

Temperature Controllers

E5CSL/E5CWL/E5EWL

The Simple and New Temperature Controller is Released that Easily Achieves the Temperature Control.

- Easy to Read (Character Height E5CSL: 21.7 mm, E5CWL: 16.2 mm (PV), E5EWL: 20 mm (PV)).
- Depth beyond front panel: Only 60 mm.
- Fewer parameters for simple setup.
- Faster sampling at 250 ms.

Note: Refer to Precautions on page 9.



48 × 48 mm
E5CSL

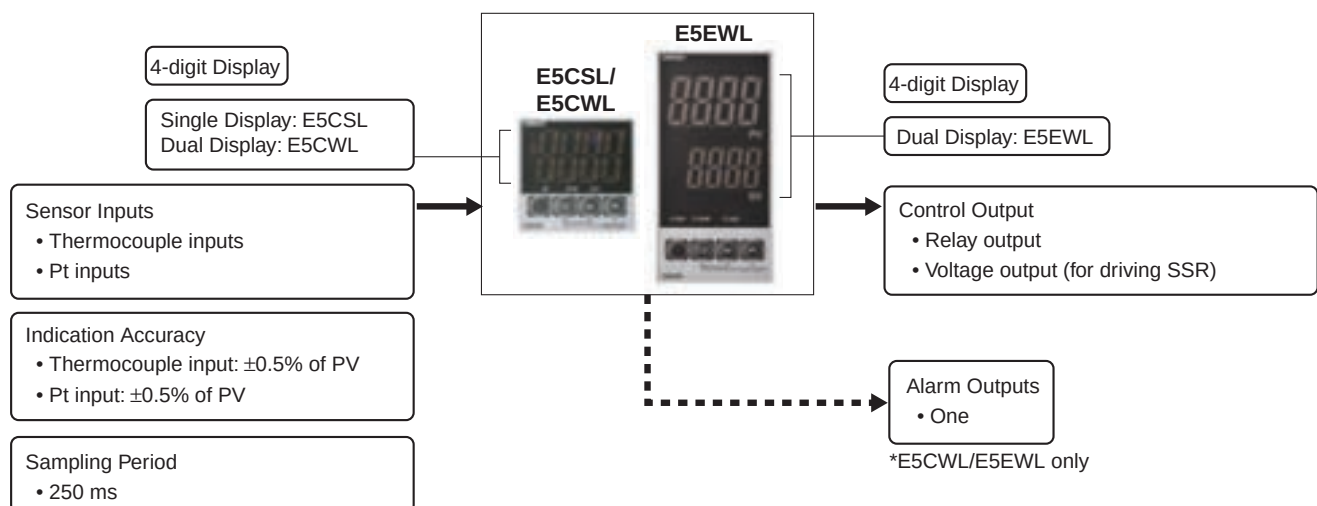
48 × 48 mm
E5CWL



48 × 96 mm
E5EWL

NEW

Main I/O Functions



Model Number Structure

Model Number Legend

E5CSL-□□
1 2

- Control Output**
R: Relay output: 250 VAC, 3 A
Q: Voltage output (for driving SSR): 12 VDC, 21 mA
- Sensor type**
TC: Thermocouple (K, J, T, R, or S)
P: Platinum resistance thermometer (Pt100)

E5CWL-□1□
1 2 3

- Control Output**
R: Relay output: 250 VAC, 3 A
Q: Voltage output (for driving SSR): 12 VDC, 21 mA
- Alarm**
1: Relay output: 250 VAC, 1 A (resistive load)
- Sensor type**
TC: Thermocouple (K, J, T, R, or S)
P: Platinum resistance thermometer (Pt100)

E5EWL-□1□
1 2 3

- Control Output**
R: Relay output: 250 VAC, 3 A
Q: Voltage output (for driving SSR): 12 VDC, 21 mA
- Alarm**
1: Relay output: 250 VAC, 1 A (resistive load)
- Sensor type**
TC: Thermocouple (K, J, T, R, or S)
P: Platinum resistance thermometer (Pt100)

E5CSL/E5CWL/E5EWL

Ordering Information

E5CSL

Size	Power supply voltage	Input type	Alarm output	Control output	Model
1/16 DIN 48 × 48 × 60 (W × H × D)	100 to 240 VAC	Thermocouple	None	Relay output	E5CSL-RTC
		Resistance thermometer			E5CSL-RP
		Thermocouple		Voltage output (for driving SSR)	E5CSL-QTC
		Resistance thermometer			E5CSL-QP

E5CWL

Size	Power supply voltage	Input type	Alarm output	Control output	New model
1/16 DIN 48 × 48 × 60 (W × H × D)	100 to 240 VAC	Thermocouple	1	Relay output	E5CWL-R1TC
		Resistance thermometer			E5CWL-R1P
		Thermocouple		Voltage output (for driving SSR)	E5CWL-Q1TC
		Resistance thermometer			E5CWL-Q1P

