

A New High-performance Controller: High Resolution, High Speed, and High Input Accuracy.

Logic Operations and Preventive Maintenance Function.



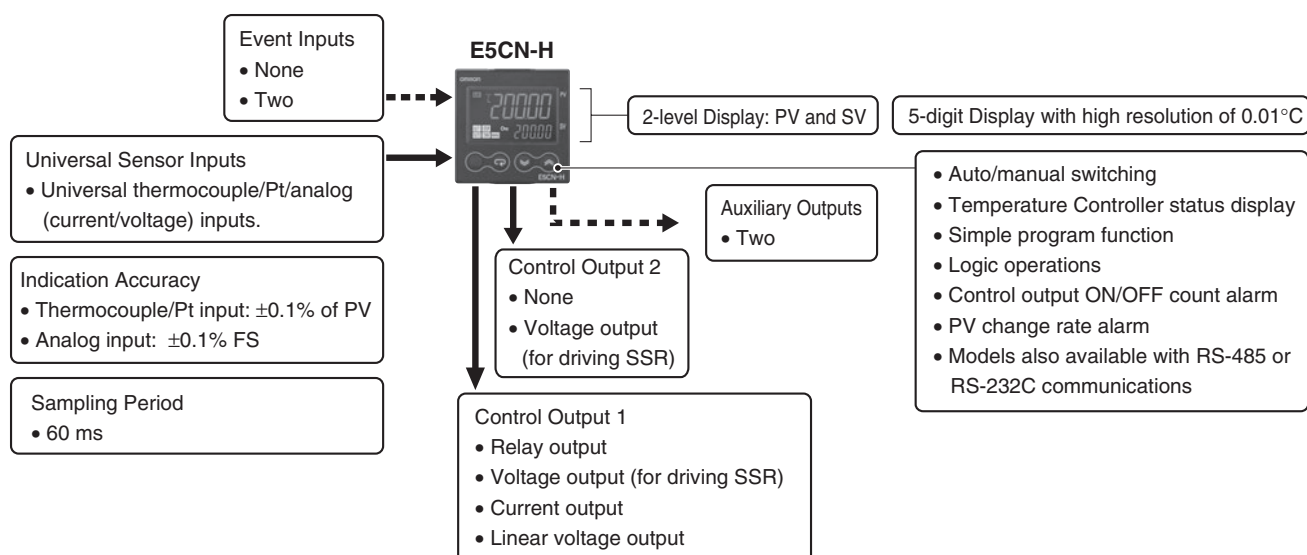
48 × 48 mm
E5CN-H

- 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: $\pm 0.1\%$ of PV
Analog input: $\pm 0.1\%$ 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.

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

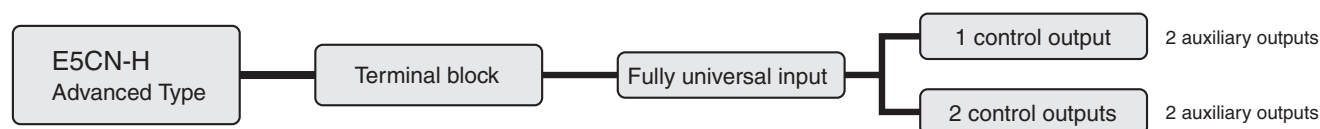


This data sheet is provided as a guideline for selecting products. Be sure to refer to the following user manuals for application precautions and other information required for operation before attempting to use the product.

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- 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-).

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
	Black	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
				Linear voltage output	E5CN-HV2M-W-500
	Silver	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
				Linear voltage output	E5CN-HV2MD-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-CNHB2
Communications RS-485				Control output 2 (Voltage for driving SSR)		E53-CNQ03N2
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-CNQH2
		3-phase heater burnout/SSR failure/ Heater overcurrent detection		Control output 2 (Voltage for driving SSR)		E53-CNQH2N2
			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-CNBF2
	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-CNHH01N2

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-29

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□.

