

Digital Controller E5□K-T

The E5□K-T Programmable Type Digital Controllers Expand the Variety of E5□K Digital Controllers and are Available in Three Sizes (1/4, 1/8, and 1/16 DIN).



E5□K-T Series



Contents

Digital Controllers

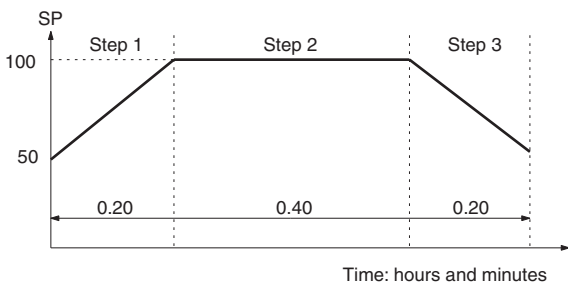
E5AK-T/E5EK-T	I-125
E5CK-T	I-127

Temperature Controller

Compact and Easy-to-use Controllers

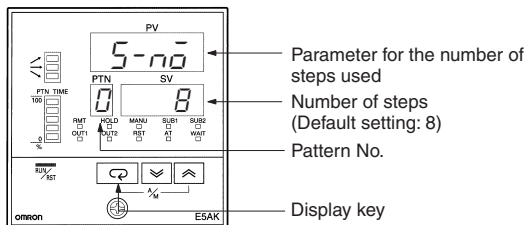
■ Programming is as easy as following the steps below.

Program can be set in pattern 0 according to the following procedure.

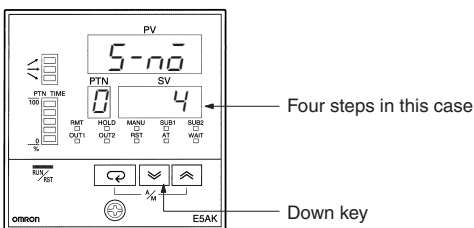


Step No.	Target value	Time (hours.minutes)
0	50	0.00
1	100	0.20
2	100	0.40
3	50	0.20

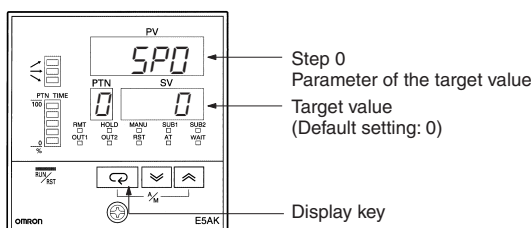
1. Press the Display Key to shift to the display for the number of steps.



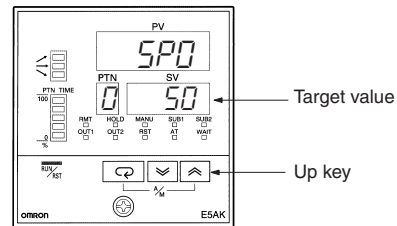
2. Press the Down Key and set the number of steps.



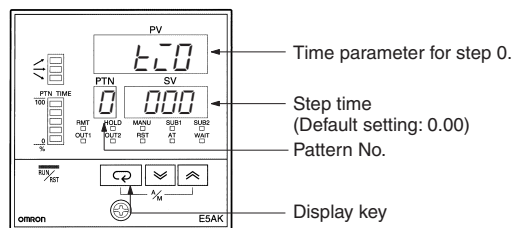
3. Press the Display Key to shift to the display for the target value of step 0.



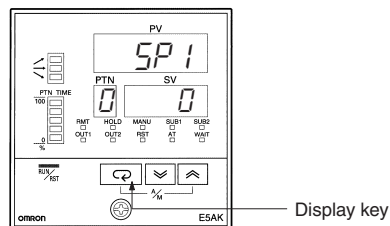
4. Set the target value to "50."



