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# Single-Phase, Integrated Heatsink Type SSR

## SRHL1 Series

### [Left-Right Terminal]

## Single-Phase, Integrated Heatsink Type SSR [Left-Right Terminal]

### ■ Features

- Zero cross turn-on, random turn-on models available
- Input indicator (green LED)
- Alarm function (overheat prevention)
  - Rated load current 10A/15A/20A/25A: alarm indicator (red LED)
  - Rated load current 40A: alarm indicator (red LED), alarm output
- DIN rail mount or panel mount installation

NEW



**⚠ Please read "Safety considerations" in operation manual before using.**

CE c **UL** US

### ■ Ordering Information

|     |   |   |   |   |   |    |  |                                      |
|-----|---|---|---|---|---|----|--|--------------------------------------|
| SRH | L | 1 | - | 1 | 4 | 40 |  |                                      |
|     |   |   |   |   |   |    |  | Function                             |
|     |   |   |   |   |   |    |  | No mark                              |
|     |   |   |   |   |   |    |  | R                                    |
|     |   |   |   |   |   |    |  | Rated input current (resistive load) |
|     |   |   |   |   |   |    |  | 10                                   |
|     |   |   |   |   |   |    |  | 15                                   |
|     |   |   |   |   |   |    |  | 20                                   |
|     |   |   |   |   |   |    |  | 25                                   |
|     |   |   |   |   |   |    |  | 40                                   |
|     |   |   |   |   |   |    |  | Rated load voltage                   |
|     |   |   |   |   |   |    |  | 2                                    |
|     |   |   |   |   |   |    |  | 4                                    |
|     |   |   |   |   |   |    |  | Rated input voltage                  |
|     |   |   |   |   |   |    |  | 1                                    |
|     |   |   |   |   |   |    |  | 4                                    |
|     |   |   |   |   |   |    |  | Control phase                        |
|     |   |   |   |   |   |    |  | 1                                    |
|     |   |   |   |   |   |    |  | Input/output terminal                |
|     |   |   |   |   |   |    |  | L                                    |
|     |   |   |   |   |   |    |  | Item                                 |
|     |   |   |   |   |   |    |  | SRH                                  |

| Model        | Rated input voltage | Rated load current | Rated load voltage | Function                             | Alarm (overheat prevention)   |
|--------------|---------------------|--------------------|--------------------|--------------------------------------|-------------------------------|
| SRHL 1-1210  | 10-30VDC            | 10A                | 24-240VAC          | Zero cross turn-on                   | Alarm indicator               |
| SRHL 1-4210  | 90-240VAC           | 15A                |                    |                                      | Alarm indicator               |
| SRHL 1-1215  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4215  | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1220  | 10-30VDC            | 20A                |                    |                                      | Alarm indicator               |
| SRHL 1-4220  | 90-240VAC           | 25A                |                    |                                      | Alarm indicator               |
| SRHL 1-1225  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4225  | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1240  | 10-30VDC            | 40A                | 48-480VAC          | Zero cross turn-on<br>Random turn-on | Alarm indicator +Alarm output |
| SRHL 1-4240  | 90-240VAC           | 10A                |                    |                                      | Alarm indicator               |
| SRHL 1-1410  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1410R | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4410  | 90-240VAC           | 15A                |                    |                                      | Alarm indicator               |
| SRHL 1-1415  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1415R | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4415  | 90-240VAC           | 20A                |                    |                                      | Alarm indicator               |
| SRHL 1-1420  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1420R | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4420  | 90-240VAC           | 25A                |                    |                                      | Alarm indicator               |
| SRHL 1-1425  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1425R | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4425  | 90-240VAC           | 40A                |                    |                                      | Alarm indicator +Alarm output |
| SRHL 1-1440  | 10-30VDC            |                    |                    |                                      | Alarm indicator               |
| SRHL 1-1440R | 90-240VAC           |                    |                    |                                      | Alarm indicator               |
| SRHL 1-4440  | 90-240VAC           |                    | Alarm indicator    |                                      |                               |

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets

(H) Temperature Controllers

(I) SSRs / Power Controllers

(J) Counters

(K) Timers

(L) Panel Meters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors & Drivers & Controllers

