Digital Temperature Controller
E5DC (22.5 mm Wide, and DIN Track-mounting Type)

The E5DC Mounts to DIN Track and Is Ideal for Connections to HMIs and PLCs. It provides the Same Easy Operation and Advanced Performance as the Rest of the E5□C Series.

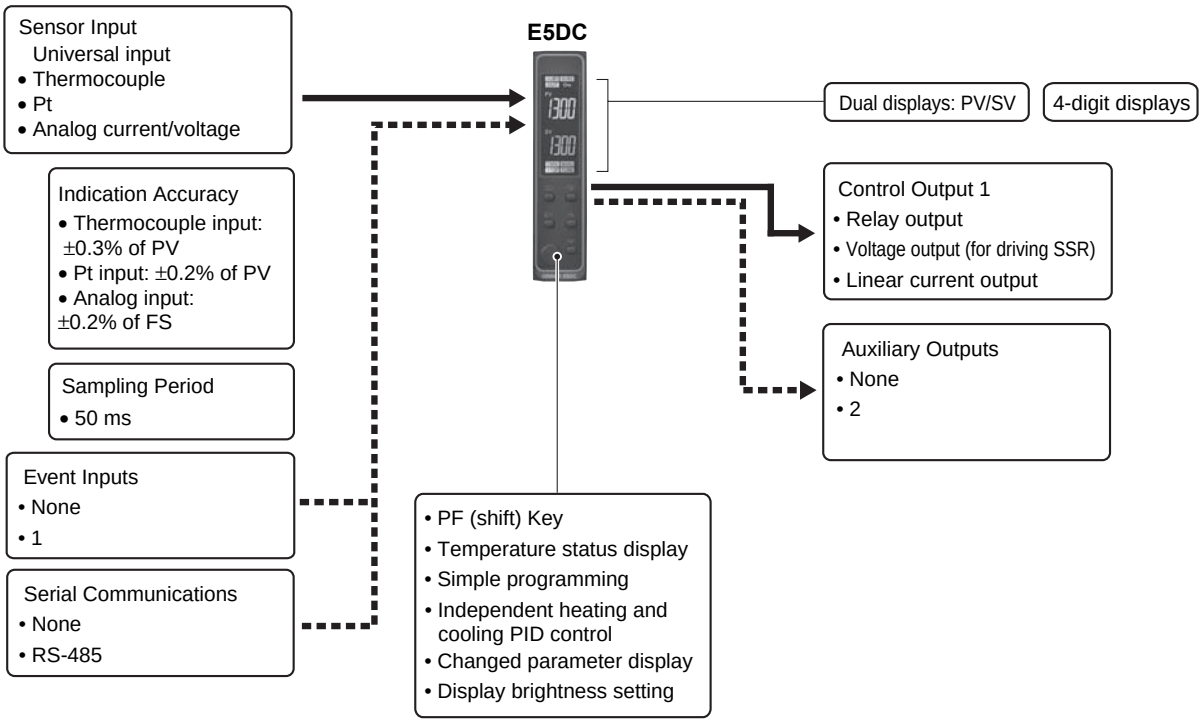
- A slim body at 85 × 22.5 mm (D × W) that fits into narrow control panels and mounts to DIN Track.
- Removable terminal block for easy replacement to simplify maintenance.
- High-speed sampling at 50 ms for applications with high-speed temperature increases.
- Easy connections to a PLC with programless communications.
- 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).
- Models are available with up to 2 auxiliary outputs and 1 event input to complete basic functions.
- A white PV display (height: 8.5 mm) is easy to read when setting up, checking alarms, and making settings in a control panel.

22.5 mm Wide, and DIN Track-mounting Type E5DC

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

⚠ **Refer to *Safety Precautions* on page 54.**

Main I/O Functions



This datasheet is provided as a guideline for selecting products.
Be sure to refer tothe 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 and Standard Models

Model Number Legend

●Models with Screw Terminals

E5DC-□□ □ □ □ □ -□□□ (Example: E5DC-RX0ASM-015)

①②③④⑤⑥

Model	① Control output 1	② No. of auxiliary outputs	③ Power supply voltage	④ Terminal type	⑤ Input type	⑥ Options	Meaning
E5DC							22.5 mm wide and mounts to DIN Track
							Control output 1
	RX						Relay output
	QX						Voltage output (for driving SSR)
	CX						Linear current output *5
		0					None
		2					2 (one common)
			A				100 to 240 VAC
			D				24 VAC/DC
				S			Screw terminals
					M		Universal input

		HB alarm and HS alarm	Communications	Event input
*1	000	---	---	---
*2	002	1	RS-485	---
*3	015	---	RS-485	---
*4	016	---	---	1
*2	017	1	---	1

*1 Option 000 can be selected only if two auxiliary outputs are selected.
*2 Options 002 and 017 can be selected only if the control output is a relay output or voltage output and two auxiliary outputs are selected.
*3 Option 015 cannot be selected if the control output is a relay output or voltage output and two auxiliary outputs are selected.
*4 Options 016 can be selected only if the control output is a linear current output and two auxiliary outputs are selected.
*5 The control output cannot be used as a transfer output.

List of Models

Control output	No. of auxiliary outputs	Options			Model	Model
		HB alarm and HS alarm	No. of event inputs	Communications	Power supply voltage	Power supply voltage
					100 to 240 VAC	24 VAC/DC
Relay output	---	---	---	RS-485	**E5DC-RX0ASM-015**	**E5DC-RX0DSM-015**
	2			---	**E5DC-RX2ASM-000**	**E5DC-RX2DSM-000**
		Detection for single-phase heater		RS-485	**E5DC-RX2ASM-002**	**E5DC-RX2DSM-002**
			1	---	**E5DC-RX2ASM-017**	**E5DC-RX2DSM-017**
Voltage output (for driving SSR)	---	---	---	RS-485	**E5DC-QX0ASM-015**	**E5DC-QX0DSM-015**
	2			---	**E5DC-QX2ASM-000**	**E5DC-QX2DSM-000**
		Detection for single-phase heater		RS-485	**E5DC-QX2ASM-002**	**E5DC-QX2DSM-002**
			1	---	**E5DC-QX2ASM-017**	**E5DC-QX2DSM-017**
Linear current output	---	---	---	RS-485	**E5DC-CX0ASM-015**	**E5DC-CX0DSM-015**
	2			---	**E5DC-CX2ASM-000**	**E5DC-CX2DSM-000**
				RS-485	**E5DC-CX2ASM-015**	**E5DC-CX2DSM-015**
			1	---	**E5DC-CX2ASM-016**	**E5DC-CX2DSM-016**

Note: These products are sold as a set with a terminal block (i.e., Terminal Unit).

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

Conversion Cable

Model
E58-CIFQ2-E

Note: Always use this product together with the E58-CIFQ2. This Cable is used to connect to the front-panel Setup Tool port.

Current Transformers (CTs)

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

Mounting Adapters

Model
Y92F-53

Short Bars

Model
Y92S-P11

CX-Thermo Support Software

Model
EST2-2C-MV4

Note: CX-Thermo version 4.6 or higher is required for the E5DC. For the system requirements for the CX-Thermo, refer to information on the EST2-2C-MV4 on the OMRON website (www.ia.omron.com).

End Plate

Model
PFP-M

Spacer

Model
PFP-S

DIN Tracks

Model
PFP-100N
PFP-50N

Unit Labels

Model
Y92S-L2

End Cover

Model
Y92F-54

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		4.9 VA max. at 100 to 240 VAC, and 2.8 VA max. at 24 VDC or 1.5 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, 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/THB.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	**Relay output**	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	Voltage output (for driving SSR)	Output voltage 12 VDC ±20% (PNP), max. Load current: 21 mA, with short-circuit protection circuit
	Linear current output	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: Approx. 10,000
Auxiliary outputs	**Number of outputs**	2 (depends on model)
	Output specifications	SPST-NO relay outputs: 250 VAC, 2 A (resistive load), Electrical life: 100,000 operations, Minimum applicable load: 10 mA at 5 V
Event inputs	**Number of inputs**	1 (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 displays and individual indicators Character height: PV: 8.5 mm, SV: 8.0 mm
Multi SP		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, simple calculations, 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 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 shut-off capacity
Installation environment		Installation Category II, Pollution Class 2 (IEC 61010-1 compliant)

* Only two set points are selectable for event inputs.

Input Ranges

●Thermocouple/Platinum Resistance Thermometer (Universal inputs)

Sensor type	Platinum resistance thermometer					Thermocouple															Infrared temperature sensor			
Sensor specification	Pt100			JPt100		K		J		T		E	L	U		N	R	S	B	W	PLII	10 to 70°C	60 to 120°C	115 to 165°C	140 to 260°C
Temperature range (°C)	850 / -200	500.0 / -199.9	100.0 / 0.0	500.0 / -199.9	100.0 / 0.0	1300 / -200	500.0 / -20.0	850 / -100	400.0 / -20.0	400 / -200	400.0 / -199.9	600 / -200	850 / -100	400 / -200	400.0 / -199.9	1300 / -200	1700 / 0	1700 / 0	1800 / 100	2300 / 0	1300 / 0	90 / 0	120 / 0	165 / 0	260 / 0
Set value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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

