

E5CC-B OMRON

Digital Controller

EN INSTRUCTION MANUAL

Thank you for purchasing the OMRON E5CC Digital Controller. This manual describes the functions, performance, and application methods needed for optimum use of the product. Please observe the following items when using the product.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
- Before using the product, thoroughly read and understand this manual to ensure correct use.
- Keep this manual in a safe location so that it is available for reference whenever required.

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検査合格
裏面は日本語です
検算員: 〇〇
品質管理課
作成済が います。

Refer to the *E5-C Digital Controllers User's Manual* (Cat. No. H174) for detailed application procedures.

CC-B21 3686270-4C (Side-A)

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 Minor injury due to electric shock may occasionally occur. Do not touch the terminals while power is being supplied.

Electric shock, fire, or malfunction may occasionally occur. Do not allow metal objects, conductors, cuttings from installation work, moisture, or other foreign matter to enter the Digital Controller, the Setup Tool ports, or between the pins on the connectors on the Setup Tool cable. Attach the cover to the front-panel Setup Tool port whenever you are not using it to prevent foreign objects from entering the port.

Minor injury from explosion may occasionally occur. Do not use the product where subject to flammable or explosive gases.

Fire may occasionally occur. Do not allow dirt or other foreign objects to enter a Setup Tool port, or between the pins on the connectors on the Setup Tool cable.

Minor electric shock, fire, or malfunction may occasionally occur. Never disassemble, modify, or repair the product or touch any of the internal parts.

CAUTION - Risk of Fire and Electric Shock

- (a) This product is UL listed as Open Type Process Control Equipment. It must be mounted in an enclosure that does not allow fire to escape externally.
- (b) More than one disconnect switch may be required to de-energize the equipment before servicing.
- (c) Signal inputs are SELV, limited energy.
- (d) Caution: To reduce the risk of fire or electric shock, do not interconnect the outputs of different Class 2 circuits.
- (e) E5CC-U, E5CC products: Use wires with heat resistance of 65°C min to wire the terminals because the maximum terminal temperature is 65°C. Other models of products: Use wires with heat resistance of 75°C min to wire the terminals because the maximum terminal temperature is 75°C.

If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.

If you replace only the Main Unit of the E5DC or E5DC-B, check the condition of the Terminal Unit.
If corroded terminals are used, contact failure in the terminals may cause the temperature inside the Digital Controller to increase, possibly resulting in fire. If the terminals are corroded, replace the Terminal Unit as well.

Loose screws may occasionally result in fire. Tighten the terminal screws to the specified torque of 0.43 to 0.58 N·m.*1

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 Digital Controller may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage. To maintain safety in the event of malfunction of the Digital Controller, take appropriate safety measures, such as installing a monitoring device on a separate line.

*1 The specified torque is 0.5 N·m for the E5CC-U.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product.

At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient to make a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT 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(S) IS/ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Precautions for Safe Use

- Be sure to observe the following precautions to prevent operation failure, malfunction, or adverse effects on the performance and functions of the product. Not doing so may occasionally result in unexpected events.
- Use the product within specifications.
- (1) The product is designed for indoor use only. Do not use the product outdoors. Do not use or store the product 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 gases (in particular, sulfide gas and ammonia gas).
 - Places subject to intense temperature change.
 - Places subject to icing and condensation.
 - Places subject to vibration and large shocks.
 - (2) Use and store the product within the rated ambient temperature and humidity range. When multiple Digital Controllers are mounted in close contact or stacked vertically, heat generated by the controllers can cause the internal temperature of each unit to rise, which may shorten their service life. In such cases, provide forced cooling, for example by directing airflow from a fan toward the controllers.
 - (3) To allow heat to escape, do not block the area around the product. Do not block the ventilation holes on the product.
 - (4) Be sure to wire properly with correct polarity of terminals.
 - (5) To connect bare wires, use copper stranded or solid wires.

Model	Recommended wires	Stripping length
E5CC, E5EC, E5AC, E5DC, or E5GC (models with screw terminal blocks)	AWG24 to AWG18 (0.21 to 0.82 mm ²) Copper stranded or solid wires	6 to 8 mm
E5GC (models with screwless clamp terminal blocks)	AWG24 to AWG14 (0.21 to 2.08 mm ²) Copper stranded or solid wires	8 to 12 mm
E5CC-U (plug-in models)	AWG24 to AWG14 (0.21 to 2.08 mm ²) Copper stranded or solid wires	5 to 6 mm
E5C-C-B (models with Push-In Plus terminal blocks)*1	0.25 to 1.5 mm ² (equivalent to AWG24 to AWG16) Copper stranded or solid wires	With ferrules: 10 mm Without ferrules: 8 mm

*1 Use Ferrules with UL certification (R/C).

Connect only one wire to each terminal.
Use the specified size of crimped terminals to wire the E5CC, E5EC, E5AC, E5DC, and E5GC (models with screw terminal blocks) as well as the E5CC-U (plug-in models).

Crimp Terminal Sizes	Model	Crimp terminal size
	E5CC, E5EC, E5AC, E5DC, or E5GC (models with screw terminal blocks)	M3, Width: 5.8 mm max.
	E5CC-U (plug-in models)	M3.5, Width: 7.2 mm max.

