READ AND SAVE THESE INSTRUCTIONS

VAPORSTREAM® and VAPORSTREAM® DI

ELECTRIC STEAM HUMIDIFIERS

For Commercial, Institutional, Industrial and Large Residential Applications Without a Steam Boiler

Installation Instructions and Maintenance Operations Manual

UL LISTED

LR 52511

CSA APPROVED

DRI-STEEM® HUMIDIFIER COMPANY

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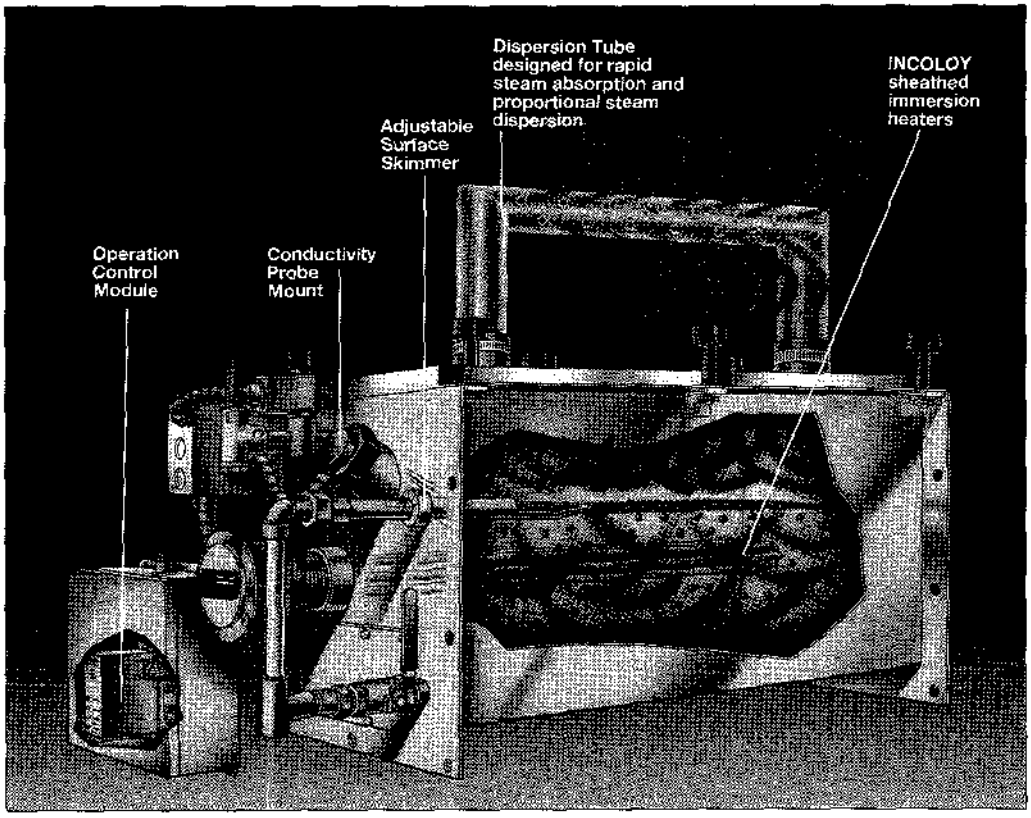
TO THE PURCHASER AND THE INSTALLER

Thank you for deciding to purchase VAPORSTREAM equipment. We have applied our best efforts to design and build this equipment to give you total satisfaction and many years of trouble free service. Avoiding certain pitfalls during installation and observing proper operating practices thereafter will assure you of achieving that objective. We therefore respectfully urge you to familiarize yourself with the contents of this bulletin.

This bulletin covers material for both the VAPORSTREAM and VAPORSTREAM D.I. humidifiers. Most of the application material will apply to both units. When information differs for the two units it will be noted as such.

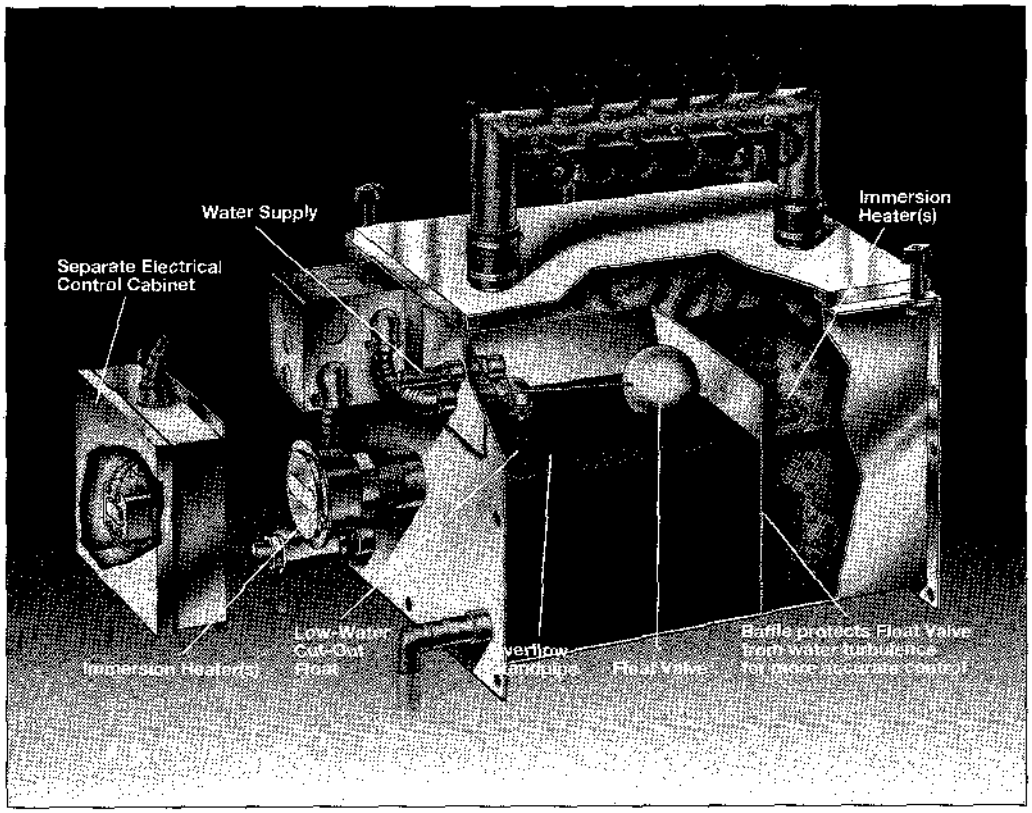
DRI-STEEM Humidifier Company

VAPORSTREAM AND VAPORSTREAM D.I.



VAPORSTREAM
Electric Humidifier

Sophisticated state-of-the-art technology in a simple, low maintenance humidifier.



VAPORSTREAM
Model D.I.

For use with deionized or reverse osmosis water. This unit produces chemically-free steam and reliable , accurate humidification control. And it is virtually maintenance-free with no wasted water, heat or downtime.

Selecting the Location

To put VAPORSTREAM humidifiers to work, you need just three things: available tap water (preferably softened) or DI/RO water, available electricity and a drain system. VAPORSTREAM humidifiers are not built to fit rigid, set situations, but are made to adapt to any existing physical condition.

When selecting the location, first consideration should be given to rapid, thorough absorption of the steam. *The warmest air will most readily absorb the steam. The most active part of the air stream will provide the best mixing of the steam and air. Avoid dead spots* such as the inside curve of an elbow or an area immediately downstream of a baffle plate. Since the "fog" will travel some distance before "disappearing" and will saturate objects it touches while visible, the distance steam will travel within a given airstream is predictable and can be determined using the VAPORSTREAM catalog. If this has already been done, the travel distance should be specified; if not, consult the VAPORSTREAM catalog.

A. It is very important that the humidifier be located where the water vapor being discharged will be carried off with the air stream and will not cause condensation or dripping from the duct.

B. In general, the electric evaporative humidifier is best placed where the air can most readily absorb the moisture being added without causing condensation at or after the unit. This will normally be after the heating coil or where the air temperature is highest.

C. Do not place in an outside air intake unless air is tempered with a preheat coil.

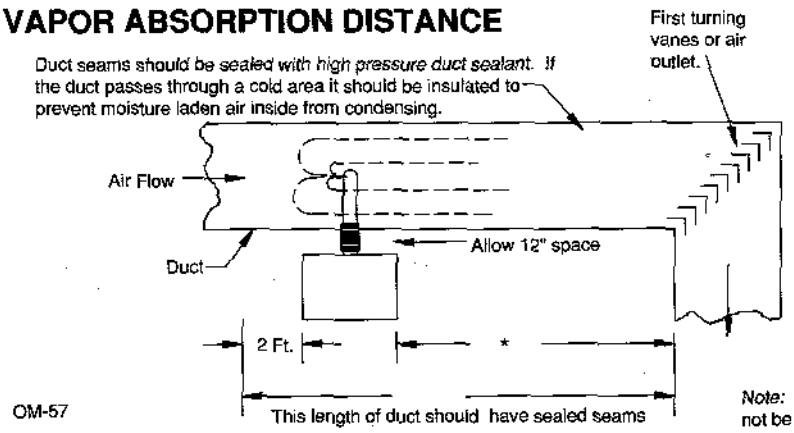
D. Do not place the unit too near to the intake of a high efficiency filter. The filter will remove the visible moisture and become waterlogged.

E. Do not place unit where discharged vapor will impinge on a metal surface.

F. Do not place the unit too close to a spilt in the duct. The unit may put more moisture in one branch than the other.

When adequate absorption distance is not available, a rapid absorption tube bank should be used. Refer to pages 12 - 15 in the VAPORSTREAM product catalog or contact DRI-STEEM or your DRI-STEEM representative.

VAPOR ABSORPTION DISTANCE



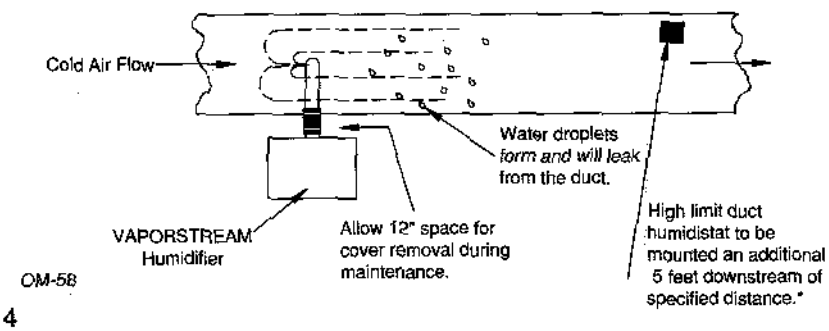
OM-57

Note: If desired, unit need not be tight to duct.

A distance of air travel is required for the *steam to "disappear" or go into the* gaseous state.

While visible, the steam will collect on internal devices such as turning vanes resulting in dripping.

INSTALLATION IN COLD AIR STREAM



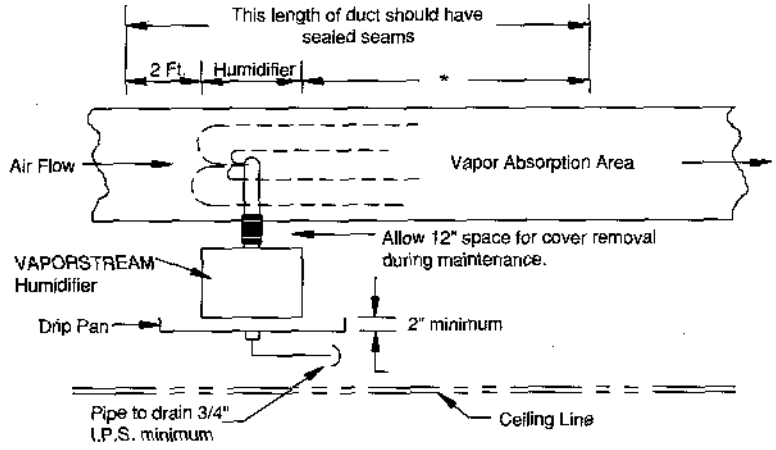
OM-58

When a humidifier is installed in a duct that will carry cold air periodically, the dew point temperature should be determined.

If the psychrometric chart reveals that *saturation may occur, protection should* be provided. A high limit humidistat or *thermostat, set to cut off the humidifier* at a safe temperature, can be used for this purpose.

INSTALLATION

INSTALLATION ABOVE VALUABLE EQUIPMENT



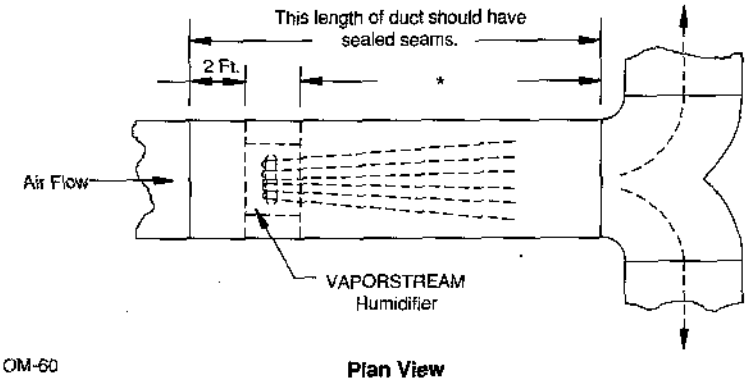
OM-59

Water piping and humidifiers should not be installed above expensive apparatus or equipment. A broken water pipe, leaking valve gland, condensation or other water leaks may occur causing serious damage and costly repairs to the equipment below.

Where this type of installation cannot be avoided install a drip tray constructed of galvanized sheet steel under the humidifier, valve, etc. to catch any possible water drip.

It is advisable to end the drain above an open floor drain. The overflow from the VAPORSTREAM should be piped to a floor drain rather than the drip pan.

INSTALLATION AHEAD OF DUCT SPLIT



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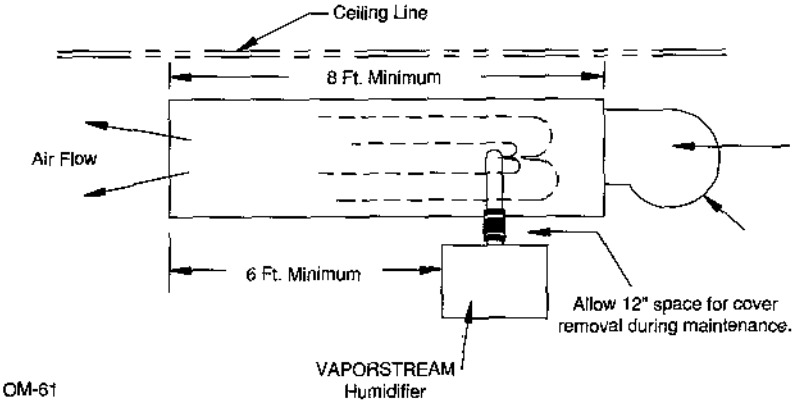
Plan View

When a VAPORSTREAM humidifier is installed upstream of a duct split, the humidifier should span most of the duct width or be centered upon it to equalize the humidifying effect between the two branches.

RECIRCULATION UNIT



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In an application where no duct system exists, or if the duct air is too cool for proper humidity absorption, a recirculation fan can be used. The fan circulates room temperature air across the VAPORSTREAM humidifier and discharges humidified air into the space. The point of discharge should be carefully selected to avoid condensation on surfaces of the building or equipment.

