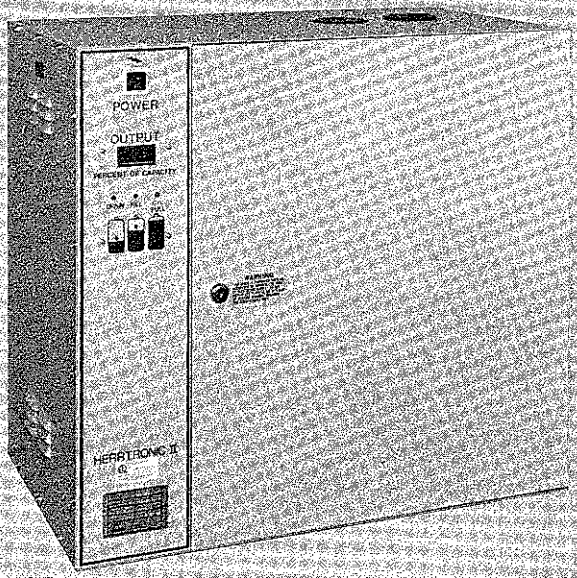
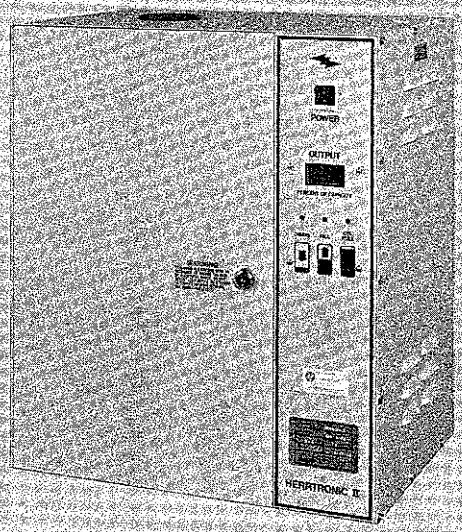
READ AND SAVE THESE INSTRUCTIONS

HERRTRONIC II SERIES

ELECTRONIC STEAM HUMIDIFIERS



MODEL HST
(30-100 lbs./hr.)



MODEL MHST
(5-30 lbs./hr.)

MODEL HST (110-200 lbs./hr.)

LISTED HUMIDIFIER

CSA CERTIFIED

Owner's Manual and Installation Instructions

HERRMIDIFIER®

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CONTENTS

	Pages
Unit Operation	2-3
Engineering and Installation	4-5
Mounting Instructions	6-7
Distribution Method	8
Plumbing Connections	9
Power Supply Connections	10
Control Circuit Connections	11
Start-Up Instructions	12
Maintenance Instructions	13
Troubleshooting	14-16
Optional Diagnostic Circuitry	16
Room Distribution Unit	17-20
Appendix A - Standard Control Hookups	21
Appendix B - The Circuit Boards	22-23
HST Series Exploded View and Parts List	24-25
MHST Series Exploded View and Parts List	26-27
HST Series and MHST Series - Unit Wiring Diagram	28-29

UNIT OPERATION

The **HERRTRONIC II** electronic steam humidifier represents the technological forefront of the humidification industry. Using advanced microprocessor controls, the **HERRTRONIC II** automatically adjusts to any water quality in the range of 100 to 1500 micromhos.

1. On initial start-up, when the humidistat calls for humidity, the fill valve will open and allow water to enter the cylinder. When the water level reaches the electrodes, current will flow and the water will begin to warm up. The cylinder will fill to 100% amp draw and stop. As the water continues to warm up, the conductivity will increase and the amperage will rise. The drain valve will then open when the amperage reaches 115% of rated amp draw and lower the amperage to the set point to prevent overamping. Boiling will commence.

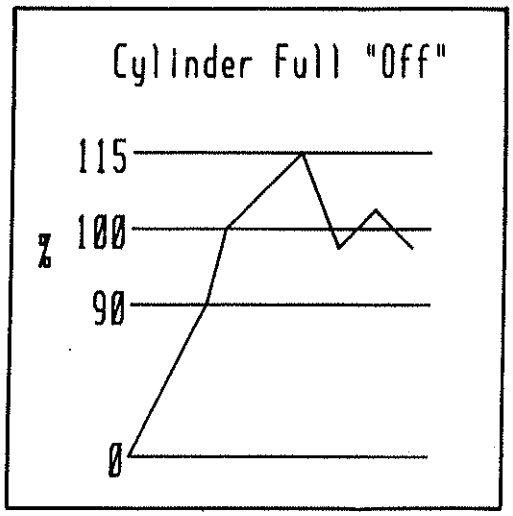


FIGURE 1

2. Alternatively, if the water is of low conductivity, the water level will reach the cylinder full electrode before reaching full capacity. The circuit board will then stop filling to prevent overflow and allow boiling to commence. As water is boiled off the mineral conductivity in the cylinder will increase and hence amperage draw will also increase. Eventually, the cylinder will reach full output and go to normal operation. No drain is permitted until this point.

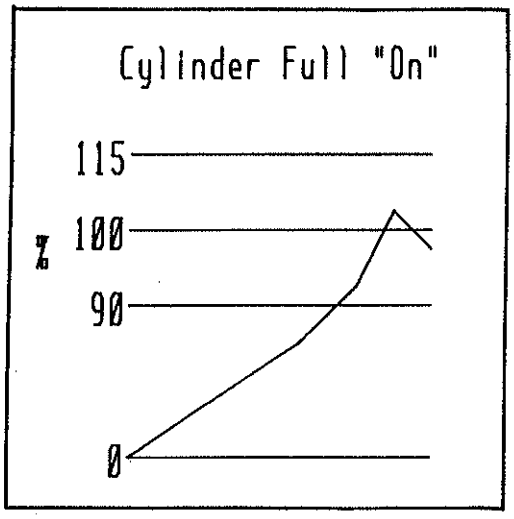


FIGURE 2

3. When full output is reached, the circuit board will monitor amperage changes (how fast amperage falls as water boils off). During these repeating time cycles, the fill valve will open periodically to replenish the water being boiled off and maintain a "steady state" output level right at the set point. The amperage variance permitted by the circuit board will depend on the conductivity of the water.

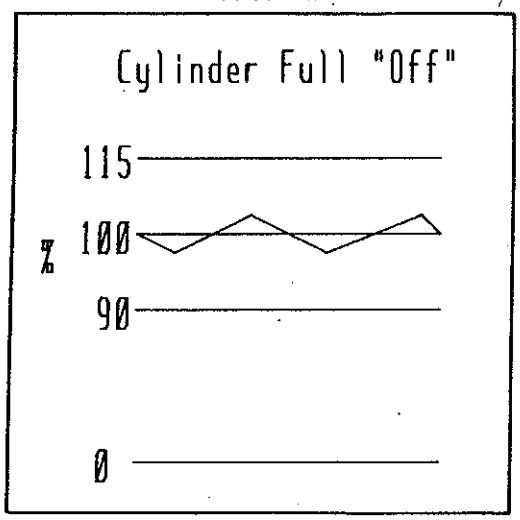


FIGURE 3

4. After a period of time, the mineral concentration in the cylinder will reach a level that the circuit board considers too high (as evidenced by the amperage change in the time cycle). At this point, the drain valve will open and drain enough of the mineral laden water and replace it with fresh water to significantly lower the mineral concentration and return the cylinder to "steady state" operation. This permits low drainage and high efficiency as well as prolonged cylinder life.

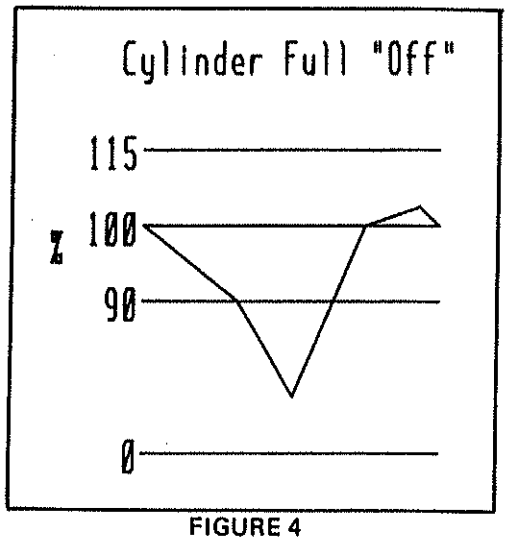


FIGURE 4

5. Over a period of time, the minerals in the water will coat the electrodes and cause a drop in current flow, as minerals can also insulate. As this happens, the water level in the cylinder will slowly rise, exposing new electrode surface to the water, and thus maintaining output and efficiency (better than 92%). Eventually, the water will reach the cylinder full electrode and indicate so by activating the cylinder full light. At this point, all usable electrode surface has been depleted and the cylinder should be replaced.

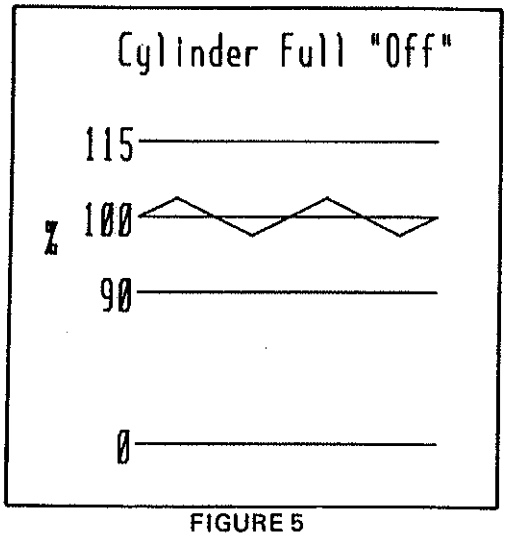


FIGURE 5

6. Once the usable electrode has been depleted, the output will begin to fall off to "0". This usually occurs in the last 300 hours of electrode life and should allow you adequate time to schedule maintenance.

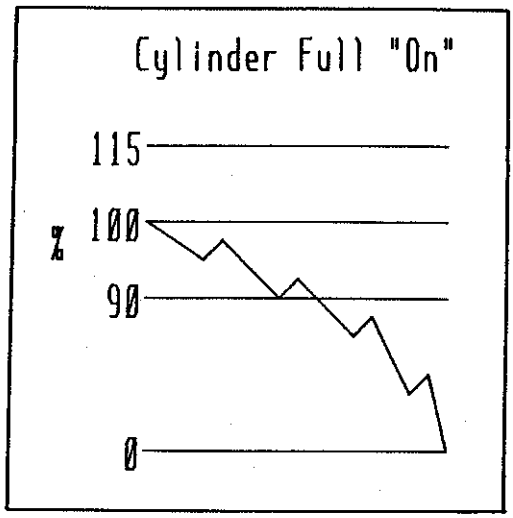


FIGURE 6

ENGINEERING AND INSTALLATION

SIMPLE AIR HANDLING SYSTEM

In most simple AHS, the air is generally recirculated except for a small (less than 15%) amount of outside air. A fan is used in conjunction with heating and cooling coils to maintain a desired temperature level. The Herrtronic II can be installed anywhere in this system, a minimum of three feet from any object (coil, fan, elbow, filter) downstream of it (See Fig. 7). Control of the humidifier is accomplished with either a room humidistat or a duct mounted humidistat on the return plenum. Whenever mechanical cooling is to be used at the same time as the humidifier, a high-limit humidistat should be installed in the coldest area of the duct, at least ten feet downstream of the humidifier. If airflow is intermittent, a fan interlock or airflow switch should be used to prevent operation of the humidifier when there is no air movement.

ECONOMIZER AIR HANDLING SYSTEM (Variable or 100% Outside Air)

In an AHS using the economizer cycle for free cooling, or with 100% outside air intake, the Herrtronic II can be installed in any area of the system except the return air plenum, the intake plenum, and the mixing chamber (See Fig. 8). The same three foot clearance rule applies in this application. Care must be taken to insure that the distribution manifold is not placed in an area of the duct where cold temperature could cause condensation of the steam. Installation of the manifold in the return plenum is useless as some or all of this air may be exhausted to the outside. Control is accomplished by a humidistat in the room or return air plenum. A high-limit humidistat is always recommended and an airflow switch should be used when intermittent air flow is a possibility.

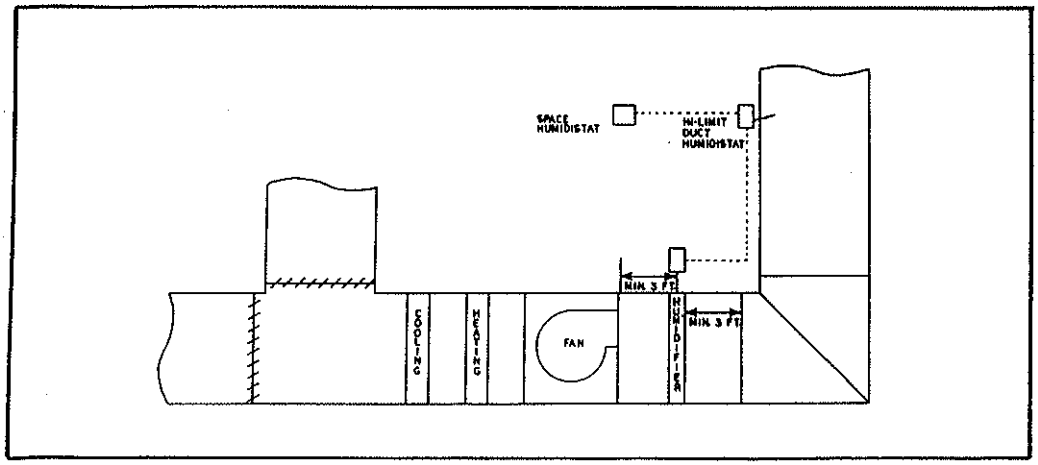


FIGURE 7

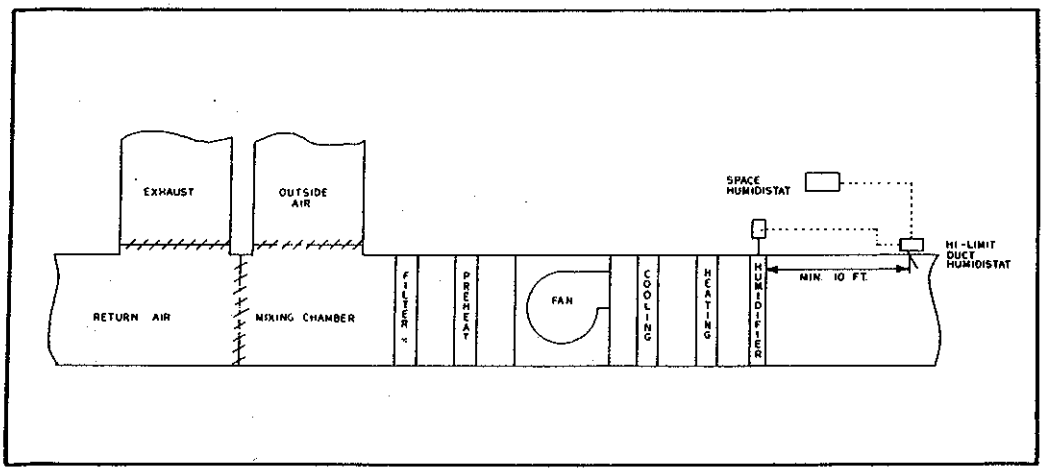


FIGURE 8

DOUBLE DUCT AND MULTIPLE AREA SYSTEMS

In this application results are best served by use of primary and secondary humidifiers (See Fig. 9). The primary humidifier should be installed in the common plenum, before it divides, and controlled by a duct mounted humidistat placed downstream of the humidifier. As an alternative in special applications, the primary humidifier may be located in either the hot or cold ducts and then controlled the same way. The secondary humidifier is placed in or after the mixing plenum supply to each individual area and may be controlled by a duct or room mounted humidistat.

