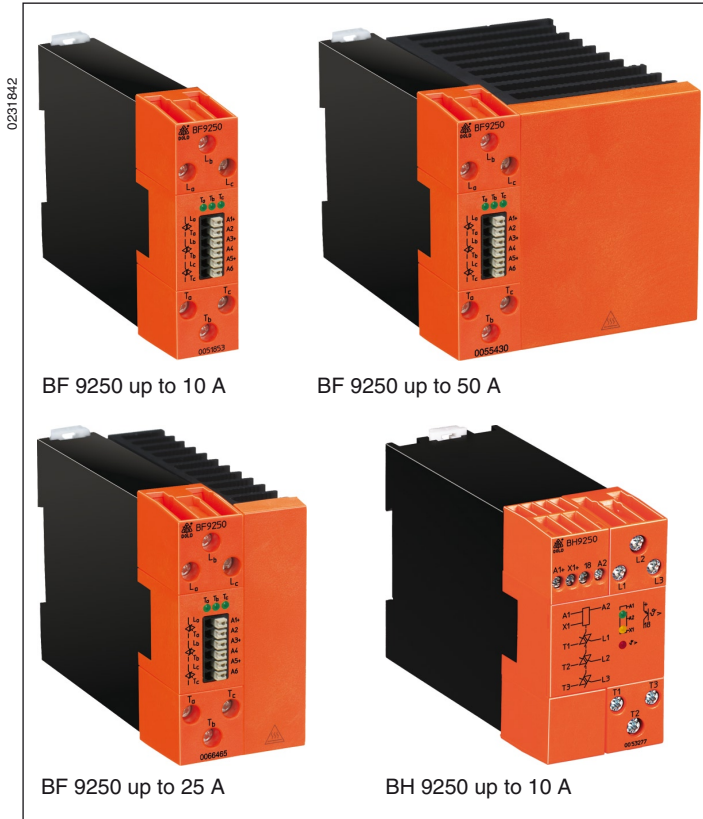


Semiconductor contactor BF 9250, BH 9250  
POWERSWITCH

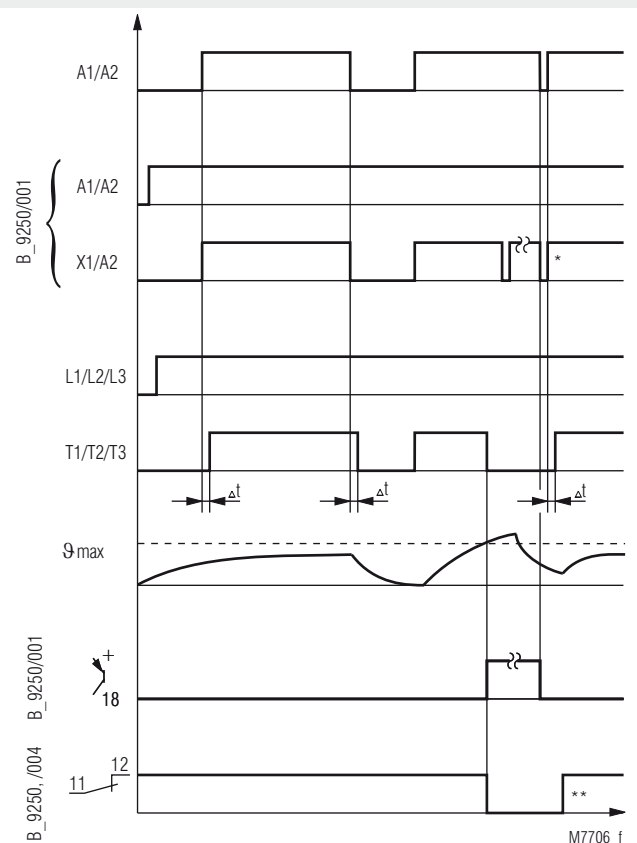


- According to IEC/EN 60 947-4-2, IEC/EN 60 947-4-3
- 1-, 2- and 3-pole models
- Load current up to 50 A
- For AC load up to 480 V
- Switching at zero crossing
- Protected by varistors
- As option temperature protection of the power semiconductors with monitoring output
- Mounting on DIN-rail
- As option with control input X1 with low current consumption e.g. to be controlled by a PLC
- As option up to 3 separate semiconductor contactors in one unit
- BF 9250: width 22.5 mm, 45 mm and 90 mm
- BH 9250: width 45 mm, 67.5 mm and 112.5 mm

