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VWR INTERNATIONAL™



INCUBATORS

MODELS: 1525, 1535, 1545, 1555, 1565

GENERAL PURPOSE INCUBATORS

INSTALLATION AND OPERATION MANUAL

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These units are UL listed general purpose air incubators for professional, industrial or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated. These units are not intended for hazardous or household locations or use.

Sheldon Manufacturing Inc.
P.O. Box 627
Cornelius, Oregon 97113

EMAIL**:** **tech@Shellab.com**

INTERNET**:** **http://www.Shellab.com**

PHONE: 1-800-322-4897 (503) 640-3000

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REVISION HISTORY

Manual	Revision	Updates
4861417	07-99	Initial release

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Section 1

INTRODUCTION

Thank you for choosing a general purpose incubator. These units are not intended for use at hazardous or household locations.

Before you use the unit, read this entire manual carefully to understand how to install, operate, and maintain the unit in a safe manner. Your satisfaction with the unit will be maximized as you read about its safety and operational features.

Keep this manual for use by all operators of the unit. Ensure that all operators of the unit are given appropriate training before you put the unit in service.

Note: Use the unit only in the way described in this manual. Failure to follow the guidelines and instructions in this manual may be dangerous and illegal.

General Safety Considerations

Your incubator and its recommended accessories have been designed and tested to meet strict safety requirements.

For continued safe operation of your incubator, always follow basic safety precautions including:

- Read this entire manual before using the incubator.
- Be sure you follow any city, county, or other ordinances in your area regarding the use of this unit.
- Use only approved accessories. Do not modify system components. Any alterations or modifications to your incubator may be dangerous and will void your warranty.
- Always plug the unit's power cord into a grounded electrical outlet that conforms to national and local electrical codes. If the unit is not grounded, parts such as knobs and controls may conduct electricity and cause serious injury.
- Do not connect the unit to a power source of any other voltage or frequency beyond the range stated on the data plate at the rear of the unit.
- Do not modify the power cord provided with the unit. If the plug does not fit an outlet, have a proper outlet installed by a qualified electrician.
- Avoid damaging the power cord. Do not bend it excessively, step on it, place heavy objects on it. A damaged cord can easily become a shock or fire hazard. Never use a power cord after it has become damaged.

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Section 2

RECEIVING YOUR UNIT

Before leaving our factory, all units are packaged in high quality shipping materials designed to provide protection from transportation related damage.

Once a unit leaves our factory, however, safe delivery becomes the responsibility of the carrier who is liable for loss or damage to your unit. Damage sustained during transit is not covered under your unit warranty.

When you receive your unit, inspect it for concealed loss or damage to its interior and exterior. Should you find any damage to the unit, follow the carrier's procedure for claiming damage or loss.

Inspection Guidelines

Carefully inspect the shipping carton for damage. If the carton is damaged, report the damage to the carrier service that delivered the unit. If the carton is not damaged, open the carton and remove its contents.

Verify that all of the following equipment, according to the type of unit, is included in the crate.

Table 1. Equipment

Unit	Shelf	Shelf Clip	Leveling Foot
1525 & 1535	2	8	4
1545	3	12	4
1555 & 1556	6	24	4

Carefully check all packaging before discarding. Save the shipping carton until you are sure everything is in order.

Returning Shipment

If you must return the unit for any reason, first contact your service representative for authorization. You will be asked to provide the data plate information. See Recording Data Plate Information below.

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Recording Data Plate Information

Once you have determined the unit is free from damage, locate the data plate at the back of the unit. The data plate indicates your unit's model number and serial number. Record this information below for future reference.

Table 2. Data Plate Information

Model Number	
Serial Number	
Part Number	
Voltage	

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Section 3

GRAPHIC SYMBOLS

Your incubator is provided with a display of graphic symbols on the control panel and adjacent to the power inlet. They are designed to help identify the use and function of the adjustable components.

