

# CJ-series Power Supply Unit

# CJ1W-PA/PD

CSM\_CJ1W-PA\_PD\_DS\_E\_5\_1

Equipped with the RUN output for checking the operation status, as well as the replacement notification function for easy maintenance.

Lineup of five models including the AC power supply (25W).



CJ1W-PA205C



CJ1W-PA202

- Stable power supply is available from the CJ-series CPU Unit to each I/O Units via the dedicated bus. The most suitable Power Supply Unit can be selected among various I/O specifications and/or options.

## Features

- The replacement notification function can prevent an overflow of the system due to the power lifetime. (CJ1W-PA205C only)
- Power Supply Unit provides wide variations according to the system scale up to maximum 25 W.
- Power Supply Unit provides wide variations according to the power supply (100 to 240 V AC/ 24 V DC) status.
- The output contact during operation enables you to check the CPU operation. (CJ1W-PA205R only)
- Conforming to the SEMI-F47 Standard. \*



\* AC input type, 200 V min. input.

## Ordering Information

### International Standards

- The standards are abbreviated as follows: U: UL, U1: UL(Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Contact your OMRON representative for further details and applicable conditions for these standards.

### Power Supply Units

| Product name  | Powersupply voltage | Output capacity       |                        |                         | Options                     |            |                              | Model       | Standards     |            |
|---|---------------------|-----------------------|------------------------|-------------------------|-----------------------------|------------|------------------------------|-------------|---------------|------------|
|   |                     | 5-VDC output capacity | 24-VDC output capacity | Total power consumption | 24-VDC service power supply | RUN output | Maintenance forecast monitor |             |               |            |
| <br>AC Power Supply Unit   | 100 to 240 VAC      | 5 A                   | 0.8 A                  | 25 W                    | No                          | No         | Yes                          | CJ1W-PA205C | UC1, N, L, CE |            |
|   |                     | 2.8 A                 | 0.4 A                  | 14 W                    |                             | No         | No                           | No          |               | CJ1W-PA202 |
|   |                     | 5 A                   | 0.8 A                  | 25 W                    |                             | No         | No                           | No          |               | CJ1W-PD025 |
| <br>DC Power Supply Unit | 24 VDC              | 2 A                   | 0.4 A                  | 19.6 W                  | No                          | No         | No                           | CJ1W-PD022  | UC1, CE       |            |

**Note:** This unit cannot be used with the Machine Automation Controller NJ-series.

### Accessories

There is no accessory for the CJ series Power Supply Unit.

