HANYOUNG NUX HSR-2E Single Phase 2 Wire Control Overcurrent Sensing Solid State Relay Instruction Manual

Contents

HANYOUNG NUX

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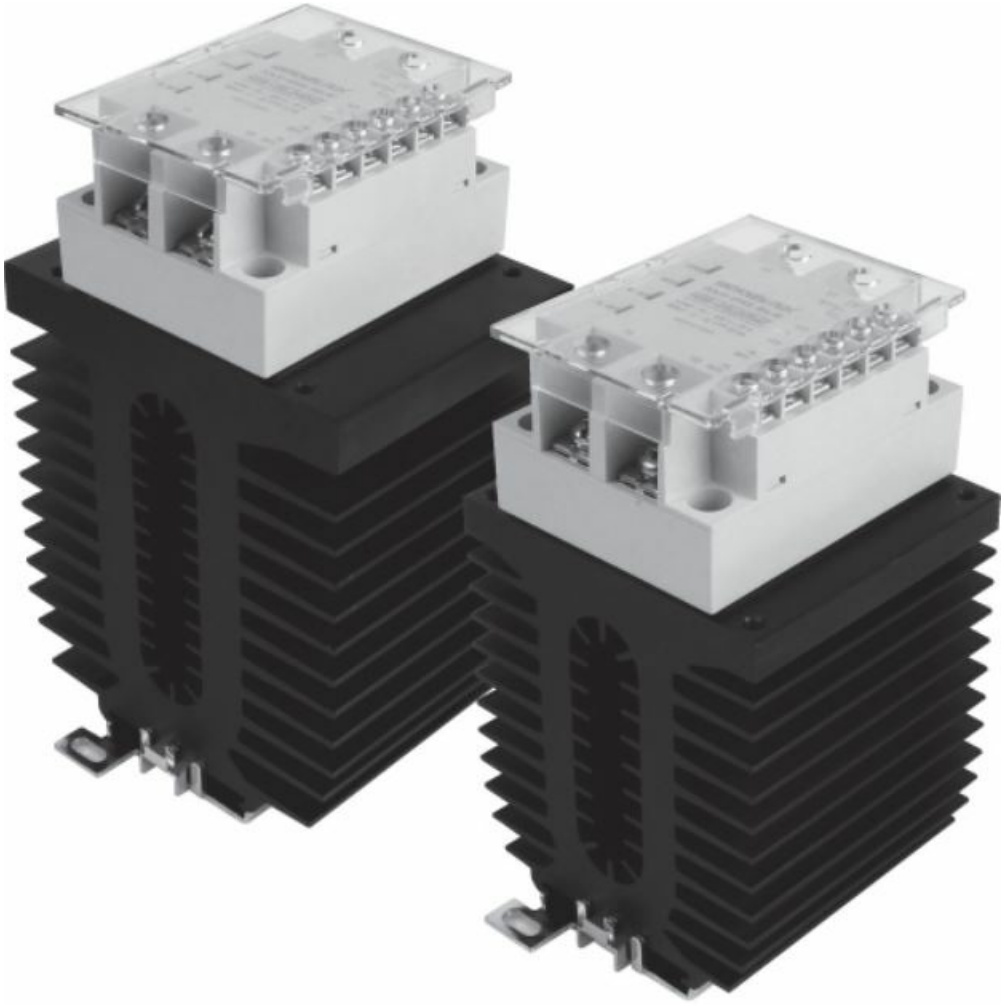


Thank you for purchasing Hanyoung Nux products. Please read the instruction manual carefully before using this product, and use the product correctly.
Also, please keep this instruction manual where you can view it at any time.

Safety information

Please read the safety information carefully before 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 that, 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 your body or conductive substances.

WARNING

- When used in equipment with a high risk of personal injury or property damage (examples: medical devices, nuclear control, ships, aircraft, vehicles, railways, combustion devices, safety devices, crime/disaster prevention equipment etc.) install double safety devices and prevent accidents. Failure to do so may result in fire, personnel accident or property damage.

- Please read the safety information carefully before 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, 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.

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, and magnetic noise are generated.
- Please avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.
- When water enters, a 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 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 disposing of the product, treat it as industrial waste.