- E5C-C-B (models with Push-In Plus terminal blocks) Do not insert multiple wires into a single terminal (insertion) hole.
- E5C-C (models with screw terminals) You can connect up to two wires of the same size and type to a single terminal. You can also connect up to two crimp terminals.
- E5GC (models with screwless clamp terminal blocks) When connecting two wires to a single terminal, be sure to use ferrules (twin ferrules). *1 Select ferrules that meet the following specifications:
 - Outer diameter: 0.8 to 1.4 mm
 - Length of exposed conductive part: 8 to 12 mm
 - Must be a double crimp (twin) type*1 The E5GC (models with screwless clamp terminal blocks) has been UL tested with a single stranded wire connected.
- (6) Do not wire the terminals that are not used.
- (7) To prevent inductive noise, keep the wiring of the Digital Controller separate from high-voltage or high-current power lines. Do not run the controller wiring parallel to or in the same conduit as power lines. Effective measures include using separate conduits or ducts and using shielded cables. Install surge absorbers or noise filters on nearby equipment that generates noise, especially devices with inductive components such as motors, transformers, solenoids, and magnetic coils. When using a noise filter on the power supply, check the voltage and current ratings, and install the filter as close to the Digital Controller as possible. Also, keep the controller as far as possible from equipment that generates strong high-frequency signals (such as high-frequency welders or sewing machines) or equipment that produces surges.
- (8) Use the product within the rated power supply voltage and load.
- (9) Make sure that the rated voltage is attained within two seconds of turning ON the power using a switch or relay contact. If the voltage is applied gradually, the power may not be reset or other malfunctions may occur.
- (10) Make sure that the Digital Controller has 30 minutes or more to warm up after turning ON the power before starting actual control operations to ensure the correct temperature display.
- (11) When executing self-tuning, turn on the power for both the load and the Digital Controller simultaneously, or turn on the load power before the controller power. If you turn on the controller power first and then the load power, proper self-tuning and optimal control cannot be achieved.
- (12) A switch or circuit breaker should be provided close to this unit. The switch or circuit breaker should be within easy reach of the operator, and must be marked as a disconnecting means for the Digital Controller.
- (13) Wipe off any dirt from the Digital Controller with a soft dry cloth. Never use thinners, benzine, alcohol, or any cleaners that contain these or other organic solvents. Deformation or discoloration may occur.
- (14) Design the system (control panel, etc.) considering a 2-second delay before the controller's output is set after power ON.
- (15) The output will turn OFF when you move to the Initial Setting Level. Take this into consideration when performing control.
- (16) The number of non-volatile memory write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
- (17) Always touch a grounded piece of metal before touching the Digital Controller to discharge static electricity from your body.
- (18) Use suitable tools when taking the Digital Controller apart for disposal. Sharp parts inside the Digital Controller may cause injury.
- (19) For compliance with Lloyd's standards, the E5CC, E5CC-U, E5CC-B, E5EC, E5EC-B, E5AC, and E5GC must be installed under the conditions that are specified in Shipping Standards.
- (20) On models with two Setup Tool ports (E5EC, E5EC-B, E5AC, E5DC, E5DC-B, and E5GC), do not connect cables to both ports at the same time. The Digital Controller may be damaged or may malfunction.
- (21) Do not exceed the communications distance that is given in the specifications and use the specified communications cable.
- (22) Do not turn the power supply to the Digital Controller ON or OFF while the USB-Serial Conversion Cable is connected. The Digital Controller may malfunction.
- (23) Do not bend the communications cables past their natural bending radius. Do not pull on the communications cables.
- (24) For the E5DC and E5DC-B, when you attach the Main Unit to the Terminal Unit, make sure that the hooks on the Main Unit are securely inserted into the Terminal Unit.
- (25) For the E5CC-U, when you attach the Main Unit to the socket, make sure that the hooks on the socket are securely inserted into the Main Unit.
- (26) Install the DIN Track vertically to the ground.
- (27) For the E5DC and E5DC-B, always turn OFF the power supply before connecting the Main Unit to or disconnecting the Main Unit from the Terminal Unit, and never touch or apply shock to the terminals or electronic components. When connecting or disconnecting the Main Unit, do not allow the electronic components to touch the case.
- (28) Observe the following precautions when you remove the terminal block or pull out (draw out) the interior of the E5GC.
 - Turn OFF the power supply before you start and never touch or apply shock to the terminals or electric components. When you insert the interior body of the Digital Controller, do not allow the electronic components to touch the case.
 - Check for any corrosion on the terminals.
 - When you insert the interior body into the rear case, confirm that the hooks on the top and bottom are securely engaged with the case.
 - Do not wire anything to the release holes.
 - Do not tilt or twist a flat-blade screwdriver while it is inserted into a release hole on the terminal block. The terminal block may be damaged.
 - Insert a flat-blade screwdriver into the release holes at an angle. The terminal block may be damaged if you insert the screwdriver straight in.
 - Do not allow the flat-blade screwdriver to fall out while it is inserted into a release hole.
 - Do not bend a wire past its natural bending radius or pull on it with excessive force. Doing so may cause the wire to break.
 - Do not perform crossover wiring except for the input power supply and communications. (E5CC-B/E5EC-B only)
 - Do not perform crossover wiring. (E5DC only)
- (30) Use a commercial power supply for the power supply voltage input to a Digital Temperature Controller with AC input specifications. Do not use the output from an inverter as the power supply. Depending on the output characteristics of the inverter, temperature increases in the Digital Temperature Controller may cause smoke or fire damage even if the inverter has a specified output frequency of 50/60 Hz.
- (31) Do not use the product if the front sheet is peeled off. The front sheet is a structural part of the product and is different from the protective film. The protective film is intended to prevent scratches during transportation. Remove the protective film before using the product.

