

VACUUM OVEN
(Model : VO- 27 / 64)

VACUUM OVEN



Before operating this unit,
please read and understand
this manual completely and
keep it for future reference.





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• Safety warnings







Before operating, read and understand safety warnings thoroughly and use this equipment properly.



Keep these warnings in mind for your safety.



Safety Warnings: Danger!,Warning!,Caution!

-  **Danger** : Failure to observe this instruction can result in a personal injury or death.
-  **Warning** : Failure to observe this instruction may cause a fatal injury
-  **Caution** : Violation of this instruction and improper use may cause a serious injury and property damage.

 Do not contact	 Caution
	Fire or heat injury may occur. Do not touch the exhaust port. Do not put objects near the exhaust port.

 High Voltage	 Warning
	Electric shock may occur. Unplug the power before you open the covers.

 Explosion	 Danger
	Explosion or fire may occur due to improper handling. Do not put flammable, explosive materials in the oven.

 Electric Shock	 Warning
	A risk of electric shock exists. Make sure to install a ground wire. Electric shock may occur without a ground wire installation.

1. Features

This unit operates under vacuum condition to provide various applications such as drying of glassware lab tools, heat-aging test, and drying of test samples, etc. Drying under vacuum is much easier because the boiling point of solvent become low under vacuum. It is very useful to dry the materials that become explosive in contact with oxygen.

This product has following features for user's safety and convenience.

- 1) The grounded circuit prevents a short circuit and over current of electricity.
- 2) Accurate temperature controls by Digital PID controller.
- 3) High temperature ceramic wool & glass wool optimize insulation and heat loss.
- 4) Tempered safety glass windows for excellent insulation and easy observation.
- 5) Set time and stable temperature functions.

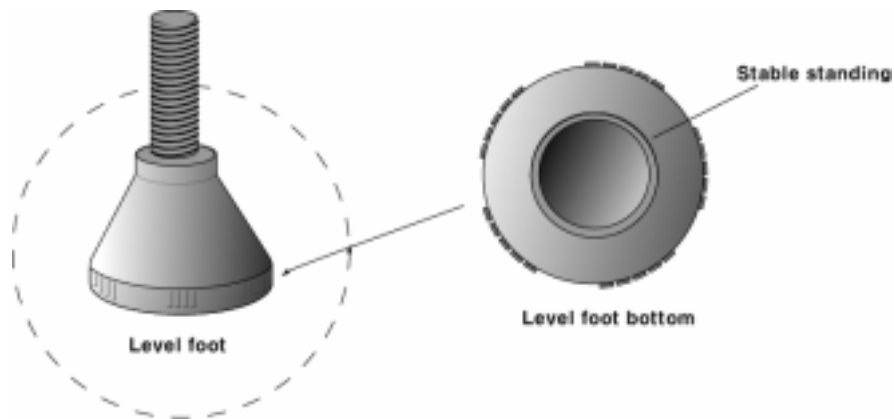
2. Setup



Caution

- Improper set up can cause a malfunction or an accident.

- 1) Install the equipment on a firm area avoiding heat, humidity, dust, and vibration.
- 2) Place it in a well-ventilated area with enough space.
- 3) Install it horizontally on a firm and stable surface.
- 4) The door can opens to an angle of 180 degree, please consider enough space.



Confirm that the equipment is leveled by using of leveling feet.

3. Cautions

Danger

- Do not put flammable, explosive materials in the chamber. Explosion or fire may occur due to improper handling.

