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## Safety precautions

### EH-150 series PLC **HITACHI** EH-PSR, EH-BS8R Redundant power supply module and base unit

Thank you for purchasing a Hitachi Programmable Logic Controller. To operate it safely, please read this instruction manual and all the user manuals carefully. Please be sure to use the latest versions of user manuals and keep them at hand of end users for future reference.

#### Caution

1. All rights reserved.
2. The content of this manual may be changed without notice.
3. While efforts have been made on this manual to be accurate, please contact us if any mistake or unclear part is found.

#### Warranty period and coverage

The warranty period is within 18 months after manufacturing date (MFG No) or 12 months after installation.

Examination and repair within the warranty period is covered. However within the warranty period, the warranty will be void if the fault is due to;

- (1) Incorrect use from instructed in this manual and the application manual.
- (2) Malfunction or failure of external other devices than this unit.
- (3) Attempted repair by unauthorized personnel.
- (4) Natural disasters.

The warranty is for the PLC only, any damage caused to third party equipment by malfunction of the PLC is not covered by the warranty.

#### Repair

Any examination or repair after the warranty period is not covered. And within the warranty period any repair and examination which results in information showing the fault was caused by any of the items mentioned above, the repair and examination cost are not covered. If you have any questions regarding the warranty or repair cost, please contact your supplier or the local Hitachi Distributor. (Depending on failure part, repair might be impossible.)

#### Ordering spare parts and inquiries

Please contact your local suppliers for ordering products/spare parts or any inquiries with providing the following information.

- (1) Product name
- (2) Manufacturing number (MFG No.)
- (3) Details of failure

#### Definitions and Symbols



**DANGER**

Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.



**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage of product.



: Indicates Prohibition



: Indicates Compulsion



**DANGER**

- Do not touch terminals while power ON. There is a danger of electric shock and/or injury.
- Be sure to install external safety devices outside of the PLC like emergency stop circuit or interlock circuit.



**CAUTION**

- Be sure that the rated voltage matches the power supply voltage of the unit. Otherwise, there is a danger of breakdown and/or injury and/or fire.
- Only qualified personnel shall carry out wiring work. Otherwise, there is a danger of breakdown and/or injury and/or fire.



**COMPULSION**

- Be sure to ground the unit. Otherwise, there is a danger of electric shock and/or malfunction.



**PROHIBITION**

- Do not attempt to modify nor disassemble the unit. There is a danger of breakdown and/or injury and/or fire.

#### Mounting

- Mount the PLC on a metal plate and install in a cabinet as follows.
- Be sure to ground the cabinet and the metal plate, otherwise there is a risk of malfunction.
- Install the PLC as described in user manual.
- Take appropriate measures when the PLC system installed in locations:
  - Influenced easily due to noise or static electricity or other forms of noise.
  - Under strong electromagnetic field.
  - Close to power supplies.
- Be sure to tighten mounting screws, terminal screws and connector screws.
- Be sure to check that devices with lock mechanism, such as an expansion cable or terminal blocks, are locked properly.

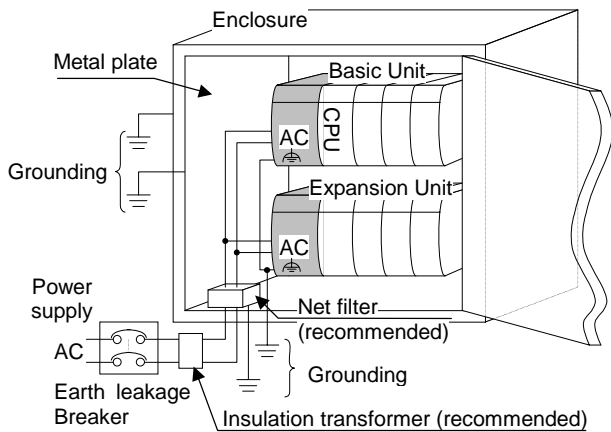


Figure 1 Power wiring example

Table 1 Specifications of the net filter

Item		Spec.
Rated voltage(VAC)		250
Rated current(A)		5
Withstand voltage (V) (between Terminal and case)		1500
Insulation resistance (MΩ) (500V DC, 1min., between terminal and case)		min. 100
Attenuation characteristic (dB)	0.5 to 30 MHz	Common mode more than 40dB
	0.15 to 30 MHz	Differential mode more than 40dB

