

Autonics Solid State Relay SR2/SR3 SERIES INSTRUCTION MANUAL



Detachable heatsink type Integrated heatsink type
Thank you for choosing our Autonics product.

Please read the following safety considerations before use.

Safety Considerations

- ⚠ Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ⚠ symbol represents caution due to special circumstances in which hazards may occur.

- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.

Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel or DIN rail to use.** Failure to follow this instruction may result in electric shock or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in electric shock or fire.
- Check 'Connections' before wiring.** Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.** Failure to follow this instruction may result in electric shock or fire.

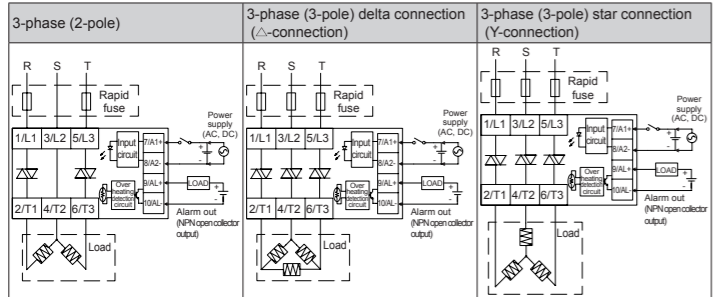
Caution

- Use the unit within the rated specifications.** Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.** Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.** Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit.** Failure to follow this instruction may result in fire or product damage.
- Since leakage current still flows right after turning off the power or in the output OFF status, do not touch the load terminal.** Failure to follow this instruction may result in electric shock.

Ordering Information

SR	H	3	-	1	4	15	R	Function	No mark	Zero cross turn-on
									R	Random turn-on
								Rated input current (resistive load)	15	15A
									30	30A
									40	40A
									50	50A
									75	75A
								Rated load voltage	2	24-240VAC
									4	48-480VAC
								Rated input voltage	1	4-30VDC
									2	24VAC
									4	90-240VAC
								Control phase	2	3-phase (2-pole)
									3	3-phase (3-pole)
								Type	No mark	Detachable heatsink type
									H	Integrated heatsink type
								Item	SR	Solid State Relay

Connections



⚠ For DC signal input models, 8 and 10 terminals are connected inside.

⚠ For AC signal input models, 8 and 10 terminals are insulated inside.

⚠ Use terminals of size specified below.

Terminal type	Input	Output
	a	Min. 3.5mm
	b	Max. 7.0mm
		Min. 5.0mm
		Max. 12.0mm

⚠ The above specifications are subject to change and some models may be discontinued without notice.
⚠ Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

Specifications

Input		24VACrms ~ (50/60Hz)	90-240VACrms ~ (50/60Hz)
Rated input voltage range	4-30VDC=	24-26.4VACrms ~ (50/60Hz)	85-264VACrms ~ (50/60Hz)
Allowable input voltage range	4-32VDC=	19-26.4VACrms ~ (50/60Hz)	85-264VACrms ~ (50/60Hz)
Max. input current	25mA	15mA	25mA
Pick-up voltage	Min. 4VDC=	Min. 19VACrms ~	Min. 85VACrms ~
Drop-out voltage	Max. 1VDC=	Max. 4VACrms ~	Max. 10VACrms ~
Turn-on time	Zero cross turn-on	Max. 0.5 cycle of load source + 1ms	Max. 1.5 cycle of load source + 1ms
	Random turn-on	Max. 1ms	—
Turn-off time	—	Max. 0.5 cycle of load source + 1ms	Max. 1.5 cycle of load source + 1ms

Output		24-240VACrms ~ (50/60Hz)	48-480VACrms ~ (50/60Hz)
Rated load voltage range	24-240VACrms ~ (50/60Hz)	48-480VACrms ~ (50/60Hz)	—
Allowable load voltage range	24-264VACrms ~ (50/60Hz)	48-528VACrms ~ (50/60Hz)	—
Rated load (Resistive load) (AC-51) ^{※1}	15Arms 30Arms 50Arms 75Arms	15Arms 30Arms 40Arms 50Arms 75Arms	—
Min. load current	0.15Arms 0.2Arms 0.5Arms 0.5Arms	0.5Arms	—
Max. 1 cycle surge current (60Hz)	250A 400A 1000A	300A 500A 1000A	—
Max. non-repetitive surge current (I _t = 8.3ms)	340A ² s 1000A ² s 4000A ² s	350A ² s 1000A ² s 4000A ² s	—
Peak voltage (non-repetitive)	600V	1200V (Zero cross turn-on), 1000V (Random turn-on)	—
Leakage current (Ta=25°C)	Max. 10mArms (240VAC ~ /60Hz)	Max. 10mArms (480VAC ~ /60Hz)	—
Output on voltage drop [Vpk] (max. load current)	Max. 1.6V	—	—
Static off state dv/dt	500V/μs	—	—

※1: AC-51 is utilization category at IEC60947-4-3.