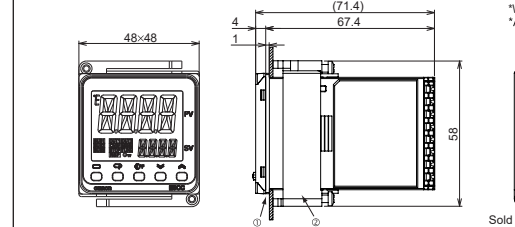
Specifications

Power supply voltage	100 to 240 VAC, 50/60 Hz or 24 VDC, 50/60 Hz / 24 VDC
Operating voltage range	85 to 110% of the rated voltage
Power consumption	
Output 000:	5.2 VA max. (100 to 240 VAC) 3.1 VA max. (24 VAC)/1.6 W max. (24 VDC) 6.5 VA max. (100 to 240 VAC) 4.1 VA max. (24 VAC)/2.3 W max. (24 VDC)
All other specifications:	Thermocouple: ±0.3 % of indication value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer: ±0.2 % of indication value or ±0.8°C, whichever is greater) ±1 digit max. Analog input: ±0.2 % FS ±1 digit max. Output current: approx. 7 mA per contact. ON: 1 kΩ max., OFF: 100 kΩ min. ON: residual voltage 1.5 V max., OFF: leakage current 0.1 mA max. Relay output: SPST-NO 250VAC, 3A(resistive load) Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC ±20%, 21 mA ON/OFF or 2-PID control Relay outputs: SPST-NO, 250 VAC, 2 A (resistive load) Electrical life of relay: 100,000 operations 4 to 20 mA DC with load of 500 Ω max. 1 to 5 VDC with load of 1 kΩ min. -10 to 55°C (Avoid freezing or condensation) -25 to 65°C (Avoid freezing or condensation) Max. 2,000m T2A, 250 VAC, time-lag, low-breaking capacity Approx. 120 g (Digital Controller only) Front panel: IP66 Rear case: IP20, Terminal section: IP00 Overvoltage category II, pollution degree 2 (as per IEC61010-1)
Control method	ON/OFF or 2-PID control
Auxiliary outputs	Relay outputs: SPST-NO, 250 VAC, 2 A (resistive load) Electrical life of relay: 100,000 operations 4 to 20 mA DC with load of 500 Ω max. 1 to 5 VDC with load of 1 kΩ min. -10 to 55°C (Avoid freezing or condensation) -25 to 65°C (Avoid freezing or condensation) Max. 2,000m T2A, 250 VAC, time-lag, low-breaking capacity Approx. 120 g (Digital Controller only) Front panel: IP66 Rear case: IP20, Terminal section: IP00 Overvoltage category II, pollution degree 2 (as per IEC61010-1)
Transfer output	
Ambient temperature	
Ambient humidity	
Storage temperature	
Altitude	
Recommended fuse	
Weight	
Degree of protection	
Installation environment	
Memory protection	
Temporary overvoltage	

Wiring

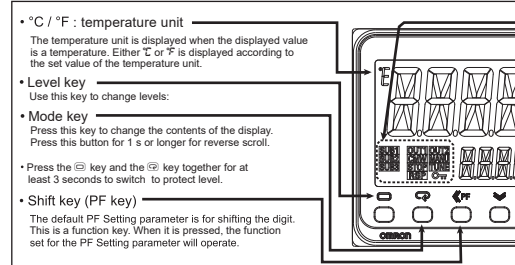
● Dimensions

Dimensions (mm)



* Do not remove the terminal block. Doing so may result in failure or malfunction.
* A Setup Tool port is provided on the upper of the product. Use this port to connect a personal computer to the product when using the Setup Tool. E5C-CIF22 USB-Serial Conversion Cable is required to connect the personal computer to the product. (Do not use the product with the USB-Serial Conversion Cable left permanently connected.)
* Refer to the instruction manual provided with the USB-Serial Conversion Cable for details on connection methods.

● Names of Parts on Front Panel



Operation Menu

● Input Type

	Input type	Input	Setting	Setting range	
Temperature inputs	Platinum resistance thermometer	PT100	0	-200 to 850 -199.9 to 500.0	
			1	-199.9 to 500.0 -199.9 to 900.0	
			2	0.0 to 100.0 0.0 to 210.0	
			3	-199.9 to 500.0 -199.9 to 900.0	
	Thermocouple	K	4	0.0 to 100.0 0.0 to 210.0	
			5	-200 to 1300 -300 to 2300	
			6	-20.0 to 500.0 0.0 to 900.0	
			J	7	-100 to 850 100 to 1500
			8	-20.0 to 400.0 -300 to 700	
			T	9	-200 to 400 -300 to 700
			10	-199.9 to 400.0 -199.9 to 700.0	
			E	11	-200 to 850 -300 to 1100
	Infrared Thermosensors ES1B		12	-100 to 850 -300 to 1500	
			U	13	-200 to 400 -300 to 700
			14	-199.9 to 400.0 -199.9 to 700.0	
			N	15	-200 to 1300 -300 to 2300
16			0 to 1700 0 to 3000		
S			17	0 to 1700 0 to 3000	
B			18	100 to 1800 300 to 3200	
W			19	0 to 2300 0 to 3200	
Analog input type	Current input	PL	20	0 to 1700 0 to 3000	
		10 to 70 °C	21	0 to 90 0 to 190	
		80 to 120 °C	22	0 to 120 0 to 240	
		115 to 165 °C	23	0 to 165 0 to 320	
		140 to 200 °C	24	0 to 260 0 to 500	
		4 to 20 mA	25		
		0 to 20 mA	26	Use the following ranges for scaling: -1999 to 9999, -199.9 to 999.9, -19.99 to 99.99, -1.999 to 9.999	
		1 to 5 V	27		
Voltage input		0 to 3 V	28		
		0 to 10 V	29		

*The default is "5".
*S.E.P.P. will be displayed when a platinum resistance thermometer is mistakenly connected while input type is not set for it. To clear the S.E.P.P. display, correct the wiring and cycle the power supply.

● Alarms (Alarms are output from auxiliary outputs.)

Setting	Alarm type	Alarm output function
0	No alarm function	Output off
1	Deviation upper/lower limit	ON: "L", "H" values OFF: "L", "H" values
2	Deviation upper limit	ON: "L" value OFF: "L" value
3	Deviation lower limit	ON: "H" value OFF: "H" value
4	Deviation upper/lower range	ON: "L", "H" values OFF: "L", "H" values
5	Deviation upper/lower limit standby sequence ON	ON: "L", "H" values OFF: "L", "H" values
6	Deviation upper limit standby sequence ON	ON: "L" value OFF: "L" value
7	Deviation lower limit standby sequence ON	ON: "H" value OFF: "H" value
8	Absolute value upper limit	ON: "L" value OFF: "L" value
9	Absolute value lower limit	ON: "H" value OFF: "H" value
10	Absolute value upper limit standby sequence ON	ON: "L" value OFF: "L" value
11	Absolute value lower limit standby sequence ON	ON: "H" value OFF: "H" value
12	LBA (only for alarm 1)	ON: "L" value OFF: "L" value
13	PV Change Rate Alarm	ON: "L" value OFF: "L" value
14	SP absolute value upper limit	ON: "L" value OFF: "L" value
15	SP absolute value lower limit	ON: "H" value OFF: "H" value
16	MV absolute value upper limit	ON: "L" value OFF: "L" value
17	MV absolute value lower limit	ON: "H" value OFF: "H" value

*1: Upper and lower limits can be set for parameters 1, 4 and 5 to provide for different types of alarm.
• The default alarm type is "2".

● Conformance to EN/IEC Standards

This is a class A product.
In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가전규제지역에서 사용하는 것을 목적으로 합니다.

● Conformance to Safety Standard

Reinforced insulation is provided between input power supply, relay outputs, and between terminals.

