

0231842



BF 9250 up to 10 A

BF 9250 up to 50 A



BF 9250 up to 25 A

BH 9250 up to 10 A

Applications

Fast and noiseless switching of:

- heating elements
- motors
- valves
- lighting

Indication

BF 9250. ___,
BF 9250. __/008
green LED: on, when voltage on A1/A2

BF 9250. __/001 and /002
BH 9250. __/001
green LED: on, when voltage on A1/A2
yellow LED: on, when voltage on X1
red LED: on, when overtemperature

BF 9250. __/003
green LED A1: on, when A1 connected
green LED A3: on, when A3 connected
green LED A5: on, when A5 connected

BF 9250. __/004
green LED A1: on, when A1 connected
green LED A2: on, when A2 connected
green LED A3: on, when A3 connected

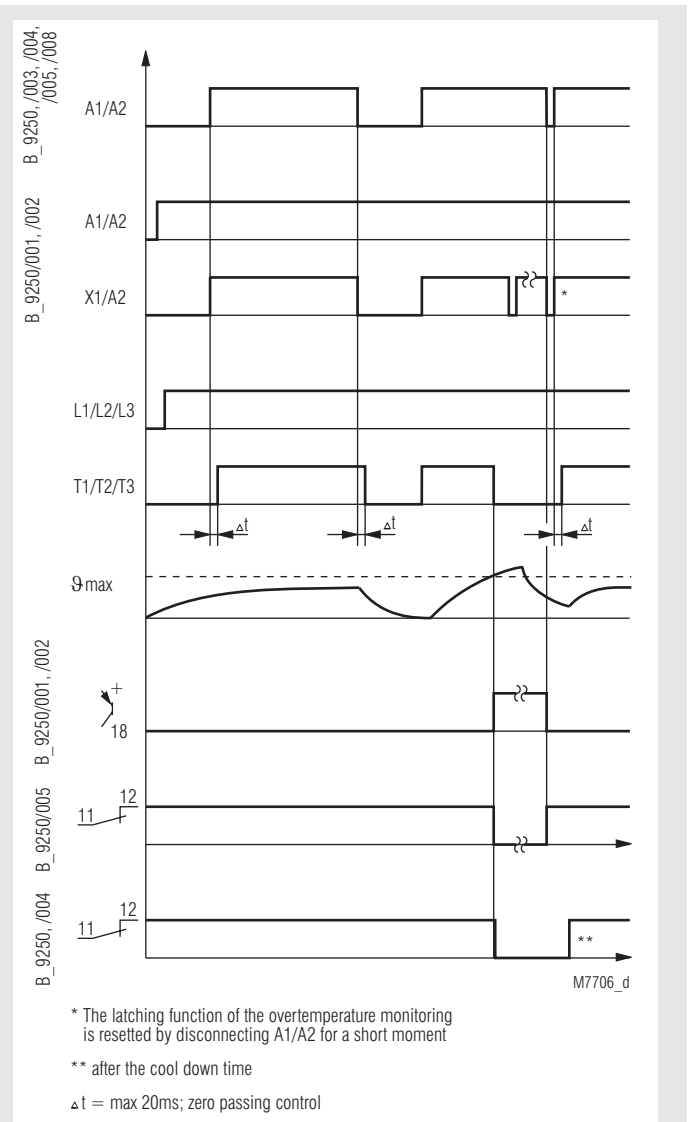
BF 9250. __/005
green LED: on, when voltage on A1/A2
red LED: on, when overtemperature

- According to IEC/EN 60 947-4-2, IEC/EN 60 947-4-3
- 1-, 2- and 3-pole models
- Control voltage AC 230 V on A1/A2
- Load current up to 50 A
- For AC load up to 480 V
- Switching at zero crossing
- Protected by varistors
- Temperature protection of the power semiconductors with monitoring output, as option with latching function
- Mounting on DIN-rail
- As option with LED indicators
- 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