# Specifications

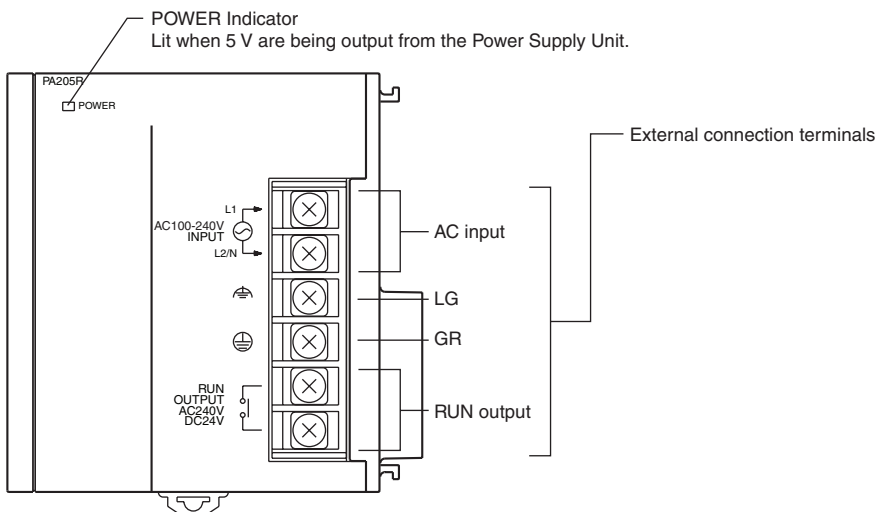
| Item                                   | Specifications  |  |  |   |  |
|--|---|--|--|---|--|
|  | CJ1W-PA205R   | CJ1W-PA205C  | CJ1W-PA202   | CJ1W-PD025  | CJ1W-PD022                                   |
| Supply voltage                         | 100 to 240 V AC (wide-range), 50/60 Hz  |  |  | 24 VDC  |  |
| Operating voltage and frequency ranges | 85 to 264 V AC, 47 to 63 Hz   |  |  | 19.2 to 28.8 V DC   | 21.6 to 26.4 V DC                            |
| Power consumption                      | 100 VA max.   |  | 50 VA max.   | 50 W max.   | 35 W max.                                    |
| Inrush current *1                      | At 100 to 120 V AC:<br>15 A/8 ms max. for cold start at room temperature<br>At 200 to 240 V AC:<br>30 A/8 ms max. for cold start at room temperature  |  | At 100 to 120 V AC:<br>20 A/8 ms max. for cold start at room temperature<br>At 200 to 240 V AC:<br>40 A/8 ms max. for cold start at room temperature | At 24 V DC:<br>30 A/20 ms max. for cold start   |  |
| Output capacity *7                     | 5.0 A, 5 V DC (including supply to CPU Unit)  |  | 2.8 A, 5 V DC (including supply to CPU Unit)   | 5.0 A, 5 V DC (including supply to CPU Unit)  | 2.0 A, 5 V DC (including supply to CPU Unit) |
|  | 0.8 A, 24 V DC  |  | 0.4 A, 24 V DC   | 0.8 A, 24 V DC  | 0.4 A, 24 V DC                               |
|  | Total: 25 W max.  |  | Total: 14 W max.   | Total: 25 W max.  | Total: 19.6 W max.                           |
| Output terminal (service supply)       | Not provided.   |  |  |   |  |
| RUN output *2                          | Contact configuration:<br>SPST-NO<br>Switch capacity:<br>250 V AC, 2 A (resistive load)<br>120 V AC, 0.5 A (inductive load), 24 V DC, 2A (resistive load)<br>24 V DC, 2 A (inductive load)      | Not provided.  |  |   |  |
| Replacement notification function      | Not provided.   | With Alarm output (open-collector output)<br>30 V DC max., 50 mA max.  | Not provided.  |   |  |
| Insulation resistance                  | 20 M $\Omega$ min. (at 500 V DC) between AC external and GR terminals *3  | <ul style="list-style-type: none"> <li>20 M<math>\Omega</math> min. (at 500 V DC) between all external terminals and GR terminal *3, and between all alarm output terminals.</li> <li>20 M<math>\Omega</math> 1 min. (at 250 V DC) between all alarm output terminals and GR terminal *3.</li> </ul>   | 20 M $\Omega$ min. (at 500 V DC) between AC external and GR terminals *3   | 20 M $\Omega$ min. (at 500 V DC) between DC external and GR terminals *3                              | –<br>*6                                      |
| Dielectric strength *4                 | 2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals *3<br>Leakage current: 10 mA max.  | <ul style="list-style-type: none"> <li>2,300 VAC, 50/60 Hz for 1 min between all external terminals and GR terminal *3 and between all alarm output terminals with a leakage current of 10 mA max.</li> <li>1,000 V AC, 50/60 Hz for 1 min between all alarm output terminals and GR terminal *3 with a leakage current of 10 mA max.</li> </ul> | 2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals *3<br>Leakage current: 10 mA max.   | 1,000 V AC, 50/60 Hz for 1 min between DC external and GR terminals *3<br>Leakage current: 10 mA max. | –<br>*6                                      |
|  | 1,000 V AC, 50/60 Hz for 1 minute between DC external and GR terminals *3<br>Leakage current: 10 mA max.  |  |  |   |  |
| Noise immunity                         | 2 kV on power supply line (conforming to IEC61000-4-4)  |  |  |   |  |
| Vibration resistance                   | Conforms to IEC60068-2-6<br>5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz<br>Acceleration of 9.8 m/s <sup>2</sup> for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min) |  |  |   |  |
| Shock resistance                       | Conforms to IEC60068-2-27<br>147 m/s <sup>2</sup> , 3 times in X, Y, and Z directions (100 m/s <sup>2</sup> for Relay Output Units)   |  |  |   |  |
| Ambient operating temperature          | 0 to 55°C   |  |  |   |  |
| Ambient operating humidity             | 10% to 90% (with no condensation)   | 10% to 90% (with no condensation)<br>*5  | 10% to 90% (with no condensation)  |   |  |
| Atmosphere                             | Must be free from corrosive gases.  |  |  |   |  |
| Ambient storage temperature            | –20 to 70°C (excluding battery)   | –20 to 75°C<br>*5  | –20 to 75°C (excluding battery)  |   |  |
| Grounding                              | Less than 100 $\Omega$  |  |  |   |  |
| Enclosure                              | Mounted in a panel.   |  |  |   |  |
| Weight                                 | All models are each 5 kg max.   |  |  |   |  |

