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Digital Temperature Controller (Simple Type)

E5CC-800/E5CC-B-800/E5CC-U-800 (48 × 48 mm)

**Large White PV Display That's Easier to Read.
Easy to Use, from Model Selection to
Setup and Operation.
Models with Push-In Plus Terminal
Blocks Added to Lineup.**



- The white PV display with a height of 15.2 mm improves visibility.
- High-speed sampling at 50 ms.
- Select from models with screw terminal blocks, models with Push-In Plus terminal blocks for reduced wiring work, and Plug-in Models that can be removed from the terminal block.
- Short body with depth of only 60 mm. (Screw Terminal Blocks)
- Easy connections to a PLC with programless communications. Use component communications to link Temperature Controllers to each other.



48 × 48 mm
Screw Terminal
Blocks
E5CC-800

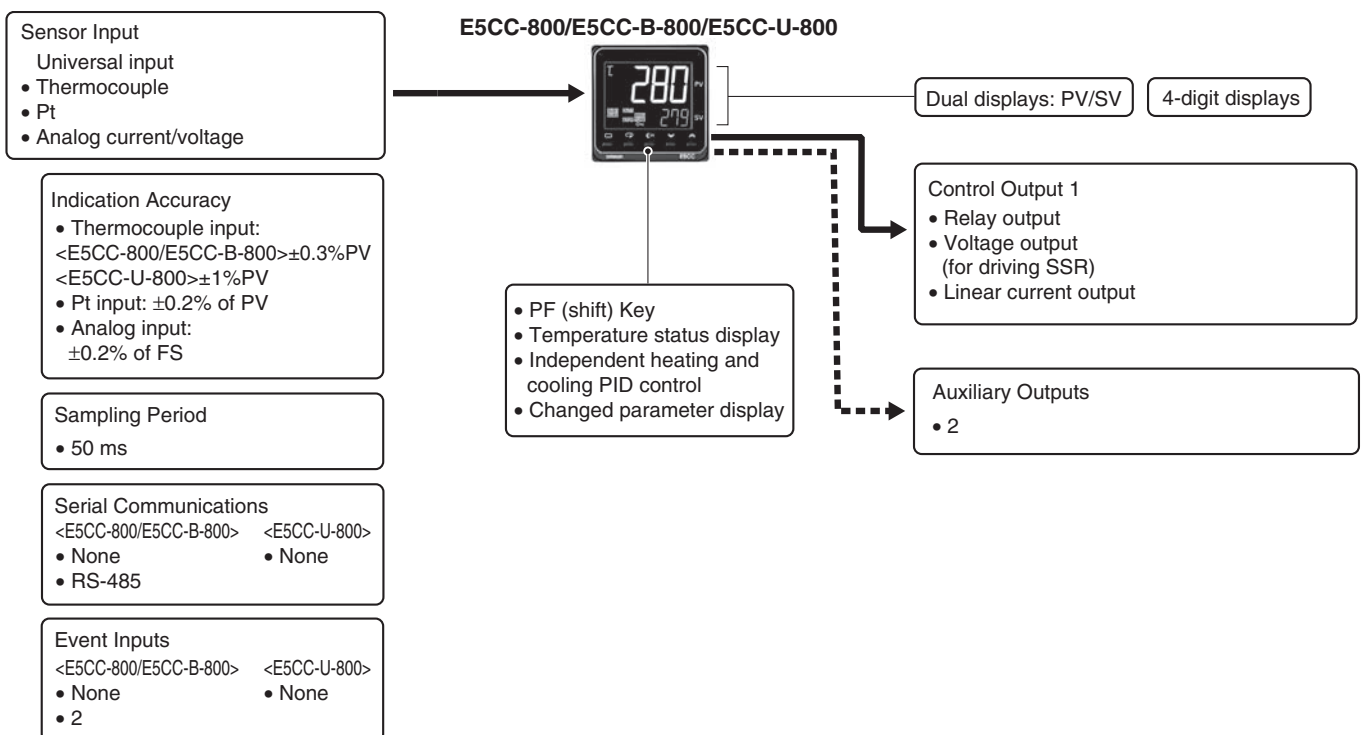
48 × 48 mm
Push-In Plus
Terminal Blocks
E5CC-B-800

48 × 48 mm
Plug-in Models
E5CC-U-800

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

⚠ Refer to Safety Precautions on page 58.

Main I/O Functions



E5CC-800/E5CC-B-800/E5CC-U-800

Model Number Legend and Standard Models

Model Number Legend

● Models with Screw Terminal Blocks

E5CC-800 48 × 48 mm

Control output 1	Auxiliary output	Communications	Heater burnout	Event inputs	Power supply voltage	Model
Relay output	Two	-	-	-	100 to 240 VAC	E5CC-RX2ASM-800
Voltage output						E5CC-QX2ASM-800
Linear current output						E5CC-CX2ASM-800
Relay output					24 VAC/VDC	E5CC-RX2DSM-800
Voltage output						E5CC-QX2DSM-800
Linear current output						E5CC-CX2DSM-800
Relay output		One	-	Two	100 to 240 VAC	E5CC-RX2ASM-801
Voltage output						E5CC-QX2ASM-801
Relay output						E5CC-RX2DSM-801
Voltage output					24 VAC/VDC	E5CC-QX2DSM-801
Relay output						E5CC-RX2ASM-802
Voltage output						E5CC-QX2ASM-802
Relay output		RS-485	-	-	100 to 240 VAC	E5CC-RX2ASM-802
Voltage output						E5CC-QX2ASM-802
Relay output						E5CC-RX2DSM-802
Voltage output					24 VAC/VDC	E5CC-QX2DSM-802
Linear current output						E5CC-CX2ASM-804
Linear current output						E5CC-CX2DSM-804

Note: Draw-out-type models of the E5CC-800 are available. Ask your OMRON representative for details.

● Models with Push-In Plus Terminal Blocks

E5CC-B-800 48 × 48 mm

Control output 1	Auxiliary output	Communications	Heater burnout	Event inputs	Power supply voltage	Model	
Relay output	Two	-	-	-	100 to 240 VAC	E5CC-RX2ABM-800	
Voltage output						E5CC-QX2ABM-800	
Linear current output						E5CC-CX2ABM-800	
Relay output		RS-485	One			Two	E5CC-RX2ABM-802
Voltage output							E5CC-QX2ABM-802
Linear current output							E5CC-CX2ABM-804

● Plug-in Models

E5CC-U-800 48 × 48 mm

Control output 1	Auxiliary output	Communications	Heater burnout	Event inputs	Power supply voltage	Model
Relay output	Two	-	-	-	100 to 240 VAC	E5CC-RW2AUM-800
Voltage output						E5CC-QX2AUM-800
Relay output					24 VAC/VDC	E5CC-RW2DUM-800
Voltage output						E5CC-QX2DUM-800

Heating and Cooling Control

● Using Heating and Cooling Control

① Control Output Assignment

An auxiliary output is used as the cooling control output.

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 (for E5CC-800)

Model
E53-COV17
E53-COV23 (3pcs)

Note: The E53-COV10 cannot be used.
Refer to page 14 for the mounted dimensions.

Waterproof Packing

Model
Y92S-P8

Note: This Waterproof Packing is provided only with E5CC-800/
E5CC-B-800 Controllers.
The E5CC-U-800 cannot be waterproofed even if the
Waterproof Packing is attached.

Current Transformers (CTs)

Hole diameter	Model
5.8 mm	E54-CT1
5.8 mm	E54-CT1L *
12.0 mm	E54-CT3
12.0 mm	E54-CT3L *

* Lead wires are included with these CTs. If UL certification is
required, use these CTs.

Adapter

Model
Y92F-45

Note: Use this Adapter when the panel has already been prepared for
an E5B□ Controller.

