



10310003

Hephaestus V900

Vacuum Oven

# User Manual

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## II. Safety



### **IMPORTANT Safety Items to be Observed.**

#### **Safety Warnings**

#### **! DANGER (may cause serious damage to property and or casualties)**

1. The vacuum oven must be grounded reliably and away from any electromagnetic interference sources (cannot be grounded or neutral).
2. Please confirm that the voltage and frequency of your power supply matches the specified voltage and frequency advised prior to use.
3. This vacuum oven should be operated on an independent power outlet and always verify that the plug and socket are well-grounded.
4. Do not allow the vacuum oven to be plugged in or unplugged without firstly ensuring to turn off the main power switch.
5. It is not permitted to lengthen, reduce or cut the power connection cord to the product.
6. Do not bake or dry any flammable, explosive, volatile, or corrosive substances in this vacuum oven.
7. When working at temperatures above 80 °C do not touch the door, inspection window, or surrounding surfaces of the product to prevent burns.
8. Repairs must not be carried out without prior authorization. Repairs should be commissioned only via repair qualified and accredited professionals.

#### **! WARNING (may cause property damage or personal injury)**

9. You must read and understand all the instruction manual details for this product prior to operation.
10. The 304 stainless steel liner is not acid resistant, please adhere to advised anti-corrosion measures and never use acidic media within the oven.
11. Use a power outlet with a grounding wire to prevent electric shock. If the power outlet is not grounded, a ground wire must be installed by a qualified engineering technician.
12. When pulling the power plug out from a power source, do not pull out using the power cord directly.
13. The power plug of the vacuum oven must be 'unplugged' in the following instances:
  - Prior to replacing the fuse tube
  - In the event of a failure or breakdown an inspection or a repair is required
  - When not in use for a long period
  - When moving or relocating the vacuum oven

14. When the vacuum oven is turned on, the upper deviation alarm function must be adjusted or confirmed.

**! ATTENTION (may affect operational performance or service life)**

15. Always place the vacuum oven on a hard, firm, and level surface.
16. Do not allow the door to open or close via gravity only. Always guide the door to avoid product damage or potential injury.
17. This vacuum oven must be used and operated in accordance with the safety and user manual conditions outlined.



## III. Vacuum Oven – Introduction

### 3.1 Overview

The Hephaestus V900 vacuum oven is designed to efficiently process raw materials in a temperature controlled vacuum environment. It is ideal for research, pilot process development and production. This process has the following advantages:

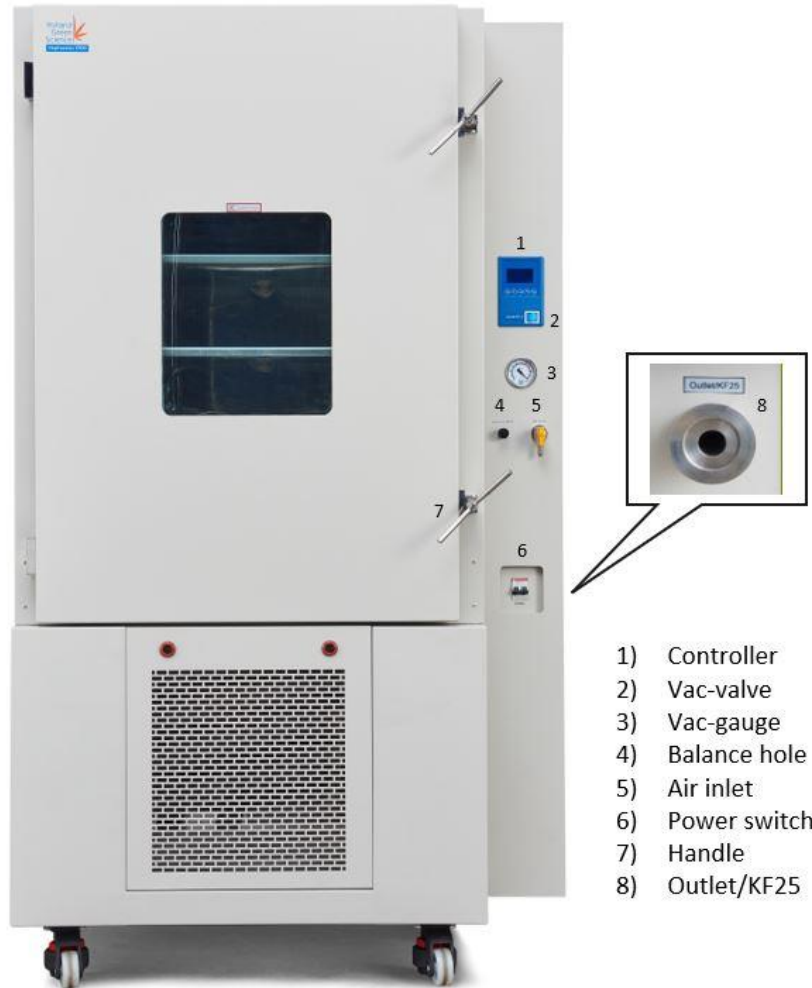
- Lowers the drying temperature due to low pressure.
- Prevents damage caused by dirt.
- The reduced processing temperature minimizes the oxidation rate of the product ensuring less oxidative damage.

