Advanced Digital Temperature Controller

E5AN-H/E5EN-H

(96 x 96 mm and 48 x 96 mm)

CSM_E5AN-H_E5EN-H_DS_E_3_16

A New High-performance Controller: High Resolution, High Speed, and High Input Accuracy.
Logic Operations and Preventive Maintenance Function.

- High-resolution display with 5 digits/0.01°C display.
- High-speed sampling cycle of 60 ms.
- High Accuracy
  Thermocouple/Pt input: ±0.1% of PV
  Analog input: ±0.1% FS
- Universal inputs on all models (thermocouple, PT, or analog input) to handle various sensors with one Controller. Models also available with Remote SP.
- 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.
- Flexible contact outputs with logic operations (AND, OR, and delays) set from the Support Software (CX-Thermo Ver. 4.0)
- 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.

96 × 96 mm
E5AN-H

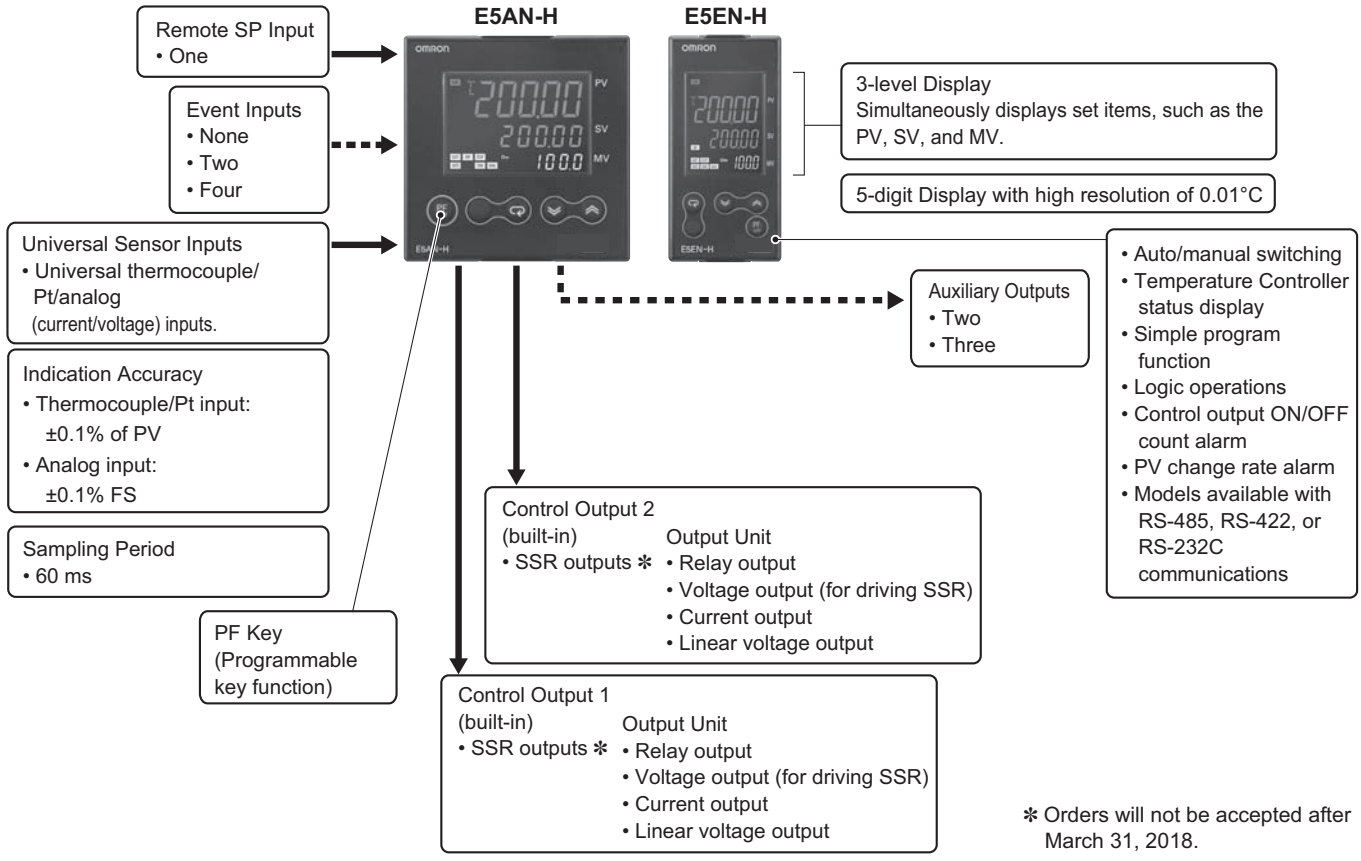
48 × 96 mm
E5EN-H

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

E5AN-HSS□-500, E5EN-HSS□-500 in this catalog have been discontinued at the end of March 2018.

E5AN-HPRR□-500, E5EN-HPRR□-500 in this catalog have been discontinued at the end of March, 2025.

Main I/O Functions



✻ Orders will not be accepted after March 31, 2018.

Lineup

Note: The Controller can be used for heating/cooling control even if only 1 control output is used.

Model Number Structure

Model Number Legend

Controllers

E5AN/E5EN-□□□□□□□M□-□-500
1 2 3 4 5 6 7 8 9 10 11

1. **Type**
   H: Advanced
2. **Control Mode**
   Blank: Standard or heating/cooling control