Suffix code

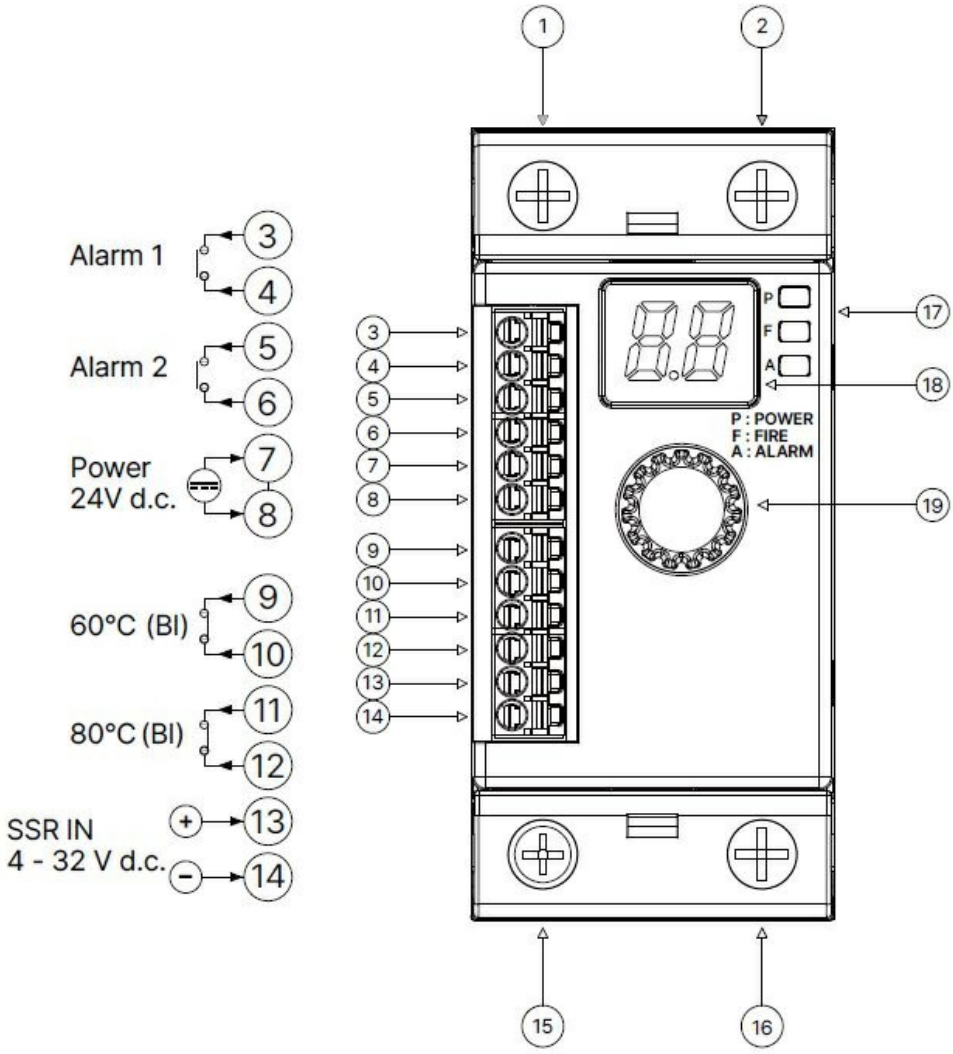
Model	Code			Content
HSR	☐	☐	☐	Single-phase 2-wire control overcurrent sensing solid-state relay
Rated load current	10			10 A
	20			20 A
	30			30 A
Rated load voltage		L		24 - 240 V a.c.
		H		24 - 480 V a.c.
Operation method			Z	Zero cross switching

Specifications

Model			HSR-2E10LZ HSR-2E10HZ	HSR-2E20LZ HSR-2E20HZ	HSR-2E30LZ HSR-2E30HZ
Output	Load voltage range		24 - 240 V a.c.		
			24 - 480 V a.c.		
	Peak voltage		1,200 V		
	Surge current		400 A		
	Rated load current		10 A	20 A	30 A
	Leakage current		Max. 15 mA		
	Voltage Drop at ON-state		Max. 1.6 V (R.M.S)		
Input	control signal	Voltage (V)	4 ~ 32 V d.c.		
		Current (mA)	4 ~ 14 mA d.c.		
	circuit power		22 ~ 25 V d.c.		
	OFF-state voltage		Max. 1 V		
	current consumption		Max. 34 mA d.c.		
Contact Rating	Relay Contact		Alarm1, Alarm2, 0.5A, 125 V a.c. / 0.3A, 110 V d.c. / 1A, 30 V d.c.		
	BI METAL Contact		Max. 60°C, 80°C, 2.5A, 48 V d.c.		Max. 60°C, 80°C, 0.5A, 240 V a.c.
Response Time			1/2 Cycle +1 ms max. 8.3 msec (60Hz)		
Insulation resistance			500 V d.c., 100 MΩ		
Dielectric strength			2,500 V.a.c. (60 Hz for one minute)		
Rated impulse withstand voltage (Uimp)			2,500 V		
Vibration resistance			10 - 55Hz, single amplitude : 1.5 mm, Each X • Y • Z axis for 2 hours		
Shock resistance			1,000 ㎨, X • Y • Z Each X· Y· Z axis for 3 times		
Storage temperature			-30 ~ 90°C		
Ambient temperature			-20 ~ 50°C (No Condensation)		
Ambient humidity			30 ~ 85% RH		
Load current used			Resistive load		
Mounting Specification			DIN Rail & Screw		
Approval			CE cULus		
Weight (g) with heatsink box			Approx. 350 g	Approx. 542 g	Approx. 700 g