DIN Track Mounting Adapter (for E5CC-800)

Model
Y92F-52

Sockets (for E5CC-U-800)

Type	Model
Front-connecting Socket	P2CF-11
Front-connecting Socket with Finger Protection	P2CF-11-E
Back-connecting Socket	P3GA-11
Terminal Cover for Back-connecting socket with Finger Protection	Y92A-48G

Waterproof Cover

Model
Y92A-48N

Mounting Adapter

Model
Y92F-49

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

Front Covers

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

E5CC-800/E5CC-B-800/E5CC-U-800

Specifications

Ratings

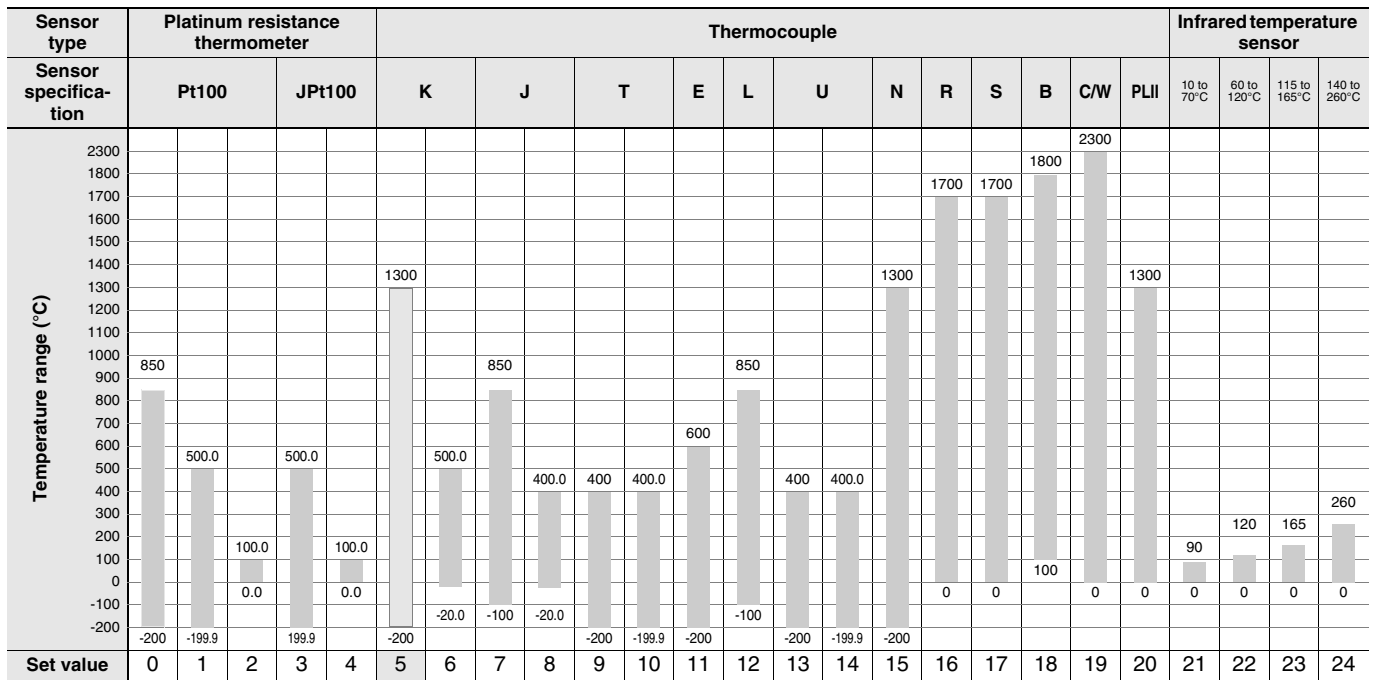
Power supply voltage		A in model number: 100 to 240 VAC, 50/60 Hz D in model number: 24 VAC, 50/60 Hz; 24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		Models with option selection of 800: 5.2 VA max. at 100 to 240 VAC, and 3.1 VA max. at 24 VAC or 1.6 W max. at 24 VDC All other models: 6.5 VA max. at 100 to 240 VAC, and 4.1 VA max. at 24 VAC or 2.3 W max. at 24 VDC
Sensor input		Temperature input Thermocouple: K, J, T, E, L, U, N, R, S, B, C/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, 0 to 10 V, or 0 to 50 mV (The 0 to 50 mV range applies to the E5CC-U-800 only for those manufactured in May 2014 or later.)
Input impedance		Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the ES2-HB-N/THB-N.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	Relay output	E5CC-800/E5CC-B-800: SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA (reference value) E5CC-U-800: SPDT, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA (reference value)
	Voltage output (for driving SSR)	Output voltage: 12 VDC ±20% (PNP), max. load current: 21 mA, with short-circuit protection circuit
	Linear current output *1	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000
Auxiliary output	Number of outputs	2
	Output specifications	SPST-NO relay outputs, 250 VAC, E5CC-800/E5CC-U-800 models with 2 output: 3 A (resistive load), E5CC-B-800 models with 2 outputs: 2 A (resistive load) Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5 V
Event input *1*2	Number of inputs	2 (depends on model)
	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
Setting method		Digital setting using front panel keys
Indication method		11-segment digital display and individual indicators Character height: PV: 15.2 mm, SV: 7.1 mm
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.
Other functions		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
Ambient operating temperature		-10 to 55°C (with no condensation or icing)
Ambient operating humidity		25% to 85%
Storage temperature		-25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Recommended fuse		T2A, 250 VAC, time lag, low-breaking capacity
Installation environment		Overvoltage category II, Pollution Degree 2 (EN/IEC/UL 61010-1)

*1 There are no optional functions for the E5CC-U-800. Refer to *Model Number Legend* on page 2.

*2 There are no optional functions for the E5CC-B-800. Refer to *Model Number Legend* on page 2.

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 1602-2015, IEC 60584-1

L: Fe-CuNi, DIN 43710-1985

U: Cu-CuNi, DIN 43710-1985

C/W: W5Re/W26Re, JIS C 1602-2015, ASTM E988-1990

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

Pt100: JIS C 1604-1997, IEC 60751

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

● Analog input

Input type	Current		Voltage			
Input specification	4 to 20 mA	0 to 20 mA	1 to 5 V	0 to 5 V	0 to 10 V	0 to 50 mV *
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	30

* The range applies to the E5CC-U-800 only for those manufactured in May 2014 or later.

Alarm Outputs

Each alarm can be independently set to one of the following 19 alarm types. The default is 2: Upper limit. (see note.)

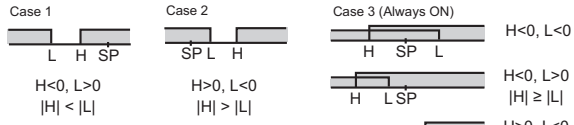
Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

Note: In the default settings for models with HB or HS alarms, alarm 1 is set to a heater alarm (HA) and the Alarm Type 1 parameter is not displayed. To use alarm 1, set the output assignment to alarm 1.

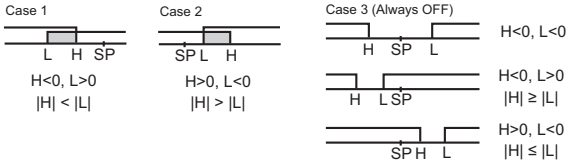
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1	Upper- and lower-limit *1		*2	Set the upward deviation in the set point for the alarm upper limit (H) and the lower deviation 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 Controllers User's Manual (Cat. No. H174) for information on the operation of the standby sequence.

*7 Refer to the E5□C Digital Controllers User's Manual (Cat. No.H174) for information on the loop burnout alarm (LBA).

