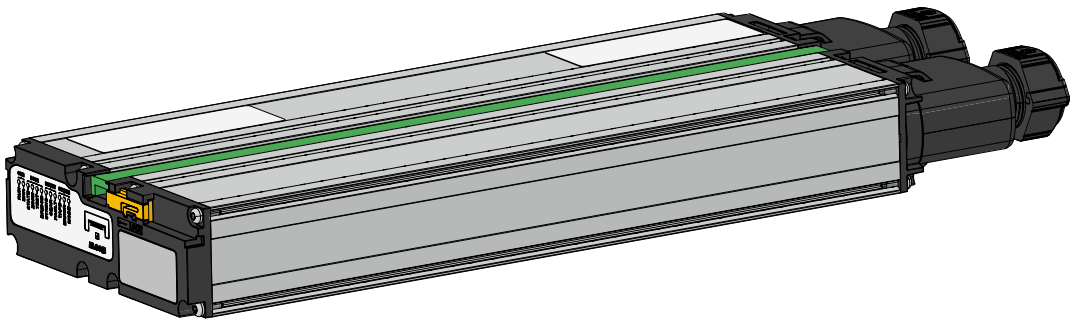
ELGO ELECTRONIC

LIMAX2CP

Magnetic Shaft Information and Safety System with Safe Inputs and Outputs

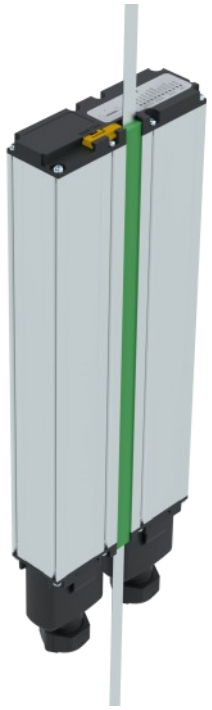


- Safe, absolute position detection up to 130 m and safety-relevant switching and control functions in one housing
- High cost savings due to the reduction of components
- Noiseless magnetic measuring principle
- Insensitive against dirt, dust and smoke
- Protection class selectively IP43, IP54 or IP65
- Low system costs through reduction of components for the fulfillment of safety functions. Further cost reduction by the use of various additional functionalities (see info box "Possible Savings")
- High flexibility through configurable safety functions (the behavior of the safety functions can be optimally adapted to the respective lift system)
- High reliability due to omission of electromechanical switches
- EU type examination according to EN 81-20
- SIL3 tested in compliance with EN61508
- Quick and uncomplicated installation

LIMAX2CP - Magnetic Absolute Shaft Information and Safety System

General:

With the LIMAX3CP ELGO has already offered for the first time a system on the market which combines the entire functionality of LIMAX SAFE. Thus, shaft information and safety functions have been combined in one housing, which has led to a further reduction of components in the lift shaft. The new LIMAX2CP is a further development of the LIMAX3CP.



LIMAX2CP

Further development in terms of reliability:

With the LIMAX3CP the triggering of the safety gear was realized by electronic switches instead of electromechanical safety relays. With the LIMAX2CP all actuators are now realized by electronic switches (MOSFet).

Further development in terms of functionality:

- Support in the detection of unintentional bridging of the door contacts.
- UCM now also realizable via remote triggering of the speed limiter by feedback input.
- Separate activation of protective space/inspection limit switch for shaft pit and head.
- UCM now also realizable without safety brake by safe return channel for speed limiter triggering.
- Improved reaction time through fully electronic actuator technology.

Further advantages:

- Protection of the tape breakage (S-RMS) now internally by means of acceleration sensors. S-RMS optionally configurable for earthquake-endangered areas.
- Very fast test (< 500 μs) of electronic actuators → no external effect of the actuator test; neither dropping of the main contactor nor coordination with the controller is necessary.
- Improved handling during installation due to plug connectors directly on the device.
- Only a few contacts intervene in the lift system, which greatly simplifies installation and handling.
- Reduced energy consumption

Measuring System:

Two measuring systems with mutual monitoring record the current absolute car position. This position information is processed internally. This means that the speed and acceleration of the elevator are calculated from it and converted into corresponding switching functions via the actuators. The basic measuring principle of the system has already been in use for 20 years in ELGO devices and is known for its excellent reliability. Over the years, reliability has been continuously increased, since the proven principle has been retained, but the details have been continuously optimized by many years of field experience. During the transition from LIMAX3CP to LIMAX2CP a further optimization could be made, which was made possible by using a newer and more powerful controller.