Description of Each Part

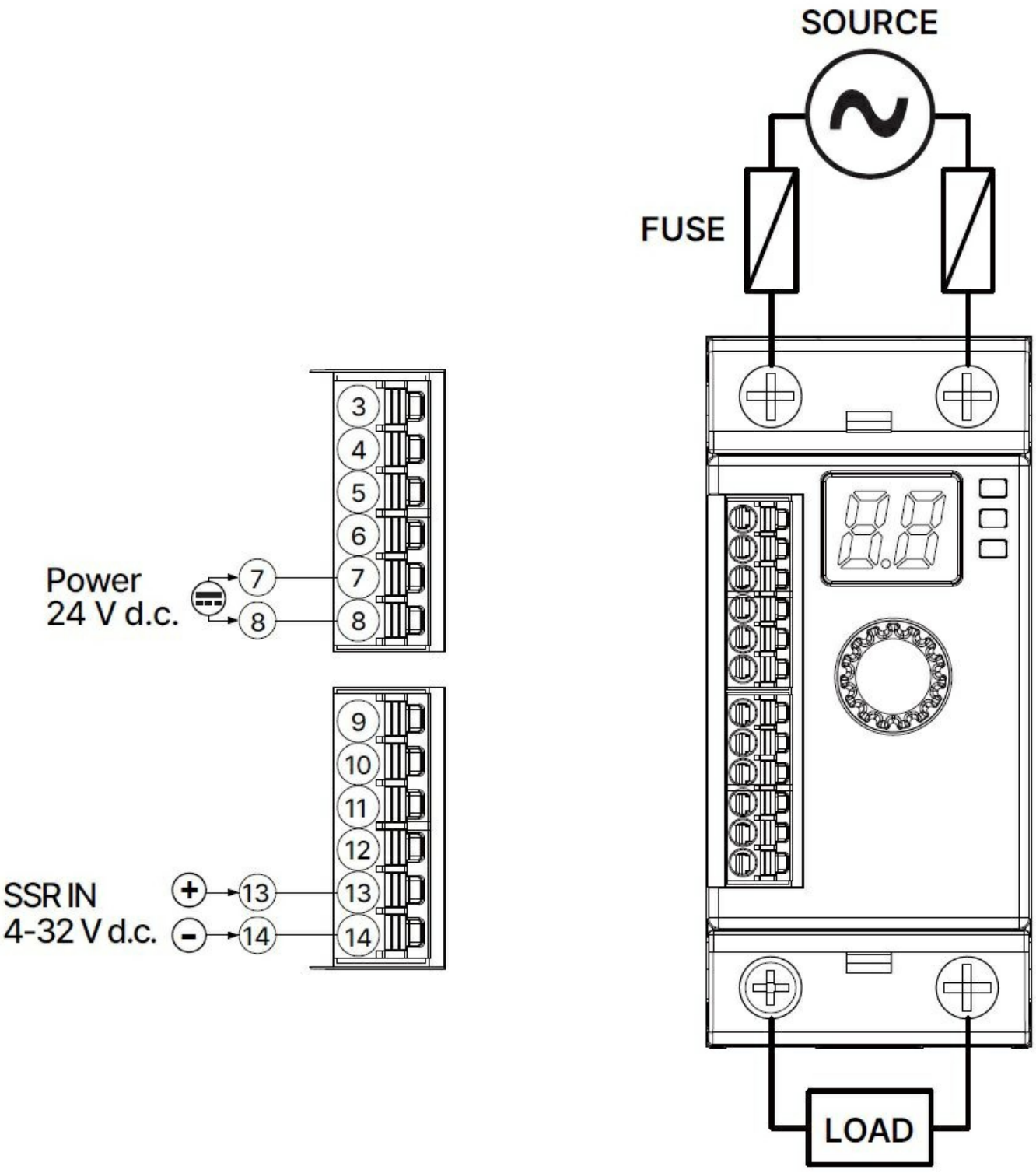
No,	Content
1	Load Power
2	
3	Alarm 1 Relay (Warning)
4	
5	Alarm 2 Relay (Alarm)
6	
7	Power Input 24 V d.c.
8	
9	Alarm 60 (Bimetal)
10	
11	Alarm 80 (Bimetal)
12	
13	SSR Input 4 ~ 32 V d.c.
14	
15	Load
16	
17	Status Display LED
18	Status Display FND
19	Operation Jog



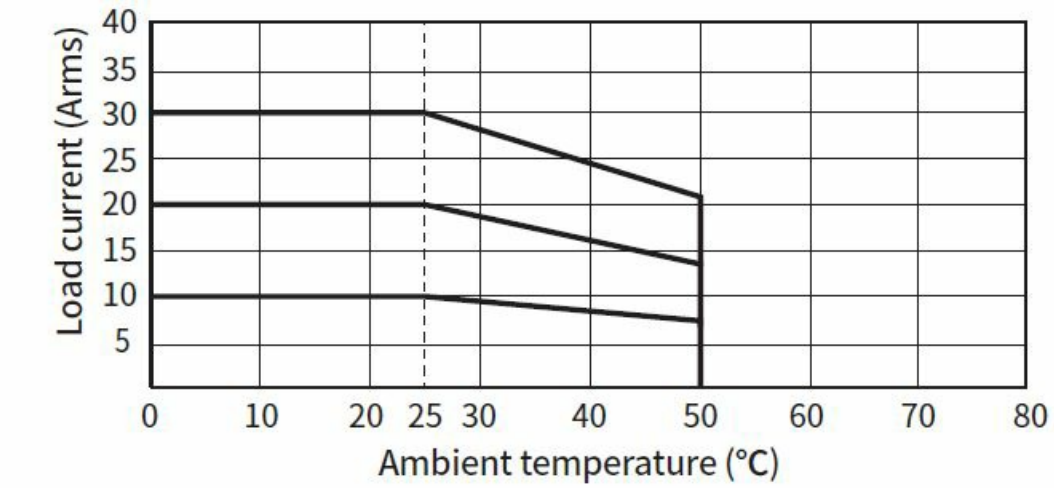
Connection Example

Caution

- This product does not have an internal fuse.
- We recommend using an external fast-acting fuse as shown in the diagram.
- Operating circuit power: terminals 7 and 8.
- Control signal input: terminals 13 and 14.

