

## New Generation of Digital Temperature Controller

- Depth of only 78mm
- Various temperature inputs: thermocouple, platinum resistance thermometer, infrared temperature sensor, and analog inputs.
- Auto-tuning and self-tuning are available. Auto-tuning is possible even while self-tuning is being executed.
- Heating or heating/cooling control is available.
- Start/stop function
- Conforms to UL, CSA and IEC safety standards as well as CE marking.



48(W) x 48(H) x 78 (D) mm

## Ordering Information

### ■ E5CZ Standard Models

Size	Power supply voltage	Number of alarm points	Control outputs	Heater burnout alarm	Model
1/16 DIN 48(W) x 48(H) x 78(D) mm	100 to 240 VAC	2	Relay	No	E5CZ-R2
			Voltage (for driving SSR)	No	E5CZ-Q2

## ■ Input Ranges

### Platinum Resistance Thermometer Input

Input type	Pt100			JPt100	
	Temperature range	-200 to 850°C	-199.9 to 500.0°C	0.0 to 100.0°C	-199.9 to 500.0°C
Setting number	0	1	2	3	4

### Thermocouple Input

Input type	K		J		T		E	L	U		N	R	S	B
	Temperature range	-200 to 1300°C	-20 to 500°C	-100 to 850°C	-20.0 to 400.0°C	-200 to 400°C	-199.9 to 400.0°C	0 to 600°C	-100 to 850°C	-200 to 400°C	-199.9 to 400.0°C	-200 to 1300°C	0 to 1700°C	0 to 1700°C
Setting number	5	6	7	8	9	22	10	11	12	23	13	14	15	16

Shaded setting indicates default setting

### ES1B Infrared Temperature Sensor

Input type	K10 to 70°C	K60 to 120°C	K115 to 165°C	K140 to 260°C
	Temperature range	0 to 90°C	0 to 120°C	0 to 165°C
Setting number	17	18	19	20

### Analog Input

Input type	0 to 50mV
Temperature range	Usable in the following ranges by scaling: -1999 to 9999 or -199.9 to 999.9
Setting number	21

Applicable standards by input type are as follows:

K: GB/T 2814-98                      R: GB/T 1598-98  
 J, L: GB/T 4994-98                  S: GB/T 3772-98  
 T, U: GB/T 2903-98                B: GB/T 2902-99  
 E: GB/T 4993-98                    JPt100, Pt100: GB/T 5977-99  
 N: GB/T 17615-98

## Specifications

### ■ Ratings

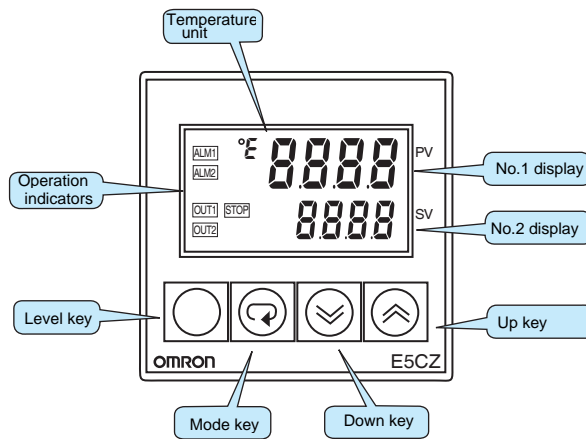
<b>Supply voltage</b>		100 to 240 VAC
<b>Operating voltage range</b>		85% to 110% of rated supply voltage
<b>Power consumption</b>		7W (7VA)
<b>Sensor input</b>		Thermocouple: K, J, T, E, L, U, N, R, S, B Platinum resistance thermometer: Pt100, JPt100 Infrared temperature sensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 160 to 260°C Voltage input: 0 to 50mV
<b>Control output</b>	<b>Relay output</b>	SPST-NO, 250VAC, 3A (resistive load), electrical life: 100,000 operations
	<b>Voltage output</b>	12 VDC +15%/-20% (PNP), max. load current: 21mA, with short-circuit protection circuit
<b>Alarm output</b>		SPST-NO, 250VAC, 1A (resistive load), electrical life: 100,000 operations
<b>Control method</b>		2-PID control or ON/OFF control
<b>Setting method</b>		Digital setting using front panel keys
<b>Indication method</b>		7-segment digital display and single-lighting indicator Character height: PV:10.0mm; SV: 6.5mm
<b>Other functions</b>		According to Controller model
<b>Ambient operating temperature</b>		-10 to 55°C (with no condensation or icing)
<b>Ambient operating humidity</b>		25% to 85%
<b>Storage temperature</b>		-25 to 65°C (with no condensation or icing)

