

**EN** Instruction Manual

Thank you for purchasing the OMRON Product. To ensure the safe application of the Product, only a professional with an understanding of electricity and electric devices must handle it. Read this manual carefully before using the Product and always keep it close at hand when the Product is in use.

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For detailed operating instructions, please refer to the EJ1 Modular Temperature Controller User's Manual (Cat. No. H142) or the EJ1 Modular Temperature Controller (Gradient Temperature Control Model) User's Manual (Cat. No. H143).

**Safety Precautions**

**Key to Warning Symbols**

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or property damage. Read this manual carefully before using the product.

**Warning Symbols**

**CAUTION**

- Do not touch the terminals while power is being supplied. Doing so may occasionally result in minor injury due to electric shock.
- Use a power supply that complies with the reinforced insulation specified in IEC 60664 for the EJ1 external power supply or the power supply connected to the EJ1. If non-compliant power supplies are used, electric shock may occasionally result in minor injury.
- Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.
- Do not use the product where subject to flammable or explosive gas. Otherwise, minor injury from explosion may occasionally occur.
- Never disassemble, modify, or repair the product or touch any of the internal parts. Minor electric shock, fire, or malfunction may occasionally occur.
- Tighten the terminal screws to between 0.40 and 0.56 N·m. Loose screws may occasionally result in fire.
- Set the parameters of the product so that they are suitable for the system being controlled. If they are not suitable, unexpected operation may occasionally result in property damage or accidents.
- A malfunction in the product may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage. To maintain safety in the event of malfunction of the product, take appropriate safety measures, such as installing a monitoring device on a separate line.
- Gradient temperature control controls the average temperature for multiple channels. Therefore, if a heater burnout occurs during gradient temperature control, the temperature for that channel will drop and the temperature for the other channels will rise, which may occasionally result in property damage. During gradient temperature control, provide safety measures using information such as using the heater burnout alarm and temperature data for each channel.

**Precautions for Safe Use**

- The product is designed for indoor use only. Do not use the product outdoors or in any of the following locations.
  - Places directly subject to heat radiated from heating equipment.
  - Places subject to splashing liquid or oil atmosphere.
  - Places subject to direct sunlight.
  - Places subject to dust or corrosive gas (in particular, sulfide gas or ammonia gas).
  - Places subject to intense temperature change.
  - Places subject to vibration or strong shocks.
- Use and store the product within the rated temperature and humidity ranges. Provide forced-cooling if required.
- To allow heat to escape, do not block the area around the product. Do not block the ventilation holes on the product.
- Be sure to wire properly with correct polarity of terminals.
- Use specified size (M3, width 5.8 mm or less) crimped terminals for wiring. To connect bare wires to the terminal block, use copper braided or solid wires with a gage of AWG22 to AWG14 (equal to cross-sectional area of 0.326 to 2.081 mm<sup>2</sup>) for power supply lines and a gage of AWG28 to AWG16 (equal to cross-sectional area of 0.081 to 1.308 mm<sup>2</sup>). (The stripping length is 6 to 8 mm.) Up to two wires of same size and type, or two crimped terminals can be inserted into a single terminal.
- Do not wire terminals that do not have an identified wire.
- Allow as much space as possible between the product and devices that generate a powerful high-frequency or surge. Separate the high-voltage or large-current power lines from other lines, and avoid parallel or common wiring with the power lines when you are wiring to the terminals.
- Use the product within the rated load and power supply.
- Make sure that the rated voltage is attained within 2 seconds of turning ON the power.
- Make sure that the product has 30 minutes or more to warm up after turning ON the power before starting actual control operations to ensure the correct temperature display.
- The switch or circuit breaker must be within easy reach of the operator, and must be marked as a disconnecting means for this unit.
- Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
- Design the system (e.g., the control panel) allowing leeway for the delay required before product outputs are valid after turning ON power to the product.
- Never touch the electronic components, connectors, or patterns on product boards with your bare hands. Always hold the product by the case. Inappropriately handling the product may occasionally damage internal components due to static electricity.
- Use a switch, relay, or other device with contacts to turn OFF the power supply quickly. Gradually lowering the voltage of the power supply may result in incorrect outputs or memory errors.
- Do not touch the electronic components with your hands or subject them to shock when removing the terminal block.
- Connect only the specified number of products in only a specified configuration.
- Mount the product to a DIN Rail mounted vertically to the ground.
- Always turn OFF the power supply before wiring the product, replacing the product, or changing the product configuration.
- Attach the enclosed cover seal to the connector opening on the left end product during installation.
- Do not use port B on the End Units when using port C on Advanced Units.

