

# Temperature Controllers

## E5CSV

### Simple to Set and Operate 1/16 DIN Size Controllers

- Easy setting using internal DIP and rotary switches
- ON/OFF or PID control (with on-demand auto-tuning) selectable
- Clearly visible digital display with character height of 13.5 mm
- Deviation indicator makes monitoring more effective
- Multiple temperature sensor input (thermocouple/platinum resistance thermometer) models stocked; thermocouple input only and platinum RTD input only models available
- Models with two alarms are ideal for temperature alarm applications
- Setting change protection prohibits tampering
- Sampling rate (500 ms) and selectable control period (2 and 20 s) improves response
- 8-mode alarm output and sensor error detection
- "Input shift" function adjusts display to reflect known sensor offsets



**NEW**

- °C or °F field selectable
- Black or white cases available to match panel aesthetics
- RoHS compliant
- Water-resistant front panel rated NEMA 4X/IP66
- Compact: measures 48 H x 48 W x 78 D mm
- Accuracy  $\pm 0.5\%$  of value

## Model Number Structure

### Model Number Legend

#### Models with Terminal Blocks

E5CSV-□□□□-□□  
1 2 3 4 5 6

#### 1. Output type

- R: Relay
- Q: Voltage for driving SSR

#### 2. Number of alarms

- Blank: No alarm
- 1: 1 alarm
- 2: 2 alarms

#### 3. Input type

- T: Thermocouple/platinum resistance thermometer (multi-input)
- KJ: Thermocouple
- P: Platinum resistance thermometer

#### 4. Power supply voltage

- Blank: 100 to 240 VAC
- D: 24 VAC/VDC

#### 5. Case color / Display scale

- Blank: Black
- W: Light gray
- F: Scale marked in °F (Black case only)

#### 6. Power supply voltage

- AC100-240: 100 to 240 VAC
- AC/DC24: 24 VAC/VDC

**Note:** A functional explanation is provided here for illustration, but models are not necessarily available for all possible combinations. Please refer to *Ordering Information* when ordering.

#### Examples

- Voltage control output, without alarm, multi-input, light gray case: 115 VAC: E5CSV-QT-W AC100-240
- Relay control output, one alarm output, multi-input, black case: 24 VDC: E5CSV-R1TD AC/DC24

# Ordering Information

## ■ List of Models

Size	Power supply voltage	Number of alarm points	Control output	TC/Pt multi-input Case color: Black Scale marked in °C	TC input Case color: Light gray Scale marked in °C	Pt input Case color: Light gray Scale marked in °C	TC/Pt multi-input Case color: Black Scale marked in °F
1/16 DIN 48 × 48 × 78 mm (W × H × D)	100 to 240 VAC	0	Relay	E5CSV-RT AC100-240			E5CSV-RT-F AC100-240
			Voltage (for driving SSR)	E5CSV-QT AC100-240			E5CSV-QT-F AC100-240
		1	Relay	E5CSV-R1T AC100-240	E5CSV-R1KJ-W	E5CSV-R1P-W	E5CSV-R1T-F AC100-240
			Voltage (for driving SSR)	E5CSV-Q1T AC100-240	E5CSV-Q1KJ-W	E5CSV-Q1P-W	E5CSV-Q1T-F AC100-240
		2 (See note)	Relay	E5CSV-R2T AC100-240			E5CSV-R2T-F AC100-240
			Voltage (for driving SSR)	E5CSV-Q2T AC100-240			E5CSV-Q2T-F AC100-240
	24 VAC/ VDC	0	Relay	E5CSV-RTD AC/DC24			
			Voltage (for driving SSR)	E5CSV-QTD AC/DC24			
		1	Relay	E5CSV-R1TD AC/DC24			E5CSV-R1TD-F AC/DC24
			Voltage (for driving SSR)	E5CSV-Q1TD AC/DC24			E5CSV-Q1TD-F AC/DC24
		2 (See note)	Relay	E5CSV-R2TD AC/DC24			
			Voltage (for driving SSR)	E5CSV-Q2TD AC/DC24			

