



## ULTRA-SORB® STEAM DISPERSION PANEL

- *Guaranteed short non-wetting distances*
- *Reduce wasted energy and condensate up to 85%*
- *Lowest installation cost*

# ALL ULTRA-SORB MODELS FEATURE

## **EFFICIENT BY DESIGN**

### **Reduce wasted energy and condensate up to 85%.**

High-Efficiency Insulated Tubes significantly reduce airstream heat gain and condensate production. (Standard on Model XV; optional on Models LV, LH, and MP.)

### **Higher capacities per tube increase efficiency, reduce cost.**

Insulated dispersion tubes produce less condensate and, therefore, have more steam available for humidification, increasing the capacity of each tube.

As a result, fewer tubes may be required to meet application requirements, further lowering condensate production and heat gain while reducing resource consumption and cost.

### **No steam jackets; no unnecessary heat gain.**

When there is no call for humidity, Ultra-sorb panels are at duct temperature while conventional jacketed steam injection systems stay hot and continue to add heat to the airstream.

## **GUARANTEED, SHORT NON-WETTING DISTANCES**

### **Install within inches of downstream devices.**

Rapid, drip-free steam absorption means steam does not condense on downstream devices.

## **LOWEST INSTALLATION COST**

### **Factory assembly eases installation.**

Panels ship preassembled and install quickly with easy mounting, steam, and condensate connections.



*Learn More*



## **ULTRA-SORB STEAM DISPERSION PANELS**

*Steam for humidification can be non-pressurized or pressurized. DriSteem steam dispersion units disperses steam generated by pressurized steam boilers or by nonpressurized steam humidifiers. The steam is distributed through ducts, air handlers, and even directly into finished spaces, where it is released in the airstream with a steam dispersion system.*

## MODEL XV: HIGHEST PERFORMANCE

### Integral condensate management.

An industry first for pressurized steam, Ultra-sorb Model XV vaporizes dispersion-generated condensate and returns pressurized condensate to the boiler without additional pumps, valves, vents, or controls.

### Most efficient dispersion.

- Zero water waste.  
All condensate returns to the boiler while still hot, saving energy, water, and boiler chemicals.
- Lowest heat gain.  
High-Efficiency Insulated Tubes and an insulated steam delivery header reduce airstream heat gain by up to 85%.
- 304 and 316 stainless steel construction options

## MODELS LV AND LH: MOST VERSATILE

### Disperse pressurized or nonpressurized steam.

- Models LV and LH disperse steam generated by pressurized steam boilers or by nonpressurized steam generators such as DriSteam's GTS®, STS®, RTS®, Vaporstream®, Vapormist®, and XT humidifiers.

### Wide capacity range of options

- Steam capacity up to 4,000 lbs/hr (1815 kg/h)
- High-Efficiency Insulated Tubes option
- 316 stainless steel construction options

## MODEL MP: LOWEST TOTAL INSTALLED COST

- Same side steam inlet and drain for reduced piping
- In-frame condensate drain piping maximizes available face dimensions and minimizes blank-off requirements for low duct air pressure losses.
- Integral steam header allows clear space on exterior walls of AHUs.
- High-Efficiency Insulated Tubes option
- 304 and 316 stainless steel construction options

## ULTRA-SORB MODEL XV

Integral condensate management



## ULTRA-SORB MODEL LV/LH

Unmatched capacity and versatility



## ULTRA-SORB MODEL MP

Lowest total installed cost



# ULTRA-SORB MODELS COMPARISON

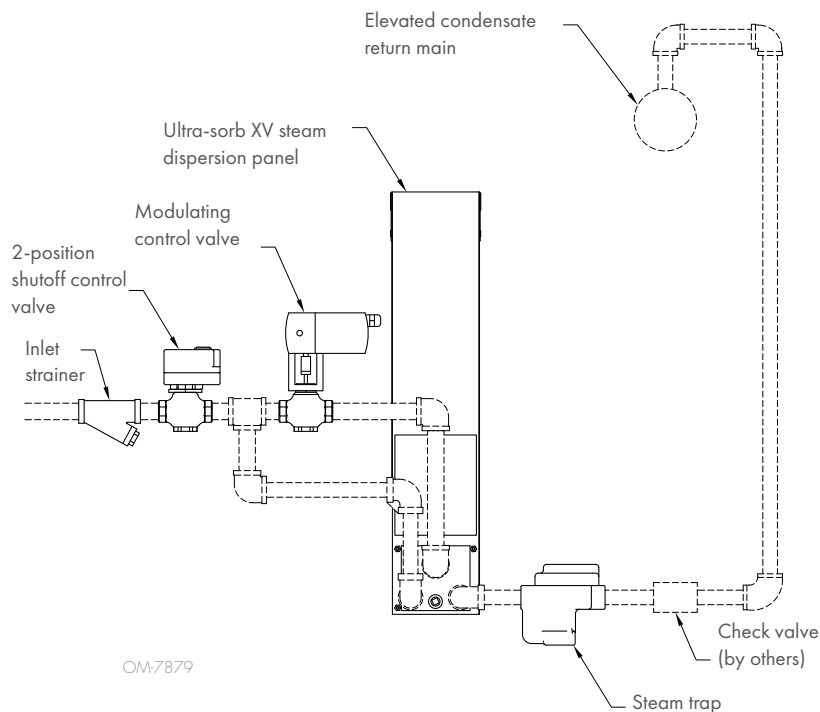
**Table 4-1:**  
**Ultra-sorb models comparison**

	Model XV Integral condensate management	Ultra-sorb Model LV Vertical tubes	Ultra-sorb Model LH Horizontal tubes	Ultra-sorb Model MP Lowest total installed cost
Steam source	<u>Humidification steam inlet:</u> Steam from boiler or steam-to-steam (STS) humidifier <u>Internal heat exchanger:</u> Pressurized boiler steam	Pressurized boiler steam or nonpressurized steam		
Maximum steam capacity	<u>Per panel:</u> Pressurized boiler steam: Up to 2720 lbs/hr (1235 kg/h) One Ultra-sorb Model XV with STS: Up to 450 lbs/hr (204 kg/h)  <u>Per tube:</u> 80 lbs/hr (36 kg/h)	<u>Per panel:</u> Up to 4000 lbs/hr (1815 kg/h)  <u>Per tube:</u> Insulated: 86 lbs/hr (39 kg/h) Uninsulated: 80 lbs/hr (36 kg/h)	<u>Per panel:</u> Up to 3268 lbs/hr (1482 kg/h)  <u>Per tube:</u> Insulated: 86 lbs/hr (39 kg/h) Uninsulated: 80 lbs/hr (36 kg/h)	<u>Per panel:</u> Up to 2720 lbs/hr (1235 kg/h)  <u>Per tube:</u> Insulated: 80 lbs/hr (36 kg/h) Uninsulated: 77 lbs/hr (35 kg/h)
Steam pressure	<u>Heat exchanger:</u> 5 to 50 psi (35 to 345 kPa) <u>Humidification steam inlet:</u> 5 to 50 psi (35 to 345 kPa), pressurized boiler; or atmospheric, STS humidifier	4 to 50 psi (14 to 345 kPa)		
Airflow	Horizontal	Horizontal	<u>Horizontal or vertical:</u> pressurized steam  <u>Vertical:</u> nonpressurized steam	Horizontal
High-Efficiency Insulated Dispersion Tubes	Standard	Available option		
Header insulation	Header inside of enclosure is insulated	Header enclosure provides air gap insulation		Optional header enclosure provides air gap insulation (standard on units > 60" width)
Condensate drain	Pressurized	Atmospheric		
Condensate lifting	Vaporizes dispersion tube- generated condensate in header; returns pressurized condensate to condensate return main	Available pump		
Airstream heat gain	Lowest	Low with High-Efficiency Insulated Tubes option		
Non-wetting distance	Shortest; performs to published Ultra-sorb non-wetting distance			
Face dimensions	12" x 12" up to 144" x 144" (305 x 305 to 3660 x 3660 mm)	12" x 12" up to 144" x 144" (305 x 305 to 3660 x 3660 mm)	12" x 12" up to 120" x 120" (305 x 305 to 3050 x 3050 mm)	12" x 12" up to 144" x 144" (305 x 305 to 3660 x 3660 mm)
Assembly	Pre-assembled (shipped unassembled by request or as larger dimensions require)			
Dispersion tube mounting	Spring-loaded tubes and frame	Slip couplings and frame		Sealing grommets and frame
Steam / drain connections	Inlet: Steam for humidification Inlet: Pressurized steam for heat exchanger Outlet: Pressurized condensate to return main Outlet: Optional header overflow (if no float switch)	Inlet: Steam for humidification Outlet: Condensate drain		
Piping connections	Same-side connections	Top or side steam inlet, opposite-side drain connection	Top or side steam inlet, 2 drain connections (one per header)	Same-side steam supply and condensate drain connections
Optional stainless steel features	Header/dispersion tubes: 316 stainless steel (304 standard) Enclosure/frame: 304 or 316 stainless steel (galvanized standard)	Header/dispersion tubes: 316 stainless steel (304 standard) Enclosure/frame: 304 or 316 stainless steel (galvanized standard)		Header/dispersion tubes: 316 stainless steel (304 standard) Enclosure/frame: 304 or 316 stainless steel (galvanized standard)

**Table 5-1:**  
**Condensate piping for Ultra-sorb steam dispersion**

	Model XV	Models LV, LH, and MP	
		Nonpressurized steam	Pressurized steam
P-trap water seal for condensate drain	Not required	Drop: 2" (50 mm) Seal: 5" (130 mm)	Recommended: Drop: 2" (50 mm) Seal: 10" (255 mm)
F&T trap, for lifting condensate to elevated condensate return main	Yes, with no additional pumps, valves, vents or controls (<15 PSI steam)	No	No
Inverted bucket trap, for lifting condensate to elevated condensate return main	Yes, with no additional pumps, valves, or controls (>15 PSI steam)	No	No
Stainless steel thermostatic trap	No	No	No
Condensate to open drain	Not required Pressurized condensate return	Yes	Yes
Condensate return by condensate pump	Not required Pressurized condensate return	Yes	Yes
Condensate return to humidifier by gravity	n/a	Yes	n/a
Condensate return to boiler via return line	Yes, with no additional pumps, valves, vents or controls	n/a	No

**FIGURE 5-1: LIFTING CONDENSATE WITH ULTRA-SORB MODEL XV**



*Ultra-sorb Model XV vaporizes dispersion-generated condensate and returns pressurized condensate to the boiler without additional pumps, valves, vents, or controls.*

# HIGH-EFFICIENCY INSULATED DISPERSION TUBES

High-efficiency tubes are standard on Ultra-sorb Model XV and an available option for new or existing Ultra-sorb Models LV, LH, and MP.

The PVDF insulation on High-Efficiency Tubes provides the following benefits:

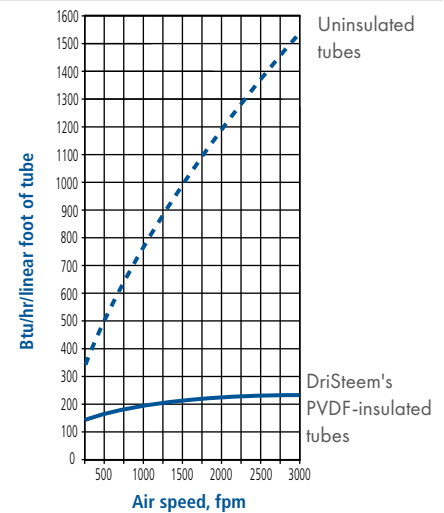
- **Reduce heat gain and condensate production by up to 85%** compared to uninsulated dispersion tubes, regardless of load or airstream temperature.
- **Save energy and water.** Every pound of condensate that does not drain from the dispersion assembly saves the heat energy (about 1,000 BTUs) required to boil it into steam.
- **Gain capacity.** Use fewer tubes and smaller steam generators. With a higher percentage of generated steam meeting the humidification load, fewer dispersion tubes are needed, and steam generators can be downsized in many cases.

