Version : 2022 Rev.0

1800 MoSi2
Vacuum Muffle Furnace

SH-FU-4.5MSV / SH-FU-10MSV /SH-FU-20MSV

TABLE OF CONTENTS

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.

1. General description

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

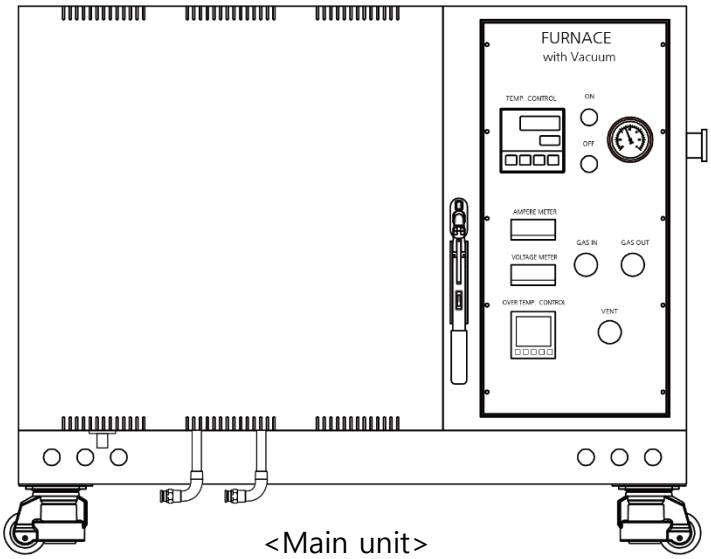
Explosive.

No disassemble.

Flammable.

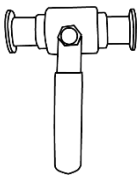
Hot surface or steam.

3. Basic Parts

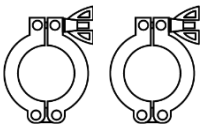


<Main unit>

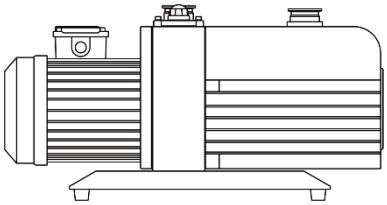
+



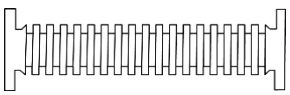
Ball Valve



Clamp

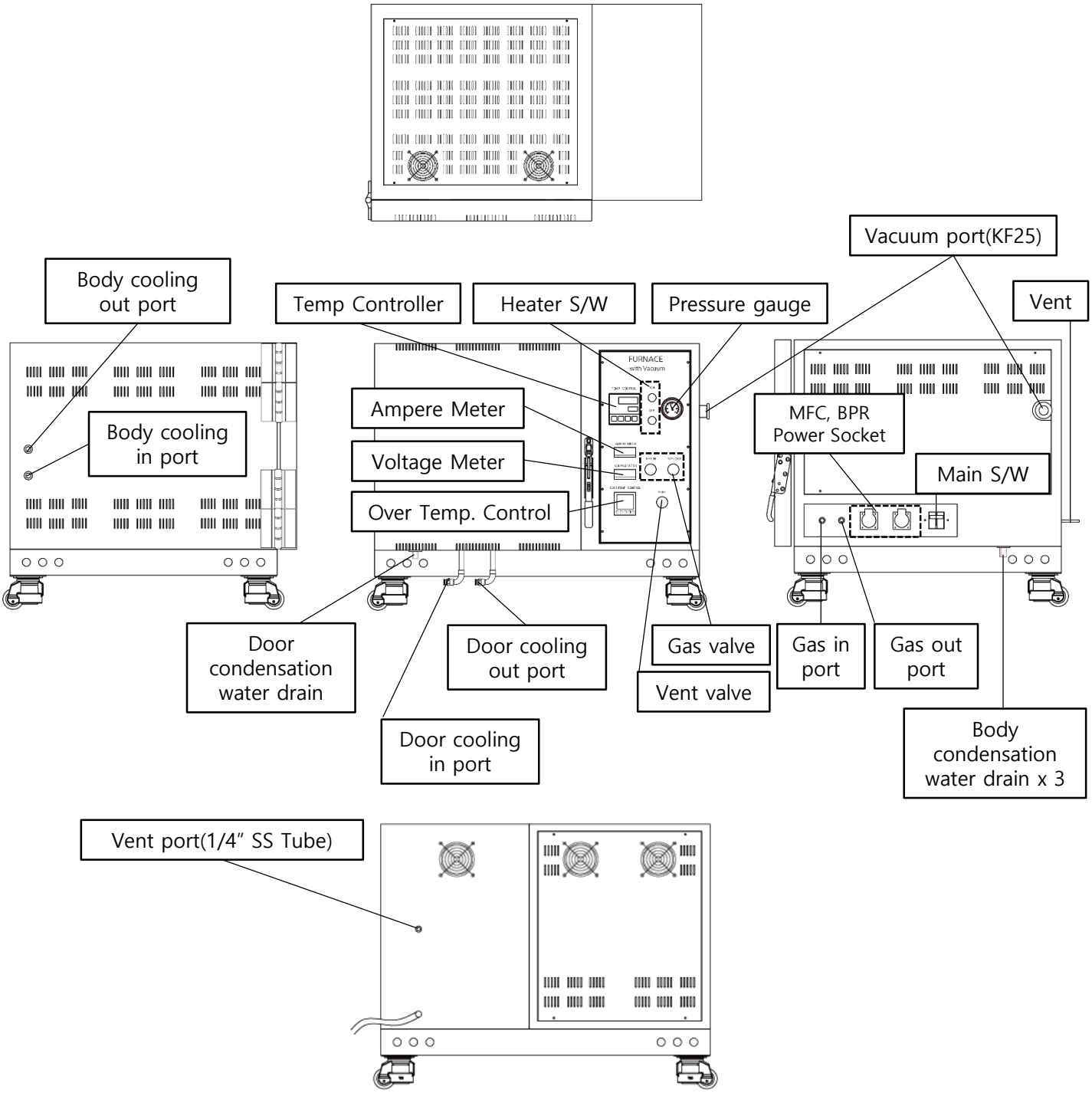


Pump(Option)



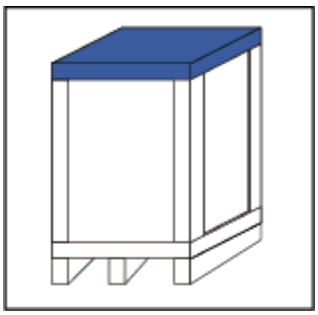
Bellows (Supplied with purchase of Pump)

4. The outward

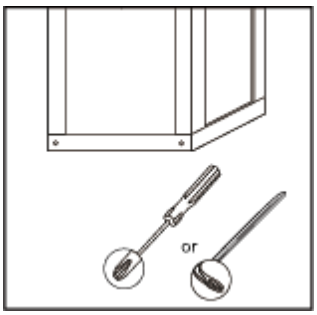


<SH-FU-20MSV-OM>

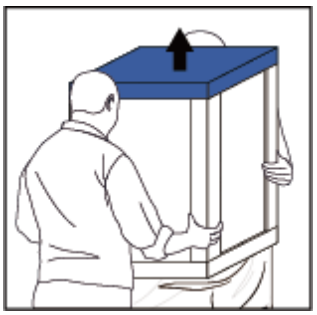
5. Installation



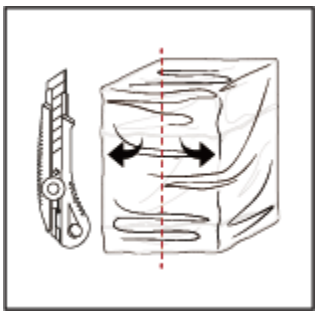
① Once the product is delivered, place the package on a flat location.



② Unscrew the bottom of the box.

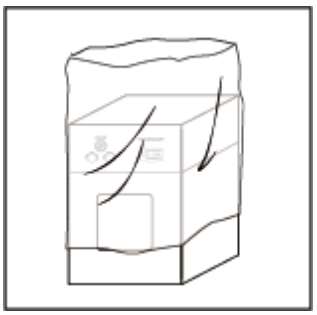


③ Lift the box as shown in the picture.