Table 3. Symbols

Symbol	Identification
	Indicates that you should consult your operator's manual for further instructions.
	Indicates "Temperature"
	Indicates "Overtemperature Protection"
	Indicates "AC Power"
I	Indicates the power is "ON"
O	Indicates the power is "OFF"
	Indicates "Protective Earthground"
	Indicates "Up" and "Down" respectively
	Indicates "Manually Adjustable"
	Indicates "Potential Shock Hazard" behind partition

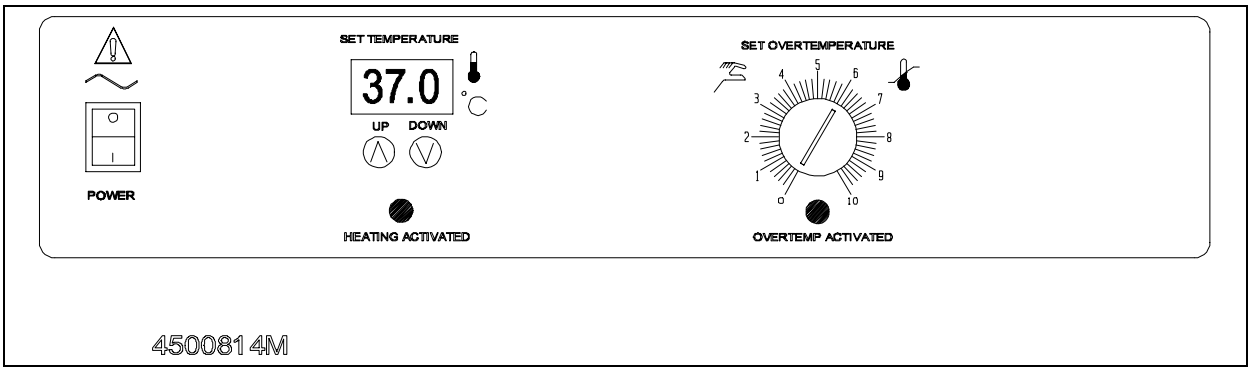
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Section 4

CONTROL PANEL OVERVIEW

Figure 1 provides an illustration of the control panel.

Figure 1. Control Panel



Power Switch

The main power I/O (On/Off) switch controls all power to the unit. It must be in the I position before any systems are operational.

Main Temperature Control

This control is marked SET TEMPERATURE and consists of the digital display and Up/Down arrow pads for inputting set point temperature and calibration.

Overtemperature Thermostat

This control is marked SET OVERTEMPERATURE. It is equipped with a graduated dial marked from 0 to 10 and a knob that requires a flat-edged tool for adjusting settings to eliminate accidental changes. Completely independent of the Main Temperature Controller, the Overtemperature Thermostat guards against any Main Temperature Controller failure, which would allow the temperature to rise past the set point. If the temperature rises to the Overtemperature set point, this thermostat takes control of the heating element and allows continued use of the incubator until the problem can be resolved, or service can be arranged.

We do not recommend operating the unit for an extended period of time using only the Overtemperature because the temperature uniformity will be affected.

HEATING Light

This green pilot light is marked HEATING ACTIVATED. The light is ON when the unit is heating up to the set point and blinks when controlling temperature at set point.

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OVERTEMP Light

This red pilot light is marked OVERTEMP ACTIVATED. The light is ON when the Overtemperature Thermostat has been activated. Under normal operating conditions this light should never come on.

Fuse

Located within the power inlet, the fuse offers protection against power source variations. If the fuse is blown, the unit will shut down. The cause should be determined and corrected before replacing the fuse.

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Section 5

INSTALLATION

This equipment must be used only for its intended application; any alterations or modifications will void your warranty. Local city, county, or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. The end user may perform installation.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° and 27°C, at no greater than 80% Relative Humidity (at 25°C) and with a supply voltage that does not vary by more than 10%. Customer service should be contacted for operating conditions outside these limits.

Location

In selecting a location, consider all conditions that might affect performance, for example:

- Heating/cooling ducts
- Ovens
- Stoves
- Autoclaves
- Direct sun
- Fast moving air currents
- High-traffic areas

Allow a minimum of 5 cm between the unit and walls or partitions that might obstruct free airflow.

Lifting and Handling

These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Follow the below guidelines when lifting and handling the unit.

- Units should be lifted only from their bottom surfaces.
- Doors, handles, and knobs are not adequate for lifting or stabilization.
- The unit should be completely restrained from tipping while lifting or transporting.
- All moving parts, such as shelves and trays, should be removed and doors must be positively locked in the closed position during transfer to prevent shifting and damage.

