

HSR-2

취급설명서

(주)한영닉스의 제품을 구입하여 주셔서 대단히 감사합니다.
본 제품을 사용하기 전에 취급설명서를 잘 읽은 후에 올바르게 사용을 주십시오.
또한, 취급설명서는 언제나 들고 볼 수 있는 곳에 반드시 보관해 주십시오.



(주)한영닉스
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MC0801KE231018

안전상 주의사항

사용전에 안전에 관한 주의사항을 잘 읽어 주시고 올바르게 사용하여 주십시오. 설명서에 표시된 주의사항은 중요도에 따라 위험, 경고, 주의 심별로 구분하고 있습니다.

⚠ 위험	지키지 않을 경우, 사망 또는 중상에 이르는 결과를 낳는 절박한 위험 상황을 표시하고 있습니다.
⚠ 경고	지키지 않을 경우, 사망 또는 중상이 발생할 가능성이 예상되는 내용을 표시하고 있습니다.
⚠ 주의	지키지 않을 경우, 경미한 상해나 재산상의 손해가 발생할 가능성이 예상되는 내용을 표시하고 있습니다.

위험

· 인, 출력 단자는 감전의 위험이 있으니 신체 및 통틀음이 절대로 접촉되지 않도록 하십시오.

경고

· 사용 전 안전 주의사항을 잘 읽고 올바르게 사용하여 주십시오.
· 본 기기의 고장이나 이상이 중대한 사고에 대한 우려가 있는 경우에는 외부에 적절한 보호 회로를 설치하고, 사고방지를 도모하여 주십시오.

· 본 기기의 파손방지 및 고장방지를 위하여 정격에 맞는 정격전압을 공급하여 주십시오.

· 감전방지 및 기기 고장방지를 위하여 모든 배선이 종료될때까지 전원을 투입하지 마십시오.

· 본 기기의 발착은 전원을 OFF한 후 조치하여 주십시오.
· 제조자가 지정한 방법 이외로 사용시에는 상해를 입거나 재산상의 손실이 발생할 수 있으니 주의 하십시오.

· 감전될 위험이 있으므로 통전중 본 기기를 패달에 설치된 상태로 사용하여 주십시오.

· 4 - 32 V d.c. 모델 신호 입력은 절연되고 제한된 전압/전류 또는 Class2, SELV 전원 장치로 공급하십시오.

· 쇼트회로 정격 전류는 3kA입니다.

사양

지류입력

형명	저압용	HSR-2D10LZ	HSR-2D20LZ	HSR-2D30LZ	HSR-2D40LZ	HSR-2D50LZ	HSR-2D70LZ
부하	저압용	10A	20A	30A	40A	50A	70A
	고압용	170A	260A	370A	420A	525A	525A
입력	저압용	170A	250A	370A	370A	525A	525A
	고압용	160A	250A	400A	400A	500A	500A
전력	정격부하전류	10A	20A	30A	40A	50A	70A
	투입전류 60Hz (8.3ms 비반복)	170A	260A	370A	420A	525A	525A
입력	투입전류 50Hz (10ms 비반복)	160A	250A	400A	400A	500A	500A
	누설전류	20 mA 이하					
전력	출력ON 전압강하	1.6 V (R.M.S)이하					
	정격전압	5 - 24 V d.c.					
전력	사용전압범위 (ON 전압)	4 - 32 V d.c.					
	복귀전압 (OFF 전압)	3V 이하					
전력	임피던스	4 kΩ 이하					
	소비전류	정전류 방식: 14 mA 이하					
전력	응답속도	1/2 Cycle + 1 ms max. ("R"타입 1 ms 이하)					
	절연저항	500 V d.c., 100 MΩ (임력과 출력 및 케이스사이)					
전력	내전압	2,500 V a.c. (60 Hz에서 1분간)					
	정격 임펄스 내전압 (Uimp)	2,500 V					
전력	내전동	10 - 55 Hz, 복전폭: 1.5 mm, X, Y, Z 각축방향 2시간					
	내충격	1,000 ms, X, Y, Z 각축방향 3회					
전력	보관온도	-30 ~ 90 °C					
	사용 주위 온도/습도	-30 ~ 80 °C (단, 결로되지 않을 것), 45 - 85 % RH					
전력	오염도 등급	2등급					
	볼트 체결 토크	입력 단자: 0.05 Nm / 출력 단자: 0.25 Nm					
전력	사용용도	저항성 부하					
	적용규격	CE 60947-4-3 RoHS2					
전력	중량 (박스포함)	약 110g				약 120g	

