

READ AND SAVE THESE INSTRUCTIONS

# VAPORSTREAM®

# Models VLC and VLDI

## ELECTRIC STEAM HUMIDIFIERS

Installation Instructions  
and  
Maintenance Operations  
Manual



**DRI STEEM®**  
HUMIDIFIER COMPANY



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## TO THE PURCHASER AND THE INSTALLER

Thank you for purchasing VAPORSTREAM® Model VLC equipment. We have designed and built this equipment to give you total satisfaction and many years of trouble-free service. Proper installation and operating practices will assure you of achieving that objective. We therefore urge you to become familiar with the contents of this manual.

This manual covers material for both VAPORSTREAM Model VLC and VAPORSTREAM Model VLDI 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

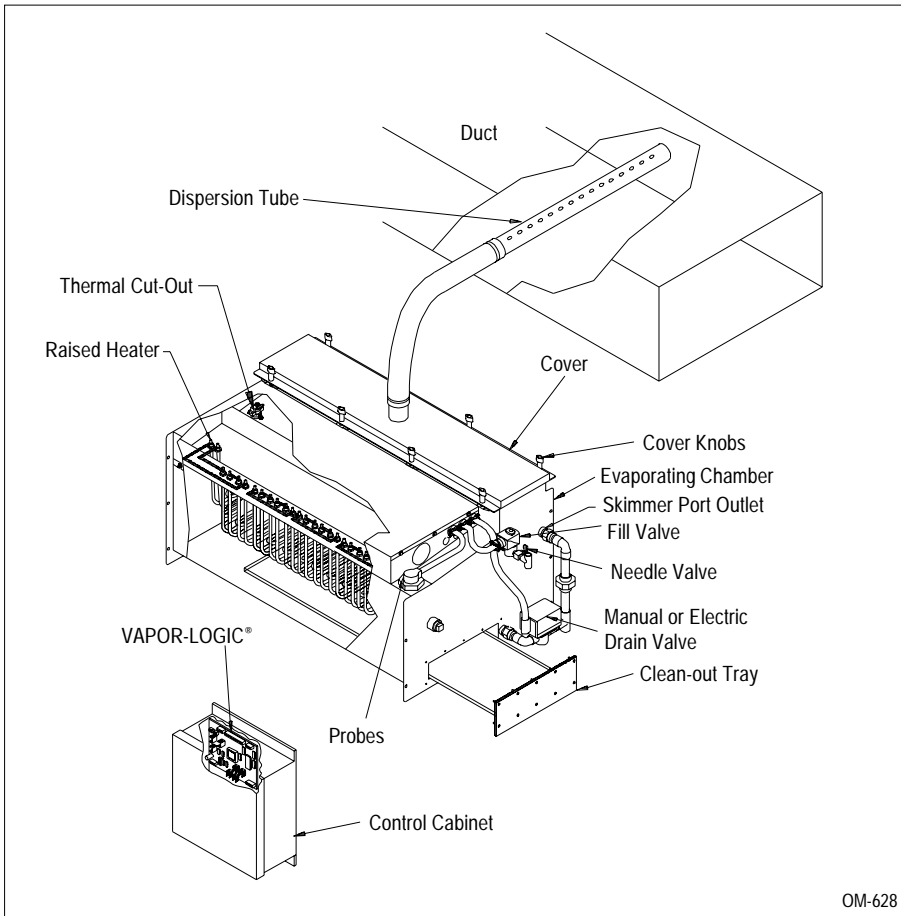
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# VAPORSTREAM® Models VLC AND VLDI

## VAPORSTREAM VLC Electric Humidifier

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

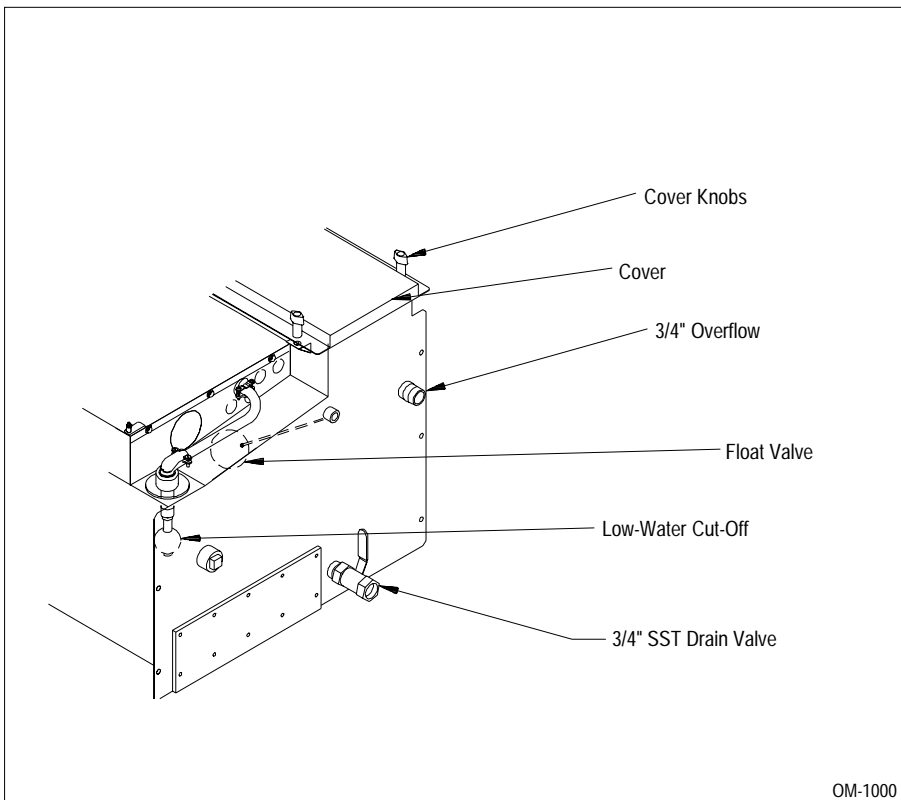
This humidifier is designed to be used with either softened or unsoftened water (preferably softened). The probe-type level control system requires water conductivity of 100  $\mu\text{S}/\text{cm}$  (34 mg/l) minimum to function, and therefore will not operate on water treated by reverse osmosis or deionization. However, VAPORSTREAM Model VLC humidifiers are available for use with these water types. The standard humidifier can be converted in the field to a VLDI model. See below.



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## VAPORSTREAM VLDI Option

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



OM-1000

# CAPACITIES AND ELECTRICAL SPECIFICATIONS

**Table 4-1: Capacities and Electrical Specifications**

Model Number	Heaters		Current Draw (A)						Control Cabinet Sizes**
			Single Phase			Three Phase			
	Qty	Stages*	230V	kW	Capacities (kg/h)	400V	kW	Capacities (kg/h)	
VLC/VLDI 2-1	1	1	8.0	1.84	2.4				M
3-1	1	1	12.0	2.76	3.7				M
4-1	1	1	16.0	3.68	4.8				M
5-1	1	1	21.3	4.90	6.3				M
VLC/VLDI 6-1	3	1	24.0	5.52	7.2	8.7	6	7.8	M
9-1	3	1	35.9	8.28	10.8	13.0	9	11.7	M
12-1	3	1	47.9	11.04	14.3	17.3	12	15.5	M
16-1	3	1				23.1	16	20.7	M
21-1	3	1				30.3	21	27.2	M
25-1	3	1				36.1	25	32.3	M
VLC/VLDI 12-2	6	2	47.9	11.04	14.3	17.3	12	15.5	M
18-2	6	2	71.9	16.56	21.4	26.0	18	23.3	M
24-2	6	2	95.8	22.08	28.5	34.6	24	31.0	M
32-2	6	2				46.2	32	41.4	M
42-2	6	2				60.6	42	54.3	M
50-2	6	2				72.2	50	64.6	M
VLC/VLDI 18-3	9	3	71.9	16.56	21.4	26	18	23.3	L
27-3	9	3	107.8	24.84	32.2	39	27	35.0	L
36-3	9	3	143.8	33.12	42.8	52	36	46.5	L
48-3	9	3				69.3	48	62.1	L
63-3	9	3				90.9	63	81.5	L
75-3	9	3				108.3	75	97.0	L
VLC/VLDI 24-4	12	4	95.8	22.08	28.5	34.6	24	31.0	XL
36-4	12	4	143.8	33.12	42.8	52	36	46.5	XL
48-4	12	4	191.7	44.16	57.1	69.3	48	62.1	XL
64-4	12	4				92.4	64	82.7	XL
84-4	12	4				121.2	84	108.7	XL
100-4	12	4				144.3	100	129.3	XL

\*Heater stage identifies the number of contactors.  
 \*\* Refer to table 4-2 for Control Cabinet Dimensions.

**Table 4-2: Control Cabinet Dimensions**

Size	Milimeters	Shipping Wt.
Series M	355 w x 400 h x 150 d	15 kg
Series L	500 w x 500 h x 180 d	25 kg
Series XL	600 w x 600 h x 180 d	33 kg

**Capacity Notes**

Approximately 400 kJ are required to raise the temperature of one kg of water from 5° to 100° C. An additional 2230 kJ are required to change one kg of water to water vapor.

The addition of 20 mm rigid foil faced fiberglass insulation (optional) on all surfaces of evaporating chamber will increase unit efficiency by approximately 2%. Another factor to consider is condensation steam loss from hoses and tubes.

