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HERRMIDIFIER 6000-2 Owner's Manual

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6000 Series

Electronic Steam Humidifiers

**Installation
Operation
Service**

OWNER'S MANUAL

The 6000 Series Humidifiers represent that latest in humidification technology. Please read these instructions carefully for trouble free operation and to get the most out of your purchase. For further information concerning this product, contact your local Herrmidifier representative.



engineered humidification systems

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SECTION I WARRANTY

Warranty

1. Herrmidifier warrants to the buyer or any user during the duration of the Warranty that the humidifier described in this manual will be free from defects of material and workmanship for a period of two (2) years from the date of shipment.
2. For this Warranty to be effective, this humidifier must be installed, operated and maintained in accordance with the Installation Instructions, Operations and Maintenance Manual(s) supplied with the humidifier.
3. In the event of a defect or malfunction in this product during the Warranty Period, user may contact the Customer Service Department or their Herrmidifier Representative for a Material Return Authorization (MRA) number. Items tagged (on the outside of the box) with this number may be returned to the Herrmidifier Factory Repair Department for complete reconditioning without charge to the user for parts or labor. Incidental expenses such as cost of transporting the humidifier to Herrmidifier shall be come by the user. Upon completion of the reconditioning, the humidifier will be returned at no cost to the user. In an effort to keep equipment on line, we may send items out and use the MRA to return alleged defective parts for examination. Credit consideration will be given upon return and confirmation of improper performance. In either case item, returned without an MRA number will not be accepted!
4. Each of the 6000 series of steam generating humidifiers contains a plastic steam generating cylinder which is to be considered a routinely disposable part to be changed at regular maintenance intervals at the user's expense. This steam-generating cylinder is not covered by this Warranty. If, after the flat installation of your 6000 humidifier, you feel the steam-generating cylinder is not operating normally, you should contact the Herrmidifier Company, Inc. with an explanation of the problem. However, in the continuing operation of the humidifier, replacements of this part are your responsibility as part of routine maintenance.
5. **This Warranty does not cover field labor for repairs to this humidifier or any special, indirect or consequential damages.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.
6. If, after a reasonable number of attempts to do so, Herrmidifier is unable to remedy any defects or malfunctions in this humidifier, then the user may elect either a replacement of such product or part which may be defective without charge or a refund at the buyer's original purchase price.
7. This Warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state.

NOTE

Water quality plays a vital role in the performance and maintenance requirement of any humidifier. Adjustments to the circuit board may be necessary based on the incoming water quality. See pages: 13-16.

Performance problems associated with water quality are not warranty issues!

SECTION II UNIT OPERATION

Basic Operation

Controlled humidification requires a very precise control system. The 6000 utilizes a solid state control to monitor performance and maintain humidity. The humidifier evaluates the operation and alerts the operator to problem conditions and prevents undesirable operation.

On initial start-up or a call for humidity, the humidifier will attempt to fill to its full load amp rating. **The unit will not necessarily have a full cylinder of water.** Water level depends on the conductivity of the water. The more conductive the water, the more current that can be passed through the same volume of water.

If the water is not conductive enough to allow the unit to reach full load amps (full capacity) on the initial fill; the cylinder full light will indicate a full cylinder condition. The unit will operate in this mode with repetitive fill and boil cycles until the unit has concentrated enough minerals in the water to reach the rated amp level.

Once full load amp (FLA) has been reached, the fill valve will shut off. The unit will now compare the rate of change of amp draw to a time cycle.

If the water in the cylinder is mineral laden and hence very conductive, a dram cycle will be initiated.

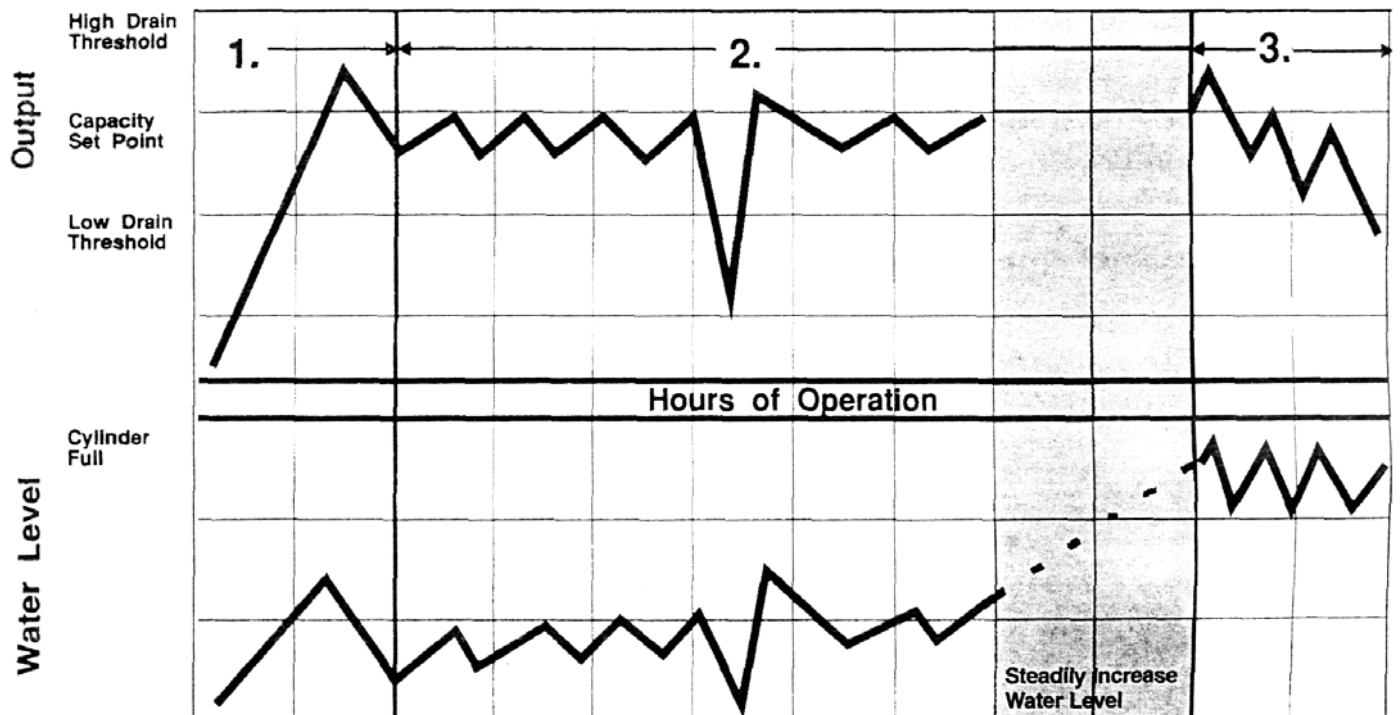
After the dram cycle and or the time cycle is completed, the unit will refill and start the process over.

These cycles will repeat until:

- The call for humidity is removed.
- The cylinder is used up.
- A fault condition occurs.

On initial start-up, if the water is not conductive enough for the unit to reach FLA, the water will stop filling when the water reaches the cylinder f4U electrode. Once the unit has entered a cylinder full condition it will operate with fill and boil cycles only. By eliminating the dram cycle, the water conductivity will be increased by producing pure steam and letting the minerals behind. The increased mineral levels will raise the conductivity allowing the humidifier to draw sufficient amperage to achieve FLA. Normal operation will then commence.

As the electrodes in the cylinder are coated with minerals, the water level will slowly increase to the cylinder full level. Concentration will no longer allow the unit to reach FLA. After a period of time, the cylinder will display the red "Service" light indicating the need to change the cylinder.



Key Features

Adjustable Setpoints

Capacity

- Range = 50-100%
- Preset at 100% for 6000-1,3,4
- Preset at 50% for 6000-2

Low Drain Threshold

- Range = 50-100%
- Preset at 90%

Cycle Time

- Range = 60-300 seconds
- Preset at 60 seconds

Faults

Overcurrent

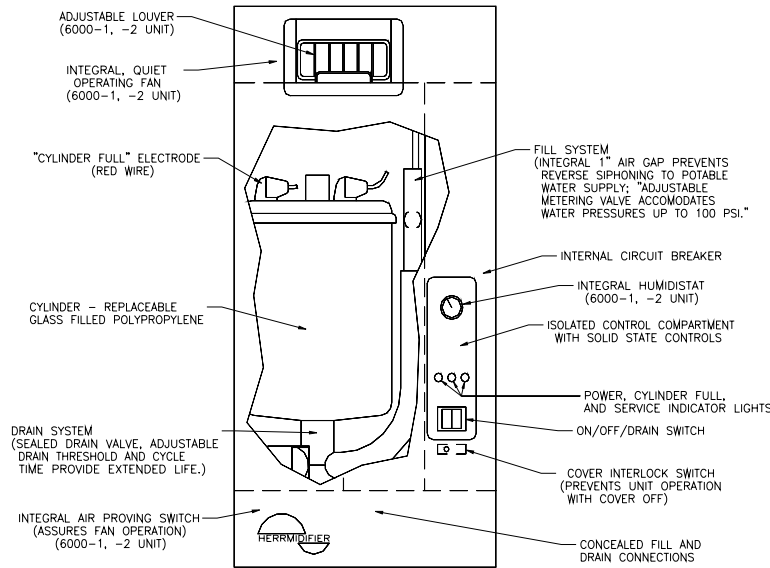
- 138% of Rated Current
- System Shutdown

Fill System

- Fill valve open for 6 hours without achieving capacity setpoint or cylinder full
- System Shutdown

End of Cylinder Life

- 6 hours of operation while on cylinder full without achieving capacity setpoint
- System Shutdown (See Pg. 14 for Manual Override)



Conductivity* Micromhos (approx.)	Average Life** Expectancy – Hrs. (approx.)
100	2000
135	1900
170	1800
250	1300
500	800
750	650
1000	500

**If the conductivity of your supply water is less than 100 micromho, consult Herrmidifier for specific circuit board adjustments and replacement tank information (GT-176-1).*

Unit performance may be affected.

