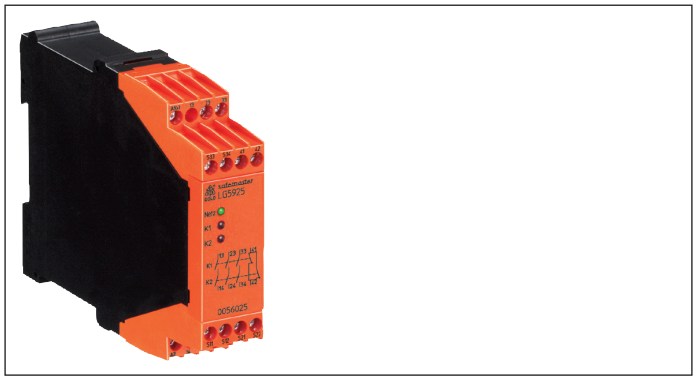
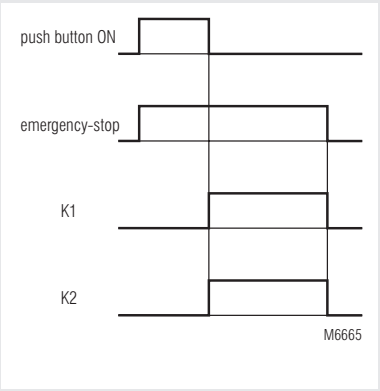
# SAFEMASTER
# Safety Module for Elevator Controls
# LG 5925.03/034

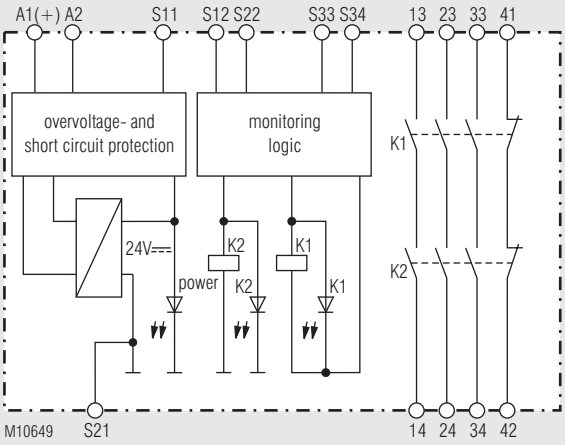
0269441



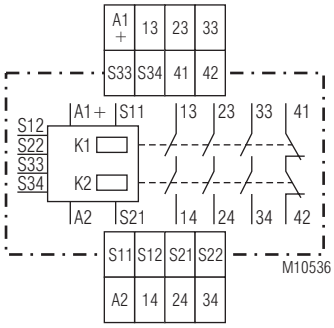
## Function Diagram




## Block Diagram




## Circuit Diagram




## Your Advantages

- For elevators according to EN 81-1/-2
- Emergency stop in elevators

## Features

- **According to**
  - **Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008**
  - **SIL Claimed Level (SIL CL) 3 to IEC/EN 62061**
  - **Safety Integrity Level (SIL) 3 to IEC/EN 61508**
  - **Directive 95/16/EG for elevators**
- Output: 3 NO contacts, 1 NC contact
- Single or 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart, switch S2
- With or without cross fault monitoring in the E-stop loop, switch S1
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Can be mounted in cabinets and installations with lower degree of protection without additional measures (depending on ambient conditions)
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width 22,5 mm

## Approvals and Marking

CE | TÜVRheinland Functional Safety Type Approved FS | A025518

## Applications

Bridging of the door and locking switches while moving the elevator in the unlocking zone with open doors according to EN81-1/-2 for elevators for people and loads.

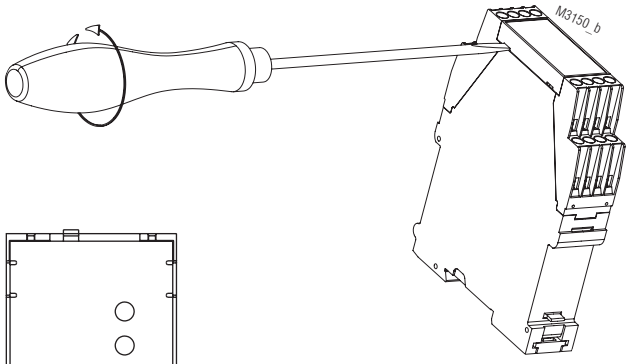
## Indicators

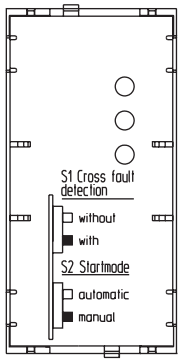
| | |
|---|---|
| LED Netz: | on when supply connected |
| LED K1/K2: | on when relay K1 and K2 energized |

