

**SAFEMASTER
Two-Hand Safety Relay
BD 5980N**

**Translation
of the original instructions**

0266372



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Before installing, operating or maintaining this device, these instructions must be carefully read and understood.



Keep instructions for future reference



The installation must only be done by a qualified electrician!



Do not dispose of household garbage!
The device must be disposed of in compliance with nationally applicable rules and requirements.

To help you understand and find specific text passages and notes in the operating instructions, we have important information and information marked with symbols.

Symbol and Notes Statement



DANGER:
Indicates that death or severe personal injury will result if proper precautions are not taken.



WARNING:
Indicates that death or severe personal injury can result if proper precautions are not taken.



CAUTION:
Indicates that a minor personal injury can result if proper precautions are not taken.



INFO:
Referred information to help you make best use of the product.



ATTENTION:
Warns against actions that can cause damage or malfunction of the device, the device environment or the hardware / software result.

General Notes

The product hereby described was developed to perform safety functions as a part of a whole installation or machine. A complete safety system normally includes sensors, evaluation units, signals and logical modules for safe disconnections. The manufacturer of the installation or machine is responsible for ensuring proper functioning of the whole system. DOLD cannot guarantee all the specifications of an installation or machine that was not designed by DOLD. The total concept of the control system into which the device is integrated must be validated by the user. DOLD also takes over no liability for recommendations which are given or implied in the following description. The following description implies no modification of the general DOLD terms of delivery, warranty or liability claims.

Designated Use

The BD 5980N enables and disables a safety circuit in a safe way. It is used to protect people and machines in applications with 2-hand buttons on presses for metal products as well as for other production machinery with dangerous closing movements according to EN ISO 13851 Kategorie III A. When used in accordance with its intended purpose and following these operating instructions, this device presents no known residual risks. Nonobservance may lead to personal injuries and damages to property.

Safety Notes



Risk of electrocution! **Danger to life or risk of serious injuries.**

- Disconnect the system and device from the power supply and ensure they remain disconnected during electrical installation.
- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The contact protection of the elements connected and the insulation of the supply cables must be designed in accordance with the requirements in the operating instructions / data sheet.
- Note the VDE and local regulations, particularly those related to protective measures.



Risk of fire or other thermal hazards! **Danger to life, risk of serious injuries or property damage.**

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed. In particular, the current limit curve must be heeded.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.



Functional error! **Danger to life, risk of serious injuries or property damage.**

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.
- The unit should be panel mounted in an enclosure rated at IP 54 or superior. Dust and dampness may lead to malfunction.



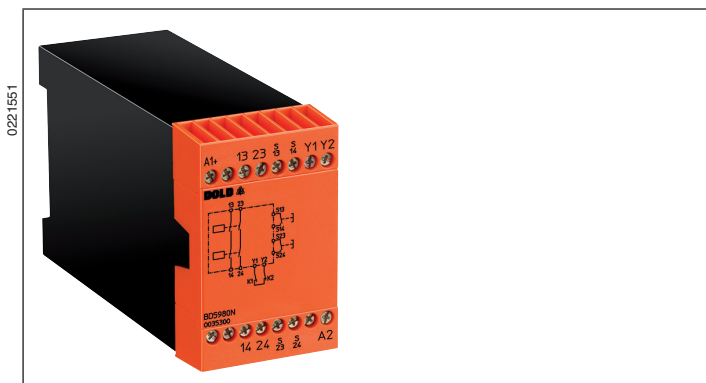
Installation fault! **Danger to life, risk of serious injuries or property damage.**

- Make sure of sufficient protection circuitry at all output contacts for capacitive and inductive loads.



Attention!

