

# RSR45

## single-phase solid state relays, industrial

RSR45-38...

RSR45-38...-A



- Zero-crossing or random-on switching
- DC control input
- Triac output
- Load current 10...25 A
- Max. load voltage 440 V AC (single-phase)
- Dielectric strength 4 000 Vrms (opto-isolation)
- RC protection (built-in resistor, capacitor)
- LED indicator (red)
- Screw terminals or flat insert connectors - faston 250 (6,3 x 0,8 mm)
- Mounting on panel or on heatsinks
- Recognitions, certifications, directives: RoHS, REACH,



### Applications

Two technologies of wire connection allow to use it in various applications: widely used for resistive, inductive or capacitive load – laboratory incubators, industrial automation, industrial machinery, temperature chamber, food machinery (cofee machine, food warmers, electrical grills, fryers), control cabinets.

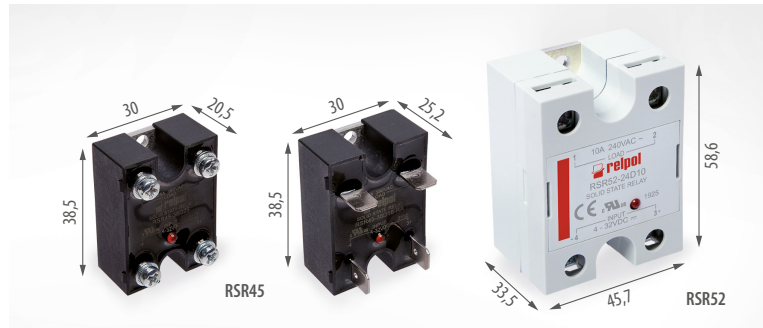


### Description

The RSR45 solid state relay is perfect addition to the solid state relays range. It takes up much less space than a standard SSR (see opposite: comparison of relays RSR45 and RSR52).

### Basic technical data

Load voltage: 24...440 V AC  
 Control input: DC  
 Load current: 10 A, 16 A, 25 A



### Type

Load voltage	Control voltage	Load current		
		10 A	16 A	25 A
24...440 V AC	4...32 V DC	<b>RSR45-38D10</b>	<b>RSR45-38D16</b>	<b>RSR45-38D25</b>
		<b>RSR45-38D10-R</b>	<b>RSR45-38D16-R</b>	<b>RSR45-38D25-R</b>
		<b>RSR45-38D10-A</b>	<b>RSR45-38D16-A</b>	<b>RSR45-38D25-A</b>
		<b>RSR45-38D10-RA</b>	<b>RSR45-38D16-RA</b>	<b>RSR45-38D25-RA</b>

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### Load voltage

	<b>RSR45-38...</b>
Rated load voltage	380 V AC
Rated range of load voltage	24...440 V AC
Blocking voltage	800 V <sub>pk</sub>
Rated frequency	47...63 Hz
Power factor	0,5 380 V AC

### Control input

	zero-crossing	random-on
	<b>RSR45-...D...</b>	<b>RSR45-...D..-R.</b>
Control voltage range	4...32 V DC	4...32 V DC
Must turn-on voltage	4 V DC	4 V DC
Must turn-off voltage	1 V DC	1 V DC
Maximum input current	25 mA	25 mA
Response time pick-up	≤ 1/2 cycle + 1 ms	≤ 1 ms
Response time drop-out	≤ 1/2 cycle + 1 ms	≤ 1/2 cycle + 1 ms

### Output circuit

	<b>RSR45-...10...</b>	<b>RSR45-...16...</b>	<b>RSR45-...25...</b>
Rated load current	10 A	16 A	25 A
Maximum surge current	120 A 10 ms	160 A 10 ms	250 A 10 ms
I <sup>2</sup> t for fusing	72 A <sup>2</sup> s 10 ms	128 A <sup>2</sup> s 10 ms	312 A <sup>2</sup> s 10 ms
Max. operational current AC-51 rating	10 A	16 A	25 A
Max. operational current AC-53 rating	2 A	3,2 A	5 A
Min. operational current	100 mA	100 mA	100 mA
Maximum off-state leakage current (at rated load voltage)	5 mA	5 mA	5 mA
Maximum on-state voltage drop (at rated current)	1,5 V <sub>rms</sub>	1,5 V <sub>rms</sub>	1,5 V <sub>rms</sub>
Minimum off-state dV/dt (at max. rated voltage)	200 V/μs	200 V/μs	200 V/μs

