

Autonics

Solid State Relay
SR1 SERIES



INSTRUCTION MANUAL

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.

▲ Safety considerations are categorized as follows.

⚠ 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.

※ The symbols used on the product and instruction manual represent the following.

▲ symbol represents caution due to special circumstances in which hazards may occur.

⚠ 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 personal injury, fire, or economic loss.
- The unit must be installed on a device panel before use.**
Failure to follow this instruction may result in electric shock.
- Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in electric shock.
- Do not disassemble or modify the unit. Please contact us if necessary.**
Failure to follow this instruction may result in fire, or electric shock.

⚠ Caution

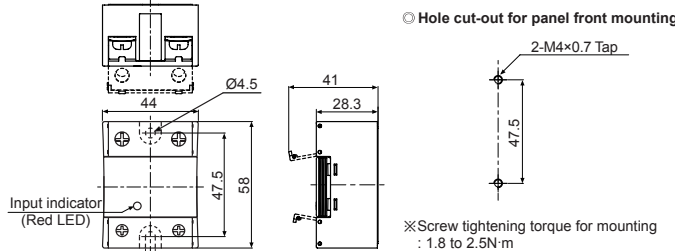
- Do not use the unit outdoors.**
Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
- Use the unit within the rated specifications.**
Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**
Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.**
Failure to follow this instruction may result in fire or explosion.
- Keep dust and wire residue from flowing into the unit.**
Failure to follow this instruction may result in fire or malfunction.
- Do not touch SSR output terminals right after power switch turns OFF.**
Failure to follow this instruction may result in electric shock due to electric charge of snubber circuit.

■ Ordering Information

SR	1	-	1	4	25	R	Function	No mark	Zero cross turn-on		
							R	15	Random turn-on		
							Rated input current (resistive load)	15	15A	50	50A
								25	25A	75	75A
							Rated load voltage	40	40A		
							Rated input voltage	2	24-240VAC		
								4	48-480VAC		
							Rated input voltage	1	4-30VDC		
								4	90-240VAC		
							Control phase	1	Single-phase		
							Item	SR	Solid State Relay (detachable heatsink type)		

■ Dimensions

(unit: mm)



※ The above specifications are subject to change and some models may be discontinued without notice.

■ Specifications

○ Input

Rated input voltage range	4-30VDC	90-240VACrms (50/60Hz)
Allowable input voltage range	4-32VDC	85-264VACrms (50/60Hz)
Max. input current	9mA (Zero cross turn-on), 13mA (Random turn-on)	7mA (240VACrms)
Pick-up voltage	Min. 4VDC	Min. 85VACrms
Drop-out voltage	Max. 1VDC	Max. 10VACrms
Turn-on time	Zero cross turn-on: Max. 0.5 cycle of load source + 1ms Random turn-on: Max. 1ms	Max. 1.5 cycle of load source + 1ms
Turn-off time	Max. 0.5 cycle of load source + 1ms	Max. 1.5 cycle of load source + 1ms

○ Output

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 current (AC-5) ^{※1}	15Arms 25Arms 40Arms 50Arms 75Arms	15Arms 25Arms 40Arms 50Arms 75Arms
Min. load current	0.15Arms 0.2Arms 0.5Arms	0.5Arms
Max. 1 cycle surge current (60Hz)	190A 270A 330A 1000A	300A 500A 1000A
Max. non-repetitive surge current (I _t , t=8.3ms)	150A ² s 300A ² s 500A 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 (T _a =25°C)	Max. 10mA (240VAC/60Hz)	Max. 10mA (480VAC/60Hz)
Output on voltage drop [V _{pk}] (Max. load current)	Max. 1.6V	
Static off state dv/dt	500V/μs	

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

○ General specifications

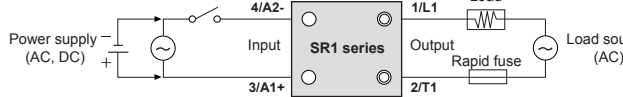
Dielectric strength (Vrms)	4000VAC 50/60Hz 1 min (Input-Output, Input/Output-Case)
Insulation resistance	Over 100MΩ (at 500VDC megger) (Input-Output, Input/Output-Case)
Indicator	Input indicator: Green LED
Vibration	Mechanical: 0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction 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 temperature: -30 to 80°C (in case of the rated input voltage 90-240VAC; -20 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 humidity: 45 to 85%RH, storage: 45 to 85%RH
Input 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)
Input terminal fixed torque	0.75 to 0.95N·m
Output terminal fixed torque	1.6 to 2.2N·m
Approval	CE, C, US
Weight ^{※1}	Approx. 111g (approx. 73g)

※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, an O-ring terminal must be used.

