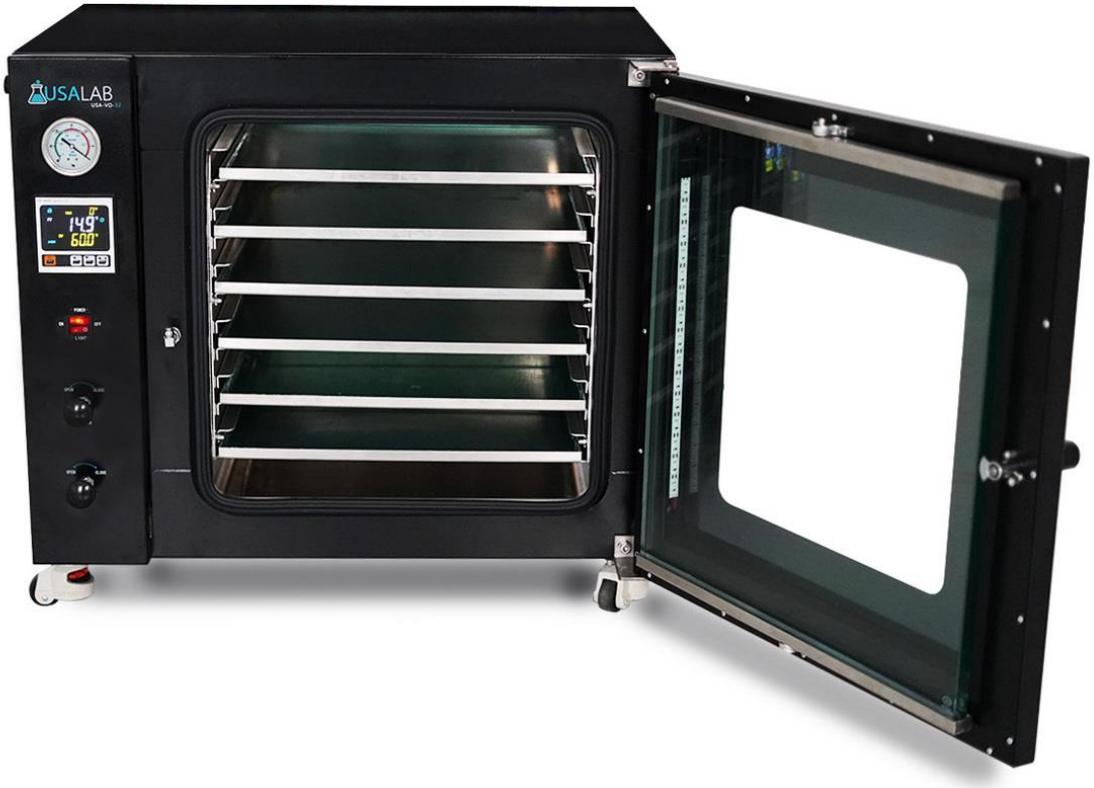
Vacuum Oven

Model: VO Series

VO-09, VO-19, VO-32



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Safety Precautions and Explanations

At USA Lab, safety is our number one priority. The following information provides guidelines for safety when using USA Lab equipment. Any piece of machinery can become dangerous to personnel when improperly operated or poorly maintained. ALL employees operating and maintaining USA Lab equipment should be familiar with its operation, thoroughly trained, and Instructed on the best safety practices. Most industry accidents are preventable through safety awareness.

Training

It is the responsibility of the customer to ensure that all personnel who will be expected to operate or maintain the equipment. Participate in training and instruction sessions to become trained operators. All personnel operating, inspecting, servicing, or cleaning this equipment must be properly trained in the operation and machine safety. **BEFORE** operating this equipment, read the operating instructions in this equipment manual. Become thoroughly familiar with the machinery and its controls.

