POWERSWITCH
Solid-State Relay / - Contactor, 2-poles
PH 9260.92

Translation of the original instructions

0269447

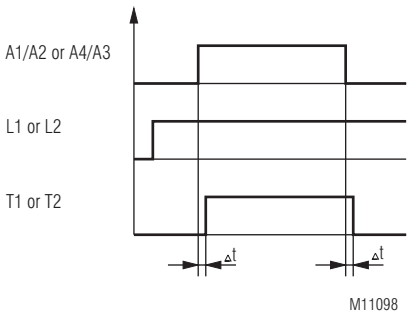
Solid-state relay
PH 9260.92

Solid-state contactor
PH 9260.92/000/0_

Your Advantages
- Free from wearing, noiseless, economic
- Excellent EMC- performance, because of switching at zero crossing
- Separate control of both poles
- Available with heatsink to be mounted on DIN rail
- Easy connection via cage clamp terminals

Features
- AC solid-state relay / -contactor
- According to IEC/EN 60947-4-3
- As option load current up to 2 x 32 A or 2 x 48 A
- As option with hight I^2t up to 6600 A^2s
- Load voltages up to AC 480 V
- 2 anti-parallel thyristors for each pole
- DCB technology (direct bonding method) for excellent heat transmission propertie
- Touch protection IP20
- Box terminals for load connections
- LED status indicator for both poles
- Peak reverse voltage up to ± 1200 V
- Insulation voltage 4000 V
- Width 45 mm

Function Diagram

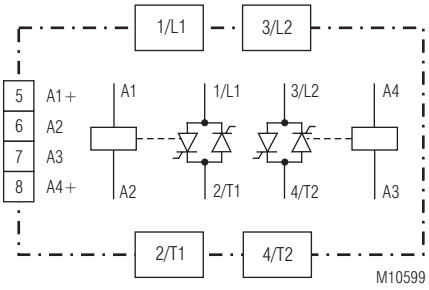


Δt = max. 20ms; zero crossing control

Approvals and Markings

CE

Circuit Diagram



PH 9260.92

Applications

Solid state relays switching at zero crossing:

For frequent no-wear and no-noise switching of

- Heating systems
- Motors
- Valves
- Lighting systems

The solid-state relay switches at zero crossing and is suitable for many applications e.g. extrusion machines for plastic and rubber, packaging machines, solder lines, machines in food industry.

Connection Terminals

Terminal destinations	Signal description
A1+, A2; A4+, A3	Control inputs
L1, L2	Mains connections
T1, T2	Load outputs

Function

The solid-state relay PH 9260 is designed whith 2 anti-parallel connected thyristors switching at zero crossing.

When connecting the control voltage the output of the solid-state relay is activated at the next zero crossing of the sinusoidal voltage. When disconnecting the control voltage the output is switched off at the next zero crossing of the load courrent.

The LED shows the state of the control input.

As option the solid-state relay is available with heatsink to be mounted on DIN rail. This provides optimum heat transmission.

Technical Data

Output

Load voltage AC [V]	24 ... 240, 48 ... 480	
Frequency range [Hz]:	47 ... 63	
Load current [A], AC-51:	32	48
Load limit integral I2t [A2s]:	800 6600*)	1800 6600*)
Max. Overload current [A] t = 10 ms:	400 1150*)	600 1150*)
Periodic overload current t = 1 s [A]:	40 150*)	120 150*)
Min. current [mA]:	20	
On-state voltage at nominal current [V]:	1.2	1.4
Rate of rise of off-state voltage [V/µs]:	500	500
Rate of rise of current [A/µs]:	100	100
Thermische Daten		
Thermal resistance junction - housing [K/W]:	0.6	0.5
Thermal resistance housing - ambient [K/W]:	12	12
Junction temperature [°C]:	≤ 125	

*) Variant PH 9260.92/100

Control Circuit

Control voltage range [V]:	DC 18 ... 30
max. input current [mA]:	15
Turn-on delay [ms]:	0.5 ... 10.5
Turn-off delay [ms]:	0.5 ... 10.5

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 40 ... 40 °C	
Storage:	- 40 ... 80 °C	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	6 kV / 3	IEC/EN 60664-1
EMC:	IEC/EN 61 000-6-4,	IEC/EN 61000-4-1
Electrostatic discharge (ESD):	8 kV air	IEC/EN 61000-4-2
HF irradiation:	10 V / m	IEC/EN 61000-4-3
Fast transients:	2 kV	IEC/EN 61000-4-4
Surge voltages between		
Wires for power supply:	1 kV	IEC/EN 61000-4-5
Between wire and ground:	2 kV	IEC/EN 61000-4-5
HF-wire guided:	10 V	IEC/EN 61000-4-6
Interference suppression:	Limit value class A*)	

*) The device is designed for the usage under industrial conditions (Class A, EN 55011) When connected to a low voltage public system (Class B, EN 55011) radio interference can be generated. To avoid this, appropriate measures have to be taken.

