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Advanced Digital Temperature Controller

E5CN-H (48 x 48 mm)

CSM_E5CN-H_DS_E_4_11

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.



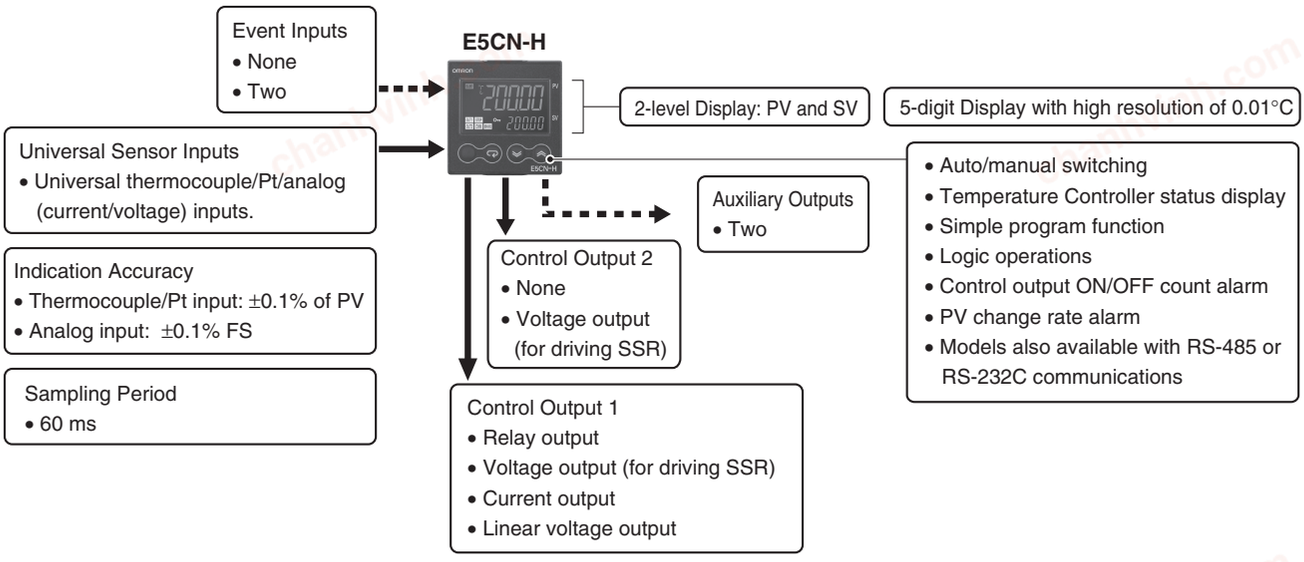
48 × 48 mm
E5CN-H

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

⚠ 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



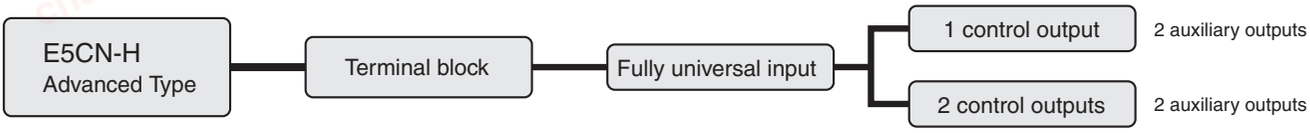
This data sheet is provided as a guideline for selecting products. Be sure to refer to the following user manuals for application precautions and other information required for operation before attempting to use the product.

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)

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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-□□□M□-□-500
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

E53-□□□□
1 2 3 4

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-□□□□).

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Ordering Information

Controllers

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

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

CX-Thermo Support Software

Model
EST2-2C-MV4

Mounting Adapter

Model
Y92F-49

Note: This Mounting Adapter is provided with the Digital Temperature Controller.