## Connection Terminals

| Terminal designation | Signal designation |
|---|---|
| A1+ | + / L |
| A2 | - / N |
| S12, S22, S33, S34 | Inputs |
| S11, S21 | Outputs |
| 13, 14, 23, 24, 33, 34 | Positive driven NO contacts for release circuit |
| 41, 42 | Positive guided indicator output |

## Setting




Disconnect unit before setting of S1

M8892

## Notes

Line fault detection on On-button:
The line fault detection is only active when S12 and S22 are switched simultaneously. If The On-button is closed before S12, S22 is connected to voltage (also when line fault across On-Button), the output contacts will not close. A line fault across the On-button which occurred after activation of the relay, will be detected with the next activation and the output contacts will not close.

**ATTENTION ! If a line fault occurs after the voltage has been connected to S12, S22, the unit will be activated because this line fault is similar to the normal On-function.**

The terminal S21 permits the operation of the device in IT-systems with insulation monitoring, serves as a reference point for testing the control voltage and is used to connect the E-stop loop when cross fault monitoring is selected.
Connecting the terminal S21 to the protective ground bridges the internal short-circuit protection of Line A2 (-). The short-circuit protection of line A1 (+) remains active.

To alter the functions automatic start - manual start and with or without cross fault monitoring, the switches S1 and S2 are used. These are located behind the front cover (see unit programming).
The setting with or without cross fault monitoring on E-stop buttons is made with S1

**Attention! Switch S1 must not be set while device is under supply voltage!**
S2 is used to change between automatic an manual restart. On automatic start also the terminals S33 - S34 have to be linked. For connection please see application examples.

**ATTENTION - AUTOMATIC START!**

According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

## Technical Data

### Input circuit

| | |
|---|---|
| **Nominal Voltage $U_N$:** | |
| LG 5925: | AC/DC 24 V |
| **Voltage range:** | 0.9 ... 1.1 $U_N$ |
| **Nominal consumption at $U_N$:** | DC ca. 1.5 W |
| **Min. Off-time:** | 250 ms |
| **Control voltage on S11 at $U_N$:** | DC 22 V |
| **Control current typ. over S12, S22** | 30 mA at $U_N$ |
| **Min. voltage on S12, S22 when relay activated** | DC 20 V |
| **Short-circuit protection:** | Internal PTC |
| **Overvoltage protection:** | Internal VDR |

### Output

**Contacts:** 3 NO, 1 NC contact

The NO contacts are safety contacts.
**ATTENTION! The NC contacts 41-42 can only be used for monitoring**

| | | |
|---|---|---|
| **Operate delay typ. at $U_N$:** | | |
| Manual start: | 30 ms | |
| Automatic start: | 350 ms | |
| **Release delay typ. at $U_N$:** | | |
| Disconnecting the supply: | typ. 20 ms | |
| Disconnecting S12, S22: | typ. 15 ms | |
| **Contact type:** | forcibly guided | |
| **Nominal output voltage:** | AC 250 V<br>DC see limit curve for arc-free operation | |
| **Thermal current $I_{th}$:** | max. 2 A per contact | |
| **Switching capacity** | | |
| to AC 15: | | |
| NO contacts: | 3 A / AC 230 V | IEC/EN 60 947-5-1 |
| NC contacts: | 2 A / AC 230 V | IEC/EN 60 947-5-1 |
| to DC 13: | | |
| NO contacts: | 2 A / DC 24 V | IEC/EN 60 947-5-1 |
| NC contacts: | 2 A / DC 24 V | IEC/EN 60 947-5-1 |
| **Electrical contact life** | | |
| to 5 A, AC 230 V cos $\varphi$ = 1: | > 2.2 x $10^5$ switching cycles | |
| **Permissible operating frequency:** | max. 1 200 operating cycles / h | |
| **Short circuit strength** | | |
| max. fuse rating: | 10 A gL | IEC/EN 60 947-5-1 |
| line circuit breaker: | B 6 A | |
| **Mechanical life:** | > 20 x $10^6$ switching cycles | |