* The distance steam will travel within a given airstream is predictable and can be determined using the VAPORSTREAM catalog. If this has already been done, the travel distance should be specified; if not, consult the VAPORSTREAM catalog or contact your DRI-STEEM representative or the DRI-STEEM factory.

VAPORSTREAM /VSDI ELECTRICAL SPECIFICATIONS

	Single Phase □					Three Phase □						Capacities-hr See Notes	
Model**	120 V Amps	208 V Amps	240 V Amps	480 V Amps	575 V Amps	208 V Amps	240 V Amps	480 V Amps	575 V Amps	KW	Control Cabinets	Lbs.	Kg
VPC-2	16.6	9.6	8.3	4.2	3.5	55.5	4.8	2.4	2.0	2	S	5.7	2.59
3	25.0	14.4	12.5	6.3	5.2	8.3	7.2	3.6	3.0	3	S	8.5	3.86
4	33.3	19.2	16.7	8.3	7.0	11.1	9.6	4.8	4.0	4	S	11.4	5.17
5	41.6	24.0	20.8	10.4	8.7	13.9	12.0	6.0	5.0	5	S	14.2	6.44
6		28.8	24.9	12.5	10.4	16.5	14.4	7.2	6.0	6	S	17.0	7.71
7		33.7	29.1	14.6	12.2	19.4	16.9	8.45	7.0	7	S	19.9	9.03
8		38.5	33.3	16.7	13.9	22.2	19.2	9.6	8.0	8	S	22.7	10.30
9		43.2	37.5	18.8	15.7	25.0	21.7	10.8	9.0	9	S	25.5	11.57
10		48.0	41.7	20.8	17.4	27.7	24.1	12.1	10.0	10	S	28.4	12.88
12				25.0	20.9	33.3	28.9	14.5	12.1	12	S	34.1	15.47
14				29.2	24.3	38.8	33.7	16.9	14.1	14	S	39.7	18.01
16				33.3	27.8	44.4	38.5	19.3	16.1	16	S	45.4	20.59
18				37.5	31.3		43.3	21.7	18.1	18	S	51.1	23.18
20				41.7	34.8		48.0	24.1	20.1	20	S	56.8	25.76
VPC-2-2	33.2	19.2	16.6	8.4	7.0	11.0	9.6	4.8	4.0	4	M	11.4	5.17
3-3	50.0	28.8	25.0	12.6	10.4	16.6	14.4	7.2	6.0	6	M	17.0	7.71
4-4	66.6	38.4	33.4	16.6	14.0	22.2	19.2	9.6	8.0	8	M	22.7	10.30
5-5	83.2	48.0	41.6	20.8	17.4	27.8	24.0	12.0	10.0	10	M	28.4	12.88
6-6		57.6	49.8	25.0	20.8	33.2	28.8	14.4	12.0	12	M	34.1	15.47
7-7		67.4	58.2	29.2	24.4	38.8	33.8	16.9	14.0	14	M	39.7	18.01
8-8		77.0	66.6	33.4	27.8	44.4	38.4	19.2	16.0	16	M	45.4	20.59
9-9		86.4	75.0	37.6	31.4	50.0	43.4	21.7	18.0	18	M	51.1	23.18
10-10		96.0	83.4	41.7	34.8	55.4	48.2	24.1	20.0	20	M	56.8	25.76
12-12				50.0	41.8	66.6	57.8	28.9	24.2	24	M	68.2	30.94
14-14				58.4	48.6	77.6	67.4	33.7	28.2	28	M	79.5	36.06
16-16				66.6	55.6	88.8	77.0	38.5	32.2	32	M	90.9	41.23
18-18				75.0	62.6		86.6	43.3	36.2	36	M	102.0	46.27
20-20				83.4	69.6		96.0	48.0	40.2	40	M	113.6	51.53
VPC-2-2-2	49.8	28.8	24.9	12.6	10.5	16.5	14.4	7.2	6.0	6	M	17.0	7.71
3-3-3	75.0	43.2	37.5	18.9	15.6	24.9	21.6	10.8	9.0	9	M	25.5	11.57
4-4-4	99.9	57.6	50.1	24.9	21.0	33.3	28.8	14.4	12.0	12	M	34.1	15.47
5-5-5	124.8	72.0	62.4	31.2	26.1	41.7	36.0	18.0	15.0	15	M	42.6	19.32
6-6-6		86.4	74.7	37.5	31.2	49.8	43.2	21.6	18.0	18	M	51.1	23.18
7-7-7		101.1	87.3	43.8	36.6	58.2	50.7	25.3	21.0	21	M	59.6	27.83
8-8-8		115.5	99.9	50.1	41.7	66.6	57.6	28.8	24.0	24	M	68.2	30.94
9-9-9		129.6	112.5	56.4	47.1	75.0	65.0	32.4	27.0	27	M	76.7	34.79
10-10-10		144.0	125.1	62.4	52.2	83.1	72.3	36.1	30.0	30	M	85.2	38.65
12-12-12				75.0	62.7	99.9	86.7	43.2	36.3	36	M	102.0	46.27
14-14-14				87.6	72.9	116.4	101.1	50.7	42.3	42	M	119.3	54.11
16-16-16				99.9	83.4	133.2	115.5	57.8	48.3	48	M	136.3	61.83
18-18-18				112.5	93.9		129.9	65.0	54.3	54	M	153.3	69.54
20-20-20				125.1	104.4		144.0	72.3	60.3	60	M	170.4	77.29
VPC-14-14-14-14				116.8	97.2	155.2	134.8	67.6	56.4	56	L	159.0	72.11
16-16-16-16				133.2	111.2	177.6	154.0	77.2	64.4	64	L	181.8	82.46
18-18-18-18				150.0	125.2		173.2	86.8	72.4	72	L	204.0	92.53
20-20-20-20				166.8	139.2		192.0	96.0	80.4	80	L	227.2	103.06

Capacities Notes:
Approximately 172 BTU's are required to raise the temperature of one pound of water from 40°F to 212°F. An additional 970 BTU's are required to change this one pound of water to water vapor.

A factor to consider when calculating humidifier capacity is the heat loss from the humidifier chamber to the air surrounding it. This will vary with air temperature and velocity. Calculations show that for a condition of 70°F. air and 1500 feet per minute velocity, the loss will be about 5%. In still air it will be about 3%. The addition of 3/4" of rigid foil faced fiberglass insulation (optional) on all surfaces except front of vaporizing tank will cut this loss to about 1%.

A second factor to consider is steam loss from hoses and tubes. Use the following steam loss guidelines: vapor hose, .15 lbs/ft/hr; insulated hard pipe, .05 lbs/ft/hr; dispersion tubes, u-tubes and standard tubes, .25 lbs/ft/hr.

Control Cabinets				
	Inches	cm	Shipping Wt.	
Series S	12"W x 12"H x 6"D	30.8W x 30.8H x 15.24D	24 lbs.	11 kg
Series M	14"W x 16"H x 6"D	35.56W x 40.64H x 15.24D	32 lbs.	14.5 kg
Series L	20"W x 20"H x 6"D	50.8W x 50.8H x 15.24D	55 lbs.	25 kg

NOTE: The control panel may be larger than specified depending on the electrical options selected.
□ = Alternate voltages available upon request.

VAPORSTREAM/VSDI MECHANICAL SPECIFICATIONS

VPC and VSDI Model No. (2)	Dim. "A"		Dim. "B"		U Tubes (3)	Hose Kits (4)	Weight Empty		Weight Full	
	Inches	Cm	Inches	Cm			Lbs.	Kg	Lbs.	Kg
2 (1)	7.5	19	x	x	1	1	28	12.4	50	22.7
3 (1)	7.5	19	x	x	1	1	28	12.4	50	22.7
4 (1)	7.5	19	x	x	1	1	28	12.4	50	22.7
5	15.5	39.4	10.5	26.67	1	1	36	16.3	79	35.8
6	15.5	39.4	10.5	26.67	1	1	36	16.3	79	35.8
7	15.5	39.4	10.5	26.67	1	1	36	16.3	79	35.8
8	15.5	39.4	10.5	26.67	1	1	37	16.8	80	36.3
9	23.5	59.7	20.5	52.07	1	1	47	21.32	112	50.8
10	23.5	59.7	20.5	52.07	1	1	47	21.32	112	50.8
12	23.5	59.7	20.5	52.07	1	1	47	21.32	112	50.8
14	39.5	101.3	32.5	82.55	1	1 (5)	54	25.0	162	73.5
16	39.5	101.3	32.5	82.55	1	1 (5)	54	25.0	162	73.5
18	39.5	101.3	32.5	82.55	1	1 (5)	54	25.0	162	73.5
20	39.5	101.3	32.5	82.55	1	1 (5)	55	25.0	163	73.9
2-2 (1)	7.5	19	x	x	1	1	35	15.9	62	28.1
3-3 (1)	7.5	19	x	x	1	1	35	15.9	62	28.1
4-4 (1)	7.5	19	x	x	1	1	35	15.9	62	28.1
5-5	15.5	39.4	10.5	26.67	1	1	46	20.9	100	45.4
6-6	15.5	39.4	10.5	26.67	1	1	46	20.9	100	45.4
7-7	15.5	39.4	10.5	26.67	1	1	46	20.9	100	45.4
8-8	15.5	39.4	10.5	26.67	1	1	46	20.9	100	46.3
9-9	23.5	59.7	20.5	52.07	1	1	56	25.4	137	62.1
10-10	23.5	59.7	20.5	52.07	1	1	56	25.4	137	62.1
12-12	23.5	59.7	20.5	52.07	1	2	56	25.4	137	62.1
14-14	39.5	101.3	32.5	82.55	2	2 (5)	77	34.9	212	96.2
16-16	39.5	101.3	32.5	82.55	2	2 (5)	77	34.9	212	96.2
18-18	39.5	101.3	32.5	82.55	2	2 (5)	77	34.9	212	96.2
20-20	39.5	101.3	32.5	82.55	2	2 (5)	79	35.8	214	97.1
2-2-2 (1)	7.5	19	x	x	1	1	44	20.0	83	37.6
3-3-3 (1)	7.5	19	x	x	1	1	44	20.0	83	37.6
4-4-4 (1)	7.5	19	x	x	1	1	44	20.0	83	37.6
5-5-5	15.5	39.4	10.5	26.27	2	1	62	28.1	140	63.5
6-6-6	15.5	39.4	10.5	26.27	2	1	62	28.1	140	63.5
7-7-7	15.5	39.4	10.5	26.27	2	1	62	28.1	140	63.5
8-8-8	15.5	39.4	10.5	26.27	2	2	64	29.0	142	64.1
9-9-9	23.5	29.7	20.5	52.07	2	2	72	32.7	188	85.3
10-10-10	23.5	29.7	20.5	52.07	2	2	72	32.7	188	85.3
12-12-12	23.5	29.7	20.5	52.07	2	2	72	32.7	188	85.3
14-14-14	39.5	101.3	32.5	82.55	2	2 (5)	96	43.6	290	131.5
16-16-16	39.5	101.3	32.5	82.55	2	3 (5)	96	43.6	290	131.5
18-18-18	39.5	101.3	32.5	82.55	3	3 (5)	96	43.6	290	131.5
20-20-20	39.5	101.3	32.5	82.55	3	3 (5)	99	44.9	293	132.9
14-14-14-14	39.5	101.3	32.5	82.55	3	3 (5)	110	49.9	347	157.4
16-16-16-16	39.5	101.3	32.5	82.55	3	3 (5)	110	49.9	347	157.4
18-18-18-18	39.5	101.3	32.5	82.55	3	3 (5)	110	49.9	347	157.4
20-20-20-20	39.5	101.3	32.5	82.55	4	3 (5)	114	51.7	351	159.2

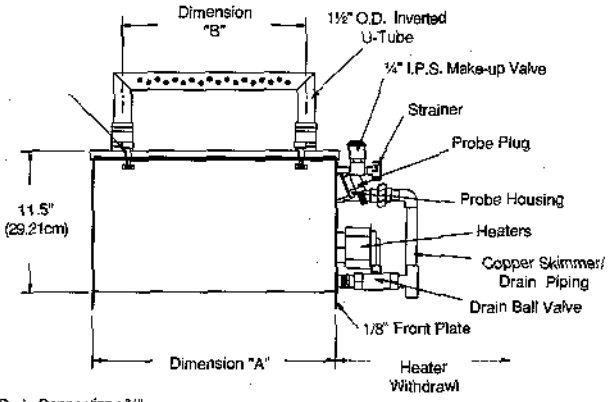
(2) CSA approved unit has a prefix "C" in the model number.
(3) Number of U-tubes furnished with standard unit.
(4) Recommended minimum quantity of vapor hose kits (when used).
(5) Humidifier hose kits incorporate dispersion tubes with condensate drains see page 12.
x = L-tube

Dimensions and specifications subject to change without notice.

(1) Dim. "A" and Weights for Certain VSDI Models

VSDI Model	Dim. "A"		Weight Empty		Weight Full	
	Inches	Cm	Lbs.	Kg	Lbs.	Kg
2	11.5	29.2	32	14.5	65	29.5
3	11.5	29.2	32	14.5	65	29.5
4	11.5	29.2	32	14.5	65	29.5
2-2	11.5	29.2	35	15.9	62	28.1
3-3	11.5	29.2	35	15.9	62	28.1
4-4	11.5	29.2	35	15.9	62	28.1
2-2-2	11.5	29.2	44	20.0	83	37.6
3-3-3	11.5	29.2	44	20.0	83	37.6
4-4-4	11.5	29.2	44	20.0	83	37.6

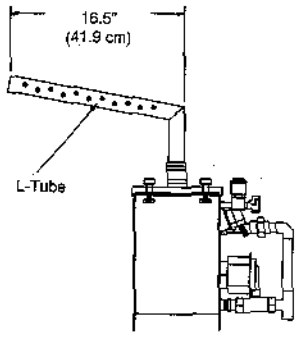
SIDE VIEW: U-TUBE MODELS



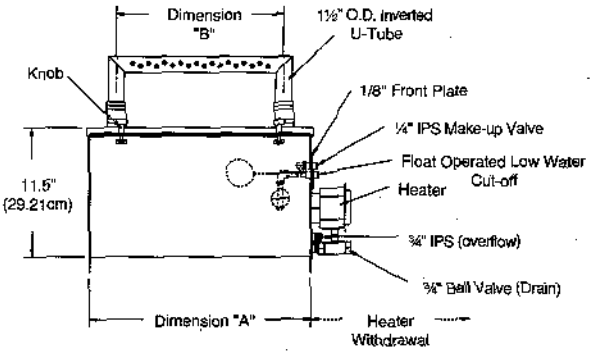
Drain Connection : ¾"
Copper Sweat: 6½" from Face Plate

(Note: Same as Dimension "A")

SIDE VIEW: L-TUBE MODELS



SIDE VIEW: VSDI U-TUBE MODEL

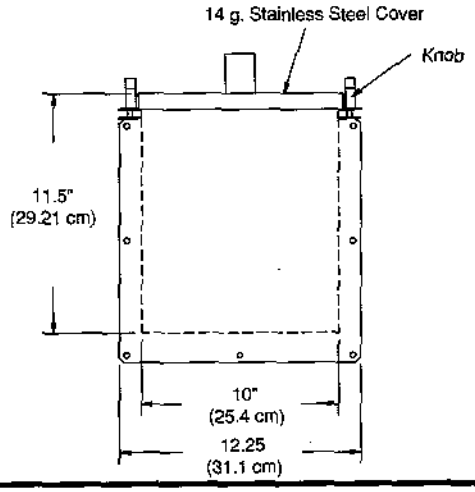


(Note: Same as Dimension "A")

