Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

OMRON

Programmable Controllers

CJ1

The CJ1 Expands the World of Machine Control!

» Flexible !

» Fast !

» Small !

real i **zing**

The Fast, Small, and Flexible CJ1 the World of Machine Control!

Expands

Fast!

Versatile Machine Control with the Highest Performance Standards in the Industry.

Upgraded Basic Functions

Small!

Super-compact design that meets the highest standards in its class. Even a narrow space in a machine serves as a control panel.

Height: 90 mm, Depth: 65 mm

Backplane-free structure for a flexible Rack width.

Smaller Units.

Flexible!

Suitable for essentially any application, from small device and temperature control, to large-scale control over networks.

Application-specific CPU Units

CPU Units are available for a variety of applications, such as CPU Units with built-in I/O, CPU Units with Ethernet function, or CPU Units for loop control.

Full Complement of I/O Units

From Basic I/O Units, Analog Units, and Position Control Units to Ethernet Units, any of the Units can be used with any of the CPU Units.

New CJ2 series introduction

With the base of CJ1 series, CJ2 series with advanced functions has been released.
The CJ2 series will easily innovate your systems widely ranging from compact machinery to high-speed and highly precise systems.
Refer to the catalog (Cat No. P059) for details.
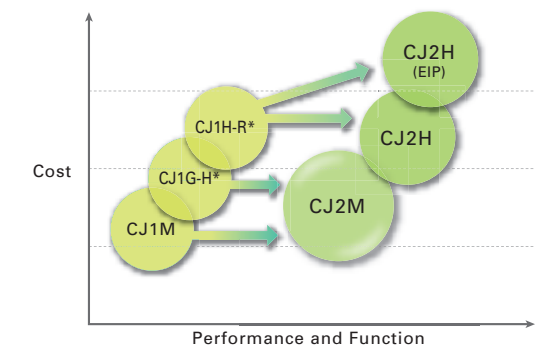
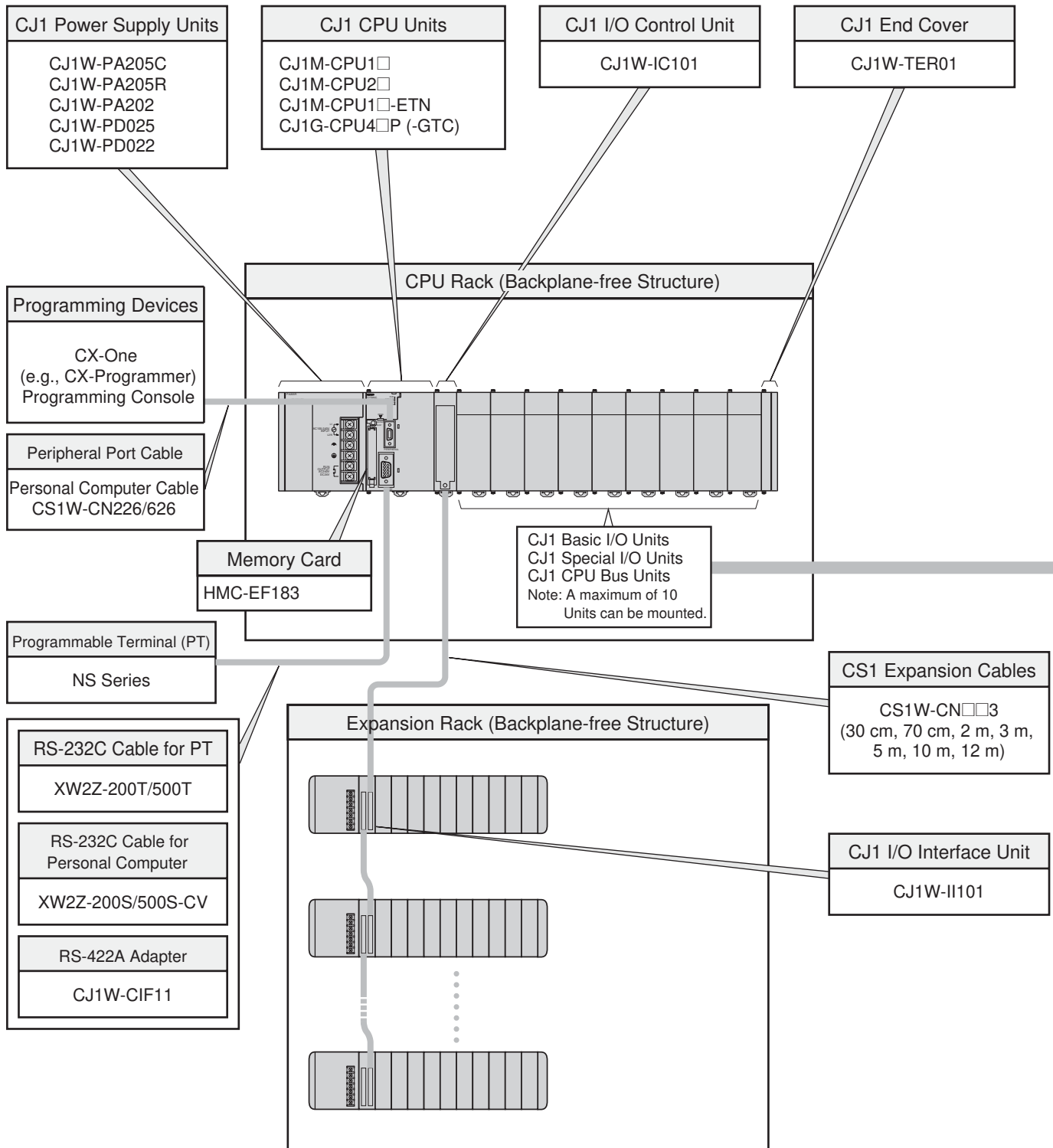* Including models whose production were discontinued.

Programmable Controller
SYSMAC CJ1

MEMO

System Design Guide

System Configuration

■ Basic System

CJ1 Power Supply Units
CJ1W-PA205C CJ1W-PA205R CJ1W-PA202 CJ1W-PD025 CJ1W-PD022

CJ1 CPU Units
CJ1M-CPU1□ CJ1M-CPU2□ CJ1M-CPU1□-ETN CJ1G-CPU4□P (-GTC)

CJ1 I/O Control Unit
CJ1W-IC101

CJ1 End Cover
CJ1W-TER01

CPU Rack (Backplane-free Structure)

Programming Devices
CX-One (e.g., CX-Programmer) Programming Console

Peripheral Port Cable
Personal Computer Cable CS1W-CN226/626

Memory Card
HMC-EF183

CJ1 Basic I/O Units
CJ1 Special I/O Units
CJ1 CPU Bus Units
Note: A maximum of 10 Units can be mounted.

Programmable Terminal (PT)
NS Series

RS-232C Cable for PT
XW2Z-200T/500T

RS-232C Cable for Personal Computer
XW2Z-200S/500S-CV

RS-422A Adapter
CJ1W-CIF11

Expansion Rack (Backplane-free Structure)

CS1 Expansion Cables
CS1W-CN□□3 (30 cm, 70 cm, 2 m, 3 m, 5 m, 10 m, 12 m)

CJ1 I/O Interface Unit
CJ1W-II101

■ Configuration Units

CJ1 Basic I/O Units			
8-point Units	**16-point Units**	**32-point Units**	**64-point Units**
Input Units			
● DC Input Unit CJ1W-ID201 ● AC Input Unit CJ1W-IA201	● DC Input Unit CJ1W-ID211 CJ1W-ID212 `High-speed type` ● AC Input Unit CJ1W-IA111	● DC Input Unit CJ1W-ID231 CJ1W-ID232 CJ1W-ID233 `High-speed type`	● DC Input Unit CJ1W-ID261 CJ1W-ID262
Output Units			
● Relay Contact Output Unit (independent commons) CJ1W-OC201 ● Triac Output Unit CJ1W-OA201 ● Transistor Output Units CJ1W-OD201 CJ1W-OD202 CJ1W-OD203 CJ1W-OD204	● Relay Contact Output Unit CJ1W-OC211 ● Transistor Output Units CJ1W-OD211 CJ1W-OD213 `High-speed type` CJ1W-OD212	● Transistor Output Units CJ1W-OD231 CJ1W-OD233 CJ1W-OD234 `High-speed type` CJ1W-OD232	● Transistor Output Units CJ1W-OD261 CJ1W-OD263 CJ1W-OD262
I/O Units			
---	---	(16 inputs, 16 outputs) ● DC Input/Transistor Output Units CJ1W-MD231 CJ1W-MD233 CJ1W-MD232	32 inputs, 32 outputs ● DC Input/Transistor Output Units CJ1W-MD261 CJ1W-MD263 32 inputs, 32 outputs ● TTL I/O Unit CJ1W-MD563
Other Units			
---	● Interrupt Input Unit CJ1W-INT01 ● High-speed Input Unit CJ1W-IDP01	---	● B7A Interface Units (64 inputs) CJ1W-B7A14 (64 outputs) CJ1W-B7A04 (32 inputs, 32 outputs) CJ1W-B7A22

