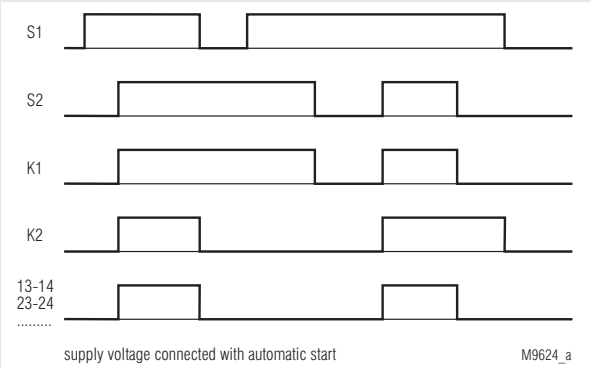
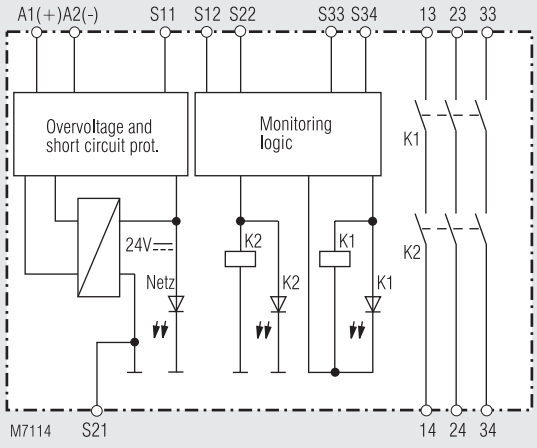
SAFEMASTER
Safety Module for Elevator Controls
BG 5925._ _/034

0255083

Function Diagram



Block Diagram



- **According to**
  - **Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008**
  - **SIL Claimed Level (SIL CL) 3 to IEC/EN 62061**
  - **Safety Integrity Level (SIL) 3 to IEC/EN 61508**
  - **Directive 95/16/EG and DIN EN 81-1,-2:2010**
- Output: max. 2 NO contacts, see contacts
- Single and 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart, 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

Approvals and Marking

CE | TÜVRheinland CERTIFIED – Functional Safety Type Approved – www.tuv.com ID 0600000000 | c UL us LISTED – Canada / USA

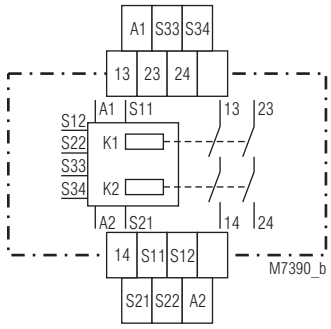
Applications

To readjust the elevator cabin position while the doors are open on load change when entering or leaving the cabin.

