

感谢您购买欧姆龙E5CZ数字温度控制器。为了您更好的使用这一产品，该手册描述了其功能、特性以及应用方法。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手册以确保正确的使用。
妥善保管该手册以确保在需要时可以随时查阅。

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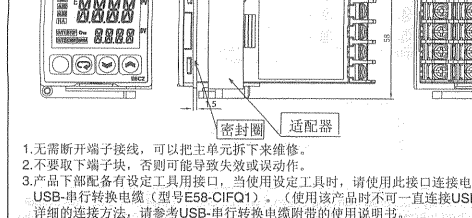
详细的操作指令请参考E5CZ/AZ/EZ用户手册(Cat. No.H207)。警告和注意的意义

安全警告

警告符号的要点
表示潜在的紧急情况，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本手册。

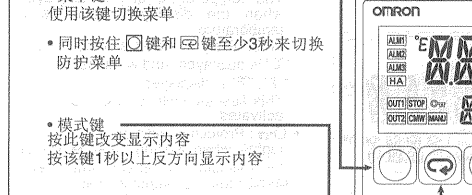
配线

尺寸规格



- 1. 无需断开端子接线，可以把主单元拆下来维修。
2. 不要取下端子块，否则可能导致失效或误动作。
3. 产品下部配有设定工具用接口，当使用设定工具时，请使用此接口连接电脑和该产品。连接时使用专用的USB-串行转换电缆(型号E5B-CIFQ1)。(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，请参考USB-串行转换电缆附带的用户手册。

前面板的名称



操作菜单

输入类型

Table with columns: Input Type, Input, Setting, Setting Range. Rows include Pt100, JPt100, K, J, T, E, L, U, N, R, S, B, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23.

Table with columns: Input Type, Input, Setting, Setting Range. Rows include 0, 1, 2, 3, 4.

报警

Table with columns: Setting, Alarm Type, Alarm Output Function. Rows include 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

错误显示 (故障诊断)

Table with columns: First Display, Meaning, Operation, Fault Status. Rows include SERR, E111, HERR.

联系方式

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欧姆龙(中国)有限公司武汉办事处
电话: 027-65776566
欧姆龙(中国)有限公司苏州办事处
电话: 0512-8669277
台湾欧姆龙股份有限公司(台北)
电话: 02-27153331

警告

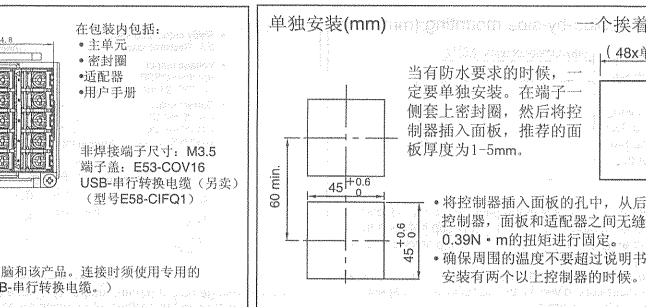
当电源带电时，不要接触端子。这样做很可能会因电击导致轻度伤害。
不允许金属碎片、导线头或者安装时产生的细小的金属屑进入设备。这样做很可能导致电击、火灾或误动作。
不要将该产品用于有易燃易爆气体的场合。否则有可能因为爆炸而造成轻度伤害。
绝对不要拆卸、改装以及修理该产品或接触任何内部元件。有时会发生轻微的电击、火花或误动作。
注意-火灾或触电的危险
a) 该产品为UL recognized的开放型过程控制设备，必须安装在能够防止火花进出的机壳中。
b) 在使用两个以上断电开关的情况下，维修前请先断开所有开关，确保本产品处于断电状态。
c) 信号输入为SELV，有限能量。
d) 注意：为了减少火灾或触电的危险，不要将不同的2类回路的输出互联。
如果输出继电器超过了预期的使用寿命，有时会发生触点融化和燃烧。始终要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随着输出负载以及开关条件的变化而变化。
使用0.74 ~ 0.90 Nm的力矩拧紧端子螺丝。松动的螺丝可能导致火灾。
设定适当的产品参数以使系统可控。如果设置不合适，意外的操作可能造成财产损失或事故。
温度控制器误动作很可能造成控制操作失效或阻止报警输出，导致财产损失，为了在温度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系统。

