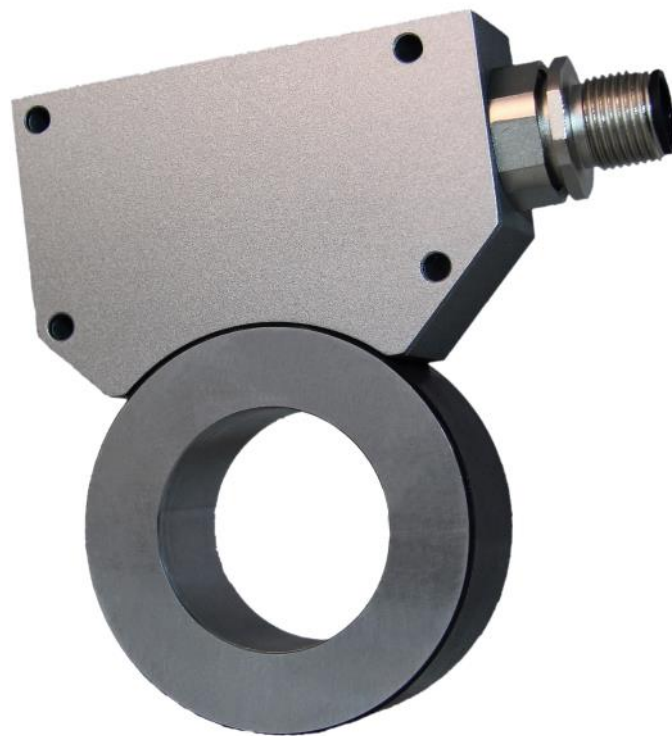


# **SERIES EMAX-RO**

Rotative Magnetic Absolute Encoder



- Magnetic Single-turn Absolute Encoder
- Angular measurement without bearing
- High resolution, 16000 measuring steps / turn
- Additional incremental signals for highly dynamic drives
- Diverse Interfaces available:
  - Standard: SSI or CANopen
  - On request: RS422, RS422 (addressable), RS232, CAN BASIC ELGO
  - In preparation: BISS-C

# EMAX-RO - Rotative Magnetic Absolute Encoder

**General:** The angle measuring system EMAX-RO is a combination of a sensor and a magnetic ring. The magnetic ring is mounted directly to an engine shaft or an axle. This ensures a quick and easy installation. EMAX-RO is especially suited for measuring rotative angles. The sensor head with its high protection class is resistant against any kind of dust and dirt and works completely without wear.

Furthermore, the rotative measuring system EMAX-RO has the advantage of absolute measurement and therefore belongs in the category of single turn encoders.

## Essential features:

- Rotative angle measuring system
  - Resolution of 16000 measuring steps over 360° (other resolutions on request)
  - Absolute measurement
  - Different interfaces are available
- Absolute:** Standard: SSI or CANopen  
On request: RS422, RS422 (addressable), RS232 or CAN BASIC ELGO  
In preparation: BISS-C
- Incremental:** 90° phase shifted square-wave signals (TTL or HTL) or 1 V<sub>ss</sub> sine/cosine signals
- Direct measurement on engine shaft or axis possible
  - No wear thanks to contact-free measuring principle

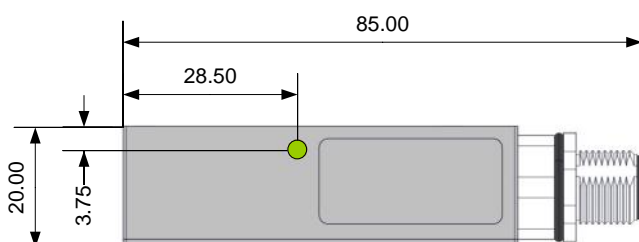
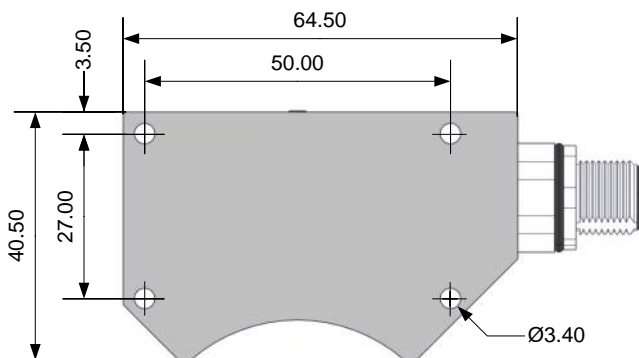


**The magnetic ring:** The magnetic ring that is included in the delivery has a diameter of 50.95 mm (max. 1000 rpm) or 51.50 mm (max. 20000 rpm) in the version with protection ring.