### General data

	<b>RSR45-...</b>
Dielectric strength	input - output: 4 000 V <sub>rms</sub> 50/60 Hz input, output - base: 2 500 V <sub>rms</sub> 50/60 Hz
Minimum insulation resistance	1 000 MΩ 500 V DC
Ambient temperature (non-condensation and/or icing)	storage: -30...+100 °C operating: -30...+80 °C


❶ Data given for ambient temperature ≤ 25 °C. Above 25 °C the maximum current decreases - see "Thermal derating curves", page 4.


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### Mechanical data

	<b>RSR45-38D.. RSR45-38D..-R</b>	<b>RSR45-38D..-A RSR45-38D..-RA</b>
Dimensions (L x W x H)	38,5 x 30 x 20,5 mm	38,5 x 30 x 25,2 mm
Weight (typical)	35 g	35 g
Protection category EN 60529	without cover: IP 00 with cover <b>PCR-20</b> : IP 20	IP 00
Connection mode	screws M3  tightening moment: 0,58...0,98 N•m	faston 250 (6,3 x 0,8 mm) flat insert connectors
Mounting on panel or heatsink 	screws M3 tightening moment: 0,58...0,98 N•m	screws M3 tightening moment: 0,58...0,98 N•m

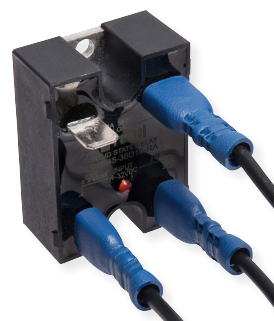
 When connection cables to relay: please ensure, screws are torqued down properly.

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

### Mounting options




Screws 4 x M3 x 6

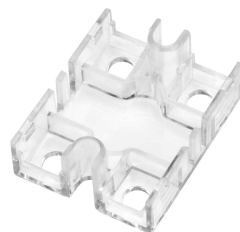
Faston 250 (6,3 x 0,8 mm)



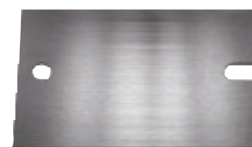
### Mounting, accessories for relays

Relays **RSR45** are designed for: • direct mounting on panel • mounting on heatsinks **RH**.  
For **RSR45** relays we offer protection covers **PCR-20** (IP 20) and thermal pads **RTP-11**.

	<b>RH28</b>	<b>RH21</b>	<b>RH19B</b>
			
Material	aluminum	aluminum	aluminum
Color	grey	grey	grey
Dimensions (L x W x H)	80 x 32 x 50 mm	80 x 50 x 50 mm	81 x 50 x 83 mm
Weight (typical)	70 g	115 g	335 g
Thermal resistance	2,8 °C/W	2,1 °C/W	1,9 °C/W
Mounting	on panel, on 35 mm rail mount	on panel, on 35 mm rail mount	on 35 mm rail mount