L: Fe-CuNi, DIN 43710-1985

U: Cu-CuNi, DIN 43710-1985

W: W5Re/W26Re, ASTM E988-1990

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

Pt100: JIS C 1604-1997, IEC 60751

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

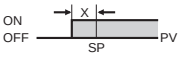
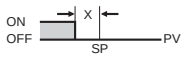
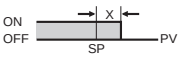
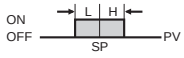
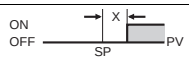
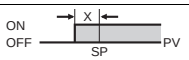
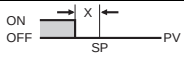
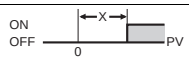
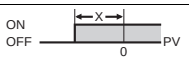
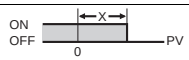
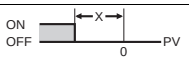
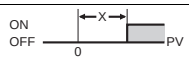
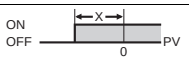
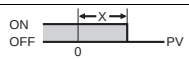
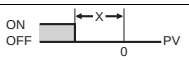
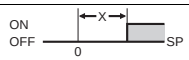
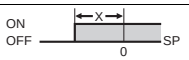
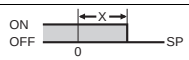
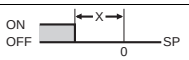
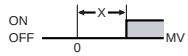
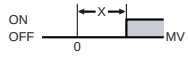
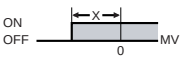
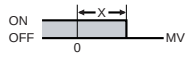
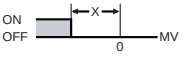
●Analog input

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
Setting range	Usable in the following ranges by scaling: -1999 to 9999, -199.9 to 999.9, -19.99 to 99.99 or -1.999 to 9.999				
Set value	25	26	27	28	29

Alarm Types

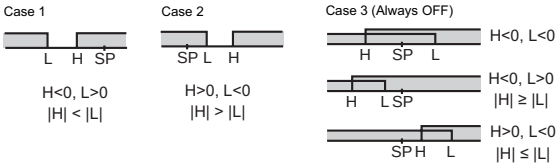
Each alarm can be independently set to one of the following 17 alarm types. The default is 2: Upper limit. (See note.)
Auxiliary outputs are allocated to alarms. ON delays and OFF delays (0 to 999 s) can also be specified.

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.

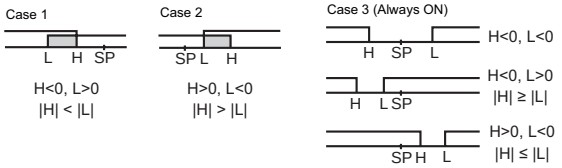
Set value	Alarm type	Alarm output operation		Description of function
		When alarm value X is positive	When alarm value X is negative	
0	Alarm function OFF	Output OFF		No alarm
1	Upper- and lower-limit *1		*2	Set the upward deviation in the set point for the alarm upper limit (H) and the lower deviation 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  Heating/Cooling Control (Heating MV) 	Standard Control  Heating/Cooling Control (Heating MV) Always ON	This alarm type turns ON the alarm when the manipulated variable (MV) is higher than the alarm value (X).
17	MV absolute-value lower-limit alarm *9	Standard Control  Heating/Cooling Control (Cooling MV) 	Standard Control  Heating/Cooling Control (Cooling MV) Always ON	This alarm type turns ON the alarm when the manipulated variable (MV) 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 at *2
- In cases 1 and 2 above, the alarm is always OFF if the upper- and lower-limit hysteresis overlaps.
- In case 3, the alarm is always OFF.

*5 Set value: 5, Upper- and lower-limit alarm with standby sequence
The alarm is always OFF if upper- 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 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-value upper-limit alarm functions only for the heating operation and the MV absolute-value lower-limit alarm functions only for the cooling operation.

Characteristics

Indication accuracy (when mounted individually, ambient temperature of 23°C)		Thermocouple:*1 (±0.3 % of PV or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer: (±0.2 % of PV or ±0.8°C, whichever is greater) ±1 digit max. Analog input: ±0.2% FS ±1 digit max. CT input: ±5% FS ±1 digit max.
Influence of temperature *2		Thermocouple input (R, S, B, W, PL II): (±1% of PV or ±10°C, whichever is greater) ±1 digit max. Other thermocouple input: (±1% of PV or ±4°C, whichever is greater) ±1 digit max. *3 Platinum resistance thermometer: (±1% of PV or ±2°C, whichever is greater) ±1 digit max. Analog input: ±1% FS ±1 digit max. CT input: ±5% FS ±1 digit max.
Influence of voltage *2		
Installation influence (E5DC only)		R, S, B, W, or PLII thermocouple: (±1% of PV or ±10°C, whichever is greater) ±1 digit max. Other thermocouple: (±1% of PV or ±4°C, whichever is greater) ±1 digit max. *3
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) *4
Derivative time (D)		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s) *4
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) *4
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) *4
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		−1,999 to 9,999 (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 MΩ 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/s² for 10 min each in X, Y and Z directions
	Resistance	10 to 55 Hz, 20 m/s² for 2 hr each in X, Y, and Z directions
Shock	**Malfunction**	100 m/s², 3 times each in X, Y, and Z directions
	Resistance	300 m/s², 3 times each in X, Y, and Z directions
Weight		Controller: Approx. 120 g
Degree of protection		Main unit: IP20, Terminal unit: IP00
Memory protection		Non-volatile memory (number of writes: 1,000,000 times)
Setup Tool		CX-Thermo version 4.6 or higher
Setup Tool port		E5DC bottom panel: An E58-CIFQ2 USB-Serial Conversion Cable is used to connect a USB port on the computer. *5 E5DC front panel: An E58-CIFQ2 USB-Serial Conversion Cable and E58-CIFQ2-E Conversion Cable are used together to connect a USB port on the computer.*5
Standards	**Approved standards**	UL 61010-1, Korean Radio Waves Act (Act 10564)
	Conformed standards	EN 61010-1 (IEC 61010-1): Pollution level 2, overcurrent category II
EMC		EMI: EN61326 Radiated Interference Electromagnetic Field Strength: EN55011 Group 1, class A Noise Terminal Voltage: EN55011 Group 1, class A EMS: EN61326 ESD Immunity: EN61000-4-2 Electromagnetic Field Immunity: EN61000-4-3 Burst Noise Immunity: EN61000-4-4 Conduction Disturbance Immunity: EN61000-4-6 Surge Immunity: EN61000-4-5 Voltage Dip/Interrupting Immunity: EN61000-4-11

*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 or less, and U and L thermocouples at any temperature is ±2°C ±1 digit max. The indication accuracy of B thermocouples 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 ±3°C max.
The indication accuracy of R and S thermocouples at a temperature of 200°C max. is ±3°C ±1 digit max. The indication accuracy of W thermocouples is (±0.3% of PV or ±3°C, whichever is greater) ±1 digit max.
The indication accuracy of PLII thermocouples is (±0.3% of PV or ±2°C, whichever is greater) ±1 digit max.
*2 Ambient temperature: −10 to 23 to 55°C, Voltage range: −15% to 10% of rated voltage
*3 K thermocouple at −100°C max: ±10°C max.
*4 The unit is determined by the setting of the Integral/Derivative Time Unit parameter.
*5 External serial communications (RS-485) and USB-Serial Conversion Cable communications can be used at the same time.

USB-Serial Conversion Cable Specifications

Applicable OS	Windows XP, Vista, or 7
Applicable software	CX-Thermo version 4.6 or higher
Applicable models	E5□C-T Series, E5□C Series, and E5CB Series
USB interface standard	Conforms to USB Specification 2.0
DTE speed	38,400 bps
Connector specifications	Computer: USB (Type A plug) Digital Temperature Controller: Special serial connector
Power supply	Bus power (supplied from the USB host controller) *
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 other countries.

* 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*	9,600, 19,200, 38,400, or 57,600 bps
Transmission code	ASCII
Data bit length *	7 or 8 bits
Stop bit length *	1 or 2 bits
Error detection	Vertical parity (none, even, or odd) Block check character (BCC) with CompoWay/F or CRC-16 with 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 the PLC. 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 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: 1 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

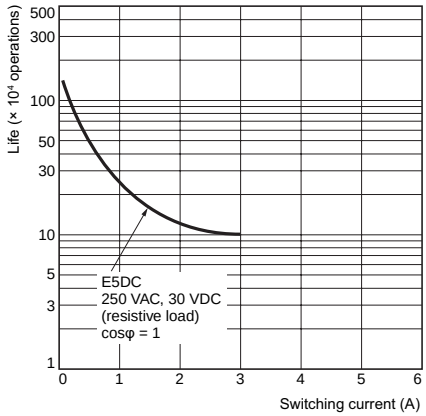
*1 For heater burnout alarms, the heater current will be measured when the control output is ON, and the output will turn ON if the heater current is lower than the set value (i.e., heater burnout detection current value).

*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.