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Leveling

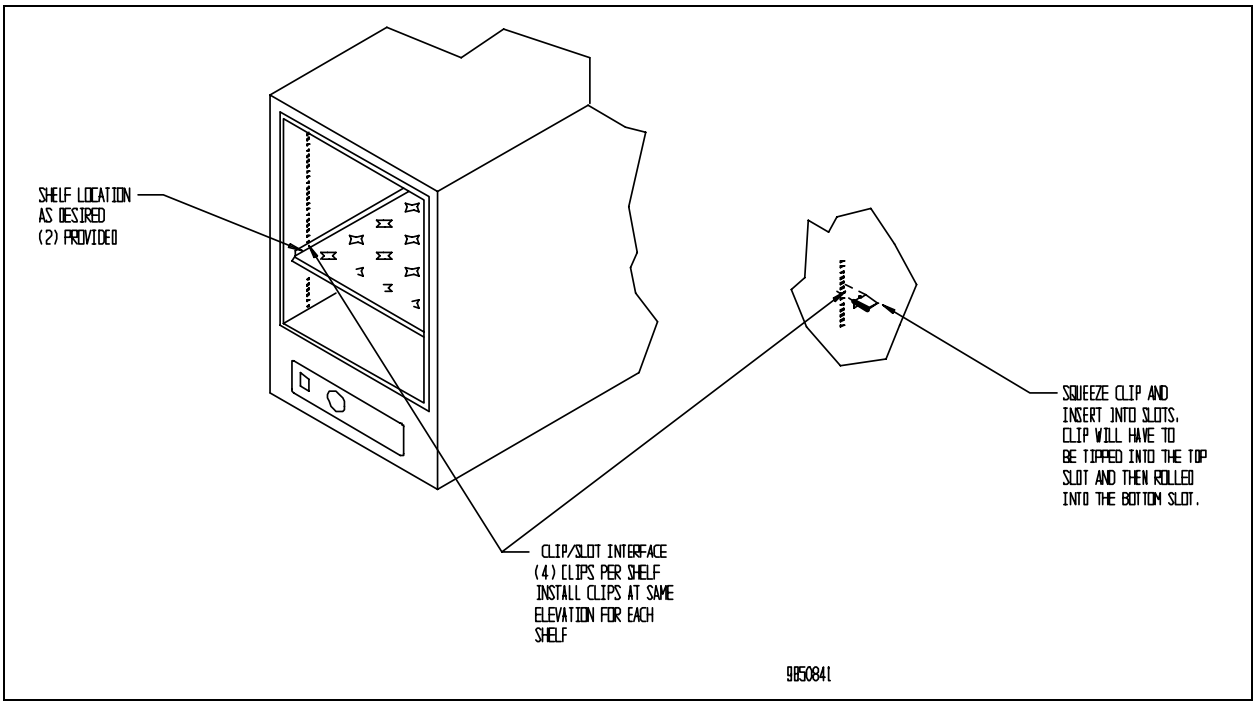
The unit must sit levelly and solidly. Leveling feet are supplied and must be installed in the four holes in the bottom corners of the unit. Turn the leveling feet counterclockwise to raise level. Adjust the foot at each corner until the unit stands levelly and solidly without rocking.

Note: If the unit must be moved, turn the leveling feet all the way clockwise to prevent damage while moving.

Shelves

Place shelves in the chamber as desired. See Figure 2.

Figure 2. Shelf Installation



Power Source

Check the data plate for voltage and ampere requirements before making a connection. If the requirements match your power source, plug the power cord into a grounded outlet. VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE DATA PLATE RATING. These units are intended for a 50/60 Hz application. We recommend a separate circuit to prevent loss of product due to overloading or circuit failure.

Note: Electrical supply to the unit must conform to all national and local electrical codes.

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Cleaning

The incubator interior was cleaned at the factory but not sterilized. See the CLEANING section for more information.

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Section 6

OPERATION

Turning On the Unit

To turn on the unit, perform the following steps:

1. Check the power supply against unit data plate; they must match.
2. Plug the service cord into the grounded electrical outlet. Ensure that the fuse is installed in the power inlet of the unit.
3. Push the power switch to the ON position.
4. Turn the Overtemperature Thermostat to its maximum position, clockwise, so that the Main Temperature control can be set and calibrated without interruption from the Overtemperature setting.

Setting the Main Temperature Control

To set the main temperature controller, perform the following steps:

1. To enter set point mode on the controller, press either the UP or DOWN arrow pad one time.
2. The digital display will start to blink, going from bright to dim. While blinking, the digital display is showing the set point.
3. To change the set point, use the UP and DOWN arrow pads. If the arrow pads are not pressed in five (5) seconds, the display will stop blinking and will read the temperature of the unit.
4. Allow the incubator at least 24 hours to stabilize.

