Thermo
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Programmable Vacuum Oven

Catalog No. 3625A, 3625A-1

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Introduction

The Lab-Line Vacuum Oven is a new, multi-purpose unit that operates under reduced pressures and/or inert atmospheres. Intended for both low and high temperature applications, it features a 304 stainless-steel work chamber, which resists contamination and corrosion from chemically active vapors, and a dual-electronic control system, the Safety Sentinel, which automatically protects samples from overheating.

To achieve temperature uniformity, sheath heaters completely cover the top, bottom and sides of the oven chamber. Moreover, four-inch-thick fiberglass insulation surrounds the chamber and heater assemblies.

For operational convenience, all controls and indicators are located on the front panel. In addition to a power switch and three indicators, one to show power, one to indicate when the heaters are energized and one to indicate when the primary temperature control has failed – these include purge gas and vacuum control valves, a 0-to-30-inch vacuum gauge and a temperature control. The door is equipped with a full-length, low temperature handle and a large observation window to assure safe sample loading and viewing, even at high temperatures. There is also a positive-action cam-type lock that holds the door tightly against the oven seal. The rear panel contains gas and vacuum system connectors, and the chamber contains a thermometer and two removable shelves.

The Vacuum Oven can fulfill practically every need associated with general drying, conditioning, curing, desiccating, and annealing – as well as moisture tests. When compared with conventional ovens, samples dry faster at lower temperatures, and heat-sensitive materials dry safely without degradation problems.

General Specifications

Performance Characteristics

Power Requirements:	
Cat. No. 3625A	120V, 50/60 Hz, 8.5A
Cat. No. 3625A-1	240V, 50/60 Hz, 4.2A
Power Input:	1000W max.
Temperature Range:	Ambient to 280°C
Control Sensitivity:	±1.0°C
Constancy:	±1.0°C (at ultimate vacuum)
Safety Differential:	~ 5.0°C
Vacuum Range:	Atm. to 30” Hg
Pump-Down Time:	6 Min*
Vacuum Leak Rate:	< .5” Hg per 24 hours

Physical Data

Overall Dimensions:	22 3/4H x 17 3/4D x 18W
Chamber Dimensions:	9 3/4H x 11 1/2D x 9 3/4W
Chamber Capacity:	0.65 cubic feet
Shelf and Floor Area:	313 square inches
Shipping Weight:	~ 90 pounds

• Using a single-stage mechanical vacuum pump with a free air capacity of 35 liters per 1 minute.

Approximate Dial Settings in Static Air

Dial Setting	Temperature
2	25°C
4	55°C
6	85°C
8	115°C
10	145°C
12	180°C
14	210°C
16	240°C
18	275°C

Approximate Heat Up Times to Various Temperatures

T. Initial	T. Final	Standard	Accelerated
25°C	100°C	75 min.	35 min.
25°C	200°C	95 min.	75 min.
25°C	275°C	120 min.	----------

Unpacking

The Vacuum Oven is shipped in a single carton. After unpacking, check each "loose" item against the packing list below. If a shortage exists, notify Customer Service at 1-800-553-0039. Where damage occurred during transit, keep everything intact, including the carton and packing material, and immediately file a claim with the final carrier. Usually the firm will send a representative to ascertain liability.

Quantity	Item
1	Vacuum Oven
2	Serrated Hose Connector
2	Shelf
1	Warranty Card
1	Instruction Manual
1	Vacuum Grease

Part numbers are listed in the Replacement Parts and Accessory Items section located at the end of this manual.

Assembly

To prepare the Vacuum Oven for operation:

1. Remove all holding tape from surface of cabinet and work chamber, as well as the shelves.

2. Place shelves in work chamber.

3. Check that the dial thermometer is inserted through the metal support located at the top center of oven chamber, adjust if necessary to reading position and then finger-tighten holding screw.

4. Remove and discard plastic sealing caps from both connector openings on rear panel, and attach the supplied serrated hose connectors. To assure an airtight connection, use thread sealing compound or Teflon sealing tape.

5. Place unit on a suitable table or bench where it is to be used.

6. Close PURGE and VACUUM VALVE controls on control panel by turning each clockwise as far as possible.

Caution
Never operate unit with caps in openings. Under certain circumstances, they could clog vacuum and purge lines.

7. Turn TEMPERATURE control to low position on dial, and place POWER switch in OFF position.

8. Connect a vacuum pumping system with suitable trap to serrated outlet fitting marked VACUUM. Use heavy-walled vacuum tubing and secure connection with a hose clamp.