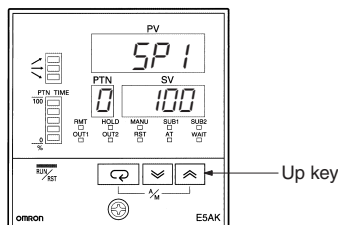
5. Press the Display Key to shift to the display for the time of step 0.



6. Press the Display Key again with the step time set at 0 minutes, and the target value parameter for step 1 will be displayed.



7. Press the Up Key to increment to "100."



In the same manner, set the time for step 1, target value for step 2, time for step 2, etc.

When the target value and time settings are complete, press the Display Key.

Digital Controller E5AK-T/E5EK-T

Advanced Programmable Digital Controllers Ideal for Worldwide Use

- Offers up to eight patterns of simple programming control (16 steps per pattern).
- Modular structure, one-stock type
- High-accuracy: 100-ms sampling (for analog input)
- Conforms to international EMC and safety standards.
- IP66/NEMA4 (indoor use) front face
- Serial communications (RS-232C, RS-422 and RS-485) and transfer output (4 to 20 mA)
- Position-proportional control model
- Heating/cooling control
- 24VAC/DC types are also available.



Model Number Structure

Model Number Legend

E5□K-T□□□□-500
 1 2 3 4

1. Size

- A: 96 x 96 mm
- E: 96 x 48 mm
- C: 58 x 58 mm

2. Programmable type

- T: Programmable type

3. Model

- AA: Standard model
- PRR: Position-proportional model

4. Number of alarms

- 2: Two alarms

Ordering Information

List of Models

Description	Model	Specification
Base Unit	E5AK-TAA2 AC100-240	Standard model
	E5AK-TAA2-500 AC100-240	Standard model with terminal cover
	E5AK-TAA2 AC/DC24	Standard model
	E5AK-TAA2-500 AC/DC24	Standard model with terminal cover
	E5AK-TPRR2 AC100-240	Position-proportional model
	E5AK-TPRR2-500 AC100-240	Position-proportional model with terminal cover
	E5AK-TPRR2 AC/DC24	Position-proportional model
	E5AK-TPRR2-500 AC/DC24	Position-proportional model with terminal cover
	E5EK-TAA2 AC100-240	Standard model
	E5EK-TAA2-500 AC100-240	Standard model with terminal cover
	E5EK-TAA2 AC/DC24	Standard model
	E5EK-TAA2-500 AC/DC24	Standard model with terminal cover
	E5EK-TPRR2 AC100-240	Position-proportional model
	E5EK-TPRR2-500 AC100-240	Position-proportional model with terminal cover
	E5EK-TPRR2 AC/DC24	Position-proportional model
	E5EK-TPRR2-500 AC/DC24	Position-proportional model with terminal cover

Note: 1. When using the heater burnout alarm function with a standard model, the Linear Output Unit cannot be used for the control outputs (heat).
 2. Be sure to specify the Current Transformer, Output Unit, and Option Unit when ordering.

Temperature Controller

Nomenclature

E5AK

Pattern Number

Indicates the pattern number.

Program Status Indicators

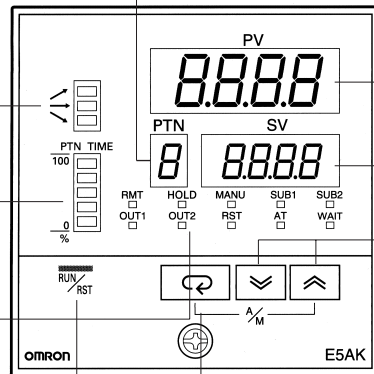
The top indicator indicates the rising step, the middle indicator indicates the constant step, and the bottom indicator indicates the falling step.

Bar Graph

Indicates the rate of pattern elapsing time at the rate of 20% (5 levels) per one segment.