CJ1 Special I/O Units and CPU Bus Units			

■ Process I/O Units
● Isolated-type Units with Universal
  Inputs
CJ1W-PH41U
CJ1W-AD04U
● Isolated-type Thermocouple Input
  Units
CJ1W-PTS15
CJ1W-PTS51
● Isolated-type Resistance
  Thermometer Input Units
CJ1W-PTS16
CJ1W-PTS52
● Isolated-type DC Input Unit
CJ1W-PDC15
■ Analog I/O Units
● Analog Input Units
CJ1W-AD042 `High-speed type`
CJ1W-AD081-V1
CJ1W-AD041-V1
● Analog Output Units
CJ1W-DA042V `High-speed type`
CJ1W-DA08V
CJ1W-DA08C
CJ1W-DA041
CJ1W-DA021
● Analog I/O Units
CJ1W-MAD42
 	
■ Temperature Control Units
CJ1W-TC001, CJ1W-TC002
CJ1W-TC003, CJ1W-TC004
CJ1W-TC101, CJ1W-TC102
CJ1W-TC103, CJ1W-TC104
	■ High-speed Counter Units
	CJ1W-CT021
	■ Position Control Units
	CJ1W-NC214 `High-speed type`
	CJ1W-NC414 `High-speed type`
	CJ1W-NC234 `High-speed type`
	CJ1W-NC434 `High-speed type`
	CJ1W-NC113
	CJ1W-NC213
	CJ1W-NC413
	CJ1W-NC133
	CJ1W-NC233
	CJ1W-NC433
	■ Position Control Unit with EtherCAT
	  interface
	CJ1W-NC281 *NEW*
	CJ1W-NC481 *NEW*
	CJ1W-NC881 *NEW*
	CJ1W-NCF81 *NEW*
	CJ1W-NC482 *NEW*
	CJ1W-NC882 *NEW*
	■ Position Control Unit with
	  MECHATROLINK-II interface
	CJ1W-NC271
	CJ1W-NC471
	CJ1W-NCF71
	CJ1W-NCF71-MA
	■ Motion Control Unit with
	  MECHATROLINK-II interface
	CJ1W-MCH71
		■ Serial Communications Units
		CJ1W-SCU22 `High-speed type`
		CJ1W-SCU32 `High-speed type`
		CJ1W-SCU42 `High-speed type`
		CJ1W-SCU21-V1
		CJ1W-SCU31-V1
		CJ1W-SCU41-V1
		■ EtherNet/IP Unit
		CJ1W-EIP21
		■ Ethernet Unit
		CJ1W-ETN21
		■ Controller Link Units
		CJ1W-CLK23
		■ FL-net Unit
		CJ1W-FLN22
		■ DeviceNet Unit
		CJ1W-DRM21
		■ CompoNet Master Unit
		CJ1W-CRM21
		■ CompoBus/S Master Unit
		CJ1W-SRM21
			■ ID Sensor Units
			CJ1W-V680C11
			CJ1W-V680C12
			CJ1W-V600C11
			CJ1W-V600C12
			
			■ High-speed Data Storage Unit
			CJ1W-SPU01-V2

Note: Windows is a registered trademark of Microsoft Corporation in the USA. MECHATROLINK II is a registered trademark of the MECHATROLINK Members Association. Other company names and product names etc. are the trademarks or registered trademarks of their respective companies.

■ CJ-series CPU Racks

A CJ-series CPU Rack consists of a CPU Unit, Power Supply Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.
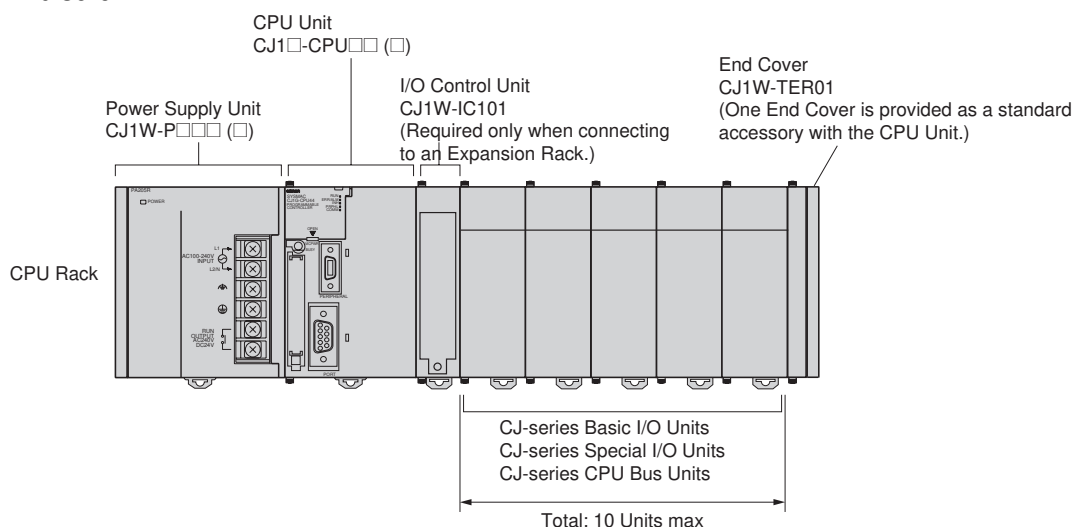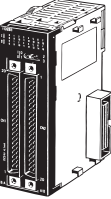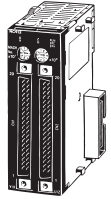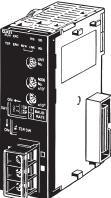

● **Required Units**

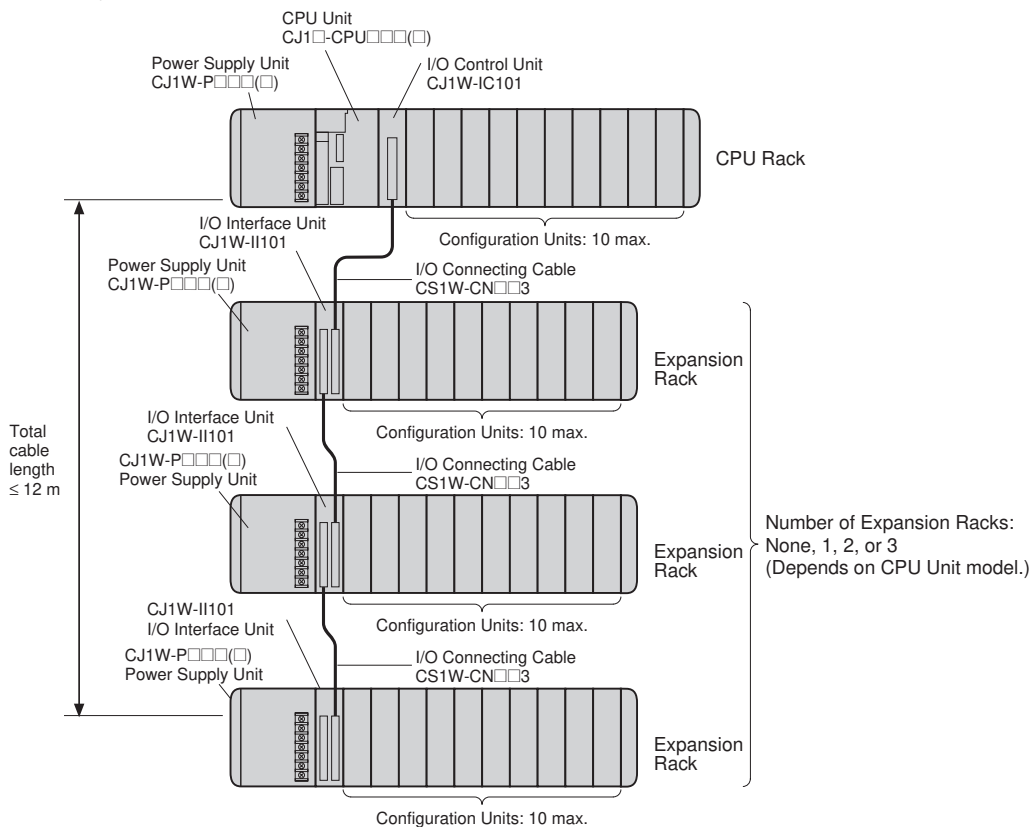| Rack	Unit name	Required number of Units
CPU Rack	**Power Supply Unit**	1
	CPU Unit	1
	I/O Control Unit	Required only for mounting to an Expansion Rack.
	Number of Configuration Units	10 max. (Same for all models of CPU Unit.) (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. The number does not include the I/O Control Unit.)
	End Cover	1 (Included with CPU Unit.)

