SERIES MIRE
Magnetic Incremental Rotary Encoder

- Contactless encoder for angles and speeds
- 1.40625° resolution (at 4-edge triggering)
- Speeds up to 10,000 revolutions per minute
- Direct measurement at the motor shaft or axis
- Wear-free and contactless measuring principle
**MIRE** - Magnetic Incremental Rotary Encoder

**General:**

*MIRE* = Magnetic Incremental Rotary Encoder. The angle measurement system *MIRE* is a combination of a sensor and a round magnet. The sensor is mounted directly on the engine shaft or on an axis. This ensures easy and quick installation. *MIRE* is especially suitable for measuring angles.

The sensor head with its high protection class IP64 is resistant against all kinds of dirt and dust and is completely wear-free. The resolution of the system is **1.40625°** at 4-edge triggering. The maximum revolution speed of the magnet is 10,000 revolutions per minute.

**Essential Features:**

- Contactless encoder for angles and speeds
- **1.40625°** resolution (at 4-edge triggering)
- Speeds up to 10,000 revolutions per minute
- Direct measurement at the motor shaft or axis
- Wear-free and contactless measuring principle

**The magnet:**

The round magnet has a diameter of 6 mm and a height of 2.5 mm. One of the flat sides must be aligned with the center of the sensor; it does not matter which side faces the sensor. **Caution:** The *MIRE* measuring system may only be operated with the special ELGO “DRM magnet”, which is available as an accessorional part.

**Distance between sensor and magnet:**

The ideal distance range between magnet and the active sensor area of the measuring system is 0.2 ... 1.0 mm. Outside this range the accuracy cannot be guaranteed. In order to meet the correct mounting distance, the two side-mounted LEDs are used (see figure on next page).

**Fastening of the magnet:**

The magnet can either be glued or be placed directly on a shaft or a guiding system, as long as it is made of a non-magnetic material such as stainless steel, V2A, V4A or aluminium. The magnet and the bonding surface must be clean and greaseless before gluing the parts together. When gluing the magnet to a plastic surface, we recommend rubbing the surface with fine sand paper first.

**Suitable adhesives are:**

- LOCTITE 405 (viscosity liquid, curing in about one minute)
- LOCTITE 409 (viscosity gel-like, curing in about two minutes)

**Function:**

During one full rotation of the magnet (360°), the sensor transmits 64 pulses. At 4-edge triggering this corresponds to 256 increments. The angular resolution at 4-edge triggering is **1.40625°**. The maximum rotation speed of the magnet without losing increments is 10,000 revolutions/minute.

**Signal sequence:**

![Signal sequence diagram](image-url)
MIRE - Magnetic Incremental Rotary Encoder

**Technical Data:**

**Mechanical Data**

<table>
<thead>
<tr>
<th>Measurement principle</th>
<th>incremental, rotative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat accuracy</td>
<td>±1 increment</td>
</tr>
<tr>
<td>System accuracy in angular degrees at 20°C</td>
<td>±1 increment resp. ±1.0625°</td>
</tr>
<tr>
<td>Distance sensor/magnet</td>
<td>0.2 ... 1.0 mm</td>
</tr>
<tr>
<td>Round magnet Ø</td>
<td>6 mm</td>
</tr>
<tr>
<td>Sensor housing material</td>
<td>Hotmelt plastic</td>
</tr>
<tr>
<td>Sensor dimensions</td>
<td>L x W x H = 35 x 10 x 25 mm</td>
</tr>
<tr>
<td>Required magnet</td>
<td>DRM round magnet; type designation „DRM-000-060-025“</td>
</tr>
<tr>
<td>Measurement angle</td>
<td>max. 360°</td>
</tr>
<tr>
<td>Type of connection</td>
<td>Open cable ends</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 25 g without cable</td>
</tr>
<tr>
<td></td>
<td>cable: approx. 60 g per meter</td>
</tr>
</tbody>
</table>

**Electrical Data**

<table>
<thead>
<tr>
<th>Power supply voltage</th>
<th>10 ... 30 VDC or 5 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual ripple</td>
<td>10 ... 30 VDC: &lt; 10 %, resp. 5 VDC ±25 mV</td>
</tr>
<tr>
<td>Consumption</td>
<td>40 mA (unloaded output drivers)</td>
</tr>
<tr>
<td>Output signals</td>
<td>A, A′, B, B′, Z, Z′ (push-pull, durable short circuit proof)</td>
</tr>
<tr>
<td>Output levels</td>
<td>10 ... 30 V-HTL or 5 V-TTL</td>
</tr>
<tr>
<td>Resolution</td>
<td>1.40625° (at 4 edge triggering)</td>
</tr>
<tr>
<td>Edges per revolution</td>
<td>256 edges (at 4 edge triggering)</td>
</tr>
<tr>
<td></td>
<td>= 64 pulses</td>
</tr>
<tr>
<td>Output current</td>
<td>max. 50 mA / channel</td>
</tr>
<tr>
<td>Max. rotation speed</td>
<td>10,000 U/ min</td>
</tr>
<tr>
<td>Sensor cable</td>
<td>1.5 m standard length (others on request), drag chain suitable</td>
</tr>
<tr>
<td>Available cable lengths</td>
<td>1.0 / 1.5 / 3.0 / 5.0 / 8.0 m</td>
</tr>
<tr>
<td>Bending radius of the sensor cable</td>
<td>min. 60 mm</td>
</tr>
</tbody>
</table>

**Environmental Conditions**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>-10 ... +70°C C, (-25 ... +85°C on request)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-25 ... +85°C C</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP64</td>
</tr>
<tr>
<td>Humidity</td>
<td>max. 80 %, not condensing</td>
</tr>
</tbody>
</table>

**Installation LEDs:**

To meet the correct mounting distance

<table>
<thead>
<tr>
<th>LED Mag INC</th>
<th>LED Mag DEC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Distance between sensor and magnet is correct</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>Distance between sensor and magnet is too big</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Distance between sensor and magnet is too small</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>Distance is outside of the range</td>
</tr>
</tbody>
</table>

**Type Designation:**

Please use the following code for your orders:

MIRE -

A A A - B B B - C C C C - D D

A SN-Number

000 ELGO Standard
001 1st special version

B Cable lengths

1.5m (ELGO standard)
others on request

C Pulses

64 pulses / revolution

D Supply / output levels

00 10 ... 30 VDC / 10 ... 30 V-HTL
01 10 ... 30 VDC / 5 V-TTL
11 5 VDC / 5 V-TTL

Example:

MIRE - 0 0 0 - 0 3 : 0 - 0 0 6 4 - 0 0
A A A - B B B - C C C C - D D

MIRE (ELGO standard), with 3.0 m cable length, 64 pulses / revolution, 10 ... 30 VDC power supply and 10 ... 30 V-HTL output levels

Your order:

MIRE -

A A A - B B B - C C C C - D D

Accessories:

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRM-000-060-025</td>
<td>DRM round magnet for MIRE</td>
</tr>
</tbody>
</table>
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**Dimensions of the MIRE Sensor:**

- Active Sensor Area:
  - Sensor area Ø 6,00
  - ± 0.1 mm
  - ± 0.1 mm

**Dimensions of the DRM Magnet:**

- Ø 6
- 2.5

- Cable sheath Ø 9.00
- Signal cable Ø 6.00

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Measuring | Positioning | Control

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