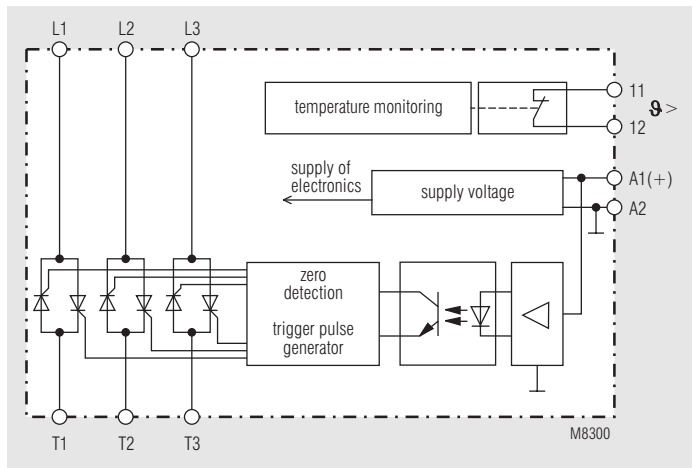
Approvals and marking



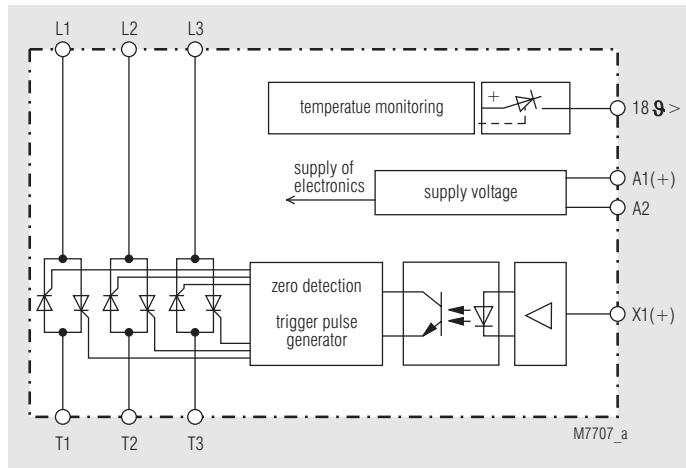
Function diagram



Block diagram

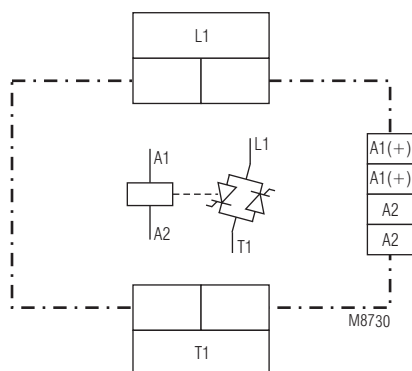


BF9250, BF 9250/004, BH 9250/005,
BF 9250/008 without temperature monitoring

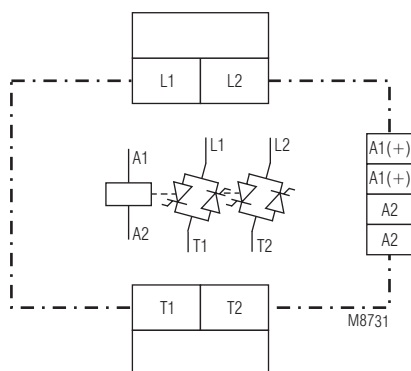


BF9250/001, BF 9250/002, BH 9250/001

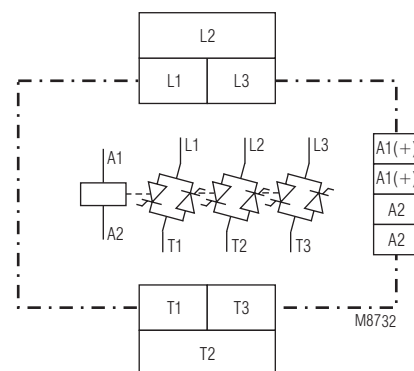
Circuit diagrams



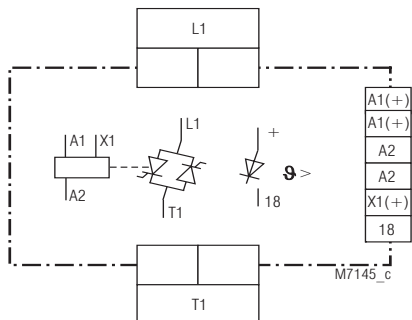
BF 9250.01/008



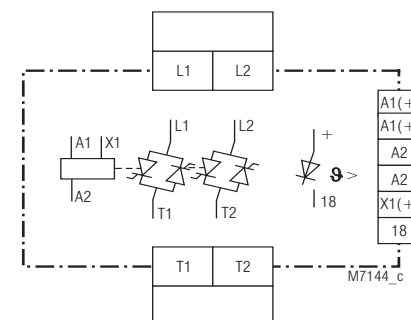
BF 9250.02/008



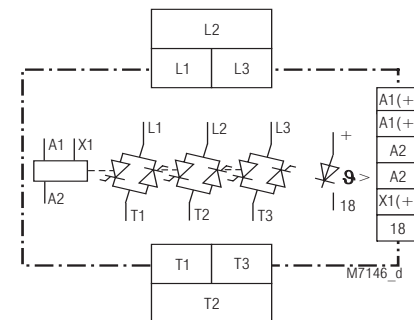
BF 9250.03/008



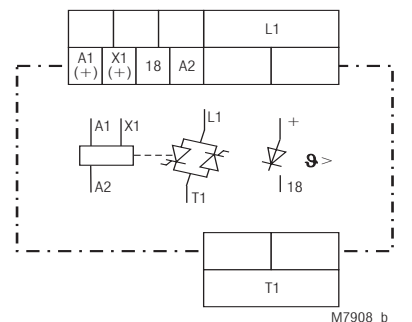
BF 9250.01/001; BF 9250.01/002



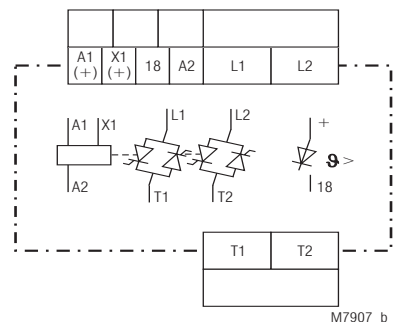
BF 9250.02/001; BF 9250.02/002



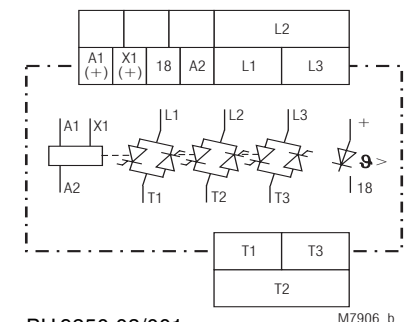
BF 9250.03/001; BF 9250.03/002



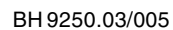
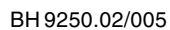
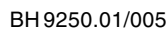
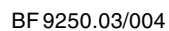
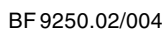
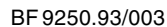
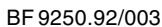
BH 9250.01/001



BH 9250.02/001



BH 9250.03/001



Technical data

Input

Control voltage

BF 9250..., **BH 9250...** /005

