

Actions in case of abnormalities(Error Display)

An alarm sound will be emitted to notify customers of the abnormality when an error occurs.

Error list

PV Display	Failure description	Output status	Cause
E1	Thermocouple abnormality	OFF	Thermocouple disconnection or thermocouple malfunction
E2	Excessive temperature rise absolute value abnormality		Measured temperature \geq Overheat prevention set temperature Heater abnormality
E4	Relay welding		Relay contact welding
E5	Memory abnormality		CPU memory area abnormality
E6	Relay high-frequency opening/closing		Relay opening/closing more than 20 times within a 30-second interval
E7	Measured temperature drop detection		Measured temperature \leq Overdropping prevention set temperature Heater abnormality
E8	Measured temperature rise error detection		Abnormality: Set temperature not reached despite passing a certain time
Blinking	Relay opening/closing count monitoring		Normal operation

Recovery Methods

PV Display	Recovery Methods
E1	The error display can be cleared by restarting the unit after checking the connection of the thermocouple or replacing the thermocouple
E2	Reset by restarting after removing the heater abnormality or by setting the temperature higher the operating temperature
E4	Replace main unit
E5	
E6	Power on the unit again
E7	Reset by restarting after removing the heater abnormality or by setting the temperature below the operating temperature
E8	Reset by restarting after checking or replacing the thermocouple
Blinking	Replace main unit

※If the above recovery method does not resolve the issue, please contact us for further assistance.

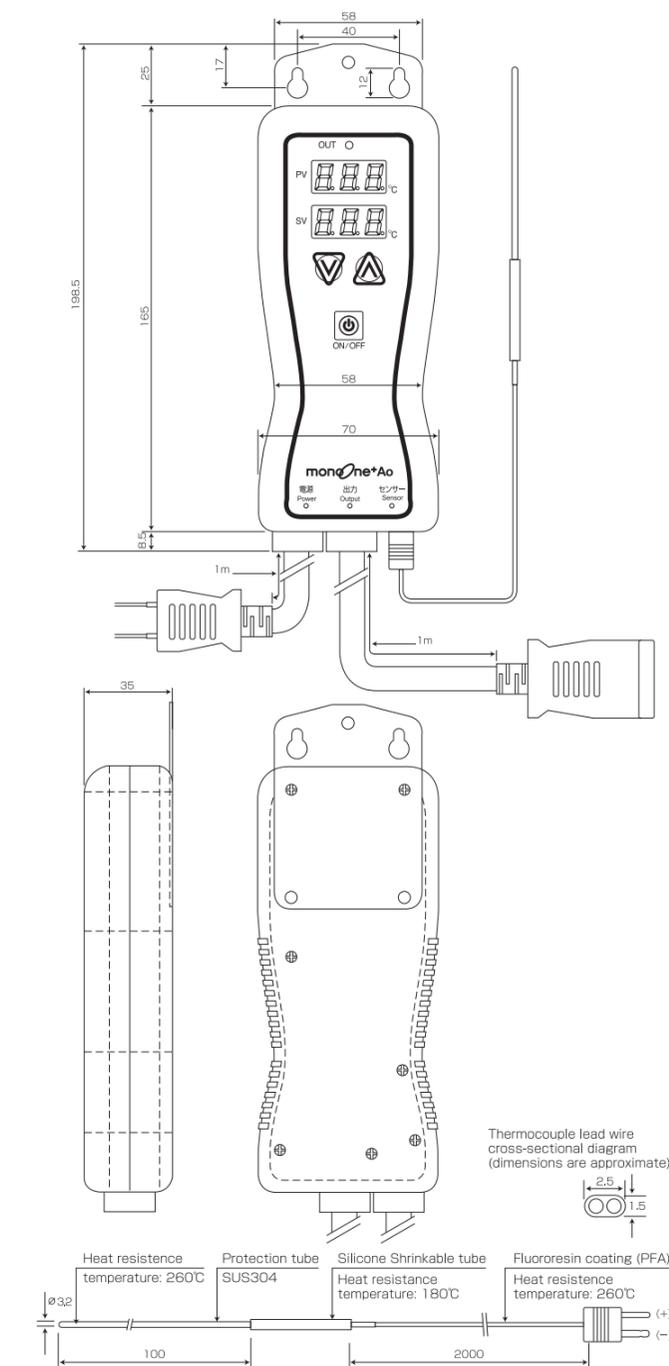
※The alarm sound can be silenced by pressing the or .

