



SAFEMASTER
Delay module,
release delayed
LG 7928

Translation
of the original instructions



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Contents

Symbol and Notes Statement.....	11
General Notes	11
Designated Use	11
Safety Notes	11
Product Description	13
Function Diagram	13
Block Diagram	13
Approvals and Markings	13
Applications	13
Indicators	13
Circuit Diagrams	13
Connection Terminals	13
Technical Data	14
Technical Data	14
UL-Data	14
Standard Type.....	14
Ordering Example	15
Troubleshooting	15
Maintenance and repairs	15
Characteristic.....	15
Application Examples	16
Mounting / disassembly of the PS / PC-terminal blocks	26
Safety Related Data	27
CE-Declaration of Conformity.....	28



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



Keep instructions for future reference



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.

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 7928 is used for delayed stopp of a movement or to control the stop of parts of machines.

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.
- To achieve the safety levels stated under features, a the supervising control must check the NC contact 55/56 before starting to make sure that both relays (Kt1 and Kt2) are switched off.
- Opening the device or implementing unauthorized changes voids any warranty

SAFEMASTER Delay Module, Release Delayed LG 7928



Your advantage

- Easy to realise safe timing circuits
- 4 forcibly guided output contacts at only 22.5 mm width

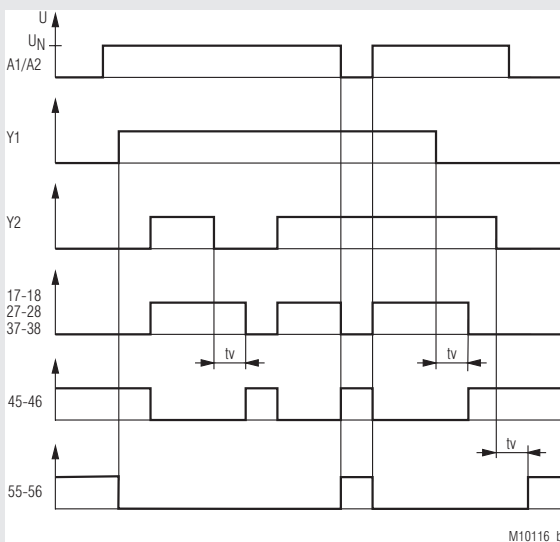
Features

- Can be used in conjunction with a suitable switchgear / control unit in safety applications as follows:
 - Up to PL d and category 3 according to EN ISO 13849-1
 - Up to SIL 2 according to EN 61508 and EN 61511
- Adjustable time delay
- As option fixed time delay
- High long life stability due to digital time base
- Adjustable with or without cross fault detection
- Output: 3 NO contacts + 1 NC contact + 1 forcibly guided feedback contact or 4 NO contacts + 1 forcibly guided feedback contact
- LED indicator for channel 1, 2 and operation voltage
- 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

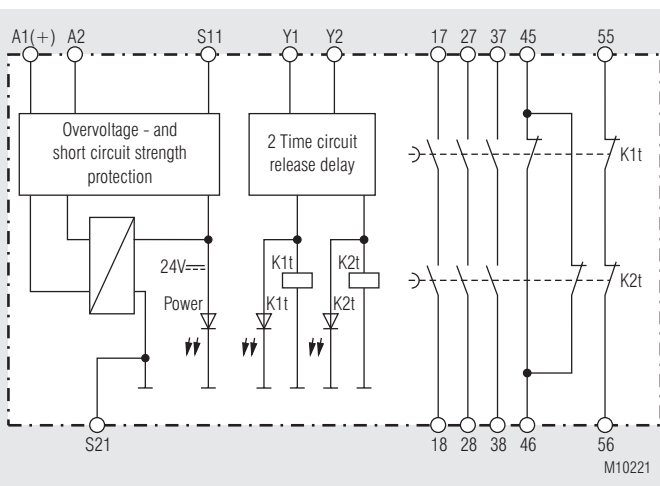
Product Description

The LG 7928 can be used for delayed stopp with status request of the safety relays (Stop category 1 acc. to DIN EN 60204-1) or controlled stopping of plant components.

