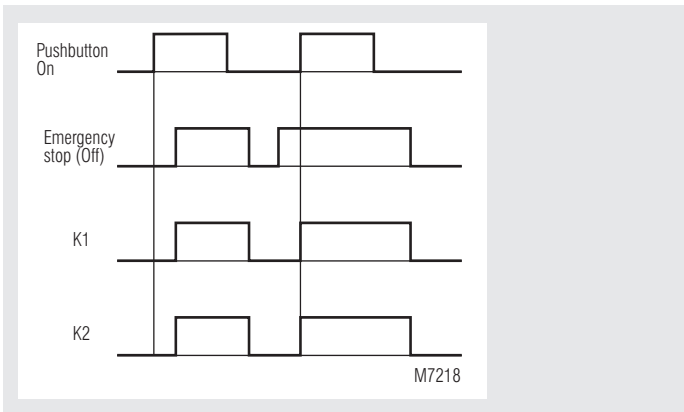




- According to
 - Performance Level (PL) d and category 3 to EN ISO 13849-1: 2008
 - SIL Claimed Level (SIL CL) 2 to IEC/EN 62061
 - Safety Integrity Level (SIL 2) to IEC/EN 61508
- Single channel operation
- Output: max. 4 NO contacts
- AC 230 V model with galvanic separation
- LED indicator for channel 1 / 2 and state of operation
- Short circuit detection between terminal Y1 and common
- 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 Marking



Applications

- Protection of people and machines
- Emergency stop circuits on machines

Indicators

LED Phase: on, when supply connected
LED K1/K2: on, when relay K1 and K2 energized

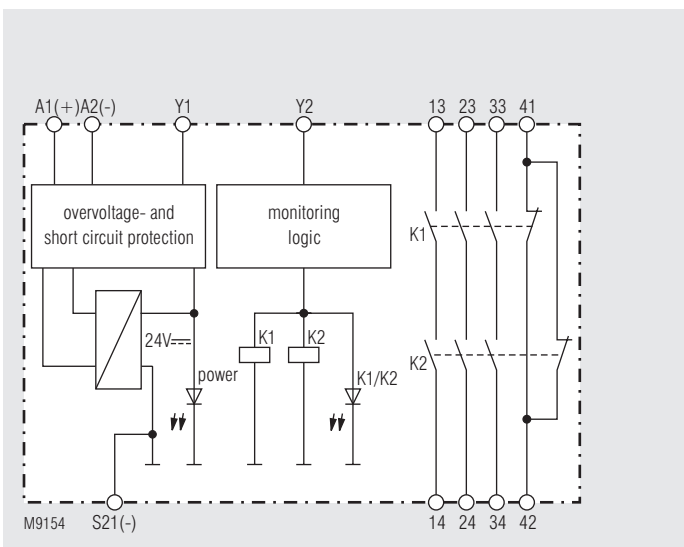
Notes

ATTENTION - AUTOMATIC START!