LARGE SYSTEM-STEPPED CONTROL

In very large air handling systems, particularly those on the economizer cycle or 100% outside air intake, the humidification demand load may vary to extremes. In this application, the best results are obtained by use of two humidifiers, one acting as a primary and one as a secondary. The humidifiers are stepped by use of different starting points. The primary humidifier should be sized for approximately 1/3 of the load. This will provide precision control for small demand periods. The secondary humidifier should be sized to handle the remaining 2/3 of the load and will operate only as a supplement to the primary humidifier. Control is accomplished by room or return air humidistats connected to a step controller which then controls the humidifier. A high-limit humidistat is recommended as is an airflow switch when air flow may be interrupted.

OTHER APPLICATIONS

This brief listing of applications is by no means exhaustive or complete. **Herrmidifier Co., Inc.** has built a reputation on innovation and technological superiority. If you have a special project or application, chances are we have already encountered it and may have the solution waiting for you. If not, we will do our best to work with you in designing a humidification system to meet your needs.

Note: If duct liner is used, insure that the steam output does not impinge on the liner.

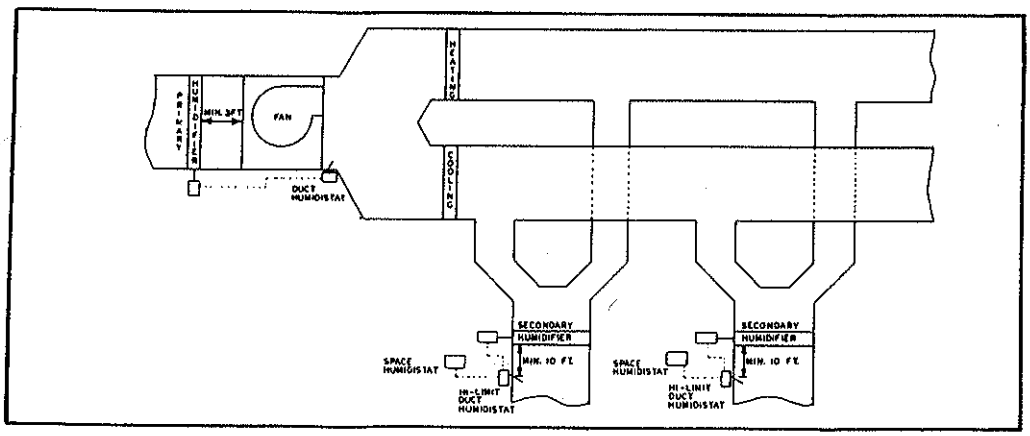


FIGURE 9

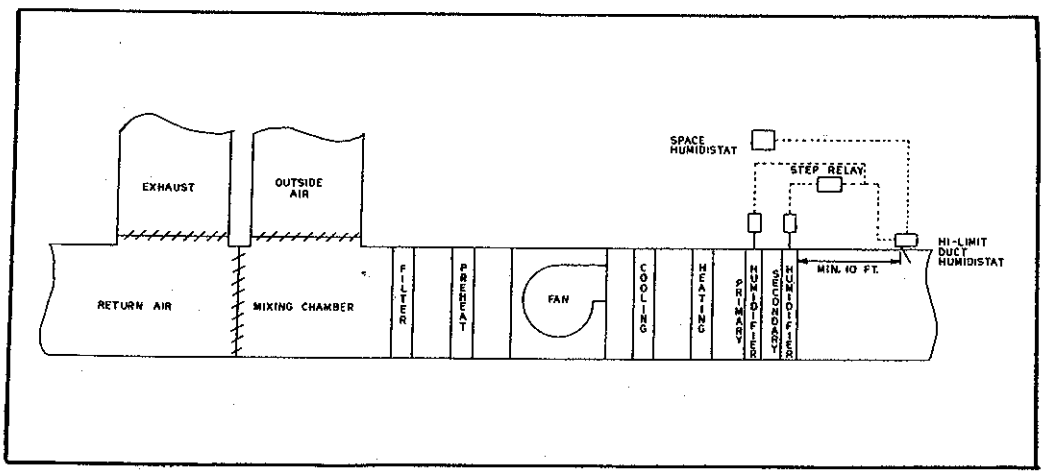


FIGURE 10

MOUNTING INSTRUCTIONS

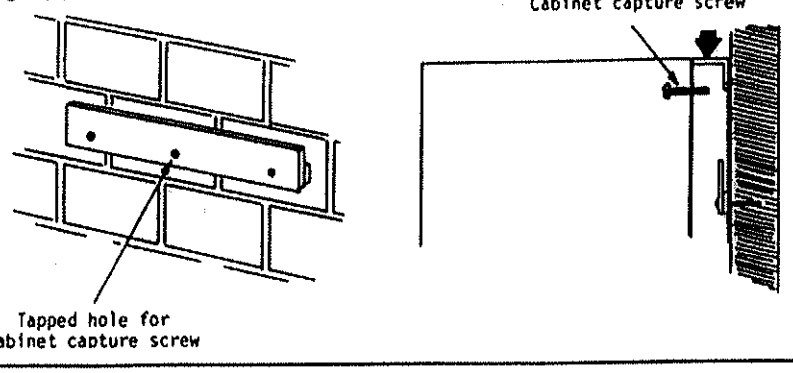
Correct positioning of the Herrtronic II is important to allow for proper operation and easy maintenance. Minimum clearances around the cabinet should be maintained as shown in the two figures "MHST—Series Minimum Cabinet Clearances" and "HST—Series Minimum Cabinet Clearances." Remember, the cabinet was designed to safely contain the working parts of the Herrtronic II and dissipate heat to protect the electronics. Never allow things to be piled up around the cabinet which could defeat its purpose. With the exception of connecting external controls or Room Distribution Units to the Control Wiring Box, **NEVER** mount any controls inside the unit or tap any power from any location inside the unit.

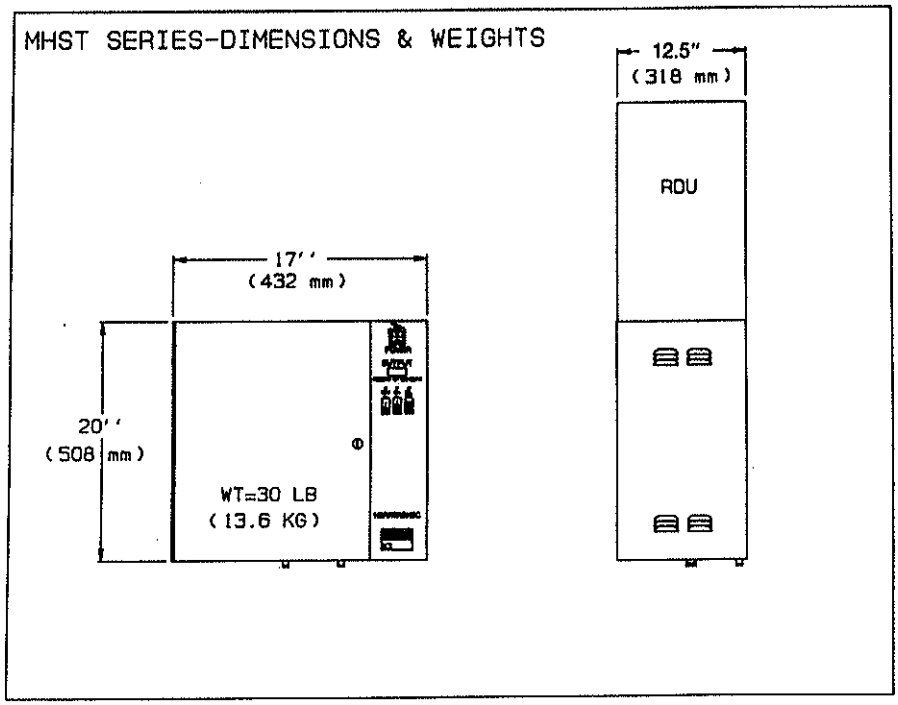
A mounting bracket is supplied with each Herrtronic II and is designed to be secured to the wall by use of the two lag screws supplied. Be sure the bracket is secured to the wall by use of lag shields or directly to wood studs 2" thick or greater. **NEVER** attach to dry wall without studs. A threaded hole in the center of the mounting bracket is designed to hold a capture screw (supplied) which inserts from inside the cabinet.

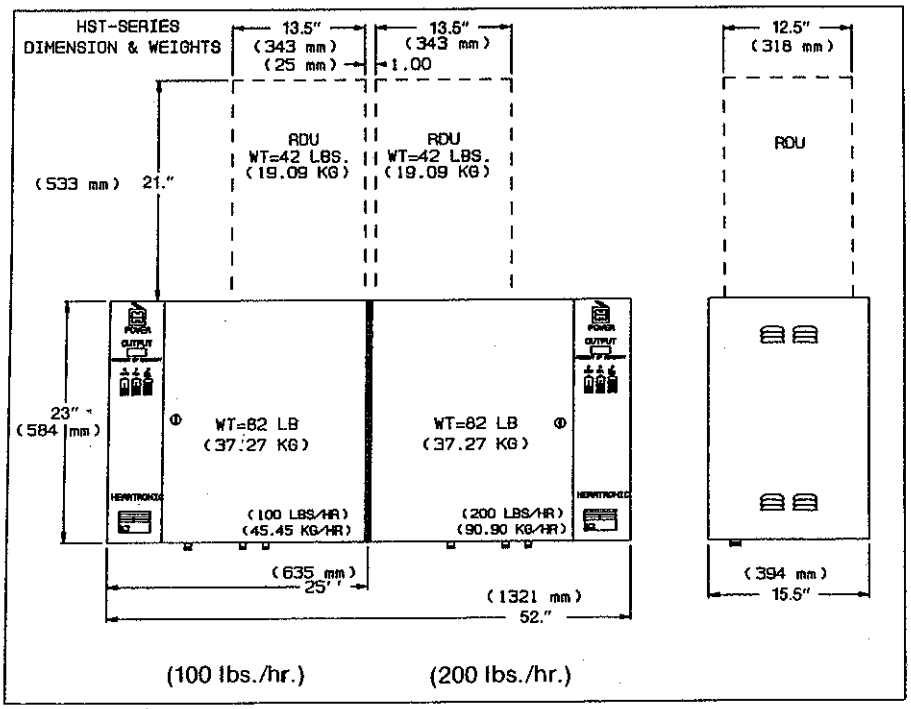
NOTE: HERRTRONIC II ELECTRONIC STEAM HUMIDIFIERS, ROOM DISTRIBUTION UNIT, STEAM PIPES, AND ANY ACCESSORIES SHOULD BE LOCATED IN A MANNER TO FACILITATE ROUTINE INSPECTION AND ANY NECESSARY MAINTENANCE.

LOCATION OF THIS SYTEM IN SUCH A WAY THAT UNUSUAL INSTANCES OF MALFUNCTION COULD CAUSE DAMAGE TO UNREPLACEABLE OR PRICELESS PROPERTY (SUCH AS ABOVE FALSE CEILINGS) IS NOT RECOMMENDED.

FIGURE 11

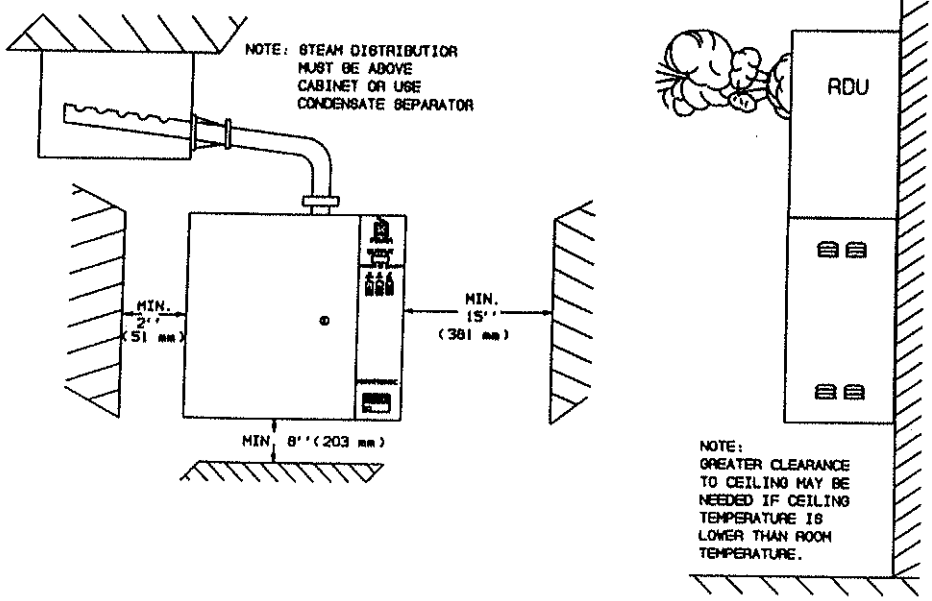




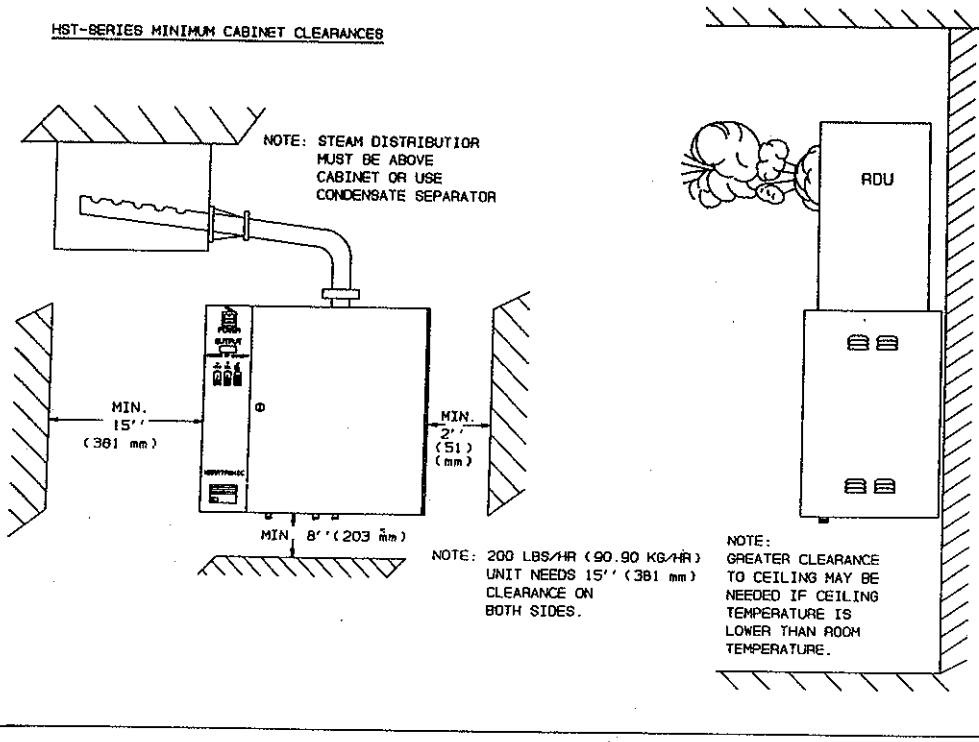


SEE RDU SECTION FOR ROOM DISTRIBUTION UNITS REQUIRED HORIZONTAL AND VERTICAL CLEARANCES. (See Page 20)

MHST-SERIES MINIMUM CABINET CLEARANCES



HST-SERIES MINIMUM CABINET CLEARANCES



DISTRIBUTION METHOD

Each steam cylinder requires at least one outlet for steam via a duct distributor pipe or Room Distribution Unit.

