

READ AND SAVE THESE INSTRUCTIONS

VAPORMIST[®] and VAPORMIST DI ELECTRIC STEAM HUMIDIFIERS

Installation, Operation and Maintenance Manual

**For toll-free technical support
call 1-800-328-4447**



DRISTEEM[®]
HUMIDIFIER COMPANY

A SUBSIDIARY OF RESEARCH PRODUCTS CORPORATION



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To the purchaser and installer

Thank you for purchasing our VAPORMIST® humidifier. We have designed and built this equipment to give you complete satisfaction and trouble-free service for many years. Familiarizing yourself with this manual will help ensure proper operation of the equipment for years to come.

This manual covers the installation and maintenance procedures for both the VAPORMIST and VAPORMIST DI humidifiers.

DRI-STEEM Humidifier Company

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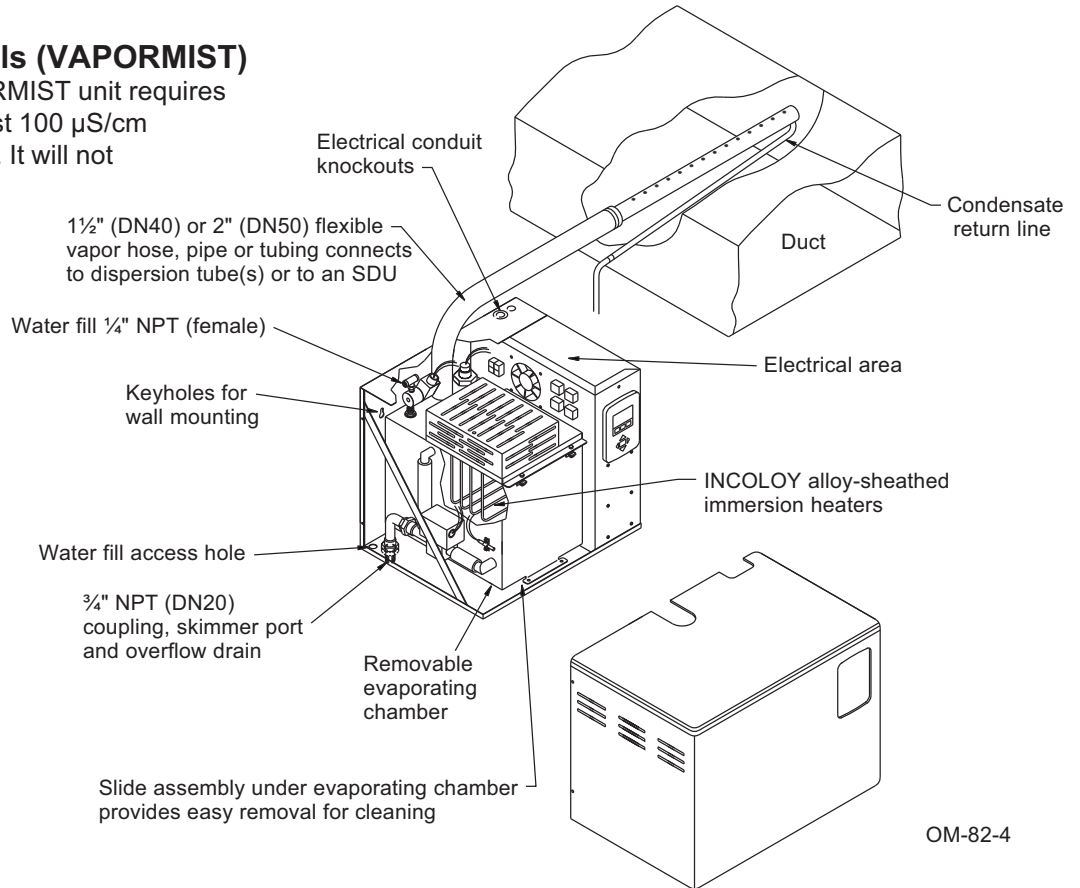
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VAPORMIST® HUMIDIFIER OVERVIEW

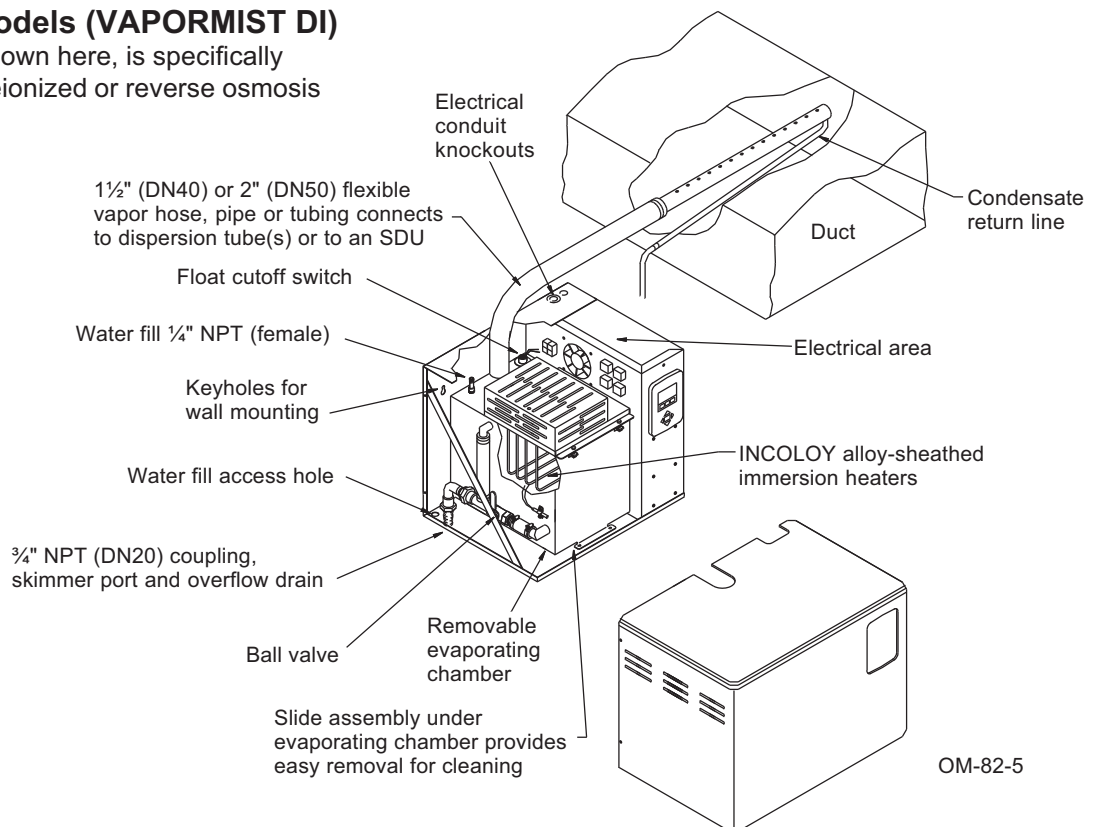
Standard water models (VAPORMIST)

The standard water VAPORMIST unit requires water conductivity of at least 100 $\mu\text{S}/\text{cm}$ (2 grains/gallon) to operate. It will not operate with water treated by reverse osmosis or deionization processes (see DI water model below).

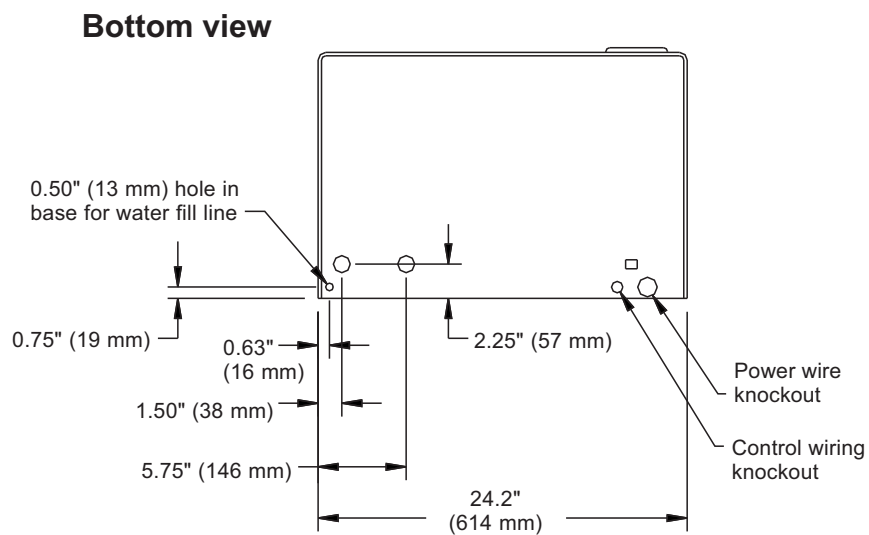
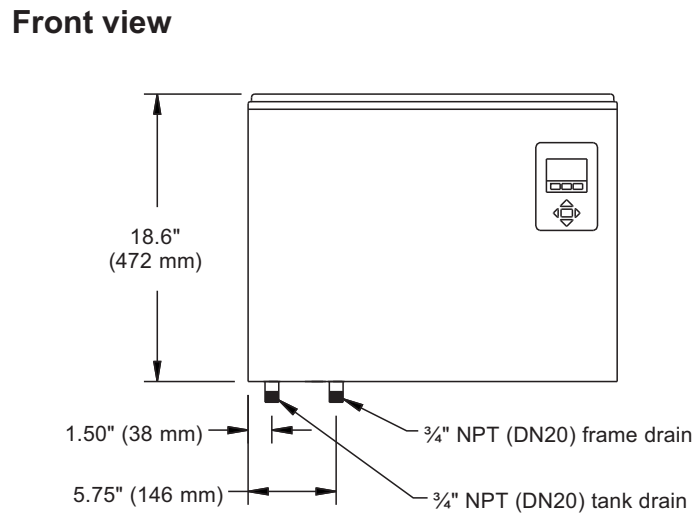
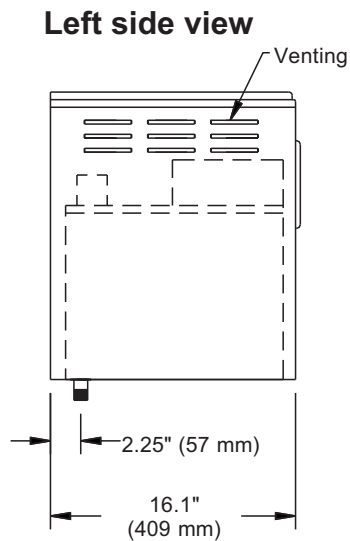
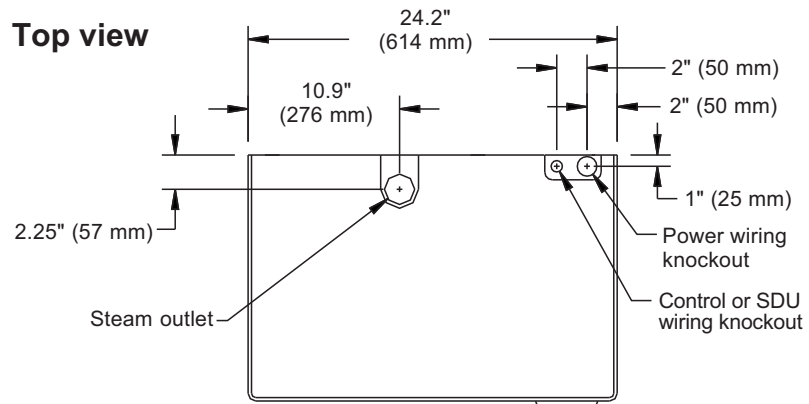


Deionized water models (VAPORMIST DI)

The VAPORMIST DI, shown here, is specifically designed for use with deionized or reverse osmosis water.