Operation Indicators

- **OUT1**
Lights when the pulse output function assigned to control output 1 turns ON.
- **OUT2**
Lights when the pulse output function assigned to control output 2 turns ON.
- **SUB1**
Lights when the output function assigned to auxiliary output 1 turns ON.
- **SUB2**
Lights when the output function assigned to auxiliary output 2 turns ON.
- **MANU**
Lights when the manual operation mode.
- **RST**
Lights when the operation is reset.
- **RMT**
Lights during remote operation.
- **AT**
Flashes during auto-tuning.
- **HOLD**
Lights when the program is on hold.
- **WAIT**
Lights when the program is waiting.



Display 1

Displays the process value or parameter code.

Display 2

Displays the present SP, manipulated variable, or parameter settings.

Up Key/Down Key

Press to increase or decrease the value on the No.2 display.

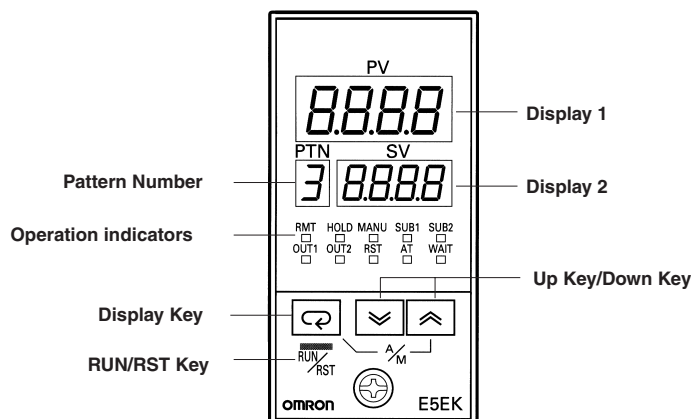
Display Key

Press to shift the display to the next parameter.

RUN/RST Key

Switches between RUN and RESET mode.

E5EK



Display 1

Display 2

Up Key/Down Key

Pattern Number

Operation indicators

Display Key

RUN/RST Key

Digital Controller E5CK-T

Advanced, Compact Programmable Digital Controllers Ideal for Worldwide Use

- Offers up to four patterns of simple programming control (16 steps per pattern).
- IP66/NEMA4 (indoor use) front face.
- Modular structure, one-stock type.
- Heating/cooling control.
- Serial communications (RS-232C and RS-485).
- Temperature and analog inputs.
- High-accuracy: 100-ms sampling (for analog input).
- Conforms to international EMC and safety standards.
- 24 VAC/DC types are also available.



Ordering Information

List of Models

Description	Model	Specification
Base Unit	E5CK-TAA1 AC100-240	Standard model
	E5CK-TAA1-500 AC100-240	Standard model with terminal cover
	E5CK-TAA1 AC/DC24	Standard model
	E5CK-TAA1-500 AC/DC24	Standard model with terminal cover

Note: A single Output Unit and Option Unit can be mounted to each Base Unit.

Description	Model	Specification
Output Unit	E53-R4R4	Relay/Relay
	E53-Q4R4	Pulse (NPN)/Relay
	E53-Q4HR4	Pulse (PNP)/Relay
	E53-C4R4	Linear (4 to 20 mA)/Relay
	E53-C4DR4	Linear (0 to 20 mA)/Relay
	E53-V44R4	Linear (0 to 10 V)/Relay
	E53-Q4Q4	Pulse (NPN)/Pulse (NPN)
	E53-Q4HQ4H	Pulse (PNP)/Pulse (PNP)

Description	Model	Specification
Option Unit	E53-CK01	RS-232C
	E53-CK03	RS-485
	E53-CKB	Event input: 1 point
	E53-CKF	Transfer output (4 to 20 mA)

Inspection Report

The Digital Controller can be provided together with an inspection report.

Refer to the following legend with the suffix "K" when ordering a model provided together with an inspection report.

E5CK-TAA1-K

Accessories (Order Separately)

Name	Model
Terminal Cover	E53-COV07

Temperature Controller

Precautions

⚠ WARNING

Do not touch any of the terminals while the power is being supplied.
Doing so may result in electric shock.

