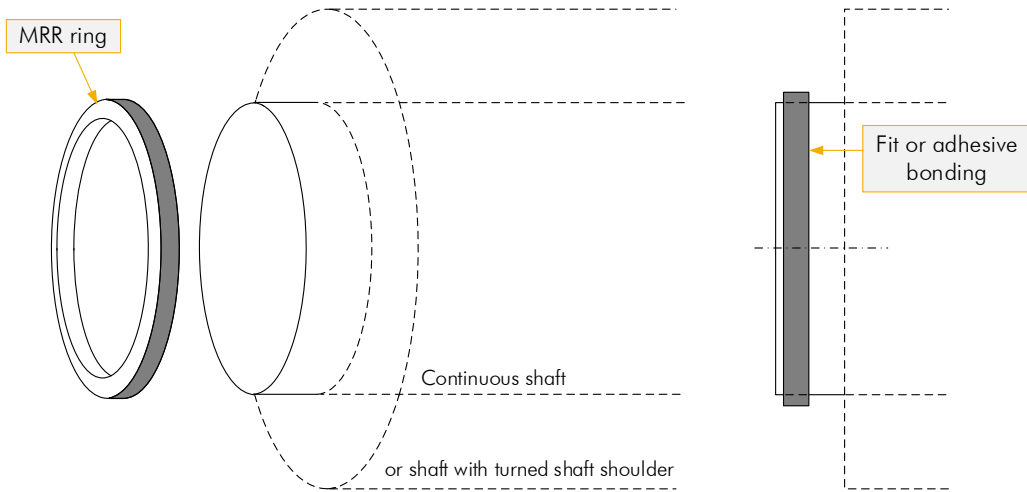
E Height of the Steel Ring „H“

10 = 10 mm (example)

F Number of Poles

0128 = 128 poles (example)

MRR - Mounting Examples (radial):



MRA - Mounting Examples (axial):

