

Version : 2025 Rev.0

www.shscientific.com
www.labandfurnace.com

1200°C RTCVD Tube Furnace Gas Flow Package



SH-RTCVD-50/80/100/120/200/250TG300

SH-RTCVD-50/80/100/120/200/250TG200-3

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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

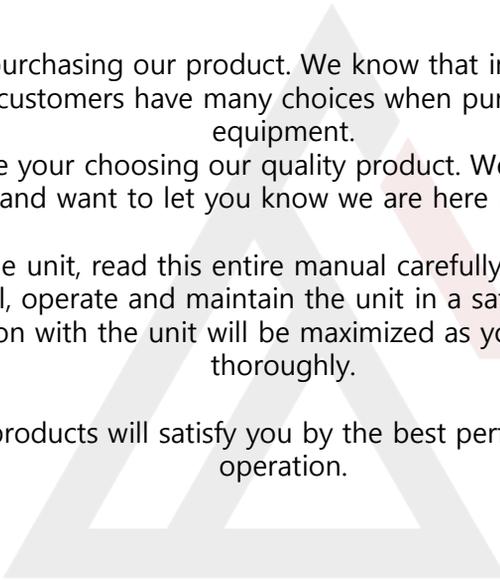
Thank you for purchasing our product. We know that in today's competitive marketplace, customers have many choices when purchasing laboratory equipment.

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.



SH SCIENTIFIC

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 **STRICTLY PROHIBITED** with regards to the unit.



Potential electrical hazards.



Explosive.



No disassemble.

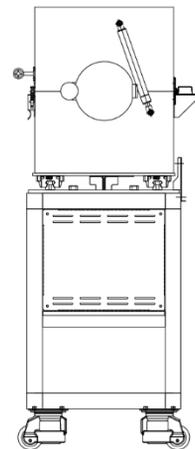
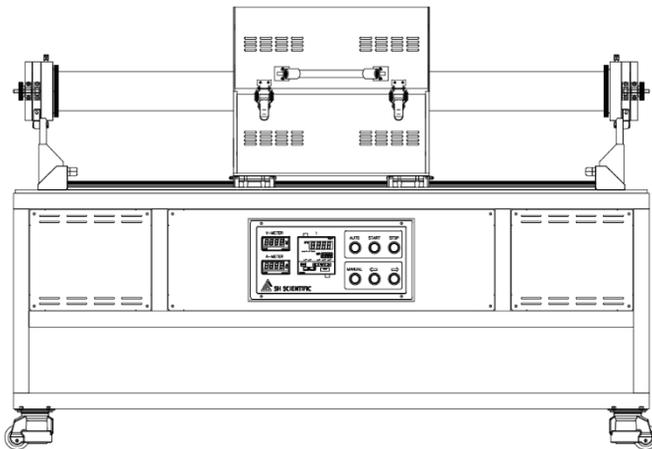
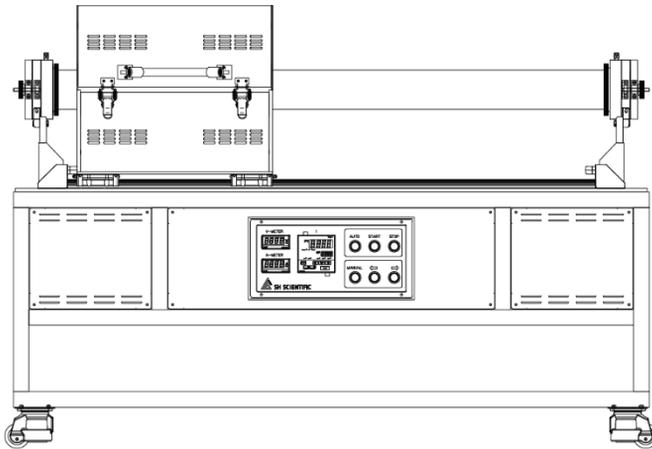


Flammable.

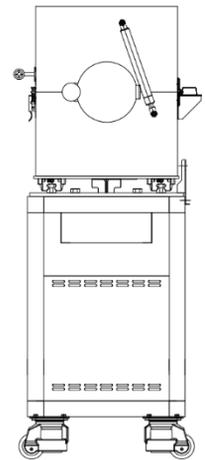
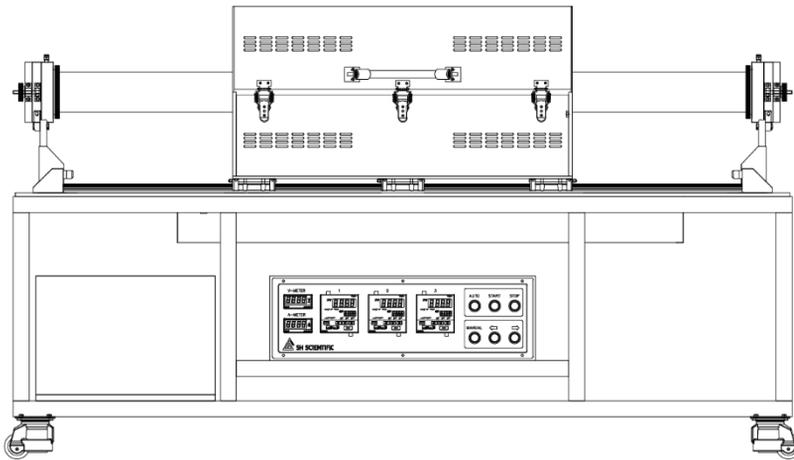
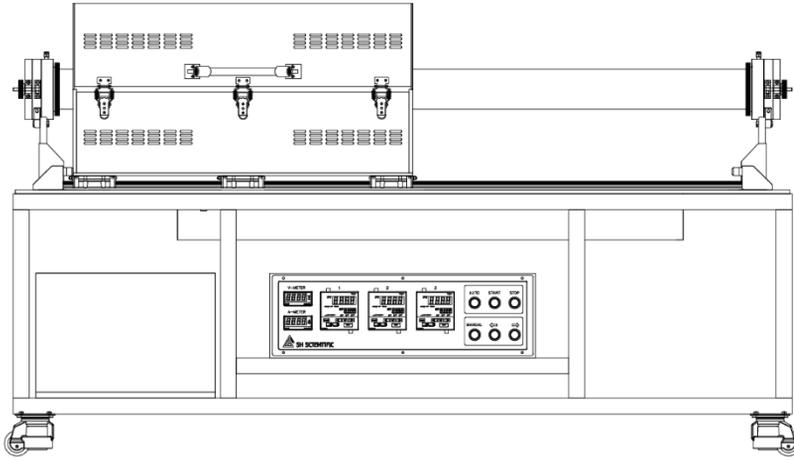


Hot surface or steam.

3. The Outward

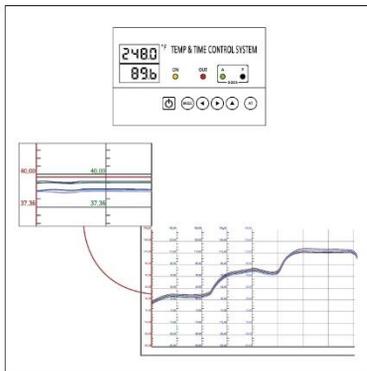


<SH-RTCVD-XXTG300>



<SH-RTCVD-XXTG200-3 >

4. Key Feature



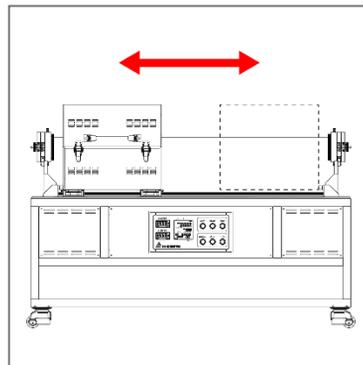
- Digital display of temp and time
- Multi key-in (100Ω(DIN Pt100Ω), KPt100Ω(JPt100Ω), K(CA))
- Precise temperature control
- Alarm when timer ends



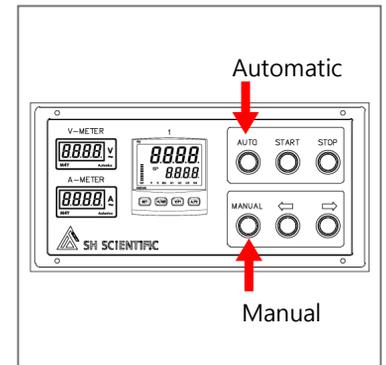
- Auto back up



- Over-temperature protection function(RTCVD-xxTG)

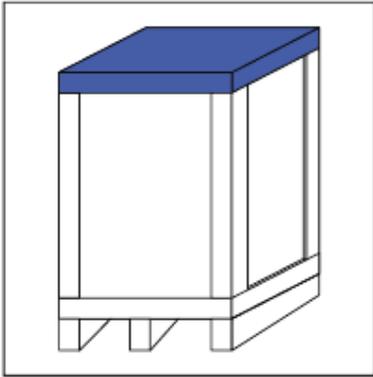


- Performs RTCVD (Rapid Thermal Chemical Vapor Deposition) with rapid heat-up and fast cool-down using a movable furnace body.

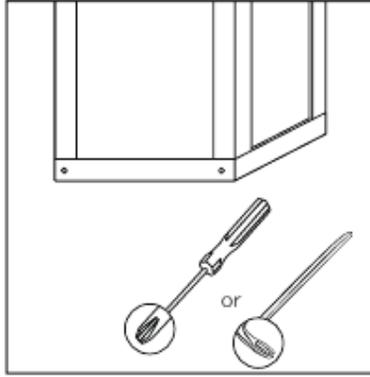


- Two operation mode available (Automatic / Manual)
 - Automatic = RTCVD
 - Manual = CVD

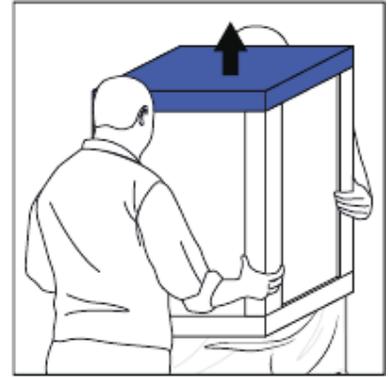
5. Unboxing



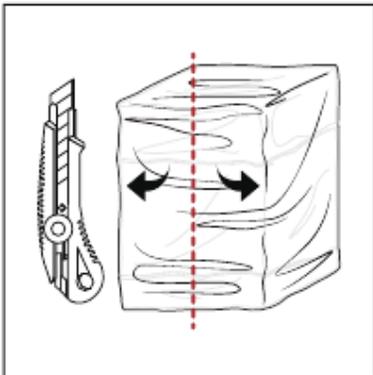
① Once the product is delivered, place the package on a flat location.



