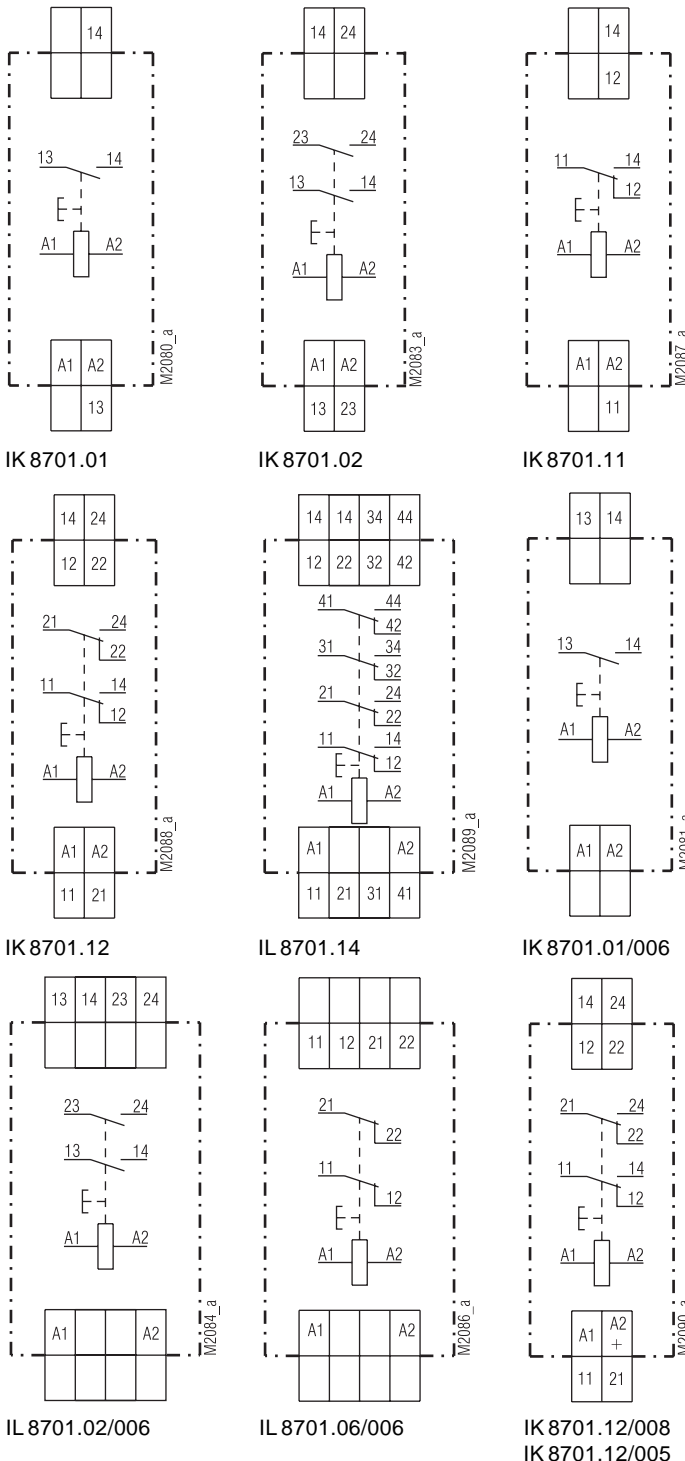


Switching relay IK 8701, IL 8701, IN 8701 Input-output interface relay



- According to EN 61 810-1
- Optionally contacts with up to a maximum of 4 changeover contacts
- High thermal current I_{th}
- Pushbutton for manual actuation of the contact
- Operating position display
- Optionally without manual actuation and an operating position display
- Optionally for 2-wire initiator activation
- Optionally for switching low loads
- Optionally for switching lamps with parallel compensation (e.g. HQ lamps)
- Optionally for switching large inductive direct current loads
- Optionally with a recovery diode
- Optionally with reliable release voltage of AC 120 V
- IK 8701: width 17,5 mm
IL 8701: width 35 mm
IN 8701: width 52,5 mm

Circuit diagrams



Approvals and marking



Applications

- For switching lamp loads
- Input interface relay, e.g. for activation of PLC
- Output interface relay, e.g. for PLC-controlled loads

Function

The contacts are actuated with an armature via a plunger. After the exciting voltage has dropped, a spring returns the armature (which is connected to the plunger) to its home position. The contacts can be actuated manually via a pushbutton on the front as well. This pushbutton acts at the same time as an operating position display. The contacts are closed when the pushbutton is pressed. The red pushbutton is flush with the front edge when there is no current.

Indicators

Pushbutton: pressed in when the relay is supplied with current

Standard type

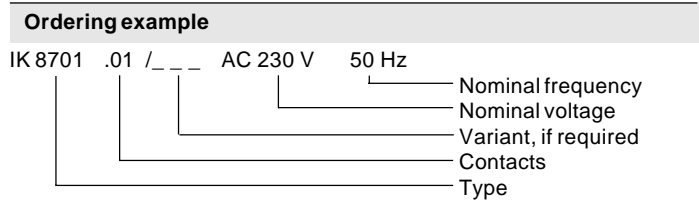
- IK 8701.12 AC 230 V 50 Hz
 Article number: 0033896 stock item
- Pushbutton for manual actuation of the contacts and operating position display
 - Output: 2 changeover contacts
 - Nominal voltage U_N : AC 230 V

Variants	
IK 8701. __ /001:	For switching low loads up to a maximum of 6 VA/W at 0,3 ... 60 V / 1 ... 300 mA The contacts also permit the maximum switching current. However, since the gold plating is burnt off at this current level, the unit is no longer suitable for switching low loads again afterwards.
IK 8701. __ /002:	Can be activated with 2-wire initiators, permissible residual current ≤ 3 mA. Max. 6 glow lamps (0,5 mA each) are possible parallel to the mains button.
IK 8701. __ /003:	3 mm contact opening
IK 8701. __ /005:	Same as IK 8701. __ /001 with a recovery diode to provide protection against voltage surges
IK 8701. __ /006:	For switching large inductive direct current voltage loads (DC 220 V, L/R = 30 ms)
IK 8701. __ /007:	For switching lamps with parallel compensation, e.g. HQ lamps. Maximum parallel compensation 100 μ F
IK 8701. __ /008:	With a recovery diode to provide protection against voltage surges
IK 8701. __ /009:	With a reliable release voltage of AC 120 V with a nominal voltage of AC 230 V.
IK 8701. __ /010:	Same as IK 8701. __ /006 with a recovery diode to provide protection against voltage surges
IK 8701.12/016:	Nominal voltage DC 24 V Voltage range 0,8 ... 1,15 UN Temperature range - 20 ... + 55°C
IK 8701. __ /700:	Without manual actuation and an operating position display

