OMRON

Multipoint Temperature Controller | E5ZE-8□D1□B

Multipoint Temperature Controller Connects to the Programmable Controller with Ease

- Conforms to DeviceNet requirements with remote I/O and FINS message communications, thus connecting to a CompoBus/D Master without programs for remote I/O communications and to OMRON's Programmable Controller with ease for FINS message communications.

- High-speed input sampling requires only 0.2 s at a maximum of eight temperature inputs.

Ordering Information

No. of control points	Control method	Control output	Heater burnout and SSR failure detection	Input type	
				Thermocouple	Platinum resistance thermometer
8	Standard (see note 1)	Voltage	Available (see note 2)	E5ZE-8AQHD1TCB	E5ZE-8AQHD1PB
		Current	Not available	E5ZE-8ACAD1TCB	E5ZE-8ACAD1PB
	Heating and cooling	Voltage	Available (see note 2)	E5ZE-8VQHD1TCB	E5ZE-8VQHD1PB
		Current (see note 3)	Not available	E5ZE-8VCAD1TCB	E5ZE-8VCAD1PB

Note:
1. Cooling control is possible by making a change in output operation.
2. Models without the heater burnout/SSR failure detection function are also available.
3. Cooling control output is an open collector output (NPN).

■ Temperature Ranges

Thermocouple

Input (switch selectable)		K (CA) Chromel vs. alumel (see note 1)	J (IC) Iron vs. constantan	R Platinum vs. Platinum rhodium 13%	S Platinum vs. Platinum rhodium 10%	T (CC)/U Copper vs. constantan	E (CRC) Chromel vs. constantan	B Platinum rhodium 30% vs. platinum rhodium 6%	N Nichrosil vs. nisil	L Iron vs. constantan	U Copper vs. constantan	W (see note 2)	PL-II (Platinum)
Range	°C	−200 to 1,300	−100 to 850	0 to 1,700	0 to 1,700	−200 to 400	0 to 600	100 to 1,800	0 to 1,300	−100 to 850	−200 to 400	0 to 2,300	0 to 1,300
	°F	−300 to 2,300	−100 to 1500	0 to 3,000	0 to 3,000	−300 to 700	0 to 1100	300 to 3,000	0 to 2,300	−100 to 1,500	−300 to 700	32 to 4,100	0 to 2,300
Setting no.		0	1	2	3	4	5	6	7	8	9	A	B
Min. setting unit		1°C or 0.1°C											

Platinum Resistance Thermometer

Input (switch selectable)		Pt 100 (see note 1)	JPt 100
Range	°C	−100.0 to 500.0	−100.0 to 500.0
	°F	−100.0 to 900.0	−100.0 to 900.0
Setting no.		0	1
Min. setting unit		1°C or 0.1°C	

Note:
1. A temperature range is factory-set to a range of −200° to 1,300°C (for K(CA)) or −100.0° to 500.0°C (for Pt 100).
2. Thermocouple W is W/Re5-26 (tungsten rhenium 5, tungsten rhenium 26).

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1

■ Accessories (Order Separately)

Setting Display Unit

Connecting model	Connecting part	Power supply	Model
RS-232C	Connector	100 to 240 VAC	E5ZD-SDL1
		24 VDC	

Note: Not all the functions of the E5ZE can be set, which should be taken into consideration when designing the system. For details, refer to the *E5ZD-SDL Setting Display Unit Datasheet (H061)*.

Current Transformers (CT)

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

Special Cables

Model
E5ZE-CBL200
ES100-CT021-202 (25-pin)
ES100-CT023-202 (9-pin)

