

Version : 2016 Rev.0

MUFFLE FURNACE



SH-FU-3/5/7/14/27MG
SH-FU-3/5/7/11MGE

MUFFLE FURNACE MANUAL



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Keep this manual on-hand so it can be used by all operators of the unit.
Use the unit only in the way described in this manual.
Failure to follow the instruction in this manual may cause wrong operation.

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1. GENERAL DESCRIPTION

Thank you for purchasing our product. We know that in today's competitive marketplace, customers have many choices when purchasing laboratory equipments.

We appreciate your choosing our quality product. We stand behind our products and want to let you know we are here if you need us.

Before you use the unit, read this entire manual carefully to understand how to install, operate and maintain the unit in a safe manner.

Your satisfaction with the unit will be maximized as you read this manual thoroughly.

Our capable products will satisfy you by the best performance with easy operation.

2. GRAPHIC SYMBOLS

BE SURE THAT YOU UNDERSTAND ALL OF THESE SYMBOLS
BEFORE OPERATING THE UNIT.



Important operating and / or maintenance instruction.
Read the accompanying text carefully.



This symbol indicates items and procedures that are **STRICTY PROHIBITED** with regards to the unit.



Potential electrical hazards.



Explosive.



No disassemble.

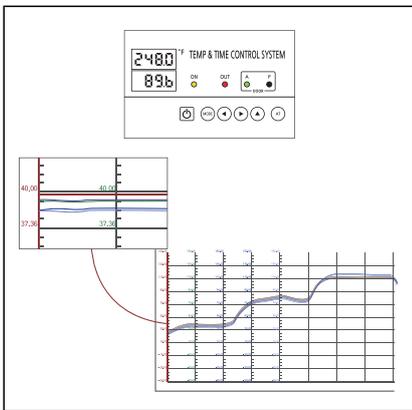


Flammable.



Hot surface or steam.

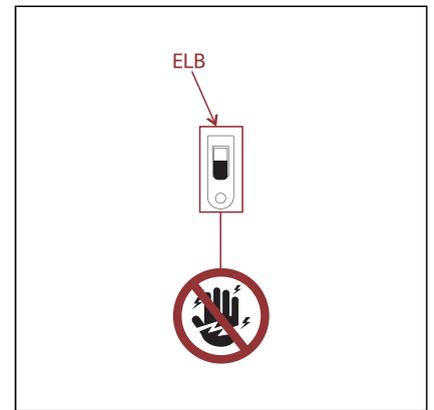
3. KEY FEATURES



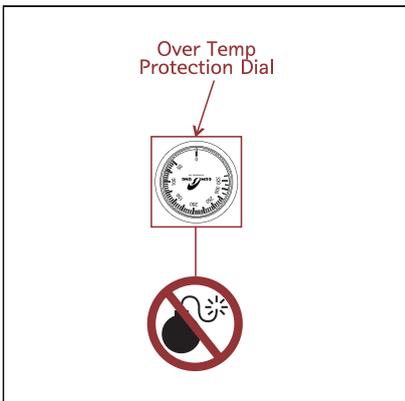
- Digital display of temp and time
- Multi key-in (100Ω(DIN Pt100Ω), KPt100Ω(JPt100Ω), K(CA))
- Precise temperature control
- Alarm when timer ends



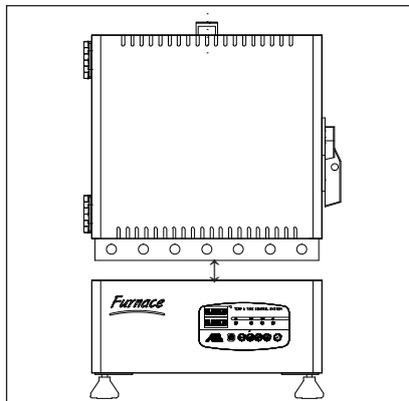
- Auto back up



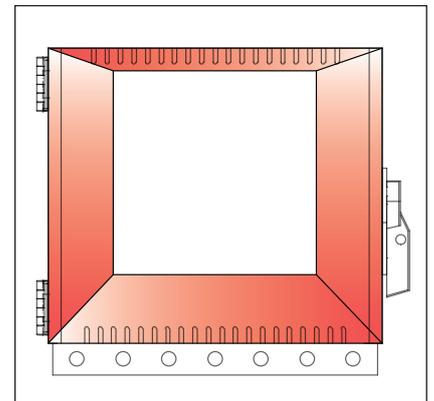
- Over-current protection function



- Over-temperature protection function.(FU-xxMG)

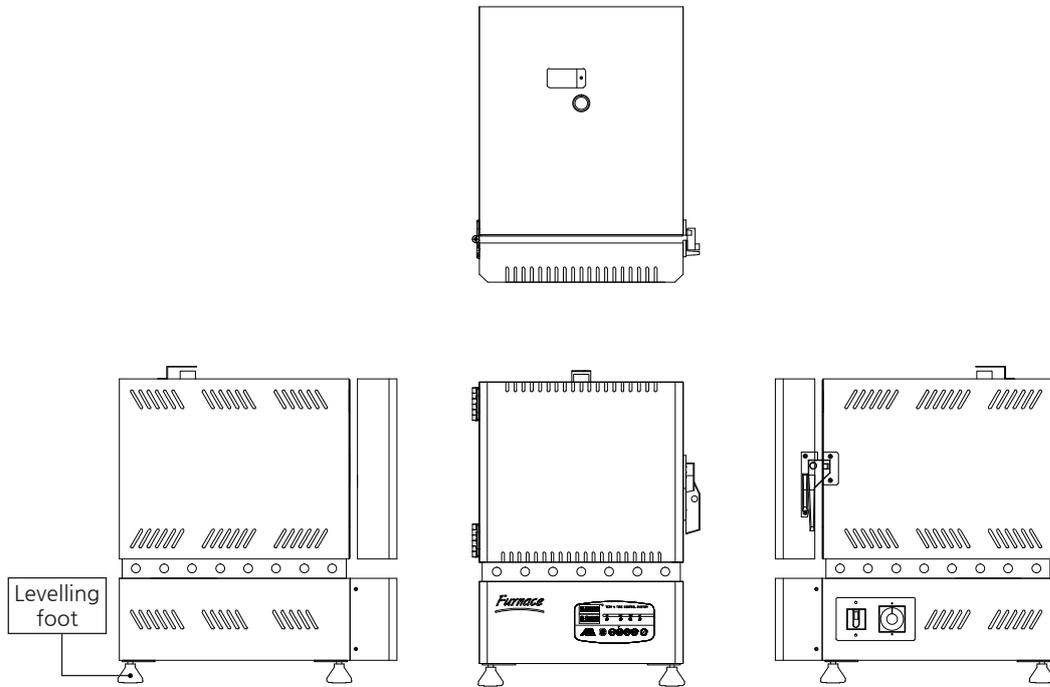


- Separated body and control box design protecting from thermal shock.(FU-xxMG)

