

RSR92

single-phase solid state relays, industrial

RSR92-..V..



RSR92-..I..



- Single-phase power controller (phase angle load control)
- Control input: DC voltage 0...10 V DC (RSR92-..V..) or current 4...20 mA (RSR92-..I..)
- SCR output (thyristors) • Load current 25...80 A
- Max. load voltage 280, 530 V AC (single-phase)
- Dielectric strength 4 000 Vrms (opto-isolation)
- MOV protection (built-in varistor)
- LED indicator (green) • Screw terminals
- Mounting on panel or on heatsinks
- Recognitions, certifications, directives: RoHS, REACH, CE ENEC



Applications

They are used to regulate the power delivered to the receiver, where this power is proportional to the input control signal. They are used in automation control systems where smooth control of receiver power is required for resistive or resistive-inductive loads. Typical applications for power controllers: heaters, industrial furnaces (annealing, quenching, drying, etc.), dryers, plastics processing equipment, industrial sealing machines, glass production industry, industrial heating systems (matting and lining of pipelines), load transformers.



Basic technical data

Load voltage: 176...280 V AC, 300...530 V AC
 Control input: DC voltage 0...10 V DC or current 4...20 mA
 Load current: 25 A, 40 A, 60 A, 80 A

Type

Load voltage	Control voltage/current	Load current	
		25 A	40 A
176...280 V AC	0...10 V DC	RSR92-24V25	RSR92-24V40
	4...20 mA	RSR92-24I25	RSR92-24I40
300...530 V AC	0...10 V DC	RSR92-48V25	RSR92-48V40
	4...20 mA	RSR92-48I25	RSR92-48I40

Type

Load voltage	Control voltage/current	Load current	
		60 A	80 A
176...280 V AC	0...10 V DC	RSR92-24V60	RSR92-24V80
	4...20 mA	RSR92-24I60	RSR92-24I80
300...530 V AC	0...10 V DC	RSR92-48V60	RSR92-48V80
	4...20 mA	RSR92-48I60	RSR92-48I80

Load voltage

	RSR92-24...	RSR92-48...
Rated load voltage	240 V AC	480 V AC
Rated range of load voltage	176...280 V AC	300...530 V AC
Blocking voltage	600 V _{pk}	1 200 V _{pk}
Maximum voltage permissible for voltage sensitivity	420 V AC	550 V AC
MOV protection voltage range	612...748 V	819...1001 V
Rated frequency	47...63 Hz	47...63 Hz
Output power	0...99%	0...99%

Control input

	voltage control	current control
	RSR92-..V..	RSR92-..I..
Control voltage range	0...10 V DC	–
Power supply voltage range	10...32 V DC	–
Must turn-on voltage	max. 0,3 V DC	–
Must turn-off voltage	min. 0,1 V DC	–
Control current range	–	4...20 mA
Must turn-on current	–	max. 4,6 mA
Must turn-off current	–	min. 3,8 mA
Input impedance (typical)	60 k Ω	390 k Ω ②

Output circuit ①

	RSR92-...25	RSR92-...40
Rated load current	25 A	40 A
Maximum surge current	250 A 10 ms	500 A 10 ms
I ² t for fusing	312 A ² s 10 ms	1 250 A ² s 10 ms
Maximum off-state leakage current (at rated load voltage)	5 mA 220 VAC 50 Hz	5 mA 220 VAC 50 Hz
Minimum off-state dV/dt (at max. rated voltage)	500 V/ μ s	500 V/ μ s

Output circuit ①

	RSR92-...60	RSR92-...80
Rated load current	60 A	80 A
Maximum surge current	700 A 10 ms	1 000 A 10 ms
I ² t for fusing	2 450 A ² s 10 ms	5 000 A ² s 10 ms
Maximum off-state leakage current (at rated load voltage)	5 mA 220 VAC 50 Hz	5 mA 220 VAC 50 Hz
Minimum off-state dV/dt (at max. rated voltage)	500 V/ μ s	500 V/ μ s

① Data given for ambient temperature ≤ 25 °C. Above 25 °C the maximum current decreases - see "Thermal derating curves", page 5.

② When current version is used, the drive voltage should be more than 10 V.