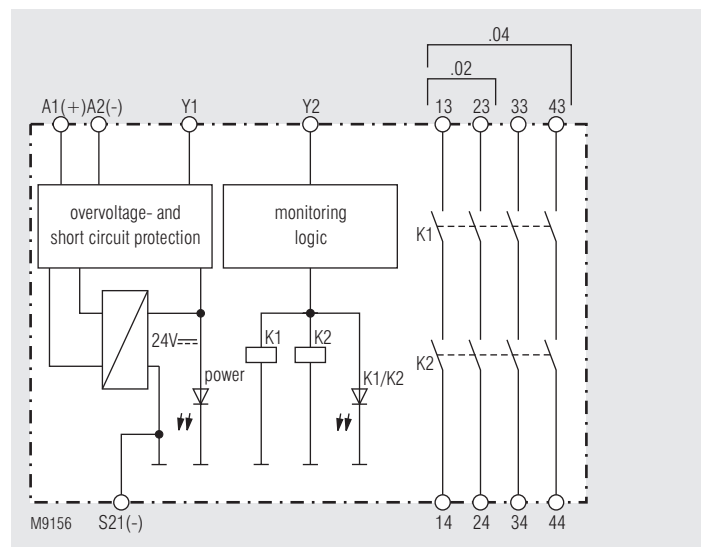


According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

Block Diagrams

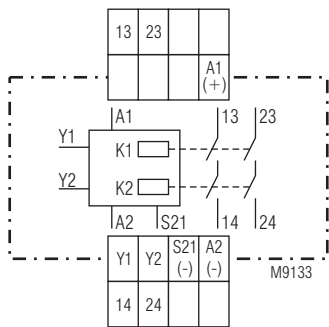


LG 5924.48

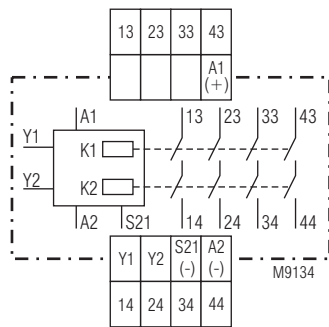


LG 5924.02, LG 5924.04

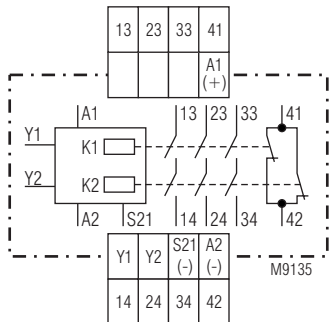
Circuit Diagrams



LG 5924.02



LG 5924.04



LG 5924.48

Connection Terminals

| Terminal designation | Signal designation |
|--------------------------------|---|
| A1(+) | + / L |
| A2 (-) | - / N |
| Y2 | Inputs |
| S21(-), Y1 | Outputs |
| 13, 14, 23, 24, 33, 34, 43, 44 | Forcibly guided NO contacts for release circuit |
| 41, 42 | Forcibly guided indicator output |

Technical Data

Input

| | |
|--|--|
| Nominal voltage U_N: | DC 24 V AC 110, 230 V |
| Nominal frequency: | 50 / 60 Hz |
| Voltage range: | AC 0.85 ... 1.1 U_N DC 0.9 ... 1.1 U_N DC 0.85 ... 1.1 U_N |
| Nominal consumption | |
| DC: | DC 1.5 W |
| AC: | 3.5 VA |
| Control voltage on Y1 | |
| DC: | typ. DC 22 V |
| AC: | typ. DC 45 V |
| Control current | |
| DC: | typ. DC 65 mA |
| AC: | typ. AC 16 mA |
| Recovery time: | 0.5 s |

Output

| | |
|-----------------|---------------------|
| Contacts | |
| LG 5924.02: | 2 NO contacts |
| LG 5924.04: | 4 NO contacts |
| LG 5924.48: | 3 NO, 1 NC contacts |

The NO contacts are safety contacts.

ATTENTION! The NC contacts 41-42 can only be used for monitoring

Operate delay

| | |
|-----|----------------|
| DC: | typ. DC 40 ms |
| AC: | typ. AC 200 ms |

Release delay

| | |
|-----|---------------|
| DC: | typ. DC 70 ms |
| AC: | typ. AC 35 ms |

Technical Data

| | |
|--|---|
| Contact type: | forcibly guided |
| Thermal current I_{th}: | max. 5 A (see quadratic total current limit curve) AC 250 V |
| Nominal output voltage: | |
| Switching capacity to AC 15 | |
| NO contact: | 3 A / AC 230 V IEC/EN 60 947-5-1 |
| NC contact: | 2 A / AC 230 V IEC/EN 60 947-5-1 |
| to DC 13 | |
| NO contact: | 2 A / DC 24 V IEC/EN 60 947-5-1 |
| NC contact: | 2 A / DC 24 V IEC/EN 60 947-5-1 |
| Electrical life at 5 A, AC 230 V $\cos \varphi = 1$: | > 2.2 x 10 ⁵ switching cycles |
| Permissible operating frequency: | 600 switching 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: | 10 x 10 ⁶ switching cycles |

