RSR93
three-phase power controllers, with heatsinks

RSR93-40W25-3



RSR93-40W..-F-3



- Three-phase power controller (phase angle load control)
- Control input: DC voltage 0...5 V DC, 0...10 V DC or current 4...20 mA
- SCR output (thyristors) • Load current 25...80 A
- Max. load voltage 440 V AC (three-phase)
- Dielectric strength 4 000 V_{rms} (opto-isolation)
- RC protection (built-in resistor, capacitor)
- Functions (only RSR93-...-M.-3):
  - Over-temperature Protection,
  - Load Disconnection Detection,
  - Phase-lack Detection,
  - EMR Alarm Node
- LED indicators (green, red) • Screw terminals
- Mounting on panel or on 35 mm rail mount acc. to EN 60715 (integrated with heatsink)
- Recognitions, certifications, directives: RoHS, REACH, CE

NEW

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 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).



Basic technical data

Load voltage: 200...440 V AC
Control input: DC voltage 0...5 V DC, 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	60 A	80 A
200...440 V AC	0...5 V DC, 0...10 V DC / 4...20 mA	**RSR93-40W25-3**	**RSR93-40W40-F-3**	**RSR93-40W60-F-3**	**RSR93-40W80-F-3**

Type

Load voltage	Control voltage/ current	Load current 25 A	40 A	60 A	80 A
200...440 V AC	0...5 V DC, 0...10 V DC / 4...20 mA	**RSR93-40W25-M-3**	**RSR93-40W40-MF-3**	**RSR93-40W60-MF-3**	**RSR93-40W80-MF-3**

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Load voltage

	RSR93-40...
Rated load voltage	380 V AC
Rated range of load voltage	200...440 V AC
Blocking voltage	1 200 V_{pk}
Rated frequency	47...63 Hz
Output power	0...99%

Control input

voltage control

	RSR93-..W...	
Control voltage range	0...5 V DC	0...10 V DC
Power supply voltage range	21,6...26,4 V DC	21,6...26,4 V DC
Must turn-on voltage	max. 0,2 V DC	max. 0,4 V DC
Must turn-off voltage	min. 0,05 V DC	min. 0,1 V DC
Input impedance (typical)	49 kΩ	25 kΩ

Control input

current control

	RSR93-..W...
Control current range	4...20 mA
Power supply voltage range	21,6...26,4 V DC
Must turn-on current	max. 4,6 mA
Must turn-off current	min. 3,8 mA
Input impedance (typical)	200 Ω

Output circuit ❶

	RSR93-...25-.-3	RSR93-...40-.F-3
Rated load current	25 A	40 A
Maximum surge current	400 A 10 ms	500 A 10 ms
I^2t for fusing	800 A^2s 10 ms	1 250 A^2s 10 ms
Maximum off-state leakage current	5 mA 220 VAC 50 Hz	5 mA 220 VAC 50 Hz
Minimum off-state dV/dt (at max. rated voltage)	500 V/µs	500 V/µs

Output circuit ❶

	RSR93-...60-.F-3	RSR93-...80-.F-3
Rated load current	60 A	80 A
Maximum surge current	700 A 10 ms	1 100 A 10 ms
I^2t for fusing	2 450 A^2s 10 ms	6 050 A^2s 10 ms
Maximum off-state leakage current	5 mA 220 VAC 50 Hz	5 mA 220 VAC 50 Hz
Minimum off-state dV/dt (at max. rated voltage)	500 V/µs	500 V/µs

❶ Data given for ambient temperature ≤ 25 °C. Above 25 °C the maximum current decreases - see "Thermal derating curves", page 7.

General data ❶

	RSR93-...
Dielectric strength	input - output: 4 000 Vrms 50/60 Hz input, output - base: 4 000 Vrms 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
Electrostatic discharge immunity level IEC 61000-4-2	4 kV contact discharge 8 kV air discharge
Electrical fast transient / burst immunity level IEC 61000-4-4	2 kV criteria B
Surge immunity level IEC 61000-4-5	2 kV line-PE, criteria B 1 kV line-line, criteria B

Mechanical data

	RSR93-...-3	RSR93-...-.F -3
Dimensions (L x W x H)	124 x 55 x 118,3 mm	153,5 x 81 x 158 mm
Weight (typical)	650 g	1 160 g
Protection category EN 60529	IP 20	
Connection mode	input: screws M2,6 ❷ tightening moment: 0,35...0,45 N•m output: screws M4 ❷ tightening moment: 0,98...1,37 N•m	

Functions (only RSR93-...-M.-3)

Over-temperature Protection ❸

When the product is working, the temperature of the product is monitored in real time. When the set temperature value is exceeded by 100 °C (typical value), the output of the product will be cut off. At the same time, the fault indicator light is on and the output is normally open and the alarm contacts (NO, COM) are closed. It is necessary to wait for the temperature of the product to drop below the set value of 60 °C (typical value) before the product can return to normal working state on its own.