② Unscrew the bottom of the box.



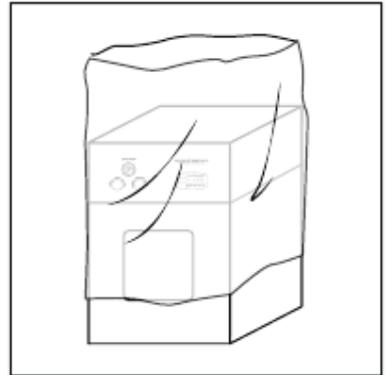
③ Lift the box as shown in the picture.



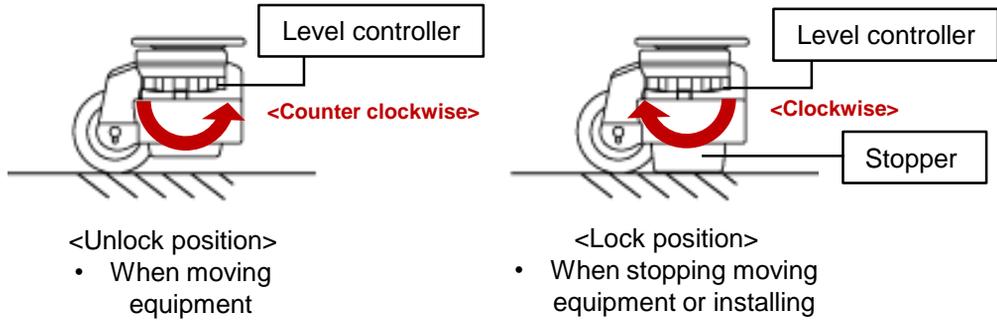
④ Unwrap the bag.



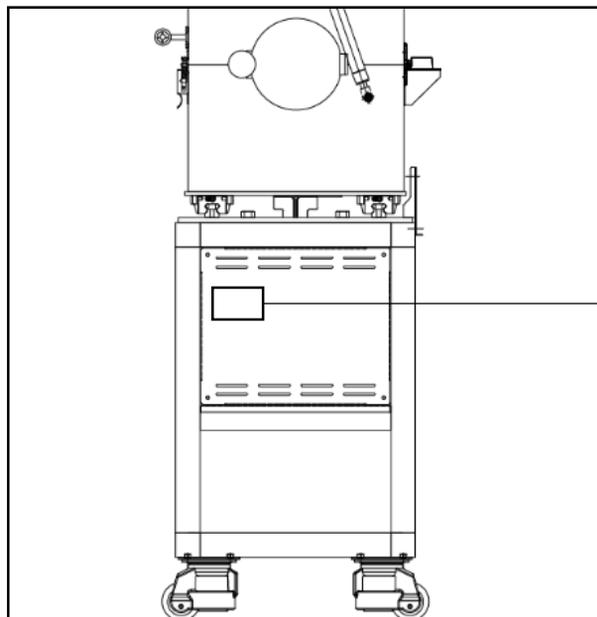
⑤ Place the equipment on your desired location.



⑥ Lift the remaining plastic up.



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



	Model SH-	<input type="checkbox"/> 230V	<input type="checkbox"/> 115V
Certified 	Power	V	Φ A WATT
	Temp	Humid	
Serial No.	R.P.M		
		www.santheurg21.com	

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



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

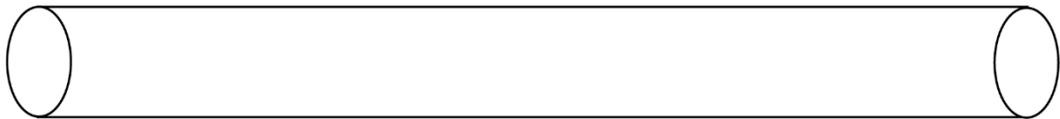
6. Installation

-How to assemble tube and pipes lines

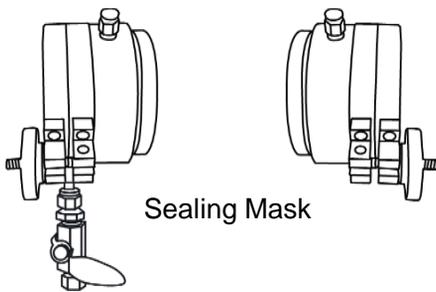
[Tube Furnace Gas Flow package equipped with optional MFC & BPR]

1) Please check if all parts are in the package;

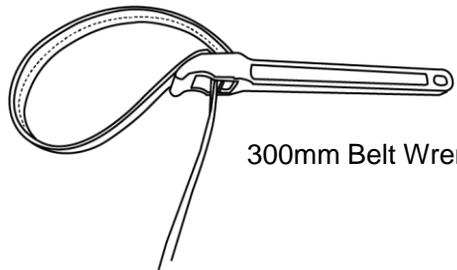
- 1x Quartz Tube or Alumina Tube
- 2x Sealing Mask
- 3x Flexible Stainless Tube Hose
- 1x 300mm Belt Wrench



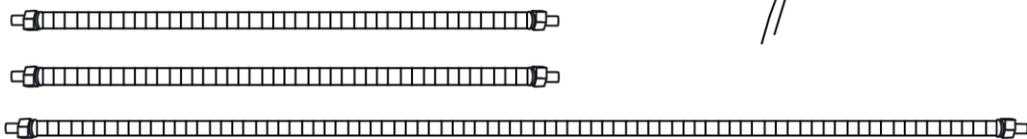
Quartz Tube or Alumina Tube



Sealing Mask



300mm Belt Wrench



Flexible Stainless Tube Hose

-How to assemble tube

1) Assembly process



②

Lock



Unlock



④



7. 1 Setting and Operation

RTCVD Series provides two operation modes.

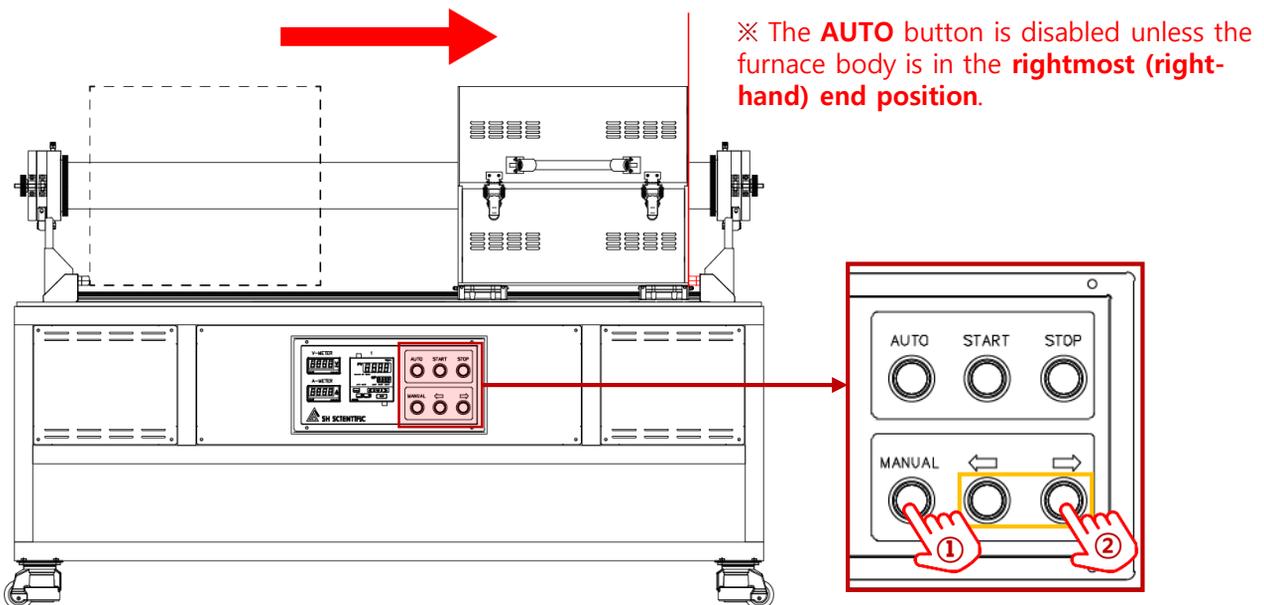
1. Automatic Mode

Optimized for RT(Rapid Thermal) CVD process.

2. Manual Mode

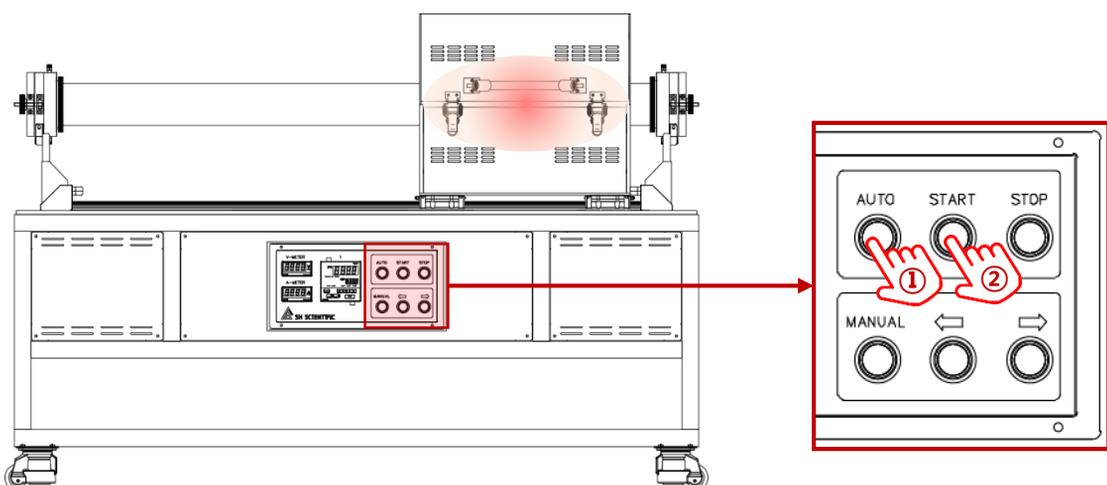
Optimized for conventional CVD process.