Operation on water of less than 60 micromho is not recommended.

***Your actual cylinder life may be higher or lower depending on the exact composition of your water supply.*

Engineering and Application

The Herrmidifier 6000 Series Steam Humidifiers can be applied in a variety of applications. The simplest application is to utilize the model with the built-in blower package (6000-1,2). The steam generated by the unit is distributed into the conditioned space by the built-in blower package (Figure 1).

Alternatively, steam generated by the "6000" unit can be discharged directly into the system ductwork (6000-3,4). In this application, a steam pipe is preferably installed in the system ductwork at least five (5) feet downstream of the supply air blower. There should be no obstructions within the first five- (5) feet downstream of the steam distributor as shown in Figure 2. An air-proving switch and high limit humidistat are provided for better system control in ducted applications. If the heating system

operates for short periods at a time and the desired relative humidity level is not achieved, the humidifier can be wired to turn on the blower when there is a call for humidity. In this case an air-proving switch will not be necessary, but the high limit humidistat should still be utilized.

NOTE

The steam distributor pipe is inherently sloped to return the condensate to the humidifier.

The steam piping from the humidifier to the steam distributor should have an 8% slope (1" per foot) up to the steam distributor. Steam hose may be used up to a maximum of 20' between the unit and the steam distributor. The hose provided with the unit is 10' long. There can be no sags in the steam hose, as this will create a trap and will produce back pressure in the steam cylinder and may blow condensate in the duct.

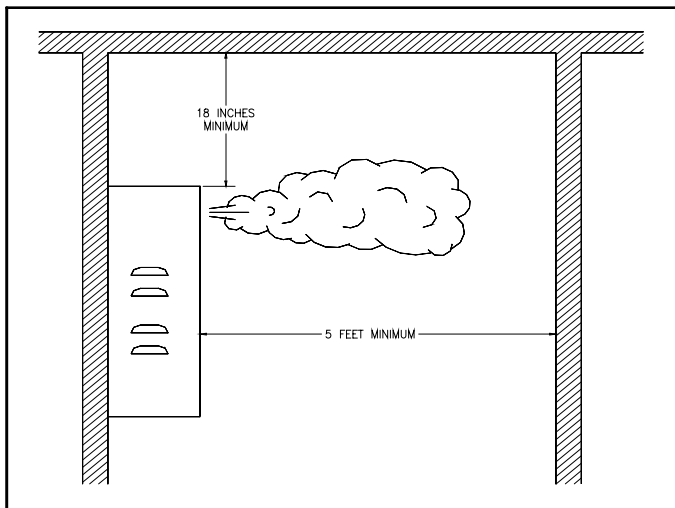


Figure 1

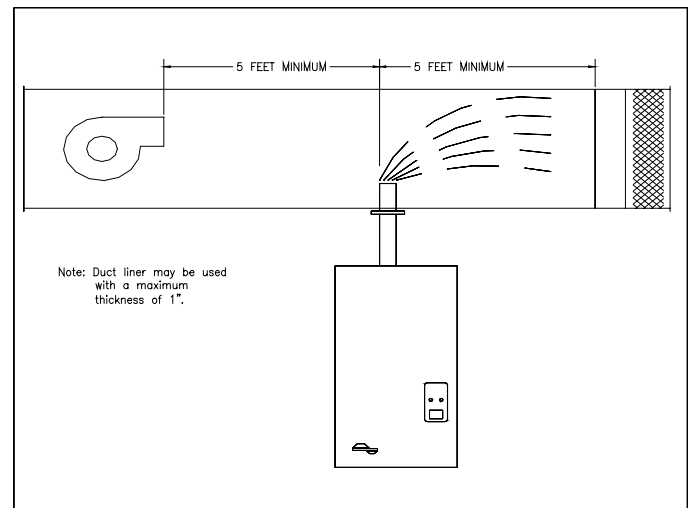


Figure 2

Allowable Operating Conditions:

Ambient Temperature:
40°F (4°C) to 120°F (50°C)
Ambient Relative Humidity:
0% to 90% (non-condensing)
Line Voltage: -15% to +10% of Nominal
Frequency: 50/60 HZ.
Water Supply Pressure: 20psi – 100 psi.
Maximum Duct Static Pressure: 1" (6000-4)

SECTION III INSTALLATION INSTRUCTIONS

Mounting

The cabinet is designed to safely contain the working components of the Humidifier 6000 series humidifier and dissipate heat to protect the electronics. Locate humidifier, steam pipe and accessories in a manner to allow routine inspection and any necessary maintenance. **DO NOT install the unit above (such as false ceilings) or around valuable property, where a malfunction could cause damage.** Correct positioning of the humidifier is important to allow for proper operation and easy maintenance. Minimum clearance around the cabinet should be maintained as follows:

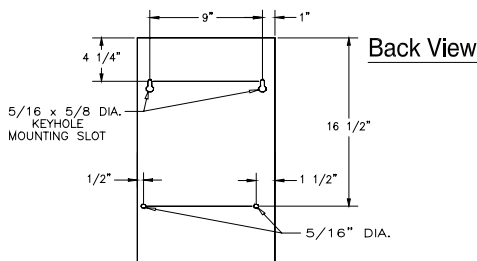


Figure 3

Remove foam packing from top of tank.

Four lag bolts, (2) 5/16" and (2) 1/4", are supplied with the 6000 unit. Install the top two lag bolts (5/16") according to the dimensions in Figure 3. Hang the unit on the wall, and then install the bottom two lag bolts (1/4") and secure all four bolts. Be sure the unit is level and mounted directly to the wall to wood studs at least 2" thick (or equivalent). Operating weights are as follows:

6000-1,2: 35 lbs.

6000-3,4: 35 lbs.

WARNING!

Do not mount any controls inside the unit or tap power from any location in the unit, except as stated in these instructions. **Do not** place objects near the cabinet. **Do not** attach to dry wall without studs. At least one 5/16" and one 1/4" lag bolt must be located on a stud.

Plumbing

To make the necessary connections for water fill and drain the following steps are required: (refer to figure 4 for locations)

1. Install external shutoff valve between the water supply and the humidifier for ease in servicing the unit.
2. Connect water supply to the 1/4" compression fitting on the bottom of the cabinet.

CAUTION!

Do not use reverse osmosis or demineralized water treatment without first consulting the factory. This water may not be sufficiently conductive to allow proper operation. Consult factory if water is outside the range of allowable conductivities. **Do not use hot water.**

3. Connect the 3/4" tube from the accessory pack to the drain reservoir. Cut hose to necessary length.

WARNING!

Do not mount any controls inside the unit or tap power from any location in the unit, except as stated in these instructions. **Do not** place objects near the cabinet. **Do not** attach to dry wall without studs. At least one 5/16" and one 1/4" lag bolt must be located on a stud.

4. Insert the other end of the tube into a minimum 6" vertical length of 1-1/4" minimum I.D. copper line. The balance of the drain line should be 1" I.D. minimum with a minimum 1/8" per foot slope. (See Figure 4, page 8)

WARNING!

If the drain line is exposed, it is recommended that it be insulated for safety. Do not use PVD drain line unless "Drain Tempering" is enabled (see page 10, step 10).

NOTE

Inlet water pressure must be in the range of 20-100 psig. Consult the factory if you are outside this range. Softened water may be used but requires that the low dram threshold be adjusted (page 13). Drain water can be tempered to lower its temperature (refer to page 10).