● **Types of Units**

In the SYSMAC CJ Series, Units are classified into the following three types. The number of Racks differs depending on the type.

Type	Appearance (example)	Description	Unit recognition method	No. of Units
Basic I/O Units		Basic I/O Units with contact inputs and contact outputs.	Recognized by the CPU Unit according to the position of the Rack and slot.	No restrictions.
Special I/O Units		Special I/O Units provide more advanced functions than do Basic I/O Units, including I/O other than contact inputs and contact outputs. Examples of Special I/O Units are Analog I/O Units and High-speed Counter Units. They differ from CPU Bus Units (including Network Communications Units) in having a smaller area for exchanging data with the CPU Unit.	Recognized by the CPU Unit according to the unit number (0 to 95) set with the rotary switches on the front panel.	A maximum of 96 Units can be connected. (Multiple unit numbers are allocated per Unit, depending on the model and settings.)
CPU Bus Units		CPU Bus Units exchange data with the CPU Unit via the CPU Bus. Examples of CPU Bus Units are Network Communications Units and Serial Communications Units. They differ from Special I/O Units in having a larger area for exchanging data with the CPU Unit.	Recognized by the CPU Unit according to the unit number (0 to F) set with the rotary switch on the front panel.	A maximum of 16 Units can be mounted. (See note.)

Note: CJ1M-CPU1□-ETN: A Maximum of 15 Units can be mounted. (The built-in Ethernet port on the CPU Unit must be allocated as one of the CPU Bus Units)

■ CJ-series Expansion Racks

A CJ-series Expansion Rack consists of a Power Supply Unit, an I/O Interface Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.

● Required Units

Rack	Unit name	Required number of Units
CPU Rack	I/O Control Unit	One Unit. Required only when an Expansion Rack is used. Mount the I/O Control Unit immediately to the right of the CPU Unit. (See note 1.)
Expansion Rack	Power Supply Unit	One Unit
	I/O Interface Unit	One Unit. Mount the I/O Interface Unit immediately to the right of the Power Supply Unit. (See note 2.)
	Number of Configuration Units	Ten Units max. (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. This number does not include the I/O Interface Unit.)
	End Cover	One (Included with the I/O Interface Unit.)

Note 1. Mounting the I/O Control Unit in any other location may cause faulty operation.
  2. Mounting the I/O Interface Unit in any other location may cause faulty operation.

● Maximum Number of Configuration Units That Can Be Mounted

| CPU Unit	Model	Total Units	No. of Units on CPU Rack	No. of Expansion Racks
CJ1G	CJ1G-CPU45P (-GTC)	40	10 per Rack	3 Racks x 10 Units
	CJ1G-CPU44P			
	CJ1G-CPU43P	30	10 per Rack	2 Racks x 10 Units
	CJ1G-CPU42P			
CJ1M	CJ1M-CPU13 (-ETN)	20	10 per Rack (See note.)	1 Rack x 10 Units
	CJ1M-CPU23			
	CJ1M-CPU12 (-ETN)	10	10 per Rack (See note.)	Cannot be connected.
	CJ1M-CPU11 (-ETN)			
	CJ1M-CPU22			
	CJ1M-CPU21			

Note: Up to nine Units can be connected to a CJ1M-CPU1□-ETN CPU Units. The maximum number of Configuration Units that can be connected is thus reduced by 1.

Dimensions

Note: Units are in mm unless specified otherwise.

■ Product Dimensions

### Example Rack Widths using CJ1WPA202 Power Supply Unit (AC, 14 W)
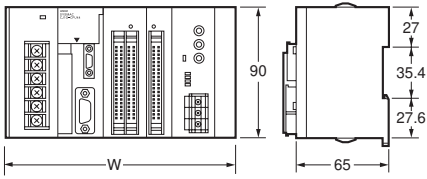
No. of Units mounted with 31-mm width	Rack width (mm)			
	With CJ1M-CPU11/ 12/13	With CJ1M-CPU21/ 22/23	With CJ1M-CPU1□-ETN	With CJ1G-CPU4□P(-GTC) CPU Unit
1	121.7	139.7	152.7	159.7
2	152.7	170.7	183.7	190.7
3	183.7	201.7	214.7	221.7
4	214.7	232.7	245.7	252.7
5	245.7	263.7	276.7	283.7
6	276.7	294.7	307.7	314.7
7	307.7	325.7	338.7	345.7
8	338.7	356.7	369.7	376.7
9	369.7	387.7	400.7	407.7
10	400.7	418.7	431.7	438.7

Power Supply Units, CPU Units, and End Covers

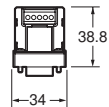| Unit/product	Model	Width
Power Supply Unit	CJ1W-PA205C	80
	CJ1W-PA205R	80
	CJ1W-PA202	45
	CJ1W-PD025	60
	CJ1W-PD022	27
CPU Unit	CJ1M-CPU1□	31
	CJ1M-CPU2□	49
	CJ1M-CPU1□-ETN	62
	CJ1G-CPU4□P	69
End Cover	CJ1W-TER01	14.7

◆ Power Supply Units
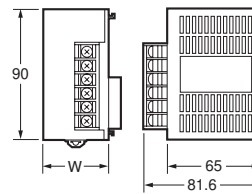
W=27: CJ1W-PD022
W=45: CJ1W-PA202
W=80: CJ1W-PA205R
      CJ1W-PA205C
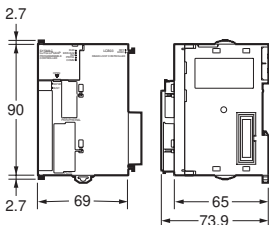W=60: CJ1W-PD025

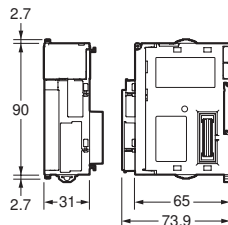◆ End Cover (included with CPU Units)
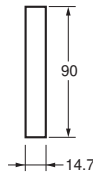
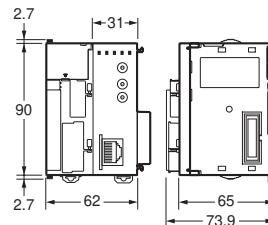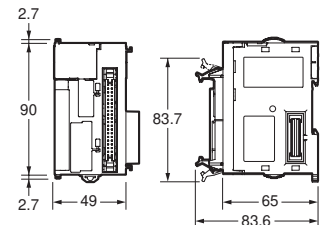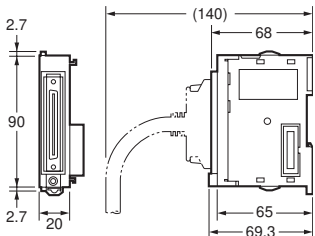◆ RS-422A Adapter CJ1W-CIF11

### CPU Units

CJ1G-CPU4□P

CJ1M-CPU1□

CJ1M-CPU1□-ETN

CJ1M-CPU2□

● **Units of Width 20 mm**

| Unit/product	Model	Width
I/O Control Unit	CJ1W-IC101	
32-point Basic I/O Units	CJ1W-ID231/232/233	
	CJ1W-OD231/232/233/234	20
B7A Interface Unit	CJ1W-B7A22 CJ1W-B7A14 CJ1W-B7A04	
CompoBus/S Master Unit	CJ1W-SRM21	
Space Unit	CJ1W-SP001	

● I/O Control Unit

● 32-Point I/O Units (CJ1W-ID223□/OD23□)

Fujitsu connector   MIL connector
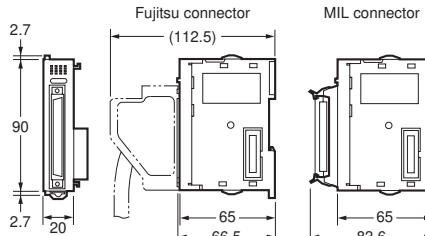
●**Units of Width 31 mm**