7. 1. 1 Automatic Mode



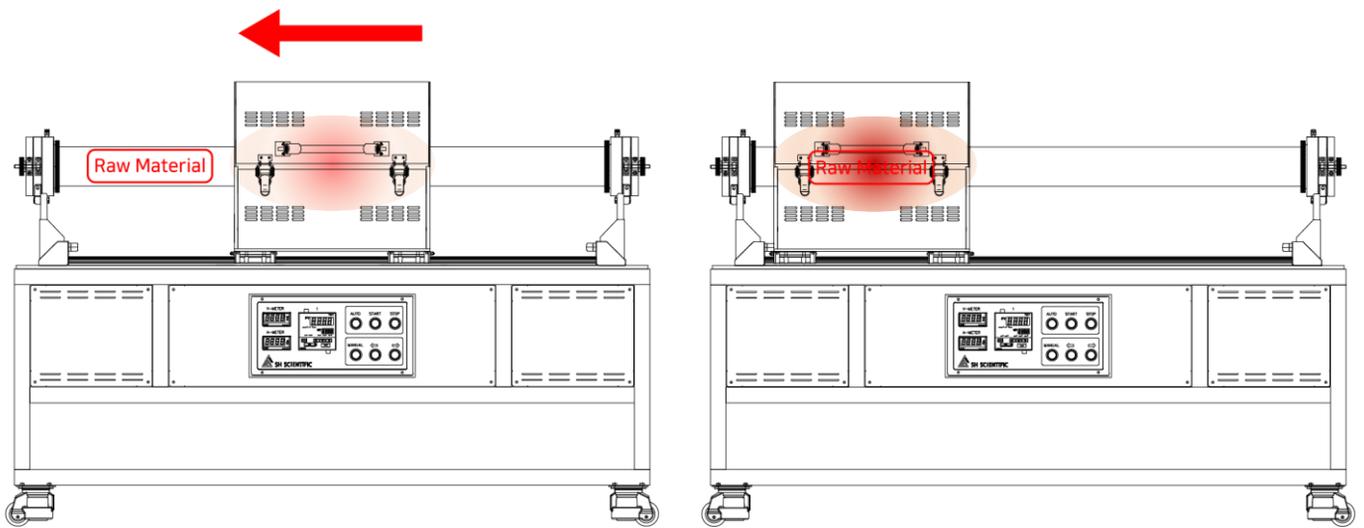
Automatic operation is available only when the furnace body is positioned at the rightmost end of the frame.

Select **MANUAL**, then use the ← and → buttons to move the furnace to the frame's rightmost end.

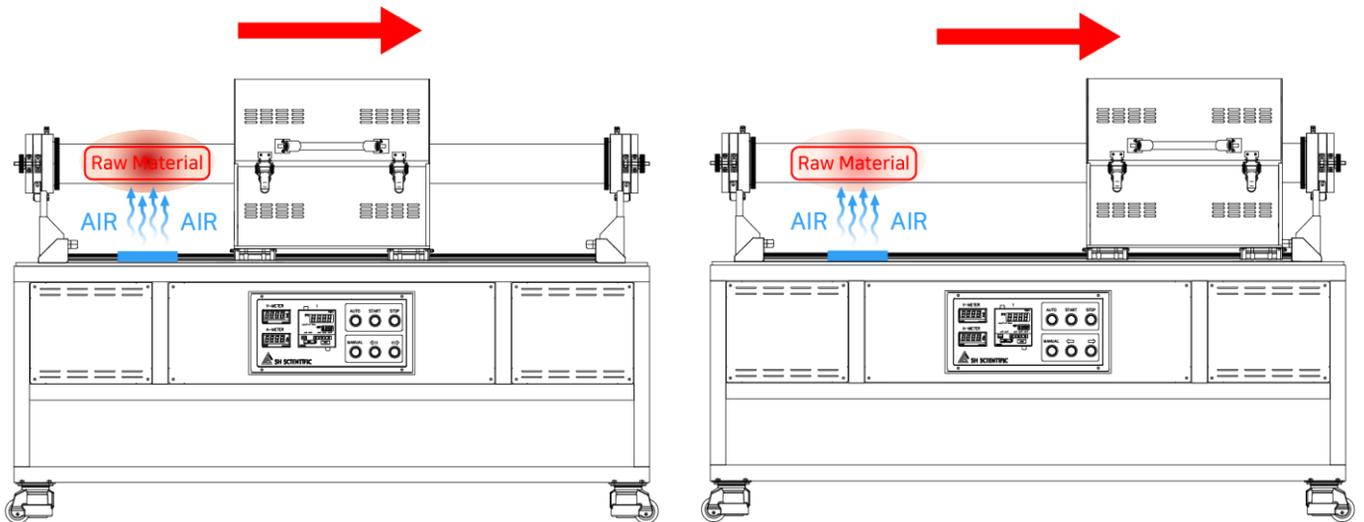


Select **AUTO** on the control panel and press **START**.

The furnace will ramp to and hold the temperature according to the set points configured on the designated controller.



After the heat up to and hold the set temperature, the furnace body automatically moves to the frame's leftmost end and begins rapid heating of the material.



When the set-temperature hold time ends, the furnace body moves back to the frame's rightmost end and begins rapid cooling of the material.

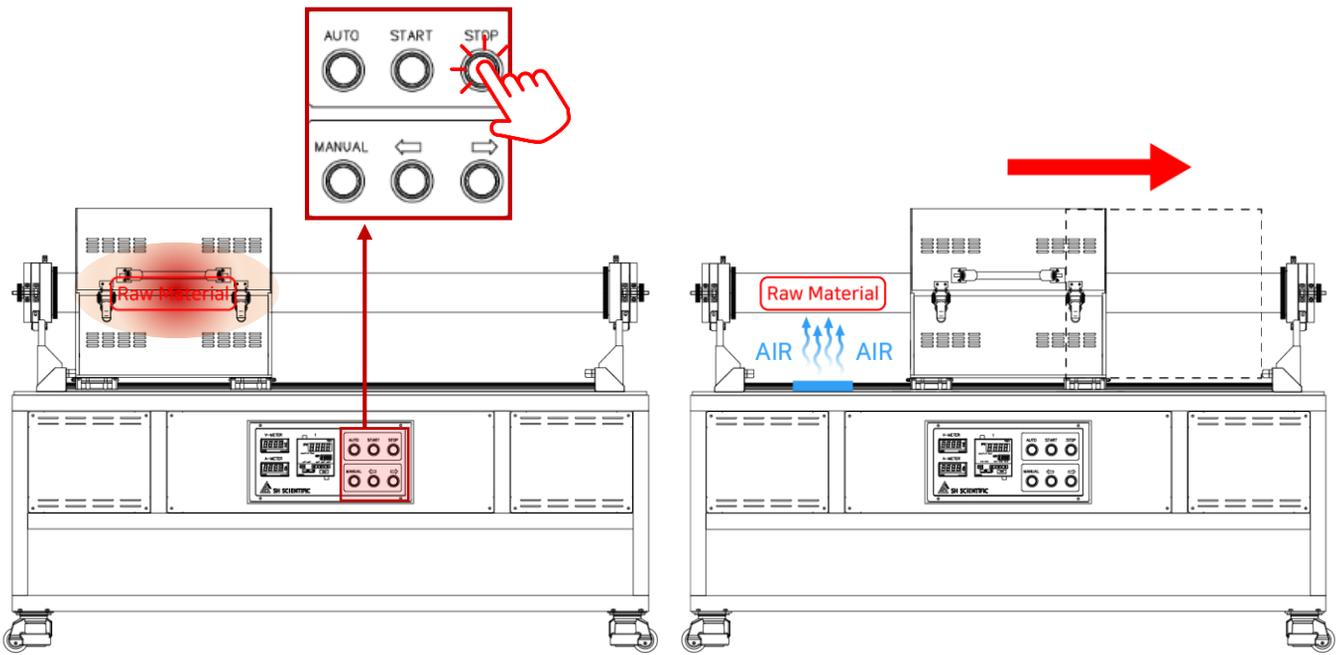
※ When Automatic Mode is selected, the system operates according to the settings of the designated controller, even if multiple controllers are installed.

RTCVD-xxTG300 Series : one controller installed.

RTCVD-xxTG200-3 Series : designated controller = Controller #2.

4 zones or more : use the designated controller

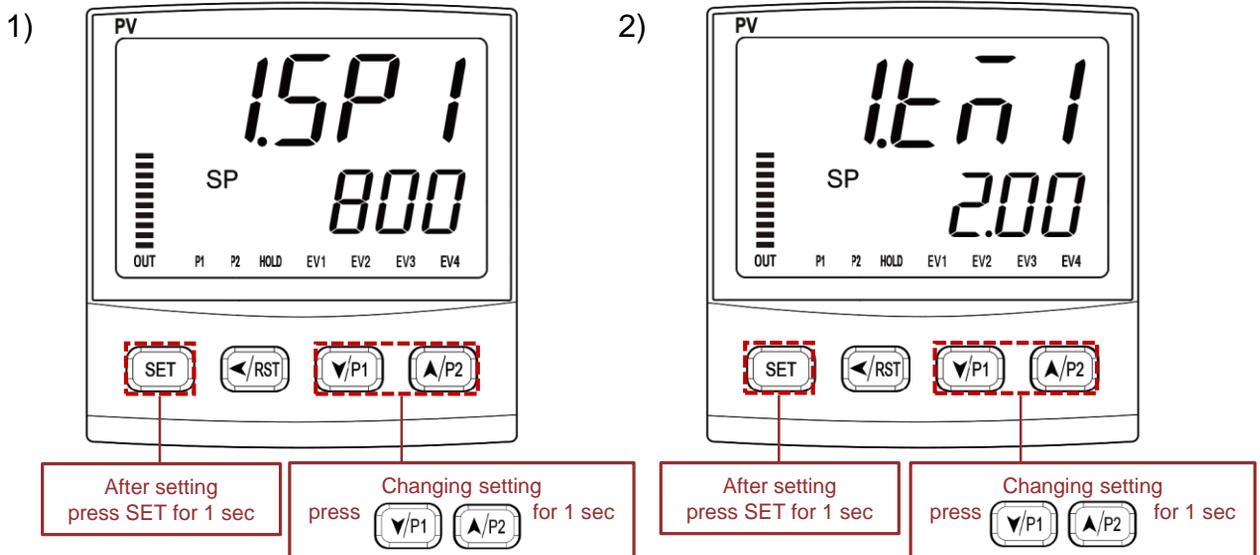
(the controller labeled "AUTO" on the control panel)



In AUTO mode, pressing STOP immediately halts operation (including temperature control) and moves the furnace body to the frame's rightmost end, regardless of its current position.

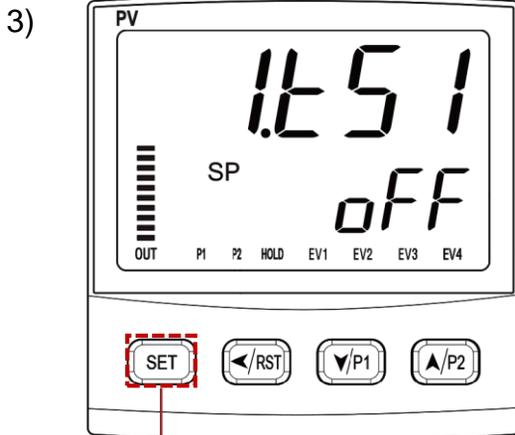
● Automatic Operation Example

- example) Step 1. At the frame's rightmost end, ramp up to 800 °C over 2 hours.
 Step 2. Move to the frame's leftmost end and hold at 800 °C for 30 minutes.
 Step 3. Stop temperature control and return the furnace body to the frame's rightmost end.



