

Thank you for purchasing the OMRON E5AN temperature controller. Read this manual carefully before using the controller and always keep it close at hand while the controller is in use.

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For detailed operating instructions, please refer to the E5AN User's Manual.

Safety Precautions

Key to Warning Symbols

CAUTION Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or property damage. Read this manual carefully before using the product.

Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product. Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product. NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product catalog for Warranty and Limitation of Liability.

Precautions for safety use

- 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.
- Use/store within the rated temperature and humidity ranges. Provide forced-cooling if required.
- To allow heat to escape, do not block the area around the product. Do not block the ventilation holes on the product.
- Be sure to wire properly with correct polarity of terminals.
- Use specified size (M3.5, width 7.2 mm or less) crimped terminals for wiring.
- Do not wire the terminals which are not used.
- Allow as much space as possible between the controller and devices that generate a powerful high-frequency or surge. Separate the high-voltage or large-current power lines from other lines, and avoid parallel or common wiring with the power lines when you are wiring to the terminals.
- Use this product within the rated load and power supply.
- Make sure that the rated voltage is attained within two seconds of turning the power ON.
- Make sure the controller has 30 minutes or more for warm up.
- When executing self-tuning, turn the load and the unit ON simultaneously, or turn the load ON before you turn the controller ON.
- A switch or circuit breaker should be provided close to this unit. The switch or circuit breaker should be within easy reach of the operator, and must be marked as a disconnecting means for this unit.
- If you remove the controller from its case, or put the controller into its case, never touch nor apply shock to the terminals and the electronic parts inside. Make sure the electronic components and the case are not contacted when inserting the internal mechanism.
- Cleaning: Do not use paint thinner or the equivalent. Use standard grade alcohol to clean the product.

Specifications

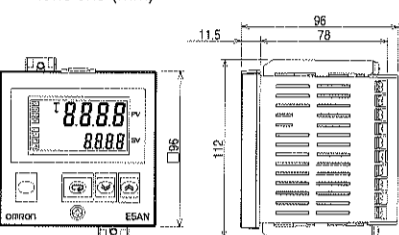
Power supply voltage	100-240VAC type 24V AC/DC type
Operating frequency	50-60Hz
Operating voltage range	85 to 110% of the rated voltage
Power consumption	9VA (AC100-240V) 5VA (AC24V) 4W (DC24V)
Sensor input	Thermocouple, platinum resistance thermometer, analog input, Infrared Thermosensor ES1A
Control output	Relay/Voltage/Current output
Mechanical life of relay	10 million operations
Electrical life of relay	100,000 operations
Control method	ON/OFF or advanced PID
Ambient temperature	-10 to 55°C (Avoid freezing or condensation)
Ambient humidity	RH 25 to 85%
Storage temperature	-25 to 65°C (Avoid freezing or condensation)
Altitude	Max. 2,000m
Recommended fuse	T2A, 250V AC, time-lag, low-breaking capacity
Weight	Approx. 310g (main unit only)
Installation environment	Category II, pollution degree2 (as per IEC61010-1)

Wiring

A1 0696899-0E

Dimensions

Dimensions (mm)



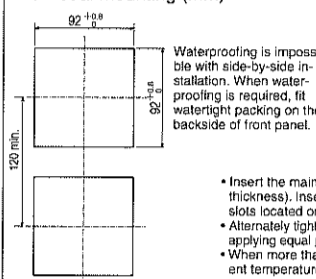
* When drawing out from its case, press down the hook and turn a screwdriver to loosen the screw on the lower part of the front panel.

- In the pack:
- Main unit
 - Waterproof packing
 - Adapter
 - Instruction manual
 - Terminal cover (E5AN-□-500 only)

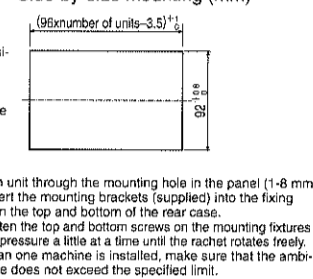
Solderless terminal size: M3.5
Terminal cover: E53-COV11

Installation

Individual mounting (mm)

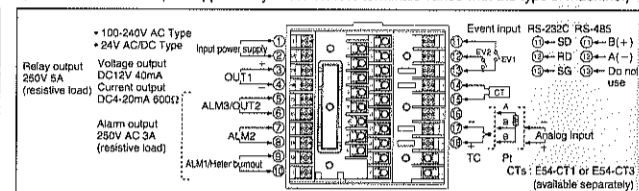


Side-by-side mounting (mm)



- Insert the main unit through the mounting hole in the panel (1-8 mm thickness). Insert the mounting brackets (supplied) into the fixing slots located on the top and bottom of the rear case.
- Alternately tighten the top and bottom screws on the mounting fixtures applying equal pressure a little at a time until the ratchet rotates freely.
- When more than one machine is installed, make sure that the ambient temperature does not exceed the specified limit.