Note
Vacuum operation to 30” Hg can be obtained easily using a single-stage mechanical pump with a free air capacity of 35 liters per minute.

9. If desired, connect a purge gas supply to serrated inlet fitting marked PURGE. Use a two-stage gas-flow regulator if gas is to be supplied by a pressurized cylinder.

10. Check data plate and plug line cord into a suitable power receptacle.

11. Spread a light coating of vacuum grease on the surface of door seal.

Operation

The Vacuum Oven is equipped with a 0 to 300°C dial thermometer, which is graduated in five degree increments and mounted internally at the top of the oven chamber. Easily read through the observation window, the thermometer is used in conjunction with the TEMPERATURE control dial – arbitrarily numbered from low to 20 – to obtain the specified temperature for a given application. If desired, the same temperature can be obtained again simply by reproducing the control setting.

Note
After controlling at a specified temperature, if the Set Temperature Dial is rotated counter clockwise the Safety Sentinel indicator will come on. This is a normal condition and not a malfunction.

Along with the other controls and indicators, the front panel contains a power switch and three indicators. During operation, the red HEAT lamp section will illuminate to show that the heaters are energized. The yellow SAFETY lamp section will illuminate to show that the primary thermostat is malfunctioning and that the SAFETY is controlling temperature at approximately five degrees above set point.

1. Place POWER switch to ON position.

2. Slowly rotate TEMPERATURE control dial clockwise until heat indicator comes on.

3. Observe the chart of approximate temperature settings. Set the dial to the number indicated for the desired temperature. Allow sufficient time for the oven to stabilize.

4. Due to the high mass of vacuum ovens the heat up time is relatively slow. Observe the chart of approximate heat up times. The oven can be heated at a faster rate by setting the dial, 2 settings above the desired temperature. Observe the thermometer. When the temperature reaches 20°C below the desired temperature, set the dial 2 settings lower. The oven will come into the final temperature quicker using this method.

5. Readjust the temperature control dial for the exact temperature. A record of temperature control settings versus thermometer readings should be constructed for future reference. The data will serve as an effective means of reproducing given temperatures and establishing intermediate heat levels.

T. Initial	T. Final	Standard	Accelerated
25°C	100°C	75 min.	35 min.
25°C	200°C	95 min.	75 min.
25°C	275°C	120 min.	----------

Approximated Heat Up Times to Various Temperatures

6. After desired temperature is obtained, place material to be processed in work chamber, and operate unit per one of the following methods.

In a Static Environment

The unit can be operated at atmospheric pressure with ambient air or with a controlled atmosphere. If the latter is desired, turn on the vacuum pumping system, and open the VACUUM VALVE control by turning knob counterclockwise as far as possible. After the chamber is pumped down, close the VACUUM VALVE control and turn off the vacuum pumping system. Next, bleed in an inert gas by opening and then closing PURGE VALVE control.

In a Vacuum

To operate the unit at reduced pressure, first apply a light film of Silicone Grease around the oven seal, then close and lock the door in position. Next, turn on the vacuum pumping system and open the VACUUM VALVE control.

In a Purged Atmosphere

Operate unit with a purged atmosphere by pulling gas through chamber. To do this, turn on vacuum pumping system, and open VACUUM VALVE control. Next, open the PURGE VALVE control to bleed in gas.

Accelerated Heat Up Method

1. Set temperature dial 2 divisions higher than the final desired temperature.

2. When actual temperature is 20°C below desired temperature, set the dial 2 divisions lower to the number that coincides with your set

3. Example: 100°C setting is approximately position #7. Set dial to position #9 until actual temperature on the thermometer is 80°C. Set the dial to position #7. The oven will stabilize in about half the time compared to a standard run.

Precautions

When using the Vacuum Oven, the following precautions must be observed at all times:

- Do not operate the unit at temperatures above 280°C.
- Do not permit materials of any kind to rest on top of the unit when operating at elevated temperatures.
- Do not touch the door, particularly the glass portion, with unprotected hands when operating at elevated temperatures.

Safety Precautions

Before operation, always observe the following Safety precautions. This unit is not explosion proof. Do not use in the presence of flammable or combustible materials; fire or explosion may result. Unit contains components that may ignite such materials. Do not place volatile items in the chamber. Fumes and spillage from acidic solutions cause corrosion of the stainless steel chamber. Care should be taken to maintain neutral pH at all times.