About Celsius / Fahrenheit

Fahrenheit (°F) is a temperature unit primarily used in the United States.

※The temperature display of this product can be switched between Celsius and Fahrenheit, but the unit printing on the body will remain in °C. Please refer to the 'Celsius-Fahrenheit switching mode' under 'Advanced operations' for the settings.

Dimensional diagram



Specifications

Product name	monoOne+Ao
Model	mpa20
Body Color	iceblue
Power supply voltage	AC 85V~250V (single phase) 50/60Hz
Output rating	0.1A~15A (resistive loading)
Input	Thermocouple(K)
Output format	Relay
Control method	ON/OFF control
Display range	-199~999°C
Indication accuracy	$\pm 2^{\circ}\text{C}$ (-199°C~700°C) $\pm 4^{\circ}\text{C}$ (+700°C~+999°C)
Sampling cycle	0.1 second
Memorizing the setup values	EEPROM
Short circuit protection	Built-in fuse (cannot be exchanged by the user)
Other functions	Error display/Sensor error detection function Overheat prevention setting/Relay-welding detection function Relay high-frequency opening/closing detection function Relay opening/closing count monitoring function Measured temperature drop detection Measured temperature rise error detection
Electric energy consumption	4VA or less
Operable temperature range	Temperature:-10 to 40°C, Humidity:10 to 85% RH (non-condensing)
Withstand voltage	AC1500V per minute (both power supply and output)
Noise Resistance	Pulse width 50ns, 1500V at 1000ns
Dimensions/weight	165(vertical)×70(width)×35(depth)mm ※Approx. 600g excluding protrusions and mounting brackets
Installation	Wall-mounting/DIN Rail(Optional)
Included sensor	Thermocouple(K) $\phi 3.2 \times 100$ L with 2m lead wire and male connector ※ Please contact us when using at 260°C or higher.
Power supply cable length	Power supply side: 1m(with 100V male plug connector) Heater side: 1m(with 100V female plug connector)

Warranty

We highly appreciate that you have purchased our product. This warranty has been prepared to promise free repairs to our customers in accordance with the provisions set forth below. For details, please read our provisions below.

Date of Purchase	Date	Month	Year
Product	Digital Temperature Controller monoOne+Ao		
Lot No.			
Sales agent			

【 Provisions of our warranty 】

Our warranty shall apply only to the original purchaser of our product in case that malfunctions occur during the use of our product under the normal conditions. Warranty period is limited to 1 year from the date of original purchase.

The warranty does not cover the following cases even during the said period of warranty.

- Malfunctions or damages resulting from intentional or negligent acts such as failures to use the product properly.
- Malfunctions or damages resulting from mishandling (falls, impacts by foreign objects, etc.) of our product while transporting or moving it after purchase.
- Malfunctions or damages resulting from fire, earthquake, flooding, lightning, and other acts of God.
- Malfunctions or damages resulting from the factors unrelated to our product.
- When repair, modification, or disassembly of our product is done by other than our company.
- In case this warranty is not presented to us.
- Replacement of repair parts (consumable parts).

Please acknowledge that our company is not liable for all sorts of financial loss such as direct, indirect, collateral or consequential losses resulting from the use malfunction of our product. If a malfunction occurs during the warranty period, please present this document and request repairs from the store of purchase or from us.

※Note

- This warranty certificate will not be reissued. Therefore, please keep it safe.
- This warranty certificate is valid only in Japan.



The included thermocouple is not antibacterial.