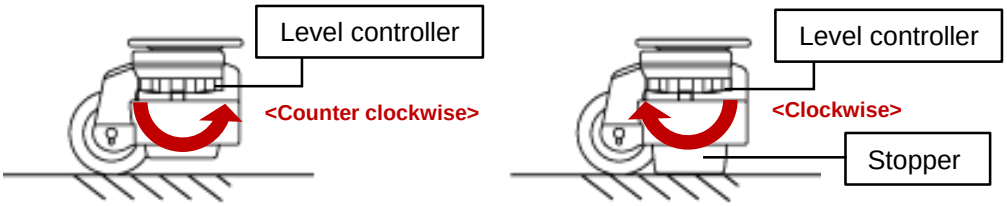


④ Unwrap the bag.

⑤ Place the equipment on your desired location.



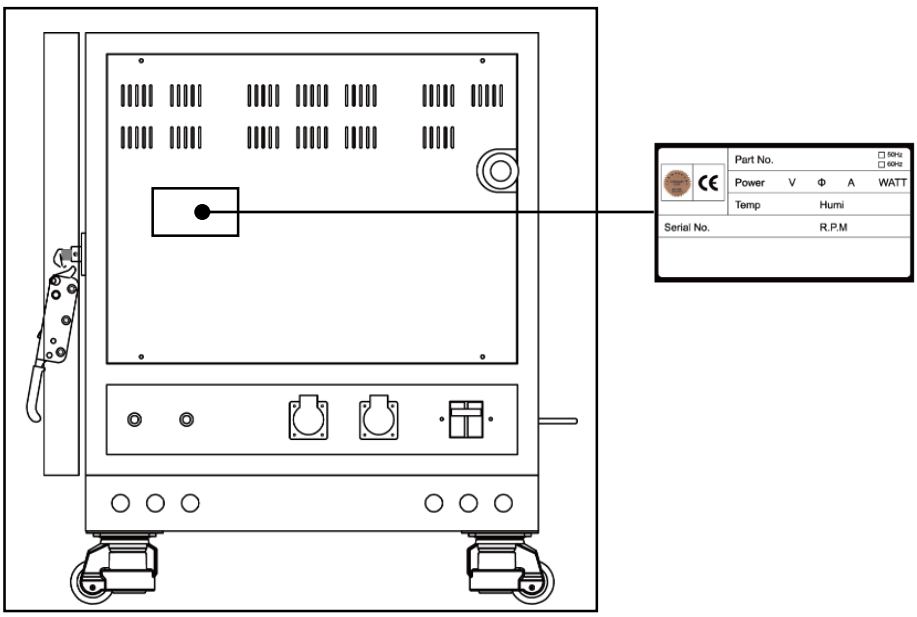
⑥ Lift the remaining plastic up.



<Unlock position>
- When moving equipment

<Lock position>
- When stopping moving equipment or installing

When installing equipment, fix the stopper to the floor by turning the level controller clockwise or counterclockwise.

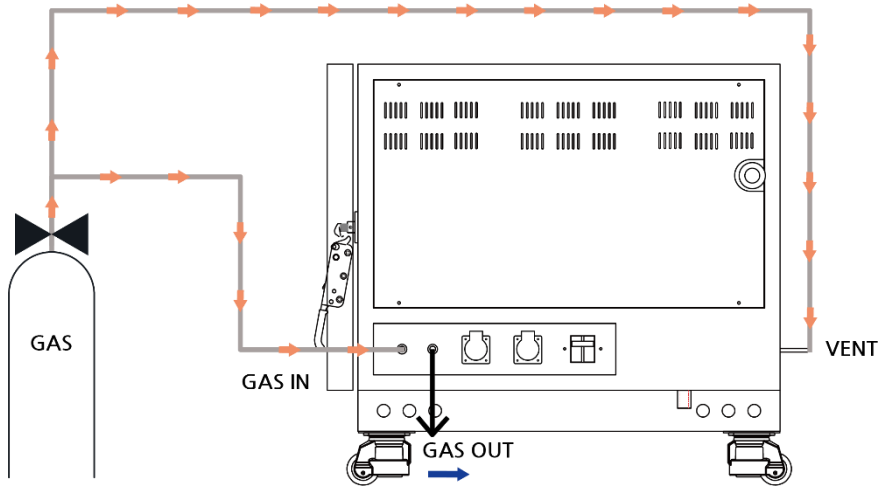


Serial label shows the electric power specification of the unit.
Connect power and turn on the main switch (E.L.B)

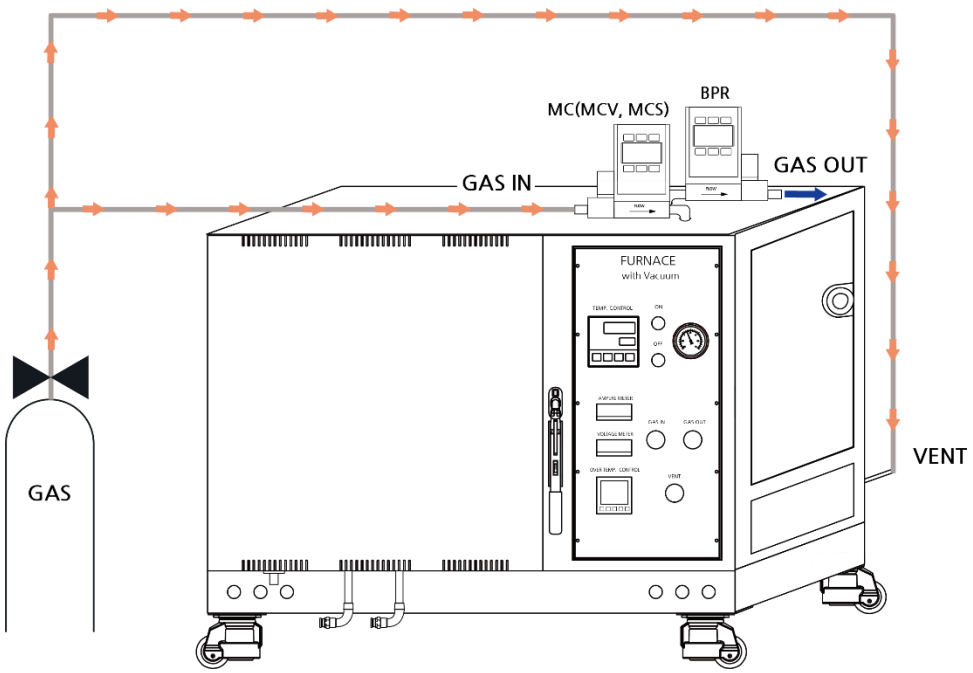
Please avoid a sharp and rapid increase in temperature, which will deteriorate the durability of heating elements. We recommend 15℃/min or similar as ideal ramp up rate.

< Configuration of Gas connection >

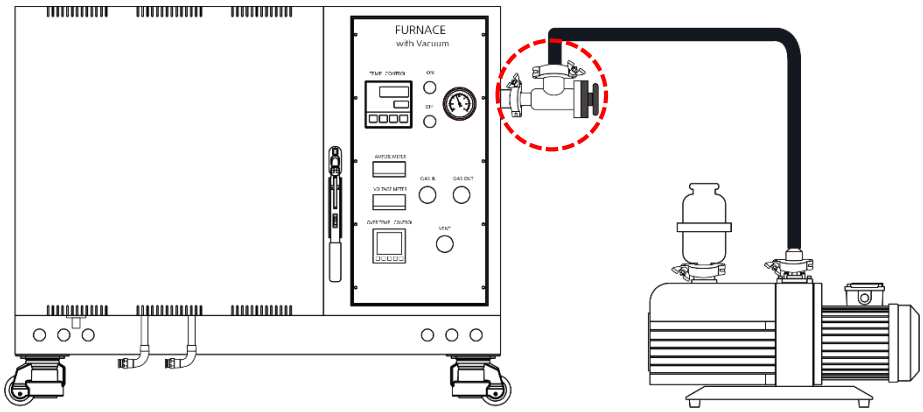
▶ Standard



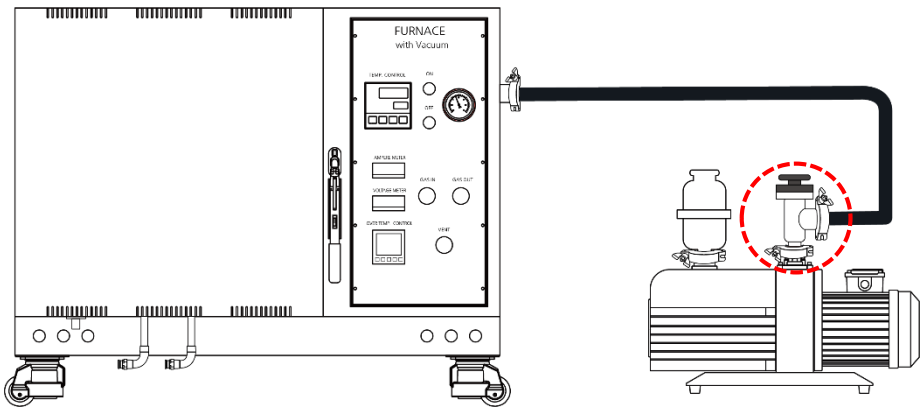
▶ MC (MCV, MCS), BPR (**Optional**)