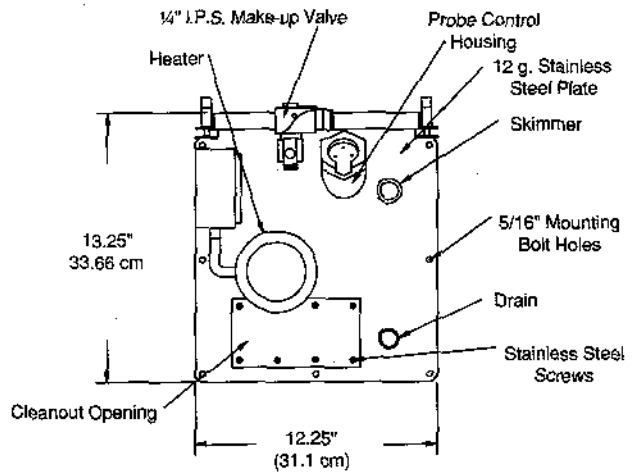
MECHANICAL SPECIFICATIONS

One Heater Units

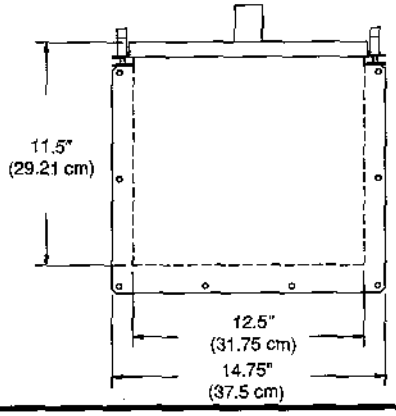
Back View

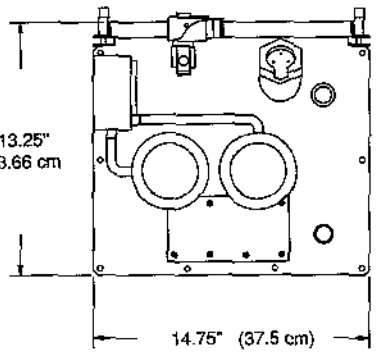


Front View

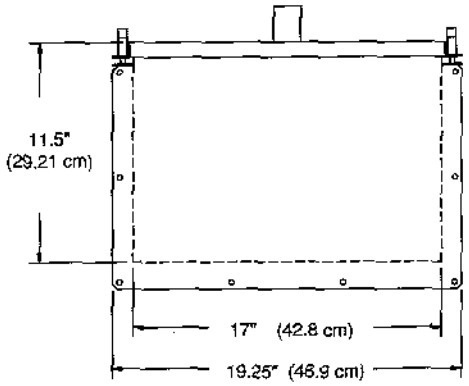


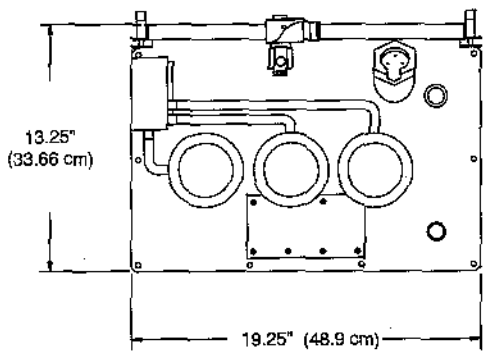
Two Heater Units



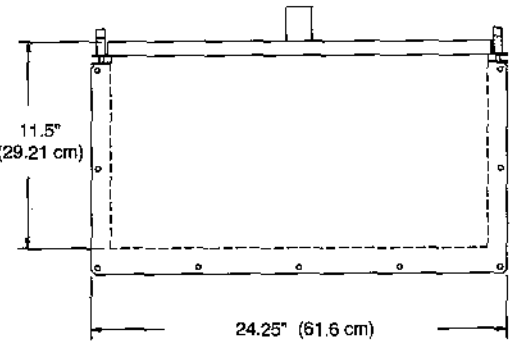


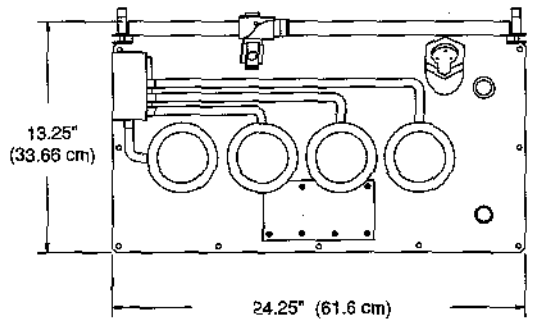
Three Heater Units





Four Heater Units





MOUNTING METHODS

Mounting Procedures

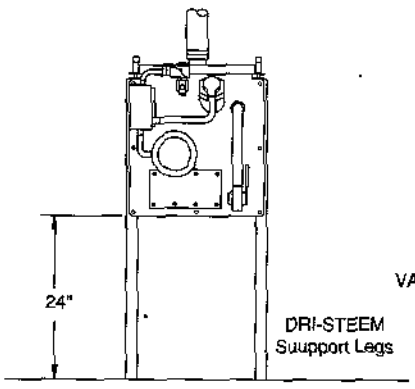
For proper operation of the electrode probe water level control and the skimmer system the humidifier should be mounted level.

Access for periodic removal of the top cover is recommended. In most cases, scale that forms on the heating elements continuously flakes off as it forms and the loose scale that settles to the bottom can be raked or flushed out through the front face cleanout opening. However, removal through the top cover is easier.

If the VAPORSTREAM is to be installed above expensive materials or devices, a drain pan of sufficient size and depth to retain rapid or sudden drainage of the contents of the humidifier should be provided. The drain pan should be drained to a sanitary waste.

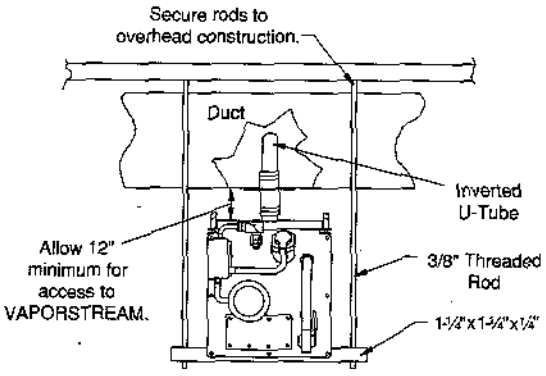
Mounting Support Methods

Floor Stand Method

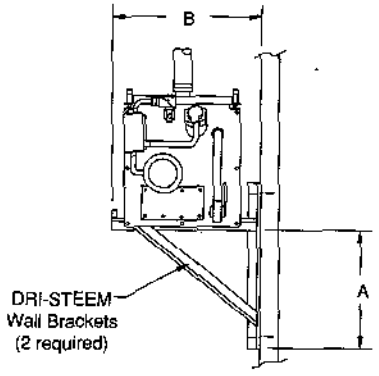


OM-62-64

Trapeze Hanger Method



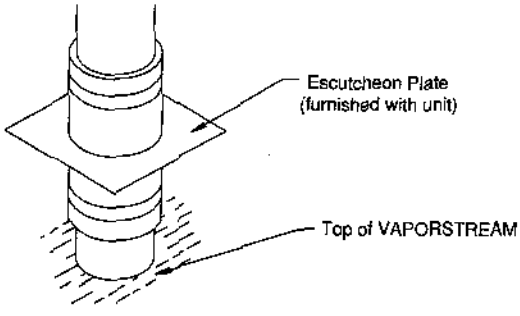
Bracketed to Wall Method



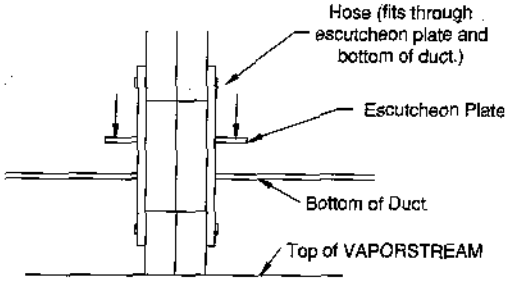
Unit	Dimensions A	B
Single Heater	15"	13"
Double Heater	19"	15½"
Triple Heater	21"	21"
Quad Heater	40"	25"

Mounting Unit on Underside of Duct

Manufacturer recommends mounting humidifier 12" below duct to facilitate cover removal (see note on page 10).



OM-65

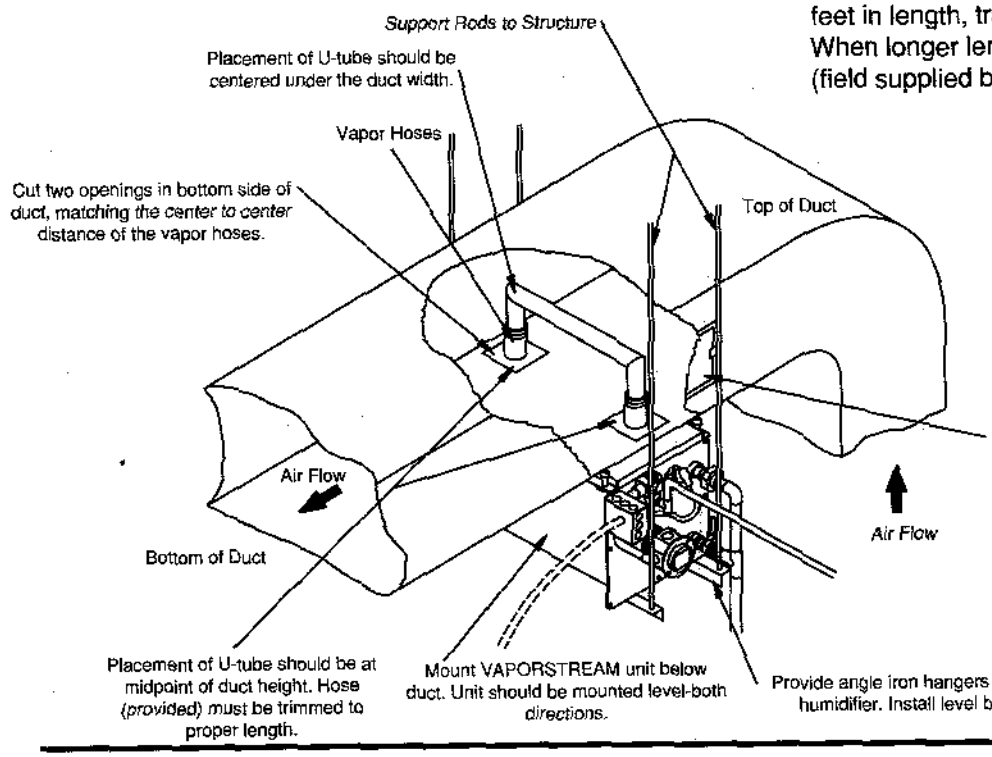


OM-66

(Continued on next page.)

Mounting Unit on Underside of Duct (continued)

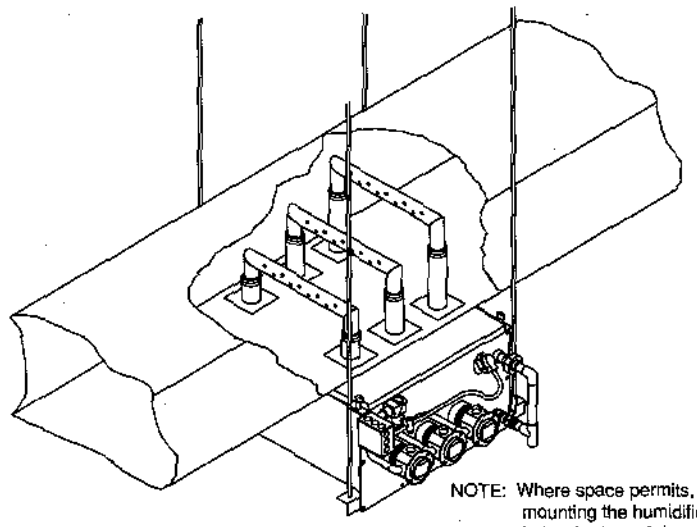
All units ordered with U-tube or L-tube covers are shipped with one set of trapeze type mounting brackets. Each bracket set comes with 4 rods 3 feet in length, trapeze bars, nuts and washers. When longer length mounting rods are required (field supplied by others) use 3/8" material.



OM-75

Multiple Inverted U-Tubes For "Tall" Air Streams

Recommendation For *Improved Absorption*	
Duct Height	Number of Tubes
Up to 24" tall	One Tube
24" - 48"	Two Tubes
Over 48"	Three Tubes



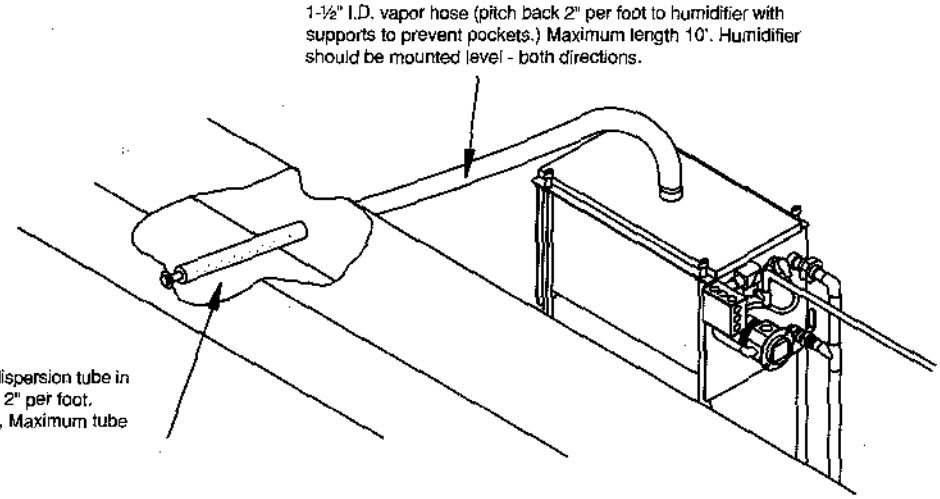
OM-79

NOTE: Where space permits, mounting the humidifier 12" below bottom of duct facilitates removal of cover for periodic inspection.

