Advanced Digital Temperature Controller

E5CN-H (48 x 48 mm)

CSM_E5CN-H_DS_E_4_7

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 in a compact Controller (48 x 48 mm).
- 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.
- 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.



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

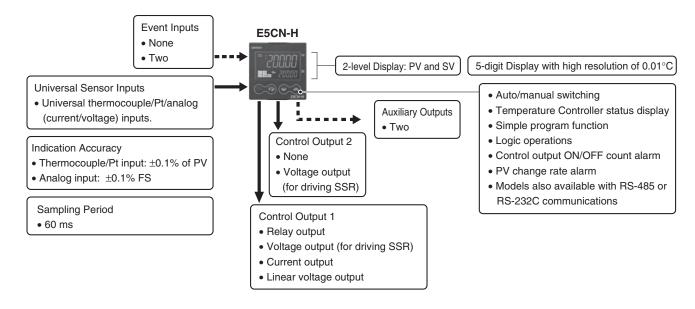
E5CN-H

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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

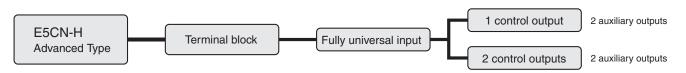


This data sheet is provided as a guideline for selecting products. Be sure to refer to the following user manuals for application precautions and other information required for operation before attempting to use the product.

E5CN-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)

Lineup



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

Model Number Structure

Model Number Legend Controllers

E5CN-1 2 3 4 5 6 7

1. Type

H: Advanced

2. Control Output 1

R: Relay output

Q: Voltage output (for driving SSR)

C: Current output

V: Linear voltage output

3. Auxiliary Outputs

2: Two outputs

4. Option 1

M: Option Unit can be mounted.

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

1. Applicable Controller

CN: E5CN-H or E5CN

2. Function 1

Blank: None

Q: Control output 2 (voltage output for driving SSR)

P: Power supply for sensor

C: Current output

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

H01: Heater burnout/SSR failure/Heater overcurrent detection (CT1)/RS-232C communications

F: Transfer output

BF: Two event inputs/Transfer output

4. Version

N2: Available only to models released after January 2008

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

Ordering Information

Controllers

Size	Case Color	Power supply voltage	Auxiliary output	Control output 1	Model
				Relay output	E5CN-HR2M-500
		100 to 240 VAC	2	Voltage output (for driving SSR)	E5CN-HQ2M-500
		100 to 240 VAC	2	Current output	E5CN-HC2M-500
	Black			Linear voltage output	E5CN-HV2M-500
	DIACK			Relay output	E5CN-HR2MD-500
		24 VAC/VDC	2	Voltage output (for driving SSR)	E5CN-HQ2MD-500
1/16 DIN 48 × 48 × 78		24 VAC/VDC	2	Current output	E5CN-HC2MD-500
$(W \times H \times D)$				Linear voltage output	E5CN-HV2MD-500
(W × 11 × B)				Relay output	E5CN-HR2M-W-500
		100 to 240 VAC	2	Voltage output (for driving SSR)	E5CN-HQ2M-W-500
	Silver			Current output	E5CN-HC2M-W-500
	Silvei			Relay output	E5CN-HR2MD-W-500
		24 VAC/VDC	2	Voltage output (for driving SSR)	E5CN-HQ2MD-W-500
				Current output	E5CN-HC2MD-W-500

Option Units

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

	Functions										
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					
Communications RS-485		Heater burnout/SSR failure/ Heater overcurrent detection				E53-CNH03N2					
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-CNQHHN2					
			Event inputs	Control output 2 (Voltage for driving SSR)		E53-CNQBN2					
				Control output 2 (Voltage for driving SSR)	Transfer Output	E53-CNQFN2					
			Event inputs		Transfer Output	E53-CNBFN2					
	Communications RS-232C			Control output 2 (Voltage for driving SSR)		E53-CNQ01N2					
	Communications RS-232C					E53-CN01N2					
	Communications RS-232C	Heater burnout/SSR failure/ Heater overcurrent detection				E53-CNH01N2					

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

Accessories (Order Separately)

USB-Serial Conversion Cable

Model	
E58-CIFQ1	

Terminal Cover

Model	
E53-COV17	

Note: 1. The Terminal Cover comes with the E5CN-□□-500 models.