E5EWL

Size	Power supply voltage	Input type	Alarm output	Control output	New model
1/8 DIN 48 × 96 × 60 (W × H × D)	100 to 240 VAC	Thermocouple	1	Relay output	E5EWL-R1TC
		Resistance thermometer			E5EWL-R1P
		Thermocouple		Voltage output (for driving SSR)	E5EWL-Q1TC
		Resistance thermometer			E5EWL-Q1P

Accessories (Order Separately)

Terminal Cover

Model	E53-COV19
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Front Panel (for E5CSL/E5CWL)

Model	E53-COV20
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Note: 1. This Front Panel accessory is required to attach the Y92A-48B or Y92A-48D.
2. This Front Panel accessory is only the frame. It does not include the plastic cover.

Adapter

Model	Remarks
Y92F-45	- Use this Adapter when the Front Panel has already been prepared for the E5B□. - Only black is available. - Order separately.
Y92F-49	- Use for E5CSL/E5CWL only. - Provided with E5CSL/E5CWL.
Y92F-51	- Use for E5EWL only. - Provided with E5EWL.

Specifications

Ratings

Power supply voltage		100 to 240 VAC, 50/60 Hz
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		3.5 VA
Sensor input		Models with thermocouple inputs Thermocouple: K, J, T, R, or S
		Models with platinum resistance thermometer inputs Platinum resistance thermometer: Pt100
Control output	Relay output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum load: 5 V, 10 mA
	Voltage output (for driving SSR)	Output voltage: 12 VDC +25%/–15% (PNP), max. load current: 21 mA, with short-circuit protection circuit
Alarm output (See note.)		SPST-NO, 250 VAC, 1 A (resistive load), electrical life: 100,000 operations, minimum load: 5 V, 10 mA
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Setting method		Digital setting using front panel keys
Indication method		7-segment digital display and individual indicators Character height: E5CSL: 21.7 mm, E5CWL: 16.2 mm (PV), E5EWL: 20 mm (PV)
Other functions		Temperature input shift, run/stop, protection functions, etc.
Ambient operating temperature		–10 to 55°C (with no icing or condensation)
Ambient operating humidity		25% to 85%
Storage temperature		–25 to 65°C (with no icing or condensation)

Note: E5CWL/E5EWL only

Input Ranges

Models with Thermocouple Inputs

Model (temperature input)	Set value	Input type	Range	
			°C	°F
TC input	0	K	-200 to 1,300	-300 to 2,300
	1		-20.0 to 500.0	0.0 to 900.0
	2	J	-100 to 850	-100 to 1500
	3		-20.0 to 400.0	0.0 to 750.0
	4	T	-200 to 400	-300 to 700
	5		-199.9 to 400.0	-199.9 to 700.0
	6	R	0 to 1,700	0 to 3,000
	7	S	0 to 1,700	0 to 3,000

Default setting: 0

Applicable standards (K, J, T, R, S): JIS C1602-1995 and IEC 60584-1

Models with Resistance Thermometer Inputs

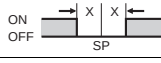
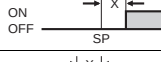
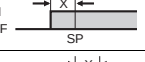
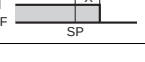
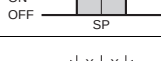
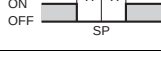
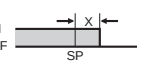
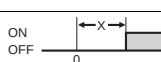
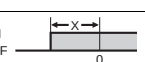
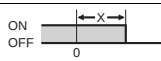
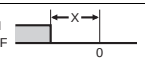
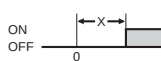
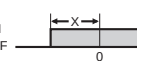
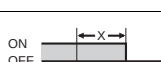
Model (temperature input)	Set value	Input type	Range	
			°C	°F
Pt input	8	Pt100	-200 to 850	-300 to 1500
	9		-199.9 to 500.0	-199.9 to 900.0

Default setting: 8

Applicable standards (Pt100): JIS C1604-1997 and IEC 60751

Alarm Types

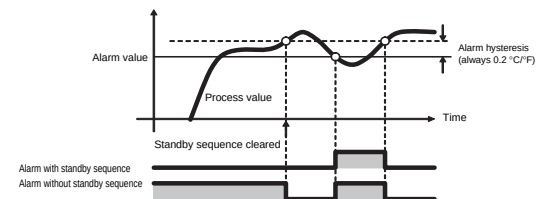
Select alarm types out of the 11 alarm types listed in the following table.

