

POWERSWITCH Semiconductor Contactor BF 9250, BH 9250

0231842



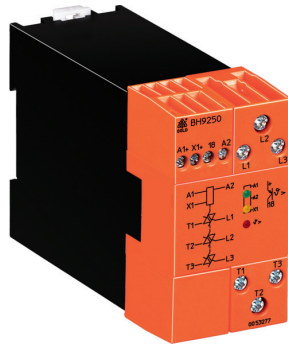
BF 9250 up to 10 A



BF 9250 up to 50 A



BF 9250 up to 25 A



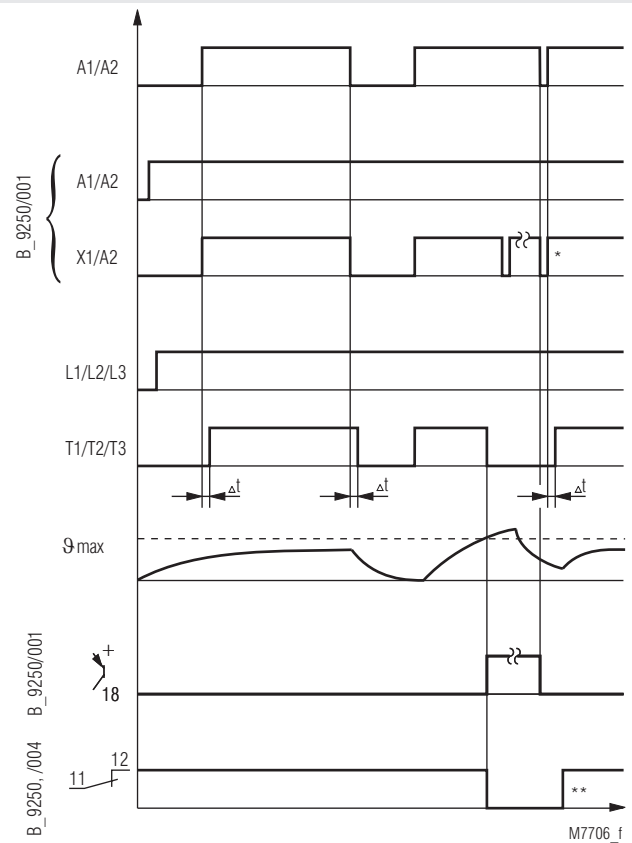
BH 9250 up to 10 A

- 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



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^a":

on, when A1 connected

green LED "T^b":

on, when A3 connected

green LED "T^c":

on, when A5 connected

BF 9250/004

green LED "T^a":

on, when A1 connected

green LED "T^b":

on, when A2 connected

green LED "T^c":

