

Adiatec®

High-Pressure System



Installation, Operation, and Maintenance Manual

Read and save these instructions

Warnings and cautions



WARNING



Attention installer

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

DriSteem® Technical Support:

North America: 800-328-4447

Europe: +3211823595

Read all warnings and instructions

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

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



Disconnect electrical power

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

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

Follow the shutdown procedure in this manual before performing service or maintenance procedures on any part of the system.



Electric shock hazard

If the reverse-osmosis system starts up during maintenance, severe bodily injury or death from electric shock could occur. To prevent such start-up, follow the procedure below before performing service or maintenance procedures on this reverse-osmosis system:





1. Use Vapor-logic® keypad/display to change control mode to Standby.
2. Shut off all electrical power to the reverse-osmosis system using field-installed fused disconnect, and lock all power disconnect switches in OFF position.
3. Close field-installed manual water supply shut-off valve.



Tipping hazard

Before installing the high-pressure system, use supplied leg brackets or lag points to permanently fix the system to the floor and/or adjacent building structure. Failure to install according to instructions can result in serious injury or death. See page 9 for instructions.

Warnings and cautions

 WARNING	
	Monitor open-space dispersion areas for leaks or drips Monitor the system for leaks or drips in the dispersion area. Uncorrected leaks or drips could cause wet floors and slippery footing, which could lead to personal injury. Leaks or drips above equipment could cause property damage.
	Team lift required Team lift is required when replacing the membranes. Membrane banks are heavy. Do not try to lift without assistance. Wear steel-toed shoes and have adequate room for maneuvering when servicing. Never lean membrane banks vertically when removed from system. Failure to do so may damage the system or result in injury.
	Crushing hazard Verify system is on a stable and secure surface before un-crating, operation and performing maintenance. Failure to follow instructions could result in death or serious injury.

NOTICE	
Health risks The user is responsible for operating and maintaining the provided system in accordance with city, state, and federal regulations. Please follow local health and state codes for regulations around application of adiabatic humidifiers or adiabatic cooling devices. There is an associated risk with all water sources and the potential for bio growth, including bacterium that causes Legionnaires disease. DriSteem high-pressure systems, products, and components are designed, with consideration, to reduce the risk of Legionnaires disease and other similar situations. The water treatment and high-pressure system design take into account lower operating temperatures, minimization of stagnant water through mechanical design and flush cycles, and provides an option for UV disinfection of the RO storage water. Inadequate installation, operation or maintenance of the water system and humidifier can support the growth of bacterium. A competent environmental, health, and safety representative should identify the risks of any interacting systems. As deemed appropriate, plans and controls should be implemented at the facility to help mitigate risk.	

Fill in the following information for your records

Date of purchase _____

Customer's name _____

Model number _____

Serial number _____

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ATTENTION INSTALLER

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

DriSteem® Technical Support
800-328-4447

WHERE TO FIND MORE INFORMATION

Our website:

The following documents are available on our web site: www.dristeem.com

- Evaporative Cooling and Humidification Catalog
- Vapor-logic Controller Installation and Operation Manual
- Water Treatment System Catalog

DriCalc® sizing and selection software:

DriCalc, our software for system sizing and selection, can be ordered at our web site. Also in DriCalc:

- Library of installation guides
- Dispersion and sensor placement in ducts and air handlers

Call us at 800-328-4447

Obtaining documents from our web site or from DriCalc is the quickest way to view our literature, or we will be happy to mail literature to you.

Keypad/display and troubleshooting

The *Vapor-logic Installation and Operation Manual*, which was shipped with your High-Pressure System, is a comprehensive operation manual. Refer to it for information about using the keypad/display and Web interface, and for troubleshooting information.

