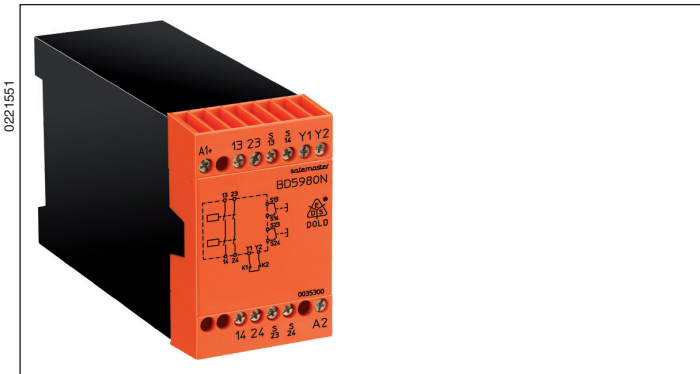
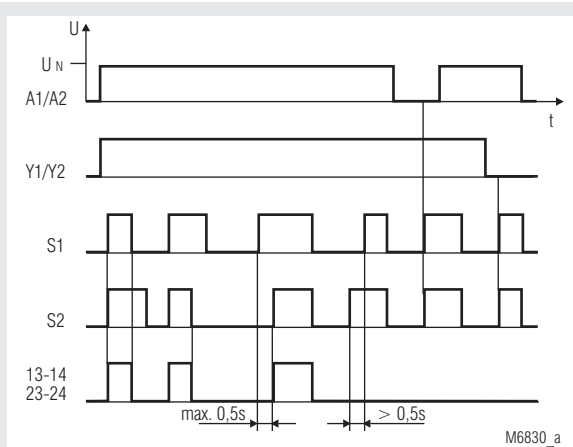


SAFEMASTER Two-Hand Safety Relay BD 5980N



- According to
 - Performance Level (PL) c and category 1 to EN ISO 13849-1: 2008
 - SIL Claimed Level (SIL CL) 1 to IEC/EN 62061
 - Safety Integrity Level (SIL 1) to IEC/EN 61508
 - Category 1 to EN 954-1
 - Safety niveau Typ III-A according to EN 574
- 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
- Optionally dual-voltage version
- Width 45 mm

Function Diagram



Approvals and Markings



*) see variants

Application

Designed for use in press controls in metalworking as well as in other working machines with dangerous closing movements.

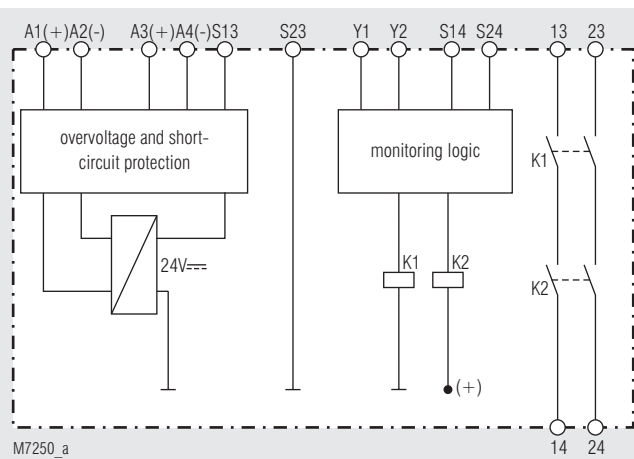
Notes

ATTENTION - AUTOMATIC START!

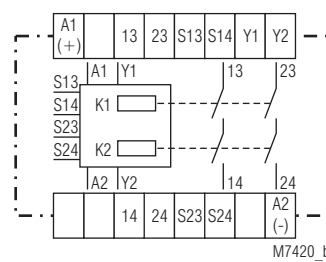


According to IEC/EN 60 204-1 part 9.2.5.4.2 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.