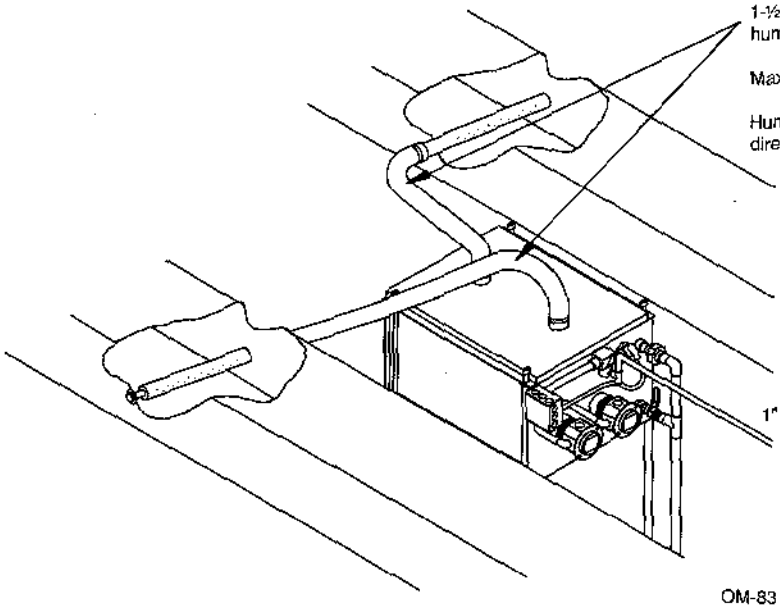
U-tubes extended upwards into duct over 12" should be secured to duct.

MOUNTING METHODS

Mounting Units Away from Duct(s) by Use of Vapor Hose

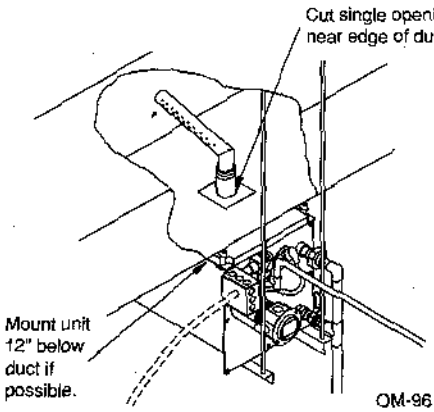


OM-82



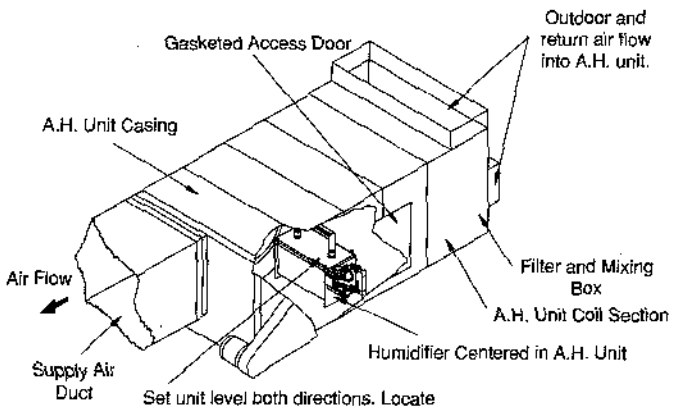
OM-83

Mounting L-Tube Under Duct



OM-96

Mounting In Air Handling Unit



OM-84

VAPORSTREAM Dispersion Tube Installation with Condensate Drain

***Vapor Hose**

- Vapor hose should be suported to prevent sags or low spots and to maintain a minimum pitch of 2" per foot back to the humidifier.
- Insulating the vapor hose or rigid piping will reduce the loss in output caused by condensation.
- When mounting the humidifier above the level of dispersion tube, see pg 14.

Failure to follow the above recommendation may result in excessive back pressures being imposed on the humidifier. This in turn may lead to dispersion tube(s) spitting, lost water seals or leaking gaskets. When distance between humidifier and the dispersion tube(s) exceeds 10 feet, consult factory for special recommendations.

Vapor Rigid Piping (when used)

- Vapor piping should have a minimum I.D. of 1.5 inches.
- A minimum pitch of 2" per foot back to the humidifier should be maintained.
- 90° elbows are not recommended, use two 45° elbows one foot apart instead.
- Thin wall tubing will heat up faster and cause less start up loss than heavy wall pipe.

Tube Mounting

- Mount dispersion tube dead level.
- Best vapor absorption occurs when dispersion tube discharges against the air flow; specify right or left hand discharge (right hand shown).

* *1/2" Diameter condensate tubing is not needed and not provided when steam flow is 12 KW (34 pph) or less per dispersion tube.

***Return line piping material must be suitable for 212° F (100°C) water.

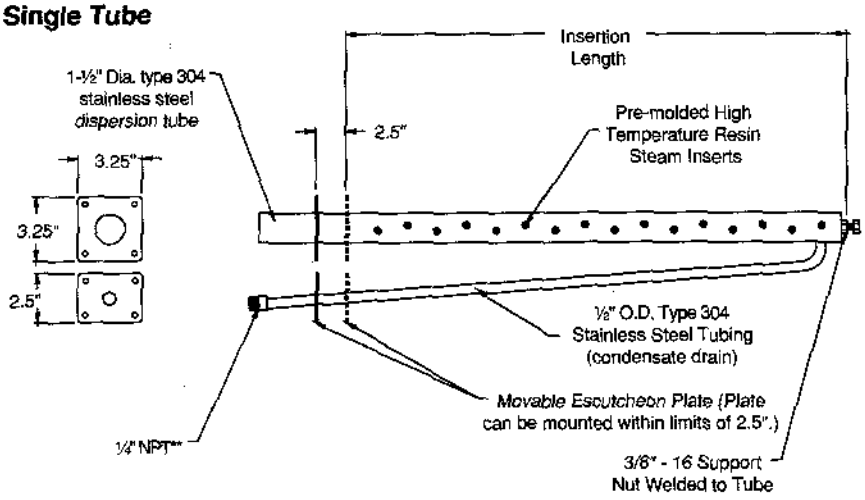
Min. Condensate Drain Line Sizing

- One or two tubes: 3/4" I.D.
- Three or more tubes - 1" I.D.

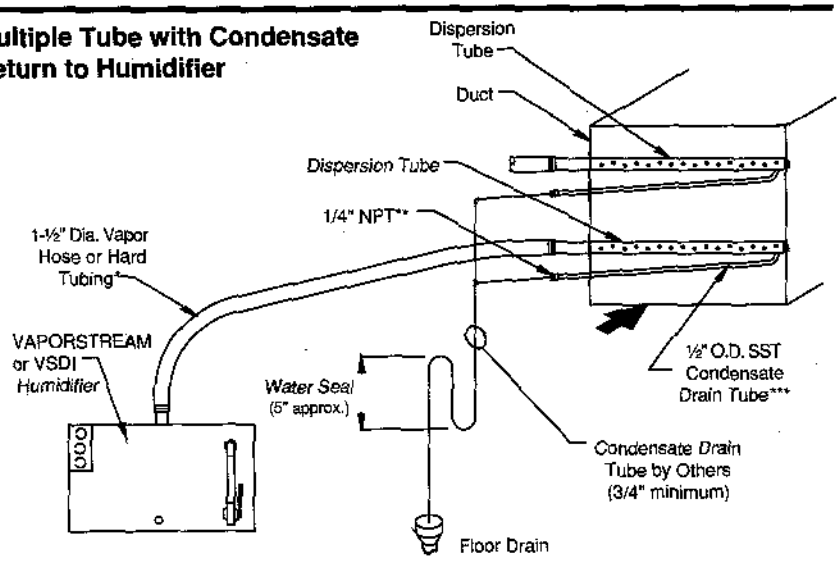
Water Seal Minimum Height ① ■	
Pounds/Hour	Height (Inches)
5-50	5
51-94	7
95-138	10
139-183	14
184-227	18

■ Height required to overcome humidifier internal pressure.

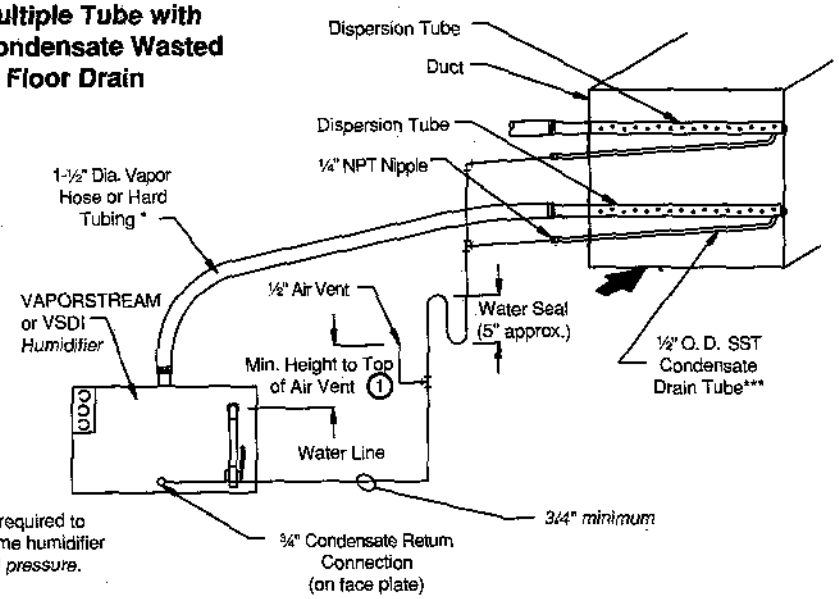
Single Tube



Multiple Tube with Condensate Return to Humidifier



Multiple Tube with Condensate Wasted to Floor Drain



Rapid Absorption Assembly Installation

1. Unpack Shipment and verify receipt of all rapid absorption components with packing list. Report any shortages at once to the DRI-STEEM factory.

2. Provide necessary access around and into duct work.

3. Locate 1" x 1½" stainless steel channel inside duct centered between duct side walls. Hang channel from top of duct with the two mounting holes provided.

4. Locate dispersion tubes and slide hose cuffs over end of each tube, include a pair of hose clamps.

5. Note direction of air flow within duct then arrange each dispersion tube so steam will blow against the air flow. Use the hex bolts provided to attach tubes to overhead 1" x 1½" channel. Do not secure. On style 2, punch-out necessary clearance holes in base of duct to slide dispersion tubes up from bottom.

6. Style 1: punch or cut out necessary clearance holes for rapid absorption header. Slide header into the duct, position header and slide the dispersion tube hose cuffs over the header dispersion tube nipples. Style 2: position header under dispersion tubes, then slide hose cuffs over header dispersion tube nipples. Secure some hose clamps.

7. Style 1: position the header so vertical dispersion tubes are perpendicular to duct and the header is level across duct. Secure header with the header escutcheons provided and to welded ¼"-20 nut. Style 2: position the header and dispersion tubes as stated above, then secure dispersion tubes in place with the tube escutcheons provided.

8. Style 1: check that the dispersion tube release steam against air flow. Secure tubes to overhead channel (1" x 1½"). Secure channel to duct, position hose cuffs over tube and header tube nipples, then secure hose clamps. Style 2: check position of tubes for steam release against air flow. Secure tubes to overhead channel, secure channel to duct. With header in level position slip hose cuffs over tube and header tube nipples, secure hose clamps.

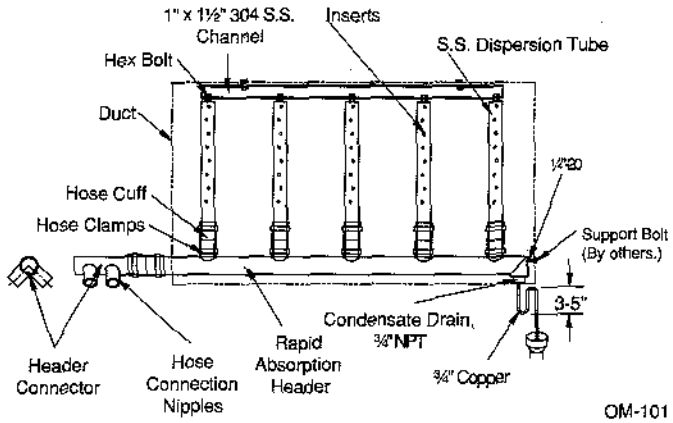
9. Connect a condensate drain to header, provide the water trap as shown and run to open drain.

10. Attach the header swivel hose connector to main header using the hose cuff and clamps provided, do not secure.

11. Route the necessary number of vapor hoses from humidifier tank, position swivel to except these hoses, then secure all necessary hose clamps.

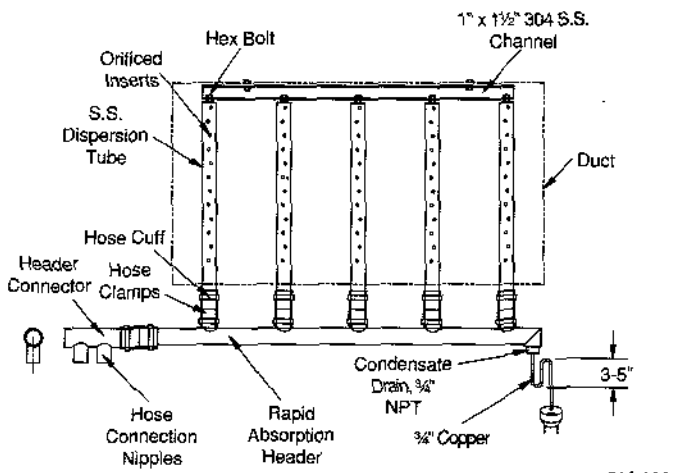
Note: Refer to page 11 for vapor hose information on routing and page 14 alternate vapor hose piping methods.

Rapid Absorption Header (Style 1)
Mounted Inside Duct



OM-101

Rapid Absorption Header (Style 2)
Mounted Under Duct



OM-102

Drain Piping

A drain line should be extended from the skimmer connection to a sanitary waste or suitable drain. If non-metallic pipe or hose is used it must be capable of withstanding 212°F temperature.

To prevent steam from escaping from the drain line, a water seal must be provided in the drain line of sufficient height to contain the pressure developed within the humidifier. This pressure is the sum of the flow resistance in the dispersion tube and hose plus the static pressure of the duct system. Without this water seal, steam will escape from the drain line. The depth of the water seal must be sufficient to overcome the static pressure of the air handling system plus the pressure developed by the humidifier itself. See table on page 15.

Makeup Water Piping

This humidifier is designed for use with either softened or unsoftened water (preferably softened). The probe type level control system requires water conductivity of 100 micromhos/cm (2 grains/gal) minimum, to function and therefore will not operate on water treated by the reverse osmosis or deionizing process. However, special design VAPORSTREAM humidifiers are available for use with these water types.

When non-metallic water piping is used it must be rated to withstand 212°F or greater temperature. If not, the final 3 feet connected to the humidifier should be metallic and should not be insulated.

If the water pressure is above 60 psi and/or water hammer would be objectionable, a pressure reducing valve or shock arrester should be installed.

The VAPORSTREAM has a one inch internal "air gap". However, local codes may require a vacuum breaker.

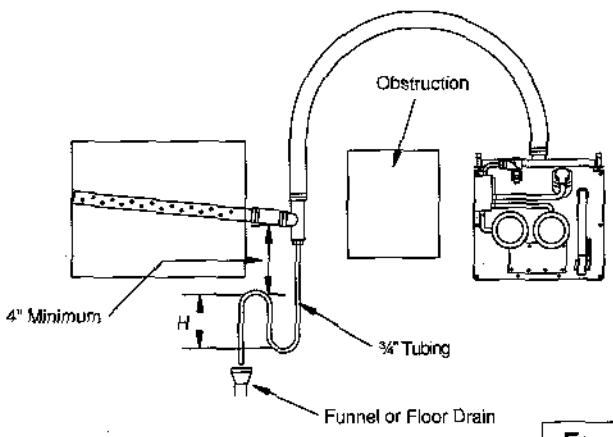
Vapor Hose Piping

When the vapor hose and stainless steel dispersion tube are used they should be pitched back to the humidifier. A gradual slope of 2" per foot of length (min.) with no "low spots" is recommended. When this is not possible due to duct elevation or an obstruction, alternate arrangements may be used as shown.

