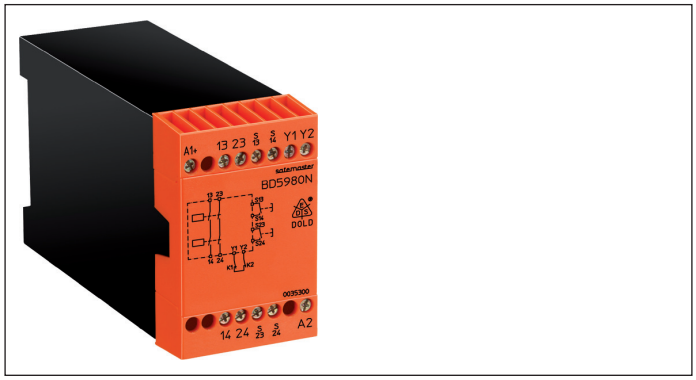
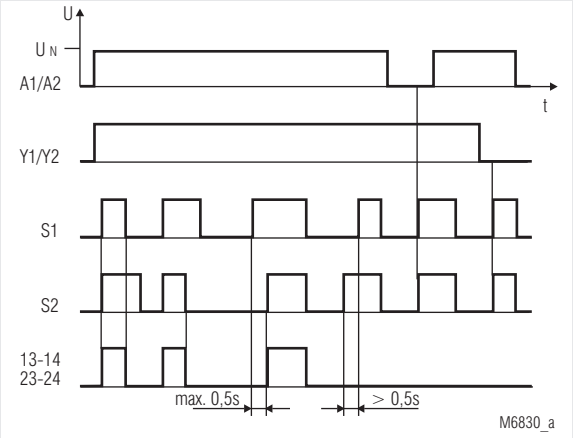
SAFEMASTER
Two-Hand Safety Relay
BD 5980N

0221551



- **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

CE cULus Canada / USA *

*) see variants

Application

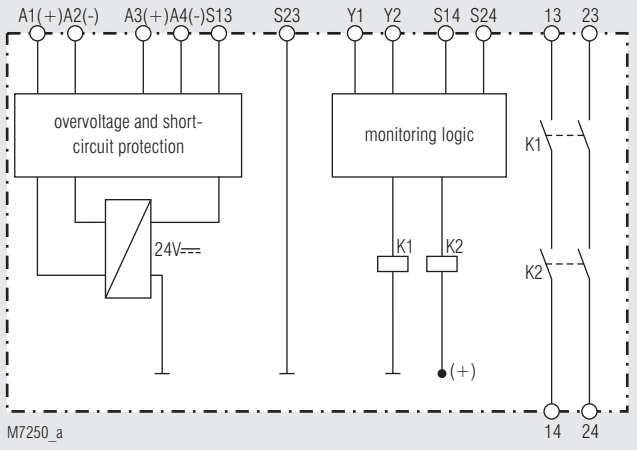
Designed for use in press controls in metalworking as well as in other working machines with dangerous closing movements.

Notes

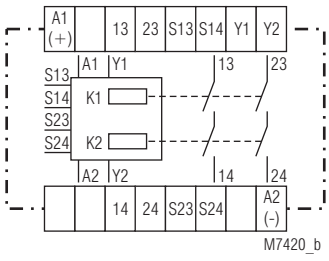
ATTENTION - AUTOMATIC START!

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.

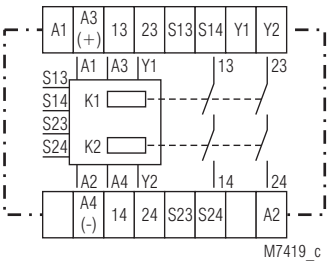
Block Diagram



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	
BD 5980N.02/024:	DC 24 V[1] + AC 24 V[2] DC 24 V[1] + AC 42 V[2] DC 24 V[1] + AC 110 V[2] DC 24 V[1] + AC 230 V[2] DC 24 V[1] + AC 240 V[2]	
	[1] DC 24 V at terminals A3-A4 [2] DC 24 V at terminals A1-A2	
Voltage range:	AC 0.8 ... 1.1 U_N	
at 10 % residual ripple:	DC 0.9 ... 1.2 U_N	
at 48 % residual ripple:	DC 0.8 ... 1.1 U_N	
Nominal consumption:	AC 24 V ... 230 V	4.0 VA
	DC 24 V	2.5 W
Nominal frequency:	50 / 60 Hz	
Delay time for simultaneity demand:	0.5 s	
Control contacts:	2 x 1 NO contacts	
Current via control 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	
Device fuse protection:	internal with PTC	