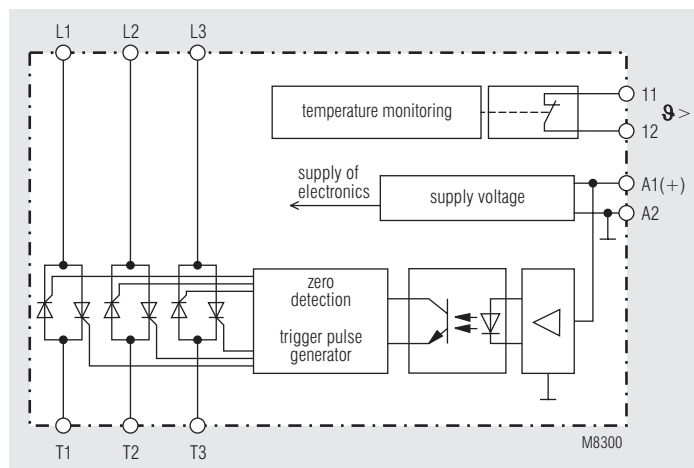
on, when A3 connected

BF 9250

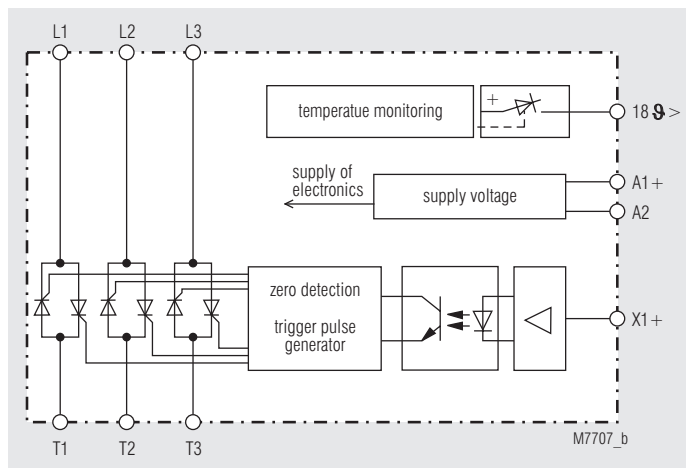
green LED "A1-A2":

