

READ AND SAVE THESE INSTRUCTIONS

HUMIDI-TECH[®] and HUMIDI-TECH DI ELECTRIC STEAM HUMIDIFIERS

**Installation, Operation
and
Maintenance Manual**

CE

DRISTEEM[®]
HUMIDIFIER COMPANY

A SUBSIDIARY OF RESEARCH PRODUCTS CORPORATION

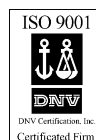


TABLE OF CONTENTS

To the purchaser and installer

Thank you for purchasing our HUMIDI-TECH® 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 HUMIDI-TECH and HUMIDI-TECH DI humidifiers.

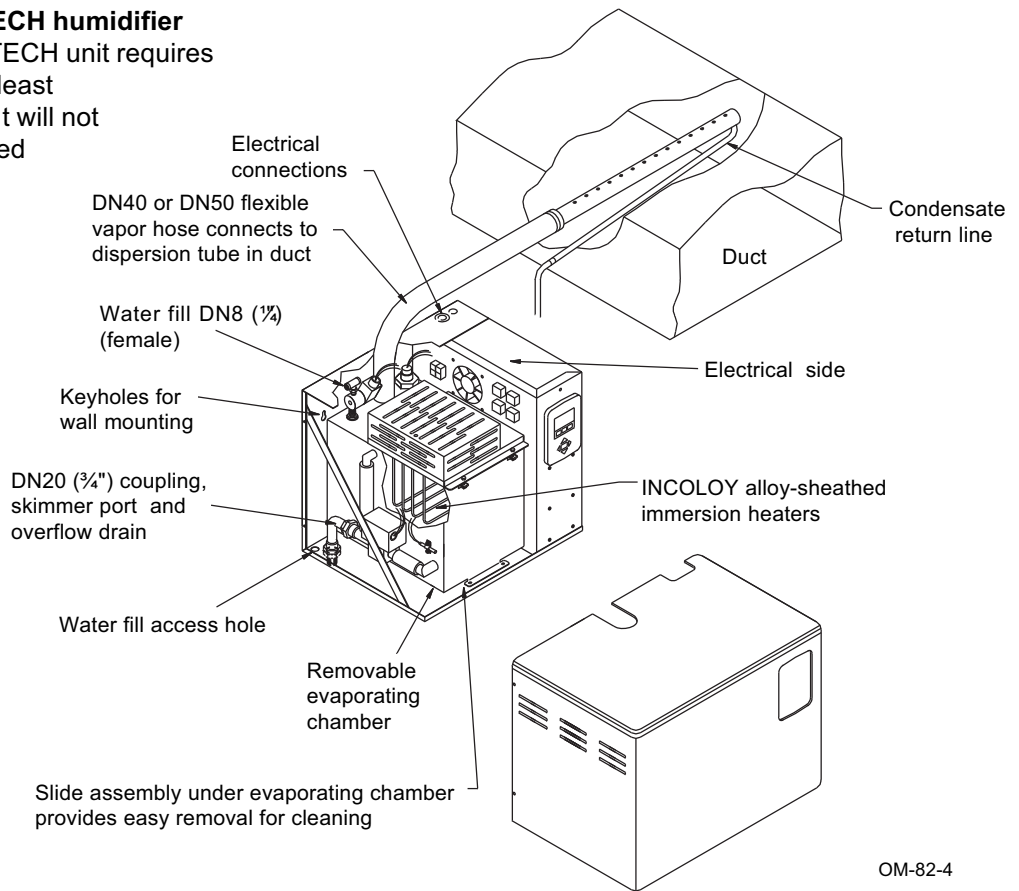
DRI-STEEM Humidifier Company

HUMIDI-TECH humidifier overview	3	
Electrical specifications, capacities and dimensions	4	
Installation		
Locating and mounting the HUMIDI-TECH humidifier	5	
Piping	6	
Wiring	7	
Dispersion using space distribution units (SDU-E and SDU-I)		8
Dispersion using dispersion tubes	11	
Dispersion using a RAPID-SORB® dispersion panel	12	
Start-up and operation	13	
Maintenance	15	
HUMIDI-TECH (standard water models) trouble shooting guide	18	
HUMIDI-TECH DI trouble shooting guide	19	
Replacement parts	20	
Two-year limited warranty	24	

HUMIDI-TECH® HUMIDIFIER

Figure 3-1: HUMIDI-TECH humidifier

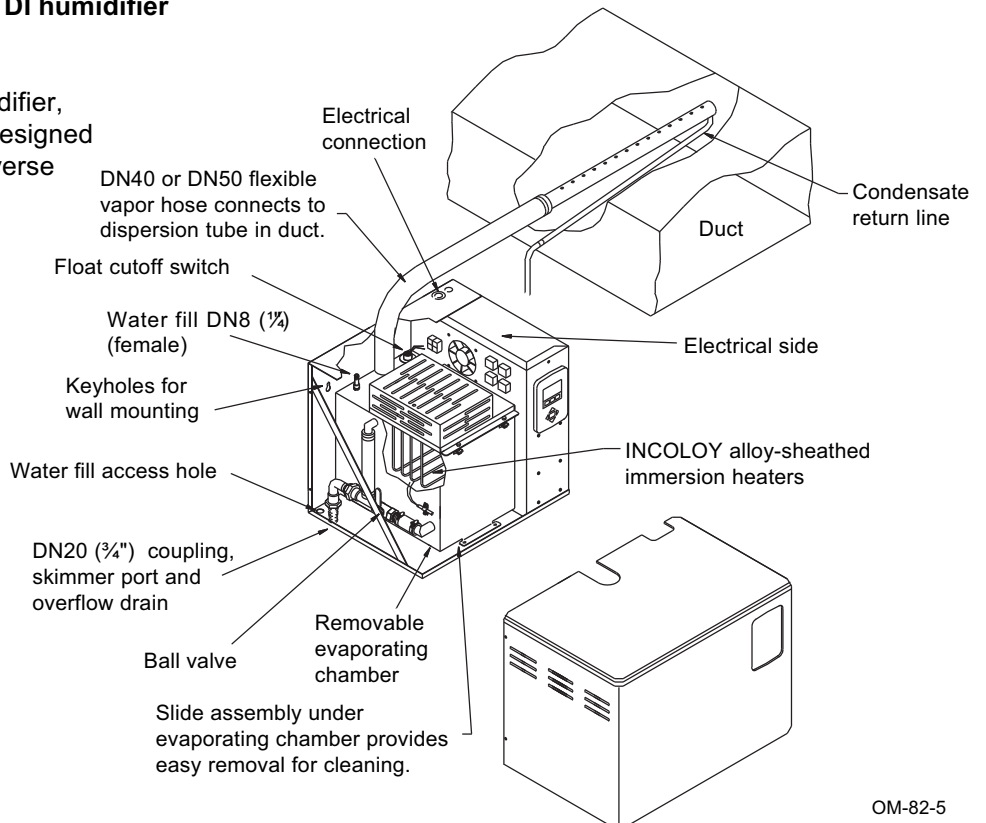
The standard HUMIDI-TECH unit requires water conductivity of at least 100 $\mu\text{S}/\text{cm}$ to operate. It will not operate with water treated by reverse osmosis or deionization processes. (See DI model below.)



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Figure 3-2: HUMIDI-TECH DI humidifier (deionized water)

The HUMIDI-TECH DI humidifier, shown here, is specifically designed for use with deionized or reverse osmosis water.



