EN INSTRUCTION MANUAL

Thank you for purchasing the OMRON E5EC 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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Refer to the E5CC/E5EC Digital Controllers User's Manual (Cat. No. H174) for detailed application procedures.

Safety Precautions

Key to Warning Symbols



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

⚠ CAUTION

nter the product. Doing so may occasionally result in electric shock, fire, or malfunction.

o not use the product where subject to flammable or explosive gas. Otherwise, minor injury fror

This product is UL recognized as Open Type Process Control Equipment. It must be mounted in an enclosure that does not allow fire to escape externally.

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

the output relays are used past their life expectancy, contact full output relays are used past their life expectancy, contact full output relays are used past their life expectancy, contact full relays are used past their life expectancy, contact full relays within their rated load and electrical life expectance the elife expectancy of output relays varies considerably without put of output load and switching conditions.

ose screws may occasionally result in fire. Tighten the terminal screws to the specified torque of 0.43 to 0.58 N·m.

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 Temperature 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.

explosion may occasionally occur.

Never disassemble, modify, or repair the product or touch any of the internal parts. Minchock, fire, or malfunction may occasionally occur.

b) More than one disconnect switch may be required to de-energize the equipment before s

CAUTION - Risk of Fire and Electric Shock

c) Signal inputs are SELV, limited energy.

The life expectancy of output relays varies cor

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.

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

1654642-3 OR SYSTEM.See also Product catalog for Warranty and Limitation of Liability.

Precautions for Safe Use

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formance and functions of the product. Not doing so may occasionally result in unexpected events. Use the
dutct within specifications.

The product is designed for indoor use only. Do not use the product outdoors. Do not use or store the product
in any of the following locations.

• Places directly subject to heat radiated from heating equipment.

• Places subject to direct sunlight.

• Places subject to direct sunlight.

• Places subject to direct sunlight.

• Places subject to intense temperature change.

• Places subject to intense temperature change.

• Places subject to intense temperature change.

• Places subject to intense 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 view properly with correct polarity of terminals.

Use the specified size of crimged terminals (M3, width 5.8 mm or less) for wiring, To connect bare wires to the terminal block, use copper braided or solid wirines with a gage of AWG24 to AWG18 (equal to a cross-sectional area of 0.205 to 0.8231 mm²). (The stripping length is 6 to 8 mm.). Up to two wires of same size and type, or two crimged terminals which are not used.

Allow as much space as possible between the controller and devices that generate a powerful high-frequency of surge.

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. When executing self-tuning, turn the load and the unit ON simultaneously, or turn the load ON before you turn the controller ON.

) When Executing Surrouncing the controller on 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.

Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.) Design system (control panel, etc) considering the 2 second of delay that the controller's output to be set after

19 Design System (como parier, Ret) contributing the 2 section of voils. Take this into consideration when performing control. for the output may turn OFF when shifting to certain levels. Take this into consideration when performing control. for the properties of the control of the control

Thermoor When the proposed of the Control of the Co Event input Contact input No-contact input ON:1 KU max., DF:100 KU min.
ON: residual voltage 1.5 V max.,
OFF: leakage current 0.1 mA max.
4 to 20 m AD Cor 0 to 20 m AD C
0 to 5 V DC or 0 to 10 V DC
Relay output: SPST-NO,
250 VAC, 5 A (resistive load)
Electrical li Remote SP input Control output 1

Specifications

perating voltage range

Ambient temperature

Ambient humidity Storage temperature

Veight Degree of protection

Memory protection

ransfer output

Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC ±20%, 40 mA for one control output, 21 mA if there are two control outputs. 21 mA if there are two control outputs. 25 mA DC, 0 to 20 mA DC, 0 to 20 mA DC. 250 VAC, 5 A (resistive load) Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC, 21 mA Current output 4 to 20 mA DC or 10 ±20 mA DC with load of 500 0 max. Pelay outputs: 250 VAC, two outputs: 3 A (resistive load) Electrical life of relay: 100,000 operations electrical life of relay: 100,000 operations of 500 for relay: 100,000 operations of 500 CM CM outputs: 26 (resistive load) four outputs: 2 A (resistive load) four outputs: 3 A (resistive load) four outputs: 4 A (resistive load) four outputs:

Option 000: Approx. 4.1 VA (100 to 240 VAC) Approx. 3.0 VA (24 VAC)/approx. 1.7 W (24 VDC) All other specifications: Approx. 5.1 VA (100 to 240 VAC) Approx. 3.9 VA (24 VAC)/approx. 2.3 W (24 VDC) Thermocouple:

(Avoid freezing or condensation) RH25 to 85% -25 to 65°C (Avoid freezing or condensation) Max. 2,000 m T2A, 250 VAC, time-lag,

Installation environmen

Iow-broaking canacity Approx. 210 g (Digital Controller only) Front panel: IP86 Rear case: IP20, Terminal section: IP00 Installation category II, pollution degree 2 (as per IEC6 1101-1) Non-votable memory Non-votable memory and a control to the c

■ Wiring • Dimensions Dimensions (mm)

4.10 ےے ا

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 Terminal cover: (Model: E53-COV24) USB-Serial Conve (Sold Separately) (E58-CIFQ2)

No.1 display

input value

or set data type

No.2 display Set point, set data read-out value or changed

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

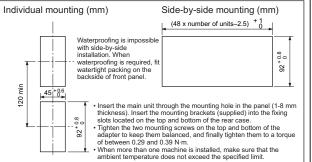
Press the key and the key together for at least 3 seconds to switch to protect level

* 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. The E58-CIFQ2 USB-Senial Conversion Cable is required to connect to the port shown in the above figure. The E58-CIFQ2-E USB-Senial Conversion Cable is required to connect to the port on the front panel. (Do not use the product with the USB-Senial Conversion Cable left permanently connected.)

Refer to the instruction manual provided with the USB-Senial Conversion Cable for details on

Installation



- Operation indicators · SUB1: Auxiliary output 1 indicator
- · SUB2: Auxiliary output 2 indicator SUB3: Auxiliary output 3 indicator
- OUT1: Control output 1 indicator For a current output, lit except for a For a current output, lit except for a 0% output.

 OUT2: Control output 2 indicator
- Up and Down keys
 Each press of A key increments or advances · RSP: Remote SP indicator Lit when the assigned function is ON. the values displayed on the No.2 display.

 Each press of we key decrements or returns the values displayed on the No.2 display. • TUNE:
 - Flashing during self-tuning. Lit during auto-tuning.
- STOP: control stop indicator
 Lit when event input or "Run/Stop" is stopped during operation.
 During control stop, functions other than control output are valid.
- CMW: communications writ Lit when communications out when it is "disabled".
- Oπ: Protection indicator
- Lit when Setting Change Protect is ON (die Up and Down Keys).

 MANU: Manual output indicator

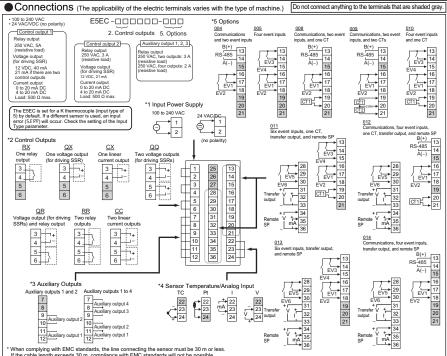
Operation Level

25 PV/SP 5.ERR is d

R - M Auto/Manual Switch
PID control only.
Auto/Manual Switch
Addition

M - 5P Multi-SP Set Point

Lit when the Auto/Manual Mode is set to Manua



● Adjustment Level

■ Operation Menu-

Names of Parts on Front Panel

The temperature unit is displayed when the displayed value is a temperature.

Either ${\mathfrak T}$ or ${\mathfrak F}$ is displayed according to the set value of the temperature unit.

Shift key (PF key)

The default PF Setting parameter is for shifting the digit. This is a function key. When it is pressed, the function set for the PF Setting parameter will operate.

Front-panel Setup Tool port
This port is used to connect the Controller to a computer to use the Setup Tool.

