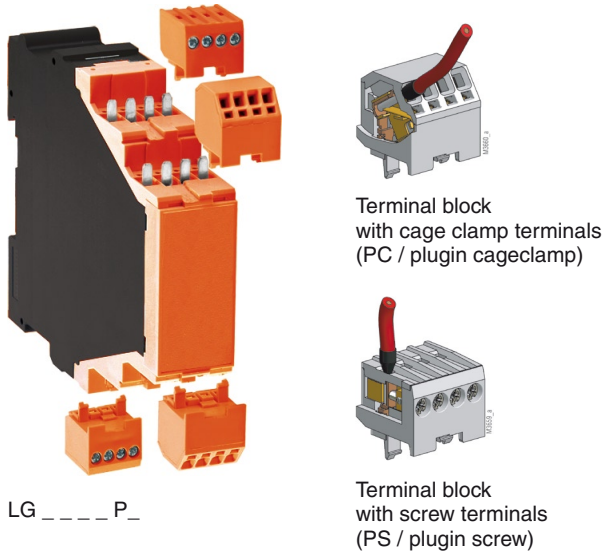


Now with selectable
Plug-in technology



- 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. 8 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
- LG 5925: 22.5 mm width
- LH 5925: 45 mm width

Options with pluggable terminal blocks



Approvals and marking



*1) see variants

The LH 5925 is a combination of 2 approved modules LG 5925 and LG 5929 but has no own approved.

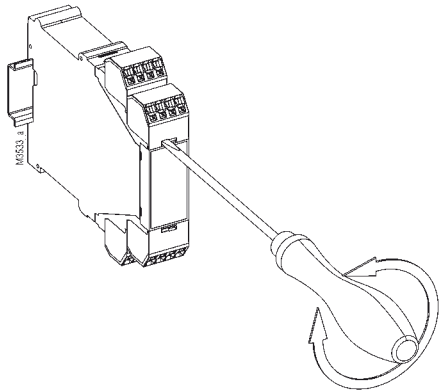
Applications

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

Notes

Removing the terminal blocks with cage clamp terminals

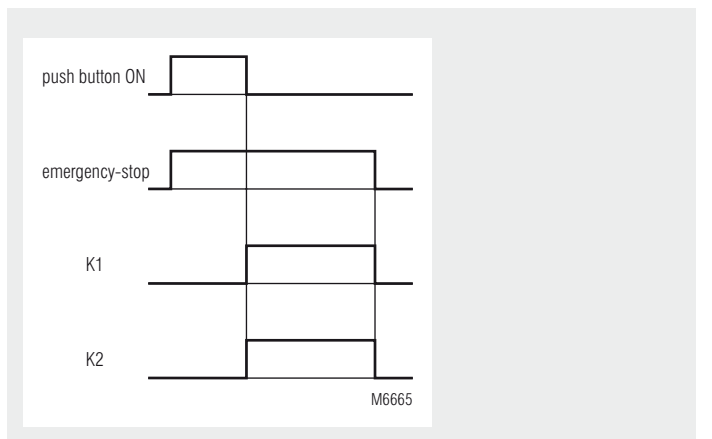
1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



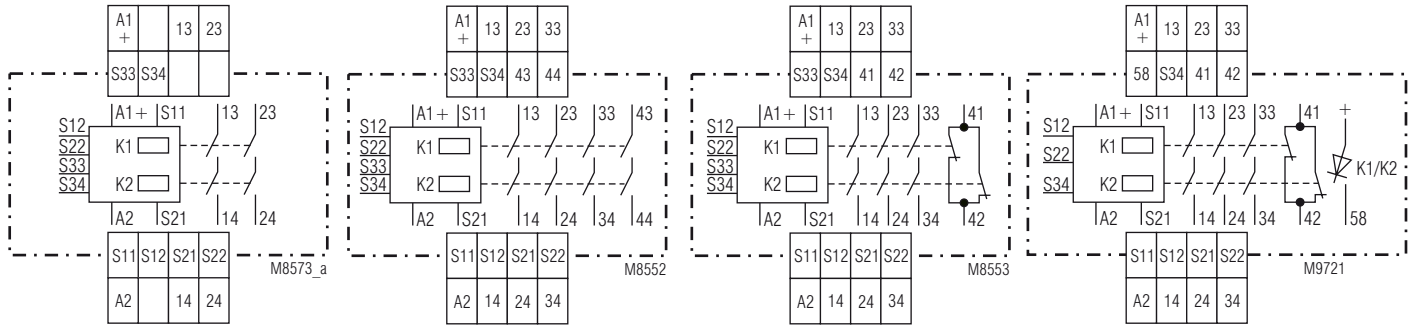
Indicators

LED "Netz":	on when supply connected
LG 5925 LED K1/K2:	on when relay K1 and K2 energized
LH 5925 LED K1/K3 und K2/K4:	on when relay K1/K3 and K2/K4 energized