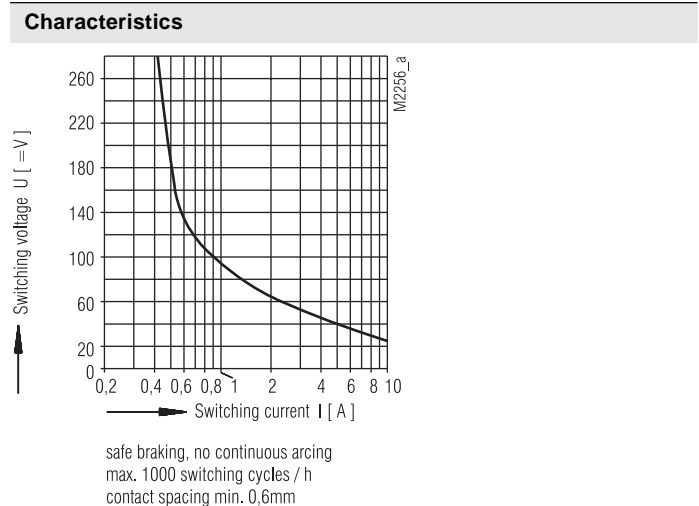
Technical data	
Input	
Nominal voltage U_N:	AC 24, 42, 230 V DC 12, 24 V other voltages available on request
Voltage range:	0,9 ... 1,1 U_N
Nominal consumption:	AC 1,8 VA / DC 1,5 W
Nominal frequency:	50 or 60 Hz
Output	

Contacts	
IK 8701.01:	1 NO contact
IK 8701.02:	2 NO contacts
IK 8701.05:	1 NC contact
IK 8701.06:	2 NC contacts
IK 8701.11:	1 changeover contact
IK 8701.12:	2 changeover contacts
IL 8701.13:	3 changeover contacts
IL 8701.14:	4 changeover contacts
Operate time:	< 30 ms
Release time:	< 30 ms
Nominal output voltage:	AC 230 / 400 V EN 60 947-5-1
Thermal current I_{th}:	16 A
Direct current load:	See arc limit curve
Switching capacity	
fluorescent lamp load:	20 lamps with 58 W / contact each
duo switching	
(series compensated):	2 x 20 lamps with 58 W / contact each
bulb load:	5 x 10 ⁴ switching cycles 1200 W / contact 5 x 10 ⁴ switching cycles
Electrical life:	500 switching cycles / h
with ohmic load AC 230 V:	6 A 150 x 10 ⁴ switching cycles 10 A 75 x 10 ⁴ switching cycles 16 A 12 x 10 ⁴ switching cycles
Inductive load cos ϕ 0,6:	10 A 10 x 10 ⁴ switching cycles
DC-load:	see arc limit curve
Permissible switching frequency:	1 000 switching cycles / h
Short circuit strength	
max. fuse rating:	16 A gL EN 60 947-5-1
Mechanical life:	> 10 x 10 ⁶ switching cycles

Technical data	
General data	
Operating mode:	Continuous operation
Temperature range:	- 20 ... + 45°C
Clearance and creepage distances	
overvoltage category / contamination level:	4 kV / 2 VDE 0110-1 (04.97)
Degree of protection:	Housing: IP 30 EN 60 529 Terminals: IP 20 EN 60 529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0,35 mm, frequency 10 ... 55 Hz EN 60 068-2-6
Climate resistance:	Humid heat EN 60 068-2-30
Terminal designation:	EN 50 005
Wire connection:	2 x 2,5 mm ² solid or 2 x 1,5 mm ² stranded wire with sleeve DIN 46 228-1/-2/-3 or 2 x 1 mm ² stranded wire with sleeve DIN 46 228-4
Wire fixing:	Flat terminals with self-lifting clamping piece EN 60 999 DIN rail EN 50 022
Mounting:	
Weight:	
IK 8701:	100 g
IL 8701:	200 g
IN 8701:	300 g



Dimensions	
Width x height x depth	
IK 8701:	17,5 x 89 x 58 mm
IL 8701:	35 x 89 x 58 mm
IN 8701:	52,5 x 89 x 58 mm



Arc limit curve for direct current voltage

Specifiacion for tender for IK 8701

Switching relay according to EN 61 810-1 to be built in consumer units, 1 NO contact, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

Width 17,5 mm.

Type IK 8701.01

Manufactured by: E. DOLD & SÖHNE KG

Switching relay according to EN 61 810-1 to be built in consumer units, 2 NO contacts, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

Width 17,5 mm.

Type IK 8701.02

Manufactured by: E. DOLD & SÖHNE KG

Switching relay according to EN 61 810-1 to be built in consumer units, 1 changeover contact, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

Width 17,5 mm.

Type IK 8701.11

Manufactured by: E. DOLD & SÖHNE KG

Switching relay according to EN 61 810-1 to be built in consumer units, 2 changeover contacts, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

Width 17,5 mm.

Type IK 8701.12

Manufactured by: E. DOLD & SÖHNE KG

Switching relay according to EN 61 810-1 to be built in consumer units, 3 changeover contacts, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

Width 17,5 mm.

Type IK 8701.13

Manufactured by: E. DOLD & SÖHNE KG

Switching relay according to EN 61 810-1 to be built in consumer units, 4 changeover contacts, thermal current 16 A, pushbutton for manual actuation of the contacts and operating position display.

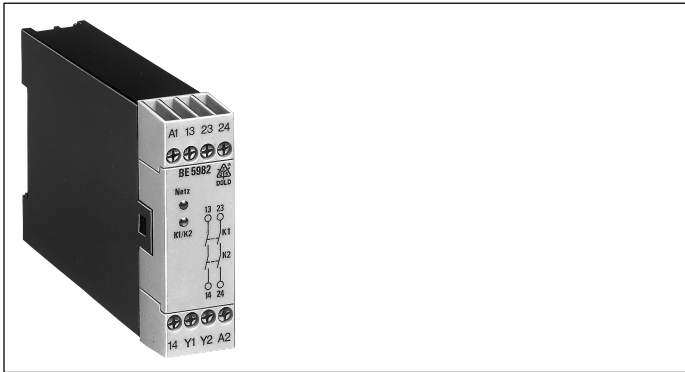
Width 17,5 mm.

