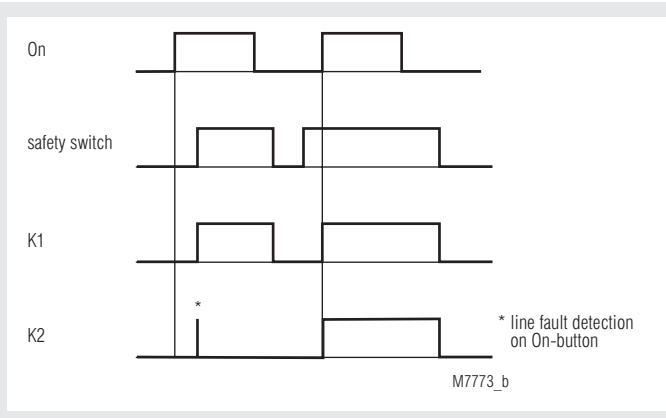


- According to
  - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
  - Safety Integrity Level (SIL) 3 to IEC/EN 61508
- to connect:
  - magnetic switch NE 5020
  - magnetic switch NE 5021
- Output: max. 3 NO contacts, see contacts
- 2-channel 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 mm<sup>2</sup> stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm<sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

### Function Diagram



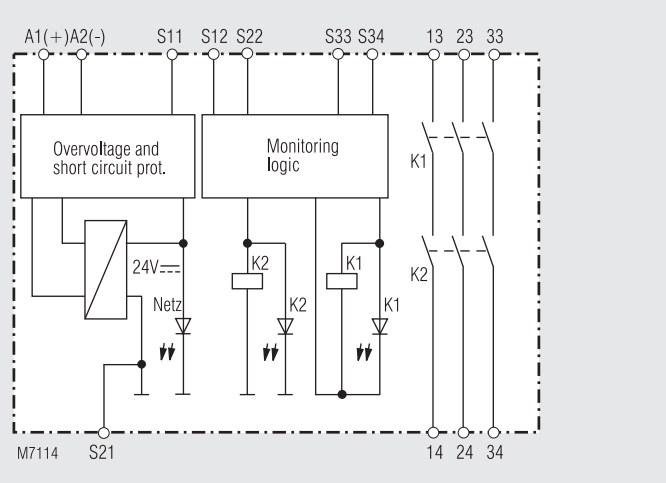
### Additional information about this topic