Calibrating the Main Temperature Control

We recommend that you calibrate your unit once it has been installed in its working environment and has been stable at the set point for 24 hours. To calibrate your unit, perform the following steps:

1. Place a certified reference thermometer in the chamber by placing it either directly inside or through the access tube at the top left of the unit. Ensure that the thermometer is not touching any shelving. If you place the thermometer directly inside the chamber, taping the thermometer to a Petri dish will raise it off the shelf and keep the scale in view.
2. Allow the temperature to stabilize again until the thermometer reads a constant value for one hour.
3. Compare the digital display with the reference thermometer.
4. If there is an unacceptable difference, put the display into calibration mode by pressing both the Up and Down arrow pads at the same time for approximately five (5) seconds until the display blinks off and on.
5. While blinking, the display can be calibrated by pressing the Up or Down arrow pads until the display reads the correct value.

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6. Allow the incubator temperature to stabilize again, and recalibrate if necessary.

Setting the Overtemperature Thermostat

To set the Overtemperature Thermostat, perform the following:

1. The Overtemperature Thermostat should be initially set to its maximum position to allow the Main Temperature Controller to stabilize.
2. Once the incubator is stable at the desired set point, turn the Overtemperature Thermostat counterclockwise until the OVERTEMP ACTIVATED light turns on.
3. Next, turn the Overtemperature Thermostat clockwise just until the light turns off.
4. Then turn the Thermostat clockwise again, two minor increments on the dial past the point where the light went out. This will set the Overtemperature Thermostat at approximately 1°C above Main Temperature set point.

Interior Accessory Outlet

An outlet inside the chamber may be used with the equipment, not exceeding 1 amp.

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Section 7

MAINTENANCE

Warning: Prior to any maintenance or service on this unit, disconnect the power cord from the power supply. Before reattaching the unit to its power supply, be sure all volatile and flammable cleaners are evaporated and dry.

Cleaning

Note: The unit chamber should be cleaned and disinfected prior to use.

Periodic cleaning is required. To clean the incubator, perform the following steps:

1. Remove all of the interior parts, if assembled.
2. Clean the incubator with a mild soap and water solution, including all corners. DO NOT USE spray cleaners that might leak through openings and cracks and get on electrical components, or that may contain solvents that will harm coatings. DO NOT USE chlorine-based bleaches or abrasives, as they will damage the stainless steel interior.
3. Rinse with distilled water and wipe dry with a soft cloth.
4. Special care should be taken when cleaning around the sensing heads to prevent damage.

Disinfecting

Disinfect the incubator on a regular basis. To disinfect the incubator, perform the following steps.

1. Remove all of the interior parts, if assembled.
2. Disinfect the incubator, including all corners and the access port, using a suitable disinfectant. Shelves and shelf clips are autoclaveable. DO NOT USE spray disinfectants that might leak through openings and cracks and get on electrical components, or that may contain solvents that will harm the coatings. Special care should be taken when cleaning around sensing heads to prevent damage and around the door gasket so as not to impair the positive seal.

Warning: Never clean the unit with alcohol or flammable cleaners and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

Periodically inspect the door latch, trim, catch and gasket for signs of deterioration. Failure to maintain the integrity of the door system will shorten the life span of the incubator.

No maintenance is required on electrical components. If the incubator fails to operate as specified, please review the TROUBLESHOOTING section prior to calling for service.

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Section 8

TROUBLESHOOTING

Should the unit malfunction, use this section to determine the problem and resolution. Troubleshooting topics include:

- Temperature
- Mechanical
- Other

Warning: Troubleshooting procedures involve working with high voltages that can cause injury or death. Troubleshooting should be performed only by trained personnel.