The Hephaestus V900 vacuum oven has an inner chamber, a vacuuming system, and a temperature-control system.

The inner chamber of the vacuum oven is constructed from high-quality 304 stainless steel and the exterior surface of the vacuum oven is polymer-coated. The inner chamber uses either a galvanized or stainless-steel armor plate. Fiberglass insulation is used to thermally insulate the chamber.

The chamber door has a viewing window that allows visual inspection of the process. The window is constructed using a double-layered fortified glass design. The door uses a heavy-duty column door pin. The door frame uses an airproof rubber seal to prevent vacuum leaking when closed.

**Note:** The rubber airproof seal is not oil-proof.



- 1) Controller
- 2) Vac-valve
- 3) Vac-gauge
- 4) Balance hole
- 5) Air inlet
- 6) Power switch
- 7) Handle
- 8) Outlet/KF25

The power plug for the vacuum oven is shown below. The model of the power plug is L6-30P.



## 3.2 Cautions

- The shell of the vacuum oven inner chamber should be grounded to ensure safety.
- The vacuum oven should be placed in an environment with less than 85% humidity level. Ensure that there is no strong electromagnetic fields or vibration source nearby.
- The vacuum oven is not explosive proof or corrosion proof. Combustible materials and corrosive liquids or gases should not be placed in the vicinity of the drying chamber.
- To maximize the lifespan of the vacuum pump, do not use it for a prolonged period.
- When the chamber reaches the required vacuum, switch 'OFF' the vacuum pump first and then switch 'OFF' the power of the vacuum pump.
- If the product is excessively damp before drying, add a "precipitation" filter between the vacuum pump and the cabinet to avoid steam entering the pump.
- If the material for drying is light and/or small in size (e.g. grains) a net should be used in the mouth of the vacuum pump inside the chamber to prevent any grains from getting into the pump and causing damage to the electromagnetic valve.
- If the air-release rubber stopper becomes difficult to turn, Vaseline may be used to lubricate the contact area.
- The vacuum chamber should be always clean. The glass on the Inner chamber door should NOT be cleaned with any chemical solutions and should only be cleaned using a soft cotton cloth.
- Whenever the vacuum chamber is not used for a prolonged period of time, it is recommended that all exposed plated parts to be cleaned with a nonabrasive lubricant. A plastic film cover is recommended to be placed over the cabinets to prevent dust from accumulating.