Use the following steam loss guidelines:

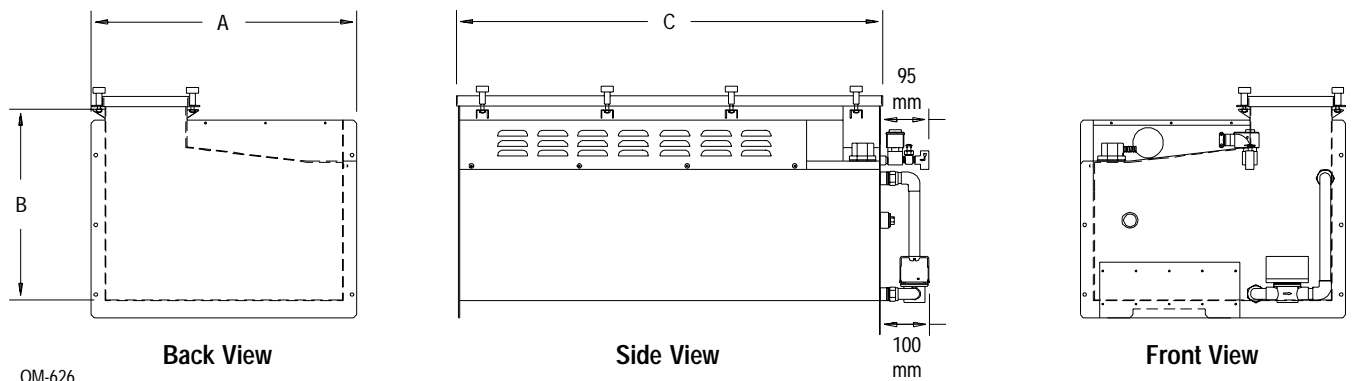
- vapor hose: 223 g/m/h
- insulated pipe: 74 g/m/h
- dispersion tubes: 744 g/m/h

# MECHANICAL SPECIFICATIONS

**Table 5-1: Mechanical Specifications**

Model Number	A	B	C	Weight Empty (kg)	Weight Full (kg)
	mm	mm	mm		
VLC/VLDI 2-1	515	430	190	16	36
3-1	515	430	190	16	36
4-1	515	430	190	16	36
5-1	515	430	190	16	36
VLC/VLDI 6-1	560	465	325	26	71
9-1	560	465	325	26	71
12-1	560	465	325	26	71
16-1	560	465	325	26	71
21-1	560	465	325	26	71
25-1	560	465	325	26	71
VLC/VLDI 12-2	560	465	515	36	108
18-2	560	465	515	36	108
24-2	560	465	515	36	108
32-2	560	465	515	36	108
42-2	560	465	515	36	108
50-2	560	465	515	36	108
VLC/VLDI 18-3	560	465	705	50	148
27-3	560	465	705	50	148
36-3	560	465	705	50	148
48-3	560	465	705	50	148
63-3	560	465	705	50	148
75-3	560	465	705	50	148
VLC/VLDI 24-4	560	465	900	70	194
36-4	560	465	900	70	194
48-4	560	465	900	70	194
64-4	560	465	900	70	194
84-4	560	465	900	70	194
100-4	560	465	900	70	194

**Figure 5-1: Dimensions**



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# VAPORSTREAM® Model VLC Area-Type Humidifier

## Area-Type Humidifier Application Information

The operating characteristics of Area-Type steam humidifiers should be considered when selecting humidifier capacities and choosing mounting locations.

Steam discharge from the humidifier quickly cools and turns to visible, warm, microscopic drops or particles of water (fog) which are lighter than air.

Should this fog contact any solid surface (columns, beams, ceiling, pipes, etc.) before it disappears, it may collect and drip, as water.

The greater the space relative humidity, the higher and farther the "fog" will carry and rise in the space before disappearing.

The table at right states the vertical (rise), horizontal (throw), and width (spread) dimensions that can be expected with the Area-Type humidifiers.

To avoid steam impingement on surrounding areas, these dimensions should be observed.

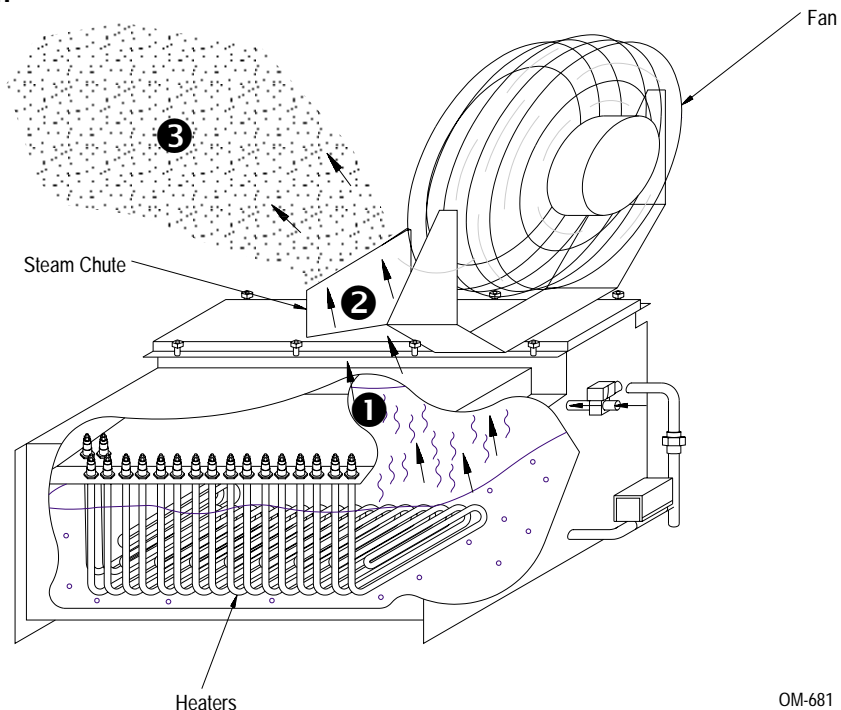
**Note:** Tank dimension C, in Figure 5-1 on page 5, must be at least 325 mm and output should not exceed 130 kg/h.

Table: 6-1: Minimum Distance for Rise, Spread and Throw

Space Temp	Space R.H.		20 kg/h	45 kg/h	65 kg/h	90 kg/h	110 kg/h	130 kg/h
16°C	30%	Rise	0.5 m	1.5 m	2.0 m	2.5 m	2.5 m	3.0 m
		Spread	1.0 m	1.5 m	2.0 m	2.5 m	2.5 m	3.0 m
		Throw	2.0 m	3.0 m	4.0 m	4.0 m	5.0 m	5.5 m
	40%	Rise	0.5 m	1.5 m	2.0 m	2.5 m	3.0 m	3.0 m
		Spread	1.0 m	1.5 m	2.0 m	2.5 m	3.0 m	3.0 m
		Throw	2.0 m	3.0 m	4.0 m	4.5 m	5.0 m	5.5 m
	50%	Rise	0.5 m	1.5 m	2.0 m	2.5 m	3.0 m	3.0 m
		Spread	1.0 m	2.0 m	2.0 m	2.5 m	3.0 m	3.0 m
		Throw	2.0 m	3.0 m	4.0 m	4.5 m	5.0 m	5.5 m
21°C	30%	Rise	0.5 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Spread	0.5 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Throw	1.5 m	2.5 m	3.0 m	3.5 m	4.0 m	4.5 m
	40%	Rise	0.5 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Spread	1.0 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Throw	1.5 m	2.5 m	3.5 m	4.0 m	4.0 m	5.0 m
	50%	Rise	0.5 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Spread	1.0 m	1.0 m	1.5 m	2.0 m	2.0 m	2.5 m
		Throw	1.5 m	2.5 m	3.5 m	4.0 m	4.5 m	5.0 m

Figure 6-1: Principle of Operation

Steam created in the evaporating chamber (1), flows up through the chute (2), and is distributed into the space (3) via the fan.



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# MOUNTING METHODS

## Mounting Procedures

For proper operation of the electrode probe water level control and the skimmer system, the humidifier must be mounted level in both directions.

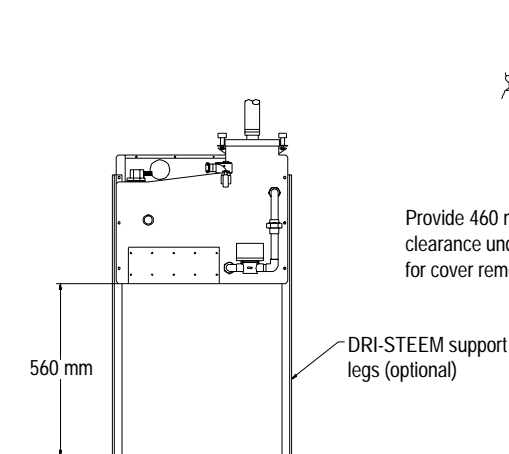
Access (460 mm minimum) for periodic removal of the top cover is recommended. The cover is removed for inspection and cleaning of the evaporating chamber. In most cases, scale that forms on the heating elements continuously flakes off as it forms and the loose scale

settles to the bottom. A clean-out tray on the floor of the evaporator may be removed periodically through the front clean-out opening. Allow space for withdrawal of the tray when installing the humidifier.

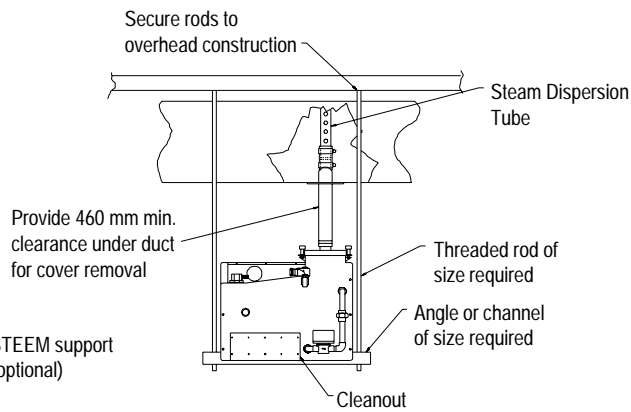
In some installations, an overflow drain pan may be necessary to prevent possible damage to flooring. This may be caused by a rapid or sudden drainage of the contents of the humidifier. The drain pan must be connected to the sanitary waste water system.