Approvals and marking



Function diagram



\* The latching function of the overtemperature monitoring is reset by disconnecting A1/A2 for a short moment  
 \*\* after the cool down time  
 Δt = switching delay

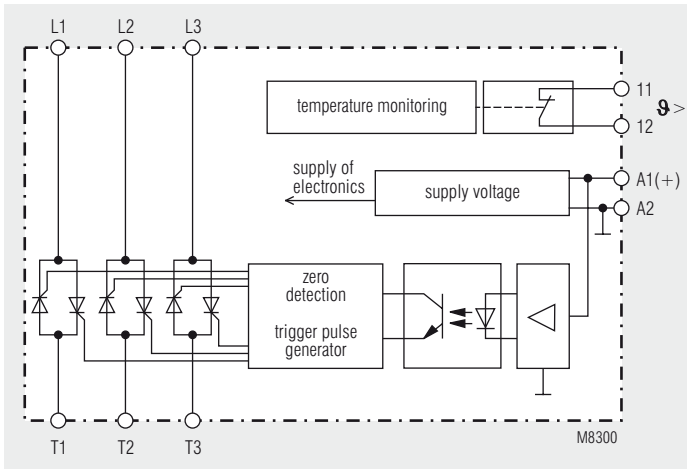
Applications

- Fast and noiseless switching of:
- heating elements
  - motors
  - valves
  - lighting

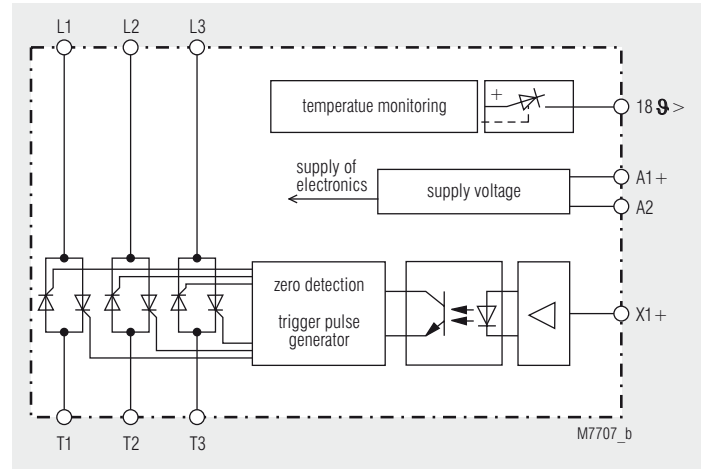
Indication

- BF 9250/001, BH 9250/001**  
 green LED "A1-A2": on, when voltage on A1/A2  
 yellow LED "x1": on, when voltage on X1  
 red LED "θ>": on, when overtemperature
- BF 9250/003**  
 green LED "T<sub>a</sub>": on, when A1 connected  
 green LED "T<sub>b</sub>": on, when A3 connected  
 green LED "T<sub>c</sub>": on, when A5 connected
- BF 9250/004**  
 green LED "T<sub>a</sub>": on, when A1 connected  
 green LED "T<sub>b</sub>": on, when A2 connected  
 green LED "T<sub>c</sub>": on, when A3 connected
- BF 9250**  
 green LED "A1-A2": on, when voltage on A1