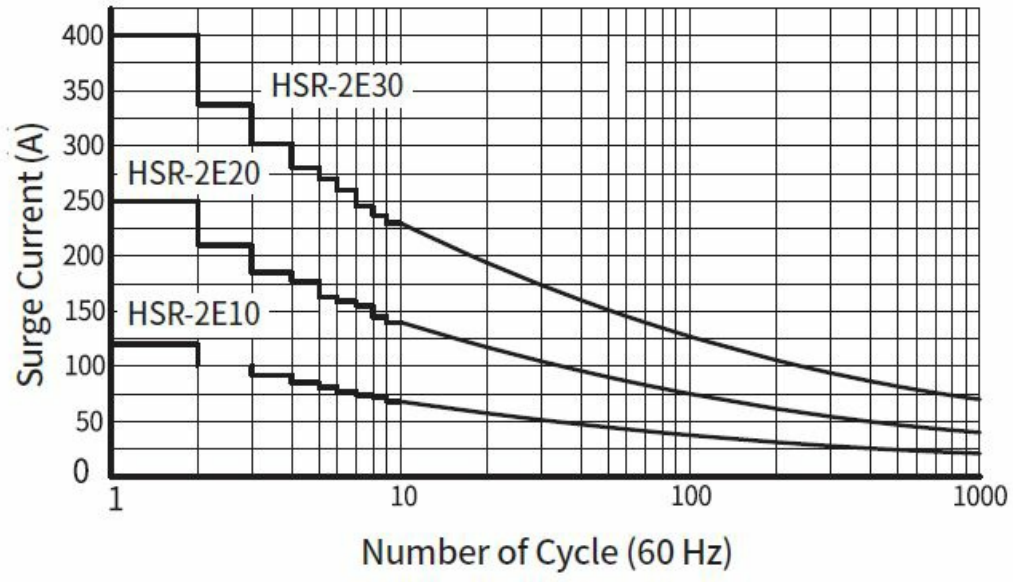


Load Current Characteristics



25°C	10 A	20 A	30 A
50°C	7 A	14 A	21 A

Input current characteristics
10 A ~ 30 A



LED Status Display and Function

LED Color	Functions	Content
Green (P: POWER)	System Management	System monitor: Auto mode = lit / Manual mode = flashing
Blue (F: FIRE)	Output Status	Output monitor: Lit when control input is ON in Auto mode Flashing according to output level from 0 to 100% in Manual mode
Red (A: ALARM)	Abnormal Alarm	Alarm 2 (Alert) : Illuminated (Triac Short, Overcurrent 200%) Alarm 1 (Caution) : Flashing (Overcurrent, Undercurrent, Load Bottom Wire)
Jog	Function Control	Function operation and selection.

Description of Automatic Mode Jog Operation

Types of Operation	How to operate	Function Description:
Switch operation	Press the jog switch	Menu function selection / saving
Jog operation	Rotate to the right	Increase menu change and setting value
	Rotate to the left	Decrease menu change and setting value
Setting method		

How to use User Setup Menu

1. Press and hold Jog on the main screen to enter the user settings menu.
2. On the user setting menu screen, the parameter name is displayed for 1 second, then blinks twice and the parameter setting value is displayed repeatedly.
3. Rotate the jog left/right on the user setting menu screen to change the parameter setting value.
4. If you press the jog button once briefly, you can enter the parameter setting value editing screen.
5. After completing the setting, press and hold the jog on the user setting menu screen to save and return to the main screen.

If there is no operation for more than 5 seconds, it will automatically return to the main screen without saving.

Description of User Settings Menu Display

No	Display	FND	Setting value	factory default	Function
①	dt	dt	1 ~ 99 sec	1 sec	Initial start-up delay time setting *Available only at first start-up
②	oc	oc	0.5 ~ 15/25/35 A	10/20/30 A	Overcurrent detection current value setting *oF = Not used ※Caution 1) Current value varies depending on the product
③	ot	ot	0.1 ~ 30 sec	0.5 sec	Overcurrent detection delay time setting
④	Uc	Uc	0.4 ~ 14/24/34 A	oF	Low current detection current value setting *oF = not used (you cannot set a value higher than overcurrent)
⑤	Ut	Ut	0.1 ~ 30 sec	5 sec	Low current detection delay time setting
⑥	Ar	Ar	0.1 ~ 9.9 sec	oF	Set automatic alarm reset delay time *oF = disabled
⑦	tS	tS	0.5 ~ 9.9 sec	oF	Current sampling time setting (adjusted according to control frequency)
⑧	om	om	-	-	not used
⑨	cm	cm	oF, Vc, Fc, Pc	Vc	Control mode selection (Vc = variable cycle control when using manual mode, Fc = fixed cycle control)*Auto mode not applicable*
⑩	cl	c1	-	-	not used
⑪	Lb	Lb	1 ~ 5 Sec	oF	Set load shedding delay time *oF = not used (Activated when not measuring current when the control input signal is ON)
⑫	Wc	wc	_A/_b	_b	Alarm 2 (Alarm) Always change contact state
⑬	cc	cc	_A/_b	_b	ALARM 1 (Caution) Continuous contact status change
⑭	oA	oA	on/oF	on	Change overcurrent alarm type (oF = Alarm 1 (Caution), On = Alarm 2 (Alarm))
⑮	Mc	mc	on/oF	oF	Current measurement method change
⑯	Lc	Lc	on/oF	oF	Set whether to use knob operation lock in auto mode *oF = Not used (Unlock by pressing and holding the knob for 2 seconds or more)
⑰	PI	P1	on/oF	oF	Factory reset of user-set parameters (automatic system reset after setup)

