型 E5CZ
数字式温度控制仪

OMRON

操作说明书

(请详阅说明书)

感谢您购买OMRON产品,为了能够安全正确使用本产品,请先仔细阅读此说明书,并妥善保管,以备随时参考。

(English on the other side)

1648080-5 C

详细的操作方法请参考E5CZ操作手册。

安 全 警 告

警告的含义

⚠注意	如果操作不当,其引起的危险程度是引起轻度/中度伤害,或者物品损坏等。

⚠ 注意

输出继电器的寿命会因开关容量、开关条件而有很大的不同,因此必须考虑实际使用条件,请在额定负载、电气寿命次数内使用。 在超过寿命的状态下使用时,会有接点溶着及烧毁的情况发生。	
注意 火灾和触电的危险 a)本产品作为开式过程控制设备通过UL listed的认证,必须安装在不能向外喷火构造内使用。 b)在使用2个以上断路器的情况在,修理点检前,请关闭所有的开关,确保产品处于不通电状态。 c)信号输入为SELV限制回路。 d)注意:为了降低火灾和触电的危险,请勿在内部连接异于SELV限制回路输出	⚠
通电中请勿触摸端子,并于配线后装上端子盖,否则恐有触电之危险。 因触电会导致人员的轻、中度伤害。	⚡
如果操作不当,其引起的危险程度是引起轻度/中度伤害,或者物品损坏等。	
制品中请勿有金属或导线、加工的粉屑等进入;否则有触电、火灾、故障的危险。	🚫
请勿在有易燃性、爆炸性瓦斯的地方使用;否则可能引起爆炸。	
请勿自行分解、修理、改造及触摸端子内部;否则有触电、火灾、故障的危险。	🚫
端子螺丝请依规定的扭矩(0.74~0.90N·m)锁紧 螺丝松了的话,可能会产生起火及误动作。	❗
温控仪的各种设定值,请配合控制对象做正确的设定。在设定内容与控制对象的内容相异的情况下,错误的动作是造成装置的破损与事故的原因。	
当温控仪因故障而无法正常运行时会损坏设备和机器。为了安全请考量温控仪可能的故障,并在别系统中安装监视设备或防止温度过高的报警系统。	
确保铂电阻温度传感器的类型与温控仪的内部设置保持一致。	

使用时的承诺事项

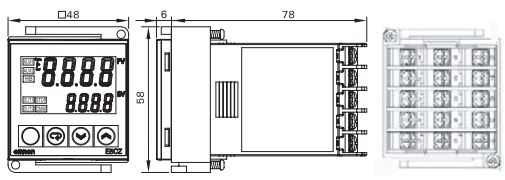
在以下环境使用时,请确认操作说明书,并与本公司营业人员商谈。同时使用在产品的规格及性能范围内,在万一故障时,请采取可将危险降至最小的安全对策。
a)使用在室外,或使用在可能产生潜在化学污染及电气妨害的用途时。或者在目录,使用说明书中所没有记载的条件及环境下的使用。
b)使用在核能控制设备、燃烧设备、铁道航空、车辆及医用机械娱乐器材、安全装置等业界所特有的设备。
c)使用在对于人的生命及财产有危险的系统、机械及装置中。
d)水道、电力供给系统及24小时连续运转系统等设备。使用在需要具有高度可靠性的设备中。
e)其他,以上列 a-d 为准,需具有高度安全性的用途。
※以上为适合条件的一部分。详细内容请阅读敝社的综合目录、资料文件等最新版的目录、使用说明书中所记载的保证及免责事项内容。

安全使用注意事项

1) 请勿在下列环境中使用
.有水、油飞溅的地方
.阳光直射的地方
.有粉尘、腐蚀性气体(尤其是硫化气体、氨气等)存在的地方
.温度变化激烈的地方
.会产生结冰、结露的地方
.振动或冲击很强烈的地方
.会直接受到加热机器辐射热的地方
2) 为了防止火灾和触电,必须在相对远离污染源并且可控制的环境中使用。
3) 请在规格范围内的周围温度及湿度下使用及保存,必要时请做强制冷却。
4) 为了不妨碍散热,温控仪周边请勿封闭。
温控仪本身的通风孔也不要堵塞。
5) 配线用压接端子请使用指定尺寸(M3.5、宽7.2mm以下)的端子。
6) 配线用材料,请使用AWG24(截面积0.205mm²)~AWG18(截面积0.832mm ²) 的电线,剥线长度:5~6mm。
7) 请确认端子的极性,做正确的配线。
8) 不使用的端子,请勿连接。
9) 内部电路和电压输出(控制输出)不是电隔离的。当使用一个接地温度传感器时,不能连接任何控制输出接地端。否则不明电流会导致计量错误。
10) 设置时请尽量远离产生高频率或浪涌冲击的机器。
配线则请与高电压、大电流的动力线做分开配置。此外,请避免与动力线做平行配线或同一配线。
11) 电源电压及负载,请在规格、式样范围内使用。
12) 电源投入时,请在2秒内达到额定电压。如果加载电源电压缓慢增加,电源没有充分复位时,输出将可能误动作。
13) 使用自调节时,请将温调仪与负载电源同时或负载电源先投入。
14) 电源启动后经约2秒钟输出才开启,在配置控制回路时请给予充分的考虑。
15) 请设置作业员能够马上关上电源的开关或断路器,并做适当的表示。
16) 请确认至少有30分钟以上的预热时间。
17) 变更设定时间请考虑到可能会造成出力持续为OFF。
18) 电流关断时,开关、继电器等的接线点不能慢慢降低电压,避免输出误动作或存储错误。
19) 当要延长热电偶的导线时,要使用与热电偶类型相匹配的补偿导线,不要延长铂电阻的导线。只能使用低阻值的导线(每根最大5Ω),并且保证三根导线的阻值都是相同的。
20) 模板基板必须安装正确。在安装的时候,不要将本体内部的基板取下。
21) 当将温控仪从机壳中抽出时,不能用力过大,以免使温控仪发生变形或损坏。
22) 当将温控仪从后机壳中抽出更换时,要检查端子的状态;如果有必要,将后机壳一起更换。
23) 将前盖插入后外壳时,若无法顺利进行,就不要勉强插入,因为可能会损坏内部的其它部品。
24) 可直接由前盖取出的温控仪,在取出前需先关闭电源,请绝对不要用手触摸端子或电子部品,或者给予冲击。插回时,请不要让电子部品与外壳接触。
25) 静电能够损坏内部部品,在用手拿温控仪前,一定要先触摸一下与地相连的金属物,以释放手上的静电。在抽出温控仪时,不要接触到板上的电子部品和电路;但用手拿温控仪时,抓住前面板的边缘部分。
26) EEPROM的写入次数是有寿命的。数据频繁写入的场合请用RAM模式。
27) 关于清洁:请勿使用油漆稀释剂,请用标准等级的酒精。
28) 请使用工具来分离部品。

