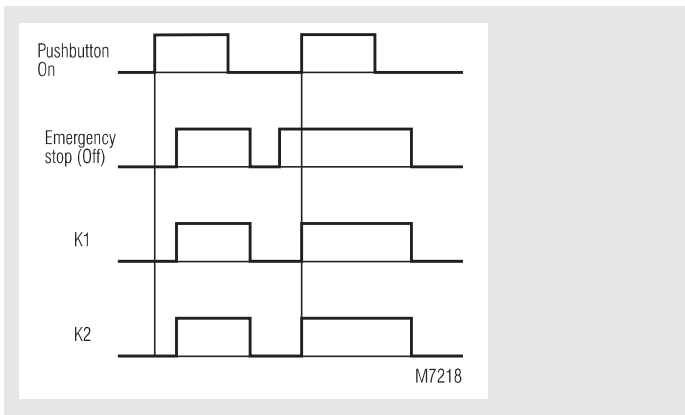




- According to
  - Performance Level (PL) d and category 3 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 2 to IEC/EN 62061
  - Safety Integrity Level (SIL 2) to IEC/EN 61508
- Single channel operation
- Output: max. 4 NO contacts
- AC 230 V model with galvanic separation
- LED indicator for channel 1 / 2 and state of operation
- Short circuit detection between terminal Y1 and common
- Wire connection: also 2 x 1,5 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 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

