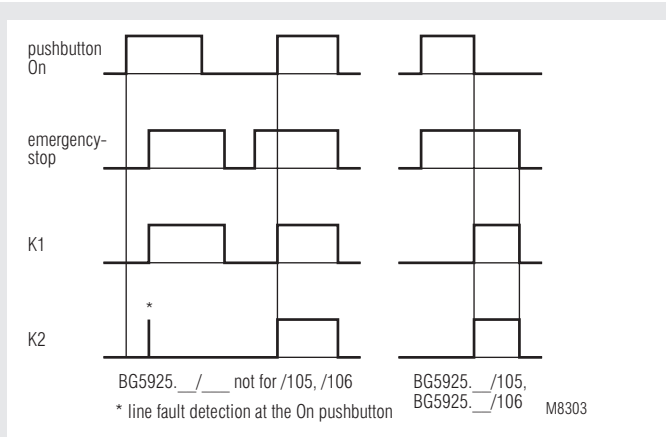




- According to
 - SIL-Claimed Level (SIL CL) 3 to EN 62061
 - Performance Level (PL) e to DIN EN ISO 13849-1
 - Category 4 to EN 954-1
- Output: max. 3 NO contacts, see contacts
- Single and 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart when connecting the supply voltage, switch S2
- With or without cross fault monitoring in the E-stop loop, switch S1
- 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 (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function diagram



Approvals and marking



1) valid to 31.12.2009; 2) pending * see variants

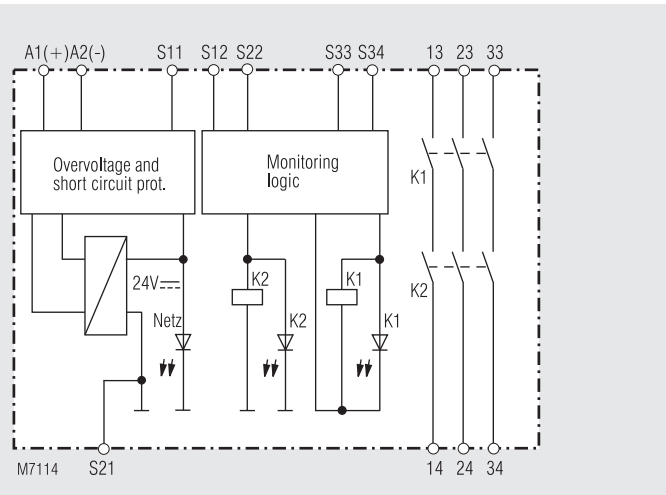
Applications

- Protection of people and machines
- Emergency stop circuits on machines
 - Monitoring of safety gates
 - Control unit for lightbars

Indicators

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

Block diagram



Notes

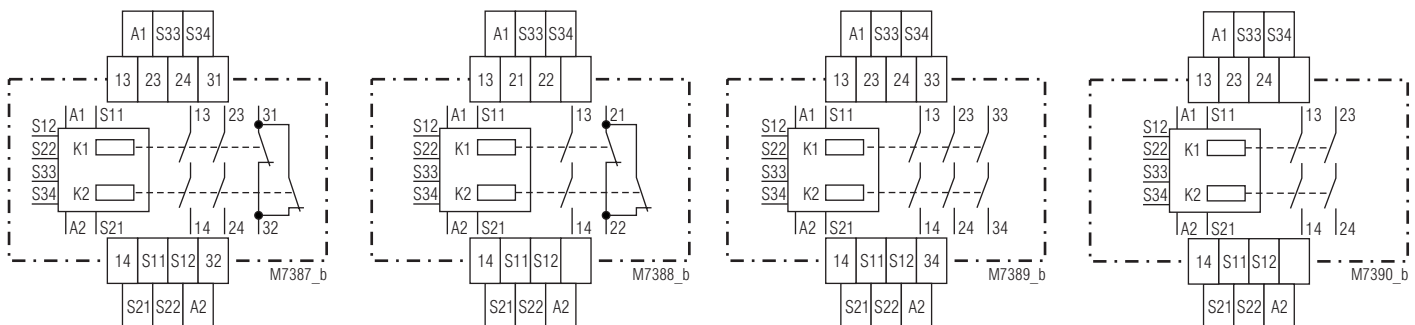
The category of a safety relevant part of a control circuit according to EN 954-1 can be different to the category 4 of the E-stop module BG 5925 depending on the external connections.