■配线

●外形尺寸(单位:mm)



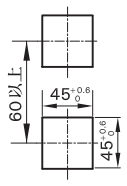
包装内容
· 温控仪 1 个
· 安装附件 1 个
· 操作说明书 1 份
· 合格证 1 枚

接线端子尺寸:M3.5

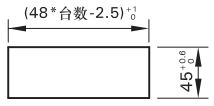
插入OPTION模块及修理时,请用螺丝起子将前盖面板上下的卡勾顶出,再将温控仪前盖取出。

●安装

单个安装(单位:mm)

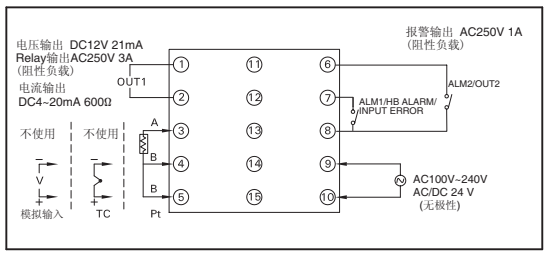


多个并行安装(单位:mm)



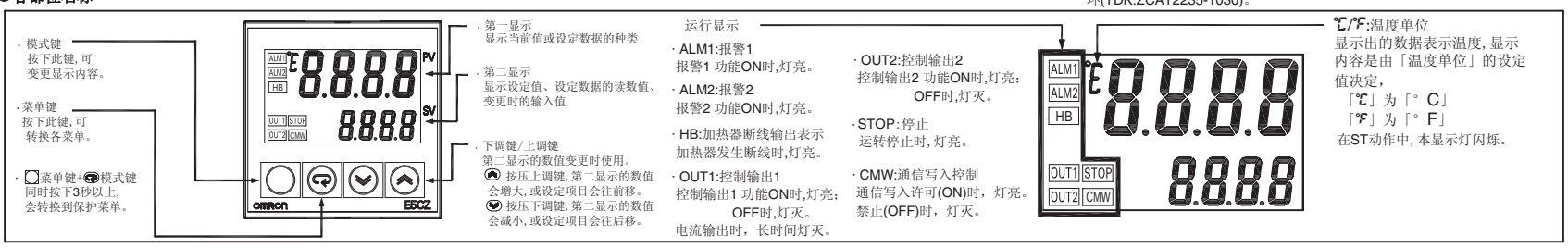
· 安装时,请将温控仪插入面板(厚度1~4mm)开好的面孔穴,并将附属安装配件嵌入后盖,再将固定的螺丝锁紧。
· 多个安装使用时,温控仪的环境温度请勿超过规格范围。
· 多个并行安装是可以仅在一个方向上,也可以是平行的或是垂直的。

●连线(依据机种,端子的用途不同)



• OPTION模块仅用于E5CZ-□2M□型温控仪。
• OPTION模块的详细功能请参见"E5CZ OPTION模块操作说明书"。
• 对于型号为E5CZ-C2M, E5CZ-C2M加OPTION模块E53-CN03N或E53-CNBN的产品,为了满足EN61326 CLASS A中发射的规格值,温控仪的电源线上加载磁环(TDK:ZCAT2235-1030)。

●各部位名称



■规格

工作条件:	
电源电压	AC100-240V DC 24V 或 AC 24V
电源频率	50/60Hz
工作电压范围	额定电压的85~110%
环境温度	-10~55℃(不可有结冰、结露)
相对湿度	25~85%(RH)
高度	小于海拔2,000m
技术指标:	
显示误差	(±0.5%PV或±1℃取大值)±1b 以下温度范围的显示误差限为: K,T,N分度-100℃及以下: ±(2℃+1b) R,S分度200℃及以下: ±(3℃+1b) U,L分度400℃及以下: ±(2℃+1b) B分度400℃ 以下不计误差 模拟输入:(±0.5%FS+1b)
功率消耗	E5CZ-R2 / Q2 7VA(AC100~240V) E5CZ-□2M 7.5VA(AC100~240V) 5VA(24V AC)/3W(24V DC)
传感器输入	热电偶,铂电阻,模拟信号输入 非接触温度传感器ES1B
控制输出	继电器输出:AC250V 3A(阻性负载) 电压输出:DC12V (21mA) 电流输出:DC4~20mA 负载600Ω以下
报警输出	继电器输出:AC250V 1A(阻性负载)
继电器的机械寿命	1,000万次
继电器的电气寿命	10万次
控制方式	PID或ON/OFF
其它:	
保存温度	-25~65℃(不可有结冰、结露)
安装场所	Type 4X,仅在室内使用
推荐保险丝	T2A、250VAC慢熔
重量	低分断能力 140g (仅本体) 150g (包含OPTION模块)
保护程度	前面板:IP50 Category 2 (依据IEC60529) 后外壳:IP20 端子部分:IP00
安装环境	CategoryⅡ、污染度2 仅在市内使用 (依据IEC61010-1)
存储保护	可擦除只读存储器(不易失存储) (写操作次数:100万)
端子	配线端