Degree of protection		
Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz,	IEC/EN 60068-2-6
Housing material:	Fiberglass reinforced polycarbonate Flame resistant; UL 94 V0	
Base plate:	Aluminum, copper nickle-plated	
Potting compound:	Polyurethane	
Mounting screws:	M5 x 8 mm	
Fixing torque:	2.5 Nm	
Connections control circuit:	Cage clamp terminals	
Wire cross section:	0.2 ... 1.5 mm² wire	

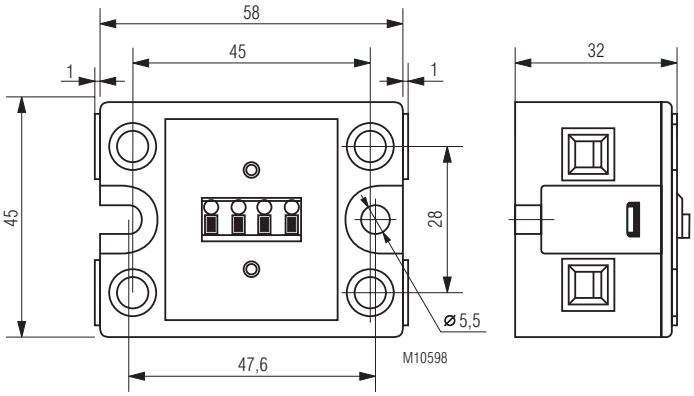
Technical Data

Connections load circuit:	Mounting screws M4 Pozidrive 2 PT
Fixing torque:	1.2 Nm
Wire cross section:	10 mm² wire
Nominal insulation voltage	
Control circuit - load circuit:	4 $kV_{eff.}$
Load circuit - base plate:	4 $kV_{eff.}$
Control circuit A1/A2 - A3/A4:	250 $V_{eff.}$
Overvoltage category:	II
Weight	
Without heat sink:	Approx. 107 g
PH 9260.92/_ _ _ /01:	Approx. 537 g
PH 9260.92/_ _ _ /02:	Approx. 657 g

Dimensions

Width x height x depth	
Without heat sink:	45 x 60 x 35 mm
PH 9260.92/_ _ _ /01:	45 x 80 x 127 mm
PH 9260.92/_ _ _ /02:	45 x 100 x 127 mm

Dimensions



Accessories

PH 9260-0-12:	Graphite foil 55 x 40 x 0.25 mm to be fitted between device and heat sink, for better heat transmission Article number: 0058395

Standard Type

PH 9260.92 AC 48 ... 480 V 2 x 48 A DC 18 ... 30 V

Article number:	0064252
• Load voltage:	AC 48 ... 480 V
• Load current:	2 x 48A
• Control voltage:	DC 18 ... 30 V
• Width:	45 mm

Variants

PH 9260 .92 / _ 0 0 / 0 _

- 0 Without heat sink
- 1 With heat sink 1.5 K / W
- 2 With heat sink 0.95 K / W

- 0 Standard

- 0 Switching at zero crossing

- 0 Standard
- 1 With heigh I²t-value

Ordering example for variants

PH 9260.92 /100/02 AC 48 ...480 V 2 x 48 A DC 18 ... 30 V

- Control voltage
- Load current
- Load voltage
- With heat sink 0.95 K / W
- With height I²t-value
- Type

Notes on Sizing for Selection of a Heat Sink

The heat generated by the load current must be dissipated by a suitable heat sink. It is imperative that the junction temperature of the semiconductor is maintained for all potential environmental temperatures of under 125 °C. For this reason, it is important to keep the thermal resistance between the base plate of the solid-state relay and the heat sink to a minimum.

To protect the solid-state relay effectively from excess heating, a thermally conducting paste should be applied before installation to the base plate of the heat sink between solid-state relay and heat sink.

From the tables below, select a suitable heat sink with the next lowest thermal resistance. Thus, it is ensured that the maximum junction temperature of 125 °C is not exceeded. The load current in relation to the environmental temperature can be seen from the table.

