Temperature Controllers **E5CSV**

CSM_E5CSV_DS_E_7_3

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.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

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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



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

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Ordering Information

■ List of Models

Case Color: Light Gray, Thermocouple or Platinum Resistance Thermometer,

Power S	Supply	Voltage: 1	100 to 240	<u>VAC</u>

Size	Туре	Control modes	Alarms	Outputs	Model with thermocouple	Model with platinum resistance thermometer
E5CSV	Terminal block		1	Relay	E5CSV-R1KJ-W	E5CSV-R1P-W
$48 \times 48 mm$		PID		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	Terminal block		1	Relay	E5CSV-R1KJD-W
48×48 mm		PID			

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

Size	Туре	Control modes	Alarms	Outputs	Model with universal- input (thermocouple or platinum resistance thermometer)
E5CSV	Terminal block		0	Relay	E5CSV-RT
48×48 mm		PID		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	Туре	Control modes	Alarms	Outputs	Model with universal- input (thermocouple or platinum resistance thermometer)
E5CSV	Terminal block	ON/OFF or	0	Relay	E5CSV-RTD
48×48 mm		PID		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

Туре	Model
Hard Protective Cover	Y92A-48B

Terminal Cover

	Model
E53-COV10	

Terminal Cover

(For Controllers after the design change scheduled for October 2010)

	Model
E53-COV17	

Note: The E53-COV10 Terminal Cover cannot be mounted to Controllers that are manufactured after the design change scheduled for October 2010

DIN Track Mounting Adapter

	Model	
Y92F-52		

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	g voltage range	85% to 110% of rated supply voltage		
Power co	onsumption	100 to 240 VAC: 5 VA 24 VAC: 3 VA, 24 VDC: 2 W		
Sensor input		Thermocouple input type: Platinum resistance thermometer input type: Priloo, JPt100 Universal-input (thermocouple/platinum resistance thermometer) type: K, J, L, T, U, N, R, Pt100, JPt100		
Control	Relay output	SPST-NO, 250 VAC, 3A (resistive load)		
output	Voltage output (for driving the SSR)	12 VDC, 21 mA (with short-circuit protection circuit)		
Control n	nethod	ON/OFF or 2-PID (with auto-tuning)		
Alarm ou	ıtput	SPST-NO, 250 VAC, 1A (resistive load)		
Setting m	nethod	Digital setting using front panel keys		
Indication	n 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 t	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.			
Indication accuracy (ambient temperatur	e of 23°C)	Platinum resistance thermometer (See note 2	.): (±0.5% of indication value or ±1°C, whichever is ğreater) ±1 diğit max.			
Influence of temperature		R thermocouple inputs: (±1%	6 of PV or ±10°C, whichever is greater) ±1 digit max.			
Influence of voltage		Other thermocouple inputs: (±1%) Platinum resistance thermometer inputs: (±1%)	6 of PV or ±4°C, whichever is greater) ±1 digit max. 6 of PV or ±2°C, whichever is greater) ±1 digit max.			
Hysteresis (for ON/O	FF control)	0.2% FS (0.1% FS for universal-input (thermocouple/platinum resistance thermometer) models)				
Proportional band (F	')	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 rand Other: Other:				
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	Malfunction	10 to 55 Hz, 20 m/s² for 10 min each in X, Y, and Z directions				
resistance	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/s ² min., 3 times each in 6 directions				
	Destruction	300 m/s ² 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	l	Front panel: Equivalent to IP66; Rear case: IP20; Terminals: IP00				
Memory protection		EEPROM (non-volatile memory) (number of w	vrites: 1,000,000)			
EMC		EMI Conducted: ESD Immunity: Radiated Electromagnetic Field Immunity: Conducted Disturbance Immunity: Noise Immunity (First Transient Burst Noise): Burst Immunity: Surge Immunity:	EN 55011 Group 1 Class A 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 61010-1 (listing) CSA C22.2 No.1010-1				
Conformed standard	ls	EN 61326, EN 61010-1, IEC 61010-1 VDE 0106 Part 100 (finger protection), when t	the terminal cover is mounted.			

Note: 1. The following exceptions apply to thermocouples.

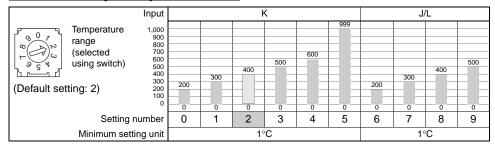
• U, L: ±2°C ±1 digit max.

• 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.

■ Temperature Range

Thermocouple Input Models



The shaded value indicates the default setting status.

