

## Power and Expansion Selection

This section provides tools to calculate the CJ1 system current consumption total needed to select the power supply. When the number of modules or power requirements exceeds the capability of the power supplies available, I/O expansion racks solve the problem. If the number of modules per rack exceeds 10 or the current consumption is greater than the capacity of the power supply units, use the CPU and expansion rack configuration.

### What is the basic configuration?

A CJ1 system consists of a power supply, a CPU, and up to 10 basic I/O, special I/O and CPU bus units, and an end cover. See page B-109.

### What goes on expansion I/O racks?

The expansion I/O rack contains a power supply, an I/O interface module and the remaining I/O modules. Each expansion rack requires a power supply, the I/O interface module and up to 10 more modules.

### Where are ratings to calculate overall current consumption?

All the current consumption ratings for the CPU, basic I/O, special I/O and CPU bus units are collected in the tables on pages B-110 to B-111.

### Which power supply is right?

Compare the current consumption total of basic I/O, special I/O, and CPU bus units to determine which power supply to use.

| Input Voltage      | 100 to 240 VAC                 |              | 24 VDC       |
|--------------------|--------------------------------|--------------|--------------|
| Output rating      | 5 A, 5 VDC with 2 A RUN output | 2.8 A, 5 VDC | 5 A, 5 VDC   |
| Output capacity    | 25 W max.                      | 14 W max.    | 25 W max.    |
| Power supply model | CJ1W-PA205R                    | CJ1W-PA202   | CJ1W-PD025   |
| See page           | <b>B-110</b>                   | <b>B-110</b> | <b>B-110</b> |

Note: If more than 10 modules are required or the current consumption exceeds the output capacity of the power supplies, go to page B-109 for configuration of I/O expansion racks. The same power supply units can be used for both CPU and I/O expansion racks.

### How many expansion I/O racks can be used?

Depending on the CPU chosen, the system can be expanded with up to three additional racks of basic I/O, special I/O and CPU bus units.

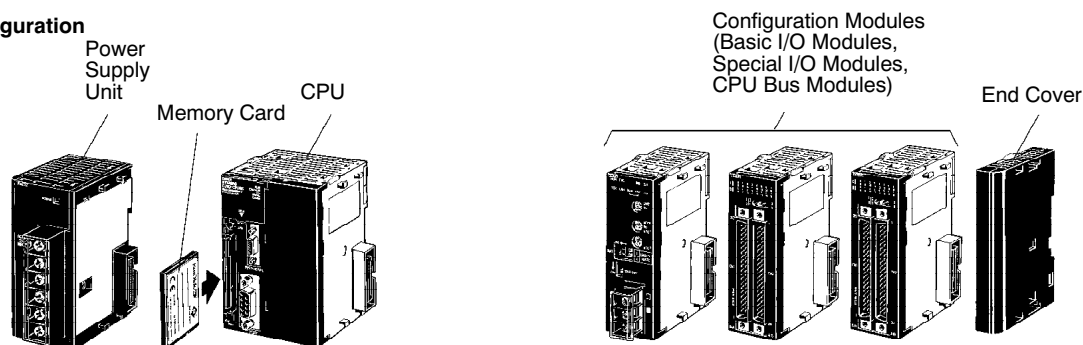
|                                     |             |             |            |            |            |
|-------------------------------------|-------------|-------------|------------|------------|------------|
| Maximum I/O modules per CPU         | 40          | 30          | 20         | 10         | 10         |
| Maximum I/O expansion racks per CPU | 3           | 2           | 1          | 0          | 0          |
| CPU models                          | CJ1G-CPU44H | CJ1G-CPU42H | CJ1M-CPU13 | CJ1M-CPU12 | CJ1M-CPU11 |
|                                     | CJ1G-CPU45H | CJ1G-CPU43H | CJ1M-CPU23 | CJ1M-CPU22 | CJ1M-CPU21 |
|                                     | CJ1H-CPU65H |             |            |            |            |
|                                     | CJ1H-CPU66H |             |            |            |            |

Note: Order one CJ1W-IC101 I/O control module for the CPU rack and one CJ1W-II101 I/O interface module for each I/O expansion rack. Connect the modules with a cable of the appropriate length. Second and third I/O expansion racks connect between I/O interface modules. See page B-117 for details.

## ■ Basic Configuration

A CJ1 Series basic configuration consists of a CPU, Power Supply Unit, Basic I/O Modules, Special I/O Modules, CPU Bus Modules, and an End Cover. Add up the current consumption of all the modules and the CPU according to the formula on the following page and then select the Power Supply Unit right for the application.