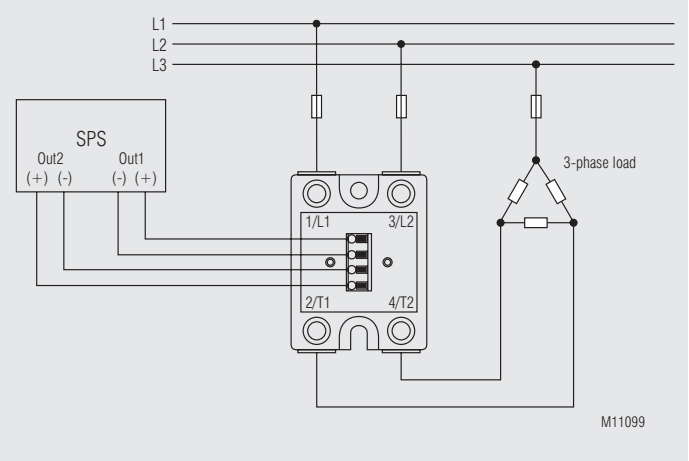
Selection of a Heat Sink

Load current (A)	Version for 2 x 32 A Thermal resistance (K/W)					
64	0.9	0.8	0.6	0.55	0.4	0.3
56	1.1	0.9	0.8	0.65	0.55	0.4
48	1.3	1.1	1.0	0.85	0.6	0.5
40	1.6	1.4	1.2	1.1	0.9	0.7
32	2.1	1.9	1.6	1.4	1.2	0.9
26	2.7	2.4	2.1	1.8	1.5	1.2
16	4.7	4.2	2.7	3.2	2.7	2.2
8	10.0	8.5	7.8	6.8	5.9	5.0
	20	**30**	**40**	**50**	**60**	**70**
	Ambient-temperature (°C)					

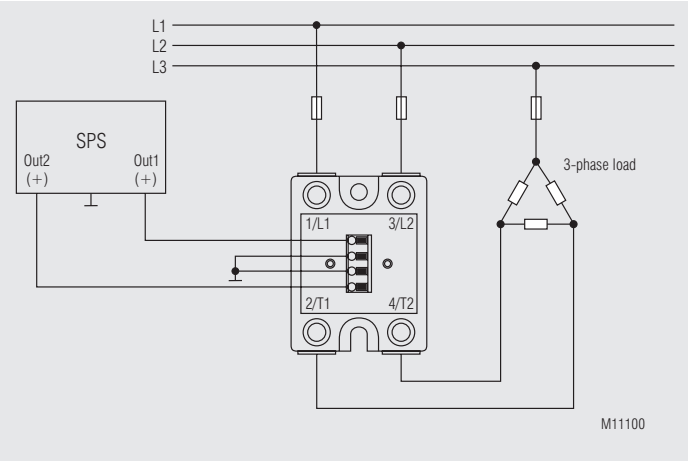
Load current (A)	Version for 2 x 48 A Thermal resistance (K/W)					
96	0.6	0.5	0.4	0.35	0.25	0.15
84	0.7	0.6	0.55	0.45	0.35	0.25
72	0.9	0.8	0.65	0.55	0.45	0.35
60	1.1	1.0	0.85	0.75	0.6	0.45
48	1.5	1.3	1.1	1.0	0.8	0.65
36	2.1	1.9	1.6	1.44	1.2	0.9
24	3.3	3.0	2.6	2.3	1.9	1.6
12	7.0	6.0	5.5	4.9	4.0	3.5
	20	**30**	**40**	**50**	**60**	**70**
	Ambient-temperature (°C)					

Load current (A)	Version fo 2 x 48 A at I^2t = 6600 A^2s Thermal resistance (K/W)					
96	0.8	0.7	0.6	0.5	0.4	0.3
84	0.9	0.8	0.7	0.61	0.5	0.4
72	1.1	1.0	0.85	0.75	0.6	0.45
60	1.4	1.2	1.1	0.9	0.75	0.6
48	1.8	1.6	1.4	1.2	1.0	0.8
36	2.5	2.2	1.9	1.65	1.4	1.2
24	3.5	3.4	3.0	2.6	2.2	1.85
12	7.5	7.0	6.0	5.5	4.5	4.0
	20	**30**	**40**	**50**	**60**	**70**
	Ambient-temperature (°C)					

Application Examples



Ansteuerung durch galvanisch getrennte Ausgänge.



Ansteuerung durch Ausgänge mit gemeinsamer Masse.