   P: Position-proportional control ✻2
3. **Control Output 1**
   A: Control Output Unit
   R: Relay output ✻2
   S: SSR output ✻1
4. **Control Output 2**
   A: Control Output Unit
   R: Relay output ✻2
   S: SSR output ✻1
5. **Auxiliary Outputs**
   2: Two outputs
   3: Three outputs
6. **Option 1**
   Blank: None
   H: Heater burnout/SSR failure/Heater overcurrent detection (CT1)
   HH: Heater burnout/SSR failure/Heater overcurrent detection (CT2)
7. **Option 2**
   B: Two event inputs
   BF: Event input + Transfer output
8. **Option 3**
   M: Option Unit can be mounted.
9. **Power Supply Voltage**
   Blank: 100 to 240 VAC
   D: 24 VAC/VDC
10. **Case Color**
    Blank: Black
    W: Silver
11. **Terminal Cover**
    -500: With Terminal Cover

✻1. Orders are no longer available since March 31, 2018.
✻2. Orders are no longer available since March 31, 2025.

Option Units

E53-□
1

1. **Function**
   EN01: RS-232C communications
   EN02: RS-422 communications
   EN03: RS-485 communications
   AKB: Event input

Output Units

E53-□□
1 2

1. **Control Output**
   R: Relay output
   Q: Voltage output (for driving SSR)
   Q3: Voltage output (for driving SSR) + 24 VDC (NPN)
   Q4: Voltage output (for driving SSR) + 24 VDC (PNP)
   C3: Current output + 4 to 20 mA DC
   C3D: Current output + 0 to 20 mA DC
   V34: Linear voltage output + 0 to 10 VDC
   V35: Linear voltage output + 0 to 5 VDC
2. **Version**
   Blank: Available for E5AN-E5EN-H.
   N: Available only for E5AN-H/E5EN-H.