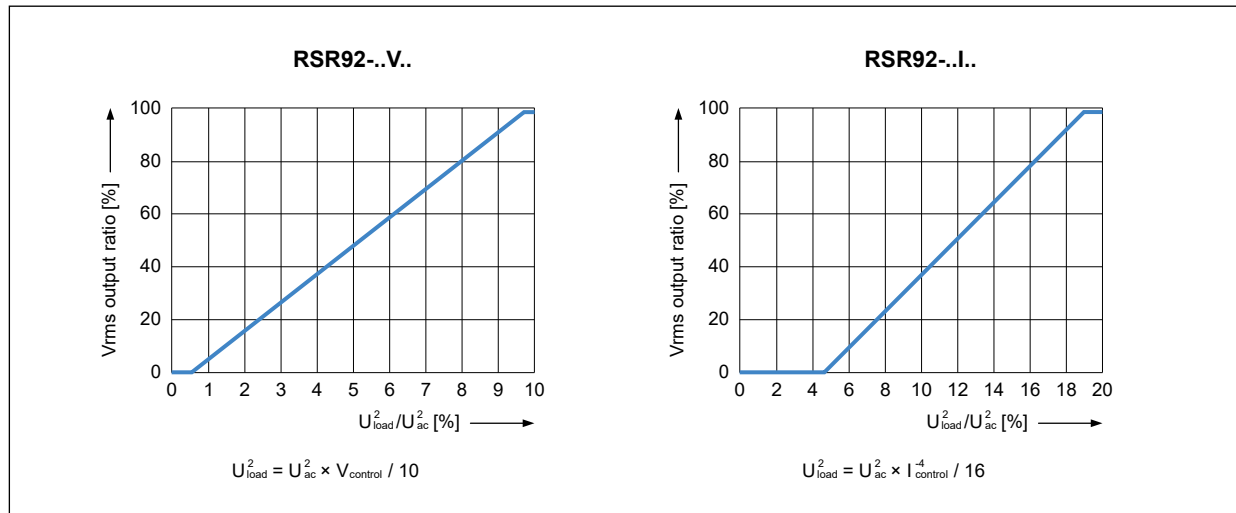
General data ❶

	RSR92-...
Dielectric strength	input - output: 4 000 Vrms 50/60 Hz input, output - base: 2 500 Vrms 50/60 Hz
Minimum insulation resistance	1 000 MΩ 500 V DC
Ambient temperature (non-condensation and/or icing)	storage: -40...+100 °C operating: -30...+80 °C

Mechanical data

	RSR92-..V25	RSR92-..V40 RSR92-..V60	RSR92-..V80	RSR92-..I25	RSR92-..I40 RSR92-..I60	RSR92-..I80
Dimensions (L x W x H)	58,6 x 45,7 x 39,5 mm			58,6 x 45,7 x 33,5 mm		
Weight (typical)	115 g	120 g	170 g	115 g	120 g	170 g
Protection category EN 60529	IP 20			IP 20		
Connection mode	input: screws M3 (plugable connector) ❸ tightening moment: 0,58...0,98 N•m output: screws M4 ❹ tightening moment: 0,98...1,37 N•m			input: screws M3 ❸ tightening moment: 0,58...0,98 N•m output: screws M4 ❹ tightening moment: 0,98...1,37 N•m		
Mounting on panel or heatsink ❺	screws M4 tightening moment: 0,98...1,37 N•m			screws M4 tightening moment: 0,98...1,37 N•m		

Output / proportional control characteristics ❸



❶ Data given for ambient temperature ≤ 25 °C. Above 25 °C the maximum current decreases - see "Thermal derating curves", page 5.

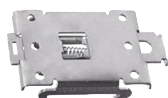
❸ When connection cables to relay: please ensure, screws are torqued down properly.

❹ Relay must be mounted to proper sized heatsink, based on "Thermal derating curves". Between relay and heatsink must be used thermal pad.

❺ The output curves were measured at 50 Hz.

RSR92

single-phase solid state relays, industrial



RDR-10

RH21



RH19A

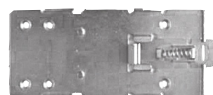


RH19B



Material	aluminum	aluminum	aluminum
Dimensions (L x W x H)	80 x 50 x 50 mm	70 x 50 x 69 mm	81 x 50 x 83 mm
Weight (typical)	115 g	275 g	335 g
Thermal resistance	2,1 °C/W	1,9 °C/W	1,9 °C/W
Additional equipment	–	RDR-10 ⑥	–
Mounting	on panel, on 35 mm rail mount	on 35 mm rail mount (with clip RDR-10)	on 35 mm rail mount

RH17A



RDR-30



RH16

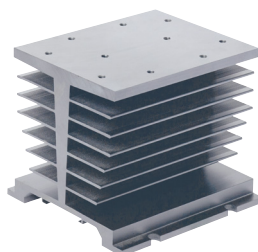


RH16-F



Material	aluminum	aluminum	aluminum
Dimensions (L x W x H)	90 x 50 x 69 mm	106 x 50 x 96 mm	106 x 80 x 96 mm
Weight (typical)	350 g	375 g	645 g
Thermal resistance	1,7 °C/W	1,6 °C/W	0,6 °C/W
Additional equipment	RDR-30 ⑦	–	built-in fan
Mounting	on 35 mm rail mount (with clip RDR-30)	on panel, on 35 mm rail mount	on panel, on 35 mm rail mount