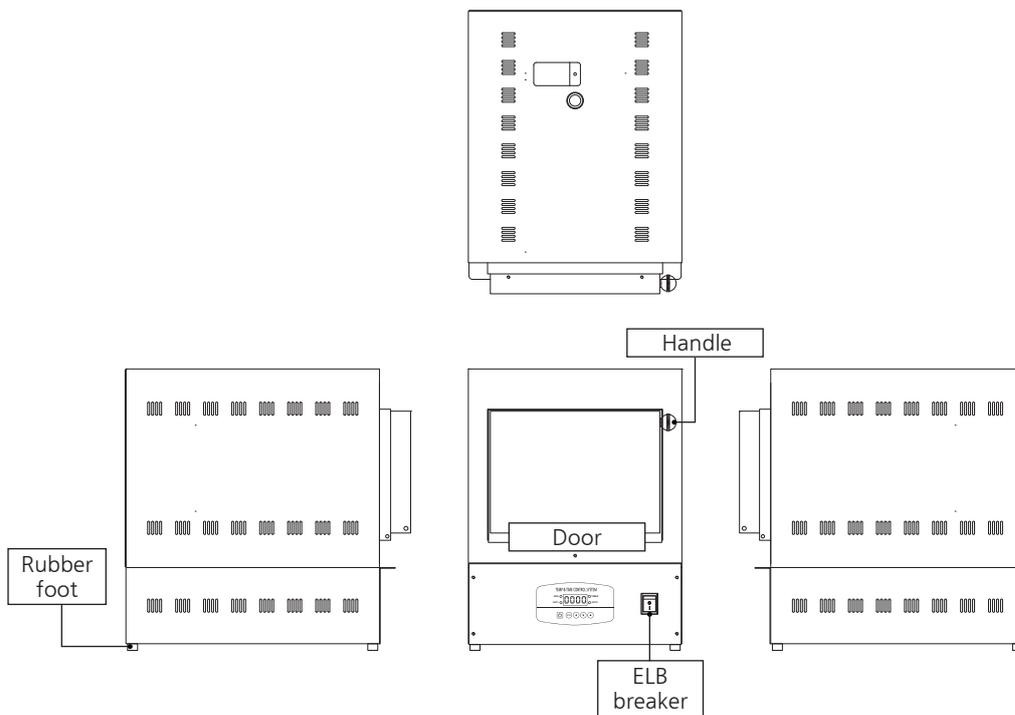


- Heating plate with excellent durability.(FU-xxMG)

4. THE OUTWARD

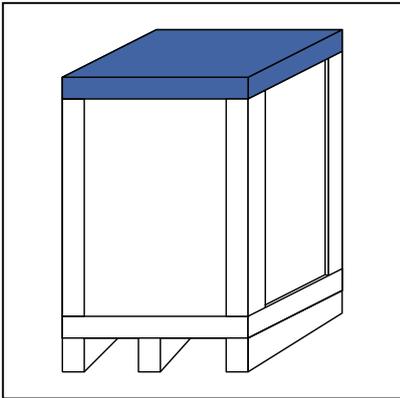


<FU-3/5/7/14/27MG>

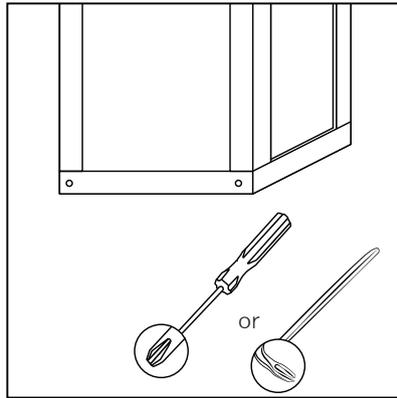


<FU-3/5/7/11MGE>

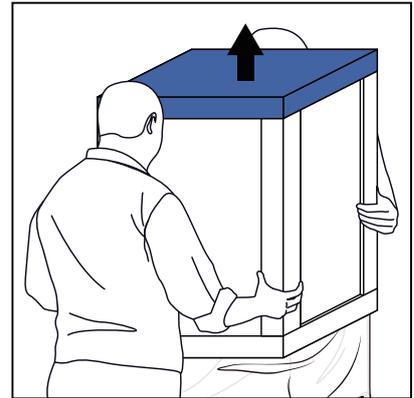
5. INSTALLATION



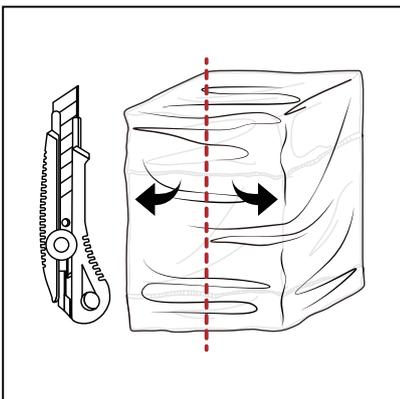
① Once the product is delivered, place the package on a flat location.



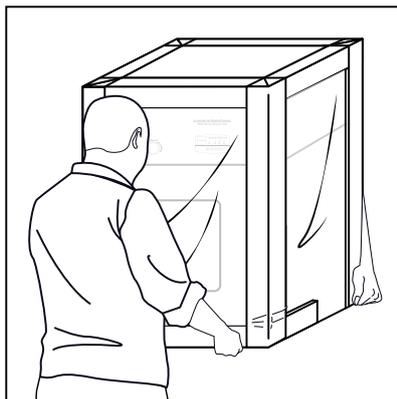
② Unscrew the bottom of the box.



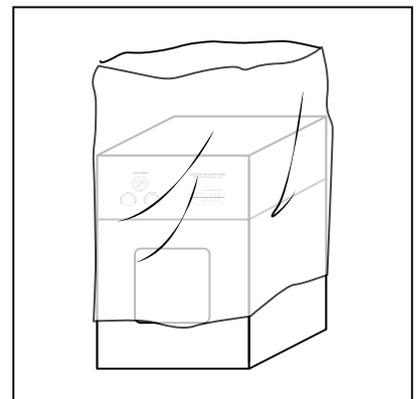
③ Lift the box as shown in the picture.



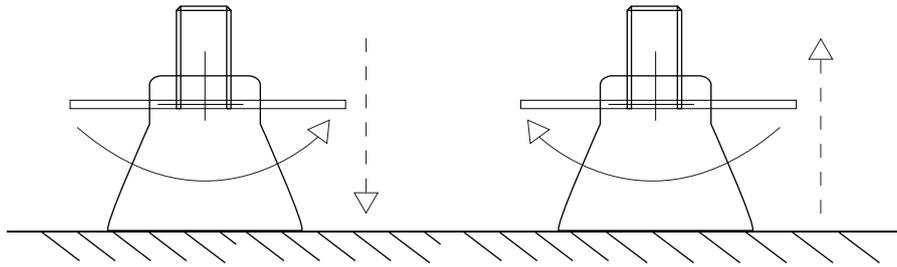
④ Unwrap the bag.



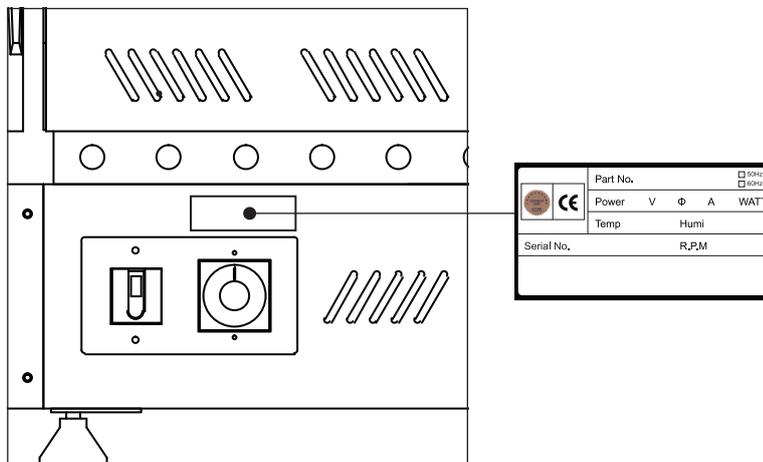
⑤ Place the equipment on your desired location.



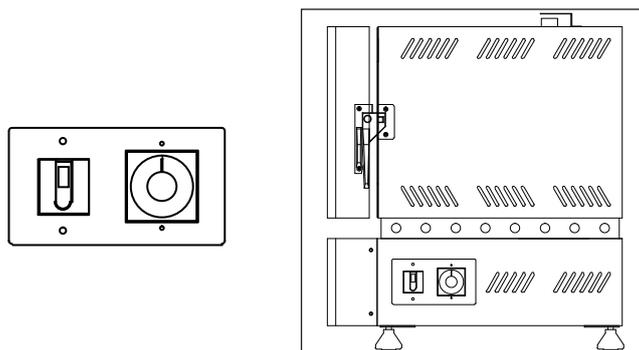
⑥ Lift the remaining plastic up.



