

Emergency Stop Relay

Type BO 5988
safemaster



Models BO 5988.61, BO 5988.47



Features

- Category 3 or 4
- Contacts (5 µm gold plated)
 - .61 - 6 N/O, 1 N/C
 - .47 - 3 N/O, 1 N/C, 1 N/O delayed release
- Removable terminal strips for fast replacement
- Internal auxiliary power supply protection with auto-reset
- Dual voltage AC and 24V DC power supply
- Link programmable
 - Single or dual channel operation
 - Auto or manual reset
 - Short circuit/link monitoring of EStop and reset pushbutton circuits

Description

Emergency Stop Relay Type BO 5988 complies fully with the requirements of the standard specifications referred to on page 3 of this publication. It is a derivative of models BN 5983 / BD 5987 utilising fail-safe control logic to offer greatly extended control capability within a compact 100 mm wide DIN rail mounted enclosure.

Circuit Connections

The adjacent circuit (diag. 1) is for standard 2 channel input, manual reset operation.

The OFF and the EMERGENCY STOP buttons are connected in series between terminals S11/A3(+) and S12/S22.

The ON/button Button is connected between terminals Y1 and Y2. The a.c. auxiliary supply is connected to terminals A1 and A2. If a 24V d.c. auxiliary supply is used it should be connected to terminals S11/A3(+) and A4(-).

The circuits to be tripped are connected to terminals 13–14, through to 63–64. Terminals 81–82 are dedicated to remote signalling and must not be used for direct control purposes. The bridges across S21/S23 and X1/X2 are left in place unless another mode of operation is required. (see diags 2, 3 and 4).

For additional security an insulation monitoring relay may be connected to monitor terminal PE(-) to ground. (Details on request). When used with cross fault monitoring of the EStop button circuit diagram 3, this relay is suitable for Category 4 applications.

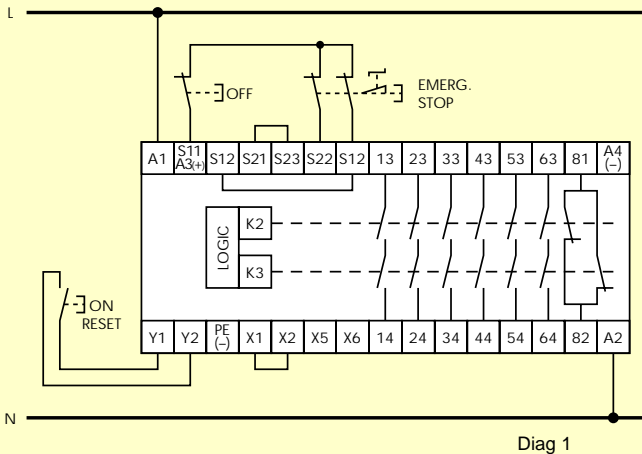
Indication

The relay is equipped with three green LEDs. When illuminated they indicate the healthy condition of the auxiliary supply and circuits K2–K3.

Typical Schematic Diagram

BO 5988.61 Category 3 applications

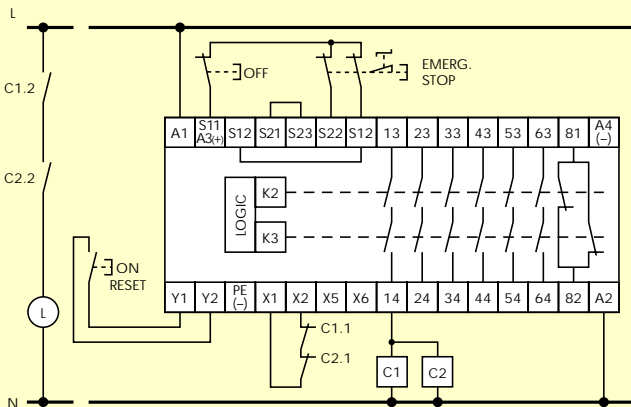
Fit links
S21 - S23
X1 - X2



Diag 1

BO 5988.61 with External contactors.