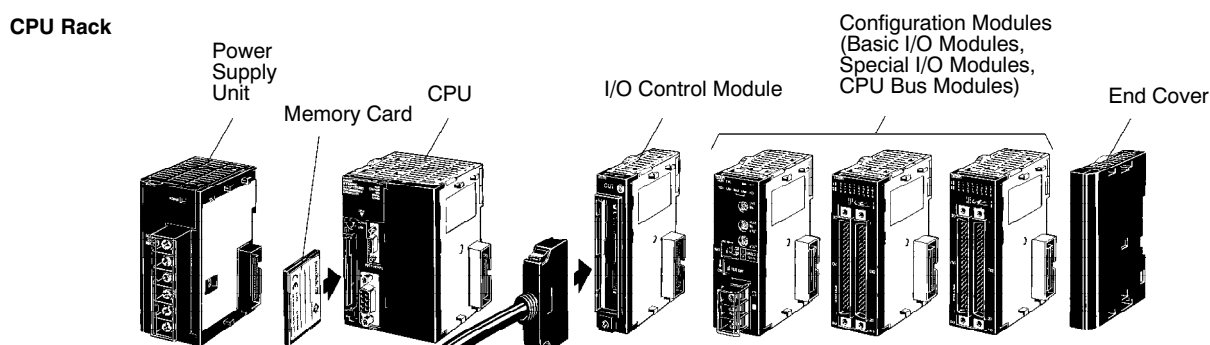
### Basic Configuration



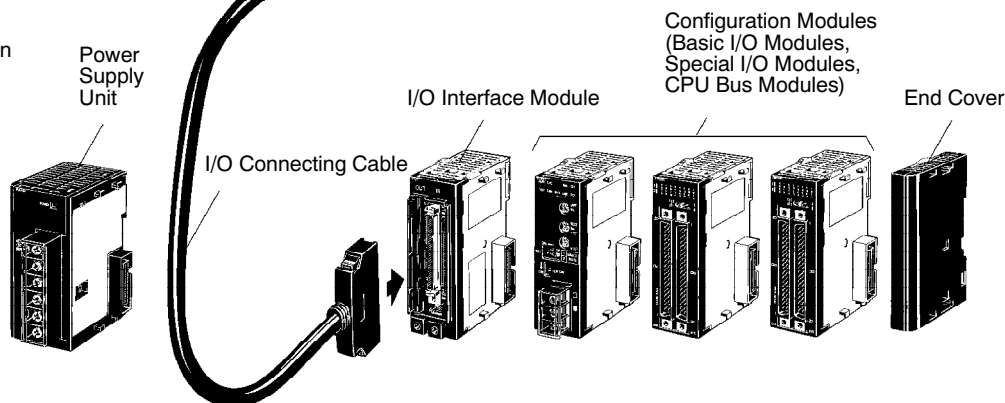
## ■ CPU and Expansion Racks

If the number of modules per rack exceeds 10 or the current consumption is greater than the capacity of the Power Supply Units, use the CPU and Expansion Rack configuration. This divides the load from the modules across two Power Supply Units. To ensure communication and automatic channel assignment in programming, order an I/O Control Module for the CPU Rack and an I/O Interface Module on each Expansion Rack.

### CPU Rack



### Expansion Rack (Up to 3 Expansion Racks Allowed)



## Current Consumption

Calculate All Aspects of Current Consumption

### ■ Calculating Maximum Current Consumption

#### A. Calculate Maximum Current Supply (See the table below.)

- Current required at 5 VDC by all Modules in column (A)  $\leq$  Maximum current consumption shown in table
- Current required at 24 VDC by all Modules in column (B)  $\leq$  Maximum current consumption shown in table
- Current required at 24 VDC for service power supply in column (C)  $\leq$  Maximum current consumption shown in table

#### B. Calculate Maximum Total Power Supply (See the table below.)

- $A \times 5 \text{ VDC} + B \times 24 \text{ VDC} + C \times 24 \text{ VDC} \leq$  Maximum total power consumption shown in column (D)
- The amount of current/power that can be supplied to the Modules mounted in a Rack is limited by the capacity of the Power Supply Unit.
- Design the system so that the total current consumption of the Modules does not exceed the maximum current for each voltage group and the total power consumption does not exceed the maximum for the Power Supply Unit.

### Reference Table for Maximum Current Consumption

The following table shows the maximum currents and power that can be supplied by Power Supply Units on CPU Racks and Expansion Racks.

| Power Supply Unit | Maximum current consumption |                                          |                                     | (D) Maximum total power consumption |
|-------------------|-----------------------------|------------------------------------------|-------------------------------------|-------------------------------------|
|                   | (A) 5-V group               | (B) 24-V group relay driver power supply | (C) 24-V group service power supply |                                     |
| CJ1W-PA205R       | 5.0 A                       | 0.8 A                                    | None                                | 25 W                                |
| CJ1W-PA202        | 2.8 A                       | 0.4 A                                    | None                                | 14 W                                |
| CJ1W-PD025        | 5.0 A                       | 0.8 A                                    | None                                | 25 W                                |

- Note:1. When calculating current/power consumption in a CPU Rack — be sure to include the power required by the CPU itself. When expanding the configuration, be sure to include the power required by the I/O Control Module.
2. When calculating current/power consumption in an Expansion Rack — be sure to include the power required by the I/O Interface Module itself.

