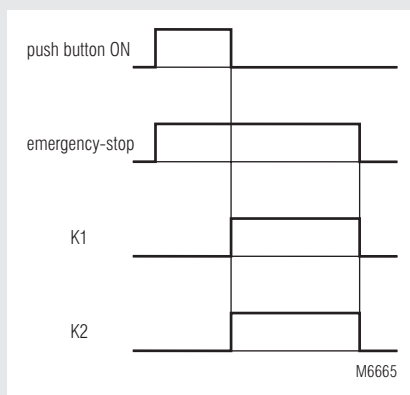




0243372

- 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
 - Category 4 to EN 954-1
- 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 mm² stranded ferruled, or 2 x 2.5 mm² 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



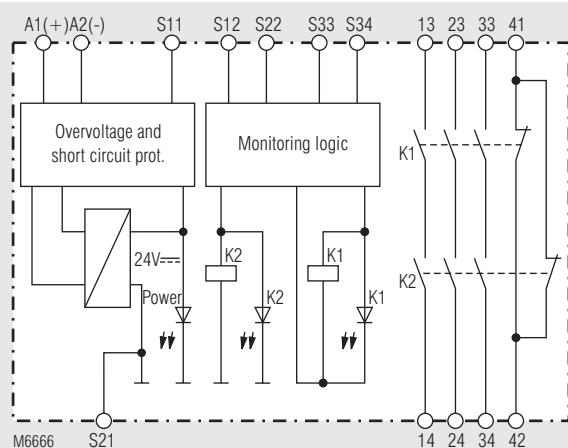
Applications

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

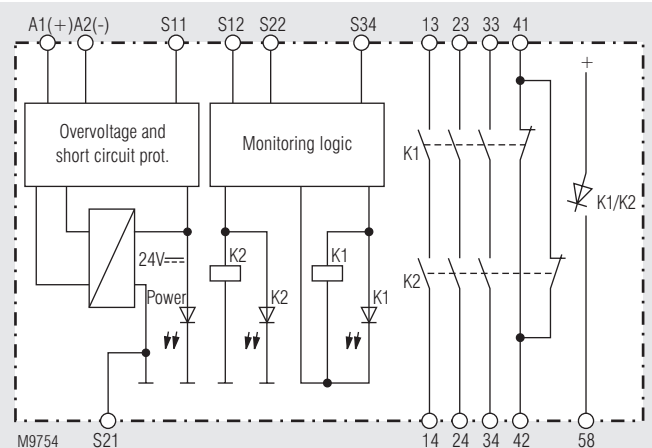
Indicators

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

Block Diagrams

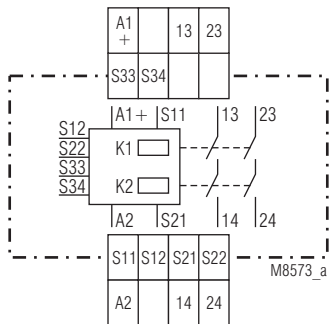


LG 5925

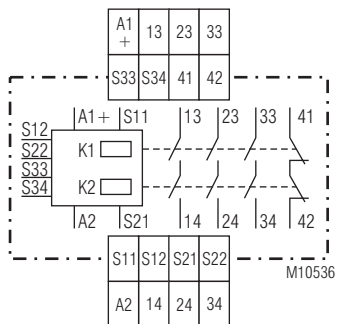


LG 5925.54

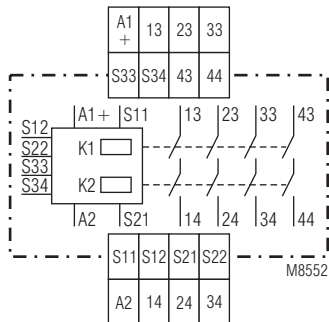
Circuit Diagrams



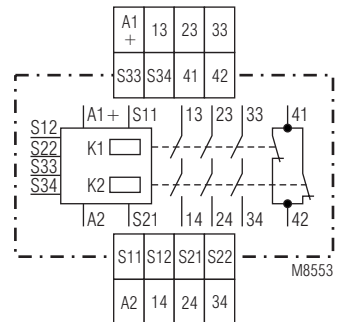
LG 5925.02



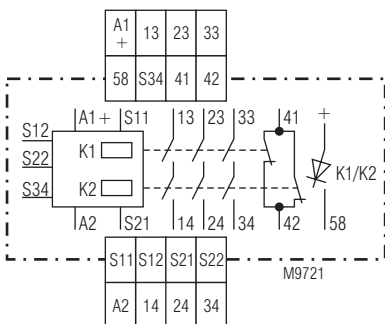
LG 5925.03



LG 5925.04



LG 5925.48

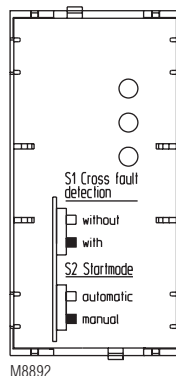
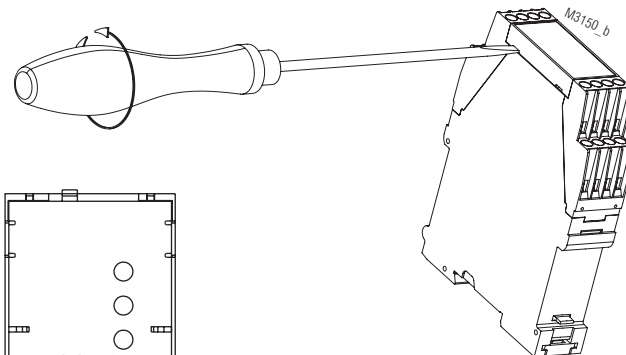


LG 5925.54

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

EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2

HF irradiation: 10 V / m IEC/EN 61 000-4-3

Fast transients: 2 kV IEC/EN 61 000-4-4

Surge voltages

between

wires for power supply: 1 kV, 0.5 kV IEC/EN 61 000-4-5

24 V at AC/DC units

between wire and ground: 2 kV IEC/EN 61 000-4-5