**Figure 7-1: Mounting Support Methods**

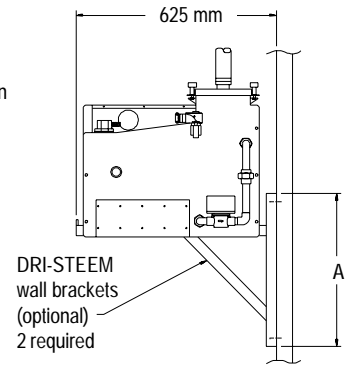
### Floor Stand Method



### Trapeze Hanger Method



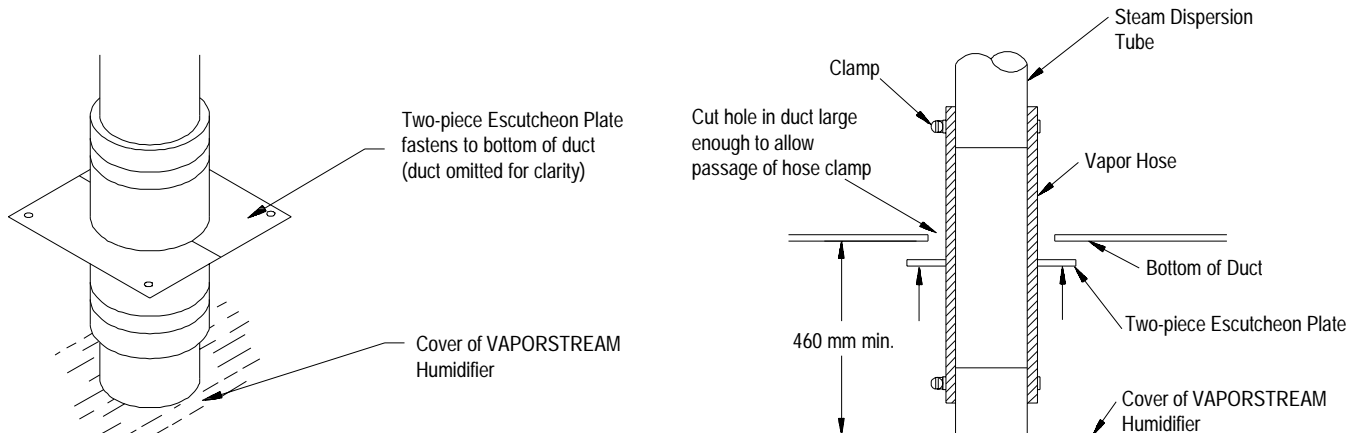
### Wall Brackets Method



Unit	Dimensions	
	A	
3 Heater	480 mm	
6 Heater	480 mm	
9 Heater	760 mm	
12 Heater	915 mm	

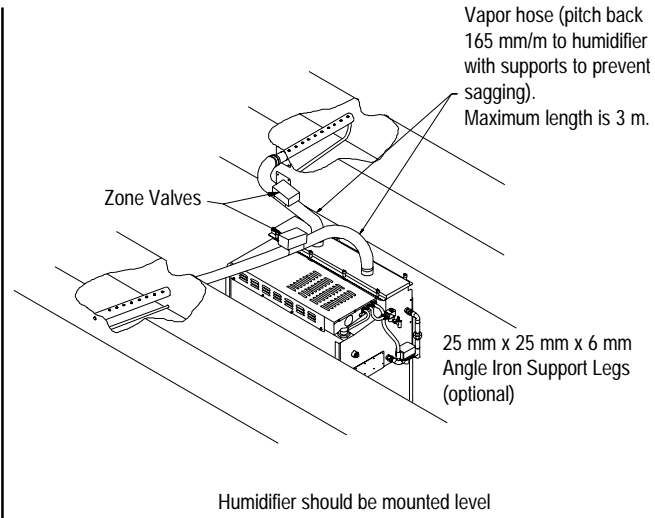
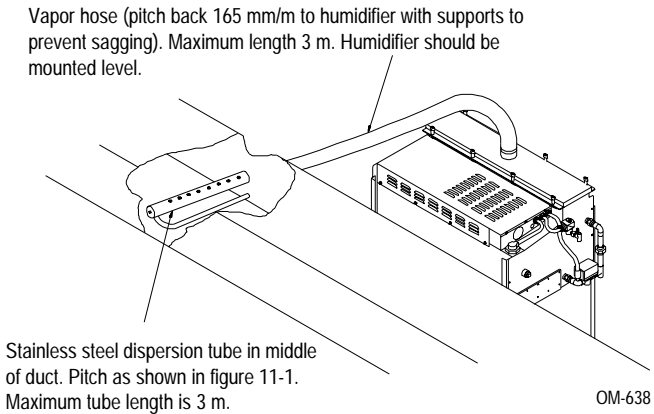
**Figure 7-2: Mounting Unit Below Duct**

Mounting humidifier 460 mm below duct is recommended to facilitate cover removal.

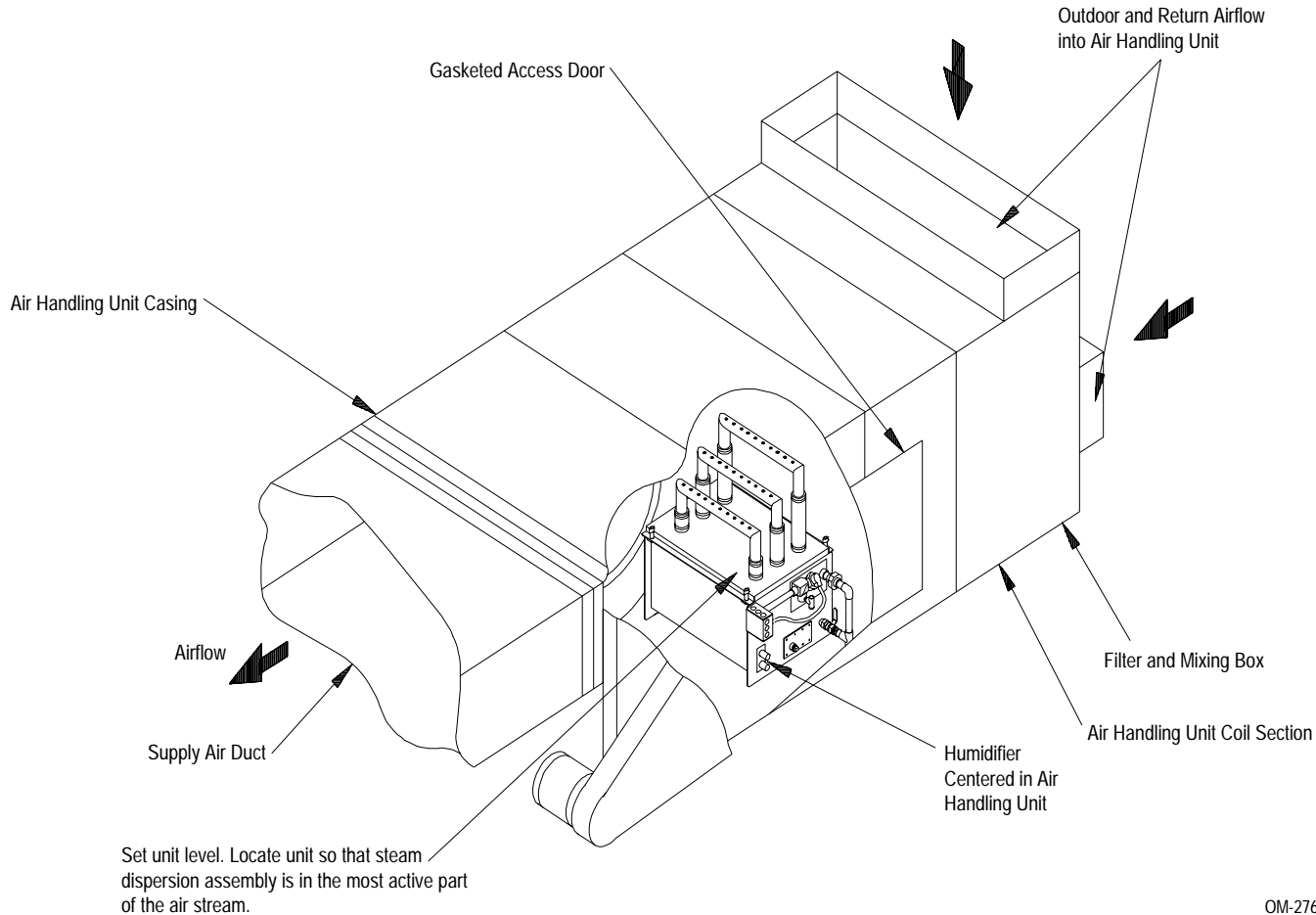


# MOUNTING METHODS

**Figures 8-1 and 8-2: Mounting Units Away from Duct(s) Using Vapor Hose**



**Figure 8-3: Mounting In Air Handling Unit**





# MOUNTING METHODS

## Dispersion Tube Installation with Condensate Drain

(over 13 kg/h per dispersion tube)

### Vapor Hose

When a vapor hose and stainless steel dispersion tube are used, they should be pitched back to the humidifier. A minimum slope of 165 mm/m (with no "low spots") is recommended. Vapor hose should be supported to prevent sags or low spots. When this is not possible due to duct elevation or an obstruction, alternate arrangements should be used as shown in figure 15-1 or 15-2.

Any condensate that forms in the vapor hose must be removed. Preferably, it should be returned to an open drain with a water seal of sufficient height to contain the duct static pressure, as shown in figure 10-1.

The condensate can also be returned to the VLC, as shown in figure 10-2, with an air vent. This method requires a water seal and an air gap to allow condensate to flow back into the VLC chamber.

Excessive back pressures imposed on the humidifier may lead to dispersion tube(s) spitting, lost water seals, or leaking gaskets. When the distance between the humidifier and the dispersion tube(s) exceeds 3 metres, consult factory for special recommendations.

### Rigid Piping (when used)

- Vapor piping should have a minimum I.D. of 40 mm.
- A minimum pitch of 165 mm/m back to the humidifier should be maintained.
- 90° elbows are not recommended; use two 45° elbows 300 mm apart instead.
- Thin-walled tubing will heat up faster and cause less start-up loss than heavy-walled pipe.
- Insulating the rigid piping will reduce output loss due to condensation.

### Tube Mounting

- Tubes without condensate return lines, mount dispersion tube with outboard end 165mm/m higher than supply end (Example A).
- Tubes with condensate return lines, mount dispersion tube level (Example B).
- Best vapor absorption occurs when dispersion tube discharges against the air flow.
- Return line piping material must be suitable for 100° C water.