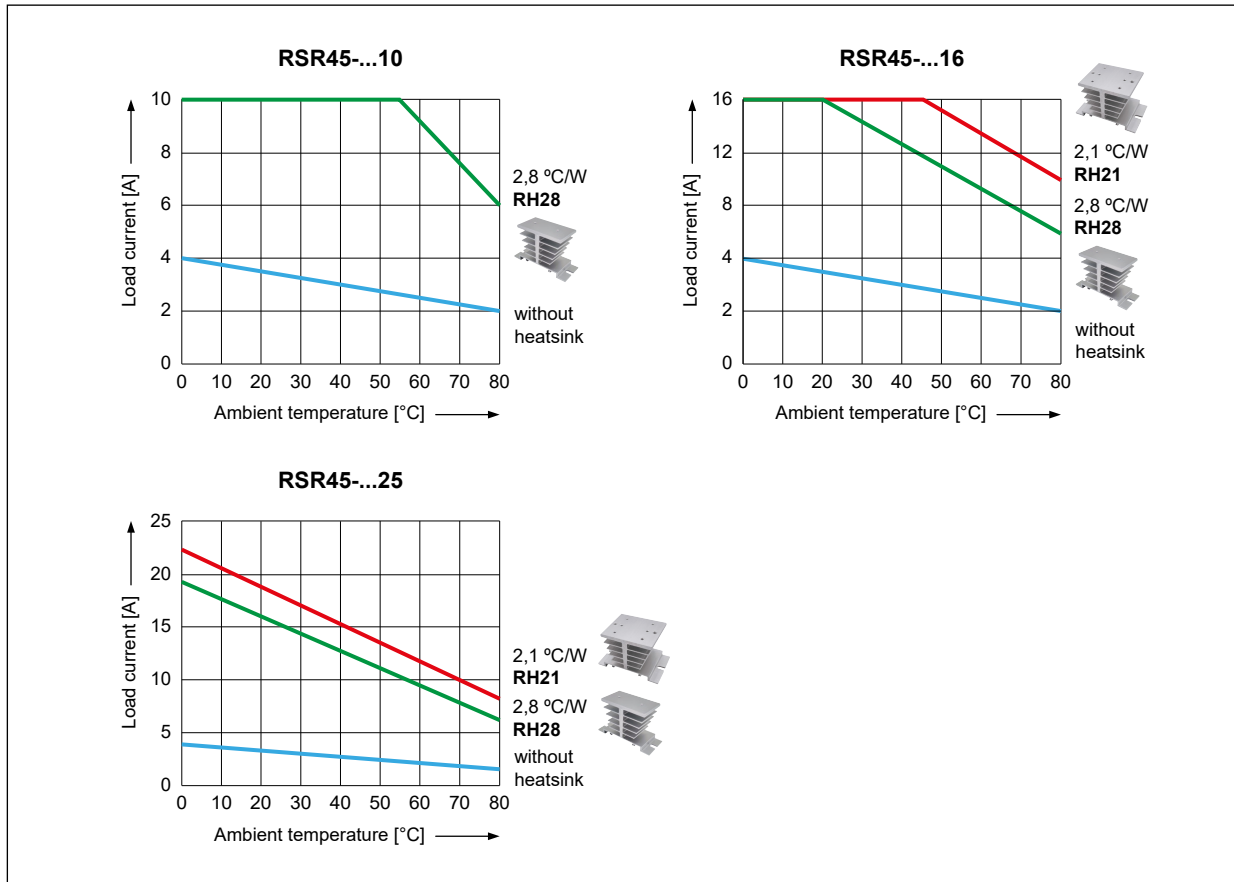


Protection cover **PCR-20**



Thermal pad **RTP-11**

### Thermal derating curves

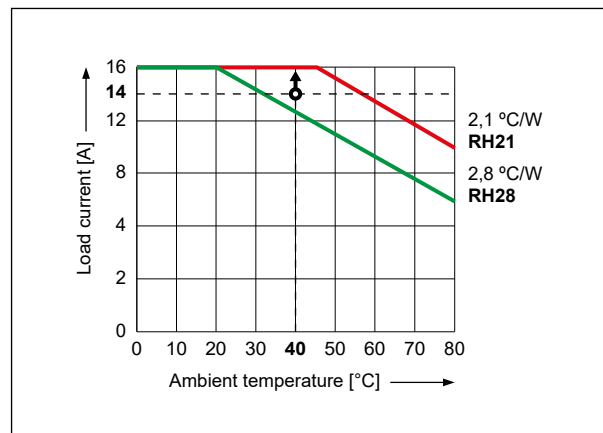


#### To select the proper sized heatsink:

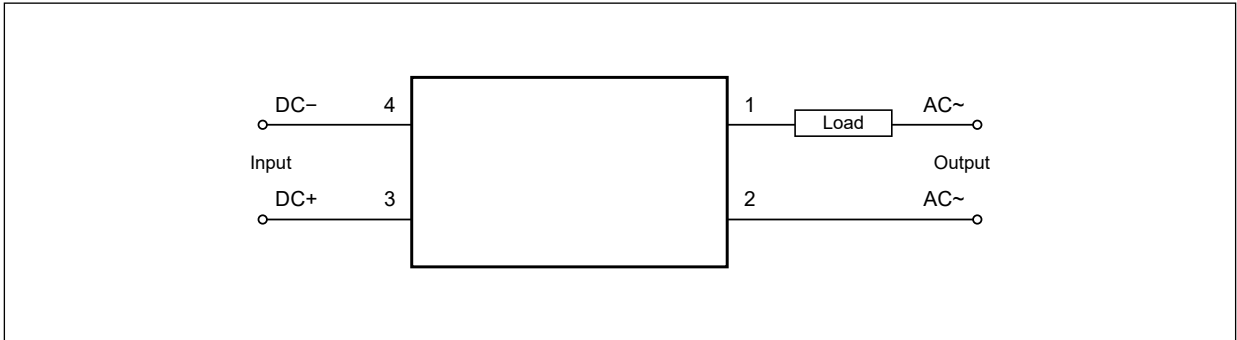
- determine the load current and the maximum ambient temperature the relay will be exposed to,
- use the "Thermal derating curves" (see above).

