

Two Hand Safety Relays

Type BG BH BL 5933
safemaster



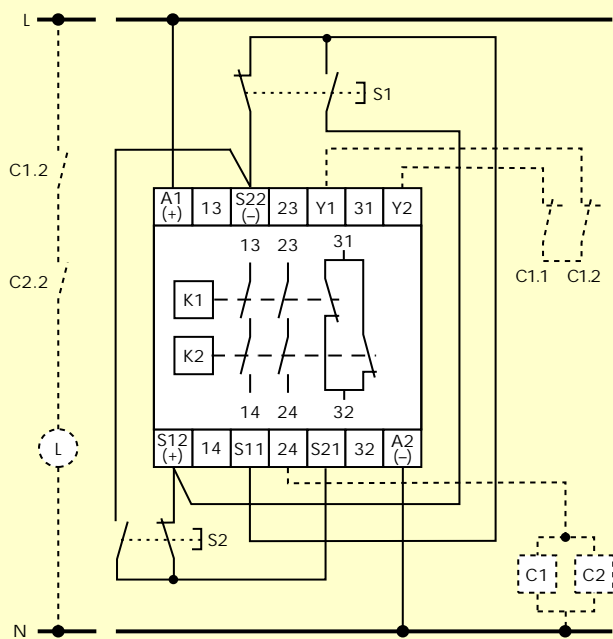
Model BG BH BL 5933



Technical Committee
of Electrical
Engineering

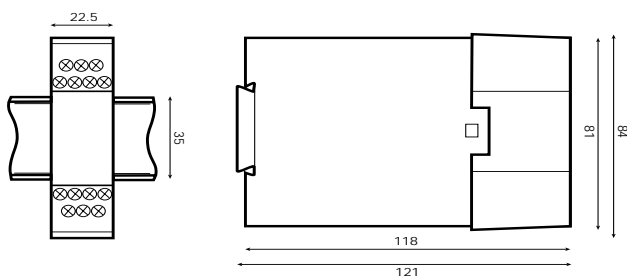
Typical Schematic Diagram

BG 5933.22



Diag 1

Dimensions



Weight 0.21 Kg

Features

- Category Type 111-C, SIL CL3
- Contacts
 - BG5933.22 - 2 N/O, 1 N/C
 - BH5933.48 - 3 N/O, 1 N/C
 - BL5933.48 - 3 N/O, 1 N/C, .02 - 2 N/O
- Compact case BG 22.5mm, BH 45mm, BL 90mm
- Internal auxiliary power supply protection with automatic reset
- 24VAC and 24VDC auxiliary power supply, BG & BH versions
- Dual voltage AC and 24V DC auxiliary power supply BL versions

Description

Certain types of machine processes such as presses and guillotines must incorporate safety measures to prevent injury to the limbs of the operator. A method of achieving this is to ensure that the command operation to the machine can only be made via two pushbuttons, which when depressed requires the use of both the operator's hands. If this technique is employed then the control process must conform to the safety requirements which are laid down in BS/EN 60204: Part 1: 1993 Clause 9.2.5.7.

These are that:

- The two buttons must be depressed within a prescribed time period.
- Both buttons must be released and then depressed to commence a new cycle.

Models BG BH BL 5933 satisfies these conditions and will respond safely to component or wiring failures in the control circuit. Housed in a compact 45 mm enclosure suitable for DIN rail mounting the unit is equipped with positive guided contacts and incorporates redundant self checking circuitry. BG BH BL 5933 meets the regulations of the German Employers Liability Association ZH1-456 is approved by E.L.A. "Eisen and Metal III" class IV of DIN24980 and complies with VDE0435 (IEC 255) and EN574 cat 111-C.

Circuit Connections

The auxiliary supply is connected to terminal A1(+) and A2(-). Changeover pushbuttons S1 and S2 are connected across terminals S11 – S12 – S22 and S21 – S12 – S22. The command signals to the process are generated via contact chains 13 – 14 and 23 – 24. Terminals Y1 – Y2 may be used to monitor contacts from machine sensors, e.g. pressure, temperature which override the BG 5933 command function in the event of machine abnormality. If external positive guided auxiliary contactors are used the auxiliary contactor N/C contacts should be connected in series between Y1 – Y2 to provide the necessary redundancy. If Y1 – Y2 are not used these terminals are bridged.

Special Note

The dotted lines on (diag.1) show how external contactors with positive guided contacts C1 and C2 may be used to reinforce the switching capacity of BG 5933 with continued redundancy. Feedback loop Y1-Y2 should be linked if external contact reinforcement is not required.

