

Preface

Thank you for purchasing our solid state relay SA-400.

This manual contains instructions for the mounting, functions, operations and notes when operating the SA-400.

To prevent accidents arising from the misuse of this unit, please ensure the operator receives this manual.


Notes


- This instrument should be used in accordance with the specifications described in the manual.
If it is not used according to the specifications, it may malfunction or cause a fire.
- Be sure to follow the warnings, cautions and notices. If they are not observed, serious injury or malfunction may occur.
- Specifications and the contents of this instruction manual are subject to change without notice.
- Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- This instrument is designed to be installed on a DIN rail within a control panel. If it is not, measures must be taken to ensure that the operator cannot touch power terminals or other high voltage sections.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos CO., LTD. is not liable for any damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

SAFETY PRECAUTIONS (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution".

Depending on the circumstances, procedures indicated by ⚠ Caution may be linked to serious results, so be sure to follow the directions for usage.

 **Warning** Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

 **Caution** Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

 **Warning**

- To prevent an electric shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electric shock, fire or damage to instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

 **SAFETY PRECAUTIONS**

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage by consulting with our agency or main office about your purpose of use. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protection equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Also proper periodic maintenance is required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

 **Warning**

- A semiconductor is used in this instrument. Take note that in general semiconductors sometimes malfunction.
- As a result of malfunction when using this SSR, injuries, fire or social damage may occur.
Therefore system safety designs such as a redundancy, fire control and prevention and malfunction contingency must be provided and implemented.
- Do not use this SSR if any terminal screw is not tightened securely. Otherwise the unit may be burnt out due to abnormal heating of the terminal section.
- Do not apply overvoltage or overcurrent to the input or output circuit of this unit. A malfunction or burnout may occur.

Caution with respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

1. Model

SA-4□□-Z

Rated current 20: 20A, 40: 40A

2. Mounting to the control panel

2.1 Site selection

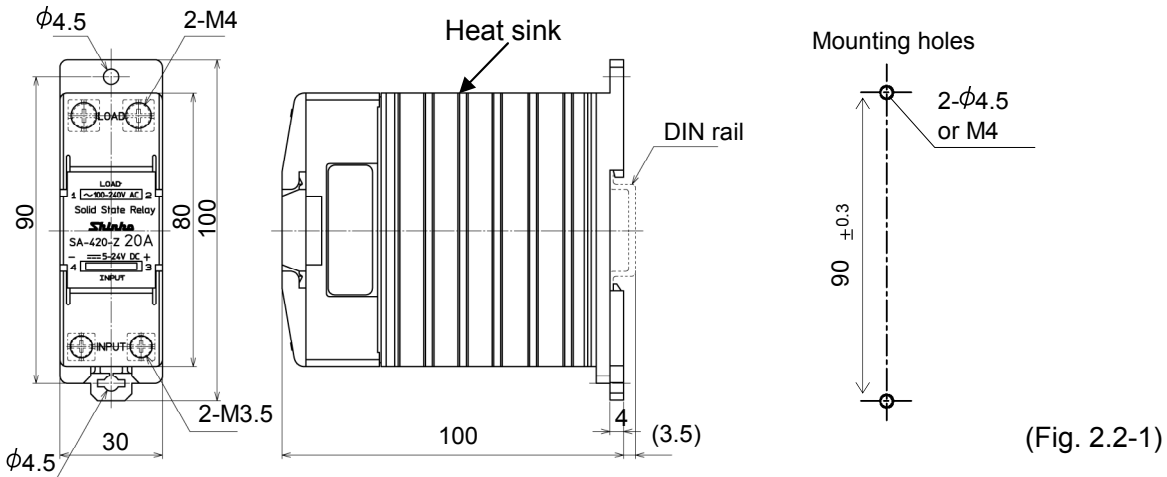
⚠ Caution Use within the following temperature and humidity ranges.
 Temperature: -10 to 50°C (14 to 122°F), Humidity: 45 to 85%RH (No icing, no condensation)
 If the SA-400 is installed within the control panel, the ambient temperature of the SA-400 must be kept to under 50°C. Otherwise the life of electronic parts of this unit will be shortened.