Front cover

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

CX-Thermo Support Software

Model
EST2-2C-MV4

Specifications

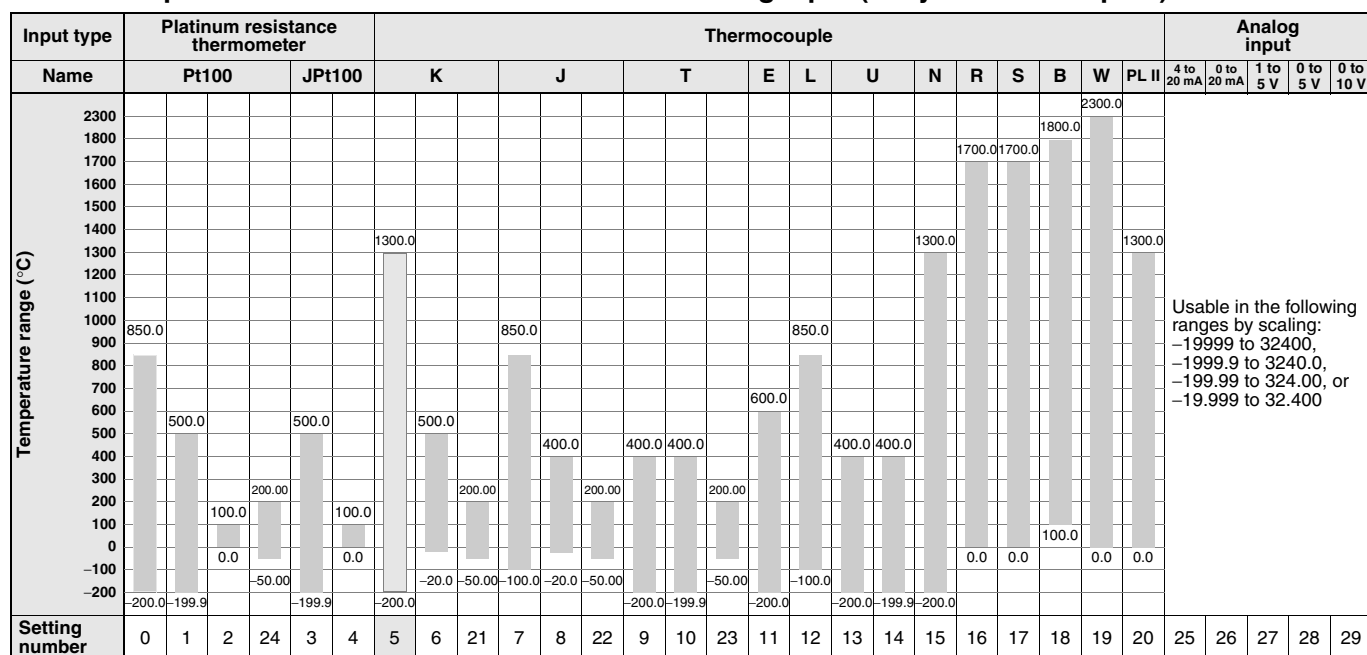
Ratings

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		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 M Ω min. (Use a 1:1 connection when connecting the ES2-HB.)
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 \pm 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 k Ω 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 k Ω max., OFF: 100 k Ω 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
	Outputs	One work bit per operation
Transfer outputs	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	1 max.
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 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.

Input Ranges

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



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*.

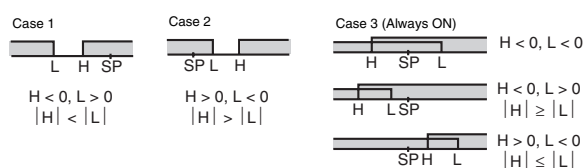
Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

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).