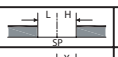
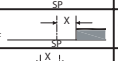
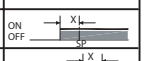
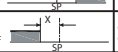
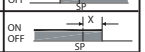
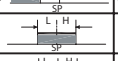
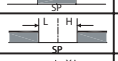
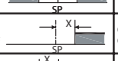
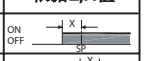
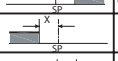
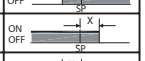
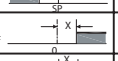
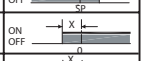
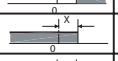
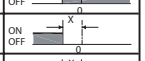
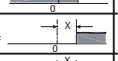
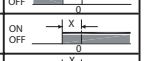
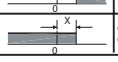
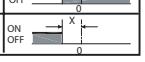
■操作手册

●输入种类

输入种类	规格	设定值	设定范围
铂电阻	Pt100	0	-200~850(°C) /-300~1500(°F)
		1	-199.9~500.0(°C) /-199.9~900.0(°F)
		2	0.0~100.0(°C) /0.0~210.0(°F)
	JPt100	3	-199.9~500.0(°C) /-199.9~900.0(°F)
		4	0.0~100.0(°C) /0.0~210.0(°F)
热电偶	K	5	-200~1300(°C) /-300~2300(°F)
		6	-20.0~500.0(°C) /0.0~900.0(°F)
	J	7	-100~850(°C) /-100~1500(°F)
		8	-20.0~400.0(°C) /-0.0~750.0(°F)
	T	9	-200~400(°C) /-300~700(°F)
		22	-199.9~400.0(°C) /-199.9~700.0(°F)
	E	10	0~600(°C) /0~1100(°F)
	L	11	-100~850(°C) /-100~1500(°F)
	U	12	-200~400(°C) /-300~700.0(°F)
		23	-199.9~400.0(°C) /-199.9~700.0(°F)
	N	13	-200~1300(°C) /-300~2300(°F)
	R	14	0~1700(°C) /0~3000(°F)
	S	15	0~1700(°C) /0~3000(°F)
	B	16	100~1800(°C) /300~3200(°F)
非接触温度传感器 ES1B	10~70°C	17	0~90(°C) /0~190(°F)
	60~120°C	18	0~120(°C) /0~240(°F)
	115~165°C	19	0~165(°C) /0~320(°F)
	140~260°C	20	0~260(°C) /0~500(°F)
模拟输入	0~50mV	21	依照刻度,在-1999~9999,-199.9~999.9的范围内使用。

· **初始值为「5」**

●报警种类

设定值	报警种类	报警输出功能	
		报警值(X):正	报警值(X):负
0	无报警功能	输出OFF	
1	上下限 *1		依据L,H值
2	上限		
3	下限		
4	上下限范围 *1		依据L,H值
5	附待机顺序上下限 *1		依据L,H值
6	附待机顺序上限		
7	附待机顺序下限		
8	绝对值上限		
9	绝对值下限		
10	附待机顺序绝对值上限		
11	附待机顺序绝对值下限		

· 初始值为「2」

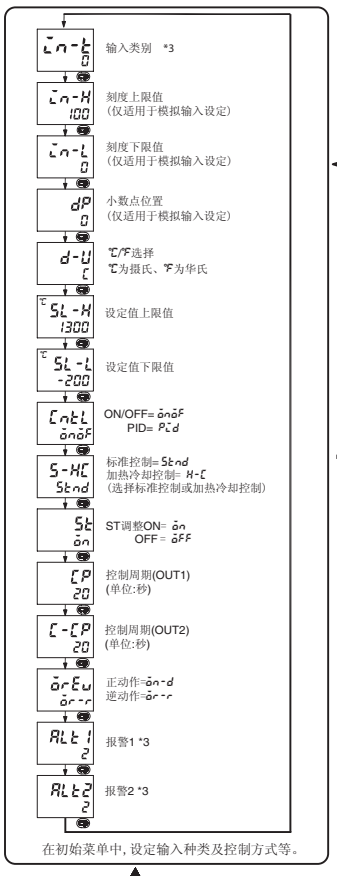
●异常显示(故障排除)

发生异常时,会在第1显示中显示错误代码。请依错误显示确认错误内容,并按下列内容处理。

第1显示	异常内容	处理	异常时的输出状态	
			控制输出	报警输出
SEr(S.Er)	输入异常 *2	请确认输入接线、断路、短路及输入种类。	OFF	按照上限高温处理
	A/D转换异常 *2	确认输入无异常后,重新上电,显示依旧异常,则需更换温控器。如果恢复正常,可能是受噪音干扰。	OFF	OFF
E111(E111)	存储错误	重新上电,显示依旧异常,则需更换温控器。如果恢复正常,可能是受噪音干扰。	OFF	OFF
HErr(H.Er)	内部电路异常 *2		OFF	OFF
FFFF	电流值超过	控制继续,正常运行。在显示"加热器电流值检测"时,显示错误信息。	ON	ON

