

Temperature Controllers

E5CSV

CSM_E5CSV_DS_E_5_1

Easy Setting Using DIP Switch and Simple Functions in DIN 48 × 48 mm-size Temperature Controllers

- Easy setting using DIP switch.
- Models with two alarms added to Series, ideal for temperature alarm applications.
- Universal-input (thermocouple/platinum resistance thermometer) models also available.
- Clearly visible digital display with character height of 13.5 mm.
- Models available with black in addition to white cases.
- RoHS compliant.



Refer to *Safety Precautions for All Temperature Controllers*.

Refer to *E5CS/E5CSV Operation* for operating procedures.

Model Number Structure

Model Number Legend

Models with Terminal Blocks

E5CSV-□□□□-□
1 2 3 4 5

1. Control Outputs

R: Relay
Q: Voltage for driving SSR

2. Alarm Outputs

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

3. Input

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

4. Power Supply Voltage

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

5. Case Color

Blank: Black
W: Light gray

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

Examples

- Relay control output, without alarm, thermocouple input, light gray case: E5CSV-RKJ-W
- Relay control output, one alarm output, platinum resistance thermometer input, black case: E5CSV-R1P-W

Ordering Information

■ List of Models

**Case Color: Light Gray, Thermocouple or Platinum Resistance Thermometer,
Power Supply Voltage: 100 to 240 VAC**

Size	Type	Control modes	Alarms	Outputs	Model with thermocouple	Model with platinum resistance thermometer
E5CSV 48 × 48mm	Terminal block	ON/OFF or PID	1	Relay	E5CSV-R1KJ-W	E5CSV-R1P-W
				Voltage (for driving SSR)	E5CSV-Q1KJ-W	E5CSV-Q1P-W

Case Color: Light Gray, Thermocouple, Power Supply Voltage: 24 VAC/VDC

Size	Type	Control modes	Alarms	Outputs	Model with thermocouple
E5CSV 48 × 48mm	Terminal block	ON/OFF or PID	1	Relay	E5CSV-R1KJD-W

Case Color: Light Gray, Universal-input, Power Supply Voltage: 100 to 240 VAC

Size	Type	Control modes	Alarms	Outputs	Model with universal-input (thermocouple or platinum resistance thermometer)
E5CSV 48 × 48mm	Terminal block	ON/OFF or PID	0	Relay	E5CSV-RT
				Voltage (for driving SSR)	E5CSV-QT
			1	Relay	E5CSV-R1T
				Voltage (for driving SSR)	E5CSV-Q1T
			2 (See note.)	Relay	E5CSV-R2T
				Voltage (for driving SSR)	E5CSV-Q2T

Note: There is no alarm output 2 mode switch. The default setting for alarm output 2 is for the upper limit alarm mode. To change the setting, change the alarm type for alarm output 2 in initial setting level 5. For details, refer to the "E5CSV/E5CS-U Digital Temperature Controller User's Manual" (Cat. No. H140-E1-01).

Case Color: Black, Universal-input, Power Supply Voltage: 24 VAC/VDC

Size	Type	Control modes	Alarms	Outputs	Model with universal-input (thermocouple or platinum resistance thermometer)
E5CSV 48 × 48mm	Terminal block	ON/OFF or PID	0	Relay	E5CSV-RTD
				Voltage (for driving SSR)	E5CSV-QTD
			1	Relay	E5CSV-R1TD
				Voltage (for driving SSR)	E5CSV-Q1TD
			2 (See note.)	Relay	E5CSV-R2TD
				Voltage (for driving SSR)	E5CSV-Q2TD

Note: There is no alarm output 2 mode switch. The default setting for alarm output 2 is for the upper limit alarm mode. To change the setting, change the alarm type for alarm output 2 in initial setting level 5. For details, refer to the "E5CSV/E5CS-U Digital Temperature Controller User's Manual" (Cat. No. H140-E1-01).

■ Accessories (Order Separately)

Protective Cover

Type	Model
Hard Protective Cover	Y92A-48B

Terminal Cover

Model
E53-COV10

Rubber Packing

Model
Y92S-29

Note: The Rubber Packing is provided with the Digital Controller.

