



## XT SERIES HUMIDIFIER

### Electrode Steam Humidifiers

- *Easy to maintain*
- *Adaptable*
- *Comprehensive control with Vapor-logic® option*

# COST-EFFECTIVE STEAM HUMIDIFICATION

Model  
XTP



Model  
XTR



## XT SERIES ELECTRODE HUMIDIFIERS

The XT series electrode humidifier uses heat caused by electrical resistance in conductive fill water to boil the water into steam. Automatic drain and fill cycles keep electrical current within demand parameters, based on water conditions and steam production.



## XT SERIES FAN PACK OR STEAM BLOWER

An optional fan pack or steam blower is available for use in finished spaces. They disperse steam into open spaces and are used when there is not associated air-handling equipment.

XT Series electrode steam humidifiers from DriSteem provide humidification for a wide range of buildings, including health care, commercial, industrial, and government facilities. Easy installation and minimal maintenance make XT Series one of the most affordable humidification systems to purchase and install.

### EASY TO MAINTAIN

No cleaning required. Just replace the affordable steam cylinder when prompted by the controller display.

### ADAPTABLE

- Compact in size to fit into small spaces
- Model XTP capacity range is 5 to 287 lbs/hr (2 to 130 kg/h); Model XTR capacity range is 5 to 11 lbs/hr (2 to 5 kg/h)
- Disperses steam into ductwork or open spaces
- Works with water conductivity from 350 to 1250  $\mu\text{S}/\text{cm}$  (roughly comparable to water hardness of 10 to 36 grains per gallon).
- User-selectable drain water tempering, if desired

### COMPREHENSIVE CONTROL

- The Vapor-logic controller is included with the Model XTP and sets the standard for control capabilities in electrode humidifiers.
- An easy-to-use standard controller is provided on the Model XTR.



Vapor-logic  
controller  
(Model XTP)

Standard  
controller  
(Model XTR)

|  | Vapor-logic<br>controller<br>(Model XTP) | Standard<br>controller<br>(Model XTR) |
|--|--|---------------------------------------|
| Easy-to-use menus for all humidifier functions   | ✓  |                                       |
| Push-button operation, with LED indicators for operating status and troubleshooting  |  | ✓                                     |
| Web interface for Ethernet access to all functions   | ✓  |                                       |
| Accurate, responsive RH control with PID tuning for maximum performance  | ✓  |                                       |
| BACnet®, Modbus®, and optional LonTalk® for inter-operability with multiple building automation systems                                | ✓  |                                       |
| Automatic drain and fill events for optimized humidifier performance based on water type   | ✓  | ✓                                     |
| Cylinder drains after a user-specified time with no call for humidity to prevent microbial growth                                      | ✓  | ✓                                     |
| A USB port is provided for downloading controller data to a PC for viewing and analysis, data backup and restore, and firmware updates | ✓  |                                       |

**Table 3-1:**  
**Line currents and recommended fusing for XT Series humidifiers**

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

\*These models have two steam cylinders and require independent service connections.

# CONTROLLERS

## XT SERIES CONTROL INTERFACE WITH VAPOR-LOGIC KEYPAD/DISPLAY

Status display and menu selection

Softkeys for direct menu access

Navigation buttons for item selection

Controller on-off switch



## VAPOR-LOGIC WEB INTERFACE



## STANDARD CONTROLLER

**Push-button operation**, with indicators for operating status and troubleshooting information.

**Automatic draining and filling** optimize humidifier performance according to your specific water type.

**USB port** allows firmware updates.

**Cylinder automatically drains** after a user-specified time with no call for humidity to prevent microbial growth; default is 72 hours.

## OPTIONAL VAPOR-LOGIC CONTROLLER

Vapor-logic provides the standard control features above, plus:

**Accurate, responsive RH control** with PID tuning for maximum performance.

**Easy-to-use menus** for all humidifier functions.

**Modbus, BACnet, or LonTalk** allow interoperability with multiple building automation systems. Modbus is standard, and BACnet or LonTalk are available options.

**Web interface** provides the capability to set up, view, and adjust humidifier functions via Ethernet, either directly or remotely through a network.

**USB port** allows firmware updates and data backup and restore.

**Cycle counter** triggers a message when it's time to replace the contactor.

**Real-time clock** allows time-stamped alarm and message tracking.

**Programmable outputs** allow remote signaling and device activation.

**Data logging** allows controller data to be downloaded to a PC for viewing and analysis.

**Enhanced diagnostics** include:

- **Test outputs** function using keypad/display or Web interface to verify component operation
- **Test humidifier** function using simulated demand to validate performance

# 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.

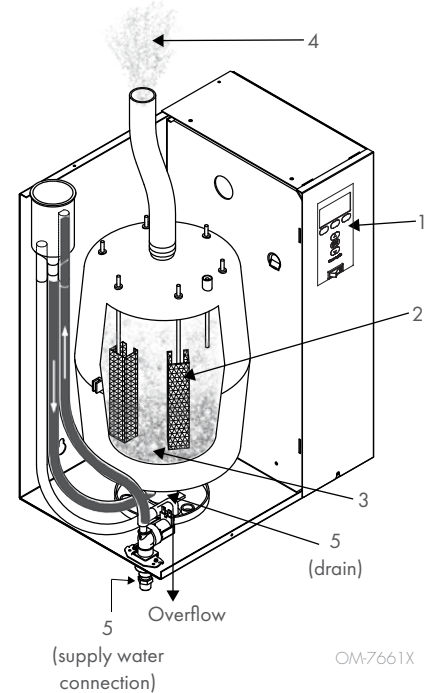
## 5. CONTROLLER INITIATES DRAIN/FILL EVENTS TO FLUSH CONDUCTIVE IONS

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.

Humidifier performance is optimized based on water conditions and steam production. An algorithm in the on-board controller auto tunes drain and fill cycles to keep electrical current within demand parameters.

