

MICRO-EHV+ (20 points type basic unit) Safety Precautions

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

Caution

1. It is not allowed to reprint any part of this manual without permission.
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 mistakes or unclear part is found.

■ Warranty period and coverage

The warranty period is either 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 as directed 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.)

Reference Manual

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

Manual name	Manual number
MICRO-EHV+ APPLICATION MANUAL	NJI-611*(X)

The postfix of the manual number stands for revision.

General cautions

■ 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 during power ON. Failure to observe this caution may cause personal injury.
- Be sure to install external safety devices outside of the PLC like emergency stop circuit or interlock circuit.



CAUTION

- Always use the rated power voltage according to the module specifications. Using other voltages may damage the equipment or cause personal injury or fire.
- Only qualified personnel shall carry out wiring work. Failure to observe this caution may damage the equipment or cause personal injury or fire.



COMPULSION

- Be sure to ground the unit. Failure to do so may cause malfunction.



PROHIBITION

- Do not attempt to disassemble, repair or modify any part of the PLC. Failure to observe this caution may cause fire or damage of the equipment or malfunction.

Mounting

- This equipment must be placed within a suitable enclosure such as a cabinet (key or tool entry) .
- 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 installing systems in locations :
 - Subject to static electricity or other forms of noise.
 - Subject to strong electromagnetic field.
 - Close to power supplies.
- Be sure to tighten mounting screws, terminal screws and connector screws.
- Check if devices with lock mechanism, such as an expansion cable and terminal blocks, are locked properly.

■ Power Wiring Procedures

- Appropriate emergency circuitry, interlock circuitry and similar safety measures should be added to the system.
- Appropriate safety measures should be included in the system to ensure safety in the event of abnormal signals caused by broken wires or momentary power interruptions.
- Always use the rated power voltage according to the manual. Using other voltages may damage the equipment or cause personal injury or fire.
- Install an external earth leakage breakers to avoid short circuit accident.
- Always turn off the power supply to the PLC before attempting any of the following. Performing any of these acts may result in damage to the PLC or personal injury or malfunction.
 - Mounting or dismantling the basic or expansion unit.
 - Assembling the equipment.
 - Wiring.
- Install net filter specified in Table-1. 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 wired to a common power source and powered up together as shown in Figure1.
- Install a lightning arrester
To prevent damage to the equipment as a result of being struck by lightning, it is recommended that a lightning arrester be installed for each PLC's power supply circuit.

Table-1 Net filter

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

Reference : EMC filter ZAC2205-00U (TDK)

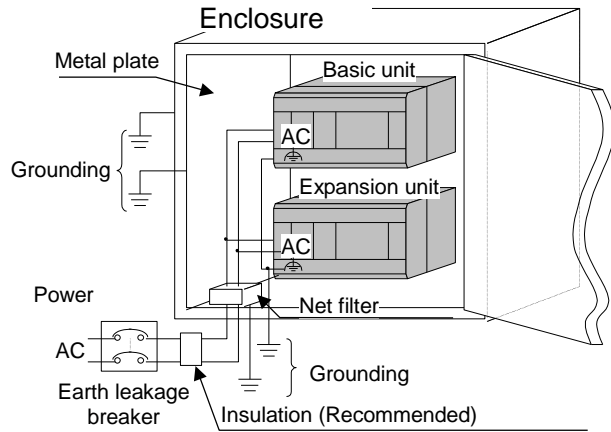


Figure 1 Power wiring example

■ I/O Wiring Procedures

- Always use the rated input/output voltage according to the module specifications. Using other voltages may damage the equipment or cause personal injury or fire.
- Install AC power cables in separate cable trays or bunches from I/O signal or data lines.
- 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.