## ADVANCED INSULATION MEETS STRINGENT REQUIREMENTS

PVDF is an advanced material commonly used in chemical, semiconductor, medical, defense, and aerospace industries and has the following characteristics:

- **Approved for use in plenums.** Flame spread/smoke developed values are 0/0, exceeding UL 723 (ASTM E84) requirement of 25/50.
- **Rated for high-temperature operation.** Rated for 300°F (149°C) continuous operation.
- **Will not absorb water or support microbial growth** due to its closed-cell construction.
- **Virtually no airflow pressure drop.** PVDF insulation is only 1/8" (3.2mm) thick.
- **Will not shift or slip on tubes.** Advanced manufacturing process ensures insulation attaches securely to tubes.
- **Odor free.** Virtually no measurable outgassing.
- **Resistant to UV light.**
- **Rugged and durable.** No particle erosion per ASTM C1071 erosion resistance test; does not contain fiberglass.

## DISPERSION TUBE HEAT LOSS



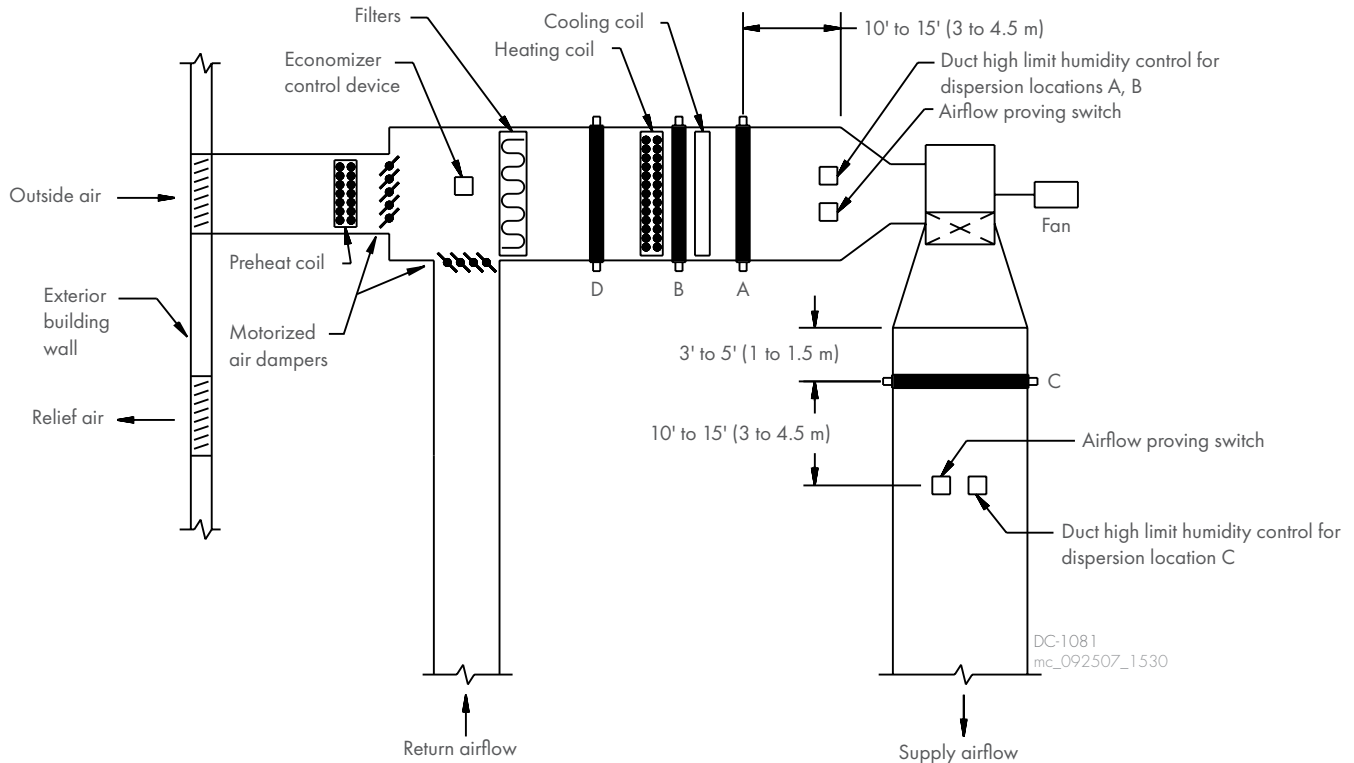
### Notes:

- This graph illustrates dispersion tube heat loss vs. airspeed at 50 °F (10 °C) for a 3" (76 mm) spaced tube bank, 1 1/2" (DN40) dia. stainless steel tubes with 212 °F (100 °C) internal wall temperature
- Heat loss calculations based on the following references: Zhukauskas, A. 1987. *Convective Heat Transfer in Cross Flow*. In S. Kakac, R.K. Shah, and W. Ang, eds. *Handbook of Single-Phase Convective Heat Transfer*. New York: John Wiley & Sons, pp. 6.1-6.45.
- PVDF insulation on tube is 1/8" (3.2 mm) thick and has a thermal conductivity of 0.0185 Btu/hr-ft-F 0.0107 W/m • K.

Read our white paper

For details on the industry-leading performance of DriSteem High-Efficiency Tubes, see our white paper on [www.dristeem.com](http://www.dristeem.com).

**FIGURE 7-1: PLACING A DISPERSION ASSEMBLY IN AN AIR HANDLING UNIT**



## DETERMINE HUMIDIFIER PLACEMENT

Check available non-wetting distance, and review Figure 7-1. Dispersed steam must be absorbed into the airflow before it comes in contact with duct elbows, fans, vanes, filters, or any object that can cause condensation and dripping.

## PLACEMENT IN AN AIR HANDLING UNIT

- **Location A is the best choice.** Installing downstream of heating and cooling coils provides the most even flow through the dispersion unit; plus, the heated air provides an environment for best absorption.
- **Location B is the second-best choice.** However, in change-over periods, the cooling coil will eliminate some moisture for humidification.
- **Location C is the third-best choice.** Air leaving a fan is usually very turbulent and can cause vapor to not absorb at the expected non-wetting distance. Allow for more distance if installing downstream of a fan.
- **Location D is the poorest choice.** The cooler air at this location requires an increased non-wetting distance.



# MODEL XV: OPERATION AND COMPONENTS

## PRINCIPLE OF OPERATION - PRESSURIZED STEAM

### 1 Pressurized steam enters heat exchanger

Pressurized steam entry to the heat exchanger is controlled by a 2-position shutoff valve that admits steam to the heat exchanger when there is a call for humidity.

### 2 Humidification steam enters insulated header

Humidification steam entry is controlled by a modulating valve located downstream of the 2-position shutoff valve to meet humidification demand.

### 3 Humidification steam flows through High-Efficiency Insulated Dispersion Tubes

Humidification steam flows through the insulated header, up the High-Efficiency Insulated Tubes, and into the airstream. Dispersion tube insulation provides up to an 85% reduction in wasted energy by significantly reducing airstream heat gain and condensate production. See page 9 for more information.

### 4 Integral condensate management

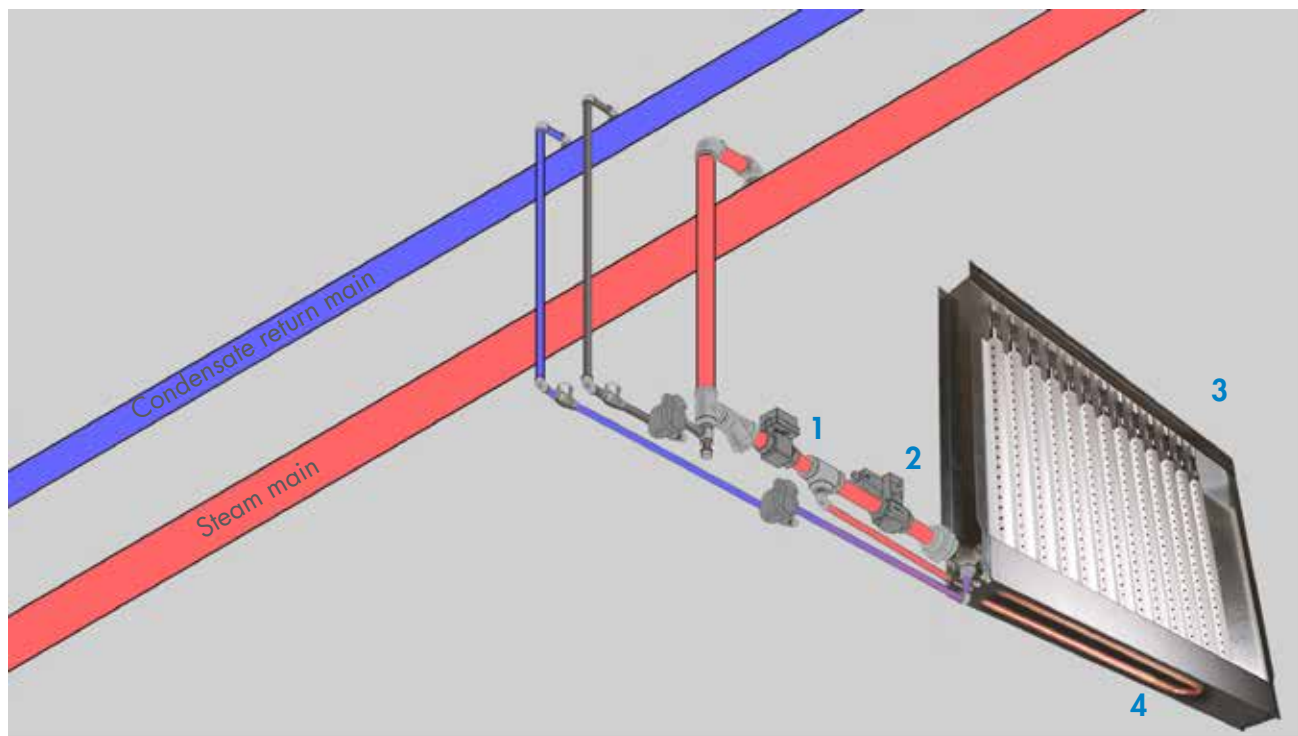
The heat exchanger vaporizes dispersion-generated condensate, which creates condensate within the heat exchanger. This condensate returns to the boiler via the condensate return main with no additional pumps, valves, vents, or controls.

**FIGURE 8-2: USE MODEL XV WITH A STS HUMIDIFIER FOR CLEAN STEAM**



*Ultra-sorb Model XV accepts humidification steam directly from a boiler or DriSteam STS steam-to-steam humidifier. The STS transfers boiler steam energy (through a heat exchanger) to clean fill water to boil it into humidification steam.*

**FIGURE 8-1: MODEL XV PRINCIPLE OF OPERATION**





## PRINCIPLE OF OPERATION AND COMPONENTS

### Control safety options

The Ultra-sorb XV steam dispersion panel utilizes a built-in heat exchanger to evaporate condensate generated in the humidification process.

- For maximum energy efficiency, a DriSteam control cabinet is used to sequence a 2-position shutoff valve for the heat exchanger, with a modulating valve for humidification control.
- A float switch in the steam dispersion panel header, along with control sequence timings assure effective condensate management along with humidification output based on demand.
- When humidity demand ends, the digital controller in the DriSteam control cabinet keeps the heat exchanger valve open for 15 minutes, maintaining steam flow through the heat exchanger to evaporate any remaining condensate in the steam header.
- Optionally a temperature switch monitors the steam trap temperature and if below setpoint, closes the modulating steam valve or STS humidifier control system to stop humidification steam from entering the header and prevents further condensate production.

### Heat exchanger control options

Heat exchanger options are packaged and available for ordering as shown below.