Alarm output (temperature overheat)

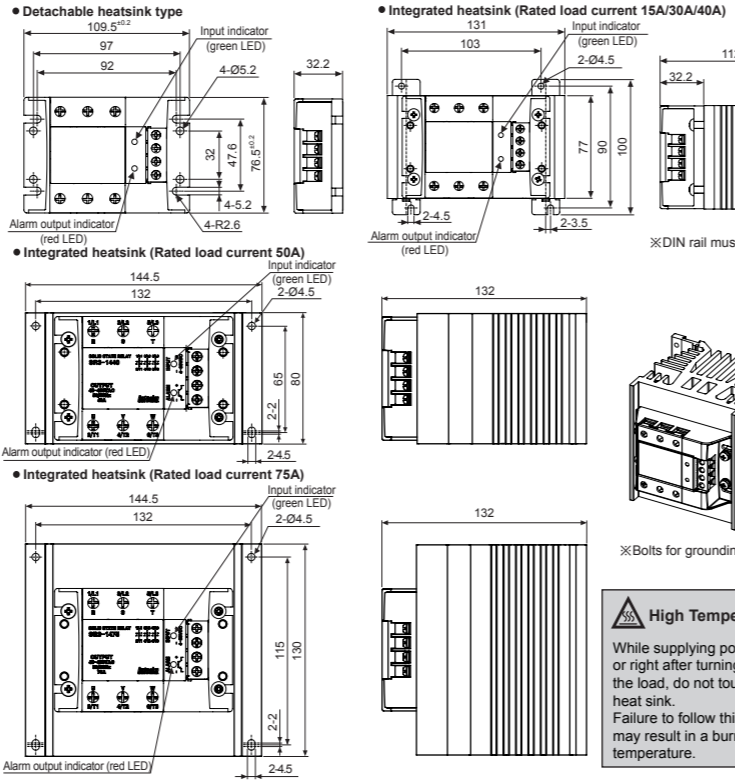
Rated input voltage range		24VACrms ~ (50/60Hz)	90-240VACrms ~ (50/60Hz)
Load voltage	Max. 30VDC=	Max. 30VDC=	Max. 30VDC=
Load current	Max. 100mA	Max. 50mA	Max. 50mA
Turn-off time	Max. 20ms	Max. 40ms	Max. 40ms

General specifications

Dielectric strength (Vrms)	• 24-240VAC ~ rated load current 15A/30A : 2500VAC 50/60Hz 1 min (input-output, input/output-case) • 24-240VAC ~ rated load current 50A/75A, 48-480VAC ~ rated load current 15A/30A/40A/50A/75A : 4000VAC 50/60Hz 1 min (input-output, input/output-case)
Insulation resistance	Over 100MΩ (at 500VDC megger) (input-output, input/output-case)
Indicator	Input indicator: Green LED, alarm output indicator: Red LED
Vibration	Mechanical: 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour Malfunction: 0.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min
Shock	Mechanical: 300m/s ² (approx. 30G) in each X, Y, Z direction for 3 times Malfunction: 100m/s ² (approx. 30G) in each X, Y, Z direction for 3 times
Environment	Ambient temp.: -30 to 80°C (in case of the rated input voltage 90-240VAC ~: -30 to 70°C), storage: -30 to 100°C (The rated load current capacity is different depending on ambient temperature. Refer to 'SSR Derating Curve'.) Ambient humi.: 45 to 85%RH, storage: 45 to 85%RH
Input terminal connection, alarm output terminal connection	Min. 1×0.5mm ² (1×AWG20), max. 1×1.5mm ² (1×AWG16) or 2×1.5mm ² (2×AWG16)
Output terminal connection	Min. 1×1.5mm ² (1×AWG16), max. 1×16mm ² (1×AWG6) or 2×6mm ² (2×AWG10) ※Use wires compliant with load current capacity to connect to the terminal.
Input terminal fixed torque	0.75 to 0.95N·m
Output terminal fixed torque	1.6 to 2.2N·m
Approval	CE, UL
Weight ^{※1}	• Detachable heatsink type: Approx. 365g (approx. 275g) • Integrated heatsink type - Rated load current 15A/30A/40A: Approx. 896g (approx. 686g) - Rated load current 50A: Approx. 1508g (approx. 1268g) - Rated load current 75A: Approx. 2354g (approx. 2064g)