- The safety function must be triggered during commissioning.
- **AUTOMATIC START !**
According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.
- Opening the device or implementing unauthorized changes voids any warranty



0221.651

Features

- According to
 - Performance Level (PL) c and category 1 to EN ISO 13849-1
 - SIL Claimed Level (maximum SIL) 1 to IEC/EN 62061
 - Safety Integrity Level (SIL) 1 to IEC/EN 61508
 - Safety niveau Typ III A according to EN ISO 13851
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46228-1/-2/-3
- Width 45 mm

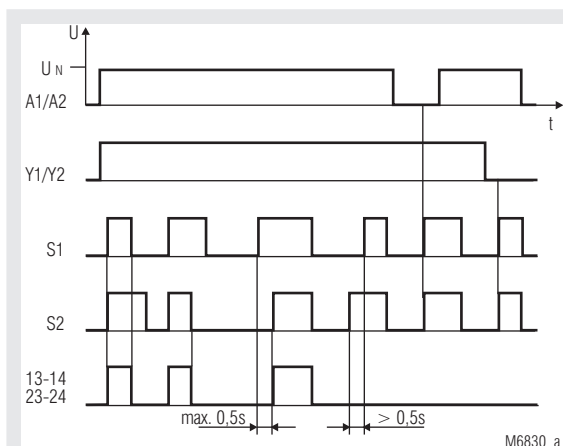
Product Description

The BD 5980N enables and disables a safety circuit in a safe way. It is used to protect people and machines in applications with 2-hand buttons on presses for metal products as well as for other production machinery with dangerous closing movements according to EN ISO 13851 Kategorie III A.

Approvals and Markings



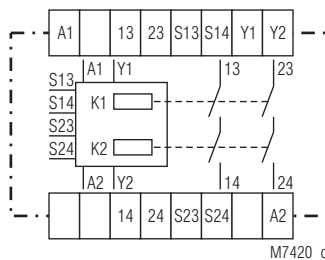
Function Diagram



Application

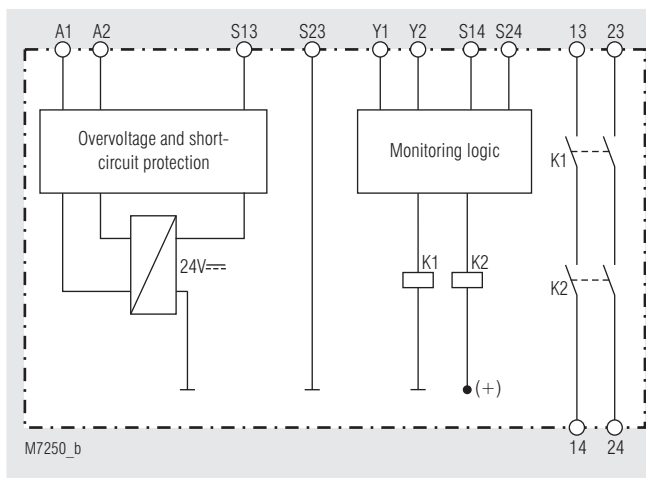
Designed for use in press controls in metalworking as well as in other working machines with dangerous closing movements.

Circuit Diagram



BD 5980N.02

Block Diagram



Connection Terminals

Terminal designation	Signal description
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:	DC 24 V, AC 24, 42, 48, 110, 115, 120, 230, 240 V
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:	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 arc limit curve
Thermal current I_{th}:	See continuous current limit curve
Switching capacity	
to AC 15:	3 A / AC 230V IEC/EN 60947-5-1
To AC 15:	6 A / AC 230V at 0.25 Hz
To DC 13:	2 A / DC 24 V IEC/EN 60947-5-1
To DC 13:	6 A / DC 24 V at 0.1 Hz
Electrical life	
at AC 230 V, 6 A $\cos \varphi = 1$:	> 5 x 10 ⁵ switching cycles
Permissible operating frequency:	Max. 1200 switching cycles / h
Short circuit strength	
max. fuse rating:	6 A gG / gL IEC/EN 60947-5-1
Max.line circuit breaker:	C 10 A
Mechanical life:	10 x 10 ⁶ switching cycles