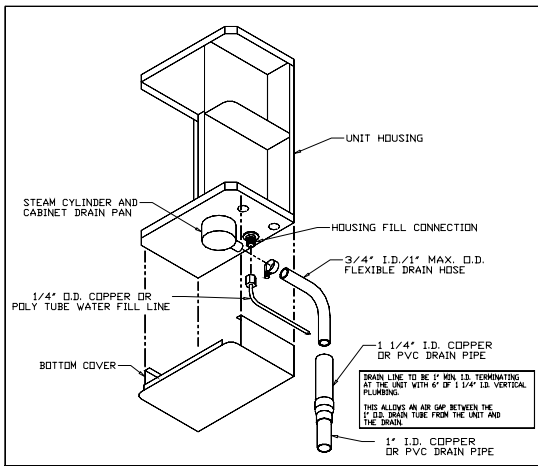


Figure 4

Steam Distribution

Blower Version (6000-1,2)

The 6000 Series Steam Humidifier with the built in blower pack should be mounted a minimum of 18" from the ceiling. There should also be 5' of horizontal clearance in front of the unit to prevent steam from condensing on obstructions (See Figure 1). There is an adjustable louver to adjust the direction of the steam plume.

WARNING!

Do not adjust this louver to extreme angles as it will restrict the airflow causing condensation to form around the steam distribution manifold.

WARNING!

Locate away from areas where people can walk into steam path.

DUCTED VERSION (6000-3,4)

Herrmidifier supplies a stainless steel duct distributor for injecting pure steam into the duct. This can be installed in the bottom or the side of the duct (See Figure 5). When installing in the side of the ductwork make sure it is positioned to allow condensate to drain back down the steam hose. The duct distributor pipe has a built in pitch to allow condensate to drain back into the hose. The hose must be installed with a minimum 8% (1" per foot) pitch back to the humidifier to allow condensate to drain back to the steam cylinder (See Figures 5 & 6). A minimum of 5 feet downstream clearance before any bends or obstructions is recommended for most applications (See Figure 2). However, different psychrometric conditions may require greater or lesser steam absorption distances. A minimum duct temperature of 60 degrees F is recommended. Temperatures below this may cause condensation to form in the duct. Lined duct may be used if the thickness is 1" or less.

Distributor Mounting Instructions

Sheet metal Duct:

Make a 1-1/4" hole in the duct at desired location. Insert duct distributor and secure with self-tapping sheet metal screws (supplied by others).

Fiberboard Duct:

Make a 1-1/4" hole in the duct at desired location. Insert duct distributor and mark the four holes on flange. Drill (4) 1/4"- holes at marked locations. Cut an access hole in duct and install the enclosed tee nuts from the inside of the duct. Fasten distributor with enclosed 1/4" bolts.

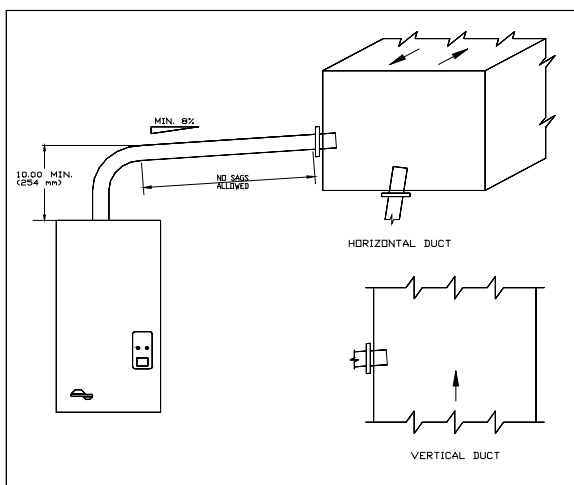


Figure 5

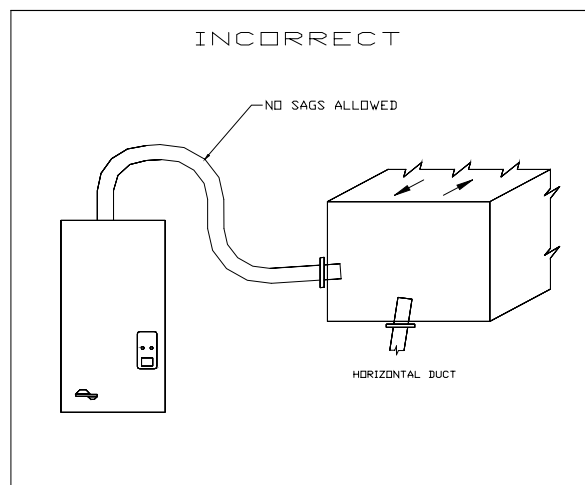


Figure 6

Wiring

All field wiring should be routed up through the knockout in the bottom panel or in the back of the unit.

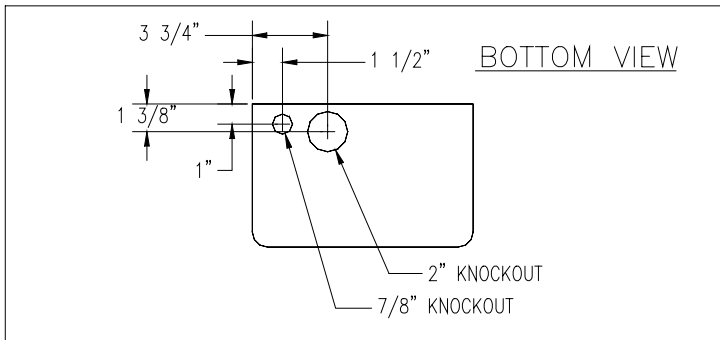


Figure 7

Supply Power.

1. Insure that minimum circuit ampacity is 15 amps.
2. Terminals are provided in the electrical compartment for field connection of the main power supply legs (single phase) and a ground wire.
3. Install external overcurrent protection and provide wiring in accordance with the NEC, state and local codes.
4. Power supply must be "clean": free of spikes, surges and sags: +10%, -15% of nominal.

Electrical Characteristics

Capacity	Steam Output	
Lbs. / hr	4	8
Kg / hr	1.8	3.7
	Input kW	
	1.33	2.66
Volts/Ph:	Amps	
120/1	11.8	N/A
230/1	5.9	11.8

Control Circuit Connections

WARNING!

Do Not install any controls inside the Humidifier 6000 cabinet. Installations of any extraneous devices inside the electrical compartment may cause erratic behavior of the circuitry and will **VOID** the warranty.

6000-1,2

The 6000 units with built-in blowers require no external control wiring since the humidistat and air proving switch are built-in.

6000-3,4

The control wiring for the ducted version is to be connected to the 5 pole controls terminal strip located in the low voltage compartment. Terminals #1 and #2 are for connecting the control and high limit humidistats as well as the air proving switch in series (all included). If desired, terminals #3 and #4 are relay contacts to energize your fan relay (Relay contact rating 12 Amps at 125 VAC, 8 Amps at 250 VAC). With this optional wiring, on a call for humidity, the humidifier will close the interlock relay and energize the fan blower. **The air-proving switch must not be used if the fan interlock is utilized.** All control wiring should be 22 AWG or larger (See figure 8). Consult with the factory if you have any special wiring requirements.

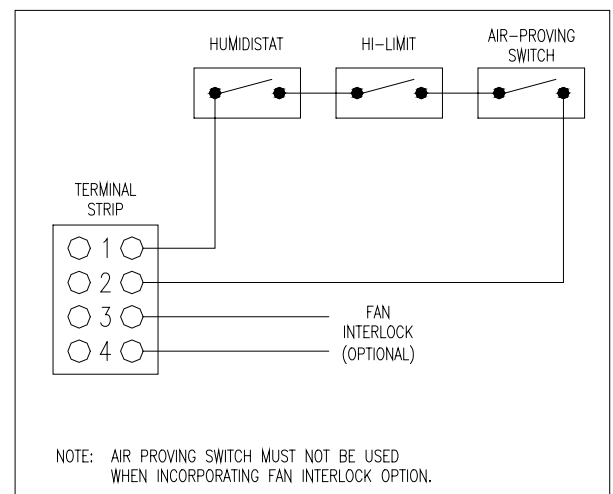


Figure 8

SECTION IV OPERATING INSTRUCTIONS

Start-up Instructions

1. Check that the humidifier is properly mounted and level.
2. Check that the water fill and drain are properly connected.
3. Check that the correct voltage and amperage services are supplied.
4. Check all controls are wired properly.
5. Check that the steam distributor is properly installed and that the steam hose has been properly routed without any kinks or flat spots.
6. With power off, double-check all electrical connections and plumbing connections to insure that they did not loosen during shipment.
7. With the "on-off-drain" switch in the "off" position, and the control and high limit (ducted versions only) humidistats at their lowest settings, turn on the main disconnect. The contractor should remain deenergized and the power light should remain "off". Place the "on-off-drain" switch in the "on" position and the power light should illuminate.
8. Turn the control and high limit (ducted versions only) humidistats up to their highest setting. The contractor should pull in.
9. After approximately a twenty second delay, the fill valve should open and water begins to fill the cylinder to the preset amp level or cylinder full condition, depending on the incoming water supply. When starting up the unit, it is best to put an amp clamp on the power leg that passes through the

NOTE

If upon initial start-up of this humidifier the cylinder is slow in heating and/or the service light continues to come on, drain the tank to 1/4 full. Turn off power at breaker and crumble 1/2 of one tablet (Alka-Seltzer) from the envelope tagged EST-1583 included with unit into the grey fill tee. Change the middle blue dial on the left side of the circuit board, R18, from 90% to 87%. Then turn the breaker on and run the unit. If you have had to use these this step on a 230V unit (6000-2,4), it is advisable that you order a GT-176-1 replacement cylinder rather than the standard replacement cylinder in the future so this procedure will not need to be repeated. Upon receipt of the GT-176-1 cylinder, adjust the dial, R18, on the circuit board back to 90%.

torroid transformer. Insure that the humidifier fills to "cylinder full" (approximately 1.5" from the top of the cylinder), or that the amperage reaches the data plate maximum and the fill valve closes.