Example: for a single-phase **RSR45** 16 A, at 14 A load current and ambient temperature at 40 °C:

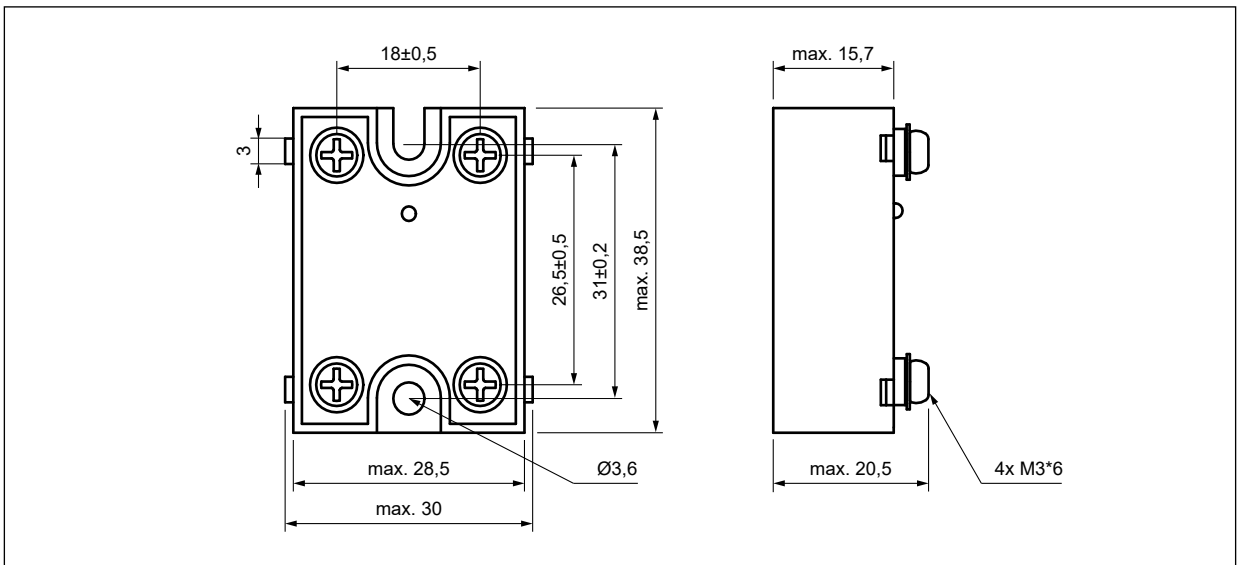
- on the Y axis we find the current value for which we draw a line perpendicular to Y,
- on the X axis we find the ambient temperature for which we draw a line perpendicular to X,
- we determine the intersection of both lines,
- read the heatsink rating – **always choose the rating above your point**: we need a 2,1 °C/W sized heatsink, since the 2,8 °C/W heatsink will not ensure sufficient cooling of the solid state relay.