*8 Refer to the E5□C Digital 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

Indication accuracy (at the ambient temperature of 23°C)	E5CC-800/E5CC-B-800	
	Thermocouple: ($\pm 0.3\%$ of indication value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max. *1 Platinum resistance thermometer: ($\pm 0.2\%$ of indication value or $\pm 0.8^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 0.2\%$ FS ± 1 digit max. CT input: $\pm 5\%$ FS ± 1 digit max.	
Simple transfer output accuracy	E5CC-U-800	
	Thermocouple: ($\pm 1\%$ of indication value or $\pm 2^\circ\text{C}$, whichever is greater) ± 1 digit max. *1 Platinum resistance thermometer: ($\pm 0.2\%$ of indication value or $\pm 0.8^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 0.2\%$ FS ± 1 digit max.	
Influence of temperature *3	Thermocouple input (R, S, B, C/W, PL II): ($\pm 1\%$ of indication value or $\pm 10^\circ\text{C}$, whichever is greater) ± 1 digit max. Other thermocouple input: ($\pm 1\%$ of indication value or $\pm 4^\circ\text{C}$, whichever is greater) ± 1 digit max. *4 Platinum resistance thermometer: ($\pm 1\%$ of indication value or $\pm 2^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 1\%$ FS ± 1 digit max.	
Influence of voltage *3	CT input: $\pm 5\%$ FS ± 1 digit max.	
Influence of EMS. (at EN 61326-1)		
Input sampling period	50 ms	
Hysteresis	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)	
Proportional band (P)	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)	
Integral time (I)	0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *5	
Derivative time (D)	0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *5	
Proportional band (P) for cooling	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)	
Integral time (I) for cooling	0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *5	
Derivative time (D) for cooling	0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *5	
Control period	0.1, 0.2, 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	-1999 to 9999 (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	3,000 VAC, 50/60 Hz for 1 min between terminals of different charge	
Vibration	Malfunction	10 to 55 Hz, 20 m/s ² for 10 min each in X, Y, and Z directions
	Resistance	10 to 55 Hz, 20 m/s ² for 2 hrs each in X, Y, and Z directions
Shock	Malfunction	100 m/s ² , 3 times each in X, Y, and Z directions
	Resistance	300 m/s ² , 3 times each in X, Y, and Z directions
Weight	E5CC-800/E5CC-B-800: Controller: Approx. 120 g, Adapter: Approx. 10 g E5CC-U-800: Controller: Approx. 100 g, Adapter: Approx. 10 g	
Degree of protection	E5CC-800/E5CC-B-800: Front panel: IP66, Rear case: IP20, Terminals: IP00 E5CC-U-800: Front panel: IP50, Rear case: IP20, Terminals: IP00	
Memory protection	Non-volatile memory (number of writes: 1,000,000 times)	
Standards	Approved standards	cULus: UL 61010-1/CSA C22.2 No.61010-1 *6, Korean wireless regulations (Radio law: KC Mark) (Some models only.) *7, Lloyd's standards *8
	Conformed standards	EN 61010-1 (IEC 61010-1)
EMC	EMI:	EN 61326-1 *9
	Radiated Interference Electromagnetic Field Strength:	EN 55011 Group 1, class A
	Noise Terminal Voltage:	EN 55011 Group 1, class A
	EMS:	EN 61326-1 *9
	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	
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° 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 C/W thermocouples is ($\pm 0.3\%$ of PV or $\pm 3^\circ\text{C}$, whichever is greater) ± 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, ± 1 digit max.

*2 However, the precision between 0 and 4 mA for a 0 to 20 mA output is $\pm 1\%$ FS max.

*3 Ambient temperature: -10°C to 23°C to 55°C, Voltage range: -15% to 10% of rated voltage

*4 K thermocouple at -100°C max.: $\pm 10^\circ\text{C}$ max.

*5 The unit is determined by the setting of the Integral/Derivative Time Unit parameter.

*6 The E5CC-U plug-in model is certified for UL listing only when used together with the OMRON P2CF-11 or P2CF-11-E Socket. The P3GA-11 is not certified for UL listing.

*7 Access the following website for information on certified models. <http://www.ia.omron.com/support/models/index.html>

*8 Refer to information on maritime standards in *Shipping Standards* on page 61 for compliance with Lloyd's Standards.

*9 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 *1	9600, 19200, 38400, or 57600 bps
Transmission code	ASCII
Data bit length *1	7 or 8 bits
Stop bit length *1	1 or 2 bits
Error detection	Vertical parity (none, even, odd) Block check character (BCC) with CompoWay/F or CRC-16 with Modbus *2
Flow control	None
Interface	RS-485
Retry function	None
Communications buffer	217 bytes
Communications response wait time	0 to 99 ms Default: 20 ms

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

*2 Modbus is a registered trademark of Schneider Electric.

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, CP Series, NJ Series, or NX1P Mitsubishi Electric PLCs MELSEC Q Series, L Series, FX3 Series, or iQ-R Series 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.

MELSEC is a registered trademark of Mitsubishi Electric Corporation.
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

	E54-CT1 E54-CT3	E54-CT1L E54-CT3L
Dielectric strength	1,000 VAC for 1 min	1,500 VAC for 1 min
Vibration resistance	50 Hz, 98 m/s ²	
Weight	E54-CT1: Approx. 11.5 g, E54-CT3: Approx. 50 g	E54-CT1: Approx. 14 g, E54-CT3: Approx. 57 g
Accessories	E54-CT3 Only Armatures (2) Plugs (2)	None

Heater Burnout Alarms and SSR Failure Alarms

CT input (for heater current detection)	Models with detection for single-phase heaters: One input
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

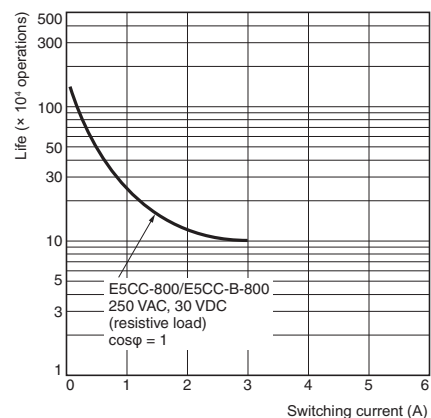
*1 For heater burnout alarms, the heater current will be measured when the control output is ON, and the output will turn ON if the heater current is lower than the set value (i.e., heater burnout detection current value).

*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.

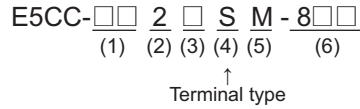
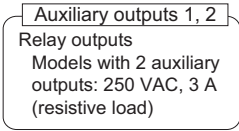
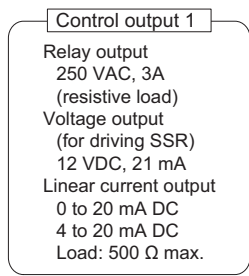
Electrical Life Expectancy Curve for Control output Relays (Reference Values)



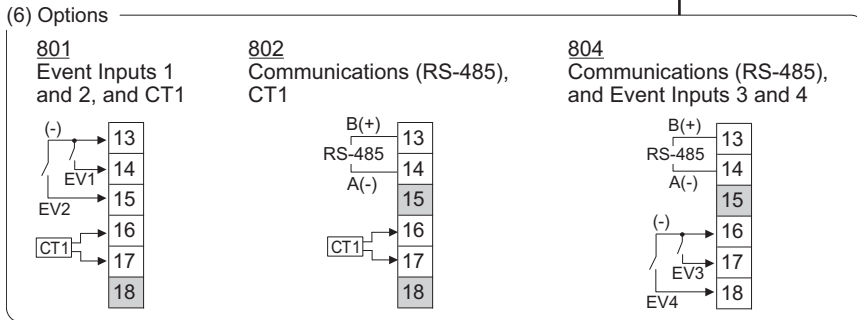
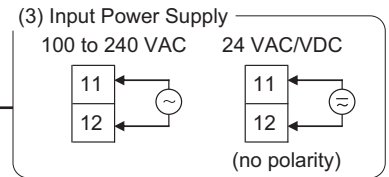
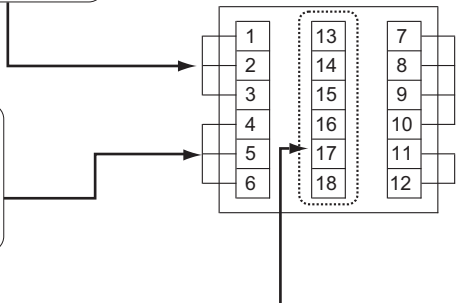
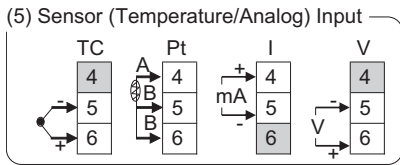
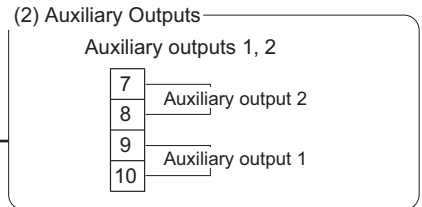
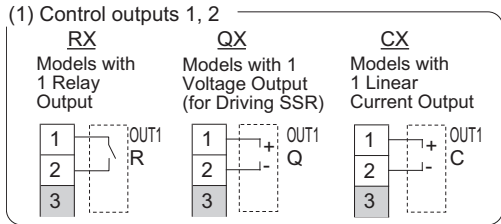
E5CC-800/E5CC-B-800/E5CC-U-800

External Connections

E5CC-800 (Screw Terminal Blocks)



The E5CC-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.