Function diagram



Circuit diagrams

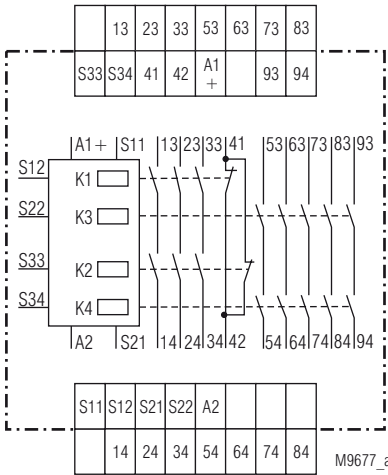


LG 5925.02

LG 5925.04

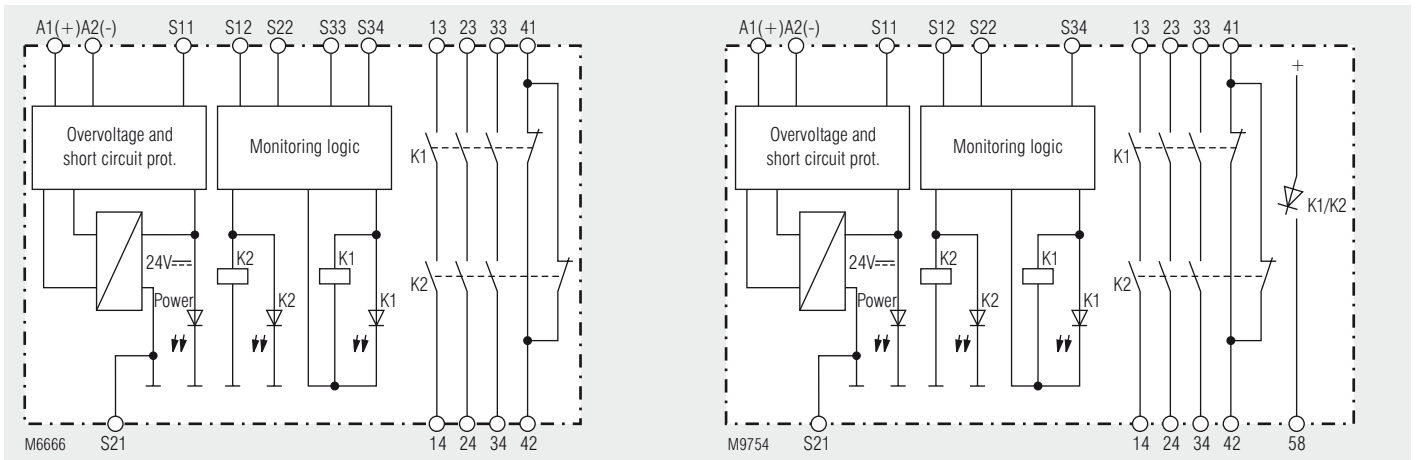
LG 5925.48

LG 5925.54



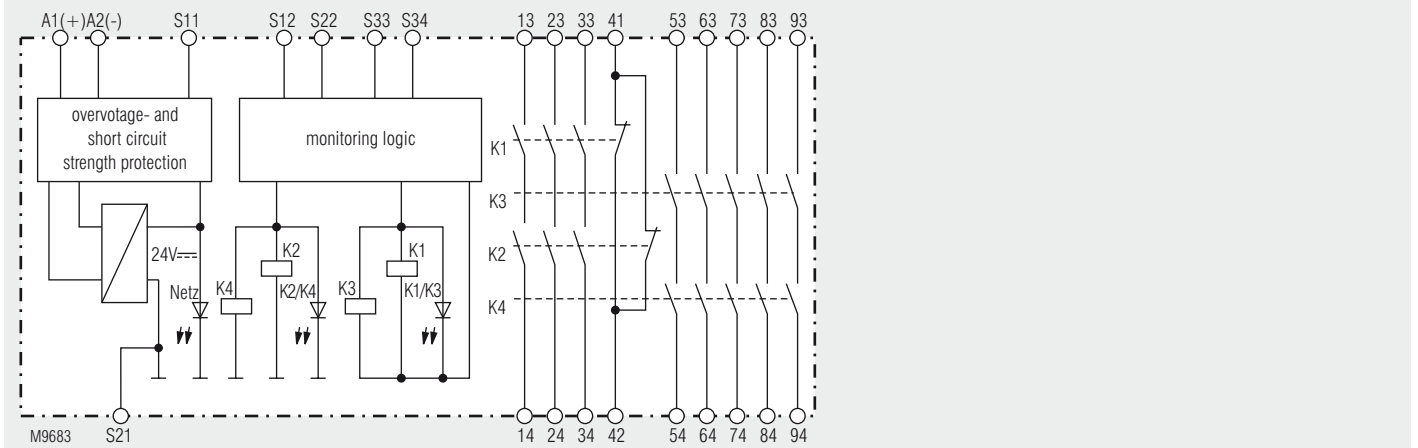
LH 5925.69

Block diagrams



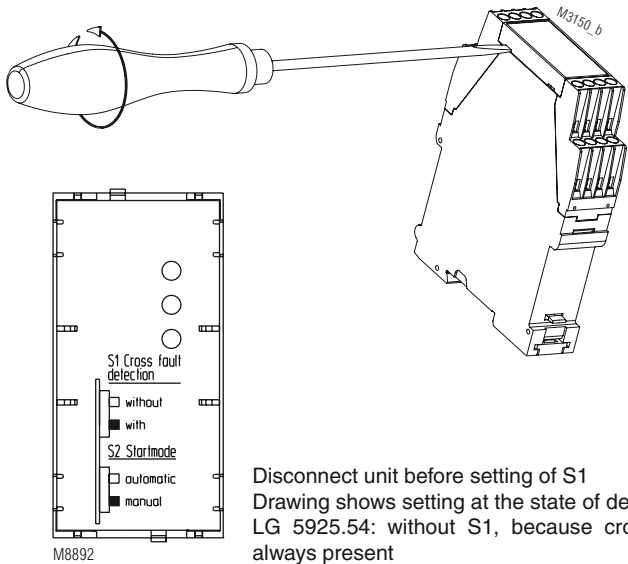
LG 5925

LG 5925.54



LH 5925

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
LH 5925:	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 :

LG 5925:	DC approx. 1.5 W
	AC approx. 3.7 VA
LH 5925:	DC approx. 3 W
	AC approx. 4 VA

Min. Off-time:

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 5925.48, LG 5925.54:	3 NO, 1 NC contact
LH 5925.69:	8 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

Contact type:

Nominal output voltage:

Relay positive guided
AC 250 V
DC: see limit curve for arc-free operation
max. 8 A per contact
see current limit curve

Thermal current I_{th} :

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:	4 A / DC 24 V	IEC/EN 60 947-5-1
	0.5 A / 110 V	IEC/EN 60 947-5-1
	4 A / 24 V	IEC/EN 60 947-5-1
NC contacts:		
to DC 13:		
NO contacts:	8 A / 24 V > 25 x 10 ³	
	ON: 0.4 s, OFF: 9.6 s	

Electrical contact life

to 5 A, AC 230 V $\cos \varphi = 1$: > 2.2 x 10⁵ 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 10⁶ switching cycles

Semiconductor output:

DC 24 V 100 mA, plus switching

Technical Data**General Data**

Operating mode:	Continuous operation	
Temperature range		
operation:	- 15 ... + 55 °C	
storage :	- 25 ... + 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
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 mm ² solid or 1 x 2.5 mm ² stranded ferruled or 2 x 1.5 mm ² stranded ferruled or 2 x 2.5 mm ² solid	
Insulation of wires or sleeve length:	8 mm	
Plugin with screw terminals		
max. cross section for connection:	1 x 2.5 mm ² solid or 1 x 2.5 mm ² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plugin with cage clamp terminals		
max. cross section for connection:	1 x 4 mm ² solid or 1 x 2.5 mm ² stranded ferruled	
min. cross section for connection:	0.5 mm ²	
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	
Mounting:	DIN rail	IEC/EN 60 715
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

Technical Data**Safety related data****Values according to EN ISO 13849-1:**

Category:	4	
PL:	e	
MTTF _d :	> 100	a
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⁾ :	1	
DC :	99,0	%
SFF	99,7	%
PFH _D :	2,66E-10	h ⁻¹

