

## Temperature Controller

## E5□J

### Fuzzy Self-tuning Temperature Controller with Advanced PID (2-PID) Control

- DIN-size:  
96 x 96 mm (E5AJ), 72 x 72 mm (E5BJ),  
48 x 48 mm (E5CJ), 48 x 96 mm (E5EJ)
- Fuzzy self-tuning and Auto-tuning optimize temperature control.
- Minimal user setup.
- Dual set point, selectable by external input.
- RUN/STOP operation (E5AJ/E5EJ) by external input.
- Front panel protection conforming to IP54 on E5AJ/E5EJ/E5BJ (IP66/NEMA4 with optional cover). E5CJ conforms to IP50 (IP66/NEMA4 with optional cover).
- Serial communications models (E5AJ/E5EJ).
- Relay, voltage or linear outputs.
- Conforms to international EMC and safety standards.



## Ordering Information

### Temperature Controllers

#### E5AJ/EJ/BJ

Item	Standard type Two alarm outputs; two event inputs (with heater burnout alarm)	Communications type			Communications Board add-on type
		RS-232C	RS-422	RS-485	
Model	E5AJ-A2HB E5EJ-A2HB E5BJ-A2HB	E5AJ-A2H01 E5EJ-A2H01	E5AJ-A2H02 E5EJ-A2H02	E5AJ-A2H03 E5EJ-A2H03	E5AJ-A2HM E5EJ-A2HM

- Note:**
1. Be sure to specify Control Output Unit and Current Transformer as necessary when ordering.  
Example: E5AJ-A2HB, Relay Output Unit E53-R, Current Transformer E54-CT1
  2. The heater burnout alarm is not available when the E5□J is used with Linear Output Units.
  3. Ask your OMRON representative for the *E5AJ/E5EJ Communications Manual (Z102)* when using a model incorporating a communications function.
  4. Be sure to specify Communications Boards as necessary when ordering E5AJ/EJ-A2HM Communications Board add-on types.

#### Control Output Unit (Required for E5AJ, E5BJ, and E5EJ)

Type	Relay Output Unit	Voltage Output Unit (for SSR drive)	Current Output Unit
Model	E53-R	E53-Q	E53-C3

#### Communications Boards

When communications capability is required, mount one of the following Boards on the E5AJ-A2HM or E5EJ-A2HM.

Communications	RS-232C	RS-422	RS-485
Model	E53-J01	E53-J02	E53-J03

**Note:** For details, refer to the *E5AJ/E5EJ Communications Manual (Z102)*.

## E5CJ

Item	Standard type			Single-function type					
	Two alarm points; one event input			Two alarm points; without event input			Without alarm and event input		
	Relay output	Voltage output	Current output	Relay output	Voltage output	Current output	Relay output	Voltage output	Current output
Model	E5CJ-R2HB	E5CJ-Q2HB	E5CJ-C2B	E5CJ-R2	E5CJ-Q2	E5CJ-C2	E5CJ-R	E5CJ-Q	E5CJ-C

**Note:** Be sure to specify Current Transformer as necessary when ordering E5CJ-R2HB and E5CJ-Q2HB.  
The heater burnout alarm is not available for models other than E5CJ-R2HB and E5CJ-Q2HB.

### ■ Current Transformers (CT) (Order Separately)


Hole diameter	5.8 mm	12.0 mm
Model	E54-CT1	E54-CT3

**Note:** No CT is required unless the heater burnout alarm function is used.

### ■ Terminal Covers (Order Separately)

Model	E5AJ	E5EJ	E5CJ
Connectable models	E53-COV02	E53-COV03	E53-COV04

### ■ Temperature Ranges

Input (switch selectable)	Temperature-resistance thermometer	Thermocouple							
		JPt100 Platinum resistance thermometer	Pt100 Platinum resistance thermometer	K (CA) Chromel vs. alumel	J (IC) Iron vs. constantan	T (CC) Copper vs. constantan	L Iron vs. constantan	U Copper vs. constantan	N Nichrosil vs. nilsil
Built-in switch  Default setting: 2(K)	°C 1,300 900 800 600 400 300 200 100 0 -100 -200 Temperature range	650.0	650.0	1,300	850	400.0	850	400.0	1,300
	Setting No.	0	1	2	3	4	5	6	7
Minimum setting unit	Target value	0.1°C	0.1°C	1°C	1°C	0.1°C	1°C	0.1°C	1°C
	Alarm	0.1°C	0.1°C	1°C	1°C	0.1°C	1°C	0.1°C	1°C

**Note:** Default setting: 2 (K).

# Specifications

## ■ Ratings

<b>Supply voltage</b>		100 to 240 VAC, 50 or 60 Hz	24 V AC/DC, 50 or 60 Hz
<b>Operating voltage range</b>		85% to 110% of rated supply voltage	
<b>Power consumption</b>		E5AJ/E5EJ: 10 VA (at 100 VAC) to 14 VA (at 240 VAC) E5BJ/E5CJ: 10 VA (at 100 VAC) to 12 VA (at 240 VAC)	10 VA (at 24 VAC) 6 W (at 24 VDC)
<b>Input</b>		Thermocouple (K/J/T/L/U/N) or platinum resistance thermometer (JPt100/Pt100), selectable	
<b>Current Transformer input</b>		Connect an exclusive Current Transformer unit (E54-CT1 or E54-CT3)	
<b>Control output</b>	<b>E5AJ/E5BJ/E5EJ</b>		Replaceable Output Unit (sold separately)
	<b>E5CJ</b>	<b>Relay output</b>	SPST-NO, 3 A at 250 VAC (resistive load)
		<b>Voltage output</b>	20 mA at 12 VDC (with short-circuit protection)
		<b>Current output</b>	4 to 20 mA DC with a load of 600 Ω max. and a resolution of approx. 2600
<b>Control mode</b>		ON/OFF or PID control (2-PID) with fuzzy self-tuning and auto-tuning	
<b>Alarm output</b>		E5AJ/E5EJ: Relay output, 2 independent SPST-NO contacts; 3 A, 250 VAC E5BJ/E5CJ: Common 2 outputs, 2 independent SPST-NO contacts; E5CJ: 1 A, 250 VAC; E5BJ: 3 A, 250 VAC	
<b>Setting method</b>		Digital setting via Up and Down Keys	
<b>Indication method</b>		Digital indications Character heights: E5AJ: PV: 15 mm, SV: 10.5mm E5EJ/E5BJ: PV: 14 mm, SV: 9.5 mm E5CJ: PV: 12 mm, SV: 8 mm	
<b>Event input</b>		Contact input: ON: 1 kΩ max., OFF: 100 kΩ min. No-contact input: ON: residual voltage: 3 V max., OFF: leakage current: 1 mA max.	
<b>Other functions</b>		Key protection Direct and reverse output selection Multiple SP (four set points; up to four set points available on E5AJ/E5EJ by engineering level) RUN/STOP (selected via external terminals) (E5AJ, E5EJ) Heater burnout detection	

**Note:** It is possible to add other functions from the engineering level. Refer to the *E5□J Operation Manual*, obtainable from your OMRON representative, for details.

## ■ Characteristics

<b>Indication accuracy (see note 1)</b>	(±0.5% of indication value or ±1°C, whichever greater) ±1 digit max.
<b>Hysteresis</b>	0.1° to 999.9°C/°F (in units of 0.1°C/°F) (during ON/OFF control action)
<b>Proportional band</b>	0.1° to 999.9°C/°F (in units of 0.1°C/°F)
<b>Integral (reset) time</b>	0 to 3,999 s (in units of 1 s)
<b>Derivative (rate) time</b>	0 to 3,999 s (in units of 1 s)
<b>Alarm output setting range</b>	Thermocouple (K/J/L/N): -1,999° to 9,999°C/°F (in units of 1°C/°F) Platinum resistance thermometer, thermocouple (T/U): -199.9° to 999.9°C/°F (in units of 0.1°C/°F)
<b>Control period</b>	Pulse output: 1 to 99 s (in units of 1 s)
<b>Sampling period</b>	500 ms
<b>Output refresh time</b>	500 ms
<b>Display refresh time</b>	500 ms
<b>Insulation resistance (see note 2)</b>	20 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	2,000 VAC, 50/60 Hz for 1 min between terminals of different polarities
<b>Vibration resistance</b>	Malfunction: 10 to 55 Hz, 9.8 m/s <sup>2</sup> (1G) for 10 min each in X, Y, and Z directions Destruction: 10 to 55 Hz, 19.6 m/s <sup>2</sup> (2G) for 2 hrs each in X, Y, and Z directions
<b>Shock resistance</b>	Malfunction: 196 m/s <sup>2</sup> (20G), 3 times each in 6 directions (98 m/s <sup>2</sup> (10G) applied to the relay) Destruction: 294 m/s <sup>2</sup> (30G), 3 times each in 6 directions
<b>Life expectancy</b>	Mechanical: 10,000,000 operations (relay alarm output) Electrical: 100,000 operations (relay alarm output)
<b>Ambient temperature</b>	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>Memory protection</b>	Non-volatile memory (number of write operations: 100,000)
<b>Enclosure ratings</b>	Front panel: E5AJ/E5EJ/E5BJ: IEC standard IP54 E5CJ: IEC standard IP50 (see note 3) Rear case: IEC standard IP20 Terminals: IEC standard IP00
<b>Weight</b>	E5AJ: Approx. 360 g, E5EJ: Approx. 280 g, E5BJ: Approx. 240 g, E5CJ: Approx. 170 g; Mounting adapter for E5CJ: approx. 10 g; Mounting bracket for E5AJ, E5BJ, and E5EJ: Approx. 65 g
<b>EMC</b>	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: EN61000-4-2: 4-kV contact discharge (level 2) 8-kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (amplitude modulated, 80 MHz to 1 GHz) (level 3) 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2-kV power-line (level 3) 2-kV I/O signal-line (level 4)
<b>Approved standards</b>	UL1092, CSA C22.2 No. 142 Conforms to EN50081-2, EN50082-2, EN61010-1 (IEC1010-1) (see note 4) Conforms to VDE0106/part 100 (Finger Protection), when the separately-ordered terminal cover is mounted.

- Note:**
1. The indication accuracy of the K, T, and N thermocouples at a temperature of -100°C or less is ±2°C±1 digit maximum. The indication accuracy of the U thermocouple at any temperature is ±2°C±1 digit maximum.
  2. The insulation resistance was measured with a Control Output Unit attached.
  3. The model numbers of the exclusive watertight covers conforming to IP66, NEMA4 are as follows:  
For E5AJ: Y92A-96N; For E5BJ: Y92A-72N; For E5CJ: Y92A-48N; For E5EJ: Y92A-49N
  4. Basic insulation is between the input and output.

## ■ Output Unit Ratings

No event input is photoelectrically insulated from the voltage or current output.

<b>Relay Output Unit (see note 2)</b>	<b>E53-R</b>	SPDT, 5 A at 250 VAC (resistive load)
<b>Voltage Output Unit (for driving SSR)</b>	<b>E53-Q</b>	NPN, 40 mA at 12 VDC (with short-circuit protection)
	<b>E53-Q3</b>	NPN, 20 mA at 24 VDC (with short-circuit protection)
	<b>E53-Q4</b>	PNP, 20 mA at 24 VDC (with short-circuit protection)
<b>Linear Output Unit (see note 1 and 3)</b>	<b>E53-C3</b>	4 to 20 mA; DC: 600 Ω max.; resolution: approx. 2,600
	<b>E53-C3D</b>	0 to 20 mA; DC: 600 Ω max.; resolution: approx. 2,600
	<b>E53-V34</b>	0 to 10 V; DC: 1 kΩ min.; resolution: approx. 2,600
	<b>E53-V35</b>	0 to 5 V; DC: 1 kΩ min.; resolution: approx. 2,600

- Note:**
1. The current output is not a transmission output.  
The heater burnout alarm cannot be used with the E53-C Current Output Units.
  2. The contact configuration will be SPST-NO when used with the E5□J.
  3. No heater burnout alarm is available if the Linear Output Unit is used with the E5□J.

## ■ Heater Burnout Alarm

<b>Max. heater current</b>	Single-phase 50 A VAC (see note 1)
<b>Heater current value display accuracy</b>	±5% FS ±1 digit max.
<b>Heater burnout alarm setting range</b>	0.1 to 49.9 A (in units of 0.1 A) (see note 2)
<b>Min. detection ON time</b>	190 ms (see note 3)

- Note:**
1. Use the K2CU-F□□A-□GS (with gate input terminals) for the detection of three-phase heater burnout.
  2. The heater burnout alarm is always OFF if the alarm is set to 0.0 A and always ON if the alarm is set to 50.0 A.
  3. No heater burnout detection or heater current value measurement is possible if the control output is ON for less than 190 ms.