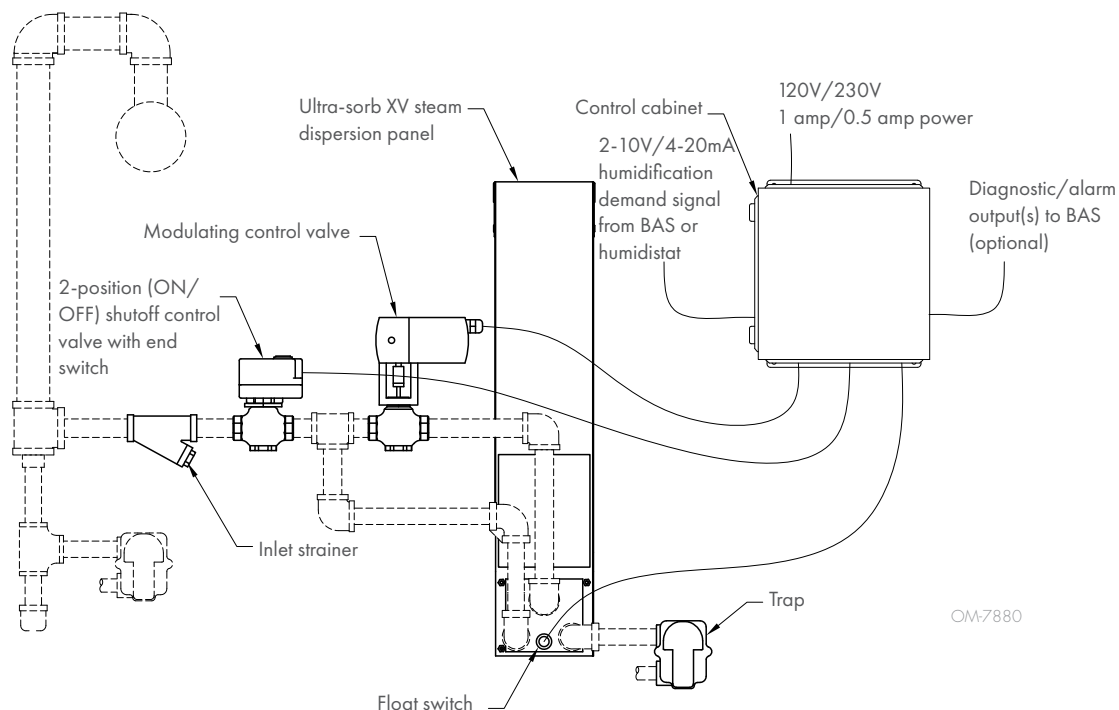
#### Boiler steam only:

- Heat exchanger 2-position shutoff valve, modulating humidifier valve, control panel, float switch, and optional temperature switch
- Temperature switch, electric
- Temperature switch, pneumatic

#### Boiler steam paired with an STS Humidifier:

- Control via STS Humidifier
- Temperature switch, electric
- Temperature switch, pneumatic

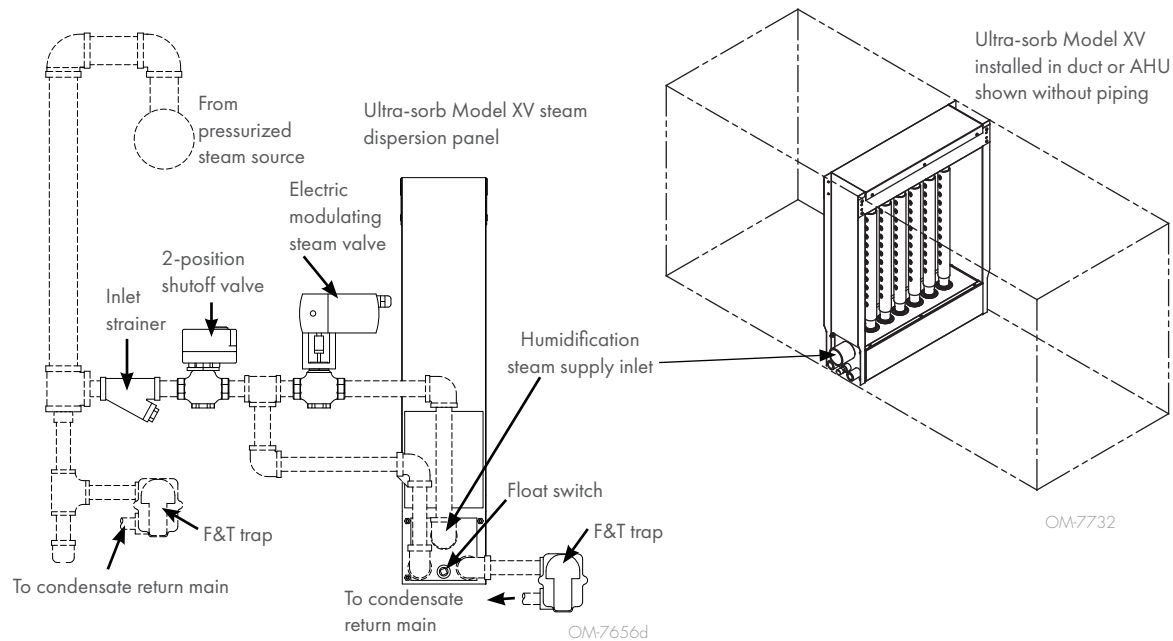
**FIGURE 9-1: CONTROL COMPONENTS**



# MODEL XV: OPERATION AND COMPONENTS

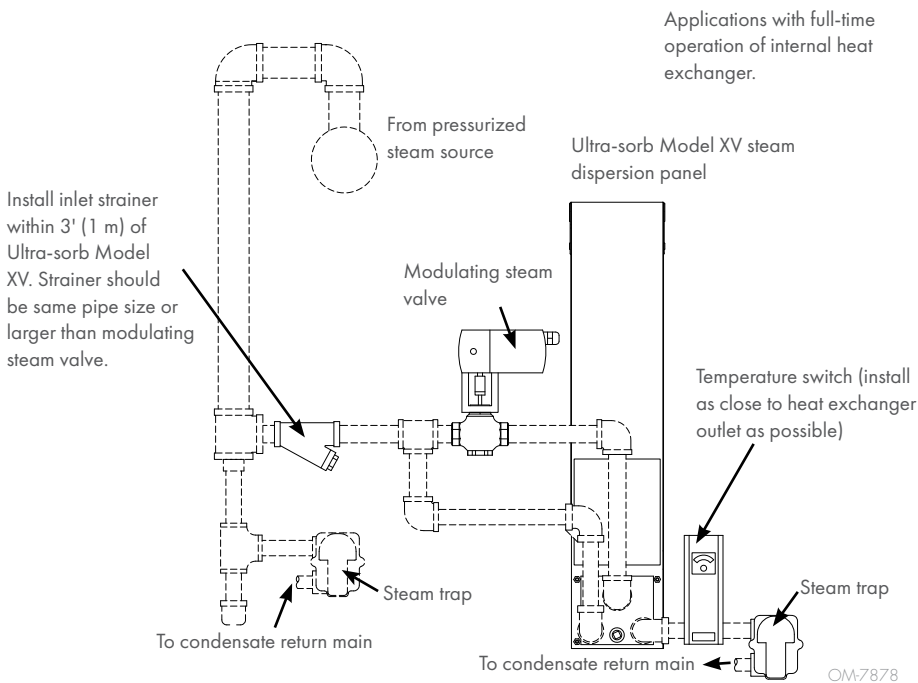
**FIGURE 10-1: ULTRA-SORB MODEL XV OPERATING WITH PRESSURIZED HUMIDIFICATION STEAM**

Standard trap piping



Note: Dashed lines indicate provided by installer.

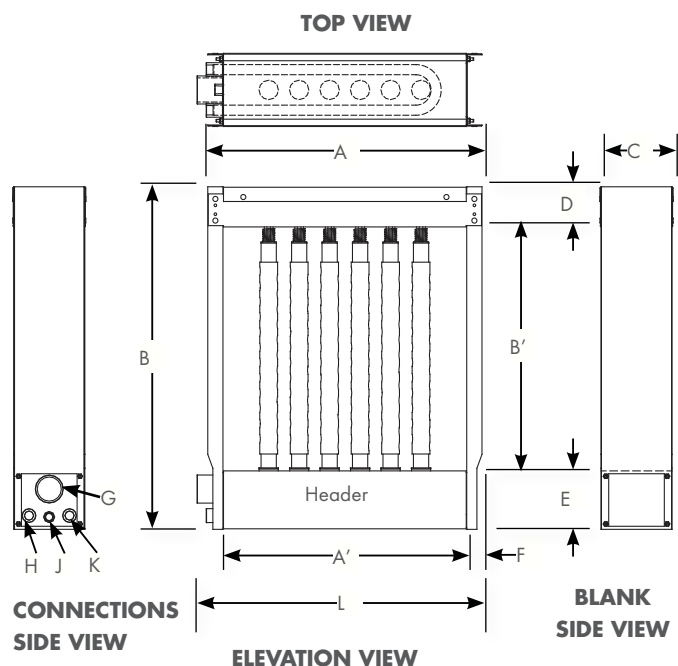
**FIGURE 10-2: ULTRA-SORB MODEL XV PIPING COMPONENTS WITH TEMPERATURE SWITCH, PRESSURIZED STEAM SOURCE**



Note: Dashed lines indicate provided by installer.

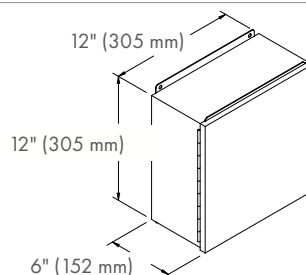
# MODEL XV: DIMENSIONS AND CAPACITY

**FIGURE 11-1: ULTRA-SORB MODEL XV DIMENSIONS**



QM-7483

**FIGURE 11-2: ULTRA-SORB MODEL XV CONTROL CABINET**



QM-7533

Notes:

- Electrical power requirements: 120 VAC, 1 Amp, or 240 VAC, 0.5 Amps
- Components are 24 VAC, powered by a transformer in the control cabinet.
- Maximum distance from control cabinet to Ultra-sorb Model XV is 50' (15 m).

**Table 11-1:**

**Ultra-sorb Model XV tube capacity**

Diameter	lbs/hr	kg/h
1.5"	43	19.5
2.0"	80	36.3

Consult DriCalc® sizing and selection software to calculate capacities for your specific application.