General Data

Operating mode:	Continuous operation
Temperatur range	
Operation:	- 15 ... + 55 °C
Storage:	- 25 ... + 85 °C
Altitude:	≤ 2000 m
Clearance and creepage distances	
Rated impuls voltage / pollution degree:	4 kV / 2 IEC 60664-1
EMC:	EN 61326-3-1
Interference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60529
Terminal plate:	IP 20 IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0,35 mm, IEC/EN 60068-2-6 frequency 10 ... 55 Hz
Climate resistance:	15 / 055 / 04 IEC/EN 60068-1
Terminal designation:	EN 50005
Wire fixing:	Plus-minus terminal screws M3.5, box terminal with wire protection
Mounting:	DIN rail IEC/EN 60715
Weight:	410 g

Dimensions

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

BD 5980N.02 DC 24 V	
Article number:	0035300
• Nominal voltage U_N :	DC 24 V
• Simultaneity:	0,5 s
• Output:	2 NO contacts
• Width:	45 mm

Order Example

BD 5980N .02 AC 230 V 50/60 Hz



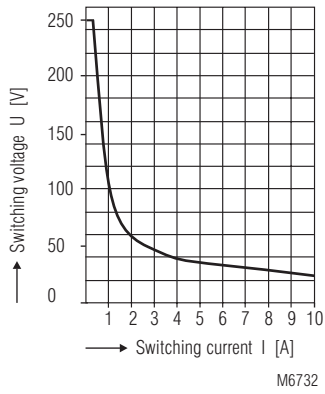
Troubleshooting

Failure	Potential cause
Device cannot be activated	<ul style="list-style-type: none">- Power supply not connected- A safety relay is welded (replace device)- Feedback circuit Y1-Y2 not closed- The 2-Hand-buttons have not been operated simultaneously within ≤ 0,5s

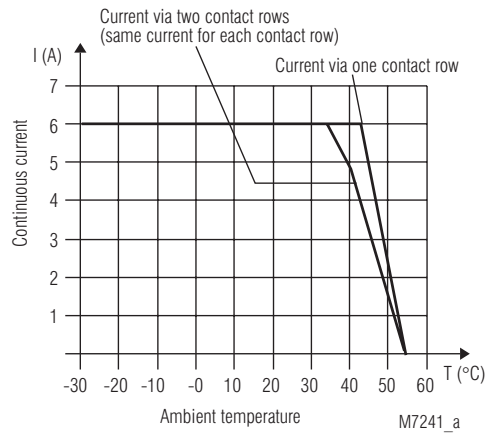
Maintenance and repairs

- The device contains no parts that require maintenance.
- In case of failure, do not open the device but send it to manufacturer for repair.