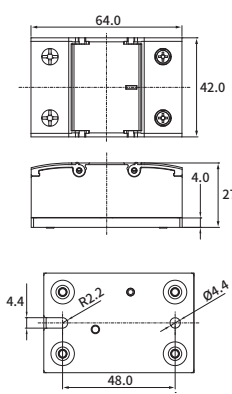
교류입력

형명	저압용	HSR-2A10LZ	HSR-2A20LZ	HSR-2A30LZ	HSR-2A40LZ	HSR-2A50LZ	HSR-2A70LZ
부하	저압용	10A	20A	30A	40A	50A	70A
	고압용	170A	260A	370A	420A	525A	525A
입력	저압용	170A	250A	370A	370A	525A	525A
	고압용	160A	250A	400A	400A	500A	500A
전력	정격부하전류	10A	20A	30A	40A	50A	70A
	투입전류 60Hz (8.3ms 비반복)	170A	260A	370A	420A	525A	525A
입력	투입전류 50Hz (10ms 비반복)	160A	250A	400A	400A	500A	500A
	누설전류	20 mA 이하					
전력	출력ON 전압강하	1.6 V (R.M.S)이하					
	정격전압	100 - 240 V a.c. 50/60 Hz					
전력	사용전압범위 (ON 전압)	90 - 264 V a.c. 50/60 Hz					
	복귀전압 (OFF 전압)	50V 이하					
전력	임피던스	40 kΩ 이하					
	소비전류	14 mA 이하					
전력	응답속도	1/2 Cycle + 1 ms max. ("R"타입 1 ms 이하)					
	절연저항	500 V d.c., 100 MΩ (임력과 출력 및 케이스사이)					
전력	내전압	2,500 V a.c. (60 Hz에서 1분간)					
	정격 임펄스 내전압 (Uimp)	2,500 V					
전력	내전동	10 - 55 Hz, 복전폭: 1.5 mm, X, Y, Z 각축방향 2시간					
	내충격	1,000 ms, X, Y, Z 각축방향 3회					
전력	보관온도	-30 ~ 90 °C					
	사용 주위 온도/습도	-30 ~ 80 °C (단, 결로되지 않을 것), 45 - 85 % RH					
전력	오염도 등급	2등급					
	볼트 체결 토크	입력 단자: 0.05 Nm / 출력 단자: 0.25 Nm					
전력	사용용도	저항성 부하					
	적용규격	CE 60947-4-3 RoHS2					
전력	중량 (박스포함)	약 110g				약 120g	

형명구성

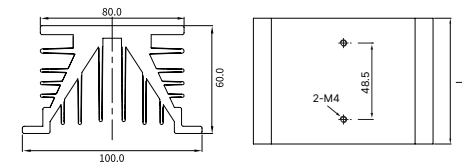
형명	코드	내용
HSR-2	□□□□□□□□	단상 일반형 무점점 릴레이
제어입력전압	D	4 - 32 V d.c.
	A	90 - 240 V a.c.
정격부하전류	10:	10A
	20:	20A
	30:	30A
	40:	40A
	50:	50A
	70:	70A
사용부하전압	L	24 - 240 V a.c. (저압용)
	H	24 - 480 V a.c. (고압용)
동작 방법	Z	제로크로스 스위칭 (표준품)
	R	랜덤 스위칭
방열판 옵션	T	방열판 + 바이메탈 장착 (50 A, 70 A에 한 함)
	N	방열판 없음 ※ 주의! 별도의 방열판 사용시에는 열저항표에 준한 방열판을 사용하여 합니다.

