

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

E5DC-QX2ABM-000



Image

100 to 240 VAC, 1 point input, Thermocouple/Platinum resistance thermometer/Infrared Thermosensor (ES1B)/Analog input, Control output: Voltage output (for driving SSR)/None, Push-In Plus Terminal Block, Black (N1.5)

Shape	22.5 mm wide
Terminal type	Push-In Plus Terminal Block
Input type	Thermocouple/Platinum resistance thermometer/Infrared Thermosensor (ES1B)/Analog input
Control output 1	Voltage output (for driving SSR)
Control output 2	None
Number of total auxiliary output	2 point
Power supply voltage	100 to 240 VAC (50/60 Hz)

Ratings / Performance

As of October 12, 2022

Ratings

Shape	22.5 mm wide	
Fixed/Programmable	Fixed	
Power supply voltage	100 to 240 VAC (50/60 Hz)	
Allowable voltage variable range	85 to 110% of the power supply voltage	
Power consumption	4.9 VA max. (at 100 to 240 VAC)	
Input	Number of input points	1 point
	Temperature input	Thermocouple: K, J, T, E, L, U, N, R, S, B, C/W, PLII Platinum resistance thermometer: Pt100, JPt100 Infrared Thermosensor (ES1B): 10 to 70 °C, 60 to 120 °C, 115 to 165 °C, 140 to 260 °C
	Analog input	4 to 20 mA or 0 to 20 mA
	Input impedance	Current input: 150 Ω max., voltage input: 1 MΩ min. (Applicable when connecting 1:1 to ES2-HB-N/THB-N.)
Control method	ON/OFF control or 2-PID control (with auto-tuning)	
Control output	Number of total control output	1 point
	Control output 1	Voltage output (for driving SSR)
	Control output 2	None
	Voltage output (for driving SSR)	1 point 12 VDC±20%, Maximum load current: 21 mA, PNP, with short-circuit protection circuit

Auxiliary output	Number of total auxiliary output	2 point
	Relay output	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)
Setting method		Digital setting using front panel keys (with protection function)
Indication method		11-segment digital display and individual indicators
Multi SP functions		Up to eight set points (SP0 to SP7) can be saved and selected using key operations.
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		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		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s)
Derivative time		0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s)
for cooling	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)
	Derivative time (D)	0 to 9999 s (in units of 1 s), 0.0 to 999.9 s (in units of 0.1 s)
Control period		0.1 s, 0.2 s, 0.5 s, 1 to 99 s (in units of 1 s)
Manual reset value		0.0% to 100.0% (in units of 0.1%)
Insulation resistance		Between charged terminals and exposed uncharged parts: 20 MΩ min. (500 VDC) Between current-carrying terminals: 20 MΩ min. (500 VDC) Between non-continuous contacts: 20 MΩ min. (500 VDC)
Dielectric strength		3,000 VAC 50/60 Hz 1 min (Between current-carrying terminals of different polarity)
Vibration resistance		Destruction: 10 to 55 Hz, 20 m/s ² for 2 h each in X, Y, and Z directions Malfunction: 10 to 55 Hz, 20 m/s ² for 10 min each in X, Y, and Z directions
Shock resistance		Destruction: 300 m/s ² , 3 times each in X, Y, and Z directions Malfunction: 100 m/s ² , 3 times each in X, Y, and Z directions
Ambient temperature (Operating)		-10 to 55 °C (with no freezing or condensation) For 3-year warranty with standard mounting: -10 to 50 °C (with no freezing or condensation)
Ambient temperature (Storage)		-25 to 65 °C (with no freezing or condensation)
Ambient humidity (Operating)		25 to 85 %
Altitude		2000 m max.
Degree of protection		Main unit: IP20, Terminal unit: IP00
Memory protection		Non-volatile memory (number of writes: 1,000,000)
Case color		Black (N1.5)
Terminal type		Push-In Plus Terminal Block
Accessories		Two of Instruction Manual, One of Compliance information sheet, One of Connector Cover
Weight		Main Unit: Approx. 80 g Models with Push-In Plus Terminal Unit: Approx. 40 g
Sold separately		Push-In Plus Terminal Block Unit: E5DC-SCT1B USB Serial Conversion Cable: E58-CIFQ2 Communications Conversion Cable: E58-CIFQ2-E Mounting adapter: Y92F-53 Unit label: Y92S-L2 CX-Thermo Support Software: EST2-2C-MV4

DIN Tracks: PFP-100N/PFP-50N
 Spacer: PFP-S
 End Plate: PFP-M
 End Cover: Y92F-54
 Connector cover: E53-COV26