■ Connections



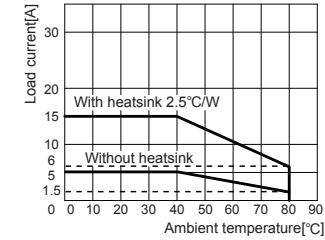
■ Cautions During Use

- Attach a heatsink and ventilate for smooth convection current. If not, congested heat transfer may cause product failure or malfunction.
- For mounting multiple SSR, please keep certain installation intervals for heat prevention. For horizontal installation (when the heights of input part and output part are equal), it is recommended to apply less than 50% of the rated load current.
- Make sure do not touch the heatsink or the unit body while power is supplied or right after load power is turned OFF. If not, it may cause a burn.
- Connect the proper cable for the rated load current with output terminal.
- Use rapid fuse of which I_t is under 1/2 of SSR I_t in order to protect the unit from load's short-circuit current. In case of a short-circuit please replace the fuse which has same specification.
- In case that load's current is lower than SSR min. load current, connect dummy resistance to the load in parallel so as to make load's current higher than SSR min. load current.
- When selecting phase control with random turn-on model, install the noise filter between load and load's source.
- Make sure that the screw on output terminal is tightly fastened. Using the unit with loose bolt may cause product failure or malfunction.
- Do not touch the load's terminal even if output is OFF. It may cause electric shock.
- The signal input of the 4-30VDC model should be supplied by the insulated and limited voltage/current or by Class 2 power supply.
- To attach the heatsink, use Thermal Grease as below or that of equal specification.
 - ① Thermal Grease: GE TOSHIBA (YG6111), KANTO-KASEI (FLOIL G-600), SHINETSU (G746)
- Avoid following environments to install this unit.
 - ① Where temperature/humidity is over the rated specifications
 - ② Where due condensation occurs due to temperature change
 - ③ Where inflammable or corrosive gas exists
 - ④ Where direct rays of light exists
 - ⑤ Where several shock, vibration or dust exists
 - ⑥ Where near facilities generating strong magnetic forces or electric noise
- This product may be used in the following environments.
 - ① Indoors
 - ② Max. altitude: 2,000m
 - ③ Pollution degree 2
 - ④ Installation category III

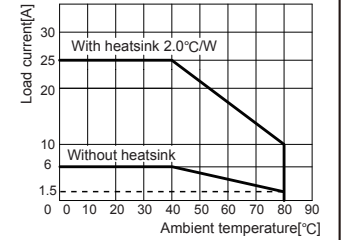
※ Failure to follow these instructions may result in product damage.

■ SSR Derating Curve

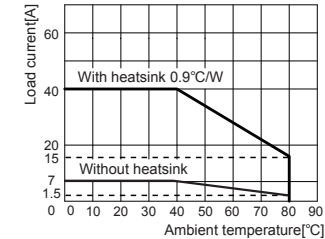
○ SR1-1215/4215



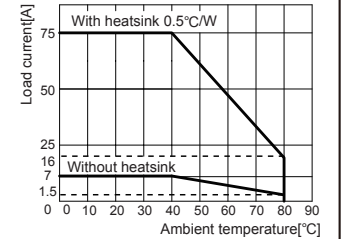
○ SR1-1225/4225



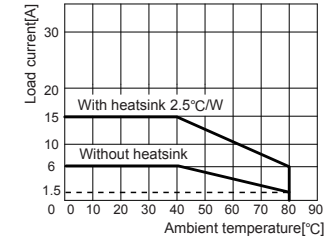
○ SR1-1240/4240



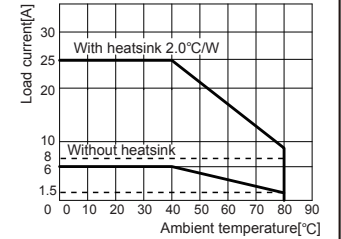
○ SR1-1275/1475/1475R/4275/4475



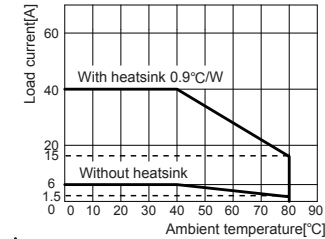
○ SR1-1415/1415R/4415



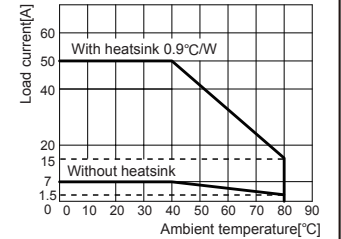
○ SR1-1425/1425R/4425



○ SR1-1440/1440R/4440



○ SR1-1250/1450/1450R/4250/4450



△ Please supply less than 50% of the rated load current when installing several SSRs closely due to decreasing effectiveness of protection against heat.

■ 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
- Timers
- Panel Meters
- Tachometers/Pulse (Rate) Meters
- Sensor Controllers
- Display Units

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