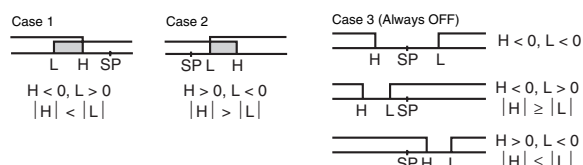
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1 *1	Upper- and lower-limit	ON OFF	*2	Set the deviation in the set point by setting the alarm upper limit (H) and alarm lower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

Characteristics

Indication accuracy		Thermocouple: ($\pm 0.1\%$ of indicated value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max. *1 Platinum resistance thermometer: ($\pm 0.1\%$ of indicated value or $\pm 0.5^\circ\text{C}$, 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		$\pm 0.3\%$ FS max.
Influence of temperature *2		Thermocouple input (R, S, B, W, PLII): ($\pm 1\%$ of PV or $\pm 10^\circ\text{C}$, whichever is greater) ± 1 digit max. Other thermocouple input: ($\pm 1\%$ of PV or $\pm 4^\circ\text{C}$, whichever is greater) ± 1 digit max. *3
Influence of voltage *2		Platinum resistance thermometer: ($\pm 1\%$ of PV or $\pm 2^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: ($\pm 1\%$ 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 (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 M Ω min. (at 500 VDC)
Dielectric strength		2,300 VAC, 50 or 60 Hz for 1 min (between terminals with different charge)
Vibration resistance	Malfunction	10 to 55 Hz, 20 m/s ² for 10 min each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 0.75-mm single amplitude for 2 hrs each in X, Y, and Z directions
Shock resistance	Malfunction	100 m/s ² , 3 times each in X, Y, and Z directions
	Destruction	300 m/s ² , 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 Radiated Interference Electromagnetic Field Strength: EN 55011 Group 1, class A Noise Terminal Voltage: EN 55011 Group 1, class A EMS: EN 61326 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 $\pm 2^\circ\text{C} \pm 1$ 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 $\pm 3^\circ\text{C}$ max. The indication accuracy of the R and S thermocouples at a temperature of 200°C max. is $\pm 3^\circ\text{C} \pm 1$ digit max. The indication accuracy of W thermocouples is ± 0.3 of PV or $\pm 3^\circ\text{C}$, whichever is greater, ± 1 digit max. The indication accuracy of PL II thermocouples is ± 0.3 of PV or $\pm 2^\circ\text{C}$, 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.: $\pm 10^\circ\text{C}$ 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.

USB-Serial Conversion Cable

Applicable OS	Windows 2000, XP, or Vista
Applicable software	CX-Thermo version 4 or higher
Applicable models	E5AN/E5EN/E5CN/E5CN-U/ E5AN-H/E5EN-H/E5CN-H/E5GN
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

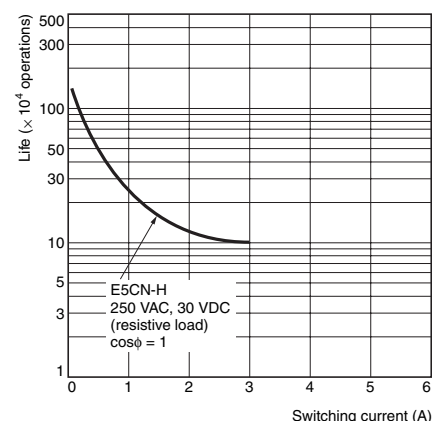
CT input (for heater current detection)	Models with detection for single-phase heaters: One input Models with detection for single-phase or three-phase heaters: Two inputs
Maximum heater current	50 A AC
Input current indication accuracy	±5% FS ±1 digit max.
Heater burnout alarm setting range *1	0.1 to 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).