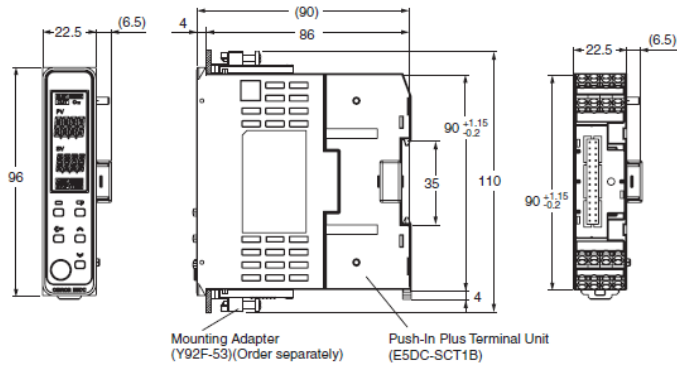
Accuracy

Indication accuracy	Thermocouple: ($\pm 0.3\%$ of indicated value or $\pm 1\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Platinum resistance thermometer: ($\pm 0.2\%$ of indicated value or $\pm 0.8\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 0.2\%$ FS ± 1 digit max. (The indication accuracy of K thermocouples in the -200 to $1300\text{ }^\circ\text{C}$ range, T and N thermocouples at a temperature of $-100\text{ }^\circ\text{C}$ max., and U and L thermocouples at any temperatures is $\pm 2\text{ }^\circ\text{C}$ ± 1 digit max. B thermocouple at a temperature of $400\text{ }^\circ\text{C}$ max. is not specified. B thermocouples in the 400 to $800\text{ }^\circ\text{C}$ range is $\pm 3\text{ }^\circ\text{C}$ max. R and S thermocouples at a temperature of $200\text{ }^\circ\text{C}$ max. is $\pm 3\text{ }^\circ\text{C}$ ± 1 digit max. C/W thermocouples is ($\pm 0.3\%$ PV or $\pm 3\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. PL II thermocouples is ($\pm 0.3\%$ PV or $\pm 2\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max.)
Influence of temperature/voltage	Thermocouple: R, S, B, C/W, and PLII: ($\pm 1\%$ of indicated value or $\pm 10\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Others: ($\pm 1\%$ of indicated value or $\pm 4\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max.. However K thermocouple at $-100\text{ }^\circ\text{C}$ max.: $\pm 10\text{ }^\circ\text{C}$ max. Platinum resistance thermometer: ($\pm 1\%$ of indication value or $\pm 2\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 1\%$ FS ± 1 digit max. Ambient temperature: -10 to 23 to $55\text{ }^\circ\text{C}$, Voltage range: -15 to 10% of rated voltage
Influence of EMS.	Thermocouple: R, S, B, C/W, and PLII: ($\pm 1\%$ of indicated value or $\pm 10\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Others: ($\pm 1\%$ of indicated value or $\pm 4\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max.. However K thermocouple at $-100\text{ }^\circ\text{C}$ max.: $\pm 10\text{ }^\circ\text{C}$ max. Platinum resistance thermometer: ($\pm 1\%$ of indication value or $\pm 2\text{ }^\circ\text{C}$, whichever is greater) ± 1 digit max. Analog input: $\pm 1\%$ FS ± 1 digit max.
Influence of signal source resistance	Thermocouple: $0.1\text{ }^\circ\text{C}/\Omega$ max. ($100\ \Omega$ max.) Platinum resistance thermometer: $0.1\text{ }^\circ\text{C}/\Omega$ max. ($10\ \Omega$ max.)

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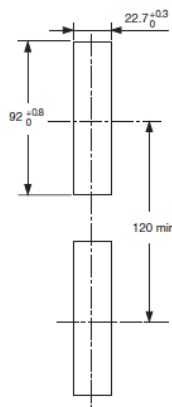
Dimensions

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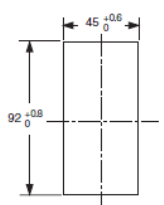


- Setup Tool ports are provided as standard feature. Use these ports to connect a computer to the Digital Temperature Controller. The E58-CIFQ2 USB-Serial Conversion Cable is required to connect to the port on the bottom panel. The E58-GIFQ2 USB-Serial Conversion Cable and E58-GIFQ2-E Communications Conversion Cable are required to connect to the port on the front panel. (You cannot leave either port connected constantly during operation.)

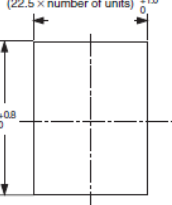
Mounted Separately



Two-Unit Mounting



Group Mounted



- 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.

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Connection diagram

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Alarm mode list

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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		*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) 	
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) 	

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