### General Data

| | | |
|---|---|---|
| **Operating mode:** | Continuous operation | |
| **Temperature range** | | |
| operation: | - 15 ... + 55 °C | |
| storage : | - 40 ... + 85 °C | |
| **altitude:** | < 2.000 m | |
| **Clearance and creepage distances** | | |
| Rated impuls voltage / pollution degree: | 4 kV / 3 (basis insulation) | IEC 60 664-1 |
| **EMC** | | |
| Electrostatic discharge (ESD): | 15 kV (Luftentladung) | IEC/EN 61 000-4-2 |
| HF irradiation: | 30 V / m | IEC/EN 61 000-4-3 |
| Fast transients: | 4 kV | IEC/EN 61 000-4-4 |
| Surge voltages between | | |
| wires for power supply: | 0.5 kV | IEC/EN 61 000-4-5 |
| between wire and ground: | 2 kV | IEC/EN 61 000-4-5 |
| Interference suppression: | Limit value class B | EN 55 011 |
| **Degree of protection** | | |
| Housing: | IP 40 | IEC/EN 60 529 |
| Terminals: | IP 20 | IEC/EN 60 529 |
| **Housing:** | Thermoplastic with V0 behaviour according to UL subject 94 | |
| **Vibration resistance:** | Amplitude 0.35 mm frequency 10 ... 55 Hz | IEC/EN 60 068-2-6 |
| **Climate resistance:** | 15 / 055 / 04 | IEC/EN 60 068-1 |
| **Terminal designation:** | | EN 50 005 |

## Technical Data

| | | |
|---|---|---|
| **Terminal designation:** | | EN 50 005 |
| **Wire connection** | | DIN 46 228-1/-2/-3/-4 |
| **Screw terminals (integrated):** | 1 x 4 mm² solid or<br>1 x 2.5 mm² stranded ferruled or<br>2 x 1.5 mm² stranded ferruled or<br>2 x 2.5 mm² solid | |
| Insulation of wires or sleeve length: | 8 mm | |
| **Plug in with screw terminals** | | |
| max. cross section for connection: | 1 x 2.5 mm² solid or<br>1 x 2.5 mm² stranded ferruled | |
| Insulation of wires or sleeve length: | 8 mm | |
| **Plug in with cage clamp terminals** | | |
| max. cross section for connection: | 1 x 4 mm² solid or<br>1 x 2.5 mm² stranded ferruled | |
| min. cross section for connection: | 0.5 mm² | |
| Insulation of wires or sleeve length: | 12 $^{\pm 0.5}$ mm | |
| **Wire fixing:** | Plus-minus terminal screws M 3.5<br>box terminals with wire protection or<br>cage clamp terminals | |
| **Mounting:** | DIN rail | IEC/EN 60 715 |
| **Weight:** | 210 g | |

### Dimensions

| | |
|---|---|
| **Width x height x depth** | |
| LG 5925: | 22.5 x 90 x 121 mm |
| LG 5925 PC: | 22.5 x 111 x 121 mm |
| LG 5925 PS: | 22.5 x 104 x 121 mm |

### Safety Related Data

**Values according to EN ISO 13849-1:**

| | | |
|---|---|---|
| Category: | 4 | |
| PL: | e | |
| $MTTF_d$: | 176.2 | a (year) |
| $DC_{avg}$: | 99.0 | % |
| $d_{op}$: | 365 | d/a (days/year) |
| $h_{op}$: | 24 | h/d (hours/day) |
| $t_{Zyklus}$: | 3600 | s/Zyklus |
| | ≙ 1 | /h (hour) |

**Values according to IEC EN 62061 / IEC EN 61508:**

| | | |
|---|---|---|
| SIL CL: | 3 | IEC EN 62061 |
| SIL: | 3 | IEC EN 61508 |
| HFT*): | 1 | |
| $DC_{avg}$: | 99.0 | % |
| SFF: | 99.7 | % |
| $PFH_D$: | 2.66E-10 | $h^{-1}$ |
| $T_1$: | 20 | a (year) |

*) HFT = Hardware-Failure Tolerance

Info

The values stated above are valid for the standard type.
Safety data for other variants are available on request.

The safety relevant data of the complete system has to be determined by the manufacturer of the system.