Turn the levelling foot clockwise or counter clockwise to adjust.(FU-xxMG)



! Serial label shows the electric power specification of the unit.
Connect power and turn on the main switch (E.L.B)



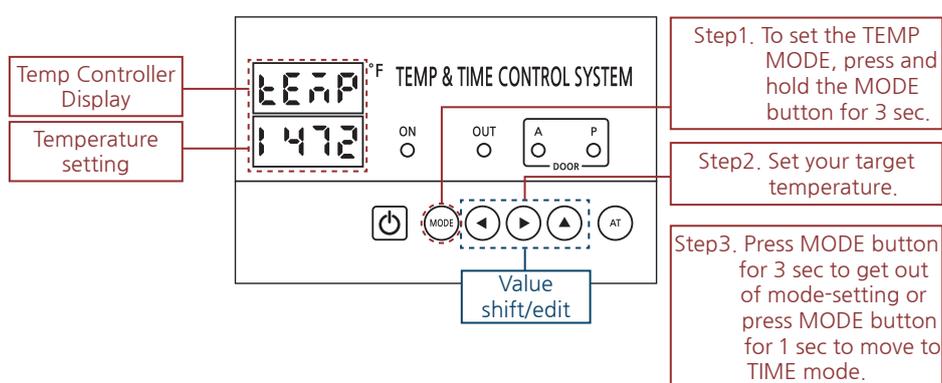
<Position of OVER TEMP Dial Inside Control Panel>

! OVER TEMP should be set at least 30°C higher than the target set temp.(FU-xxMG)

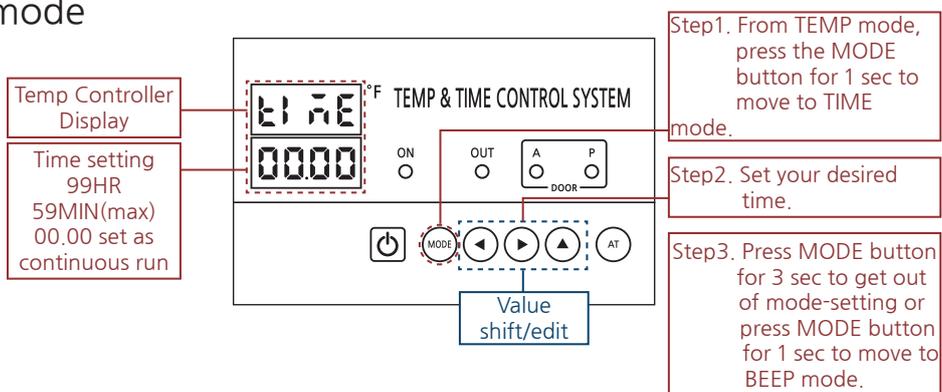
If the TEMP CONTROLLER set value is 800°C, OVER TEMP controller must set over 830°C.

6-1. SETTING AND OPERATION (FU-xxMG Series)

(1) TEMP mode



(2) TIME mode



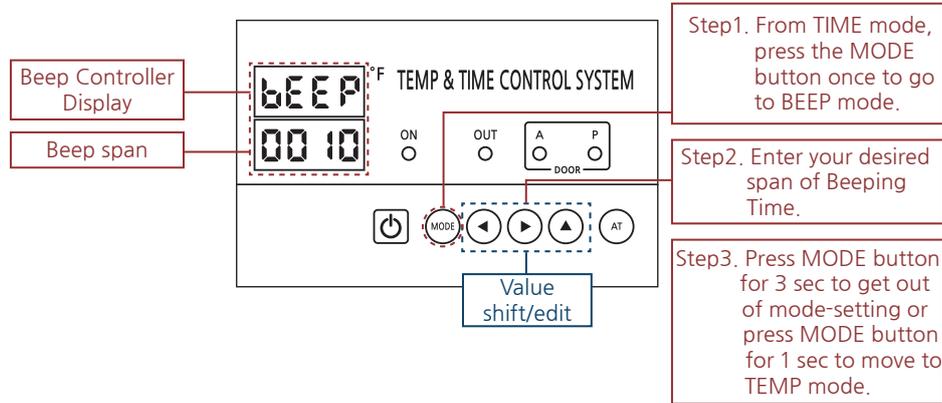
※ The first 2 digits=hours
The last 2 digits=minutes

If you want a minute-second or day-hour time combination instead, feel free to contact your supplier.

※ Be aware that 00.00 means infinite value.

The unit will continue to run until the user manually turns it off.

(3) BEEP mode

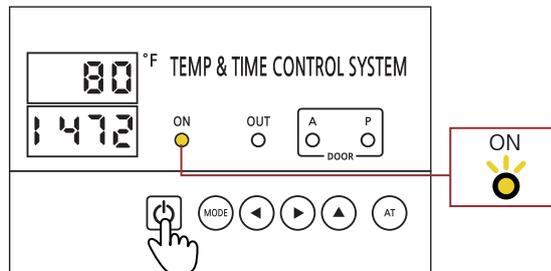


The span of time set under beep mode is the duration of the beeping once the set operating time has been finished.

1 buzzer sound/sec.

The BEEP timer will only operate once TIME mode is set.

(4) Start the unit



Press  for 3 sec and the unit will start running with lamp ON.

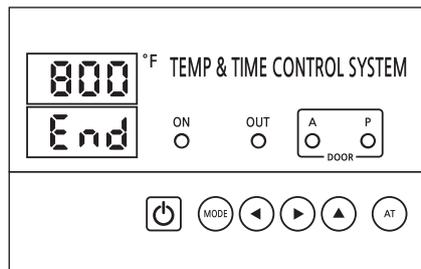


Make sure that you should press  always to run the unit.



Lamp A and P's status is nothing to do with this product so you do not need to pay attention for A/P Lamp status in this product.

(5) Stop the unit



When TIME mode ends or operator stops it manually by pressing  the unit will stop running.



Be careful about the hot air.

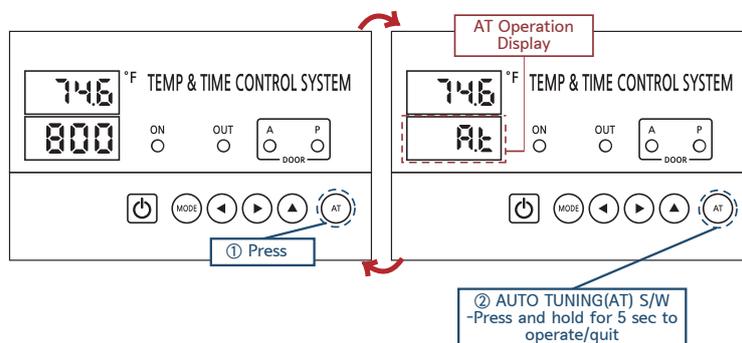
(6) Auto Tuning(AT)

AT is recommended under 2 cases.

case1. When the change of current temp is fluctuating more than $\pm 1.0^{\circ}\text{C}$.

case2. When the unit can not reach at the set temp.