### ■ Example Calculations

In this example, the following modules are mounted to a CJ1 Series CPU Rack with a CJ1W-PA205R Power Supply Unit.

| Module              | Model       | Quantity | 5 VDC                                                                              | 24 VDC                                                  |
|---------------------|-------------|----------|------------------------------------------------------------------------------------|---------------------------------------------------------|
| CPU                 | CJ1G-CPU45  | 1        | 0.910 A                                                                            | —                                                       |
| I/O Control Module  | CJ1W-IC101  | 1        | 0.020 A                                                                            | —                                                       |
| Input Modules       | CJ1W-ID211  | 2        | 0.080 A                                                                            | —                                                       |
|                     | CJ1W-ID231  | 2        | 0.090 A                                                                            | —                                                       |
| Output Modules      | CJ1W-OC201  | 2        | 0.090 A                                                                            | 0.048 A                                                 |
| Special I/O Module  | CJ1W-DA041  | 1        | 0.120 A                                                                            | —                                                       |
| CPU Bus Module      | CJ1W-CLK21  | 1        | 0.350 A                                                                            | —                                                       |
| Current consumption | Calculation |          | $0.910 + 0.020 + 0.080 \times 2 + 0.090 \times 2 + 0.090 \times 2 + 0.120 + 0.350$ | $0.048 \text{ A} \times 2$                              |
|                     | Result      |          | 1.92 A ( $\leq 5.0 \text{ A}$ )                                                    | 0.096 A ( $\leq 0.8 \text{ A}$ )                        |
| Power consumption   | Calculation |          | $1.92 \times 5 \text{ V} = 9.60 \text{ W}$                                         | $0.096 \text{ A} \times 24 \text{ V} = 2.304 \text{ W}$ |
|                     | Result      |          | $9.60 + 2.304 = 11.904 \text{ W} (\leq 25 \text{ W})$                              |                                                         |

## ■ Current Consumption Tables

### 5-Volt Group: CPUs and Expansion Modules

| Module                                                                                         | Model                                                       | Current consumption at 5 V (A) |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------|
| CPUs<br>(These values include current consumption for a Programming Console or CX-Programmer.) | CJ1H-CPU66H/<br>CJ1H-CPU65H                                 | 0.99<br>(See note.)            |
|                                                                                                | CJ1G-CPU45H/<br>CJ1G-CPU44H/<br>CJ1G-CPU43H/<br>CJ1G-CPU42H | 0.91<br>(See note.)            |
|                                                                                                | CJ1G-CPU45/<br>CJ1G-CPU44                                   | 0.91<br>(See note.)            |
|                                                                                                | CJ1M-CPU11/<br>CJ1M-CPU12<br>CJ1M-CPU13                     | 0.58                           |
|                                                                                                | CJ1M-CPU21/<br>CJ1M-CPU22<br>CJ1M-CPU23                     | 0.64                           |
| I/O Control Module                                                                             | CJ1W-IC101                                                  | 0.02                           |
| I/O Interface Module                                                                           | CJ1W-II101                                                  | 0.13                           |
| End Cover<br>(Included in CPU or Expansion Module.)                                            | CJ1W-TER01                                                  | —                              |

Note: Add 0.15 A per Module when the NT-AL001-E is connected.

### Basic I/O Modules and Interrupt Input Module

| Category               | Name             | Model      | Current consumption at 5 V (A) |
|------------------------|------------------|------------|--------------------------------|
| Basic Input Modules    | DC Input Modules | CJ1W-ID201 | 0.06                           |
|                        |                  | CJ1W-ID211 | 0.08                           |
|                        |                  | CJ1W-ID231 | 0.09                           |
|                        |                  | CJ1W-ID232 | 0.09                           |
|                        |                  | CJ1W-ID261 | 0.09                           |
|                        |                  | CJ1W-ID262 | 0.09                           |
| Basic Output Modules   | AC Input Modules | CJ1W-IA111 | 0.09                           |
|                        |                  | CJ1W-IA201 | 0.08                           |
|                        | Transistor       | CJ1W-OD201 | 0.09                           |
|                        |                  | CJ1W-OD202 | 0.11                           |
|                        |                  | CJ1W-OD203 | 0.10                           |
|                        |                  | CJ1W-OD204 | 0.10                           |
|                        |                  | CJ1W-OD211 | 0.10                           |
|                        |                  | CJ1W-OD212 | 0.10                           |
|                        |                  | CJ1W-OD231 | 0.14                           |
|                        |                  | CJ1W-OD232 | 0.15                           |
|                        |                  | CJ1W-OD233 | 0.14                           |
|                        |                  | CJ1W-OD261 | 0.17                           |
|                        |                  | CJ1W-OD262 | 0.17                           |
|                        |                  | CJ1W-OD263 | 0.17                           |
|                        | Relay            | CJ1W-OC201 | 0.09                           |
|                        |                  | CJ1W-OC211 | 0.11                           |
|                        | Triac            | CJ1W-OA201 | 0.22                           |
| Interrupt Input Module |                  | CJ1W-INT01 | 0.08                           |
| Pulse Catch Module     |                  | CJ1W-IDP01 | 0.08                           |
| Mixed                  |                  | CJ1W-MD231 | 0.13                           |
|                        |                  | CJ1W-MD232 | 0.13                           |
|                        |                  | CJ1W-MD233 | 0.13                           |
|                        |                  | CJ1W-MD261 | 0.14                           |
|                        |                  | CJ1W-MD263 | 0.14                           |
|                        |                  | CJ1W-MD563 | 0.19                           |

