

# Series **BMIX**

Magnetic, battery-backed Quasi-Absolute Encoder up to 5000 mm



- 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

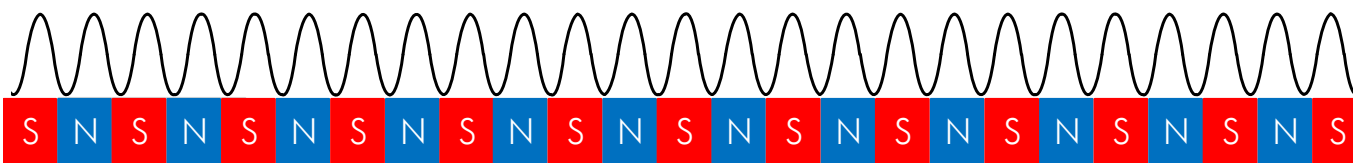
# BMIX - Magnetic, battery-backed Quasi-Absolute Encoder up to 5000 mm

## General:

The ELGO measuring system **BMIX** is based on the physical principle of length and position measurement by using mag-neto-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:

### 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.

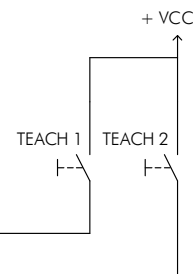
If the sensor is removed from the magnetic tape at any point, the calibration must be carried out again.

### Calibration with CAN Interface:

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

## 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



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## Technical Data:

Mechanical Data	
Measuring principle	incremental, quasi-absolute
Repeat accuracy	± 1 increment
System accuracy in $\mu\text{m}$ 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	up to 5000 mm
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	min. 6 months after power-off
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	-25 ... +85 °C
Operation temperature	-25 ... +85 °C
Protection class	IP67
Humidity	max. 95 %, non-condensing

## Type Designation:

BMIX \_\_\_\_\_  
A A B B C C C C D D D D F F F F G H I

### A Version

00 = ELGO standard version  
01 = 1. customer specified version

### B Signal Cable Length (in dm)

015 = 15 dm ( $\approx$  1.5 m) standard length  
(others on request)

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

1000 = 1000  $\mu\text{m}$  ( $\approx$  1 mm)

### 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)

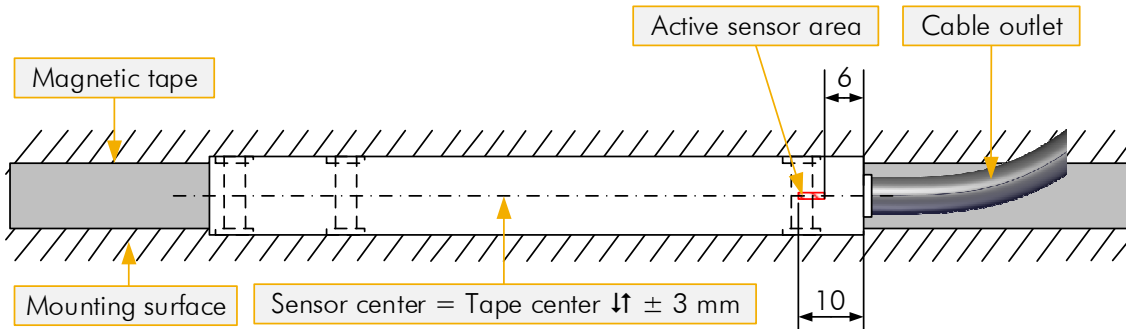
### I A = CANopen without internal termination

Ordering example:

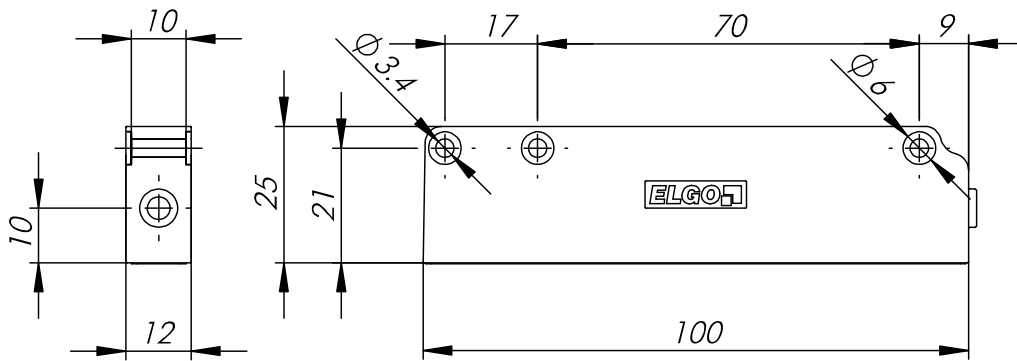
**BMIX000151000V04-----R8M0-**  
A A B B C C C C D D D D F F F F G H H H H I

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 Area:

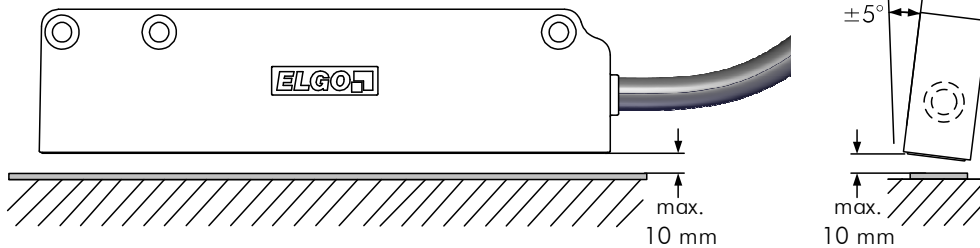


## Dimensions of BMIX:

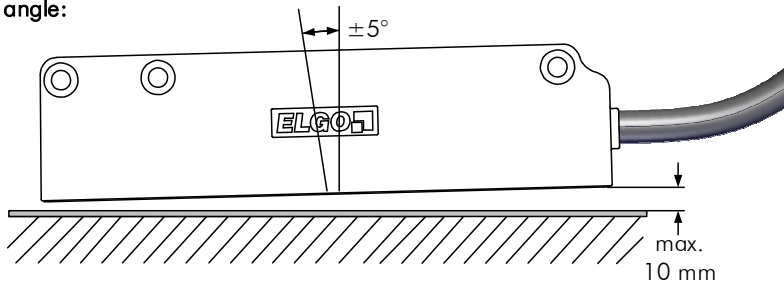


## Mounting Tolerances:

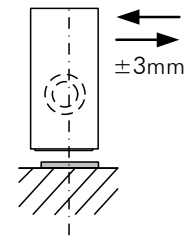
Reading distance:



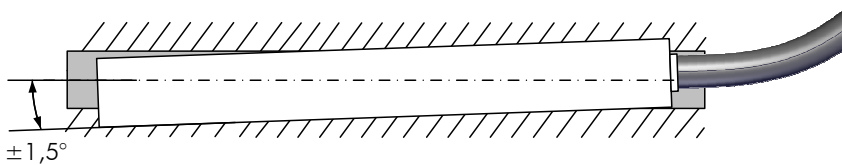
Pitch angle:



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