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SPECIFICATIONS

Table 4-1: Electrical specifications, capacities and weights

Model number	Steam capacity per hour kg/h	I max. A		kW	Shipping weight† kg	Operating weight† kg
		Single-phase 230V***	Three-phase 400V			
	VM-2	2.7	8.0	--	2	26
VM-4	5.4	16.0	8.7**	4	26	38
VM-6	8.2	24.0	13.0**	6	36	55
VM-8	10.9	31.9	17.3**	8	36	55
VM-10	13.6	39.9	15.2**	10	38	63
VM-12	16.3	47.9	17.3	12	38	63
VM-14	19.1	--	20.2	14	38	63
VM-16	21.8	--	23.1	16	38	63
VM-21	28.6	--	30.3	21	39	69
VM-25	34.0	--	36.1	25	39	69
VM-30	40.9	--	43.3	30	41	71
VM-34	46.3	--	49.1	34	41	71

Table notes:

** For wire sizing, the highest leg draw is shown due to current imbalance.

*** Output capacity and kW derate of 7%

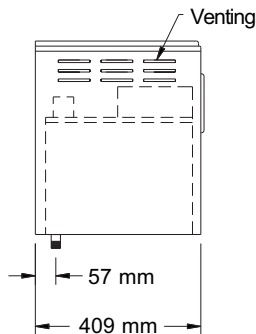
† Add the following to shipping and operating weights for HUMIDI-TECH options:

- SDU-I: 5 kg
- SDU-E: 4 kg
- SSR control: 1 kg

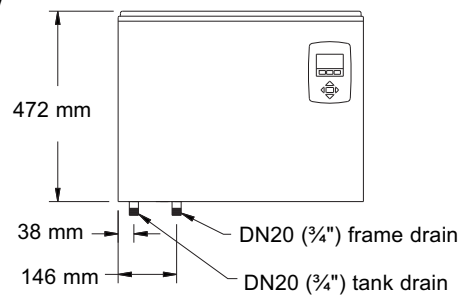
All HUMIDI-TECHs operate at 50/60 Hz. SDU-E is not an available option on 400V three-phase HUMIDI-TECH models drawing more than 21.7 amps and using SSR control.

Figure 4-1: HUMIDI-TECH® dimensions

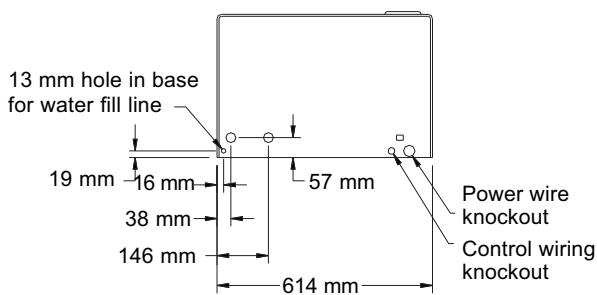
Left side view



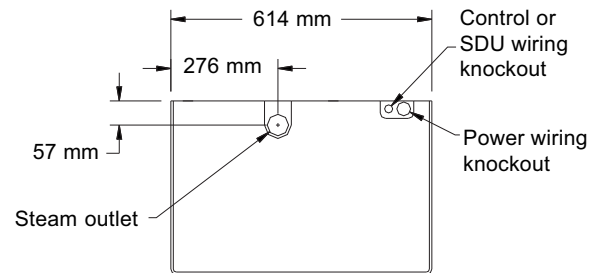
Front view



Bottom view



Top view



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MOUNTING THE HUMIDI-TECH®

Locating and mounting the HUMIDI-TECH humidifier

The HUMIDI-TECH humidifier is designed to lag bolt to the wall, and it should be installed in a space located near an air duct system.

Consider the following when selecting the location of the humidifier:

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

The mounting location should provide a minimum clearance of 915 mm to the front and 610 mm to the right side of the unit. This clearance is required for removing the evaporating chamber and accessing electrical compartment. Also, a minimum clearance of 150 mm to the left side is required for louvers and enclosure fasteners.

Electrical power supply, water make up 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 draining piping connections are made at the lower left rear corner.

When mounting on a stud wall (studs 405 mm centres), locate studs and position coach screws in place so that each of the screws (405 mm apart) will center on a stud. Mark hole locations and pre-drill 6 mm diameter pilot holes using mounting template on the HUMIDI-TECH box. Secure frame to wall with coach screws provided.

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

PIPING

Water make up piping may be of any code-approved material (copper, steel, or plastic). The final connection size is DN6 (1/4"). In cases where water hammer may be a possibility, a shock arrestor should be considered water pressure must be between 170 kPa and 582 kPa.

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

The final connection size is DN20 (3/4") for drain fitting and frame drain. This connection size should not be reduced. (See Figures below for proper drain piping configurations.) The evaporator drain should be piped and discharge into a floor drain. Combining the two drain pipes into a single drain line may result in the backflow of drain water into the humidifier cabinet, causing the unit to malfunction.

Figure 6-1: Drain adjacent to wall

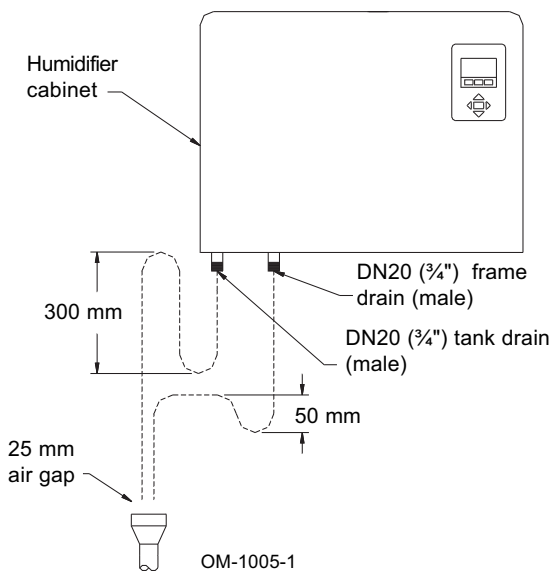
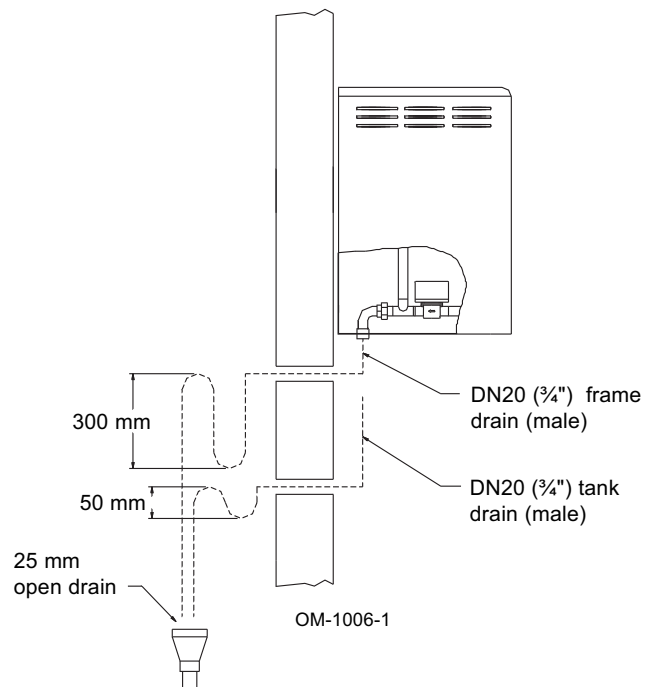


Figure 6-2: Drain through or in wall



Note: Locate the cabinet drain line exit away from the humidifier drain line exit, if possible. This will prevent water vapor from migrating up the cabinet drain line. Extending the cabinet drain line may also be effective.