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 IEC/EN 61 000-4-5 |
| between wire and ground: | 2 kV IEC/EN 61 000-4-5 |
| HF wire guided: | 10 V IEC/EN 61 000-4-6 |
| Interference suppression | Limit value class B EN 55011 |
| 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 15 / 055 / 04 IEC/EN 60 068-1 EN 50 005 |
| Climate resistance: | |
| Terminal designation: | |
| Wire connection | |
| Screw terminals (integrated): | DIN 46 228-1/-2/-3/-4 |
| | 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

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

Mounting:

DIN rail IEC/EN 60 715

Weight

| | |
|--------------------|-------|
| LG 5924, DC 24 V: | 200 g |
| LG 5924, AC 230 V: | 270 g |

Technical Data

Dimensions

Width x height x depth

| | |
|-------------|---------------------|
| LG 5924: | 22.5 x 90 x 121 mm |
| LG 5924 PC: | 22.5 x 111 x 121 mm |
| LG 5924 PS: | 22.5 x 104 x 121 mm |

Safety Related Data

Values according to EN ISO 13849-1:

| | | |
|-----------------------|-------|-----------------|
| Category: | 3 | |
| PL: | d | |
| MTTF _d : | 180.3 | 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: | 2 | IEC/EN 62061 |
| SIL | 2 | IEC/EN 61508 |
| HFT ¹⁾ : | 1 | |
| DC _{avg} : | 99.0 | % |
| SFF | 99.7 | % |
| PFH _D : | 2.60E-10 | h ⁻¹ |
| T _r : | 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: DC 24 V
AC 110, 230 V

Ambient temperature: -15 ... +55°C

Switching capacity:
Ambient temperature 45°C: Pilot duty B300
5A 250Vac Resistive
5A 24Vdc Resistive or G.P.
Ambient temperature 55°C: Pilot duty B300
4A 250Vac Resistive
4A 24Vdc Resistive or G.P.

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

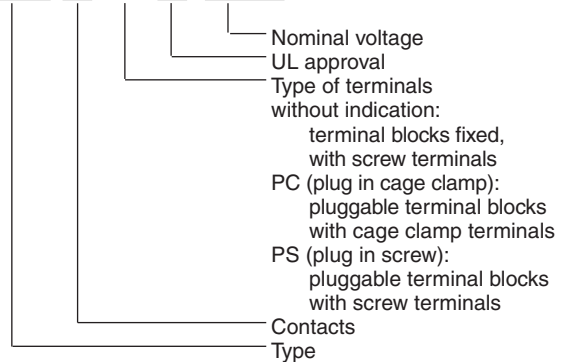
Standard Type

LG 5924.48/61 DC 24 V

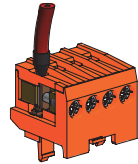
| | |
|------------------------------------|---------------------|
| Article number: | 0061916 |
| • Output: | 3 NO, 1 NC contacts |
| • Nominal voltage U _N : | DC 24 V |
| • Width: | 22.5 mm |

Ordering Example

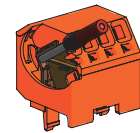
LG 5924 .48 /61 DC 24 V



Options with Pluggable Terminal Blocks



Screw terminal
(PS/plugin screw)

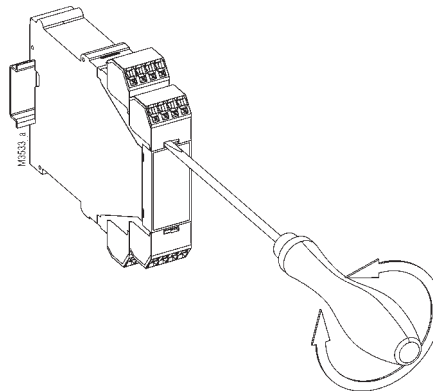


Cage clamp terminal
(PC/plugin cage clamp)