Interference suppression: Limit value class B EN 55 011

Technical Data

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

Terminal designation: EN 50 005

Wire connection: DIN 46 228-1/-2/-3/-4

Screw terminals

(integrated): 1 x 4 mm² solid or
 1 x 2.5 mm² stranded ferruled or
 2 x 1.5 mm² stranded ferruled or
 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

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

1 x 2.5 mm² stranded ferruled

min. cross section

for connection: 0.5 mm²

Insulation of wires

or sleeve length: 12 ±0.5 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_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

HFT¹⁾: 1

DC: 99.0 %

SFF_{avg}: 99.7 %

PFH_D: 2.66E-10 h⁻¹

T₁: 20 a (year)

¹⁾ 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

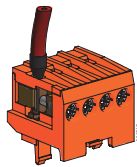
- Output: 3 NO contacts, 1 NC contact
- Nominal voltage U_N : AC/DC 24 V
- Width: 22.5 mm

Ordering Example

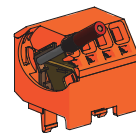
LG 5925 /61 DC 24 V

- 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)

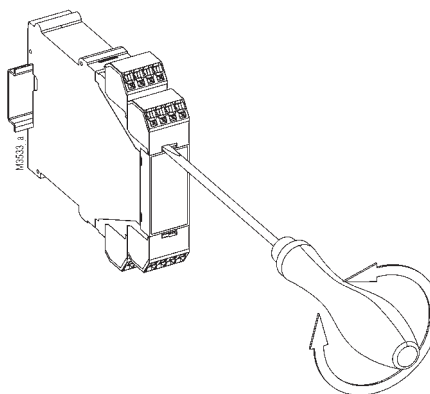


Cage clamp terminal
(PC/plugin cage clamp)

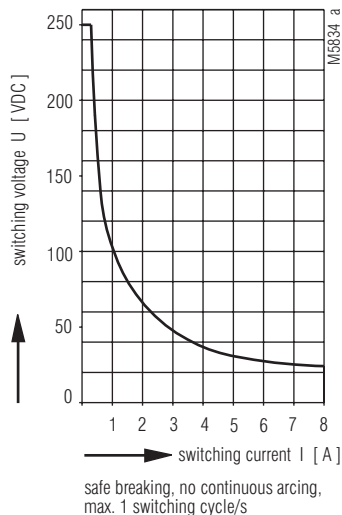
Notes

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.

