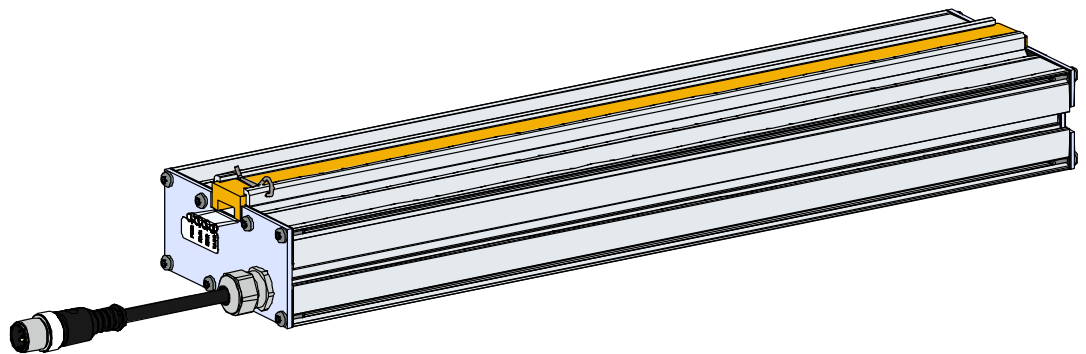


# LIMAX3R

Magnetic Absolute Safety Shaft Information System



- Safe detection of the absolute car position up to 260 meters
- Redundant and self-monitoring dual channel measuring system
- Position measurement with 62,5  $\mu\text{m}$  resolution (others on request)
- Very robust against dust, dirt, smoke and moisture
- Door zone indication up to 128 floors
- Travel speed up to max. 10 m/s
- With RS485 interface (others on request)
- No referencing necessary
- Wear-free, contactless and noiseless measuring principle
- Certified magnetic tape assembly kit with tape presence control (according to EN61508) available
- SIL3 type-examination tested (EC)

# LIMAX3R - Magnetic Absolute Safety Shaft Information System

## General:

LIMAX3R is a SIL3 certified absolute measuring system which detects the cars absolute position in a shaft in a self-monitoring way. In order to satisfy functional safety requirements, the integrated reader electronic are fully redundant.

The housing contains two channels, which are checked for their functionality by an integrated monitoring system. This ensures that the position values as well as any possible system errors are reliably detected. In the case of failure of one system channel, LIMAX3R reports the error to the master control. The sensor is designed to be used as a safe sensor along with a safe evaluation unit (e. g. ELGO SAFEBOX) or directly with a safe elevator control. Used together, the system performs elevator safety functions.

LIMAX3R is able to cover lifting heights up to 260 meters and speeds up to 10 m/s. A simple and flexible mounting ensures quick installation or replacement of the measuring system.

## Magnetic Tape:

For measurement of the lift position, the dual-sensor - which is integrated in aluminum profile housing - requires an absolute coded magnetic tape (type AB20-80-10-1-R-D-15-BK80). The magnetic tape carries the unique position information as a magnetic code.

## Resolution:

The standard resolution of the LIMAX3R is 62.5  $\mu\text{m}$  (others on request).

## Interface:

A bidirectional RS485 interface is used to transmit the position data and to communicate with the elevator control resp. evaluation unit. On request, other interfaces and customer-specific protocols can also be implemented.

## Status LEDs:

The LIMAX3R housing front has five status LEDs which serve for various messages, e. g. operational readiness or error states of the dual channel system as well as the functional state of the magnetic tape.

## Door Zone Indication:

For the indication of the door zones, a PNP-output is integrated in the sensor. It can be directly connected to a light bulb or an LED for indicating the status.

## Connections:

Standardly, the LIMAX3R measuring system is delivered with a 2.0 m long signal cable and a 5-pin M12 round connector (A-coded). Either 3.2 or 5.0 m are available as optional cable lengths (see also the type designation on the next page). Further cable lengths are available on request.

## Sensor Installation:

In order to attach the sensor to the lift cabin, the mounting angle kit LIMAX3 MW SET (see drawings next page) can be used, which is available as an ELGO accessory. This mounting kit also includes the required 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.

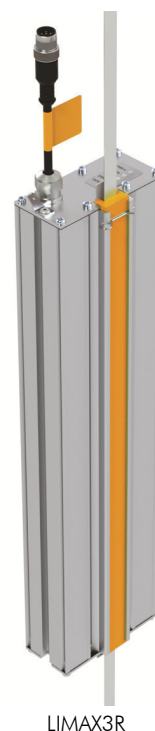
With the remaining long holes, the unit can be fastened on the cabin roof. The tape guidance at the sensor permanently ensures the correct distance between magnetic tape and sensor.