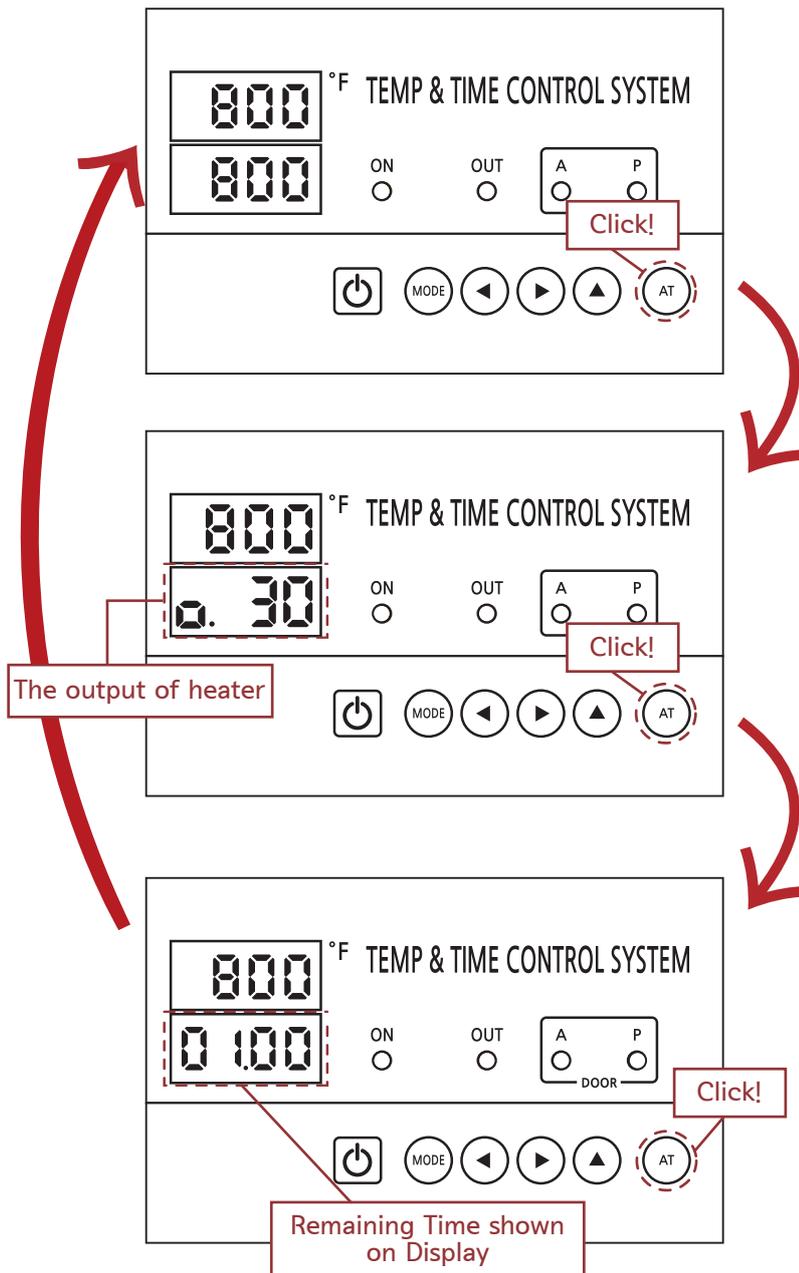
You can enter / quit AT mode by pressing AT button for 5 sec.



AT will be finished automatically when it is done.

(7) Checking the remaining operation time and the output of heater

- ➔ You can check the output of heater by clicking "AT" button for 1 sec.
- ➔ You can check the remaining operating time by clicking "AT" button one more time.
- ➔ You can return to the original display by clicking "AT" button one more time.

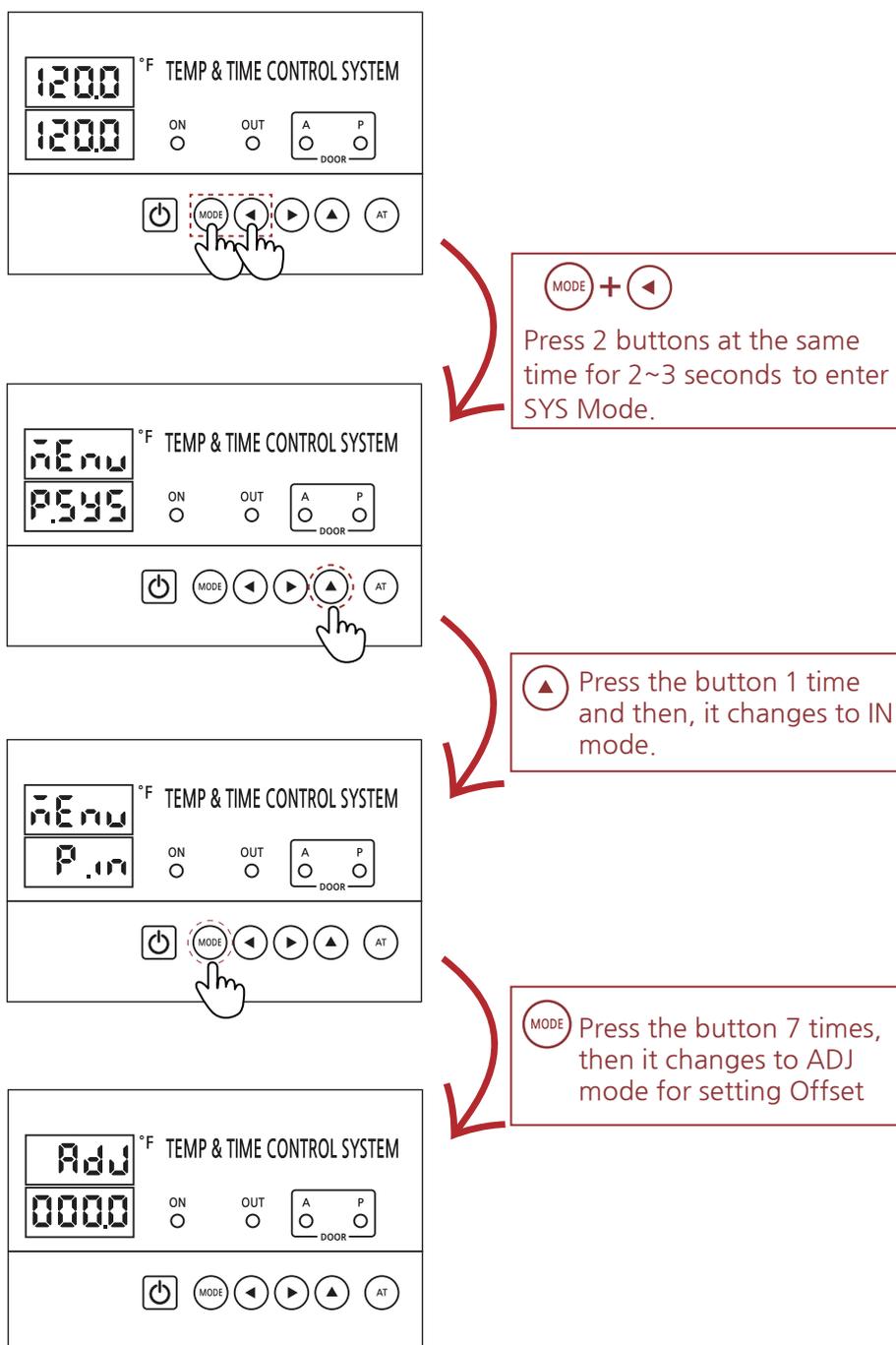


- * 0.100=100% Output of heater
- 0.60=60% Output of heater
- 0.30=30% Output of heater