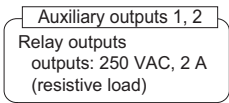
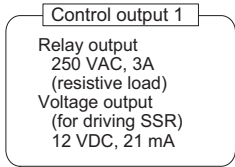
Use no-voltage inputs for the event inputs.
The polarity for non-contact inputs is given in parentheses.

- Note:**
- The application of the terminals depends on the model.
 - Do not wire the terminals that are shown with a gray background.
 - 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.
 - Connect M3 crimped terminals.
 - Due to UL Listing requirements, use the E54-CT1L or E54-CT3L Current Transformer with the factory wiring (internal wiring). Use a UL category XOBA or XOBA7 current transformer that is UL Listed for field wiring (external wiring) and not the factory wiring (internal wiring).

E5CC-B-800 (Push-In Plus Terminal Blocks)

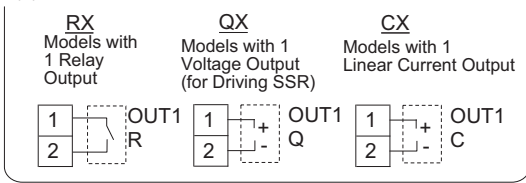
E5CC-□□ 2 □ B M - 8□□
 (1) (2) (3) (4) (5) (6)

Terminal type

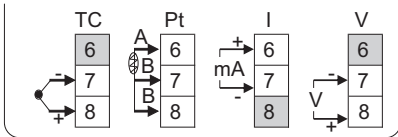


The E5CC is set for a K-type thermocouple (input type = 5) by default. An input error (5ERR) will occur if the input type setting does not agree with the temperature sensor. Check the input type.

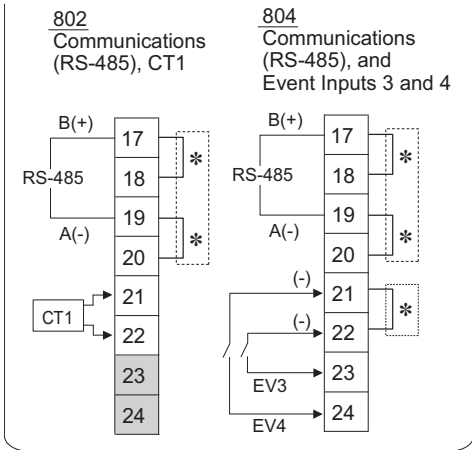
(1) Control outputs 1



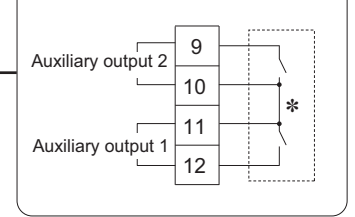
(5) Sensor (Temperature/Analog) Input



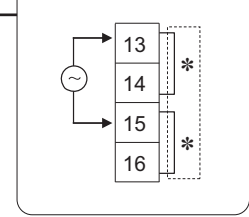
(6) Options



(2) Auxiliary Outputs



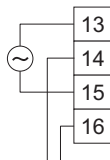
(3) Input Power Supply
100 to 240 VAC



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. Refer to *Wiring Precautions for E5□C-B (Controllers with Push-In Plus Terminal Blocks)* on page 65 for wire specifications and wiring methods.
5. Common terminals are indicated with asterisks (*). You can use the input power supply and communications common terminals for crossover wiring. Do not exceed the maximum number of Temperature Controllers given below if you use crossover wiring for the input power supply.
100 to 240 VAC Controllers: 16 max.

Wiring Example:



To another E5□C

6. Due to UL Listing requirements, use the E54-CT1L or E54-CT3L Current Transformer with the factory wiring (internal wiring). Use a UL category XOBA or XOBA7 current transformer that is UL Listed for field wiring (external wiring) and not the factory wiring (internal wiring).

E5CC-800/E5CC-B-800/E5CC-U-800

E5CC-U-800

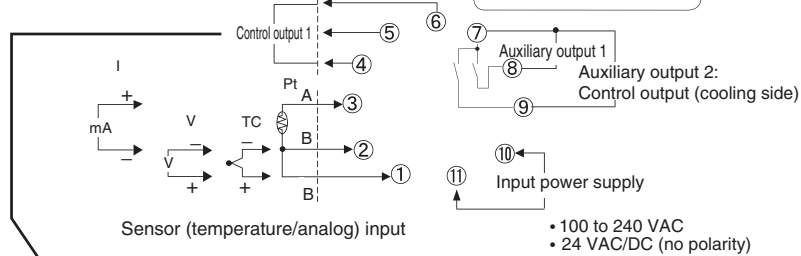
The E5CC-U is set for a K-type thermocouple (input type = 5) by default. An input error (5.ERR) will occur if the input type setting does not agree with the temperature sensor. Check the input type.

E5CC-□□□UM-800

Control output 1

Auxiliary outputs 1 and 2

Relay output
250 VAC, 3 A (resistive load)



Control output 1

Voltage output (for driving SSR)
12 VDC, 21 mA
Relay output (three terminals used)
SPDT, 250 VAC, 3 A
(resistive load)

Control output 1:

QX

Models with 1

Voltage Output

(for Driving SSR)

Output 1

Q

+

RW

Models with 1

Relay Output

Output 1

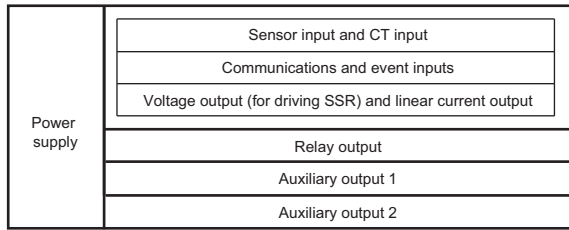
R

- 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 M3.5 crimped terminals for the E5CC-U-800.