Load Disconnection Detection

When no control signal is applied to the product, if load disconnection is found, SSR output will be cut off. At the same time, the fault indicator will be lighted and the output of the alarm contacts (NO, COM) will be closed.

Phase-lack Detection

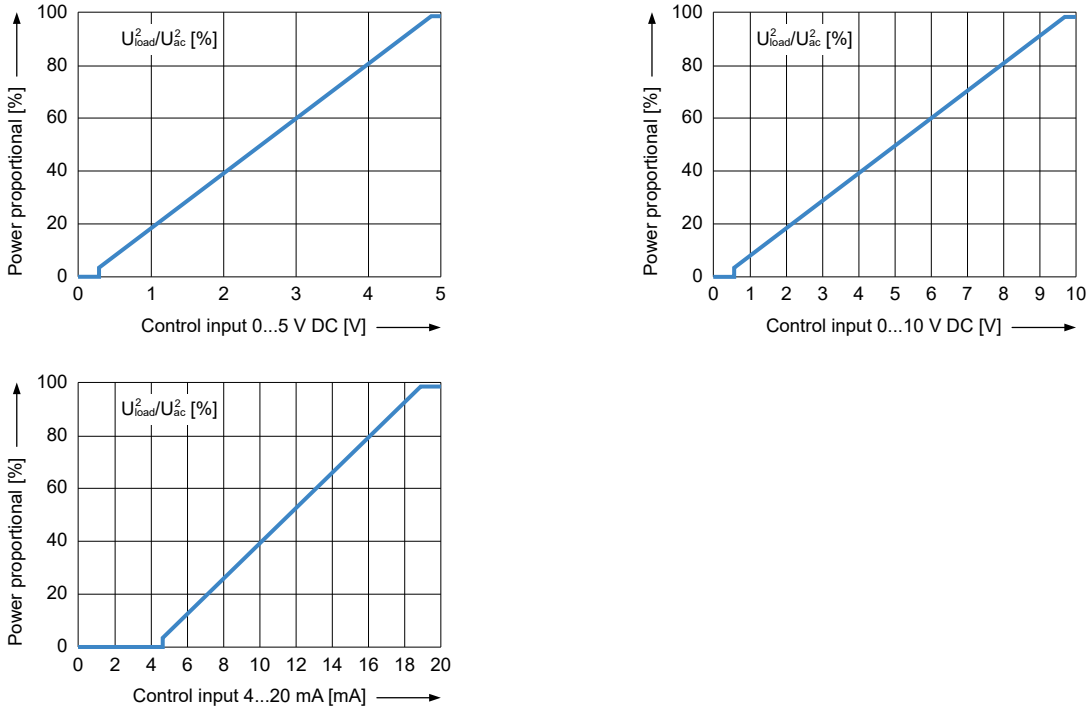
When the phase-lack failure happens in 3 phase voltage, the relay will automatically cut off the output with the fault indicator lighted and the output of the alarm contacts (NO, COM) will be closed.

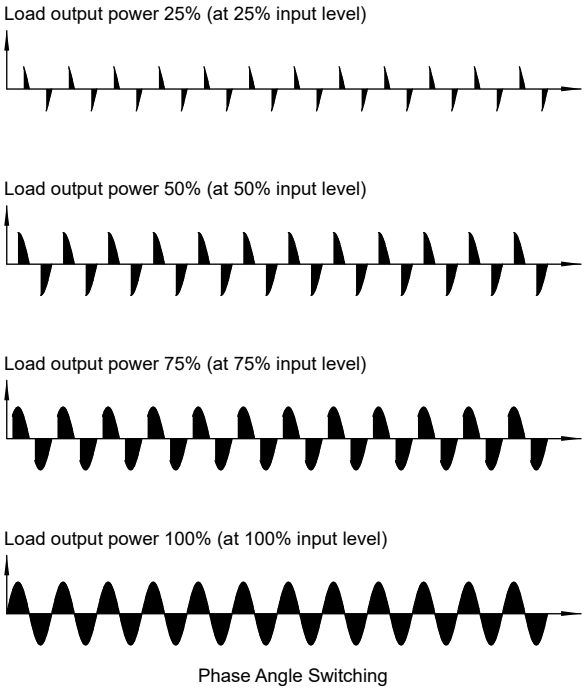
SCR Fault Detection

When no control signal is applied to the product, if the SCR short circuit is found, the product will cut off the output, at the same time, the fault indicator light is on and the output is normally open and the alarm contact (NO, COM) is closed.