Safety

- Never leave the equipment running unattended. Use this equipment only for its intended purpose.
- Ensure that all power sources are turned off when the machine is not in use. This encompasses electrical and pneumatic power.
- Read the manual for any special operational instructions for each piece of equipment. All USA Lab authored manuals are typically included with each device as well as posted online.
- Know how the equipment functions and understand the operating and halting processes.
- Wear the appropriate personal protective equipment for the task.
- When working on or around all equipment, avoid wearing loose clothing, jewelry, unrestrained long hair, loose ties, belts, scarves, or articles that may be caught in moving parts. Keep all extremities away from moving parts. Entanglement can cause death or severe injury.
- For new equipment, check input voltage and compare with the equipment voltage rating. DO NOT supply the incorrect power to any equipment for any reason whatsoever. Electrical specifications for your machine are printed on the machine tag. A properly grounded receptacle is required for safe operation regardless of voltage requirements.
- Keep the equipment operating zone free of obstacles that could cause a person to trip or fall toward an operating machine. Keep fingers, hands, or any part of the body out of the machine and away from moving parts when the machine is operating.
- Any machine with moving parts and/or electrical components can be potentially dangerous no matter how many safety features it contains. Stay alert and think clearly while operating or servicing the equipment. Be aware of operations and personnel in your surroundings. Be attentive to indicator lights, warning lights, and/or operator interface screens displayed on the machine and know how to respond.
- Do not operate machinery if you are fatigued, emotionally distressed, or under the influence of drugs or alcohol.
- Know where the FIRST AID SAFETY STATION is located.
- Know where the FIRE EXTINGUISHING EQUIPMENT is located.
- Never sit or stand on the machine or on anything that might cause you to fall against the machine.
- Rotating and moving parts are dangerous. Keep clear of the operating area. Never put any foreign object into the operating area.
- Use proper lifting and transporting devices for heavy equipment. Some types of equipment can be extremely heavy. An appropriate lifting device should be used.
- Use caution when moving portable equipment. In some cases, the machinery can be heavy and/or may be top heavy. Portable equipment can gain momentum during transporting and must always be controlled.

Symbols and Warnings

Below are examples of commonly used symbols and what they mean. Understand them and their potential consequences.

High Voltage or Electrical Hazard

Explosive Hazard

Not User Serviceable

Flammable Hazard

Hot Surface or Steam Hazard

Section 1 | Important Information

1.1 Safety Notices

The oven can become very hot, use caution when touching any surface.

The use of Personal Protection Equipment (PPE) is REQUIRED.

Follow all federal, state, and municipal laws, codes, and ordinances.

Please make sure the power connection is correct and well-grounded. (See section 1.3)

Apply a rag to wipe the parts clean after washing away stains; do not use hard objects.

Do not use flammable, corrosive, or explosive substances on, in, or near the equipment.

Do not unplug the unit while it is running.

Install the equipment in a climate-controlled facility ONLY.

Never use a generator to power this equipment.

Do not change the length of the power cable.

Repairs must be made by USA Lab or by instruction from USA Lab.

If there is a problem, do not continue to use the oven.

Contact us immediately.

USA Lab, Inc.

12400 Belden Ct.

(734) 855-4890

10am to 6pm | Monday thru Friday

Sales@usalab.com

Support@usalab.com

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1.2 Features

- Standard 110V operation.
- Bright white LED lights for full visibility of the trays.
- Stainless-steel tubing throughout helps reduce the need to replace old worn tubing.
- KF25 vacuum port.
- 4-sided heating in the **VO-09** & **VO-19**. 5-sided heating in the **VO-32**.
- Large characters on the controller help with the readability of the display.
- Solid state control.
- Robust door gasket helps to maintain vacuum pressures with ease.
- Shielded door window.
- Temperature accuracy of ±1°C.
- Durable paint for easy cleaning.
- Expandable shelving, up to 12 shelves on the VO-32 model.