Function Diagram



Block Diagram



Approvals and Markings



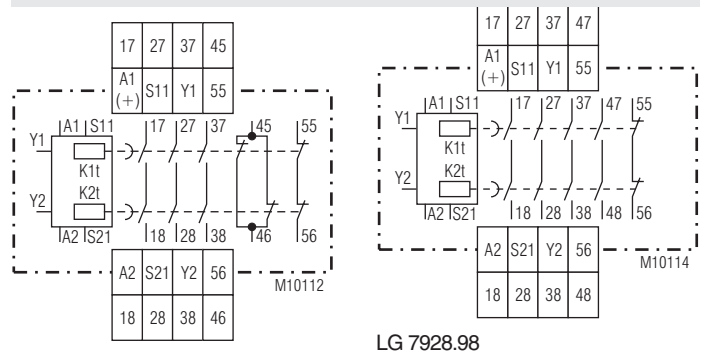
Applications

- Delayed disconnection with the possibility for status check of the safety relays, stop category 1 according to DIN EN 60204-1
- Controlled stop of system parts

Indicators

- Upper LED: On, when supply connected
- Lower LED: On, when relay K1t and K2t energized

Circuit Diagrams



LG 7928.97

LG 7928.98

Connection Terminals

Terminal designation	Signal description
A1 (+)	+ / L
A2 (-)	- / N
S11, S21	Inputs
Y1, Y2	Outputs
17, 18, 27, 28, 37, 38, 47, 48	Positive driven NO contacts for release circuit
45, 46	Positive guided indicator output
55, 56	Positive guided feedback circuit

Technical Data

Input

Nominal voltage U_N:	DC 24 V AC/DC 24 V
Voltage range:	0.9 ... 1.1 U_N
Nominal frequency:	50 / 60 Hz
Nominal consumption:	Typ. DC 2.0 W typ. AC 3.5 VA
Control voltage on S11:	Min. DC 20 V at U_N
Control current in Y1, Y2:	Typ. DC 2,2 mA at U_N typ. AC 3,1 mA at U_N
Short-circuit protection:	Internal with PTC
Überspannungsschutz:	Internal with VDR

Output

Contacts	
LG 7928.97:	3 NO contacts, 2 NC contacts
LG 7928.98:	4 NO contacts, 1 NC contacts

ATTENTION! The NC contacts 45-46 can only be used for monitoring.

Contact type:	Forcibly guided	
Release delay typ. at U_N:	35 ms	
Disconnecting the supply:	40 ms	
Disconnecting Y1, Y2:		
Time delay t_v:	Adjustable	Fixed
	0.1 ... 1 s	1 s
	0.3 ... 3 s	3 s
	0.5 ... 5 s	5 s
	1.0 ... 10 s	10 s
	3.0 ... 30 s	30 s
	6.0 ... 60 s	60 s
	30.0 ... 300 s	300 s
	60.0 ... 600 s	600 s
	Other time ranges on request	
Repeat accuracy:	± 1% of setting value	
Thermal current I_{th}:	Max. 5 A (see quadratic total current limit curve)	

Switching capacity

NO contact:	3 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	2 A / AC 230 V	IEC/EN 60947-5-1
to DC 13		
NO contact:	2 A / DC 24 V	IEC/EN 60947-5-1
NC contact:	2 A / DC 24 V	IEC/EN 60947-5-1
to DC 13		
NO contact:	4 A / 24 V at 0.1 Hz	
NC contact:	4 A / 24 V at 0.1 Hz	

Electrical life:

at 5 A, AC 230 V cos. $\varphi = 1$: > 2.2 x 10⁵ switch. cycl. IEC/EN 60947-5-1

Permissible switching frequency:

Max. 2000 switching cycles / h with manual restart and short release delay time

Short circuit strength

Max. fuse rating: 6 A gG / gL IEC/EN 60947-5-1

Mechanical life:

20 x 10⁶ switching cycles

Technical Data

General Data

Nominal operating mode:	Continuous operation	
Temperatur range		
Operation:	- 15 ... + 55 °C	
Storage:	- 25 ... + 85 °C	
Altitude:	≤ 2000 m	
Clearance and creepage distance		
Rated impulse voltage / pollution degree:	4 kV / 2	IEC 60664-1
EMC		
EN 61326-3-1		
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 VO behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm Frequency 10 ... 55 Hz, IEC/EN 60068-2-6 15 / 055 / 04 IEC/EN 60068-1	
Climate resistance:		
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:	Approx. 190 g	

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 : AC/DC 24 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:

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

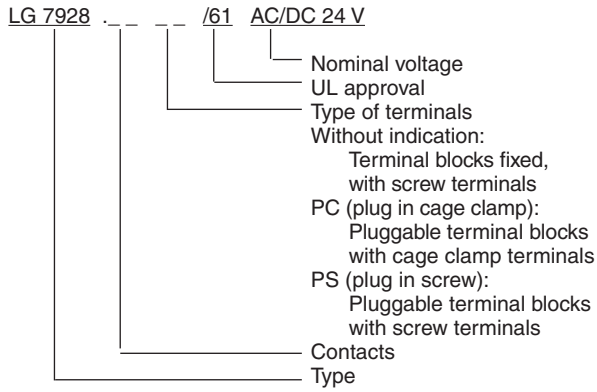


Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

LG 7928.97/61	AC/DC 24 V	1 ... 10 s
Article number:	0062796	
• Output:	3 NO contacts, 2 NC contacts	
• Nominal voltage U_N :	AC/DC 24 V	
• Time delay t_v :	1 ... 10 s	
• Width:	22.5 mm	

