XT SERIES

Electrode Steam Humidifiers

Installation, Operation, and Maintenance Manual

Read and save these instructions

driSteem

Warnings & Cautions

⚠ WARNING	CAUTION
Indicates a hazardous situation that could result in death or serious injury if instructions are not followed.	Indicates a hazardous situation that could result in damage to or destruction of property if instructions are not followed.

⚠ WARNING

Attention installer

Read this manual before installing, and leave this manual with product owner. This product must be installed by qualified HVAC and electrical contractors. Installation must be code approved. Improper installation can cause property damage, severe personal injury, or death as a result of electric shock, burns, or fire.

DriSteem® Technical Support: North America: 800-328-4447

Europe: +3211823595

Read all warnings and instructions

Read this manual before performing service or maintenance procedures on any part of the system. Failure to follow all warnings and instructions could produce the hazardous situations described, resulting in property damage, personal injury, or death.

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

Hot surfaces and hot water

This steam humidification system has extremely hot surfaces. Water in steam cylinders, steam tubing, and dispersion assemblies can be as hot as 212 °F (100 °C). Discharged steam is not visible. Contact with hot surfaces, discharged hot water, or air into which steam has been discharged can cause severe personal injury. To avoid severe burns, follow the cool-down procedure in this manual before performing service or maintenance procedures on any part of the system.

Disconnect electrical power

Disconnect electrical power before installing supply wiring or performing service or maintenance procedures on any part of the humidification system. Failure to disconnect electrical power could result in fire, electrical shock, and other hazardous conditions. These hazardous conditions could cause property damage, personal injury, or death.

Contact with energized circuits can cause property damage, severe personal injury, or death as a result of electrical shock or fire. Do not remove cabinet doors until electrical power is disconnected.

Follow the shutdown procedure on Page 58 before performing service or maintenance procedures on any part of the system.

⚠ WARNING

Electrical shock hazard
If the humidifier starts up responding to a call for humidity during maintenance, severe personal injury or death from electrical shock could occur. To prevent such start-up, follow the shutdown procedure on Page 58.

CAUTION

Follow steam piping recommendations
Controlling condensate flow and collection in an XT Series humidifier system is critical to maximize performance. Failure to follow the steam piping recommendations in this manual can cause system pressure fluctuations and increase cylinder pressure, steam velocity, and condensate noise.

Hot discharge water
Discharge water can be as hot as 212 °F (100 °C) and can damage some drain plumbing materials not rated for hot drain water. To prevent such damage, make sure drain water tempering is selected, and supply water is not heated. Do not shut off supply water to the cylinder before it is drained.

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

Table of Contents

ATTENTION INSTALLER

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

DriSteem Technical Support
800-328-4447

Website:

Documents can be viewed, printed or ordered from our website, www.dristeem.com.

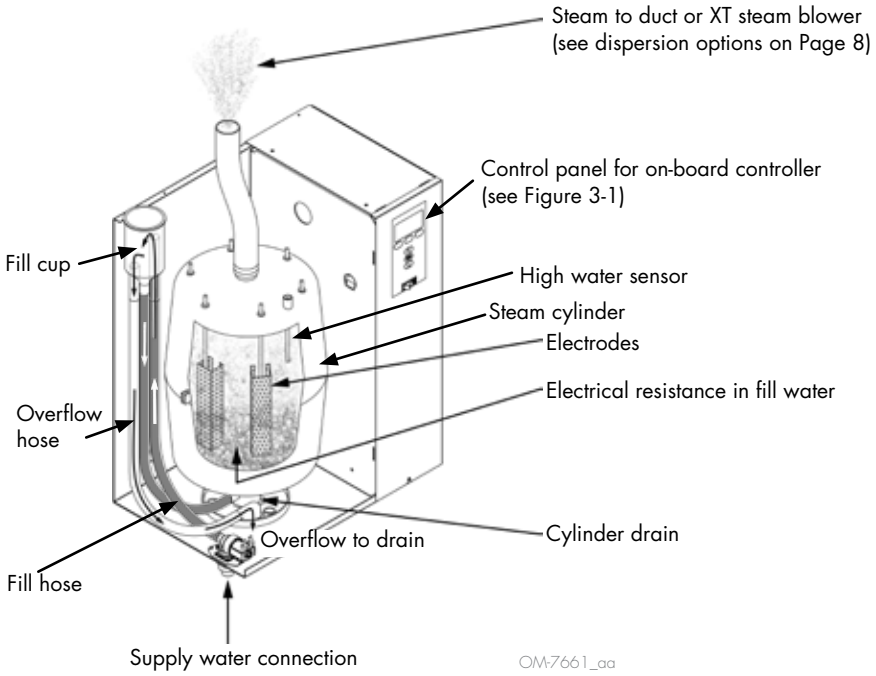
DriCalc sizing and selection software:

DriCalc® is our humidification system sizing and selection software, which can be accessed from dristeem.com.

Table of Contents

DriSteem XT Series electrode steam humidifiers use heat caused by electrical resistance in their fill water to boil the fill water into humidification steam. Steam output and water conductivity are managed via automatic draining and filling. See Figure 2-1.

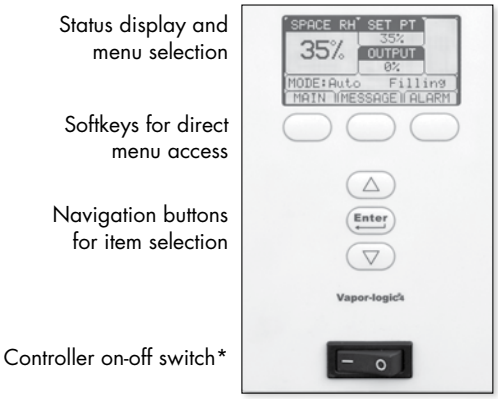
FIGURE 2-1: XT SERIES HUMIDIFIER COMPONENTS



Note: See detailed installation drawing on Page 14 and principle of operation on Page 54.

FIGURE 2-1: XT SERIES HUMIDIFIER CONTROL PANEL

XTP Vapor-logic keypad/display



* On-off switch for control board — not a safety shut-off to humidifier power wiring.

Download DriSteem literature

DriSteem product manuals can be downloaded, printed, and ordered from our website: www.dristeem.com

The *Vapor-logic Installation and Operation Manual* ships with Model XTP humidifiers. It is a comprehensive manual. Refer to it for information about the keypad/display and Web interface, and for troubleshooting information.

Table 2-1:
DriSteem supply water guidelines for XT series electrode humidifiers

Supply water conductivity	125-350 mS Low conductivity cylinder* 350- 1250 mS Standard cylinder
Chlorides	Not limited
pH	6.5 to 8.5
Silica	< 15 ppm

Demineralized, **deionized**, and **reverse-osmosis** water cannot be used.

Supply water outside of these guidelines may void your DriSteem warranty. Please contact your DriSteem Representative or DriSteem Technical Support if you need advice.

The start-up time will vary based on supply water conductivity and operational conditions, the humidifier may not reach the full steam capacity during the first few hours of operation. NOTE: For very low conductivity supply water applications, when full capacity is required quickly, Dristeem's resistance style generators are recommended.

* For optimal low conductivity operation enable the Mini Drain feature in your Vapor-logic controller: Main > Setup > XT management > Mini Drain > Enable.

See Table 6-1 for Low conductivity availability.

SUPPLY WATER

Hard water is 10 grains hardness and above. Naturally occurring soft water is below 10 grains hardness. The benefit of hard water is less frequent draining and filling than with softened water, which results in better energy and water efficiency and more consistent steam output. However, cylinder replacement could be more frequent with hard water, because hard water scale coats the electrodes. The harder the water, the more frequent the need for a new cylinder.

CONTROLLER

The Model XTP humidifier Vapor-logic® controller features menus for all humidifier functions, with a Web interface for access to all functions via Ethernet. See "Operations" beginning on page 45 for details.

CONDUCTIVITY OF THE WATER

All of DriSteem's isothermal humidifiers can use hard, softened, DI, or RO water except for XT Series electrode humidifiers. Electrode humidifiers require conductive water and, therefore, cannot use water with little or no total dissolve solids (TDS), such as DI, RO, or softened water.

Electrical conductivity in water is proportional to the concentration of conductive ions in the water. The higher the concentration of conductive ions, the higher the conductivity of the water.

Resistivity is the inverse of conductivity. Ultra-pure water has so few conductive ions that it is, for all practical purposes, infinitely resistive. Conductivity is determined by the following:

- Charge on the ions
- Size of the ions
- Temperature of the water

Conductivity and resistivity are critical to the operation of an electrode humidifier. In electrode humidifiers, steam output is directly related to the resistance of the water in the steam cylinder and, therefore, to the conductivity of the water between the electrodes.

As the water in an electrode humidifier cylinder heats up, the conductivity increases. When it boils into steam, the concentration of the conductive ions increases until it reaches a threshold that triggers a drain-and fill cycle. This rids the cylinder of highly conductive water and replaces it with less conductive supply water.

The more conductive the supply water and the higher the demand, the more quickly the threshold is reached, and the more frequently the cylinder automatically drains and fills to stay within the parameters for the proper steam output. The frequency and duration of the drain-and-fill cycles is proportional to the conductivity of the supply water. Generally, less conductive supply water takes somewhat longer to reach full output at startup but requires less frequent drain-and-fill cycles. This results in more consistent steam output over time and more efficient use of energy and water.

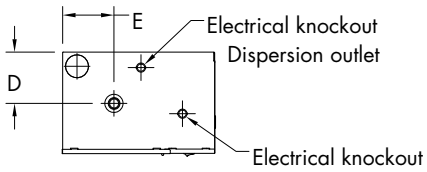
To test your job site's water conductivity use conductivity tester kit or ask your local municipalities for a water report.

Dimensional drawings

FIGURE 4-1: XT SERIES HUMIDIFIER DIMENSIONAL DRAWINGS

Models XTP 002 through 048

Top



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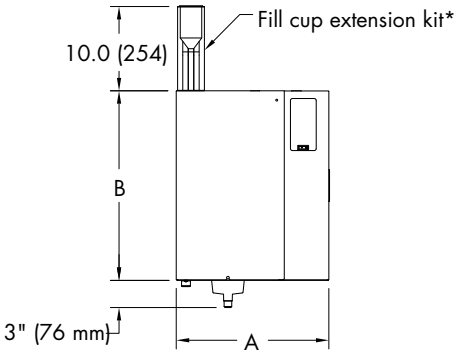

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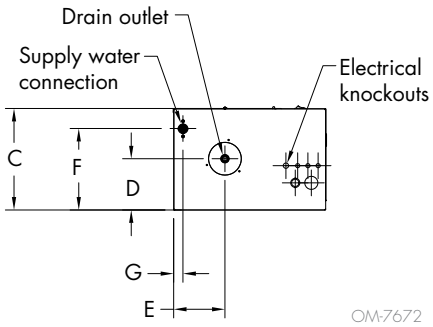
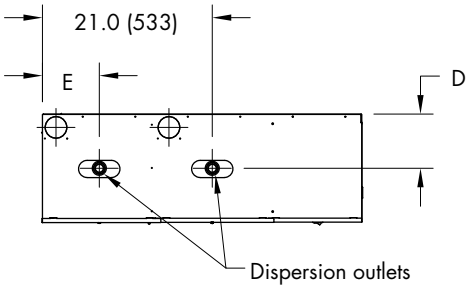


Models XTP 050 through 096

Top



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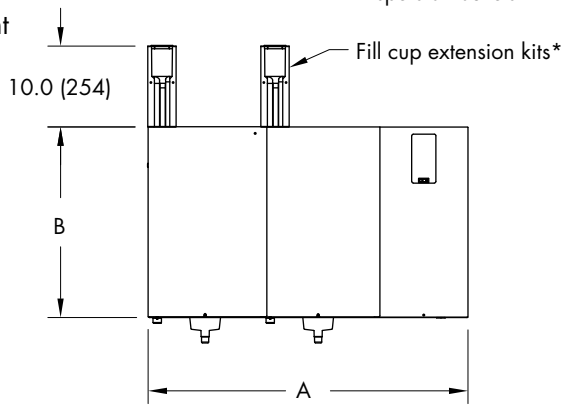

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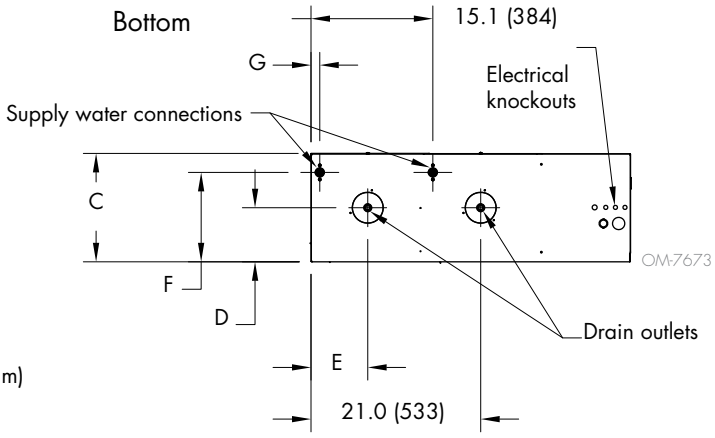


Notes:

* Fill cup extension (Figure 4-1) is required for the following:
- All XT Series humidifiers using Ultra-sorb or Rapid-sorb
- When developed length of steam tubing is more than 20' (6 m) and duct static pressure exceeds 2" wc (498 Pa)

- Labeled dimensions: inches (millimeters).
- See mounting dimensions in Figure 9-1.
- See Figure 22-1 and Table 23-1 for units mounted in an outdoor enclosure.

Dimensions and weights

Table 5-1:
XT Series humidifier dimensions by model number

Dimension	Description	Model XTP							
		002, 003, 006		010, 017		025, 033, 042, 048		050, 067, 083, 096	
		inches	mm	inches	mm	inches	mm	inches	mm
A	Cabinet width	14.6	370	17.7	450	19.9	504	39.6	1005
B	Cabinet height	20.6	523	24.1	612	25.6	650	25.6	650
C	Cabinet depth	8.7	221	11.8	300	13.4	340	13.4	340
D	Cabinet back edge to steam/drain outlet centers	4.5	114	6.0	152	6.7	170	6.7	170
E	Cabinet left edge to steam/drain outlet centers	4.4	112	6.0	152	7.0	178	7.0	178
F	Cabinet back edge to supply water connection center	6.1	156	9.2	235	10.8	275	10.8	275
G	Cabinet left edge to supply water connection center	1.0	25	1.0	25	1.1	28	1.1	28

Refer to Figure 22-1 and Table 23-1 for units mounted in an outdoor enclosure.

Table 5-2:
XT Series humidifier weights by model number

	Model XTP									
	002, 003		006		010, 017		025, 033, 042, 048		050, 067, 083, 096	
	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
Shipping weight	37	17	37	17	50	23	64	29	139	63
Maximum operating weight	38	17	46	21	79	36	115	52	219	99

Refer to Table 21-1 for units mounted in an outdoor enclosure.

Capacities, line currents, and fusing

Table 6-1:
Line currents and recommended fusing for XT Series humidifiers[1]

Model	Nominal steam capacity		kW	Phase	Volts	Maximum line current (amps)	Recommended fusing (amps)	Low conductivity cylinder option**
XTP	lbs/hr	kg/h						
002	5	2	1.7	1	120	17	25	yes
					208	10	15	yes
					230	8	15	yes
					240	8	15	yes
003	10	5	3.3	1	208	19	25	yes
					230	17	25	yes
					240	17	25	yes
					277	14	20	yes
					400	10	13	yes
					480	8	15	N/A
					600	7	10	yes
				3	208	11	15	N/A
					240	10	15	N/A
					400	6	10	yes
					480	5	10	yes
					600	4	10	yes
006	18	8	6.0	1	208	35	45	N/A
					230	31	40	N/A
					240	30	40	N/A
					277	26	35	N/A
					400	18	25	yes
					480	15	20	yes
					600	12	15	yes
				3	208	20	25	N/A
					240	17	25	N/A
					400	10	13	yes
					480	9	15	yes
					600	7	10	yes
010	30	14	10.0	3	208	33	45	N/A
					240	29	40	N/A
					400	17	25	N/A
					480	14	20	yes
					600	12	15	yes
017	50	22	16.5	3	208	55	70	yes
					240	48	60	yes
					400	29	40	yes
					480	24	35	yes
					600	19	25	yes
025	75	34	25.0	3	400	43	63	yes
					480	36	50	yes
					600	29	40	yes
033	100	45	33.3	3	400	58	80	yes
					480	48	70	yes
					600	39	50	yes
042	125	57	41.7	3	400	72	100	yes
					480	60	80	yes
					600	48	70	yes
048	143	65	47.8	3	400	80	100	yes
					480	69	90	yes
					600	55	70	yes
050*	150	68	50.0	3	400	2 x 43	2 x 63	yes
					480	2 x 36	2 x 50	yes
					600	2 x 29	2 x 40	yes
067*	198	90	66.7	3	400	2 x 58	2 x 80	yes
					480	2 x 48	2 x 70	yes
					600	2 x 39	2 x 50	yes
083*	250	113	83.3	3	400	2 x 72	2 x 100	yes
					480	2 x 60	2 x 80	yes
					600	2 x 48	2 x 70	yes
096*	287	130	95.7	3	400	2 x 80	2 x 100	yes
					480	2 x 69	2 x 90	yes
					600	2 x 55	2 x 70	yes

(1) For units with outdoor enclosure:
- If unit is a model XTP002 - XTP-048 without heater package, add 1 amp to "Maximum Line Current".
- If unit is a model XTP002 - XTP-048 with heater package, add 5 amps to " Maximum Line Current ".

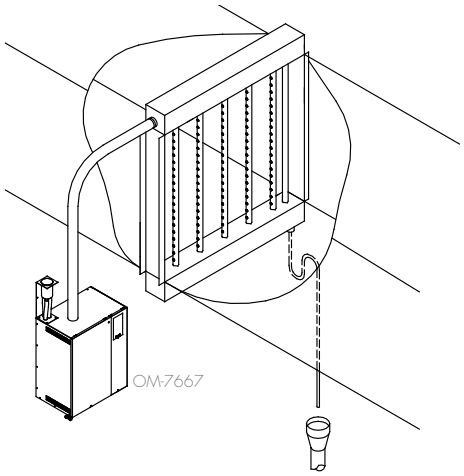
* These models have two steam cylinders and require independent service connections.
** For part numbers refer to DriSteem parts website.

Dispersion options

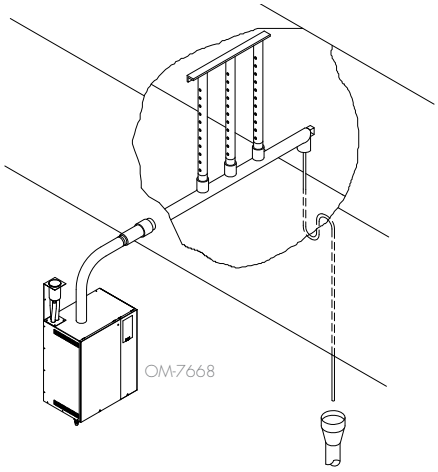
The duct dispersion options in Figure 7-1 and the open space dispersion options in Figure 7-2 are available for XT Series humidifiers. For installation details, see "Dispersion" beginning on Page 30.

FIGURE 7-1: XT SERIES HUMIDIFIER DUCT DISPERSION OPTIONS

Ultra-sorb



Rapid-sorb



Single dispersion tube

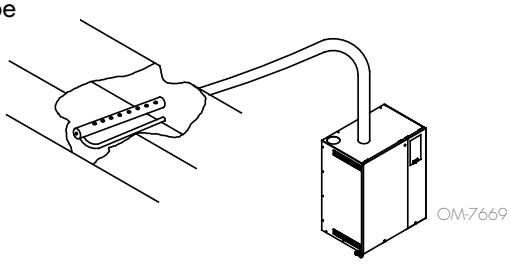
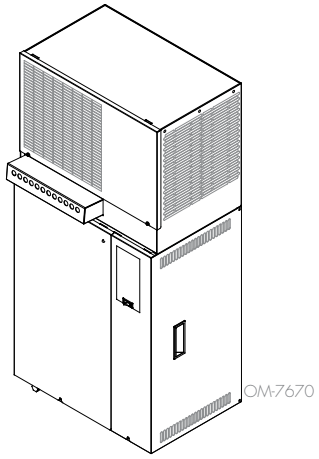
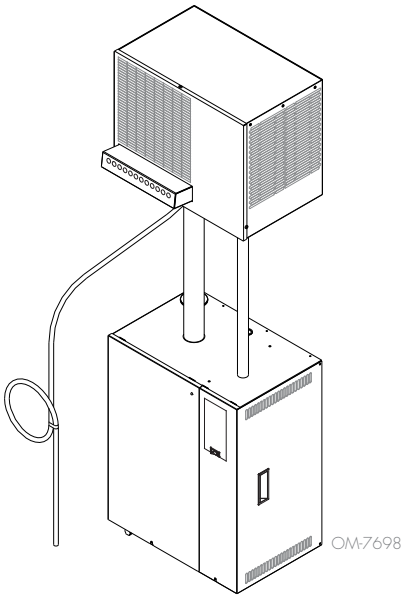


FIGURE 7-2: XT STEAM BLOWERS

Mounted on top of humidifier



Mounted up to 10' (3 m) away from humidifier



Notes:
- Models XTP 010 and larger require condensate drain. See Page 41.
- XT steam blowers (SDU) shipped with fuses to be installed in connected XT series humidifiers. North America only

Selecting a location

HUMIDIFIER

When selecting a location for the humidifier, consider the following:

- **Proximity to the duct**

  Install the humidifier near the air duct system where the dispersion assembly will be located. The maximum recommended length for steam hose connecting a single humidifier to a dispersion assembly is 10' (3 m). The maximum recommended developed length for tubing connecting a single humidifier to a dispersion assembly is 20' (6 m).

  For more information about installing dispersion assemblies, see "Dispersion" beginning on Page 30.

- **Elevation of the installed dispersion assembly**

  The recommended installation location for the dispersion assembly is at an elevation higher than the humidifier. However, if the dispersion assembly must be installed at an elevation lower than the humidifier, install a drip tee and drain. See "Drip tee installation" on Page 38.

  Before installing a dispersion assembly or interconnecting piping, review all pitch requirements in the "Dispersion" section of this manual.

- Temperature and relative humidity (RH):

  Install humidifier only in locations that meet the following temperature and RH requirements:

  - Maximum ambient temperature: 104 °F (40 °C)
  - Minimum ambient temperature: 41 °F (5 °C)
  - Maximum ambient humidity: 80% RH (non-condensing)

- Required clearances (see Figure 8-1)
- Electrical connections
- Electrical power supply connections are at the lower or upper right rear corner of the unit. See "Humidifier wiring" on Pages 17 and 18.
- Supply water and drain piping connections

  Water supply piping and drain connections are at the bottom of the cabinet. See "Piping" on Page 13.

- Exterior wall insulation

  Install the humidifier on an exterior wall only if the wall is properly insulated.

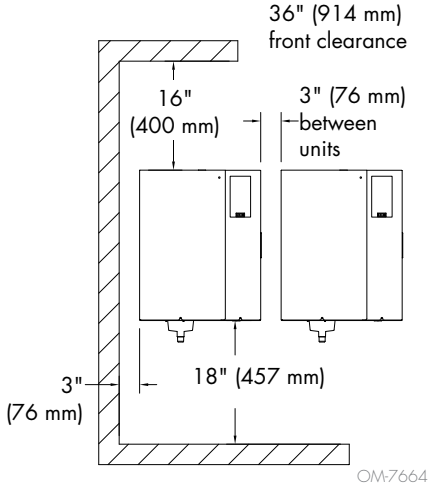
DISPERSION CONTROL DEVICES

See page 30 for recommended installation locations for the dispersion assembly and associated control devices.

Staging multiple humidifiers

Up to four Model XTP humidifiers can be staged to operate in sequence. In a sequenced application, one control input signal is divided into user-selectable control input signals for the connected humidifiers. See the *Vapor-logic Installation and Operation Manual* for instructions on staging multiple humidifiers.

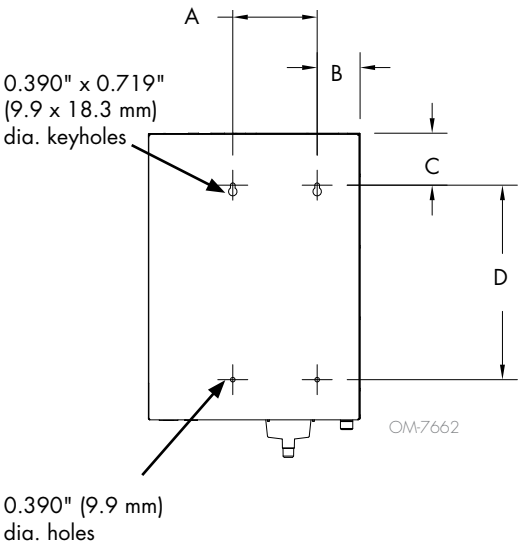
FIGURE 8-1: XT SERIES INDOOR HUMIDIFIER RECOMMENDED MINIMUM CLEARANCES



Mounting

FIGURE 9-1: XT SERIES HUMIDIFIER MOUNTING KEYHOLE LOCATIONS

Models XTP 002 through 048



Models XTP 050 through 096

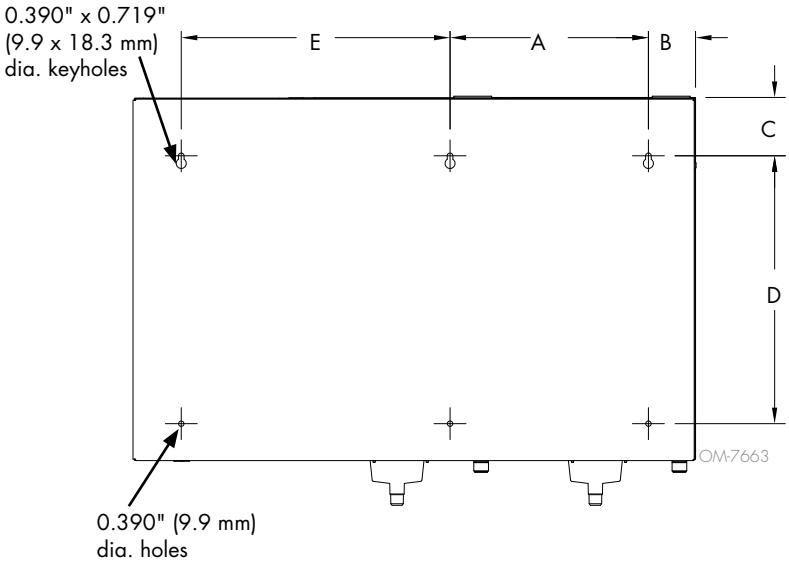


Table 9-1:
XT Series humidifier mounting keyhole dimensions

Dimension	Model XTP							
	002, 003, 006		010, 017		025, 033, 042, 048		050, 067, 083, 096	
	inches	mm	inches	mm	inches	mm	inches	mm
A	3.9	100	7.1	180	7.5	190	14.0	356
B	3.0	75	3.6	92	3.4	86	3.3	84
C	3.2	81	4.4	112	4.1	104	4.1	104
D	14.0	355	16.3	414	18.9	480	18.9	480
E	—	—	—	—	—	—	19.0	483

Refer to Figure 25-1 for units mounted in an outdoor enclosure.

Mounting

Unpack the humidifier from the shipping carton, and remove the cabinet doors and steam cylinder (see removing steam cylinder instructions below).

