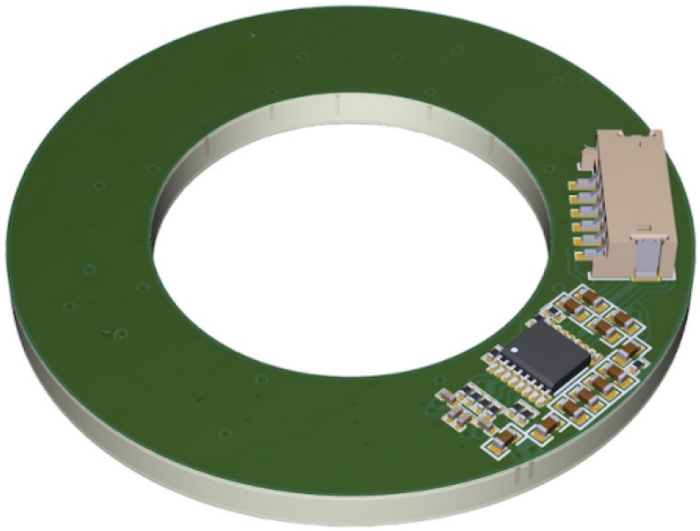
ELGO ELECTRONIC

SERIES *IRM*

Inductive Rotary Measuring System for Integration into Electrical Drives



- Mechanically customizable built-in-encoder
- Ideal for detecting pole position, angle, and speed
- Contactless measurement through inductive scanning
- Stable sin/cos output signals corresponding to the number of pole pairs of the synchronous machine
- Compatible with all common controllers and inverters featuring a sin/cos interface

ADVANTAGES

- Can be integrated into any motor design in very limited space and with generous mounting tolerances
- Absolute measurement - immediate signal output after power-on with no reference run required
- Magnet-free and insensitive to magnetic stray fields
- High sensor accuracy contributes positively to the energy efficiency of the drive

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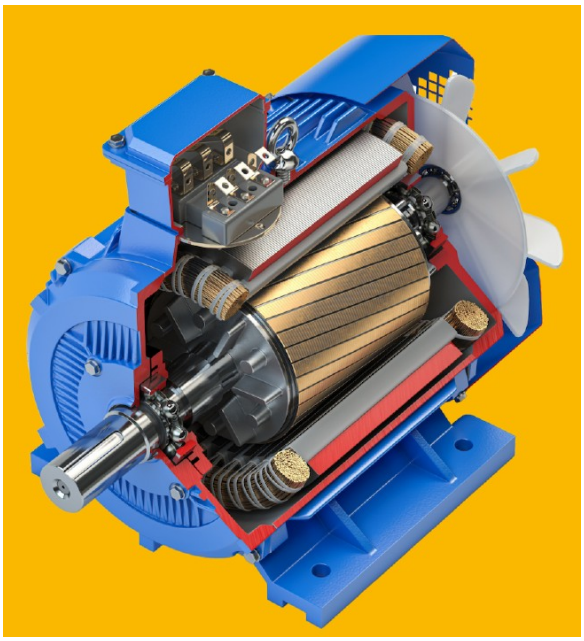
IRM - Inductive Rotary Measuring System

General:

The efficiency, noise development and service life of electric drives are heavily dependent on the signal quality of the sensors used. ELGO offers measurement solutions for speed and torque control.

Inductive rotor position sensors provide faster and more accurate signals than conventional sensor systems such as re-solvers. Benefit from ripple-free load-torque curves thanks to higher accuracy. This is particularly beneficial in situations where high torque is required at low speed.

The IRM sensor consists of a stator and a rotor. The compact design makes the system suitable for integration in electric drives with high electromagnetic compatibility requirements.

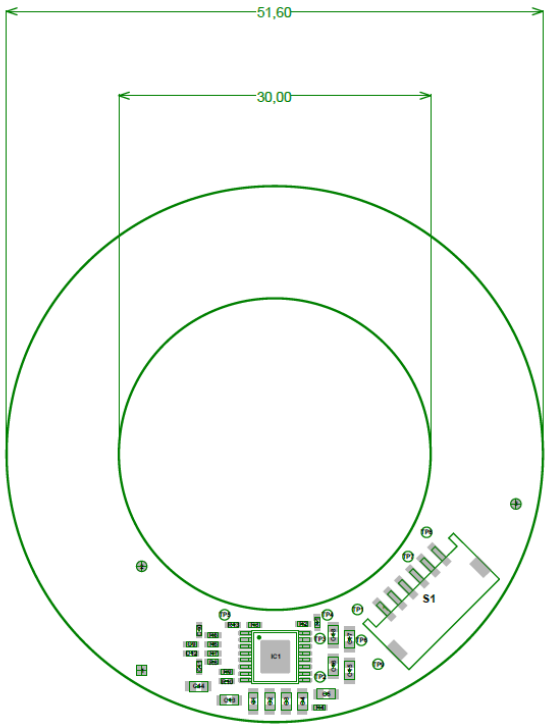


Pin Assignment:

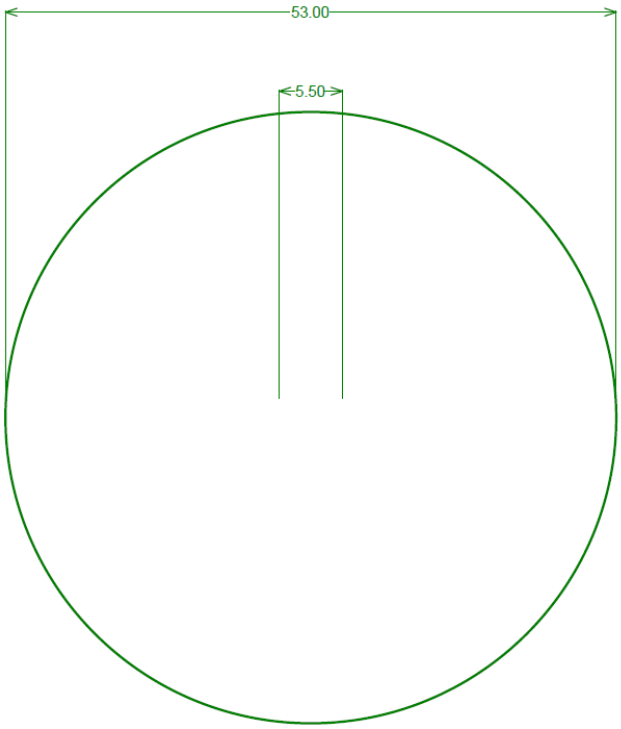
Pin	Function
1	0 V / GND
2	5 VDC
3	S+
4	S-
5	C+
6	C-

Dimensions:

Stator



Rotor



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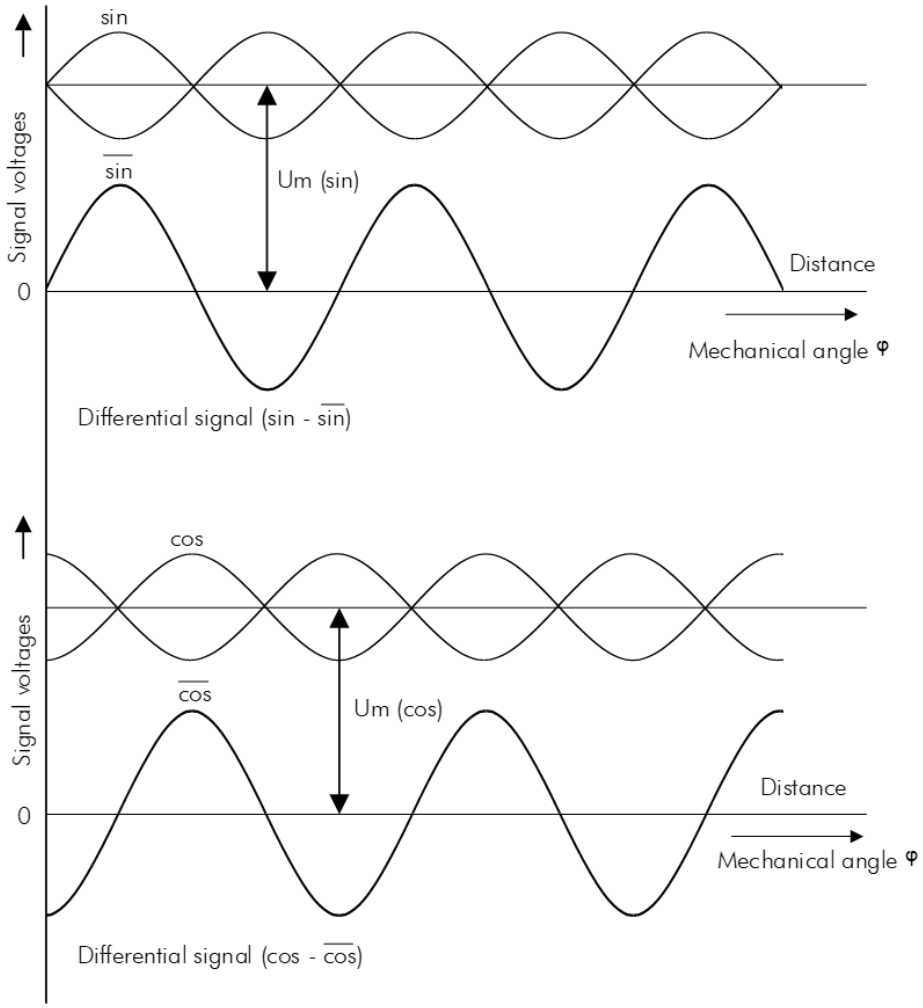
IRM - Inductive Rotary Measuring System

Technical Specifications:

Mechanical Data Integrated Encoder	
Air gap (nominal)	max. 2.0 mm
Mechanical Data Stator	
Material	FR4
Outer Diameter	52 … 200 mm
Mounting Types	bonding, clamping, srew mounting on request
Axial Height	at least 10.6 mm
Mechanical Data Rotor	
Material	conductive material ≥ 35 µm (PCB, aluminium, steel)
Speed	≤ 100.000 min^{-1}, depending on number of pole pairs, mounting type, diameter, and material
Shaft diameter	2 … 138 mm
Elektrical Data	
Supply voltage U_B	5 V DC
Current consumption IB (no load)	< 30 mA
Output signals (short-circuit-proof)	sin/cos single ended: two sine signals, phase-shifted by 90° differential: two sine signals, phase-shifted by 90° and their inverse signals
Output signal level (single ended)	3 V_{pp}, depending on output current and temperature
Accuracy per period	< 0.5° electrical
Latency	< 5 µs
Number of periods per mechanical revolution	1 … 64
Frequeny range	0 … 10 kHz
Recommended output current	< 5 mA
Environmental Conditions	
Operating temperature	-40 °C ... +125 °C according to ISO 16750-4:2010, short-term up to +150 °C depending on availability of the safety function, operating temperature range, and service life (MTTF value)
Storage temperature	-40 °C ... +125 °C

TIRM - Inductive Rotary Measuring System

Representation of Signal Waveforms:



Accessories:

Order Designation	Description
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