

# E5EC/E5AC-800

(48 × 96 mm/96 × 96 mm)

**Large White PV Display That's Easier to Read.  
Easy to Use, from Model Selection to  
Setup and Operation.  
A Complete Range of I/O Capacities,  
Functions, and Performance.  
Handles More Applications.**

- A white LCD PV display with a height of approx. 18 mm for the E5EC-800 and 25 mm for the E5AC-800 improves visibility.
- High-speed sampling at 50 ms.
- Short body with depth of only 60 mm.
- Easy connections to a PLC with programless communications. Use component communications to link Temperature Controllers to each other.
- The new position-proportional control models allow you to control valves as well.



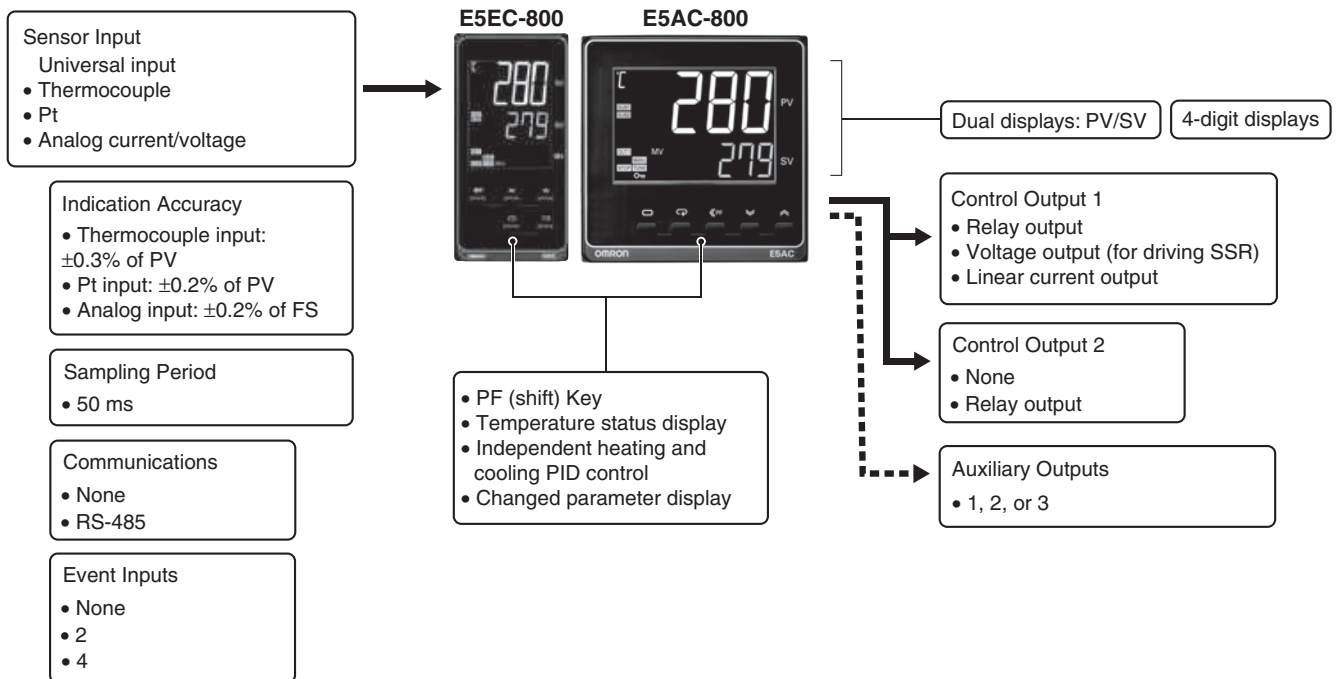
48 × 96 mm  
E5EC-800

96 × 96 mm  
E5AC-800

Refer to your OMRON website for the most recent information on applicable safety standards.

Refer to Safety Precautions on page 50.

## Main I/O Functions



# E5EC/E5AC-800

## Model Number Legend and Standard Models

### Model Number Legend

#### ● Models with Screw Terminals

#### E5EC-800 48 × 96 mm

Control output 1	Control output 2	Auxiliary output	Communications	Heater burnout	Event inputs	Power supply voltage	Model							
Relay output	-	Two	-	-	-	100 to 240 VAC	E5EC-RX2ASM-800							
Voltage output	-						E5EC-QX2ASM-800							
Linear current output	-						E5EC-CX2ASM-800							
Relay output	Relay output						E5EC-RR2ASM-800							
Voltage output	Relay output						E5EC-QR2ASM-800							
Linear current output	Relay output						E5EC-CR2ASM-800							
Relay output	-					24 VAC/VDC	-	-	-	E5EC-RX2DSM-800				
Voltage output	-									E5EC-QX2DSM-800				
Linear current output	-									E5EC-CX2DSM-800				
Relay output	Relay output									E5EC-RR2DSM-800				
Voltage output	Relay output									E5EC-QR2DSM-800				
Linear current output	Relay output									E5EC-CR2DSM-800				
Relay output	Relay output		RS-485	-	-	Two				E5EC-RR2ASM-808				
Voltage output	Relay output									E5EC-QR2ASM-808				
Relay output	Relay output									E5EC-RR2DSM-808				
Voltage output	Relay output									E5EC-QR2DSM-808				
Relay output	Relay output									-	-	-	Four	E5EC-RR2ASM-810
Voltage output	Relay output													E5EC-QR2ASM-810
Relay output	Relay output		E5EC-RR2DSM-810											
Voltage output	Relay output		E5EC-QR2DSM-810											
Linear current output	Relay output		RS-485	-	-	Two	E5EC-CR2ASM-804							
Linear current output	Relay output						E5EC-CR2DSM-804							
Relay output (Open)*	Relay output (Close)*						-	-	-	-	E5EC-PR0ASM-800			
Relay output (Open)*	Relay output (Close)*										Two	-	-	-
Relay output (Open)*	Relay output (Close)*	E5EC-PR2ASM-804												

\* Position proportional control model.

