

Digital Temperature Controller

E5CC/E5CC-B/E5CC-U (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 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, models with Push-In Plus terminal 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)
- Easy connections to a PLC with programless communications. Use component communications to link Temperature Controllers to each other.
- Set up the Controller without wiring the power supply by connecting to the computer with a Communications Conversion Cable (sold separately). Setup is easy with the CX-Thermo (sold separately).



(E5CC-U) (E5CC-B)
* CSA conformance evaluation by UL.

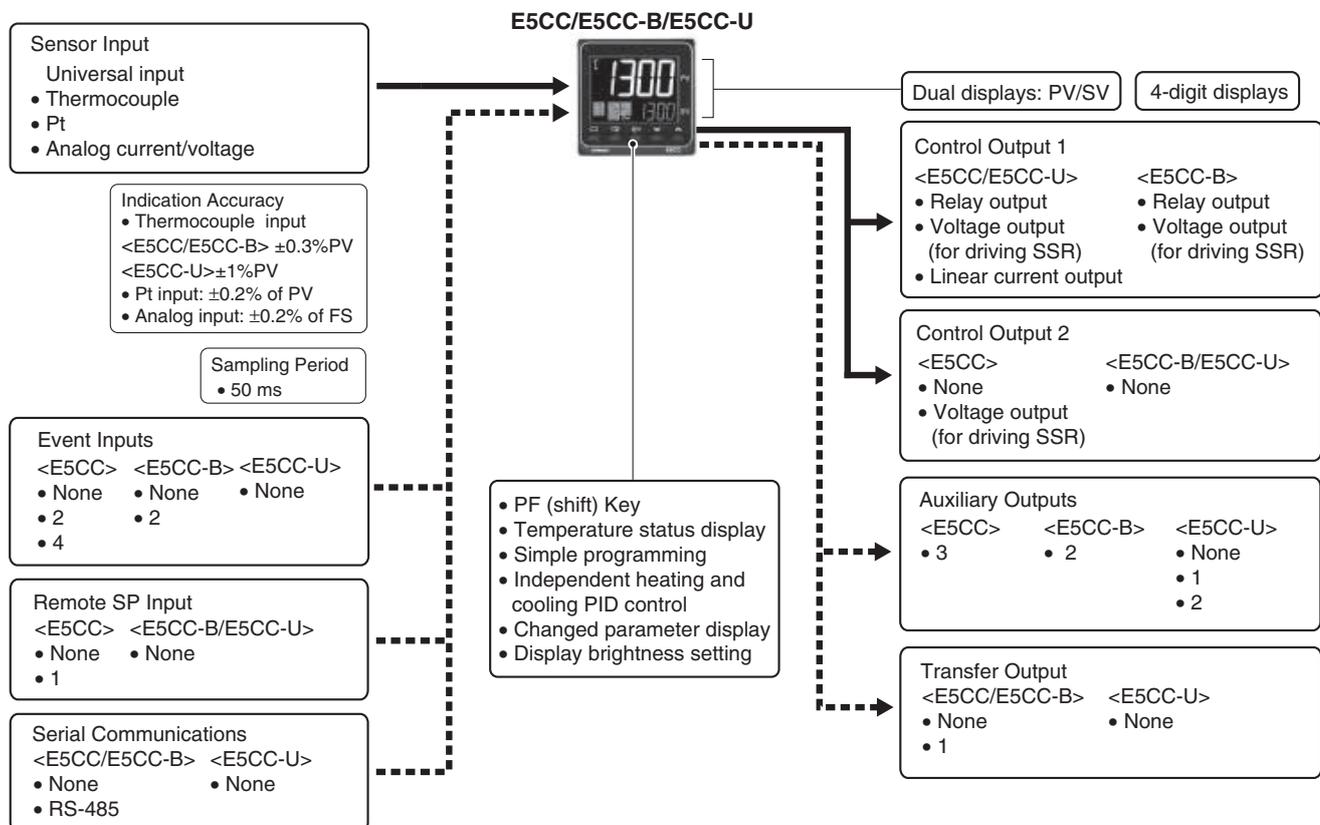


48 × 48 mm
E5CC

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

Refer to Safety Precautions on 108.

Main I/O Functions



This datasheet is provided as a guideline for selecting products.

Be sure to refer to the following manuals for application precautions and other information required for operation before attempting to use the product.

E5□C Digital Temperature Controllers User's Manual (Cat. No. H174)

E5□C Digital Temperature Controllers Communications Manual (Cat. No. H175)

Model Number Legend

Models with Push-In Plus Terminal

E5CC-□□ 2 □ B M -□□□ (Example: E5CC-RX2ABM-000)

① ② ③ ④ ⑤ ⑥

Model	①	②	③	④	⑤	⑥	Meaning							
	Control outputs 1 and 2	No. of auxiliary outputs	Power supply voltage	Terminal type	Input type	Options								
E5CC							48 × 48 mm							
							Control output 1			Control output 2				
RX							Relay output			None				
QX							Voltage output (for driving SSR)			None				
		2					2 (one common)							
			A				100 to 240 VAC							
			D				24 VAC/DC							
				B			Push-in plus terminal							
					M		Universal input							
							HB alarm and HS alarm	Communications	Event inputs	Remote SP Input	Transfer output			
							000	---	---	---	---			
							001	1	---	2	---			
							002	1	RS-485	---	---			
							004	---	RS-485	2	---			
							006	---	---	2	---	Provided.		

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)

USB-Serial Conversion Cable

Model
E58-CIFQ2

Terminal Covers (for E5CC)

Model
E53-COV17
E53-COV23 (3pcs)

Note: The E53-COV10 cannot be used.
Refer to page 31 for the mounted dimensions.

Waterproof Packing

Model
Y92S-P8

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

Current Transformers (CTs)

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

Adapter

Model
Y92F-45

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

Waterproof Cover

Model
Y92A-48N

Mounting Adapter

Model
Y92F-49

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

DIN Track Mounting Adapter (for E5CC)

Model
Y92F-52

Sockets (for E5CC-U)

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

Front Covers

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

CX-Thermo Support Software

Model
EST2-2C-MV4

Note: CX-Thermo version 4.5 or higher is required for the E5CC.
CX-Thermo version 4.61 or higher is required for the E5CC-U.
CX-Thermo version 4.65 or higher is required for the E5CC-B.
For the system requirements for the CX-Thermo, refer to information on the EST2-2C-MV4 on the OMRON website (www.ia.omron.com).

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 000:5.2 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, 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 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/THB.)	
Control method	ON/OFF control or 2-PID control (with auto-tuning)	
Control output	Relay output	E5CC/E5CC-B: SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA (reference value) E5CC-U: 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 *2	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000
Auxiliary output	Number of outputs	E5CC: 3 E5CC-B: 2 E5CC-U: 1 or 2 (depends on model)
	Output specifications	SPST-NO relay outputs, 250 VAC, Models with 1 output: 3 A (resistive load), E5CC-U models with 2 outputs: 3 A (resistive load), E5CC-B models with 2 outputs: 2 A (resistive load), Models with 3 outputs: 2 A (resistive load), Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5 V (reference value)
Event input *1	Number of inputs	E5CC: 2 or 4 (depends on model) E5CC-B: 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
Transfer output *1	Number of outputs	1 (only on models with a transfer output)
	Output specifications	Current output: 4 to 20 mA DC, load: 500 Ω max., resolution: approx. 10,000 Linear voltage output: 1 to 5 VDC, load: 1 kΩ min., resolution: Approx. 10,000
Setting method	Digital setting using front panel keys	
Remote SP input *1 *2	Current input: 4 to 20 mA DC or 0 to 20 mA DC (input impedance: 150 Ω max.) Voltage input: 1 to 5 V, 0 to 5 V, or 0 to 10 V (input impedance: 1 MΩ min.)	
Indication method	11-segment digital display and individual indicators Character height: PV: 15.2 mm, SV: 7.1 mm	
Multi SP *3	Up to eight set points (SP0 to SP7) can be saved and selected using the 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, robust tuning, PV input shift, run/stop, protection functions, extraction of square root, MV change rate limit, logic operations, temperature status display, simple programming, moving average of input value, and display brightness setting	
Ambient operating temperature	-10 to 55°C (with no condensation or icing), For 3-year warranty: -10 to 50°C with standard mounting (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)	