**Table 11-2:**

**Ultra-sorb Model XV dimensions**

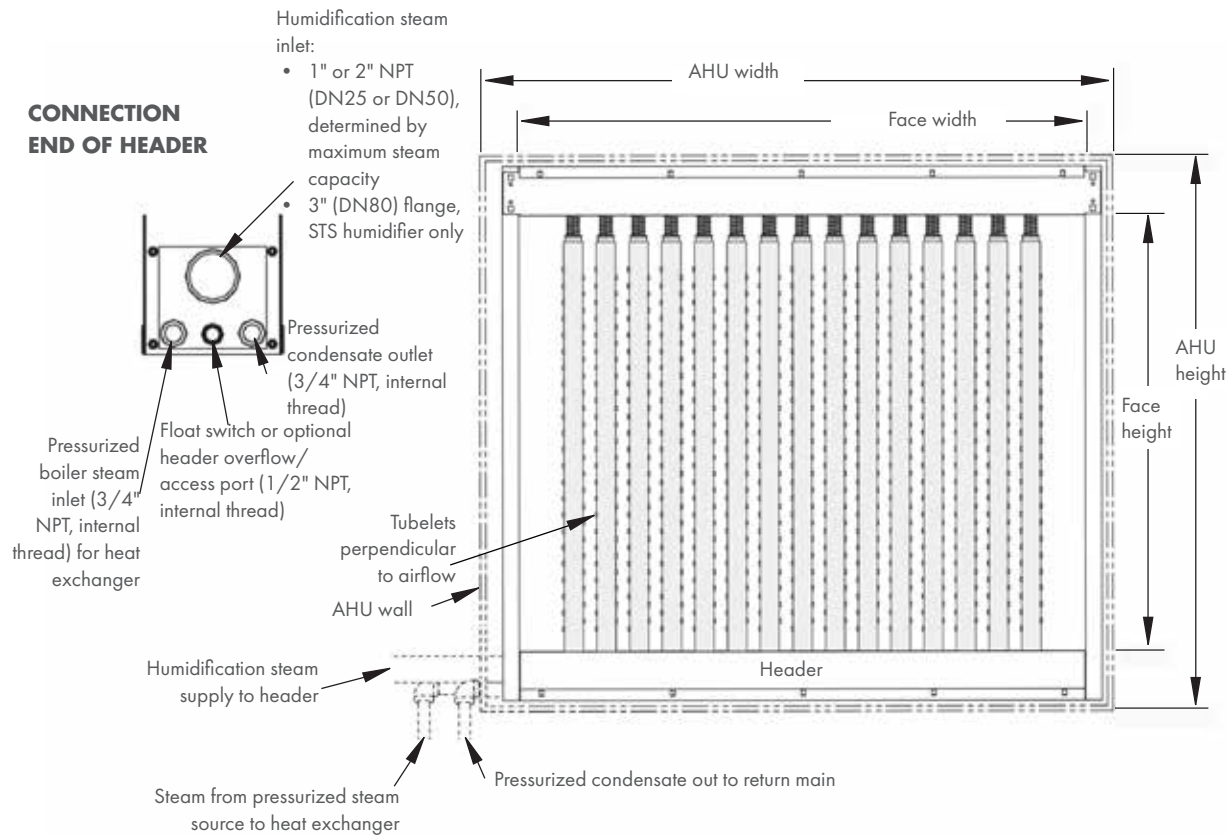
A Unit width	15" (380 mm) min, 147" (3735 mm) max, in 1" (25 mm) increments
A' Face width	12" (305 mm) min, 144" (3660 mm) max, in 1" (25 mm) increments
B Unit height*	21.75" (550 mm) min, 153.75" (3905 mm) max, in 1" (25 mm) increments Shipped unassembled by request or if unit height is more than 98" (2490 mm)
B' Face height	12" (305 mm) min, 144" (3660 mm) max, in 1" (25 mm) increments
C Frame depth	7.2" (183 mm)
D Frame enclosure	3.9" (99 mm)
E Header enclosure	5.85" (149 mm)
F Mounting flange	1.5" (38 mm)
G Humidification steam inlet (internal thread)	1" or 2" NPT (DN25 or DN50), determined by maximum steam capacity 3" (DN80) flange, for humidification steam from STS humidifier only
H Pressurized steam inlet (internal thread)	3/4" NPT (DN20)
J Float switch, optional header overflow/access port (internal thread)	1/2" NPT (DN15)
K Pressurized condensate outlet (internal thread)	3/4" NPT (DN20)
L Overall width	1" (DN25) connection, same as dimension A 2" (DN50) connection, dimension A + 1" (dimension A + 25 mm) 3" (DN80) flange, dimension A + 6.5" (dimension A + 165 mm)
Control cabinet	See Figure 11-2

Note:

\* Panels with unit height more than 120" (3048 mm) have two-piece side flanges and are shipped with brackets and panel fasteners for easy field assembly. Panels with unit height more than 93" (2362 mm) are shipped unassembled.

# MODEL XV: INSTALLATION

**FIGURE 12-1: ULTRA-SORB MODEL XV IN AN AIR HANDLER**

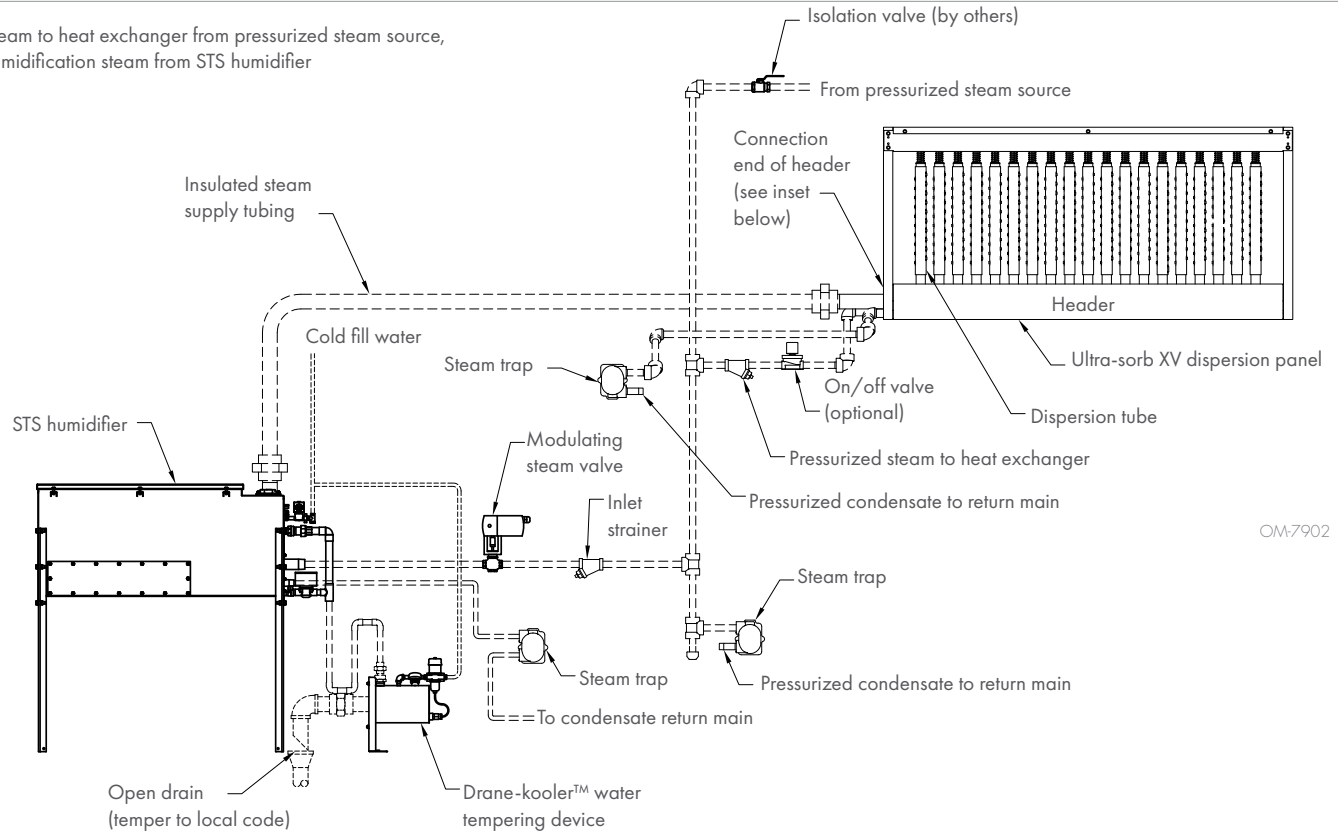


**Notes:**

1. Dashed lines indicate provided by installer.
2. See Page 7 for location guidelines.
3. Steam supply line to unit, and piping, are not included.
4. Dispersion tubes are available on 3", 4", 6", 9" and 12" (75,100, 150, 225, and 300 mm) centers.
5. Ultra-sorb humidifiers will be assembled, crated, and shipped intact in all sizes up to 93" (2362 mm) overall height. Any Ultra-sorb can be shipped unassembled by request, requiring field assembly.
6. Standard sizes are 12" x 12" up to 144" x 144" in 1" increments (305 x 305 mm up to 3660 x 3660 mm in 25 mm increments). Larger sizes are available.
7. Heat exchanger requires 5 psig (35 kPa) minimum steam pressure.

**FIGURE 13-1: ULTRA-SORB MODEL XV PIPING WITH STS HUMIDIFIER**

Steam to heat exchanger from pressurized steam source,  
humidification steam from STS humidifier



OM-7902

# MODELS LV AND LH: OPERATION AND COMPONENTS

## PRINCIPLE OF OPERATION

### 1 Steam enters steam supply header

Pressurized steam from a boiler or nonpressurized steam from a DriSteam steam generator enters the supply header/separator after passing through a modulating steam control valve.

### 2 Steam enters dispersion tubes

Steam flows through the dispersion tubes and into the airstream. Dispersion tube diagonal end cuts capture only the driest steam from the center of the header. Calibrated thermal resin tubelets allow only the driest steam to exit into the airstream.

The dispersion tubes operate drip-free without steam jackets, so no unnecessary heat is added to the airstream when the humidifier is idle.

High-Efficiency Insulated Dispersion Tubes, available as a new or retrofit option, provide up to an 85% reduction in wasted energy by significantly reducing airstream heat gain and condensate production. See Pages 6 and 15 for more information.

### 3 Condensate flows to condensate return header and drain

Any condensate generated in the dispersion tubes flows by gravity to the condensate return header to the condensate drain.

## ULTRA-SORB MODEL LV



- Vertical tubes
- Suitable for AHUs or ductwork
- Use when duct height is greater than duct width
- May use with pressurized or nonpressurized steam (horizontal airflow only)

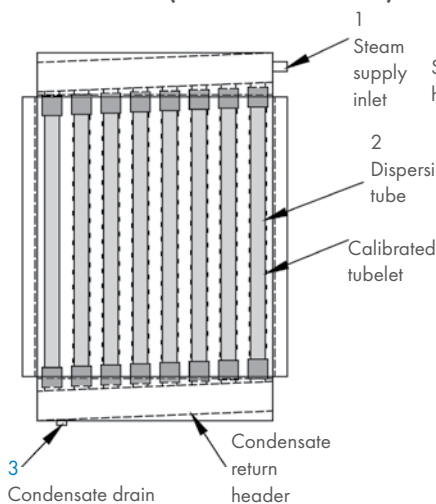
## ULTRA-SORB MODEL LH



- Horizontal dispersion tubes
- Suitable for AHUs or ductwork
- Use when duct width is greater than duct height
- May use with pressurized steam in a vertical or horizontal airflow; may use with nonpressurized steam in a vertical airflow

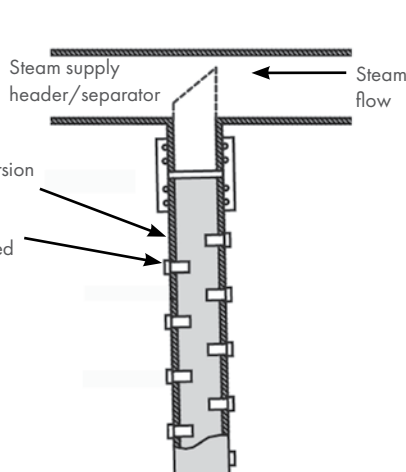
FIGURE 14-1: ULTRA-SORB MODELS LV AND LH COMPONENTS

### ULTRA-SORB PANEL (MODEL LV SHOWN)



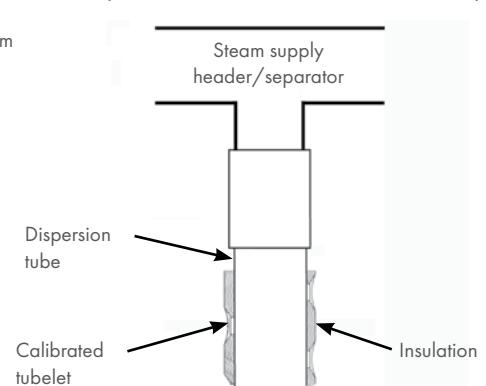
OM-186a

### DISPERSION TUBE DETAIL



OM-186ab

### INSULATION DETAIL (HIGH-EFFICIENCY TUBES OPTION)



OM-159



# MODEL LV AND LH: OPERATION AND COMPONENTS

## HIGH-EFFICIENCY INSULATED TUBE RETROFIT OPTION

Engineered for existing dispersion systems, DriSteem's High-Efficiency Tubes are available as a retrofit option for existing Ultra-sorb Models LV and LH and Rapid-sorb® steam dispersion assemblies.

Energy efficiencies and water savings are provided by a simple upgrade to currently installed steam dispersion panels. See page 6 for a complete description of the benefits of High-Efficiency Tubes.