※If a malfunction occurs during the aforementioned warranty period, please present this document and request repairs from the store of purchase or from us.

THREE HIGH
CO.,LTD. SINCE 1990

4-42-16 Higashiyamata, Tsuzuki-ku, Yokohama City, Kanagawa, 224-0023

TEL +81-45-590-5561 FAX +81-45-590-5571

www.threehigh.com/



Digital Temperature Controller

Made in Japan

RoHS2 Compliant Product

monoOne+Ao
monoOne plus Ao

OPERATION MANUAL

Please read this manual before attempting to operate the unit.



Safety Precautions

The symbols below indicate prohibited actions and mandatory operations that must be followed to prevent personal injury and damage or malfunction of the product.

	Prohibited item		Required operation
--	-----------------	--	--------------------

Warning If the cautions corresponding to this indication are not observed, death, electric shock, burns, or other physical injury may occur.

- Do not touch anything inside the unit while the power is applied.
- Never operate the unit with wet hands.
- Do not push anything through the openings in the case while power is applied to the unit.

- Turn off the power before attempting to make any connections.
- This product does not contain protection devices for short-circuit or leakage current inside. Please install appropriate protection devices, such as a leakage breaker, on the power input side.

Warning If the cautions corresponding to this indication are not observed, death, electric shock, burns, or other physical injury may occur.

- Never modify or disassemble the unit. Otherwise, a malfunction may occur, possibly causing a fire. Replacing the power plug will not cause problems.

- Before applying power to the instrument, be sure to check that the wiring is correct. Incorrect wiring may cause malfunction and could lead to dangerous accidents.

Caution If the cautions corresponding to this indication are not observed, injury to the user and/or damage to the unit may occur.

Notes on safety measures

- While the utmost care is applied during the manufacturing of the unit, specific measures for dealing with abnormal ambient temperatures must be applied to prevent a malfunction.
- Temporary malfunctions caused by noise can be eliminated by turning the power off and then turning it back on. Should such a fault occur repeatedly, however, consider permanent measures to prevent noise.

- Use this unit with an appropriate safety margin, taking into consideration surge currents, voltage fluctuations, and load characteristics.
- Ensure that the wiring is done with sufficient slack in the electrical wires.
- Do not subject the unit to any type of impact.
- Do not touch metal plates while the unit is in operation, as they may become hot.
- Use this unit in conjunction with safety devices to prevent serious accidents in the event of a malfunction.
- Avoid twisting or tangling the cables of this product during use.

Notes on installation location

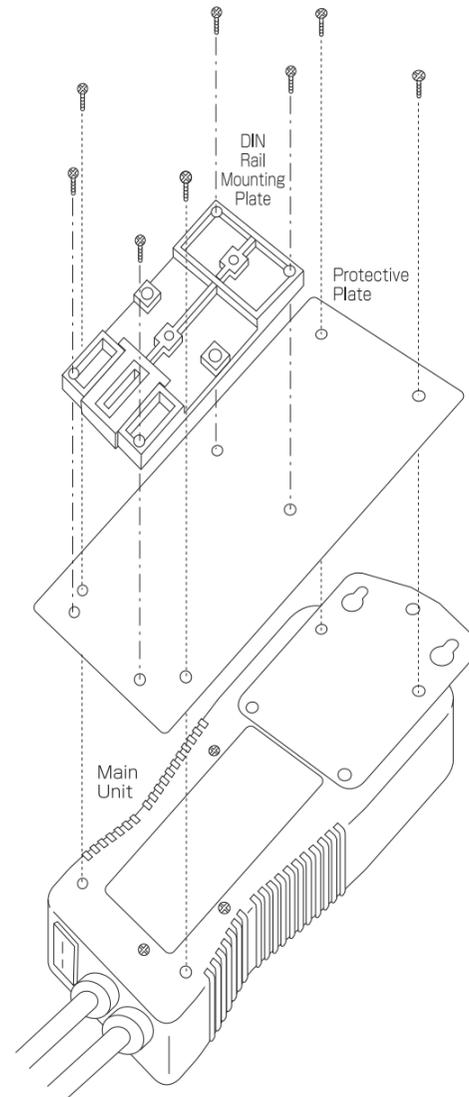
- Install the unit in a location that satisfies the following conditions.
- Indoor location where the ambient temperature is between -10°C and 40°C; away from direct sunlight or sources of heat such as electric furnaces; where the temperature change is small, ideally where the temperature is as near to room temperature as possible; and with good ventilation.
- Install in a location where the ambient humidity ranges from 25% to 85% RH, and where low or high humidity conditions (no condensation) are not experienced.
- Location where there is no sulfide gas, corrosive gas, or grinding fluid mist.
- Location where there is no dust or oily fumes, and which is not likely to suffer smoke or salt damage.
- Location that is not splashed with water, oil, or chemical agents.
- Location with minimal mechanical vibration or shock.
- Location where the effect of electrical noise is minimal.
- Do not select a location close to electrical circuitry or where there is a risk of inductive interference.
- Location where the effect of electromagnetic fields is minimal.
- Do not obstruct the area around the temperature controller to ensure proper heat dissipation.