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Specifications

Ratings

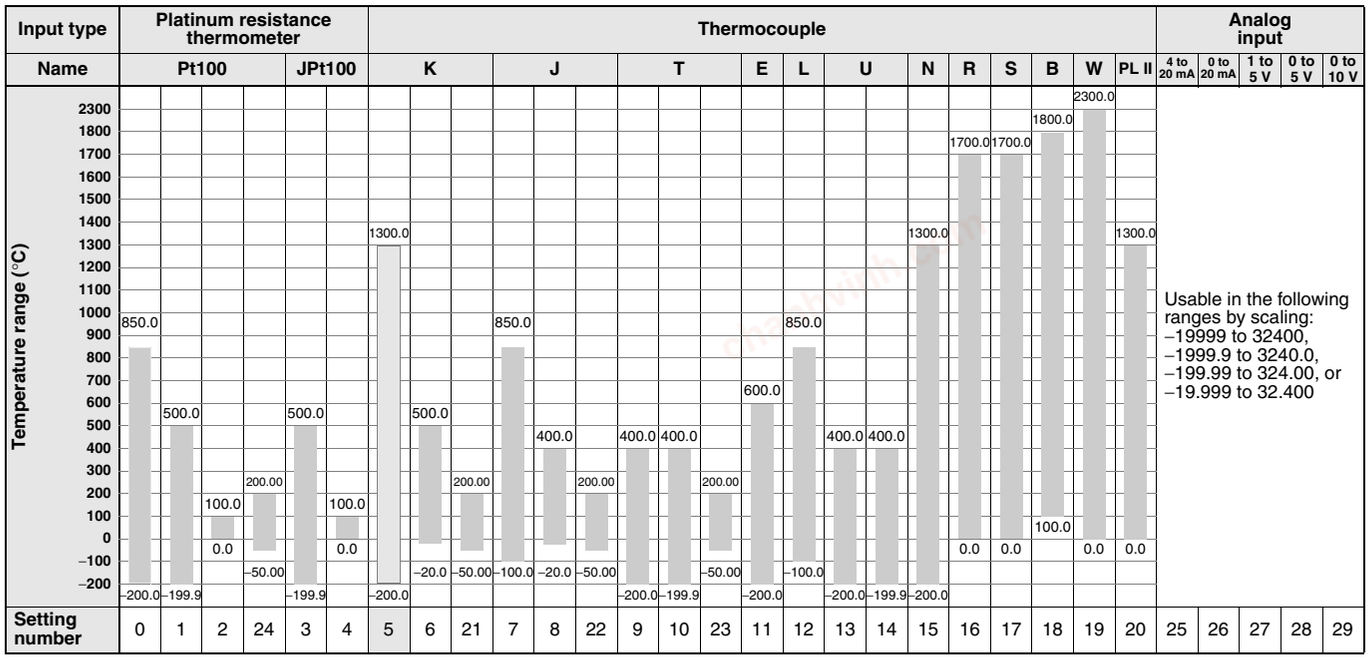
Power supply voltage		No D in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		100 to 240 VAC: 8.5 VA (max.) (E5CN-HR2 at 100 VAC: 3.0 VA) 24 VAC/VDC: 5.5 VA (24 VAC)/3.5 W (24 VDC) (max.) (E5CN-HR2D at 24 VAC: 2.7 VA)
Sensor input		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
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**	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	Voltage output (for driving SSR)	Output voltage: 12 VDC ±15% (PNP), max. load current: 21 mA, with short-circuit protection circuit
	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 kΩ min.), Resolution: Approx. 10,000
Auxiliary output	**Number of outputs**	2 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
	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. (Combinations can be made using work bits.)
	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
	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.
Transfer outputs	**Number of outputs**	1 max.
	Output specifications	Current output: 4 to 20 mA DC, Load: 600 Ω max., Resolution at 4 to 20 mA: Approx. 10,000
RSP input		Not supported
Setting method		Digital setting using front panel keys
Indication method		11-segment digital display and individual indicators (7-segments displays also possible) Character height: PV: 11 mm, SV: 6.5 mm
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)

✻ For models with current outputs, control output 1 can be used as a transfer output.