Type IK 8701.14

Manufactured by: E. DOLD & SÖHNE KG

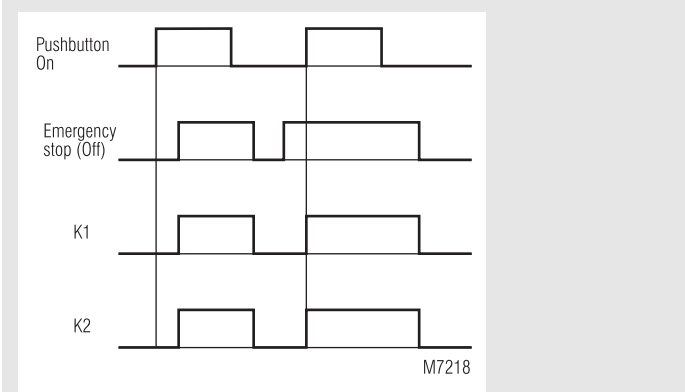
Emergency stop module BE 5982 safemaster

0221555

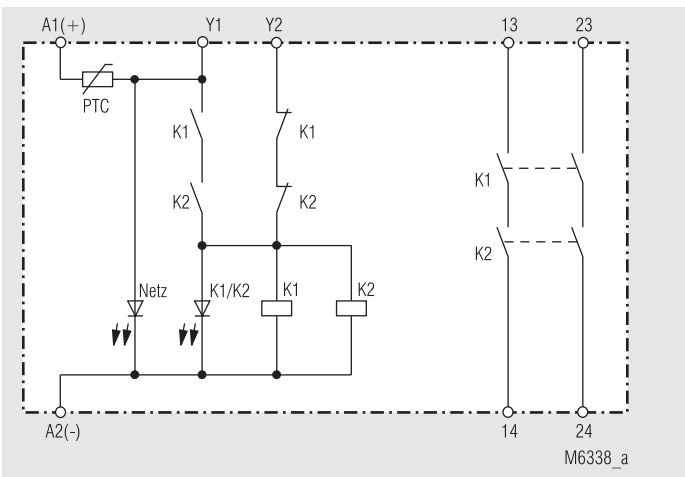


- According to EU Directive for machines 98/37/EG
- According to EN 60 204-1, DIN VDE 0113-1
- Safety category 4 according to DIN EN 954-1
- Output: 2 NO contacts for AC 250 V
- Single-channel emergency stop circuit
- LED indication for channels 1 / 2 and operating state
- Short circuit protection
- Width 22,5 mm

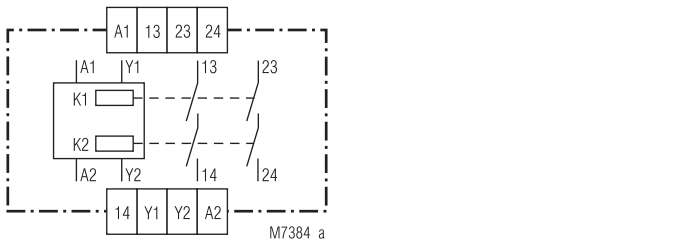
Function diagram



Block diagram



Circuit diagram



Approvals and marking



Application

- Protection of persons and machines
- Emergency stop circuits on machines

Indication

LED power supply: on when operating voltage present
 LED K1/K2: on when output relays K1, K2 are energized

Standard type

BE 5982.02 DC 24 V
 Article number: 0044292 stock item
 • Output: 2 NO contacts
 • Nominal voltage U_N : DC 24 V

Technical data

Input

Nominal voltage U_N : DC 24 V
Voltage range
 at 10 % residual ripple: DC 0,9 ... 1,1 U_N
 at 48 % residual ripple: DC 0,8 ... 1,1 U_N
Nominal consumption: approx. 1,6 W
Control voltage Y1: DC 24 V
Control current: typ. DC 45 mA
Recovery time: 0,5 s

Output

Contacts BE 5982.02: 2 NO contacts
Response time: max. 100 ms
Release time: max. 35 ms
Contact type: Relay, positively driven
Output rated voltage: AC 250 V
Thermal current I_{th} : see continuous limit curve (max. 6 A in one contact path)

Switching capacity

to AC 15: 5 A / AC 250 V EN 60 947-5-1
 for NO contact
 2 A / AC 250 V EN 60 947-5-1
 for NC contact

Electrical life

to AC 15 at 2 A, AC 230 V: 10⁵ switching cycles EN 60 947-5-1

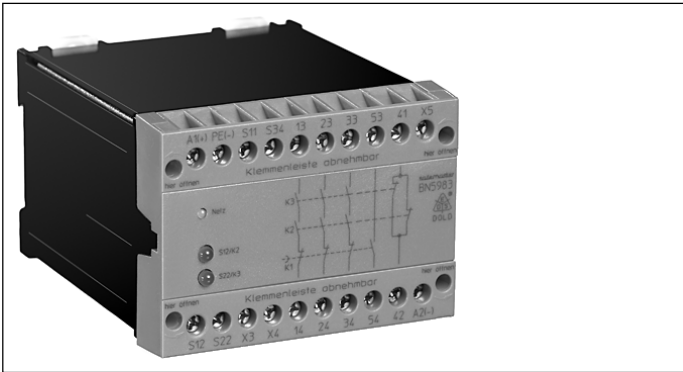
Permissible switching frequency:

600 switching cycles / h

Short circuit strength

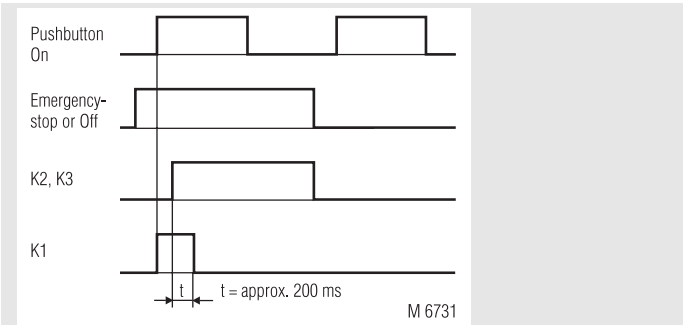
max. fuse rating: 4 A gL EN 60 947-5-1

0221560

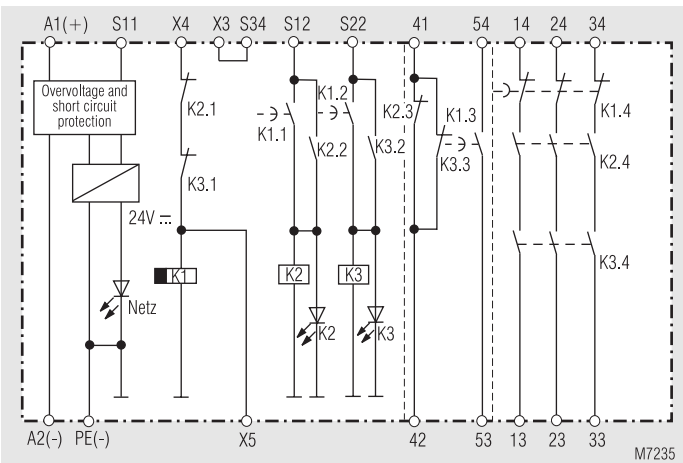


- According to EC Directive for machines 98/37/EG
- According to EN 60204-1, DIN VDE 0113-1
- Safety category 4 according to DIN EN 954-1
- Output: 3 NO, 1 NC contacts for AC 400 V
- Optionally gold-plated contacts to switch small loads (input for PLC)
- 1-channel or 2-channel connection
- LED displays for channels 1 and 2
- Feedback circuit X3 - X4 for monitoring external contactors
- Optionally with protective separation to VDE 0106
- Removable terminal strips
- Overvoltage and short circuit protection
- Width 100 mm