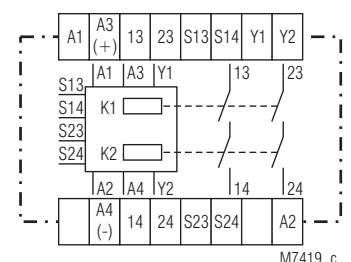
Block Diagram



Circuit Diagrams



BD 5980N.02



BD 5980N.02/024

Connection Terminals

Terminal designation	Signal designation
A1 (+)	+ / L
A2 (-)	- / N
S14, S24, Y2	Inputs
S13, S23, Y1	Outputs
13, 14, 23, 24	Forcibly guided NO contacts for release circuit

Technical Data

Input

Nominal voltage U_N
BD 5980N.02:

DC 24 V,
AC 24, 42, 110, 230, 240 V
DC 24 V¹⁾ + AC 24 V²⁾
DC 24 V¹⁾ + AC 42 V²⁾
DC 24 V¹⁾ + AC 110 V²⁾
DC 24 V¹⁾ + AC 230 V²⁾
DC 24 V¹⁾ + AC 240 V²⁾

BD 5980N.02/024:

¹⁾ DC 24 V at terminals A3-A4
²⁾ DC 24 V at terminals A1-A2

Voltage range:

at 10 % residual ripple:

at 48 % residual ripple:

Nominal consumption:

AC 0.8 ... 1.1 U_N
DC 0.9 ... 1.2 U_N
DC 0.8 ... 1.1 U_N
AC 24 V ... 230 V 4.0 VA
DC 24 V 2.5 W
50 / 60 Hz

Nominal frequency:

Delay time for simultaneity

demand:

Control contacts:

Current via control contacts:

2 x 1 NO contacts
35 mA at 24 V
The control lines must not exceed a length of 30 m and must be routed separately from line cables internal with PTC

Device fuse protection:

Output

Contacts

BD 5980N.02:

2 NO contacts

Operate / release time:

typ. 30 ms / typ. 30 ms

Contact type:

Relay, forcibly guided

Nominal output voltage:

AC 250 V
DC: see limit curve for arc-free operation
see continuous current limit curve

Thermal current I_{th} :

Switching capacity

to AC 15:

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

Electrical life

to AC 15 at 2 A, AC 230 V:

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

Permissible operating

frequency:

max. 1200 switching cycles / h

Short circuit strength

max. fuse rating:

6 A gL IEC/EN 60 947-5-1

max. line circuit breaker:

C 10 A

Mechanical life:

10 x 10⁶ switching cycles

General Data

Operating mode:

Continuous operation

Temperature range:

- 15 ... + 55°C

Clearance and creepage distances

rated impulse voltage /

pollution degree:

4 kV / 2 IEC 60 664-1

EMC

Electrostatic discharge:

8 kV (air) IEC/EN 61 000-4-2

Fast transients:

2 kV IEC/EN 61 000-4-4

Surge voltages

between

wires for power supply:

2 kV IEC/EN 61 000-4-5

between wire and ground:

4 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

Terminal plate:

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 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:

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

Mounting:

DIN rail IEC/EN 60 715

Weight:

410 g

Technical Data

Dimensions

Width x height x depth: 45 x 74 x 121 mm

Safety Related Data

Values according to EN ISO 13849-1:

Category:	1	
PL:	c	
MTTF _d :	342.9	a
DC _{avg} :	4.9	%
d _{op} :	365	d/a (days/year)
h _{op} :	24	h/d (hours/day)
t _{cycle} :	3600	s/cycle
	± 1	h (hour)

Values according to IEC EN 62061 / IEC EN 61508:

SIL CL:	1	IEC EN 62061
SIL	1	IEC EN 61508
HFT ^{*)} :	0	
DC _{avg} :	4.9	%
SFF	69.6	%
PFH _D :	8.02E-08	h ⁻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.