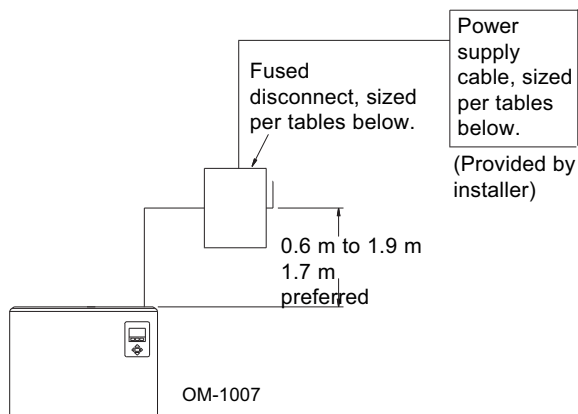
WIRING

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

Refer to the amp draw on the rating plate, and use the following tables to determine the appropriate wire, conduit and fused disconnect requirements.

When selecting a space to install the HUMIDI-TECH, avoid areas close to sources of electromagnetic emissions such as power distribution transformers.

Figure 7-1: Field wiring requirements

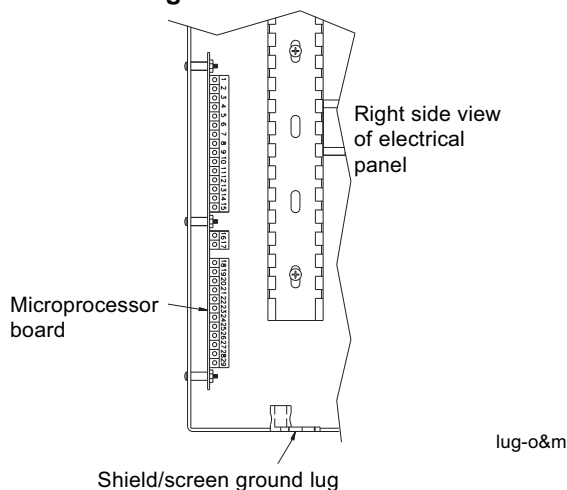


Note: Control wiring and power wiring must be run in dedicated or separate earthed metal conduit, cable trays or trunking.

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.

Figure 7-2: Shielded/screened cable drain wire connection to lug



Note: For maximum E.M.C. effectiveness, all humidity, temperature, and airflow controls should be wired using multi-colored 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 50 mm.

Table 7-1: 230 Volt single phase

A	Wire size mm ²	Ground wire size mm ²
0 - 18	2.5	2.5
18.1 - 24	4	4
24.1 - 30.7	6	6
30.8 - 42.7	10	10
42.8 - 57	16	16
57.1 - 75.7	25	16
75.8 - 93.7	35	16
93.8 - 113.2	50	25
113.3 - 144	70	35
144.1 - 174	95	50
174.1 - 201.7	120	70

Table 7-2: 400 Volt three phase

A	Wire size mm ²	Ground wire size mm ²
0 - 15.7	2.5	2.5
15.8 - 21	4	4
21.1 - 27	6	6
27.1 - 37.5	10	10
37.6 - 51	16	16
51.1 - 66.7	25	16
66.8 - 82.5	35	16
82.6 - 100.5	50	25
100.6 - 128.2	70	35
128.3 - 155.2	95	50
155.3 - 179.2	120	70

Table 7-3: Fuse/ breaker requirements

I max. A	Breaker size amps
0 - 8	10
8.1 - 10.4	13
10.5 - 12.8	16
12.9 - 16	20
16.1 - 20	25
20.1 - 25.6	32
25.7 - 32	40
32.1 - 40	50
40.1 - 50.4	63
50.5 - 64	80
64.1 - 80	100
80.1 - 100	125
100.1 - 128	160
128.1 - 160	200

Note: The use of semiconductor fusing is recommended with the use of the SSR option.

DISPERSION USING SPACE DISTRIBUTION UNITS

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 HUMIDI-TECH® with an SDU-I ideal for use in finished spaces. When room RH is 40% 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-10.

SDU-E:

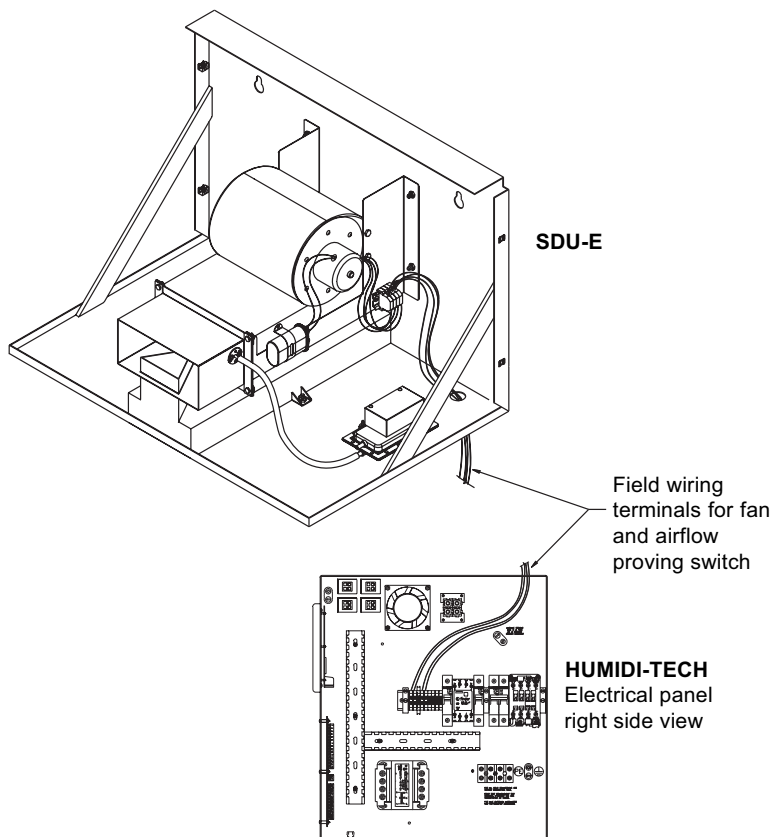
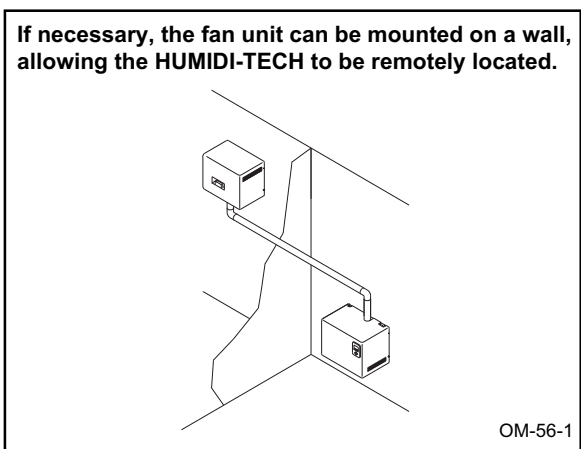
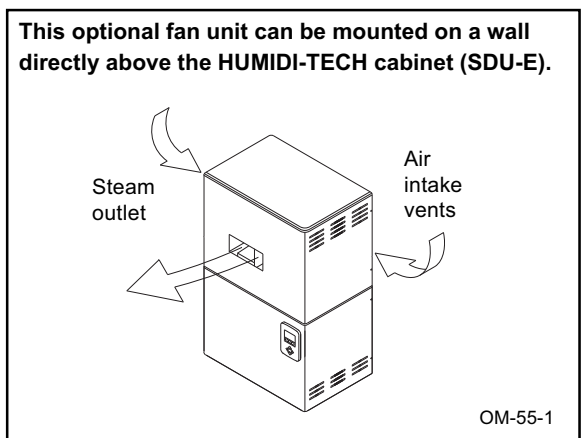
For higher capacity units or remote mounting

The Space Distribution Unit External Absorption (SDU-E) mounts either directly on top of the HUMIDI-TECH cabinet or remotely within a space, providing application flexibility. The SDU-E is available for models VM-4 through VM-34.