## ■ Current Transformer Ratings

<b>Max. continuous heater current</b>	50 A
<b>Dielectric strength</b>	1,000 VAC
<b>Vibration resistance</b>	50 Hz, 98 m/s <sup>2</sup> (10G)
<b>Weight</b>	E54-CT1: Approx. 11.5 g; E54-CT3: Approx. 50 g
<b>Accessories (E54-CT3 only)</b>	Contact: 2; Plug: 2

## ■ Output Unit Characteristics

<b>Relay unit life expectancy</b>	Mechanical: 10,000,000 operations min. Electrical: 100,000 operations min.
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## ■ Communications (E5AJ/E5EJ)

Protocol		RS-232C, RS-422, RS-485
<b>Transmission method</b>		Half-duplex
<b>Synchronization method</b>		Start-stop synchronization (asynchronous method)
<b>Baud rate</b>		1,200/2,400/4,800/9,600/19,200 bps
<b>Transmission code</b>		ASCII
<b>Communications</b>	<b>Write to Temperature Controller</b>	Set point, alarm value, remote/local selection etc. (proportional band, integral time, derivative time)
	<b>Read from Temperature Controller</b>	Process value, output value, set point, alarm value, heater current value, initial status, etc. (proportional band, integral time, derivative time)

- Note:**
1. The maximum total cable length must not exceed the following limits.  
RS-422: 500 m, RS-232C: 15 m, RS-485: 500 m
  2. The number of connecting Units including the host computer via RS-485 is 32. The number of connecting Units via RS-422 is 32.

# Nomenclature

## E5CJ

### Set Value (SV) Display

Displays the set temperature and set value of each setting item.

### Process Value (PV) display

Displays the process value, the character for the parameter being displayed on the SV display, and error messages.

### Output Indicator

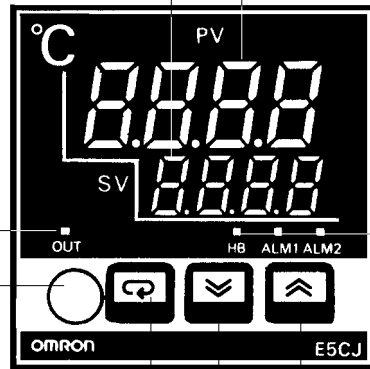
Lights when the control output is ON. In current output mode, however, the output indicator will not be lit.

### Level Key

Press for 1 second minimum to change levels to set different groups of parameters.

### Display Key

Press to shift the display to the next parameter.



### Heater Burnout Indicator

Lights when a heater burnout is detected and stays lit until reset.

### Alarm 1 Indicator

Lights when alarm output 1 is ON.

### Alarm 2 Indicator

Lights when alarm output 2 is ON.

### Down and Up Keys

Press to increase or decrease the value on the SV display. Successively increases or decreases the value when held down for 1 s or more. The value set will be effective automatically in 2 s or immediately after pressing the Display Key or Level Key.

**Note:** There are models that do not incorporate HB, ALM1, and ALM2 indicators.

## E5AJ/E5BJ/E5EJ

### Stop Indicator

Lights when the Temperature Controller is not in operation. The E5BJ or any other E5□J model with a communications function does not incorporate a stop indicator.

### Output Indicator

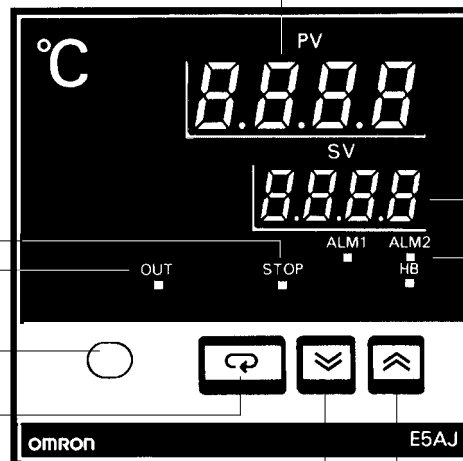
Lights when the control output is ON. In current output mode, however, the output indicator will not be lit.

### Level Key

Press for 1 second minimum to change levels to set different groups of parameters.

### Display Key

Press to shift the display to the next parameter.



### Process Value (PV) display

Displays the process value, the character for the parameter being displayed on the SV display, and error messages.

### Set Value (SV) Display

Displays the set temperature and set value of each setting item.

### Alarm 1 Indicator

Lights when alarm output 1 is ON.

### Alarm 2 Indicator

Lights when alarm output 2 is ON.

### Down and Up Keys

Press to increase or decrease the value on the SV display. Successively increases or decreases the value when held down for 1 s or more. The value set will be effective automatically in 2 s or immediately after pressing the Display Key or Level Key.

### Heater Burnout Indicator

Lights when a heater burnout is detected and stays lit until reset.

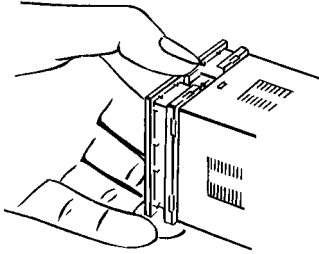
# Operation

**NOTICE:** Always turn off the power supply to the Temperature Controller before changing any switch settings.

## ■ Settings

### E5CJ

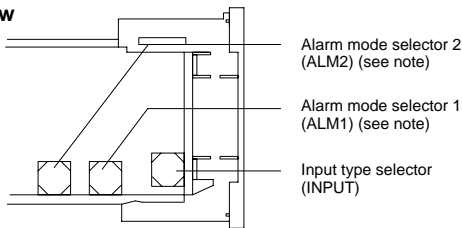
Remove the internal mechanism from the housing. Pull out the internal mechanism while pressing the hook at the bottom of the front panel.



### Internal Switches

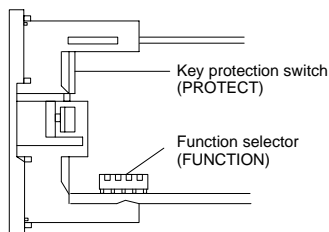
#### E5CJ

##### Top View



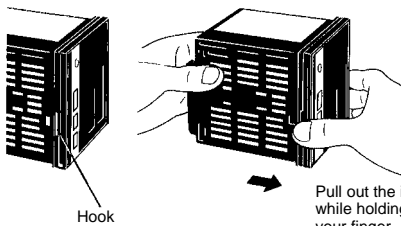
**Note:** A model with no alarm does not incorporate an alarm mode selector.

##### Bottom View



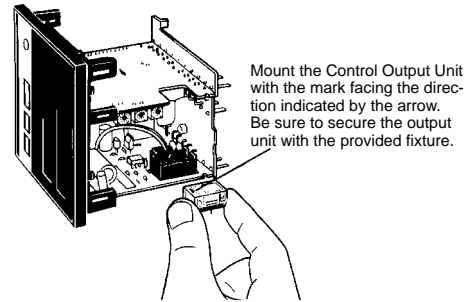
### E5AJ/E5BJ/E5EJ

1. Remove the internal mechanism from the housing. Pull out the internal mechanism while pressing the hook at the bottom of the front panel.

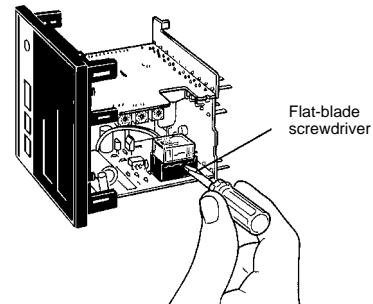


Pull out the internal mechanism while holding down the hook with your finger.  
When inserting the internal mechanism back into the case, push the internal mechanism into the case until it clicks into place.

2. Connect a Control Output Unit to the vacant socket on the printed circuit board as shown below.



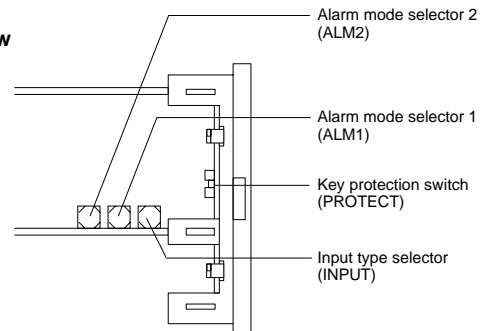
To remove a Control Output Unit, push it up with the tip of a flat-blade screwdriver as shown below.



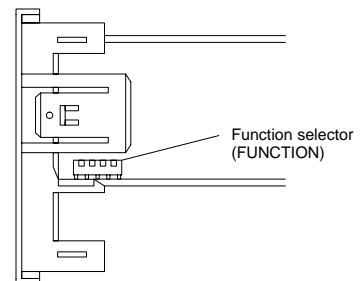
### Internal Switches

#### E5AJ

##### Top View

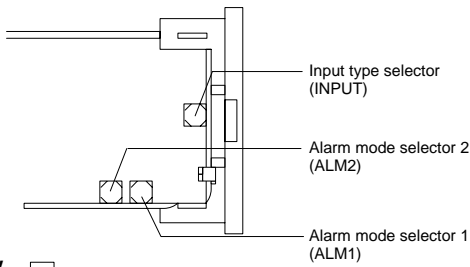


##### Bottom View

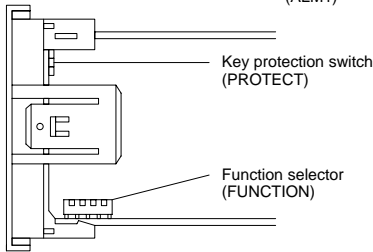


**E5BJ**

**Top View**

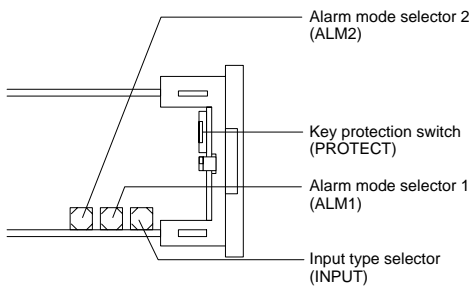


**Bottom View**

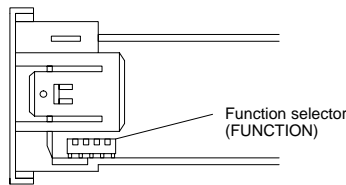


**E5EJ**

**Top View**



**Bottom View**



**Input Type Selector (INPUT)**



This selector selects the temperature sensor to be used. It is factory-set to position 2 to designate a K-type (chromel-alumel thermocouple) temperature sensor. The following table lists the other possible settings for temperature sensors. Refer to temperature range charts under *Ordering Information* for further information.

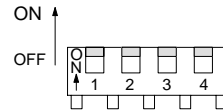
Switch setting	Temperature sensor code	Temperature range	
		°C	°F
0, 8	JPt100	-199.9 to 650.0	-199.9 to 999.9
1, 9	Pt100	-199.9 to 650.0	-199.9 to 999.9
2	K	-200 to 1,300	-300 to 2,300
3	J	-100 to 850	-100 to 1,500
4	T	-199.9 to 400.0	-199.9 to 700.0
5	L	-100 to 850	-100 to 1500
6	U	-199.9 to 400.0	-199.9 to 700.0
7	N	-200 to 1,300	-300 to 2,300

**Note:** JPt100: 139.16 Ω at 100°C  
Pt100: 138.50 Ω at 100°C

**Temperature Control in Fahrenheit**

1. After setting all internal switch settings, set pin number 4 of the function switch to ON. This pin is normally set to OFF.
2. Insert the internal mechanism into the housing and turn on the Temperature Controller.
3.  $F$  will be displayed. Then press the Up Key to change the set value display into Fahrenheit "F."
4. Turn off the power 2 s after the set value display has changed to Fahrenheit.
5. Remove the internal mechanism from the housing, set pin number 4 of the function switch to OFF, replace it and turn on the power.

**Function Selector (FUNCTION)**



The DIP switch sets the operating parameters listed in the following table. All pins are factory-set to OFF.