## Block diagram

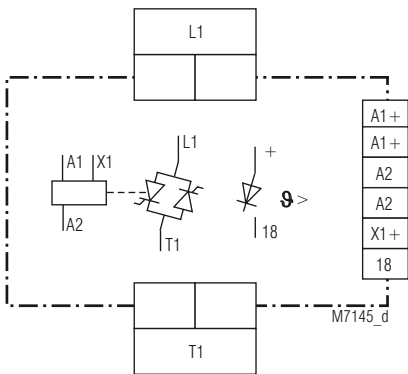


BF9250, BF 9250/004

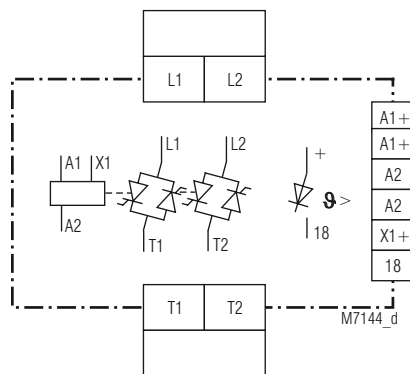


BF9250/001, BH 9250/001

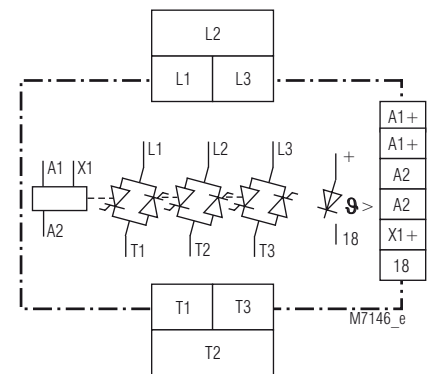
## Circuit diagrams



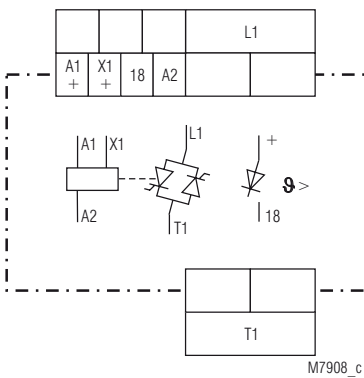
BF 9250.01/001



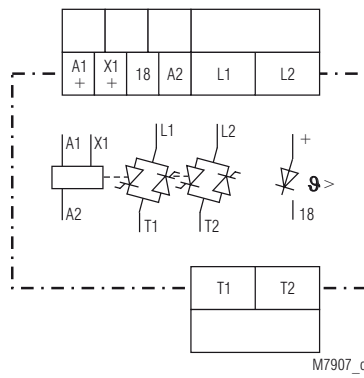
BF 9250.02/001



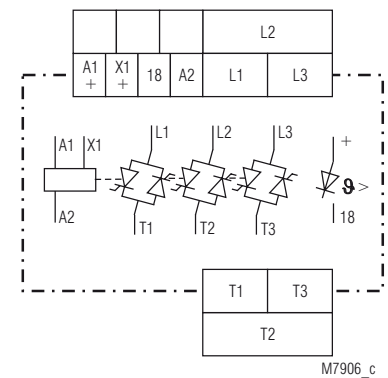
BF 9250.03/001



BH 9250.01/001

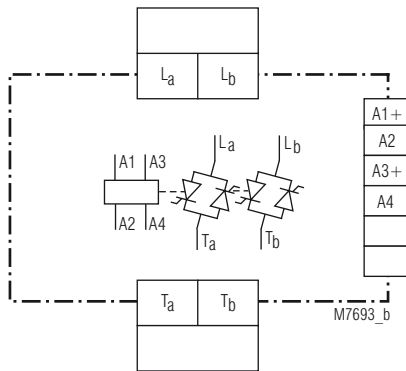


BH 9250.02/001

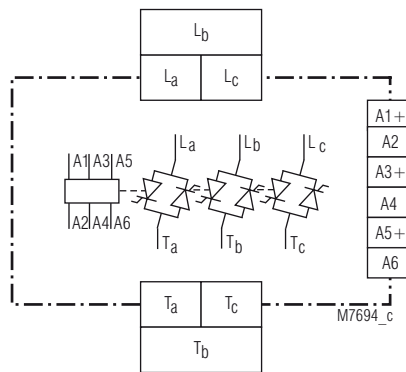


BH 9250.03/001

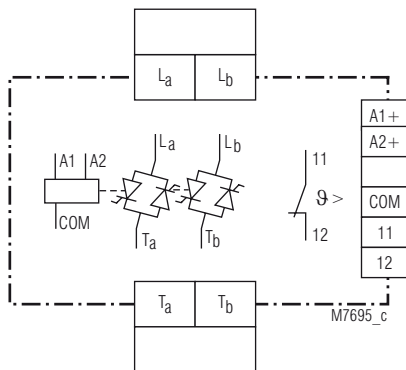
## Circuit diagrams



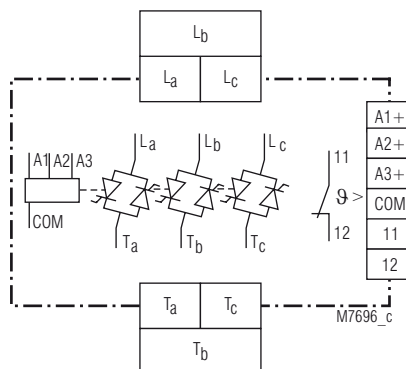
BF 9250.92/003



BF 9250.93/003



BF 9250.02/004



BF 9250.03/004

## Technical Data

### Input

#### BF 9250/001, BH 9250/001:

Operation voltage A1/A2:	DC 24 V
Voltage tolerance:	± 10 %
Input current:	35 mA
Control voltage X1/A2:	DC 3 ... 48V
Making voltage:	DC 3 V
Switch off voltage:	DC 2 V
Start current:	0,5 mA at DC 3 ... 10 V 10 mA at DC 10 ... 48 V
Start up delay [ms]:	≤ 2 + 1/2 Periode
Release delay [ms]:	≤ 1 + 1/2 Periode