Ensure the mounting location corresponds to the following conditions:

- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- Few mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of -10 to 50°C (14 to 122°F) that does not change rapidly
- An ambient non-condensing humidity of 45 to 85%RH
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with the controller

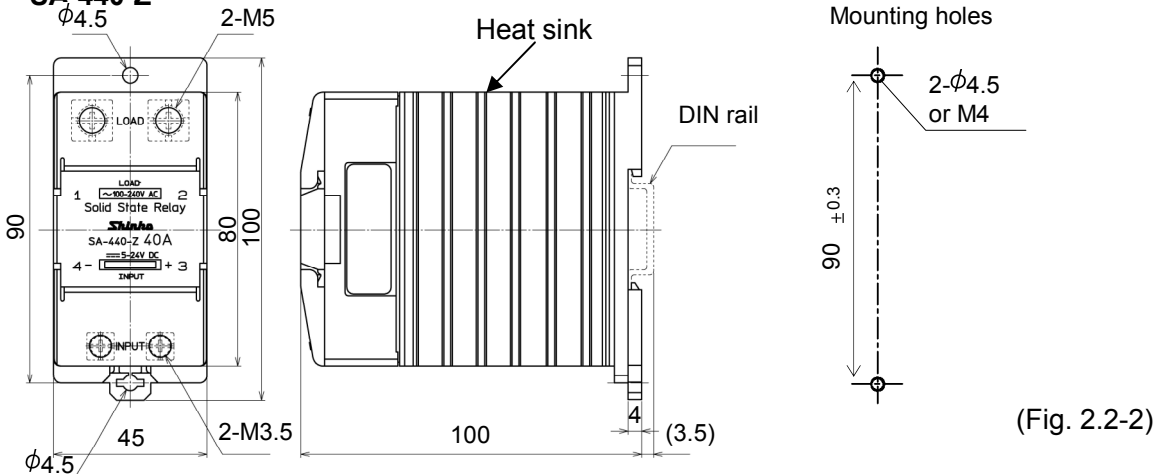
2.2 External dimensions (Scale: mm)

• SA-420-Z



(Fig. 2.2-1)

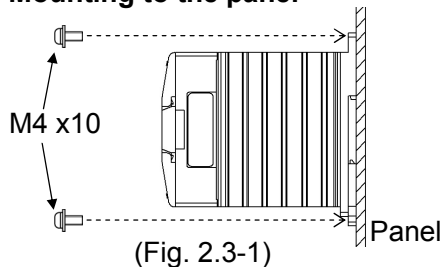
• SA-440-Z



(Fig. 2.2-2)

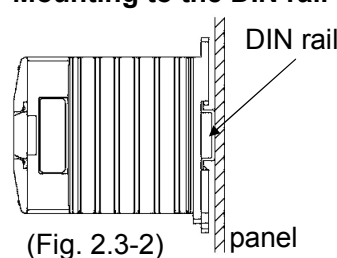
2.3 Mounting

• Mounting to the panel



(Fig. 2.3-1)

• Mounting to the DIN rail

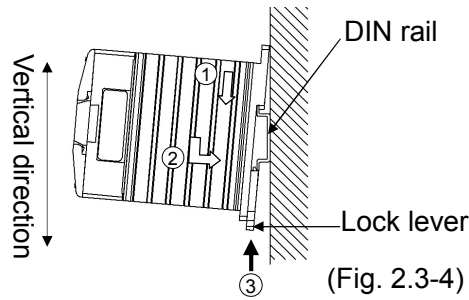
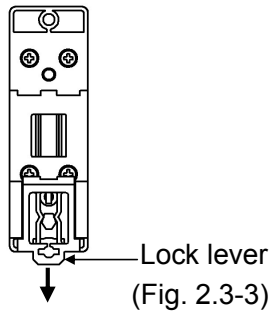


(Fig. 2.3-2)

• **Mounting and removal to/from the DIN rail**

To mount the unit to the DIN rail, pull the lock lever down beforehand (Fig. 2.3-3). Hook the unit to the DIN rail (①), mount it (②), and push the lock lever up (③) (Fig. 2.3-4).

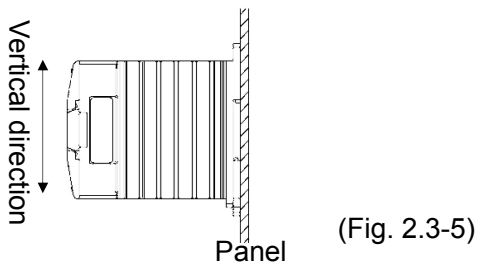
To remove the unit from the DIN rail, pull the lock lever down, and remove the unit from the DIN rail.