- 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

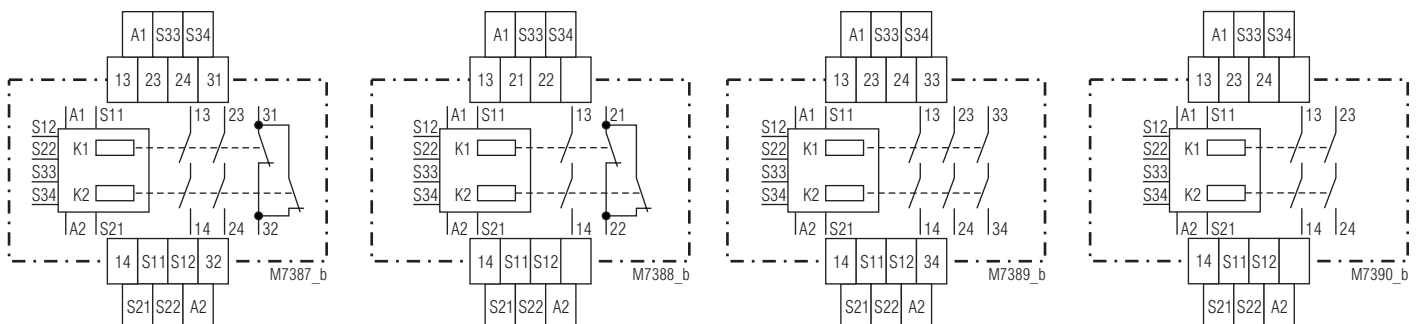
### Indicators

- 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



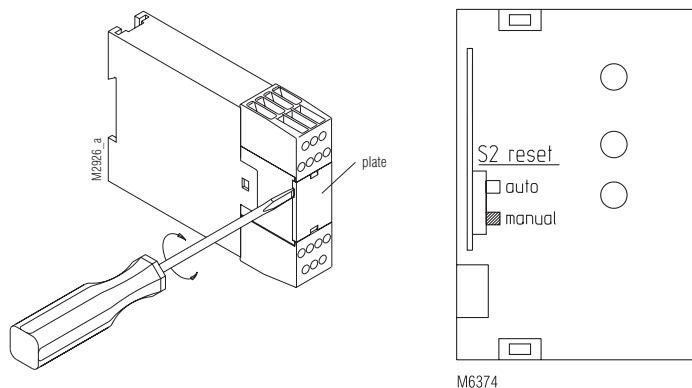
BG 5925.22/920

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

<b>Nominal voltage <math>U_N</math>:</b>	DC 24 V
<b>Voltage range:</b>	
at 10% residual ripple:	0.9 ... 1.1 $U_N$
<b>Nominal consumption:</b>	DC approx. 2 W
<b>Min. Off-time:</b>	250 ms
<b>Control voltage on S11:</b>	DC 23 V at $U_N$
<b>Control current over S12, S22:</b>	40 mA at $U_N$
<b>Min. voltage between terminals S12, S22 and S21:</b>	DC 19.5 V when relay activated and $U_N$ on A1 - A2
<b>Short-circuit protection:</b>	Internal PTC
<b>Overvoltage protection:</b>	Internal VDR

### Output

<b>Contacts</b>	
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.**

<b>Operate delay typ. at <math>U_N</math>:</b>	
Manual start:	40 ms
Automatic start:	250 ms
<b>Release delay typ. at <math>U_N</math>:</b>	
Disconnecting the supply:	50 ms
Disconnecting S12, S22:	15 ms
<b>Contact type:</b>	forcibly guided
<b>Nominal output voltage:</b>	AC 250 V
	DC: see limit curve for arc-free operation

## Technical Data

<b>Switching of low loads:</b>	24 V, 10 mA	
<b>Thermal current <math>I_{th}</math>:</b>	max. 5 A	see current limit curve
<b>Switching capacity to AC 15</b>		
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
<b>to DC 13:</b>		
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
<b>Electrical life to AC 15 at 2 A, AC 230 V:</b>	10 <sup>5</sup> switching cycles	IEC/EN 60 947-5-1
<b>Permissible operating frequency:</b>	max. 1 200 switching cycles / h	
<b>Short circuit strength</b>		
max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
line circuit breaker:	C 8 A	
<b>Mechanical life:</b>	10 x 10 <sup>6</sup> switching cycles	

## General Data

<b>Operating mode:</b>	Continuous operation
<b>Temperature range</b>	
operation:	- 15 ... + 55 °C
storage :	- 25 ... + 85 °C
<b>altitude:</b>	< 2.000 m
<b>Clearance and creepage distances</b>	
rated impuls voltage / pollution degree:	4 kV / 2 (basis insulation) IEC 60 664-1
<b>EMC</b>	
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
<b>Degree of protection</b>	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94
<b>Vibration resistance:</b>	Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz
<b>Climate resistance:</b>	15 / 055 / 04 IEC/EN 60 068-1
<b>Terminal designation:</b>	EN 50 005
<b>Wire connection:</b>	1 x 4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
<b>Wire fixing:</b>	Box terminals with M3.5 screws
<b>Mounting:</b>	DIN rail IEC/EN 60 715
<b>Weight:</b>	220 g

## Dimensions

<b>Width x height x depth:</b>	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 <sub>d</sub> :	236.3	a
DC / DC <sub>avg</sub> :	99.0	%
d <sub>op</sub> :	365	d/a (days/year)
h <sub>op</sub> :	24	h/d (hours/day)
t <sub>Zyklus</sub> :	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 <sub>avg</sub> :	99.0	%
SFF	99.7	%
PFH <sub>D</sub> :	1.97E-10	h <sup>-1</sup>
T <sub>1</sub> :	20	a (year)

<sup>1)</sup> 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<sub>N</sub>:

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



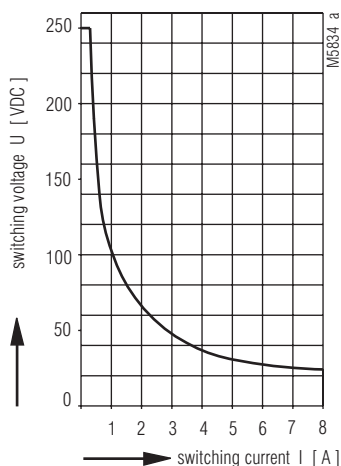
Technical data that is not stated in the CSA-Data, can be found in the technical data section.