Caution: the measuring system may only be operated with the corresponding magnetic ring!

**Distance between ring and sensor:** The ideal distance between the magnetic ring and the active sensor area of the measuring system is between 0.5 ... 1.0 mm without protection ring and max. 0.45 mm with protection ring. Outside this area, proper functioning of the device cannot be guaranteed!

## Dimensions sensor:



## Technical Data:

Mechanical Data	
Measuring principle	Absolute
Repeat accuracy	+/- 1 Increment
System accuracy in $\mu\text{m}$ at 20 °C	+/- (150 + 20 x L)/ +/- 0,35° (type designation 010) +/- (50 + 20 x L)/ +/- 0,16° (type designation F10)
Sensor distance to magnetic Ring	max. 1.0 mm (without protection ring) max. 0.45 mm (with protection ring)
Basic pole pitch	5 mm
Sensor housing material	Zinc die cast
Housing dimensions	L x W x H = 62 x 40 x 20 mm
Required magnetic ring	MRR-00-050-030-20-0032 (without protection ring) MRR-00-051-030-20-0032 (with protection ring)
Max. measuring range	360°
Connection type	Circular plug M12 on housing
Weight	130 g (without cable) Cable (accessory): approx. 60 g per meter
Ambient conditions	
Operating temperature	-10 ... +70 °C (-25 ... +85 °C) on request
Storage temperature	-25 ... +85 °C
Protection type	IP40 (standard), IP65 (option V)
Electrical data	
Supply voltage	10 ... 30 VDC
Ripple	<5 %
Current consumption	max. 150 mA
Interfaces	Standard: SSI (Gray or binary), CANopen On request: CAN BASIC ELGO, RS232, RS422 or addressable RS422 In preparation: BiSS-C
Resolution	16000 measuring steps/revolution
Max. rotation speed	20000 rev./min. (depending on interface) ■ 0 to 1000 rpm without protection ring ■ 1000 to 20000 rpm with protection ring
Sensor cable	max. 30 m (depending on interface)

Examples:

RMAX 00000 010 S B 0 - - - - -  
A A B B B C C C D D E E E E F G G G G H I J J J J

EMAX-RO with SSI binary interface, 25 bit and circular plug

RMAX 00000 010 C A 0 1 2 5 k 0 - - - - -  
A A B B B C C C D D E E E E F G G G G H I J J J J

EMAX-RO after ELGO standard with CANopen (DS406) interface,  
12 pin round connector, Bitrate 125 kbit/s and device address: 0

## Order Designation:

For orders, please use the following order key:

RMAX A A B B B B C C C D D D E E E E E F G G G G H I J J J J

### A SN-Number

00 0 ... 99

### B Signal cable length (cable length in dm)

000 0 m - (standard version without cable)

### C Resolution in $\mu\text{m}$

010 10  $\mu\text{m}$  - with system accuracy in  $\mu\text{m}$  +/- (150 + 20 x L)  
F10 10  $\mu\text{m}$  - with system accuracy in  $\mu\text{m}$  +/- (50 + 20 x L)

### D Interface

SBO SSI-Interface (25 Bit binary code)  
SGO SSI-Interface (25 Bit Gray code)  
CA0 CANopen (DS406)  
CNO CAN BASIC ELGO (on request)  
420 RS422 (on request)  
A20 addressable RS422 (on request)  
230 RS232 (on request)