■ General Wiring Procedures

- Use copper conductors for all wiring. You can use one copper conductor – AWG#14 (2.1 mm²) through AWG#22 (0.36 mm²) or two copper conductors – AWG#16 (1.3 mm²) through AWG#22 (0.36 mm²) – per terminal.
- The suggested torque for terminal connections is 0.5 to 0.6 Nm.
- 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 the power supply to a broken PLC.
- Be sure to check all wiring before applying the power. Incorrect wiring may damage the equipment or cause 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. The lines may break.
- Check carefully your PLC program before using.
- Keep PLC modules in their boxes during storage and transport.

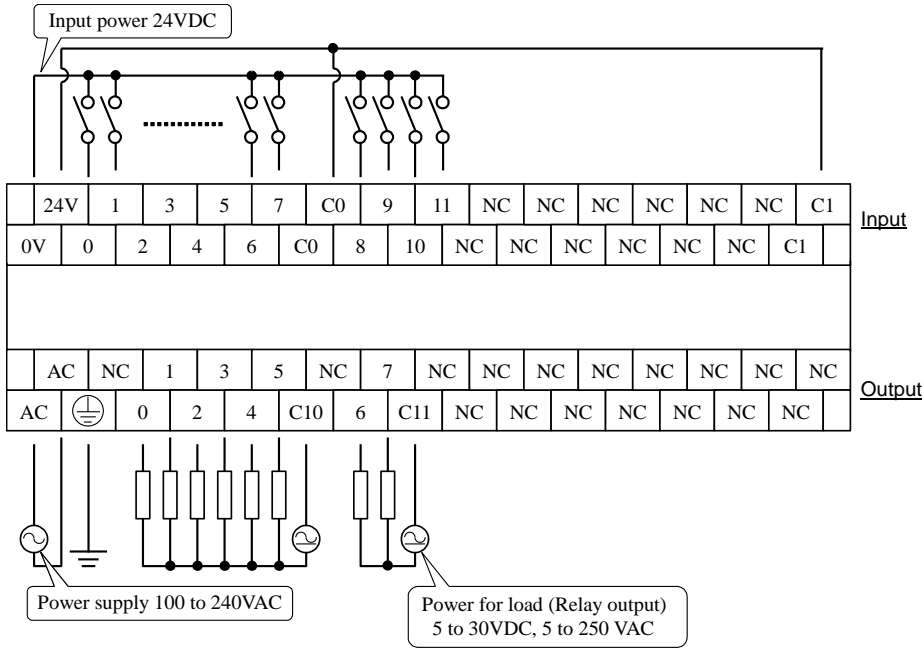
Environmental Conditions

- Avoid the following locations to install the PLC.
- Excessive dust, salty air, or conductive materials. (iron powder, etc.)
 - Direct sunlight.
 - Temperature less than 0°C or more than 55°C.
 - Humidity less than 5% or more than 95%.
 - 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.

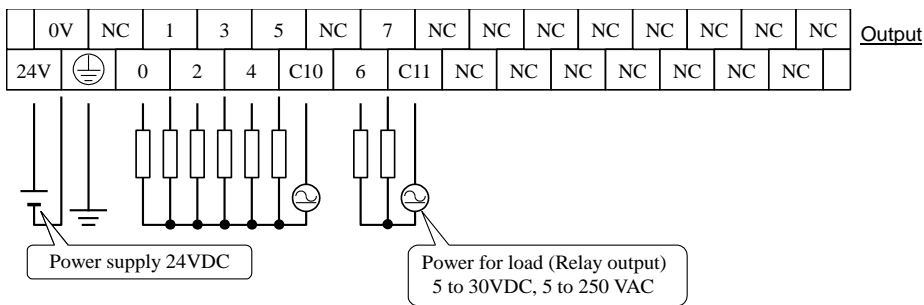
■ Terminal layout and wiring

MV-A20DR (AC power type)