### Special I/O Modules

| Category                  | Module                      | Model                            | Current consumption at 5 V (A) |
|---------------------------|-----------------------------|----------------------------------|--------------------------------|
| Special I/O Modules       | Analog Input Modules        | CJ1W-AD081-V1                    | 0.42                           |
|                           |                             | CJ1W-AD041-V1                    | 0.42                           |
|                           | Analog Output Modules       | CJ1W-DA041                       | 0.12                           |
|                           |                             | CJ1W-DA021                       | 0.12                           |
|                           |                             | CJ1W-DA08V                       | 0.14                           |
|                           |                             | CJ1W-DA08C                       | 0.14                           |
|                           | Mixed Analog Module         | CJ1W-MAD42                       | 0.58                           |
|                           | Temperature Control Modules | CJ1W-TC□□□□                      | 0.25                           |
|                           | Position Control Modules    | CJ1W-NC113/133<br>CJ1W-NC213/233 | 0.25                           |
|                           |                             | CJ1W-NC413/433                   | 0.36                           |
| High-speed Counter Module |                             | CJ1W-CT021                       | 0.28                           |
|                           |                             |                                  |                                |
|                           |                             |                                  |                                |
| ID Sensor Modules         |                             | CJ1W-V600C11                     | 0.26                           |
|                           |                             | CJ1W-V600C12                     | 0.32                           |

### CPU Bus Communication Modules

| Category        | Name                         | Model         | Current consumption at 5 V (A) |
|-----------------|------------------------------|---------------|--------------------------------|
| CPU Bus Modules | Ethernet Module              | CJ1W-ETN21    | 0.38                           |
|                 | Controller Link Module       | CJ1W-CLK21-V1 | 0.35                           |
|                 | DeviceNet Module             | CJ1W-DRM21    | 0.33                           |
|                 | ProfiBus-DP Module           | CJ1W-PRM21    | 0.40                           |
|                 |                              | CJ1W-PRT21    | 0.40                           |
|                 | Serial Communications Module | CJ1W-SCU41    | 0.38<br>(See note.)            |
|                 |                              | CJ1W-SCU21    | 0.28<br>(See note.)            |
|                 | CompoBus/S Master Module     | CJ1W-SRM21    | 0.15                           |
|                 |                              |               |                                |

Note: Add 0.15 A per Module when the NT-AL001-E is connected.

### 24-Volt Group: CJ1 Series Basic Output Modules

| Category             | Name               | Model      | Current consumption at 24 V (A)     |
|----------------------|--------------------|------------|-------------------------------------|
| Basic Output Modules | Relay Output Units | CJ1W-OC201 | 0.048<br>(0.006 × No. of points ON) |
|                      |                    | CJ1W-OC211 | 0.096<br>(0.006 × No. of points ON) |

## I/O Allocations

### Overview

In CJ1 Series PLCs, I/O memory is allocated based on the following: Basic I/O are automatically assigned words based on position in the rack. In contrast, for Communications and Bus I/O, the user assigns the word allocations within set ranges.

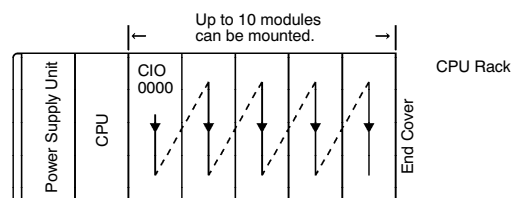
### Allocations to Basic I/O Module Groups

Allocated words in the CIO Area: CIO 0000 to CIO 0079

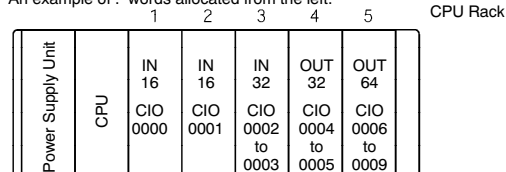
Basic I/O Modules can be mounted to the CPU Rack and to the Expansion Racks.

#### CPU Rack Allocations

Basic I/O Modules on the CPU Rack are allocated words left to right (i.e., from the module nearest the CPU) starting from CIO 0000. Modules are allocated as many words as required in word units. Words can be reserved using CX-Programmer Software.