(R) Graphic/ Logic Panels

(S) Field Network Devices

(T) Software

# SRHL1 Series

## ■ Specifications

### ○ Input

|                               |                                      |                                                 |
|-------------------------------|--------------------------------------|-------------------------------------------------|
| Rated input voltage range     | 10-30VDC==                           | 90-240VACrms~ (50/60Hz)                         |
| Allowable input voltage range | 9-32VDC==                            | 85-264VACrms~ (50/60Hz)                         |
| Max. input current            | 15mA                                 | 22mA                                            |
| Pick-up voltage               | Min. 9VDC==                          | Min. 85VACrms~                                  |
| Drop-out voltage              | Max. 1VDC==                          | Max. 10VACrms~                                  |
| Turn-ON time                  | Zero cross turn-on<br>Random turn-on | Max. 0.5 cycle of load source + 1ms<br>Max. 1ms |
| Turn-off time                 | Max. 0.5 cycle of load source + 1ms  | Max. 2 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                                           | Resistive load current (AC-51)*1 | 10Arms                      | 15Arms              | 20Arms              | 25Arms              | 40Arms              | 10Arms                                             | 15Arms              | 20Arms               | 25Arms               | 40Arms               |
| Min. load current                                            |                                  | 0.15Arms                    | 0.15Arms            | 0.2Arms             | 0.2Arms             | 0.5Arms             | 0.5Arms                                            | 0.5Arms             | 0.5Arms              | 0.5Arms              | 0.5Arms              |
| Max. 1 cycle surge current (60Hz)                            |                                  | 160A                        | 160A                | 250A                | 250A                | 400A                | 300A                                               | 300A                | 500A                 | 500A                 | 500A                 |
| Max. non-repetitive surge current (I <sub>t</sub> , t=8.3ms) |                                  | 130A <sup>2</sup> s         | 130A <sup>2</sup> s | 300A <sup>2</sup> s | 300A <sup>2</sup> s | 910A <sup>2</sup> s | 350A <sup>2</sup> s                                | 350A <sup>2</sup> s | 1000A <sup>2</sup> s | 1000A <sup>2</sup> s | 1000A <sup>2</sup> 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 IEC 60947-4-3.

### ○ Alarm output (overheat prevention)

|                           |              |                         |
|---------------------------|--------------|-------------------------|
| Rated input voltage range | 10-30VDC==   | 90-240VACrms~ (50/60Hz) |
| Load voltage              | Max. 30VDC== | Max. 30VDC==            |
| Load current              | Max. 50mA    | Max. 50mA               |
| Turn-off time             | Max. 50ms    | Max. 100ms              |

※ Overheat prevention function: When SSR internal temperature is overheated, the load output is cut off to prevent internal device damage. The alarm indicator turns ON and alarm output turns ON.

※ Alarm output is only for the rated load current 40A model (SRHL1-□□□40□). In case of the rated load current 10A/15A/20A/25A models (SRHL1-□□□10□□□15□□□20□□□25□), the alarm indicator turns ON, regardless of alarm output.

※ To clear alarm, cut OFF the input signal during over alarm output return time at the rated ambient temperature.

### ○ General specifications

|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                         |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dielectric strength (Vrms)                                  | <ul style="list-style-type: none"> <li>Input-output: 2500VAC 50/60Hz for 1 min</li> <li>Input/output-case: 4000VAC 50/60Hz for 1 min</li> </ul>                                                                                                                                                                                                                                                                         |                                                                                                                                                         |
| Insulation resistance                                       | Over 100MΩ (at 500VDC megger) (input-output, input/output-case)                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                         |
| Indicator                                                   | Input indicator: green LED, alarm 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 <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 70°C, storage: -30 to 100°C<br>(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, alarm output terminal connection | Min. 1×0.5mm <sup>2</sup> (1×AWG20), max. 1×4mm <sup>2</sup> (1×AWG12) or 2×1.5mm <sup>2</sup> (2×AWG16)                                                                                                                                                                                                                                                                                                                |                                                                                                                                                         |
| Output terminal connection                                  | <ul style="list-style-type: none"> <li>Rated load current 10A/15A/20A/25A: min. 1×0.75mm<sup>2</sup> (1×AWG18), max. 1×6mm<sup>2</sup> (1×AWG10) or 2×2.5mm<sup>2</sup> (2×AWG14)</li> <li>Rated load current 40A: 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)</li> <li>※ Use wires compliant with load current capacity to connect to the terminal.</li> </ul> |                                                                                                                                                         |
| Input terminal fixed torque                                 | 0.75 to 0.95N·m                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                         |
| Output terminal fixed torque                                | <ul style="list-style-type: none"> <li>Rated load current 10A/15A/20A/25A: 1.0 to 1.35N·m</li> <li>Rated load current 40A: 1.6 to 2.2N·m</li> </ul>                                                                                                                                                                                                                                                                     |                                                                                                                                                         |
| Approval                                                    | CE                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
| Weight*1                                                    | <ul style="list-style-type: none"> <li>Rated load current 10A/15A/20A/25A: approx. 270g (approx. 192g)</li> <li>Rated load current 40A: approx. 468g (approx. 372g)</li> </ul>                                                                                                                                                                                                                                          |                                                                                                                                                         |

\*1: The weight includes packaging. The weight in parenthesis is for unit only.

