

**DRISTEEM®**



**VT Series**  
Electric Humidifier  
**Installation, Operation,  
and Maintenance Manual**

*from the Humidification Experts*

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**ATTENTION INSTALLER**

Read this manual before installing.  
Leave manual with product owner.

**DRI-STEEM technical support**

800-328-4447

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**WARNING!**

Disconnect electrical power before installing supply wiring. Contact with energized circuits may cause severe personal injury or death as a result of electrical shock.

This product must be installed by qualified HVAC and electrical contractors and in compliance with local, state, and federal codes. Improper installation may cause property damage, severe personal injury, or death as a result of electric shock, burns, and/or fire.

The humidifier tank, dispersion assembly, and all connected hose or piping may contain or discharge hot steam and/or hot water at 212 °F (100 °C). Discharged steam is not visible. Contact with hot surfaces, discharged hot water, or air into which steam has been discharged may cause severe personal injury.

Failure to follow the instructions in this manual may cause moisture to accumulate, which may cause bacteria and mold growth or dripping water into building spaces. Dripping water may cause property damage; bacteria and mold growth may cause illness.

Supply water pressure greater than 80 psi (550 kPa) may cause the humidifier to overflow.

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## Operation

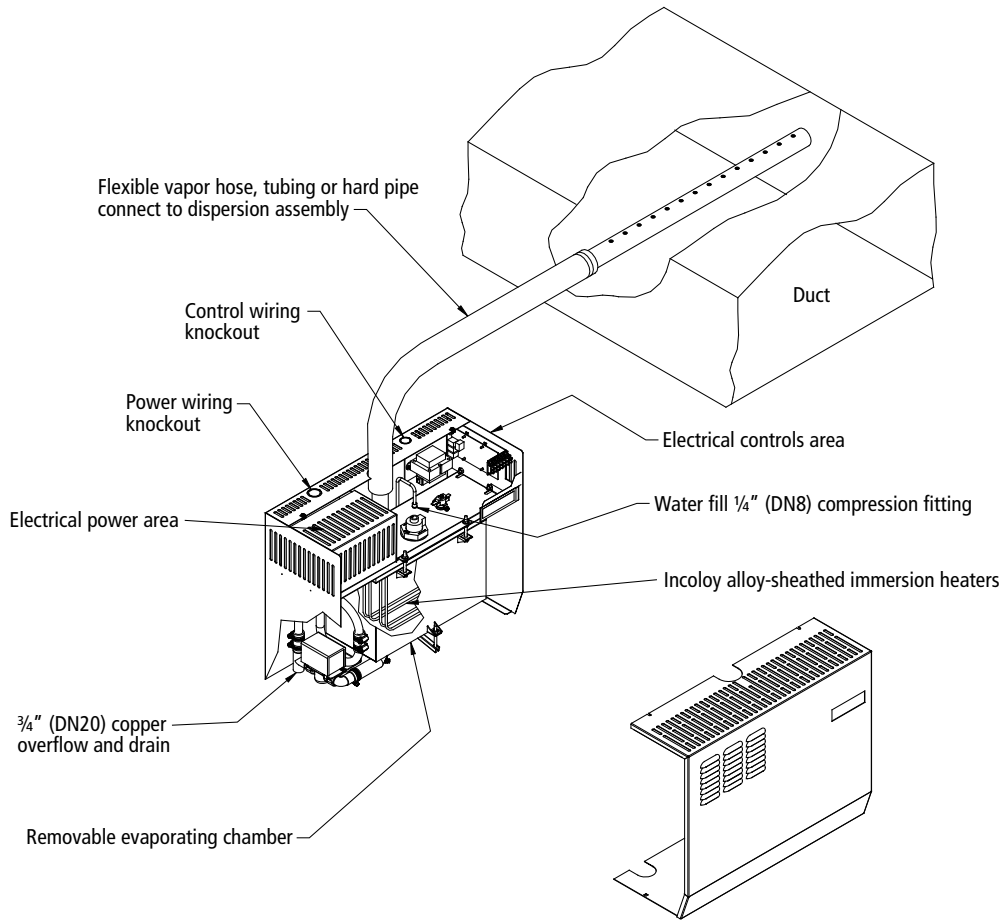
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# Product overview and specifications

**Figure 2-1:  
Product overview**



OM-4051

**Table 2-1:  
VT Series electrical specifications**

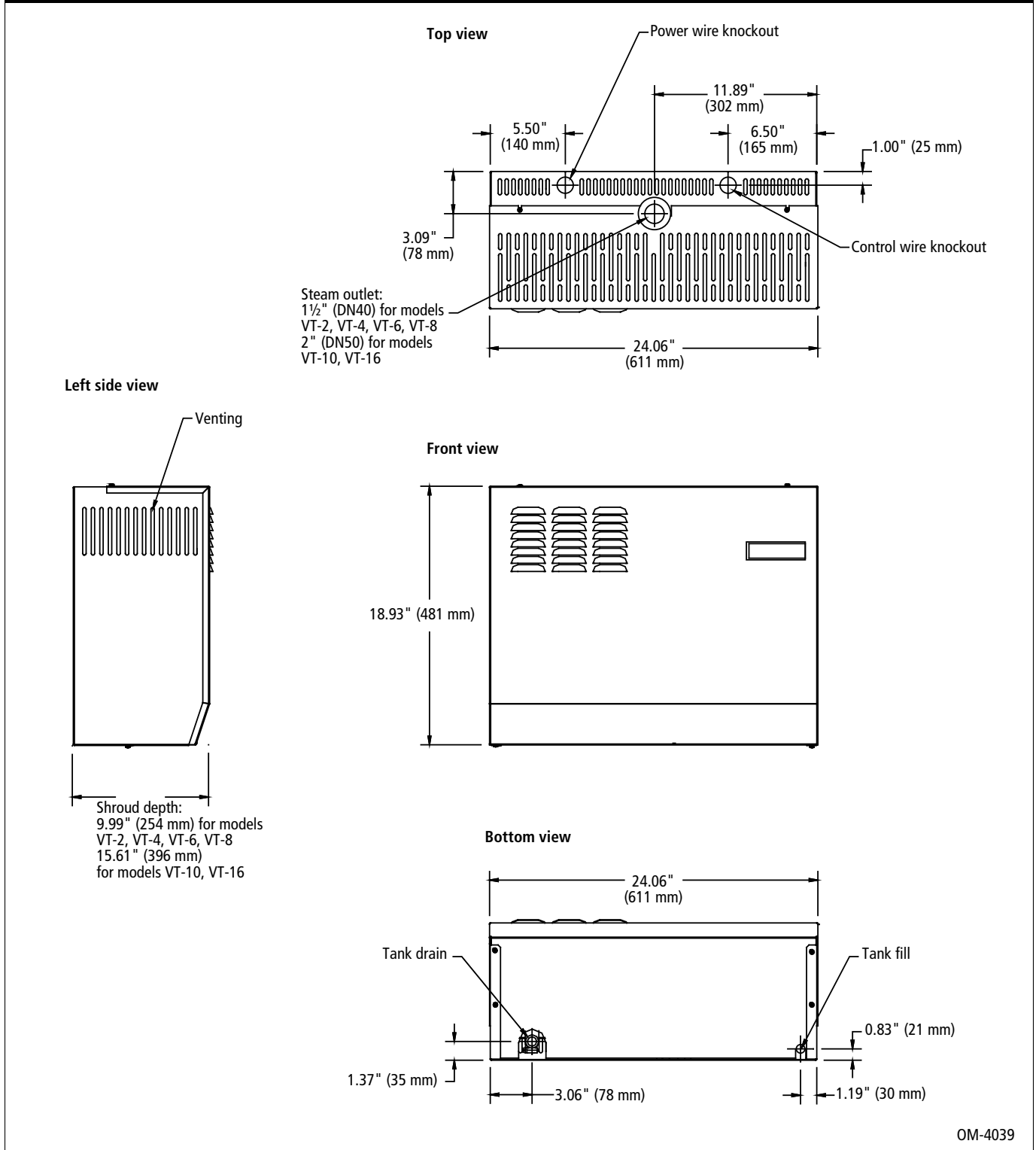
VT Series model number (kW)	Maximum steam capacity		Current draw (amps)							Water usage at maximum capacity		Weights**			
			Single-phase				Three-phase					Shipping		Operating	
	lbs/hr	kg/h	120V	208V	240V	480V	208V	480V	600V	gals/hr	litres/hr	lbs	kg	lbs	kg
2	6	2.7	16.7*	9.6*	8.3*	4.2	—	—	—	0.7	2.6	47	22	59	27
4	12	5.4	—	19.2*	16.7*	—	16.7*	7.2*	5.8*	1.4	5.3	47	22	59	27
6	18	8.2	—	—	—	—	25.0*	10.8*	8.7*	2.2	8.3	49	23	68	31
8	24	10.9	—	—	—	—	33.3*	14.4*	11.5*	2.9	11.0	49	23	68	31
10	30	13.6	—	—	—	—	29.1*	12.6*	10.1*	3.6	13.6	63	29	101	46
16	48	21.8	—	—	—	—	—	19.2	15.4	5.8	22.0	63	29	101	46

**Notes:**

- \* For wire sizing, the highest leg draw is shown due to current imbalance.
- \*\* Shipping and operating weights are for humidifier only; they do not include the weight of vapor hose, dispersion assembly, or accessories.
- \* If these models have on-off control, they have a sound rating of less than 60 dB.
- All VT models with electrical contactors have a sound rating of 65 dB.
- All VT Series humidifier models operate at 50/60 Hz.
- Install in locations with maximum ambient temperature of 80 °F (26.7 °C).

# Dimensions

**Figure 3-1:  
Dimensions**



# Internal controller overview

## Internal controller introduction

The internal controller provides:

- **Relative humidity (RH) control**
  - With an on-off demand signal, the controller maintains RH within 5% of set point.
  - With a modulating demand signal, the humidifier maintains RH within 3% of set point. Modulating demand signal options include a 0–10 VDC humidistat signal, or a signal by others (0–10 VDC or 4–20 mA).
- **Automatic water level control and safety shut-down**

If there is insufficient water, the controller will add water or turn off the heaters.
- **Operating time monitoring**

The controller accumulates humidifier run time to activate end-of-season draining, water cool-down, and auto draining.
- **Automatic preheating**

When the unit receives a call for humidity, it will run at 100% until the water is approximately at boiling temperature.
- **Automatic end-of-season draining**

If the humidifier doesn't receive a humidity demand signal for 72 hours, the tank automatically drains.
- **Periodic automatic draining**

To reduce mineral buildup in the tank, the humidifier automatically drains at intervals based on operating time, output capacity, and water type.
- **Tank water cooling before draining**

To ensure that water is at or below 140 °F (60 °C) before discharging to the plumbing system, the humidifier remains idle for a defined period of time before draining.
- **Safety/enable circuit**

DRI-STEEM recommends installing an airflow proving switch and duct high limit humidistat on this circuit. The humidifier will not start making steam unless these two devices are satisfied.
- **Remote fault alarm**

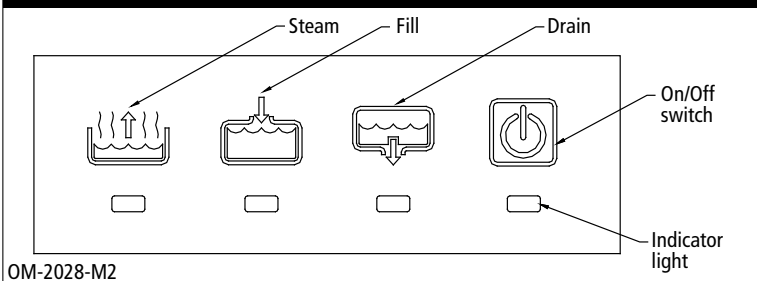
When wired to a remote alarm device, a relay will indicate if there is a fault with draining, filling, or water level control functions of the humidifier.

# Internal controller overview (continued)

## Display panel and indicator lights

The display panel shows operating status and troubleshooting information. See the display panel detail (Figure 5-1) and the table describing display panel lights (Table 5-1). For more information about blinking indicator lights, see the troubleshooting section in this manual.

**Figure 5-1:  
Display panel**



OM-2028-M2

**Table 5-1:  
Display panel light indications**

Indicator light(s)	Status	Description
All	Blinking sequentially from right to left	The humidifier is in a forced cool-down period prior to a required automatic drain sequence.
On/Off (switch)	On	The power is on; the humidifier is functioning normally.
	Slow blinking (1 blink/second)	The electronic water level probe needs cleaning.
	Fast blinking (10 blinks/second)	Probe logic fault. See the troubleshooting section of this manual for more information.
Drain	On	The humidifier is draining.
	Blinking	The allowed amount of time for draining has been exceeded; humidifier will continue to operate.
Fill	On	The humidifier is filling.
	Blinking	The allowed amount of time for filling has been exceeded; humidifier will shut down.
Steam	On	The humidifier is making steam.
	Blinking	The humidifier has received a demand signal but cannot make steam because: <ul style="list-style-type: none"> <li>• There is not enough water in the tank, or</li> <li>• An enable/safety switch is open</li> </ul>
<b>Note:</b> See the troubleshooting section in this manual for more information.		

## Internal controller overview (continued)

### Autodrain sequence minimizes output interruptions

The humidifier drains automatically at regular intervals to remove minerals from the tank.

After the humidifier has run for a preprogrammed amount of time and has sat idle until the tank cools, it drains.

If the humidifier has not completed an autodrain sequence due to continual demand signal interruptions, after an additional amount of run time the humidifier begins a forced cool-down period and then it drains.