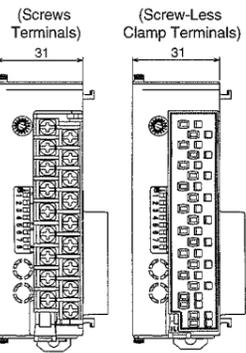
**Specifications**

Power supply voltage	24 VDC 5A (at max. DC load)
Operating voltage range	85% to 110% of the rated voltage
Power consumption	Basic Unit: TC4 5 W max. (at max. DC load) TC2 4 W max. (at max. DC load)
Indication accuracy	Thermocouple, Platinum Resistance Thermometer Input: (±0.5% of indication value or ±1°C, which is greater) ±1 digit max. Analog input: (±0.5% F/S) ±1 digit max. CT Input: (±5% F/S) ±1 digit max.
Control output	Voltage output: 12 VDC, 21 mA max. Current output: 0 to 20 mA DC, 4 to 20 mA DC load of 500 Ω max. Transistor output: 30 VDC, 100 mA max.
Auxiliary output	Transistor output: 30 VDC, 50 mA max.
Control method	ON/OFF or advanced PID
Ambient temperature	Operating: -10 to 55°C * Storage: -25 to 65°C (with no freezing or condensation) * Ambient temperature according to UL61010C-1: -10 to 40°C
Ambient humidity	Operating RH 25% to 85% Storage RH 25% to 85%
Inrush current (POWER)	Individual Unit: 15 A max.
Weight	End Unit: 70 g Basic Unit: 180 g
Degree of protection	Rear case, End Unit case: IP20 Terminal section: IP00
Installation environment	Overvoltage category II, pollution degree 2 (as per IEC 61010-1)
Altitude	2,000 m max.
Event inputs	Output current: Approx. 4 mA Contact input ON: 1 kΩ max., OFF: 100 kΩ min. No-contact input ON: Residual voltage of 1.5 V max., OFF: Leakage current of 0.1 mA max.
Max. heater current	Single-phase, 100 A (AC)
Memory protection	EEPROM (non-volatile memory) (Number of write operations: 100,000)

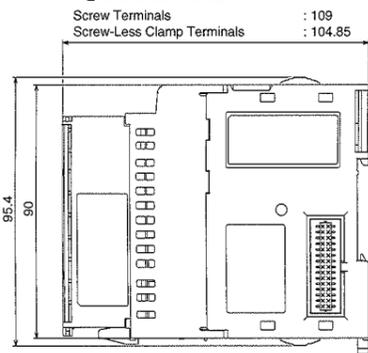
**Wiring**

**Dimensions (mm)**

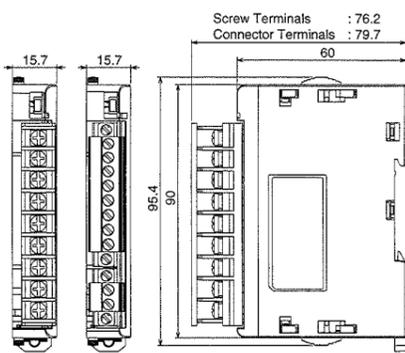
[EJ1□-TC: Basic Unit]



In the pack: Basic Unit, Instruction manual



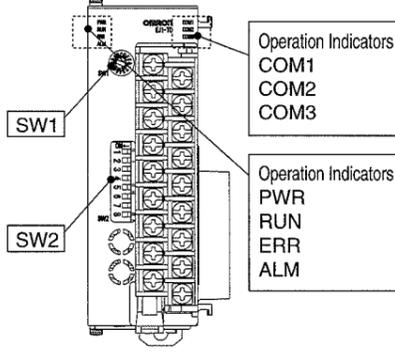
[EJ1C-EDU: End Unit]



In the pack: End Unit, Instruction manual, End Plate, Cover seal

**Display**

**Names of Parts on Front Panel**



**Operation Indicators**

Indicator	Description
PWR (green)	Lit when power is supplied.
RUN (green)	Lit during operation.
ERR (red)	Flashes or lights when an error occurs.
ALM (red)	Lights when an alarm occurs.
COM1 (orange)	Flashes during communications on End Unit port A.
COM2 (orange)	Flashes during communications on End Unit port B.
COM3 (orange)	Flashes during communications with the G3ZA.