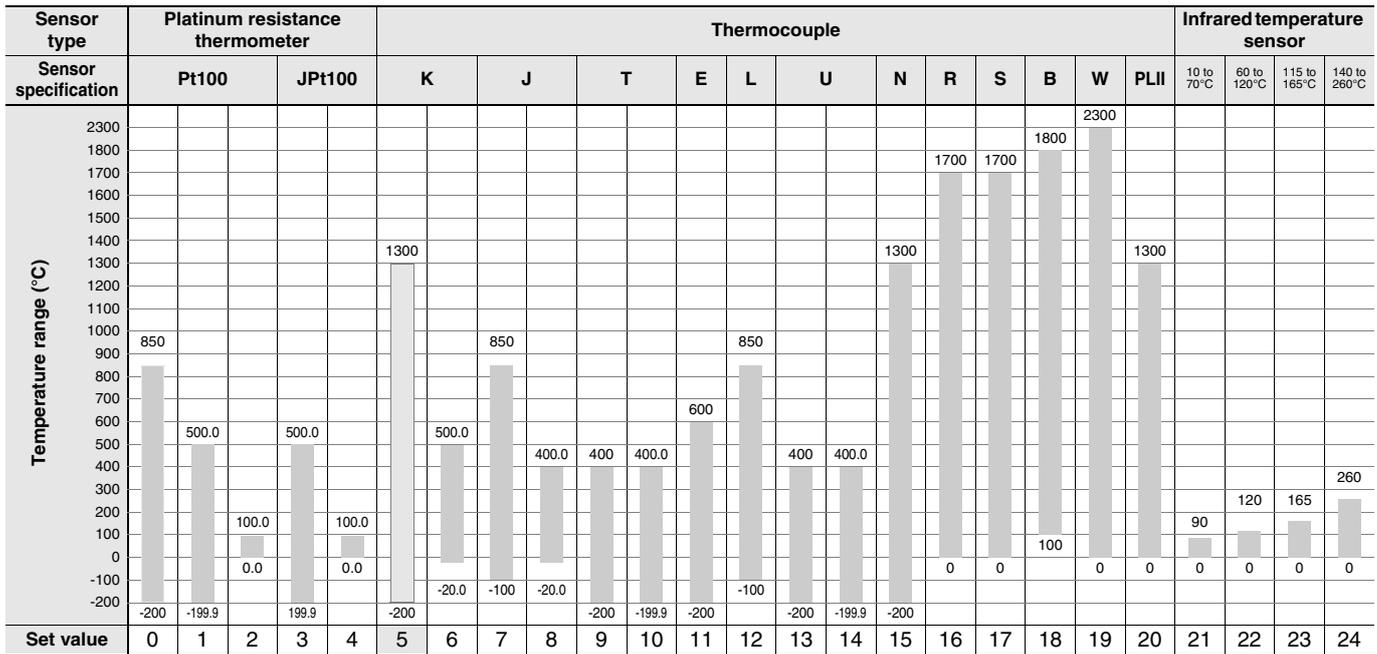
*1. There are no optional functions for the E5CC-U. Refer to *Model Number Legend* and *List of Models* on page 19.

*2. This function is not supported by the E5CC-B. Refer to *Model Number Legend* on page 18.

*3. With the E5CC-B, there can be up to four set points if event inputs are used to select them.

Input Ranges

Thermocouple/Platinum Resistance Thermometer (Universal inputs)



Shaded settings are the default settings.

The applicable standards for the input types are as follows:

K, J, T, E, N, R, S, B: JIS C 1602-1995, IEC 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 Platine 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	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 only for those manufactured in May 2014 or later.

Alarm Types

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

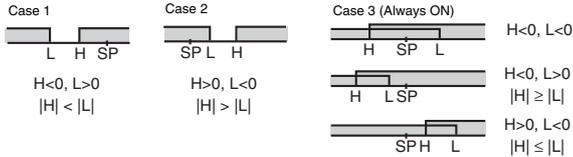
Auxiliary outputs are allocated for alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

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.

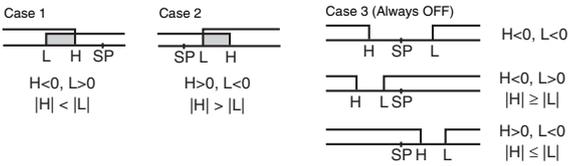
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1	Upper- and lower-limit *1		*2	Set the upward deviation in the set point for the alarm upper limit (H) and the lower deviation 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	*5 	*4	A standby sequence is added to the upper- and lower-limit alarm (1). *6
6	Upper-limit with standby sequence			A standby sequence is added to the upper-limit alarm (2). *6
7	Lower-limit with standby sequence			A standby sequence is added to the lower-limit alarm (3). *6
8	Absolute-value upper-limit			The alarm will turn ON if the process value is larger than the alarm value (X) regardless of the set point.
9	Absolute-value lower-limit			The alarm will turn ON if the process value is smaller than the alarm value (X) regardless of the set point.
10	Absolute-value upper-limit with standby sequence			A standby sequence is added to the absolute-value upper-limit alarm (8). *6
11	Absolute-value lower-limit with standby sequence			A standby sequence is added to the absolute-value lower-limit alarm (9). *6
12	LBA (alarm 1 type only)	-		*7
13	PV change rate alarm	-		*8
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	
18	RSP absolute-value upper-limit alarm *10			This alarm type turns ON the alarm when the remote SP (RSP) is higher than the alarm value (X).
19	RSP absolute-value lower-limit alarm *10			This alarm type turns ON the alarm when the remote SP (RSP) is lower than the alarm value (X).

*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 loop burnout alarm (LBA).

*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.

*10. This value is displayed only when a remote SP input is used. It functions in both Local SP Mode and Remote SP Mode. Remote SP input is supported only for the E5CC.

Characteristics

Indication accuracy (at the ambient temperature of 23°C)	E5CC/E5CC-B 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. E5CC-U 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.	
Transfer output accuracy	$\pm 0.3\%$ FS max.	
Simple transfer output accuracy	$\pm 0.3\%$ FS max.*2	
Remote SP Input Type	$\pm 0.2\%$ FS ± 1 digit max.	
Influence of temperature *3	Thermocouple input (R, S, B, 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	
Influence of voltage *3	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 EMS. (at EN 61326-1)	CT input: $\pm 5\%$ FS ± 1 digit max. Remote SP input: $\pm 1\%$ FS ± 1 digit max.	
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)	
Influence 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/E5CC-B: Controller: Approx. 120 g, Adapter: Approx. 10 g E5CC-U: Controller: Approx. 100 g, Adapter: Approx. 10 g	
Degree of protection	E5CC/E5CC-B: Front panel: IP66, Rear case: IP20, Terminals: IP00 E5CC-U: Front panel: IP50, Rear case: IP20, Terminals: IP00	
Memory protection	Non-volatile memory (number of writes: 1,000,000 times)	
Setup Tool	E5CC: CX-Thermo version 4.5 or higher E5CC-B: CX-Thermo version 4.65 or higher E5CC-U: CX-Thermo version 4.61 or higher	
Setup Tool port	E5CC/E5CC-B/E5CC-U top panel: An E58-CIFQ2 USB-Serial Conversion Cable is used to connect to a USB port on the computer. *6	

*1. The indication accuracy of K thermocouples in the -200 to 1,300°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) ± 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. External communications (RS-485) and USB-serial conversion cable communications can be used at the same time.