使用的适用性

欧姆龙不负责遵守任何使用该产品的集成用户产品的标准、章程或规则。采取一切必要的步骤来决定该产品对采用该产品的系统、机器和设备的适用性。了解并遵守一切使用该产品的禁止行为。如果应用该产品的系统在设计上不能保证有效处理对生命、财产的危害，不要在这样的系统上使用该产品。在整套装备或系统中适当使用和安装欧姆龙产品。参见产品目录中有关保证和免责声明。

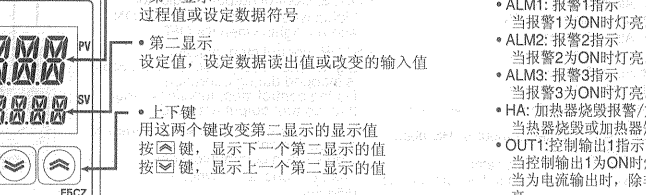
安装

单独安装(mm) 一个挨着一个安装(mm)



当有防水要求的时候，一定要单独安装。在端子一侧套上密封圈，然后将控制器插入面板，推荐的面板厚度为1-5mm。

连接



因为电压输出(控制输出)在内部接线不是电气绝缘的，所以使用接地的热电偶温度计时，必须使用一个控制输出端子不接地。(连接会由于寄生电流造成测量不可靠)

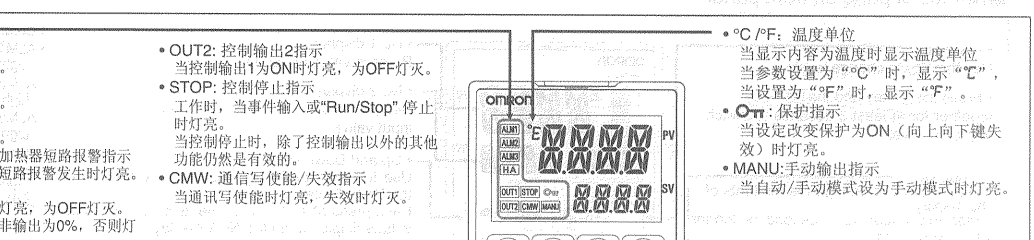
了解以下警告以避免操作失误、误动作或产品特性、功能的相反效果。如果不这样做，可能导致不可预期的事情发生。

- (1) 该产品只被设计为室内使用。不要将该产品用在室外或者下列地点。
• 直接受加热设备热辐射的地方。
• 有液体或油飞溅的地方。
• 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) 在规定的温度和湿度范围内使用/存储该设备。必要时应采取强制冷却。
(3) 允许热量散发，不要堵塞该产品周围的空间。不要堵塞产品的通风孔。
(4) 按端子的极性进行正确的接线。
(5) 使用规定的尺寸(M3.5, 小于等于7.2mm)的接线端子进行接线。
(6) 在规定的温度和湿度范围内使用/存储该设备。
(7) 在额定负载和供电电源下使用该产品。
(8) 使用开关或继电器触点以确保在2秒内将电源升为额定电压。如果电压是逐渐上升的，电源无法复位或者发生输出误动作。
(9) 在接通电源到开始实际操作前应确保温度控制器进行30分钟以上的预热，以保证正确的温度显示。
(10) 在执行自整定时，应将负载和控制单元同时通电或者在控制器通电之前对负载通电。
(11) 在该产品的附近应该有开关或者断路器。
(12) 在拉出产品的内核时一定要关闭电源，不要触碰端子或电子元件。在把产品的内核装入时，不要使电子元件接触到外壳。
(13) 不要使用油漆稀释剂或同类型化学品清洁该产品。使用标准等级的酒精。
(14) 在设置系统(如控制柜)的时候，需要考虑到控制器的输出在电源上电后有2秒的延迟。
(15) 在改变至某一模式的时候输出可置OFF。在实施控制的时候需要考虑到这一点。
(16) EEPROM的写次数是有限的。所以在通信或其他操作需要频繁写数据时，请使用RAM。
(17) 安装可选单元(E53-CZH/E53-CZH03/E53-CZB/E53-CZ03)时参考指导书。