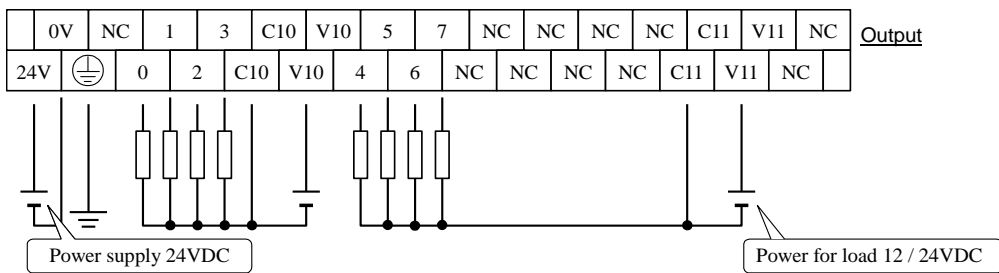
* For the DC input, both sink and source type are available. It is possible to reverse the polarity of 24VDC.



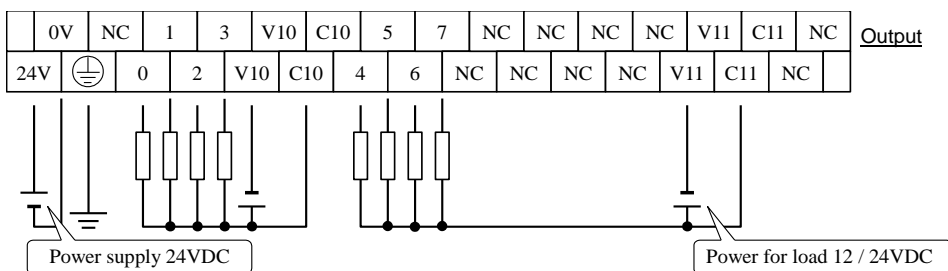
MV-D20DR (DC power type) (Input wiring is same as MV-A20DR)



MV-D20DTPS (DC power type) (Input wiring is same as MV-A20DR)



MV-D20DT (DC power type) (Input wiring is same as MV-A20DR)



■ NOTE

▪ HX-CODESYS/EHV-CODESYS

Be sure to use the HX-CODESYS or EHV-CODESYS V3.5 SP3 Patch6 or higher. CODESYS V3.5 SP3 Patch5 or older (incl. EHV-CoDeSys V3.4 SP4 HF1) does not support MICRO-EHV+ series.

▪ CPU initialization

When you use the PLC first time, be sure to initialize (Reset origin) with HX-CODESYS/EHV-CODESYS because data memory could be undefined status.

▪ OK LED status without battery

Battery is not included in MICRO-EHV+. (Battery is optional.)

If the setting of [OK LED blinking while battery error] *1 in HX-CODESYS/EHV-CODESYS is enabled (default) without a battery installed, OK LED will blink. If you want to disable this LED blinking, set Disable in this parameter.

*1: [OK LED blinking while battery error] is found in [Device] - [Configuration] in the project tree.

▪ Behavior when RETAIN data is undefined values

If power failure time of the PLC exceeds 12 hours, data in variables configured as RETAIN (backup by optional battery or capacitor in the unit) are not retained (undefined values). When PLC is powered up with RETAIN data undefined values, behavior of PLC can be selected in the setting [Retain mismatch] of HX-CODESYS/EHV-CODESYS. If this setting is RUN (default), PLC starts with all RETAIN data initialized. (If RUN/STOP switch is in STOP position, PLC does not start regardless of the setting.)

▪ Start up sequence

It takes 9 to 20 seconds for MICRO-EHV+ series from power up to start program execution depending on the size of user program. As shown in the chart below, PLC does not react immediately to RUN/STOP switch while OK LED is not lighting. Even while OK LED is lighting, it could take about 1 second to start/stop after toggling RUN/STOP switch depending on CPU load condition (e.g. Thousands of variables accessed by OPC communication). If RUN/STOP switch is toggled back before the transition of CPU status in such condition, CPU could fail to run or stop.

