型 E5CSZ 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)

1649996-4 C

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)在维修前,请将一个以上开关断开以确保设备处于断电状态。 c)信号输入为SELV限制回路。 d)注意:为了降低火灾或触电的危险,请勿在内部连接不同级别的2条电路。
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。
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。
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坏与事故的原因。温控仪设定如下: · 设定温控仪的参数,使其与控制对象的内容相同。 · 在改变开关设定前请切断温控仪电源。当温控仪电源打开时,开关设定只读。 · 在操作温控仪前请确定在控制模式选择状态下的INIT开关是切断的。
当温控仪因故障而无法正常运行时会损坏设备和机器。为了安全请考虑温控仪可能的故障,并在别系统中安装监视设备或防止温度过高的报警系统。
错误的端子连接可能会导致火灾或设备故障。设定好开关后请把温控仪插入后外壳,并确定上下钩链是否安全锁住。

符合的安全标准

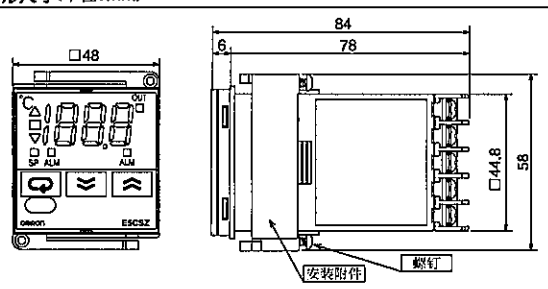
在输入电源、继电器输出和其他端子之间增强绝缘。

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0.832mm²)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)不是电器离的。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、大电流的动力线散分开配置。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) 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。
18) 变更设定时间请考虑到可能会造成出力持续为OFF。
19) 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。
20) 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。
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) 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。插同时,请不要让电子部品与外壳接触。
24) 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。
25) 关于清洁:请勿使用油漆稀释剂,请用标准等级的酒精。
26) 请使用工具来分离部品。

■配线

●外形尺寸(单位:mm)



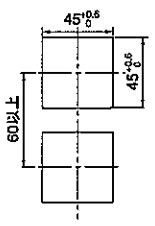
包装内容
- 温控仪 1个
- 安装附件 1个
- 操作说明书 1份
- 合格证 1枚

- 在没有连接端子的情况下,可以把温控仪从外壳取出维修。
- 不能移去端子排,这样操作会导致失误或故障。

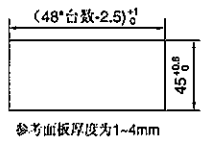
●安装

●平行安装(面板切断)

单个安装(单位:mm)



多个并行安装(单位:mm)

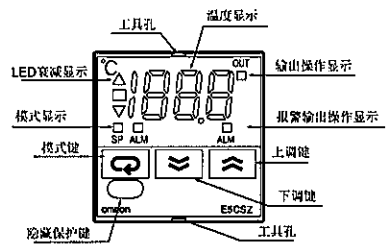


参考面板厚度为1~4mm

- 安装时,请将温控仪插入面板(厚度1~4mm)开好的面孔穴,并将附属安装附件嵌入后盖,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。

●前部位各名称

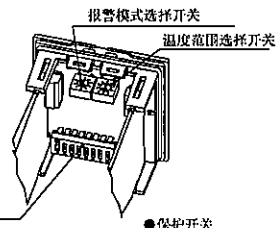
●显示

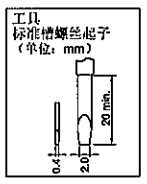


- 温度显示
显示当前温度、设定温度、报警设定温度或是输入变化值。
- LED衰减显示
▲:当当前值与设定值之间的差值大于0.25%量程,灯亮。
■:当当前值与设定值之间的差值在±0.25%量程之内,灯亮。
▼:当当前值与设定值之间的差值小于0.25%量程,灯亮。
当自调或自动调节时,温度显示会闪烁。
- 输出操作显示
OUT:控制输出显示
控制输出功能ON时,灯亮;
控制输出功能OFF时,灯亮;
- 报警输出操作显示
ALM:报警显示
报警输出功能ON时,灯亮;
- 模式显示
SP:当设置温度显示时,灯亮;
ALM:当报警设置温度显示时,灯亮;
- 模式键
切换显示:当前值、设定值、报警值和输入变化值。
- 上调键/下调键
当按压上调键时,当前值、设定值、报警值和输入变化值会随之增加;
当按压下调键时,当前值、设定值、报警值和输入变化值会随之减小;
- 隐藏保护键
当同时按住此键和上调键/下调键时,设定值会改变。