Unit	Model	Width
I/O Interface Unit	CJ1W-II101	
8/16-point Basic I/O Units	CJ1W-ID201 CJ1W-ID211/212 CJ1W-IA111/201 CJ1W-OD20□ CJ1W-OD211/212/213 CJ1W-OC201/211 CJ1W-OA201	
32-point Basic I/O Units	CJ1W-MD231 CJ1W-MD232/233	
64-point Basic I/O Units	CJ1W-ID261 CJ1W-OD261 CJ1W-MD261	
	CJ1W-ID262 CJ1W-OD262/263 CJ1W-MD263 CJ1W-MD563	31
Interrupt Input Unit	CJ1W-INT01	
High-speed Input Unit	CJ1W-IDP01	
Analog I/O Units	CJ1W-AD□□□(-V1) CJ1W-DA□□□(□) CJ1W-MAD42	
Process Input Units	CJ1W-PH41U CJ1W-AD04U CJ1W-PTS51/52/15/16 CJ1W-PDC15	
Temperature Control Units	CJ1W-TC□□□	
Position Control Units	CJ1W-NC113/133 CJ1W-NC213/233 CJ1W-NC413/433	

Unit	Model	Width
Position Control Units with EtherCAT interface	CJ1W-NC281 CJ1W-NC481 CJ1W-NC881 CJ1W-NCF81 CJ1W-NC482 CJ1W-NC882	
Position Control Unit with MECHATROLINK-II interface	CJ1W-NC271 CJ1W-NC471 CJ1W-NCF71 CJ1W-NCF71-MA	
High-speed Counter Unit	CJ1W-CT021	
ID Sensor Units	CJ1W-V680C11 CJ1W-V680C12 CJ1W-V600C11 CJ1W-V600C12	31
Controller Link Units	CJ1W-CLK23	
Serial Communications Units	CJ1W-SCU22 CJ1W-SCU32 CJ1W-SCU42 CJ1W-SCU41-V1 CJ1W-SCU21-V1 CJ1W-SCU31-V1	
EtherNet/IP Unit	CJ1W-EIP21	
Ethernet Unit	CJ1W-ETN21	
DeviceNet Unit	CJ1W-DRM21	
CompoNet Master Unit	CJ1W-CRM21	
FL-net Unit	CJ1W-FLN22	

● I/O Interface Unit
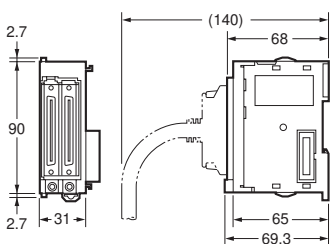
● 8/6-point Basic I/O Units, Interrupt Input Unit, and High-speed Input Unit
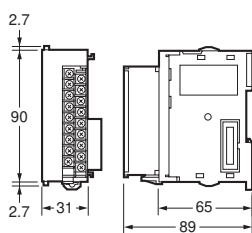
● 64-point Basic I/O Units and 32-point Basic I/O Units (CJ1W-MD23□)

Fujitsu connector   MIL connector

● Special I/O Units and CPU Bus Units

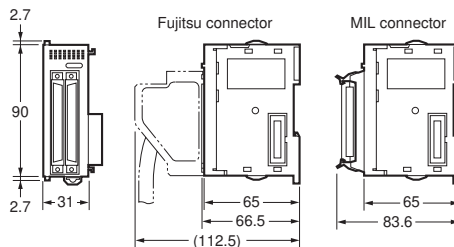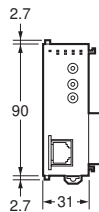### ● Unit of Width 51 mm

Unit	Model	Width
SYSMAC SPU (High-speed Data Storage Unit)	CJ1W-SPU01-V2	51
Position Control Units (High-speed type)	CJ1W-NC214/234	

● SYSMAC SPU (High-speed Data Storage Unit)
CJ1W-SPU01-V2

2.7
90
2.7
51 9 65
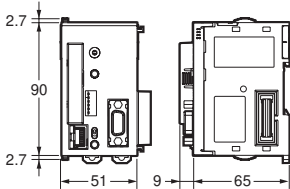
● Unit of Width 79.8 mm

Unit	Model	Width
Motion Control Unit with MECHATROLINK-II interface	CJ1W-MCH71	79.8

● Motion Control Unit with MECHATROLINK-II interface
CJ1W-MCH71

90
79.8
65
70.9

● Unit of Width 62 mm

Unit	Model	Width
Position Control Units (High-speed type)	CJ1W-NC414/434	62

● Position Contorl Unit (High-speed model)
CJ1W-NC414/434

84
65
2.7
90
2.7
62
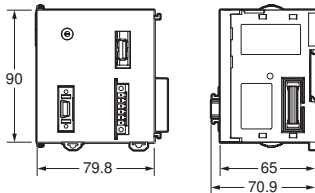
■ Mounting Dimensions

27.5
35
27.5
90
65 A
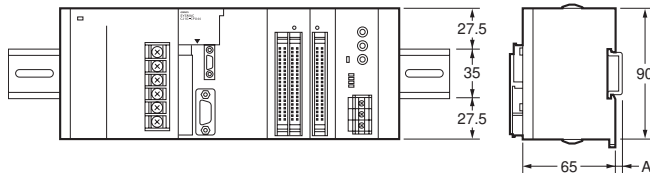
DIN Track model number	A
PFP-100N2	16 mm
PFP-100N	7.3 mm
FPP-50N	7.3 mm
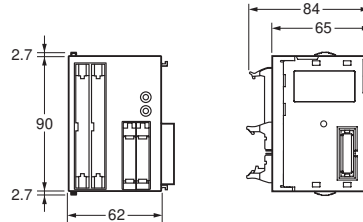
■ Mounting Height

The mounting height of CJ-series CPU Racks and Expansion Racks is from 81.6 to 89.0 mm depending on the Units that are mounted.
Additional height is required to connect Programming Devices (e.g., CX-Programmer or Programming Console) and Cables. Be sure to allow sufficient mounting height.

Approx. 100 to 150 mm

81.6 to 89.0 mm
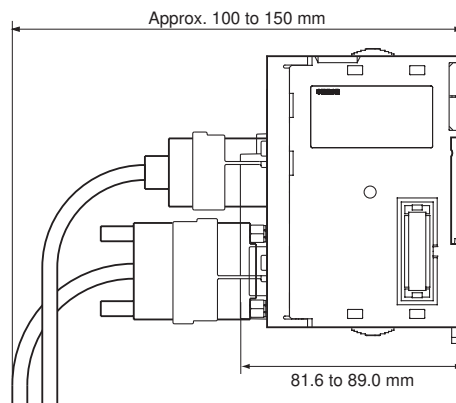
Note: Consider the following points when expanding the configuration:
The total length of I/O Connecting Cable must not exceed 12 m.
I/O Connecting Cables require the bending radius indicated below.

● CJ-series Connecting Cable

R R ≥ 69 mm
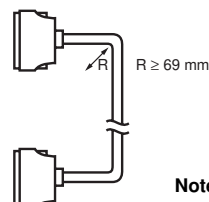
Note: Outer diameter of cable: 8.6 mm.

General Specifications

Item	Specifications				
Power Supply Unit	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 (See note 1.)	At 100 to 120 V AC: 15 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 30 A/8 ms max. for cold start at room temperature		At 100 to 120 V AC: 20 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 40 A/8 ms max. for cold start at room temperature	At 24 V DC: 30 A/20 ms max. for cold start at room temperature	
Output capacity (See note 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 (See note 2.)	Contact configuration: SPST-NO Switch capacity: 250 V AC, 2 A (resistive load) 120 V AC, 0.5 A (inductive load), 24 V DC, 2A (resistive load) 24 V DC, 2 A (inductive load)	Not provided.			
Replacement notification function	Not provided.	With Alarm output (open-collector output) 30 V DC max., 50 mA max.	Not provided.		
Insulation resistance	20 MΩ min. (at 500 V DC) between AC external and GR terminals (See note 3.)	• 20 MΩ min. (at 500 V DC) between all external terminals and GR terminal (See note 3.), and between all alarm output terminals. • 20 MΩ 1 min. (at 250 V DC) between all alarm output terminals and GR terminal (See note 3.).	20 MΩ min. (at 500 V DC) between AC external and GR terminals (See note 3.)	20 MΩ min. (at 500 V DC) between DC external and GR terminals (See note 3.)	--- (See note 6.)
Dielectric strength (See note 4.)	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 3.) Leakage current: 10 mA max.	• 2,300 VAC, 50/60 Hz for 1 minute between all external terminals and GR terminal (See note 3.) and between all alarm output terminals with a leakage current of 10 mA max. • 1,000 V AC, 50/60 Hz for 1 minute between all alarm output terminals and GR terminal (See note 3.) with a leakage current of 10 mA max.	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See not 3.) Leakage current: 10 mA max.	1,000 V AC, 50/60 Hz for 1 minute between DC external and GR terminals (See note 3.) Leakage current: 10 mA max.	--- (See note 6.)
	1,000 V AC, 50/60 Hz for 1 minute between DC external and GR terminals (See note 3.) 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 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s^2 for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)				
Shock Resistance	Conforms to IEC60068-2-27 147 m/s^2, 3 times in X, Y, and Z directions (100 m/s^2 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) (See note 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 (See note 5.)	–20 to 75°C (excluding battery)		
Grounding	Less than 100 Ω				
Enclosure	Mounted in a panel.				
Weight	All models are each 5 kg max.				