This diagram shows how external contactors with positive guided contacts C1 and C2 can be used to reinforce the switching capacity of BO 5988.61 with continued redundancy



Diag 2

Emergency Stop Relay

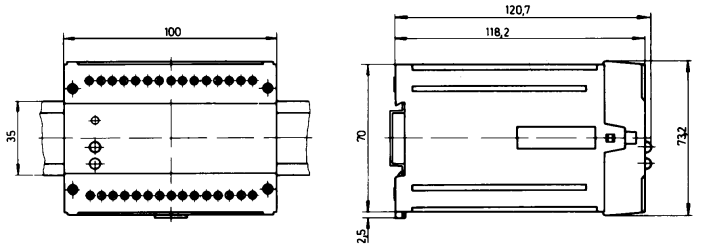
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Additional Information

- BO 5988 provides short circuit protection of the reset button. If terminals Y1–Y2 are continuously linked the relay will not re-energise in the event of Emergency Stop Button reset or restoration of the auxiliary supply.
 - Automatic reset facility is enabled by linking terminals X5–X6. NB. There will be a 900 ms delay on reset.
 - Terminals 81–82 are for remote signalling, e.g. to a PLC.
 - If additional control contacts are required the Relay BO 5988 may be used in conjunction with one or more extension modules type BG 5929/BN 3081 (diag. 7).
 - Model BO 5988 can be supplied with an integral timed delayed release contact but this does limit the number of contacts available (see BO 5988.47).
- Model BO 5988.61 may also be used with the time delay modules BG 7925, IL 7824, IN 7824 and BA 7924 described on (page 49-51).