Isolation/Insulation Block Diagrams

• E5CC-800

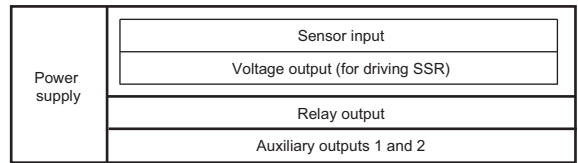
Models with 2 Auxiliary Outputs



: Reinforced insulation
 : Functional isolation

• E5CC-U-800

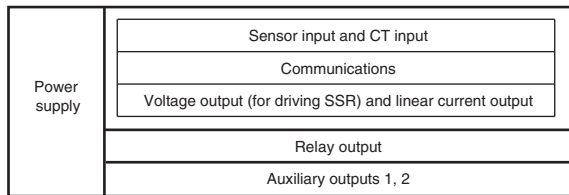
Models with 2 Auxiliary Outputs



: Reinforced insulation
 : Functional isolation

• E5CC-B-800

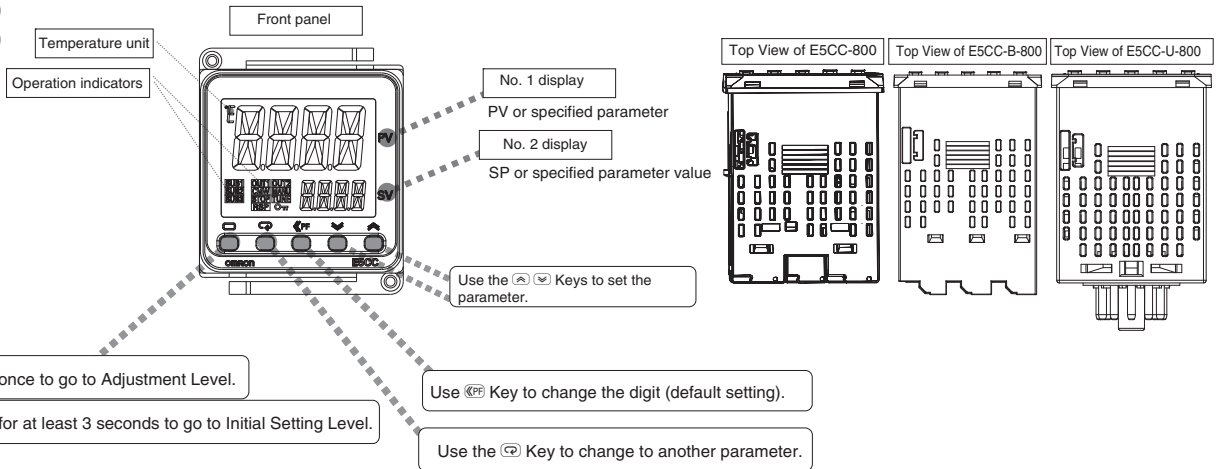
Models with 2 Auxiliary Outputs



: Reinforced insulation
 : Functional isolation

Nomenclature

**E5CC-800
 E5CC-B-800
 E5CC-U-800**



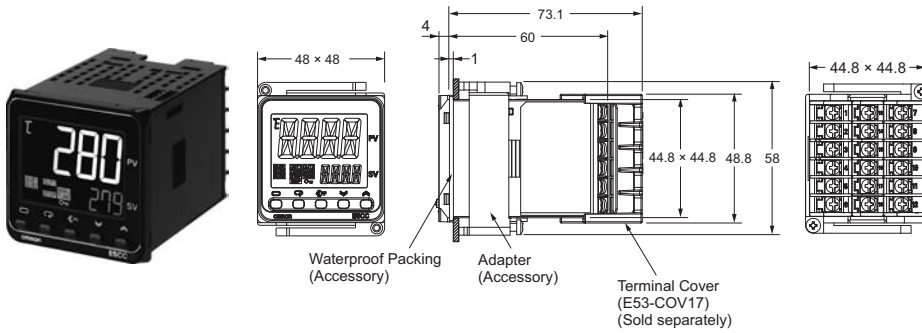
E5CC-800/E5CC-B-800/E5CC-U-800

Dimensions

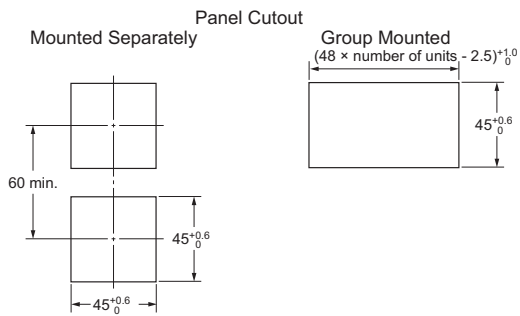
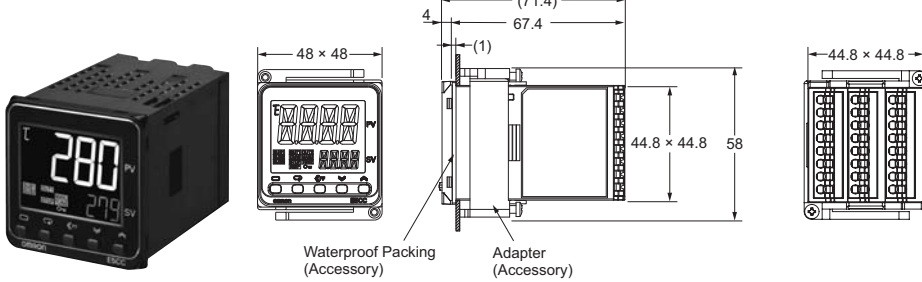
(Unit: mm)

Controllers

E5CC-800

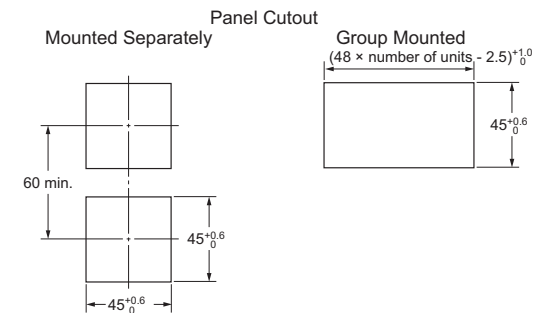
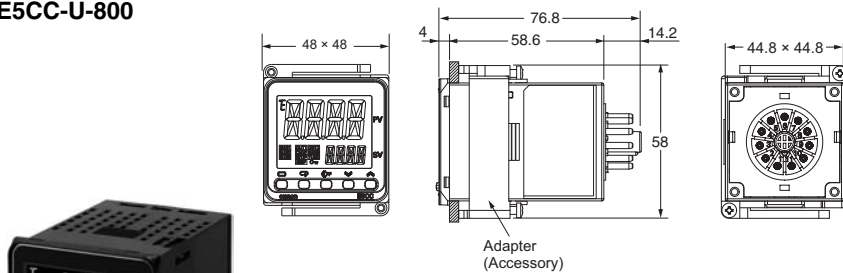


E5CC-B-800



- 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.

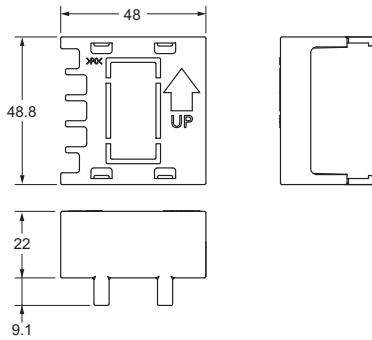
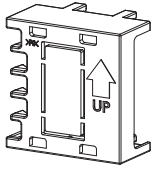
E5CC-U-800



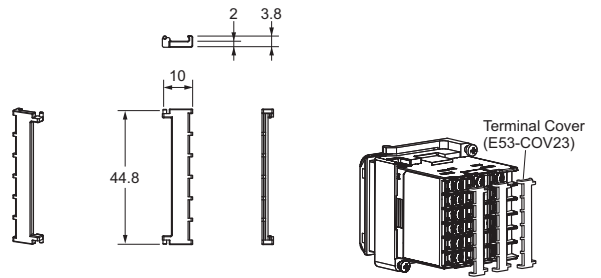
- Recommended panel thickness is 1 to 5 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers.)
- When two or more Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature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

Accessories (Order Separately)

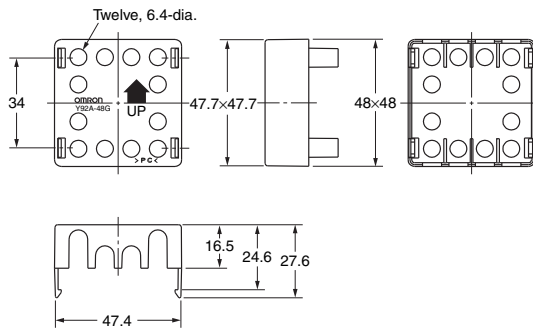
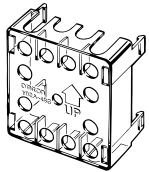
● Terminal Covers
E53-COV17



● Terminal Covers
E53-COV23 (Three Covers provided.)

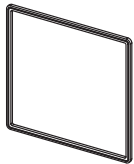


● Terminal Cover (for the P3GA-11 Back-connecting Socket)
Y92A-48G



Note: You can attach the P3GA-11 Back-connecting Socket for finger protection.