❶ Data given for ambient temperature ≤ 25 °C. Above 25 °C the maximum current decreases - see "Thermal derating curves", page 7. ❷ When connection cables to relay: please ensure, screws are torqued down properly. The relay terminal should ensure reliable connection; poor connection may lead to the product overheating and damaging the product. ❸ If you need to change the threshold value of over-temperature protection temperature setting and recovery temperature setting in the over-temperature protection function, you can contact the manufacturer to customize.

Output / proportional control characteristics ❹

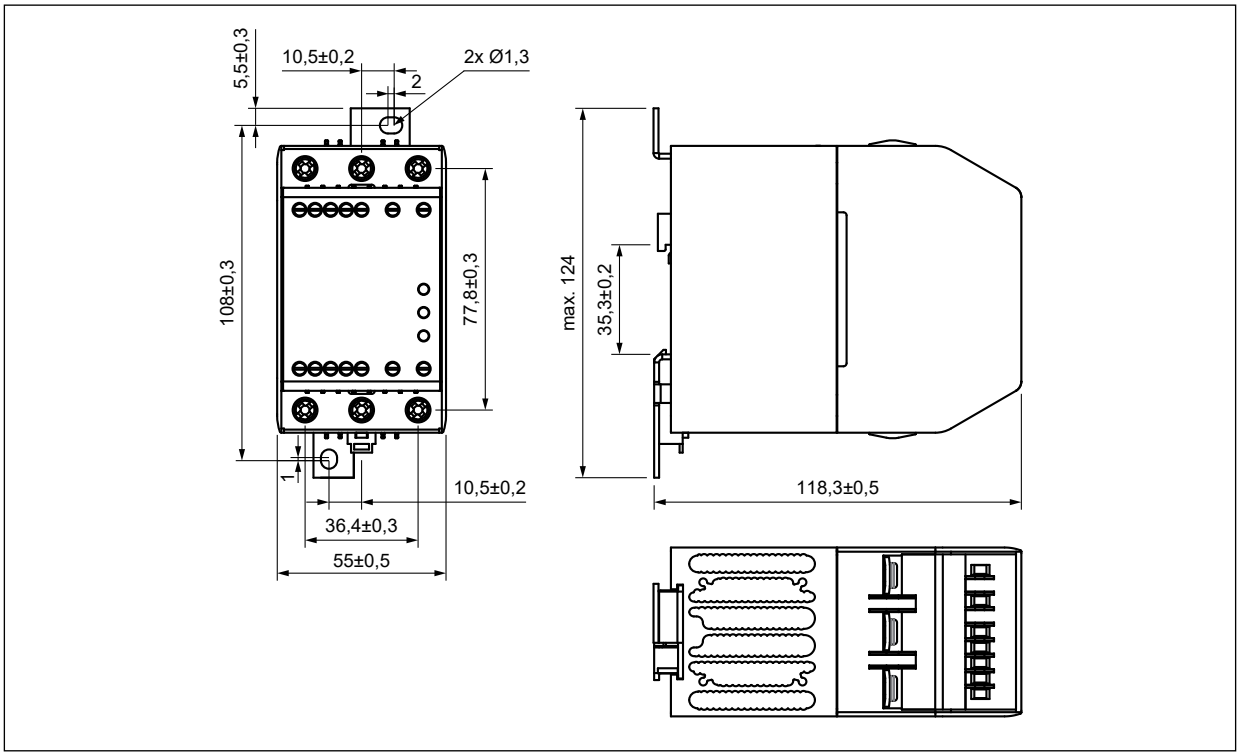




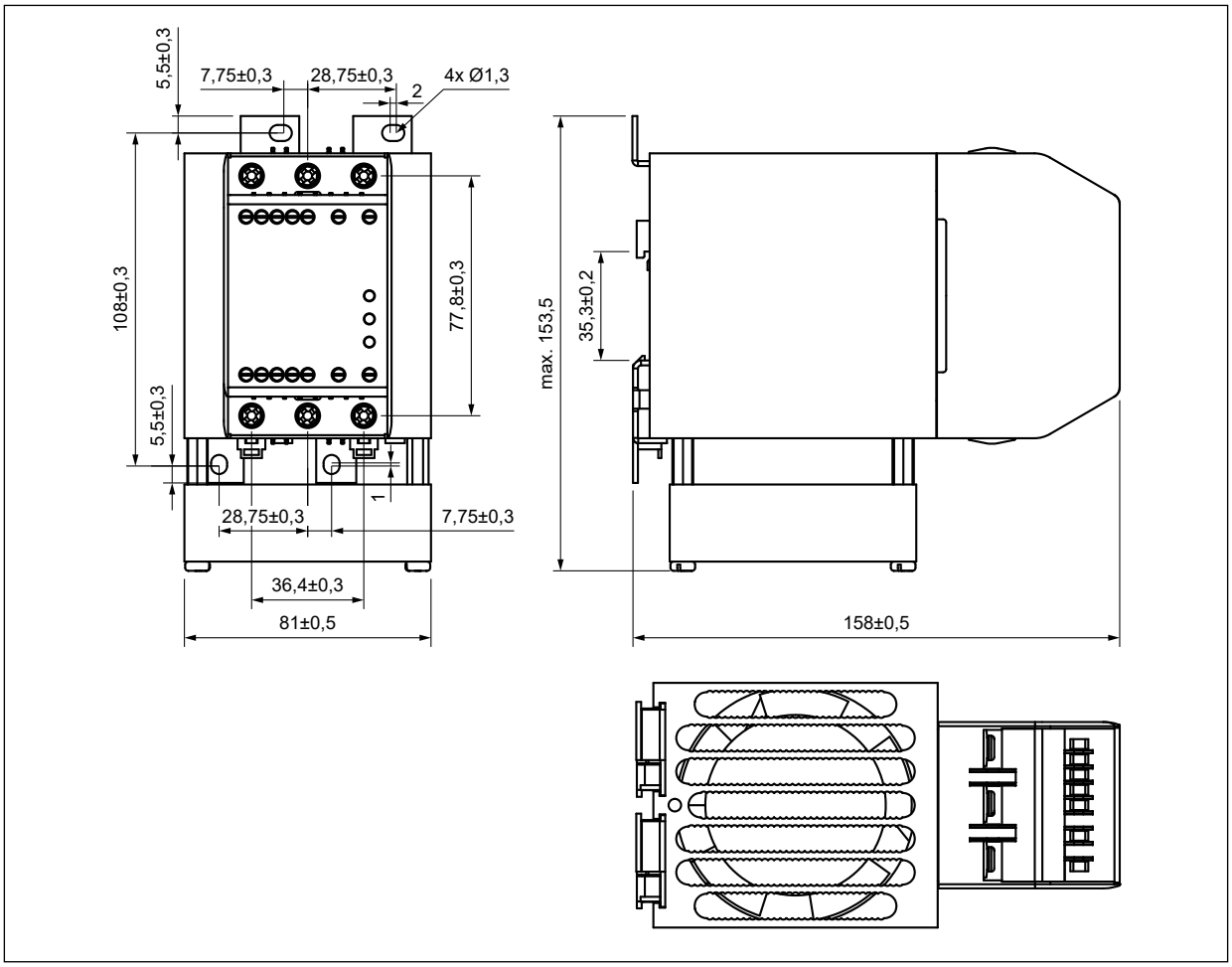
Phase Angle Switching

❹ The output curves were measured at 50 Hz.