Function selector pin number		1	2	3	4
Output operation	Normal (see note 1)	ON	---	---	---
	Reverse (see note 1)	OFF	---	---	---
Control mode	ON/OFF	---	ON	---	---
	Advanced PID	---	OFF	---	---
PID tuning mode	With auto-tuning (see note 2)	---	---	ON (see note 3)	---
	With fuzzy self-tuning	---	---	OFF (see note 3)	---
Level	Engineering level	---	---	---	ON
	Normal operation	---	---	---	OFF
Factory setting		OFF	OFF	OFF	OFF

- Note:**
1. For heating applications, use the reverse operation mode. For cooling applications use the normal operation mode. (In other cases, select the desired setting.)
  2. To start auto-tuning, press the Level and Display Keys simultaneously, for 1 s or longer to start auto-tuning. During auto-tuning, the set value display flashes. (The display will stop flashing after tuning is finished.)
  3. If the control mode is ON/OFF, pin 3 can be set ON or OFF. (Pin 3 is not important in case of ON/OFF control.)



## ■ Alarm Mode Selectors (ALM1, ALM2)

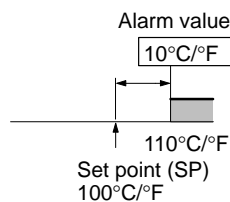
Alarm modes, listed in the following table, can be selected using this switch. The switch is factory-set to position 2, i.e., the upper-limit alarm mode.



Switch setting	Mode	Alarm output		Setting range
		When X is positive	When X is negative	
0	No alarm	OFF		---
1	Upper- and lower-limit alarm (deviation)		Always ON	-1999 to 9999, or -199.9 to 999.9 (The decimal position varies with the input type.)
2	Upper-limit alarm (deviation)			
3	Lower-limit alarm (deviation)			
4	Upper- and lower-limit alarm (deviation)		Always OFF	
5	Upper- and lower-limit alarm with standby sequence (deviation)		Always OFF	
6	Upper-limit alarm with standby sequence (deviation)			
7	Lower-limit alarm with standby sequence (deviation)			
8	Absolute-value upper-limit alarm			
9	Absolute-value lower-limit alarm			

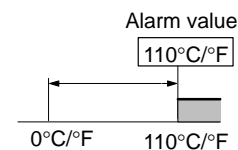
### Deviation Alarm

If the alarm mode selector is set to a number between 1 to 7, alarm values are set to the width deviated from the set point as shown in the following illustration.



### Absolute Alarm

If the alarm mode selector is set to 8 or 9, alarm values are set to the absolute value based on 0°C/°F as shown in the following illustration.



### ■ Key Protection Switch (PROTECT)

The key protection switch is factory-set to the OFF position.



SP → OFF → ALL

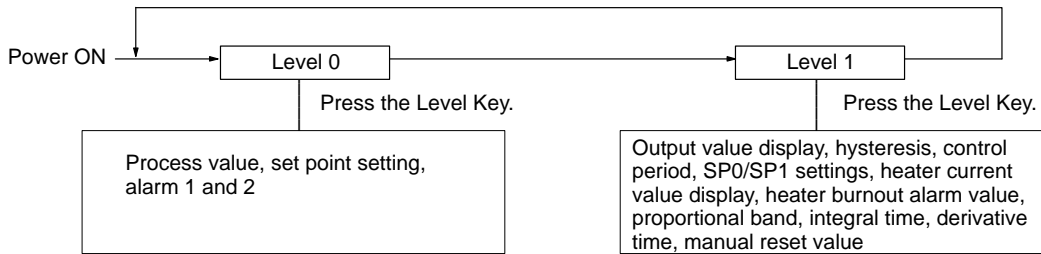
To write-protect set values, the settings of the protect modes must be changed.

Mode	Protection
SP	All set values other than the set point will be write-protected.
	The Level Key will not be valid. The Down and Up Keys will not be valid except set point setting.
OFF	No key protection will be valid.
	All keys will work normally.
ALL	All set values will be write-protected.
	The Level, Down, and Up Keys will not be valid.

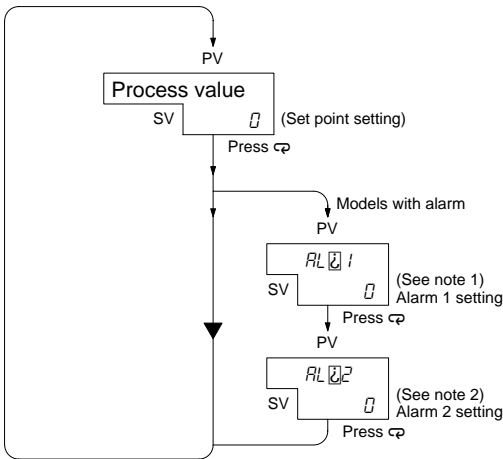
### ■ Inputting Parameters

The temperature Controller has two display levels 0 and 1, in which only specific parameters can be set. Level 0 is the initial level and is automatically entered upon power application. To change the mode to set or change a different group of parameters, hold down the Level Key for 1 second minimum. The display level mode changes as shown below. Actual displays vary with models and switch settings. If a display does not appear as expected, check your switch settings.

Besides the functions explained here, the Temperature Controller incorporates an alarm hysteresis function, set point limit function, automatic return of display mode function, input shift function, and event input 2 type selection (incorporated by the E5AJ and E5EJ only). Refer to the *E5□J Operation Manual (Z103)*, which can be obtained from your OMRON representative, for details on these functions.

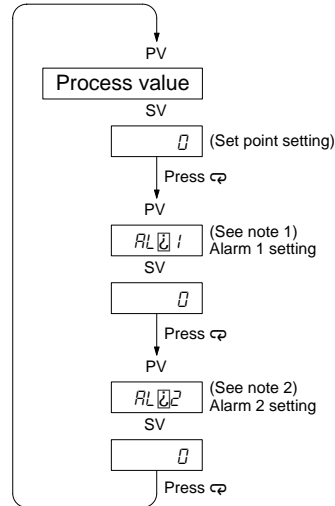


#### Level 0 E5CJ



- Note:**
- Nothing is displayed if ALM1 is set to 0 (i.e., no alarm function is ON).
  - Nothing is displayed if ALM2 is set to 0 (i.e., no alarm function is ON).

#### E5AJ/E5BJ/E5EJ



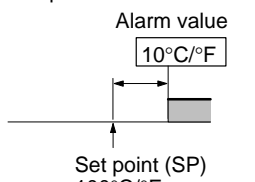
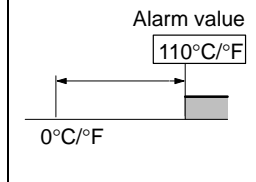
- Note:**
- Nothing is displayed if ALM1 is set to 0 (i.e., no alarm function is ON).
  - Nothing is displayed if ALM2 is set to 0 (i.e., no alarm function is ON).

**Set Point Setting (°C or °F)**

Use the Down and UP Keys to set the set point. A model with event input allows the change of the set point (SP0 or SP1) that has been selected.

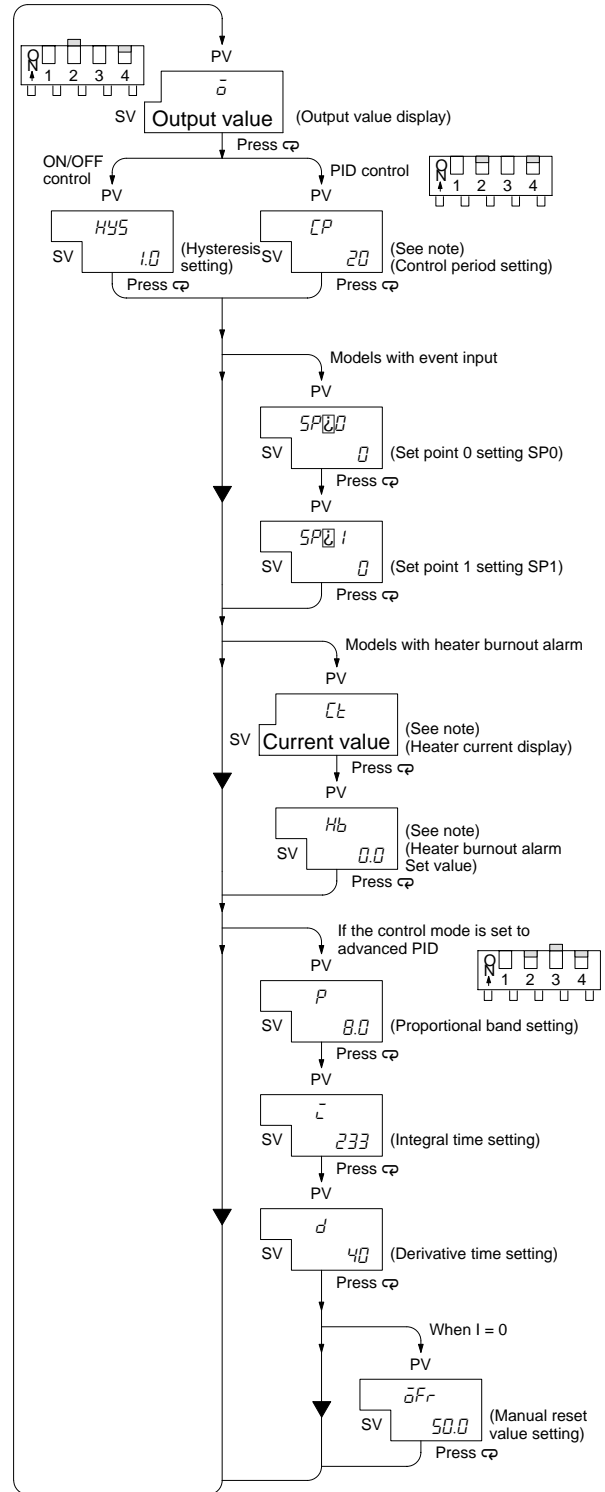
**Alarm 1, 2:  $RL\ \bar{0}1$ ,  $RL\ \bar{0}2$  (°C or °F)**

Alarm values can be set with Down and Up Keys. The alarm mode is factory set to upper-limit alarm (deviation) mode. The alarm mode can be changed with the alarm mode selector. An alarm value can be set to the deviation width or absolute value according to the alarm mode.

Deviation alarm	Absolute-value alarm
Upper- and lower-limit alarm, upper-limit alarm, lower-limit alarm, upper- and lower-limit range alarm	Absolute-value upper-limit alarm, absolute-value lower-limit alarm
Set to the width deviated from the set point. 	Set to the absolute value based on 0°C/°F. 