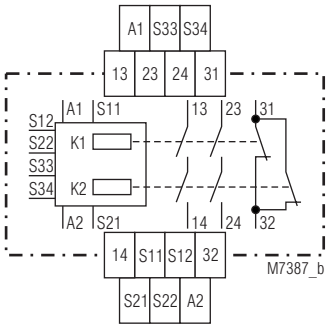
Indicators

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

Circuit Diagrams



BG 5925.02

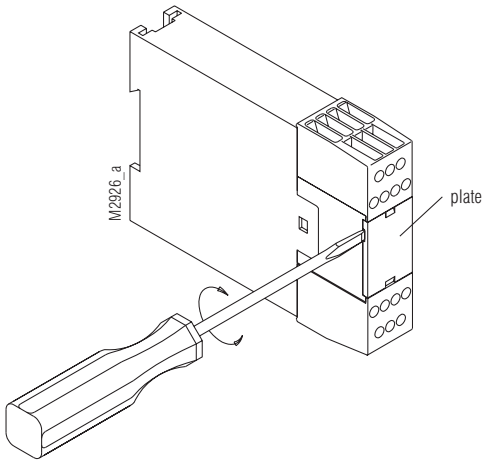


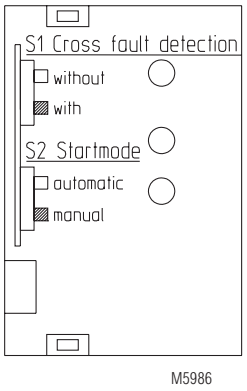
BG 5925.22

Connection Terminals

Terminal designation	Signal designation
A1+	+ / L
A2	- / N
S12, S22, S33, S34	Inputs
S11, S21	Outputs
13, 14, 23, 24	Positive driven NO contacts for release circuit
31, 32	Positive guided indicator output

Unit Programming





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

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. 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.
The terminal S21 permits the operation of the device in IT-systems with insulation monitoring.
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, between S_{pos} 1 and S_{pos} 2 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 between S_{pos} 1 and S_{pos} 2 are 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.

This unit has to be mounted in a cabinet with protection class IP 54.

Technical Data

Input circuit

Nominal Voltage U_N:	DC 24 V, AC/DC 24 V	
Voltage range	DC	AC/DC
at 10% residual ripple:	0.9 ... 1.1 U_N	0.95 ... 1.1 U_N
at 48% Rresidual ripple:	0.8 ... 1.1 U_N	0.8 ... 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 5925.22:	2 NO, 1 NC contact

The NO contacts are safety contacts.
ATTENTION! The NC contact 31-32 can only be used for monitoring

Operate delay typ. at U_N:		
Manual start:	40 ms	
automatic start:	250 ms	
Release delay typ. at U_N:		
Disconnecting the supply:	50 ms	
Disconnecting S12, S22:	15 ms	
Contact type:	forcibly guided	
Nominal output voltage:	AC 160 V DC: see limit curve for arc-free operation	
Switching of low loads:	≥ 100 mV	
(contact 5 µ Au)	≥ 1 mA	
Thermal current I_{th}:	max. 5 A see current limit curve	
Switching capacity		
to AC 15:		IEC/EN 60 947-5-1
NO contact:	3 A / 160 V	
NC contact	2 A / 160 V	IEC/EN 60 947-5-1
to DC 13:		
NO contacts:	1 A / DC 24 V	IEC/EN 60 947-5-1
NC contacts:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical contact life		
to AC 15 at 2 A, AC 230 V:	10^5 switching cycles	IEC/EN 60 947-5-1
Permissible operating frequency:	max. 1 200 operating cycles / h	
Short circuit strength		
max. fuse rating:	6 A general-purpose	IEC/EN 60 947-5-1
line circuit breaker:	C 8 A	
Mechanical life:	10 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	0 ... + 65 °C	
Clearance and creepage distances		
rated impuls voltage / pollution degree:	4 kV / 3	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
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Enclosure:	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
Climate resistance:	15 / 055 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 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	
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

Values according to EN ISO 13849-1:

Category:	4	
PL:	e	
$MTTF_d$:	236.3	a
DC / 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:	3	IEC/EN 62061
SIL	3	IEC/EN 61508
HFT:	1	
DC / DC_{avg}:	99.0	%
SFF	99.7	%
PFH_D:	1.97E-10	h^{-1}
T_1:	20	a (year)

*) 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/DC 24 V
Ambient temperature:	0 … +65°C
Switching capacity:	
Ambient temperature 45°C	Pilot duty B300 5A 160Vac Resistive 5A 24Vdc Resistive or G.P.
Ambient temperature 55°C:	Pilot duty B300 1.5A 160Vac Resistive 1.5A 24Vdc Resistive or G.P.
Wire connection:	60°C / 75°C copper conductors only AWG 20 - 12 Sol Torque 0.8 Nm AWG 20 - 14 Str Torque 0.8 Nm