Setting	Alarm type	Positive alarm value (X)	Negative alarm value (X)
0	No alarm	Output OFF	
1	Deviation upper/lower limit	ON OFF 	Always ON
2	Deviation upper limit	ON OFF 	ON OFF 
3	Deviation lower limit	ON OFF 	ON OFF 
4	Deviation upper/lower range	ON OFF 	Always OFF
5 (See note.)	Deviation upper/lower limit standby sequence ON	ON OFF 	Always OFF
6 (See note.)	Deviation upper limit standby sequence ON	ON OFF 	ON OFF 
7 (See note.)	Deviation lower limit standby sequence ON	ON OFF 	ON OFF 
8	Absolute value upper limit	ON OFF 	ON OFF 
9	Absolute value lower limit	ON OFF 	ON OFF 
10 (See note.)	Absolute value upper limit standby sequence ON	ON OFF 	ON OFF 
11 (See note.)	Absolute value lower limit standby sequence ON	ON OFF 	ON OFF 
12	Do not set.		

Note: Alarms with a Standby Sequence

The alarm is blocked until the first safe-state is reached.
Unwanted alarm during start-up are prevented.

Example: Deviation Lower Limit Standby Sequence ON



The standby sequence is cleared when the alarm OFF condition has been met.

The standby sequence is started again when any of the following conditions is met.

- Operation is started (power is turned ON or operation is switched from stop to run).
- The alarm value is changed.
- The temperature input offset is changed.
- The set point is changed.

Characteristics

Indication accuracy		Thermocouple: (See note 1.) ($\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max. Platinum resistance thermometer: ($\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max.
Influence of temperature		R and S thermocouple inputs: ($\pm 1\%$ of PV or $\pm 10^\circ\text{C}$, whichever is greater) ± 1 digit max.
Influence of voltage		K, J, and T thermocouple inputs: ($\pm 1\%$ of PV or $\pm 4^\circ\text{C}$, whichever is greater) ± 1 digit max.
Influence of EMS. (at EN61326-1)		Platinum resistance thermometer inputs: ($\pm 1\%$ of PV or $\pm 2^\circ\text{C}$, whichever is greater) ± 1 digit max.
Hysteresis		0.1 to 999.9 (in units of 0.1) $^\circ\text{C}/^\circ\text{F}$
Proportional band (P)		0.1 to 999.9 (in units of 0.1) $^\circ\text{C}/^\circ\text{F}$
Integral time (I)		0 to 3999 s (in units of 1 s)
Derivative time (D)		0 to 3999 s (in units of 1 s)
Control period		0.5, 1 to 99 s (in units of 1 s)
Alarm setting range		-1999 to 9999 (decimal point position depends on input type)
Sampling period		250 ms
Affect of signal source resistance		Thermocouple: $0.1^\circ\text{C}/\Omega$ max. (100 Ω max.) (See note 2.) Platinum resistance thermometer: $0.6^\circ\text{C}/\Omega$ max. (10 Ω max.)
Insulation resistance		20 M Ω min. (at 500 VDC)
Dielectric strength		2,300 VAC, 50 or 60 Hz for 1 min (between terminals with different charge)
Vibration resistance	Malfunction	10 to 55 Hz, 20 m/s ² for 10 min each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 20 m/s ² for 2 hrs each in X, Y, and Z directions
Shock resistance	Malfunction	100 m/s ² min., 3 times each in X, Y, and Z directions
	Destruction	300 m/s ² min., 3 times each in X, Y, and Z directions
Weight	E5CSL/E5CWL	Controller: Approx. 100 g, Mounting Bracket: Approx. 10 g
	E5EWL	Controller: Approx. 150 g, Mounting Bracket: Approx. 10 g
Degree of protection		Front panel: IP50 Rear case: IP20, Terminals: IP00
Memory protection		Non-volatile memory (number of writes: 100,000 times)
Conformed standards		EN61326-1 (See note 3.), EN61010-1, IEC61010-1 VDE0106 Part 100 (Finger protection), when the terminal cover is mounted.
EMC		Emission Enclosure: EN55011 Group1 Class A Emission AC Mains: EN55011 Group1 Class A Immunity ESD: EN61000-4-2 Immunity RF-interference: EN61000-4-3 10 V/m Immunity Conducted Disturbance: EN61000-4-6 3 V Immunity Burst: EN61000-4-4 Immunity Surge: EN61000-4-5 Immunity Voltage Dip/Interrupting: EN61000-4-11

Note: 1. The indication accuracy of K and T thermocouples at a temperature of -100°C max. is $\pm 2^\circ\text{C} \pm 1$ digit maximum. The indication accuracy of the R and S thermocouples at a temperature of 200°C max. is $\pm 3^\circ\text{C} \pm 1$ digit max.

2. R, and S sensors: $0.2^\circ\text{C}/\Omega$ max. (100 Ω max.)

3. Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

Electrical Life Expectancy Curve for Relays (Reference Values)