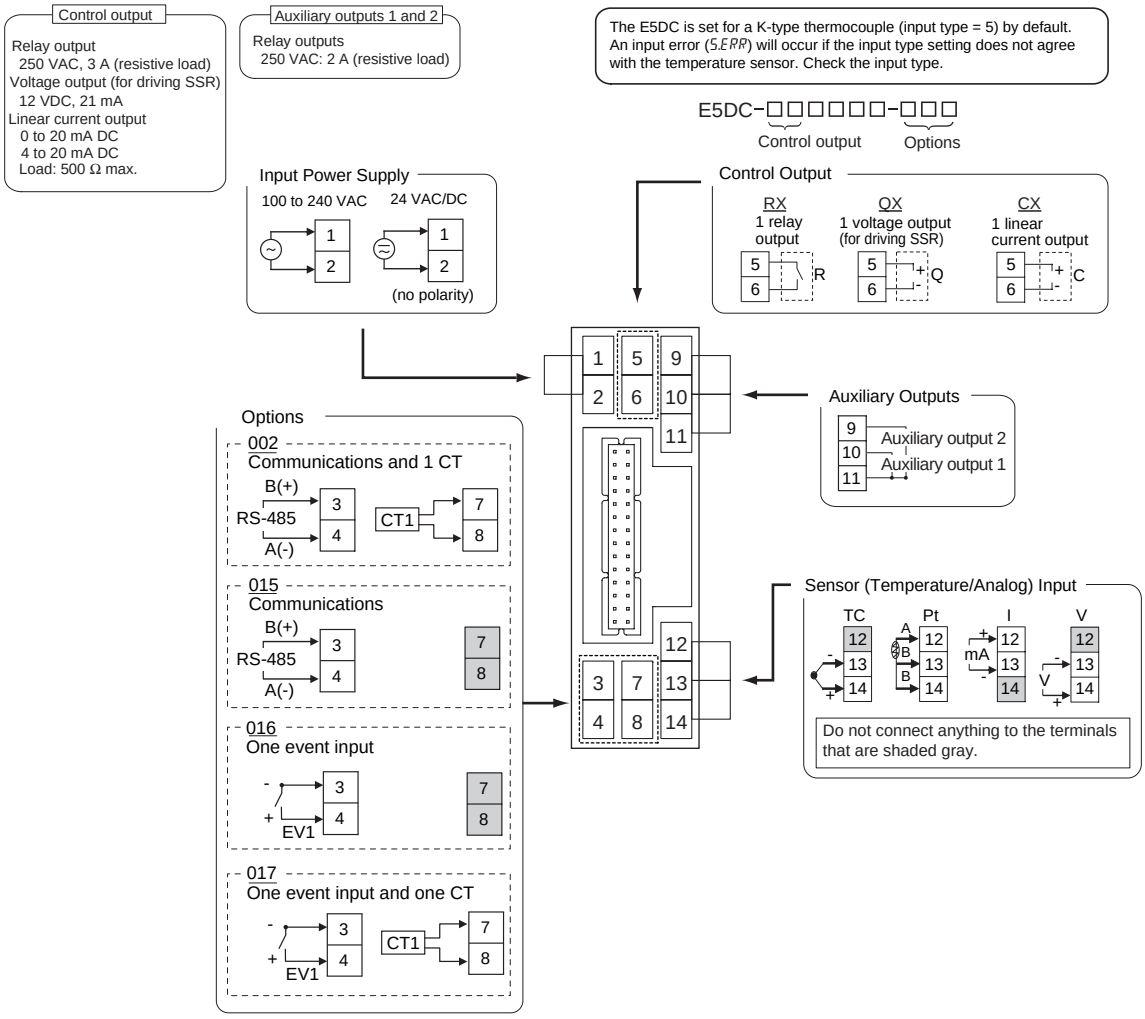
*4 The value is 35 ms for a control period of 0.1 s or 0.2 s.

Electrical Life Expectancy Curve for Control Output Relay (Reference Values)



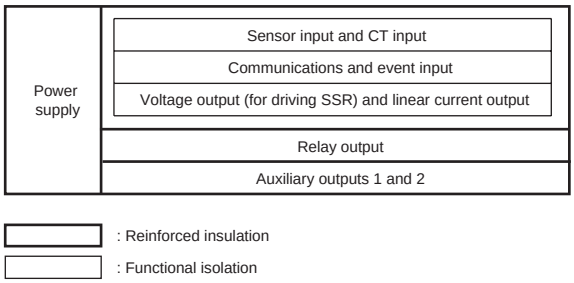
External Connections

E5DC



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 30m, compliance with EMC standards will not be possible.
4. Connect M3 crimped terminals.

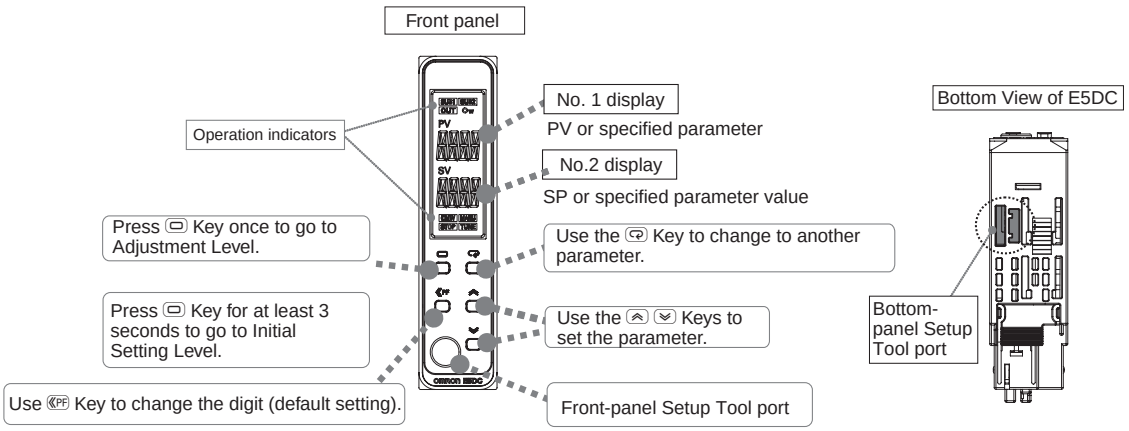
Isolation/Insulation Block Diagrams



Note: Auxiliary outputs 1 to 2 are not insulated.

Nomenclature

E5DC

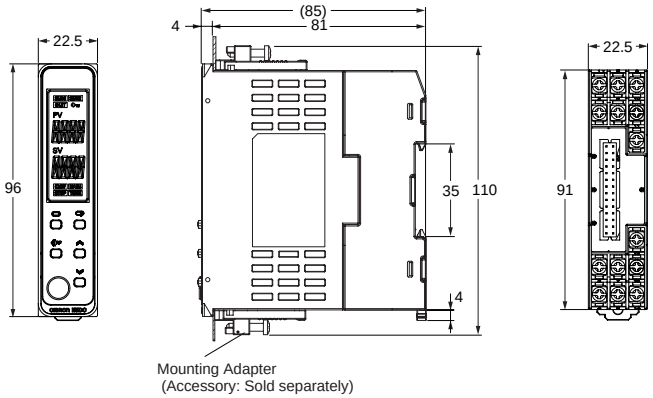


Dimensions

(Unit: mm)

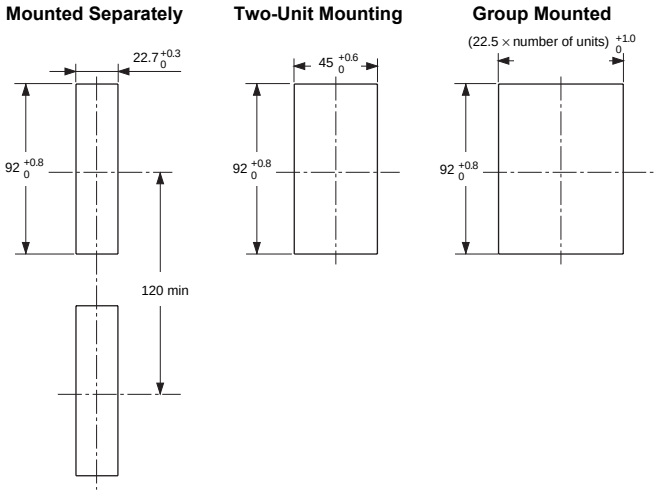
Controllers

E5DC



The Setup Tool ports are on the front and bottom of the Digital 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 Digital Temperature Controller.

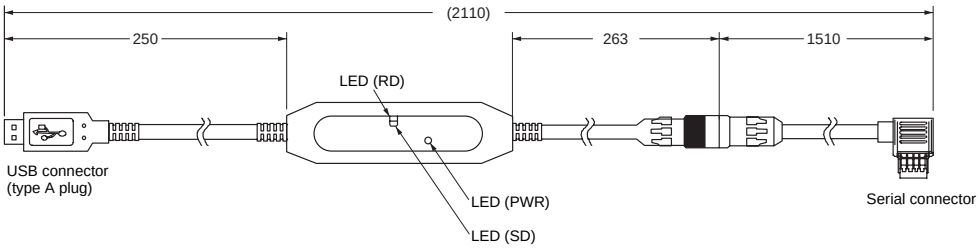


- Recommended panel thickness is 1 to 8 mm.
- Group mounting is not possible in the vertical direction. (Maintain the specified mounting space between Controllers.)
- When two or more Digital Temperature Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature specified in the specifications.

Accessories (Order Separately)

● USB-Serial Conversion Cable

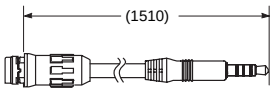
E58-CIFQ2



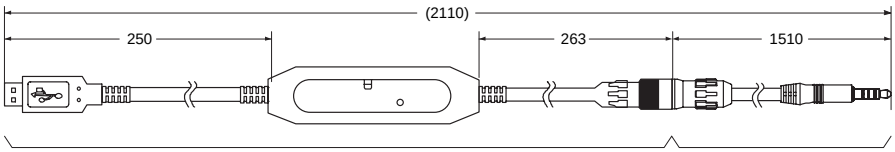
● Conversion Cable

E58-CIFQ2-E

Conversion Cable



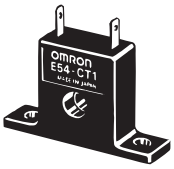
Connecting to the E58-CIFQ2 USB-Serial Conversion Cable

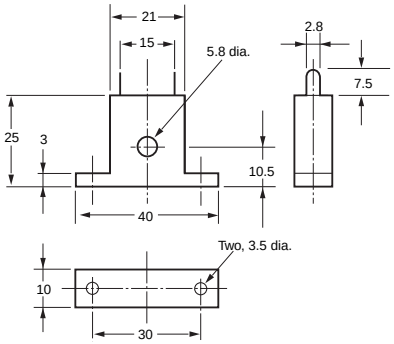


Note: Always use this product together with the E58-CIFQ2.