USB-Serial Conversion Cable

Applicable OS	Windows XP/Vista/7/8/10 *1
Applicable software	CX-Thermo version 4.5 or higher (Version 4.61 or higher is required for the E5CC-U, Version 4.65 or higher is required for the E5CC-B.)
Applicable models	E5□C-T Series, E5□C Series, and E5CB Series
USB interface standard	Conforms to USB Specification 2.0.
DTE speed	38400 bps
Connector specifications	Computer: USB (type A plug) Digital Temperature Controller: Special serial connector
Power supply	Bus power (Supplied from USB host controller.)*2
Power supply voltage	5 VDC
Current consumption	450 mA max.
Output voltage	4.7±0.2 VDC (Supplied from USB-Serial Conversion Cable to the Digital Temperature Controller.)
Output current	250 mA max. (Supplied from USB-Serial Conversion Cable to the Digital Temperature Controller.)
Ambient operating temperature	0 to 55°C (with no condensation or icing)
Ambient operating humidity	10% to 80%
Storage temperature	-20 to 60°C (with no condensation or icing)
Storage humidity	10% to 80%
Altitude	2,000 m max.
Weight	Approx. 120 g

Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

*1. CX-Thermo version 4.65 or higher runs on Windows 10.

*2. Use a high-power port for the USB port.

Note: A driver must be installed on the computer. Refer to the *Instruction Manual* included with the Cable for the installation procedure.

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 Digital 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.

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

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

Heater Burnout Alarms and SSR Failure Alarms

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

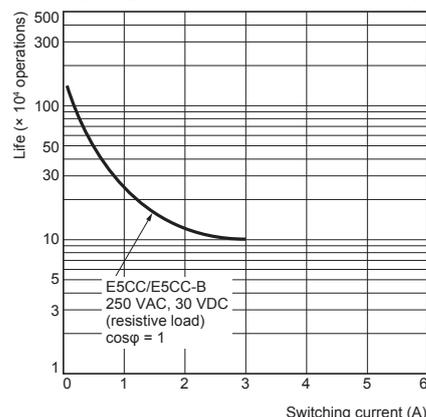
*1. For heater burnout alarms, the heater current will be measured when the control output is ON, and the output will turn ON if the heater current is lower than the set value (i.e., heater burnout detection current value).

*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)



E5CC-B (Push-In Plus Terminal)

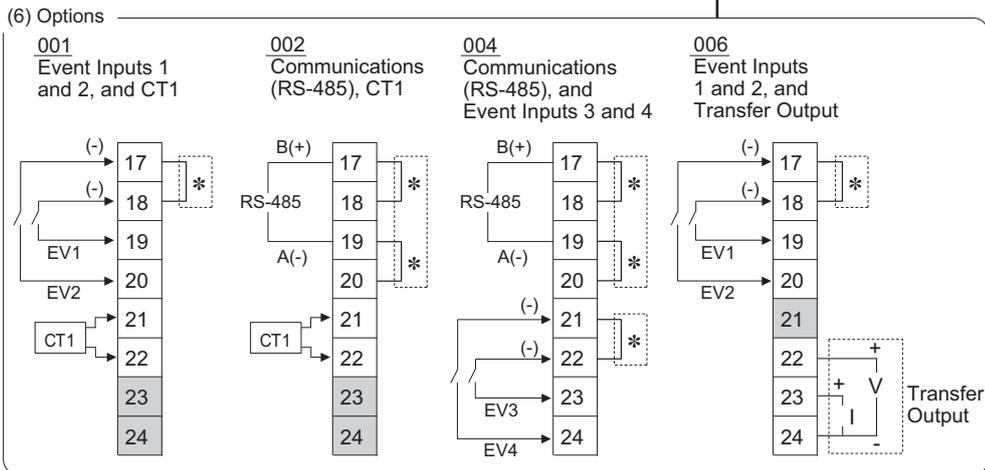
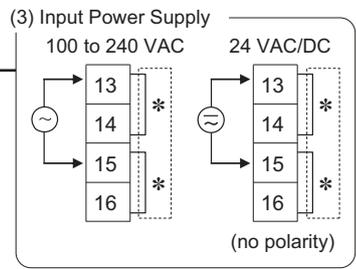
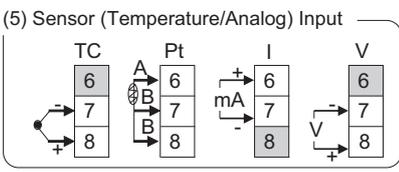
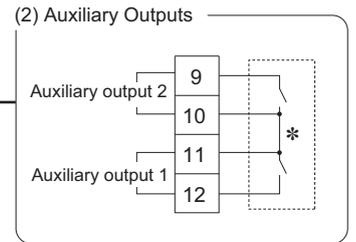
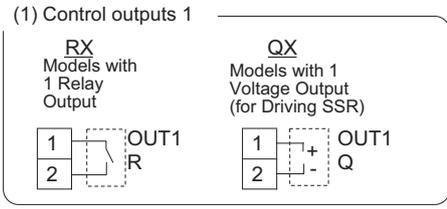
E5CC-□□ 2 □ B M - □□□
 (1) (2) (3) (4) (5) (6)

Terminal type

Control output 1
 Relay output
 250 VAC, 3A
 (resistive load)
 Voltage output
 (for driving SSR)
 12 VDC, 21 mA

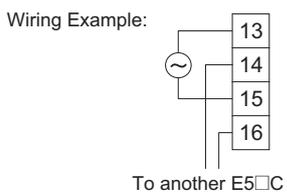
Auxiliary outputs 1, 2
 Relay outputs
 outputs: 250 VAC, 2 A
 (resistive load)

The E5CC 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.



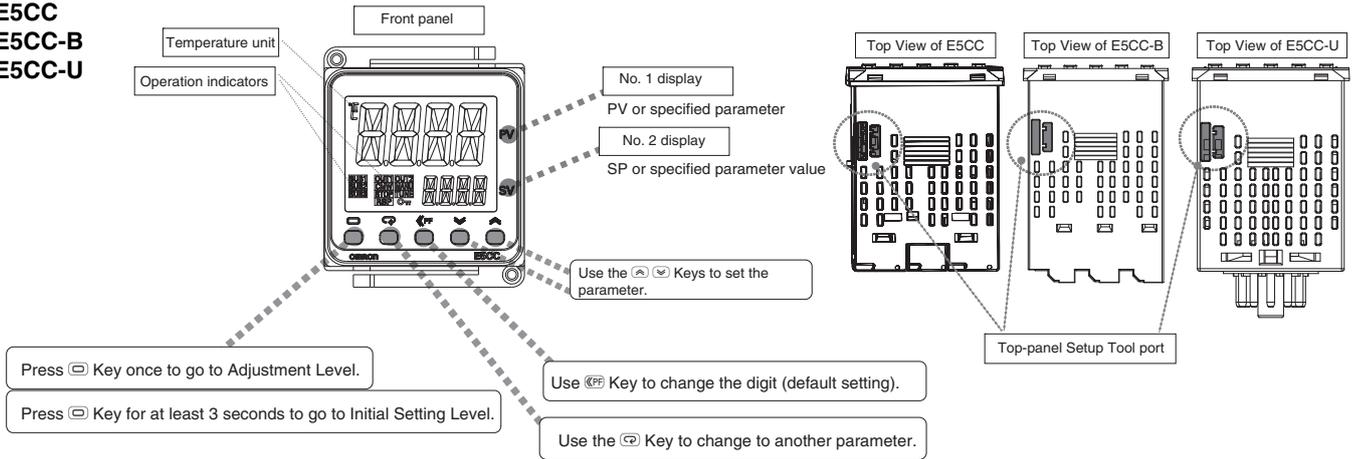
Use no-voltage inputs for the event inputs.
 The polarity for non-contact inputs is given in parentheses.