A1/A2: AC/DC 110 ... 230 V

BF 9250... /003:

A1/A2: DC 24 V, control of T_a

A3/A4: DC 24 V, control of T_b

A5/A6: DC 24 V, control of T_c

BF 9250... /004:

A1/A4: DC 24 V, control of T_a

A2/A4: DC 24 V, control of T_b

A3/A4: DC 24 V, control of T_c

BF 9250.91/008: DC 4 ... 32 V

BF 9250.92/008: DC 7 ... 32 V

BF 9250.93/008: DC 9 ... 32 V

Control input X1 (/001)

Control voltage: DC 3 ... 48 V

Pick-up voltage: DC 3 V

Drop-out voltage: DC 2 V

Input current: 0,5 mA at DC 3 ... 10 V

10 mA at DC 10 ... 48 V

Analogue input X1 (/002) 0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA optional

Auxiliary voltage

U_H A1/A2 (/001): DC 24 V

Voltage tolerance: ± 10 %

Pick-up voltage: DC 20 V

Drop-out voltage: DC 8 V

Input current: 35 mA

Output

Load output T1, T2, T3

Load current I _L :		Width			
		BF 9250	22,5 mm	45 mm	90 mm
BF 9250.01 1-pole BH 9250.01	AC 1:	10 A	25 A	50 A	
	AC 51:	10 A	25 A	50 A	
	AC 53a:	10 A	15 A	15 A	
BF 9250.02 2-pole BF 9250.92 BH 9250.02	AC 1:	2 x 6,5 A	2 x 15 A	2 x 25 A	
	AC 51:	2 x 6,5 A	2 x 15 A	2 x 25 A	
	AC 53a:	2 x 6,5 A	2 x 15 A	2 x 15 A	
BF 9250.03 3-pole BF 9250.93 BH 9250.03	AC 1:	3 x 5 A	3 x 10 A	3 x 15 A	
	AC 51:	3 x 5 A	3 x 10 A	3 x 15 A	
	AC 53a:	3 x 5 A	3 x 10 A	3 x 15 A	

