VWR INTERNATIONAL

INCUBATOR

MODEL: 1570
ORBITAL SHAKING INCUBATOR

09/11
4861479

INSTALLATION AND OPERATIONAL MANUAL

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This incubator shaker is for professional 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 incubators are not intended for hazardous locations or use.

Section 1

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 Service Representative for authorization. Supply nameplate data, including model number and serial number.

1.4 Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all packaging before discarding. This incubator is equipped with shaking platform and 4 leveling feet.

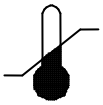
Section 2

GRAPHIC SYMBOLS

Graphic symbols on the incubator have the following meanings.

2.1  Indicates that you should consult your manual for further description or discussion of a control or user item.

2.2  Indicates **"Temperature"**.

2.3  Indicates **"Over Temperature Safety"**.

2.4 °C Indicates **"Degrees Centigrade"**.

2.5  Indicates **"AC Power"**.

2.6  Indicates **"Manual Adjustable Components"**.

2.7  Indicates **"Oscillator"**.

2.8  Indicates "**Unit should be recycled"** (Not disposed of in land-fill)

Section 3

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 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.

3.1 **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.

3.2 **Location:** When selecting a site for the incubator, consider all conditions which may affect performance, such as extreme heat from steam radiators, stoves, ovens, autoclaves, etc. Avoid direct sun, fast-moving air currents, heating/cooling ducts, and high traffic areas. To ensure air circulation around the unit allow a minimum of 20 cm between the unit rear and sides and any walls or partitions which might obstruct free airflow.

3.3 **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 and door need to be positively closed position during transfer to prevent shifting and damage.

3.4 **Leveling:** The unit must sit level and solidly. Leveling feet are supplied and must be installed in the four holes in the bottom of the unit. Turn the leveling feet counterclockwise to raise level. 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 in all the way to prevent bending and damage.

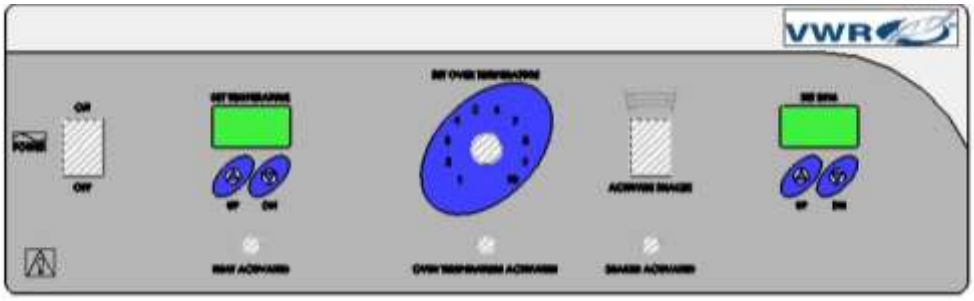
3.5 **Cleaning:** The incubator interior was cleaned at the factory, but not sterilized. Remove all interior parts and clean with a disinfectant that is appropriate to your application. A thorough periodic cleaning is strongly recommended.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile of flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

Section

4

CONTROL PANEL OVERVIEW



4.1 **Power Switch:** The main power I/O (on/off) switch controls all power to the incubator and must be in the I/ON position before any systems are operational.

4.2 **Main Temperature Control:** Marked SET TEMPERATURE, the Main Temperature Control consists of the digital display and UP/DOWN arrow pads for inputting set point temperatures and calibration.

4.3 **Heating Lamp:** This pilot lamp in ON when the unit is heating up to set point and is blinking when controlling temperature at set point.

4.4 **Over Temperature Protection (OTP) Safety Thermostat:** This thermostat, labeled SET OVERTEMPERTURE, is completely independent of the Main Temperature Controller. The OTP guards against any failure of the Main Temperature Controller that would allow the temperature to rise past the set point. If temperature rises to the Safety set point, the Safety takes control of the heating element and allows continued use of the incubator until the problem can be resolved or service can be arranged. The control is adjusted using a screwdriver or a small coin.

4.5 **Safety Lamp:** Located directly below the Safety Thermostat, this pilot lamp comes ON when the Safety Thermostat is activated. During normal operating conditions, this light should never come on.

4.6 **Shaker Switch:** Located to the right of the Safety Thermostat, this switch engages the oscillation mode of the incubator. To enable oscillation, this switch must be in the I/ON position. This switch does not have to be On to adjust the oscillation set point.

4.7 **Shaker Controller:** This control is labeled RPM and consists of the UP/DOWN arrow pads and a digital display that shows oscillations per minute. This control is adjustable from 30 to 400 RPM.

