

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	- 15 ... + 50°C	
Clearance and creepage distances		
rated impuls voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages between wires for power supply:	0,5 kV	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
HF-wire guided:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
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 / 050 / 04 IEC/EN 60 068-1	
Terminal designation:	EN 50 005	
Wire connection:	1 x 4 mm ² solid or 1 x 2,5 mm ² stranded ferruled (isolated) or 2 x 1,5 mm ² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2,5 mm ² stranded ferruled DIN 46 228-1/-2/-3	
Wire fixing:	Plus-minus terminal screws M 3,5 box terminal with wire protection	
Mounting:	DIN rail IEC/EN 60 715	
Weight:	850 g	

Dimensions

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

Safety related data

Probability of dangerous Failure per Hour (PFH_D):	4,77 · 10 ⁻¹⁰ 1/h (BO 5988.61, BO 5988.62) 8,60 · 10 ⁻¹⁰ 1/h (BO 5988.47/124)
Safe Failure Fraction (SFF):	99,4 % (BO 5988.61, BO 5988.62) 99,3 % (BO 5988.47/124)
Proof Test Intervall (T1):	20 Years



The values stated above are valid for the standard type. Safety data for other variants are available on request

Standard types

BO 5988.61/024	DC 24 V + AC 230 V	50 / 60 Hz	
Article number:	0040375		stock item
<ul style="list-style-type: none"> • Dual voltage version • Output: 6 NO contacts, 1 NC contact as monitoring contact • Width: 100 mm 			
BO 5988.47/124	DC 24 V + AC 230 V	50 / 60 Hz	1 ... 10 s
Article number:	0040430		stock item
<ul style="list-style-type: none"> • Dual voltage version • Output: 3 NO contacts, 1 NC contact as monitoring contact, 1 release delayed NO contact • With adjustable time delay t_v to 10 s • Width: 100 mm 			

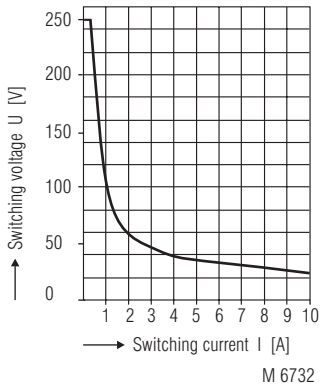
Variants

BO 5988. __ / 60:	with CSA approval
BO 5988. __ / 61:	with UL approval (Canada/USA)
Auxiliary supply is not necessary during elapse of time:	
BO 5988.47 / 1 __:	3 NO / 1 NC contacts + t _v adjustable
BO 5988.47 / 2 __:	3 NO / 1 NC contacts + t _v fixed
Auxiliary supply must be connected during elapse of time:	
BO 5988.47 / 4 __:	3 NO / 1 NC contacts + t _v adjustable
BO 5988.47 / 5 __:	3 NO / 1 NC contacts + t _v fixed
Without time delay t _v :	
BO 5988.48 / 0 __:	3 NO / 1 NC contacts
BO 5988.61 / 0 __:	6 NO / 1 NC contacts as monitoring contact
BO 5988.62 / 0 __:	6 NO / 1 NC contacts as monitoring contact
BO 5988. __ / __00:	single voltage model
BO 5988. __ / __24:	dual voltage model
BO 5988.61 / 106:	
Protective separation of control and load circuits according to IEC/EN 61 140, IEC/EN 60 947 4 kV / 2 referred to overvoltage category II with basic insulation to IEC 60 664 of 2,5 kV / 2.	
BO 5988.61 / 324:	Dual voltage model 0,5 s operate delay with automatic restart

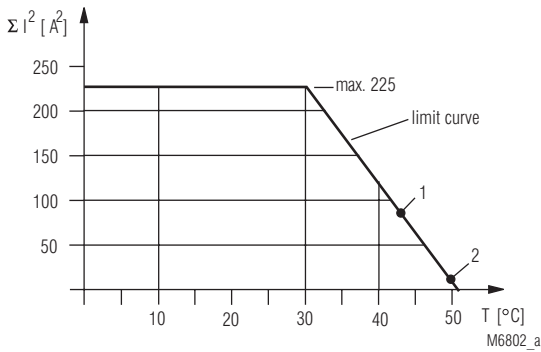
Ordering example for variants

BO 5988.47/124	1 ... 10 s	DC 24 V + AC 230 V	50 / 60 Hz	
				Nominal frequency
				Nominal voltage
				Time delay
				00: 1 nominal voltage
				24: 2 nominal voltages
				0: without t _v
				without auxiliary supply during time elapse:
				1: t _v adjustable
				2: t _v fixed
				with auxiliary supply during time elapse:
				4: t _v adjustable
				5: t _v fixed
				Contacts
				Type

Characteristics



Limit curve for arc-free operation with resistive load



Total current limit curve

It is necessary to use the square of the currents in order to obtain a linear limit curve.