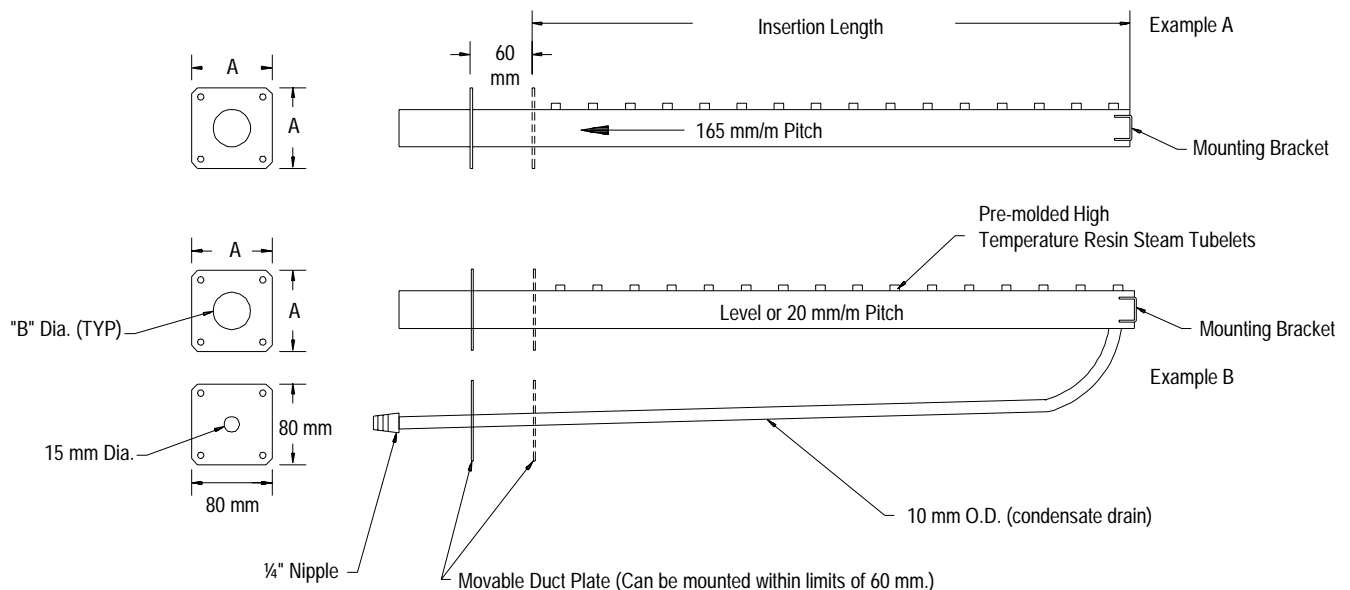
### Minimum Condensate Drain Line Sizing

- One or two tubes: 20 mm I.D.
- Three or more tubes: 25 mm I.D.

Table 9-1: Dispersion Tube Capacities

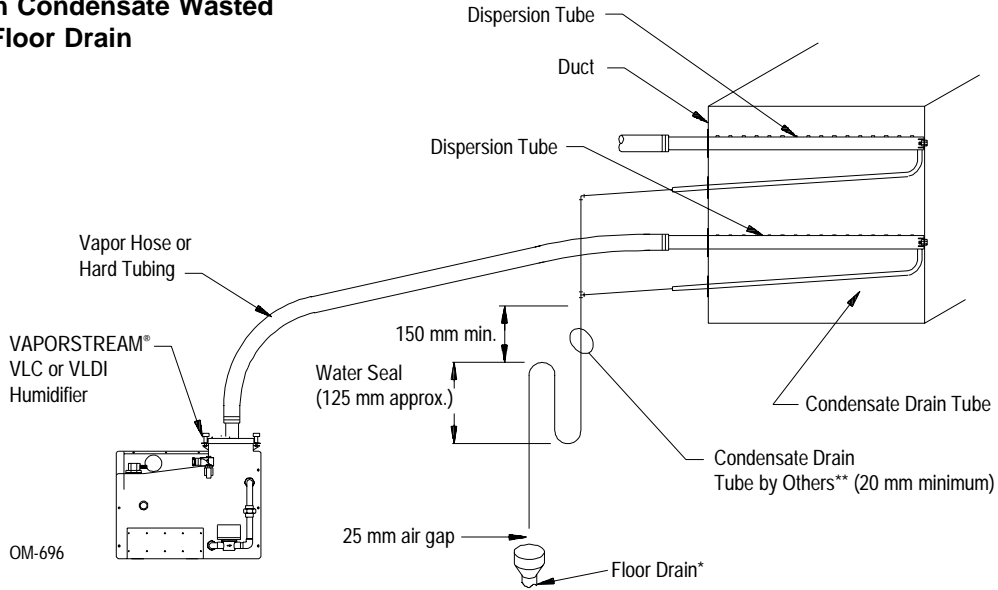
Tube Dia.	Capacity		A	B
	Without Drain	With Drain		
25 mm	4.5 kg/h	N/A	80 mm	25 mm
40 mm	13 kg/h	26 kg/h	80 mm	38 mm
50 mm	26 kg/h	38 kg/h	125 mm	50 mm

Figure 9-1: Single Tube



# MOUNTING METHODS

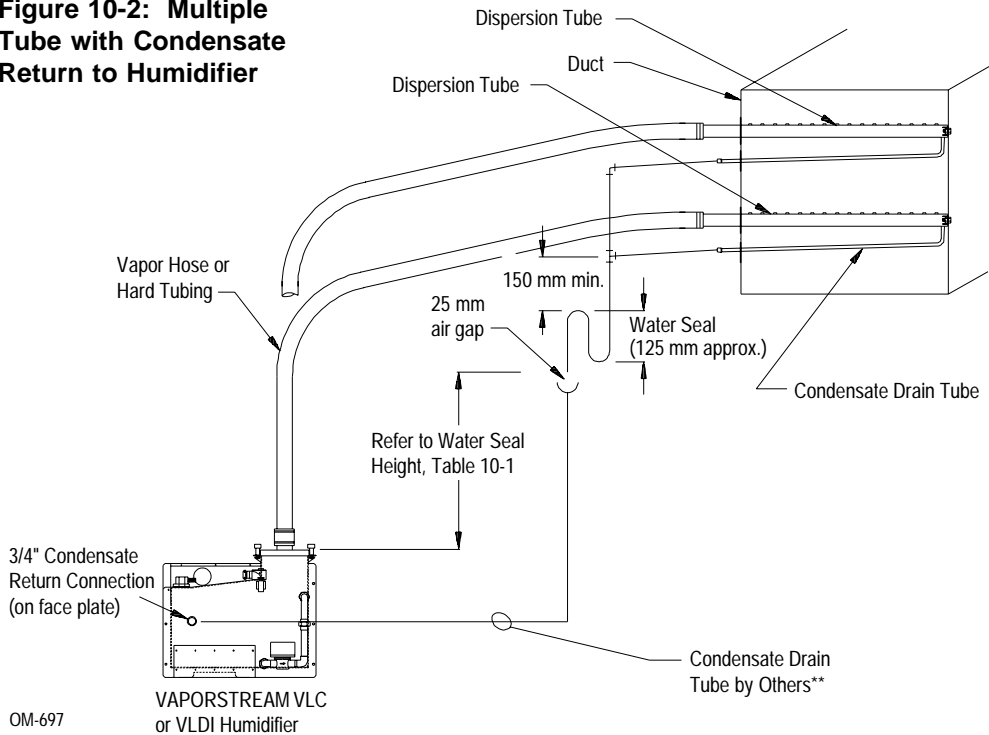
**Figure 10-1: Multiple Tube with Condensate Wasted to Floor Drain**



\*Refer to local codes for drain pipe sizing requirements.

\*\*Return line piping material must be suitable for 100° C water.

**Figure 10-2: Multiple Tube with Condensate Return to Humidifier**



**Table 10-1: Water Seal Minimum Height\***

Humidifier	kg/h	Height
Up to 48 kW	2-62	300 mm
49 kW to 64 kW	63-83	375 mm
65 kW to 100 kW	84-103	450 mm

\* Height required to overcome humidifier internal pressure.

# RAPID-SORB™ ASSEMBLY AND INSTALLATION

## Instructions for Horizontal Duct

1. Unpack shipment and verify receipt of all RAPID-SORB components with packing list. Report any shortages to the DRI-STEEM factory immediately.
2. Provide necessary access in and around duct work.
3. Locate stainless steel channel inside the duct. Hang the channel from the top of the duct, centered between duct side walls, with the two mounting holes provided.
4. If hose cuffs are used, slide cuffs over the open end of each tube. Install a pair of hose clamps on each tube.
5. Note direction of air flow within duct, then arrange each dispersion tube so steam will discharge perpendicular to the air flow. Use hex bolts and nuts to attach tubes to overhead channel. Do not secure. If the header is under the duct (see figure 11-2), punch-out necessary clearance holes in the base of the duct to slide dispersion tubes up from bottom.

6. **For a Header Inside the Duct** (See figure 11-1): Punch or cut out necessary clearance holes for RAPID-SORB header. Slide header into the duct, position header and slide the dispersion tube hose cuffs or slip couplings over the header dispersion tube nipples.

Position the header so vertical dispersion tubes are perpendicular to duct and pitch the header to condensate drain. Secure header mounting bracket to the ductwork. Use escutcheon plates to secure header where it enters the duct.

Check that the dispersion tubes discharge steam perpendicular to the air flow. Secure tubes to the overhead channel. Secure the channel to the duct. Position hose cuffs or slip couplings over tube and header tube nipples, and secure with clamps.

7. **For a Header Under the Duct** (See figure 11-2): Position header under dispersion tubes, then slide hose cuffs or slip couplings over header dispersion tube nipples.

Position the header so dispersion tubes are perpendicular to duct and pitch the header to condensate drain. Secure header mounting bracket to a support strap. Secure dispersion tubes in place with the tube escutcheon plates provided.

Check the position of the tubes for steam release perpendicular to the air flow. Secure tubes to the overhead channel, and secure channel to the duct. With header pitched to condensate drain, slip hose cuffs or slip couplings over tube nipples and secure with clamps.

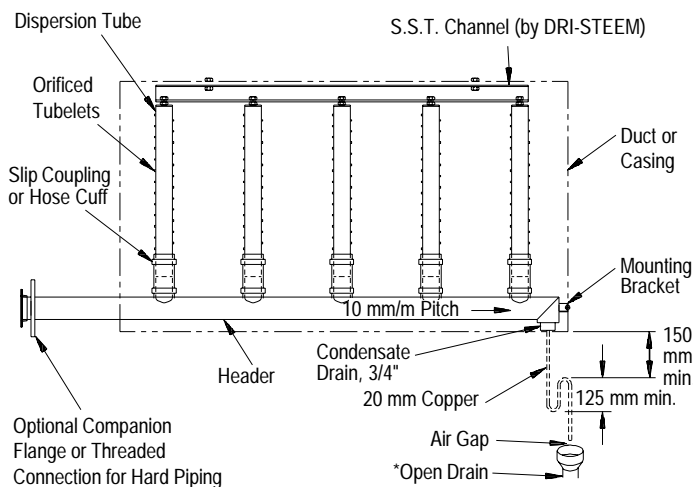
7. Connect a condensate drain to the header, provide the water trap as shown, and run to open drain, sized according to local codes.

