



**Herrtronic® MD Series**  
*Electrode Steam Humidification*

## Features & Benefits

- Three Chassis Sizes: 5 to 250 lbs/hr
- Versatile Microprocessor-Based Control
- Enhanced System Control Accuracy
- Robust Cabinet Design
- Networkability — Up to 29 Member Units for 3000 lbs/hr (1360 kg/hr) Humidification
- Alphanumeric LCD Display
- User-Friendly Programming
- System Diagnostics
- Operates with Raw and Softened Water
- ETL Listed to UL - 998
- Fault Annunciation
- Full Complement of Accessories
- Disposable Steam Cylinder Minimizes Maintenance Time

## Applications

- Hospitals
- Computer Rooms
- Laboratories
- Cleanrooms
- Telecommunications
- Switch Gear Facilities



## Enhanced System Control Accuracy

The Herrtronic MD Series is an economical steam humidification solution to meet your exacting requirements. Selection includes three sizes with capacities ranging from 5 to 250 lbs/hr (2.27 to 113 kg/hr) and up to 600 VAC. All units are ETL listed.

Principal features are “user-friendly” microprocessor-based controls, a digital display providing up-to-date operating information, closed-system networking potential to accommodate up to 29 member units, and the diagnostic capability to prevent operational problems before they occur. This diagnostic capability simplifies service and maintenance, saving both time and expense. The Herrtronic MD design accommodates a variety of control systems to meet the needs of each application.



*The MD Series with its microprocessor controller is available in three cabinet sizes with capacities from 5 to 250 lbs/hr (2.27 to 113 kg/hr) per unit.*

## Specifications

Unit Sizes	MDM	5-30 lbs/hr (2.27-13.6 kg/hr)
	MDS	10-100 lbs/hr (4.5-45 kg/hr)
	MDD	110-250 lbs/hr (49.9-113 kg/hr)
Max. Humidification Capacity		250 lbs/hr (113 kg/hr)
Voltage		208/1 to 600/3 VAC
Cycle		50/60 Hz
Phase		Single through 50 lbs/hr (23 kg/hr); Three through 250 lbs/hr (113 kg/hr)
Conductivity		100-1500 Microsiemens
Control System		Microprocessor-based: • On/Off • Proportional • Proportional + Integral
Input Devices		Control, High-limit Input, Air Proving Switch
Sensors		VDC or mADC
Communication Link		RS-485
Display		LCD, 2 lines, 20 Alphanumeric Characters
LED Indicators		Three: Power • Cylinder Full • Fault
High-limit Input		• On/Off • Proportional • Proportional + Integral
Steam Distribution System		Stainless Steel Dispersion Tubes or Room Distribution Unit (RDU)
Piping		EPDM Steam Hose or Insulated Copper
Cabinet Construction		16-gauge and 18-gauge Steel — Powder Coat Finish

## II. UNIT OPERATION

### Herrtronic MD: Basic Operation

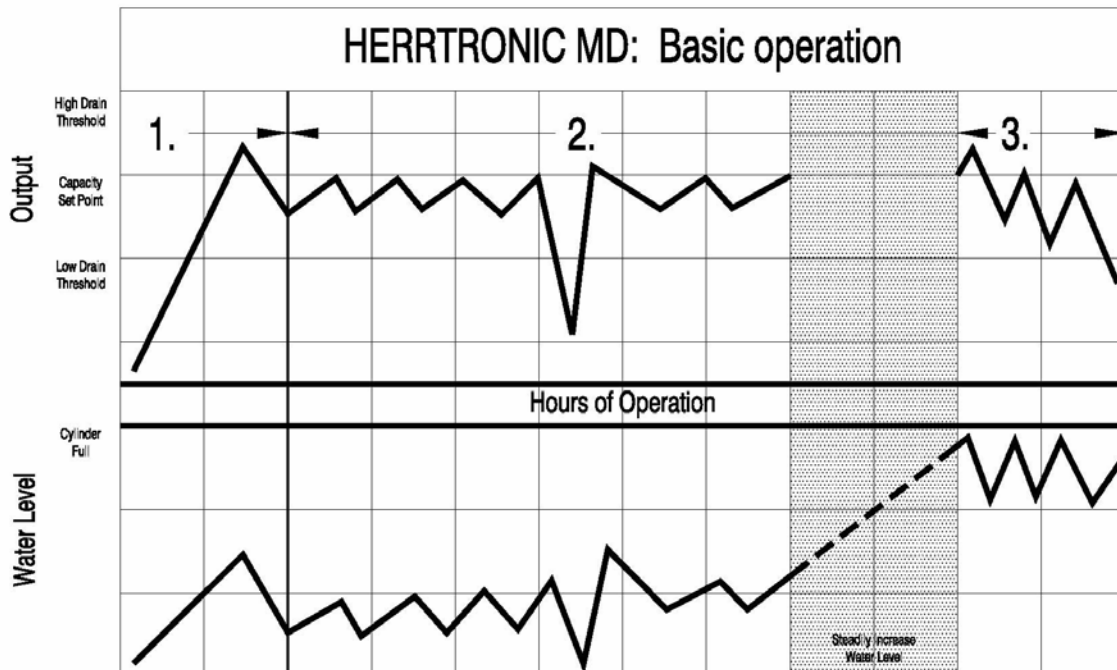
Controlled humidification requires a very precise control system. The Herrtronic MD utilizes a microprocessor to monitor performance and maintain humidity. Further, the Herrtronic MD evaluates the operation and alerts the operator to problem conditions and prevents undesirable operation:

1. **Start-up:** On initial start-up (prompted by the humidistat), the fill valve opens allowing water to enter the cylinder. When the water level rises to the electrodes, current will flow and the water will begin heating. As the water temperature increases, its conductivity also increases, accelerating the rate of temperature increase. When the output reaches the "capacity set point," the fill valve closes. The output capacity may continue to rise slightly beyond the "capacity set point." As the water boils, the water level falls with resulting output reduction.
2. **Normal Operation:** Upon achieving "capacity set point," the system begins operation in a *steady state mode*. Output capacity slowly decreases until the elapsed "cycle time" opens the fill valve to replenish the water level until the "capacity set point" output is achieved. As the mineral concentration in the

water increases, the water conductivity also increases. Accordingly, the rate of boiling increases. Eventually, the rate of boiling reduces the output capacity below the "low drain threshold" before the "cycle time" initiates the fill cycle. As this point, the drain valve opens discarding the mineral laden (highly conductive) water, replacing it with fresh water, that lowers the mineral concentration until the system is restored to the steady state mode.

The *steady state* operating mode continues with small increases in the water level to maintain output capacity (by exposing new electrode surface).

3. **End-of-Cylinder Life:** *Steady State* operation continues with "fill and boil" and periodic drain cycles with ever increasing water levels. Eventually, the water level reaches the cylinder full electrode, representing the maximum allowable water level. The system output begins to decrease since there is no new electrode surface to expose. If the system operates continuously without achieving "capacity set point," an "end of cylinder life" fault will be displayed.



## Types of Control

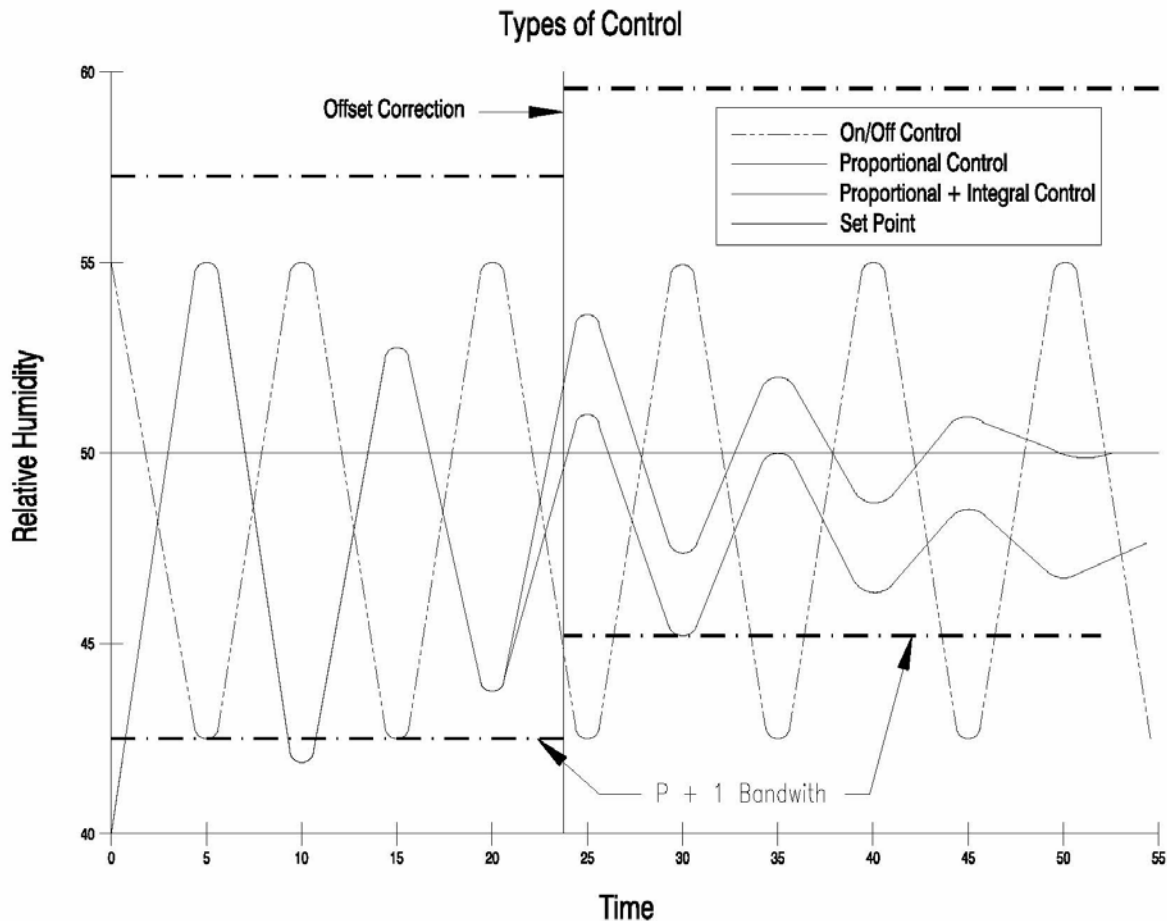
The Herrtronic MD System is available with (3) types of control ---(1) On/Off, (2) Proportional, (3) Proportional + Integral:

1. **On/Off** – Humidity is sensed by a humidistat that provides an On/Off input to the humidifier. Humidity varies above and below the setpoint based on the tolerance and accuracy of the humidistat.
2. **Proportional** – A proportional controller produces a signal (ohms, volts DC, or milliamps DC) corresponding to the difference between the control humidity and the humidity setpoint. The humidifier output increases as this difference (and signal) increases. Humidity variations will be smaller than with “On/Off” control and the control humidity will be maintained within the bandwidth of the controller.

