Laboratory Equipment Manufacturer
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INSTRUCTION MANUAL FOR

Vacuum Oven

1407/1408

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION

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MRC.VER.02-10.10

CONTROL PANEL OVERVIEW (see Figure Two)

4.1 **POWER**: The main power I/O (ON / OFF) switch must be in the I/On position before any electrical systems are optional.

4.2 **HEATING** : This pilot lamp is on when the temperature controller has activated the heating elements to reach and maintain set point.

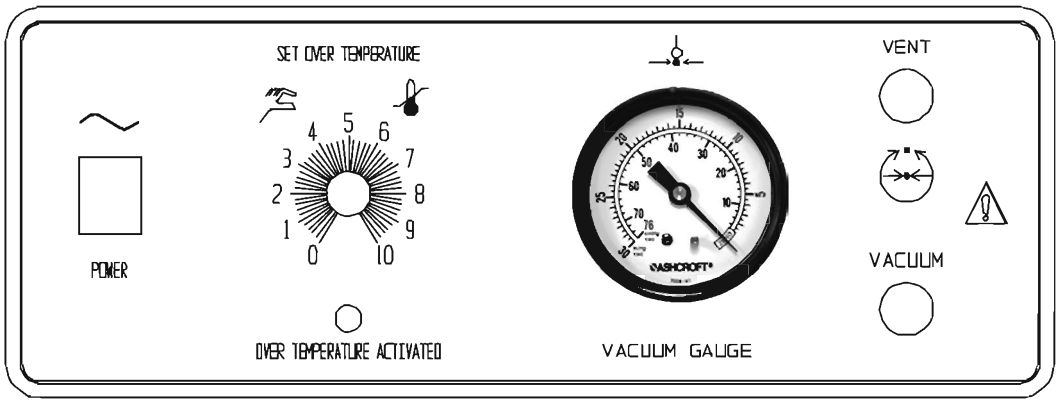
4.3 **TEMPERATURE CONTROLLER**: This is the manually adjustable temperature controller marked SET TEMPERATURE. Its dial is marked from 0 to 10 and is adjustable across this scale. A clockwise adjustment raises the temperature.

4.4 **VACUUM**: This adjustment valve, located on the right of the panel, allows opening and closing of the piping system to an external vacuum pump or system.

4.5 **VENT** : This adjustment valve, located on the left of the panel, controls the vacuum release to return the chamber to atmospheric pressure.

4.6 **VACUUM GAUGE** : This component, indicates the chamber operating pressure in inches of mercury

Figure TWO


SET OVER TEMPERATURE
POWER
OVER TEMPERATURE ACTIVATED
VACUUM GAUGE
VENT
VACUUM

PRECAUTIONS

THIS IS NOT AN EXPLOSION PROOF OVEN

5.1 Do not place or use explosive, combustible, or flammable materials in the oven.

5.2 Do not use sealed containers in the oven chamber.

5.3 Do not cut or remove the ground prong from the power cord or use an ungrounded 2- prong adapter plug.

5.4 Disconnect the unit from the electrical power source before attempting to make any repairs or component replacements.

5.5 If a mercury thermometer is used and breakage should occur, all spilled mercury must be completely removed from the chamber.

5.6 THIS OVEN IS NOT SUITABLE FOR USE IN CLASS 1,2 OR 3 LOCATIONS AS DEFINED BY THE NATIONAL ELECTRICAL CODE NFPA 70.

5.7 This oven is not intended, nor can it be used, as a patient connected device.

VACUUM OPERATION (See Figure Two)

6.1 IT IS IMPORTANT TO USE VACUUM TUBING FOR ALL THE VACUUM HOOKUPS. OTHER TYPES OF TUBING MAY COLLAPSE AND PREVENT COMPLETE EVACUATION.