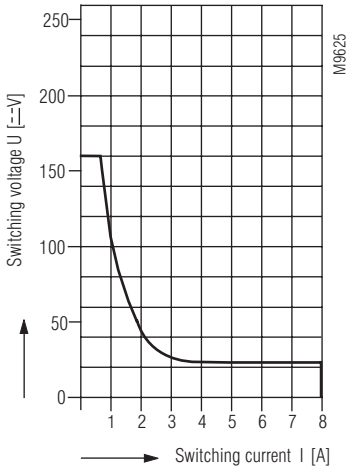
Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

BG 5925.03/61 AC/DC 24 V

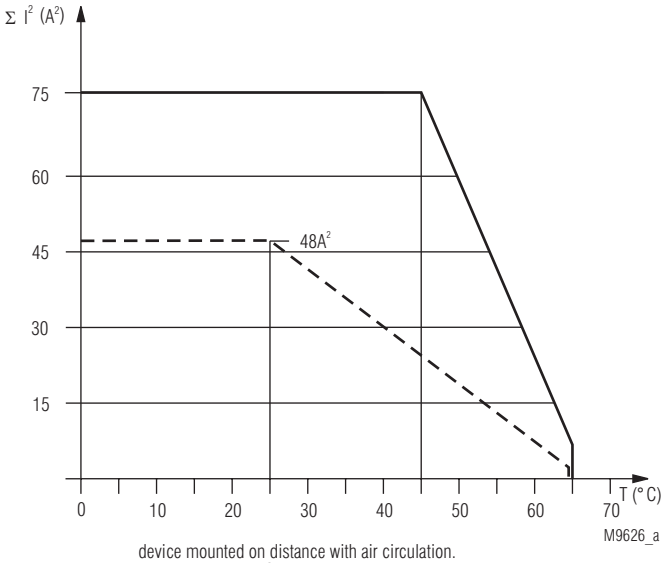
Article number:	0056748
• Output:	2 NO contacts
• Nominal voltage U_N:	AC / DC 24 V
• Width:	22.5 mm

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 65°C over
3 contactrows = 1,5A ≙ 3x1,5²A²=6,75A²

device mounted without distance heated by
devices with same load,
max current at 65°C over
3 contactrows = 0,5A ≙ 3x0,5²A²=0,75A²

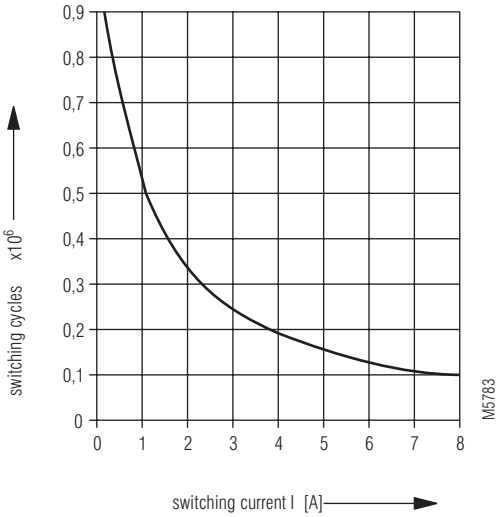
$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2$

I_1, I_2, I_3 - current in contactrows

Quadratic total current limit curve

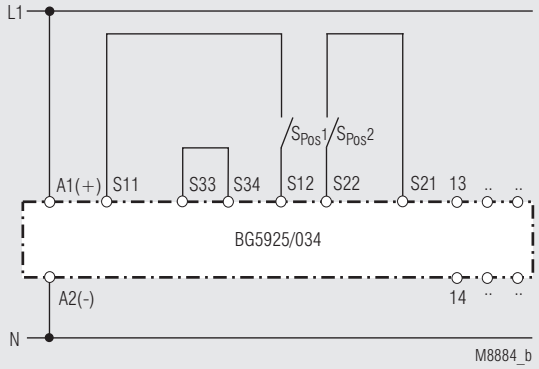
Characteristic

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



Contact service life

Application Example



2-channel application with cross fault detection.
Suited up to SIL3, Performance Level e, Cat. 4