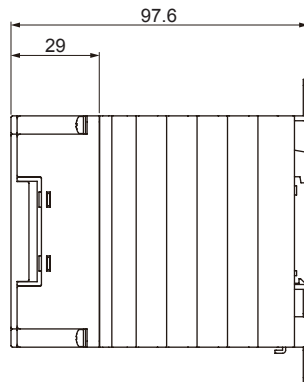
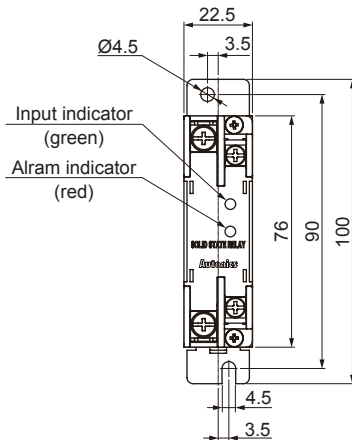
※ Environment resistance is rated at no freezing or condensation.

※ For wiring the terminal, round terminal must be used.

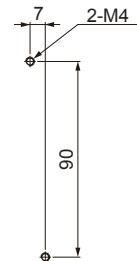
# Single-Phase, Integrated Heatsink Type SSR [Left-Right Terminal]

## ■ Dimensions

### ● Rated load current 10A/15A/20A/25A



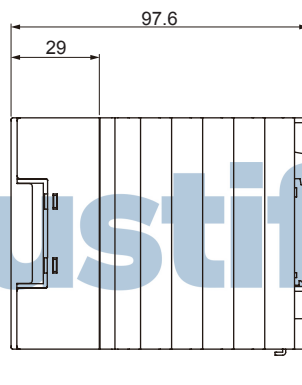
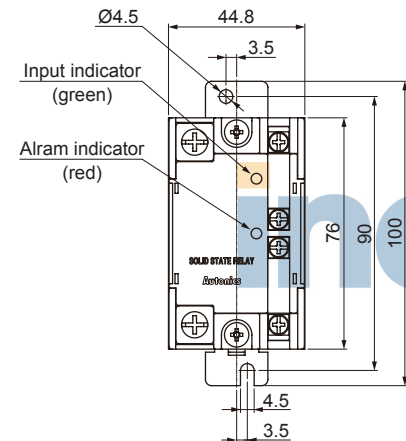
### ○ Panel cut-out



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

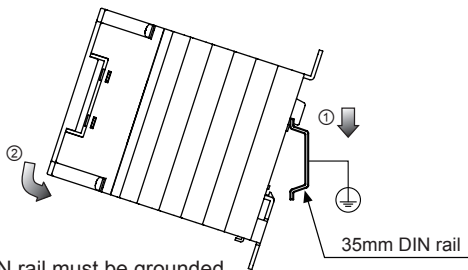
(unit: mm)

### ● Rated load current 40A



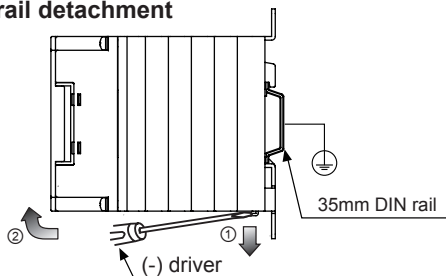
### ○ DIN rail mounting

#### ● DIN rail attachment

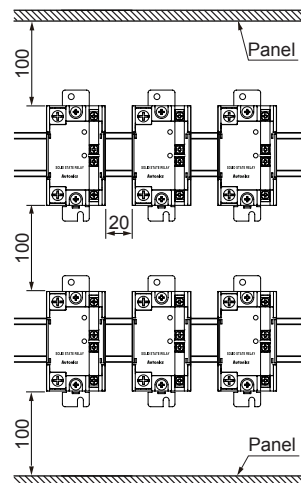


※DIN rail must be grounded.