Due to UL Listing requirements, use the E54-CT1L or E54-CT3L current transformer with the factory wiring (internal wiring).
Use a UL category X0BA or X0BA7 current transformer that is UL listed for field wiring (external wiring) and not the factory wiring (internal wiring).

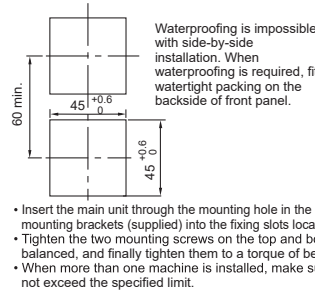
Always externally connect the recommended fuse that is specified in the Instruction Manual before you use the Digital Controller.

Analogue Input
• If you input an analogue voltage or current, set the Input Parameter to the correct input type.
• Do not use the Digital Controller to measure a circuit with Measurement Category I, II, or IV.
• Do not use the Digital Controller to measure an energized circuit to which a voltage that exceeds 30 Vrms or 60 VDC is applied.

The protection provided by the Digital Controller may be impaired if the Digital Controller is used in a manner that is not specified by the manufacturer.

● Installation

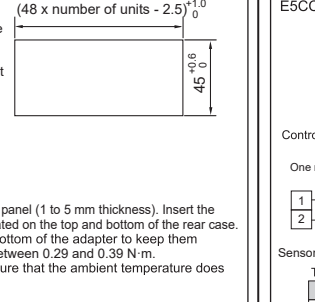
Individual mounting (mm)



Waterproofing is possible with side-by-side installation. When waterproofing is required, fit waterproofing packing on the backside of front panel.

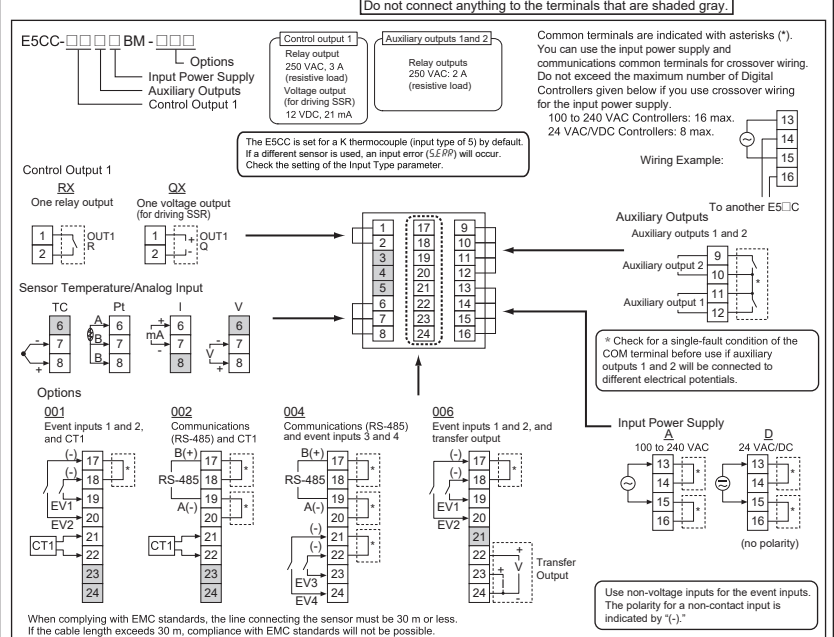
- Insert the main unit through the mounting hole in the panel (1 to 5 mm thickness). Insert the mounting brackets (supplied) into the fixing slots located on the top and bottom of the rear case.
- Tighten the two mounting screws on the top and bottom of the adapter to keep them balanced, and finally tighten them to a torque of between 0.29 and 0.39 N·m.
- When more than one machine is installed, make sure that the ambient temperature does not exceed the specified limit.

Side-by-side mounting (mm)

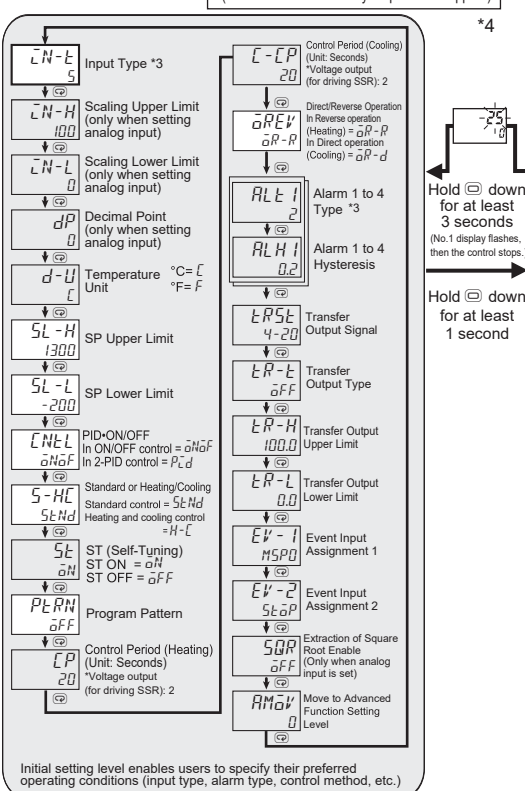


- CMW: Communications writing enabled/disabled indicator
LI when communications writing is enabled and not lit when it is disabled.
- Ott: Protection indicator
LI when "Run/Stop" is stopped during operation.
LI when the Auto/Manual Mode is set to Manual Mode.
- MANU: Manual output indicator
LI when the Auto/Manual Mode is set to Manual Mode.

● Connections (The applicability of the electric terminals varies with the type of machine.)



● Initial Setting Level



*3: Refer to the adjoining tables for details of input types and alarm types.
*4: Operation is stopped when moved to the initial setting level.
(Both control and auxiliary outputs are stopped.)

*5: The grayed-out setting items are not displayed for some models and some settings of other setting items.

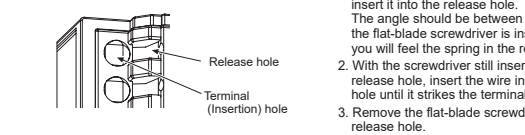
Typical example: The parameters are not displayed under the following conditions.
• SP Ramp Set Value: Not displayed if ST is set to ON.
• Alarm 1 Type: The default settings of the models that equipped with HBHS alarms. Can be displayed for a Controller with heater burnout and SSR failure detection if alarm 1 (default setting) is set for the Auxiliary Output 1 Assignment (Advanced Function Setting Level). Refer to the *E5-C Digital Controllers User's Manual* (Cat. No. H174) for the setting method.