8. Attach the header steam supply connector to main header using the hose cuff and clamps provided, but do not secure.

9. Route the necessary number of vapor hoses or pipes from the humidifier tank, position connector to accept the hoses or pipes and secure.

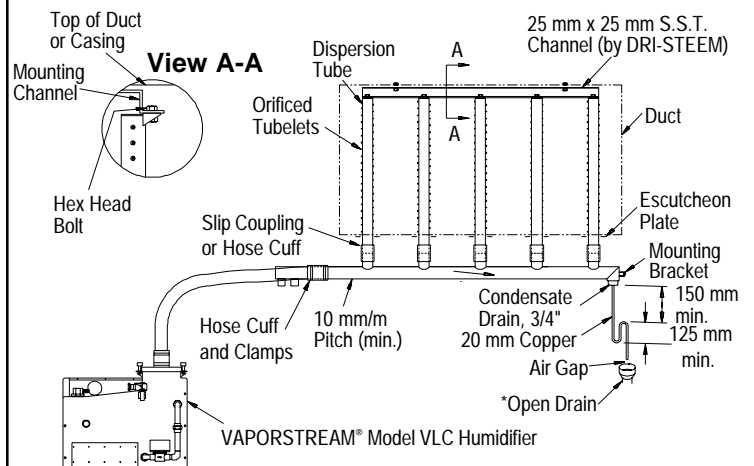
**Note:** Refer to page 15 for vapor hose information on routing and for alternate vapor hose installation methods.

**Figure 11-1: RAPID-SORB Unit Header Inside Duct**



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**Figure 11-2: RAPID-SORB Unit Header Under Duct**



\* Refer to local codes for drain pipe size requirements.

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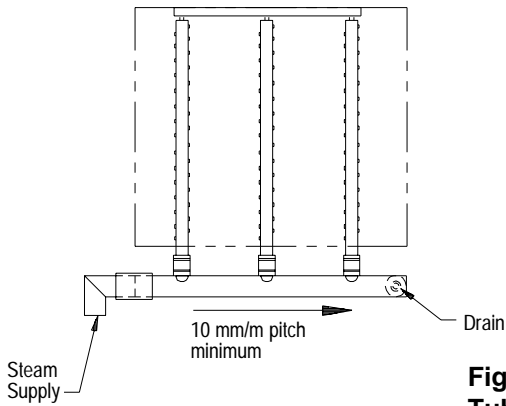
# RAPID-SORB™ ASSEMBLY AND INSTALLATION

## Vertical Duct Installation

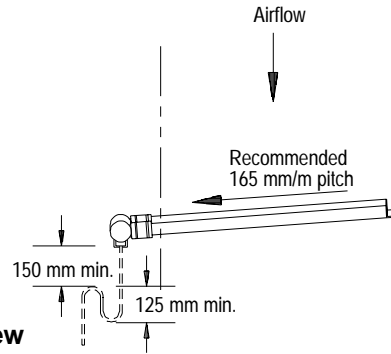
Install the RAPID-SORB™ with dispersion tubes and header pitched to condensate drain as shown in figures 12-1, 12-2, and 12-3.

See "Instructions for Horizontal Duct" for additional information, as applicable.

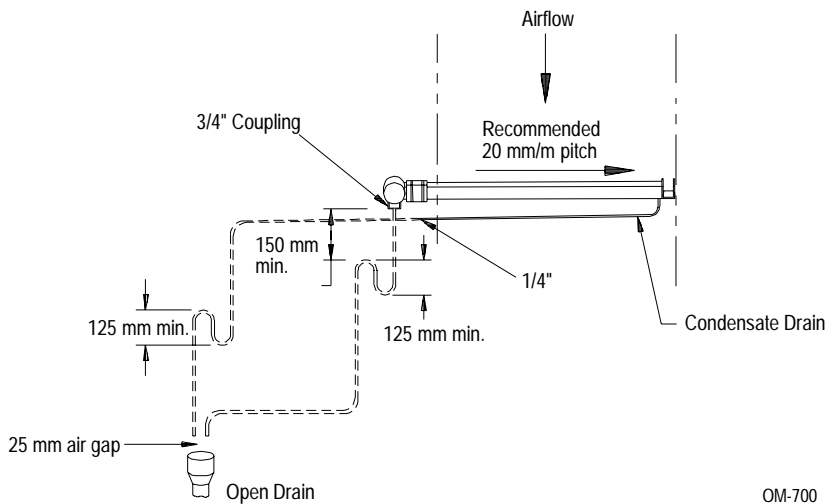
**Figure 12-1: Plan View**



**Figure 12-2: Elevation View Tube without Drain**



**Figure 12-3: Elevation View Tube with Drain**



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# INSTALLATION REQUIREMENTS

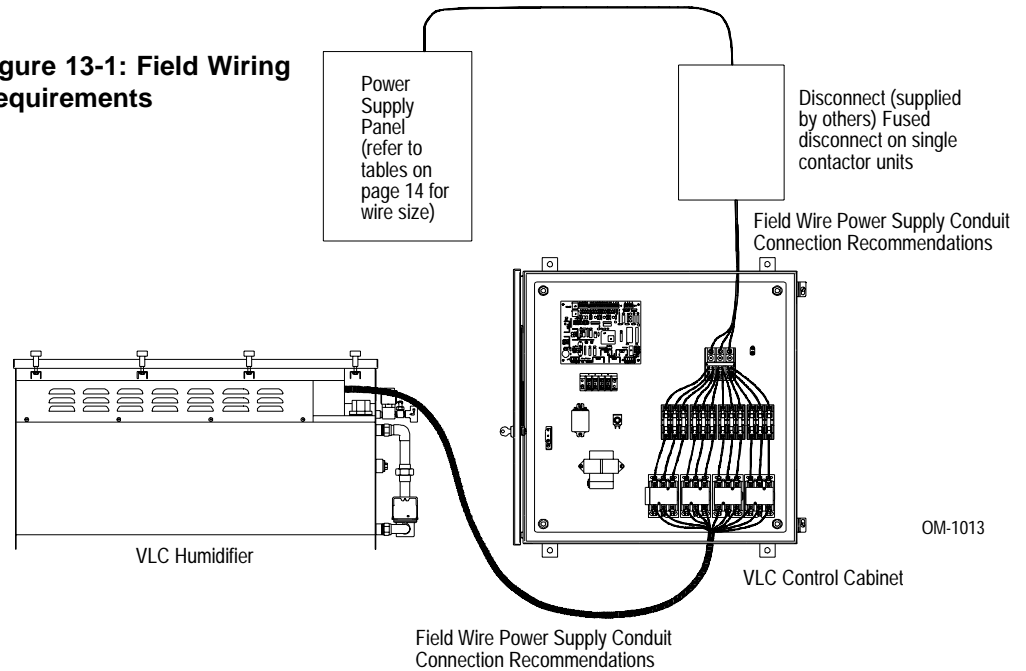
## Electrical

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 local codes, and with VAPORSTREAM® Model VLC wiring diagram. The diagram is inside the control cabinet. The wiring between the control cabinet and humidifier must be rated at 105° C minimum.

Refer to the amp draw on the rating plate and use the tables on page 14 to determine the appropriate wire, conduit and fuse disconnect (on single contactor models).

**Caution: Only qualified electrical personnel should perform installation procedures.**

**Figure 13-1: Field Wiring Requirements**



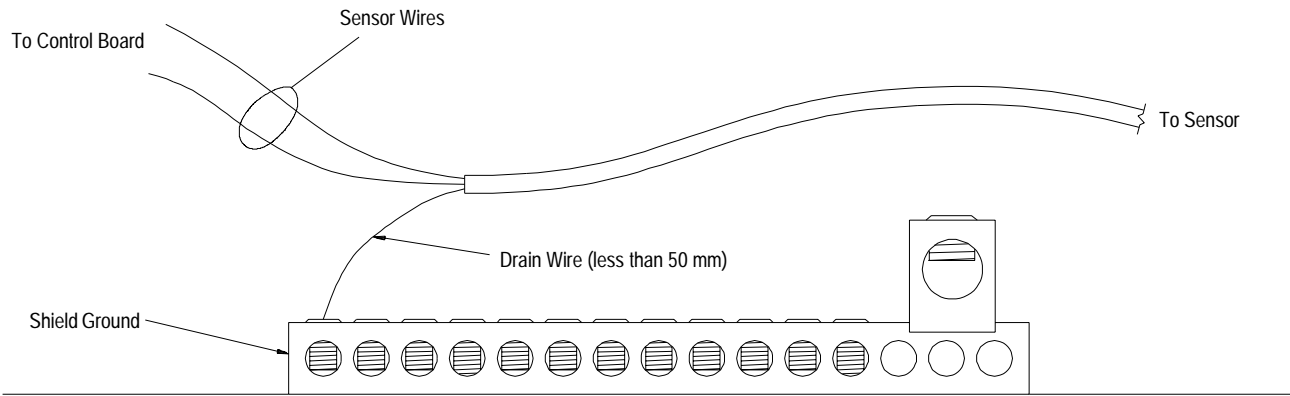
When selecting a space to install the VLC humidifier, avoid areas close to sources of electromagnetic emissions such as KVA transformers.

Control wiring and power wiring must be run in dedicated/separate earthed metal conduit, cable trays or trunking. Separation must occur in supply lines and interconnecting lines when control cabinet is mounted away from the humidifier.

Grounding requirements: the earth must be made by solid metal-to-metal connections. The ground must be a good radio frequency earth. Ground wire should be same size as power wiring.

# INSTALLATION REQUIREMENTS

**Figure 14-1: Shielded Cable Drain Wire Connection to Earth Bar**



For maximum E.M.C. effectiveness, all humidity, temperature and air flow controls should be wired using multi-conductor shielded plenum-rated cable with a drain wire for the shield. The drain wire should be connected to the shield ground terminal with its length kept to less than 50 mm.