VO Vacuum **O**ven model number breakdown:

VO-XX = XX is the cubic foot volume of the chamber

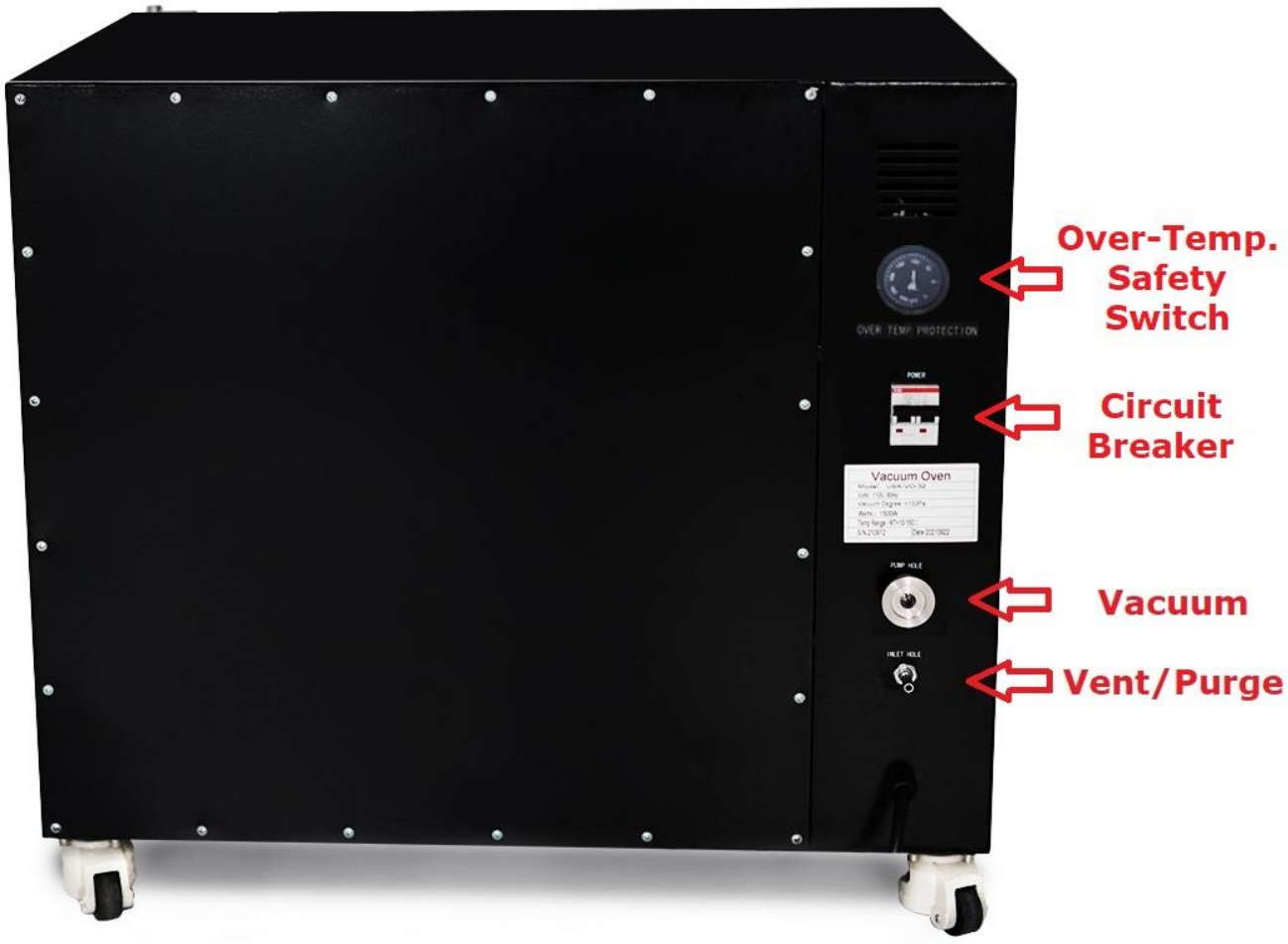
1.3 Technical Specifications

Technical Specifications			
Model	VO-09	VO-19	VO-32
Voltage	110V Single Phase 60Hz		
Plug	NEMA 5-15p		
Wattage	500 W	1400 W	1500 W
Temperature Range	Room + 10°C - 200°C		Room + 10°C - 150°C
Temperature Accuracy	± 1°C		
Lowest Vacuum Depth	1 Torr / 1,000 Microns / 1 mmHg(a)		
Vacuum Port Size	KF25 / NW25		
Maximum Shelves	8 (4 included)	10 (5 included)	12 (6 included)
Chamber Dimensions	11.9" X 11.7" X 10.9"	16.4" X 14.7" X 13.6"	17.8" X 17.8" X 17.8"