Note: When first unpacking the humidifier, cut and remove the shipping strap that goes around the cylinder and through the cylinder guides. This strap does not need to be replaced.

REMOVING STEAM CYLINDER

If sent to this page from the "Maintenance" section, and the humidifier has been operating, make sure the cylinder is empty and cooled before removing it. See the shutdown and cool-down procedures on Page 58.

1. Carefully pull the electrode plugs straight up off the cylinder to ensure no damage to the plug boot occurs.
2. Disconnect the high water sensor wire.
3. Place hands palms-down below cylinder on both sides of drain outlet.
4. Press up against bottom of cylinder with backs of hands while pressing down against cabinet floor with fingers.
5. Raise cylinder until drain outlet clears drain valve body and the side tabs on the cylinder have cleared the cylinder guides. Remove cylinder from cabinet.

WALL MOUNTING HUMIDIFIER

Mount the humidifier level and plumb using the lag bolts provided. Follow the instructions below for mounting on a wood stud wall.

1. Mount spanner boards on wall, spanning at least two studs. Position one board at top of cabinet (for the lag bolts), and other board at bottom of cabinet.
2. Predrill pilot holes in spanner boards, and secure humidifier to spanner boards with lag bolts.

Note: Use the appropriate mounting methods and mounting hardware for other wall types.

⚠ WARNING

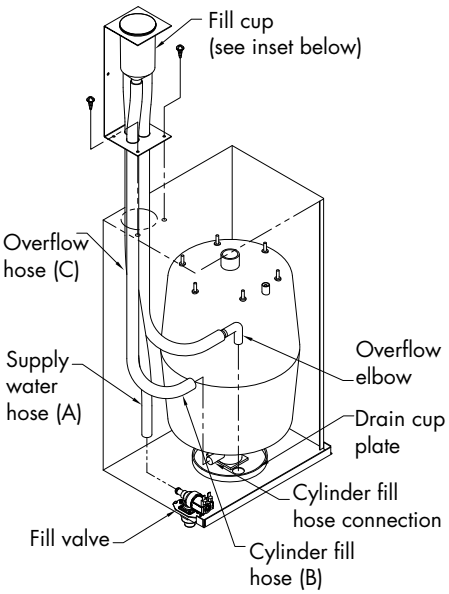
Mounting hazard
Mount humidifier per the instructions in this manual and to a structurally stable surface. Improper mounting of the humidifier can cause it to fall or tip, resulting in severe personal injury or death.

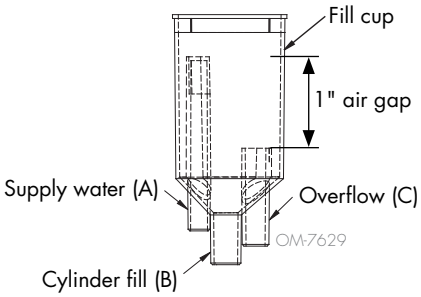
Fill cup extension kit

A fill cup extension (Figure 11-1) is required for the following:

- All XT Series humidifiers using Ultra-sorb or Rapid-sorb
- When developed length of steam tubing is more than 20' (6 m) and duct static pressure exceeds 2" wc (498 Pa)
- Outdoor enclosure units include an integral fill cup extension kit.

FIGURE 11-1: FILL CUP EXTENSION KIT





REMOVING EXISTING FILL CUP

Remove the existing fill cup as follows:

1. Remove steam cylinder from XT cabinet (if not already out).
2. Expand spring clamps and slide them up cylinder fill hose and supply water hose, and disconnect hoses from cylinder fill hose connection and fill valve adapter.
3. Disconnect overflow hose from overflow elbow.
4. Remove fill cup and hoses (fill cup is press fit into top of XT cabinet).

INSTALLING FILL CUP EXTENSION KIT

1. Remove steam cylinder(s) from XT cabinet (if not already out).
2. Route fill cup extension kit hoses into cabinet through fill cup hole, and fasten extension bracket as shown with two screws provided.
3. Route hoses along back of cabinet interior to provide clearance for cylinder.
4. Cut supply water hose (small-diameter hose) (A) to length so it can attach to fill valve adapter without kinking.
5. Expand spring clamp and slide it onto supply water hose (A) far enough so it will not interfere, then push hose onto fill valve adapter. Expand and slide spring clamp into place.
6. Cut cylinder fill hose (bottom, center hose) (B) to length so it can attach to cylinder fill hose connection without kinking.
7. Expand spring clamp and slide it onto cylinder fill hose (B) far enough so it will not interfere, then push hose onto cylinder fill hose connection. Expand and slide spring clamp into place.
8. Cut overflow hose (C) to length so it can attach to overflow elbow without kinking.
9. Push overflow hose onto overflow elbow. Spring clamp is not required on this connection.

Steam cylinder

INSTALLING STEAM CYLINDER

1. Make sure strainer is pressed into steam cylinder drain outlet and strainer flange is flush with bottom of cylinder outlet. See Figure 12-1.
2. Use water to lubricate drain outlet on bottom of cylinder and O-ring in drain valve body. See Figure 12-1.

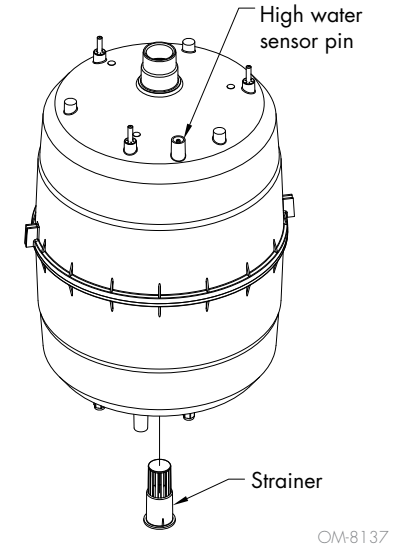
Note: Because of tight clearances, perform Steps 3 through 4 only if servicing Models XTP 002 through 017 with top-mounted steam blower. For all other models, skip to Step 5.

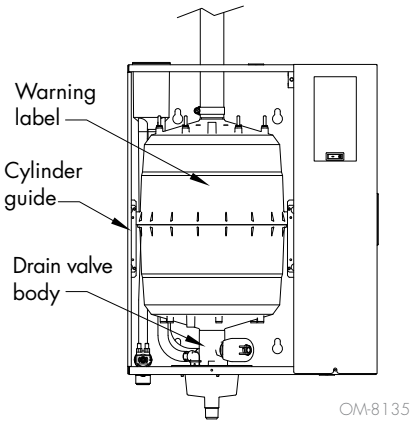
3. Slide steam hose that connects to cylinder and steam blower up until it is engaged on steam inlet of steam blower and tight against bottom of steam blower.
4. Slide steam outlet of new cylinder all the way up into open end of steam hose from Step 3.

5. With Warning label on cylinder facing you, lower cylinder drain outlet into drain valve body, and rotate cylinder so side tabs line up with cylinder guides inside cabinet. Push down on cylinder until drain outlet is fully seated in drain valve body.
6. Slide steam hose down so it is fully engaged on cylinder steam outlet. Re-install hose clamp(s).
7. Connect high water sensor (yellow) wire to single pin surrounded by plastic shoulder on cylinder.
8. **Connect electrode wires to pins on top of cylinder. Make sure all plugs fit snugly and are fully engaged on pins.**

Important: Three phase cylinders have color-coded dots on the cylinder and color bands on the electrode plugs. When connecting the plugs, match the band colors on the plugs with the dot colors on the cylinder. Refer to the wiring diagram shipped with the humidifier if necessary.

FIGURE 12-1: STEAM CYLINDER INSTALLATION





CAUTION

If cylinder plugs become loose, damage to the humidifier may occur. Obtain replacement plugs from DriSteem. See “Replacement parts” on Pages 67 and 69 for part numbers.

Piping: Supply water and drain

SUPPLY WATER PIPING

Use only copper for supply water piping; do not use rubber or plastic. The standard supply water connection before the fill valve is a 3/4" BSPP.

Note: The supply water connection size is 3/4" BSPP [DN20] in Europe.

In cases where water hammer may be a possibility, consider installing a shock arrestor. Water pressure must be 25 to 80 psi (175 to 550 kPa).

DRAIN PIPING

Drain piping must be code-approved, 3/4" (DN 20) ID material rated for 212 °F (100 °C) minimum.

The drain cup has an integral grounding plate and requires a field-installed 1" (25 mm) air gap to a drain funnel to prevent conduction of electricity in the drain line.

The XT Series humidifier features user-selectable drain water tempering. When drain water tempering is selected, the humidifier tempers drain water by opening the fill valve whenever the drain valve is energized to cool drain water before it enters the drain. Drain water tempering keeps water entering the drain line less than 140 °F (60 °C). Manually energizing the drain valve when the supply water is shut off can allow 212 °F (100 °C) water to enter the drain line.

Observe the following precautions when selecting and installing drain piping to ensure personal safety and material integrity:

- When using copper or other metallic drain piping, ground the drain piping to the earth ground lug in the XT Series humidifier.
- Chlorinated polyvinyl chloride (CPVC) piping is a non-metallic alternative for drain piping. It is rated up to 212 °F (100 °C) for intermittent-use, low-pressure applications.

The connection size for the steam cylinder drain is 1" (DN25) hose. Do not reduce this connection size. If drainage by gravity is not possible, use a reservoir pump rated for 212 °F (100 °C) water.

The open drain must be at least 12" (300 mm) below the bottom of the XT humidifier, to help prevent steam condensation on the humidifier. Use the 12" (300 mm) drain hose provided and position above field-installed open drain. Alternately, route drain line away from beneath humidifier to open drain. See Figure 13-1.

AUTOMATIC DRAIN WATER TEMPERING

XT Series humidifiers are shipped with drain water tempering set to ON for North America (OFF for Europe). To activate automatic drain water tempering see the *Vapor-logic Installation and Operation Manual*.

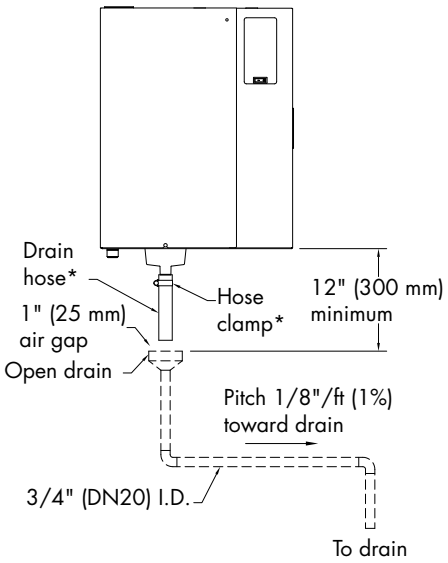
Important: Thoroughly flush supply water piping to remove pipe residue and stagnant water before connecting piping to humidifier. Pipe residue and stagnant water in water supply piping can cause foaming, preventing humidifier from reaching required steam capacity.

⚠ WARNING

Hot drain pipes

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

FIGURE 13-1: DRAIN PIPING DETAIL



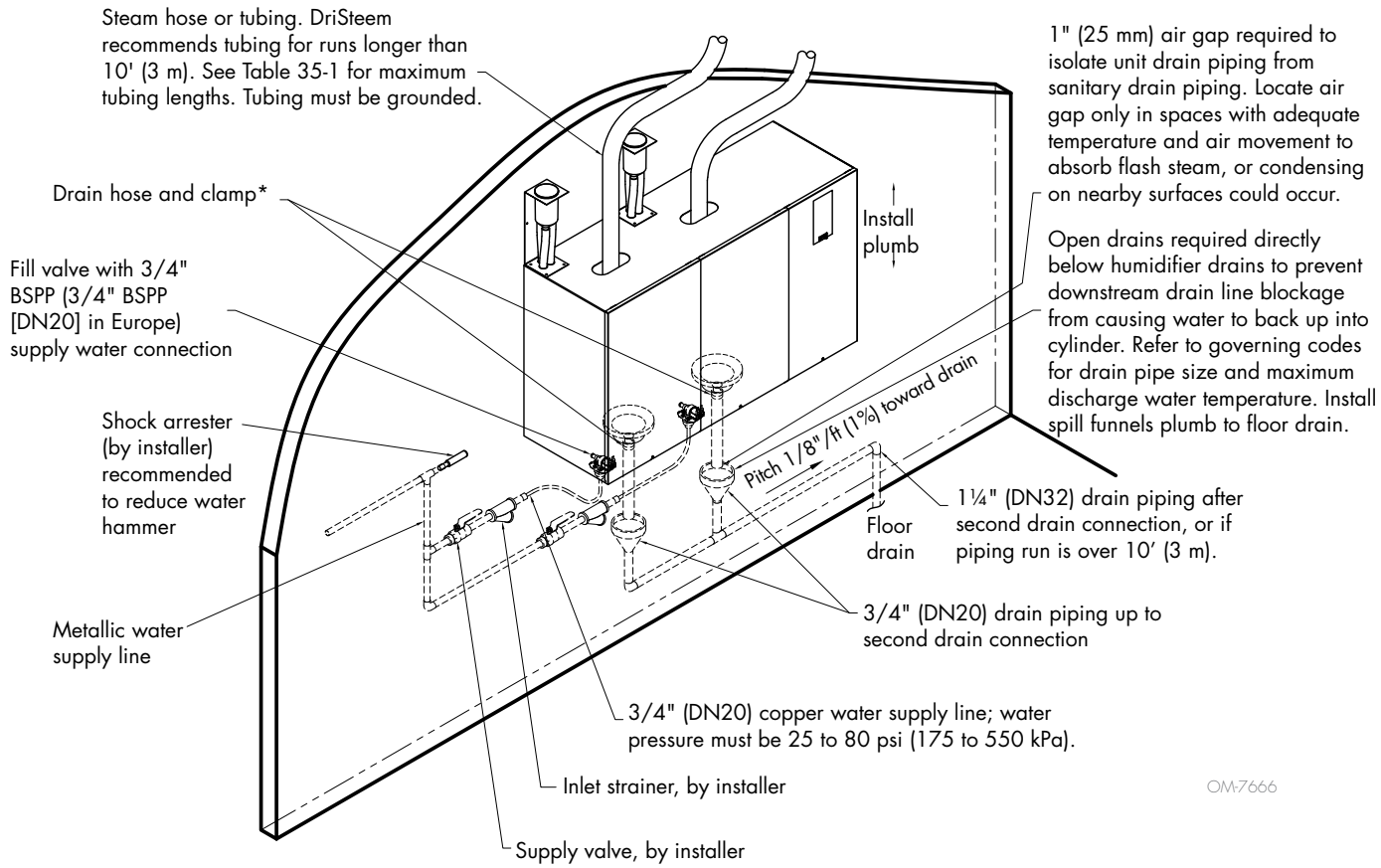
* Ships with humidifier

- Dashed lines indicate provided by installer
- The open drain must be at least 12" (300 mm) below the bottom of the XT humidifier, to help prevent steam condensation on the humidifier.
- Offset the open drain beyond edge of unit when installed in still air environment.

OM-7691

Piping: Field piping overview

FIGURE 14-1: XT SERIES HUMIDIFIER FIELD PIPING OVERVIEW

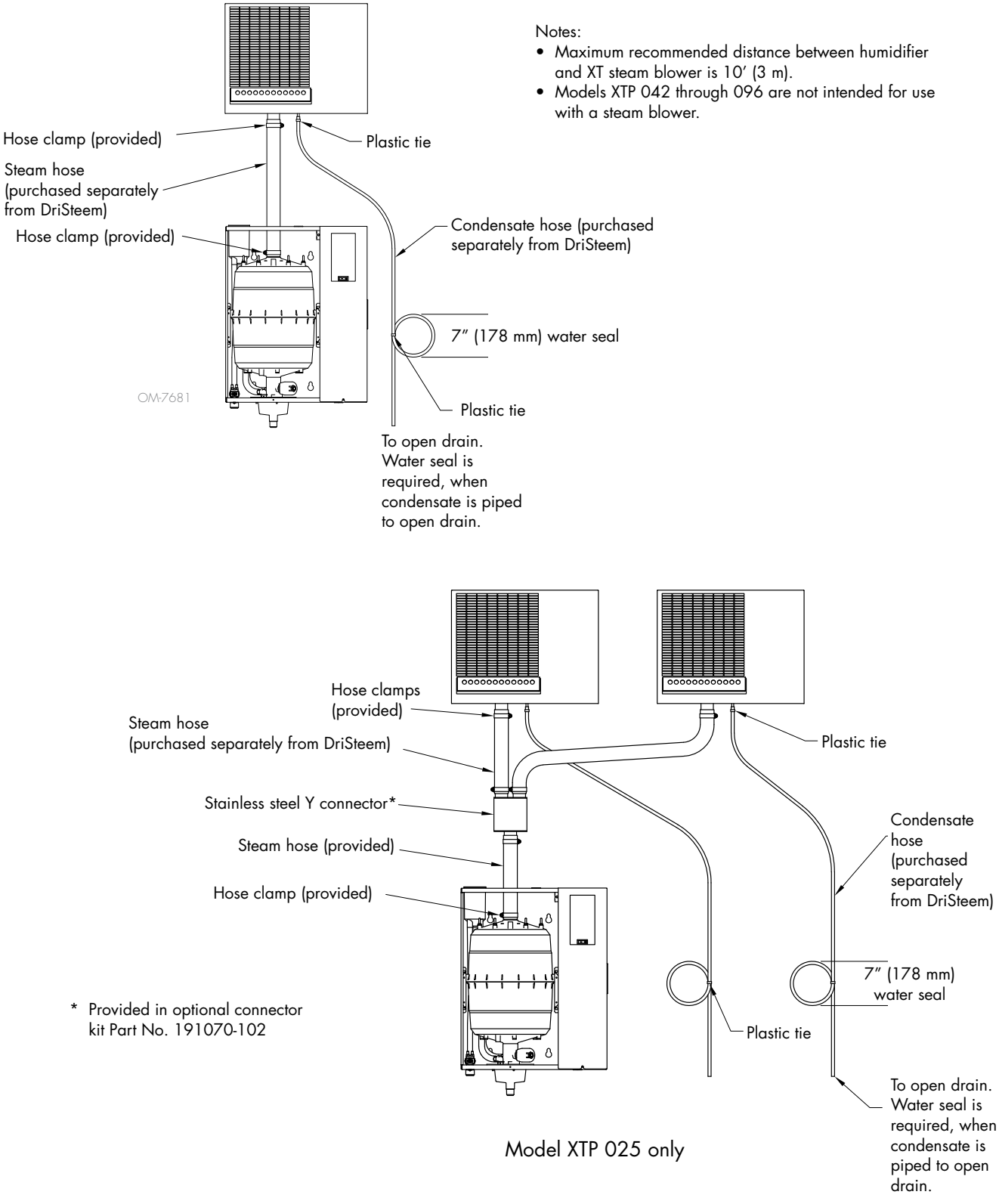


Notes:
- Dashed lines indicate provided by installer.
- Two-cylinder model shown.

* Ships with humidifier

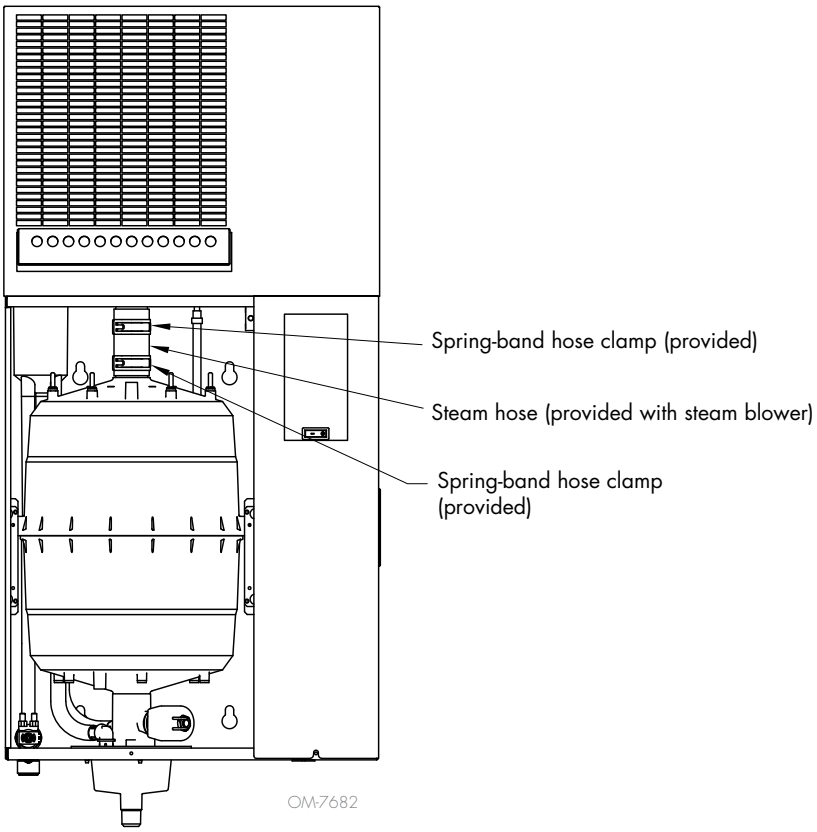
Piping: XT steam blowers

FIGURE 15-1: PIPING FROM XT SERIES HUMIDIFIER TO REMOTE XT STEAM BLOWER



Piping: XT steam blowers

FIGURE 16-1: PIPING FROM XT SERIES HUMIDIFIER TO TOP-MOUNTED XT STEAM BLOWER



Notes:
- Maximum recommended distance between humidifier and XT steam blower is 10′ (3 m).
- Models XTP 025 and 033 are not intended for use with a direct-mounted steam blower.
- Models XTP 042 through 096 are not intended for use with a steam blower.

Humidifier wiring

All wiring must be code approved and in accordance with the unit wiring diagram. Power supply wiring must be rated for 105 °C. See Figure 17-1 for the humidifier wiring diagram locations.

When selecting a location for installing the humidifier:

- Avoid areas close to sources of electromagnetic emissions such as power distribution transformers.
- Do not loop power wiring.
- Do not use aluminum wire.

CONDUIT KNOCKOUTS

Conduit and control wiring knockouts are provided on the XT Series humidifier cabinet. See Figure 4-1.

CONTROL COMPONENT PLACEMENT

Follow the guidelines on Page 19 for placing humidistats, transmitters, and airflow proving switches.

CAUTION

Adding conduit connections not recommended

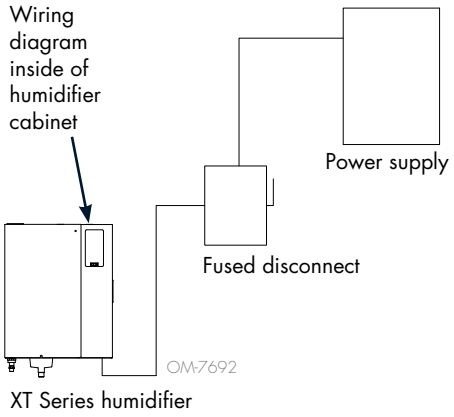
Adding alternate conduit connections is not recommended. If you must make additional holes in the humidifier cabinet, protect all internal components from debris, and vacuum out the cabinet when finished. Failure to follow these precautions can damage sensitive electronic components and void the DriSteem warranty.

⚠ WARNING

Electric shock hazard

Only qualified electrical personnel should perform field wiring installation procedures. 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.

FIGURE 17-1: FIELD WIRING REQUIREMENTS



Notes:

- Control wiring and power wiring must be run in dedicated or separate earthed metal conduit, cable trays, or trunking.
- Separate the line voltage wiring from low voltage control circuit wiring when routing electrical wiring inside the humidifier cabinet.
- Do not use chassis or safety grounds as current-carrying commons. Never use a safety ground as a conductor or neutral to return circuit current.
- For circuit protection requirements, see recommended fusing in Table 6-1.

Humidifier wiring

CONNECTION INSTRUCTIONS

Before connecting power, refer to the wiring diagram or the data plate on the outside of the cabinet for wire sizing amperage.

For control signal wiring from a humidistat, transmitter, or signal by others, see the wiring diagrams shipped inside the humidifier.

See "Step 1 – Field wiring" in the *Vapor-logic Installation and Operation Manual* for detailed instructions on the following:

- Control input wiring:
- See the "Control input" section.
- Duct airflow proving switch and duct high limit humidistat wiring (recommended optional devices):
- See the following sections:
  "Airflow proving switch" and
  "Duct high limit switch or transmitter"
- Remote signal wiring:
- See the following sections:
  "Programmable triac" and
  "Programmable relay (dry contact)"

EARTH GROUNDING REQUIREMENTS

A code-approved safety earth grounding system is required. The ground connection must be made with solid metal-to-metal connections. Ground wire should be the same size as power wiring.

UNITS WITH STEAM BLOWER

Steam blowers (SDUs) receive power for operation from the XT series humidifier. For North America only: Install 2 fuses in the XT unit to provide power to the steam blower. Fuses are shipped with the steam blower. Replacements available from DriSteem.

⚠ WARNING

Excessive moisture hazard

DriSteem strongly recommends installing a duct airflow proving switch and a duct high limit humidistat. These devices prevent a humidifier from making steam when there is low airflow in the duct or when the RH level in the duct is too high. Failure to install these devices can result in excessive moisture in the duct, which can cause bacteria and mold growth or dripping through the duct.

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.

Sensor placement

SENSOR LOCATION IS CRITICAL

Sensor location has a significant impact on humidifier performance. See the recommendations below and Figure 19-1.

Note: DriSteem recommends that you do not interchange room and duct humidity devices. Room humidity devices are calibrated with zero or little airflow, whereas duct humidity devices require air passing across them.

Recommended humidity control (transmitter/humidistat) locations:

A. Ideal. Ensures the best uniform mix of dry and moist air with stable temperature control.

B. Acceptable, but room environment can affect controllability, such as when sensor is too close to air grilles, registers, or heat radiation from room lighting.

C. Acceptable. Provides uniform mixture of dry and moist air. If extended time lag exists between humidity generation and sensing, extend sampling time.

D. Acceptable (behind wall or partition) for sampling entire room if sensor is near an air exhaust return outlet. Typical placement for sampling a critical area.

E. Not acceptable. These locations might not represent actual overall conditions in the space.

F. Not acceptable. Do not place sensors near windows, door passageways, or areas of stagnant airflow.

Recommended safety (airflow and high limit) sensor location:

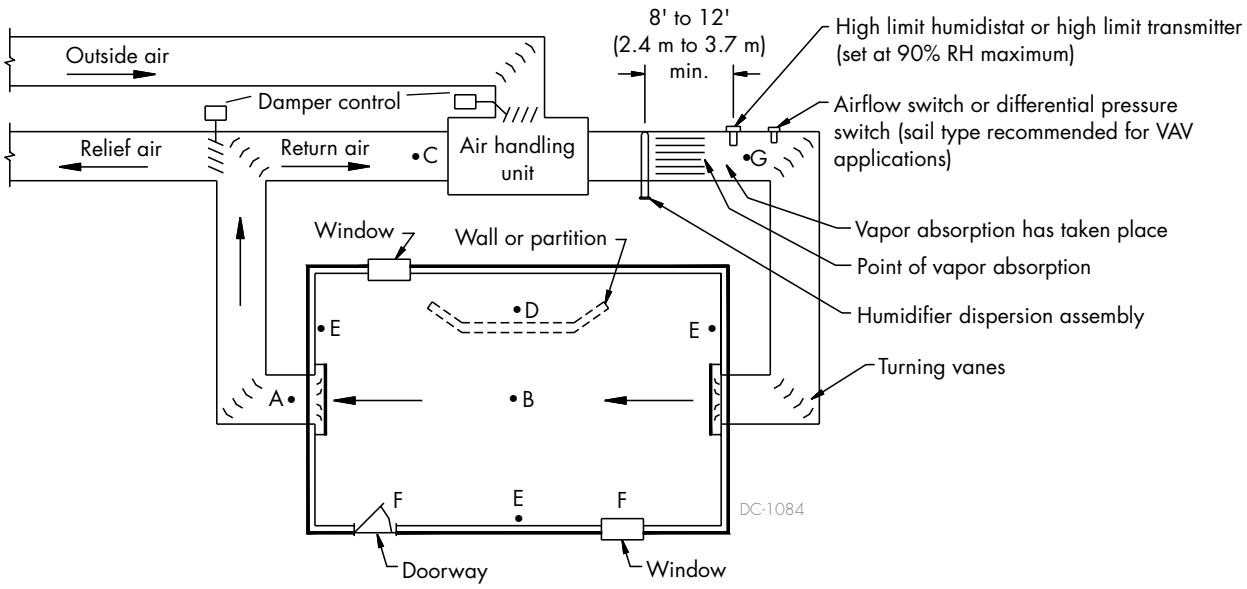
G. Best sensing location for high limit humidistat or humidity sensor and airflow proving switch.