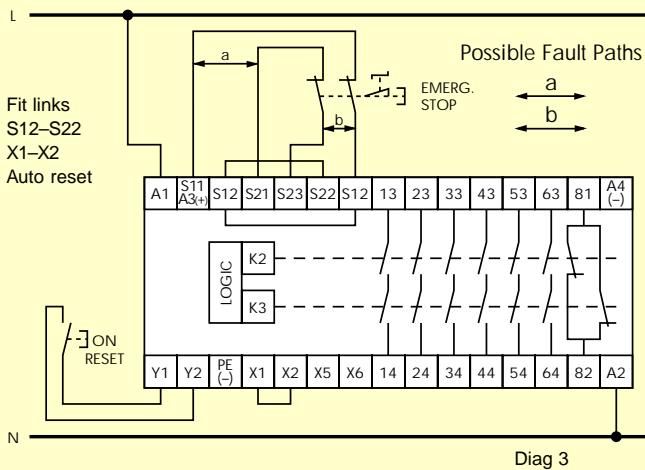
Dimensions



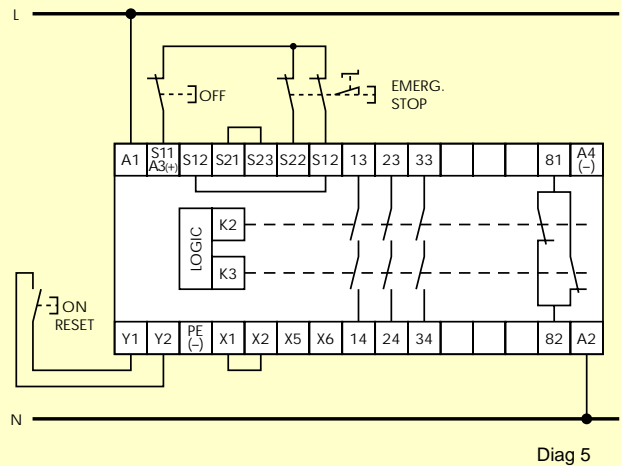
Weight 0.85 Kg

Schematic Diagram

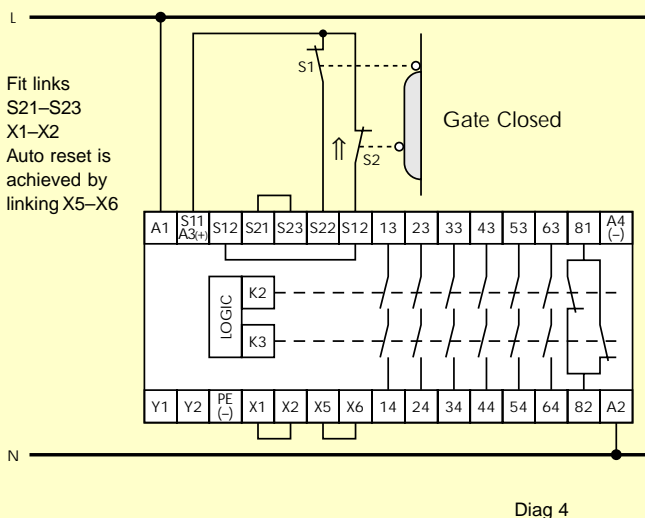
BO 5988.61 with cross fault monitoring of EStop pushbuttons
Category 4 Applications



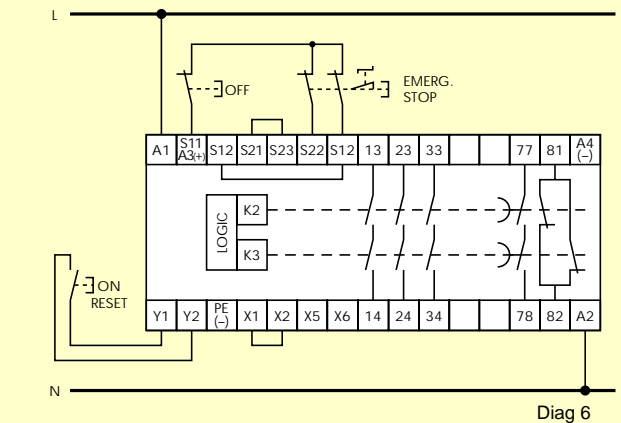
BO 5988.48 3 N/O, 1 N/C - see also BD 5935.48



BO 5988.61 As safety gate monitor
Category 3 applications



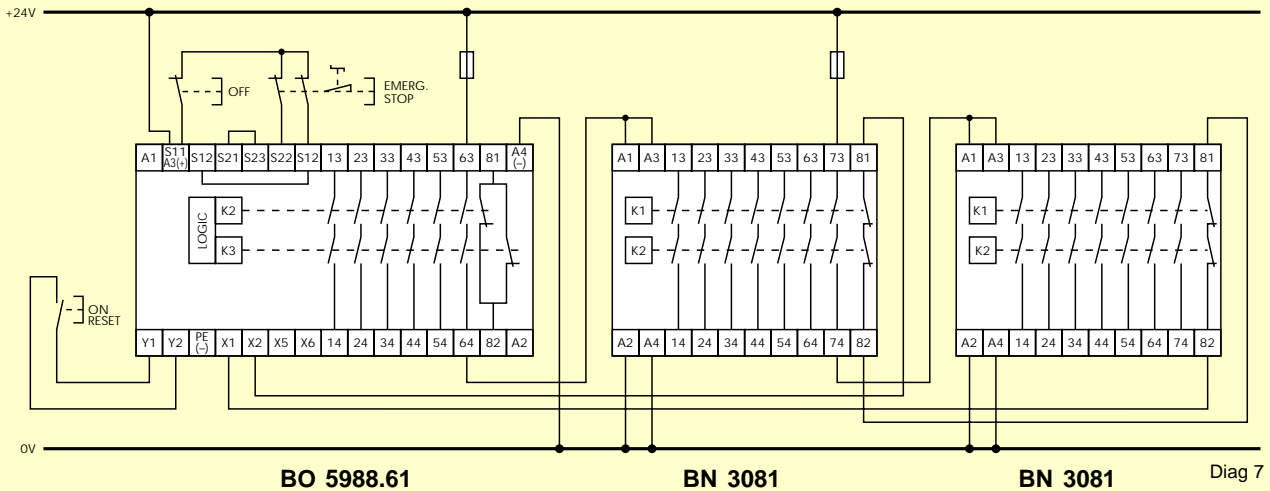
BO 5988.47 3 N/O, 1 N/C, 1 N/O adj. timed delayed release contact



Special Note

(Diag 1)
It is recommended that redundancy is carried through to the EMERGENCY STOP button by using a dual contact button as shown. If a single contact button is used then terminals S12 and S22 should be bridged. (Category 2 applications only)