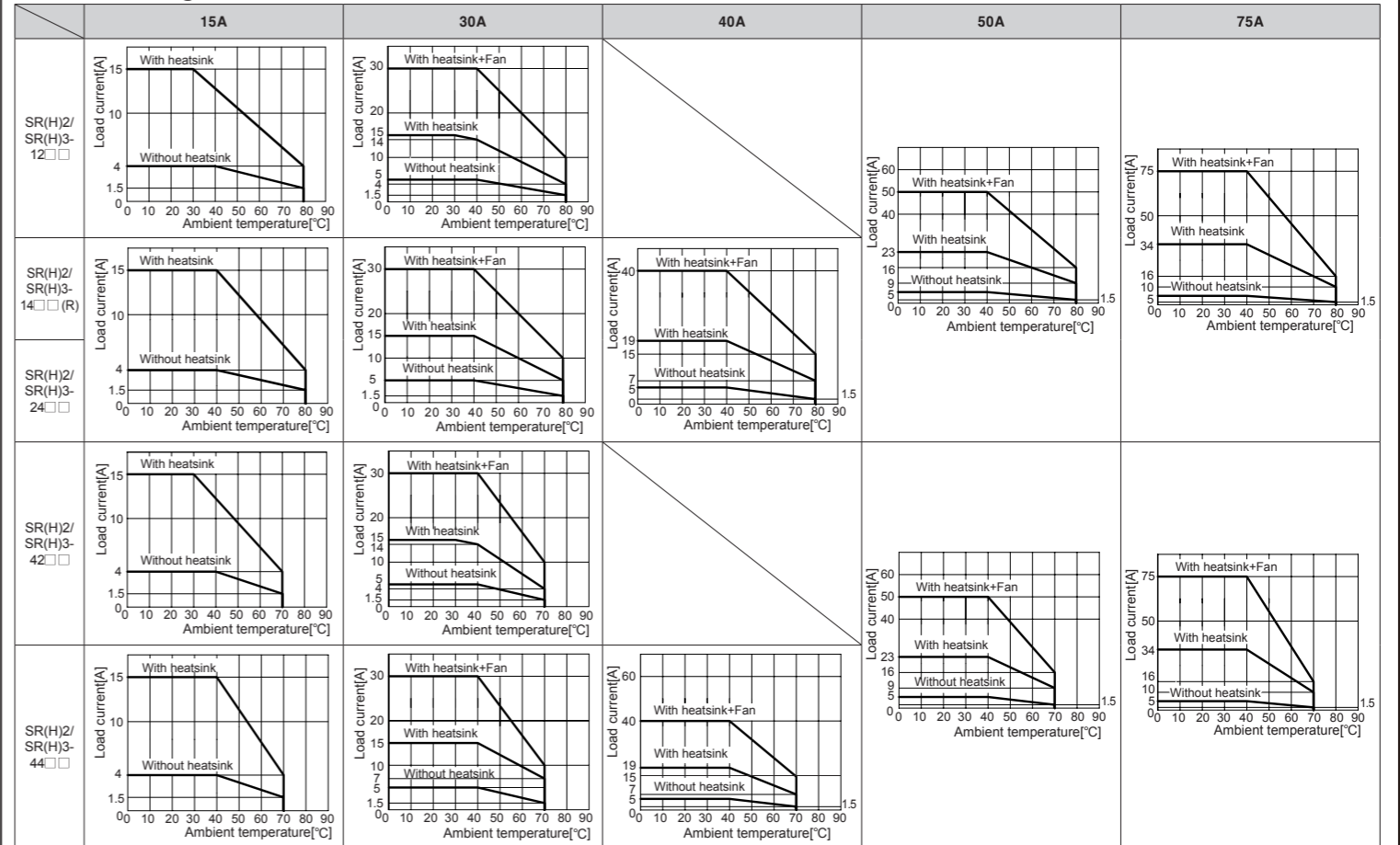
※1: The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.
※For wiring the terminal, round terminal must be used.