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Input Ranges

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



Input type	Platinum resistance thermometer						Thermocouple																		Analog input				
Name	Pt100				JPt100		K			J			T			E	L	U		N	R	S	B	W	PL II	4 to 20 mA	0 to 20 mA	1 to 5 V	0 to 5 V	0 to 10 V
Setting number	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

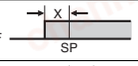
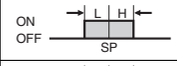
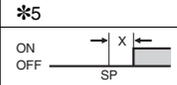
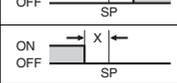
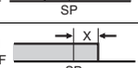
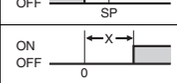
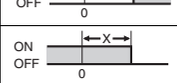
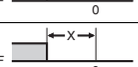
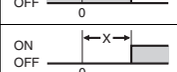
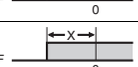
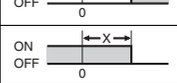
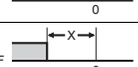
PL II: According to Platinel II electromotive force charts from BASF (previously Engelhard)

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Alarm Outputs

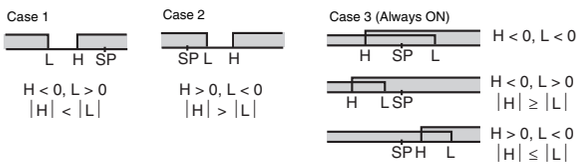
Each alarm can be independently set to one of the following 13 alarm types. The default is *2: Upper limit*.
Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

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).

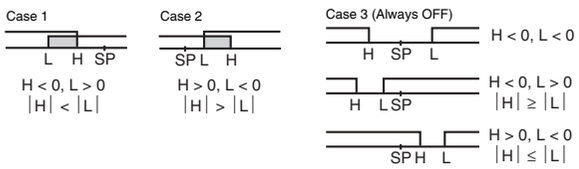
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1 ✻1	Upper- and lower-limit		✻2	Set the deviation in the set point by setting the alarm upper limit (H) and alarm lower limit (L).
2	Upper-limit			Set the upward deviation in the set point by setting the alarm value (X).
3	Lower-limit			Set the downward deviation in the set point by setting the alarm value (X).
4 ✻1	Upper- and lower-limit range		✻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	 ✻5	✻4	A standby sequence is added to the upper- and lower-limit alarm (1). ✻6
6	Upper-limit with standby sequence			A standby sequence is added to the upper-limit alarm (2). ✻6
7	Lower-limit with standby sequence			A standby sequence is added to the lower-limit alarm (3). ✻6
8	Absolute-value upper-limit			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			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			A standby sequence is added to the absolute-value upper-limit alarm (8). ✻6
11	Absolute-value lower-limit with standby sequence			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 "L" 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
  Always OFF when the upper-limit and lower-limit hysteresis overlaps.
- Case 3: Always OFF

✻5. Set value: 5, Upper- and lower-limit with standby sequence
Always OFF 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.

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Characteristics

Indication accuracy		Thermocouple: (±0.1% of indicated value or ±1°C, whichever is greater) ±1 digit max. ✻1 Platinum resistance thermometer: (±0.1% of indicated value or ±0.5°C, whichever is greater) ±1 digit max. Analog input: ±0.1% FS ±1 digit max. CT input: ±5% FS ±1 digit max.
Transfer output accuracy		±0.3% FS max.
Influence of temperature ✻2		Thermocouple input (R, S, B, W, PLII): (±1% of PV or ±10°C, whichever is greater) ±1 digit max. 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. Analog input: (±1%FS) ±1 digit max.
Influence of voltage ✻2		
Influence of EMS. (at EN 61326-1)		
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 (I)		0.0 to 3240.0 s (in units of 0.1 s)
Derivative time (D)		0.0 to 3240.0 s (in units of 0.1 s)
Control period		0.5, 1 to 99 s (in units of 1 s)
Manual reset 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°C/Ω max. (100 Ω max.) Platinum resistance thermometer: 0.1°C/Ω 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 resistance	**Malfunction**	10 to 55 Hz, 20 m/s² for 10 min each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 0.75-mm single amplitude for 2 hrs each in X, Y, and Z directions
Shock resistance	**Malfunction**	100 m/s², 3 times each in X, Y, and Z directions
	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 protection		Non-volatile memory (number of writes: 1,000,000 times)
Setup Tool		CX-Thermo version 4.0 or higher
Setup Tool 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
	Conformed standards	EN 61010-1 (IEC 61010-1): Pollution level 2, overcurrent category II, Lloyd's standards ✻5
EMC		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 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)

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USB-Serial Conversion Cable

Applicable OS	Windows XP/Vista/7/8/8.1/10
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