Other factors affecting humidity control

Humidity control involves more than the controller's ability to control the system. Other factors that play an important role in overall system control are:

- Size of humidification system relative to load
- Overall system dynamics associated with moisture migration time lags
- Accuracy of humidistats and humidity transmitters and their location
- Dry bulb temperature accuracy in space or duct
- Velocities and airflow patterns in ducts and space environments
- Electrical noise or interference

FIGURE 19-1: RECOMMENDED SENSOR LOCATIONS



Outdoor enclosure: Operation

GENERAL DESCRIPTION

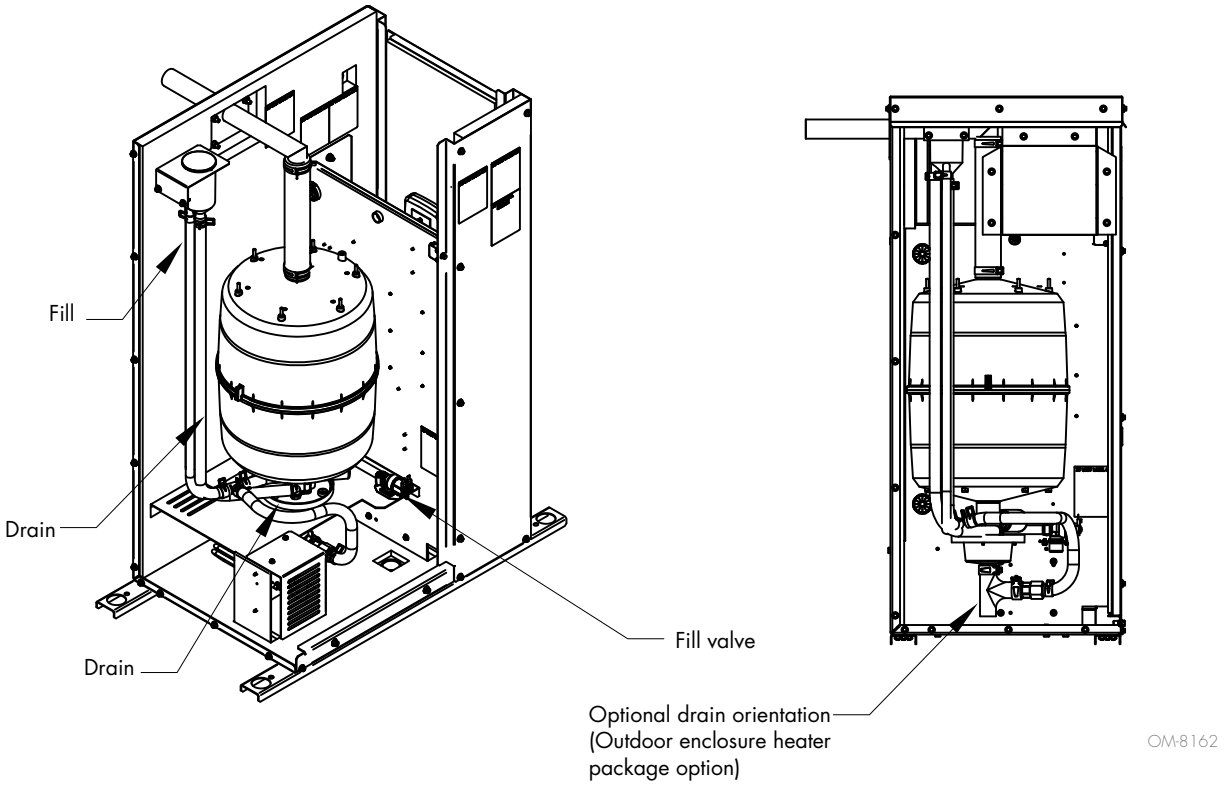
- The outdoor XT humidifier is CSA/ETL approved for installation outdoors. It uses an optional heater and fans to properly operate in temperatures of -40°F to 122°F (-40°C to 50°C). The unit is intended to be mounted to the side of an air handler unit (AHU) or exterior wall.
- Knockouts for electrical and plumbing connections are located on the back and bottom of the unit.
- If constant monitoring of the unit is desired, or if the unit is located in a severe climate, install a remotely mounted display. Additional cable lengths up to 500' (152 m) are available as an option.
- A single source of power can be supplied to operate the humidifier, and the heater and fans.

OPERATION

If the ambient temperature in the enclosure is below 50 °F (10 °C), the heater is energized. The heater remains energized until the enclosure reaches 60 °F (15.5 °C). When there is no call for humidity, an aquastat maintains tank temperature at the factory default of 50 °F (10 °C). This temperature can be reset in the field to be from 50-180 °F (10-82 °C). If for any reason the tank temperature falls below 40 °F (4 °C), the tank will drain to keep the unit from freezing.

When the temperature of the enclosure reaches 85 °F (29 °C), the ventilation fans energize to cool the electrical components. If the enclosure temperature reaches 150 °F (66 °C), the Vapor-logic controller will disable any heating elements and allow the ventilation fans to cool the enclosure. When the enclosure temperature falls below 150 °F (66 °C), the XT humidifier automatically resumes normal operation.

FIGURE 20-1: OUTDOOR ENCLOSURE FILL AND DRAIN



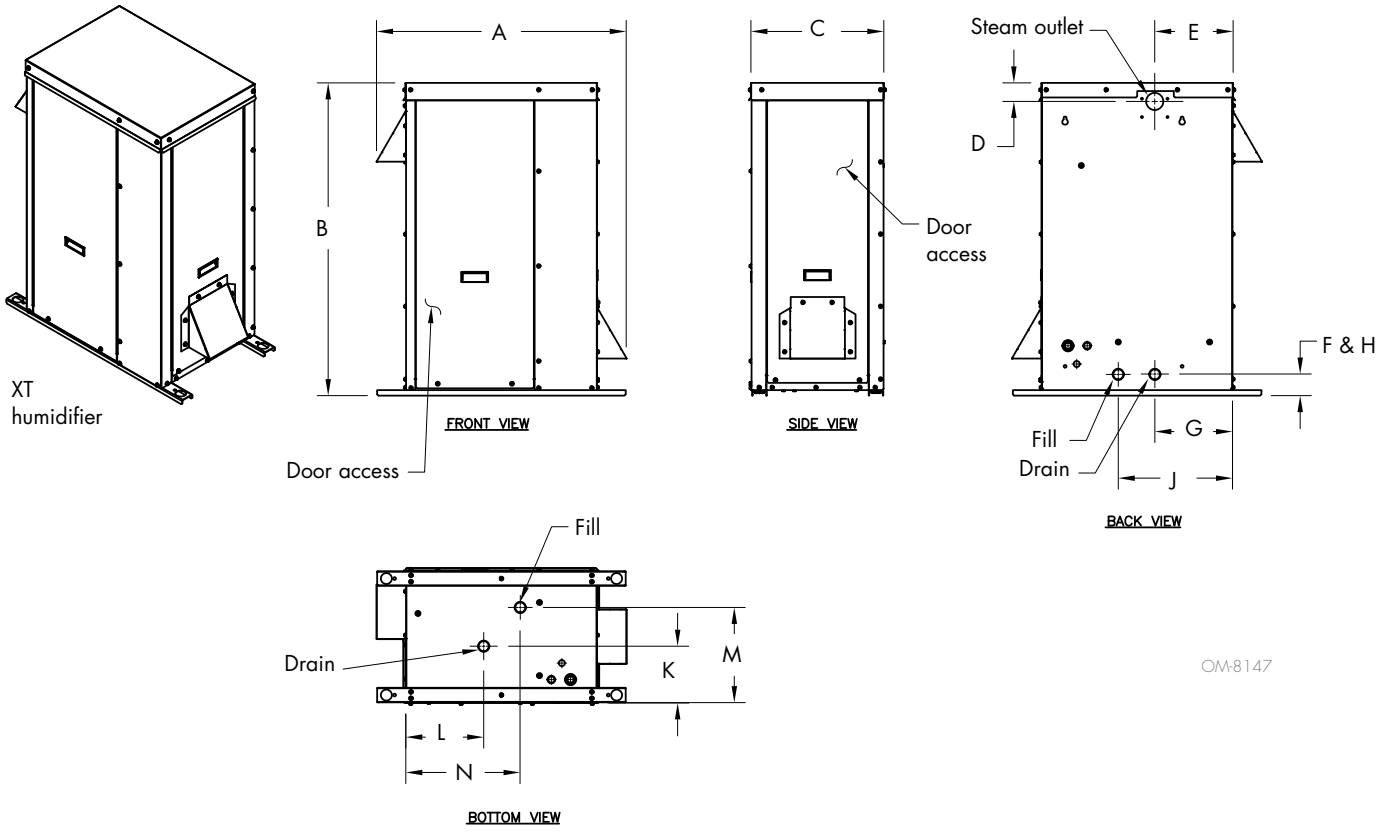
Outdoor enclosure: XT outdoor enclosure voltage and weights

Table 21-1: Voltages and Weights

Model	Phase	Voltage	Weight Configuration					
			Dry		Shipping		Operating	
			(lbs)	(kg)	(lbs)	(kg)	(lbs)	(kg)
XTP002A1	1	120	145.0	65.9	209.0	95.0	150.4	68.4
XTP002B1	1	208	158.0	71.8	222.0	100.9	163.4	74.3
XTP002D1		230	145.0	65.9	209.0	95.0	150.4	68.4
XTP002E1		240	158.0	71.8	222.0	100.9	163.4	74.3
XTP003B1	1	208	158.0	71.8	222.0	100.9	163.4	74.3
XTP003D1		230	145.0	65.9	209.0	95.0	150.4	68.4
XTP003E1		240	158.0	71.8	222.0	100.9	163.4	74.3
XTP003F1		277	158.0	71.8	222.0	100.9	163.4	74.3
XTP003H2		400	145.0	65.9	209.0	95.0	150.4	68.4
XTP003L1		480	158.0	71.8	222.0	100.9	163.4	74.3
XTP003P1		600	157.6	71.6	221.6	100.7	163.0	74.1
XTP003B3	3	208	158.0	71.8	222.0	100.9	163.4	74.3
XTP003E3		240	158.0	71.8	222.0	100.9	163.4	74.3
XTP003H3		400	145.0	65.9	209.0	95.0	150.4	68.4
XTP003L3		480	158.0	71.8	222.0	100.9	163.4	74.3
XTP003P3		600	157.6	71.6	221.6	100.7	163.0	74.1
XTP006B1	1	208	158.7	72.1	222.7	101.2	171.2	77.8
XTP006D1		230	145.7	66.2	209.7	95.3	158.2	71.9
XTP006E1		240	158.7	72.1	222.7	101.2	171.2	77.8
XTP006F1		277	158.7	72.1	222.7	101.2	171.2	77.8
XTP006H2		400	145.7	66.2	209.7	95.3	158.2	71.9
XTP006L1		480	158.7	72.1	222.7	101.2	171.2	77.8
XTP006P1		600	158.3	72.0	222.3	101.0	170.8	77.6
XTP006B3	1	208	158.7	72.1	222.7	101.2	171.2	77.8
XTP006E3	3	240	158.7	72.1	222.7	101.2	171.2	77.8
XTP006H3		400	145.7	66.2	209.7	95.3	158.2	71.9
XTP006L3		480	158.7	72.1	222.7	101.2	171.2	77.8
XTP006P3		600	158.3	72.0	222.3	101.0	170.8	77.6
XTP010B3	3	208	160.0	72.7	224.0	101.8	187.5	85.2
XTP010E3		240	160.0	72.7	224.0	101.8	187.5	85.2
XTP010H3		400	147.0	66.8	211.0	95.9	174.5	79.3
XTP010L3		480	160.0	72.7	224.0	101.8	187.5	85.2
XTP010P3		600	159.6	72.5	223.6	101.6	187.1	85.1
XTP017B3	3	208	160.0	72.7	224.0	101.8	187.5	85.2
XTP017E3		240	160.0	72.7	224.0	101.8	187.5	85.2
XTP017H3		400	147.0	66.8	211.0	95.9	174.5	79.3
XTP017L3		480	160.0	72.7	224.0	101.8	187.5	85.2
XTP017P3		600	159.6	72.5	223.6	101.6	187.1	85.1
XTP025H3	3	400	149.8	68.1	213.8	97.2	197.8	89.9
XTP025L3		480	162.8	74.0	226.8	103.1	210.8	95.8
XTP025P3		600	162.4	73.8	226.4	102.9	210.4	95.6
XTP033H3	3	400	152.2	69.2	216.2	98.3	200.2	91.0
XTP033L3		480	165.2	75.1	229.2	104.2	213.2	96.9
XTP033P3		600	164.8	74.9	228.8	104.0	212.8	96.7
XTP042H3	3	400	152.2	69.2	216.2	98.3	200.2	91.0
XTP042L3		480	165.2	75.1	229.2	104.2	213.2	96.9
XTP042P3		600	164.8	74.9	228.8	104.0	212.8	96.7
XTP048H3	3	400	152.2	69.2	216.2	98.3	200.2	91.0
XTP048L3		480	165.2	75.1	229.2	104.2	213.2	96.9
XTP048P3		600	164.8	74.9	228.8	104.0	212.8	96.7

Outdoor enclosure: Dimensions

FIGURE 22-1: OUTDOOR ENCLOSURE DIMENSIONS



Outdoor enclosure: Dimensions

Table 23-1:
Outdoor enclosure dimensions

	Description	002 through 048	
		inches	mm
A	Enclosure width (including lift brackets)	34.2	869
B	Enclosure height (including lift brackets)	42.8	1087
C	Enclosure depth	18.5	470
D	Enclosure top to steam outlet center	2.5	64
E	Enclosure left wall to steam outlet center	10.6	269
F	Enclosure bottom edge to drain knockout center (back wall) (including lift brackets)	2.9	74
G	Enclosure left wall to drain knockout center (back wall)	10.6	269
H	Enclosure bottom edge to water fill knockout center (back wall) (including lift brackets)	2.9	74
J	Enclosure left wall to water fill knockout center (back wall)	15.6	396
K	Enclosure back wall to drain knockout center (bottom)	7.7	196
L	Enclosure left wall to drain knockout center (bottom)	10.6	269
M	Enclosure back wall to water fill knockout center (bottom)	11.0	279
N	Enclosure left wall to water fill knockout center (bottom)	15.6	396

Outdoor enclosure: Location

- The following information is not intended to supersede any requirements of federal, state, or governing codes having jurisdiction; prior to locating the unit, authorities having jurisdiction should be consulted.
- The XT humidifier must be level and located so there is enough clearance for opening the access panels (see Figure 24-2).
- The unit should be located so prevailing winds do not blow into the air intakes.
- When located on the roof, the air intakes must be a minimum of 14" (360mm) off the roof to prevent intake of snow or splashed rain.
- Locate unit so air intakes are not too close to other exhaust fan outlets, gasoline storage, or other contaminants that could potentially cause dangerous situations. Using and storing gasoline or other flammable vapors and liquids in open containers near this appliance is hazardous.

FIGURE 24-1: OUTDOOR ENCLOSURE

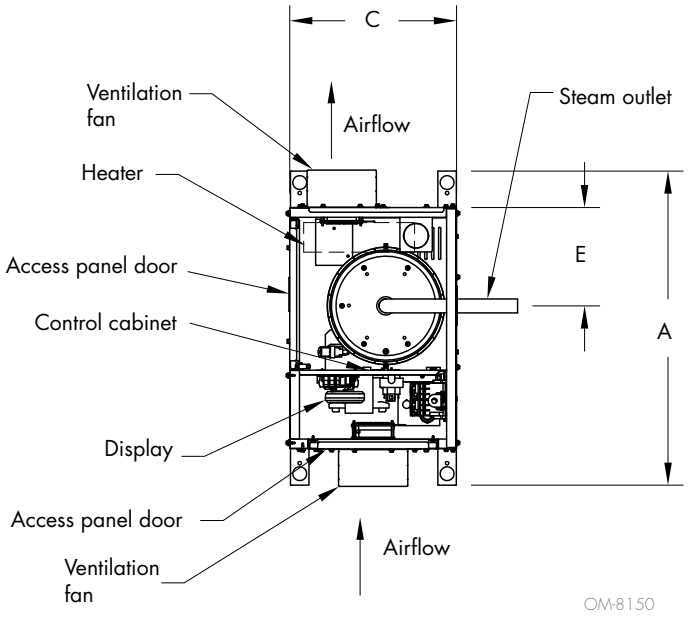
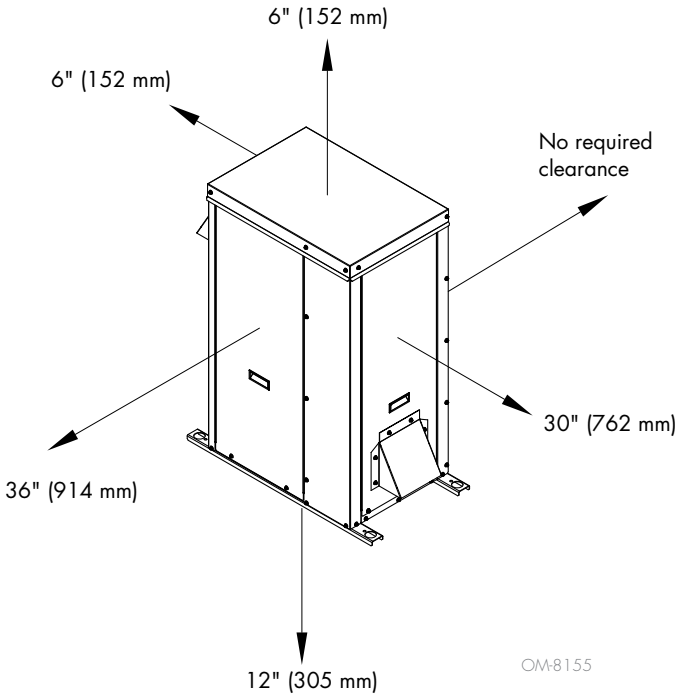


FIGURE 24-2: OUTDOOR ENCLOSURE CLEARANCES



Note: The steam outlet exits rear of enclosure. When base mounting, consider rear clearance for steam piping.

Outdoor enclosure: Mounting

- Verify that the position and integrity of the wall properly supports the unit and that support structure dimensions coincide with unit dimensions.
- Prior to installation, remove all of the unit packaging.
- The XT outdoor enclosure must be lifted by the designated lift points as shown in Figure 25-2. It must be lifted in a fashion that holds it level and keeps it from tipping, falling, or twisting.
  - If the unit is severely twisted during handling, permanent damage can occur.
  - It is the installer's responsibility to verify the handling equipment's capability to safely handle the unit.
  - All lifting operations must be accomplished with a load spreader of sufficient width to ensure that the lifting cables clear the side of the unit.
- Once mounted, seal along the top and sides between enclosure and mating wall to prevent water from running down the backside of the enclosure.

FIGURE 25-2: OUTDOOR ENCLOSURE MOUNTING WITH LIFT BRACKET

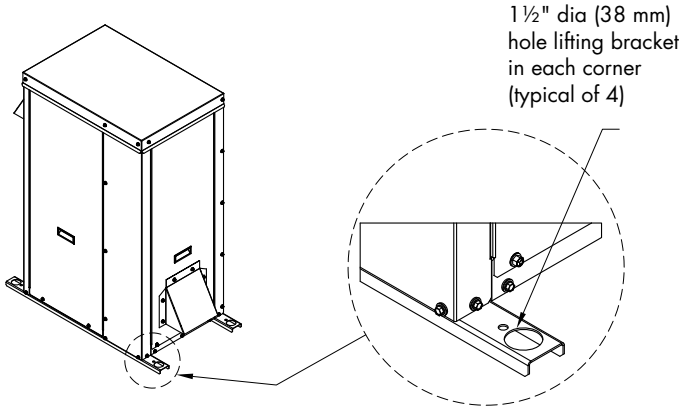
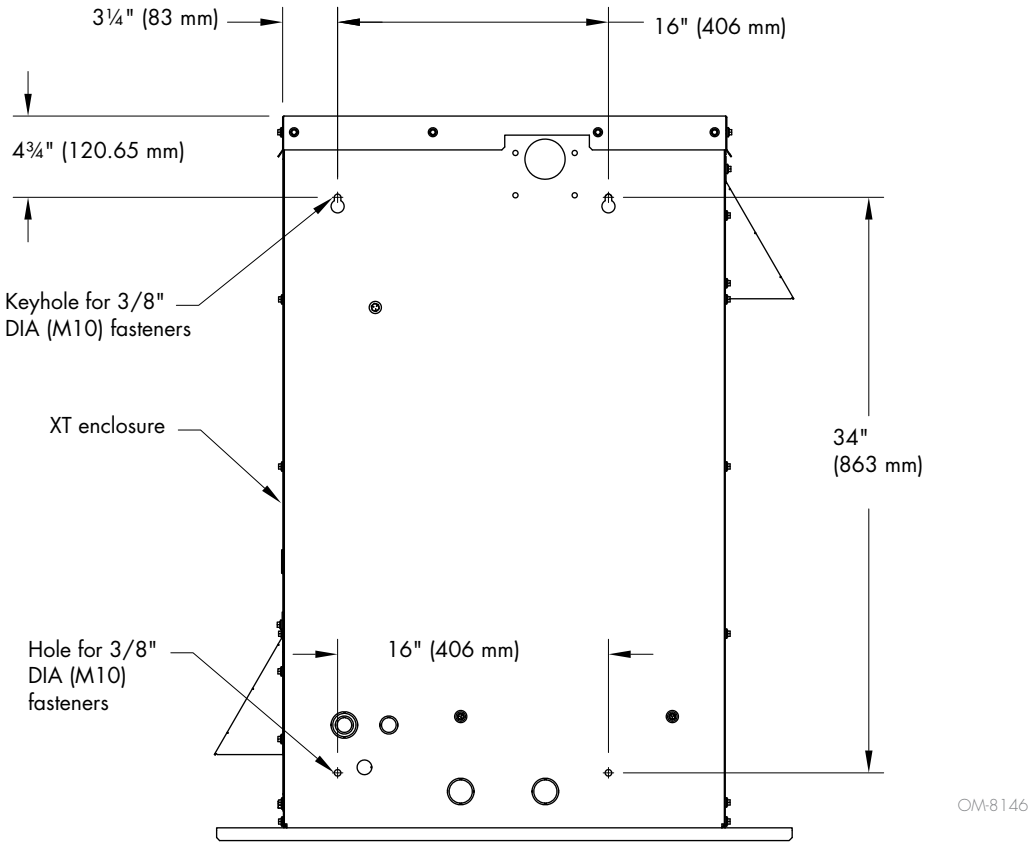


FIGURE 25-1: OUTDOOR ENCLOSURE (WALL/AHU MOUNT)



Outdoor enclosure: Mounting

FIGURE 26-1: OUTDOOR ENCLOSURE (BASE MOUNT)

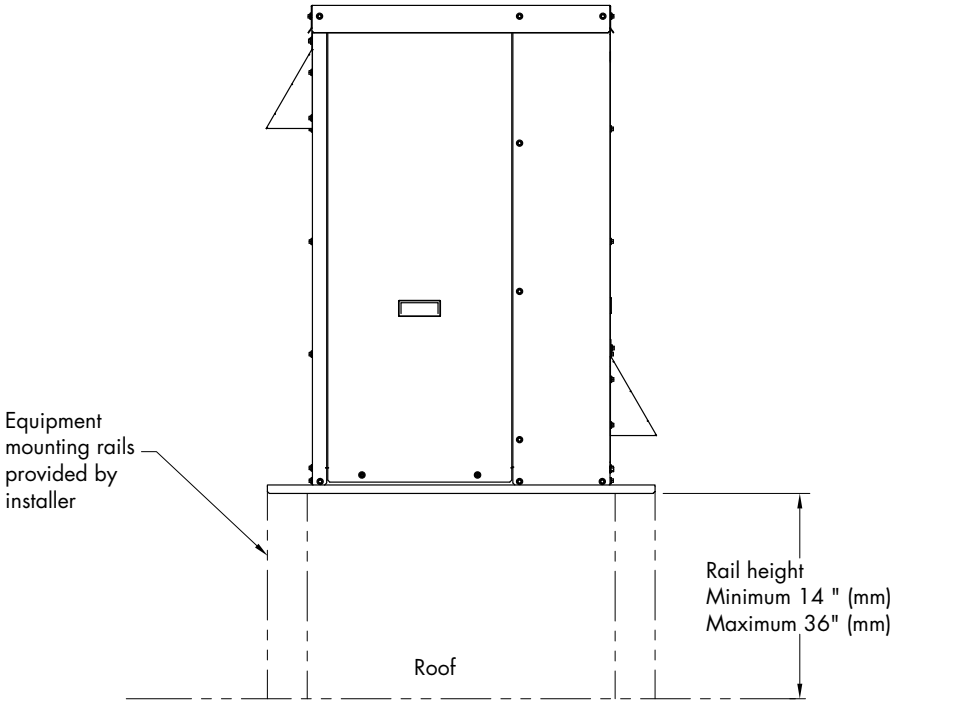
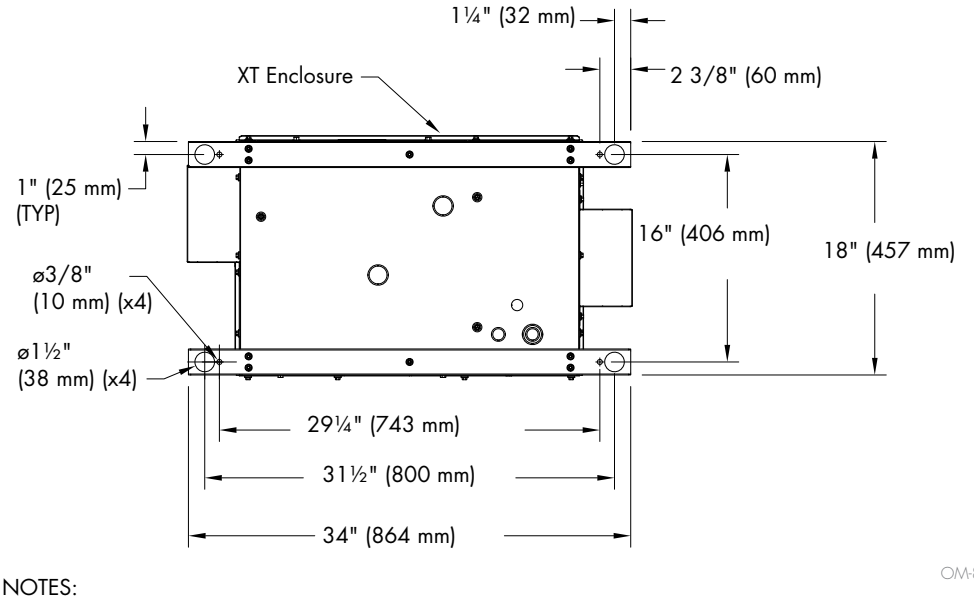


FIGURE 26-2: OUTDOOR ENCLOSURE (BASE MOUNT)



NOTES:
For all outdoor mounting methods:

- Mounting hardware to be four 3/8" diameter grade 8 bolts and washers.
- A rigid and structurally sound wall or equipment rails are required. Consult with the Structural Engineer on Record to determine acceptability of mounting structure.