values at T_u = 40°C and 100 % duty cycle

AC 51: Switching of resistive/inductive loads of cos φ = 0,1 ... 1

AC 53 a: Switching of squirrel cage motors similar to AC 3

Current reduction

over 40°C

BF 9250.01, BH 9250.01

BF 9250.02 and .92,

BH 9250.02

BF 9250.03 and .93,

BH 9250.03

0,2 A / °C	0,4 A / °C	0,6 A / °C
0,2 A / °C	0,3 A / °C	0,4 A / °C
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°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: 600 A

BF 9250.03; .93;

BH 9250.03: 400 A

Power dissipation

P = 1,2 [V] x I eff. [A] / k [W]

with k as formfactor and

k = 1,1 for sinusoidal current

Technical data

Semiconductor fuse

	Load limit integral	D 02 or D III semiconductor fuse e.g. Lindner RECTICUR
BF 9250.01; .02; .92; BH 9250.01; .02;	1.800 A² s	≤ 50 A
BF 9250.03; .93; BH 9250.03;	800 A² s	≤ 35 A

Varistor voltage:

AC 510 V

Output contacts

BF/BH 9250.01:	1-pole + 1 monitoring output (NC contact)
BF/BH 9250.02:	2-pole + 1 monitoring output (NC contact)
BF/BH 9250.03:	3-pole + 1 monitoring output (NC contact)
BF/BH 9250.01/001:	1-pole + 1 monitoring output (Transistor)
BF/BH 9250.02/001:	2-pole + 1 monitoring output (Transistor)
BF/BH 9250.03/001:	3-pole + 1 monitoring output (Transistor)
BF 9250.92/003:	2 x 1-pole
BF 9250.93/003:	3 x 1-pole
BF 9250.02/004:	2 x 1-pole + 1 monitoring output (NC contact)
BF 9250.03/004:	3 x 1-pole + 1 monitoring output (NC contact)
BH 9250.01/005:	1-pole + 1 monitoring output (NC contact)
BH 9250.02/005:	2-pole + 1 monitoring output (NC contact)
BH 9250.30/005:	3-pole + 1 monitoring output (NC contact)

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

General data

Fitting position:	cooling ribs vertically
Operating mode:	Continuous operation
Temperature range:	0 ... 40°C
max. temperature:	60°C (with current derating factor) see table
	- 20 ... + 80°C
Storage temperature:	
Clearance and creepage distances	
overvoltage category / contamination level	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
Vibration resistance:	Amplitude 0,35 mm frequency 10 ... 55 Hz IEC/EN 60 068-2-6

Technical data		
Climate resistance:	0 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection	DIN 46 228-1/-2/-3/-4	
Load terminals:	1 x 10 mm ² solid 1 x 6 mm ² stranded ferruled	
Control terminals		
BF 9250:	1 x 0,75 mm ² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 1 x 1,5 mm ² stranded ferruled DIN 46 228-1/-2/-3	
BH 9250:	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		
Load terminals:	Terminal screws M 4 Box terminal with wire protection	
Control terminals:	Terminal screws M 2 Box terminal with wire protection Terminal screws M 3,5 Box terminal with wire protection	
Mounting:	DIN rail	IEC/EN 60 715

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

Temperature monitoring

If the temperature exceeds the limit the power semiconductors are switched off and the monitoring contact is activated.

The table shows the different variants and their behaviour in the case of temperature faults.

Type	Temperature monitoring/ with manual reset	Monitoring output/ terminal	Reset of power semiconductor and monitoring output	LED
BF 9250	yes / no	contact / 11,12	after cooling down *)	no
BF/BH 9250/001 BF/BH 9250/002	yes / yes	transistor / 18	after cooling down by momentarily disconnecting X1 or A1	yes
BF 9250/003	no / no	-	-	-
BF 9250/004	yes / no	contact / 11,12	after cooling down	no
BH 9250/005	yes / yes	contact / 11,12	after cooling down by momentarily disconnecting A1	yes

*) The power semiconductors on BF 9250 can only be disconnected by external wiring of the monitoring contact. See application example BF 9250.03