Ordering Example



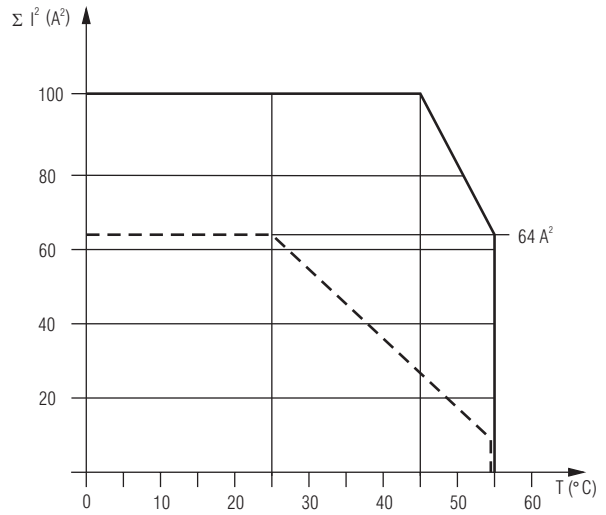
Troubleshooting

Failure	Potential cause
LED "Power" does not light up	Power supply A1/A2 not connected
LED "K1t" lights up, but "K2t" remains off	- Signal on Y2 is not present - Wrong setting of operation mode (cross fault detection)
LED "K2t" lights up but "K1t" remains off	- Signal on Y1 is not present
Device cannot be activated	Safety relay is welded (replace device)

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.

Characteristic



M10191

— AC/DC 24V device mounted on distance with air circulation.
Max. current at 55°C over 4 contactrows = 4A \cong 4x4²A²=64A²

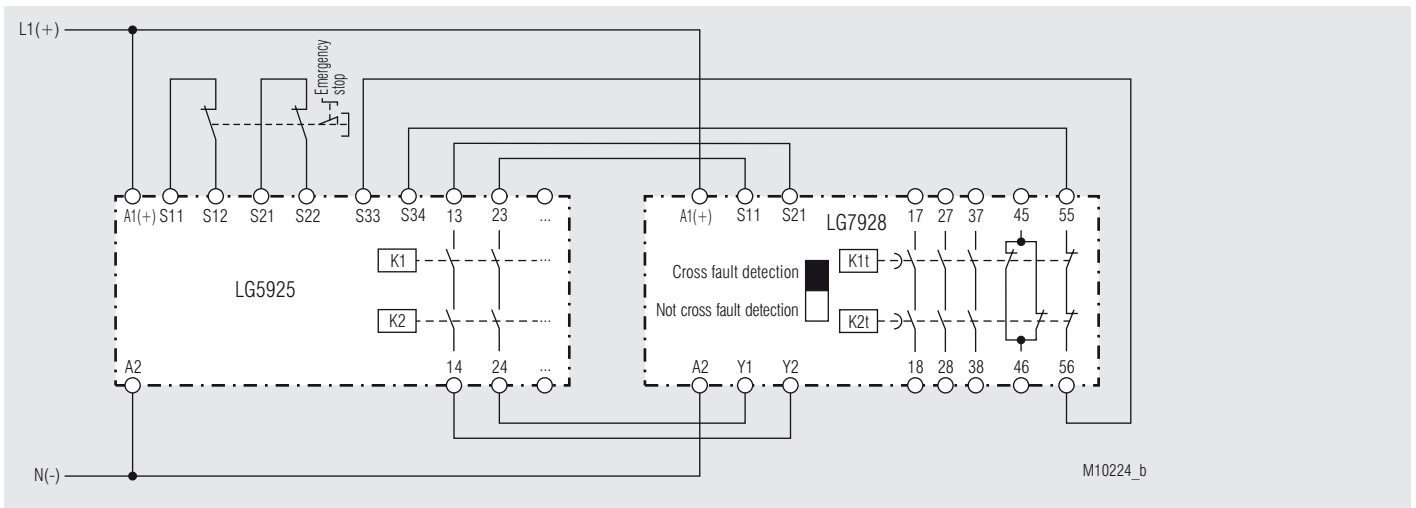
- - - AC/DC 24V device mounted without distance heated by devices with same load.
Max. current at 55°C over 4 contactrows = 1,5A \cong 4x1,5²A²=9A²