• **Mounting direction**

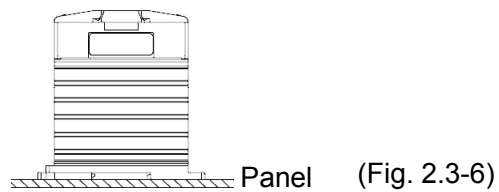
[Vertical mounting]

Can be used at the rated load current.



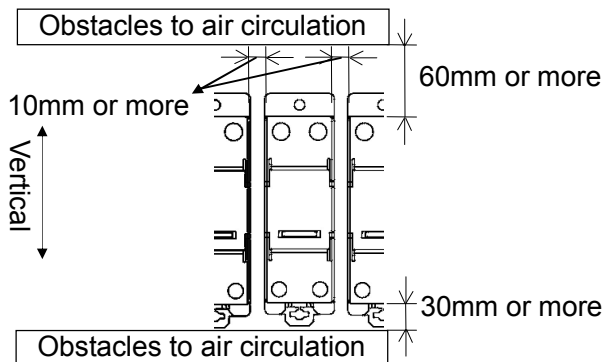
[Horizontal mounting]

Use the unit with 50% of the rated load current.



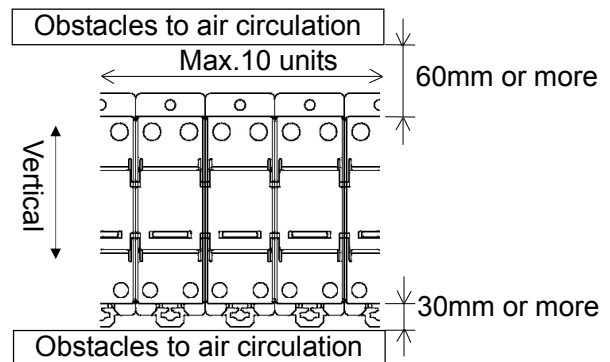
• **Mounting conditions within the control panel**

[Standard mounting]



(Fig. 2.3-7)

[Close (side-by-side) mounting]



(Fig. 2.3-8)

- When mounting units above and below each other, keep a space of more than 80mm between them.
- As the SA-400 is heavy, fix the unit with end plates after securely mounting on the DIN rail.
- For close mounting, reduce the rated load current.

For details, refer to “Load current and ambient temperature characteristics” of “4. Specifications”.

3. Wiring

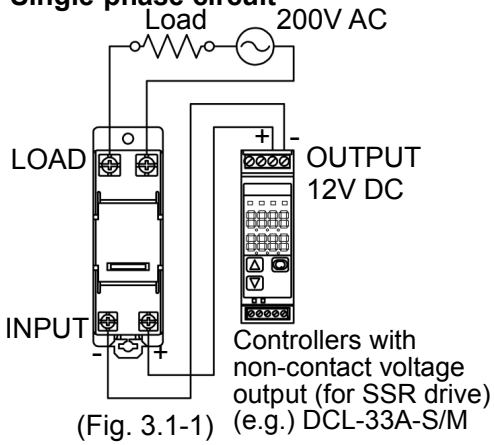
3.1 Wiring examples

Warning

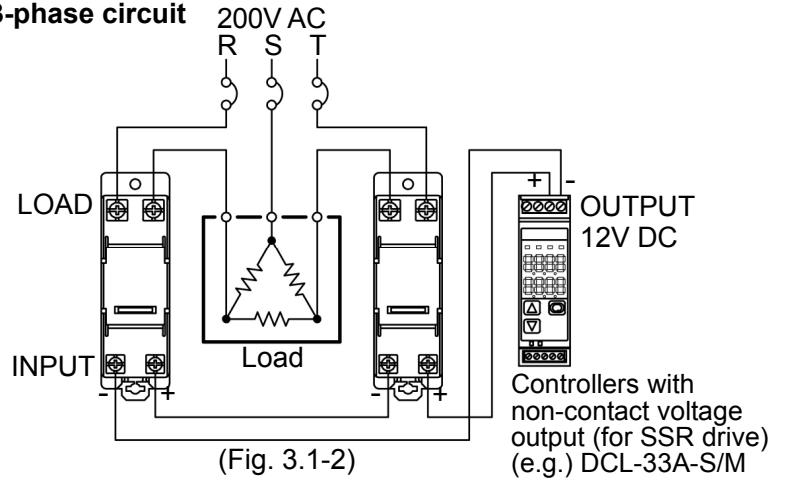
Turn the power supply to the instrument off before wiring. Working or touching the terminal with the power switched on may result in severe injury or death due to Electric Shock.