**Important:** The humidifier attempts to complete an autodrain sequence when there is no demand for humidity. However, if an autodrain sequence is not completed within a defined period of time, the humidifier ignores the demand signal until completing an autodrain sequence. This could cause the relative humidity level in the humidified space to drop until the autodrain sequence completes.

### Remote fault alarm

If no preference is selected when the humidifier is ordered, the humidifier will be factory-programmed to send a fault alarm signal to a remote device. This function can also be field-programmed if the humidifier was shipped substituting blower starting for a remote alarm (see below). To enable the remote fault alarm function, set slide switch S2 position 9 to On and provide wiring to control terminals NO, O, and NC. See Figure 7-1 on Page 7 for slide switch positions.

### Substituting blower starting for remote fault alarm

The humidifier may be field-programmed to start the HVAC system blower. To enable this function, set slide switch S2 position 9 to Off and provide wiring to control terminals NO, O, and NC. See Page 8 for more information about field wiring; see Figure 7-1 on Page 7 for slide switch positions.



# Setting slide switches

## Inlet water type

The controller allows autodrain settings for three water supply types:

- Normal water (hardness greater than 4 grains/gallon and less than 10 grains/gallon)
- Hard water (hardness greater than or equal to 10 grains/gallon)
- Softened water (hardness less than or equal to 4 grains/gallon)

**Important:** For proper operation, the humidifier requires supply water to have a minimum water conductivity of 100  $\mu\text{S}/\text{cm}$ .

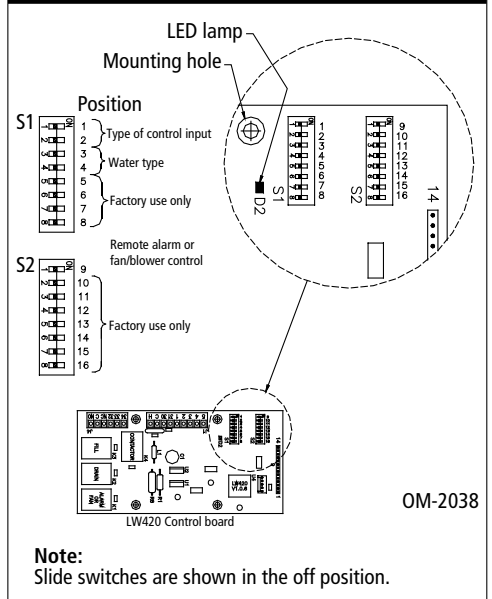
The humidifier is preprogrammed for use with normal water. If your water supply is hard or softened, follow the instructions below:

- For hard water supply (hardness greater than or equal to 10 grains/gallon):
  - Set switch S1 position 3 to On; position 4 remains Off. See Figure 7-1.
- For softened water supply (hardness less than or equal to 4 grains/gallon):
  - Set switch S1 position 4 to On; position 3 remains Off. See Figure 7-1.

**Important:** Slide switch on-off positions 1 through 16 are preset at the factory. These settings are determined by output capacity, water type, and demand signal type. Changing these settings can affect humidifier operation. Change on-off positions only per the instructions in this manual or as instructed by DRI-STEEM technical support staff.

If you change any on-off settings, record them in the table below for future reference.

**Figure 7-1:**  
**Slide switches**



**Table 7-1:**  
**Factory slide switch settings**

Slide switch S1			Slide switch S2		
Position	Factory setting	My setting	Position	Factory setting	My setting
1	Off		9	On for remote fault alarm Off for blower starting	
2	Off		10	Determined by model	Do not change.
3	Off		11	Off	Do not change.
4	Off		12	Off	Do not change.
5	Determined by model	Do not change.	13	Off	Do not change.
6	Determined by model	Do not change.	14	Off	Do not change.
7	Determined by model	Do not change.	15	Off	Do not change.
8	Determined by model	Do not change.	16	Off	Do not change.

**Note:**  
Positions 5-8 and 10-16 are for factory use only.

## Field wiring

### **WARNING!**

Improper wiring or contact with energized circuits may cause property damage, severe personal injury, or death as a result of electric shock and/or fire.

### **Humidifier field wiring**

All wiring must be in accordance with all governing codes and with the humidifier wiring diagram. The wiring diagram for your humidifier model is located inside the removable shroud. Power supply wiring must be rated for 105 °C.

**Important:** The maximum operating ambient temperature is 80 °F (27 °C).

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

### **Field wiring connections and requirements**

Conduit knockouts are provided on the top of the cabinet. Control wiring knockouts are on the back right; power wiring knockouts are on the back left.

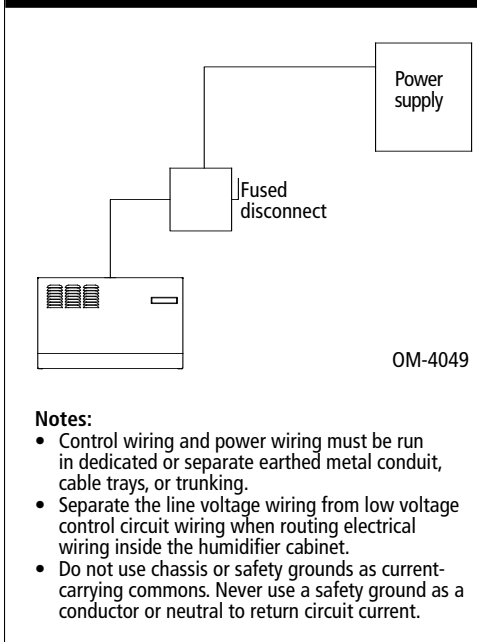
**CAUTION!** Adding alternate conduit connections is not recommended; however, when making holes and knockouts in the humidifier cabinet, protect all internal components from debris and vacuum out cabinet when finished. Failure to comply with this caution can damage sensitive electronic components and void the DRI-STEEM warranty.

Below are field wiring connections:

- **Connect to line power.**  
Refer to the wiring diagram or the data plate on the outside of the cabinet for wire sizing amperage.
- **Connect to control signal wiring**  
(from a humidistat or from signal by others).
- **Connect remote fault alarm wiring.**  
When wired to a remote alarm device, a relay indicates if there is a fault with draining, filling, or water level control functions of the humidifier. To enable the remote fault alarm, connect wiring to control terminals NO, O, and NC.
- **Connect to the HVAC system blower (optional).**  
The humidifier may be field programmed to send a signal to start the HVAC system blower instead of sending a fault alarm signal. To enable this function, set slide switch S2 position 9 to Off and provide wiring to control terminals NO, O, and NC (NO to air handler terminal R; O to air handler terminal G; NC to thermostat terminal G).

**More on the next page ►**

**Figure 8-1:**  
**Field wiring requirements**



## Field wiring (continued)

- Connect to the duct airflow proving switch and duct high limit humidistat wiring (recommended optional devices).

### WARNING!

DRI-STEEM strongly recommends installing a duct airflow proving switch and a duct high limit humidistat. These devices prevent the humidifier from making steam when there is no airflow in the duct or when the RH level in the duct is too high. Failure to install these devices may result in excessive moisture in the duct, which may cause bacteria and mold growth or dripping through the duct.

### Grounding requirements

The ground connection must be made with solid metal to metal connections. The ground must be a good radio frequency earth. Ground wire should be the same size as power wiring.

More on the next page ►

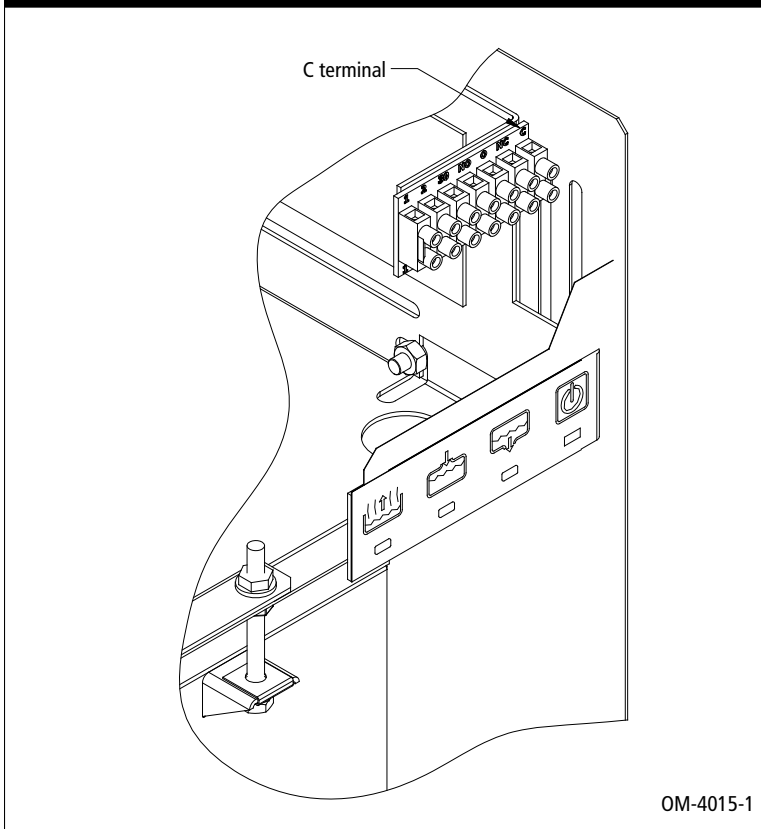
### Proper wiring prevents electrical noise.

Electrical noise can produce undesirable effects on electronic control circuits, which affects controllability. Electrical noise is generated by electrical equipment such as inductive loads, electric motors, solenoid coils, welding machinery, or fluorescent light circuits. The electrical noise or interference generated from these sources (and the effect on controllers) is difficult to define, but the most common symptoms are erratic control or intermittent operational problems.

### Important:

- For maximum EMC effectiveness, wire all humidity, high limit, and airflow controls using multicolored shielded/screened plenum-rated cable with a drain wire for the shield/screen. Connect the drain wire to the shield/screen ground terminal with wire less than 2" (50 mm) in length.
- Do not ground shield at the device end.

**Figure 9-1:**  
Shielded/screened cable drain wire connection to C terminal



## Field wiring (continued)

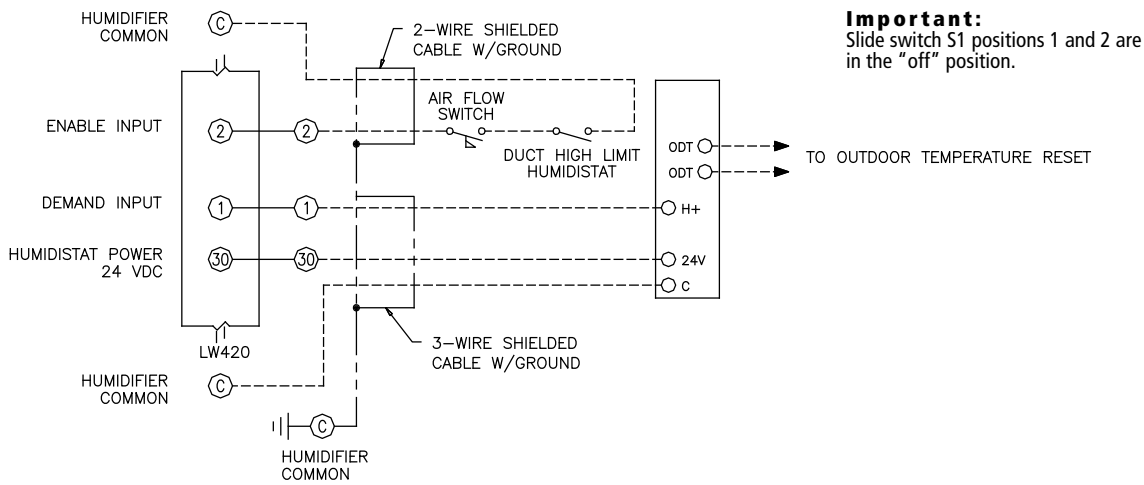
**Important:**

Note the slide switch S1 settings in each control input wiring drawing.

**Control input wiring**

The internal controller offers four input control types. For wiring connection requirements, first determine which humidistat was provided with your humidifier. Then, refer to the corresponding control input wiring diagram shown below, on the next page, or located inside the humidifier shroud.

