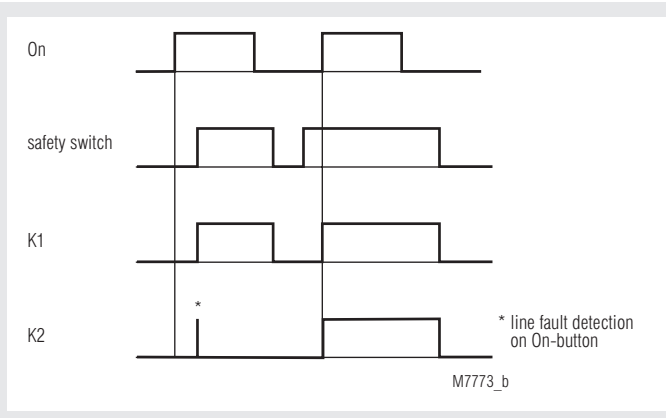


- According to
 - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
 - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
 - Safety Integrity Level (SIL) 3 to IEC/EN 61508
- to connect:
 - magnetic switch NE 5020
 - magnetic switch NE 5021
- Output: max. 3 NO contacts, see contacts
- 2-channel operation
- Line fault detection on On-button
- Manual restart or automatic restart, switch S2
- Cross fault monitoring
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Optionally with fast Auto start
- 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



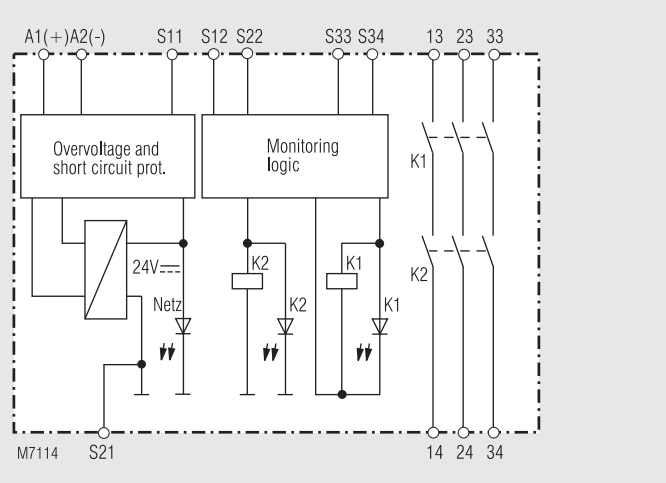
Additional information about this topic

- data sheet magnetic switch NE 5020
- data sheet magnetic switch NE 5021

Approvals and Marking



Block Diagram



Applications

- Protection of people and machines
- Monitoring of safety gates

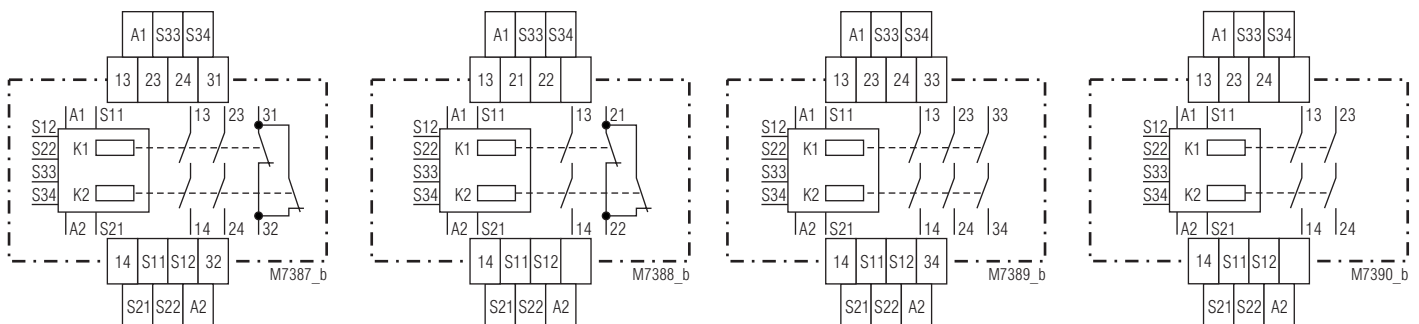
Indicators

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

Connection Terminals

Terminal designation	Signal designation
A1 (+)	+ / L
A2 (-)	- / N
S12, S22, S34	Inputs
S11, S21, S33	Outputs
13, 14, 23, 24, 33, 34	Forcibly guided NO contacts for release circuit
21, 22, 31, 32	Forcibly guided indicator output