°C / °F : temperature unit •

Level key
Use this key to change levels

Input Type

	Input type	Input	Setting			
	Platinum	Pt100	0	-200 to 850 (°C) /-300 to 1500 (°F)		
	resistance		1	-199.9 to 500.0 (°C)/-199.9 to 900.0 (°F)		
	thermometer		2	0.0 to 100.0 (°C) /0.0 to 210.0 (°F)		
		JPt100	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)		
	Thermocouple	K	5	-200 to 1300 (°C) /-300 to 2300 (°F)		
			6	-20.0 to 500.0 (°C) /0.0 to 900.0 (°F)		
		J	7	-100 to 850 (°C) /-100 to 1500 (°F)		
रु			8	-20.0 to 400.0 (°C) /0.0 to 750.0 (°F)		
Temperature inputs		Т	9	-200 to 400 (°C) /-300 to 700 (°F)		
			10	-199.9 to 400.0 (°C)/-199.9 to 700.0 (°F)		
1 2		E	11	-200 to 600 (°C) /-300 to 1100 (°F)		
atr		L	12	-100 to 850 (°C) /-100 to 1500 (°F)		
l e		U	13	-200 to 400 (°C) /-300 to 700 (°F)		
ΙĒ			14	-199.9 to 400.0 (°C)/-199.9 to 700.0 (°F)		
l e		N	15	-200 to 1300 (°C) /-300 to 2300 (°F)		
1		R	16	0 to 1700 (°C) /0 to 3000 (°F)		
		S	17	0 to 1700 (°C) /0 to 3000 (°F)		
		В	18	100 to 1800 (°C) /0 to 3200 (°F)		
		W	19	0 to 2300 (°C) /0 to 2300 (°F)		
		PL II	20	0 to 1300 (°C) /300 to 3200 (°F)		
	Infrared Thermosensor ES1B	10 -70°C	21	0 to 90 (°C) /0 to 190 (°F)		
		60 -120°C	22	0 to 120 (°C) /0 to 240 (°F)		
		115 -165°C	23	0 to 165 (°C) /0 to 320 (°F)		
		140 -260°C	24	0 to 260 (°C) /0 to 500 (°F)		
e e	C	4 to 20mA	25	U th- f-lli 1000		
Analog nput type	Current input	0 to 20mA	26	Use the following ranges for scaling: -1999 to 9999, -199.9 to 999.9, -1999 to 9.999 to 9.999		
E H	Voltage input	1 to 5V	27			
Anal		0 to 5V	28			
		0 to 10V	29			

] =. ⊂ *The default is "5".

*5.ERR will be displayed when a platinum resistance thermometer is mistakenly connected while input type is not set for it. To clear the 5.ERR display, correct the wiring and cycle the

		Alarm output function Positive alarm value (X) Negative alarm value (X) Output off			
Setting	Alarm type				
0	No alarm function				
1	Deviation upper/lower limit	ON THE	Vary with "L", "H" values		
2	Deviation upper limit	ON SP X +	ON SP		
3	Deviation lower limit	ON → X ← SP	ON OFF SP		
4	Deviation upper/lower range	ON OFF SP	Vary with "L", "H" values		
5	Deviation upper/lower limit standby sequence ON	ON OFF SP	Vary with "L", "H" values		
6	Deviation upper limit standby sequence ON	ON -XX -	ON OFF SP		
7	Deviation lower limit standby sequence ON	ON → X +	ON SP		
8	Absolute value upper limit	ON OFF 0	ON OFF		
9	Absolute value lower limit	ON OFF 0	ON OFF		
10	Absolute value upper limit standby sequence ON	ON OFF 0	ON OFF 0		
11	Absolute value lower limit standby sequence ON	ON OFF	ON OFF		
12	LBA (only for alarm 1)				
13	PV Change Rate Alarm				
14	SP absolute value upper limit	ON FX	ON OFF 0		
15	SP absolute value lower limit	ON OFF 0	ON OFF		
16	MV absolute value upper limit	ON OFF 0	ON OFF 0		
17	MV absolute value lower limit	ON OFF 0	ON OFF		
18	RSP absolute value upper limit	ON CFF 0	ON OFF 0		
19	RSP absolute value lower limit	ON CFF	ON TX		

*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".