Specifications

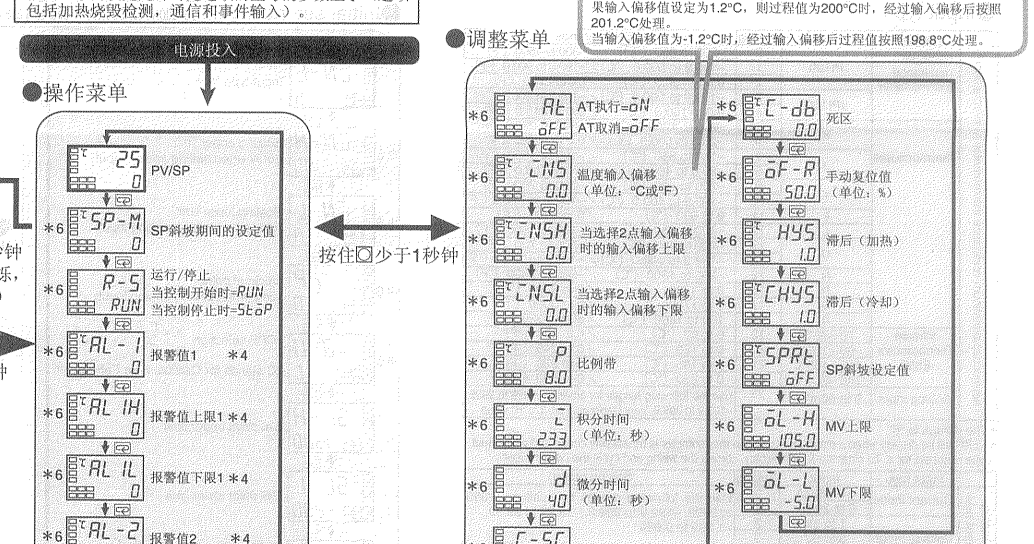
Table with columns: Item, Specification. Rows include Power Voltage, Working Voltage Range, Power Consumption, Accuracy, Event Input, Control Output, Control Method, Environment, Height, Protection, Installation, and Memory Protection.

报警输出(继电器输出) 250 VAC, 1 A (电阻负载)



当显示内容为温度时显示温度单位。当参数设置为“°C”时，显示“C”，当设置为“°F”时，显示“F”。

调整菜单



保护功能

保护功能用来避免不想要的设定、限制使用的设定项目、或指定操作键有效还是无效。

操作/调整保护

Table showing protection status for various menu items like Setpoint, PV/SP, and other parameters.

初始设定/通信保护

Table showing protection status for initial settings, communication settings, and advanced function settings.

设定改变保护

用键操作改变设定被限制。关“OFF”：用键操作能改变设定。开“ON”：用键操作不能改变设定(“On”会亮)。

AT (自整定)

在调整菜单下的自整定指定“ON: AT执行”执行自整定。“OFF: AT取消”取消自整定。

技术咨询

800免费技术咨询电话: 800-820-4535(仅限于中国大陆)

制造单位

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欧姆龙(中国)有限公司成都办事处
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### 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.
- 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.
- CAUTION - Risk of Fire and Electric Shock
  - This product is UL recognized as Open Type Process Control Equipment. It must be mounted in an enclosure that does not allow fire to escape externally.
  - More than one disconnect switch may be required to de-energize the equipment before servicing.
  - Signal inputs are SELV, limited energy.
  - Caution: To reduce the risk of fire or electric shock, do not interconnect the outputs of different Class 2 circuits.
- 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.
- Tighten the terminal screws to between 0.74 and 0.90 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 Temperature 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 Temperature Controller, take appropriate safety measures, such as installing a monitoring device on a separate line.

### EN INSTRUCTION MANUAL

Thank you for purchasing the OMRON E5CZ Digital Temperature 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.

OMRON Corporation  
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For detailed operating instructions, please refer to the E5CZ/AZ/EZ User's Manual (Cat. No. H207). Significance of WARNINGS and CAUTIONS

### Safety Precautions

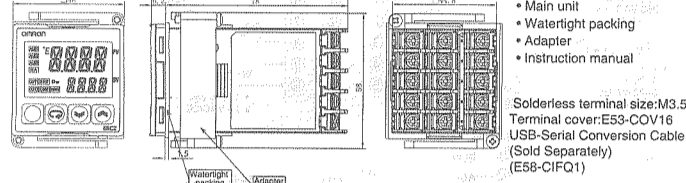
#### Key to Warning Symbols

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.

