

# 3-Phase Solid State Relay HSR-3D/3A

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## 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.

## 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**, **Warning** and **Caution** 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 property damage.
- ⚠ DANGER**
    - The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with any body or conductive substance.
  - ⚠ WARNING**
    - When used in equipment with a high risk of personal injury or property damage (examples: medical devices, nuclear control, power plants, etc.), the product is classified as a Class II product. Please read the safety information carefully before the use, and use the product correctly.
    - Please read the safety information carefully before the use, and use the product correctly.
    - Please avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.
    - Please do not touch the terminals when the product is powered on. So please inspect the product carefully.
    - Do not connect anything to the unused terminals.
    - For DC types, please use correctly, after checking the polarity of the terminals.
  - ⚠ CAUTION**
    - When using the SSR, the product may be damaged if the specified heat sink is not used. Be sure to use the specified heat sink.
    - When the product is used in a humid environment, please use the product with a desiccant.
    - If the fan does not work, check the SSR, as it may break down.

## Suffix code

Model	Code	Content
HSR	<input type="checkbox"/> 1	1-Phase Solid State Relay
Control phase	<input type="checkbox"/> 3	3-Phase
Input control voltage	A	3-Phase 100~240 VAC
Rated load current	10	10~264 VAC
	20	30 A
	30	30 A
	40	40 A
	50	50 A
	70	70 A
Rated load voltage	2	90~264 VAC
	4	4~53 VDC
	7	90~480 VAC
Operation method (selecting model)	R	Random switching
	R	Random switching
Heat sink	-T	Without heat sink (only for 50A, 10A)
	-T	With heat sink (only for 50A, 10A)

## Specifications

Classification	HSR-3D10Z	HSR-3D20Z	HSR-3D30Z	HSR-3D40Z	HSR-3D50Z	HSR-3D70Z
Power voltage	600V	600V	600V	600V	600V	600V
Operating voltage range	10 A	20 A	30 A	40 A	50 A	70 A
Impedance	Min. 3 VDC					
Operating voltage	Min. 14 VDC					
Reset voltage	Min. 3 VDC					
Input current	Max. 4.0 A					
Speed load voltage range	Constant current method: 14 mV (±3)					
Load voltage range	50~264 VAC					
Peak voltage (non-temperature)	90~480 VAC					
Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
Frequency	50/60 Hz					
Surge current	125 A	260 A	315 A	315 A	580 A	580 A
Leakage current	15 mA	15 mA	15 mA	15 mA	15 mA	15 mA
ON state voltage drop	1.5 V	1.8 V	1.8 V	1.8 V	1.8 V	1.8 V
Min. operating current	1 A	1 A	1 A	1 A	1 A	0.5 A
Zero cross switching	1/2 cycle ± 1 ms max.					
Random switching	Max. 1 ms					
Insulation resistance	500 VDC, 100 MΩ (input/output and among cases)					
Dielectric strength	2500 VAC (60 Hz for one minute)					
Vibration resistance	10~55 Hz, double amplitude: 1.5 mm, Each X, Y, Z axis for 2 hours					
Shock resistance	1000 m/s (about 100 G), Each X, Y, Z axis for 3 times					
Storage temperature	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Ambient temperature & humidity	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Approval	CE					
Weight (g)	400					

※ Weight when packed

## DC input type (high voltage)

Classification	HSR-3D10Z	HSR-3D20Z	HSR-3D30Z	HSR-3D40Z	HSR-3D50Z	HSR-3D70Z
Power voltage	600V	600V	600V	600V	600V	600V
Operating voltage range	10 A	20 A	30 A	40 A	50 A	70 A
Impedance	Min. 3 VDC					
Operating voltage	Min. 14 VDC					
Reset voltage	Min. 3 VDC					
Input current	Max. 4.0 A					
Speed load voltage range	Constant current method: 10 mV (±3)					
Load voltage range	90~480 VAC					
Peak voltage (non-temperature)	90~480 VAC					
Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
Frequency	50/60 Hz					
Surge current	170 A	250 A	315 A	315 A	580 A	580 A
Leakage current	15 mA	15 mA	15 mA	15 mA	15 mA	15 mA
ON state voltage drop	1.5 V	1.8 V	1.8 V	1.8 V	1.8 V	1.8 V
Min. operating current	1 A	1 A	1 A	1 A	1 A	0.5 A
Zero cross switching	1/2 cycle ± 1 ms max.					
Random switching	Max. 1 ms					
Insulation resistance	500 VDC, 100 MΩ (input/output and among cases)					
Dielectric strength	2500 VAC (60 Hz for one minute)					
Vibration resistance	10~55 Hz, double amplitude: 1.5 mm, Each X, Y, Z axis for 2 hours					
Shock resistance	1000 m/s (about 100 G), Each X, Y, Z axis for 3 times					
Storage temperature	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Ambient temperature & humidity	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Approval	CE					
Weight (g)	400					