●开关

把工具插入前面板的上下孔槽(见右图)抓住面板,把它从温控仪中拉出。

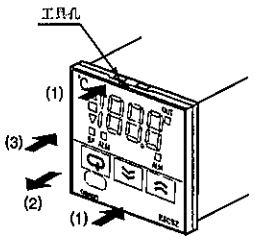




●保护开关
- 保护开关上调到ON时,不能使用上调键及下调键并能防止设定错误。
- 但是,保护开关上调到ON时模式键仍可以使用。(显示仍能在当前温度、设定温度、报警温度和输入变化值之间选择。)
- 默认值为"OFF"。

●从外壳中取出E5CSZ

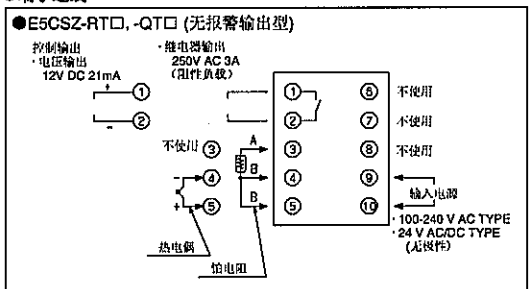
E5CSZ能在不移去端子连接的情况下从外壳中取出进行维修。



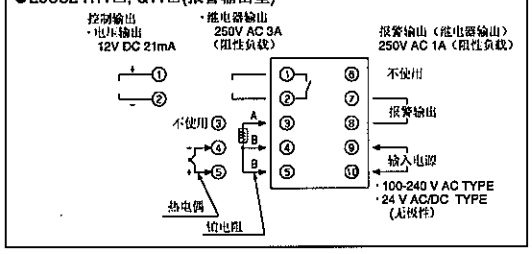
1. 把工具插入两个工具孔(一个在上面一个在下面),然后释放该孔。
2. 把工具插入前面板与后外壳之间的缝隙,握住前面板的上下两端,轻轻用力把前面板往自己的方向拖出,切忌不能用力过大。
3. 当插入E5CSZ时,把E5CSZ推进后外壳直到它位置固定。插入E5CSZ的同时,按下后外壳表面上下的卡口,直到卡口能安全的锁住。最后请确认电子元件没有接触到外壳。

●端子连线

●E5CSZ-RT□, -QT□ (无报警输出型)



●E5CSZ-R1T□,-Q1T□(报警输出型)

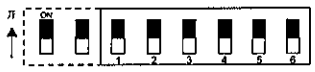


■操作手册

■设定

步骤一 设定开关的操作模式

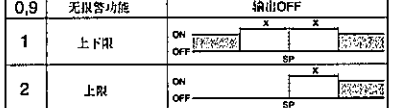
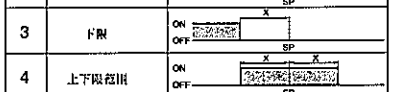
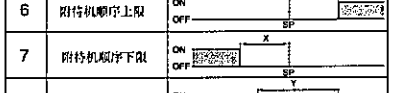
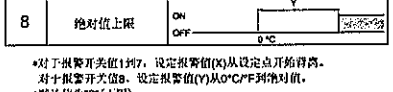
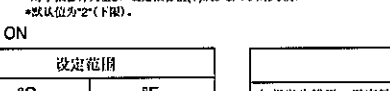
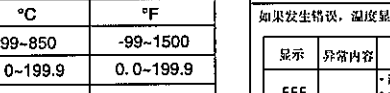
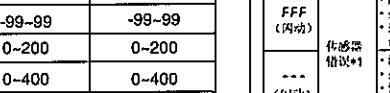
●控制模式选择开关



开关	功 能	OFF	ON
1	控制模式	ON/OFF控制	2-PID控制
2	控制周期	20秒	2秒
3	正/逆动作选择	逆动作	正动作
4	温度输入偏移	不能使用	可使用
5	输入类型	热电偶	铂电阻
6	°C / °F 选择	°C	°F