输入在控制范围内超过显示范围(-1999(199.9)~9999(999.9))时,小于-1999(-199.9)时呈现 [----];大于9999(999.9)时呈现 [JJJJ]。出现此显示时,控制输出及报警输出皆可正常动作。

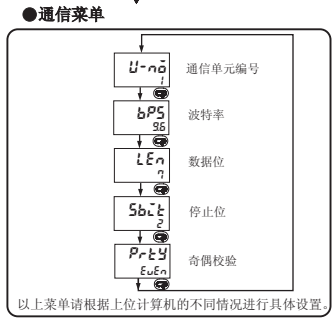
●初始菜单 控制停止 *4



在初始菜单中,设定输入种类及控制方式等。

□ 键不到1秒

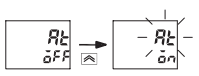
●通信菜单



以上菜单请根据上位计算机的不同情况进行具体设置。

●AT (自动调整)

· AT调整
执行AT时「on:AT执行」
中止AT时「oFF:AT中止」
AT结束后则为OFF
· AT 执行/中止



●其它功能

除了以上提及的功能以外,它还具有警报延时,自动转到显示模式和其它高级设定菜单的功能。
详细的请参考"E5CZ操作手册"。
关于通信的详细情况,请参考"E5AZ/EZ/CZ/PRR通信用户手册"。

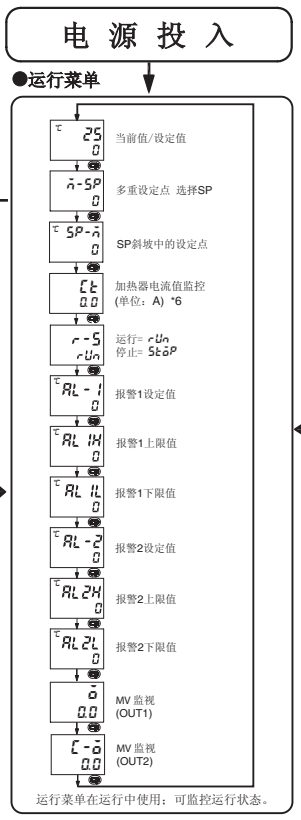
电 源 投 入

□ 键
3秒以上

按□键(1秒以上后)第一显示灯闪烁。

□ 键
1秒以上

●运行菜单

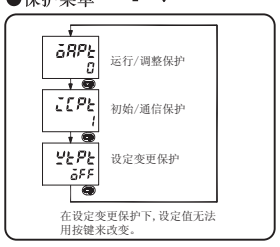


运行菜单在运行中使用:可监控运行状态。

□ +Ⓟ 键
1秒以上

□ +Ⓟ 键
3秒以上

●保护菜单



在设定变更保护下,设定值无法用按键来改变。

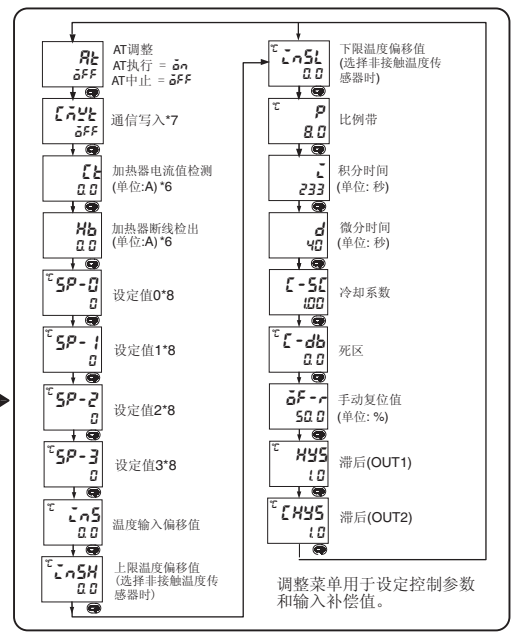
□ 键
1秒以下

以下操作可转换各菜单。
运行菜单 → 保护菜单:□ +Ⓟ 键 3秒以上
运行菜单 → 调整菜单:□ 键 1秒未满
运行菜单 → 初始菜单:□ 键 3秒以上

● 动作不正常时的检查项目

现象	可能的原因
当被测对象的温度变化时,指示值维持不变	虽使用铂电阻,但温控仪的输入种类却设定为热电偶。 在使用热电偶的情况下,热电偶本身产生短路现象。
显示温度比实际的温度高(低)	设定了不合适的温度输入补正值。 热电偶的极性错误。
温度控制不动作	运行/停止的功能,设定在停止状态下,在比例带中设定了太大的值。 正动作/逆动作的设定错误(例如加热控制时设定为正动作)。
按键不能操作	因目标值极限机能,而被限制住设定值的变动。 按键处于保护状态。

●调整菜单



调整菜单用于设定控制参数和输入补偿值。

●运行/调整保护

设定值与保护范围的关系如下表所示。

模式	设定值			
	0	1	2	3
当前值	○	○	○	○
设定值	◎	◎	◎	○
其它	◎	◎	×	×
调整菜单	◎	×	×	×

◎:可显示/变更
○:可显示
×:不可显示/不可转移菜单

· 设定值「0」时,无保护功能
· 初期值为「0」

●初始/通信保护

初始设定菜单、通信设定菜单与高级功能设定菜单有切换限制。

设定值	初始设定菜单	通信设定菜单
0	可切换(可切换至「高级功能设定菜单」)	可切换
1	可切换(不可切换至「高级功能设定菜单」)	可切换
2	不可切换	不可切换