Section 2 | Diagrams

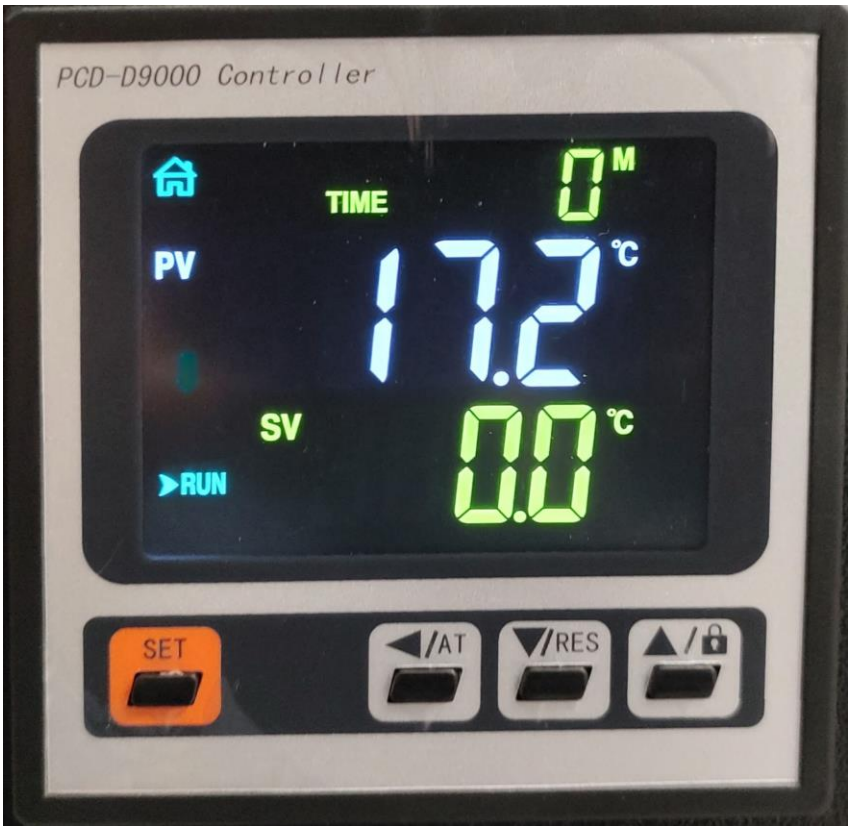
Front Connections

Back Connections



Section 3 | Control Panel Operation

3.1 LCD Display Operation



Buttons:

| [SET] Set Menu **|** [◄/AT] Move Left / Auto Tune **|** [▼/RES] Decrease / Reset **|** [▲/◘] Increase / Lock **|**

How to set the heating and timer values:

Press SET to enter the programming menu.
'SP' will be displayed – This is the temperature setting page. Adjust using ◄,▲,▼. Confirm with [SET].
'ST' will be displayed – This is the set timer page. Adjust using ◄,▲,▼. Confirm with [SET].
You will be returned to the main menu.

Auto Tune (automated self-calibration):

To run Auto Tune, set the oven for your desired running temperature. Then hold the [◄/AT] button.
After 5 seconds the display will show 'AT' 0000. Increase the value to 0001, then press [SET].
The oven will now calibrate the heater and controller to your temperature. !! this will take a long time !!