Recommended Power Supplies

Series
S82J
S82K

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2

Specifications ─────────────────────────────────────

■ Ratings

Supply voltage		24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		15 W + 20% max. at rated supply voltage
Input	**Input type**	Thermocouple: K, J, R, S, T, E, B, N, L, U, W, PL-II Platinum resistance thermometer: Pt100, JPt100
	Input impedance	Thermocouple: 1 MΩ min.
	Rated platinum resistance thermometer current	1 mA
Control outputs	**Standard (Heating side)**	Voltage output (with short-circuit protecting function) ON: 12 ± 1.2 VDC OFF: 0.5 VDC max. Max. load current: 30 mA DC per point Current output Rated output range: 4 to 20 mA DC Current output range: 0 to 22 mA DC With an output value of 0%: $4^{+0}/_{-0.6}$ mA DC With an output value of 100%: $20^{+2}/_{-0}$ mA DC Max. load resistance: 600 Ω per point
	Cooling side	Open collector output (NPN) Max. applied voltage: 30 VDC Max. load current: 50 mA DC per point ON residual voltage: 2 VDC max. OFF leakage current: 1 mA DC max.
Alarm outputs		Temperature alarm: The total output of all control points (alarm 1 NPN open collector output and alarm 2 NPN open collector output) HB alarm (heater burnout detection): Total output of all control points (1-point NPN open collector output) HS alarm (SSR failure detection): Total output of all control points (1-point NPN open collector output) Temperature controller error output (memory, set value, or hardware error): 1-point NPN open collector output Max. applied voltage: 30 VDC Max. load current: 50 mA DC per point
No. of input control points		8 input and 8 control points
Setting method		Through communication
Control modes		ON/OFF control Hybrid of advanced PID control and fuzzy control Manual operation
Memory bank input		No. of points: 8 for each control point Designation method: Through communication or memory bank designation input
Memory bank designation inputs		With contact signal input ON short-circuit resistance: 1 kΩ max. OFF open resistance: 100 kΩ min. With no-contact signal input ON residual voltage: 2 VDC max. OFF leakage current: 1 mA DC max.

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3

■ Characteristics

Measurement accuracy (see note)	Thermocouple:
	    (±0.3% of the process value or ±2°C, whichever greater) ±1 digit max.
	    (±0.3% of the process value or ±3.6°F, whichever greater) ±1 digit max.
	Platinum resistance thermometer:
	    (±0.3% of the process value or ±0.8°C, whichever greater) ±1 digit max.
	    (±0.3% of the process value or ±1.5°F, whichever greater) ±1 digit max.

Hysteresis	0.0° to 99.9°C/°F for ON/OFF control only (in units of 0.1°C/°F)
Cooling coefficient	0.0 to 10.0 (in units of 0.1)
Proportional band	0.0° to 999.9°C/°F (in units of 0.1°C/°F) Cooling side: Cooling coefficient × Proportional band
Integral (reset) time	0 to 3,999 s (in units of 1 s) (for both heating and cooling)
Derivative (rate) time	0 to 3,999 s (in units of 1 s) (for both heating and cooling)
Control period	Heating side: 1 to 99 s (in units of 1 s) Cooling side: 1 to 99 s (in units of 1 s)
Sampling period	200 ms for 8 control points
Dead band/overlap band	−999° to 999°C/°F (in units of 1°C/°F)
Alarm output setting range	−999° to 9999°C/°F, 0 to 9999°C/°F (upper- and lower-limit alarm) (in units of 1°C/°F) −999.9° to 9999.9°C/°F, 0.0 to 9999.9°C/°F (upper- and lower-limit alarm) (in units of 0.1°C/°F) (see note 3)
Fuzzy strength	0% to 99% (in units of 1%)
Fuzzy scale 1	0.2° to 999.9°C/°F (in units of 0.1°C/°F)
Fuzzy scale 2	0.02° to 99.99°C/s or °F/s (in units of 0.01°C/s or °F/s)
Set value backup	Lithium battery
Set value backup period	10 years min. provided that the ambient temperature is within the room temperature
Insulation resistance	20 MΩ min. between the FG terminal and all analog input terminals (at 500 VDC)
Dielectric strength	A leakage current of 1 mA AC max. with 500 VAC for 1 minutes between the FG terminal and all analog input terminals
Vibration resistance	Malfunction: 10 to 55 Hz, 15 m/s^2 for 8 min each in X, Y, and Z directions Destruction: 10 to 55 Hz, 20 m/s^2 for 8 min each in X, Y, and Z directions
Shock resistance	Malfunction: 150 m/s^2, 3 times each in 6 directions Destruction: 200 m/s^2, 3 times each in 6 directions
Ambient temperature	Operating: 0° to 55°C (with no icing or condensation) Storage: −25° to 65°C (with no icing or condensation)
Ambient humidity	Operating: 35% to 85% Storage: 35% to 95%
Dimensions	With casing: 173.5 x 253 x 65 mm max.
Enclosure rating	IP00
Weight	With casing: 1,700 g max.

Note: 1. The measurement accuracy of the E5ZE used with a thermocouple B at 400°C or 750°F max. is not guaranteed. The following measurement accuracy values are applied to the E5ZE.

