

CP1L

# CPU Units and Expansion Units

When it comes to controllers for compact machines, Omron's new CP1L series offers the compactness of a micro-PLC with the capability of a modular PLC.

But this new and exciting range is not only compact, it is scaleable, has a faster processing speed than other controllers and is in a class of its own when it comes to price/performance. Naturally, it is compatible with all other devices in the Omron PLC line up.

- 4 high-speed encoder inputs and 2 high-speed pulse outputs
- CPUs with AC or DC supply and 14, 20, 30 or 40 I/O built-in
- Instruction set compatible with CP1H-, CJ1-, and CS1 series PLC
- Optional RS232C and RS-422A/485 serial ports
- USB programming port
- Scaleable with a wide range of I/O units (maximum up to 160 I/O points)
- Motion functionality
- One and the same software as other Omron controllers



## CPU Unit Specification

| Item                          | Type<br>Model | AC power supply models<br>CP1L-□□□-A                                                                                                                                                                                  | DC power supply models<br>CP1L-□□□-D                                          |
|-------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Power supply                  |               | 100 to 240 VAC 50/60 Hz                                                                                                                                                                                               | 24 VDC                                                                        |
| Operating voltage range       |               | 85 to 264 VAC                                                                                                                                                                                                         | 20.4 to 26.4 VDC                                                              |
| Power consumption             |               | 50 VA max. (CP1L-M40/M30DR-A) (See next page.)<br>30 VA max. (CP1L-L20/L14DR-A)                                                                                                                                       | 20 W max. (CP1L-M40/M30□□-D) (See next page.)<br>13 W max. (CP1L-L20/L14□□-D) |
| Inrush current (See note.)    |               | 100 to 120 VAC inputs:<br>20 A max. (for cold start at room temperature)<br>8 ms max.<br>200 to 240 VAC inputs:<br>40 A max. (for cold start at room temperature), 8 ms max.                                          | 30 A max. (for cold start at room temperature)<br>20 ms max.                  |
| External power supply         |               | 300 mA at 24 VDC (CP1L-M30/M40)<br>200 mA at 24 VDC (CP1L-L14/L20)                                                                                                                                                    | None                                                                          |
| Insulation resistance         |               | 20 MΩ min. (at 500 VDC) between the external AC terminals and GR terminals                                                                                                                                            | No insulation between primary and secondary for DC power supply               |
| Dielectric strength           |               | 2,300 VAC at 50/60 Hz for 1 min between the external AC and GR terminals, leakage current: 5 mA max.                                                                                                                  | No insulation between primary and secondary for DC power supply               |
| Noise immunity                |               | Conforms to IEC 61000-4-4. 2 kV (power supply line)                                                                                                                                                                   |                                                                               |
| Vibration resistance          |               | Conforms to JIS C0040. 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 each. Sweep time: 8 minutes x 10 sweeps = total time of 80 minutes) |                                                                               |
| Shock resistance              |               | Conforms to JIS C0041. 147 m/s <sup>2</sup> three times each in X, Y, and Z directions                                                                                                                                |                                                                               |
| Ambient operating temperature |               | 0 to 55°C                                                                                                                                                                                                             |                                                                               |
| Ambient humidity              |               | 10% to 90% (with no condensation)                                                                                                                                                                                     |                                                                               |
| Ambient operating environment |               | No corrosive gas                                                                                                                                                                                                      |                                                                               |
| Ambient storage temperature   |               | -20 to 75°C (Excluding battery.)                                                                                                                                                                                      |                                                                               |
| Power holding time            |               | 10 ms min.                                                                                                                                                                                                            | 2 ms min.                                                                     |

**Note:** The above values are for a cold start at room temperature for an AC power supply, and for a cold start for a DC power supply.

- A thermistor (with low-temperature current suppression characteristics) is used in the inrush current control circuitry for the AC power supply. The thermistor will not be sufficiently cooled if the ambient temperature is high or if a hot start is performed when the power supply has been OFF for only a short time. In those cases the inrush current values may be higher (as much as two times higher) than those shown above. Always allow for this when selecting fuses and breakers for external circuits.
- A capacitor charge-type delay circuit is used in the inrush current control circuitry for the DC power supply. The capacitor will not be charged if a hot start is performed when the power supply has been OFF for only a short time, so in those cases the inrush current values may be higher (as much as two times higher) than those shown above.

## Current Consumption

The power consumption shown on page 1 is the maximum power consumption. To obtain the correct power consumption for the system configuration, calculate the power consumption for the external power supply from the current consumption given below for the CPU Unit, Expansion Units, and Expansion I/O Units.

### CPU Units

| Model         | Current consumption |        | External power supply |
|---------------|---------------------|--------|-----------------------|
|               | 5 VDC               | 24 VDC | 24 VDC                |
| CP1L-M40DR-A  | 0.22 A              | 0.08 A | 0.3 A max.            |
| CP1L-M40DR-D  | 0.22 A              | 0.08 A | ---                   |
| CP1L-M40DT-D  | 0.31 A              | 0.03 A | ---                   |
| CP1L-M40DT1-D | 0.31 A              | 0.03 A | ---                   |
| CP1L-M30DR-A  | 0.21 A              | 0.07 A | 0.3 A max.            |
| CP1L-M30DR-D  | 0.21 A              | 0.07 A | ---                   |
| CP1L-M30DT-D  | 0.28 A              | 0.03 A | ---                   |
| CP1L-M30DT1-D | 0.28 A              | 0.03 A | ---                   |
| CP1L-L20DR-A  | 0.20 A              | 0.05 A | 0.2 A max.            |
| CP1L-L20DR-D  | 0.20 A              | 0.05 A | ---                   |
| CP1L-L20DT-D  | 0.24 A              | 0.03 A | ---                   |
| CP1L-L20DT1-D | 0.24 A              | 0.03 A | ---                   |
| CP1L-L14DR-A  | 0.18 A              | 0.04 A | 0.2 A max.            |
| CP1L-L14DR-D  | 0.18 A              | 0.04 A | ---                   |
| CP1L-L14DT-D  | 0.21 A              | 0.03 A | ---                   |
| CP1L-L14DT1-D | 0.21 A              | 0.03 A | ---                   |

- Note 1.** The current consumption of the CP1W-ME05M Memory Cassette and the CP1W-CIF01/CIF11 Option Boards are included in the current consumption of the CPU Unit.
- 2.** CPU Units with DC power do not provide an external power supply.
- 3.** The current consumptions given in the following table must be added to the current consumption of the CPU Unit if an Expansion Unit or Expansion I/O Unit is connected.
- 4.** The external power supply cannot be used if an Expansion Unit or Expansion I/O Unit is connected to a CPU Unit with 14 or 20 I/O points.

### Expansion Units and Expansion I/O Units

| Unit name                |                                                  | Model       | Current consumption |         |
|--------------------------|--------------------------------------------------|-------------|---------------------|---------|
|                          |                                                  |             | 5 VDC               | 24 VDC  |
| Expansion I/O Units      | 40 I/O points<br>24 inputs<br>16 outputs         | CP1W-40EDR  | 0.080 A             | 0.090 A |
|                          |                                                  | CP1W-40EDT  | 0.160 A             | ---     |
|                          |                                                  | CP1W-40EDT1 | ---                 | ---     |
|                          | 20 I/O points<br>12 inputs<br>8 outputs          | CP1W-20EDR1 | 0.103 A             | 0.044 A |
|                          |                                                  | CP1W-20EDT  | 0.130 A             | ---     |
|                          |                                                  | CP1W-20EDT1 | ---                 | ---     |
|                          | 16 outputs                                       | CP1W-16ER   | 0.042 A             | 0.090 A |
|                          | 8 inputs                                         | CP1W-8ED    | 0.018 A             | ---     |
|                          | 8 outputs                                        | CP1W-8ER    | 0.026 A             | 0.044 A |
|                          |                                                  | CP1W-8ET    | 0.075 A             | ---     |
|                          |                                                  | CP1W-8ET1   | ---                 | ---     |
| Analog Input Unit        | 4 inputs                                         | CP1W-AD041  | 0.080 A             | 0.120 A |
| Analog Output Unit       | 4 outputs                                        | CP1W-DA041  | 0.080 A             | 0.120 A |
|                          | 2 outputs                                        | CP1W-DA021  | 0.095 A             | 0.040 A |
| Analog I/O Unit          | 2 inputs and 1 output                            | CP1W-MAD11  | 0.083 A             | 0.110 A |
| Temperature Sensor Units | K or J thermocouple inputs                       | CP1W-TS001  | 0.040 A             | 0.059 A |
|                          |                                                  | CP1W-TS002  | ---                 | ---     |
|                          | Pt or JPt platinum resistance thermometer inputs | CP1W-TS101  | 0.054 A             | 0.073 A |
|                          |                                                  | CP1W-TS102  | ---                 | ---     |
| CompoBus/S I/O Link Unit | 8 inputs and 8 outputs                           | CP1W-SRT21  | 0.029 A             | ---     |