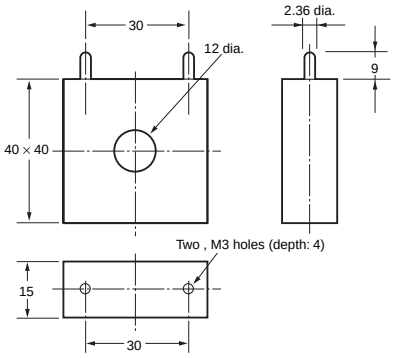
● Current Transformers

E54-CT1



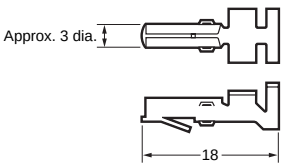


E54-CT3

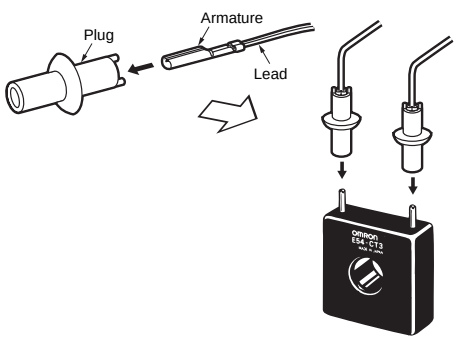


E54-CT3 Accessories

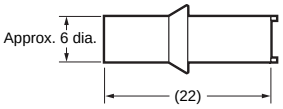
• **Armature**



Connection Example



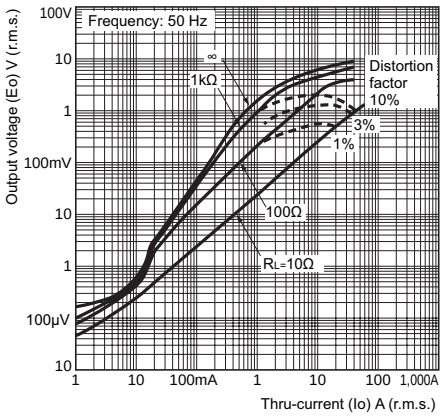
• **Plug**



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

E54-CT1

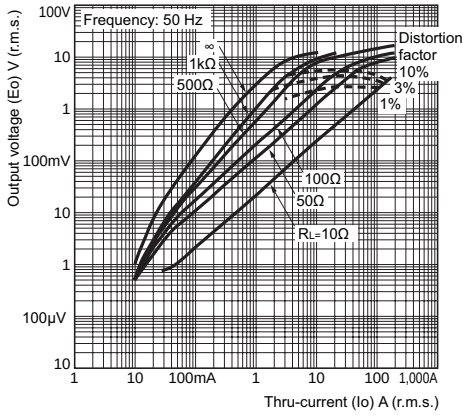
Maximum continuous heater current: 50 A (50/60 Hz)
Number of windings: 400±2
Winding resistance: 18±2 Ω



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

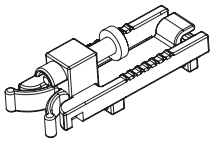
E54-CT3

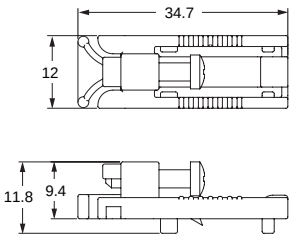
Maximum continuous heater current: 120 A (50/60 Hz) (Maximum continuous heater current for an OMRON Digital Temperature Controller is 50 A.)
Number of windings: 400±2
Winding resistance: 8±0.8 Ω



● Mounting Adapters
Y92F-53 (Two included.)

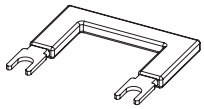
This accessory is not included with the product. Order it separately to mount the product to a panel.

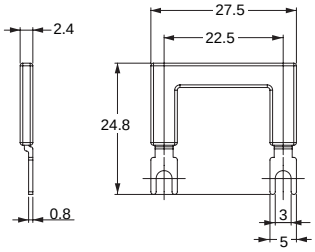




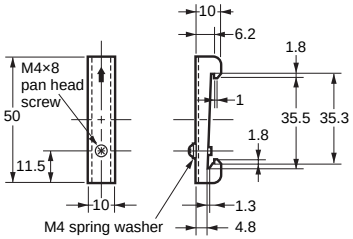
● Short Bars
Y92S-P11 (Four included.)

Use this product to connect between terminals (for power supplies, communications, etc.) when you use multiple E5DC Controllers.

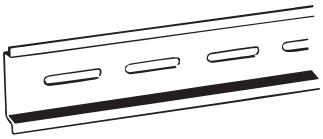


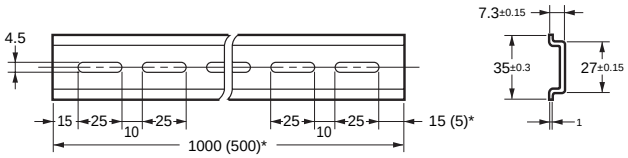


● End Plate
PFP-M



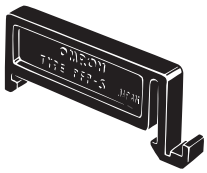
● DIN Tracks
PFP-100N
PFP-50N

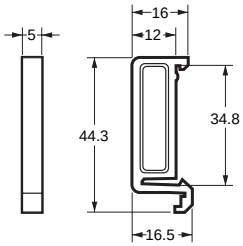




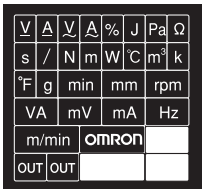
* Dimensions in parentheses are for the PFP-50N.

● Spacer
PFP-S



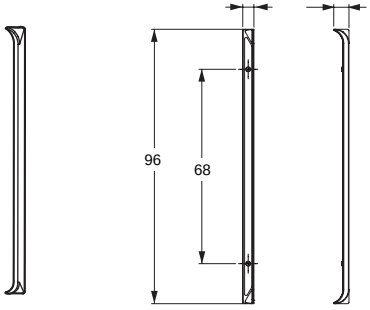


● Unit Labels
Y92S-L2



The Unit Labels for the Digital Panel Meter are used. Use either the °C or °F label from the sheet.

● End Cover
Y92F-54 (Two included.)

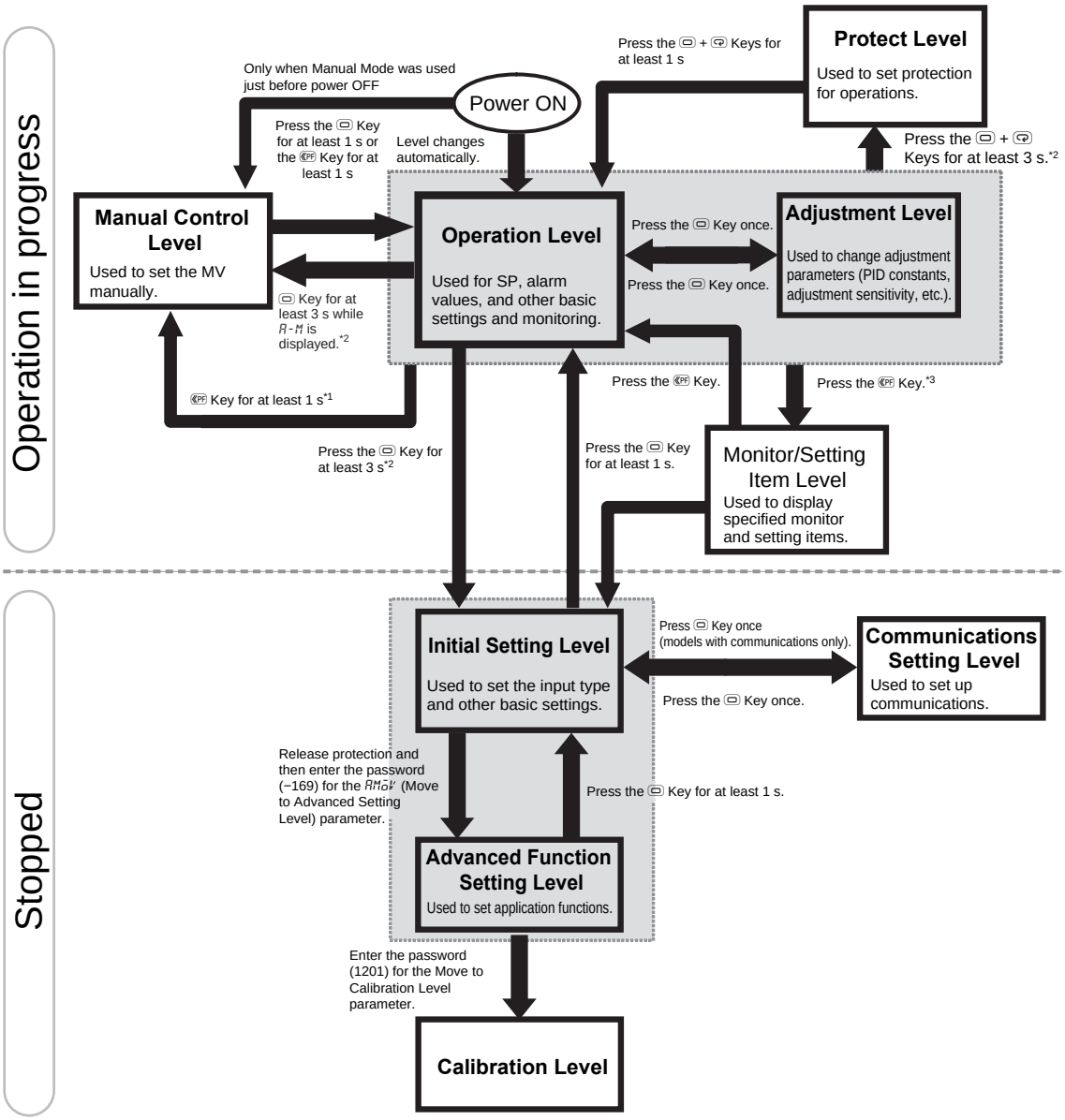


Use the End Cover when you mount the E5DC to a panel to hide the gap between the Controller and the panel.

Operation

Setting Levels Diagram

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 To use a key procedure to move to Manual Control Level, set the Auto/Manual Select Addition parameter to ON and 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).

