



SAFEMASTER

Safety Module for Safety Switches

LG 5925/920

Translation of the original instructions

DOLD 

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Before installing, operating or maintaining this device, these instructions must be carefully read and understood.



The installation must only be done by a qualified electrician!



Do not dispose of household garbage!

The device must be disposed of in compliance with nationally applicable rules and requirements.



Storage for future reference

To help you understand and find specific text passages and notes in the operating instructions, we have important information and information marked with symbols.

Symbol and Notes Statement



DANGER:

Indicates that death or severe personal injury will result if proper precautions are not taken.



WARNING:

Indicates that death or severe personal injury can result if proper precautions are not taken.



CAUTION:

Indicates that a minor personal injury can result if proper precautions are not taken.



INFO:

Referred information to help you make best use of the product.



ATTENTION:

Warns against actions that can cause damage or malfunction of the device, the device environment or the hardware / software result.

General Notes

The product hereby described was developed to perform safety functions as a part of a whole installation or machine. A complete safety system normally includes sensors, evaluation units, signals and logical modules for safe disconnections. The manufacturer of the installation or machine is responsible for ensuring proper functioning of the whole system. DOLD cannot guarantee all the specifications of an installation or machine that was not designed by DOLD. The total concept of the control system into which the device is integrated must be validated by the user. DOLD also takes over no liability for recommendations which are given or implied in the following description. The following description implies no modification of the general DOLD terms of delivery, warranty or liability claims.

Designated Use

The LG 5925/920 is used to interrupt a safety circuit in a safe way. It can be used to protect people and machines in applications with safety switches, e.g. to monitor sliding gates.

When used in accordance with its intended purpose and following these operating instructions, this device presents no known residual risks. Non-observance may lead to personal injuries and damages to property.

Safety Notes



Risk of electrocution!

Danger to life or risk of serious injuries.

- Disconnect the system and device from the power supply and ensure they remain disconnected during electrical installation.
- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The contact protection of the elements connected and the insulation of the supply cables must be designed in accordance with the requirements in the operating instructions / data sheet.
- Note the VDE and local regulations, particularly those related to protective measures.



Risk of fire or other thermal hazards!

Danger to life, risk of serious injuries or property damage.

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed. In particular, the current limit curve must be heeded.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.



Functional error!

Danger to life, risk of serious injuries or property damage.

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.
- The unit should be panel mounted in an enclosure rated at IP 54 or superior. Dust and dampness may lead to malfunction.



Installation fault!

Danger to life, risk of serious injuries or property damage.

- Make sure of sufficient protection circuitry at all output contacts for capacitive and inductive loads.



Attention!

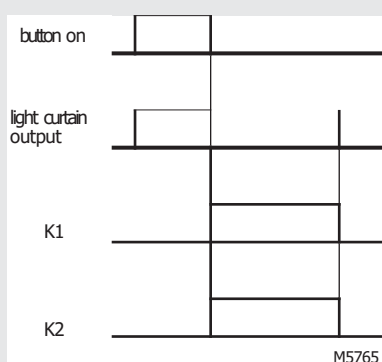
- The safety function must be triggered during commissioning.
- If a line fault occurs after the voltage has been connected to S12, S22, the unit will be activated because this line fault is similar to the normal On-function.
- Switch S1 must not be set while device is under supply voltage.
- AUTOMATIC START!
According to IEC/EN 60204-1 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.
- Opening the device or implementing unauthorized changes voids any warranty

