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WATERJACKET INCUBATOR

MODEL: 3015, 3025

INSTALLATION AND OPERATIONAL MANUAL

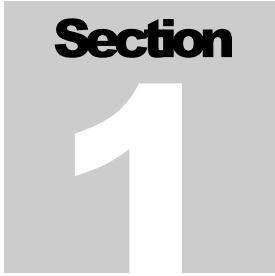
Sheldon Manufacturing Inc. P.O. Box 627 Cornelius, Oregon 97113
EMAIL: tech@Shellab.com INTERNET: <http://www.Shellab.com/~Shellab>
1-800-322-4897 (503) 640-3000 FAX (503) 640-1366

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**REV. 05/09
4861398**

These units are general purpose Water jacketed 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.



RECEIVING AND INSPECTION

Your satisfaction and safety require a complete understanding of this unit. Read the instructions thoroughly and be sure all operators are given adequate training before attempting to put the unit in service. **NOTE:** This equipment must be used only for its intended application; any alterations or modifications will void your warranty.

- 1.1 Inspection:** The carrier, when accepting shipment, also accepts responsibility for safe delivery and is liable for loss or damage. On delivery, inspect for visible exterior damage, note and describe on the freight bill any damage found, and enter your claim on the form supplied by the carrier.
- 1.2** Inspect for concealed loss or damage on the unit itself, both interior and exterior. If necessary, the carrier will arrange for official inspection to substantiate your claim.
- 1.3 Return Shipment:** Save the shipping crate until you are sure all is well. If for any reason you must return the unit, first contact your customer representative for authorization. Supply nameplate data, including model number and serial number. Please see the manual cover for information on where to contact customer service.
- 1.4 Accessories:** Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all packaging before discarding. The 3015 is equipped with 3 shelves, 4 Shelf Standards, humidity pan, and 4 adjustable feet. The 3025 is equipped with 6 shelves, 8 Shelf Standards, 2 humidity pans and 4 adjustable feet.

INSTALLATION

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. Installation may be performed by the end user.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° and 40°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 of these limits.

- 2.1 Power Source:** The electrical supply circuit to the incubator must conform to all national and local electrical codes. Consult the incubator's serial data plate for the voltage and ampere requirements before making connection. **VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE SERIAL PLATE RATING.** This unit is intended for 50/60 Hz application. A separate circuit is recommended to prevent possible loss of product due to overloading or failure of other equipment on the same circuit.
- 2.2 Location:** In selecting a location, consider all conditions which might affect performance, such as heat from radiators, ovens, autoclaves, etc. Avoid direct sun, fast moving air currents, heating/cooling ducts and high-traffic areas. Allow a minimum of 10cm between the unit and walls or partitions which might obstruct free air flow.
- 2.3 Lifting / Handling:** These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Doors, handles and knobs are not adequate for lifting or stabilization. The unit should be completely restrained from tipping during lifting or transport. All moving parts, such as shelves and trays should be removed and doors need to be positively locked in the closed position during transfer to prevent shifting and damage.

CAUTION: Position and level the incubator before filling with water.

- 2.4 Leveling:** The unit must sit level and solidly. Leveling feet are supplied and must be installed in the four holes in the bottom corners of the unit. With the feet installed and the unit standing upright, each foot can be raised by turning it in a counterclockwise direction. Adjust the foot at each corner until the unit stands

level and solid without rocking. If the unit must be moved, turn the leveling feet all the way clockwise to prevent damage while moving.

2.5 Cleaning: The unit chamber should be cleaned and disinfected prior to use. Your operating conditions and appropriate protocol will determine the correct procedure for decontamination. A typical decontamination procedure that is adequate for many situations has been described below. As well, certain steps are listed that will help reduce the likelihood of contamination and the necessity of decontamination. Whatever process is appropriate, it needs to be done on a regularly scheduled basis. Depending on usage and protocol, this may be monthly, quarterly or otherwise. Regardless of the decontamination procedure used, certain precautions will need to be taken:

- A.** Always disconnect the unit from the electrical service when cleaning. Assure all volatile or flammable cleaners are evaporated and dry before reconnecting the unit to the power supply.
- B.** Special care should be taken when cleaning around sensing heads to prevent damage.
- C.** If you use chlorine-based bleaches or abrasive cleaners this will modify the stainless steel interior finish. **DO NOT USE** hard tools such as metal wire brushes or steel wool. Use non-abrasive cleaners and soft tools such as plastic brushes.
- D.** Use only **DISTILLED** water in the water jacket and the humidity pan. **DO NOT USE** de-ionized water due to its reactivity with metal components.