Circuit Diagrams



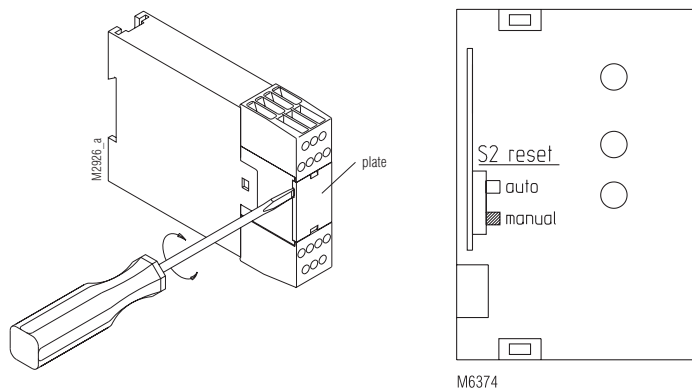
BG 5925.22/920

BG 5925.16/920

BG 5925.03/920

BG 5925.02/920

Unit Programming



Disconnect unit over switch S2.
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. (Cross fault detection between terminals S12-S22)

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.

Technical Data

Input

Nominal voltage U_N:	DC 24 V
Voltage range:	
at 10% residual ripple:	0.9 ... 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 19.5 V when relay activated and U_N on A1 - A2
Short-circuit protection:	Internal PTC
Overvoltage protection:	Internal VDR

Output

Contacts	
BG 5925.02/920:	2 NO contacts
BG 5925.03/920:	3 NO contacts
BG 5925.16/920:	1 NO contact, 1 NC contact
BG 5925.22/920:	2 NO contacts, 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
Release delay typ. at U_N:	
Disconnecting the supply:	50 ms
Disconnecting S12, S22:	15 ms
Contact type:	forcibly guided
Nominal output voltage:	AC 250 V
	DC: see limit curve for arc-free operation

Technical Data

Switching of low loads:	24 V, 10 mA	
Thermal current I_{th}:	max. 5 A	see current limit curve
Switching capacity 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:	1 A / DC 24 V	IEC/EN 60 947-5-1
NC contact:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical 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 switching cycles / h	
Short circuit strength		
max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
line circuit breaker:	C 8 A	
Mechanical life:	10 x 10 ⁶ switching cycles	

General Data

Operating mode:	Continuous operation
Temperature range	
operation:	- 15 ... + 55 °C
storage :	- 25 ... + 85 °C
altitude:	< 2.000 m
Clearance and creepage distances	
rated impuls voltage / pollution degree:	4 kV / 2 (basis insulation) 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
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz
Climate resistance:	15 / 055 / 04 IEC/EN 60 068-1
Terminal designation:	EN 50 005
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 terminals with M3.5 screws
Mounting:	DIN rail IEC/EN 60 715
Weight:	220 g

Dimensions

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

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} :	3.60E+03	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)

¹⁾ 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.

CSA-Data

Nominal voltage U_N:

BG 5925/920/60: DC 24 V

Ambient temperature: -15 ... +55°C

Switching capacity: 5A 230Vac

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



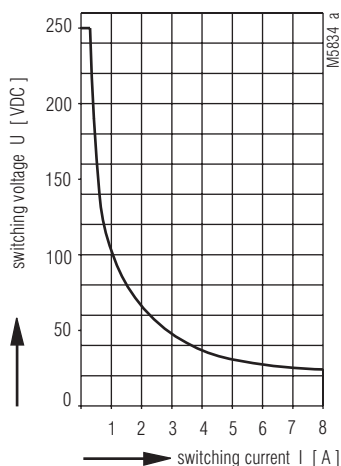
Technical data that is not stated in the CSA-Data, can be found in the technical data section.

Standard Type

BG 5925.22/920/60 DC 24 V

Article number: 0052272
 • Output: 2 NO contacts, 1 NC contact
 • Nominal voltage U_N: DC 24 V
 • Width: 22.5 mm