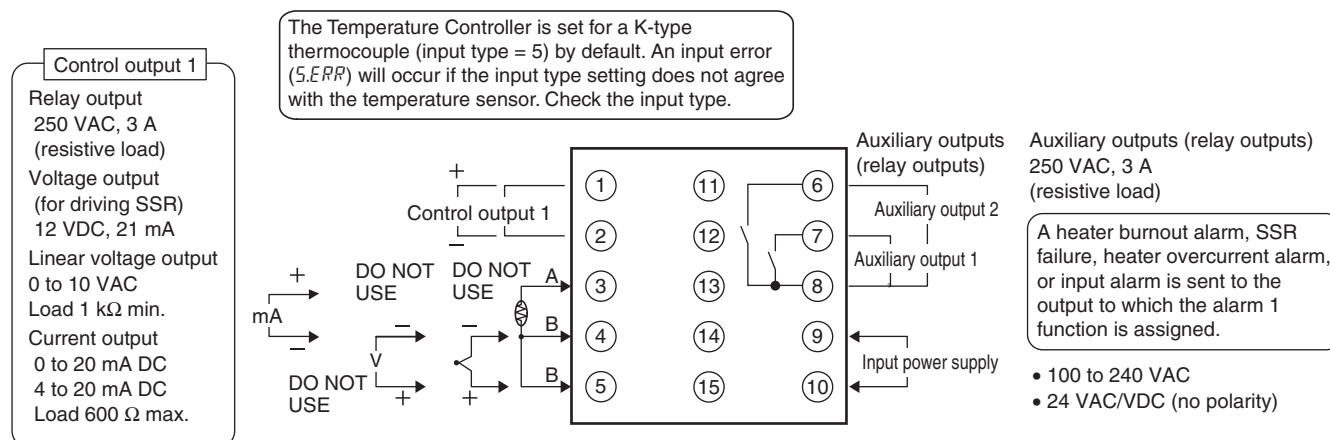
Electrical Life Expectancy Curve for Relays (Reference Values)