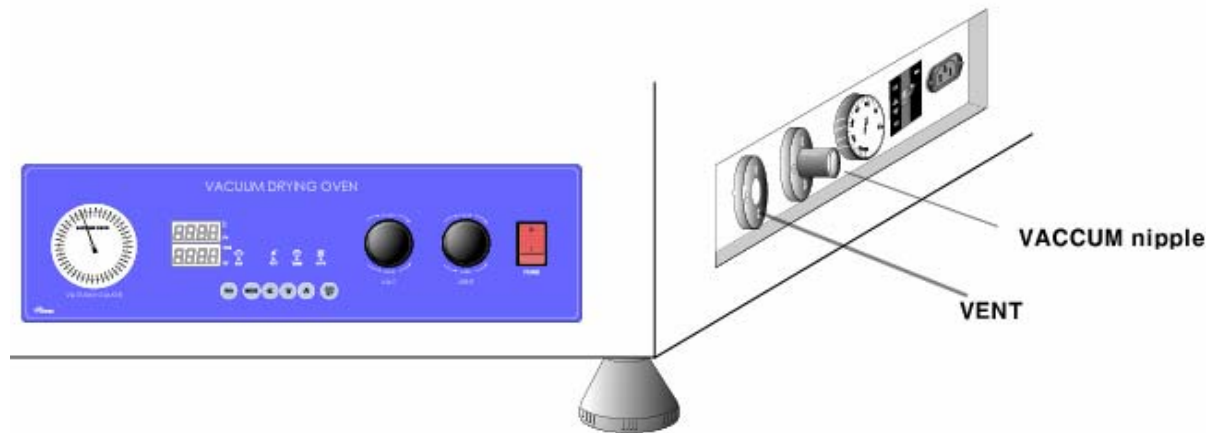
Warning

- Do not place flammable materials near the equipment. Fire may occur.
- Do not touch the power cord with wet hands. Electric shock may occur .
- Do not plug too many equipment into the same electric outlet. Overload may cause a fire..
- Make sure to connect a ground wire. Electric shock may occur without a ground wire.

Caution

- Before plugging into the electric outlet, make sure that the power voltage is **220VAC, 50/60Hz.**
- Avoid using other electric equipment with high voltage current near this equipment.
- Do not pour water on this equipment directly.
A short circuit may occur. .
- Do not use acid solution, benzene, and sharp objects, to clean the equipment. It may cause changes of color or damage. Rubber and plastic parts are likely to change easily. Do not use any volatile material. If you use any detergent, clean it with water thoroughly
- Unplug from an outlet by holding the plug. Do not unplug it by pulling on the power cord.
- If this unit is not going to be used for a long period of time, remove the plug from an outlet.
- Damaged power cord can cause a short circuit or a fire.
- **Please identify physical and chemical properties of samples when you use this vacuum oven.**
- **Make sure to set temperatures lower than the boiling point of samples.**
- **Do not use sublimating materials. They can be sublimated and block the vacuum line to cause damages of the pump.**

4. Description of Parts and Functions - Vacuum operation



Activate Vacuum



Put sample in the chamber and close the door.
Turn the VAC valve knob to 'OPEN' direction, and connect the vacuum line hose to VAC nipple on side of unit, and activate vacuum.
At this time, the VENT valve is "CLOSE"



Turn the VAC valve knob to 'CLOSE' direction.
Now, stop the vacuum pump. (The chamber is maintained under vacuum.)



Release Vacuum

To release vacuum after use, turn the VENT valve knob to 'OPEN' direction.
(Vacuum release in the chamber.)
At this time the VAC valve knob must be in 'CLOSE'.

5. Controls



(1) Functions and Features of the control panel

Displays actual oven temperature & each mode

Displays set temperature & data of each mode

Displays the system is running (START)

Displays the heater is operating (OUT)

Displays the timer is working (TIMER)

Displays Auto Tuning is functioning. (AUTO)

Needle valve handle

Start/Stop running key (RUN)

Parameter setting key (MODE)

Digit position movement key ()

Decrease value key ()

Increase value key ()

DSP Auto tuning key (AUTO)

Pressure

(2) Indicator lights



Will be lit when the system is running/ Turns off when it stops running



Will be lit when the heater is operating.



Begins flashing until set temperature is reached. After set temperature is reached, it will be lit. Turns off at the end of set time. (If timer set is 00:00, it will not be lit.)



Begins flashing during Auto tuning. Turns off at the end of Auto tuning. .

(3) Operating Procedures

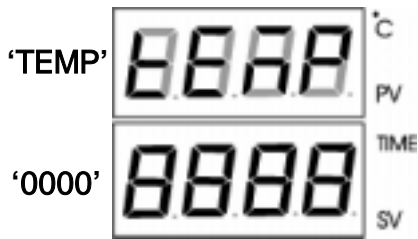
Start



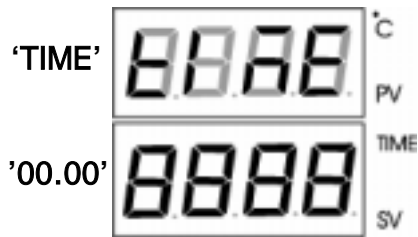
Turn the power switch on.