#### ● DIN rail detachment



### ○ 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.



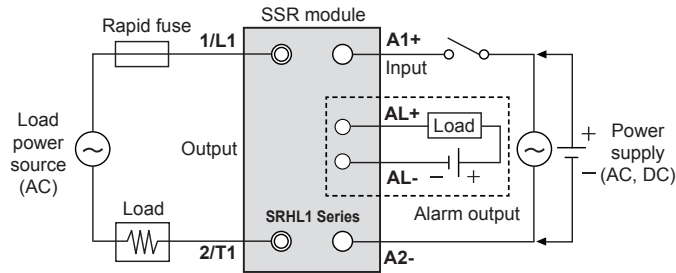
#### High temperature caution

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.

|     |                                                                 |
|-----|-----------------------------------------------------------------|
| (A) | Photoelectric Sensors                                           |
| (B) | Fiber Optic Sensors                                             |
| (C) | Door/Area Sensors                                               |
| (D) | Proximity Sensors                                               |
| (E) | Pressure Sensors                                                |
| (F) | Rotary Encoders                                                 |
| (G) | Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets |
| (H) | Temperature Controllers                                         |
| (I) | SSRs / Power Controllers                                        |
| (J) | Counters                                                        |
| (K) | Timers                                                          |
| (L) | Panel Meters                                                    |
| (M) | Tacho / Speed / Pulse Meters                                    |
| (N) | Display Units                                                   |
| (O) | Sensor Controllers                                              |
| (P) | Switching Mode Power Supplies                                   |
| (Q) | Stepper Motors & Drivers & Controllers                          |
| (R) | Graphic/ Logic Panels                                           |
| (S) | Field Network Devices                                           |
| (T) | Software                                                        |

# SRHL1 Series

## ■ Connections

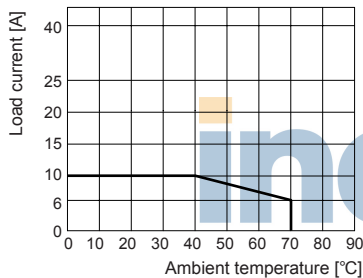


※Alarm output terminals (AL+ and AL-) are only for the rated load current 40A model (SRHL1-□□40□).  
※Use terminals of size specified below.

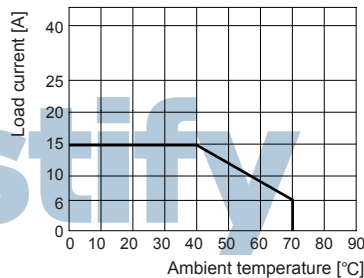
| Terminal type                                                                     | Input, alarm output     | Output                 |
|-----------------------------------------------------------------------------------|-------------------------|------------------------|
| Rated load current                                                                | 10A, 15A, 20A, 25A, 40A | 10A, 15A, 20A, 25A 40A |
|  | a Min. 3.5mm            | Min. 4.0mm             |
| b                                                                                 | Max. 7.0mm              | Max. 9.0mm             |

## ■ SSR Derating Curve

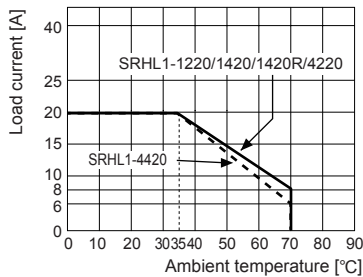
### ◎ SRHL1-1210/1410/1410R/4210/4410



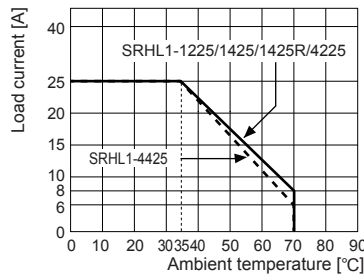
### ◎ SRHL1-1215/1415/1415R/4215/4415



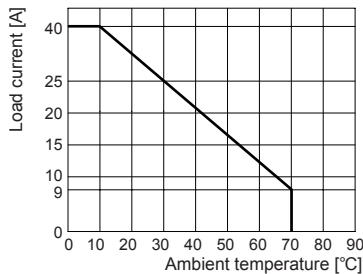
### ◎ SRHL1-1220/1420/1420R/4220/4420



### ◎ SRHL1-1225/1425/1425R/4225/4425



### ◎ SRHL1-1240/1440/1440R/4240/4440



△ 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.

# Single-Phase, Integrated Heatsink Type SSR

## [Left-Right Terminal]

### ■ Proper Usage

#### ⚠ Cautions during use

1. Follow instructions in 'Cautions during use'. Otherwise, it may cause unexpected accidents.
2. 10-30VDC 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

industify

|     |                                                                          |
|-----|--------------------------------------------------------------------------|
| (A) | Photoelectric Sensors                                                    |
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