## Standard Type

LG 5925.03/034 AC / DC 24 V

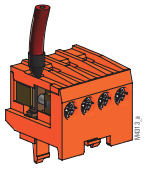
| | |
|---|---|
| Article number: | 0064797 |
| • Output: | 3 Schließer, 1 Öffner |
| • Nominal voltage $U_N$: | AC/DC 24 V |
| • Width: | 22,5 mm |

## Ordering Example

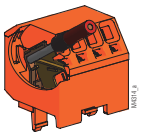
LG 5925.03 _ _ /034 AC / DC 24 V

- Nominal voltage
- Type of terminals
  without indication:
  terminal blocks fixed with screw terminals
  PC (plug in cage clamp):
  pluggable terminal blocks with cage clamp terminals
  PS (plug in screw):
  pluggable terminal blocks with screw terminals
- Contacts
- Type

## Options with Pluggable Terminal Blocks



Screw terminal (PS/plugin screw)

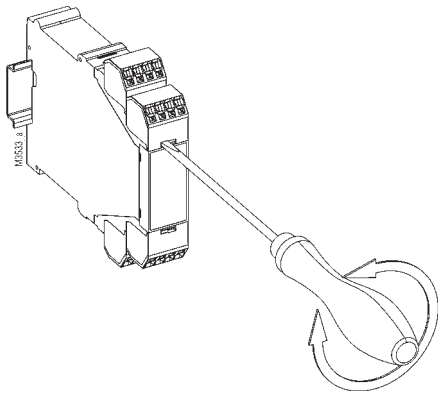


Cage clamp terminal (PC/plugin cage clamp)

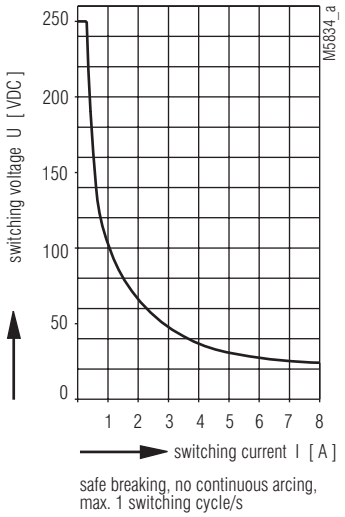
## Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.

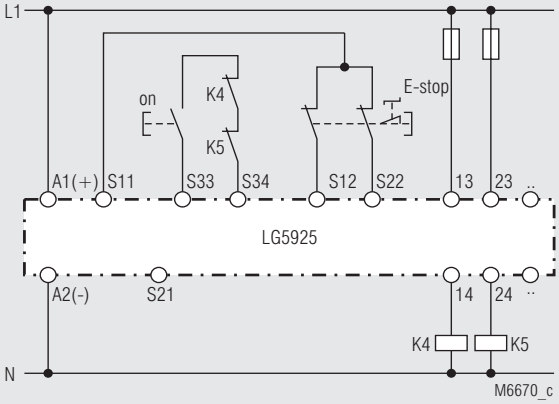


## Characteristics

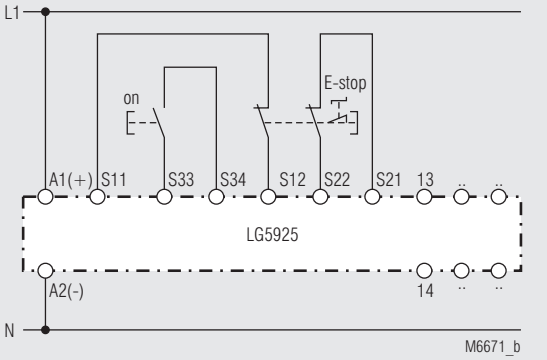



Arc limit curve under resistive load

## Application Examples




Contact reinforcement by external contactors, 2-channel controlled.
The output contacts can be reinforced by external contactors with forcibly guided contacts for switching currents > 8 A.
Functioning of the external contactors is monitored by looping the NC contacts into the closing circuit (terminals S33-S34).
**Note: Refer to "Unit programming"!**
Switches in pos.: S1 no cross fault detection
S2 manual start
Suited up to SIL3, Performance Level e, Cat. 4




2-channel emergency stop circuit with cross fault detection
**Note: Refer to "Unit programming"!**
Switches in pos.: S1 cross fault detection
S2 manual start
Suited up to SIL3, Performance Level e, Cat. 4