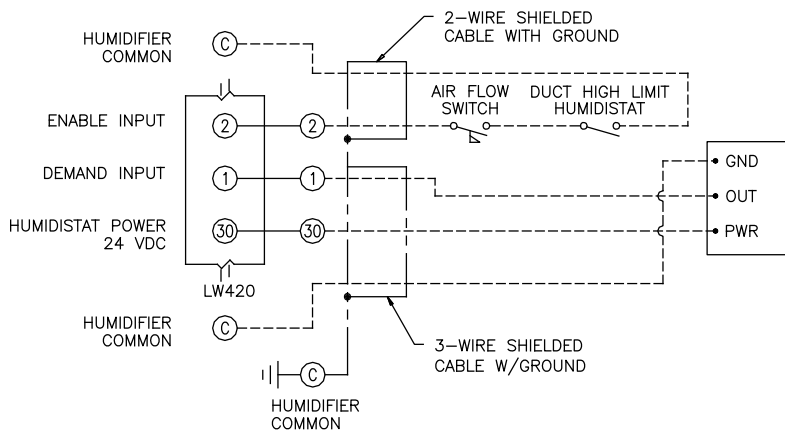
**Figure 10-1:**  
Input wiring for on-off or modulating duct mounted humidistats



**Important:**  
Slide switch S1 positions 1 and 2 are in the "off" position.

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**Figure 10-2:**  
Input wiring for modulating room humidistat



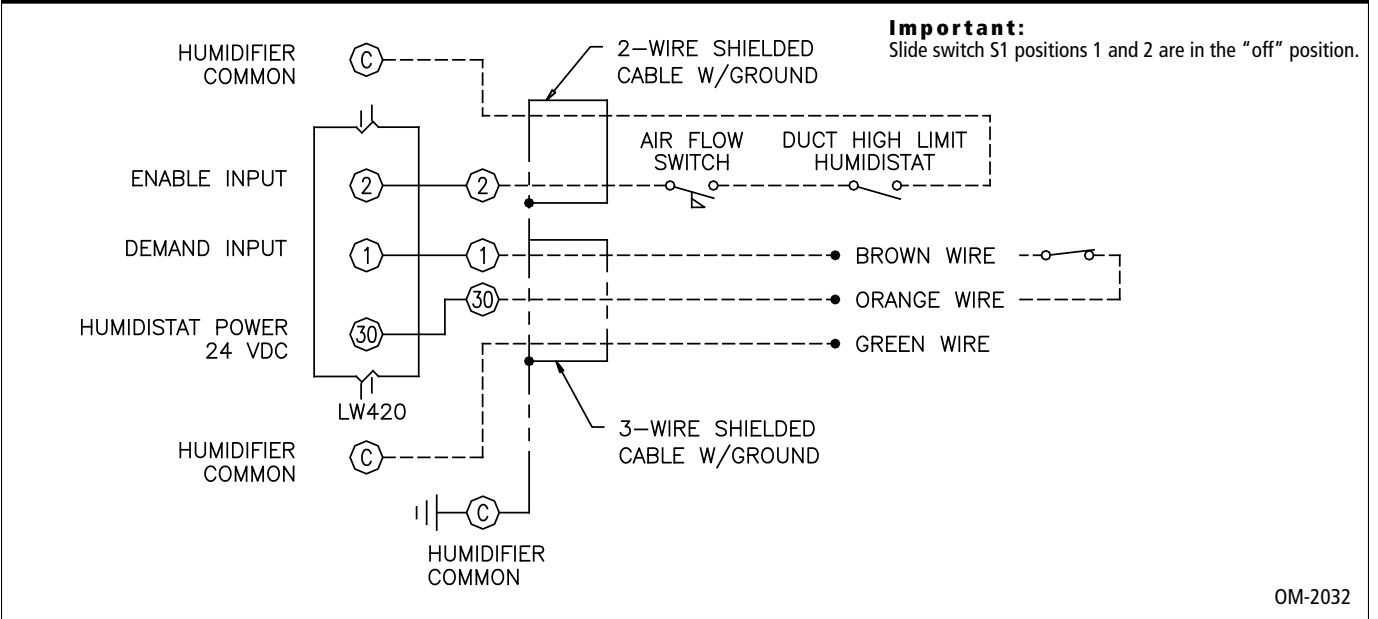
**Important:**  
Slide switch S1 positions 1 and 2 are in the "off" position.

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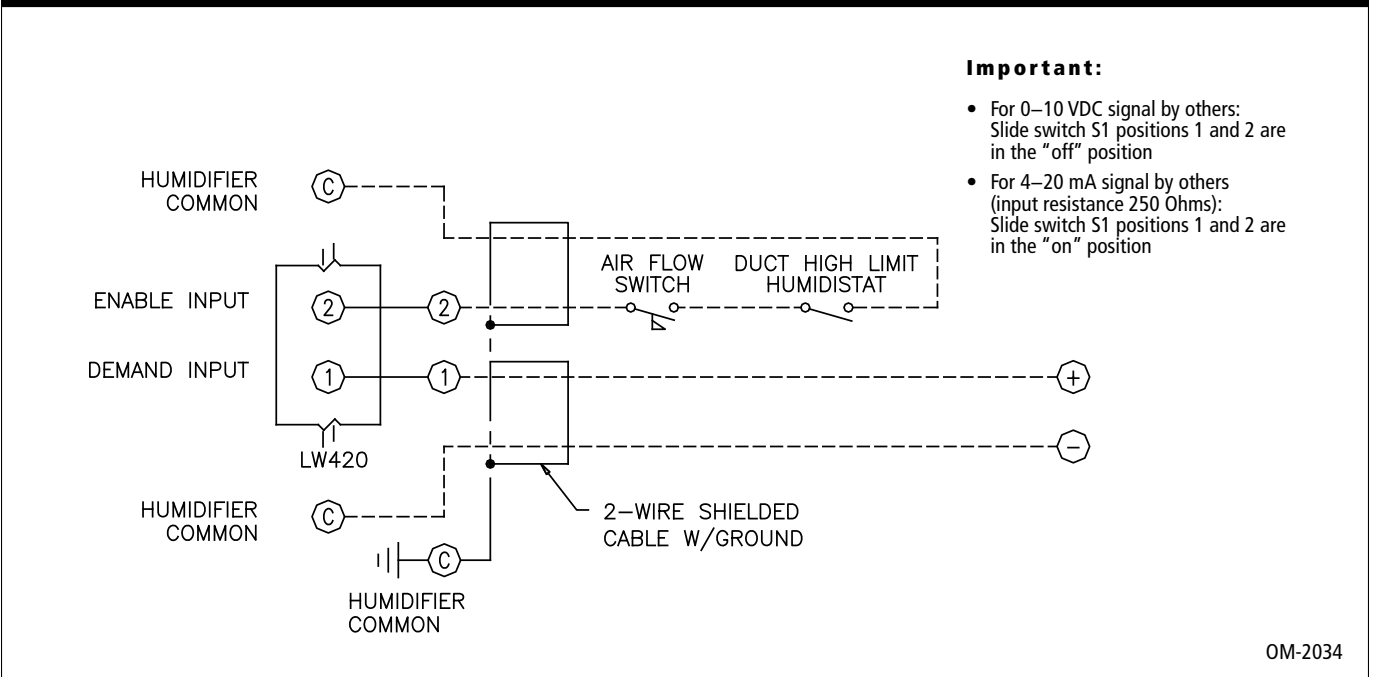
# Field wiring (continued)

## Control input wiring (continued)

**Figure 11-1:**  
Input wiring for on-off room humidistat



**Figure 11-2:**  
Input wiring for signal by others (4–20 mA or 0–10 VDC)



## Choosing a location

### Choosing a location for the humidifier

The humidifier is designed to attach to a wood stud wall with lag bolts, and it should be installed in a space located near an air duct system.

When selecting the location of the humidifier, consider the following:

- **Proximity to duct**

To avoid having to install a drain at the dispersion tube in the duct, the dispersion tube must be mounted at an elevation higher than the humidifier. Hose must have a constant downward slope from the dispersion tube to the humidifier of at least 2"/ft (15%). If the dispersion tube must be installed at an elevation lower than the humidifier, install a drip tee and drain as shown in Figure 20-1.

- **Required clearances** (see Figure 12-1)

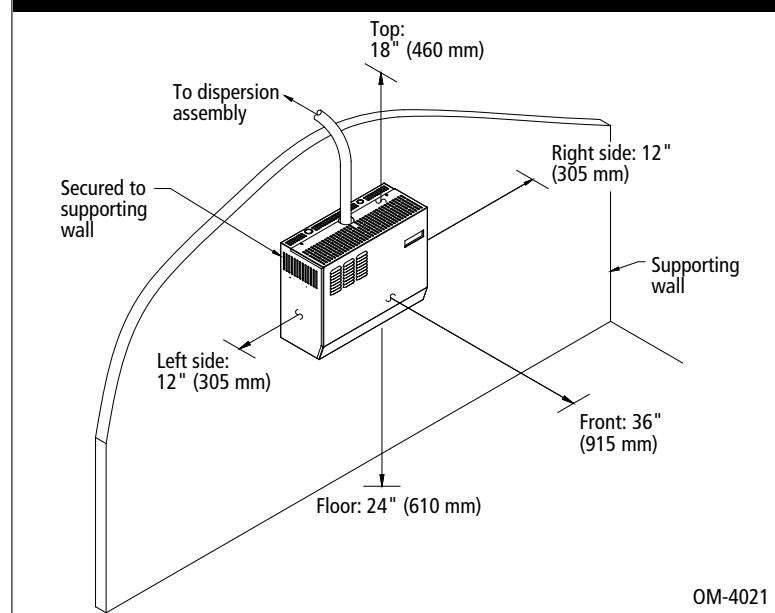
- **Electrical and plumbing connections**

Electrical power supply, water supply piping, and drain piping must also be considered. Electrical power supply connections are made at the upper left rear corner of the unit. The control wiring is in the upper right rear corner. Water supply piping connections are made in the lower right rear corner. Drain piping connections are made at the lower left rear corner.

### Choosing a location for the dispersion tube and control devices

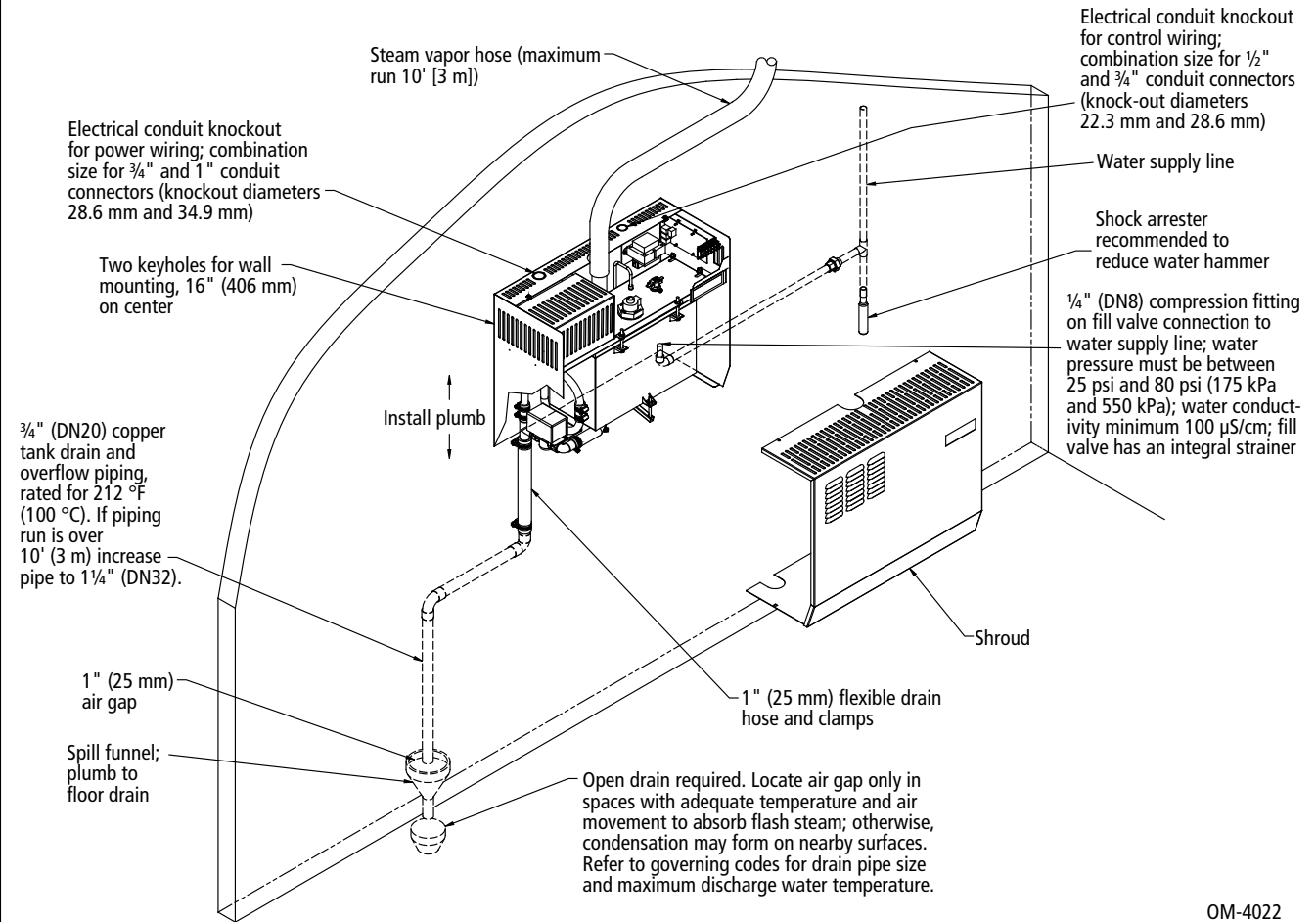
See Figure 17-1 for recommended installation locations for the dispersion assembly and associated control devices.

