

# Autonics Single-Phase, Integrated Heatsink Type SSR [Voltage Input Type] SRH1 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.  
※ 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.

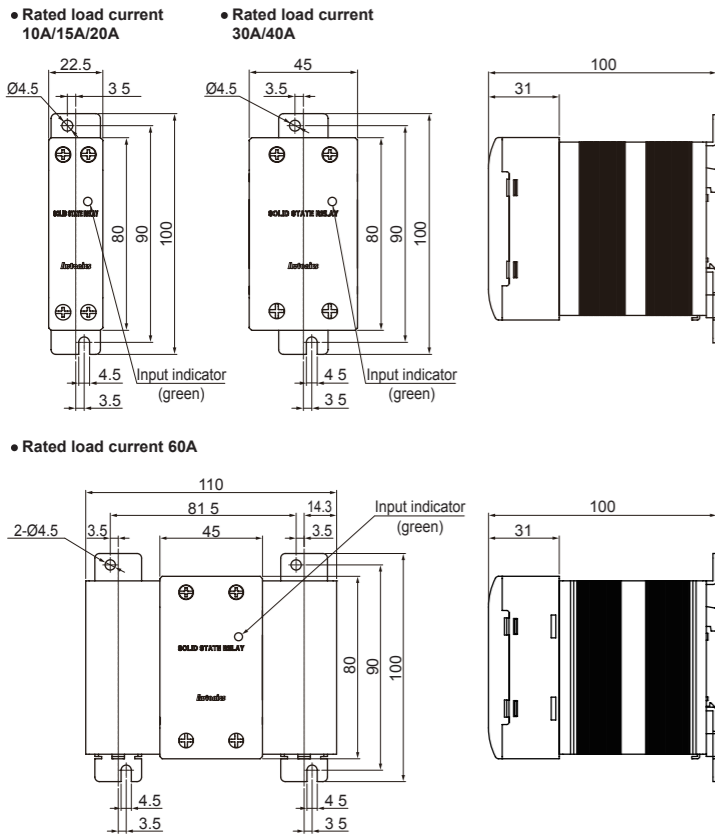
### ⚠Warning

- 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.

## ■ Dimensions

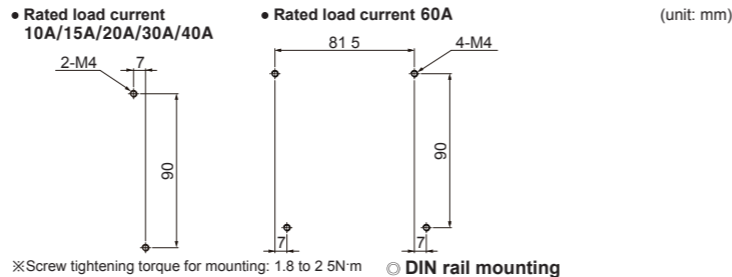


※The above specifications are subject to change and some models may be discontinued without notice.  
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

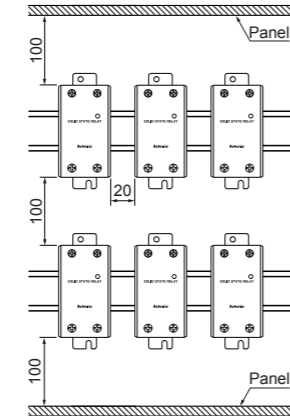
## ■ Model

Model	Rated input voltage	Rated load current	Rated load voltage	Function						
SRH1-1210-N	4-30VDC	10A	24-240VAC	Zero cross turn-on						
SRH1-2210-N	24VAC									
SRH1-4210-N	90-240VAC									
SRH1-1215-N	4-30VDC	15A								
SRH1-2215-N	24VAC									
SRH1-4215-N	90-240VAC									
SRH1-1220-N	4-30VDC	20A								
SRH1-2220-N	24VAC									
SRH1-4220-N	90-240VAC									
SRH1-1230-N	4-30VDC	30A								
SRH1-2230-N	24VAC									
SRH1-4230-N	90-240VAC									
SRH1-1240-N	4-30VDC	40A								
SRH1-2240-N	24VAC									
SRH1-4240-N	90-240VAC									
SRH1-1260-N	4-30VDC	60A	48-480VAC	Zero cross turn-on						
SRH1-2260-N	24VAC									
SRH1-4260-N	90-240VAC									
SRH1-1410-N	4-30VDC	10A			48-480VAC	Zero cross turn-on				
SRH1-1410R-N	4-30VDC									
SRH1-2410-N	24VAC									
SRH1-1415-N	4-30VDC	15A					48-480VAC	Zero cross turn-on		
SRH1-1415R-N	4-30VDC									
SRH1-2415-N	24VAC									
SRH1-1420-N	4-30VDC	20A							48-480VAC	Zero cross turn-on
SRH1-1420R-N	4-30VDC									
SRH1-2420-N	24VAC									
SRH1-1430-N	4-30VDC	30A	48-480VAC	Zero cross turn-on						
SRH1-1430R-N	4-30VDC									
SRH1-2430-N	24VAC									
SRH1-1440-N	4-30VDC	40A			48-480VAC	Zero cross turn-on				
SRH1-1440R-N	4-30VDC									
SRH1-2440-N	24VAC									
SRH1-1460-N	4-30VDC	60A					48-480VAC	Zero cross turn-on		
SRH1-1460R-N	4-30VDC									
SRH1-2460-N	24VAC									