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-H/E5AN-H/E5EN-H Digital Controllers User's Manual Advanced Type (Cat. No. H157)

E5CN-H/E5AN-H/E5EN-H Digital Controllers Communications Manual Advanced Type (Cat. No. H159)

Ordering Information

E5AN-H

Size	Case color	Power supply voltage	Control method	Auxiliary output	Control output 1/2	Heater burnout	Optional functions			Model
							Event inputs	Transfer output	RSP	
1/4 DIN 96 × 96 × 78 (W × H × D)	Black	100 to 240 VAC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5AN-HAA2HBM-500**
					SSR outputs × 2	1	2		4 to 20-mA input	**E5AN-HSS2HBM-500 ✻1**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5AN-HAA2HHBFM-500**
					SSR outputs × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5AN-HSS2HHBFM-500 ✻1**
				3	Control Output Unit × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HAA3BFM-500**
					SSR outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HSS3BFM-500 ✻1**
			Valve	2	Relay outputs × 2		2		4 to 20-mA input	**E5AN-HPRR2BM-500 ✻2**
					Relay outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HPRR2BFM-500 ✻2**
		24 VAC/ VDC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5AN-HAA2HBMD-500**
					SSR outputs × 2	1	2		4 to 20-mA input	**E5AN-HSS2HBMD-500 ✻1**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5AN-HAA2HHBFMD-500**
					SSR outputs × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5AN-HSS2HHBFMD-500 ✻1**
				3	Control Output Unit × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HAA3BFMD-500**
					SSR outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HSS3BFMD-500 ✻1**
			Valve	2	Relay outputs × 2		2		4 to 20-mA input	**E5AN-HPRR2BMD-500 ✻2**
					Relay outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5AN-HPRR2BFMD-500 ✻2**
	Silver	100 to 240 VAC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5AN-HAA2HBM-W-500**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5AN-HAA2HHBFM-W-500**
		24 VAC/ VDC			Control Output Unit × 2	1	2		4 to 20-mA input	**E5AN-HAA2HBMD-W-500**

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✻2. Orders are no longer available since March 31, 2025.

E5EN-H

Size	Case color	Power supply voltage	Control method	Auxiliary output	Control output 1/2	Heater burn-out	Optional Functions			Model
							Event inputs	Transfer output	RSP	
1/8 DIN 48 × 96 × 78 (W × H × D)	Black	100 to 240 VAC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5EN-HAA2HBM-500**
					SSR outputs × 2	1	2		4 to 20-mA input	**E5EN-HSS2HBM-500 ✻1**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5EN-HAA2HHBFM-500**
					SSR outputs × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5EN-HSS2HHBFM-500 ✻1**
				3	Control Output Unit × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HAA3BFM-500**
					SSR outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HSS3BFM-500 ✻1**
			Valve	2	Relay outputs × 2		2		4 to 20-mA input	**E5EN-HPRR2BM-500 ✻2**
					Relay outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HPRR2BFM-500 ✻2**
		24 VAC/VDC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5EN-HAA2HBMD-500**
					SSR outputs × 2	1	2		4 to 20-mA input	**E5EN-HSS2HBMD-500 ✻1**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5EN-HAA2HHBFMD-500**
					SSR outputs × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5EN-HSS2HHBFMD-500 ✻1**
				3	Control Output Unit × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HAA3BFMD-500**
					SSR outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HSS3BFMD-500 ✻1**
			Valve	2	Relay outputs × 2		2		4 to 20-mA input	**E5EN-HPRR2BMD-500 ✻2**
					Relay outputs × 2		2	4 to 20-mA output	4 to 20-mA input	**E5EN-HPRR2BFMD-500 ✻2**
	Silver	100 to 240 VAC	Basic	2	Control Output Unit × 2	1	2		4 to 20-mA input	**E5EN-HAA2HBM-W-500**
					Control Output Unit × 2	2	2	4 to 20-mA output	4 to 20-mA input	**E5EN-HAA2HHBFM-W-500**
		24 VAC/VDC			Control Output Unit × 2	1	2		4 to 20-mA input	**E5EN-HAA2HBMD-W-500**

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✻2. Orders are no longer available since March 31, 2025.