#### BF 9250/003:

Control voltage A1/A2:	DC 24 V, control of $T_a$
Control voltage A3/A4:	DC 24 V, control of $T_b$
Control voltage A5/A6:	DC 24 V, control of $T_c$
Start up delay [ms]:	≤ 1 + 1/2 Periode
Release delay [ms]:	≤ 1 + 1/2 Periode

#### BF 9250/004:

Control voltage A1/COM:	DC 24 V, control of $T_a$
Control voltage A2/COM:	DC 24 V, control of $T_b$
Control voltage A3/COM:	DC 24 V, control of $T_c$
Start up delay [ms]:	≤ 1 + 1/2 Periode
Release delay [ms]:	≤ 1 + 1/2 Periode

#### BF 9250:

Control voltage A1/A2:	AC/DC 110 ... 230V, AC/DC 24 V
Start up delay [ms]:	≤ 3 + 1/2 Periode
Release delay [ms]:	≤ 35 + 1/2 Periode

### Output

#### Load output T1, T2, T3; $T_a, T_b, T_c$

#### Load currents at 100 % duty cycle ED, AC 51:

	Ambient temperature	Device without heat sink	Device with small heat sink	Device with large heat sink
<b>1-pole</b>	25°C	13 A	30 A	55 A
	40°C	10 A	25 A	50 A
<b>2-pole</b>	25°C	7 A	17,5 A	28 A
	40°C	6,5 A	15 A	25 A
<b>3-pole</b>	25°C	6 A	14 A	20 A
	40°C	5 A	10 A	15 A

#### Current reduction over 40°C

	Device without heat sink	Device with small heat sink	Device with large heat sink
<b>1-polig</b>	0,2 A / °C	0,4 A / °C	0,6 A / °C
<b>2-polig</b>	0,2 A / °C	0,3 A / °C	0,4 A / °C
<b>3-polig</b>	0,2 A / °C	0,2 A / °C	0,3 A / °C

**Load voltage range:** AC 24 ... 480 V

**Frequency range:** 50 / 60 Hz

**Leakage current in off state at nominal voltage  $U_N$  and nominal frequency**

( $T_j=125^\circ\text{C}$ , max.): 1.0 mA

**at load voltage up to:** AC 480 V

Peak inverse voltage: ± 1 200 Vp

**Short circuit current**

at  $t=10$  ms

BF 9250.01; .02; .92;

BH 9250.01; .02:

BF 9250.03; .93;

BH 9250.03:

600 A

**Power dissipation:**  $P = 1.2 [V] \times I_{\text{eff}} [A] / k [W]$

with k as formfactor and

$k = 1.1$  for sinusoidal current

## Technical Data

BF 9250 BH 9250	I <sub>N</sub>	load limit integral of the semi- conductor	Semiconductor fuse		
			Type	Article-No.	Brand
1-pole	10 A	1800 A <sup>2</sup> s	fuse 10 x 38	6003434.16	SIBA
	25 A	1800 A <sup>2</sup> s	fuse 10 x 38	6003434.30	SIBA
	50 A	1800 A <sup>2</sup> s	NH-00	2020920.63	SIBA
2-pole	2x6,5 A	1800 A <sup>2</sup> s	fuse 10 x 38	6003434.10	SIBA
	2x15 A	1800 A <sup>2</sup> s	fuse 10 x 38	6003434.20	SIBA
	2x25 A	1800 A <sup>2</sup> s	fuse 10 x 38	6003434.30	SIBA
3-pole	3x5 A	800 A <sup>2</sup> s	fuse 10 x 38	6003434.8	SIBA
	3x10 A	800 A <sup>2</sup> s	fuse 10 x 38	6003434.16	SIBA
	3x15 A	800 A <sup>2</sup> s	fuse 10 x 38	6003434.20	SIBA

Varistor voltage: AC 510 V

### Semiconductor monitoring output

**Output** (Terminal 18): transistor, plus switching  
switched auxiliary voltage: DC 24 V  
Switching capacity: 100 mA, short circuit proof  
Residual voltage: typ. 0.6 V