#### E5AC-800 48 × 96 mm

Control output 1	Control output 2	Auxiliary output	Communications	Heater burnout	Event inputs	Power supply voltage	Model								
Relay output	-	One	-	-	-	100 to 240 VAC	E5AC-RX1ASM-800								
Voltage output	-						E5AC-QX1ASM-800								
Linear current output	-						E5AC-CX1ASM-800								
Relay output	-						Three	-	-	-	E5AC-RX3ASM-800				
Voltage output	-										E5AC-QX3ASM-800				
Linear current output	-										E5AC-CX3ASM-800				
Relay output	-						One				-	-	-	E5AC-RX1DSM-800	
Voltage output	-													E5AC-QX1DSM-800	
Linear current output	-													E5AC-CX1DSM-800	
Relay output	-	Three	RS-485	-	-	Two	E5AC-RX3DSM-800								
Voltage output	-						E5AC-QX3DSM-800								
Linear current output	-						E5AC-CX3DSM-800								
Relay output	-						-	-	-	-				E5AC-RX3ASM-808	
Voltage output	-													E5AC-QX3ASM-808	
Relay output	-													E5AC-RX3DSM-808	
Voltage output	-		-	-	-	-	E5AC-QX3DSM-808								
Relay output	-						Four				E5AC-RX3ASM-810				
Voltage output	-										E5AC-QX3ASM-810				
Relay output	-	E5AC-RX3DSM-810													
Voltage output	-	E5AC-QX3DSM-810													
Linear current output	-	RS-485	-				-	-	Two	E5AC-CX3ASM-804					
Linear current output	-			E5AC-CX3DSM-804											
Relay output (Open)*	Relay output (Close)*			-	-	-				-	-	E5AC-PR0ASM-800			
Relay output (Open)*	Relay output (Close)*	Two							-			-	-	-	E5AC-PR2ASM-800
Relay output (Open)*	Relay output (Close)*														E5AC-PR2ASM-804

\* Position proportional control model.

## Heating and Cooling Control

### I Using Heating and Cooling Control

#### ① Control Output Assignment

If there is no control output 2, an auxiliary output is used as the cooling control output.

If there is a control output 2, the two control outputs are used for heating and cooling.

(It does not matter which output is used for heating and which output is used for cooling.)

#### ② Control

If PID control is used, you can set PID control separately for heating and cooling.

This allows you to handle control systems with different heating and cooling response characteristics.

## Optional Products (Order Separately)

### Terminal Covers

Model
E53-COV24

### Waterproof Packing

Applicable Controller	Model
E5EC-800	Y92S-P9
E5AC-800	Y92S-P10

**Note:** This Waterproof Packing is provided with the Digital Temperature Controller.

### Waterproof Cover

Applicable Controller	Model
E5EC-800	Y92A-49N
E5AC-800	Y92A-96N

### Front Port Cover

Model
Y92S-P7

**Note:** This Front Port Cover is provided with the Digital Temperature Controller.

### Mounting Adapter

Model
Y92F-51

(Two Adapters are included.)