Disclaimer – Parameters are not allowed to be modified by end users. This is to protect the equipment from accidental damage. Modifying parameters for any reason, without our knowledge and/or permission will constitute a void of the warranty.

Section 4 | Installation

4.1 Included Items

If you are missing any items, contact us.

Packing List	
Vacuum Oven	1 Unit
Tubing	11 ft.
Barb to KF25 Adapter	1 pc
KF25 Gasket and Clamp	1 pc ea

4.2 Tubing Connections

4.4 Electrical Connections

Each unit has its own power requirements, please understand their differences. This unit must be operated on its own circuit Installed by a licensed professional.
Each unit uses a NEMA 5-15p plug end.

4.5 Operating Area

Always leave 12-16 inches around the unit. Always keep the operating area clean and organized to prevent injury or damage.

4.6 Operating Instructions and Notes

Ensure that you have read and understand **section 3.1**. You will need to know how to program the controller to operate the equipment.

How to use the Over-temperature Protection function of the equipment.
The over-temperature protection system is responsible for limiting the heating output of the heater. It does this by using a temperature sensitive mechanical switch.

Set the dial to 10°C above the temperature you plan to use.

To verify its function: Set the controller higher than the dial and ensure operation.

How to operate
Your process may differ. These instructions are for the general use of the equipment.

1. Power on the vacuum oven.
2. Enable the LED Lighting.
3. Set the Over-temperature protection dial.
4. Set the controller to the desired temperature.
5. Allow the oven to reach the set temperature and regulate.
6. Open the door and add the sample to be vacuum dried.
7. Turn on the vacuum source (pump).
8. Open the vacuum valve and watch the vacuum gauge drop in pressure.
   [If your sample rises and requires “purging”. Open and close the vent valve as necessary.]
9. When the sample has finished drying, close the vacuum valve and open the vent valve slowly.
10. Allow the pressure to equalize slowly.
11. When the pressure has normalized, open the front door, and then remove the sample.
12. Allow the oven to cool completely before cleaning any surfaces.

If you have any questions on how to operate the unit further, contact the technical department.

Section 5 | Maintenance

5.1 Periodic Maintenance

Shut off the power switch AND disconnect the power cord before any maintenance.

Use a damp soft cloth to wipe clean. Stubborn stains should be cleaned by neutral detergents.

The maintenance of internal electrical and heating parts must be performed by professionals or trained electricians.