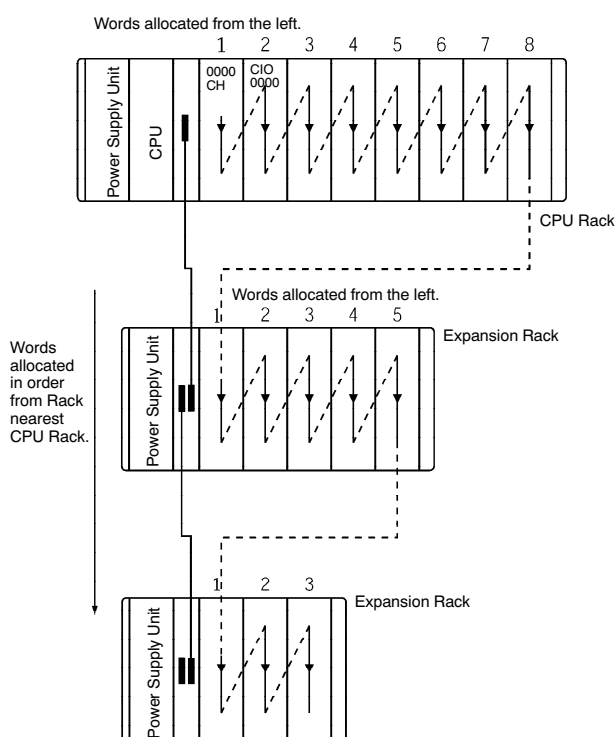
An example of : words allocated from the left.



Modules with between 1 and 16 I/O points are allocated 1 word (16 bits), and modules having between 17 and 32 I/O points are allocated 2 words (32 bits). For example, 8-point Relay Modules are allocated 1 word, with bits 00 to 07 actually allocated to the I/O points.

### Allocations to Expansion Racks

I/O allocation to Basic I/O Modules continues from the CPU Rack to the Expansion Racks. Words are allocated from left to right, and each module is allocated as many words as it requires in word units— just like modules in the CPU Rack. A Rack's first word setting can be changed to any word from CIO 0000 to CIO 9999.



### ■ CompoBus/S and Special I/O Allocations

When allocating I/O in CPU memory, CompoBus/S is considered a Special I/O Module. These modules can be mounted to the CPU Rack and Expansion Racks. Each CompoBus/S Module is allocated ten words in the Special I/O Module Area (CIO 2000 to CIO 2959). Refer to the table provided to the right.

Note: During I/O allocation to Basic I/O Modules, Special I/O Modules are ignored. (Slots containing Special I/O Modules are treated as empty slots.)

#### Special I/O Allocations for CompoBus/S

| Unit number | Words allocated      |
|-------------|----------------------|
| 0           | CIO 2000 to CIO 2009 |
| 1           | CIO 2010 to CIO 2019 |
| 2           | CIO 2020 to CIO 2029 |
| ⋮           | ⋮                    |
| 15          | CIO 2150 to CIO 2159 |
| ⋮           | ⋮                    |
| 95          | CIO 2950 to CIO 2959 |

### ■ Allocations for All Networking and Communications Modules — Except CompoBus/S

Each CPU Bus Module is allocated 25 words in the CPU Bus Module Area (CIO 1500 to CIO 1899).

CPU Bus Modules can be mounted to the CPU Rack or Expansion Racks.

Each Module is allocated 25 words in the CPU Bus Module Area according to its unit number, as shown in the table to the right.

Note: CPU Bus Modules are ignored during I/O allocation to Basic I/O Modules. The same unit numbers can be used for Special I/O Modules and CPU Bus Modules.

#### Allocations for All Networking and Communications Modules — Except Special I/O

| Unit number | Words allocated      |
|-------------|----------------------|
| 0           | CIO 1500 to CIO 1524 |
| 1           | CIO 1525 to CIO 1549 |
| 2           | CIO 1550 to CIO 1574 |
| ⋮           | ⋮                    |
| 15          | CIO 1875 to CIO 1899 |

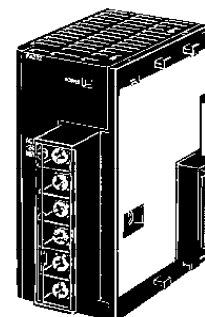
## Power Supply Units

### ■ Features

Select the Power Supply Unit to match the current consumption requirements of a Basic Configuration CJ1 Series system or a CPU Rack and Expansion Rack system.

- Choose 100-120 VAC/200-240 VAC or 24 VDC models.
- Separate RUN output on CJ1W-PA205R Power Supply Unit provides confirmation of operation for troubleshooting and remote diagnostics.