Characteristics

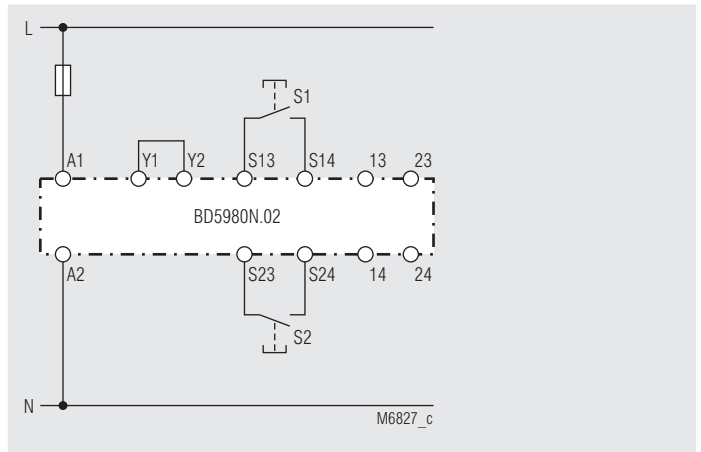


Arc limit curve with resistive load

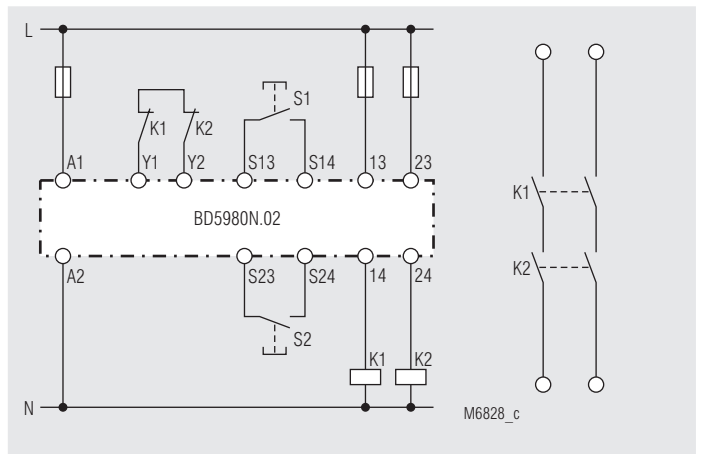


Continuous current limit curve as a function of ambient temperature

Application Examples



Two-hand control
Suited up to SIL1, Performance Level c, Cat. 1

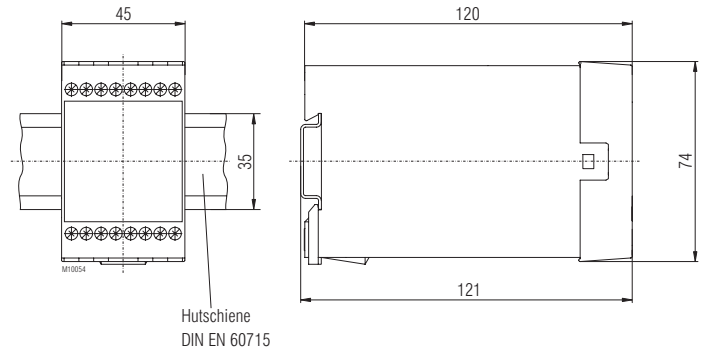
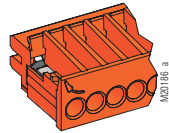


Two-hand control with contact reinforcement via external forcibly guided contactors.
Suited up to SIL1, Performance Level c, Cat. 1

DE	Anschlussstechnik
EN	Connection Technology
FR	Technologie de connexion
IT	Tecnologia di connessione

DE	Maßbild (Maße in mm)
EN	Dimensions (dimensions in mm)
FR	Dimensions (dimensions en mm)
IT	Dimensioni (dimensione in mm)

Schraubklemme, nicht abnehmbar
Screw terminal, not removable
Borne à vis, non amovible
Terminale a vite, no rimovibile



	<p>ø 4 mm / PZ 1 0,8 Nm 7 LB. IN</p>
	<p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p>
	<p>A = 10 mm 1 x 0,5 ... 2,5 mm² 1 x AWG 20 to 14 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p>
	<p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p>

DE	Sicherheitstechnische Kenndaten
EN	Safety Related Data
FR	Données techniques sécuritaires
IT	I dati di sicurezza

EN ISO 13849-1:		
Kategorie / Category:	1	
PL:	c	
MTTF _d :	342,9	a (year)
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)

IEC/EN 62061 IEC/EN 61508		
Maximum SIL:	1	IEC/EN 62061
SIL:	1	IEC/EN 61508
HFT ¹⁾ :	0	
DC:	4,9	%
PFH _D :	8,02E-08	h ⁻¹
¹⁾ HFT = Hardware-Fehlertoleranz Hardware failure tolerance Tolérance défauts Hardware Tolleranza ai guasti hardware		



DE	<p>Die angeführten Kenndaten gelten für die Standardtype. Sicherheitstechnische Kenndaten für andere Geräteausführungen erhalten Sie auf Anfrage.</p> <p>Die sicherheitstechnischen Kenndaten der kompletten Anlage müssen vom Anwender bestimmt werden.</p>
EN	<p>The values stated above are valid for the standard type. Safety data for other variants are available on request.</p> <p>The safety relevant data of the complete system has to be determined by the manufacturer of the system.</p>
FR	<p>Les valeurs données sont valables pour les produits standards. Les valeurs techniques sécuritaires pour d'autres produits spéciaux sont disponibles sur simple demande.</p> <p>Les données techniques sécuritaires de l'installation complète doivent être définies par l'utilisateur.</p>
IT	<p>I rating sopra si applicano al tipo standard. Dati di sicurezza per gli altri modelli sono disponibili su richiesta.</p> <p>I dati caratteristici relativi alla sicurezza per l'intero sistema deve essere determinato dall'utente.</p>