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 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

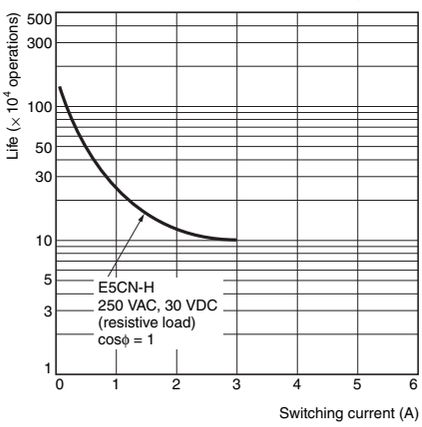
Dielectric strength	1,000 VAC for 1 min
Vibration resistance	50 Hz, 98 m/s^2
Weight	E54-CT1: Approx. 11.5 g, E54-CT3: Approx. 50 g
Accessories (E54-CT3 only)	Armatures (2) Plugs (2)

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)



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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

Control output 1

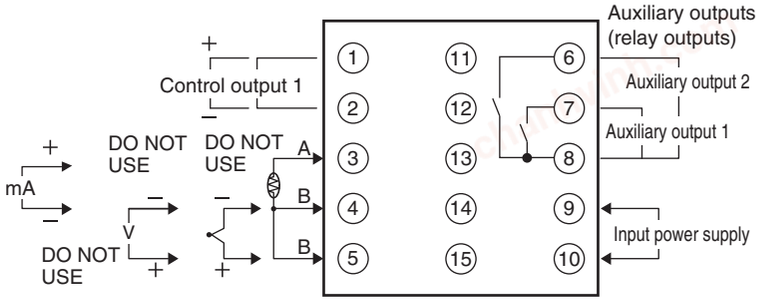
Relay output
250 VAC, 3 A
(resistive load)

Voltage output
(for driving SSR)
12 VDC, 21 mA

Linear voltage output
0 to 10 VDC
Load 1 kΩ min.

Current output
0 to 20 mA DC
4 to 20 mA DC
Load 600 Ω max.

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.



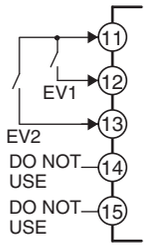
Auxiliary outputs (relay outputs)
250 VAC, 3 A
(resistive load)

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.

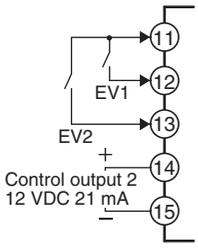
- 100 to 240 VAC
- 24 VAC/VDC (no polarity)

Option Units

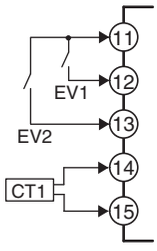
E53-CNBN2
Event Inputs



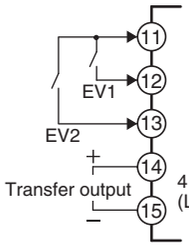
E53-CNQBN2
Event Inputs and Control Output 2



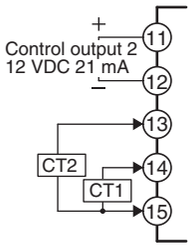
E53-CNHBN2
Event Inputs and CT



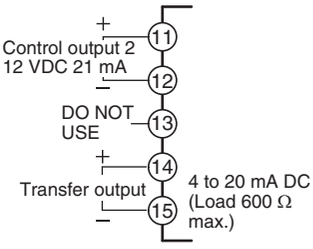
E53-CNBFN2
Event Inputs and Transfer Output



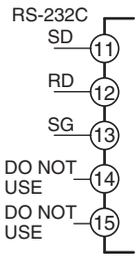
E53-CNQHHN2
Control Output 2 and CT2



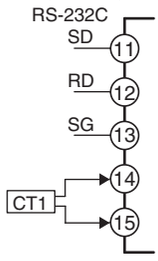
E53-CNQFN2
Control Output 2 and Transfer Output



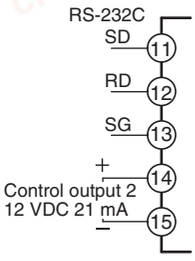
E53-CN01N2
Communications (RS-232)



