

Digital Temperature Controller

E5DC/E5DC-B

(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.

Models with Push-In Plus Terminal Blocks Added to Lineup.

- 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.
- Select from models with screw terminal blocks and models with Push-In Plus terminal blocks for reduced wiring work.
- No need for power supply and communication line wiring when using connectors with Push-In Plus terminal blocks. (Maximum connectable units: 16)
- 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.



* CSA conformance evaluation by UL.



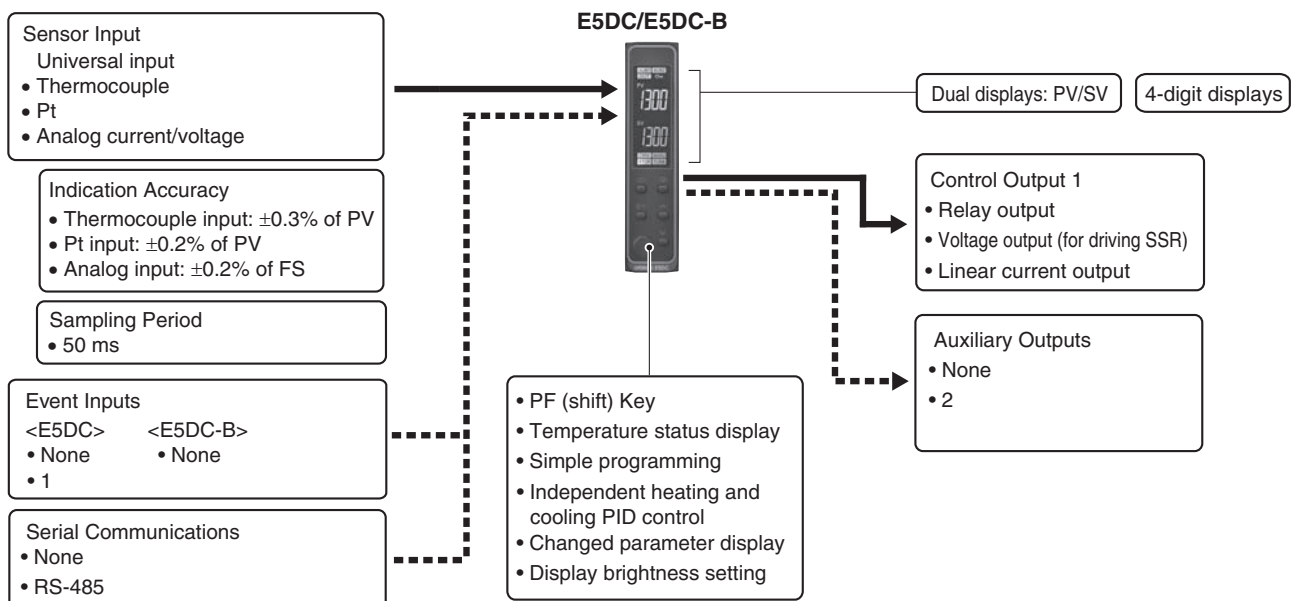
22.5 mm Wide, and DIN Track-mounting Type Models with Push-In Plus Terminal Blocks
E5DC-B

22.5 mm Wide, and DIN Track-mounting Type Models with Screw Terminal Blocks
E5DC

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

Refer to **Safety Precautions** on page 122.

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 and Standard Models

Model Number Legend

Models with Screw Terminal Blocks

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

(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				
E5DC							22.5 mm wide and mounts to DIN Track			
							Control output 1		Control output 2	
	RX						Relay output		None	
	QX						Voltage output (for driving SSR)		None	
*1	CX						Linear current output *1		None	
		0					None			
		2					2 (one common)			
			A				100 to 240 VAC			
			D				24 VAC/DC			
				S			Screw terminal blocks (Main Unit and Terminal Unit together)			
				U			Main Unit only (no Terminal Unit)			
					M		Universal input			
							HB alarm and HS alarm		Communications	Event input
					*2	000	---		---	---
					*3	002	1		RS-485	---
					*4	015	---		RS-485	---
					*5	016	---		---	1
					*3	017	1		---	1

*1. The control output can be used as a simple transfer output for the Digital Temperature Controllers manufactured in July 2014 or later.

*2. Option 000 can be selected only if two auxiliary outputs are selected.

*3. 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.

*4. Option 015 cannot be selected if the control output is a relay output or voltage output and two auxiliary outputs are selected.

*5. Options 016 can be selected only if the control output is a linear current output and two auxiliary outputs are selected.

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.