3. **Proportional + Integral** – Over a repeating time period the “P+I” control simply evaluates the difference between the average control humidity and the humidity setpoint and adjusts the bandwidth to minimize the “offset.” Optimal control is attained in most cases with this alternative.

### **NOTE!**

**If your application is unique or water is excessively “clean” or “dirty,” consult Herrmidifier for assistance in matching your humidifier, water treatment, and its control scheme to your application!**



### III. INSTALLATION INSTRUCTIONS

#### Allowable Operating Conditions

Ambient Temperature: 40°F (4°C) to 120°F (50°C)  
 Ambient Relative Humidity: 0% to 90%  
 Line Voltage: -15% to +10% of Nominal Frequency: 50/60 Hz.  
 Supply Water Temperature: 40°F-100°F (4°C-38°C)  
 Supply Water Pressure: 20-100 psig  
 Supply Water Conductivity:  
     70-1000 mincromho (on-off control)  
     200-1000 micromho (prop or P + I control)  
 (See Figure 31, page 32 for proper setting for softened water)  
 Maximum Duct Static Pressure:  
     5" MDM, 7" MDS or MDD units

If units are mounted in outdoor enclosures, conditions inside enclosure must be maintained as shown above.

#### Mounting

The cabinet is designed to safely contain the working components of the Herrtronic MD humidifier and dissipate heat to protect the electronics. Herrtronic MD Series electronic steam humidifiers, room distribution units, steam pipes, and any accessories should be located in a manner to facilitate routine inspection and any necessary maintenance. The unit should not be located above (such as false ceilings) or around valuable property, where a malfunction could cause damage. Correct positioning of the Herrtronic MD humidifier is important to allow for proper operation and easy maintenance. Minimum clearance around the cabinet should be maintained as follows:

CLEARANCES			
UNIT SERIES	MDM 5-30#	MDS 10-100#	MDD 110-200#
Left	2"	2"	2"
Right	20"	20"	20"
Top	12"	12"	12"
Bottom	10"	10"	10"

Four lag bolts, (2) 5/16" and (2) 1/4", are supplied with the MDS and MDM units which are designed to be secured to a wall. Install the top two lag bolts (5/16") according to the dimensions in Figure 1. 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:

MDM - 82 lbs.  
 MDS - 131 lbs.  
 MDD - 258 lbs.

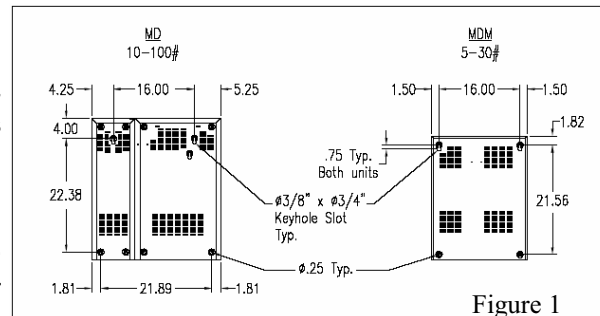


Figure 1

#### 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.

#### NOTE

To mount the Room Distribution Unit, refer to the "supplemental" RDU Installation Instructions. (PART # 157550-001)

#### Plumbing

To make the necessary connections for water fill and drain, the following steps are required: (refer to Figure 2 for drain location)

1. Install an external shutoff valve between the water supply and the humidifier for ease in servicing the unit.
2. Connect water supply to 1/2" 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  $\frac{3}{4}$ " tube from the accessory pack to the drain reservoir. Cut hose to necessary length.

### WARNING

Be sure that the  $\frac{3}{4}$ " drain tube is not kinked or bent in a manner to prevent free flowing drainage from the drain cup to the drain pipe.

4. Insert the other end of the tube into a minimum 6" length of  $1\frac{1}{4}$ " minimum I.D. copper line. The balance of the drain line should be 1" I.D. minimum with a minimum  $\frac{1}{8}$ " per foot slope. (See Figure 2)