Error Displays (Troubleshooting)

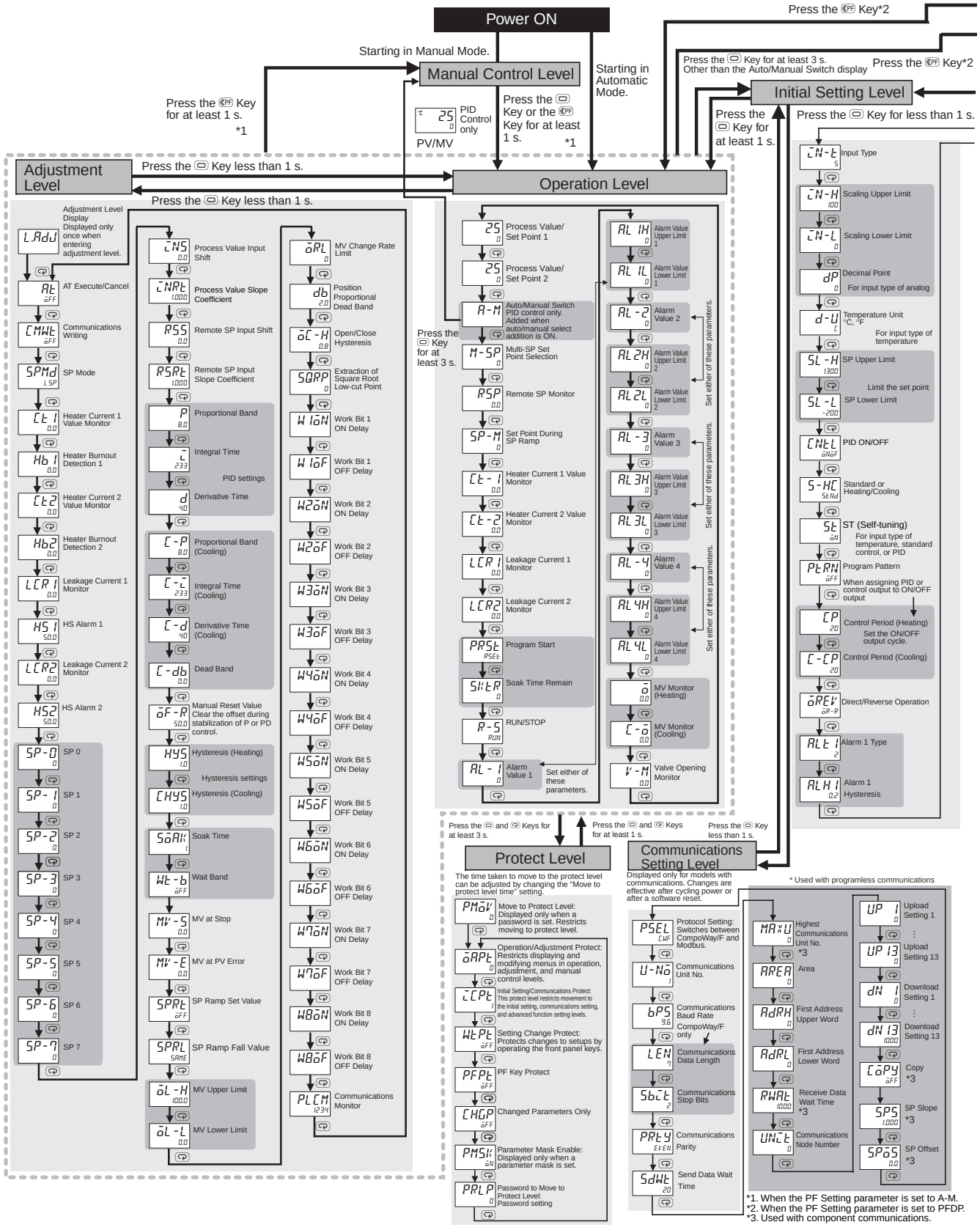
When an error occurs, the No. 1 display or No. 2 display shows the error code.
Take necessary measure according to the error code, referring the following table.

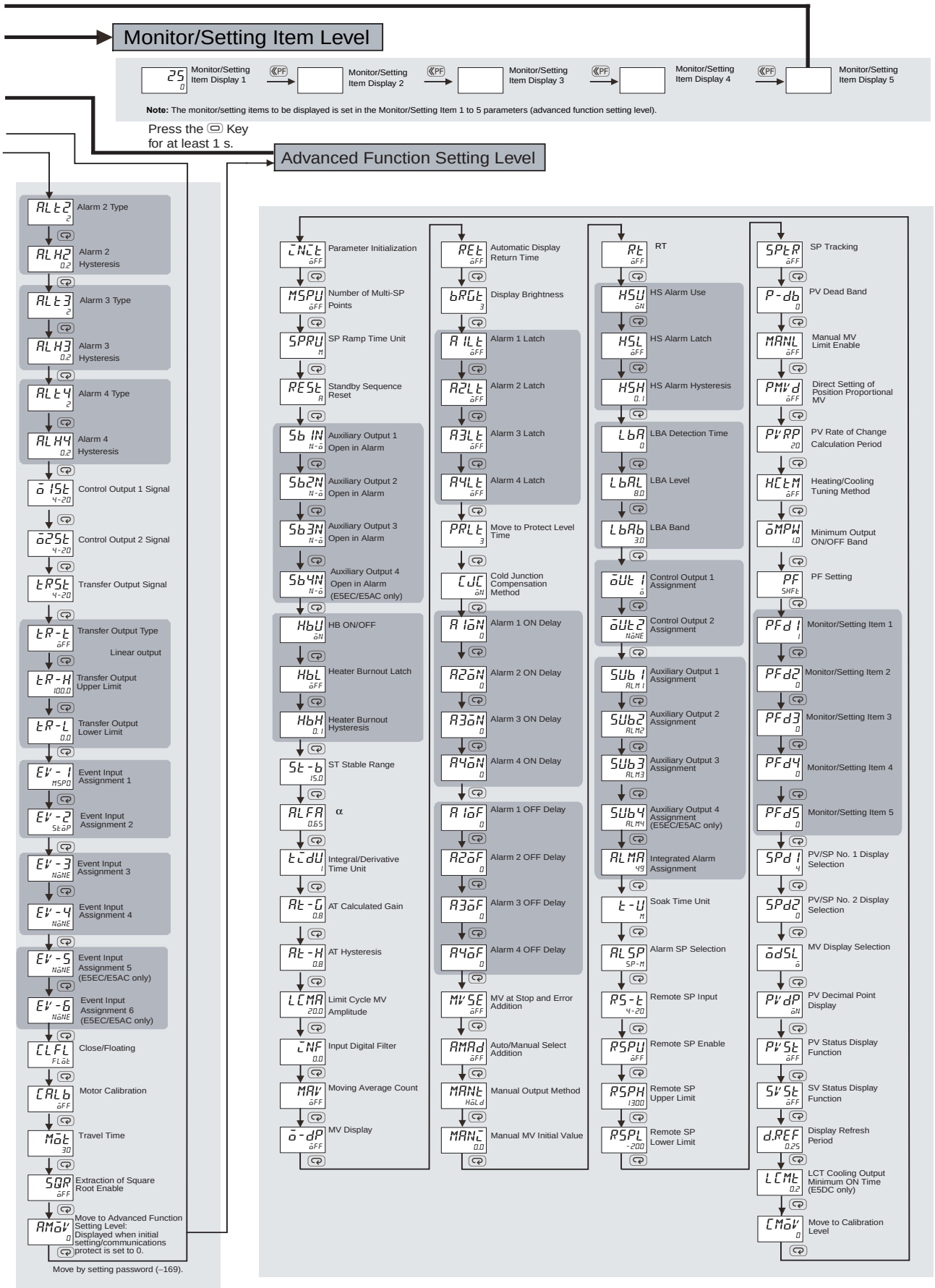
Display	Name	Meaning	Action	Operation
S.ERR	Input error	The input value exceeded the control range.* The input type is not set correctly. The sensor is disconnected or short-circuited. The sensor is not wired correctly. The sensor is not wired. * Control Range Temperature resistance thermometer or thermocouple 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%	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. **Note:** For a temperature resistance thermometer, the input is considered disconnected if the A, B, or B' line is broken.	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. **Note: 1.** The heating and cooling control outputs will turn OFF. **2.** When the manual MV, MV at stop, or MV at error is set, the control output is determined by the set value.
cccc 3333	Display range exceeded	Below -1,999 Above 9,999	This is not an error. It is displayed when the control range is wider than the display range and the PV exceeds the display range. The PV is displayed for the range that is given on the left (the number without the decimal point).	-	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) for information on the controllable range.
E333	A/D converter error	There is an error in the internal circuits.		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.	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.		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.	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
HB1 HB2 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)	"----" will be displayed for the Valve Opening Monitor parameter if any of the following error occurs. • 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.

Operation

Parameters

The following pages describe the parameters set in each level. Pressing the (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.