< How to connect Pump to the Vacuum Port >

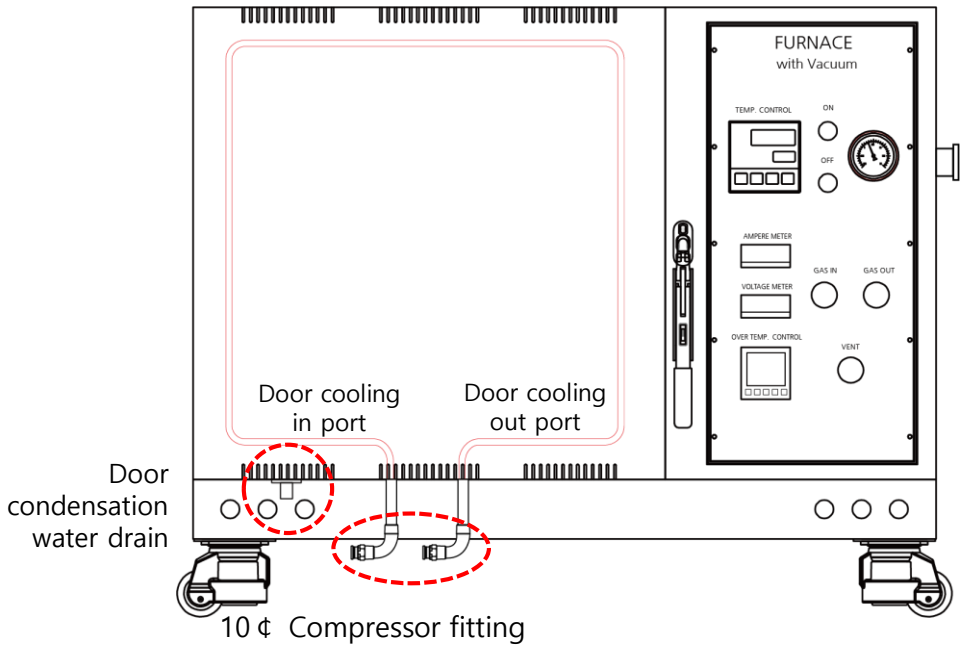


Installation of Ball Valve & Clamp towards to Furnace

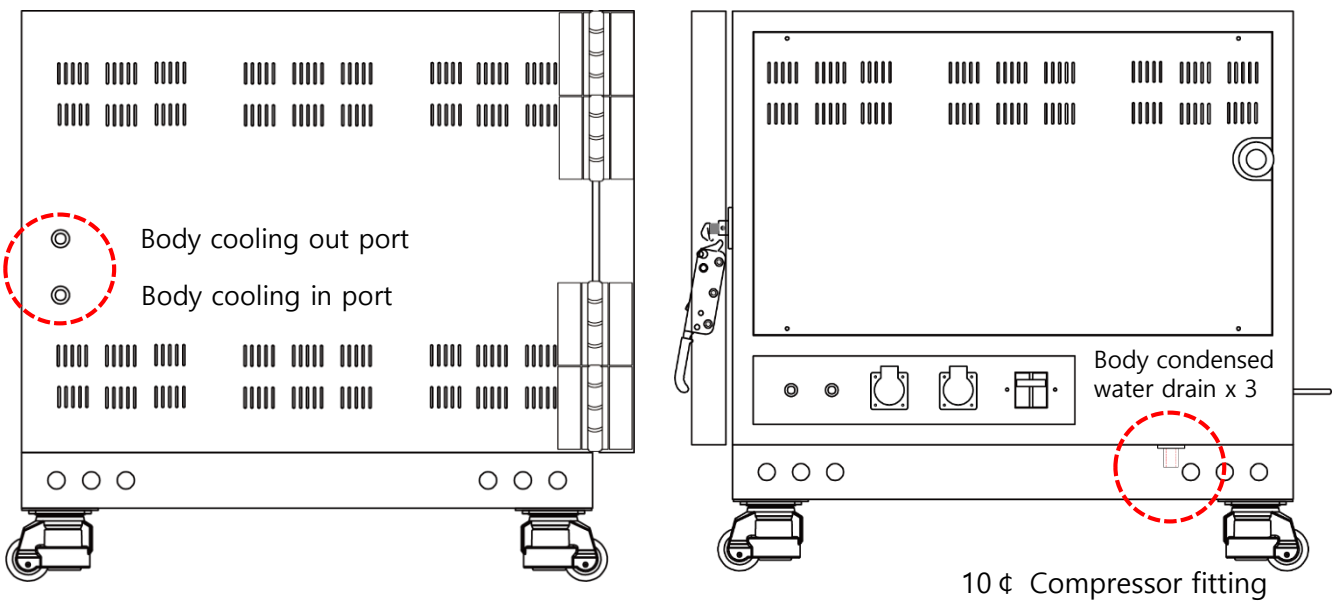


Installation of Ball Valve & Clamp towards to Pump

< Configuration of coolant connection >



Please connect a chiller in the door in case of running furnace at higher than 1500°C.



OPTION

Please connect a chiller in the body of furnace when it necessary,

such as fast cooling of inner chamber temperature after ending running.

6. Vacuum Setting and Operation

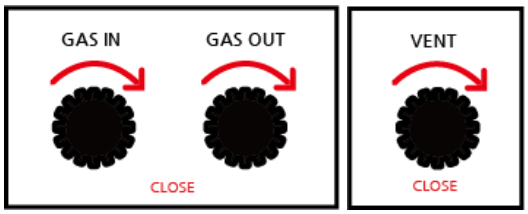
❖ Please watch this tutorial video for more information.

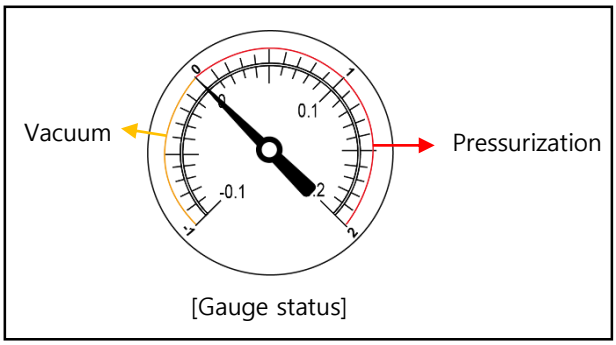
6.1 Standard

① Connect the input gas to the Gas in port(1/4” Tube Look) and Vent port(1/4” Tube).

② Connect the Pump to the Vacuum port.

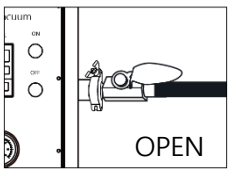
③ Close the Gas valves & Vent valve.



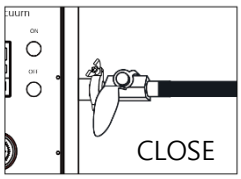


④ Power on the Pump.

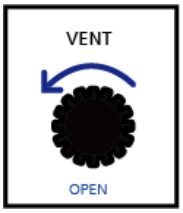
⑤ Open the vacuum valve connecting the Vacuum Pump and the Vacuum Muffle Furnace.(Vacuum gauge begins to fall.)



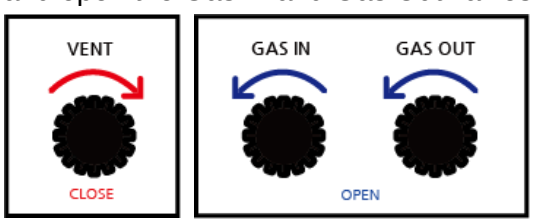
⑥ When the vacuum gauge falls down as shown in the below picture, power off the vacuum pump and close the vacuum valve connecting the Vacuum Pump and Vacuum Muffle Furnace.