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

### Current Transformers (CTs)

Hole diameter	Model
5.8 mm	E54-CT1
12.0 mm	E54-CT3

# E5EC/E5AC-800

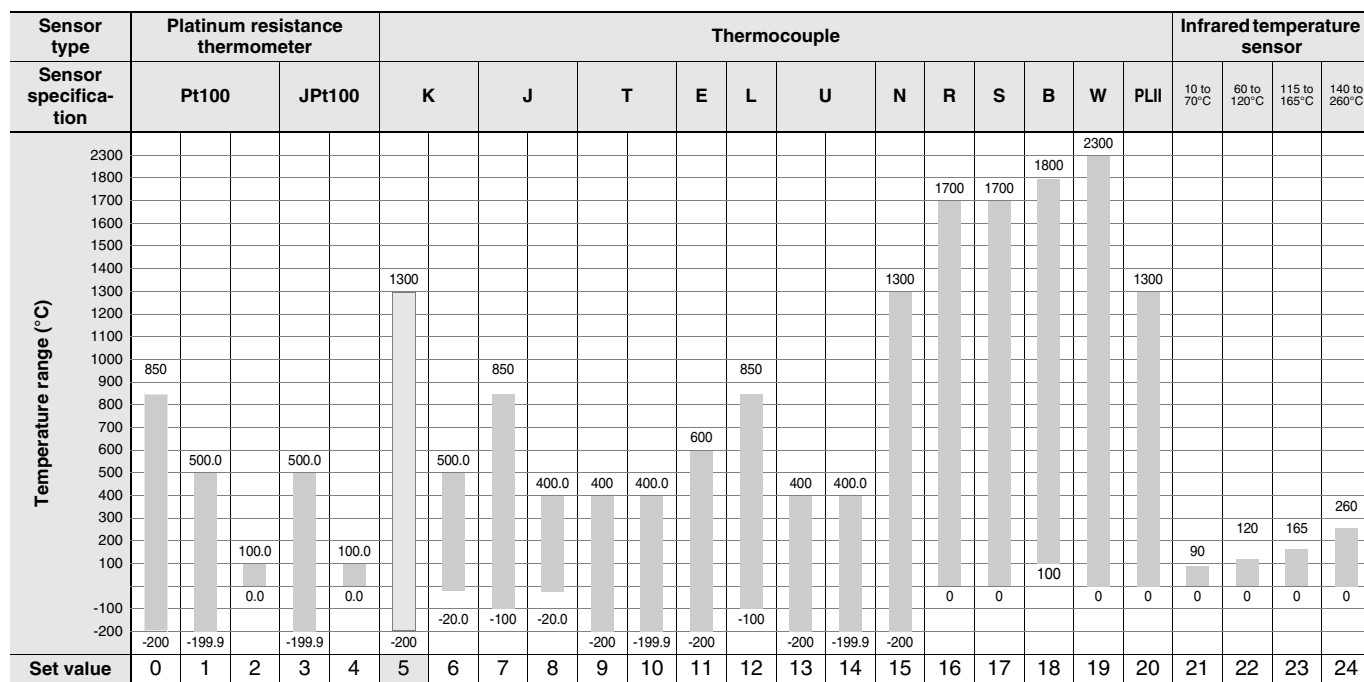
## Specifications

### Ratings

<b>Power supply voltage</b>		A in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC
<b>Operating voltage range</b>		85% to 110% of rated supply voltage
<b>Power consumption</b>	<b>E5EC-800</b>	6.6 VA max. at 100 to 240 VAC, and 4.1 VA max. at 24 VAC or 2.3 W max. at 24 VDC
	<b>E5AC-800</b>	7.0 VA max. at 100 to 240 VAC, and 4.2 VA max. at 24 VAC or 2.4 W max. at 24 VDC
<b>Sensor input</b>		Temperature input Thermocouple: K, J, T, E, L, U, N, R, S, B, W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C Analog input 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
<b>Input impedance</b>		Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the ES2-HB/THB.)
<b>Control method</b>		ON/OFF control or 2-PID control (with auto-tuning)
<b>Control output</b>	<b>Relay output</b>	SPST-NO, 250 VAC, 5 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	<b>Voltage output (for driving SSR)</b>	Output voltage: 12 VDC ±20% (PNP), max. load current: 40 mA, with short-circuit protection circuit (The maximum load current is 21 mA for models with two control outputs.)
	<b>Linear current output</b>	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000
<b>Auxiliary output</b>	<b>Number of outputs</b>	1, 2, or 3 (depends on model)
	<b>Output specifications</b>	SPST-NO relay outputs, 250 VAC, Models with 2 outputs: 3 A (resistive load), Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5 V
<b>Event input</b>	<b>Number of inputs</b>	2 or 4 (depends on model)
	<b>External contact input specifications</b>	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
<b>Potentiometer input</b>		100 Ω to 10 kΩ
<b>Setting method</b>		Digital setting using front panel keys
<b>Indication method</b>		11-segment digital display and individual indicators Character height: E5EC-800: PV: 18.0 mm, SV: 11.0 mm E5AC-800: PV: 25.0 mm, SV: 15.0 mm
<b>Multi SP</b>		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.
<b>Bank switching</b>		None
<b>Other functions</b>		Manual output, heating/cooling control, loop burnout alarm, SP ramp, other alarm functions, heater burnout (HB) alarm (including SSR failure (HS) alarm), 40% AT, 100% AT, MV limiter, input digital filter, self tuning, PV input shift, run/stop, protection functions, temperature status display, moving average of input value, FB moving average
<b>Ambient operating temperature</b>		-10 to 55°C (with no condensation or icing), for 3-year warranty: -10 to 50°C (with no condensation or icing)
<b>Ambient operating humidity</b>		25% to 85%
<b>Storage temperature</b>		-25 to 65°C (with no condensation or icing)
<b>Altitude</b>		2,000 m max.
<b>Recommended fuse</b>		T2A, 250 VAC, time lag, low shut-off capacity
<b>Installation environment</b>		Installation Category II, Pollution Class 2 (IEC 61010-1 compliant)

## Input Ranges (Universal inputs)

### ● Thermocouple/Platinum Resistance Thermometer



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 60584-1

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

L: Fe-CuNi, DIN 43710-1985

Pt100: JIS C 1604-1997, IEC 60751

U: Cu-CuNi, DIN 43710-1985

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

W: W5Re/W26Re, ASTM E988-1990

### ● Analog input

Input type	Current		Voltage		
	Input specification	4 to 20 mA	0 to 20 mA	1 to 5 V	0 to 5 V
Setting range	Usable in the following ranges by scaling: -1999 to 9999, -199.9 to 999.9, -19.99 to 99.99 or -1.999 to 9.999				
Set value	25	26	27	28	29

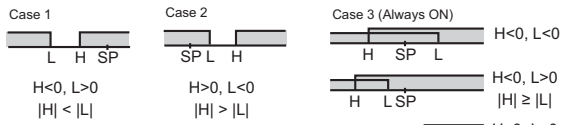
## Alarm type

Each alarm can be independently set to one of the following 19 alarm types. The default is 2: Upper limit. (see note.)  
 Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

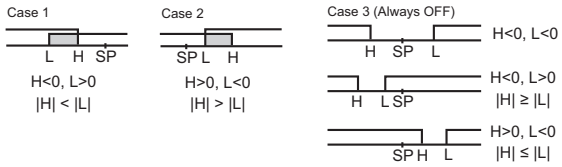
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1	Upper- and lower-limit *1		*2	Set the upward deviation in the set point for the alarm upper limit (H) and the lower deviation in the set point for the alarm lower limit (L). The alarm is ON when the PV is outside this deviation range.
2 (default)	Upper-limit			Set the upward deviation in the set point by setting the alarm value (X). The alarm is ON when the PV is higher than the SP by the deviation or more.
3	Lower-limit			Set the downward deviation in the set point by setting the alarm value (X). The alarm is ON when the PV is lower than the SP by the deviation or more.
4	Upper- and lower-limit range *1		*3	Set the upward deviation in the set point for the alarm upper limit (H) and the lower deviation in the set point for the alarm lower limit (L). The alarm is ON when the PV is inside this deviation range.
5	Upper- and lower-limit with standby sequence *1		*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
14	SP absolute value upper limit alarm			This alarm type turns ON the alarm when the set point (SP) is higher than the alarm value (X).
15	SP absolute value lower limit alarm			This alarm type turns ON the alarm when the set point (SP) is lower than the alarm value (X).
16	MV absolute value upper limit alarm *9	Standard Control 	Standard Control 	This alarm type turns ON the alarm when the manipulated variable (MV) is higher than the alarm value (X).
		Heating/Cooling Control (Heating MV) 	Heating/Cooling Control (Heating MV) Always ON	
17	MV absolute value lower limit alarm *9	Standard Control 	Standard Control 	This alarm type turns ON the alarm when the manipulated variable (MV) is lower than the alarm value (X).
		Heating/Cooling Control (Cooling MV) 	Heating/Cooling Control (Cooling MV) Always ON	

\*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 \*2

- 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 E5□C Digital Temperature Controllers User's Manual (Cat. No. H174) for information on the operation of the standby sequence.
- \*7. Refer to the E5□C Digital Temperature Controllers User's Manual (Cat. No. H174) for information on the PV change rate alarm. This setting cannot be used with a position-proportional model.
- \*8. Refer to the E5□C Digital Temperature Controllers User's Manual (Cat. No. H174) for information on the PV change rate alarm.
- \*9. When heating/cooling control is performed, the MV absolute upper limit alarm functions only for the heating operation and the MV absolute lower limit alarm functions only for the cooling operation.