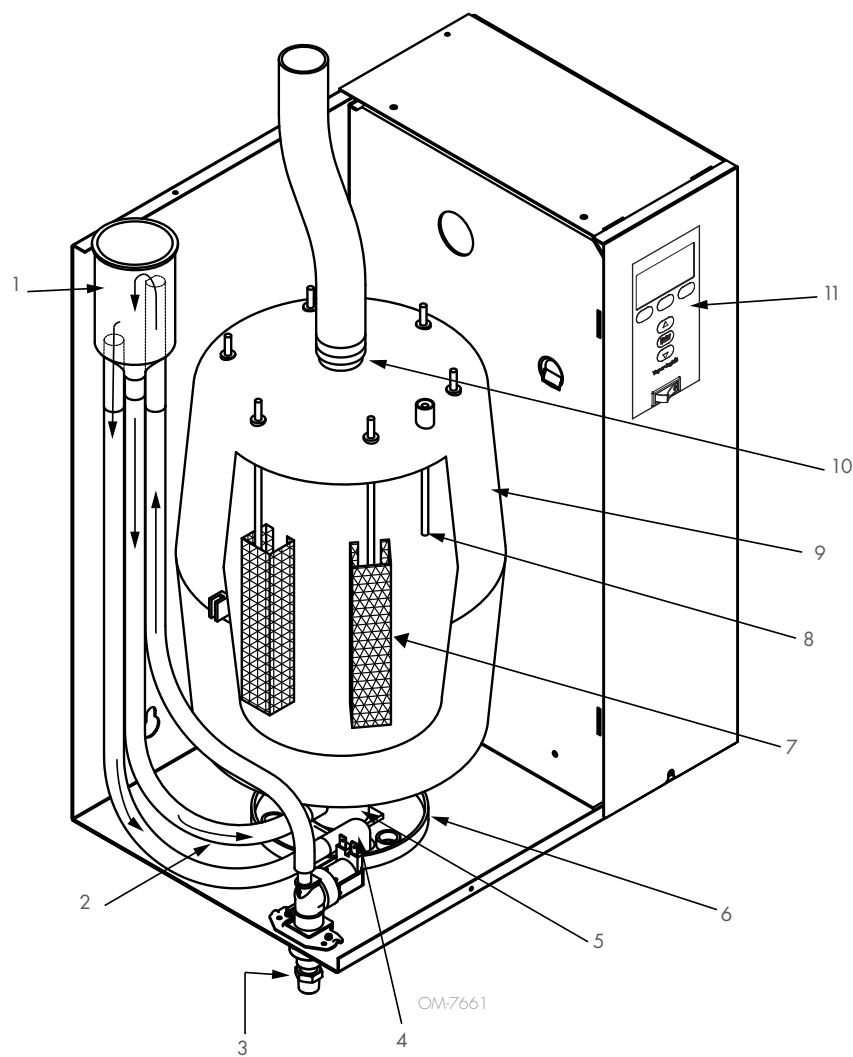
### XT SERIES PRINCIPLE OF OPERATION



# COMPONENTS

## XT SERIES HUMIDIFIER COMPONENTS

Model XTP shown



**1. FILL CUP**

Accepts supply water from fill valve and returned condensate from remote steam blower.

**2. FILL HOSE**

Connects fill cup to steam cylinder. Water in fill cup enters bottom of steam cylinder.

**3. FILL VALVE**

Controls flow of supply water and is connected to fill cup. Supply water connection is under cabinet.

**4. OVERFLOW**

Overflow to drain prevents fill cup from overfilling.

**5. DRAIN**

Drain valve at bottom of cylinder opens to allow water to exit.

**6. DRAIN CUP**

Accepts drain water from cylinder and overflow from fill cup.

**7. ELECTRODES**

Electrical current between electrodes heats water into steam.

**8. HIGH WATER SENSOR**

Filling stops if water reaches high water sensor.

**9. STEAM CYLINDER**

Where water boils and steam is produced. Indicator on control panel prompts user when time to replace steam cylinder.

**10. STEAM OUTLET**

Steam generated in steam cylinder rises through steam outlet and travels to steam blower or dispersion assembly through steam hose or tubing.

**11. CONTROL PANEL**

Controller in cabinet controls all humidifier functions. See Page 4.

DriSteem XT Series humidifiers are ideal for finished spaces and applications where space is limited. Electrical and plumbing connections are easily accessible for hassle-free installation.

*No cleaning required. Just replace the affordable steam cylinder when prompted.*

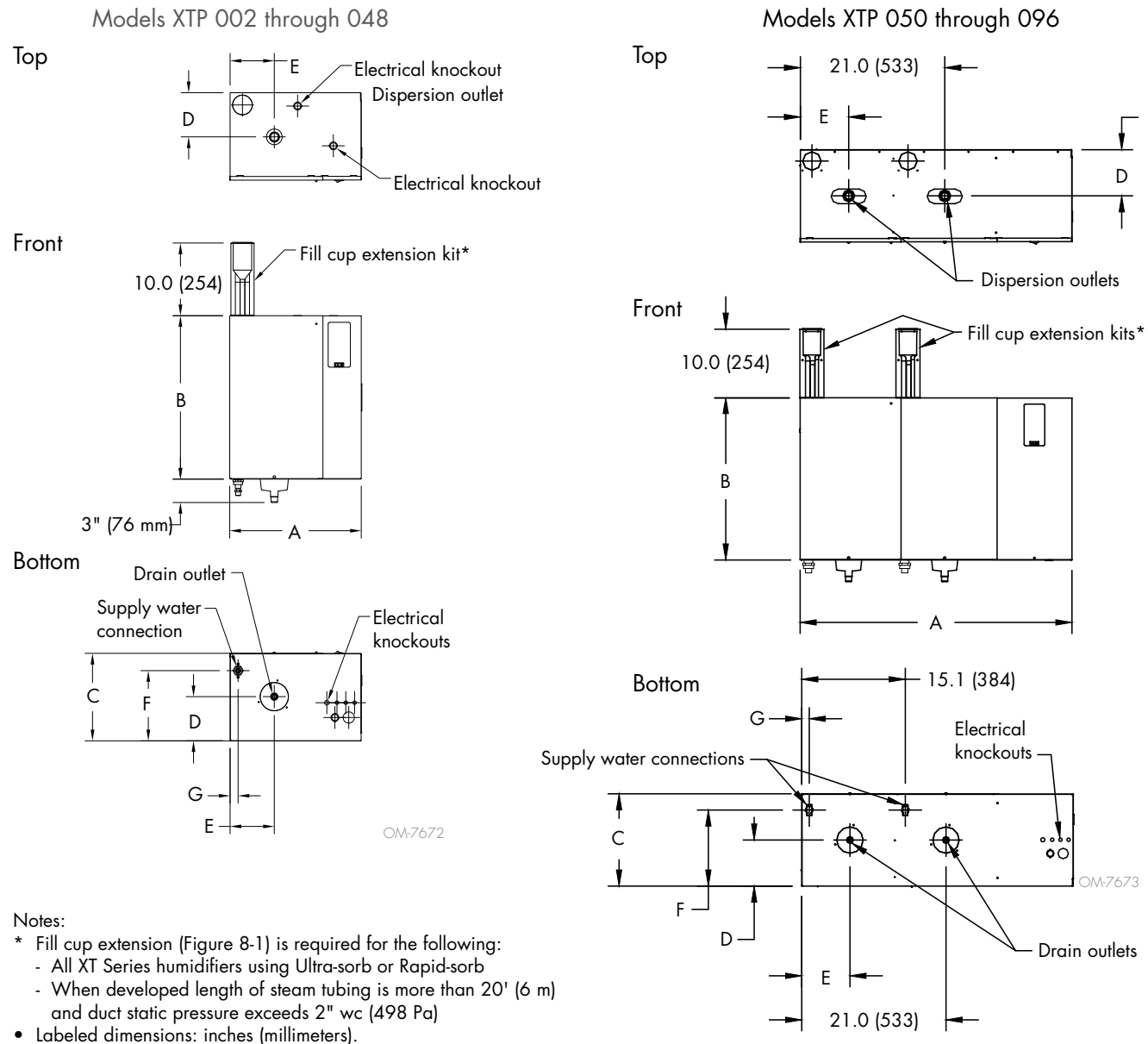


*Insert a USB flash drive into the USB port on the controller board to perform firmware updates or back up and restore data (Model XTP).*



# DIMENSIONS

**FIGURE 8-1: XT SERIES HUMIDIFIER DIMENSIONAL DRAWINGS**





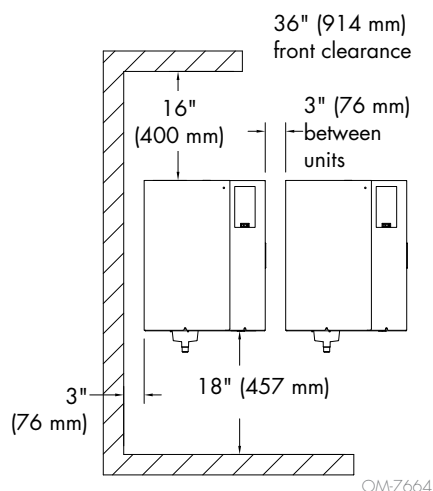
**Table 9-1:**  
**Dimensions by model number**

| 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 | 6.7           | 170 | 9.5      | 241 | 11.1               | 282 | 11.1               | 282  |
| G         | Cabinet left edge to supply water connection center | 1.0           | 25  | 1.0      | 25  | 1.1                | 28  | 1.1                | 28   |

