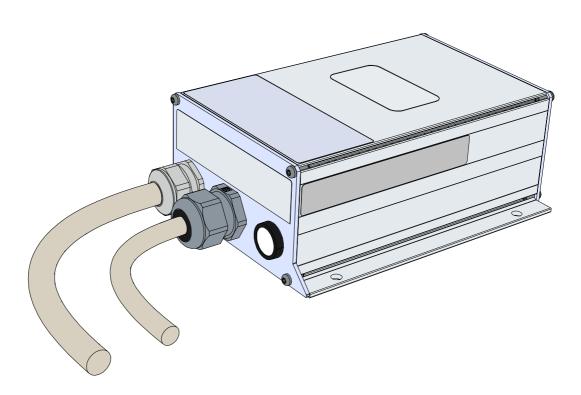


SAFE BOX ⇒ LIMAX33 SAFE ⇒ LIMAX44 SAFE

Evaluation Box for SIL3 Safety Monitoring of Elevators



- Safety function unit for the redundant shaft information systems LIMAX33 RED & LIMAX44 RED
- Replaces electromechanical components in the elevator shaft
- Electronic evaluation unit with implemented safety-relevant switching and control functions
- Up to 3 safety relay pairs for safety-relevant switching and control functions
- Up to 5 safety inputs, 1 electronical output and 1 safety circuit input
- CANopen DS406 interface (others on request)
- RS485 interface for sensor communication
- EC type examination tested (EN 81-20/50)
- TÜV certification for SIL3

SAFE BOX - Evaluation Box for SIL3 Safety Monitoring of Elevators

General and Function:

SAFE BOX is a useful extension of the redundant absolute shaft information systems LIMAX33 RED and LIMAX44 RED. It serves as an additional component for monitoring the position and speed of the car, as well as the shaft and cabin doors. The system ensures important safety-relevant requirements in the elevator shaft, for example:

- Limit switch function
- Speed limitation, also relative to the distance to the shaft end
- Door-bridging function for leveling and readjust with open doors
- Detection of unintended car movement with open doors

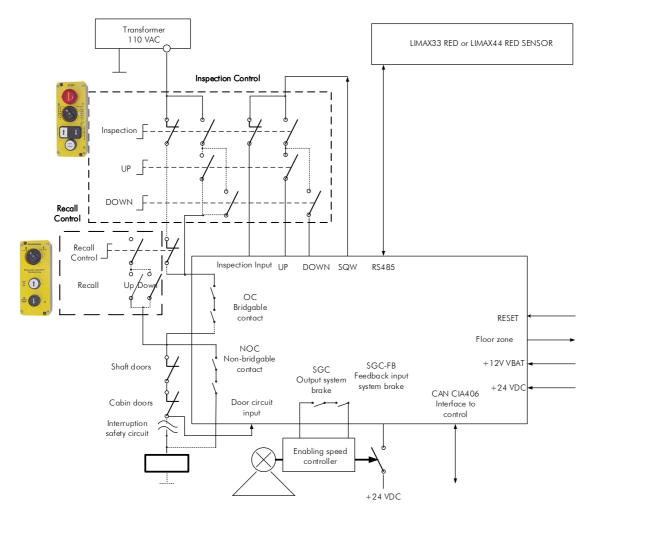
In case of error, the safety circuit will be opened and/or the clasp brake will be triggered. The **SAFE BOX** is SIL3 certified by TÜV and comply the requirements of the EN81-20 norm. In order to assure a redundancy of the entire function, relevant hardware components like relay contacts and microcontrollers are integrated twice.

The **SAFE BOX** evaluates the position of the lift and emulates the shaft end zone switch and door zone switch. To ensure rapid opening of the elevator doors on each floor, the door is opened before it reaches the door threshold.

Apart from speed control and deceleration control, the **SAFE BOX** guarantees (the function of) protection from unintended movement of the elevator car with open doors. The safety circuit will be opened and/or the safety gear will be triggered in case of overspeed. By eliminating the conventional monitoring components of shaft information systems, extensive cost savings can be realized.

If an error occurs, the SAFE BOX can be replaced without having to remove the sensor and vice versa.

Integration into the Safety Circuit:



The **SAFE BOX** is integrated directly into the safety circuit of the elevator and actively influences the drive and the safety gear in case of a fault. This ensures a safe operation of the elevator at all times.