**Table 14-1: Conduit and Wire Size**

**Amp Draw	Incoming Wire Size		Conduit Size (Ø mm)	
	AWG	KcMIL (mm <sup>2</sup> )	2 Conductor and Ground	3 Conductor and Ground
0-12.5	14	2.5	20	25
12.6-16.7	12	4.0	25	32
16.8-25.0	10	6.0	25	32
25.1-41.7	8	10.0	32	32
41.8-54.2	6	16.0	32	40
54.3-70.8	4	25.0	40	50
70.9-95.8	2	35.0	50	50
95.9-108.3	1	50.0	50	63
108.4-145.8	2/0	70.0	63	63

**Table 14-3: Fuse/Breaker Requirements**

**Amp Draw	Fuse Size (A)
0-8.7	10
8.8-13.0	15
13.1-17.4	20
17.5-19.2	25
19.3-21.7	25
21.8-26.1	30
26.2-29.1	35
29.2-30.4	35
30.5-34.7	40
34.8-39.1	45
39.2-43.5	50
43.6-52.2	60
52.3-60.9	70
61.0-69.6	80
69.7-78.3	90
78.4-87.0	100
87.1-95.7	110
95.8-104.4	120
104.5-113.1	130
113.2-121.8	140
121.9-130.5	150

**Table 14-2: Conduit and Wire Size**

**Amp Draw	Incoming Wire Size		Conduit Size (Ø mm)
	AWG	KcMIL (mm <sup>2</sup> )	4 Conductor and Ground*
0-10.0	14	2.5	32
10.1-13.3	12	4.0	32
13.4-20.0	10	6.0	32
20.1-33.3	8	10.0	40
33.4-43.3	6	16.00	40
43.4-56.7	4	25.0	50
56.8-76.7	2	35.0	63
76.8-86.7	1	50.0	63
86.8-116.7	2/0	70.0	

\* For use with star wiring for 240V heaters used with 415V power supply.

\*\* Refer to Amp Draw on Rating Plate.

# INSTALLATION REQUIREMENTS

## 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 temperatures up to 100° C.

To prevent steam from escaping out the drain line, a water seal must be provided in the drain line of sufficient height to contain the pressure developed within the humidifier and steam dispersion system. To determine the proper height of the water seal, see table 17-1.

## Make-up Water Piping

When non-metallic water piping is used, it must be rated to withstand 100° C or greater temperature. If not, the final 1 meter connected to the humidifier should be metallic and should not be insulated.

As part of the fill valve assembly, the needle valve restricts the rush of cold water entering the evaporating chamber during the fill cycle. Cold water could drop the chamber water temperature and collapse the steam. If a rumbling sound occurs during the fill cycle, adjust the needle valve to decrease the water fill rate.

The VAPORSTREAM® Model VLC has a 25 mm internal “air gap”. However, local codes may require a vacuum breaker.

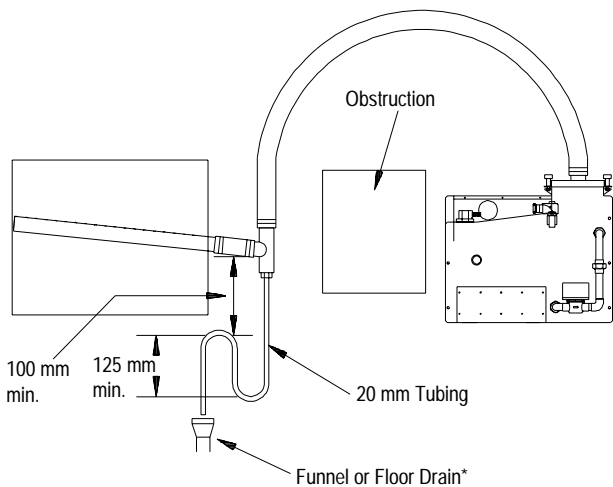
## Vapor Hose Piping

When a vapor hose and stainless steel dispersion tube are used, they should be pitched back to the humidifier. A minimum slope of 165 mm/m (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 below.

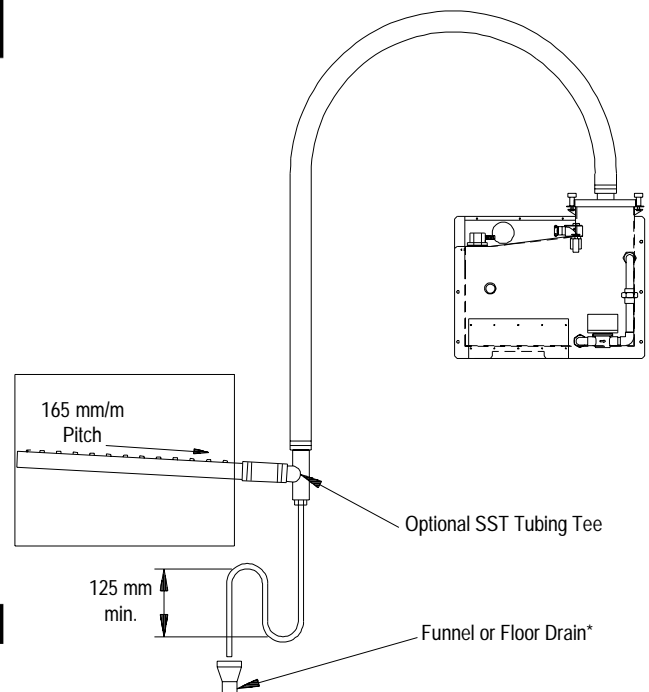
Any condensate that forms in the vapor hose must be removed. Preferably, it should be returned to an open drain with a water seal of sufficient height to contain the duct static pressure, as shown in figure 10-1.

The condensate can also be returned to the VAPORSTREAM VLC, as shown in figure 10-2, with an air vent. This method requires a water seal and an air gap to prevent back pressure from the VAPORSTREAM VLC tank affecting condensate returning below the VAPORSTREAM VLC water line.

**Figure 15-1: Piping method recommended when obstruction prevents dispersion tube from being continuously pitched back to humidifier**

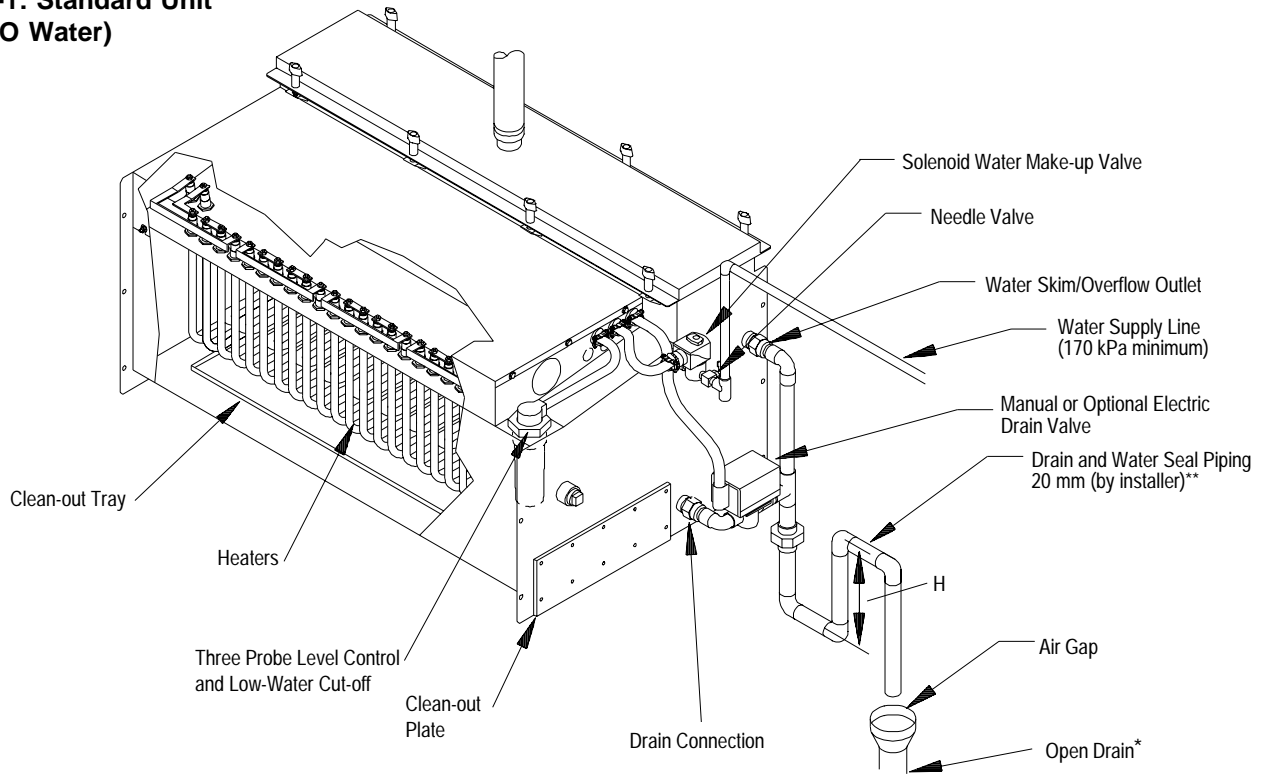


**Figure 15-2: Piping method recommended when humidifier must be mounted higher than the duct**



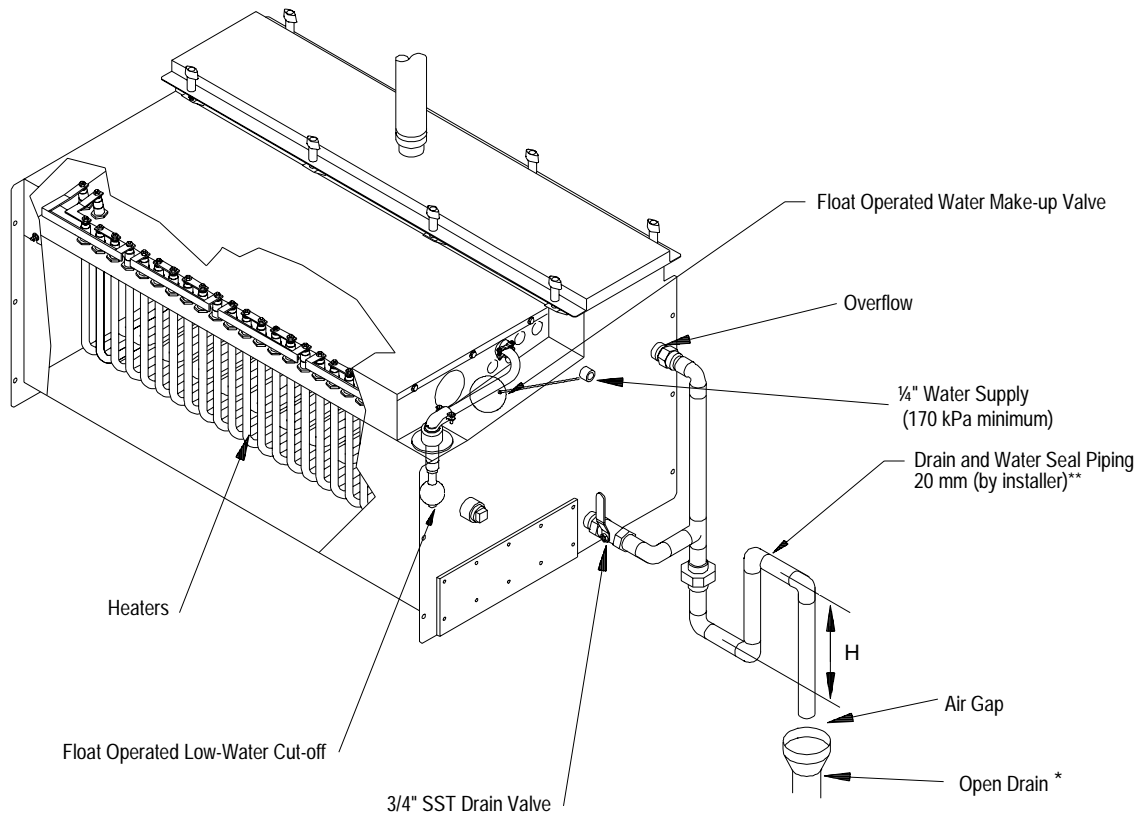
# PIPING DIAGRAMS: STEAM, WATER AND DRAIN

