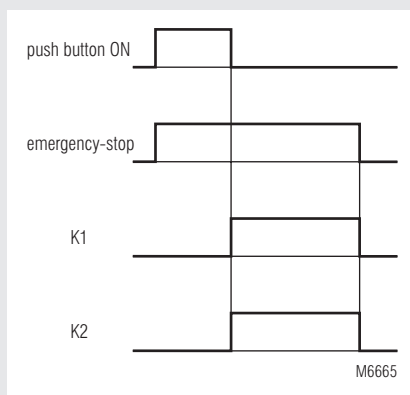




0243372

- 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
- Output: max. 4 NO contacts, see contacts
- LG 5925.54: 1 semiconductor output
- Single and 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
- LG 5925.54: with cross fault monitoring in the E-stop loop
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Removable terminal strips
- Wire connection: also 2 x 1.5 mm<sup>2</sup> stranded ferruled, or 2 x 2.5 mm<sup>2</sup> solid DIN 46 228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width: 22.5 mm

### Function Diagram



### Approvals and Markings



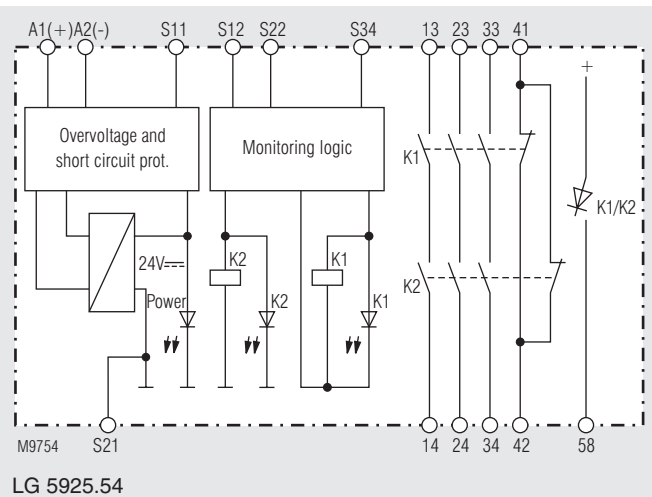
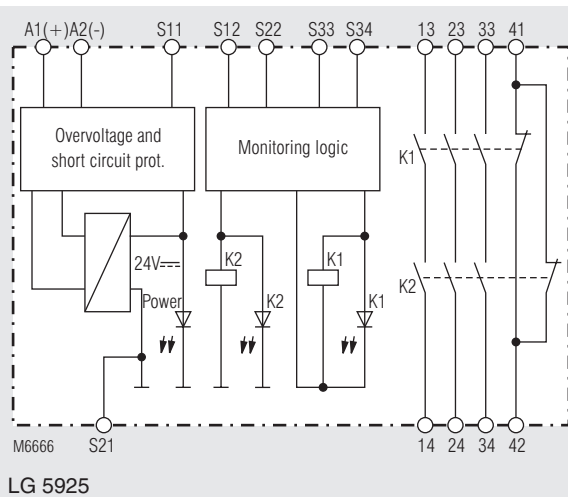
### Applications

- Protection of people and machines
- Emergency stop circuits on machines
  - Monitoring of safety gates