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. 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 gold plated contacts of the BG 5925 mean that this module is also suitable for switching small loads of 1 mVA - 7 VA, 1 mW - 7 W in the range 0.1 - 60 V, 1 - 300 mA. The contacts also permit the maximum switching current. However since the gold plating will be burnt off at this current level, the device is no longer suitable for switching small loads after this.

Circuit diagrams



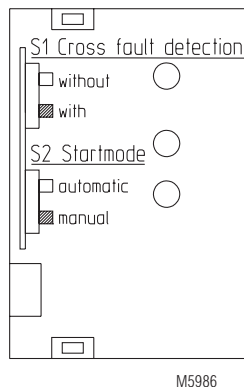
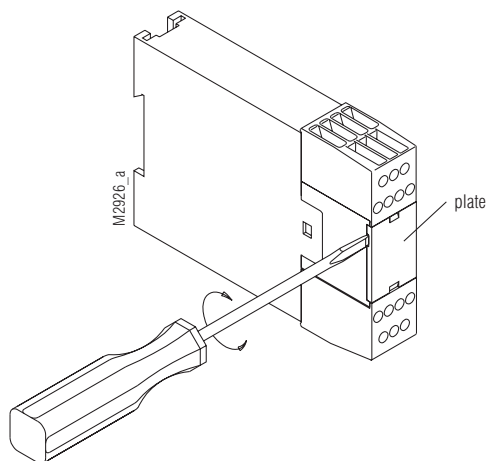
BG 5925.22

BG 5925.16

BG 5925.03

BG 5925.02

Unit programming



	S1	S2
	available in unit	
BG 5925	yes	yes
BG 5925._ _/101	yes	yes
BG 5925._ _/105	no	yes
BG 5925._ _/106	no	yes
BG 5925._ _/113	no	no
BG 5925._ _/114	no	no

Disconnect unit before setting of S1
Drawing shows setting at the state of delivery

Notes

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. 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:	DC 24 V, AC/DC 24 V AC 230 V with variant /105 and /106	
Voltage range	DC	AC/DC
at 10% residual ripple:	0.9 ... 1.1 U_N	0.95 ... 1.1 U_N
at 48% Residual ripple:	0.8 ... 1.1 U_N	0.8 ... 1.1 U_N
AC:	—	0.85 ... 1.1 U_N
Nominal consumption:	DC approx. 2 W	
Min. Off-time:	250 ms	
Control voltage on S11:	DC 23 V at U_N	
Control current over S12, S22:	40 mA at U_N	
Min. voltage between terminals S12, S22 and S21:	DC 21 V when relay activated and U_N on A1 - A2	
Short-circuit protection:	Internal PTC	
Overvoltage protection:	Internal VDR	

Output

Contacts	
BG 5925.02:	2 NO contacts
BG 5925.03:	3 NO contact
BG 5925.16:	1 NO, 1 NC contact
BG 5925.22:	2 NO, 1 NC contact
	The NO contacts are safety contacts.
	ATTENTION! The NC contacts 21-22 or 31-32 can only be used for monitoring.
Operate delay typ. at U_N:	
Manual start:	40 ms
automatic start:	250 ms
BG 5925._ _/101:	100 ms

Technical Data

Release delay typ. at U_N :

Disconnecting the supply:

Disconnecting S12, S22:

Contact type:

Nominal output voltage:

50 ms
15 ms
positive guided
AC 250 V
DC: see limit curve for arc-free operation

Switching of low loads:

(contact 5 μ Au)

(contact AgNi)

Thermal current I_{th} :

on 1 contact path:

max. 5 A
see current limit curve

Switching capacity

to AC 15:

AC 3 A / 230 V IEC/EN 60 947-5-1

for NO contacts

AC 2 A / 230 V IEC/EN 60 947-5-1

for NC contacts

DC 2 A / 24 V IEC/EN 60 947-5-1

for NC contacts

to DC 13:

to DC 13

NO contacts:

8 A / 24 V > 10⁵

ON: 0.4 s, OFF: 9.6 s

Electrical contact life

to AC 15 at 2 A, AC 230 V:

to DC 13 at 2 A, DC 24 V:

10⁵ switching cycles IEC/EN 60 947-5-1

> 1.5 x 10⁵ switching cycles

Permissible operating frequency:

max. 1 200 operating cycles / h

Short circuit strength

max. fuse rating:

line circuit breaker:

6 A general-purpose IEC/EN 60 947-5-1

C 8 A

Mechanical life:

10 x 10⁶ switching cycles

General Data

Operating mode:

Continuous operation

Temperature range:

- 15 ... + 55 °C

Clearance and creepage distances

rated impuls voltage /

pollution degree:

4 kV / 2

IEC 60 664-1

EMC

Electrostatic discharge:

HF irradiation:

Fast transients:

Surge voltages

between

wires for power supply:

between wire and ground:

Interference suppression:

Degree of protection

Housing:

Terminals:

Housing:

Vibration resistance:

Climate resistance:

Terminal designation:

1 kV

2 kV

Limit value class B

IP 40

IP 20

Thermoplastic with V0 behaviour

according to UL subject 94

Amplitude 0.35 mm IEC/EN 60 068-2-6

frequency 10 ... 55 Hz

15 / 055 / 04

IEC/EN 60 068-1

EN 50 005

Technical data

Wire connection:	1 x 4 mm ² solid or 1 x 2.5 mm ² stranded ferruled (isolated) or 2 x 1.5 mm ² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm ² stranded ferruled DIN 46 228-1/-2/-3
Wire fixing:	Box terminal with wire protection, removable terminal strips
Mounting:	DIN rail IEC/EN 60 715
Weight:	220 g

Dimensions

Width x height x depth: 22.5 x 84 x 121 mm

Safety related data

Probability of dangerous Failure per Hour (PFH_D):	9.90 · 10 ⁻¹⁰ 1/h
Safe Failure Fraction (SFF):	99.0 %
Proof Test Intervall (T1):	20 Years



The values stated above are valid for the standard type. Safety data for other variants are available on request

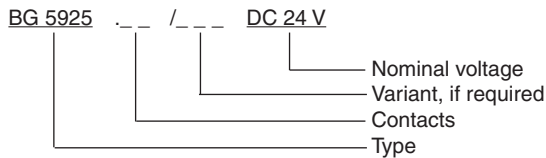
Standard type

BG 5925.03 AC/DC 24 V	
Article number:	0049169
• Output:	3 NO contacts
• Nominal voltage U _N :	AC / DC 24 V
• Width:	22.5 mm

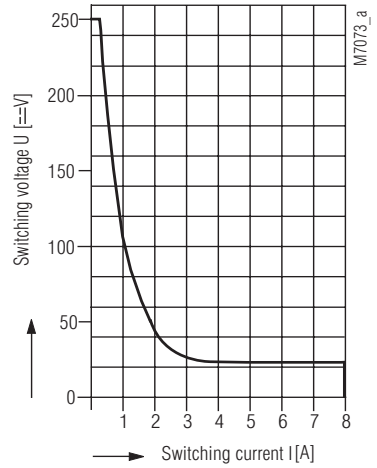
Variants

BG 5925.___/60:	CSA/UL approval
BG 5925.___/101:	E-stop with fast automatic start without line fault detection on the ON-button
BG 5925.___/105:	With switch S1 and without crossfault monitoring for AC 230 V
BG 5925.___/106:	With switch S2 and with crossfault monitoring for AC 230 V
BG 5925.02/113:	Manual restart, with crossfault monitoring for DC 24 V Switching capacity to AC 15: 5 A / 230 V Contact fuse 6 A fast / 4 A slow without internal switches S1 and S2
BG 5925.02/114:	Automatic restart, with cross fault monitoring for DC 24 V Switching capacity to AC 15: 5 A / 230 V Contact fuse 6 A fast / 4 A slow without internal switches S1 and S2