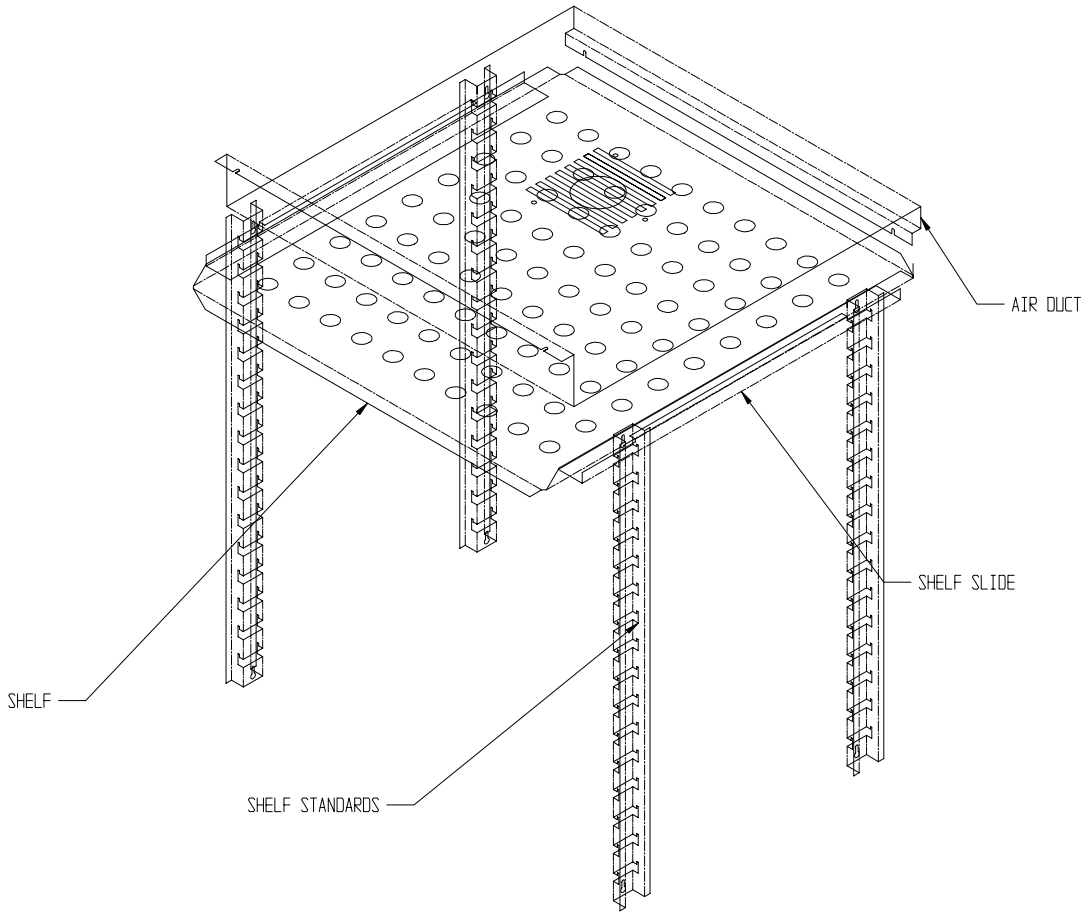
TYPICAL DECONTAMINATION PROCEDURE

- 1.** Remove the humidity pan every week and autoclave, or wash with soap and water then disinfect with 70% alcohol solution. Replace in the incubator with fresh, **DISTILLED** water.
- 2.** Remove the inner door gasket, clean and disinfect. Clean and disinfect all mounting grooves for the door gasket.
- 3.** Remove all shelves, shelf supports, shelf standards and shields. Autoclave, or wash and disinfect as described in item 1.
- 4.** Wash and disinfect all interior surfaces.