Section 5

OPERATION

5.1 Check power supply against unit serial plate. They must match.

5.2 Plug service cord into the grounded electrical outlet.

5.3 Push the power switch to the On position, and turn the Safety Thermostat to its maximum position, clockwise.

5.4 **Installing Platform:** The platform is positioned by enclosing all corners of the shaking mechanism within the lips of the platform. This can be done easily by positioning the front two corners then setting the rest of the tray down. The platform should be shaken by its handles after placement to confirm that it is firmly in place.

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 High Limit Thermostat should be turned to its maximum position until the unit has stabilized at desired set point temperature. Allow the incubator at least 5 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 stabile at set point for several hours. Place a certified reference thermometer in the chamber by placing it directly inside. Be certain the thermometer is not touching platform. Allow the temperature to stabilize again until the thermometer reads a constant value for one hour. 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 Over Temperature Protection Safety Thermostat:** Once the incubator is stabile at the desired set point, turn the Safety Thermostat counterclockwise just until the Safety indicator light turns on. Next, turn the Safety Thermostat clockwise just until the safety indicator light turns off. Then continue to turn clockwise an additional two small divisions on its scale past the point where the indicator light went out. This will set the Safety Thermostat at approximately 1°C above the Main Temperature set point.

5.8 **Set Oscillation Control:** Enter set point mode by pushing and releasing either the UP or Down arrow pad one time. The display will start to blink on and off showing the RPM set point. Pushing the UP or DOWN arrow pad will increase or decrease the RPM set point in increments of 1 RPM. The range for this set point is 30 – 400 RPM. If the arrow pads are not pressed for five (5) seconds the display will stop blinking and revert to displaying the actual RPM. The set point can be set to 0.0.

Note that for shaker controls to work as described, the door must be completely closed. There is a door switch that will stop the shaker if the door is opened.

Section 6

MAINTENANCE

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

6.1 Cleaning: Clean with mild soap and water solution, rinse with distilled water and wipe dry with a soft cloth.

6.2 Disinfecting: Disinfect the incubator interior on a regular basis. Decontamination of the shaker mechanism should be done in place.

Remove the parts and clean 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 they may damage stainless steel surfaces.

Handle the gasket carefully when washing the interior to impair the positive seal.

6.3 Controls: There is no maintenance required on the main temperature controller, high limit thermostat or main temperature probe. If the incubator fails to maintain temperature, see Section 7 Troubleshooting, before calling Customer Service.

Setting the Oscillation Stroke

To set the oscillation stroke, perform the following steps.

Note: A 3/16 -inch Allen wrench should be used.

1. Assure that the power cord has been disconnected to prevent accidental operation.
2. Remove sample tray.
3. Open the access panel by rotating the wing nut ¼ turn counterclockwise and rotate the counterweight platform until the stoke adjuster appears.
4. Remove the locking bolt and adjust the arm to any of the available options.
5. The dimensions shown are the total stroke of the oscillator, i.e., ½ designates a pattern that is + ¼" from center.

Note: When the stroke has been changed, counterbalance adjustments may be required.

Setting the Counterbalance

To set the counterbalance, perform the following steps:

1. Assure that the power has been disconnected to prevent accidental operation.
2. Remove the sample tray.
3. Open the access panel and rotate the counterweight platform until the counterweight appears.
4. Remove the wing nuts to adjust the counterweights.

Table 1 shows counterbalance starting locations. For example, 5 kg of sample load being shaken with ½ inch stroke will require four counterweights attached to the counterbalance platform as shown in Figure 1. Loads should be properly counterbalanced before continuous operation. Unbalanced loading may damage mechanical and electrical operating systems.

Table 1. Counterbalance Starting Locations

	No Load	5 kg of samples	10 kg of samples
Counterweights	2	4	6
For ½" stroke	See Figure 1	See Figure 1	See Figure 1
For ¾" stroke	See Figure 2	See Figure 2	See Figure 2
For 1" stroke	See Figure 3	See Figure 3	See Figure 3

Note: Each unit includes six (6) single counterweights when shipped.