### Wiring

#### Dimensions

#### Dimensions (mm)

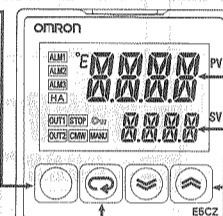


- In the pack:
- Main unit
  - Waterlight packing
  - Adapter
  - Instruction manual
- Solderless terminal size: M3.5  
Terminal cover: E53-COV16  
USB-Serial Conversion Cable (Sold Separately) (E58-CIFQ1)

- The internal mechanisms can be drawn out for maintenance without removing terminal wiring.
- Do not remove the terminal block. Doing so may result in failure or malfunction.
- A Setup Tool port is provided on the bottom of the product. Use this port to connect a personal computer to the product when using the Setup Tool. E58-CIFQ1 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

- Level key: Use this key to change levels.
- Protect key: Press this key and the "ENT" key together for at least 3 seconds to switch to protect level.
- Mode key: Press this key to change the contents of the display. Press this button for 1 second or longer for reverse scroll.



- No.1 display: Process value or set data symbol
- No.2 display: Set point, set data read-out value or changed input value
- Up and Down keys: Use the keys to change the values displayed on the No.2 display. Each press of the up key increments or advances the values displayed on the No.2 display. Each press of the down key decrements or returns the values displayed on the No.2 display.

- Operation indicators
  - ALM1: Alarm 1 indicator. Lights when alarm 1 is ON.
  - ALM2: Alarm 2 indicator. Lights when alarm 2 is ON.
  - ALM3: Alarm 3 indicator. Lights when alarm 3 is ON.
  - HA: Heater burnout alarm/Heater short alarm indicator. Lights when a heater burnout or HS alarm has occurred.
  - OUT1: Control output 1 indicator. Lights when control output 1 is ON and not lights when it's OFF.
  - OUT2: Control output 2 indicator. Lights when control output 2 is ON and not lights when it's OFF.
  - STOP: control stop indicator. Lights when event input or "Run/Stop" is stopped during operation. During control stop, functions other than control output are valid.
  - COMW: communications writing enable/disable indicator. Lights when communications writing is "enabled" and is out when it is "disabled".

- Protection indicator: Lights when Setting Change Protect is ON (disables the Up and Down Keys).
  - MANU: Manual output indicator. Lights when the Auto/Manual Mode is set to Manual Mode.
- \* °C/°F: temperature unit  
The temperature unit is displayed when the displayed value is a temperature. When this parameter is set to "°C", "°C" is displayed, and when set to "°F", "°F" is displayed. This flashes while ST (Self-Tuning) is activated.

### Operation menu

#### Input type

Input type	Input	Setting	Setting range
Platinum resistance thermometer (universal-input)	PI100	0	-200 to 850 (°C) / -300 to 1500 (°F)
		1	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)
		2	0.0 to 100.0 (°C) / 0.0 to 210.0 (°F)
		3	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)
Thermocouple	K	5	-200 to 1300 (°C) / -300 to 2300 (°F)
		6	-20.0 to 500.0 (°C) / 0.0 to 900.0 (°F)
	J	7	-100 to 850 (°C) / -100 to 1500 (°F)
		8	-20.0 to 400.0 (°C) / 0.0 to 750.0 (°F)
	T	9	-200 to 400 (°C) / -300 to 700 (°F)
		10	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)
	E	11	0 to 600 (°C) / 0 to 1100 (°F)
	L	12	-100 to 850 (°C) / -100 to 1500 (°F)
	U	13	-200 to 400 (°C) / -300 to 700 (°F)
	N	14	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)
	R	15	-200 to 1300 (°C) / -300 to 2300 (°F)
	S	16	0 to 1700 (°C) / 0 to 3000 (°F)
Infrared Thermosensor ES1B	B	18	100 to 1800 (°C) / 300 to 3200 (°F)
		19	0 to 70 (°C) / 0 to 190 (°F)
		20	0 to 120 (°C) / 0 to 240 (°F)
		21	0 to 165 (°C) / 0 to 320 (°F)
Analog input	A	22	0 to 260 (°C) / 0 to 500 (°F)
	V	23	Use the following ranges for scaling: -1999 to 9999, -199.9 to 999.9, Vary Depending on "L", "H" value