**Table 9-2:**  
**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 |

## **XT SERIES HUMIDIFIER RECOMMENDED MINIMUM CLEARANCES**



# MOUNTING KEYHOLE LOCATIONS

FIGURE 10-1: XT SERIES HUMIDIFIER MOUNTING KEYHOLE LOCATIONS

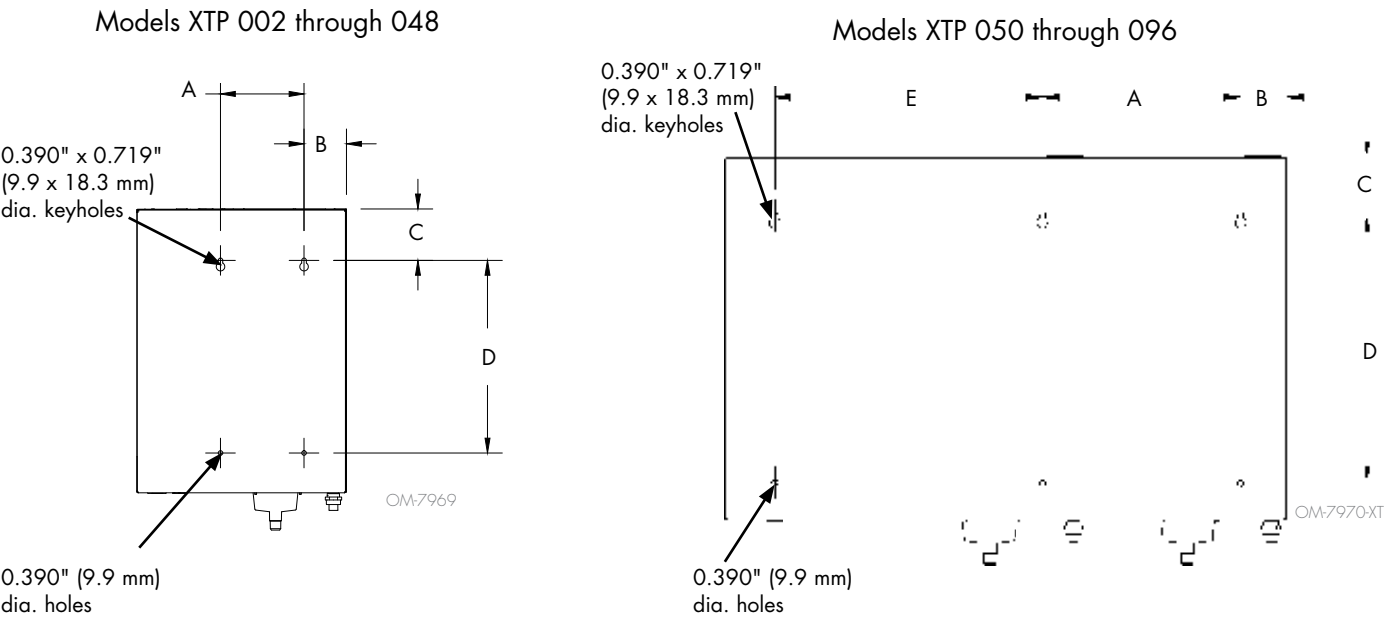
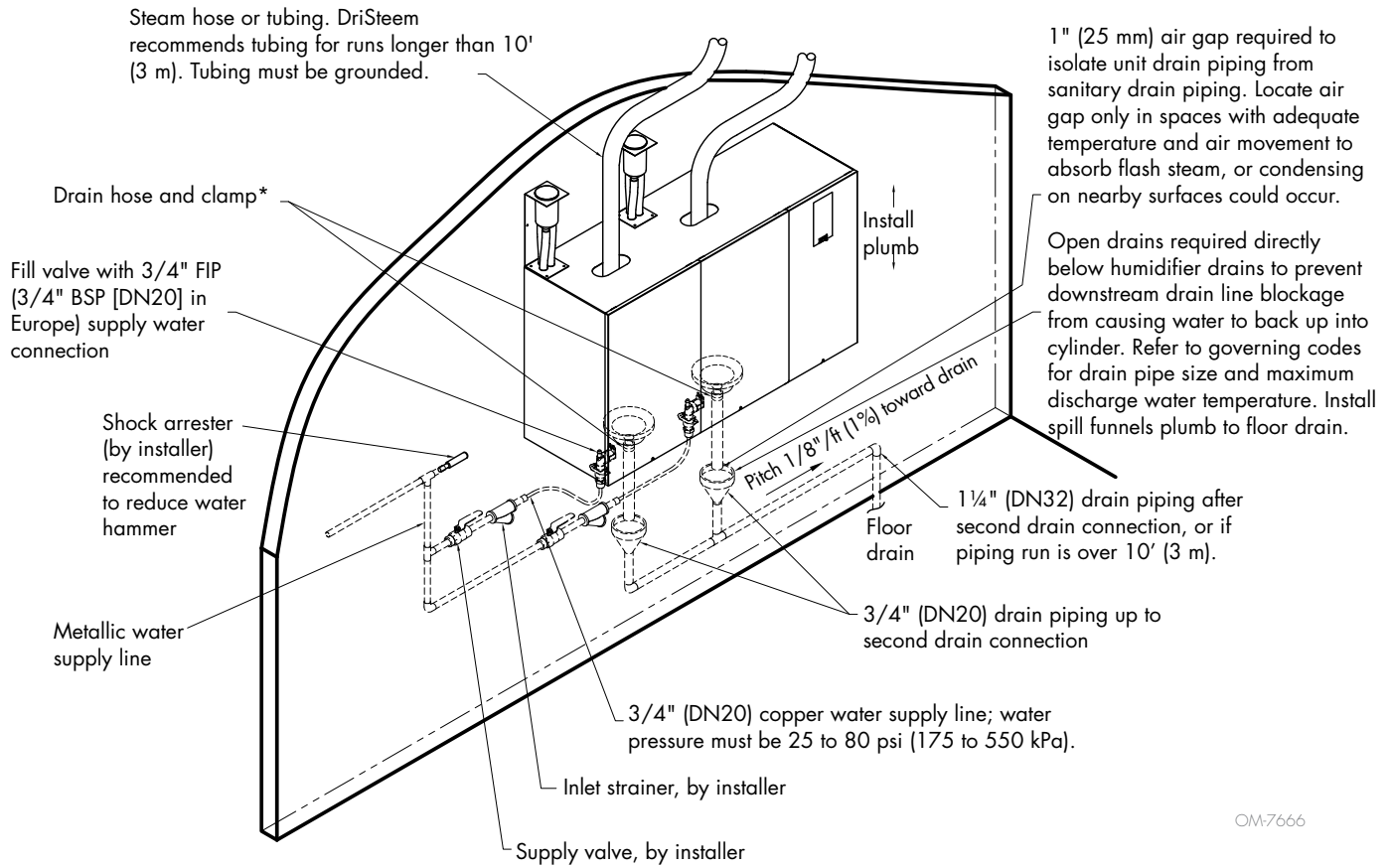


Table 10-1:  
XT Series humidifier mounting keyhole dimensions

| 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 |

**FIGURE 11-1: XT SERIES HUMIDIFIER FIELD PIPING OVERVIEW**



OM-7666

**Notes:**

- Dashed lines indicate provided by installer.
- Two-cylinder model shown.
- \* Ships with humidifier