However, the condensate that forms in the vapor hose must be removed. Preferably is should be returned to an open drain with a water seal of sufficient height to contain the duct static pressure, as shown on page 12.

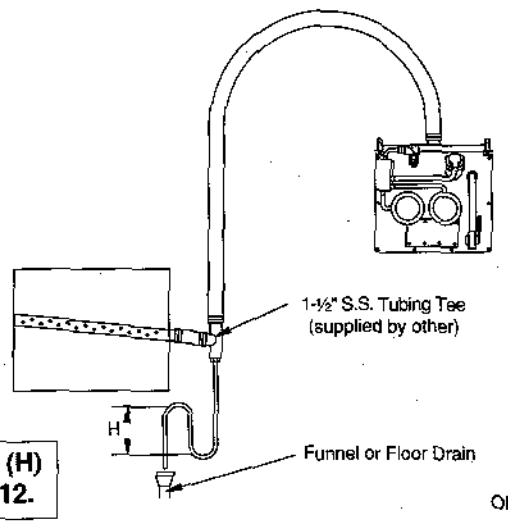
When the condensate must be returned to the VAPORSTREAM a method is shown on page 12, air vent arrangement. This method does require a water seal and an air gap to prevent back pressure from the VAPORSTREAM tank effecting condensate returning below the VAPORSTREAM water line.

Piping method recommended when obstruction prevents dispersion tube from being continuously pitched back to humidifier.



OM-67

Piping Method recommended when humidifier must be mounted higher than the duct.



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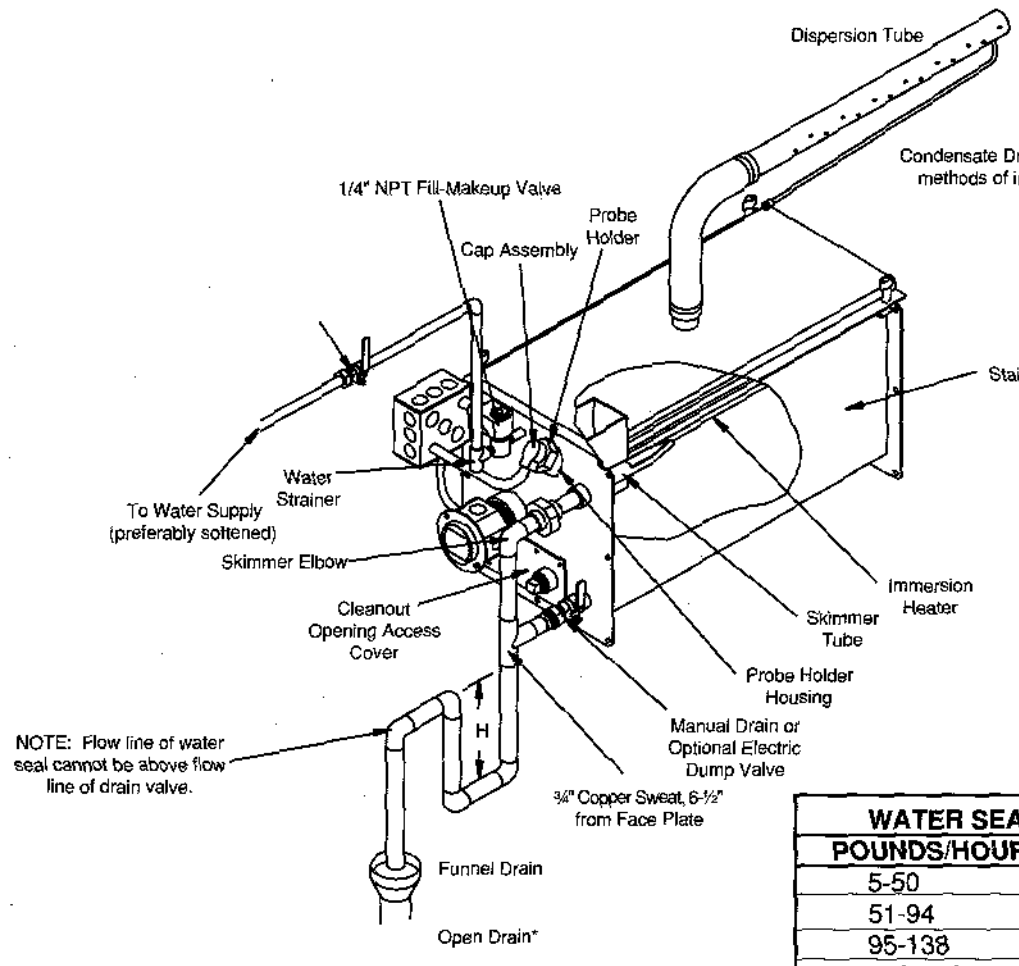
For water seal height (H) follow chart on page 12.

PIPING METHODS



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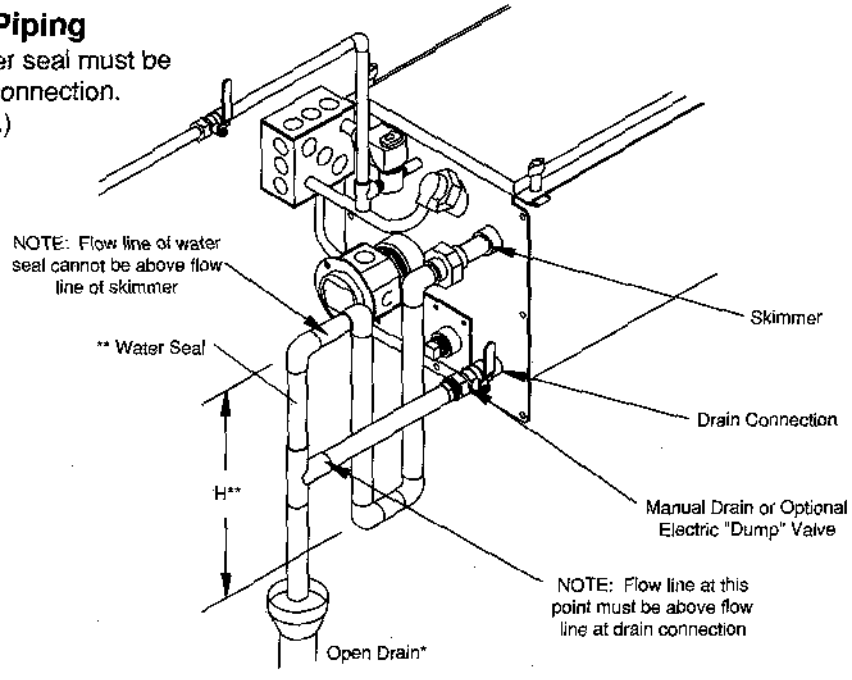
WATER SEAL HEIGHT	
POUNDS/HOUR	H(inches)
5-50	5
51-94	7
95-138	10
139-183	14
184-227	18

*Drain pipe from funnel drain should be 1" up to 20' and 1-¼" over a 20 foot run. Slope or pitch drain line as necessary to open drain.

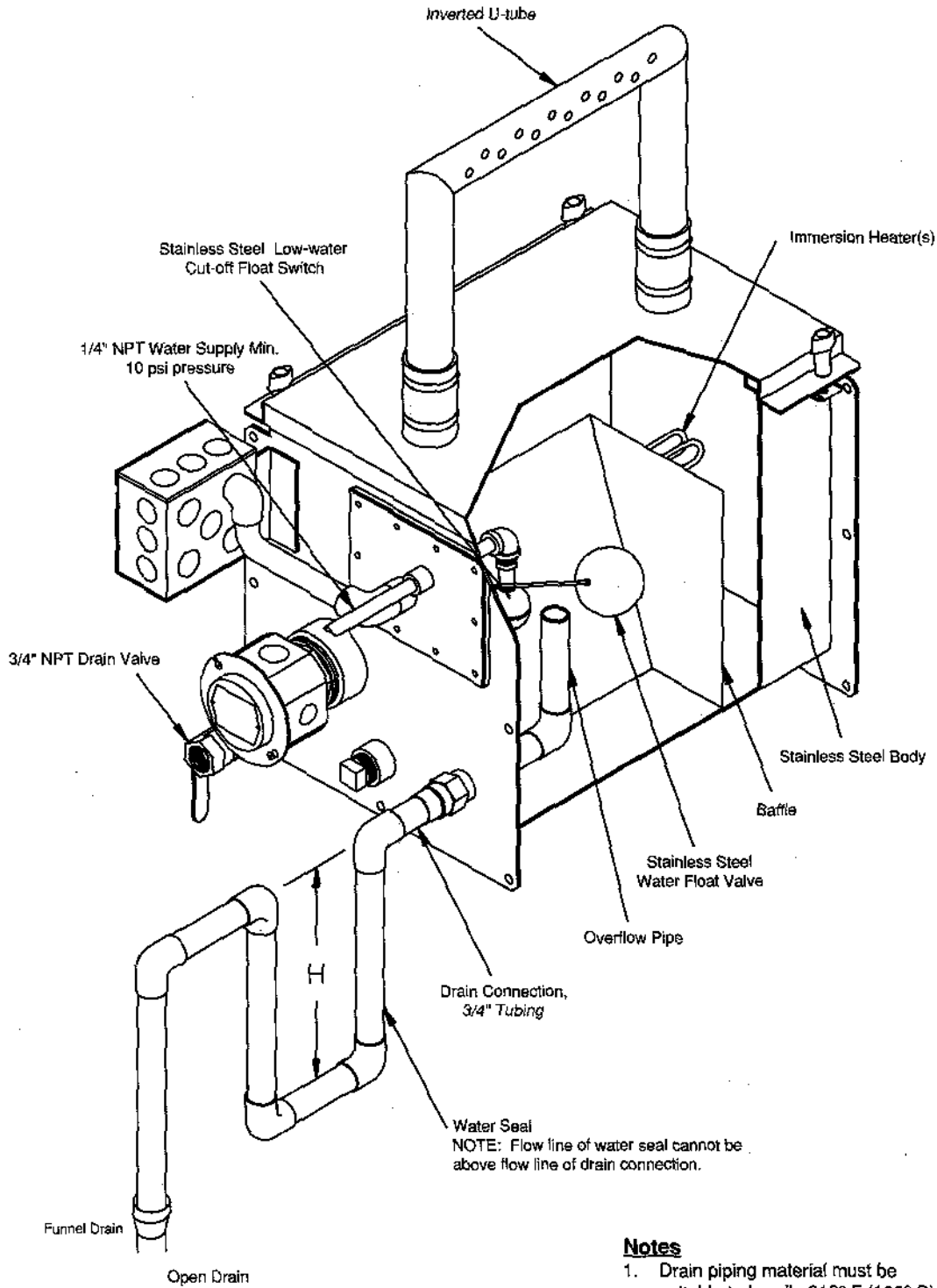
Alternate Water Seal and Valve Piping

This piping method is used when the water seal must be elevated above the flow line of the drain connection. (i.e. VAPORSTREAM is close to the floor.)



** For water seal height (H) follow chart above

Piping for Deionized Water Unit (VSDI)



Notes

1. Drain piping material must be suitable to handle 212° F (100° C) water.
2. For water seal height (H), see page 15.

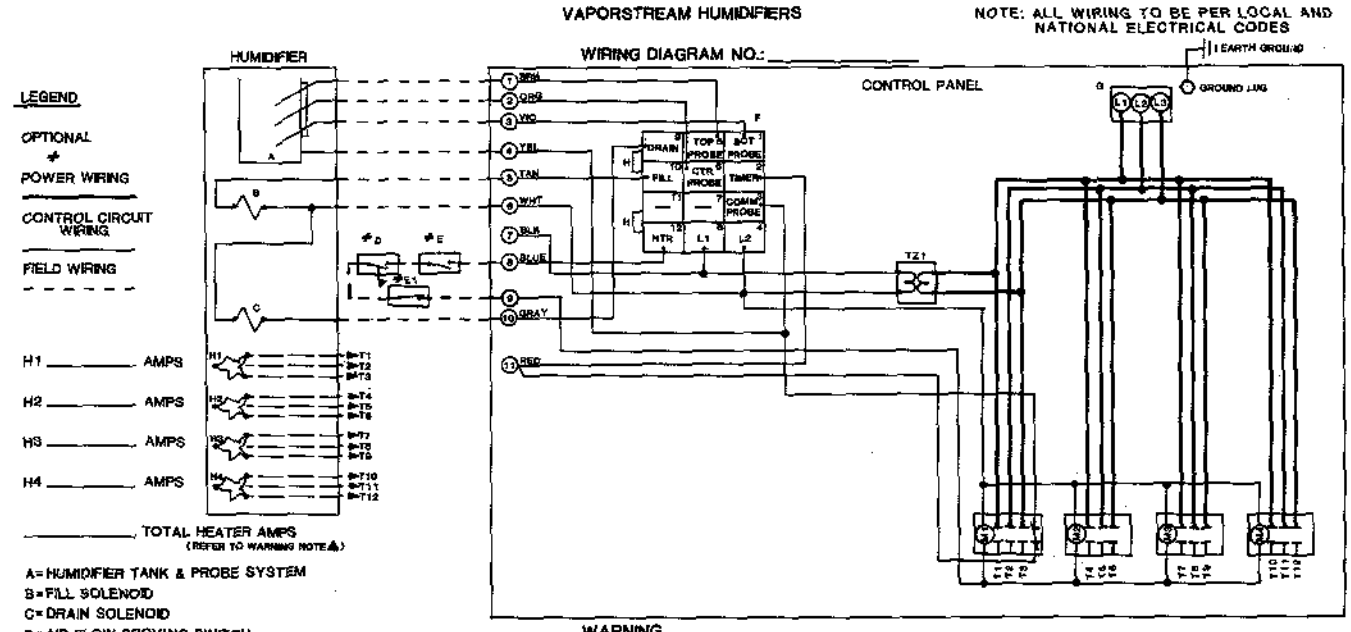
Electrical

The current characteristics, and capacity requirements should be checked against the nameplates. The control cabinet should be mounted in a location convenient for service. All wiring must be in accordance with all governing codes and the VAPORSTREAM wiring diagram. The diagram is inside the control cabinet. The wiring between the control cabinet and humidifier must be 105° C rated wire.

The basic water level control and low water protection circuit found below is common to all VPC model VAPORSTREAM humidifiers.

> Caution: Only qualified electrical personnel should perform installation and startup procedures.

VAPORSTREAM Electric Humidifier Wiring Diagram
Multiple Heater - Single Stage - Timer Drain



WARNING

▲WIRING DIAGRAM SHOWS MAXIMUM NUMBER OF HEATING ELEMENTS. YOUR PARTICULAR HUMIDIFIER MAY INCORPORATE LESS POWER CIRCUITRY DEPENDING ON THE NUMBER OF HEATERS.

FOR SUPPLY CONNECTIONS USE COPPER CONDUCTORS ONLY AND GAUGE WIRE SIZE AT 75°C RATING. THEN USE SUITABLE CONDUCTORS FOR 105°C ENVIRONMENT.

REPLACE FUSES ONLY WITH SAME TYPE.

GROUND HUMIDIFIER SYSTEM TO AN APPROVED EARTH GROUND.