**Note:** Models with two alarm outputs always use the upper limit alarm mode for the alarm 2 output.

## ■ Accessories (Order Separately)

### Protective Cover

Type	Model
Hard Protective Cover	Y92A-48B

### Terminal Cover

Model
E53-COV10

# Specifications

## ■ Ratings

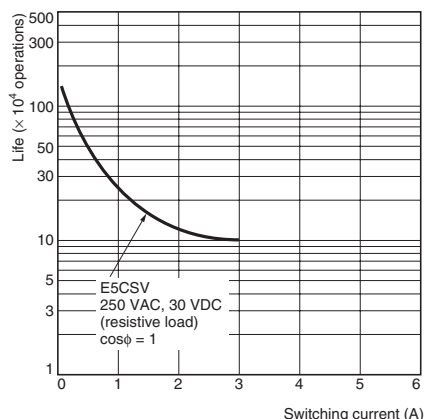
Supply voltage	100 to 240 VAC, 50/60 Hz	24 VAC/VDC, 50/60 Hz
Operating voltage range	85% to 110% of rated supply voltage	
Power consumption	5 VA	3 VA/2 W
Sensor input	Thermocouple input type: Platinum resistance thermometer input type: Multi-input (thermocouple/platinum resistance thermometer) type:	K, J, L Pt100, JPt100 K, J, L, T, U, N, R, Pt100, JPt100
Control output	Relay output	SPST-NO, 250 VAC, 3A (resistive load)
	Voltage output (for driving the SSR)	12 VDC, 21 mA (with short-circuit protection circuit)3
Control method	ON/OFF or 2-PID (with auto-tuning)	
Alarm output	SPST-NO, 250 VAC, 1A (resistive load)	
Setting method	Digital setting using front panel keys	
Indication method	3.5 digit, 7-segment digital display (character height: 13.5 mm) and deviation indicators	
Other functions	<ul style="list-style-type: none"> <li>• Setting change prohibit (key protection)</li> <li>• Input shift</li> <li>• Temperature unit change (°C/°F)</li> <li>• Direct/reverse operation</li> <li>• Temperature range, Sensor switching (K/J/L, Pt100/JPt100)</li> <li>• Switching is performed between a thermocouple and platinum resistance thermometer for multi-input models.</li> <li>• Control period switching</li> <li>• 8-mode alarm output</li> <li>• Sensor error detection</li> </ul>	
Ambient temperature	-10 to 55° C (with no condensation or icing)	
Ambient humidity	25% to 85%	
Storage temperature	-25 to 65° C (with no condensation or icing)	

## ■ Characteristics

<b>Setting accuracy</b>	Thermocouple (See note 1.):	(±0.5% of indication value or ±1°C, whichever is greater) ±1 digit max.
<b>Indication accuracy (ambient temperature of 23°C)</b>	Platinum resistance thermometer (See note 2.):	(±0.5% of indication value or ±1°C, whichever is greater) ±1 digit max.
<b>Influence of temperature</b>	R thermocouple inputs:	(±1% of PV or ±10°C, whichever is greater) ±1 digit max.
<b>Influence of voltage</b>	Other thermocouple inputs:	(±1% of PV or ±4°C, whichever is greater) ±1 digit max.
	Platinum resistance thermometer inputs:	(±1% of PV or ±2°C, whichever is greater) ±1 digit max.
<b>Hysteresis (for ON/OFF control)</b>	0.2% FS (0.1% FS for multi-input (thermocouple/platinum resistance thermometer) models)	
<b>Proportional band (P)</b>	1 to 999°C (automatic adjustment using auto-tuning/self-tuning)	
<b>Integral time (I)</b>	1 to 1,999 s (automatic adjustment using auto-tuning/self-tuning)	
<b>Derivative time (D)</b>	1 to 1,999 s (automatic adjustment using auto-tuning/self-tuning)	
<b>Alarm output range</b>	Absolute-value alarm:	Same as the control range
	Other:	0% to 100% FS
	Alarm hysteresis:	0.2°C or °F (fixed)
<b>Control period</b>	2/20 s	
<b>Sampling period</b>	500 ms	
<b>Insulation resistance</b>	20 MΩ min. (at 500 VDC)	
<b>Dielectric strength</b>	2,000 VAC, 50/60 Hz for 1 min between current-carrying terminals of different polarity	
<b>Vibration resistance</b>	<b>Malfunction</b>	10 to 55 Hz, 20 m/s <sup>2</sup> for 10 min each in X, Y, and Z directions
	<b>Destruction</b>	10 to 55 Hz, 0.75-mm single amplitude for 2 hr each in X, Y, and Z directions
<b>Shock resistance</b>	<b>Malfunction</b>	100 m/s <sup>2</sup> min., 3 times each in 6 directions
	<b>Destruction</b>	300 m/s <sup>2</sup> min., 3 times each in 6 directions
<b>Life expectancy</b>	<b>Electrical</b>	100,000 operations min. (relay output models)
<b>Weight</b>	Approx. 120 g (Controller only)	
<b>Degree of protection</b>	Front panel: Equivalent to IP66; Rear case: IP20; Terminals: IP00	
<b>Memory protection</b>	EEPROM (non-volatile memory) (number of writes: 1,000,000)	
<b>EMC</b>	EMI Radiated:	EN 55011 Group 1 Class A
	EMI Conducted:	EN 55011 Group 1 Class A
	ESD Immunity:	EN 61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3)
	Radiated Electromagnetic Field Immunity:	EN 61000-4-3: 10 V/m (80-1000 MHz, 1.4-2.0 GHz amplitude modulated) (level 3) 10 V/m (900 MHz pulse modulated)
	Conducted Disturbance Immunity:	EN 61000-4-6: 3 V (0.15 to 80 MHz) (level 2)
	Noise Immunity (First Transient Burst Noise):	EN 61000-4-4
	Burst Immunity:	2 kV power-line (level 3), 1 kV I/O signal-line (level 3)
	Surge Immunity:	EN 61000-4-5: Power line: Normal mode 1 kV; Common mode 2 kV Output line (relay output): Normal mode 1 kV; Common mode 2 kV
	Voltage Dip/Interrupting Immunity:	EN 61000-4-11 0.5 cycle, 100% (rated voltage)
<b>Approved standards</b>	UL 61010C-1 (listing) CSA C22.2 No.1010-1	
<b>Conformed standards</b>	EN 61326, EN 61010-1, IEC 61010-1 VDE 0106 Part 100 (finger protection), when the terminal cover is mounted.	