SAFEMASTER Safety Module for Safety Switches LG 5925/920



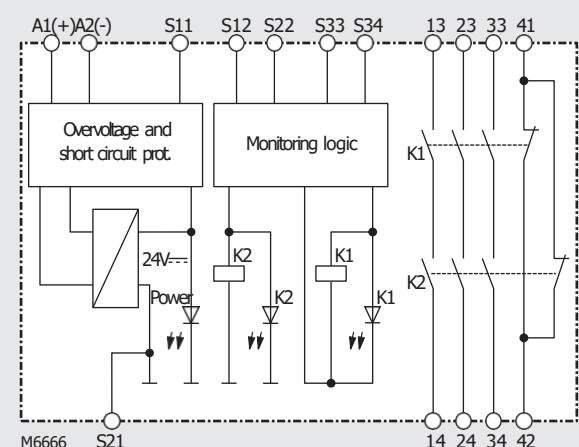
LG 5925/900

Function Diagram

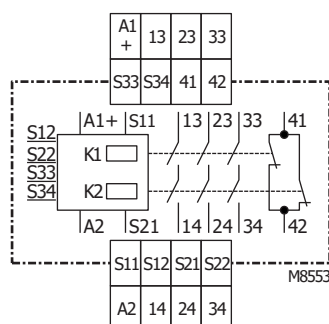


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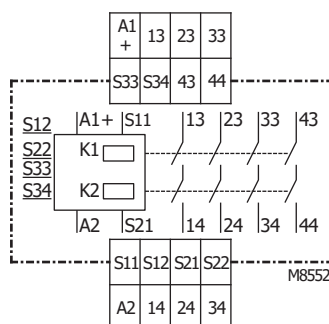
Block Diagram



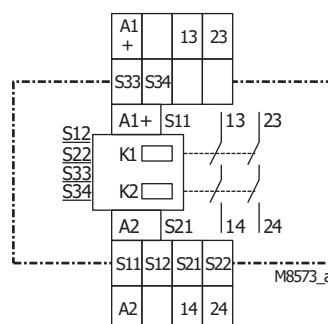
Circuit Diagrams



LG 5925.48/920



LG 5925.04/920



LG 5925.02/920

- According to
 - Performance Level (PL) e and category 4 to EN ISO 13849-1
 - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
 - Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
- According to EN 50156-2 for furnaces
- To connect:
 - Safety switch NE 5020
 - Safety switch NE 5021
- Output: max. 4 NO contacts, see contacts
- 1- or 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart, switch S2
- with or without cross fault monitoring switch S1
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46228-1/-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

Approvals and Markings



Applications

Protection of people and machines

- Monitoring of safety gates
- Usage in furnace application in continuous operation acc. to EN 50156-1

Indicators

- upper LED: on, when supply connected
- lower LEDs: on, when relay K1 and K2 energized

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.

Connection Terminals	
Terminal designation	Signal description
A1 (+)	+ / L
A2 (-)	- / N
S12, S22, S34	Inputs
S11, S21, S33	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
Voltage range:	0.9 ... 1.1 U_N
Nominal consumption:	DC approx. 1.7 W
Min. Off-time:	250 ms
Control voltage on S11 at U_N:	DC 22.5 V
Control current /typ.) over S12 or S22:	35 mA at U_N
Min. voltage between terminals S12, S22 when relay activated:	DC 19 V
Short-circuit protection:	Internal PTC
Overvoltage protection:	Internal VDR
Output	

Contacts	
LG 5925.02/920:	2 NO contacts
LG 5925.04/920:	4 NO contacts
LG 5925.48/920:	3 NO contacts, 1 NC contact

The NO contacts are safety contacts.
The NC contacts 41-42 can only be used for monitoring

Operate delay typ. at U_N:	
Manual start:	20 ms
Automatic start:	350 ms
Release delay typ. at U_N:	
Disconnecting the supply:	20 ms
Disconnecting S12, S22:	15 ms
Contact type:	Forcibly guided
Nominal output voltage:	AC 250 V
Thermal current I_{th}:	
max. 8 A per contact see quadratic total current limit curve	
Switching capacity	
to AC 15:	
NO contacts:	3 A / AC 230 V IEC/EN 60947-5-1
NC contacts:	2 A / AC 230 V IEC/EN 60947-5-1
to DC 13:	
NO contacts:	2 A / DC 24 V IEC/EN 60947-5-1
NC contacts:	2 A / DC 24 V IEC/EN 60947-5-1
to DC 13:	
NO contact:	4 A / DC 24 V at 0.1 Hz
NC contact:	4 A / DC 24 V at 0.1 Hz
Electrical life	
at 5 A, AC 230 V $\cos \varphi = 1$:	> 2.2 x 10 ⁵ switching cycles
Permissible operating frequency:	max. 1200 switching cycles / h
Short circuit strength	
max. fuse rating:	10 A gG / gL IEC/EN 60947-5-1
line circuit breaker:	B 6 A
Mechanical life:	> 20 x 10 ⁶ switching cycles