Monitor/Setting Item Level
Monitor/Setting Item Display 1
Monitor/Setting Item Display 2
Monitor/Setting Item Display 3
Monitor/Setting Item Display 4
Monitor/Setting Item Display 5
Note: The monitor/setting items to be displayed is set in the Monitor/Setting Item 1 to 5 parameters (advanced function setting level).
Press the Key for at least 1 s.
Advanced Function Setting Level
Alarm 2 Type
Alarm 2 Hysteresis
Alarm 3 Type
Alarm 3 Hysteresis
Alarm 4 Type
Alarm 4 Hysteresis
Control Output 1 Signal
Control Output 2 Signal
Transfer Output Signal
Transfer Output Type
Linear output
Transfer Output Upper Limit
Transfer Output Lower Limit
Event Input Assignment 1
Event Input Assignment 2
Event Input Assignment 3
Event Input Assignment 4
Event Input Assignment 5 (E5EC/E5AC only)
Event Input Assignment 6 (E5EC/E5AC only)
Close/Floating
Motor Calibration
Travel Time
Extraction of Square Root Enable
Move to Advanced Function Setting Level: Displayed when initial setting/communications protect is set to 0.
Move by setting password (–169).
Parameter Initialization
Number of Multi-SP Points
SP Ramp Time Unit
Standby Sequence Reset
Auxiliary Output 1 Open in Alarm
Auxiliary Output 2 Open in Alarm
Auxiliary Output 3 Open in Alarm
Auxiliary Output 4 Open in Alarm (E5EC/E5AC only)
HB ON/OFF
Heater Burnout Latch
Heater Burnout Hysteresis
ST Stable Range
α
Integral/Derivative Time Unit
AT Calculated Gain
AT Hysteresis
Limit Cycle MV Amplitude
Input Digital Filter
Moving Average Count
MV Display
Automatic Display Return Time
Display Brightness
Alarm 1 Latch
Alarm 2 Latch
Alarm 3 Latch
Alarm 4 Latch
Move to Protect Level Time
Cold Junction Compensation Method
Alarm 1 ON Delay
Alarm 2 ON Delay
Alarm 3 ON Delay
Alarm 4 ON Delay
Alarm 1 OFF Delay
Alarm 2 OFF Delay
Alarm 3 OFF Delay
Alarm 4 OFF Delay
MV at Stop and Error Addition
Auto/Manual Select Addition
Manual Output Method
Manual MV Initial Value
RT
HS Alarm Use
HS Alarm Latch
HS Alarm Hysteresis
LBA Detection Time
LBA Level
LBA Band
Control Output 1 Assignment
Control Output 2 Assignment
Auxiliary Output 1 Assignment
Auxiliary Output 2 Assignment
Auxiliary Output 3 Assignment
Auxiliary Output 4 Assignment (E5EC/E5AC only)
Integrated Alarm Assignment
Soak Time Unit
Alarm SP Selection
Remote SP Input
Remote SP Enable
Remote SP Upper Limit
Remote SP Lower Limit
SP Tracking
PV Dead Band
Manual MV Limit Enable
Direct Setting of Position Proportional MV
PV Rate of Change Calculation Period
Heating/Cooling Tuning Method
Minimum Output ON/OFF Band
PF Setting
Monitor/Setting Item 1
Monitor/Setting Item 2
Monitor/Setting Item 3
Monitor/Setting Item 4
Monitor/Setting Item 5
PV/SP No. 1 Display Selection
PV/SP No. 2 Display Selection
MV Display Selection
PV Decimal Point Display
PV Status Display Function
SV Status Display Function
Display Refresh Period
LCT Cooling Output Minimum ON Time (E5DC only)
Move to Calibration Level

Safety Precautions

- **Be sure to read the precautions for all E5CC/E5EC/E5AC/E5DC models in the website at: http://www.ia.omron.com/.**

Warning Indications

⚠ CAUTION	**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.**
Precautions for Safe Use	**Supplementary comments on what to do or avoid doing, to use the product safely.**
Precautions for Correct Use	**Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.**

Meaning of Product Safety Symbols

	**Used to warn of the risk of electric shock under specific conditions.**
	**Used for general prohibitions for which there is no specific symbol.**
	**Used to indicate prohibition when there is a risk of minor injury from electrical shock or other source if the product is disassembled.**
	**Used for general CAUTION, WARNING, or DANGER precautions for which there is no specified symbol. (This symbol is also used as the alerting symbol, but shall not be used in this meaning on the product.)**
	**Used for general mandatory action precautions for which there is no specified symbol.**

⚠ CAUTION

Do not touch the terminals while power is being supplied.
Doing so may occasionally result in minor injury due to electric shock.

Electric shock may occur. Do not touch any cables or connectors with wet hands.

Electric shock, fire, or malfunction may occasionally occur. Do not allow metal objects, conductors, cuttings from installation work, or moisture to enter the Digital Temperature Controller or the Setup Tool port or ports. Attach the cover to the front-panel Setup Tool port whenever you are not using it to prevent foreign objects from entering the port.

Do not use the Digital Temperature Controller where subject to flammable or explosive gas. Otherwise, minor injury from explosion may occasionally occur.

Not doing so may occasionally result in fire. Do not allow dirt or other foreign objects to enter the Setup Tool port or ports, or between the pins on the connectors on the Setup Tool cable.

Minor electric shock or fire may occasionally occur. Do not use any cables that are damaged.

Never disassemble, modify, or repair the product or touch any of the internal parts. Minor electric shock, fire, or malfunction may occasionally occur.

CAUTION - Risk of Fire and Electric Shock

a. This product is UL listed*1 as Open Type Process Control Equipment. It must be mounted in an enclosure that does not allow fire to escape externally.
b. More than one disconnect switch may be required to de-energize the equipment before servicing the product.
c. Signal inputs are SELV, limited energy. *2
d. Caution: To reduce the risk of fire or electric shock, do not interconnect the outputs of different Class 2 circuits. *3

If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.

Even if you replace only the Main Unit of the E5DC, check the condition of the Terminal Unit.
If corroded terminals are used, contact failure in the terminals may cause the temperature inside the Digital Controller to increase, possibly resulting in fire.
If the terminals are corroded, replace the Terminal Unit as well.

Tighten the terminal screws to the rated torque of between 0.43 and 0.58 N•m. *4
Loose screws may occasionally result in fire.

Set the parameters of the product so that they are suitable for the system being controlled. If they are not suitable, unexpected operation may occasionally result in property damage or accidents.

A malfunction in the product may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage.
To maintain safety in the event of malfunction of the product, take appropriate safety measures, such as installing a monitoring device on a separate line.

*1. E5CC, E5EC, E5AC, and E5DC Controllers that were shipped through November 2013 are UL recognized.
*2. An SELV (separated extra-low voltage) system is one with a power supply that has double or reinforced insulation between the primary and the secondary circuits and has an output voltage of 30 V r.m.s. max. and 42.4 V peak max. or 60 VDC max.
*3. A class 2 circuit is one tested and certified by UL as having the current and voltage of the secondary output restricted to specific levels.
*4. The specified torque is 0.5 N·m for the E5CC-U.

Precautions for Safe Use

Be sure to observe the following precautions to prevent malfunction or adverse affects on the performance or functionality of the product. Not doing so may occasionally result in faulty operation.

1. This product is specifically designed for indoor use only.
   Do not use this product in the following places:
   - Places directly subject to heat radiated from heating equipment.
   - Places subject to splashing liquid or oil atmosphere.
   - Places subject to direct sunlight.
   - Places subject to dust or corrosive gas (in particular, sulfide gas and ammonia gas).
   - Places subject to intense temperature change.
   - Places subject to icing and condensation.
   - Places subject to vibration and large shocks.
2. Use and store the product within the rated ambient temperature and humidity.
   Gang-mounting two or more Digital Temperature Controllers, or mounting Digital Temperature Controllers above each other may cause heat to build up inside the Digital Temperature Controllers, which will shorten their service life. In such a case, use forced cooling by fans or other means of air ventilation to cool down the Digital Temperature Controllers.
3. To allow heat to escape, do not block the area around the Digital Temperature Controller.
   Do not block the ventilation holes on the Digital Temperature Controller.
4. Be sure to wire properly with correct polarity of terminals.
5. Use the specified size of crimped terminals (M3, width of 5.8 mm or less) to wire the E5CC, E5EC, E5AC, or E5DC. To connect bare wires to the terminal block of the E5CC, E5EC, E5AC, or E5DC, use copper braided or solid wires with a gage of AWG24 to AWG18 (equal to a cross-sectional area of 0.205 to 0.8231 mm^2). (The stripping length is 6 to 8 mm.) Up to two wires of the same size and type, or two crimped terminals can be inserted into a single terminal.
   Use the specified size of crimped terminals (M3.5, width of 7.2 mm or less) to wire the E5CC-U. To connect bare wires to the terminal block of the E5CC-U, use copper braided or solid wires with a gage of AWG24 to AWG14 (equal to a cross-sectional area of 0.205 to 2.081 mm^2). (The stripping length is 5 to 6 mm.) Up to two wires of the same size and type, or two crimped terminals can be inserted into a single terminal.
6. Do not wire the terminals that are not used.
7. Use a commercial power supply for the power supply voltage input to a Digital Temperature Controller with AC input specifications. Do not use the output from an inverter as the power supply. Depending on the output characteristics of the inverter, temperature increases in the Digital Temperature Controller may cause smoke or fire damage even if the inverter has a specified output frequency of 50/60 Hz.
8. To avoid inductive noise, keep the wiring for the product's terminal block away from power cables carry high voltages or large currents. Also, do not wire power lines together with or parallel to product wiring. Using shielded cables and using separate conduits or ducts is recommended.
   Attach a surge suppressor or noise filter to peripheral devices that generate noise (in particular, motors, transformers, solenoids, magnetic coils, or other equipment that have an inductance component).
   When a noise filter is used at the power supply, first check the voltage or current, and attach the noise filter as close as possible to the product.
   Allow as much space as possible between the product and devices that generate powerful high frequencies (high-frequency welders, high-frequency sewing machines, etc.) or surge.
9. Use this product within the rated load and power supply.
10. Make sure that the rated voltage is attained within two seconds of turning ON the power using a switch or relay contact. If the voltage is applied gradually, the power may not be reset or output malfunctions may occur.
11. Make sure that the Digital Temperature Controller has 30 minutes or more to warm up after turning ON the power before starting actual control operations to ensure the correct temperature display.
12. When executing self-tuning with E5□C, turn ON power to the load (e.g., heater) at the same time as or before supplying power to the product. If power is turned ON to the product before turning ON power to the load, self-tuning will not be performed properly and optimum control will not be achieved.
13. A switch or circuit breaker must be provided close to the product. The switch or circuit breaker must be within easy reach of the operator, and must be marked as a disconnecting means for this unit.
14. Use a soft and dry cloth to clean the product carefully. Do not use organic solvent, such as paint thinner, benzine or alcohol to clean the product.
15. Design the system (e.g., control panel) considering the 2 seconds of delay that the product's output to be set after power ON.
16. The output may turn OFF when you move to the initial setting level. Take this into consideration when performing control operations.
17. The number of non-volatile memory write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
18. Use suitable tools when taking the Digital Temperature Temperature Controller apart for disposal. Sharp parts inside the Digital Temperature Controller may cause injury.
19. For compliance with Lloyd's standards, the E5CC, E5CC-U, E5EC, and E5AC must be installed under the conditions that are specified in *Shipping Standards*.
20. Do not connect cables to both the front Setup Tool port and the top-panel or bottom-panel Setup Tool port at the same time. The Digital Controller may be damaged or may malfunction.
21. Do not place heavy object on the Conversion Cable, bend the cable past its natural bending radius, or pull on the cable with undue force.
22. Do not disconnect the Communications Conversion Cable or the USB-Serial Conversion Cable while communications are in progress. Damage or malfunction may occur.
23. Do not touch the external power supply terminals or other metal parts on the Digital Temperature Controller.
24. Refer to the E5□C Digital Temperature Controllers User's Manual (Cat. No. H174) for information on the communications distances and cables for the E5□C.
25. Do not bend the communications cables past their natural bending radius. Do not pull on the communications cables.
26. Do not turn the power supply to the Digital Temperature Controller ON or OFF while the USB-Serial Conversion Cable is connected. The Digital Temperature Controller may malfunction.
27. Make sure that the indicators on the USB-Serial Conversion Cable are operating properly. Depending on the application conditions, deterioration in the connectors and cable may be accelerated, and normal communications may become impossible. Perform periodic inspection and replacement.
28. Connectors may be damaged if they are inserted with excessive force. When connecting a connector, always make sure that it is oriented correctly. Do not force the connector if it does not connect smoothly.
29. Noise may enter on the USB-Serial Conversion Cable, possibly causing equipment malfunctions. Do not leave the USB-Serial Conversion Cable connected constantly to the equipment.
30. For the E5DC, when you attach the Main Unit to the Terminal Unit, make sure that the hooks on the Main Unit are securely inserted into the Terminal Unit.
31. For the E5CC-U, when you attach the Main Unit to the socket, make sure that the hooks on the socket are securely inserted into the Main Unit.
32. Install the DIN Track vertically to the ground.
33. For the E5DC, always turn OFF the power supply before connecting the Main Unit to or disconnecting the Main Unit from the Terminal Unit, and never touch nor apply shock to the terminals or electronic components. When connecting or disconnecting the Main Unit, do not allow the electronic components to touch the case.