| Item                | Specifications   |             |            |            |            |
|---------------------|--|-------------|------------|------------|------------|
| Model               | CJ1W-PA205R  | CJ1W-PA205C | CJ1W-PA202 | CJ1W-PD025 | CJ1W-PD022 |
| CPU Rack dimensions | 90.7 to 466.7 × 90 × 65 mm (W × H × D) (not including cables)<br><b>Note:</b> W = a + b + 20 × n + 31 × m + 14.7<br>a: Power Supply Unit: PA205R and PA205C = 80; PA202 = 45; PD025 = 60; PD022=27<br>b: CPU Unit: CJ1-H or CJ1 = 62; CJ1M-CPU1□ = 31; CJ1M-CPU2□ = 49<br>The total width is given by the following: W = 156.7 + n × 20 + m × 31, where n is the number of 32-point I/O Units or I/O Control Units and m is the number of other Units. |             |            |            |            |
| Safety measures     | Conforms to cULus and EC Directives.   |             |            |            |            |

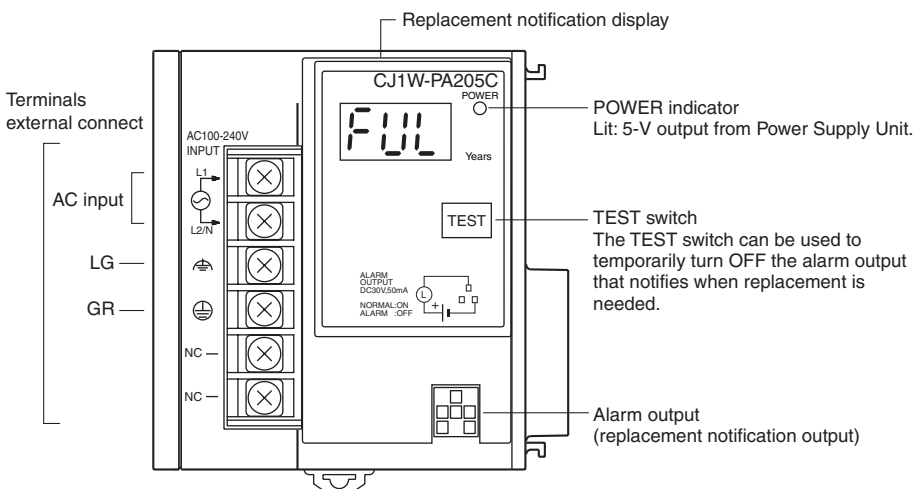
- \*1. Disconnect the Power Supply Units LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the CPU Unit.
- \*2. Supported only when mounted to CPU Rack.
- \*3. The inrush current is given for a cold start at room temperature. The inrush control circuit uses a thermistor element with a low-temperature current control characteristic. If the ambient temperature is high or the PLC is hot-started, the thermistor will not be sufficiently cool, and the inrush currents given in the table may be exceeded by up to twice the given values. When selecting fuses or breakers for external circuits, allow sufficient margin in shut-off performance.
- \*4. Maintain an ambient storage temperature of -25 to 30°C and relative humidity of 25% to 70% when storing the Unit for longer than 3 months to keep the replacement notification function in optimum working condition.
- \*5. Change the applied voltage gradually using the adjuster on the Tester. If the full dielectric strength voltage is applied or turned OFF using the switch on the Tester, the generated impulse voltage may damage the Power Supply Unit.
- \*6. CJ1W-PD022 is not insulated between the primary DC power and secondary DC power.
- \*7. Internal components in the Power Supply Unit will deteriorate or be damaged if the Power Supply Unit is used for an extended period of time exceeding the power supply output capacity or if the outputs are shorted.