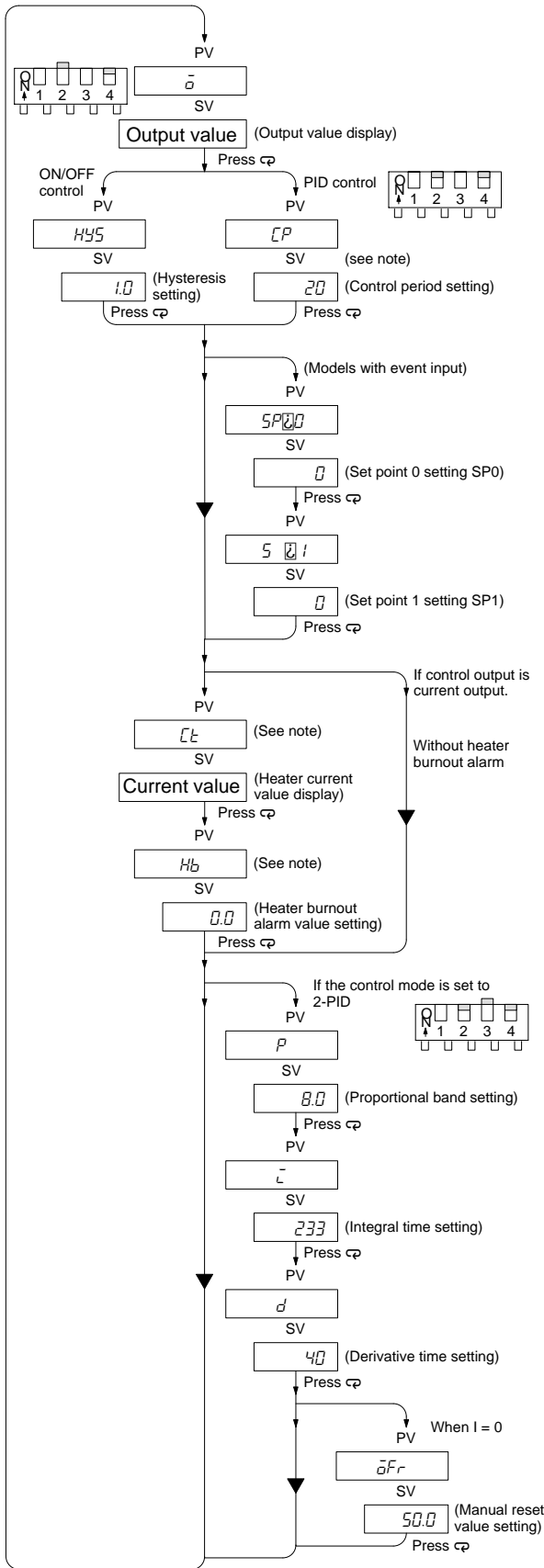
**Level 1**

**E5CJ**



**Note:** Nothing is displayed in current output model.

E5AJ/E5BJ/E5EJ



**Note:** Nothing is displayed in current output model.

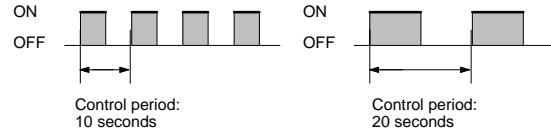
**Output Value Display:** 0.0

Displayed range 0.0% to 100.0%

**Control Period:** CP

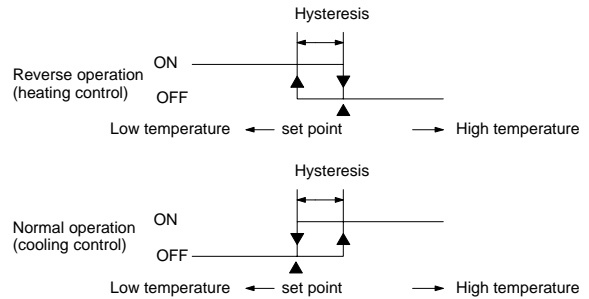
The control period can be set with the Down and Up Keys within a range of 1 to 99 s. The control period is factory-set to 20 s. In the case of 2-PID, the relay output or voltage output repeats turning ON and OFF, the cycle of which is called a control period. The duration that the output is ON is in proportion to the output value. The shorter the control period is, the smoother the control operation will be. If the control period is, however, too short, the life of the relay will be shortened. Therefore the control period should be 20 s minimum in the case of relay output.

**Output Value: 50.0%**



**Hysteresis:** HY5

The hysteresis value for the ON/OFF control can be set in a range from 0.0° to 999.9°C/°F while "HY5" is displayed on the PV display using the Up and Down Keys. The value is factory-set to 1.0°C/°F. However, the E5□J-F (Fahrenheit Model) is factory-set to 1.8 °F.



**Set Point 0 Setting (°C or °F): SP00**

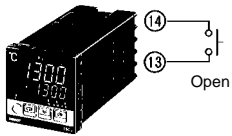
Use the Down and Up Keys to set the set point 0. It is possible to set the value regardless of whether the set value presently selected is on SP0 or SP1.

**Set Point 1 Setting:**  $SP1$

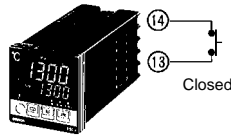
Use the Down and Up Keys to set the set point 1. It is possible to set the value regardless of whether the set value presently selected is on SP0 or SP1.

**E5CJ**

The set point can be selected by opening or short-circuiting the EV1 terminals (terminals 13 and 14).

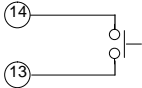


Set point 0 (SP0)



Set point 1 (SP1)

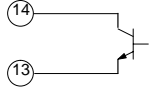
**Contact Input**



ON: The resistance is 1 kΩ max. when short-circuited.

OFF: The resistance is 100 kΩ min. when opened.

**No-contact Input (Open Collector)**

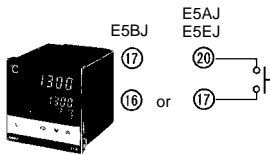


ON: The residual voltage is 3 V min.

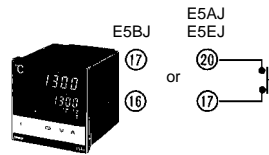
OFF: The current leakage is 1 mA max.

**E5AJ/E5BJ/E5EJ**

The set point can be selected by opening or short-circuiting the EV1 terminals (terminals 17 and 20). In the case of the E5BJ, however, the terminals 16 and 17 of which should be opened or short-circuited instead.

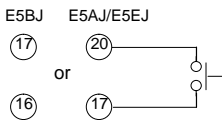


Set point 0 (SP0)



Set point 1 (SP1)

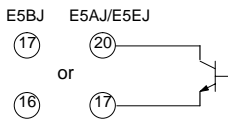
**Contact Input**



ON: The resistance is 1 kΩ max. when short-circuited.

OFF: The resistance is 100 kΩ min. when opened.

**No-contact Input (Open Collector)**



ON: The residual voltage is 3 V max.

OFF: The current leakage is 1 mA max.

**Heater Current Value Display:**  $EL$

The display range is 0.0 to 55.0 A. FFFF will be displayed if the current exceeds 55.0 A. When the control output is ON, the current flowing to the heater is measured and displayed. If the control output is, however, turned ON for less than 190 ms, the current flow will not be measured and the current previously measured will be displayed.

**Heater Burnout Alarm Value Setting:**  $Hb$

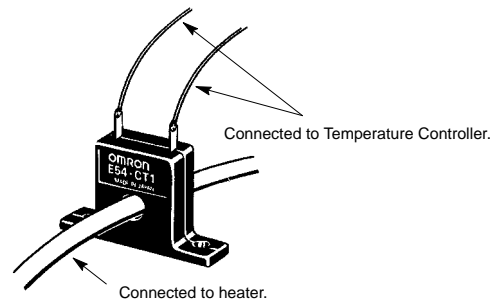
The current value to detect heater burnout can be set within a range of 0.0 to 50.0 A.

The current value is factory-set to 0.0 A. Check the normal heater current and the current at the time of heater burnout from the heater current value display, and set the set value to the mean value of the current values (i.e., set value = (normal current value + heater burnout current) ÷ 2).

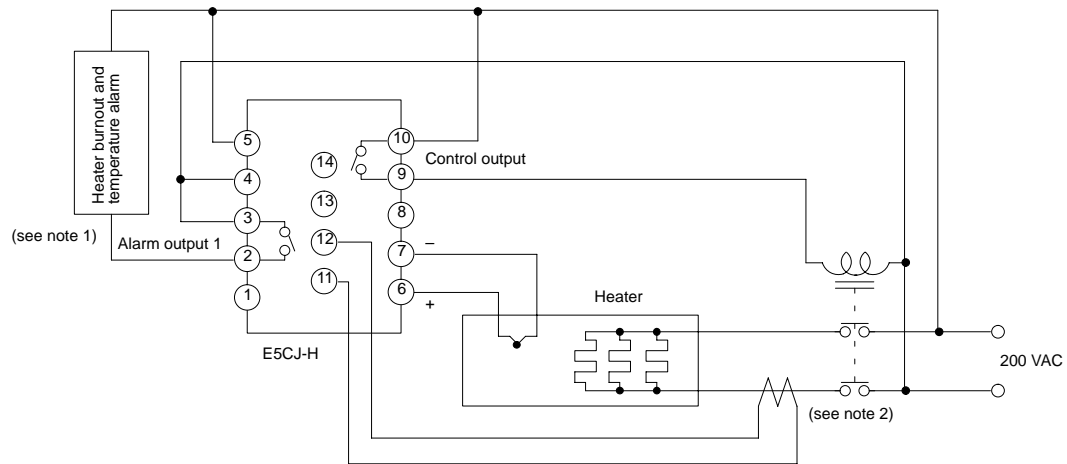
If the difference between the normal heater current and heater burnout current is small, heater burnout detection will not be stable. For stable detection, the difference in current must be 1.0 A minimum if the heater input is less than 10.0 A and 2.5 A minimum if the heater input is 10.0 A or more.

- Note:**
1. Do not allow a current exceeding 50 A to flow in the CT; the maximum continuous heater current is 50 A.
  2. Set the value to 0.0 A if the heater burnout alarm is not used, in which case the alarm will not function at all.

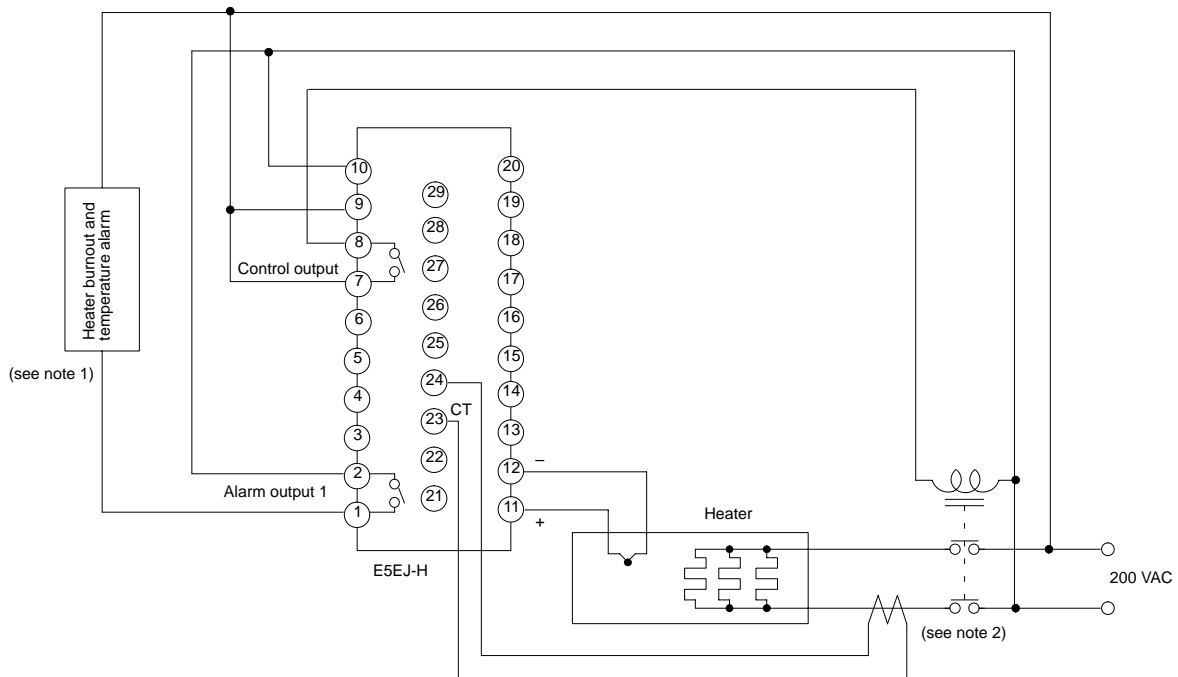
**Current Transformer Connections**



## E5CJ-H



## E5EJ-H



- Note:**
1. Alarm 1 is used as heater burnout alarm and temperature alarm for models incorporating a heater burnout alarm.
  2. Wire through the hole of the Current Transformer. The Current Transformer and the Temperature Controller can be connected regardless of polarity.

- Set the alarm mode selector 1 to 0 (i.e., no alarm function is ON) so that alarm output 1 will output only heater burnout alarms.
- If the difference in current is small, increase the apparent electrical current by increasing the number of turns of the heater wire around the CT. The current displayed by the heater current value display increases in proportion to the number of turns of the heater wire.
- Use the K2CU-F□□A-□GS (incorporating gate input terminals) for detecting three-phase heater burnout.

**Output Retention Reset**

Once the heater burnout alarm detects heater burnout, alarm output 1 will turn ON. To turn OFF alarm output 1, set the heater burnout alarm value to 0.0 A or turn off the Temperature Controller and then turn on the Temperature Controller.

- If the control mode is 2-PID with fuzzy self-tuning, the parameters  $P$ ,  $I$ ,  $d$ , or  $\bar{\sigma}Fr$  will not be displayed (i.e., there is no need to set these parameters). Fuzzy self-tuning always adjusts all PID constants to optimum values inside the Temperature Controller.

#### Proportional Band: $P$

When the character " $P$ " is displayed on the PV display, the proportional band (P constant) can be changed using the Up and Down Keys. The new value will be displayed on the SV display. It can be set in a range from 0.1° to 999.9°C/°F in units of 0.1°C/°F. The value is factory-set to 8.0°C/°F. However, the E5□J-F (Fahrenheit Model) is factory-set to 14.4 °F.