6.2 A pump with a pumping capacity four times greater than the chamber volume is advisable. For example a 1410 has a chamber volume of one (1) cubic foot so a pump with a pumping with a pumping capacity of four (4) cubic feet per minute is recommended. When working below 1mm, a diffusion type pump will be needed. See unit specifications for chamber capacities.

6.3 **Vacuum** : To apply vacuum to the chamber attach the hose from the vacuum pump to the larger 3/8" hose connection on top of the oven. Close the VENT valve and open the VACUUM valve. Latch the door shut and start the vacuum pump. Be certain the vacuum valve is open and the VENT valve is closed. This action will hold the door shut and against the gasket until the pump creates a vacuum in the chamber. Once a good vacuum seal is accomplished, the door will hold itself shut and sealed until the chamber is returned to atmospheric pressure.

6.4 Watch the VACUUM GAUGE and when the required vacuum is obtained, close the VACUUM valve and turn the pump off. The VACUUM GAUGE is calibrated from zero to 30 inches of Hg (762mm of Hg) with zero representing atmospheric pressure. The oven can be evacuated to pressures as low as 10 microns.

6.5 **Vacuum Release** : To return the chamber to atmospheric pressure, open the VENT valve very slowly and allow the chamber to re-pressurize. The speed of pressurizing can be controlled by how much the valve is opened.

OPERATION

NOTE: Slight vapor or smoke may occur in the initial heat-up. This is the dissipation of protective coatings that have been applied to the oven elements.

7.1 **Power Supply** : Connect the service cord to a grounded outlet and push the power switch to the I/ON position. If supplied with a detachable cordset, plug the female end into the inlet of the unit and the male plug into the supply. Assure that units requiring a fuse have a fuse installed. This fuse may be at the inlet or part of the cordset male plug.

7.2 Place a reference thermometer inside the chamber where it can be easily viewed through the window. Then vacuum down the chamber as described in section 6.0.

7.3 **Setting Temperature:** The temperature control dial is marked from 0-10. These scale numbers do not represent temperature but are to be used as a reference guide. The operating range is 40ºC – 200ºC. The dial should be used according to the operating range. To set the temperature control, turn the knob clockwise to the setting on the dial that is just above the approximate operating temperature desired. The HEATING light will come on indicating that the oven is heating. Allow the unit to heat until the reference thermometer has reached the desired temperature. When the desired temperature has been reached, turn the control knob counterclockwise just until the HEATING light goes off. Allow the unit to stabilize for several hours. Re-adjust the control knob up or down as required until the desired temperature is obtained. Allow the unit to stabilize between each setting. Temperature stability is obtained when the HEATING light circulates on and off to maintain set point and the temperature value in the chamber remains consistent .

MAINTENANCE

NOTE : Prior to any maintenance or service on this unit, disconnect the service cord from the power supply.

8.1 Cleaning : Disinfect the oven interior on a regular basis. To prepare the oven for cleaning remove the shelves and door gasket. The shelves and door gasket are autoclavable.

A. First clean removed parts and interior with soap and water. To decontaminate use a disinfectant that is suitable to your Application. DO NOT use chlorine based bleaches or abrasives as this will damage stainless steel surfaces.

B. When washing the gasket, handle carefully so as not to impair the positive seal.

8.2 If the oven is to be shut down for storage or transporting, remove shelves and latch the door closed. Screw the leveling feet in on the 1430. See Section 3.3 for transport procedures.

8.3 There is no maintenance required on the electrical components. If the oven fails to operate as specified, see Troubleshooting before calling for service.

Section

TROUBLESHOOTING AND SERVICE

Always make a visual inspection of the oven and control console when troubleshooting. Look for loose or disconnected wires or tubing, which may be the source of the problem. The oven is designed so that no internal electrical servicing should be required under normal conditions. If electrical servicing is necessary, it should be performed by qualified service personnel.