**Output** (NC contact 11, 12)  
Switching capacity: AC 240 V\* / 2.0 A cos φ = 1  
AC 240 V\* / 1.0 A cos φ = 0.6 inductive  
DC 24 V / 1.0 A

\*) max. AC 150 V at variant /004

### General Data

**Fitting position:** cooling ribs vertically  
**Operating mode:** Continuous operation  
**Temperature range:**  
Operation: 0 ... 40°C  
max. 60°C (with current derating factor  
see table)  
Storage temperature: - 20 ... + 80°C

**Clearance and creepage  
distances**  
rated impuls voltage /  
pollution degree 4 kV / 3 IEC 60 664-1  
**EMC**  
IEC/EN 61 000-6-4, IEC/EN 61 000-6-1  
Electrostatic discharge: 8 kVair / 6 kV contact 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: 1 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 A IEC/EN 60 947-4-3  
A higher suppression class can be  
reached by connecting capacitors of  
0.47 µF / 600 V AC across the phases  
or across phase and neutral.

### Insulation voltages

Input to Output: 2.5 kV  
Input to semiconductor  
monitoring output  
(NC contact) 2.0 kV  
Input to heat sink: 2.5 kV  
Output to Output: 2.5 kV  
Output to heat sink: 2.5 kV

### Degree of protection

Housing: IP 40 IEC/EN 60 529  
Terminals: IP 20 IEC/EN 60 529

## Technical Data

**Vibration resistance:** Amplitude 0,35 mm  
Frequency 10 ... 55 Hz, IEC/EN 60 068-2-6  
0 / 060 / 04 IEC/EN 60 068-1

**Climate resistance:** EN 50 005

**Terminal designation**  
**Wire connection:** DIN 46 228-1/-2/-3/-4  
Load terminals:  
1 x 10 mm<sup>2</sup> solid  
1 x 6 mm<sup>2</sup> stranded ferruled

Control terminals  
BF 9250: 1 x 0.75 mm<sup>2</sup> stranded ferruled (isolated)  
DIN 46 228-1/-2/-3/-4  
1 x 1.5 mm<sup>2</sup> stranded ferruled  
DIN 46 228-1/-2/-3

BH 9250: 1 x 4 mm<sup>2</sup> solid or  
1 x 2.5 mm<sup>2</sup> stranded ferruled (isolated)  
or  
2 x 1.5 mm<sup>2</sup> stranded ferruled (isolated)  
DIN 46 228-1/-2/-3/-4 or  
2 x 2.5 mm<sup>2</sup> stranded ferruled  
DIN 46 228-1/-2/-3

### Wire fixing

Load terminals: Terminal screws M 4  
Box terminal with wire protection

Control terminals:  
BF9250/001, BF9250/003,  
BF9250/004:  
BF9250:

cage clamp terminals "Push-In"  
captive flat screw M2,  
box terminal

BH9250:

Plus-minus terminal screws M3,5  
box terminals with wire protection  
DIN rail IEC/EN 60 715

### Mounting:

### Weight

BF 9250  
Width 22.5 mm: 350 g  
Width 45 mm: 580 g  
Width 90 mm: 1 050 g  
BH 9250  
Width 45 mm: 394 g  
Width 67.5 mm: 638 g  
Width 112.5 mm: 1 094 g

### Dimensions

#### Width x height x depth:

BF 9250: 22.5 x 85 x 120 mm  
45 x 85 x 120 mm  
90 x 85 x 120 mm  
BH 9250: 45 x 85 x 120 mm  
67,5 x 85 x 120 mm  
112.5 x 85 x 120 mm

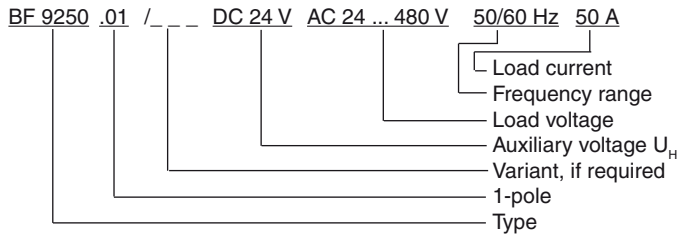
## Standard types

BF 9250.01/001	DC 24 V	AC 24 ... 480 V	50/60 Hz	10 A
Article number:	0050515			stock item
• 1-pole				
• Control input X1:	DC 3 ... 48 V			
• Auxiliary voltage:	DC 24 V			
• Load voltage:	AC 24 ... 480 V			
• Load current:	10 A			
• With signal output				
• Width:	22,5 mm			
BF 9250.03/001	DC 24 V	AC 24 ... 480 V	50/60 Hz	3 x 10 A
Article number:	0050520			stock item
• 3-pole				
• Control input X1:	DC 3 ... 48 V			
• Auxiliary voltage:	DC 24 V			
• Load voltage:	AC 24 ... 480 V			
• Load current:	3 x 10 A			
• With signal output				
• Width:	45 mm			