Safe Inputs:

With the safe inputs further status signals of the lift can be detected, e.g. the opening of a shaft door by means of a triangle - whereupon the LIMAX2CP activates the corresponding monitoring measures.

Actuators:

These can open the safety circuit and/or trigger the safety brake.

Digital Output:

The system also includes a push-pull output, which is switched within the door zones of the stored floor positions. In case of an emergency, the output signals whether the car is inside a door zone.

Magnetic Tape:

To determine the position of the lift, the measuring electronics which is integrated in an aluminium profile housing requires an absolutely encoded magnetic tape AB20-80-10-1-R-D-15-BK80. The tape carries the unique position information as a magnetic code.

Resolution:

According to CiA 406, the resolution of the LIMAX2CP can be freely configured up to a value of 62.5 μm via the CANopen interface. On default the resolution is 1 mm.

Interface:

In order to transmit the position and speed of the lift cabin, LIMAX2CP is connected to the lift controller via the internal CANopen interface (either CiA 406 or 417). The interface is also used to activate the door bridging, to query safety-relevant parameters (shaft image and configuration) and for diagnostic purposes. Customer-specific device profiles are available on request.

Status LEDs:

On the front side of the LIMAX2CP sensor housing there are status LEDs, which are used for different messages about the operational readiness resp. malfunctions of the two-channel system and for information about the magnetic tape status.

Connections:

The LIMAX2CP shaft information system is supplied with two plug-in connectors as standard.
The different IP protection classes are achieved by external cable covers.

LIMAX2CP - Magnetic Absolute Shaft Information and Safety System

Technical Data:

Mechanical Data	
Measuring principle	absolute, redundant
Repeat accuracy	± 1 increment
System accuracy in µm at 20 °C	± (1000 + 100 x L) L = measuring length in meters
Distance sensor - tape	the correct distance is guaranteed by the magnetic tape guidance
Basic pole pitch (tape)	8 mm
Housing materiall	aluminium
Housing dimensions	L x W x H = 374,5 x 120 x 40 mm
Reuired magnetic tape	AB20-80-10-1-R-D-15-BK80
Max. measuring length	130 m
Connections	Wago connectors for supply, CAN interface, digital inputs and safety circuit
Weight	ca. 980 g without cable cable: ca. 60 g per meter
Electrical Data	
Power supply voltage	10 ... 30 VDC stabilized (48 V on request); Note: A PELV power supply must be used!
Residual ripple	<100 mV
DZO output	+ 24 VDC −20 %, max.200 mA (push-pull)
Rev. polarity protection	integrated
Current consumption	max. 150 mA at 24 VDC
Interface	CANopen CiA 406 or 417
Resolution	configurable up to 62,5 µm factory setting: 1 mm
Operating speed	max. 6 m/s
Digital input voltage	18... 30 VDC for HIGH level (48 V on request); open for LOW level
Safety circuit	0 ... 230 VAC, 50/60Hz (max. 250 VAC), max. 2 A; with resistive/inductive load with L/R < 40 ms
External supply of eSGC-actuator	according to supply voltage; restrictions for connected trip coil must be observed.
Miscellaneous	
Maximum operating time	20 years
Reaction time of actuators	< 30 ms
Conformance / Standards / Certifications	
Achieved SIL	SIL3 (TÜV-certified) according to EN61508
Standard fulfilled from	EN81-20 / EN81-21 / 72 (fire brigades)
Type-examination	EU type examination acc. to EN 81-20 SIL3 test according to EN61508 standard Chinese TSG T7007-2016 standard
Environmental Conditions	
Storage temperature	–20° C … +70° C
Operating temperature	–20° C … +65° C
Operation height	max. 2000 m above sea level
Humidity	95 %, non-condensing
Protection class	IP43, IP54 or IP65 (acc. to EN60529)
Interference emission / immunity	EN 12015 / EN 12016
Vibration / shock resistance	EN 60068-2-6 / EN 60068-2-27 EN 60068-2-29