## External Interface

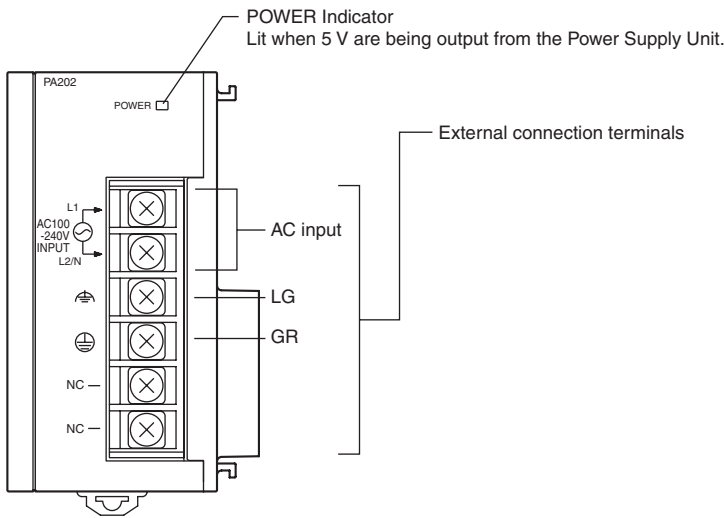
### CJ1W-PA205R



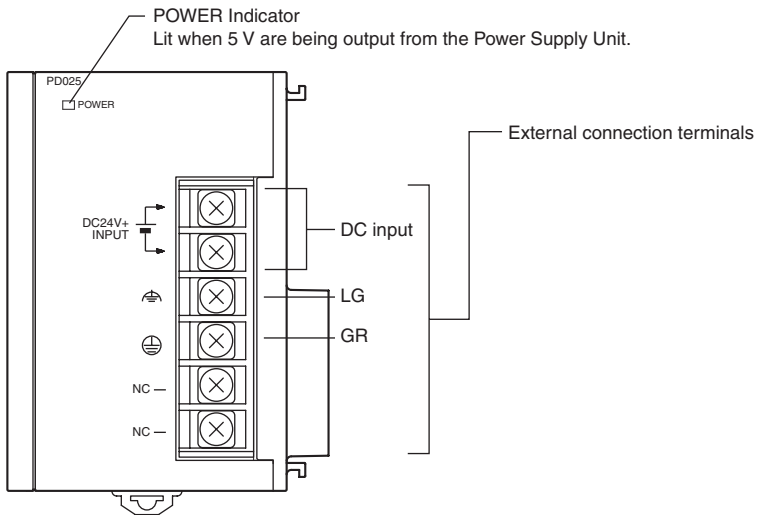
### CJ1W-PA205C



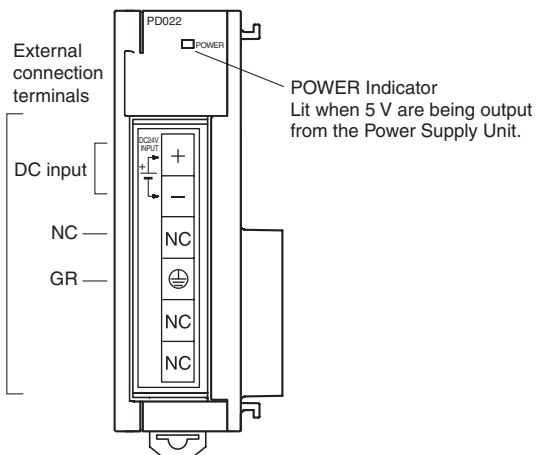
**CJ1W-PA202**



**CJ1W-PD025**



**CJ1W-PD022**



## AC Input

Supply 100 to 240 V AC (allowable: 85 to 264 V AC). (Voltage selection is not required.)

## DC Input

Supply 24 V DC.

| Model      | Allowable power supply voltage fluctuation range |
|------------|--|
| CJ1W-PD025 | 19.2 to 28.8 VDC ( $\pm 20\%$ )                  |
| CJ1W-PD022 | 21.6 to 26.4 VDC ( $\pm 10\%$ )                  |

## LG

Ground to a resistance of 100  $\Omega$  or less to increase noise resistance and avoid electric shock.

## GR

Ground to a resistance of 100  $\Omega$  or less to avoid electric shock.

## RUN Output (CJ1W-PA205R Only)

The internal contact turns ON when the CPU Unit is operating (RUN or MONITOR mode). The Power Supply Unit must be in the CPU Rack to use this output.

## Alarm Output (CJ1W-PA205C Only)

The alarm output is used to notify when Power Supply Unit replacement is required. The output is normally ON. The output turns OFF when the time until replacement is 6 months or less.