**Figure 16-1: Standard Unit  
(Non-DI/RO Water)**



OM-633

**Figure 16-2: DI/RO Water Unit**



OM-634

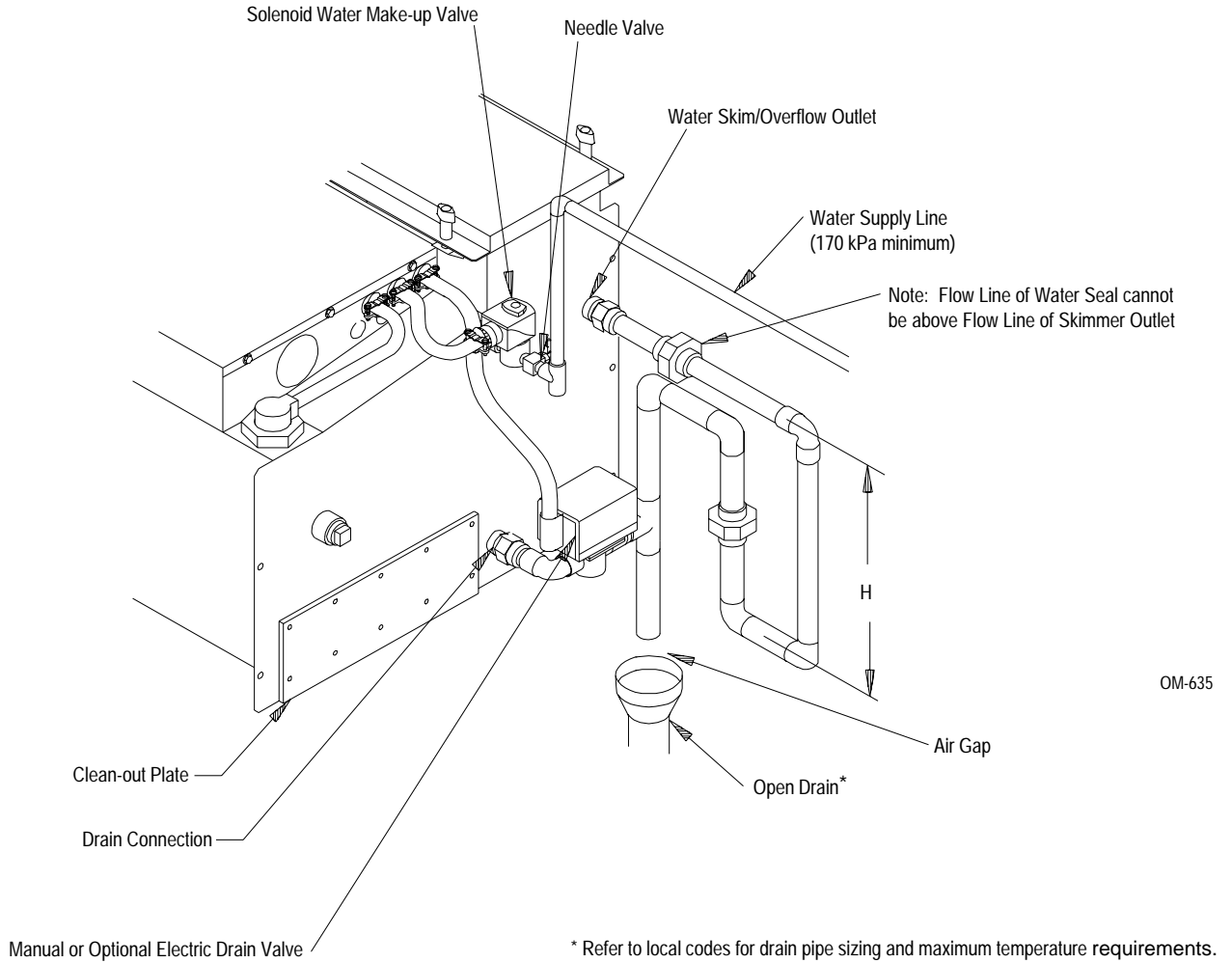
\* Refer to local codes for drain pipe sizing and maximum temperature requirements.

\*\* Drain piping material must be suitable for 100° C water.



# PIPING DIAGRAMS: STEAM, WATER AND DRAIN

**Figure 17-1: Alternate Water Seal and Drain Valve Piping (by installer)**  
 Used when water seal must be elevated above flow line of drain connection  
 (humidifier near floor)



**Table 17-1: Water Seal Height (H) Recommendations**

Humidifier	kg/h	Height
Up to 48 kW	2-62	300 mm
49 kW to 64 kW	63-83	375 mm
65 kW to 100 kW	84-103	450 mm

Note: If piping to dispersion tube is over 6 metres increase water seal height by 15%.

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## START-UP PROCEDURE

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### Introduction

After the system has been properly installed and connected to both electrical and water supplies, it may then be started.

### Start-up 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 all governing codes and the enclosed VAPORSTREAM® VLC wiring diagram.

**Caution: Only qualified electrical personnel should perform start-up procedure.**

#### Control System

For start-up instructions, see the operations and maintenance manual for your humidifier control system.

**Caution: Overtightening cover will cause leaks.**

All cover knobs are turned down at the factory until the bottom of the knob makes contact with the flange, then one half turn further. If more compression is required, turn all knobs a half turn more. Do not turn knobs more than a half turn before identifying that a leak still exists.

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## OPERATION

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For operating instructions, see the *VAPOR-LOGIC® Installation Instructions and Maintenance Operations Manual*.

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## MAINTENANCE

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### Cool Down Note

**Caution:** Insulated and uninsulated tanks will have hot surfaces. Allow unit to cool before performing any maintenance. Manually open the drain valve and the fill valve will be energized. Let the fill water run until the tank is cooled, then shut off the field-installed supply water valve.

### VAPORSTREAM® Model VLC Only

Using softened water will significantly reduce mineral build-up in the humidifier. When softened water is not available, the VAPORSTREAM VLC is designed to deal with water hardness in one of two ways depending on the degree of hardness. For light to moderate hardness (up to 170 mg/l), using the surface water skim time feature with annual cleaning is recommended. For high mineral content water (above 170 mg/l), a periodic drain and flush through the motorized drain valve, in addition to the surface water skim time feature, is recommended. The frequency of cleaning will depend on water condition and evaporation load.

The humidifier should be inspected for leaks at least annually. 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.

**Caution:** When performing maintenance on the VAPORSTREAM Model VLC, always set control module switch to "STBY" position, place main disconnect in "OFF" position, and close manual water shut-off valve.

### Seasonally or as Required

- 1. Cleaning Tank** - Slide the clean-out tray out and dispose of any loose scale that has collected in the tray. This should be done before the build-up reaches the underside of the heating elements.
- 2. Cleaning Probes** - Disconnect the plug and cable assembly and unscrew the probe holder from the VAPORSTREAM VLC unit. The scale will easily flake off from the sensing portion. The sensing portion (bottom 10 mm) of the probe should be brushed clean with stainless steel wool.
- 3. Cleaning Skim Overflow Port** - Loosen deposits with a long tool, such as a screwdriver. Proper skimmer drainage should be verified by a weekly visual inspection. Water should drain from skimmer drain pipe after

each fill cycle. (For cleaning piping, disconnect and flush out. If mineral deposits have restricted the flow, replace piping.)

### Summer Maintenance

After the humidification season, a complete inspection and cleaning of the heaters, probe control, skimmer port, and water chamber is recommended. After cleaning, the unit should remain empty until humidification is required.

### Adjusting the Surface Skim Bleed-Off Quantity

The skim time determines the quantity of water skimmed with each fill cycle. The skim time is field adjustable using the VAPOR-LOGIC® keypad.

Each time the VAPORSTREAM VLC refills, it fills to an elevation near the lip of the skim overflow fitting. A portion of the refill water then flows to drain carrying most of the minerals left by the previous evaporating cycle. This 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 an operational cost. Therefore, it is recommended that the user observe and adjust the skimming quantity. By doing so, a balance between minimizing mineral build-up and conserving hot water can be achieved.

### VAPORSTREAM® Model VLDI Only

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

### Make-up Water Piping

Use cold or hot makeup water. If the water pressure is above 410 kPa and/or water hammer would be objectionable, a pressure reducing valve or shock arrester should be installed. Even though the VAPORSTREAM VLC has an internal 25 mm air gap, some local codes may require a vacuum breaker.

**Caution:** Minimum water supply pressure is 170 kPa.

### Cleaning Evaporating Chamber

As long as mineral-free water is used in the VAPORSTREAM VLDI, no cleaning or flushing of the evaporating chamber should be necessary.