#### Integral Time : $I$

When the character " $I$ " is displayed on the PV display, the integral time (I constant) can be changed using the Up and Down Keys. It can be set in a range from 0 to 3,999 seconds in units of 1 second. The value is factory-set to 233 seconds.

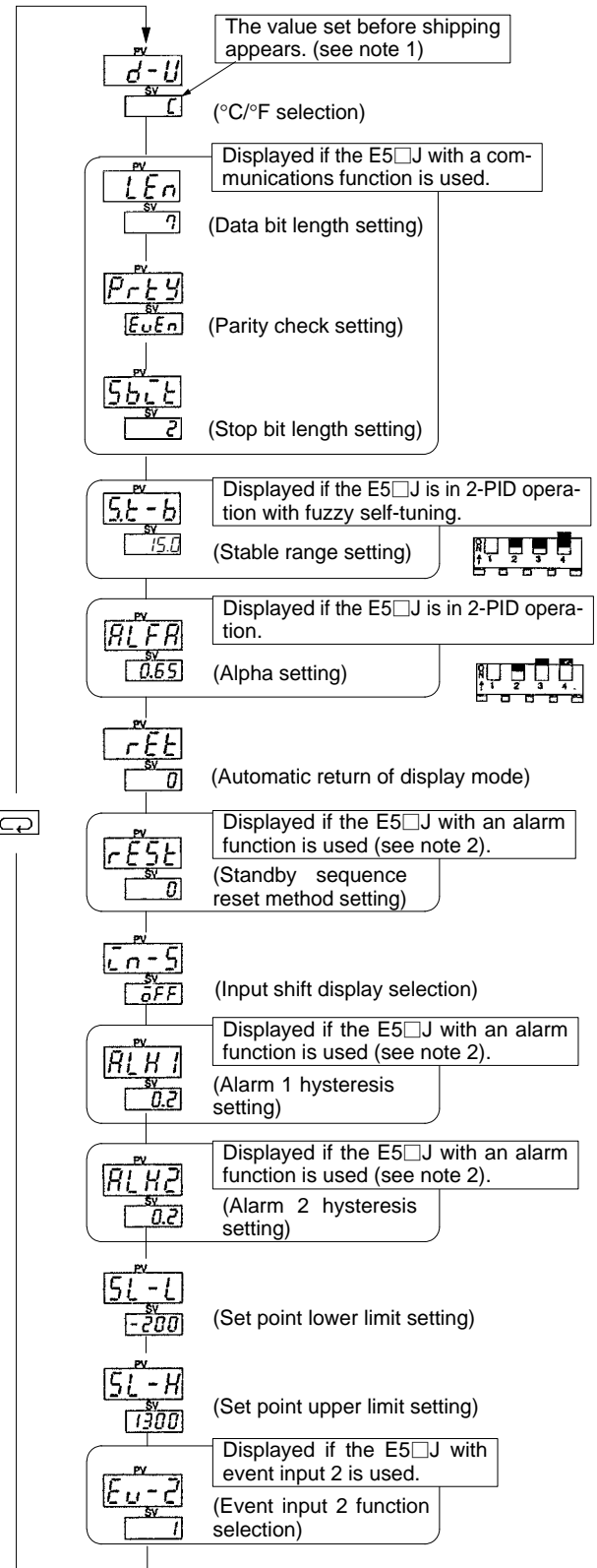
#### Derivative Time : $d$

When the character " $d$ " is displayed on the PV display, the derivative time (D constant) can be changed using the Up and Down Keys. It can be set in a range from 0 to 3,999 seconds in units of 1 second. The value is factory-set to 40 seconds.

#### Manual Reset Value Setting (%) : $\bar{\sigma}Fr$

The necessary output value in stable state will be set within a range of 0.0% to 100.0%. The output value is factory-set to 50.0%. In P or PD mode (i.e., when I is 0), the Temperature Controller will be balanced with a deviation value between the set point and process value. This deviation value is called the offset. By changing the manual reset value, the offset can be eliminated.

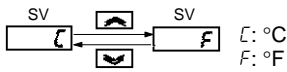
## ■ Engineering Level Parameters



- Note:**
- The E5□J-□□□□-F values set before shipping are different. Refer to the *E5□J Operation Manual (Z103)*.
  - The value will not be displayed if the alarm mode switch is set to 0 or if the E5□J does not incorporate any alarm.

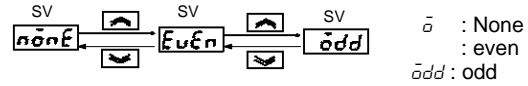
**d-U °C/°F Selection**

To change the temperature display unit from °C to °F, press the Up Key so that F will be displayed in the set value display.



**P-r-ε-y Parity Check**

Use this parameter to change the communications parity check.



**E5□J with Communications Function**

The communications specifications of the E5□J are as follows:

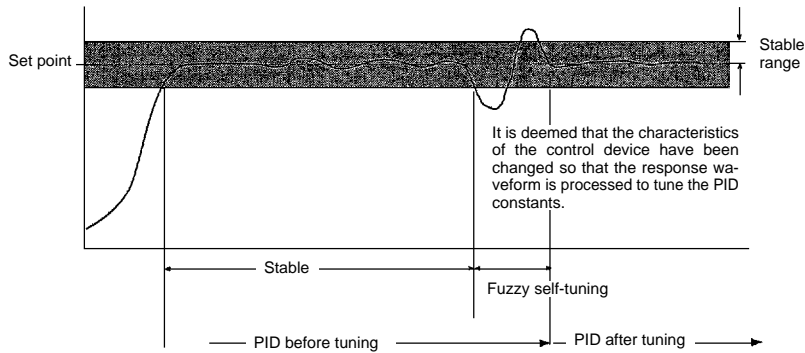
- Data bit length: ASCII 7- (set before shipping) or 8-bit code
- Parity check: None, even (set before shipping), or odd
- Stop bit length: 1 or 2 (set before shipping)
- Use the following parameters to change the above setting.

**L Data Bit Length**

Use this parameter to change the communications data bit length.

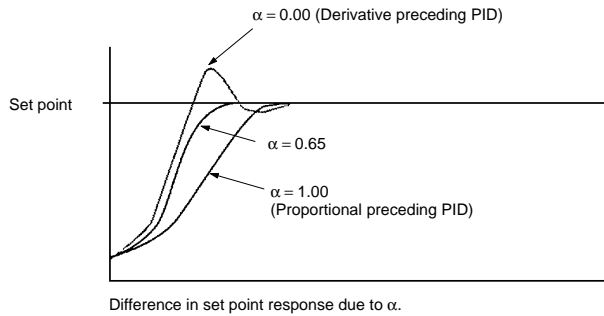
**5.ε-ōb Stable Range (°C/°F)**

This parameter is used to decide conditions under which fuzzy self-tuning operates and can be set within a range of 0.1 to 999.9. If the absolute value of the deviation (the difference between the process value and set point) is within the stable range, temperature control operation is deemed smooth and fuzzy self-tuning will not start.



**RLFR (α) PID Control Type**

By adjusting internal parameter α of 2-PID within a range of 0.00 to 1.00, PID control such as derivative preceding PID or proportional 2-PID (I-PD) control will be possible.



To increase the set point response speed, decrease the value of parameter α. If the value of parameter α is decreased, however, the overshoot value will increase.

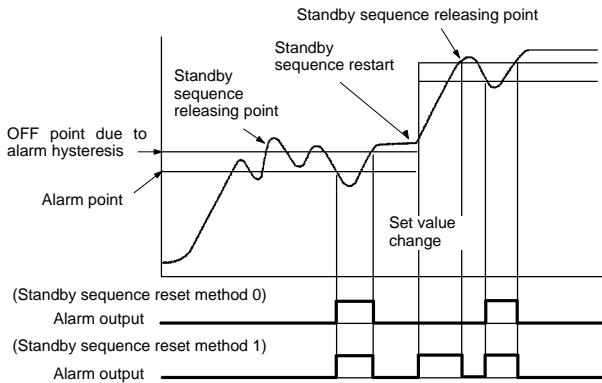
**r-ε Automatic Return of Display Mode (Return Time)**

By setting automatic return of display mode, the display will return to the normal operation display (on level 0 displaying the process value or set point) if no key is operated for the time set with this parameter. The return time can be set within a range of 0 to 99 s. If the return time is set to 0 s, this function will not work. The return time is set to 0 s before shipping.



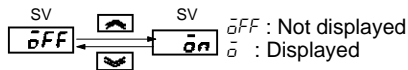
**5t Standby Sequence Reset Method**

It is possible to select the restart conditions of the standby sequence of the alarm attached with standby sequence. If this parameter is set to 0, the standby sequence will restart when the set point, alarm value, or input shift value is changed or the moment the E5□J starts operating including the moment the E5□J is turned on. If this parameter is set to 1, the standby sequence will restart only the moment the E5□J is turned on. The following timing chart is an example of a lower limit alarm attached with standby sequence.



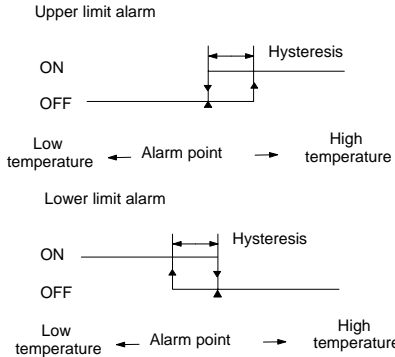
**5 Input Shift Display**

It is possible to select to display or not to display the input shift function on display level 1 with this parameter.



**ALH1 Alarm 1 Hysteresis and ALH2 Alarm 2 Hysteresis**

It is possible to adjust alarm sensitivity with both these parameters within a range of 0.1 to 999.9. Change the alarm sensitivity of the E5□J if the alarm output chatters.



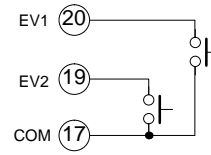
The alarm output will be OFF when the process value is within the alarm hysteresis range when the E5□J restarts (e.g., when the E5□J is turned on).

**5L-L Set Point Lower Limit Value (°C/°F) and 5L-UH Set Point Upper Limit Value (°C/°F)**

It is possible to limit the set point changeable range with both these parameters. For example, if the set point lower limit value is set to 0°C and the set point upper limit value is set to 400°C, the set point can be changed only between 0°C and 400°C.

**U-2 Event Input 2 Type Selection**

It is possible to select the function of event input 2. If 0 (set point value selection) is selected, 5P-2 and 5P-3 will be displayed on display level 1 and if 1 is selected RUN/STOP will be selected. When 0 is selected, the set point can be selected from the following.



EV1	EV2	Set point to be selected
Open	Open	SP0
Short-circuit	Open	SP1
Open	Short-circuit	SP2
Short-circuit	Short-circuit	SP3

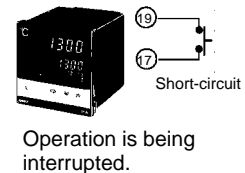
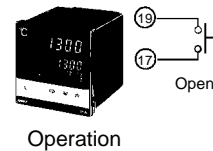
## ■ Starting Control Operation

The E5□J will start control operations as soon as power is turned on until power is turned off. Turn off the power and then turn it back on after setting the desired parameters.

By short-circuiting the EV2 terminals (terminals 17 and 19) of the E5AJ/E5EJ incorporating event input, control operation can be interrupted.

**Note:** Always turn on the Controller and the load simultaneously. Never turn on the load when the Controller is already turned on. Doing so will disable proper self-tuning and optimum control.

For example, when setting the parameters to the Controller with the load turned off, turn off the Controller once after completing the setting and then turn it on again simultaneously with the load. Or, switch event input 2 from STOP to RUN.



## ■ Error Messages

The Temperature controller is provided with self-diagnostic functions, and will display an error message on the PV display when an error is detected.

Message	Error	Error output status		Item to be checked
		Control output	Alarm output	
5. r r (S.Err)	Input error	OFF (2 mA max.)	Processes the error as an abnormally high temperature error.	<ol style="list-style-type: none"> <li>1. Check if the input is outside the possible control range (i.e., <math>\pm 10\%</math> of the set temperature range) (see note).</li> <li>2. Check if the settings of the inputs are wrong.</li> <li>3. Check if there is any wiring mistake, wire burnout, or short-circuit.</li> </ol>
!!! (E111)	Memory error	OFF (2 mA max.)	OFF	Turn off and then turn on the Temperature Controller. If the display does not change then, repairs are necessary.
333 (E333)	A/D converter error	OFF (2 mA max.)	OFF	If the display returns to normal, the Temperature Controller may have been influenced by noise. Check if noise is being generated.
R. r r (A.Err)	Calibration data error (displayed for 3 s when the Temperature Controller is turned on)	Normal operation (accuracy not guaranteed)		Re-calibration is necessary.