on, when voltage on A1

Block Diagrams

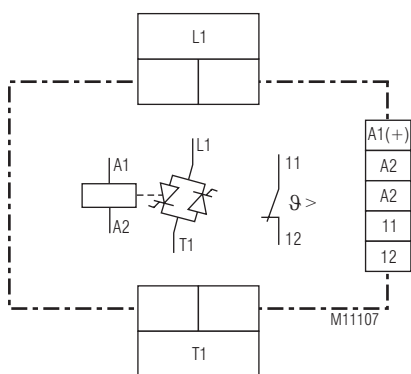


BF 9250, BF 9250/004

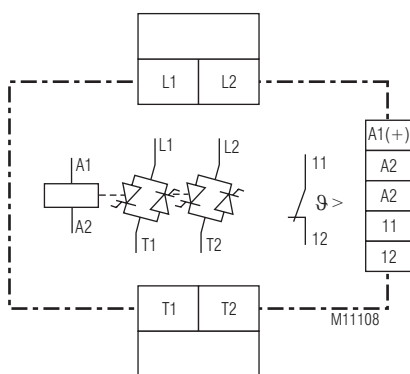


BF 9250/001, BH 9250/001

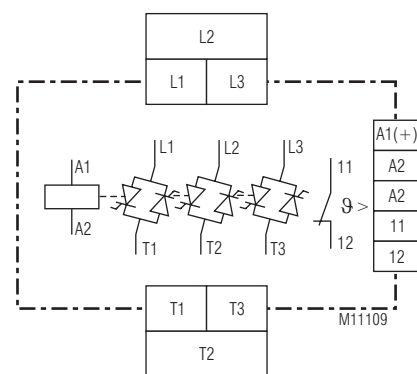
Circuit Diagrams



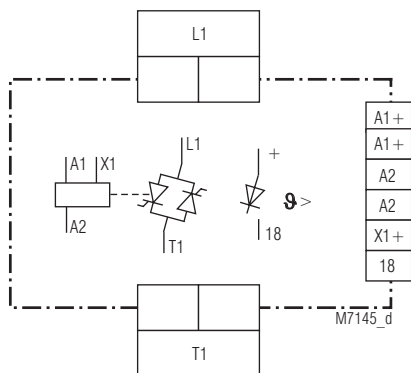
BF 9250.01



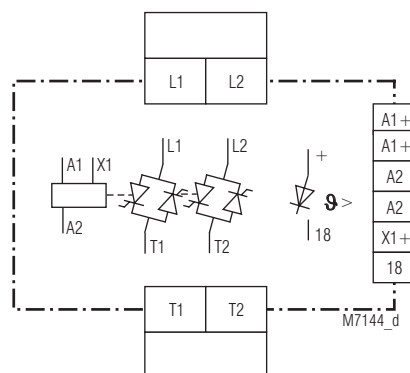
BF 9250.02



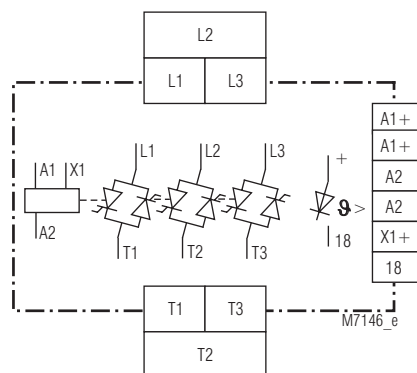
BF 9250.03



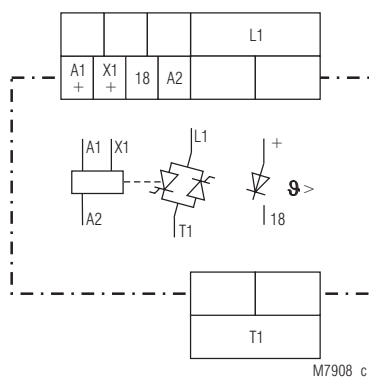
BF 9250.01/001



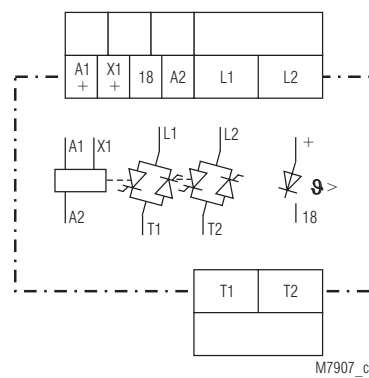
BF 9250.02/001



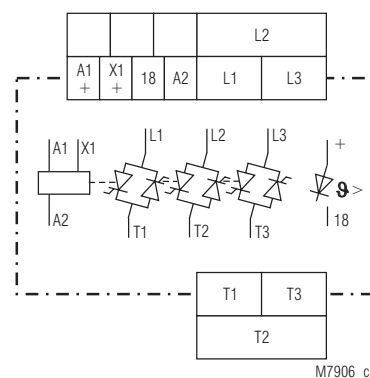
BF 9250.03/001



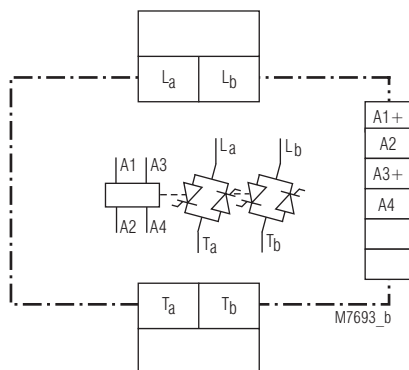
BH 9250.01/001



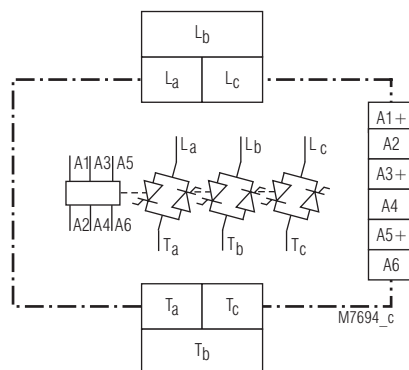
BH 9250.02/001



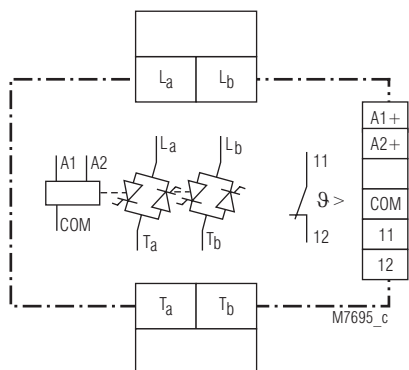
BH 9250.03/001



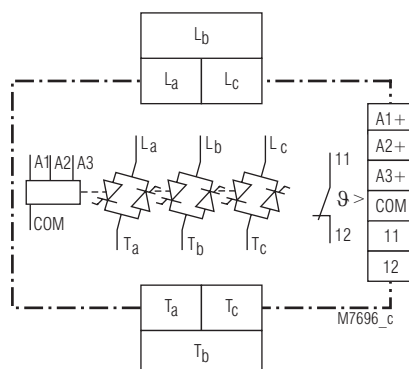
BF 9250.92/003



BF 9250.93/003



BF 9250.02/004



BF 9250.03/004

Input

BF 9250/001, BH 9250/001:

Operation voltage A1/A2:	DC 24 V
Voltage tolerance:	$\pm 10 \%$
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]:	$\leq 2 + 1/2$ Periode
Release delay [ms]:	$\leq 1 + 1/2$ 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]:	$\leq 1 + 1/2$ Periode
Release delay [ms]:	$\leq 1 + 1/2$ 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]:	$\leq 1 + 1/2$ Periode
Release delay [ms]:	$\leq 1 + 1/2$ Periode

BF 9250:

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

Output

Load output T1, T2, T3; T_a, T_b, T_c **Load currents at 100 % duty cycle ED, AC 51:**

BF 9250 BH 9250	Ambient temperature	Device without heat sink	Device with small heat sink	Device with large heat sink
1-pole	25°C	13 A	30 A	55 A
	40°C	10 A	25 A	50 A
2-pole	25°C	7 A	17,5 A	28 A
	40°C	6,5 A	15 A	25 A
3-pole	25°C	6 A	14 A	20 A
	40°C	5 A	10 A	15 A

Current reduction over 40°C