· 初始值为「1」

●设定变更保护

限制以按键操作的设定变更。
OFF:可以用按键操作来变更设定
ON: 不可用按键操作来变更设定,但该菜单可更改。

*1: 设定值1、4、5可各别设定报警种类的上、下限,以L, H表示。
*2: 仅在「当前值/设定值」时显示的错误,在其它状态下,则不会显示。
*3: 请参照输入种类与报警种类项目表。
*4: 初始菜单设置时,控制停止。
*5: 有些设定项目在设定中可能不被显示。
*6: 仅限有加热器断线报警功能的机种。
*7: 仅限有通讯功能的机种。
*8: 仅限有事件功能的机种。
*9: E5CZ-R2/-Q2不能使用*6, *7,*8提到的三种功能,仅E5CZ-□2M型可使用E53-CN□□N模块。

■ 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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E5CZ OMRON
Temperature Controller

Instruction Manual

Introduction

Thank you for purchasing this OMRON product. Read this instruction manual and thoroughly familiarize yourself with the function and characteristics of the product before using it. This product is designed for use by qualified personnel with knowledge of electrical systems. Keep this instruction manual for future reference.

OMRON Corporation

For detailed operation instruction manual, please refer to the E5CZ User's Manual.

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.

⚠CAUTION

The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. Using the product beyond its service life may occasionally result in contact welding or burning.	
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.	⚠
Do not touch the terminals while power is being supplied. Doing so occasionally result in minor injury due to electric shock.	
If operating improperly, it will cause minor or moderate injury, or property damage.	
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 in locations where flammable or explosive gases are present. Doing so may occasionally result in minor or moderate explosion, causing minor or moderate injury, or property damage.	
Do not attempt to disassemble, repair, or modify the product. Doing so may occasionally result in minor or moderate injury due to electric shock.	
Tighten the screws on the terminal block using the tightening torque within the following ranges（0.74~0.90N.m）. Loose screws may occasionally cause fire, resulting in minor or moderate injury,or damage to the equipment.	
Perform correct setting of the product according to the application. Failure to do so is may occasionally cause unexpected operation, resulting in minor or moderate injury, or damage to equipment.	
Ensure safety in the event of product failure by taking safety measures, such as installing a separate overheating alarm system. Product failure may occasionally prevent control operations or alarm output, resulting in damage to the connected facilities and equipment.	
Be sure that the platinum resistance thermometer type and the input type set on the Temperature Controller are the same.	

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.

Precautions for Safe Use

1) Do not use the following locations:
Locations where water or oil may splatter on the Temperature Controller
Locations where directly exposed to sunlight
Locations where dust or corrosive gas is present(in particular, sulfur or ammonia gases)
Locations subject to sudden or extreme changes of temperature
Locations where condensation or ice may form
Locations subject to strong shocks and vibration.
2) To reduce the risk of fire of electric shock, install in a controlled environment relatively free of contaminants.
3) Use and store the Temperature Controller within the specified ambient temperature and humidity ranges. If necessary, cool the Temperature Controller.
4) Do not prevent heat dissipation by obstructing the periphery of the Temperature Controller. Do not block the vents on the Temperature Controller.
5) Use the specified size of crimp terminals (M3.5,width:7.2mm max.) to wire the terminal block.
6) To connect bare wires to the terminal block, use AWG24 to AWG18. (Length of exposed wire: 5 to 6mm)
7) Be sure to confirm the name and polarity for each terminal before wiring the terminal block.
8) Do not connect anything to unused terminals.
9) The voltage output (control output) is not electrically isolated from the internal circuits. When using a grounded temperature sensor, do not connect any of the control output terminals to ground. Otherwise unwanted current paths will cause measurement errors.
10) Install the Temperature Controller as far away as possible from devices that emit strong, high-frequency energy or devices that cause surges. Keep the Temperature Controller wiring separate from high-voltage, high-current power lines. Avoid connecting in parallel with a power line or on the same line as a power line.
11) The power supply voltage and load must be within the rated and specified ranges.
12) Use a switch, relay, or other contact so that the power supply voltage reaches the rated voltage within 2 seconds. If the applied voltage is increased gradually, the power supply may not be reset or malfunctions may occur.
13) When executing self-tuning, turn ON the power of load (e.g.heater) simultaneously or before turning on the Temperature Controller.
14) After turning on the power,the temperature controller will start until 2 seconds, please give enough consideration of control circuit setup.
15) Install a switch or circuit breaker that allows the operator to immediately turn off the power, and label suitably.
16) Allow a warm-up time of at least 30 minutes.
17)The output may turn OFF when shifting to certain levels.Take this into consideration when performing control.
18) After turning off the power, the connection points of switch and relay can not decrease the voltage slowly, this can avoid the wrong action and storage error.
19) When extending the thermocouple lead wires, always use compensating conductors suitable for the type of thermocouple. Do not extend the lead wires on a platinum resistance thermometer. Use only low-resistance wire (5 Ω max. per line) for lead wires and make sure that the resistance is the same for all three wires.
20) Please make sure that the installment of OPTION UNITs must be correct. When installing, you shouldn't take the internal PCB out.
21) When drawing out the controller from the case, do not apply force that would deform or alter the Product.
22) When drawing out the controller from the case to replace the Product, check the status of the terminals.
If necessary, replace the rear case as well.
23) When inserting the controller into the case, if it is hard to do, please stop it. Because it will damage the other internal parts.
24) If you need to draw out the Temperature Controller, ture off the power first.Never touch the terminals or the electronic components, or subject them to physical shock. When inserting the Temperature Controller, do not allow the electric components to contact the case.
25) Static electricity can damage internal components. Always touch grounded metal to discharge any static electricity before handling the Temperature Controller. When drawing out the controller from the case, do not touch the electronic components or patterns on the board with your hand. Hold the Temperature Controller by the edge of the front panel when handling it.
26) The number of EEPROM write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
27) Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
28) Use tools when separating parts for disposal.