## Wiring

### Wire

#### For AC/DC power supply

|                       |  |
|-----------------------|--|
| Recommended wire size | AWG14 to 20<br>(0.517 to 2.08mm <sup>2</sup> ) |
|-----------------------|--|

#### For grounding wire

|                       |                        |
|-----------------------|------------------------|
| Recommended wire size | 2 mm <sup>2</sup> min. |
|-----------------------|------------------------|

#### For alarm output

| Recommended wire size                           | Use                                     | Pushing strength (clamping operation) | Pulling strength (holding force) | Length of stripped section |
|---|---|---------------------------------------|----------------------------------|----------------------------|
| AWG 22 to 18<br>(0.32 to 0.82 mm <sup>2</sup> ) | Connecting to PLC terminal block models | 30 N max.                             | 30 N min.                        | 7 to 10 mm                 |
| AWG 28 to 24<br>(0.08 to 0.2 mm <sup>2</sup> )  | Connecting to PLC connector models      |                                       | 10 N min.                        |                            |

## Crimp Terminals

The terminals on the Power Supply Unit are M4, self-raising terminals with screws. Use crimp terminals for wiring.

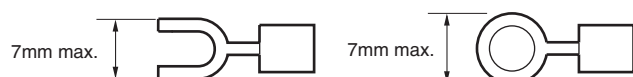
### Crimp terminal for the AC power supply



### Crimp terminal for the DC power supply



### Crimp terminal for the grounding wire



The crimp terminal is not required for the alarm output.

## Checking Current Consumption and Power Consumption

After selecting a Power Supply Unit based on considerations such as the power supply voltage, calculate the current and power requirements for each Rack.

### Condition 1: Current Requirements

There are two voltage groups for internal power consumption: 5 V and 24 V.

Current consumption at 5 V (internal logic power supply)

Current consumption at 24 V (relay driving power supply)

### Condition 2: Power Requirements

For each Rack, the upper limits are determined for the current and power that can be provided to the mounted Units. Design the system so that the total current consumption for all the mounted Units does not exceed the maximum total power or the maximum current supplied for the voltage groups shown in the following tables.

The maximum current and total power supplied for CPU Racks and Expansion Racks according to the Power Supply Unit model are shown below.

**Note: 1.** For CPU Racks, include the CPU Unit current and power consumption in the calculations. When expanding, also include the current and power consumption of the I/O Control Unit in the calculations.

**2.** For Expansion Racks, include the I/O Interface Unit current and power consumption in the calculations.

| Power Supply Units | Max. current supplied |                              | Max. total power supplied |
|--------------------|-----------------------|------------------------------|---------------------------|
|                    | 5 V                   | 24 V (relay driving current) |                           |
| CJ1W-PA205R        | 5.0 A                 | 0.8 A                        | 25 W                      |
| CJ1W-PA205C        | 5.0 A                 | 0.8 A                        | 25 W                      |
| CJ1W-PA202         | 2.8 A                 | 0.4 A                        | 14 W                      |
| CJ1W-PD025         | 5.0 A                 | 0.8 A                        | 25 W                      |
| CJ1W-PD022         | 2.0 A                 | 0.4 A                        | 19.6 W                    |

Conditions 1 and 2 below must be satisfied.

### Condition 1: Maximum Current

(1) Total Unit current consumption at 5 V  $\leq$  (A) value

(2) Total Unit current consumption at 24 V  $\leq$  (B) value

### Condition 2: Maximum Power

(1)  $\times$  5 V + (2)  $\times$  24 V  $\leq$  (C) value

### Example: Calculating Total Current and Power Consumption

Example: When the Following Units are Mounted to a CJ-series CPU Rack Using a CJ1W-PA202 Power Supply Unit