VAPORMIST® DIMENSIONS



VAPORMIST® SPECIFICATIONS

VAPORMIST specifications

VM model number	Steam capacity		Current draw (amps)									kW	Shipping weight ‡		Operating weight ‡	
			Single-phase					Three-phase								
	lbs/hr	kg/h	120V	208V*	240V*	480 †	600V †	208V*	240V †	480V †	600V †		lbs	kg	lbs	kg
2	6	2.7	16.7	9.6	8.3	4.2	3.3	--	--	--	--	2	80	36	95	43
4	12	5.4	33.3	19.2	16.7	8.3	6.7	16.7**	14.4**	7.2**	5.8**	4	80	36	95	43
6	18	8.2	--	28.8	25.0	12.5	10.0	25.0**	21.7**	10.8**	8.7**	6	88	40	122	55
8	24	10.9	--	38.5	33.3	16.7	13.3	33.3**	28.9**	14.4**	11.5**	8	88	40	122	55
10	30	13.6	--	--	41.7	20.8	16.7	29.1**	25.3**	12.6**	10.1**	10	93	42	139	63
12	36	16.3	--	--	--	25.0	20.0	33.3	28.9	14.4	11.5	12	93	42	139	63
14	42	19.1	--	--	--	29.2	23.3	38.9	33.7	16.8	13.5	14	93	42	139	63
16	48	21.8	--	--	--	33.3	26.7	44.4	38.5	19.2	15.4	16	93	42	139	63
21	63	28.6	--	--	--	43.8	35.0	--	--	25.3	20.2	21	95	43	152	69
25	75	34.0	--	--	--	--	41.7	--	--	30.1	24.1	25	95	43	152	69
30	90	40.9	--	--	--	--	--	--	--	36.1	28.9	30	101	46	156	71
34	102	46.3	--	--	--	--	--	--	--	40.9	32.7	34	101	46	156	71

Table notes:

- * On 208V/240V/single-phase/three-wire and on 208V/three-phase/four-wire supplies, the neutral line provides a separate 120V circuit for the SDU fan unit.
- ** For wire sizing, the highest leg draw is shown due to current imbalance.
- † Add the following to VAPORMIST weights if using an SDU option:
 - SDU-I: 12 lbs (5.5 kg)
 - SDU-E: 9 lbs (4 kg)
 Note: These weights are for additional control components housed within the VAPORMIST cabinet. See the SDU weights table at right for SDU weights (shipped separately).
- ‡ Add the following if using the SSR option:
 - For single-phase or three-phase models drawing less than 21.7 amps, add 2 lbs (1 kg)
 - For three-phase models drawing more than 21.7 amps, add 4 lbs (2 kg)

All VAPORMISTs operate at 50/60 Hz.

Notes about SDUs (Space Distribution Units):

- The SDU-I is available for models VM-2 through VM-8, and all VM-10 models except those using 240V, three-phase power with SSR control.
- The SDU-E is available for all VAPORMIST models except those models using 240V/480V/600V/three-phase power with the SSR control option and drawing more than 21.7 amps.
- SDUs ship separately from the VAPORMIST.

SDU weights

SDU model	Shipping weight		Operating weight	
	lbs	kg	lbs	kg
SDU-I	68	31	58	26
SDU-E	61	28	51	23

VAPORMIST® MOUNTING AND PIPING

Locating and mounting the humidifier

The VAPORMIST humidifier is designed to attach to the wall with lag bolts, and it should be installed in a space located near an air duct system, unless using a Space Distribution Unit (SDU) for dispersion.

Consider the following when selecting the location of the humidifier:

- Convenient access to duct
- Electrical and plumbing connections
- Required clearances
- External water seal requirements

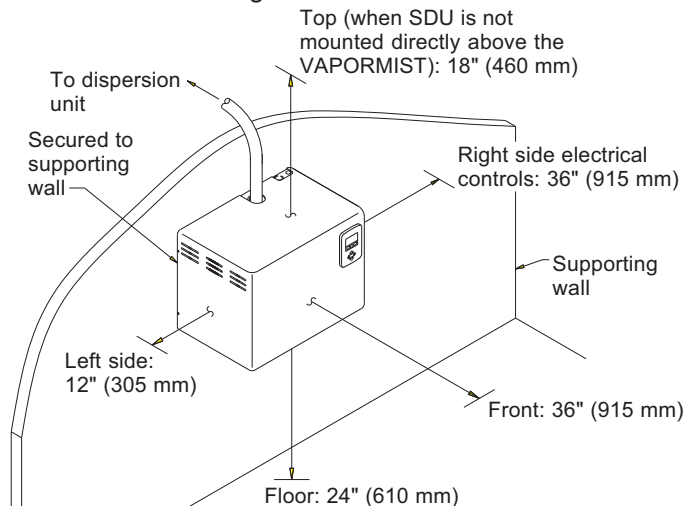
Electrical power supply, water makeup piping and drain piping must also be considered. Electrical power supply connections are made at the lower or upper right rear corner of the unit. Water makeup and drain piping connections are made at the lower left rear corner.

When mounting on a stud wall (studs 16" [406 mm] on center), locate studs and position lag bolts in place so that each of the bolts will center on a stud. Mark hole locations and predrill ¼" (6 mm) diameter pilot holes using mounting template on the VAPORMIST box. Secure frame to wall with lag bolts provided.

For hollow block or poured concrete wall mounting, position template in place and mark the holes. Drill appropriate pilot holes for two 3/8" (10 mm) toggle bolts or two 3/8" (10 mm) machine bolt lead anchors. Secure frame in place.

Clearance recommendations

For recommended service and maintenance purposes, maintain the following clearances:



VAPORMIST piping

Water makeup piping may be of any code-approved material (copper, steel, or plastic). The final connection size is ¼" NPT (DN8). In cases where water hammer may be a possibility, a shock arrestor should be considered. Water pressure must be between 25 psi and 80 psi (175 kPa and 550 kPa).

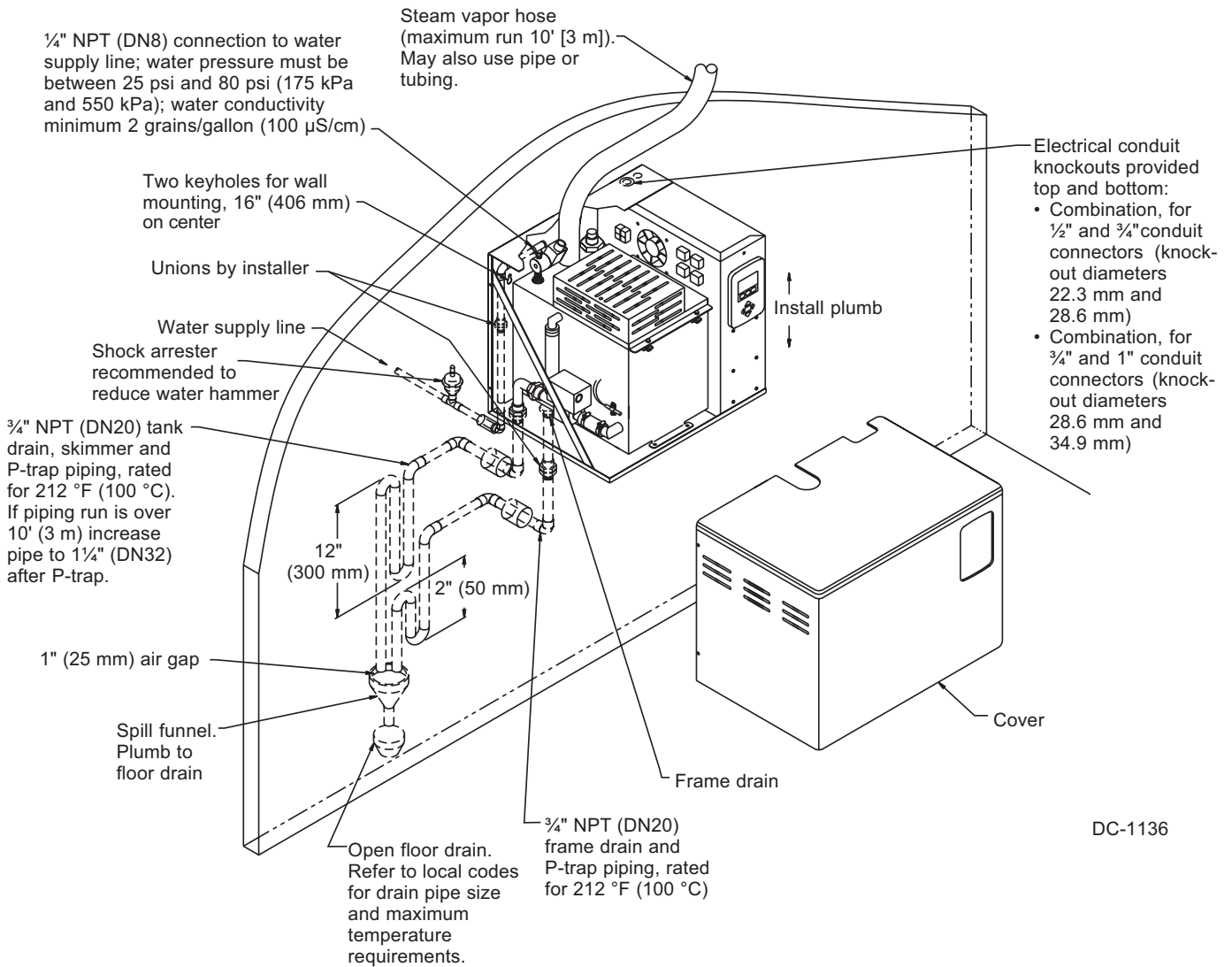
Drain piping may be of any code-approved material (copper, steel, or plastic rated for 212 °F [100 °C] minimum). If drainage by gravity is not possible, use a small pump (DRI-STEEM Part No. 400280).

The final connection size is ¾" NPT (DN20) for tank and frame drains. This connection size should not be reduced. (See the drawings on the following pages for proper drain piping configurations.) The tank drain should be piped separately from the frame drain, as shown, to prevent backflow of drain water into the humidifier cabinet.

Install a union in the water supply line as shown in the drawings on the next two pages to allow tank removal.

VAPORMIST® PIPING

VAPORMIST (standard water) field piping overview

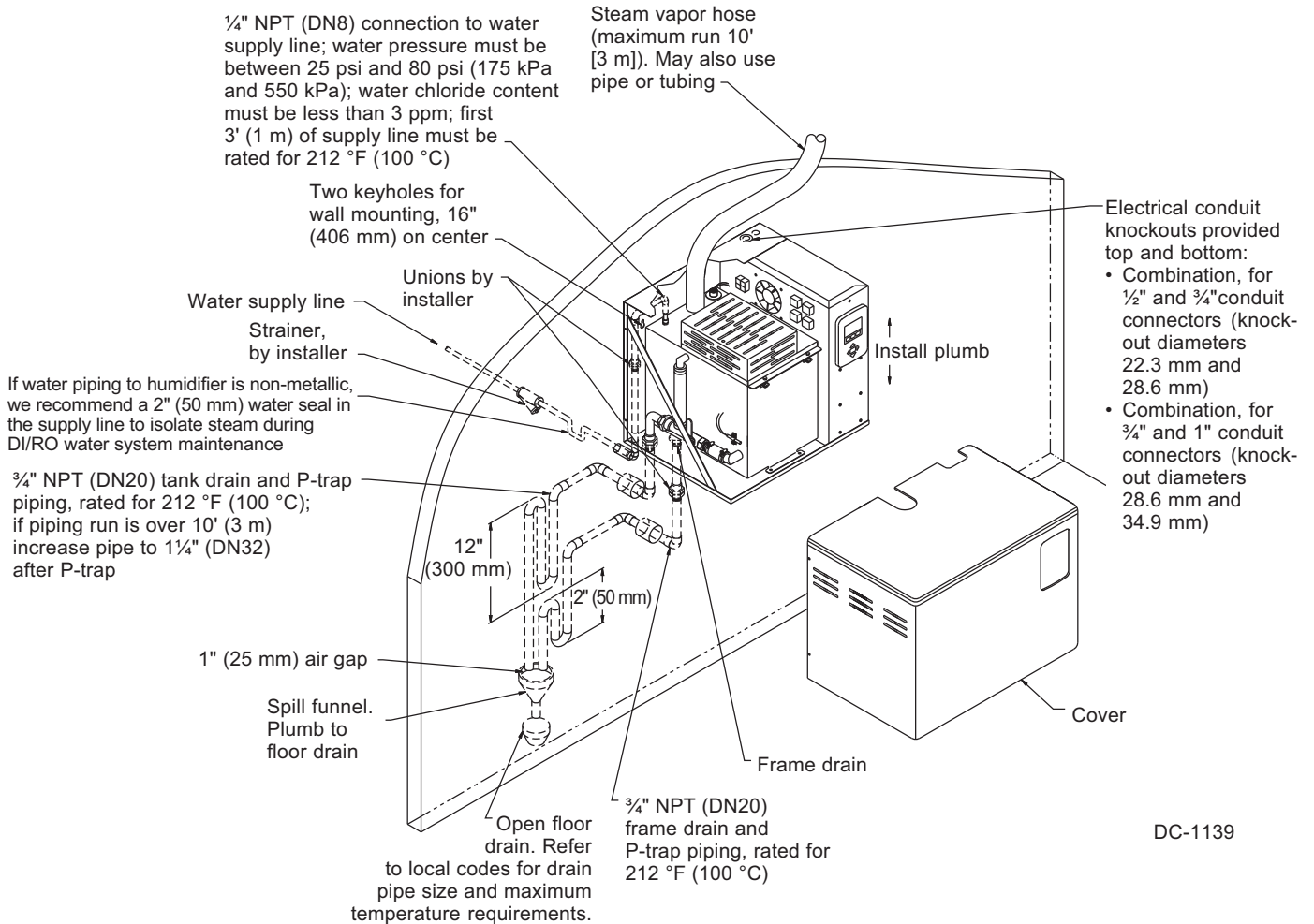


Notes:

- Offset humidifier from spill funnel or floor drain to prevent flash steam from rising into the cabinet.
- Dashed lines indicate provided by installer.
- The water supply inlet is more than 1" (25 mm) above the skim/overflow port, eliminating the possibility of backflow or siphoning from the tank. No additional backflow prevention is required, however, local codes prevail.
- Install a union in the water supply line as shown to allow tank removal.