Outdoor enclosure: Piping and electrical

- Use the dedicated knockouts that best fit the specific installation.
    - Heat trace and insulate piping if freezing temperatures are a concern.
- Insulate supply water piping inside the unit to avoid dripping from condensation.
- If equipped with outdoor enclosure heater package, drain tee can be reoriented for drain water to exit through bottom of enclosure. (See Figure 20-1).
- Insulate exterior steam piping where applicable.
- See note in Table 6-1 regarding current draw and fuse sizing if equipped with outdoor enclosure heater package.
- Once mounted and plumbed, seal along the top and sides between enclosure and mating wall to prevent water from running down the backside of the enclosure.

Piping Notes

1. To ensure that water does not remain in the fill line and freeze if there is a loss of power, use additional field installed valves upstream of the fill valve in a conditioned space. Power these valves on the same source as the XT humidifier; if the power goes off, water drains out of the fill line to prevent freezing. If these valves are used, a vacuum breaker needs to be installed on the fill line near the unit.
2. In extreme or critical applications, in which the unlikely event of a water leak could cause severe damage an additional safety measure is recommended. Use a thermostat with remote sensor or temperature switch on the fill line to cut power to XT humidifier and safety valves. This will stop fill water to the XT humidifier and drain the fill piping when the temperature is below freezing.
3. Locate a 1" air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
4. DriSteem is not responsible for any freeze related damage to the humidifier or lines leading to the humidifier.
5. If equipped with outdoor enclosure heater package, a freeze protection valve is plumbed into the unit from the factory. This valve opens when water inside the unit approaches freezing temperatures, draining the fill cup and cylinder. (See Figure 20-1).

Outdoor enclosure: Piping and electrical

FIGURE 28-1: UTILITY CONNECTIONS

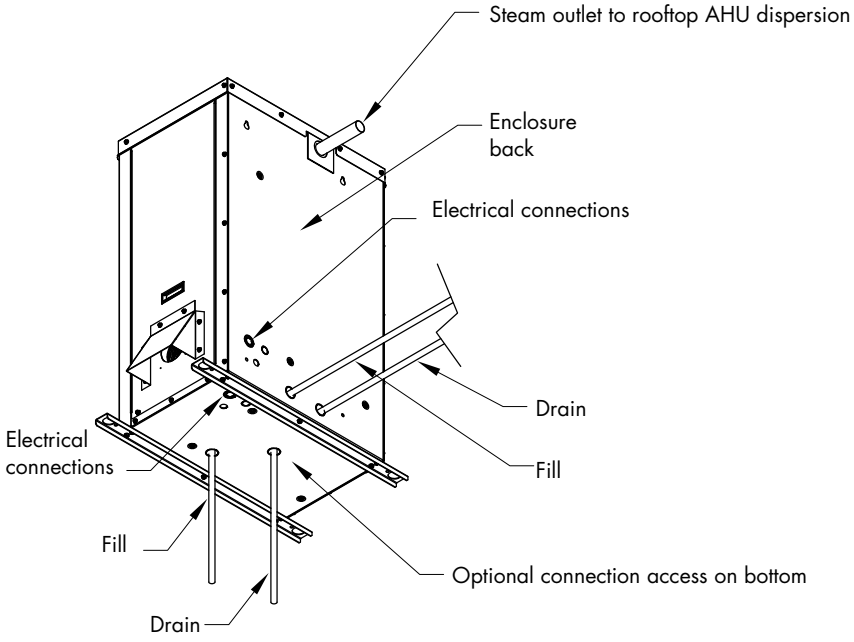


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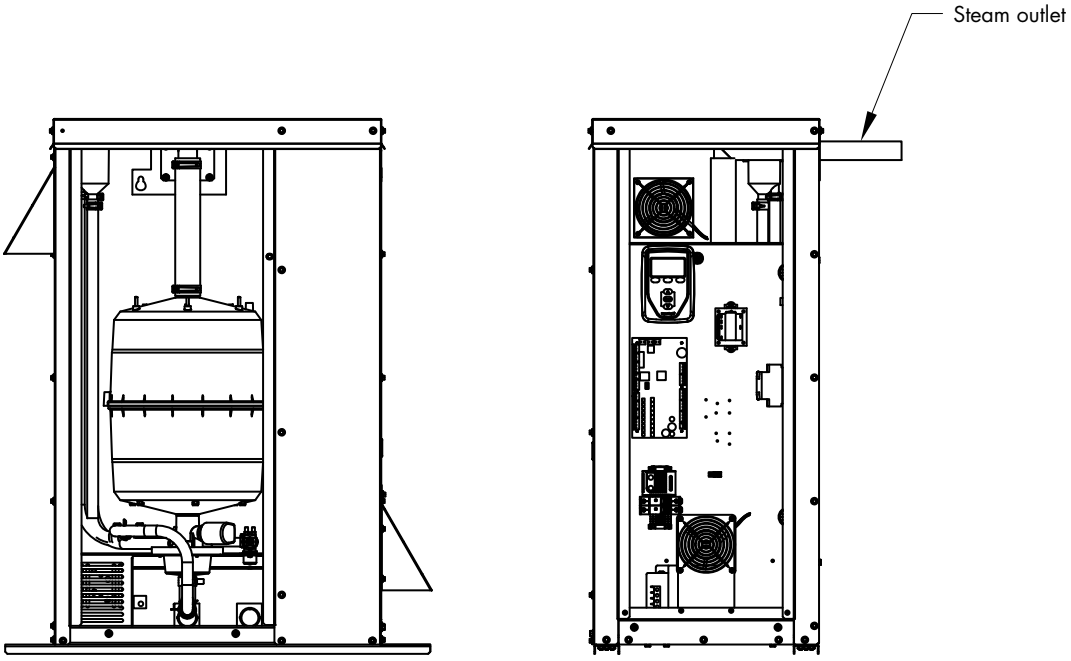
FIGURE 28-2: OUTDOOR ENCLOSURE WITH DOORS REMOVED



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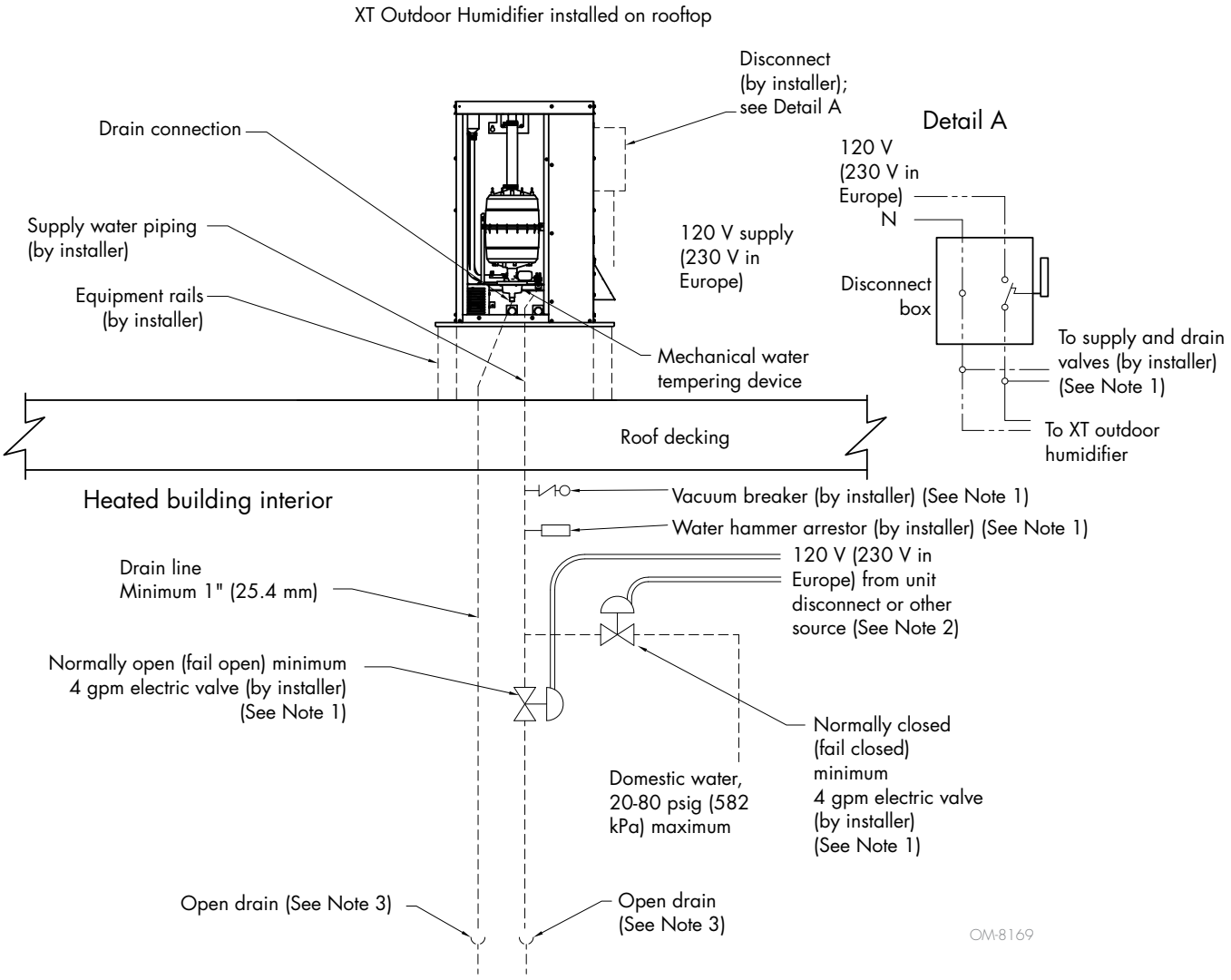
Outdoor enclosure: Freeze Protection Piping

FIGURE 29-1: OUTDOOR ENCLOSURE FREEZE PROTECTION PIPING



Piping notes:

1. Insulate supply water piping to avoid dripping from condensation.
2. To ensure that water does not remain in the fill line and freeze if there is a loss of power, use field installed additional valves upstream of the fill valve in a conditioned space. Power these valves on the same circuit as the XT humidifier; if the power goes off, water drains out of the fill line to prevent freezing (see above). If these valves are used, a vacuum breaker needs to be installed on the fill line near the unit.
3. In extreme or critical applications in which the unlikely event of a water leak could cause severe damage, use a thermostat with a remote sensor on the fill line to cut power to the Model XT outdoor humidifier and safety valves to stop fill water to the Model XT outdoor humidifier and drain the fill piping when the temperature is below freezing.
4. Locate 1" air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
5. If the valves are installed as per note 2 and drain water tempering is required during a power outage, a DriSteem Drane-kooler needs to be installed inside the building. Piping between the unit and the Drane-kooler must be rated for 212°F water.
6. DriSteem is not responsible for any freeze related damage to the humidifier or lines leading to the humidifier.

Dispersion: Selecting the dispersion assembly location

DriSteem humidifiers operate with several types of dispersion assemblies for open spaces and for ducts and air handling units.

Dispersion assemblies in ducts and air handling units must be positioned where the water vapor being discharged is carried off with the airstream and is absorbed before it can cause condensation or dripping.

- In general, the dispersion assembly is best placed where the air can absorb the moisture being added without causing condensation at or after the unit. This normally will be after the heating coil or where the air temperature is highest.
- Place the dispersion assembly such that absorption will occur:
  - before the intake of a high efficiency filter, because the filter can remove the visible moisture and become waterlogged;
  - before coming in contact with any metal surface;
  - before fire or smoke detection devices;
  - before a split in the duct; otherwise, the dispersion assembly can direct more moisture into one duct than the other.
- When draining dispersion condensate to an open drain, provide a 1" (25 mm) air gap between the condensate drain piping and the drain. Locate the gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces.

⚠ WARNING

Hot surface and steam hazard
Dispersion assembly and steam hose or tubing can contain steam, and surfaces can be hot. Discharged steam is not visible. Contact with hot surfaces or air into which steam has been discharged can cause severe personal injury.

Dispersion: Returning condensate to steam cylinder

CONDENSATE RETURN GUIDELINES

To prevent overfilling the steam cylinder, follow the condensate guidelines below:

- When condensate can be returned to the steam cylinder:
  - Single dispersion tube
  - Up to 20 lbs/hr (9.1 kg/h) of steam production
  - 10' (3 m) or less of steam hose between humidifier and dispersion
  - 20' (6 m) or less of tubing between humidifier and dispersion
- When condensate should be wasted to the drain:
  - Ultra-sorb or Rapid-sorb dispersion
  - Single dispersion tube with condensate drain
  - Single dispersion tube with:
    - More than 20 lbs/hr (9.1 kg/h) or more of steam production, or
    - More than 10' (3 m) of steam hose between humidifier and dispersion
    - More than 20' (6 m) of tubing between humidifier and dispersion

XT Series humidifier steam outlet

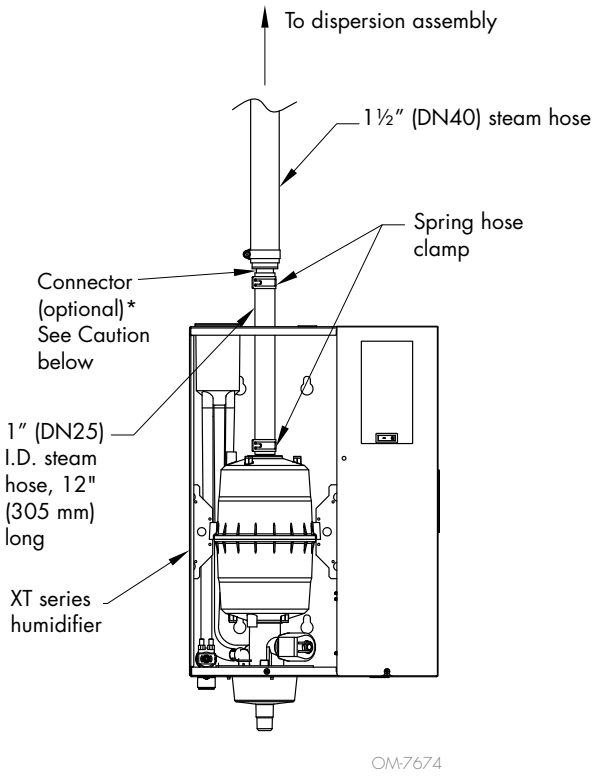
The steam outlet on the humidifier is sized to the output of the humidifier. DO NOT use interconnecting steam hose or tubing with an inside diameter smaller than the humidifier steam outlet. Reducing the inside diameter will result in the internal humidifier system pressure exceeding the parameters for acceptable performance.

- See maximum steam carrying capacities in Table 35-1 and 36-1.
- If the humidifier must be located higher than the dispersion assembly, use the recommended installation shown in Figure 38-1.

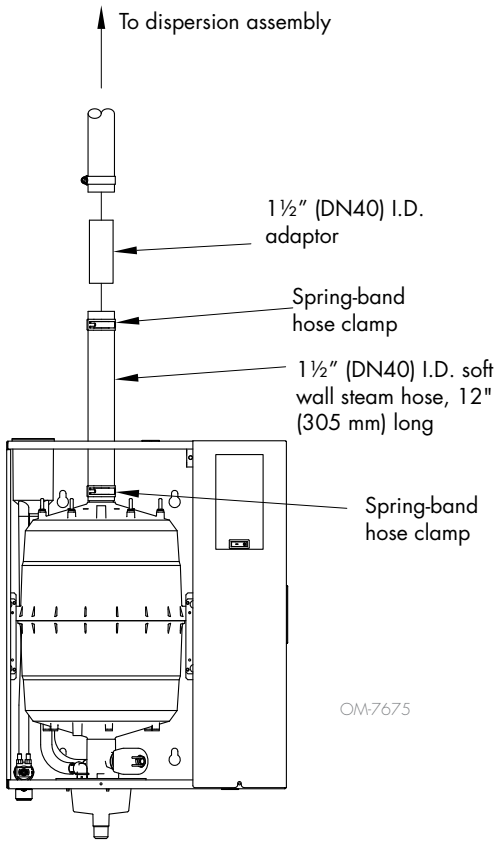
Dispersion: Steam outlet connections

FIGURE 32-1: STEAM OUTLET CONNECTIONS, MODELS XTP 002 THROUGH 025 INDOOR UNITS

Models XTP 002 through 006



Models XTP 010 through 025



* Provided in optional connector kit Part No. 191070-100 (see Table 75-1)

CAUTION

Connector kit location

Install the connector for increasing from 1" to 1½" (DN25 to DN40) hose or tube immediately above the XT Series humidifier as shown above.

Failure to install the connector kit immediately above the humidifier will cause system pressure fluctuations and increase cylinder pressure, steam velocity, and condensate noise.

Dispersion: Steam outlet connections with hose

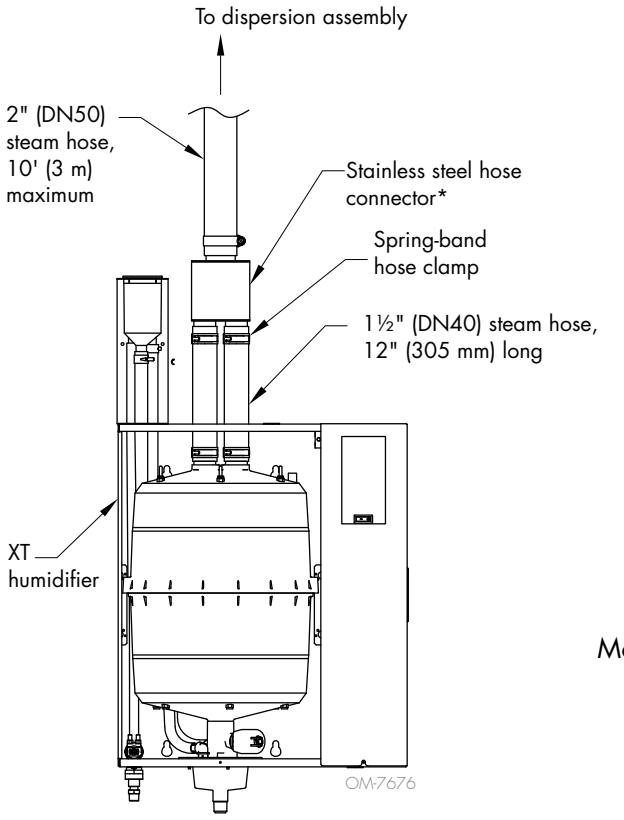
FIGURE 33-1: STEAM OUTLET CONNECTIONS WITH HOSE, MODELS XTP 033 THROUGH XTP096 WITHIN 10' (3 M) OF DISPERSION ASSEMBLY FOR INDOOR UNITS

⚠ WARNING

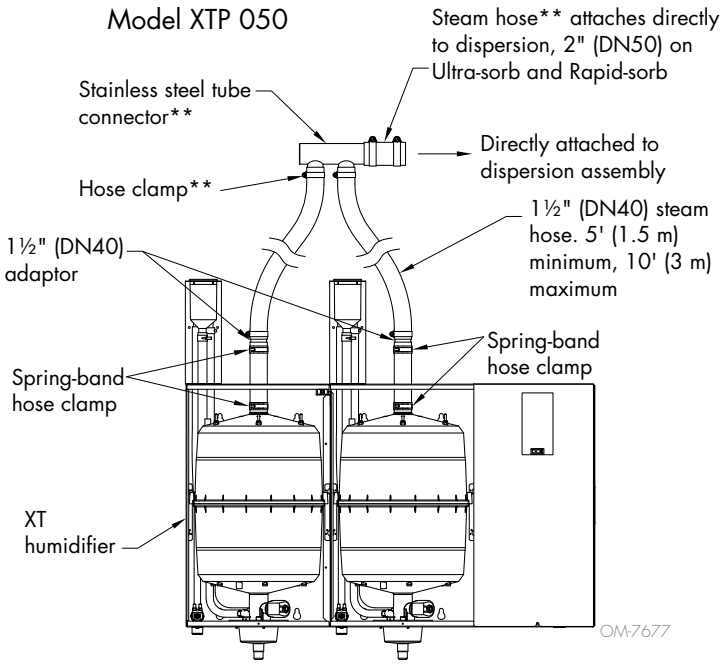
Preventing back pressure/abnormal operation in dual cylinder humidifiers and installations where two individual units are connected to a single dispersion panel.

Read and follow all steam hose installation instructions. Failure to follow these instructions could result in excessive back pressure or abnormal operation of the unit. Severe personal injury or damage to the unit may result.

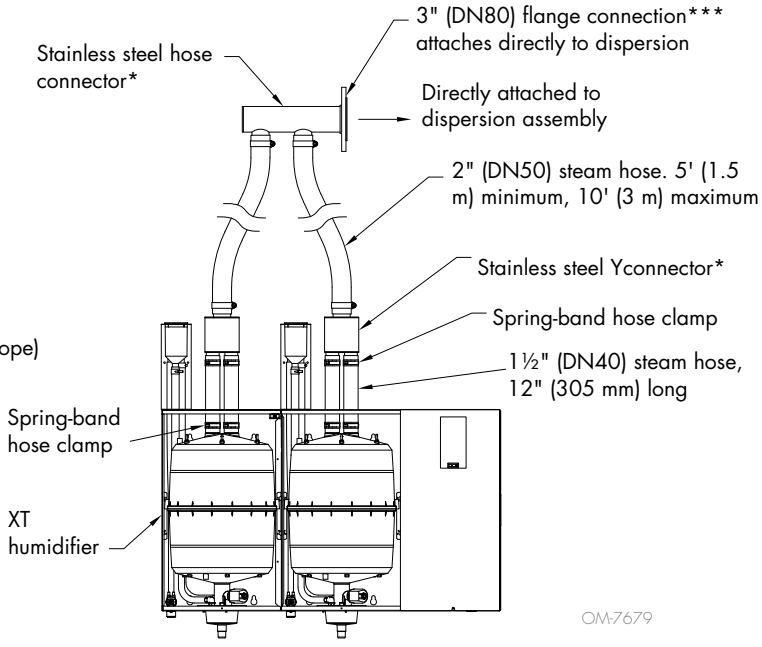
Models XTP 033, 042, and 048



Model XTP 050



Models XTP 067 through 096



Notes:

- For horizontal runs longer than 5' (1.5 m) or vertical runs long than 10' (3m), tubing is required. Do not use steam hose.
- See Table 75-1 for optional kits listed below.

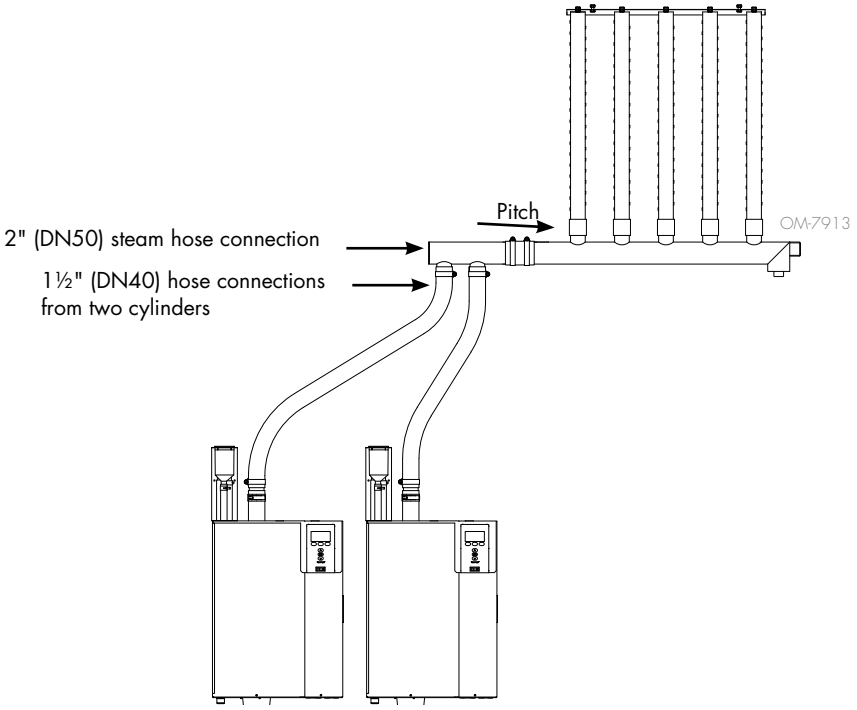
* Provided in connector kit Part No. 162715-005 (Optional Europe)

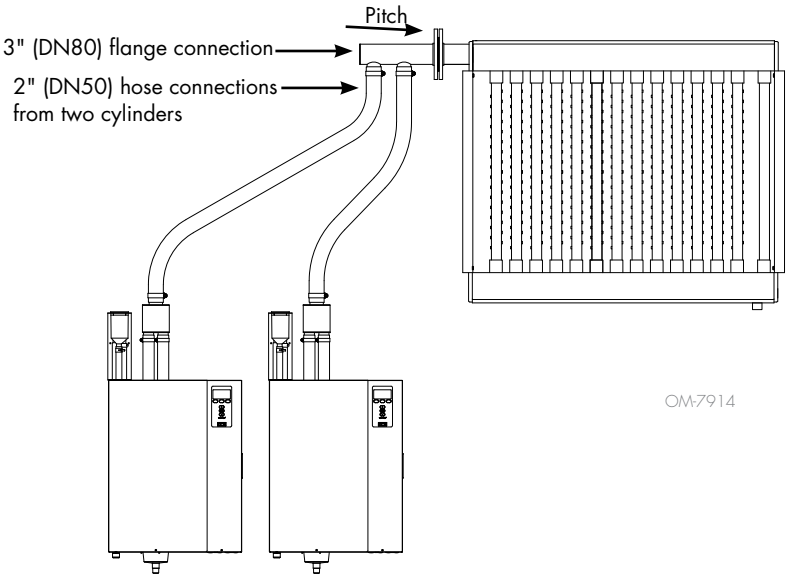
** Provided in optional connector kit Part No. 191070-002

*** Provided in optional connector kit Part No. 162825-202F

Dispersion: Steam outlet connections with hose

FIGURE 34-1: CONNECTING TWO CYLINDERS TO A DISPERSION ASSEMBLY





⚠ WARNING

Preventing back pressure/abnormal operation in dual cylinder humidifiers and installations where two individual units are connected to a single dispersion panel.
Read and follow all steam hose installation instructions. Failure to follow these instructions could result in excessive back pressure or abnormal operation of the unit. Severe personal injury or damage to the unit may result.

Notes:

- For two cylinders, connect the stainless steel tube connector directly to the dispersion inlet as shown. The diameter and pitch of the tube connector must match the inlet diameter and pitch of the dispersion unit.
- **Always run separate steam hose/tubing from each cylinder to the connection of the dispersion device. Only connect a maximum of two cylinders to any single dispersion unit.**

Dispersion: Interconnecting piping requirements

Condensate control and collection

Controlling condensate flow and collection in an XT Series humidifier system is critical to performance. To maximize humidifier performance:

- See Table and 35-1.
- Follow all installation recommendations for your specific humidifier and dispersion assembly from here through Page 53.