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



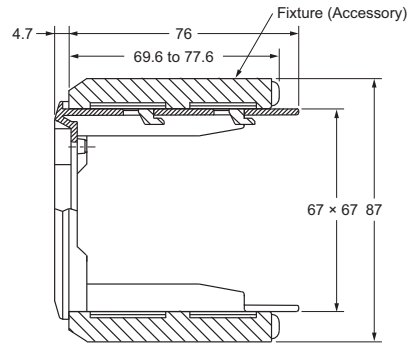
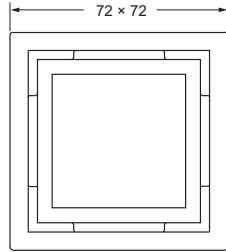
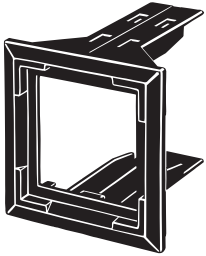
The Waterproof Packing is provided only with the E5CC-800/E5CC-B-800. It is not included with the E5CC-U-800. Order the Waterproof Packing separately if it becomes lost or damaged. The Waterproof Packing can be used to achieve an IP66 degree of protection. (Deterioration, shrinking, or hardening of the 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 three years as a rough standard.) The E5CC-U-800 cannot be waterproofed even if the Waterproof Packing is attached.

E5CC-800/E5CC-B-800/E5CC-U-800

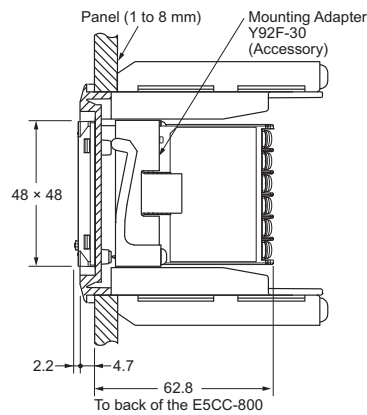
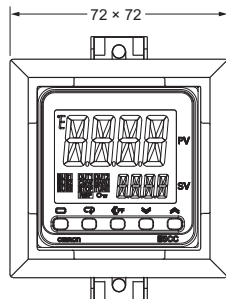
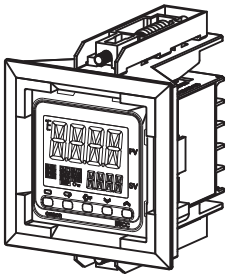
● Adapter

Y92F-45

- Note:** 1. Use this Adapter when the Front Panel has already been prepared for the E5B□.
2. Only black is available.



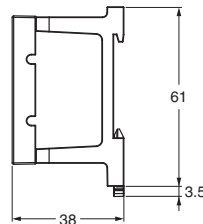
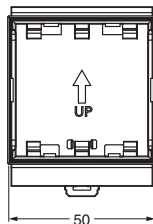
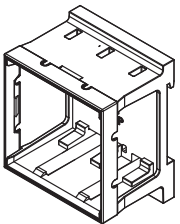
Mounted to E5CC-800



● DIN Track Mounting Adapter

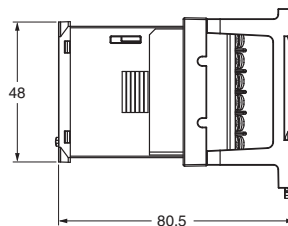
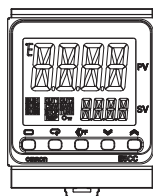
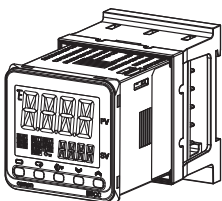
Y92F-52

- Note:** 1. This Adapter cannot be used together with the Terminal Cover. Remove the Terminal Cover to use the Adapter.
2. This Adapter cannot be used with the E5CC-B.



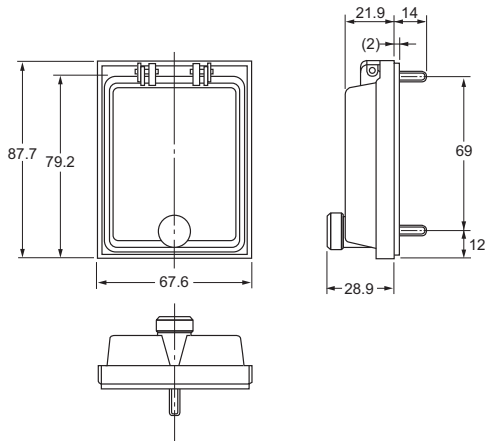
This Adapter is used to mount the E5CC-800 to a DIN Track. If you use the Adapter, there is no need for a plate to mount in the panel or to drill mounting holes in the panel.

Mounted to E5CC-800



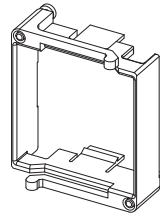
● **Watertight Cover**

Y92A-48N



● **Mounting Adapter**

Y92F-49

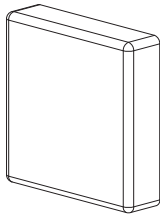


The Mounting Adapter is provided with the Temperature Controller. Order this Adapter separately if it becomes lost or damaged.

● **Protective Cover**

Y92A-48D

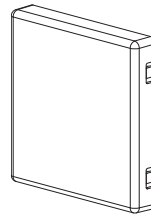
Note: This Protective Cover cannot be used if the Waterproof Packing is installed.



This Protective Cover is soft type. It is able to operate the controller with using this cover.

● **Protective Cover**

Y92A-48H

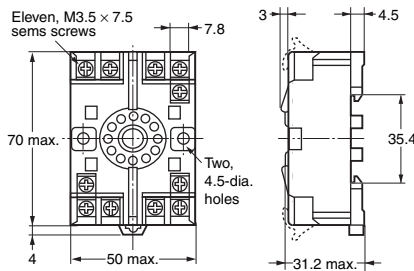
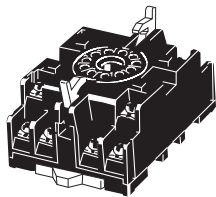


This Protective Cover is hard type. Please use it for the mis-operation prevention etc.

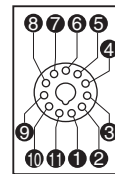
● **E5CC-U-800 Wiring Socket**

Front-connecting Socket

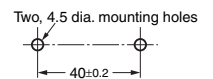
P2CF-11



Terminal Layout/Internal Connections (Top View)



Mounting Holes

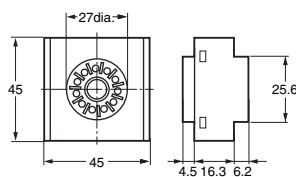
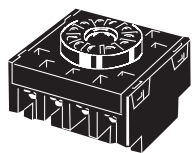


Note: Can also be mounted to a DIN track

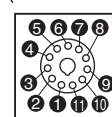
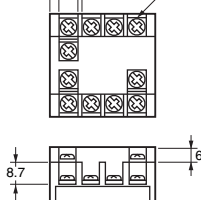
- Note:** 1. A model with finger protection (P2CF-11-E) is also available.
- 2. You cannot use the P2CF-11 or P2CF-11-E together with the Y92F-45.

Back-connecting Socket

P3GA-11



Terminal Layout/Internal Connections (Bottom View)

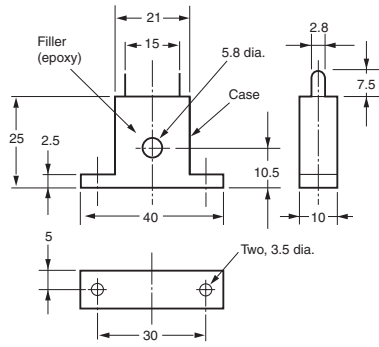
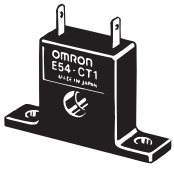


- Note:** 1. Using any other sockets will adversely affect accuracy. Use only the specified sockets.
- 2. A Protective Cover for finger protection (Y92A-48G) is also available.
- 3. You cannot use the P3GA-11 together with the Y92F-45.

