ELGO ELECTRONIC

Series *BMIX*

Magnetic, battery-backed Quasi-Absolute Encoder

- Quasi-absolute length and position measurement
- Movements are also detected when switched off
- Proven magnetically based measuring technology
- Wear-free, contactless measurement principle
- Selectively with Analog output (voltage or current) or CANopen interface (DS406 encoder profile)
- High shock and vibration resistance
- Robust against dust, dirt, smoke and water

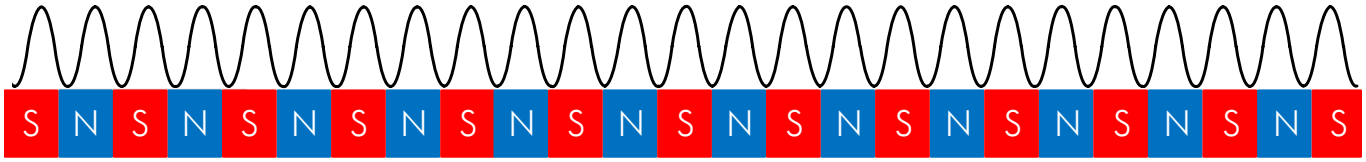
BMIX - Magnetic, battery-backed Quasi-Absolute Encoder

General:

The ELGO measuring system BMIX is based on the physical principle of length and position measurement by using magneto-sensitive components. It is used for a high-precision determination of the position, moving distance or speed. Based on this wear-free and contactless single-track measuring system, ELGO offers these "quasi absolute" version.

Principle of Scanning:

The basis of the magnetic incremental linear encoder consists of a scanning technology, which scans the north and south poles on the single-track coded magnetic tape and produces a single sine/cosine wave for each pole. The pole pitch of the magnetic tape is 16 mm. The complete sine/cosine signal process is interpolated electronically.



Depending on refinement of the interpolation, together with the pole pitch of the magnetic tape, the resolution of the measuring system is determined. Depending on the ordered interface option, the sampled signal information is converted by the internal evaluation electronics into the corresponding output format.

Available Output Interfaces:

- Interface option I20 → Analog 12 bit output signal (0 … 20 mA), proportional to the measured value
- Interface option I24 → Analog 12 bit output signal (4 … 20 mA), proportional to the measured value
- Interface option V04 → Analog 12 bit output signal (0.5 … 4.5 V), proportional to the measured value
- Interface option V10 → Analog 12 bit output signal (0 … 10 V), proportional to the measured value
- Interface option CA0 → CANopen standard interface according to the DS406 encoder profile

The quasi-absolute Measuring Principle:

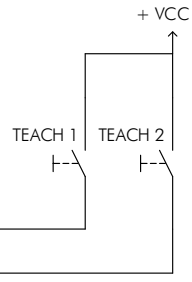
A battery line integrated in the sensor turns the incremental measuring system into a quasi absolute measuring system, since the current position is permanently detected and internally processed even in a de-energized state. This is guaranteed for up to 6 months under consideration of the optimal charging and environmental conditions.

Connections:

The connections are made via the open cable ends of the signal cable. Pluggable connectors are optionally available:

Pin Assignment:

Color	CAN Version	Analog Version
black	0 V / GND	0 V / GND
brown	+VCC	+VCC
red	-	TEACH 1
orange	-	TEACH 2
green	CAN HIGH	Analog OUT
yellow	CAN LOW	Analog GND



Calibration with Analog Output:

To define the minimum and maximum position, a calibration procedure must be performed during commissioning of the analog version. For this purpose the inputs TEACH 1 and TEACH 2 are required.

First, these two inputs should (temporarily) be connected to a switch or push-button against +VCC (see Pin Assignment).

Then perform the following steps in order:

- Move the sensor to the desired lower (MIN) position on the magnetic tape.
- Activate the "Teach Mode" by pressing TEACH 1 and TEACH 2 simultaneously. Keep them pressed for at least 3 seconds, then release.
- Save the defined MIN position by pressing TEACH 1 briefly.
- Move the sensor to the desired upper (MAX) position on the magnetic tape.
- Briefly press TEACH 2 to save the MAX position.
- This concludes the teach process and the calibration is complete.

If the sensor is removed from the magnetic tape at any point, the calibration must be carried out again.

Calibration with CAN Interface:

When using a BMIX with CAN interface, the values MIN/MAX must be approached and stored in the control system.