### ○ Panel cut-out

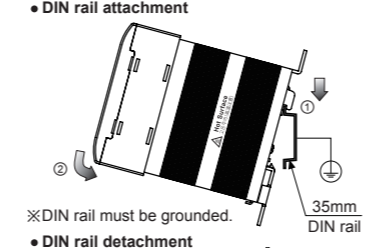


### ○ Spacing

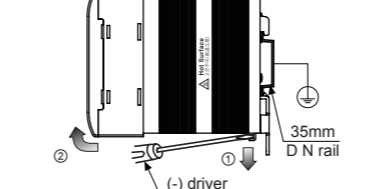


※When installing multiple SSRs, please keep space between SSRs for heat radiation.  
When installing SSRs horizontally (input part and output part on the same height), please supply less than 50% of the rated load current.

### ● DIN rail mounting



### ● DIN rail detachment



### ⚠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.

## ■ Specifications

### ○ Input

Rated input voltage range	4-30VDC	24VACrms~ (50/60Hz)	90-240VACrms~ (50/60Hz)
Allowable input voltage range	4-32VDC	19-30VACrms~ (50/60Hz)	85-264VACrms~ (50/60Hz)
Max. input current	18mA	15mA (24VACrms~)	18mA (240VACrms~)
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. 2 cycle of load source + 1ms
	Random turn-on	Max. 1ms	—
Turn-off time	Zero cross turn-on	Max. 0.5 cycle of load source + 1ms	Max. 2 cycle of load source + 1ms
	Random turn-on	—	—

### ○ Output

Rated load voltage range	24-240VACrms~ (50/60Hz)						
Allowable load voltage range	24-264VACrms~ (50/60Hz)						
Rated load current	Resistive load (AC-51) <sup>※1</sup>	10Arms	15Arms	20Arms	30Arms	40Arms	60Arms
	Min. load current	0.15Arms	0.15Arms	0.2Arms	0.5Arms	0.5Arms	0.5Arms
Max. 1 cycle surge current (60Hz)		160A	160A	250A	400A	500A	1000A
	Max. non-repetitive surge current (t <sub>r</sub> = 8.3ms)	130A <sup>2</sup> s	130A <sup>2</sup> s	300A <sup>2</sup> s	910A <sup>2</sup> s	1000A <sup>2</sup> s	4000A <sup>2</sup> s
Peak voltage (non-repetitive)		600V					
Leakage current (Ta=25°C)		Max. 10mA (240VAC~60Hz)					
Output on voltage drop [Vpk] (max. load current)		Max. 1.6V					
Static off state dv/dt		500V/μs					
Rated load voltage range	48-480VACrms~ (50/60Hz)						
Allowable load voltage range	48-528VACrms~ (50/60Hz)						
Rated load current	Resistive load (AC-51) <sup>※1</sup>	10Arms	15Arms	20Arms	30Arms	40Arms	60Arms
	Min. load current	0.5Arms	0.5Arms	0.5Arms	0.5Arms	0.5Arms	0.5Arms
Max. 1 cycle surge current (60Hz)		300A	300A	300A	500A	500A	1000A
	Max. non-repetitive surge current (t <sub>r</sub> = 8.3ms)	350A <sup>2</sup> s	350A <sup>2</sup> s	350A <sup>2</sup> s	1000A <sup>2</sup> s	1000A <sup>2</sup> s	4000A <sup>2</sup> s
Peak voltage (non-repetitive)		1200V (Zero cross turn-on), 1000V (Random turn-on)					
Leakage current (Ta=25°C)		Max. 10mA (480VAC~60Hz)					
Output on voltage drop [Vpk] (max. load current)		Max. 1.6V					
Static off state dv/dt		500V/μs					

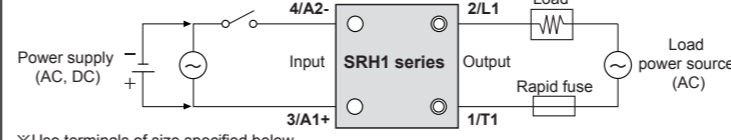
※1: AC-51 is utilization category at IEC60947-4-3.