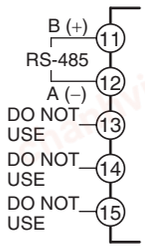
E53-CNH01N2
Communications (RS-232) and CT



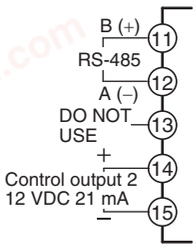
E53-CNQ01N2
Communications (RS-232) and Control Output 2



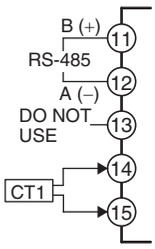
E53-CN03N2
Communications (RS-485)



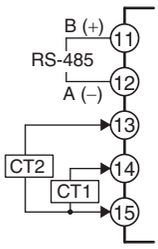
E53-CNQ03N2
Communications (RS-485) and Control Output 2



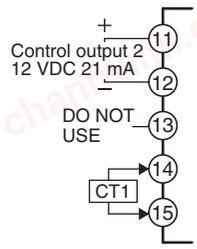
E53-CNH03N2
Communications (RS-485) and CT



E53-CNHH03N2
Communications (RS-485) and CT2



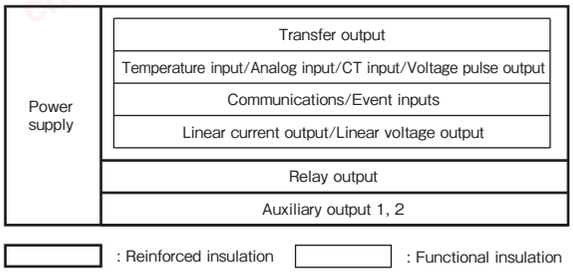
E53-CNQHN2
Control Output 2 and CT



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

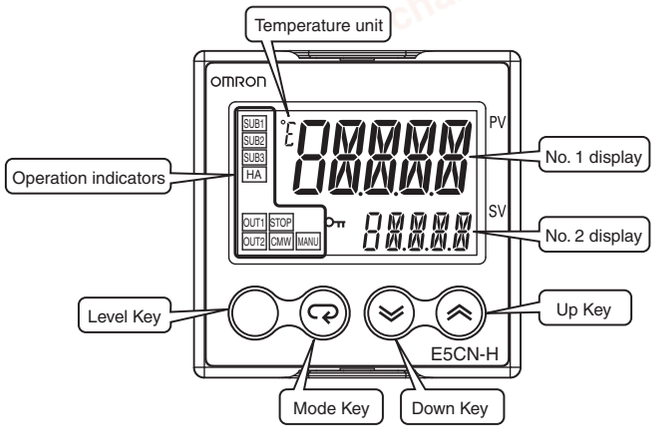
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Isolation/Insulation Block Diagrams



Nomenclature

E5CN-H

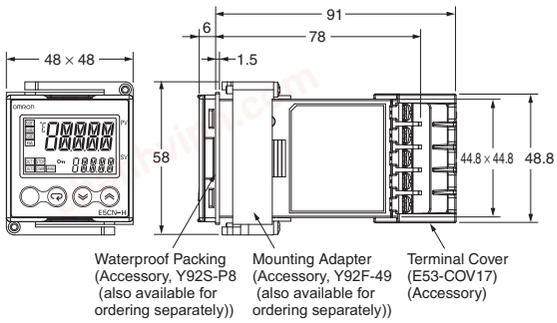


Dimensions

(Unit: mm)

E5CN-H

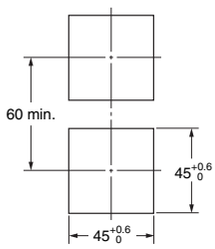




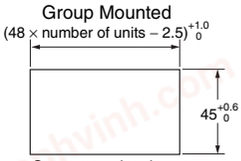
Note: The terminal block cannot be removed.

Panel Cutout

Mounted Separately



Group Mounted



Group mounting does not allow waterproofing.