Specifications

■ Ratings

Supply voltage		100 to 240 VAC, 50/60 Hz 24 VAC, 50/60 Hz; 24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		100 to 240 VAC: 5 VA 24 VAC: 3 VA, 24 VDC: 2 W
Sensor input		Thermocouple input type: K, J, L Platinum resistance thermometer input type: Pt100, JPt100 Universal-input (thermocouple/platinum resistance thermometer) type: 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)
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		7-segment digital display (character height: 13.5 mm) and deviation indicators
Other functions		• Setting change prohibit (key protection) • Input shift • Temperature unit change (°C/°F) • Direct/reverse operation • Temperature range, Sensor switching (K/J/L, Pt100/JPt100) • Switching is performed between a thermocouple and platinum resistance thermometer for universal-input models. • Control period switching • 8-mode alarm output • Sensor error detection
Ambient operating temperature		−10 to 55°C (with no condensation or icing); with 3-year guarantee: −10 to 50°C
Ambient operating humidity		25% to 85%
Storage temperature		−25 to 65°C (with no condensation or icing)

Note: 1. Do not use an inverter output as the power supply. (Refer to *Safety Precautions for All Temperature Controllers*.)
2. Models for 24 VAC/DC can also be manufactured.

■ Characteristics

Setting accuracy	Thermocouple (See note 1.): (±0.5% of indication value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer (See note 2.): (±0.5% of indication value or ±1°C, whichever is greater) ±1 digit max.	
Indication accuracy (ambient temperature of 23°C)		
Influence of temperature	R thermocouple inputs: (±1% of PV or ±10°C, whichever is greater) ±1 digit max. Other thermocouple inputs: (±1% of PV or ±4°C, whichever is greater) ±1 digit max.	
Influence of voltage	Platinum resistance thermometer inputs: (±1% of PV or ±2°C, whichever is greater) ±1 digit max.	
Hysteresis (for ON/OFF control)	0.2% FS (0.1% FS for universal-input (thermocouple/platinum resistance thermometer) models)	
Proportional band (P)	1 to 999°C (automatic adjustment using auto-tuning/self-tuning)	
Integral time (I)	1 to 1,999 s (automatic adjustment using auto-tuning/self-tuning)	
Derivative time (D)	1 to 1,999 s (automatic adjustment using auto-tuning/self-tuning)	
Alarm output range	Absolute-value alarm: Same as the control range Other: 0 to input setting range full scale (°C or °F) Alarm hysteresis: 0.2°C or °F (fixed)	
Control period	2/20 s	
Sampling period	500 ms	
Insulation resistance	20 MΩ min. (at 500 VDC)	
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between current-carrying terminals of different polarity	
Vibration resistance	Malfunction	10 to 55 Hz, 20 m/s² for 10 min each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 0.75-mm single amplitude for 2 hr each in X, Y, and Z directions
Shock resistance	Malfunction	100 m/s² min., 3 times each in 6 directions
	Destruction	300 m/s² min., 3 times each in 6 directions
Life expectancy	Electrical	100,000 operations min. (relay output models)
Weight	Approx. 120 g (Controller only)	
Degree of protection	Front panel: Equivalent to IP66; Rear case: IP20; Terminals: IP00	
Memory protection	EEPROM (non-volatile memory) (number of writes: 1,000,000)	
EMC	EMI Radiated: EMI Conducted: ESD Immunity: Radiated Electromagnetic Field Immunity: Conducted Disturbance Immunity: Noise Immunity (First Transient Burst Noise): Burst Immunity: Surge Immunity: Voltage Dip/Interrupting Immunity:	EN 55011 Group 1 Class A EN 55011 Group 1 Class A EN 61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) 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) EN 61000-4-6: 3 V (0.15 to 80 MHz) (level 2) EN 61000-4-4 2 kV power-line (level 3), 1 kV I/O signal-line (level 3) 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 EN 61000-4-11 0.5 cycle, 100% (rated voltage)
Approved standards	UL 61010C-1 (listing) CSA C22.2 No.1010-1	
Conformed standards	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: $\pm 2^{\circ}\text{C} \pm 1$ digit max.
- R: $\pm 3^{\circ}\text{C} \pm 1$ 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: $0.5\% \text{ FS} \pm 1$ digit max.