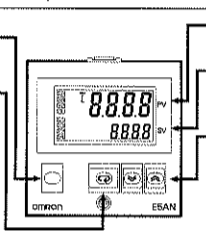
Connections (The applicability of the electric terminals varies with the type of machine.)



- Since the voltage output (control output) is not electrically insulated from the internal wiring, one of other of the control output terminals must be left unearthed when using an earthed thermocouple thermometer or resistance thermometer. (Connection makes measurements unreliable due to sneal currents.)
- Power supply, input, output, and communication terminals (for models with communications) have basic insulation between them.
- When double insulation is required, apply supplemental insulation defined in IEC 60664 that is suitable for the maximum operating voltage with clearances or solid insulation.

Names of parts on front panel

- Level key: Use this key to change levels.
- Display key: Press this key to change the contents of the display.
- Protect key: Press the \square key and the \square key together for at least 3 seconds to switch to protect level.



- No.1 display: Process value or set data symbol
- No.2 display: Set point, set data read-out value or changed input value
- Up and Down keys: Use the keys to change the values displayed on the No.2 display. Each press of \uparrow key increments or advances the values displayed on the No.2 display. Each press of \downarrow key decrements or returns the values displayed on the No.2 display.

- °C / °F temperature display: Used to indicate that the value in the display relates to temperature. Determined in accordance with the chosen "Temperature unit" setting.
F = °F
C = °C



Operation Indicators

- ALM1: Alarm 1: Lights up while alarm 1 is operating function.
- ALM2: Alarm 2: Lights up while alarm 2 is operating function.
- ALM3: Alarm 3: Lights up while alarm 3 is operating function.
- HB: Heater burnout: Lights up to indicate that heater burn-out has occurred.

- OUT1: Lights up when Process control 1 is on; goes off when Process control 1 is off. E5AN-C□□ type doesn't have this indicator.
- OUT2: Lights up when Process control 2 is on; goes off when Process control 2 is off.

- STOP: Lights up when operation has stopped. Lights up during control operation to indicate that event input or Run/Stop has been set to stop. Remains out at all other times.
- CMW: "write" control by communications: Lights up when "write" is enabled; goes off when "write" is disabled.

Operation menu

Input type

Input type	Input	Setting	Setting range		
Platinum resistance thermometer	Pt100	0	-200 to 850 (°C) / -300 to 1500 (°F)		
		1	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)		
		2	0.0 to 100.0 (°C) / 0.0 to 210.0 (°F)		
		3	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)		
Thermocouple	K	0	-200 to 1300 (°C) / -300 to 2300 (°F)		
		1	-20.0 to 500.0 (°C) / 0.0 to 900.0 (°F)		
		2	-100 to 850 (°C) / -100 to 1500 (°F)		
		3	-20.0 to 400.0 (°C) / 0.0 to 750.0 (°F)		
		4	-200 to 400 (°C) / -300 to 700 (°F)		
		17	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)		
		5	0 to 800 (°C) / 0 to 1100 (°F)		
		6	-100 to 850 (°C) / -100 to 1500 (°F)		
		7	-200 to 400 (°C) / -300 to 700 (°F)		
		18	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)		
		8	-200 to 1300 (°C) / -300 to 2300 (°F)		
Infrared Thermosensor ES1A	10-70°C	12	0 to 90 (°C) / 0 to 190 (°F)		
		13	0 to 120 (°C) / 0 to 240 (°F)		
		14	0 to 185 (°C) / 0 to 320 (°F)		
		15	0 to 260 (°C) / 0 to 500 (°F)		
		Analog input	0 to 50mV	16	Use the following ranges for scaling: -199.9 to 999.9, -199.9 to 999.9, Vary Depending on "L", "H" value

• Default="0" (both of input types)