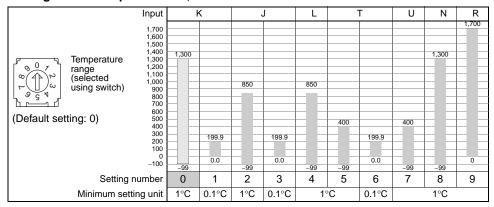
Platinum Resistance Thermometer Input Models

0 7 2 3 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Temperature	Input	JPt100/Pt100									
	range 500							400		400		
	(selected	400 300						300		300		
	using switch) 2	200	50	50.0	80	99.9	200					199.9
		100										
(Default setting: 3)		-100	-50	0.0	-20	0.0	0	0	0	0	0	0.0
Setting number			0	1	2	3	4	5	6	7	8	9
Minimum setting unit			1°C	0.1°C	1°C	0.1°C	1°C					0.1°C

The shaded value indicates the default setting status.

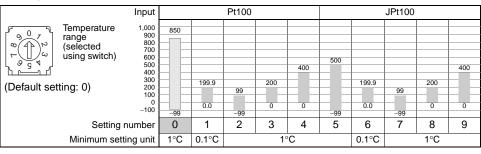
Universal-input (Thermocouple/Platinum Resistance Thermometer) Models

• Using Thermocouple Sensors, Control Mode Switch 5: OFF



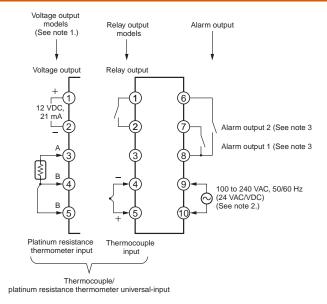
The shaded value indicates the default setting status.

• Using Platinum Resistance Thermometers, Control Mode Switch 5: ON



The shaded value indicates the default setting status.

External Connection Diagram



- Note: 1. The voltage output (12 VDC, 21 mA) is not electrically isolated from the internal circuits. When using a grounding thermocouple, do not connect output terminals 1 or 2 to ground. Otherwise, unwanted current paths will cause measurement errors.
 - 2. Models with 100 to 240 VAC and 24 VAC/VDC are separate. Models using 24 VDC have no polarity.
 - 3. The number of alarm outputs depends on the model.

Nomenclature

E5CSV Models with Terminal Blocks



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Dimensions

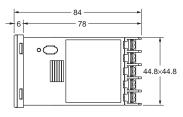
Note: All units are in millimeters unless otherwise indicated.

■ Controller

E5CSV

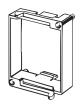






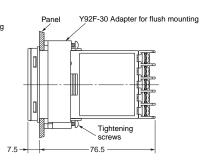
Panel Cutout Dimensions 60 min
$$\label{eq:L} \begin{split} L &= (48 \times \text{N--}2.5)^{+1}_{0} \\ \text{Mounting side-by-side} \\ \text{(group mounting of N Controllers)} \end{split}$$
Note: Terminals cannot be removed.

E5CSV + Adapter for Flush Mounting (Provided)







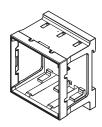


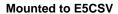
Note: 1. The recommended panel thickness is 1 to 4 mm.

2. Group mounting is possible in one direction only.

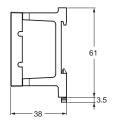
DIN Track Mounting Adapter

Y92F-52 Note: This Adapter cannot be used together with the Terminal Cover. Remove the Terminal Cover to use the Adapter.

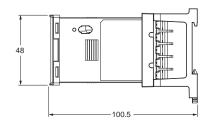












■ Accessories (Order Separately)

Hard Protective Cover

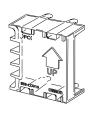
The Y92A-48B Protective Cover (hard type) is available for the following applications.

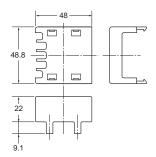
- To protect the set from dust and dirt.
- To prevent the panel from being accidentally touched causing displacement of set values.
- To provide effective protection against water droplets.



Terminal Cover

E53-COV10

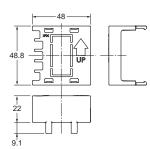




E53-COV17







Rubber Packing

Y92S-29 (for DIN48 × 48)



Order the Rubber Packing separately if it becomes lost or damaged. The Rubber Packing can be used to achieve an IP66 degree of protection for models with terminal blocks.

(Deterioration, shrinking, or hardening of the rubber packing may occur depending on the operating environment. Therefore, periodic replacement is recommended to ensure the level of waterproofing specified in NEMA4. The time for periodic replacement depends on the operating environment. Be sure to confirm this point at your site. Consider one year a rough standard. OMRON shall not be liable for the level of water resistance if the customer does not perform periodic replacement.)

The Rubber Packing does not need to be attached if a waterproof structure is not required.

Safety Precautions

Refer to Safety Precautions for All Temperature Controllers. Refer to E5CS/E5CSV Operation for operating procedures.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

In the interest of product improvement, specifications are subject to change without notice.

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Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

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