BF 9250 BH 9250	Device without heat sink	Device with small heat sink	Device with large heat sink
1-polig	0,2 A / °C	0,4 A / °C	0,6 A / °C
2-polig	0,2 A / °C	0,3 A / °C	0,4 A / °C
3-polig	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:	600 A
BF 9250.03; .93;	
BH 9250.03:	400 A

Power dissipation:	$P = 1.2 [V] \times I_{eff} [A] / k [W]$ with k as formfactor and $k = 1.1$ for sinusoidal current
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Technical Data					
BF 9250 BH 9250	I _N	load limit integral of the semi- conductor	Semiconductor fuse		
			Type	Article-No.	Brand
1-pole	10 A	1800 A ² s	fuse 10 x 38	6003434.16	SIBA
	25 A	1800 A ² s	fuse 10 x 38	6003434.30	SIBA
	50 A	1800 A ² s	NH-00	2020920.63	SIBA
2-pole	2x6,5 A	1800 A ² s	fuse 10 x 38	6003434.10	SIBA
	2x15 A	1800 A ² s	fuse 10 x 38	6003434.20	SIBA
	2x25 A	1800 A ² s	fuse 10 x 38	6003434.30	SIBA
3-pole	3x5 A	800 A ² s	fuse 10 x 38	6003434.8	SIBA
	3x10 A	800 A ² s	fuse 10 x 38	6003434.16	SIBA
	3x15 A	800 A ² 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
IEC/EN 61 000-6-4, IEC/EN 61 000-6-1
EMC
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 EN 50 005
Climate reseistance:	
Terminal designation	
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	
BH 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 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:
BF 9250, BF 9250/001,
BF 9250/003, BF 9250/004:
BH 9250: cage clamp terminals "Push-In"
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 heigth 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 9250.00/001: 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

BF 9250 .01 / _ _ DC 24 V AC 24 ... 480 V 50/60 Hz 50 A

Diagram illustrating the breakdown of the product code BF 9250 .01 / _ _ DC 24 V AC 24 ... 480 V 50/60 Hz 50 A into its components:

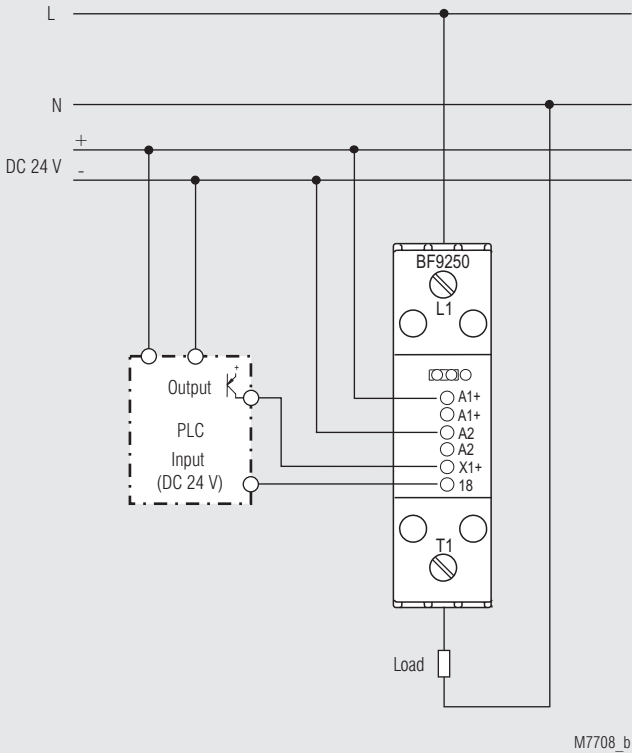
- BF 9250: Type
- .01: 1-pole
- / _ _ : Variant, if required
- DC 24 V: Auxiliary voltage U_H
- AC 24 ... 480 V: Load voltage
- 50/60 Hz: Frequency range
- 50 A: Load current

Installation

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

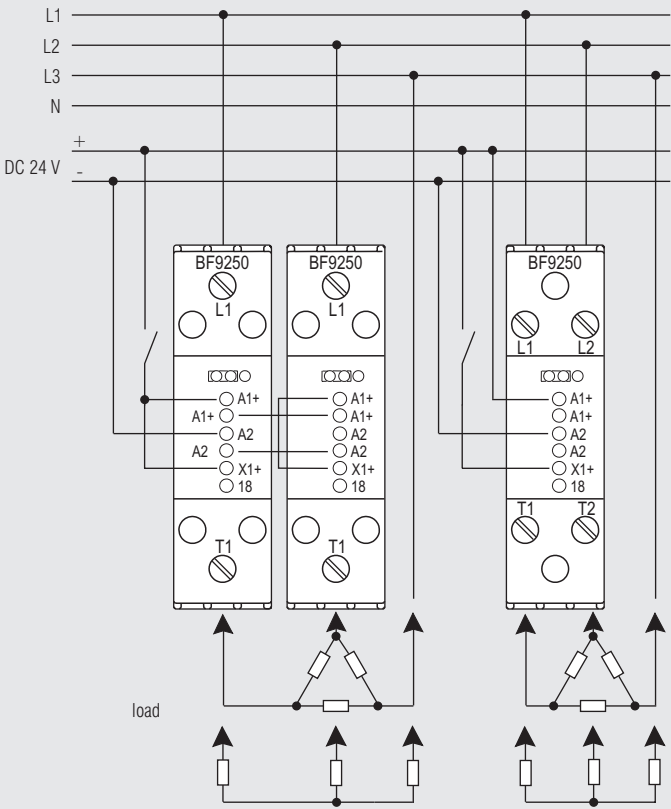
Distance on left and right: 10 mm; with max. load current and 100 % duty cycle