**Figure 12-1:**  
**Recommended minimum service and maintenance clearances**



# Piping overview

**Figure 13-1:**  
Field piping overview showing hose drain



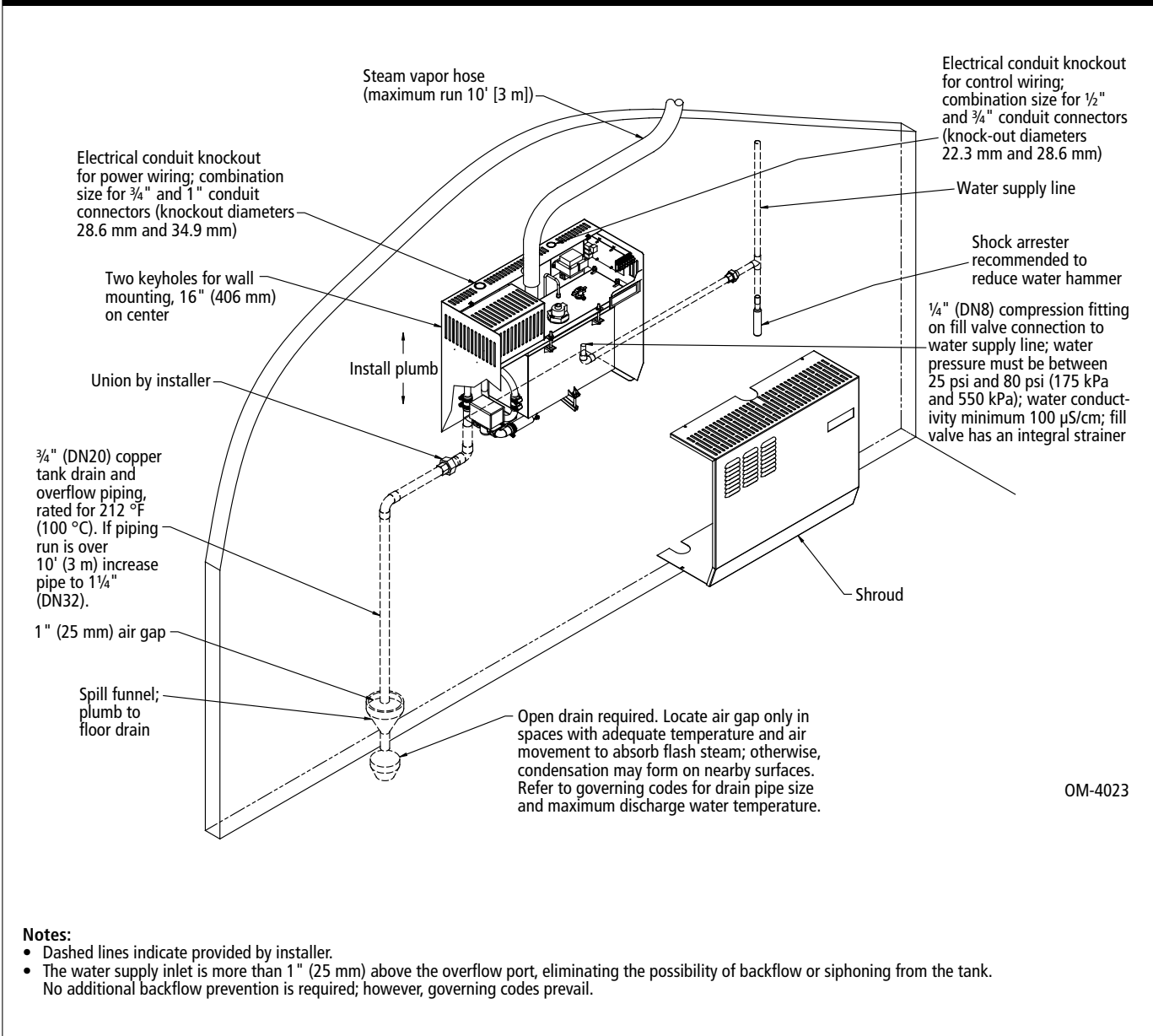
OM-4022

**Notes:**

- 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, governing codes prevail.

# Piping overview

**Figure 14-1:**  
Field piping overview showing hard pipe drain





# Mounting the humidifier

## Mounting the humidifier on the wall

When mounting on a wood stud wall (studs 16" [406 mm] on center), locate studs and position lag bolts in place so that each of the bolts centers on a stud. Mark hole locations and predrill  $\frac{1}{4}$ " (6 mm) diameter pilot holes. Secure cabinet to wall with lag bolts provided.

When mounting on a metal stud wall, locate the studs (16" [406 mm] on center) and drill a  $\frac{3}{8}$ " (10 mm) hole through the studs and wall. Push a  $\frac{3}{8}$ " (10 mm) bolt through the wall, studs, and a backing plate on the backside of the wall and secure with a nut and washer.

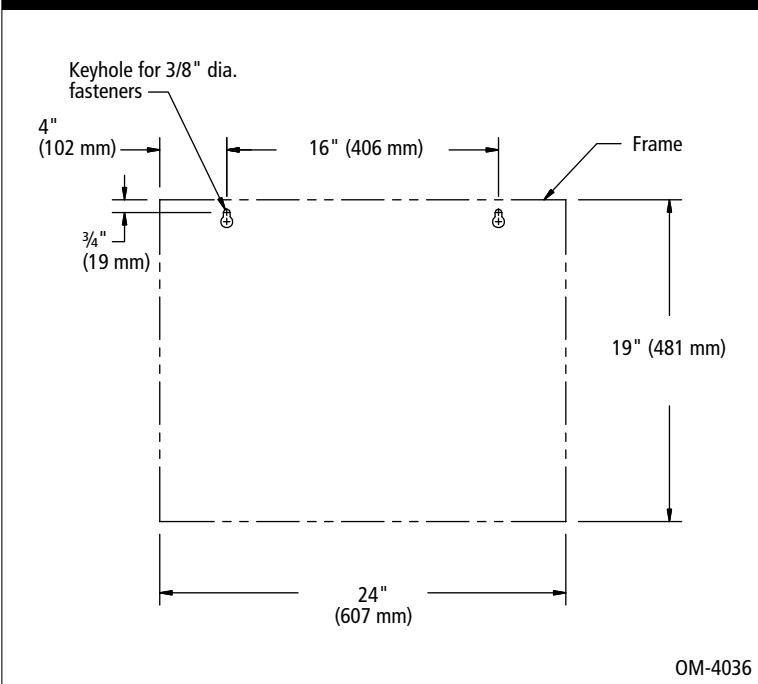
If 16" (406 mm) on-center studs are not available, mount spanner boards on the wall, spanning two studs. If two horizontal boards are used, locate one at the top of the cabinet for the lag bolts and the other board located 3" (76 mm) on center from the bottom of the cabinet.

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

## WARNING!

Mount humidifier per the instructions in this manual and to a structurally stable surface. Improper mounting of humidifier may cause the humidifier to fall off the wall resulting in severe personal injury or death.

**Figure 15-1:**  
**Mounting keyhole locations**



## Supply water and drain piping

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### **WARNING!**

Drain piping surface may be hot. Touching or contact with hot pipe may cause severe personal injury.

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### **Supply water and drain piping**

Supply water piping may be of any code-approved material (copper, steel, or plastic). The fill valve connection size is a ¼" (DN8) compression fitting. In cases where water hammer may be a possibility, consider installing a shock arrestor. 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 reservoir pump rated for 212 °F (100 °C) water.

The final connection size is 1" (DN25) hose or ¾" (DN20) copper for the tank drain. Do not reduce this connection size. (See Figures 13-1 and 14-1 for proper drain piping configurations.)

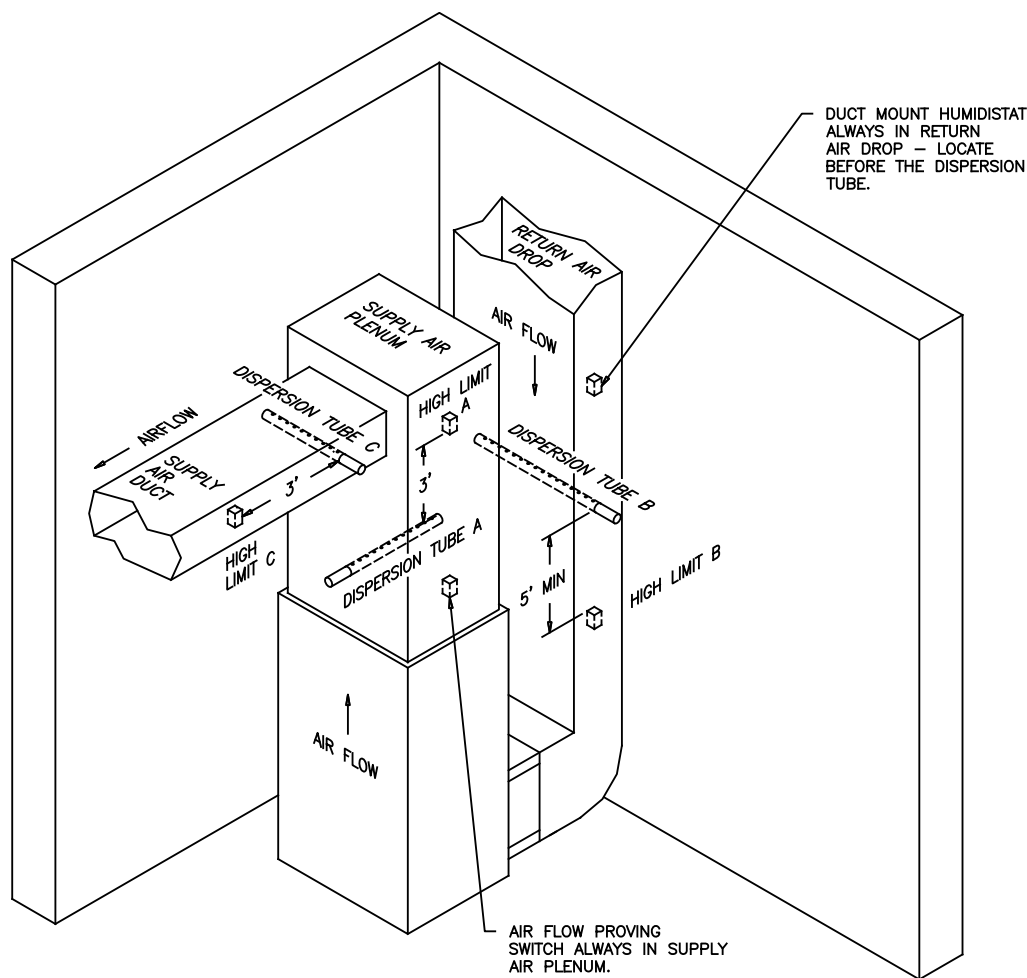
A 12" (305 mm) piece of 1" (DN25) hose is provided to function as the flexible connection from the drain valve to the field installed drain plumbing. The flexible connection provides a disconnect point so that the tank can be removed for cleaning. (See Figure 13-1).

**Important:** Hard piping can be connected directly to the drain valve, but the vertical drop should be minimized prior to a horizontal run. Install a union at the beginning of the horizontal run to remove the tank for cleaning. (See Figure 14-1).

If the equivalent length of pipe from the humidifier drain to the plumbing system drain is more than 10' (3 m), increase the pipe size to 1¼" (DN32). See Figures 13-1 and 14-1.

# Mounting the dispersion tube and control devices

**Figure 17-1:**  
**Recommended installation locations for Models VT-2 and VT-4 installed in residential furnaces**



OM-4016

## Choosing a dispersion tube location

**Location A is the best choice** for two reasons:

- The dispersion tube is humidifying 100% of the airflow, and
- The supply air temperature is typically warmer than the return air temperature, allowing for better absorption.

**Location B is the second best choice** because the dispersion tube is humidifying 100% of the airflow, but the cooler temperature of the return airflow requires more space for absorption.

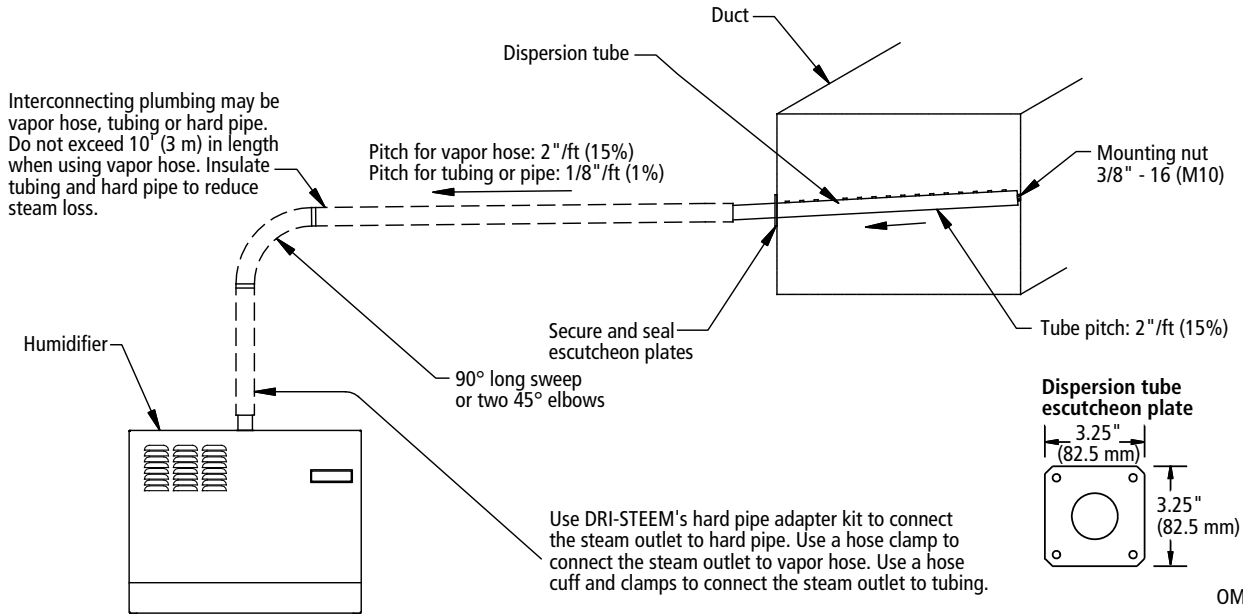
**Location C is the third best choice** because, in many cases, there is more than one branch off the supply air plenum. If the dispersion tube is placed in only one branch when there are other branches, 100% of the airflow cannot be humidified. However, if there is only one branch, then Location C would be the second best choice because of the supply air temperature.