Dimensions

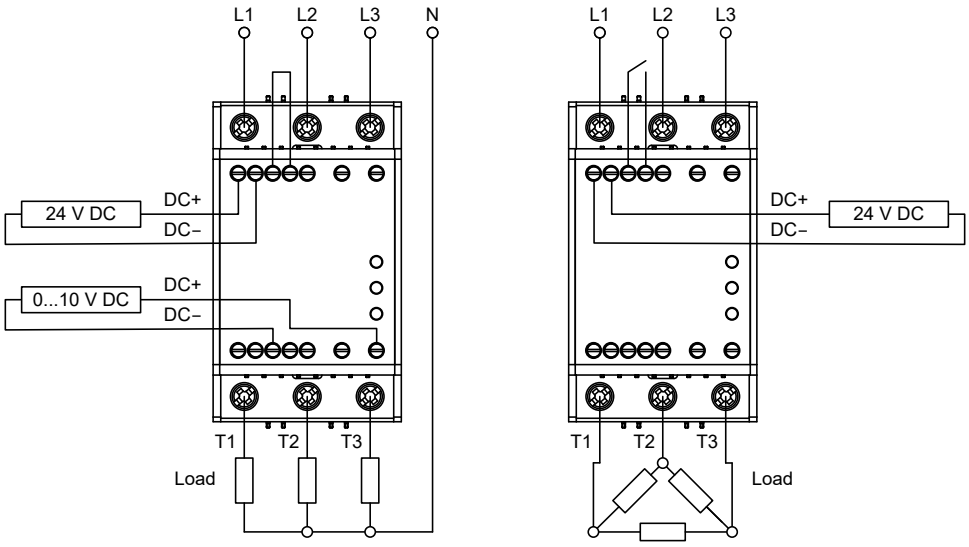


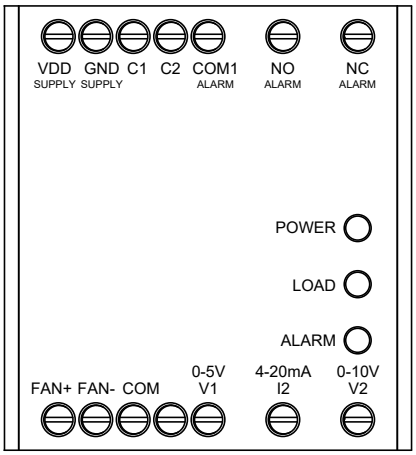
Power controller **RSR93-...-3**



Power controller **RSR93-...-.F-3**

Connection diagrams ❺





GND, COM: GND and COM are connected together as public negative end
VDD: positive pole of auxiliary power supply
V1: positive pole of 0...5 V DC voltage control input
V2: positive pole of 0...10 V DC voltage control input
I2: positive pole of 4...20 mA current control input

POWER: power LED is lighted when with APS (red)
LOAD: connection LED is lighted when the load has an output (green)
ALARM: fault LED is lighted when relay has a failure (red)

FAN+: positive pole of fan 24 V DC
FAN-: negative pole of fan 24 V DC

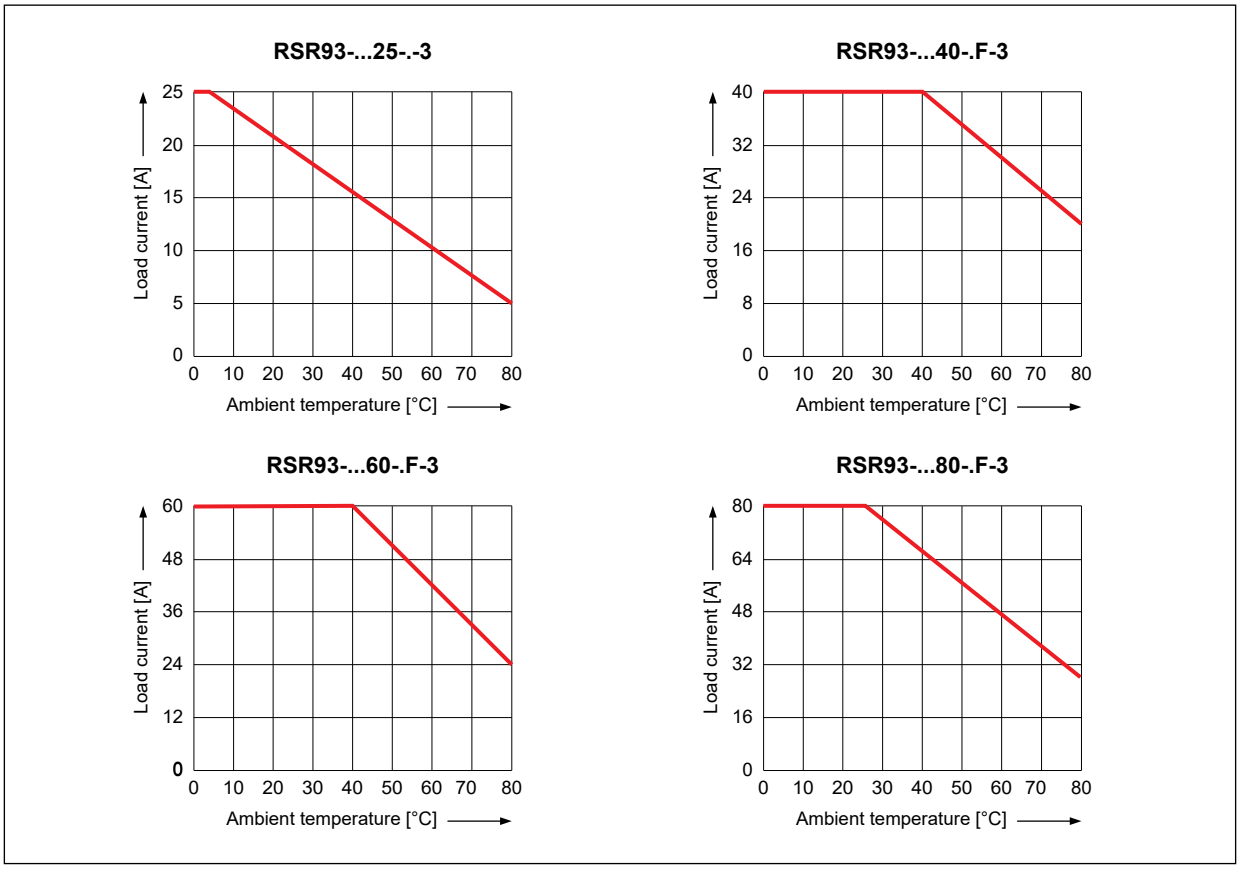
NC: EMR output normally closed alarm contacts
NO: EMR output normally open alarm contacts
COM1: EMR output common end