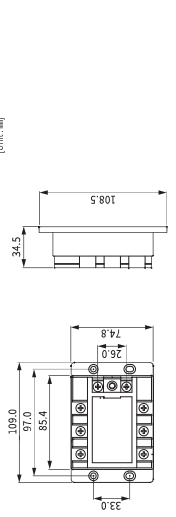
※ Weight when packed

## AC input type (low voltage)

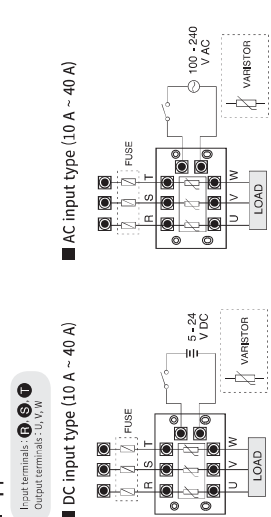
Classification	HSR-3A10Z	HSR-3A20Z	HSR-3A30Z	HSR-3A40Z	HSR-3A50Z	HSR-3A70Z
Power voltage	600V	600V	600V	600V	600V	600V
Operating voltage range	10 A	20 A	30 A	40 A	50 A	70 A
Impedance	Min. 75 VAC					
Operating voltage	Min. 15 VAC					
Reset voltage	Min. 75 VAC					
Input current	Max. 30 VAC					
Rated load voltage range	100~240 VAC					
Peak voltage (non-temperature)	90~264 VAC					
Rated load current	10 A	20 A	30 A	40 A	50 A	70 A
Frequency	50/60 Hz					
Surge current	125 A	260 A	315 A	315 A	580 A	580 A
Leakage current	15 mA	15 mA	15 mA	15 mA	15 mA	15 mA
ON state voltage drop	1.5 V	1.8 V	1.8 V	1.8 V	1.8 V	1.8 V
Min. operating current	1 A	1 A	1 A	1 A	1 A	0.5 A
Zero cross switching	1/2 cycle ± 1 ms max.					
Random switching	Max. 1 ms					
Insulation resistance	500 VDC, 100 MΩ (input/output and among cases)					
Dielectric strength	2500 VAC (60 Hz for one minute)					
Vibration resistance	10~55 Hz, double amplitude: 1.5 mm, Each X, Y, Z axis for 2 hours					
Shock resistance	1000 m/s (about 100 G), Each X, Y, Z axis for 3 times					
Storage temperature	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Ambient temperature & humidity	-20 ~ 80 °C, 45 ~ 85 % R.H.					
Approval	CE					
Weight (g)	400					

※ Weight when packed

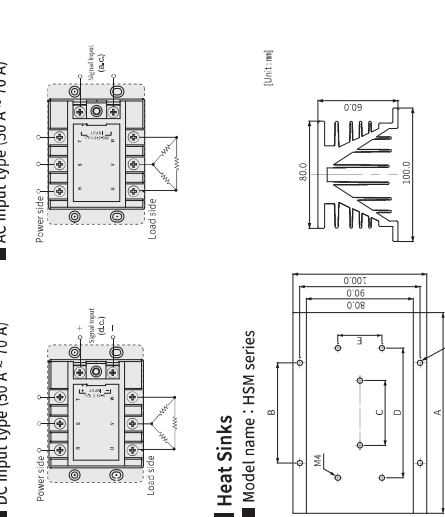
## Dimensions



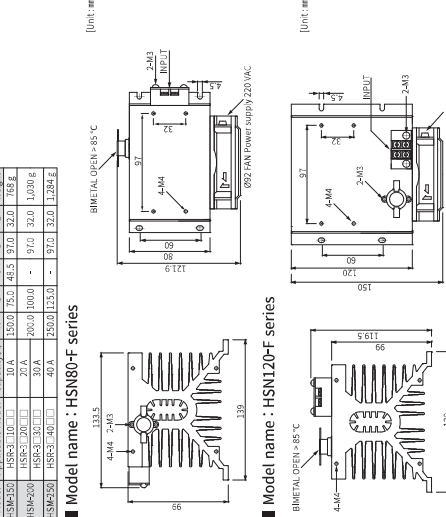
## Application circuits



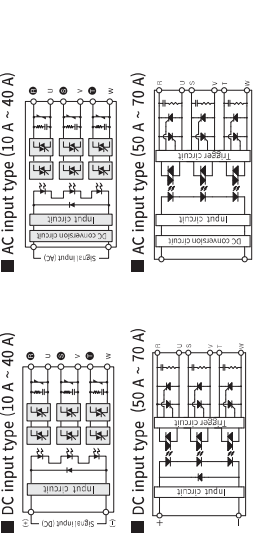
## DC input type (high voltage)