## Choosing control device locations

- Install the high limit humidistat (a recommended optional device) the correct distance downstream of the dispersion tube.
- Install the control humidistat in the return air drop upstream of the dispersion tube.
- Install the airflow proving switch (a recommended optional device) in the supply air plenum.

# Dispersion tube installation

**Figure 18-1:**  
**Dispersion tube installation in a duct**



**Notes:**

- 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)
- Position the humidifier below the dispersion tube such that the hose has a minimum pitch as shown in this drawing.
- When mounting the humidifier above the level of dispersion tube, see Figure 20-1.
- Hard pipe or tubing diameter must match humidifier's steam outlet size 1½" (DN40) or 2" (DN50).
- Thin-walled tubing heats up faster than heavy-walled pipe causing less steam loss at start-up.
- Orient dispersion tube so that tubelets (steam orifices) point up. On the outside of the duct, mark the top of the dispersion tube leader to be able to verify from outside the duct that dispersion tubes are pointing up.
- See the Maximum Steam Carrying Capacity and Steam Loss tables on Page 21.
- The table below shows hose kit sizes by humidifier model. A hose kit includes vapor hose, a dispersion tube and hardware.
- **CAUTION!** Failure to follow the recommendations on this page can result in excessive back pressure on the humidifier. This may lead to dispersion tube spitting, steam blowing through the humidifier's P-trap into the plumbing system, or leaking gaskets.

**WARNING!**

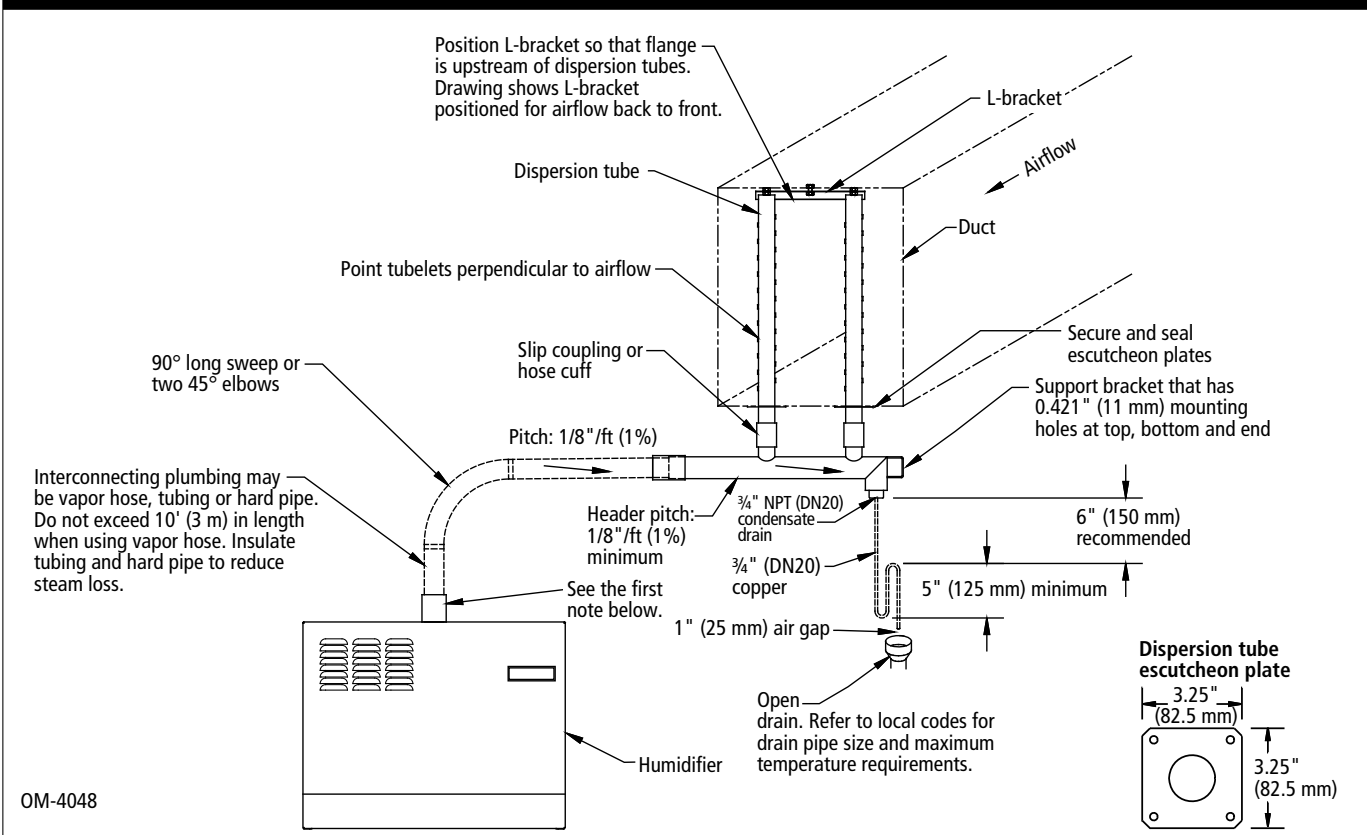
Dispersion tube, vapor hose, tubing or hard pipe may contain steam, and surfaces may be hot. Discharged steam is not visible. Contact with hot surfaces or air into which steam has been discharged may cause severe personal injury.

**Table 18-1:**  
**Hose kit sizing by model**

Humidifier models	Hose kit (vapor hose, dispersion tube and hardware)	Maximum capacity of dispersion tube	
		lbs/hr	kg/h
VT 2-8	1½" (DN40) hose kit	28.4	13
VT 10-16	2" (DN50) hose kit	56.8	25.8

# Rapid-sorb dispersion installation

**Figure 19-1:**  
**Rapid-sorb dispersion assembly**



OM-4048

- 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.
  - When mounting the humidifier above the level of the Rapid-sorb, see the drawing on Page 20.
  - Hard pipe or tubing diameter must match the humidifier steam outlet size 1½" (DN40) or 2" (DN50).
  - Thin-walled tubing heats up faster than heavy-walled pipe causing less steam loss at start-up.
  - See the Maximum Steam Carrying Capacity and Steam Loss tables on Page 21.
  - 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 size: 1½" (DN40)
  - **CAUTION!** Failure to follow the recommendations on this page can result in excessive back pressure on the humidifier. This may lead to dispersion tube spitting, steam blowing through the humidifier's P-trap into the plumbing system, or leaking gaskets.

## WARNING!

Dispersion tube, vapor hose, tubing or hard pipe may contain steam, and surfaces may be hot. Discharged steam is not visible. Contact with hot surfaces or air into which steam has been discharged may cause severe personal injury.

# Dispersion drip tee installation

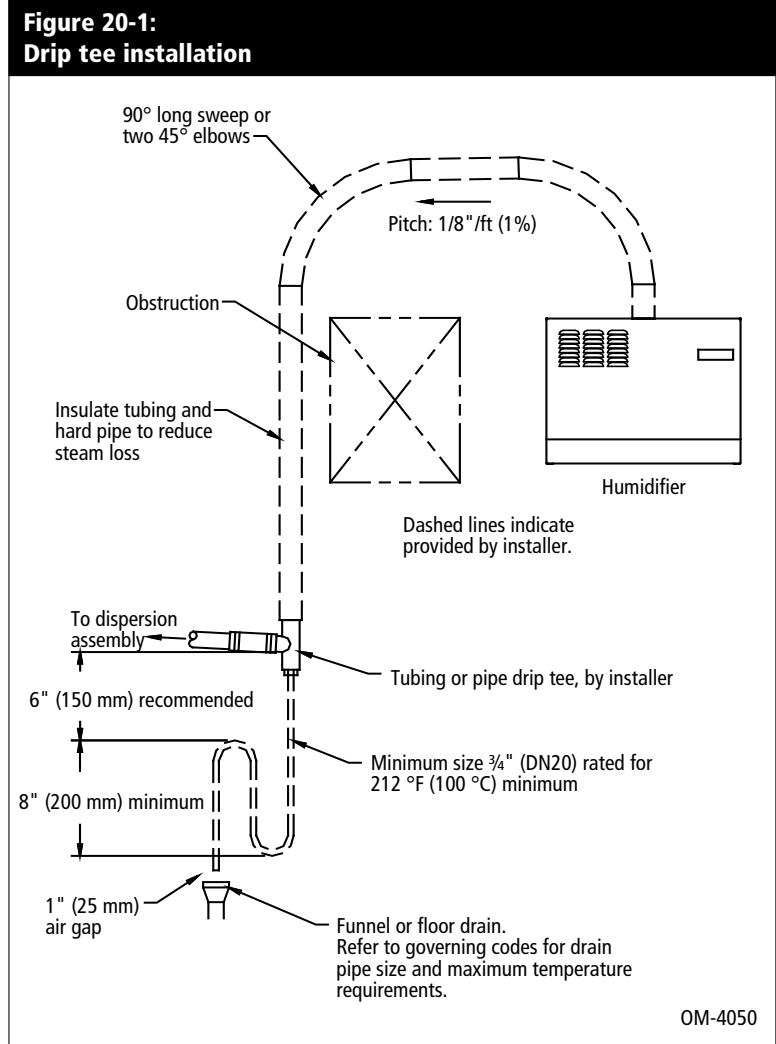
## WARNING!

Dispersion tube, vapor hose, tubing or hard pipe may contain steam, and surfaces may be hot. Discharged steam is not visible. Contact with hot surfaces or air into which steam has been discharged may cause severe personal injury.

## Drip tee installation

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

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



# Humidifier to dispersion inter-connecting hose, tubing and pipe

**Table 21-1:  
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.

**Table 21-2:  
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.

# Humidifier start-up procedure

**Table 22-1:  
Torque specifications**

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

After the system is properly installed and connected to both electrical and water supplies, it can be started.

### Start-up procedure:

#### Mounting

Before filling with water, check mounting to verify that the tank cover and tank are level and securely supported.

#### Piping

Verify that all piping connections are completed as recommended and that water pressure is available.

Use cold or hot supply 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 humidifier has an internal 1" (25 mm) air gap, some governing codes may require backflow prevention.

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

#### Electrical

Before start-up, verify that electrical connections have been made per the wiring requirements listed in this manual.

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### WARNING!

Do not remove the power/heater terminal cover until electrical power is disconnected. Contact with energized circuits may cause property damage, severe personal injury or death as a result of electrical shock or fire.

Only qualified electrical personnel should perform start-up procedure.

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- Verify that all wiring connections have been made in accordance with all governing codes and the humidifier's wiring diagram.
- Verify that all DIN rail-mounted components are securely fastened to the DIN rail.
- Verify that all power terminal screws and lugs are tight from power block to heaters. See Table 22-1 for torque specifications.

**More on the next page ►**

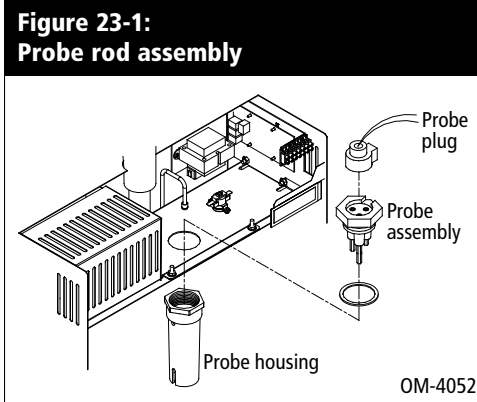


## Humidifier start-up (continued)

### Electrical (continued)

- Verify that the transformer, drain valve, fill valve, and contactor electrical plugs located under the humidifier shroud are completely plugged in.
- Confirm the internal controller board slide switch S1 and S2 positions marked 1 through 16 are in the correct on or off position.
- Turn water supply on; confirm drain valve is closed.
- Turn the supply power on.
  - The On/Off indicator light illuminates along with the Fill indicator light.
  - The fill valve opens and adds water until the humidifier tank is full, at which time the fill valve closes and the Fill indicator light turns off.
- Unplug the probe plug from the probe assembly (located on the tank cover; see Figure 23-1) to allow the fill valve to energize and overfill the tank. This ensures that the water seal (P-trap) is filled with water. When water is seen coming from the drain line, plug the probe plug back into the probe assembly.
  - With sufficient water in the tank and the safety/enable circuit closed (recommended options: duct airflow proving and duct high limit humidity switches), the humidity demand signal illuminates the Steam indicator light and energizes the heaters.

**CAUTION!** In the event the humidifier tank does not contain water and the heaters are energized, turn main power off. Operation of the heaters without water will cause damage to the humidifier.



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## Humidifier maintenance

The best way to determine how often your particular system needs maintenance is to remove the tank and inspect it after the first year 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, determines your own unique maintenance schedule.

### To inspect and service humidifier:

1. Access and prepare the tank for removal (see Figure 25-1 on Page 25 for drawing callout numbers):
  - **CAUTION!** If the drain light is blinking on the display panel (Callout 1 in drawing), there is water in the tank that was unable to drain. When full of water, the tank may weigh up to 60 lbs (27 kg). Take necessary precautions to support the additional weight when removing the tank fasteners.
  - Loosen the fasteners on the top of the shroud.
  - Remove the fasteners on the bottom of the shroud.
  - Remove the shroud.

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### WARNING!

Do not remove the power/heater terminal cover until electrical power is disconnected. Contact with energized circuits may cause property damage, severe personal injury or death as a result of electrical shock.

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- If the tank is hot, cool it down by moving the valve lever located on the drain valve to the manual open position. The fill valve eventually opens, allowing cool water to run into the tank until it is cool enough to handle.

**Important:** After the drain valve is manually opened, verify that tank water is running from the drain piping to the plumbing system. If tank water is not draining, unplug the probe plug from the probe assembly (located on the tank cover) to allow the fill valve to energize and overfill the tank. When the tank is cool enough to handle, plug the probe plug back into the probe assembly. Take necessary precautions to support the additional water weight when removing the tank fasteners.