Alarms

Setting	Alarm type	Alarm output function
0	No alarm function	Positive alarm value (X) Negative alarm value (X) Output off
1	Deviation upper/lower limit	ON OFF \rightarrow L H SP Vary with "L", "H" values
2	Deviation upper limit	ON OFF \rightarrow SP ON OFF \rightarrow SP
3	Deviation lower limit	ON OFF \rightarrow SP ON OFF \rightarrow SP
4	Deviation upper/lower range	ON OFF \rightarrow L H SP Vary with "L", "H" values
5	Deviation upper/lower limit standby sequence ON	ON OFF \rightarrow SP Vary with "L", "H" values
6	Deviation upper limit standby sequence ON	ON OFF \rightarrow SP ON OFF \rightarrow SP
7	Deviation lower limit standby sequence ON	ON OFF \rightarrow SP ON OFF \rightarrow SP
8	Absolute value upper limit	ON OFF \rightarrow 0 ON OFF \rightarrow 0
9	Absolute value lower limit	ON OFF \rightarrow 0 ON OFF \rightarrow 0
10	Absolute value upper limit standby sequence ON	ON OFF \rightarrow 0 ON OFF \rightarrow 0
11	Absolute value lower limit standby sequence ON	ON OFF \rightarrow 0 ON OFF \rightarrow 0

*1: Upper and lower limits can be set for parameters 1, 4 and 5 to provide for different types of alarm. These are indicated by the letter "L" and "H".
• Default="2"

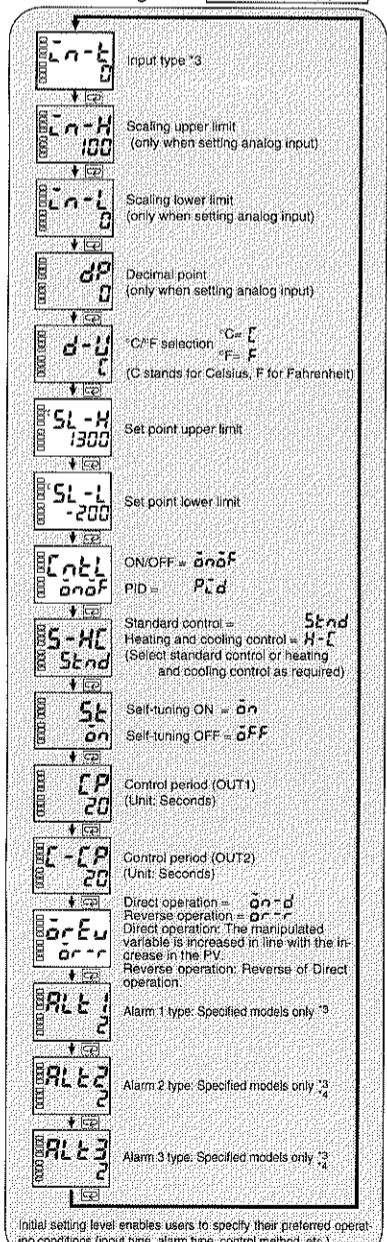
Error display (trouble shooting)

When an error has occurred, the No.1 display alternately indicates error codes together with the current display item.

No.1 display	Meaning	Action	Output status
SErr (S.Err)	Input error	Check the wiring of inputs, disconnections, shorts and input type.	Control output: OFF Alarm output: Operates as above the upper limit.
E111 (E1.1)	A/D converter error	After the correction of input error, turn the power OFF then back ON again. If the display remains the same, the controller must be changed. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	Control output: OFF Alarm output: OFF
HErr (H.Err)	Memory error	First, turn the power OFF then back ON again. If the display remains the same, the controller must be changed. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	Control output: OFF Alarm output: OFF
HErr (H.Err)	Internal circuit error		Control output: OFF Alarm output: OFF

If the input value exceeds the display limit (-199.9 to 999.999.9), though it is within the control range, [E111] will be displayed under -199.9 (-199.9) and [E222] above 999.9 (999.9). Under these conditions, control output and alarm output will operate normally. Refer to "E5AN User's Manual" for details of control range.
*2: Error shown only for "Process value / Set point". Not shown for other status.