### ■ Power Wiring

- Appropriate emergency circuitry, interlock circuitry and similar safety measures should be added to the system.
- Appropriate safety measures should be included in the system for unexpected breaking of wire or malsignal caused from instantaneous power failure.
- Applied voltage must be in the range specified in the manual. Otherwise, there is a danger of breakdown and/or injury and/or fire.
- Install an external earth leakage breakers to avoid short circuit accident.
- In case of the following operations, turn off power. Otherwise, there is a danger of breakdown and/or injury and/or fire.
  - Mounting or dismounting CPU and I/O modules.
  - Assembling cabinet or machine including PLC.
  - Wiring.
- Install net filter specified in Table-1 or similar. The input and output cable of the net filter should be separated as much as possible. Be sure to ground the net filter.
- A shielded and insulated transformer is recommended.
- The basic and expansion unit should be connected to common power source and powered up together as shown in Figure.1.
- To install an arrester in each power wire is recommended in order to prevent lightning damage and/or injury.

### ■ I/O Wiring

- Be sure that the input/output matches the specified voltage. Otherwise, there is a danger of breakdown and/or fire.
- Use shielded cable for relay outputs modules, and connect shields to a functional ground for one side or both sides depending on applications.
- Route the AC power line and I/O lines separated as much as possible. Do not route both cables in a same duct.
- Route the I/O lines and data lines as close as possible to the grounded surfaces such as cabinet elements, metal bars and cabinets panels.
- Refer to the following table.

Electric wire for wiring			Terminal tightening torque
Size	Material	Type	
22-14 AWG	Copper	Single/twisted wire available	9in. -1bs (1.02 Nm)

### ■ Common precautions

- Use proper cable ferrules for terminals. Using improper cable ferrules or connecting bare wires to terminals directly might result in fire.
- Do not turn on power, if the unit appears damaged.
- Be sure to check all the field wiring before PLC power on. Otherwise, there is a risk of fire.
- Do not attempt to disassemble, repair or modify any part of the PLC.
- Do not pull on cables or bend cables beyond their natural limit. Otherwise, there is a risk of breaking of wire.
- Keep PLC modules in their boxes during storage and transport.
- Check carefully your PLC program before operation.

### Installation environment

- Avoid the following locations to install the PLC.
- Excessive dusts, salty air, or conductive materials (iron powder, etc.)
  - Direct sunlight.
  - Temperature less than 0°C or more than 55°.
  - Humidity less than 20% or more than 90%.
  - Dew condensation.
  - Direct vibration or impact to the unit.
  - Corrosive, explosive or combustible gases.
  - Water, chemicals or oil splashing on the PLC.
  - Close to noise emission devices.

### Reference Manual

Read the following application manual carefully depends on series to use the PLC safely and properly. Be sure to keep the latest version.

Manual name	Manual No.
EH-150 series APPLICATION MANUAL	NJI-280 (X)*
EHV series APPLICATION MANUAL	NJI-481(X)*

\* The alphabet between 280 and (X) means version (A, B...) and the space means the first edition.

# Redundant power supply module

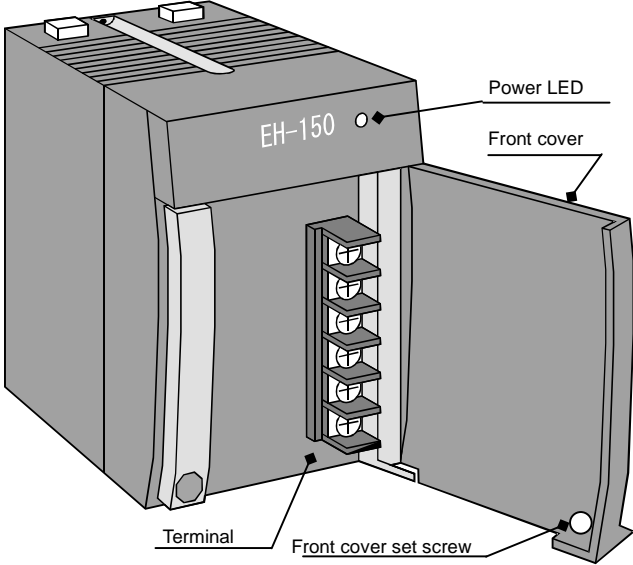
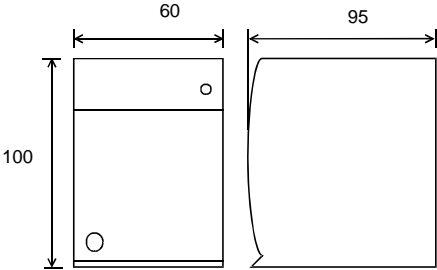
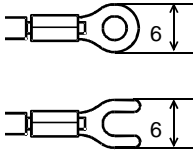
## Outline:

It is possible to construct a redundant power supply system by using redundant power supply module (EH-PSR) and redundant base unit (EH-BS8R).

EH-PSR is possible to output an error status by relay contact.

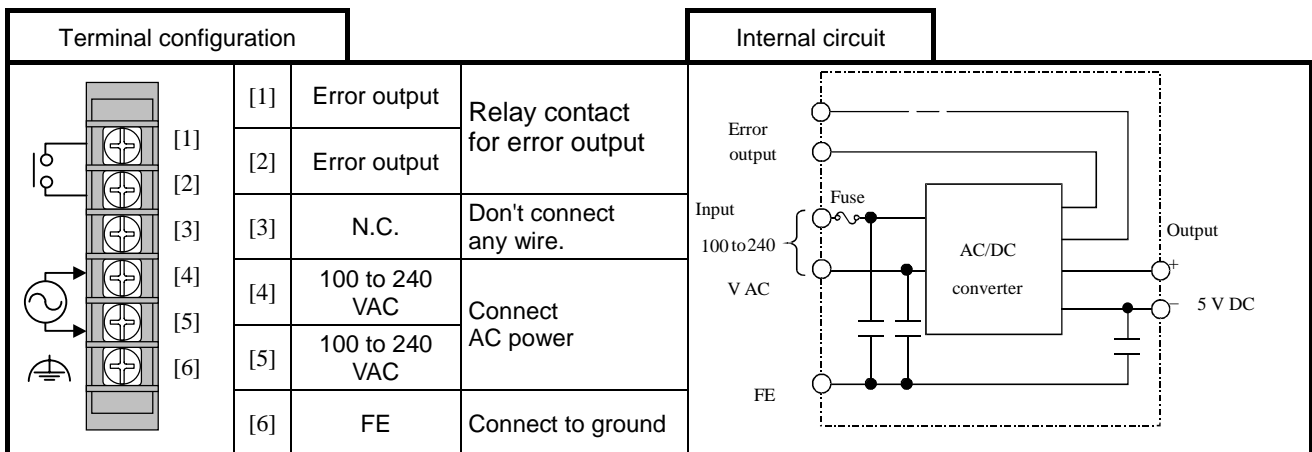
Also it is possible to monitor the power supply operation status by using EH-BS8R base unit and EHV-CPU, or EH-516/548CPU. The operation status could monitor as input data of 11th slot.

EH-PSR is possible to use as large capacity power supply on the standard base.

Name and function		Type(Weight)	EH-PSR (approximately 0.36kg)
		Dimension (mm)	
			
Function	This module convert the AC power supplied from external to DC power for digital circuit. The operation status can be confirmed with a front POWER lamp.		
Name	Function	Remarks	
POWER lamp	Light on: it is supply AC power lights off: it is not supply AC power or there is an error in power supply unit	LED color: Green	
Front cover / Front cover set screw	This is used when wiring. This is used to fix the front cover. When fixing is necessary, use M3 × 6 mm (0.24 in.) set screws.		
Terminal	It is used for the externally wiring. Recommend size of solderless terminal is follows.  Please note wiring because there is a possibility of dropping out because of loosening of the screw. unit : mm		