Shipping Standards

The E5CC, E5CC-U, E5EC, and E5AC comply with Lloyd's standards. When applying the standards, the following installation requirements must be met in the application.

Application Conditions

● Installation Location

The E5CC, E5CC-U, E5EC, and E5AC comply with installation category ENV1 and ENV2 of Lloyd's standards. Therefore, they must be installed in a location equipped with air conditioning. They cannot be used on the bridge or decks, or in a location subject to strong vibration.

Precautions for Correct Use

● Service Life

1. Use the product within the following temperature and humidity ranges:
   Temperature: -10 to 55°C (with no icing or condensation)
   Humidity: 25% to 85%
   If the product is installed inside a control board, the ambient temperature must be kept to under 55°C, including the temperature around the product.
2. The service life of electronic devices like Digital Temperature Controllers is determined not only by the number of times the relay is switched but also by the service life of internal electronic components. Component service life is affected by the ambient temperature: the higher the temperature, the shorter the service life and, the lower the temperature, the longer the service life. Therefore, the service life can be extended by lowering the temperature of the Digital Temperature Controller.
3. When two or more Digital Temperature Controllers are mounted horizontally close to each other or vertically next to one another, the internal temperature will increase due to heat radiated by the Digital Temperature Controllers and the service life will decrease. In such a case, use forced cooling by fans or other means of air ventilation to cool down the Digital Temperature Controllers. When providing forced cooling, however, be careful not to cool down the terminals sections alone to avoid measurement errors.

● Measurement Accuracy

1. When extending or connecting the thermocouple lead wire, be sure to use compensating wires that match the thermocouple types.
2. When extending or connecting the lead wire of the platinum resistance thermometer, be sure to use wires that have low resistance and keep the resistance of the three lead wires the same.
3. Mount the product so that it is horizontally level.
4. If the measurement accuracy is low, check to see if input shift has been set correctly.

● Waterproofing (Not applicable to the E5CC-U/E5DC.)

The degree of protection is as shown below. Sections without any specification on their degree of protection or those with IP□0 are not waterproof.

Front panel: IP66, Rear case: IP20, Terminal section: IP00

When waterproofing is required, insert the Waterproof Packing on the backside of the front panel. Keep the Port Cover on the front-panel Setup Tool port of the E5EC/E5AC securely closed. The degree of protection when the Waterproof Packing is used is IP66. To maintain an IP66 degree of protection, the Waterproof Packing and the Port Cover for the front-panel Setup Tool port must be periodically replaced because they may deteriorate, shrink, or harden depending on the operating environment. The replacement period will vary with the operating environment. Check the required period in the actual application. Use 3 years or sooner as a guideline. If the Waterproof Packing and Port Cover are not periodically replaced, waterproof performance may not be maintained. If a waterproof structure is not required, then the Waterproof Packing does not need to be installed.

● Operating Precautions

1. When using self-tuning, turn ON power for the load (e.g., heater) at the same time as or before supplying power to the Digital Controller. If power is turned ON for the Digital Controller before turning ON power for the load, self-tuning will not be performed properly and optimum control will not be achieved.
   When starting operation after the Digital Temperature Controller has warmed up, turn OFF the power and then turn it ON again at the same time as turning ON power for the load. (Instead of turning the Digital Temperature Controller OFF and ON again, switching from STOP mode to RUN mode can also be used.)
2. Avoid using the Controller in places near a radio, television set, or wireless installing. These devices can cause radio disturbances which adversely affect the performance of the Controller.

● Others

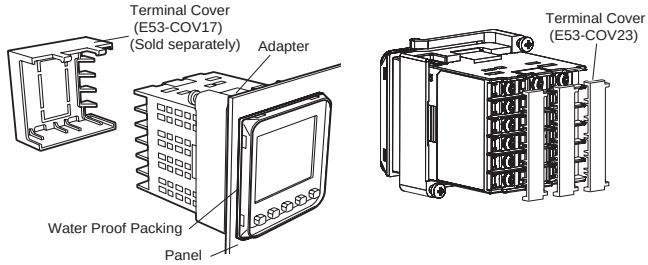
1. Do not Connect or disconnect the Conversion Cable connector repeatedly over a short period of time.
   The computer may malfunction.
2. After connecting the Conversion Cable to the computer, check the COM port number before starting communications. The computer requires time to recognize the cable connection. This delay does not indicate failure.
3. Do not connect the Conversion Cable through a USB hub. Doing so may damage the Conversion Cable.
4. Do not use an extension cable to extend the Conversion Cable length when connecting to the computer. Doing so may damage the Conversion Cable.

● Mounting

Mounting to a Panel

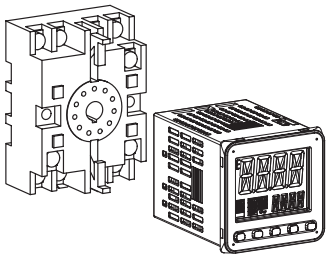
E5CC

There are two models of Terminal Covers that you can use with the E5CC.



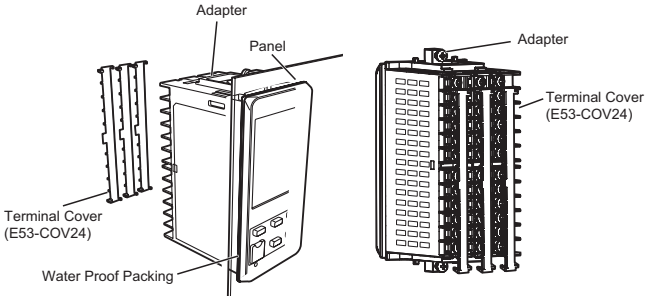
E5CC-U

For the Wiring Socket for the E5CC-U, purchase the P2CF-11 or PG3A-11 separately.



1. For waterproof mounting, waterproof packing must be installed on the Controller. Waterproofing is not possible when group mounting several Controllers. Waterproof packing is not necessary when there is no need for the waterproofing function.
   The E5CC-U cannot be waterproofed even if the Waterproof Packing is inserted.
2. Insert the E5CC/E5CC-U into the mounting hole in the panel.
3. Push the adapter from the terminals up to the panel, and temporarily fasten the E5CC.
4. Tighten the two fastening screws on the adapter.
   Alternately tighten the two screws little by little to maintain a balance. Tighten the screws to a torque of 0.29 to 0.39 N·m.

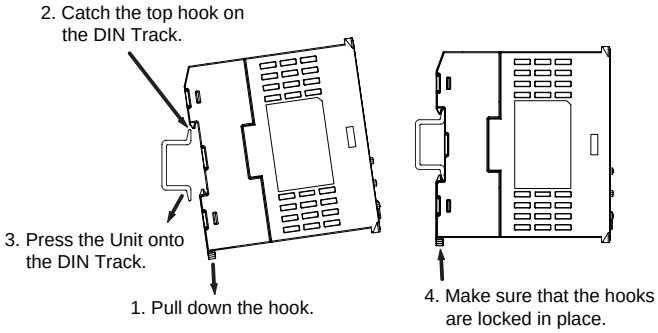
E5EC/E5AC



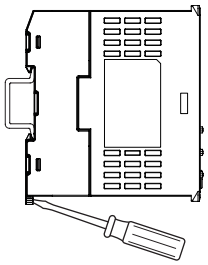
1. For waterproof mounting, waterproof packing must be installed on the Controller. Waterproofing is not possible when group mounting several Controllers. Waterproof packing is not necessary when there is no need for the waterproofing function.
2. Insert the E5EC/E5AC into the mounting hole in the panel.
3. Push the adapter from the terminals up to the panel, and temporarily fasten the E5EC/E5AC.
4. Tighten the two fastening screws on the adapter. Alternately tighten the two screws little by little to maintain a balance. Tighten the screws to a torque of 0.29 to 0.39 N·m.