## CPU Units

| Type                                                          | CP1L-M40 (40 points)                                                                                                                                                                                                                                           | CP1L-M30 (30 points)                                                                                                                         | CP1L-L20 (20 points)                                                | CP1L-L14 (14 points)                                                                               |                             |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------|
| Models                                                        | CP1L-M40□□-□                                                                                                                                                                                                                                                   | CP1L-M30□□-□                                                                                                                                 | CP1L-L20□□-□                                                        | CP1L-L14□□-□                                                                                       |                             |
| Control method                                                | Stored program method                                                                                                                                                                                                                                          |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| I/O control method                                            | Cyclic scan with immediate refreshing                                                                                                                                                                                                                          |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Program language                                              | Ladder diagram                                                                                                                                                                                                                                                 |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Function blocks                                               | Maximum number of function block definitions: 128<br>Maximum number of instances: 256<br>Languages usable in function block definitions: Ladder diagrams, structured text (ST)                                                                                 |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Instruction length                                            | 1 to 7 steps per instruction                                                                                                                                                                                                                                   |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Instructions                                                  | Approx. 500 (function codes: 3 digits)                                                                                                                                                                                                                         |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Instruction execution time                                    | Basic instructions: 0.55 μs min. Special instructions: 4.1 μs min.                                                                                                                                                                                             |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Common processing time                                        | 0.4 ms                                                                                                                                                                                                                                                         |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Program capacity                                              | 10K steps                                                                                                                                                                                                                                                      |                                                                                                                                              | 5K steps                                                            |                                                                                                    |                             |
| Number of tasks                                               | 288 (32 cyclic tasks and 256 interrupt tasks)                                                                                                                                                                                                                  |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Scheduled interrupt tasks                                     | 1 (interrupt task No. 2, fixed)                                                                                                                                                                                                                                |                                                                                                                                              |                                                                     |                                                                                                    |                             |
|                                                               | Input interrupt tasks                                                                                                                                                                                                                                          |                                                                                                                                              | 4 (interrupt task No. 140 to 143, fixed)                            |                                                                                                    |                             |
|                                                               | (Interrupt tasks can also be specified and executed for high-speed counter interrupts and executed.)                                                                                                                                                           |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Maximum subroutine number                                     | 256                                                                                                                                                                                                                                                            |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Maximum jump number                                           | 256                                                                                                                                                                                                                                                            |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| I/O areas                                                     | Input bits                                                                                                                                                                                                                                                     | 24: CIO 0.00 to CIO 0.11 and CIO 1.00 to CIO 1.11                                                                                            | 18: CIO 0.00 to CIO 0.11 and CIO 1.00 to CIO 1.05                   | 12: CIO 0.00 to CIO 0.11                                                                           | 8: CIO 0.00 to CIO 0.07     |
|                                                               | Output bits                                                                                                                                                                                                                                                    | 16: CIO 100.00 to CIO 100.07 and CIO 101.00 to CIO 101.07                                                                                    | 12: CIO 100.00 to CIO 100.07 and CIO 101.00 to CIO 101.03           | 8: CIO 100.00 to CIO 100.07                                                                        | 6: CIO 100.00 to CIO 100.05 |
|                                                               | 1:1 Link Area                                                                                                                                                                                                                                                  | 1,024 bits (64 words): CIO 3000.00 to CIO 3063.15 (CIO 3000 to CIO 3063)                                                                     |                                                                     |                                                                                                    |                             |
|                                                               | Serial PLC Link Area                                                                                                                                                                                                                                           | 1,440 bits (90 words): CIO 3100.00 to CIO 3189.15 (CIO 3100 to CIO 3189)                                                                     |                                                                     |                                                                                                    |                             |
| Work bits                                                     | 8,192 bits (512 words): W000.00 to W511.15 (W0 to W511)<br>CIO Area: 37,504 bits (2,344 words): CIO 3800.00 to CIO 6143.15 (CIO 3800 to CIO 6143)                                                                                                              |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| TR Area                                                       | 16 bits: TR0 to TR15                                                                                                                                                                                                                                           |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Holding Area                                                  | 8,192 bits (512 words): H0.00 to H511.15 (H0 to H511)                                                                                                                                                                                                          |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| AR Area                                                       | Read-only (Write-prohibited): 7168 bits (448 words): A0.00 to A447.15 (A0 to A447)<br>Read/Write: 8192 bits (512 words): A448.00 to A959.15 (A448 to A959)                                                                                                     |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Timers                                                        | 4,096 bits: T0 to T4095                                                                                                                                                                                                                                        |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Counters                                                      | 4,096 bits: C0 to C4095                                                                                                                                                                                                                                        |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| DM Area                                                       | 32 Kwords: D0 to D32767                                                                                                                                                                                                                                        |                                                                                                                                              | 10 Kwords: D0 to D9999, D32000 to D32767                            |                                                                                                    |                             |
| Data Register Area                                            | 16 registers (16 bits): DR0 to DR15                                                                                                                                                                                                                            |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Index Register Area                                           | 16 registers (32 bits): IR0 to IR15                                                                                                                                                                                                                            |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Task Flag Area                                                | 32 flags (32 bits): TK0000 to TK0031                                                                                                                                                                                                                           |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Trace Memory                                                  | 4,000 words (500 samples for the trace data maximum of 31 bits and 6 words.)                                                                                                                                                                                   |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Memory Cassette                                               | A special Memory Cassette (CP1W-ME05M) can be mounted. <b>Note:</b> Can be used for program backups and auto-booting.                                                                                                                                          |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Clock function                                                | Supported. Accuracy (monthly deviation): -4.5 min to -0.5 min (ambient temperature: 55°C), -2.0 min to +2.0 min (ambient temperature: 25°C), -2.5 min to +1.5 min (ambient temperature: 0°C)                                                                   |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Communications functions                                      | One built-in peripheral port (USB 1.1): For connecting Support Software only.<br>A maximum of two Serial Communications Option Boards can be mounted.                                                                                                          |                                                                                                                                              | A maximum of one Serial Communications Option Board can be mounted. |                                                                                                    |                             |
| Memory backup                                                 | Flash memory: User programs, parameters (such as the PLC Setup), comment data, and the entire DM Area can be saved to flash memory as initial values.<br>Battery backup: The Holding Area, DM Area, and counter values (flags, PV) are backed up by a battery. |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Battery service life                                          | 5 years at 25°C. (Use the replacement battery within two years of manufacture.)                                                                                                                                                                                |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Built-in input terminals                                      | 40 (24 inputs, 16 outputs)                                                                                                                                                                                                                                     | 30 (18 inputs, 12 outputs)                                                                                                                   | 20 (12 inputs, 8 outputs)                                           | 14 (8 inputs, 6 outputs)                                                                           |                             |
| Number of connectable Expansion Units and Expansion I/O Units | CP-series Expansion Unit and Expansion I/O Units: 3 max.                                                                                                                                                                                                       |                                                                                                                                              | CP-series Expansion Units and Expansion I/O Units: 1 max.           |                                                                                                    |                             |
| Max. number of I/O points                                     | 160 (40 built in + 40 per Expansion (I/O) Unit × 3 Units)                                                                                                                                                                                                      | 150 (30 built in + 40 per Expansion (I/O) Unit × 3 Units)                                                                                    | 60 (20 built in + 40 per Expansion (I/O) Unit × 1 Unit)             | 54 (14 built in + 40 per Expansion (I/O) Unit × 1 Unit)                                            |                             |
| Interrupt inputs                                              | 6 inputs (Response time: 0.3 ms)                                                                                                                                                                                                                               |                                                                                                                                              |                                                                     | 4 inputs (Response time: 0.3 ms)                                                                   |                             |
| Interrupt inputs counter mode                                 | 6 inputs (Response frequency: 5 kHz max. for all interrupt inputs), 16 bits<br>Up or down counters                                                                                                                                                             |                                                                                                                                              |                                                                     | 4 inputs (Response frequency: 5 kHz max. for all interrupt inputs), 16 bits<br>Up or down counters |                             |
| Quick-response inputs                                         | 6 points (Min. input pulse width: 50 μs max.)                                                                                                                                                                                                                  |                                                                                                                                              |                                                                     | 4 points (Min. input pulse width: 50 μs max.)                                                      |                             |
| Scheduled interrupts                                          | 1                                                                                                                                                                                                                                                              |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| High-speed counters                                           | 4 counters, 2 axes (24-VDC input) 4 inputs: Differential phases (4x), 50 kHz or Single-phase (pulse plus direction, up/down, increment), 100 kHz<br>Value range: 32 bits, Linear mode or ring mode<br>Interrupts: Target value comparison or range comparison  |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| Pulse outputs (models with transistor outputs only)           | Pulse outputs                                                                                                                                                                                                                                                  | Trapezoidal or S-curve acceleration and deceleration (Duty ratio: 50% fixed)<br>2 outputs, 1 Hz to 100 kHz (CCW/CW or pulse plus direction)  |                                                                     |                                                                                                    |                             |
|                                                               | PWM outputs                                                                                                                                                                                                                                                    | Duty ratio: 0.0% to 100.0% (specified in increments of 0.1% or 1%)<br>2 outputs, 0.1 to 6553.5 Hz or 1 to 32,800 Hz (Accuracy: ±5% at 1 kHz) |                                                                     |                                                                                                    |                             |
| Analog control                                                | 1 (Setting range: 0 to 255)                                                                                                                                                                                                                                    |                                                                                                                                              |                                                                     |                                                                                                    |                             |
| External analog input                                         | 1 input (Resolution: 1/256, Input range: 0 to 10 V). Not isolated.                                                                                                                                                                                             |                                                                                                                                              |                                                                     |                                                                                                    |                             |

## Input Terminal Block Arrangement (Top Block)

### CP1L-M40

· AC Power Supply Models

|    |      |     |    |    |    |    |    |    |    |    |    |    |    |    |
|----|------|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| L1 | L2/N | COM | 01 | 03 | 05 | 07 | 09 | 11 | 01 | 03 | 05 | 07 | 09 | 11 |
|    |      |     | 00 | 02 | 04 | 06 | 08 | 10 | 00 | 02 | 04 | 06 | 08 | 10 |

Inputs (CIO 0) Inputs (CIO 1)

· DC Power Supply Models

|    |   |     |    |    |    |    |    |    |    |    |    |    |    |    |
|----|---|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| +  | - | COM | 01 | 03 | 05 | 07 | 09 | 11 | 01 | 03 | 05 | 07 | 09 | 11 |
| NC |   |     | 00 | 02 | 04 | 06 | 08 | 10 | 00 | 02 | 04 | 06 | 08 | 10 |

Inputs (CIO 0) Inputs (CIO 1)

### CP1L-L20

· AC Power Supply Models

|    |      |     |    |    |    |    |    |    |
|----|------|-----|----|----|----|----|----|----|
| L1 | L2/N | COM | 01 | 03 | 05 | 07 | 09 | 11 |
|    |      |     | 00 | 02 | 04 | 06 | 08 | 10 |

Inputs (CIO 0)

· DC Power Supply Models

|    |   |     |    |    |    |    |    |    |
|----|---|-----|----|----|----|----|----|----|
| +  | - | COM | 01 | 03 | 05 | 07 | 09 | 11 |
| NC |   |     | 00 | 02 | 04 | 06 | 08 | 10 |

Inputs (CIO 0)