Power Supply Units  
CJ1W-PA205R  
CJ1W-PA202  
CJ1W-PD025



### ■ Specifications

| Item                                   | Specifications                                                                                                                                                                            |                                                                                                                                                              |                                                                                                      |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Power Supply Unit                      | CJ1W-PA205R                                                                                                                                                                               | CJ1W-PA202                                                                                                                                                   | CJ1W-PD025                                                                                           |
| Supply voltage                         | 100 to 240 VAC (wide-range), 50/60 Hz                                                                                                                                                     |                                                                                                                                                              | 24 VDC                                                                                               |
| Operating voltage and frequency ranges | 85 to 264 VAC, 47 to 63 Hz                                                                                                                                                                |                                                                                                                                                              | 19.2 to 28.2 VDC                                                                                     |
| Power consumption                      | 100 VA max.                                                                                                                                                                               | 50 VA max.                                                                                                                                                   | 50 W max.                                                                                            |
| Inrush current<br>(See note 3.)        | 100 to 120-VAC input: 15 A/8 ms max. (with cold start at room temperature)<br><br>200 to 240-VAC input: 30 A/8 ms max. (at cold start under room temperature)                             | 100 to 120-VAC input: 20 A/8 ms max. (with cold start at room temperature)<br><br>200 to 240-VAC input: 40 A/8 ms max. (with cold start at room temperature) | At 24 VDC: 30 A/20 ms max. for cold start at room temperature                                        |
| Output capacity                        | 5.0 A, 5 VDC (including supply to the CPU);<br>0.8 A, 24 VDC (total: 25 W max.)                                                                                                           | 2.8 A, 5 VDC (including supply to the CPU);<br>0.4 A, 24 VDC (total: 14 W max.)                                                                              | 5.0 A, 5 VDC (including supply to CPU);<br>0.8 A, 24 VDC;(total: 25 W max.)                          |
| Output terminal                        | Not provided                                                                                                                                                                              |                                                                                                                                                              |                                                                                                      |
| RUN output<br>(See note 2.)            | Contact configuration: SPST-NO<br>Switching capacity:<br>250 VAC, 2 A (resistive load)<br>120 VAC, 0.5 A (inductive load)<br>24 VDC, 2 A (resistive load)<br>24 VDC, 2 A (inductive load) | None provided                                                                                                                                                |                                                                                                      |
| Insulation resistance<br>(See note 1.) | 20 MΩ min. (at 500 VDC) between AC external and GR terminals                                                                                                                              |                                                                                                                                                              | 20 MΩ min. (at 500 VDC) between DC external and GR terminals                                         |
| Dielectric strength<br>(See note 1.)   | 2,300 VAC 50/60 Hz for 1 min between AC external and GR terminals<br>Leakage current: 10 mA max.                                                                                          |                                                                                                                                                              | 1,000 VAC 50/60 Hz for 1 min between DC external and GR terminals<br><br>Leakage current: 10 mA max. |
|                                        | 1,000 VAC 50/60 Hz for 1 min between DC external and GR terminals<br>Leakage current: 10 mA max.                                                                                          |                                                                                                                                                              |                                                                                                      |

(This table continues on the next page.)

- Note: 1. Disconnect the Power Supply Unit's 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.
2. Supported only when mounted to CPU Rack.
3. These values are based on the condition that the Unit is cold-started at room temperature. Thermistor elements with current suppression characteristics are used in the inrush current limiting circuits provided in the power supply. The inrush current may exceed as much as twice these values if the ambient temperature is high or when the power supply is hot-started with insufficient cooling down time because the thermistors are not sufficiently cooled down. When selecting fuses or breakers for external circuits, ensure a sufficient allowance for fuse or current detection characteristics.

## Specifications (continued)

| Item                           | Specifications                                                                                                                                                                                         |            |            |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|
| Power Supply Unit              | CJ1W-PA205R                                                                                                                                                                                            | CJ1W-PA202 | CJ1W-PD025 |
| Noise immunity                 | Conforms to IEC61000-4-4, 2 kV (power lines)                                                                                                                                                           |            |            |
| Vibration resistance           | 10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s <sup>2</sup> in X, Y, and Z directions for 80 minutes. (Time coefficient: 8 minutes × coefficient factor 10 = total time 80 min.) |            |            |
| Shock resistance               | 147 m/s <sup>2</sup> , 3 times each in X, Y, and Z directions (Relay Output Module: 100 m/s <sup>2</sup> )                                                                                             |            |            |
| Operating temperature          | 0 to 55°C                                                                                                                                                                                              |            |            |
| Operating humidity             | 10% to 90% (with no condensation)                                                                                                                                                                      |            |            |
| Atmosphere                     | Must be free from corrosive gases.                                                                                                                                                                     |            |            |
| Storage temperature            | -20 to 75°C (excluding battery)                                                                                                                                                                        |            |            |
| Grounding                      | Less than 100 Ω                                                                                                                                                                                        |            |            |
| Enclosure                      | Mounted in a panel.                                                                                                                                                                                    |            |            |
| Item                           | Specifications                                                                                                                                                                                         |            |            |
| CJ1 Series CPU Rack dimensions | Refer to "Dimensions" in the <i>Reference</i> Section of this catalog                                                                                                                                  |            |            |
| Dimensions                     | 60 × 90 × 65 mm (W × H × D) power supply only, not including terminal block)                                                                                                                           |            |            |
| Safety measures                | Conforms to cULus and EC directives.                                                                                                                                                                   |            |            |