10. All units are equipped with a drain-tempering feature which mixes cold fill water with the hot drain water to protect drain piping. Depending on your fill water pressure, some adjustment of the fill metering valve may be necessary to insure drain water of less than 140 degrees F (See Figure 9). To deactivate, remove diode from socket CR18 from circuit board (See Figure 12).
11. Reset control and high limit humidistats to their desired settings. Typical control humidistat settings are 30-40% and limit humidistat settings are 65-70%.

NOTE

The capacity of the humidifier can be adjusted between 500% and 100% of the maximum level by adjusting the capacity adjustment potentiometer (labeled R39) on the main circuit board. All blower versions are set from the factory to produce 4 lbs/hr. If the psychrometric conditions permit, the 6000—2 may be increased to 8 lbs/hr by adjusting R39 from 50% to 100% capacity.

CAUTION!

Inadequate airflow may allow humidity to collect in areas causing condensation.

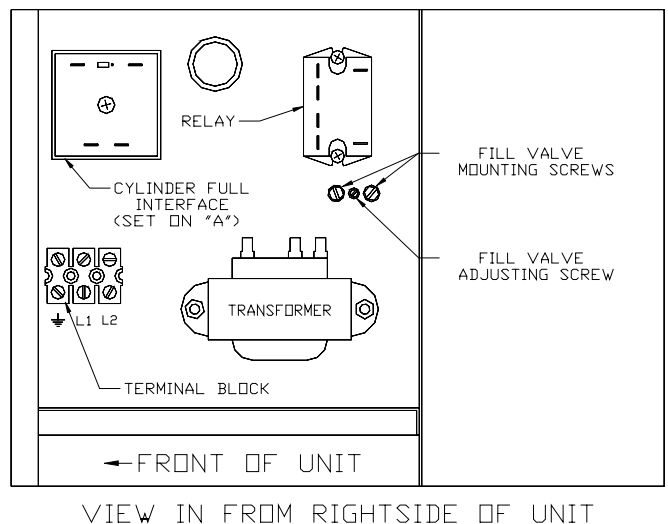


Figure 9

Checklist

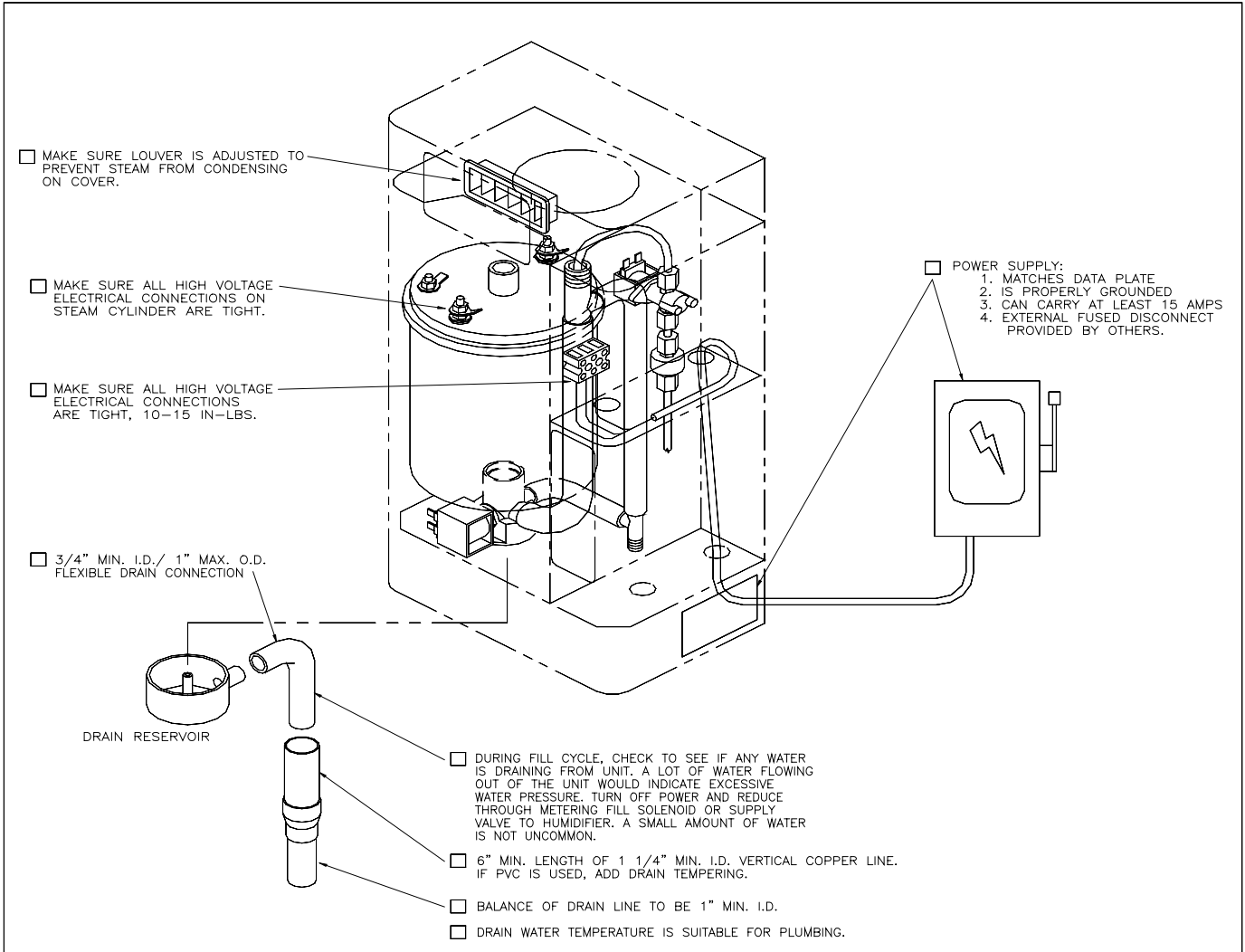


Figure 10

NOTE

The Herrmidifier 6000 Humidifier checklist is provided to help the installer insure a successful installation. If further assistance is needed from the Herrmidifier representative or the factory, the checklist is expected to be completed. If a jobsite visit is required from the Herrmidifier representative or the factory, and the checklist has not been accurately completed, additional charges will be required by the individual(s) representing Herrmidifier. If the visit uncovers a component malfunction, the parts will be replaced under warranty.

Project Name _____

Checklist completed by _____

Humidifier Installer (Company) _____

Checklist completion date _____

Maintenance

To maintain output, the water level in the cylinder will slowly move upwards, exposing new electrode to the water as the electrodes become coated with minerals. Eventually, all of the usable electrode surfaces will be coated and the cylinder will be full of water. At this point, the output will begin to fall and the red "service" light will come on. The unit will shutdown. This indicates the need to change the cylinder-typically 500-2000 hours of operation, depending on the quality of the fill water supply.

To remove the cylinder

1. Drain cylinder completely using the 'on-off- drain' switch.
2. Turn off power to the unit at the external disconnect. Disconnect electrode power wires (#38 & #39) and cylinder full electrode wire (#29) from the tank. These connections are 1/4" quick connects.
3. Disconnect 1" tube at top of tank.

4. Remove tank, clean out drain cup and insert with new tank. Be sure that "o" ring is in place on the cylinder fill/drain neck prior to installation (See Figure 11a). New "o" ring is included with each replacement cylinder.
5. Clean and check both the fill and drain valves while servicing the unit.
6. Check the strainer. If it is dirty or restricting the water-replace it.
7. Install cylinder in unit by pushing downward with a slight twisting motion, while ensuring proper orientation of tank within cabinet.
8. Reconnect electrode power wires #38 and #39, and cylinder full electrode, wire #29. Make sure that all electrical connections are securely tightened.
9. Follow cold start-up instructions on page 10. Monitor amp draw for several cycles.

Extended Shutdown

Always drain cylinder completely if unit will be off for an extended period of time. This will preserve the life of the cylinder.