외형치수

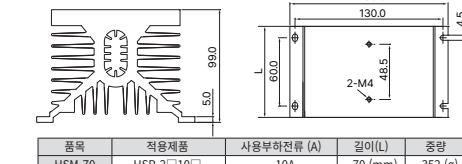


방열판 치수 (HEAT SINK)

■ 모델 : HSM series



■ 모델 : HSN series



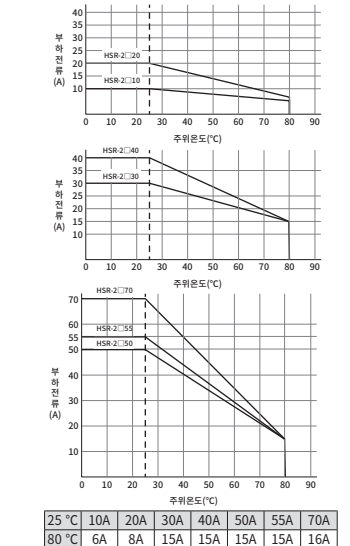
품목	적용제품	사용부하전류 (A)	길이(L)	중량
HSM-70	HSR-2□110□	10A	70 (mm)	352 (g)
HSM-110	HSR-2□120□	20A	110 (mm)	558 (g)
HSM-150	HSR-2□130□	30A	150 (mm)	758 (g)
	HSR-2□140□	40A	150 (mm)	758 (g)
HSM-80	HSR-2□150□	50A	80 (mm)	1,146 (g)
HSM-120	HSR-2□170□	70A	120 (mm)	1,712 (g)

※ 주의 1 (열저항표)

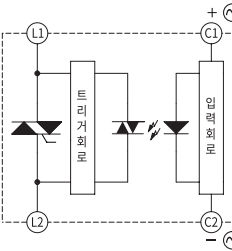
부하용량	방열판 열저항 (40°C 기준)
10A	2.00 °C/W
20A	1.00 °C/W
30A	0.50 °C/W
40A	0.25 °C/W
50A	0.30 °C/W
70A	0.15 °C/W