Function diagram



Block diagram BN 5983.53



Approvals and marking



* see variants

Application

- Protection of people and machines
- Emergency-stop circuits on machines
 - Monitoring of safety gates

Indication

- LED power supply: on when operating voltage present
- LED S12 / K2: on when supply on relay K2
- LED S22 / K3: on when supply on relay K3

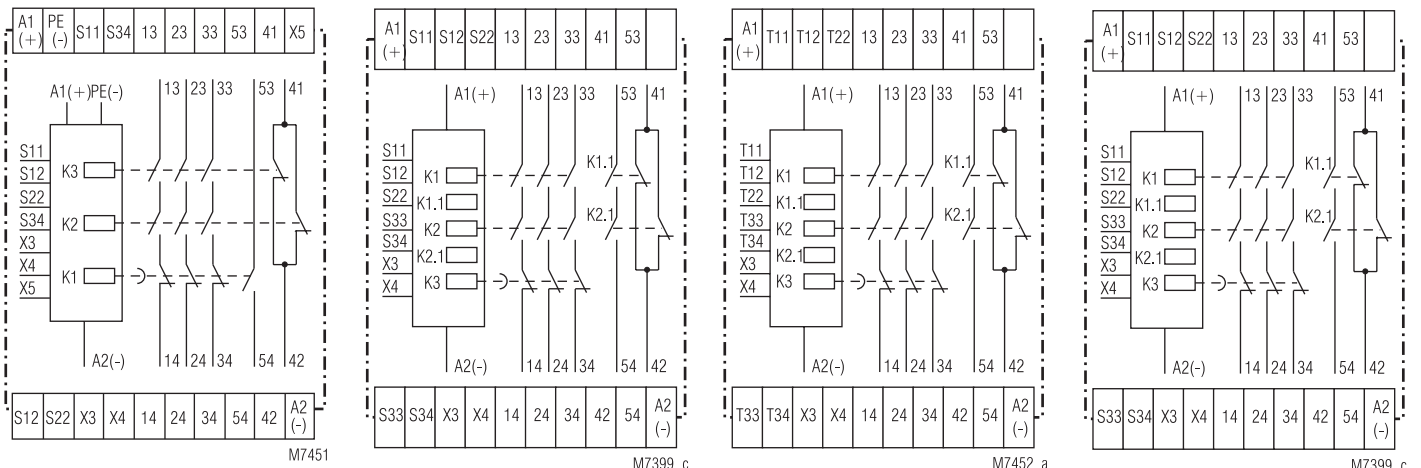
Notes

The PE terminal permits operation of the device in IT systems with insulation monitoring and also serves as a reference point for testing the control voltage. The internal short-circuit protection will be bridged on DC devices, if the protective ground is connected to terminal PE. One or more extension modules BN 3081 or external contactors with positively-driven contacts may be used to multiply the number of contacts of the emergency-stop module BN 5983.

Standard type

- BN 5983.53 DC 24 V
- Article number: 0032155 stock item
- Output: 3 NO, 1 NC contacts
- Nominal voltage U_N : DC 24 V

Circuit diagrams



BN 5983.53, _/101, _/104, _/107, BN 5983.53/110, _/200

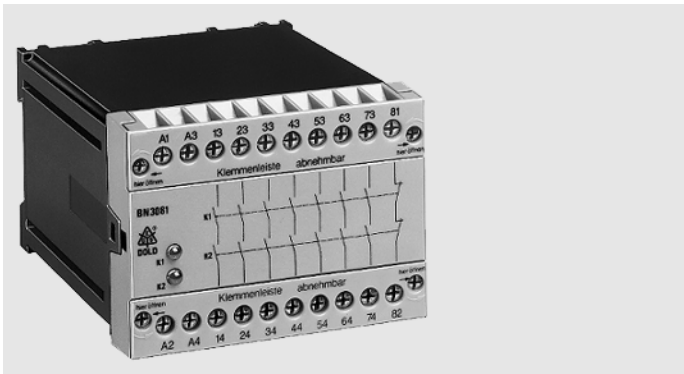
BN 5983.53/106

BN 5983.53/202

BN 5983.54

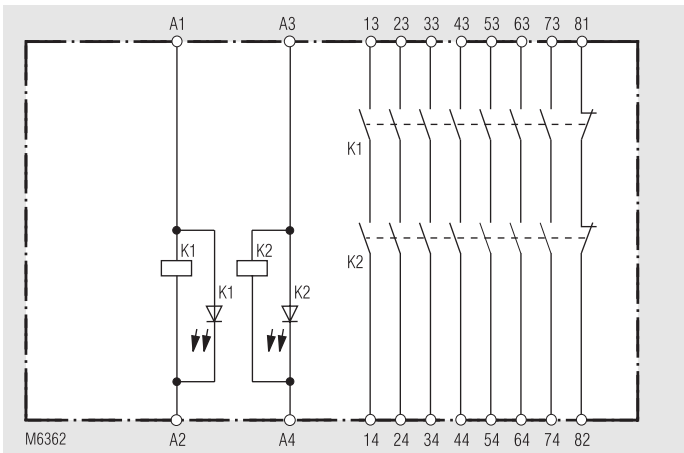
Expansion module BN 3081 safemaster

0221558

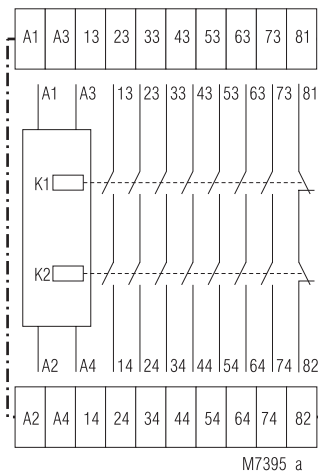


- According to EC Directive for machines 98/37/EG
- According to IEC 204-1, EN 60204-1, DIN VDE 0113-1
- Safety category 4 according to DIN EN 954-1
- Redundant and positively-driven contacts
- Output: 7 NO contacts, 1 NC contact
- 1- or 2-channel connection
- LED displays for channels 1,2
- Removable terminal strips
- Width 100 mm

Block diagram



Circuit diagram



Approvals and marking



* see variants

Applications

Contact multiplication of emergency-stop modules and safety door monitors.