- 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.
 - Refer to *Wiring Precautions for E5□C-B (Controllers with Push-In Plus Terminal)* on page 116 for wire specifications and wiring methods.
 - 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.
 24 VAC/VDC Controllers: 8 max.



Nomenclature

E5CC
E5CC-B
E5CC-U

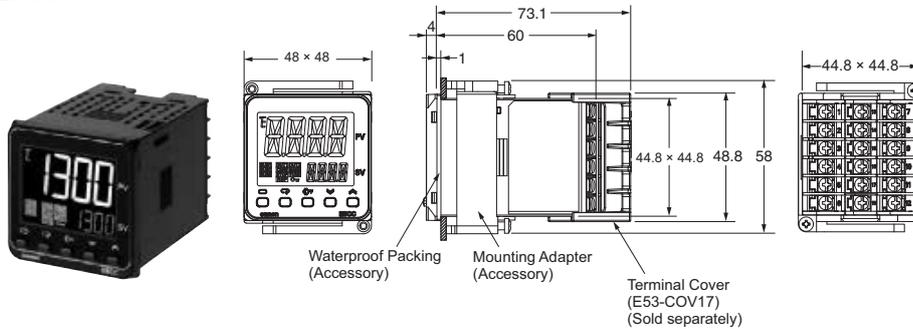


Dimensions

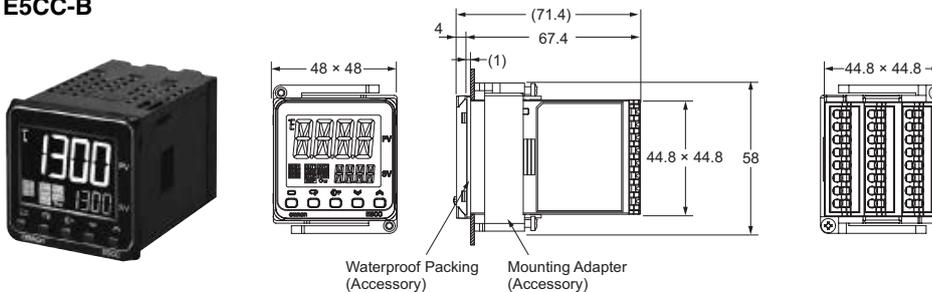
(Unit: mm)

Controllers

E5CC



E5CC-B



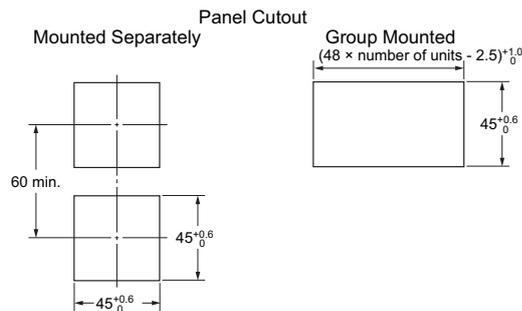
The Setup Tool port is on the top of the Temperature Controller.

It is used to connect the Temperature Controller to the computer to use the Setup Tool.

The E58-CIFQ2 USB-Serial Conversion Cable is required to make the connection.

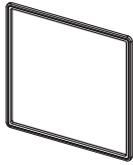
Refer to the instructions that are provided with the USB-Serial Conversion Cable for the connection procedure.

Note: Do not leave the USB-Serial Conversion Cable connected when you use the Temperature Controller.



- 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.
- Use a control panel thickness of 1 to 3 mm if the Y92A-48N and a USB-Serial Conversion Cable are used together.

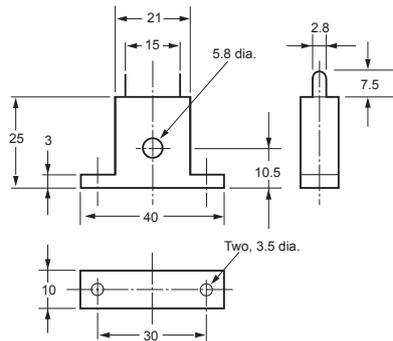
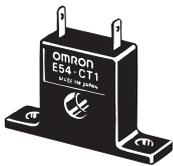
Waterproof Packing
Y92S-P8 (for DIN 48 × 48)



The Waterproof Packing is provided only with the E5CC/E5CC-B.
It is not included with the E5CC-U.
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 cannot be waterproofed even if the Waterproof Packing is attached.

Current Transformers

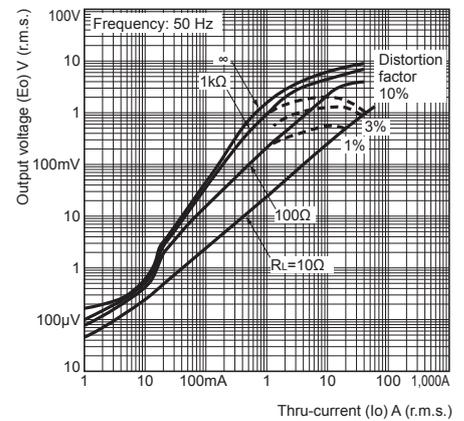
E54-CT1



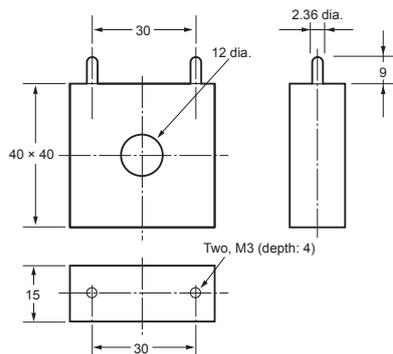
Thru-current (Io) vs. Output Voltage (Eo)
(Reference Values)