⑦ Open the Vent valve. (The vacuum gauge begins to rise.)



⑧ When the vacuum gauge reaches to atmospheric pressure as shown in the below picture, close the Vent valve and open the Gas In and Gas Out valves.



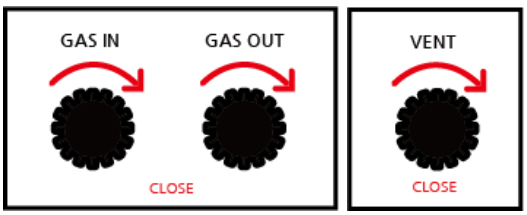
6. Vacuum Setting and Operation

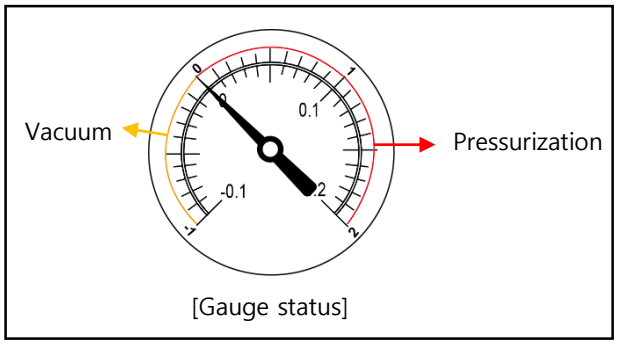
6.2 MC (MCV, MCS), BPR (Optional)

① Connect the input gas to the Gas in port(1/4” Tube Look) and Vent port(1/4” Tube).

② Connect the Pump to the Vacuum port.

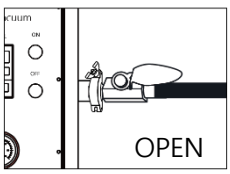
③ Close the Gas valves & Vent valve.



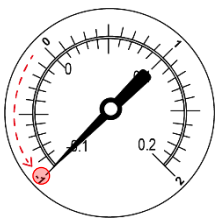


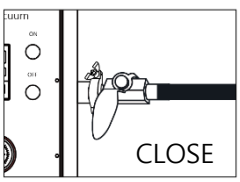
④ Power on the Pump.

⑤ Open the vacuum valve connecting the Vacuum Pump and the Vacuum Muffle Furnace. (Vacuum gauge begins to fall.)

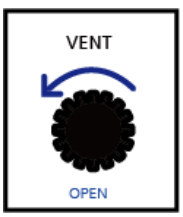


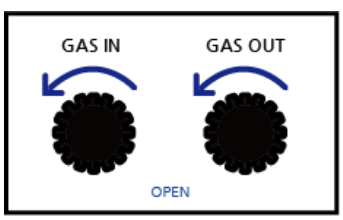
⑥ When the vacuum gauge falls down as shown in the below picture, power off the vacuum pump and close the vacuum valve connecting the Vacuum Pump and Vacuum Muffle Furnace. Pump.



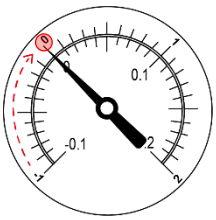


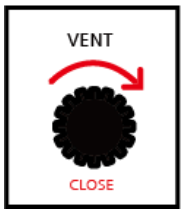
⑦ Open Vent valve, Gas In and Gas Out valves.(The vacuum gauge begins to rise.)





⑧ When the vacuum gauge reaches to atmospheric pressure as shown in the below picture, close the Vent valve and open the Gas In and Gas Out valves.



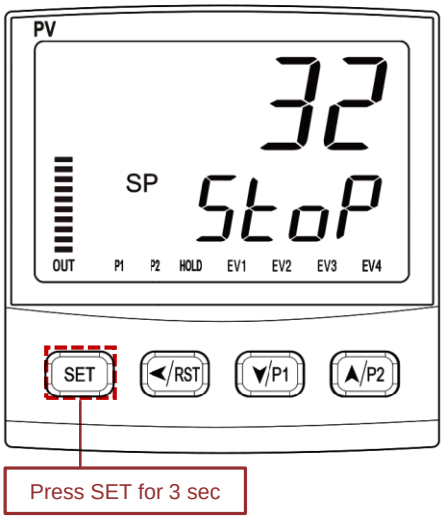


❖ Please watch this tutorial video for more information.

7. Temperature Setting and Time Programming

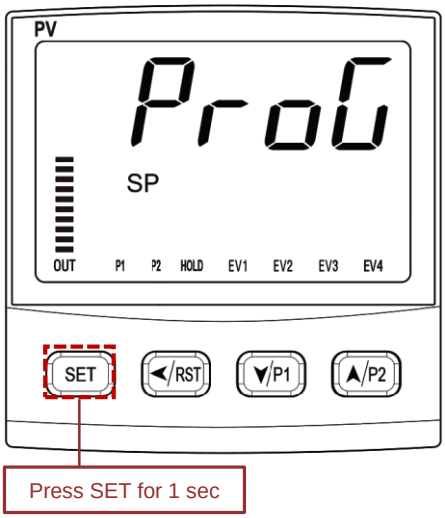
example) Step 1. Ramp up to 800℃ for 2hours
Step 2. Hold at 800℃ for 30minutes
Step 3. Ramp up to 850℃ for 30minutes
Step 4. Hold at 850℃ for 30minutes

1)



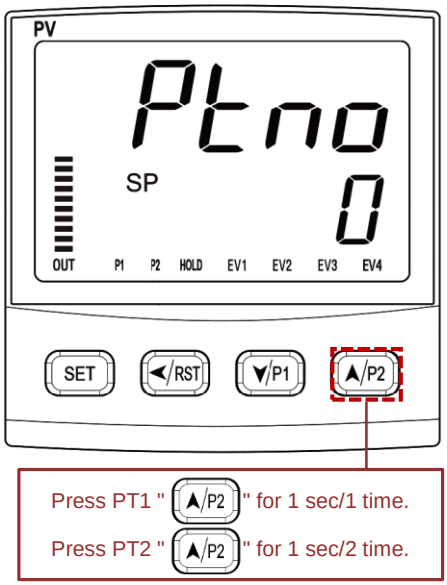
Press SET for 3 sec,
Go to setting mode.

2)



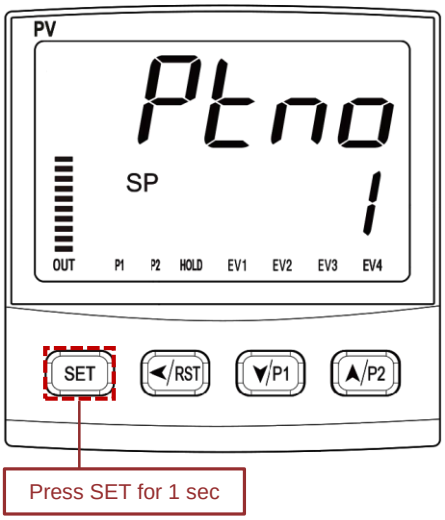
Press SET for 1 sec,
Go to program mode.

3)



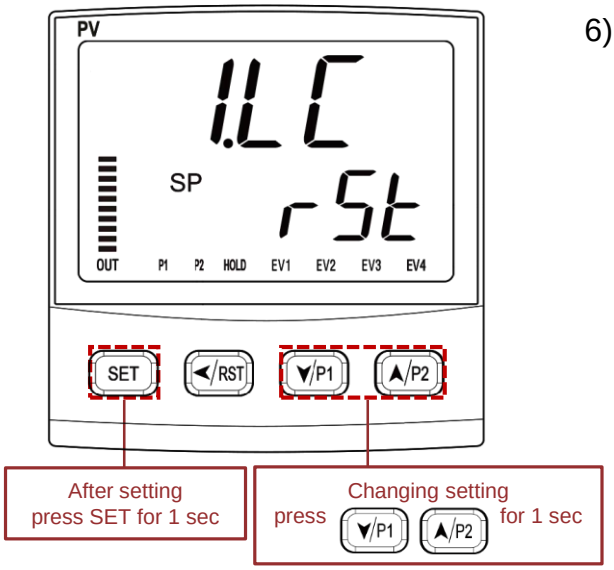
Using up/down button,
set the number of your pattern (1 or 2)

4)



Press SET for 1 Sec to fix
the number of your pattern.