TEMPERATURE	
Temperature too high	
	1/ controller failed on – call Customer Service
Temperature too low	
	1/ unit not recovered from door opening 2/ unit not recovered from power failure or being turned off 3/ element failure – see if heating light is on; compare current draw to data plate 4/ controller failure – confirm with front panel light that controller is calling for heat
Unit will not heat up at all	
	1/ verify that controller is asking for heat by looking for controller light – if pilot light is not on continuously during initial start up, there is a problem with the controller 2/check amperage – amperage should be virtually at maximum rated (data plate) amperage
MECHANICAL	
Door not sealing	
	1/ check physical condition of gasket 2/ adjust hinges and latch to insure that the glass is laying flat against the gasket 3/ Confirm that unit has not been damaged and body is not out of square.
Unit won't hold vacuum	
	1/ check door gasket for damage, wear or improper installation. 2/ assure all vent and feed valves are closed tightly 3/ assure tight connections to pump
OTHER	
Unit or wall fuse/circuit breaker is blown	
	1/ check wall power source 2/ compare current draw and compare to specs on data plate 3/ see what other loads are on the wall circuit
Unit will not turn on	
	1/ check wall power source 2/ check fuse/circuit breaker on unit or in wall 3/ see if unit is on, e.g., heater, and just controller is off
Unit is smoking – Out of box	
	This is not uncommon during initial operation. Put unit under vent and run at full power for one hour.
Contamination in chamber	
	1/ see cleaning procedure in operator's manual 2/ develop and follow standard operating procedure for specific application; include definition of cleaning technique and maintenance schedule

SERVICE: *If this product should require service, contact your service representative. Should return of the product be necessary, a return authorization number must be obtained and the product shipped prepaid, to the proper service center. To insure prompt handling, the return authorization number should be placed on the outside of the package or container. Make sure a detailed explanation of the reason for return is enclosed with the unit. For information on where to contact customer service, please see the manual cover.*

PARTS LIST

DESCRIPTION	PART NUMBER
Control Knob	4450528
Door Glass 1407 & 1407-2	3550542
Door Glass 1408 & 1408-2	3550540
Heating Element	9570939
I/O (ON/OFF) Switch	7850570
Pilot Light	4650554
Power Cord 120v	1800516
Power Cord 230v	1800541
Temperature Controller	1750863
Vent Valve	9990736
Vacuum Valve	9990737
Vacuum Gauge	9990618
Shelf 1407 & 1407-2	5680506
Shelf 1408 & 1408-2	5680518
Temp Limit Thermostat	1750748
Fuse 1407, 1407-2 & 1408-2 6.3A 250v	3300515
Fuse 1408 10A 230v	3300516

DOOR GASKETS AVAILABLE:

Material	1407 & 1407-2	1408 & 1408-2
Silicone, Red	3450508	3450707
Fluorosilicone	3450610	3450611
Viton	3450669	3450670
Buna-N	3450712	3450708