Indication

LED K1: on when supply on relay K1
LED K2: on when supply on relay K2

Notes

The redundant design of the DOLD safety modules ensures that all safety modules switch off reliably if a fault occurs in one of the devices

Standard type

BN 3081.63 AC/DC 24 V

Article number: 0044207 stock item
• Output: 7 NO contacts, 1 NC contact
• Nominal voltage U_N : AC/DC 24 V

Variant

BN 3081.63/61: with UL approval (Canada/USA)

Technical data

Input

Nominal voltage U_N : AC 110, 230 V; AC/DC 24 V
For extension modules where the nominal voltage is the mains voltage EN 60204 part 9.1.1 must be fulfilled

Voltage range:
at 10% residual ripple: AC 0,8 ... 1,1 U_N
DC 0,9 ... 1,2 U_N
at 48% residual ripple: DC 0,8 ... 1,1 U_N

Nominal consumption: 5,5 VA; 2,8 W

Nominal frequency: 50 / 60 Hz

Control current: approx. 12 mA for K1 and K2 at AC 230 V

approx. 55 mA for K1 and K2 at DC 24 V

Output

Contacts

BN 3081.63: 7 NO contacts, 1 NC contact

Response / release time of

K1 and K2: 35 ms / 35 ms

Contact type: Relay, positively-driven

Nominal output voltage: AC 400 V / DC 230 V

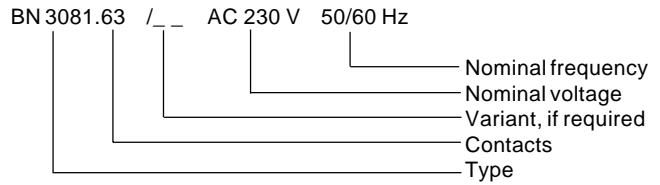
Technical data

Thermal current I_{th}:	see Limit curve for arc-free operation (max. 10 A in one contact path)	
Switching capacity to AC 15:	5 A / AC 250 V for NO contact	EN 60 947-5-1
	2 A / AC 250 V for NC contact	EN 60 947-5-1
Electrical life to AC 15 at 2 A, AC 230 V:	10 ⁵ switching cycles	EN 60 947-5-1
Permissible operating frequency:	6000 switching cycles / h	
Short circuit strength max. fuse rating:	10 A gL	EN 60 947-5-1
Mechanical life:	10 x 10 ⁶ switching cycles	

General data

Operating mode:	Continuous operation	
Temperature range:	- 15 ... + 55 °C at max. 90 % humidity	
Clearance and creepage distances overvoltage category / contamination level:	4 kV / 2	DIN VDE 0110-1 (04.97)
EMC		
Electrostatic discharge:	8 kV (air)	EN 61 000-4-2
HF irradiation:	10 V / m	EN 61 000-4-3
Fast transients:	2 kV	EN 61 000-4-4
Surge voltages between wires for power supply:	2 kV	EN 61 000-4-5
between wire and ground:	4 kV	EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection:	Housing: IP 40	EN 60 529
	Housing: IP 20	EN 60 529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0,35 mm	EN 60 068-2-6
	frequency 10 ... 55 Hz	
Climate resistance:	15 / 55 / 04	EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2,5 mm ² solid or 2 x 1,5 mm ² stranded wire with sleeve DIN 46 228	
Wire fixing:	Flat terminals with self-lifting clamping piece EN 60 999 Terminal strip removable	
Mounting:	DIN rail EN 50 022	
Weight:	510 g	

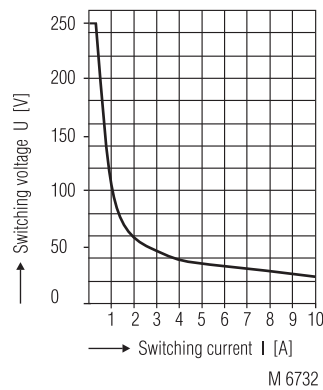
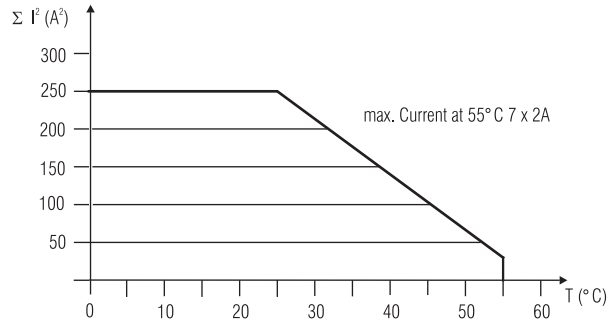
Ordering example



Dimensions

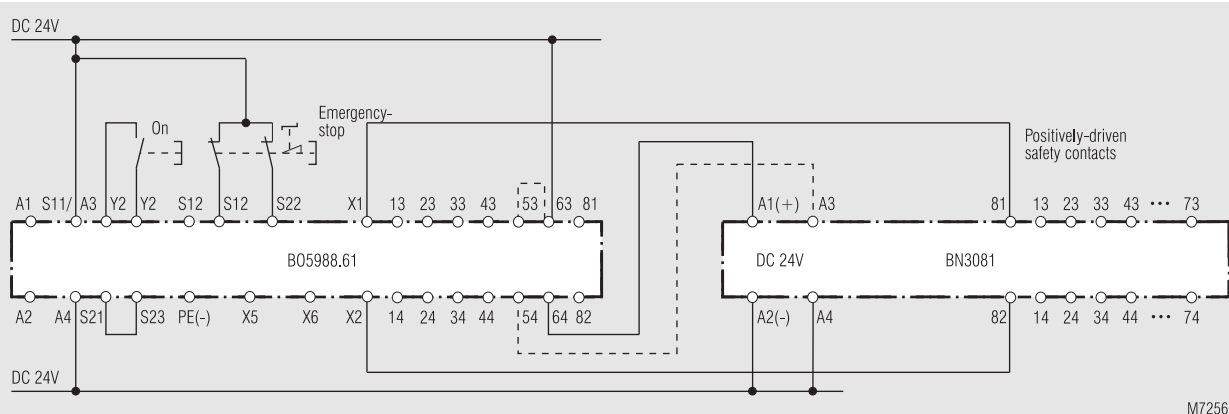
Width x height x depth: 100 x 74 x 121 mm

Characteristics



Limit curve for arc-free operation for resistive load

Application example



Contact multiplication of the emergency-stop module BO 5988

Contact multiplication of emergency-stop modules by two-channel connection of the BN 3081

Single-channel connection of the BN 3081 to emergency-stop modules is also possible. The wires indicated by the dotted lines are omitted for this purpose, and a jumper must be inserted between terminals A1(+) and A3 of BN 3081. When incorporating the unit in the installation, observe the applicable regulations of the employers professional liability insurance association responsible for you.