### ○ General specifications

Dielectric strength (Vrms)	2500VAC 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 <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times
	Malfunction	100m/s <sup>2</sup> (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 <sup>2</sup> (1×AWG20), Max. 1×1.5mm <sup>2</sup> (1×AWG16) or 2×1.5mm <sup>2</sup> (2×AWG16)
	Output terminal connection	• Rated load current 10A/15A/20A: Min. 1×0.75mm <sup>2</sup> (1×AWG18), max. 1×4mm <sup>2</sup> (1×AWG12) or 2×2.5mm <sup>2</sup> (2×AWG14) • Rated load current 30A/40A/60A: Min. 1×1.5mm <sup>2</sup> (1×AWG16), max. 1×16mm <sup>2</sup> (1×AWG6) or 2×6mm <sup>2</sup> (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	• Rated load current 10A/15A/20A: 1.0 to 1.35N m • Rated load current 30A/40A/60A: 1.6 to 2.2N m	
Approval	CE, UL, etc.	
Weight <sup>※1</sup>		• Rated load current 10A/15A/20A: approx. 298g (approx. 225g)
		• Rated load current 30A/40A/60A: approx. 500g (approx. 410g)
		• Rated load current 60A: approx. 770g (approx. 680g)

※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.

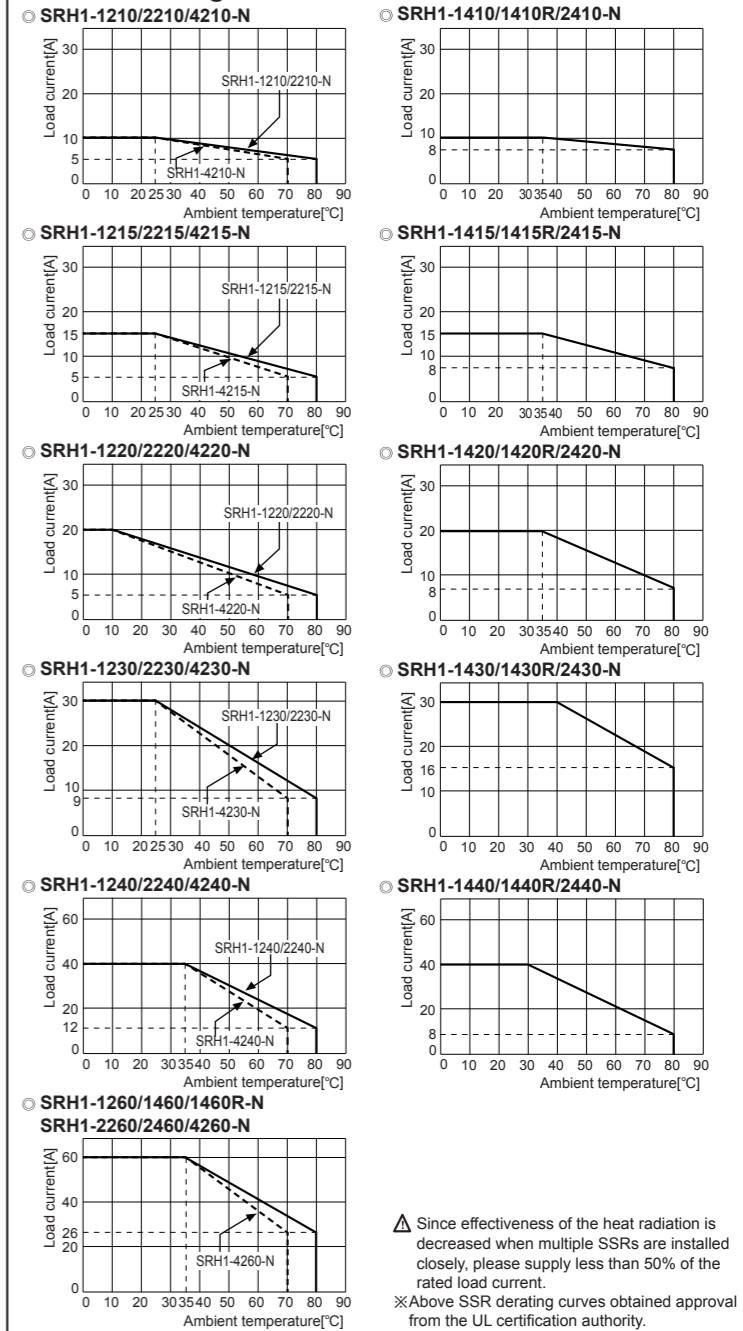
## ■ Connections



※Use terminals of size specified below.

Terminal type	Input	Output
Rated load current	10A, 15A, 20A, 30A, 40A, 60A	10A, 15A, 20A, 30A, 40A, 60A
	a Min. 3.5mm	Min. 4.0mm
	b Max. 7.0mm	Max. 9.0mm
		Max. 12.0mm

## ■ SSR Derating Curve



⚠ 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.

## ■ 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.
- Install the unit in the well ventilated place.
- 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<sup>2</sup>t is under the 1/2 of SSR I<sup>2</sup>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