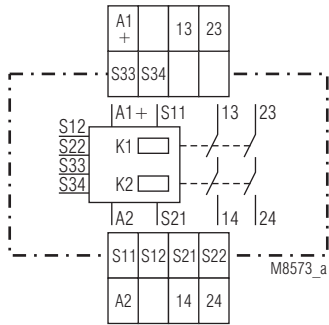
### Indicators

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

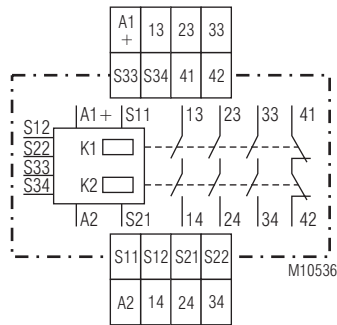
### Block Diagrams



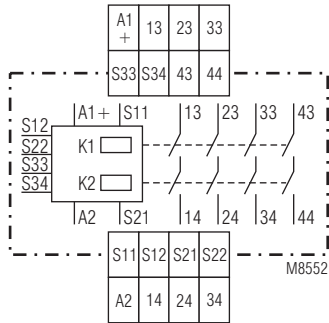
## Circuit Diagrams



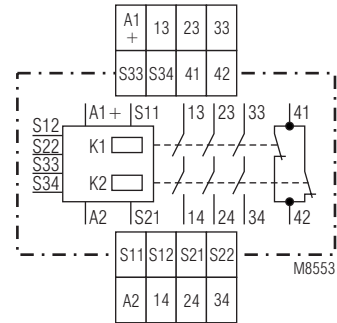
LG 5925.02



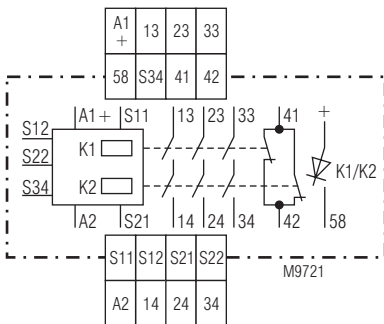
LG 5925.03



LG 5925.04



LG 5925.48

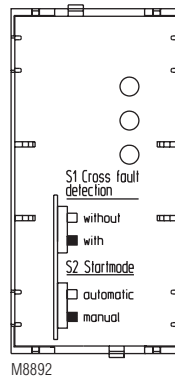
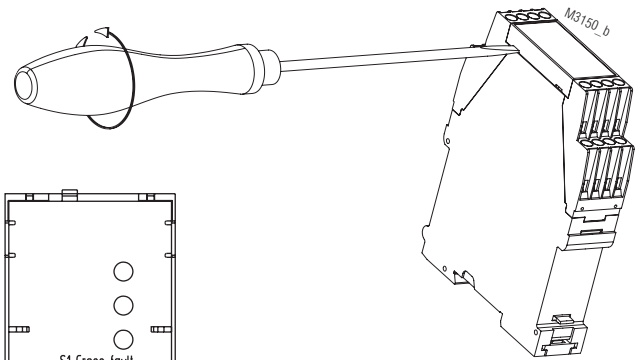


LG 5925.54

## Connection Terminals

Terminal designation	Signal designation
A1+	+ / L
A2	- / N
S12, S22, S33, S34	Inputs
S11, S21	Outputs
13, 14, 23, 24, 33, 34, 43, 44	Forcibly guided NO contacts for release circuit
41, 42	Forcibly guided indicator output

## Setting



Disconnect unit before setting of S1  
Drawing shows setting at the state of delivery  
LG 5925.54: without S1, because cross fault is always present

## 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 (not for LG 5925.54). The LG 5925.54 has always cross fault monitoring.

**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, AC 110 ... 115 V, AC 230 V  
 LG 5925.54: AC/DC 24 V

#### Voltage range

AC / DC

at 10% residual ripple:

0.9 ... 1.1  $U_N$

AC:

0.85 ... 1.1  $U_N$

#### Nominal consumption at $U_N$ :

DC approx. 1.5 W

AC approx. 3.7 VA

#### Min. Off-time:

250 ms

#### Control voltage on S11 at $U_N$ :

DC 22 V at AC/DC units

DC 24 V at AC units

#### Control current typ. over S12, S22:

LG 5925: 30 mA at  $U_N$

LG 5925.54: 25 mA at  $U_N$

#### Min. voltage on S12, S22

#### when relay activated:

DC 20 V at AC/DC units

DC 19 V at AC units

#### Short-circuit protection:

Internal PTC

#### Overvoltage protection:

Internal VDR

### Output

#### Contacts

LG 5925.02: 2 NO contacts

LG 5925.04: 4 NO contact

LG 5925.03 ,

LG 5925.48, LG 5925.54: 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: 150 ms at AC units

50 ms at DC units

Disconnecting S12, S22: 130 ms at AC units

50 ms at DC units

forcibly guided

AC 250 V

DC see limit curve for arc-free operation

max. 8 A per contact

see current limit curve

#### 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  $\cos \varphi = 1$ :  $> 2.2 \times 10^5$  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:**  $> 20 \times 10^6$  switching cycles