RH08



RH08-F

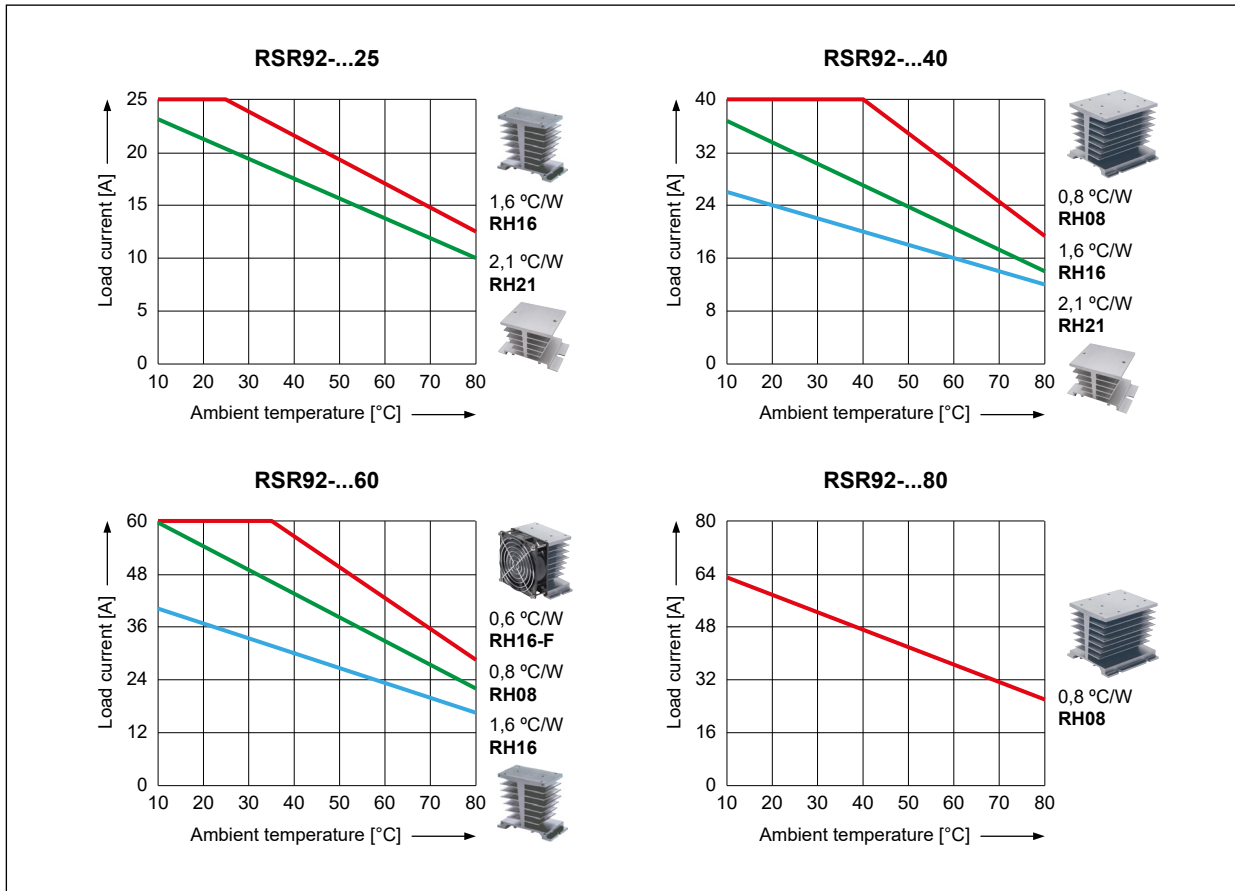


Material	aluminum	aluminum
Dimensions (L x W x H)	106 x 110 x 96 mm	106 x 140 x 96 mm
Weight (typical)	825 g	1 095 g
Thermal resistance	0,8 °C/W	0,35 °C/W
Additional equipment	–	built-in fan
Mounting	on panel, on 35 mm rail mount	on panel, on 35 mm rail mount

⑥ Clip RDR-10 for heatsink RH19A: for mounting on 35 mm rail mount (including 6 holes on M4 screws).

⑦ Clip RDR-30 for heatsink RH17A: for mounting on 35 mm rail mount (including 6 holes on M3 screws).

Thermal derating curves

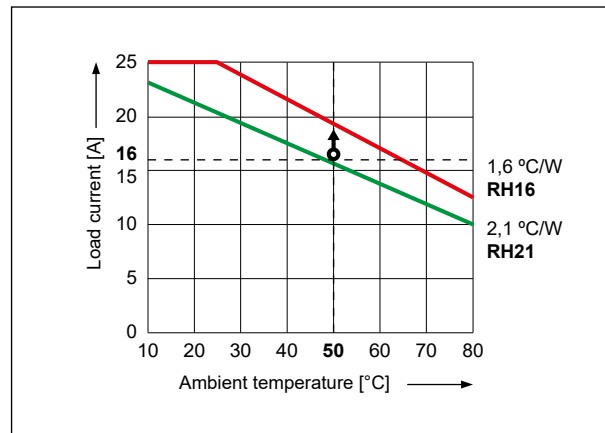


To select the proper sized heatsink:

- determine the load current and the maximum ambient temperature the relay will be exposed to,
- use the "Thermal derating curves" (see above).