Dimensions



High Temperature Caution
While supplying power to the load or right after turning off the power of the load, do not touch the body and heat sink.
Failure to follow this instruction may result in a burn due to the high temperature.

SSR Derating Curve

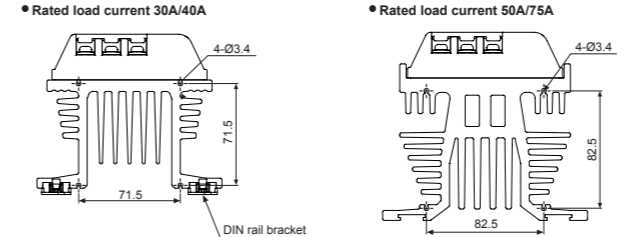


Specifications of cooling fan

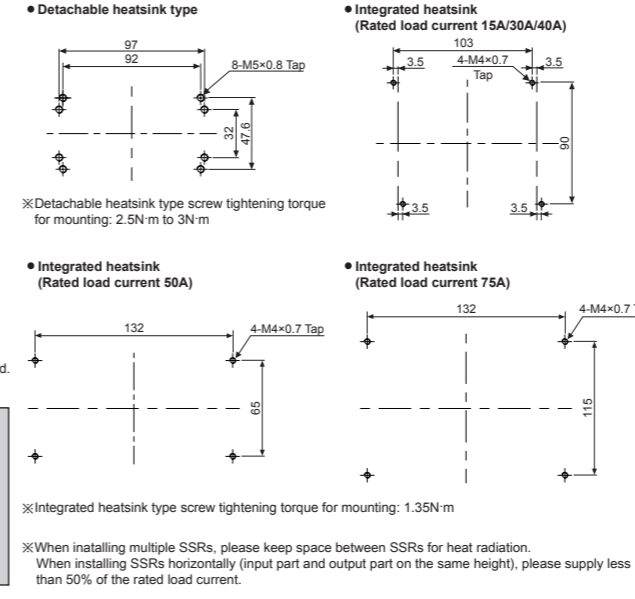
Load capacity	Cooling fan type	Size (mm)	Rated air flow ^{※1} m ³ /min	CFM
30A/40A	AC Fan	80×80	0.68	24.0
	DC Fan	80×80	1.25	44.0
50A/75A	AC Fan	92×92	1.13	40.0
	DC Fan	92×92	1.80	63.5

※The heatsink of the curves is dedicated for the SRH2/SRH3.
※Install SR2/SR3 Series on the metal plate (min. 130mm×120mm).
⚠ Since effectiveness of the heat radiation is decreased when multiple SSRs are installed closely, please supply less than 50% of the rated load current.
※Above SSR derating curves obtained approval from the UL certification authority.
※1: The cooling fan should be over the rated air flow value.
※Autonics does not provide or sell a cooling fan. (Please buy a cooling fan separately.)

Cooling fan mounting hole



Panel cut-out



Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 4-30VDC, 24VAC signal input should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Attach a heat sink or install the unit in the well ventilated place.
When attaching the heat sink, use the heat sink grease.
※Heat sink grease: GE TOSHIBA(YG6111), KANTO-KASEI(FLOIL G-600), SHINETSU(G746)
- Ground to the heat sink, panel, or DIN rail.
Failure to follow this instruction may result in electric shock.
- While supplying power to the load or right after turning off the power of the load, do not touch the body and heat sink.
Failure to follow this instruction may result in a burn due to the high temperature.
- In order to protect the product from the short-circuit current of the load, use rapid fuse of which I_t is under the 1/2 of SSR I_t. When short-circuited, replace the fuse to those of same specification with the used rapid fuse.
- Install dummy resistance in parallel with the load, to keep the sum of current flowing in the load and dummy resistance being over SSR minimum load current.
- When using random turn-on model for phase control, install noise filter between the load and the power of the load.
- Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000m
 - Pollution degree 2
 - Installation category III

Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, Co., Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate) Meters
- Display Units
- Sensor Controllers

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