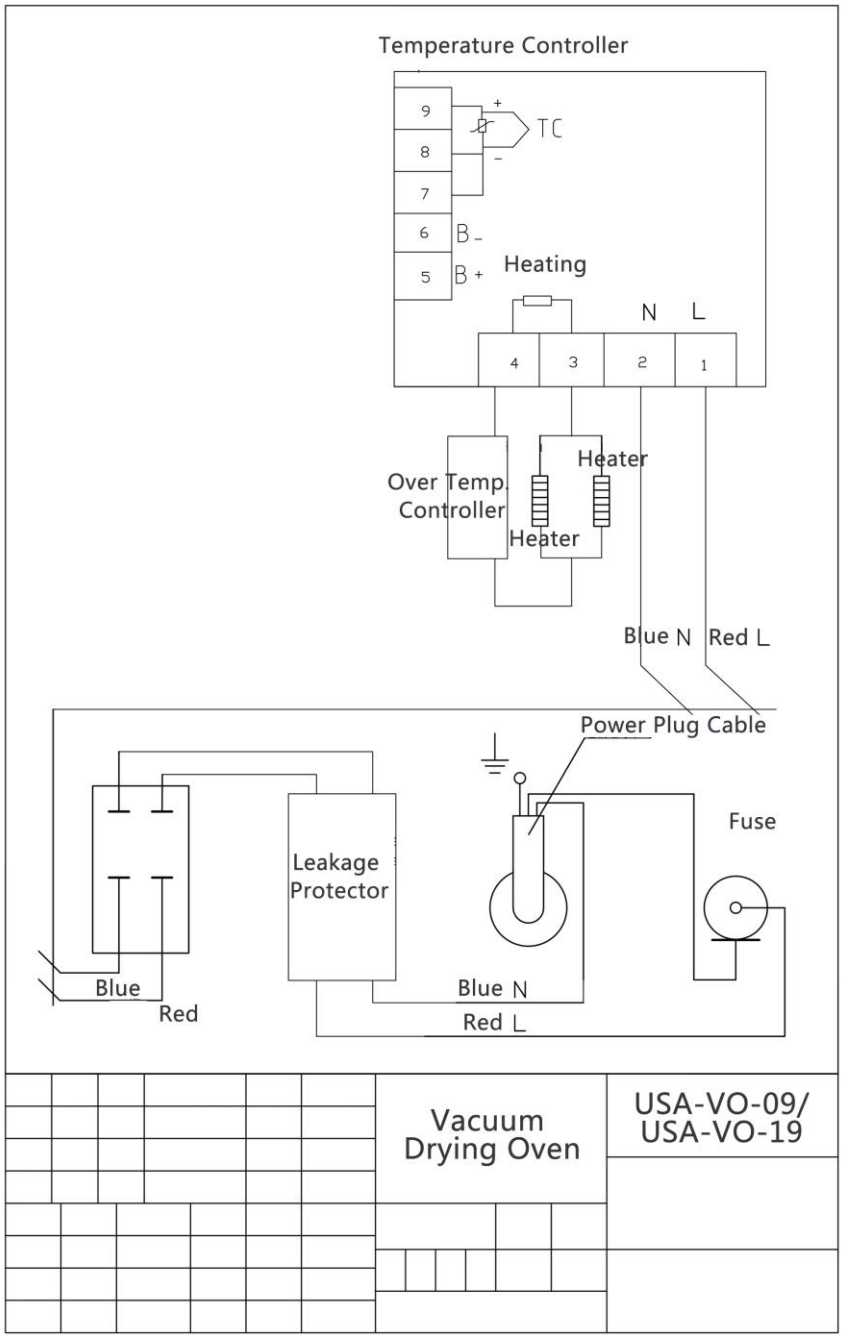
Do not directly splash water over the product or use abrasive powder, diluent, oil, kerosene, acidic material, and similar substances during cleaning, or else shock or other accidents will occur.

Check the unit over monthly for leaks, broken glass, melting, burning, or any other damages.
Please bring any concerns to our attention immediately.