## Standard Type

BG 5925.22/920/60 DC 24 V

Article number: 0052272  
• Output: 2 NO contacts, 1 NC contact  
• Nominal voltage U<sub>N</sub>: DC 24 V  
• Width: 22.5 mm

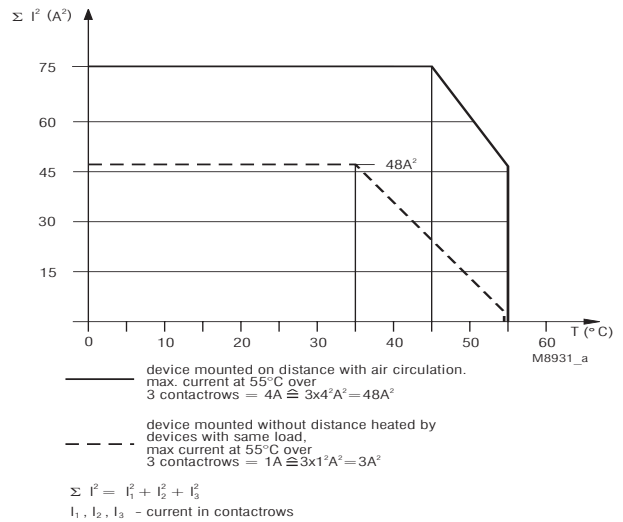
## Characteristic



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

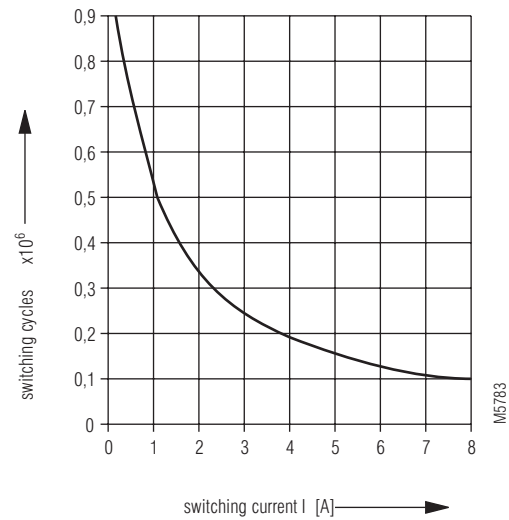
Arc limit curve under resistive load

## Characteristics



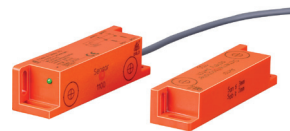
Quadratic total current limit curve

electric life DC13 24V DC / t<sub>ON</sub> 0,4s; t<sub>OFF</sub> 9,6s  
2 contacts in series



Contact service life

## Accessories

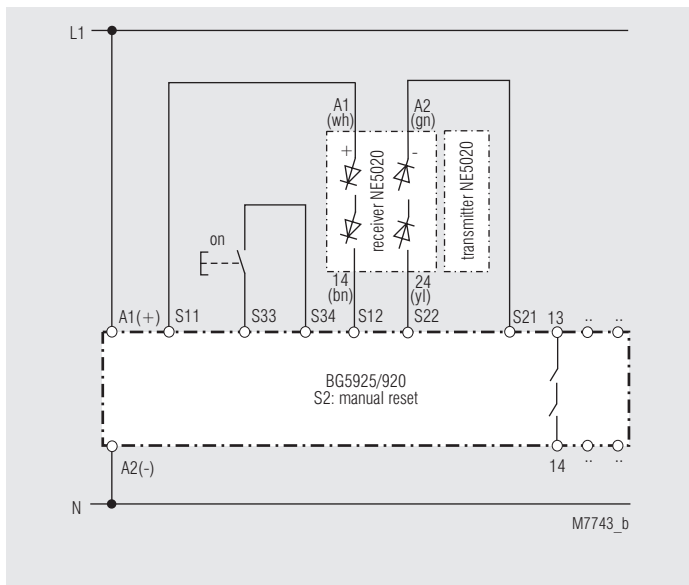


NE 5020.92  
Article number: 0051641  
magnetic switch coded, for DC 24 V,  
with 2 semiconductor outputs

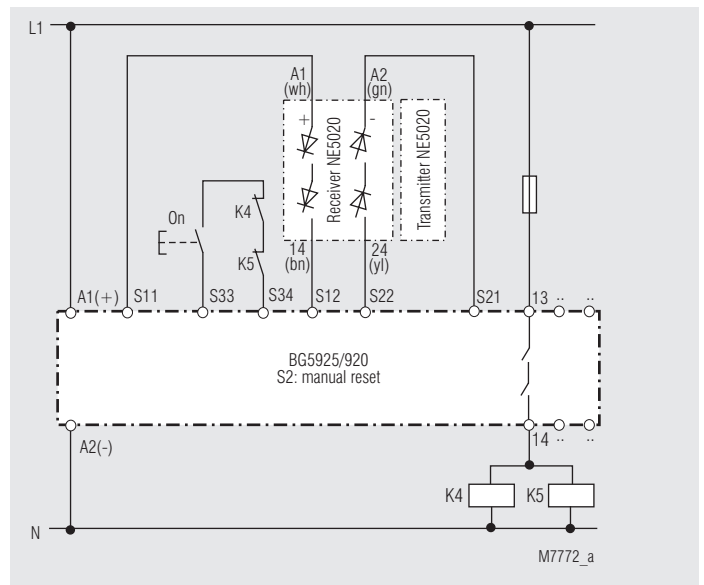


NE 5021.02  
Article number: 0054695  
magnetic switch coded, with  
2 NO contacts (reed contacts)