Initial setting level

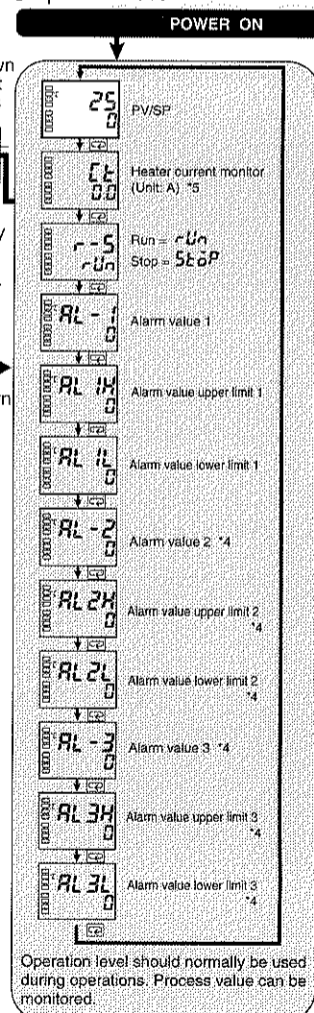


Other functions

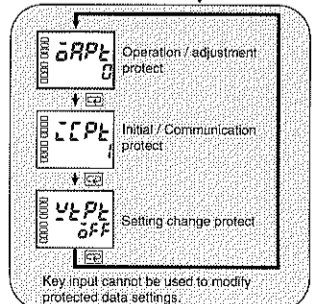
In addition to the aforementioned, there are alarm hysteresis, automatic return of display mode and others in the advanced setting level. Refer to "E5AN User's Manual" for details. For communications details, please refer to "E5AN/EN/CN/GN communications User's Manual".

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Operation level



Hold \square and \square keys down for at least 1 second

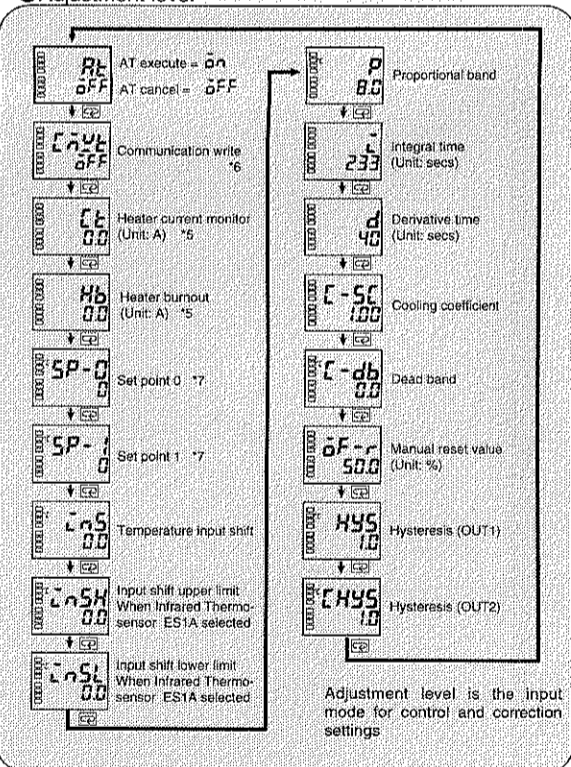


AT (auto-tuning)

- AT for temperature adjustment: When AT is running, "on": AT execute. To cancel AT, select "OFF": AT cancel.
- AT execute/cancel

The display reads "OFF" after AT is finished running.

Adjustment level



- *3: Refer to the adjoining tables for details of input types and alarm types.
- *4: Applicable only to models with alarm functions.
- *5: Applicable only to models with the heater burnout alarm function.
- *6: Applicable only to models with a communications function.
- *7: Applicable only to models with an event function.
- *8: Controller does not operate during initial setting level. (Process will be stopped)

Use the following key operations for transition between levels:
Operation level \rightarrow Protect level: \square + \square keys for at least three seconds
Operation level \rightarrow Adjustment level: \square key for less than one second
Operation level \rightarrow Initial level: \square key for at least three seconds
The values of grayed out parameters are shown only when set.

Operation / Adjustment protect

The following table shows the relationship between settings and protect limits related to Operation level and Adjustment level.

Mode	Setting	0	1	2	3
Process value		○	○	○	○
Set point		○	○	○	○
Others		○	○	○	○
Adjustment level		○	○	○	○

- : Can be displayed or changed
- : Can be displayed
- : Can not be displayed and move to other levels not possible

Initial / Communication protect

Limits transition to the Initial setting level, Communication setting level and Advanced function setting level

Setting	Initial setting level	Communication setting level
0	Transition possible (Transition to Advanced function level possible)	transition possible
1	Transition possible (Transition to Advanced function level not possible)	transition possible
2	Transition not possible	transition not possible

Setting change protect

Limits changes of setting by key operations.
OFF: Key operations can be used to change settings
ON: Key operations cannot be used to change settings (Protect level settings can all be changed)