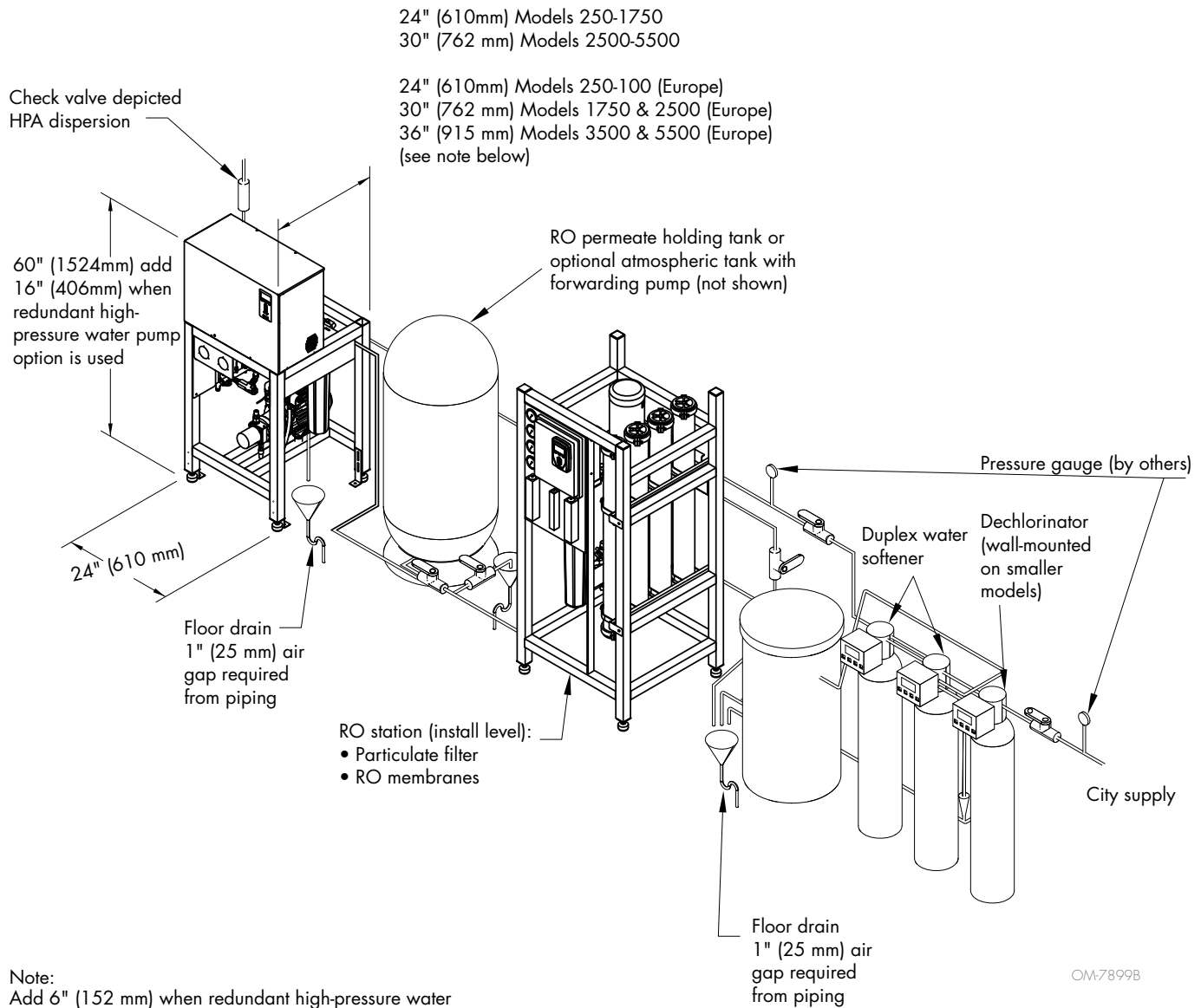
Download DriSteem literature

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



System dimensions

FIGURE 2-1: DRISTEEM HIGH-PRESSURE SYSTEM DIMENSIONS



Water quality

REVERSE OSMOSIS MEMBRANES ELIMINATE REMAINING MINERALS AND ORGANICS

Dissolved minerals and organics must be eliminated from the water in order to keep system components operating properly. Potable water passes through a dechlorinator and duplex water softener to take out chlorine and hard water deposits. The softened water enters the RO station, then flows through a 5 micron filter cartridge. Thereafter, a multi-stage pump pressurizes the water to approximately 125 psig (860 kPa), depending on the quality of water and the desired flow. Then, water is forced to cross a reverse-osmosis membrane, which removes most dissolved minerals. The water is now purified and contains very few minerals (typically less than 10 ppm) and is then stored in the pressurized storage tank. A portion of the rejection water may be recirculated; the rest, which is saturated with minerals, is sent to the drain.

For VDI compliance; Parameters and testing of the required microbiological drinking water quality must be observed VDI/DVGW 6023, DIN EN 1717 and DIN 1988-100.

NOTE:

Reverse osmosis permeate can include a variety of equipment to achieve the goals. If DriSteem provides water treatment, it is typically equipment listed above.

CAUTION

Water supplied to the high-pressure system that does not meet the required water quality standards will cause premature component failure and void the DriSteem warranty.

