

CAUTION

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

Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.

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

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 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.

c) Signal inputs are SELV, limited energy.

d) Caution: To reduce the risk of fire or electric shock, do not interconnect the outputs of different Class 2 circuits.

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.

Tighten the terminal screws to between 0.74 and 0.90 N·m. 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 Digital Controller may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage. To maintain safety in the event of malfunction of the Digital Controller, take appropriate safety measures, such as installing a monitoring device on a separate line.

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 Safe Use

- Observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance and functions. Problems may occasionally occur. Do not handle the Controller in ways that exceed product specifications.
- This product is designed for indoor use only. Do not use or store the product in any of the following places.
 - Places subject to splashing liquid or oil atomization.
 - 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 vibration and condensation.
 - Places subject to blowing and large shocks.
 - Use store with 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 top.
 - 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. To connect bare wires to the terminal block, use copper braided or solid wires with a gage of AWG24 to AWG14 (equal to cross-sectional area of 0.205 to 2.081 mm²). (The stripping length is 5 to 6 mm.) Up to two wires of same size and type, or two crimped terminals can be inserted into a single terminal.
 - 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 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.
 - Make sure that the Digital 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.
 - 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.
 - Always turn OFF the power supply before pulling out the interior of the product, and never touch nor apply shock to the terminals or electronic components. When inserting the interior of the product, do not allow the electronic components to touch the case.
 - Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.
 - Design system (control panel, etc) considering the 2 second delay of the controller's output to be set after power ON.
 - The output may turn OFF when shifting to certain levels. Take this into consideration when performing control.
 - The number of non-volatile memory write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
 - The product's Setup Tool port and Infrared communication port are internally connected in models. Stop transmission from Infrared communication port before using the Setup Tool port.
 - Make sure the information provided in the catalog and manual and be sure you understand it before attaching a Control Output Unit.
 - Always use suitable tools to dismantle the product for disposal.
 - Do not continue to use the product if the front surface peels or becomes cracked.

Specifications

Power supply voltage	100 to 240 VAC, 50/60 Hz or 24 VDC
Operating voltage range	85 to 110% of the rated voltage
Power consumption	Approx. 12 VA (100 to 240 VAC) Approx. 8.5 VA (24 VDC)/5.5 W (24 VDC)
Indication accuracy (Ambient temperature: 23°C)	Thermocouple: (±0.1% of indication value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer: (±0.1% of indication value or ±0.5°C, whichever is greater) ±1 digit max. Analog input: ±0.1% FS ±1 digit max. Output current: approx. 7 mA per contact. ON: 1 kΩ max., OFF: 100 kΩ min. ON: residual voltage 1.5 V max. OFF: leakage current 0.1 mA max. Relay output: SPST-NO, 250 VAC, 5 A (resistive load) Electrical life of relay: 100,000 operations Control Output Unit ON/OFF or 2-PID control Relay outputs: SPST-NO, 250 VAC, 3 A (resistive load) Electrical life of relay: 100,000 operations -10 to 55°C (With no condensation or icing) 25 to 85% (With no condensation or icing) Max. 2,000 m T2A, 250 VAC, time-lag, low-breaking capacity Approx. 310 g (main unit only) Front panel: IP66 Rear case: IP20, Terminal section: IP00 Installation category II, pollution degree 2 (as per IEC61010-1) Non-volatile memory Number of write operations: 1,000,000 at ambient temperature of 25°C Position proportional potentiometer input, Remote SP input 4 to 20 mA DC, Load 600 Ω max.
Event input	
Contact input	
Contact input	
Control output 1 and 2	
Control method	
Auxiliary outputs	
Ambient temperature	
Ambient humidity	
Storage temperature	
Altitude	
Recommended fuse	
Weight	
Degree of protection	
Installation environment	
Memory protection	
Input	
Transfer output	

EN Instruction Manual

Thank you for purchasing the OMRON E5AN-HT Digital Controller. This manual describes the functions, performance, and application methods needed for optimum use of the product.

Please observe the following items when using the product.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
- Before using the product, thoroughly read and understand this manual to ensure correct use.
- Keep this manual in a safe location so that it is available for reference whenever required.