2. The E53-COV10 cannot be used.

Waterproof Packing

Model	
Y92S-P8	

Note: 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 type	Y92F-45

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

DIN Track Mounting Adapter

Model	
Y92F-52	

Front cover

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

CX-Thermo Support Software

Model
EST2-2C-MV4

Specifications

Ratings

ııatınıg	,0										
Power su	ıpply 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	g voltage range	85% to 110% of rated supply voltage 100 to 240 VAC: 8.5 VA (max.) (E5CN-HR2 at 100 VAC: 3.0 VA) 24 VAC/VDC: 5.5 VA (24 VAC)/3.5 W (24 VDC) (max.) (E5CN-HR2D at 24 VAC: 2.7 VA)									
Power co	onsumption										
Sensor input Input impedance Control method		Any of the following can be selected (i.e., fully universal input). 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									
		Current input: 150 Ω max., Voltage input: 1 M Ω min. (Use a 1:1 connection when connecting the ES2-HB.)									
		ON/OFF control or 2-PID control (with auto-tuning)									
	Relay output	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA									
Control	Voltage output (for driving SSR)	Output voltage: 12 VDC ±15% (PNP), max. load current: 21 mA, with short-circuit protection circuit									
output	Current output	4 to 20 mA DC/0 to 20 mA DC, load: 600 Ω max., resolution: approx. 10,000 *									
	Linear voltage output	0 to 10 VDC (load: 1 $k\Omega$ min.), Resolution: Approx. 10,000									
Auxiliary	Number of outputs										
output	Output specifications	Relay output: SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA									
	Number of outputs										
Event	External contact	Contact input: ON: 1 k Ω max., OFF: 100 k Ω min.									
	input	Non-contact input: ON: Residual voltage: 1.5 V max., OFF: Leakage current: 0.1 mA max.									
	specifications	Current flow: Approx. 7 mA per contact									
	Number of operations	8 max. (Combinations can be made using work bits.)									
Logic opera- tions	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 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 									
	Outputs	One work bit per operation									
	Work bit assignments	Any of the following can be assigned to up to eight work bits (logic operation results): Event input operations, auxiliary outputs, or control outputs.									
	Number of outputs										
Transfer outputs	Output specifications	Current output: 4 to 20 mA DC, Load: 600 Ω max., Resolution at 4 to 20 mA: Approx. 10,000									
RSP inpu	ıt	Not supported									
Setting n	nethod	Digital setting using front panel keys									
Indicatio	n method	11-segment digital display and individual indicators (7-segments displays also possible) Character height: PV: 11 mm, SV: 6.5 mm									
Bank switching Other functions		Supported (number of banks: 8) Local SP, alarm settings, PID sets (PID constants, MV upper limit, MV lower limit, etc.)									
		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 temperat	operating ure	-10 to 55°C (with no condensation or icing), for 3-year warranty: -10 to 50°C									
Ambient	operating humidity	25% to 85%									
Storage t	temperature	−25 to 65°C (with no condensation or icing)									
	•	-25 to 65°C (with no condensation or icing)									

^{*} For models with current outputs, control output 1 can be used as a transfer output.

Input Ranges

Thermocouple/Platinum Resistance Thermometer/Analog Input (Fully Universal Inputs)

Inp	out type	F			resis omet)		Thermocouple												Analog input										
I	Name		Pt	100		JPt	100		K			J			Т		Е	L	ι	J	N	R	s	В	W	PL II	4 to 20 mA	0 to 20 mA	1 to 5 V	0 to 5 V	0 to 10 V
	2300																								2300.0)					
	1800																							1800.0			ļ				
	1700																					1700.0	1700.0	-	-						
	1600																					-	-	-	-		ļ				
	1500																					-	-	-	-		ļ				
	1400							1300.0													1300.0	-	-	-	-	1300.0					
\tilde{c}	1300							1300.0													1300.0	-	-	-	+ -	1300.0					
range (°C)	1200							H																-		-					
ge	1100							H													+	\vdash				+	Usa	hle in	the t	ollow	/ina
a	1000	850.0						$H \vdash$			850.0							850.0					H		+	+	rang	ges by 999 to	y sca	ling:	9
	900							H																			-19	999 t	o 324	00,	
Ę	800							H										+ -							+ -		-19	99.9	to 32	40.0, 4.00,	or
era	700	-						H									600.0	-										.999 t			OI
Temperature	600	-	500.0			500.0		H	500.0																		1				
<u>e</u>	500											400.0		400.0	400.0				400.0	400.0											
_	400																										ĺ				
	300 200				200.00					200.00			200.00			200.00											ĺ				
	100			100.0			100.0	ПГ																			Ì				
	0																							100.0							
	-100			0.0			0.0															0.0	0.0		0.0	0.0					
	200				-50.00				-20.0	-50.00	-100.0	-20.0	-50.00			-50.00		-100.0													
		-200.0	-199.9			-199.9		-200.0						-200.0	-199.9		-200.0)	-200.0	-199.9	-200.0										
	ting nber	0	1	2	24	3	4	5	6	21	7	8	22	9	10	23	11	12	13	14	15	16	17	18	19	20	25	26	27	28	29