Caution Regarding Contact Life

- Please do not exceed the contact life of the relay.
- The contact life is 200,000 cycles. Exceeding this limit may cause a fire hazard.
- When the operation exceeds 200,000 cycles, the PV screen will start blinking.

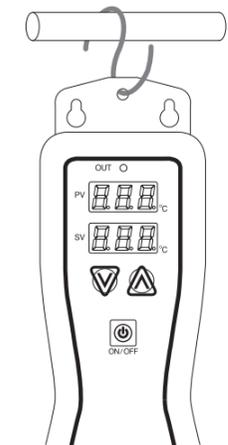
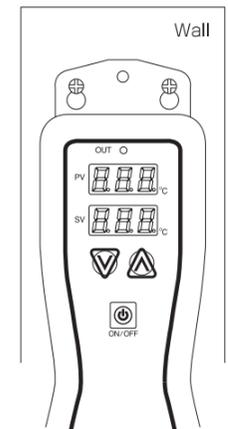
Installation Instructions

For customers who wish to mount this product on a DIN rail (35mm) and use it, we offer an optional mounting plate. Please contact us for more information. The mounting plate can be attached and detached using screws.

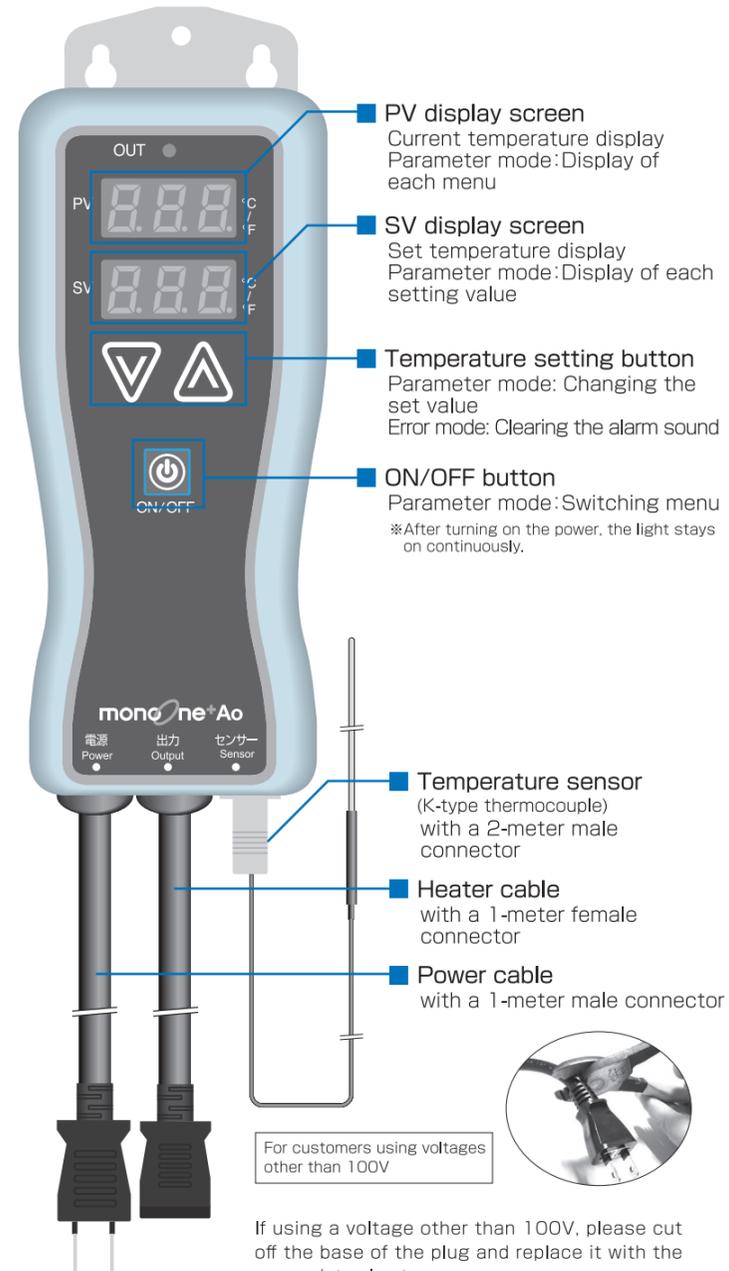


When mounting the plate on a wall, please use mounting brackets and secure them with bolts, screws, or similar hardware.

When suspending the plate, please ensure that the installation is done in a way that minimizes vibration and swinging.