VAPORMIST® PIPING

VAPORMIST DI (deionized/reverse osmosis water) field piping overview



DC-1139

Notes:

- Offset humidifier from spill funnel or floor drain to prevent flash steam from rising into the cabinet.
- Dashed lines indicate provided by installer.
- The water supply inlet is more than 1" (25 mm) above the overflow port, eliminating the possibility of backflow or siphoning from the tank. No additional backflow prevention is required, however, local codes prevail.
- Install a union in the water supply line as shown to allow tank removal.

VAPORMIST® WIRING

VAPORMIST wiring

All wiring must be in accordance with all governing codes, and with the VAPORMIST or VAPORMIST DI wiring diagram. The diagrams are located inside the removable subpanel cover on the right side of the humidifier cabinet. Power supply wiring must be rated for 105 °C.

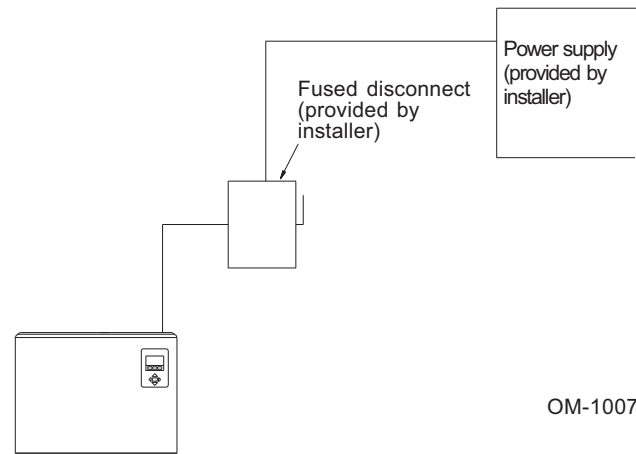
When selecting a location for installing the VAPORMIST, avoid areas close to sources of electromagnetic emissions such as power distribution transformers.

The use of semiconductor fusing sized per the National Electric Code is recommended with the SSR option.

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.

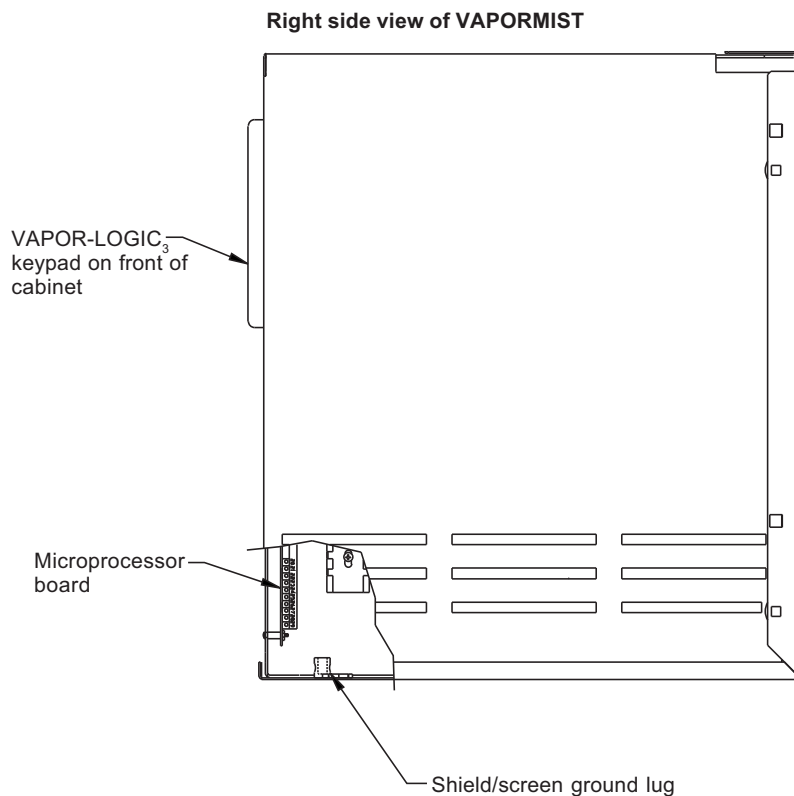
Field wiring requirements



OM-1007

Note: Control wiring and power wiring must be run in dedicated or separate earthed metal conduit, cable trays or trunking.

Shielded/screened cable drain wire connection to lug



OM-1505

Note: For maximum EMC effectiveness, all humidity, temperature, and airflow controls should be wired using multicolored shielded/screened plenum-rated cable with a drain wire for the shield/screen. The drain wire should be connected to the shield/screen ground terminal with its length kept to less than 2".

VAPORMIST® DISPERSION

SDU-I:

Provides instant, internal absorption

The Space Distribution Unit Internal Absorption (SDU-I) disperses humidity with no visible vapor trail or wetness, making the VAPORMIST® with an SDU-I ideal for use in finished spaces. When room RH is 45% or less, the SDU-I fan mixes room air and steam to ensure complete absorption before discharge as humidified air. The SDU-I is available for models VM-2 through VM-8, and all VM-10 models except those using 240 V, three-phase power with SSR control.

SDU-E:

For higher capacity units

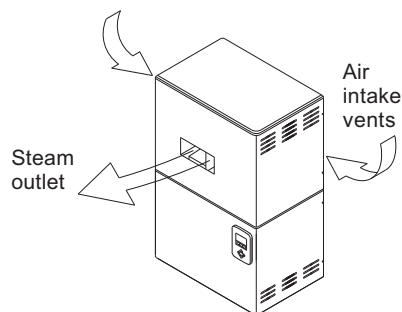
The Space Distribution Unit External Absorption (SDU-E) is designed for higher capacity dispersion. The SDU-E is available for all VAPORMIST models except those models using 240V/480V/600V/three-phase power with the SSR control option and drawing more than 21.7 amps.

Mounting the SDU-I and SDU-E

Both SDUs may be mounted on a wall directly above the VAPORMIST cabinet or mounted on a wall remote from the VAPORMIST. Use the mounting template on the box for correct placement. Two lag bolts are provided with each fan unit.

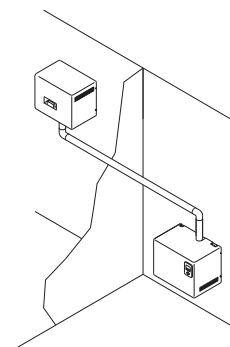
Note: See the following pages for more information about SDU-I and SDU-E.

The SDU can be mounted directly above the VAPORMIST.



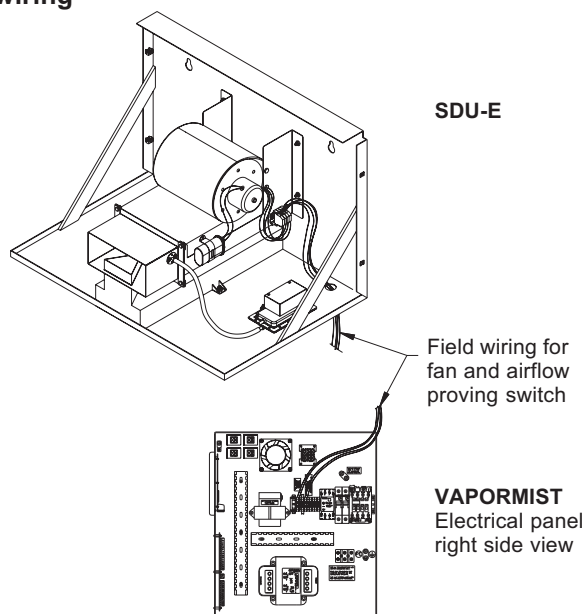
OM-55-1

The SDU can be mounted remotely from the VAPORMIST.



OM-56-1

SDU field wiring



OM-921

VAPORMIST® DISPERSION

Installing Space Distribution Units (SDUs)

Provide at least 6" (150 mm) clearance on each side of the SDU.

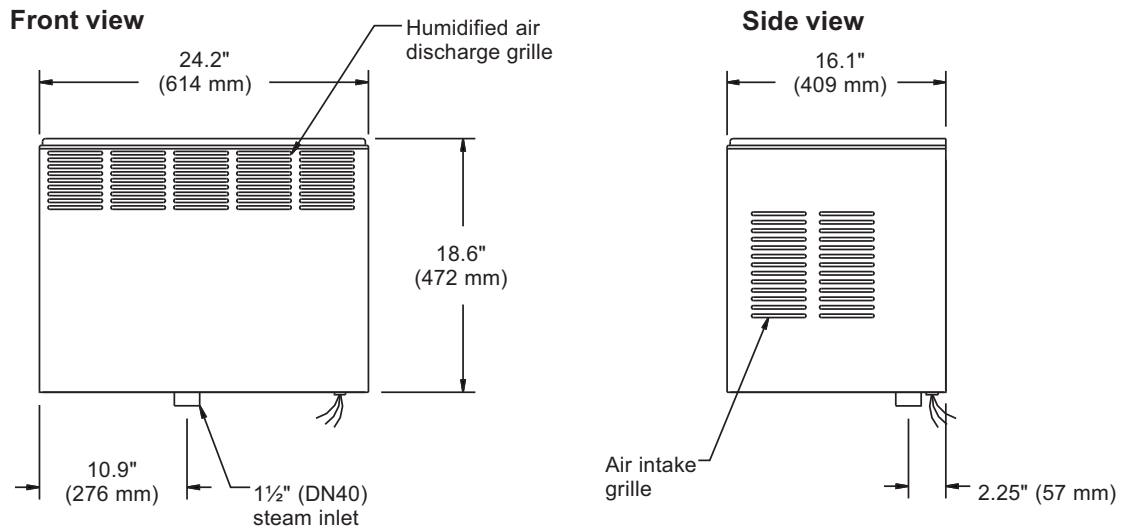
Field wiring is required to connect the SDU fan and airflow proving switch terminals to the respective VAPORMIST electrical panel terminals. Refer to the external connections diagram in the package shipped with your unit.

When performing VAPORMIST maintenance

If the SDU-E or SDU-I is installed immediately above the VAPORMIST, disconnect both hose clamps on the steam hose, grip the hose and rotate it to break it loose from the tubing, and then slide the hose up onto the SDU steam tube until sufficient clearance is provided to move the tank.

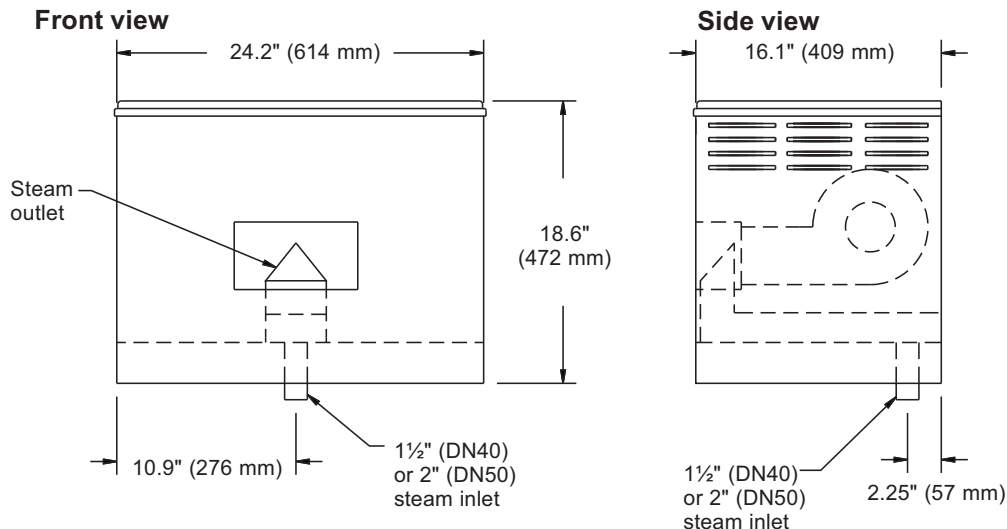
Note: Maximum ambient RH must not exceed 45% for the SDU-I to operate properly.