Mounting to and Removing from DIN Track
E5DC

- Mounting a Unit
  Pull down the DIN Track hook on the Terminal Unit and catch the top hook on the DIN Track.
  Press the Unit onto the DIN Track until the DIN Track hooks are locked in place.

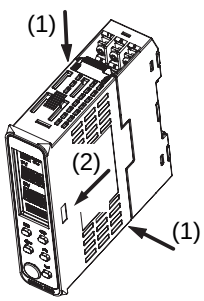


- Removing a Unit
  Pull down on the DIN Track Hook with a flat-blade screwdriver and lift up the Unit.



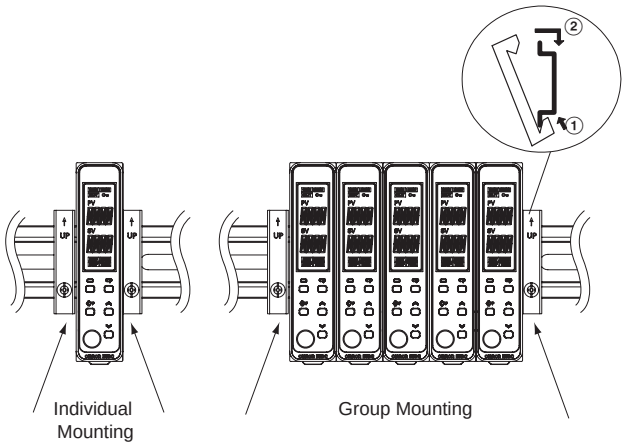
Removing the Main Unit

Press in the two hooks on the Main Unit and remove the Main Unit from the Terminal Unit.



End Plate Installation

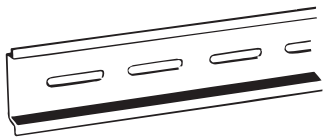
Make sure to attach PFP-M End Plates to the ends of the Units.



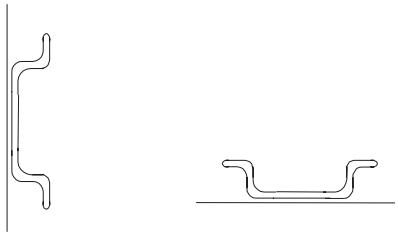
Mounting the DIN Track

Attach the DIN Track to the inside of the control panel with screws to at least three locations.

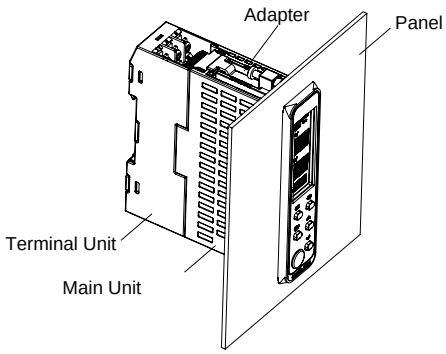
- DIN Track (sold separately)
  PFP-50N (50 cm) and PFP-100N (100 cm)



Install the DIN Track vertically to the ground.



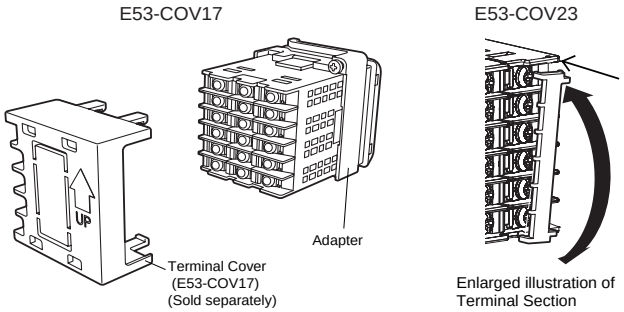
Mounting to a Panel
E5DC



1. Insert the E5DC into the mounting hole in the panel. (Attach the Terminal Unit after you insert the Main Unit.)
2. Push the Adapter from the Terminal Unit up to the panel, and temporarily fasten the E5DC.
3. Tighten the two fastening screws on the Adapter. Alternately tighten the two screws little by little to maintain a balance. Tighten the screws to a torque of 0.29 to 0.39 N·m.

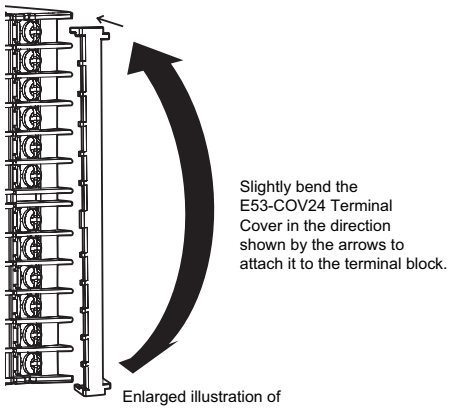
Mounting the Terminal Cover
E5CC

Slightly bend the E53-COV23 Terminal Cover to attach it to the terminal block as shown in the following diagram. The Terminal Cover cannot be attached in the opposite direction. E53-COV17 Terminal Cover can be also attached.
Make sure that the "UP" mark is facing up, and then attach the E53-COV17 Terminal Cover to the holes on the top and bottom of the Digital Temperature Controller.



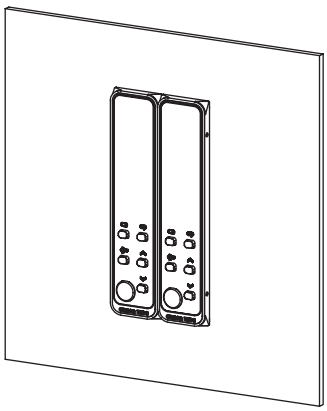
E5EC/E5AC

Slightly bend the E53-COV24 Terminal Cover to attach it to the terminal block as shown in the following diagram. The Terminal Cover cannot be attached in the opposite direction.

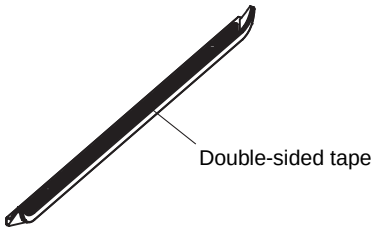


Attaching the End Cover
E5DC

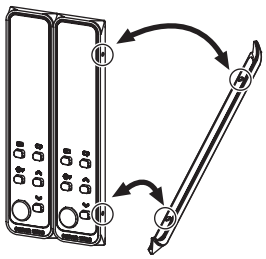
1. Install the E5DC in a panel.

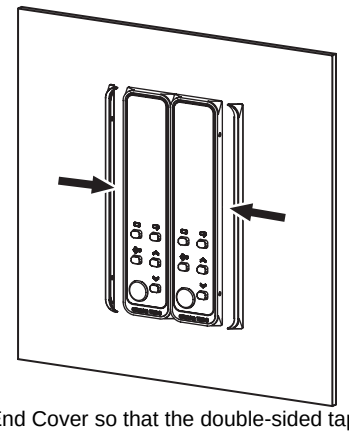


2. Peel off the release paper from the double-sided tape on the End Cover.

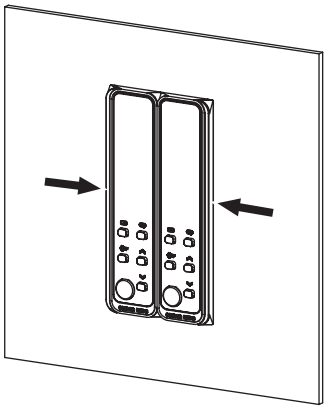


3. Align the tabs on the End Cover with the depressions on the E5DC and attach the End Cover.



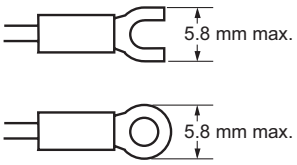


4. Secure the End Cover so that the double-sided tape is firmly attached.

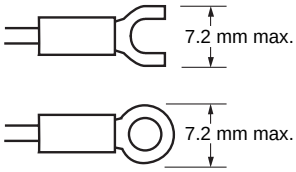


● Precautions when Wiring

- Separate input leads and power lines in order to prevent external noise.
- Use a shielded, AWG24 to AWG18 (cross-sectional area of 0.205 to 0.8231 mm^2) twisted-pair cable. Use a shielded, AWG24 to AWG14 (cross-sectional area of 0.205 to 2.081 mm^2) twisted-pair cable for the E5CC-U. The stripping length is 6 to 8 mm for the E5CC, E5EC, E5AC, or E5DC and 5 to 6 mm for the E5CC-U.
- Use crimp terminals when wiring the terminals.
- Use the suitable wiring material and crimp tools for crimp terminals.
- Tighten the terminal screws to a torque of 0.43 to 0.58 N·m. The specified torque is 0.5 N·m for the E5CC-U.
- For the E5CC, E5EC, E5AC, or E5DC, use the following types of crimp terminals for M3 screws.



- For the E5CC-U, use the following types of crimp terminals for M3.5 screws.



Three-year Guarantee

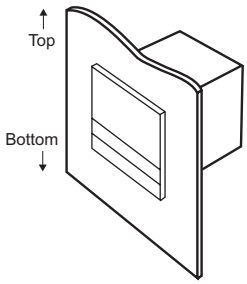
● Period of Guarantee

The guarantee period of the Unit is three years starting from the date the Unit is shipped from the factory.

Scope of Guarantee

The Unit is guaranteed under the following operating conditions.

1. Average Operating Temperature (see note): –10°C to 50°C
2. Mounting Method: Standard mounting



Note: Average Operating Temperature
Refer to the process temperature of the Unit mounted to a control panel and connected to peripheral devices on condition that the Unit is in stable operation, sensor input type K is selected for the Unit, the positive and negative thermocouple input terminals of the Unit are short-circuited, and the ambient temperature is stable.

Should the Unit malfunction during the guarantee period, OMRON shall repair the Unit or replace any parts of the Unit at the expense of OMRON.

MEMO

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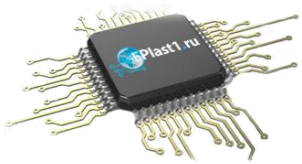
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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