6-2. Temperature Offset setting

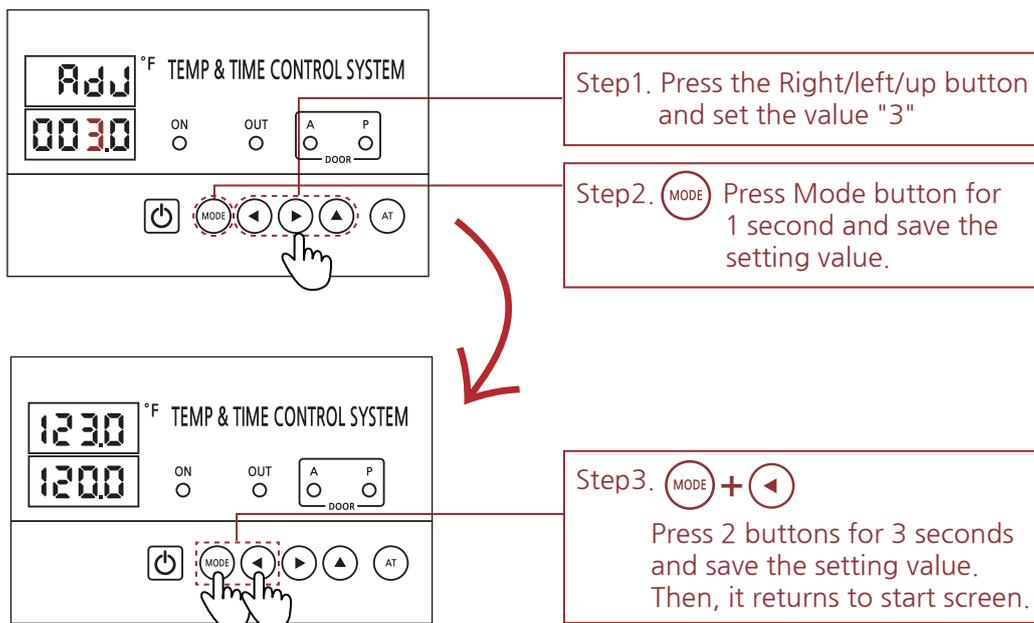
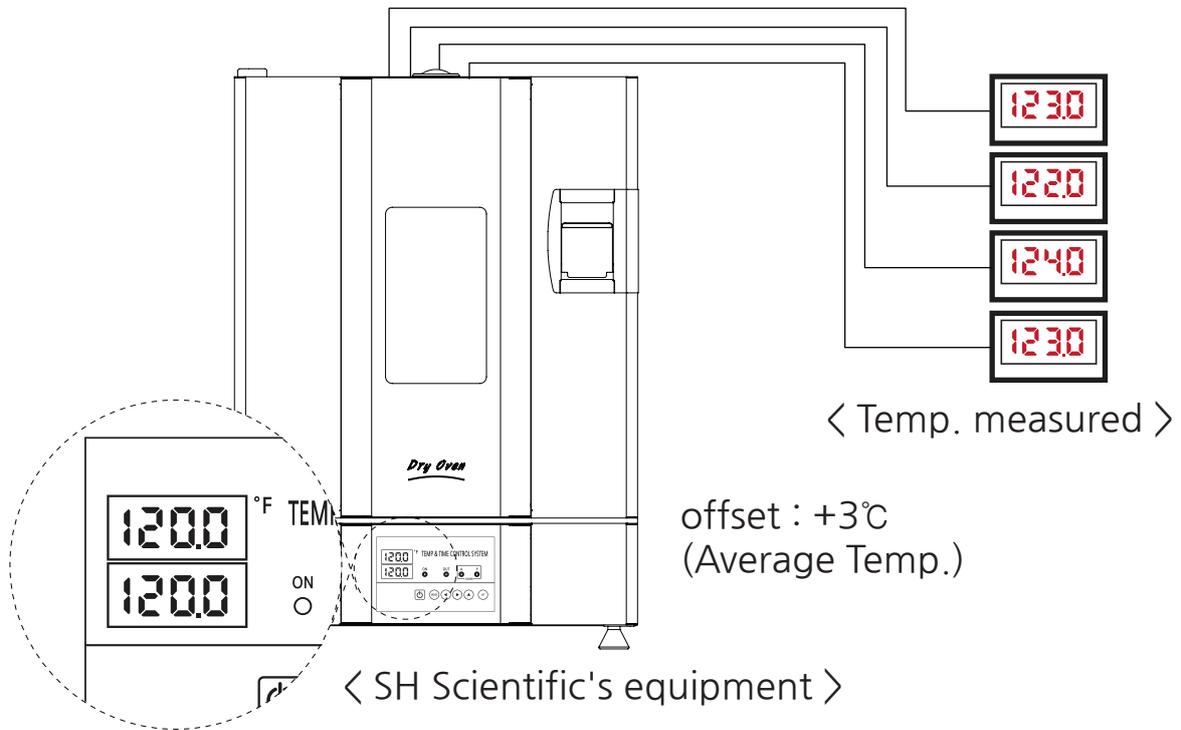
This setting is necessary to keep the optimal temperature uniformity.
Please follow the Offset setting process

(1) Offset setting mode

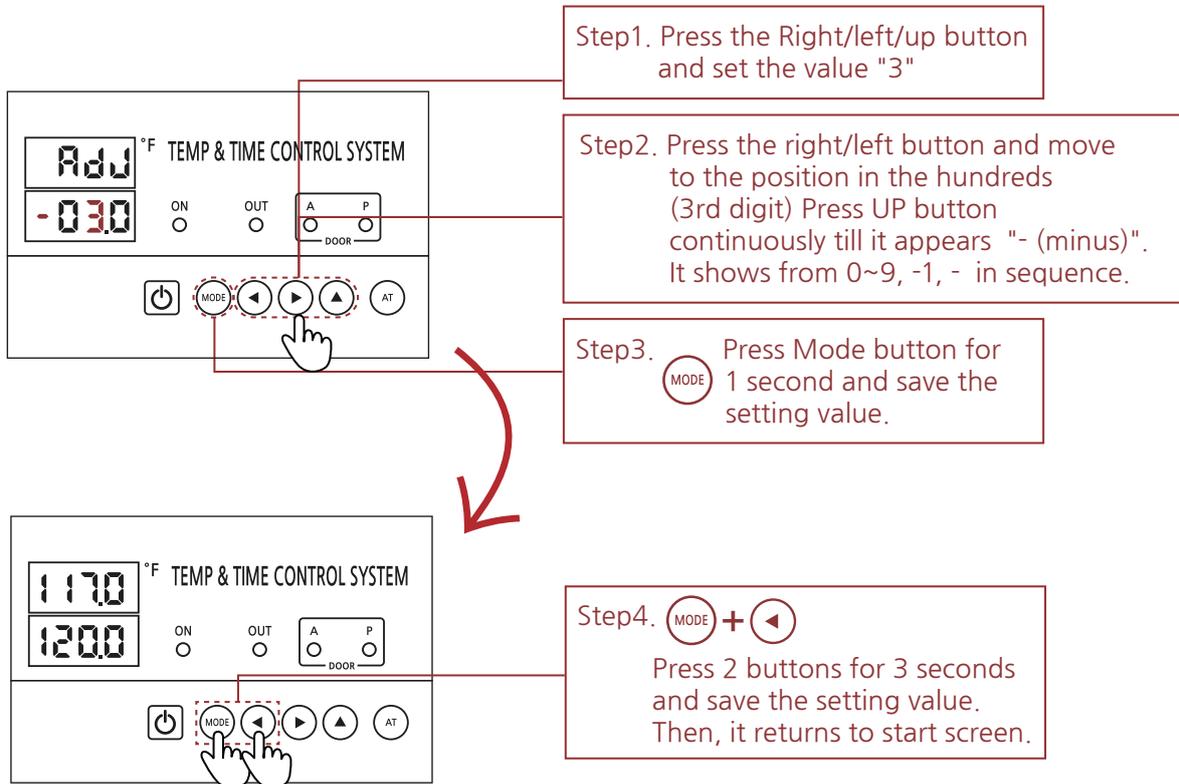
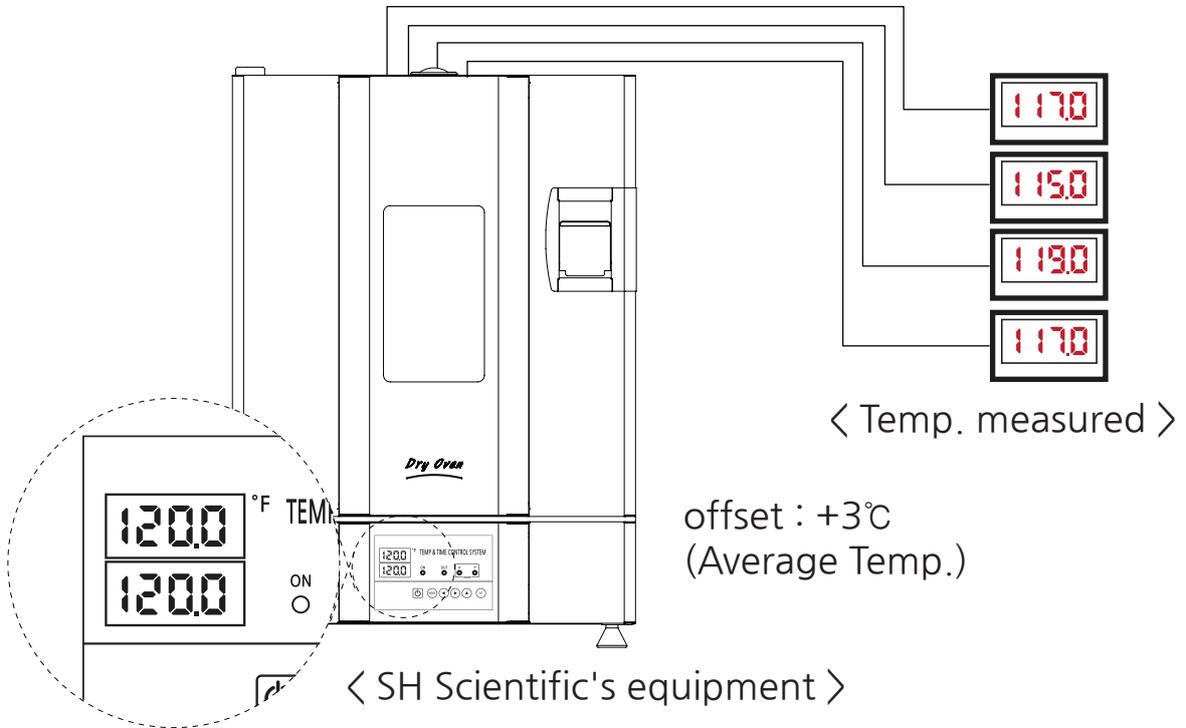