¹⁾ HFT = Hardware-Failure Toleranz

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
Plugin screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plugin 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 AC/DC 24 V
Article number: 0056025
LG 5925.54 AC/DC 24 V
Article number: 0061293
• Output: 3 NO contacts, 1 NC contact
• Nominal voltage U_N : AC/DC 24 V
• Width: 22.5 mm

Variant

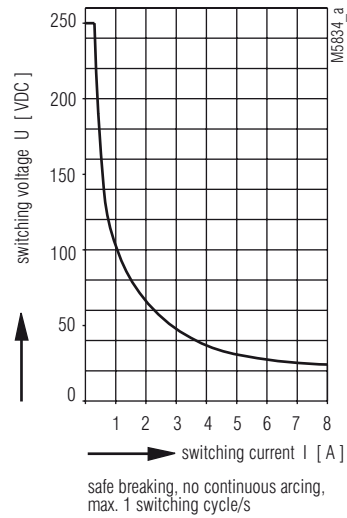
LG 5925. __ / 61: with UL-approval

Ordering example for variants

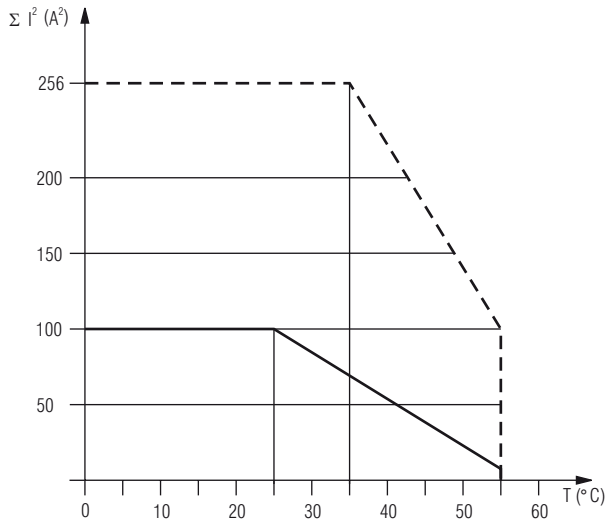
L_ 5925 . _ _ / 60 . _ . DC 24 V

Nominal voltage
Type of terminals
without indication: terminal blocks fixed, with screw terminals
PC (plugin cage clamp): plugable terminal blocks with cage clamp terminals
PS (plugin screw): plugable terminal blocks with screw terminals
Variant, if required
Contacts
G: Width 22.5 mm
H: Width 45 mm

Characteristics



Characteristics



M8893_d

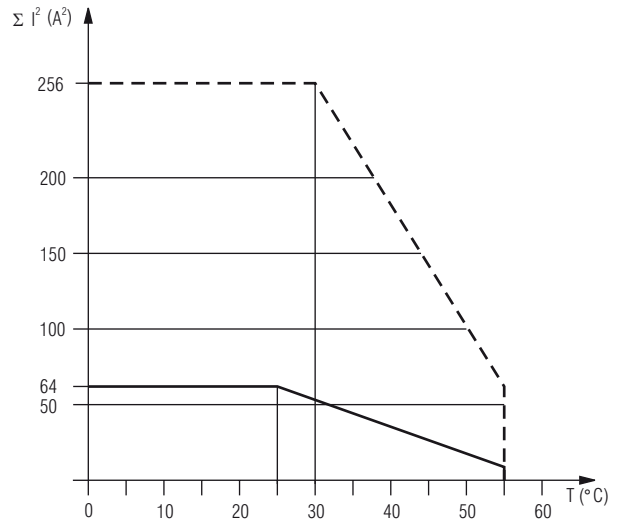
--- device mounted away from heat generation components.
Max. current at 55°C over 4 contact path = $5A \cong 4 \times 5^2 A^2 = 100A^2$

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

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

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

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



M9926

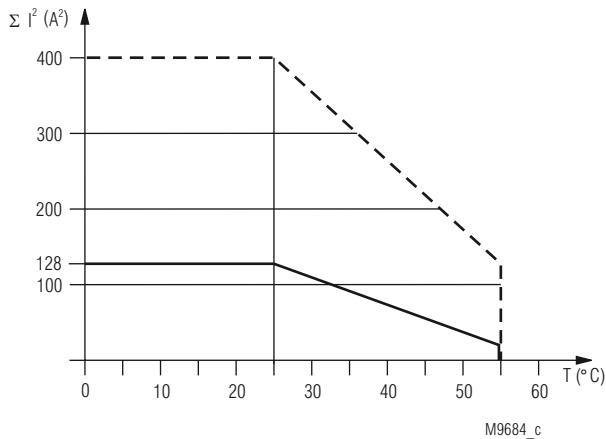
--- device mounted away from heat generation components.
Max. current at 55°C over 4 contact path = $1A \cong 4 \times 4^2 A^2 = 64A^2$