UNIT SPECIFICATIONS

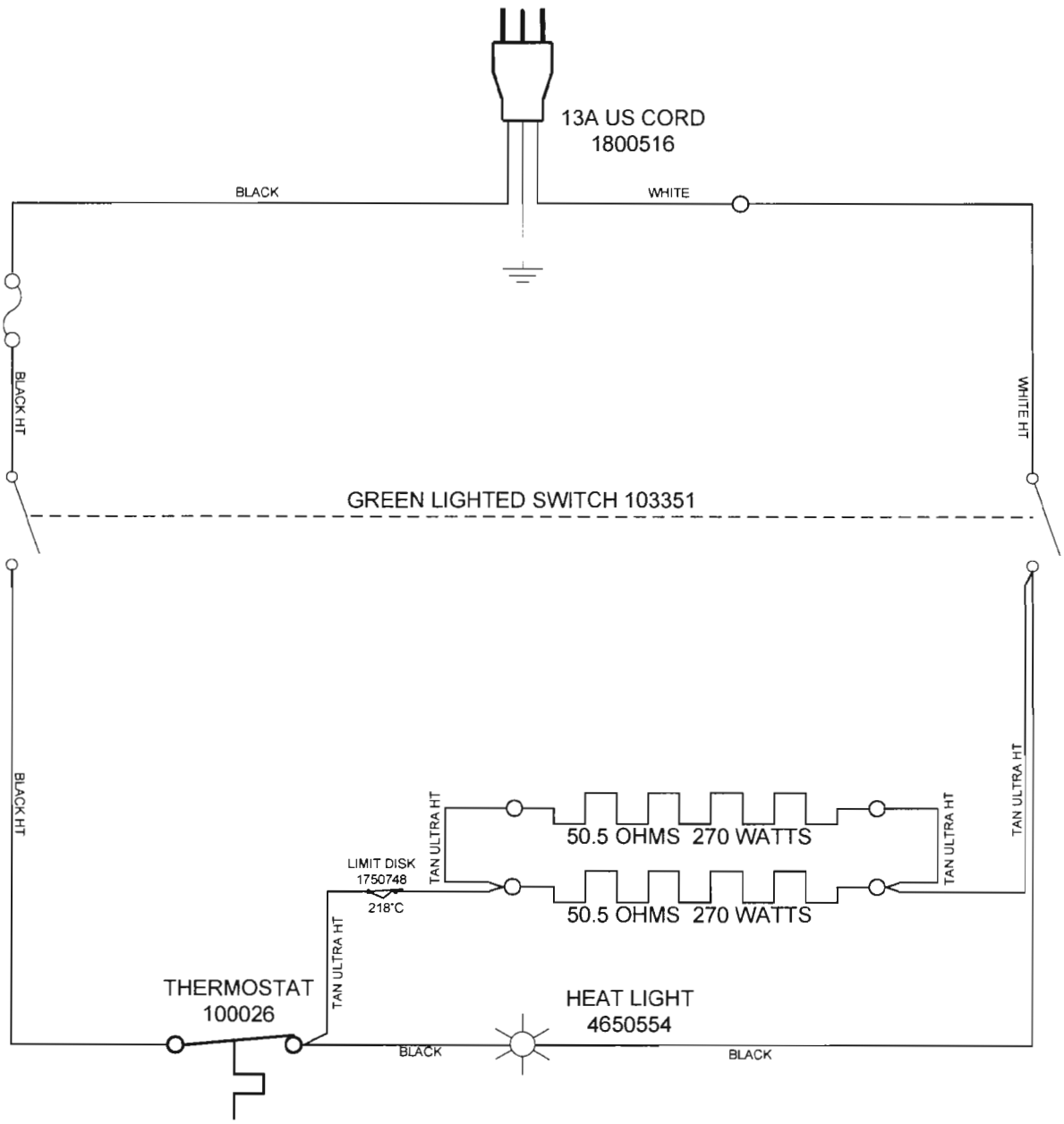
Weight	Shipping	Net
1407 & 1407-2	71 lbs.	59.4 lbs.
1408 & 1408-2	TBD	TBD

Dimensions	Exterior WxDxH	Interior WxDxH
1407 & 1407-2	14.25 x 19.5 x 22.25	9" x 12" x 9"
1408 1408-2	TBD	TBD

Capacity	Cubic Feet
1407 & 1407-2	0.6
1408 1408-2	1.6

Temperature	Range	Uniformity	Rise Time
1407 & 1407-2	40 to 210°C	±3.5°C @ 100°C ±5.0°C @ 200°C	30 min. to 100°C
1408 1408-2	40 to 210°C	±3.5°C @ 100°C ±5.0°C @ 200°C	30 min. to 100°C

