

## INSTRUCTION MANUAL

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Thank you for purchasing Hanyoung Nux products. Please read the instruction manual carefully before using this product, and use the product correctly. Also, please keep this instruction manual where you can view it any time.

MC0801KE231018

## Safety information

Please read the safety information carefully before the use, and use the product correctly.

The alerts declared in the manual are classified into **Danger** and **Warning** according to their importance.

<b>⚠ DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
<b>⚠ WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
<b>⚠ CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or properties damage

### DANGER

- The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

### WARNING

- Please read the safety information carefully before the use, and use the product correctly.
- If there is a possibility that a malfunction or abnormality of this product may lead to a serious accident, install an appropriate protection circuit on the outside and plan to prevent accidents.
- Please supply the rated power voltage, in order to prevent product breakdowns or malfunctions.
- To prevent electric shocks and malfunctions, do not supply power until the wiring is completed.
- Please disassemble the product after turning OFF the power.
- Any use of the product other than those specified by the manufacturer may result in personal injury or property damage.
- Please use this product after installing it to a panel, because there is a risk of electric shock.
- 4 - 32 V.d.c model signal inputs must be supplied with an isolated and limited voltage/current or Class2, SELV power supply.
- Short circuit rated current is 3kA.

### CAUTION

- Please make sure that the product specifications are the same as you ordered.
- Please use the product in places where corrosive gases (especially harmful gases, ammonia, etc.) and flammable gases are not generated.
- Please use the product in places without liquids, oils, chemicals, steam, dust, salt, iron, etc. (pollution degree 1 or 2).
- Please avoid places where large induction interference, static electricity, magnetic noise are generated.
- Please avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.
- When water enters, short circuit or fire may occur, so please inspect the product carefully.
- Do not connect anything to the unused terminals.
- For DC types, please wire correctly, after checking the polarity of the terminals.
- When disposing of the product, treat it as industrial waste.
- Since a heat sink corner is sharp, it would lead to a serious injury.
- When electricity flows, desktop or heat sink's corner temperature would be high so that it could lead people to suffer burns.
- When it is out of order, please separate HSR from heat sink and change only HSR.
- This model has epoxy molding for the purpose of safety, reliability and extends of the life.
- When applying an electric current, HSR is heated more and more. So, it has more durable at low heat sink temperature and ambient temperature.
- Note 1) The N option model must be installed and used with a heatsink (HSN or HSM series, sold separately) of our company's appropriate specifications. However, when using a separate heat sink, it is recommended to select and install the heat sink size based on the thermal resistance value (Note 1).

## Specifications

### DC input

Model	Low	HSR-2D10LZ	HSR-2D20LZ	HSR-2D30LZ	HSR-2D40LZ	HSR-2D50LZ	HSR-2D70LZ
		High	HSR-2D10LR	HSR-2D20LR	HSR-2D30LR	HSR-2D40LR	HSR-2D50LR
Rated Load Voltage	Low	24 - 240 V.a.c. 50/60 Hz					
	High	24 - 480 V.a.c. 50/60 Hz					
Peak Voltage (Non-repetition)	Low	1,200V					
	High	1,200V					
Rated load current	Low	10A	20A	30A	40A	50A	70A
	High	170A	260A	420A	420A	525A	525A
Surge current 60Hz (8.3ms No repetition)	Low	170A	250A	370A	370A	500A	500A
	High	160A	250A	400A	400A	500A	500A
Surge current 50Hz (10ms No repetition)	Low	160A	240A	340A	340A	500A	500A
	High	160A	240A	340A	340A	500A	500A
Leakage current	Low	Less than 20 mA					
	High	Less than 1.6 V (R.M.S)					
Output ON voltage dropping	Low	5 - 24 V.d.c.					
	High	5 - 24 V.d.c.					
Rated Voltage	Low	4 - 32 V.d.c.					
	High	4 - 32 V.d.c.					
Operating Voltage Range (ON Voltage)	Low	Less than 3V					
	High	Less than 4kΩ					
return voltage (OFF Voltage)	Low	Constant current method: 14 mA or less					
	High	1/2 Cycle + 1 ms max. ("R" type below 1ms)					
Impedance	Low	500 V.d.c., 100 MΩ (Between input and output and case)					
	High	2,500 V.a.c. (For 1min at 60Hz)					
Current Consumption	Low	2,500 V					
	High	2,500 V					
Response Time	Low	10 - 55 Hz, Double amplitude: 1.5 mm, X-Y-Z each axis direction for 2 hour					
	High	1,000 mS, X-Y-Z each axis 3 time					
Insulating Resistance	Low	30 ~ 90 °C					
	High	-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH					
Dielectric strength	Low	2 level pollution					
	High	2 level pollution					
Rated impulse withstand voltage (Uimp)	Low	Input terminal: 0.05 Nm / Output terminal: 0.25 Nm					
	High	Resistive load					
Vibration resistance	Low	Resistive load					
	High	Resistive load					
Shock resistance	Low	Resistive load					
	High	Resistive load					
Storage Temperature	Low	Resistive load					
	High	Resistive load					
Ambient Temperature & Humidity	Low	Resistive load					
	High	Resistive load					
Pollution level grade	Low	Resistive load					
	High	Resistive load					
bolt tightening torque	Low	Resistive load					
	High	Resistive load					
Usage	Low	Resistive load					
	High	Resistive load					
Accepted standard	Low	Resistive load					
	High	Resistive load					
Weight	Low	Resistive load					
	High	Resistive load					