E5CC-800/E5CC-B-800/E5CC-U-800

● Current Transformers

E54-CT1



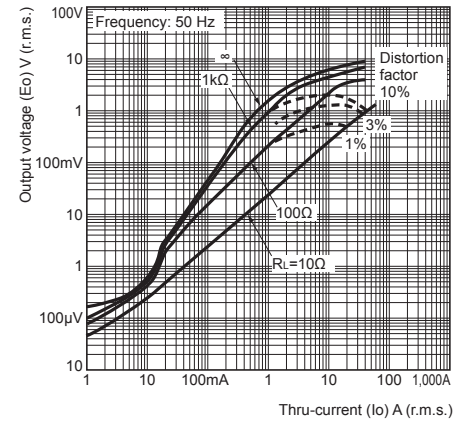
Thru-current (I_o) vs. Output Voltage (E_o) (Reference Values)

E54-CT1 or E54-CT1L

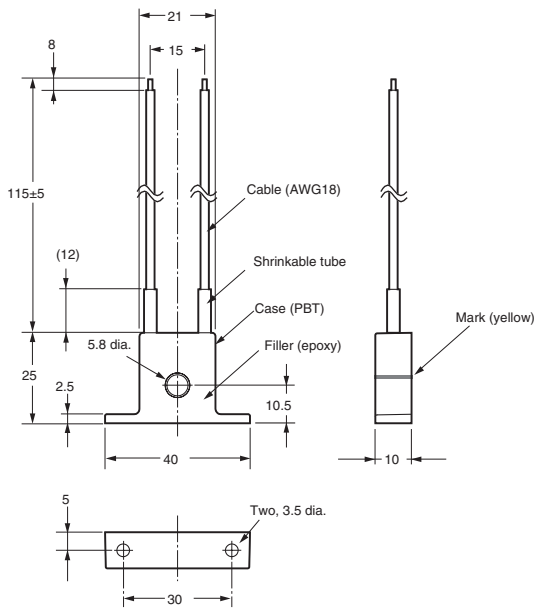
Maximum continuous heater current: 50 A (50/60 Hz)

Number of windings: 400±2

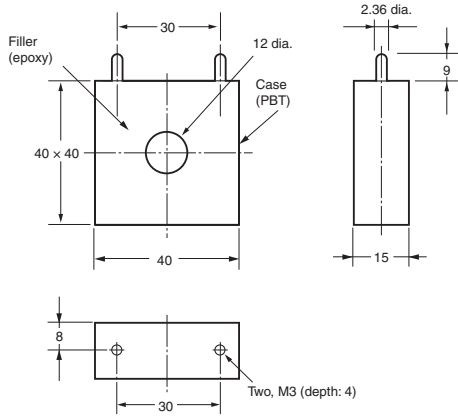
Winding resistance: 18±2 Ω



E54-CT1L

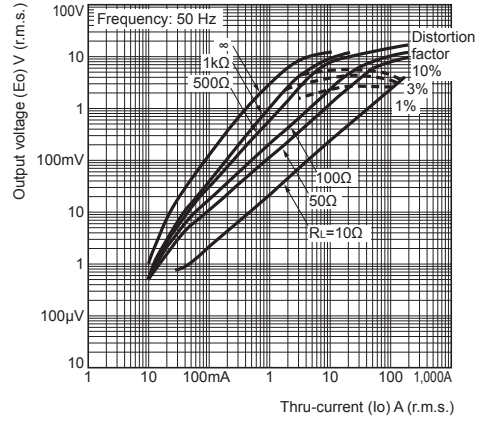


E54-CT3



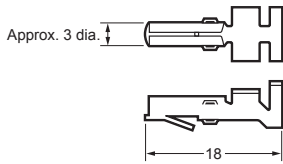
**Thru-current (I_o) vs. Output Voltage (E_o)
(Reference Values)
E54-CT3 or E54-CT3L**

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: $8 \pm 0.8 \Omega$

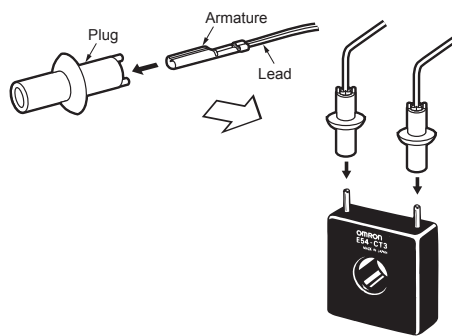


E54-CT3 Accessories

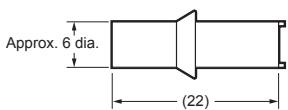
• **Armature**



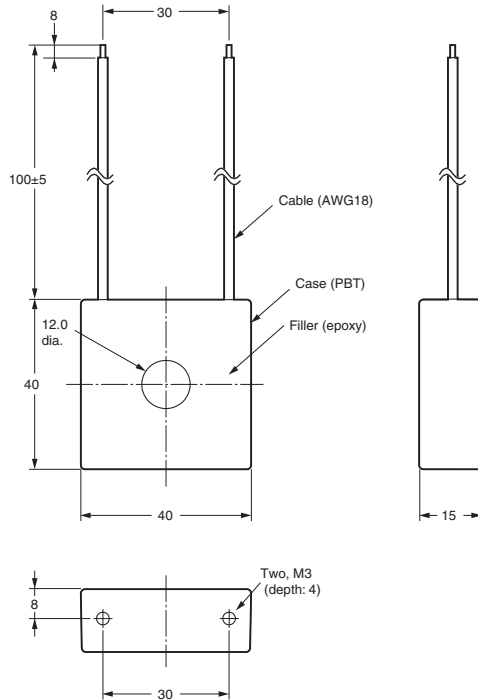
Connection Example



• **Plug**



E54-CT3L



Digital Temperature Controller (Simple Type)

E5EC-800/E5EC-B-800/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.

Models with Push-In Plus Terminal Blocks Added to 48 × 96-mm Lineup.

- A white LCD PV display with a height of approx. 18 mm for the E5EC/E5EC-B-800 and 25 mm for the E5AC-800 improves visibility.
- High-speed sampling at 50 ms.
- With 48 x 96-mm Controllers, you can select between screw terminal blocks or Push-In Plus terminal blocks to save wiring work.
- Short body with depth of only 60 mm. (Screw Terminal Blocks)
- Easy connections to a PLC with programless communications. Use component communications to link Temperature Controllers to each other.



(E5EC/AC-800) (E5EC-B-800)
* CSA conformance evaluation by UL.