## IV. Technical Specifications

<b>Parameters</b>	<b>Model</b>
	10310003
Power Supply	AC 230V 60Hz
Temperature Range	(RT + 10 ~ 200) °C
Temperature Resolution	0.1°C
Fluctuating Degree (°C)	±1°C
Attainable Vacuum Degree	133Pa
Input Power (W)	5800
Shelf (Layer)	5
Bladder Material	Stainless Steel 304 (1Cr~18Ni9Ti)
Bladder Size (mm)	750 × 1160 × 1050
Outer Size (mm)	1400 × 1395 × 2010

**NOTE:** “RT” refers to the ambient temperature.

## V. Standards and Conformity

**Construction in Accordance with the following Safety Standards:**

**UL 61010-1:2012**

**CSA C22.2#61010-1-12:2012**

**UL 61010-2-010:2015**

**CSA C22.2#61010-2- 010:2015**

**Construction in Accordance with the following EMC Standards:**

**EN 61326-1**

## VI. Inspection

### 6.1 Packing List

Unpack the equipment carefully and check for any damages which may have arisen during transport. In the event of identified damage, please contact [serviceusa@hollandgreenscience.com](mailto:serviceusa@hollandgreenscience.com).

The package includes the following items:

Item Description.	Quantity.
Main Unit	1pcs
Spanner	2pcs (14*17/8*10)
Rubber Tube	1pcs (Φ14mm×0.9m)
Adapting flanges	1pcs (KF25)
Quick setup card	1pcs

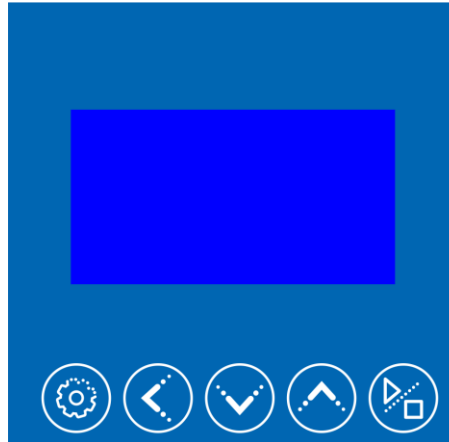


**Note:**






If you find any visible damage on the product, please do not connect the product to a power supply.

## VII. Operating Instructions

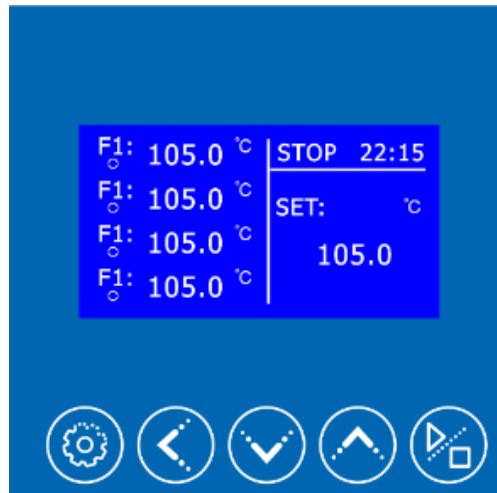
### 7.1 Command key instructions



#### Description of Controller Panel Keys

- 1)  press hold the key for 3s or more to control the run/stop of the program
- 2)  in a mode of setup, click this key to add one number and press hold the key to increase successively
- 3)  in a mode of setup, click this key to decrease one number and press hold the key to decrease successively
- 4)  used to return in operating.
- 5)  used to set the target temperature value and enter the internal parameter layers.




## 7.2 Functions





- F1: first layer measurement temperature
- F2: second layer measurement temperature
- F3: third layer measurement temperature
- F4: fourth layer measurement temperature
- “RUN” display of running status.
- “XX: XX” display of controller system.
- “STOP” display of set value.





## 7.3 Temperature Setting

- 1) When the instrument is switched on, press the  button one time, and the set temperature value will start to blink. Set the desired temperature value (in Celsius degrees) by pressing keys.
- 2) The  button works for a quick movement between the digits.
- 3) Confirm the set value with another press of the  button.


**Note:**

Pressing the  or  Key only once changes the value by 0.1  
Press and Holding either of the keys will change a numerical value rapidly.