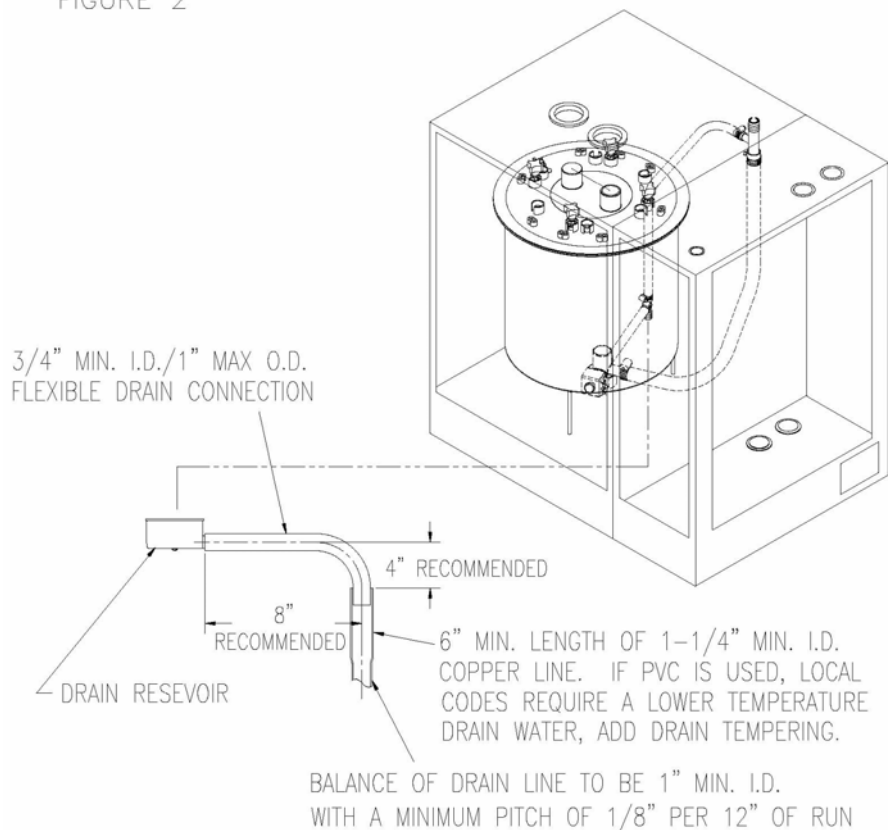
### WARNING

If the drain line is exposed, it is recommended that it be insulated for safety. Do not use PVC drain line unless "Drain Tempering" is enabled (see page 21).

### 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 drain threshold be adjusted (refer to Fig. 31 page 35). Drain water can be tempered to lower its temperature (refer to page 21).

FIGURE 2



## Supply Power

1. Insure that adequate service is available to carry 125% of rated amp level.
2. Field wiring of the main power supply is connected directly to the contactor (single contactor units) or to a power distribution block (multiple contactor units) located in the high voltage compartment. A ground lug is provided for the ground wire.
3. Install external overcurrent protection and provide wiring in accordance with the NEC, state and local code.
4. Power supply must be "clean"; free of spikes, surges and sags; +10%, -15% of nominal. Ground should be a true earth ground.

## Steam Distribution for Ducted Systems

### NOTE!

See RDU supplement for Room Distribution Unit (OM-102)

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

### Steam Distributor Pipes

Herrmidifier supplies stainless steel duct distributor pipe(s) for use in injecting pure steam into ducts. Refer to Figure 3,4, or 5 (page 10) for proper placement. A minimum of 3' clearance downstream is required for most applications. However, differing psychrometric condi-

## Engineering Data: Steam Output / Electrical Characteristics

Capacity:	Steam Output																								
Lbs/Hr	5	10	15	20	25	30	40	50	60	80	100	110	120	130	140	150	160	170	180	190	200	220	225	230	250
Kg/Hr	2.3	4.5	6.8	9.1	11.4	13.6	18.2	22.7	27.2	36.3	45.4	50	54.4	59.1	63.6	68.2	72.6	77.3	81.7	86.4	90.9	100	102.2	104.5	113.6
	Input KW																								
	1.7	3.3	5	6.6	8.3	10.0	13.3	16.7	20	26.6	33.3	36.6	40	43.3	46.6	50	53.3	56.6	60	63.3	66.6	73.3	75.3	76.6	83.3
Volts / Ph:	AMPS																								
208/1	8	16	24	32	40	48.1	64.1	80.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
240/1	6.9	13.8	20.8	27.6	34.7	41.7	55.6	69.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
208/3	4.6	9.2	13.9	18.5	23.1	27.8	37.0	46.3	55.5	74.0	92.6	101.7	110.9	120.2	129.4	138.6	147.9	157.1	166.4	175.6	184.9	---	---	---	---
240/3	4.0	8.0	12.0	16.0	20.0	24.1	32.1	40.1	48.1	64.2	80.2	88.1	96.1	104.2	112.2	120.2	128.2	136.2	144.2	152.2	160.2	---	---	---	---
480/3	2.0	4.0	6.0	8.0	10	12.0	16.0	20.0	24.0	32.1	40.1	44.1	48.1	52.1	56.1	60.1	64.1	68.1	72.1	76.1	80.1	88.1	90.5	92.1	100.1
600/3	1.6	3.2	4.8	6.4	8	9.6	12.8	16.0	19.2	25.6	32.1	35.2	38.5	41.7	44.9	48.1	51.3	54.5	57.7	60.9	64.1	70.5	72.4	73.7	80.1

$Kg/Hr = .454 \times Lbs/Hr$   
 $Kw = .33 \times Lbs/Hr$   
 $Amps (1Ph) = Kw \times 1000 \div Volt$