Technical Data	
General Data	
Operating mode:	Continuous operation
Temperature range	
Operation:	- 25 ... + 55 °C
Storage :	- 40 ... + 85 °C
Altitude:	≤ 2000 m
Clearance and creepage distances	
rated impuls voltage / pollution degree:	4 kV / 2 (base insulation) IEC 60 664-1 IEC/EN 62061
EMC	
Interference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm IEC/EN 60068-2-6 frequency 10 ... 55 Hz
Climate resistance:	25 / 055 / 04 IEC/EN 60068-1
Terminal designation:	EN 50005
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals
Mounting:	DIN rail IEC/EN 60715
Weight:	220 g
Dimensions	

Width x height x depth	
LG 5925/920:	22.5 x 90 x 121 mm
LG 5925/920 PC:	22.5 x 111 x 121 mm
LG 5925/920 PS:	22,5 x 104 x 121 mm

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
Ambient temperature:	- 25 ... + 55 °C
Switching capacity	
LG 5925.04/920	
Ambient temperature 35°C:	Pilot duty B300 8A 250Vac Resistive 8A 24Vdc Resistive or G.P.
Ambient temperature 55°C:	Pilot duty B300 4A 250Vac Resistive 4A 24Vdc Resistive or G.P.
LG 5925.02/920, LG 5925.48/920	
Ambient temperature 45°C:	Pilot duty B300 8A 250Vac Resistive 8A 24Vdc Resistive or G.P.
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 5925.48/920/61 DC 24 V

Article number:

0063683

• Output:

3 NO contacts, 1 NC contact

• Nominal voltage U_N :

DC 24 V

• Width:

22.5 mm

Ordering Example

LG 5925 /920 /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

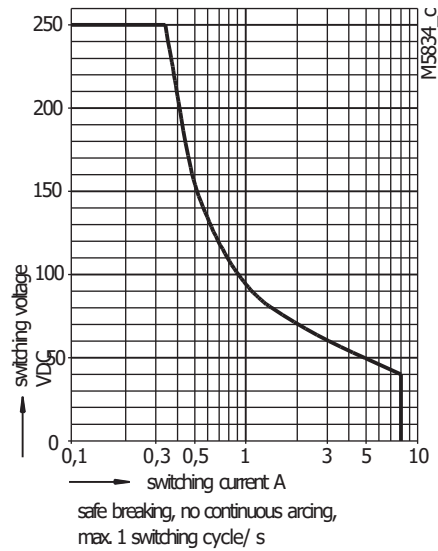
PS (plug in screw):

Pluggable terminal blocks
with screw terminals

Contacts

Type

Characteristics



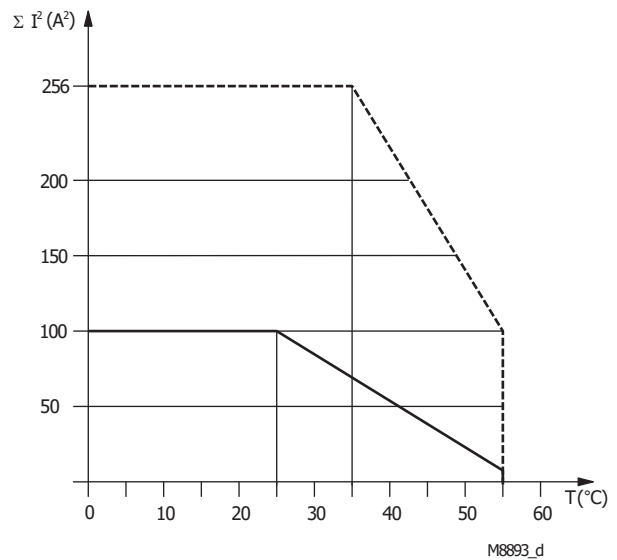
Arc limit curve under resistive load

Troubleshooting

Failure	Potential cause
LED "Power" does not light up	- Power supply not connected
LED "K1" lights up, but "K2" remains off	- Safety relay K1 is welded (replace device) - A 1-channel switch-off occurred on S12 (switch channel off on S22)
LED "K2" lights up, but "K1" remains off	- Safety relay K2 is welded (replace device) - A 1-channel switch-off occurred on S22 (switch channel off on S12)
Device cannot be activated	- Safety relay K2 is welded (replace device) - Incorrect setting of switch S2 - Manual start mode: Line fault on start-button (disconnect power supply and remove fault) - Automatic start mode: S33-S34 not bridged