Shaded settings are the default settings.

The applicable standards for the input types are as follows:

K, J, T, E, N, R, S, B: JIS C 1602-1995, IEC 584-1

L: Fe-CuNi, DIN 43710-1985

U: Cu-CuNi, DIN 43710-1985

W: W5Re/W26Re, ASTM E988-1990

JPt100: JIS C 1604-1989, JIS C 1606-1989

Pt100: JIS C 1604-1997, IEC 751

PL II: According to Platinel II electromotive force charts from BASF (previously Engelhard)

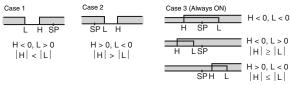
Alarm Outputs

Each alarm can be independently set to one of the following 13 alarm types. The default is 2: Upper limit. Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

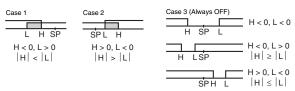
Note: For models with heater burnout, SSR failure, and heater overcurrent detection, alarm 1 will be an OR output of the alarm selected from the following alarm types and the alarms for heater burnout, SSR failure, and heater overcurrent. To output only a heater burnout alarm, SSR failure alarm, and heater overcurrent alarm for alarm 1, set the alarm type to 0 (i.e., no alarm function).

	Alarm type	Alarm output operation		
Set value		When alarm value X is positive	When alarm value X is negative	Description of function
0	Alarm function OFF	Output OFF		No alarm
1 *1	Upper- and lower-limit	ON COFF SP	* 2	Set the deviation in the set point by setting the alarm upper limit (H) and alarm lower limit (L).
2	Upper-limit	ON X SP	ON X - SP	Set the upward deviation in the set point by setting the alarm value (X).
3	Lower-limit	ON X SP	ON X - SP	Set the downward deviation in the set point by setting the alarm value (X).
4 *1	Upper- and lower-limit range	ON OFF SP	*3	Set the deviation in the set point by setting the alarm upper limit (H) and alarm lower limit (L).
5 *1	Upper- and lower-limit with standby sequence	ON OFF SP SP \$5	*4	A standby sequence is added to the upper- and lower-limit alarm (1). *6
6	Upper-limit with standby sequence	ON X SP	ON OFF SP	A standby sequence is added to the upper-limit alarm (2). *6
7	Lower-limit with standby sequence	ON X SP	ON OFF SP	A standby sequence is added to the lower-limit alarm (3). *6
8	Absolute-value upper-limit	ON ←X→	ON OFF 0	The alarm will turn ON if the process value is larger than the alarm value (X) regardless of the set point.
9	Absolute-value lower-limit	ON ←X→	ON OFF 0	The alarm will turn ON if the process value is smaller than the alarm value (X) regardless of the set point.
10	Absolute-value upper-limit with standby sequence	ON OFF 0	ON OFF 0	A standby sequence is added to the absolute-value upper-limit alarm (8). *6
11	Absolute-value lower-limit with standby sequence	ON ←X→ OFF 0	ON OFF 0	A standby sequence is added to the absolute-value lower-limit alarm (9). *6
12	LBA (alarm 1 type only)			*7
13	PV change rate alarm			*8

- ***1.** With set values 1, 4 and 5, the upper and lower limit values can be set independently for each alarm type, and are expressed as "I" and "H"
- *2. Set value: 1, Upper- and lower-limit alarm



*3. Set value: 4, Upper- and lower-limit range



- ***4.** Set value: 5, Upper- and lower-limit with standby sequence For Upper- and Lower-Limit Alarm Described Above
 - Case 1 and 2
 <u>Always OFF</u> when the upper-limit and lower-limit hysteresis overlaps.
 - Case 3: Always OFF

- *5. Set value: 5, Upper- and lower-limit with standby sequence <u>Always OFF</u> when the upper-limit and lower-limit hysteresis overlaps.
- ***6.** Refer to the E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type (Cat. No. H156) for information on the operation of the standby sequence.
- *7. Refer to the E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type (Cat. No. H156) for information on the loop burnout alarm (LBA).
- *8. Refer to the E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type (Cat. No. H156) for information on the PV change rate alarm.