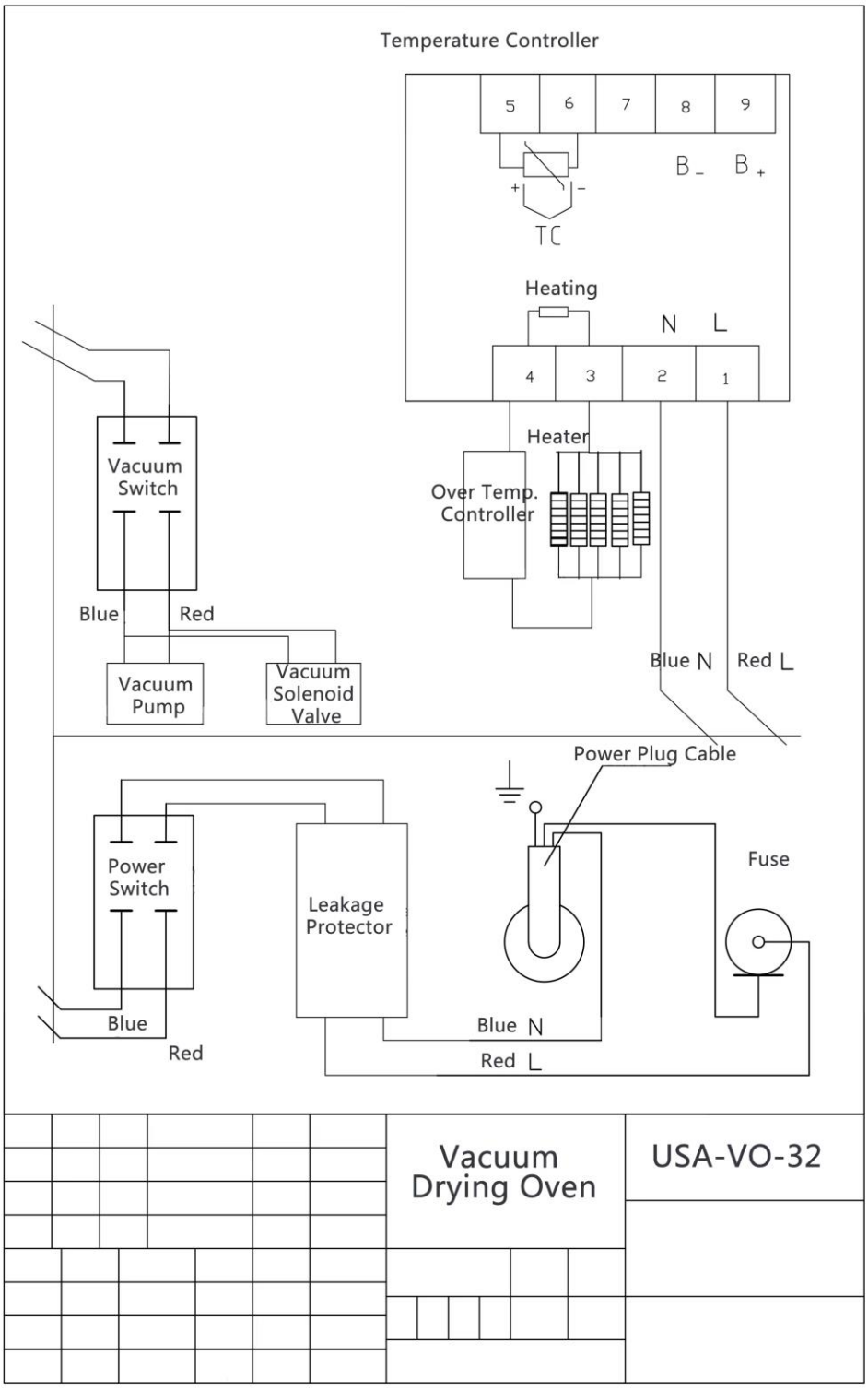
Section 6 | Technical Diagrams and Troubleshooting

6.1 Circuit Board Diagrams

VO-09 & VO-19:



VO-32:


Temperature Controller
5
6
7
8
9
B-
B+
+
-
TC
Heating
N
L
4
3
2
1
Heater
Over Temp. Controller
Vacuum Switch
Blue
Red
Vacuum Pump
Vacuum Solenoid Valve
Blue N
Red L
Power Plug Cable
Power Switch
Leakage Protector
Fuse
Blue
Red
Blue N
Red L
Vacuum Drying Oven
USA-VO-32

6.2 Troubleshooting

USA Lab VO Series - Troubleshooting		
Problem	Cause	Solution
No Power	A. Unit not plugged in. B. Breaker has tripped. C. No power from outlet. D. Damaged internal part.	A. Plug unit in. B. Reset the breaker on rear. C. Investigate building power fault. D. Contact us.
No Display	A. Ribbon cable unplugged. B. Power switch failure. C. Controller main board failure.	A. Reseat the ribbon cable. B. Contact us. C. Contact us.
Not Heating / Slow to Heat	A. Damaged heating elements. B. Damaged wiring. C. Controller main board failure.	A. Contact us. B. Contact us. C. Contact us.
Not Holding Vacuum	A. Bad door seal. B. Valve open. C. Poorly performing vacuum source. D. Leaking internal tubing.	A. Replace door gasket. B. Close valve. C. Inspect and repair vacuum source. D. Check and repair tubing.
LED Lights not Working	A. Damaged door wiring. B. Bad LED light switch. C. Power supply failure.	A. Contact us. B. Replace bad switch. C. Contact us.
Valves not Working	A. Bad valve. B. Handle is loose. C. Broken hardware.	A. Replace the bad valve. B. Tighten the set screw on the internal adapter. C. Contact us.
Intermittent Heating	A. Controller set too low. B. Over-temp. safety set too low.	A. Set the temp. higher. B. Set the Over-temp. dial higher.
Bad Vacuum Gauge	A. Broken vacuum gauge. B. Leaking tubing.	A. Replace vacuum gauge. B. Check and repair tubing.