Figure 1. Setup for ½ Inch Stroke

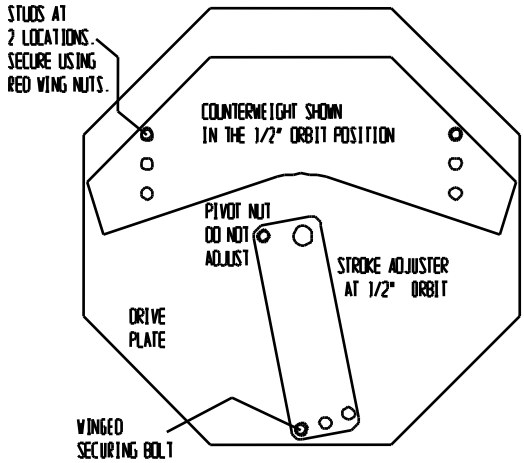


Figure 2. Setup for ¾ Inch Stroke

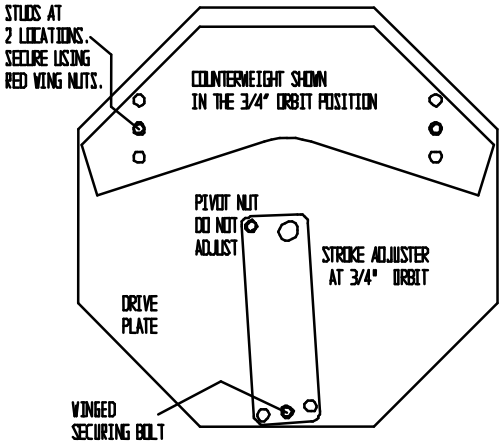
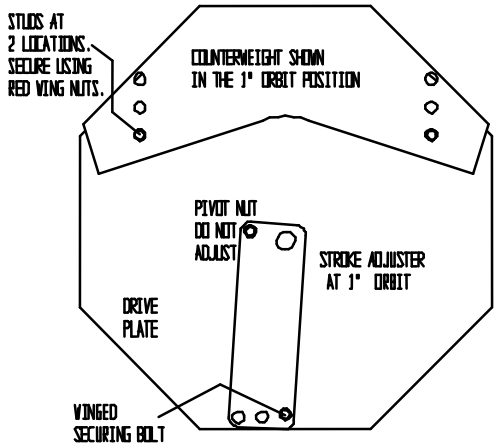


Figure 3. Setup for 1 Inch Stroke



Section 7

TROUBLESHOOTING

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"	
	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/ OTP set too low – turn OTP fully clockwise. 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 5 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/ OTP failure – confirm with front panel lights that OTP is operating correctly. 8/ Loose connection – check shadow box for loose connections.
Display reads "LO"	
	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 amperage and voltage match data plate 2/ Confirm that set point is set high enough –turn OTP all the way clockwise and see if heating light or safety light comes on. 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 OTP 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/ Calibration sensitivity – call Customer Service. 4/ OTP 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 5.6 for correct setting. 5/ Electrical noise – remove nearby sources of RFI including motors, arcing relays or radio transmitters. 6/ 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. 7/ 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	
	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/ 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.
MECHANICAL	
Door not sealing	
	1/ Check physical condition of gasket.
Water leaking	
	1/ If leaking inside: dry chamber, run at temperature with door open. Check all seams with flashlight including front face.
Shaker motor noise	
	1/ Continuous Squeal - continuous squealing noise of a constant pitch or tone. Changes only in intensity for various rpm settings. Stops when the oscillate switch is turned off. Appears to be coming directly from the motor, not the mechanism or gear box. A/ Make sure the motor cable plugs are properly seated. B/ Replace the speed control.
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	
	Fuse on circuit breaker.
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/ Check all wiring connections, especially around the on/off switch.
Contamination in chamber	
	1/ See cleaning procedure in operator's manual. 2/ Develop and follow standard operating procedure for specific application, cleaning technique and maintenance schedule.