Characteristics

Indication accuracy		Thermocouple: $(\pm 0.1\%$ of indicated value or $\pm 1^{\circ}$ C, whichever is greater) ± 1 digit max. ± 1 Platinum resistance thermometer: $(\pm 0.1\%$ of indicated value or $\pm 0.5^{\circ}$ C, whichever is greater) ± 1 digit max. Analog input: $\pm 0.1\%$ FS ± 1 digit max. CT input: $\pm 5\%$ FS ± 1 digit max.			
Transfer output accuracy		±0.3% FS max.			
Influence of temperature *2		Thermocouple input (R, S, B, W, PLII): ($\pm 1\%$ of PV or $\pm 10^{\circ}$ C, whichever is greater) ± 1 digit max.			
Influence of	voltage *2	Other thermocouple input: (±1% of PV or ±4°C, whichever is greater) ±1 digit max. *3 Platinum resistance thermometer: (±1% of PV or ±2°C, whichever is greater) ±1 digit max.			
Influence of EMS. (at EN 61326-1)		Analog input: (±1%FS) ±1 digit max.			
Input sampling period		60 ms			
Hysteresis		Temperature input: 0.1 to 3240.0°C or °F (in units of 0.1°C or °F) Analog input: 0.01% to 99.99% FS (in units of 0.01% FS)			
Proportional band (P)		Temperature input: 0.1 to 3240.0°C or °F (in units of 0.1 °C or °F) Analog input: 0.1% to 999.9% FS (in units of 0.1% FS)			
Integral time	e (I)	0.0 to 3240.0 s (in units of 0.1 s)			
Derivative ti	me (D)	0.0 to 3240.0 s (in units of 0.1 s)			
Control peri	od	0.5, 1 to 99 s (in units of 1 s)			
Manual rese	t value	0.0 to 100.0% (in units of 0.1%)			
Alarm setting range		-19999 to 32400 (decimal point position depends on input type)			
Affect of signal source resistance		Thermocouple: $0.1^{\circ}C/\Omega$ max. (100 Ω max.) Platinum resistance thermometer: $0.1^{\circ}C/\Omega$ max. (10 Ω max.)			
Insulation resistance		20 MΩ min. (at 500 VDC)			
Dielectric strength		2,300 VAC, 50 or 60 Hz for 1 min (between terminals with different charge)			
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 hrs each in X, Y, and Z directions			
Shock	Malfunction	100 m/s², 3 times each in X, Y, and Z directions			
resistance	Destruction	300 m/s², 3 times each in X, Y, and Z directions			
Weight		Controller: Approx. 150 g, Mounting Bracket: Approx. 10 g			
Degree of protection		Front panel: IP66, Rear case: IP20, Terminals: IP00			
Memory pro	tection	Non-volatile memory (number of writes: 1,000,000 times)			
Setup Tool		CX-Thermo version 4.0 or higher			
Setup Tool p	port	Provided on the bottom of the E5CN-H. Use this port to connect a computer to the E5CN-H. An E58-CIFQ1 USB-Serial Conversion Cable is required to connect the computer to the E5CN-H. *4			
Standards	Approved standards	UL 61010-1, CSA C22.2 No. 1010-1			
Standards	Conformed standards	EN 61010-1 (IEC 61010-1): Pollution level 2, overcurrent category II, Lloyd's standards *5			
ЕМС		EMI: EN 61326-1 *6 Radiated Interference Electromagnetic Field Strength: EN 55011 Group 1, class A Noise Terminal Voltage: EN 55011 Group 1, class A EMS: EN 61326-1 *6 ESD Immunity: EN 61000-4-2 Electromagnetic Field Immunity: EN 61000-4-3 Burst Noise Immunity: EN 61000-4-4 Conducted Disturbance Immunity: EN 61000-4-6 Surge Immunity: EN 61000-4-5 Power Frequency Magnetic Field Immunity: EN 61000-4-8 Voltage Dip/Interrupting Immunity: EN 61000-4-11			
★1 The indication accuracy		of K thermocountee in the _200 to 1300°C range T and N thermocountee at a temperature of _100°C may, and II			