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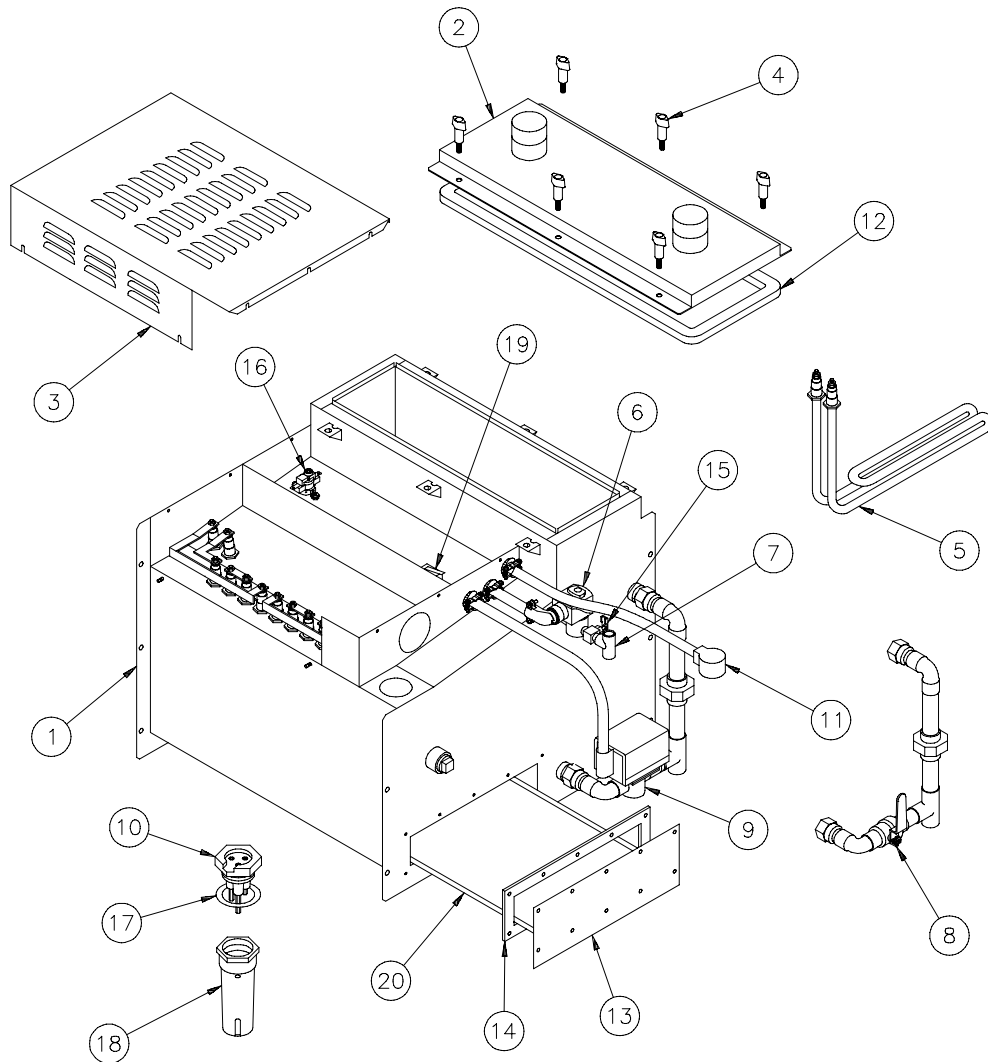
## TROUBLE-SHOOTING GUIDE

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For trouble-shooting instructions, see the *VAPOR-LOGIC® Installation Instructions and Maintenance Operations Manual*.

# REPLACEMENT PARTS

Figure 20-1: VAPORSTREAM® Model VLC Humidifier



OM-650

No.	Description	Part No.
1	Chamber	*
2	Cover, Chamber	*
3	Cover, Louvered	*
4	Knob, T-Handled Utility	700725
5	Heater	*
6	Valve, ¼" Brass Fill	505080*
7	Sediment Strainer, ¼"	300050
8	Valve, ¾" Sweat Brass (Manual Drain)	505011
9	Valve, ¾" HW Drain (Auto Drain)	505400*
10	Probe Assembly	406015

No.	Description	Part No.
11	Probe Plug Wire Assembly	406050-002*
12	Gasket, Cover	160691*
13	Clean-Out Plate	165472
14	Gasket, 90 mm x 300 mm	308225
15	Valve, Needle ¼"	505070-001
16	Thermal Cut-Out	409560-001
17	Gasket, Probe	160698
18	Probe Housing, Nylon	308500
19	Switch, Interlock	408475
20	Tray, Clean-Out	167770*

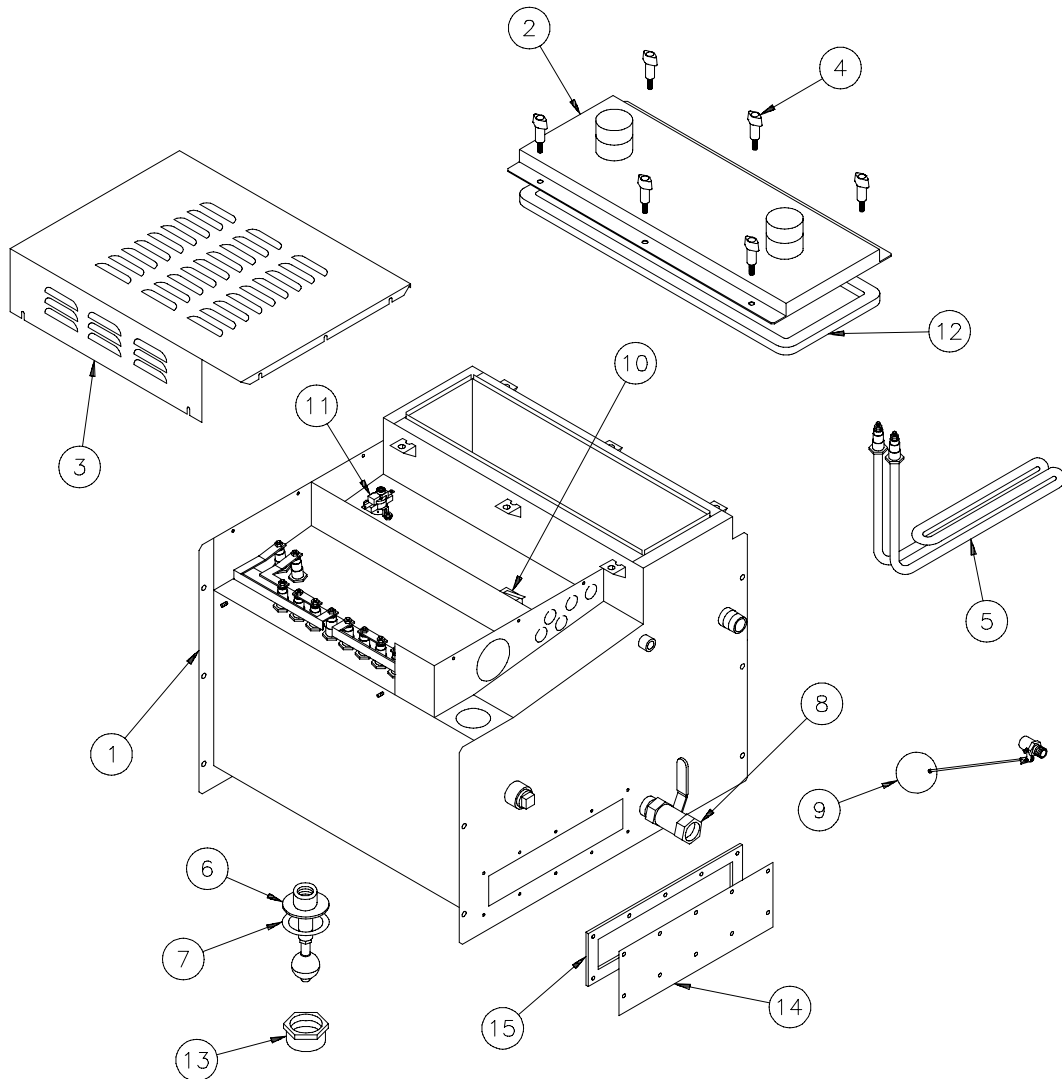
\* Specify humidifier model and serial numbers when ordering.

**Notes:**

- For dispersion tube(s) specify type (L-tube, straight tube), humidifier model and serial numbers.
- Parts not itemized are typical hardware stock items.

# REPLACEMENT PARTS

Figure 21-1: VAPORSTREAM® Model VLDI Humidifier



OM-651

No.	Description	Part No.
1	Chamber	*
2	Cover, Chamber	*
3	Cover, Electrical	*
4	Knob, T-Handled Utility	700725
5	Heater	*
6	Plate, VLDI Conversion	167785
7	Gasket	160698
8	Valve, ¼" SST	505000-001

No.	Description	Part No.
9	Float Valve Assembly, Straight	505210
10	Switch, Interlock	408475
11	Thermal Cut-Out	409560-001
12	Gasket, Cover	160691*
13	DI Housing, Nylon	167780
14	Clean-Out Plate	165472
15	Gasket, 90 mm x 300 mm	308225

\* Specify humidifier model and serial numbers when ordering.

**Notes:**

- For dispersion tube(s) specify type (L-tube, straight tube, RAPID-SORB™, etc), humidifier model and serial numbers.
- Parts not itemized are typical hardware stock items.





## TWO-YEAR LIMITED WARRANTY

DRI-STEEM Humidifier Company ("DRI-STEEM") warrants to the original user that its products will be free from defects in materials and workmanship for a period of two (2) years after installation or twenty-seven (27) months from the date DRI-STEEM ships such product, whichever date is the earlier.

If any DRI-STEEM product is found to be defective in material or workmanship during the applicable warranty period, DRI-STEEM's entire liability, and the purchaser's sole and exclusive remedy, shall be the repair or replacement of the defective product, or the refund of the purchase price, at DRI-STEEM's election. DRI-STEEM shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or re-installation of any defective product.

DRI-STEEM's limited warranty shall not be effective or actionable unless there is compliance with all installation and operating instructions furnished by DRI-STEEM, or if the products have been modified or altered without the written consent of DRI-STEEM, or if such products have been subject to accident, misuse, mishandling, tampering, negligence or improper maintenance. Any warranty claim must be submitted to DRI-STEEM in writing within the stated warranty period.

DRI-STEEM's limited warranty is made in lieu of, and DRI-STEEM disclaims all other warranties, whether express or implied, including but not limited to any IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, any implied warranty arising out of a course of dealing or of performance, custom or usage of trade.

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By purchasing DRI-STEEM's products, the purchaser agrees to the terms and conditions of this limited warranty.

Continuous product improvement is a policy of DRI-STEEM Humidifier Company. Therefore, product features and specifications are subject to change without notice.

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