List of Models

Control output	No. of auxiliary outputs	Options			Model			
		HB alarm and HS alarm	No. of event inputs	Communications	Power supply voltage 100 to 240 VAC	Power supply voltage 24 VAC/DC		
Relay output	---	---	---	RS-485	E5DC-RX0ASM-015	E5DC-RX0DSM-015		
				---	E5DC-RX0AUM-015	E5DC-RX0DUM-015		
				2	Detection for single-phase heater	---	E5DC-RX2ASM-000	E5DC-RX2DSM-000
							E5DC-RX2AUM-000	E5DC-RX2DUM-000
	2	Detection for single-phase heater	1	RS-485	E5DC-RX2ASM-002	E5DC-RX2DSM-002		
				---	E5DC-RX2AUM-002	E5DC-RX2DUM-002		
				---	E5DC-RX2ASM-017	E5DC-RX2DSM-017		
				---	E5DC-RX2AUM-017	E5DC-RX2DUM-017		
Voltage output (for driving SSR)	---	---	---	RS-485	E5DC-QX0ASM-015	E5DC-QX0DSM-015		
				---	E5DC-QX0AUM-015	E5DC-QX0DUM-015		
				2	Detection for single-phase heater	---	E5DC-QX2ASM-000	E5DC-QX2DSM-000
							E5DC-QX2AUM-000	E5DC-QX2DUM-000
	2	Detection for single-phase heater	1	RS-485	E5DC-QX2ASM-002	E5DC-QX2DSM-002		
				---	E5DC-QX2AUM-002	E5DC-QX2DUM-002		
				---	E5DC-QX2ASM-017	E5DC-QX2DSM-017		
				---	E5DC-QX2AUM-017	E5DC-QX2DUM-017		
Linear current output	---	---	---	RS-485	E5DC-CX0ASM-015	E5DC-CX0DSM-015		
				---	E5DC-CX0AUM-015	E5DC-CX0DUM-015		
				2	---	---	E5DC-CX2ASM-000	E5DC-CX2DSM-000
							E5DC-CX2AUM-000	E5DC-CX2DUM-000
	2	---	1	RS-485	E5DC-CX2ASM-015	E5DC-CX2DSM-015		
				---	E5DC-CX2AUM-015	E5DC-CX2DUM-015		
				---	E5DC-CX2ASM-016	E5DC-CX2DSM-016		
				---	E5DC-CX2AUM-016	E5DC-CX2DUM-016		

Model Number Legend

Models with Push-In Plus Terminal Blocks

E5DC-□□ □□ B M-□□□□ (Example: E5DC-QX2ABM-002)

(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	Control output 1	Control output 2
E5DC							22.5 mm wide and mounts to DIN Track	
	RX						Relay output	None
	QX						Voltage output (for driving SSR)	None
*1	CX						Linear current output *1	None
		0					None	
		2					2 (one common)	
			A				100 to 240 VAC	
			D				24 VAC/DC	
				B			Push-In Plus Terminal Blocks	
					M		Universal input	
							HB alarm and HS alarm	Communications
					*2	000	---	---
					*3	002	1	RS-485
					*4	015	---	RS-485

*1. The control output can be used as a simple transfer output for the Digital Temperature Controllers manufactured in July 2014 or later.

*2. Option 000 can be selected only if two auxiliary outputs are selected.

*3. 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.

*4. Option 015 cannot be selected if the control output is a relay output or voltage output and two auxiliary outputs are selected.

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.

List of Models

Control output	No. of auxiliary outputs	Options		Model	
		HB alarm and HS alarm	Communications	Power supply voltage	
				100 to 240 VAC	24 VAC/DC
Relay output	2	---	---	E5DC-RX2ABM-000	E5DC-RX2DBM-000
		Detection for single-phase heater	RS-485	E5DC-RX2ABM-002	E5DC-RX2DBM-002
	---	---	---	E5DC-RX0ABM-015	E5DC-RX0DBM-015
Voltage output (for driving SSR)	2	---	---	E5DC-QX2ABM-000	E5DC-QX2DBM-000
		Detection for single-phase heater	RS-485	E5DC-QX2ABM-002	E5DC-QX2DBM-002
	---	---	---	E5DC-QX0ABM-015	E5DC-QX0DBM-015
Linear current output	2	---	---	E5DC-CX2ABM-000	E5DC-CX2DBM-000
	---	---	---	E5DC-CX0ABM-015	E5DC-CX0DBM-015
	2	---	RS-485	E5DC-CX2ABM-015	E5DC-CX2DBM-015

Optional Products (Order Separately)

Terminal Unit

Model
E5DC-SCT1S

Push-In Plus Terminal Unit

Model
E5DC-SCT1B

USB-Serial Conversion Cable

Model
E58-CIFQ2

Communications 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
5.8 mm	E54-CT1L*
12.0 mm	E54-CT3
12.0 mm	E54-CT3L*

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

Mounting Adapter

Model
Y92F-53 (2pcs)

Short Bars (for E5DC)

Model
Y92S-P11 (4 pcs)

CX-Thermo Support Software

Model
EST2-2C-MV4

Note: CX-Thermo version 4.6 or higher is required for the E5DC.
CX-Thermo version 4.69 or higher is required for the E5DC-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).

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

Connector Cover (for E5DC-B)

Model
E53-COV26

E5DC/E5DC-B

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, C/W, or PL II Platinum resistance thermometer: Pt100 or JPt100 Infrared temperature sensor (ES1B): 10 to 70°C, 60 to 120°C, 115 to 165°C, or 140 to 260°C Analog input Current input: 4 to 20 mA or 0 to 20 mA Voltage input: 1 to 5 V, 0 to 5 V, or 0 to 10 V
Input impedance		Current input: 150 Ω max., Voltage input: 1 MΩ min. (Use a 1:1 connection when connecting the ES2-HB-N/THB-N.)
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Control output	Relay output	SPST-NO, 250 VAC, 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	4 to 20 mA DC/0 to 20 mA DC, load: 500 Ω max., resolution: Approx. 10,000
Auxiliary output	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 (reference value)
Event input *1	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. *2
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, display brightness setting, simple transfer output, *3 and work bit message *3
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. This function is not supported by the E5DC-B. Refer to *Model Number Legend* on page 60.

*2. Only two set points are selectable for event inputs.

*3. Usage is possible for the Digital Temperature Controllers manufactured in July 2014 or later.