Mounting the SDU

The SDU may be mounted on a wall above the HUMIDI-TECH cabinet or mounted on a wall remote from the HUMIDI-TECH. Use the mounting template on the box for correct placement. Two coach screws are provided with each fan unit. (See Page 5 for mounting instructions.)

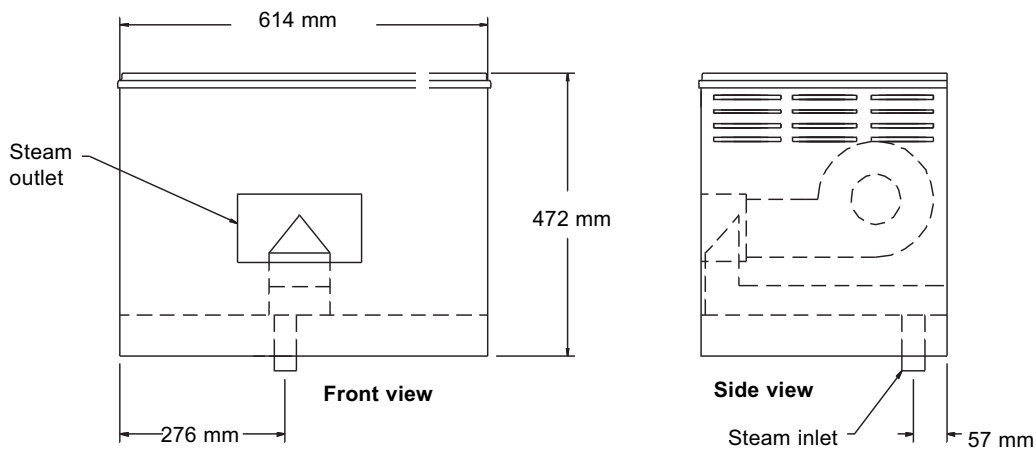
Figure 8-1: SDU field wiring



vmsbpnlasm-11-a-o&m

DISPERSION USING SPACE DISTRIBUTION UNITS

Figure 9-1: SDU-E mechanical detail



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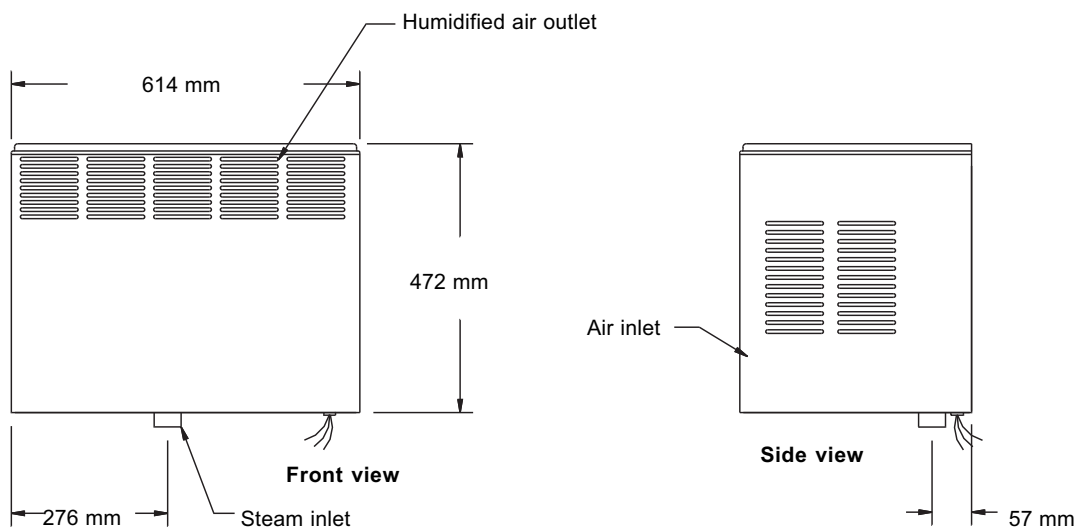
Field wiring is required to connect the SDU fan and airflow proving switch terminals to the respective HUMIDI-TECH® electrical panel terminals. Refer to the external connections diagram in the package shipped with your unit.

Note: Maximum ambient RH must not exceed 40% for the SDU-I to operate properly.

If the SDU-E or SDU-I is immediately above the HUMIDI-TECH, 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.

HUMIDI-TECH is a class-one-rated assembly with the SDU. It has been tested and is in compliance with the requirements to be mounted in areas accessible to the general public.

Figure 9-2: SDU-I mechanical detail



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SPACE DISTRIBUTION UNIT, EXTERNAL ABSORPTION (SDU-E)

Rise, throw and spread (SDU-E)

As steam is discharged from the humidifier, it quickly cools and turns to a visible fog that is lighter than air. As this fog is carried away from the humidifier 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 before disappearing. The distances the fog travels before it disappears are given in Table 10-1.

Table 10-1 lists the recommended minimum vertical (rise), horizontal (throw) and width (spread) clearances for SDU-E area-type humidifiers at 40%, 50% and 60% RH in the space.

The SDU-E contains a 926 cmh blower (m³/h) and an airflow proving switch field wired to the HUMIDI-TECH humidifier electrical panel. A wiring diagram of the SDU-E is included with the unit.

On a call for humidity, the humidifier will begin producing steam and the start relay will energize the SDU blower. Time-delay is controlled by the VAPOR-LOGIC₃ microprocessor.

Table 10-1: SDU-E Visible vapor travel

Model	40% RH@ 21°C			50% RH@ 21°C			60% RH@ 21°C		
	Rise (m)	Throw (m)	Spread (m)	Rise (m)	Throw (m)	Spread (m)	Rise (m)	Throw (m)	Spread (m)
VM-4	0.30	1.5	0.30	0.50	2.0	0.50	.80	2.3	0.80
VM-6	0.30	1.5	0.30	0.50	2.0	0.50	.80	2.3	0.80
VM-8	0.30	1.7	0.30	0.50	2.0	0.50	.80	2.3	0.80
VM-10	0.50	1.8	0.50	0.60	2.1	0.60	1.0	2.5	1.0
VM-12	0.50	1.8	0.50	0.60	2.1	0.60	1.0	2.5	1.0
VM-16	0.60	2.1	0.60	0.60	2.1	0.60	1.0	2.7	1.0
VM-21	0.60	2.3	0.60	0.60	3.0	0.60	1.0	3.7	1.0
VM-25	0.60	2.5	0.60	0.80	3.2	0.80	1.1	3.8	1.1
VM-30	0.60	2.5	0.60	0.80	3.2	0.80	1.1	3.8	1.1
VM-34	0.60	2.5	0.60	0.80	3.2	0.80	1.1	3.8	1.1

Table 10-1 notes:

Table 10-1 states the vertical (rise), horizontal (throw) and width (spread) dimensions that can be expected with the HUMIDI-TECH with SDU-E.