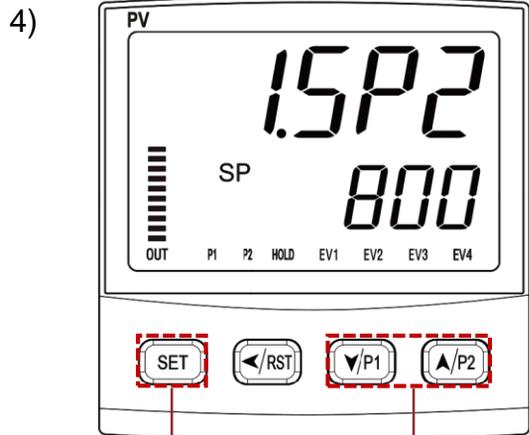
1.SP1 means the first temperature you want to reach

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



After setting
press SET for 1 sec

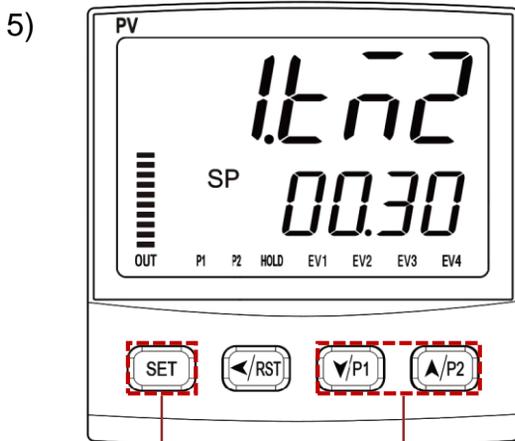
Keep 1.tS1 as oFF always.



After setting
press SET for 1 sec

Changing setting
press v/P1 ^/P2 for 1 sec

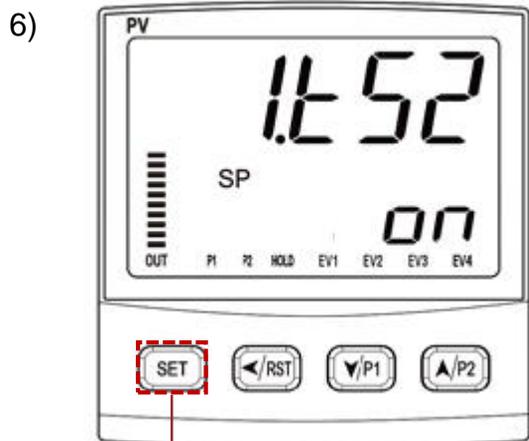
1.SP2 means the second temperature
you want to reach or hold



After setting
press SET for 1 sec

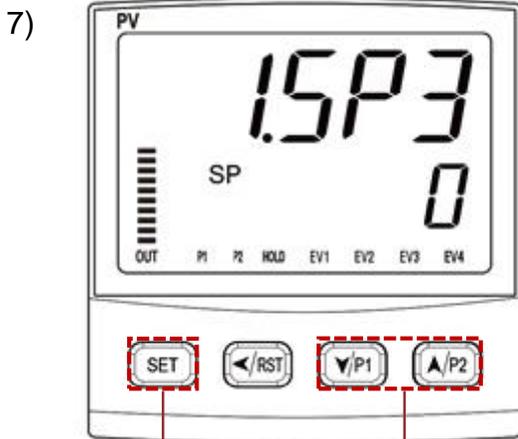
Changing setting
press v/P1 ^/P2 for 1 sec

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



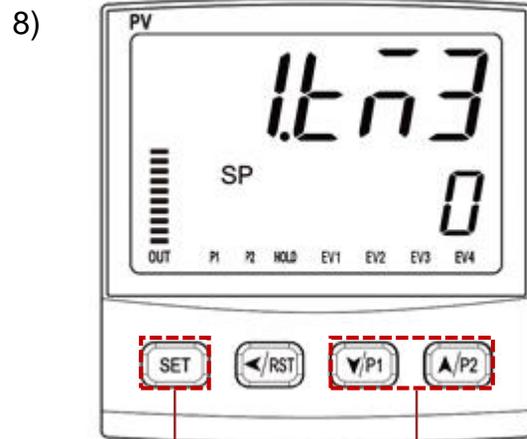
After setting
press SET for 1 sec

Keep 1.tS2 as on always.



After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

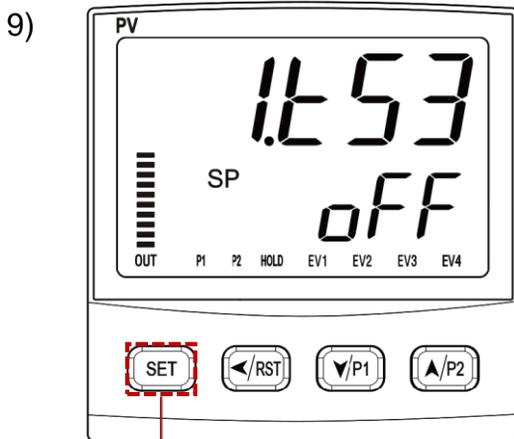


After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

1.SP3 means the third temperature you want to reach

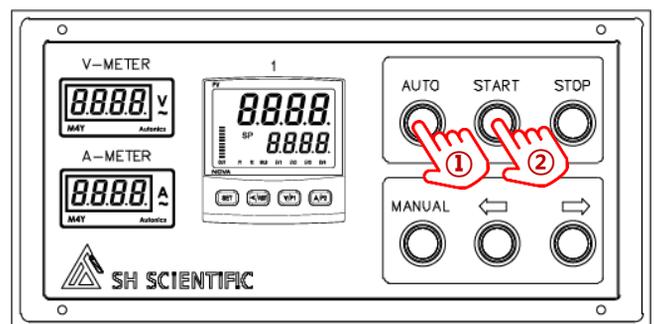
1.tn3 means the time you want in order to reach at 1.SP3

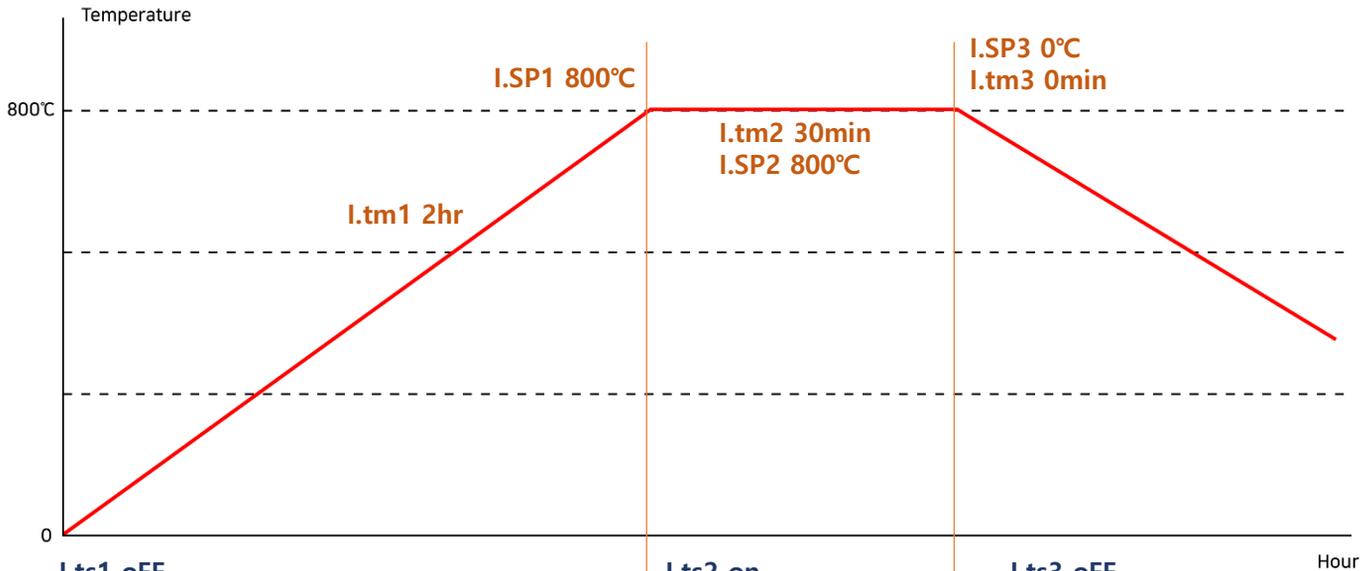


After setting
press SET for 1 sec

Keep 1.t53 as OFF always

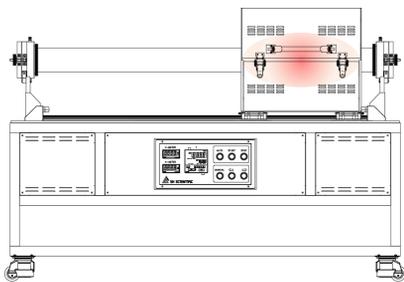
10)





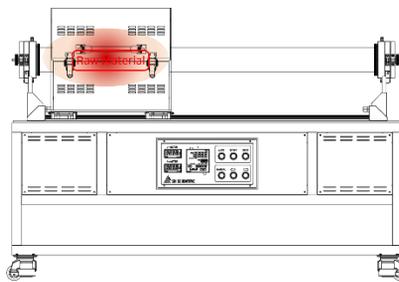
I.ts1 OFF

Furnace body at the rightmost end position & temperature ramp-up



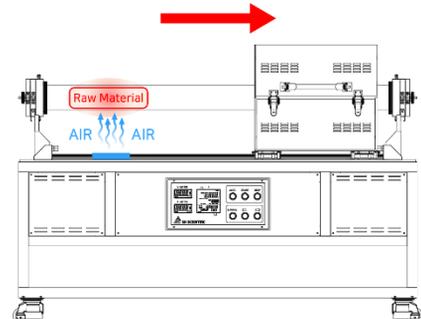
I.ts2 ON

Furnace body moves to the leftmost end and hold the temperature.