^{*1.} The indication accuracy of K thermocouples in the -200 to 1300°C range, T and N thermocouples at a temperature of -100°C max., and U and L thermocouples at any temperatures is ±2°C ±1 digit max. The indication accuracy of the B thermocouple at a temperature of 400°C max. is not specified. The indication accuracy of B thermocouples in the 400 to 800°C range is ±3°C max. The indication accuracy of the R and S thermocouples at a temperature of 200°C max. is ±3°C ±1 digit max. The indication accuracy of W thermocouples is ±0.3 of PV or ±3°C, whichever is greater, ±1 digit max. The indication accuracy of PL II thermocouples is ±0.3 of PV or ±2°C, whichever is greater, ±1 digit max.

^{*2.} Ambient temperature: -10°C to 23°C to 55°C, Voltage range: -15% to 10% of rated voltage

^{*3.} K thermocouple at -100°C max.: ±10°C max.

^{*4.} External communications (RS-232C or RS-485) and cable communications for the Setup Tool can be used at the same time.

^{★5.} Refer to information on maritime standards in Safety Precautions for E5□N/E5□N-H for compliance with Lloyd's Standards.

^{*6.} Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

USB-Serial Conversion Cable

Applicable OS	Windows XP/Vista/7/8	
Applicable software	CX-Thermo version 4 or higher	
Applicable models	E5AN/E5EN/E5CN/E5CN-U/ E5AN-H/E5EN-H/E5CN-H	
USB interface standard	Conforms to USB Specification 1.1.	
DTE speed	38400 bps	
Connector specifications	Computer: USB (type A plug) Temperature Controller: Setup Tool port (on bottom of Controller)	
Power supply	Bus power (Supplied from USB host controller.)	
Power supply voltage	5 VDC	
Current consumption	70 mA	
Ambient operating temperature	0 to 55°C (with no condensation or icing)	
Ambient operating humidity	10% to 80%	
Storage temperature	-20 to 60°C (with no condensation or icing)	
Storage humidity	10% to 80%	
Altitude	2,000 m max.	
Weight	Approx. 100 g	

Note: A driver must be installed in the personal computer. Refer to installation information in the operation manual for the Conversion Cable.

Communications Specifications

	<u>.</u>		
Transmission line connection method	RS-485: Multipoint RS-232C: Point-to-point		
Communications	RS-485 (two-wire, half duplex)/RS-232C		
Synchronization method	Start-stop synchronization		
Protocol	CompoWay/F, SYSWAY, or Modbus		
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, or 57600 bps		
Transmission code	ASCII (CompoWay/F, SYSWAY) RTU (Modbus)		
Data bit length *	7 or 8 bits		
Stop bit length *	1 or 2 bits		
Error detection	Vertical parity (none, even, odd) Frame check sequence (FCS) with SYSWAY Block check character (BCC) with CompoWay/F or CRC-16 Modbus		
Flow control	None		
Interface	RS-485, RS-232C		
Retry function	None		
Communications buffer	217 bytes		
Communications response wait time	0 to 99 ms Default: 20 ms		
* The hand rate data bit length stop bit length and vertical parity can			

^{*}The baud rate, data bit length, stop bit length, and vertical parity can be individually set using the Communications Setting Level.

Current Transformer (Order Separately) Ratings

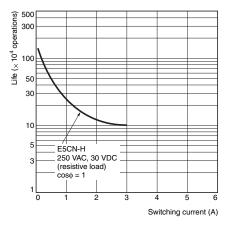
Dielectric strength	1,000 VAC for 1 min	
Vibration resistance	50 Hz, 98 m/s ²	
Weight	E54-CT1: Approx. 11.5 g, E54-CT3: Approx. 50 g	
Accessories (E54-CT3 only)	Armatures (2) Plugs (2)	