Ordering example for Variants

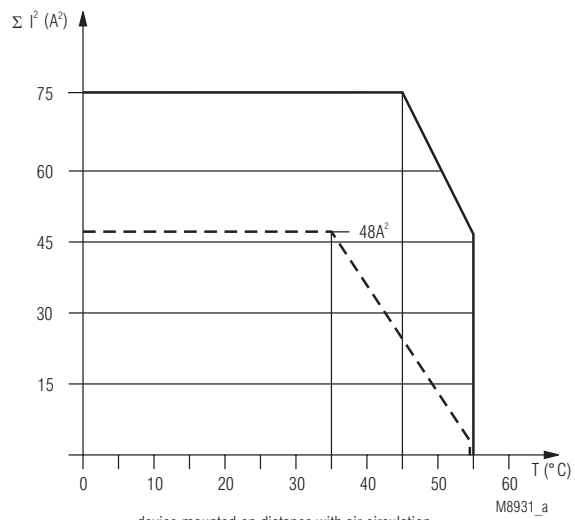


Characteristics



safe breaking, no continuous arcing under the curve, max. 1 switching cycle/s

Arc limit curve under resistive load



device mounted on distance with air circulation. max. current at 55°C over 3 contactrows = 4A $\cong 3 \times 4^2 \text{A}^2 = 48 \text{A}^2$

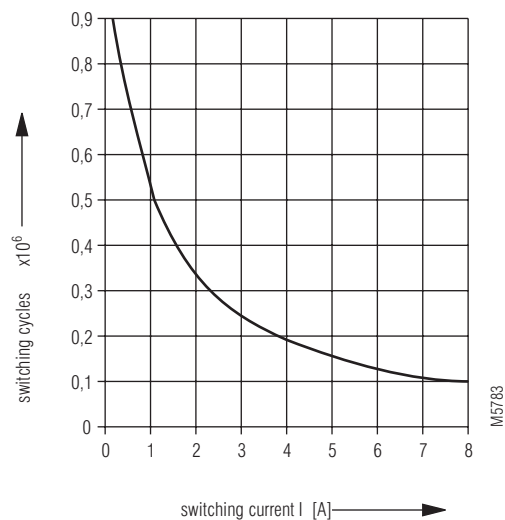
device mounted without distance heated by devices with same load, max current at 55°C over 3 contactrows = 1A $\cong 3 \times 1^2 \text{A}^2 = 3 \text{A}^2$

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

I₁, I₂, I₃ - current in contactrows

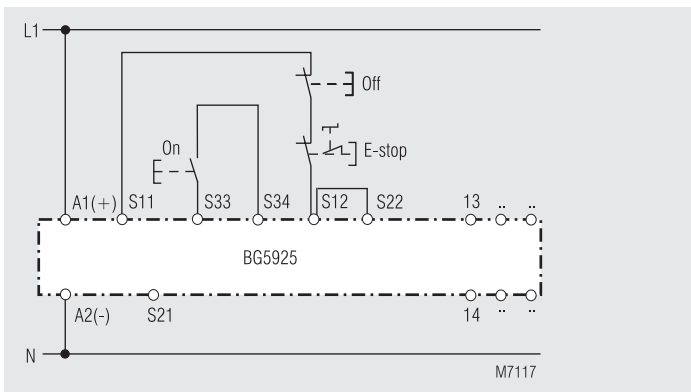
Quadratic total current limit curve

electric life DC13 24V DC / t_{on} 0,4s; t_{off} 9,6s
2 contacts in series



Contact service life

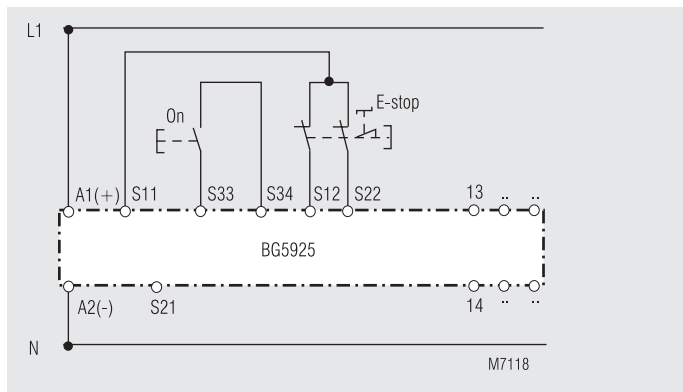
Application examples



Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.

Note: Refer to „Unit programming“!