Surfaces cooler than ambient temperature, or objects directly in the path of visible vapor discharge, may cause condensation and dripping.

Rise: Maximum height visible vapor rises above the steam outlet grill of the SDU-E.

Throw: Maximum horizontal distance visible vapor travels from the steam outlet of the SDU-E.

Spread: Maximum width visible vapor spreads out from the steam outlet of the SDU-E.

DISPERSION USING DISPERSION TUBES

Examples of mounting a dispersion tube

Figure 11-1: Mounted horizontally in duct

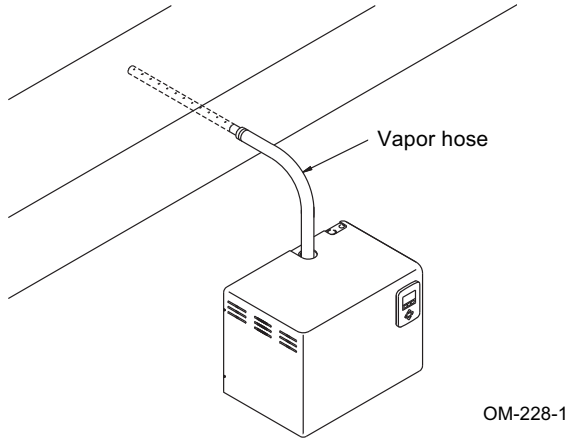
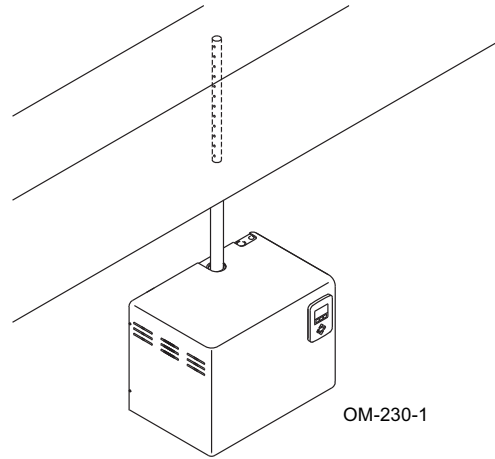


Figure 11-3: Mounted vertically

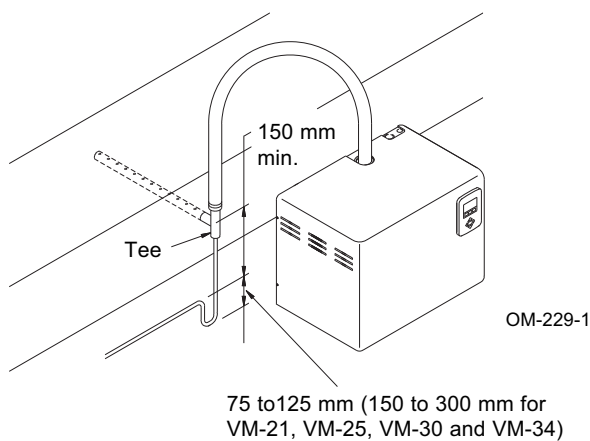


Vapor hose and dispersion tube should be pitched back to the humidifier with a gradual slope of 15%. **A single dispersion tube cannot be used with VM-30 or VM-34.**

This is not recommended on models VM-10 through VM-34.

IMPORTANT NOTES: When duct is located more than 3 m away from unit, vapor hose is not recommended; DN40 minimum hard pipe should be used instead. VM-30 and VM-34 must use a multiple tube steam dispersion system.

Figure 11-2: Mounted horizontally in duct and lower than HUMIDI-TECH unit



A water seal must be located in drain line as shown to maintain steam pressure. **A single dispersion tube cannot be used with VM-30 or VM-34.**

Table 11-1: Vapor hose sizing

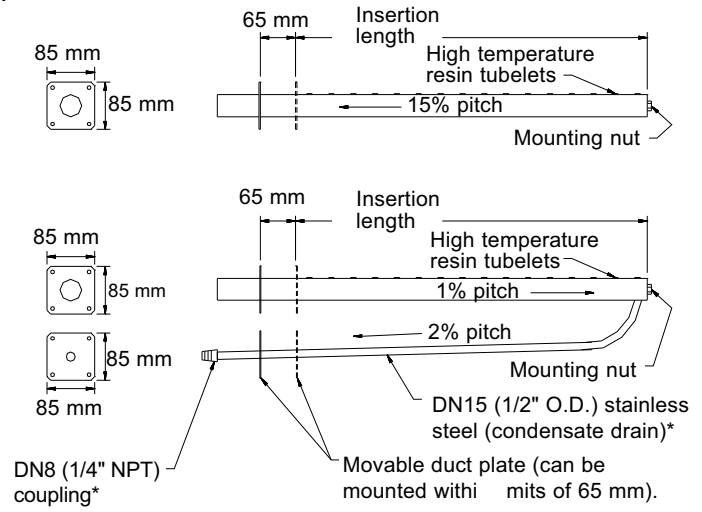
Model	Capacity kg/hr	Vapor hose DN
VM 2-10	up to 13.5	DN40 hose kit without drain
VM 12-16	up to 26	DN40 hose kit with drain
VM 12-16	over 26	DN50 hose kit without drain
VM 21-25	up to 38.5	DN50 hose kit with drain
VM 30-35	These models require multiple tube assemblies.	

DISPERSION USING DISPERSION TUBES

Mounting dispersion tube without condensate drain

- Orient dispersion tubes so that tubelets point up.
- Connection can be made to the humidifier with vapor hose or hard piping.
- Hard piping should have a minimum I.D. of DN40 (1½").
- Maintain a minimum pitch of 15% back to the humidifier should be maintained.
- Short-sweep 90° elbows are not recommended; use two 45° elbows 300 mm apart or long-sweep 90° elbows instead.
- Thin-walled tubing will heat up faster than heavy-walled pipe, causing less steam loss at start-up.
- Insulating hard piping will reduce the steam output loss caused by condensation.
- When mounting the humidifier above the level of dispersion tube, see Figure 10-2 on Page 10.

Figure 12-1: Single-Tube



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Mounting dispersion tube with condensate drain

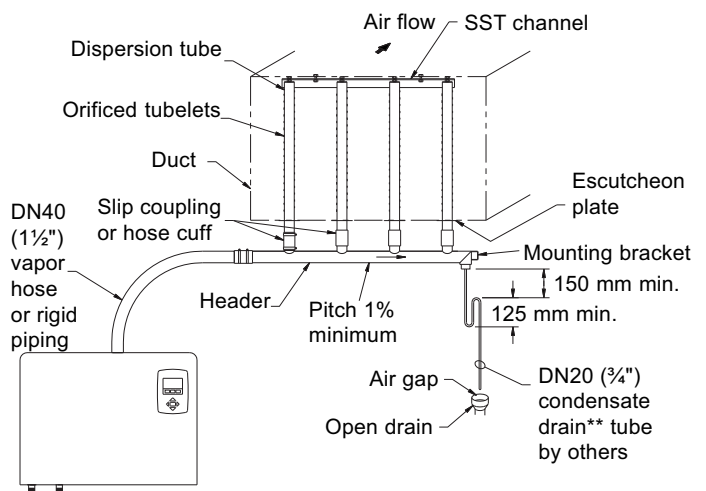
- Orient dispersion tube so that tubelets point up.
- The dispersion tube must be pitched a minimum of 1% toward the drain when using a condensate drain.
- Condensate drain tubing must be pitched a minimum of 2% back to the humidifier.
- Condensate drain is not provided when steam flow is kg/h or less.