**Semiconductor output:** DC 24 V 100 mA, plus switching

### 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 / 2 (basis insulation) IEC 60 664-1

IEC/EN 62 061

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 IEC/EN 60 068-2-6

frequency 10 ... 55 Hz

**Climate resistance:** 15 / 055 / 04 IEC/EN 60 068-1

## Technical Data

**Terminal designation:** EN 50 005

#### Wire connection

DIN 46 228-1/-2/-3/-4

#### Screw terminals

#### (integrated):

1 x 4 mm<sup>2</sup> solid or

1 x 2.5 mm<sup>2</sup> stranded ferruled or

2 x 1.5 mm<sup>2</sup> stranded ferruled or

2 x 2.5 mm<sup>2</sup> solid

Insulation of wires

or sleeve length:

8 mm

#### Plug in with screw terminals

max. cross section

for connection:

1 x 2.5 mm<sup>2</sup> solid or

1 x 2.5 mm<sup>2</sup> stranded ferruled

Insulation of wires

or sleeve length:

8 mm

#### Plug in with cage

#### clamp terminals

max. cross section

for connection:

1 x 4 mm<sup>2</sup> solid or

1 x 2.5 mm<sup>2</sup> stranded ferruled

min. cross section

for connection:

0.5 mm<sup>2</sup>

Insulation of wires

or sleeve length:

12 <sup>±0.5</sup> mm

#### Wire fixing:

Plus-minus terminal screws M 3.5

box terminals with wire protection or

cage clamp terminals

DIN rail

IEC/EN 60 715

#### Mounting:

#### Weight:

LG 5925, AC/DC 24 V: 210 g

LG 5925.54, AC/DC 24 V: 220 g

LG 5925, AC 230 V: 275 g

LH 5925, AC/DC 24 V: 375 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

LH 5925: 45 x 90 x 121 mm

### Safety Related Data

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

Category: 4

PL: e

MTTF<sub>d</sub>: 176,2 a (year)

DC<sub>avg</sub>: 99.0 %

d<sub>op</sub>: 365 d/a (days/year)

h<sub>op</sub>: 24 h/d (hours/day)

t<sub>Zyklus</sub>: 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<sup>1)</sup>: 1

DC<sub>avg</sub>: 99.0 %

SFF: 99.7 %

PFH<sub>D</sub>: 2.66E-10 h<sup>-1</sup>

T<sub>i</sub>: 20 a (year)

<sup>1)</sup> HFT = Hardware-Failure Tolerance



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.

## UL-Data

The safety functions were not evaluated by UL. Listing is accomplished according to requirements of Standard UL 508, "general use applications"

### Nominal voltage $U_N$ :

LG 5925: AC/DC 24 V, AC 110 ... 115 V  
AC 230 V

### Ambient temperature

LG 5925 -15 ... +55°C,

### Switching capacity:

LG 5925.04

Ambient temperature 35°C: Pilot duty B300  
8A 250Vac Resistive  
8A 24Vdc Resistive or G.P.

LG 5925.04

Ambient temperature 55°C: Pilot duty B300  
4A 250Vac Resistive  
4A 24Vdc Resistive or G.P.

### Switching capacity:

LG 5925.02, .48, .54

Ambient temperature 45°C: Pilot duty B300  
8A 250Vac Resistive  
8A 24Vdc Resistive or G.P.

LG 5925.02, .48, .54

Ambient temperature 55°C: Pilot duty B300  
6A 250Vac Resistive  
6A 24Vdc Resistive or G.P.

### Wire connection:

Screw terminals fixed: 60°C / 75°C copper conductors only

AWG 20 - 12 Sol/Str Torque 0.8 Nm

Plug in screw: AWG 20 - 14 Sol Torque 0.8 Nm

AWG 20 - 16 Str Torque 0.8 Nm

Plug in cage clamp: AWG 20 - 12 Sol/Str



Technical data that is not stated in the UL-Data, can be found in the technical data section.