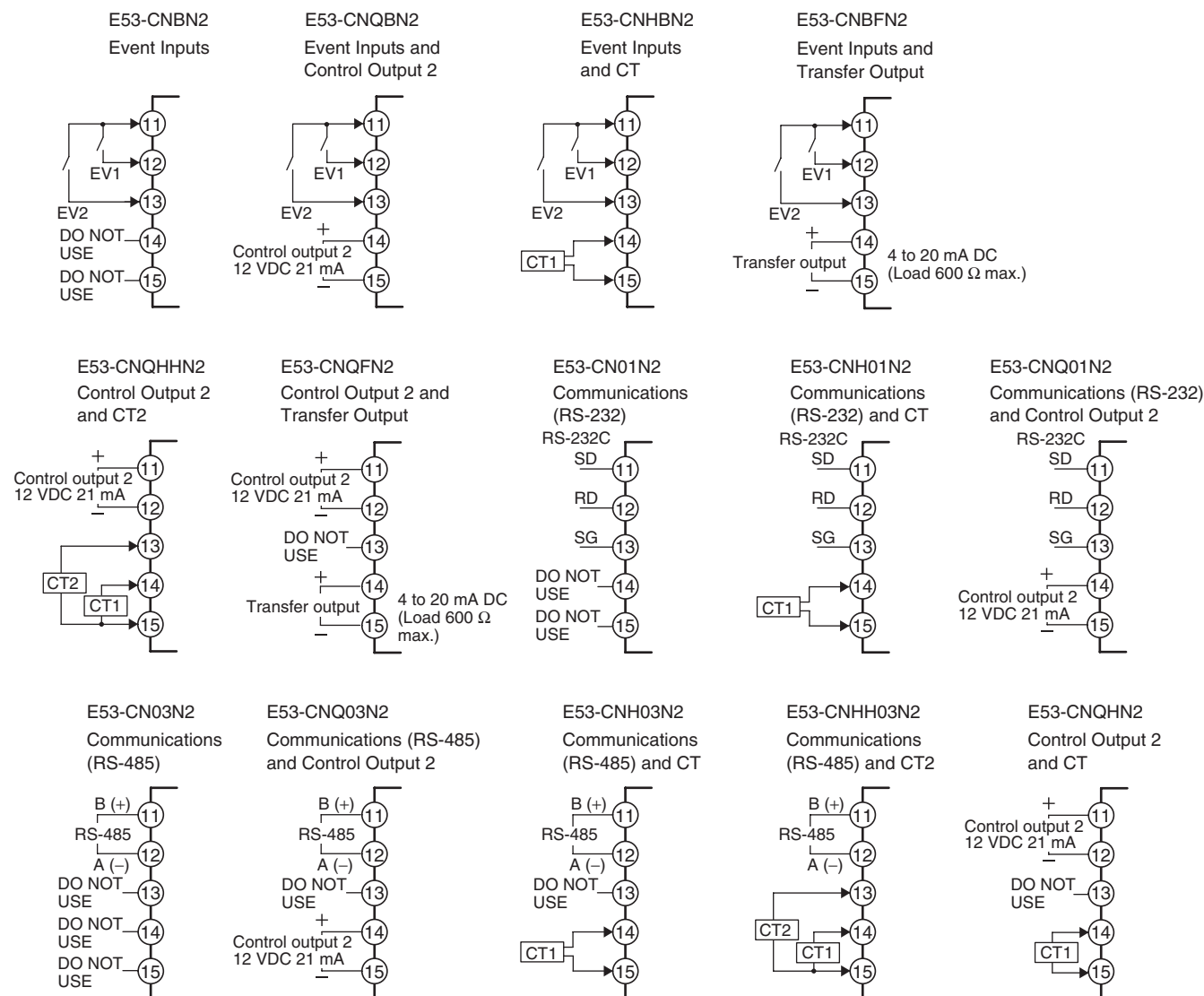
External Connections

- 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



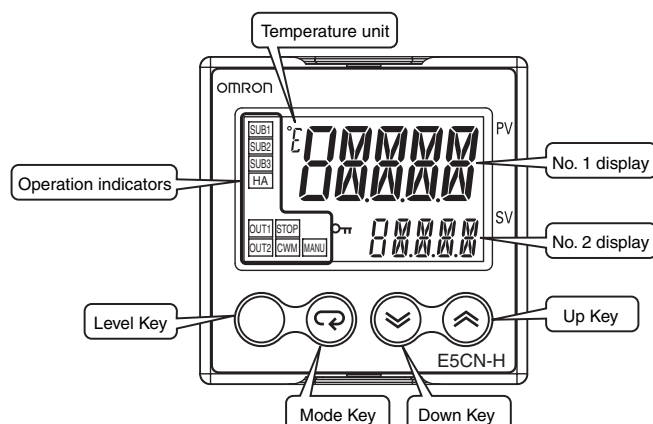
Option Units



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

Nomenclature

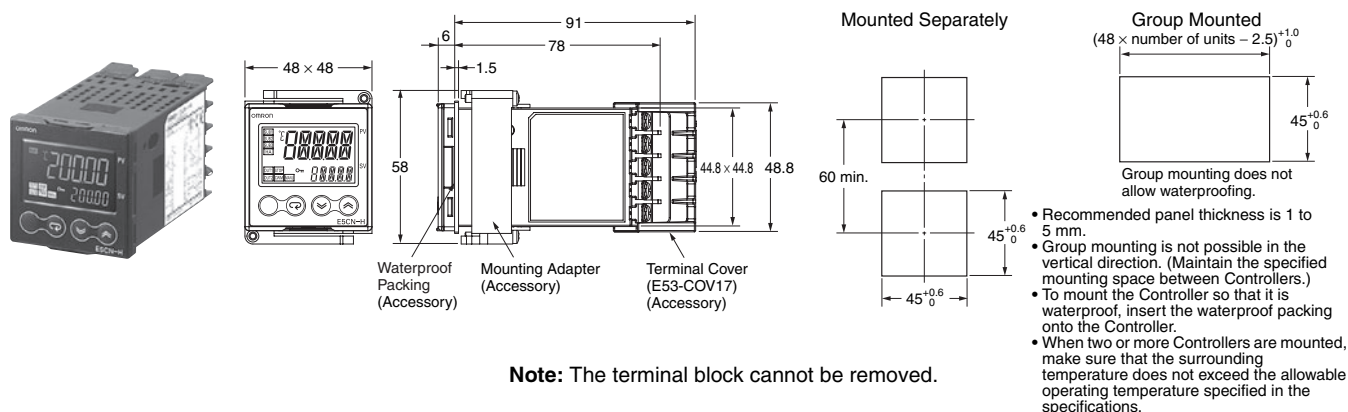
E5CN-H



Dimensions

(Unit: mm)