Table 35-1:
Maximum steam carrying capacity and length of interconnecting steam hose and tubing for Models XTP 002 through XTP096

Model	DriSteem steam hose*						Copper or stainless steel tubing (Insulate tubing to minimize loss of capacity and efficiency.)					
	Hose I.D.		Maximum capacity per cylinder†		Maximum length††		Tube size		Maximum capacity per cylinder†		Maximum developed length†††	
XTP	inches	DN	lbs/hr	kg/h	ft	m	inches	DN	lbs/hr	kg/h	ft	m
002	1½	40	5	2	10	3	1½	40	5	2	13	4.0
003	1½	40	10	5	10	3	1½	40	10	5	25	7.6
006	1½	40	18	8	10	3	1½	40	18	8	50	15.2
010	1½	40	30	14	10	3	1½	40	30	14	50	15.2
017	1½	40	50	22	10	3	1½	40	50	22	50	15.2
025, 050**	1½	40	75	34.0	10	3	1½	40	75	34.0	100	30
033, 067**	2	50	100	45.4	10	3	2	50	100	45.4	100	30
042, 083**	2	50	125	56.7	10	3	2	50	125	56.7	100	30
048, 096**	2	50	143	65.0	10	3	2	50	143	65.0	100	30

Notes:

- Values in this table are based on XT Series humidifiers, and condensate flowing in direction of steam (steam hose or tubing pitched toward dispersion device).

* Use DriSteem steam hose for best results. Field-supplied hose may have shorter life and may cause foaming in cylinder, resulting in condensate discharge at dispersion assembly. Do not use steam hose for outdoor applications.

** These models have two steam cylinders. Capacities based on use with fill cup extensions.

† For Models XTP 050 through XTP 096, capacities listed are maximum steam carrying capacity per tube attached to each cylinder, with separate steam tubing from each cylinder to connection on dispersion device. See Figure 33-1.

†† DriSteem recommends 10' (3 m) maximum steam hose length pitched at 2"/ft (15%). Steam hose can sag if not supported for its full length. Sagging leads to collecting condensate and system pressure issues. Metallic tubing is less prone to sagging and can allow for 1/8"/ft (1%) pitch minimum and longer distances.

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

Dispersion: Interconnecting piping requirements

CONNECTING TO HUMIDIFIER WITH STEAM HOSE

- Support steam hose for its full length to prevent sags, or low spots:
  - For single dispersion tube without condensate drain, maintain a minimum pitch of 2"/ft (15%) toward the steam cylinder.
  - For dispersion devices with condensate drain, maintain a minimum pitch of 2"/ft (15%) toward the dispersion device.
- Use DriSteem steam hose. Other manufacturers of steam hose may use unacceptable release agents or material mixes that can affect humidifier system performance adversely. Using hose from alternative manufacturers increases the possibility of foaming in the cylinder and accelerated steam hose aging. Foaming causes condensate discharge at the dispersion assembly.
- Do not use steam hose in outdoor applications.
- Do not insulate steam hose. Insulation causes accelerated heat aging, causing the steam hose to become hard and susceptible to failure due to cracks.
- For single dispersion tube applications, see hose kit sizes in Table 41-1.

For tubing connections, see "Connecting to humidifier with tubing" on page 37.

Important:

Steam hose must be supported for its full length to prevent sagging or low spots.

Table 36-1:
Steam loss of interconnecting steam hose and tubing

Description	Nominal hose or tubing size		Steam loss				Insulation thickness	
			Noninsulated		Insulated			
	inches	DN	lbs/hr/ft	kg/h/m	lbs/hr/ft	kg/h/m	inches	mm
Steam 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

Note: These data are based on an ambient air temperature of 80 °F (27 °C), fiberglass insulation, and copper tubing.

Dispersion: Connecting to humidifier with tubing

See Figures 40-1 and 41-1 for interconnecting tubing pitch requirements for single dispersion tube applications. See Table 43-3 for interconnecting tubing pitch requirements for Rapid-sorb applications.

- Support tubing between the humidifier steam outlet and the dispersion system with pipe hangers. Failure to properly support the entire tubing weight may cause damage to the humidifier tank and void the warranty.
- Ground metal steam tubing. See "Grounding steam tubing" at right.
- 90° elbows are not recommended. DriSteem recommends 90° long sweeps. Two 45° elbows, 1' (0.3 m) apart may also be used.
- Insulating tubing reduces the loss in output caused by condensation.
- If flux or any other surface preparation material is used when connecting steam tubing and fittings, drain and fill the steam cylinder two times after the first half hour of steam production:
  - Model XTP, step 5 on page *57*
  - This will minimize the possibility of foaming in the steam cylinder.

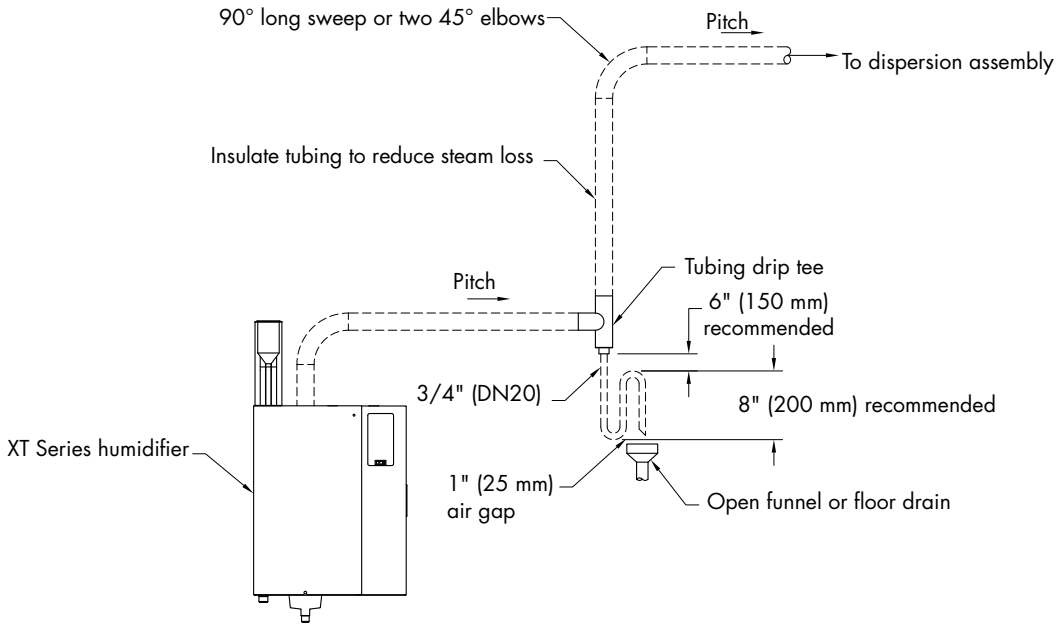
Important:

Failure to follow the recommendations in this section can result in excessive back pressure on the humidifier. This will result in unacceptable humidification system performance such as leaking gaskets, blown water seals, erratic water level control, and spitting condensate from dispersion tubes.

Grounding steam tubing

The XT Series humidifier has built-in functionality for detecting and eliminating foaming in the steam cylinder. However, because brief periods of foaming are possible, grounding metal steam tubing back to the humidifier earth ground lug is necessary. This earth ground will prevent foam from creating an electrically conductive path from the electrically charged cylinder water to the metal steam tubing.

FIGURE 37-1: DETAIL OF VERTICAL RISER DRIPS



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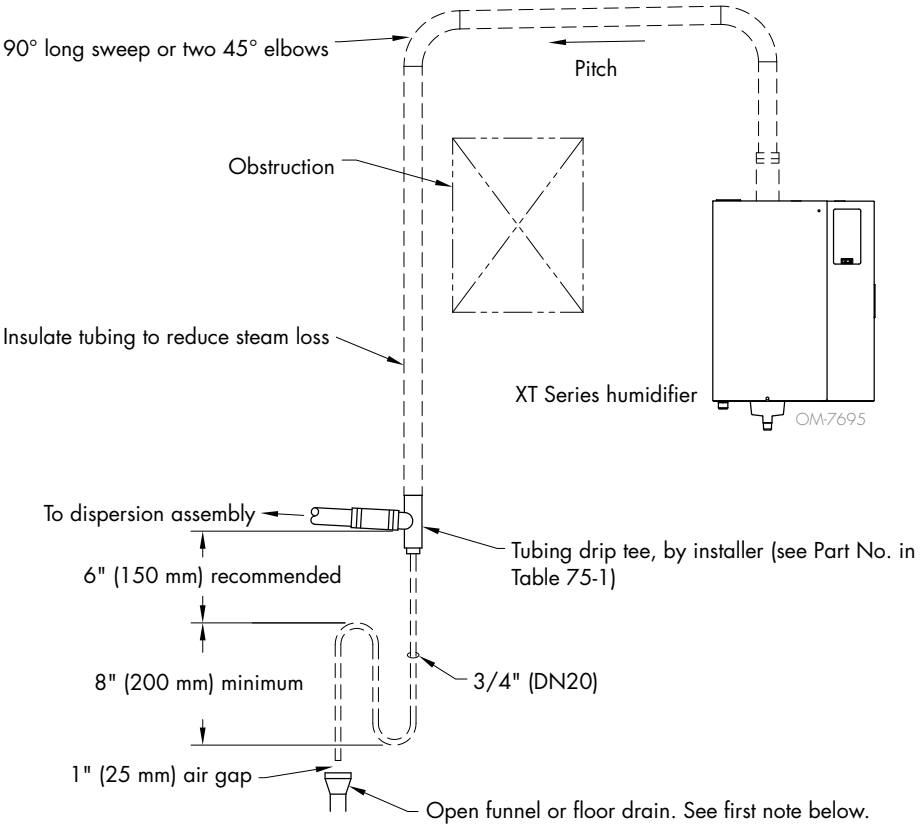
Dispersion: Drip tee installation

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

FIGURE 38-1: DRIP TEE INSTALLATION



Notes:

- Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
- Support steam hose for its full length so there are no sags or low spots.
- Dashed lines indicate provided by installer.

Dispersion: Single dispersion tube

DISPERSION TUBE WITH OR WITHOUT CONDENSATE DRAIN

- Use a hose cuff and clamps to connect the steam outlet to tubing.
- Tubing diameter must match XT steam outlet connection.
- See maximum steam carrying capacities in Table 35-1 and steam loss in Table 36-1.
- If mounting the humidifier above the level of dispersion tube, see "Drip tee installation" on Page 38. See also "Vertical riser drip details" in Figure 37-1.

DISPERSION TUBE WITHOUT CONDENSATE DRAIN, XTP 002 THROUGH 006

- See Figure 40-1.
- Maximum capacity of 1½" (DN40) dispersion tube without condensate drain is 29 lbs/hr (13.2 kg/h) insulated; 28 lbs/hr (12.7 kg/h) uninsulated.
- Condensate can flow back to the cylinder against 20 lbs/hr (9.1 kg/h) steam flow. Pitch the steam supply line back toward the humidifier (see Figure 40-1).

Important:
Failure to follow the recommendations in this section can result in excessive back pressure on the humidifier. This will result in unacceptable humidification system performance such as leaking gaskets, blown water seals, erratic water level control, and spitting condensate from dispersion tubes.

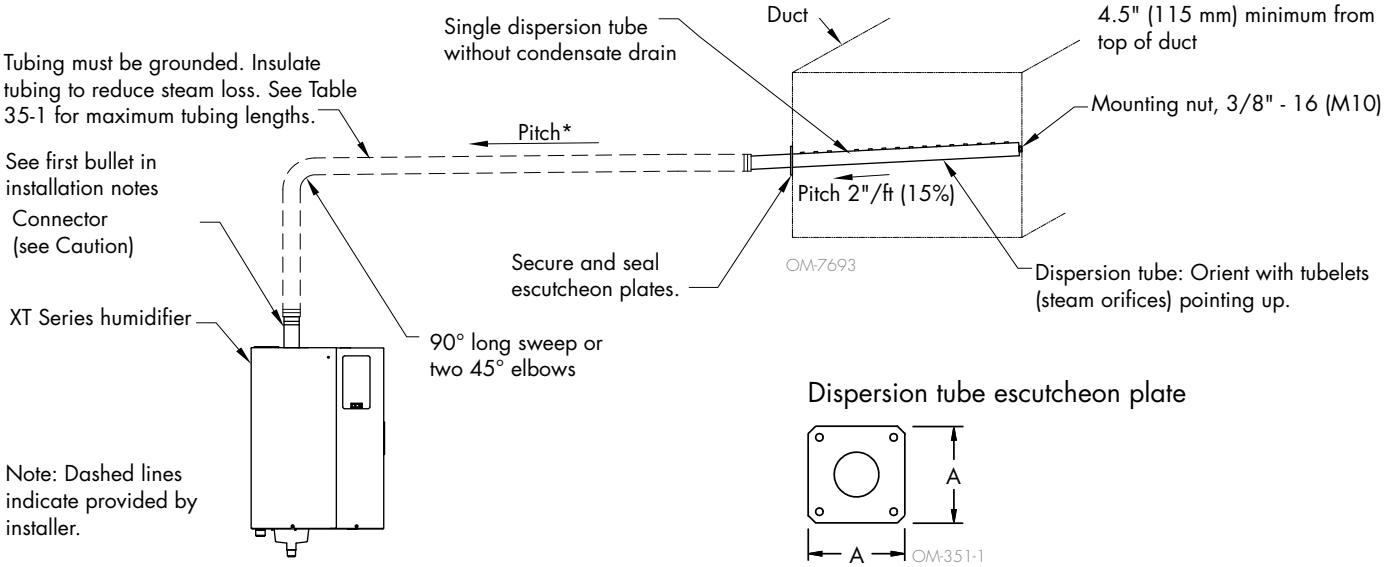
CAUTION

Connector kit location
Install the connector for increasing from 1" to 1½" (DN25 to DN40) hose or tube immediately above the XT Series humidifier as shown in Figure 40-1.

Failure to install the connector kit immediately above the humidifier will cause system pressure fluctuations and increase cylinder pressure, steam velocity, and condensate noise.

Dispersion: Single dispersion tube

FIGURE 40-1: SINGLE DISPERSION TUBE WITHOUT CONDENSATE DRAIN, MODELS XTP 002 THROUGH 006 ONLY

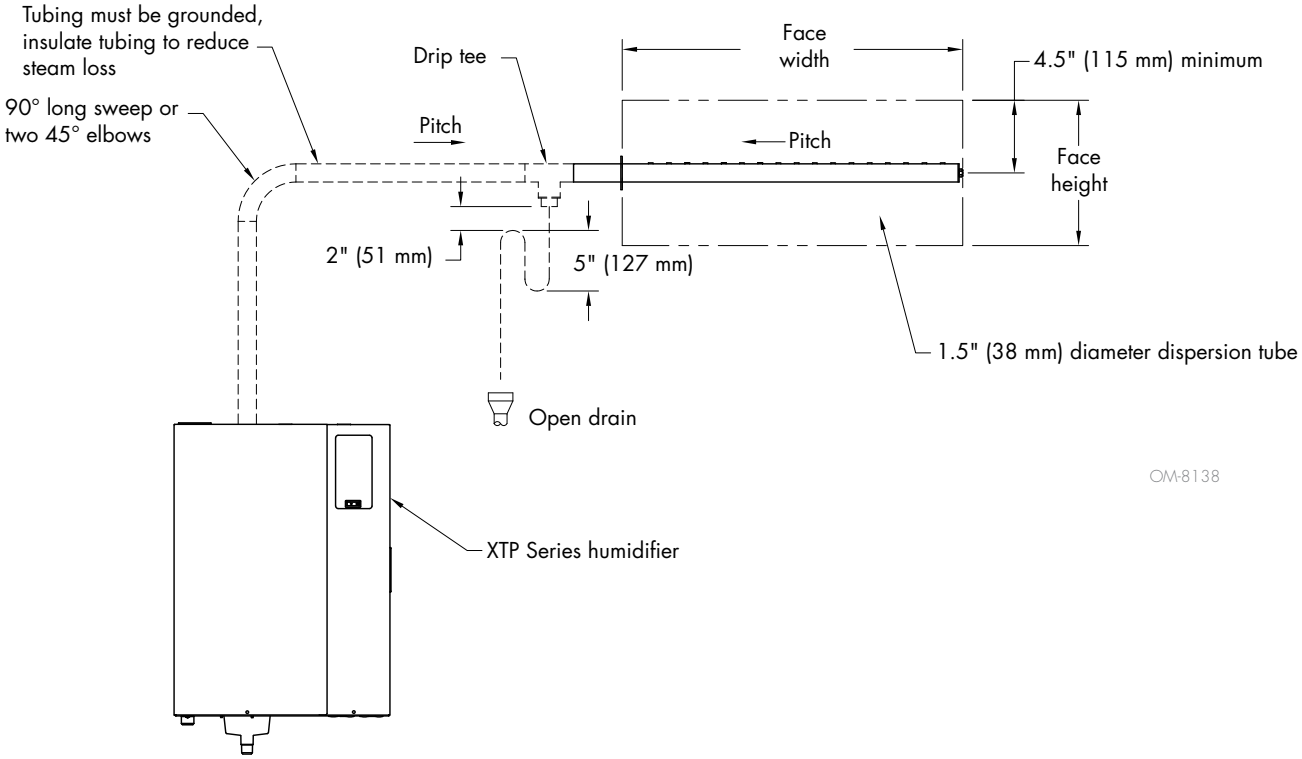


Dispersion tube escutcheon plate

Dimension A: 3.25" (82.5 mm) for 1½" tubes

* Pitch steam hose or tubing toward humidifier:
- 2"/ft (15%) when using steam hose
- ½"/ft (5%) when using 1½" tubing
- ¼"/ft (2%) when using 2" tubing

FIGURE 40-2: SINGLE DISPERSION TUBE WITHOUT CONDENSATE DRAIN WITH DRIP TEE, MODELS XTP 002 THROUGH 017



Dispersion: Single dispersion tube

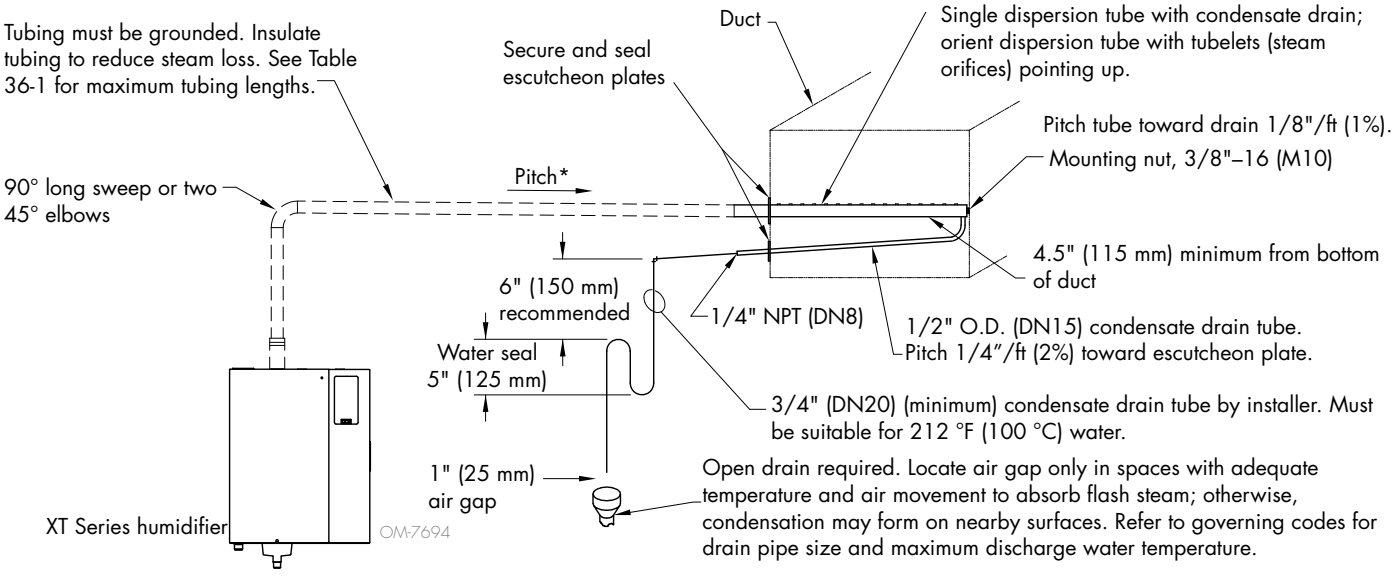
DISPERSION TUBE WITH CONDENSATE DRAIN, MODELS XTP 010 AND 017

- See Figure 41-1.
- Maximum capacity of 1½" (DN40) dispersion tube with condensate drain is 65 lbs/hr (29.5 kg/h) insulated; 62 lbs/hr (28.1 kg/h) uninsulated.
- Models XTP 010 through XTP096 have capacities requiring dispersion devices with condensate drains. DriSteem recommends pitching steam tubing for these models towards the dispersion device. For XT Series humidifiers with capacities more than 20 lbs/hr (9.1 kg/h), the installer should not attempt to drain condensate back to the cylinder. When a vertical riser is required in the steam tubing, a drip tee is required in order to eliminate a condensate collection point that will restrict steam flow. See vertical riser examples in Figure 37-1.
- If maximum developed length is more than 20' (6 m) and duct static pressure exceeds 2" wc (498 Pa), a fill cup extension kit (Figure 11-1) is required.

Table 41-1:
Hose kit sizing by capacity

Hose kit (steam hose, dispersion tube, and hardware)	Maximum tube capacity			
	Insulated		Uninsulated	
	lbs/hr	kg/h	lbs/hr	kg/h
1½" (DN40) without drain	29.0	13.2	28.0	12.7
1½" (DN40) with drain	65.0	29.5	62.0	28.1
These capacities require multiple tube assemblies and cannot use a single hose kit.	>65.0	>29.5	>62.0	>28.1
Capacities of Models XTP 025 through XTP096 require multiple tube assemblies and cannot use a hose kit. For multiple tube assemblies, see "Rapid-sorb" beginning on Page 42.				

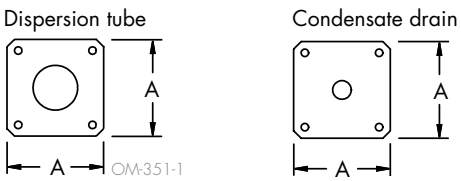
FIGURE 41-1: SINGLE DISPERSION TUBE WITH CONDENSATE DRAIN, MODELS XTP 002 THROUGH 025



* Pitch steam hose or tubing toward humidifier:
- 2"/ft (15%) when using steam hose
- 1/8"/ft (1%) when using tubing

Note: Dashed lines indicate provided by installer.

Escutcheon plates



Dimension A: 3.25" (82.5 mm) for 1½" tubes

Dispersion: Rapid-sorb

Read all dispersion instructions in this manual, and follow the installation instructions below:

- Unpack shipment and verify receipt of all Rapid-sorb® components with packing list. Report any shortages to DriSteem immediately. The components typically include the following:
  - Multiple dispersion tubes
  - Header
  - 3/4" × 2" (19 mm × 51 mm) L-bracket
  - Note: Dispersion tubes, header, and L-bracket are each tagged with the customer requested identification number.
  - A single duct escutcheon plate the size of the header
  - Slip couplings or hose cuffs and clamps
  - Accessories such as duct plates, slip couplings, or hose cuffs
  - Bolts and washers for mounting the dispersion tubes to the bracket
- L-bracket mounting holes (see note):
  - L-bracket 50" (1270 mm) long or shorter has a mounting hole 4" (100 mm) from each end for mounting the L-bracket to the duct or air handler wall.
  - L-bracket longer than 50" (1270 mm) has an additional mounting hole in the center.
  - Note: Hardware for mounting the L-bracket to the duct or air handler wall and the hardware for the header support bracket is not provided.
- Select an installation location that provides necessary access in and around the ductwork or air handler.
- The Rapid-sorb typically is installed centered side to side in a duct, or is installed across the face of a coil in an air handler.
- The center line of the outer dispersion tubes should never be closer than 4.5" (114 mm) from the side of the ductwork or air handler wall.
- The following instructions are for a typical Rapid-sorb installation — horizontal-airflow duct with Rapid-sorb header either inside or outside the duct. See the DriCalc Installation Guides library or contact your representative/distributor or DriSteem for installation instructions for air handler or vertical airflow applications.

⚠ WARNING

Hot surface and steam hazard
Dispersion assembly and steam hose or tubing can contain steam, and surfaces can be hot. Discharged steam is not visible. Contact with hot surfaces or air into which steam has been discharged can cause severe personal injury.

Important:

Before marking and drilling holes in the duct or air handler, refer to ALL pitch requirements for the Rapid-sorb assembly you received (see page 43). The size, quantity, and location of penetrations are determined by the dimensions and configuration of the Rapid-sorb assembly you received.

Important:

Failure to follow the recommendations in this section can result in excessive back pressure on the humidifier. This will result in unacceptable humidification system performance such as leaking gaskets, blown water seals, erratic water level control, and spitting condensate from dispersion tubes.

Dispersion: Rapid-sorb

PITCH REQUIREMENTS

- For Rapid-sorb with the header outside a horizontal-airflow duct, consider the following:
  - 1½" (DN40) dispersion tubes: Use a fastener of sufficient length to accommodate the 1/8"/ft (1%) pitch requirement toward the 3/4" pipe thread (DN20) header drain fitting.
  - 2" (DN50) dispersion tubes: Bracket can be mounted flush to ductwork. Typically, the 1/8"/ft (1%) pitch can be accomplished in the length of the hose cuffs used to connect tubes to header.
- See Table 43-3 and the drawings on the following pages for pitch requirements.

Table 43-1:
Rapid-sorb dispersion tube capacities*

Tube diameter		Tube capacity			
		Insulated (High-Efficiency Tubes)		Uninsulated	
inches	DN	lbs/hr	kg/h	lbs/hr	kg/h
1½	40	43.0	19.5	40.0	18.2
2	50	80.0	36.4	77.0	35.0

* Capacities shown are for horizontal airflow.
See DriCalc for vertical airflow capacities. If face height is <22" (559 mm), tube quantity per panel may need to increase to compensate for reduced capacity of short tubes. Consult DriSteem or see DriCalc sizing and selection software for the correct calculation.