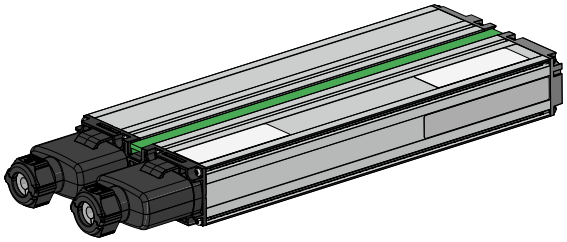
Possible Savings:

Low system costs through reduction of components for the fulfillment of safety functions:

- Savings in material and installation costs for mechanical switching curves through various limit switch functionalities (e.g. emergency and inspection limit switches, shaft flags).
- Saving of mechanical measures for the realization of the protective space with shortened shaft pit / shaft head.
- Savings in material and installation costs for conventional door bridging systems and UCM solutions.
- Savings in material and installation costs for conventional ETSL solutions for delay control with shortened buffer stroke.
- Savings of the conventional speed limiter when connected to an electronic safety gear.
- Further savings by implementing the pre-tripping speed with the LIMAX2CP.

Further cost savings by using various additional functionalities of the LIMAX2CP (e.g. Floor signaling for emergency rescue, detection of unintentional bridges on door contacts, as well as CANopen transmission of the current car position and speed and other states to the control system (CiA 417 or alternatively 406).

Connection View:



Sensor Installation:

In order to fix the sensor optimally to the lift cabin, the ELGO mounting angle set LIMAX2CP MW SET can be used (see "Accessories" on the last page). The set also includes the necessary screws with sliding nuts. These can be inserted into the mounting grooves of the sensor housing to attach the mounting angle to the sensor.

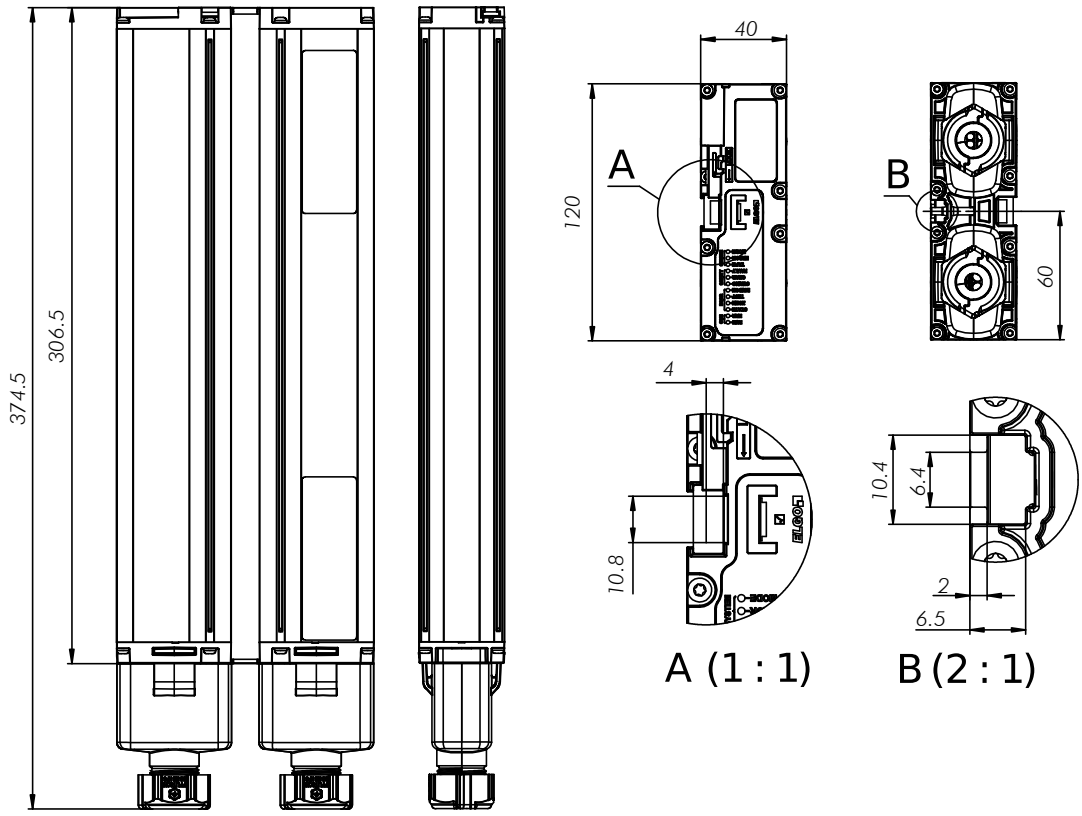
The remaining oblong holes can then be used to fix the unit to the cabin roof at the desired distance and to establish the recommended offset as pretension (see figure on last page). The correct distance from the sensor to the magnetic tape is permanently ensured by the magnetic tape guidance at the sensor.