### CP1L-M30

· AC Power Supply Models

|                                                                                   |                                                                                   |     |    |    |    |                |    |    |    |    |    |    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----|----|----|----|----------------|----|----|----|----|----|----|
| L1                                                                                | L2/N                                                                              | COM | 01 | 03 | 05 | 07             | 09 | 11 | 01 | 03 | 05 |    |
|  |  |     | 00 | 02 | 04 | 06             | 08 | 10 | 00 | 02 | 04 | NC |
| Inputs (CIO 0)                                                                    |                                                                                   |     |    |    |    | Inputs (CIO 1) |    |    |    |    |    |    |

· DC Power Supply Models

|                |                                                                                   |     |    |    |    |                |    |    |    |    |    |
|----------------|-----------------------------------------------------------------------------------|-----|----|----|----|----------------|----|----|----|----|----|
| +              | -                                                                                 | COM | 01 | 03 | 05 | 07             | 09 | 11 | 01 | 03 | 05 |
| NC             |  | 00  | 02 | 04 | 06 | 08             | 10 | 00 | 02 | 04 | NC |
| Inputs (CIO 0) |                                                                                   |     |    |    |    | Inputs (CIO 1) |    |    |    |    |    |

### CP1L-L14

· AC Power Supply Models

|    |      |     |    |    |    |    |    |    |
|----|------|-----|----|----|----|----|----|----|
| L1 | L2/N | COM | 01 | 03 | 05 | 07 | NC | NC |
|    |      |     | 00 | 02 | 04 | 06 | NC | NC |

Inputs (CIO 0)

· DC Power Supply Models

|    |   |     |    |    |    |    |    |    |
|----|---|-----|----|----|----|----|----|----|
| +  | - | COM | 01 | 03 | 05 | 07 | NC | NC |
| NC |   |     | 00 | 02 | 04 | 06 | NC | NC |

Inputs (CIO 0)

## Built-in Input Area

### CPU Units

| Number of inputs | Input terminal block | Word | Bit | Input operation |                   |                        | High-speed counter operation                                                  |                                                                                                                                  | Origin search                                               |
|------------------|----------------------|------|-----|-----------------|-------------------|------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
|                  |                      |      |     | Normal inputs   | Interrupt inputs  | Quick-response inputs  | Operation settings<br>• High-speed counters enabled<br>• Phase-Z signal reset |                                                                                                                                  | Origin searches enabled for pulse outputs 0 and 1           |
| 14               | CIO 0                | 00   | 00  | Normal input 0  | ---               | ---                    | Single-phase (increment pulse input)<br>High-speed counter 0 (increment)      | Two-phase (differential phase x4, up/down, or pulse plus direction)<br>High-speed counter 0 (phase-A, increment, or count input) | ---                                                         |
|                  |                      |      | 01  | Normal input 1  | ---               | ---                    | High-speed counter 1 (increment)                                              | High-speed counter 0 (phase-B, decrement, or count input)                                                                        | ---                                                         |
|                  |                      |      | 02  | Normal input 2  | ---               | ---                    | High-speed counter 2 (increment)                                              | High-speed counter 1 (phase-A, increment, or count input)                                                                        | Pulse output 0: Origin proximity input signal (See note 1.) |
|                  |                      |      | 03  | Normal input 3  | ---               | ---                    | High-speed counter 3 (increment)                                              | High-speed counter 1 (phase-B, decrement, or count input)                                                                        | Pulse output 01 Origin proximity input signal (See note 1.) |
|                  |                      |      | 04  | Normal input 4  | Interrupt input 0 | Quick-response input 0 | Counter 0, phase-Z/reset input                                                | High-speed counter 0 (phase-Z/reset)                                                                                             | ---                                                         |
|                  |                      |      | 05  | Normal input 5  | Interrupt input 1 | Quick-response input 1 | Counter 1, phase-Z/reset input                                                | High-speed counter 1 (phase-Z/reset)                                                                                             | ---                                                         |
|                  |                      |      | 06  | Normal input 6  | Interrupt input 2 | Quick-response input 2 | Counter 2, phase-Z/reset input                                                |                                                                                                                                  | Pulse output 0: Origin input signal                         |
|                  |                      |      | 07  | Normal input 7  | Interrupt input 3 | Quick-response input 3 | Counter 3, phase-Z/reset input                                                |                                                                                                                                  | Pulse output 1: Origin input signal                         |
|                  |                      |      | 08  | Normal input 8  | Interrupt input 4 | Quick-response input 4 | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 09  | Normal input 9  | Interrupt input 5 | Quick-response input 5 | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 10  | Normal input 10 | ---               | ---                    | ---                                                                           |                                                                                                                                  | Pulse output 0: Origin proximity input signal (See note 2.) |
|                  |                      |      | 11  | Normal input 11 | ---               | ---                    | ---                                                                           |                                                                                                                                  | Pulse output 1: Origin proximity input signal (See note 2.) |
| 20               | CIO 0                | 00   | 00  | Normal input 12 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 01  | Normal input 13 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 02  | Normal input 14 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 03  | Normal input 15 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 04  | Normal input 16 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 05  | Normal input 17 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 06  | Normal input 18 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 07  | Normal input 19 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 08  | Normal input 20 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 09  | Normal input 21 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 10  | Normal input 22 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 11  | Normal input 23 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
| 30               | CIO 1                | 00   | 00  | Normal input 12 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 01  | Normal input 13 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 02  | Normal input 14 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 03  | Normal input 15 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 04  | Normal input 16 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 05  | Normal input 17 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 06  | Normal input 18 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 07  | Normal input 19 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 08  | Normal input 20 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 09  | Normal input 21 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 10  | Normal input 22 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 11  | Normal input 23 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
| 40               | CIO 1                | 00   | 00  | Normal input 12 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 01  | Normal input 13 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 02  | Normal input 14 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 03  | Normal input 15 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 04  | Normal input 16 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 05  | Normal input 17 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 06  | Normal input 18 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 07  | Normal input 19 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 08  | Normal input 20 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 09  | Normal input 21 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 10  | Normal input 22 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |
|                  |                      |      | 11  | Normal input 23 | ---               | ---                    | ---                                                                           |                                                                                                                                  | ---                                                         |

**Note 1.** The origin proximity input signals for CPU Units with 14 points are bits 02 and 03 of CIO 0.

**2.** The origin proximity input signals for CPU Units with 20 points are bits 10 and 11 of CIO 0.

## Output Terminal Block Arrangement (Bottom Block)

### CP1L-M40

· AC Power Supply Models

|   |     |     |     |     |    |    |     |    |     |    |    |
|---|-----|-----|-----|-----|----|----|-----|----|-----|----|----|
| + | 00  | 01  | 02  | 03  | 04 | 06 | 00  | 01 | 03  | 04 | 05 |
| - | COM | COM | COM | COM | 05 | 07 | COM | 02 | COM | 05 | 07 |

CIO 100 CIO 101

· DC Power Supply Models

|    |     |     |     |     |    |    |     |    |     |    |    |
|----|-----|-----|-----|-----|----|----|-----|----|-----|----|----|
| NC | 00  | 01  | 02  | 03  | 04 | 06 | 00  | 01 | 03  | 04 | 05 |
| NC | COM | COM | COM | COM | 05 | 07 | COM | 02 | COM | 05 | 07 |

CIO 100 CIO 101

### CP1L-L20

· AC Power Supply Models

|   |     |     |     |    |     |    |
|---|-----|-----|-----|----|-----|----|
| + | 00  | 01  | 02  | 04 | 05  | 06 |
| - | COM | COM | COM | 03 | COM | 07 |

CIO 100

· DC Power Supply Models

|    |     |     |     |    |     |    |
|----|-----|-----|-----|----|-----|----|
| NC | 00  | 01  | 02  | 04 | 05  | 06 |
| NC | COM | COM | COM | 03 | COM | 07 |

CIO 100

### CP1L-M30

· AC Power Supply Models

|   |     |     |     |    |     |    |     |    |    |
|---|-----|-----|-----|----|-----|----|-----|----|----|
| + | 00  | 01  | 02  | 04 | 05  | 07 | 00  | 02 |    |
| - | COM | COM | COM | 03 | COM | 06 | COM | 01 | 03 |

CIO 100 CIO 101

· DC Power Supply Models

|    |     |     |     |    |     |    |     |    |    |
|----|-----|-----|-----|----|-----|----|-----|----|----|
| NC | 00  | 01  | 02  | 04 | 05  | 07 | 00  | 02 |    |
| NC | COM | COM | COM | 03 | COM | 06 | COM | 01 | 03 |

CIO 100 CIO 101

### CP1L-L14

· AC Power Supply Models

|   |     |     |     |    |     |    |
|---|-----|-----|-----|----|-----|----|
| + | 00  | 01  | 02  | 04 | 05  | NC |
| - | COM | COM | COM | 03 | COM | NC |

CIO 100

· DC Power Supply Models

|    |     |     |     |    |     |    |
|----|-----|-----|-----|----|-----|----|
| NC | 00  | 01  | 02  | 04 | 05  | NC |
| NC | COM | COM | COM | 03 | COM | NC |