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For detailed operating instructions, refer to the E5CN-HT/E5AN-HT/E5EN-HT Digital Controllers User's Manual (Cat. No. H169).

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.

(AHT) 2153002-0A

Wiring

Dimensions

Dimensions (mm)

In the pack:

- Main unit
- Watertight packing
- Two mounting brackets
- Instruction manual
- Terminal cover (Provided only for models with "-500" suffix.)
- Solderless terminal size: M3.5
- Terminal cover: (Sold Separately) (Model: E53-COV16)
- USB-Serial Conversion Cable (Sold Separately) (E58-CIFQ1)
- USB-Infrared Conversion Cable (Sold Separately) (model E58-CIFR)

* The main unit can be removed for maintenance without disconnecting the terminal wiring.
* Do not remove the terminal block. Doing so may result in failure or malfunction.
* A Setup Tool port is provided on the bottom of the product. Use this port to connect a personal computer to the product when using the Setup Tool. E58-CIFQ1 USB-Serial Conversion Cable is required to connect the personal computer to the product. (Do not use the product with the USB-Serial Conversion Cable left permanently connected.)
Refer to the instruction manual provided with the USB-Serial Conversion Cable for details on connection methods.

Installation

Individual mounting (mm)

Mounting the output unit

When waterproofing is required, fit watertight packing on the backside of front panel.

Output placement is not required on the E5AN-HTPRR□□

- 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.)

* A heater burnout alarm, heater short alarm, heater overcurrent alarm, or input alarm is output to the output to which the alarm 1 function is assigned.
* The voltage output (control output) is not electrically insulated from the internal wiring. When using a grounded thermocouple thermometer, one or the other of the control output terminals must not be grounded. (If both terminals are grounded, measurements will be unreliable due to sneak current.)
* The last character of the lot number "R" indicates that reinforced insulation is provided between input power supply, relay outputs, and between other terminals.

Names of parts on front panel

Level key
Use this key to change levels.

Mode key
Press this key to change the contents of the display. Press this key for 1 s or longer for reverse scroll.

Function Key/Run Reset Key
Press this function key to operate the function set with the PF Setting.

Operation indicators

- SUB1: Auxiliary output 1 indicator
Lit when the function assigned to auxiliary output 1 is ON.
- SUB2: Auxiliary output 2 indicator
Lit when the function assigned to auxiliary output 2 is ON.
- SUB3: Auxiliary output 3 indicator
Lit when the function assigned to auxiliary output 3 is ON.
- HA: Heater burnout alarm/Heater short alarm/Heater overcurrent alarm indicator
Lit when a heater burnout alarm, heater short alarm, or heater overcurrent alarm has occurred.
- WAIT: Lit while the program is in wait status.
- ←: Shows the direction of change in the SP.

Operation Level

Hold [] down for at least 1 second

Hold [] down for at least 3 seconds

Press [] Key for less than 1 s

(The No. 3 display is applied)

Program Setting Level

Hold [] down for at least 1 second

Press [] Key for less than 1 s

(The No. 3 display is applied)

Adjustment Level

Press [] Key for less than 1 s.

Conformance to EN/IEC Standards

This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

Conformance to Safety Standards

Reinforced insulation is provided between input power supply, relay outputs, and between other terminals.

Operation menu

Input type

Input type	Input	Setting	Input setting range		
Platinum resistance thermometer	Pt100	0	-200.0 to 850.0 (°C) / -300.0 to 1500.0 (°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)		
Thermocouple	K	3	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)		
		4	0.0 to 100.0 (°C) / 0.0 to 210.0 (°F)		
		5	-200.0 to 1300.0 (°C) / -300.0 to 2300.0 (°F)		
		6	-20.0 to 850.0 (°C) / 0.0 to 900.0 (°F)		
		7	-100.0 to 850.0 (°C) / -100.0 to 700.0 (°F)		
		8	-20.0 to 400.0 (°C) / 0.0 to 750.0 (°F)		
		9	-200.0 to 400.0 (°C) / -300.0 to 700.0 (°F)		
		10	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)		
		11	-200.0 to 600.0 (°C) / -300.0 to 1100.0 (°F)		
		12	-100.0 to 850.0 (°C) / -100.0 to 1500.0 (°F)		
		Current input	4 to 20mA	25	One of the following ranges is used depending on scaling: -1999.9 to 32400
26	-1999.9 to 3240.0				
27	-199.99 to 3240.0				
28	-199.99 to 324.00				
29	-19.999 to 32.400				
Voltage input	0 to 5V			25	One of the following ranges is used depending on scaling: -1999.9 to 32400
				26	-1999.9 to 3240.0
				27	-199.99 to 3240.0
				28	-199.99 to 324.00
				29	-19.999 to 32.400