## ORDERING AND RETROFITTING ARE EASY

Instructions are provided in the High-Efficiency Tubes Retrofit Brochure on the literature page of our website: [www.dristeem.com](http://www.dristeem.com).

## SHORT PAYBACK

Retrofit High-Efficiency Tubes have a short payback period –usually less than two years based on the significant energy savings.

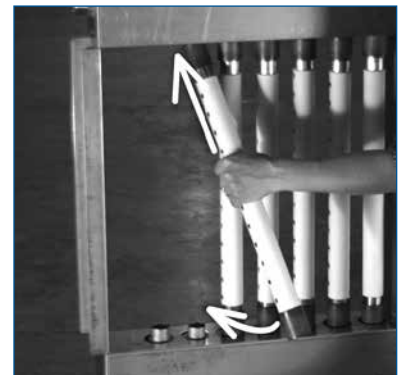
For an application-specific payback analysis, contact your local DriSteem Representative.

## UPDATING FOR EFFICIENCY IS EASY!

Remove the existing tubes



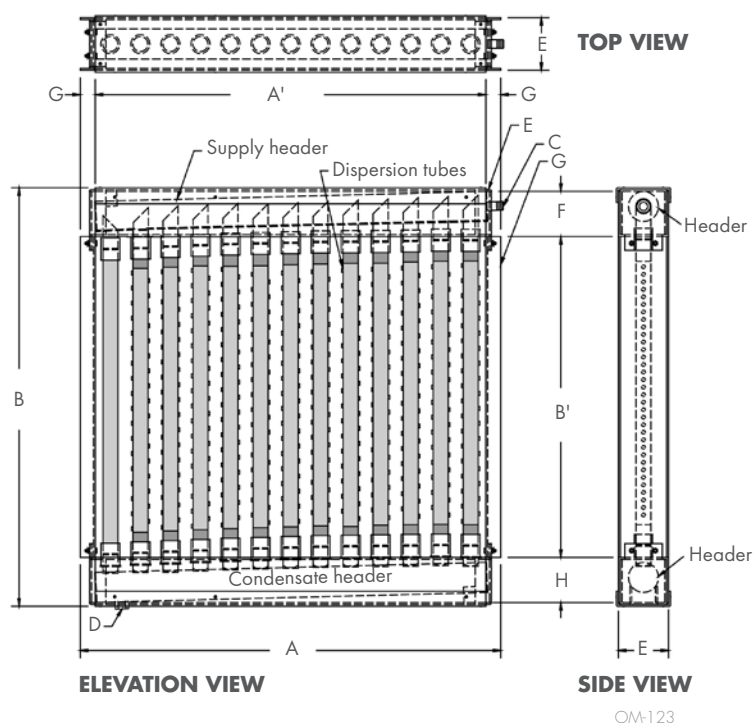
Install the High-Efficiency Tubes



*The energy saved by a DriSteem dispersion panel with High-Efficiency Tubes will more than make up for the cost of replacing any uninsulated steam dispersion assembly.*

# ULTRA-SORB MODEL LV: DIMENSIONS AND CAPACITY

**FIGURE 16-1: ULTRA-SORB MODEL LV DIMENSIONS**



**Table 16-2:**  
Ultra-sorb Model LV and LH tube capacity\*

Insulated		Uninsulated	
lbs/hr	kg/h	lbs/hr	kg/h
86	39	80	36

Consult DriCalc® sizing and selection software to calculate capacities for your specific application.

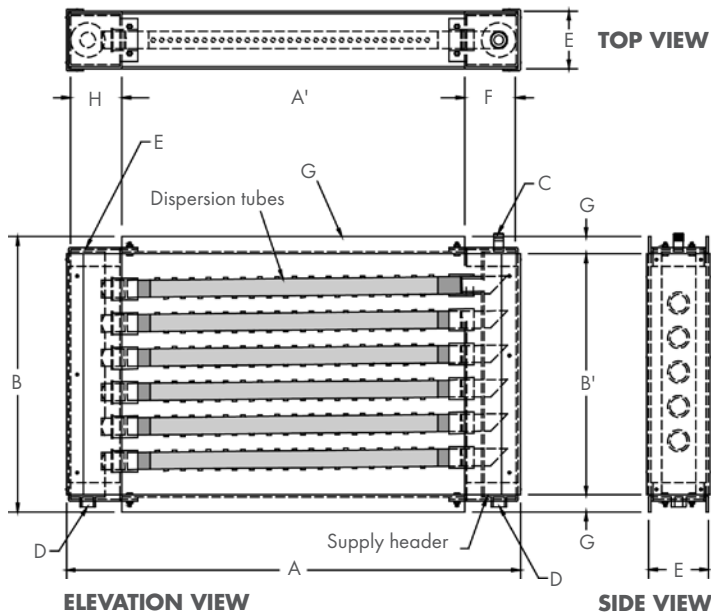
**Table 16-1:**  
Ultra-sorb Model LH dimensions

A Unit width	15" (380 mm) min, 147" (3735 mm) max, in 1" (25 mm) increments
A' Face width	12" (305 mm) min, 144" (3660 mm) max, in 1" (25 mm) increments
B Unit height	21" (530 mm) min, 156" (3960 mm) max, in 1" (25 mm) increments Shipped unassembled by request or if unit height is more than 93" (2362 mm)
B' Face height	12" (305 mm) min, 144" (3660 mm) max, in 1" (25 mm) increments
C Steam inlet diameter	Determined by maximum steam capacity
D Condensate drain	3/4" pipe thread (DN20)
E Header enclosure (front to back)	For 3" (DN80) and 4" (DN100) headers, E = 5" (127 mm); for 5" (DN125) header, E = 6" (152 mm); for 6" (DN150) header, E = 7" (178 mm)
F Header enclosure (top to bottom)	For 3" (DN80) header, F = 4.5" (114 mm); for 4" (DN100) header, F = 5.5" (140 mm); for 5" (DN125) header, F = 6.5" (165 mm); for 6" (DN150) header, F = 7.5" (191 mm)
G Mounting flange	1.5" (38 mm)
H Condensate header enclosure	4.5" (114 mm)

Note: Header enclosure dimensions are determined by supply header diameter. See Tables 17-2 and 17-3.

# ULTRA-SORB MODEL LH: DIMENSIONS AND CAPACITY

## ULTRA-SORB MODEL LH DIMENSIONS



OM-124b

**Table 17-2:**  
Nonpressurized steam header capacities

Header capacity		Header diameter	
lbs/hr	kg/h	inches	DN
300	135	3	80
600	270	4	100
1100	500	5	125
1850	820	6	150

Notes:

- When connected to a CRUV humidifier install Ultra-sorb Model LH in vertical airflows only.
- For more information about Ultra-sorb, see the Ultra-sorb catalog or DriSteem's DriCalc software.

**Table 17-3:**  
Boiler steam header capacities

Header capacity		Header diameter	
lbs/hr	kg/h	inches	DN
980	445	3	80
1750	793	4	100
2750	1245	5	125
4000	1815	6	150

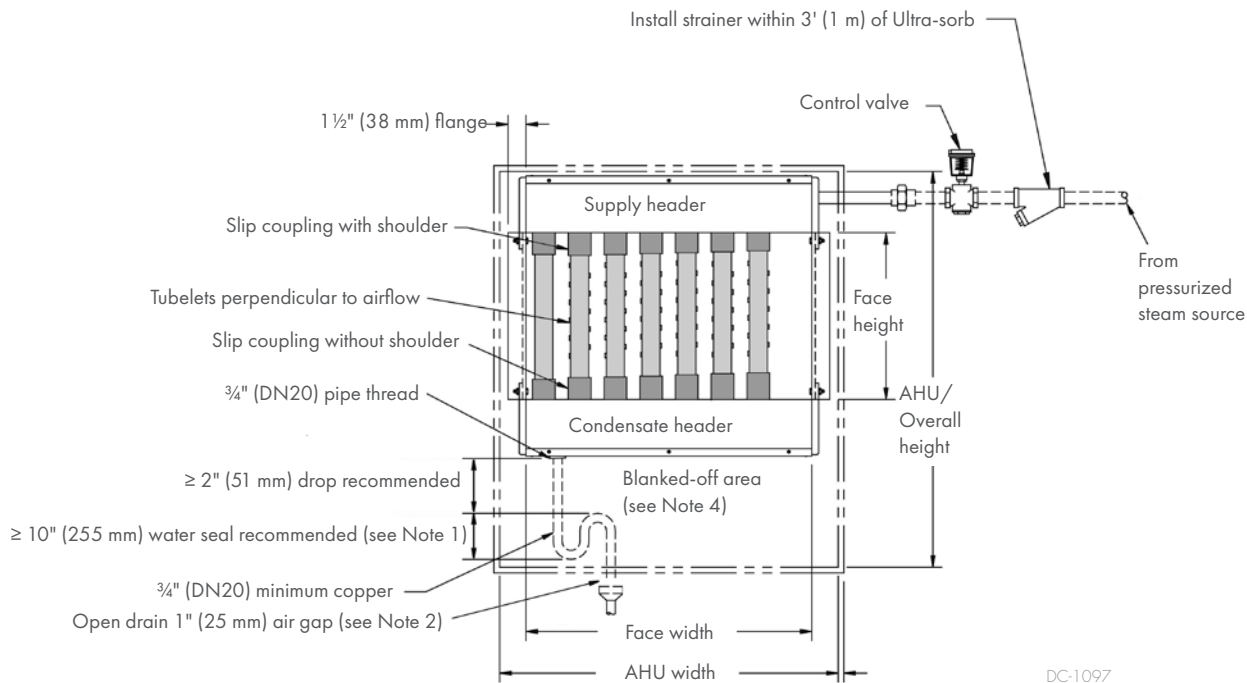
**Table 17-1:**  
Ultra-sorb Model LH dimensions

A Unit width	21" (530 mm) min, 129" (3280 mm) max, in 1" (25 mm) increments
A' Face width	12" (305 mm) min, 120" (3050 mm) max, in 1" (25 mm) increments
B Unit height	15" (380 mm) min, 123" (3125 mm) max, in 1" (25 mm) increments Shipped unassembled by request or if unit width is more than 93" (2362 mm)
B' Face height	12" (305 mm) min, 120" (3050 mm) max, in 1" (25 mm) increments
C Steam inlet diameter	Determined by maximum steam capacity
D Condensate drain	3/4" pipe thread (DN20)
E Header enclosure (front to back)	For 3" (DN80) and 4" (DN100) headers, E = 5" (127 mm); for 5" (DN125) header, E = 6" (152 mm); for 6" (DN150) header, E = 7" (178 mm)
F Header enclosure (top to bottom)	For 3" (DN80) header, F = 4.5" (114 mm); for 4" (DN100) header, F = 5.5" (140 mm); for 5" (DN125) header, F = 6.5" (165 mm); for 6" (DN150) header, F = 7.5" (191 mm)
G Mounting flange	1.5" (38 mm)
H Condensate header enclosure	4.5" (114 mm)

Note: Header enclosure dimensions are determined by supply header diameter. See Tables 17-2 and 17-3.