E54-CT1

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



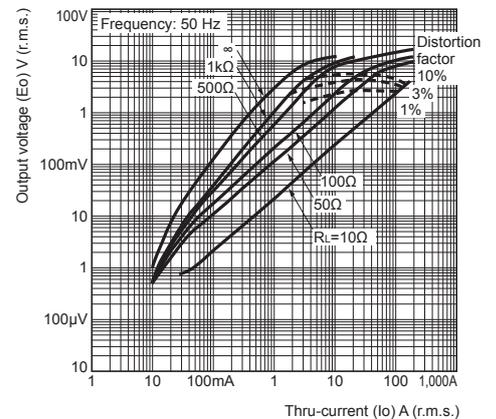
E54-CT3



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

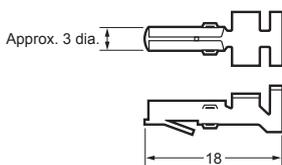
E54-CT3

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

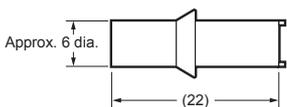


E54-CT3 Accessories

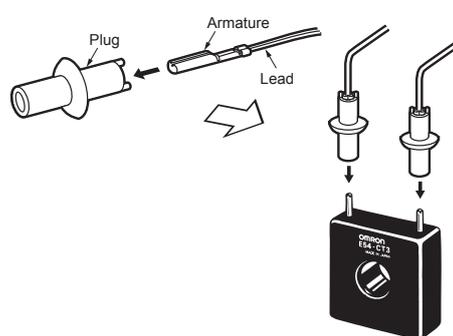
• Armature



• Plug



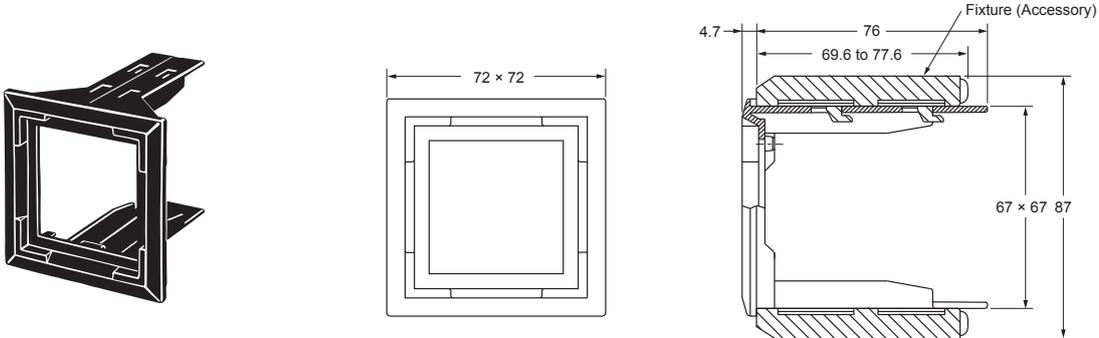
Connection Example



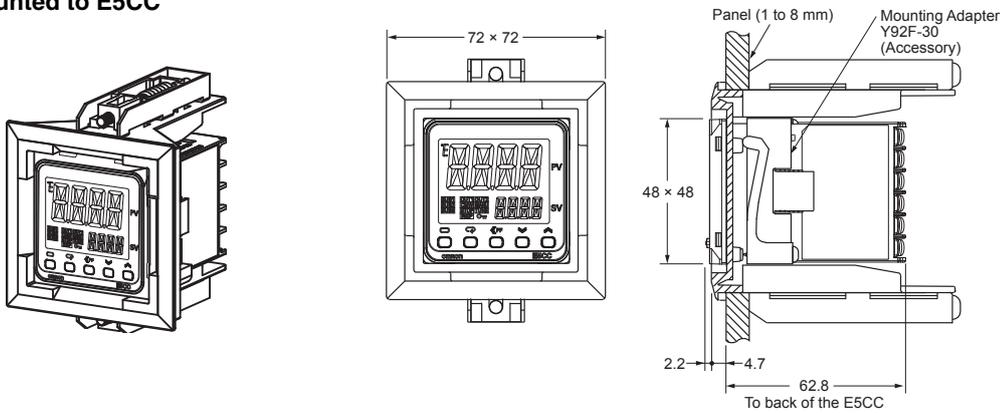
Adapter

Y92F-45

- Note:**
1. Use this Adapter when the Front Panel has already been prepared for the E5B□.
 2. Only black is available.
 3. You cannot use the E58-CIFQ2 USB-Serial Conversion Cable if you use the Y92F-45 Adapter. To use the USB-Serial Conversion Cable to make the settings, do so before you mount the Temperature Controller in the panel.
 4. You cannot use it together with the Y92F-49 Adapter that is enclosed with the Controller.



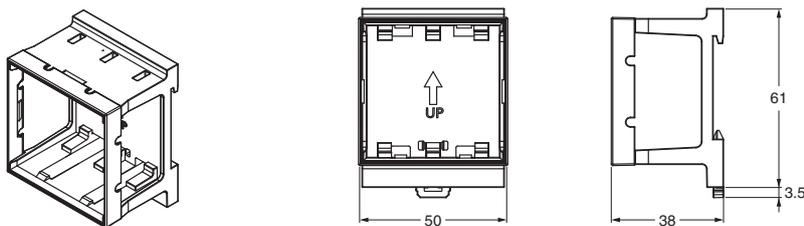
Mounted to E5CC



DIN Track Mounting Adapter

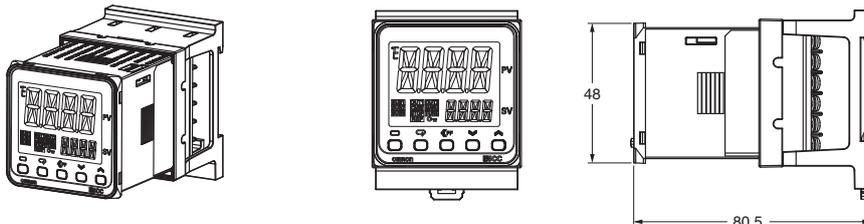
Y92F-52

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

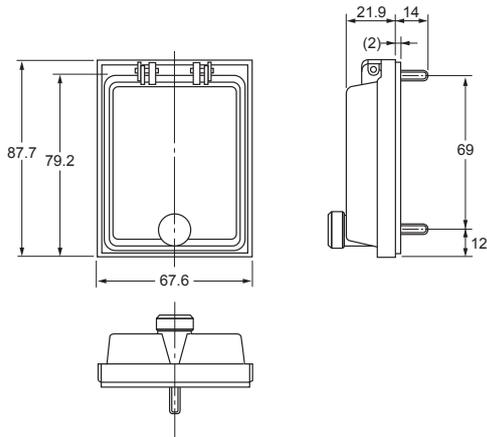


This Adapter is used to mount the E5CC to a DIN Track. If you use the Adapter, there is no need for a plate to mount in the panel or to drill mounting holes in the panel.

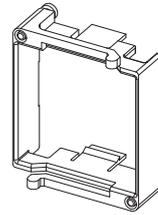
Mounted to E5CC



Watertight Cover
Y92A-48N

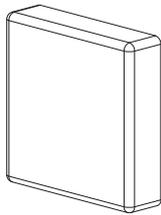


Mounting Adapter
Y92F-49



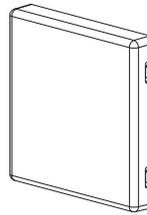
The Mounting Adapter is provided with the Temperature Controller. Order this Adapter separately if it becomes lost or damaged.

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.

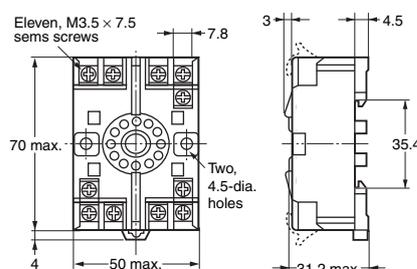
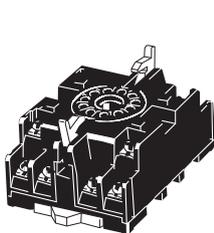
Protective Cover
Y92A-48H



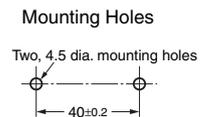
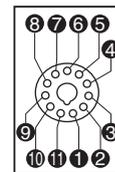
This Protective Cover is hard type. Please use it for the mis-operation prevention etc.

E5CC-U Wiring Socket

Front-connecting Socket
P2CF-11



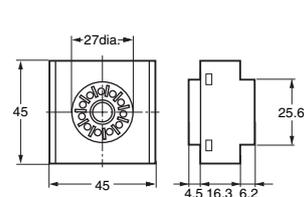
Terminal Layout/Internal Connections
(Top View)



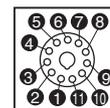
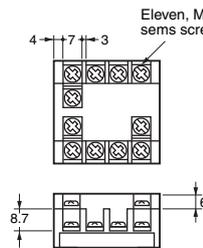
Note: Can also be mounted to a DIN track

- 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)