## ■ Characteristics

<b>Indication accuracy</b>	Thermocouple: (±0.5% of indicated value or ±1°C, whichever greater) ±1 digit max. (see note) Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever greater) ±1 digit max. Analog input: ±0.5% FS ±1 digit max.
<b>Hysteresis</b>	0.1 to 999.9°C (in units of 0.1°C)
<b>Proportional band (P)</b>	0.1 to 999.9°C (in units of 0.1°C)
<b>Integral time (I)</b>	0 to 3999 s (in units of 1 s)
<b>Derivative time (D)</b>	0 to 3999 s (in units of 1 s)
<b>Control period</b>	1 to 99 s (in units of 1 s)
<b>Manual reset value</b>	0.0% to 100.0% (in units of 0.1%)
<b>Alarm setting range</b>	-1999 to 9999 (decimal point position depends on input type)
<b>Input sampling period</b>	500ms
<b>Insulation resistance</b>	20MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	2000VAC, 50 or 60 Hz for 1 min (between different charging terminal)
<b>Vibration resistance</b>	10 to 55 Hz, 20m/s <sup>2</sup> for 10 min in X, Y, Z directions
<b>Shock resistance</b>	100m/s <sup>2</sup> , 3 times each in 3 axes, 6 directions
<b>Weight</b>	Approx. 150g
<b>Memory protection</b>	EEPROM (non-volatile memory) (number of writes: 100,000)
<b>EMC</b>	Emission Enclosure: EN55011(GB/T 6113.1,2) Group1 class A Emission AC Mains: EN55011(GB/T 6113.1,2) Group1 class A Immunity ESD : IEC61000-4-2(GB/T 17626.2) 4kV contact discharge (level 2) 8kV air discharge (level 3) Immunity RF-interference: IEC61000-4-3(GB/T17626.3): 10V/m, 80MHz-1Ghz (level) Immunity Conducted Disturbance: IEC61000-4-6(GB/T17626.6): 10V (0.15-80MHz) (level 3) Immunity Burst: IEC61000-4-5(GB/T17626.5): 2kV power-line (level 3) 2kV I/O signal-line (level 4)
<b>Applicable standards</b>	UL61010C-1, CSA C22.2 No.1010.1 Conforms to EN61326, EN61010-1(IEC61010-1)

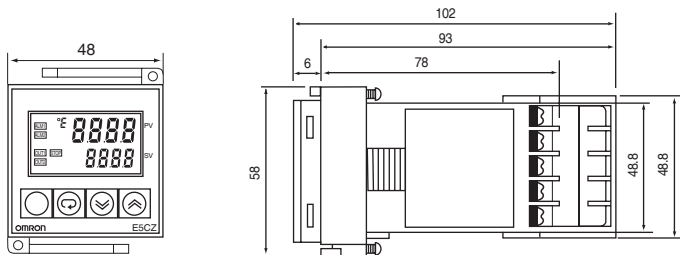
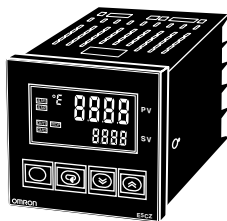
**Note:** The indication of K thermocouples in the -200 to 1300°C range, T and N thermocouples at a temperature of -100°C max., and U and L thermocouples at any temperature is ±2°C±1 digit maximum. The indication accuracy of the B thermocouples at a temperature of 400°C max. is not specified. The indication of the R and S thermocouples at a temperature of 200°C max. is ±3°C±1 digit maximum.

# Nomenclature

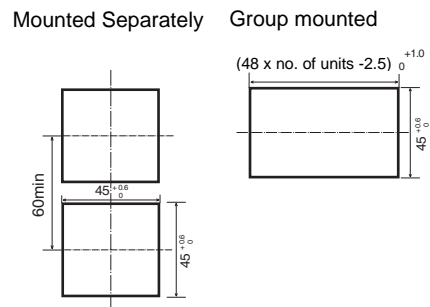


# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.



## Panel Cutouts



- Recommended panel thickness is 1 to 8 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers when they are group mounted).
- When two or more E5CZs controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature specified in the specifications.

# Wiring Terminals

- The voltage output (control output) is not electrically insulated from the internal circuits. When using a grounding thermocouple, do not connect any of the control output terminals to the ground. If the control output terminals are connected to the ground, errors will occur in the measured temperature values as a result of leakage current.
- Standard insulation is applied to the power supply I/O sections. If reinforced insulation is required, connect the input and output terminals to a device without any exposed current-carrying parts or to a device with standard insulation suitable for maximum operation voltage of the power supply I/O section.