Maintenance and repairs

- The device contains no parts that require maintenance.
- In case of failure, do not open the device but send it to manufacturer for repair.



device mounted away from
heat generation components.
Max. current at 55 $^{\circ}C$ over
4 contact path = $5A \cdot 4 = 20A$
 $4 \text{ contact path} = 5A \cdot 4 = 20A$
 $4 \text{ contact path} = 5A \cdot 4 = 20A$

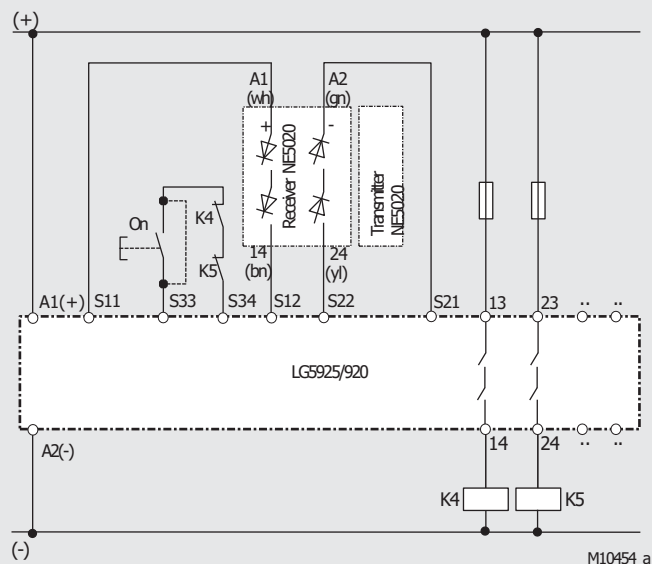
device mounted without distance heated by
devices with same load,
Max. current at 55 $^{\circ}C$ over
4 contact path = $4A \cdot 4 = 16A$
 $4 \text{ contact path} = 4A \cdot 4 = 16A$

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

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

Quadratic total current limit curve

Application Examples



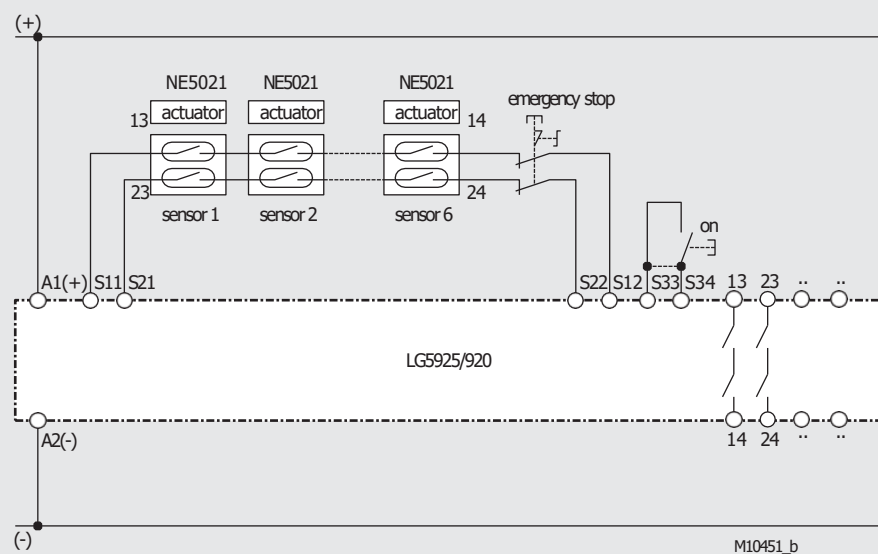
With safety switch NE 5020. Contact reinforcement by external contactors. 2-channel operation, cross fault detection

Please note: Refer to „Unit programming“!

Switches in position: S1 cross fault detection
S2 manual start

With autostart link On-button and set S2 to „automatic“.

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



6 safety switches NE 5021 + 1 E-stop button in series. 2-channel operation, cross fault detection

Please note: Refer to „Unit programming“!

Switches in position: S1 cross fault detection
S2 manual start

With autostart link On-button and set S2 to „automatic“.

Suited up to SIL3, Performance Level e, Cat. 3