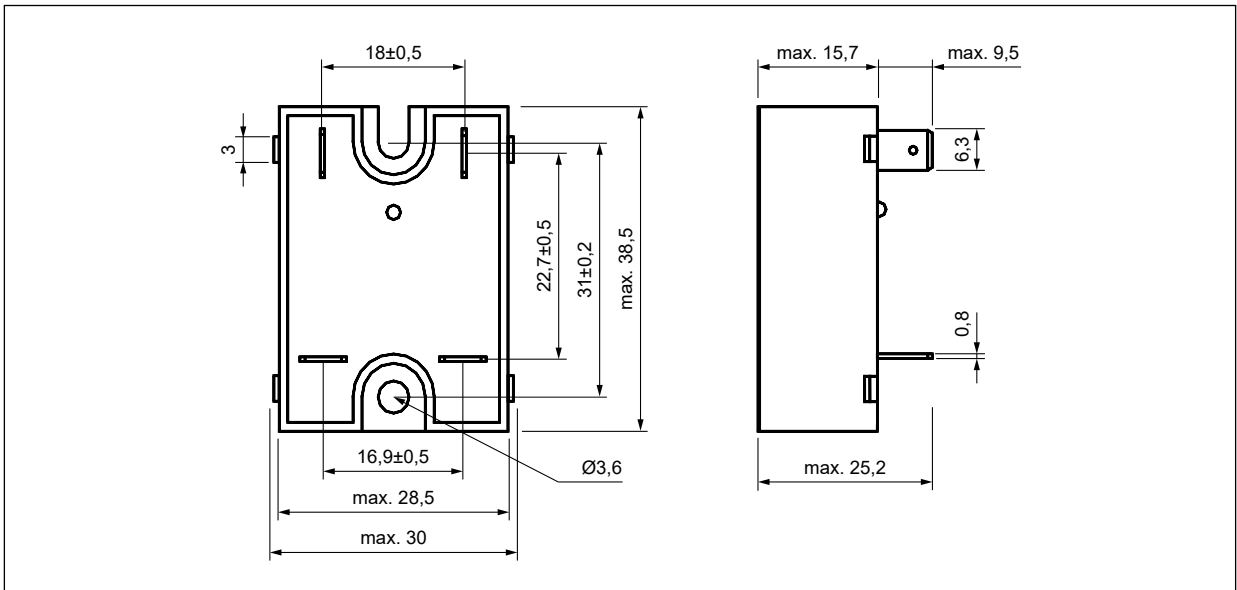
### Connection diagram



### Dimensions



Solid state relay **RSR45-38D.., RSR45-38D..-R**

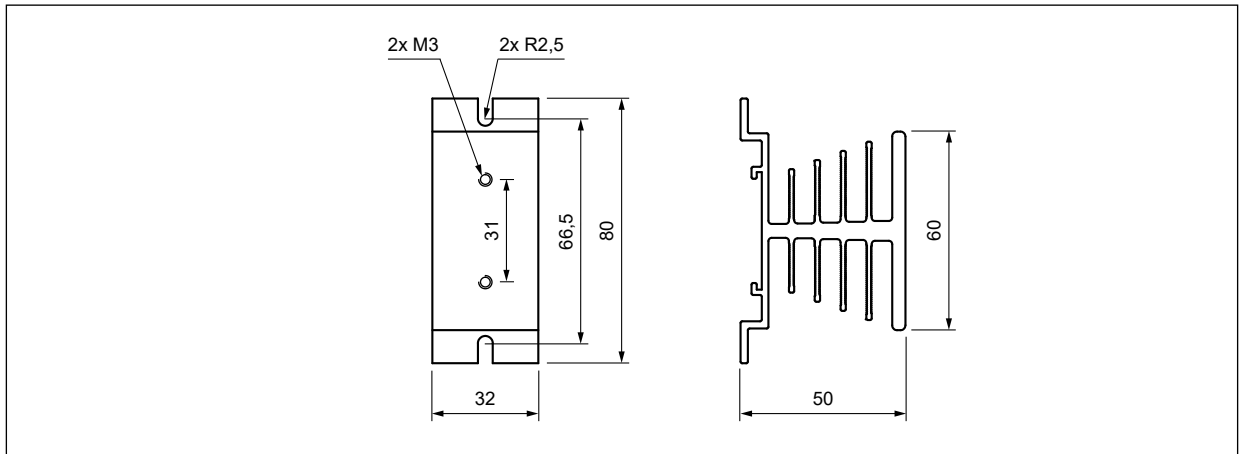


