**LIMAX1M**

Magnetic Pseudo Absolute Shaft Information System

- Absolute measurement for hoisting heights up to 90 m
- Auto-referencing: Absolute position is detected after 240 mm
- Resolutions: 62.5 / 125 / 250 / 500 or 1000 µm
- Insensitive to dirt, smoke and humidity
- Travel speed up to 4 m/s (more on request)
- Interfaces: Selectively CANopen DS417, CANopen DS406, RS485, RS422, USB or SSI (on request)
- Easy and flexible to install
- Vertical installation of the magnetic tape
- Wear-free, contactless and noiseless measuring principle
General:
The absolute shaft information system LIMAX1M with its significant advantages is a particularly affordable, non-sensitive and easy-to-install alternative to conventional shaft information systems. During commissioning, a one-time referencing is required, which must be requested by the lift control. Then LIMAX1M always references the absolute position automatically after a moving distance of 240 mm. Compared to other shaft information systems, LIMAX1M is characterized by an extraordinarily low price.

LIMAX1M is able to cover lifting heights up to 90 meters and operating speeds up to 4 m/s.

The indication 1M in the type designation stands for “Mini” and means the smallest sensor design of the LIMAX1 series. With its low space requirement, LIMAX1M is also ideally suited for retrofitting and modernization of existing elevator systems.

A simple and flexible mounting ensures quick installation or replacement of the measuring system.

Magnetic Tape:
For measurement resp. scanning of the lift position, the LIMAX1M sensor requires an absolute coded magnetic tape of the type AB20-80-10-1-R-D-15-BK80, which carries the unique position information as a magnetic code.

The magnetic tape is mounted free-hanging in the shaft by using an ELGO mounting set (see accessories on the last page). At the lower end, the tape is tensioned while it is guided along the cabin by a plastic guidance at the sensor. The actual measurement resp. scanning is basically contactless. The guidance merely serves to keep the correct distance to the sensor.

Resolution:
Depending on the requirements, an appropriate system resolution can be defined with the order (see type designation). The available standard resolutions are 62.5 / 125 / 250 / 500 and 1000 µm.

Available Interfaces:
For communication with the lift control, an interface can be defined with the order (see type designation). Available are CANopen interfaces with different protocols as well as RS458 and RS422. Further, a USB interface with standard protocol is available. SSI interfaces (binary or Gray code) or customer-specific solutions are also available on request.

Status LEDs:
The LIMAX1M sensor has 3 status LEDs which serve for various messages, e. g. operational readiness or error states of the system, magnetic tape and interface.

Connections:
By default the LIMAX1M sensor is supplied with a RJ45 socket. To connect the sensor, a commercially available network cable can be used. In case of an ordered USB interface a Mini USB socket is equipped and a USB-cable must be used.

Sensor Installation:
In order to mount the sensor to the lift cabin, the mounting angle kit LIMAX1M MW SET (see figure right) must be used, which is available as an ELGO accessory. This mounting kit includes two screws with sliding nuts which can be inserted into the mounting groove of the sensor housing in order to fix the angle to the sensor housing. With the remaining long holes, the unit can be fastened on the cabin roof. The tape guidance at the sensor permanently ensures the correct distance between magnetic tape and sensor.

Magnetic Tape Installation:
For elevator applications, the magnetic tape is attached free hanging to the upper end of the shaft and is tensioned at the lower end of the shaft by using a tension spring. Several mounting sets are available for the tape installation, which contain different components depending on the respective requirements.

All variants and their order designations are summarized in the table “Accessories” on the last page. Available are various mounting sets as well for central guided cabins as for rucksack-guided systems (see “Accessories” on the last page.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
</tr>
<tr>
<td>2</td>
<td>VCC</td>
</tr>
<tr>
<td>3</td>
<td>CLK-</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>CLK+</td>
</tr>
<tr>
<td>7</td>
<td>CAN-H / DATA-</td>
</tr>
<tr>
<td>8</td>
<td>CAN-L / DATA+</td>
</tr>
</tbody>
</table>
**LIMAX1M - Magnetic Pseudo Absolute Shaft Information System**