SDU-I mechanical detail



DC-1076

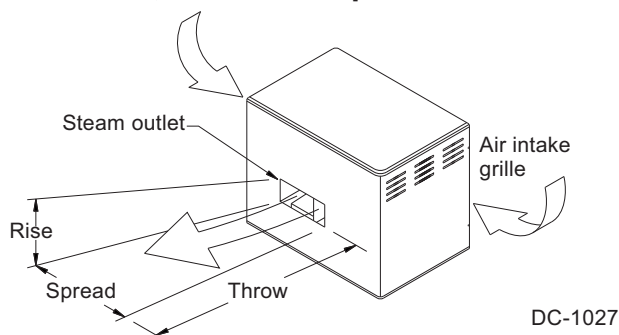
SDU-E mechanical detail



DC-1078

VAPORMIST® DISPERSION

SDU-E: Rise, throw and spread



As steam is discharged from the SDU-E, it quickly cools and turns to a visible fog that is lighter than air. As this fog is carried away from the SDU-E by the airstream, it tends to rise toward the ceiling. If this fog contacts solid surfaces (columns, beams, ceiling, pipes, etc.) before it disappears, it could collect and drip as water. The greater the space relative humidity, the more the fog will rise, throw and spread.

The table below lists the minimum rise, throw and spread non-wetting distances for SDU-E area-type humidifiers at 40%, 50% and 60% RH in the space. Surfaces cooler than ambient temperature, or objects located within this minimum dimension, may cause condensation and dripping. To avoid steam impingement on surrounding areas, observe the minimum non-wetting distances in the table below.

The SDU-E contains a 545 cfm blower (120 V, single-phase, 60 Hz) and an airflow proving switch field-wired to the VAPORMIST humidifier electrical panel. A wiring diagram of the SDU-E is included with the unit.

On a call for humidity, the humidifier begins producing steam and the start relay energizes the SDU-E blower. When the call for humidity is satisfied, the VAPOR-LOGIC₃ microprocessor keeps the blower running to disperse residual moisture using a time-delay.

SDU-E minimum non-wetting distances

Model	40% RH @ 70 °F (21 °C)						50% RH @ 70 °F (21 °C)						60% RH @ 70 °F (21 °C)					
	Rise		Throw		Spread		Rise		Throw		Spread		Rise		Throw		Spread	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
VM-2	1.0	0.3	5.0	1.5	1.0	0.3	1.5	0.5	6.5	2.0	1.5	0.5	2.5	0.8	7.5	2.3	2.5	0.8
VM-4	1.0	0.3	5.0	1.5	1.0	0.3	1.5	0.5	6.5	2.0	1.5	0.5	2.5	0.8	7.5	2.3	2.5	0.8
VM-6	1.0	0.3	5.0	1.5	1.0	0.3	1.5	0.5	6.5	2.0	1.5	0.5	2.5	0.8	7.5	2.3	2.5	0.8
VM-8	1.0	0.3	5.5	1.7	1.0	0.3	1.5	0.5	6.5	2.0	1.5	0.5	2.5	0.8	7.5	2.3	2.5	0.8
VM-10	1.5	0.5	6.0	1.8	1.5	0.5	2.0	0.6	7.0	2.1	2.0	0.6	3.0	1.0	8.0	2.5	3.0	1.0
VM-12	1.5	0.5	6.0	1.8	1.5	0.5	2.0	0.6	7.0	2.1	2.0	0.6	3.0	1.0	8.0	2.5	3.0	1.0
VM-14	2.0	0.6	7.0	2.1	2.0	0.6	2.0	0.6	7.0	2.1	2.0	0.6	3.0	1.0	9.0	2.7	3.0	1.0
VM-16	2.0	0.6	7.0	2.1	2.0	0.6	2.0	0.6	7.0	2.1	2.0	0.6	3.0	1.0	9.0	2.7	3.0	1.0
VM-21	2.0	0.6	7.5	2.3	2.0	0.6	2.5	0.8	10.0	3.0	2.5	0.8	3.0	1.0	12.0	3.7	3.0	1.0
VM-25	2.0	0.6	8.0	2.5	2.0	0.6	2.5	0.8	10.5	3.2	2.5	0.8	3.5	1.1	12.5	3.8	3.5	1.1
VM-30	2.0	0.6	8.0	2.5	2.0	0.6	2.5	0.8	10.5	3.2	2.5	0.8	3.5	1.1	12.5	3.8	3.5	1.1
VM-34	2.0	0.6	8.0	2.5	2.0	0.6	2.5	0.8	10.5	3.2	2.5	0.8	3.5	1.1	12.5	3.8	3.5	1.1

Table notes:

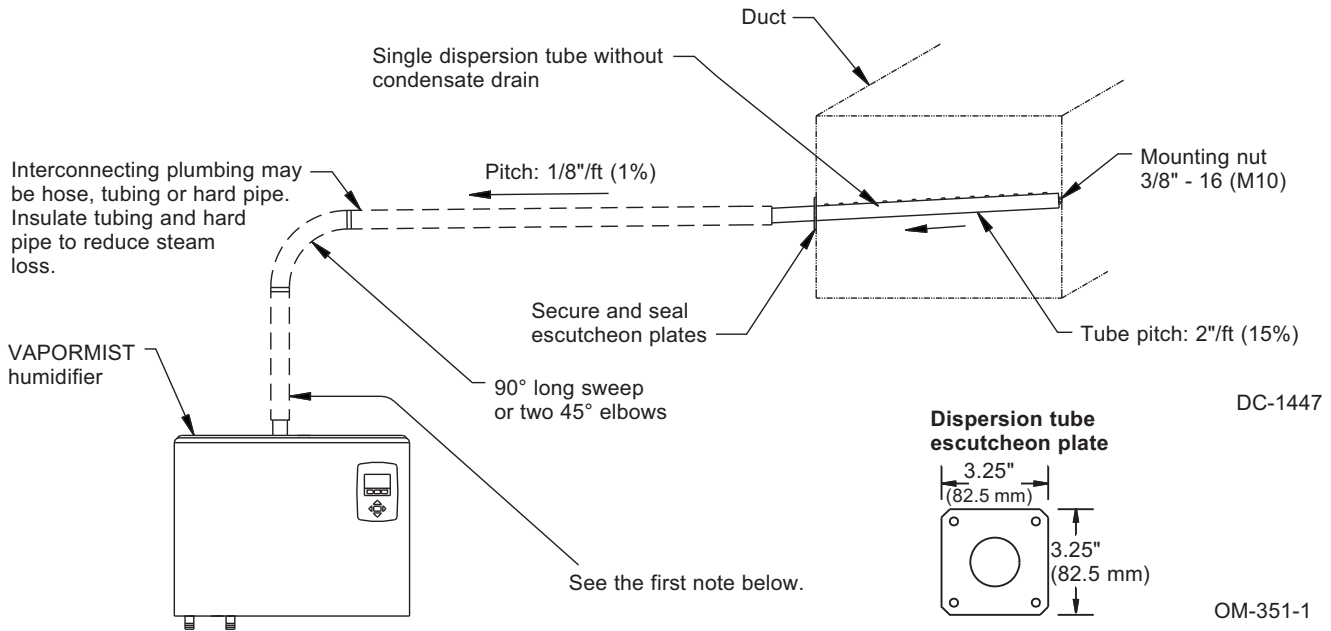
Rise: Minimum non-wetting height above the steam outlet of the SDU-E

Throw: Minimum non-wetting horizontal distance from the steam outlet of the SDU-E.

Spread: Minimum non-wetting width from the steam outlet of the SDU-E.

VAPORMIST® DISPERSION

Single tube without condensate drain



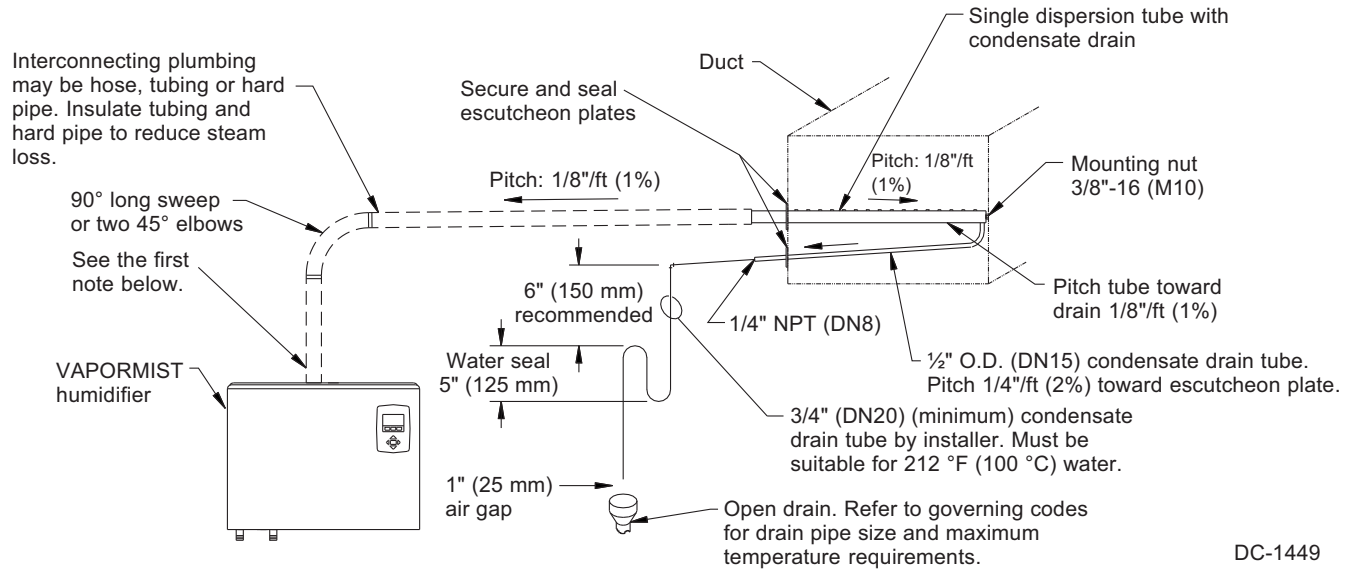
Notes:

- Use DRI-STEEM's hard pipe adapter kit to connect the steam outlet to hard pipe. Use a hose clamp to connect the steam outlet to vapor hose. Use a hose cuff and clamps to connect the steam outlet to tubing.
- Thin-walled tubing heats up faster than heavy-walled pipe causing less steam loss at start-up.
- Hard pipe or tubing diameter must match VAPORMIST steam outlet size 1½" (DN40) or 2" (DN50).
- See the Maximum Steam Carrying Capacity and Steam Loss tables on Page 17.
- Maximum capacity of dispersion tube (without condensate drain):
 - 1½" (DN40): 28.4 lbs/hr (13 kg/h)
 - 2" (DN50): 56.8 lbs/hr (25.8 kg/h)
- Orient dispersion tube so that tubelets (steam orifices) point up.
- When mounting the humidifier above the level of dispersion tube, see the drawing on Page 16.
- Failure to follow the recommendations on this page may result in excessive back pressures on the humidifier. This may lead to dispersion tube(s) spitting, steam blowing through water seals, or leaking gaskets.
- The table at right shows hose kit sizes by humidifier model. A hose kit includes vapor hose, a dispersion tube and hardware. Note that the capacities of models VM-30 and VM-34 require multiple tube assemblies and therefore cannot use a hose kit. For multiple tube assemblies, see information on RAPID-SORB on Page 15.

Hose kit sizing by model

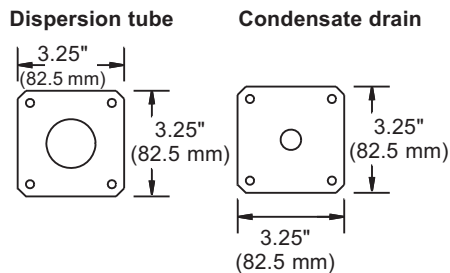
Humidifier models	Hose kit (vapor hose, dispersion tube and hardware)	Maximum capacity of dispersion tube	
		lbs/hr	kg/h
VM 2-8	1½" (DN40) hose kit without drain	28.4	13
VM 10-16	1½" (DN40) hose kit with drain	56.8	25.8
	2" (DN50) hose kit without drain	56.8	25.8
VM 21-25	2" (DN50) hose kit with drain	85.2	38.6
VM 30-34	These models require multiple tube assemblies and cannot use a hose kit.		