**Note:** When the input is within the possible control range but outside the possible display range (i.e.,  $-1999$  to  $9999$ ),  $cccc$  will be displayed if the value is smaller than  $-1999$  and  $cccc$  will be displayed if the value is larger than  $9999$ , however, the control and alarm output functions of the Temperature Controller will work normally.

## ■ Fuzzy Self-tuning

Fuzzy self-tuning is a function that enables the E5□J to calculate the most suitable PID constants for the controlled object.

### Features

The E5□J judges by itself when to perform fuzzy self-tuning.

### Fuzzy Self-tuning Function

The fuzzy self-tuning function has three modes.

In SRT (step response tuning) mode, the PID constants are tuned using a step response method at the time the set point is changed.

In DT (disturbance tuning) mode, the PID constants are amended so that the controlled temperature will be within the target range set in advance when there is external disturbance.

In HT (hunting tuning) mode, when hunting occurs, the PID constants are amended to suppress the hunting.

**Note:** Be sure to turn on the power supply to the load either before or simultaneously with the start of Temperature Controller operation.

Dead time will be measured from the time the Temperature Controller starts operating. If a load such as a heater is turned on after the Temperature Controller is turned on, dead time longer than the actual value will be measured and inappropriate PID constants will be obtained. If an extremely large amount of dead time is measured, the control amount will be set to 0% for a short period of time before being returned to 100%, and the constants will then be retuned. Retuning is performed only for large amounts of dead time, so be sure to follow the precaution given above when starting operation.

### Startup Conditions of SRT

SRT will start if the following conditions are satisfied simultaneously when the E5□J is turned on or the set point is changed.

At the time the E5□J starts operating	At the time set point is changed
<ol style="list-style-type: none"> <li>1. The set point at the time the E5□J starts operating is different from the set point used at the time SRT was last executed (see note).</li> <li>2. The difference between the set point and the process value at the time the E5□J starts operating is larger than the present proportional band value (P) x 1.27+4.</li> <li>3. The process value at the time the E5□J starts operating is smaller than the set point in reverse operation and larger than the set point in normal operation.</li> </ol>	<ol style="list-style-type: none"> <li>1. The new set point is different from the set point used at the time SRT was last executed (see note).</li> <li>2. The set point changing range is larger than the present proportional band value (P) x 1.27+4.</li> <li>3. The process value is in stable condition before the set point is changed.</li> <li>4. A larger set point value is set in reverse operation and a smaller set point is set in normal operation.</li> </ol>

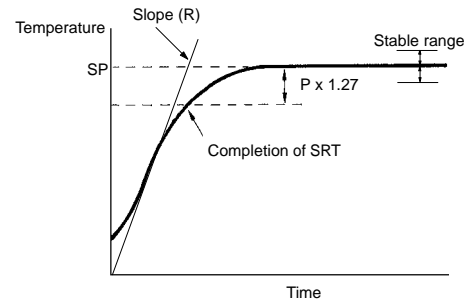
**Note:** The last SRT-executed set point is set to 0 before shipping and when changing from 2-PID control to 2-PID control with fuzzy self-tuning.

### Imposition Completion Condition of Step Control Amount

In order to prevent overshooting, the step controlled amount must be imposed continuously only while the present deviation is the same as or greater than the value obtained from the proportional band (P) x 1.27. The step control will not be applied when the deviation becomes smaller than this value.

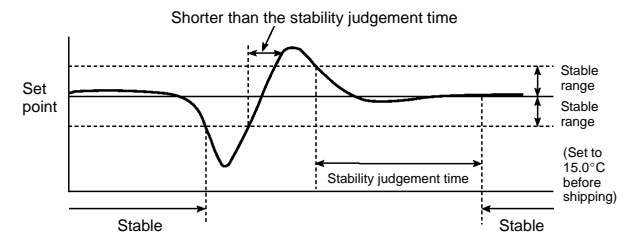
### PID Constant Refreshing Conditions

If the step control amount is applied before the maximum temperature slope (R) is obtained, SRT will not renew any PID constant. If the proportional band obtained from the R and L values that were measured before the imposition had been completed is larger than the present proportional band, the PID constants will be renewed because the measured value is in the direction towards the suitable proportional band value, and the set point at that time will be the SRT-executed set point.



### Stable Temperature Status

If the temperature is within the stable range for a certain time, it is deemed that the temperature is stable. This time is called stability judgement time. Like PID constants, stability judgement time is adjusted with fuzzy self-tuning according to the characteristics of the object to be controlled. Fuzzy self-tuning will not be activated if the temperature is stable because the Temperature Controller deems that temperature control is smooth.



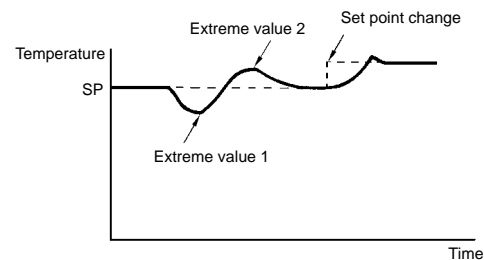
### Balanced Status

If the process value is within the stable range for 60 s when there is no output, it is deemed that the the temperature is balanced.

### Startup Conditions of DT

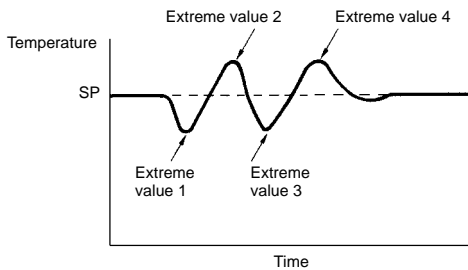
1. DT will start if the temperature that has been stable varies due to external disturbance and the deflection of the temperature exceeds the stable range, and then the temperature becomes stable, provided that the number of maximum temperature values is less than four.
2. DT will start if the set point is changed under the condition that SRT does not start and the temperature becomes stable, provided that the number of maximum temperature values is less than four.

If there are four or more maximum temperature values, HT will start.



### Startup Conditions of HT

HT will be ON when there is hunting with four or more maximum temperature values (extreme values) while SRT is not being executed.



**Note:** In specific applications where temperature varies periodically due to disturbance, internal parameters need to be adjusted. For details, refer to *E5□J Operation Manual*.

## ■ Auto-tuning

### Starting Auto-tuning

Auto-tuning can be started by using the following procedure. Use this procedure when appropriate results are not achieved via fuzzy self-tuning.

1. Turn ON pin 3 of the function selector switch to select the 2-PID control mode (refer to *page 8*).
2. Press the Level Key and the Display Key simultaneously for 1 s or longer to start auto-tuning.

### Conditions that Prevent Auto-tuning

You will not be able to start auto-tuning when any of the following conditions exist.

- When the control mode is set for ON/OFF control or 2-PID control with fuzzy self-tuning.
- When an engineering level parameter is displayed.
- When the key protection switch is set to  $\overline{SP}$  or ALL.
- When the remote/local setting is set to remote.
- When the RUN/STOP setting is set to STOP.
- When a sensor error, memory error, or A/D converter error has occurred.

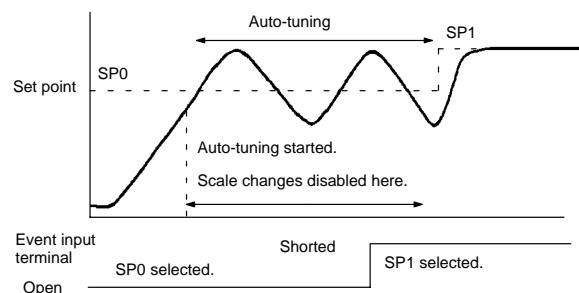
### Force-ending Auto-tuning

Auto-tuning will be forced to end for any of the following conditions.

- When the Temperature Controller is turned off.
- When the RUN/STOP setting is changed to STOP.
- When a sensor error occurs.
- When the Level Key and the Display Key are pressed simultaneously for 1 s or longer.

### Changing Parameters during Auto-tuning

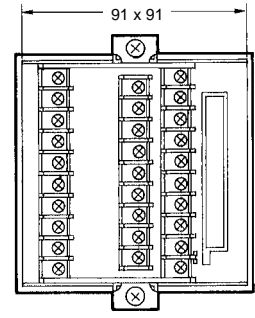
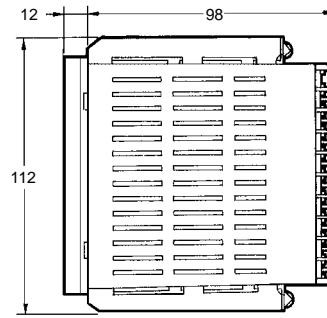
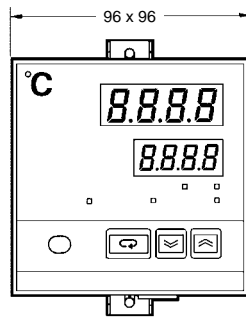
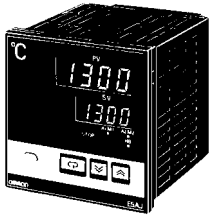
- Parameters cannot be changed during auto-tuning, but the remote/local setting can be changed.
- The SP also cannot be changed via the event input during auto-tuning, but the event input status can be changed and the SP will be changed after auto-tuning has been completed.



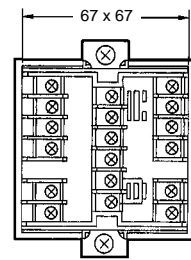
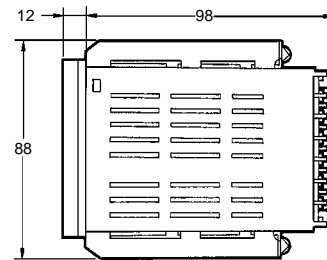
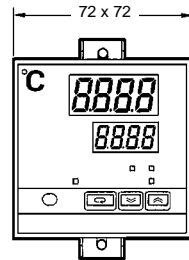
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

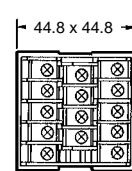
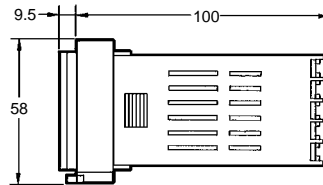
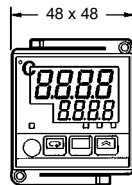
## E5AJ



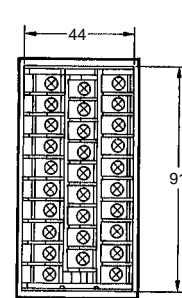
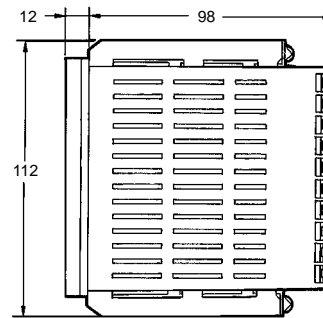
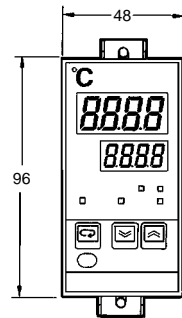
## E5BJ