- Note: 1.** The following exceptions apply to thermocouples.
- U, L: ±2°C ±1 digit max.
  - R: ±3°C ±1 digit max. at 200°C or less
- 2.** The following exceptions apply to platinum resistance thermometers.
- Input set values 0, 1, 2, 3 for E5CSV: 0.5% FS ±1 digit max.  
Input set value 1 for E5CSV: 0.5% FS ±1 digit max.

## ■ Electrical Life Expectancy Curve for Relays (Reference Values)

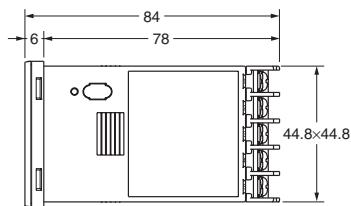
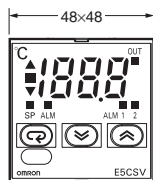
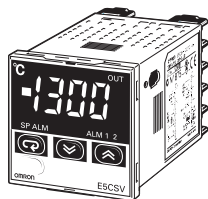


# Dimensions

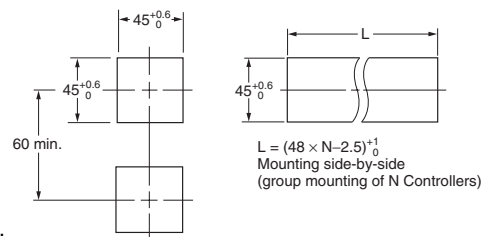
Note: All units are in millimeters unless otherwise indicated.

## Controller

### E5CSV

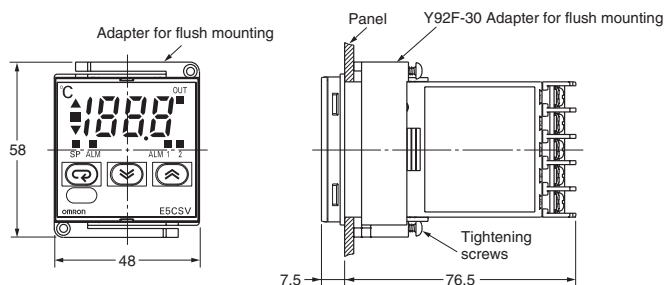
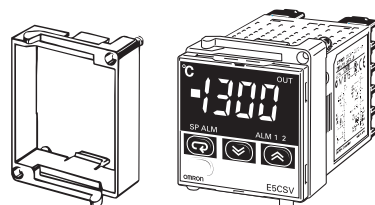


### Panel Cutout Dimensions



Note: Terminals cannot be removed.

### E5CSV + Adapter for Flush Mounting (Provided)

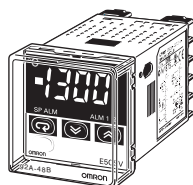


- Note: 1. The recommended panel thickness is 1 to 4 mm.  
2. Group mounting is possible in one direction only.

## Hard Protective Cover

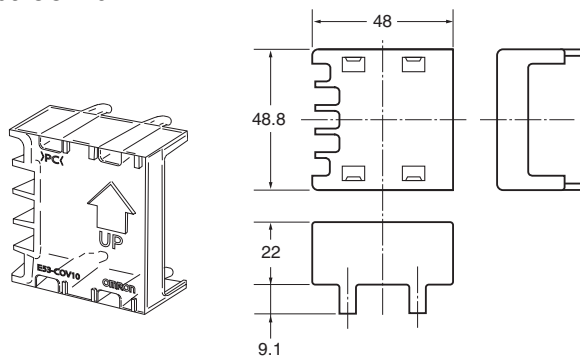
The Y92A-48B Protective Cover (hard type) is available for the following applications.

- To protect the set from dust and dirt.
- To prevent the panel from being accidentally touched causing displacement of set values.
- To provide effective protection against water droplets.



## Terminal Cover

### E53-COV10



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