Standard types

BF 9250.91/008	DC 4 ... 32 V	AC 24 ... 480 V	50/60 Hz	10 A
Article number:	0056823			stock item
• 1-pole				
• Control input A1/A2:	DC 4 ... 32 V			
• Load voltage:	AC 24 ... 480 V			
• Load current:	10 A			
• Width:	22,5 mm			
BF 9250.01	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			
• Width:	22,5 mm			
BF 9250.03	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			
• Width:	45 mm			

Variants

BF 9250.___/001:	With low current input X1
BH 9250.___/001:	With bigger diameter for control wires
BF 9250.___/002:	Analogue input X1 0 ... 10 V or 0 ... 20 mA
(on request)	or 4 ... 20 mA semiconductor output with pulse cycle control and 2 sec cycle time
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 ϑ .
BH 9250.___/005:	Control via A1/A2 with larger control terminals
BF 9250.9_/08:	Control via A1/A2, cage clamp terminals

Ordering example for Variants

BF 9250 .01 / - - -	DC 24 V	AC 24 ... 480 V	50/60 Hz	50 A
				Load current
				Frequency range
				Load voltage
				Auxiliary voltage U _H
				Variant, if required
				1-pole
				Type

Installation

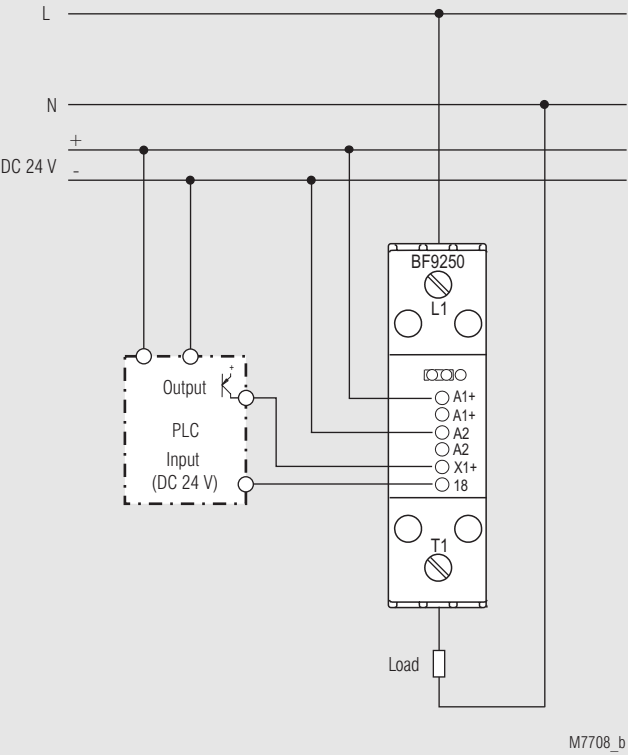
Recommended distance:

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

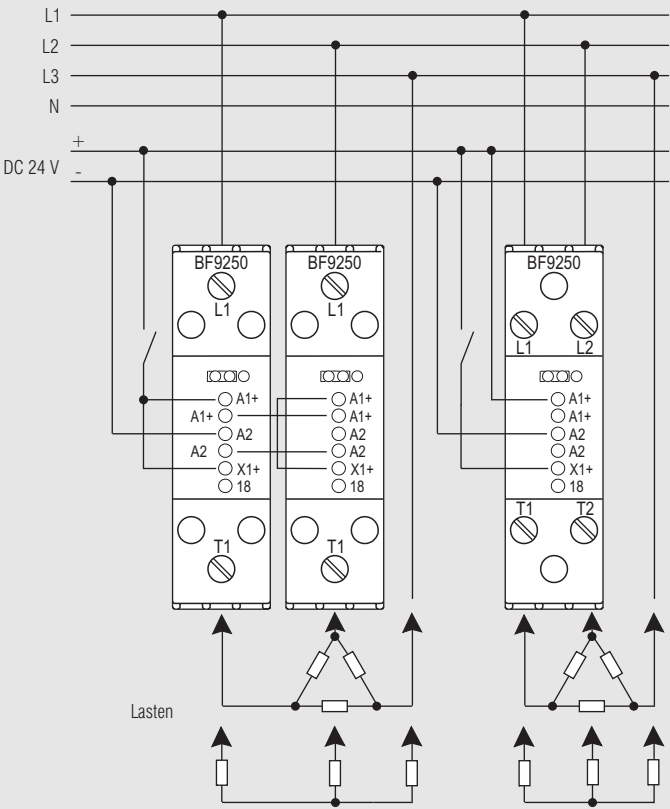
single phase system



M7708_b

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

3-phase system, 2 phases controlled



M7149_a

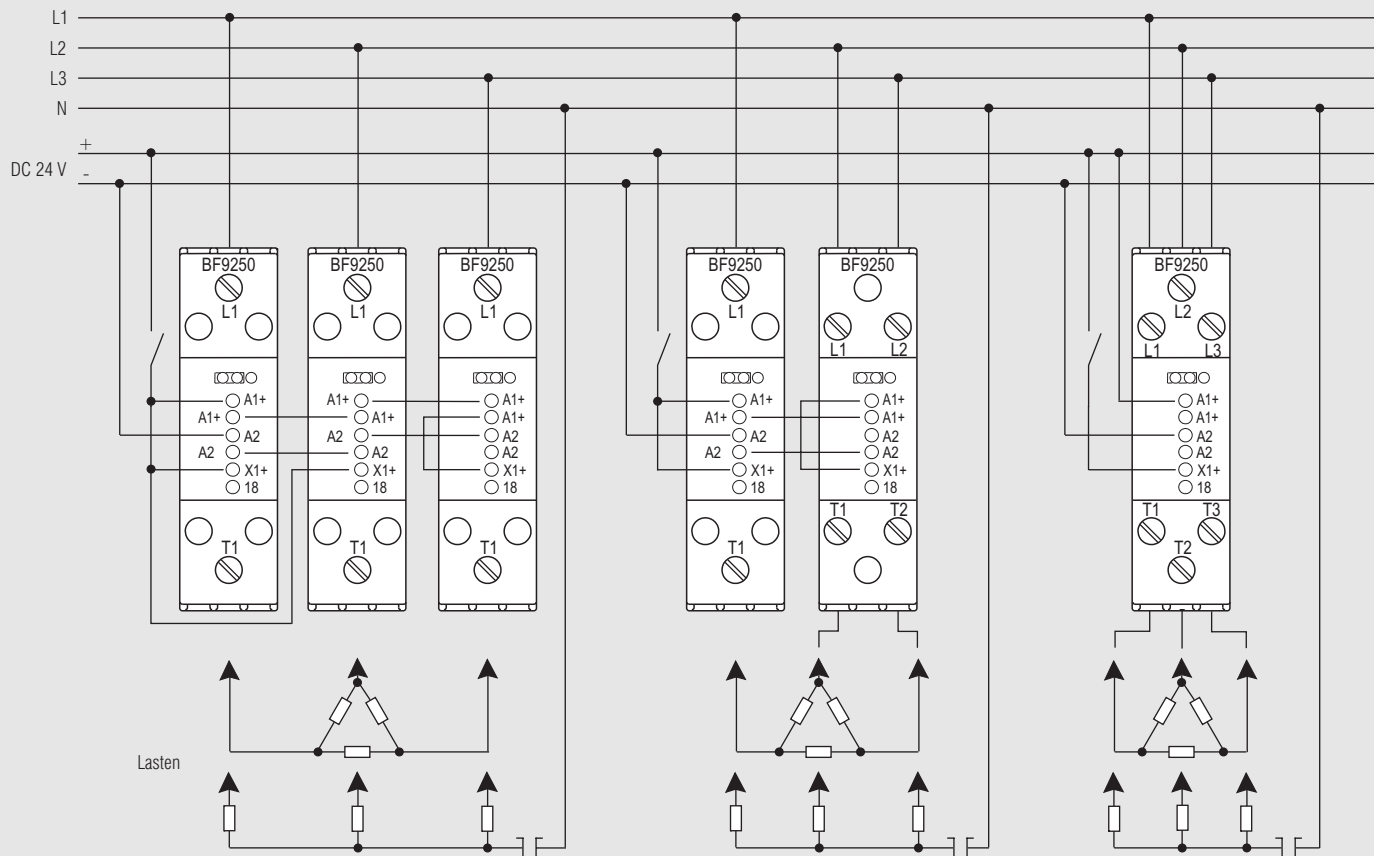
3-phase load, switched by 2 single-pole semiconductor contactors (left side) or by 1 2-pole semiconductor contactor (right side)