# STEAM DISPERSION OPTIONS



Model LV:  
Vertical tubes



Model LH:  
Horizontal tubes



Rapid-sorb dispersion  
tube system



Ultra-sorb Model MP  
Lowest total installed cost

## ULTRA-SORB MODELS LV AND LH

*Most versatile*

- Guaranteed, short non-wetting distances — install within inches of downstream devices
- Available with high efficiency dispersion tubes
- Horizontal or vertical air flows

**Capacity:** Up to 1850 lbs/hr (840 kg/h) per panel

## HIGH-EFFICIENCY DISPERSION TUBES OPTION

*For new and existing Ultra-sorb, Rapid-sorb, single dispersion tube*

- Increases tube capacity up to 6 lbs/hr (2.7 kg/h)
- Up to 85% reduction in wasted energy, airstream heat gain, and condensate production
- Plenum approved for in-duct installation



## RAPID-SORB® DISPERSION TUBE SYSTEM

*Multiple tubes, short non-wetting distance*

- Short non-wetting distance, compared to single dispersion tube
- Horizontal or vertical airflows
- Install Rapid-sorb header inside or outside duct
- Available with High-Efficiency Dispersion Tubes

**Capacity:** Up to 2100 lbs/hr (955 kg/h) per system

## SINGLE DISPERSION TUBE

*Installation flexibility*

- Low-capacity dispersion for horizontal or vertical airflows.
- Available as a High-Efficiency Dispersion Tube



**Capacity:** Up to 97 lbs/hr (38 kg/h)

Model MP: Lowest total installed cost

- **Same side steam inlet and drain** for reduced piping
- **In-frame drain piping** maximizes available face dimensions and minimizes blank-off requirements.
- **Integral steam header** allows clear space on exterior wall of AHUs or ducts
- **Capacity**  
Pressurized steam: Up to 2720 lbs/hr (1235 kg/h)  
Nonpressurized steam: Up to 700 lbs/hr (318 kg/h)

# STEAM DISPERSION OPTIONS

## XT STEAM BLOWERS

XT steam blowers, designed to disperse steam directly into large open spaces, are particularly useful in finished spaces and rooms where there are no air-handling ducts.

There are two XT steam blower models:

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

SDU-017, 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 13-1.

For more information on XT steam blowers, see Pages 20 and 21.

**Table 13-1:**  
Single or multiple XT steam blowers for XT Series humidifiers\*

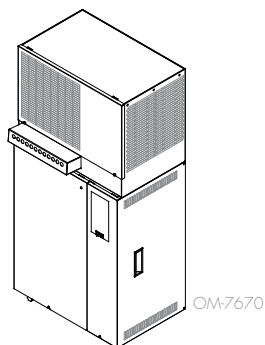
| Model           | SDU-006 per kit | SDU-017 per kit |
|-----------------|-----------------|-----------------|
| XTP             |                 |                 |
| 002             | 1               | —               |
| 003             | 1               | —               |
| 006             | 1               | —               |
| 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.

## TOP- AND REMOTE-MOUNTED XT STEAM BLOWER

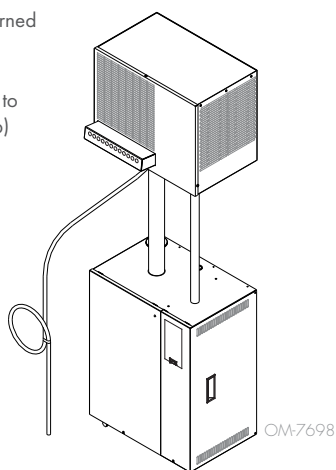
### Mounted on top of humidifier

Condensate returned to steam cylinder fill hose

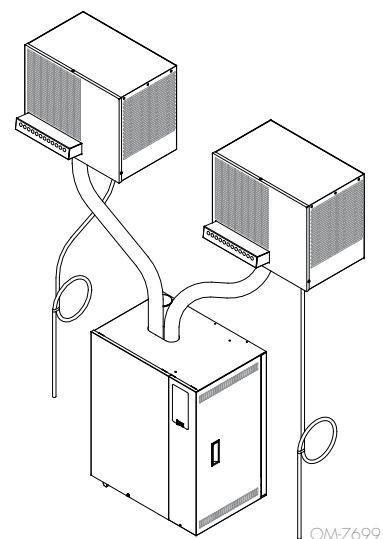


### Mounted remotely from humidifier

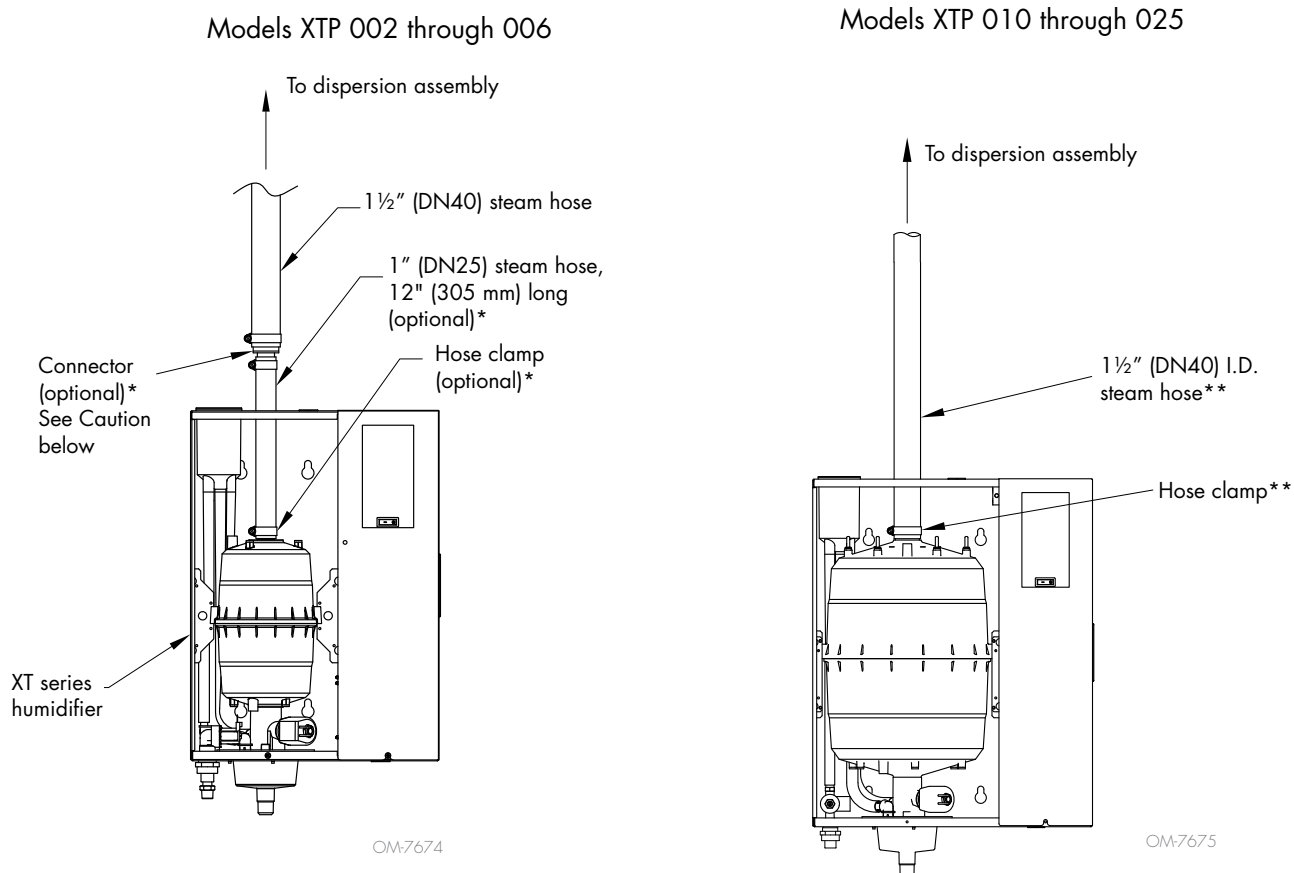
Condensate returned to open drain (condensate can also be returned to humidifier fill cup)



### One XT Series humidifier with two XT steam blowers



**FIGURE 14-1: STEAM OUTLET CONNECTIONS, XTP MODELS 002 THROUGH 025**



\* Provided in optional connector kit Part No. 191070-100 (see Table 4-1)

\*\* Provided by installer.