Single tube with condensate drain



DC-1449

Escutcheon plates:

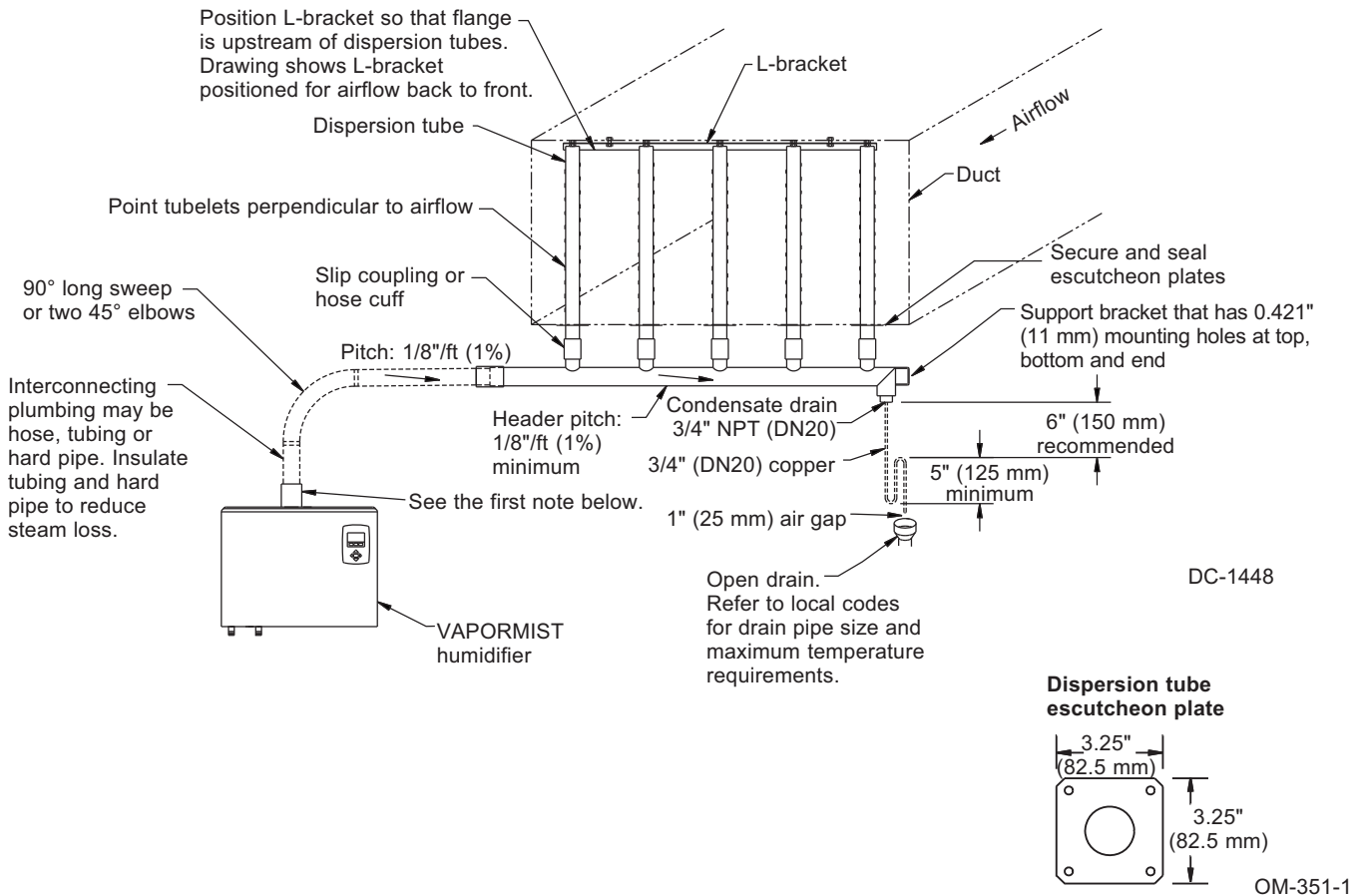


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Notes:

- Use DRI-STEEM's hard pipe adapter kit to connect the steam outlet to hard pipe. Use a hose clamp to connect the steam outlet to vapor hose. Use a hose cuff and clamps to connect the steam outlet to tubing.
- Thin-walled tubing heats up faster than heavy-walled pipe causing less steam loss at start-up.
- Hard pipe or tubing diameter must match VAPORMIST steam outlet size 1½" (DN40) or 2" (DN50).
- See the Maximum Steam Carrying Capacity and Steam Loss tables on Page 17.
- Maximum capacity of dispersion tube with condensate drain:
 - 1½" (DN40): 56.8 lbs/hr (25.8 kg/h)
 - 2" (DN50): 85.2 lbs/hr (38.6 kg/h)
- Orient dispersion tube so that tubelets (steam orifices) point up.
- The dispersion tube must be pitched a minimum of 1/8"/ft (1%) toward the drain when using a condensate drain. Condensate drain tubing must be pitched a minimum of 1/4"/ft (2%) toward the drain.
- When mounting the humidifier above the level of dispersion tube, see the drawing on Page 16.
- Failure to follow the recommendations on this page may result in excessive back pressures on the humidifier. This may lead to dispersion tube(s) spitting, steam blowing through water seals, or leaking gaskets.
- See the Hose Kit Sizing table on the previous page.

RAPID-SORB dispersion assembly



Notes:

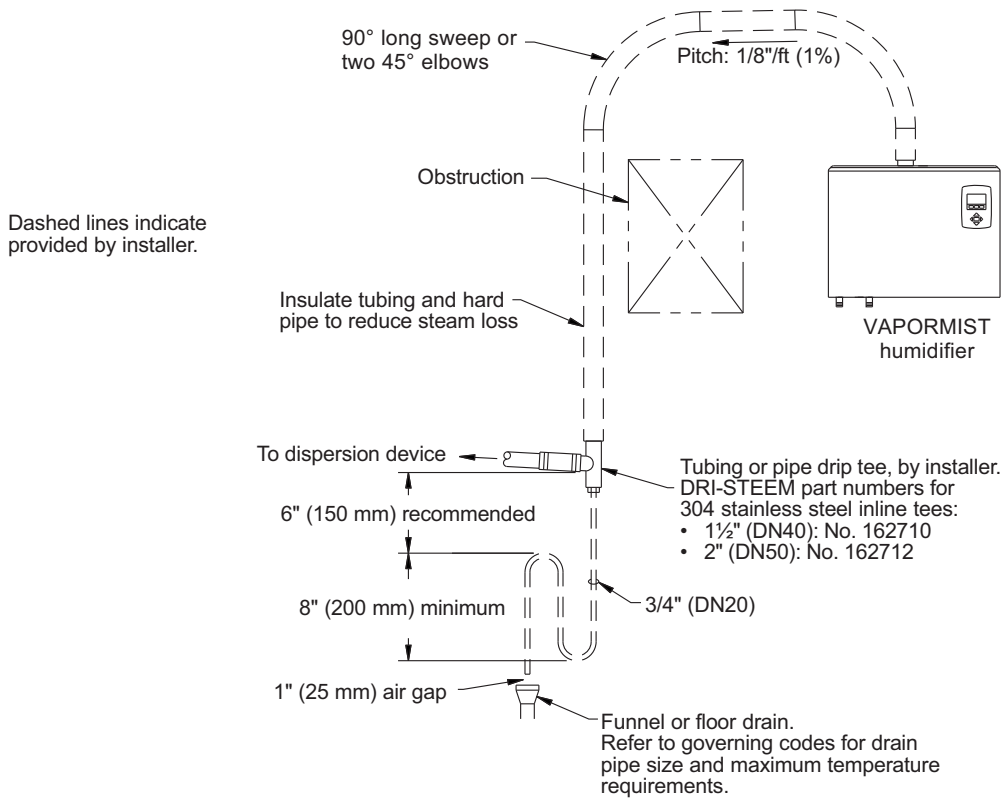
- Use DRI-STEEM's hard pipe adapter kit to connect the steam outlet to hard pipe. Use a hose clamp to connect the steam outlet to vapor hose. Use a hose cuff and clamps to connect the steam outlet to tubing.
- Thin-walled tubing heats up faster than heavy-walled pipe causing less steam loss at start-up.
- Hard pipe or tubing diameter must match VAPORMIST steam outlet size 1½" (DN40) or 2" (DN50).
- See the Maximum Steam Carrying Capacity and Steam Loss tables on Page 17.
- Position dispersion tubes and tubelets perpendicular to airflow.
- Pitch header toward condensate drain.
- Make sure header and tubes are square in the duct, slanting only to allow the pitch of the header.
- Secure header at both ends.
- Dashed lines indicate provided by installer.
- Dispersion tube sizes:
 - 1½" (DN40)
 - 2" (DN50)
- When mounting the humidifier above the level of the RAPID-SORB, see the drawing on Page 16.
- Failure to follow the recommendations on this page may result in excessive back pressures on the humidifier. This may lead to dispersion tube(s) spitting, steam blowing through water seals, or leaking gaskets.

VAPORMIST® DISPERSION

Drip tee installation

Install a drip tee as shown below when the humidifier is mounted higher than the dispersion device, when interconnecting hose or piping needs to go over an obstruction, or when interconnecting piping runs are long.

IMPORTANT: Vapor hose must be supported to prevent sagging or low spots.



DC-1450

VAPORMIST® DISPERSION

Maximum steam carrying capacity and length of interconnecting vapor hose, tubing and pipe*

Vapor hose						Copper or stainless steel tubing and Schedule 40 steel pipe					
Hose I.D.		Maximum capacity		Maximum length**		Tube or pipe size***		Maximum capacity		Maximum developed length†	
inches	DN	lbs/hr	kg/h	ft	m	inches	DN	lbs/hr	kg/h	ft	m
1½	40	150	68	10	3	1½	40	150	68	20	6.1
2	50	250	113	10	3	2	50	220	100	30	9.2

Notes:

* Based on total maximum pressure drop in hose, tubing or piping of 5" wc (1250 Pa)

** Maximum recommended length for vapor hose is 10' (3 m). Longer distances may cause kinking or low spots.

*** To minimize loss of capacity and efficiency, insulate tubing and piping.

† Developed length equals measured length plus 50% of measured length, to account for pipe fittings.

Steam loss of interconnecting vapor hose, tubing and pipe

Description	Nominal hose, tubing or pipe size		Steam loss				Insulation thickness	
			Noninsulated		Insulated			
	inches	DN	lbs/hr/ft	kg/h/m	lbs/hr/ft	kg/h/m	inches	mm
Hose	1½	40	0.15	0.22	N/A	N/A	N/A	N/A
	2	50	0.20	0.30	N/A	N/A	N/A	N/A
Tubing	1½	40	0.11	0.164	0.02	0.03	2	50
	2	50	0.14	0.21	0.025	0.037	2	50
Pipe	1½	40	0.22	0.33	0.02	0.03	2	50
	2	50	0.25	0.38	0.025	0.037	2	50

Notes:

This data is based on an ambient air temperature of 80 °F (27 °C), fiberglass insulation, copper tubing, and Schedule 40 pipe.

VAPORMIST® START-UP AND OPERATION

Introduction

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

Start-up and checkout procedures

Mounting

Check mounting to verify that the 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.

- **Standard makeup water piping (VAPORMIST models)**

Use cold or hot makeup water. If the water pressure is above 60 psi (415 kPa) and/or water hammer would be objectionable, install a pressure-reducing valve or shock arrester. Even though the VAPORMIST has an internal 1" (25 mm) air gap, some local codes may require backflow prevention.

Important: Minimum water supply pressure is 25 psi (175 kPa).

- **DI makeup water piping (VAPORMIST DI models)**

In this unit the electronic probe control is replaced by float valve control. A float switch provides heater protection in the event of a low-water condition and is common to all DI humidifiers. The wiring diagram is located inside the electrical panel cover.

Electrical

Verify electrical connections before start-up.