## Characteristics

<b>Indication accuracy (at the ambient temperature of 23°C)</b>		Thermocouple: ( $\pm 0.3\%$ of PV or $\pm 1^\circ\text{C}$ , whichever is greater) $\pm 1$ digit max. *1 Platinum resistance thermometer: ( $\pm 0.2\%$ of PV or $\pm 0.8^\circ\text{C}$ , whichever is greater) $\pm 1$ digit max. Analog input: $\pm 0.2\%$ FS $\pm 1$ digit max. CT input: $\pm 5\%$ FS $\pm 1$ digit max. Potentiometer input: $\pm 5\%$ FS $\pm 1$ digit max.
<b>Influence of temperature *2</b>		Thermocouple input (R, S, B, W, PL II): ( $\pm 1\%$ of PV or $\pm 10^\circ\text{C}$ , whichever is greater) $\pm 1$ digit max.
<b>Influence of voltage *2</b>		Other thermocouple input: ( $\pm 1\%$ of PV or $\pm 4^\circ\text{C}$ , whichever is greater) $\pm 1$ digit max. *3 Platinum resistance thermometer: ( $\pm 1\%$ of PV or $\pm 2^\circ\text{C}$ , whichever is greater) $\pm 1$ digit max.
<b>Influence of EMS. (at EN 61326-1)</b>		Analog input: $\pm 1\%$ FS $\pm 1$ digit max. CT input: $\pm 5\%$ FS $\pm 1$ digit max.
<b>Input sampling period</b>		50ms
<b>Hysteresis</b>		Temperature input: 0.1 to 999.9°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)
<b>Proportional band (P)</b>		Temperature input: 0.1 to 999.9°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)
<b>Integral time (I)</b>		Standard, heating/cooling, or Position-proportional (Close) 0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) Position-proportional (Floating) 1 to 9999 s (in units of 1 s), 0.1 to 999.9 s (in units of 0.1 s)
<b>Derivative time (D)</b>		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *4
<b>Proportional band (P) for cooling</b>		Temperature input: 0.1 to 999.9°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)
<b>Integral time (I) for cooling</b>		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *4
<b>Derivative time (D) for cooling</b>		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *4
<b>Control period</b>		0.1, 0.2, 0.5, 1 to 99 s (in units of 1 s)
<b>Manual reset value</b>		0.0 to 100.0% (in units of 0.1%)
<b>Alarm setting range</b>		-1999 to 9999 (decimal point position depends on input type)
<b>Affect of signal source resistance</b>		Thermocouple: $0.1^\circ\text{C}/\Omega$ max. (100 $\Omega$ max.) Platinum resistance thermometer: $0.1^\circ\text{C}/\Omega$ max. (10 $\Omega$ max.)
<b>Insulation resistance</b>		20 M $\Omega$ min. (at 500 VDC)
<b>Dielectric strength</b>		2,300 VAC, 50/60 Hz for 1 min between terminals of different charge
<b>Vibration</b>	<b>Malfunction</b>	10 to 55 Hz, 20 m/s <sup>2</sup> for 10 min each in X, Y, and Z directions
	<b>Resistance</b>	10 to 55 Hz, 20 m/s <sup>2</sup> for 2 hrs each in X, Y, and Z directions
<b>Shock</b>	<b>Malfunction</b>	100 m/s <sup>2</sup> , 3 times each in X, Y, and Z directions
	<b>Resistance</b>	300 m/s <sup>2</sup> , 3 times each in X, Y, and Z directions
<b>Weight</b>	<b>E5EC-800</b>	Controller: Approx. 210 g, Mounting Brackets: Approx. 4 g $\times$ 2
	<b>E5AC-800</b>	Controller: Approx. 250 g, Mounting Brackets: Approx. 4 g $\times$ 2
<b>Degree of protection</b>		Front panel: IP66, Rear case: IP20, Terminals: IP00
<b>Memory protection</b>		Non-volatile memory (number of writes: 1,000,000 times)
<b>Standards</b>	<b>Approved standards</b>	UL 61010-1, Korean Radio Waves Act (Act 10564)
	<b>Conformed standards</b>	EN 61010-1 (IEC 61010-1): Pollution level 2, overcurrent category II, Lloyd's standards *5
<b>EMC</b>		EMI Radiated Interference Electromagnetic Field Strength: EN 55011 Group 1, class A Noise Terminal Voltage: EN 55011 Group 1, class A EMS: ESD Immunity: EN 61326-1 *6 Electromagnetic Field Immunity: EN 61000-4-2 Burst Noise Immunity: EN 61000-4-4 Conducted Disturbance Immunity: EN 61000-4-6 Surge Immunity: EN 61000-4-5 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 at a temperature of 400 to 800°C 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 ( $\pm 0.3$  of PV or  $\pm 3^\circ\text{C}$ , whichever is greater)  $\pm 1$  digit max. The indication accuracy of PL II thermocouples is ( $\pm 0.3\%$  of PV or  $\pm 2^\circ\text{C}$ , whichever is greater)  $\pm 1$  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. The unit is determined by the setting of the Integral/Derivative Time Unit parameter.