FIELD WIRING TORQUE REQUIREMENTS: (POUND/INCHES)

CONTROL BLOCK: _____ POWER BLOCK: _____

CONTACTORS: _____ GROUND LUG: _____

MODEL NO: _____

ORDER NO: _____

PRIMARY VOLTAGE: _____ PH: ___ HZ: ___

CONTROL VOLTAGE: _____ ▲HEATERS: ___

STAGE: SINGLE

JOB: _____

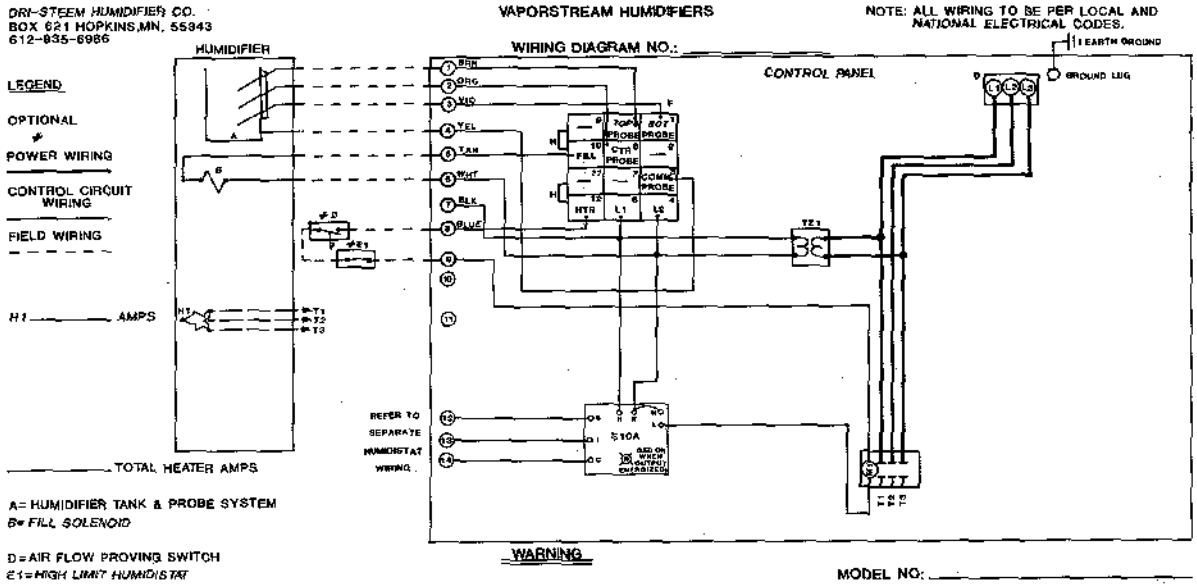
VAPORSTREAM Electric Humidifier Wiring Diagram
Single Heater - TP Modulation

DRI-STEEM HUMIDIFIER CO.
BOX 621 HOPKINS,MN, 55343
612-935-6986

VAPORSTREAM HUMIDIFIERS

NOTE: ALL WIRING TO BE PER LOCAL AND NATIONAL ELECTRICAL CODES.

WIRING DIAGRAM NO.:



A= HUMIDIFIER TANK & PROBE SYSTEM
B= FILL SOLENOID

D=AIR FLOW PROVING SWITCH
E1=HIGH LIMIT HUMIDISTAT
F=HARNESS RECEPTICAL
G=POWER BLOCK MAX WIRE GAUGE____
H=INDEX TABS
H1=HEATER

M1=CONTACTOR

TZ1=TRANSFORMER, CLASS 2, 75 VA.

WARNING

FOR SUPPLY CONNECTIONS USE COPPER CONDUCTORS ONLY AND GAUGE WIRE SIZE AT 75°C RATING. THEN USE SUITABLE CONDUCTORS FOR 105°C ENVIRONMENT

GROUND HUMIDIFIER SYSTEM TO AN APPROVED EARTH GROUND.

FIELD WIRING TORQUE REQUIREMENTS: (POUND/INCHES)

CONTROL BLOCK:_____ POWER BLOCK:_____

CONTACTORS:_____ GROUND LUG:_____

MODEL NO: _____

ORDER NO: _____

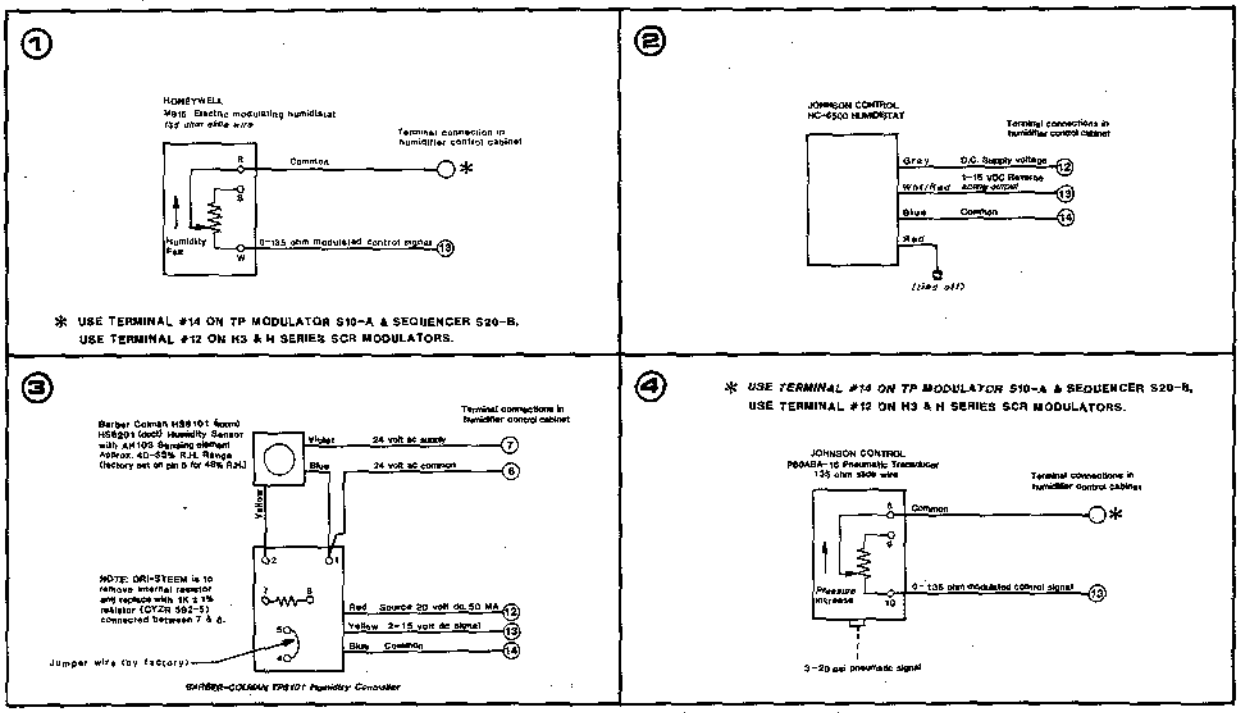
PRIMARY VOLTAGE _____ PH:____ HZ:____

CONTROL VOLTAGE: 24 HEATERS: 1

STAGE: MODULATING

JOB: _____

Electric Modulating Controller Typical Wiring Diagram

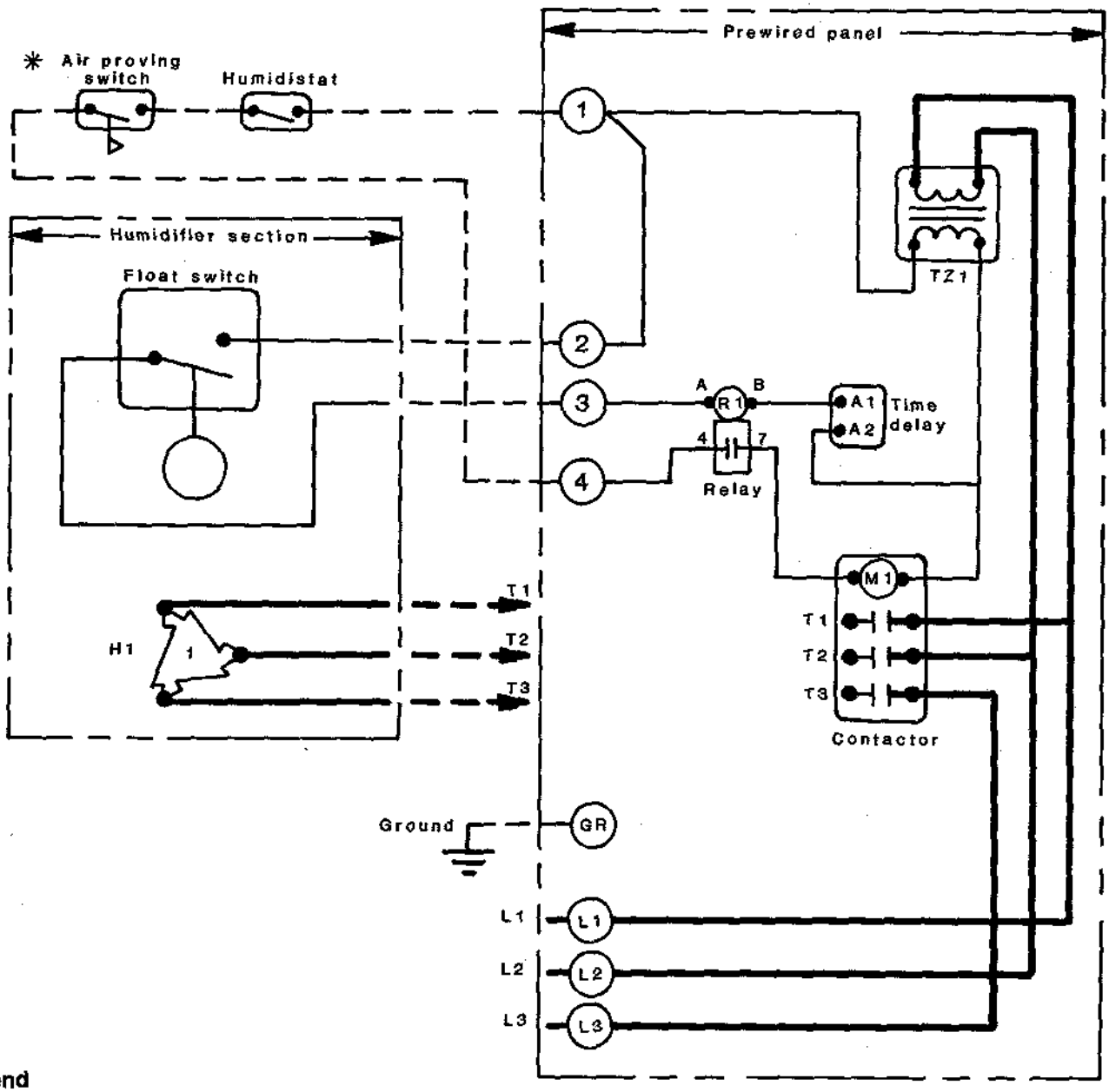


VAPORSTREAM DI Wiring Diagram

Shown below is a typical wiring schematic for the Control Cabinet.

Please refer to the diagram furnished with the humidifier for specific questions concerning the unit being installed.

3Φ 1 HEATER
1 STAGE
WITH TIMER AND DUMP VALVE



Legend

* Optional
—— Power Wiring
—— Control Circuit Wiring
– – – Field Wiring

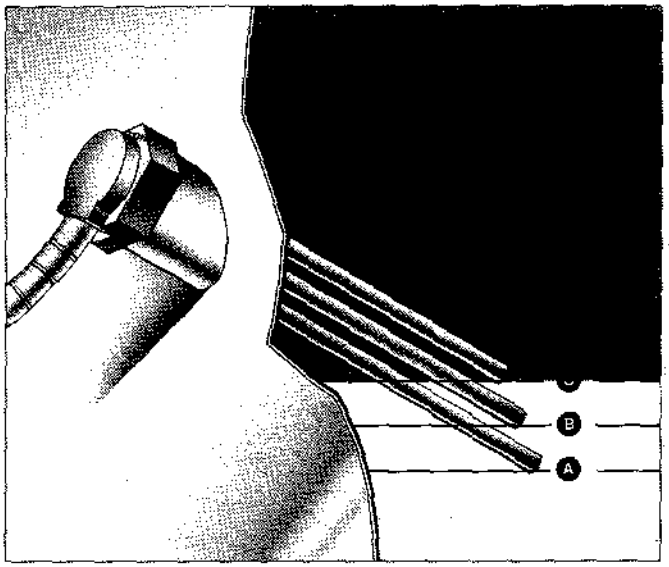
Note: All wiring per national and local electrical codes.

_____ Unit Amps _____ Per Heater Amps

Primary Voltage_____ Control Voltage_____

Model No._____ Job_____ Order No._____

Reliable Electronic Probe Control Maintains Water Level



The *exclusive* VAPORSTREAM probe system consists of 3 stainless steel probes, molded in a thermoset plastic threaded plub. The stainless steel probes are TEFLON® coated for easy cleaning. Both the probe mounting fixture and the plug are indexed for proper and easy remounting after cleaning.

The 3 probe sensors perform all of the necessary functions of water level control.

Probe A provides low water protection for the heating element(s). When the water level is below Probe A no conductivity is established thus preventing the heater(s) from being energized.

Probes B and C perform the functions of maintaining proper operating water level. The level of probe B signals the water valve to open and fill to probe C level. Upon reaching probe C level, the water valve is closed. A 1" space for airgap is provided between the top probe (Level C) and the water inlet level.

Note: Preferably this humidifier should be supplied with softened water. However, the probe type level control system requires water conductivity of 100 micromhs/cm (2 gr/gal) minimum to function and may not operate in water treated by the reverse osmosis or deionizing process. Specially designed VAPORSTREAM Model DI humidifiers are available for use with these water types.

Optional: Timer-Operated Drain/Flush Operation

This option, in addition to the features of the standard control module, provides a drain and flush sequence at preset intervals. This feature effectively reduces the frequency of cleaning associated with VAPORSTREAM humidifiers. It is recommended when the water supply contains a large quantity of dissolved minerals and softened water for make-up is not available.

An integral electronic timer accumulates the "on" or "humidifying" time of the unit. When this accumulated time reaches the hours pre-selected by the user (field adjustable between 5 and 50 hours), an electronic programmer automatically activates the drain/flush cycle.

Then this cycle, which is also field adjustable (between 1 and 30 minutes), is activated the drain valve opens, beginning the drain-off of the humidifier water. When 50% of the pre-set drain duration time has elapsed the fill valve opens for the remainder of the time, completing the flushing action.

At the end of the flushing time the control module closes the drain valve, keeps the fill valve open which refills the unit, restarts the cumulative timer and allows the humidifier to resume operation normally.

When draining the humidifier prior to servicing, the "manual drain" feature of this control module is used. Placing the three-position switch in the "manual drain" position deactives the fill valve and opens the drain valve.

The chart below shows recommended hours of operation for various water hardness. Refer to table 21-1 on page 21 for recommended drain duration settings.

Grains/Gal.	Hours of Op. Time*	Grains/Gal.	Hours of Op. Time*
14	24	24	14
16	22	26	13
18	19	28	12
20	18	30	11
22	16	32	10

* Note: Due to various waters, these are starting points. Field adjustments may be made to suit a particular water condition.