### E Bit rate

09k6 9600 Bit/s - standard bit rate for RS422 (420/A20)  
19k2 19200 Bit/s for RS422  
38k4 38400 Bit/s for RS422  
125k 125000 Bit/s for CAN  
250k 250000 Bit/s for CAN  
500k 500000 Bit/s for CAN  
1MHz 1000000 Bit/s for CAN

### Additional options

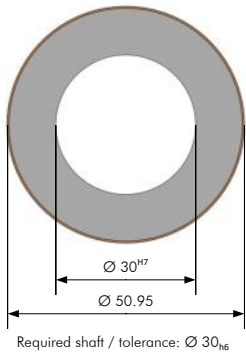
F Device address 0 ... F  
(standard setting: device address 0)  
---- standard version  
G V Standard version always with 12-pin M12 round connector  
H A without terminating resistor

### I Inkrementalsignale

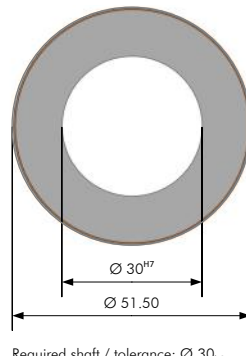
J H2N5 incremental square wave signals HTL with 2.5  $\mu\text{m}$  resolution  
H005 incremental square wave signals HTL with 5  $\mu\text{m}$  resolution  
H010 incremental square wave signals HTL with 10  $\mu\text{m}$  resolution  
H025 incremental square wave signals HTL with 25  $\mu\text{m}$  resolution  
T2N5 incremental square wave signals TTL with 2.5  $\mu\text{m}$  resolution  
T005 incremental square wave signals TTL with 5  $\mu\text{m}$  resolution  
T010 incremental square wave signals TTL with 10  $\mu\text{m}$  resolution  
T025 incremental square wave signals TTL with 25  $\mu\text{m}$  resolution  
SC50 sine-cosine signal 1 V<sub>ss</sub>, 5 mm pole pitch

**Note:** options that are not required are filled in with „-“!

## Dimensions of the magnetic ring:



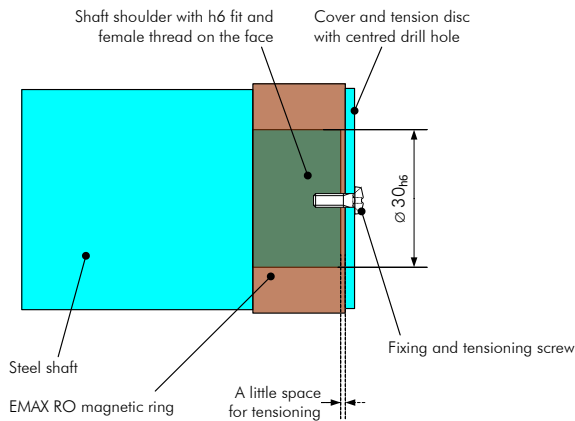
Without protection ring  
Usage up to max. 1000 rpm



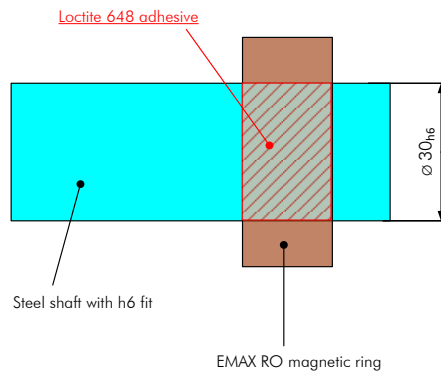
With protection ring  
Usage up to max. 20000 rpm

## Magnetic ring - Installation suggestions:

### Screw mounting example:



### Adhesive mounting example:



## Accessories:

### Magnetic ring

MRR-00-050-030-20-0032  
(without protection ring)  
MRR-00-051-030-20-0032  
(with protection ring)  
Resolution 16 000 steps per turn

### PNO1

SSI / PROFIBUS Converter

### DKA-00-RCF0-050-XXX-12-T-D-S

Connection cable for EMAX-RO, device side with 12-pol. M12-plug female, cable length 5.0 m, evaluation unit with open wires, 12 wires, twisted pair, drag chain suitable, with shield