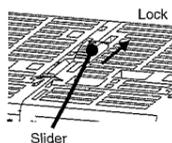
\* Functions only on Modular Temperature Control Models (EJ1N).

**Installation**

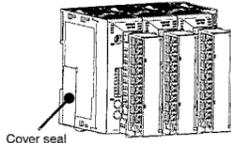
**Connecting Units**

- Align the connector and connect the Units to each other. Connect and End Unit to the Unit on the right end. (Up to 16 Units can be connected side by side.)

- Slide the yellow sliders on the tops and bottoms of the Units until they click into place.

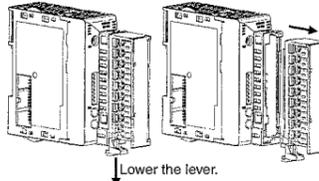


- Attach the cover seal to the connector on the Unit on the left end.



**Removing the Terminal Block**

- Press down the terminal block levers.
- Pull out the terminal block.



**Precautions for Correct Use**

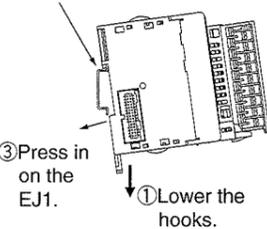
- Do not connect an End Unit directly to an Advanced Unit.
- Always connect an End Unit to the right side of a Basic Unit.
- This Unit cannot be connected to the CJ1 Series.
- Use the EJ1G-□□ in the configuration when performing gradient temperature control, and use the EJ1N-□□ when not performing gradient temperature control.
- When removing the terminal block and replacing the Unit, make sure that the new Unit matches the original Unit.

**Mounting to the DIN Rail**

**<Mounting>**

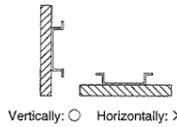
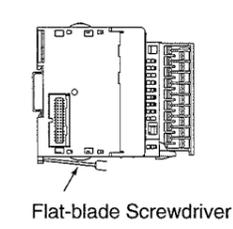
Insert the hooks on the top of the EJ1 into the DIN Rail and press the EJ1 until the hooks lock into place.

- Insert the upper hooks into the DIN Rail.



**<Dismounting>**

Pull down on the hooks with a flat-blade screwdriver and lift up on the EJ1.



Install the DIN Rail vertically to the ground.

Applicable DIN Rail (sold separately): PFP-100N (100 cm), PFP-50N (50 cm)

Mount one End Plate to each side of the EJ1 (PFP-M End Plates are included with the End Unit).

To mount an End Plate, hook the bottom of the End Plate on the bottom of the DIN Rail ⑤, place the top of the End Plate on the DIN Rail ⑥, and then pull down on the End Plate. Tighten the screw on the End Plate to secure it.

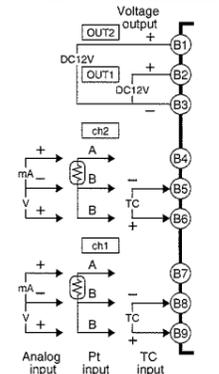
**Setting SW2**

SW2	SW1
OFF	OFF
ON	OFF
OFF	ON
ON	ON

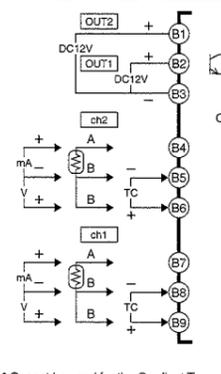
SW2	Description
3 to 6	Not used (OFF).
7	Set to ON when using the G3ZA.
8	Used when using an Advanced Unit and distributed installation. (Refer to the User's Manual for details.)