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### WARNING!

Opening the drain valve when the tank is hot may discharge water with a temperature up to 212 °F (100 °C) into the plumbing system. This may cause damage to the plumbing system. Do not touch the tank or drain piping until the unit has had sufficient time to cool, or serious injury may occur.

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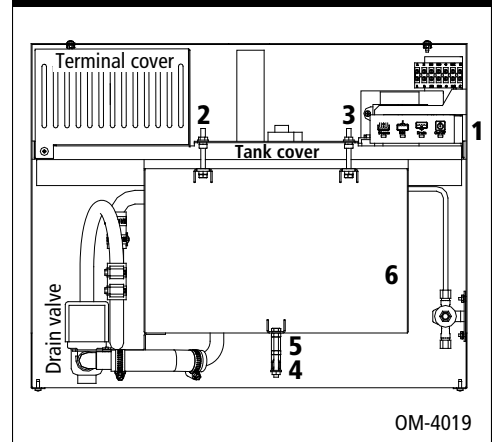
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## Humidifier maintenance (continued)

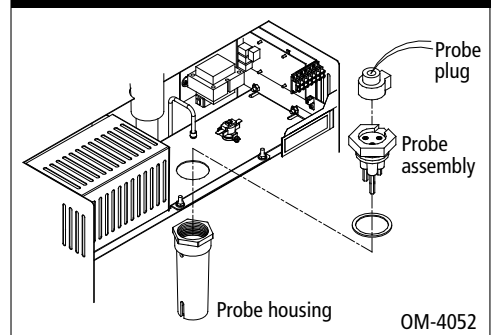
- Shut off the water supply.
  - Shut off the electrical supply.
  - Allow the tank to completely drain.
  - Disconnect the drain hose or the field installed union from the drain valve connection on the back left corner of the cabinet. Disconnect the drain valve electrical plug.
2. Remove the tank (see Figure 25-1 for drawing callout numbers):
    - Hold up on the bottom of the tank (Callout 6 in drawing) and remove the top mounting nuts (Callouts 2 and 3).
    - Hold up on the bottom of the tank while removing the bottom mounting nut (Callout 4). When the bottom mounting nut is removed, the handle (Callout 5) falls away from the tank. Use both hands to support the tank and lower it straight down to clear heaters. Use care not to damage gasket.
  3. Clean the tank interior using a putty knife or similar flat instrument. Clean the strainer inside the tank located over the tank drain opening. Use a wire brush and verify that all the strainer holes are open.
  4. Open the drain valve with the manual lever on the side of the actuator and run water through the drain valve to remove any collected sediment.
  5. Unscrew the probe assembly and clean the plastic probe housing, ensuring that all passageways are clear (see Figure 25-2). Clean the probe rods using steel wool or a similar mild abrasive material. Inspect the composite plastic probe assembly for any signs of cracking, roughness, or deterioration. If found, replace.
  6. Install the probe assembly, probe plug, probe housing and the gasket into the cover (see Figure 25-2).
  7. Re-install the tank (see Figure 25-3 for drawing callout numbers):
    - Using both hands, lift the tank (Callout 6 in drawing) up around the heaters until the threaded fasteners penetrate the cover flange.
    - Hold the tank in place with one hand and pull the handle (Callout 5) toward you and up onto the threaded fastener on the front bottom of the tank. Make sure gasket is centered on tank flange.
    - Push the handle up against the backing nut (Callout 9) and run nut (Callout 4) up the threaded fastener so it holds the handle in place.
    - Tighten nut (Callouts 2 and 3) down on the threaded fasteners extending through the cover flange.

More on the next page ►

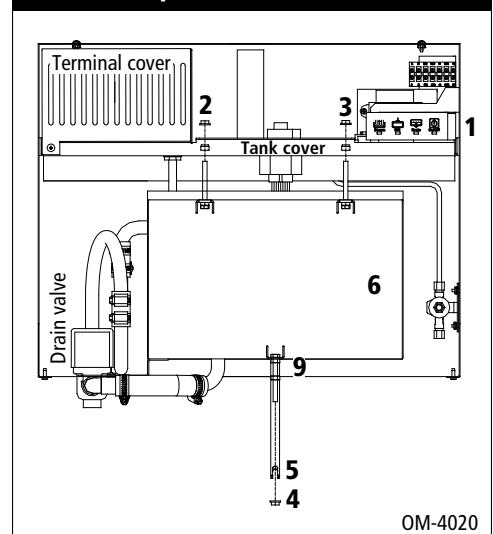
**Figure 25-1:**  
Tank with closed fastener



**Figure 25-2:**  
Probe rod assembly



**Figure 25-3:**  
Tank with open fastener



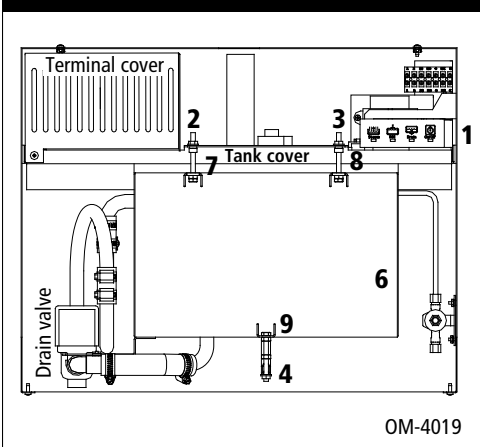
## Humidifier maintenance (continued)

**Table 26-1:**  
**Torque specifications**

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

- Tighten nuts (Callouts 2, 3, and 4) to complete the process of returning the tank to its position prior to removal.
  - Reconnect the drain hose to the drain valve connection in the back left corner.
  - Reconnect the drain valve electrical plug.
8. Verify electrical connections:
    - Verify that all DIN rail-mounted components are securely fastened to the DIN rail.
    - Verify that all power terminal screws and lugs are tight from power block to heaters. See Table 26-1 for torque specifications.
    - Verify that all electrical plugs located under the shroud are completely plugged in (transformer, contactor, drain valve, and fill valve).
  9. Move the drain valve lever back to the auto position.
  10. Turn on the water supply.
  11. Turn on the electrical power.
  12. Allow the tank to fill with water and initiate a humidity demand signal (see Figure 26-1 for drawing callout numbers).
    - **Important:** Verify that the gasket seal is not leaking prior to leaving the humidifier unattended.
      - If a leak is observed in the left front or side of the gasket, loosen backing nut (Callout 7 in drawing) one turn and tighten fastener nut (Callout 2) down onto the cover flange. Continue this one turn at a time until the leak stops.
      - If a leak is observed in the right front or side of the gasket, loosen backing nut (Callout 8) one turn and tighten fastener nut (Callout 3) down onto the cover flange. Continue this one turn at a time until the leak stops.
      - If a leak is observed in the rear of the tank, loosen backing nut (Callout 9) two turns and tighten up fastener nut (Callout 4) onto the handle. Continue this two turns at a time until the leak stops. Replace gasket if necessary.
  13. If this maintenance occurred at the end of a humidification season, turn the demand for humidity down to the minimum setting and the humidifier will go into an end-of-season drain after 72 hours.
  14. If this maintenance occurred during the humidification season, turn the demand for humidity to the desired set point.

**Figure 26-1:**  
**Tank with closed fastener**



**More on the next page ►**

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## Humidifier maintenance (continued)

### Off-season shut down procedure

Perform tank cleaning and humidifier maintenance at the end of the humidification season.

- If softened water is used, the tank may not need cleaning until after multiple humidification seasons.
- **Important:** The tank should be removed after the first season of use to observe the amount of collected minerals in the tank.
- If there is more than ½" (13 mm) of minerals in the tank after one season of use, clean the tank annually.
- If it is determined that cleaning is necessary every two or three seasons, then the only off-season shut-down procedure required is to turn the demand for humidity down to the minimum setting.
- The tank will go into an end-of-season drain after 72 hours without a demand for humidity.
- When humidification is desired, turn the demand up to the desired set point and the system will start up.

## Troubleshooting guide

**Table 28-1:  
Problem/possible cause/action**

Problem	Possible cause	Action
All indicator lights are blinking sequentially from right to left	The humidifier is in a forced cool-down period prior to a required automatic drain sequence.	<ul style="list-style-type: none"> <li>• WAIT for tank water to cool down, drain, and refill. DO NOT RESET POWER. The humidifier will automatically resume making steam once it has refilled.</li> </ul>
All indicator lights are off	On/Off switch is off	<ul style="list-style-type: none"> <li>• Push On/Off switch on display panel.</li> </ul>
	Display panel ribbon cable connection	<ul style="list-style-type: none"> <li>• Connect display panel ribbon cable.</li> <li>• Verify ribbon cable is connected correctly.</li> </ul>
	Transformer secondary circuit breaker tripped	<ul style="list-style-type: none"> <li>• Check for wiring shorts; reset breaker.</li> </ul>
Steam light on the display panel is blinking on and off	The enable/safety circuit is open.	<ul style="list-style-type: none"> <li>• If no other lights are on or blinking, check the airflow proving switch (a recommended optional component):                             <ul style="list-style-type: none"> <li>– Verify that tube orientation in the duct is correct.</li> <li>– Verify tube is connected to the switch correctly.</li> <li>– If connections are correct and switch does not make with airflow, replace switch.</li> </ul> </li> <li>• Check high limit humidistat (a recommended optional component):                             <ul style="list-style-type: none"> <li>– Verify connection per the wiring diagram and the diagram on the high limit humidistat cover.</li> <li>– Verify that the high limit humidistat is the correct distance downstream of dispersion tube.</li> <li>– If connections and location are correct, replace high limit humidistat.</li> </ul> </li> </ul>
	Low water condition	<ul style="list-style-type: none"> <li>• If the fill light is also on:                             <ul style="list-style-type: none"> <li>– Verify that the water shut-off valve is open.</li> <li>– Check fill valve strainer; clean or replace if clogged (strainer is in valve assembly inlet).</li> </ul> </li> <li>• If the fill light is also blinking, refer to the "Fill light on the display panel is blinking on and off" section below.</li> </ul>
Fill light on the display panel is blinking on and off (fill fault)	<p>When in a fill sequence, the internal controller allows 15 minutes for water to reach the maximum upper water level. If water is not sensed at the top probe of the probe assembly after filling for 15 minutes, the fill light on the display panel will blink on and off.</p> <p>There are two causes for this: either the tank did not fill, or the tank filled but water is not being detected.</p>	<p><b>Tank is not full</b></p> <ul style="list-style-type: none"> <li>• Verify that water shut-off valve is open.</li> <li>• Verify that the fill valve electrical plug is fully engaged.</li> <li>• Verify proper fill valve wiring at terminals 33 and C.</li> <li>• Verify voltage supplied to fill valve is correct. Valve coil should be 24 VAC.</li> <li>• Check fill valve strainer; clean or replace if clogged. Check the strainer by disconnecting the fill valve inlet fitting. Remove the strainer with a small screwdriver.</li> <li>• Fill valve may be plumbed backward. Note flow direction and correct as needed.</li> <li>• Verify that water supply pressure is at least 25 psi (175 kPa).</li> <li>• Verify that fill and drain valve wiring are not reversed.</li> <li>• Remove fill valve and check for any foreign material plugging the valve.</li> <li>• Excessive water hammer can bend a needle valve and make it difficult to open. If this is happening, the valve may need to be replaced. Install a water hammer shock arrestor.</li> </ul> <p><b>Tank is full</b></p> <ul style="list-style-type: none"> <li>• Clean or replace probe.</li> <li>• Check water conductivity. Water conductivity must be at least 100 µS/cm. Add salt to increase. Consult DRI-STEEM for further advice.</li> </ul>