Indication

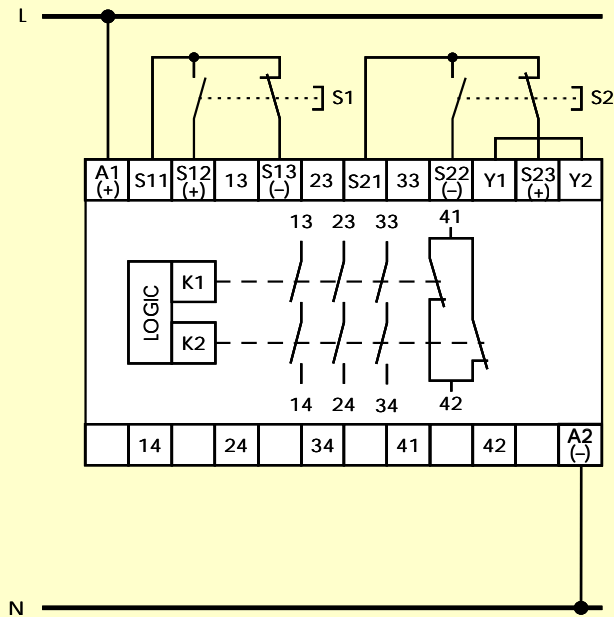
The relays are equipped with three green LEDs. When illuminated they indicate the healthy condition of the auxiliary supply and circuits K1-K2.

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BH 5933.48

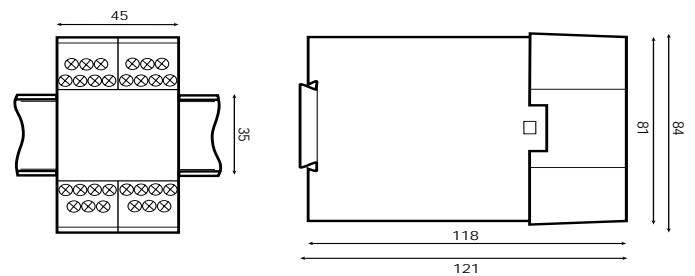


Diag 2

Typical Arrangement

S1 and S2 are buttons which must be pressed simultaneously to initiate the process. BG BH 5933 is configured such that K1 and K2 will only close together provided the time interval between the depression of buttons S1 and S2 does not exceed 500 ms. Furthermore, a repeat operation is not possible until the contacts on buttons S1 and S2 have been returned to the open position. These measures ensure that it is not possible for the operator to defeat the safety criteria by permanently depressing one of the operating buttons.

Dimensions



Weight 0.40 Kg

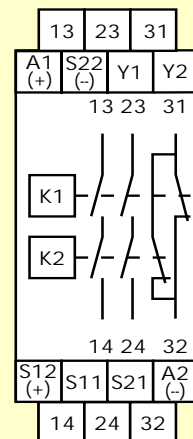
Specification

Nominal Voltage (Vn) Terminals A1(+) / A2(-)
BG 5933 24Vdc , 24V ac (To Be Specified)
BH 5933 Terminals A1(+) / A2(-)
24, 48 -110 -127- 230V ac
or 24Vdc (To Be Specified)
Burden <4VA ac/3W 24V dc
Voltage Tolerance 0.8–1.1 Vn ac 0.8–1.2 Vn dc
Frequency 50 to 60Hz ±5%
Control Contact Load S1, S2 N/O-50 mA, N/C-20mA
max control line length 30m.
Avoid close proximity to AC lines.

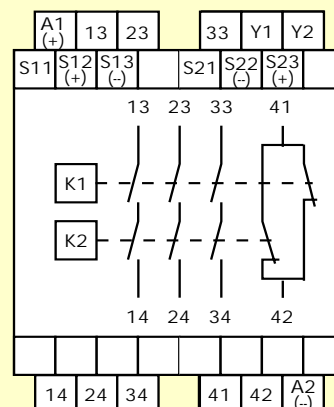
Max Switching Capacity 8A ac (cos ϕ 1–0.7)
8A dc see page **
Continuous Current Rating see page **
Contact Life Mechanical 30 x 10⁶ operations
Contact Life Electrical see page **
Derated Capacity AC15, 4A, 250V ac
(for Heavy Inductive Loads) DC13, 4A, 24V dc
Min. Switching Voltage & Current 0.1–60V, 1–300mA
Max. Switching Voltage 250V ac, 250V dc
Max. Switching Power 2000VA (AC1)/192W dc
Max. Switching Frequency 1200 operations/hour
Simultaneity Delay 500ms
Reaction Times Trip < 15ms
Reset 40ms
Operating Temperature –15°C...+55°C at 90% RH
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 VO Rating UL94
Terminations 1 x 4mm² solid
2 x 2.5mm² solid
1 x 2.5mm² stranded ferruled
1 x 1.5mm² stranded