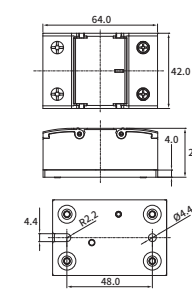
### AC input

Model	Low	HSR-2A10LZ	HSR-2A20LZ	HSR-2A30LZ	HSR-2A40LZ	HSR-2A50LZ	HSR-2A70LZ
		High	HSR-2A10LR	HSR-2A20LR	HSR-2A30LR	HSR-2A40LR	HSR-2A50LR
Rated Load Voltage	Low	24 - 240 V.a.c. 50/60Hz					
	High	24 - 480 V.a.c. 50/60Hz					
Peak Voltage (Non-repetition)	Low	1,200V					
	High	1,200V					
Rated load current	Low	10A	20A	30A	40A	50A	70A
	High	170A	260A	420A	420A	525A	525A
Surge current 60Hz (8.3ms No repetition)	Low	170A	250A	370A	370A	500A	500A
	High	160A	250A	400A	400A	500A	500A
Surge current 50Hz (10ms No repetition)	Low	160A	240A	340A	340A	500A	500A
	High	160A	240A	340A	340A	500A	500A
Leakage current	Low	Less than 20 mA					
	High	Less than 1.6 V (R.M.S)					
Output ON voltage dropping	Low	100-240 V.a.c. 50/60Hz (public)					
	High	100-240 V.a.c. 50/60Hz (public)					
Rated Voltage	Low	90-264 V.a.c. 50/60Hz (public)					
	High	90-264 V.a.c. 50/60Hz (public)					
Operating Voltage Range (ON Voltage)	Low	Less than 50V					
	High	Less than 40kΩ					
return voltage (OFF Voltage)	Low	Less than 14 mA					
	High	1/2 Cycle + 1 ms max. ("R" type below 1ms)					
Impedance	Low	500 V.d.c., 100 MΩ (Between input and output and case)					
	High	2,500 V.a.c. (For 1min at 60Hz)					
Current Consumption	Low	2,500 V					
	High	2,500 V					
Response Time	Low	10 - 55 Hz, Double amplitude: 1.5 mm, X-Y-Z each axis direction for 2 hour					
	High	1,000 mS, X-Y-Z each axis 3 time					
Insulating Resistance	Low	30 ~ 90 °C					
	High	-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH					
Dielectric strength	Low	2 level pollution					
	High	2 level pollution					
Rated impulse withstand voltage (Uimp)	Low	Input terminal: 0.05 Nm / Output terminal: 0.25 Nm					
	High	Resistive load					
Vibration resistance	Low	Resistive load					
	High	Resistive load					
Shock resistance	Low	Resistive load					
	High	Resistive load					
Storage Temperature	Low	Resistive load					
	High	Resistive load					
Ambient Temperature & Humidity	Low	Resistive load					
	High	Resistive load					
Pollution level grade	Low	Resistive load					
	High	Resistive load					
bolt tightening torque	Low	Resistive load					
	High	Resistive load					
Usage	Low	Resistive load					
	High	Resistive load					
Accepted standard	Low	Resistive load					
	High	Resistive load					
Weight	Low	Resistive load					
	High	Resistive load					

## Suffix code

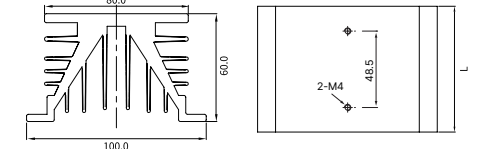
Model	Code	Information
HSR-2	□ : □ : □ : □	Single-Phase Solid State Relay
Control Input Voltage	D	4 - 32 V.d.c.
	A	90 - 240 V.a.c.
Rated load current	10	10A
	20	20A
	30	30A
	40	40A
	50	50A
	70	70A
Rated load voltage	L	24 - 240 V.a.c. (Low voltage)
	H	24 - 480 V.a.c. (High voltage)
Operation method (Switching Mode)	Z	Zero Cross Switching (Standard product)
	R	Random Switching
Heatsink option	T	Heat sink + bimetal mounting (50 A, 70 A only)
	N	No Heat sink ※CAUTION 1) When using a separate heat sink, you must use a heat sink that meets the thermal resistance table.