Section 7 | Warranty Information and Coverages

7.1 Warranty

Continental United States

USA Lab products are warrantied to be free of workmanship, mechanical, and material defects for ***one to two years*** from date of purchase depending on product. Within this warranty period USA Lab will replace or repair components that fail due to manufacturer defect. For such repairs or parts, shipping charges will be covered in full or in part by USA Lab.

This warranty ***does not cover any failures*** due to alteration, repairs, misuse, accident, or abuse. This warranty also ***does not cover wear items*** such as glassware, heating elements, thermocouples, oil seal sets, switches, and sensors. The warranty does also not cover wrongful input voltage. The customer needs to be responsible in monitoring power rating and routine checking. If using water in a heater or chiller, the customer must only use ***distilled water.*** Other forms of water will ***void the warranty.***

Non-continental United States

USA Lab products are warrantied to be free of workmanship, mechanical, and material defects for ***one to two years*** from date of purchase depending on product. Within this warranty period USA Lab will replace or repair components that fail during normal daily use. Such repairs or parts will be covered in full by USA Lab and ***the customer will be responsible for shipping, labor, and custom duties.***

This warranty ***does not cover any failures*** due to alteration, repairs, misuse, accident, or abuse. This warranty also ***does not cover wear items*** such as glassware, heating elements, thermocouples, oil seal sets, switches, and sensors. The warranty does also not cover wrongful input voltage. The customer needs to be responsible in monitoring power rating and routine checking. If using water in a heater or chiller, the customer must only use ***distilled water.*** Other forms of water will ***void the warranty.***

7.2 Return Policy

We offer a 30-day return policy from when your package is delivered to your shipping address. By placing an order with USA Lab, you express that you have read and agreed to the following return policies.

• ***We do not accept returns for customized items***. When purchasing a customized item, you agree that there are no returns due to the nature of the item(s) being specific to your needs. **We do not accept returns on any solvents or consumables.**

• ***Pre-orders***: There will be a ***10% non-refundable fee*** associated with pre-orders that are canceled. This covers the banking fees and the hold fee.

• By default, a ***15% restocking fee*** is applied on all items that are in original packaging and unused with no damage. This applies to all items returned within 30 days. ***No exceptions***. You will be responsible for the return shipment unless deemed defective by USA Lab. In that case, we will pay for return shipment and replacement shipment costs.

• The item(s) must be returned in original packaging and in undamaged condition. The item(s) must have no signs of usage or wear including stickers, scratches, dents, resins, non-standard fluids, plant matter, or any other wear not representing a new, unused item.

Unused and undamaged products not in original packaging will be subject to a restocking fee equal to 25% of the purchase price.

Products deemed defective with any signs of usage or wear whatsoever of damage or usage (including but not limited to the presence of botanical material, resins, cleaning agents, stickers or decals, or any damage, wear, or tear) will not be accepted for return.

• Once the returned item is received, tested, inspected, and processed, a refund will be issued. If your item(s) are in original packaging and unused, ***you will be refunded the initial purchase price with the 15% restocking fee deducted***.
If your item(s) are deemed damaged or used, ***you will not be refunded.***

7.3 Notes

Keep all original packaging in the event you need to return the unit or to send it in for to us for repair.
We are not responsible for providing packaging material.

This manual and its contents are subject to change without notice.

USA Lab reserves the right of ultimate interpretation of this instruction manual. Additionally, USA Lab is not responsible for damages or injuries caused by improper use; knowingly or unknowingly.

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