Three-Phase Solid State Relay(For High Voltage)

HSR-3D/3A

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

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Safety Information

Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor injury or loss of properity

⚠ DANGER

Do not touch or contact the input/output terminals because they may cause electric shock.

⚠ WARNING

- The place of operating this product affect to the its functions and life cycle so that avoid to use it in the following circumstance.
- Before you use, read safety precautions carefully, and use this product properly.
- Do not touch or contact the input/output terminals because they may cause electric shock.
- To prevent defection or malfunction of this product, supply proper power voltage in accordance with the rating.
- To prevent electric shock or devise malfunction of this product, do not supply the power until the wiring is completed.
- Reassemble this product while the power is off. Otherwise, it may cause malfunction or electric shock.
- If the user use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

⚠ CAUTION

- Before using the product you have purchased, check to make sure that it is exactly what you ordered.
- Do not use this product at any place with corrosive(especially noxious gas or ammonia) or flammable gas.
- Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents.
- Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
- Do not connect anything to the unused terminals.
- For DC types, connect wires at the correct position after checking polarity of terminal.
- The rated heat sink must be used; otherwise, the product may be destroyed.
- When product is disposed, treat as a industrial waste.

Suffix code

Model	Code	Information
HSR	□□□□□	Three-Phase Solid State Relay
Control Phase	2	Single Phase
	3	Three Phase
Input control voltage	D	4 - 32 V d.c
	A	90 - 264 V a.c
Rated load current	10	10 A
	20	20 A
	30	30 A
	40	40 A
Rated load voltage	2	90 - 264 V a.c
	4	90 - 480 V a.c
Operation method (Switching Mode)	Z	Zero Cross Switching
	R	Random Switching

Specification

■ Direct Current(DC) Input Type

Model		HSR-3D104Z / HSR-3D104R	HSR-3D204Z / HSR-3D204R	HSR-3D304Z / HSR-3D304R	HSR-3D404Z / HSR-3D404R
OUTPUT	Rated Load Voltage	100 - 440 V a.c			
	Operating Voltage Range	90 - 480 V a.c			
	Peak Voltage (non-repetition)	800 V	1200 V		
	Rated Load Current	10 A	20 A	30 A	40 A
	Frequency	25 - 65 Hz			
	Surge Current	170 A	250 A	315 A	315 A
	Leakage Current	15 mA			
	One State Voltage drop	1.95 V	1.8 V	1.8 V	1.8 V
	Min. Operation Current	1 A			
	Zero Cross Function	O X	O X	O X	O X
INPUT	Rated Voltage	5 - 24 V d.c			
	Operating Voltage Range	4 - 32 V d.c			
	Impedance	4 kΩ max.			
	Operation Voltage	3 V d.c min.			
	Reset Voltage	1.4 V d.c max.			
	Input Current	Constant Current method : 14 mA (±3)			
Response Time		1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms
Insulating Resistance		500 V DC, 100 MΩ (Input/Output and between Cases)			
Dielectric strength		2500 V a.c (50 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/s² (about 100 G), Each X · Y · Z axis for 3 times			
Storage Temperature		-30 - 90 ℃			
Ambient Temperature		-20 - 80 ℃			
Ambient Humidity		45 - 85 % R.H.			
Weight		About 380 g			

Notes : The weight does not include package box.

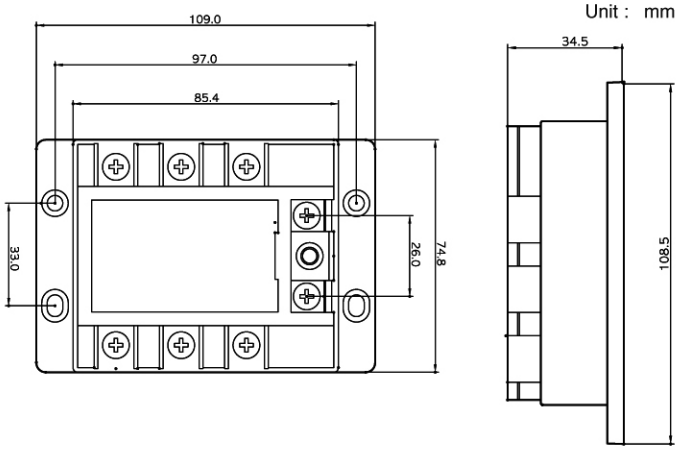
■ Alternating Current(AC) Input Type

Model		HSR-3A104Z / HSR-3A104R	HSR-3A204Z / HSR-3A204R	HSR-3A304Z / HSR-3A304R	HSR-3A404Z / HSR-3A404R
OUTPUT	Rated Load Voltage	100 - 440 V a.c			
	Operating Voltage Range	90 - 480 V a.c			
	Peak Voltage (non-repetition)	800 V	1200 V		
	Rated Load Current	10 A	20 A	30 A	40 A
	Frequency	25 - 65 Hz			
	Surge Current	170 A	250 A	315 A	315 A
	Leakage Current	20 mA			
	One State Voltage drop	1.95 V	1.8 V	1.8 V	1.8 V
	Min. Operation Current	1 A			
	Zero Cross Function	O X	O X	O X	O X
INPUT	Rated Load Voltage	100 - 240 V a.c			
	Power Supply Voltage	90 - 264 V a.c			
	Impedance	72 kΩ max.			
	Operation Voltage	75 V a.c min.			
	Reset Voltage	40 V a.c max.			
	Input Current	240 V a.c / 9 mA (±4)			
Response Time		1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms	1/2Cycle+1 ms Max. / Below 1 ms
Insulating Resistance		500 V DC, 100 MΩ (Input/Output and between Cases)			
Dielectric strength		2500 V a.c (50 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/s² (about 100 G), Each X · Y · Z axis for 3 times			
Storage Temperature		-30 - 90 ℃			
Ambient Temperature		-20 - 80 ℃			
Ambient Humidity		45 - 85 % R.H.			
Weight		About 380 g			

Notes : The weight does not include package box.