Item	Specifications				
Power Supply Unit	**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)
	Note: W = a + b + 20 × n + 31 × m + 14.7
	  a: Power Supply Unit: PA205R and PA205C = 80; PA202 = 45; PD025 = 60; PD022=27
	  b: CPU Unit: CJ1-H or CJ1 = 62; CJ1M-CPU1□ = 31; CJ1M-CPU1□-ETN = 62; CJ1M-CPU2□ = 49
	  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.				

Note 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 re-placement 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.

Specifications

■ Common Specifications

Item		Specifications	
Control method		Stored program	
I/O control method		Cyclic scan and immediate processing are both possible.	
Programming Languages		Ladder Logic (LD), Sequential Function Charts (SFC), Structured Text (ST), and Mnemonic.	
CPU processing mode		CJ1M CPU Units: Normal Mode or Peripheral Servicing Priority Mode CJ1 CPU Units: Normal Mode or Peripheral Servicing Priority Mode	
Instruction length		1 to 7 steps per instruction	
Ladder instructions		Approx. 400 (3-digit function codes)	
Execution time	Basic instructions	CJ1M CPU Units (CPU12(-ETN)/13(-ETN)/22/23): 0.10 μs min. CJ1M CPU Units (CPU11(-ETN)/21): 0.10 μs min. CJ1 CPU Units: 0.08 μs min.	
	Special instructions	CJ1M CPU Units (CPU12(-ETN)/13(-ETN)/22/23): 0.15 μs min. CJ1M CPU Units (CPU11(-ETN)/21): 0.15 μs min. CJ1 CPU Units: 0.12 μs min.	
Overhead time		CJ1M CPU Units (CPU12(-ETN)/13(-ETN)/22/23): 0.5 ms min. CJ1M CPU Units (CPU11(-ETN)/21): 0.7 ms min. CJ1 CPU Units: 0.5 ms min.	
Unit connection method		No Backplane: Units connected directly to each other.	
Mounting method		DIN Track (screw mounting not possible)	
Maximum number of connectable Units		• CJ1M CPU Units: Total of 20 Units in the System, including 10 Units on CPU Rack and 10 Units on one Expansion Rack. • CJ1M CPU Units (CPU1□-ETN): Total of 19 Units, including 9 Units on CPU Rack and 10 Units on one Expansion Rack. (The built-in Ethernet port on the CPU Unit must be allocated to a slots 0, and is counted as one Unit.	
Maximum number of Expansion Racks		• CJ1 CPU Units: 3 max. (An I/O Control Unit is required on the CPU Rack and an I/O Interface Unit is required on each Expansion Rack.) • CJ1M CPU Units (CPU 13(-ETN)/23 only): 1 max. (An I/O Control Unit is required on the CPU Rack and an I/O Interface Unit is required on the Expansion Rack.) • CJ1M CPU Units (CPU11(-ETN)/12(-ETN)/21/22): Expansion is not possible.	

Number of tasks		288 (cyclic tasks: 32, interrupt tasks: 256)
		With CJ1M CPU Units, interrupt tasks can be defined as cyclic tasks called extra cyclic tasks. Including these, up to 288 cyclic tasks can be used.
		Note 1. Cyclic tasks are executed each cycle and are controlled with TKON(820) and TKOF(821) instructions.
		    2. The following 4 types of interrupt tasks are supported.
		      Power OFF interrupt tasks: 1 max.
		      Scheduled interrupt tasks: 2 max.
		      I/O interrupt tasks: 32 max.
		      External interrupt tasks: 256 max.	

Interrupt types		Scheduled Interrupts: Interrupts generated at a time scheduled by the CPU Units built-in timer. (See note. 1)
		I/O Interrupts: Interrupts from Interrupt Input Units.
		Power OFF Interrupts (See note 2.): Interrupts executed when the CPU Units power is turned OFF.
		External I/O Interrupts: Interrupts from the Special I/O Units or CPU Bus Units.
		Note 1. CJ1 CPU Units: Scheduled interrupt time interval is either 1 ms to 9,999 ms or 10 ms to 99,990 ms, in units of 1 ms or 10 ms.
		    CJ1M CPU Units: In addition to the above, a scheduled interrupt time interval of 0.5 ms to 999.9 ms, in units of 0.1 ms, is also possible.
		    2. Not supported when the CJ1W-PD022 Power Supply Unit is mounted.	

CIO (Core I/O) Area	I/O Area	2,560: CIO 000000 to CIO 015915 (160 words from CIO 0000 to CIO 0159) The setting of the first word can be changed from the default (CIO 0000) so that CIO 0000 to CIO 0999 can be used. I/O bits are allocated to Basic I/O Units.	The CIO Area can be used as work bits if the bits are not used as shown here.
	Link Area	3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199) Link bits are used for data links and are allocated to Units in Controller Link Systems.	
	CPU Bus Unit Area	6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899) CPU Bus Unit bits store the operating status of CPU Bus Units. (25 words per Unit, 16 Units max.)	
	Special I/O Unit Area	15,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959) Special I/O Unit bits are allocated to Special I/O Units. (10 words per Unit, 96 Units max.)	
	Serial PLC Link Area (CJ1M CPU Units only)	1,440 (90 words): CIO 310000 to CIO 318915 (words CIO 3100 to CIO 3189)	

Item		Specifications	
CIO (Core I/O) Area	DeviceNet Area	9,600 (600 words): CIO 320000 to CIO 379915 (words CIO 3200 to CIO 3799) DeviceNet bits are allocated to Slaves for DeviceNet Unit remote I/O communications when the Master function is used with fixed allocations. **Fixed allocation setting 1** — Outputs: CIO 3200 to CIO 3263; Inputs: CIO 3300 to CIO 3363 **Fixed allocation setting 2** — Outputs: CIO 3400 to CIO 3463; Inputs: CIO 3500 to CIO 3563 **Fixed allocation setting 3** — Outputs: CIO 3600 to CIO 3663; Inputs: CIO 3700 to CIO 3763 The following words are allocated to the Master function even when the DeviceNet Unit is used as a Slave. **Fixed allocation setting 1** — Outputs: CIO 3370 (Slave to Master); Inputs: CIO 3270 (Master to Slave) **Fixed allocation setting 2** — Outputs: CIO 3570 (Slave to Master); Inputs: CIO 3470 (Master to Slave) **Fixed allocation setting 3** — Outputs: CIO 3770 (Slave to Master); Inputs: CIO 3670 (Master to Slave)	The CIO Area can be used as work bits if the bits are not used as shown here.
	Internal I/O Area	4,800 (300 words): CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499) 37,504 (2,344 words): CIO 380000 to CIO 614315 (words CIO 3800 CIO 6143) These bits in the CIO Area are used as work bits in programming to control program execution. They cannot be used for external I/O.	
Work Area		8,192 bits (512 words): W00000 to W51115 (W000 to W511) Controls the programs only. (I/O from external I/O terminals is not possible.) **Note:** When using work bits in programming, use the bits in the Work Area first before using bits from other areas.	
Holding Area		8,192 bits (512 words): H00000 to H51115 (H000 to H511) Holding bits are used to control the execution of the program, and maintain their ON/OFF status when the PLC is turned OFF or the operating mode is changed. **Note:** The Function Block Holding Area words are allocated from H512 to H1535. These words can be used only for the function block instance area (internally allocated variable area).	
Auxiliary Area		Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447) Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959) Auxiliary bits are allocated specific functions.	
Temporary Area		16 bits (TR0 to TR15) Temporary bits are used to temporarily store the ON/OFF execution conditions at program branches.	
Timer Area		4,096: T0000 to T4095 (used for timers only)	
Counter Area		4,096: C0000 to C4095 (used for counters only)	
DM Area		32 Kwords: D00000 to D32767 Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in the DM Area maintain their status when the PLC is turned OFF or the operating mode is changed. Internal Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units) Used to set parameters for Special I/O Units. CPU Bus Unit DM Area: D30000 to D31599 (100 words × 16 Units) Used to set parameters for CPU Bus Units.	
Index Registers		IR0 to IR15 Store PLC memory addresses for indirect addressing. Index registers can be used independently in each task. One register is 32 bits (2 words). • CJ1 CPU Units: Index registers used independently in each task.	
Task Flag Area		32 (TK0000 to TK0031) Task Flags are read-only flags that are ON when the corresponding cyclic task is executable and OFF when the corresponding task is not executable or in standby status.	
Trace Memory		4,000 words (trace data: 31 bits, 6 words)	
File Memory		• Memory Cards: Compact flash memory cards can be used (MS-DOS format). • OMRON Memory Cards can be used.	