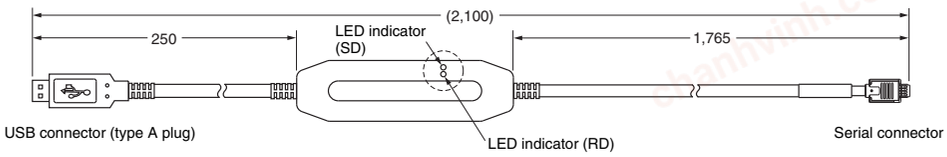
- Recommended panel thickness is 1 to 5 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers.)
- To mount the Controller so that it is waterproof, insert the waterproof packing onto the Controller.
- When two or more Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature specified in the specifications.

Accessories (Order Separately)

USB-Serial Conversion Cable

E58-CIFQ1

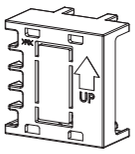




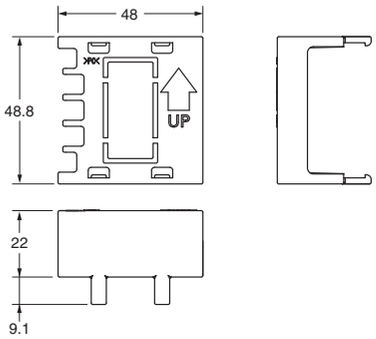
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Terminal Cover

E53-COV17

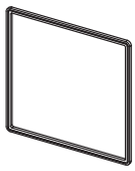


Note: The E53-COV10 can not be used.



Waterproof Packing

Y92S-P8 (for DIN 48 × 48)

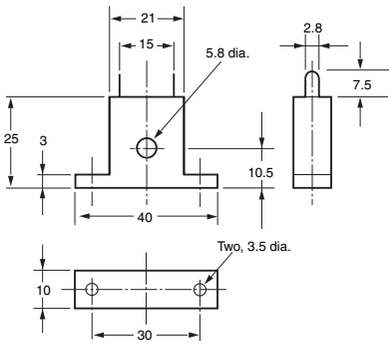


Order the Waterproof Packing separately if it becomes lost or damaged.
The Waterproof Packing can be used to achieve an IP66 degree of protection.
(Deterioration, shrinking, or hardening of the waterproof packing may occur depending on the operating environment. Therefore, periodic replacement is recommended 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