Initial Setting Level

Operation stopped. (Control/alarm are both stopped.)

The setting data for the E5AN-HTAA2HB is shown here as an example.

Check the wiring before turning ON the power supply.

Program Setting Level

Adjustment Level

Press [] Key for less than 1 s.

Operation/Adjustment protection

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

Level	0	1	2	3	4	5
Process value	○	○	○	○	○	○
PV/SP	○	○	○	○	○	○
Others	○	○	○	○	○	○
Program Setting Level	○	○	○	○	○	○
Adjustment level	○	○	○	○	○	○
PID Setting Level	○	○	○	○	○	○

Initial setting/Communications protection

This protect level restricts movement to the initial setting level, communications setting level and advanced function setting level.

Set value	Initial setting level	Communications setting level	Advanced function setting level
0	○	○	○
1	○	○	○
2	○	○	○

PID Setting Level

Press [] Key for less than 1 s.

AT (auto-tuning)

AT in Adjustment level
Designate "Rt-2: 100% AT execute" or "Rt-1: 40% AT execute" to execute AT and "dFF: AT cancel" to cancel AT. "Rt" flashes "100%AT Execute".

Advanced Function Setting Level

Hold [] down for at least 1 second

Moving to the next level is possible when the password (169) is input.

Other functions

For parameters in the Advanced Function Setting Level, PID Setting Level, Monitor/Setting Item Level, and Manual Control Level and for other information, refer to the E5CN-HT/E5AN-HT/E5EN-HT User's Manual (Cat. No. H169).

For information on communications, refer to the E5CN-HT/E5AN-HT/E5EN-HT Communications Manual (Cat. No. H170).

Alarm type

Setting	Alarm type	Alarm output function
0	No alarm function	Positive alarm value (X) / Negative alarm value (X)
1	Deviation upper/lower limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
2	Deviation upper limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
3	Deviation lower limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
4	Deviation upper/lower range	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
5	Deviation upper/lower limit standby sequence ON	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
6	Deviation upper limit standby sequence ON	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
7	Deviation lower limit standby sequence ON	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
8	Absolute value upper limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
9	Absolute value lower limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
10	Absolute value upper limit standby sequence ON	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
11	Absolute value lower limit standby sequence ON	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
12	LBA (only for alarm 1)	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
13	PV change rate alarm	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
14	RSP absolute value upper limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values
15	RSP absolute value lower limit	ON: Vary with "L", "H" values
		OFF: Vary with "L", "H" values

*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".
*2: The default alarm type is "2".

Error display (trouble shooting)

When an error has occurred, the No.1 display shows the error code. Take necessary measure according to the error code, referring the table below.

No.1 display	Meaning	Action	Status at error
SErr	Input error	Check the setting of the Input Type parameter, check the input wiring, and check for broken or shorts in the temperature sensor.	Control output Off Alarm as above the upper limit.
E333 (E333)	A/D converter error	After the correction of A/D converter error, turn the power OFF then back ON again. 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.	Control output Off Alarm as above the upper limit.
E111 (E111)	Memory error	Turn the power OFF then back ON again. 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.	Control output Off Alarm as above the upper limit.

If the input value exceeds the display limit (-19999 to 32400), though it is within the control range, [] will be displayed under -19999 and [] above 32400. Under these conditions, control output on the control output will operate normally.
For information on the controllable range, refer to the E5CN-HT/E5AN-HT/E5EN-HT Digital Controllers User's Manual (Cat. No. H169).

*2: Error shown only for "Process value / Set point". Not shown for other status.