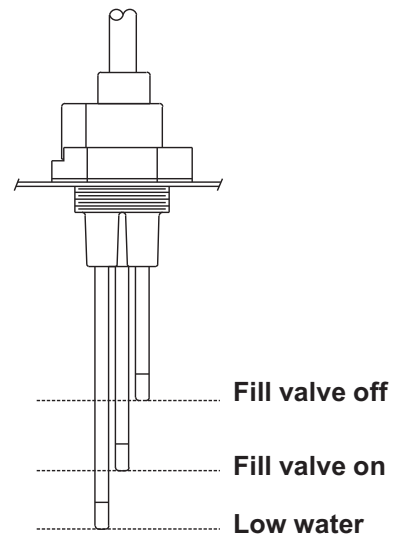
Do not remove the electrical panel cover or heater terminal cover until electrical power is disconnected. Safety first.

- Verify that all wiring connections have been made in accordance with all local codes and the VAPORMIST wiring diagram. The external connections diagram will be found in the packet with this manual.
- Verify that all DIN-rail-mounted components are securely fastened to DIN rail.
- Verify that all power terminal screws and lugs are tight from power block to heaters. See the table on Page 21 for torque specifications.
- Verify that all plugs located under the humidifier cover are completely plugged in.

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

Electronic probe control

(standard water VAPORMIST models only)
A three-probe conductivity sensor cycles a solenoid-operated water fill valve to maintain proper water levels.



OM-211-3

VAPOR-LOGIC₃® control

VAPOR-LOGIC₃ is the standard controller for the VAPORMIST. For more information regarding the operation of the VAPOR-LOGIC₃ microprocessor, see the VAPOR-LOGIC₃ Installation, Operation and Maintenance Manual.

Control system start-up/checkout

1. Confirm that proper grounding and an approved earth ground are provided.
2. Confirm that the control signal connected to the VAPOR-LOGIC₃ system is compatible with the VAPOR-LOGIC₃ program. Identify the VAPOR-LOGIC₃ program code on the wiring diagram. Refer to the VAPOR-LOGIC₃ manual to decipher the code using the nomenclature description.
3. Confirm all wiring is correct per wiring diagram.
4. Confirm J17, J18 and J19 shunt connectors on VAPOR-LOGIC₃ board are in their correct position per wiring diagram. See the VAPOR-LOGIC₃ manual for the physical locations.
5. Confirm that the keypad is mounted on the VAPORMIST with modular cable routed away from high voltage circuits and connected to the J2 female connector on the control board.
6. Turn on water supply. Confirm drain valve is closed.
7. Turn on power. The keypad will display the introduction of VAPOR-LOGIC₃ and will then enter AUTO mode.
8. The system will initiate filling of the tank with water. The keypad will display "Filling" as part of the idle screen information.
9. Airflow switch input must be closed.
10. High limit humidistat input must be closed or variable air volume (VAV) control system high limit transmitter must be connected.
11. Sufficient water in the tank, airflow switch closed, high limit humidistat closed, and a call for humidity will activate the heat output.
If the tank does not contain water and the heat output is activated by the VAPOR-LOGIC₃ control system, a serious failure will result. Immediately remove power from the system and verify that all wiring has been completed per the wiring instructions in the manual and the unit wiring diagram.
12. During normal operation, the keypad will display humidifier operating status. See the VAPOR-LOGIC₃ manual for descriptions to change any of the operating parameters.

The best way to determine how often your particular system will need maintenance is to remove the cover and inspect it after its first three months of duty. Potable water carries a variety of minerals and other materials in a mix that varies from location to location. This variation in water quality, combined with the hours of operation and duty cycle, will determine your own unique maintenance schedule.

Water quality makes a difference

1. Light to moderately hard water (2 to 10 grains hardness per gallon) requires:
 - Annual cleaning
 - Regular skimming
2. High mineral content water (more than 10 grains hardness per gallon) requires:
 - Cleaning frequency determined by use and water quality
 - Regular skimming
 - Periodic drain and flush cycles
3. DI/RO water (VAPORMIST DI models) requires:
 - No regular cleaning (regular inspections are advised)
 - No regular skimming or drain and flush cycles
 - Regular verification that water processing equipment is operating correctly. The presence of chlorides in improperly processed DI water will eventually cause pitting and failure of the tank and its components.
4. To dramatically reduce mineral accumulation inside the standard water models, use softened water. (Solids, like silica, are not removed in the softening process.)

Standard water models (VAPORMIST)

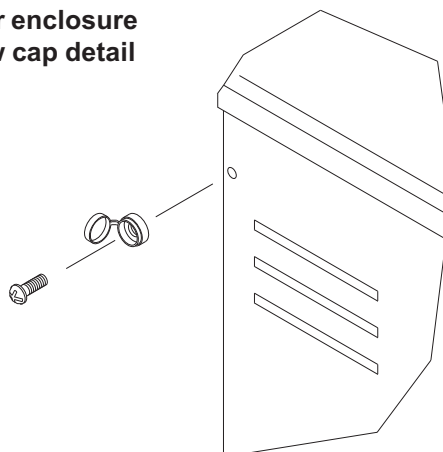
Proper skimming, draining and flushing

1. Skimming will remove most water impurities at the surface, ensuring proper surface tension and an even boil. Skimming will remove most entrained contaminants that have not yet precipitated as scale.
2. Draining and flushing will remove entrained contaminants and assist in removing precipitated contaminants like scale and silica.

To inspect and service standard water models

1. Remove the evaporating chamber
 - Remove the two fasteners on each side of the cover enclosure (see figure below)
 - Remove the enclosure.
 - **Do not remove the electrical panel cover or heater terminal cover until electrical power is disconnected. Safety first.**
 - If the VAPORMIST has an SDU mounted directly above it, the SDU cover must be removed before removing the humidifier cover.
 - If the tank is hot, cool it down by moving the valve lever located on the back of the drain valve to the manual open position – the fill valve will eventually open allowing cool water to run through the tank until it is cool enough to handle.
 - Shut off the water supply.
 - Shut off the electrical supply.
 - Allow the tank to completely drain.
 - Disconnect the fill line at the supply side of the fill valve.
 - Disconnect the electrical plugs between the tank components and the back of the electrical panel (includes: power plug, fill plug, drain plug, water level control plug, tank temperature sensor plug and thermal trip plug). **DISCONNECT BY PULLING ON PLUG HOUSING. DO NOT DISCONNECT BY PULLING ON CORD OR WIRES.**
 - Disconnect the drain union on the back left corner of the frame.
 - Disconnect the steam supply hose from the top of the tank.
 - Lift the tank foot above the frame flange and slide the tank assembly forward to remove.

Cover enclosure
screw cap detail



OM-778-3

VAPORMIST® MAINTENANCE

Standard water models (VAPORMIST, continued)

2. Loosen the four cover bolts and remove the cover assembly from the tank.
3. Clean the tank interior using a putty knife or similar flat instrument.
4. Unplug probe plug assembly. Leave ground wire connected to tank. Unscrew the probe rod assembly and clean the plastic probe housing, ensuring that all passageways are clear. Clean the probe rods using steel wool or a similar mild abrasive material. Inspect the composite plastic probe housing for any signs of cracking, roughness, or deterioration. If found, replace.
5. Install the probe and probe plug assembly. Verify ground wire is solidly connected to tank.
6. Secure the chamber cover, making sure the cover gasket is seated and the chamber is sealed.
7. Re-install the evaporating chamber.
 - Reconnect the fill line.
 - Reconnect the electrical plugs (plugs are color coded).
 - Reconnect the drain union.
 - Reconnect the vapor hose.
8. Verify electrical connections.
 - Verify that all DIN rail-mounted components are securely fastened to DIN rail.
 - Verify that all power terminal screws and lugs are tight from power block to heaters. See the table at right for torque specifications.
 - Verify that all plugs located under the humidifier cover are completely plugged in.
9. Move the drain valve lever back to the auto position.
10. Turn on the water supply.
11. Turn on the electrical power.

Off-season shut-down procedure

1. Switch off electrical power.
2. Remove enclosure.
3. Shut off water supply to makeup valve.
4. Drain evaporating chamber, and clean if necessary (see "To inspect and service" on previous page).
5. Replace enclosure.
6. Leave chamber dry, power off and the water shut-off valve closed until the next humidification season.

VAPORMIST torque specifications

Screw or lug location		Torque	
		inch-lbs	Nm
Power block		16	1.8
Contactor		16	1.8
Heater nut	8-32 (8.5 mm) nut	20	2.2
	10-32 (9.5 mm) nut	25	2.8
Heater wire lug	6 gauge (10 mm ²) wire	35	4.0
	8 gauge (6 mm ²) wire	25	2.8
	10-14 gauge (< 6 mm ²) wire	20	2.2

DI water models (VAPORMIST® DI)

The VAPORMIST DI unit uses DI/RO water. Because these water types are mineral-free, cleaning the evaporating chamber should not be necessary. However, there are some maintenance steps that should be followed to ensure all parts of the unit are in working order

To inspect and service

1. Remove the evaporating chamber.
 - Remove the two fasteners on each side of the cover enclosure.
 - Remove the enclosure.
 - **Do not remove the electrical panel cover or heater terminal cover until electrical power is disconnected. Safety first.**
 - If the VAPORMIST has a space distribution unit (SDU) mounted directly above it, the SDU cover must be removed before removing the humidifier cover.
 - If the tank is hot, cool it down by opening the manual ball valve on the side of the tank. The float valve will open allowing cool water to run into the tank until it is cool enough to handle.
 - Shut off the water supply.
 - Shut off the electrical supply.
 - Allow the tank to drain completely.
 - Disconnect the fill line at the fill fitting.
 - Disconnect the electrical plugs between the tank components and the back of the electrical panel (includes: power plug, low water switch plug, tank temperature sensor plug and thermal trip plug).
DISCONNECT BY PULLING ON PLUG HOUSING. DO NOT DISCONNECT BY PULLING ON CORD OR WIRES.
 - Disconnect the drain union on the back left corner of the frame.
 - Disconnect the steam supply hose from the top of the tank.
 - Lift the tank foot above the frame flange and slide the tank assembly forward to remove.
2. Loosen the four cover bolts and remove the cover assembly from the tank.
3. Inspect the tank interior for debris or pitting.
4. Inspect the valve inlet for debris.
5. Check the operation of the float valve and the condition of the float seat.
6. Check the low water switch to make sure the float slides freely on the stem.
7. Secure the chamber cover making sure the cover gasket is seated and the chamber is sealed.
8. Reinstall the evaporating chamber.
 - Reconnect the fill line.
 - Reconnect electrical plugs (plugs are color coded).
 - Reconnect drain union.
 - Reconnect vapor hose.
9. Verify electrical connections.
 - Verify that all DIN rail-mounted components are securely fastened to DIN rail.
 - Verify that all power terminal screws and lugs are tight from power block to heaters. See the table on Page 21 for torque specifications.
 - Verify that all plugs located under the humidifier cover are completely plugged in.
10. Close the drain valve.
11. Turn on the water supply.
12. Turn on the electrical power.

Off-season shut-down procedure

1. Switch off electric power.
2. Remove enclosure.
3. Shut off water supply to makeup valve.
4. Drain evaporating chamber by opening the drain valve. For units with end-of-season drain, refer to the VAPOR-LOGIC₃ manual.
5. Replace enclosure.
6. Leave chamber dry, power off, and water shut-off valve closed until the next humidification season.

VAPORMIST® TROUBLESHOOTING GUIDE

Troubleshooting guide for standard water models

PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Humidifier does not heat.	Incorrect or nonexistent supply voltage to unit	Check main line safety switch. Check main line fuses. Check for proper supply voltage.
	Incorrect or nonexistent control voltage	Reset control transformer circuit breaker. Check for 24 VAC control circuit voltage at T-1 and T-2 on the control board.
	Humidistat not calling	Set humidistat to call. Inspect for faulty humidistat.
	Safety controls open	Check safety controls, airflow switch, and high limit humidistat.
Humidifier will not fill.	No water pressure at valve	Check water supply/shut-off valves.
	Faulty water fill valve	Check for 24 volts at the fill valve.
	Plugged strainer	Check strainer.
	Plugged valve	Check valve.
	Faulty control board	Verify control voltage across the fill valve output.
Humidifier does not stop filling.	Lack of tank to probe electrical continuity	Water conductivity must be 2 grains/gallon (100 µS/cm) or 34.2 mg/l. Add salt to the tank. If this does not solve the problem, consult factory for further advice.
	Fill valve stuck open	Check valve for foreign matter.
	Drain valve not closed	Verify that lever on drain valve is in closed position.
	Fill valve installed backward	Check for correct water flow through valve by noting arrow.
	Autodrain mode	Humidifier may be in periodic drain and flush. Check controller display.
Low output	Electric drain valve not seating	Correct the cause of leakage or replace valve.
	Fill valve stuck open	Check valve for foreign matter.
Unit short-cycles	Controller cycle rate set too low	Adjust heater cycle time using the VAPOR-LOGIC ₃ keypad setup menu. See the VAPOR-LOGIC ₃ manual if you need more information.
Reduced or no output even though water is at the proper level	Heater malfunctioning	Verify that proper voltage is being applied to heaters. Check heater amp draw and compare to wiring diagram ratings.
	Malfunctioning control system	Replace heater contactor if not functioning. Verify auxiliary limit controls (humidistat, airflow proving switch, etc.) and reset, replace or calibrate as needed.