Width mm	22,5	45	90		22,5	45	90		22,5	45	90
I _L / phase	10 A	25 A	50 A		10 A	25 A	50 A		6,5 A	15 A	25 A

BF 9250._._/001

Application example

3-phase system, 3-phases controlled



M7150_a

3-phase load switched by 3 single-pole semiconductor contactors

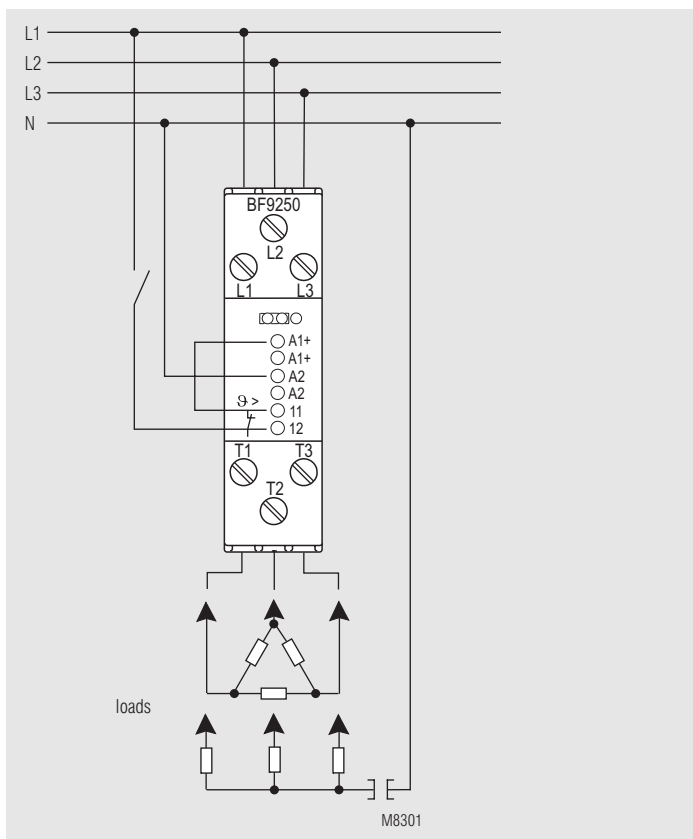
3-phase load switched by 1 single-pole an 1 2-pole semiconductor contactor

3-phase load switched by 1 3-pole semiconductor contactor

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

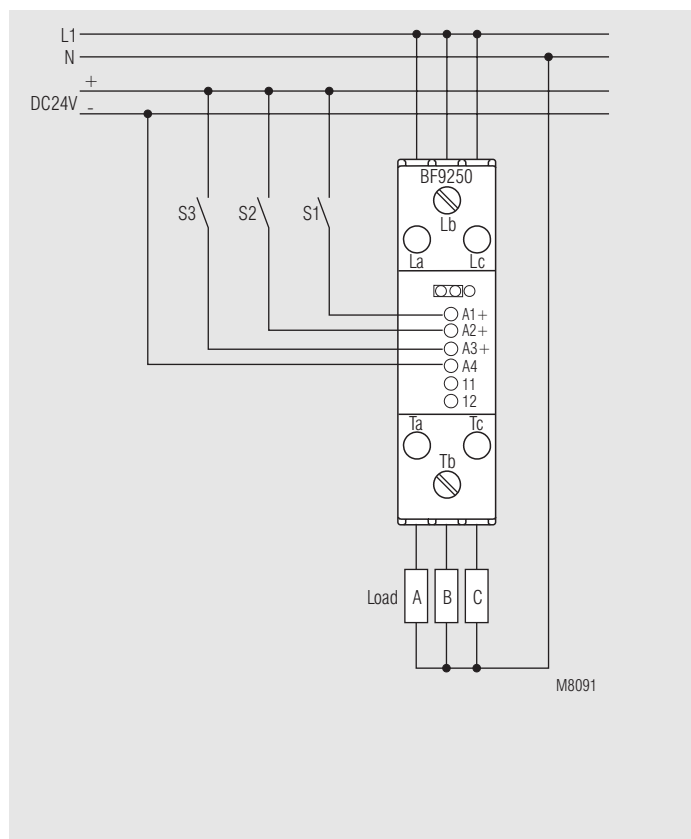
BF 9250.__/001

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