Note 1) Overload current value depends on the model ▶ 15A ▶ 25A ▶ 35A

Display of User Assistance Menu Screen

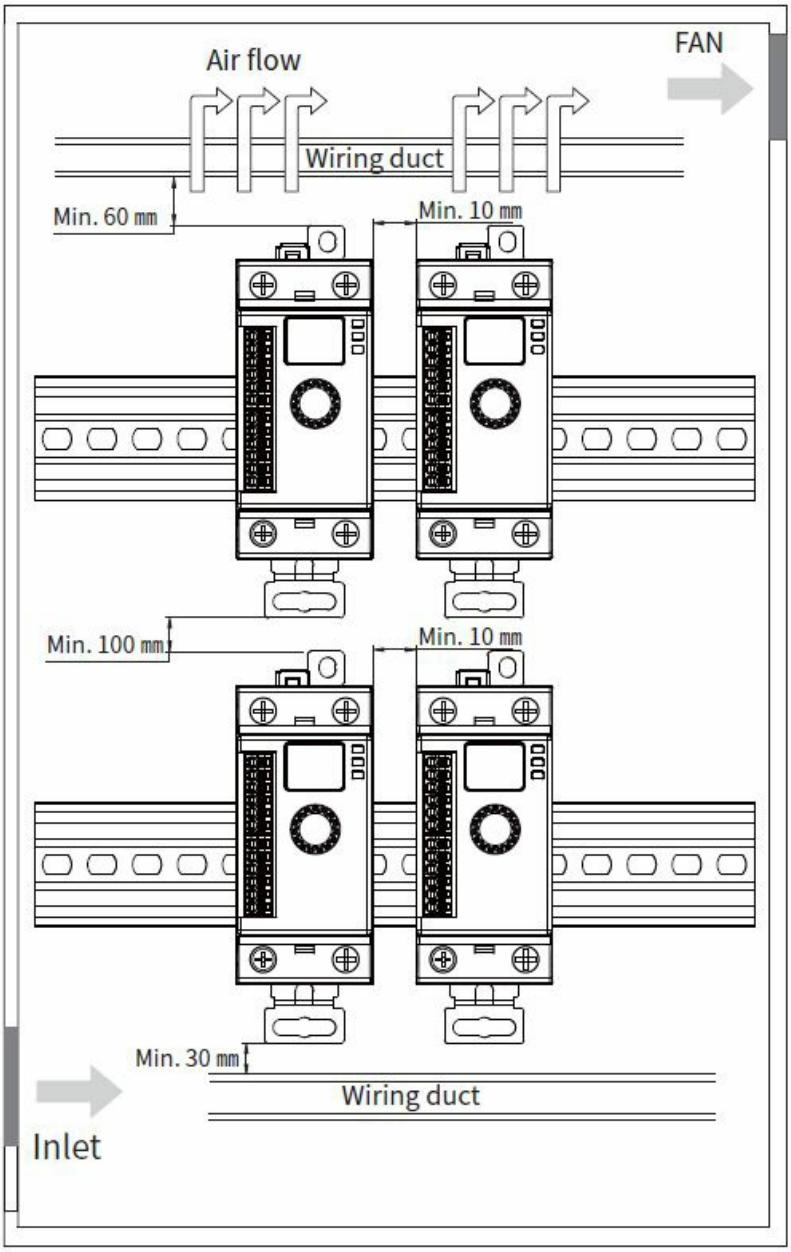
Display	FND display	Set value	Shipment set value	Function
om	AU/mU	AU/mU	AU	Select operation mode (AU = automatic mode, mU = manual mode)
Lt	Lt	on/oF	oF	FND/LED self-test ON/OFF
At	At	on/oF	oF	Alarm relay self-test ON/OFF
AL	AL	-		Alarm list (move to the alarm list confirmation screen)

Manual Mode Description

(Stand Alone Control)
Cannot be used except for adjusting the amount of output

Types of Operation	How to operate	Function Description	
Switch operation	no manipulation	Output amount: 0%	
	Jog Push Down	Output amount: 100%	
Jog operation	Turn to the right	Increase output amount: 0 ~ 100%	
	Turn to the left	Decrease output amount: 100 ~ 0%	
Incremental output control method			Operation method of manual mode
Output control methods		1. Variable cycle On/Off control	User Sub Menu -> om -> mU setting
		2. Fixed cycle On/Off control	Method of ending Stand Alone Control
			When external control input is applied, it immediately switches to automatic operation mode.
			If the switch is operated twice in a row, it switches to automatic operation mode.