Startup and Checkout Procedures
(LW 310 Level Control Module)

1. **Mounting** - Check mounting to see that unit is level and securely supported before filling with water.
2. **Piping** - Verify that all piping connections have been completed as recommended and that water pressure is available.
3. **Electrical** - Verify that all wiring connections have been made in accordance with the VAPORSTREAM wiring diagram.
4. **Control circuits**

a) Adjust humidistat to "call" setting.
b) Open shut off valve on water supply line.
c) Set control module switch of LW310 to "standby" position.
d) Set main disconnect switch to "on" position; control module "power" lamp should now light.
e) Set control module switch in "normal op" position. For unit with LW320, set module switches to "auto" and "normal op." positions. The "fill" lamp should now light and the makeup valve should now open.
f) When water level reaches point A (see figure on page 20), the "ready water" lamp should light and the heating elements (contactors) should pull-in. Filling should continue until the uppermost electrode (point C) has been in water contact for two seconds. At that point, the "fill" lamp should go out.
g) Check low water cut off circuit:
   1. Close manual stop valve on water supply.
   2. Open ball valve and start draining unit. For units equipped with automatic drain down, open "dump valve", by moving dump valve lever to manual position.
   3. As water level drops past center electrode "fill" lamp will light; when water level drops past lowest electrode "ready water" light will go out and the heating element contactor(s) will drop out.
   4. When step 3 has been satisfactorily completed, close manual drain valve or return dump valve lever to automatic position and refill unit as in step "e".

h) Fill water seal in drain line by setting control module switch in "skimmer blowdown" position until water flows from drain pipe, reset to "normal op." and unit is ready to operate.
i) Check out function of field installed safety controls such as high limit humidistat, fan proving switch; contactor(s) should drop out when proving switch is "open".
j) Check heater draw by testing and recording voltage and amperage in each phase. Readings should match nameplate readings - nameplate is located on the humidifier housing.
k) Inspect installation for leaks by operating the VAPORSTREAM. Any steam or air leaks should be sealed.

Optional LW320 Startup and Checkout Procedures (Level Control with Drain/Flush)

Setting the Drain Interval Timer

If this option was purchased your humidifier was shipped from the factory with the "drain interval" timer set for 20 hours. This means that at the end of 20 hours of actual humidifying time the unit will go through its drain/flush cycle.

If you know the hardness of the water being supplied to your humidifier, you should reset the "hours" dial in accordance with the grains/gallon table found on page 20. If you can't get this information leave it set at 20 hours for now. Because of the many variables involved, trial and error may be the next most reliable means of arriving at the proper "hours" setting for your particular humidifier installation.

Trial and error means simply inspecting the humidifier at two week intervals. If the sides of the tank are building up with lime, lower the hours to 15. If after two more weeks it is continuing to build up, lower it to10, etc. If, on the other hand, no build up is evident, increase the hours to 25, etc.

The objective is to make sure the drain/flush cycle does the job, but does it without wasting water. It should drain/flush often enough to keep the unit free of rapid build-up, but no more often. The drain/flush cycle may not totally eliminate mineral build-up.

Note: After a week or two of operation, loose scale will begin to accumulate on the floor of the humidifier chamber. This is scale that forms on the heat exchanger. When it gets thick enough, about 3/32", of it flakes off. This is normal and need not be removed until the top of the accumulation approaches the underside of the electric heaters (usually once per season). **The use of softened water will greatly minimize the rate at which scale formation occurs.**

Setting the Drain Duration Timer (Minutes)

This setting is affected by the size (gallons capacity) of the various VAPORSTREAM models. Large units require more drain time and vice versa. This setting is made before the humidifier leaves the factory. It is always a good idea to check and make sure the setting of your unit agrees with the "drain duration" Table 21-1 below.

Testing the Drain/Flush System

As a part of final checkout the installer should always verify the operation of the (optional) drain/flush system. To test:

1. Set the "drain interval" timer dial to "0" hours.
2. Set the "drain duration" timer dial to "10" minutes. In 30 to 45 minutes (varies) the drain valve should open, 5 minutes later the fill valve should open which creates the flushing action. After an additional five minutes the drain valve should close. The fill valve should remain open until the unit is refilled to the level of the top probe and then also close.

If all of the above takes place as described, the drain/flush system is functioning correctly. The drain interval timer dial (hours) should then be returned to 20 hours and the drain duration timer dial (minutes) should be set to agree with the table below. The unit will then be ready to resume humidifying.

Table 21-1

Total KW	Drain Duration (minutes)
2-8	5
9-24	10
28-40	15
42-60	20
64-80	25

Recommended Maintenance
(VAPORSTREAM only)

The use of softened water will significantly reduce mineral build-up in the humidifier. When softened water is not available, the VAPORSTREAM is designed to deal with dissolved minerals in one of two ways depending on the degree of hardness. For light to moderate hardness (up to 10 grains per gallon), the surface skimmer action plus annual cleaning is usually adequate. For high mineral content water (above 10 grains per gallon) an electronic timer and motorized "drain" valve is recommended in addition to the surface skimmer, along with cleaning as needed. If the VAPORSTREAM was originally purchased without a timer and drain valve they usually can be easily added in the field. Consult factory for details.The frequency of cleaning will be dictated by water condition and evaporation load.

Note: *When performing maintenance on the VAPORSTREAM, always place control module switch in "standby" and place main disconnect in "off" position and close manual water shut-off valve.*

Seasonaly or as Required

1. Cleaning Tank - Remove loose scale in humidifier tank before the build-up reaches the underside of the heating element(s).

2. Cleaning Probes - Disconnect the plug and cable assembly and unscrew the probe holder from the VAPORSTREAM unit. The scale will easily flake off from the TEFLON®coated sensing portion. The uncoated sensing portion (bottom 3/8") of the probe should be brushed clean with stainless steel wool. Reinstall the probe holder with arrows up and "top" marking at the top.

3. Cleaning Skimmer Tube - Remove the elbow section of the skimmer and rotate tube so that loosened material will drop out. Loosen deposits with a long tool such as screwdriver or section of small diameter pipe and reassemble elbow. Skimmer drainage should be verified by visual inspection once per week. Water should drain from skimmer drain pipe after each fill cycle.

Summer Maintenance

At the conclusion of the humidification season a complete cleaning of the heaters, probe control, skimmer, and water chamber is recommended. After cleaning the unit should be left unfilled until such time when humidification is required again.

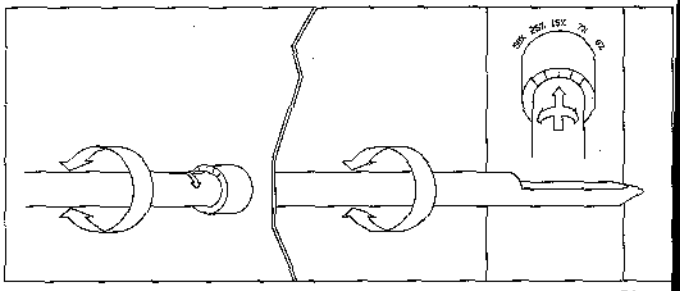
Adjusting the Surface Skimmer

The elevation of the lip of the skimmer tube in respect to the water line, determines the quantity of "skimming" that takes place with each fill cycle. The height is field adjustable by rotation of the tube. As evaporation takes place, a portion of the dissolved minerals precipitate (come out of solution) and remain on the water surface.

Each time the VAPORSTREAM refills, it fills to an elevation above the lip of the skimmer tube. A portion of the refill water then flows to drain carrying the floating mineral with it. This action constantly reduces the mineral concentration thereby reducing the frequency of cleaning needed.

The heated water that flows to drain is a cost of operation. Cleaning the humidifier is also a cost as well as in inconvenience. It is, therefore, recommended that the user, at the time of initial startup, observe and adjust the skimming quantity. By doing so, a balance between minimized mineral build-up and conservation of waste water can be achieved.

The quantity of skimming water drained off per fill cycle is adjusted by rotation of the skimmer tube which alters the height of the overflow lip. It is factory set to skim about 15% of the total evaporating capacity of the unit. For example: a Model VPC 10-10 having an output capacity of 56.8 pounds per hour would skim about 8.5 pounds (one gallon) per hour.



Surface Skimmer OM-81

To adjust, loosen the union nut and rotate the tube to the desired percentage of skimming rate. Markings on the unit indicate the following:

50% 25% 15% 7% 0%

Allow the VAPORSTREAM to operate five or ten days and then inspect it. If a mineral buildup is evident, increase the skim amount. If not, it should be reduced. Repeat the above process several times or until it is felt the proper adjustment has been attained.

Recommended Maintenance
(VAPORSTREAM DI only)

The VAPORSTREAM DI should follow the same basic rules for humidifier location and mounting as is required for the standard VAPORSTREAM unit. See pages 4 and 5 for location, pages 9-13 for mounting methods and page 14 for drain piping.

Makeup Water Piping
Use cold or hot makeup water. If the water pressure is above 60 psi and/or water hammer would be objectionable, a pressure reducing valve or shock arrester should be installed. Even though the VAPORSTREAM has an internal 1" air gap, some local codes may require a vacuum breaker.

Warning: Minimum water supply pressure is 10 psi.

Electrical
The current characteristics, and capacity requirements should be check against the nameplates. The control cabinet should be mounted in a location convenient for service. All wiring must be in accordance with all governing codes and the VAPORSTREAM wiring diagram. The diagram is inside of the control cabinet. The wiring between the control cabinet and the humidifier must be 105° degrees C rated wire.

The basic water level system and low water protection circuit found on page 18 is common to all VSDI humidifiers.

Caution: Only qualified electrical personnel should perform installation and startup procedures.

Startup and Checkout Procedures

Mounting
Check mounting to see that unit is level and securely supported before filling with water.

Piping
Verify that all piping connections have been completed as recommended and that water pressure is available.

Electrical
Verify that all wiring connections have been made in accordance with the VAPORSTREAM wiring diagram.

Control Circuit
a) Adjust humidistat to "call" setting.
b) Open shut off valve on water supply line. Unit should begin filling through operated fill valve.
c) Shortly before fill valve shuts off, the low water cutoff switch will "make". When this switch makes, the heating element contactor(s) will be actuated after a ten second delay. A time delay relay prevents contactor chatter due to bouncing of low water cutoff float.
d) Check low water cutoff circuit.
   1. Close manual top valve on water supply.
   2. Open ball valve and start draining unit.
   3. When water level drops past switching level on the low water cutoff float, the heating element contactor(s) will drop out.
   4. When step 3 has been satisfactorily completed, close drain valve.
e) Check out function of field installed safety controls such as fan proving switch etc. Contactor(s) should drop out when any proving switch is "open".
f) Check heater draw by testing and recording voltage and amperage in each phase. Readings should match nameplate readings - nameplate is located on the humidifier housing.
g) Inspect installation for leaks by operating the VAPORSTREAM. Any steam or air leaks should be sealed.

Recommended Maintenance
Assuming that the demineralizing equipment has supplied the VAPORSTREAM with mineral free water, cleaning and flushing will not be needed.

At least annually however, the humidifier should be inspected for leaks. Also, the current draw of the heaters should be checked and all safety devices in the control circuit should be cycled on and off to verify that they are functioning.

VAPORSTREAM TROUBLE-SHOOTING GUIDE

	CONTROL MODULE LIGHTS				
PROBLEM	**POWER**	**FILL**	**READY WATER**	**POSSIBLE CAUSE**	**RECOMMENDED ACTION**
Humidifier will not heat	Off	Off	Off	Control transformer	Verify control voltage across terminals 6 & 7.
	On	Off	On	Humidistat is not calling	Set humidistat to call. Inspect for faulty humidistat.
				Safety controls open	Check safety controls.
				Faulty control module	Verify control voltage between terminals 6 & 8.
				Probe head deterioration*	Replace probe head.
Humidifier will not fill	On	On	Off	No water pressure at valve.	Check manual water supply.
				Faulty water fill valve	Verify action of fill water solenoid valve by turning control module switch from standby to normal op. Audible click should be heard as solenoid operates.
				Plugged strainer	Check strainer.
				Plugged valve	Check valve.
				Faulty control module	Verify control voltage across terminals 5 & 6.
Humidifier does not stop filling	On	On	Off	Lack of tank to probes electrical continuity. Water conductivity 100 micromhos/cm (2 gr/gal) minimum	Jumper terminals 1 & 4. If water stops, verify tank ground to terminal 4; check water supply conductivity; then consult factory.
				Fill valve is stuck open	Check valve for foreign matter.
				Fill valve installed backwards	Check for worrect water flow, through valve, note arrow.
Low output	On	Off	On	Electric drain valve not seating	Correct cause of leakage or replace valve.
	On	Off	On	Too much skimmer/drain	Adjust skimmer drain amount.
				Fill valve is stuck open	Check valve for foreign matter.
Unit short cycles				Probes may be incorrectly wired or need cleaning	Confirm that unit is wired per diagram. Clean probe rod tips with steel wool.

*Probe rod corrosion or probe head material aging may cause level control system failure. This generally does not occur in the first two years of operation.

VAPORSTREAM VSDI TROUBLE-SHOOTING GUIDE

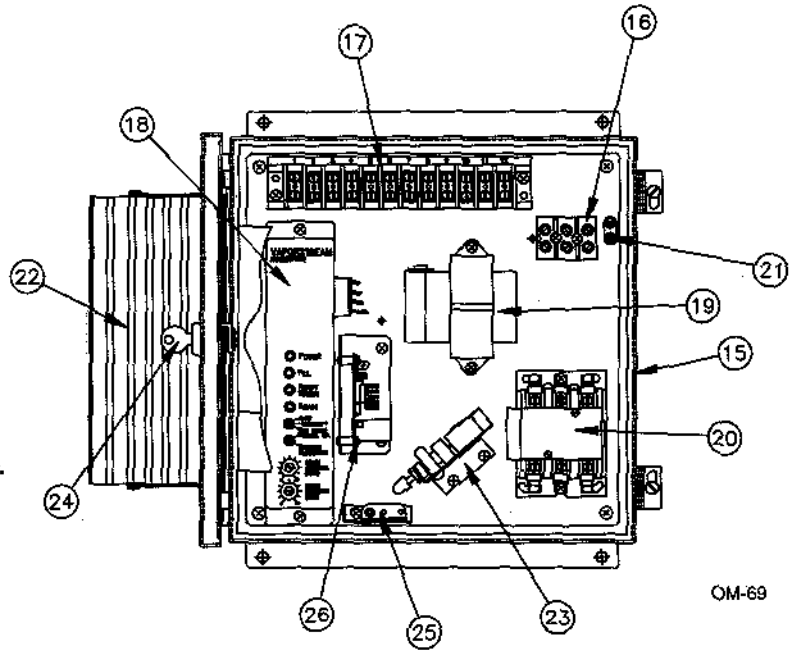
PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Humidifier will not heat	Control transformer	Verfiy control voltage across terminal #1 and transformer secondary common.
	Humidistat is not calling	Set humidistat to call. Inspect for faulty humidistat.
	Safety controls open	Check safety control. Air flow switch, high limit humidistat, etc.
	Low water float switch	Verify control voltage #3 and transformer secondary common.
Humidifier will not fill	No water pressure at valve	Check manual water supply. Valve, minimum 10 psi water pressure.
	Malfunctioning water float valve	Check to make sure that valve float & steam moves freely.
	Plugged float valve	Check float valve seat.
Water Float Valve does not close	Open drain valve	Obstruction in drain valve will not allow complete closure, clean or replace valve.
	Manual drain valve not closed	
	Malfunctioning Float Valve	Float ball has water leak. Float valve seat defective, replace.
	Water passing into overflow stand pipe	Readjust float valve rod, so water level reaches 1/4-3/8" from over flow edge when water is at ambient or cold state. Excessive water pressure, 100 psi maximum.
	Float valve stuck	Obstruction will not allow float valve to seat properly, clean or replace with new seat.
Reduced or no output even though water level is proper	Heater malfunctioning	Verify that proper voltage is being applied to heaters. Check heaters (amp draw on each leg should be equal.)
	Malfunctioning control system	Heater contactor not functioning, replace. Heater fuses blown. Auxiliary limit controls not allowing system to operate (duct humidistat, air flow proving switch, etc.). Reset, replace or calibrate as required. Faulty or inaccurate humidistat, replace or calibrate.
	Time delay/interlock relays	On delay relay delay time 10-15 seconds. Check relays.
	Low water cut-off switch	Check for proper operation.