single phase system



M7708_b

3-phase system, 2 phases controlled



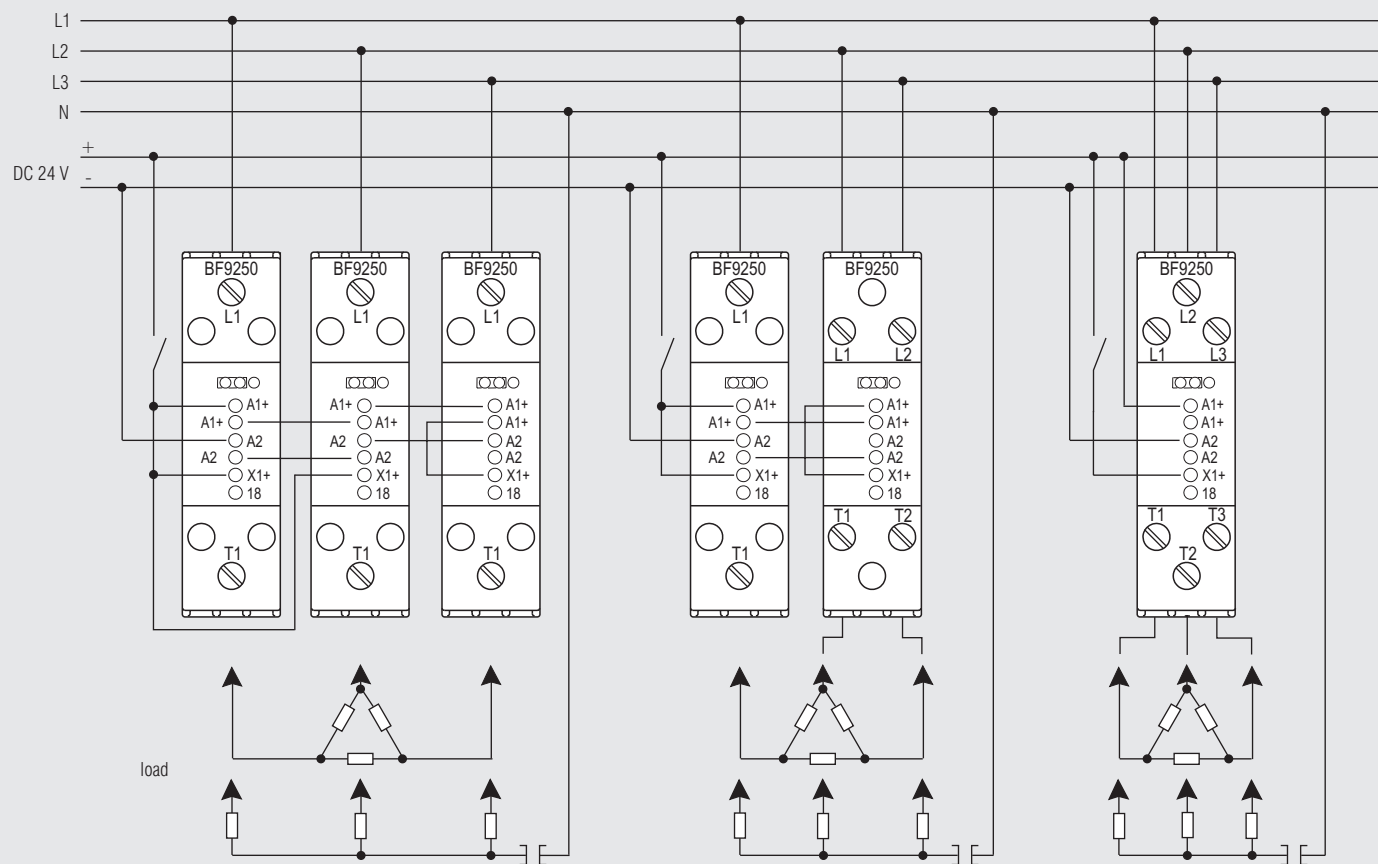
M9632

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 _L / phase	10 A	25 A	50 A		10 A	25 A	50 A		10 A	25 A	50 A