- 所有开关的默认状态为OFF。
- 当选择开/关控制时,滞后量为0.1%量程。
- 当选择2-PID时,PID参数会通过自调自动设置到最适宜的控制状态。
- 当输入变化不显示时,输入变化值也会有所影响(如当显示输入变化不能使用时)。
- 不使用输入变化就把它的值调节至H0,默认设置为H0。

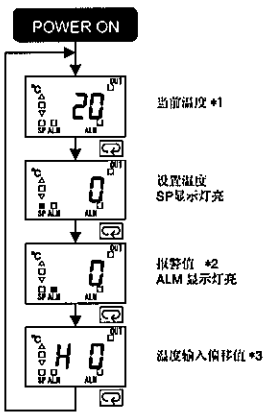
●报警模式选择开关

开关值	报警种类	报警输出
0,9	无报警功能	输出OFF
1	上下限	
2	上限	
3	下限	
4	上下限范围	
5	附待机顺序上下限	
6	附待机顺序上限	
7	附待机顺序下限	
8	绝对值上限	

*对于报警开关值1到7,设定报警值(X)从设定点开始得到。
对于报警开关值8,设定报警值(Y)从0°C/°F到绝对值。
*默认值为"2"(下限)。

步骤二 设定控制温度

●温度显示



*1 要开启AT(自动调节),请同时按住上调键及下调键2秒以上直到温度显示开始显示,同样操作可关闭AT。
*2 仅在报警模式下显示。
当报警模式选择开关设置到0或9时,没有报警温度显示。
*3 当控制模式选择开关4设置为OFF时,输入变化值不显示。

● 温度范围选择开关

控制模式选择开关5:OFF

输入	设定值	设定范围 °C	设定范围 °F
K	0	-99~1300	-99~1999
	1	0.0~199.9	0.0~199.9
J	2	-99~850	-99~1500
	3	0.0~199.9	0.0~199.9
L	4	-99~850	-99~1500
	5		
	6		
	7		
	8		
	9		

*设定值5到9不能使用。

控制模式选择开关5:ON

输入	设定值	设定范围 °C	设定范围 °F
Pt100	0	-99~850	-99~1500
	1	0.0~199.9	0.0~199.9
	2	-99~99	-99~99
	3	0~200	0~200
	4	0~400	0~400
	5		
	6		
	7		
	8		
	9		

自我诊断功能

如果发生错误,温度显示会有所显示。请检查错误类型,并按下列内容处理。

显示	异常内容	现 象	处理	控制输出 相反	控制输出 正常
FFF (闪动)	传感器错误*1	· 温度上升超过最申温度。 · 热电偶或铂电阻发生错误。 · 热电偶/铂电阻多输入模式:温度传感器在设定温度范围以外的高温情况下发生故障。	请确认输入接线、断路、短路及输入种类。	OFF	OFF
--- (闪动)		· 温度下降低于下限温度。 · 热电偶的极性(正极或负极)相反。 · 铂电阻发生错误。 · 热电偶/铂电阻多输入模式:温度传感器在设定温度范围以外的低温情况下发生故障。		OFF	OFF
E11	储存错误	储存发生故障	在纠正输入错误以后,可再次打开电源。	OFF	OFF

*1 输入在控制范围内超过显示范围(-99~1999)时,小于-99时呈现 ccc ;大于1999时呈现 ddd 。
在以下情况下,控制输出和报警输出会操作正常。
- 当FFF显示(闪动)时,报警输出会作为一个不正常的高温报警输出。
- 当---显示(闪动)时,报警输出会作为一个不正常的低温报警输出。
- 当E11显示时,报警输出会被关闭。

●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°C(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	· 热电偶 (±0.5%PV或1°C取大值) ±1b · 铂电阻 (±0.5%PV或1°C取大值) ±1b
功率消耗	5VA (100~240V AC) 3VA(24V AC)/2W(24V DC)
传感器输入	热电偶、铂电阻
控制输出	继电器输出:250V AC 3A(阻性负载) 电压输出:12V DC (21mA)
报警输出	继电器输出:250V AC 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	开/关或2自由度 PID
其它:	
保存温度	-25~65°C(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 低分断能力
重量	本体约120g(仅本体)
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	Category II、污染度2 (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

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。再或者在目录,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、安全装置及各个业界所特有的设备。
c) 使用在对于人的生命及财产有危险产的系统、机械及装置。
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信赖性的设备。
e) 其他,以上到 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总合目录、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。