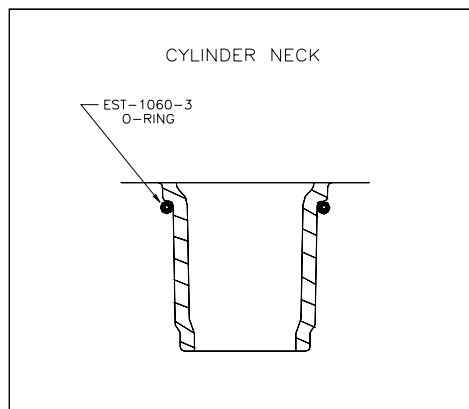


Figure 11A

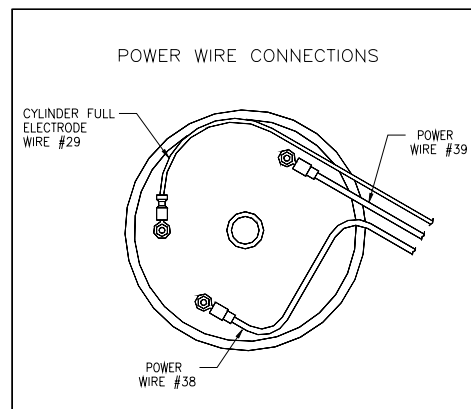


Figure 11C

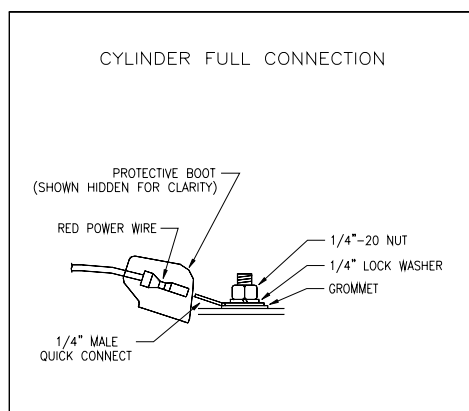


Figure 11B

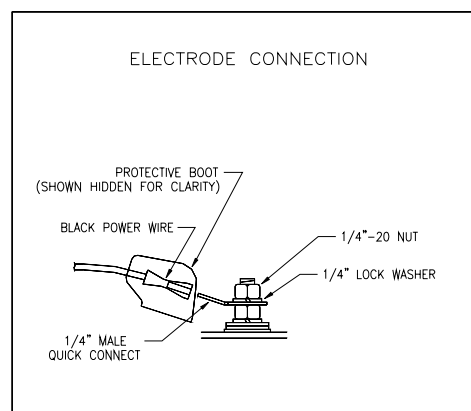


Figure 11D

SECTION V TROUBLESHOOTING GUIDE

All Herrmidifier 6000 Series Humidifiers are manufactured under strict quality control and are subjected to a complete operational test. All circuit board adjustments are made at the factory and should not be adjusted beyond the guidelines set in this troubleshooting guide without first consulting a factory representative. The following information is for your help and reference. If you still experience difficulty after trying these remedies, contact your Herrmidifier representative.

WARNING!

The Herrmidifier 6000 Series Electronic Steam Humidifier cabinet was designed to house and shield the components from outside interference. Absolutely NO other components may be mounted inside or be electrically tapped into the humidifier without Herrmidifier's express written permission. Failure to heed this warning will void your warranty.

TEST POINTS

Each circuit board (See Figure 12) features three test points to aid in the troubleshooting process. Each of these test points works on a 0-4 VDC scale. "0 VDC" = 0%. "4 VDC" = 100%. All readings are between the test point and ground (Molex J1, terminal 11 [far right of molex connector, hours wire #11]).

Test Point #1:

Provides exact reading of drain threshold setting.

Test Point #2:

Provides circuit board reference voltage. Should always read 4 VDC +/-2%.

Test Point #3:

Provides actual percentage of output. For example, a unit running at 80% of maximum output would have a Test Point #3 to ground reading of 3.2 VDC.

Maximum Capacity Setpoint

The potentiometer labeled "R39" located in the top left-hand corner of the board allows adjustment of the unit's

NOTE

All blower units have their capacity set from the factory at 4 lbs/hr. These units can have their capacity increased by increasing the capacity adjustment potentiometer. Ensure there is sufficient air circulation in the conditioned space to prevent condensation on walls or ceiling when increasing capacity beyond 4 lbs/hr.

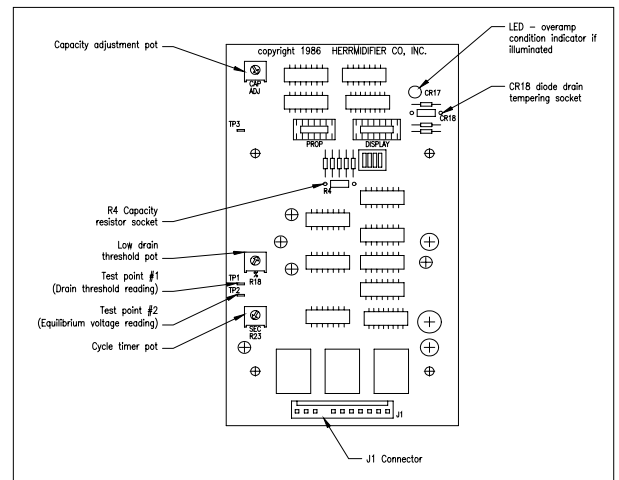


Figure 12

capacity in the range of 50-100% of maximum.

Circuit Board Settings

Models	Time Cycle R23	Low Drain Setting, R18	Capacity, R39
Standard Settings			
All	60 sec	90	100%
High Conductivity Settings (over 1000 micromhos)			
All	84 sec	93	90%
Softened Water Settings (750-1000 micromho)			
All	60 sec	92	95%
Low Conductivity Settings (<100 micromho)			
All	60 sec	85	100%

Problem / Symptom	Probable Cause	Reason - Correction
Overcurrent The alarm condition occurs when an overcurrent situation (>138% of rated current) has occurred and the humidifier has shut down to prevent any damage. This alarm indicates that there has been a significant reduction in resistance between the main legs of the supply power and the humidifier has been shut down to prevent damage and should be serviced before it is restarted. Overcurrent LED CR 17 (Figure 12) is illuminated.	Dead short between electrodes.	Replace the steam cylinder. Check resistance between electrodes with power "off"
	Restricted or blocked drain.	Clean and inspect drain system.
	Restricted fill system	Clean and inspect the fill system. Check for restriction or loss of supply pressure.
	Incoming water conductivity is outside the range of normal circuit board settings.	Consult the factory for options.
	Check amp draw to unit during start-up. If amp draw greatly exceeds rated amp draw, the drain threshold pot, labeled "% adj." (R18), must be increased 2% to increase the frequency and duration of drains to reduce the conductivity inside the cylinder.	Manually drain the unit and restart.
End of Cylinder This alarm condition occurs if the humidifier is unable to reach full output over a 6-hour timeframe. It is constantly switching between "fill" and "cylinder full" modes. This alarm indicates a need to change the cylinder that the water supply is low in conductivity that the water supply is low in conductivity, or that a foaming condition exists:	End of cylinder life – Cylinder life is typically between 500 and 2000 hours, depending on incoming water supply. (See unit operation section for typical cylinder life expectancy chart on Pg. 5).	For emergency use, you may restart the humidifier with the capacity setpoint, R39, at a lower level to allow operation until a replacement steam cylinder can be obtained. To clear the fault, turn the main disconnect to the unit "off" and then back "on".
	If incoming water supply is less than 100 micromho, the unit may not be able to pass the rated current through the water.	See – NON-FAULT ACTIVATED PROBLEMS GUIDE – "Unit fills to the cylinder full condition and remains cold"
	Foaming condition exists.	Flush and fill the steam cylinder several times and restart. If it persists, you must filter or treat the water to remove the foaming agent. See circuit board settings on previous page if supply water is softened. See NON – FAULT ACTIVATED PROBLEMS GUIDE – "Water foaming inside the cylinder"
Fill System Fault This alarm condition occurs when the fill valve has been energized for a 6-hour timeframe. The humidifier has been shutdown to prevent any damage.	Loss of or restricted water supply	Check fill system.
	Leaking drain system.	Check drain system.
	Defective drain valve.	Repair and replace as required.
	Defective fill valve.	Repair and replace as required.

NOTE: The three fault conditions outlined above will cause the humidifier to shut down and the service light on the front of the unit to illuminate. To clear these faults, the main power must be turned "off" and back "on" again.