Terminal Layout

BG 5933.22



BH 5933.48

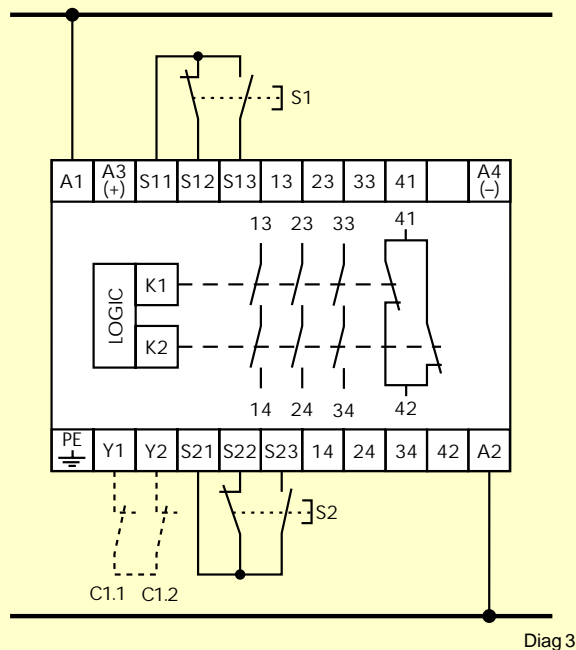


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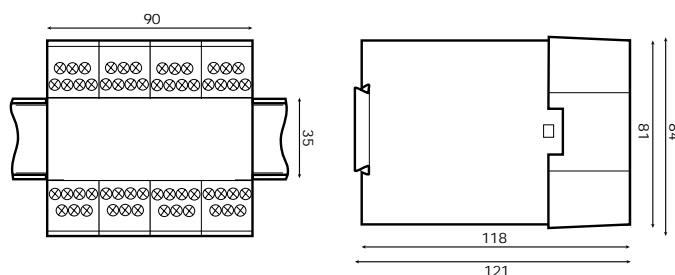
BL 5933.48



Typical Arrangement

S1 and S2 are buttons which must be pressed simultaneously to initiate the process. BL 5933 is configured such that K1 and K2 will only close together provided the time interval between the depression of buttons S1 and S2 does not exceed 500 ms. Furthermore, a repeat operation is not possible until the contacts on buttons S1 and S2 have been returned to the open position. These measures ensure that it is not possible for the operator to defeat the safety criteria by permanently depressing one of the operating buttons.

Dimensions



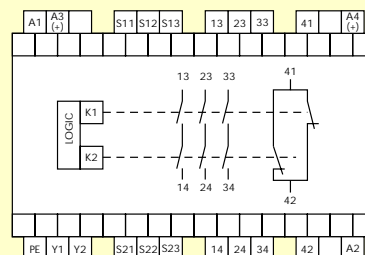
Weight 0.85 Kg

Specification

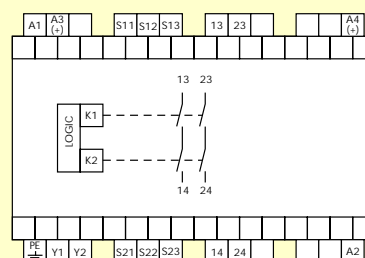
Nominal Voltage (Vn)	24Vdc (Terminals A3(+)/A4(-)
BL5933	ac Voltages (Terminals A1,A2)
(N.B. ac Voltage to be specified)	24, 48-110-127-230V ac
Burden	<3VA ac/3W 24V dc
Voltage Tolerance	0.8–1.1 Vn ac 0.8–1.2 Vn dc
Frequency	50 to 60Hz ±5%
Control Contact Load	S1, S2 N/O-6.5mA, N/C-10mA max control line length 30m. Avoid close proximity to AC lines.
Contacts	.48 3N/O, 1 N/C; .02 2N/O
Max Switching Capacity	10A ac (cos φ 1–0.7) 10A dc see page **
Continuous Current Rating	see page **
Contact Life Mechanical	30 x 10 ⁶ operations
Contact Life Electrical	see page **
Derated Capacity	AC15, 6A, 250V ac
(for Heavy Inductive Loads)	DC13, 6A, 24V dc
Min. Switching Voltage & Current	0.1–60V, 1–300mA
Max. Switching Voltage	250V ac, 250V dc
Max. Switching Power	2500VA (AC1)/240W dc
Max. Switching Frequency	1200 operations/hour
Simultaneity Delay	500ms
Reaction times	Trip < 15ms Reset 40ms
Operating Temperature	–15°C...+55°C at 90% RH
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 VO Rating UL94
Terminations	1 x 4mm ² solid 2 x 2.5mm ² solid 1 x 2.5mm ² stranded ferruled 1 x 1.5mm ² stranded

Terminal Layout

BL 5933.48



BL 5933.02



Information Required With Order

• Model type • Auxiliary supply

Example: Emergency Stop Relay Type BG 5933.22
Auxiliary Supply 24V dc.