(2) Example for Temperature offset setting

ex 1) To raise 3 °C

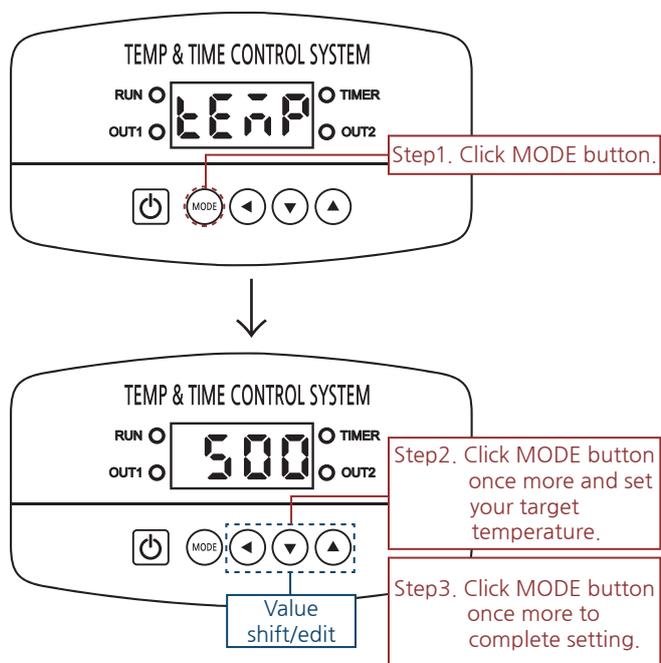


ex 2) To decrease 3

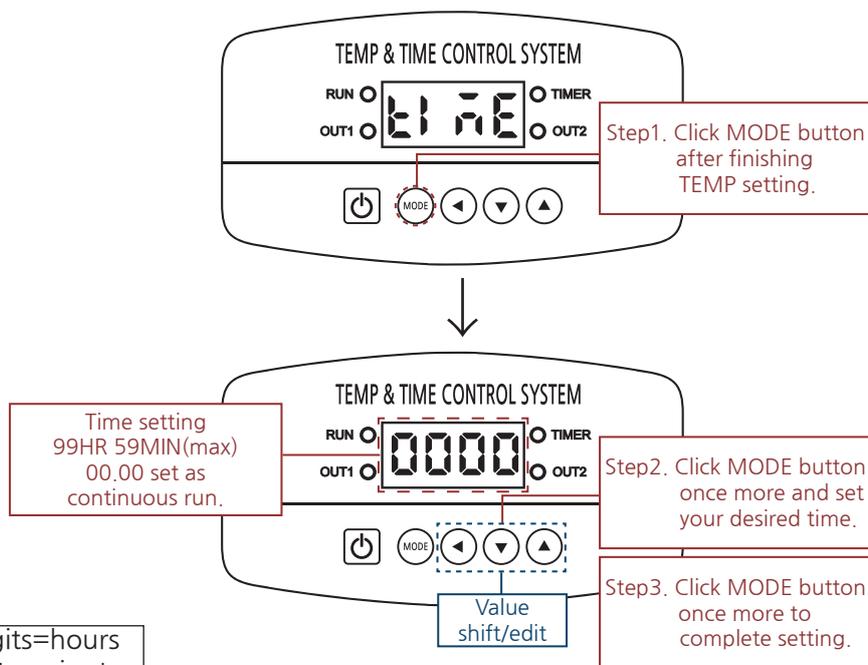


6-3. SETTING AND OPERATION (FU-xxMGE Series)

(1) TEMP mode



(2) TIME mode



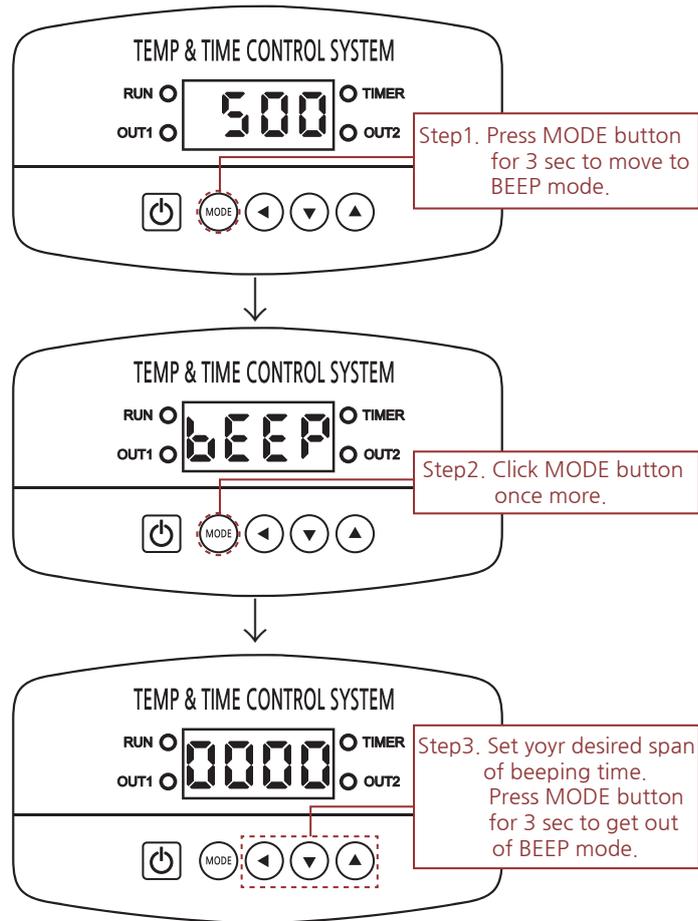
※The first 2 digits=hours
The last 2 digits=minutes

If you want a minute-second or day-hour time combination instead, feel free to contact your supplier.