DE	EG-Konformitätserklärung
EN	Declaration of Conformity
FR	Déclaration de conformité européenne
IT	Dichiarazione di conformità CE

EG - Konformitätserklärung
Declaration of Conformity
Déclaration de conformité européenne



Hersteller: E. Dold & Söhne GmbH & Co. KG
Manufacturer: / Fabricant:
Anschrift: Bregstraße 18
Address: / Adresse: 78120 Furtwangen
Germany

Produktbezeichnung: Zweihand Sicherheitsrelais **BD5980N.kkccc** mit: kk = 02
Product description: Two-hand safety relay *with:* optional ccc = /60 .. /69
Désignation du produit: Relais de sécurité bimanuelle *avec:*

Das bezeichnete Produkt stimmt mit den Vorschriften folgender europäischer Richtlinien überein:
The indicated product is in conformance with the regulations of the following european directives:
Le produit désigné est conforme aux instructions des directives européennes:

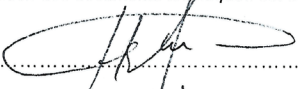
Maschinenrichtlinie: 2006/42/EG EU-Abl. L157/24, 09.06.2006
Machinery directive: / Directives Machines:
EMV - Richtlinie: 2014/30/EU EU-Abl. L96/79, 29.03.2014
EMC - Directive: / Directives- CEM::
RoHS - Richtlinie 2011/65/EU EU-Abl. L174/88, 01.07.2011
RoHS -Directive: / Directives - RoHS:

Prüfgrundsätze: EN ISO 13849-1:2015 EN ISO 13851:2019
Basis of Testing: EN IEC 62061:2021 EN 61508 Parts 1-2:2010
Lignes de contrôle: EN 61326-1:2013 EN 61326-3-1:2017
EN 61000-6-1:2007 EN 61000-6-2:2005 + AC:2005
EN 61000-6-3:2007 + A1:2011 EN 61000-6-4:2007 + A1:2011
EN 61000-6-7:2015 EN 55011:2016 + A1:2017

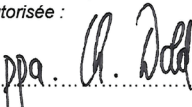
Die Übereinstimmung eines Baumusters des bezeichneten Produktes mit der oben genannten Maschinenrichtlinie wurde bescheinigt durch:
Consistency of a production sample with the marked product in accordance to the above machiney directive has been certified by:
La conformité d'un échantillon du produit désigné aux directives machines susmentionnées a été certifiée par:

Benannte Stelle: TÜV Süd Product Service GmbH,
Certification office: / l'organisme notifié: Ridlerstraße 65, 80339 München
Nummer der benannten Stelle: 0123
Number of certification office: / Numéro de l'organisme notifié:
Nummer der Bescheinigung: Z10 040066 0022 Rev. 00
Certification number: / Numéro de certificat:
Ausstellungsdatum : 20.01.2023
Date of issue: / Date de délivrance:

Für die Zusammenstellung der technischen Unterlagen ist bevollmächtigt:
For the compilation of technical documents is authorized:
Pour la composition des documents techniques est autorisé:


.....
Gamal Hagar – Entwicklungsleiter / R&D Manager

Rechtsverbindliche Unterschrift:

Signature of authorized person:
Signature autorisée :

.....
Christian Dold - Produktmanagment

Ort, Datum : Furtwangen, 31.01.2023
Place, Date: / Lieu, date:

Diese Original - Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der Produktdokumentation sind zu beachten.
This original declaration confirms the conformity of the mentioned directives but does not comprise any guarantee of the product characteristics. The safety directives of the product documentation are to be considered.
Cette déclaration originale certifie la conformité des directives nommées mais ne comprend aucune garantie des caractéristiques du produit. Les directives de sécurité de la documentation du produit sont à considérer.