Table 4. Temperature Troubleshooting

Problem	Possible Cause	Solution
Temperature too high; display and reference thermometer do not match	Controller set too high	See Setting the Main Temperature Control.
	Controller failed on	Call customer service.
	Wiring error	Call customer service.
Display reads “HI” or “400”+	Probe is unplugged	Trace wire from display to probe; move wire and watch display to see intermittent problems.
	Probe is broken	Replace probe.
	Wire to sensor is broken	Replace probe.
Chamber temperature spikes over set point and then settles to set point	N/A	Recalibrate. See Calibrating the Main Temperature Control.
Temperature too low; display and reference thermometer do not match	Overtemperature set too low	Turn thermostat fully clockwise
	Controller set too low	See Setting the Main Temperature Control.
	Unit not recovered from door opening	Wait for display to stop changing
	Unit not recovered from power failure or being turned off	Incubators will need 24 hours to warm up and stabilize.
	Element failure	See if HEATING light is on; compare current draw to data plate.
	Controller failure	Confirm with front panel lights that controller is calling for heat.
	Thermostat failure	Confirm with front panel lights that Overtemperature is operating correctly.
	Wiring problem	Check all functions and compare wiring to the owner’s manual, especially around any areas

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Problem	Possible Cause	Solution
		recently worked on.
	Loose connection	Call customer service.
Display reads "LO"	Ambient temperature is lower than range of unit	Compare set points and ambient temperature to rated specifications in UNIT SPECIFICATIONS.
	Sensor is plugged in backwards	Call customer service.
Unit will not heat over a temperature that is below set point	N/A	Confirm that fan is moving and that amperage and voltage match data plate. Check fan motor motion by removing back body panel of the unit.
	N/A	Confirm that set point is set high enough. Turn Overtemperature all the way clockwise and see if HEATING light or OVERTEMP light comes on.
	N/A	Check connections to sensor.
	N/A	Check calibration. Using an independent thermometer, follow instructions in Calibrating the Main Temperature Control.
Unit will not heat up at all	N/A	Verify that controller is asking for heat by looking for HEATING light. If pilot light is not on continuously during initial start up, there is a problem with the controller.
	N/A	Check amperage. Amperage should be virtually at maximum rated (data plate) amperage.
	N/A	Do all controller functions work?
	N/A	Is the Overtemperature Thermostat set high enough? For diagnostics, should be fully clockwise with the Overtemperature light never on.
	N/A	Has the fuse or circuit breaker blown?
Indicated chamber temperature unstable	N/A	±0.1 may be normal.
	N/A	Is the fan working? Remove back panel and verify movement of cooling fan.
	N/A	Is ambient temperature radically changing? The door opening, room airflow from heaters, or air conditioning may be destabilizing temperature. Stabilize ambient conditions.
	Sensor miss-located or damaged, or wires may be damaged.	Check mounts for control and Thermostat sensors, then trace wires or tubing between sensors and controls.
	Calibration sensitivity	Call customer service.
	Overtemperature set too low	Ensure that the incubator setting is more than 5 degrees over desired set point. Check if pilot light is on continuously. Turn the controller knob completely clockwise to see if the problem is solved, then follow instructions in Setting the Main Temperature Control for correct setting.
	Electrical noise	Remove nearby sources of RFI including motors,

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Problem	Possible Cause	Solution
		arcing relays or radio transmitters.
	Bad connection on temperature sensor or faulty sensor	Check connectors for continuity and mechanical soundness while watching display for erratic behavior. Check sensor and wiring for mechanical damage.
	Bad connections	Check connectors for mechanical soundness and look for corrosion around terminals or signs of arcing or other visible deterioration.
Will not maintain set point	N/A	Assure that set point is at least 5 degrees over ambient.
	N/A	See if ambient is fluctuating. Check for adjacent open doors or HVAC duct openings, stabilize ambient conditions.
Display and reference thermometer do not match	Calibration error	See Calibrating the Main Temperature Control.
	Temperature sensor failure	Evaluate if pilot light is operating correctly.
	Controller failure	Evaluate if pilot light is operating correctly.
	N/A	Allow at least 24 hours to stabilize at set point temperature.
	N/A	Verify that reference thermometer is certified.
Can not adjust set points or calibration	N/A	Turn entire unit off and on to reset.
	N/A	If repeatedly happens, call customer service.
Calibrated at one temperature but not at another	N/A	This can be a normal condition when operating temperat ure varies widely. For maximum accuracy, calibration should be done at or as close to the set point temperature as possible.

Note: N/A is not available.