# MODEL LV: INSTALLATION

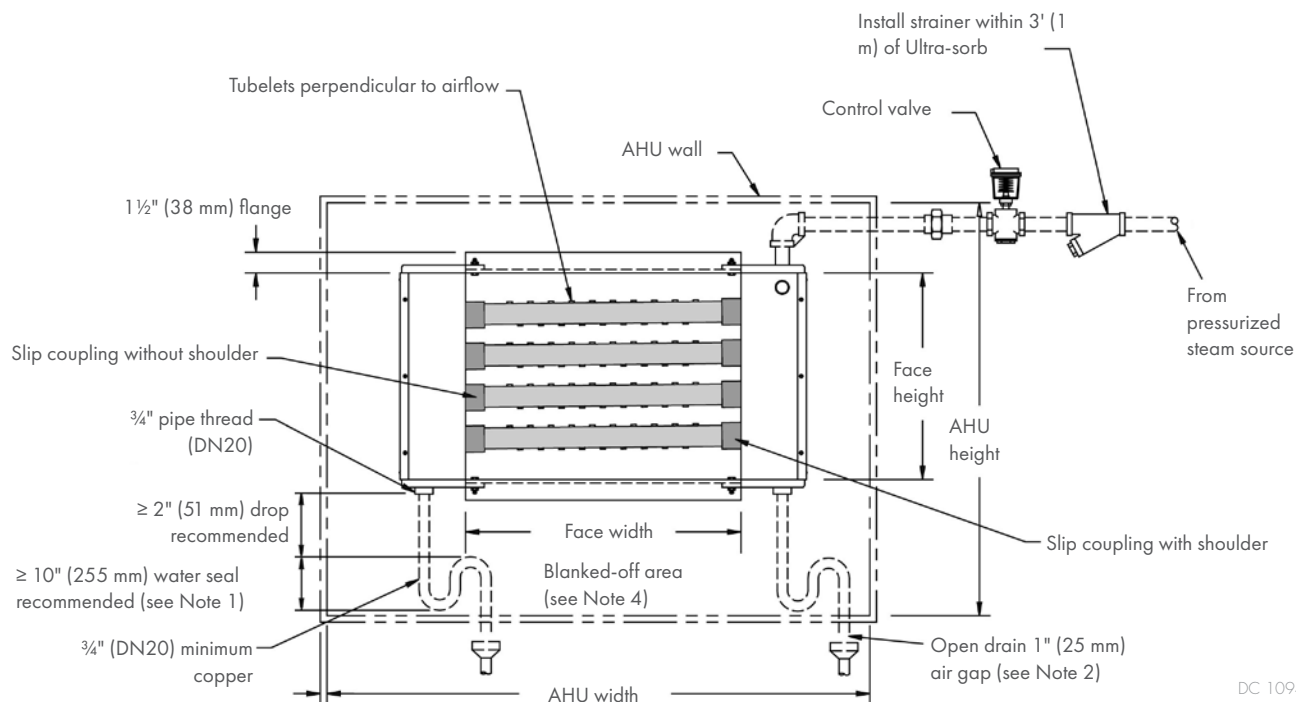
**FIGURE 18-1: ULTRA-SORB MODEL LV IN A HORIZONTAL AIRFLOW (PRESSURIZED STEAM APPLICATION SHOWN)**



**Notes:**

1. For pressurized steam applications provide a 10" (255 mm) minimum water seal. For atmospheric steam applications, provide a 5" (127 mm) minimum water seal.
2. 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.
3. When mounting an Ultra-sorb in a duct, headers and flanges are mounted outside the duct.
4. 100% of the airflow must pass through the Ultra-sorb, which means that any openings surrounding it must be sealed. The blanked-off area below the Ultra-sorb provides clearance height for F&T traps, water seals, and condensate piping connections.
5. Dashed lines indicate provided by installer.

**FIGURE 19-1: ULTRA-SORB MODEL LH IN A HORIZONTAL AIRFLOW (PRESSURIZED STEAM APPLICATION ONLY)**



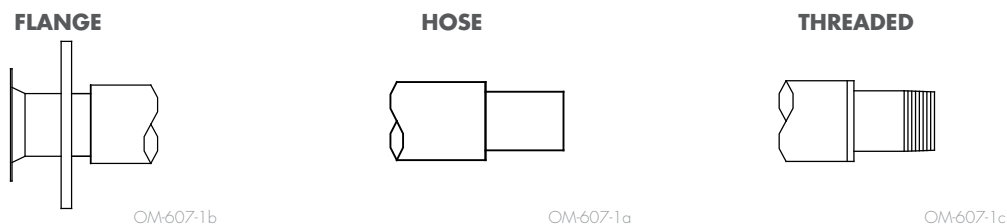
DC 1094

**Notes:**

1. A water seal or trap is required on each condensate line. For pressurized steam applications provide a 10" (255 mm) minimum water seal.
2. 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.
3. When mounting an Ultra-sorb in a duct, headers and flanges are mounted outside the duct.
4. 100% of the airflow must pass through the Ultra-sorb, which means that any openings surrounding it must be sealed. The blanked-off area below the Ultra-sorb provides clearance height for F&T traps, water seals, and condensate piping connections.
5. For Ultra-sorb Model LH in a vertical airflow, see the *Ultra-sorb Models LV and LH Steam Dispersion Panels Installation, Operation, and Maintenance Manual* (available at [www.dristeem.com](http://www.dristeem.com)).
6. Dashed lines indicate provided by installer.

# MODELS LV AND LH: CONNECTIONS

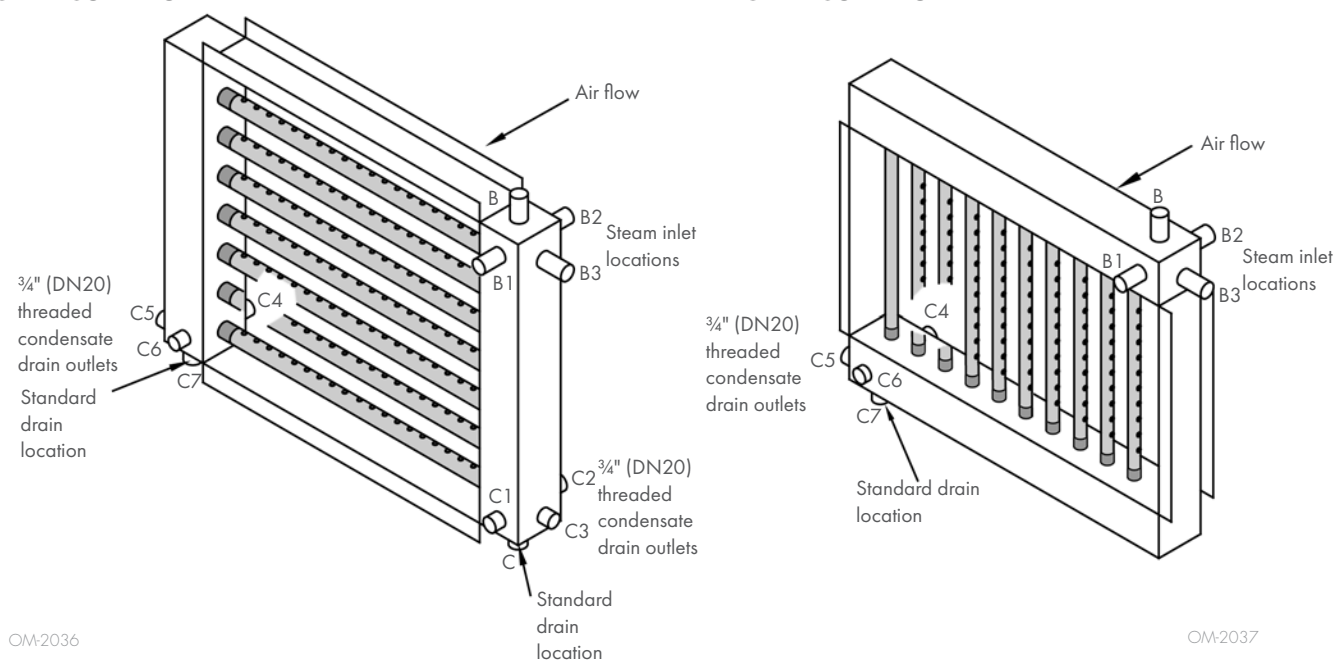
**FIGURE 20-1: ULTRA-SORB MODELS LV AND LH STEAM INLET TYPES**



**FIGURE 20-2: ULTRA-SORB MODEL LV AND LH STEAM INLET AND CONDENSATE OUTLET POSITIONS**

**ULTRA-SORB MODEL LH**

**ULTRA-SORB MODEL LV**

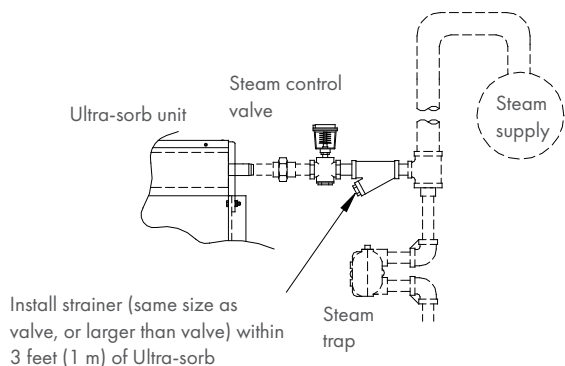


**Table 20-1:**  
Standard length steam inlet extends beyond header

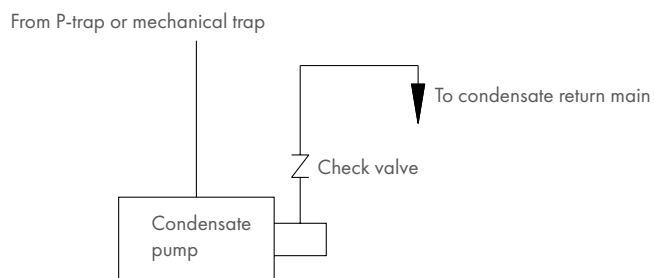
Inlet type		Inlet nominal diameter, inches (DN)									
		1/2" (15)	3/4" (20)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)	3" (80)	4" (100)	5" (125)	6" (150)
Threaded	extends, inches (mm)	2.83" (72 mm)					2.95" (75 mm)	3.95" (93 mm)	---		
Hose		---				2.83" (72 mm)		3.95" (93 mm)	---		
Flange		---						3.95" (93 mm)			5.95" (151 mm)



**FIGURE 21-1: 200 SERIES  
CONNECTION TO A BOILER  
(PRESSURIZED STEAM APPLICATIONS)**

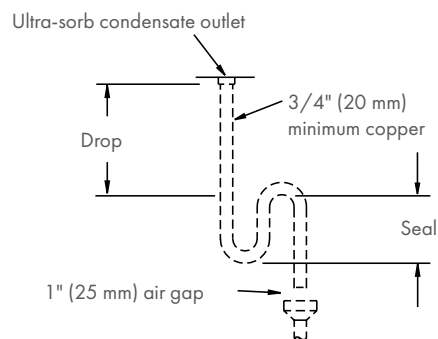


**FIGURE 21-2: LIFTING CONDENSATE (MODELS LV AND LH)**



Note: The Ultra-sorb must be installed with the drain connection at an elevation that permits gravity drainage. For lifting condensate, use a condensate pump rated for your application. Pumps are rated by fluid temperature, head (pressure), and flow (gpm). Contact your local DriSteam representative for pump selection.

**FIGURE 21-3: P-TRAP WATER SEAL DIMENSIONS  
(MODELS LV, LH, AND MP)**



Note:  
Drop: 2" (51 mm)  
Seal pressurized standard: 10" (255 mm)  
Seal non-pressurized standard: 5" (127 mm)

# MODEL MP: OPERATION AND COMPONENTS

## PRINCIPLE OF OPERATION

### 1 Steam enters steam supply header

Pressurized steam from a boiler or nonpressurized steam from a DriSteam steam generator enters the supply header after passing through a modulating steam control valve.

### 2 Steam enters dispersion tubes

Steam flows through the dispersion tubes and into the airstream. Dispersion tube design with calibrated tubelets capture only the driest steam to exit into the airstream.

The dispersion tubes operate drip-free without steam jackets, so no unnecessary heat is added to the airstream when the humidifier is idle.

High-Efficiency Insulated Dispersion Tubes, available as an option, provide up to an 85% reduction in wasted energy by significantly reducing airstream heat gain and condensate production. See Page 15 for more information.

### 3 Condensate flows through header to condensate return drain

Any condensate generated in the dispersion tubes flows by gravity to the condensate return drain connection.