Maintenance

Seal Replacement

To replace the oven seal, remove the old seal and perform the following:

1. Clean the edge of the chamber with Xylene (Cat. No LLX5-500).

2. Mount the seal around the edge of the chamber.

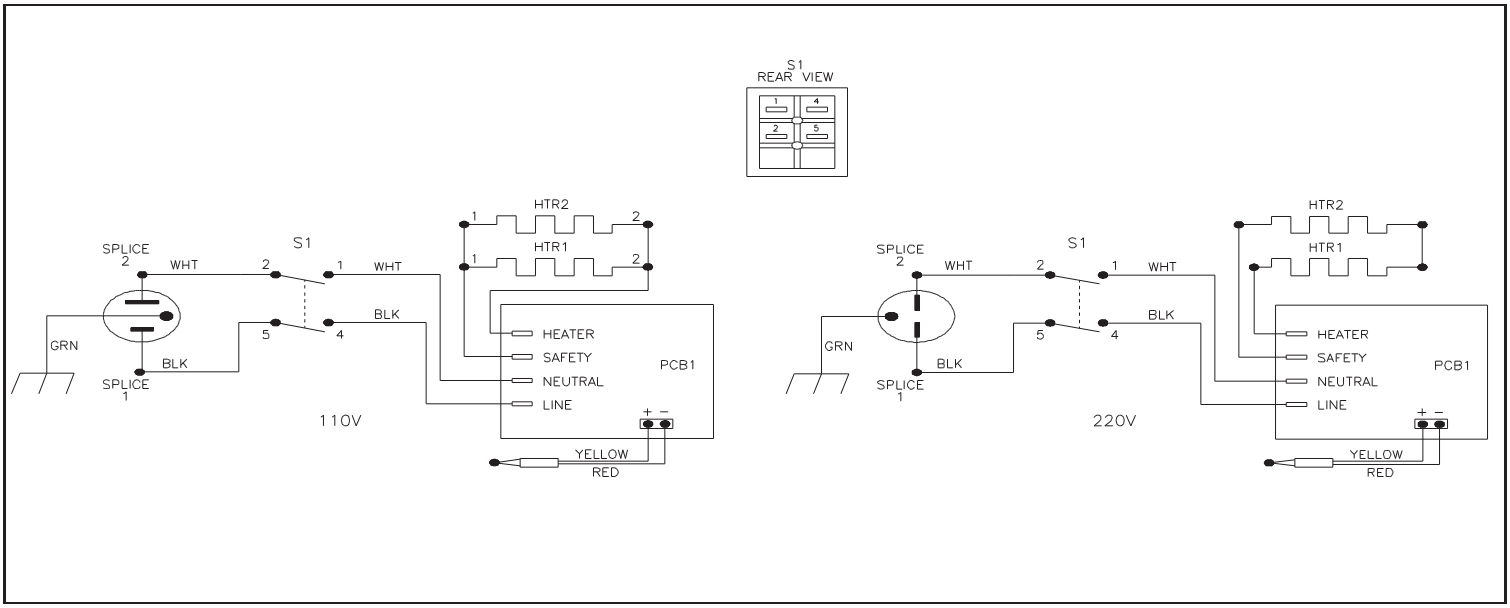
Temperature Controller and Heating Element Replacement

Replacing the temperature controller or the heating elements requires complete disassembly of the cabinet panels and insulation, and should be done only by qualified personnel. If it should become necessary to replace any of these components, contact Customer Servicel.

Replacement Parts/Accessory Items

Item	Number
Vacuum Gauge	LL02330
Vacuum or Purge Valve with Knob	LL44342
Heater Element (HTR1, 2)	LL 30790
Temperature Controller (120V)	LL83372
Temperature Controller (240V)	LL88196
Knob, Temp. Controller (PC26B 1)	LL32615
Power Switch (S1)	LL102627
Door Seal Replacement Kit	LL50430
Shelf	LL02340
Hose Connector (1/4”)	LL98573
Vacuum Grease	LL16023
Thermocouple	LL102716

Wiring Diagram



One Year Limited Warranty

This Thermo Scientific product is warranted to be free of defects in materials and workmanship for one (1) year from the first to occur of (i) the date the product is sold by the manufacturer or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above, the MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of the manufacturer must perform all warranty inspections. In the event of a defect covered by the warranty, we shall, as our sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold within the continental United States or Canada, the manufacturer shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

The warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than the manufacturer or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Thermo Scientific products.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, the manufacturer will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to the factory, it shall be sent prepaid and a prior written authorization from the manufacturer assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL THE MANUFACTURER BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us:

2555 Kerper Blvd., Dubuque, Iowa, 52004-0797
Phone: 563-556-2241 or 1-800-553-0039
Fax: 563-589-0516
Web: www.thermo.com