## 7.4 Start / Stop Operation

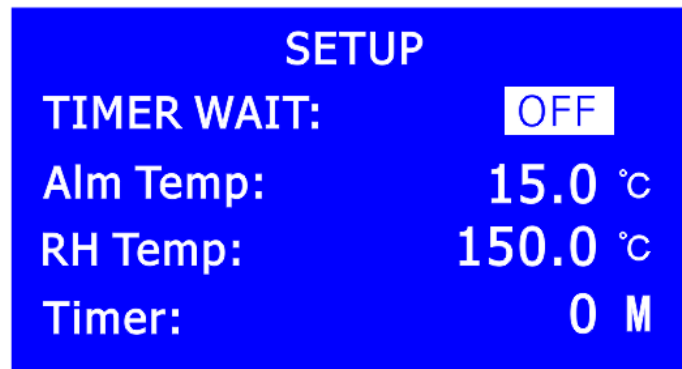
- 1) After setting the operating parameters, press  button for about 4-5 seconds to start the heating process. When the word “STOP” disappears on the upper right corner of the screen, the system is in the stopped state. When the message “RUN” will appear in the upper right corner, the system is in the running state and the system will display issues like contemporary, timer, and temperature measured inside the chamber.
- 2) At any time, you can always manually stop running by pressing the  button for 4-5 seconds.

## 7.5 Setting the Deviation Alarm and Timer




- On the controller panel, press and hold the  key for 4-5 seconds.



- Press  key to confirm, press  or  key to move, press  key to return.



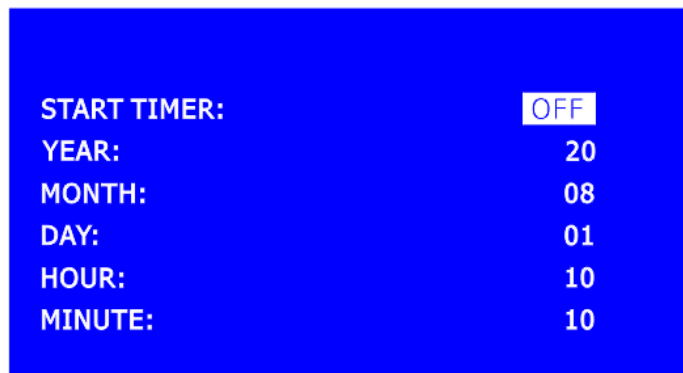
- TIMER WAIT: ON/OFF of waiting temperature. When 'ON' the waiting temperature is available. When 'OFF' no waiting temperature is available.
- ALM Temp: Setting of Temperature Deviation Alarm: when the measured temperature > Set Temperature +ALM TEMP, an audible alarm will sound.
- RH Temp: Setting the upper limit for Temperature Control.
- Timer: Timing Function: when the time is set as 0, the timing function is not available. When other than 0 is applied the controller is in the 'Timer' function.

Press the  key so, that Timer numerical value is backlit displayed, indicating the timer can now be set as required, by pressing either the  or  key.

NOTE: If no operation is performed for a long time, the system automatically returns to the home screen.









## 7.6 Setting the Pre-set Start Function

- Press and hold the  key and press  key, then shift the cursor to 'START SETUP', and press  key.



- 1) START TIMER: Press 'ON' to start the Pre-Set timer function settings
- 2) YEAR, MONTH, DAY, HOUR, MINUTE: Enter timer pre-set required details

## 7.7 Setting the ENGINEER SETUP

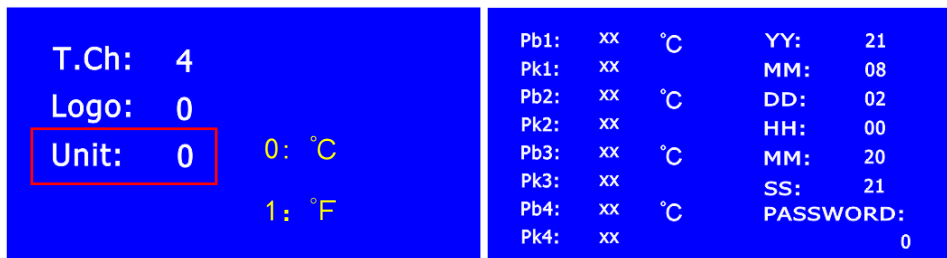
- Press and hold the  key and press  key, then shift the cursor to 'ENGINEER SETUP', and press  key, enter the password (The default is "0"), and press  to confirm. Press  key to move, press  key to confirm, and then press  or  key to adjust.