## Standard Type

LG 5925.48/61 AC/DC 24 V

Article number: 0061919

LG 5925.54/61 AC/DC 24 V

Article number: 0064882

• Output: 3 NO contacts, 1 NC contact

• Nominal voltage  $U_N$ : AC/DC 24 V

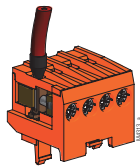
• Width: 22.5 mm

## Ordering Example

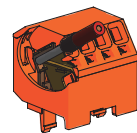
LG 5925 . . . . . /61 DC 24 V

Nominal voltage  
UL-approval  
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)

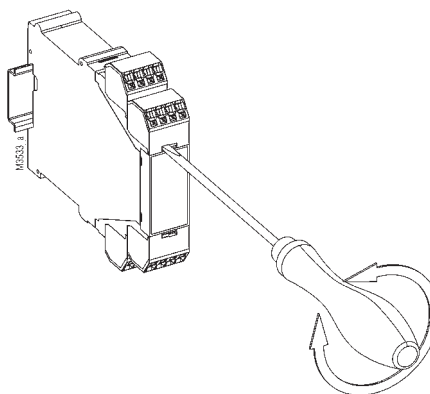


Cage clamp terminal  
(PC/plugin cage clamp)

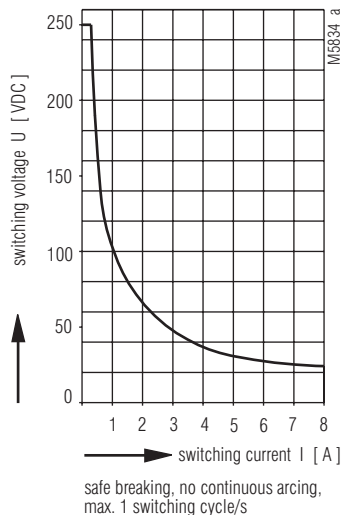
## Notes

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.

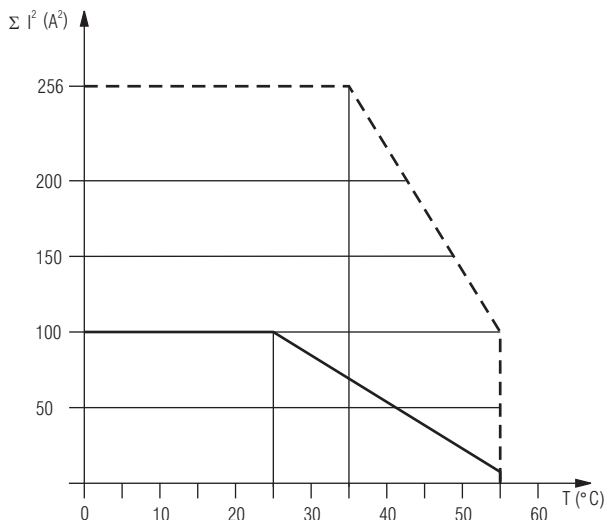


## Characteristics



Arc limit curve under resistive load

## Characteristics



M8893\_d

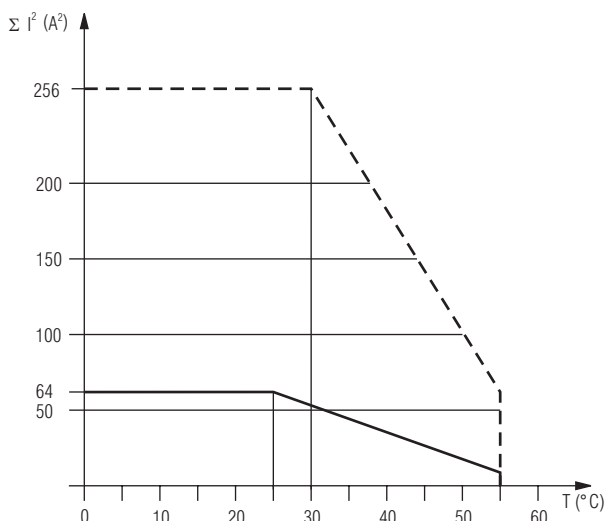
--- device mounted away from heat generation components.  
Max. current at 55°C over 4 contact path = 5A  $\cong 4 \times 5^2 \text{A}^2 = 100\text{A}^2$

— device mounted without distance heated by devices with same load.  
Max. current at 55°C over 4 contact path = 4A  $\cong 4 \times 1^2 \text{A}^2 = 4\text{A}^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3, I_4$  - current in contact paths

Quadratic total current limit curve LG 5925; AC/DC 24 V



M9926

--- device mounted away from heat generation components.  
Max. current at 55°C over 4 contact path = 1A  $\cong 4 \times 1^2 \text{A}^2 = 4\text{A}^2$

