

New 48 x 48-mm Basic Temperature Controller with Enhanced Functions and Performance. Improved Indication Accuracy and Preventive Maintenance Function.

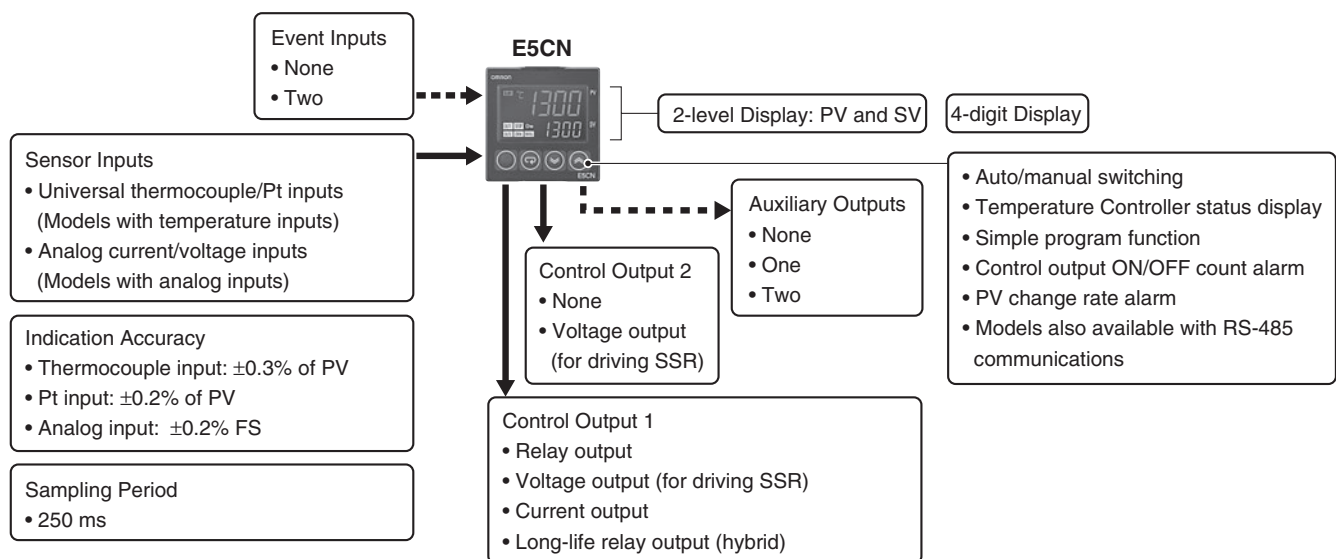
- Indication Accuracy
Thermocouple input: $\pm 0.3\%$ of PV (previous models: $\pm 0.5\%$)
Pt input: $\pm 0.2\%$ of PV (previous models: $\pm 0.5\%$)
Analog input: $\pm 0.2\%$ FS (previous models: $\pm 0.5\%$)
- New E5CN-U Models (Plug-in Models) with analog inputs and current outputs.
- A PV/SV-status display function can be set to automatically alternate between displaying the status of the Temperature Controller (auto/manual, RUN/STOP, and alarms) and the PV or SV.
- Preventive maintenance for relays in the Temperature Controller using a Control Output ON/OFF Counter.



Refer to *Safety Precautions for E5□N/E5□N-H*.

Refer to *Operation for E5□N/E5□N-H* for operating procedures.