CIO 100

## Built-in Output Area

### CPU Units

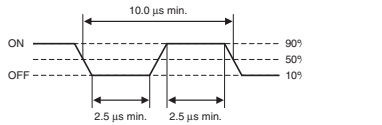
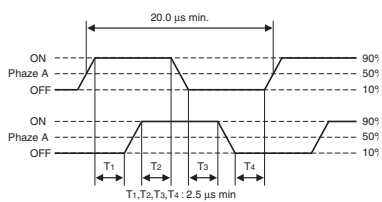
| Number of outputs | Output Terminal Block |     | When the instructions to the right are not executed | When a pulse output instruction (SPED, ACC, PLS2, or ORG) is executed |                            | When the origin search function is set to be used in the PLC Setup, and an origin search is executed by the ORG instruction | When the PWM instruction is executed |
|-------------------|-----------------------|-----|-----------------------------------------------------|-----------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|                   | Word                  | Bit | Normal output                                       | Fixed duty ratio pulse output                                         |                            | When the origin search function is used                                                                                     | Variable duty ratio pulse output     |
|                   |                       |     |                                                     | CW/CCW                                                                | Pulse plus direction       |                                                                                                                             | PWM output                           |
| 14                | CIO 100               | 00  | Normal output 0                                     | Pulse output 0 (CW)                                                   | Pulse output 0 (pulse)     | ---                                                                                                                         | ---                                  |
|                   |                       | 01  | Normal output 1                                     | Pulse output 0 (CCW)                                                  | Pulse output 0 (direction) | ---                                                                                                                         | PWM output 0                         |
|                   |                       | 02  | Normal output 2                                     | Pulse output 1 (CW)                                                   | Pulse output 1 (pulse)     | ---                                                                                                                         | ---                                  |
|                   |                       | 03  | Normal output 3                                     | Pulse output 1 (CCW)                                                  | Pulse output 1 (direction) | ---                                                                                                                         | PWM output 1                         |
|                   |                       | 04  | Normal output 4                                     | ---                                                                   | ---                        | Origin search 0 (Error counter reset output)                                                                                | ---                                  |
|                   |                       | 05  | Normal output 5                                     | ---                                                                   | ---                        | Origin search 1 (Error counter reset output)                                                                                | ---                                  |
|                   |                       | 06  | Normal output 6                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 07  | Normal output 7                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 00  | Normal output 8                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 01  | Normal output 9                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 02  | Normal output 10                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 03  | Normal output 11                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 04  | Normal output 12                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 05  | Normal output 13                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
| 20                | CIO 100               | 06  | Normal output 6                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 7                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 00  | Normal output 8                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 01  | Normal output 9                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 02  | Normal output 10                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 03  | Normal output 11                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 04  | Normal output 12                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 05  | Normal output 13                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 06  | Normal output 14                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 15                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
| 30                | CIO 100               | 06  | Normal output 6                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 7                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 00  | Normal output 8                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 01  | Normal output 9                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 02  | Normal output 10                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 03  | Normal output 11                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 04  | Normal output 12                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 05  | Normal output 13                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 06  | Normal output 14                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 15                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
| 40                | CIO 100               | 06  | Normal output 6                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 7                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 00  | Normal output 8                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 01  | Normal output 9                                     | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 02  | Normal output 10                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 03  | Normal output 11                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 04  | Normal output 12                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   | CIO 101               | 05  | Normal output 13                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 06  | Normal output 14                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |
|                   |                       | 07  | Normal output 15                                    | ---                                                                   | ---                        | ---                                                                                                                         | ---                                  |

## Input Specifications

| ITEM                  | Specifications                             |                                            |                                             |
|-----------------------|--------------------------------------------|--------------------------------------------|---------------------------------------------|
|                       | High-speed counter inputs (phases A and B) | Interrupt inputs and quick-response inputs | Normal inputs                               |
| CP1L                  | CIO 0.00 to CIO 0.03                       | CIO 0.04 to CIO 0.09                       | CIO 0.10, CIO 0.11 and CIO 1.00 to CIO 1.11 |
| Input voltage         | 24 VDC +10%/−15%                           |                                            |                                             |
| Applicable sensors    | 2-wire sensors                             |                                            |                                             |
| Input impedance       | 3.0 kΩ                                     |                                            | 4.7 kΩ                                      |
| Input current         | 7.5 mA typical                             |                                            | 5 mA typical                                |
| ON voltage            | 17.0 VDC min.                              |                                            | 14.4 VDC min.                               |
| OFF voltage/current   | 1 mA max. at 5.0 VDC                       |                                            |                                             |
| ON delay              | 2.5 μs max.                                | 50 μs max.                                 | 1 ms max.                                   |
| OFF delay             | 2.5 μs max.                                | 50 μs max.                                 | 1 ms max.                                   |
| Circuit configuration |                                            |                                            |                                             |

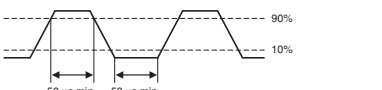
## High-speed Counter Function Input Specifications

Input bits: CIO 0.00 to CIO 0.03

| Item         | Specifications                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ON/OFF delay | <ul style="list-style-type: none"> <li>Pulse plus direction input mode</li> <li>Increment mode</li> <li>Up/down input mode</li> </ul>  <ul style="list-style-type: none"> <li>Differential phase input mode</li> </ul>  |

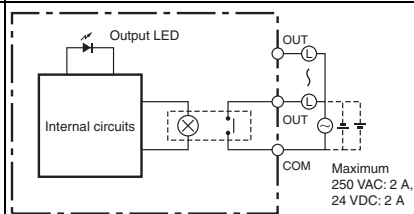
## Interrupt Input Counter Mode

Input bits: CIO 0.04 to CIO 0.09

| Item         | Specifications                                                                    |
|--------------|-----------------------------------------------------------------------------------|
| ON/OFF delay |  |

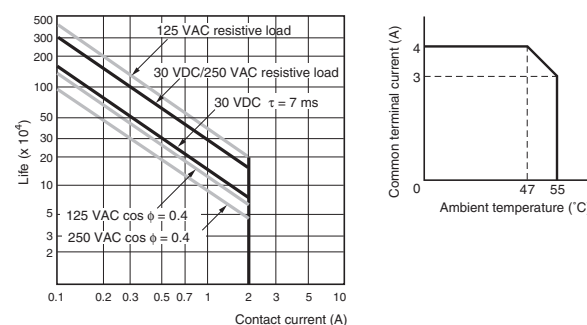
## Output Specifications

### CPU Units with Relay Outputs

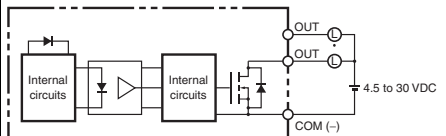
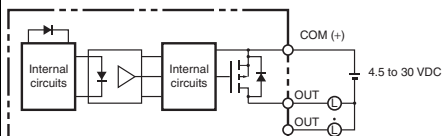
| Item                    |             |                | Specifications                                                                                 |
|-------------------------|-------------|----------------|------------------------------------------------------------------------------------------------|
| Max. switching capacity |             |                | 2 A, 250 VAC ( $\cos\phi = 1$ ), 2 A, 24 VDC 4 A/common                                        |
| Min. switching capacity |             |                | 5 VDC, 10 mA                                                                                   |
| Service life of relay   | Elec-trical | Resistive load | 100,000 operations (24 VDC)                                                                    |
|                         |             | Inductive load | 48,000 operations (250 VAC, $\cos\phi = 0.4$ )                                                 |
|                         | Mechanical  |                | 20,000,000 operations                                                                          |
| ON delay                |             |                | 15 ms max.                                                                                     |
| OFF delay               |             |                | 15 ms max.                                                                                     |
| Circuit configuration   |             |                | <div></div> |

**Note:** Under the worst conditions, the service life of output contacts is as shown on the left.

The service life of relays is as shown in the following diagram as a guide-line.



## CPU Units with Transistor Outputs (Sinking/Sourcing)

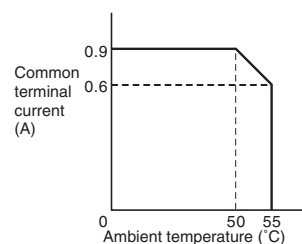
| Item                    | Specifications                                                                                                                                                                                                                                                |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CP1L CPU Units          | CIO 100.00 to CIO 100.03                                                                                                                                                                                                                                      |
| Max. switching capacity | 4.5 to 30 VDC: 300 mA/point, 0.9 A/common, 3.6 A/Unit (See notes 3 and 4.)                                                                                                                                                                                    |
| Min. switching capacity | 4.5 to 30 VDC, 1 mA                                                                                                                                                                                                                                           |
| Leakage current         | 0.1 mA max.                                                                                                                                                                                                                                                   |
| Residual voltage        | 0.6 V max.                                                                                                                                                                                                                                                    |
| ON delay                | 0.1 ms max.                                                                                                                                                                                                                                                   |
| OFF delay               | 0.1 ms max.                                                                                                                                                                                                                                                   |
| Fuse                    | 1/common (See note 2.)                                                                                                                                                                                                                                        |
| Circuit configuration   | <div> <div> <p>Sinking Outputs</p>  </div> <div> <p>Sourcing Outputs</p>  </div> </div> |

**Note 1.** Do not apply a voltage or connect a load to an output terminal exceeding the maximum switching capacity.

**Note 2.** Fuses cannot be replaced by the user.

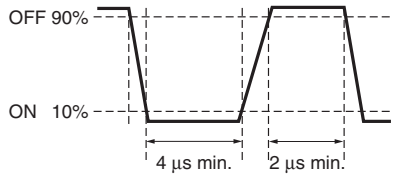
**Note 3.** Do not use more than 0.9 A total for CIO 100.00 to CIO 100.03.

**Note 4.** A maximum of 0.9 A per common can be switched at an ambient temperature of 50°C.



Pulse outputs

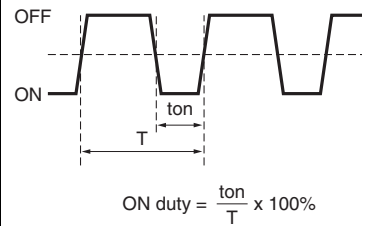
Output bits CIO 100.00 to CIO 100.03

| Item                    | Specifications                                                                    |
|-------------------------|-----------------------------------------------------------------------------------|
| Max. switching capacity | 30 mA at 4.75 to 26.4 VDC                                                         |
| Min. switching capacity | 7 mA at 4.75 to 26.4 VDC                                                          |
| Max. output frequency   | 100 kHz                                                                           |
| Output waveform         |  |

- Note 1.** The above values assume a resistive load and do not consider the impedance of the cable connecting the load.
- 2.** The pulse widths during actual use may be smaller than the ones shown above due to pulse distortion caused by connecting cable impedance.

Pulse outputs

Output bits CIO 100.01, CIO 100.03

| Item                    | Specifications                                                                      |
|-------------------------|-------------------------------------------------------------------------------------|
| Max. switching capacity | 30 mA at 4.75 to 26.4 VDC                                                           |
| Max. output frequency   | CP1L: 32.8 kHz                                                                      |
| PWM output precision    | ON duty +5%, -0% at output frequency of 1 kHz                                       |
| Output waveform         |  |

- Note 1.** The above values assume a resistive load and do not consider the impedance of the cable connecting the load.
- 2.** The pulse widths during actual use may be smaller than the ones shown above due to pulse distortion caused by connecting cable impedance.