■ Function Specifications

Item	Specifications
Constant cycle time	1 to 32,000 ms (Unit: 1 ms)
Cycle time monitoring	Possible (Unit stops operating if the cycle is too long): 10 to 40,000 ms (Unit: 10 ms)
I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097). **Note:** ORF(097) refreshes I/O bits allocated to Basic I/O Units and Special I/O Units. With the CJ1M CPU Units, the CPU BUS UNIT I/O REFRESH (DLNK(226)) instruction can be used to refresh bits allocated to CPU Bus Units in the CIO and DM Areas.
Timing of special refreshing for CPU Bus Units	Data links for Controller Link Units and SYSMAC LINK Units, remote I/O for DeviceNet Units, and other special refreshing for CPU Bus Units is performed at the following times: • CJ1 and CJ1M CPU Units: I/O refresh period
I/O memory holding when changing operating modes	Depends on the ON/OFF status of the IOM Hold Bit in the Auxiliary Area.
Load OFF	All outputs on Output Units can be turned OFF when the CPU Unit is operating in RUN, MONITOR, or PROGRAM mode.
Timer/Counter PV refresh method	CJ1M CPU Units: BCD or binary (CX-Programmer Ver. 3.0 or higher). CJ1 CPU Units: BCD only.
Input response time setting	Time constants can be set for inputs from Basic I/O Units. The time constant can be increased to reduce the influence of noise and chattering or it can be decreased to detect shorter pulses on the inputs.
Mode setting at power-up	Possible. **Note:** By default, the CPU Unit will start in RUN mode if a Programming Console is not connected.
Flash memory	• The user program and parameter area data (e.g., PLC Setup) are always backed up automatically in flash memory. (automatic backup and restore.) • CPU Units with unit version 3.0 or later only: When downloading projects from CX-Programmer Ver. 5.0 or higher, symbol table files (including CX-Programmer symbol names, I/O comments), comment files (CX-Programmer rung comments, other comments), and program index files (CX-Programmer section names, section comments, or program comments) are stored in comment memory within the flash memory.
Memory Card functions	Automatically reading programs (autoboot) from the Memory Card when the power is turned ON.	Possible.
	Program replacement during PLC operation	Possible.
	Format in which data is stored in Memory Card	User program: Program file format PLC Setup and other parameters: Data file format I/O memory: Data file format (binary format), text format, or CSV format
	Functions for which Memory Card read/write is supported	User program instructions, Programming Devices (including CX-Programmer and Programming Consoles), Host Link computers, AR Area control bits, easy backup operation
Filing	Memory Card data and the EM (Extended Data Memory) Area can be handled as files.
Debugging	Control set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), instruction error tracing, storing location generating error when a program error occurs.
Online editing	User programs can be overwritten in program-block units when the CPU Unit is in MONITOR or PROGRAM mode. This function is not available for block programming areas. With the CX-Programmer, more than one program block can be edited at the same time.
Program protection	Overwrite protection: Set using DIP switch. Copy protection: Password set using CX-Programmer or Programming Consoles.
Error check	User-defined errors (i.e., user can define fatal errors and non-fatal errors) The FPD(269) instruction can be used to check the execution time and logic of each programming block. **Note:** FAL and FALS instructions can be used with the CJ1M CPU Units to simulate errors.
Error log	Up to 20 errors are stored in the error log. Information includes the error code, error details, and the time the error occurred. **Note:** A CJ1M CPU Unit can be set so that user-defined FAL errors are not stored in the error log.
Serial communications	Built-in peripheral port: Programming Device (including Programming Console) connections, Host Links, NT Links, Serial Gateway (CompoWay/F master) Built-in RS-232C port: Programming Device (excluding Programming Console) connections, Host Links, no-protocol communications, NT Links, Modbus-RTU Slave, Serial Gateway (CompoWay/F master or Modbus master)
	Serial Communications Unit (sold separately): Protocol macros, Host Links, NT Links

Clock	Provided on all models.
	
	Accuracy: Ambient temperature Monthly error
	      55°C −3.5 min to +0.5 min
	      25°C −1.5 min to +1.5 min
	      0°C −3 min to +1 min
	Note: Used to store the time when power is turned ON and when errors occur.

Power OFF detection time	AC Power Supply Unit: 10 to 25 ms (not fixed) DC Power Supply Unit PD025: 2 to 5 ms; PD022: 2 to 10 ms
Power OFF detection delay time	0 to 10 ms (user-defined, default: 0 ms) **Note:** Not supported when the CJ1W-PD022 Power Supply Unit is mounted.
Memory protection	Held Areas: Holding bits, contents of Data Memory and Extended Data Memory, and status of the counter Completion Flags and present values. **Note:** If the IOM Hold Bit in the Auxiliary Area is turned ON, and the PLC Setup is set to maintain the IOM Hold Bit status when power to the PLC is turned ON, the contents of the CIO Area, the Work Area, part of the Auxiliary Area, timer Completion Flag and PVs, Index Registers, and the Data Registers will be saved for up to 20 days.
Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via the Host Link System by executing Network Communications Instructions from the PLC.
Remote programming and monitoring	Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.

Item	Specifications
Communicating across network levels	Remote programming and monitoring from Support Software and FINS message communications can be performed across different network levels, even for different types of network. Pre-Ver. 2.0: Three levels Version 2.0 or later: Eight levels for Controller Link and Ethernet networks (See note.), three levels for other networks. **Note:** To communicate across eight levels, the CX-Integrator or the CX-Net in Programmer version 4.0 or higher must be used to set the routing tables.
Storing comments in CPU Unit	I/O comments can be stored as symbol table files in the Memory Card, EM file memory, or comment memory (see note). **Note:** Comment memory is supported for CX-Programmer version 5.0 or higher and CS/CJ-series CPU Units with unit version 3.0 or later only.
Program check	Program checks are performed at the beginning of operation for items such as no END instruction and instruction errors. CX-Programmer can also be used to check programs.
Control output signals	RUN output: The internal contacts will turn ON (close) while the CPU Unit is operating (CJ1W-PA205R).
Battery life	• Battery Set for CJ1 CPU Units: CPM2A-BAT01 • Battery Set for CJ1M CPU Units: CJ1W-BAT01
Self-diagnostics	CPU errors (watchdog timer), I/O bus errors, memory errors, and battery errors.
Other functions	Storage of number of times power has been interrupted. (Stored in A514.)

● **Functions Added for New Unit Versions**

Refer to the SYSMAC CJ-series CJ1 CPU Units Datasheet.

● **Relations between CX-Programmer Versions and Unit Versions of CPU Units**

Refer to the SYSMAC CJ-series CJ1 CPU Units Datasheet.

CJ1M-CPU2☐ (CJ1M CPU with Built-in I/O) Specifications

- CJ1M-CPU2☐ CPU Units have 10 built-in inputs and 6 built-in outputs.
- The 10 inputs can be used as general-purpose inputs, interrupt inputs, quick-response inputs, high-speed counters, or origin search origin input signals.
- The 6 outputs can be used as general-purpose outputs, pulse outputs, or origin search deviation counter reset outputs.

■ Data Area Allocations for Built-in I/O

I/O Code			IN 0	IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8	IN 9	OUT 0	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5
Address			2960										2961					
Bit			0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
Inputs	General purpose inputs		General purpose input 0	General purpose input 1	General purpose input 2	General purpose input 3	General purpose input 4	General purpose input 5	General purpose input 6	General purpose input 7	General purpose input 8	General purpose input 9	---	---	---	---	---	---
	Interrupt inputs		Interrupt input 0	Interrupt input 1	Interrupt input 2	Interrupt input 3	---	---	---	---	---	---	---	---	---	---	---	---
	Quick response inputs		Quick response input 0	Quick response input 1	Quick response input 2	Quick response input 3	---	---	---	---	---	---	---	---	---	---	---	---
	High-speed counters		---	---	High-speed counter 1 (phase-Z/reset)	High-speed counter 0 (phase-Z/reset)	---	---	High-speed counter 1 (phase-A, increment, or count input)	High-speed counter 1 (phase-B, decrement, or direction input)	High-speed counter 0 (phase-A, increment, or count input)	High-speed counter 0 (phase-B, decrement, or direction input)	---	---	---	---	---	---
Outputs	General-purpose outputs		---	---	---	---	---	---	---	---	---	---	General-purpose output 0	General-purpose output 1	General-purpose output 2	General-purpose output 3	General-purpose output 4	General-purpose output 5
	Pulse outputs	CW/CCW outputs	---	---	---	---	---	---	---	---	---	---	Pulse output 0 (CW)	Pulse output 0 (CCW)	Pulse output 1 (CW)	Pulse output 1 (CCW)	---	---
		Pulse + direction outputs	---	---	---	---	---	---	---	---	---	---	Pulse output 0 pulse)	Pulse output 1 (pulse)	Pulse output 0 (direction)	Pulse output 1 (direction)	---	---
		Variable duty ratio outputs	---	---	---	---	---	---	---	---	---	---	---	---	---	---	PWM(891) output 0	PWM(891) output 1
Origin search			Origin search 0 (Origin Input Signal)	Origin search 0 (Origin Proximity Input Signal)	Origin search 1 (Origin Input Signal)	Origin search 1 (Origin Proximity Input Signal)	Origin search 0 (Positioning Completed Signal)	Origin search 1 (Positioning Completed Signal)	---	---	---	---	---	---	---	---	Origin search 0 (Error Counter Reset Output)	Origin search 1 (Error Counter Reset Output)

Note: CJ1M-CPU21 CPU Units have one PWM output only and do not have PWM output 1.