Standard Type

BD 5980N.02 DC 24 V

Article number:

0035300

stock item

• Nominal voltage U_N :

DC 24 V

• Simultaneity:

0,5 s

• Output:

2 NO contacts

• Width:

45 mm

Variants

BD 5980N.02/61:

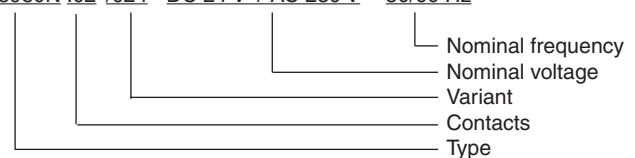
with UL approval (Canada/USA)

BD 5980N.02/024:

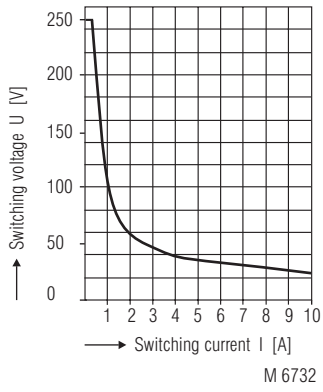
dual voltage version

Ordering example for variants

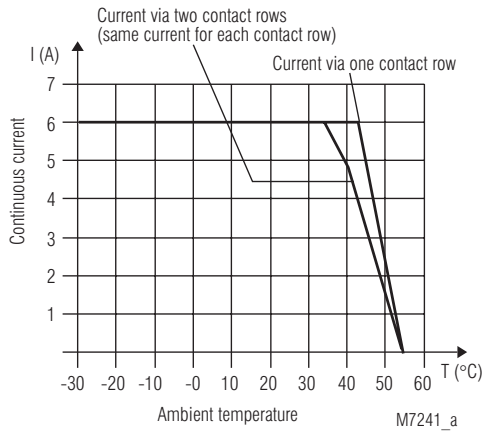
BD 5980N .02 /024 DC 24 V + AC 230 V 50/60 Hz



Characteristics

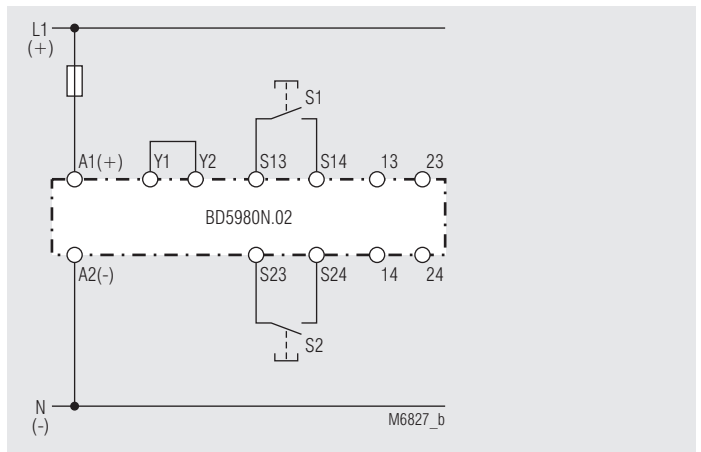


Limit curve for arc-free operation with resistive load

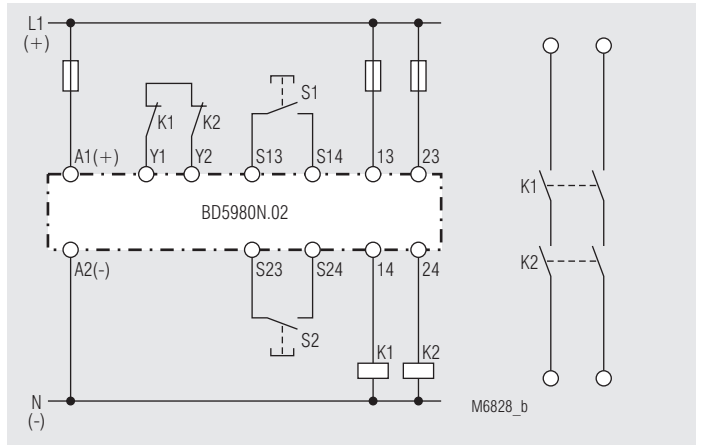


Continuous current limit curve as a function of ambient temperature

Application Examples



Two-hand control



Two-hand control with contact reinforcement via external forcibly guided contactors