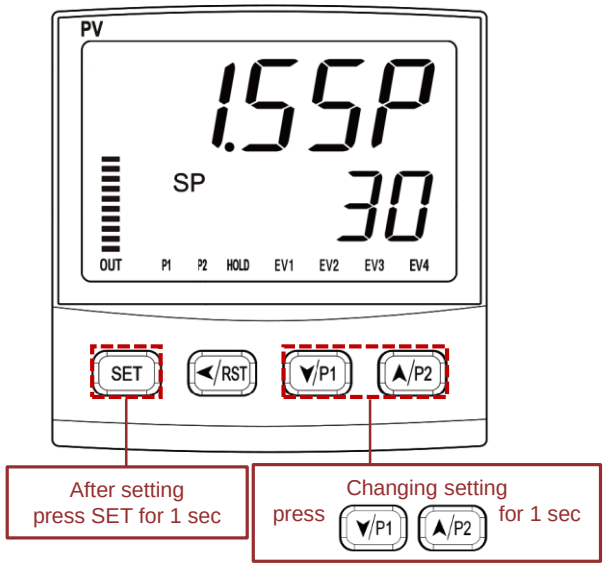
5)



1.LC has 4 ending modes of your pattern 1or 2 you input

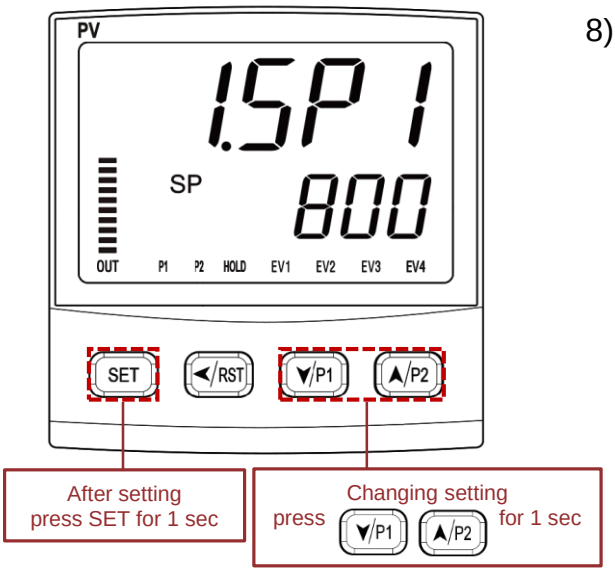
RST-Stop operating after last step
HOLD-Keep temp of last step
PTH1-Endless repeat of No.1 pattern
PTH2-Endless repeat of No.2 pattern

6)



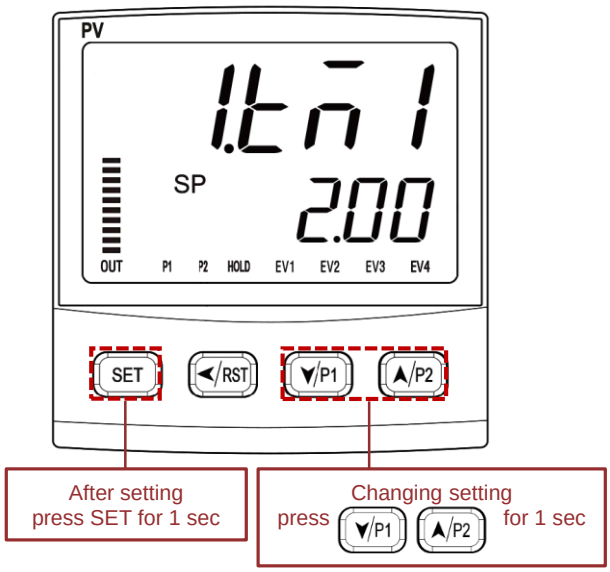
1.SSP means the starting temperature.

7)



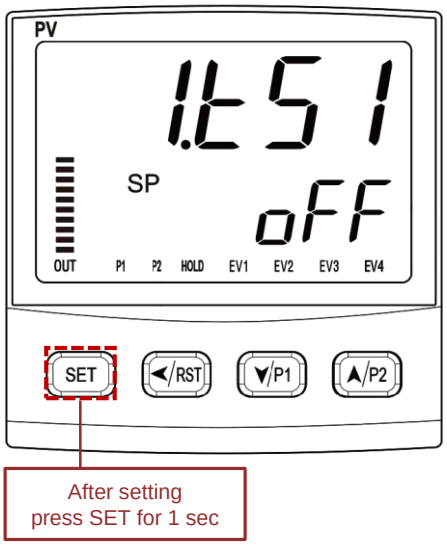
1.SP1 means the first temperature you want to reach

8)



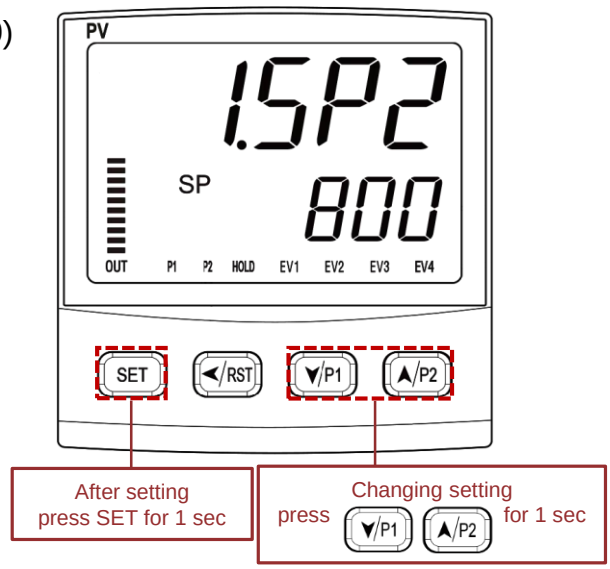
1.tm1 means the time you want in order to reach 800℃
(00.00) (HH.MM)

9)



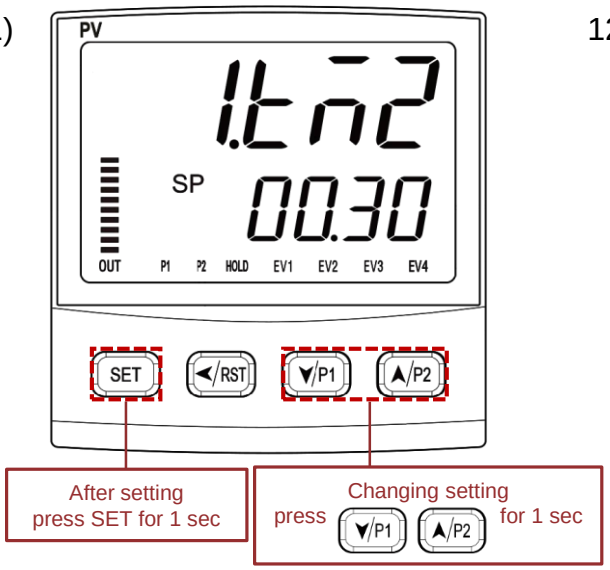
Keep 1.tS1 as oFF always.