SAFE BOX - Evaluation Box for SIL3 Safety Monitoring of Elevators

Technical Data:

Mechanical Data		
Housing material	aluminium	
Housing dimensions	$W \times B \times H = 203 \times 125 \times 66 \text{ mm}$	
Signal cable (SCA and PIO)	standard: 2.0 m optional: 1.0 or 5.0 m	
Connections	sensor: pluggable M12 socket SCA, PIO cable: open cable ends (plug connectors optionally)	
Weight	approx. 2000 g (without cable), cable approx. 60 g / m	
Electrical Data		
Power supply voltage	24 VDC, +20 % / -25 %	
Residual ripple	<100 mV	
Current consumption	max. 500 mA	
Battery voltage	12 VDC \pm 20%	
Interfaces	CANopen DS406 (others on request), RS485 for sensor communication	
Number of safe inputs	5	
Number of safety circuit inputs	1	
Number of electronic outputs	1	
Safety Relays		
Number of safety relays	3 (OC, NOC, SGC)	
Voltage	110 VAC / 220 VAC / 24 VDC	
Contact load	max. 1 A	
Response time	<55 ms	
Conformity / Standards / Certifications		
Achieved SIL	SIL3	
Fulfilled standards	EN81-20	
Type-examination	EC according to EN81-20	
Environmental Conditions		
Storage temperature	-20 +70 °C	
Operating temperature	0 +65 °C (-25 +85 °C on request)	
Humidity	95 %, non-condensing	
Operating height	max. 2000 m above sea level	
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	
Delay by motor brake	>1.7 m/s ²	
Delay by lift control	$< 1.2 \text{ m/s}^2$	
Buffer dimensioning	>0.63 m/s (inspection speed)	

Type Designation:

A Version

- 07 = LIMAX SAFE SG, safety circuit 110 VAC
- **08** = LIMAX SAFE SC, safety circuit 230 VAC
- 09 = LIMAX SAFE SC, safety circuit 110 VAC (others: customer specific)

B Signal Cable Length

- **020** = 1.0 m
- 032 = 2.0 m standard (LIMAX33 SAFE SG/SC)
- 050 = 5.0 m (other lengths on request)

C Resolution

62N5 = 62,5 μm	(0.0625 mm)
0125 = 125 μm	(0.125 mm)
0250 = 250 μ m	(0.25 mm)
0500 = 500 μ m	(0.5 mm)
1000 = 1000 μ m	(1 mm) standard

Interface

D CO0 = CANopen DS406 (encoder profile)

CANopen- Interface		with galvanic isolation (G)
DS406	with termination 120R (T)	COOTG
	without termination	CO0 G

E Connection Options

W25 = 25-pin "Weidmüller" connector

Order example:

SBOX - 00 - 020 - 1 0 0 0 - COOTG - W25X AA - BBB - CCCC - DDDDD- E E E E

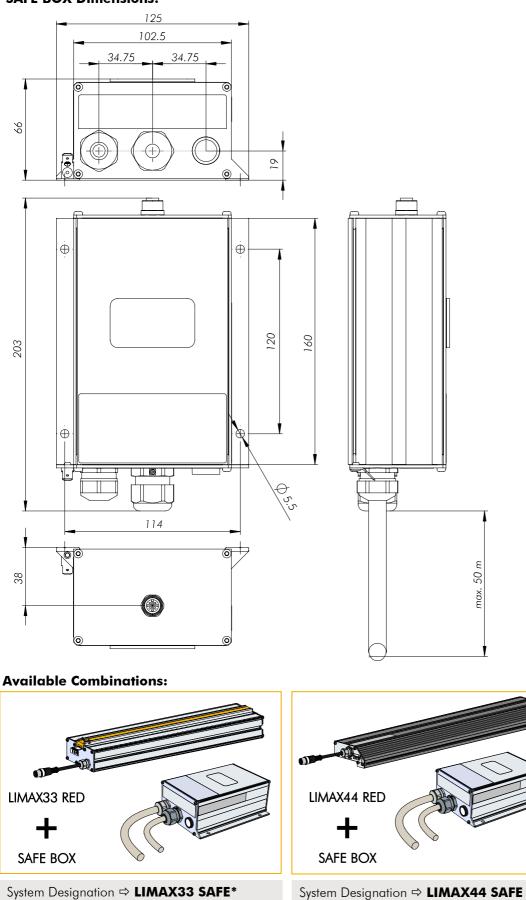
ELGO standard SAFE BOX with 2 m long cables, 1 mm resolution, with 120R terminated and galvanic isolated CANopen (DS406) interface and with 25-pin "Weidmüller" connectors

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SAFE BOX Features

- Safety monitoring for elevators, TÜV tested according to SIL 3
- Monitoring of the following elevator functions: speed, shaft end delay, unintended movement with open door, triggering the safety gear at excessive speed
- Emulation of the mechanical components shaft end switches and door zone switches
- Extensive cost savings compared to conventional components of shaft information systems

SAFE BOX Dimensions:



*) The LIMAX**33** SAFE system includes the certified LIMAX S-RMS magnetic tape mounting kit with safety position switch for an easy and uncomplicated installation of the magnetic tape.

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