## Magnetic Tape Installation:

The certified mounting kits S-RMS or S-RMS2 (see accessories on last page) makes the tape assembly very easy and straight forward. The magnetic tape must be installed freely suspended in the shaft. 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.

## Magnetic Tape Presence Detector:

The tape presence detector in the complete system ensures that the tape is permanently in its correct position. This detector is a contact system, which opens the safety circuit if the magnetic tape is not in proper position. It thus serves to ensure the magnetic tape is in the intended position and remains there. This is very important since various safety functions depend on the position derived from it.



# LIMAX3R - Magnetic Absolute Safety Shaft Information System

## Technical Data:

Mechanical Data	
Measuring principle	absolute, redundant
Repeat accuracy	± 1 increment
System accuracy in $\mu\text{m}$ at 20 °C	± (1000 + 100 x L) L = measuring length in meters
Distance sensor / tape	the correct distance is guaranteed by guidance
Housing material	aluminium
Housing dimensions	L x W x H = 355 x 85 x 48 mm
Required magnetic tape	AB20-80-10-1-R-D-15-BK80
Basic pole pitch (tape)	8 mm
Max. measuring length	260 m
Connections	5-pin M12 round connector
Sensor cable	standard length: 2.0 m, optional: 3.2 m or 5.0 m (others on request)
Weight	approx. 900 g without cable cable: approx. 60 g per meter

Electrical Data	
Power supply voltage	2-channel: + 18 ... 29 VDC (stabilized) 1-channel: + 10 ... 18 VDC (stabilized) Use only a SELV- or PELV power supply!
Residual ripple	< 100 mV
Current consumption	max. 600 mA
Interface	RS485, others on request
Special output features	door zone indication output: short circuit proof against GND, but not against +24 V
Resolution	62.5 $\mu\text{m}$
Operating speed	max. 10 m/s
Cycle time	4 ms

Conformance / Standards / Certifications	
Achieved SIL	SIL3 (TÜV-certified)
Fulfilled standard	EN81-20
Type-examination	EC according to EN81-20

Environmental Conditions	
Storage temperature	-25 ... +85 °C
Operating temperature	-10 ... +70 °C (-25 ... +85 °C on request)
Operation altitude	max. 2000 m above sea level
Humidity	95 %, non-condensing
Protection class	IP54 (according to EN60529), higher on request
Interference emission / immunity	EN 12015 / EN 12016
Vibration / shock resistance	EN 60068-2-6 / EN 60068-2-27 EN 60068-2-29

Safety Parameters		
Designation	Value	Remark
Safety Integrity Level	SIL 3	
PFH [1/h]	2.2 E-9	2.2 % of SIL 3
PFDavg	1.9 E-4	1.9 % of SIL 3
Proof Test Interval T1	20 years	

## Type Designation:

LIMAX3R -  $\overline{\text{A A}} - \overline{\text{B B B}} - \overline{\text{C C C C}} - \overline{\text{D D D D}} - \overline{\text{E E E E}}$

**A Version**  
02 = standard version (LIMAX33 Safe)

**B Signal Cable Length**  
020 = 2.0 m standard (LIMAX33 Safe)  
032 = 3.2 m  
050 = 5.0 m (others on request)

**C Resolution**  
62N5 = 62.5  $\mu\text{m}$  (0.0625 mm)

**D Interface**  
485X = RS485 [special protocol, separately defined by version number]\*

**\*) CAUTION:**  
The RS485 interface is basically terminated!

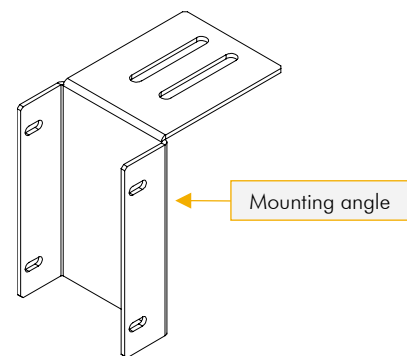
**E Connections**  
M12M = 5-pin M12 round connector (A-coded)

Order example:

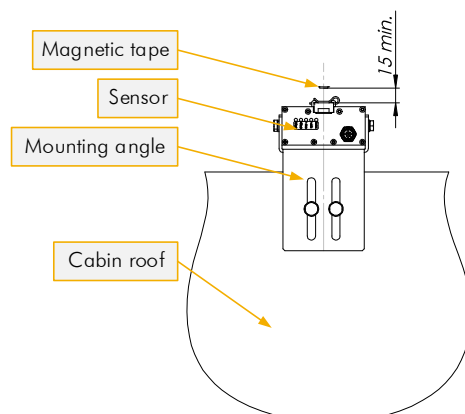
LIMAX3R - 02 - 020 - 62N5 - 485X - M12M  
AA - BBB - CCCC - DDDD- E E E E