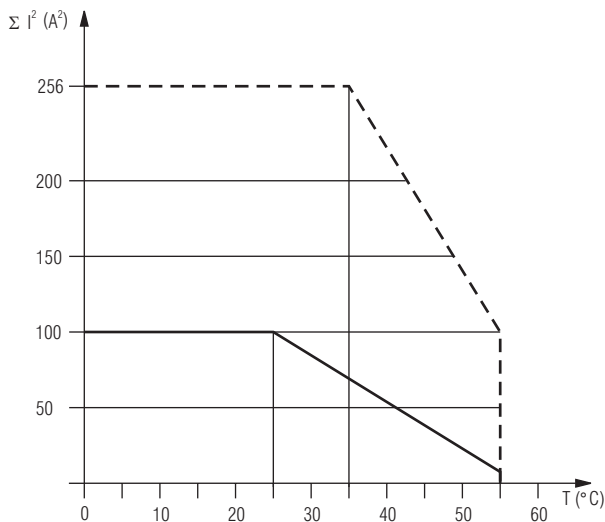


Characteristics



Arc limit curve under resistive load

Characteristics



M8893_d

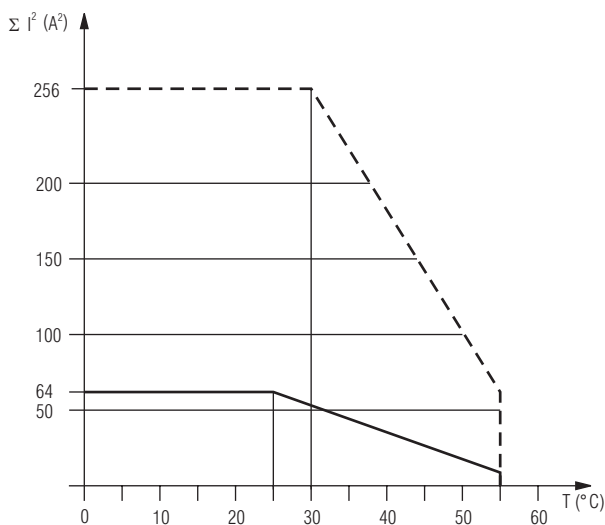
--- device mounted away from heat generation components.
Max. current at 55°C over 4 contact path = 5A $\cong 4 \times 5^2 \text{A}^2 = 100\text{A}^2$

— 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 $\cong 4 \times 1^2 \text{A}^2 = 64\text{A}^2$

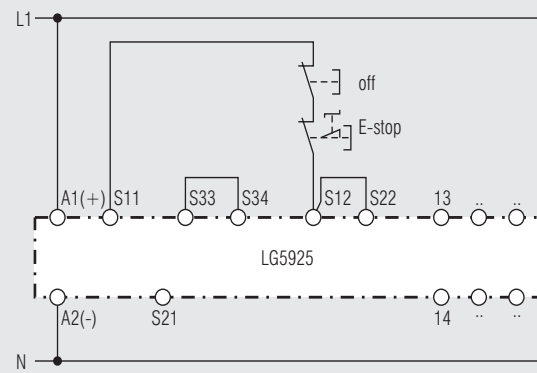
— device mounted with 5mm distance
Max. current at 55°C over 4 contact path = 1A $\cong 4 \times 1^2 \text{A}^2 = 64\text{A}^2$

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

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

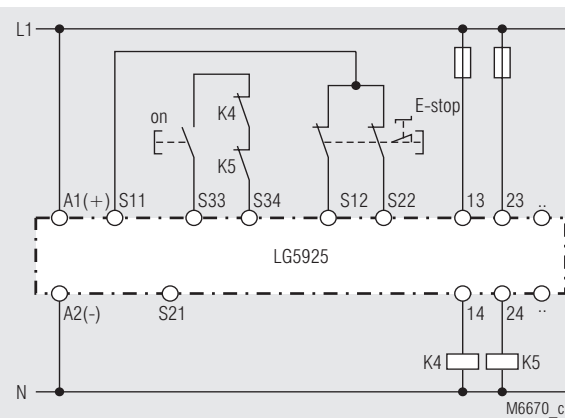


Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.

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.

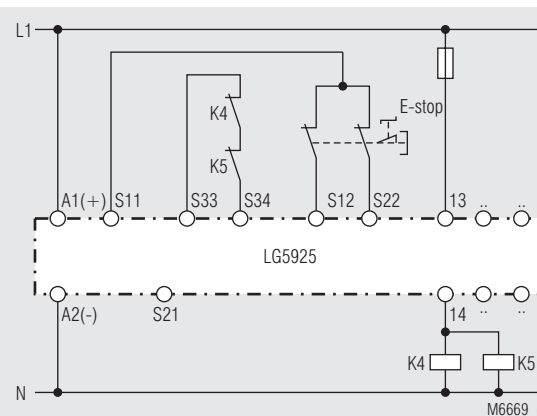
The output contacts can be reinforced by external contactors with forcibly guided contacts for switching currents > 8 A.