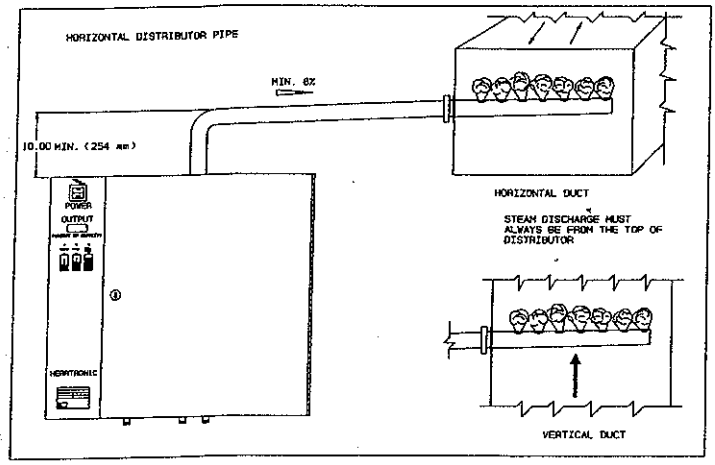
STEAM DISTRIBUTOR PIPES

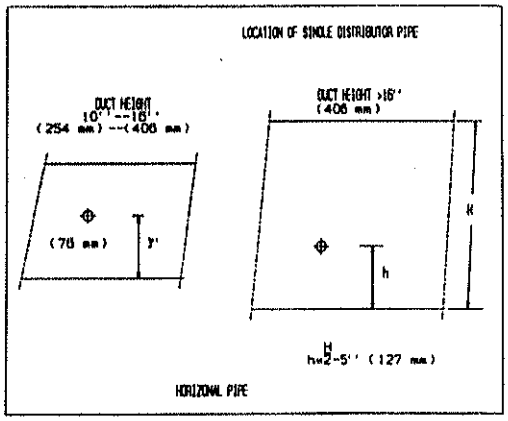
Herrmidifier supplies stainless steel duct distributor pipe(s) for use in injecting pure steam into ducts. A minimum of 3' downstream clearance before any bends or obstructions is recommended for most applications, however differing pyschrometric conditions may require a greater of lesser steam absorption distance. Consult your representative or the factory if you have any questions. The duct distributor pipes have a built-in pitch to allow condensate drainage back into the hose. **The rubber steam hose is of large diameter and is meant to carry steam up to the distributor pipe and condensate back to the steam cylinder for reuse.** Because of this dual-purpose of the steam hose, it must be installed with a minimum 8% pitch back to the Herrtronic II unit as specified. **Never** allow any low areas in the hose where condensate might collect and block the flow of steam. Since steam output losses are directly related to the distance from the humidifier to the steam distributor, it is recommended:

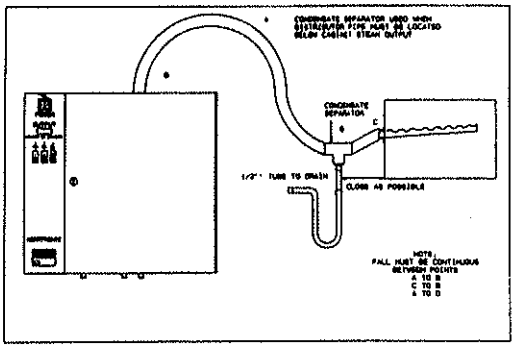
a. Mount the unit as close as possible to the steam distribution pipe.
b. Whenever possible use 1 1/2" I.D. insulated copper pipe, particularly if the length of run exceeds 20 feet.
c. Do not exceed a 30 foot run of steam hose as the actual capacity of the unit may be reduced by as much as 15% and the increased static pressure may cause static pressure problems with the fill cup.

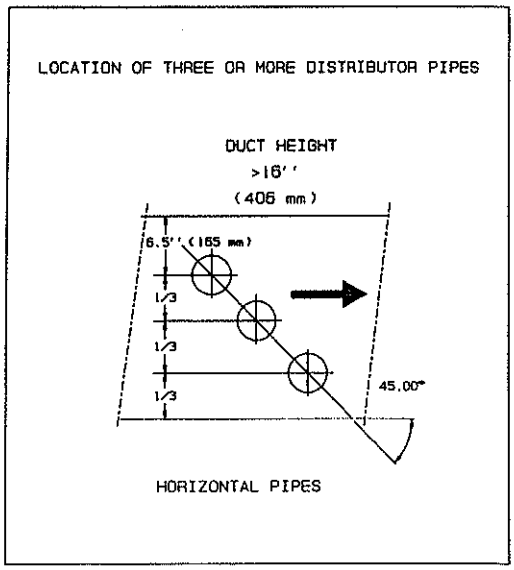
If you must mount the steam distributor pipe below the level of the humidifier, or if low spots in the steam line are unavoidable, a condensate separator is available from the factory (Part # EST-250). If you desire to split the output of one steam outlet into more than one steam pipe, steam hose "Y" connector assemblies are available from the factory (Part # EST-255). In this case, both ducts must be the same static pressure for proper distribution.

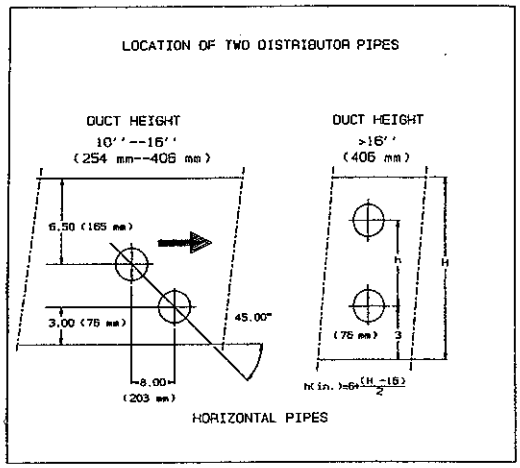
NOTE: DO NOT MOUNT THE HORIZONTAL STEAM DISTRIBUTION PIPE IN A VERTICAL DOWNFLOW DUCT. THE COMBINATION OF STATIC PRESSURE AND VELOCITY PRESSURE MAY BE MORE THAN THE CYLINDER AND/OR THE FILL CUP CAN HANDLE. STEAM HOLES ARE LOCATED WITHIN 1" OF MOUNTING PLATE AND CLOSED END OF DISTRIBUTION PIPE. CONSULT FACTORY IF SPECIAL HOLE LOCATIONS ARE REQUIRED.











PLUMBING CONNECTIONS

WATER FILL CONNECTIONS

1. Connect water supply to 1/2" compression fitting on the bottom of the cabinet.
2. Inlet pressure must be in the range of 30-80 psig. Consult the factory or your local representative if you are outside of this range.
3. The use of softened water requires that the "% pot" on the circuit board be increased from 80% to 90%. See diagram on page 22 for pot location.
4. Do not use reverse osmosis or de-ionized water treatment without first consulting the factory. Used straight, the water will not be conductive enough to allow proper conduction of electricity.
5. Do not use hot water.
6. Make sure there is an external shutoff valve to ease servicing of the unit.

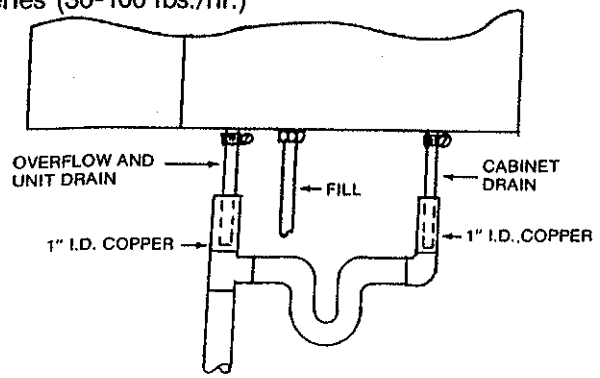
CYLINDER DRAIN CONNECTIONS

1. A 1/2" hose barb adapter extends beneath the bottom of the cabinet. Cut the 1/2" vinyl tube, which is supplied, in half. Use 1/2 for the cylinder drain fitting with a hose clamp supplied.
2. An optional tempering valve assembly is available to mix the hot drain water with cold tap water (Part #EST-1025). If you already have installed a tempering valve and are starting up the unit, be sure to adjust the valve on the assembly so that just enough cold water is mixed in with the drain water to accommodate your particular drain line situation. Opening the mixing valve too far could restrict the flow of drain water out of the cylinder and lead to overconcentration.
3. If located in a personnel area, we recommend insulating the drain line for safety.

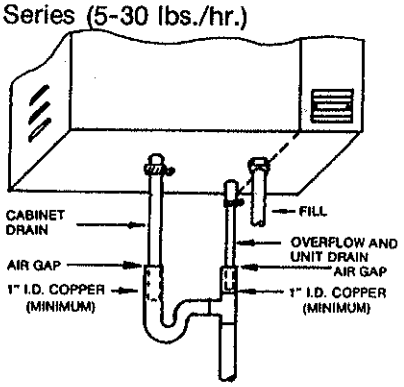
CABINET DRAIN CONNECTION

1. A 1/2" brass tube on the bottom of the cabinet (1" threaded fitting on 100-200# units) is for cabinet drain. This is a safety drain and should be connected to the cylinder drain line in the manner shown below. The purpose of the small U-trap is to prevent flash steam from the drain line from returning to the cabinet. The bottom of the cabinet is sealed to provide an integral drain pan.

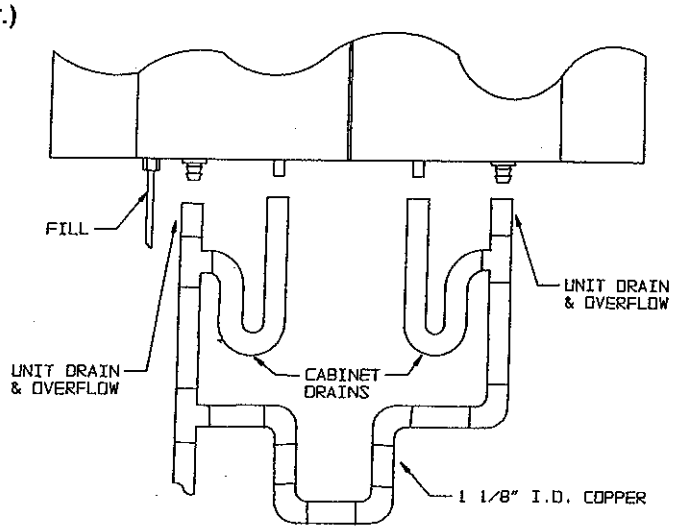
HST Series (30-100 lbs./hr.)



MHST Series (5-30 lbs./hr.)



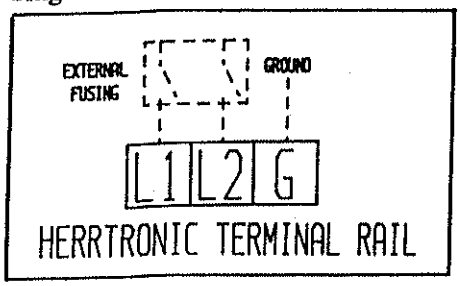
HST Series (110-200 lbs./hr.)



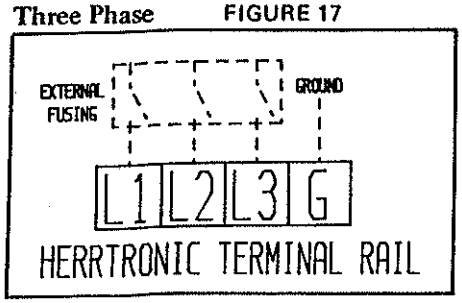
POWER SUPPLY CONNECTIONS

1. Terminals are provided in the upper left hand corner of the electrical compartment for field connection of the main power supply legs (single or three phase) and a ground wire.
2. Check to insure that available power supply matches voltage and phase of humidifier as specified on data plate.
3. Insure that adequate service is available to carry 125% of rated amp level (See Chart Below).
4. Install a dedicated fused disconnect next to the unit to protect the humidifier and provide for complete system shut down capabilities for service or extended shutdowns.
5. Internally, the units will automatically shutdown if current levels exceed 120% of the rated amp draw. If this occurs, the red light located on the top center portion of the main circuit board will illuminate. To reset, turn "on/off" switch to "off" position, turn off external disconnect, correct the cause of the over-current situation, turn on external disconnect and then turn unit on.

Single Phase FIGURE 16



Three Phase FIGURE 17



MHST Series

STEAM OUTPUT							
LBS/HR		5	10	15	20	25	30
KG/HR		2.27	4.54	6.81	9.08	11.4	13.6
INPUT KW		1.6	3.3	5	6.6	8.3	10.0
CURRENT, AMPS							
VOLTS/PHASE	208/1	8.0	16.0	24.0	–	–	–
	220/1	7.5	15.1	22.7	–	–	–
	240/1	6.9	13.9	20.8	–	–	–
	208/3	4.6	9.2	13.8	18.3	23.1	27.7
	220/3	4.3	8.7	13.1	17.3	21.8	26.2
	240/3	4.0	8.0	12.0	15.9	20.0	24.0
	380/3	2.5	5.0	7.6	10.0	12.6	15.2
	440/3	2.2	4.4	6.5	8.7	10.9	13.1
	480/3	2.0	4.0	6.0	7.9	10.0	12.0
	600/3	1.6	3.2	4.8	6.4	8.0	9.6
NUMBER OF ELECTRODES							
VOLTS/PHASE	208/1	2	2	2	–	–	–
	220/1	2	2	2	–	–	–
	240/1	2	2	2	–	–	–
	208/3	3	3	3	3	3	3
	220/3	3	3	3	3	3	3
	240/3	3	3	3	3	3	3
	380/3	3	3	3	3	3	3
	440/3	3	3	3	3	3	3
	480/3	3	3	3	3	3	3
	600/3	3	3	3	3	3	3
# STEAM OUTLETS		1	1	1	1	1	1

NOTE: Three phase units not listed on chart below require the power supply to be connected to the left and right side electrical compartments.