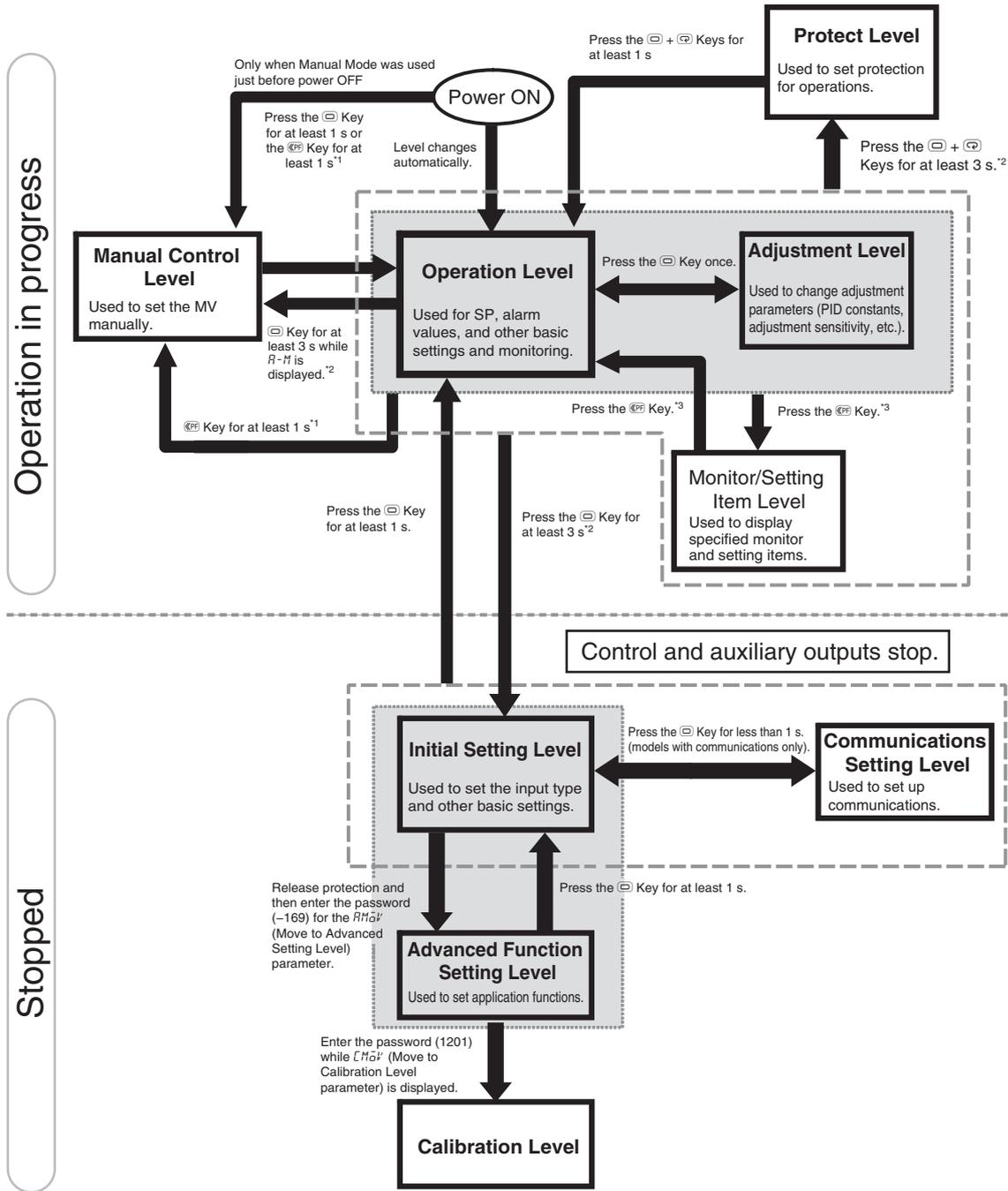
- Note:** 1. Using any other sockets will adversely affect accuracy. Use only the specified sockets.
2. A Protective Cover for finger protection (Y92A-48G) is also available.
3. You cannot use the P3GA-11 together with the Y92F-45.

Operation

Setting Levels Diagram

E5□C

This diagram shows all of the setting levels. To move to the advanced function setting level and calibration level, you must enter passwords. Some parameters are not displayed depending on the protect level setting and the conditions of use. Control stops when you move from the operation level to the initial setting level.



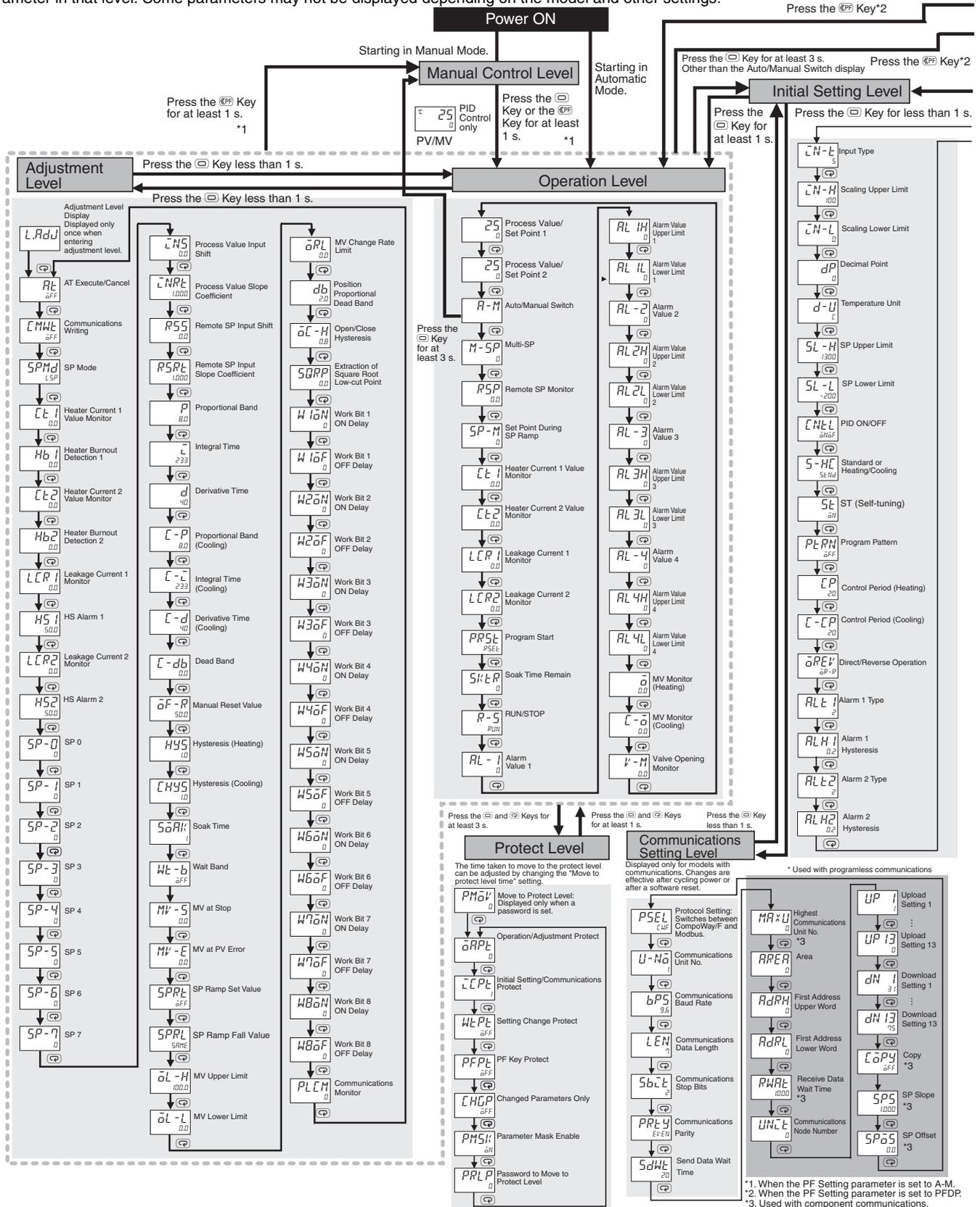
*1. Set the PF Setting parameter to a-m (Auto/Manual).
 *2. The No. 1 display will flash when the keys are pressed for 1 s or longer.
 *3. Set the PF Setting parameter to pfdp (monitor/setting items).