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	
Thermal current I_{th}:	see continuous current limit curve	
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:	10^5 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 10^6 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, frequency10 ... 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:	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

Info

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

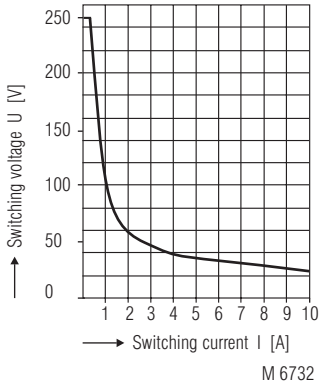
BD 5980N.02/61:	with UL approval (Canada/USA)
BD 5980N.02/024:	dual voltage version

Ordering example for variants

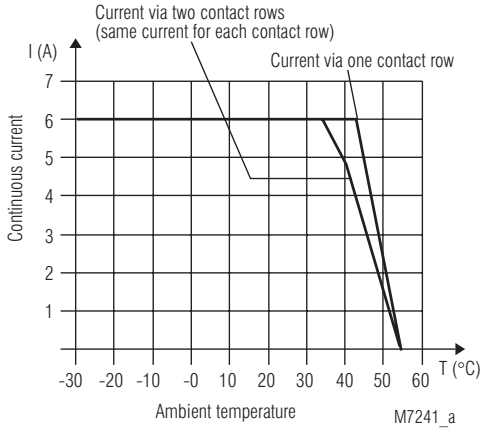
BD 5980N .02 /024 DC 24 V + AC 230 V 50/60 Hz

- 50/60 Hz — Nominal frequency
- DC 24 V + AC 230 V — Nominal voltage
- /024 — Variant
- .02 — Contacts
- BD 5980N — Type

Characteristics

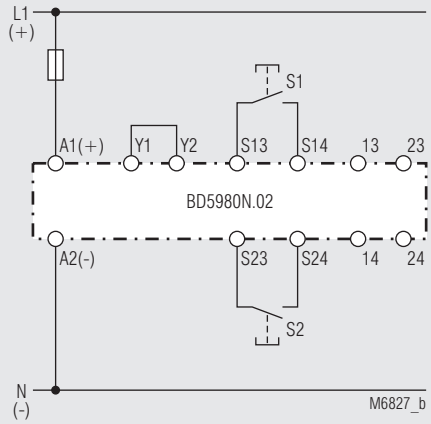


Limit curve for arc-free operation with resistive load

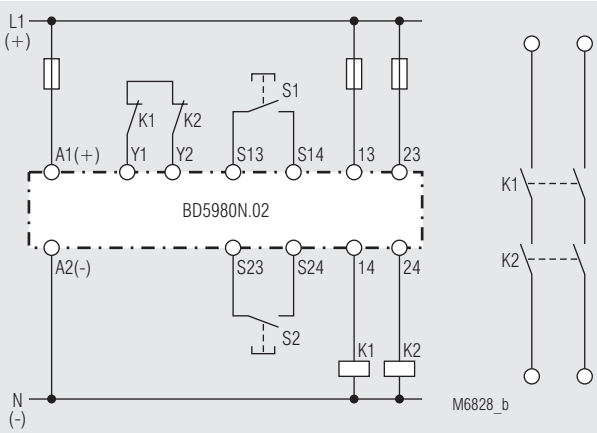


Continuous current limit curve as a function of ambient temperature

Application Examples



Two-hand control



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