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

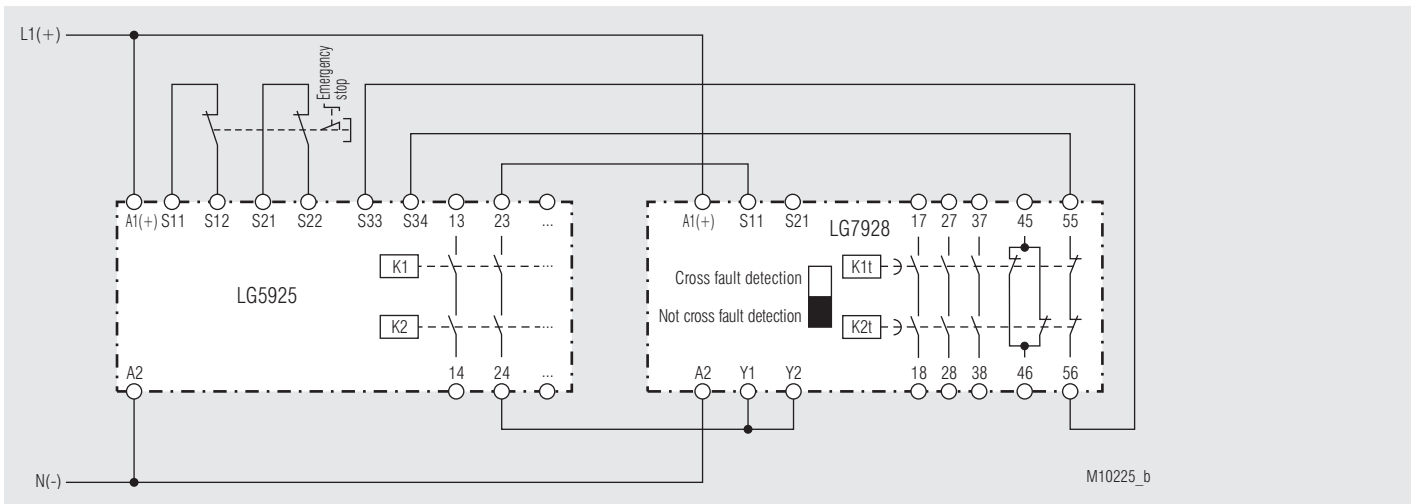
I_1, I_2, I_3, I_4 - Current in contact paths

quadratic total current limit curve

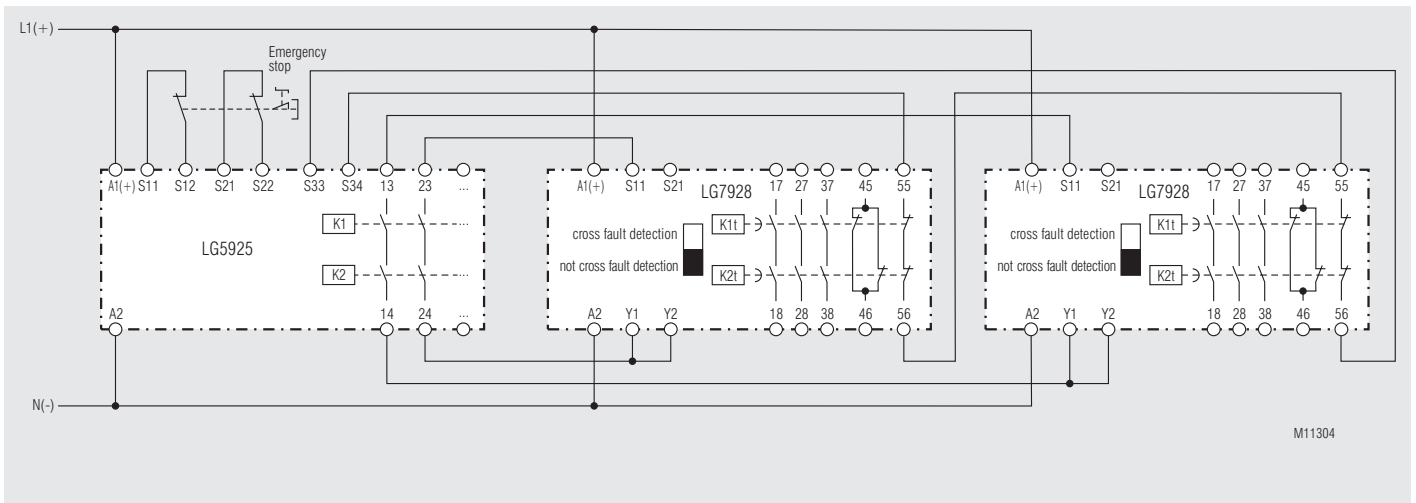
Application Examples



LG 5925 with LG 7928, cross fault detection, suitable up to SIL 2, Performance Level d, Cat. 3



LG 5925 with LG 7928, non cross fault detection, suitable up to SIL 2, Performance Level d, Cat. 3



LG 5925 with two LG 7928, non cross fault detection, suitable up to SIL 2, Performance Level d, Cat. 3