OPERATION FOR MINIMIZING CONTAMINATION










1. Keep the outside of the incubator, including the air in the laboratory, as clean as possible. This is particularly important for units placed directly on the floor. Do not place incubators near doors, air vents or other areas of high air movement or traffic.
 2. The floor around the unit needs to be clean. Units that are placed on the floor should be mounted higher – typically on a caster platform – for ease of moving the unit during cleaning and access to the back of the unit.
 3. Minimize the number of times access is made to the chamber during normal operation.
 4. Do not depend on the use of antibiotics to maintain uncontaminated conditions, as this is an inadequate technique for sterilization. Preferably use aseptic techniques as described above for maintaining sterile conditions in the incubator.
- 2.6 Filling and Draining:** Fill the water jacket with DISTILLED WATER ONLY. Refer to the Operation Section 5 of this manual for additional information.
- 2.7 Shelves and Interior Parts:** Shelving, clips and a humidity pan are supplied with each unit. See **Figure 1** for proper placement of these accessories. Also see similar shelf assembly instructions sent with the assembly kit.

Figure One



GRAPHIC SYMBOLS

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

-  Indicates that you should consult your manual for further description and discussion of a control or user item.
-  Indicates “**Temperature**”
-  Indicates “**Overtemperature**”
-  Indicates “**Degrees Centigrade**”
-  Indicates “**AC Power**”
-  Indicates “**Manual Adjustment**”
-  Indicates “**Potential Shock Hazard**” behind partition
-  Indicates “**Earth Ground**”
-  Indicates “**Unit should be recycled**” (Not disposed of in land-fill)

CONTROL PANEL OVERVIEW



- 4.1 Power Switch:** The main power I/O (on/off) switch controls all power to the unit and must be in the I/ON position before any systems are operational.
- 4.2 Main Temperature Control:** This control consists of the digital display and Up/Down arrow pads for inputting set point temperatures and calibration.
- 4.3 Overtemperature Thermostat:** This controller is equipped with an adjustment knob and a graduated dial marked 1 to 10. Completely independent of the Main Temperature Controller, the Overtemperature Thermostat guards against any failure of the Main Temperature Controller which would allow temperature to rise past set point. If temperature rises to the Overtemperature set point, the 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.
- 4.4 HEATING Light:** This light is on when the unit is heating up to set point and is blinking when controlling temperature at set point.
- 4.5 OVERTEMP Light:** This light comes on when the High Limit Thermostat is activated. Under normal operating conditions this light should never come on.
- 4.6 Circuit Breaker:** Located adjacent to the power cord, the breaker, when tripped, is manually resettable by pushing in the extended button and offers protection against power source variations.
- 4.7 Water Low Light:** When lit, this indicator shows that the water level in the jacket is low, and DISTILLED WATER should be added until the indicator turns off.

OPERATION

- 5.1 Check power supply against unit serial plate. They must match.
- 5.2 Plug service cord into the grounded electrical outlet. The water jacket must be filled. See Section 2.6 for instruction. Push the power switch to the ON position and turn the Overtemperature Thermostat to its maximum position, clockwise using a coin or flat edged tool.

WATER RECOMMENDATIONS FOR USE IN WATER JACKET INCUBATORS

The addition of a dis-similar metal anode in Water Jacket incubators will allow the use of good-quality tap water to fill the Jacket. The anode is located in a threaded port near the fill port on the rear of the unit. (diagram). The anode will dissolve as it is in contact with mineral salts or dissolved gasses in the tap water. The anode should be removed and checked for erosion every year. When the anode appears to be over 50% eroded, a new one should be purchased from Sheldon Mfg., Inc. (Replacement Part #0260500)

Tap water with a hardness of more than 30 parts per million (PPM) or 1.5 grains per gallon (GPG) will require assessment of the anode on a yearly basis. Dissolved gasses should be no more than 120 PPM or 7 GPG. The Ph of the water should test to between 6.0 and 8.5.

When in doubt, it is advisable to use DISTILLED WATER ONLY.