More on the next page ►

## Troubleshooting guide (continued)

**Table 29-1:  
Problem/possible cause/action**

Problem	Possible cause	Action
<b>Drain light on the display panel is blinking on and off (drain fault)</b>  <b>Note: The humidifier will continue to operate in this mode.</b>	When in autodrain sequence or end-of-season drain, the internal controller allows 12 minutes for the water level to drop from the top probe to below the lowest probe. If the tank does not drain to this level in the time allotted, the drain light on the display panel will blink on and off.	<ul style="list-style-type: none"> <li>• Verify that drain valve electrical plug is fully engaged.</li> <li>• Check drain valve wiring at terminals 32 and C.</li> <li>• Check for voltage present at the valve. Valve motor should be 24 VAC; if present, clean or replace valve.</li> <li>• Check if the tank drain outlet from the humidifier is plugged. Clean if needed.</li> </ul>
	Water detection probes	<ul style="list-style-type: none"> <li>• Clean probes or replace probe rod assembly.</li> </ul>
	Fill valve is not closing	<ul style="list-style-type: none"> <li>• Fill valve may be plumbed backwards. Note flow direction on valve body and replumb if necessary.</li> <li>• If fill valve is plumbed correctly and leaking water, replace fill valve.</li> </ul>
	Drain line is backing up with water	<ul style="list-style-type: none"> <li>• Verify drain line pitch. Pitch drain pipe toward drain 1/8" /ft (1%) minimum.</li> <li>• Verify drain line size. If piping run is over 10' (3 m) , increase drain pipe size from 3/4" (DN20) to 1 1/4" (DN32).</li> <li>• Verify that the drain line is not plugged. Disconnect drain piping from the humidifier at the hose or union connection. Replace or clean drain piping if there is standing water in the piping or if water does not flow freely through the drain piping.</li> </ul>
<b>The On/Off light on the display panel is blinking slowly (one blink per second)</b>	Mineral buildup or oxidation on probe rods	<ul style="list-style-type: none"> <li>• Remove probe assembly and clean probe rods; reset power to clear warning.</li> </ul>
	Deterioration of probe rod assembly	<ul style="list-style-type: none"> <li>• Replace probe rod assembly.</li> </ul>
<b>The On/Off light on the display panel is blinking rapidly (10 blinks per second) (illogical probe fault)</b>	Probe is wired incorrectly	<ul style="list-style-type: none"> <li>• Verify wiring; see wiring diagram.</li> <li>• Verify that probe wires are routed separately from high voltage wires to avoid interference.</li> <li>• Verify the green and yellow ground wire is connected to the subpanel and to the C terminal.</li> </ul>
	Deterioration of probe rod assembly	<ul style="list-style-type: none"> <li>• Replace probe rod assembly.</li> </ul>
	Tank water is foaming.	<ul style="list-style-type: none"> <li>• Clean tank.</li> </ul>
<b>No remote fault indication (drain fault, fill fault, illogical probe fault)</b>	Field wiring not installed	<ul style="list-style-type: none"> <li>• Provide field wiring to a remote fault indicator from NO, O, NC control terminal block.</li> </ul>
	Remote fault relay is not switching.	<ul style="list-style-type: none"> <li>• Check relay continuity NO, O, NC control terminal block for contact closure.</li> </ul>
	Field-supplied remote fault indicator lamp is burned out.	<ul style="list-style-type: none"> <li>• Check if lamp by others is burned out; replace if needed.</li> </ul>
<b>System fan/blower doesn't operate.</b>  <b>Note: This is an optional connection.</b>	System fan/blower power supply is off.	<ul style="list-style-type: none"> <li>• Turn power supply on.</li> </ul>
	System fan/blower is not wired to humidifier control board.	<ul style="list-style-type: none"> <li>• See Page 8 for wiring to terminals NO, O, NC.</li> </ul>
	Control board relay is configured for fault relay function.	<ul style="list-style-type: none"> <li>• Slide switch S2 position 9 must be in "off" position. See Page 7 for more information.</li> </ul>
<b>More on the next page ►</b>		

## Troubleshooting guide (continued)

**Table 30-1:  
Problem/possible cause/action**

Problem	Possible cause	Action
<b>Humidifier does not energize; tank does not heat up</b>	Nonexistent supply voltage to humidifier	<ul style="list-style-type: none"> <li>• Check main line fuse.</li> <li>• Check main line safety switch.</li> <li>• Verify contactor electrical plug is fully engaged.</li> </ul>
	Nonexistent control voltage	<ul style="list-style-type: none"> <li>• Check for proper supply voltage per wiring diagram.</li> <li>• Verify proper wiring of multi-tap transformer.</li> <li>• Verify transformer electrical plug is fully engaged.</li> <li>• Check for control circuit voltage, 24 VAC. If voltage is not present at H and C, check transformer circuit breaker.</li> <li>• Reset if needed by pressing On/Off switch on display panel.</li> <li>• Reset manual over-temperature switch located above heater on humidifier cover.</li> </ul>
	Resettable over-temperature thermostat is open.	<ul style="list-style-type: none"> <li>• Reset manual switch located above heater on humidifier cover.</li> <li>• Verify contactor and transformer electrical plugs are fully engaged.</li> </ul>
	Non-resettable over-temperature thermostats (in power lines to heaters) are open.	<ul style="list-style-type: none"> <li>• Replace non-resettable thermostats.</li> <li>• Check all components for over-temperature damage.</li> <li>• Determine cause of dry fire by checking for a frozen contactor or a probe assembly malfunction and remedy before restarting humidifier.</li> </ul>
<b>Reduced or no output (even though water level is correct)</b>	Malfunctioning control system	<ul style="list-style-type: none"> <li>• Check if auxiliary limit controls are not allowing system to operate, e.g., high limit humidistat, airflow proving switch, etc. Reset, replace, or calibrate as needed.</li> <li>• Check if the resettable over-temperature thermostat has tripped. Reset if necessary.</li> <li>• Check if the non-resettable over-temperature thermostats have tripped. Replace if necessary.</li> </ul>
	Heater malfunctioning	<ul style="list-style-type: none"> <li>• Verify that contactor and transformer electrical plugs are fully engaged.</li> <li>• Verify that proper voltage is being applied to heaters.</li> <li>• Check heater amperage.</li> <li>• If heater power components are not functioning, replace.</li> </ul>
<b>Heater burnout</b>	Improper wiring	<ul style="list-style-type: none"> <li>• Verify proper voltage applied to heater.</li> <li>• Verify proper electrical connections.</li> </ul>
	Water level is too low.	<ul style="list-style-type: none"> <li>• Replace probe assembly.</li> </ul>
	Mineral buildup on heaters	<ul style="list-style-type: none"> <li>• If heaters are on continuously and therefore not expanding and contracting with on-off cycles to shed mineral buildup, the humidifier may be undersized. Replace with a larger unit or add an additional humidifier.</li> <li>• Inspect tank for severe mineral buildup on or around heater. If present, increase cleaning frequency or use softened supply water.</li> </ul>
	Heater corrosion	<ul style="list-style-type: none"> <li>• Inspect heater for surface corrosion or pitting. This is usually caused by a high chloride level in the supply water. Test water and consult DRI-STEEM for advice.</li> </ul>
<b>Unit does not fill with water.</b>	No water supply to fill valve	<ul style="list-style-type: none"> <li>• Verify that manual water supply valve is open and that pressure exists.</li> <li>• Check if water supply line strainer is plugged. Clean strainer or replace.</li> <li>• Verify fill valve electrical plug is fully engaged.</li> </ul>
	Unit control is not on	<ul style="list-style-type: none"> <li>• Press On/Off switch on display panel.</li> <li>• Verify transformer electrical plug is fully engaged.</li> </ul>
	Malfunctioning fill valve	<ul style="list-style-type: none"> <li>• Unplug probe head. Fill valve should open. If fill valve does not open:                             <ul style="list-style-type: none"> <li>– Verify fill valve electrical plug is fully engaged.</li> <li>– Verify proper 24 VAC (terminals 33 and C) to fill valve. If voltage is present and valve does not open, replace valve.</li> </ul> </li> </ul>
	Malfunctioning level control system	<ul style="list-style-type: none"> <li>• Check terminals 3, 4, 5, and C on the internal controller board terminal block for correct wiring.</li> </ul>
	Humidifier is in end-of-season drain mode.	<ul style="list-style-type: none"> <li>• Check for humidification demand signal at control board terminals 1 and C of terminal block.</li> </ul>
<b>More on the next page ►</b>		



## Troubleshooting guide (continued)

Table 31-1: Problem/possible cause/action		
Problem	Possible cause	Action
Fill valve does not close.	Malfunctioning level control system	<ul style="list-style-type: none"> <li>• Check that probe electrical plug is fully engaged.</li> <li>• Verify that probe is wired per wiring diagram.</li> <li>• Verify the green and yellow ground wire is connected to the C terminal and the subpanel.</li> <li>• If the internal control board relay output is shorted to fill valve coil, replace board.</li> <li>• If needed, clean probe rods.</li> <li>• Check water conductivity. Water conductivity must be at least 100 µS/cm. Add salt to increase. Consult DRI-STEEM for further advice.</li> </ul>
	Fill valve is stuck.	<ul style="list-style-type: none"> <li>• Check for control voltage across fill valve coil (terminals 33 and C on control terminal strip).</li> <li>• Check if fill valve is installed backwards. If yes, repipe.</li> <li>• Check if there is an obstruction that does not allow valve to seat properly. Clean or replace valve as needed.</li> <li>• If there is a faulty internal spring or diaphragm in the fill valve, replace valve.</li> </ul>
	Drain valve is open.	<ul style="list-style-type: none"> <li>• If automatic drain valve is locked in manual open position, reset to automatic.</li> <li>• Replace valve if there is a broken return spring on the drain valve.</li> <li>• Clean or replace drain valve if an obstruction in the valve does not allow complete closure.</li> </ul>
Fill valve cycles on and off frequently (several times per minute)	Malfunctioning level control system	<ul style="list-style-type: none"> <li>• If needed, clean probes.</li> <li>• Verify that probe wiring is correct.</li> <li>• Check water conductivity. Water conductivity must be at least 100 µS/cm. Add salt to increase. Consult DRI-STEEM for further advice.</li> </ul>
	Drain valve not fully closed	<ul style="list-style-type: none"> <li>• If an obstruction does not allow drain valve to fully close, clean valve.</li> <li>• If there is a broken or weak return spring on drain valve, replace the valve.</li> </ul>
Unit does not perform autodrain sequence	No power to automatic drain valve	<ul style="list-style-type: none"> <li>• Verify drain valve electrical plug is fully engaged.</li> <li>• Check if 24 VAC is present at the internal controller board terminals 32 and C for drain valve.</li> </ul>
	Drain fault, plugged drain valve, or plugged drain pipe	<ul style="list-style-type: none"> <li>• Check drain valve piping.</li> </ul>
	Defective automatic drain valve	<ul style="list-style-type: none"> <li>• If voltage is present at valve and it still does not open, replace valve.</li> </ul>
Unit does not perform end-of-season drain	Input signal always has a demand	<ul style="list-style-type: none"> <li>• Reduce demand signal.</li> </ul>
	Drain valve	<ul style="list-style-type: none"> <li>• Verify drain valve electrical plug is fully engaged.</li> <li>• Verify drain valve is wired correctly to control board.</li> <li>• Check 24 VAC across valve coil during test cycle (terminals 32 and C on control terminal strip).</li> </ul>

More on the next page ►

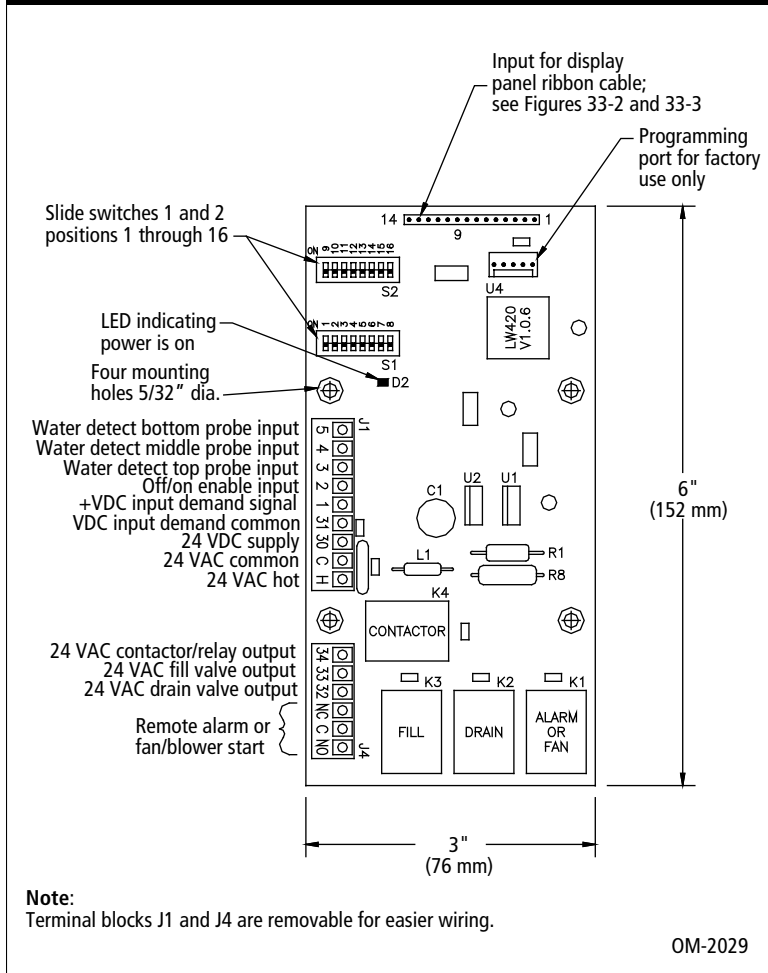
## Troubleshooting guide (continued)