Heater Burnout Alarms, SSR Failure Alarms, and Heater Overcurrent Alarms

CT input (for heater current detection)	Models with detection for single- phase heaters: One input Models with detection for single- phase or three-phase heaters: Two inputs		
Maximum heater current	50 A AC		
Input current indication accuracy	±5% FS ±1 digit max.		
Heater burnout alarm setting range *1	0.1 to 49.9 A (in units of 0.1 A) Minimum detection ON time: 100 ms		
SSR failure alarm setting range *2	0.1 to 49.9 A (in units of 0.1 A) Minimum detection OFF time: 100 ms		
Heater overcurrent alarm setting range *3	0.1 to 49.9 A (in units of 0.1 A) Minimum detection ON time: 100 ms		

- *1. For heater burnout alarms, the heater current will be measured when the control output is ON, and the output assigned to the alarm 1 function will turn ON if the heater current is lower than the set value (i.e., heater burnout detection current value).
- *2. For SSR failure alarms, the heater current will be measured when the control output is OFF, and the output assigned to the alarm 1 function will turn ON if the heater current is higher than the set value (i.e., SSR failure detection current value).
- *3. For heater overcurrent alarms, the heater current will be measured when the control output is ON, and the output assigned to the alarm 1 function will turn ON if the heater current is higher than the set value (i.e., heater overcurrent detection current value).

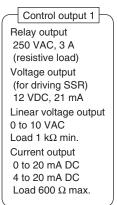
Electrical Life Expectancy Curve for Relays (Reference Values)



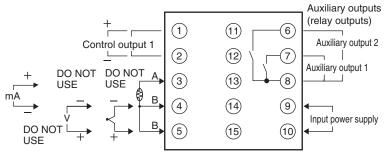
External Connections

A voltage output (control output, for driving SSR) is not electrically insulated from the internal circuits. When using a grounding thermocouple,
do not connect any of the control output terminals to ground. If the control output terminals are connected to ground, errors will occur in the
measured temperature values as a result of leakage current.

Controllers



The Temperature Controller is set for a K-type thermocouple (input type = 5) by default. An input error (5.ERR) will occur if the input type setting does not agree with the temperature sensor. Check the input type.

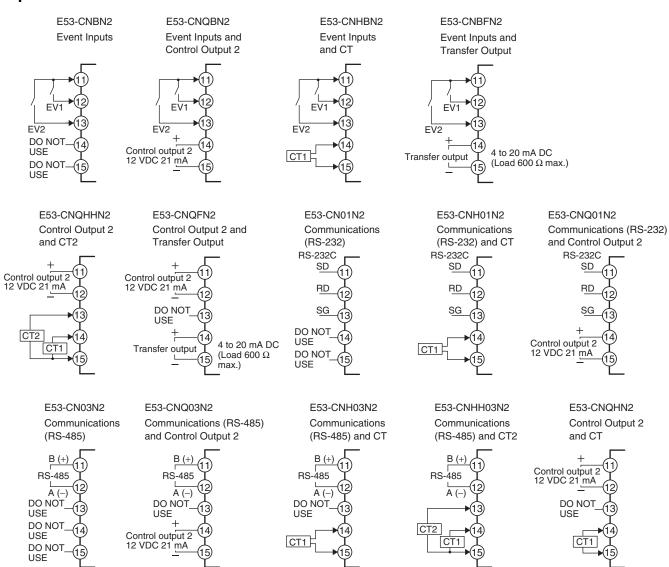


Auxiliary outputs (relay outputs) 250 VAC, 3 A (resistive load)

A heater burnout alarm, SSR failure, heater overcurrent alarm, or input alarm is sent to the output to which the alarm 1 function is assigned.

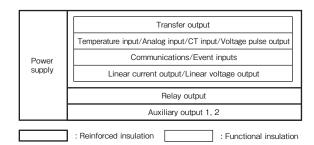
- 100 to 240 VAC
- 24 VAC/VDC (no polarity)

Option Units



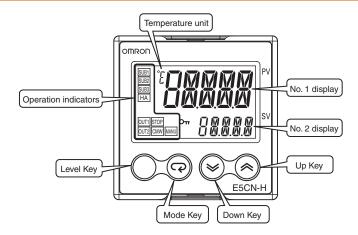
Note: Wire all voltage input terminals correctly. The Controller may fail if voltage input terminals are wired incorrectly.