### EH-PSR specifications

item	Specifications
Rated output voltage	5 V DC
Maximum output current	5.6 A (up to 45 deg ambient temp), 5.0A (from 45 to 55 deg)
Efficiency	65 % or more (Load of 5 V 5.6 A after energizing for 5 minutes at room temperature and humidity)
Input rated voltage range	85 to 264 V AC wide range
Input current	1 A or less (85 to 264 V AC)
Input rush current	50 A or less (Ta=25 °C), 100 A or less (Ta=55 °C)
Output over current protection	Output short circuit protection
Instantaneous power failure guarantee	less than 5 ms (85 to 100 V AC), less than 20 ms (100 to 264 V AC)
Input leak current	3.5 mA or less (60 Hz, 264 V AC)
Dielectric withstand voltage	1 minute at 1500 V AC between (AC input) and (DC output) 1 minute at 750 V AC between (DC output) and (FE)
Insulation resistance	20 M ohm or more (500 V DC)(1) Between AC input and FE (2) Between AC input and DC output
Vibration resistance	Base on IEC60068-2-6
Shock resistance	Base on IEC60068-2-27
Error output	Relay 24 V DC, 0.5A



※1 When fuse was blown, the POWER LED don't light. Also the module must repair by manufacture. It is impossible to replace the blown flow by customer.

### Available combination

Base · Power supply	EH-PSA/PSD			EH-PSR		
	EH-BS8R	EH-BS3A,5A,6A,8A	EH-BS11A	EH-BS8R	EH-BS3A,5A,6A,8A	EH-BS11A
CPU type						
EHV-CPU	× ※1	○	○	◎	△ ※3	△ ※3
EH-CPU548/516	× ※1	○	○	◎	△ ※3	△ ※3
EH-CPU316A/208A/104A	× ※1	○	×	△ ※2	△ ※2,3	×

※1 EH-PSA/PSD are not mounted in EH-BS8R.

※2 EH-CPU316A/208A/104A can not monitor the operation status.

※3 Redundant power supply module (EH-PSR) is possible to use as large capacity power supply on the standard base. But it can not monitor the operation status.

◎ : Redundant power supply system is available, ○ : Available, △ : limitation on using, × : it is not available

### Monitor of operation status

Combination of EH-PSR + EHV-CPU or EH-PSR + EH-CPU548/516, operation status can monitor as input data of 11th slot.



In EH-BS8R, 8 IO modules is available. input data of 11th slot.