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E5CSZ 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

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

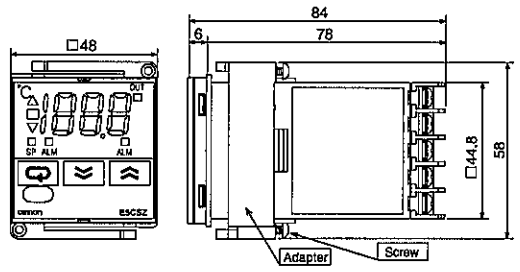
The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. Using the product beyond its service life may occasionally result in contact welding or burning.	
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.	⚠
Do not allow piece of metal, wire clippings, or fine metallic shavings or filings from installation to entar 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.	
Unexpected operation may result in equipment damage or accidents if the settings are not appropriate for the controlled system. Set the Temperature Controller as follows: · Set the parameters of the Temperature Controller so that they are appropriate for the controlled system. · Turn the power supply to the Temperature Controller OFF before changing any switch setting. Switch settings are read only when the power supply is turned ON. · Make sure that the INIT switch in the control mode selector switches is turned OFF before operating the Temperature Controller.	❗
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.	
Faulty terminal contact may result in a fire or equipment malfunction. When inserting the Temperature Controller into the rear case after setting the switches, check the watertight packing and make sure that the top and bottom hooks are locked securely in place.	

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 AWG14. (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) Be sure that the platinum resistance thermometer type and the input type set on the Temperature Controller are the same.
18)The output may turn OFF when shifting to certain levels.Take this into consideration when performing control.
19) 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.
20) 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.
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) 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.
24) 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.
25) Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
26) Use tools when separating parts for disposal.

■ Mounting

● Dimensions



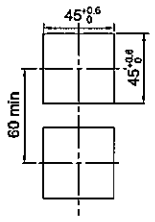
In the pack
- Main unit *1
- Adapter *1
- Instruction Manual *1
- Check out paper *1

- The main unit can be removed for maintenance without disconnecting the terminal wiring.
- Do not remove the terminal block. Doing so may result in failure or malfunction.

●Installation Diagrams

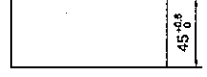
●Flush mounting (Panel cutout)

Individual mounting (mm)



Side-by-side mounting (mm)

(48 x number of units -2.5)+1 0

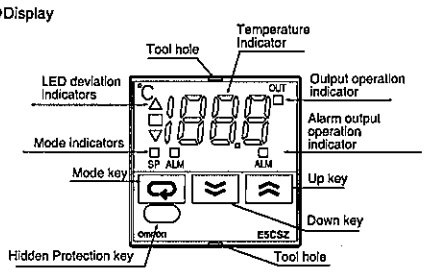


Recommended panel thickness is 1 to 4 mm.

- 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 horizontaliy or vertically.

●Names of Front Parts

●Display



Temperature Indicator
The present temperature, set temperature, alarm set temperature, or input shift value is displayed.LED deviationindicators
▲ : Lit when the difference between the present temperature and the set temperature is larger than +0.25% FS.
■ : Lit when the difference between the present temperature and the set temperature is within ±0.25% FS.
▼ : Lit when the difference between the present temperature and the set temperature is smaller than -0.25% FS.
ST or AT will flash on the temperature indicator when self-tuning or auto-tuning is being performed.

Output operation indicator
OUT : Control output indicator
Lit when the output function is ON; not lit when the output function is OFF.

Alarm output operation indicator
ALM : Alarm indicator
Lit when the alarm 1 function is ON.

Mode indicators
SP : Lit when the set temperature is displayed.
ALM : Lit when the alarm set temperature is displayed.

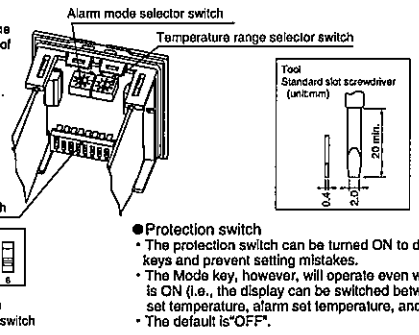
Mode key
Switches the display between the present temperature, set temperature, alarm set temperature, and input shift value.