Serial Communications Specifications

| Item                                 | Function                                                                                                                                                    | Interface                                                                                                                                                                |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Peripheral USB port                  | For connecting Peripheral Device.                                                                                                                           | Conforms to USB 1.1, B-type connector                                                                                                                                    |
| Serial port 1                        | Host Link, No-protocol, NT Link (1: N), Serial PLC Link (See note.), Serial Gateway (CompoWay/F master, Modbus-RTU master), Modbus-RTU easy master function | The following can be used for either port.<br><br>CP1W-CIF01 RS-232C Option Board<br> |
| Serial port 2<br>(CP1L-M30/M40 only) |                                                                                                                                                             | CP1W-CIF11 RS-422A/485 Option Board<br><br><br>Can be used with either port.         |

**Note:** Serial PLC Link can be used with either serial port 1 or serial port 2.

## Connecting Expansion Units and Expansion I/O Units

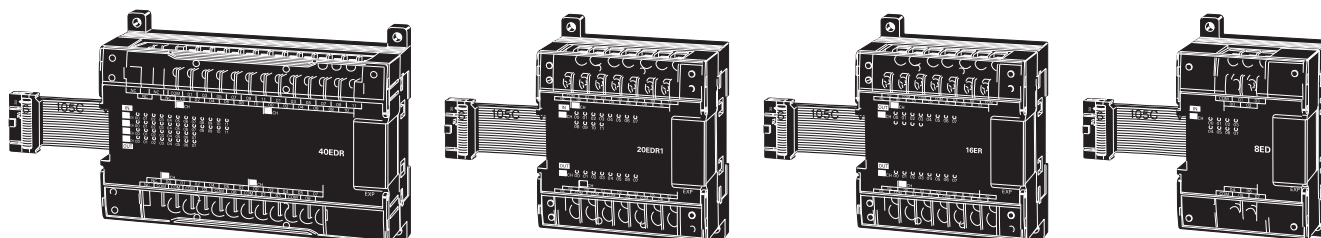
CP-series and CPM1A-series Expansion Units and Expansion I/O Units can be connected to the CP1L. Up to three Expansion Units or Expansion I/O Units can be connected to a CPU Unit with 30 or 40 I/O points and one Expansion Unit or Expansion I/O Unit can be connected to a CPU Unit with 20 or 14 I/O points.

The functionality and performance of CP-series Expansion units and Expansion I/O Units is the same as the functionality and performance of CPM1A-series Expansion Units and Expansion I/O Units. CP-series Units are black, and CPM1A-series units are ivory.

| Unit name           |                           | Output Method                                         | Inputs                                       | Outputs | Model       |                |
|---------------------|---------------------------|-------------------------------------------------------|----------------------------------------------|---------|-------------|----------------|
|                     |                           |                                                       |                                              |         | CP1W        | CPM1A          |
| Expansion I/O Units | 8-point Input Unit        |                                                       | 8                                            | -       | CP1W-8ED    | CPM1A-8ED      |
|                     | 8-point Output Unit       | Relay                                                 | -                                            | 8       | CP1W-8ER    | CPM1A-8ER      |
|                     |                           | Transistor (sinking)                                  |                                              |         | CP1W-8ET    | CPM1A-8ET      |
|                     |                           | Transistor (sourcing)                                 |                                              |         | CP1W-8ET1   | CPM1A-8ET1     |
|                     | 16-point Output Unit      | Relay                                                 | -                                            | 16      | CP1W-16ER   | -              |
|                     | 20-point I/O Unit         | Relay                                                 | 12                                           | 8       | CP1W-20EDR1 | CPM1A-20EDR1   |
|                     |                           | Transistor (sinking)                                  |                                              |         | CP1W-20EDT  | CPM1A-20EDT    |
|                     |                           | Transistor (sourcing)                                 |                                              |         | CP1W-20EDT1 | CPM1A-20EDT1   |
|                     | 40-point I/O Unit         | Relay                                                 | 24                                           | 16      | CP1W-40EDR  | CPM1A-40EDR    |
|                     |                           | Transistor (sinking)                                  |                                              |         | CP1W-40EDT  | CPM1A-40EDT    |
|                     |                           | Transistor (sourcing)                                 |                                              |         | CP1W-40EDT1 | CPM1A-40EDT1   |
| Expansion Units     | Analog I/O Unit           | Analog (resolution 1/256)                             | 2                                            | 1       | -           | CPM1A-MAD01    |
|                     |                           | Analog (resolution 1/6000)                            |                                              |         | CP1W-MAD11  | CPM1A-MAD11    |
|                     | Analog Input Unit         | Analog (resolution 1/6000)                            | 4                                            | -       | CP1W-AD041  | CPM1A-AD041    |
|                     | Analog Output Unit        | Analog (resolution 1/6000)                            | -                                            | 4       | CP1W-DA041  | CPM1A-DA041    |
|                     |                           |                                                       | -                                            | 2       | CP1W-DA021  | -              |
|                     | Temperature Sensor Unit   | Thermocouple input                                    | 2                                            | -       | CP1W-TS001  | CPM1A-TS001    |
|                     |                           |                                                       | 4                                            | -       | CP1W-TS002  | CPM1A-TS002    |
|                     |                           | Platinum resistance input                             | 2                                            | -       | CP1W-TS101  | CPM1A-TS101    |
|                     |                           |                                                       | 4                                            | -       | CP1W-TS102  | CPM1A-TS102    |
|                     |                           | Platinum resistance input and voltage/ current output | 2                                            | 1       | -           | CPM1A-TS101-DA |
|                     | DeviceNet I/O Link Unit   | -                                                     | I/O link of 32 input bits and 32 output bits |         | -           | CPM1A-DRT21    |
|                     | Profibus-DP I/O Link Unit | -                                                     | I/O link of 16 input bits and 16 output bits |         | -           | CPM1A-PRT21    |
|                     | CompoBus I/O Link Unit    | -                                                     | I/O link of 8 input bits and 8 output bits   |         | CP1W-SRT21  | CPM1A-SRT21    |

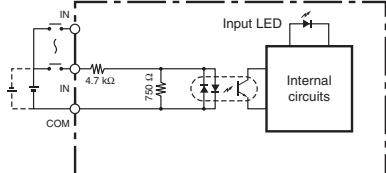
## CP1W-40EDR/40EDT/40EDT1/20EDR1/20EDT/20EDT1/16ER/8ED/8ER/8ET/8ET1 Expansion I/O Units

Expansion I/O Units can be connected to the CPU Unit to configure the required number of I/O points.



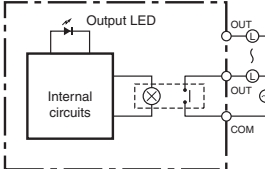
## Input Specifications of Expansion I/O Units

### DC Inputs (CP1W-40EDR/40EDT/40EDT1/20EDR1/20EDT/20EDT1/8ED)

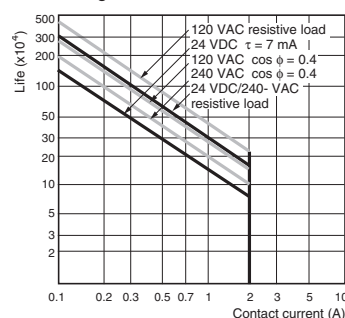
| Item                  | Specifications                                                                    |
|-----------------------|-----------------------------------------------------------------------------------|
| Input voltage         | 24 VDC +10%/-15%                                                                  |
| Input impedance       | 4.7 kΩ                                                                            |
| Input current         | 5 mA typical                                                                      |
| ON voltage            | 14.4 VDC min.                                                                     |
| OFF voltage           | 5.0 VDC max.                                                                      |
| ON delay              | 0 to 32 ms max. (Default: 8 ms) (See note 1.)                                     |
| OFF delay             | 0 to 32 ms max. (Default: 8 ms) (See note 1.)                                     |
| Circuit configuration |  |

- Note 1.** Do not apply a voltage exceeding the rated voltage to an input terminal.  
**2.** Can be set in the PLC Setup to 0, 0.5, 1, 2, 4, 8, 16 or 32 ms.  
 The CP1W-40EDR/EDT/EDT1 are fixed at 16 ms.

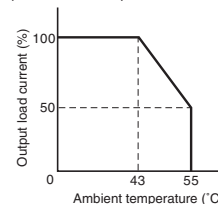
### Relay Outputs (CP1W-40EDR/20EDR1/16ER/8ER)

| Item                    |             |                | Specifications                                                                                                                                  |
|-------------------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Max. switching capacity |             |                | 2 A, 250 VAC (cosφ = 1), 24 VDC 4 A/common                                                                                                      |
| Min. switching capacity |             |                | 5 VDC, 10 mA                                                                                                                                    |
| Service life of relay   | Elec-trical | Resistive load | 150,000 operations (24 VDC)                                                                                                                     |
|                         |             | Inductive load | 100,000 operations (24 VAC cos = 0.4)                                                                                                           |
|                         | Mechanical  |                | 20,000,000 operations                                                                                                                           |
| ON delay                |             |                | 15 ms max.                                                                                                                                      |
| OFF delay               |             |                | 15 ms max.                                                                                                                                      |
| Circuit configuration   |             |                | <div></div> <p>Maximum<br/>250 VAC: 2 A,<br/>24 VDC: 2 A</p> |

**Note:** Under take worst conditions, the service life of output contacts is as shown on the left. The service life of relays is as shown in the following diagram as a guideline.