Table 3-1:
High-pressure system water quality guidelines

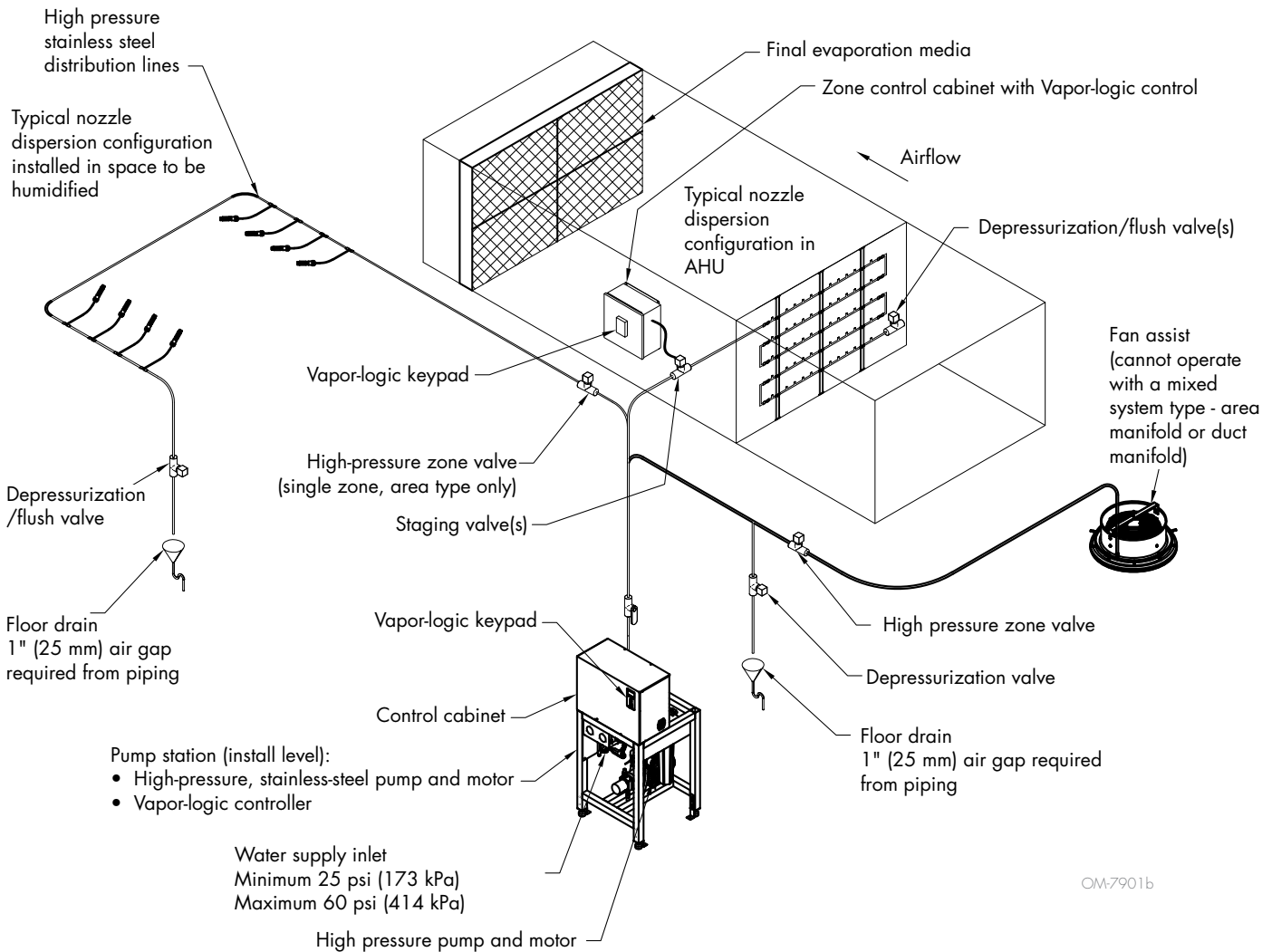
Water supply	5-50 ppm
Total dissolved solids (TDS)	5 - 50 ppm
pH	5.5-8.0
Total hardness	<0.1 ppm
Turbidity	<0.5 NTU
Temperature	40 - 60°F, 68°F maximum
Bacteria count	<1 CFU/mL
Free chlorine	<0.1 ppm
Iron	<0.05 ppm

Important:

The user is responsible for operating and maintaining the provided system in accordance with city, state, and federal regulations. See hygiene maintenance on page 65.