10)



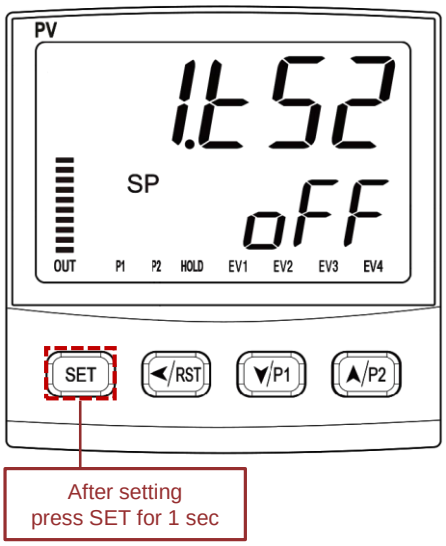
1.SP2 means the second temperature you want to reach or hold

11)



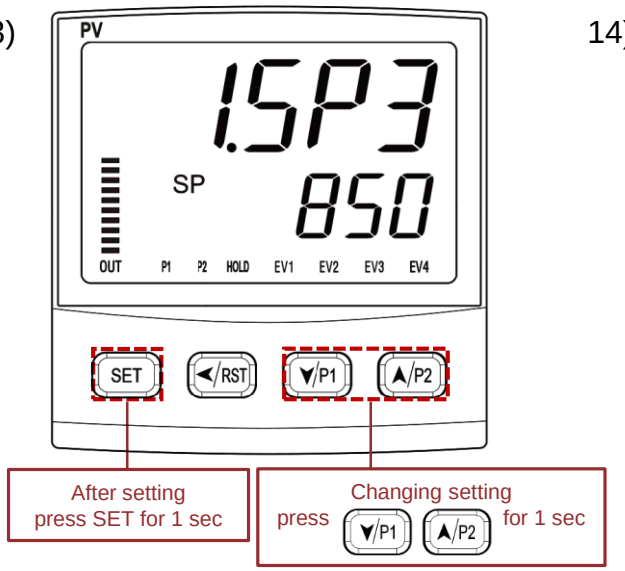
1.tm2 means the time you want to reach at 1.SP2 or hold
(00.00) (HH.MM)

12)



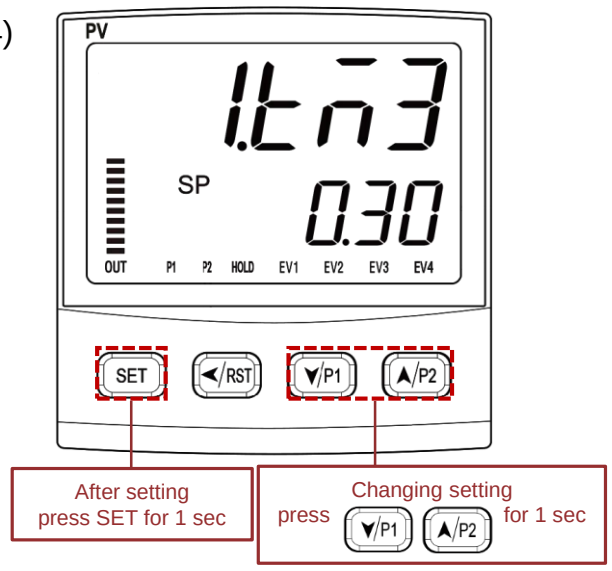
Keep 1.tS2 as oFF always.

13)



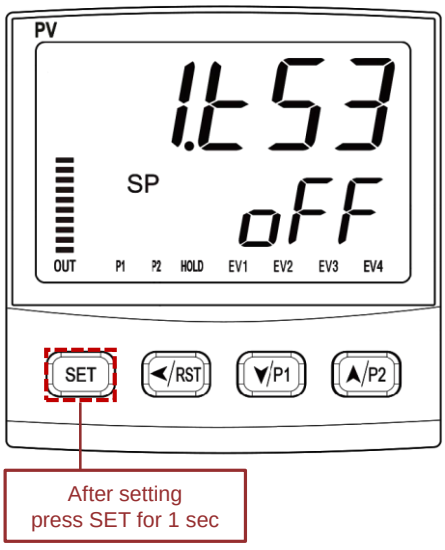
1.SP3 means the third temperature you want to reach

14)



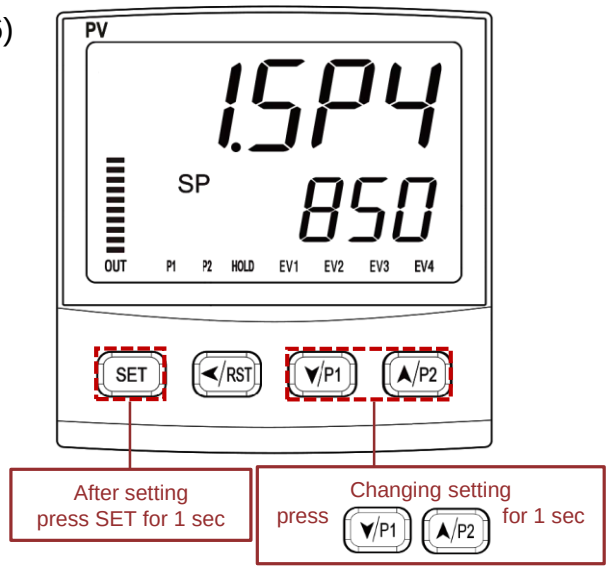
1.tm3 means the time you want in order to reach at 1.SP3

15)



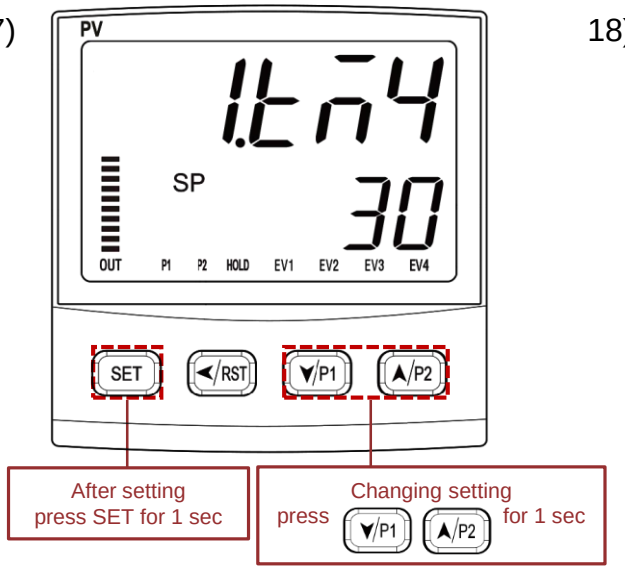
Keep 1.tS3 as oFF always

16)



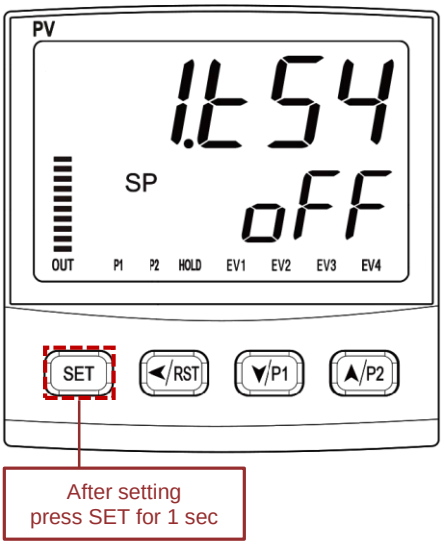
1.SP4 means the temperature you want to reach or hold

17)



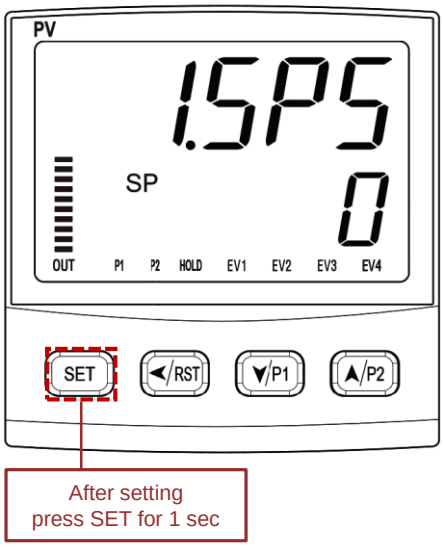
1,tm4 means the time you want in order to reach at 1.SP4 or hold

18)

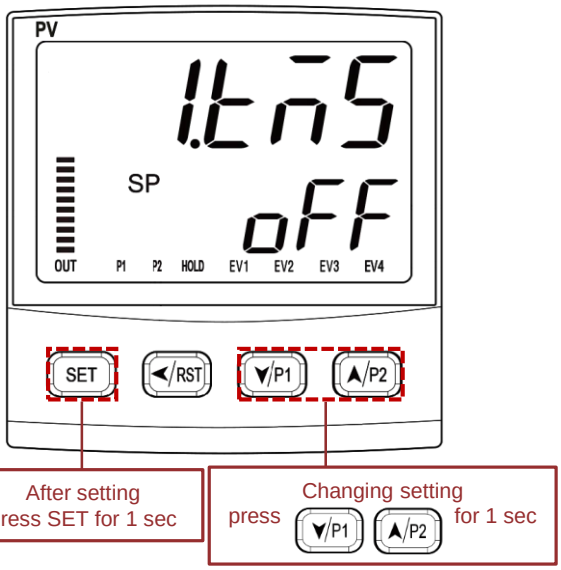


Keep 1.tS4 as oFF always

19)

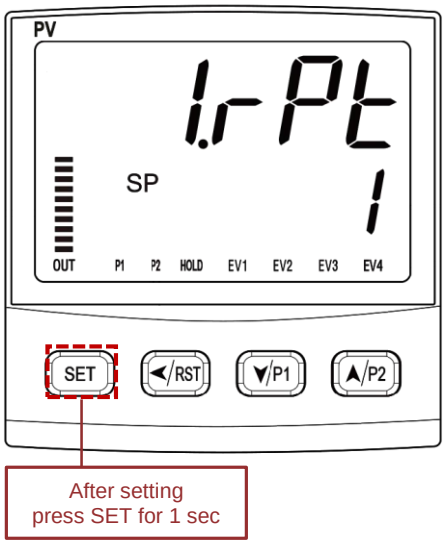


20)



When you put 0 at 1.SP5 and off at 1.tm5, it means the program is done.