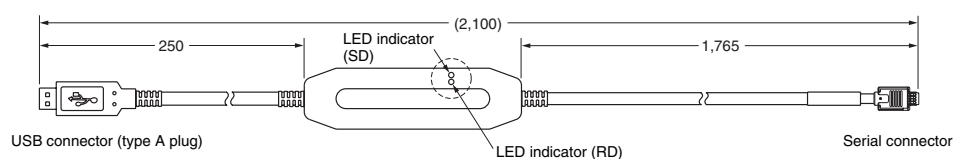
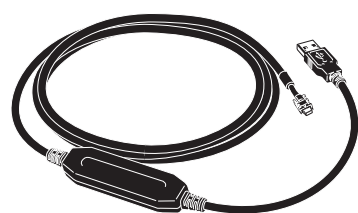
E5CN-H

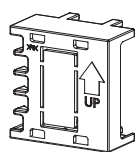


Accessories (Order Separately)

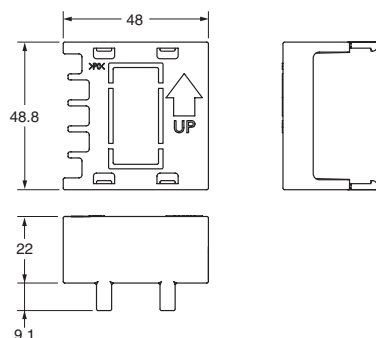
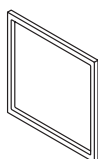
USB-Serial Conversion Cable

E58-CIFQ1



Terminal Cover**E53-COV17**

Note: The E53-COV10 can not be used.

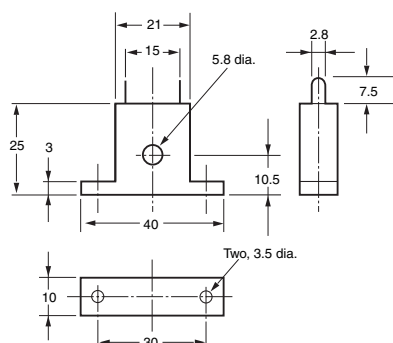
**Waterproof Packing****Y92S-29 (for DIN 48 × 48)**

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.)

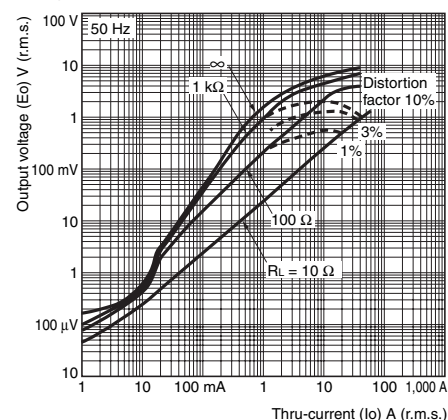
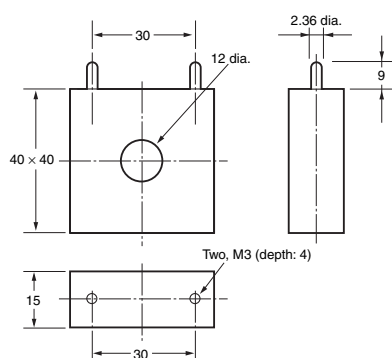
The Waterproof Packing does not need to be attached if a waterproof structure is not required.