The PV display shows the actual temperature in the oven.

The SV display shows set temperature.



Press the “Mode” key to enter temperature set mode. ‘TEMP’ appears in the PV display . Set temperature display (SV display) begins flashing to set desired temperature.



Press the “Mode” key once again to enter timer mode. ‘TIME’ appears in the PV display . The SV display begins flashing to set the timer.

Default time format is **Hour/ Minute(HH.MM)**. Other time formats are Date.Hour / Hour.Minute / Minute.Second (DD.HH/HH.MM/MM.SS)

(3) Operating Procedures



Press the “Mode” key to enter the temperature set mode. ‘TEMP’ appears in the PV display . Set temperature display (SV display) begins flashing to set desired temperature.



Press the “ ” key to move to the next digit position.



Press the “up ” key to increase value.
Press the “down ” key to decrease value.



Press the “**Mode**” key to enter timer mode. ‘**TIME**’ appears in the PV display . The SV display begins flashing to set timer.



Set the timer as the same way of temperature set by using of the arrow keys. If timer set is 00:00, the timer will not function. Only set temperature will operate.

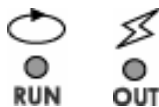


Press the “**Mode**” key to complete setting. The set value stops flashing. The displays return to PV/SV mode..

Setup

(4) Operating Procedures & Function

Start



Press "START" key for **2 seconds**.

The RUN and the OUT indicator lights turn on and the heater begins operating.

The timer does not begin operating as the timer indicator blinks until set temperature is reached. The timer starts working as the indicator turns on after set temperature is reached.

Stop



The RUN light will blink and the 'end' will appear with "beep" tone for 30 seconds.
To stop "beep" tone immediately, press "START/STOP" key.

Auto Tuning



Auto tuning function calculates the most effective integer for PID and ARW automatically. Auto Tuning can start while temperature is rising or after set temperature is reached. To start Auto tuning, press "Auto" key for 5 seconds until the "beep" tone. It begins to function with the AUTO indicator light flashing and completes its function as the AUTO light turns off. If you want to stop Auto Tuning, press the "AUTO" key for 5 seconds during Auto tuning function.

- **Because Auto tuning has already been set from the factory, Auto tuning is not necessary.**
Use Auto tuning only if it is needed or if the operation is unstable.

6. Maintenance and Storage

Warning

- Make sure to unplug the unit from an outlet before cleaning the unit to avoid an electric shock.

Caution

- Pull the plug when disconnecting from an outlet. Do not pull the power cord.
- Do not use acid solution, benzene, and sharp objects to clean the equipment. It may cause changes of color or damage of the equipment.

- 1) To clean the inside of the chamber.
 - . Remove the plug from an outlet.
 - . Remove the shelves and shelf hangers from the chamber.
 - . Wipe the inside with a soft cloth using a neutral detergent.
 - . Clean the inside once more with a soft towel.
- 2) To clean the surface of the equipment.
 - . Use a sponge or a soft cloth with a neutral detergent
 - . Wipe the unit with a dry cloth.
 - . Do not use organic solvent.
- 3) To clean the electric parts.
 - . Always use a dry cloth.
- 4) If this system is not going to be used for a long period of time.
 - . Remove the plug from an outlet.
 - . Clean the unit with a soft towel.
 - . Wrap and store it.

7. Troubleshooting



Warning

- Switch off the unit before any maintenance and make sure to disconnect the power.
- If you are not authorized personnel, do not try to open, repair, or modify the unit. It can cause a fire or malfunction inflicting an injury upon people.

Symptom	Corrective Actions
The unit does not operate	<ul style="list-style-type: none"> - . Make sure the power cord is plugged. - . Make sure the switch is on. - . Check a power outage.
Decrease of heating ability	<ul style="list-style-type: none"> - . Check the heater
Temperature does not rise	<ul style="list-style-type: none"> - . Check the set temperature - . Check the heater
Malfunctions of the controller	<ul style="list-style-type: none"> - . Check whether other high voltage electric equipment is working nearby.

8. Warranty

1) We provide free repair service for this product against defects in material or workmanship for a period of one year, when it is used under appropriate conditions. Before requesting service, check the followings;

- . Malfunctioned part and conditions (a detailed explanation is required)
- . Model Number
- . Purchased date

* Customer will pay for the delivery charges of the product for repair service.