NOTE: The parameters here are factory parameters, do not adjust (except for the system date and password)



## 7.8 Unit, SYSTM Timer, and PASSWORD Settings

- Unit: "0" °C, "1" °F
- YY: year; MM: month; DD: day; HH: hour; MM: minute; SS: second; (this is the apparatus system time setting)
- PASSWORD: for direct input and changing of a new password.



## VIII. Fault Diagnosis

Fault	Possible Causes	Solutions
No Power	The external power supply outlet has no power.	Check the lines are connected correctly and that the power outlet socket tests as operational.
	The power plug is not correctly inserted into the socket or the line is cut off	Re-insert the power plug into the socket check switch 'ON' or repair the line.
	The fuse is blown or there is no fuse.	Check the fuse. Replace the fuse. Check for a 'short circuit'. (The power transformer, heater, grounding, and other short circuit types can all cause a fuse break).
PV Display	Temperature sensor Pt100 is damaged	Check Pt100. (0°C, 100Ω, 0.3Ω/°C) Replace if required
	Temperature sensor line issues encountered.	Re-connect the lines again.
	The test scope of the vacuum oven is not correct.	Reset again.
Temperature Not Increasing	The SET value is too low.	Set temperature $SV \geq RT + 10^\circ\text{C}$ RT is the environment temperature.
	The output circuit is falling off.	Re-connect the lines again.
	The temperature controller has NO output signal or is damaged or, the controller silicon is damaged.	Replace the temperature controller Replace the silicon
	The heater is damaged (Short circuit, or open circuit)	Replace the heater
	The timing function or the setting is not correct.	$ST=0$ or $ST=(\text{Heating Time} + \text{Constant Temperature Time})$
Temperature	The output of the temperature controller is out of control.	3041 or BTA is damaged. Replace it.

Issues	Not Qualified to Use	SV $\geq$ RT+10°C
* Out of control * Offset or overshoot * Error display tested temperature vs. teal temperature	Pt sensor not connecting well.	Eliminate grounding resistance.
A large variance between test temperature and real temperature.	Relevant parameters are not correctly set.	Reset all relevant parameters, such as Ar, P, etc.
	No vacuum situation.	Vacuuming.
	The mercury thermometer head is not connecting to the shelf.	Check thermometer is in full contact with the shelf. Check the thermometer head and replace it if required.
	The parameters within the vacuum oven are not accurate.	Re-arrange Pb, and Pk parameters.
Not Vacuuming.	The vacuum pump is not the correct size for the volume within the vacuum oven	The vacuum pumping speed should not be less than 2 liters per second.
	Various connecting flanges and pipes are not secured or coming loose.	Check all are securely fitted if not replace applicable fittings.
	The vacuum gauge is damaged.	Replace the vacuum gauge.
	The oven door is not closing well.	Check the door seal ring.
	The airproof rubber door seal is aged and lacks elasticity.	Replace the airproof rubber door seal
	The air release valve and vacuum valve are not in the correct place.	Manually adjust positioning
	The electromagnetic valve is damaged.	Replace the electromagnetic valve.

## IX. Maintenance and Cleaning

Proper maintenance and operation of the vacuum oven are required to ensure good working condition and extend the oven's service life.

Keep the vacuum oven dry and clean in routine operations. Clean the exterior of the vacuum oven with a non-abrasive cleanser and only connect the power supply when the oven surface is dry.

If liquid or moist solids are spilled in the vacuum oven, please immediately disconnect the power supply and contact the service department.

- Power must be disconnected before any maintenance or cleaning.
- Surface stains on the vacuum oven should be cleaned only with a clean, soft rag and detergent.
- Keep the product clean and ensure no cleaning solution is spilled inside the vacuum oven.
- Avoid cleaning the vacuum oven with any corrosive cleaning solutions.
- If the vacuum oven is left unused for a long period, switch 'OFF' the power and store it within a dry and clean area on a level surface at room temperature.