## Dimensions

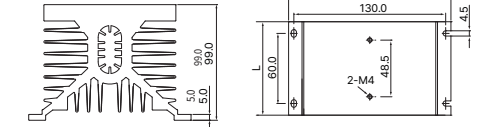


## Heat Sink

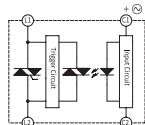
### HSM series



### HSN series



## Equivalent Circuit



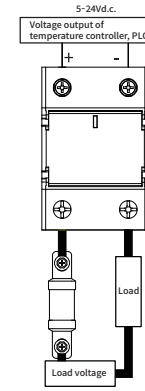
Model	Applicable Model	Capacity (A)	Length (L)	Weight
HSM-70	HSR-2   10	10A	70 mm	352 (g)
HSM-110	HSR-2   20	20A	110 mm	558 (g)
HSM-150	HSR-2   30	30A	150 mm	758 (g)
	HSR-2   40	40A	150 mm	758 (g)
HSN-80	HSR-2   50	50A	80 mm	1,146 (g)
HSN-120	HSR-2   70	70A	120 mm	1,712 (g)

### ※ CAUTION 1 (thermal resistance table)

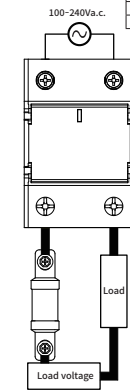
load capacity	Heatsink thermal resistance (40°C standard)
10A	2.00 °C/W
20A	1.00 °C/W
30A	0.50 °C/W
40A	0.25 °C/W
50A	0.30 °C/W
70A	0.15 °C/W

## Connection

### HSR-2D

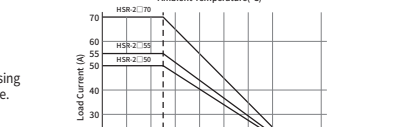
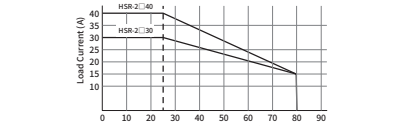
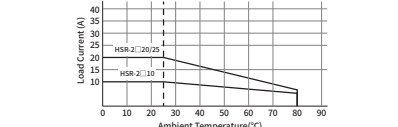


### HSR-2A

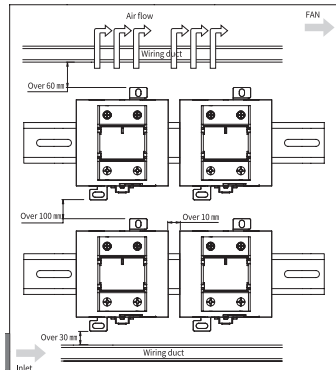


- This model does not have a fuse internally. So we suggest using fast-acting fuse separately on the outside as following picture. (using gG/gL type fuse according to IEC 60269 standard)

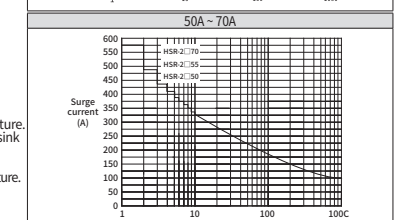
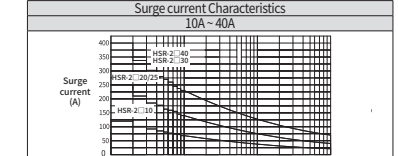
## Input/Load



## Installation



Temperature	10A	20A	30A	40A	50A	55A	70A
25 °C	10A	20A	30A	40A	50A	55A	70A
80 °C	6A	8A	15A	15A	15A	15A	16A



- Please make intervals more than the sizes in the following picture.
- Please install wiring duct less than half the height of the heat sink to prevent the flow of air.
- It is good to use Hanyoung Nux's HSR in lower than ambient temperature 40 °C so, please use it lower than standard temperature.
- When installing the HSR, be sure to install the heat sink in the vertical direction.
- Unavoidably, if installed horizontally, the performance of the product will drop below 50 %
- Input terminal wiring: 1 X 0.5 mm<sup>2</sup> (1 X AWG20) or larger
- Output terminal wiring: 1 X 1.5 mm<sup>2</sup> (1 X AWG16) or larger
- 1 X 1.5 mm<sup>2</sup> (1 X AWG16) or less than 2 X 1.5 mm<sup>2</sup> (2 X AWG16)
- 1 X 1.5 mm<sup>2</sup> (1 X AWG16) or less than 2 X 6 mm<sup>2</sup> (2 X AWG10)
- ※ Connect the wiring suitable for the load current capacity to the output terminal.

## Precautions during the use of Heat Sink

- Using standard heat sink is mandatory for this product.
- Even the standard heat sink is used, HSR damage may occur if the environment temperature rises or if the ventilation does not work well. (Environment temperature : over 40 °C)
- The normal HSR element is damaged at the maximum temperature of 125 °C. When the temperature of heat sink is 85 °C, the temperature of the element reaches around 125 °C.
- Therefore, during operation, measure the temperature of heat sink.
- When you connect HSR onto the heat sink, heat-transmitting grease is needed for smooth heat transmission.
- To prevent separation by vibration, tighten up with bolts.
- Do not use any insulating materials such as wood, plastic or rubber.
- The standard heat sink must be greased on the bottom side as shown and connected.
- ※ The heatproof silicon grease must be applied thoroughly on the heat sink as well as the bottom of HSR. The case side of heat sink needs to be installed on up and down directions.