

Three-phase contactless relay

HSR-3

INSTRUCTION MANUAL

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.

HANYOUNG NUX

HANYOUNGNUX CO.,LTD
28, Gilpa-ro 71beon-gil, Michuhol-gu,
Incheon, Korea TEL : +82-32-876-4697
http://www.hanyoungnux.com

MC0802KE230302

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.

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	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 inductive 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 head 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-3D10LZ	HSR-3D20LZ	HSR-3D30LZ	HSR-3D40LZ	HSR-3D50LZ	HSR-3D70LZ
		HSR-3D10LR	HSR-3D20LR	HSR-3D30LR	HSR-3D40LR	HSR-3D50LR	HSR-3D70LR
Rated Load Voltage	High	24 - 240 V a.c. 50/60 Hz					
	Low	24 - 480 V a.c. 50/60 Hz					
Peak Voltage (Non-repetition)	High	1,200 V					
Rated load current	Low	10A	20A	30A	40A	50A	70A
	High	170A	260A	420A	370A	525A	525A
Surge current 60Hz (8.3ms No repetition)	Low	170A	250A	400A	370A	500A	500A
Surge current 50 Hz (10ms No repetition)	Low	160A	250A	400A	370A	500A	500A
Leakage current	High	160A	240A	350A	350A	500A	500A
Output ON voltage dropping	Less than 20 mA						
Rated Voltage	Less than 1.6 V (R.M.S)						
Operating Voltage Range (ON Voltage)	5 - 24 V d.c.						
return voltage (OFF Voltage)	4 - 32 V d.c.						
Impedance	Less than 3 V						
current consumption	Less than 4 kΩ						
Response Time	Constant current method : Less than 25mA						
Insulating Resistance	1/2 Cycle + 1 ms max. ("R" type below 1ms)						
Dielectric strength	500 V d.c., 100 MΩ (Between the input / output and case)						
Rated impulse withstand voltage (Uimp)	2,500 V a.c. (For 1min at 60Hz)						
Vibration resistance	2,500 V						
Shock resistance	10 - 55 Hz, Double amplitude : 1.5 mm, X-Y-Z each axis direction for 2 hour						
Storage Temperature	1,000 m/s, X-Y-Z each axis 3 times						
Ambient Temperature & Humidity	-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH						
Pollution level grade	2 level						
bolt tightening torque	Input terminal: 0.05 Nm / Output terminal: 0.25 Nm						
Usage	Resistive load						
Accepted standard	CE (EN 60947-4-3) cULus RoHS2						
Weight	Approx 250g						Approx 310g

AC input

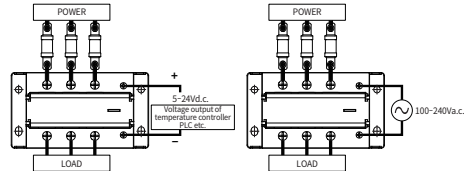
Model	Low	HSR-3A10LZ	HSR-3A20LZ	HSR-3A30LZ	HSR-3A40LZ	HSR-3A50LZ	HSR-3A70LZ
		HSR-3A10LR	HSR-3A20LR	HSR-3A30LR	HSR-3A40LR	HSR-3A50LR	HSR-3A70LR
Rated Load Voltage	High	24 - 240 V a.c. 50/60 Hz					
	Low	24 - 480 V a.c. 50/60 Hz					
Peak Voltage (Non-repetition)	High	1,200V					
Rated load current	Low	10A	20A	30A	40A	50A	70A
	High	170A	260A	420A	370A	525A	525A
Surge current 60Hz (8.3ms No repetition)	Low	170A	250A	400A	370A	500A	500A
Surge current 50 Hz (10ms No repetition)	Low	160A	250A	400A	370A	500A	500A
Leakage current	High	160A	240A	350A	350A	500A	500A
Output ON voltage dropping	Less than 20 mA						
Rated Voltage	Less than 1.6 V (R.M.S)						
Operating Voltage Range (ON Voltage)	100 - 240 V a.c. 50/60Hz						
return voltage (OFF Voltage)	90 - 264 V a.c. 50/60Hz						
Impedance	Less than 50 V						
Current consumption	Less than 40 kΩ						
Response Time	Less than 14mA						
Insulating Resistance	1/2 Cycle + 1 ms max. ("R" type below 1ms)						
Dielectric strength	500 V d.c., 100 MΩ (Between the input / output and case)						
Rated impulse withstand voltage (Uimp)	2,500 V a.c. (For 1min at 60Hz)						
Vibration resistance	2,500 V						
Shock resistance	10 - 55 Hz, Double amplitude : 1.5 mm, X-Y-Z each axis direction for 2 hour						
Storage Temperature	1,000 m/s, X-Y-Z each axis 3 times						
Ambient Temperature & Humidity	-30 ~ 80 °C (No Condensation), 45 ~ 85 % RH						
Pollution level grade	2 level						
bolt tightening torque	Input terminal: 0.05 Nm / Output terminal: 0.25 Nm						
Usage	Resistive load						
Accepted standard	CE (EN 60947-4-3) cULus RoHS2						
Weight	Approx 250g						Approx 310g