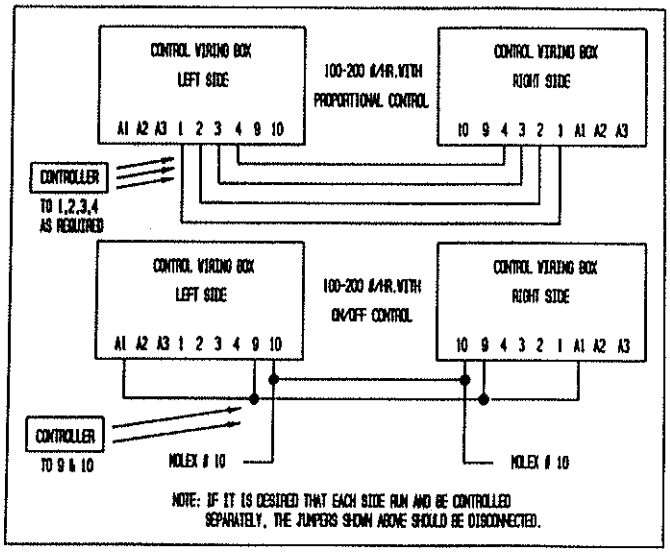
HST Series

STEAM OUTPUT																							
LBS/HR		10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
KG/HR		4.54	6.81	9.09	11.36	13.63	18.18	22.72	27.27	31.81	36.36	40.90	45.45	50.0	54.54	59.09	63.63	68.18	72.72	77.27	81.81	86.36	90.90
INPUT KW		3.3	5.0	6.6	8.3	10.0	13.3	16.6	20.0	23.3	26.6	30.0	33.3	36.6	40.0	43.3	46.6	50.0	53.3	56.6	60.0	63.3	66.6
CURRENT AMPS																							
VOLTS/PHASE	208/1	16.0	24.0	31.7	40.0	48.0	64.0	80.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	220/1	15.1	22.7	30.0	37.8	45.4	60.5	75.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	240/1	13.9	20.8	27.5	34.7	41.6	55.5	69.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	208/3	9.2	13.9	18.3	23.1	27.7	37.0	46.2	55.5	64.7	73.9	83.2	92.4	101.7	110.9	120.2	129.4	138.6	147.9	–	–	–	–
	220/3	8.7	13.1	17.3	21.8	26.2	35.0	43.7	52.4	61.2	69.9	78.7	87.4	96.1	104.9	113.6	122.3	131.1	139.8	148.6	–	–	–
	240/3	8.0	12.0	15.9	20.0	24.0	32.0	40.1	48.1	56.1	64.1	72.1	80.1	88.1	96.1	104.1	112.2	120.2	128.2	136.2	144.2	152.2	–
	380/3	5.0	7.6	10.0	12.6	15.2	20.2	25.3	30.4	35.4	40.5	45.5	50.6	55.7	60.7	65.8	70.8	75.9	81.0	86.0	91.1	96.1	101.2
	440/3	4.4	6.5	8.7	10.9	13.1	17.5	21.8	26.2	30.6	35.0	39.3	43.7	48.1	52.4	56.8	61.2	65.5	69.9	74.3	78.7	83.0	87.4
	480/3	4.0	6.0	7.9	10.0	12.0	16.0	20.0	24.0	28.0	32.0	36.1	40.1	44.1	48.1	52.1	56.1	60.1	64.1	68.1	72.1	76.1	80.1
	600/3	3.2	4.8	6.4	8.0	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.1	35.2	38.5	41.7	44.9	48.1	51.3	54.5	57.7	60.9	64.1
NUMBER OF ELECTRODES																							
VOLTS/PHASE	208/1	4	4	4	4	4	4	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	220/1	4	4	4	4	4	4	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	240/1	4	4	4	4	4	4	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	208/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	220/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	240/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	380/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	440/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	480/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
	575/3	6	6	6	6	6	6	6	6	6	6	6	6	12	12	12	12	12	12	12	12	12	12
# STEAM OUTLETS		1	1	1	1	1	1	1	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4

CONTROL CIRCUIT CONNECTIONS

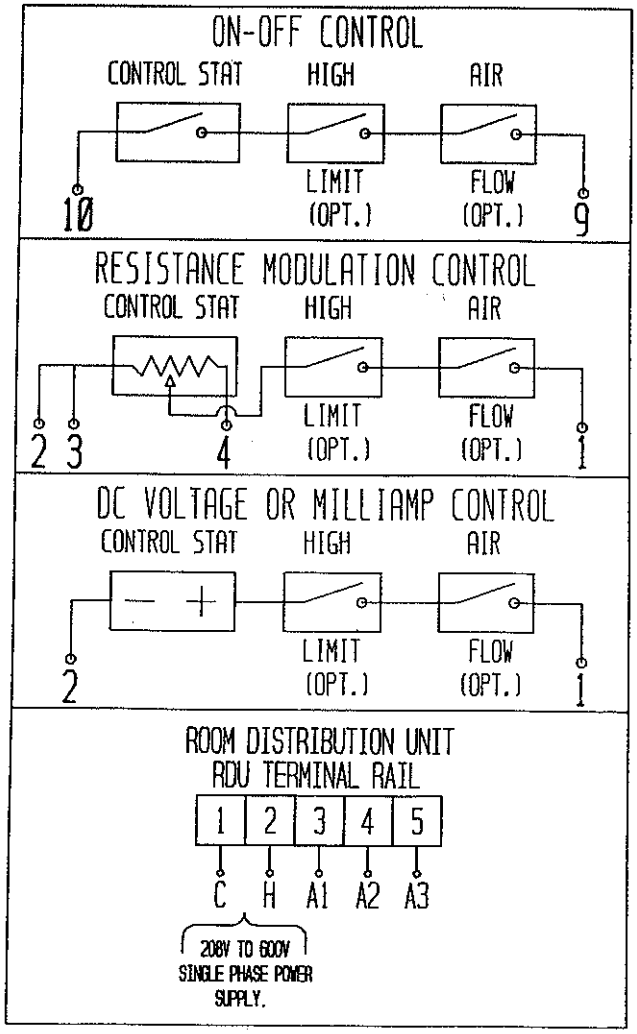
Pigtail wiring connections are provided in the control wiring enclosure for the connection of all external controls and RDU activation circuitry. Wires 1, 2, 3, 4, 9, 10 are for connection to humidifier controls. Wires A1, A2, and A3 are for connection to optional room distribution unit. See figures below for your particular application. When installing your humidity controller, **DO NOT** install inside your Herrtronic II electrical compartment. Installation of any extraneous devices inside the electrical compartment may cause erratic behavior of the circuitry and will **VOID** the warranty.

If you have ordered an optional room distribution unit (RDU), you will connect wires between the RDU terminal rail #3, 4, and 5 and wires A1, A2, and A3 in the Herrtronic II control wiring box. Terminal rail #1 and 2 in the room distribution unit connect to your 208 to 600 VAC single phase power supply. This power supply can come from the same external disconnect as the Herrtronic II but must not be tapped from inside the Herrtronic II. See picture below.



NOTE: FOR 110 TO 200 LB/HR UNITS, WIRES 1, 2, 3, 4, 9, 10 FOR THE TWO SEPARATE CONTROL CIRCUITS WILL BE CONNECTED VIA JUMPER WIRES TO ALLOW ONE SET OF CONTROLS TO HANDLE BOTH SYSTEMS. IF DESIRED, THESE JUMPER WIRES MAY BE REMOVED SO THAT THE SYSTEMS ARE CONTROLLED SEPARATELY AND THEREFORE ACT AS TWO DISTINCT HUMIDIFIERS.

FIGURE 19



See Appendix A for wiring of Honeywell H915A controller.

See Appendix A for wiring of Johnson Controls HC6100-1 controller.

See Room Distribution Unit section for complete RDU instructions.

START-UP INSTRUCTIONS

1. Check that the unit is properly mounted and level.
2. Check that the fill water, unit drain, and cabinet drain are properly connected.
3. Check that the correct voltage and amperage services are supplied.
4. Check that the unit was specified to match your controls and that all controls are wired properly.
5. Check that the steam distributor or room distribution unit 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 come loose in shipment.
7. With the manual drain switch in the "run" position, the on-off switch in the "off" position and the hi-limit and control humidistats at their lowest setting, turn on main disconnect. Display should read "off".
8. Turn control and hi-limit stats up to their highest setting. Turn on-off switch to "on". The contactor should immediately pull in and the display should read "00".
9. After approximately a twenty second delay, the fill solenoid should energize and water will begin filling the unit to the preset amp level or cylinder full depending on the incoming water supply. Insure that the water fills to "cylinder full" or that the display reads "100". Boiling will commence shortly. See note below.
10. Reset the control and hi-limit humidistats to desired levels.

There are several methods of adjusting the capacity of the units.

1. All units have a capacity reduction potentiometer on the main circuit board located in the top right hand corner. This pot can restrict the output of the unit by as much as 50%. The display will no longer fill to "100" but instead will fill to the new capacity level.
2. On proportional control units there is also a capacity reduction knob located inside the cylinder compartment which allows reduction of the units capacity to 20%. As in the case above, the display will reflect the new capacity output.

NOTE: IF YOU HAVE A UNIT WHICH HAS TWO POWER WIRES OR THREE POWER WIRES CONNECTED TO THE CYLINDER, YOU WILL FIND SEVERAL JUMPER WIRES IN YOUR ACCESSORY PACK. ON INITIAL START-UP, IF THE UNIT FILLS TO CYLINDER FULL (INDICATED BY LAMP ON THE FRONT OF THE HERRTRONIC II UNIT) AND REACHES LESS THAN 80% OF ITS FULL CAPACITY, TURN OFF THE UNIT, DISCONNECT THE POWER SUPPLY AND INSTALL THE JUMPER WIRES BETWEEN EACH POWER ELECTRODE AND THE UNUSED ELECTRODE NEXT TO IT AS SHOWN IN FIG. 1 (SINGLE PHASE UNITS) AND FIG. 2 (THREE PHASE UNITS) USING THE CONNECTION METHOD SHOWN IN FIG. 3 AND FIG. 4. DRAIN THE UNIT AND RESTART AS PER INSTRUCTIONS ABOVE.

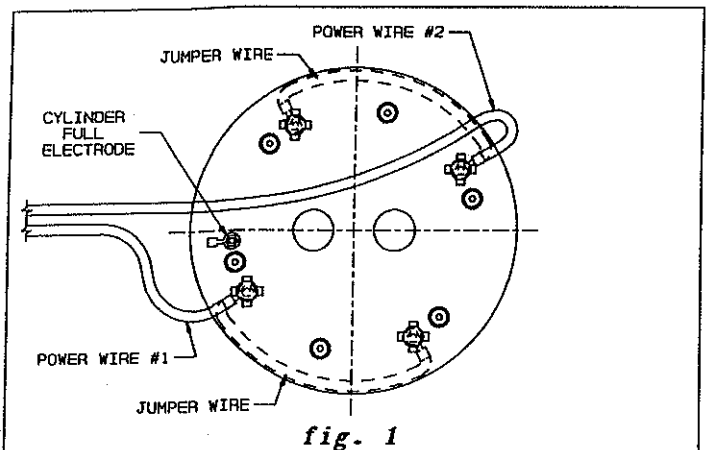


fig. 1

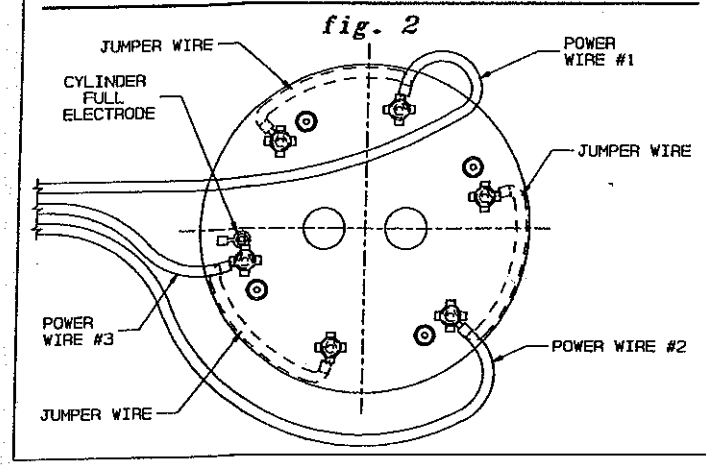


fig. 2

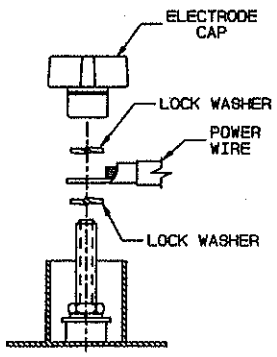


fig. 3

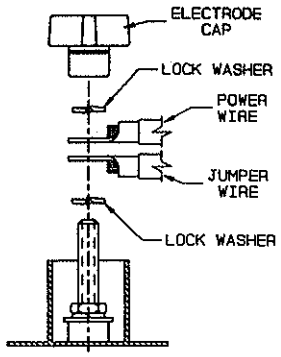


fig. 4

MAINTENANCE INSTRUCTIONS

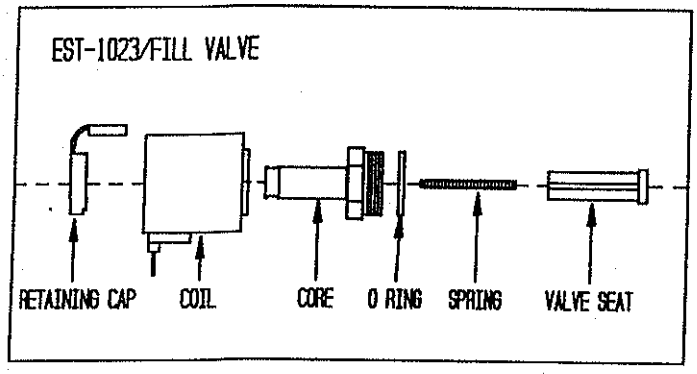
To maintain efficiency, the water level in the cylinder will slowly move upwards, as the electrodes become coated with minerals, to expose new electrode to the water. Eventually all of the usable electrode surfaces will be coated and the cylinder will be full of water. At this point, the "cylinder full" light will turn on and the output will begin to fall. This indicates the need to change the cylinder—typically 500-2000 hours of operation, depending on water supply.

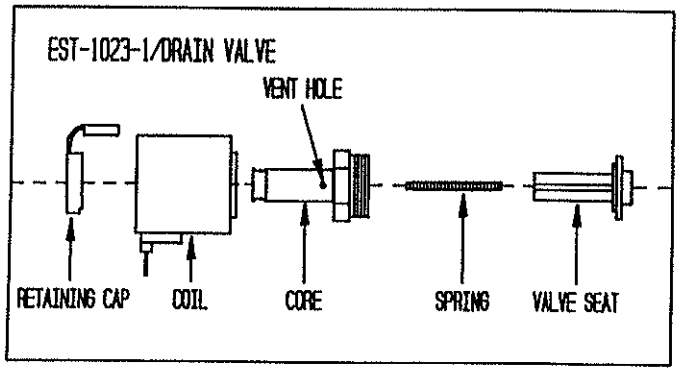
To remove the cylinder:

1. Drain cylinder completely using the Manual Drain Switch.
2. Turn off power to unit. Disconnect electrode power wires and cylinder full electrode wire from tank.
3. Remove tank and replace with new one. Be sure that both "o" rings are in place on the cylinder fill/drain neck prior to installation. Clean and check both the fill and drain solenoids while servicing the unit.
4. Install cylinder in unit. Make sure that all electrical connections are securely tightened.
5. Follow cold start-up instructions on Page 12.

Extended Shutdown.

Always drain cylinder completely if it will be off for an extended period of time.





WATER QUALITY CONSIDERATIONS

Electronic steam humidifiers rely on the mineral content in the water as a current path to generate heat and subsequently steam. As pure steam is produced, the mineral in the water stay behind in the cylinder or are flushed down the drain. The Herrtronic II Series Electronic Steam Humidifiers are designed to optimize performance of the unit versus the maintenance requirements of the cylinders by varying the drain rate based on the conductivity of the water inside the steam cylinder. Approximate cylinder life for various water qualities are listed below.

Hardness PPM	Average Life Expectancy Hours
60	2000
150	1300
300	800
450	650
600	500

TROUBLE SHOOTING

All Herrtronic humidifiers are manufactured under strict quality control and run through a series of tests. All circuit adjustments are made at the factory and should not be made in the field except under the direction of a factory representative. The following list is for your help and reference. If you still experience difficulty after trying these remedies, contact your Herrmidifier representative.