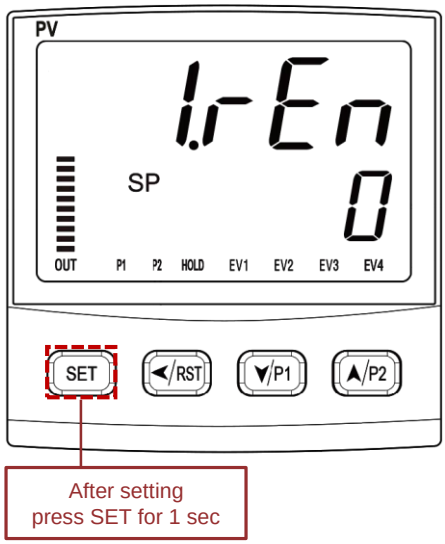
21)



1.rPt means how many time you what to repeat the pattern I.

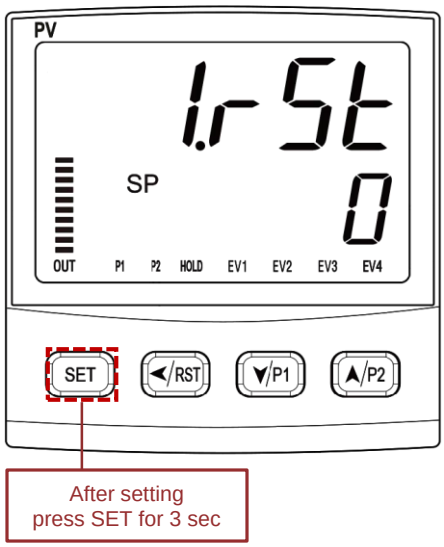
※ 0 means infinite repeat.

22)



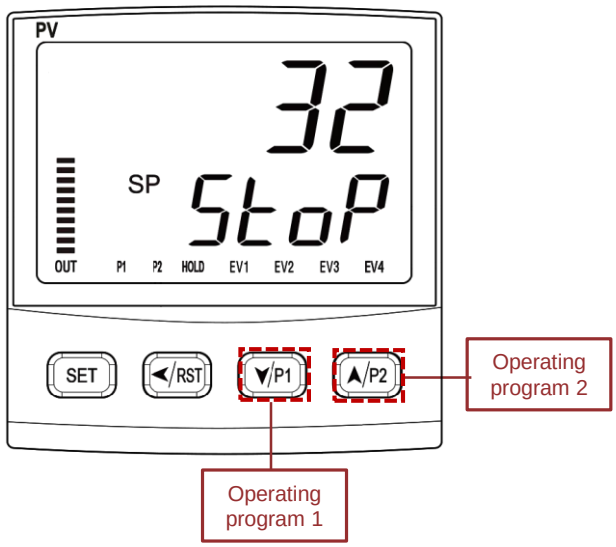
Keep 1.rEn as 0 always

23)



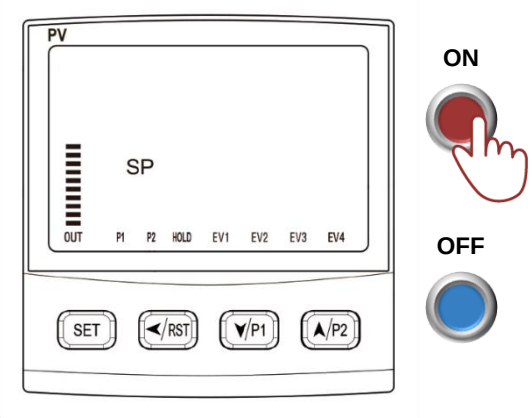
Keep 1.rSt 0 always.
And press SET for 3 sec to return standby mode.

24)



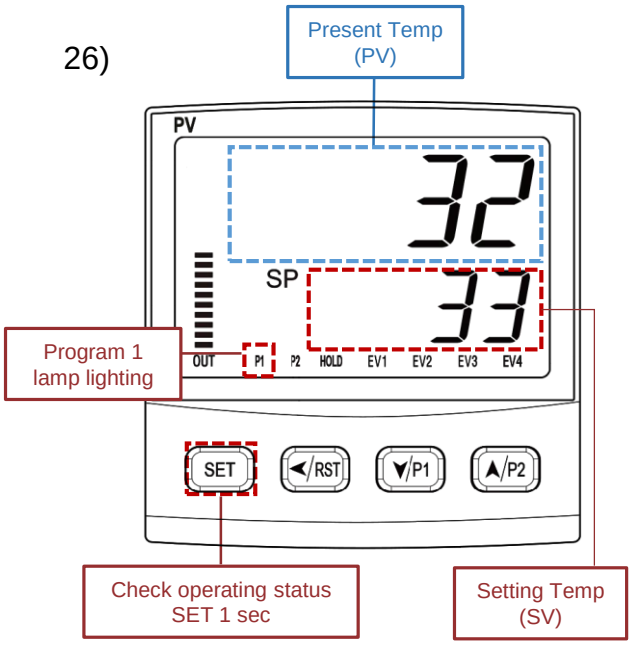
Press your pattern button for 3 sec
so the controller starts running

25)

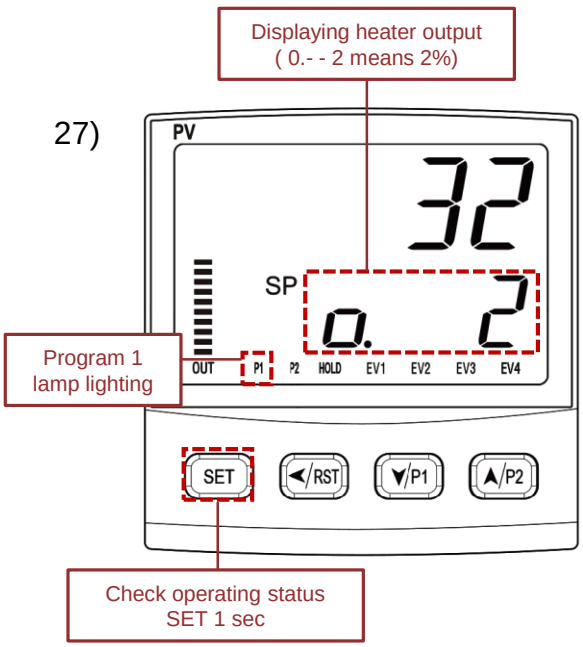


Push ON button so the furnace starts heating.
(This step is only for vacuum muffle furnace.
Tube furnace doesn't have this step)

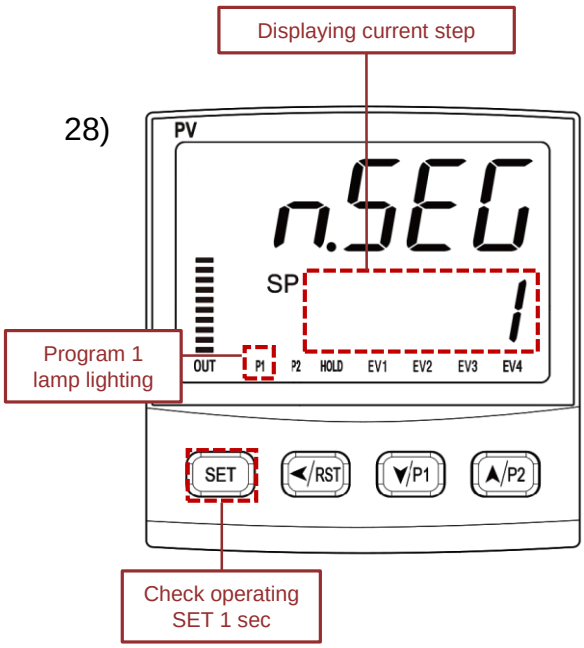
26)