## CAUTION

### Connector kit location

Install the connector for increasing from 1" to 1 1/2" (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.

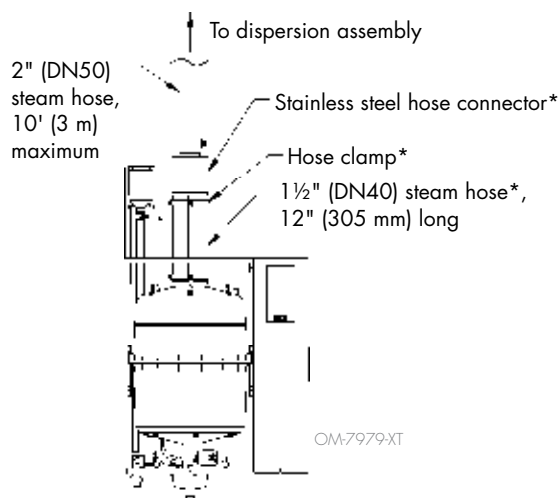
**FIGURE 15-1: STEAM OUTLET CONNECTIONS WITH HOSE, MODELS XTP 033 THROUGH XTP096 WITHIN 10' (3 M) OF DISPERSION ASSEMBLY**

## ⚠ 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.

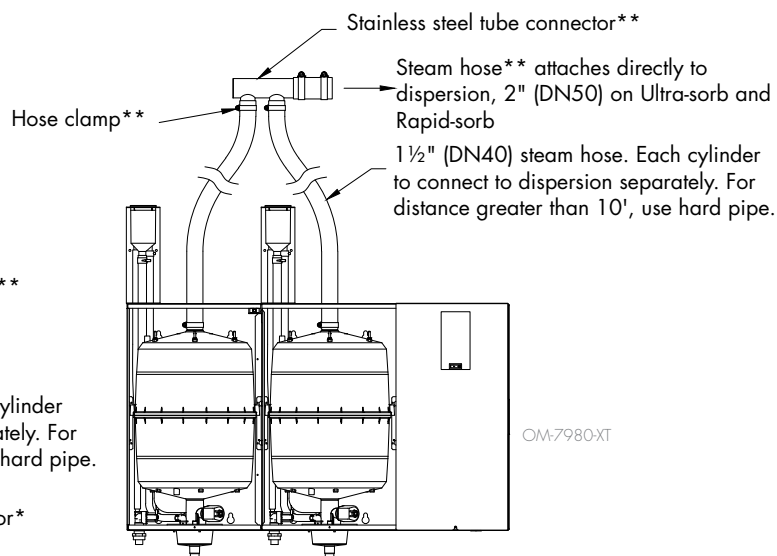
### Models XTP 033, 042, and 048



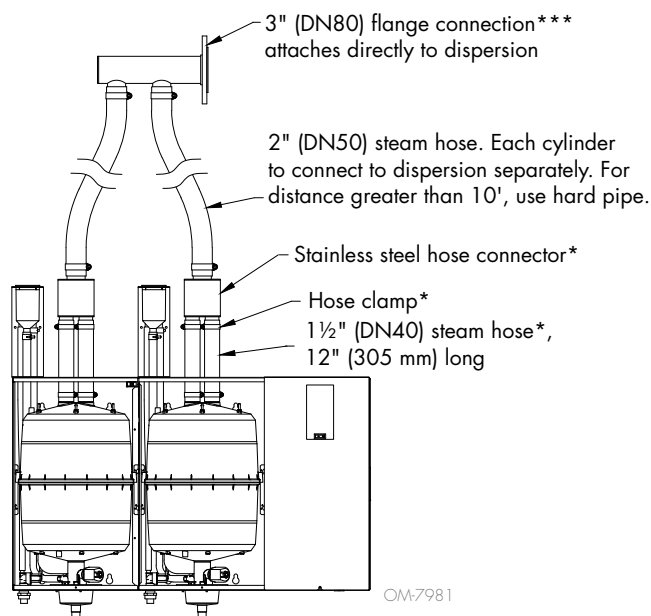
### Notes:

- For horizontal runs longer than 5' (1.5 m) or vertical runs longer than 10' (3m), tubing is required. Do not use steam hose.
- \* Provided in optional connector kit Part No. 191070-101
- \*\* Provided in optional connector kit Part No. 191070-002
- \*\*\* Provided in optional connector kit Part No. 162825-202F