부하/투입 전류 특성

■ 방열판 부착

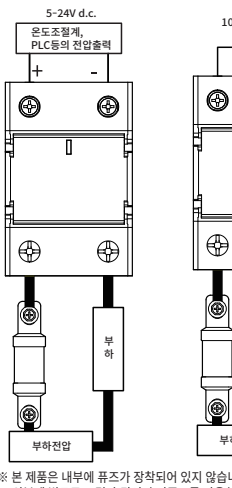


등가회로

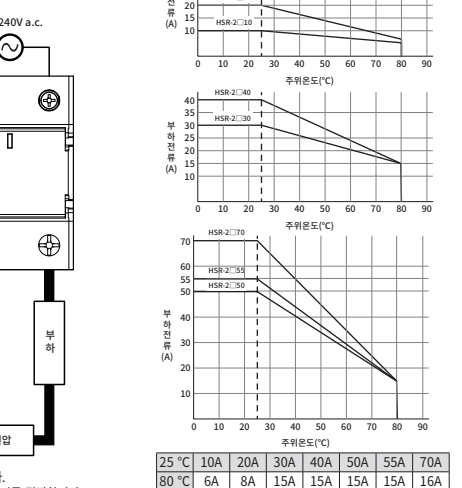


접속에

■ HSR-2D 타입

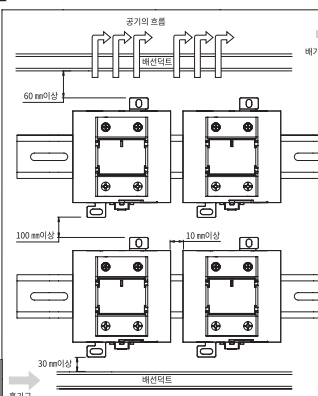


■ HSR-2A 타입



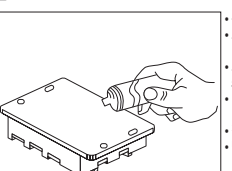
※ 본 제품은 내부에 퓨즈가 장착되어 있지 않습니다. 외부에 별도로 그림과 같이 축단퓨즈를 사용하시기를 권장합니다. (IEC 60269 규격에 따른 gG/gL 타입 퓨즈 사용)

설치간격



- 그림과 같이 설치간격을 해당부품 치수 이상으로 거리를 떨어뜨려 주십시오.
- 배선덕트는 공기의 흐름을 막지 않도록 방열판 높이 이하가 되도록 설치하여 주십시오.
- 당사 HSR은 주위온도 40°C이하의 조건에서 만족하므로 주위온도를 항상 규격온도보다 낮은 조건에서 사용하여 주십시오.
- HSR을 설치할 때는 반드시 방열판을 수직방향으로 설치하여 주십시오.
- 특이하게 수평으로 설치할 경우에는 제품의 성능이 50%이하로 떨어지게 됩니다.
- 입력단자배선: 1 X 0.5 mm² (1 X AWG20) 이상, 1 X 1.5 mm² (1 X AWG16) 또는 2 X 1.5 mm² (2 X AWG16) 이하
- 출력단자배선: 1 X 1.5 mm² (1 X AWG16) 이상, 1 X 16 mm² (1 X AWG6) 또는 2 X 6 mm² (2 X AWG10) 이하

방열판 사용시 주의사항



- 본 제품은 표준방열판과 방열 구리스를 필히 사용하십시오.
- 표준 방열판을 사용하여도 주위온도가 상승하거나 통풍이 되지 않으면 HSR 성능을 가져올 수 있으므로 주의 바랍니다. (주위온도: 40°C 이상)
- 보통 HSR 소자의 최대온도는 125°C 이상일때 파손되며 방열판의 온도가 85°C 이상일때 소자의 온도는 125°C 가 가까운 온도가 되므로 운전중 반드시 방열판 온도를 측정하여 주시기 바랍니다.
- 표준 방열판을 HSR을 취부할때는 열전도율이 원만한 방열판이 사용되도록 열전도성 구리스등을 사용하여 주시기 바랍니다.
- 진동에 풀리지 않도록 볼트로 완전히 고정하여 주십시오.
- 단열성 판재 (목판, 플라스틱, 고무)에는 사용하지 말고 반드시 표준 방열기를 이용하여 접촉면에 그림과 같이 방열 구리스를 도포한 후 부착하여 주십시오.

※ 그림과 같이 방열 실리콘 구리스를 방열기와 HSR 밑면에 골고루 도포하여 고정된 후 방열기의 골이 상하로 향하도록 감지에 고정하십시오.

INSTRUCTION MANUAL

HANYOUNGNUX CO.,LTD
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Incheon, Korea TEL : +82-32-876-4697
http://www.hanyoungnux.com

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.

⚠ 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 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					

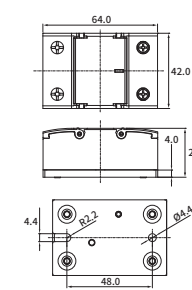
AC input

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

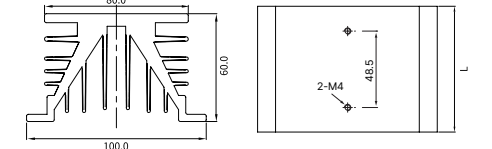
Model	Code	Information
HSR-2	[] : [] : [] : []	Single-Phase Solid State Relay
Control Input Voltage	D	4 - 32 V d.c.
	A	90 - 240 V a.c.
Rated load current	10	10A
	20	20A
	30	30A
	40	40A
	50	50A
	70	70A
Rated load voltage	L	24 - 240 V a.c. (Low voltage)
	H	24 - 480 V a.c. (High voltage)
Operation method (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