WIRE DIAGRAM
1407 115V



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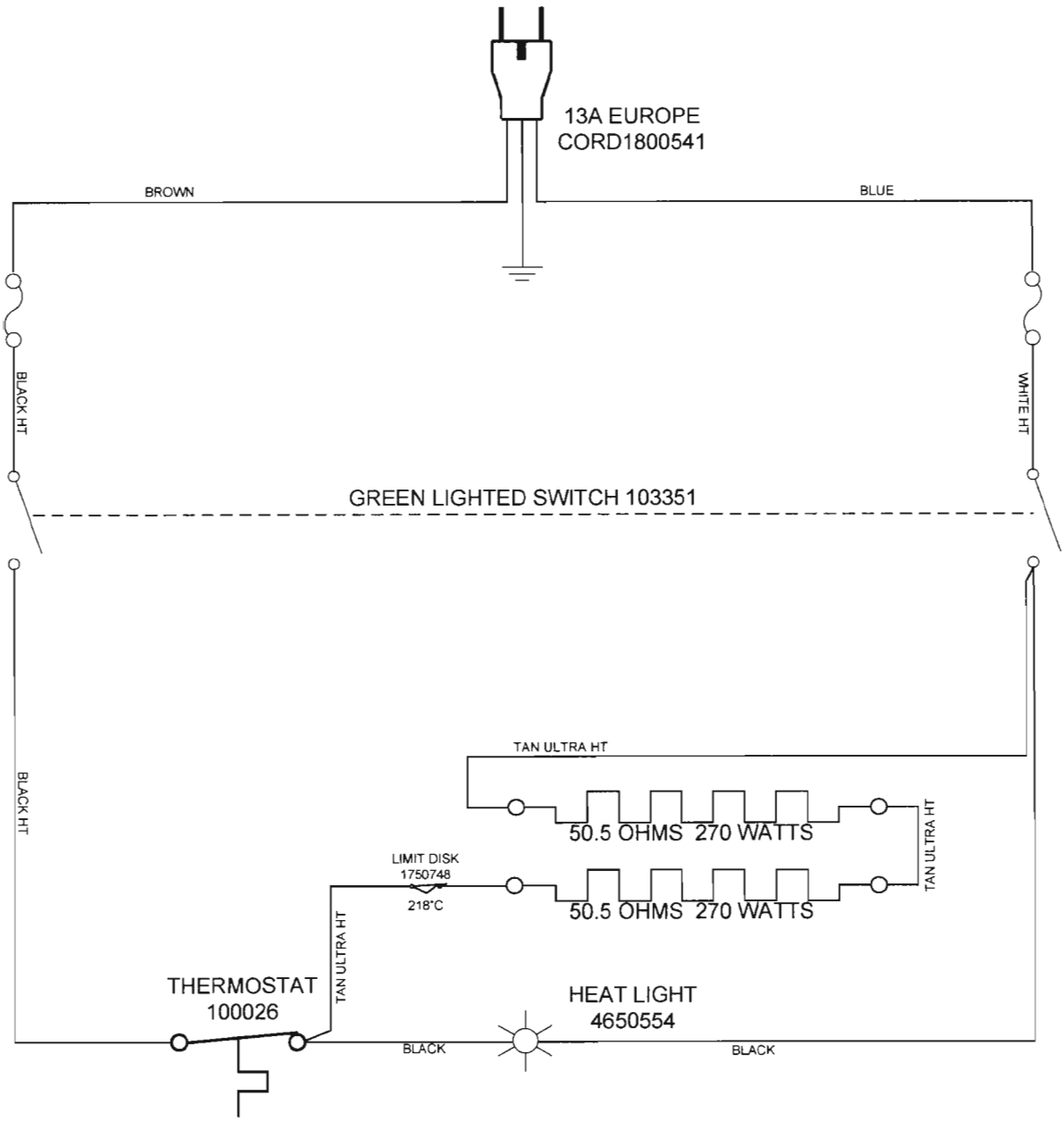