2) In case of followings, the repair service will be charged.

- . Damage due to improper operation, modification, or unauthorized attempt to repair
- . Damage due to inappropriate handling or transportation.
- . Damage due to acts of God such as fire, flood, and wrong voltage supply.
- . Damage due to not following operating instructions.

3) Contact authorized service center or your dealer for additional information.

9. Specifications

Spec.	Model	VO-27()	VO-64()
Camber volume		27	64
Temp	Range	Max 250 °C	
	Controller	Digital PID with PT100 Sensor	
Size	Internal (WxDxH, mm)	300x300x300	400x400x400
	External (WxDxH, mm)	460x420x670	560x520x770
Vacuum range		1x10 ⁻² ~76cmHg	
Timer		Max 99hr 59min	
Safety	Electrical	No fuse breaker	
Material	Internal	SUS #304 3.0t	
	External	SS #41 1.0t Double paint	
	Shelves	SUS #304 Wire Electro-Polished	
	Heater	Sheath Heater	
	Insulation	Ceramic Wool 25mm	
	Door gasket	Molded heat resistance silicon rubber	
	Windows	Tempered Safety Glass, 10t	Tempered Safety Glass, 12t
Electric Requirements		220VAC. 50/60Hz	
Power Consumption		1.4KW	2.0KW

Specifications are subject to change without notice.

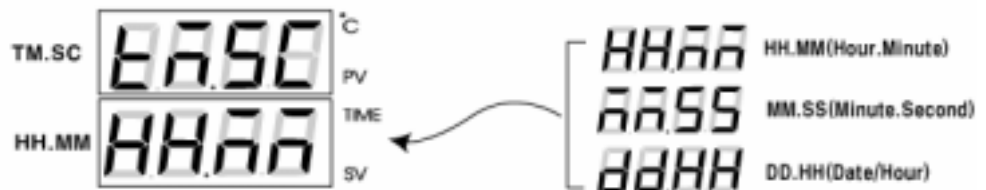
* Change of time format

Default time format is Hour / Minute (HH.MM).
You can change it with the following procedure.

1. Turn the power "On"
2. Press the "Mode" key for 2 seconds until the 'beep' sound.
(Entering Parameter Set mode)
3. Press the "Mode" key and the "<" key at the same time
for 2 seconds until 'beep' sound.(Entering Main Menu of Factory Mode).



4. After P.SYS displayed, Press the "Mode" key continuously
until TM.SC(time format set) displays.
5. Use the "Up/ Down" arrow keys to set time format (TM.SC).
HH.MM(Hour.Minute)/DD.HH(Date/Hour)/MM.SS(Minute.Second)



6. Press the "Mode" key to store the input.
(LED stops flashing after input completed)
7. Press the "Mode" and the "<" keys at the same time for 2 seconds
to exit to the initial stage.

*** storing the factory default setting**

To restore the default setting from system memory, follow the procedure.
Use it only when set values get too complicated.

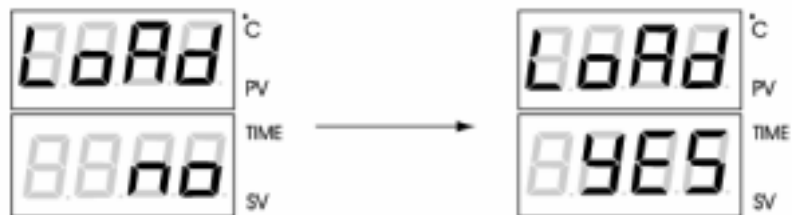
1. Turn the power on
2. Press the "Mode" key for 2 seconds until the 'beep' sound.
(Entering Parameter Set mode)
3. Press the "Mode" key to display 'LOC'.



4. Change to '1000' by using of the "Left / Down" arrow keys and press the "Mode" key once to complete the input. (LED stops flashing after input completed)



5. Press the "Mode" key to change to 'LOAD' display.
Use the arrow keys to change 'NO' to "YES" and Press the "Mode" key once to complete the input. (LED stops flashing after input completed)



6. Press the "Mode" and the "<" keys at the same time for 2 seconds to exit to the initial stage.

* 7 Segment Display Examples

A	B	C	D	E	F	G	H	I	J	K	L
M	N	O	P	Q	R	S	T	U	V	W	X
Y	Z	0	1	2	3	4	5	6	7	8	9



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