Variants

- BN 5983.53/60:** with CSA approval
BN 5983.53/61: with UL approval
BN 5983.53/101: Release delay of K1 approx. 800 ms
BN 5983.53/104:
 For switching small loads of 1 mVA ... 7 VA or 1 mW ... 7 W in the ranges 0,1 ... 60 V and 1 ... 300 mA.
 The device is also suitable for switching the maximum switching current. However, this will burn off the gold plating of the contacts, so that switching of small loads is no longer possible afterwards.
BN 5983.53/106:
 Protective separation of control and load circuits, contacts 13÷14, 23÷24 and 33÷34 according to VDE 0106 part 101 4 kV / 2 referred to overvoltage category II with basic insulation to VDE 0110 of 2,5 kV / 2. Contacts 41÷42 and 53÷54 to control circuit 2 kV/2 to VDE 0110.
BN 5983.53/107:
 This version has the device characteristics of BN 5983.53/104 and protective separation of control and load circuits of VDE 0106 part 101 4 kV / 2 referred to overvoltage category II with basic insulation to VDE 0110 of 2,5 kV / 2.
BN 5983.53/110:
 To avoid latching problems in the case of short voltage drops K2 and K3 are switched definitely off before reset.
BN 5983.53/200:
 Redundant switching off with device diversity. Device diversity means that safety relays from different production batches or from different manufacturers are used.
BN 5983.53/202:
 Special terminal arrangement (see circuit diagrams).
BN 5983.54:
 This version differs from the standard device BN 5983.53 only with respect to the contact complement. The additional signalling contacts K1.1 and K2.1 are available via the terminals 53-54 instead of the delay-release NO contact.
 Please note that these contacts must not be used for positive opening.

Technical data

Input

Nominal voltage U_N:	AC 24, 48, 110, 127, 230, 240 V DC 24 V
Voltage range: at 10 % residual ripple:	AC 0,8 ... 1,1 U_N DC 0,9 ... 1,2 U_N
at 48 % residual ripple:	DC 0,8 ... 1,1 U_N
Nominal consumption:	5 VA \pm 30 %
Nominal frequency:	50 / 60 Hz
Control voltage S11:	DC 24 V
Control current:	max. DC 100 mA
Minimum voltage at terminals S12, S22:	DC 21 V with activated device

Output

Contacts	3 NO, 1 NC contacts	
BN 5983.53:	1 delay-release NO contact (K1.3)	
Operate time:	35 ms	
Release time opening in secondary circuit (S12-S22):	30 ms \pm 25 %	
opening in supply circuit:	100 ms \pm 50 %	
Release delay of K1:	approx. 200 ms	
Contact type:	Relay, positively-driven	
Nominal output voltage:	AC 400 V / DC 230 V	
Thermal current I_{th}:	see continuous current limit curve (max. 10 A in one contact path)	
Switching capacity to AC 15:	2 A / AC 230 V	EN 60 947-5-1
Electrical life to AC 15 at 2 A, AC 230 V:	10 ⁵ switching cycles	EN 60 947-5-1
Permissible operating frequency:	6 000 switching cycles / h	
Short circuit strength max. fuse rating:	10 A gL	EN 60 947-5-1
max. line circuit breaker:	C 10 A	
Mechanical life:	10 x 10 ⁶ switching cycles	

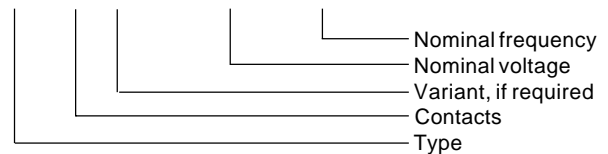
Technical data

General data

Operating mode:	Continuous operation	
Temperature range:	- 15 ... + 55°C at max. 90 % humidity	
Clearance and creepage distances overvoltage category / contamination level:	4 kV / 2	DIN VDE 0110-1 (04.97)
EMC		
Electrostatic discharge:	8 kV (air)	EN 61 000-4-2
HF irradiation:	10 V / m	EN 61 000-4-3
Fast transients:	2 kV	EN 61 000-4-4
Surge voltages between wires for power supply:	1 kV	EN 61 000-4-5
between wire and ground:	4 kV	EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection:	Housing: IP 40	EN 60 529
	Terminals: IP 20	EN 60 529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0,35 mm	EN 60 068-2-6
	frequency: 10 ... 55 Hz	
Climate resistance:	15 / 55 / 04	EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2,5 mm ² solid or 2 x 1,5 mm ² stranded wire with sleeve DIN 46 228	
Wire fixing:	Flat terminals with self-lifting clamping piece EN 60 999 Removable terminal strip	
Mounting:	DIN rail EN 50 022	
Weight:	840 g	