Example: for a single-phase **RSR92** 25 A, at 16 A load current and ambient temperature at 50 °C:

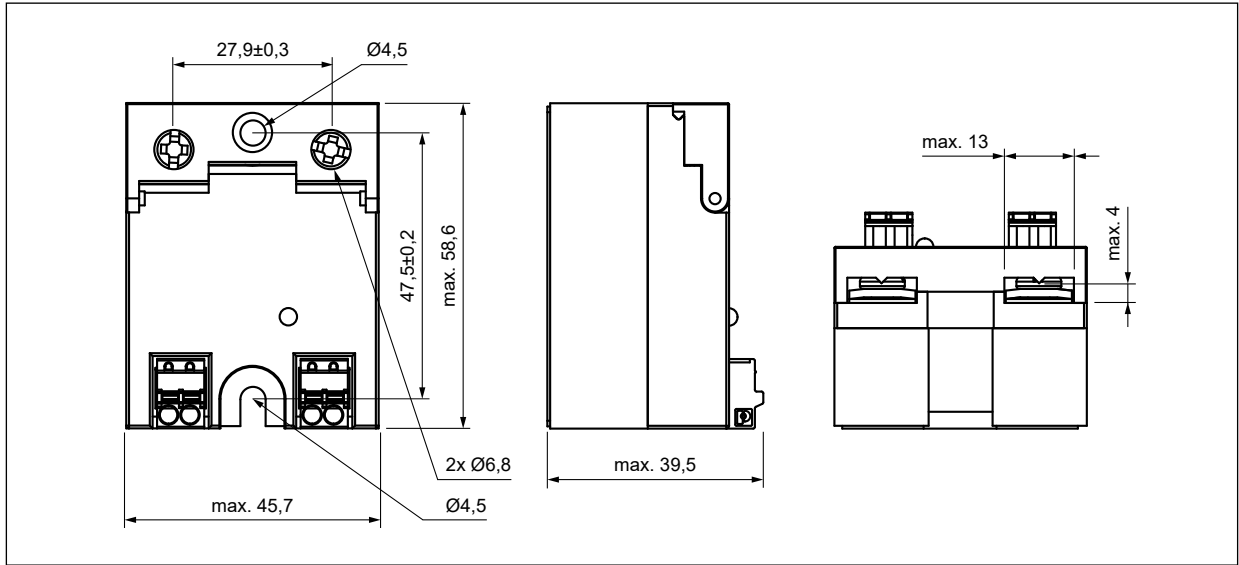
- on the Y axis we find the current value for which we draw a line perpendicular to Y,
- on the X axis we find the ambient temperature for which we draw a line perpendicular to X,
- we determine the intersection of both lines,
- read the heatsink rating – **always choose the rating above your point**: we need a 1,6 °C/W sized heatsink, since the 2,1 °C/W heatsink will not ensure sufficient cooling of the solid state relay.