Failure to follow these recommendations may result in excessive back pressure on the humidifier. This may lead to dispersion tube(s) spitting, steam blowing through water seals, or leaking gaskets. When the distance between humidifier and the dispersion tube(s) exceeds 6 m, consult factory for recommendations.

Mounting a RAPID-SORB dispersion panel

For RAPID-SORB mounting dimensions, please see the drawing at right.

Figure 12-2: RAPID-SORB® with condensate wasted to floor drain



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Notes:

* When steam flow is 15 kg/h or less, condensate drain tubing is not provided by DRI-STEEM. A minimum pitch of 15% back to the humidifier must be maintained in the dispersion tube when there is no separate condensate drain.

** Condensate drain tubing material must be suitable for 100 °C water.

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 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 (HUMIDI-TECH)**

Use cold or hot make up water. If the water pressure is above 414 kPa and/or water hammer would be objectionable, install a pressure-reducing valve or shock arrester. Even though the HUMIDI-TECH has an internal 25 mm air gap, some local codes may require a vacuum breaker.

Important: Minimum water supply pressure is 172 kPa.

- **DI makeup water piping (HUMIDI-TECH)**

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 that all wiring connections have been made in accordance with all governing codes and the enclosed HUMIDI-TECH® wiring diagram. The external connections diagram will be found in the packet with this manual.

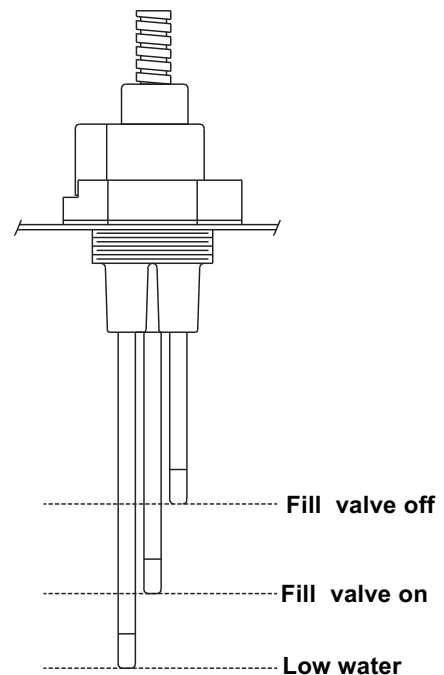
Caution: Only qualified electrical personnel should perform start-up procedure.

VAPOR-LOGIC₃ control

VAPOR-LOGIC₃ is the standard controller for the HUMIDI-TECH. For more information regarding the operation of the VAPOR-LOGIC₃ microprocessor, see the *VAPOR-LOGIC₃ Installation and operations manual*.

Figure 13-1: Electronic probe control for maintaining proper water level (standard water HUMIDI-TECH models only)

A three-probe conductivity sensor cycles a solenoid-operated water fill valve to maintain proper water levels.



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START-UP AND OPERATION

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-LOGIC[®]₃ 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 HUMIDI-TECH 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, door interlock circuit (optional) 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 done 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.

MAINTENANCE

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 (35 mg/l to 170 mg/l) requires:
 - Annual cleaning
 - Regular skimming
2. High mineral content water (more than 170 mg/l) requires:
 - Cleaning frequency determined by use and water quality
 - Regular skimming
 - Periodic drain and flush cycles
3. DI/RO water (VMDI 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, softening of the makeup water is recommended. (Solids, like silica, are not removed in the softening process.)

Standard water models (HUMIDI-TECH®)

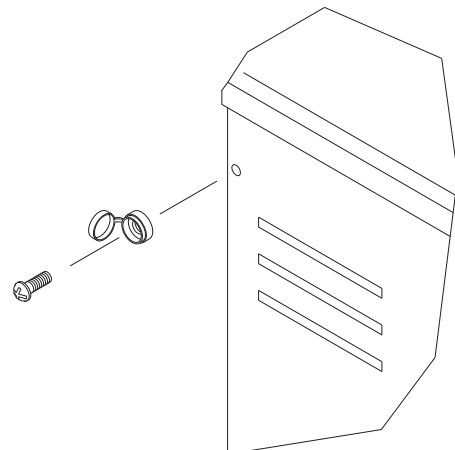
Proper skimming, draining and flushing

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

1. Remove the evaporating chamber
 - Remove the two fasteners on each side of the cover enclosure. (Figure 15-1)
 - Remove the enclosure.
 - **Do not remove the electrical panel cover or heater terminal cover until electrical power is disconnected. Safety first.**
 - If the HUMIDI-TECH has an SDU mounted directly above it, the SDU cover must be removed before removing the unit 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.

Figure 15-1: Screw cap detail



OM-778-3

MAINTENANCE

Standard water models (HUMIDI-TECH[®], 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.
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. Move the drain valve lever back to the auto position.
9. Turn on the water supply.
10. Turn on the electrical power.

Off-season shut-down procedure

1. Switch off electrical power.
2. Remove enclosure.
3. Shut off water supply to make-up valve.
4. Drain evaporation 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.

MAINTENANCE

DI water models (HUMIDI-TECH® DI)

The HUMIDI-TECH DI unit uses DI/RO water. Because these water types are mineral-free, cleaning the evaporator 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 HUMIDI-TECH has a space distribution unit (SDU) mounted directly above it, the SDU cover must be removed before removing the unit 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 for free operation.
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. Close the drain valve.
10. Turn on the water supply.
11. Turn on the electrical power.

Off-season shut-down procedure

1. Switch off electric power.
2. Remove enclosure.
3. Shut off water supply to make-up 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.