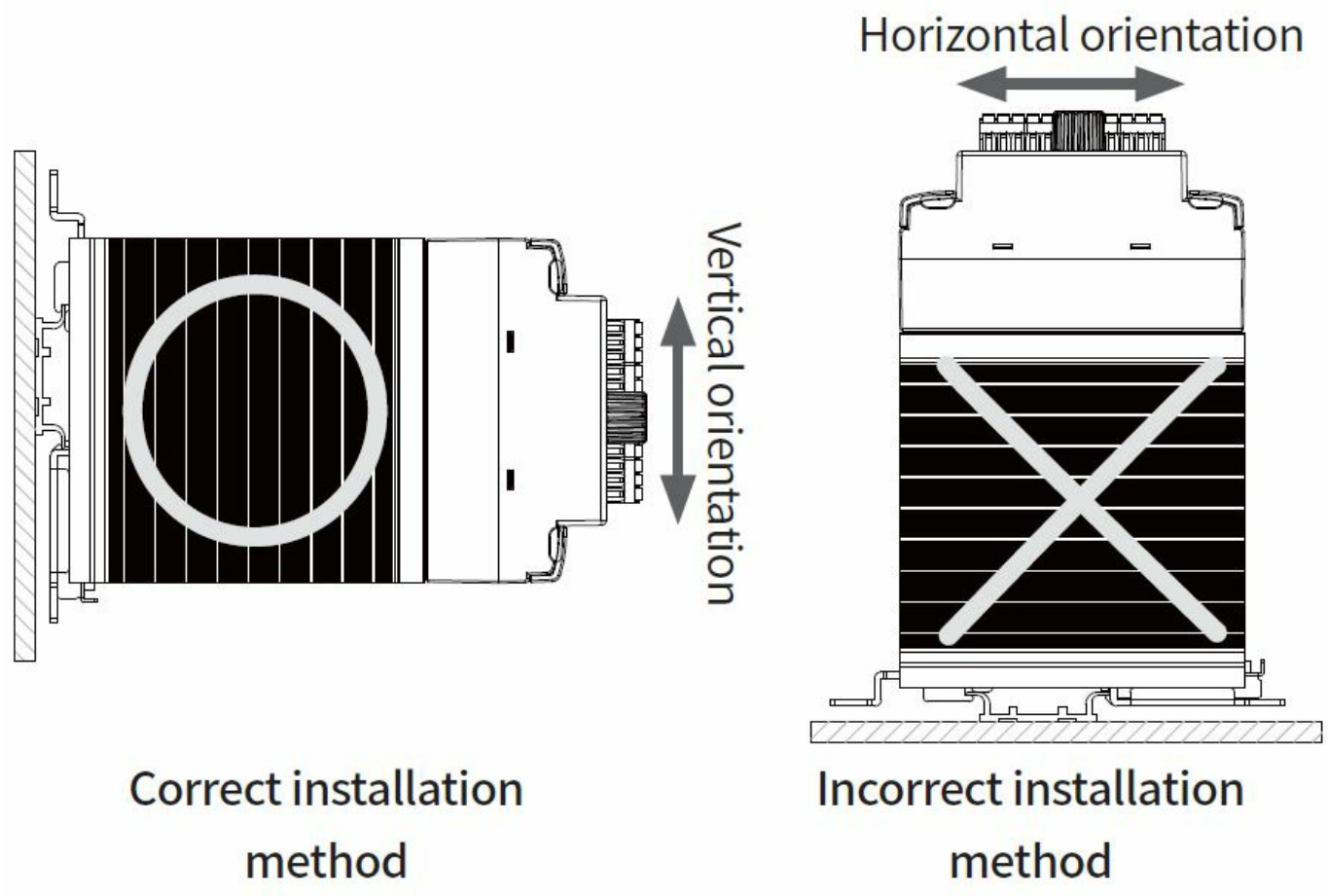
Installation Clearance



Caution

- Please ensure that the installation clearance is at least the dimension indicated in the diagram.
- When installing wiring ducts, please make sure they are installed with a height of no more than half of the heat sink plate to avoid obstructing the airflow.
- HSR is designed to meet the specified conditions at ambient temperatures of 25°C or below. Please use the product under conditions where the ambient temperature is always lower than the specified temperature.
- When installing HSR, be sure to install the heat sink plate in the vertical direction.
- If installed horizontally, the product's performance will be reduced by 50% or more.

Installation Method



Caution

1. Torque selection
    - Input/Output terminals: 0.25 Nm
2. Modification of terminal wiring notation

- Input terminal wiring (10 A / 20 A / 30 A)
- 1.31SQ (mm2)
- Output terminal wiring
- 10A: 1.31SQ (mm2)
- 20A: 4.17SQ (mm2)
- 30A: 5.26SQ (mm2)

Flow Chart

Reading parameters (example)

■ Jog operation manual

division	Operation	explanation
	turn left/right	Menu movement, setting value change
	press once briefly	Set value application, set value change, screen entry
	Press and hold for more than 2 seconds	Save set value, enter menu, exit menu
	Press twice at 1 second interval	Escape from manual mode

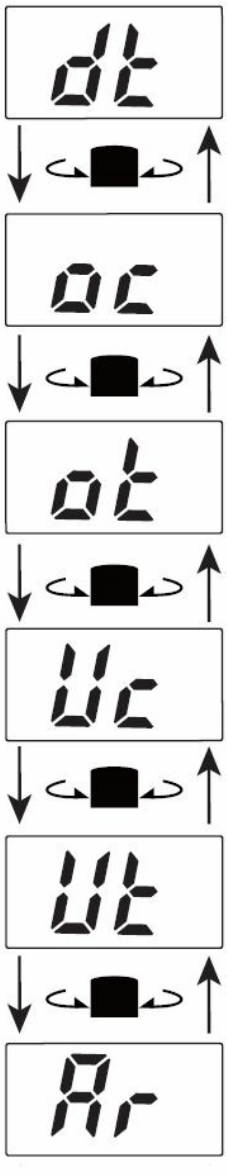
Display on FND

Initial value setting

- Setting value: 1 ~ 99 sec
- Factory setting value: 1 sec
- Initial power-on waiting time setting

Entering User Menu

(Jog push down for 1 second or more.) 