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

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

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



M9684_c

--- device mounted away from heat generation components.
max. current at 55°C over 8 contact path = $4A \cong 8 \times 4^2 A^2 = 128A^2$

— device mounted without distance heated by devices with same load,
Max. current at 55°C over 8 contact path = $2A \cong 8 \times 2^2 A^2 = 32A^2$

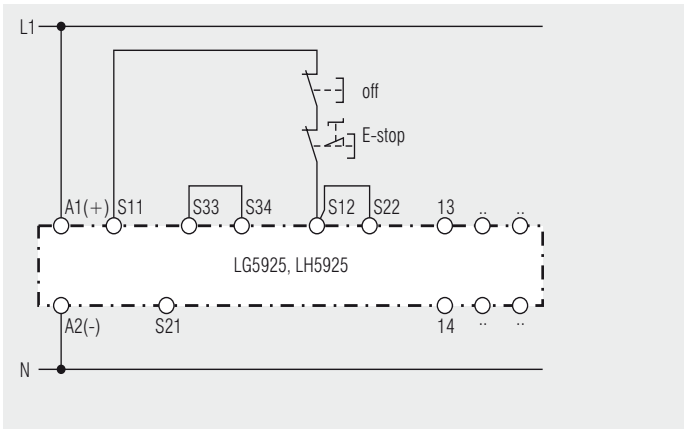
Quadratic total current

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2 + I_5^2 + I_6^2 + I_7^2 + I_8^2$$

$I_1, I_2, I_3, I_4, I_5, I_6, I_7, I_8$ - current in contact paths

Quadratic total current limit curve LH 5925

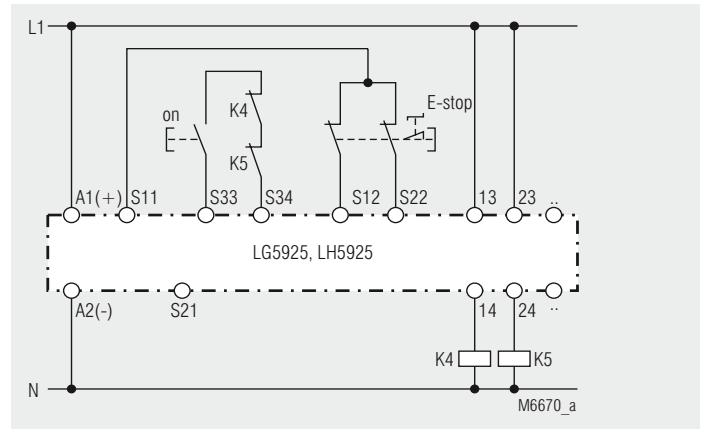
Application examples



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



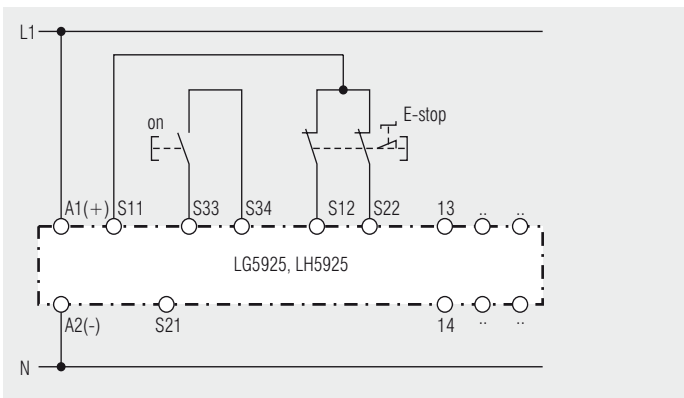
Contact reinforcement by external contactors, 2-channel controlled.

The output contacts can be reinforced by external contactors with positive 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"!