### Technical Data:

**Mechanical Data:**

- **Measuring principle:** Pseudo absolute
- **Repeat accuracy:** ± 1 increment
- **System accuracy in μm at 20 °C:** ± (1000 + 50 x L) μm, where L = measuring length in meters
- **Distance sensor / tape:** The correct distance is guaranteed by guidance
- **Housing material:** Plastic
- **Housing dimensions:** L x W x H = 82 x 68 x 30 mm
- **Required magnetic tape:** A820-80-10-1-R-D-15-BK80
- **Basic pole pitch (tape):** 8 mm
- **Max. measuring length:** 90 m (240 mm relative position after power-on before absolute position is available)
- **Connections:** Standard RJ45 socket or Mini USB socket
- **Sensor cable:** External network cable resp. USB cable required
- **Weight:** Approx. 60 g without cable

**Electrical Data:**

- **Power supply voltage:** 10 ... 30 VDC resp. 5 VDC with USB
- **Residual ripple:** < 200 mVpp
- **Current consumption:** Max. 100 mA
- **Interface:** Standard: CANopen DS417
  - Optional: CANopen DS406 or USB with standard protocol on request: SSI, RS485, RS422
- **Available resolutions:** 1.0 / 0.5 / 0.25 / 0.125 / 0.0625 mm
- **Operating speed:** Max. 4 m/s (more on request)
- **Cycle time:** 250 μs

**Environmental Conditions:**

- **Storage temperature:** −25 ... +85 °C
- **Operating temperature:** −10 ... +70 °C
  - (−25 ... +85 °C on request)
- **Operating altitude:** Max. 3000 m above sea level
- **Humidity:** 95 %, non-condensing
- **Protection class:** IP43 (standard)

### Type Designation:

**LIMAX1M** - A A - BBB - CCC - DDDD - E E E E

**A** **Version**

- 00 = standard version
- 01 = First special version (etc.)

**B** **Signal Cable Length**

- **CON** = Connector on device (no cable)

**C** **Resolution**

- 62N5 = 62.5 μm (0.0625 mm)
- 0125 = 125 μm (0.125 mm)
- 0250 = 250 μm (0.25 mm)
- 0500 = 500 μm (0.5 mm)
- 1000 = 1000 μm (1 mm)

**D** **Interface**

- CO0T* = CANopen [encoder profile DS406]
- CO1T* = CANopen [elevator profile DS417 on request]
- USB0 = USB [standard protocol]
- 4220 = RS422 [standard protocol RS422 / position]
- 4850 = RS485 [standard protocol RS485]
- SSB0 = SSI [25 bit binary code / position] on request
- SSG0 = SSI [25 bit Gray code / position] on request

**E** **Connection Options**

- **RJ45** = RJ45 socket
- **USBM** = Mini USB socket

* Remark: The CAN interface is generally terminated by 120 Ω (T), but not galvanically separated

**Order example:**

LIMAX1M - 0 0 - CON - 1000 - USB0 - USBM

ELGO standard LIMAX1M with 1 mm resolution, USB interface and micro USB socket

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**Bottom view:**

- RJ45 socket
- Status LEDs
- Mini USB
- Mounting holes
- Magnetic tape guidance

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**LIMAX1M MW SET:**

- Mounting angle
**Dimensions of LIMAX1M:**

![Dimensions of LIMAX1M](image1)

**Dimensions with Mounting Angle:**

![Dimensions with Mounting Angle](image2)

**Accessories for LIMAX1M:**

<table>
<thead>
<tr>
<th>Order designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMAX1M MW SET</td>
<td>LIMAX1M mounting angle for attachment to the lift cabin</td>
</tr>
<tr>
<td>AB20-80-10-1-R-D-15-BK80</td>
<td>Magnetic tape for LIMAX1M, absolute coding, single track system</td>
</tr>
<tr>
<td>LIMAX MKF</td>
<td>Mounting set for suspended installation with dowel</td>
</tr>
<tr>
<td>LIMAX MKB</td>
<td>Mounting set for suspended installation with guiding rails and rail holder</td>
</tr>
<tr>
<td>LIMAX RMS</td>
<td>Mounting set for suspended installation with crossbeam for standard layout</td>
</tr>
<tr>
<td>LIMAX RMS 90</td>
<td>Mounting set for suspended installation with crossbeam for Rucksack-layout</td>
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</tbody>
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