**Amps (3Ph) = Kw x 1000÷ (Volt.(s) x 1.732)**

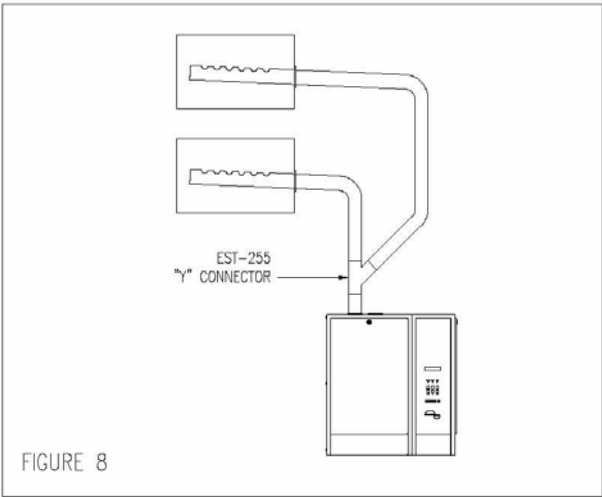
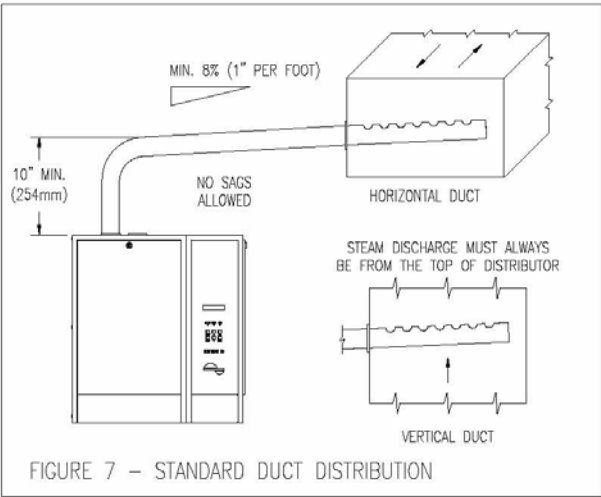
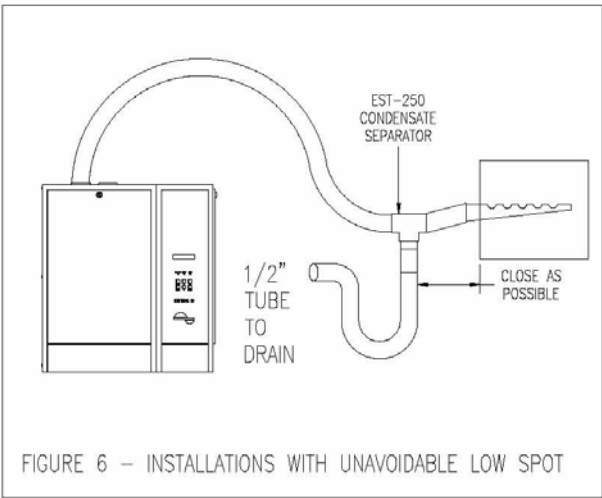
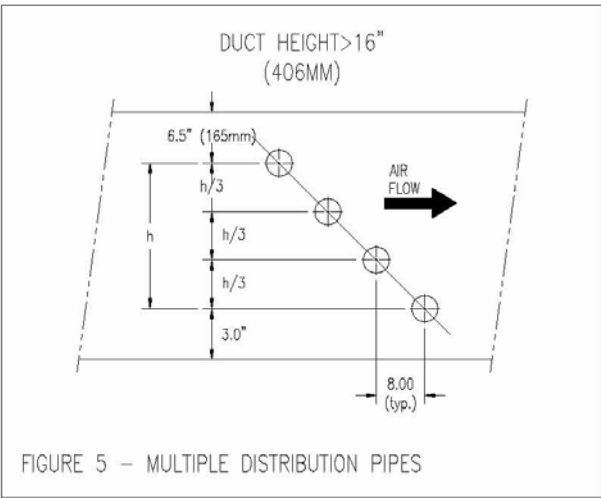
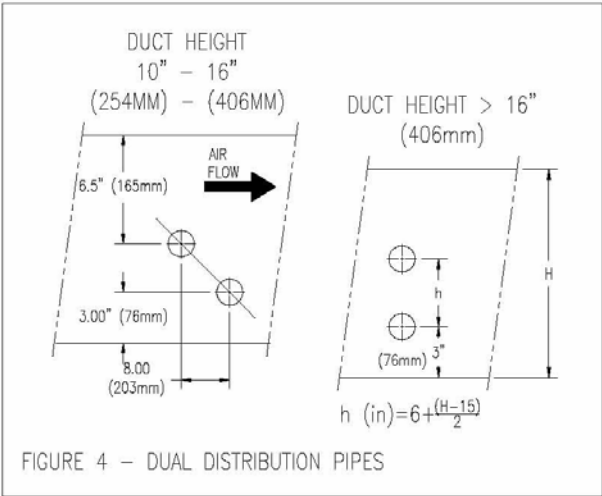
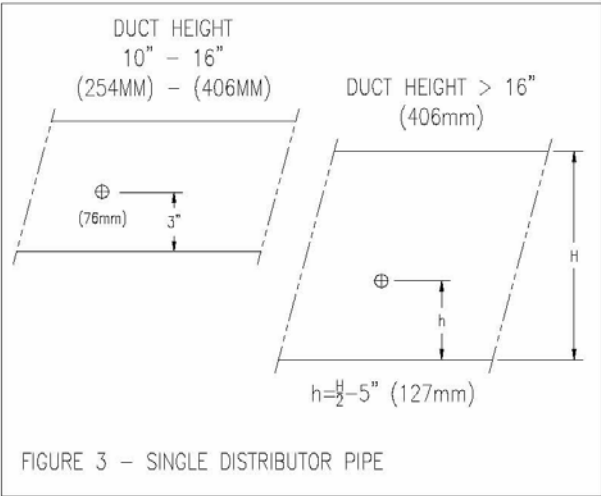
Min Circuit Ampacity = 1.25 x Rated Electrode Amps (Note: With RDU, add .5 Amp @ 208/240v; add .25 Amps @ 480v)  
 Min Circuit Ampacity determines wire size (AWG)