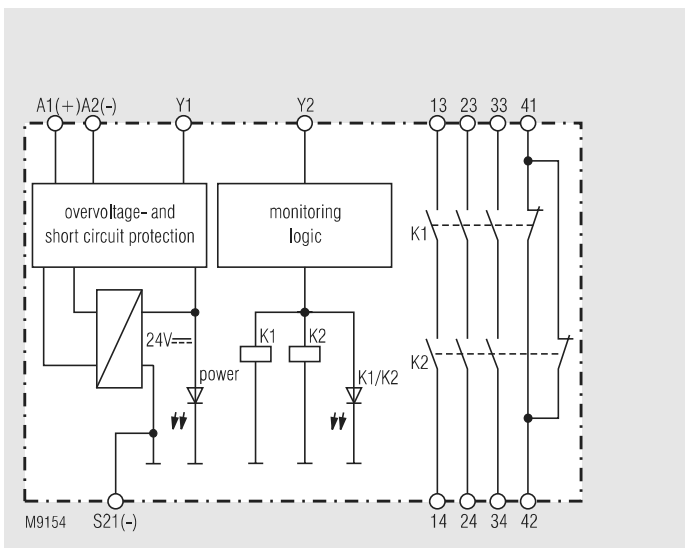
### Notes

#### ATTENTION - AUTOMATIC START!

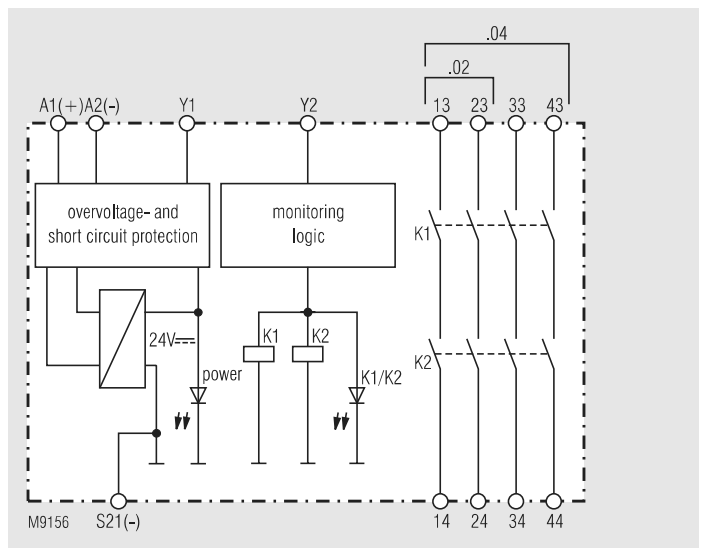


According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

### Block Diagrams

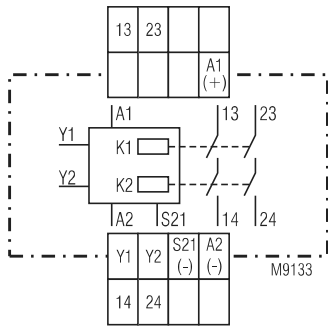


LG 5924.48

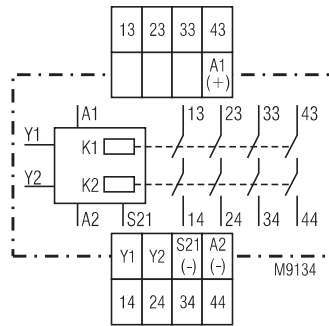


LG 5924.02, LG 5924.04

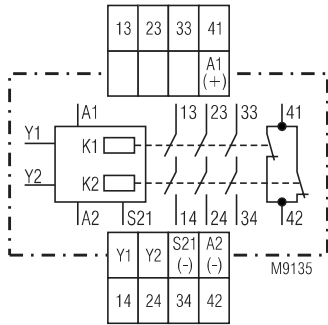
## Circuit Diagrams



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

<b>Nominal voltage <math>U_N</math>:</b>	DC 24 V AC 110, 230 V
<b>Nominal frequency:</b>	50 / 60 Hz
<b>Voltage range:</b>	AC 0.85 ... 1.1 $U_N$ DC 0.9 ... 1.1 $U_N$
at 10 % residual ripple:	
at 48 % residual ripple:	
<b>Nominal consumption</b>	
DC:	DC 1.5 W
AC:	3.5 VA
<b>Control voltage on Y1</b>	
DC:	typ. DC 22 V
AC:	typ. DC 45 V
<b>Control current</b>	
DC:	typ. DC 65 mA
AC:	typ. AC 16 mA
<b>Recovery time:</b>	0.5 s

### Output

<b>Contacts</b>	
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

<b>Contact type:</b>	forcibly guided	
<b>Thermal current <math>I_{th}</math>:</b>	max. 5 A (see quadratic total current limit curve) AC 250 V	
<b>Nominal output voltage:</b>		
<b>Switching capacity</b>	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
<b>Electrical life</b>		
at 5 A, AC 230 V $\cos \varphi = 1$ :	> 2.2 x 10 <sup>6</sup> switching cycles	
<b>Permissible operating frequency:</b>	600 switching cycles / h	
<b>Short circuit strength</b>		
max. fuse rating:	10 A gL	IEC/EN 60 947-5-1
line circuit breaker:	B 6 A	
<b>Mechanical life:</b>	10 x 10 <sup>6</sup> switching cycles	

## General Data

<b>Operating mode:</b>	Continuous operation	
<b>Temperature range</b>		
operation:	- 15 ... + 55 °C	
storage :	- 25 ... + 85 °C	
<b>altitude:</b>	< 2.000 m	
<b>Clearance and creepage distances</b>		
rated impuls voltage /	4 kV / 2 (basis insulation) IEC 60 664-1	
pollution degree:		
<b>EMC</b>		
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
<b>Degree of protection</b>		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94	
<b>Vibration resistance:</b>	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	
<b>Climate resistance:</b>		
<b>Terminal designation:</b>	EN 50 005	
<b>Wire connection</b>	DIN 46 228-1/-2/-3/-4	
<b>Screw terminals (integrated):</b>	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 ±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 <sub>d</sub> :	180.3	a
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:	2	IEC/EN 62061
SIL	2	IEC/EN 61508
HFT <sup>1)</sup> :	1	
DC <sub>avg</sub> :	99.0	%
SFF	99.7	%
PFH <sub>D</sub> :	2.60E-10	h <sup>-1</sup>
T <sub>r</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<sub>N</sub>:** 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.

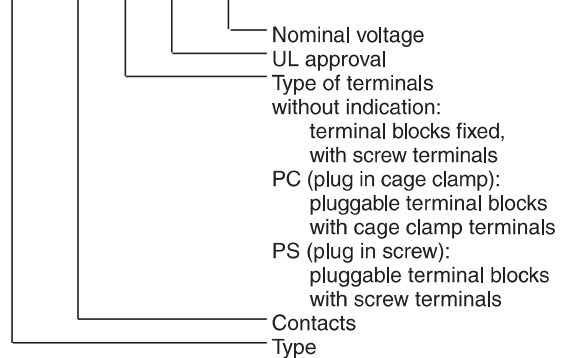
## Standard Type

LG 5924.48/61 DC 24 V

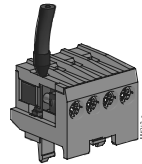
Article number:	0061916
• Output:	3 NO, 1 NC contacts
• Nominal voltage U <sub>N</sub> :	DC 24 V
• Width:	22.5 mm

## Ordering Example

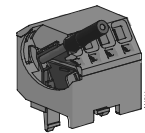
LG 5924 .48 /61 DC 24 V



## Options with Pluggable Terminal Blocks



Screw terminal  
(PS/plugin screw)