WARNING: The Herrtronic II Series Electronic Steam Humidifier cabinet was designed to house and shield the various components of the unit from outside interference from radio and other noise pollution. Absolutely **NO** other components may be mounted inside or electrically tapped into the humidifier nor may any components be adjusted without **Herrmidifier's** express permission. **Failure to heed this warning will void your warranty.**

1 Occasional false cylinder full indication due to foaming, reduced life on steam cylinder.

1. Check drain valve and insure that when it activates it drains freely. Clean if necessary and replace coil or valve if defective.
2. Check water supply. If it is commercially softened, reconnect the unit to a raw water supply, drain the cylinder and restart the unit. If the unit is connected to a hot water line, reconnect the unit to the cold water supply.
3. Observe fill cup. If water is going down overflow and water level is low:
   A. Install or reposition fill cup pad.
   B. If water supply pressure is high, it can be reduced slightly but unit should still fill to 100% after a normal cycle in about 2 minutes.
4. Unit filling slower or at the same rate as it is boiling water off causing overconcentration and foaming:
   A. Fill Rate must be increased. Check fill valve.
   B. If A is not possible, get a water sample or water analysis and consult factory.

2 Main 24 volt fuses blow as soon as unit is switched on OR unit goes immediately to fault.

1. Check the wiring at 24 volt fuses for short or loose connection.
2. Check to make sure the capacity resistor is in main board socket R4.
3. Remove contactor coil from circuit and repeat. If 24 VAC fuses don't blow, replace contactor.
4. Remove display board and proportional board from circuit. Jump two wire #9's and two wire #10's together in unit control wiring box. Disconnect two ribbon cables from main board (only one if unit is on-off control.) If fuses still blow, replace main circuit board. If not, add display board to circuit. If fuses blow, replace display board. If not, replace proportional circuit board.

3 Main 24 VAC fuses blow after unit is turned on for about 15 seconds.

1. Remove fill solenoid from circuit. If fuses remain in tact, replace fill solenoid coil.
2. Replace main circuit board.

4 Unit goes into fault shortly after start-up.

1. Check amp draw to unit on initial start-up. If reading greatly exceeds amp rating, the "% adj." pot, Pot 2 should be increased to cause the unit to drain more frequently and hence reduce the conductivity of the water in the tank. Manually drain unit down and restart.
2. Turn the capacity adjustment pot slightly counterclockwise. This will provide a buffer between the unit normal amp maximum and the overload amp level, a necessity with extremely conductive fill water.
3. Obtain a water analysis and consult the factory.
4. Check the fuses.

5 Main fuses blow whenever drain valve activates.

1. Open the drain valve and insure that it is clean and free of any obstructing mineral deposits.
2. Remove drain solenoid from circuit. If fuses remain intact, replace the drain solenoid coil.
3. Replace the main circuit board.

6 Unit turned on but will not operate. LED display reads off.

The basic path of the 24 VAC switching voltage which turns the unit on is as follows. The power exits the transformer, goes through the fuse, and into the main circuit board through molex #9 which powers the display board and gives you the "Off" reading. Power from molex #9 also goes through the overcurrent circuit on the main display board and then exits through molex #10. From here the power goes through the external controls, the on-off switch, the door interlock, the manual drain switch, energizes the contactor, travels through the auxiliary pole on the contactor, supplies power to the low voltage side of the cylinder full interface, and finally returns to the main circuit board molex #8 to energize the system. Following the power through the control loop will allow you to quickly determine the source of trouble.

1. Check RUN/DRAIN switch and place it in the "RUN" position. Contactor should pull in and the fill valve should activate.
2. Check for fault indication on main circuit board. If the red L.E.D., labelled CR17, on the main board is lit, this indicates a fault situation. The main disconnect must then be turned off and then on again for proper operation.
3. Check door interlock and on/off switch for continuity and replace if faulty.
4. If contactor has 24 VAC to coil and is not energized, replace it.
5. If contactor is energized, check continuity through the auxiliary pole. Reconnect to contactor or replace if necessary.
6. Check humidistats to insure that they are working properly.
   A. If On-Off Control, there should be continuity between the two wires marked #9 and the two wires marked #10. If not, check controls. If so, check auxiliary pole of contactor. Replace if defective. If 24 VAC is following circuit back to circuit board terminal #8 and the unit is not turning on, replace main circuit board.

Humidistat Setting	Between Terminals 2, 3-1	Between Terminals 2, 3-4	Between Terminals 1-4
High	@ 125	@ 125	0-10
Low	0-10	@ 125	@ 125

FIGURE 21

B. If proportional control, main unit can be operated without controls by jumping the two wires marked #9 and the two wires marked #10 together in the control wiring box and removing the ribbon cable connecting the main circuit board to the proportional circuit board. If unit works properly, reconnect proportional control board & return control wiring box to original position.
   1) Check to see that proper control signal is reaching proportional molex connector. Double check the polarity and that the control signal from your humidistat matches that which you specified on the unit order. If not, look for break in wiring.
   2) Check to see that there is continuity between molex #9 and molex #10 on the proportional circuit board. If not,
      A) Check resistors in proportional board. Replace if incorrect.
      B) Replace proportional circuit board.

7 Unit turned on but will not operate. Display is blank.
1. Check fuses and replace if faulty.
2. Check the molex connector on the circuit board and insure that it is plugged into the circuit board properly and that no wires are loose.
3. Insure that 24 VAC is reaching Molex #9 on main circuit board. If not, check wiring. If so, check ribbon cable connection between main and display circuit board.
4. Replace main and display circuit boards and ribbon cable.

8 Unit turned on. Contactor is pulled in, but no water enters the cylinder. Fill Light is On.
1. Check external shut-off valves and open if closed.
2. Check fill solenoid coil is receiving 24 VAC. If so, replace it.
3. Check for break in wiring.
4. Replace the circuit board.

9 Unit turn on. Contactor pulled in, but no water enters the cylinder. Cylinder full is not activated and fill light is off.
1. Remove proportional circuit board from circuit as described in step 6. If unit works properly, remove output potentiometer from circuit by placing a jumper between molex #5 and #7 on proportional circuit board. Put proportional board back in circuit. If unit works properly, replace output potentiometer or it can be left out of the circuit since there is also a capacity reduction knob on the main circuit board.
2. Replace main circuit board.

10 Unit turned on. Unit cycles properly for short period of time. Then it stops in the middle of a fill cycle and won't reset until boiling stops. Cylinder full light is on.
1. Check cylinder full interface connections. Make sure terminal #2 on the interface connects to the electrode farthest away from the cylinder full electrode.
2. Check items in first troubleshooting step if foaming exists.
3. Check amperage between cylinder full electrode and cylinder full interface terminal #1 by placing your multimeter in series between the cylinder full electrode and interface terminal #1. If it is greater than 7.0 mA AC, take fill water sample and consult the factory.

11 Cylinder fills and overflows. Cylinder full alarm does not activate.
1. Check wiring of cylinder full interface.
2. If more than 7.0 mA is passing between the cylinder full electrode and interface terminal #1, and when placing multimeter between terminal 3 and ground yields approximately - 11 VDC, replace the interface.
3. Replace the circuit board.
4. Consult the factory after obtaining a water analysis.

12 Excessive arcing in cylinder.
1. Check items in troubleshooting step #1 dealing with foaming.
2. Increase Pot 2 to 85-87%.
3. Have water analyzed. If iron content is greater than .1 mg/l, a filter will have to be used.
4. Consult the factory.

13 On cold start-up, unit fills, hits cylinder full and doesn't reach full amp draw.
1. If unit is high voltage, 380 VAC or higher, see instructions included in cylinder compartment for possible cylinder wiring alternatives.
2. If On-Off Control, drain unit down. Add 1 Alka-Seltzer tablet. Turn Pot 2 down to 77-78%. Restart unit while monitoring amp draw. If amperage rises rapidly, it may be necessary to dilute water to prevent the fuses from blowing. If amperage rises slowly, add another Alka-Seltzer tablet.
3. If unit goes back to cylinder full, check that drain solenoid closes tightly. Check conductivity of water and consult factory.

14 Unit turned on, fills to 100%, stops filling, and after a delay, the main fuses are blown or unit goes into fault.
1. Use the RUN/MAN DRAIN switch to drain the cylinder. Turn the output potentiometer in the cylinder compartment or the capacity adjustment pot on the main circuit board to 80% and put the unit on "RUN". After steady operation has returned, output pot can be turned back to 100%.
2. Check drain valve and clean or replace if necessary.
3. If no drain light comes on before the fault condition occurs, replace the main circuit board.

15 Unit on, display has inconsistant readings.
1. If unit has the optional proportional card, turn the output pot from 0 to 100 and back again. If the display changes erratically, replace the output potentiometer, otherwise replace the circuit board.

16 Contactor(s) chatter when energized.
1. Check main voltage and insure that the proper taps are used on the primary side of the transformer.
2. Check fuses in unit and replace if defective.
3. Check that 24VAC is available between S1 and S2 on the transformer. If not, change the primary taps or replace the transformer.
4. Check the controls to be sure there is no fluttering of the input signal or switches. If the inputs are not stable, replace the faulty control.
5. Clean the contactor coil or replace it.
6. Consult the factory.

17 Steam Pressure forces water out of the overflow and/or condensate is entering the duct work OR steam escapes into the cabinet.

1. Check steam hose(s) for low spots and correct so that an 8% pitch is maintained throughout the run or trap the low spots to remove condensate.
2. Check distribution manifold(s) and insure that the holes are facing upward and that the pipe is sloped toward its origin. If the manifold is to be installed vertically, contact Herrmidifier for a special manifold.
3. Check the drain valve in the unit and insure that it is clear and draining properly. Clean if dirty and replace if faulty.

18 Water collects in bottom of cabinet.

1. Check for escaping steam as in step above and correct accordingly.
2. Check all fittings inside cabinet, reseal and tighten if necessary.
3. If water is collecting on the top of the cylinder and running down into the drain pan, remove the hose(s) and replace if cracked, otherwise, tighten hose clamp.

19 Unit goes into fault when amp draw is low and proportional signal or output knob is adjusted.

1. Replace circuit board with EST-1001A circuit board.

NOTE: OF COURSE, READING THE MANUAL BEFORE START-UP IS ALWAYS A GOOD IDEA. IF YOU ARE NOT ABLE TO SOLVE YOUR PROBLEM FROM THIS GUIDE, CONTACT YOUR HERRMIDIFIER REPRESENTATIVE.

Optional - Diagnostic Circuitry

The optional diagnostic circuitry will automatically sense and indicate abnormal conditions.

Alarm Condition "F1"

This is an indication that an over-current has occurred and the unit 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 power supply and the units should be serviced before it is re-started.

Possible causes would be:

1. Dead short between electrodes. - Replace steam generator.
2. Restricted or blocked drain - Clean and inspect drain system.
3. Restricted fill water - Clean and inspect fill system. Check for restriction or loss of supply pressure.
4. Incoming water is outside range of normal circuit board settings. Consult the factory for options.

Alarm Condition "F2"

This alarm occurs if the unit is unable to satisfy the amp drawn requiement over an extended period of time. This alarm indicates a need to change the cylinder, that the water supply is low in conductivity or that a foaming condition exists.

1. See page 12 if alarm occurs within the first few hours of operation.
2. If a foaming condition exists, flush and fill the unit several times and restart. If it persists, you must filter or treat the water to remove the foaming product.
3. End of cylinder life - Typical Steam cylinder life is 500 to 2000 hours depending on incoming water supply. Refer to water quality consideration chart on page 13.

Alarm Condition "F3"

This alarm indicates that the fill solenoid has been energized for an excessive period of time. The unit has been shut-down to prevent any damage.

Possible causes include:

1. Defective Fill Solenoid. Repair or replace as required.
2. Defective Drain Solenoid. Repair or replace as required.
3. Loss of or restricted water supply. Check fill system.
4. Leaking drain system. Check drain system.

NOTE: ALL ALARM CONDITIONS CAN BE CLEARED BY BREAKING THE MAIN POWER TO THE UNIT.

RDU II
INSTALLATION AND OPERATION INSTRUCTIONS

The RDU (Room Distribution Unit) is designed to be used with Herrtronic Electronic Steam Humidifiers. The RDU may be mounted directly to the top of the Herrtronic unit or mounted remotely.

Power and control wiring may be brought into the RDU cabinet from either the right or left side. There are two 7/8" knock-outs on each side. The upper knockout is for control wiring from the Herrtronic unit. The lower knockout is for power wiring brought from the same disconnect as is used for the Herrtronic unit. **Power wiring is not to be brought from the Herrtronic unit directly.** To do so will void the E.T.L. and C.S.A. listings, and the warranties on the Herrtronic and RDU units. **POWER TO HERRTRONIC MUST BE OFF BEFORE BEGINNING INSTALLATION.**

A. Mounting:

1. Direct Mount.

(a) If the RDU is to be mounted directly to the top of the Herrtronic unit, first establish that the mounting system for the Herrtronic will accomodate the extra 50 pounds of the RDU unit.

(b) Remove the plug and grommet from the bottom of the RDU cabinet. (Two grommets and no plug if there are to be two steam outlets).

(c) Set the RDU atop the Herrtronic cabinet so that the four mounting holes in the two cabinets line up. Four hex head self-tapping screws are included in the hardware bag. Install these screws upward from inside the Herrtronic cabinet.

2. Remote Mounting.

(a) The RDU must be placed higher than the Herrtronic cabinet. See chart, Room Distribution Unit - Horizontal and Vertical Clearances.

(b) Two 1/4" x 2" lag screws are included for wall mounting. There are two key-hole slots on the back of the cabinet on 10 1/2" centers for hanging on these lag screws. Be sure that the screws are secure enough to support the 50 lbs. weight of the RDU. Be sure the two screws are level so that the RDU will hang level (side-to-side). An unlevel mounting could result in unwanted excess condensate in the manifold and cause spitting. Drive the screws in until the heads are about 1/16" away from the mounting surface. Then hang the cabinet on the screw heads through the keyhole slots.

B. Wiring:

1. Power wiring: Remove all of the screws holding the front panel on the RDU cabinet. A wiring diagram is attached to the back of this panel. Run wiring suitable for the intended use from the disconnect to the RDU cabinet. Determine whether right or left side is to be used for wiring and remove the appropriate knockouts. Upper knockout for control, lower knockout for power. Use appropriate cable clamps in the holes. If the power source is 208 or 230 VAC, connect directly to terminals 1 and 2 on the terminal strip using 1/4" quick connect terminals. If the power source is 380, 480 or 600 VAC, connect to the appropriate terminals on the transformer using 1/4" quick connect terminals.

C. Steam Hose Connection:

1. Direct Mount: The length of steam hose provided in the RDU is sufficient to reach from the steam outlet on top of the Herrtronic cylinder through the cabinets and up to the steam manifold of the RDU. Secure the hose at the manifold and cylinder with the hose clamps provided. The hose clamp at the manifold should be turned so that the tail end of the clamp does not face forward, otherwise it will rub on the front panel. If there are two steam outlets and two manifolds you will have two hoses to connect.

2. Remote Mounting: Find the steam hose adapter(s) and mount on the studs inside the bottom to the RDU cabinet. Nuts are provided in the hardware bag. If there are two adapters to be mounted, be sure to mount them such that the notched edges dovetail together. Cut the steam hose(s) provided to 17 1/2" inch length. Mount the hose from the adapter to the manifold using the hose clamps provided. Turn the hose clamp at the manifold so that the tail end of the clamp does not interfere with the front panel. Be sure that the clamp at the adapter is away from all wiring. Steam hose is available from Herrmidifier to run from the Herrtronic to the RDU.

D. Start-up:

With all electrical connections and hoses connected, replace all sheet metal panels removed during installation. Follow start-up procedure in your Herrtronic Owner's Manual.

E. Operation:

When the Herrtronic is turned "ON", the RDU blower circuit is energized first. When air flow is sensed by the pressure switch, the remainder of the circuitry is energized. This sequence assures that there is air flow before steam is generated.

When the Herrtronic is turned "OFF" either by switch or humidistat, the RDU blower will continue to operate until the steam manifold has cooled enough to prevent the formation of condensate inside the cabinet.

