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

1. **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.
2. **Install on a device panel or DIN rail to use.**
   Failure to follow this instruction may result in electric shock or fire.
3. **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.
4. **Check 'Connections' before wiring.**
   Failure to follow this instruction may result in fire.
5. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in electric shock or fire.

⚠Caution

1. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **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.
3. **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.
4. **Keep metal chip, dust, and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.
5. **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.

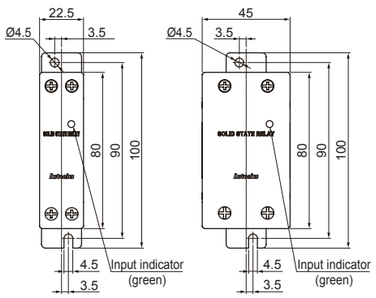
■ Model

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		
SRH1-2260-N	24VAC			
SRH1-4260-N	90-240VAC			
SRH1-1410-N	4-30VDC	10A	48-480VAC	Zero cross turn-on
SRH1-1410R-N				Random turn-on
SRH1-2410-N	24VAC			Zero cross turn-on
SRH1-1415-N	4-30VDC	15A		Zero cross turn-on
SRH1-1415R-N				Random turn-on
SRH1-2415-N	24VAC			Zero cross turn-on
SRH1-1420-N	4-30VDC	20A		Zero cross turn-on
SRH1-1420R-N				Random turn-on
SRH1-2420-N	24VAC			Zero cross turn-on
SRH1-1430-N	4-30VDC	30A		Zero cross turn-on
SRH1-1430R-N				Random turn-on
SRH1-2430-N	24VAC			Zero cross turn-on
SRH1-1440-N	4-30VDC	40A		Zero cross turn-on
SRH1-1440R-N				Random turn-on
SRH1-2440-N	24VAC			Zero cross turn-on
SRH1-1460-N	4-30VDC	60A		Zero cross turn-on
SRH1-1460R-N				Random turn-on
SRH1-2460-N	24VAC			Zero cross turn-on

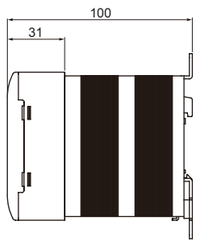
■ Dimensions

(unit: mm)

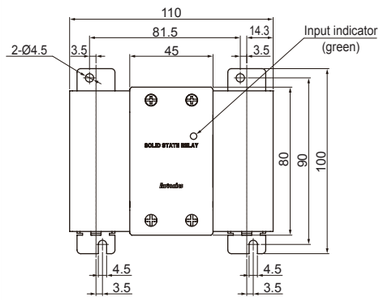
● **Rated load current 10A/15A/20A**

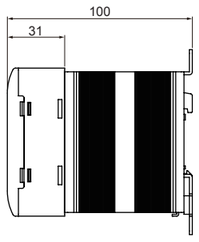


● **Rated load current 30A/40A**



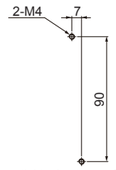
● **Rated load current 60A**



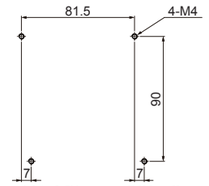


◎ Panel cut-out

● **Rated load current 10A/15A/20A/30A/40A**

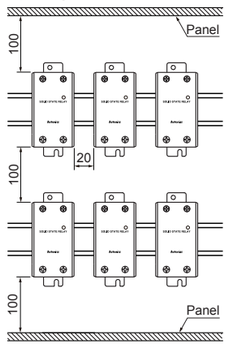


● **Rated load current 60A**



※Screw tightening torque for mounting: 1.8 to 2.5N·m

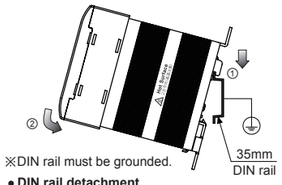
◎ Spacing



※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.

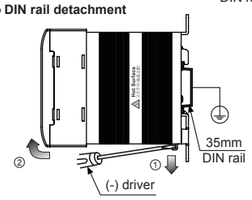
◎ DIN rail mounting

● **DIN rail attachment**



※DIN rail must be grounded.

● **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.

※**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

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	15mArms (24VACrms~)	18mArms (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	Max. 2 cycle of load source + 1ms
	Random turn-on	Max. 1ms	—	—
Turn-off time		Max. 0.5 cycle of load source + 1ms	Max. 2 cycle of load source + 1ms	Max. 2 cycle of load source + 1ms

◎ Output

Rated load voltage range		**24-240VACrms~ (50/60Hz)**					
Allowable load voltage range		24-264VACrms~ (50/60Hz)					
Rated load current	Resistive load (AC-51)※1	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 (I^2t, t=8.3ms)		130A^2s	130A^2s	300A^2s	910A^2s	1000A^2s	4000A^2s
Peak voltage (non-repetitive)		600V					
Leakage current (Ta=25℃)		Max. 10mArms (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)※1	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 (I^2t, t=8.3ms)		350A^2s	350A^2s	350A^2s	1000A^2s	1000A^2s	4000A^2s
Peak voltage (non-repetitive)		1200V (Zero cross turn-on), 1000V (Random turn-on)					
Leakage current (Ta=25℃)		Max. 10mArms (480VAC~/60Hz)					
Output on voltage drop [Vpk] (max. load current)		Max. 1.6V					
Static off state dv/dt		500V/μs					

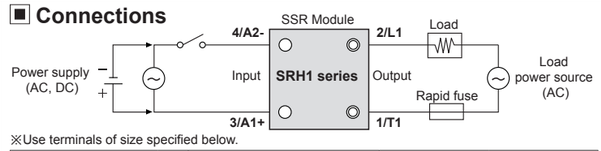
※1: AC-51 is utilization category at IEC60947-4-3.