▶ Setting value: 1 ~ 99 sec
▶ Factory setting value: 1 sec
▶ Setting the initial power-on waiting time.

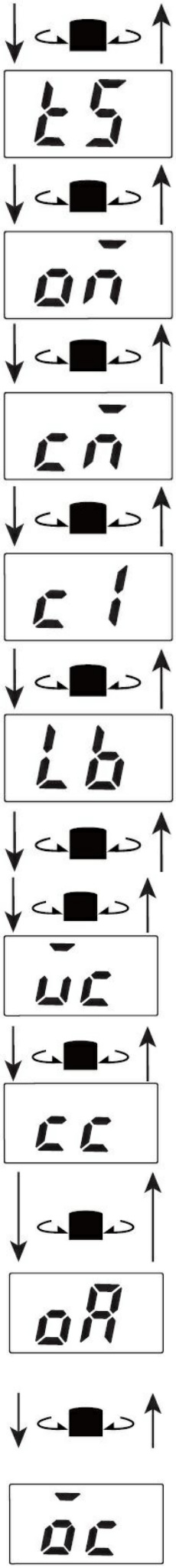
▶ Setting value: 0.5 ~ 25 A
▶ Factory setting value: 20 A
▶ Setting the overcurrent detection current value.

▶ Setting value: 0.1 ~ 30 sec
▶ Factory setting value: 0.5 sec
▶ Setting the overcurrent detection delay time.

▶ Setting value: 0.4 ~ 24 A
▶ Factory setting value: oF
▶ Setting the undercurrent detection current value.

▶ Setting value: 0.1 ~ 30 sec
▶ Factory setting value: 5 sec
▶ Setting the undercurrent detection delay time.

▶ Setting value: 0 ~ 99 sec
▶ Factory setting value: oF
▶ Setting the delay time for automatic alarm reset.



▶ Setting value: 0.5 ~ 10 sec
▶ Factory setting value: oF
▶ Setting the current sampling time.

▶ Setting value: -
▶ Factory setting value: -
▶ Selecting the operating mode.

▶ Setting Value: oF, Vc, Fc, Pc
▶ Default Value: Vc
▶ Control Mode Selection

▶ Setting Value: -
▶ Default Value: -
▶ Control Input Selection

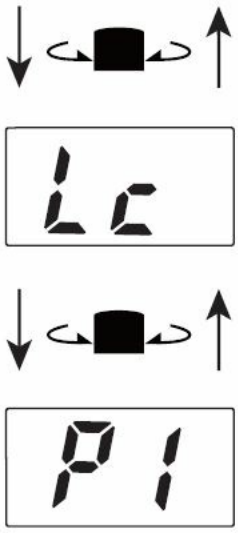
▶ Setting range: on/oF
▶ Default setting: oF (not used)
▶ Setting the load disconnect delay time

▶ Setting value: _A/_b
▶ Default value: _b
▶ Constant change of contact state for Alarm 2 (Alert)

▶ Setting value: _A/_b
▶ Default value: _b
▶ Constant change of contact state for Alarm 1 (Caution)

▶ Setting value: on/oF
▶ Default value: on
▶ Change of overcurrent alarm type
(oF = Alarm 1 (Caution), on = Alarm 2 (Alert))

▶ Setting value: on/oF
▶ Default setting: oF
▶ Change current measurement method

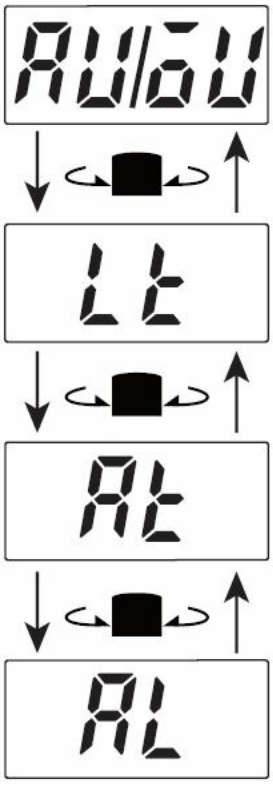


▶ Setting range: on/oF
▶ Default setting: oF (not used)
▶ Whether to use knob operation lock

▶ Setting range: on/oF
▶ Default setting: oF
▶ Factory Reset User Setting Parameters

Entering Auxiliary Menu

(Rotate jog to the right.) 