Up key / Down key
The set temperature, alarm set temperature, or input shift value will increase when the Up Key is pressed.
The set temperature, alarm set temperature, or input shift value will decrease when the Down Key is pressed.

Hidden protection key
Set values can be changed when the protection switch is ON by holding down the hidden protection key and pressing the Up or Down keys.

●Switch

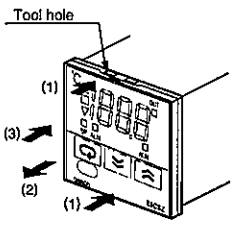
Insert the release tool (see the following diagram) into each of the two insertion holes to release the hooks at the top and bottom of the front panel. Grasp the panel and pull it forward to drawing out the Temperature Controller.



●Protection switch
- The protection switch can be turned ON to disable the Up and Down keys and prevent setting mistakes.
- The Mode key, however, will operate even when the protection switch is ON (i.e., the display can be switched between the present temperature, set temperature, alarm set temperature, and input shift value).
- The default is"OFF".

●Removing the E5CSZ from the Case

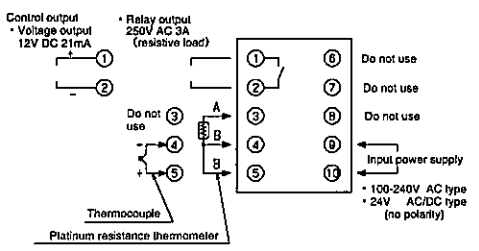
The E5CSZ can be removed from the case to perform maintenance without removing the terminal leads.



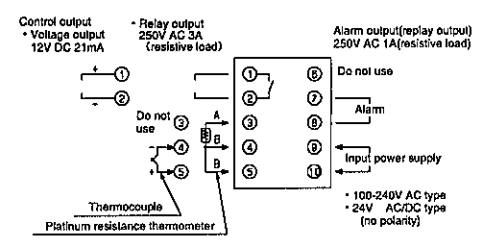
1. Insert the tool into the two tool holes (one on the top and one on the bottom) and release the hooks.
2. Insert the tool in the gap between the front panel and rear case, and pull out the front panel slightly. Hold the top and bottom of the front panel and carefully pull it out toward you, without applying unnecessary force.
3. When inserting the E5CSZ, push the E5CSZ toward the rear case until it snaps into position. While pushing the E5CSZ into place, push down on the hooks on the top and bottom surfaces of the rear case so that the hooks are securely locked in place. Be sure that electronic components do not come into contact with the case.

●Terminal Layout

●E5CSZ-RT□, -QT□ (No alarm output type)



●E5CSZ-R1T□,-Q1T□ (Alarm output type)

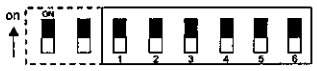


■ Operation

■ Setting

Step1 Set the operating specifications with the switches.

● Control mode selector switch



Switch	Function	OFF	ON
1	PID ·ON/OFF	ON/OFF control	2-PID control
2	Control period	20 seconds	2 seconds
3	Forward/reverse operation	Reverse	Normal
4	Input shift	Disable	Enable
5	Thermometer replacement	Thermocouple	Platinum resistance thermometer
6	Selection	°C	°F

- All switches are OFF by default.
- Hysteresis is 0.1% FS when ON/OFF control is selected. The PID parameters are automatically set for optimum control by ST (self-tuning) when 2-PID control is selected.
- The input shift values will be effective even when the input shift is not displayed (i.e., when displaying the input shift is disabled). To disable the input shift, set the input shift value to H0. The default setting is H0.

● Alarm mode selector switch

SW No.	Alarm type	Alarm output
0,9	No alarm function	Output off
1	Upper-and lower-limit (deviation)	
2	Upper-limit(deviation)	
3	Lower-limit(deviation)	
4	Upper-and lower-range (deviation)	
5	Upper-and lower-limit with standby sequence (deviation)	
6	Upper-limit with standby sequence (deviation)	
7	Lower-limit with standby sequence (deviation)	
8	Absolute-value upper-limit	

*For alarms 1 to 7, set the alarm value (X) to the deviationfrom the set point. For alarm 8, set the alarm value (Y) to the absolute value from 0 °C/°F.
*The default is "2" (Deviation upper limit).