*6: The four numeric digits of the product code are displayed in the No. 2 display. The setting cannot be changed and there is nothing that you need to set.

Precautions for Correct Use

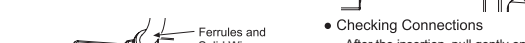
1. Connecting Wires to Push-In Plus Terminal Block

● Part Names of the Terminal Block



● Connecting Wires with Ferrules and Solid Wires

Insert the solid wire or ferrule straight into the terminal block until the end strikes the terminal block.

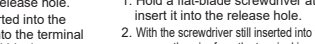


If a wire is difficult to connect because it is too thin, use a flat-blade screwdriver in the same way as when connecting stranded wire.

2. Removing Wires from Push-In Plus Terminal Block

● Recommended Flat-Blade Screwdriver

Use the following procedure to remove wires from the terminal block.
1. Hold a flat-blade screwdriver at an angle and insert it into the release hole.
2. With the screwdriver still inserted into the release hole, insert the wire into the terminal hole until it strikes the terminal block.
3. Remove the flat-blade screwdriver from the release hole.



After the insertion, pull gently on the wire to make sure that it will not come off and the wire is securely fastened to the terminal block.
To prevent short circuits, insert the stripped part of a stranded or solid wire or the conductive part of a ferrule until it is hidden inside the terminal insertion hole. (See the following diagram.)

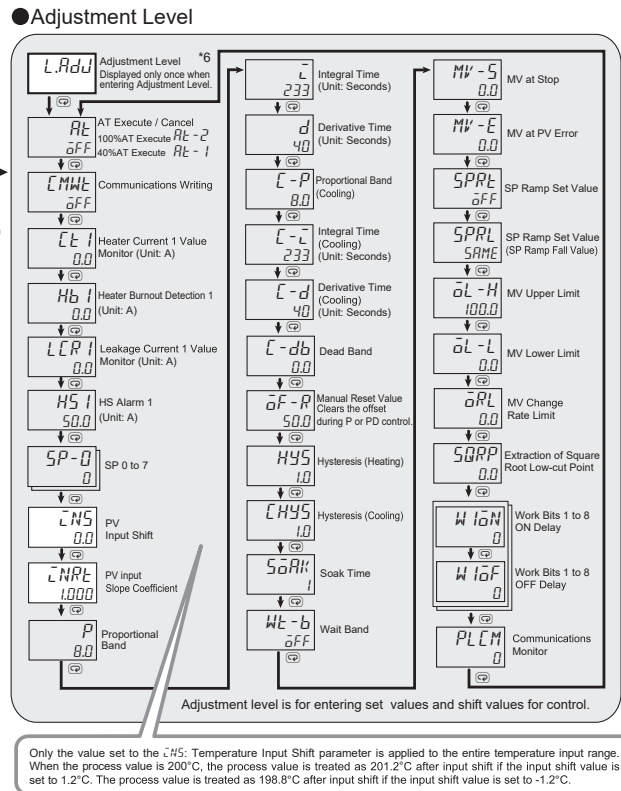


Checking Connections
• After the insertion, pull gently on the wire to make sure that it will not come off and the wire is securely fastened to the terminal block.
To prevent short circuits, insert the stripped part of a stranded or solid wire or the conductive part of a ferrule until it is hidden inside the terminal insertion hole. (See the following diagram.)



Recommended Flat-Blade Screwdriver
Use the following flat-blade screwdriver to connect and remove wires.
Use the following flat-blade screwdriver to connect and remove wires.
Model: XW42-00B Manufacturer: Omron

● Adjustment Level



Only the value set to the '15: Temperature Input Shift parameter' is applied to the entire temperature input range. When the process value is 200°C, the process value is treated as 201.2°C after input shift if the input shift value is set to 1.2°C. The process value is treated as 198.8°C after input shift if the input shift value is set to -1.2°C.

● Other functions

Refer to the *E5-C Digital Controllers User's Manual* (Cat. No. H174) for information on the Advanced Function Setting Level, Manual Control Level, and other functions.
Refer to the *E5-C Digital Controllers Communications Manual* (Cat. No. H175) for information on communications.

● Error Display (troubleshooting)

When an error has occurred, the No.1 display shows the error code. Take necessary measure according to

OMRON

E5CC-B

数字式控制器

CHN

使用说明书

感谢您购买欧姆龙E5CC数字式控制器。本说明书描述了产品的功能、性能以及使产品达到最佳使用效果的应用方法。

请在使用该产品时注意以下事项：

· 使用该产品的人必须具备足够的电气系统知识。

· 在使用该产品前应通读并理解本说明书以确保正确的使用。

· 妥善保管该说明书以确保在需要时可以随时查阅。

欧姆龙公司

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有关详细的应用步骤，请参阅《E5□C数字式控制器用户手册》(Cat. No. H180)。

安全注意事项

警告符号的要害

警告

表示潜在的危险情况，如不加以防止，很可能导致轻度或中度的人身伤害或财产损失。

在使用该产品前应仔细阅读读本手册。

警告符号

警告

通电期间，请勿触摸端子。否则会导致触电而导致轻伤。

可能会偶尔发生轻微的触电、起火或设备故障。请务必防止金属物体、导线、安装过程中产生的切屑或水分等进入产品内部。设置工具端口内部，或设置工具电缆连接器的引脚之间。

在未使用前设置工具端口时，请务必盖好端口盖，以防止上述异物进入。

请勿将该产品用于有易燃易爆气体的场合。否则有可能因为爆炸而造成轻度伤害。

请确保产品主体的设置工具端口内以及电缆连接器的插针间无积灰等，否则偶尔会引发火灾。

绝对不要拆卸、改装以及修理该产品或接触任何内部元件。否则会导致轻微触电、火灾或机器故障。

注意

· 火灾或触电的危险

a) 该产品为UL认证的开放型过程控制设备，必须安装在能够防止火花进出的机壳旁。

b) 在使用两个以上断电开关的情况下，维修前请先断开所有开关，保持本产品处于断电状态。

c) 信号输入为SELV(安全低电压电源)，回路受限。

d) 注意：为了减少火灾或触电的危险，请勿在内部连接不同 Class 2 回路的输出。

e) E5CC-U、E5GC产品:最高端子温度为65℃，接线请使用耐热温度65℃以上的电线。

其他型号产品:最高端子温度为75℃，接线请使用耐热温度75℃以上的电线。

如果输出继电器超过了预期的使用寿命，有时会发生触点熔化或燃烧。请务必注意输出继电器的应用环境，并在额定负载及预期寿命以内使用。输出继电器的预期寿命会随着输出负载以及开关条件的变化而变化。