■ Built-in Input Specifications

● Interrupt Inputs and Quick-response Inputs

Item		Specifications
No. of interrupt inputs/ quick-response inputs		4 total
Input interrupts	Direct (Input Interrupt) Mode	Execution of an interrupt task is started at the interrupt input's rising or falling edge. Interrupt numbers 140 to 143 are used (fixed). Response time from meeting input condition to start of interrupt task execution: 93 μs min.
	High-speed Counter Mode	Rising or falling edges of the interrupt are counted using either an incrementing or decrementing counter, and an interrupt task is started when the input count reaches the set value. Interrupt numbers 140 to 143 are used (fixed). I/O response frequency: 1 kHz
Quick-response inputs		Signals that are shorted than the cycle time (30 μs min.) can be read and treated the same as signals that are one for more than one cycle time.

● High-speed Counter Inputs

Item		Specifications			
Number of high-speed counters		2 (High-speed counters 0 and 1)			
Pulse input mode (Selected in PLC Setup)		Differential phase inputs (phase-A, phase-B, and phase-Z input)	Up/down inputs (up inputs, down inputs, reset inputs)	Pulse + direction inputs (pulse inputs, direction inputs, reset inputs)	Increment inputs (increment inputs, reset inputs)
Response frequency	Line-driver inputs	50 kHz	100 kHz	100 kHz	100 kHz
	24-V DC inputs	30 kHz	60 kHz	60 kHz	60 kHz
Counting mode		Linear mode or Ring mode (Select in the PLC Setup.)			

Item	Specifications
Count value	Linear mode: 80000000 to 7FFFFFFF hex Ring mode: 00000000 to Ring SV (The Ring SV is set in the PLC Setup and the setting range is 00000001 to FFFFFFFF hex.)
High-speed counter PV storage locations	High-speed counter 0: A271 (leftmost 4 digits) and A270 (rightmost 4 digits) High-speed counter 1: A273 (leftmost 4 digits) and A272 (rightmost 4 digits) Target value comparison interrupts or range comparison interrupts can be executed based on these PVs. **Note:** The PVs are refreshed in the overseeing processes at the beginning of each cycle. Use the PRV(881) instruction to read the most recent PVs.

Control method	**Target value comparison**	Up to 48 target values and corresponding interrupt task numbers can be registered.
	Range comparison	Up to 8 ranges can be registered, with an upper limit, lower limit, and interrupt task number for each.

Counter reset method	Phase-Z + Software reset: Counter is reset when phase-Z input goes ON while Reset Bit is ON. Software reset: Counter is reset when Reset Bit goes ON. Reset Bits: High-speed Counter 0 Reset Bit is A53100, Counter 1 Reset Bit is A53101.

■ Built-in Output Specifications

● Position Control and Speed Control

Item	Specifications
Number of pulse outputs	2 (Pulse output 0 or 1)
Output frequency	1 Hz to 100 kHz (1-Hz units from 1 to 100 Hz, 10-Hz units from 100 Hz to 4 kHz, and 100-Hz units from 4 to 100 kHz)
Frequency acceleration and deceleration rates	Set in 1 Hz units for acceleration/deceleration rates from 1 Hz to 2 kHz (every 4 ms). The acceleration and deceleration rates can be set separately only with PLS2(887).
Changing SVs during instruction execution	The target frequency, acceleration/deceleration rate, and target position can be changed. Changes to the target frequency and acceleration/deceleration rate must be made at constant speed.
Pulse output method	CW/CCW inputs or Pulse + direction inputs
Number of output pulses	Relative coordinates: 00000000 to 7FFFFFFF hex (Each direction accelerating or decelerating: 2,147,483,647) Absolute coordinates: 80000000 to 7FFFFFFF hex (−2,147,483,648 to 2,147,483,647)
Instruction used for origin searches and returns	ORIGIN SEARCH (ORG(889)): Origin search and origin return operations according to set parameters
Instructions used for position and speed control	PULSE OUTPUT (PLS2(887)): Trapezoidal output control with separate acceleration and deceleration rate SET PULSES (PULS(886)): Setting the number of pulses for pulse output SPEED OUTPUT (SPED(885)): Pulse output without acceleration or deceleration (Number of pulses must be set in advance with PULS(886) for position control.) ACCELERATION CONTROL (ACC(888)): Changes frequency or pulse output with acceleration and deceleration MODE CONTROL (INI(880)): Stopping pulse output
Pulse output PV's storage location	The following Auxiliary Area words contain the pulse output PVs: Pulse output 0: A277 (leftmost 4 digits) and A276 (rightmost 4 digits) Pulse output 1: A279 (leftmost 4 digits) and A278 (rightmost 4 digits) The PVs are refreshed during regular I/O refreshing. PVs can be read to user-specified words with the PRV(881) instruction.

● Variable-duty Pulse Outputs (PWM)

Item	Specifications
Number of PWM outputs	CJ1M-CPU22/23: 2 (PWM output 0 or 1) CJ1M-CPU21: 1 (PWM output 0)
Duty ratio	0% to 100%, set in 0.1% units (See note.)
Frequency	0.1 Hz to 999.9 Hz, Set in 0.1 Hz units.
Instruction	PULSE WITH VARIABLE DUTY RATIO (PWM(891)): Sets duty ratio and outputs pulses.

Note: CJ1M CPU Unit Ver. 2.0 or later only. (0% to 100%, set in 1% units for Pre-Ver. 2.0 CPU Units.)

■ Hardware Specifications
● Input Specifications

Item	Specifications			
Number of inputs	10 inputs			
Input method	24-V DC inputs or line driver (wiring changed to select)			
Input voltage specifications	24 V DC		Line driver	
	IN0 to IN5	IN6 to IN9	IN0 to IN5	IN6 to IN9
Input voltage	20.4 to 26.4 V DCV		RS-422A or RS-422 line driver (conforming to AM26LS31), Power supply voltage of 5 V ± 5%	
Input impedance	3.6 kΩ	4.0 kΩ	---	
Input current (typical)	6.2 mA	4.1 mA	13 mA	10 mA
Minimum ON voltage	17.4 V DC/3 mA min.		---	
Maximum OFF voltage	5.0 V DC/1 mA max.		---	
Response speed (for general-purpose inputs)	ON response time	Default setting: 8 ms max. (The input time constant can be set to 0 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, or 32 ms in the PLC Setup.)		
	OFF response time	Default setting: 8 ms max. (The input time constant can be set to 0 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, or 32 ms in the PLC Setup.)		

● Input Circuit Configuration

Item	Specifications	
Input	IN0 to IN5	IN6 to IN9
Circuit configuration		

● General-purpose Output Specifications for Transistor Outputs (Sinking)

Item	Specifications	
Output	OUT0 to OUT3	OUT4 to OUT5
Rated voltage	5 to 24 V DC	
Allowable voltage range	4.75 to 26.4 V DC	
Max. switching capacity	0.3 A/output; 1.8 A/Unit	
Number of circuits	6 outputs (6 outputs/common)	
Max. inrush current	3.0 A/output, 10 ms max.	
Leakage current	0.1 mA max.	
Residual voltage	0.6 V max.	
ON delay	0.1 mA max.	
OFF delay	0.1 mA max.	
Fuse	None	
External power supply	10.2 to 26.4 V DC 50 mA min.	
Circuit configuration		

● Pulse Output Specifications (OUT0 to OUT3)

Item	Specifications
Max. switching capacity	30 mA, 4.75 to 26.4 V DC
Min. switching capacity	7 mA, 4.75 to 26.4 V DC
Max. output frequency	100 kHz
Output waveform	

OMRON

CJ1M-CPU1□-ETN (CJ1M CPU with Ethernet Function) Specifications

These CPU Units provide built-in Ethernet functionality.