Table 43-2:
Rapid-sorb header capacities

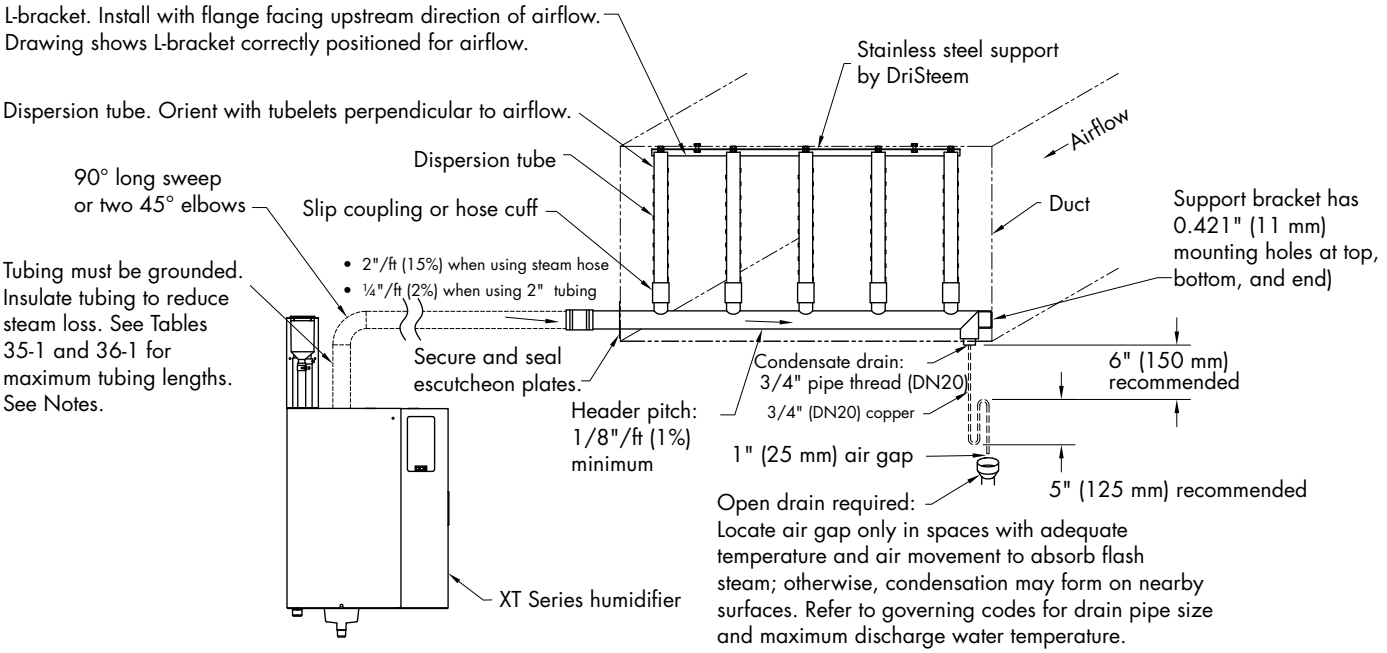
Header capacity		Header diameter	
lbs/hr	kg/h	inches	DN
≤ 250	≤ 113	2	50
251-500	114-227	3	80
501-800	228-363	4	100
801-1300	364-591	5	125
1301-2100	592-955	6	150

Table 43-3:
Pitch of interconnecting piping, dispersion tubes, and headers for Rapid-sorb evaporative dispersion units

Airflow	Type of interconnecting piping	Diameter of interconnecting piping	Pitch of interconnecting piping	Pitch of dispersion tubes	Pitch of header
Horizontal	Steam hose	1½" (DN40) 2" (DN50)	2"/ft (15%) toward Rapid-sorb	Vertically plumb	1/8"/ft (1%) toward condensate drain
	Tubing	1½" (DN40) 2" (DN50)	1/8"/ft (1%) toward Rapid-sorb		
Vertical	Steam hose	1½" (DN40) 2" (DN50)	2"/ft (15%) toward Rapid-sorb	2"/ft (15%) toward header	1/8"/ft (1%) toward condensate drain
	Tubing	1½" (DN40) 2" (DN50)	1/8"/ft (1%) toward Rapid-sorb		

Dispersion: Rapid-sorb with Models XTP 025 through 048

FIGURE 44-1: RAPID-SORB IN A HORIZONTAL AIRFLOW WITH HEADER INSIDE THE DUCT



Notes:
1. Use a hose cuff and clamps to connect steam outlet to tubing.
2. See installation procedure on Page 46.
3. Dashed lines indicate provided by installer.

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⚠ WARNING

Hot surface and steam hazard

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

Dispersion: Rapid-sorb and Ultra-sorb with Models XTP 050 through 096

Models XTP 050 through XTP 096 have capacities requiring dispersion devices with condensate drains (Figure 35-1). For these models, DriSteem recommends the following:

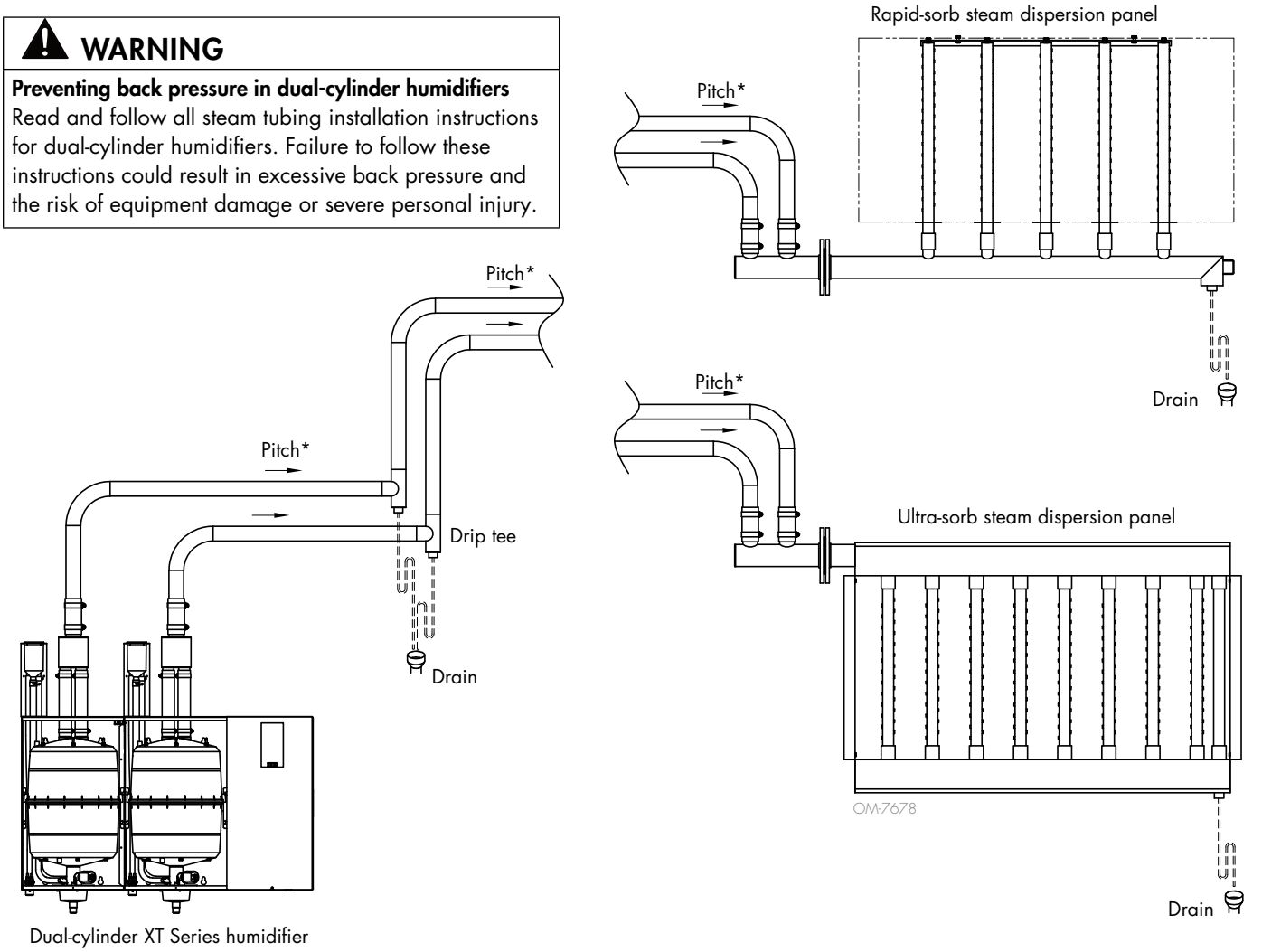
- Run separate steam tubing from each cylinder to the connection on the dispersion device.
- Pitch steam tubing toward the dispersion device.

The installer should not attempt to drain condensate back to the cylinder. When a vertical riser is required in the steam tubing, a drip tee is required in order to eliminate a condensate collection point that will restrict steam flow.

FIGURE 45-1: DUAL-CYLINDER XT SERIES HUMIDIFIER CONNECTED TO RAPID-SORB OR ULTRA-SORB WITH RISER DRIPS IN STEAM SUPPLY LINES

⚠ WARNING

Preventing back pressure in dual-cylinder humidifiers
Read and follow all steam tubing installation instructions for dual-cylinder humidifiers. Failure to follow these instructions could result in excessive back pressure and the risk of equipment damage or severe personal injury.



Notes:
* Pitch 1/8"/ft (1%) minimum toward dispersion panel.
• See installation notes in Figure 25-1.

Dispersion: Rapid-sorb

WITH HEADER INSIDE OF DUCT FOR HORIZONTAL AIRFLOW

Note: See the instructions for installing Rapid-sorb with the header outside the duct for horizontal airflow.

1. Mark and cut holes in ductwork or air handler for steam header penetration, condensate drain piping, and header support bracket fastener. Allow 1/8"/ft (1%) header pitch toward the support bracket when you drill the hole for the header support bracket fastener.
2. Loosely fasten the header in place.
3. Rotate the header 90° so the header stubs point horizontally in the duct.

- When installing in an air handler, the rotation of the header is often less than 90°. Typically, due to the condensate drain piping requirements, the header can be set on the floor of the air handler, assembled in the vertical position, and then raised and mounted in place.

4. Mount the dispersion tubes on the header with the slip couplings or hose cuffs:
   - When installing slip couplings for 1½" (DN40) dispersion tubes, take care not to shear O-rings.
   - Set slip coupling on header stub or dispersion tube so O-ring is resting on face of tubing.
   - Rotate slip coupling while pushing it onto the tubing.
   - O-rings are lubricated at factory. If additional lubrication is necessary, DO NOT use petroleum-based lubricant.
5. Allow the dispersion tubes to rest against the bottom of the duct.

CAUTION

Operate Rapid-sorb within rated steam capacity

Excessive steam flow to the Rapid-sorb steam dispersion assembly can cause condensate to exit the tubelets, which can cause water damage and standing water in the duct or air handler.

To avoid condensate exiting the tubelets, do not operate the Rapid-sorb beyond its rated capacity.

With header outside of duct for horizontal airflow

1. Mark and cut holes in the ductwork for the dispersion tubes. Use the L-bracket as a template to mark the holes on the duct floor.
2. Temporarily, loosely suspend or support the header below the final location. Vertical balance point of the dispersion tube length dictates where the header should be suspended or temporarily supported.
3. Continue with Step 4 at right.

Dispersion: Rapid-sorb

6. Position the flange of the L-bracket so it is upstream of the tubes when the assembly is rotated into position. Fasten the L-bracket to the end of the dispersion tubes with the provided bolt, lock washer, and flat washer.
7. Rotate the assembly up until the L-bracket aligns with the mounting holes in the duct or air handler.
   - For 1½" (DN40) dispersion tubes:
     - Header pitch is duplicated in the L-bracket.
     - Dispersion tube and slip coupling must be fully engaged on header stub for O-rings to provide a seal.
     - High end of L-bracket can be fastened tight to duct or air handler.
     - Fastener on low end of L-bracket must be long enough to compensate for pitch. Use a nut on both sides of L-bracket and duct or air handler for stability.
   - 2" (DN50) dispersion tubes
     - Fasten bracket to top of duct and use hose cuffs to compensate for header pitch.
     - Before securing hose cuffs with hose clamps on dispersion tube and header stub, verify that dispersion tube orifices are directed perpendicular to airflow.
8. Verify that all fasteners are secure:
   - L-bracket to duct
   - Dispersion tubes to L-bracket
   - Hose clamps on 2" (DN50) tubes
   - Header support bracket fastener
9. Secure and seal the header escutcheon plate around the header.

Note:

See Page 48 for steam supply and condensate drain line connection instructions.

Dispersion: Rapid-sorb

STEAM SUPPLY CONNECTIONS TO RAPID-SORB HEADER

Connect the steam supply interconnecting piping from the humidifier to the Rapid-sorb. Steam supply piping requires a minimum of 1/8"/ft (1%) pitch toward the header.

If two humidifiers are supplying one Rapid-sorb, a steam supply connector is needed. Typically, the steam supply connector attaches to the Rapid-sorb header supply end with hose cuff and clamps:

1. Always run separate steam tubing from each cylinder to the connection on the dispersion device. Connect a maximum of two cylinders to any single dispersion unit. See page 33 for more detailed instructions and connector kit part numbers.
2. Position the steam supply connector to accept the steam supplies while maintaining the necessary pitch.
3. Make sure the hose clamps on the steam supply connector and header are tight.

CONDENSATE DRAIN CONNECTIONS TO RAPID-SORB HEADER

Piping must be minimum 3/4" I.D. (DN20) and rated for 212 °F (100 °C) minimum continuous operating temperature.

The condensate drain line must be piped as shown in Figure 44-1. Provide a 6" (150 mm) drop prior to a 5" (125 mm) water seal to:

- Ensure drainage of condensate from the header
- Keep steam from blowing out of the drain line

After the water seal, run the drain line to an open drain with a 1" (25 mm) vertical air gap.

- Cut the drain line at a 45° angle on the end above the drain to permit a direct stream of water into the drain pipe while maintaining a 1" (25 mm) air gap.
- Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam, or condensing on nearby surfaces may occur.

All drain lines must be installed and sized according to governing codes.

Dispersion: XT steam blowers

Fuses provided with the steam blowers must first be installed in the associated XT series humidifiers.

On a call for humidity, the controller closes the contactors to energize the humidifier electrodes and the XT steam blower. When the call for humidity is satisfied, the controller opens the humidifier contactor, which stops the steam blower.

As steam is discharged from the XT steam blower, it quickly cools and turns to a visible fog that is lighter than air. As this fog is carried away from the XT steam blower by the airstream, it tends to rise toward the ceiling. If the fog contacts solid surfaces (columns, beams, ceiling, pipes, etc.) before it disappears, it can condense and drip. The greater the space relative humidity, the further the fog will rise, spread, and throw.

XT STEAM BLOWER RISE, SPREAD, AND THROW

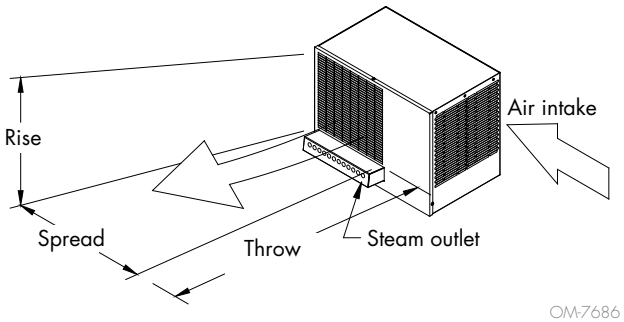


Table 49-1 lists the maximum rise, spread, and throw non-wetting distances for XT Series humidifiers with XT steam blowers. Surfaces cooler than ambient temperature, or objects located within this minimum dimension, can cause condensation and dripping. To avoid steam impingement on surrounding areas, observe the minimum non-wetting distances in the table.

XT steam blowers are field wired to the XT Series humidifier blower terminals. A wiring diagram is included with the XT steam blower.

Table 49-1:
XT steam blower minimum non-wetting distances

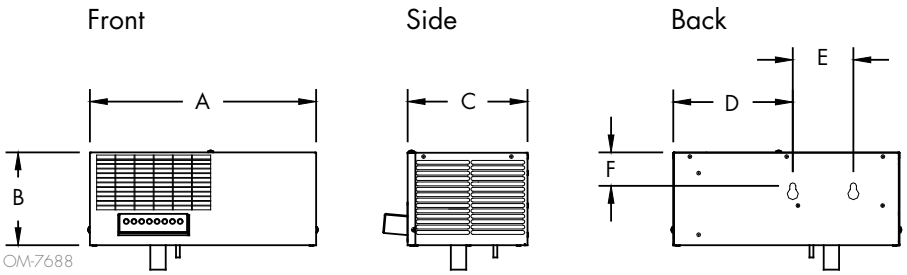
Model	Nominal steam capacity		30% RH @ 70 °F (21 °C)						40% RH @ 70 °F (21 °C)						50% RH @ 70 °F (21 °C)						60% RH @ 70 °F (21 °C)					
			Rise		Spread		Throw		Rise		Spread		Throw		Rise		Spread		Throw		Rise		Spread		Throw	
XTP	lbs/hr	kg/h	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
002	5	2	0.7	0.2	0.9	0.3	1.9	0.6	0.8	0.2	1.2	0.4	2.1	0.6	1.1	0.3	1.5	0.5	2.5	0.8	1.5	0.5	1.5	0.5	3.2	1.0
003	10	5	1.4	0.4	1.9	0.6	3.8	1.2	1.7	0.5	2.4	0.7	4.3	1.3	2.3	0.7	3.0	0.9	5.0	1.5	3.0	0.9	3.0	0.9	6.5	2.0
006	20	8	2.5	0.8	2.8	0.9	6.5	2.0	3.0	0.9	3.3	1.0	7.4	2.3	3.8	1.2	4.0	1.2	8.5	2.6	4.0	1.2	4.0	1.2	10.0	3.0
010	30	14	3.1	0.9	3.0	0.9	7.5	2.3	3.6	1.1	3.4	1.0	8.7	2.7	4.3	1.3	4.0	1.2	9.5	2.9	4.2	1.3	3.5	1.1	11.0	3.4
017	50	22	3.3	1.0	3.1	0.9	9.6	2.9	3.8	1.2	3.5	1.1	10.7	3.3	4.4	1.3	4.0	1.2	12.0	3.7	4.8	1.5	4.7	1.4	14.0	4.3
025*	75	34	3.3	1.0	3.1	0.9	9.6	2.9	3.8	1.2	3.5	1.1	10.7	3.3	4.4	1.3	4.0	1.2	12.0	3.7	4.8	1.5	4.7	1.4	14.0	4.3
033*	100	45	3.3	1.0	3.1	0.9	9.6	2.9	3.8	1.2	3.5	1.1	10.7	3.3	4.4	1.3	4.0	1.2	12.0	3.7	4.8	1.5	4.7	1.4	14.0	4.3

Rise: Minimum non-wetting height above the steam outlet of the XT steam blower
Spread: Minimum non-wetting width from the steam outlet of the XT steam blower
Throw: Minimum non-wetting horizontal distance from the steam outlet of the XT steam blower
* These models use two XT steam blowers.

Dispersion: XT steam blowers

FIGURE 50-1: XT STEAM BLOWER DIMENSIONS

SDU-006E shown



The XT steam blower can be mounted on top of an XT Series humidifier cabinet, or wall-mounted remotely from the humidifier. See Figure 50-1.

SDU-006E, for capacities up to 20 lbs/hr (9.1 kg/h), can be directly mounted on Models XTP 002 through 006.

SDU-017E, for capacities up to 50 lbs/hr (22.7 kg/h), can be directly mounted on Models XTP 010 and 017.

XT Series humidifiers can be configured to operate with one or two steam blowers. Multiple SDU-017 are used remotely with Model XTP 025 or 033. See Table 50-2.

Note: XT steam blower installation must comply with governing codes.

Table 50-1:
XT steam blower dimensions

Dimension	SDU-006E		SDU-017E	
	inches	mm	inches	mm
A	14.7	373	17.9	455
B	6.0	152	13.8	350
C	7.8	198	11.0	279
D	3.0	76	3.6	91
E	3.9	99	7.1	180
F	2.7	69	4.2	107

Table 50-2:
Single or multiple XT steam blowers for XT Series humidifiers*

Model	SDU-006 per kit	SDU-017 per kit
XTP		
002	1	—
003	1	—
006	1	—
010	—	1
017	—	1
025	—	2
033	—	2
042 through 096	n/a	n/a

* XT steam blowers are sold as kits to match the associated XT Series humidifier. The number of XT steam blowers per kit are shown in this table.

Table 50-3:
XT steam blower specifications

Model	Maximum capacity		Shipping weight		Operating weight		Volume airflow		Current draw at 115V (50/60 Hz)	Input power	Noise
	lbs/hr	kg/h	lbs	kg	lbs	kg	cfm	m^3/min			
SDU-006E	20	9.1	14.0	6.4	11.0	5.0	106	3.0	0.16 A	17 W	49 dBA
SDU-017E	50	22.7	29.0	13.2	24.0	10.9	665	18.8	0.23 A	23 W	53 dBA

Notes:
- XT steam blowers ship separately from XT Series humidifiers.
- Noise measurements taken 6.5' (2 m) in front of XT steam blower cabinet.

Dispersion: XT steam blowers

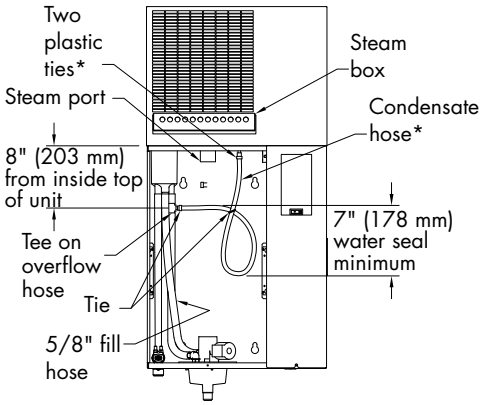
MOUNTING XT STEAM BLOWER ON TOP OF HUMIDIFIER

The condensate tee kit shipped with the XT steam blower returns condensate from a top-mounted XT steam blower to the humidifier's cylinder fill hose. See Figure 51-1. Install the kit as follows:

1. If humidifier is not already mounted to wall, see "Wall mounting humidifier" on Page 10.
2. Remove steam cylinder (see "Removing steam cylinder"on Page 10).
3. Assemble condensate hose from kit to condensate outlet at base of steam box, and install both plastic ties (included) on hose to ensure secure connection to steam box condensate outlet.
4. Assemble hose cuff and clamp to steam port on steam box.
5. Remove middle-rear knockout on top of humidifier cabinet, and mount XT steam blower to wall as noted on Page 52.
6. Feed condensate hose into humidifier cabinet through knockout hole created in Step 5, place XT humidifier below XT steam blower on wall, and secure humidifier to wall.
7. Push small burr of tee into loose end of condensate hose that was fed into cabinet in Step 6.
8. Cut the 5/8" overflow hose that connects the off-center port on fill cup to overflow connection on floor of humidifier cabinet at 8" below the inside top of the unit. Avoid kinks by leaving slack in overflow hose for cylinder installation.
9. Create a seal loop with the condensate hose and install tee in 5/8" overflow hose that was cut in Step 8.
10. Install steam cylinder (see "Installing steam cylinder" on Page 12).

For remote-mounting the XT steam blower, see Page 52.

FIGURE 51-1: CONDENSATE TEE KIT FOR TOP-MOUNTED XT STEAM BLOWER

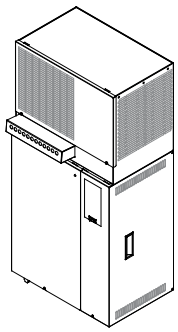


* Supplied with condensate tee kit

FIGURE 51-2: TOP- AND REMOTE-MOUNTED XT STEAM BLOWER

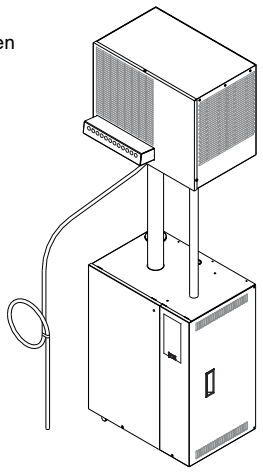
Mounted on top of humidifier

Condensate returned to steam cylinder fill hose

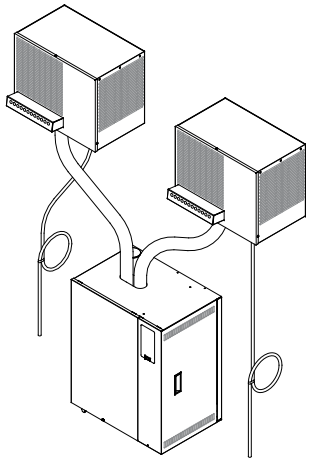


Mounted remotely from humidifier

Condensate returned to open drain



One XT Series humidifier with two XT steam blowers



Dispersion: XT steam blowers

REMOTE MOUNTING XT STEAM BLOWER

The XT steam blower is constructed with a pitch toward the drain; however, it must be installed level and plumb for proper drainage. See the Warning.

⚠ WARNING

Standing water in XT steam blower

Make sure the XT steam blower is installed plumb. If it is not installed plumb, standing water can accumulate, which can:

- cause bacteria and mold growth, which can cause illness;
- affect XT steam blower performance;
- cause 212 °F (100 °C) water to discharge from the XT steam blower, which can cause severe personal injury.

Follow the instructions below for your wall type:

Mount the XT steam blower using the lag bolts provided. Follow the instructions below for mounting on a wood stud wall.

1. Mount spanner board on wall, spanning at least two studs, at top of XT steam blower cabinet (for the lag bolts).
2. Predrill pilot holes in spanner board, and secure XT stream blower to spanner board with lag bolts.
   - Note: Use the appropriate mounting methods and mounting hardware for other wall types.

See Table 49-1 to determine clearance requirements for your application. Make sure walls, ceilings, and other obstructions are not within the non-wetting dimension, or condensation and dripping could occur (read Page 49). Provide at least 3" (76 mm) of clearance on each side of the XT steam blower for air intake.

INSTALLING BASE PLATE

The steam blower has a base plate for remote-mounted steam blower applications. The base plate isolates the hot steam box from contact. After the electrical connections are made, assemble the base plate onto the bottom of the steam blower with the screws provided.

Dispersion: XT steam blowers

WIRING XT STEAM BLOWERS

Make the following wiring connections between the humidifier and the XT steam blower, and tighten all terminals securely:

Fuses provided. See page "XT steam blowers" on page 49.

Connect XT steam blower fan wires to humidifier terminals 32, 33, and GRD.

Refer to the external connections diagram shipped with the XT steam blower.

PIPING CONDENSATE TO DRAIN

The XT steam blower condensate hose must be routed as shown in Figure 53-2. The water seal is required to ensure condensate drainage from the XT steam blower and to keep steam from blowing out of the condensate hose.

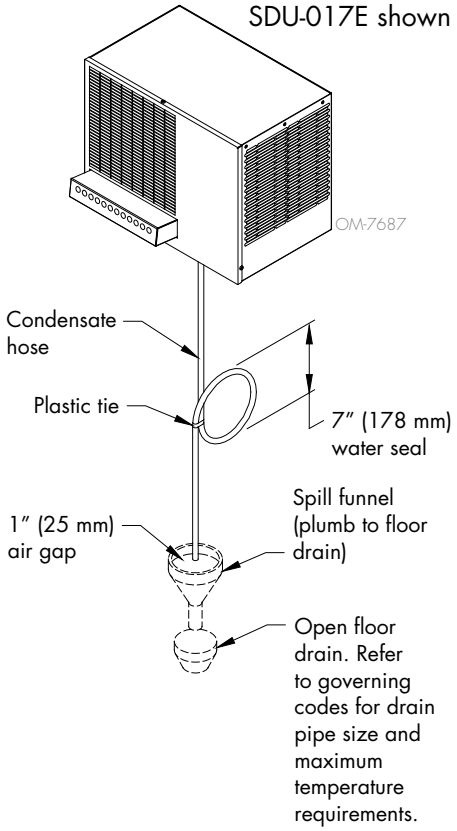
After the water seal, run the condensate hose to an open drain. Cut the hose at a 45 degree angle on the end above the drain to permit a direct stream of water into the drain while maintaining an air gap.

The condensate hose must be installed and sized according to governing codes.

ADDITIONAL INSTRUCTIONS

See instructions for piping from XT Series humidifier to XT steam blower on pages 15 and 16.

FIGURE 53-1: PIPING CONDENSATE TO DRAIN



Note:
Shown with condensate to open drain.