3-phase system, 3-phases controlled



M9633

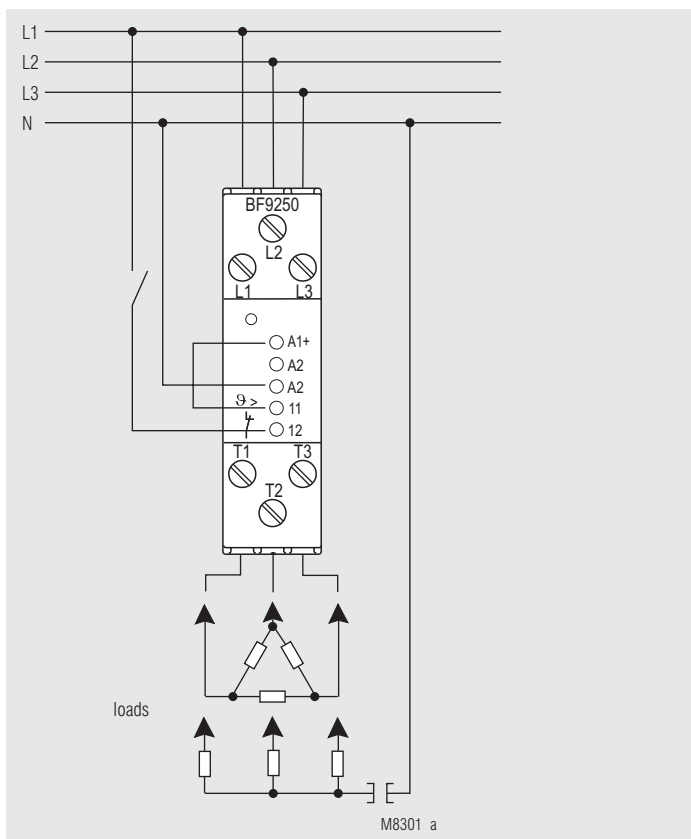
3-phase load switched by 3 single-pole semiconductor contactors

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 _N / phase	10 A	25 A	50 A		6,5 A	15 A	25 A		5 A	10 A	15 A

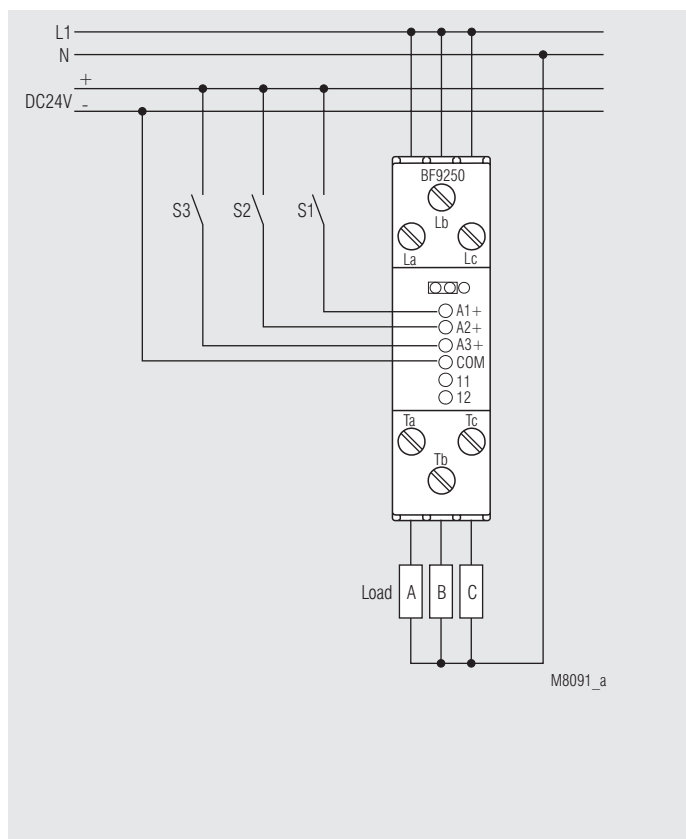
BF 9250._._/001

Application Examples



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