Ordering example

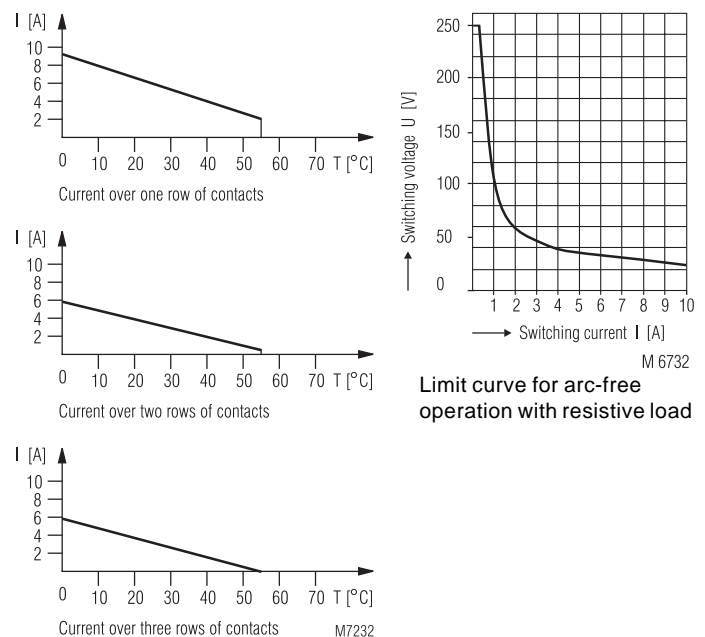
BN 5983 .53 / _ _ _ AC 230 V 50/60 Hz



Dimensions

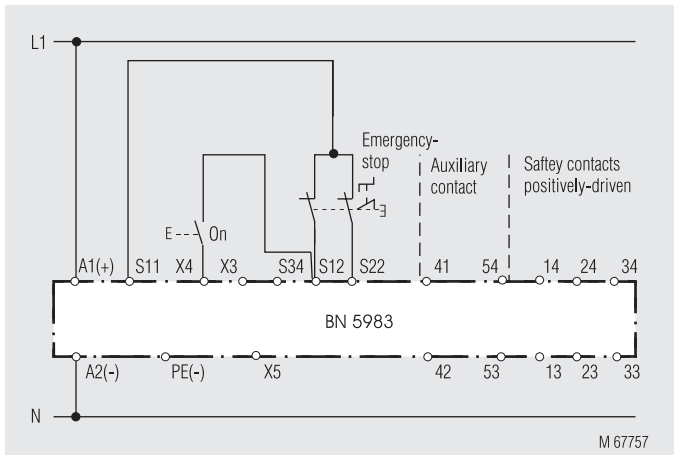
Width x height x depth: 100 x 74 x 121 mm

Characteristics

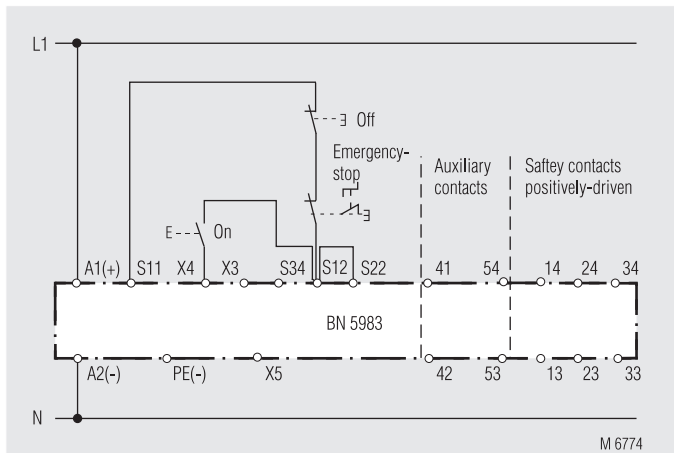


Continuous current limit curves as a function of ambient temperature

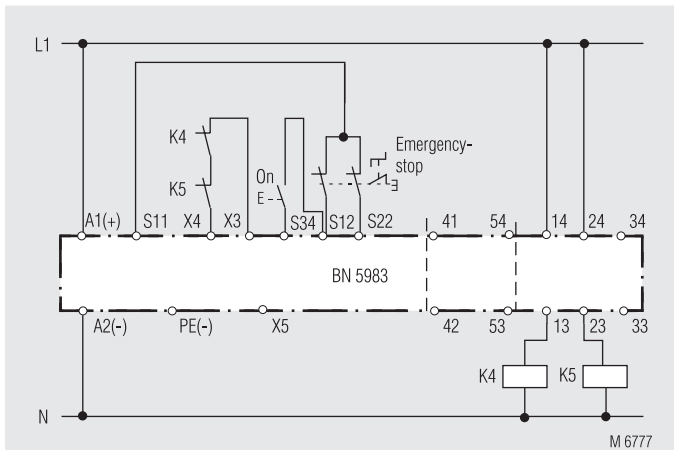
Application examples



Two-channel emergency stop circuit



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

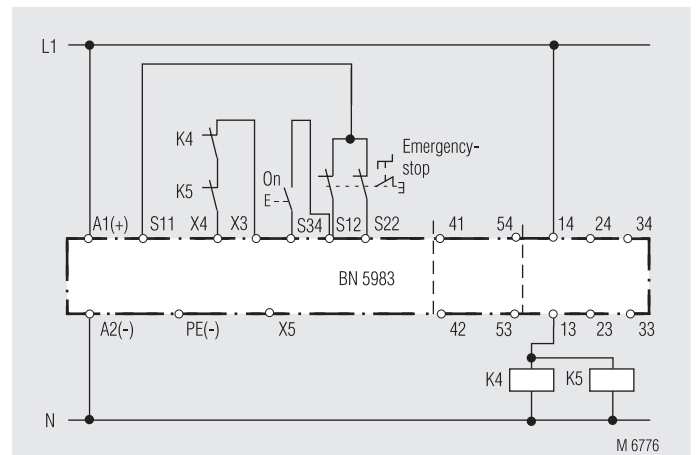


Contact reinforcement by external contactors, 2-channel. The output contacts can be reinforced by external contactors with positively-driven contacts for switching currents > 10 A. Functioning of the external contactors is monitored by looping the NC contacts into the closing circuit (terminals X3 - X4).

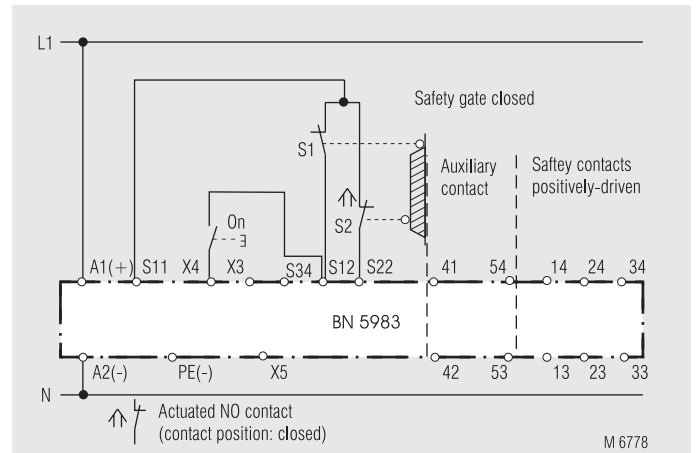
Picture M 6797:
Two-pole emergency-stop circuit with emergency stop control device in supply circuit. Application for long emergency stop loops where the control voltage drops below the minimum voltage of 21 V.