K and T at −100°C max. and U:	±3°C ±1 digit max.
K and T at −100°F max. and U:	±5.4°F ±1 digit max.
R, S, and W at 200°C max., and B at 1,000°C max.:	±4°C ±1 digit max.
R, S, and W at 400°F max., and B at 1,800°F max.:	±7.2°F ±1 digit max.

2. The measurement accuracy of the E5ZE used with any thermocouple is 1°C/°F. The thermocouple can be used under the following temperature ranges to increase the measurement accuracy to as high as 0.1°C/°F.

K thermocouple:	0.0 °C to 1,300.0 °C, 0.0 °F to 2,300.0 °F
T or U thermocouple:	0.0 °C to 400.0 °C, 0.0 °F to 700.0 °F
N thermocouple:	400.0 °C to 1,300.0 °C, 700.0 °F to 2,300.0 °F
J, E, L, or PLII thermocouple:	Any temperature

3. Upper limit is 3000.0°C/°F when set from CompoBus/D.

■ Communications

Conforming to DeviceNet Communications Protocol

For details, refer to the *CompoBus/D (DeviceNet) Operation Manual (W267)* and the *E5ZE-8 (CompoBus/D) Operation Manual (H104)*.

Connection method	Multi-drop or T-branching (see note 1)
Baud rate	500/250/125 kbps
Communications media	Dedicated 5-wire cable (with 2 communications wires, 2 power wires, and 1 shield wire)
Communications distance	Baud rate Maximum network length (see note 2) Branch line length Total branch line length 500 kbps 100 m max. (see note 3) 6 m max. 39 m max. 250 kbps 250 m max. (see note 3) 6 m max. 78 m max. 125 kbps 500 m max. (see note 3) 6 m max. 156 m max.
Remote I/O points	IN: 14 / OUT: 9
Error control	CRC error and node address duplication check

Note: 1. An external terminator must be attached.

2. Indicates the distance between nodes farthest from each other.

3. The maximum network length is 100 m if a thin dedicated cable is applied to the trunk line.

⚠ **NOTICE:** This product has been tested by ODVA's authorized Independent Test Lab and found to comply with ODVA Conformance Test Software Version 2.0-1.00.

For the specifications of objects in details, refer to the *E5ZE-8 (CompoBus/D) Operation Manual (H104)*.

CompoBus/D Communications Items

Remote I/O communications	IN: Temperature measurement (8 points), Alarms 1 and 2 status, AT status, HB alarm status, HS alarm status, and error status
	OUT: RUN/STOP and SP (set point) (8 points)
FINS message communications	All read and write parameters

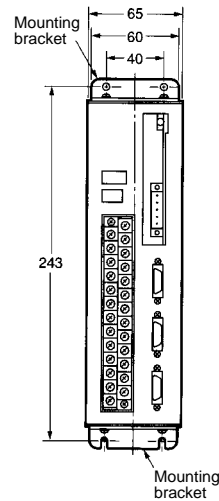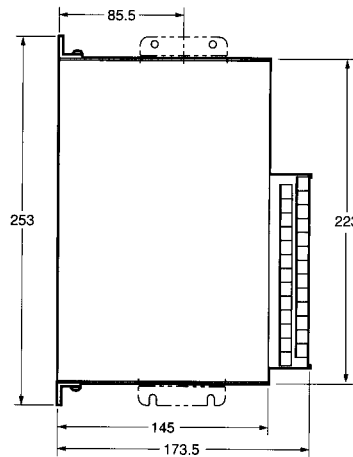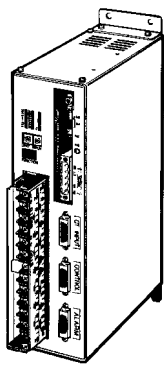# Operation ──────────────────────────