Input type	Input	Setting	Setting range
Current input	4 to 20mA	0	Use the following ranges for scaling: -1999 to 9999, -199.9 to 999.9, -19.99 to 99.99
	0 to 20mA	1	
	1 to 5V	2	-1.999 to 9.999
Voltage input	0 to 5V	3	
	0 to 10V	4	

#### Alarms

Setting	Alarm type	Alarm output function
0	No alarm function	Output off
*1 1	Deviation upper/lower limit	ON OFF SP Vary with "L", "H" values
*1 2	Deviation upper limit	ON OFF SP
*1 3	Deviation lower limit	ON OFF SP
*1 4	Deviation upper/lower range	ON OFF SP Vary with "L", "H" values
*1 5	Deviation upper/lower limit standby sequence ON	ON OFF SP Vary with "L", "H" values
*1 6	Deviation upper limit standby sequence ON	ON OFF SP
*1 7	Deviation lower limit standby sequence ON	ON OFF SP
*1 8	Absolute value upper limit	ON OFF SP
*1 9	Absolute value lower limit	ON OFF SP
*1 10	Absolute value upper limit standby sequence ON	ON OFF SP
*1 11	Absolute value lower limit standby sequence ON	ON OFF SP
*1 12	LBA (only for alarm 1)	

### Error display (trouble shooting)

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

No.1 display	Meaning	Action	Status at error
S.E.P.P. (S. Err)	Input error	Check the wiring of inputs, disconnections, shorts and input type.	Control OFF Alarm Operates as above the upper limit.
E111 (E111)	A/D converter error	After the correction of input error, turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	Control OFF Alarm OFF
H.E.R.P. (H. Err)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	Control OFF Alarm OFF
H.E.R.P. (H. Err)	Internal circuit error		Control OFF Alarm OFF

\*1: Upper and lower limits can be set for parameters 1, 4 and 5 to provide for different types of alarm. These are indicated by the letter "L" and "H".  
\*2: Error shown only for "Process value / Set point". Not shown for other status.

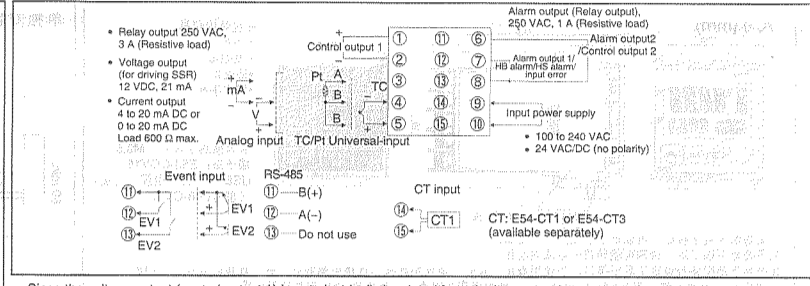
### Precautions for safety use

- 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.
- 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 and ammonia gas).
    - Places subject to intense temperature change.
    - Places subject to long and condensation.
    - Places subject to vibration and large shocks.
  - Use/store 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 the specified size (M3.5, width 7.2 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 AWG24 to AWG14 (equal to a cross-sectional area of 0.205 to 2.081 mm<sup>2</sup>). (The stripping length is 5 to 6 mm.). Up to two wires of same size and type or two wire terminals can be inserted into a single terminal.
  - Do not wire the terminals which are not used.
  - Allow as much space as possible between the controller 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 this product within the rated load and power supply.
  - Make sure that the rated voltage is attained within 2 seconds of turning ON the power by using a switch or relay contact. If the voltage is applied gradually, the power may not be reset or output malfunctions may occur.
  - Make sure that the Temperature 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.
  - When executing self-tuning, turn the load and the unit ON simultaneously, or turn the load ON before you turn the controller ON.
  - 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 this unit.
  - Always turn OFF the power supply before pulling out the interior of the product, and never touch nor apply shock to the terminals or electronic components. When inserting the interior of the product, do not allow the electronic components to touch the case.
  - Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
  - Design system (control panel, etc) considering the 2 seconds of delay that the controller's output to be set after power ON.
  - The output may turn OFF when shifting to certain levels. Take this into consideration when performing control.
  - The number of EEPROM write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
  - Refer to the instruction sheet for installing Option unit (E53-CZHB/E53-CZB/E53-CZH/E53-CZ3).