Attention:
Single faults (e.g. line faults at the emergency stop control device) are not detected with this external circuit configuration

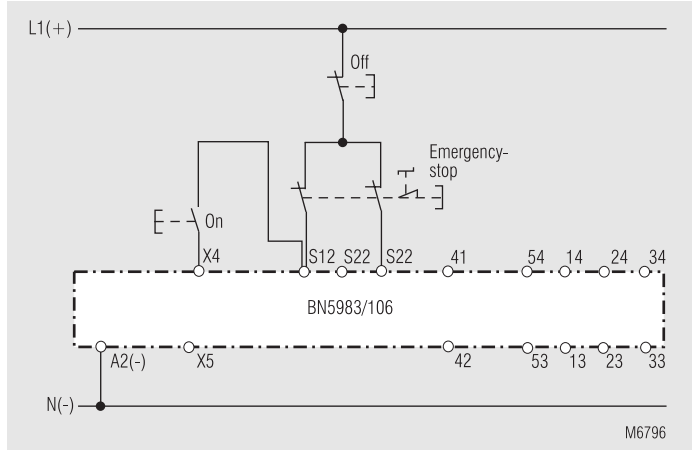
Application examples



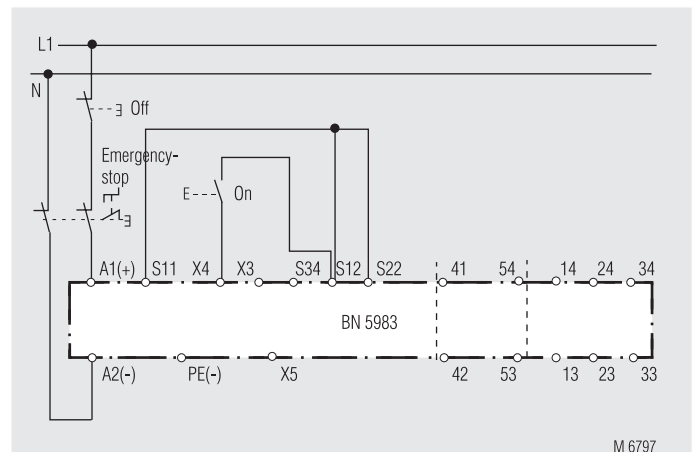
Contact reinforcement by external contactors with reduced safety level



Two-channel monitoring of a safety gate



Two-channel emergency stop circuit with BN 5983/106.



Technical data

Mechanical life: 10 x 10⁸ switching cycles

General data

Operating mode: Continuous operation
Temperature range: - 15 ... + 55 °C

Clearance and creepage distances

overvoltage category /
contamination level: 4 kV / 2 DIN VDE 0110-1 (04.97)

EMC

Electrostatic discharge: 8 kV (air) EN 61 000-4-2
 HF irradiation: 10 V / m EN 61 000-4-3
 Fast transients: 4 kV EN 61 000-4-4

Surge voltages between

wires for power supply: 1 kV EN 61 000-4-5
 between wire and ground: 2 kV EN 61 000-4-5

Interference suppression: Limit value class B EN 55 011
Degree of protection: Housing: IP 40 EN 60 529
 Terminals: IP 20 EN 60 529

Housing:

Thermoplastic with V0 behaviour according to UL subject 94

Vibration resistance:

Amplitude 0,35 mm frequency 10 ... 55 Hz, EN 60 068-2-6
 15 / 55 / 04 EN 60 068-1

Climate resistance:

Terminal designation:

EN 50 005

Wire connection:

1 x 4 mm² solid or
 2 x 1,5 mm² stranded wire with sleeve
 DIN 46 288

Wire fixing:

Plus-minus terminal screws M3.5,
 box terminal with wire protection

Mounting:

DIN rail EN 50 022

Weight:

170 g

Ordering example

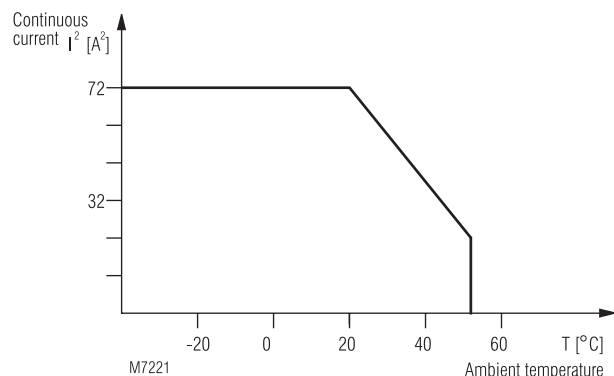
BE 5982 .02 DC 24 V

Nominal voltage
 Contact
 Type

Dimensions

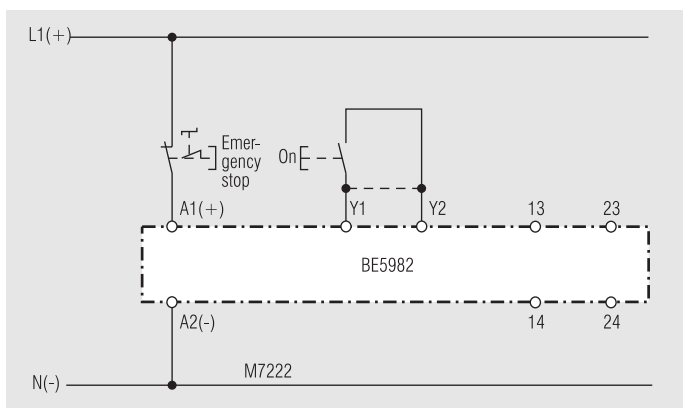
Width x height x depth: 22,5 x 74 x 121 mm

Characteristics

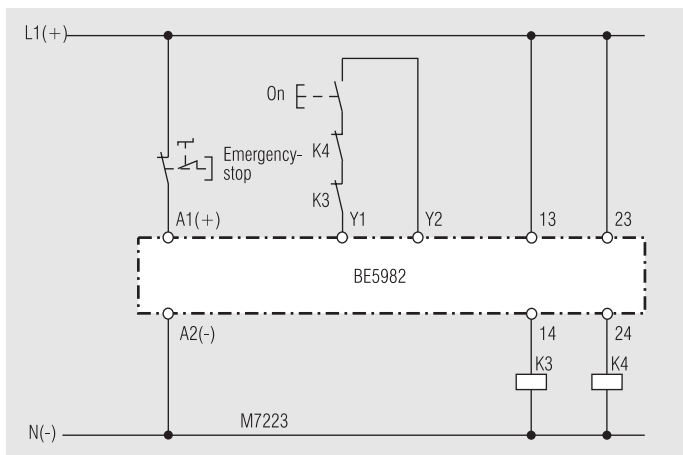


Continuous current limit curve

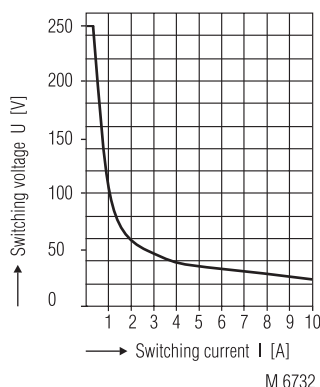
Application examples



Single-channel emergency stop circuit, optionally with or without automatic On function. Set jumper Y1 - Y2 for automatic On function. The On button is omitted.



Contact reinforcement by external contactors. With switching currents > 5 A, the output contacts can be reinforced by external contactors with positively-driven contacts. The function of the external contactors is monitored by looping the NC contacts into the switch-on circuit (terminals Y1 - Y2).



Limit curve for arc-free operation for a resistive load