Main I/O Functions

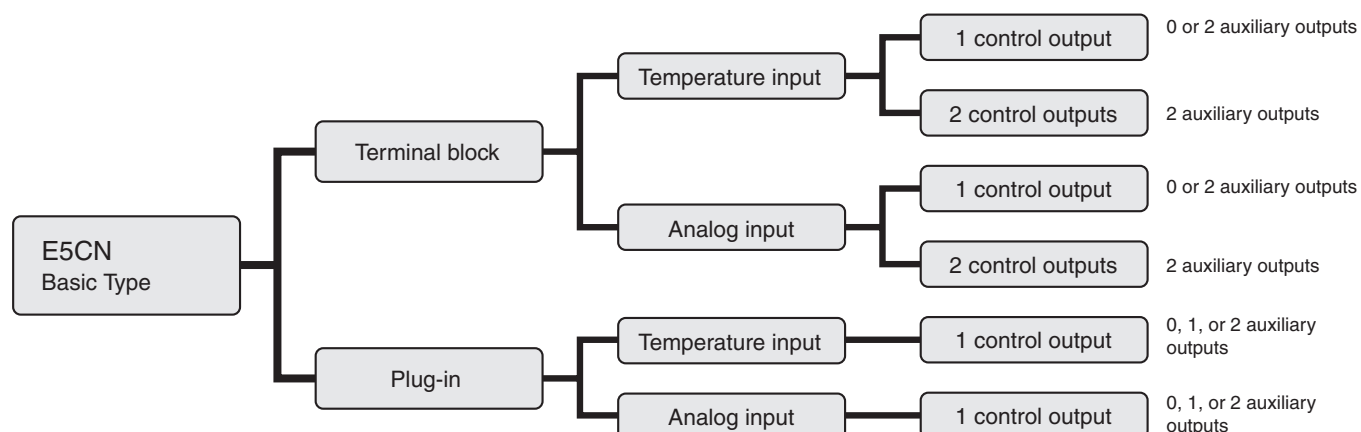


This data sheet is provided as a guideline for selecting products. Be sure to refer to the following user manuals for application precautions and other information required for operation before attempting to use the product.

E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type (Cat. No. H156)

E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers Communications Manual Basic Type (Cat. No. H158)

Lineup



Note: Models with one control output and one or two auxiliary outputs and models with two control outputs can be used for heating/cooling control.

Model Number Structure

Model Number Legend

Controllers

E5CN- M - -500

1 2 3 4 5 6 7

1. Control Output 1

- R: Relay output
- Q: Voltage output (for driving SSR)
- C: Current output
- Y: Long-life relay output (hybrid) *1

2. Auxiliary Outputs *2

- Blank: None
- 2: Two outputs

3. Option

- M: Option Unit can be mounted.

4. Input Type

- T: Universal thermocouple/platinum resistance thermometer
- L: Analog current/voltage input

5. Power Supply Voltage

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

6. Case Color

- Blank: Black
- W: Silver

7. Terminal Cover

- 500: With terminal cover

Option Units

E53-CN

1 2 3 4

1. Applicable Controller

- CN: E5CN or E5CN-H

2. Function 1

- Blank: None
- Q: Control output 2 (voltage for driving SSR)
- P: Power supply for sensor

3. Function 2

- Blank: None
- H: Heater burnout/SSR failure/Heater overcurrent detection (CT1)
- HH: Heater burnout/SSR failure/Heater overcurrent detection (CT2)
- B: Two event inputs
- 03: RS-485 communications
- H03: Heater burnout/SSR failure/Heater overcurrent detection (CT1) + RS-485 communications
- HB: Heater burnout/SSR failure/Heater overcurrent detection (CT1) + Two event inputs
- HH03: Heater burnout/SSR failure/Heater overcurrent detection (CT2) + RS-485 communications

4. Version

- N2: Applicable only to models released after January 2008

Note: 1. Not all combinations of function 1 and function 2 specifications are possible for Option Units (E53-).

2. Estimates can be provided for coatings and other specifications that are not given in the datasheet. Ask your OMRON representative for details.

*1. Always connect an AC load to a long-life relay output. The output will not turn OFF if a DC load is connected because a triac is used for switching the circuit. For details, check the conditions in *Ratings*.

*2. Auxiliary outputs are contact outputs that can be used to output alarms or results of logic operations.