▶ Setting value: AU/mU
▶ Default setting value: AU
▶ Operating mode selection (Auto/Manual)

▶ Setting value: on/oF
▶ Default setting: oF
▶ Display self-test ON/OFF

▶ Setting value: on/oF
▶ Default value: oF
▶ Alarm Relay self-test ON/OFF

▶ Setting Value: -
▶ Shipped Value: -
▶ Alarm List (Move to Alarm List Check Screen)

Alarm display list

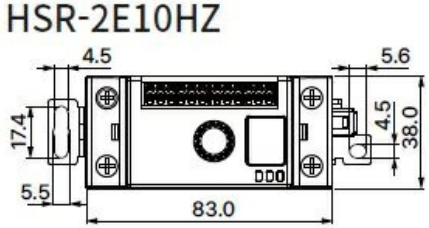
No.	FND	Function
①	- -	Data not available
②	oC	Overcurrent (Alarm 1/Alarm 2) = Occurs when the current is higher than the overcurrent setting value ※ If an alarm occurs while the alarm type is set to alarm 2, the output is forcibly released.
③	o2	Overcurrent 200% (Alarm 2) = Occurs when the overcurrent is over 200 % of the set value ※ If an overcurrent 200% alarm occurs, it is a fatal situation that may cause a short circuit on the load side. Therefore, it is necessary to immediately turn off the load power and check.

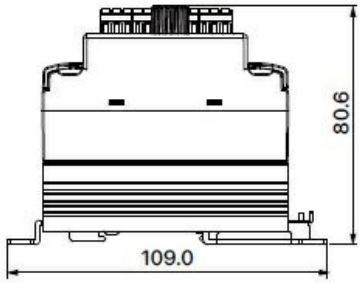
④		Low Current (Alarm 1) = Occurs when the current is lower than the low current setting value ※ The low current alarm can be used as a partial load disconnection function when using parallel loads. After setting the low current detection delay time sufficiently, the current decrease can be detected to infer partial load disconnection.
⑤		Triac Shorted (Alarm 2) = When the control input is not applied, the current Occurs when detected ※ Triac short-circuit is a fatal situation, so in order to cope with the situation, a separate safety circuit must be configured by interlocking the alarm 2 relay so that the load power can be immediately cut off when an alarm occurs.
⑥		Load disconnection during operation (Alarm 1) = Occurs when control input is applied and current is less than 0.4A during operation ※ If a load disconnection alarm occurs, it is necessary to inspect the load because it is suspected that the load is damaged or the wiring is disconnected.

Dimensions

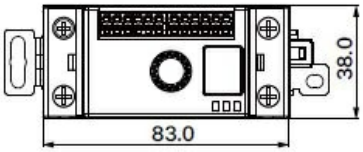
[Unit : mm]

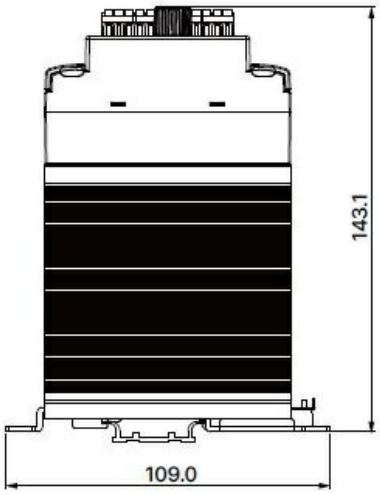
HSR-2E10HZ

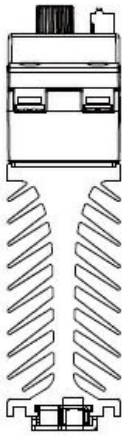




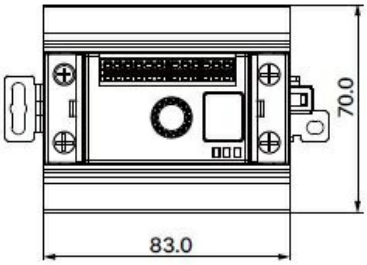
HSR-2E20HZ

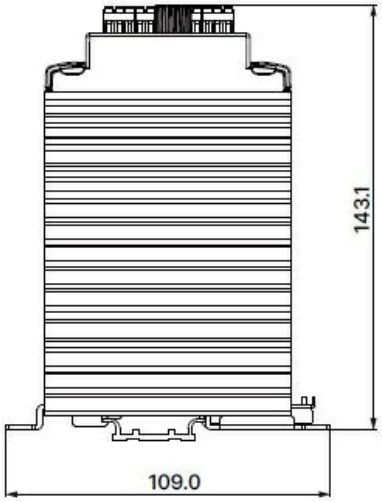


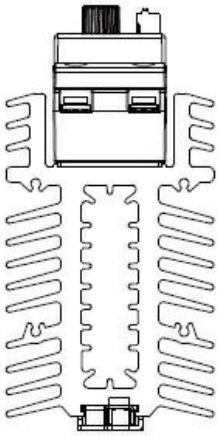




HSR-2E30HZ







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Documents / Resources

	HANYOUNG NUX HSR-2E Single Phase 2 Wire Control Overcurrent Sensing Solid State Relay [pdf] Instruction Manual HSR-2E, HSR-215E, HSR-2E Single Phase 2 Wire Control Overcurrent Sensing Solid State Relay, Single Phase 2 Wire Control Overcurrent Sensing Solid State Relay, 2 Wire Control Overcurrent Sensing Solid State Relay, Overcurrent Sensing Solid State Relay, Sensing Solid State Relay, Solid State Relay, State Relay, Relay

References

- H HANYOUNG NUX
- User Manual