

# NJ-Series Power Supply Unit

# NJ-PA/PD

CSM\_NJ-PA\_PD\_DS\_E\_1\_1

## Powerful power supply unit to supply stable power to the NJ-series controller.

Stable power supply is available from the NJ-series CPU Unit to each I/O Unit via the dedicated bus. Lineups are provided for AC and DC input types with 30 W output.



NJ-PD3001

## Features

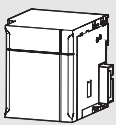
- AC input type (100 to 240 VAC)/DC input type (24 VDC) with 30 W output allows power supply to large-scale configurations.
- Operating output contact indicates the CPU operation status (available in all models).

## 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		Power supply voltage	Output current		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		
AC Power Supply Unit		100 to 240 VAC	6.0 A	1.0 A	30 W	No	Yes	No	NJ-PA3001	UC1, N, L, CE
DC Power Supply Unit		24 VDC							NJ-PD3001	

**Note:** Power supply units for the CJ-Series cannot be used as a power supply for a CPU rack of the NJ system or as a power supply for an expansion rack.

## Accessories

There is no accessory for the NJ-series Power Supply Unit.

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## General Specification

Item	Specifications	
	NJ-PA3001	NJ-PD3001
<b>Model</b>	NJ-PA3001	NJ-PD3001
<b>Supply voltage</b>	100 to 240 VAC (wide-range), 50/60 Hz	24 VDC
<b>Operating voltage and frequency ranges</b>	85 to 264 VAC, 47 to 63 Hz	19.2 to 28.8 VDC
<b>Power consumption</b>	120 VA max.	60 W max.
<b>Inrush current *1</b>	At 100 VAC: 20 A/8 ms max. for cold start at room temperature At 200 VAC: 40 A/8 ms max. for cold start at room temperature	At 24 VDC: 30 A/20 ms max. for cold start
<b>Output capacity *2</b>	5 VDC, 6.0 A (including supply to CPU Unit using CPU Rack) 5 VDC, 6.0 A (using Expansion Rack) 24 VDC, 1.0 A Total: 30 W max.	
<b>Output terminal (service supply)</b>	Not provided	
<b>RUN output *3</b>	Contact configuration: SPST-NO Switch capacity: 250 VAC, 2 A (resistive load) 120 VAC, 0.5 A (inductive load), 24 VDC, 2A (resistive load)	
<b>Replacement notification function</b>	Not provided	
<b>Insulation resistance *4</b>	20 MΩ min. (at 500 VDC) between AC external and GR terminals	20 MΩ min. (at 500 VDC) between DC external and GR terminals
<b>Dielectric strength *4*5</b>	2,300 VAC 50/60 Hz for 1 min. between AC external and GR terminals Leakage current: 10 mA max.	1,000 VAC 50/60 Hz for 1 min. between DC external and GR terminals Leakage current: 10 mA max.
<b>Noise immunity</b>	2 kV on power supply line (Conforms to IEC 61000-4-4.)	
<b>Vibration resistance</b>	5 to 8.4 Hz, 3.5-mm amplitude, 8.4 to 150 Hz, acceleration: 9.8 m/s <sup>2</sup> in X, Y, and Z directions for 100 min. (Time coefficient: 10 min. × coefficient factor 10 = total time 100 min.) (according to IEC 60068-2-6)	
<b>Shock resistance</b>	147 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (Relay Output Unit: 100 m/s <sup>2</sup> ) (according to IEC 60068-2-27)	
<b>Ambient operating temperature</b>	0 to 55°C	
<b>Ambient operating humidity</b>	10% to 90% (with no condensation)	
<b>Atmosphere</b>	Must be free from corrosive gases.	
<b>Ambient storage temperature</b>	-20 to 75°C	
<b>Grounding</b>	Less than 100 Ω	
<b>Enclosure</b>	Mounted in panel	
<b>Weight</b>	470 g max.	490 g max.
<b>CPU Rack dimensions</b>	174.7 to 484.7 × 90 × 90 mm (W × D × H) (not including cables) W = 70 (Power Supply Unit) + 90 (CPU Unit) + 20 × n + 31 × m + 14.7 (end cover) n is the number of 32-point I/O Units or I/O Control Units and m is the number of other Units.	
<b>Safety measures</b>	Conforms to cULus, EC Directives, NK and LR.	

\*1. The AC and DC values above are given for a cold start, and the AC values are at room temperature. The AC inrush control circuit uses a thermistor element with a low-temperature current control characteristic. If the ambient temperature is high or the Controller is hot-started, the thermistor will not be sufficiently cool, and the inrush current given in the table may be exceeded by up to twice the given value. The DC inrush control circuit uses a capacitor-charging delay circuit. If the power is OFF for only a short time for a hot-start, the capacitor will not sufficiently discharge and the inrush current given in the table may be exceeded by up to twice the given value. An inrush current of approximately 4 A may occur and continue for 1 s when the power is turned ON. When selecting fuses, breakers, and external DC power supply devices for external circuits, allow sufficient margin in shut-off performance.

\*2. 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.