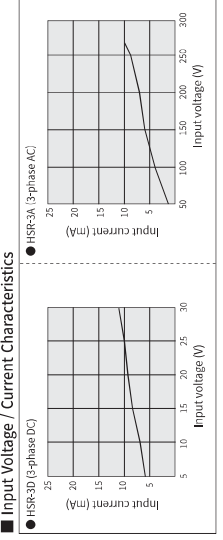
## AC input type (low voltage)



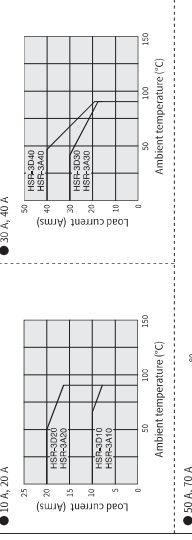
## Equivalent circuits



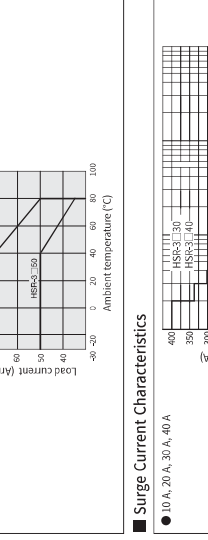
## Load Current Characteristics



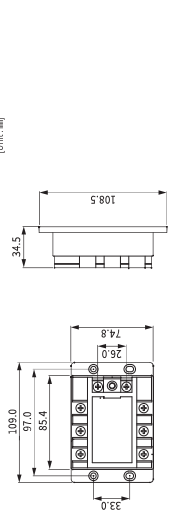
## Load Current Characteristics



## Surge Current Characteristics



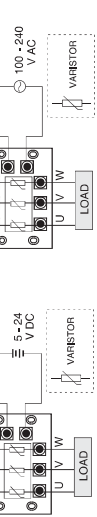
## Precautions while using the heat sinks



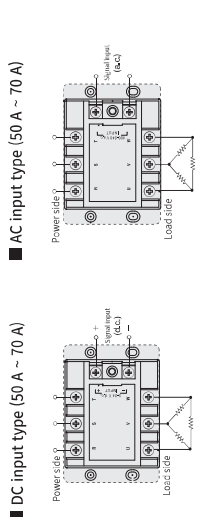
## Precautions while using the heat sinks

- Using standard heat sink, and heat-dissipation grease is mandatory for this product.
- Even the standard heat sink is used, SSR damage may occur if the environment temperature rises or the heat-dissipation grease is not used (environment temperature over 40 °C).
- When the temperature of heat sink is 85 °C or higher, or more, the temperature of the element reaches around 125 °C. Therefore, during operation, measure the temperature of heat sink.
- When you connect SSR to the heat sink, heat-conducting grease is needed for smooth heat transmission.
- Before installation, be sure to apply heat-dissipation grease to the contact surface using the standard heat sink, as shown in the above picture. Do not use insulation boards (wood, plastic, rubber).

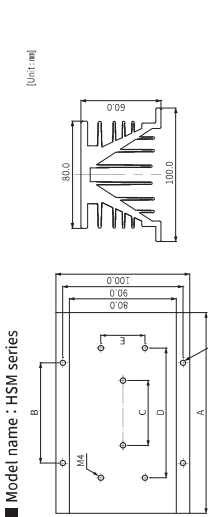
## Precautions while using the heat sinks



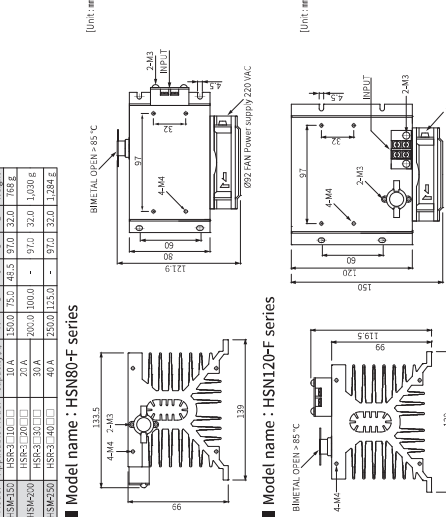
## Precautions while using the heat sinks



## Precautions while using the heat sinks



## Precautions while using the heat sinks



※ The above contents are subject to change without prior notice for performance improvement.

※ For further information, please visit our homepage (www.hyunux.com) and refer to the user's manual in the archive.