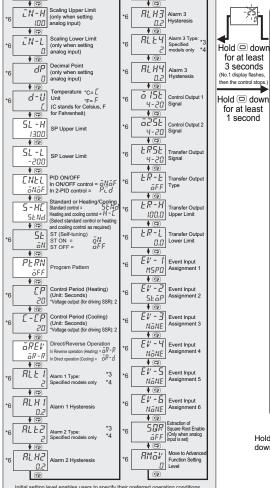
• The default alarm type is "2"

\triangle 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

 \triangle Conformance to Safety Standards Reinforced insulation is provided between input power supply, relay outputs, and between other terminals.

● Initial Setting Level Operation stopped. (Control/alarm are both stopped.) RLE3 Alarm 3 Typ Specified models only IN-E Input Type *3



*3: Refer to the adjoining tables for details of input types and alarm types *4: Applicable only to models with alarm function

Unit: A) *7 PRSE RSEL 51/ER Soak Time Remain RUN/STOP RUN When control stop = 5 E o FL - I Alarm Value 1*4 RL IH Alarm Value Upper Limit 1 *4 noiu □ and ℚ keys down for at least 1 second Protect Level Initial setting level enables users to specify the (input type, alarm type, control method. etc.) *6: The grayed-out setting items may not be displayed according to the models and setting.

*5: Operation is stopped when moved to the initial setting level.

(control/alarm are both stopped.)

*7: Applicable only to models with heater burnout functions

*8: The four numeric digits of the product code are displayed in the No. 2 display. The setting cannot be changed and there is nothing that you need

Alarm Value Lower Limit 2 *4 for at least 1 second **∳**@ 5P-M Set Point During SP Ramp RL - 3 Alarm Value 3 14 RL 3H Alarm Value Upper Limit 3 *4 LL | Heater Current (Unit: A) *7 RL3L Alarm Value Lower Limit 3 *4 Heater Current 2 Value Monitor Unit: A) *7 LER / Leakage Current Value Monitor RL-4 П.П (Unit: A) *7 LERZ Leakage Current 2 Alarm Value Upper Limit 4 *4 RL YL Alarm Value Lower Limit 4 *4 MV Monito (Heating) MV Monitor (Cooling) Operation level should normally be used during operation Hold and kevs down for at least 3 seconds Changed Parameters On

Check the wiring before turning ON the power supply.

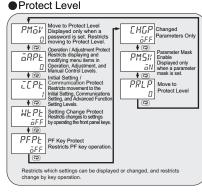
POWER ON

RL IL

RL-2

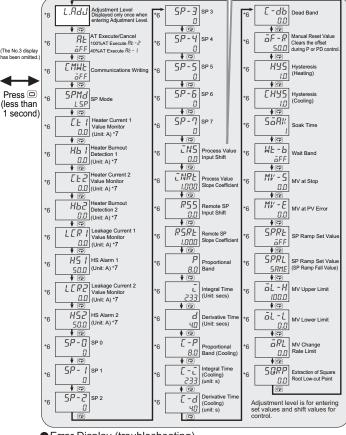
RL 2H Alarm Value U pper Limit 2 *4

Alarm Value Lower Limit 1 *4



Other functions

Refer to the E5CC/E5EC Digital Controllers User's Manual (Cat. No. H174) for information on the Advanced Function Setting Level, Monitor/Setting Item Level, Manual Control Level, and other functions Refer to the E5CC/E5EC Digital Controllers Communications Manual (Cat. No. H175) for information on communications.



Error Display (troubleshooting)

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. 4 diselect	Meaning	Action	Status at error	
	No.1 display			Control output	Alarm
	5.ERR (S. Err)	Input error	Check the setting of the Input Type parameter, check the input wiring, and check for broken or shorts in the temperature sensor.	OFF	Operates as above the upper limit.
	E 333 (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.	OFF	OFF
	E (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.	OFF	OFF

If the input value exceeds the display limit (-1999 to 9999), though it is within the control range, [cccc] will be displayed under -1999 and [323]above 9999. Under these conditions control output and alarm output will operate normally. Refer to the ESCC/ESEC Digital Controllers User's Manual (Cat. No. H174) for the controllable ranges.

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

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