- 5.3 **Humidification:** Humidification of the unit is achieved by evaporation of water from the humidity pan placed in the bottom of the incubator. By filling this stainless steel reservoir pan with DISTILLED WATER and allowing this water supply to heat and evaporate, near saturation humidity is obtained. Do not use plastic, glass or other metals. Only 300 series stainless metals are acceptable for this reservoir pan. Do not use corrosive chemicals, including copper sulphate or chlorine, in the pan or chamber as damage may occur. **Use Distilled Water Only. DO NOT use Deionized Water!**

Use of disinfecting chemicals in the chamber can change the surface tension of the reservoir water thus preventing evaporation and proper humidification of the chamber. Water in the pan should be changed and the pan cleaned at least once a week to help control contamination and maintain proper surface tension.

- 5.4 Temperature Monitoring:** To insure that the incubator is operating at the desired temperature, an accurate temperature indicator such as a certified reference thermometer should be placed in the incubator chamber for calibrating after temperatures have been set. Try to place the thermometer in the center of the chamber and raised off the shelf (taping the thermometer down to a petri dish is a method that raises it off the shelf and prevents it from rolling and hiding the scale from view). For ease of reading the thermometer, it is best if it is electronic with a remote display so it can be read without opening the doors.
- 5.5 Set Main Temperature Controller:** Enter desired set point temperature. To enter set point mode on the controller, press either the Up or Down arrow pad one time. The digital display will start to blink, going from bright to dim. While blinking, the digital display is showing the set point. To change the set point, use the Up and Down arrow pads. If the arrow pads are not pressed for five (5) seconds, the display will stop blinking and will read the temperature of the unit. Note that the Overtemperature Thermostat should be turned to its maximum position until the unit has stabilized at desired set point temperature. Allow the incubator at least 24 hours to stabilize.
- 5.6 Calibration:** It is recommended that calibration is done once the unit is installed in its working environment and has been stable at set point for several hours. As mentioned in Section 5.4 a certified reference thermometer should be in place for calibration. The thermometer should read a constant value for a minimum of one hour prior to calibrating. Compare the digital display with the reference thermometer. 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 until the two outside decimal points begin to flash. While the decimal points are flashing the display can be calibrated by pressing the Up or Down arrow pads until the display reads the correct value. Allow the incubator temperature to stabilize again, and recalibrate if necessary.
- 5.7 Set Overtemperature Thermostat:** As mentioned in step 5.6, the Overtemperature Thermostat should be initially set to its maximum position to allow the temperature to stabilize. Once stable at the desired set point, turn the Thermostat counterclockwise until the OVER TEMP light turns on. Next, turn the Thermostat clockwise just until the light turns off. This will set the Overtemperature Thermostat at approximately 1°C above the Main Temperature Controller set point.

MAINTENANCE

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

- 6.1 Cleaning:** Cleaning and decontamination are recommended on a regular basis. To prepare the incubator for cleaning remove all parts such as the shelf standards and humidity pan. All stainless steel parts are autoclavable. Please review section 2.5 for further instruction.
- 6.2** Check water level in the water jacket and in the chamber humidity pan frequently. Replenish water in the water jacket as needed.
- 6.3 Storage:** If the incubator is to be turned off for any length of time, dry the chamber and humidity pan thoroughly and leave at room temperature. Failure to do this may cause the interior to become contaminated. No adjustment to controls should be required when restarting the unit. If the unit is to be transported, disconnect the power supply, drain the water jacket (See Filling and Draining Section 2.6) turn the leveling feet in all the way to prevent damage and follow instructions in Section 2.3, Lifting and Handling.
- 6.4** There is No maintenance required on electrical components. If the incubator fails to operate as specified review Section 7 Troubleshooting, prior to calling customer service.

TROUBLESHOOTING

CAUTION: Extreme caution must be exercised any time access is made into areas housing electrical components. Repair, replacement or adjustment of components in these areas must only be done by qualified technicians familiar with electrical circuitry and the operation of the chamber. **FOR PERSONAL SAFETY, ALWAYS DISCONNECT THE POWER BEFORE SERVICING.**

TEMPERATURE

Temperature too high-display and reference thermometer don't match

- 1/ Controller set too high-see section 5.5.
- 2/ Controller failed on – call Customer Service.
- 3/ Wiring error – call Customer Service.

Display reads "HI" or "400"+

Probe is unplugged, is broken or wire to sensor is broken – trace wire from display to probe; move wire and watch display to see intermittent problems.

Chamber temperature spikes over set point and then settles to set point

Recalibrate – see section 5.6.