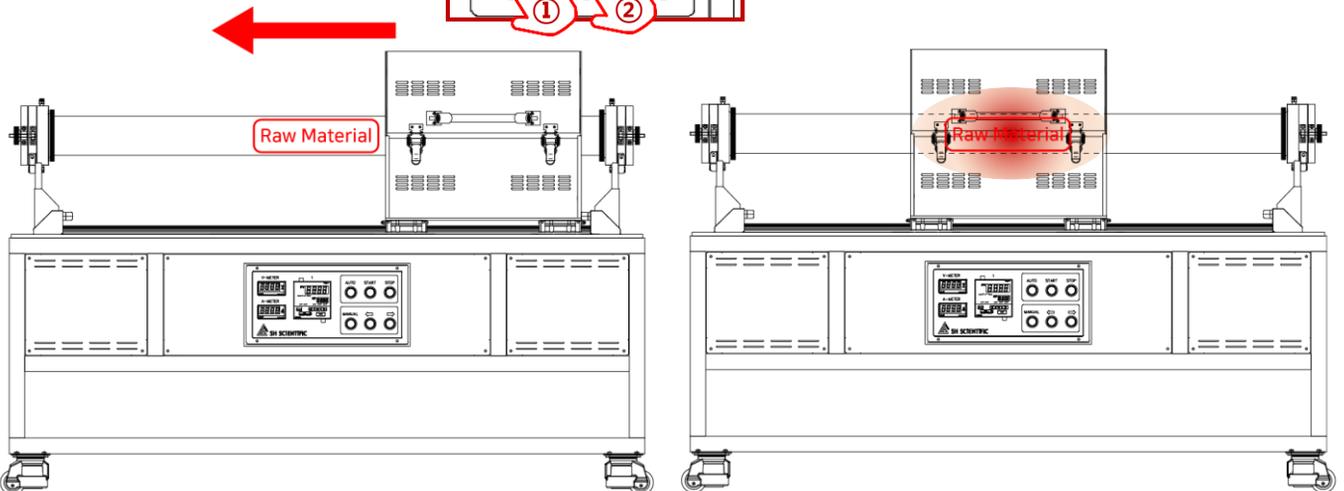
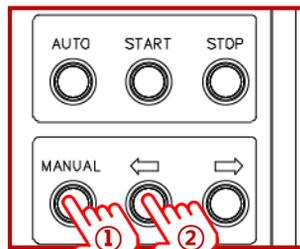


I.ts3 OFF

End temperature control and return furnace body to the rightmost end.



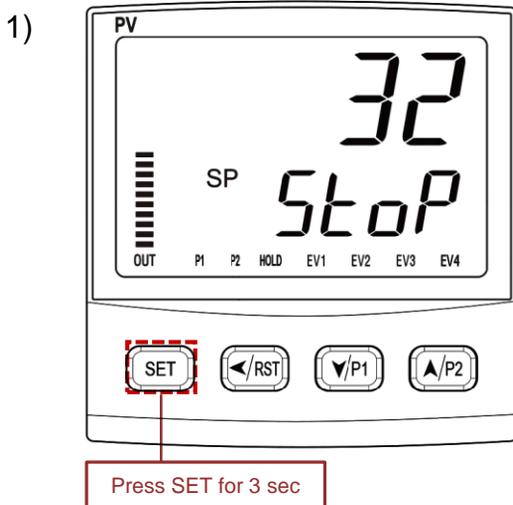
7. 1. 2 Manual Mode



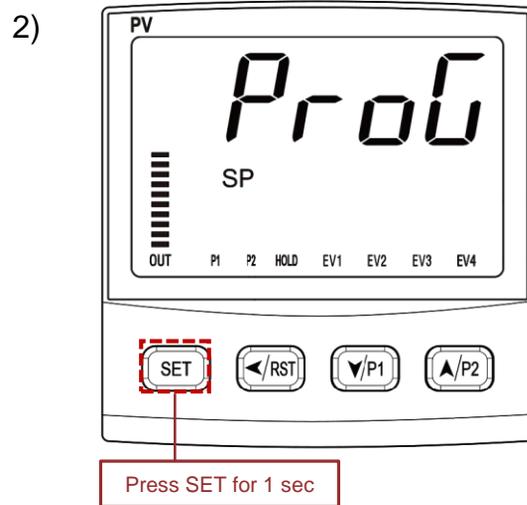
Select MANUAL, then use the ← and → buttons to move the furnace body to the desired position. The furnace will operate according to the operating conditions set on the temperature controller.

7. 2 Temp Controller Setting

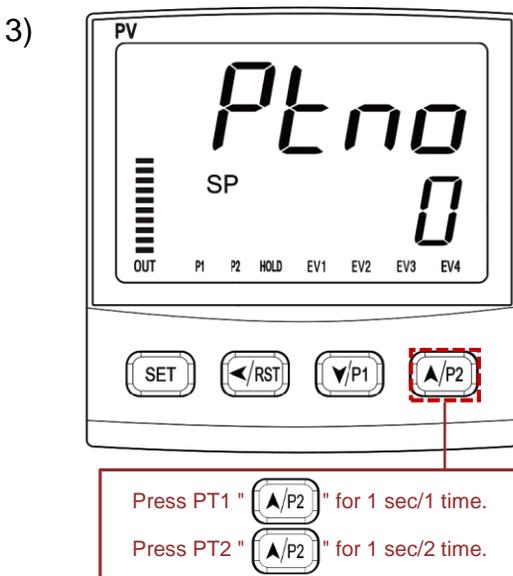
- example) Step 1. Ramp up to 800°C for 2hours
 Step 2. Hold at 800°C for 30minutes
 Step 3. Ramp up to 850°C for 30minutes
 Step 4. Hold at 850°C for 30minutes



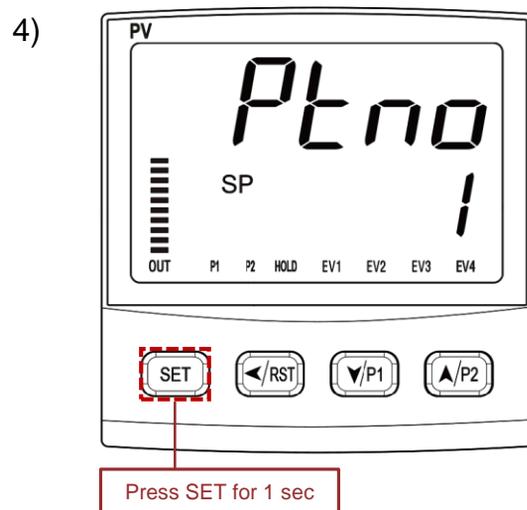
Press SET for 3 sec,
Go to setting mode.



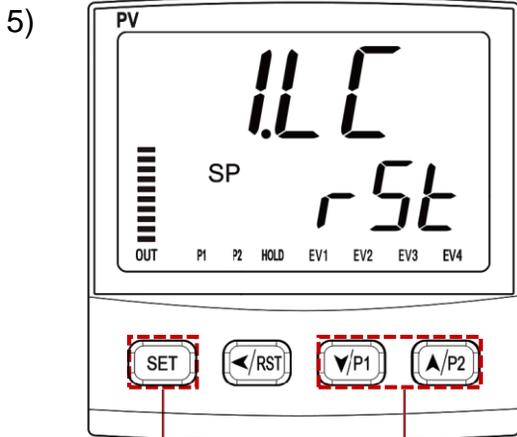
Press SET for 1 sec,
Go to program mode.



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



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

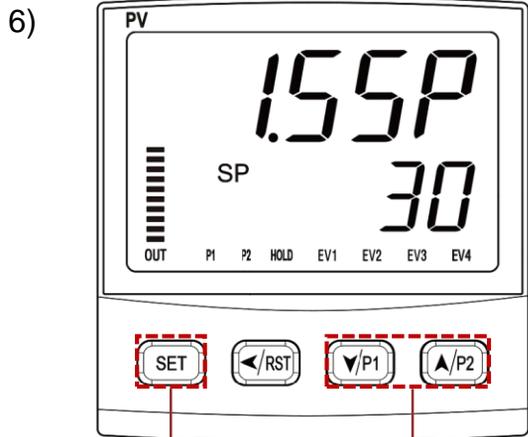


After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

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

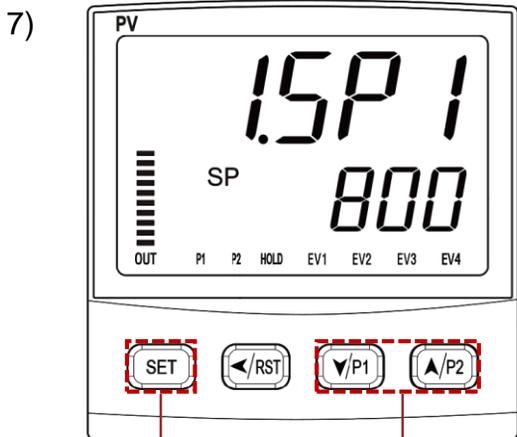
- RST-Stop operating after last step
- HOLD-Keep temp of last step
- PTH1-Endless repeat of No.1 pattern
- PTH2-Endless repeat of No.2 pattern



After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

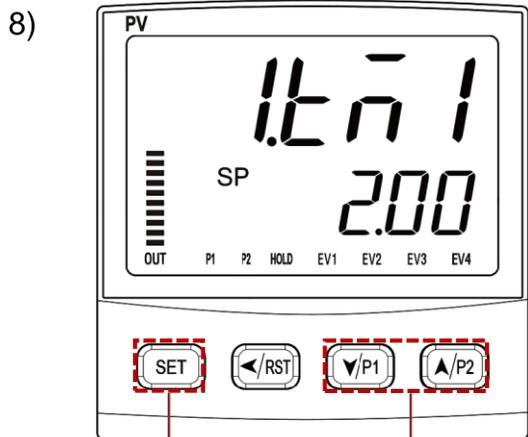
1.SSP means the starting temperature.