\*5. Refer to information on maritime standards in *Shipping Standards* on page 52 for compliance with Lloyd's Standards.

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



## Communications Specifications

Transmission line connection method	RS-485: Multidrop
Communications	RS-485 (two-wire, half duplex)
Synchronization method	Start-stop synchronization
Protocol	CompoWay/F, or Modbus
Baud rate	9600, 19200, 38400, or 57600 bps
Transmission code	ASCII
Data bit length*	7 or 8 bits
Stop bit length*	1 or 2 bits
Error detection	Vertical parity (none, even, odd) Block check character (BCC) with CompoWay/F or CRC-16 Modbus
Flow control	None
Interface	RS-485
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.

## Communications Functions

Programless communications*1	You can use the memory in the PLC to read and write E5□C parameters, start and stop operation, etc. The E5□C automatically performs communications with PLCs. No communications programming is required. Number of connected Temperature Controllers: 32 max. (Up to 16 for the FX Series) Applicable PLCs OMRON PLCs CS Series, CJ Series, or CP Series Mitsubishi Electric PLCs MELSEC Q Series, L Series, or FX Series (compatible with the FX2 or FX3 (excluding the FX1S)) KEYENCE PLCs KEYENCE KV Series
Component Communications*1	When Digital Temperature Controllers are connected, set points and RUN/STOP commands can be sent from the Digital Temperature Controller that is set as the master to the Digital Temperature Controllers that are set as slaves. Slope and offsets can be set for the set point. Number of connected Digital Temperature Controllers: 32 max. (including master)
Copying*2	When Digital Temperature Controllers are connected, the parameters can be copied from the Digital Temperature Controller that is set as the master to the Digital Temperature Controllers that are set as slaves.

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KEYENCE is a registered trademark of Keyence Corporation.

\*1 A Temperature Controller with version 1.1 or higher is required.  
A Temperature Controller with version 2.1 or higher is required for the FX Series or the KV Series.

\*2 Both the programless communications and the component communications support the copying.

## Current Transformer (Order Separately) Ratings

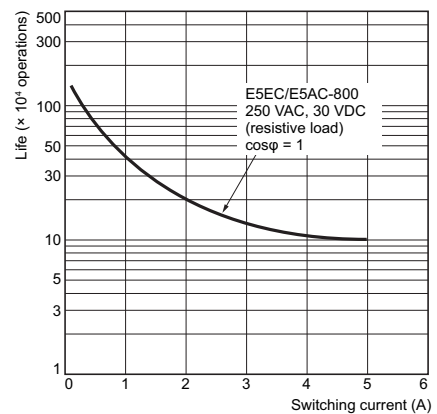
Dielectric strength	1,000 VAC for 1 min
Vibration resistance	50 Hz, 98 m/s <sup>2</sup>
Weight	E54-CT1: Approx. 11.5 g, E54-CT3: Approx. 50 g
Accessories (E54-CT3 only)	Armatures (2) Plugs (2)

## Heater Burnout Alarms and SSR Failure 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 *3
SSR failure alarm setting range *2	0.1 to 49.9 A (in units of 0.1 A) Minimum detection OFF time: 100 ms *4

- \*1. For heater burnout alarms, the heater current will be measured when the control output is ON, and the output 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 will turn ON if the heater current is higher than the set value (i.e., SSR failure detection current value).
- \*3. The value is 30 ms for a control period of 0.1 s or 0.2 s.
- \*4. The value is 35 ms for a control period of 0.1 s or 0.2 s.

## Electrical Life Expectancy Curve for Relays (Reference Values)



# E5EC/E5AC-800

## External Connections

### E5EC/E5AC-800

E5EC-□□ 2 □ S M - 8□□

(1) (2) (3) (4) (5) (6)

Terminal type

E5AC-□□ □ □ S M - 8□□

(1) (2) (3) (4) (5) (6)

Terminal type

#### Control output 1

Relay output  
250 VAC, 5 A  
(resistive load)  
Voltage output  
(for driving SSR)  
12 VDC, 40 mA  
When There Is a  
Control Output 2:  
21 mA  
Linear current output  
0 to 20 mA DC  
4 to 20 mA DC  
Load: 500 Ω max.

#### Control output 2

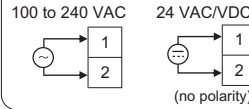
Relay output  
250 VAC, 5 A  
(resistive load)

#### Auxiliary outputs 1, 2

Relay output  
Model with 2 auxiliary  
outputs: 250 VAC, 3 A  
(resistive load)

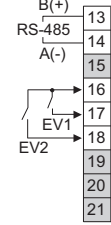
The E5EC-800 is set for a K-type thermocouple (input type = 5) by default. An input error (5.ERR) will occur if the input type setting does not agree with the temperature sensor. Check the input type.

#### (3) Input Power Supply

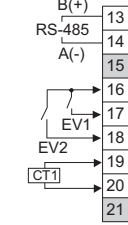


#### (6) Options

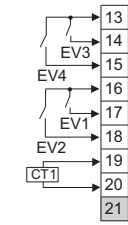
804  
Communications  
and 2 event inputs



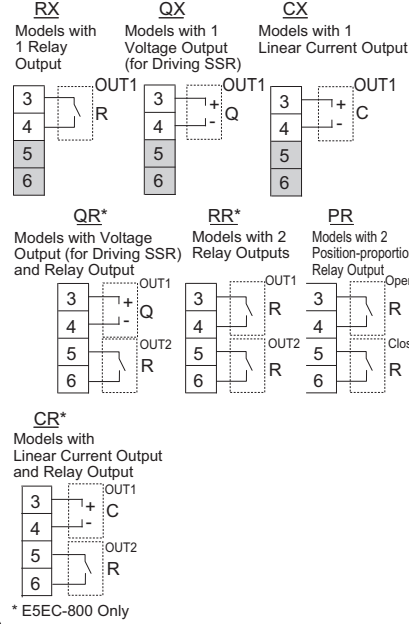
808  
Communications, 2 event  
inputs, and 1 CT input