Section 8

PARTS LIST

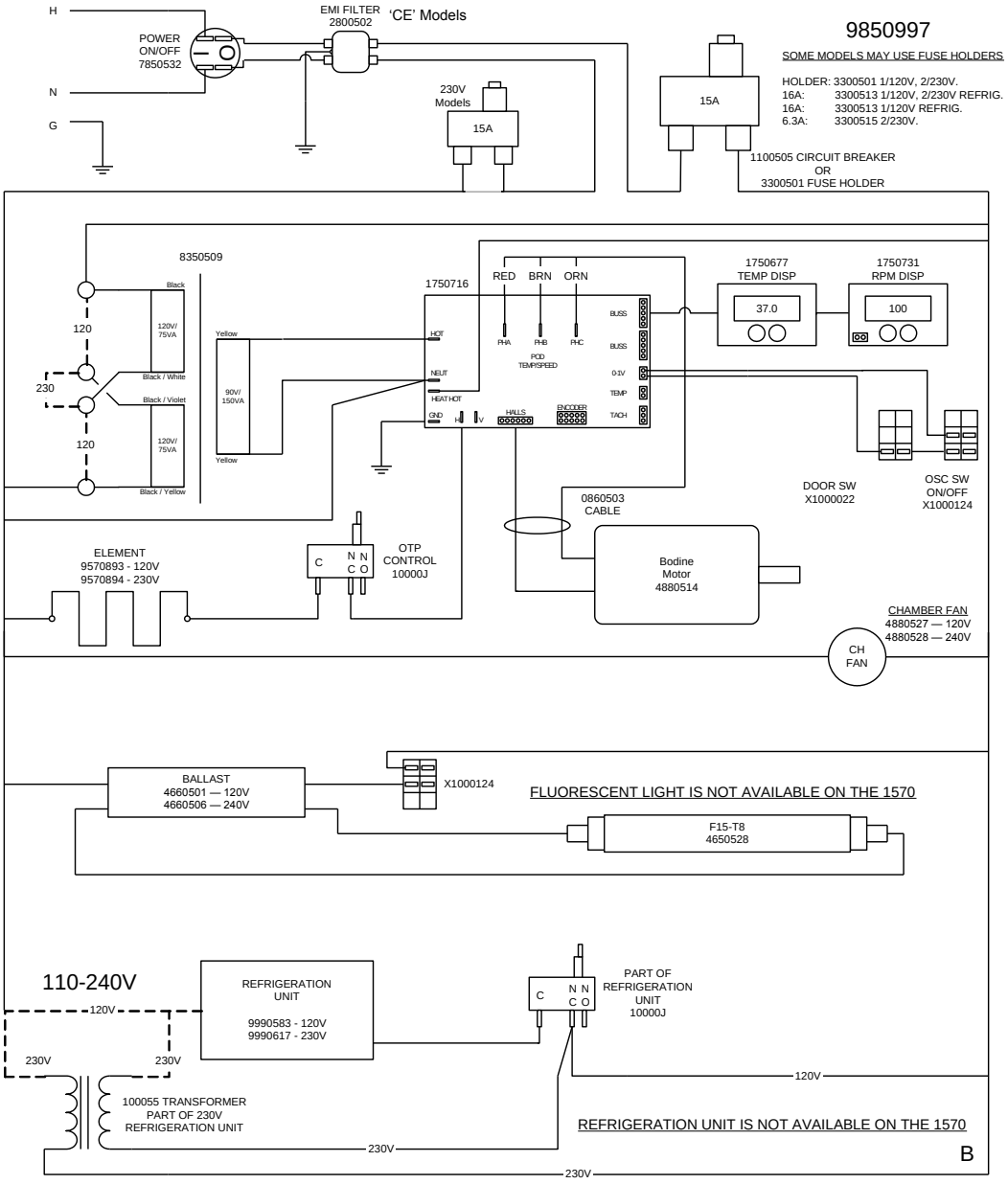
Part Description	115V	220V	220V CE
Adjustable feet	2700506		
Control, Motherboard	1750716		
Display, RPM	1750731		
Display, Temperature	1750677		
Door, Dual Shock	6400534		
Door, Gas Shock Dual, ea	7600511		
Door, Lift Spring Single	7600519		
Door, Single Spring	6400555		
Drive Belt, Oscillator	0500512		
Element	9570703	9570738	
Filter, EMI			2800502
Flask Clamps, 1 Liter	9530532		
Flask Clamps, 125 mL	9530530		
Flask Clamps, 250 mL	9530531		
Flask Clamps, 500 mL	9530526		
Fuse	3300513	3300515	
Fuse Holder	3300501		
IEC Inlet			4200505
Knob, Safety Thermostat	4450506		
Motor, Cable	0860503		
Motor, Circulation	4880527	4880528	
Motor, Oscillator	4880514		
Pilot Light, Green	4650554		
Pilot Light, Red	4650553		
Platform (Sample Tray)	5220625		
Power Cord	1800516	1800537	Detachable
Safety Thermostat	1750862		
Switch, Door	7850513		
Switch, Oscillation	7850579		
Switch, Power	7850570		
Transformer, Speed Control	8350509		

Section 9

UNIT SPECIFICATIONS

MODEL	1570	
TEMPERATURE		
Range	Ambient +5C° to 60°C	**Ambient +9F° to 158°F**
Uniformity	±.5°C	
Sensitivity	0.1°C	
Alarms	Visual Safety Lamps	
CAPACITY		
Volume	113L	**4.0 CF**
DIMENSIONS		
Interior (WxDxH)	44cmx44cmx44cm	**17" x 17" x 17"**
Exterior (WxDxH)	74cmx69cmx104cm	**29" x 27" x 41"**
SHAKING MECH.		
Motor	brushless DC	
Speed, Sample	30 to 400rpm	**4 RPM intervals (1 rpm increments)**
Speed Control	Digital	**1/2", 3/4", or 1"**
Orbit Diameter	12mm	
Max Sample Wt.	10kg	**22lbs.**
Door Switch	Yes	
Platform Dimensions	44cm x 44cm	**17" x 17"**
ELECTRICAL		
Volts	115V / 230V	
Hz	50/60Hz	
Amperage	2.3 / 3.5	

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:

Model _____

Serial No. _____

Part No. _____

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