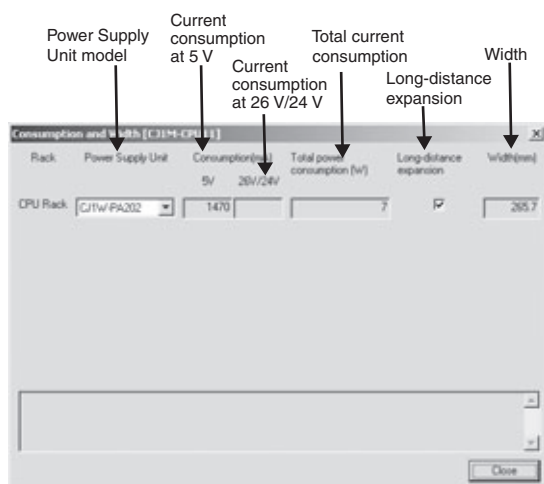
| Unit type                         | Model      | Quantity | Voltage group  |   |
|-----------------------------------|------------|----------|--|---|
|                                   |            |          | 5 V  | 24 V  |
| CPU Unit                          | CJ1M-CPU13 | 1        | 0.580 A  | –   |
| I/O Control Unit                  | CJ1W-IC101 | 1        | 0.020 A  | –   |
| Basic I/O Units<br>(Input Units)  | CJ1W-ID211 | 2        | 0.080 A  | –   |
|                                   | CJ1W-ID231 | 2        | 0.090 A  | –   |
| Basic I/O Units<br>(Output Units) | CJ1W-OC201 | 2        | 0.090 A  | 0.048 A   |
| Special I/O Unit                  | CJ1W-DA041 | 1        | 0.120 A  | –   |
| CPU Bus Unit                      | CJ1W-CLK23 | 1        | 0.350 A  | –   |
| Current consumption               | Total      |          | $0.580 + 0.020 + 0.080 \times 2 + 0.090 \times 2 + 0.090 \times 2 + 0.120 + 0.350$ | $0.048 \text{ A} \times 2$                              |
|                                   | Result     |          | 1.59 A ( $\leq 2.8 \text{ A}$ )  | 0.096 A ( $\leq 0.4 \text{ A}$ )                        |
| Power consumption                 | Total      |          | $1.59 \times 5 \text{ V} = 7.95 \text{ W}$   | $0.096 \text{ A} \times 24 \text{ V} = 2.304 \text{ W}$ |
|                                   | Result     |          | $7.95 + 2.304 = 10.254 \text{ W} (\leq 14 \text{ W})$                              |   |

**Note:** For details on Unit current consumption, refer to Ordering Information.

### Using the CX-Programmer to Display Current Consumption and Width

CPU Rack and Expansion Rack current consumption and width can be displayed by selecting Current Consumption and Width from the Options Menu in the CS/CJ/CP Table Window. (The width can be displayed for the CJ/CP Series only.) If the capacity of the Power Supply Unit is exceeded, it will be displayed in red characters. For details, refer to the CX-Programmer Operation Manual (Cat. No. W446).

Example:

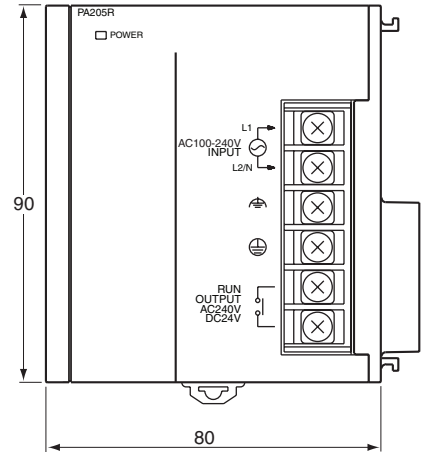
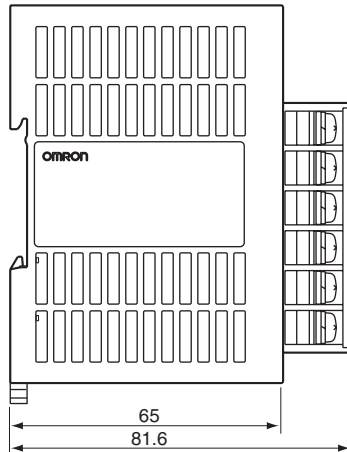