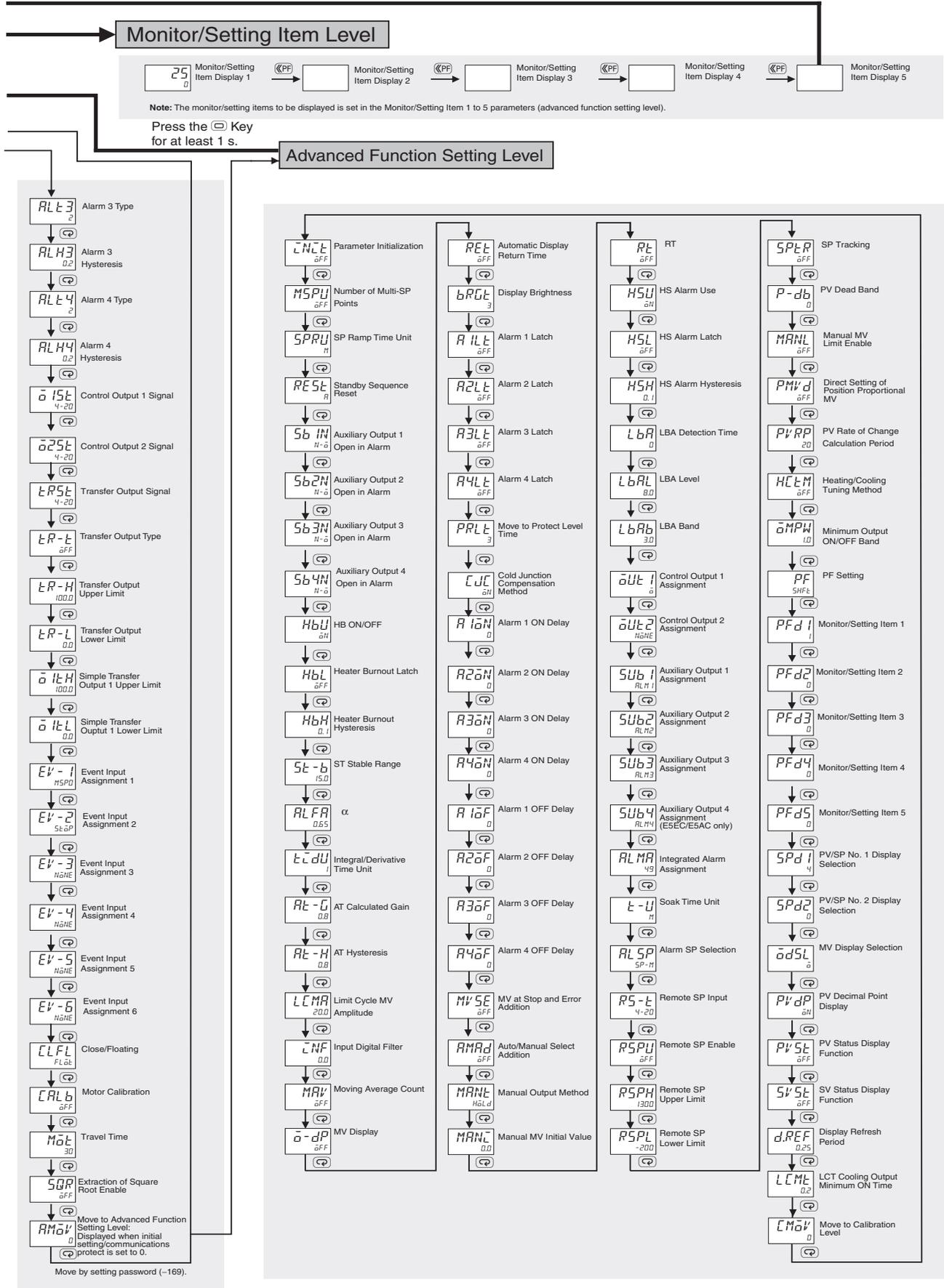
Operation

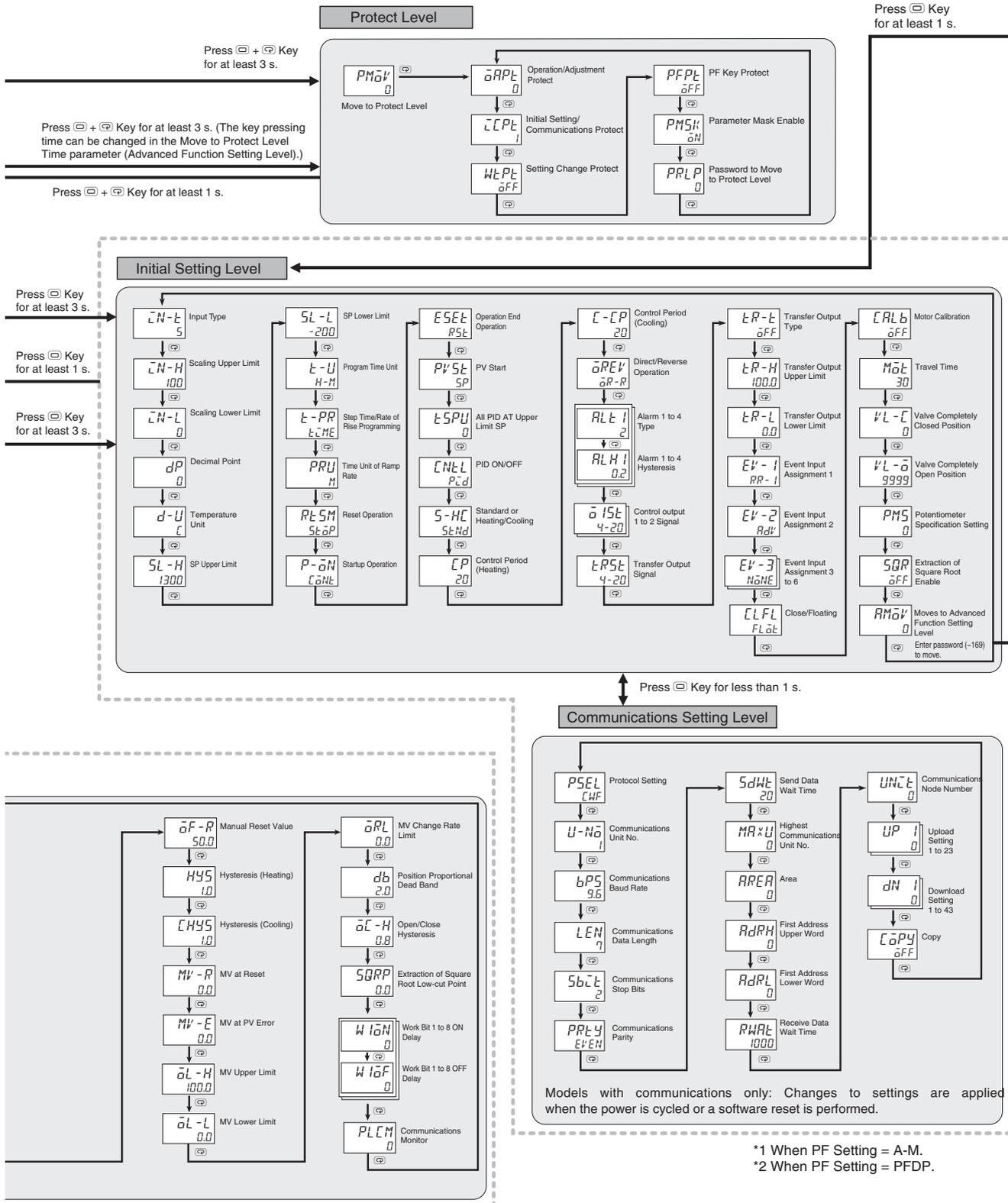
Parameters

E5□C

The following pages describe the parameters set in each level. Pressing the M (Mode) Key at the last parameter in each level returns to the top parameter in that level. Some parameters may not be displayed depending on the model and other settings.