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Table 5. Mechanical Troubleshooting

Problem	Possible Cause	Solution
Glass door not sealing	N/A	Stretch and tuck gasket.
	N/A	Align clamps till they hold gasket tight.
	N/A	Check physical condition of gasket.
	N/A	Tighten door latch until it pulls glass in.
	N/A	Assure that gasket clamps are in original location.
Motor does not move	N/A	If shaft spins freely, check connections to motor and check voltage to motor.
	N/A	If shaft rubs or is frozen, relieve binding and retest.
Motor makes noise	N/A	If noise is from the motor, tap the top of motor shaft with ball peen hammer. Remove back panel to access fan motor. If the sound gets worse, tap the other end of the shaft – avoiding touching the fan blade. If there is no change, call customer service.
	N/A	If noise is from shaft or fan blade, realign the shaft.
Outer door not sealing	N/A	Adjust hinge blocks or twist the door.
	N/A	Confirm that unit has not been damaged and body is square.

Note: N/A is not available.

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Table 6. Miscellaneous Troubleshooting

Problem	Possible Cause	Solution
Controller on at all times and is "locked-up"	N/A	Turn unit off and on to reset.
	N/A	If you cannot change any condition on the front panel, call customer service.
Front panel displays are all off	Unit or wall fuse/circuit breaker is blown.	Check for wire damage.
	N/A	Check wall power source.
	N/A	Compare current draw and compare to specifications on data plate.
	N/A	See what other loads are on the wall circuit.
Unit will not turn on	N/A	Check wall power source.
	N/A	Check fuse/circuit breaker on unit or in wall.
	N/A	Check all wiring connections, especially around the on/off switch.
	N/A	See if unit is on (fan or heater), and just controller is off.
Unit is smoking out of the box	N/A	This is not an uncommon occurrence when first operating new units as oil residues burn off. Put unit under vent and run at full power for one hour. Smoking is normal during the first cycle to temperature.
Contamination in chamber	N/A	See Cleaning.
	N/A	Develop and follow standard operating procedure for specific application; include cleaning procedures in maintenance schedule.

Note: N/A is not available.

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Section 9

PARTS LIST

Table 7. Parts

Description	120 V	230 V
Blower Motor	210002	210001
Door Element	100019	100019
Element: 1535	890081	X1000510
Element: 1525	2350500	2350500
Element: 1555	200114	2350501
Element 1545 & 1565	2350513	2350514
EMI Filter 10 Amp, CE units only	NA	2800502
Fuse, 6.3 Amp 250 V	3300515	3300515
High Limit Thermostat	10000J	10000J
Leveling Foot	200129	200129
Main Temperature Control with Probe	1750549	1750550
Moisture Proof Plug	1650530	N/A
On/Off Switch	103351	103351
Pilot Light, Green	200021	200021
Pilot Light, Red	200020	200020
Power Cord, European – detachable	NA	1800500
Power Cord, USA	1800510	104192
Shelf, 1525	5080758	5080758
Shelf, 1535	5130518	5130518
Shelf, 1555	5130524	5130524
Shelf, 1545 & 1565	5130523	5130523

Note: N/A is not available.

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Section 10

UNIT SPECIFICATIONS

These units are 120 volt or 230 volt. Please refer to the unit data plate for individual electrical specifications.

Table 8. Weight

Model	Shipping	Net
1525	120 lbs.	83 lbs.
1535	204 lbs.	162 lbs.
1555	300 lbs.	195 lbs.
1545	275 lbs.	158 lbs.
1565	550 lbs.	316 lbs.

Table 9. Dimensions

Model	Exterior WxDxH	Interior WxDxH
1525	21 x 21 x 25 in.	15 x 15 x 15 in.
1535	30 x 30 x 32 in.	24 x 24 x 20 in.
1555	42.25 x 20 x 37 in.	36 x 20 x 26 in.
1545	25 x 27 x 37 in.	19.25 x 20 x 26 in.
1565	25 x 27 x 72 in.	19.25 x 20 x 26 in.*

Note: *Each chamber.

Table 10. Capacity

Model	Cubic Feet
1525	2.0
1535	6.7
1555	11.3
1545	5.8
1565	5.8 (each chamber)

Note: *Each chamber.