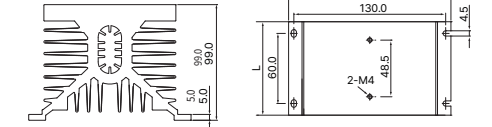


Heat Sink

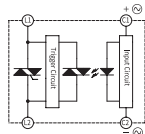
HSM series



HSN series



Equivalent Circuit



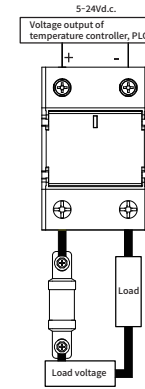
Model	Applicable Model	Capacity (A)	Length (L)	Weight
HSM-70	HSR-2 [10]	10A	70 mm	352 (g)
HSM-110	HSR-2 [20]	20A	110 mm	558 (g)
HSM-150	HSR-2 [30]	30A	150 mm	758 (g)
	HSR-2 [40]	40A	150 mm	758 (g)
HSN-80	HSR-2 [50]	50A	80 mm	1,146 (g)
HSN-120	HSR-2 [70]	70A	120 mm	1,712 (g)

※ CAUTION 1 (thermal resistance table)

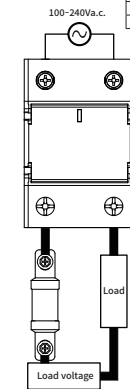
load capacity	Heatsink thermal resistance (40°C standard)
10A	2.00 °C/W
20A	1.00 °C/W
30A	0.50 °C/W
40A	0.25 °C/W
50A	0.30 °C/W
70A	0.15 °C/W

Connection

HSR-2D

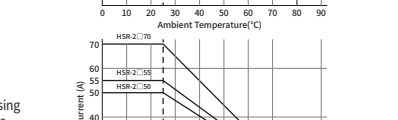
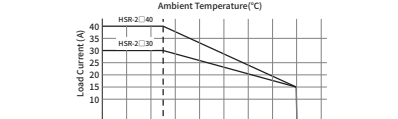
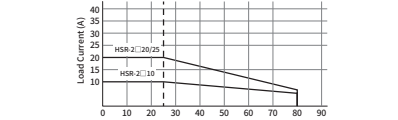


HSR-2A

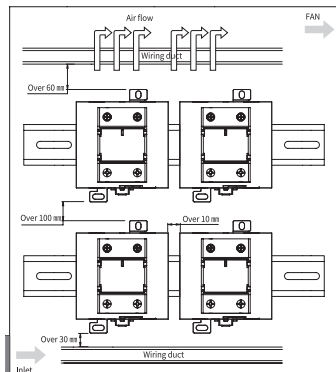


- This model does not have a fuse internally. So we suggest using fast-acting fuse separately on the outside as following picture. (using gG/gL type fuse according to IEC 60269 standard)

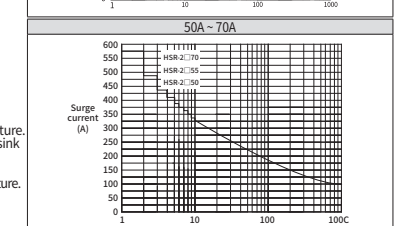
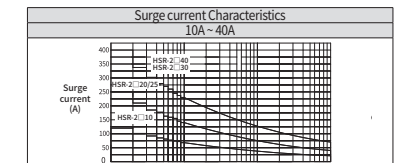
Input/Load



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 mm² (1 X AWG20) or larger
- Output terminal wiring: 1 X 1.5 mm² (1 X AWG16) or larger
- 1 X 1.5 mm² (1 X AWG16) or less than 2 X 1.5 mm² (2 X AWG16)
- 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.