After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

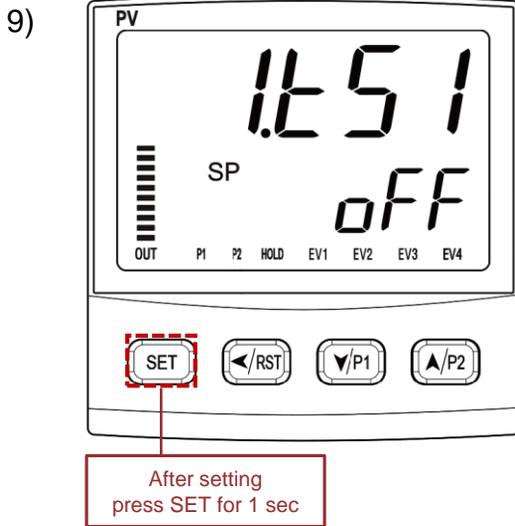
1.SP1 means the first temperature you want to reach



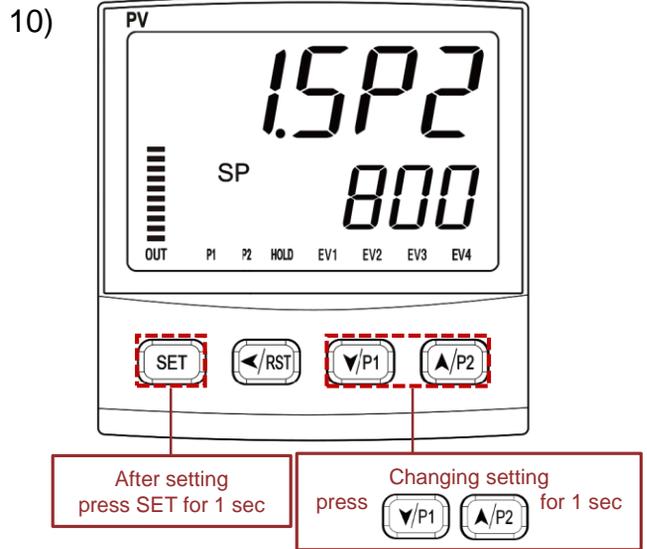
After setting
press SET for 1 sec

Changing setting
press </P1 >/P2 for 1 sec

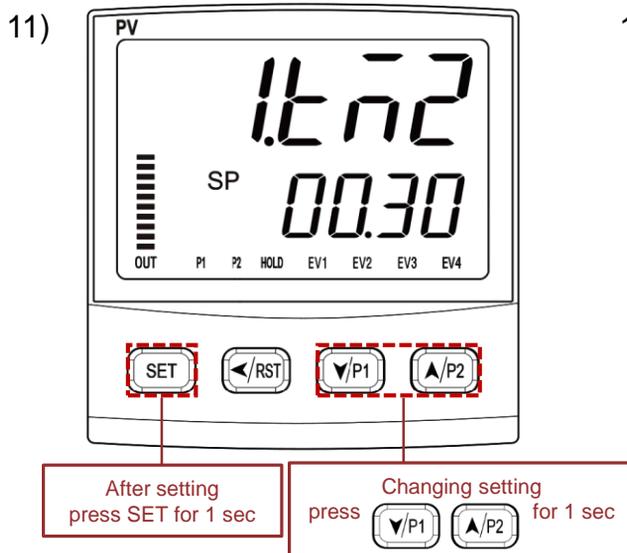
1.tn1 means the time you want in order to reach 800°C
(00.00) (HH.MM)



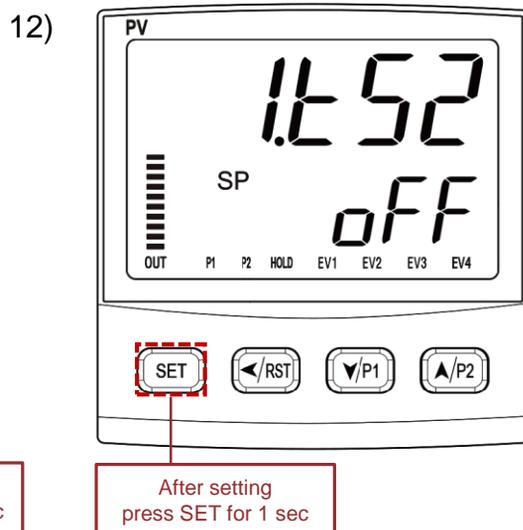
Keep 1.tS1 as oFF always.



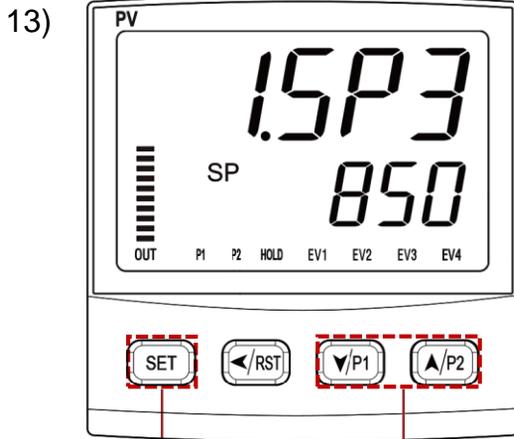
1.SP2 means the second temperature you want to reach or hold



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



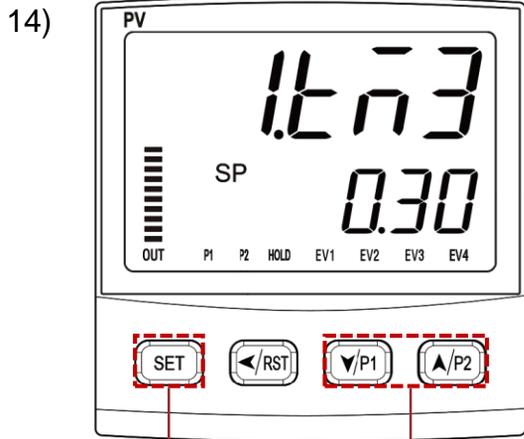
Keep 1.tS2 as oFF always.



After setting press SET for 1 sec

Changing setting press ↓/P1 ▲/P2 for 1 sec

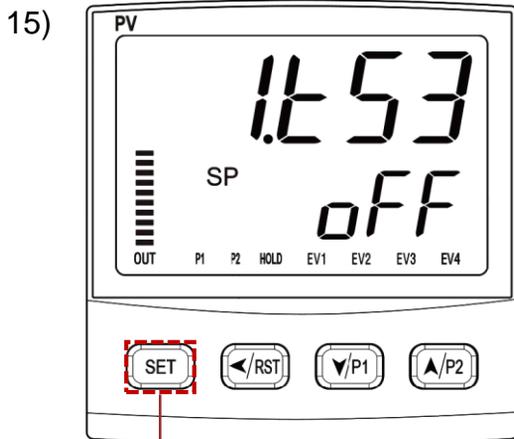
1.SP3 means the third temperature you want to reach



After setting press SET for 1 sec

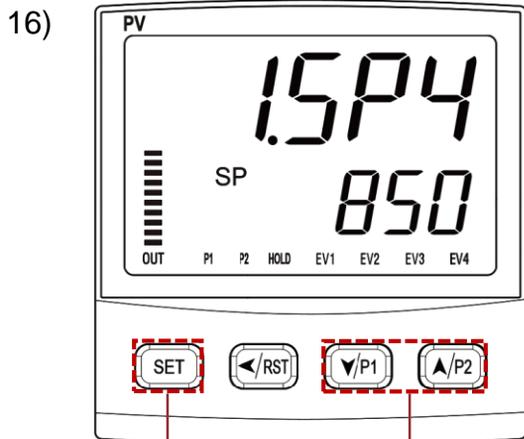
Changing setting press ↓/P1 ▲/P2 for 1 sec

1.t3 means the time you want in order to reach at 1.SP3



After setting press SET for 1 sec

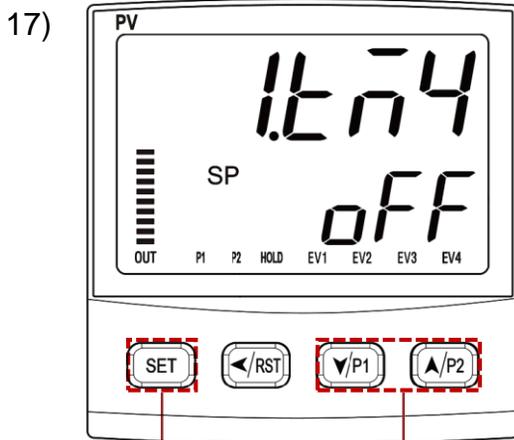
Keep 1.t53 as OFF always



After setting press SET for 1 sec

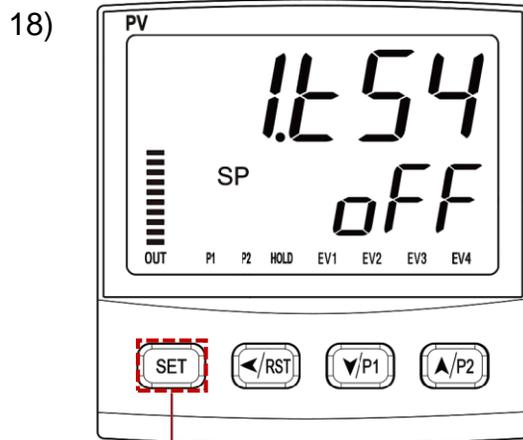
Changing setting press ↓/P1 ▲/P2 for 1 sec

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



After setting
press SET for 1 sec

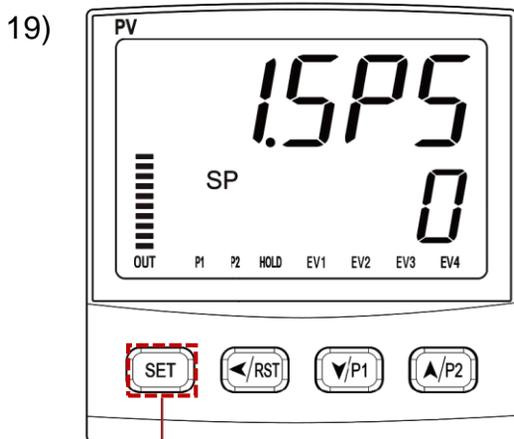
Changing setting
press  for 1 sec



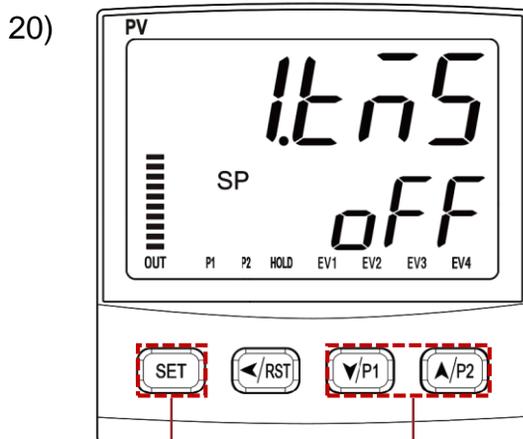
After setting
press SET for 1 sec

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

Keep 1.tS4 as OFF always



After setting
press SET for 1 sec

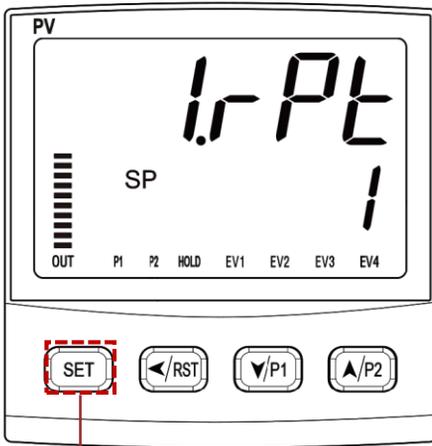


After setting
press SET for 1 sec

Changing setting
press  for 1 sec

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

21)

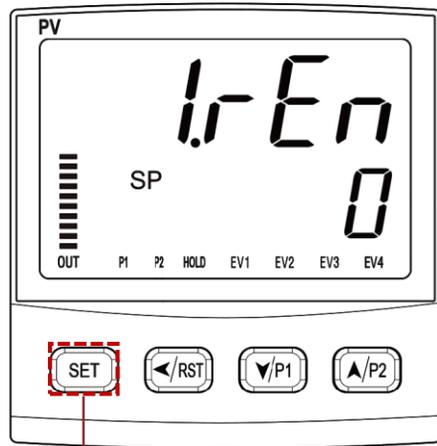


After setting
press SET for 1 sec

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

※ 0 means infinite repeat.