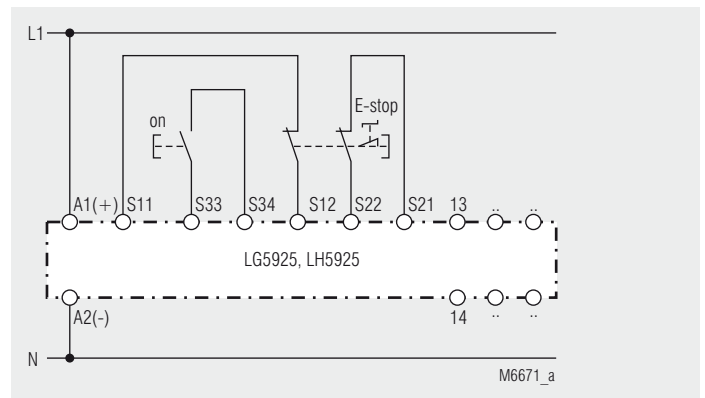
Switches in pos.: S1 no cross fault detection
S2 manual start



2-channel emergency stop circuit without cross fault monitoring.

Note: Refer to "Unit programming"!

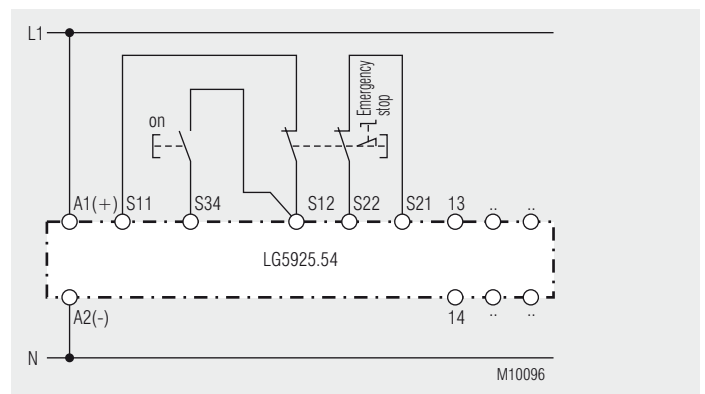
Switches in pos.: S1 no cross fault detection
S2 manual start



2-channel emergency stop circuit with cross fault detection

Note: Refer to "Unit programming"!

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

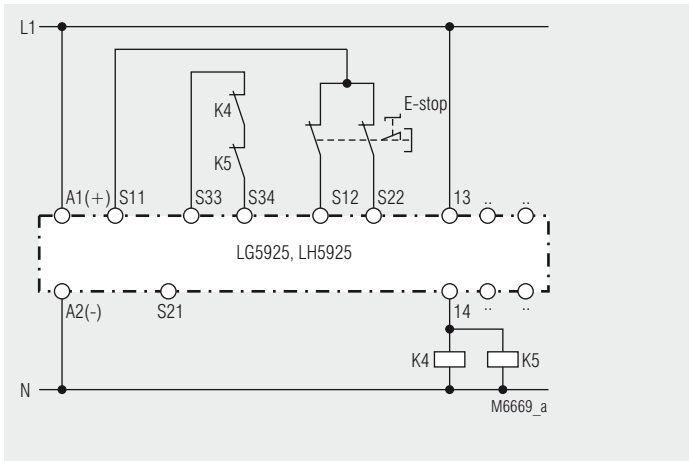


2-channel emergency stop circuit with cross fault detection

Note: Refer to "Unit programming"!

Switches in pos.: S2 automatic start

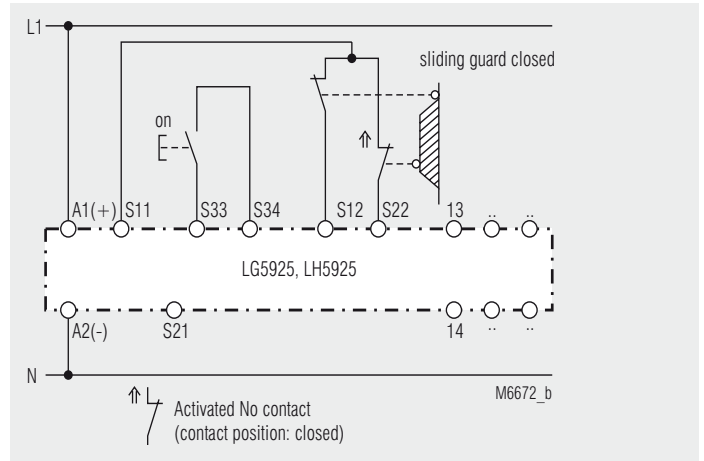
Application examples



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



2-channel safety gate monitoring.

Note: Refer to "Unit programming"!

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