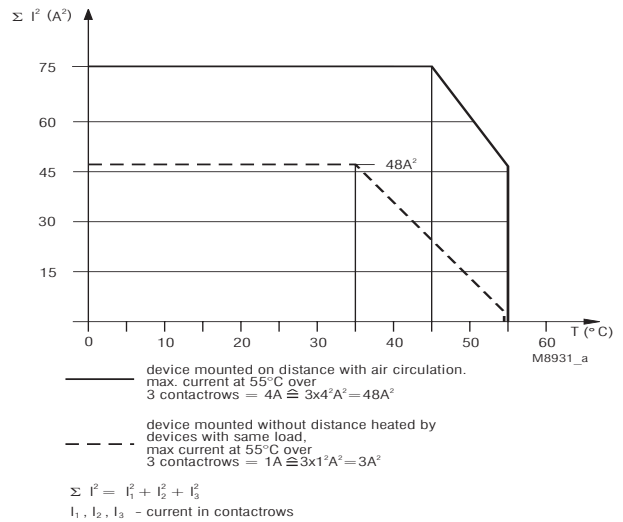
Characteristic



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

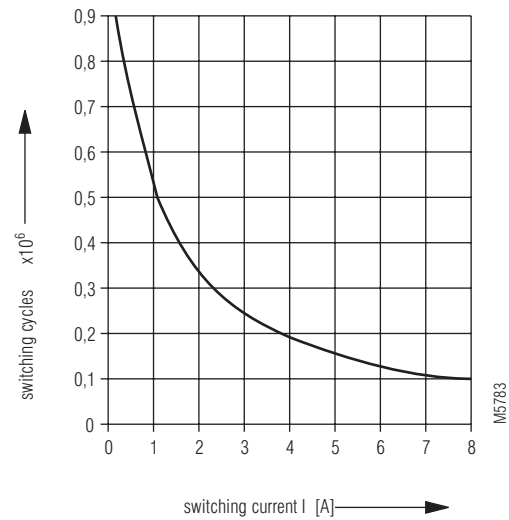
Arc limit curve under resistive load

Characteristics



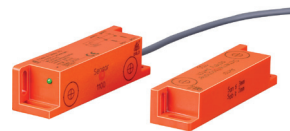
Quadratic total current limit curve

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



Contact service life

Accessories

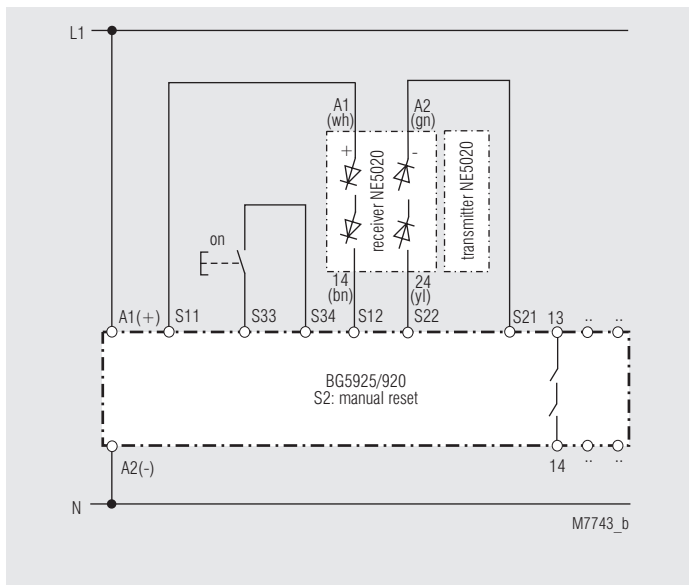


NE 5020.92
Article number: 0051641
magnetic switch coded, for DC 24 V,
with 2 semiconductor outputs

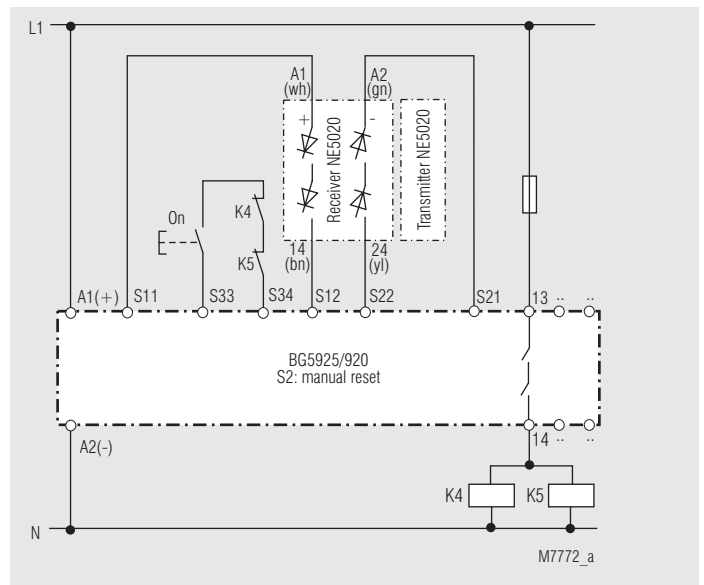


NE 5021.02
Article number: 0054695
magnetic switch coded, with
2 NO contacts (reed contacts)