Temperature too low-display and reference thermometer don't match

- 1/ Overtemperature Thermostat set too low – see section 5.7.
- 2/ Controller set too low – see section 5.5.
- 3/ Unit not recovered from door opening – wait for display to stop changing.
- 4/ Unit not recovered from power failure or being turned off – incubators will need 24 hours to warm up and stabilize.
- 5/ Element failure – see if HEATING light is on; compare current draw to data plate.
- 6/ controller failure – confirm with front panel lights that controller is calling for heat
- 7/ Overtemperature failure – confirm with front panel lights that Thermostat is operating correctly.
- 8/ Wiring problem – check all functions and compare wiring

to schematics in section 8.0 - especially around any areas recently worked on.

9/ Loose connection – check shadow box for loose connections.

Display reads "LO"

1/ If ambient temperature is lower than range of unit – compare set points and ambient temperature to rated specifications in section 8.0.
2/ Sensor is plugged in backwards – reverse sensor wires to controller.

Unit will not heat over a temperature that is below set point

1/ Confirm that set point is set high enough –turn Thermostat all the way clockwise and see if HEATING light or OVER TEMP light comes on.
2/ Check connections to sensor.
3/ Check calibration – using independent thermometer, follow instructions in section 5.6

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.
3/ Do all controller functions work?
4/ Is the Overtemperature set high enough? – for diagnostics, should be fully clockwise with the pilot light never on.
5/ Has the fuse/circuit breaker blown?

Indicated chamber temperature unstable

1/ ± 0.1 may be normal.
2/ Is ambient radically changing – either door opening or room airflow from heaters or air conditioning ? – stabilize ambient conditions.
3/ Sensor miss-located, damaged or wires may be damaged - check mounts for control and Thermostat sensors, then trace wires or tubing between sensors and controls.
4/ Calibration sensitivity – call Customer Service.
5/ Overtemperature set too low – be sure that its setting is more than 5 degrees over desired set point; check if pilot light is on continuously; turn controller knob completely clockwise to see if problem solved then follow instructions in section 5.7. for correct setting.
6/ Electrical noise – remove nearby sources of RFI including motors, arcing relays or radio transmitters.
7/ 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.
 8/ Bad connections – check connectors for mechanical soundness and look for corrosion around terminals or signs of arcing or other visible deterioration.
 9/ Water jacket empty or low – check indicator warning light or water level at fill port in back of unit.

Will not maintain set point

1 / Assure that set point is at least 5 degrees over ambient.
 2/ See if ambient is fluctuating – check for adjacent open doors or HVAC duct openings, stabilize ambient conditions.

Display and reference thermometer don't match

1/ Calibration error – see section 5.6.
 2/ Temperature sensor failure – evaluate if pilot light is operating correctly.
 3/ Controller failure – evaluate if pilot light is operating correctly.
 4/ Verify that reference thermometer is certified.

Can't adjust set points or calibration

1/ Turn entire unit off and on to reset.
 2/ If repeatedly happens, call Customer Service.

Calibrated at one temperature, but not at another

This can be a normal condition when operating temperature varies widely. For maximum accuracy, calibration should be done at or as close to the set point temperature as possible.

HUMIDITY LEVEL

Can't achieve desired humidity level

1/ Door opened recently or too frequently.
 2/ Humidity pan empty.
 3/ Access port not plugged.
 4/ Poor glass door seal.
 5/ Water in humidity pan contaminated.

Can't decrease humidity

1/ Hot water added to humidity pan.

Condensation in chamber

1/ Small amount of condensation in chamber may be normal depending on nature of test sample.
 2/ Water jacket too low or empty.
 3/ Power failure or unit was turned off for a while without opening the door.

Condensate appears on chamber walls

1/ If condensate on steel, turn temperature control on door

- counterclockwise a small amount.
- 2/ If on glass door, turn temp control on door clockwise a small amount.
- 3/ Minimize the movement of air around the unit and reduce the number of door openings.

MECHANICAL

Glass door not sealing

- 1/ Stretch and tuck gasket.
- 2/ Align clamps till they hold gasket tight.
- 3/ Check physical condition of gasket.
- 4/ Tighten door latch till it pulls glass in.
- 5/ Assure that gasket clamps are in original location.