Ordering Information

Controllers with Terminal Blocks

Size	Case color	Power supply voltage	Input type	Auxiliary outputs	Control output 1	Model
1/16 DIN 48 × 48 × 78 (W × H × D)	Black	100 to 240 VAC	Thermocouple or Resistance thermometer	None	Relay output	E5CN-RMT-500
					Voltage output (for driving SSR)	E5CN-QMT-500
					Current output	E5CN-CMT-500
				2	Relay output	E5CN-R2MT-500
					Voltage output (for driving SSR)	E5CN-Q2MT-500
					Current output	E5CN-C2MT-500
		24 VAC/VDC	Thermocouple or Resistance thermometer	None	Long-life relay output (hybrid)	E5CN-Y2MT-500
					Relay output	E5CN-RMTD-500
					Voltage output (for driving SSR)	E5CN-QMTD-500
					Current output	E5CN-CMTD-500
				2	Relay output	E5CN-R2MTD-500
					Voltage output (for driving SSR)	E5CN-Q2MTD-500
					Current output	E5CN-C2MTD-500
	Silver	100 to 240 VAC	Analog (current/voltage)	None	Relay output	E5CN-RML-500
					Voltage output (for driving SSR)	E5CN-QML-500
					Current output	E5CN-CML-500
				2	Relay output	E5CN-R2ML-500
					Voltage output (for driving SSR)	E5CN-Q2ML-500
					Current output	E5CN-C2ML-500
		24 VAC/VDC	Analog (current/voltage)	2	Long-life relay output (hybrid)	E5CN-Y2ML-500
					Relay output	E5CN-R2MLD-500
					Voltage output (for driving SSR)	E5CN-Q2MLD-500
					Current output	E5CN-C2MLD-500
		100 to 240 VAC	Thermocouple or Resistance thermometer	None	Relay output	E5CN-RMT-W-500
					Voltage output (for driving SSR)	E5CN-QMT-W-500
					Current output	E5CN-CMT-W-500
				2	Relay output	E5CN-R2MT-W-500
					Voltage output (for driving SSR)	E5CN-Q2MT-W-500
					Current output	E5CN-C2MT-W-500
	Silver	24 VAC/VDC	Thermocouple or Resistance thermometer	2	Long-life relay output (hybrid)	E5CN-Y2MT-W-500
					Relay output	E5CN-R2MTD-W-500
					Voltage output (for driving SSR)	E5CN-Q2MTD-W-500
					Current output	E5CN-C2MTD-W-500

Note: Models with analog inputs do not have temperature unit indicators.

Option Units

One of the following Option Units can be mounted to provide the E5CN with additional functions.

Functions					Model (See Note 2.)
Communications RS-485	3-phase heater burnout/SSR failure/Heater overcurrent detection				E53-CNHH03N2
	Heater burnout/SSR failure/Heater overcurrent detection	Event inputs			E53-CNHBN2
Communications RS-485			Control output 2 (Voltage for driving SSR)		E53-CNQ03N2
		Event inputs		External power supply for ES1B	E53-CNPBN2
	Heater burnout/SSR failure/Heater overcurrent detection			External power supply for ES1B	E53-CNPHN2
Communications RS-485				External power supply for ES1B	E53-CNP03N2
Communications RS-485	Heater burnout/SSR failure/Heater overcurrent detection				E53-CNHH03N2
Communications RS-485					E53-CN03N2
		Event inputs			E53-CNBN2
	Heater burnout/SSR failure/Heater overcurrent detection		Control output 2 (Voltage for driving SSR)		E53-CNQHN2
	3-phase heater burnout/SSR failure/Heater overcurrent detection		Control output 2 (Voltage for driving SSR)		E53-CNQHNN2
		Event inputs	Control output 2 (Voltage for driving SSR)		E53-CNQBN2

Note: 1. Option Units cannot be used for plug-in models.

These Option Units are applicable only to models released after January 2008.

- 2.** If the E53-CNQHN2 or E53-CNQHNN2 Option Unit is used together with the E5CN-C□ Temperature Controller and control output 1 (current output) is assigned to the heating control output, heater burnout detection will be disabled.

Model Number Structure

Model Number Legend (Plug-in-type Controllers)

E5CN-□□□□U
1 2 3 4

1. Output Type

R: Relay output
Q: Voltage output (for driving SSR)
C: Current output

2. Number of Alarms

Blank: No alarm
1: One alarm
2: Two alarms

3. Input Type

T: Universal thermocouple/platinum resistance thermometer
L: Analog Input

4. Plug-in type

U: Plug-in type

Ordering Information

Plug-in-type Controllers

Size	Case color	Power supply voltage	Input type	Auxiliary outputs	Control output 1	Model
1/16 DIN	Black	100 to 240 VAC	Thermocouple or resistance thermometer	None	Relay output	E5CN-RTU
					Voltage output (for driving SSR)	E5CN-QTU
					Current output	E5CN-CTU
				1	Relay output	E5CN-R1TU
					Voltage output (for driving SSR)	E5CN-Q1TU
					Current output	E5CN-C1TU
			Analog (current/voltage)	2	Relay output	E5CN-R2TU
					Voltage output (for driving SSR)	E5CN-Q2TU
					Current output	E5CN-C2TU
				1	Relay output	E5CN-R1LU
					Voltage output (for driving SSR)	E5CN-Q1LU
					Current output	E5CN-C1LU
				2	Relay output	E5CN-R2LU
					Voltage output (for driving SSR)	E5CN-Q2LU
					Current output	E5CN-C2LU
		24 VAC/VDC	Thermocouple or resistance thermometer	None	Relay output	E5CN-RTDU
					Voltage output (for driving SSR)	E5CN-QTDU
					Current output	E5CN-CTDU
				1	Relay output	E5CN-R1TDU
					Voltage output (for driving SSR)	E5CN-Q1TDU
					Current output	E5CN-C1TDU
			Analog (current/voltage)	2	Relay output	E5CN-R2TDU
					Voltage output (for driving SSR)	E5CN-Q2TDU
					Current output	E5CN-C2TDU

Note: Models with analog inputs do not have temperature unit indicators.