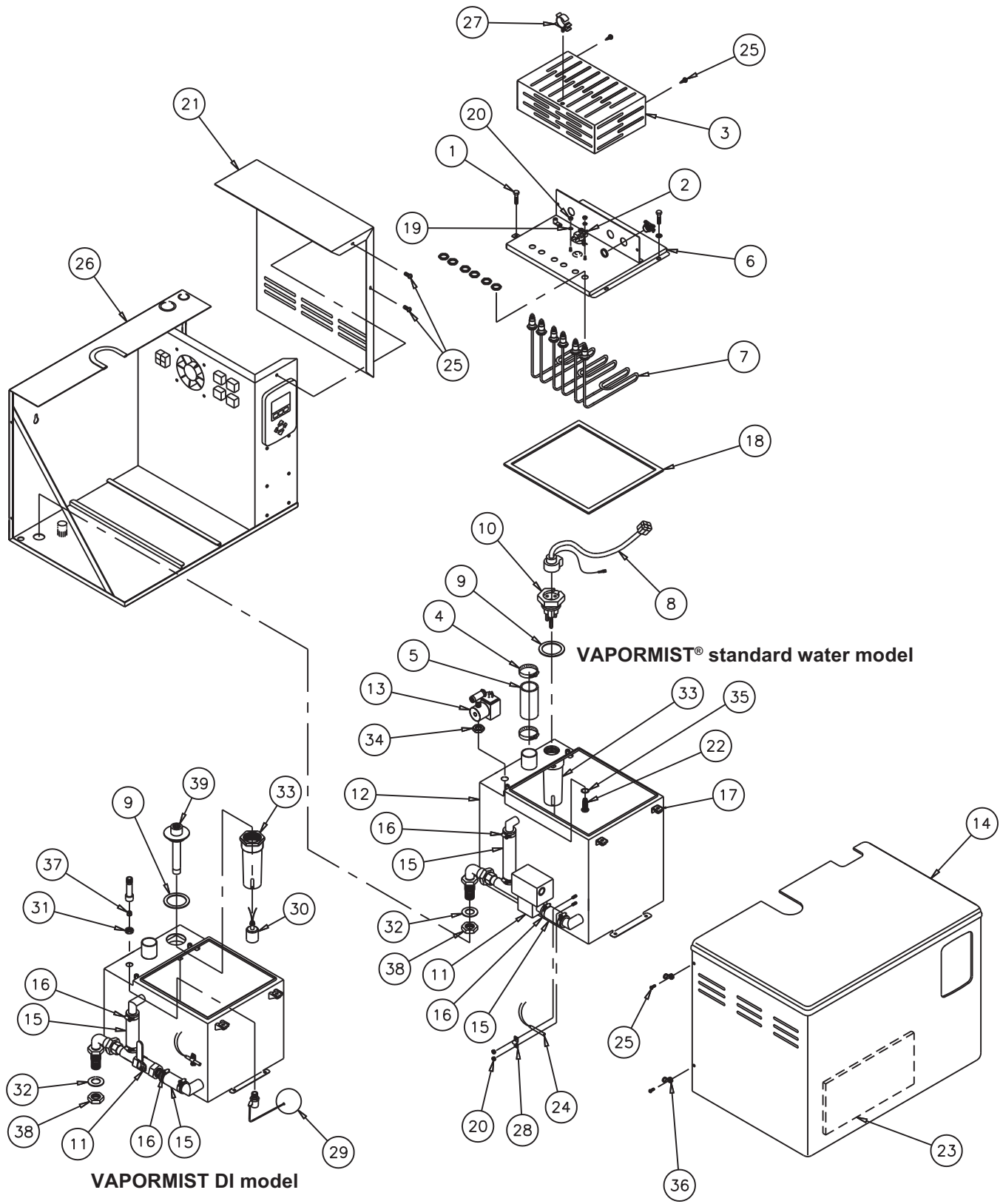
Note: Probe rod corrosion or aging probe head material may cause level control system failure. This generally does not occur in the first two years of operation.

VAPORMIST® TROUBLESHOOTING GUIDE

Troubleshooting guide for DI water models

PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Humidifier will not heat.	Control transformer	Reset control transformer circuit breaker.
	Humidistat is not calling	Set humidistat to call. Inspect for faulty humidistat.
	Safety controls open	Check safety controls, airflow switch, high limit humidistat, etc.
	Low water cutoff	Check at board 32 and 33. Measure 0 Volts for closed switch, approximately 2.5 Volts for AC open switch.
Humidifier will not fill.	No water pressure at valve	Check manual water supply valve for minimum 25 psi (175 kPa) water pressure.
	Plugged fill valve	Check fill valve inlet.
Humidifier does not stop filling.	Open drain valve	Obstruction in drain valve will not allow complete closure. Clean or replace valve.
	Manual drain valve not closed	Close drain valve.
	Fill valve stuck open	Check for foreign matter in valve, water-logged float, broken float arm, or worn valve stopper.
Reduced or no output even though water is at the proper level	Heater malfunctioning	Verify that proper voltage is being applied to heaters. Check heater amp draw and compare to wiring diagram ratings.
	Malfunctioning control system	Replace heater contactor if not functioning. Verify auxiliary limit controls (humidistat, airflow proving switch, etc.) and reset, replace or calibrate as needed.

VAPORMIST® REPLACEMENT PARTS



Note: Refer to the tables on the next page for replacement part numbers.

OM-768

VAPORMIST® REPLACEMENT PARTS

VAPORMIST® replacement parts (refer to the drawing on previous page)

No.	Description	Qty.	Part No.
1	Head bolt, large Phillips, ¼ - 20 X 1"	4	700300-013
2	Thermo cut-out	1	409560-001
3	Cover, heater terminal	1	*
4	Hose clamp, 2"	2	700560-200
5	Hose cuff, 1½"	1	305390- *
	Hose cuff, 2"	1	305391- *
6	Cover, tank	1	*
7	Heater element	*	*
8	Probe assembly with cord and plug	1	406050-100
9	Gasket, 2.50" OD x 1.90" ID	1	309750-004
10	Probe assembly, VM 2-4	1	406270
	Probe assembly, VM 6-34	1	406275
11	Valve, ¼" electric, 24V	1	505400-001
	Valve, ½" SST ball	1	505000-003
	Drain, ¼" NPT E.O.S., 24V solenoid SST w/DIN plug (not shown)	1	505086-003
12	Tank weldment	1	*
13	Valve, ¼" solenoid, 24V w/DIN plug	1	505084-001
	Valve, ¼" SST E.O.S. (not shown)	1	505084-002
14	Cabinet enclosure	1	330001-001
15	Hose, ¾" ID	2	307020-002
16	Hose clamp, ¾"	4	700560-075
17	Nut assembly, ¼-20, VM/VMDI 2-4	4	700650
	Nut assembly, ¼-20, VM/VMDI 6-34	2	700650
18	Cover, tank gasket	1	*

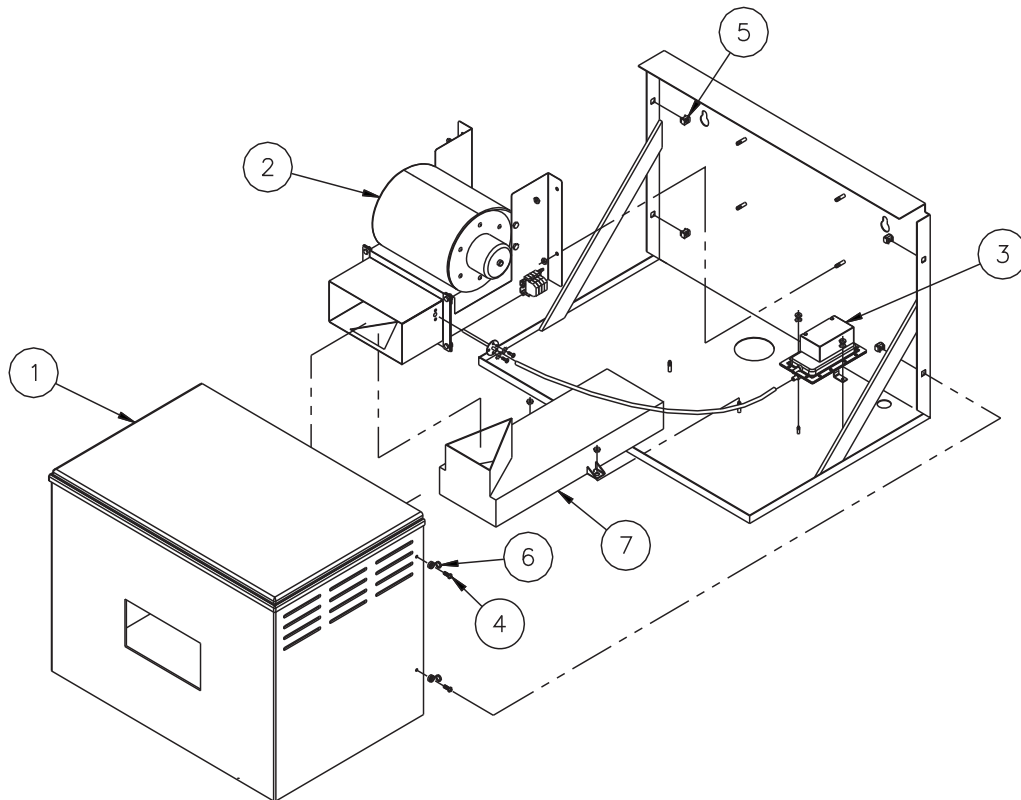
No.	Description	Qty.	Part No.
19	Washer, No. 8 external tooth, pltd	2	700200-003
20	Nut, 8-32 hex, pltd	6	700200-002
21	Cover, subpanel	1	120277
22	Fill adapter, VM 2-4	1	160226-041
	Fill adapter, VM 6-16	1	160224-041
	Fill adapter, VM 21-34	1	160224-052
23	Panel, insulation	1	309845-003
24	Sensor, temperature	1	*
25	Screw, Phillips head, 8-32 x ½"	8	700170-007
26	Frame assembly, chassis	1	165541
27	Clip, wire harness	1	405892-001
28	Clip, temperature sensor	1	408251
29	Valve assembly, float	1	505310
30	Switch, float, 1/8" NPT	1	408420-002
31	Ring, seal, ¼"-18 NPT	1	306365
32	Gasket, bulkhead, 1.60 OD X 1.15 ID	1	309750-005
33	Probe housing, nylon, VM	1	308500
34	Nut, VM heater .475	1	409601-001
35	O-ring, 5/8" EPDM No. 016	1	300400-009
36	Cap, black	4	409593-002
37	DI orifice, VM/VMDI 2-16	1	160229-041
	DI orifice, VM/VMDI 21-34	1	160229-052
38	Bulkhead nut	1	162721-002
39	Tube weld, low water, short, VMDI 2-4	1	167787
	Tube weld, low water, long, VMDI 6-34	1	167788

* Specify humidifier model and serial numbers when ordering.

Contact your DRI-STEEM representative to order parts.