Isolation/Insulation Block Diagrams

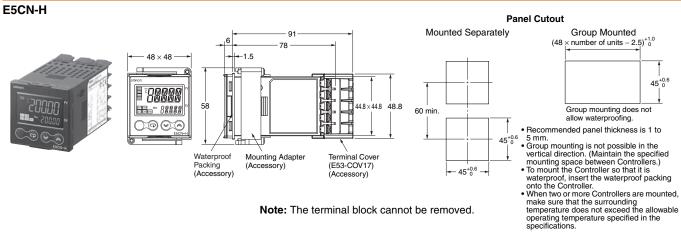


Nomenclature

E5CN-H



Dimensions (Unit: mm)

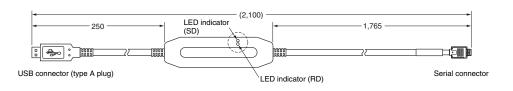


Note: The terminal block cannot be removed.

Accessories (Order Separately)

USB-Serial Conversion Cable E58-CIFQ1

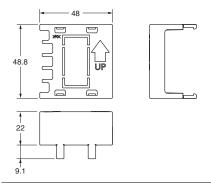




Terminal Cover E53-COV17



Note: The E53-COV10 can not be used.



Waterproof Packing Y92S-P8 (for DIN 48×48)



Order the Waterproof Packing separately if it becomes lost or damaged.

The Waterproof Packing can be used to achieve an IP66 degree of protection.

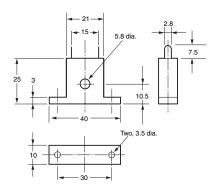
(Deterioration, shrinking, or hardening of the waterproof packing may occur depending on the operating environment. Therefore, periodic replacement is recommended to ensure the level of waterproofing specified in IP66. The time for periodic replacement depends on the operating environment. Be sure to 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 Waterproof Packing does not need to be attached if a waterproof structure is not required.

Current Transformers

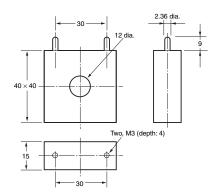
E54-CT1





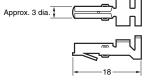
E54-CT3



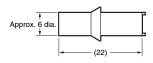


E54-CT3 Accessory

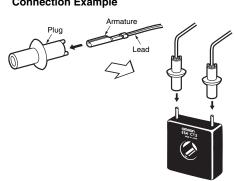
Armature



Plug



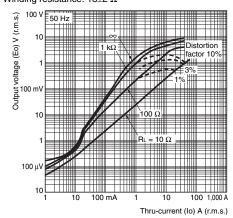
Connection Example



E54-CT1

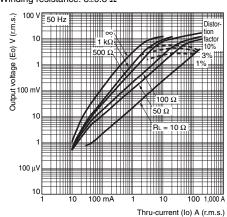
Thru-current (Io) vs. Output Voltage (Eo) (Reference Values)

Maximum continuous heater current: 50 A (50/60 Hz) Number of windings: 400±2 Winding resistance: 18±2 Ω



E54-CT3 Thru-current (Io) vs. Output Voltage (Eo) (Reference Values)

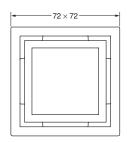
Maximum continuous heater current: 120 A (50/60 Hz) (Maximum continuous heater current for an OMRON Temperature Controller is 50 A.) Number of windings: 400±2 Winding resistance: $8\pm0.8~\Omega$

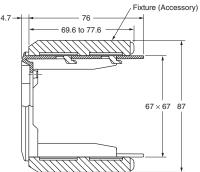


Adapter

Y92F-45 Note: 1. Use this Adapter when the panel has already been prepared for the E5B□.
2. The Adapter is available only in black.

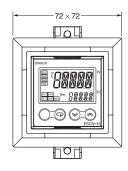


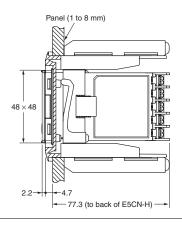




Mounted to E5CN-H

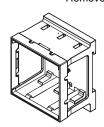


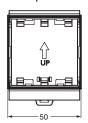


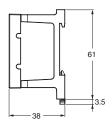


DIN Track Mounting Adapter

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

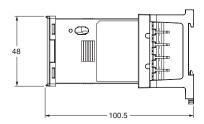






Mounted to E5CN-H





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2015.8

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