General formula for determination of the maximum ambient temperature

- Sum of currents² per safety contact = value on scale ΣI^2 (A²)
- Max. ambient temperature T = Cross point of scale ΣI^2 (A²) with limit curve

Example 1

- $(4A)^2 + (4A)^2 + (4A)^2 + (4A)^2 + (4A)^2 + (4A)^2 = 96 A^2$ (Scale ΣI^2)
- Max. ambient temperature $T = 43^\circ\text{C}$ (point 1)

Example 2

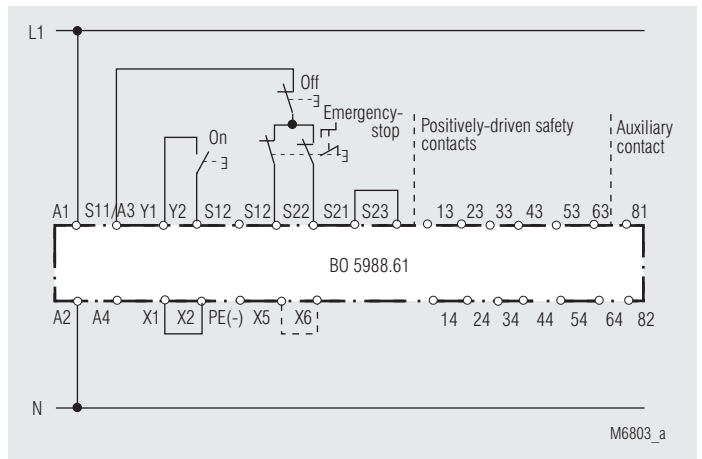
- $(0,5 A)^2 + (1 A)^2 + (2 A)^2 + (1 A)^2 = 6,25 A^2$ (Scale ΣI^2)
- Max. ambient temperature $T = 49^\circ\text{C}$ (point 2)

Please note:

The total current² can still be 1,5 A² at 50°C, i.e. 0,5 A per safety contact

- $(0,5 A)^2 + (0,5 A)^2 + (0,5 A)^2 + (0,5 A)^2 + (0,5 A)^2 + (0,5 A)^2 = 1,5 A^2$
- Max. ambient temperature = 50°C

Application examples



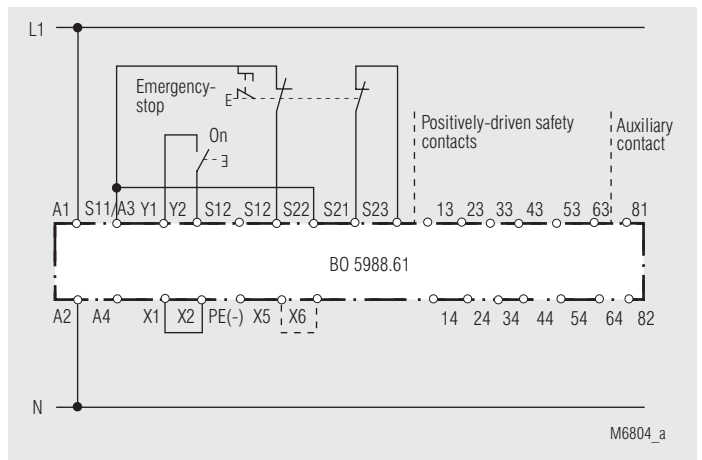
Two-channel emergency stop circuit without cross fault detection.

Activation via On pushbutton. - - - Jumper X5 - X6:

A jumper must be fitted X5 - X6 for the automatic On function.

The On pushbutton is not required.

Application examples

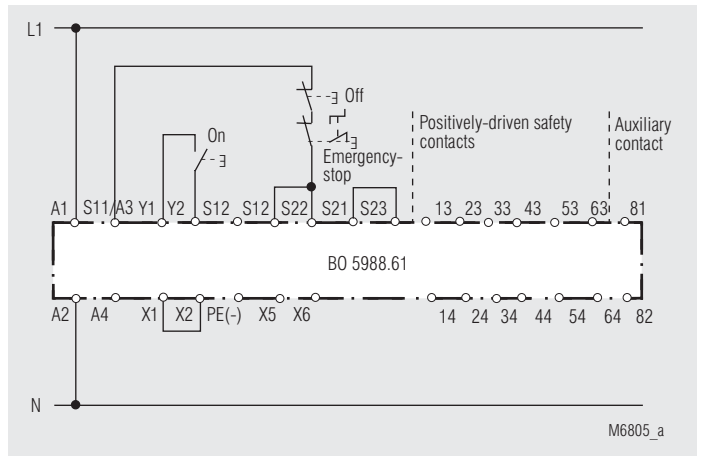


Two-channel emergency-stop circuit with cross fault detection.

Activation via On pushbutton. - - - Jumper X5 - X6:

A jumper must be fitted X5 - X6 for the automatic On function.

The On pushbutton is not required.



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