**NOTE!**

- The rubber steam hose carries steam to the distributor pipe and condensate back to the unit. It must have an 8% (1" per foot) pitch back to the unit. Support the steam hose so it will maintain the proper pitch when in operation or at rest. (See Figure 7, page 10.)
- If any low spots are in the steam line or the unit is mounted higher than the distribution system, a condensate separator (EST-250) is available from the factory. (See figure 6, page 10)
- If you must split the discharge of one steam outlet into two ducts with the same static pressure, a "Y" connector (EST-255) is available from the factory. The length of steam hose after the "Y" connector must be the same for equal distribution of steam. Mount the unit as close to the distribution pipe as possible. Use 1 ½" Type L insulated copper pipe whenever the length of run exceeds 20 feet. Do not exceed a 30 foot run as the capacity of the unit will be decreased by as much as 15% and the increased static pressure could cause problems with the fill system. (See figure 8, page 10)
- Maximum duct static pressure: 5" MDM units, 7" MDS and MDD units.
- Internal duct insulation should be removed in the "bulk evaporation" zone (Consult factory representative).
- Steam holes in the distribution pipe are located 2" from mounting plate and designed for a maximum duct wall thickness of 1". Consult factory if special hole locations are required.
- Do not mount the standard distribution pipe in a vertical downflow or vertical position in a horizontal flow system. Special pipes are available, consult the factory.

**Steam Distribution for Ducted Systems – (See RDU supplement for Room Distribution Unit)**



## **Controls**

### *MD Control Circuit Connections*

The Herrtronic MD Series Humidifier has the capability to utilize one of three types of control schemes

1. On/Off
2. Proportional
3. Proportional + Integral

Controls may be supplied by the factory or others. The following information applies to all controls factory supplied or furnished by others. All external electrical control circuits are to be connected to the unit using the twelve pole terminal strip located in the low voltage electrical compartment. The terminal strip is accessed through the side electrical compartment door. Field wiring from humidistat to humidifier and between safety devices, such as high limit humidistat and air proving switches, should be 18 AWG stranded or 20 AWG solid wire. If conduit is not used with the controls wiring, install the black plastic fingered bushing (in accessory pack) and completely seal with RTV Silicone.

Wall devices should be mounted at a height similar to that of a typical thermostat and should be located in an area that will provide good representation of the overall space being humidified. **Do not** mount wall devices directly in the air stream of a supply grille or room distribution unit.

Duct control devices should be mounted in a location where the humidity and temperature are uniform, usually the return duct. **Do not** mount in front of the steam distributor or in a mixing, turbulent, or isolated area.

Duct high limit devices should be mounted downstream of the steam distributors-far enough that under normal conditions in the air stream, the steam has been completely absorbed, typically 10 ft. The device should be located such that it can sense humidified air as it approaches saturation. **Do not** mount in dead air spaces such as inside of corners.

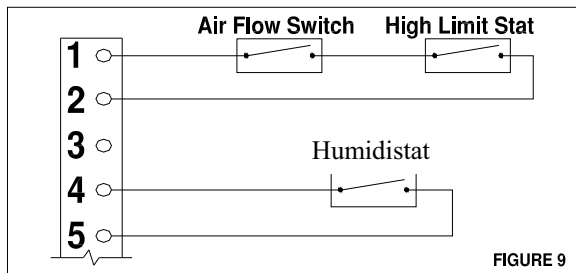
Air proving devices should be mounted so that they sense air flow (or the absence of it). Wire the device so that it closes when air flow is present and will open when there is no air flow. The purpose of the device is to prove that air flow is present before steam is distributed into the duct.

The following information and diagrams are shown for each control scheme. Please refer to the control scheme that your humidifier was set up for and follow & diagram for control circuit connections. The control type and signal are indicated on a label adjacent to the controls terminal strip.

## **Control Circuit Connections**

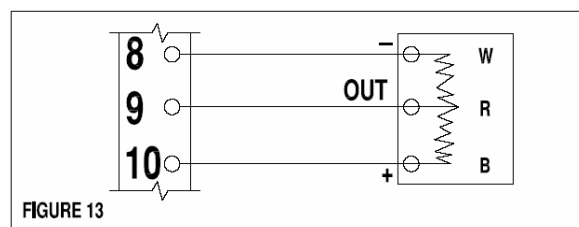
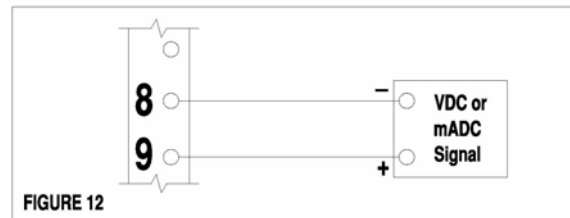
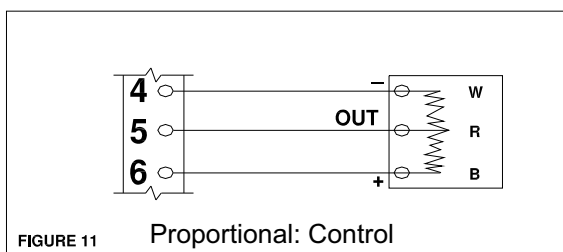
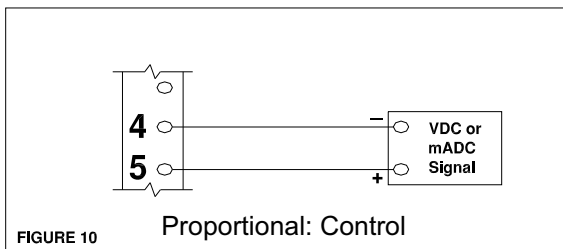
### **Mode I. (On/Off)**