※Be aware that 00.00 means infinite value.

The unit will continue to run until the user manually turns it off.

(3) BEEP mode



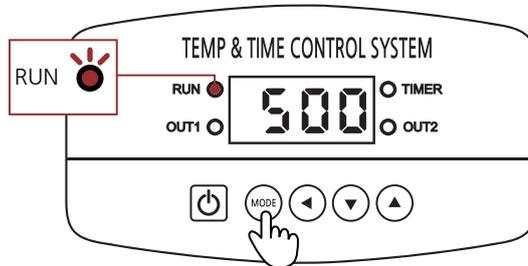
Click MODE button once more to end TEMP/TIME setting.

The span of time set under beep mode is the duration of the beeping once the set operating time has been finished.

1 buzzer sound/sec.

The BEEP timer will only operate once TIME mode is set.

(4) Start / Stop the unit



Press  for 3 sec and the unit will start running with RUN lamp on.
Press  for 3 sec and the unit will stop running with RUN lamp off.

-  OUT1 lamp will be on or blinking during the unit runs.
-  TIMER lamp will be blinking and it will be on when the set temp is reached.
-  OUT2 is nothing to do with this product.

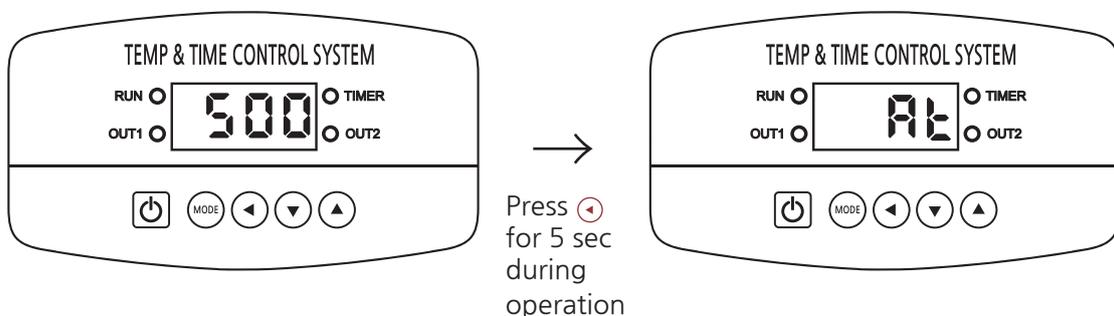
(5) Auto Tuning(AT)

AT is recommended under 2 cases.

case1. When the change of current temp is fluctuating more than $\pm 0.1^{\circ}\text{C}$.

case2. When the unit can not reach at the set temp.

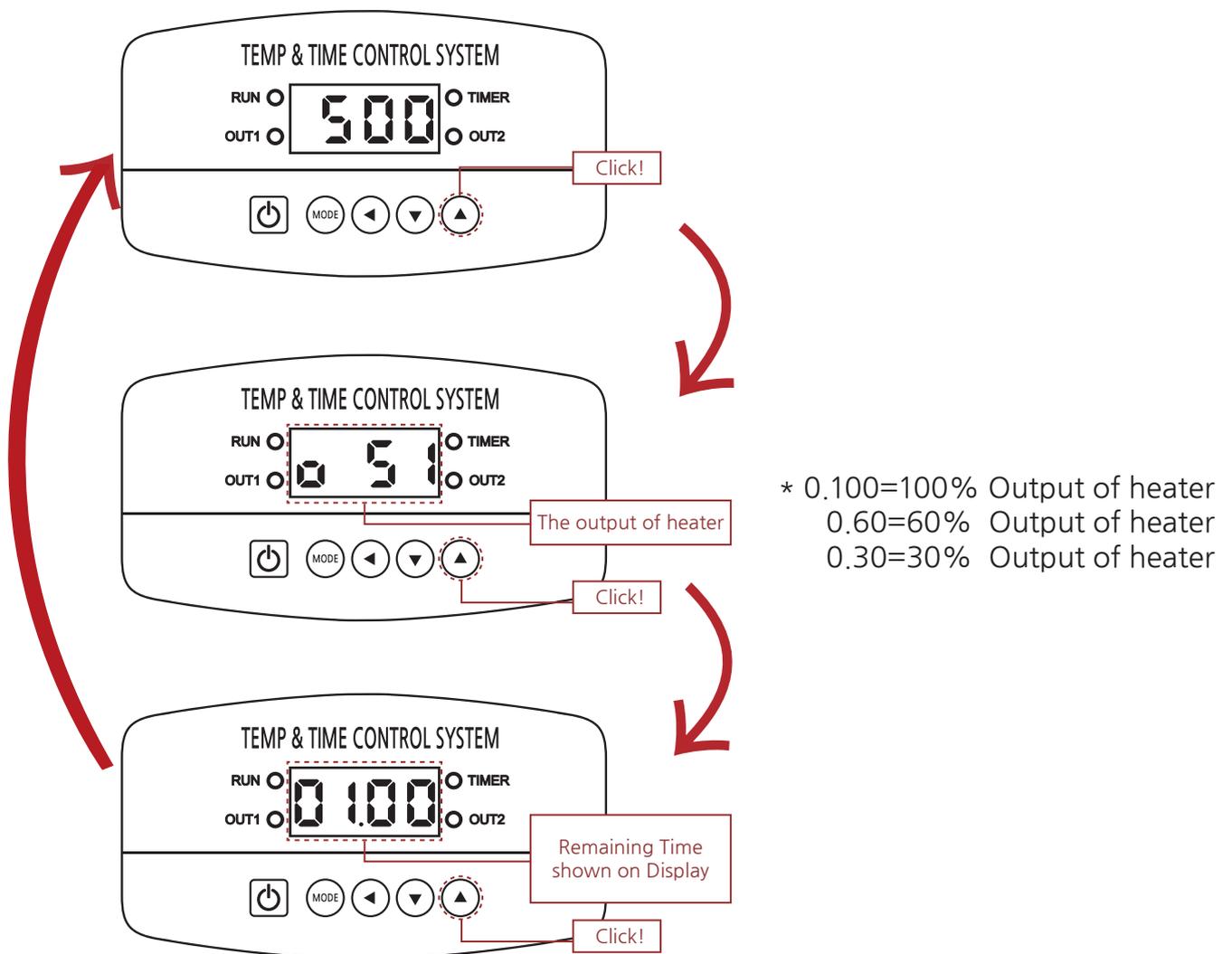
You can enter / quit AT mode by pressing  for 5 sec when the unit runs.



AT will be finished automatically when it is done.