- Do not touch this unit and heat sink during power-on or immediately after power-off. Burns may be caused as the unit and heat sink become very hot.
- Do not touch output terminals during power-on or immediately after power-off. Electric shock may be caused due to the built-in snubber circuit which has been electrically-charged.
- Do not block air circulation around the unit and heat sink. Interference may result in a short circuit fault or burnout due to abnormal heat from the unit.
- Be sure not to flow the short circuit current on the load side. If it flows, the SA-400 may break.
- To prevent damage to peripheral devices or equipment caused by malfunction of the SA-400, be sure to take safety measures such as applying a fuse before using this unit.

• **Single-phase circuit**



• **3-phase circuit**



When using 3-phase circuit, select the unit as follows.

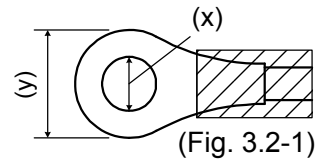
For load current 10A or less: SA-420-Z (20A), For load current 20A or less: SA-440-Z (40A)

3.2 Solderless terminals

- Use wires in accordance with the applied current. Otherwise a fire or a burnout may be caused.
- Refer to the torque for terminal screws in the table below.

(Table 3.2-1)

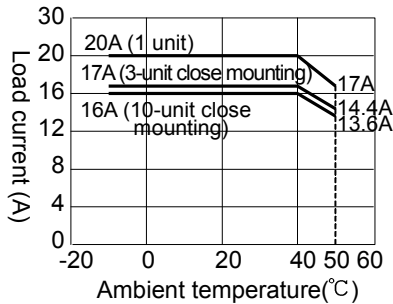
	INPUT terminals	LOAD terminals (SA-420-Z)	LOAD terminals (SA-440-Z)
Screw	M3.5	M4	M5
Tightening torque	0.75 to 1.18N·m	0.98 to 1.37N·m	1.57 to 2.35N·m
(x) (Fig. 3.2-1)	Φ3.7mm or more	Φ4.3mm or more	Φ5.3mm or more
(y) (Fig. 3.2-1)	8mm or less	8.5mm or less	10mm or less



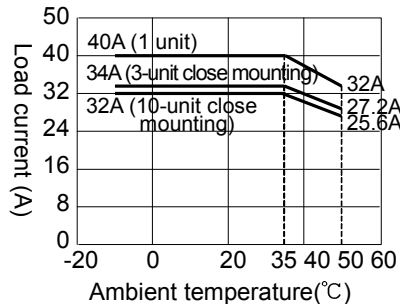
4. Specifications

- Weight: 280g (SA-420-Z), 380g (SA-440-Z)
- Rated input voltage: 5 to 24V DC
- Input current consumption: 7mA or less (at 25°C)
- Rated load current: SA-420-Z: 0.1 to 20A, SA-440-Z: 0.5 to 40A
- Rated load voltage: 100 to 240V AC
- Surge ON current tolerance: 220A (SA-420-Z), 440A (SA-440-Z)
- Applicable load: Resistive load
- Operation, restoration time: 1/2 cycle of the load current+1ms or less
- Output ON voltage drop: 1.6V (RMS) or less (when applying max. load)
- Leak current: 10mA or less (at 200V AC)
- Insulation resistance: 100MΩ or more (at 500V DC, Between INPUT/LOAD terminals, Between terminals – Heat sink)
- Dielectric strength: 3000V AC for 1 minute (Between INPUT/LOAD terminals, Between terminals – Heat sink)
- Storage temperature: -20 to 60°C (No icing and condensing)
- Operating temperature: Temperature: -10 to 50°C, Humidity: 45 to 85%RH (No icing and condensing)
- Load current and ambient temperature characteristics:

• **SA-420-Z**



• **SA-440-Z**



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