● Ethernet Functional Element Transfer Specifications

Item		Specification
Media access method		CSMA/CD
Modulation method		Baseband
Transmission paths		Star form
Baud rate		100 Mbit/s (100Base-TX), 10 Mbit/s (10Base-T)
Transmission media	100 Mbit/s	Unshielded twisted-pair (UDP) cable Categories: 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 5, 5e
	10 Mbit/s	Unshielded twisted-pair (UDP) cable Categories: 3, 4, 5, 5e Shielded twisted-pair (STP) cable Categories: 100 Ω at 3, 4, 5, 5e
Transmission distance		100 m (distance between hub and node)
Number of cascade connections		There are no restrictions with the use of switching hubs.
CPU Bus Unit System Setup Area capacity		994 bytes (See note 2.)

Note: The system settings for Ethernet are in the CPU Bus Unit System Setup Area in the CPU Unit.

CJ1G-CPU□□P (Loop-control CPU Units) Specifications

In addition to engines for executing sequence control, Loop-control CPU Units (CJ1G-CPU□□P) have built-in engines for controlling analog quantities (such as temperatures, pressure and flow rate), thus enabling high-speed sequence control and advanced high-speed control of analog quantities in a single Unit.

● CPU Element (Sequence Control)

Name	I/O bits	Program capacity	DM words	EM words	Model
Loop-control CPU Unit	1,280 bits	60K steps	32K words	32K words × 3 banks E0_00000 to E2_32767	CJ1G-CPU45P
					CJ1G-CPU45P-GTC (See note.)
		30K steps		32K words × 1 bank E0_00000 to E0_32767	CJ1G-CPU44P
	960 bits	20K steps			CJ1G-CPU43P
		10K steps			CJ1G-CPU42P

Note: These Loop-control CPU Units support gradient temperature control, a technology for uniform in-plane control of temperatures of plane-shaped objects (e.g., multi-point control of surface temperatures based on a multi-point heater). For details, please contact an OMRON representative.

● Loop Controller Element (Loop Control)

Item		Model	CJ1G-CPU42P	CJ1G-CPU43P	CJ1G-CPU44P	CJ1G-CPU45P(-GTC)
Operation method			Function block method			
Operation cycle			0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.			
Number of function blocks	Analog operations	Control and operation blocks	50 blocks max.	300 blocks max.		
	Sequence control	Step ladder program blocks	20 blocks max. 2,000 commands total	200 blocks max. 4,000 commands total		
	I/O blocks	Field terminal blocks	30 blocks max.		40 blocks max.	
		User link tables	2,400 data items max.			
		Batch allocation	HMI function, allocated 1 EM Area bank			
	System Common block		Single block			
Method for creating and transferring function blocks			Created using CX-Process Tool (order separately) and transferred to Loop Controller.			
Control method	PID control method		PID with 2 degrees of freedom (with autotuning)			
	Control combinations		Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compensation control, PID control with differential gap, override control, program control, time-proportional control, etc.			
Alarms	PID block internal alarms		4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation alarm per PID block.			
	Alarm blocks		High/low alarm blocks, deviation alarm blocks			

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-PA205C	5.0 A	0.8 A	25 W
CJ1W-PA205R	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 ≤ (A) value
    (2) Total Unit current consumption at 24 V ≤ (B) value
Condition 2: Maximum Power
$(1) \times 5 \text{ V} + (2) \times 24 \text{ V} \leq$ (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 (Input Units)	CJ1W-ID211	2	0.080 A	---
	CJ1W-ID231	2	0.090 A	---
Basic I/O Units (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 (≤ 2.8 A)	0.096 A (≤ 0.4 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 W (≤ 14 W)	

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

■ Using the CX-Programer 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:
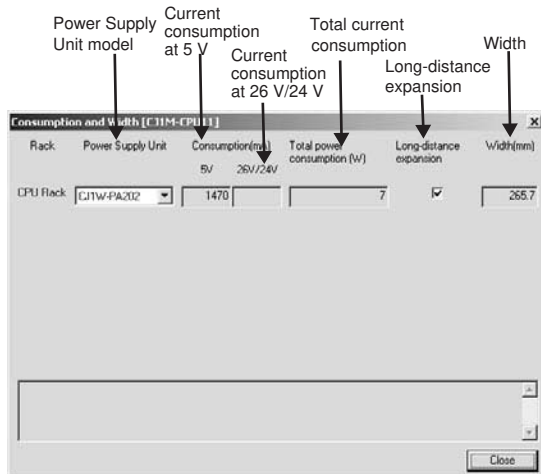
MEMO

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.

● EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

● EMC Directives

Applicable Standards
EMI: EN61000-6-4, EN61131-2
EMS: EN61000-6-2, EN61131-2
PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these
standards are satisfied for the actual system, however, must be checked by the customer.
EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

● Low Voltage Directive

Applicable Standard:EN61131-2
VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.
These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.

Ordering Information

Basic Configuration Units

CPU Units

■ CJ1 CPU Units

| Product name | | I/O capacity/ Mountable Units (Expansion Racks) | Specifications | | | Current consumption (A) | | Model | Standards |
			Program capacity	Data memory capacity	LD instruction execution time	5 V	24 V		
CJ1M CPU Units	Without built-in I/O	640 points/ 20 Units (1 Expansion Racks max.)	20K steps	32 K words (DM: 32K words, EM: None)	0.1 µs	0.58 (See note 1.)	---	CJ1M-CPU13	UC1, N, L, CE
		320 points/ 10 Units (No Expansion Rack)	10K steps			0.58 (See note 1.)	---	CJ1M-CPU12	
		160 points/ 10 Units (No Expansion Rack)	5K steps			0.58(See note 1.)	---	CJ1M-CPU11 (See note 2.)	

Note 1. Current consumptions include current for a Programming Console. Add 0.15 A per Adapter when using NT-AL001 RS-232C/RS-232A Adapters.
Add 0.04 A per Adapter when using CJ1W-CIF11 RS-422A Adapters.
2. The CJ1M low-end models (CJ1M-CPU11(-ETN)/CPU21) have different specifications for the overhead processing time, pulse start time, number of subroutines, number of jumps, number of scheduled interrupts, and number of PWM outputs than the other CJ1M models (CJ1M-CPU12(-ETN)/CPU13(-ETN)/CPU22/CPU23).
For details, refer to the SYSMAC CJ-series Operation Manual (Cat. No. W474) and the SYSMAC CJ-series Built-in I/O Operation Manual (Cat. No. W395).

■ CJ1M CPU Units (with Built-in I/O)

| Product name | | I/O capacity/ Mountable Units (Expansion Racks) | Specifications | | | | Current consumption (A) | | Model | Standards |
			Program capacity	Data memory capacity	LD instruction execution time	Built-in I/O	5 V	24 V		
CJ1M CPU Units	Built-in I/O (See note 2.)	640 points/ 20 Units (1 Expansion Racks max.)	20K steps	32K words (DM: 32K words, EM: None)	0.1 µs	10 inputs and 6 outputs, 2 counter inputs, 2 pulse outputs	0.64 (See note 1.)	---	CJ1M-CPU23 (See note 3.)	UC1, N, L, CE
		320 points/ 10 Units (No Expansion Rack)	10K steps				0.64 (See note 1.)	---	CJ1M-CPU22 (See note 3.)	
		160 points/ 10 Units (No Expansion Rack)	5K steps				0.64 (See note 1.)	---	CJ1M-CPU21 (See notes 2 and 3.)	

Note 1. Current consumptions include current for a Programming Console. Add 0.15 A per Adapter when using NT-AL001 RS-232C/RS-232A Adapters.
Add 0.04 A per Adapter when using CJ1W-CIF11 RS-422A Adapters.
2. The CJ1M low-end models (CJ1M-CPU11(-ETN)/CPU21) have different specifications for the overhead processing time, pulse start time, number of subroutines, number of jumps, number of scheduled interrupts, and number of PWM outputs than the other CJ1M models (CJ1M-CPU12(-ETN)/CPU13(-ETN)/CPU22/CPU23).
For details, refer to the SYSMAC CJ-series Operation Manual (Cat. No. W474) and the SYSMAC CJ-series Built-in I/O Operation Manual (Cat. No. W395).
3. The connector for built-in I/O in the CJ1M-CPU21/22/23 is not included. Purchase one of the connectors or connector cables, refer to connectors or connector cables on page 28.