**Connections**

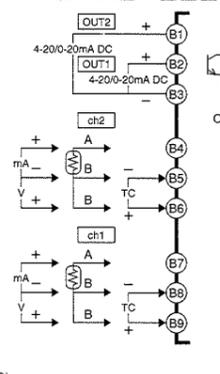
**EJ1□-TC4□-□□□□**



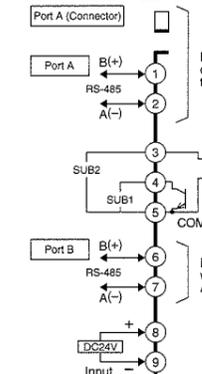
**EJ1□-TC2□-Q□□□**



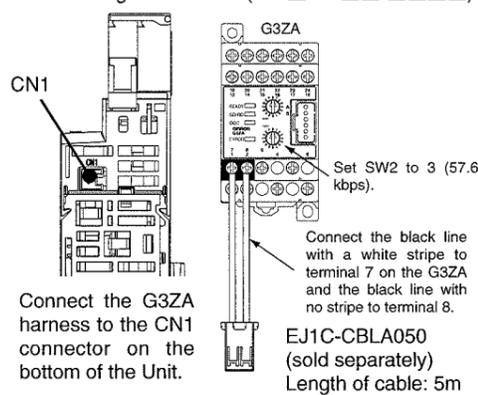
**EJ1□-TC2□-C□□□**



**EJ1C-EDUA-□FLK**

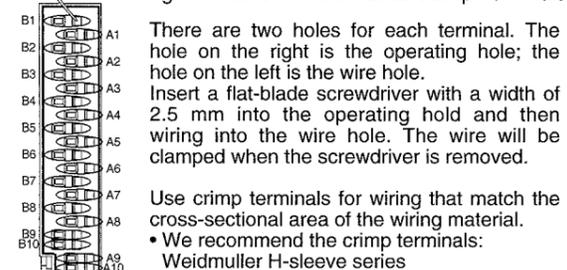


**Connecting to the G3ZA (EJ1□-TC□□-□□□□)**



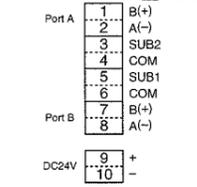
- Terminals A10 and B10 of the screw-less clamp terminals are not used.
- Port A (Connector) is used only to connect the Temperature Controller to a computer when using the Setup Tool. E58-CIFQ1 USB-Serial Conversion Cable is required for the connection. (Do not use the product with the Cable left permanently connected.) Refer to the Instruction Manual provided with the USB-Serial Conversion Cable for details on connection methods.
- When wiring a voltage input, be sure to connect the correct terminals. Incorrect wiring may cause EJ1 failure.

**Wiring Procedure for Screw-Less Clamp Terminals**



- To Conform to UL/CSA Standards: The power supply terminals must be supplied from a SELV, limited-current source. A SELV (safety extra-low voltage) source is a power supply having double or reinforced insulation between the primary and the secondary circuits and having an output voltage of 30 V r.m.s. max. and 42.4 V peak max. or 60 VDC max.
- Functional insulation is provided between the power supply, input, output, and power supply terminals. If reinforced or double insulation is required, use a power supply that complies with the reinforced or double insulation standards specified in IEC 60664 for the EJ1 external power supply and for the power supply connected to the EJ1.

**EJ1C-EDUC-□FLK**



**Suitability for Use**

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product. Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product. NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also product catalog for Warranty and Limitation of Liability.

**OMRON ELECTRONICS LLC**  
One Commerce Drive Schaumburg, IL 60173-5302 U.S.A.  
Phone 1-847-843-7900  
Telephone Consultation 1-800-55-OMRON  
FAX 1-847-843-7787

**OMRON EUROPE B.V.**  
Wegalaan 67-69 P.O. BOX 13 2130 AA Hoofddorp The Netherlands  
Phone 31-23-56-81-300  
FAX 31-23-56-81-388

**OMRON ASIA PACIFIC PTE LTD**  
83 Clemenceau Avenue, #11-01 UE Square, Singapore 239920  
Phone 65-6-835-3011  
FAX 65-6-835-2711