### Model XTP 050

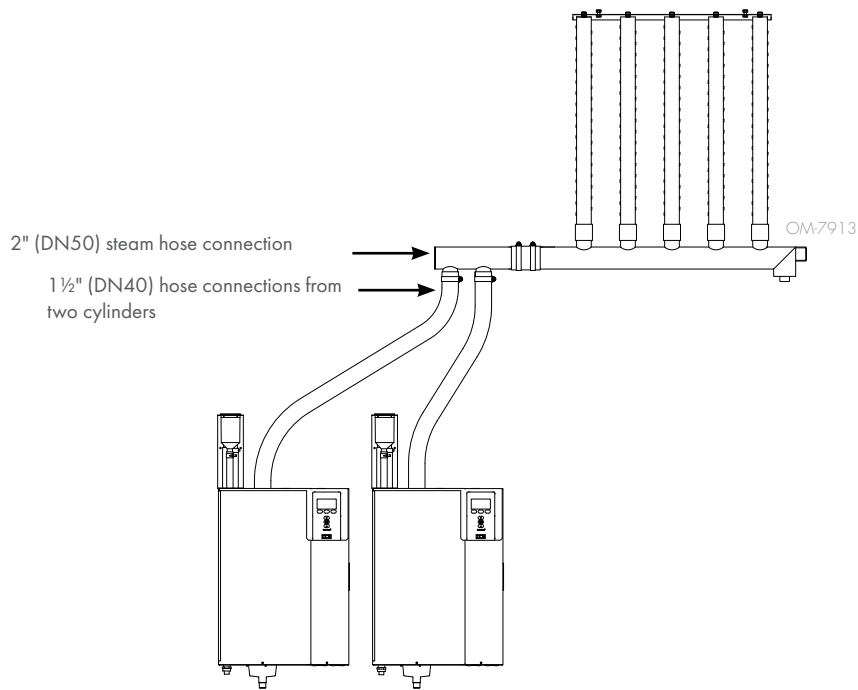


### Models XTP 067 through 096



# DISPERSION: STEAM OUTLET CONNECTIONS WITH HOSE

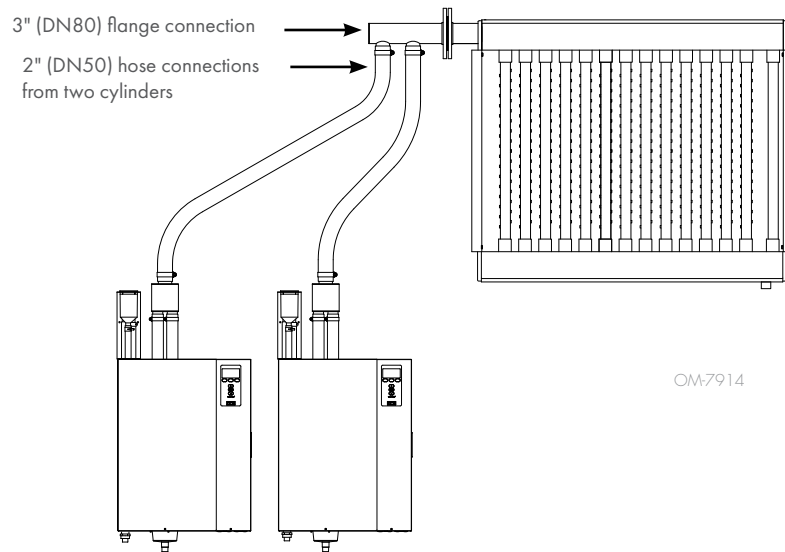
FIGURE 16-1: CONNECTING TWO CYLINDERS TO A DISPERSION ASSEMBLY



## 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 tubing from each cylinder to the connection of the dispersion device. Only connect a maximum of two cylinders to any single dispersion unit.**



# PIPING: INTERCONNECTING PIPING REQUIREMENTS

**Table 17-1:**  
Insulated 1 1/2" (DN40) steam tubing maximum lengths for Models XTP 002 through 017

| Model | Maximum developed length* |      |
|-------|---------------------------|------|
|       | ft                        | m    |
| 002   | 13                        | 4.0  |
| 003   | 25                        | 7.6  |
| 006   | 50                        | 15.2 |
| 010** | 50                        | 15.2 |
| 017** | 50                        | 15.2 |

**Notes:**

- For larger XT Series humidifier models, see Table 17-2.
- Values in this table are based on condensate flowing with steam (steam tubing pitched toward dispersion device).
- \* Maximum developed lengths are based on 5% steam loss in tubing. Developed length equals measured length plus 50% of measured length to account for fittings.
- \*\* Values in this table are based on duct static pressure of 2" wc (498 Pa). If maximum developed length is more than 20' (6 m) and duct static pressure exceeds 2" wc (498 Pa), a fill cup extension kit is required (see Page 20).

To maximize humidifier performance, see Tables 17-1 and 17-2, and follow all installation recommendations in the *XT Series Humidifier IOM*, available at [www.dristeem.com](http://www.dristeem.com).

**Table 17-2:**  
Maximum steam carrying capacity and length of interconnecting steam hose and tubing for Models XTP 025 through XTP096

| Model      | DriSteem steam hose* |    |                                |      |                  |   | Copper or stainless steel tubing<br>(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  |
| 025, 050** | 1 1/2                | 40 | 75                             | 34.0 | 10               | 3 | 1 1/2  | 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 |

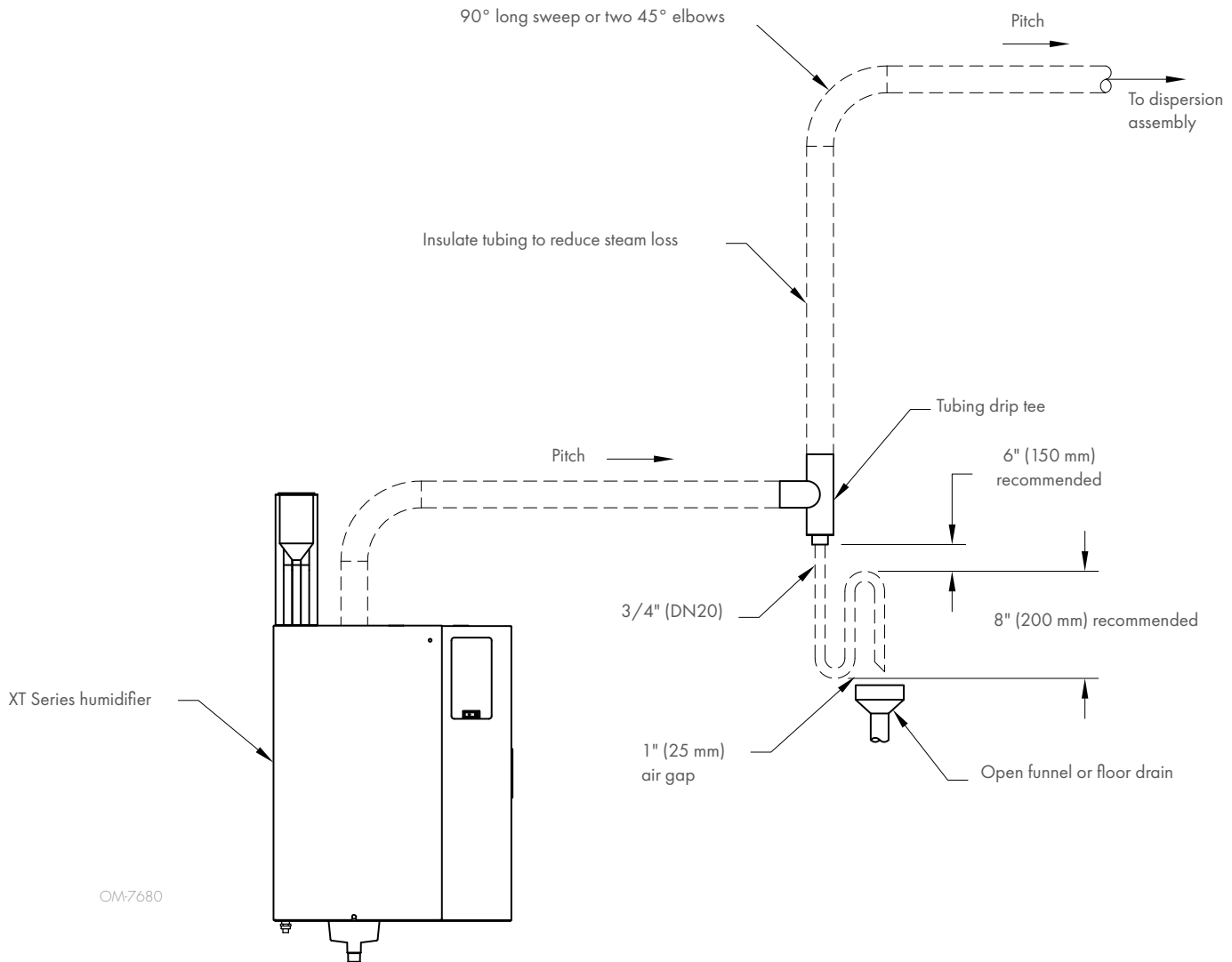
**Notes:**

- See Table 17-1 for XT Series humidifiers with lower capacities using 1 1/2" steam tubing.
- Values in this table are based on XT Series humidifiers with fill cup extensions, and condensate flowing in direction of steam (steam hose or tubing pitched toward dispersion device).
- \* When using steam hose, 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.
- † For Models XTP 050 through XTP096, 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 Page 16.
- †† DriSteem typically recommends 10' (3 m) maximum steam hose length pitched at 2"/ft (15%). Steam hose tends to sag if not supported for its full length. Sagging leads to collecting condensate and system pressure issues. Tubing is less prone to sagging and can allow for 1/8"/ft (1%) pitch minimum and longer runs.
- ††† Developed length equals measured length plus 50% of measured length to account for fittings.