## E5CJ

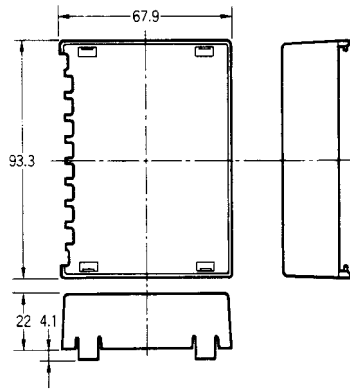


## E5EJ

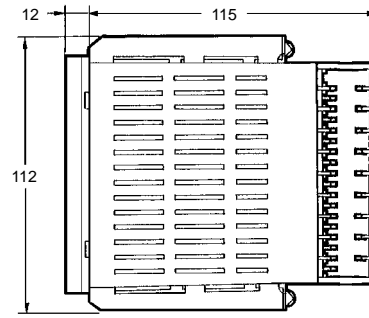


Terminal Covers

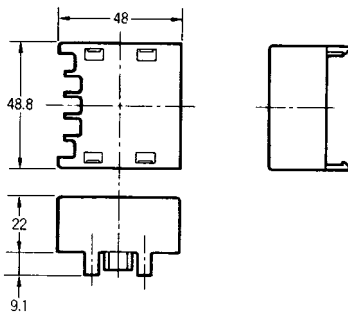
E53-COV02



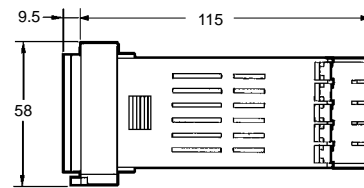
E5AJ with Terminal Cover



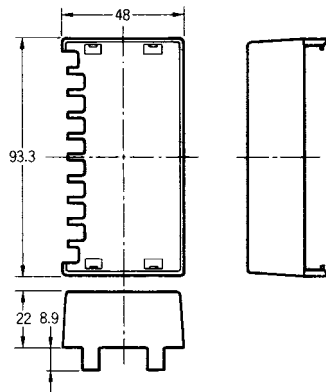
E53-COV04



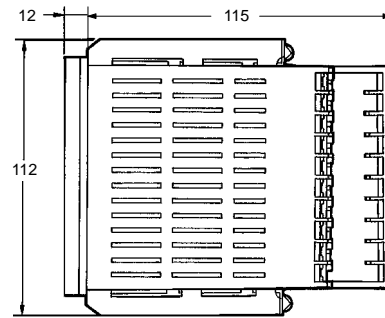
E5CJ with Terminal Cover



E53-COV03

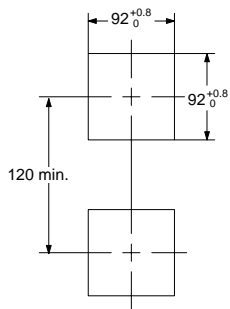


E5EJ with Terminal Cover

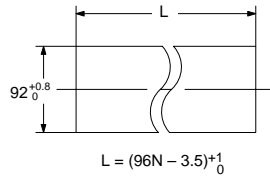


## Panel Cutout

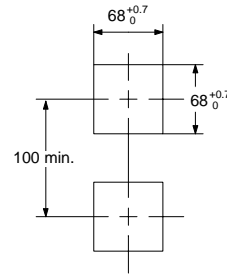
## E5AJ



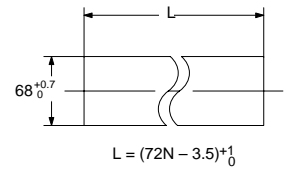
## Side-by-side Mounting of N Controllers



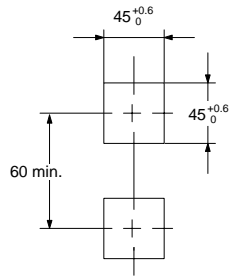
## E5BJ



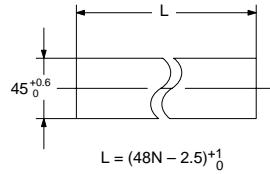
## Side-by-side Mounting of N Controllers



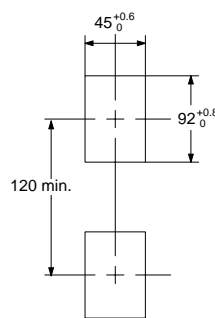
## E5CJ



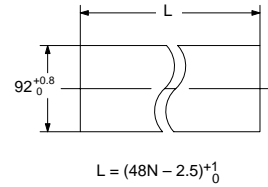
## Side-by-side Mounting of N Controllers



## E5EJ



## Side-by-side Mounting of N Controllers

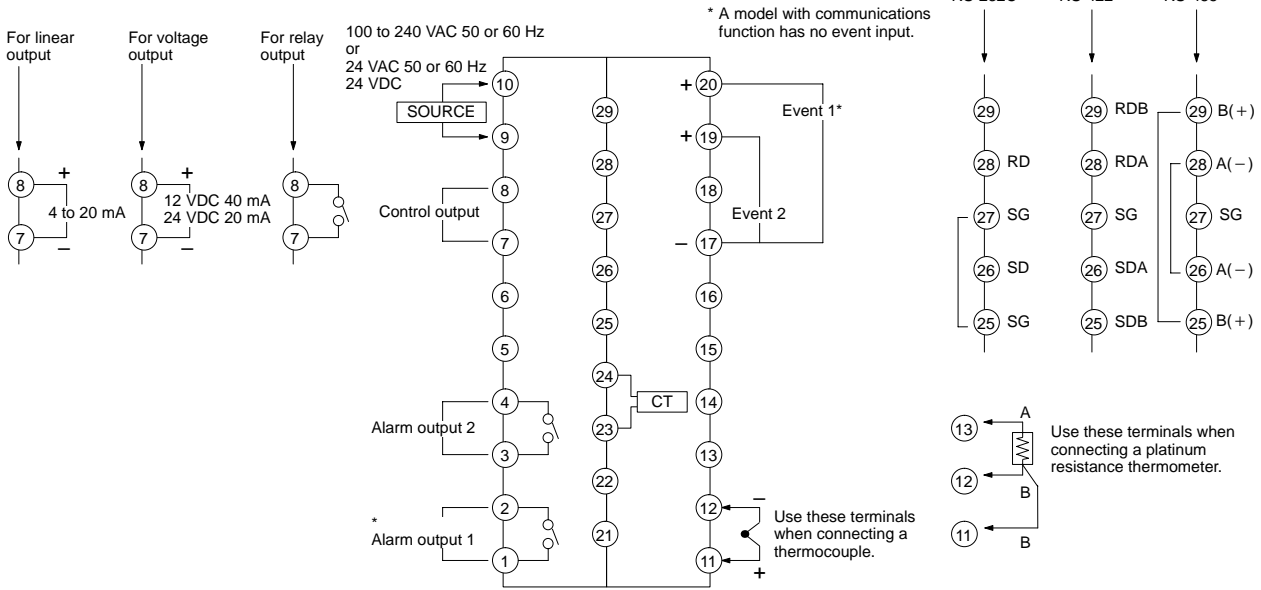


- Note:**
1. Recommended panel thickness is 1 to 4 mm for the E5CJ and 1 to 8 mm for the E5AJ, E5BJ, and E5EJ.
  2. Close side-by-side mounting is possible (in a horizontal direction).

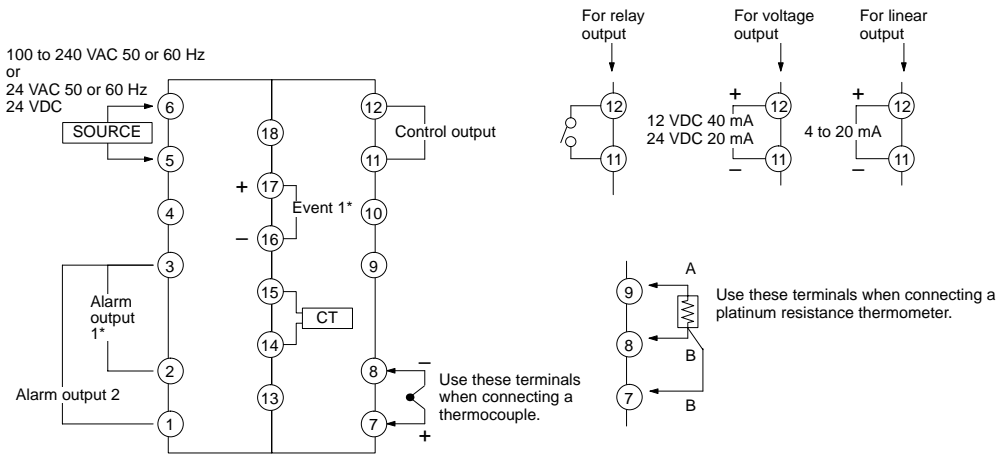
# Installation

**Note:** No event input is insulated from the voltage or current output.

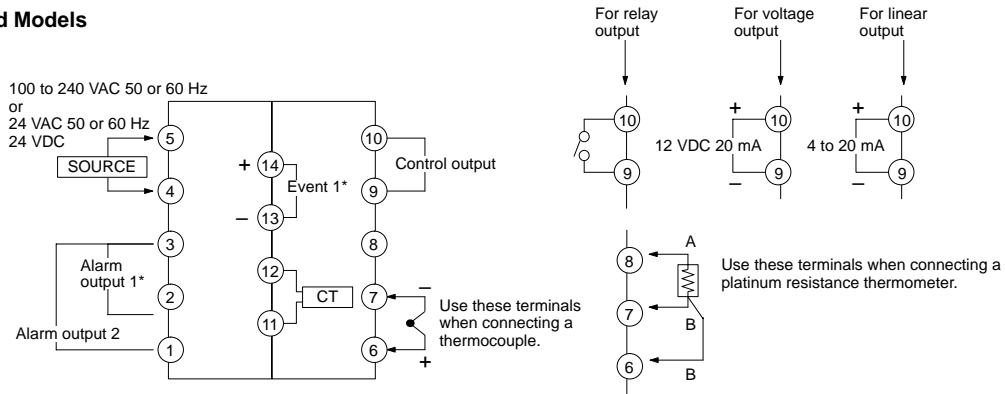
## E5AJ/E5EJ



## E5BJ

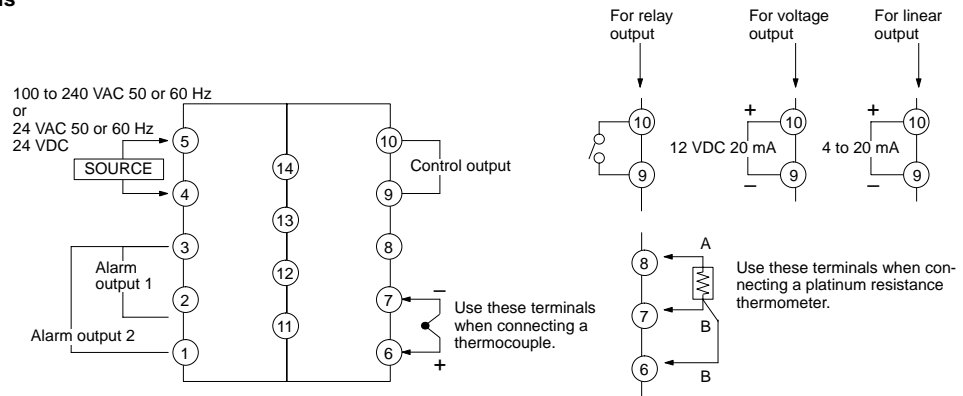


## E5CJ-□2□B Standard Models

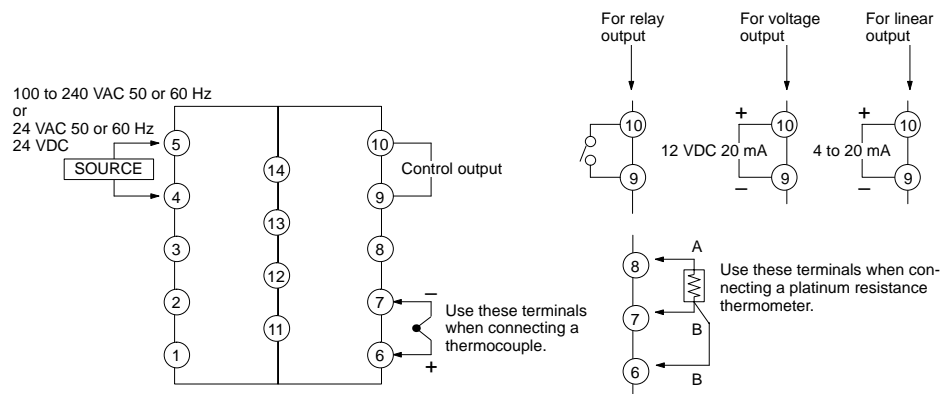




## E5CJ-□2 Simple Models



## E5CJ-□ Simple Models



**Note:** Always turn on the Controller and the load simultaneously. Never turn on the load when the Controller is already turned on. Doing so will disable proper self-tuning and optimum control.

For example, when setting the parameters to the Controller with the load turned off, turn off the Controller once after completing the setting and then turn it on again simultaneously with the load. Or, switch event input 2 from STOP to RUN.

- \* The alarm output 1 and heater burnout alarm are integrated into one general alarm.
- \* The event input is not electrically isolated from the voltage output or current output.

## Precautions

### Mounting

The dimensions of the Temperature Controller conform to DIN 43700. Recommended panel thickness is 1 to 8 mm for the E5AJ, E5BJ, and E5EJ, and 1 to 4 mm for the E5CJ.