- A. Control Input - Unit will operate with any two position device (See Fig. 9). Demand for humidity will close the contact.
- B. Limit Input - Unit will operate with any two position device (See Fig. 9). The humidistat contact will open on humidity rise.



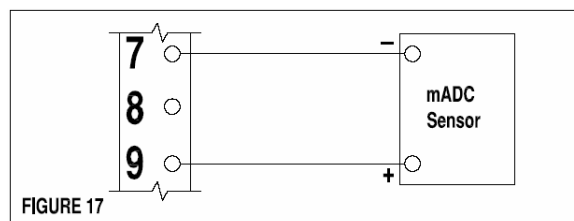
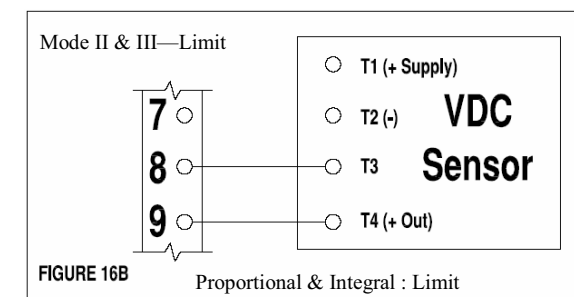
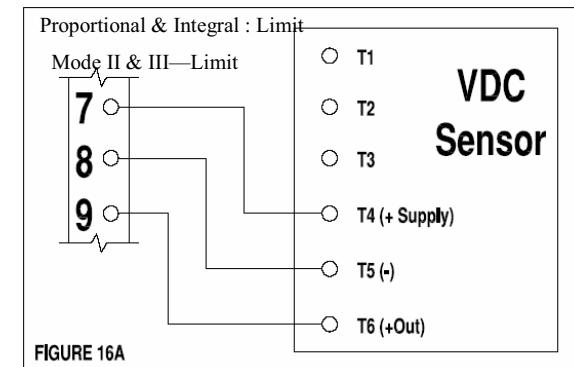
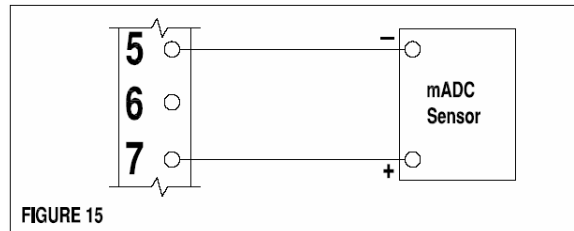
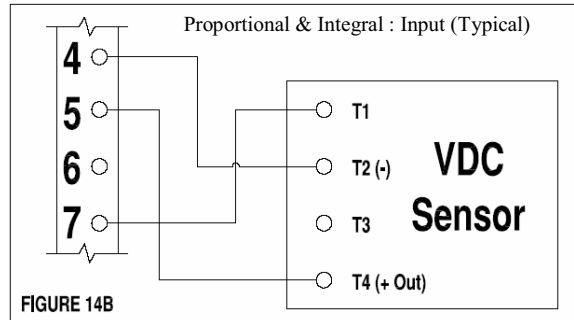
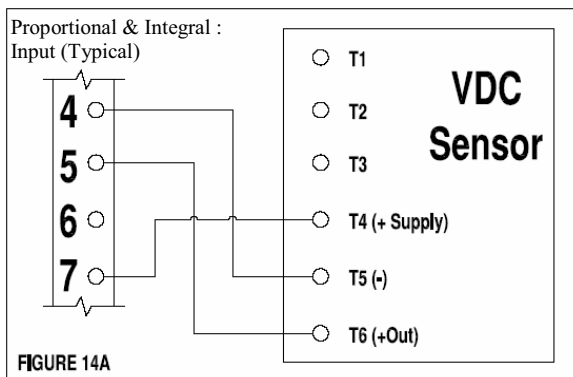
## **Mode II. (Proportional)**

- A. If two position airflow and/or high limit used wire as shown in Figure 9, page 12.
- B. Control Input - Interpreted by the humidifier as a demand of output signal. Input device should be linear. Unit can accept any VDC or mADC signal within a range of 0-20 VDC or mADC (See Fig. 10). Unit may also accept a resistive signal 0-135 ohms (See Fig. 11).
- C. Limit Input - Unit may accept any modulating input within the same ranges as the control inputs listed above.
  1. Proportional VDC or mADC (See Fig. 12)
  2. Resistive (See Fig. 13)
  3. Two position device (See Fig. 9)  
Additionally, a P + I sensor may be used as a limit input.
  4. VDC Sensor Input (See Fig. 16A wall, 16B duct)
  5. mADC Sensor Input (See Fig. 17)