■ General Precautions

Be sure to observe these precautions to ensure safe use.

- Do not use the product in places where explosive or flammable gases may be present.
- Never disassemble, repair or modify the product.
- Tighten the terminal screws properly.
- Use the specified size of solderless terminals for wiring.
- Use the product within the rated supply voltage.
- Use the product within the rated load.
- The life expectancy of the output relay varies considerably according to its switching capacity and operating conditions. Be sure to use the output relay within its rated load and electrical life expectancy. If the output relay is used beyond its life expectancy, its contacts may become fused or burned.

■ Correct Use

If you remove the Controller from its case, never touch nor apply shock to the electronic parts inside.

Do not cover the E5□K-T. (Ensure sufficient space around the Controller to allow heat radiation.)

Do not use the Controller in the following places:

- Places subject to icing, condensation, dust, corrosive gas (especially sulfide gas or ammonia gas).
- Places subject vibration and large shocks.
- Places subject to splashing liquid or oil atmosphere.
- Places subject to intense temperature changes.
- Places subject to heat radiation from a furnace.

Be sure to wire properly with correct polarity of terminals.

When wiring input or output lines to the Controller, keep the following points in mind to reduce the influence from inductive noise:

- Allow adequate space between the high voltage/current power lines and the input/output lines.
- Avoid parallel or common wiring with high voltage sources and power lines carrying large currents.
- Using separating pipes, ducts, and shielded line is also useful in protecting the Controller, and its lines from inductive noise.

Cleaning: Do not use paint thinner or organic solvents. Use standard grade alcohol to clean the product.

Use a voltage (100 to 240 VAC at 50/60 Hz, or 24 VDC). At power ON, the prescribed voltage level must be attained within two seconds.

Allow as much space as possible between the Controller and devices that generate a powerful high frequency (high-frequency welders, high-frequency sewing machines, etc.) or surge. These devices may cause malfunctions.

If there is a large power-generating peripheral device and any of its lines near the Controller, attach a surge suppressor or noise filter to the device to stop the noise affecting the Controller system. In particular, motors, transformers, solenoids and magnetic coils have an inductance component, and therefore can generate very strong noise.

When mounting a noise filter on the power supply to the Controller, be sure to first check the filter's voltage and current capacity, and then mount the filter as close as possible to the Controller.

Use within the following temperature and humidity ranges:

- Temperature: -10°C to 55°C (with no icing or condensation)
Humidity: 35% to 85% (with no icing or condensation)
If the Controller is installed inside a control board, the ambient temperature must be kept to under 55°C , including the temperature around the Controller.
If the Controller is subjected to heat radiation, use a fan to cool the surface of the Controller to under 55°C .

Store within the following temperature and humidity ranges:

- Temperature: -25°C to 65°C (with no icing or condensation)
Humidity: 35% to 85% (with no icing or condensation)

Never place heavy objects on, or apply pressure to the Controller that may cause it to deform and deteriorate during use or storage.

Avoid using the Controller in places near a radio, television set, or wireless installing. These devices can cause radio disturbances which adversely affect the performance of the Controller.

Mounting

The dimensions of the Digital Controller conform to DIN 43700.

Recommended panel thickness is 1 to 8 mm (1 to 5 mm for E5CK).

Mount the Unit horizontally.

Connection

To reduce inductive noise influence, the lead wires connecting the input type to the Digital Controller must be separated from the power lines and load lines.

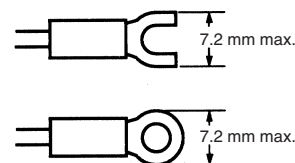
Use the specified compensating conductors for thermocouples. Use lead wires having a small resistance for platinum resistance thermometers.

Connection Example

Wire the terminals of the Unit using solderless terminals.

The tightening torque applied to the terminal screws of the Unit must be approximately 0.78 N·m or 8 kgf·cm.

Use the following type of solderless terminals for M3.5 screws.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.