● Temperature range selector switch

Control mode selector switch 5: OFF

Input	Setting	Setting range °C	Setting range °F
K	0	-99 to 1300	-99 to 1999
	1	0. 0 to 199.9	0. 0 to 199.9
J	2	-99 to 850	-99 to 1500
	3	0.0 to 199.9	0. 0 to 199.9
L	4	-99 to 850	-99 to 1500
	5		
	6		
	7		
	8		
	9		

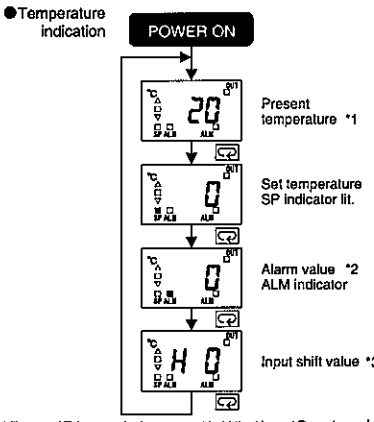
Control mode selector switch 5: ON

Input	Setting	Setting range °C	Setting range °F
Pt100	0	-99 to 850	-99 to 1500
	1	0. 0 to 199.9	0. 0 to 199.9
	2	-99 to 99	-99 to 99
	3	0 to 200	0 to 200
	4	0 to 400	0 to 400
	5		
	6		
	7		
	8		
	9		

* The range of 5 to 9 can not be used.

Step2 Set the control temperature

●Temperature indication



*1 To start AT (auto-tuning), press and hold the Up and Down keys simultaneously for at least 2 seconds while the temperature is displayed on the temperature indicator. Perform the same operation to stop AT.
*2 Displayed only for models with alarms. When alarm mode selector switch is set to 0 or 9, no alarm temperature is displayed.
*3 Input shift value is not displayed when pin 4 of control mode selector switch is set to OFF.

SELF-DIAGNOSTIC FUNCTION

If an error occurs, it will be displayed on the temperature display. Check the type of error and correct the error accordingly.

Display	Error	Meaning	Action	Control output Reverse	Control output Normal
FFF (flashing)	Sensor error *1	· The temperature has risen beyond the overflow temperature. · The thermocouple or platinum resistance thermometer has failed. · TC/PI multi-input models: A temperature sensor error has occurred at a temperature higher than the set temperature range.	Check the wiring of inputs, disconnections,shorts and input type.	OFF	OFF
--- (flashing)		· The temperature has fallen below the underflow temperature. · The polarity (positive and negative) of thermocouple has been reversed. · The platinum resistance thermometer has failed. · TC/PI multi-input models: A temperature sensor error has occurred at a temperature lower than the set temperature range.		OFF	OFF
E11	Memory error	Memory has failed	After the correction of input error, turn the power OFF then back ON again.	OFF	OFF

If the input value exceeds the display limit (-99 to 1999), though it is within the control range, ccc will be displayed under -99 and ccc above 1999. Under these conditions, control output and alarm output will operate normally.
*1 Alarm output (Models with alarm output type only)
- The alarm output will operate as an abnormally high temperature alarm output when FFF is displayed (flashes).
- The alarm output will operate as an abnormally low temperature alarm output when --- is displayed (flashes).
- The alarm output will turn OFF when E11 is displayed.

● Specifications

Power supply voltage	100-240VAC type 24VDC OR 24VAC type
Operating frequency	50/60Hz
Operating voltage range	85 to 110% of the rated voltage
Ambient 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, which is greater) ±1 digit max. Platinum resistance thermometer (±0.5 % of indication value or ±1°C, which is greater) ±1 digit max.
Power consumption	5VA (100-240V AC) 3VA (24V AC) 2W (24V DC)
Sensor input	Thermocouple Platinum resistance thermometer
Control output	Relay output:250V AC 3A (resistive load) Voltage output:12V DC(21mA)
Alarm output	Relay output:250V AC 1A (resistive load)
Mechanical life of relay	10 million operations
Electrical life of relay	100,000 operations
Control method	ON/OFF or 2-PID control
Others:	
Storage temperature	-25 to 65°C (Avoid freezing or condensation)
Recommended fuse	T2A 250V AC,time-lag, low-breaking capacity
Weight	Approx.120g (main unit only)
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 (as per IEC61010-1)
Memory protection	EEPROM (non-volatile memory) (Number of write operations: 1,000,000)
Terminal	Field wiring terminal

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 theproduct. 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.

Conformity to Safety standards

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

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