BMIX - Magnetic, battery-backed Quasi-Absolute Encoder

Technical Data:

Mechanical Data	
Measuring principle	incremental, quasi-absolute
Repeat accuracy	± 1 increment
System accuracy in µm at 20 °C	± (1000 + 20 x L) L = measuring length in meters
Distance sensor - tape	max. 10 mm
Pole pitch	16 mm
Material sensor housing	ABS plastic
Housing dimensions	L x W x H = 100 x 12 x 25 mm
Required magnetic tape	MB20-160-10-1-R
Measuring length	theoretically unlimited
Sensor cable length	1.50 m (others on request)
Weight	measuring system: approx. 120 g; cable: approx. 60 g/m
Electrical Data	
Power supply voltage	10 … 30 VDC
Residual ripple	10 … 30 VDC <10 %
Current consumption	max. 150 mA
Battery operating time	With movement: approx. 16 days after power-off Without movement: approx. 32 days after power-off
Charging time before first use	4 h
Available Interfaces (depends on order)	12 bit analog output 0 … 20 mA 12 bit analog output 4 … 20 mA 12 bit analog output 0.5 … 4.5 V 12 bit analog output 0 … 10 V CANopen (DS406)
Connection type	standard: open cable ends options: D-SUB or round connector (see Type Designation) →
Operating speed	max. 2.0 m/s
Environment Conditions	
Storage temperature	−20 … +45 °C
Operation temperature Charging process	0 … +45 °C
Operation temperature Battery operation	−20 … +45 °C
Protection class	IP67
Humidity	max. 95 %, non-condensing

Type Designation:

BMIX_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

AABBBCCCCDDDFFFFGHI

A Version
- 00 = *ELGO* standard version
- 01 = 1. customer specified version

B Signal Cable Length (in dm)
- 015 = 15 dm (≙ 1.5 m) standard length (others on request)

C Resolution (in µm)
- 1000 = 1000 µm (≙ 1mm)

D Interface
- I20 = Analog 12 bit output signal (0 … 20 mA)
- I24 = Analog 12 bit output signal (4 … 20 mA)
- V04 = Analog 12 bit output signal (0.5 … 4.5 V)
- V10 = Analog 12 bit output signal (0 … 10 V)
- CA0 = CANopen interface (DS406 encoder profile)

F Bit Rate (only with CAN interface)
- 125k = 125000 bit/s
- 250k = 250000 bit/s
- 500k = 500000 bit/s
- 1MHz = 1000000 bit/s

Additional Options

G Address Device address 0 … F (standard setting = 0)

H Connector Options
- D9M0 = 9-pin male D-SUB connector (only CANopen)
- R5M0 = 5-pin male M12 round connector (only CANopen)
- R8M0 = 8-pin male M12 round connector (only Analog out)

I A = CANopen without internal termination

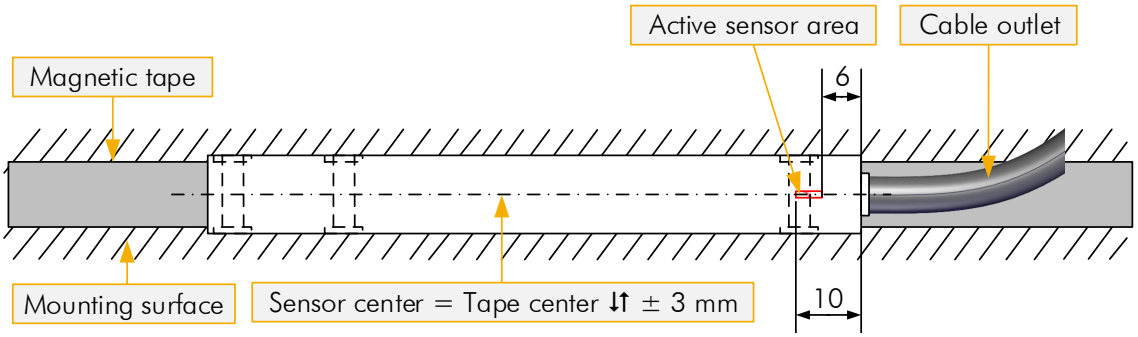
Ordering example:

BMIX000151000V04-----R8M0-

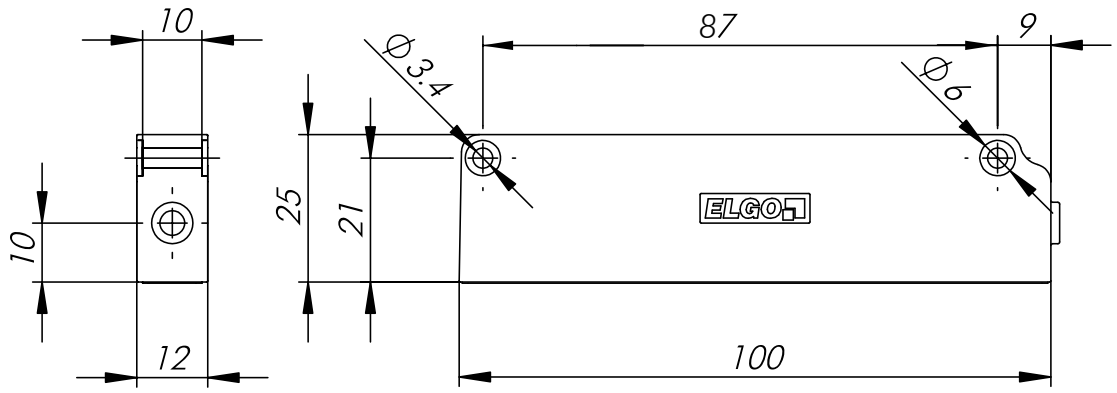
AABBBCCCCDDDFFFFGHHHHI

ELGO standard BMIX with 1.5 m cable length, 1 mm resolution, 12 bit analog output (0.5 … 4.5 V) and 8-pin (male) round connector.

Active Sensor

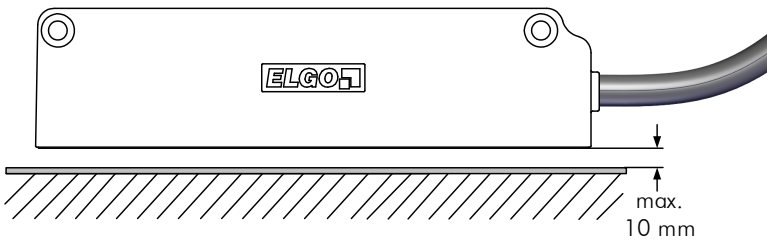


Dimensions of BMIX:

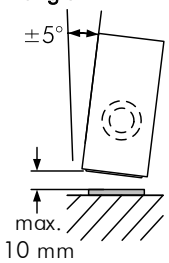


Mounting Tolerances:

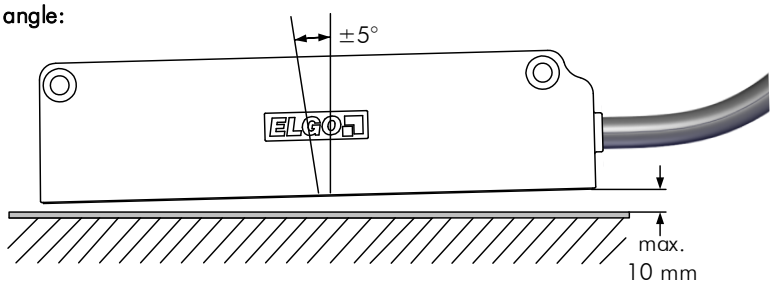
Reading distance:



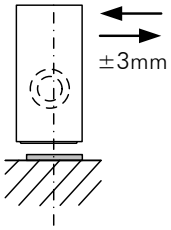
Tilt angle:



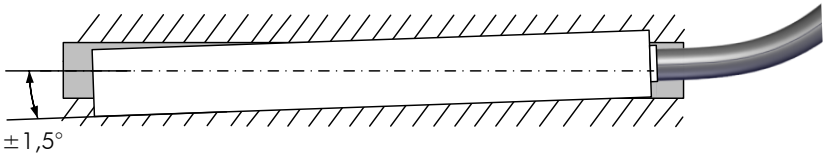
Pitch angle:



Lateral offset:



Yaw angle:



Accessories for BMIX:

Order Designation	Description
MB20-160-10-1-R1	Magnetic tape for BMIX (16.0 mm pole pitch); please indicate the desired length in XX.X m
End cap set 10 mm	2 end caps (10 mm) and 2 x M3 screws; additional fixation and protection of magnetic tape ends

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