48 × 96 mm
Screw Terminal
Blocks
E5EC-800

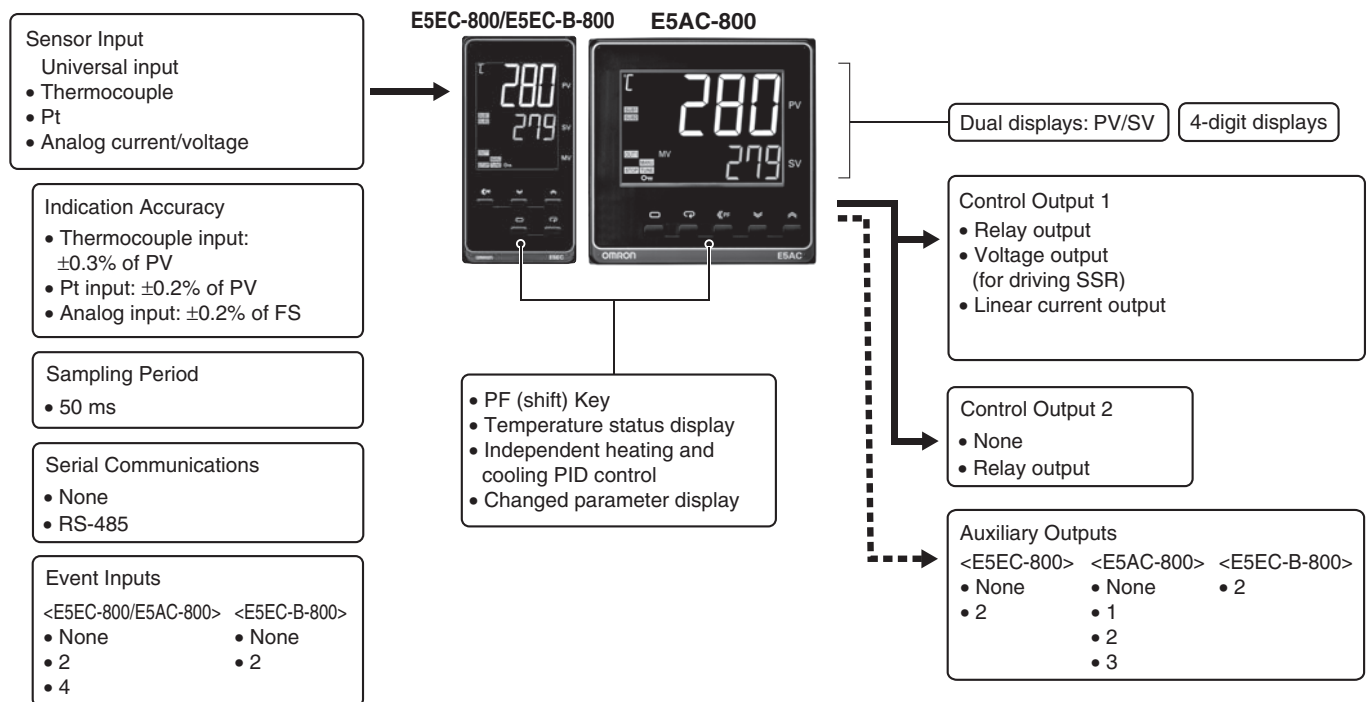
48 × 96 mm
Push-In Plus
Terminal
Blocks
E5EC-B-800

96 × 96 mm
Screw Terminal Blocks
E5AC-800

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

Refer to Safety Precautions on page 58.

Main I/O Functions



E5EC-800/E5EC-B-800/E5AC-800

Model Number Legend and Standard Models

Model Number Legend

● Models with Screw Terminal Blocks

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	-	One	Two	100 to 240 VAC	E5EC-RR2ASM-808		
Voltage output	Relay output						24 VAC/VDC	E5EC-RR2DSM-808		
Relay output	Relay output					-	-	Four	100 to 240 VAC	E5EC-RR2ASM-810
Voltage output	Relay output								24 VAC/VDC	E5EC-RR2DSM-810
Relay output	Relay output		RS-485	-	-	Two	100 to 240 VAC	E5EC-RR2ASM-810		
Voltage output	Relay output						24 VAC/VDC	E5EC-RR2DSM-810		
Linear current output	Relay output		-	-	-	-	100 to 240 VAC	E5EC-CR2ASM-804		
Linear current output	Relay output						24 VAC/VDC	E5EC-CR2DSM-804		
Relay output (Open)*	Relay output (Close)*		Two	-	-	-	100 to 240 VAC	E5EC-PR0ASM-800		
Relay output (Open)*	Relay output (Close)*							E5EC-PR2ASM-800		
Relay output (Open)*	Relay output (Close)*							RS-485	Two	E5EC-PR2ASM-804

* Position proportional control model.

Note: Draw-out-type models of the E5EC-800 are available. Ask your OMRON representative for details.

● Models with Push-In Plus Terminal Blocks

E5EC-B-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-RX2ABM-800
Voltage output	-						E5EC-QX2ABM-800
Linear current output	-						E5EC-CX2ABM-800
Relay output	Relay output						E5EC-RR2ABM-800
Voltage output	Relay output						E5EC-QR2ABM-800
Linear current output	-						E5EC-CX2ABM-804
Relay output	Relay output		RS-485	One	Two	E5EC-RR2ABM-808	
Voltage output	Relay output		E5EC-QR2ABM-808				

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				-	-	24 VAC/VDC	E5AC-RX1DSM-800			
Voltage output	-								E5AC-QX1DSM-800			
Linear current output	-								E5AC-CX1DSM-800			
Relay output	-	Three							RS-485	One	100 to 240 VAC	E5AC-RX3ASM-808
Voltage output	-											E5AC-QX3ASM-808
Relay output	-										-	-
Voltage output	-	E5AC-QX3DSM-808										
Relay output	-	Three	-	One	100 to 240 VAC	E5AC-RX3ASM-810						
Voltage output	-					E5AC-QX3ASM-810						
Relay output	-					-	-	Four	24 VAC/VDC	E5AC-RX3DSM-810		
Voltage output	-		E5AC-QX3DSM-810									
Linear current output	-		RS-485		-				Two	100 to 240 VAC	E5AC-CX3ASM-804	
Linear current output	-					24 VAC/VDC	E5AC-CX3DSM-804					
Relay output (Open)*	Relay output (Close)*	-	-	-	-	100 to 240 VAC	E5AC-PR0ASM-800					
Relay output (Open)*	Relay output (Close)*	Two					E5AC-PR2ASM-800					
Relay output (Open)*	Relay output (Close)*						RS-485	Two	E5AC-PR2ASM-804			

* Position proportional control model.

Note: Draw-out-type models of the E5AC-800 are available. Ask your OMRON representative for details.

Heating and Cooling Control

●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 (for E5EC-800/E5AC-800)

Model
E53-COV24 (3pcs)

Waterproof Packing

Applicable Controller	Model
E5EC-800/ E5EC-B-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/ E5EC-B-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
5.8 mm	E54-CT1L *
12.0 mm	E54-CT3
12.0 mm	E54-CT3L *

* Lead wires are included with these CTs. If UL certification is required, use these CTs.

Specifications

Ratings

Power supply voltage		A 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	E5EC-800/ E5EC-B-800	Models with option selection of 800: 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 All other models: 8.3 VA max. at 100 to 240 VAC, and 5.5 VA max. at 24 VAC or 3.2 W max. at 24 VDC
	E5AC-800	Models with option selection of 800: 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 All other models: 9.0 VA max. at 100 to 240 VAC, and 5.6 VA max. at 24 VAC or 3.4 W max. at 24 VDC
Sensor input		Temperature input Thermocouple: K, J, T, E, L, U, N, R, S, B, C/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
Input impedance		Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the ES2-HB-N/THB-N.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	Relay output	SPST-NO, 250 VAC, 5 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10mA (reference value)
	Voltage output (for driving SSR)	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.)
	Linear current output	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000
Auxiliary output	Number of outputs	E5EC-800: 0 or 2 (depend on model), E5EC-B-800: 2 E5AC-800: 0, 1, 2 or 3 (depend on model)
	Output specifications	SPST-NO relay outputs, 250 VAC, 3 A (resistive load), Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5V (reference value)
Event input	Number of inputs	E5EC-800/E5AC-800: 2 or 4 (depend on model), E5EC-B-800: 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
Potentiometer input *		100 Ω to 10 kΩ
Setting method		Digital setting using front panel keys
Indication method		11-segment digital display and individual indicators Character height: E5EC-800/E5EC-B-800: PV: 18.0 mm, SV: 11.0 mm, MV: 7.8 mm E5AC-800: PV: 25.0 mm, SV: 15.0 mm, MV: 9.5 mm
Multi SP		Up to eight set points (SP0 to SP7) can be saved and selected using event inputs, key operations, or serial communications.
Bank switching		None
Other functions		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*
Ambient operating temperature		-10 to 55°C (with no condensation or icing)
Ambient operating humidity		25% to 85%
Storage temperature		-25 to 65°C (with no condensation or icing)
Altitude		2,000 m max.
Recommended fuse		T2A, 250 VAC, time lag, low-breaking capacity
Installation environment		Overvoltage category II, Pollution Degree 2 (EN/IEC/UL 61010-1)

* There are no optional functions for the E5EC-B-800. Refer to Model Number Legend on page 22.