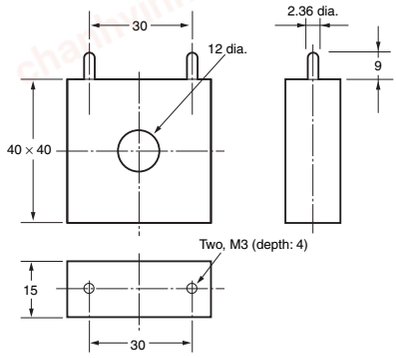
E54-CT1





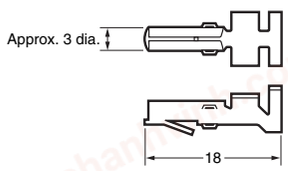
E54-CT3



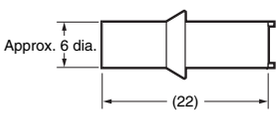


E54-CT3 Accessory

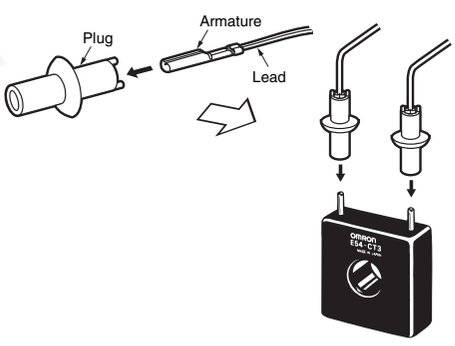
- **Armature**



- **Plug**

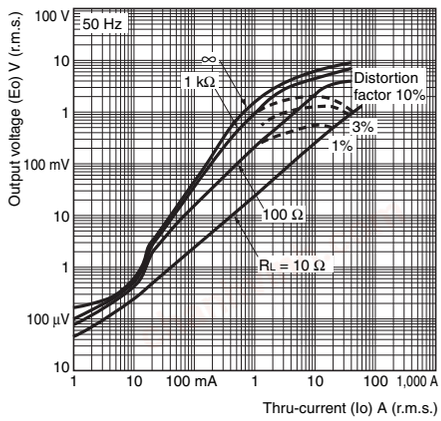


Connection Example



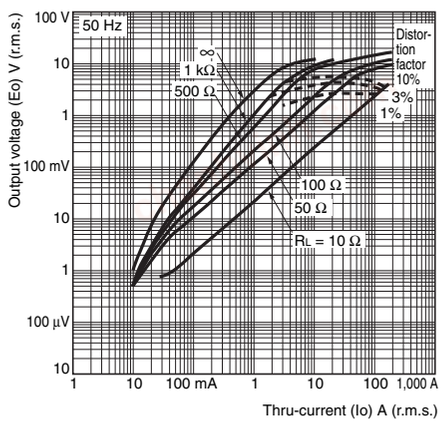
E54-CT1
Thru-current (Io) vs. Output Voltage (Eo) (Reference Values)

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)

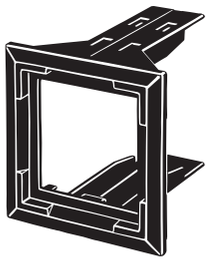
Maximum continuous heater current: 120 A (50/60 Hz)
(Maximum continuous heater current for an OMRON Temperature Controller is 50 A.)
Number of windings: 400±2
Winding resistance: 8±0.8 Ω

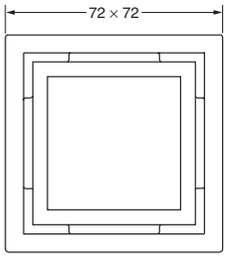


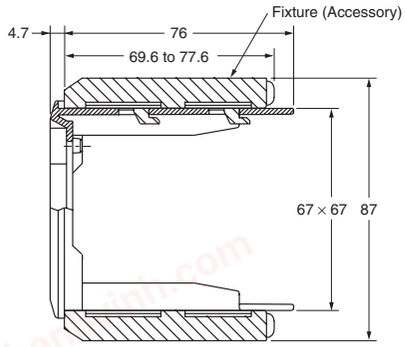
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Adapter

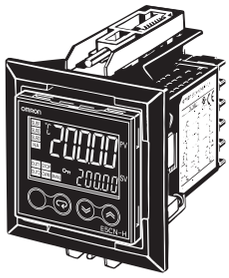
Y92F-45 **Note: 1.** Use this Adapter when the panel has already been prepared for the E5B□.
2. The Adapter is available only in black.

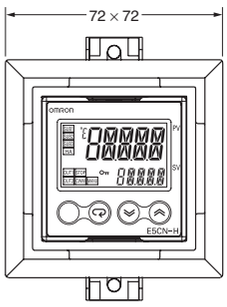


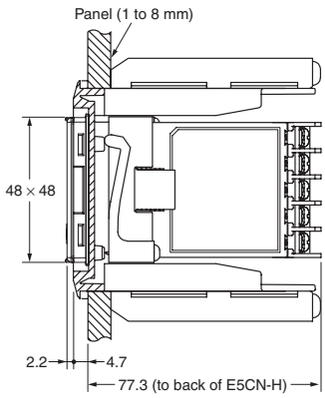




Mounted to E5CN-H

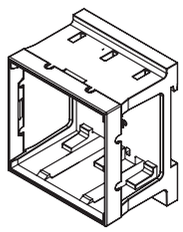


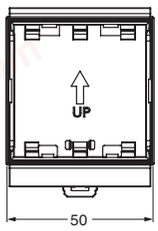


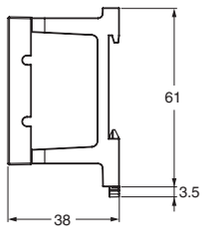


DIN Track Mounting Adapter

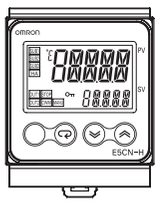
Y92F-52 **Note:** This Adapter cannot be used together with the Terminal Cover.
Remove the Terminal Cover to use the Adapter.

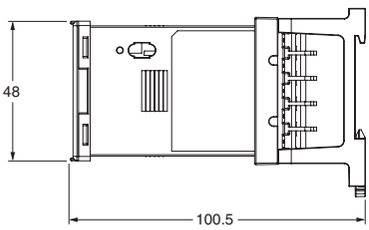






Mounted to E5CN-H





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