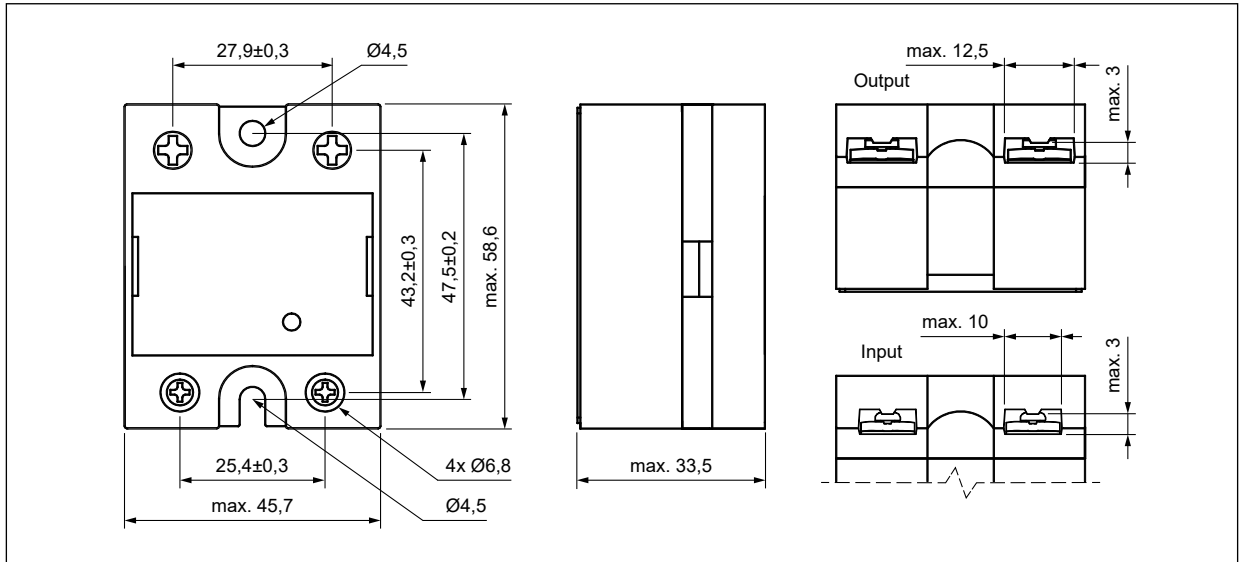
RSR92

single-phase solid state relays, industrial

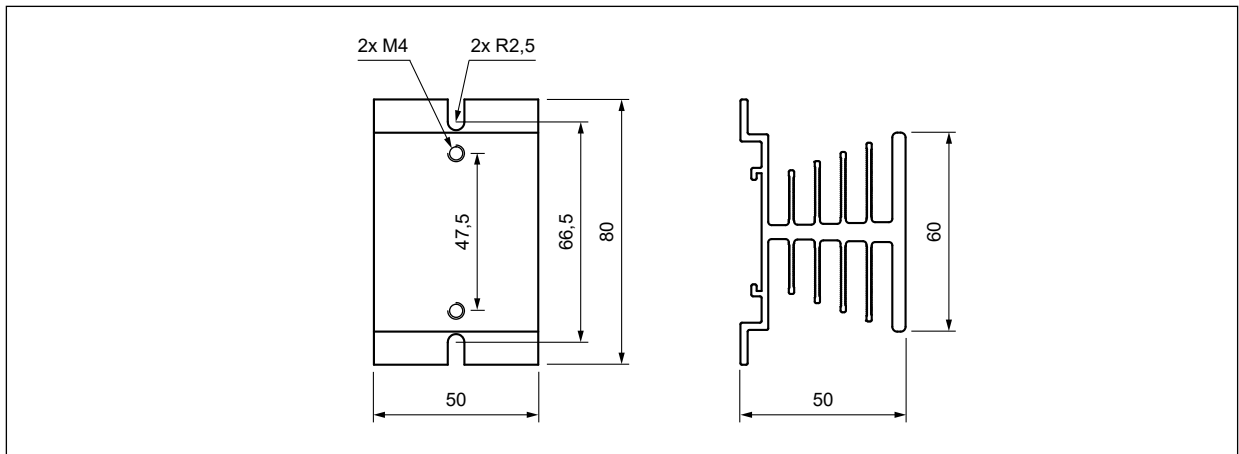
Dimensions



Solid state relay RSR92-..V..

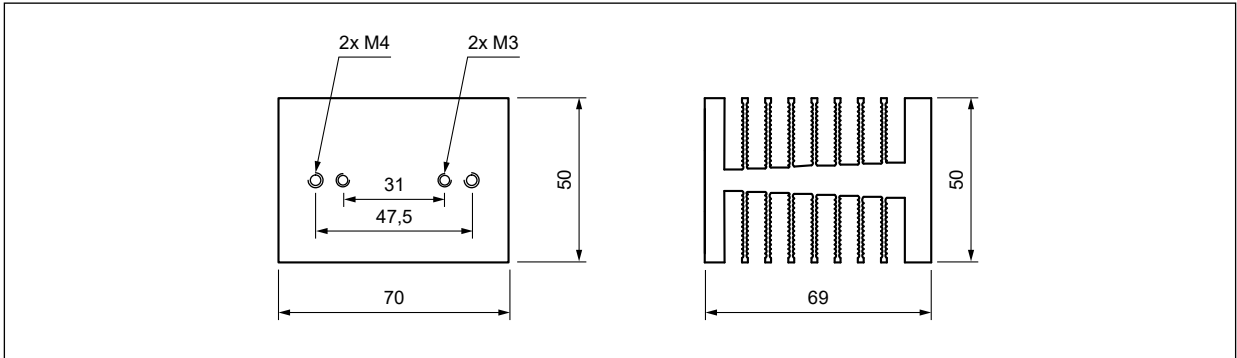


Solid state relay RSR92-..I..