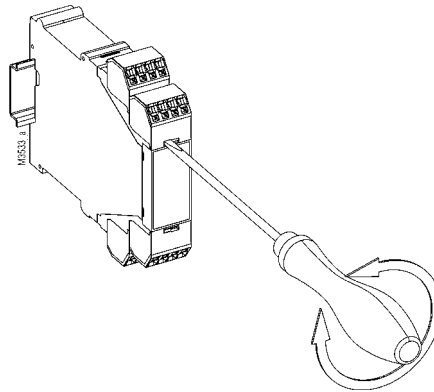


Cage clamp terminal  
(PC/plugin cage clamp)

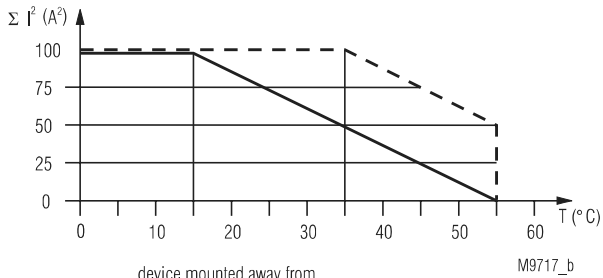
## Notes

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



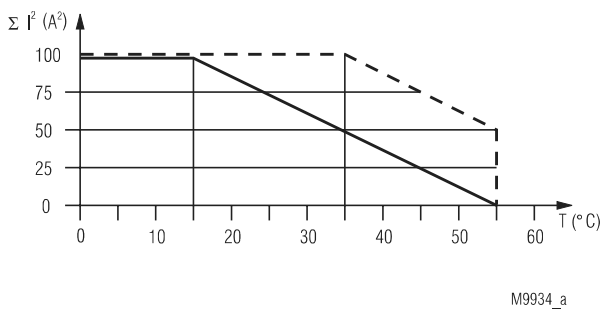
device mounted away from heat generation components.  
max. current at 55°C over 4 contactrows =  $3,5A \hat{=} 4 \times 3,5^2 A^2 = 49A^2$

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

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

$I_1, I_2, I_3, I_4$  - current in contactrows

Quadratic total current limit curve LG 5924 DC 24 V



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

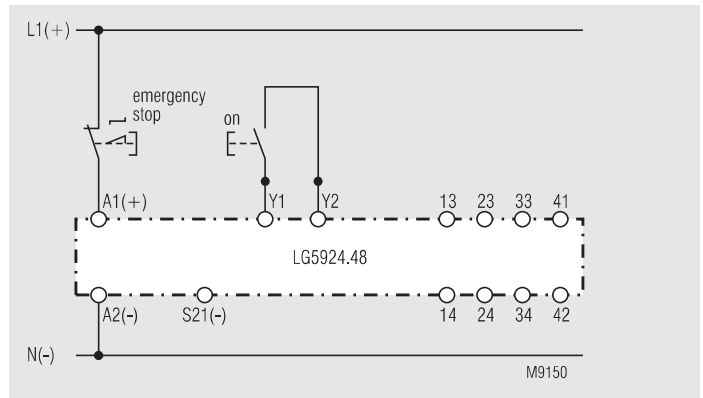
device mounted with 5mm distance  
max current at 55°C over 4 contactrows =  $1A \hat{=} 4 \times 1^2 A^2 = 4A^2$

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

$I_1, I_2, I_3, I_4$  - current in contactrows

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

## Application Examples

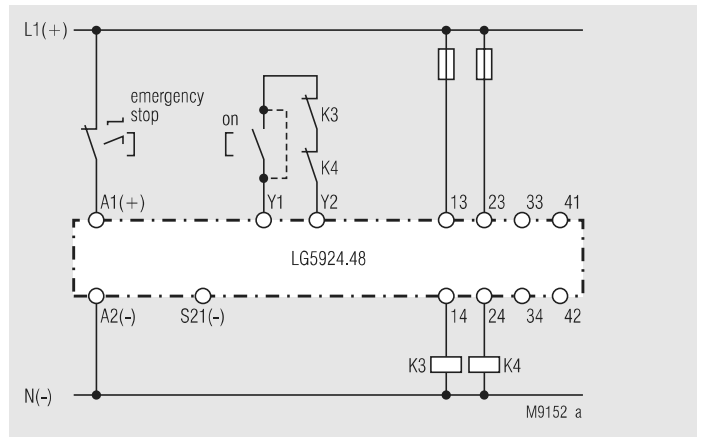


Single channel emergency-stop circuit without feed back loop, with or without automatic restart.

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