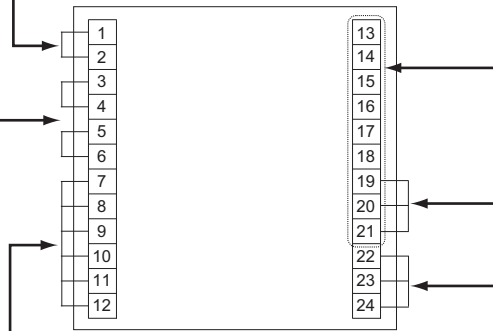
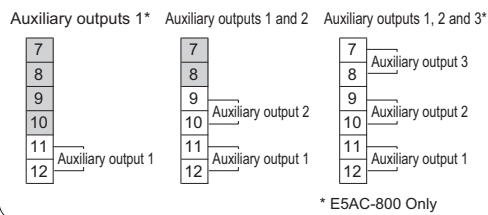
810  
Four event inputs  
and one CT



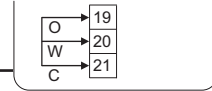
#### (1) Control output



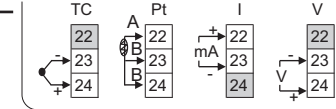
#### (2) Auxiliary Outputs



#### Potentiometer input



#### (5) Sensor (Temperature/Analog) Input



**Note:** 1. The application of the terminals depends on the model.



2. Do not wire the terminals that are shown with a gray background.

3. When complying with EMC standards, the cable that connects the sensor must be 30 m or less. If the cable length exceeds 30 m, compliance with EMC standards will not be possible.

4. Connect M3 crimped terminals.

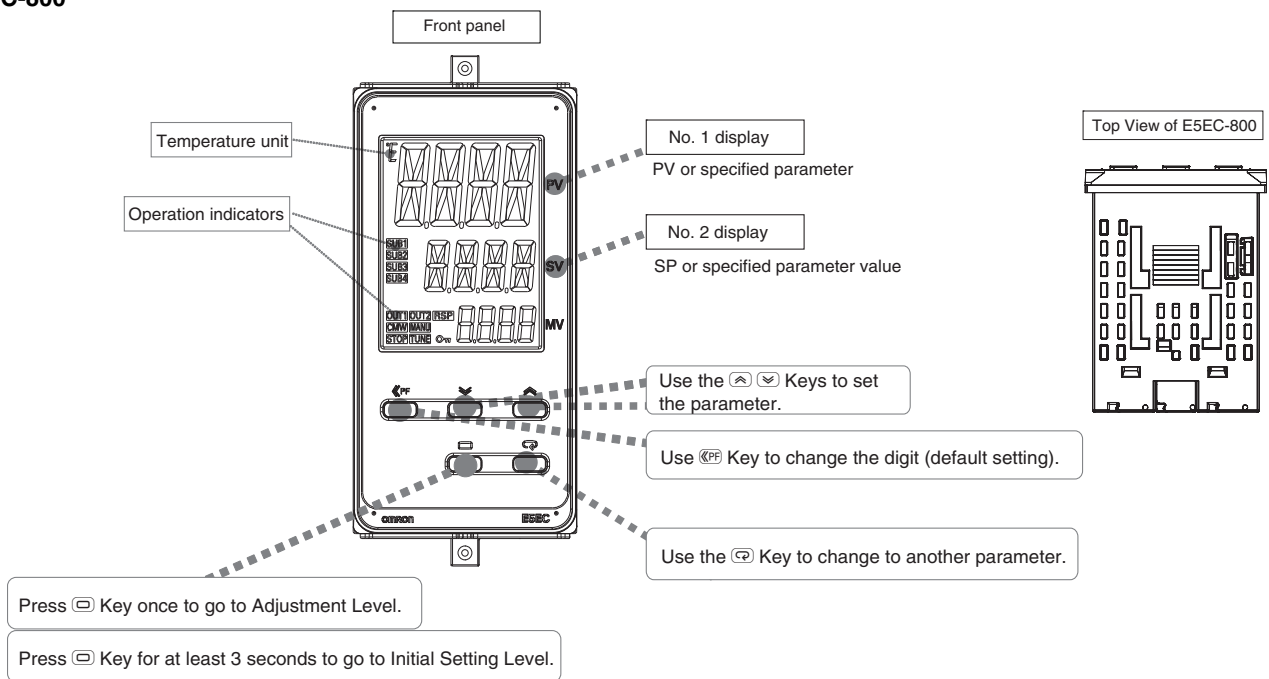
# Isolation/Insulation Block Diagrams

Power Supply	Sensor input, CT input, and potentiometer input
	Communications and event inputs
	Voltage output (for driving SSR) and linear current output
	Relay output
	Auxiliary output 1
	Auxiliary output 2
	Auxiliary output 3