E5DC/E5DC-B仅更换单元时，请确认端子单元的状态。若端子金属片已经腐蚀的状态下仍在被使用，可能因接触不良造成数字式控制器内部温度上升，从而导致起火。此时请一并更换端子单元。

松动的螺丝可能导致火灾。请以0.43~0.58N·m的扭矩拧紧螺丝。*1

请设定适合系统控制用的产品参数。如果设定不当，可能会因意外操作而造成财产损失或事故。

控制器误动作很可能造成控制器操作失效或阻止报警输出，导致财产损失。为了在控制器发生误动作时确保安全，应采取适当的安全措施，如使用单独的线路安装监控设备。

*1 E5CC-U为0.5 N·m。

承诺事项

欧姆龙对于用于用途范围内的产品组合、或产品适用规格、规范或规则的遵守状况概不负责。 如果用户需要，欧姆龙可提供适用于产品的额定值或特定使用限制的正规第三方认证文件。 仅凭此信息，不足以对最终产品、机器、系统、或其他利用或使用相关产品的适用性作出全面判断。 用户对于自身的利用、产品或系统相关特性产品适用性的判断应自行负责。 用户应对所有用途相关事宜自行负责。

在未确认系统整体是否具备应对此类风险的设计、欧姆龙产品是否具备正确的额定值、设备整体或系统整体中的安装设计能否发挥计划使用效果前，请勿在有可能对生命或财产带来严重风险的状态下使用，或大量使用本产品。

安全使用注意事项

请务必遵守以下注意事项，以避免操作失、误动作或对产品特性及功能造成不良影响。 否则，可能会导致意外事故。请在指定范围内使用本产品。

(1) 该产品只被设计为室内使用。请勿在室外使用。不要在以下任何地方使用或存放该产品。

· 直接受加热设备热辐射的地方。

· 有液体或油气飞溅的地方。

· 阳光直射的地方。

· 灰尘较多或有腐蚀性气体（特别是硫化物气体和氨气）的地方。

· 温度剧烈变化的地方。

· 结冰和结露的地方。

· 有震动或大的冲击的地方。

(2) 请在额定的环境温度 and 湿度范围内使用和存放本产品。当多个数字式控制器紧密安装或上下堆叠安装时，由于设备自身发热，可能导致控制器内部温度升高，从而缩短使用寿命。在此类情况下，请采取强制冷却措施，例如使用风扇向数字式控制器送风。

(3) 为利于散热，不要填塞该产品周围的空间。不要堵塞产品的通风孔。

(4) 请确认端子的信号名和极性并进行正确的接线。

(5) 裸线连接用的接线材料，请使用铜制的绞合线或单股线。为防止接线材料冒烟、起火，请在确认电线的额定值之后，使用下表的接线材料。

推荐电线

型号

推荐电线

剥线长度

E5CC/E5EC/ESAC/E5DC/E5GC(螺丝端子台型)

AWG24-18(0.21~0.82mm²)

6~8mm

E5GC(无螺钉夹端子台型)

铜制的绞合线或单股线

8~12mm

E5CC-U(插入型)

AWG24-14(0.21~2.08mm²)

5~6mm

E5□C-B(Push-In Plus 端子台型)*1

0.25~1.5mm²(相当于AWG 24~16) 铜制的绞合线或单股线

使用端子时:10mm
不使用端子时:8mm

*1 棒端子请使用UL认证 (R/C) 产品。

1个端子最多连接1根电线。

E5CC/E5EC/ESAC/E5DC/E5GC(螺丝端子台型) 和E5CC-U (插入型) 的接线用压接端子，请使用指定规格的端子。

压接端子规格

型号

压接端子规格

E5CC/E5EC/ESAC/E5DC/E5GC(螺丝端子台型)

M3. 宽度小于5.8mm

E5CC-U(插入型)

M3.5. 宽度小于7.2mm

接线

尺寸规格

尺寸 (mm)

48±0.8

4

1

67.4

67.4

68

在包装内含有：

· 主单元、使用说明书

· 防水密封盖 (Y92S-P8) : ①

· 防水帽 (Y92F-49) : ②

另售件

· USB串行转换电缆 (E5B-CIFQ2)

* 请勿拆下接线板。否则，会导致故障或误动作。

* 产品的上部备有调试工具端口。当需要使用调试工具时，可通过该端口将个人计算机与本产品相连。连接个人计算机与产品需要E5B-CIFQ2 USB串行转换电缆。（使用该产品时不可一直连接USB串行转换电缆。）

详细的连接方法，请参阅USB串行转换电缆附带的使用说明书。

前面板的元件名称

· °C/°F：温度单位

当显示内容变为温度时显示温度单位。根据温度单位的设定值显示 °C 或 °F。

菜单键

使用该键切换菜单。

模式键

按此键改变显示内容。

按此按钮1秒以上反方向显示内容。

同时按住回键和键至少3秒来切换至保护菜单。

移位键 (PF键)