. DO NOT INSTALL ANY OTHER COMPONENTS INSIDE THIS CABINET.
!. ANY ALTERATION MADE TO THE INTERNAL WIRING OF THIS UNIT VOIDS THE WARRANTY.
I. UNIT MUST BE MOUNTED WITH A MINIMUM OF 15" CLEARANCE ON THE ELECTRICAL INLET SIDE & 2" CLEARANCE ON THE OTHER SIDE. 18" CLEARANCE REQUIRED FOR THE TOP OF THE UNIT & MINIMUM OF 72" FREE BLOW SPACE IN FRONT. NO CLEARANCE REQUIRED FOR THE BOTTOM EXCEPT FOR STEAM SUPPLY.

HOOD CONTROL WIRING JUNCTION BOX

CONNECT TO WIRES A1.A2 & A3 IN HERRTRONIC CONTROL WIRING JUNCTION BOX

*** IMPORTANT ***

208V TO 600V SINGLE PHASE POWER SUPPLY - THIS UNIT REQUIRES ITS OWN POWER SUPPLY - DO NOT TAP POWER FROM INSIDE THE HERRTRONIC

BLOWER

RED

WHT

BLK

A1

A2

A3

61

62

TERMINAL RAIL

1 2 3 4 5

63

59

60

380V TO 600V UNITS USE TRANSFORMER -- 208V TO 240V UNITS POWER SUPPLY CONNECTS DIRECTLY TO TERMINALS 1 & 2

PRIMARY

SECONDARY

TRANSFORMER

HIGH-LOW SWITCH

64

65

58

54

52

AIR FLOW SWITCH

RELAY

1 3

4 6

7 9

A B

56

53

55

FUSE

THERMO-STAT

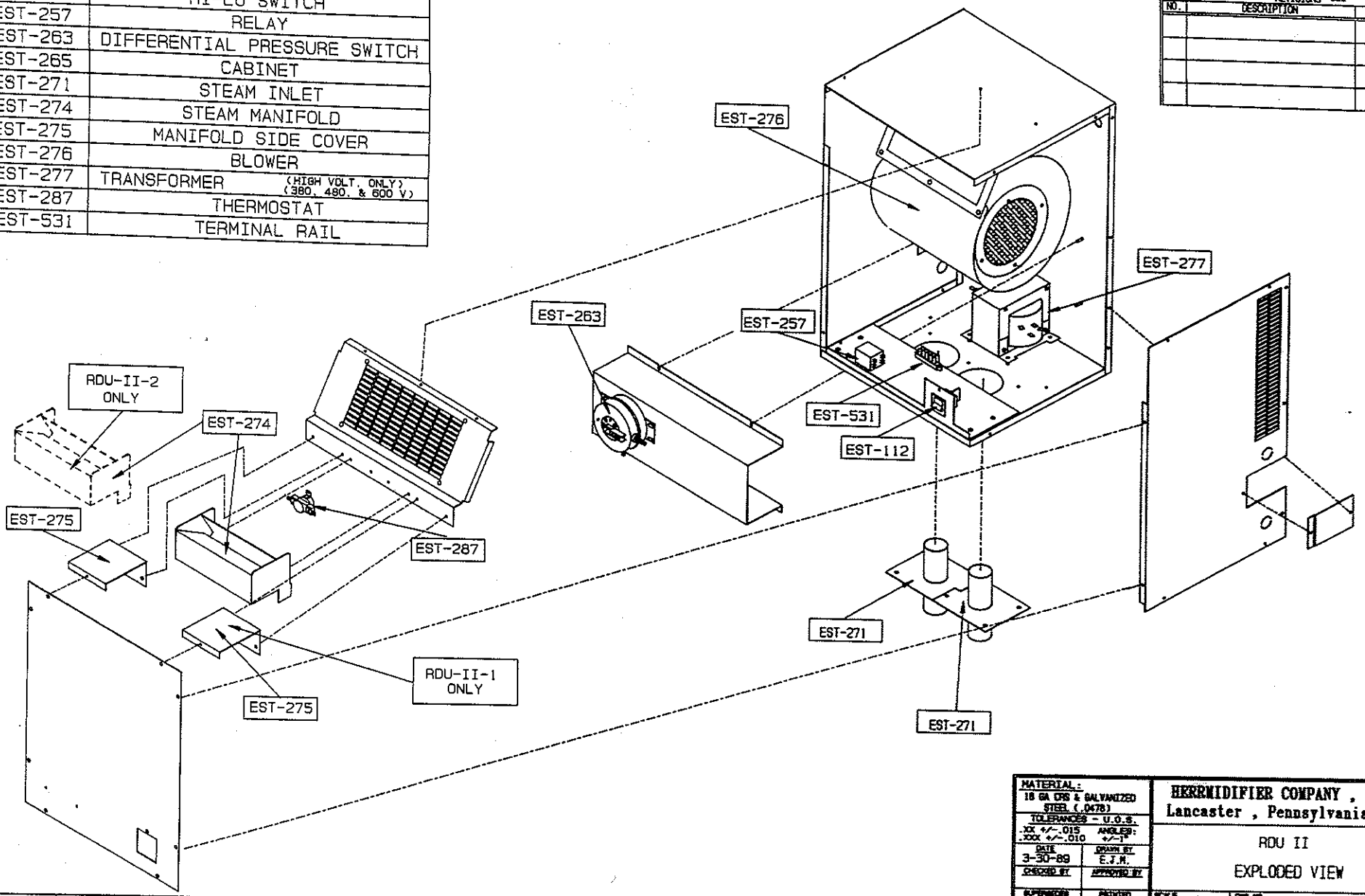
57

51

50

PART NO.	DESCRIPTION
EST-112	HI-LO SWITCH
EST-257	RELAY
EST-263	DIFFERENTIAL PRESSURE SWITCH
EST-265	CABINET
EST-271	STEAM INLET
EST-274	STEAM MANIFOLD
EST-275	MANIFOLD SIDE COVER
EST-276	BLOWER
EST-277	TRANSFORMER (HIGH VOLT. ONLY) (380, 480, & 600 V)
EST-287	THERMOSTAT
EST-531	TERMINAL RAIL

REVISIONS			
NO.	DESCRIPTION	DATE	BY



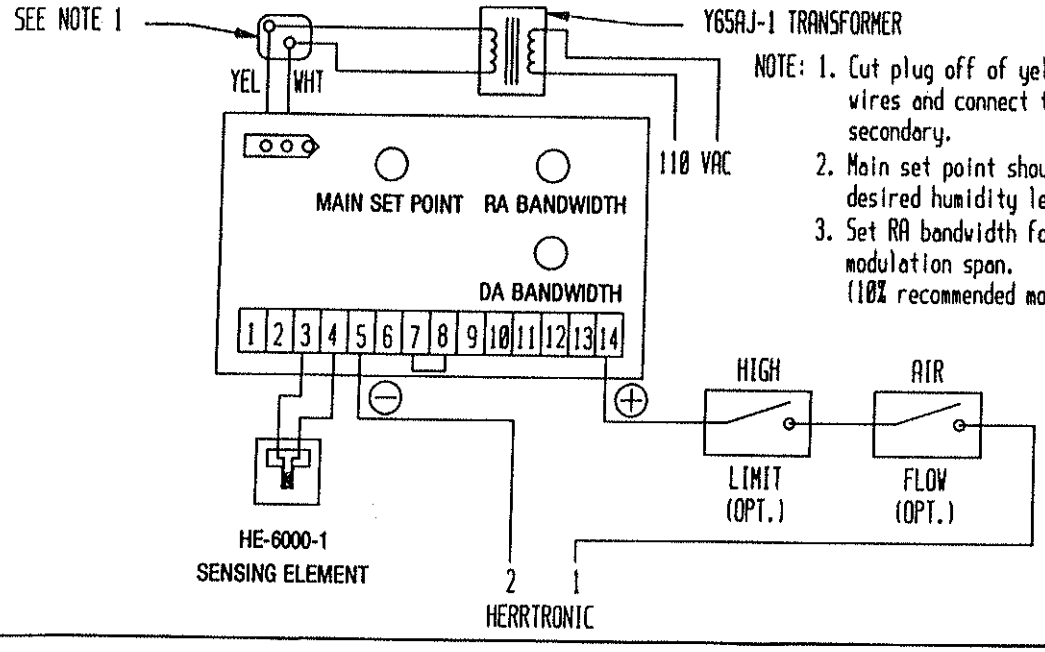
MATERIAL: 18 GA CRS & GALVANIZED STEEL (.0478)	HERRMIDIFIER COMPANY, INC. Lancaster, Pennsylvania USA
TOLERANCES - U.O.S. .XX +/-.015 .XXX +/-.010 ANGLES: +/-1°	RDU II
DATE 3-30-89 DRAWN BY E.T.M.	EXPLODED VIEW
CHECKED BY APPROVED BY	
SUPERSEDES PREVIOUS	SCALE NONE DWG NO. EST-289 SHEET 1 of 1

ROOM DISTRIBUTION UNIT - HORIZONTAL AND VERTICAL CLEARANCES

CAPACITY LBS.-HR.	VERTICAL CLEARANCE	HORIZONITAL TRAVEL (Visible Steam)
10	12"	26"
20	18"	36"
30	18"	72"
40	24"	108"
50	42"	144"
60	24"	96"
70	38"	120"
80	38"	132"
90	48"	144"
100	48"	156"

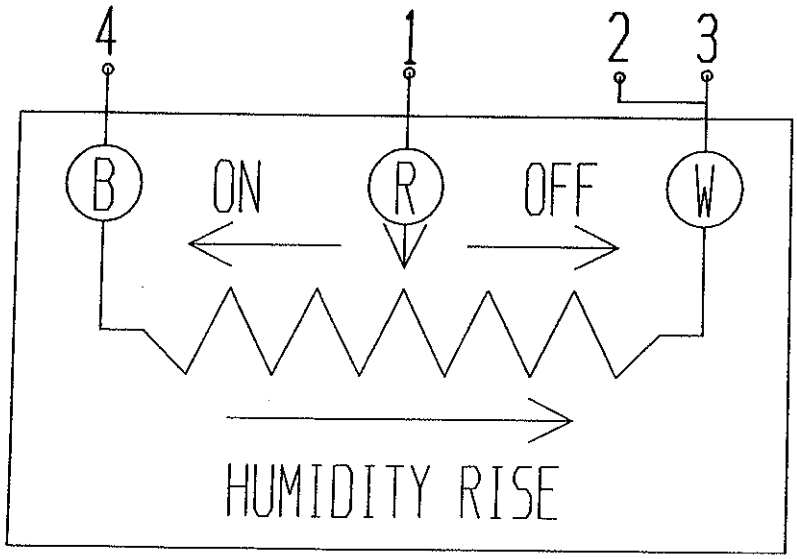
NOTE: UNITS WITH CAPACITIES OF 10-50 LBS.-HR. HAVE ONE STEAM DISTRIBUTION MANIFOLD. UNITS WITH 50-100 LBS.-HR. HAVE TWO STEAM DISTRIBUTION MANIFOLDS PER RDU.

JOHNSON HC-6100-1 CONTROLLER WIRING



NOTE: 1. Cut plug off of yellow and white wires and connect to transformer secondary.
2. Main set point should be set for desired humidity level.
3. Set RA bandwidth for desired modulation span.
(10% recommended most cases)

HONEYWELL H915A CONTROL WIRING

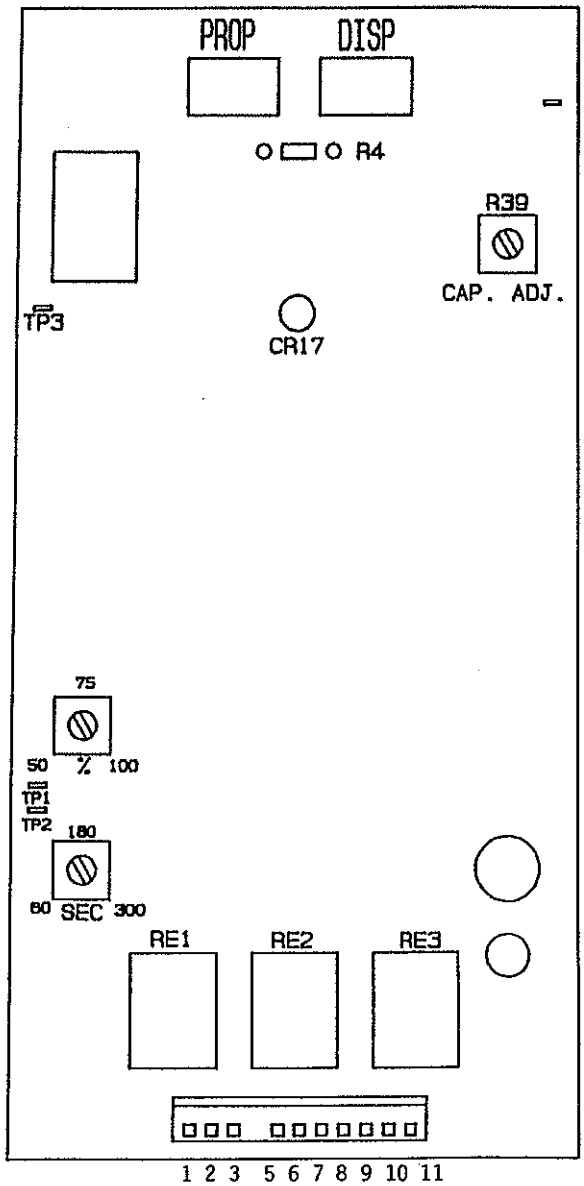


APPENDIX B
THE CIRCUIT BOARDS

The EST-1001A circuit board, pictured below, has three potentiometers located on it. The Pot labelled R39 is the capacity adjustment pot. Turning this pot counterclockwise will enable you to reduce the capacity of the unit. Once you have made the adjustment, watching the percent at which the fill solenoid de-energizes will tell you precisely how low you have turned it. The pot labelled "% adj." is for adjusting the low drain threshold. Increasing this pot will enable the unit to drain more frequently, a must for highly conductive fill water.

Decreasing this pot will enable the unit to boil more without draining, a must for pure incoming fill water. Do not adjust the pot more than 5% either direction without first consulting the factory. The pot labelled "sec" should not be adjusted before consulting the factory. The L.E.D. indication of a fault condition is labelled CR17. All circuit board inputs and outputs are indicated next to the drawing for your troubleshooting convenience.

1. Torroid Input
2. Torroid Input
3. Cyl. Full Int. Input
5. Drain Output
6. Fill Output
7. Cyl. Full Output
8. 24 VAC Hot Input
9. 24 VAC Input
10. 24 VAC Output
11. 24 VAC Common



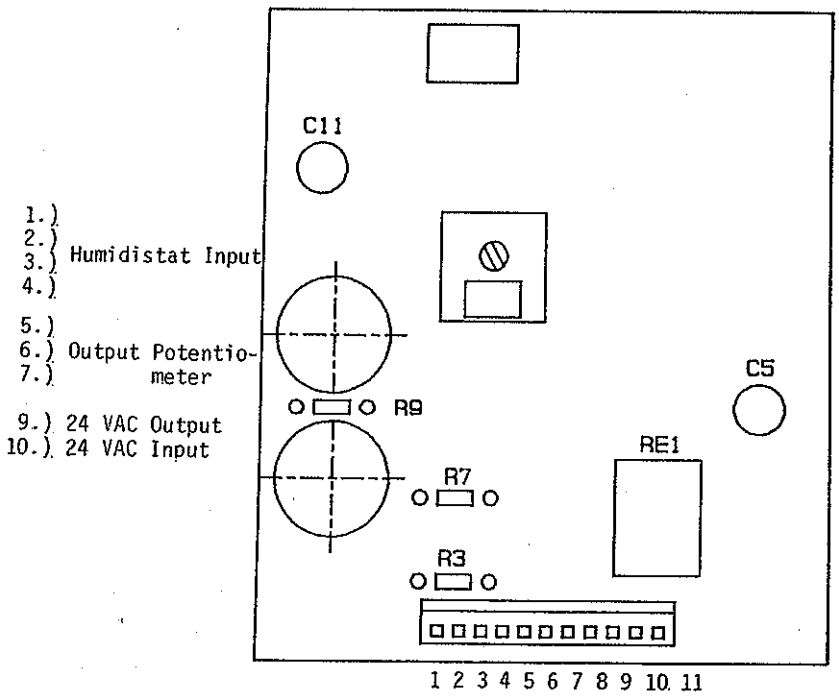
EST-1001A MAIN BOARD

The EST-001P proportional circuit board pictured below uses up to three plug in resistors to match up with your external controls. The proper resistor values for the more common controls are listed below.