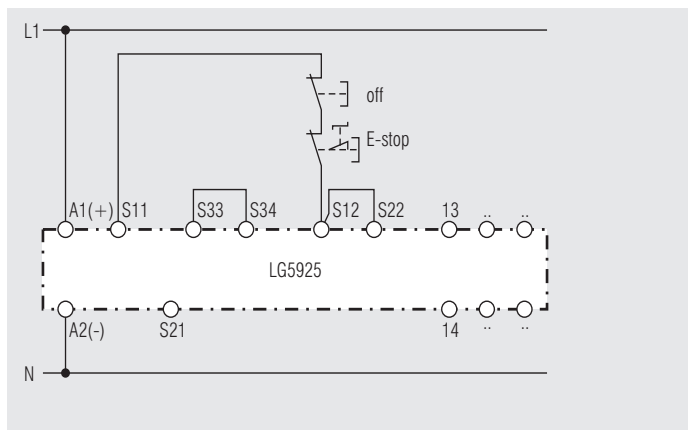
— device mounted with 5mm distance  
Max. current at 55°C over 4 contact path = 1A  $\cong 4 \times 1^2 \text{A}^2 = 4\text{A}^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3, I_4$  - current in contact paths

Quadratic total current limit curve LG 5925; AC 110 ... 115 V, AC 230 V

## Application Examples

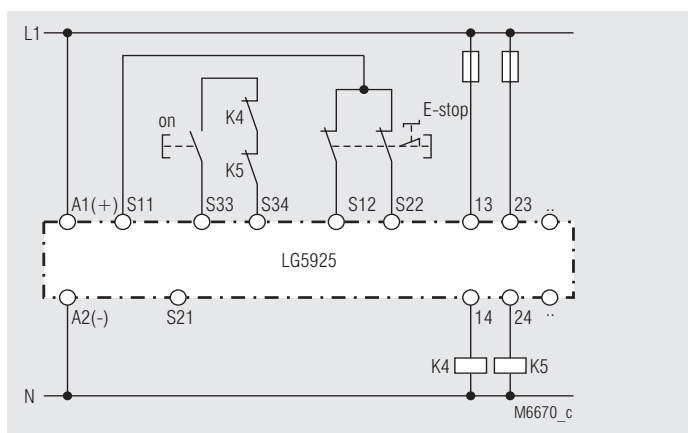


Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.

**Note: Refer to "Unit programming"!**

Switches in pos.: S1 no cross fault detection  
S2 automatic start

Suited up to SIL2, Performance Level d, Cat. 3



M6670\_c

Contact reinforcement by external contactors, 2-channel controlled.

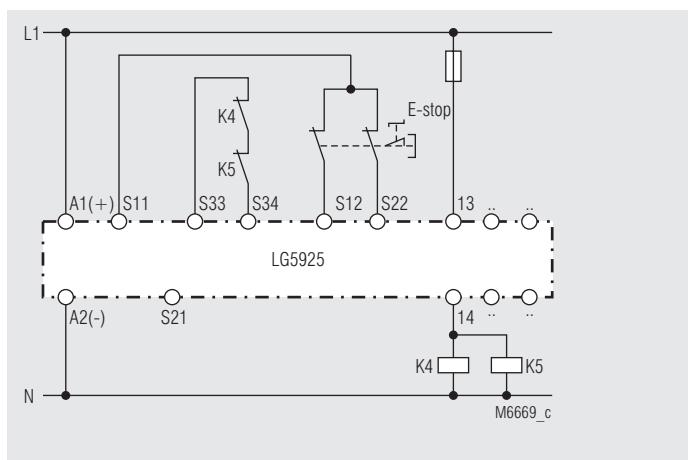
The output contacts can be reinforced by external contactors with forcibly guided contacts for switching currents > 8 A.