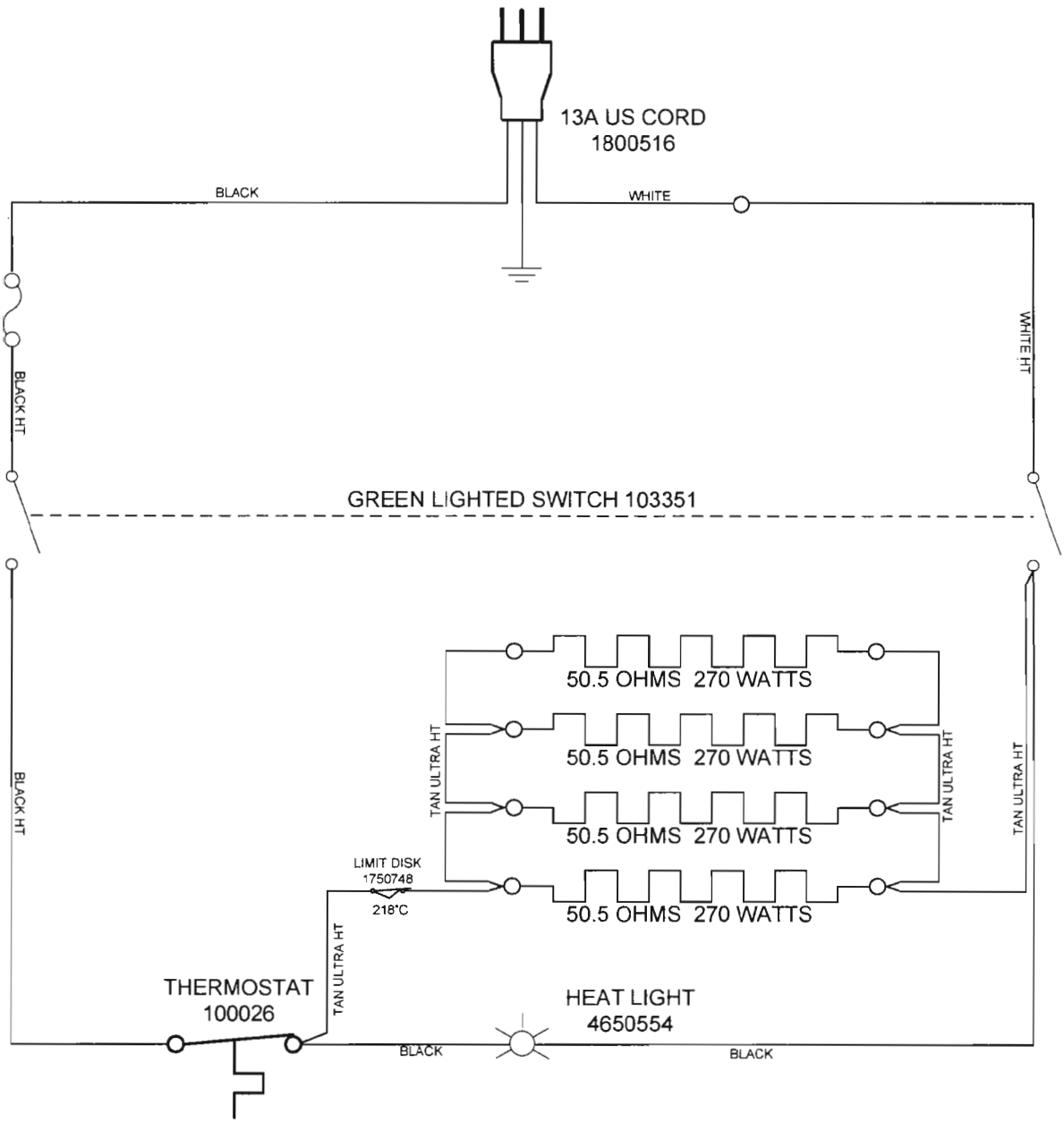
WIRE DIAGRAM
1407-2 230V



WIRE DIAGRAM
1408 115V



WIRE DIAGRAM
1408-2 230V