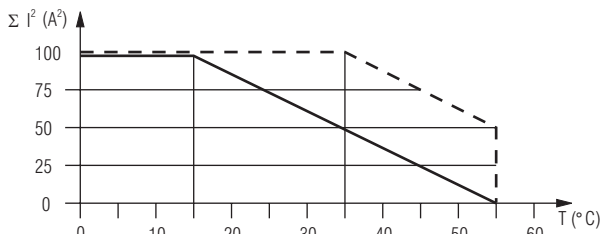
Notes

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



M9717_b

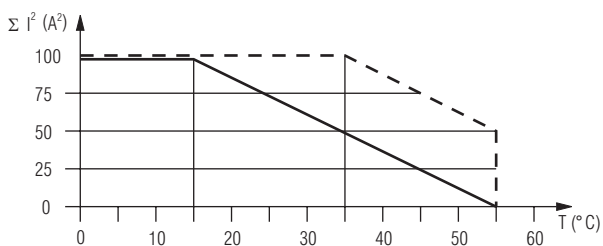
--- device mounted away from heat generation components.
max. current at 55°C over 4 contactrows = $3,5A \cong 4 \times 3,5^2 A^2 = 49A^2$

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

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

I_1, I_2, I_3, I_4 - current in contactrows

Quadratic total current limit curve LG 5924 DC 24 V



M9934_a

--- device mounted away from heat generation components.
max. current at 55°C over 4 contactrows = $3,5A \cong 4 \times 3,5^2 A^2 = 49A^2$

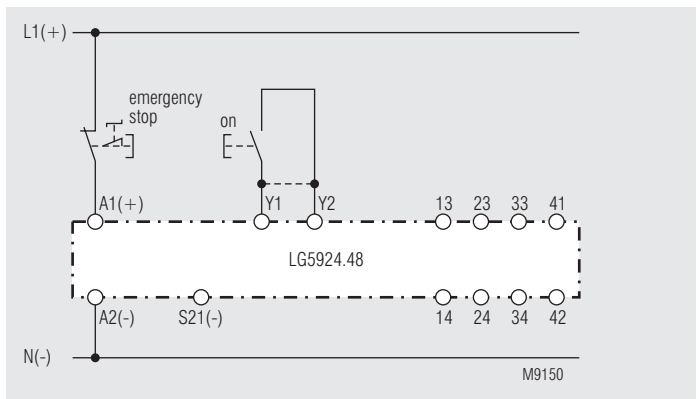
— device mounted with 5mm distance
max current at 55°C over 4 contactrows = $1A \cong 4 \times 1^2 A^2 = 4A^2$

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

I_1, I_2, I_3, I_4 - current in contactrows

Quadratic total current limit curve LG 5924 AC 110 V, AC 230 V

Application Examples

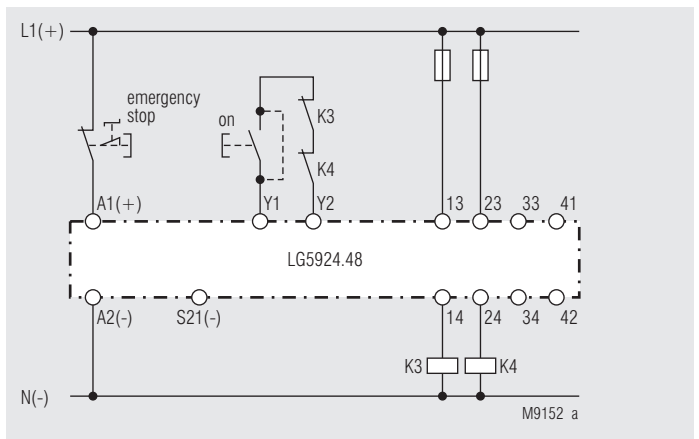


Single channel emergency-stop circuit without feed back loop, with or without automatic restart.

For automatic restart terminals Y1-Y2 must be linked.

No ON-pushbutton necessary.

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



Contact reinforcement by external contactors, 2-channel controlled. For currents > 5 A the output contacts can be reinforced by external contactors. Functioning of the external contactors is monitored by looping the NC contacts into the start circuit (Y1-Y2).

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