HUMIDI-TECH® (STANDARD WATER)TROUBLE SHOOTING

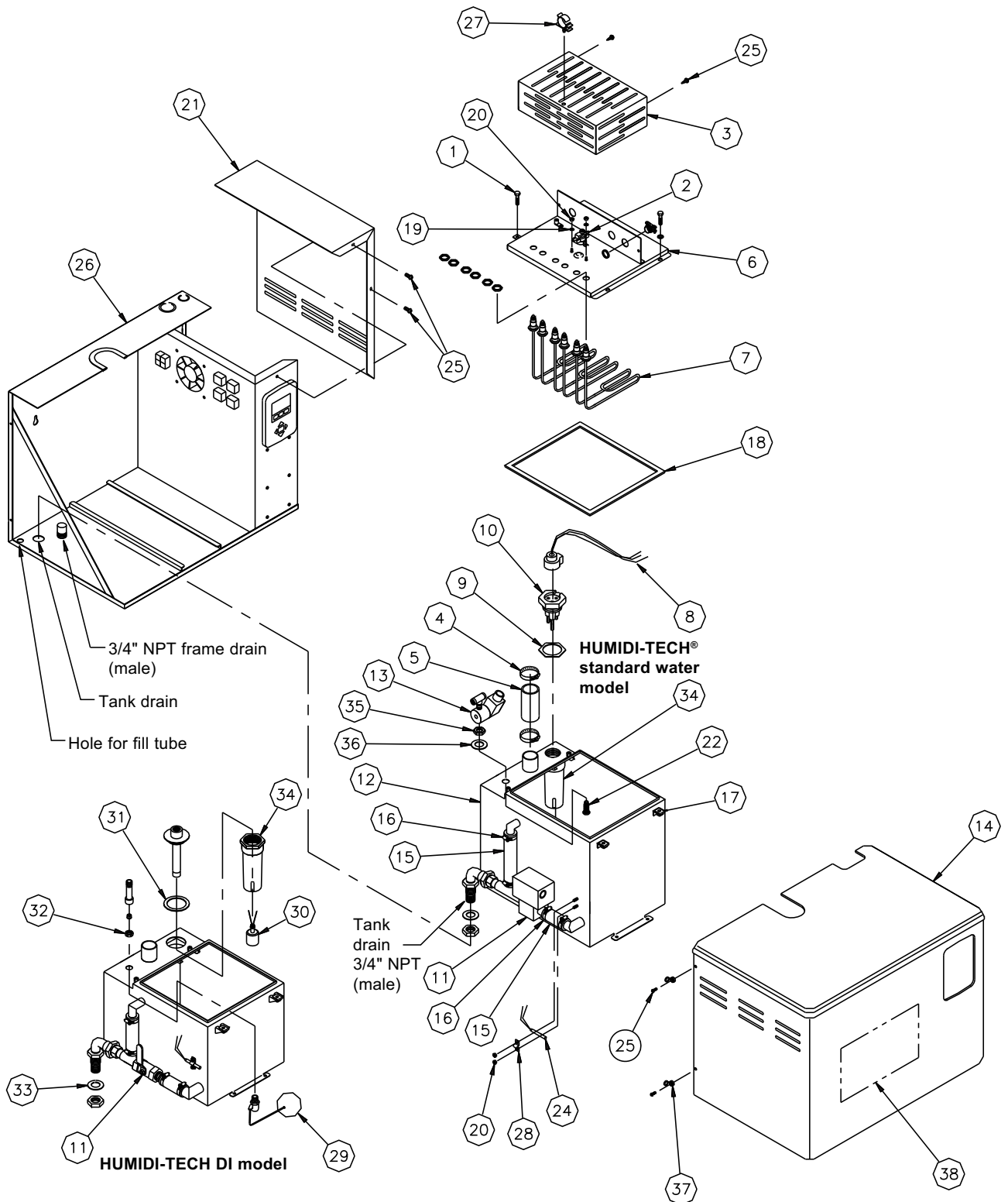
PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Humidifier does not heat.	Incorrect or nonexistent supply voltage to unit	Check main line safety switch. Check main line fuses. Check for proper supply voltage.
	Incorrect or nonexistent control voltage	Reset control transformer circuit breaker. Check for 24 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 100 μ S/cm or 34.2 mg/l. Add salt to the tank. If this solves the problem, consult factory for further advice.
	Fill valve stuck open	Check valve for foreign matter.
	Drain valve not closed 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	Review controller cycle set point.
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 contractor if not functioning. Verify auxiliary limit controls (humidistat, airflow proving switch, etc.) and reset, replace or calibrate as needed.

Note: 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.

HUMIDI-TECH® DI TROUBLESHOOTING

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 volt for A.C. open switch.
Humidifier will not fill.	No water pressure at valve	Check manual water supply. Valve for minimum 172 kPa water pressure.
	Malfunctioning float switch	Check to make sure that float moves freely on stem.
	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 valve for foreign matter, 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.

REPLACEMENT PARTS



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

REPLACEMENT PARTS

Table 21-1: HUMIDI-TECH® replacement parts (refer to the drawing on previous page)

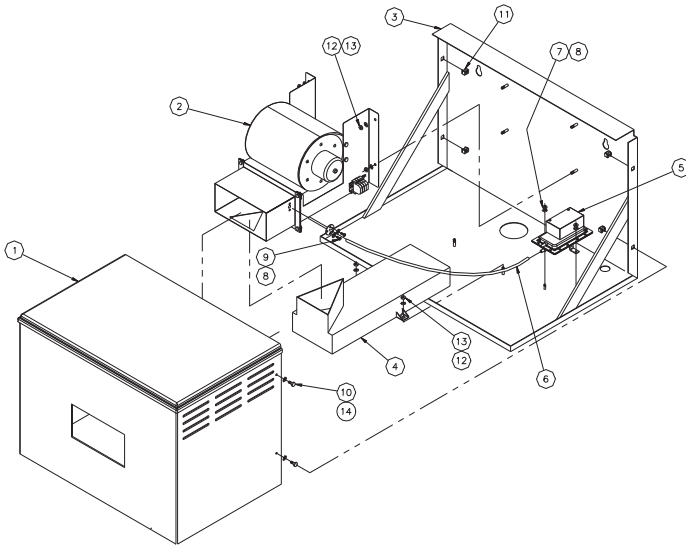
No.	Description	Qty.	Part No.
1	Head bolt, large Phillips, ¼ - 20 X 1"	4	700300-013
2	Thermo cut-out	1	409560-001
3	Cover, heater terminal	1	*
4	Hose clamp, 2"	2	700560-200
5	Hose cuff, 1½"	1	305390-006
5	Hose cuff, 2"	1	305391-006
6	Cover, tank	1	*
7	Heater element	*	*
8	Probe assembly with cord and plug	1	406050-005
9	Probe assembly gasket	1	309750-004
10	Probe assembly, VM 2-4	1	406270
10	Probe assembly, VM 6-34	1	406275
11	Valve, ¾" electric, 24V	1	505400-001
11	Valve, ½" SST ball	1	505000-003
11	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
14	Cabinet enclosure	1	330002-001
15	Hose, ¾" ID	1	307020-002
16	Hose clamp, ¾"	4	700560-075
17	Nut assembly, ¼-20, VM/VMDI 2-4	4	700650
17	Nut assembly, ¼-20, VM/VMDI 6-34	2	700650
18	Cover, tank gasket	1	*

No.	Description	Qty.	Part No.
19	Washer, #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
22	Fill adapter, VM 6-16	1	160224-041
22	Fill adapter, VM 21-34	1	160224-052
23	Panel, insulation	1	309845-003
24	Sensor, temperature	1	405760
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	Gasket, 2.50 OD X 1.90 ID	1	309750-004
32	Ring, seal, ¼"-18 NPT	1	306365
33	Gasket, bulkhead, 1.60 OD X 1.15 ID	1	309750-005
34	Probe housing, nylon, VM	1	308500
35	Nut, VM heater .475	1	409601-001
35	Nut, VM heater .375	1	409602-001
36	Gasket, VM heater .475	1	409601-002
36	Gasket, VM heater .375	1	409602-002
37	Cap, Black	4	409593-002

* Specify humidifier model and serial numbers when ordering.