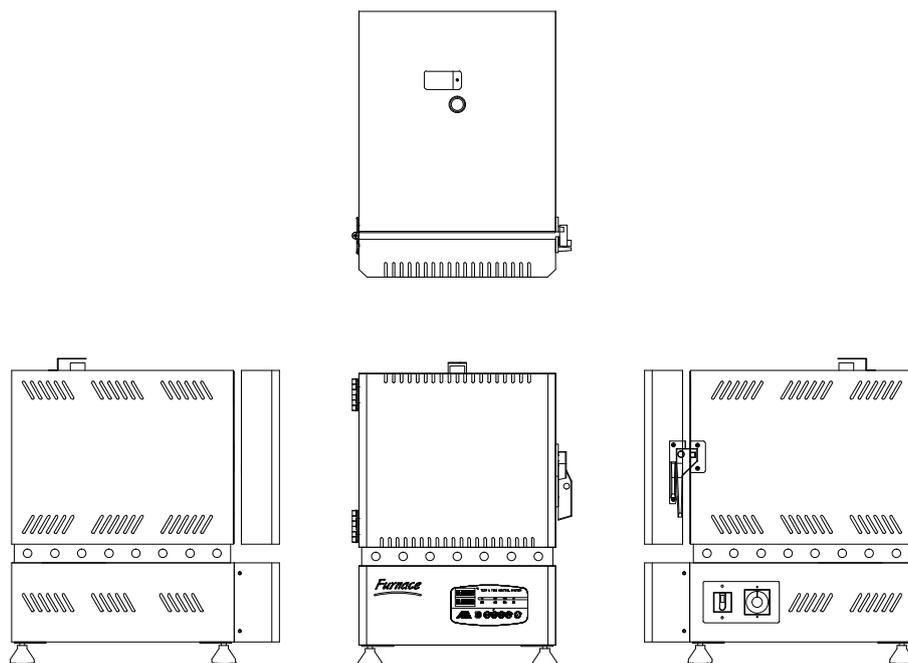
(6) Checking the remaining operation time and the output of heater

- ➔ You can check the output of heater by clicking  button for 1 sec.
- ➔ You can check the remaining operating time by clicking  button one more time.
- ➔ You can return to the original display by clicking  button one more time.



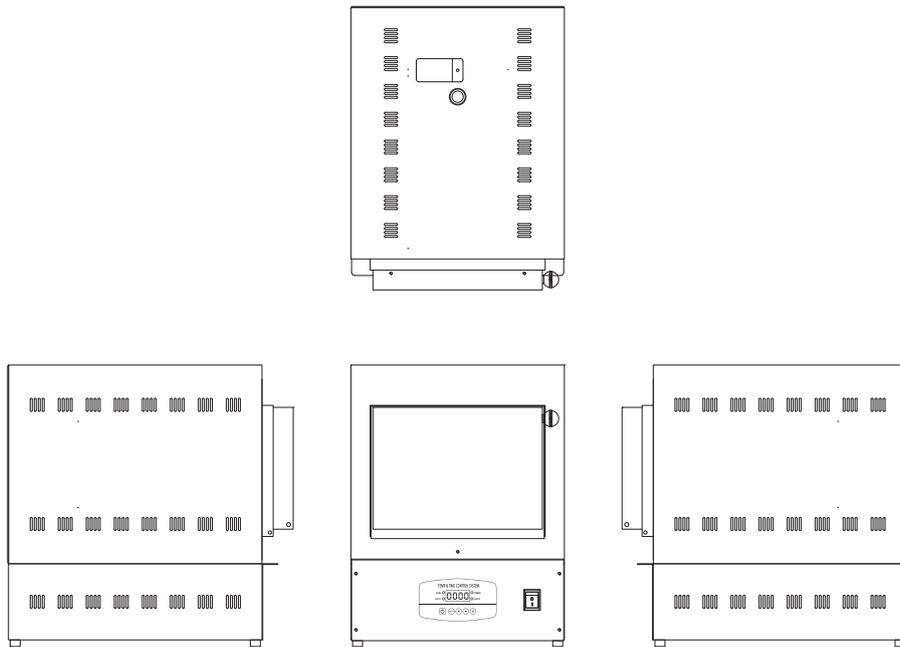
7. SPECIFICATIONS

1200°C MUFFLE FURNACE - 3/5/7/14/27MG



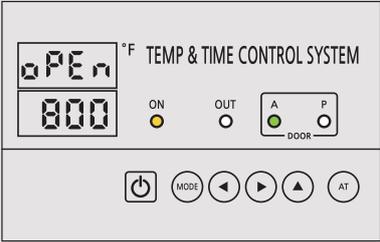
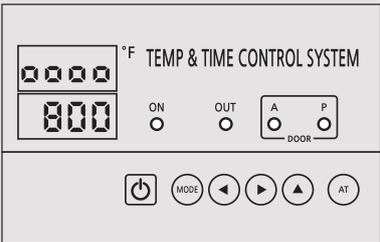
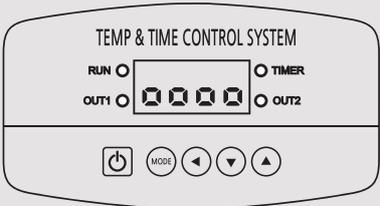
Model	SH-FU-3MG	SH-FU-5MG	SH-FU-14MG	SH-FU-27MG
Max Temp	1200°C (2192°F)			
Temp Controller	Digital PID Controller			
Sensor	K type			
Heater Capa	1400 W	1600 W	4100 W	4900 W
Capa	2.9 L	4.5 L	14 L	27 L
Dimension Internal (W×D×H)	130x250x90(mm)	150x300x100(mm)	250x350x160(mm)	300x300x300(mm)
	5.12x9.87x3.54(inch)	5.91x11.81x3.93(inch)	9.84x13.78x6.30(inch)	11.81x11.81x11.81(inch)
Dimension External (W×D×H)	370x505x570(mm)	390x555x580(mm)	500x605x670(mm)	580x585x840(mm)
	14.57x19.88x22.44(inch)	15.30x21.85x22.83(inch)	19.69x23.82x26.38(inch)	22.83x23.03x33.07(inch)
Net weight	34 Kg	44 Kg	65 Kg	105 Kg
Heater Element	KANTHAL A-1 with ARD molding			
Insulation	Ceramic Board & Wool			
Electrical Requirements 120V ,50/60Hz, 1Φ	11.7 A	13.3 A	34.2 A	N/A
Electrical Requirements 230V ,50/60Hz, 1Φ	6.1 A	7 A	17.8 A	
Electrical Requirements 230V ,50/60Hz, 3Φ	N/A			12.3 A
Electrical Requirements 380V ,50/60Hz, 3Φ	N/A			7.5 A

1050°C MUFFLE FURNACE - 3/5/7/11MGE



Model	SH-FU-3MGE	SH-FU-5MGE	SH-FU-7MGE	SH-FU-11MGE
Max Temp	1050°C (2192°F)			
Temp Controller	Digital PID Controller			
Sensor	K type			
Heater Capa	1100 W	1500 W	2000 W	2800 W
Capa	3 L	5.1 L	7.4 L	11.2 L
Dimension Internal (W×D×H)	130x220x110(mm)	150x260x130(mm)	170x290x150(mm)	200x310x180(mm)
	5.12x8.66x4.33(inch)	5.91x10.24x5.12(inch)	6.69x11.42x5.91(inch)	7.87x12.20x7.09(inch)
Dimension External (W×D×H)	300x378x405 (mm)	320x428x425(mm)	340x458x445(mm)	370x468x475(mm)
	11.81x14.88x15.94(inch)	12.60x16.85x16.73(inch)	13.39x18.03x17.52(inch)	14.57x18.43x18.70(inch)
Net weight	19 Kg	22 Kg	28 Kg	34 Kg
Heater Element	KANTAL A-1 with CERAMIC FIBER			
Insulation	Ceramic Board & Wool			
Electrical Requirements 120V ,50/60Hz, 1Φ	10 A	14 A	18 A	25 A
Electrical Requirements 230V ,50/60Hz, 1Φ	5 A	7 A	9 A	13 A

8. TROUBLESHOOTING

Symptom	Passible Causes of Problem
Unit does not work	Check power is connected well.
Temperature does not rise	Press  for 3 sec.
	Press  button for 5 sec.(FU-xxMG)
	Press  button for 5 sec.(FU-xxMGE)
	Check OVER TEMP set value.(FU-xxMG)
Operating Temp.fluctuates	Press  button for 5 sec.(FU-xxMG)
	Press  button for 5 sec.(FU-xxMGE)
	Alert of door open during operation. Make sure if door is closed. (FU-xxMG)
	Alert of temperature sensor's short circuit. (FU-xxMG)
	Alert of temperature sensor's short circuit. (FU-xxMGE)