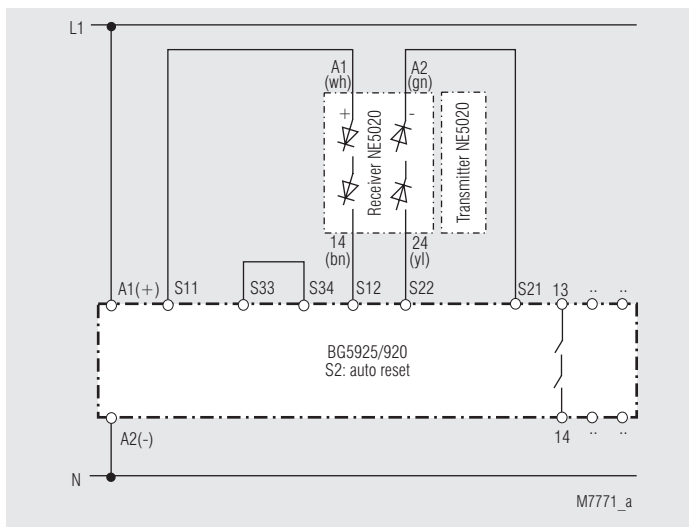
Application Examples



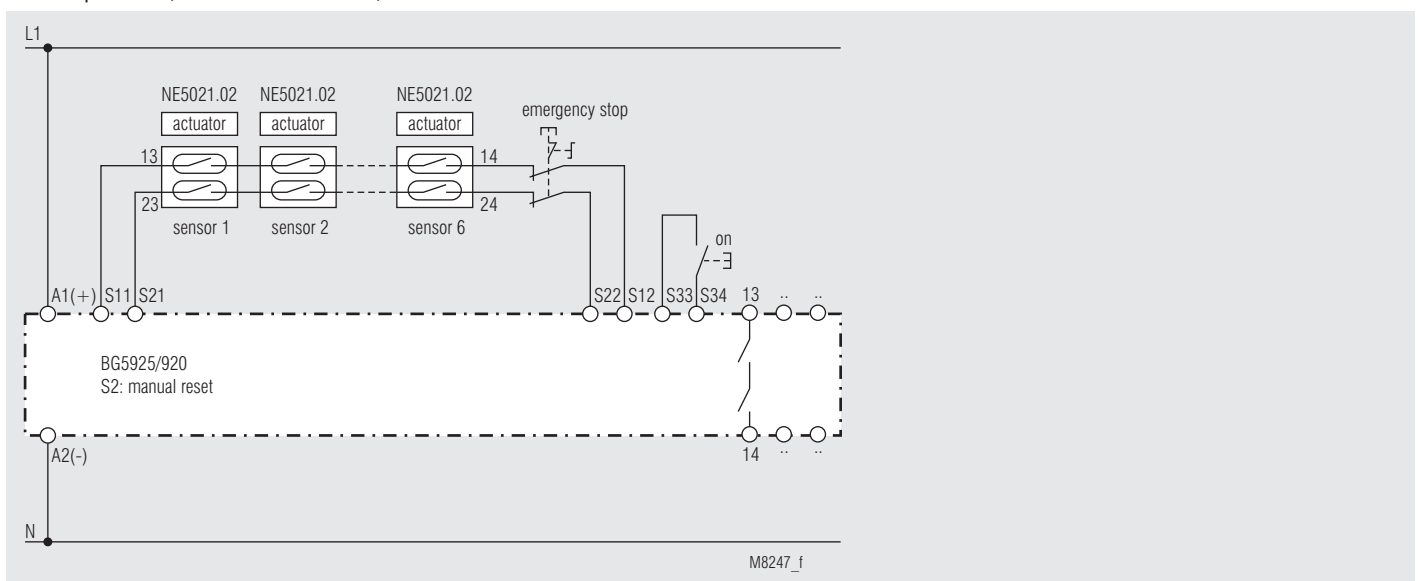
With magnetic switch NE 5020; Start with On-button
Please note: Refer to "Unit programming"!
 Switches in position: S2 manual start
 Suited up to SIL3, Performance Level e, Cat. 4



With magnetic switch NE 5020; Contact reinforcement by external contactors controlled by one contact path
Please note: Refer to "Unit programming"!
 Switches in position: S2 manual start
 Suited up to SIL3, Performance Level e, Cat. 4



With magnetic switch NE 5020; Automatic start
Please note: Refer to "Unit programming"!
 Switches in position: S2 auto start
 Suited up to SIL3, Performance Level e, Cat. 4



6 magnetic switches NE 5021 + 1 E-stop button in series, manual start. Suited up to SIL3, Performance Level e, Cat. 3