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



M6669\_c

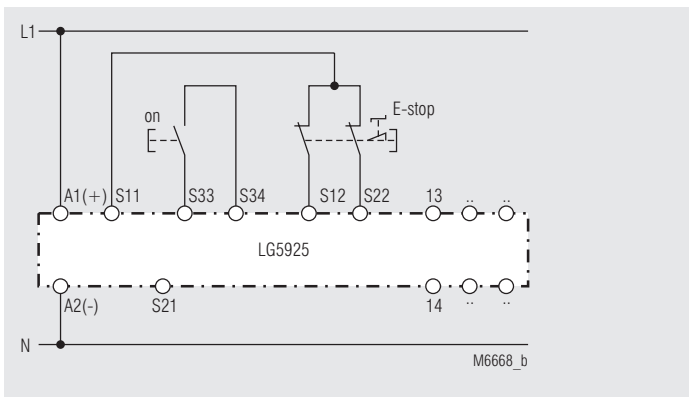
Contact reinforcement by external contactors controlled by one contact path.

**Note: Refer to "Unit programming"!**

Switches in pos.: S1 no cross fault detection  
S2 automatic start

Suited up to SIL3, Performance Level e, Cat. 4

## Application Examples

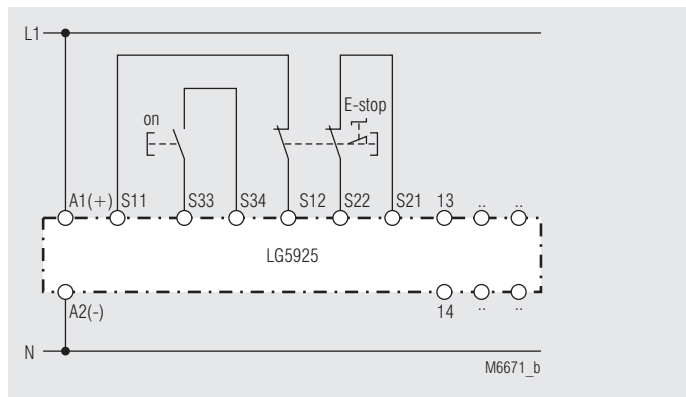


2-channel emergency stop circuit without cross fault monitoring.

**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

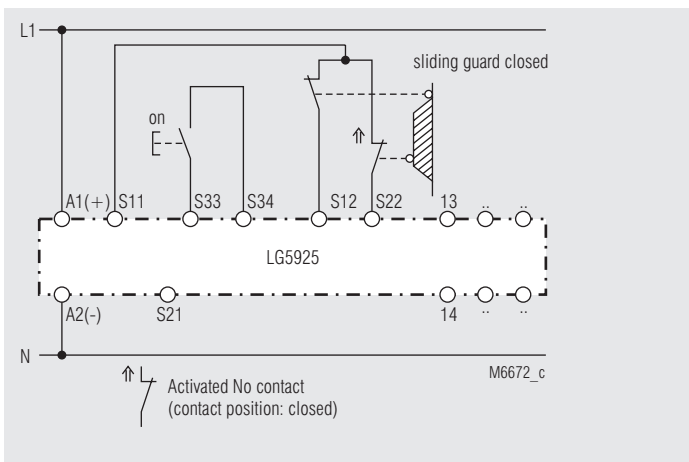


2-channel emergency stop circuit with cross fault detection

**Note: Refer to "Unit programming"!**

Switches in pos.: S1 cross fault detection  
S2 manual start

Suited up to SIL3, Performance Level e, Cat. 4

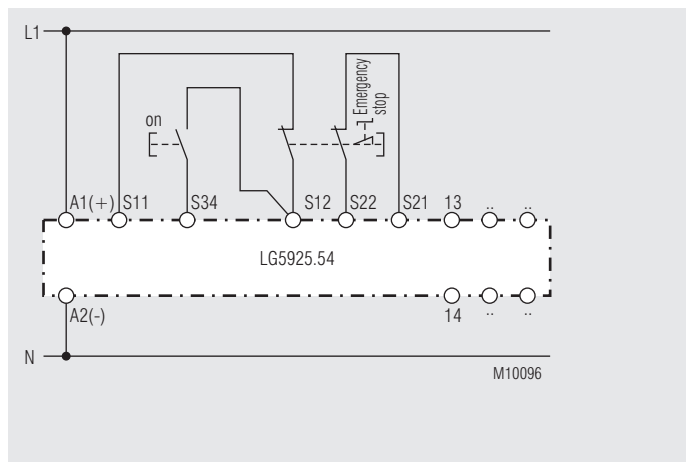


2-channel safety gate monitoring.

**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.: S2 manual start

Suited up to SIL3, Performance Level e, Cat. 4