Accessories (Order Separately)

Output unit	Model	Specifications
Relay output	E53-RN	SPST-NO, 250 VAC, 5 A (resistive load), electrical life: 100,000 operations
Voltage output (for driving SSR)	E53-QN	12 VDC (PNP), max. load current: 40-mA, with short-circuit protection
	E53-Q3	24 VDC (NPN), max. load current: 20-mA, with short-circuit protection
	E53-Q4	24 VDC (PNP), max. load current: 20-mA, with short-circuit protection
Current output	E53-C3N	4 to 20-mA DC, load: 600 Ω max., resolution: approx. 10,000
	E53-C3DN	0 to 20-mA DC, load: 600 Ω max., resolution: approx. 10,000
Linear voltage output	E53-V34N	0 to 10 VDC, load: 1 kΩ min., resolution: approx. 10,000
	E53-V35N	0 to 5 VDC, load: 1 kΩ min., resolution: approx. 10,000

USB-Serial Conversion Cable

Model
E58-CIFQ1

Terminal Cover

Connectable models	Model
E5AN-H	**E53-COV16**
E5EN-H	

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

Mounting Brackets

Model
Y92H-9

Note: These Mounting Brackets are provided with the Digital Controller.

Waterproof Packing

Connectable models	Model
E5AN-H	**Y92S-P4**
E5EN-H	**Y92S-P5**

Note: The Waterproof Packing is included with the Controller.

Current Transformers (CTs)

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

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		100 to 240 VAC: 12 VA 24 VAC/VDC: 8.5 VA (24 VAC)/5.5 W (24 VDC)
Sensor input		Any of the following can be selected. Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 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-N.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	**Relay output**	Output Unit (Install the Output Unit (sold separately).)
	Voltage output (for driving SSR)	
	Current output	
	Linear voltage output	
	Relay output for position-proportional control	Relay output: Open and close: SPST-NO, 250 VAC, 1 A (including in-rush current), electrical life: 100,000 operations min. Potentiometer input: Must be between 100 Ω and 2.5 kΩ for maximum open position.
Auxiliary output	**Number of outputs**	2 or 3 max.
	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 input	**Number of outputs**	2 or 4 (with an E53-AKB)
	External contact input specifications	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
Logic operations	**Number of operations**	8 max.
	Operations	• Logic operation: Any of the following four patterns can be selected. The input status may be inverted. (A and B) or (C and D), (A or C) and (B or D), A or B or C or D, A and B and C and D (A, B, C, and D are four inputs.) • Delay: ON delay or OFF delay for the results of the logic operation given above. Setting time: 0 to 9999 s or 0 to 9999 min • Output inversion: Possible
	Output	One work bit per operation
	Work bit assignment	Any of The following can be assigned to up to eight work bits (logic operation results): Event input operations, auxiliary outputs, or control outputs.
Transfer outputs	**Number of outputs**	1 max. (Depends on model. Models with transfer output (F in model number)
	Output specifications	Current output: 4 to 20 mA DC, Load: 600 Ω max., Resolution at 4 to 20 mA: Approx. 10,000
RSP input	**Number of inputs**	1
	Signal type	Current input: 4 to 20 mA (input impedance: 150 Ω ±10%)
	Analog input scaling	Scaling of signal to engineering units (EU) –19,999 to 30,000 (display: 30,000 max.)
	Accuracy	(±0.2% of FS) ±1 digit max.
	Input sampling period	60 ms
Setting method		Set digitally using keys on the front panel or by using the RSP input.
Indication method		11-segment digital display and individual indicators (7-segments displays also possible) Character height: E5AN-H: PV: 15.8 mm, SV: 9.5 mm, MV: 6.8 mm; E5EN-H: PV: 11.8 mm, SV: 8.1 mm, MV: 5.8 mm Content of 3-level display: PV/SV/MV, PV/SV/Bank No., or soak time remain Number of digits: 5 for PV and SV, 4 for MV
Bank switching		Supported (number of banks: 8) Local SP, alarm settings, PID sets (PID constants, MV upper limit, MV lower limit, etc.)
Other functions		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout 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, PV/SV status display, logic operations, 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)