Unit Detected Faults: (Red "Service" Light On)

Non-Fault Activated Problems:

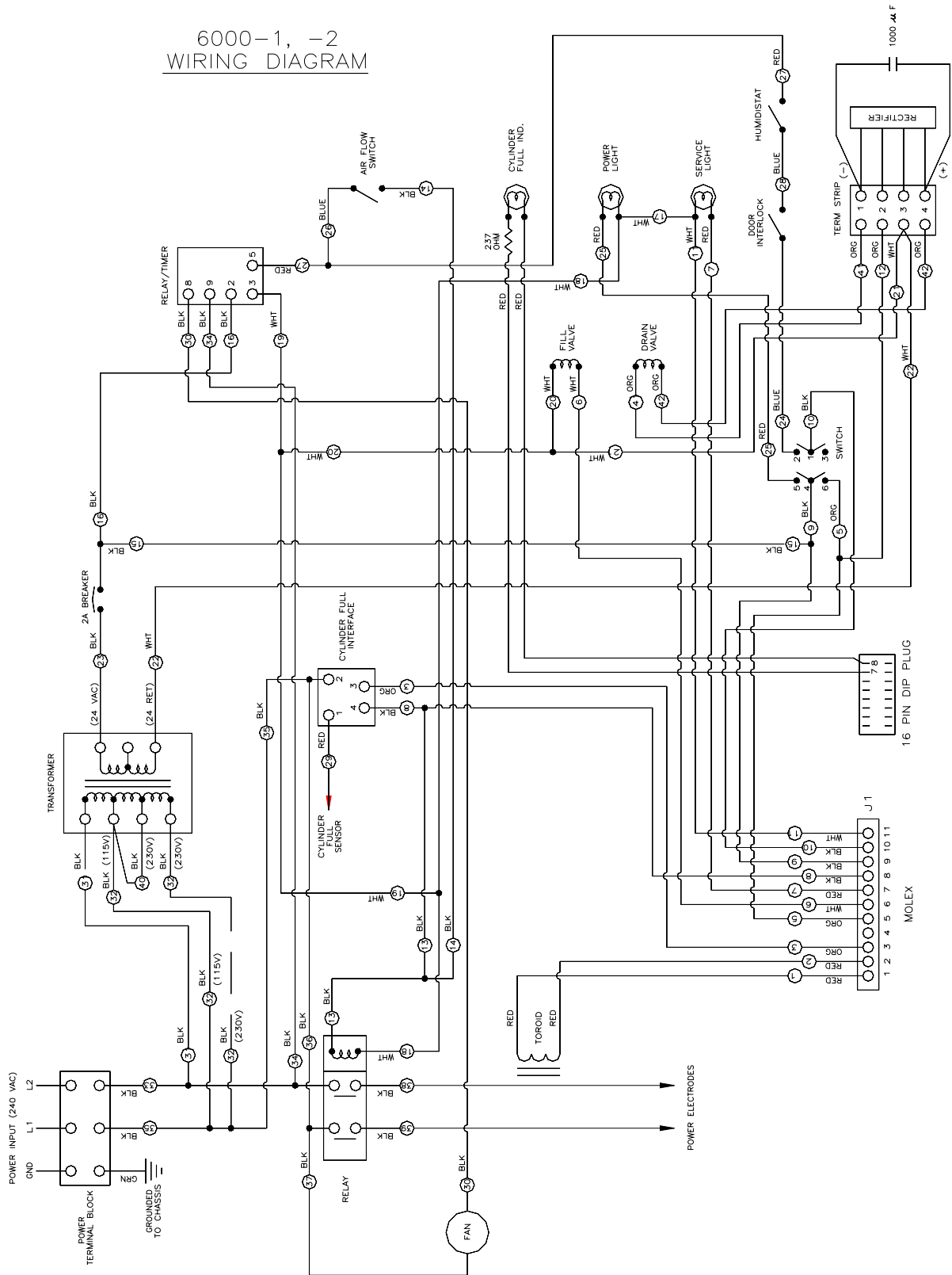
Problem / Symptom	Reason - Correction
24 VAC circuit breaker trips as soon as power switch is turned "on".	Check the wiring at the 24 VAC breaker for a short or loose connection.
	Disconnect the contractor coil from the circuit and repeat. If 24-volt breaker doesn't blow, replace the contractor.
	Replace the main circuit board.
24 VAC circuit breaker trips after the unit is turned on for about 15 seconds.	Disconnect fill valve from electrical circuit. If circuit breaker doesn't trip, replace the fill valve.
	Replace the main circuit board
24 VAC Circuit breaker trips whenever the drain valve activates	Disconnect drain valve from electrical circuit. If circuit breaker doesn't trip, replace the drain valve.
	Remove the drain valve and insure that it is clean and free of any obstructing mineral deposits.
	Replace the main circuit board.
Humidifier turned on but will not operate. Power lamp is "off".	Check power supply.
	Check circuit breaker.
	Check connector J1 on the circuit board and insure that it is plugged into the circuit board properly and that no wires are loose.
	Insure that there is 24 VAC between pole #9 and #11 connector J1. If not, check wiring.
	Place jumper between controls terminal strip #1 and #2. If unit operates, check controls settings and wiring (control stat, limit stat, air proving switch.)
	Check door interlock.
Unit turned "on". Contractor pulled in, but no water is entering the cylinder.	Check external shutoff valves and open if closed.
	Check strainer and fill valve for clogs. Turn adjusting screw (fig. 9, page 10)
	Check fill valve coil to determine if it is receiving 24 VAC. If so, replace the valve.
	Check for break in wiring.
Excessive arcing in cylinder	Check drain valve and insure that when it activates it drains freely. Clean if necessary. Replace valve if defective.
	Check water supply. If it is softened, increase the drain threshold pot, "% adj." (R18), up to 92%. (See Figure 12)
	Use high conductivity settings if water supply is very hard, >750 micromho.
	Unit filling slower or at the same rate as the water is boiling, causing over concentration and foaming. Check restriction in fill line. Adjust the metering fill valve to allow greater flow of water. (See Figure 9)
	Have water analyzed. If iron content is greater than .1 mg/1, a filter will have to be used.
	Consult factory with water analysis
Unit fills to the cylinder full condition and remains cold.	Check between Test Point #3 and ground with a multimeter set on VDC scale. Confirm the circuit board is seeing low current flow (<2.8 VDC). Proceed to next step.
	If on initial fill, unit reaches less than 70% of rated capacity (2.8 VDC on Test Point #3), adjust the drain threshold pot, "% adj." (R18), down 2-3%. Manually drain the unit down completely and add ½ Alka Seltzer tablet via the fill tee (GT-120). (See "Note" after item #9 on page 10.) Restart the unit while monitoring the amp draw. Fill unit ¼ full and turn "off" for several minutes to allow tablets to dissolve. Restart unit. If amperage rises rapidly, it may be necessary to dilute the water. If amperage rises slowly, add another Alka-Seltzer tablet.
	Check that drain valve is sealing properly.
	Check the water conductivity and consult the factory.
	Check the water conductivity and consult the factory.
Unit turned on a cycles for a short period of time. Then it stops in the middle of a fill cycle and won't reset until boiling stops.	Check cylinder fill interface connections.
	Check cylinder connections (See Figure #11)
	Check items in next troubleshooting tip concerning foaming.
	Check amperage between cylinder full electrode and cylinder full interface terminal #1. If it is greater than 7.0 mA AC is is, take a fill water sample and consult the factory.