Located next to the picture are the various molex inputs and outputs for the circuit board. Note that if you suspect that you have a faulty output potentiometer, placing a jumper wire between terminals #5 and #7 will effectively bypass the potentiometer.

Input	R7	R9	R3
6-9V	16.5KΩ	61.9KΩ	open
2-15V	71.5KΩ	806KΩ	open
5-20V	82.5KΩ	374KΩ	open
0-20V	110KΩ	open	open
4-20ma	8.87KΩ	499KΩ	100Ω
0-2V	11.0KΩ	open	open

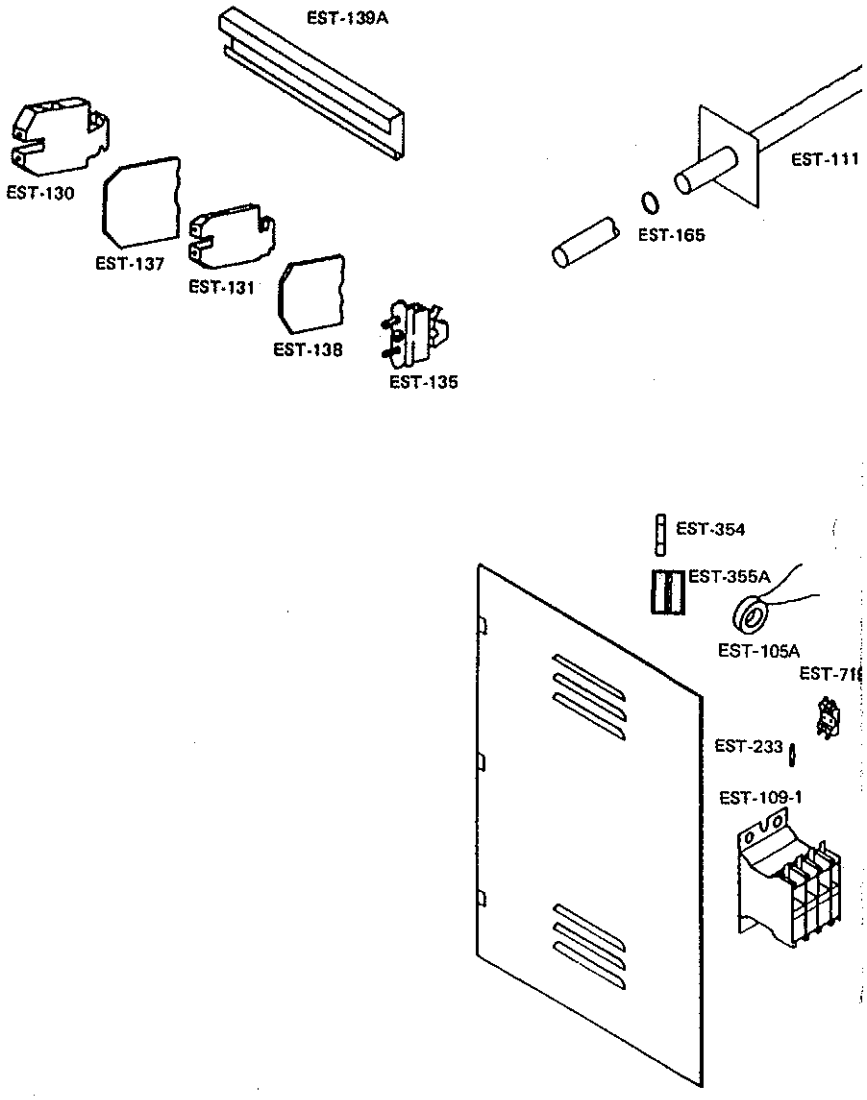
NOTES: 1. Input voltage/current to "Proportional Board (pin # 1 positive in relation to pin # 2)
2. Input voltage at pin #1 & 2 maximum 30 Volts.
3. For resistive operation use input configuration 0-2V.



EST-001P PROPORTIONAL BOARD

PARTS LIST-HST Series

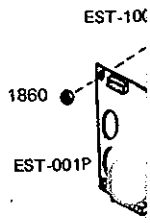
Parts No.	Description
EST-1001A	Main Circuit Board
EST-001D	Display Board
EST-001P	Proportional Board (Opt.)
EST-003B	Cylinder Full Int'Face
EST-104A	Main Transformer
EST-105A	Torroid Transformer
EST-109-1	Contactor, 24v (4-Pole)
EST-110	On-Off Panel Switch
EST-112	Drain Panel Switch
EST-117	Grommet, 2½"
EST-122	Cabinet Lock & Keys
EST-125	Button Plug, 7/8"
EST-129A	Rubber Boot
EST-131	Terminal Block, 80 amp
EST-133	Insert for Poly Tubing
EST-134	End Clamp, No. 9708
EST-135	Ground Terminal
EST-138	Partition Plate
EST-139A	Mounting Rail
EST-152	½" Adapter w/nut & ferrule
EST-154	¼" Fitting
EST-163	Delrin Sleeve
EST-165	S.S. Hose Clamp
EST-172	8-32 x 3/4 Screw Circ. Bds.
EST-175	1/4 x 2" Lag Screw
EST-177	Spacer (Circuit Board)
EST-189	5/8 Flat Washer
EST-207	Clamp, ideal, 3/4" hose
EST-233	Fuse, 3A
EST-353	7/8" Shorty Bushing
EST-354	BBS-2 Fuse, 600V
EST-355A	Fuse Holder, 5A, 600V
EST-719	Fuse Holder
EST-1000	Cabinet
EST-1002	Steam Cylinder Assembly
EST-1004A	10K Potentiometer
EST-1004B	Knob
EST-1007	Circuit Board Support
EST-1009	Circuit Board Cable
EST-1010A	Drain Hose, 12"
EST-1010B	Overflow Hose, 17"
EST-1010C	Fill Hose, 23"
EST-1011	Grommet
EST-1012	Drain Fitting
EST-1016	Hole Plug, 2½"
EST-1023	Fill Solenoid
EST-1023-1	Drain Solenoid
EST-1056	Fill Cup Top
EST-1058	Female Connector
EST-1060-2	O-Ring, 7/8 x 1 x 1/16
EST-1060-3	O-Ring, 1 x 1-3/16 x 3/32
EST-1061	Fill Cup Bottom
EST-1062	Drain Cup
EST-1072	Screw, No. 8-32 x 2"
41	Spring Clip
107	Eyelet
110A	Tinnerman Retainer
AH-13	Washer
1845	Interlock Switch
1860	6-32 Hex Nut
FV-12	Compression Nut
1095	S.S. Hose Clamp

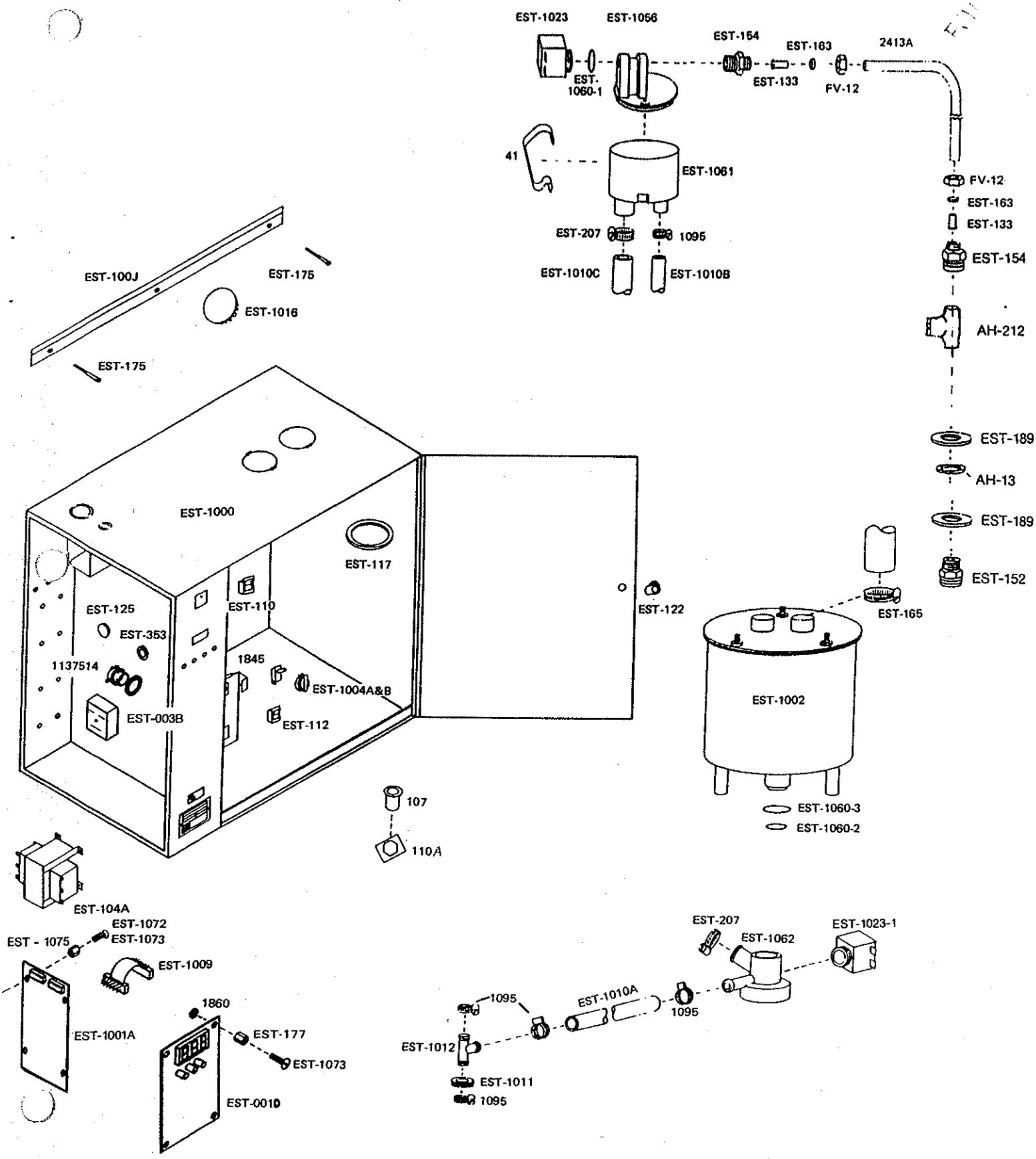


NOTE: STEAM CYLINDERS MUST BE ORDERED AS AN ASSEMBLY.

For three phase units:
EST-1002-6-1 (50#/hr. maximum)
EST-1002-6-2 (100#/hr. maximum)

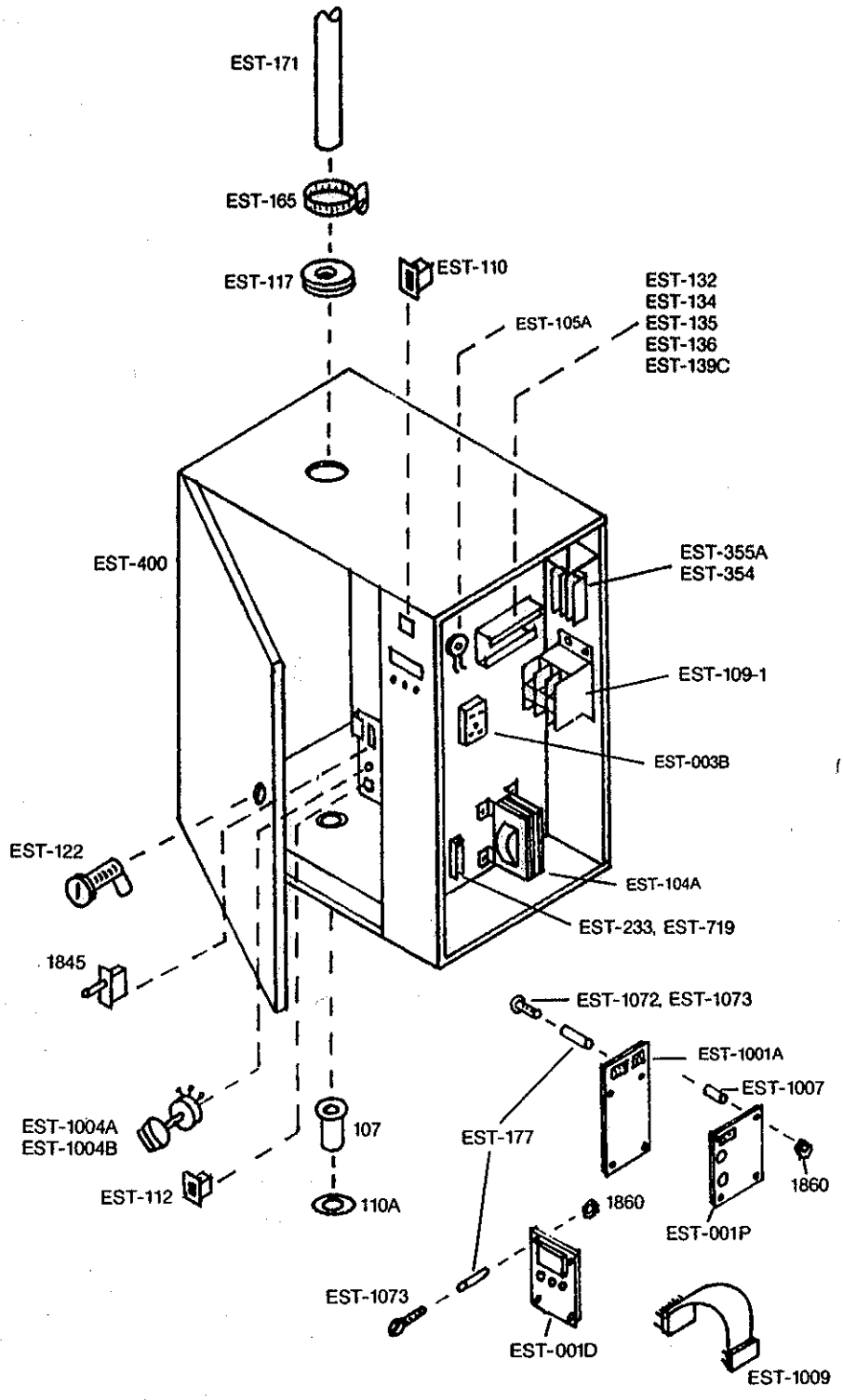
For single phase units
EST-1002-4-1 (50#/hr. maximum)