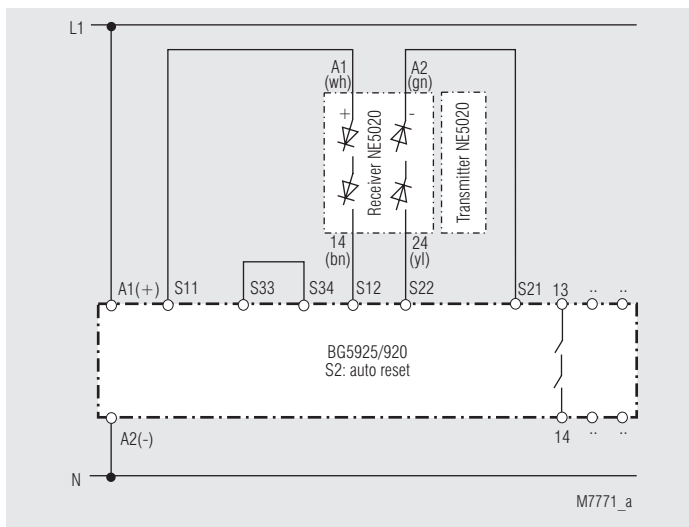
## Application Examples



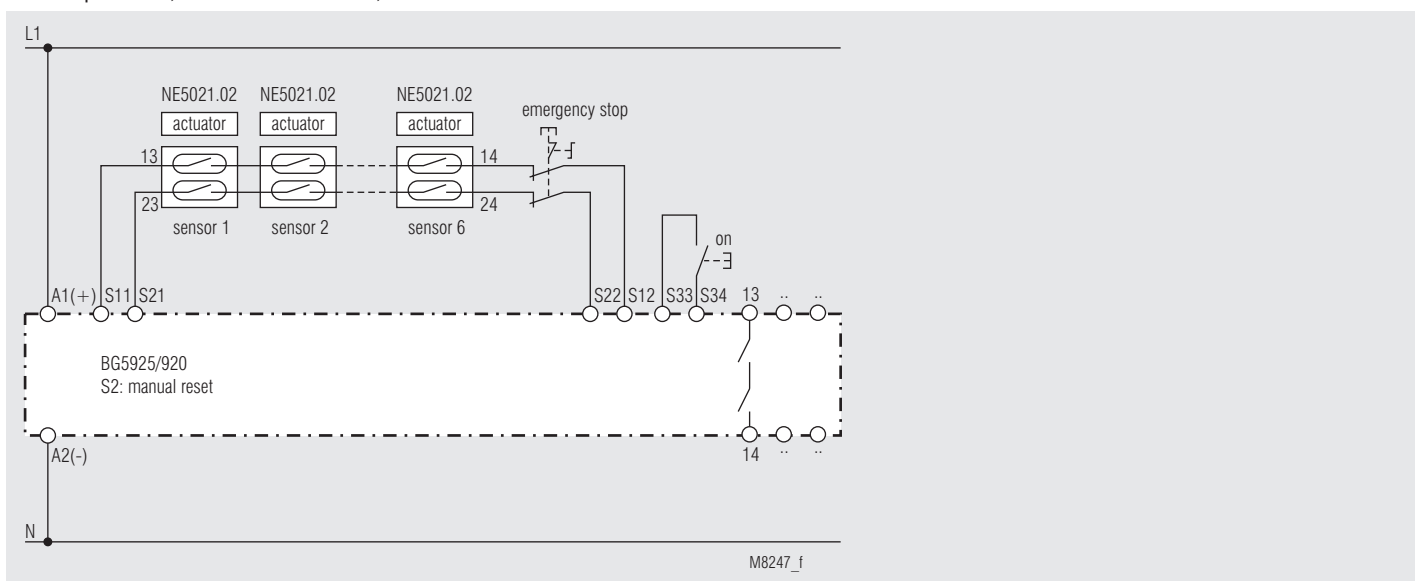
With magnetic switch NE 5020; Start with On-button  
**Please note: Refer to "Unit programming"!**  
 Switches in position: S2 manual start  
 Suited up to SIL3, Performance Level e, Cat. 4



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