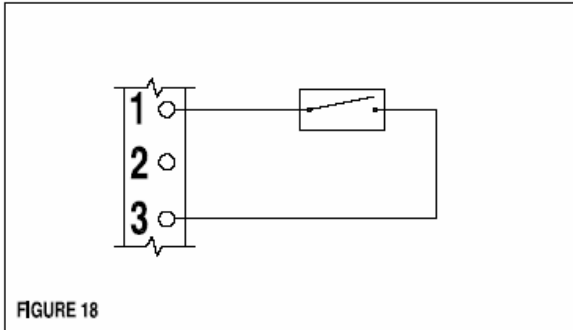
### Mode III. (Proportional + Integral)

- A. If two position airflow and/or high limit used wire as shown in Figure 9, page 12.
- A. Control Input - Unit will accept any sensor input that provides a VDC (See Fig. 14A, wall or Fig. 14B, duct) or n-MADC (See Fig. 15) signal within a range of 0-20 VDC or mADC that is proportional to the humidity level in the air. The sensor may be direct or indirect acting but must not have an impedance greater than 500 ohms, and should be linear. Example - A direct acting 2 - 10 VDC wall sensor will send a 2 VDC signal if the R.H. level in the space is 10%; it would send a 10 VDC signal if the R.H. level is 90%. The humidifier receives this input and compares it to the setpoint that has been programmed into the unit. The microprocessor modulates the output capacity of steam. The adjustable integration period will review performance over the given time and will make tuning adjustments by shifting the proportional bandwidth to correct for over or under humidification offsets automatically.
- C. Limit Input - Unit can accept any two position device or any sensor input as specified above.
  1. Two position device (See Fig. 9).
  2. VDC sensor input (See Fig. 16A, wall or Fig. 16B, duct).
  3. MADC sensor input (See Fig. 17).



### External Off Switch

Should a field installed remote off switch be required, follow the wiring diagram below (See Fig. 18). Be sure to remove the jumper wire between poles 1 and 3 on "Controls Terminal Strip." The remote off switch is to be wired between poles 1 and 3. This switch will override the unit on/off switch to turn the unit off only, **it will not restart the unit**. The unit must be turn back on by the unit on/off switch.



### Remote Alarm Option (EST-1131 or EST-1132)

If the Herrtronic MD Humidifier has been ordered with the remote alarm option, it is equipped with a set of relay activated dry contacts. The relay is energized, closing the contacts, whenever an indicating fault condition

exists. When units are networked together, the master's alarm contacts will close if a fault occurs at either the master or one of the slaves. The contacts are connected at poles 1 and 2 of terminal strip 3 (see page 34).

Do not exceed the contact specifications:

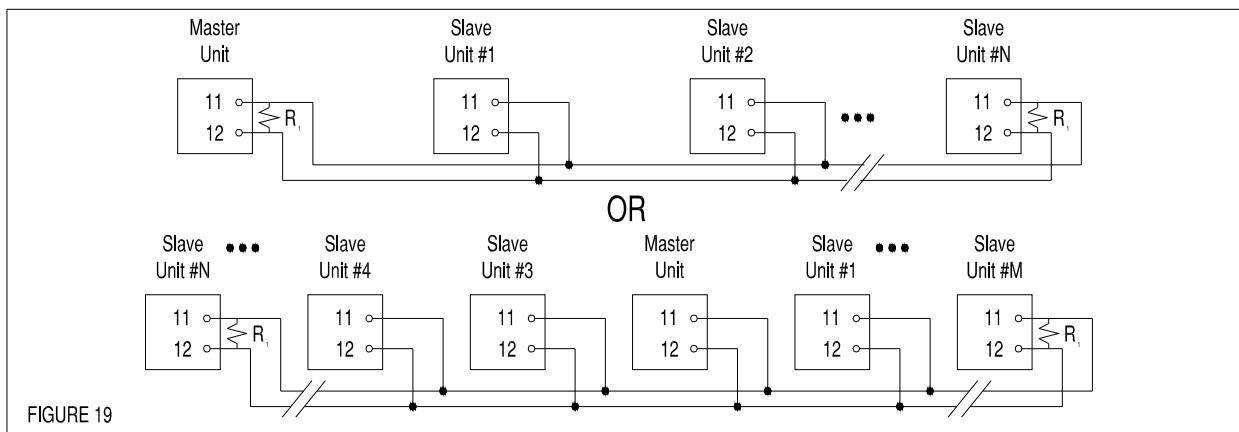
Contact rating:

24 VAC - 3.0 A

24 VDC - 2.1 A

### Unit Networking

When networking units together in a master/slave configuration, be sure to maintain polarity between poles 11 and 12 on all units. Units are to be wired as a parallel circuit. More than one branch is allowable so that the master unit can be centrally located (See Fig. 19). A maximum of 29 slave PC boards (29 MDS or MDM units or 14 MDD units) may be configured as a network. Included in each installation pack is a 120 ohm resistor. This resistor should be inserted into R28 on the microprocessor board (see Fig. 33) on the appropriate end units of the chain. (Refer to Fig. 19)







Our MD Series Humidifiers come with a two-year limited warranty.



To learn more about  
Herrmidifier products,  
contact your local  
sales representative or  
visit us on the web at  
[herrmidifier-hvac.com](http://herrmidifier-hvac.com)



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