❺ This product has a built-in fault detection circuit, so the L1, L2, L3 of the product must be connected with the phase line. Ensure the electrical grounding reliably during the use of the solid state relay.

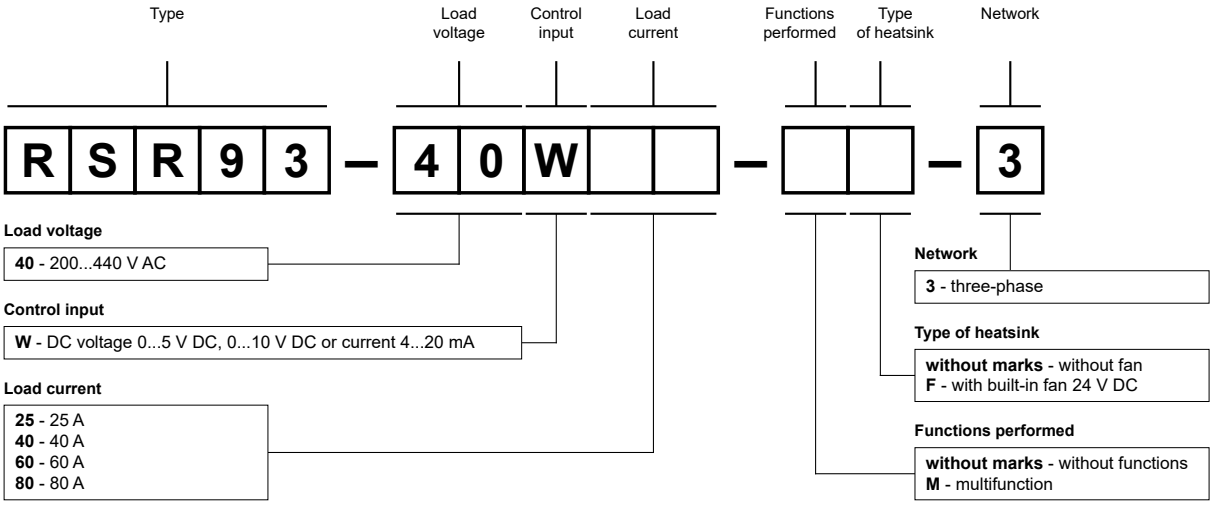
Mounting, accessories for relays

Relays **RSR93** integrated with heatsinks are designed for direct mounting on panel or on 35 mm rail mount acc. to EN 60715.

Thermal derating curves



Ordering codes



Examples of ordering codes ⓫:

RSR93-40W25-3 relay **RSR93**, integrated with heatsink (without fan), power controller, DC voltage or current control, load voltage 200...440 V AC (three-phase), load current 25 A

RSR93-40W40-F-3 relay **RSR93**, integrated with heatsink (with built-in fan), power controller, DC voltage or current control, load voltage 200...440 V AC (three-phase), load current 40 A

RSR93-40W80-MF-3 relay **RSR93**, integrated with heatsink (with built-in fan), multifunction power controller, DC voltage or current control, load voltage 200...440 V AC (three-phase), load current 80 A

ⓑ Ordering codes **RSR93** are specified in tables "Type" on page 1.

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