◎ 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/s² (approx. 30G) in each X, Y, Z direction for 3 times
	Malfunction	100m/s² (approx. 30G) in each X, Y, Z direction for 3 times
Environment	Ambient temperature	-30 to 80℃ (in case of the rated input voltage 90-240VAC~: -20 to 70℃), storage: -30 to 100℃ (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. 1×0.5mm² (1×AWG20), Max. 1×1.5mm² (1×AWG16) or 2×1.5mm² (2×AWG16)
Output terminal connection		• Rated load current 10A/15A/20A : Min. 1×0.75mm² (1×AWG18), max. 1×4mm² (1×AWG12) or 2×2.5mm² (2×AWG14) • Rated load current 30A/40A/60A : Min. 1×1.5mm² (1×AWG16), max. 1×16mm² (1×AWG6) or 2×6mm² (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 cULus
Weight※1		• Rated load current 10A/15A/20A: approx. 298g (approx. 225g) • Rated load current 30A/40A: 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

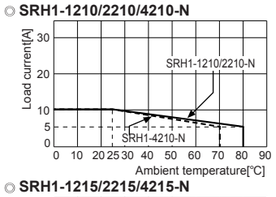


※Use terminals of size specified below.

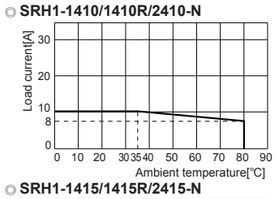
Terminal type		Input	Output	
Rated load current		10A, 15A, 20A, 30A, 40A, 60A	10A, 15A, 20A	30A, 40A, 60A
<Round>	a	Min. 3.5mm	Min. 4.0mm	Min. 5.0mm
	b	Max. 7.0mm	Max. 9.0mm	Max. 12.0mm

■ SSR Derating Curve

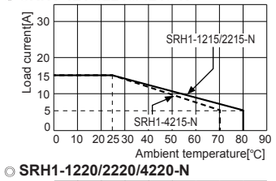
◎ **SRH1-1210/2210/4210-N**



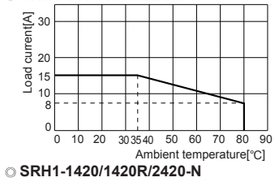
◎ **SRH1-1410/1410R/2410-N**



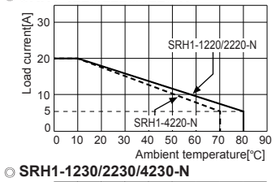
◎ **SRH1-1215/2215/4215-N**



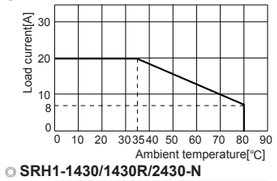
◎ **SRH1-1415/1415R/2415-N**



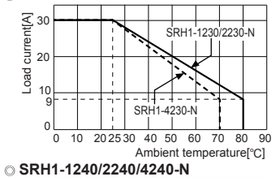
◎ **SRH1-1220/2220/4220-N**



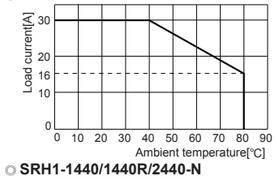
◎ **SRH1-1420/1420R/2420-N**



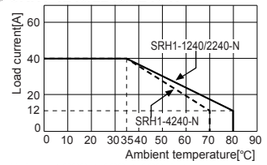
◎ **SRH1-1230/2230/4230-N**



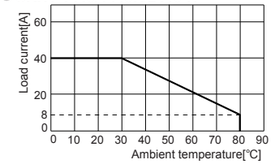
◎ **SRH1-1430/1430R/2430-N**



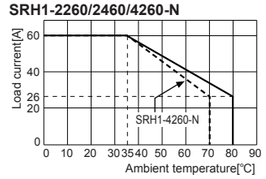
◎ **SRH1-1240/2240/4240-N**



◎ **SRH1-1440/1440R/2440-N**



◎ **SRH1-1260/1460/1460R-N**
SRH1-2260/2460/4260-N



⚠ 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

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. 4-30VDC, 24VAC signal input should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. Install the unit in the well ventilated place.
4. Ground to the heat sink, panel, or DIN rail. Failure to follow this instruction may result in electric shock.
5. 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.
6. In order to protect the product from the short-circuit current of the load, use rapid fuse of which I^2t is under the 1/2 of SSR I^2t. When short-circuited, replace the fuse to those of same specification with the used rapid fuse.
7. 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.
8. When using random turn-on model for phase control, install noise filter between the load and the power of the load.
9. Do not use near the equipment which generates strong magnetic force or high frequency noise.
10. This unit may be used in the following environments.
    ① Indoors (in the environment condition rated in 'Specifications')
    ② Altitude max. 2,000m ③ Pollution degree 2 ④ 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_2, 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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