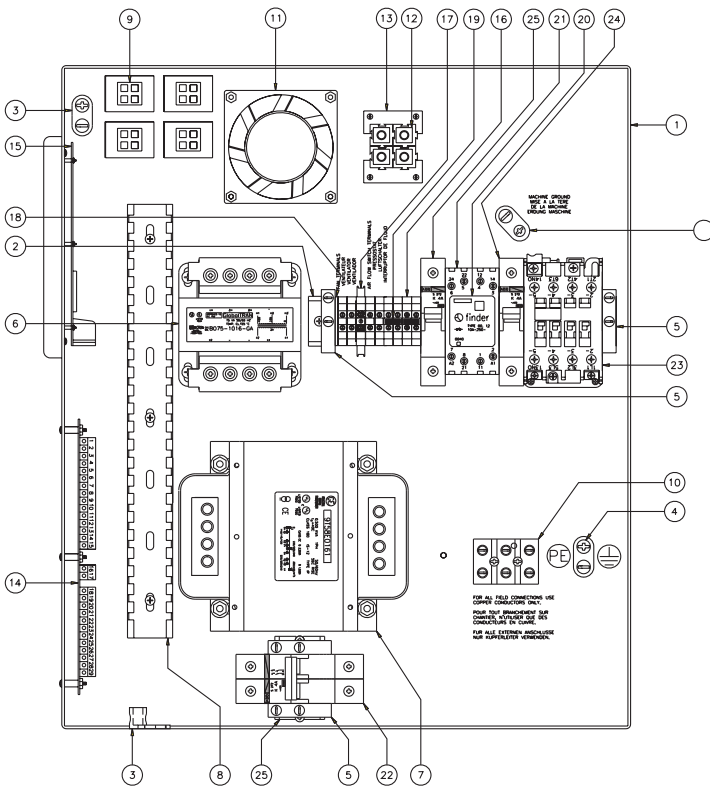
REPLACEMENT PARTS

Figure & Table 22-1: Space Distribution Unit (SDU-E)



No.	Description	Qty.	Part No.
1	Cabinet Base, SDU99	1	330000-003
2	Blower, SDU99 External Assembly	1	409540-003
3	Frame, SDU External	1	165542
4	Disp Chamber, SDU99 w/1 1/2" Out	2	160445-001
4	Disp Chamber, SDU99 w/2" Out	2	160445-002
5	Switch, Air Flow	1	406190
6	Tubing, 1/4" PVC Plastic Tubing	1	405722
7	Nut, 8-32 X 3/8"	2	700200-002
8	Star Washer, 8-32	4	700200-003
9	Screw, Self Tapping 8-32 X 3/8"	2	700170-001
10	Screw, 8-32 X 3/4 PNHD Philips F	4	700170-001
11	CageClip, 8-32	4	409593-001
12	Nut, 1/4"-20 SST Nylon Insert	6	700300-015
13	Cap, Black	4	409593-002

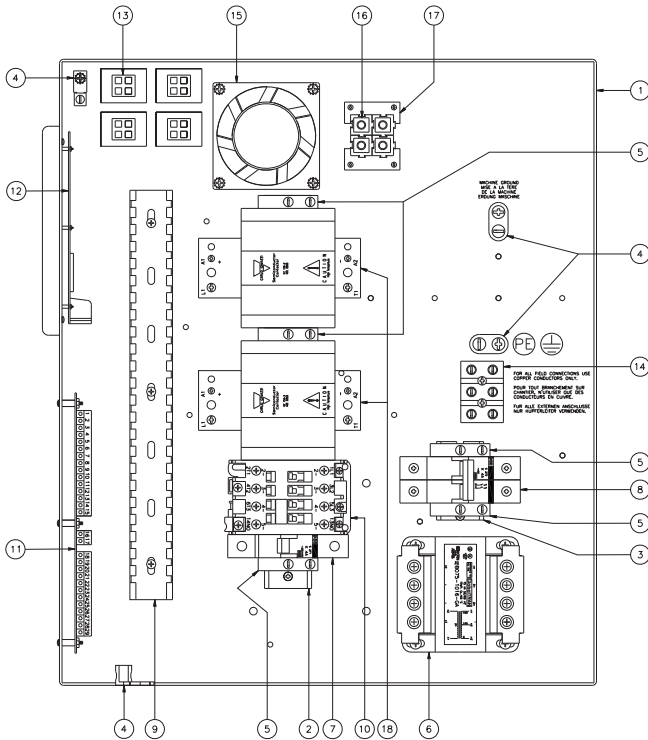
Figure & Table 22-2: HUMDI-TECH® subpanel with SDU-E



No.	Description	Qty.	Part No.
1	Subpanel, VM99 Barrier	1	120801
2	Din Rail, 10.75" Long	1	167765-0107
3	Gnd Lug, L-35 10-14 GA CP-8	2	409250-017
4	Ground Lug, L-70 6-8 GA CP-4	2	409250-018
5	Block, Din Rail Stop	4	408252-006
6	Transformer 230/400V	1	408986
7	Transformer, 230/400 500VA	1	408996-011
8	Channel, Wire w/cov, 37mm X 37mm	12.5"	408999-005
9	Plug, 4 Prong Female	4	409585-008
10	3 Pole Phase, Power Block	1	408300-002
11	Fan, 24 Volt	1	408677-001
12	Housing, 75 AMP White Connector	4	409585-001
13	Plate, Plug Retainer	2	409585-009
14	Main Board, VL-3	1	408490-001
15	Display Board, VL-3	1	408490-002
16	Terminal	8	408252-001
17	Terminal, Ground	1	408252-010
18	Terminal, End Plate	1	408252-005
19	Terminal, Jumper	2	408252-008
20	Relay Finders	1	407900-006
21	Relay Finders, Base	1	407900-007
22	Breaker, 4AMP Single Pole	4	4067750-002
23	Contactor, 60A	1	407001-021
23	Contactor, 32A	1	407001-020
24	Din Rail, 2.25" Long	1	167765-0022

REPLACEMENT PARTS

Figure & Table 23-1: HUMIDI-TECH® subpanel with SCR



No.	Description	Qty.	Part. No.
1	Subpanel, VM99 Barrier	1	120801
2	Din Rail, 10.75" Long	2	167765-0107
3	Din Rail, 2.25 Long	1	167765-0022
4	Ground Lug, L-35 10-14 GA CP-8	2	409250-017
4	Ground Lug, L-70 6-8 GA CP-4	2	409250-018
5	Block, Din Rail Stop	5	408252-006
6	Transformer 230/400V	1	408996-007
7	Breaker, 4AM 1 Pole	1	406775-002
8	Breaker, 1.6 AMP 1 Pole	2	406775-001
9	Wire Channel w/cov 37mm x 37 mm	12.5"	408999-005
10	Contactor, 60A	1	407001-021
10	Contactor, 32A	1	407001-020
11	Main Board, VL-3	1	408490-001
12	Display Board, VL-3	1	408490-002
13	Plug, 4 Prong Female	4	409585-008
14	3 Pole 3 Phase Power Block	1	408300-002
14	2 Pole 1 Phase Power Block	1	408300-001
15	Fan, 24 Volt	1	408667-001
16	Housing, 75 AMP White Connector	4	409585-001
17	Plate, Plug Retainer	2	409585-009
18	SSR, 480 Vac 63 AMP 1 Pole	2	408677-002
18	SSR, 480 Vac 63 AMP 1 Pole	2	408677-005

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.

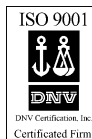
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By purchasing DRI-STEEM's products, the purchaser agrees to the terms and conditions of this limited warranty.

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