Emergency stop module BN 5983 safemaster

- According to EC Directive for machines 98/37/EG
- According to IEC/EN 60204-1
- Safety category 4 according to 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 IEC/EN 61 140, IEC/EN 69 947-1
- Removable terminal strips
- Overvoltage and short circuit protection
- Width 100 mm

**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.

**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.

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**All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.**
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 $U_{N}$
- at 48% residual ripple: DC 0.8...1.1 $U_{N}$

Nominal consumption:
- max. line circuit breaker: C 10 A
- max. fuse rating: 10 A gL IEC/EN 60 947-5-1

Short circuit strength
- frequency: 15 / 055 / 04 IEC/EN 60 068-1
- 6 000 switching cycles / h

Electrical life
- NO contacts: 10 A / 24 V > 10 $^5$
- to DC 13: 2 A / DC 24 V IEC/EN 60 947-5-1
- to DC 13: 4 A / DC 24 V IEC/EN 60 947-5-1

Switching capacity
- to AC 15: 5 A / AC 230 V IEC/EN 60 947-5-1
- to AC 15: 4 A / DC 24 V IEC/EN 60 947-5-1

Electrical life
- to AC 15 at 2 A, AC 230 V: > 240 x 10$^3$ switching cycles
- to DC 13 at 2 A, AC 230 V: 6 000 switching cycles / h

Permissible operating frequency:
- 10$^3$ switching cycles IEC/EN 60 947-5-1

Short circuit strength
- max. fuse rating: 10 A gL IEC/EN 60 947-5-1
- max. line circuit breaker: C 10 A

Mechanical life:
- 10 x 10$^4$ 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 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: 1 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 IEC EN 55 011

Degree of protection:
- Housing: IP 40 IEC/EN 60 529
- Terminals: IP 20 IEC/EN 60 529

Output

Contacts
- BN 5983.53:
  - 3 NO, 1 NC contacts
  - 1 delay-release NO contact (K1.3)
  - The NO contacts 13...33 / 14...34 are safety contacts.

ATTENTION! The NC contact 41-42 and the NO contact 53-54 can only be used for monitoring.

Operate time:
- 30 ms ± 25 %
- 100 ms ± 50 %

Release delay of K1:
- approx. 200 ms

Contact type:
- Relay, positively-driven

Nominal output voltage:
- AC 400 V / DC 230 V

See continuous current limit curve.

(max. 10 A in one contact path)

Switching capacity
- to AC 15:
  - 5 A / AC 230 V IEC/EN 60 947-5-1
  - for NO contacts
  - AC 400 V / DC 230 V IEC/EN 60 947-5-1
  - for NC contacts

- to DC 13:
  - 4 A / DC 24 V IEC/EN 60 947-5-1
  - for NO contacts
  - AC 400 V / DC 230 V IEC/EN 60 947-5-1
  - for NC contacts

- to DC 13
  - NO contacts:
    - 10 A / 24 V > 10$^5$
    - ON: 0,4 s, OFF: 9,6 s

Electrical life
- to AC 15 at 2 A, AC 230 V:
  - 10$^3$ switching cycles IEC/EN 60 947-5-1
- to DC 13 at 2 A, AC 230 V:
  - > 240 x 10$^3$ switching cycles

Permissible operating frequency:
- 10$^3$ switching cycles IEC/EN 60 947-5-1
- > 240 x 10$^3$ switching cycles

Short circuit strength
- max. fuse rating: 10 A gL IEC/EN 60 947-5-1
- max. line circuit breaker: C 10 A

Mechanical life:
- 10 x 10$^4$ switching cycles

Variants

- BN 5983.53/60: with CSA approval
- BN 5983.53/61: with UL approval (Canada/USA)
- 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 IEC 60 664-1 of 2,5 kV / 2.
  - Contacts 41÷42 and 53÷54 to control circuit 2 kV/2 to IEC 60 664-1.
- BN 5983.53/107:
  - This version has the device characteristics of BN 5983.53/104 and protective separation of control and load circuits of IEC/EN 611 140, IEC 60 947-1 4 kV / 2 referred to overvoltage category II with basic insulation to IEC 60 664-1 of 2,5 kV / 2.
  - Contacts 41÷42 and 53÷54 to control circuit 2 kV/2 to IEC 60 664-1.
- BN 5983.53/108:
  - 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.

Ordering example for Variants

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

- BN 5983 /... DC 24 V 50/60 Hz

- BN 5983 /... AC 24 V 50/60 Hz

- BN 5983 /... DC 24 V 50/60 Hz

Technical data

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:
- 2 x 2,5 mm² solid or 2 x 1,5 mm² stranded ferruled
- DIN 46 228-1/-2/-3/-4

Wire fixing:
- Flat terminals with self-lifting clamping piece IEC/EN 60 999-1

Mounting:
- Removable terminal strip
- IEC/EN 60 715
- 840 g

Dimensions

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

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
- Width: 100 mm
Characteristics

Continuous current limit curves as a function of ambient temperature

Contact service life

Limit curve for arc-free operation with resistive load

Application examples

Two-channel emergency stop 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).

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

Contact reinforcement by external contactors with reduced safety level
Application examples

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

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.