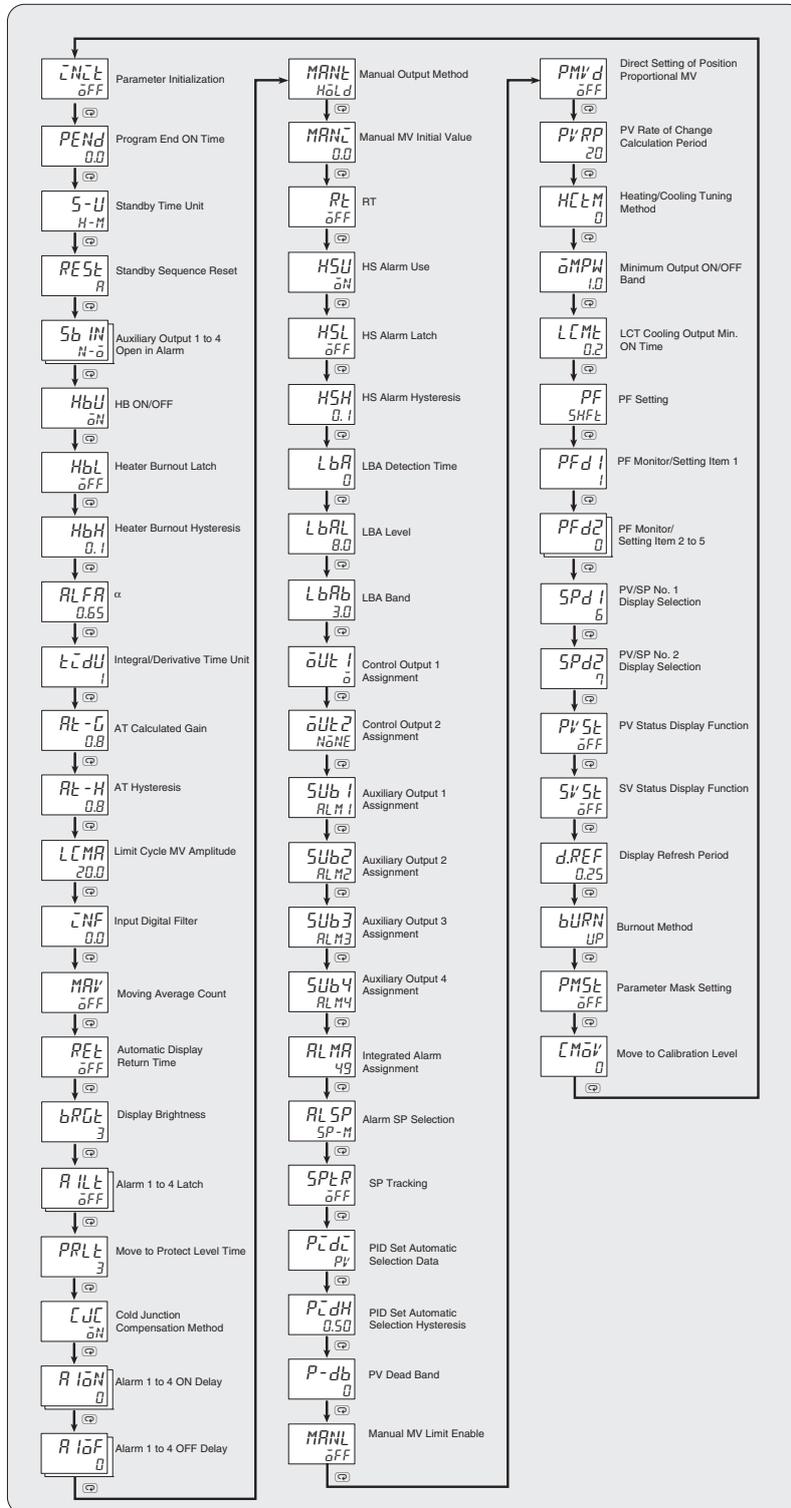






*1 When PF Setting = A-M.
*2 When PF Setting = PFDP.

Advanced Function Setting Level



Error Displays (Troubleshooting)

When an error occurs, the No. 1 display or No. 2 display shows the error code.
Take necessary measure according to the error code, referring the following table.

Display	Name	Meaning	Action	Operation
s.err	Input error	<p>The input value exceeded the control range.* The input type is not set correctly. The sensor is disconnected or short-circuited. The sensor is not wired correctly. The sensor is not wired.</p> <p>* Control Range Temperature resistance thermometer or thermocouple input: SP Lower Limit - 20°C to SP Upper Limit + 20°C (SP Lower Limit - 40°F to SP Upper Limit + 40°F) ESIB input: Same as specified input range. Analog input: Scaling range -5% to 105%</p>	<p>Check the wiring for input to be sure it is wired correctly, not broken, and not shorted. Also check the input type. If there are no problems in the wiring or input type settings, cycle the power supply. If the display remains the same, replace the Digital Temperature Controller. If the display is restored to normal, then the probable cause is external noise affecting the control system. Check for external noise.</p> <p>Note: For a temperature resistance thermometer, the input is considered disconnected if the A, B, or B' line is broken.</p>	<p>After the error occurs and it is displayed, the alarm output will operate as if the upper limit was exceeded. It will also operate as if transfer output exceeded the upper limit. If an input error is assigned to a control output or auxiliary output, the output will turn ON when the input error occurs. The error message will appear in the display for the PV.</p> <p>Note: 1. The heating and cooling control outputs will turn OFF. 2. When the manual MV, MV at stop, MV at reset, or MV at error is set, the control output is determined by the set value.</p>
[[[Display range exceeded	Below -1,999	-	Control continues and operation is normal. The value will appear in the display for the PV. Refer to the E5□C Digital Temperature Controllers User's Manual (Cat. No. H174) or the E5□C-T Digital Temperature Controllers Programmable Type User's Manual (Cat. No. H185) for information on the controllable range.
]]]		Above 9,999		
e333	A/D converter error	There is an error in the internal circuits.	<p>After checking the input error, turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.</p>	The control outputs, auxiliary outputs, and transfer outputs turn OFF. (A current output will be approx. 0 mA and a linear voltage output will be approx. 0V.)
e111	Memory error	There is an error in the internal memory operation.	<p>First, cycle the power supply. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.</p>	The control outputs, auxiliary outputs, and transfer outputs turn OFF. (A current output will be approx. 0 mA and a linear voltage output will be approx. 0V.)
ffff	Overcurrent	This error is displayed when the peak current exceeds 55.0 A.	-	Control continues and operation is normal. The error message will appear for the following displays. Heater Current Value 1 Monitor Heater Current Value 2 Monitor Leakage Current Value 1 Monitor Leakage Current Value 2 Monitor
ct1 ct2 lcr1 lcr2	HB or HS alarm	If there is a HB or HS alarm, the No. 1 display will flash in the relevant setting level.	-	The No. 1 display for the following parameter flashes in Operation Level or Adjustment Level. Heater Current Value 1 Monitor Heater Current Value 2 Monitor Leakage Current Value 1 Monitor Leakage Current Value 2 Monitor However, control continues and operation is normal.
----	Potentiometer Input Error (Position-proportional Models Only)	<p>"----" will be displayed for the Valve Opening Monitor parameter if any of the following error occurs.</p> <ul style="list-style-type: none"> Motor calibration has not been performed. The wiring of the potentiometer is incorrect or broken. The potentiometer input value is incorrect (e.g., the input is out of range or the potentiometer has failed). 	Check for the above errors.	Close control: The control output is OFF or the value that is set for the MV at PV Error parameter is output. Floating control: Operation will be normal.