VAPORMIST® REPLACEMENT PARTS

Space Distribution Unit, external absorption (SDU-E)



OM-1503

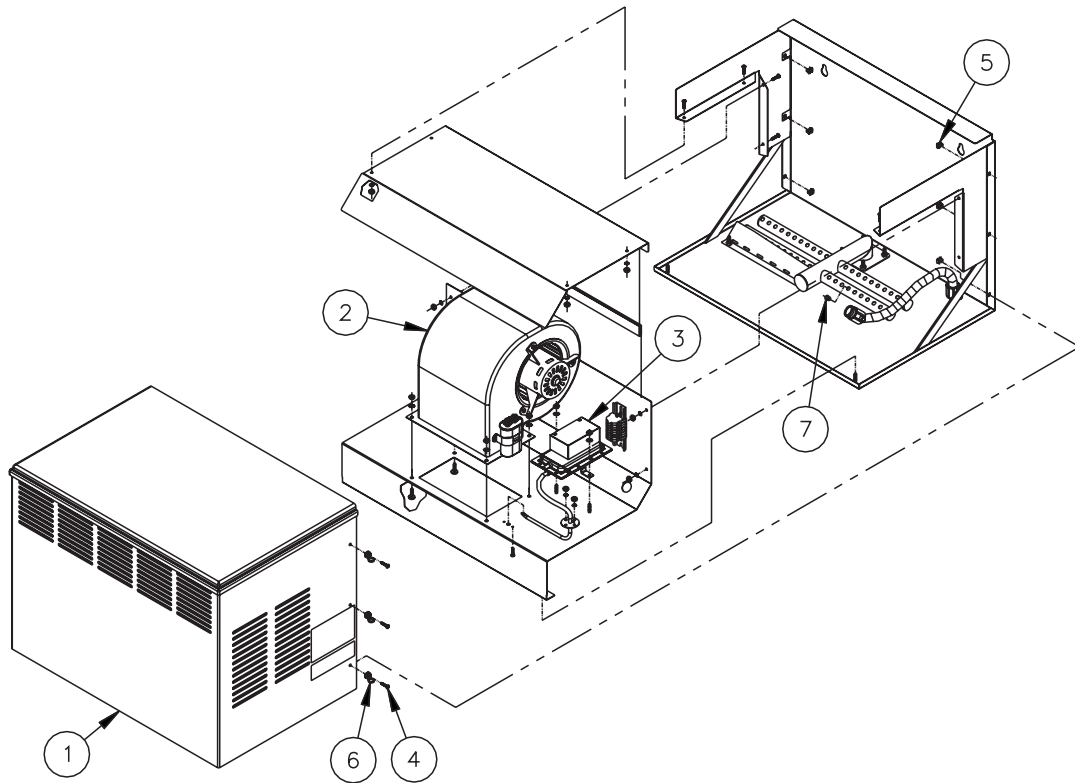
No.	Description	Qty.	Part. No.
1	Shroud	1	330001-003
2	Blower, SDU99 external assembly	1	*
3	Switch, airflow	1	406190
4	Screw, 8-32 x 1/2" PHMS Philips	4	700170-007
5	Nut retainer, 8-32	4	409593-001
6	Cap, black	4	409593-002
7	Dispersion chamber for SDU with 1½" outlet	1	160445-001
	Dispersion chamber for SDU with 2" outlet	1	160445-002

* This is an assembly of multiple parts.

Contact your DRI-STEEM representative to order parts.

VAPORMIST® REPLACEMENT PARTS

Space Distribution Unit, internal absorption (SDU-I)



OM-1504

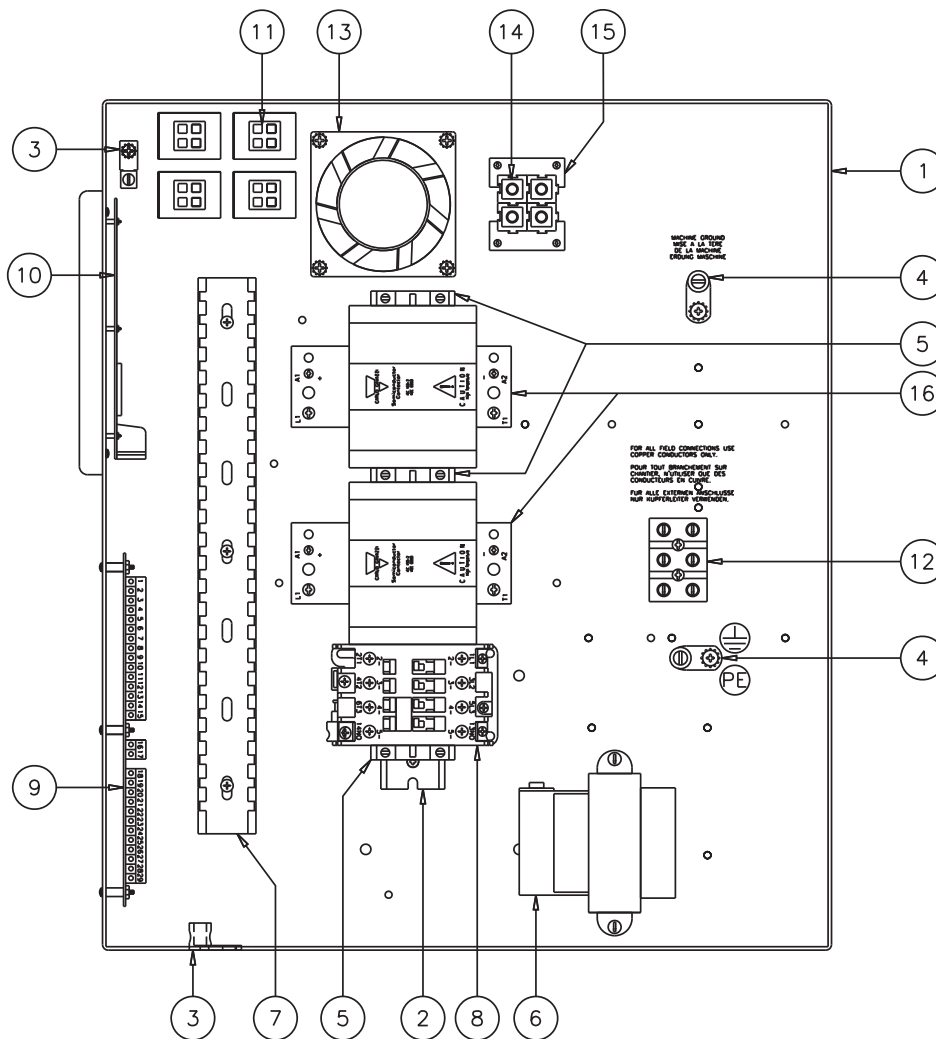
No.	Description	Qty.	Part. No.
1	Shroud	1	330001-002
2	Blower, SDU99 external assembly	1	*
3	Switch, airflow	1	406190
4	Screw, 8-32 x 1/2" PHMS Philips	6	700170-007
5	Nut retainer, 8-32	6	409593-001
6	Cap, black	6	409593-002
7	Tubelet, 0.375" x 0.375", molded	44	310280-006

* This is an assembly of multiple parts.

Contact your DRI-STEEM representative to order parts.

VAPORMIST® REPLACEMENT PARTS

VAPORMIST® subpanel with SSR



OM-213-4

No.	Description	Qty.	Part. No.
1	Subpanel, VM99 barrier	1	120801
2	DIN rail, 8" long	1	167765-008
	DIN rail, 10.75" long	1	167765-0107
3	Lug wire	2	409250-003
4	Ground lug, medium	2	409250-018
5	Block, DIN rail terminal end	3	408252-006
6	Transformer 120/208/240/480 V	1	408965-001
	Transformer 600 V	1	408986
7	Wire channel, 1" x 1"	12.5"	408999-001
	Wire channel cover	12.5"	408999-002
8	Contactor, 32 A	1	407001-020
	Contactor, 60 A	1	407001-021

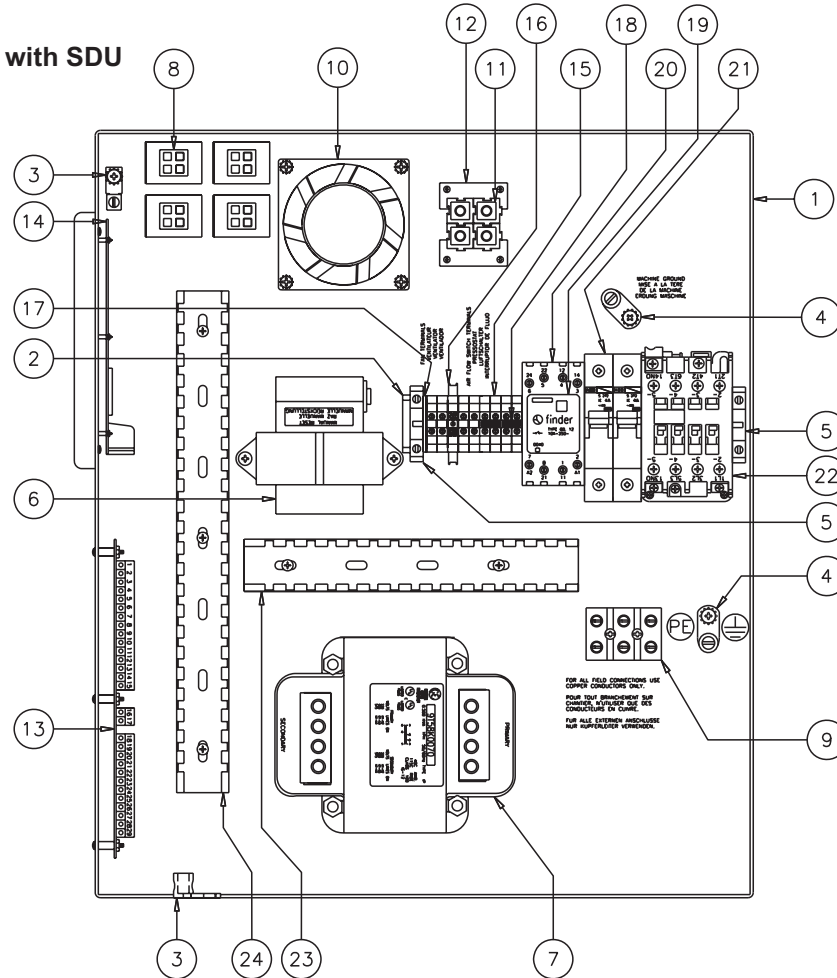
No.	Description	Qty.	Part. No.
9	Main board, VL-3	1	408490-001
10	Display board, VL-3	1	408490-002
11	Plug, 4-prong female	4	409585-008
12	Terminal block, 3-pole	1	408300-002
13	Fan, cooling	1	408667-001
14	Housing, 75 Amp white connector	4	409585-001
15	Plate, plug retainer	2	409585-009
16	SSR, 480 V, 50 Amp, 1-pole	*	408677-002
	SSR, 480 V, 50 Amp, 2-pole	*	408677-003
	SSR, 600 V, 2-pole	*	408677-004
	SSR, 480 V, 60 Amp, 1-pole	*	408677-005

* Refer to model for correct selection and quantity.

Contact your DRI-STEEM representative to order parts.

VAPORMIST® REPLACEMENT PARTS

VAPORMIST® subpanel with SDU



OM-1506

No.	Description	Qty.	Part No.
1	Subpanel, VM99 barrier	1	120801
2	DIN rail, 8" long	1	167765-008
3	Lug, wire	2	409250-003
4	Ground lug, medium	2	409250-018
5	Block, DIN rail terminal end	2	408252-006
6	Transformer, 120/208/240/480 V	1	408965-001
	Transformer, 600 V	1	408986
7	Transformer, 240/480 V, 300 VA	1	408991
	Transformer, 230/460/575 V, 300VA	1	408992
	Transformer 480 V, 500 VA	1	408996-008
	Transformer, 600 V, 500 VA	1	408996-009
8	Plug, 4-prong female	4	409585-008
9	Terminal block, 3-pole	1	408300-002
	Terminal block, 4-pole	1	408300-003
10	Fan, cooling	1	408677-001
11	Housing, 75 Amp white connector	4	409585-001
12	Plate, plug retainer	2	409585-009

No.	Description	Qty.	Part No.
13	Main board, VL3	1	408490-001
14	Display board, VL3	1	408490-002
15	Terminal, DIN rail mount	8	408252-001
16	Terminal, ground	1	408252-010
17	End cap, DIN rail mount	1	408252-005
18	Jumper, marathon terminal	2	408252-008
19	Relay, 24V DPDT finder	1	407900-016
20	Relay socket	1	407900-011
21	Circuit breaker, 1.6 A, 1-pole	*	406775-001
	Circuit breaker, 4 A, 1-pole	*	406775-002
	Circuit breaker, 1.5 A, 1-pole	*	406775-003
22	Contactor, 60 A	1	407001-021
	Contactor, 32 A	1	407001-020
23	Channel, wire cover	8"	408999-002
	Channel, wire	8"	408999-001
24	Channel, wire cover	12.5"	408999-002
	Channel, wire	12.5"	408999-001

Contact your DRI-STEEM representative to order parts.

* Refer to model for correct selection and quantity.

NOTES

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.

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