■ System Configuration
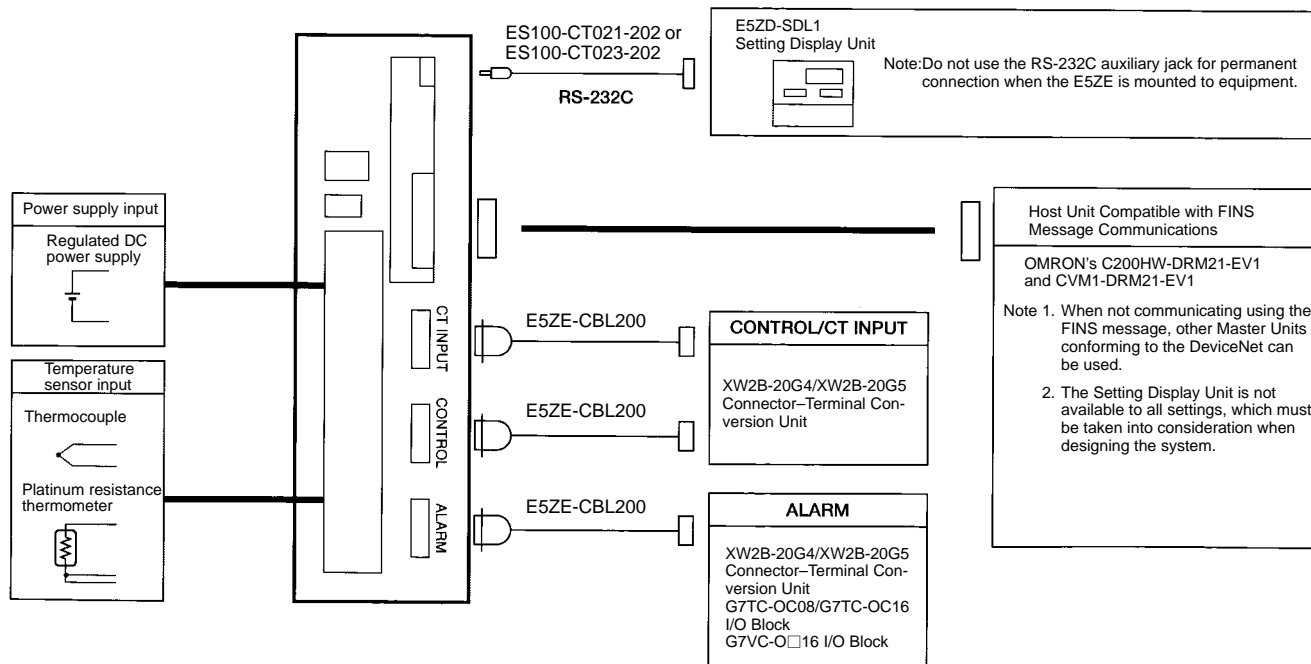
⚠ **Caution**
Be sure to use the above Units, which save wiring effort, and connection cables for the prevention of malfunctions or accidents that may be caused by mistakes in wiring.
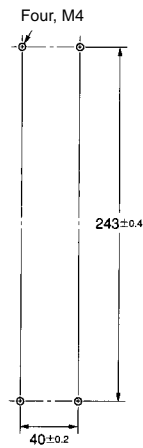
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5

Dimensions

Note: All units are in millimeters unless otherwise indicated.

E5ZE-8☐D1-☐B

Mounting Holes

253

85.5

223

243

65
60
40

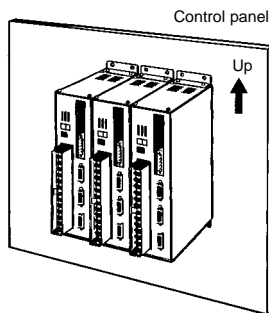Mounting bracket

Mounting bracket

145

173.5

Four, M4

243±0.4

40±0.2

Precautions
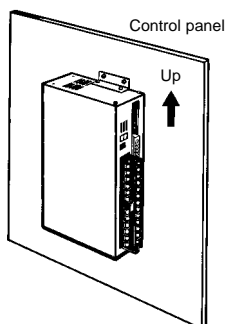
Mounting the Controllers

Side-by-side, Close Mounting

Saves space and improves wiring efficiency.

Control panel

Up

Wall Mounting

Can be mounted to places with limited depth.

Control panel

Up

General Mounting Precautions

The side of the E5ZE with the terminal block and connectors must not face up, otherwise operating errors may result.

Prepare four M4 screws to mount the E5ZE to control panels. Use flat washers and spring washers with screws to mount the E5ZE to control panels so that the screws will not loosen.

The mounting brackets must be attached to the E5ZE with the four M3 x 6 screws provided with the E5ZE and each of the screws should be tightened to a torque of 0.43 to 0.58 N • m, or 4.4 to 5.9 kgf • cm.

Do not mount as shown in the following diagram.

Up

Control panel
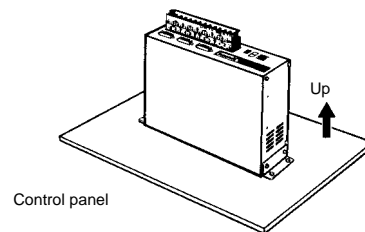
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.