ELGO standard LIMAX3R with 2 m cable, 62.5  $\mu\text{m}$  resolution, RS485 interface (terminated) and 5-pin M12 round connector

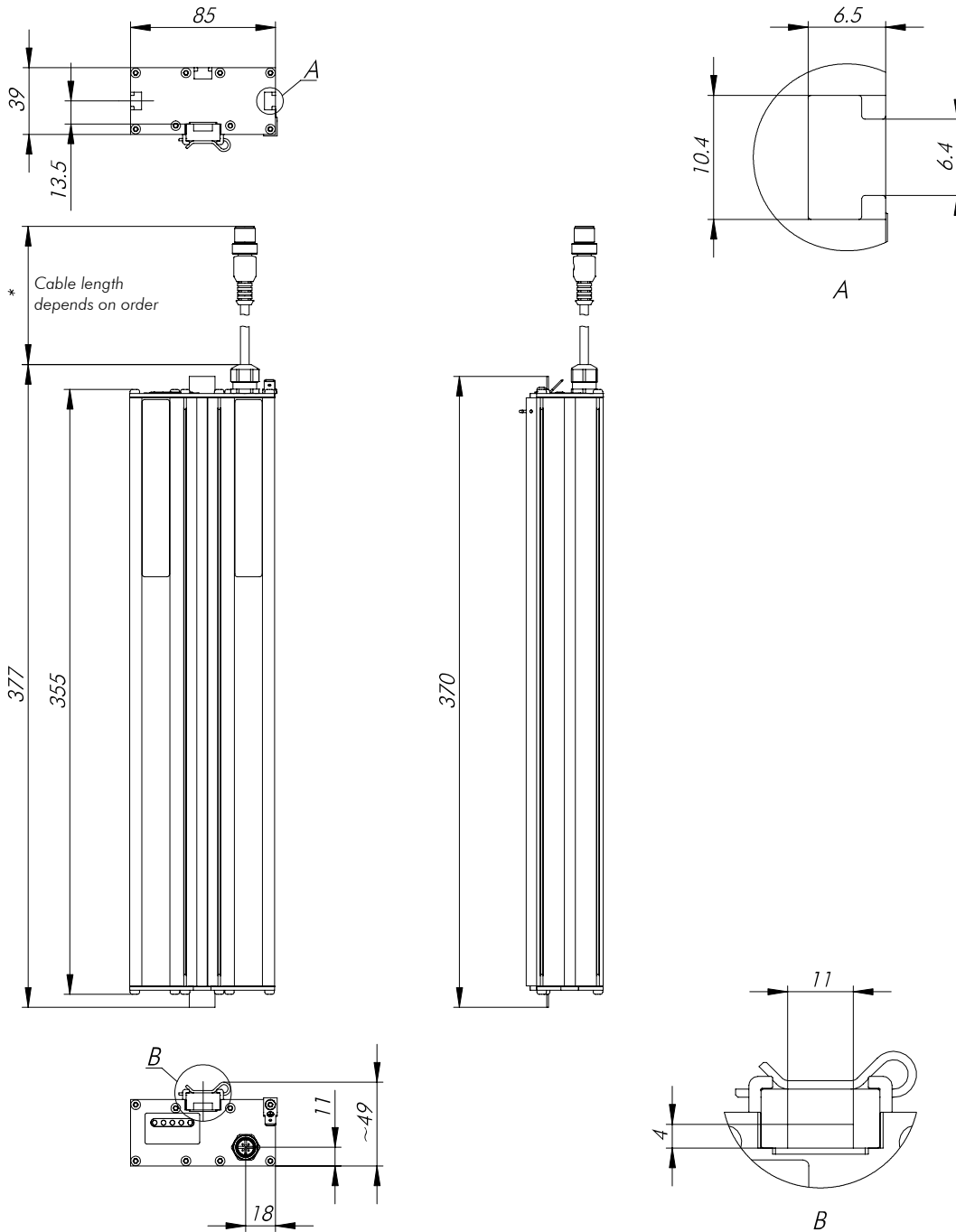
## LIMAX3 MW SET (Accessory):



## Installation on the Cabin Roof:



## Dimensions of LIMAX3R:



## Accessories for LIMAX3R:

Order designation	Description
LIMAX3 MW SET	Mounting angle for LIMAX3R with four each of screws, nuts and washers for mounting the sensor
AB20-80-10-1-R-D-15-BK80	Magnetic tape for LIMAX3R, absolute coding, single track system
LIMAX S-RMS	Magnetic tape mounting kit for rail mounting
LIMAX S-RMS2	Magnetic tape installation kit with tape detection for tight spaces
LIMAX3R Service Set	Spare part set consisting of guiding rail, plastic pad and cotter pin