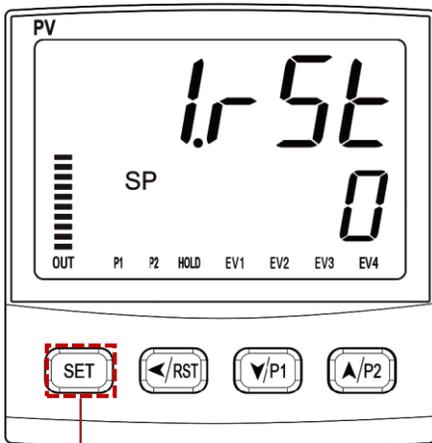
22)



After setting
press SET for 1 sec

Keep 1.rEn as 0 always

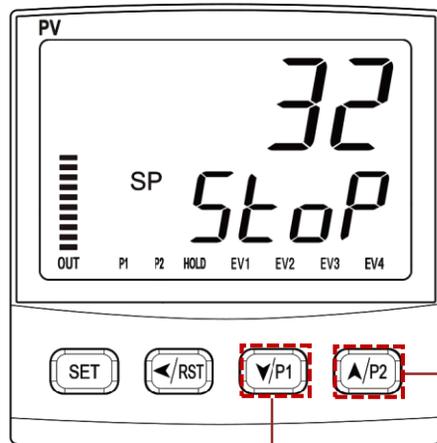
23)



After setting
press SET for 3 sec

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

24)

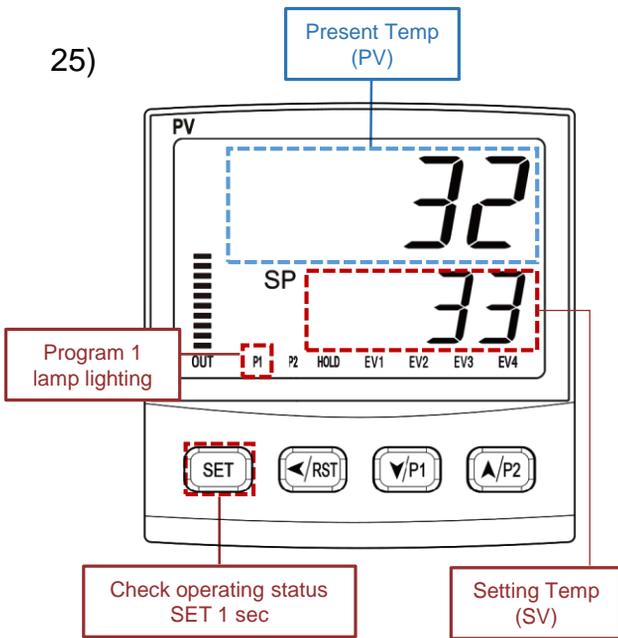


Operating
program 1

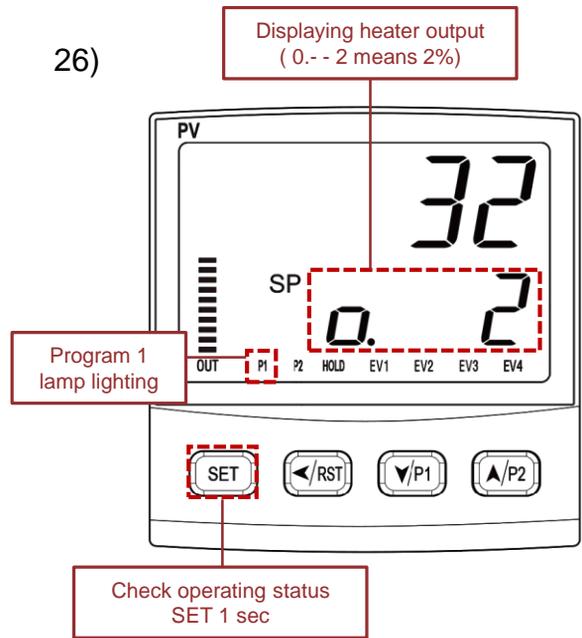
Operating
program 2

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

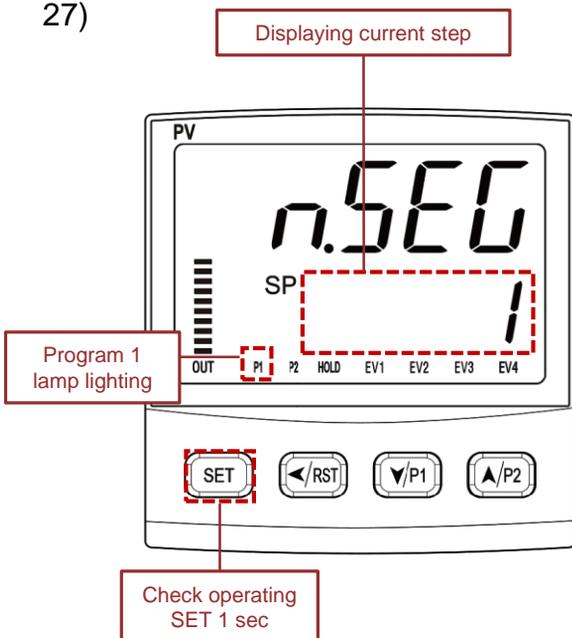
25)



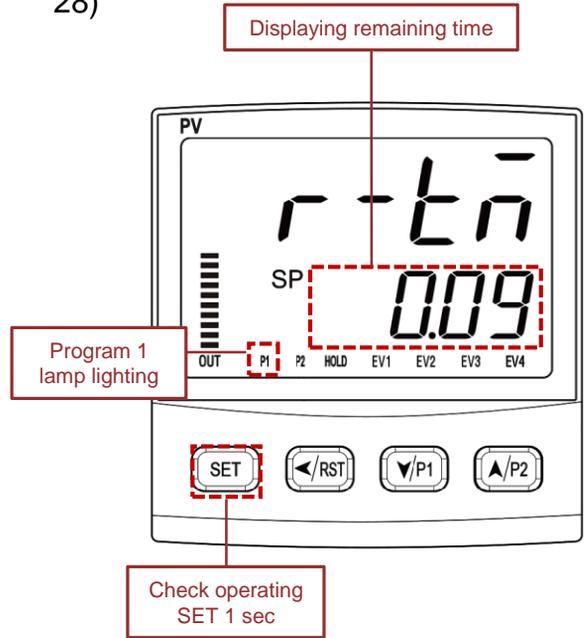
26)



27)

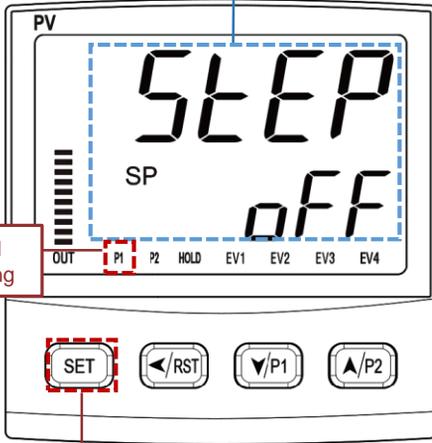


28)



29)

STEP "OFF"
Do not change



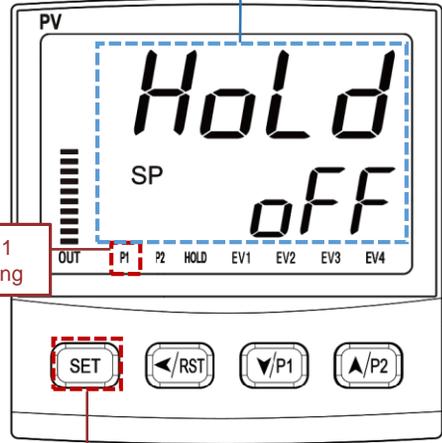
Program 1
lamp lighting

Check operating
SET 1 sec

※ STEP OFF-Do not change

30)

"HOLD OFF"
Do not change



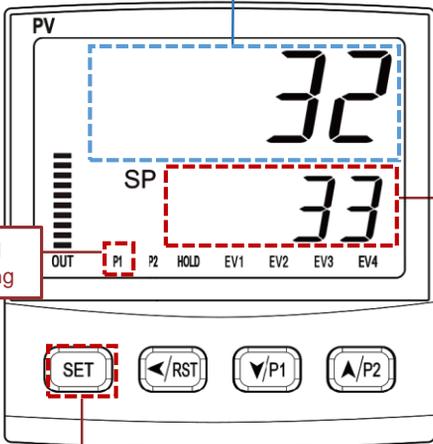
Program 1
lamp lighting

Check operating
SET 1 sec

※ HOLD OFF-Do not change

31)

Present Temp
(PV)

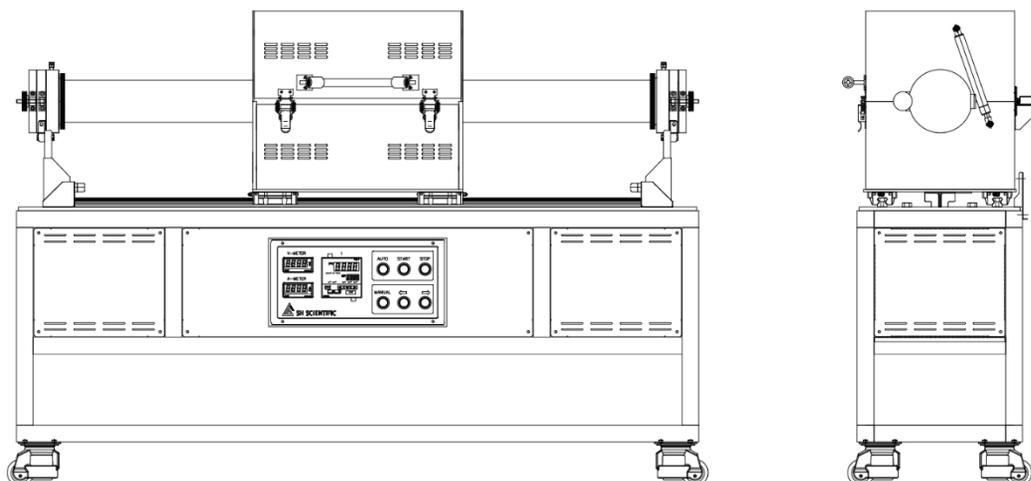


Program 1
lamp lighting

Setting Temp
(SV)