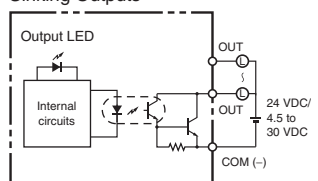
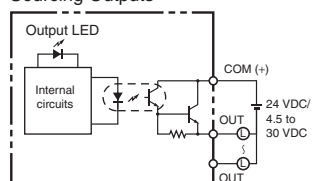


Relationship between Output Load Current and Ambient Temperature (CP1W-16ER)



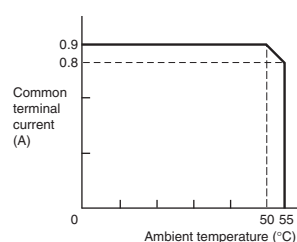
Switching frequency: 1,800 operations/h

## Transistor Outputs (Sinking/Sourcing)

| Item                                     | Specifications                                                                                                                                                                                                                                                                                                                                                                             | CP1W-20EDT<br>CP1W-40EDT1                    | CP1W-8ET<br>CP1W-8ET1                                                                     |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------|
| Max. switching capacity<br>(See note 3.) | 4.5 to 30 VDC:<br>0.3 A/point                                                                                                                                                                                                                                                                                                                                                              | 24 VAC +10%/-5%:<br>0.3 A/point              | OUT00/OUT01: 0.2 A/point at 4.5 to 30 VDC<br>OUT02 to OUT07: 0.3 A/point at 4.5 to 30 VDC |
|                                          | 0.9 A/common                                                                                                                                                                                                                                                                                                                                                                               | 0.9 A/common                                 | 0.9 A/common                                                                              |
|                                          | 3.6 A/common                                                                                                                                                                                                                                                                                                                                                                               | 1.8 A/common                                 | 1.8 A/common                                                                              |
| Leakage current                          | 0.1 mA max.                                                                                                                                                                                                                                                                                                                                                                                | 0.1 mA max.                                  | 0.1 mA max.                                                                               |
| Residual voltage                         | 1.5 V max.                                                                                                                                                                                                                                                                                                                                                                                 | 1.5 V max.                                   | 1.5 V max.                                                                                |
| ON delay                                 | 0.1 ms max.                                                                                                                                                                                                                                                                                                                                                                                | 0.1 ms max.                                  | 0.1 ms max.                                                                               |
| OFF delay                                | 1 ms max. at 24 VDC<br>+10%/-5%, 5 to 300 mA                                                                                                                                                                                                                                                                                                                                               | 1 ms max. at 24 VDC<br>+10%/-5%, 5 to 300 mA | 1 ms max. at 24 VDC<br>+10%/-5%, 5 to 300 mA                                              |
| Fuse (See note 2.)                       | None                                                                                                                                                                                                                                                                                                                                                                                       | 1/common                                     |                                                                                           |
| Circuit configuration                    | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>Sinking Outputs</b></p>  </div> <div style="text-align: center;"> <p><b>Sourcing Outputs</b></p>  </div> </div> |                                              |                                                                                           |

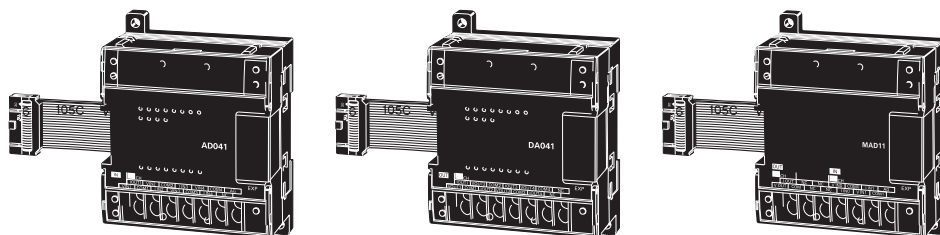
- Note 1.** Do not apply a voltage or connect a load to an output terminal exceeding the maximum switching capacity.  
**2.** The fuses cannot be replaced by the user.

- 3.** A maximum of 0.9 A per common can be switched at an ambient temperature of 50°C.



# CP1W-AD041/DA041/DA021/MAD11 Analog Units

Analog values that are input are converted to binary data and stored in the input area, or binary data is output as analog values.



## Analog Input Unit: CP1W-AD041

| Model                    |           | CP1W-AD041                                                                                                                            |                        |
|--------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Item                     |           | Input voltage                                                                                                                         | Input current          |
| Number of inputs         |           | 4                                                                                                                                     |                        |
| Input signal range       |           | 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V                                                                                            | 0 to 20 mA, 4 to 20 mA |
| Max. rated input         |           | ±15 V                                                                                                                                 | ±30 mA                 |
| External input impedance |           | 1 MΩ min.                                                                                                                             | Approx. 250 Ω          |
| Resolution               |           | 6000                                                                                                                                  |                        |
| Overall accuracy         | 25°C      | ±0.3% of full scale                                                                                                                   | ±0.4% of full scale    |
|                          | 0 to 55°C | ±0.6% of full scale                                                                                                                   | ±0.8% of full scale    |
| Conversion time          |           | 2.0 ms/point                                                                                                                          |                        |
| A/D conversion data      |           | Binary data with resolution of 6,000<br>Full scale for -10 to 10 V: F448 to 0BB8 hex<br>Full scale for other ranges: 0000 to 1770 hex |                        |
| Averaging                |           | Supported.                                                                                                                            |                        |
| Open-circuit detection   |           | Supported.                                                                                                                            |                        |
| Insulation resistance    |           | 20 MΩ min. (at 250 VDC, between isolated circuits)                                                                                    |                        |
| Dielectric strength      |           | 500 VAC for 1 min (between isolated circuits)                                                                                         |                        |
| Isolation method         |           | Photocoupler isolation (between analog inputs and secondary internal circuits).<br>No isolation between input signals.                |                        |

## Analog Output Unit: CP1W-DA041/DA021

| Model                                     |           | CP1W-DA041/DA021                                                                                                                      |                          |
|-------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Item                                      |           | Output voltage                                                                                                                        | Output current           |
| Number of outputs                         |           | DA041: 4, DA021: 2                                                                                                                    |                          |
| Output signal range                       |           | 0 to 5 V, 0 to 10 V, or -10 to 10 V                                                                                                   | 0 to 20 mA or 4 to 20 mA |
| Allowable external output load resistance |           | 2 kΩ min.                                                                                                                             | 350 Ω max.               |
| External output impedance                 |           | 0.5 Ω max.                                                                                                                            | ---                      |
| Resolution                                |           | 6000                                                                                                                                  |                          |
| Overall accuracy                          | 25°C      | ±0.4% of full scale                                                                                                                   |                          |
|                                           | 0 to 55°C | ±0.8% of full scale                                                                                                                   |                          |
| Conversion time                           |           | 2.0 ms/point                                                                                                                          |                          |
| D/A conversion data                       |           | Binary data with resolution of 6,000<br>Full scale for -10 to 10 V: F448 to 0BB8 hex<br>Full scale for other ranges: 0000 to 1770 hex |                          |
| Insulation resistance                     |           | 20 MΩ min. (at 250 VDC between isolated circuits)                                                                                     |                          |
| Dielectric strength                       |           | 500 VAC for 1 min between isolated circuits                                                                                           |                          |
| Isolation method                          |           | Photocoupler isolation between analog inputs and secondary internal circuits.<br>No isolation between analog input signals.           |                          |

## Analog I/O Unit: CP1W-MAD11

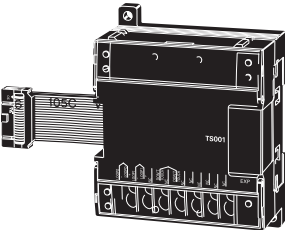
| Model                               |                                           | CP1W-MAD11                                                                                                              |                        |
|-------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------|
| Item                                |                                           | Voltage I/O                                                                                                             | Current I/O            |
| Analog Input Section                | Number of inputs                          | 2 inputs                                                                                                                |                        |
|                                     | Input signal range                        | 0 to 5 V, 1 to 5 V, 0 to 10 V, or -10 to 10V                                                                            |                        |
|                                     | Max. rated input                          | ±15 V                                                                                                                   |                        |
|                                     | External input impedance                  | 1 MΩ min.                                                                                                               |                        |
|                                     | Resolution                                | 1/6000 (full scale)                                                                                                     |                        |
|                                     | Overall accuracy                          | 25°C                                                                                                                    | ±0.3% of full scale    |
|                                     |                                           | 0 to 55°C                                                                                                               | ±0.6% of full scale    |
|                                     | A/D conversion data                       | Binary data (hexadecimal, 4 digits)<br>-10 to 10 V: F448 to 0BB8 hex<br>Full scale for other ranges: 0000 to 1770 hex   |                        |
| Analog Output Section (See note 1.) | Averaging                                 | Supported (Set for each input using a DIP switch.)                                                                      |                        |
|                                     | Disconnection detection                   | Supported                                                                                                               |                        |
|                                     | Number of outputs                         | 1 output                                                                                                                |                        |
|                                     | Output signal range                       | 1 to 5 V, 0 to 10 V, -10 to 10 V                                                                                        | 0 to 20 mA, 4 to 20 mA |
|                                     | External output max. current              | ---                                                                                                                     |                        |
|                                     | Allowable external output load resistance | 1 kΩ min.                                                                                                               | 600 Ω max.             |
|                                     | External input impedance                  | 0.5 Ω max.                                                                                                              | ---                    |
|                                     | Resolution                                | 1/6000 (full scale)                                                                                                     |                        |
|                                     | Overall accuracy                          | 25°C                                                                                                                    | ±0.4% of full scale    |
|                                     |                                           | 0 to 55°C                                                                                                               | ±0.8% of full scale    |
|                                     | Data setting                              | ---                                                                                                                     |                        |
|                                     | D/A conversion data                       | Binary data (hexadecimal, 4 digits)<br>-10 to 10 V: F448 to 0BB8 hex<br>Full scale for other ranges: 0000 to 1770 hex   |                        |
| Conversion time (See note 2.)       |                                           | 2 ms/point (6 ms for all points)                                                                                        |                        |
| Isolation method                    |                                           | Photocoupler isolation between analog I/O and internal circuits (There is no isolation between the analog I/O signals.) |                        |

**Note 1.** The voltage output and current output can be used at the same time for analog outputs, but the total output current must not exceed 21 mA.

**Note 2.** The conversion time is the total time for 2 analog inputs and 1 analog output.

Temperature Sensor Units: CP1W-TS001/TS002/TS101/TS102

By mounting a Temperature Sensor Unit to the PLC, inputs can be obtained from thermocouples or platinum resistance thermometers, and temperature measurements can be converted to binary data (4-digit hexadecimal) and stored in the input area of the CPU Unit.