Solid state relay **RSR45-38D..-A, RSR45-38D..-RA**

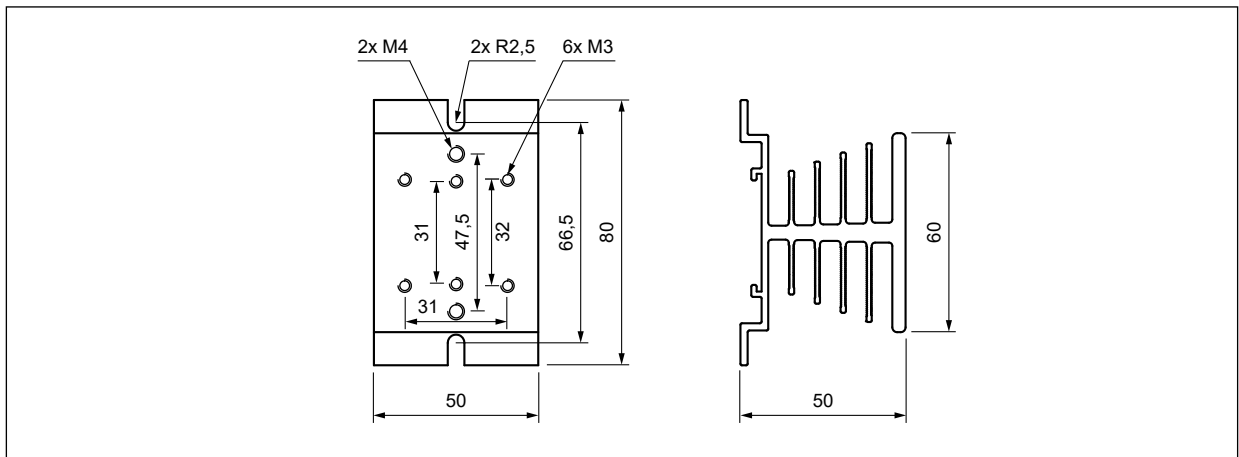
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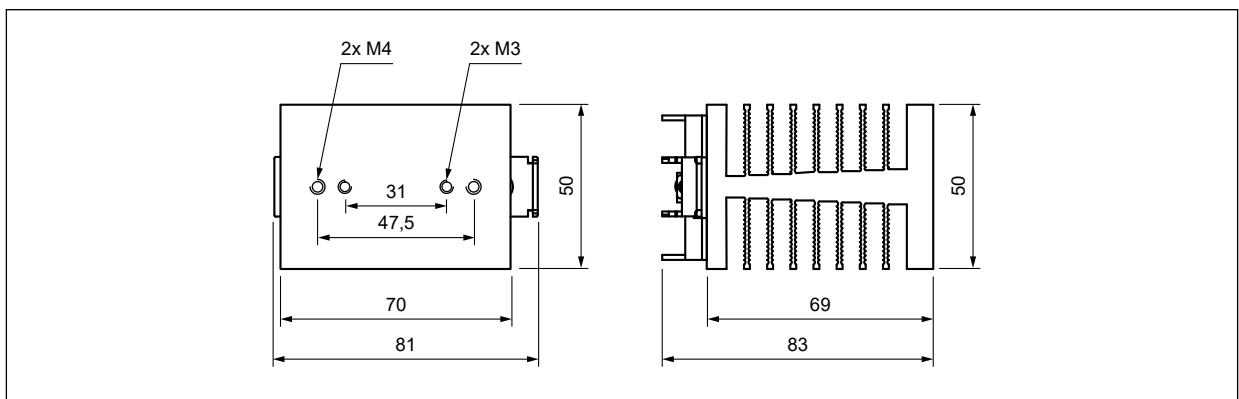
## Dimensions