PF设置参数时设定为使数位移位。此键为功能键。当按下此键，为PF设定参数设定的功能将生效。

第一显示

过程值或设定数据类型

第二显示

设定值、设定数据输出值或更改的输入值

向上和向下键

每按一次向下键，第二显示上的值将增大或显示下一个值。

每按一次回键，第二显示上的值将减小或返回上一个值。

操作菜单

输入类型

输入类型

输入

设定

设定范围

铂电阻温度计

PI100

0

-200~850

-300~1500

热电阻

K

3

-199.9~900.0

-199.9~900.0

JPT100

4

0.0~100.0

0.0~210.0

J

7

-199.9~500.0

-199.9~900.0

T

8

0.0~100.0

0.0~210.0

E

11

-200~500.0

0.0~900.0

J

6

-100~850

-100~1500

T

8

-20.0~400.0

0.0~750.0

L

12

-200~400

-300~700

U

14

-199.9~400.0

-199.9~700.0

N

15

-200~1300

-300~2300

R

16

0~1700

0~3000

S

17

0~1700

0~3000

B

18

100~1800

300~3200

W

19

0~2300

0~3200

PL I1

20

0~1300

0~2300

红外观度传感器ES1B

10~70℃

21

0~90

0~190

115~165℃

22

0~120

0~240

23

0~165

0~320

140~260℃

24

0~260

0~500

电流输入

4~20mA

25

4~20mA

1.999~9999.9

0~20mA

26

1~5V

27

-199.9~999.9、-199.9~99.99、-1.999~9.999

电压输入

0~5V

28

0~5V

29

0~10V

*默认值是“5”。

*当输入类型不是铂电阻而错误的将铂电阻接入时，将会显示SErr。为了清除SErr显示，需要正确接线并重新上电。

报警（报警是来自辅助输出的输出。）

设定

报警类型

报警输出功能

0

无报警功能

无输出

*1 1

偏差上下限

根据L、H值的不同而不同

2

偏差上限

ON OFF

ON OFF

SP

3

偏差下限

ON OFF

ON OFF

SP

*1 4

偏差上下范围

根据L、H值的不同而不同

*1 5

偏差上下限待机序列ON

ON OFF

ON OFF

SP

6

偏差上限待机序列ON

ON OFF

ON OFF

SP

7

偏差下限待机序列ON

ON OFF

ON OFF

SP

8

绝对值上限

ON OFF

ON OFF

0

9

绝对值下限

ON OFF

ON OFF

0

10

绝对值上限待机序列ON

ON OFF

ON OFF

0

11

绝对值下限待机序列ON

ON OFF

ON OFF

0

12

LBA（仅对报警1）

ON OFF

ON OFF

0

13

PV变化率报警

ON OFF

ON OFF

0

14

SP绝对值上限

ON OFF

ON OFF

0

15

SP绝对值下限

ON OFF

ON OFF

0

16

MV绝对值上限

ON OFF

ON OFF

0

17

MV绝对值下限

ON OFF

ON OFF

0

*1: 表参数1、4、5、提供不同的报警类型，可对其设定上限与下限。下限和上限分别用字母L和H指示。

* 默认的报警类型为“2”

初始设定菜单

运行停止。

(控制和辅助输出都停止。)

*4

输入类型+3

比例值上限（仅限设定模拟量输入时）

比例值下限（仅限设定模拟量输入时）

小数点（仅限设定模拟量输入时）

温度单位 °C= [] °F= F

SP上限

SP下限

PID-ON/OFF

标准或加热/冷却

ST (自校正)

程序模式

控制周期(加热)

控制周期(冷却)

报警1~4 *3

报警1~4滞后

报警1~4类型

报警1~4下限

报警1~4上限

事件输入分配1

事件输入分配2

平方根的提取范围(仅当已安装平方根提取器时)

转至高阶功能设定菜单

控制周期(冷却)

电压增益(用于驱动SSR): 2

正向或反向运行

反向运行(加热)中

正向运行(冷却)中

报警1~4 *3

报警1~4滞后

报警1~4类型

报警1~4下限

报警1~4上限

事件输入分配1

事件输入分配2

平方根的提取范围(仅当已安装平方根提取器时)

转至高阶功能设定菜单

初始设定菜单可以使用用户指定喜欢的工作条件（输入类型、报警类型、控制方法等等）。

*3: 关于输入类型和报警类型的详细情况，请参考旁边的表格。

*4: 当转至初始设定菜单时运行停止。（控制和辅助输出都停止）

*5: 对于某些型号以及其它电设项的某些设定，不显示灰色设定项。

典型示例：参数在以下条件下不显示。

· AT执行/取消：如果PID ON/OFF设定为ON/OFF，不会显示。

· SP斜坡设定值：如果ST设定为ON，不会显示。

· 报警1类型：配备+HBS报警型号时的默认设定。

如果为辅助输出1分配（高阶功能菜单）设定了报警1（默认设定），有加热器断线和SSR故障检测的控制菜单会显示报警。有关设定方法，请参阅《E5□C数字式控制器用户手册》(Cat. No. H180)。

*6: 第二显示中显示四位数的产品代码。该设定无法变更，用户无需另行设定。

正确使用注意事项

1. 连接到Push-In Plus端子台

● 接线板的元件名称

释放孔

端子（插）孔

● 将套带圈的导线与实心电缆连接

将实心电缆或套圈直接插入接线板，直至末端接触接线板。

检查连接

● 插入后，轻拉导线，确保其不会脱落且导线牢固固定在接线板上。

为防止短路，插入时将电线外皮剥皮部分（绞线/单线）或棒端子导体部完全插入到端子（插入）孔（至看不见为止）。（参见下图。）

如果导线过细而难以连接，请以连接双绞线相同的方式使用平口螺丝刀。

2. 从Push-In Plus端子台取下

● 连接绞线

使用以下步骤将导线连接至接线板。

1. 以一定角度握住平头螺丝刀并将其插入释放孔。此角度应为10°至15°之间。如果正确插入了平头螺丝刀，您将感觉到释放孔的弹性。

2. 在将螺丝刀插入释放孔的同时，将导线直接插入端子孔。直至末端接触接线板。

3. 从释放孔中移除平头螺丝刀。

● 连接套圈

使用以下步骤将套圈从接线板取下。

1. 以一定角度握住平头螺丝刀并将其插入释放孔。相同的操作可用于取下绞线、实心电缆和套圈。

2. 在螺丝刀仍插入释放孔时，将导线从端子孔中取下。

3. 从释放孔中移除平头螺丝刀。

3. 推荐工具

● 推荐平头螺丝刀

使用平头螺丝刀连接和取下导线。

使用一下平头螺丝刀。

型号

制造商

XW42-00B

欧姆龙

● 规格

供电电压

工作电压范围

功率消耗

选项000:

所有其它规格:

指示精度

(环境温度: 23°C)

事件输入

触点输入

非触点输入

控制输出1

控制方法

辅助输出

传送输出

环境温度

环境温度

存储温度

高度

推荐保险丝

重量

防护等级

安装环境

内存保护

暂时过电压

100~240 VAC, 50/60 Hz或者24 VAC, 50/60 Hz/24 VDC

额定电压的85~110%

最大5.2 VA (100-240 VAC)