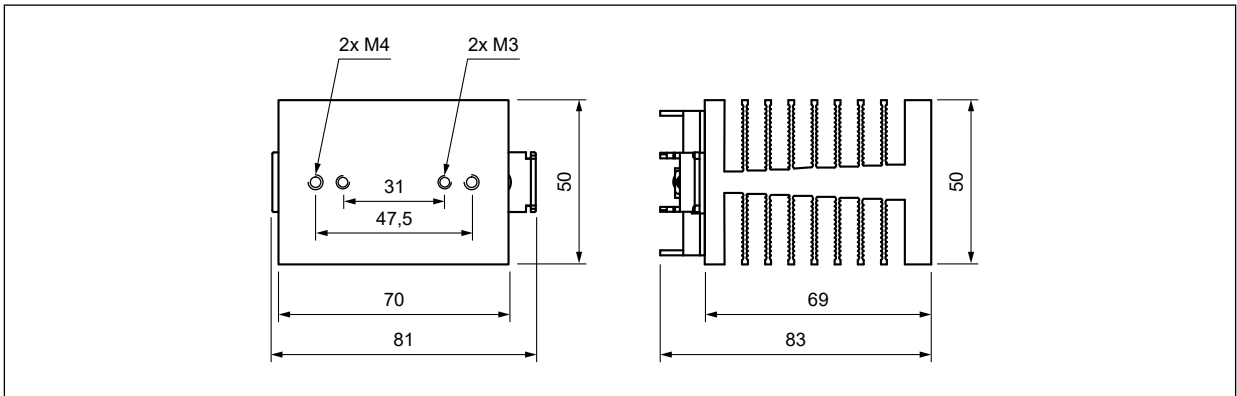


Heatsink RH21

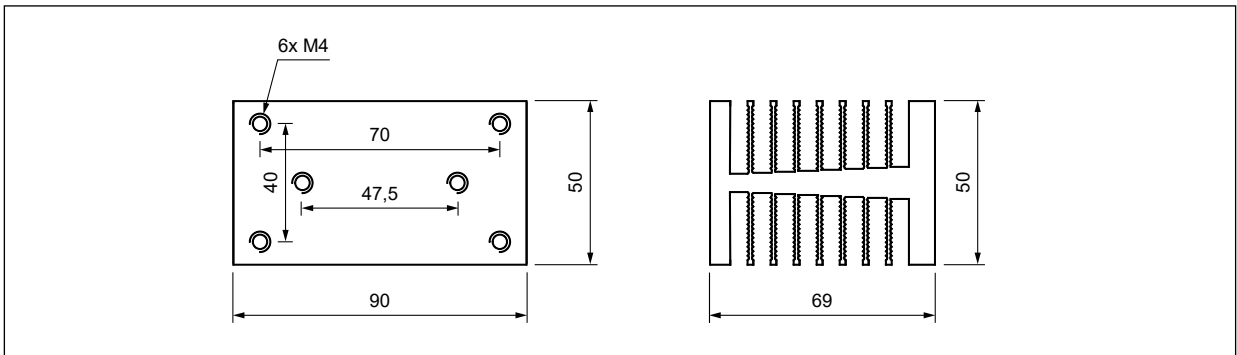
Dimensions



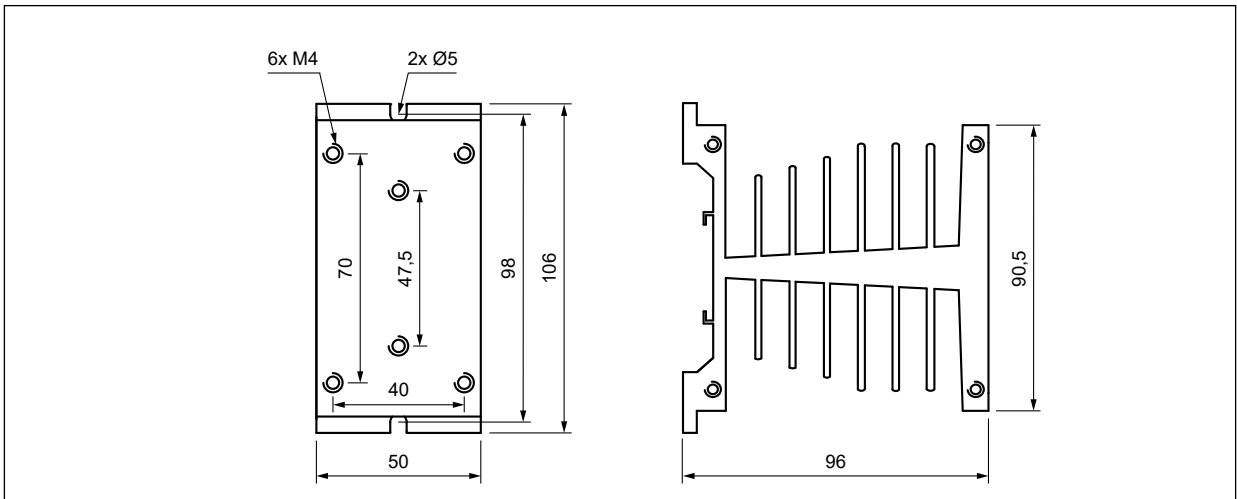
Heatsink **RH19A**



Heatsink **RH19B**

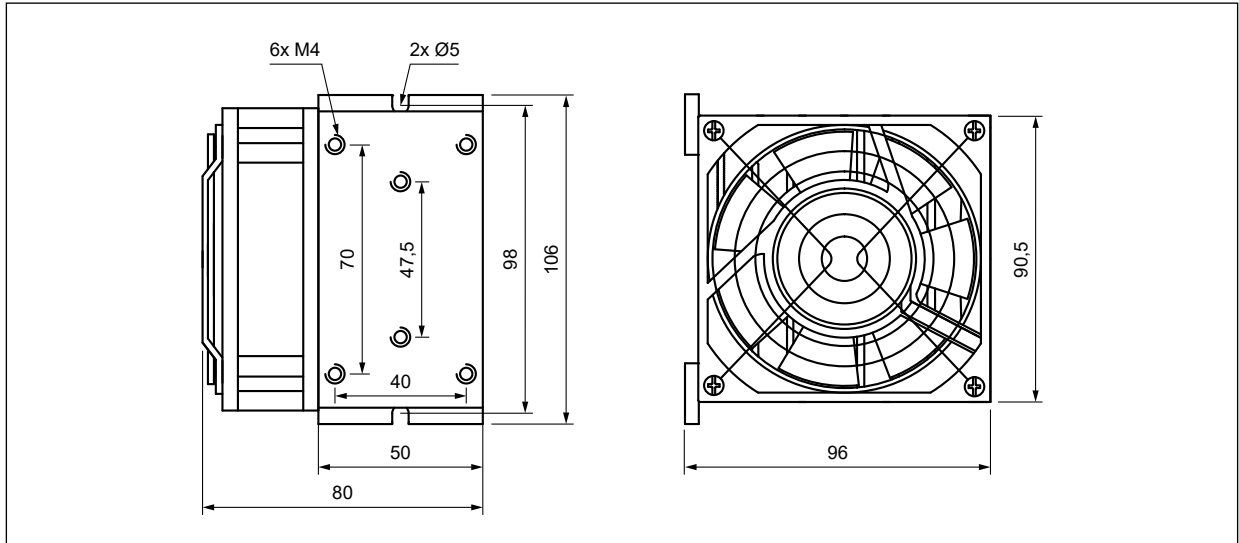


Heatsink **RH17A**

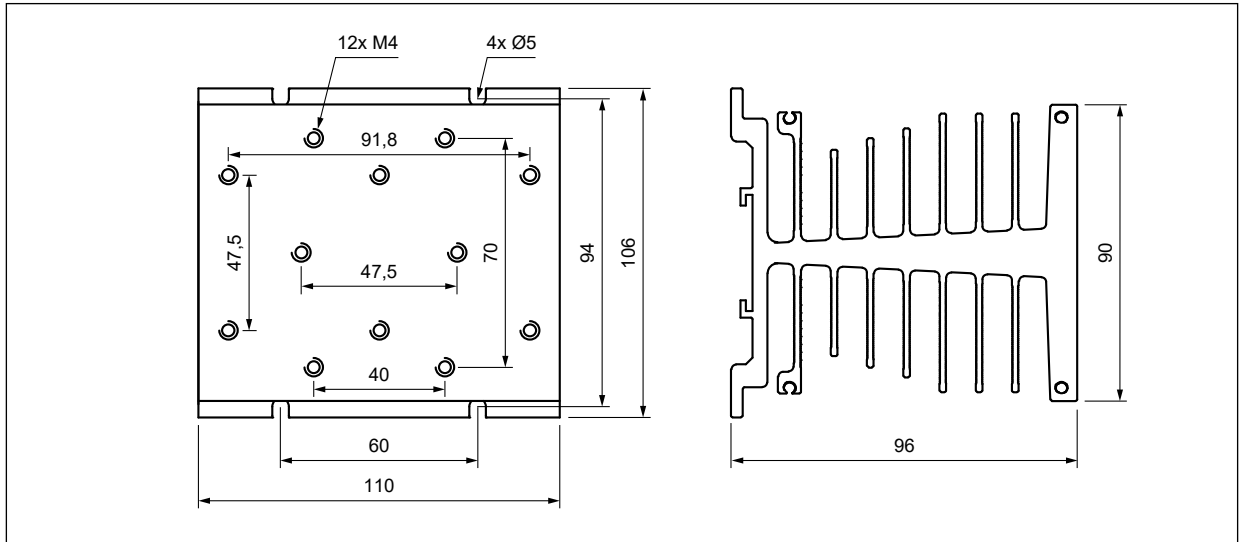


Heatsink **RH16**

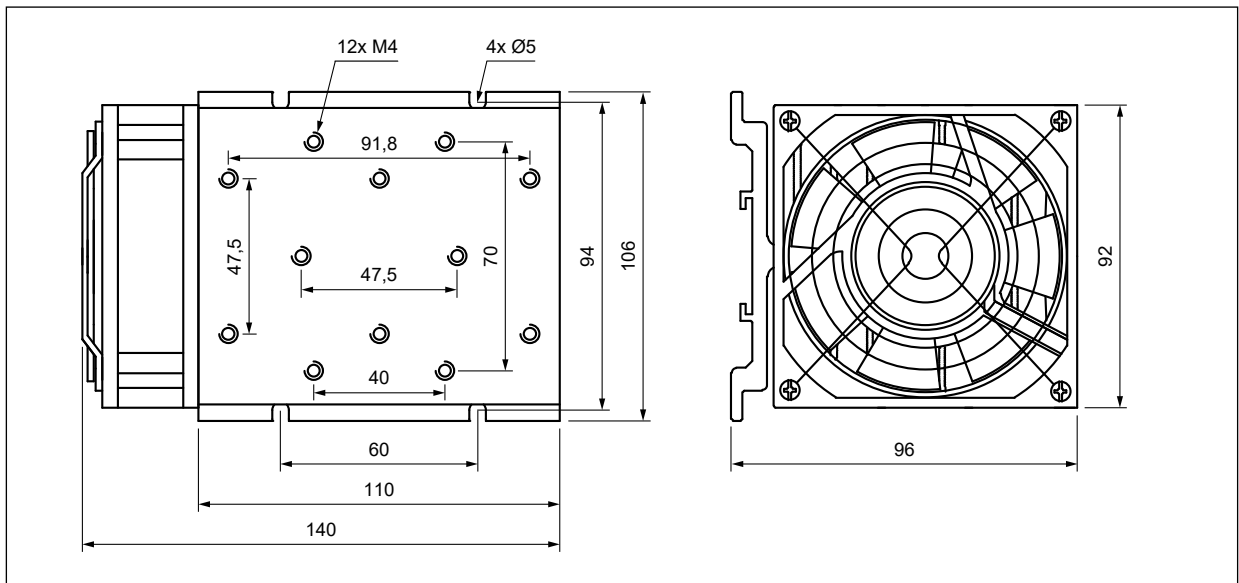
Dimensions



Heatsink RH16-F



Heatsink RH08

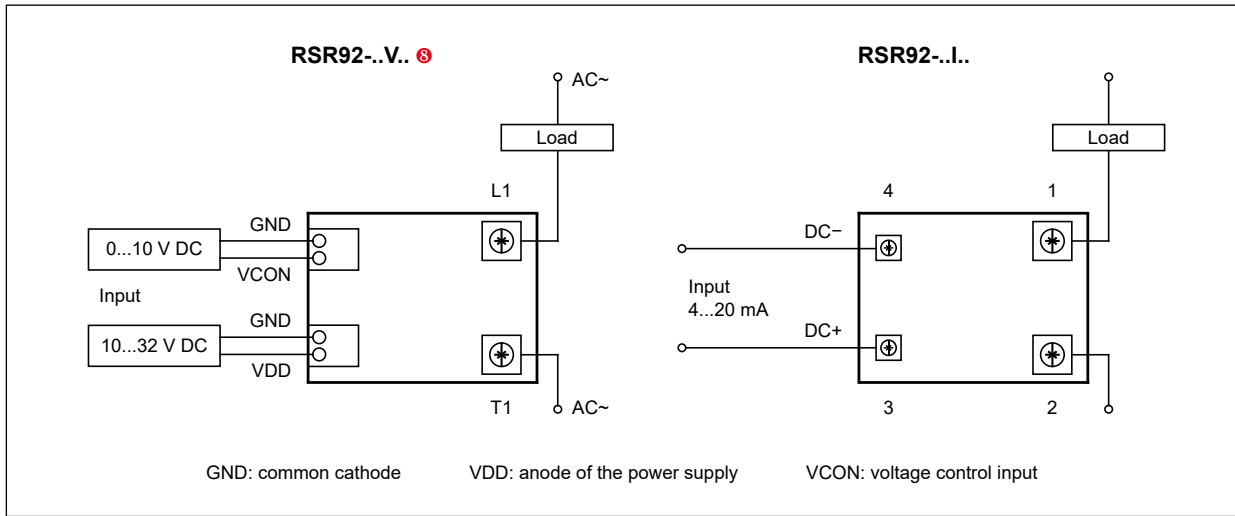


Heatsink RH08-F

RSR92

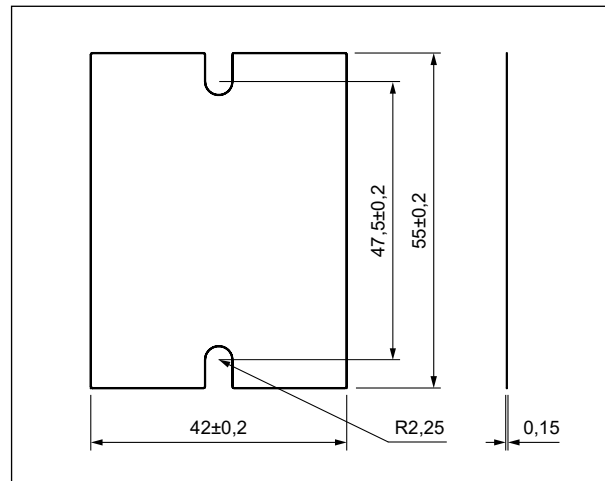