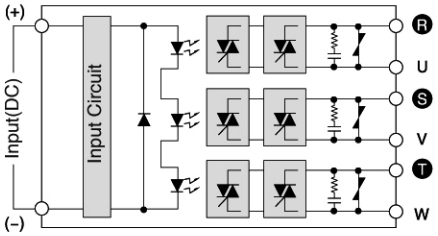
External Dimension

Unit : mm

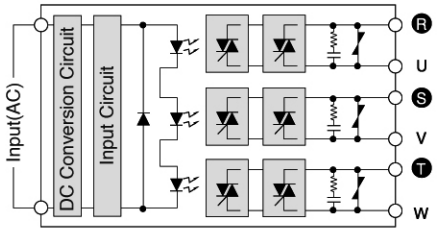


Circuit

■ DC Input Type



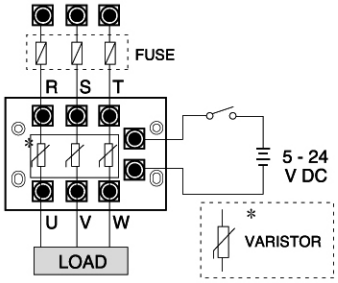
■ AC Input Type



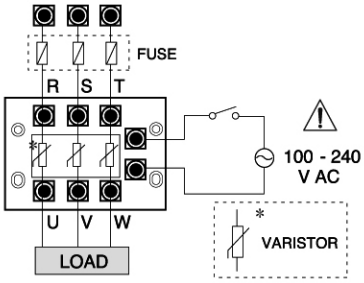
Input Terminals : R, S, T
Output Terminals : U, V, W

Application Circuit

■ DC Input Type

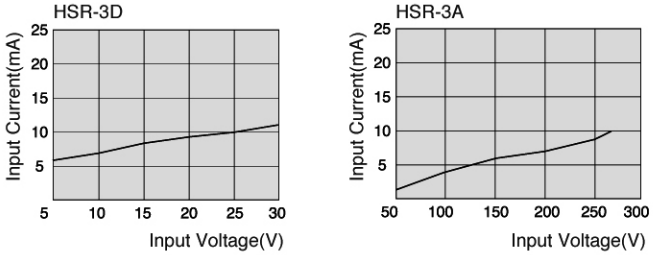


■ AC Input Type

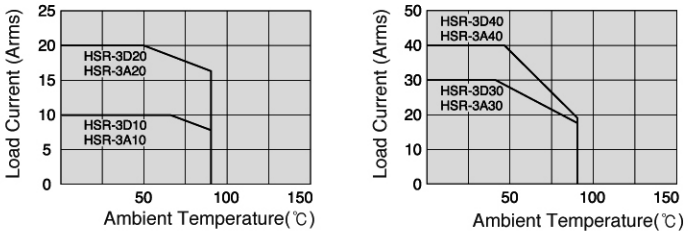


Load Current Characteristics

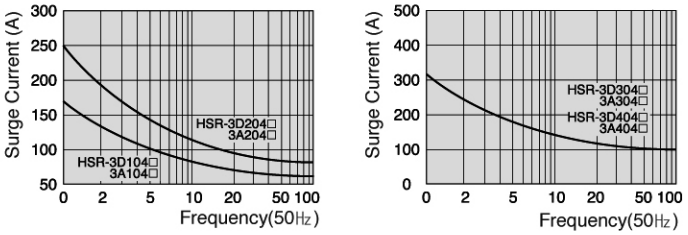
■ Input Voltage / Current Characteristics



■ Load Current Characteristics



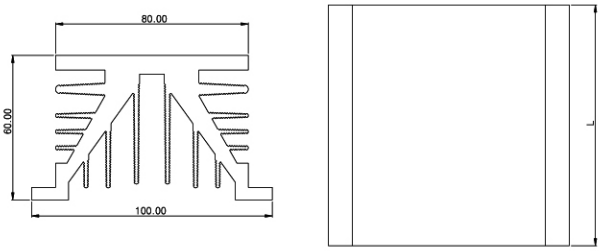
■ Surge Current Characteristics



Heat Sink

■ Model Name : HSM Series

Unit : mm



Model	Applicable Model	Capacity(A)	Length(L)
HSM-70	HSR-2□10□□	10(A)	70 mm
HSM-110	HSR-2□20□□	20(A)	110 mm
	HSR-2□30□□	30(A)	
HSM-150	HSR-2□40□□	40(A)	150 mm
	HSR-3□10□□	10(A)	
HSM-200	HSR-3□20□□	20(A)	200 mm
	HSR-3□30□□	30(A)	
HSM-250	HSR-3□40□□	40(A)	250 mm

※ The contents above may change for performance improve without any prior notice

■ Precautions during the use of Heat Sink

- Using standard heat sink is mandatory for this product.
- Even the standard heat sink is used, SSR damage may occur if the environment temperature rises or if the ventilation does not work well. (Environment temperature : over 40 ℃)
- The normal SSR element is damaged at the maximum temperature of 125 ℃. When the temperature of heat sink is 80°C, the temperature of the element reaches around 125 ℃. Therefore, during operation, measure the temperature of heat sink.
- When you connect SSR 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 SSR. The case side of heat sink needs to be installed on up and down directions.