# PIPING: FROM HUMIDIFIER TO DISPERSION ASSEMBLY

When a vertical riser is required in the steam tubing (shown below), a drip tee is required in order to eliminate a condensate collection point that will restrict steam flow.

**FIGURE 18-1: DETAIL OF VERTICAL RISER DRIPS**



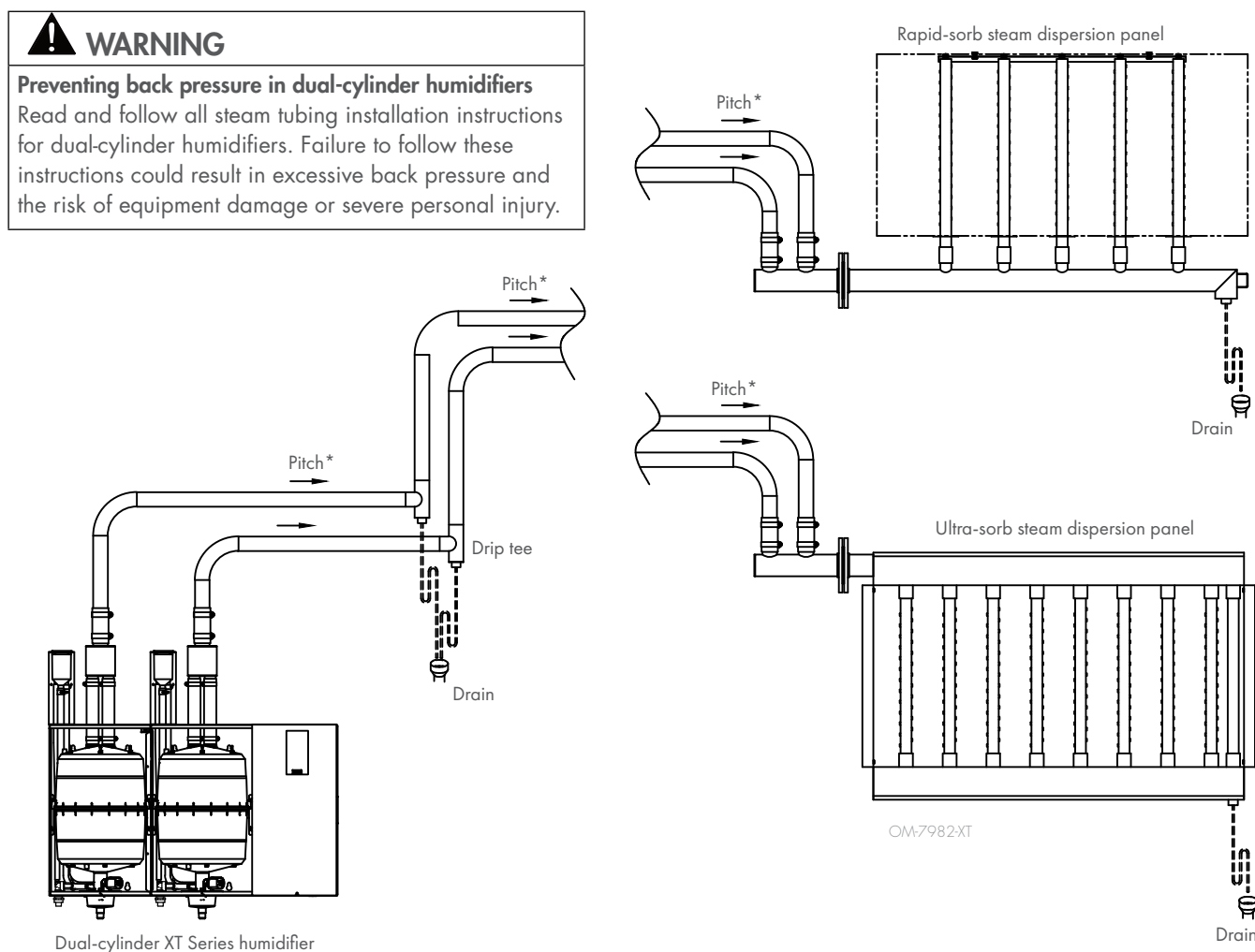
# PIPING: CONNECTING TO DUAL-CYLINDER HUMIDIFIERS WITH TUBING

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

- Run separate steam tubing from each cylinder to connection on dispersion device.
- Pitch steam tubing toward 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 19-1: DUAL-CYLINDER XT SERIES HUMIDIFIER CONNECTED TO RAPID-SORB OR ULTRA-SORB WITH RISER DRIPS IN STEAM SUPPLY LINES**

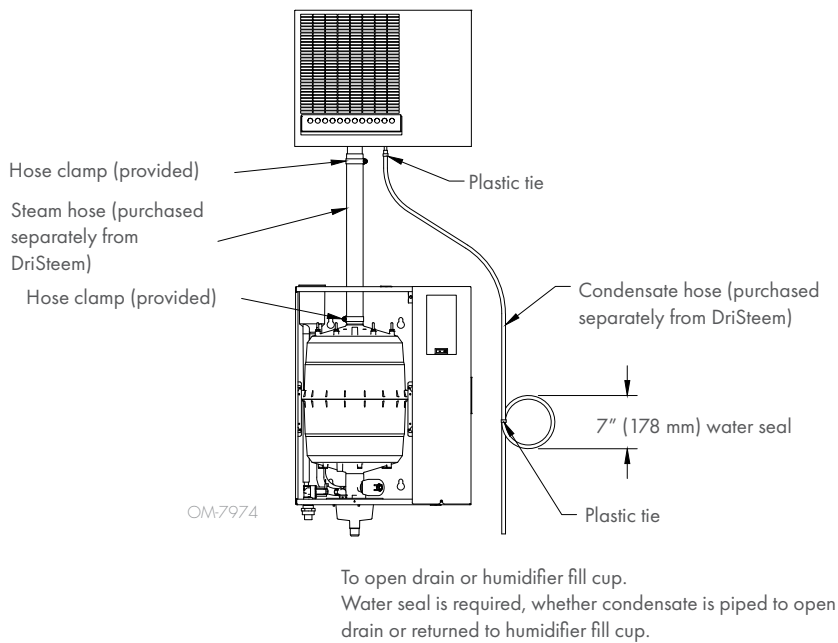


**Notes:**

- \* Pitch 1/8"/ft (1%) minimum toward dispersion panel.
- See installation notes in Figure 15-1.

# PIPING: XT STEAM BLOWERS

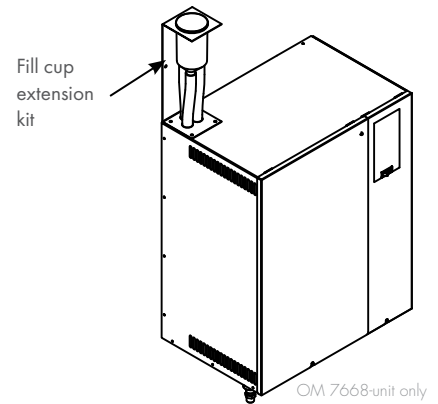
**FIGURE 20-1: PIPING FROM XT SERIES HUMIDIFIER TO REMOTE XT STEAM BLOWER**



**Notes:**

- Maximum recommended distance between humidifier and XT steam blower is 10' (3 m).
- Models XTP 042 through 096 are not intended for use with a steam blower.