Wiring

● Dimensions (mm)

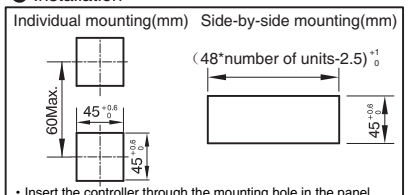
In the pack:
· Main unit ×1
· Adapter ×1
· Instruction manual ×1
· Check out paper ×1

Solderless terminal size: M3.5

*When insert the OPTION UNIT or maintain the controller, please insert the Flat-blade screwdriver into the slots(on the top and the bottom)and release the hooks.

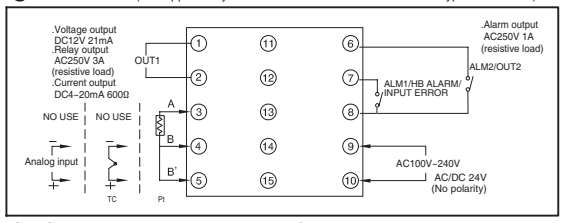
● Installation

Individual mounting(mm) Side-by-side mounting(mm)



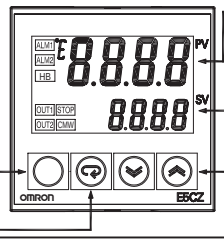
- Insert the controller through the mounting hole in the panel (1-4mm thickness). Push the adapter on from the rear and fasten temporararily,removing any gap between the controller, plane and adapter. Finally, secure two fixing screws.
- When more than one machine is installed, make sure that the ambient temperature does not exceed the specified limit.
- Close side-by-side mounting is possible in one direction only, either horizontally or vertically.

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



- OPTION UNIT is applicable only to models E5CZ-□2M□□.
- For detail function of OPTION UNITs, please refer to the "E5CZ OPTION units instuction manual".
- For the product of E5CZ-C2M, E5CZ-C2M adding OPTION UNITS of E53-CN03N or E53-CNBN satisfy the standard of EN61326 CLASS A in limit of radiated interference field strength test, please add clamp filter in the power line of temperature controller(TDK:ZCAT2235-1030).

● Names of parts on front panel



· Mode key
Press this key to change the level

· Level key
Use this key to change mode:

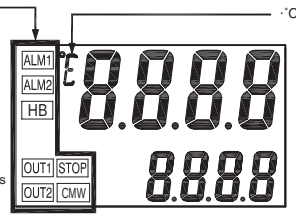
· Press the key and the key together for at least 3 seconds to switch to protect level.

· No.1 display
Process value or set data symbol

· No.2 display
Set point, set data read-put value or changed input value

· Down key/Up key
Use the keys to change the values displayed on the No.2 display.
each press of key increments or advances the values display on the No.2 display.
each press of key decrements or returns the values display on the No.2 display.

Operation indicators
· ALM1: Alarm 1
Lights up while alarm 1 is operating function.
· ALM2: Alarm 2
Lights up while alarm 2 is operating function.
· STOP
Lights up while operation has stopped.
· HB: Heater burnout
Lights up to indicate that heater burnout has occurred.
·OUT1
Lights up when Process control 1 is on; goes out when Process control 1 is off.
Current Output lights is off.
· OUT2
Lights up when Process control 2 is on; goes out when Process control 2 is off.
· CMW:"write" control by communications
Light up when "write" is enabled;
Goes off when "write" is disabled.



·℃ /℉ temperature display
Used to indicate that the value in the display relates to temperature. Determined in accordance with the chosen "Temperature unit" setting.
℉=°F
℃=°C
This flashes while ST(Self-Tuning) is activated.

Operation menu

●Input type

	Input type	Input	Setting	Setting range	
Platinum resistance thermometer input type	Platinum resistance thermometer	Pt100	0	-200~850(℃)	/-300~1500(℉)
			1	-199.9~500.0(℃)	/-199.9~900.0(℉)
			2	0.0~100.0(℃)	/0.0~210.0(℉)
		JPt100	3	-199.9~500.0(℃)	/-199.9~900.0(℉)
			4	0.0~100.0(℃)	/0.0~210.0(℉)
Thermocouple input type	Thermocouple	K	5	-200~1300(℃)	/-300~2300(℉)
			6	-20.0~500.0(℃)	/0.0~900.0(℉)
		J	7	-100~850(℃)	/-100~1500(℉)
			8	-20.0~400.0(℃)	/0.0~750.0(℉)
		T	9	-200~400(℃)	/-300~700(℉)
			22	-199.9~400.0(℃)	/-199.9~700.0(℉)
		E	10	0~600(℃)	/0~1100(℉)
		L	11	-100~850(℃)	/-100~1500(℉)
		U	12	-200~400(℃)	/-300~700(℉)
			23	-199.9~400(℃)	/-199.9~700.0(℉)
		N	13	-200~1300(℃)	/-300~2300(℉)
		R	14	0~1700(℃)	/0~3000(℉)
		S	15	0~1700(℃)	/0~3000(℉)
		B	16	100~1800(℃)	/300~3200(℉)
	Infrared Thermosensor ES1B	10~70°C	17	0~90(℃)	/0~190(℉)
		60~120°C	18	0~120(℃)	/0~240(℉)
		115~165°C	19	0~165(℃)	/0~320(℉)
		140~260°C	20	0~260(℃)	/0~500(℉)
	Analog input	0~50mV	21	Use the following ranges for scaling:-1999 to 9999, -199.9 to 999.9 Vary Depending on "L","H" value	

· Default="5"