Current Transformers**E54-CT1****E54-CT1****Thru-current (I_o) vs. Output Voltage (E_o) (Reference Values)**

Maximum continuous heater current: 50 A (50/60 Hz)

Number of windings: 400±2

Winding resistance: 18±2 Ω

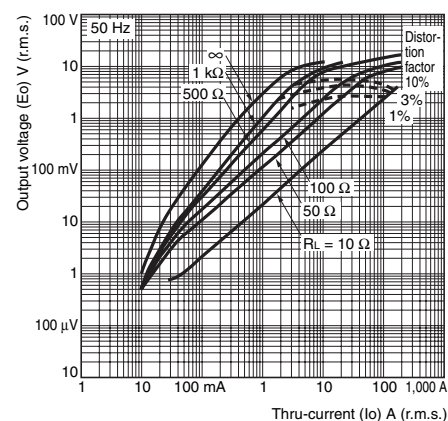
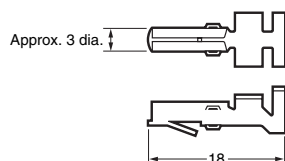
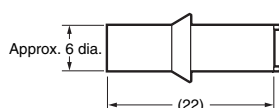
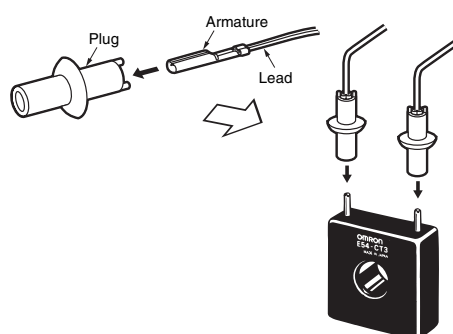
**E54-CT3****E54-CT3****Thru-current (I_o) vs. Output Voltage (E_o) (Reference Values)**

Maximum continuous heater current: 120 A (50/60 Hz)

(Maximum continuous heater current for an OMRON Temperature Controller is 50 A.)

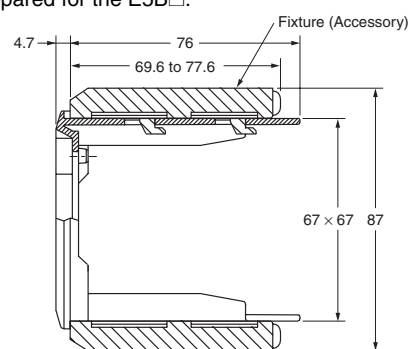
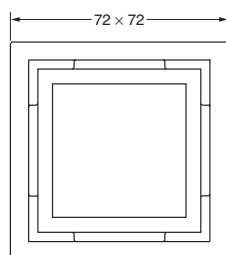
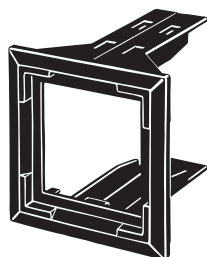
Number of windings: 400±2

Winding resistance: 8±0.8 Ω

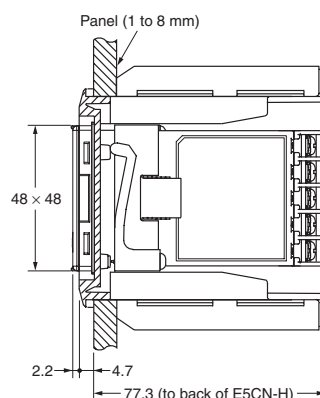
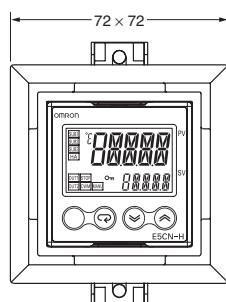
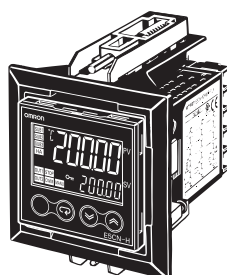
**E54-CT3 Accessory****• Armature****• Plug****Connection Example**

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



Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.