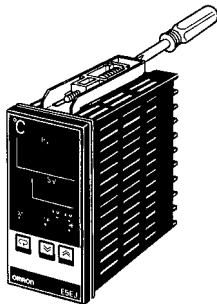
The mounted Temperature Controller must be horizontally level.

Do not install the Temperature Controller in a location exposed to excessive dust or corrosive gases. Moreover, avoid locations subject to heavy vibration or shock, water or oil spray, or high temperatures. Any of these conditions will affect product life.

Isolate the Temperature Controller from equipment that generates strong, high-frequency noises such as high-frequency welders, because such equipment may prevent proper operation.

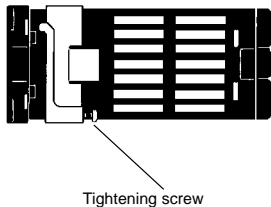
#### E5AJ/E5BJ/E5EJ

Two mounting brackets are provided with the Temperature Controller. Mount one of the brackets to the top and the other one to the bottom of the Temperature Controller. Turn the ratchets of the mounting brackets clockwise with a Phillips screwdriver until they snap. Insert the unit back into the case by pushing the unit until it clicks into place.



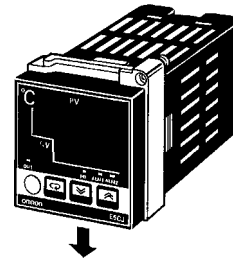
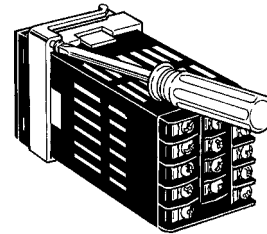
#### E5CJ

Insert the Temperature Controller into the square hole of the panel and insert an adapter from the backside so that there will be no space between the Temperature Controller and the panel. Then secure the Temperature Controller with a screw.



### Dismounting

Loosen the screw of the adapter for dismounting.



### Connection Example

#### With Solderless Terminal

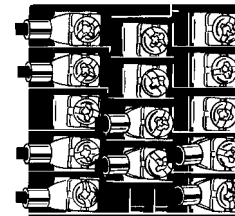
Use M3.5 x 8 solderless terminals with the Temperature Controller's M3.5 self-rising pressure plate screws.

#### Solder-dipped Leads

Strip 6 to 8 mm of the lead wires and carefully arrange the wire tips.

Do not tighten the terminal screw with excessive force, because doing so may damage them. The terminal block of the Temperature Controller is constructed so that the lead wires can be connected to all the terminals from the same direction.

Example: E5CJ



### Input Type Connection

To reduce inductive noise influence, the lead wires connecting the input type to the Temperature Controller must be separated from the power lines and load lines.

Use the specified compensating conductors for thermocouples. Use lead wires having a small resistance for platinum resistance thermometers.

### Sequenced Circuits

Several seconds are required until the relay is turned ON after power has been supplied to the Temperature Controller. Therefore, take this time delay into consideration when designing sequenced circuits which incorporate a Temperature Controller.

## ■ Watertight Cover

- Four sizes (96 x 96, 72 x 72, 48 x 96, 48 x 48) are available.
- Conforms to IP66 or NEMA4 (indoors).

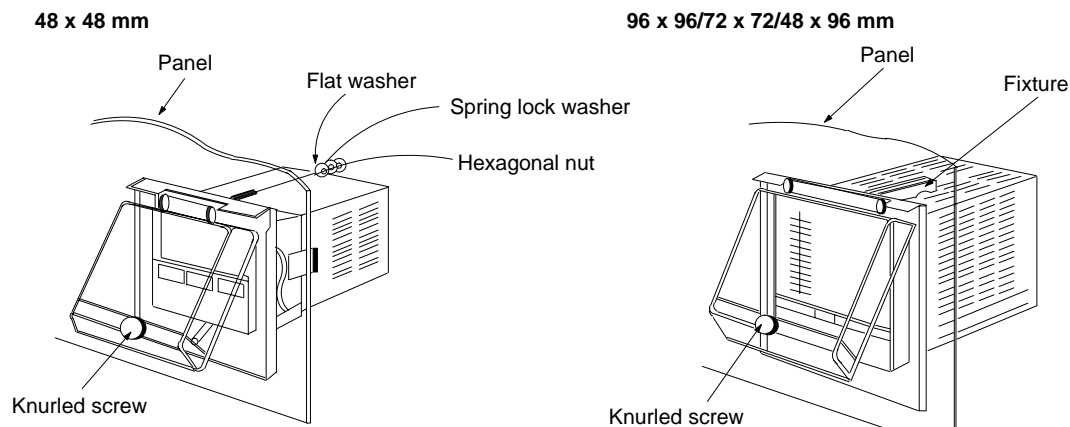
### Ordering Information

Size	96 x 96 mm	72 x 72 mm	48 x 96 mm	48 x 48
Model	Y92A-96N	Y92A-72N	Y92A-49N	Y92A-48N

### Materials

Front cover	94V-2 polycarbonate
Packing	Chloroprene rubber
Panel	SUS304

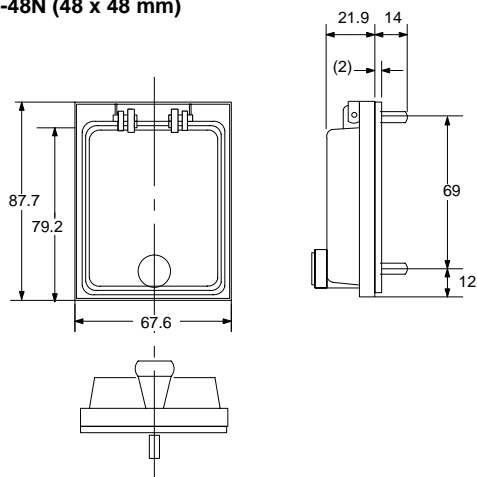
### Nomenclature



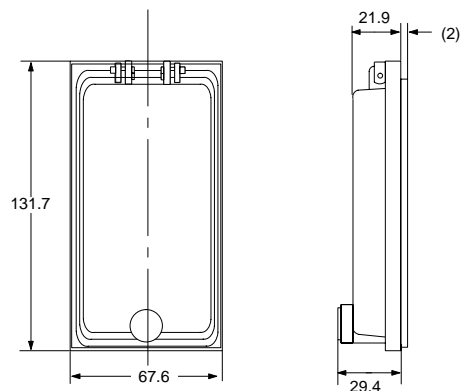
**Note:** Tighten the knurled screw to a torque of 0.03 N • m (3 kgf • cm) and the hexagonal nut to a torque of 0.05 N • m (5 kgf • cm).

### Dimensions

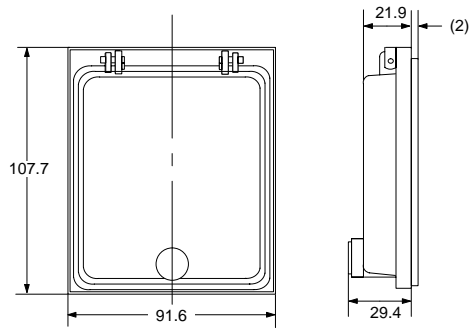
Y92A-48N (48 x 48 mm)



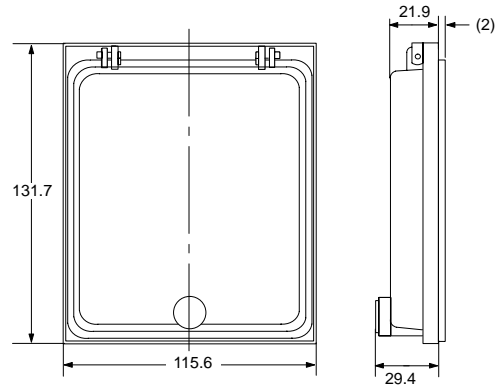
Y92A-49N (48 x 96 mm)



## Y92A-72N (72 x 72 mm)

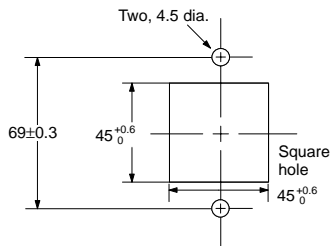


## Y92A-96N (96 x 96 mm)



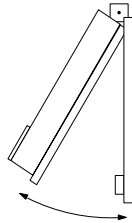
## Panel Cutout

## Y92A-48N (48 x 48 mm)



## Precautions

It is possible to open or close the front cover by untightening or tightening the knurled screw.



Be sure to take the space required for the opening and closing of the front cover into consideration when installing the Watertight Cover.

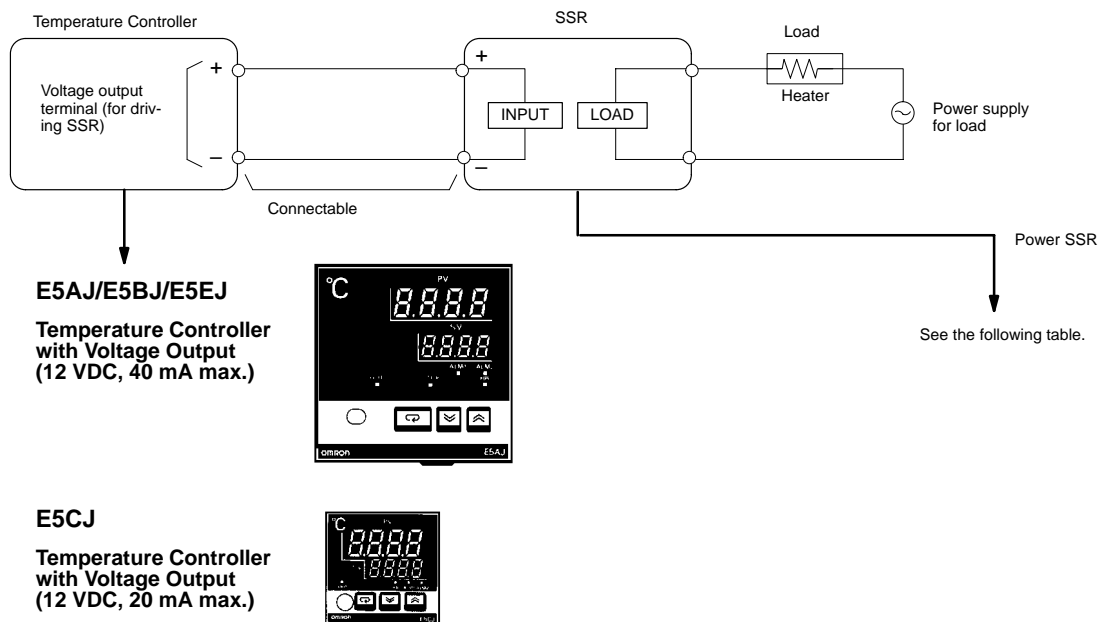
The front cover is made of polycarbonate, which can be cleaned using water, methanol, or ethanol.

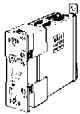

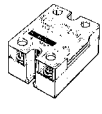
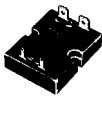

Regularly check the packing, the quality of which will deteriorate over the process of time.

The front cover can be mounted in any direction.

## ■ SSR

### Connection Example of Temperature Controller and SSR



Model	G3PA-VD	G3NH	G3NA	G3NE	G3B
	240 V: 10 A, 20 A, 40 A, 60 A 480 V: 20 A, 30 A	75 A, 150 A	240 V: 5 A, 10 A, 20 A, 40 A 480 V: 10 A, 20 A, 40 A	5 A, 10 A, 20 A	5 A
Appearance					
SSRs connected in parallel	E5AJ/BJ/EJ: 5 pcs. (8 pcs.) E5CJ: 3 pcs. (4 pcs.) (see note)	E5AJ/BJ/EJ: 8 pcs. E5CJ: 4 pcs.	E5AJ/BJ/EJ: 6 pcs. E5CJ: 3 pcs.	E5AJ/BJ/EJ: 2 pcs. E5CJ: 1 piece	E5AJ/BJ/EJ: 5 pcs. E5CJ: 2 pcs.
Rated input voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC	12 VDC	5 to 24 VDC
Features	Thin, monoblock construction with heat sink	For high-power heater control	Standard model with screw terminals	Compact, low-cost model with tab terminals	Socket, model with 5-A switching capacity

**Note:** The number of Units in parentheses is for the 400-V type.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. H062-E1-5A In the interest of product improvement, specifications are subject to change without notice.

## OMRON Corporation

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