Thermo Scientific Hi-Temp Programmable Vacuum Oven

Operating Manual 107567 Rev. 0

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Models covered in this manual		
Catalog numbers	**Model numbers**	**Voltage**
3625A	6250	120V
3625A-1	6251	240V

MANUAL NUMBER 107567 (7006250)

REV	ECR/ECN	DATE	DESCRIPTION	By
0	--	3/31/10	Transfer to Marietta (was 107567 2/6/09)	ccs

Important Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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Important operating and/or maintenance instructions. Read the accompanying text carefully.

Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.

Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.

Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.

Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.

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- ✔ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✔ Always dissipate extreme cold or heat and wear protective clothing.
- ✔ Always follow good hygiene practices.
- ✔ Each individual is responsible for his or her own safety.

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Our **Service Support** staff can supply technical information about proper setup, operation or troubleshooting of your equipment. We can fill your needs for spare or replacement parts or provide you with on-site service. We can also provide you with a quotation on our Extended Warranty for your Thermo Scientific products.

Whatever Thermo Scientific products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific
401 Millcreek Road, Box 649
Marietta, OH 45750

International customers, please contact your local Thermo Scientific distributor.

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Section 1 Introduction

The Hi-Temp Programmable Vacuum Oven is a 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.

Section 2 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: . . . . . .Atmosphere to 30" Hg

Pump-Down Time: . . . . . .6 Min*

Vacuum Leak Rate: . . . . . .<0.5" Hg per 24 hours

Physical Data

Overall Dimensions: . . . . .22¾H x 17¾D x 18W

Chamber Dimensions: . . .9¾H x 11½ D x 9¾W

Chamber Capacity: . . . . . .0.65 cubic feet

Shelf and Floor Area: . . . . . .313 square inches

Shipping Weight: . . . . . .~90 lbs.

** 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.	----------

Section 3 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 Technical Services. 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.

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

Assembly (continued)

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.

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.

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 high temperature vacuum grease on the surface of door seal.

Caution Do not use silicone vacuum grease. It will damage the door seal and has restrictions for some types of materials placed in the oven. ▲

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. ▲

Section 4 Operation

The Vacuum Oven is equipped with a 0 to 300°C dial thermometer, graduated in 5° 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.

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 5° above set point.

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

Setup

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.

Approximated Heatup 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.	----------

Setup (continued)

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.

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 high temperature vacuum 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 Heatup 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.

Section 5 Maintenance

Maintenance procedures follow.

Seal Replacement

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

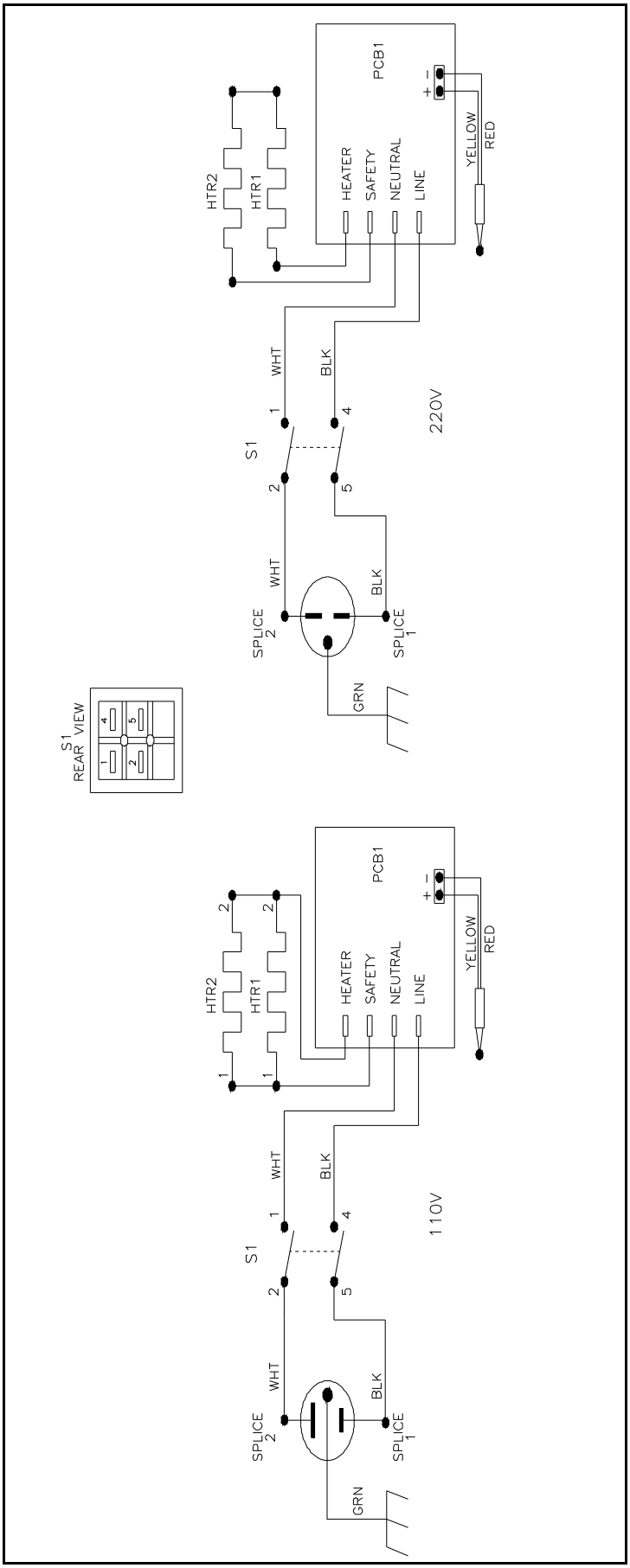
1. Clean the edge of the chamber with Xylene or similar.
2. Apply a thin bead of Dow Corning RTV-736 red silicone rubber adhesive to the edge of the chamber.
3. Install gasket and close door.
4. Keep door closed for a minimum of 16 hours with 1-2 inches of vacuum before using.

Temp Controller and Heating Element Repl.

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 Technical Services.

Section 6 Replacement Parts/ Accessory Items

Item	Number
Vacuum Gauge	LL02330
Vacuum or Purge Valve with Knob	LL44342
Heater Element (HTR1, 2)	LL30790
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


PCB1
HEATER
SAFETY
NEUTRAL
LINE
YELLOW
RED
HTR2
HTR1
WHT
BLK
S1
220V
SPLICE
GRN
S1
REAR VIEW
110V

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