●Alarms

setting value	Alarm type	Alarm output function	
		Positive alarm value(X)	Negative alarm value(X)
0	No alarm function	Output off	
1	Upper- and lower- limit (deviation) *1	ON OFF L H SP	Vary with "L","H"values
2	Upper-limit(deviation)	ON OFF X SP	ON OFF X SP
3	Lower-limit(deviation)	ON OFF X SP	ON OFF X SP
4	Upper- and lower-limit range (deviation) *1	ON OFF L H SP	Vary with "L","H"values
5	Upper- and lower-limit with standby sequence(deviation)*1	ON OFF L H SP	Vary with "L","H"values
6	Upper-limit with standby sequence(deviation)	ON OFF X SP	ON OFF X SP
7	Lower-limit with standby sequence(deviation)	ON OFF X SP	ON OFF X SP
8	Absolute-value upper-limit	ON OFF X 0	ON OFF X 0
9	Absolute-value lower-limit	ON OFF X 0	ON OFF X 0
10	Absolute-value upper-limit with standby sequence	ON OFF X 0	ON OFF X 0
11	Absolute-value lower-limit with standby sequence	ON OFF X 0	ON OFF X 0

· Default="2"

● Initial/Communication protect

Limits transition to the Initial setting level and Advancedfunction setting level.

Setting	Initial setting level	Communication Setting Level
0	Transition possible(Transition to Advanced function level possible)	Transition possible
1	Transition possible(Transition to Advanced function level not possible)	Transition possible
2	Transition not possible	Transition not possible

· Default = "1"

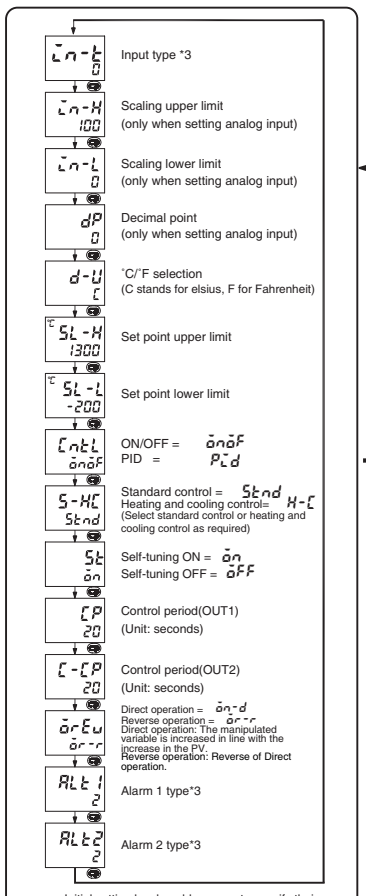
●Setting change protect

Limits changes of setting by key operations.
OFF: Key operations can be used to change settings
ON: Key operations can not be used to change settings
(Protect level settings can all be changed)

● Other functions

In addition to the aforementioned, there are alarm hysteresis, automatic return of display mode and others in the advanced setting level.
Refer to "E5CZ Manual" for details.
For communications details, please refer to "E5AZ/EZ/CZ/PRR communications User's Manual".

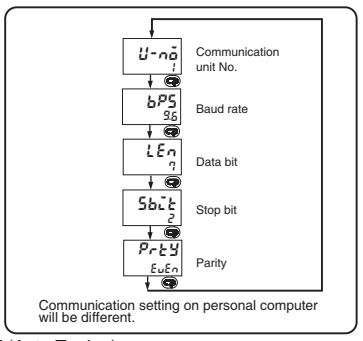
●Initial setting level control stopped *4



Initial setting level enables users to specify their preferred operating conditions(input type, alarm type, control method, etc.)

Hold down for less than 1 second

● Communication setting level

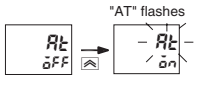


Communication setting on personal computer will be different.

●AT (Auto Tuning)

· AT in Adjustment
Designated "on" to execute AT and "oFF" to cancel AT.

Also when AT execution ends, the display automatically returns to "off"



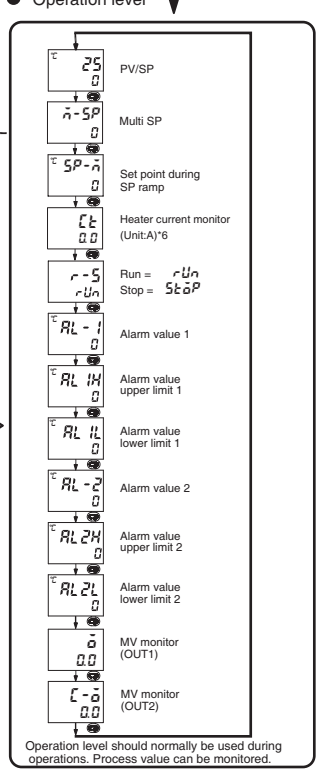
POWER ON

● Operation level

Hold down for at least 3 seconds

No.1 display flushes when hold down for more than 1 second

Hold down for at least 1 second



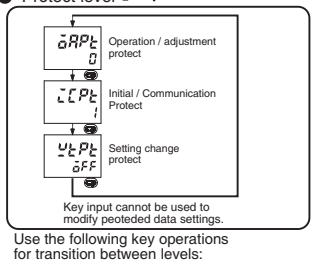
Operation level should normally be used during operations. Process value can be monitored.

Press (less than 1 second)

Hold and down for at least 1 second

Hold and down for at least 3 seconds

● Protect level



Key input cannot be used to modify peoteded data settings.