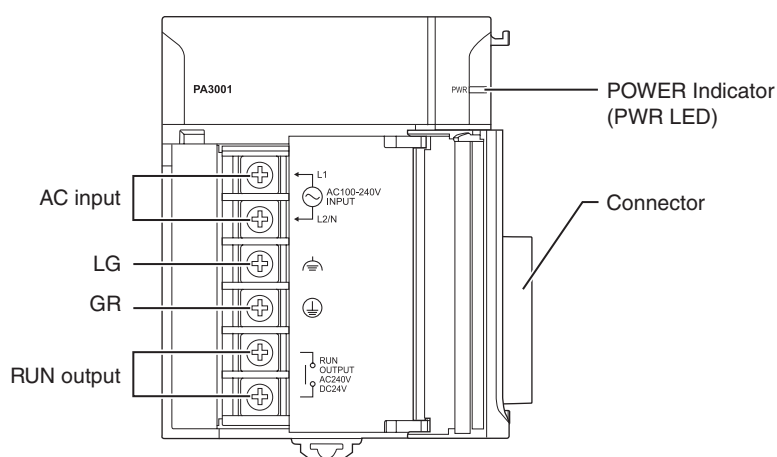
\*3. Supported only when mounted to CPU Rack.

\*4. The tests can also be performed with the LG terminal and GR terminal connected to each other.

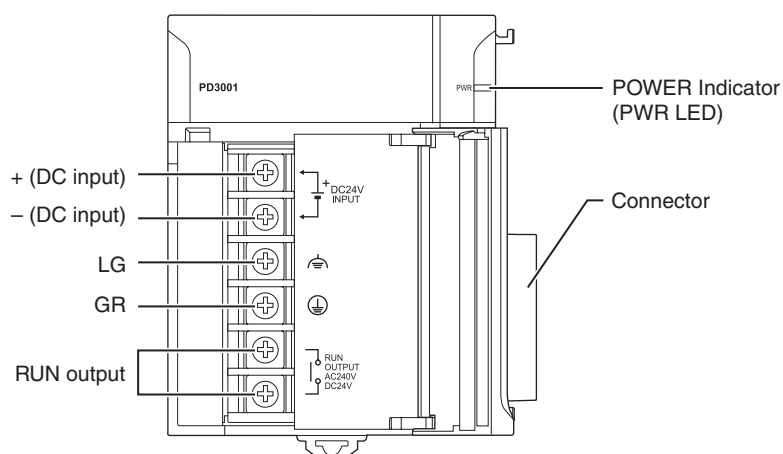
\*5. Change the applied voltage gradually using the adjuster on the Tester. If the full dielectric strength voltage is applied or turned OFF using the switch on the Tester, the generated impulse voltage may damage the Power Supply Unit.

## External Interface

### NJ-PA3001



### NJ-PD3001



### AC Input

Supply 100 to 240 VAC (allowable: 85 to 264 VAC).

The NJ-PA3001 has a wide input range, so it does not have voltage switching terminals.

### DC Input

Supply 24 VDC (allowable: 19.2 to 28.8 VDC.)

### 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

The internal contacts for the RUN output turn ON when the CPU Unit is in RUN status.

## Wiring

### ●About Power Supply

For AC/DC power supply

Recommended wire diameter	AWG 14 to 20 (Cross section 0.517 to 2.08 mm <sup>2</sup> )
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For grounding wire

Recommended wire diameter	2 mm <sup>2</sup> or thicker
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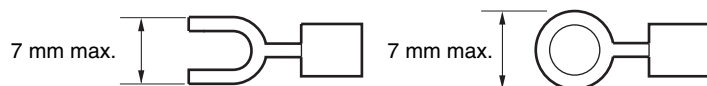
### ●Crimp Terminals

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

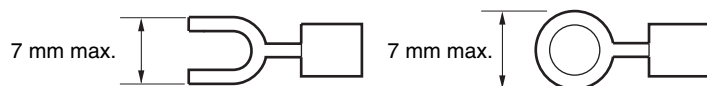
Crimp Terminals for AC Power Supplies



Crimp Terminals for DC Power Supplies



Crimp terminal for the grounding wire



## Precautions for Use

### Compatible CPU Models

NJ-PA3001/NJ-PD3001 are dedicated for NJ-series.

Please make sure to use NJ-PA3001/NJ-PD3001 for all products including NJ-series CPU rack and expansion rack.

## Power Supply Units Current Consumption

### 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			(C) Max. total power supplied
	(A) 5-VDC CPU Racks*	(A)5-VDC Expansion Rack	(B) 24 VDC	
NJ-PA3001	6.0 A	6.0 A	1.0 A	30 W
NJ-PD3001	6.0 A	6.0 A	1.0 A	30 W

\* Including supply to the CPU Unit.