single-phase solid state relays, industrial

Connection diagrams



Ⓢ The auxiliary power supply GND and the input control GND should be connected internally to the earth ground; if the external control signal and the power supply are not connected together to the earth ground, then both should be connected to each GND respectively.

Dimensions



Thermal pad RTP-10

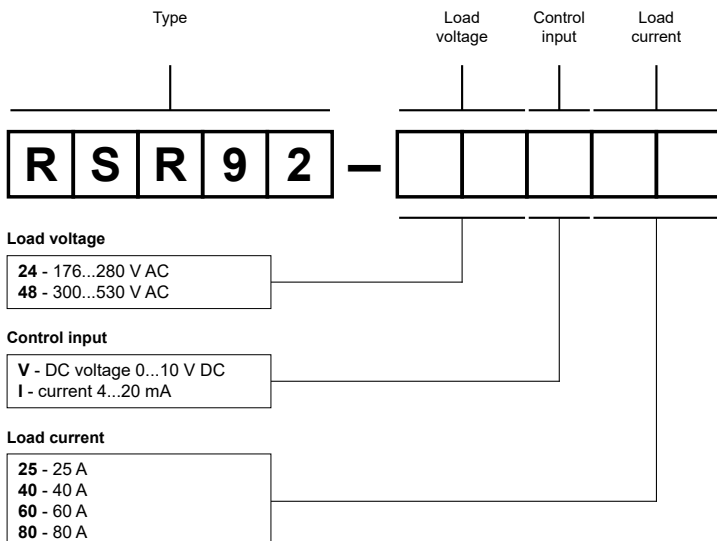
Thermal pad RTP-10

Mounting, accessories for relays

Relays **RSR92** are designed for:

- direct mounting on panel
- mounting on heatsinks **RH**. For **RSR92** relays we offer thermal pads **RTP-10**.

Ordering codes



Examples of ordering codes Ⓢ:

RSR92-24V25

relay **RSR92**, power controller, DC voltage control, load voltage 176...280 V AC (single-phase), load current 25 A

RSR92-48I80

relay **RSR92**, power controller, current control, load voltage 300...530 V AC (single-phase), load current 80 A

Ⓢ Ordering codes **RSR92** are specified in tables "Type" on page 1.