Specifications

| Item                       | Model | CP1W-TS001/002                                                                                              | CP1W-TS101/102                                                                                   |
|----------------------------|-------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Number of inputs           |       | 2 (TS001), 4 (TS002)                                                                                        | 2 (TS101), 4 (TS102)                                                                             |
| Input types                |       | K, J switchable (Note: Same for all inputs.)                                                                | Pt100, JPt100 switchable (Note: Same for all inputs.)                                            |
| Indication accuracy        |       | (The larger of the indicated value: $\pm 0.5\%$ and $\pm 2^{\circ}\text{C}$ (See note.)) $\pm 1$ digit max. | (The larger of the indicated value: $\pm 0.5\%$ and $\pm 1^{\circ}\text{C}$ ) $\pm 1$ digit max. |
| Conversion time            |       | 250 ms/2 points (TS001, TS101); 250 ms/4 points (TS002, TS102)                                              |                                                                                                  |
| Converted temperature data |       | Binary (4-digit hexadecimal)                                                                                |                                                                                                  |
| Isolation method           |       | Photocoupler isolation between the temperature input signals.                                               |                                                                                                  |

**Note:** The indication accuracy when using a K-type thermocouple for temperature less than  $-100^{\circ}\text{C}$  is  $\pm 4^{\circ}\text{C} \pm 1$  digit max.

Input Temperature Ranges for CP1W-TS001/002  
(The rotary switch can be used to make the following range and input type settings.)

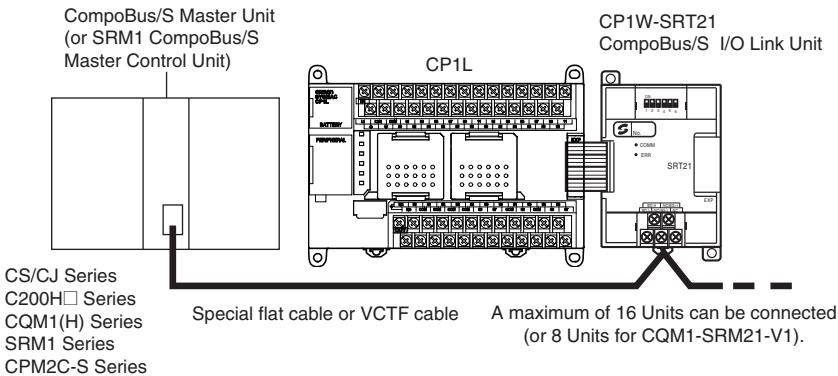
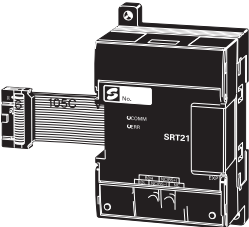
| Input type | Range ( $^{\circ}\text{C}$ ) | Range ( $^{\circ}\text{F}$ ) |
|------------|------------------------------|------------------------------|
| K          | -200 to 1300                 | -300 to 2300                 |
|            | 0.0 to 500.0                 | 0.0 to 900.0                 |
| J          | -100 to 850                  | -100 to 1500                 |
|            | 0.0 to 400.0                 | 0.0 to 750.0                 |

Input Temperature Ranges for CP1W-TS101/102  
(The rotary switch can be used to make the following range and input type settings.)

| Input type | Range ( $^{\circ}\text{C}$ ) | Range ( $^{\circ}\text{F}$ ) |
|------------|------------------------------|------------------------------|
| Pt100      | -200.0 to 650.0              | -300 to 1200.0               |
| JPt100     | -200.0 to 650.0              | -300 to 1200.0               |

CP1W-SRT21 CompoBus/S I/O Link Unit

The CompoBus/S I/O Link Unit functions as a slave for a CompoBus/S Master Unit (or an SRM1 CompoBus/S Master Control Unit) to form an I/O Link with 8 inputs and 8 outputs between the CompoBus/S I/O Link Unit and the Master Unit.



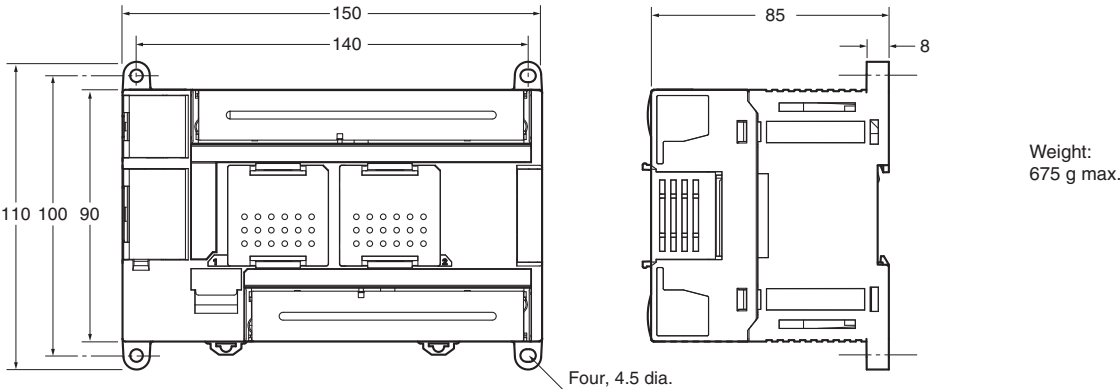
Specifications

| Item                                        | Model | CP1W-SRT21                                                                              |
|---------------------------------------------|-------|-----------------------------------------------------------------------------------------|
| Master/Slave                                |       | CompoBus/S Slave                                                                        |
| Number of I/O bits                          |       | 8 input bits, 8 output bits                                                             |
| Number of words occupied in CP1L I/O memory |       | 1 input word, 1 output word<br>(Allocated in the same way as for other Expansion Units) |
| Node number setting                         |       | Set using the DIP switch<br>(before the CPU Unit is turned ON.)                         |

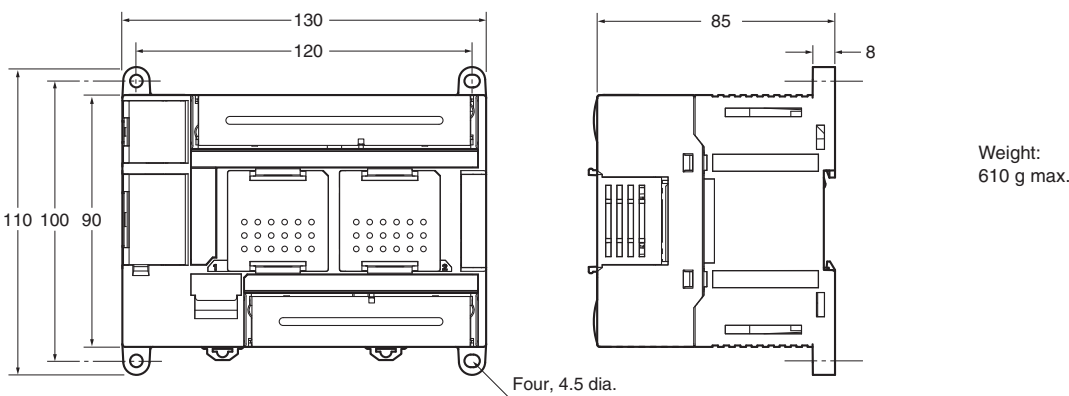
Dimensions

(Unit: mm)

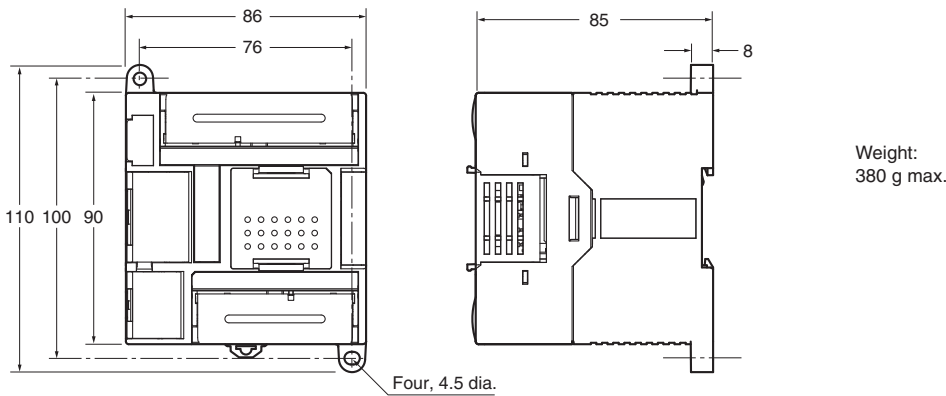
CP1L CPU Units with 40 I/O Points



CP1L CPU Units with 30 I/O Points



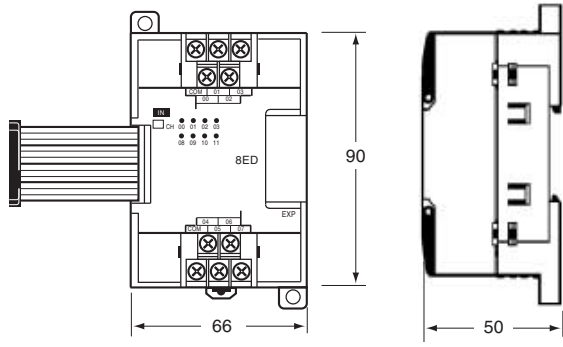
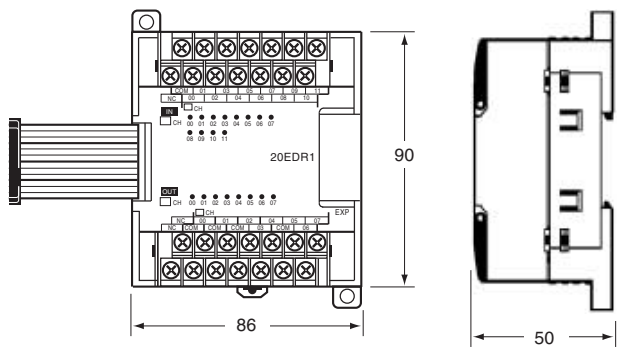
CP1L CPU Units with 14 or 20 I/O Points