## Variants

BF 9250.0_:	Without low current input X1
BH 9250.__/001:	With bigger diameter for control wires
BF 9250.92/003, BF 9250.93/003:	2 or 3 power semiconductor controlled by a separate input with galvanic isolation, without temperature monitoring of the semiconductors
BF 9250.02/004, BF 9250.03/004:	2 or 3 power semiconductor controlled by a separate input with common ground with temperature monitoring of the semiconductors signal output not latching without LED display of $\varnothing$ .

## Ordering example for Variants



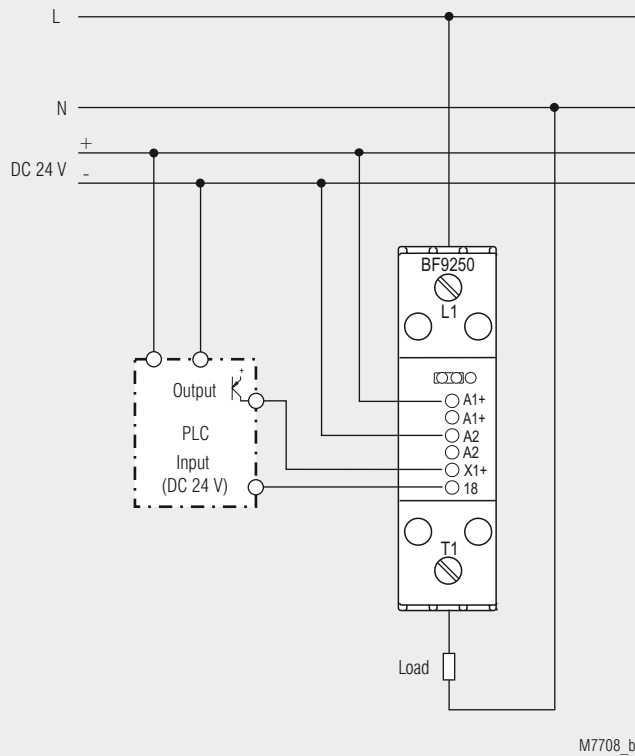
## Installation

Recommended distance:  
upper / lower side to cable duct: 20 mm

Distance on left and right: 10 mm; with max. load current and 100 % duty cycle

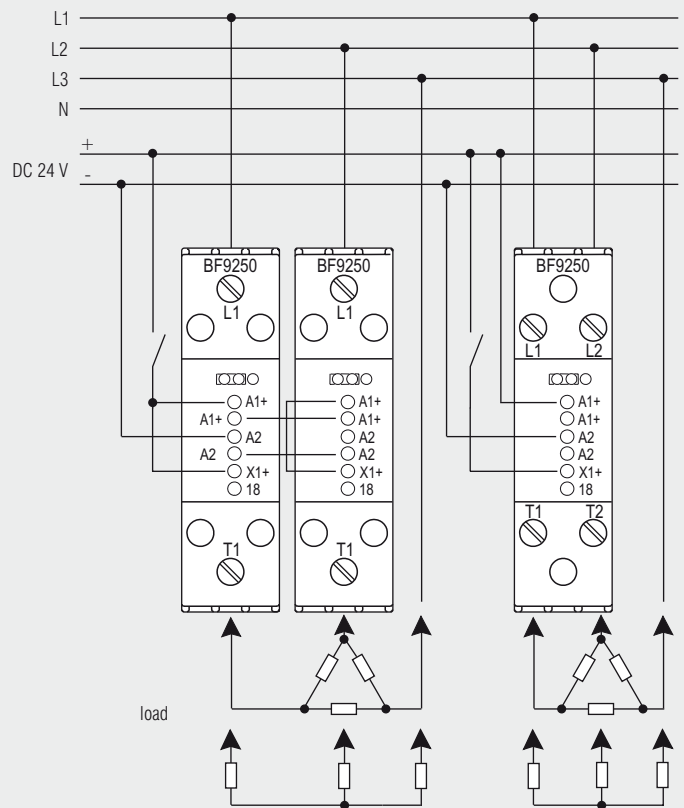
## Application example

### single phase system



M7708\_b

### 3-phase system, 2 phases controlled



M9632

Single phase load switched by 1-pole semiconductor contactor controlled from PLC or Temperature controller output.