Accessories (Order Separately)

USB-Serial Conversion Cable

Model
E58-CIFQ1

Terminal Cover

Connectable models	Model
Terminal block models	E53-COV17

Note: The Terminal Cover comes with the E5CN-□□□-500 models.

Waterproof Packing

Model
Y92S-29

Note: The Waterproof Packing is included with the Controller only for models with terminal blocks.

Current Transformers (CTs)

Hole diameter	Model
5.8 dia.	E54-CT1
12.0 dia.	E54-CT3

Adapter

Connectable models	Model
Terminal block models	Y92F-45

Note: Use this Adapter when the panel has been previously prepared for the E5B□.

Sockets (for Plug-in Models)

Type	Model
Front-connecting Socket	P2CF-11
Front-connecting Socket with Finger Protection	P2CF-11-E
Back-connecting Socket	P3GA-11
Terminal Cover for Back-connecting socket with Finger Protection	Y92A-48G

Front cover

Type	Model
Hard Front Cover	Y92A-48B
Soft Front Cover	Y92A-48D

CX-Thermo Support Software

Model
EST2-2C-MV4

Specifications

Ratings

Power supply voltage		No D in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC	
Operating voltage range		85% to 110% of rated supply voltage	
Power consumption	E5CN	100 to 240 VAC: 7.5 VA (max.) (E5CN-R2T at 100 VAC: 3.0 VA) 24 VAC/VDC: 5 VA/3 W (max.) (E5CN-R2TD at 24 VAC: 2.7 VA)	
	E5CN-U	100 to 240 VAC: 6 VA (max.) 24 VAC/VDC: 3 VA/2 W (max.) (models with current output: 4 VA/2 W)	
Sensor input		Models with temperature inputs Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C Voltage input: 0 to 50 mV	
		Models with analog inputs Current input: 4 to 20 mA or 0 to 20 mA Voltage input: 1 to 5 V, 0 to 5 V, or 0 to 10 V	
Input impedance		Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the ES2-HB.)	
Control method		ON/OFF control or 2-PID control (with auto-tuning)	
Control outputs	Relay output	E5CN	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
		E5CN-U	SPDT, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	Voltage output (for driving SSR)	E5CN E5CN-U	Output voltage: 12 VDC ±15% (PNP), max. load current: 21 mA, with short-circuit protection circuit
	Current output	E5CN	4 to 20 mA DC/0 to 20 mA DC, load: 600 Ω max., resolution: approx. 10,000
	Long-life relay output	E5CN	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 1,000,000 operations, load power supply voltage: 75 to 250 VAC (DC loads cannot be connected.), minimum applicable load: 5 V, 10 mA, leakage current: 5 mA max. (250 VAC, 60 Hz)
Auxiliary outputs	Number of outputs	1 or 2 max. (Depends on the model.)	
	Output specifications	Relay output: SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA	
Event inputs	External contact input specifications	Number of inputs	2
		Contact input: ON: 1 kΩ max., OFF: 100 kΩ min.	
		Non-contact input: ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.	
		Current flow: Approx. 7 mA per contact	
External power supply for ES1B		12 VDC ±10%, 20 mA, short-circuit protection circuit provided	
Setting method		Digital setting using front panel keys	
Indication method		11-segment digital display and individual indicators (7-segment display also possible) Character height: PV: 11 mm, SV: 6.5 mm	
Multi SP		Up to four set points (SP0 to SP3) can be saved and selected using event inputs, key operations, or serial communications.	
Bank switching		Not supported	
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout detection (including SSR failure and heater overcurrent detection), 40% AT, 100% AT, MV limiter, input digital filter, self-tuning, temperature input shift, run/stop, protection functions, control output ON/OFF counter, extraction of square root, MV change rate limit, logic operations, PV/SV status display, simple program, automatic cooling coefficient adjustment	
Ambient operating temperature		-10 to 55°C (with no condensation or icing), for 3-year warranty: -10 to 50°C	
Ambient operating humidity		25% to 85%	
Storage temperature		-25 to 65°C (with no condensation or icing)	