Input X\*\*A00 on : power supply 0 operation is correct

Input X\*\*A01 on : power supply 1 operation is correct

\*\* means the unit number

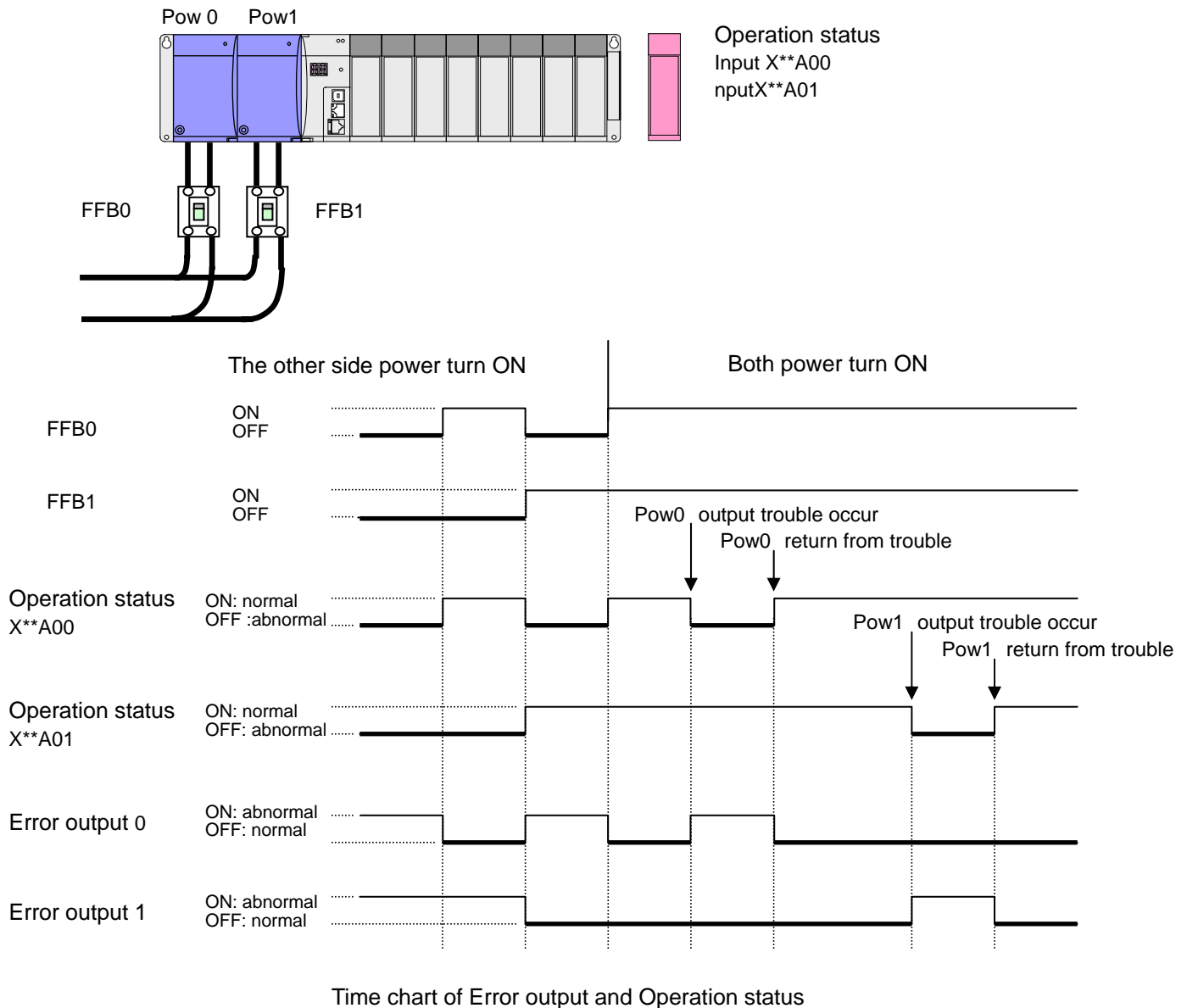
power supply 0 1

# Redundant base unit

<p>Name and function</p> <p>Communication slot</p> <table border="1"> <tr> <td>EH-BS8R</td> <td>Slot 0-7</td> </tr> </table>		EH-BS8R	Slot 0-7	<p>Type(Weight)</p> <p>EH-BS8R (0.39kg)</p>				
EH-BS8R	Slot 0-7							
<p>Dimension (mm)</p>		<table border="1"> <thead> <tr> <th>Unit:mm</th> <th>L1 (Outer dimensions)</th> <th>L2 (Mounted dimensions)</th> </tr> </thead> <tbody> <tr> <td>EH-BS8R</td> <td>432.5</td> <td>417</td> </tr> </tbody> </table>	Unit:mm	L1 (Outer dimensions)	L2 (Mounted dimensions)	EH-BS8R	432.5	417
Unit:mm	L1 (Outer dimensions)	L2 (Mounted dimensions)						
EH-BS8R	432.5	417						
Function	<p>Base unit is mounted various IO modules. Power supply module supply the power to each module through the base unit. Also, CPU module or IO control unit input/output the signal to each module through the base unit.</p>							
<b>Item</b>	<b>Description</b>							
Connector for power module	This is the connector for loading the power module.							
Connector for CPU module	This is the connector for loading the CPU module. When the unit is used as an expansion base, this becomes the connector for loading the I/O controller.							
Connector for I/O module	This is the connector for loading the I/O module.							
Expansion cable connector	This is the connector for connecting the expansion cable. It can only be used in a base unit in which a CPU is loaded.							
Mounting holes (4 locations)	These are used when the base unit is attached to a panel, etc. Use M4 × 20 mm (0.79 in.) screws.							
Mounting lever for fixing to DIN rail	This is used when attaching the unit to a DIN rail.							
Cover for expansion cable connector	This cover is used for protecting the expansion cable connector when it is not used.							

## Error output, Operation status

Error output and operation status will be change according to occurrence of error and power ON/OFF as follows.



## Replacement of fault power supply module

In case of fault the power supply module, it is possible to replace while operating another power supply module.

1. To easily replace the fault module, install the circuit breaker to each power line.
2. Please replace the fault module as the power off.  
Please attention the electric shock, because another power supply module is operating.

Please design the system of 5V capacity is used as one power supply module when the redundant power supply.