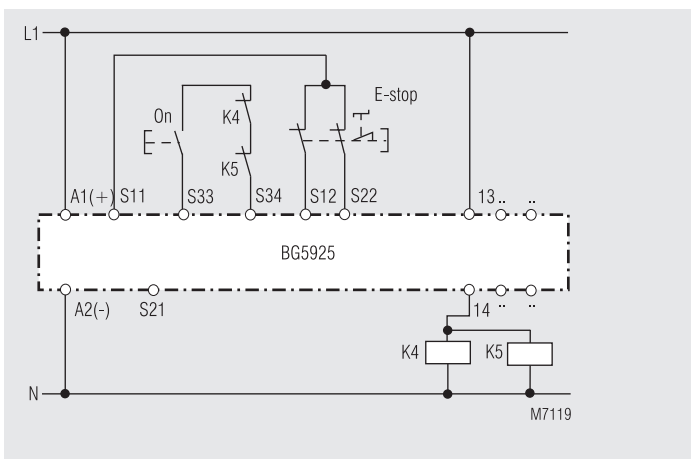
Switches in pos.: S1 no cross fault detection
S2 manual start



2-channel emergency stop circuit without cross fault monitoring.

Note: Refer to „Unit programming“!

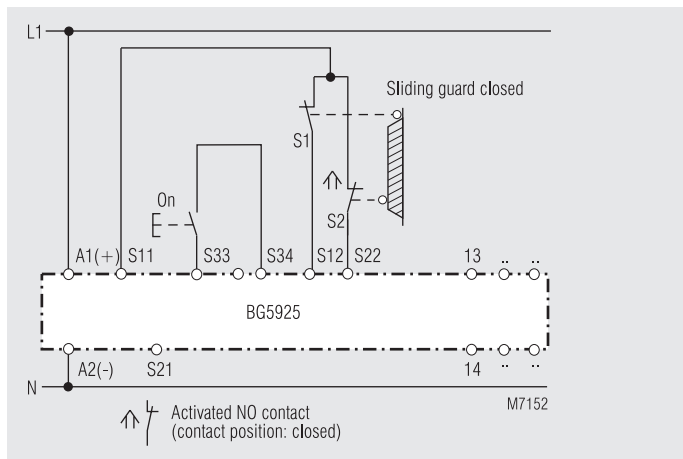
Switches in pos.: S1 no cross fault detection
S2 manual start



Contact reinforcement by external contactors controlled by one contact path.

Note: Refer to „Unit programming“!

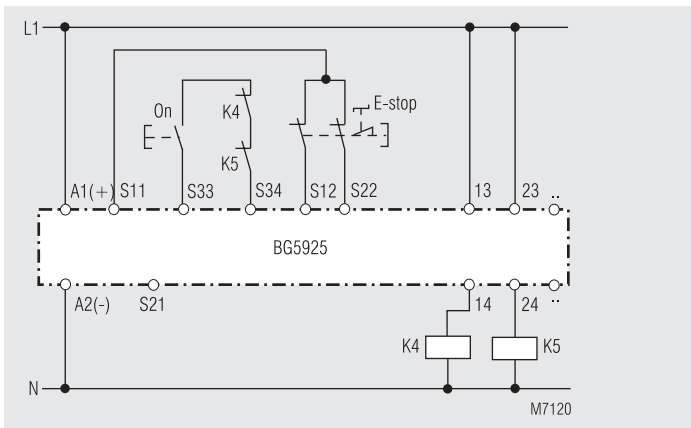
Switches in pos.: S1 no cross fault detection
S2 manual start



2-channel safety gate monitoring.

Note: Refer to „Unit programming“!

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



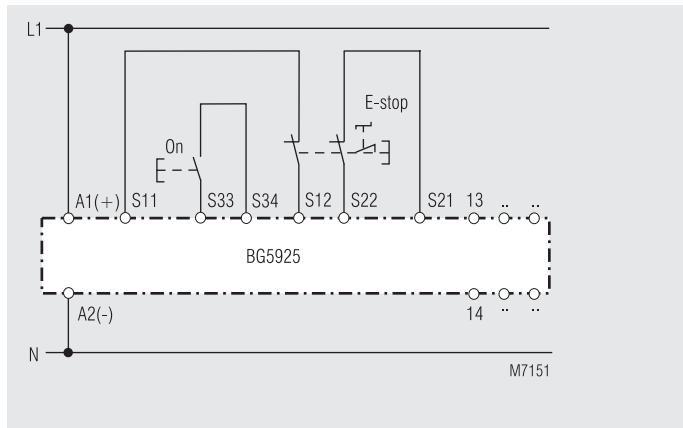
Contact reinforcement by external contactors, 2-channel controlled.

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 with cross fault detection

Note: Refer to „Unit programming“!

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