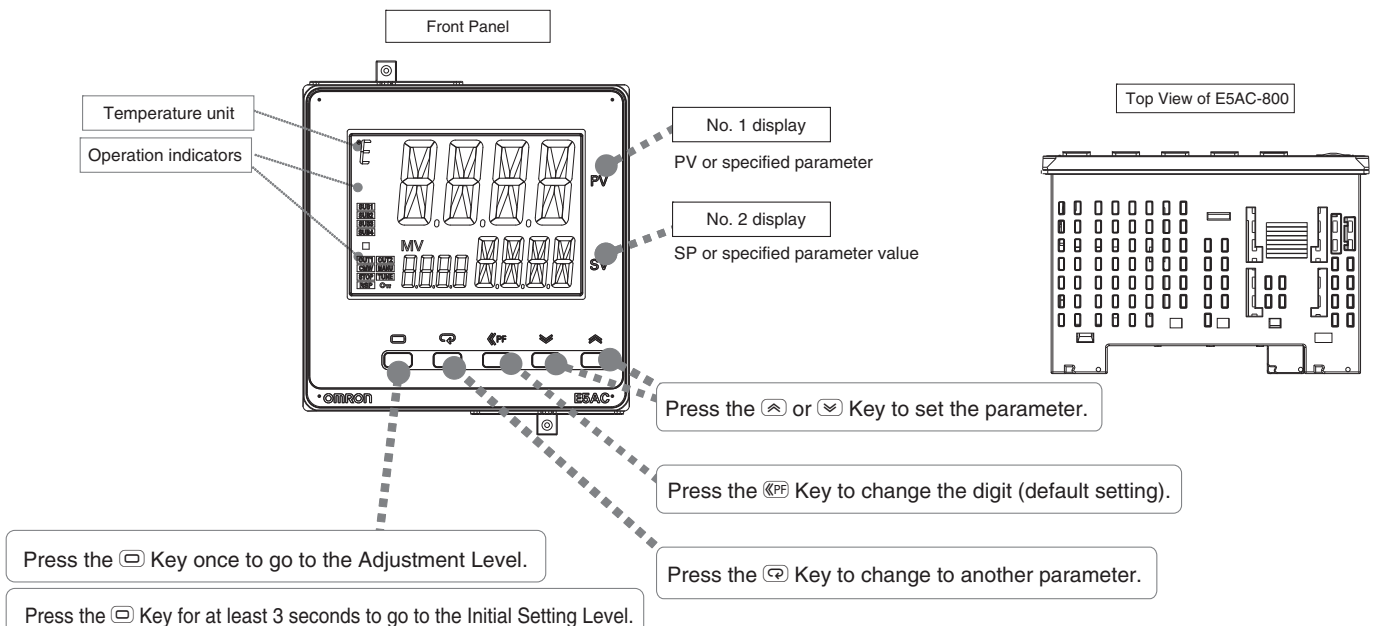
 : Reinforced insulation  
 : Functional isolation

# Nomenclature

## E5EC-800

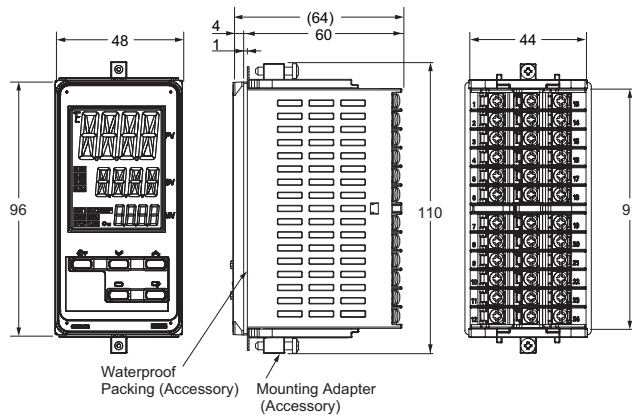


## E5AC-800

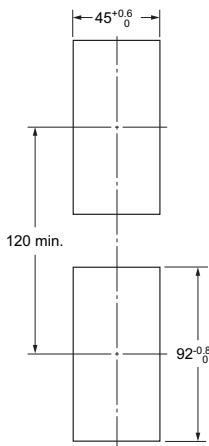


### Controllers

#### E5EC-800

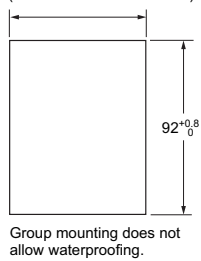


#### Mounted Separately



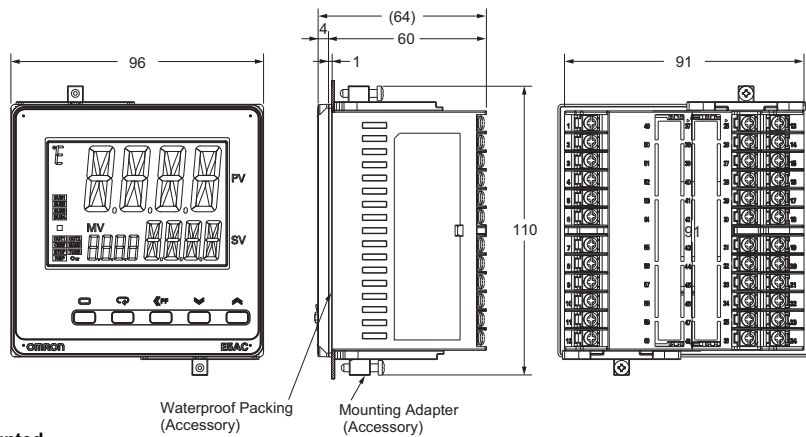
#### Group Mounted

$$(48 \times \text{number of units} - 2.5)^{+1.0}_0$$

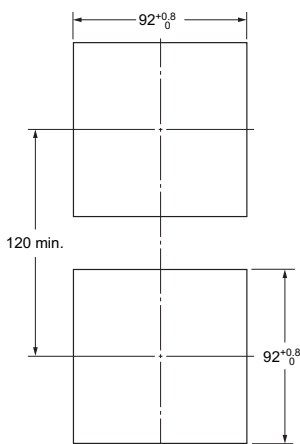


- Recommended panel thickness is 1 to 8 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers.)
- To mount the Controller so that it is waterproof, insert the waterproof packing onto the Controller.
- When two or more Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature specified in the specifications.

#### E5AC-800

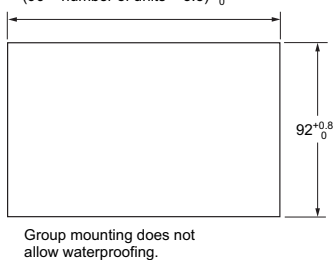


#### Mounted Separately



#### Group Mounted

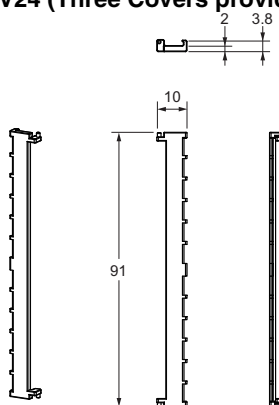
$$(96 \times \text{number of units} - 3.5)^{+1.0}_0$$



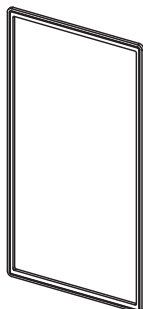
- Recommended panel thickness is 1 to 8 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers.)
- To mount the Controller so that it is waterproof, insert the waterproof packing onto the Controller.
- When two or more Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature specified in the specifications.