Use the following key operations for transition between levels:
Operation level → Protect level:
+ keys for at least 3 seconds
Operation level → Adjustment level:
key for less than 1 second
Operation level → Initial level:
key for at least 3 seconds

● Operation / Adjustment protect

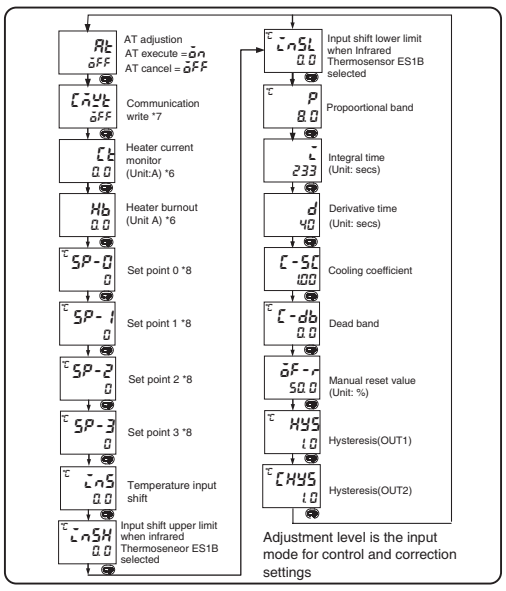
The following table shows the relationship between settings and protect limits related to Operation level and Adjustment level.

Mode	Setting			
	0	1	2	3
Process value	○	○	○	○
Set point	◎	◎	◎	○
Others	◎	◎	×	×
Adjustment level	◎	×	×	×

◎: Can be displayed or changed
○: Can be displayed
×: Can not be displayed and move to other levels not possible

·No protect when set to "0"
·Default = "0"

● Adjustment level



Adjustment level is the input mode for control and correction settings

● Error display(trouble shooting)

When an error has occurred, the No.1 display alternately indicates error codes toghther with the current display item.

No. 1 display	Meaning	Action	Output status	
			Control output	Alarm output
SErr (S.Err)	Input error *2	Check the wiring of inputs, disconnections, shorts and input type.	OFF	Operates as above the upper limit
	A/D converter error *2	After the correction of input error, turn the power Off then back On again. If the display remains the same, the controller must be changed. If the display is restored to nomal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF
E111 (E111)	Memory error	First, turn the power Off then back ON again. If the display remains the same, the controller must be changed. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF
H.Err (H.Err)	Internal circuit error *2		OFF	OFF
FFFF	Over the current	Continue to controlling, run normally. If show the "Heater current monitor", it will display the wrong information.	ON	ON

If the input value exceeds the display limit(-1999(-199.9) to 9999(999.9)), though it is within the control range, EEEE will be displayed under -1999(-199.9) and JJJJ above 9999(999.9).
Under these conditions, control output and alarm output will operate normally.

● The check list when the problem happen

Appearance	Cause
Though the control object temperature has changed, the displayed temperature was not changed.	When the used sensor is Pt, the setting of input type is Thermocouple. The sensor is TC type but the sensor short.
The displayed temperature is higher (or lower) than the control object temperature.	The temperature input shift setting is not suitable. Thermocouple connection polarity is wrong.
Can not start temperature control.	"RUN/STOP" function is set to "STOP". "Propoortional band" setting is too big. The setting of "Direct operature/Reverse operature" is wrong. (Ex: To control the heater, but set to "Direct operature")
Key switch is not function.	"Set point limits" function limits to change the set point. Operation protect funtion is working.

*1: Uper 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.
*3: Refer to the adjoining tables for details of input types and alarm types.
*4: Controller does not operate during initial setting level.(Process will be stopped)
*5: Some setting items may not be displayed according to the setting.
*6: Applicable only to models with the heater burnout alarm function.
*7: Applicable only to models with a communications function.
*8: Applicable only to models with event function.
*9: E5CZ-R2/-Q2 can not use the function of *6,*7,*8; E53-CN□□N is applicable only to models of E5CZ-□2M.

■Specifications

Power supply voltage	100-240VAC type DC 24V or AC 24V type
Operating frequency	50/60Hz
Operating voltage range	85 to 110% of the rated voltage
Environment temperature	-10 to 55°C (Avoid freezing or condensation)
Ambient humidity	RH 25 to 85%
Altitude	Max. 2,000m
Characteristic:	
Indication accuracy	Thermocouple: (±0.5% of indication value or ±1°C, whichever greater)±1 digit max. As follows the accuracy has the exceptions by temperature range. ±2°C±1 digit max.at K(-200 to 1300), or at less than -100°C of T,N ±2C±1 digit max.at U and L No accuracy regulation at under 400°C of B ±3°C±1 digit at less than 200°C of R and S Analog input: ±0.5%FS ±1digit max. Platinum resistance thermometer: (±0.5% of indication value or ±1°C, whichever greater)±1 digit max.
Power consumption	E5CZ-R2 / Q2 7VA(AC100~240V) E5CZ-□2M 7.5VA(AC100~240V) 5VA(24V AC)/3W(24V DC)
Sensor input	Thermocouple Platinum resistance thermometer Analog input Infrared Thermosensor ES1B
Control output	Relay output: SPST-NO 250VAC,3A(resistive load) Voltage output: DC12V(21mA) Current output: DC4~20mA 600Ω
Alarm output	Relay output:250VAC,1A(resistive load)
Mechanical life of relay	10 million operations
Electrical life of relay	100,000 operations
Control method	ON/OFF or advanced PID
Others:	
Storage temperature	-25 to 65°C (Avoid freezing or condensation)
Recommended fuse	T2A, 250V AC, time-lag, low-breaking capacity
Weight	Approx. 140g(main unit only) Approx. 150g(including Option Unit)
Degree of protection	Front panel : IP50, Enclosure Category 2 (as per IEC60529) Rear case : IP20, Terminal section : IP00
Installation environment	Installation category II, pollution degree 2 Indoor Use Only (as per IEC61010-1)
Memory protection	EEPROM (non-volatile memory) (Number of write operations: 1,000,000)
Terminal	Field wiring terminal

■Link Way

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