**Table 32-1:  
Problem/possible cause/action**

Problem	Possible cause	Action
<b>Humidity below desired level</b>	No humidity demand signal from humidistat	<ul style="list-style-type: none"> <li>• Low or no signal strength from humidistat. Check for proper wiring.</li> <li>• No demand signal by others.</li> </ul>
	Unit is operating but fails to meet required humidity output	<ul style="list-style-type: none"> <li>• If steam is passing to the plumbing system drain, the P-trap is not filling with water: <ul style="list-style-type: none"> <li>– Disconnect the probe assembly to allow the fill valve to overfill the tank to fill the P-trap.</li> <li>– If there is excessive internal steam pressure, determine the cause of the high pressure (e.g., high duct static pressure, undersized orifices in dispersion tube, or crushed vapor hose) and repair as required.</li> </ul> </li> <li>• If drain valve does not close fully, determine the cause and clean, repair, or replace as needed.</li> <li>• If fill valve is stuck open, repair or replace.</li> <li>• Recalibrate if controls are out of calibration.</li> <li>• Replace leaking gasket or vapor hose.</li> <li>• Unit is undersized; replace with a larger unit or add additional humidifier.</li> </ul>
	Heating elements not operating	<ul style="list-style-type: none"> <li>• Verify that humidistat is calling for humidity.</li> <li>• Check for control voltage if limit controls (airflow proving switch, etc.) are not allowing unit to operate.</li> <li>• Verify contactor and transformer electrical plugs are fully engaged.</li> <li>• Check if the resettable over-temperature switch has been tripped. Reset if necessary.</li> <li>• Check if the non-resettable over-temperature thermostats have tripped. Replace if necessary.</li> <li>• Check water conductivity. Water conductivity must be at least 100 µS/cm. Add salt to increase. Consult DRI-STEEM for further advice.</li> <li>• If heaters are burned out, refer to "heater burnout" problem on Page 30.</li> </ul>
	Humidity control input type not the same as the operating mode.	<ul style="list-style-type: none"> <li>• Check the internal control board connections and slide switches S1 and S2 positions 1 and 2. See Pages 10-11 for more information.</li> </ul>
	Excessive outside air volume	<ul style="list-style-type: none"> <li>• Verify proper operation of fans and dampers.</li> </ul>
<b>Humidity above set point</b>	Improperly located humidistat	<ul style="list-style-type: none"> <li>• Relocate, using guidelines described on Page 17.</li> </ul>
	Reduced airflow	<ul style="list-style-type: none"> <li>• Check fans and dampers.</li> </ul>
	Malfunctioning controls	<ul style="list-style-type: none"> <li>• Check for incorrect supply voltage.</li> <li>• Check for incorrect control signal.</li> <li>• Check for improper wiring hookup.</li> <li>• If humidity controller is out of calibration or malfunctioning, repair or recalibrate.</li> <li>• Check if contactor shorted. Repair or replace as needed.</li> </ul>
	Improper slide switch settings	<ul style="list-style-type: none"> <li>• If the humidifier is receiving a 4-20 mA signal by others, the slide switches need to set as shown on Page 11 or the humidifier will run continuously.</li> </ul>
	Unit oversized	<ul style="list-style-type: none"> <li>• Consult DRI-STEEM.</li> </ul>
	High entering relative humidity	<ul style="list-style-type: none"> <li>• Dehumidify.</li> </ul>
<b>Hunting (humidity swings above and below desired set point)</b>	Malfunctioning control system	<ul style="list-style-type: none"> <li>• If there is a faulty or inaccurate humidity controller repair or replace.</li> <li>• Relocate poorly located control components. See humidity control placement information on Page 17.</li> </ul>
<b>Noisy operation</b>	Thunder-type noise is coming from tank during refill.	<ul style="list-style-type: none"> <li>• This is normal on larger units and is caused by the cold fill water collapsing steam in the tank. Reduce water pressure (minimum of 25 psi [172 kPa]) if inlet water pressure is too high.</li> </ul>
	Contactor noise	<ul style="list-style-type: none"> <li>• Verify that contactor and transformer electrical plugs are fully engaged.</li> <li>• Verify 24 VAC at H on internal control board and at C on terminal strip.</li> <li>• Contactor normally makes a "clunk" sound as it pulls in. A continuous chattering noise is not normal and is symptomatic of a failing contactor or malfunctioning controls. Replace contactor or troubleshoot the control system.</li> </ul>
	Fill valve noise	<ul style="list-style-type: none"> <li>• A clicking sound as the fill valve opens or closes, and a hissing sound during fill are normal. A slamming sound as fill valve closes is "water hammer" and can be minimized by installing a shock arrestor.</li> <li>• A loud buzzing sound indicates poor alignment or valve stem. Replace valve.</li> </ul>

# Replacement parts

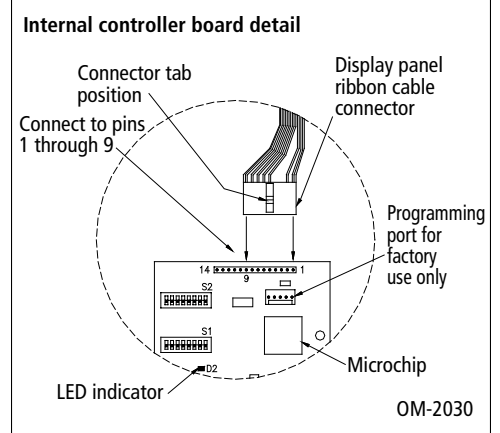
**Figure 33-1:  
Internal controller board**



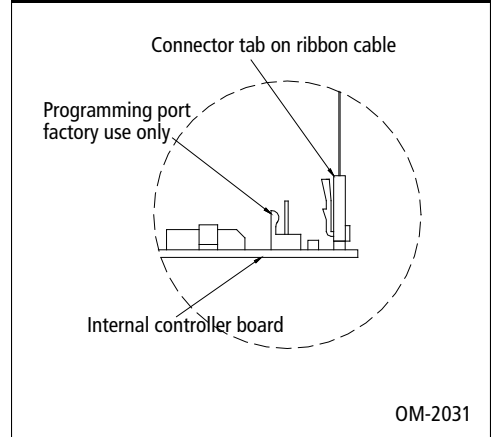
**Note**

See Page 35 for a listing of replacement part numbers.

**Figure 33-2:  
Display panel ribbon connection**

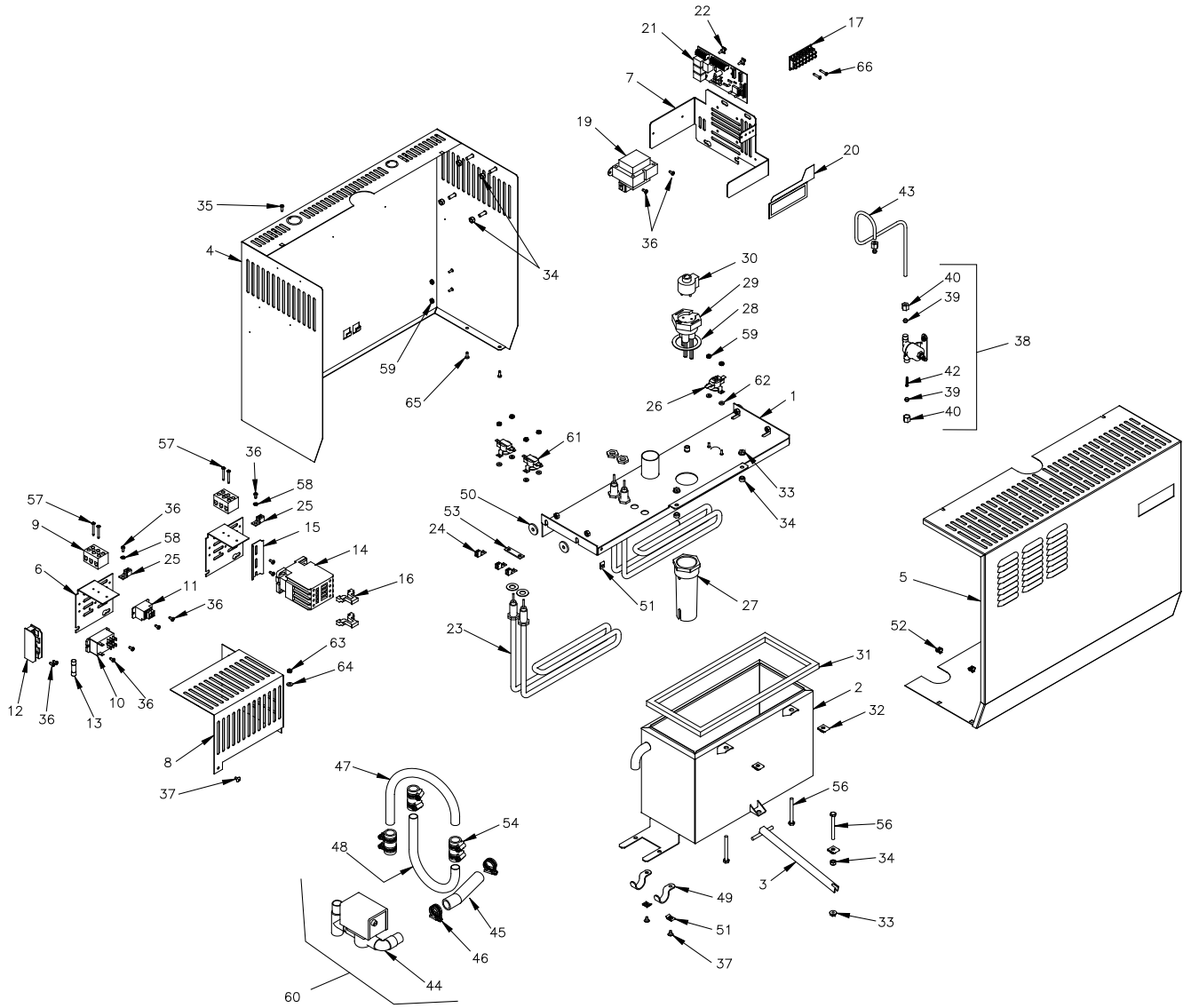


**Figure 33-3:  
Display panel connector polarity**



# Replacement parts (continued)

**Figure 34-1:**  
**Humidifier replacement parts**



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

OM-4040

## Replacement parts (continued)

**Table 35-1:  
Replacement parts (refer to drawing on Page 34)**

No.	Description	Part number	No.	Description	Part number
1	Cover weld, VT 1-heater	164702-001	31	Gasket, VT 1-heater tank	160696-001
	Cover weld, VT 2-heater	164702-002		Gasket, VT 2-heater tank	160696-002
	Cover weld, VT 3-heater	164702-003		Gasket, VT 3-heater tank	160696-003
2	Tank weld, VT 1-heater	164704-001	32	Nut retainer assy, 1/4"-20	700650
	Tank weld, VT 2-heater	164704-002	33	Nut, 1/4-20 plated flange	700300-022
	Tank weld, VT 3-heater	164704-003	34	Nut, 1/4-20 zinc w/ nylon insert	700300-016
3	Handle weld, 1-heater VT tank	160016-001	35	Screw, 10-24 × 1/2" plated pnhd phlps	700251-003
	Handle weld, 2-heater VT tank	160016-002	36	Screw, 8-32 × 3/8" pnhd phlps drv- type F	700170-001
	Handle weld, 3-heater VT tank	160016-003	37	Screw, 10-32 × 3/8" pnhd phlps drv- type M	700250-005
4	Frame weld, VT 1-heater and 2-heater	164701-001	38	Valve assy, 1/4" 24 V compression fill	505084-004
	Frame weld, VT 3-heater	164701-002	39	Ferrule, 1/4" compression	160223-010
5	Shroud, VT 1-heater and 2-heater	164710-002	40	Nut, 1/4" compression	160223-015
	Shroud, VT 3-heater	164710-003	42	Strainer, 1/4" fill valve	160223-020
6	Subpanel, VT power	164706-002	43	Fill tube, 1/4" bent copper	204812-001
7	Subpanel, VT control	164706-001	44	Drain assy, 3/4" electric sweated	180205-010
8	Cover, VT 1-heater terminal	164705-001	45	Hose, 3/4" I.D. × 5" heater	307016-005
	Cover, VT 2-heater terminal	164705-002	46	Hose Clamp, 3/4" I.D.	700560-075
	Cover, VT 3-heater terminal	164705-003	47	Tube, 3/4" copper water seal top	204811-101
9	Terminal block, pressure contact, 3-pole	408300-002	48	Tube, 3/4" copper water seal bottom	204811-102
10	Relay, AC safety	407901-001	49	Strap, 1" conduit	407150-100
11	Relay, DC control	407902-001	50	Washer, 1/4" nylon × 1/8" thick	700301-026
14	Contactor, 60 amp (GE)	407001-021	51	10-32 Tinnerman clip	700680
	Contactor, 32 amp (GE)	407001-020	52	Nut retainer, 8-32 zinc plated	409593-001
15	DIN rail, 4" long	167765-004	53	Buss bar, .50 × 1.898	167760-001
16	Bracket, DIN rail terminal end	408252-006	54	Hose, 3/4" I.D. × 2" heater	307016-002
17	Terminal block with wiring harness	409220-001	56	Bolt, 1/4-20 × 2-1/2" hex head zinc	700300-025
19	Transformer, 120/208/240/480V 24V Sec.	408965-001	57	6-32 × 1-1/4" pnhd phlps drv-typ F	700100-002
	Transformer, 600V	408986	58	Washer, #8 ext tooth plated lock	700200-003
20	Overlay & switch, LW-420 LED (DS)	408636-001	59	Nut, 8-32 KEPS	700200-008
21	Board, LW-420 control	408635	60	Drain assy, full copper P-trap	182004
22	Standoff, PC board clip	409591-001	61	Thermo cut-out, non-reset	409560-002
23	Heater		62	Spacer, copper thermal trip	164582
24	Lug, wire	409250-003	63	Nut, 8-32 plated hex	700200-002
25	Lug, medium	409250-027	64	10-32 Flat washer	700300-008
26	Thermo cut-out, VF/VM/CRU/VLC	409560-001	65	Screw, 8-32 × 1/2	700170-007
27	Probe housing, nylon	308500	66	Screw, 6-32 × 3/4	700100-001
28	Gasket, 2.5" O.D. × 1.9" I.D.	309750-004	<b>Not shown in drawing</b>		
29	Probe assy (VT-2 and VT-4 with 2 kW heaters)	406303-006		Lag bolt, 3/8 × 2" plated	700540-002
	Probe assy (VT-4 through VT-16 with > 2 kW heaters)	406303-002		Hose, 1" I.D. heater	307020-003
30	Plug, 24" vert wire assy probe w/o conduit	406050-005		Hose Clamp, 1" I.D.	700560-100
				Wire harness, VT electrical	409220-001

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## Notes

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## Notes

## Expect quality from the industry leader

For more than 40 years, DRI-STEEM has been leading the industry with creative and reliable humidification solutions. Our focus on quality is evident in the construction of this humidifier, which features cleanable, stainless steel construction, and an industry-leading two year warranty that covers all parts.

## For more information

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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 reinstallation 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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