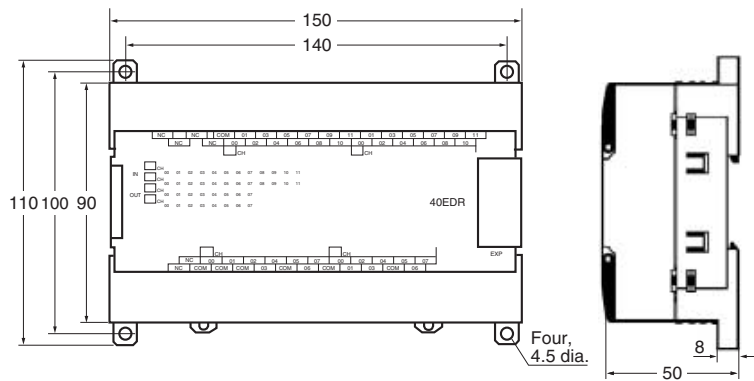
Expansion Units and Expansion I/O Units

CP1W-20ED□  
CP1W-16ER  
CP1W-AD041/CP1W-DA041/CP1W-DA021  
CP1W-MAD11/CP1W-TS□□□

CP1W-8E□□  
CP1W-SRT21



CP1W-40ED□



| Unit name                | Model number                    | Weight |
|--------------------------|---------------------------------|--------|
| Expansion I/O Units      | CP1W-40EDR                      | 380 g  |
|                          | CP1W-40EDT/-40EDT1              | 320 g  |
|                          | CP1W-20EDR1/-20EDT/-20EDT1      | 300 g  |
|                          | CP1W-16ER                       | 280 g  |
|                          | CP1W-8ED                        | 200 g  |
|                          | CP1W-8ER/-8ET/-8ET1             | 250 g  |
| Analog Units             | CP1W-AD041/-DA041/-DA021        | 200 g  |
|                          | CP1W-MAD11                      | 150 g  |
| Temperature Sensor Units | CP1W-TS001/-TS002/-TS101/-TS102 | 250 g  |
| CompoBus/S I/O Link Unit | CP1W-SRT21                      | 200 g  |

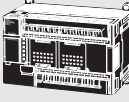
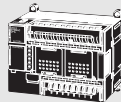
## Ordering Information

### CPU Units

#### International Standards

The standards indicated in the "Standards" column are those current for UL, CSA, cULus, NK, and Lloyd standards and EC Directives as of the end of April 2007. 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. Ask your OMRON representative for the conditions under which the standards were met.

#### CP1L CPU Units

| CPU Unit                                                                                                                      | Specifications  |                              |        |         | Model         | Standards     |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------|--------|---------|---------------|---------------|
|                                                                                                                               | Power supply    | Output method                | Inputs | Outputs |               |               |
| <b>CP1L-M CPU Units with 40 Points</b><br>   | AC power supply | Relay output                 | 24     | 16      | CP1L-M40DR-A  | UC1, N, L, CE |
|                                                                                                                               | DC power supply | Transistor output (sinking)  |        |         | CP1L-M40DR-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-M40DT-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-M40DT1-D |               |
| <b>CP1L-M CPU Units with 30 Points</b><br>   | AC power supply | Relay output                 | 18     | 12      | CP1L-M30DR-A  |               |
|                                                                                                                               | DC power supply | Transistor output (sinking)  |        |         | CP1L-M30DR-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-M30DT-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-M30DT1-D |               |
| <b>CP1L-L CPU Units with 20 Points</b><br>   | AC power supply | Relay output                 | 12     | 8       | CP1L-L20DR-A  |               |
|                                                                                                                               | DC power supply | Transistor output (sinking)  |        |         | CP1L-L20DR-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-L20DT-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-L20DT1-D |               |
| <b>CP1L-L CPU Units with 14 Points</b><br> | AC power supply | Relay output                 | 8      | 6       | CP1L-L14DR-A  |               |
|                                                                                                                               | DC power supply | Transistor output (sinking)  |        |         | CP1L-L14DR-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-L14DT-D  |               |
|                                                                                                                               |                 | Transistor output (sourcing) |        |         | CP1L-L14DT1-D |               |

#### Options for CPU Units

| Name                     | Specifications                                       | Model      | Standards     |
|--------------------------|------------------------------------------------------|------------|---------------|
| RS-232C Option Board     | For CPU Unit option port.                            | CP1W-CIF01 | UC1, N, L, CE |
| RS-422A/485 Option Board | For CPU Unit option port.                            | CP1W-CIF11 |               |
| Memory Cassette          | Can be used for backing up programs or auto-booting. | CP1W-ME05M |               |

#### Programming Devices

| Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Specifications                                                                                                                                                                                                                                                                                 | Model                              | Standards |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------|
| <b>CX-One FA Integrated Tool Package Ver. 2.0</b><br>CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS.<br>OS: Windows 98SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), or XP<br>*CX-Thermo runs only on Windows 2000 (Service Pack 3 or higher) or XP.<br>CX-One Ver. 2.0 includes CX-Programmer Ver. 7.1.<br>For details, refer to the CX-One catalog (Cat. No. R134).<br>*The software is provided on CDs for the CXONE-AL01C-EV2 and on DVD for the CXONE-AL03D-EV2.<br>*Site licenses are available for users who must run the CX-One on many computers. Ask your OMRON representative for details. | 1 license                                                                                                                                                                                                                                                                                      | CXONE-AL01C-EV2<br>CXONE-AL01D-EV2 | ---       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3 licenses                                                                                                                                                                                                                                                                                     | CXONE-AL03C-EV2<br>CXONE-AL03D-EV2 |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10 licenses                                                                                                                                                                                                                                                                                    | CXONE-AL10C-EV2<br>CXONE-AL10D-EV2 |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 50 licenses                                                                                                                                                                                                                                                                                    | CXONE-AL50C-EV2<br>CXONE-AL50D-EV2 |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |                                    |           |
| USB Programming cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | A-type male to B-type male (Length: 1.8 m)                                                                                                                                                                                                                                                     | CP1W-CN221                         | ---       |
| <b>Programming Device Connecting Cable for CP1W-CIF01 RS-232C Option Board</b><br>USB-Serial Conversion Cable (See note)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)                                                                                                                                                                                                                                            | For anti-static connectors         | ---       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)                                                                                                                                                                                                                                            |                                    |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)                                                                                                                                                                                                                                            |                                    |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)                                                                                                                                                                                                                                            |                                    |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | USB-RS-232C Conversion Cable (Length: 0.5 m) and PC driver (on a CD-ROM disc) are included.<br>Complies with USB Specification 1.1<br>On personal computer side: USB (A plug connector, male)<br>On PLC side: RS-232C (D-sub 9-pin, male)<br>Driver: Supported by Windows 98, Me, 2000, and XP |                                    |           |

- Note:**
- Cannot be used with a peripheral USB port.
  - CP1L PLCs are supported by CX-Programmer version 7.1 or higher.

## Expansion Units

| Name                     | Output method                            | Inputs                     | Outputs                    | Model       | Standards      |
|--------------------------|------------------------------------------|----------------------------|----------------------------|-------------|----------------|
| Expansion I/O Units      | Relay                                    | 24                         | 16                         | CP1W-40EDR  | N, L, CE       |
|                          | Transistor (sinking)                     |                            |                            | CP1W-40EDT  |                |
|                          | Transistor output (sourcing)             |                            |                            | CP1W-40EDT1 |                |
|                          | Relay                                    | 12                         | 8                          | CP1W-20EDR1 | U, C, L, CE    |
|                          | Transistor (sinking)                     |                            |                            | CP1W-20EDT  | U, C, N, L, CE |
|                          | Transistor output (sourcing)             |                            |                            | CP1W-20EDT1 |                |
|                          | Relay                                    | ---                        | 16                         | CP1W-16ER   | CE             |
|                          | ---                                      | 8                          | ---                        | CP1W-8ED    | U, C, N, L, CE |
|                          | Relay                                    | ---                        | 8                          | CP1W-8ER    |                |
|                          | Transistor (sinking)                     | ---                        | 8                          | CP1W-8ET    |                |
|                          | Transistor output (sourcing)             | ---                        | ---                        | CP1W-8ET1   |                |
| Analog Input Unit        | Analog (resolution: 1/6000)              | 4                          | ---                        | CP1W-AD041  | UC1, CE        |
| Analog Output Unit       | Analog (resolution: 1/6000)              | ---                        | 4                          | CP1W-DA041  | UC1, CE        |
|                          |                                          | ---                        | 2                          | CP1W-DA021  | UC1, CE        |
| Analog I/O Unit          | Analog (resolution: 1/6000)              | 2                          | 1                          | CP1W-MAD11  | U, C, N, CE    |
| CompoBus/S I/O Link Unit | ---                                      | 8<br>(I/O link input bits) | 8<br>(I/O link input bits) | CP1W-SRT21  | U, C, N, L, CE |
| Temperature Sensor Unit  | 2 thermocouple inputs                    |                            |                            | CP1W-TS001  | U, C, N, L, CE |
|                          | 4 thermocouple inputs                    |                            |                            | CP1W-TS002  |                |
|                          | 2 platinum resistance thermometer inputs |                            |                            | CP1W-TS101  |                |
|                          | 4 platinum resistance thermometer inputs |                            |                            | CP1W-TS102  |                |

## Optional Products, Maintenance Products and DIN Track Accessories

| Name                                                                                                                               | Specifications                                                         | Model      | Standards |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------|-----------|
| Battery Set                                                                                                                        | For CP1L CPU Units<br>(Use batteries within two years of manufacture.) | CJ1W-BAT01 | CE        |
| DIN Track                                                                                                                          | Length: 0.5 m; Height: 7.3 mm                                          | PFP-50N    | ---       |
|                                                                                                                                    | Length: 1 m; Height: 7.3 mm                                            | PFP-100N   |           |
|                                                                                                                                    | Length: 1 m; Height: 16 mm                                             | PFP-100N2  |           |
|                                                                                                                                    | End Plate                                                              | PFP-M      |           |
| There are 2 stoppers provided with CPU Units and I/O Interface Units as standard accessories to secure the Units on the DIN Track. |                                                                        |            |           |

### Read and Understand this Catalog

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