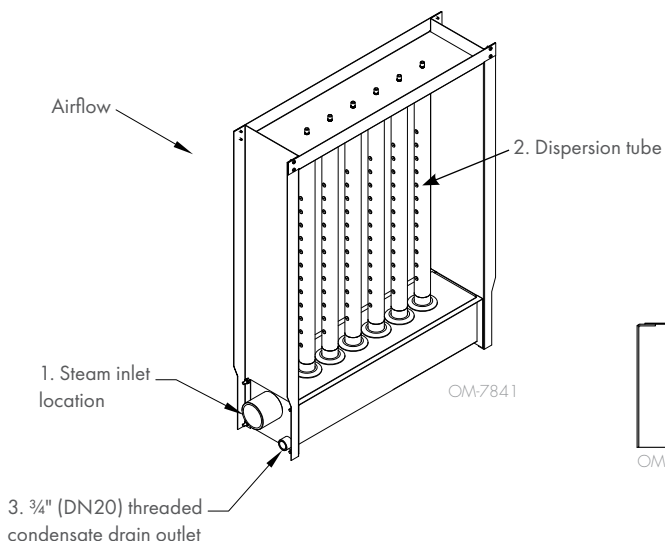
## ULTRA-SORB MODEL MP



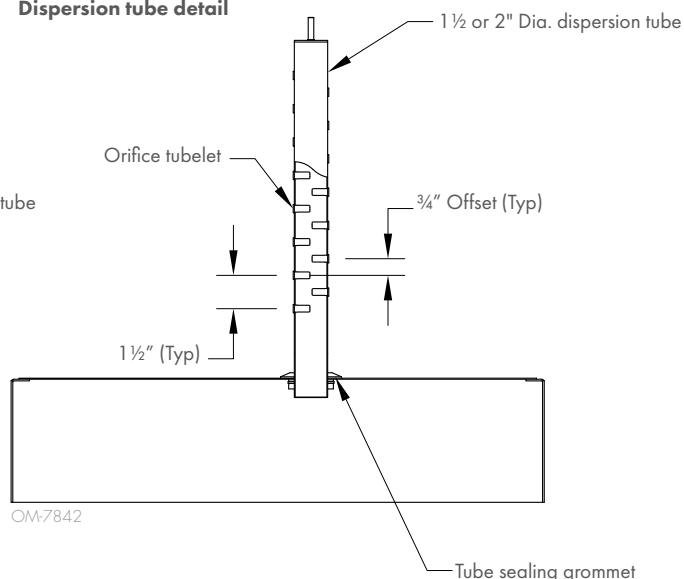
- Designed and built for today's HVAC systems where moderate-capacity humidification requirements are common, the Ultra-sorb MP is a framed steam dispersion panel for both pressurized and atmospheric steam applications in AHUs or ducts.
- Framed panel for easy design, fast installation and reliable operation.
- Available with DriSteam's industry-leading high-performance tube insulation.
- Same-side steam and condensate drain connections reduce exposed piping and allow for clean installations in AHUs or ductwork.
- Built in 1" increments to perfectly fit AHU and duct dimensions.

## ULTRA-SORB MODEL MP COMPONENTS

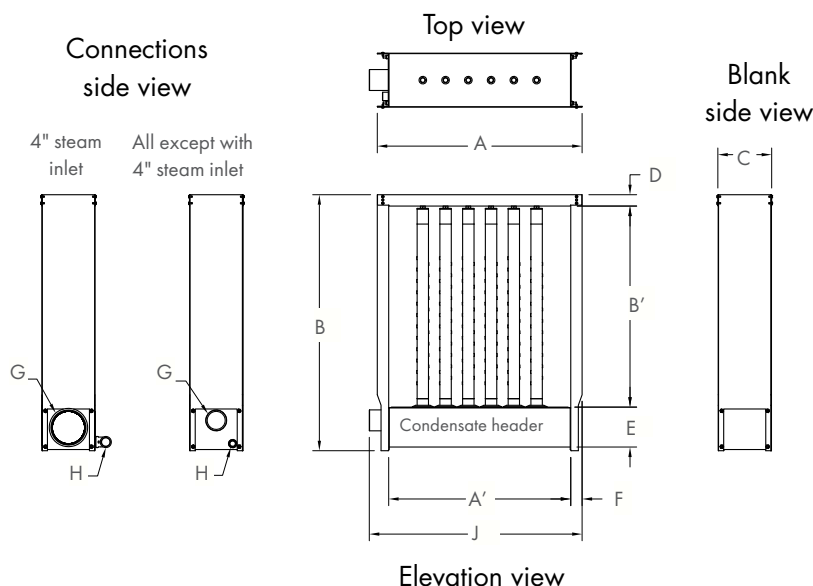
### Steam inlet and condensate outlet positions



### Dispersion tube detail



**FIGURE 23-1: ULTRA-SORB MODEL MP DIMENSIONS**



**Table 23-2:**

**Ultra-sorb Model MP unit capacity**

Evaporative steam		Pressurized steam (2-50 psi)	
lbs/hr	kg/hr	lbs/hr	kg/hr
700	318	2720	1235

**Table 23-3:**

**Ultra-sorb Model MP tube capacity\***

Tubes		lbs/hr	kg/hr
1.5"	Uninsulated	40	18.1
	Insulated	43	19.5
2.0"	Uninsulated	77	34.9
	Insulated	80	36.3

\* If face height (B') is <17" (432 mm), consult DriSteam or see DriCalc for the correct calculation.

**Table 23-1:**

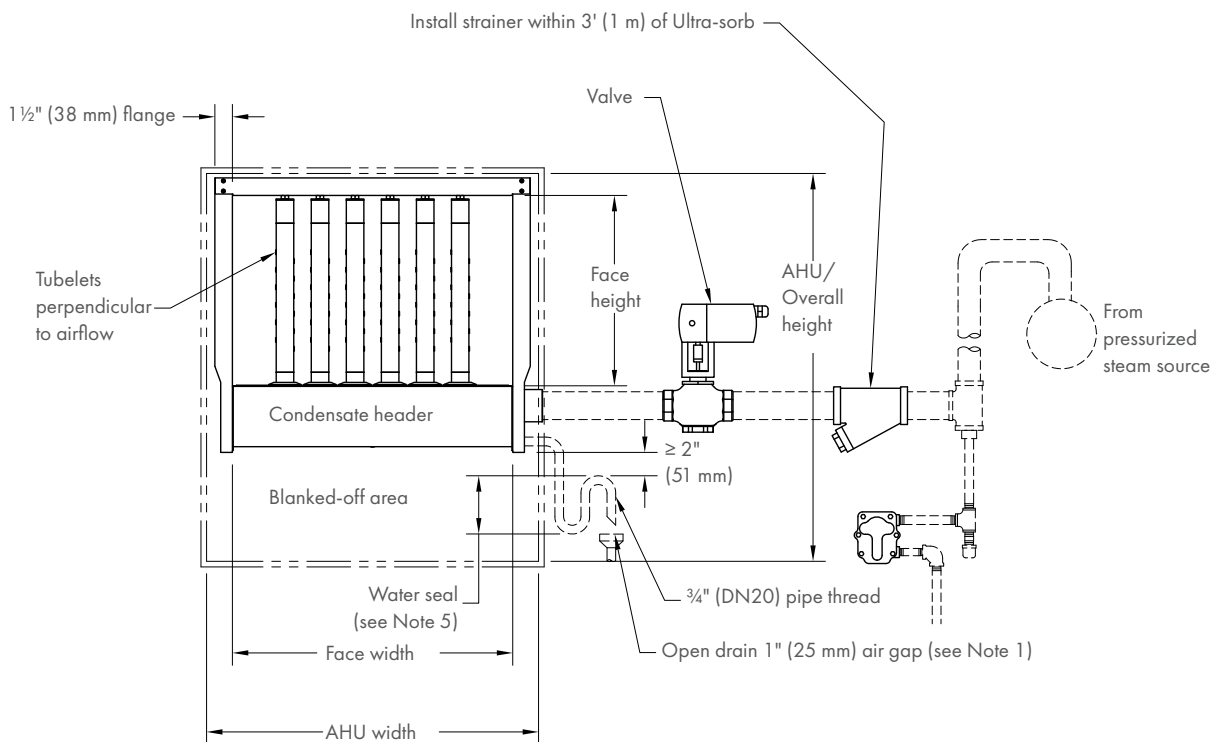
**Ultra-sorb Model MP dimensions**

Dimension	Inches (mm)
A Unit width	15" (380 mm) min, 147" (3735 mm) max, in ½" (13 mm) increments
A' Face width	12" (305 mm) min, 144" (3660 mm) max, in ½" (13 mm) increments
B Unit height*	19.375" (492 mm) min, 151.375" (3845 mm) max, in ½" (13 mm) increments
B' Face height	12" (305 mm) min, 144" (3660 mm) max, in ½" (13 mm) increments
C Frame depth	7.2" (183 mm) 2.3" (58 mm) for side drain port (H) when 4" coupling (DN100) steam inlet
D Frame enclosure	1.5" (38 mm)
E Header enclosure	5.85" (149 mm)
F Mounting flange	1.5" (38 mm)
G Humidification steam inlet	1" or 2" NPT coupling, for pressurized steam 1½" or 2" NPT coupling, for evaporative steam 3" or 4" flange, for evaporative steam DN25 or DN50 BSPT nipple, for pressurized steam DN50, DN80, or DN100 BSPT nipple, for evaporative steam 1½" or 2" (DN40 or DN50) hose, for evaporative steam
H Drain port (internal thread)	¾" NPT (DN20) coupling
J Overall width	1" NPT coupling, dimension A + 1/8"; 1½" NPT coupling, dimension A + ½"; 2" NPT coupling, dimension A + 1" 3" and 4" flange connection, dimension A + 6.5" DN25, DN50, DN80 BSP nipple, dimension A + 38 mm DN100 BSP nipple, dimension A + 64 mm 1½" or 2" (DN40 or DN50) hose connection, dimension A + ½" (dimension A + 13 mm)

\* Panels with unit height more than 120" (3048 mm) have two-piece side flanges and are shipped with brackets for easy field assembly. Panels with unit height more than 93" (2362 mm) are shipped unassembled.

# MODEL MP: INSTALLATION - PRESSURIZED STEAM APPLICATION

**FIGURE 24-1: MOUNTING ULTRA-SORB MODEL MP (PRESSURIZED STEAM APPLICATION SHOWN)**



OM-7839

## Notes:

1. Locate drain 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.
2. Dashed lines indicate provided by installer.
3. Steam supply line to unit and piping are not included.
4. Mount the Ultra-sorb Model MP vertically (for horizontal airflow only).
5. For pressurized steam applications provide a 10" (255 mm) minimum water seal.
6. Locate drain 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.
7. When mounting an Ultra-sorb in a duct, headers and flanges are mounted outside the duct.
8. 100% of the airflow must pass through the Ultra-sorb, which means that any openings surrounding it must be sealed. The blanked-off area below the Ultra-sorb provides clearance height for water seals, and condensate piping connections.
9. Due to the pressure drop across the valve, the steam pressure at the header traps is minimal. Condensate must be drained.
10. Dispersion tubes are available at : 3" (76 mm), 4" (102 mm; for 2" diameter only), 6" (152 mm), 9" (228 mm), 12" (305 mm) centers.
11. Ultra-sorb humidifiers will be assembled, crated, and shipped intact in all sizes up to 93"(2362 mm) tall. Ultra-sorb can be shipped unassembled, by request, requiring field assembly.
12. Sizes are 12" to 144" (305 mm to 3658 mm) x 12" to 144" (305 mm to 3658 mm) in 1" (25 mm) increments.