Principle of operation

1. **CONTROLLER RECEIVES A CALL FOR HUMIDITY**
   When the RH level in the humidified space drops below set point, the humidifier controller receives a call for humidity and calculates a corresponding electrical current. The controller closes the contactor, which energizes the electrodes. If there is not enough water in the steam cylinder, the fill valve opens and water enters the steam cylinder.

2. **ENERGIZED ELECTRODES BOIL WATER INTO STEAM**
   When the water level in the steam cylinder rises to touch the electrodes, electrical current flows through the water between the electrodes. Electrical resistance in the water causes the water to heat up and boil into steam. The steam flows through the steam outlet and through steam hose or tubing to the XT steam blower or dispersion assembly, where it is discharged into the airstream.

3. **ELECTRICAL CURRENT INCREASES TO MEET DEMAND**
   As the amount of water covering the electrodes increases, current flow increases. The fill valve remains open until the amperage increases to 10 percent above the current corresponding to the demand signal. Then the fill valve closes, and the water boils into steam.

4. **WATER CONTINUES TO BOIL INTO STEAM**
   As the water boils into steam, the amount of water covering the electrodes decreases, and current flow decreases. When current flow decreases to 10 percent below the current corresponding to the demand signal, the fill valve opens to increase the water level in the steam cylinder, which increases current flow and steam production.

5. **CONTROLLER INITIATES DRAIN/FILL CYCLES TO FLUSH CONDUCTIVE IONS**
   As steam production continues, the concentration of conductive ions in the water increases, eventually leading to increased electrical current through the water. An algorithm monitors water conductivity and auto tunes drain and fill cycles to keep electrical current within demand parameters. This optimizes humidifier performance based on water conditions and steam production.

   The humidifier has user-selectable drain water tempering. When drain water tempering is selected, drain water is automatically cooled before entering the drain.

WATER CONDUCTIVITY

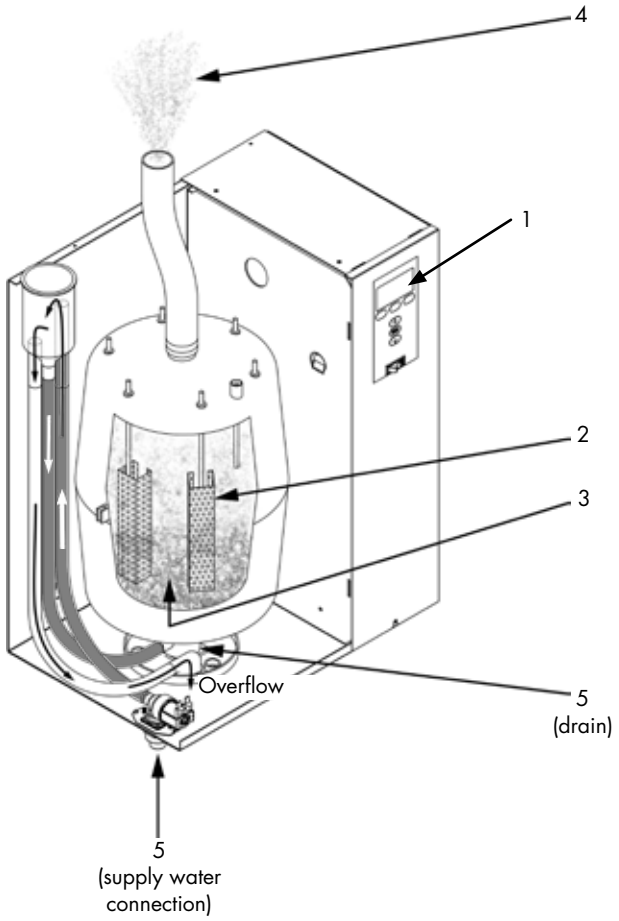
In electrode humidifiers, steam output is directly related to the resistance of the water in the steam cylinder and, therefore, the conductivity of the water between the electrodes. Higher water levels cover more electrode surface and result in more steam; lower water levels cover less electrode surface and result in less steam. Since water conductivity and water level both correlate to steam output, DriSteem's algorithm monitors conductivity and manages drain and fill cycles to optimize humidifier performance and provide proper steam output.

DRAIN AND FILL CYCLES

As the water in the cylinder boils into steam, the concentration of conductive ions increases until it reaches a threshold that triggers a drain and fill cycle. This rids the cylinder of highly conductive water and replaces it with less conductive fill water. The more conductive the fill water and the higher the demand, the more quickly the threshold is reached, and the more frequently the cylinder automatically drains and fills to stay within the parameters for proper steam output.

Principle of operation

FIGURE 55-1: XT SERIES HUMIDIFIER PRINCIPLE OF OPERATION



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SAFETY FUNCTIONS

XT Series humidifiers are protected against running dry — current does not flow if the electrodes in the steam cylinder are not submerged in water.

If the current rating exceeds 120% of nominal current, the drain valve opens automatically. As the water level drops, the current rating drops back to the nominal value.

If the current rating exceeds 120% of the nominal current after several drainage operations, the humidifier shuts down automatically.

Start-up checklist

Your humidification system may not have all of the options listed below. If an item does not apply to your system, skip to the next item.

> **⚠ WARNING**
>
> **Electric shock hazard**
> Contact with energized circuits can cause property damage, severe personal injury or death as a result of electrical shock or fire.
>
> Make sure cabinet doors are installed before turning on electrical power.
>
> For proper operation of safety interlock switch, install electrical-side door first, then install cylinder-side door.

☐ Verify that humidifier, controls, piping, electrical connections, steam supply, and dispersion units(s) are installed according to installation instructions in this manual and:

- Ladder style wiring diagram and external connections wiring diagram (inside humidifier cabinet)
- Governing codes
- Vapor-logic Installation and Operation Manual
  - Installation section
  - Pre-installation checklist

☐ Verify that field wiring is done per instructions in this manual and per unit wiring diagram.

☐ Confirm that proper grounding and an approved earth ground are provided.

☐ Confirm that instructions in the Electric shock hazard warning have been followed.

☐ Confirm that water fill line was thoroughly flushed before it was connected to the humidifier.

☐ Verify that humidifier is mounted level and securely supported before filling with water. See operating weights in Table 5-1.

☐ Make sure cylinder is fully seated into drain valve, and verify that all electrical connections are secure.

☐ Turn water supply on (do not use demineralized, deionized, or reverse-osmosis water) and confirm that drain valve is closed.

If the force of air exiting water supply lines blows fill cup cap off during first fill cycle, this is not a sign of defect or a cause for concern; simply replace fill cup cap after all air has exited water line.

☐ Verify that humidifier is level and plumb when filled with water.

☐ Turn power on and confirm that Model XTP keypad/display illuminates.

☐ Confirm that airflow switch is closed.

☐ If you choose not to use airflow switch: Jumper AFsw and 24vac terminals

☐ If you choose not to use on-off duct high limit: Jumper 21vdc and DHL terminals

☐ Confirm that high limit humidistat input is closed or that variable air volume (VAV) control system high limit transmitter is connected.

☐ With sufficient water in steam cylinder, airflow switch closed, high limit humidistat closed, door safety interlock switch closed, and a call for humidity, verify that heat outputs are activated.

☐ If you experience difficulties, see “Troubleshooting” on Page 63.

Model XTP

START-UP PROCEDURE

After the Model XTP humidifier is installed and connected properly:

1. Perform all applicable "Start-up checklist" items on Page 56.
2. Read and follow the instructions in the "Operation" section of the *Vapor-logic Installation and Operation Manual*.
3. Note: During start-up, do not leave the humidifier unattended.
4. Monitor humidifier operation through multiple drain and fill cycles.
5. Perform the cleaning procedure as follows:
   - Operate humidifier long enough for steam to be produced.
   - Using the keypad/display:
     – At the Main menu, select Tank Status, and press Enter.
     – Select Mode, and press Enter.
     – Select Drain, and press Enter.
     – Let steam cylinder drain for 5 to 10 minutes until empty.
   - Restart the humidifier, and repeat Steps a and b.

CAPACITY LIMITATION

Model XTP humidifier capacity can be limited to a user-specified maximum using the keypad/display or Web interface. From the Main menu, select **Tank Setup**, then select **Capacity Adjustment** for menu options.

⚠ WARNING

Electric shock hazard

Only qualified electrical personnel should perform start-up procedure.

Contact with energized circuits can cause property damage, severe personal injury or death as a result of electrical shock or fire.

Make sure cabinet doors are installed before turning on electrical power.

For proper operation of safety interlock switch, install electrical-side door first, then install cylinder-side door.

The *Vapor-logic Installation and Operation Manual* is a comprehensive operation manual. Refer to it for information regarding the following features:

- Keypad/display and Web interface setup and menu information
- Control input signals and functions
- Safety features
- Alarm screens and fault messages

This manual ships with Model XTP humidifiers and is available at our website: www.dristeem.com

Shutdown and cool-down procedures

SCHEDULED MAINTENANCE

At 1000-hour intervals or when "Service interval reached" appears in the Messages Log, inspect the steam cylinder, fill and drain valves, steam hose, condensate piping, water supply piping, drain piping, drain, and all other parts for proper operation and cleaning requirements. Verify proper operation of the high limit humidistat, relays, and airflow proving switch.

STEAM CYLINDER SERVICE LIFE

Steam cylinder service life depends on operating hours and water hardness. If "Check cylinder" appears in the Messages Log during and shortly after start-up, the message can be cleared and will stop repeating after a few drain and fill cycles.

When "Check cylinder" appears in the Messages Log after extended operation, the humidifier will continue to run, but the cylinder must be replaced to ensure optimum output. Sure signs that a cylinder needs to be replaced are when it is approximately one-third full of minerals, or minerals have bridged between electrodes.

To replace the steam cylinder, first follow the cool-down procedure below.

COOL-DOWN PROCEDURE

1. In Vapor-logic keypad/display Main menu, select Tank Status, and press Enter.
2. Select Mode, and press Enter.
3. Select Drain, and press Enter.
4. Let steam cylinder drain for 5 to 10 minutes (drain water is automatically tempered when drain water tempering is selected).
5. Close field-installed manual supply water shut-off valve, and allow cylinder to continue draining.

⚠ WARNING

Shutdown procedure

To prevent severe personal injury or death from electrical shock, follow this shutdown procedure before performing service or maintenance procedures on this humidifier (after cylinder is drained and cooled):

1. Use Vapor-logic keypad/display to drain cylinder.
2. Use Vapor-logic controller keypad/display to change control mode to Standby.
3. Shut off all electrical power to humidifier using field-installed fused disconnect, and lock all power disconnect switches in OFF position.

   Note: Two-cylinder XT Series humidifiers have two power supply connections.
4. Close field-installed manual water supply shut-off valve.

⚠ WARNING

Hot water system

Cylinder and any undrained water may be hot. To avoid injury from hot water, follow the cool-down procedure before proceeding with maintenance.

Replacing steam cylinder

1. When steam cylinder is completely empty, turn humidifier off. Place all power disconnects in OFF position, and lock in OFF position.
2. Remove cabinet doors, and make sure cylinder and humidifier components have cooled.
3. Carefully pull the electrode plugs straight up off the cylinder to ensure no damage to the plug boot occurs.
4. Inspect cylinder plugs. Obtain replacement plugs from DriSteem if deterioration, corrosion or loose fit occur.
5. Disconnect the high water sensor wire.
   Note: Because of tight clearances, perform Steps 6 through 7 only if servicing Model XTP 002 through 017 with top-mounted steam blower. For all other models, skip to Step 8.
   6. Remove both clamps on steam hose that connects to cylinder and steam blower.
   7. Slide steam hose from Step 6 all the way up until it is tight against bottom of steam blower. Skip to Step 9.
8. Loosen steam hose clamp, and disconnect steam hose from cylinder.
9. Place hands palms-down below cylinder on both sides of drain outlet.
10. Press up against bottom of cylinder with backs of hands while pressing down against cabinet floor with fingers.
11. Raise cylinder until drain outlet clears drain valve body and the side tabs on the cylinder have cleared the cylinder guides. Remove cylinder from cabinet.

Note:

DriSteem recommends keeping a spare steam cylinder in stock during the humidification season. See “Replacement parts" on Pages 67 and 69.

CAUTION

If cylinder plugs become loose, damage to the humidifier may occur. Obtain replacement plugs from DriSteem. See “Replacement parts” on Pages 67 and 69 for part numbers.

Replacing steam cylinder

12. Vacuum scale and debris out of drain valve port.
    Note: For more thorough cleaning, see drain valve maintenance instructions on Page 61.
13. Replace O-ring in drain valve body (new cylinder ships with new O-ring). Make sure O-ring is correctly placed.
14. Dampen O-ring seals **with water** before replacing cylinder. **Do not use lubricant or other substance.**
15. Install new steam cylinder. See "Installing steam cylinder" on Page 12.
16. Connect steam hose to cylinder, and re-install hose clamp.
17. Connect high water sensor (yellow) wire to single pin surrounded by plastic shoulder on cylinder.
18. **Connect electrode wires to pins on top of cylinder. Make sure all plugs fit snugly and are fully engaged on pins.**
    Important: Three phase cylinders have color-coded dots on the cylinder and color bands on the electrode plugs. When connecting the plugs, match the band colors on the plugs with the dot colors on the cylinder. Refer to the wiring diagram shipped with the humidifier if necessary.

If returning humidifier to operation, see the start-up procedure on page 57.

Drain valve

DRAIN VALVE

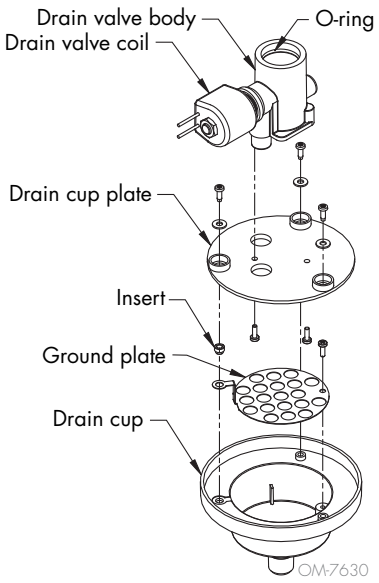
If either of the following issues occur after several months of runtime, follow the drain valve maintenance procedures below.

- Drain valve is closed, but draining and filling continue.
- End of cylinder life prompt appears prematurely.

DRAIN VALVE BODY MAINTENANCE

1. When steam cylinder is empty, turn humidifier off. Place all power disconnects in OFF position, and lock in OFF position. See Figure 61-1.
2. Remove cabinet doors and steam cylinder (see Page 10).
3. Vacuum loose scale and debris out of the drain valve port.
4. Disconnect 2-pin Molex plug from 24 VAC drain valve coil.
5. Slide cap (A) off of drain valve coil (C).
6. Turn hex nut (B) counter-clockwise. Loctite on nut will cause drain valve coil assembly to turn out of drain valve body (G). Remove coil/actuator assembly from drain valve body. Make sure spring (E) and plunger (F) do not fall out of actuator (D).
7. Clean plunger (F), spring (E), actuator (D), and plastic drain valve body (G) with clean water.
8. Reassemble drain valve. When threading actuator (D) into drain valve body (G), make sure it is not cross threaded. Torque actuator into drain valve body to 18 in-lb (2.0 N·m).
9. Plug Molex plug into its mating wire harness plug, and slide cap (A) onto drain valve coil (C).
10. See "Start-up procedure" on Page 57 if returning humidifier to operation.
    - Note: If the procedure above did not resolve drain valve issues, perform the drain valve assembly maintenance procedure on Page 62.

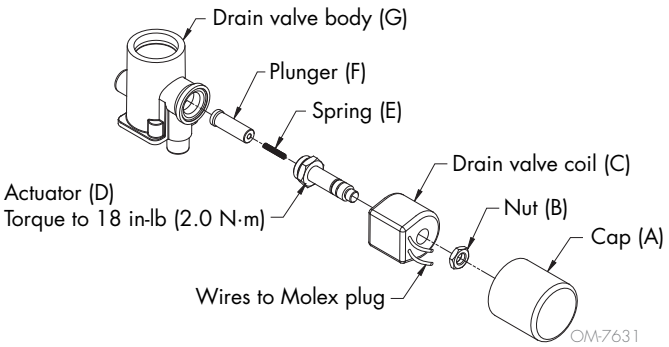
FIGURE 61-1: DRAIN VALVE ASSEMBLY



Notes:

- Pay close attention to all parts shown above. Verify that ground plate is in groove of drain cup, and insert is in place through ground plate loop.
- Failure to get ground plate and insert solidly connected to frame will compromise ground safety circuit.

FIGURE 61-2: DRAIN VALVE BODY



Drain valve

DRAIN VALVE ASSEMBLY MAINTENANCE

Perform the following procedure **only** if the procedure on Page 61 does not resolve drain valve issues. See Figure 61-2.

1. Perform Steps 1 through 4 on Page 61.
2. Remove the three screws and washers securing drain cup plate to drain cup.
3. Lift drain valve body/plate assembly off of drain cup.
4. Vacuum loose scale and debris out of drain cup.
5. Remove ground plate, and clean scale and debris from ground plate and outlet of drain valve body.
6. Reassemble drain valve assembly: Fit mounting screws with washers, insert them through drain cup plate, and tighten them into drain cup. See notes in Figure 61-2.
7. Clean end of hose, and reconnect it to drain valve body with hose clamp. Plug Molex plug into its mating wire harness plug.
8. See "Start-up procedure" on Page 57 if returning humidifier to operation.

Troubleshooting

MODEL XTP TROUBLESHOOTING

Follow the procedure below to resolve issues with Model XTP humidifiers:

1. Review possible causes and recommended actions in Table 64-1.
2. Follow the Test mode procedure beginning on Page 56.

   The Test mode procedure is intended to check the general function of Model XTP humidifiers and components, and to help diagnose and resolve general operational problems.
3. If Table 64-1 and the Test mode procedure do not help you solve the issue, call DriSteem (see inset at right) with the following information available:
   - Humidifier model number and serial number (see nameplate on side of the humidifier and steam blower)
   - Issue description
     Example: water leaking, low humidity, high humidity, etc.
   - When issue began
     Example: After maintenance, cylinder replacement, etc.
   - System changes
     Example: Pressure, new service, new controller, relocation, change in maintenance, etc.

Troubleshooting

Table 64-1:
Model XTP humidifier troubleshooting guide

Problem	Possible cause	Action
Humidifier will not turn on	Field-wired terminal connections	Check L1, N/L2 and Ground connections.
		Check wiring connections and settings on accessory items such as high limit switch and airflow proving switch.
	Internal connections	Follow the shutdown procedure on Page 50, then make sure electrode and high water probe connections on top of cylinder are securely connected.
		Make sure ribbon cable from membrane switch is securely plugged into control circuit board.
		Check that terminals from internal components are securely attached to proper tabs on circuit boards.
		Make sure one of the electrode wires extends through toroid ring on current sensing circuit board.
	No power to humidifier	Check main power supply and switch.
		Check for proper voltage across L1 and N/L2 terminals.
	Humidifier not turned on	Make sure front cover is attached to engage safety interlock switch. Press On-off button.
	No power to 24V control circuit	Make sure ribbon cable from membrane switch is securely plugged into control circuit board.
		Check reset switch on transformer.
		Check that the transformer line fuses (2) are in place and conductive.
Water constantly runs down drain.	Malfunctioning drain valve.	Check valve function using Test Mode.
	Debris in drain valve preventing it from closing	Remove cylinder, and clean debris from drain valve.
	O-ring in drain valve not properly seated in groove	Remove cylinder, and reposition O-ring.
	Water flowing from fill cup overflow port	Check internal hoses, and remove kinks or blockage.
Water is leaking from humidifier.	Loose plumbing connections	Check supply water connection at fill valve inlet. Tighten as needed.
		Check internal hose clamp connections. Reposition clamps and tighten as needed.
		Check steam hose connection on top of cylinder. Tighten clamp as needed.
Humidifier makes gurgling sound.	Excess condensate in steam hose	Make sure steam hose has constant downward slope to humidifier or to tees and traps in low spots of hose.
Fill valve makes banging sound.	Water hammer from line pressure	Make sure water supply line does not contact ductwork.
		Install shock arrestor.
		Install section of 1/4" braided fill line. Conform to governing codes.
Humidifier will not fill.	Field-installed supply water shut-off valve not open	Open valve.
	Malfunctioning fill valve	Check valve function using Test mode.
Humidifier will not drain.	Debris in drain valve blocking outlet port	Remove cylinder and clean debris from drain valve.
	Malfunctioning drain valve	Check valve function using Test mode.

Continued

Troubleshooting

Table 64-1:
Model XTP humidifier troubleshooting guide (continued)

Problem	Possible cause	Action
Water in duct from dispersion tube.	Dispersion tube installed incorrectly	Install dispersion tube with tubelets facing straight up.
	Impurities in steam hose or tubing causing foaming	Rinse cylinder and hose in clean water.
Humidifier is not satisfying demand.	Control setting too low	Adjust control to higher setting.
	Control mounted in wrong location	See installation instructions with control for correct mounting location.
Excess humidity.	Control setting too high	Adjust control to lower setting.
	Control mounted in wrong location	See installation instructions with control for correct mounting location.

MODEL XTP TROUBLESHOOTING

Follow the procedure below to resolve issues with Model XTP humidifiers:

1. Review possible causes and recommended actions in the Troubleshooting guide in the *Vapor-logic Installation and Operation Manual*.
2. If the Troubleshooting guide does not help you solve the issue, call DriSteem with the following information available:
   - Humidifier model number, serial number, and firmware version (see nameplate on side of the humidifier and steam blower)
   - To access firmware version:
   - Keypad/display: Select **Diagnostics** in the Main menu, select **Humidifier info**, scroll down to **Firmware version**.
   - Web interface: Click **Diagnostics** in the toolbar, click **Humidifier info**, see Firmware version below.
   - When issue began
   - Example: Always, after remodel, after a change in weather, etc.
   - Issue description
   - Example: water leaking, low humidity, high humidity, etc.
   - System changes
   - Example: Pressure, new service, new controller, relocation, change in maintenance, etc.

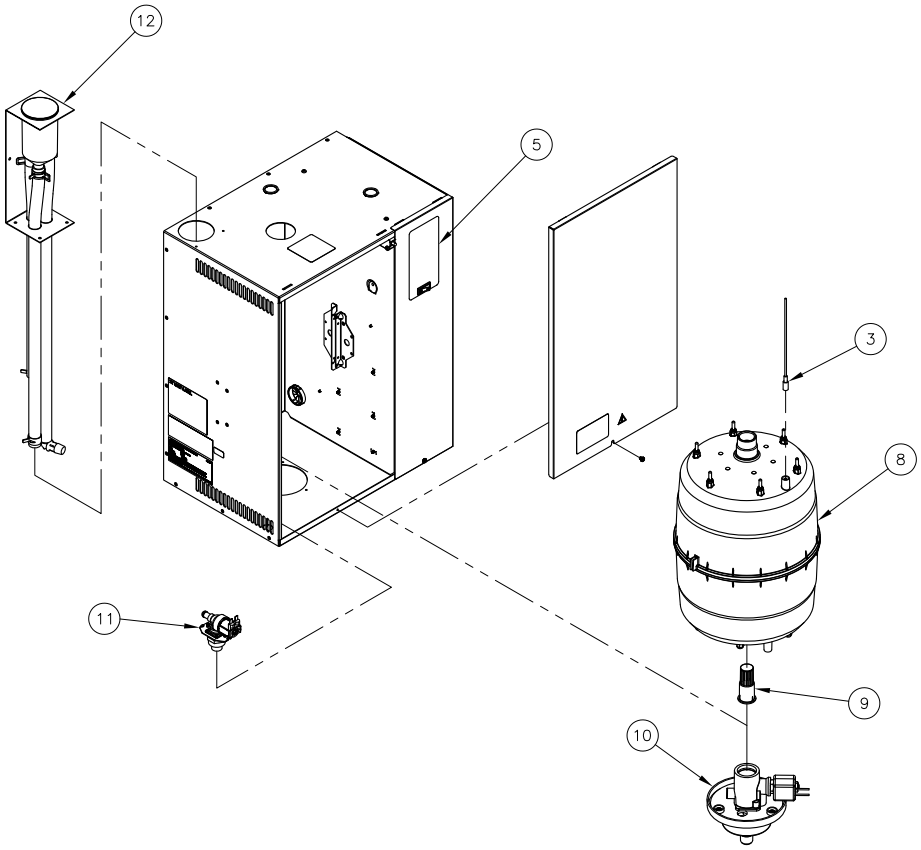
DriSteem Technical Support

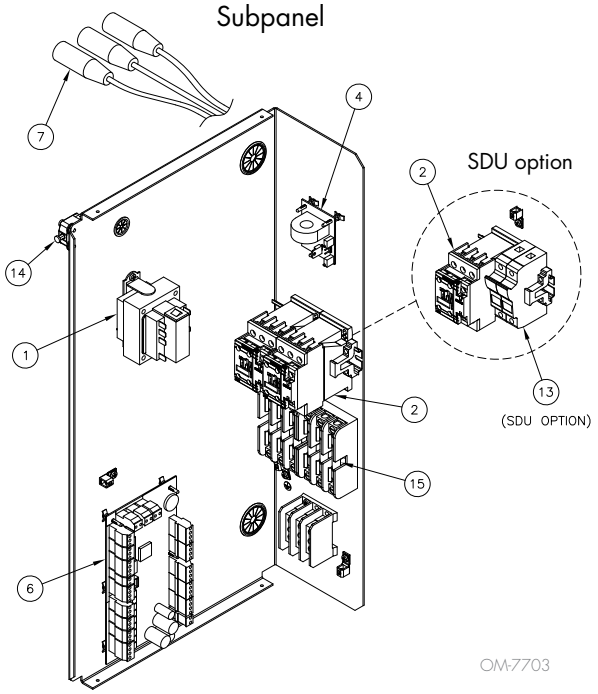
Have the following information ready when calling Technical Support. See phone number inside front cover of this manual.