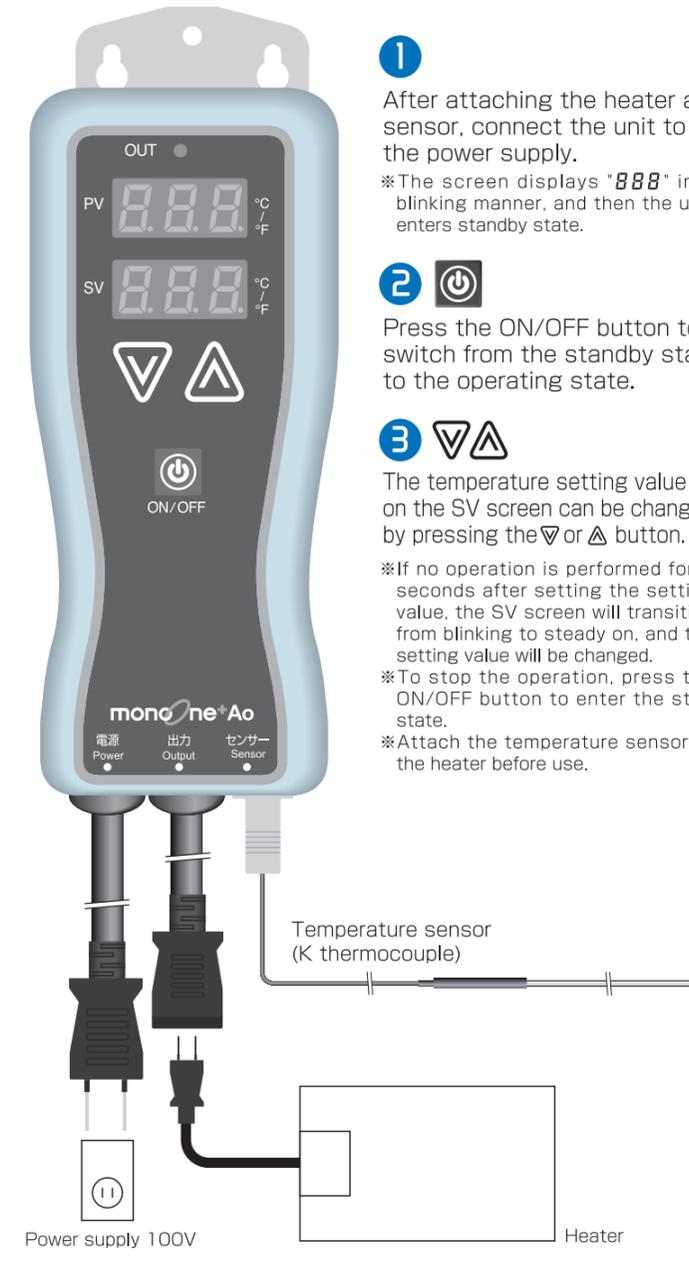
Names of parts



If using a voltage other than 100V, please cut off the base of the plug and replace it with the appropriate plug type.

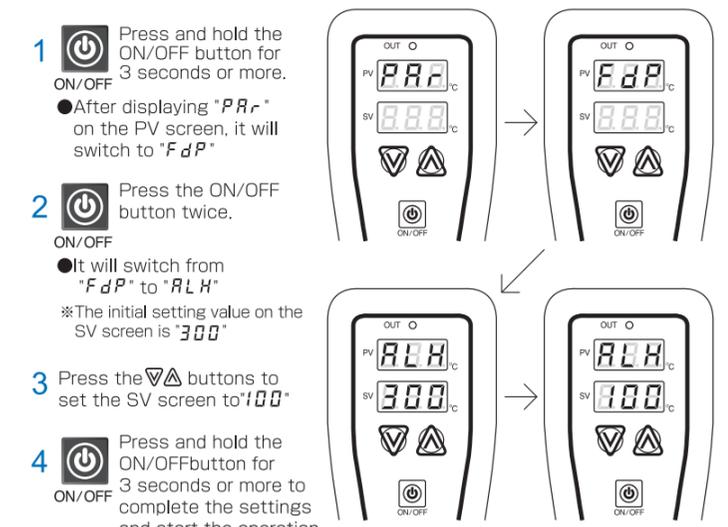
Basic settings (temperature setting)

This is the operational method to set the desired temperature for heating.



Advanced operations (setting parameters)

To set parameters, switch from normal mode to parameter mode. (Here, an example of changing the over-temperature absolute value setting to 100°C will be explained.)

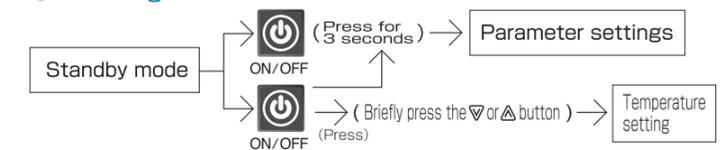


*If the detected temperature by the sensor exceeds 100°C, the PV screen will display "E.2" and an alarm sound will be activated. The power supply to the heater will be cut off.

The order of parameter display



Switching between each mode



List of parameters

Symbol	Item	Setting Range	Initial Setting Value	Resolution	Description
F.d.P.	Fahrenheit temperature display	ON, OFF	OFF	—	Switch between Celsius (°C) and Fahrenheit (°F) (When turned off, temperature displayed in Celsius (°C))
d.F.S.	Hysteresis width setting	1~100°C/°F	2°C/°F	1°C/°F	Differences between operating temperature and recovery temperature
A.L.H.	Overheat temperature Absolute value setting	0~999°C/°F	300°C/°F	1°C/°F	Overheat prevention setting
P.u.S.	PV correction	-199~999°C/°F	0°C/°F	1°C/°F	Correction value for measured temperature
C.U.L.	Measured temperature drop detection	OFF 0~999°C/°F	OFF	1°C/°F	Set temperature for over dropping prevention
C.N.H.	Measured temperature rise error detection	OFF 1~999min	OFF	1min	Error notification if PV does not reach SV within the specified time

*The resolution refers to the generally discernible limit or the smallest unit.