## Each Ultra-sorb humidifier is furnished with:

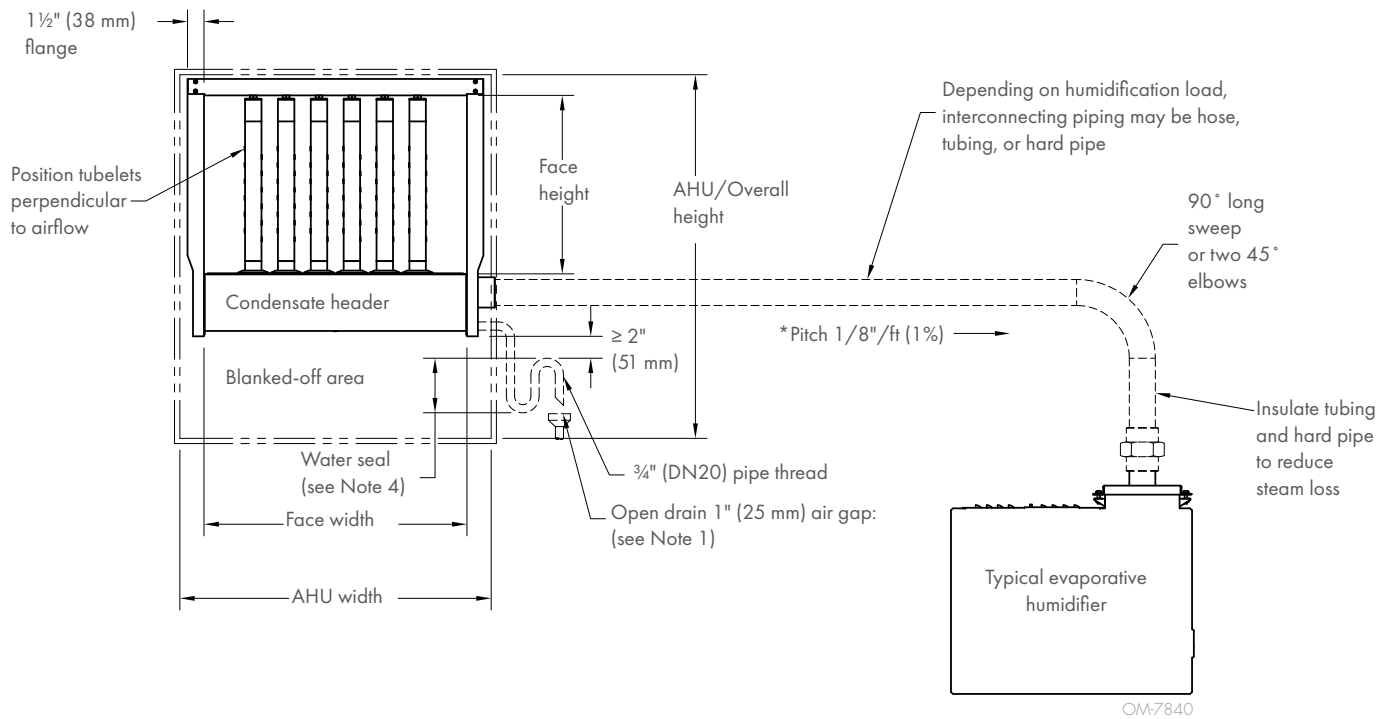
1. Type 304 stainless steel header/separator and dispersion tubes when shipped unassembled.
2. Hardware for connection of dispersion tubes to header when shipped unassembled.
3. Tube grommets for connection when shipped unassembled.

## Each Ultra-sorb humidifier used with boiler steam is also furnished with:

1. One 3/4" NPT float and thermostatic trap (≤15 psi steam source) or an inverted bucket trap for steam main drip leg use (>15 psi).
2. Inlet "Y" strainer.
3. Normally closed steam valve with stainless steel parabolic plug and seat.

# MODEL MP: INSTALLATION - NONPRESSURIZED STEAM APPLICATION

**FIGURE 25-1: MOUNTING ULTRA-SORB MODEL MP (NONPRESSURIZED STEAM APPLICATION SHOWN)**



## Notes:

1. Locate drain 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.
2. When mounting an Ultra-sorb in a duct, headers and flanges are mounted outside the duct.
3. Mount the Ultra-sorb Model MP vertically (for horizontal airflow only).
4. For non-pressurized steam, provide a 5" (127 mm) minimum water seal with a 2" (51 mm) minimum drop from the header connection.
5. 100% of the airflow must pass through the Ultra-sorb, which means that any openings surrounding it must be sealed. The blanked-off area below the Ultra-sorb provides clearance height for water seals and condensate piping connections.
6. Condensate must be drained.
7. Dispersion tubes are available at: 3" (76 mm), 4" (102 mm; for 2" diameter only), 6" (152 mm), 9" (228 mm), 12" (305 mm) centers.
8. Ultra-sorb humidifiers will be assembled, crated, and shipped intact in all sizes up to 93" (2362 mm) wide. Ultra-sorb can be shipped unassembled, by request, requiring field assembly.
9. Sizes are 12" to 144" (305 mm to 3658 mm) x 12" to 144" (305 mm to 3658 mm) in 1" (25 mm) increments.

## Each Ultra-sorb humidifier is furnished with:

1. Type 304 stainless steel header/seperator and dispersion tubes when shipped unassembled.
2. Hardware for connection of dispersion tubes to header when shipped unassembled.
3. Tube grommets for connection when shipped unassembled.

\*For electrode type humidifiers pitch towards Ultra-sorb MP steam dispersion panel.

# MODEL MP: INSTALLATION

FIGURE 26-1: ULTRA-SORB MODEL MP INSTALLED INSIDE AN AIR HANDLER

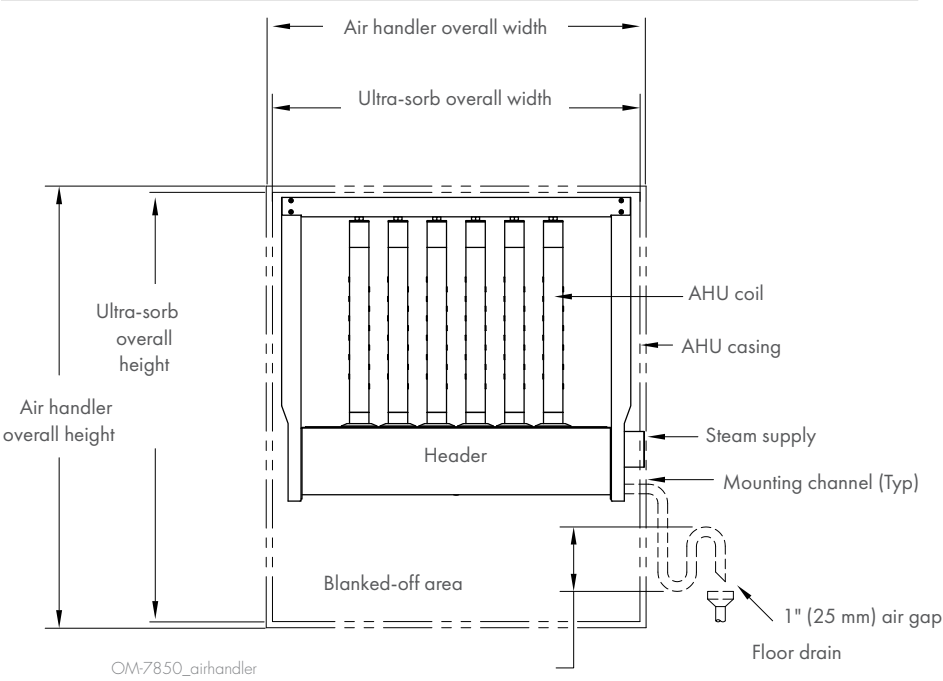


FIGURE 26-2: VERTICAL CHANNELS INSIDE AN AIR HANDLER

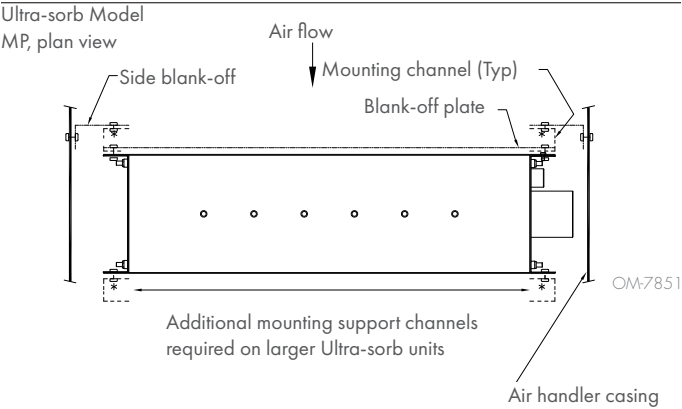
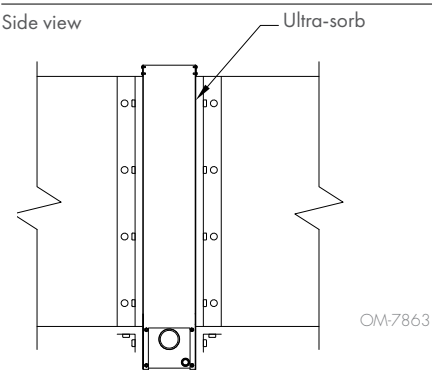
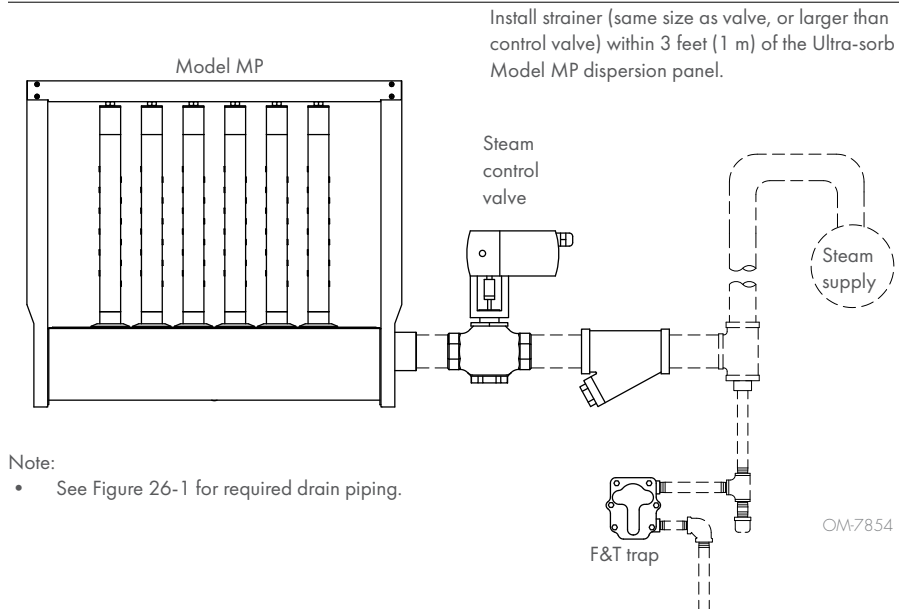


FIGURE 26-3: ULTRA-SORB MODEL MP IN DUCT

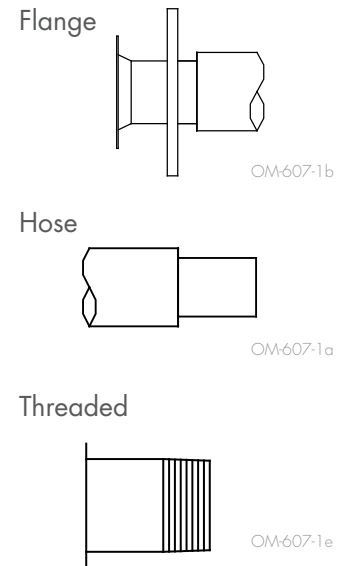




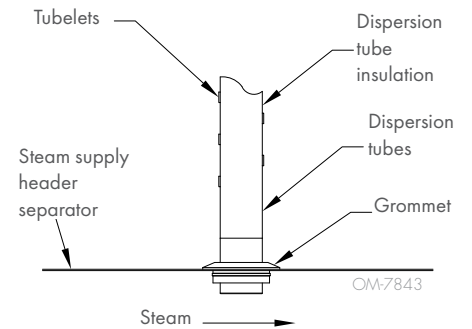
**FIGURE 27-1: STEAM SUPPLY CONNECTION TO A BOILER  
(PRESSURIZED STEAM APPLICATIONS)**



**FIGURE 27-2: ULTRA-SORB MODEL MP  
STEAM INLET TYPES**



**FIGURE 27-3: INSULATED TUBE DETAIL  
(HIGH-EFFICIENCY TUBE OPTION)**



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