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Table 11. Temperature

Model	Range	Uniformity	Stability
1525	Amb. +5° to 70°C	+.25° @ 37°C	+.1°C
1535	Amb. +5° to 70°C	+.25° @ 37°C	+.1°C
1555	Amb. +5° to 70°C	+.25° @ 37°C	+.1°C
1545	Amb. +5° to 70°C	+.25° @ 37°C	+.1°C
1565	Amb. +5° to 70°C	+.25° @ 37°C	+.1°C

Table 12. Power

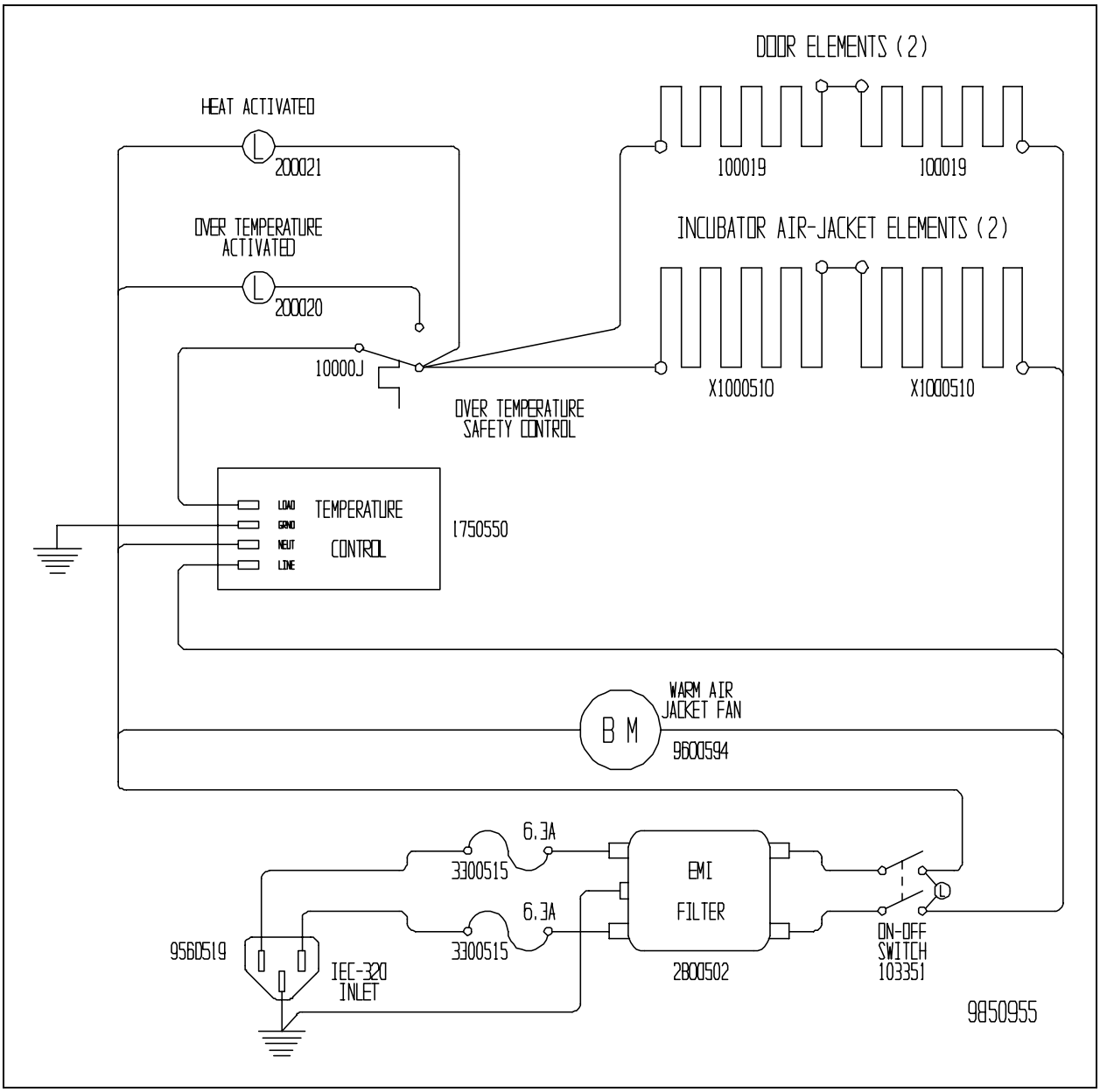
Model	Voltage	Amperage
1525	115 Volts	3.0 Amps
1525-2	220 Volts	1.5 Amps
1535	115 Volts	5.0 Amps
1535-2	220 Volts	2.5 Amps
1555	115 Volts	7.0 Amps
1555-2	220 Volts	4.0 Amps
1545	115 Volts	.5 Amps
1545-2	220 Volts	2.5 Amps
1565	115 Volts	.5 Amps
1565-2	220 Volts	2.5 Amps

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Section 11

SCHEMATICS

Figure 3. Schematics for 1525, 1535, 1555, 1545, 1565



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