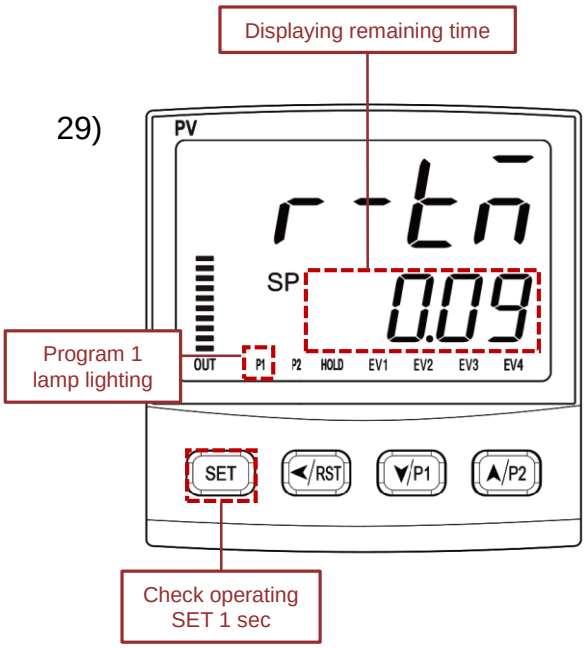
27)



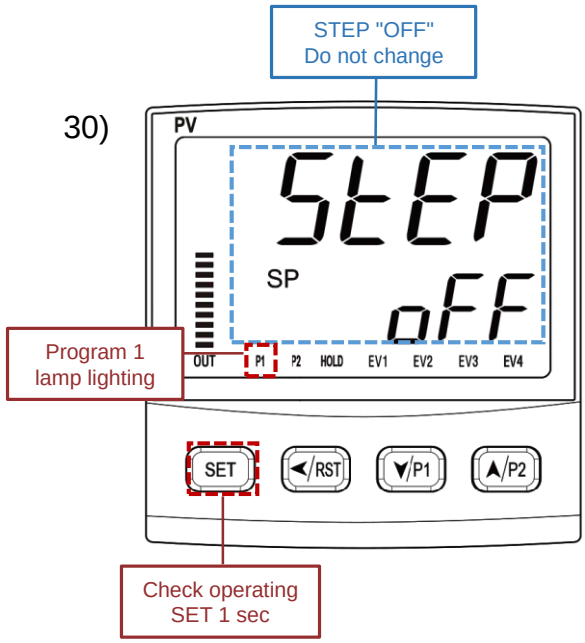
28)



29)

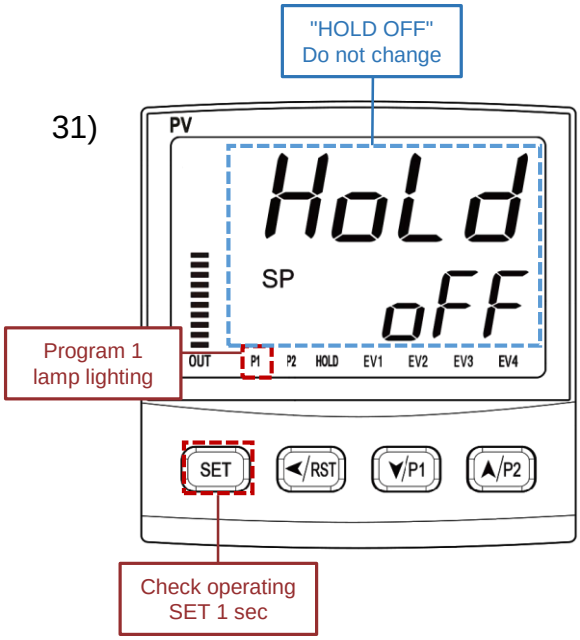


30)

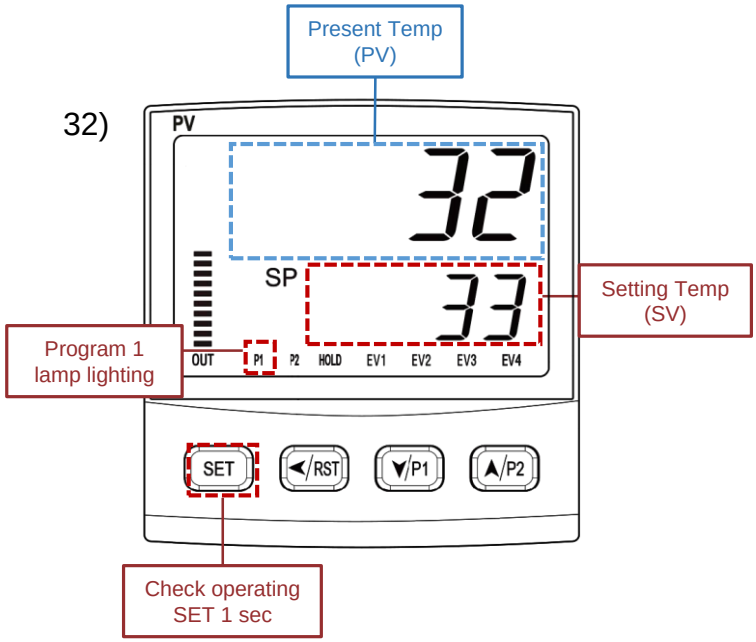


※ STEP OFF-Do not change

31)

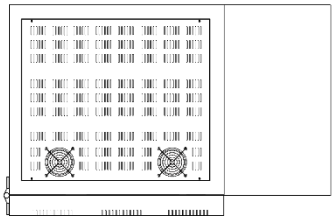
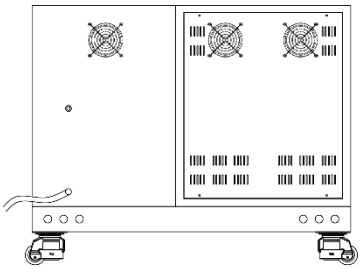
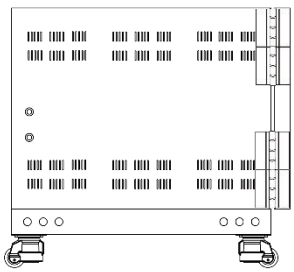
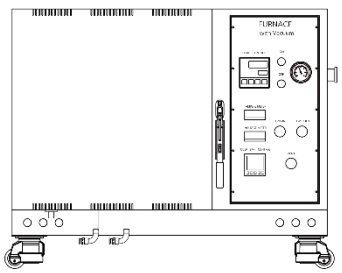
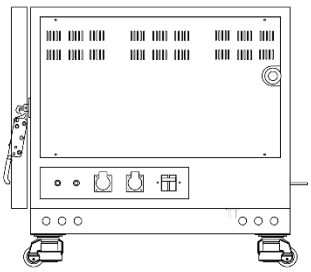


32)



※ HOLD OFF-Do not change

8. Specifications (SH-FU-4.5MSV / 10MSV / 20MSV)

Model	SH-FU-4.5MSV	SH-FU-10MSV	SH-FU-20MSV
Operating Temperature	Without vacuum - 1650C or below With vacuum - 1400C or below With vacuum and gas - 1650C or below		
Temp Controller	Programmable Controller(SP590)		
Sensor	B type		
Heater Capa	2.9KW	5.2KW	9 KW
Capa	4.5 L	10 L	20 L
Dimension Internal (W×D×H)	150 x 200 x 150 mm	200 x 250 x 200 mm	200 x 500 x 200 mm
	5.9 x 7.9 x 5.9"	7.9 x 9.8 x 7.9"	7.9 x 19.7 x 7.9"
Dimension External (W×D×H)	1020 x 670 x 770 mm	1070 x 770 x 820 mm	1130 x 1100 x 960 mm
	40.2 x 26.4 x 30.3"	42.1 x 30.3 x 32.3"	44.5 x 43.3 x 37.8"
Material External	Steel Plate with powder heating coated		
Heater Element	MoSi2		
Insulation	Ceramic Board & Wool (Ceramic fiber)		
Electrical Requirements 220V ,50/60Hz, 1Φ	14A	24A	40.9 A

Memo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