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

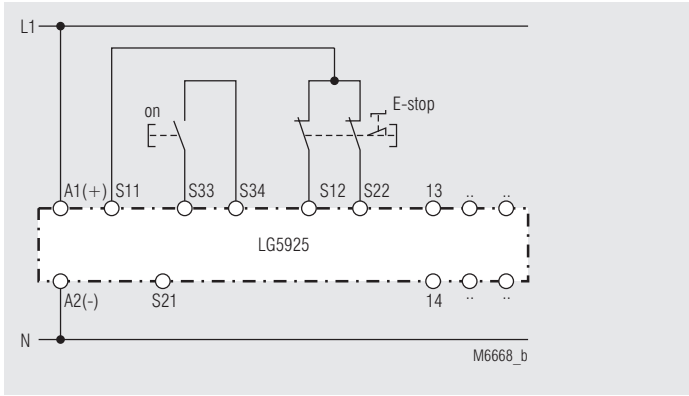
Contact reinforcement by external contactors controlled by one contact path.

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

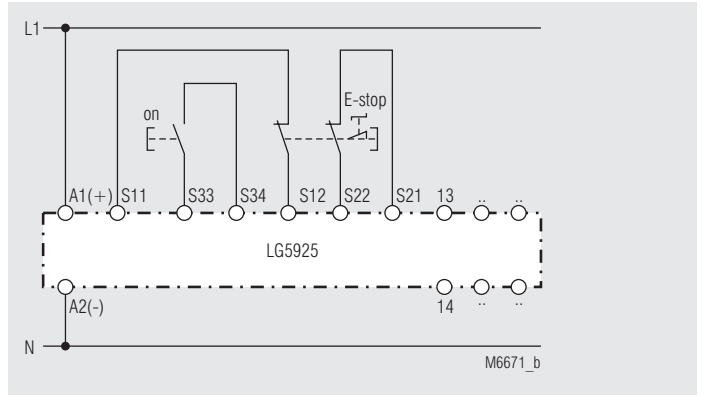


2-channel emergency stop circuit without cross fault monitoring.

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

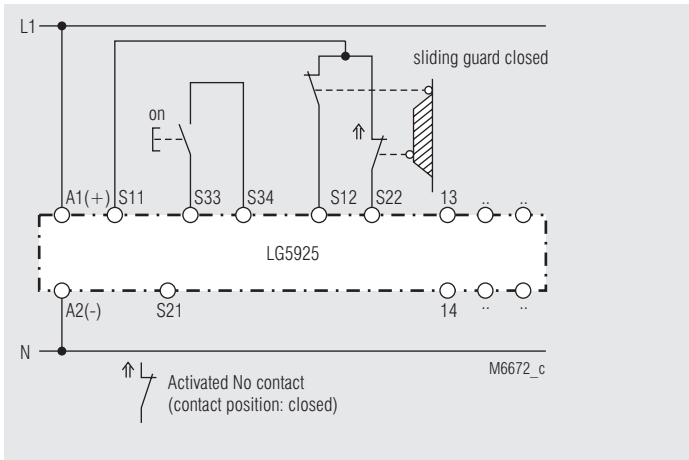


2-channel emergency stop circuit with cross fault detection

Note: Refer to "Unit programming"!

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

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

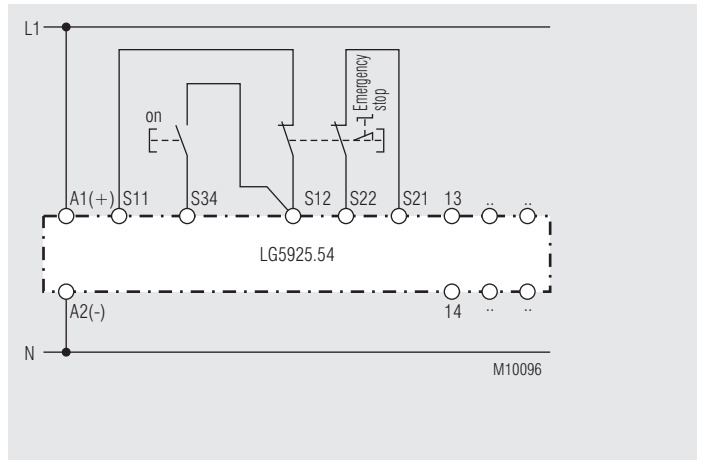


2-channel safety gate monitoring.

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