## CPU Rack Configuration Checklist

### ■ CPU Rack Configuration

| Item                | Products                                                               | Requirements                                                                                                                                                                                                               |
|---------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CJ1 Series CPU Rack | CJ1 Series CPU<br>(Provided with 1 End Cover as a standard accessory.) | One of each Module required for every CPU Rack.                                                                                                                                                                            |
|                     | CJ1 Series Power Supply Unit                                           |                                                                                                                                                                                                                            |
|                     | CJ1 Series Basic I/O Module                                            | Total number of Modules: 10 Modules max.<br>(Mounting 11 or more Modules will result in a fatal error.)                                                                                                                    |
|                     | CJ1 Series Special I/O Module                                          |                                                                                                                                                                                                                            |
|                     | CJ1 Series CPU Bus Module                                              |                                                                                                                                                                                                                            |
|                     | End Cover (CJ1W-TER01)                                                 | Required on the right-hand side of CJ1 Series CPU Racks. (One End Cover is provided with each CPU as a standard accessory. Not mounting an End Cover on the right-hand side of the CPU Rack will result in a fatal error.) |
|                     | Memory Card                                                            | Install as required.                                                                                                                                                                                                       |
|                     | I/O Control Module<br>(CJ1W-IC101)                                     | Required for connection to CJ1 Series Expansion Racks. Connect to the right-hand side of the CPU Rack.                                                                                                                     |
|                     | I/O Connecting Cable                                                   | Required for connecting CPU Racks to Expansion Racks.                                                                                                                                                                      |

### ■ Products Used in CPU Racks

| Item                      | Model       | Specifications                                                                                                                                                                                                                                  |
|---------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CJ1 Series CPUs           | CJ1H-CPU66H | I/O bits: 2,560 (3 Expansion Racks), program capacity: 120K steps, LD execution time: 0.02 $\mu$ s, Data Memory: 256K words (DM: 32K words, EM: 32K words x 7 banks)                                                                            |
|                           | CJ1H-CPU65H | I/O bits: 2,560 (3 Expansion Racks), program capacity: 60K steps, LD execution time: 0.02 $\mu$ s, Data Memory: 128K words (DM: 32K words, EM: 32K words x 3 banks)                                                                             |
|                           | CJ1G-CPU45H | I/O bits: 1,280 (3 Expansion Racks), program capacity: 60K steps, LD execution time: 0.04 $\mu$ s, Data Memory: 128K words (DM: 32K words, EM: 32K words x 3 banks)                                                                             |
|                           | CJ1G-CPU44H | I/O bits: 1,280 (3 Expansion Racks), program capacity: 30K steps, LD execution time: 0.04 $\mu$ s, Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)                                                                               |
|                           | CJ1G-CPU43H | I/O bits: 960 (2 Expansion Racks), program capacity: 20K steps, LD execution time: 0.04 $\mu$ s, Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)                                                                                 |
|                           | CJ1G-CPU42H | I/O bits: 960 (2 Expansion Racks), program capacity: 10K steps, LD execution time: 0.04 $\mu$ s, Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)                                                                                 |
|                           | CJ1M-CPU23  | I/O bits: 640 (1 Expansion Rack), program capacity: 20K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM); built-in I/O: 10 inputs, 6 outputs                                                                              |
|                           | CJ1M-CPU22  | I/O bits: 320 (No Expansion Racks), program capacity: 10K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM); built-in I/O: 10 inputs, 6 outputs                                                                            |
|                           | CJ1M-CPU21  | I/O bits: 160 (No Expansion Racks), program capacity: 5K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM); built-in I/O: 10 inputs, 6 outputs                                                                             |
|                           | CJ1M-CPU13  | I/O bits: 640 (1 Expansion Rack), program capacity: 20K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM)                                                                                                                  |
|                           | CJ1M-CPU12  | I/O bits: 320 (No Expansion Racks), program capacity: 10K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM)                                                                                                                |
|                           | CJ1M-CPU11  | I/O bits: 160 (No Expansion Racks), program capacity: 5K steps, LD execution time: 0.1 $\mu$ s, Data Memory: 32K words, (No EM)                                                                                                                 |
| Battery Set               | CPM2A-BAT01 | Can also be used with CPM2A and CQM1H PLCs.<br>This battery cannot be used for CS1 Series PLCs.                                                                                                                                                 |
|                           | CJ1W-BAT01  | Can be used with CJ1M only.<br>This battery cannot be used for CJ1G/H or CS1 Series PLCs.                                                                                                                                                       |
| CJ1 Series Power Supply   | CJ1W-PA205R | 100 to 240 VAC (with RUN output); output capacity: 5 A, 5 VDC                                                                                                                                                                                   |
|                           | CJ1W-PA202  | 100 to 240 VAC; output capacity: 2.8 A, 5 VDC                                                                                                                                                                                                   |
|                           | CJ1W-PD025  | 24 VDC; Output capacity: 5 A, 5 VDC                                                                                                                                                                                                             |
| I/O Control Module        | CJ1W-IC101  | Used to connect a CJ1 Series Expansion Rack to a CJ1 Series CPU Rack. Connect to the right-hand side of the CPU. Connect to an I/O Interface Module mounted on a CJ1 Series Expansion Rack using a CS1/CJ1 Series Connecting Cable.             |
| End Cover                 | CJ1W-TER01  | Required on the right-hand side of CJ1 Series CPU Racks. (Not mounting an End Cover on the right-hand side of the CPU Rack will result in a fatal error.)<br>Note: One is provided with CPUs and I/O Interface Modules as a standard accessory. |
| Din Track and Accessories | PFP-50N     | Length: 50 cm; height: 7.3 mm                                                                                                                                                                                                                   |
|                           | PFP-100N    | Length: 1 m; height: 7.3 mm                                                                                                                                                                                                                     |
|                           | PFP-100N2   | Length: 1 m; height: 16 mm                                                                                                                                                                                                                      |
|                           | PFP-M       | There are two locking clips provided with each CPU and I/O Interface Module as standard accessories to secure the Modules on the DIN Track.                                                                                                     |