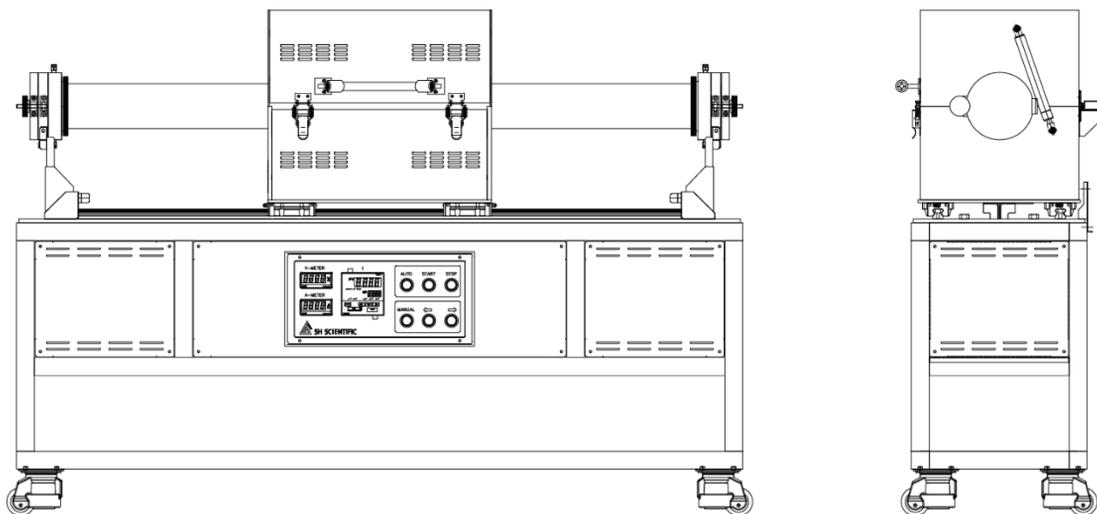
Check operating
SET 1 sec

8. Specifications <SH-RTCVD-XXTG300>



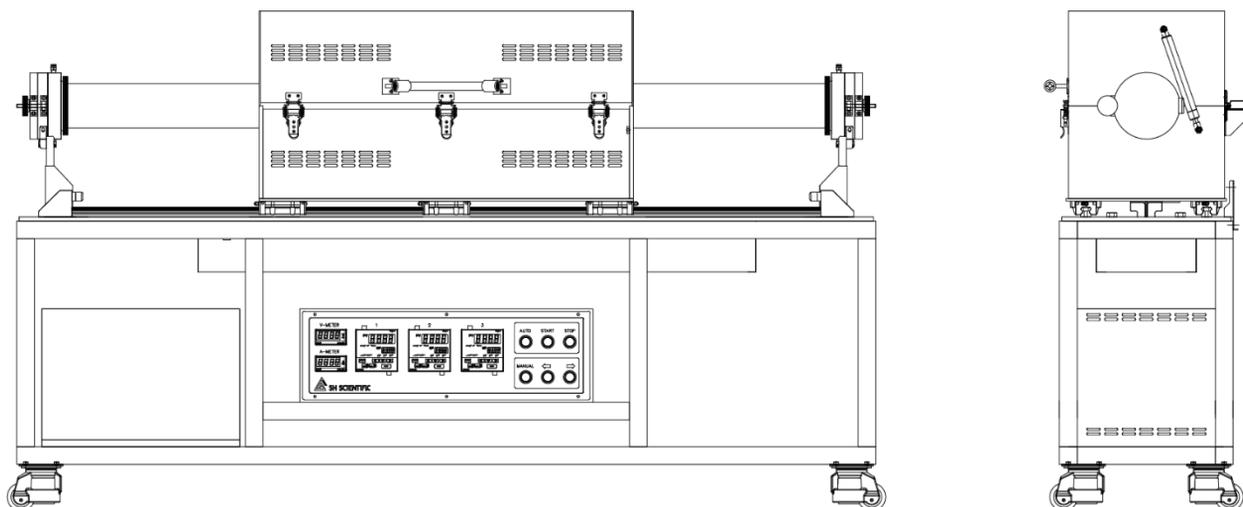
Model	SH-RTCVD-50TG300	SH-RTCVD-80TG300	SH-RTCVD-100TG300
Max Temp	1200°C (2192°F)		
Temp Controller	Programmable Controller(SP 570)		
Sensor	K type		
Applicable Tube Diameter	50 Φ	80 Φ	100 Φ
Heater Capa	2200 W	2600 W	4200 W
Dimension Hot Zone	Length 300mm		
Dimension External (W×D×H)	1625x420x1078mm	1625x450x1108mm	1625x470x1128mm
	63.97x16.53x42.44"	63.97x17.71x43.62"	63.97x18.50x44.10"
Heater Element	Kanthal A-1		
Insulation	Ceramic Board & Wool		
Electrical Requirements 110V ,50/60Hz, 1Φ	18.3 A	21.6A	35.0 A
Electrical Requirements 220V ,50/60Hz, 1Φ	9.5 A	11.3 A	18.3 A

8. Specifications <SH-RTCVD-XXTG300>



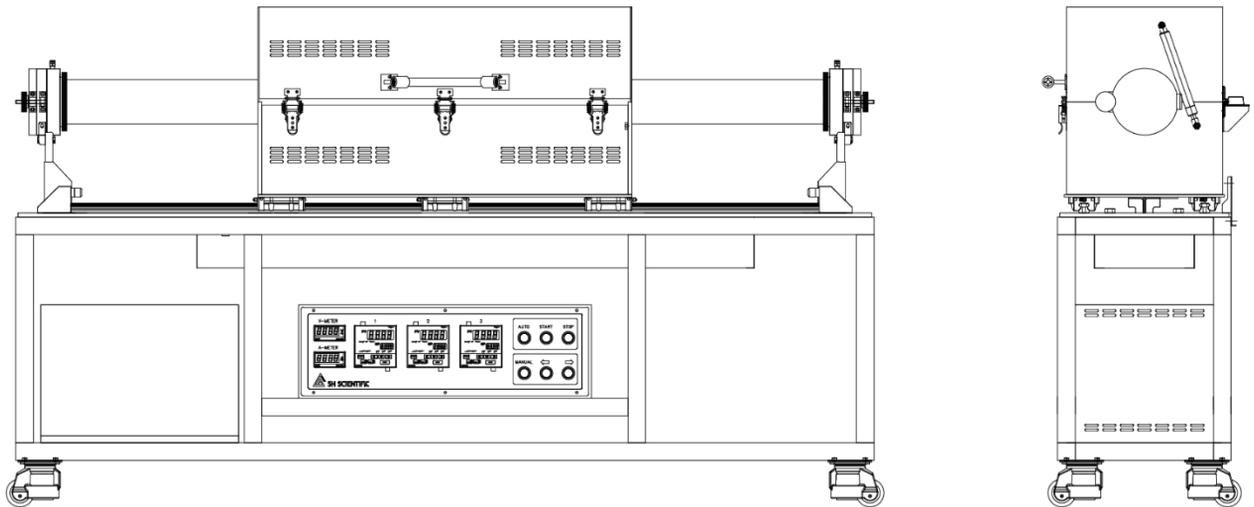
Model	SH-RTCVD-120TG300	SH-RTCVD-200TG300	SH-RTCVD-250TG300
Max Temp	1200°C (2192°F)		
Temp Controller	Programmable Controller(SP 570)		
Sensor	K type		
Applicable Tube Diameter	120 Φ	200 Φ	250 Φ
Heater Capa	5200 W	8000 W	10 kW
Dimension Hot Zone	Length 300mm		
Dimension External (W×D×H)	1625x490x1148mm	1625x570x1228mm	1625x620x1278mm
	63.97x19.29x45.19"	63.97x22.44x48.34"	63.97x24.40x50.31"
Heater Element	Kanthal A-1		
Insulation	Ceramic Board & Wool		
Electrical Requirements 220V ,50/60Hz, 1Φ	23.6 A	36.4 A	NA
Electrical Requirements 220V ,50/60Hz, 3Φ	NA	21.0 A	17.5 A
Electrical Requirements 380V ,50/60Hz, 3Φ	NA	12.2 A	10.6 A

8. Specifications <SH-RTCVD-XXTG200-3 >



Model	SH-RTCVD-50TG200-3	SH-RTCVD-80TG200-3	SH-RTCVD-100TG200-3
Max Temp	1200°C (2192°F)		
Temp Controller	Programmable Controller(SP 570)		
Sensor	K type		
Applicable Tube Diameter	50 Φ	80 Φ	100 Φ
Heater Capa	1.23 Kw x 3 Zone = 3.7 Kw	1.8Kw x 3 Zone = 5.4Kw	2.0Kw x 3 Zone = 6.0Kw
Dimension Hot Zone	200mm x 3 Hot Zone = Length 600 mm		
Dimension External (W×D×H)	1950x420x1078mm	1950x450x1108mm	1950x470x1128mm
	76.77x16.53x42.44"	76.77x17.71x43.62"	76.77x18.50x44.10"
Heater Element	Kanthal A-1		
Insulation	Ceramic Board & Wool		
Electrical Requirements 220V ,50/60Hz, 1Φ	15 A	23.5 A	26 A

8. Specifications <SH-RTCVD-XXTG200-3 >



Model	SH-RTCVD-120TG200-3	SH-RTCVD-200TG200-3	SH-RTCVD-250TG200-3
Max Temp	1200°C (2192°F)		
Temp Controller	Programmable Controller(SP 570)		
Sensor	K type		
Applicable Tube Diameter	120 Φ	200 Φ	250 Φ
Heater Capa	2.66 kW x 3 Zone=8.0 kW	4.66 kW x 3 Zone=14.0 kW	6.0 Kw x 3 Zone=18.0 kW
Dimension Hot Zone	200mm x 3 Hot Zone = Length 600 mm		
Dimension External (W×D×H)	1950x490x1148mm	1950x570x1228mm	1950x620x1278mm
	76.77x19.29x45.19"	76.77x22.44x48.34"	76.77x24.40x50.31"
Heater Element	Kanthal A-1		
Insulation	Ceramic Board & Wool		
Electrical Requirements 220V ,50/60Hz, 1Φ	36.4 A	NA	NA
Electrical Requirements 220V ,50/60Hz, 3Φ	NA	36.8 A	47.3 A
Electrical Requirements 380V ,50/60Hz, 3Φ	NA	21.3 A	27.4 A