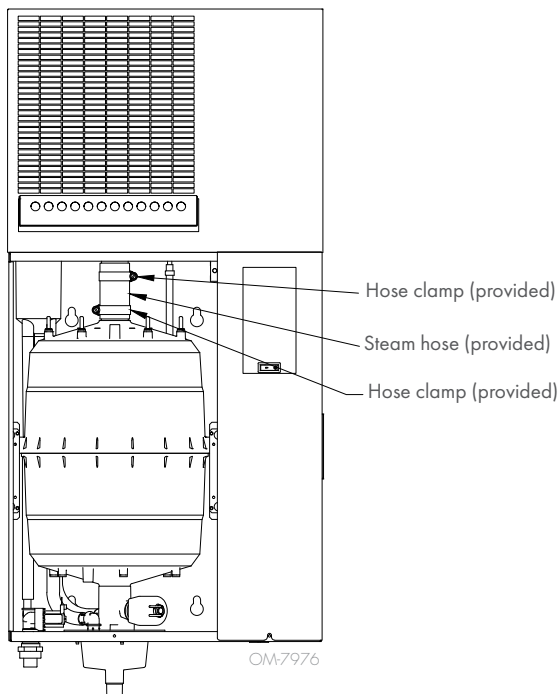
**FIGURE 20-3: FILL CUP EXTENSION KIT**



Fill cup extension 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)

**FIGURE 20-2: PIPING FROM XT SERIES HUMIDIFIER TO TOP-MOUNTED XT STEAM BLOWER**



**Notes:**

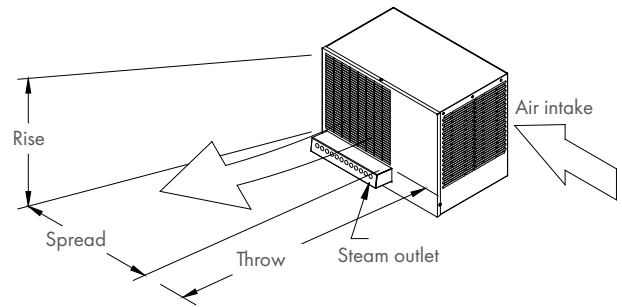
- Maximum recommended distance between humidifier and XT steam blower is 10' (3 m).
- Models XTP 025 and 033 are not intended for use with a direct-mounted steam blower.
- Models XTP 042 through 096 are not intended for use with a steam blower.

# DISPERSION: XT STEAM BLOWERS

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



QM-7686

Table 21-1 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 21-1:

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

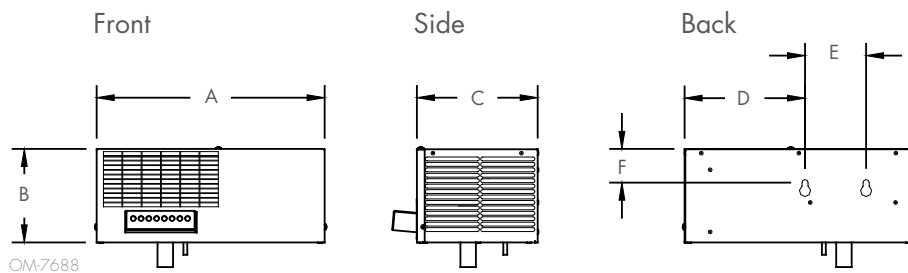
Throw: Minimum non-wetting horizontal distance from the steam outlet of the XT steam blower

\* These models use two XT steam blowers.

# DISPERSION: XT STEAM BLOWERS

**FIGURE 22-1: XT STEAM BLOWER DIMENSIONS**

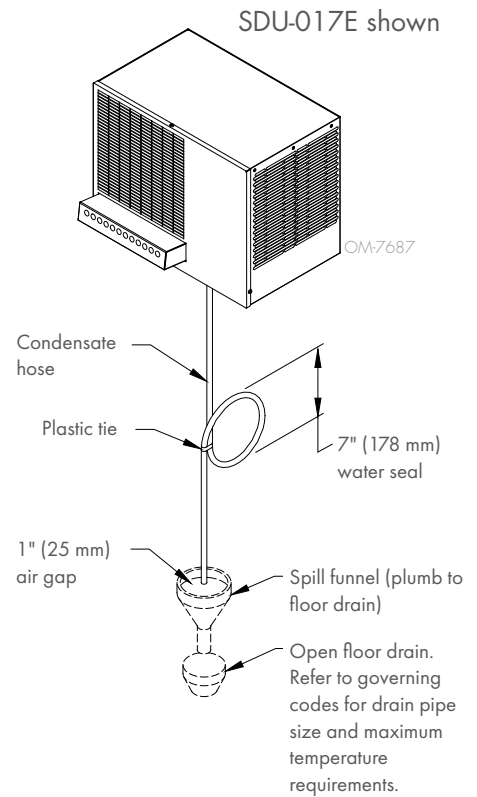
SDU-006E shown



**Table 22-1:**  
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 |

**FIGURE 22-2: PIPING CONDENSATE TO DRAIN**



Note:  
Shown with condensate to open drain. Condensate can also be returned to cup through field-installed hole in fill cup cap.

**Table 22-2:**  
XT steam blower specifications

| Model    | Maximum capacity |      | Shipping weight |      | Operating weight |      | Volume airflow |        | Current draw at 115V (50/60 Hz) | Input power | Sound* |
|----------|------------------|------|-----------------|------|------------------|------|----------------|--------|---------------------------------|-------------|--------|
|          | lbs/hr           | kg/h | lbs             | kg   | lbs              | kg   | cfm            | m³/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:

- \* Sound measurements taken 6.5' (2 m) in front of XT steam blower cabinet.
- XT steam blowers ship separately from XT Series humidifiers.

# APPLICATION CONSIDERATIONS

Electrode humidifiers function very differently from other humidifier technologies. Some of the factors to consider are steam output consistency, efficiency, cylinder life, and start-up time. Understanding these factors and the variables that impact them will result in proper application of this technology.

Recommended supply water conductivity for DriSteem electrode humidifiers is 350 to 1250  $\mu\text{S}/\text{cm}$  (roughly comparable to water hardness of 10 to 36 grains per gallon)

## OUTPUT CONSISTENCY AND EFFICIENCY

DriSteem's controller algorithm optimizes steam output consistency, water efficiency, and energy efficiency by managing the frequency and duration of drain and fill events for the supply water being used. The frequency and duration of drain and fill events is proportional to the conductivity of the supply water. Less conductive supply water requires less frequent drain and fill events, resulting in more consistent steam output and more efficient use of energy and water.

## CYLINDER LIFE

Hard water scale coats the electrodes and eventually requires a cylinder replacement. The harder the water, the more frequent the need for a new cylinder.

Softened water is an option in some facilities. Because softened water ions stay in solution to much higher concentrations than hard water ions, softened water does not coat the electrodes nearly as much as hard water, potentially extending cylinder life.

There are benefits and trade-offs to consider when the application allows a choice between hard and softened water:

- The benefit of softened water is longer cylinder life (depending on water chemistry), but the trade-off is more frequent drain and fill events.
- The benefit of hard water is less frequent drain and fill events but may result in more frequent cylinder replacement.

## START-UP TIME

Start-up time is how long it takes the humidifier to reach output from a given demand when first installed and after cylinder changes. The more conductive the water, the shorter the start-up time.

## 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 events to optimize humidifier performance and provide proper steam output.

## DRAIN AND FILL EVENTS

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 event. 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.

**DriSteem Corporation**

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DriSteem U.S. operations are  
ISO 9001:2015 certified

U.S. Headquarters:  
14949 Technology Drive  
Eden Prairie, MN 55344  
800-328-4447 or 952-949-2415  
952-229-3200 (fax)

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