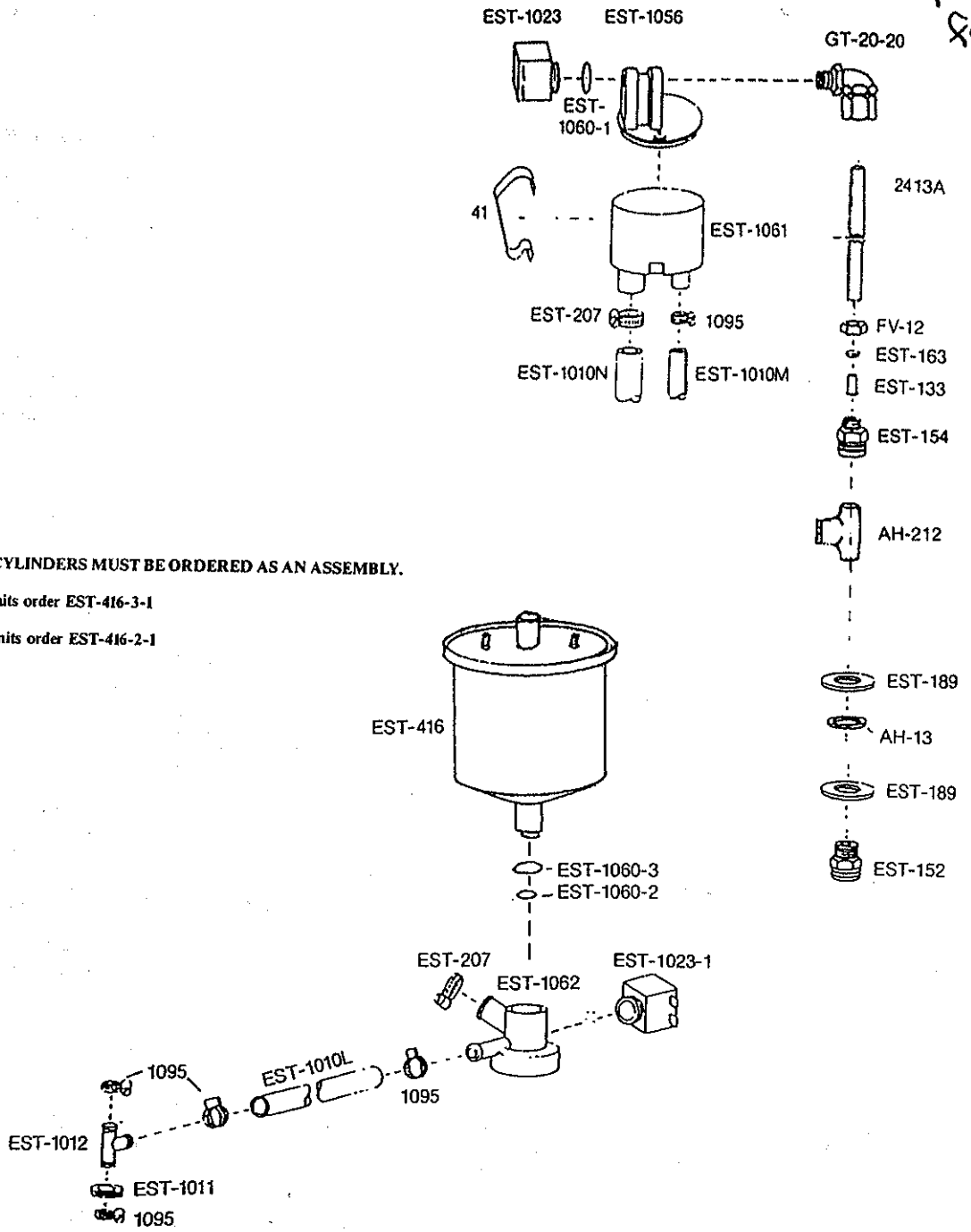

EST-1023
EST-1056
EST-154
EST-163
2413A
EST-1060-1
EST-133
FV-12
41
EST-1061
FV-12
EST-163
EST-133
EST-154
EST-207
1095
EST-1010C
EST-1010B
AH-212
EST-100J
EST-175
EST-1016
EST-175
EST-189
AH-13
EST-189
EST-152
EST-1000
EST-117
EST-122
EST-125
EST-110
EST-353
1137514
1845
EST-1004A&B
EST-003B
EST-112
EST-165
EST-1002
EST-1060-3
EST-1060-2
107
110A
EST-104A
EST-1072
EST - 1075
EST-1073
EST-1009
EST-1001A
1860
EST-177
EST-1073
EST-0010
EST-207
EST-1062
EST-1023-1
1095
EST-1010A
1095
EST-1012
EST-1011
1095

PARTS LIST-MHST Series

Part No.	Description
AH-13	Washer
AH-212	Water Strainer, ¼"
EST-001D	Display Board
EST-001P	Proportional Circuit Board
EST-003B	Cylinder Full Int'Face
EST-104A	Main Transformer
EST-105A	Toroid Transformer
EST-109-1	Contactor, 24v (4-Pole)
EST-110	On-Off Panel Switch
EST-112	Drain Panel Switch
EST-117	Grommet, 2½"
EST-122	Cabinet Lock & Keys
EST-132	Terminal Block, 55 amp
EST-133	Insert for Poly Tubing
EST-134	End Clamp, No. 9708
EST-135	Ground Terminal
EST-136	Partition Plate
EST-139C	Mounting Rail
EST-152	½" Adapter w/nut & ferrule
EST-154	¼" Comp x ¼" MPT
EST-163	Delrin Sleeve
EST-165	S.S. Hose Clamp
EST-171	Steam Hose
EST-175	1/4 x 2" Lag Screw
EST-177	Spacer (Circuit Board)
EST-189	5/8 Flat Washer
EST-207	Clamp, ideal, 3/4" hose
EST-233	Fuse, 3A
EST-354	BBS-2 Fuse, 600V
EST-355A	Fuse Holder, 5A, 600V
EST-400	Cabinet
EST-416-x-1	Steam Cylinder Ass'y. (x = # of electrodes)
EST-719	Fuse Holder
EST-1001A	Main Circuit Board
EST-1004A	10K Potentiometer
EST-1004B	Knob
EST-1007	Circuit Board Support
EST-1009	Circuit Board Cable
EST-1010L	Drain Hose, 5¼"
EST-1010M	Overflow Hose, 14½
EST-1010N	Fill Hose, 19"
EST-1011	Grommet
EST-1012	Drain Fitting
EST-1023	Solenoid, Fill Operator
EST-1023-1	Solenoid, Drain Operator
EST-1056	Fill Cup Top
EST-1060-1	O-Ring, 3/4 x 7/8 x 1/16
EST-1060-2	O-Ring, 7/8 x 1 x 1/16
EST-1060-3	O-Ring, 13/16 x 1 1/16 x 7/64
EST-1061	Fill Cup Bottom
EST-1062	Drain Cup
EST-1072	Screw, No. 6-32 x 2"
EST-1073	#6-32 x ¾ Screw
FV-12	Compression Nut
GT-20-20	Right Angle Fitting
41	Spring Clip
107	Eyelet
110A	Tinnerman Retainer
1095	S.S. Hose Clamp
1845	Interlock Switch
1860	6-32 Hex Nut



EST-368-1
Fill retrof
for MHST



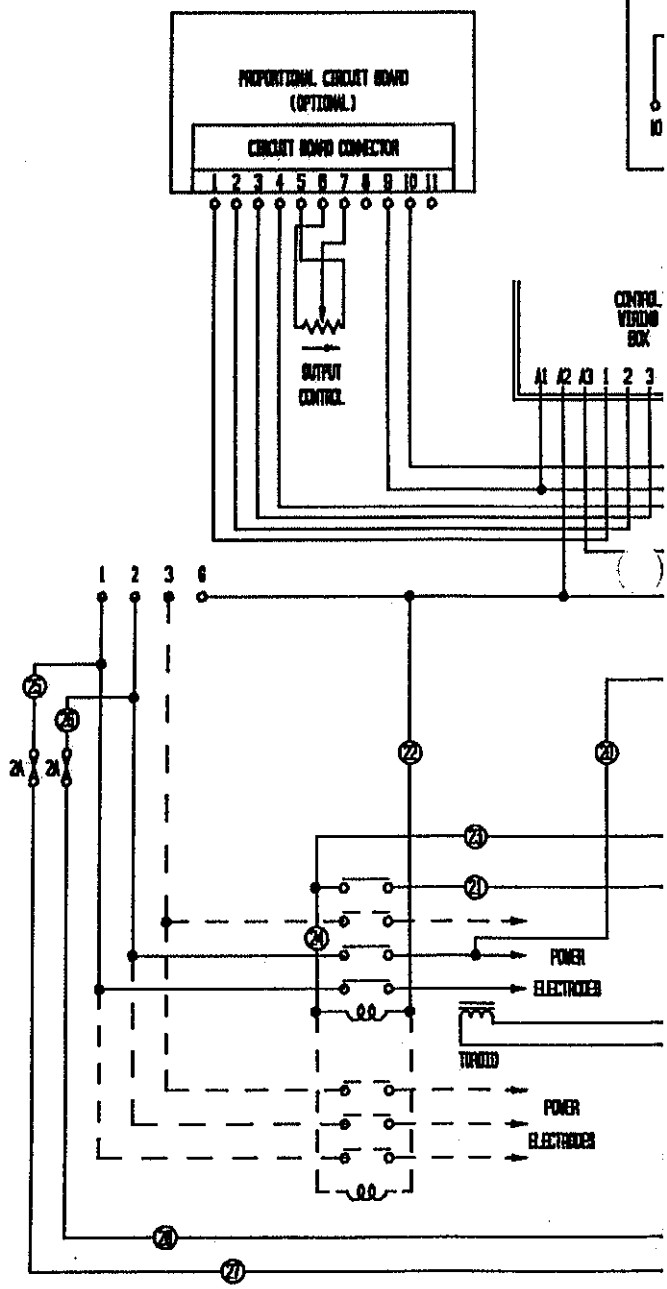
NOTE: STEAM CYLINDERS MUST BE ORDERED AS AN ASSEMBLY.

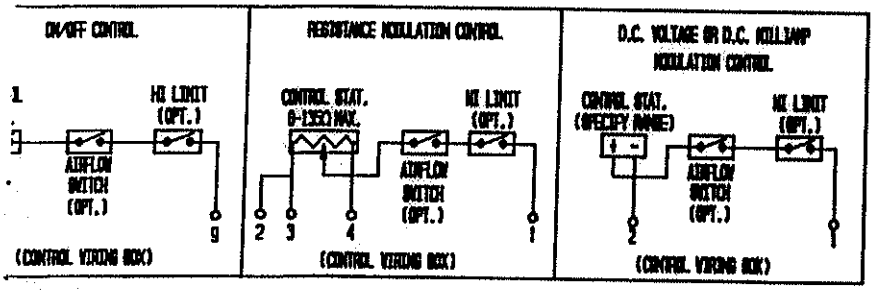
For three phase units order *EST-416-3-1*

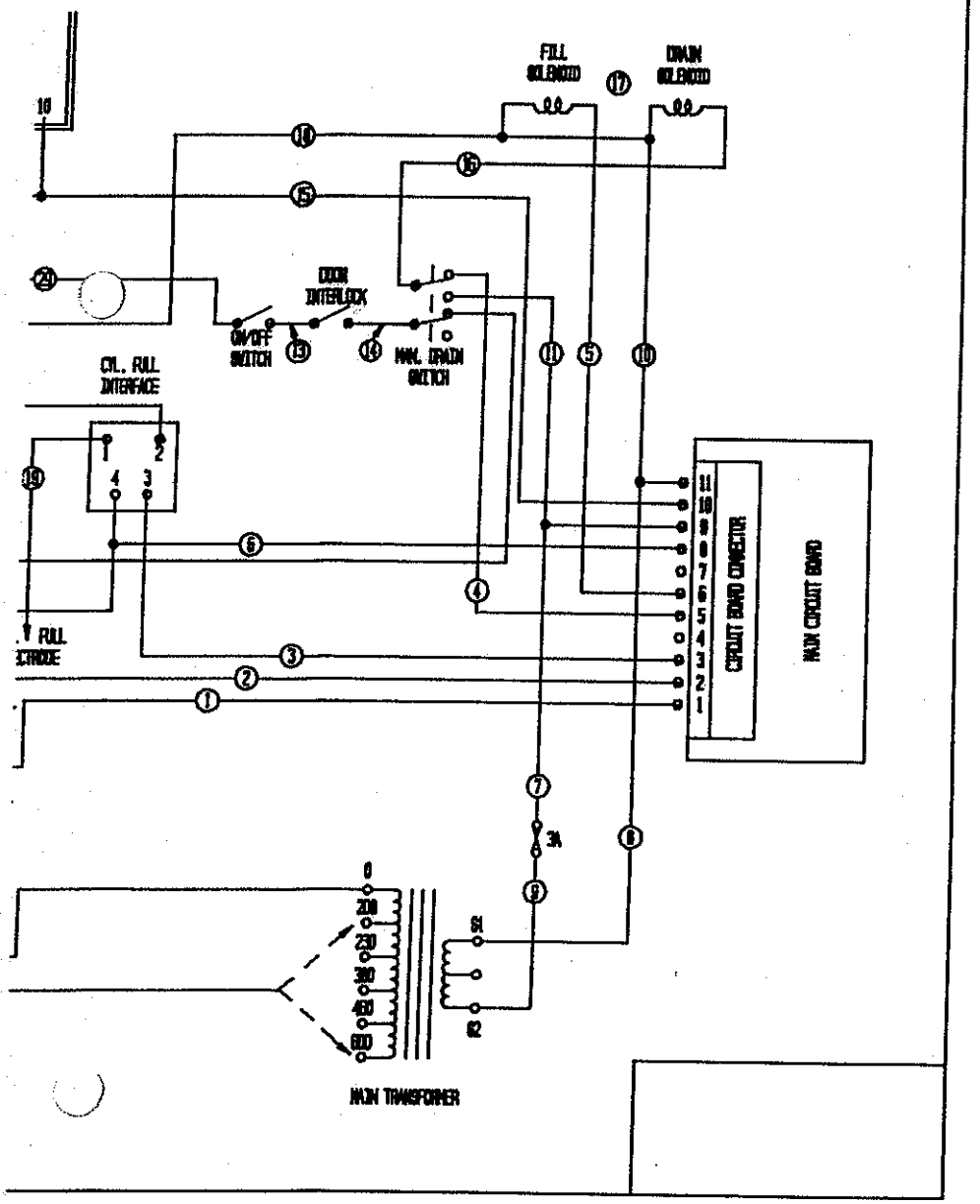
For single phase units order *EST-416-2-1*

UNIT
WIRING DIAGRAM

NOTE: If unit is not supplied with Room Distribution Unit, wires A1 and A3 must be jumpered together.




ON/OFF CONTROL
HI LIMIT (OPT.)
AIRFLOW SWITCH (OPT.)
(CONTROL WIRING BOX)
RESISTANCE MODULATION CONTROL
CONTROL STAT. 0-135Ω MAX.
HI LIMIT (OPT.)
AIRFLOW SWITCH (OPT.)
(CONTROL WIRING BOX)
D.C. VOLTAGE OR D.C. MILLIAMP MODULATION CONTROL
CONTROL STAT. (SPECIFY RANGE)
HI LIMIT (OPT.)
AIRFLOW SWITCH (OPT.)
(CONTROL WIRING BOX)


FILL SOLENOID
DRAIN SOLENOID
DOOR INTERLOCK
ON/OFF SWITCH
MAN. DRAIN SWITCH
CYL. FULL INTERFACE
FULL ELECTRODE
CIRCUIT BOARD CONNECTOR
MAIN CIRCUIT BOARD
3A
MAIN TRANSFORMER