Magnetic Tape Installation:

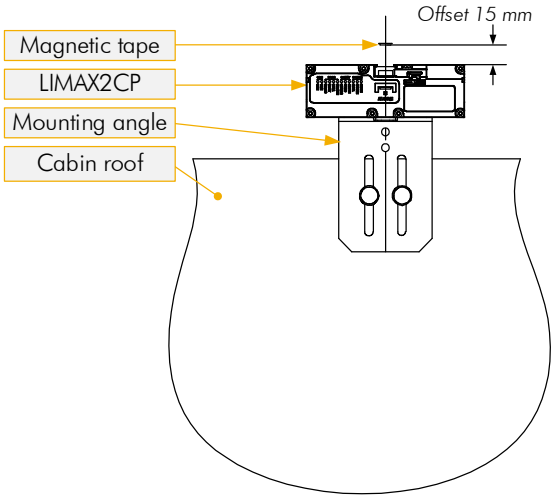
By using the accessorial magnetic tape mounting kits (see last page) the tape mounting can be done very easily and quickly. The magnetic tape is mounted freely suspended in the shaft and tensioned on the bottom side, while it is guided along the car by the slidable plastic guide at the sensor.

The measurement resp. scanning is always contactless. The guidance only serves to keep the tape within a defined distance to the sensor.

LIMAX2CP Dimensions:



Installation on the Cabin Roof:



Connections:

SC Connector (left)

Pin	Function
1	OC_IN
2	OC_OUT
3	SR1_IN
4	SR1_OUT
5	SCD1_IN
6	DR1_IN
7	NEUTRAL-IN
8	NEUTRAL-OUT

IO Connector (right)

Pin	Function	Pin	Function
1	RESET	9	0 V / GND
2	CAN-OUT-A	10	SG_POWER
3	CAN-GND	11	SG_OUT
4	CAN_OUT-B	12	Speed-Lim. IN
5	SAFE_OUT1	13	INSPECTION DOWN
6	VCC+ (BAT)	14	EN81-21 BOTTOM
7	0 V / GND	15	INSPECTION UP
8	VCC+ (Supply)	16	EN81-21 TOP

LIMAX2CP Accessories:

Order designation	Description
LIMAX2CP MW SET	Mounting angle for LIMAX2CP, to fix the sensor on the cabin
AB20-80-10-1-R-D-15-BK80	Magnetic tape for LIMAX2CP, absolute coding, single track system
LIMAX RMS	Magnetic tape mounting set for freely suspended mounting (for standard-layout)
LIMAX RMS 90	Magnetic tape mounting set for freely suspended mounting (for Rucksack-layout)
LIMAX S-RMS	Magnetic tape mounting kit for rail mounting
LIMAX S-RMS2	Magnetic tape installation kit with tape detection for tight spaces
LIMAX2CP Service Set	Spare part set consisting of guiding rail and underlay

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