Suffix code

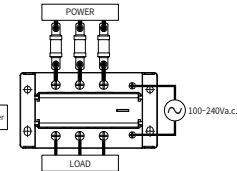
Model	Code	Information
HSR-3	□ □ □ □ □ □ □ □	Three-phase contactless relay
Input Voltage	D : □ □ □ □ □ □ □ □	4 - 32 V.d.c.
	A : □ □ □ □ □ □ □ □	90 - 240 V.a.c.
Rated load current	10 : □ □ □ □ □ □ □ □	10A
	20 : □ □ □ □ □ □ □ □	20A
	30 : □ □ □ □ □ □ □ □	30A
	40 : □ □ □ □ □ □ □ □	40A
	50 : □ □ □ □ □ □ □ □	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 installation (50A, 70A only)
	N	No heatsink ※CAUTION 1) When using a separate heat sink, you must use a heat sink that meets the thermal resistance table.

Connection

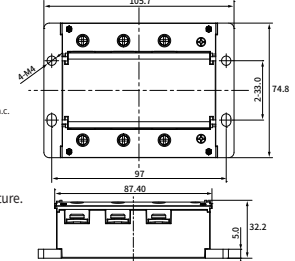
HSR-3D



HSR-3A



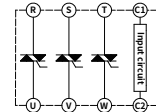
50/70A



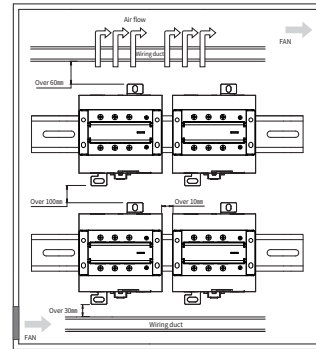
※ This model does not have a fuse internally.

So we suggest using fast-acting fuse separately on the outside as following picture. (using gG/gL type fuse according to IEC 60269 standard)

Equivalent Circuit



Installation



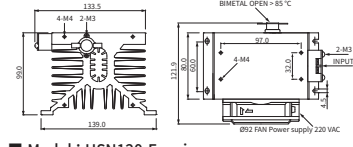
- Please make intervals more than the sizes in the following picture.
- Please install wiring duct less than half the height of the heat sink to prevent the flow of air.
- It is good to use Hanyoung Nux's HSR in lower than ambient temperature 40 °C so, please use it lower than standard temperature.
- 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 %

HEAT SINK

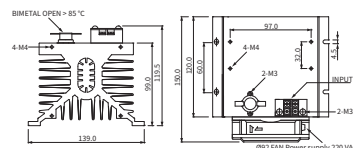
Model : HSM series

Model	Applicable Model	A	B	C	D	E	Weight
HSM-150	HSR-3 10A	150	75	49	97	32	768g
HSM-200	HSR-3 20A	200	100		97	32	1,030g
HSM-250	HSR-3 30A	250	250		97	32	1,284g
	HSR-3 40A						

Model : HSN80-F series



Model : HSN120-F series



Model	Applicable Model	Weight
HSN-80F	HSR-3 50A	1,474g
HSN-120F	HSR-3 70A	2,052g

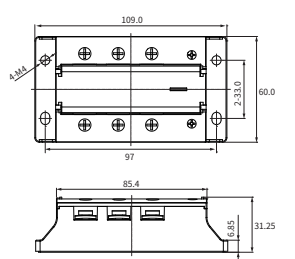
※ Precautions

- Input terminal wiring
1 X 0.5 mm² (1 X AWG20) or larger
1 X 1.5 mm² (1 X AWG16) or less than 2 X 1.5 mm² (2 X AWG16)
- Output terminal wiring
1 X 1.5 mm² (1 X AWG16) or larger
1 X 16 mm² (1 X AWG6) or less than 2 X 6 mm² (2 X AWG10)
※ Connect the wiring suitable for the load current capacity to the output terminal.

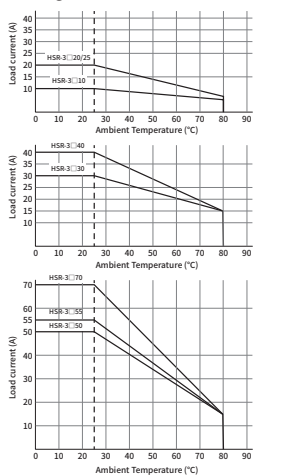
Dimensions

[Unit : mm]

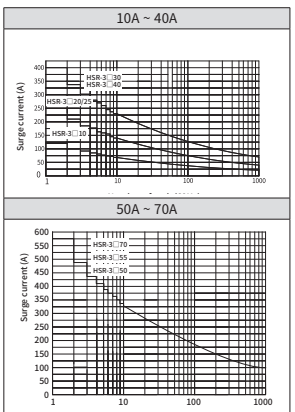
10/20/30/40A



Load/Surge current Characteristics



Surge current Characteristics



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 below 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.

※ CAUTION 1 (thermal resistance table)

load capacity	Heatsink thermal resistance (40 °C standard)
10A	0.60 °C/W
20A	0.30 °C/W
30A	0.15 °C/W
40A	0.05 °C/W
50A	0.10 °C/W
70A	0.05 °C/W