## Expansion Rack Configuration Checklist

## ■ Expansion Rack Configuration

CJ1 Series Expansion Racks can be connected to CJ1 Series CPU Racks or other CJ1 Series Expansion Racks.

| Rack                      | Configuration                                                                        | Requirements                                                                                                                                                                                                                                             |
|---------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CJ1 Series Expansion Rack | CJ1 Series Power Supply Unit                                                         | One of each Module required for every Expansion Rack. Connect the I/O Interface Module to the right of the Power Supply Unit.<br><br>Note: An I/O Control Module is required for each CJ1 Series Expansion Rack.                                         |
|                           | I/O Interface Module CJ1W-II101 (Provided with 1 End Cover as a standard accessory.) |                                                                                                                                                                                                                                                          |
|                           | CJ1 Series Basic I/O Module                                                          | Total number of Modules: 10 Modules max. (Mounting 11 or more Modules will result in a fatal error.)                                                                                                                                                     |
|                           | CJ1 Series Special I/O Module                                                        |                                                                                                                                                                                                                                                          |
|                           | CJ1 Series CPU Bus Module                                                            |                                                                                                                                                                                                                                                          |
|                           | CS1/CJ1 Series I/O Connecting Cable                                                  | Required to connect I/O Control Modules to I/O Interface Modules.<br><br>Note: The total length of CS1/CJ1 Series I/O Connecting Cable used in the system must not exceed 12 m. Correct operation is not ensured if the total cable length exceeds 12 m. |

## ■ Capacity Overview

| CPU Models  | Maximum I/O Modules per CPU (depending on power supply capacity) | Maximum I/O Expansion Racks per CPU (depending on power supply capacity) |
|-------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| CJ1M-CPU13  | 20                                                               | 1                                                                        |
| CJ1M-CPU23  |                                                                  |                                                                          |
| CJ1G-CPU42H | 30                                                               | 2                                                                        |
| CJ1G-CPU43H |                                                                  |                                                                          |
| CJ1G-CPU44H | 40                                                               | 3                                                                        |
| CJ1G-CPU45H |                                                                  |                                                                          |
| CJ1H-CPU65H |                                                                  |                                                                          |
| CJ1H-CPU66H |                                                                  |                                                                          |

## ■ Products Used in Expansion Racks

| Item                                 | Model         | Specifications                                                                                                                                                                                                                                        | Cable Length |
|--------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| CJ1 Series Power Supply Unit         | CJ1W-PA205R   | 100 to 240 VAC (with RUN output), output capacity: 5 A, 5 VDC                                                                                                                                                                                         | —            |
|                                      | CJ1W-PA202    | 100 to 240 VAC, output capacity: 2.8 A, 5 VDC                                                                                                                                                                                                         |              |
|                                      | CJ1W-PD025    | 24 VDC, 5A, 5 VDC                                                                                                                                                                                                                                     |              |
| I/O Interface Module                 | CJ1W-II101    | One is required for each CJ1 Series Expansion Rack. An End Cover is provided as a standard accessory. (Connect to an I/O Control Module on a CPU Rack or to another I/O Interface Module on an Expansion Rack using CS1/CJ1 Series Connecting Cable.) | —            |
| End Cover                            | CJ1W-TER01    | Required for the right-hand side of CJ1 Series Expansion Racks. One is provided with I/O Interface Modules as a standard. (Not connecting an End Cover will result in a fatal error.)                                                                 | —            |
| CJ1/CS1 Series I/O Connecting Cables | CS1W-CN313    | Used to connect I/O Interface Modules (CJ1W-II101) to I/O Control Modules (CJ1W-IC101) or to other I/O Interface Modules.                                                                                                                             | 0.3 m        |
|                                      | CS1W-CN713    |                                                                                                                                                                                                                                                       | 0.7 m        |
|                                      | CS1W-CN223    |                                                                                                                                                                                                                                                       | 2 m          |
|                                      | CS1W-CN323    |                                                                                                                                                                                                                                                       | 3 m          |
|                                      | CS1W-CN523    |                                                                                                                                                                                                                                                       | 5 m          |
|                                      | CS1W-CN133    |                                                                                                                                                                                                                                                       | 10 m         |
|                                      | CS1W-CN133-B2 |                                                                                                                                                                                                                                                       | 12 m         |

## Special Ordering Information

- Order one CJ1W-IC101 I/O Control Module for the CPU rack and one CJ1W-II101 I/O Interface Module for each I/O Expansion rack.
- Connect the modules with a cable of the appropriate length.
- The second and third I/O Expansion racks connect between I/O Interface Modules.