Outer door not sealing

- 1/ Adjust hinge blocks or twist the door.
- 2/ Confirm that unit has not been damaged and body is square.

Water leaking

- 1/ If leaking inside: dry chamber, run at temperature with door open. Check all seams with flashlight including front face.
- 2/ If leaking outside: dry out and see if leak repeats and find source of leak. Sources may include: fittings that need tightening, condensation due to missing insulation.

OTHER

Controller on at all times - "locked-up"

- 1/ Turn unit off and on to reset.
- 2/ If cannot change any condition on the front panel, call Customer Service.

Front panel displays are all off

- 1/ Check connections to the temperature display control board and assure that all are tight and in the correct orientation.
- 2/ Check for wire damage.

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.
- 4/ Check all wiring connections, especially around the on/off switch.

Low level light does not operate

correctly

1/ Water needs to be very close to top to activate switch.
Hand fill to top to confirm switch has been moved.

Unit is smoking – Out of box

This is not an uncommon occurrence when first operating new units. Put unit under vent and run at full power for one hour. – smoking is normal during first cycle to temperature.

Contamination in chamber

1/ See cleaning procedure, section 2.5.
2/ Develop and follow standard operating procedure for specific application; include definition of cleaning technique and maintenance schedule.

Contamination in sample

1/ See “Contamination in chamber”
2/ Protect open samples from areas of maximum air current near top center of chamber.

The incubator 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. For information on where to contact Customer Service, please see the manual cover.

PARTS LIST

Description	115V	220V
Anode	0260500	0260500
Circuit Breaker	1100505	1100505
Cord Set, European	NA	1800500
Cord set, USA	1800516	101990
Door Heater	103068	103068
Element	2350503	120071
Feet, adjustable	200129	200129
Float Switch, Water Jacket	210004	210004
Gasket, Chamber (7ft)	3450534	3450534
Glass Door	9520572	9520572
Humidity Pan	5120587	5120587
I/O (On/Off) Switch	103351	103351
Overtemperature Thermostat	10000J	10000J
Pilot Light, Green	200021	200021
Pilot Light, Red	200020	200020
Shelf Assembly	9750581	9750581
Temperature Controller	1750549	1750550

UNIT SPECIFICATIONS

These units are 115Volt or 220Volt. Please refer to the unit data plate for its individual specifications.