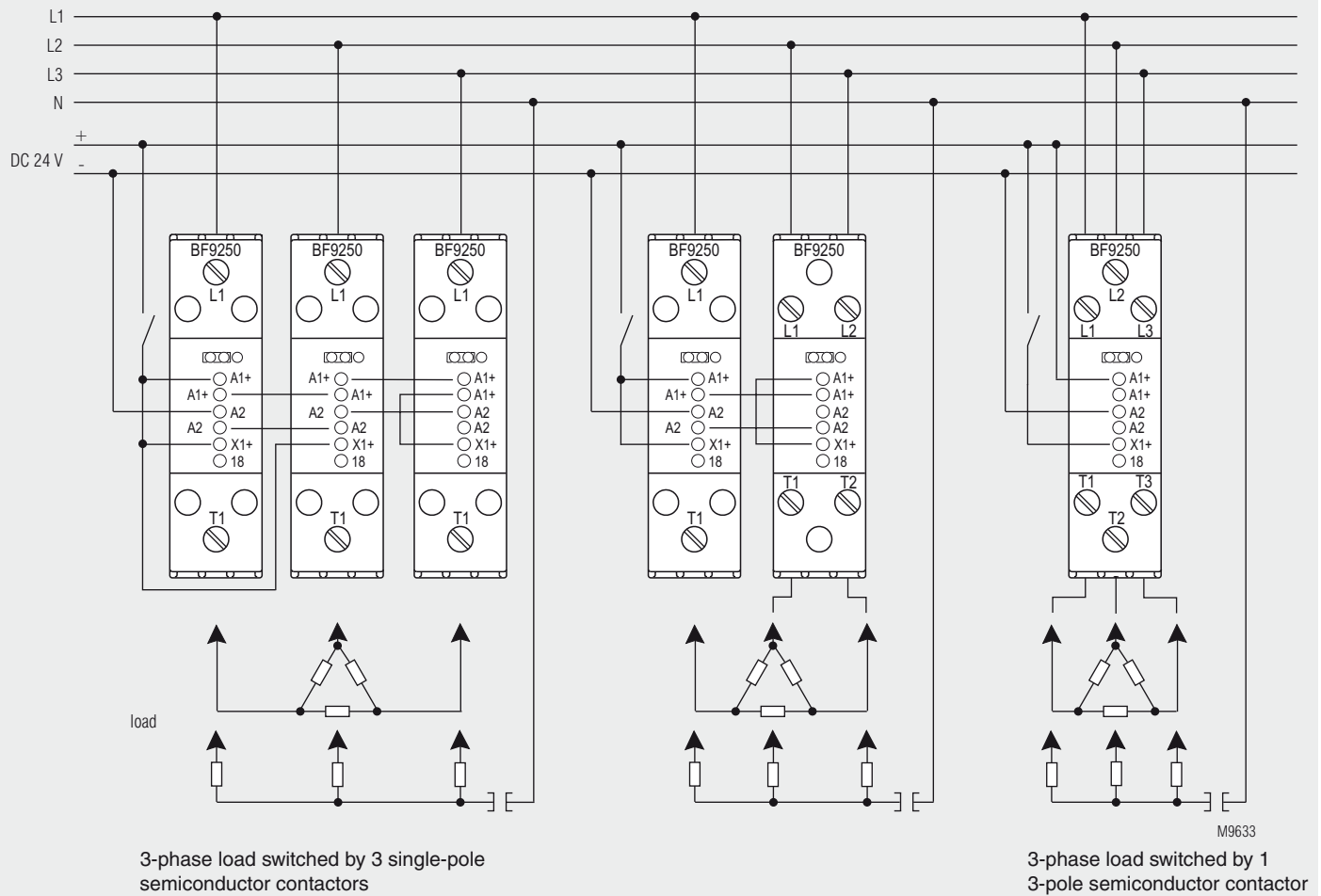
3-phase load, switched by 2 single-pole semiconductor contactors (left side) or by 1 2-pole semiconductor contactor (right side)

Width mm	22,5	45	90		22,5	45	90		22,5	45	90
$I_n$ / phase	10 A	25 A	50 A		10 A	25 A	50 A		10 A	25 A	50 A