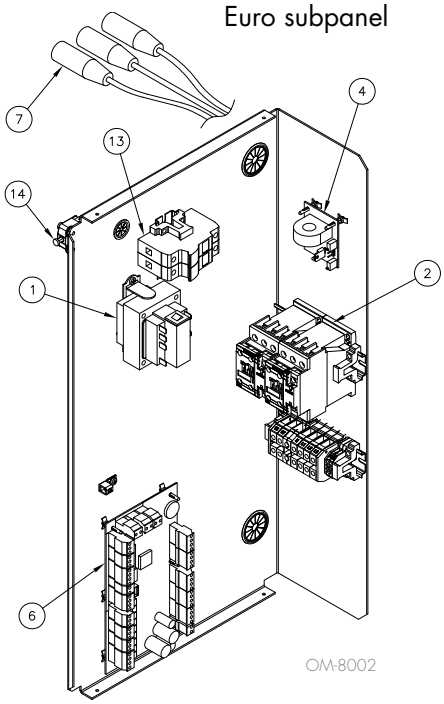
Humidifier model number
Humidifier serial number
Firmware version
_____
When issue began
_____ _____ _____
Issue description
_____ _____ _____

Replacement parts

FIGURE 66-1: MODELS XTP 002 THROUGH 048 REPLACEMENT PARTS







Replacement parts

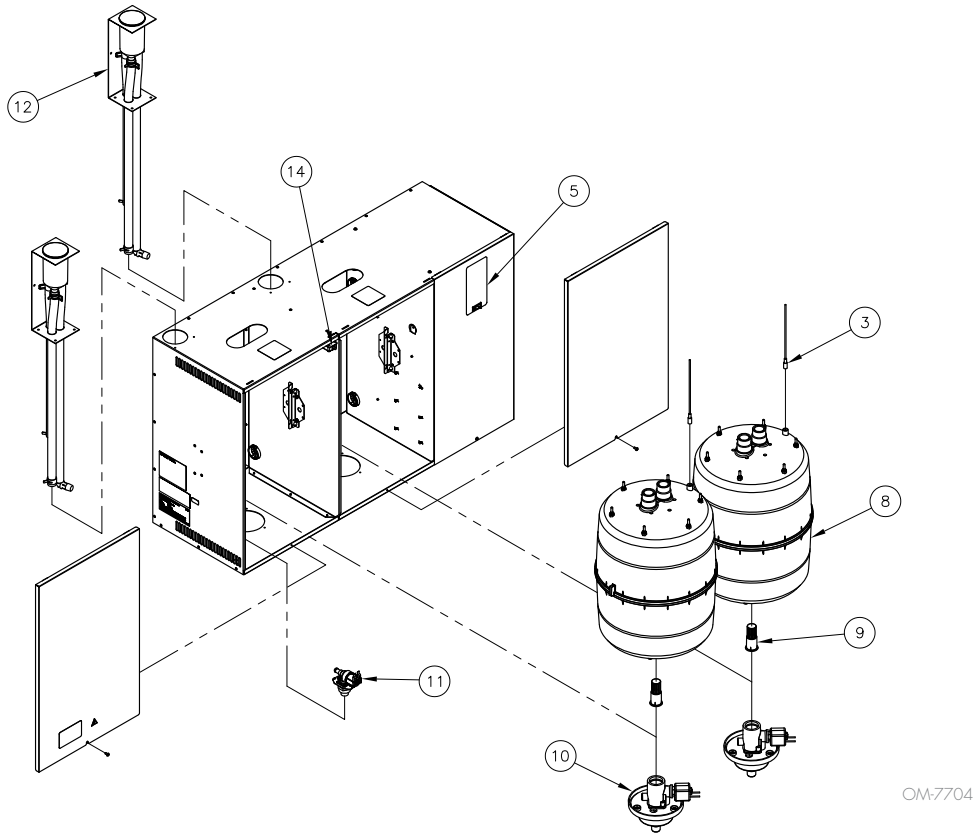
Table 67-1:
Models XTP 002 through 048 replacement parts

Item	Description	Part No.
1	Transformer, 120V, 24V SEC - QC	408965-101
	Transformer, 208/240/480V, 24V SEC - QC	408965-102
	Transformer, 277V, 24V SEC - QC	408982-101
	Transformer, 600V, 24V SEC - QC	408986-101
	Transformer, 230/400, 24V SEC - QC	408985-101
2	Contactor	407010-*
3	Plug, high water sensor	530010-105
4	Board, current sensing, 208/230/240/277 V (Model XTP 002)	530013-001
	Board, current sensing, 400/480 V	530013-002
	Board, current sensing, 600 V	530013-003
	Board, current sensing, 208/230/240/277/400 V	530013-004
5	Display board, Vapor-logic controller	408495-004
6	Main board, Vapor-logic controller	183504-004
7	Kit, electrode wiring (plugs/wires: 1 red, 1 black, 1 white)	194625-001
8*	Kit, cylinder	194801-*
9	Strainer, cylinder	531006
10	Drain valve assembly (see parts in Figure 61-1)	194610-001
11	Valve fill angled 0.26 orifice 3/4" BSPP	601038
	Valve fill angled 0.80 orifice 3/4"BSPP	601039
12	Kit, fill cup extension (see parts in Figure 11-1)	194605-101
13	Fuse 2A 600V ATM	406740-014
14	Switch interlock with override	530010-102
15	Fuse 40A 480V AG (XTP 042, 480 volt only)	406720-040
	Fuse 50A 480V AG (XTP 048, 480 volt only)	406720-050

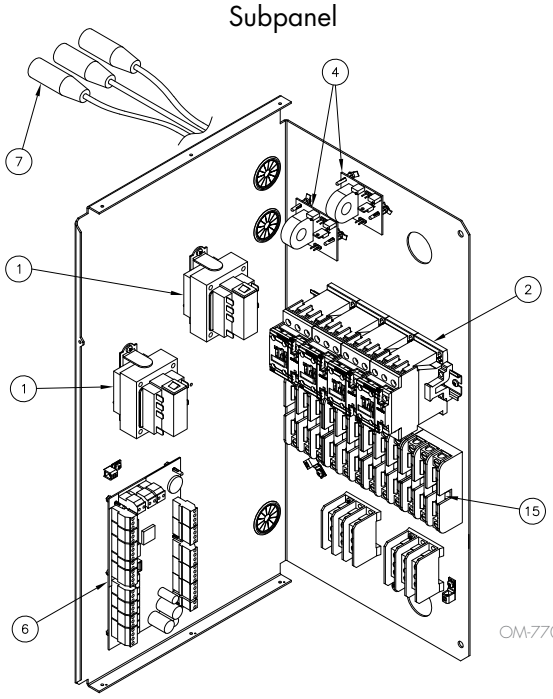
* See cylinder Part No. on your XT Series humidifier.

Replacement parts

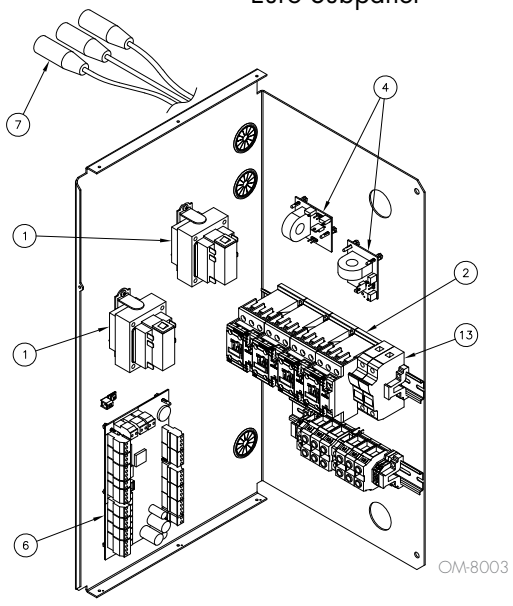
FIGURE 68-1: MODELS XTP 050 THROUGH 096 REPLACEMENT PARTS



Subpanel



Euro Subpanel



Replacement parts

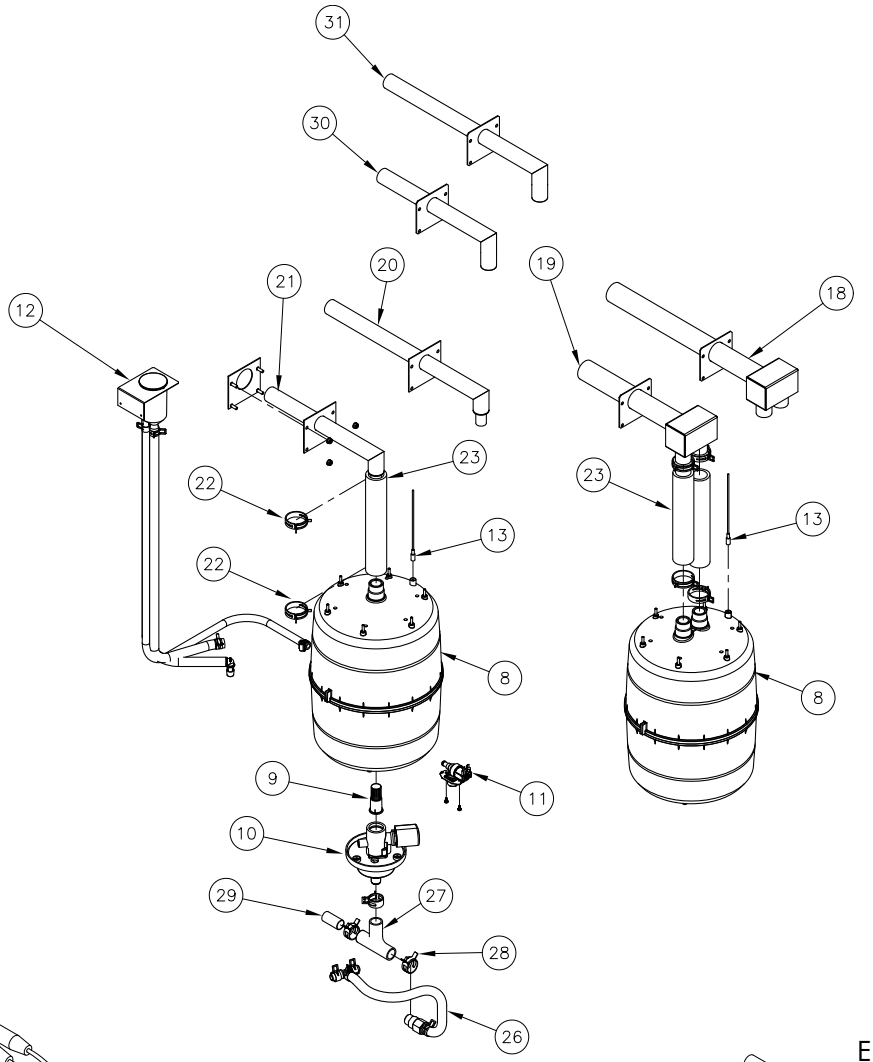
Table 69-1:
Models XTP 050 through 096 replacement parts

Item	Description	Part No.
1	Transformer, 120V, 24V SEC - QC	408965-101
	Transformer, 208/240/480V, 24V SEC - QC	408965-102
	Transformer, 277V, 24V SEC - QC	408982-101
	Transformer, 600V, 24V SEC - QC	408986-101
	Transformer, 230/400, 24V SEC - QC	408985-101
2	Contactor	407010-*
3	Plug, high water sensor	530010-105
4	Board, current sensing, 400/480 V	530013-002
	Board, current sensing, 600 V	530013-003
	Board, current sensing, 208/230/240/277/400 V	530013-004
	Board, current sensing, 230/400 V (Model XTP096 only)	530013-005
5	Display board, Vapor-logic controller	408495-004
6	Main board, Vapor-logic controller	183504-014
7	Kit, electrode wiring (plugs with wires: 1 red, 1 black, 1 white)	194625-001
	Kit, electrode wiring, extended (plugs with wires: 1 red, 1 black, 1 white)	194625-002
8*	Kit, cylinder, XT-75/150, XT-025/050, 380V, 3P	194801-023
	Kit, cylinder, XT-75/150, XT-025/050, 400-600V, 3P	194801-025
	Kit, cylinder, XT-100/200, XT-033-096, 380/400V, 3P	194801-026
	Kit, cylinder, XT-100/200, XT-033-096, 480/600V, 3P	194801-028
9	Strainer, cylinder	531006
10	Drain valve assembly (see parts in Figure 61-1)	194610-001
11	Valve fill angled 0.80 orifice 3/4"BSPP	601039
12	Kit, fill cup extension (see parts in Figure 11-1)	194605-101
13	Fuse 2A 600V ATM	406740-014
14	Switch interlock with override	530010-102
15	Fuse 40A 480V AG (XTP 083, 480 volt only)	406720-040
	Fuse 50A 480V AG (XTP 096, 480 volt only)	406720-050

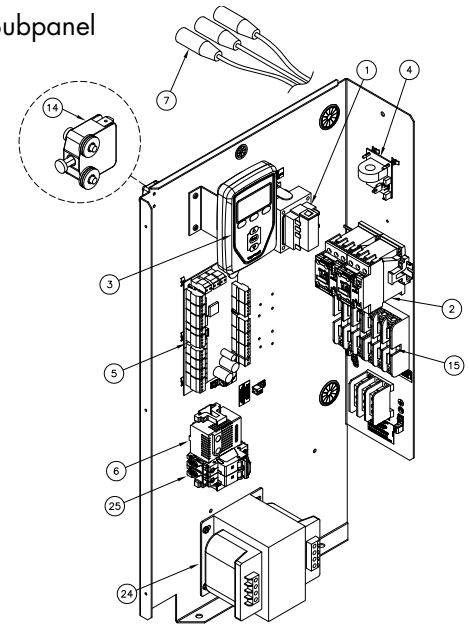
* See cylinder Part No. on your XT Series humidifier.

Replacement parts

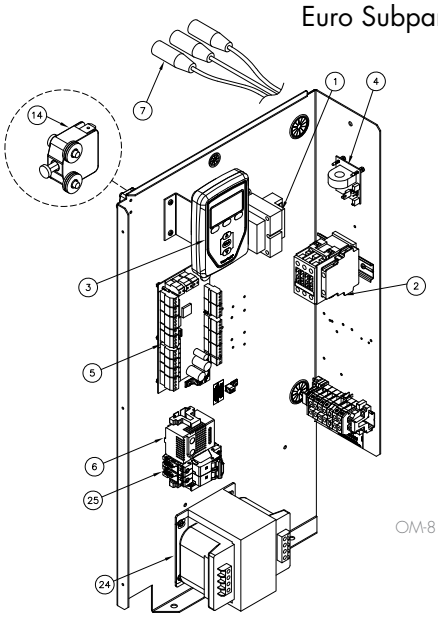
FIGURE 70-1: MODELS XTP 002 THROUGH 048 WITH OUTDOOR ENCLOSURE



Subpanel

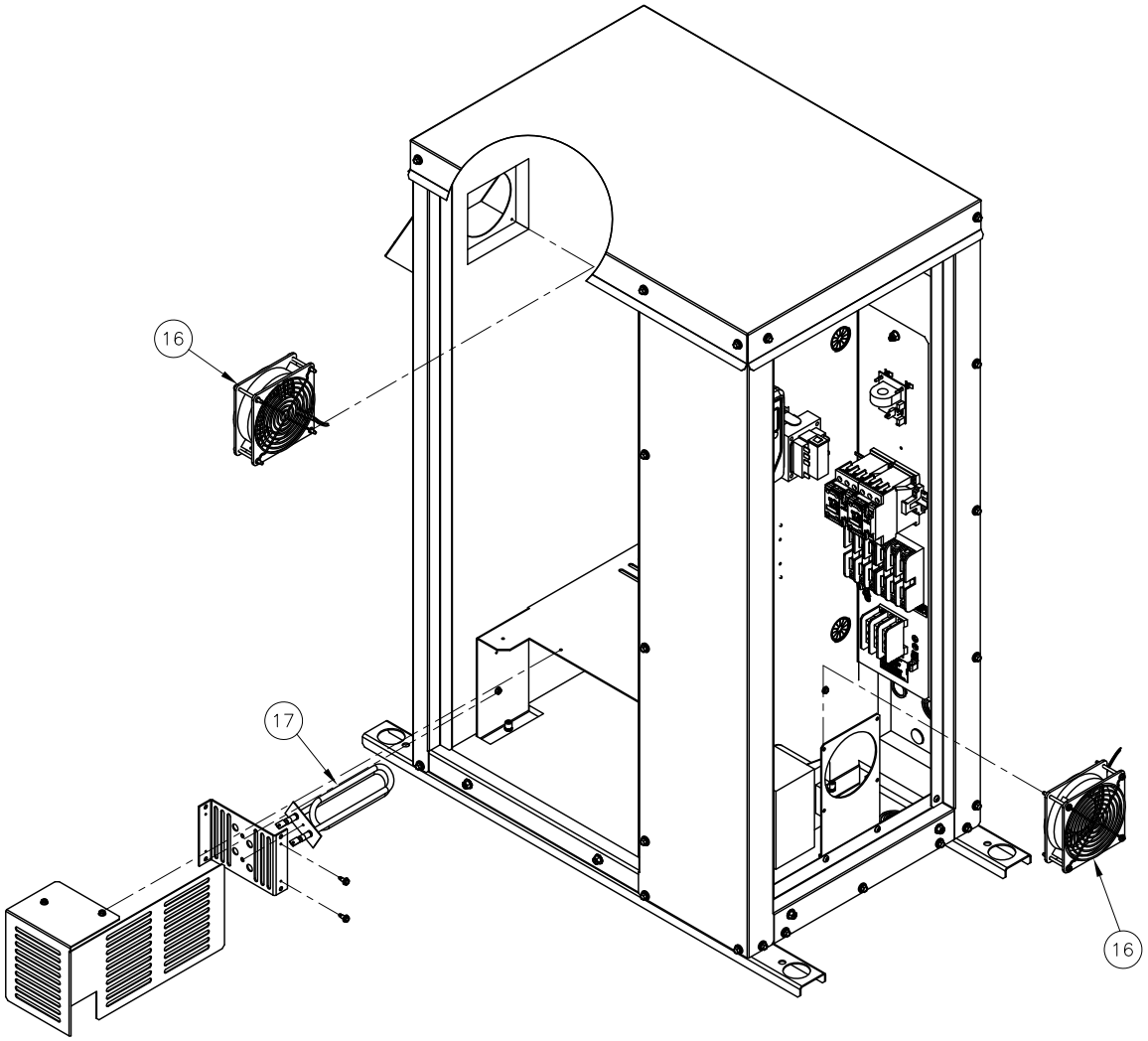


Euro Subpanel



Replacement parts

FIGURE 71-1: MODELS XTP 002 THROUGH 048 WITH OUTDOOR ENCLOSURE



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Replacement parts

Table 72-1:
Models XTP 002 through 048 with outdoor enclosure replacement parts

Item	Description	Part No.
1	TRANSFORMER, 120V, 24V SEC - QC	408965-101
	TRANSFORMER, 208/240/480V, 24V SEC - QC	408965-102
	TRANSFORMER, 277V, 24V SEC - QC	408982-101
	TRANSFORMER, 600V, 24V SEC - QC	408986-101
	TRANSFORMER, 230/400, 24V SEC - QC	408985-101
2	CONTACTOR 40 AMP SIEMENS 3RT-23	407010-202
	CONTACTOR 50 AMP SIEMENS 3RT-27	407010-203
	CONTACTOR 60 AMP SIEMENS 3RT-35	407010-207
3	DISPLAY W/BACK, VAPOR-LOGIC	408495-011
4	BOARD PC CURRENT 120/208/240V 20A	530013-001
	BOARD PC CURRENT 480V 35A	530013-002
	BOARD PC CURRENT 600V 25A	530013-003
	BOARD PC CURRENT 208/230/240/277/400V40A	530013-004
	BOARD PC CURRENT 400-600V, 45A	530013-005
5	MAIN CONTROLLER VL6	408496-006
6	DUAL THERMOSTAT, DEGREE FAHRENHEIT	600293
	DUAL THERMOSTAT, DEGREE CELSIUS	600293-001
7	WIRING KIT, XT, B/R/W	194625-001
8*	KIT, CYLINDER	194801-*
9	STRAINER, CYLINDER	531006
10	DRAIN VALVE ASSEMBLY, XT	194610-001
11	VALVE FILL ANGLED 0.26 ORIFICE 3/4"BSPP	601038
	VALVE FILL ANGLED 0.80 ORIFICE 3/4"BSPP	601039
12	FILL CUP ASSEMBLY, XTP 2-48KW O.E.	194605-300
13	PLUG SENSOR MAX WATER LEVEL	530010-105
14	SWITCH INTERLOCK W/OVERRIDE	530010-102
15	FUSE 40A 480V AG	406720-040
	FUSE 50A 480V AG	406720-050
16	FAN ASSY O.E. CABINET 120V	185110-003
	FAN ASSY EURO O.E. CABINET 230V	185110-004

* See cylinder Part No. on your XT Series humidifier.

Replacement parts

Table 73-1:
Models XTP 002 through 048 with outdoor enclosure replacement parts

Item	Description	Part No.
17	HEATER O.E. 120V 400W	600390
	HEATER O.E. 230V 400W	600390-001
18	DUAL STEAM OUTLET 2" X 12" XT O.E.	162831-011
19	DUAL STEAM OUTLET 2" X 6" XT O.E.	162831-001
20	SINGLE STEAM OUTLET 1.5" X 12" XT O.E.	162831-012
21	SINGLE STEAM OUTLET 1.5" X 6" XT O.E.	162831-002
22	HOSE CLAMP 35 MM SPRING BAND	700560-035
	HOSE CLAMP, 49 MM SPRING BAND, BLACK	700560-049
23	HOSE HEATER 1" ID BULK	307020-003
	HOSE 1-1/2" ID BLUE SILICONE BULK	305490
24	TRANSFORMER 208/277/380VTO 115V 500VA	408996-012
	TRANSFORMER 240V/480V TO 120V 500VA GE	408996-008
	TRANSFORMER 600V TO 120V 500VA GE	408996-009
25	BREAKER CIRCUIT 2A 480V 2POLE CG D-CURVE	406775-210
	BREAKER CIRCUIT 5A 480V 1POLE GE D-CURVE	406775-212
26	VALVE ASSY FREEZE PROTECTION	601104
27	TEE HOSE COUPLING 1" ID SILICONE BLK	601105
28	HOSE CLAMP 35 MM SPRING BAND	700560-035
29	TUBE, 1.00" DIA X 2.00" (304SST)	122415-002
30	SINGLE STEAM OUTLET 1.5" X 6" XT O.E.	162831-003
31	SINGLE STEAM OUTLET 1.5" X 12" XT O.E.	162831-013

* See cylinder Part No. on your XT Series humidifier.

Replacement parts

FIGURE 74-1: SDU-006E AND SDU-017E STEAM BLOWERS

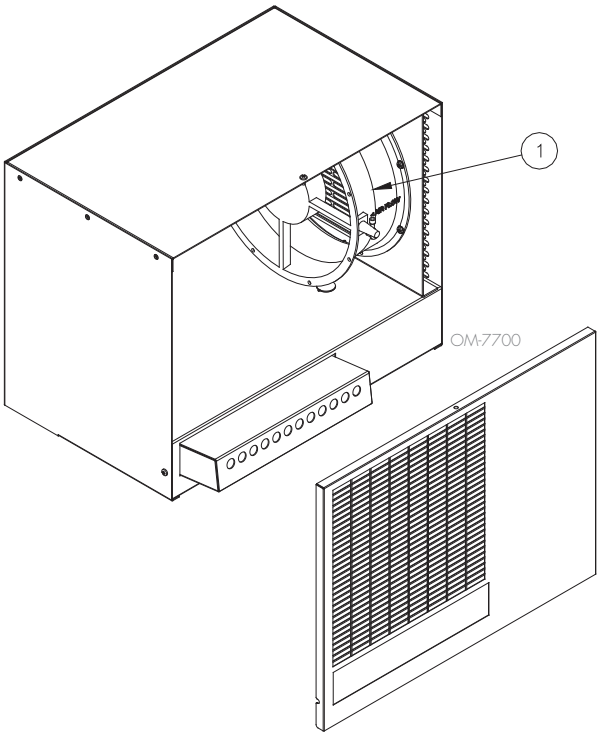

Table 74-1:
SDU-006E and SDU-017E steam blowers

Item	Description	Part No.
1	Fan, SDU-006E, 120V	407109-002
	Fan, SDU-017E, 230V	306377
	Fan, SDU-006E, 230V	407109-102
	Fan, SDU-017E, 120V	306376

Accessories

Table 75-1: Accessories	
Description	**Part No.**
Steam hose, 1" (DN25) x 10' (3 m), for remote XT steam blower	305400-100
Steam hose, 1½" (DN40) x 10' (3 m), wire-reinforced	305400-010
Steam hose, 2" (DN50) x 10' (3 m), wire-reinforced	305560-0010
Condensate hose, 1/4" (DN8) x 13' (4 m), for remote XT steam blower	305400-150
Drain hose cuff, 1" (DN25) I.D. x 12" (305 mm) long	305389-012
Hose clamp, 49 mm, spring band	700560-049
Hose clamp, 35 mm, spring band	700560-035
Hose clamp, 38 mm, spring band	601133
Hose clamp, 23 mm, spring band	700560-023
Hose clamp, 19 mm, spring band	700560-019
Hose clamp, 1½" (DN40) I.D.	700560-150
Hose clamp, 2" (DN50) I.D.	700560-200
Kit, drip tee, 304 stainless steel, 1½" (DN40)	191071-001
Humidistat, duct high limit, HC-201	405850-201
Humidistat, room, HC-101	405870
Humidity transmitter, duct, 2% RH DSB	405884-009
Humidity transmitter, room, 2% RH	405883-008
Switch, airflow, AFS-112-150, electric	406190
Kit, Y connector; Models XTP 033, 042, and 048 (see Figure 33-1)	
• 1 Y connector, stainless steel, 1½" x 2" (DN40 x DN50)	191070-101
• 2 steam hoses, 1½"(DN40), 12" (305 mm) long	
• 4 hose clamps	
Kit, Y/tube connectors; Models XTP067 through 096 (see Figure 33-1)	
• 2 Y connector kits	191070-101
• 1 flanged tube connector, stainless steel, 3" (DN80)	162825-202F
Kit, tube connector; Model XTP050 (see Figure 33-1)	
• 1 tube connector, stainless steel, 1½" x 2" (DN40 x DN50)	191070-002
• 1 hose cuff, 2" (DN50), 6" (152 mm) long	
• 2 hose clamps	
Kit, tube reducer; Models XTP 002 through 006 (see Figure 32-1)	
• 1 tube reducer, stainless steel, 1" x 1½" (DN25 x DN40)	191070-100
• 1 steam hose, 1" (DN25), 12" (305 mm) long	
• 2 hose clamps	
Kit, tube Y connector; Model XTP 025 (see Figure 32-1)	
• 1 Y connector, 1.5" x 1.5" x 1.5"(DN40 x DN40 x DN40)	191070-102
• 1 steam hose, 1.5" (DN40), 12" (305 mm) long	
• 2 hose clamps	

Expect quality from the industry leader

For more than 45 years, DriSteem has been leading the industry with creative and reliable humidification solutions. Our focus on quality is evident in the construction of the XT Series humidifier. DriSteem also leads the industry with a Two-year Limited Warranty and optional extended warranty.

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Continuous product improvement is a policy of DriSteem Corporation; therefore, product features and specifications are subject to change without notice.

Form No. XT-IOM-EN-REVR-1024
Part No. 890000-139 Rev R

DRISTEEM

Two-year Limited Warranty

DriSteem Corporation ("DriSteem") 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 DriSteem ships such product, whichever date is the earlier.

If any DriSteem product is found to be defective in material or workmanship during the applicable warranty period, DriSteem'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 DriSteem's election. DriSteem shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or reinstallation of any defective product. The Limited Warranty does not include consumables, including but not limited to: cylinders, filters, membranes, nozzles, and piezoelectric transducer replacement.

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

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

DRI-STEEM SHALL NOT, UNDER ANY CIRCUMSTANCES BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, REVENUE OR BUSINESS) OR DAMAGE OR INJURY TO PERSONS OR PROPERTY IN ANY WAY RELATED TO THE MANUFACTURE OR THE USE OF ITS PRODUCTS. The exclusion applies regardless of whether such damages are sought based on breach of warranty, breach of contract, negligence, strict liability in tort, or any other legal theory, even if DriSteem has notice of the possibility of such damages.

By purchasing DriSteem's products, the purchaser agrees to the terms and conditions of this Limited Warranty.

Extended warranty

The original user may extend the term of the DriSteem Limited Warranty for a limited number of months past the initial applicable warranty period and term provided in the first paragraph of this Limited Warranty. All the terms and conditions of the Limited Warranty during the initial applicable warranty period and term shall apply during any extended term. An extended warranty term of an additional twelve (12) months, twenty four (24) months, or thirty-six (36) months[1] of coverage may be purchased. The extended warranty term may be purchased until eighteen (18) months after the product is shipped, after which time no extended warranties are available.

Any extension of the Limited Warranty under this program must be in writing, signed by DriSteem, and paid for in full by the purchaser.

[1] 36 month extended warranty automatically included for all DriSteem Dehumidifiers.