Accessories (Order Separately)

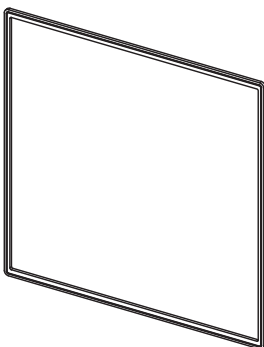
● Terminal Covers  
E53-COV24 (Three Covers provided.)



● Waterproof Packing  
Y92S-P9 (for DIN 48 × 96)  
(Provided with the Controller.)

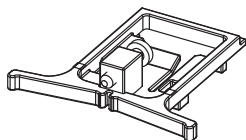


Y92S-P10 (for DIN 96 × 96)  
(Provided with the Controller.)



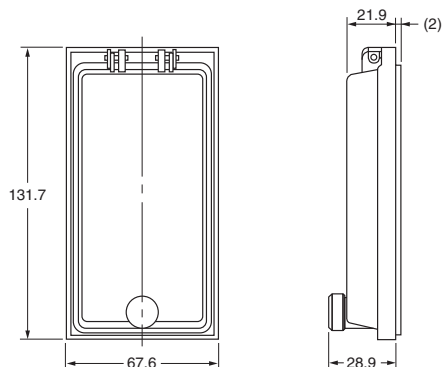
The Waterproof Packing is provided with the Temperature Controller.  
The degree of protection when the Waterproof Packing is used is IP66.  
Also, keep the Port Cover of the E5EC/E5AC-800 securely closed.  
To maintain an IP66 degree of protection, the Waterproof Packing and the Port Cover must be periodically replaced because they may deteriorate, shrink, or harden depending on the operating environment.  
The replacement period will vary with the operating environment.  
Check the required period in the actual application.  
Use 3 years or sooner as a guideline.  
If a waterproof structure is not required, then the Waterproof Packing does not need to be installed.

● Mounting Adapter  
Y92F-51 (for DIN 48 × 96)  
(Two Adapters provided.)

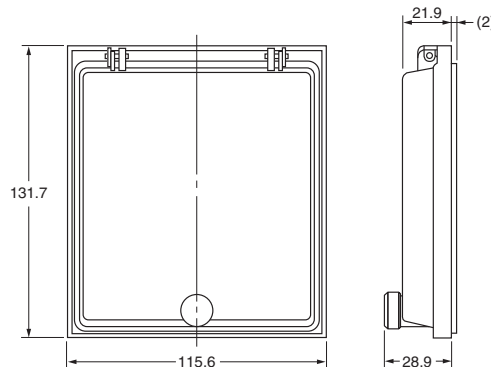


One pair is provided with the Controller.  
Order this Adapter separately if it becomes lost or damaged.

● Watertight Cover  
Y92A-49N (48 × 96)

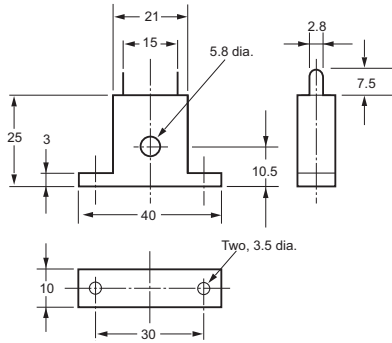


● Watertight Cover  
Y92A-96N (96 × 96)

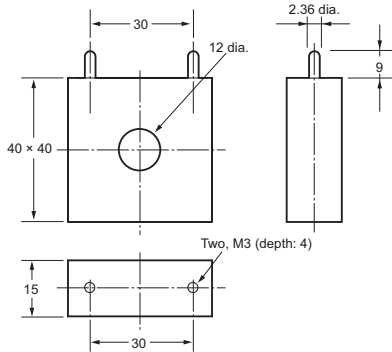


## ● Current Transformers

### E54-CT1

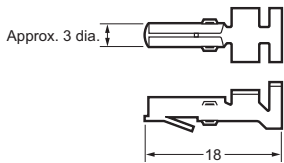


### E54-CT3

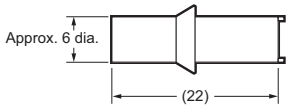


### E54-CT3 Accessories

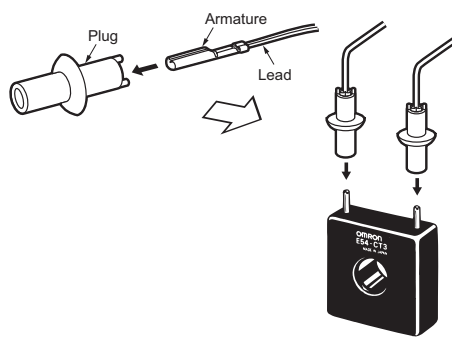
#### ● Armature



#### ● Plug



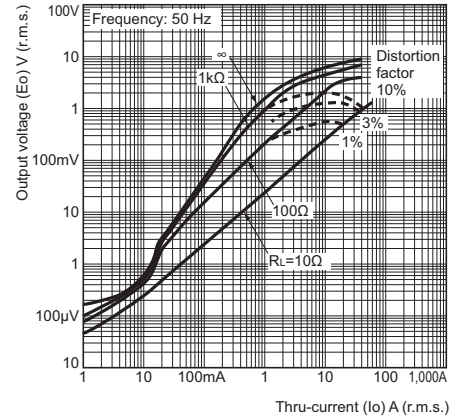
### Connection Example



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

#### E54-CT1

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



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

#### E54-CT3

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