Non-Fault Activated Problems – Cont'd

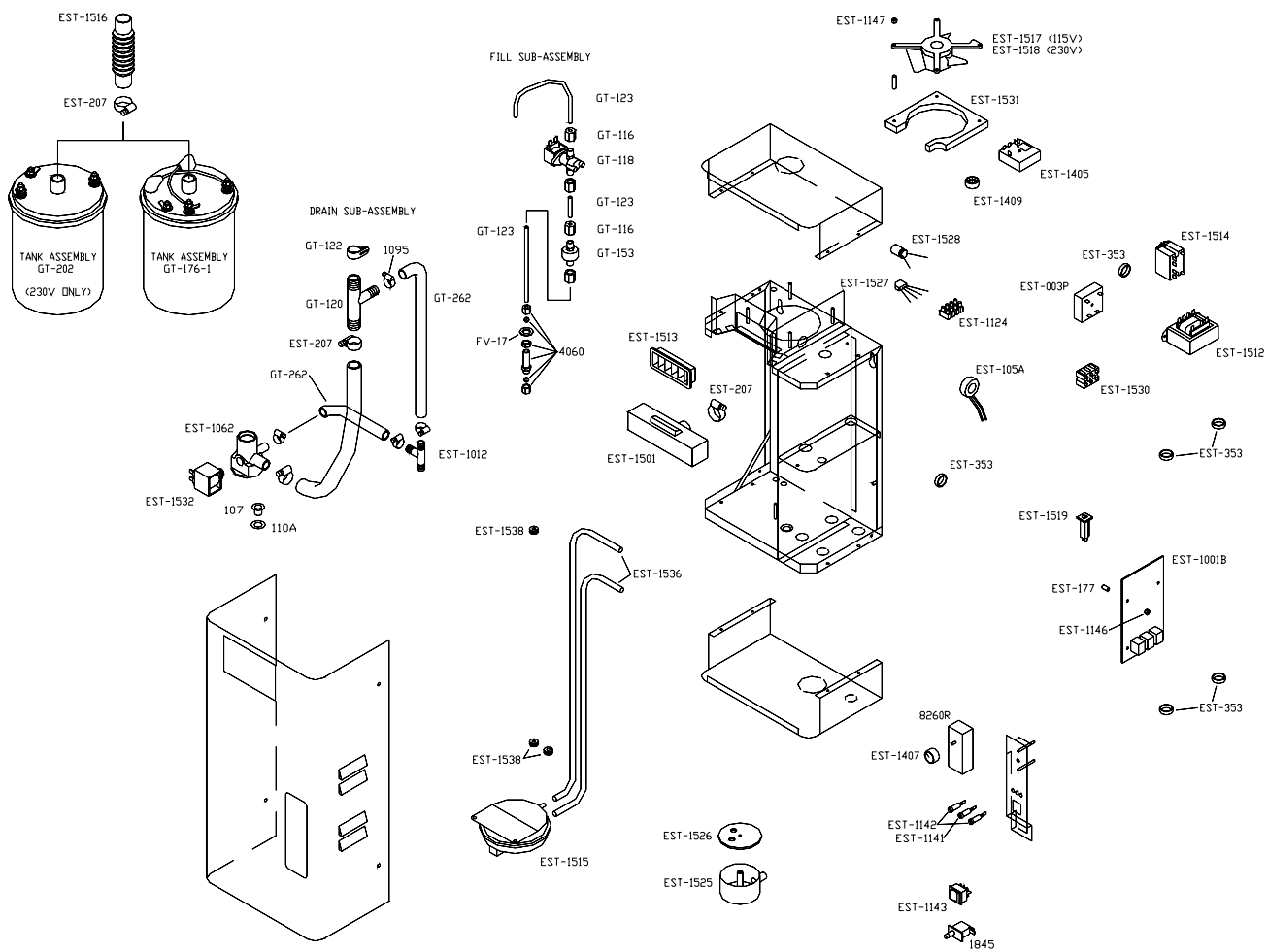
Problem / Symptom	Reason - Correction
Water "foaming" inside the cylinder.	Check drain valve and insure that water drains freely. If necessary, clean or replace valve if defective.
	Check water supply. If it is commercially softened, either increase the drain threshold (R18) to 92% or reconnect the unit to raw water. Drain and restart the unit. If the unit is connected to a hot water line, reconnect to the cold water line.
	If steam line is hard copper, drain cylinder and test unit operation disconnected from steam line to insure flux from solder joints is not causing foaming.
	Observe the fill tee (GT-120). If water is going down the overflow and the water level is low: Check to insure that static pressure in the duct is not forcing water down the overflow instead of allowing water to enter the cylinder. Adjust the fill-metering valve to regulate the water flow to the cylinder. (Figure 9) Unit filling slower or at the same rate as it is boiling off, causing over concentration and foaming. Fill rate must be increased. Open metering valve. If the fill valve is already fully open, get a water analysis and consult the factory.
Cylinder fills and overflows	Check cylinder wiring (See Figure #11)
	Check wiring of cylinder full interface.
	If more than 1.9 mA AC is passing between the cylinder full electrode and interface terminal #1, and when placing multimeter between terminal #3 and ground yields approximately negative 11 VDC, replace the interface.
	Replace the circuit board. Consult the factory after obtaining a water analysis
Unit turned on, fills to full amp draw, stops filling, and after a delay, the circuit breaker trips and the service light comes on.	Use the "On-Off Drain" switch to drain the cylinder. Turn the capacity adjustment pot (R39) on the main circuit board to 80% and restart the humidifier.
	Check the drain valve and clean or replace if necessary.
	If the drain valve doesn't come on before the service light illuminates, replace the main circuit board.
Unit cycle "on" and "off" rapidly	Check location and setting of high limit humidistat
Cabinet leaks	Check for loose connections
	Fill tube out of fill tee
	Steam cylinder out of drain cup
	Cabinet drain backing up, kink in drain line

Blower Version Wiring Diagram(6000-1 and 6000-2)

6000-1, -2
WIRING DIAGRAM



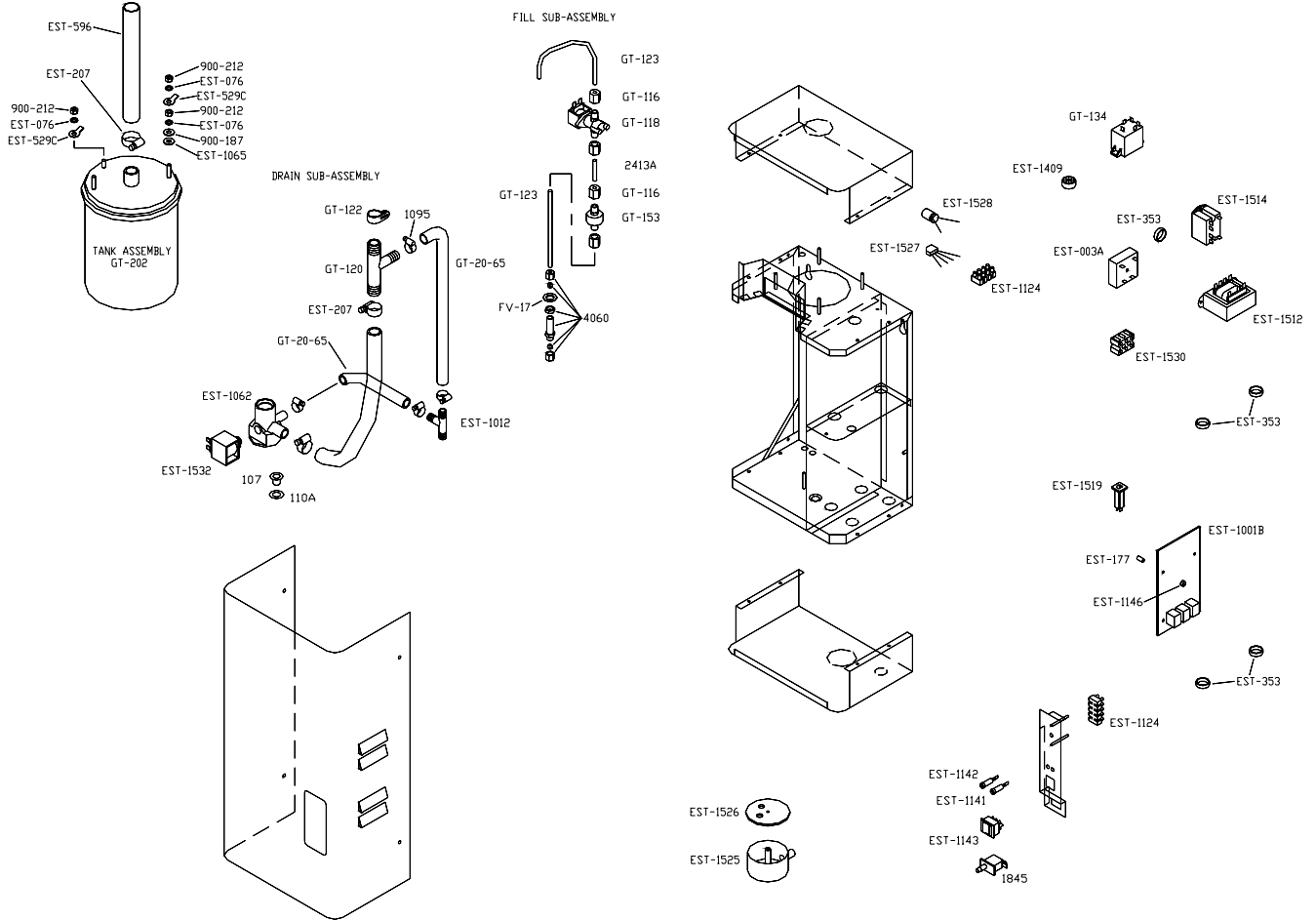
Blower Version Exploded View (6000-1 and 6000-2)



Blower Version Parts List (6000-1 and 6000-2)

1845	Door Interlock
1826	Humidistat Element
EST-003	Cylinder Full Interface (Set to "A")
EST-105A	Toroid Transformer
EST-1001B	Main Circuit Board
EST-1062	Drain Cup
EST-1124	Terminal Strip
EST-1141	Red Lamp
EST-1142	Green Lamp (2)
EST-1143	On Off Drain Switch
EST-1146	KEP Nut, 6-32
EST-1147	KEP Nut, 8-32
EST-1405	Timer/Relay
EST-1407	Knob
EST-1409	Universal Bushing
EST-1501	Steam Manifold
EST-1512	Transformer 115/230 to 24 VAC
EST-1513	Distribution Louver
EST-1514	Relay, 2 pole, 20 A
EST-1515	Differential Pressure Switch
EST-1516	Steam Hose
EST-1517	Fan, 115V
EST-1518	Fan, 230V
EST-1519	Circuit Breaker, 2A
EST-1525	Drain Reservoir
EST-1526	Drain Reservoir Gasket
EST-1527	Bridge Rectifier
EST-1528	Capacitor
EST-1529	Fan Cord
EST-1530	Terminal Block
EST-1531	Fan Shroud
EST-1532	Solenoid Operator w/ground wire
EST-1533	Drain Cup Assembly includes:
EST-1538	Grommet
EST-1542	Power Wire Assembly
EST-1543	Grommet, Vibration Dampening
EST-207	Clamp
EST-353	Bushing
GT-116	Celcon Compression Nuts
GT-118	Fill Valve
GT-153	Strainer
GT-202	Steam Cylinder Assembly (Standard 230V Units)
GT-176-1	Low Conductivity Steam Cylinder Assembly (Standard 115V Units) Drain Cup Assembly includes:
Solenoid Operator w/ ground wire	