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 NJ-Series CPU Rack Using a NJ-PA3001 Power Supply Unit

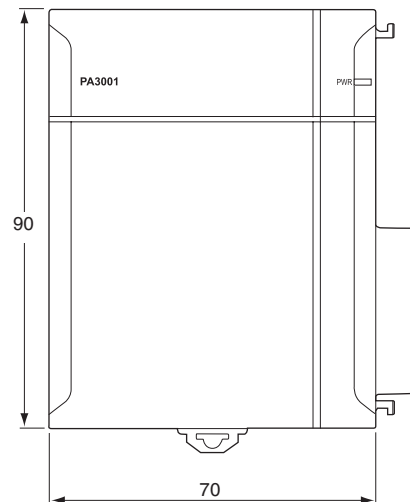
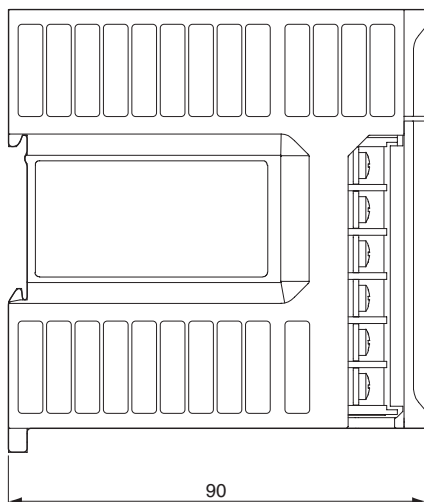
Unit type	Model	Quantity	Voltage group	
			5 V	24 V
CPU Unit	NJ501-1500	1	1.90 A	-
I/O Control Unit	CJ1W-IC101	1	0.02 A	-
Basic I/O Units (Input Units)	CJ1W-ID211	2	0.08 A	-
	CJ1W-ID231	2	0.09 A	-
Basic I/O Units (Output Units)	CJ1W-OC201	2	0.09 A	0.048 A
Special I/O Unit	CJ1W-DA041	1	0.12 A	-
CPU Bus Unit	CJ1W-SCU22	1	0.28 A	-
Current consumption	Total		$1.9\text{ A} + 0.02\text{ A} + 0.08\text{ A} \times 2 + 0.09\text{ A} \times 2 + 0.09\text{ A} \times 2 + 0.12\text{ A} + 0.28$	$0.048\text{ A} \times 2$
	Result		2.84 A ( $\leq 6.0\text{ A}$ )	0.096 A ( $\leq 1.0\text{ A}$ )
Power consumption	Total		$2.84 \times 5\text{ V} = 14.2\text{ W}$	$0.096\text{ A} \times 24\text{ V} = 2.3\text{ W}$
	Result		$14.2\text{ W} + 2.3\text{ W} = 16.5\text{ W} (\leq 30\text{ W})$	

### Using the Sysmac Studio to Display Current Consumption and Width

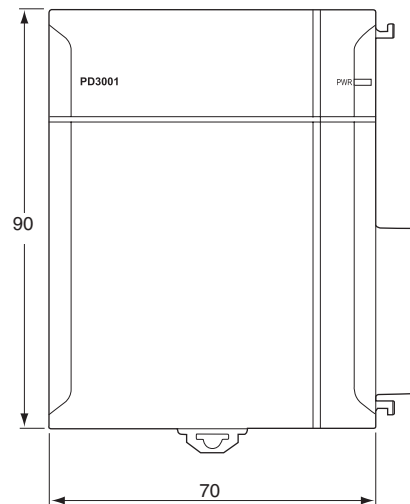
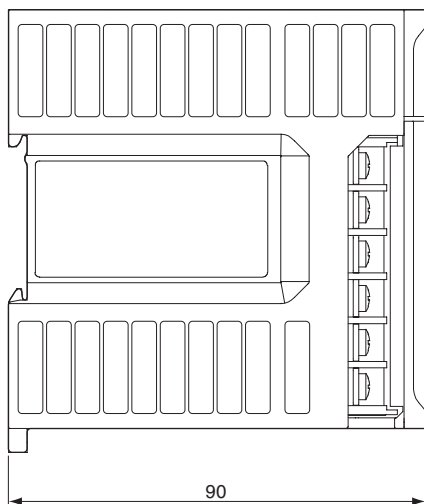
CPU Rack and Expansion Rack current consumption and width can be displayed by selecting **CPU/Expansion Racks** from the **Configurations and Setup** in the Multiview Explorer. If the capacity of the Power Supply Unit is exceeded, an error icon is displayed in the power supply unit of a corresponding rack. For details, refer to Sysmac Studio Version 1 Operation manual (W504).

# Dimensions

## NJ-PA3001



## NJ-PD3001



## Related Manuals

Manual name	Cat. No.	Model numbers	Application	Description
NJ-series CPU Unit Hardware User's Manual	W500	NJ501-□□□□	Learning the basic specifications of the NJ-series CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NJ-series system is provided along with the following information on a Controller built with an NJ501 CPU Unit. <ul style="list-style-type: none"> <li>• Features and system configuration</li> <li>• Introduction</li> <li>• Part names and functions</li> <li>• General specifications</li> <li>• Installation and wiring</li> <li>• Maintenance and inspection</li> </ul> Use this manual together with the <i>NJ-series CPU Unit Software User's Manual</i> (Cat. No. W501).

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