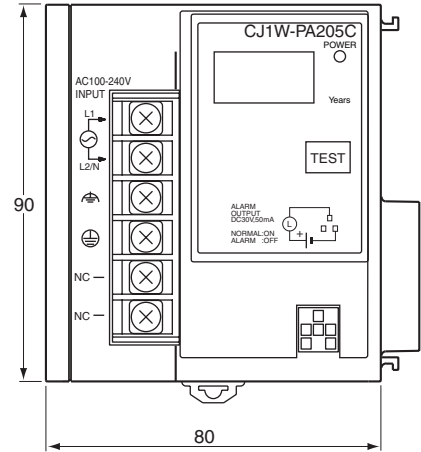
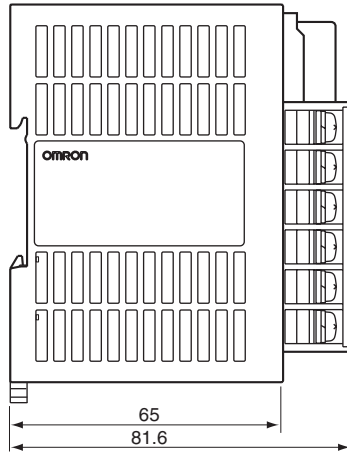
Dimension

(Unit: mm)

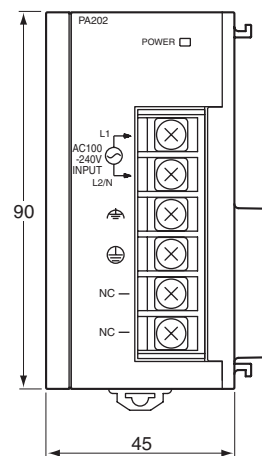
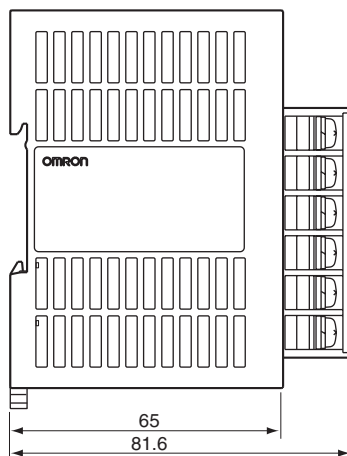
CJ1W-PA205R



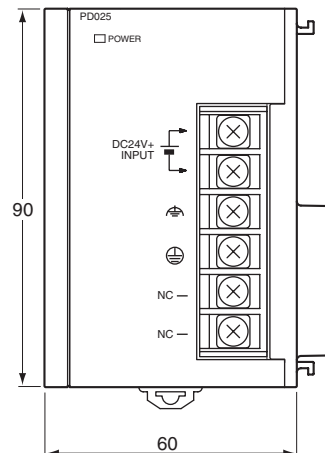
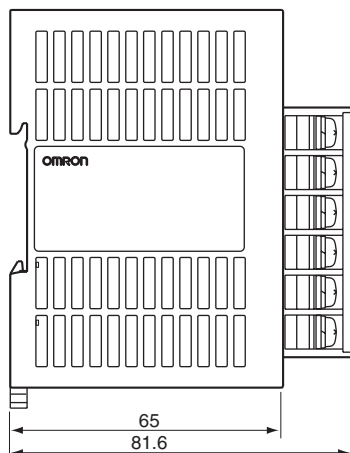
CJ1W-PA205C



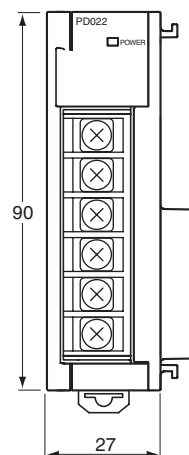
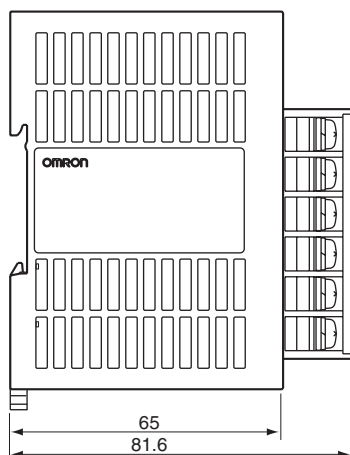
CJ1W-PA202



CJ1W-PD025



CJ1W-PD022



Related Manuals

| Cat. No. | Name  | Contents  |
|----------|---|---|
| W393     | SYSMAC CJ Series<br>CJ1H-CPU□□H-R, CJ1G/H-CPU□□H, CJ1G-CPU□□P,<br>CJ1G-CPU□□, CJ1M-CPU□□<br>Programmable Controllers Operation Manual | Provides an outlines of and describes the design, installation, maintenance, and other basic operations for the CJ-series PLCs. |

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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- Systems, machines, and equipment that could present a risk to life or property.

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NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### PERFORMANCE DATA

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