Heatsink **RH28**



Heatsink **RH21**

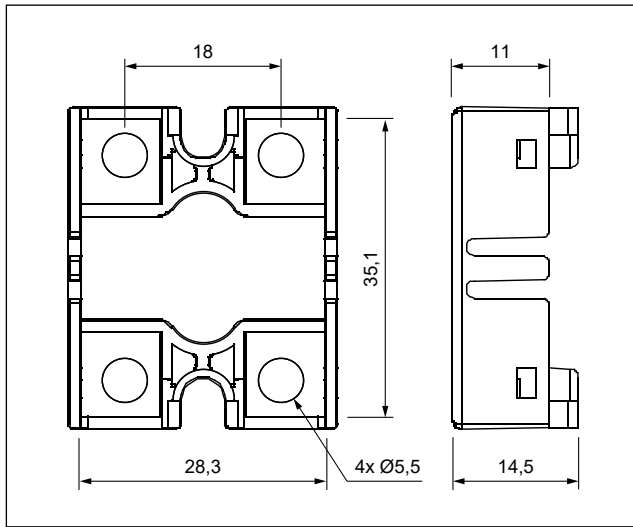


Heatsink **RH19B**

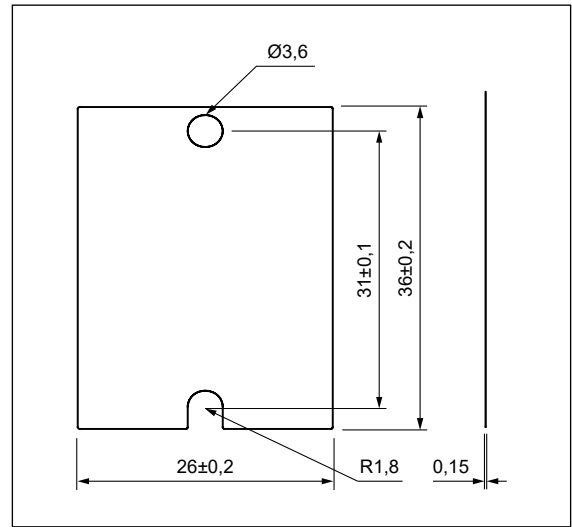
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## Dimensions

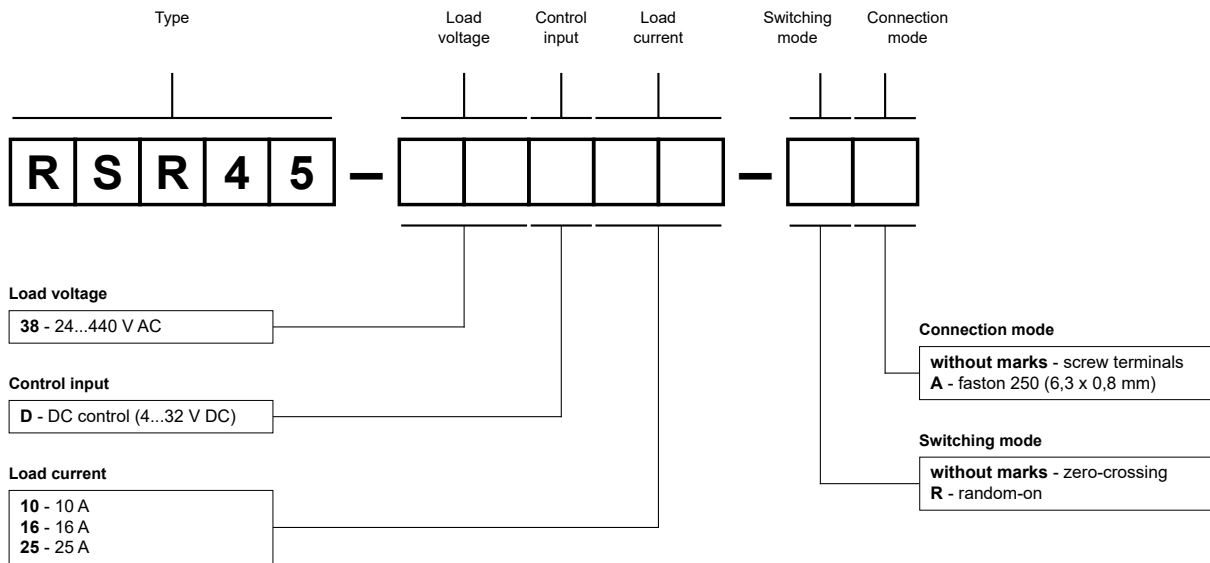


Protection cover **PCR-20**



Thermal pad **RTP-11**

## Ordering codes



Examples of ordering codes ④:

- RSR45-38D10** relay **RSR45**, screw terminals, zero-crossing switching, DC control, load voltage 24...440 V AC (single-phase), load current 10 A
- RSR45-38D16-R** relay **RSR45**, screw terminals, random-on switching, DC control, load voltage 24...440 V AC (single-phase), load current 16 A
- RSR45-38D25-RA** relay **RSR45**, faston 250 (6,3 x 0,8 mm), random-on switching, DC control, load voltage 24...440 V AC (single-phase), load current 25 A

④ Ordering codes **RSR45** are specified in table "Type" on page 1.