最大3.1 VA (24 VAC) /最大1.6 W (24 VDC)

最大6.5 VA (100-240 VAC)

最大4.1 VA (24 VAC) /最大2.3 W (24 VDC)

热电偶输入: (显示值的±0.3%或者±1°C中的较大值)

最大±1位数

铂电阻输入: (显示值的±0.2%或者±0.8°C中的较大值)

最大±1位数

模拟量输入: ±0.2 % FS 最大±1位数

输出电流: 每个触点约7 mA。

ON: 最大1 kΩ, OFF: 最小100 kΩ

ON: 残余电压最大1.5 V

OFF: 漏电流最大0.1 mA

继电器输出: SPST-NO, 250 VAC, 3 A (阻性负载)

继电器电气寿命: 100,000次运行

电压输出 (用于驱动SSR): 12 VDC ±20%, 21 mA

ON/OFF或2路PID控制

继电器输出: SPST-NO, 250 VAC, 2 A (阻性负载)

继电器电气寿命: 100,000次运行

4~20 mA DC, 最大负载500 Ω

1~5 VDC, 最小负载1 kΩ

-10~+55°C

(应避免结冰或结露)

RH 25~85%

-25~+65°C

(应避免结冰或结露)

最高2,000 m

T2A, 250 VAC, 时延, 低熔断容量

约120 g (仅控制器)

前面板: IP66

后壳: IP20, 端子: IP00

过电压目录 I, 污染等级2 (IEC61010-1)

非挥发内存

(写次数: 1,000,000)

短时间过电压 1200V+ (电源电压)

长时间过电压 250V+ (电源电压)

连接

(端子适用性因机器型号而异。)

E5CC-□□□BM-□□□

选项

继电器输出

250 VAC, 3 A (阻性负载)

电压输出: (用于驱动SSR) 12 VDC, 21 mA

控制输出1

控制输出2

控制输出3

控制输出4

控制输出5

控制输出6

控制输出7

控制输出8

控制输出9

控制输出10

控制输出11

控制输出12

控制输出13

控制输出14

控制输出15

控制输出16

控制输出17

控制输出18

控制输出19

控制输出20

控制输出21

控制输出22

控制输出23

控制输出24

控制输出25

控制输出26

控制输出27

控制输出28

控制输出29

控制输出30

控制输出31

控制输出32

控制输出33

控制输出34

控制输出35

控制输出36

控制输出37

控制输出38

控制输出39

控制输出40

控制输出41

控制输出42

控制输出43

控制输出44

控制输出45

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控制

E5CC-B

디지털 온도조절기

KOR

취급 설명서

오므론 제품을 구입해 주셔서 감사합니다.
이 취급 설명서에서는 이 제품을 사용하는데 필요한 기능, 성능, 사용 방법 등의 정보를 기재하고 있습니다.
이 제품을 사용 하실때는 아래와 같은 사항을 지켜 주십시오.
● 이 제품은 전기 작업이 있는 전문가가 취급하여 주십시오.
● 이 취급 설명서를 충분히 이해한 후 올바르게 사용하여 주십시오.
● 이 취급 설명서는 언제든지 참고할 수 있도록 잘 보관하여 주십시오.

오므론 주식회사

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상세한 사용 방법은 별책 "E5C□ Digital Temperature Controllers User's Manual" (Cat.No.H174)를 참고하여 주십시오.

안전상의 주의

●경고 표시의 의미

주의

올바르게 취급하지 않으면 위험원에 의해 가금 경상·상해를 입거나 또는 물질적 손해를 입을 우려가 있습니다. 사용하시기 전에 이 취급 설명서를 충분히 이해한 후 사용하여 주십시오.

●경고 표시

주의

감전에 의한 경미한 상해가 일어날 우려가 있습니다.
통전 중 단자에 손대지 않아 주십시오.

경미한 감전, 화재 또는 기기의 고장이 드물게 발생할 수 있습니다.
제품 내부나 설정 도구 포트 내부, 설정 도구 케이블의 커넥터 핀 사이에 금속, 도금, 설치 작업 중 발생한 절단 분진 또는 수분 등이 들어가지 않도록 하십시오. 전면 설정 도구 포트를 사용하지 않을 때에는 상기 미물질을 들어가지 않도록 덮개를 확실히 닫아 주십시오.

특별해 의해 경미한 상해의 우려가 있습니다.
인화성 폭발성 가스가 있는 장소에서는 사용하지 않아 주십시오.

화재나 폭발 위험이 있습니다. 본체의 설정 도구 포트 내부나 케이블 커넥터 핀 사이에 먼지 등이 쌓이지 않도록 하십시오.

감전, 화재, 기기의 고장이 일어날 우려가 있습니다.
분해, 개조, 수리 등 내부부를 분해하지 않아 주십시오.

주의 화재나 감전의 위험

a) 본 제품은 오므론 데이터의 프로세서 콘트롤러로서 UL Listing의 인증을 받고 있기 때문에 반드시 외부로 화재가 발생하지 않는 구조의 환경에서 사용해야 주십시오.
b) 두 개 이상의 차단 스위치를 사용하는 경우는 스위치 점접점에 모든 스위치를 OFF 하고 제품을 무전원 상태로 하여 주십시오.
c) 전원 입력은 SELV, 제한 회로입니다.
d) 주의: 화재나 감전의 위험을 줄이기 위해서 서로 다른 Class 2 회로의 충격을 내부에서 상호 연결하지 않습니다.
e) E5CC-U와 E5GC의 단자 온도는 최대 65°C이므로, 배선 시 내열 사양 65°C 이상의 선을 사용해야 합니다.
가타 제품을 단자 온도가 최대 75°C이므로, 내열 사양 75°C 이상의 전선을 사용해야 합니다.

수열을 고려한 상태로 사용하지 않을 접점 움직임이나 소음이 드물게 발생할 수 있습니다.
반드시 사용 조건을 고려하여 정격 부하 및 전기적 수명 회수 내에서 사용하여 주십시오. 출력 릴레이의 수명은 개폐 용량 및 개폐 조건에 의해 크게 달라집니다.

■배선

●외형 치수도

외형 치수(단위 mm)

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