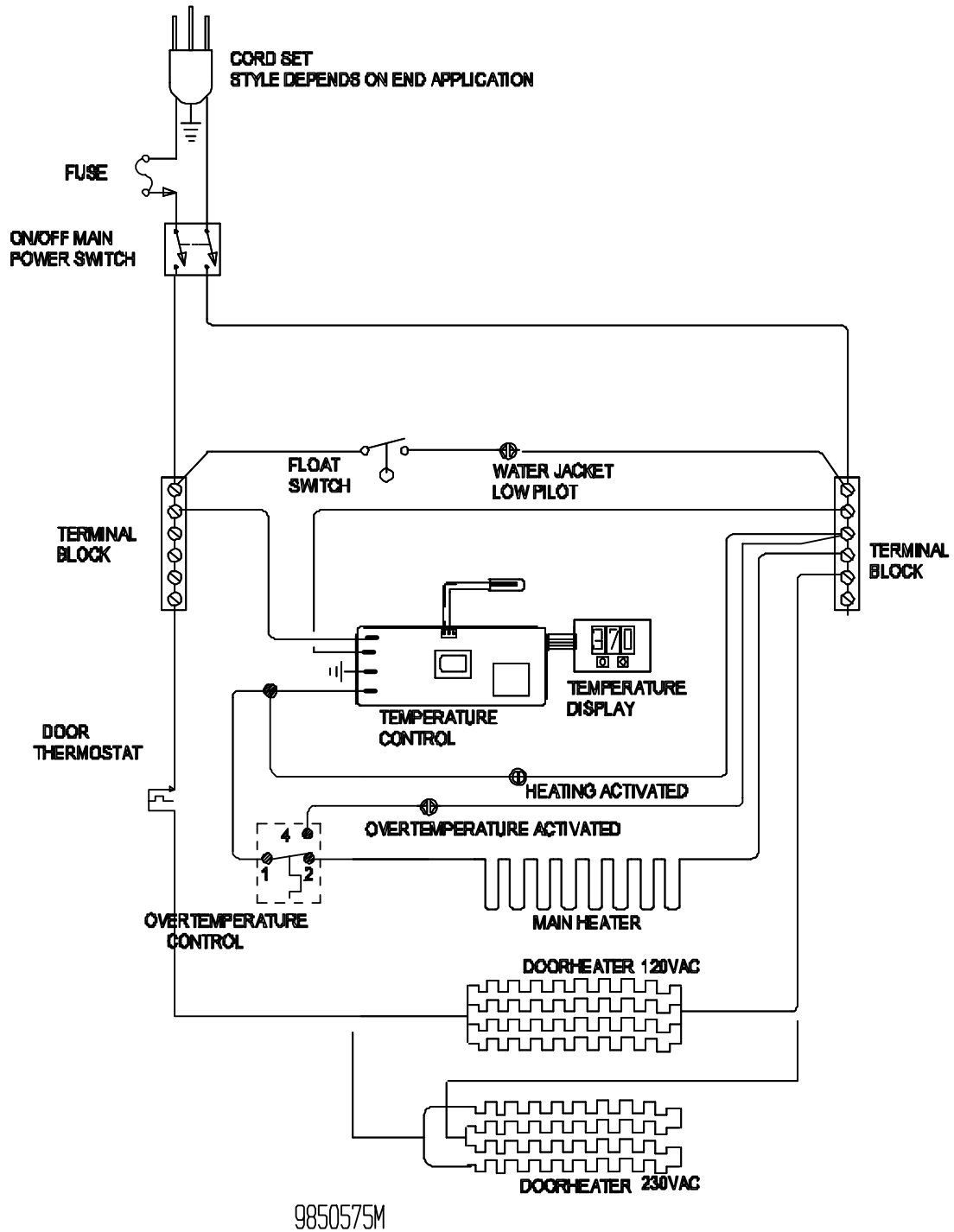
Weight	Shipping	Net
3015	315 lbs.	Call Cust. Service
3025	630 lbs.	Call Cust. Service

Dimensions	Exterior WxDxH (in.)	Interior WxDxH (in.)
3015	23x23.5x38.5	18.5x18.5x24.5
3025	12x23.5x77	18.5x18.5x24.5 ea

Capacity	Cubic Feet
3015	5.5
3025	5.5 each chmbr

Temperature	Range	Uniformity
3015	5° above amb. to 70°C	±0.2°C
3025	5° above amb. to 70°C	±0.2°C

WIRE DIAGRAM



**SHELDON MANUFACTURING, INC.
LIMITED WARRANTY**

Sheldon Manufacturing, Inc., (“Manufacturer”) warrants for the original user of this product in the U.S.A. only that this product (parts only if outside of the U.S.A.) will be free from defects in material and workmanship for a period of two years from the date of delivery of this product to the original user (the “Warranty Period”). During the Warranty Period, Manufacturer, at its election and expense, will repair or replace the product or parts that are proven to Manufacturer’s satisfaction to be defective, or, at Manufacturer’s option, refund the price or credit (against the price of future purchases of the product) the price of any products that are proven to Manufacturer’s satisfaction to be defective. This warranty does not include any labor charges if outside of the U.S.A. This warranty does not cover any damage due to accident, misuse, negligence, or abnormal use. Use of Manufacturer’s product in a system that includes components not manufactured by Manufacturer is not covered by this warranty. This warranty is void in the event that repairs are made by anyone other than Manufacturer without prior authorization from Manufacturer. Any alteration or removal of the serial number on Manufacturer’s products will void this warranty. **Under no circumstances will Manufacturer be liable for indirect, incidental, consequential, or special damages.** The terms of this warranty are governed by the laws of the state of Oregon without regards to the principles of conflicts of laws thereof. If any provision of this limited warranty is held to be unenforceable by any court of competent jurisdiction, the remainder of this limited warranty will remain in full force and effect.

This warranty is in lieu of and excludes all other warranties or obligations, either express or implied. Manufacturer expressly disclaims all implied warranties, including without limitation, the warranties of merchantability and fitness for a particular purpose.



For fast and efficient support, please have the following information available anytime you request service:

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Serial No. _____

Part No. _____

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