### 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.

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



\* Since the voltage output (control output 1) is not electrically insulated from the internal wiring, one or other of the control output terminals must be left unearthed when using an earthed thermocouple thermometer. (Connection makes measurements unreliable due to sneak currents.)

### Initial setting level (Operation stopped, control/alarm are both stopped.)

- Input type: \*3
  - Scaling upper limit (only when setting analog input): 100
  - Scaling lower limit (only when setting analog input): -100
  - Decimal point (only when setting analog input): dP
  - °C/°F selection: °C=C, °F=F (C stands for Celsius, F for Fahrenheit)
  - Set point upper limit: 1300
  - Set point lower limit: -200
  - In ON/OFF control = ONdF
  - In 2-PID control = PID
  - Standard control = SdNd
  - Heating and cooling control = H-L (Select standard control or heating and cooling control as required)
  - Self-tuning ON = ON
  - Self-tuning OFF = OFF
  - Control period (heat) (Unit: Seconds): 20
  - Control period (cool) (Unit: Seconds): 20
  - In Reverse operation (heat) = OR-R
  - In Direct operation (cool) = OR-d
  - Alarm 1 type: Specified models only: AL1 2
  - Alarm 2 type: Specified models only: AL2 2
  - Transfer output type: ER-L
  - Transfer output upper limit: 100.0
  - Transfer output lower limit: ER-L
  - Linear output type: 4-20
- Initial setting level enables users to specify their preferred operating conditions (input type, alarm type, control method, etc.)
- \*3: Refer to the adjoining tables for details of input types and alarm types.
  - \*4: Applicable only to models with alarm functions.
  - \*5: Operation is stopped when moved to the initial setting level. (control/alarm are both stopped.)
  - \*6: The grayed-out setting items may not be displayed according to the models and setting.

### Operation level

- PV/SP
  - Set point during SP ramp: 5P-M
  - Run/Stop When control start = RUN
  - When control stop = StOP
  - Alarm value 1: \*4
  - Alarm value upper limit 1: \*4
  - Alarm value lower limit 1: \*4
  - Alarm value 2: \*4
  - Alarm value upper limit 2: \*4
  - Alarm value lower limit 2: \*4
- Operation level should normally be used during operations.

### Adjustment level

- AT execute = ON
  - AT cancel = OFF
  - Dead band: 0.0
  - Manual reset value (Unit: %): 50.0
  - Hysteresis (heat): 1.0
  - Hysteresis (cool): 1.0
  - SP ramp set value: OFF
  - MV upper limit: 105.0
  - MV lower limit: -5.0
  - Integration time (Unit: secs): 233
  - Derivative time (Unit: secs): 40
  - Cooling coefficient: 1.00
- Adjustment level is for entering set values and shift values for control.

### Protection function

Protection function, to prevent unwanted settings, restricts the setting items to be used or designates if operation of the key is valid or invalid.

### Operation / Adjustment protection

The following table shows the relationship between settings and protect limits related to Operation level and Adjustment level.

Level	Set value				Symbol
	0	1	2	3	
Operation level	Process value	○	○	○	○
	Others	○	○	○	○
Adjustment level		○	○	○	○

○: Can be displayed and changed  
○: Can be displayed  
×: Display or shifting to another level is not possible.

### Initial setting/Communications protection

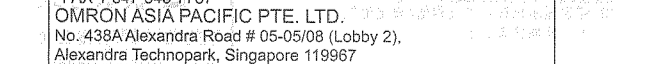
This protect level restricts shifting movement to the initial setting level, communications setting level and advanced function setting level.

Set value	Initial setting level	Communications setting level	Advanced function setting level	Symbol
0	○	○	○	○
1	○	○	○	○
2	×	×	×	○

○: Change to other levels possible  
×: Change to other levels not possible

### Setting change protection

Setting changes by key operation are restricted. OFF "OFF": Setting can be changed by key operation. ON "ON": Setting cannot be changed by key operation ("OFF" will light.) (Protect level settings can all be changed.)



\* Also when AT execution ends, the display automatically returns to "OFF".