VAPORSTREAM VPC Single Heater Control Cabinet

No.	Description	Part No.
15	Control Cabinet	4
16	Power Block	4
17	Terminal Strip	408250
18	Level Control Box	4
19	Transformer	408970-001, 002
20	Contactor	407001
21	Ground Lug	409250-017
22	SCR Master (2, 3)	4
23	P.E. Switch (3)	408100
24	Keylock (3)	407100-009
25	Door Interlock Switch (3)	408470
26	S-10 TP Modulator Board (2, 3)	408680
27	Pneumatic Transducer (1, 3)	501490

Note: When ordering specify humidifier model and serial numbers.

1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
2 Specify component part number when ordering.
3 Optional
4 Varies with specific order.



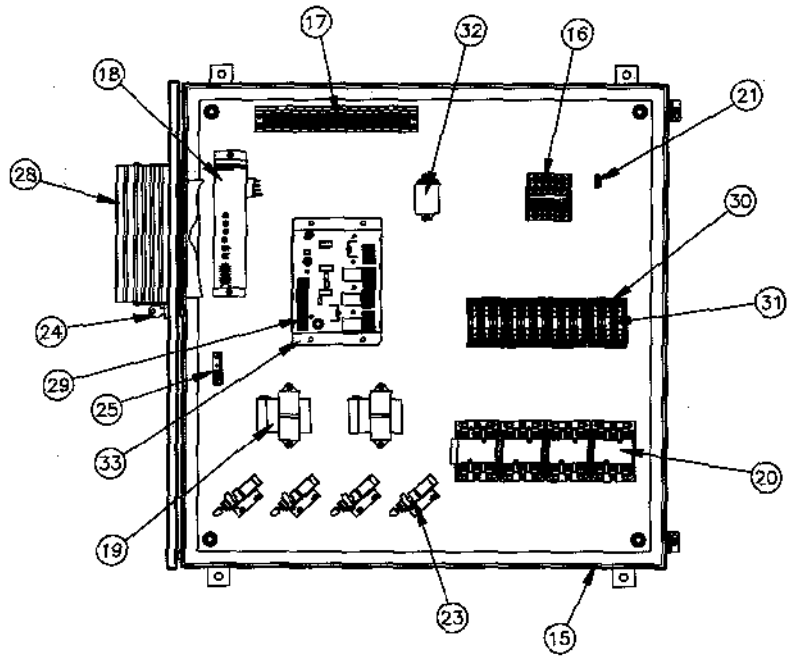
OM-69

VAPORSTREAM VPC Multiple Heater Control Cabinet

No.	Description	Part No.
15	Control Cabinet	4
16	Power Block	4
17	Terminal Strip	408250
18	Level Control Box	4
19	Transformer	408970-001, 002
20	Contactor	407001
21	Ground Lug	409250-017
22	SCR Master (2, 3)	4
23	P.E. Switch (3)	408100
24	Keylock (3)	407100-009
25	Door Interlock Switch (3)	408470
26	S-10 TP Modulator Board (2, 3)	408680
27	Pneumatic Transducer (1, 3)	501490

Note: When ordering specify humidifier model and serial numbers.

1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
2 Specify component part number when ordering.
3 Optional
4 Varies with specific order.
5 Specify S-20, S-71, S-81 or CC-8104
6 Supplied with some options and high current output conditions.
7 Two supplied when control load exceeds rating of one transformer.



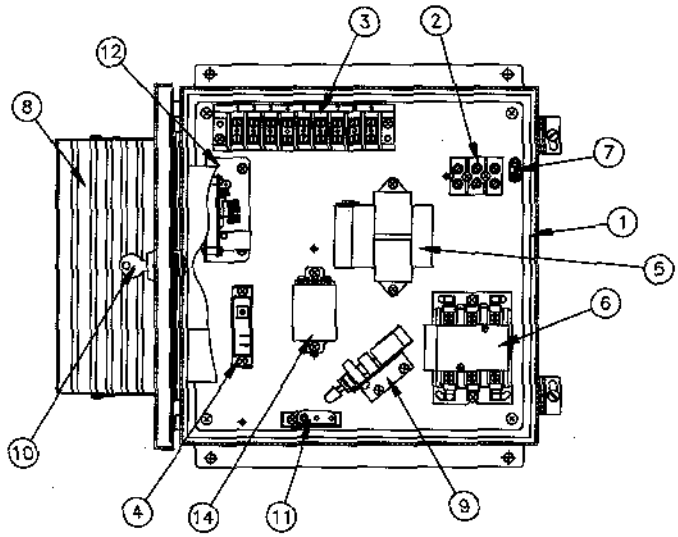
OM-71

VAPORSTREAM DI Single Heater Control Cabinet

No.	Description	Part No.
1	Control Cabinet	4
2	Power Block	4
3	Terminal Strip	408250
4	Time Delay Relay	408440
5	Transformer	4
6	Contactor	407000
7	Ground Lug	409250-017
8	SCR Master(2, 3)	4
9	P.E. Switch (3)	408100
10	Keylock (3)	407100-009
11	Door Interlock Switch (3)	408470
12	S-10 TP Modulator Board (2, 3)	408680
13	Pneumatic Transducer (1, 3)	501490
14	Relay	407900

Note: When ordering specify humidifier model and serial numbers.

1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
2 Specify component part number when ordering.
3 Optional
4 Varies with specific order.



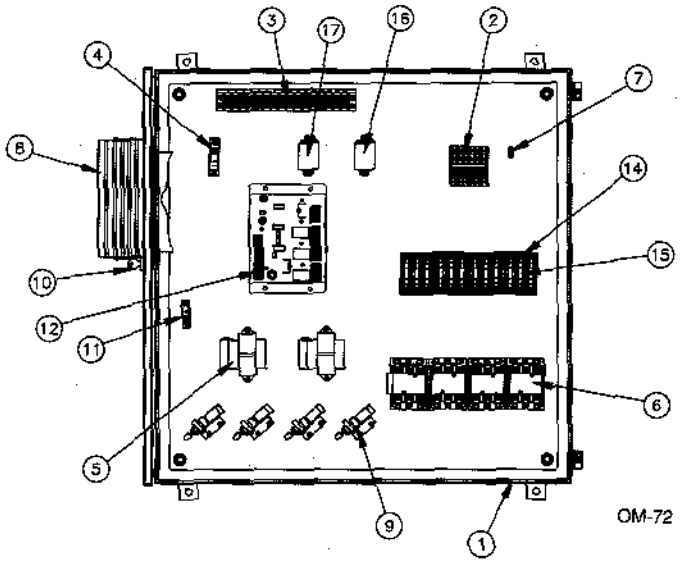
OM-70

VAPORSTREAM DI Multiple Heater Control Cabinet

No.	Description	Part No.
1	Control Cabinet	4
2	Power Block	4
3	Terminal Strip	408250
4	Time Delay Relay	408440
5	Transformer (7)	4
6	Contactor	407000
7	Ground Lug	409250
8	SCR Slave (2, 3)	4
9	P.E. Switch (3)	408100
10	Keylock (3)	407100-009
11	Door Interlock Switch (3)	408470
12	Sequencer (2, 3, 5)	4
13	Pneumatic Transducer (1, 3)	501490
14	Fuse Block	406750
15	Fuses	4
16	Relay (6)	407900
17	Relay	407900

Note: When ordering specify humidifier model and serial numbers.

1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
2 Specify component part number when ordering.
3 Optional
4 Varies with specific order.
5 Specify S-20, S-71, S-81 or CC-8104
6 Supplied with some options and high current output conditions.
7 Two supplied when control load exceeds rating of one transformer.



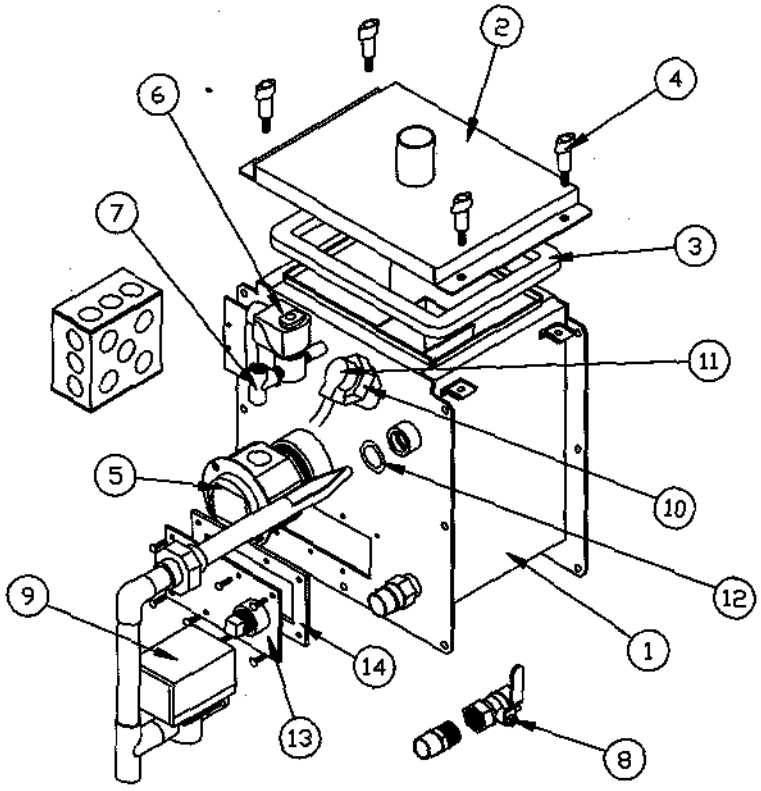
OM-72

VAPORSTREAM Humidifier

No.	Description	Part No.
1	Tank	(1)
2	Cover Gasket	(1)
3	Cover Gasket	308300 (1)
4	T-Handled Utility Knob	700725
5	Immersion Heater	(1)
6	1/4" NPT Fill Valve	505090 (1)
7	1/4" NPT Sediment Strainer	3000050
8	3/4" Ball Valve	505010 (2)
9	3/4" Electric Drain Valve	505400 (1, 3)
10	Probe Assembly	406060
11	Probe Plug	406050 (1)
12	O-Ring	300400-006
13	Clean-Out Plate	165470-001-004
14	Clean-Out Plate Gasket	308220

(1) Spedify humidifier model and serial numbers when ordering.
(2) With manual drain only.
(3) With automatic timer drain down option only.

Notes:
1. For dispersion tube(s) specify type (U-tube, L-tube, straight tube) and humidifier model and seial numbers.
2. Parts not itemized are typcial hardware stock items.



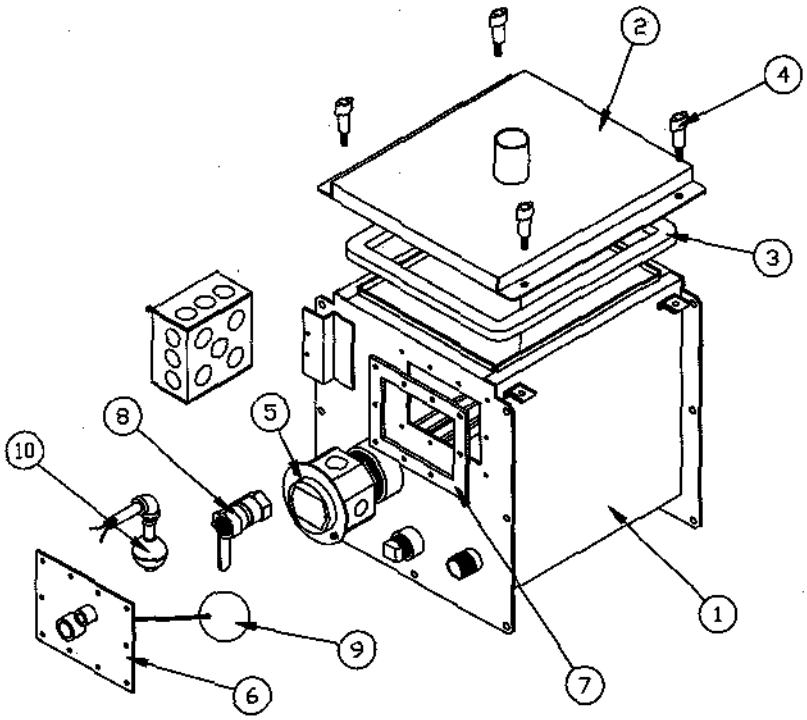
OM-73

VAPORSTREAM VSDI Humidifier

No.	Description	Part No.
1	Tank	(1)
2	Cover	(1)
3	Cover Gasket	308300 (1)
4	T-Handled Utility Knob	700725
5	Immersion Heater	(1)
6	Float Plate	165700
7	Float Plate Gasket	308260
8	3/4" NPT SST Ball Valve	505000
9	Float Cut-Out Switch	408420
10	Float Valve	505210

(1) Specify humidifier model and serial numbers when ordering.

Notes:
1. For dispersion tube(s) specify type (U-tube, L-tube, straight tube) and humidifier model and seial numbers.
2. Parts not itemized are typcial hardware stock items.



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MAINTENANCE SERVICE RECORD

DATE INSPECTED	PERSONNEL	OBSERVATION	ACTION PERFORMED

WARRANTY

The VAPORSTREAM Warranty

1. Warranty. DRI-STEEM Humidifier Company (the "Company") guarantees its products to be free of defects in materials and workmanship under the service for which they are intended. The Company will repair or replace without charge except for labor charges, products or parts which are found to be defective within one year from the date of shipment, or, at the option of the Company, will refund the purchase price.

2. Exclusions of other warranties. The warranty described in the above paragraph shall be IN LIEU OF any other warranty, express or implied, including but not limited to any implied warranty of MERCHANTABILITY or fitness for a particular purpose.

3. Limitation of Remedies. By purchasing the Company's products, the purchaser agrees with the Company that the purchaser's sole and exclusive remedy shall be for the repair or replacement of defective parts or products, without charge except for labor charges, as described in paragraph 1, above. The purchaser agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available to him.

DRI-STEEM®
HUMIDIFIER COMPANY
14949 Technology Drive • Eden Prairie, MN 55344
Telephone: 1-800-328-4447• In MN: (612)949-2415
Fax: (612)949-2933

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