Ducted Version Exploded View (6000-3 and 6000-4)

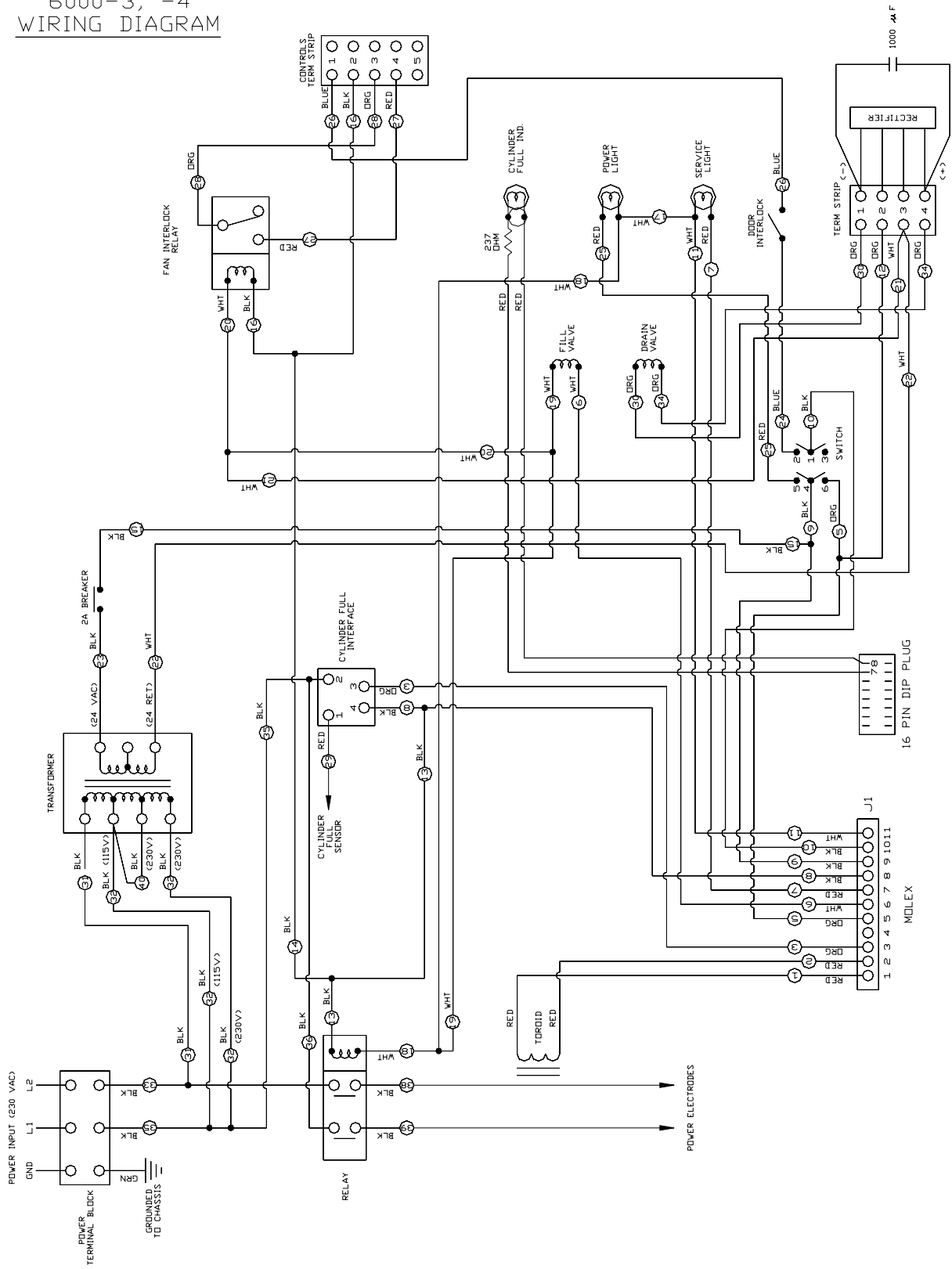


Ducted Version Parts List (6000-3 and 6000-4)

1845	Door Interlock
EST-003	Cylinder Full Interface (Set to "A")
EST-105A	Toroid Transformer
EST-596	Steam Hose
EST-1001B	Main Circuit Board
EST-1062	Drain Cup
EST-1124	Terminal Strip
EST-1141	Red Lamp
EST-1142	Green Lamp (2)
EST-1143	On Off Drain Switch
EST-1146	KEP Nut, 6-32
EST-1147	KEP Nut, 8-32
EST-1409	Universal Bushing
EST-1512	Transformer 115/230 to 24 VAC
EST-1513	Distribution Louver
EST-1514	Relay, 2 pole, 20 A
EST-1519	Circuit Breaker, 2A
EST-1525	Drain Reservoir
EST-1526	Drain Reservoir Gasket
EST-1527	Bridge Rectifier
EST-1528	Capacitor
EST-1530	Terminal Block
EST-1532	Solenoid Operator w/ground wire
EST-1533	Drain Cup Assembly includes:
EST-1542	Power Wire Assembly
EST-1543	Grommet, Vibration Dampening
EST-207	Clamp
EST-353	Bushing
GT-116	Celcon Compression Nuts
GT-118	Fill Valve
GT-134	Fan Interlock Relay
GT-153	Strainer
GT-202	Steam Cylinder Assembly (Standard 230V Units)
GT-176-1	Low Conductivity Steam Cylinder Assembly (Standard 115V Units) Drain Cup Assembly includes: Solenoid Operator w/ ground wire

Ducted Version Wiring Diagram (6000-3 and 6000-4)

6000-3, -4
WIRING DIAGRAM



SECTION VI SUGGESTED SPECIFICATIONS

Suggested Specifications

Part I-Scope

- Furnish a system of humidification for the areas known as _____.
- Operation of the system shall be controlled automatically to maintain _____%R.H. at _____ (F with a tolerance of +/- _____%R.H.
- Warrant the system for a period of two years from date of shipment (except for the replaceable steam cylinder).
- Provide (1) owner's manual to cover installation, start-up, operation and maintenance.

Part II -Scope

- Furnish self-contained electrode steam humidifier(s) with a capacity of lbs./hr. with a power supply of _____V/Ph/Hz. The humidifier shall be capable of operating on water of 60-1000 micromho. The equipment shall be supplied per the schedule on the drawings. The humidifier shall be Model 6000- _____as manufactured by Herrmidifier Company, Inc., Lancaster, PA.
- Units shall have a replaceable sealed steam cylinder with zinc plated electrodes with a published cylinder life based on incoming water conductivity.
- Water make-up system shall include inlet strainer, solenoid valve with flow regulator, and fill tee with built-in air gap to prevent back siphoning.
- Drain system shall consist of a silent operating DC valve, with shielded core dry operator, and integral air gap to comply with state and municipal codes.
- Steam distribution system shall be:
 - Integral housed blower to discharge steam directly into room without mineral dust can-over. Units shall have integral air proving switch and time-delay included to insure proper distribution of steam.
- OR
- Ducted application shall distribute steam via a stainless steel distribution pipe constructed to allow application in horizontal or vertical mounting position. Steam pipe shall be built with an integral pitch to allow any condensate to drain back to the cylinder.
- Unit shall include solid state control, which automatically adapts to incoming water to optimize operation of the steam cylinder. Control shall sense high water level via a probe and modify operation when this level is reached. Control shall provide drain tempering by mixing cool fill water with hot drain water to allow use of PVC drain lines. Fault conditions detected by control shall be "overcurrent," "fill system," and "end of cylinder life."
- Circuitry shall include "capacity adjustment" potentiometer to allow capacity to be adjusted from 50- 100% of factory set maximum.
- Indicator lights shall include "Power On," "Cylinder Full," and "Service."
- Unit shall have a cover interlock safety switch.
- Enclosure to be 18-gauge powder coated steel, contoured to conceal all service piping connections.
- The humidifier shall be controlled by a 24 VAC on/off humidistat. Blower version shall have integral humidistat and air proving switch. Ducted versions shall have remote mounted control and high limit humidistats and air proving switch.
- The humidifier shall have a built-in contractor to break power to all electrodes when humidity level is satisfied.
- The unit shall be UL and CUL listed.

Part 3 -- Execution

- The humidifier shall be wall mounted. The installation shall be in accordance with the manufacturer's instructions. Special consideration must be given to clearances to insure adequate space for absorption of vapor into the room or duct, whichever may apply.
- Provide water supply within pressure and conductivity criteria. Softened water is acceptable.
- Provide unit drain.
- All wiring shall be in accordance with applicable sections of national, state and local electrical codes. The contractor shall provide and install external overcurrent protection and install system wiring in accordance with the manufacturer's requirements.



engineered humidification systems

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