BF 9250.\_.\_/001

## Application example

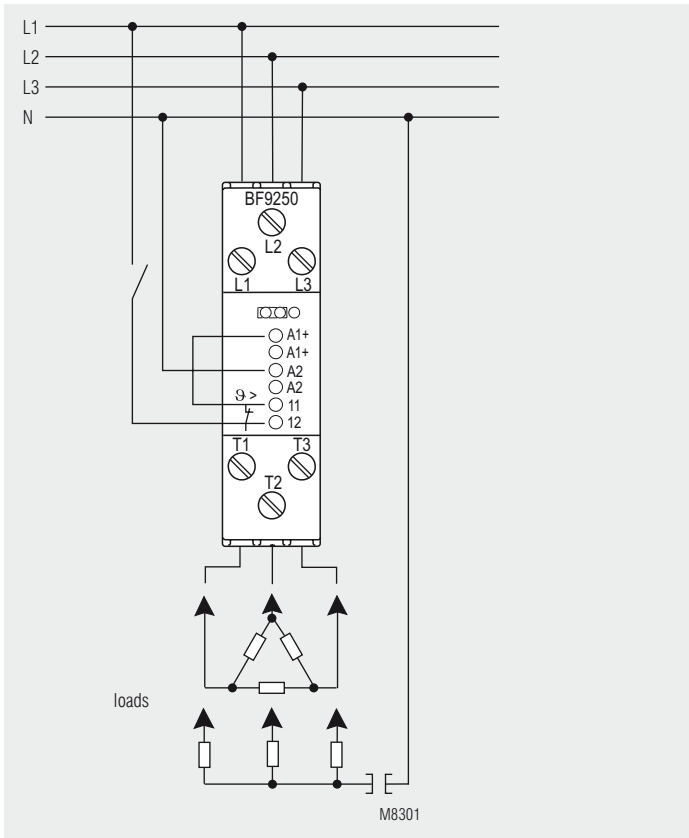
### 3-phase system, 3-phases controlled



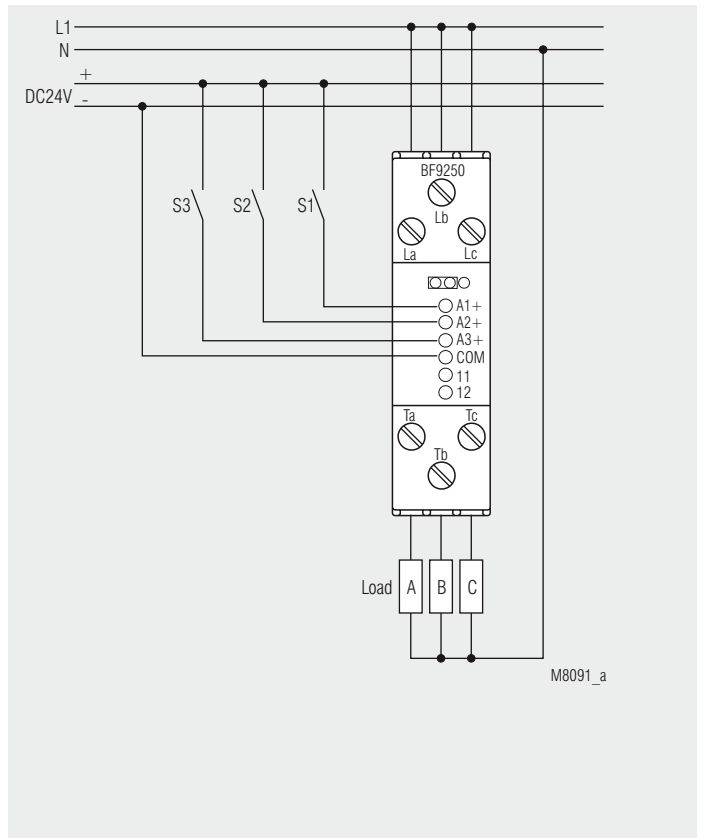
Width mm	22,5	45	90		22,5	45	90		22,5	45	90
$I_L$ / phase	10 A	25 A	50 A		6,5 A	15 A	25 A		5 A	10 A	15 A

BF 9250.\_.\_/001

**Application example**



**BF 9250.03**  
3-phase load, controlled by a 3-pole semiconductor contactor with AC/DC 110-230 V control voltage.



**BF 9250.03/004**  
3 semiconductor contactors in one housing control 3 different loads