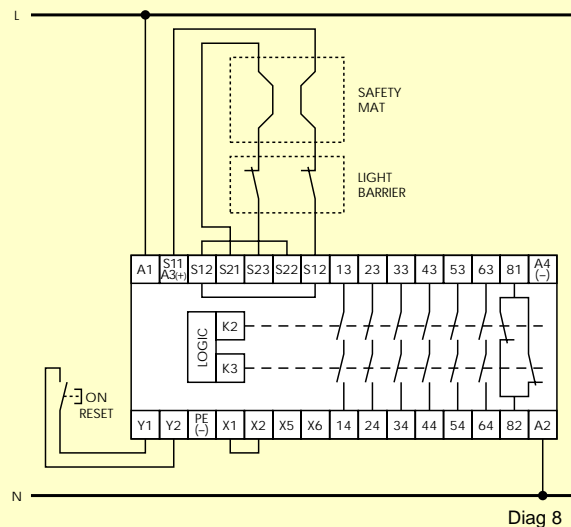
BO 5988.61 with BN 3081 Extension modules



Specifications

Nominal Voltage (Vn)	24V dc (Terminals S11/A3(+) and A4(-)) all versions Plus ac voltages (terminals A1, A2)
(N.B. a.c. voltage to be specified)	24V, 48V, 110V, 127V, 230V
Burden	<5VA ac/3W dc
Voltage Tolerance	0.8–1.1 Vn ac 0.9–1.2 Vn dc
Frequency	50 to 60Hz ±5%
Control Voltage (S11/A3(+))	24V dc
Min. Return Voltage	18.5V dc (S12, S22)
Contacts	5 µm gold plated (see versions)
Max Switching Capacity	10A ac (Cos φ 1–0.7) 10A dc see page 84
Continuous Current Rating	see page 84
Contact Life Mechanical	30 x 10 ⁶ operations
Contact Life Electrical	see page 84
Derated Capacity (for Heavy Inductive Loads)	AC15, 6A, 250V ac DC13, 6A, 24V dc
Min Switching Voltage & Current	0.1–60V, 1–300mA
Max Switching Voltage	250V ac, 250 Vdc
Max Switching Power	2500VA (AC1)/240W dc
Max Switching Frequency	6000 operations/hour
Max Loop Resistance	110Ω S11/ S12–S22 Dual Channel Operation X1–X2, 137Ω
Contact Time Delays	
Model BO 5988.47/1 (adj)	0.1–1s, 0.3–3s, 0.5–5s, 1–10s adjustable to 10min
Model BO 5988.47/4	1s, 3s, 5s, 10s
Model BO 5988.47/2 (fixed)	1s, 3s, 5s, 10s
Reaction times	Manual reset 100ms Auto reset 900ms ESTOP < 20ms
Operating Temperature	–15°C...+50°C at 90% R.H.
Protection Class	Case IP40 Terminals IP20
Test Voltage	2.5Kv 1 minute
Shock Loading	Amplitude 0.35mm Frequency 10–55Hz (5g @ 50Hz)
Enclosure Material	Thermoplastic V ₀ rating UL94
Terminations	1x4mm ² solid 2 x 2.5mm ² solid 1 x 2.5mm ² stranded ferruled 1 x 1.5mm ² stranded

BO 5988.61 used as a light barrier monitor and or safety mat monitor with cross fault monitoring of the safety contacts and link monitoring of the reset circuit.



Versions

- BO 5988.61/324 6N/O, 1N/C
- BO 5988.48/024 3N/O, 1N/C
- BO 5988.47/124 3N/O, 1N/C, 1N/O Adj delayed release.
- BO 5988.47/424 3N/O, 1N/C, 1N/O Adj delayed release up to 10 mins.
- BO 5988.47/224 3N/O, 1N/C, 1N/O Fixed delayed release
- **NB** Minimum on time for .47/124 version > set time

Information Required With Order

- Model type • Auxiliary supply
- Example: Emergency Stop Relay Type BO 5988.61/324
Auxiliary Supply 230V ac/24V dc*