System overview

FIGURE 4-1: GENERAL DRISTEEM HIGH-PRESSURE SYSTEM DISPERSION OVERVIEW



Notes:

- System components and configuration may vary to meet application requirements.
- A water treatment system must be used with the DriSteem High-pressure system. See the Pre-treatment Installation, Operation, and Maintenance manual for skid mounted options.
- All units must be wired in strict accordance with the wiring diagrams and piping furnished with this unit.
- If the developed piping length is greater than 500' (152 m), consult factory for proper sizing and layout for area type or fan assist.
- Maximum 16 zones per pump station.

Components overview

Your system may include all or some of the following components.

- Pretreatment equipment (Optional)
 - Dechlorinator
 - Softener
 - Chemical feed equipment
- RO system (Optional)
- RO permeate storage
- Pumping station components
 - High-pressure water pumping components
 - Vapor-logic controller
 - Gauges, valves
 - Control cabinet
- Atomization piping, manifolds, nozzles, valves
- Fan-assist dispersion with nozzles, tubing, valves
- Final evaporation media
- RH transmitters and airflow switches

PUMPING STATION

The pumping station arrives at the job site ready for single-point connection to power and water. Contained within the rugged, painted-steel frame are the high-pressure water pumping components, gauges, valves, and a control cabinet.

The High-pressure pump station control has the maximum capability of communicating with 16 zone controllers."

DISPERSION

To ease installation, the stages of dispersion are color coded. Unit drawings call out color by stage to help with assembly. Parts labeled include manifolds, inlet valves, and c-bends.

FIGURE 5-1: PUMPING STATION



Components overview (60Hz)

Table 6-1:
Adiatec high-pressure pump station specifications

Model	250	500	1000	1750	2500	3500	5500
System capacity, lbs/hr (kg/h)	250 (113)	500 (227)	1000 (454)	1750 (794)	2500 (1134)	3500 (1588)	5500 (2495)
System voltage/phase, Amp draw	240/1, 5.2 480/3, 1.6 600/3, 1.3	240/1, 7.3 480/3, 2.2 600/3, 1.8	240/1, 13.8 480/3, 4.0 600/3, 3.2	480/3, 6.6 600/3, 5.3	480/3, 6.6 600/3, 5.3	480/3, 9.2 600/3, 7.3	480/3, 12.6 600/3, 10.1
Fuse size (see Note 1)	240/1, 25 480/3, 16 600/3, 6	240/1, 35 480/3, 10 600/3, 6	240/1, 50 480/3, 15 600/3, 10	480/3, 30 600/3, 15	480/3, 30 600/3, 15	480/3, 35 600/3, 20	480/3, 40 600/3, 20
Dimensions (W/D/H), inches (mm)	24/24/60 (610/610/1524)	24/24/60 (610/610/1524)	24/24/60 (610/610/1524)	24/24/60 (610/610/1524)	24/30/60 (610/762/1524)	24/30/60 (610/762/1524)	24/30/60 (610/762/1524)
Dimensions (W/D/H) with redundant high- pressure pump option, inches (mm)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)
Operating weight, lbs (kg)	275 (125)	300 (136)	325 (147)	325 (147)	350 (159)	400 (181)	450 (204)
Operating weight with redundant high-pressure pump option, lbs (kg)	375 (170)	400 (181)	475 (216)	475 (216)	500 (227)	625 (284)	700 (318)
Shipping weight, lbs (kg)	296 (134)	323 (146)	349 (158)	349 (158)	376 (171)	430 (195)	484 (219)
Shipping weight with redundant high-pressure pump option, lbs (kg)	403 (183)	430(195)	511 (232)	511 (232)	538 (244)	672 (305)	753 (341)
Supply water connection diameter, inches (see Note 2)	1/2	1/2	1/2	1/2	3/4	3/4	3/4
High-pressure water connection diameter, inches (see Note 2)	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5-micron prefilter diameter x height, inches (mm)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)
High-pressure pump flow rate, gpm (L/m)	0.5 (1.89)	1.0 (3.78)	2.0 (7.57)	3.5 (13.2)	5 (18.9)	7 (26.5)	11 (41.6)
High-pressure pump motor power, hp (kW)	1 (0.75)	1.5 (1.1)	3 (2.2)	5 (3.7)	5 (3.7)	7.5 (5.5)	10 (7.5)
High-pressure pump motor rpm	1000–1500	1000–2550	1000–2250	1000–2550	1000–2250	1000–2550	700–2450

Notes:

1. Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with NEC requirements.
2. High-pressure compression fittings.
3. Unit ships with 36" x 1/2" high-pressure flexible hose and a 1/2" union for easy connection to dispersion piping.
4. 25 psi (170 kPa) supply water pressure at 125% of maximum flow rate, 60 psi (415 kPa) maximum
5. The standard enclosure on the RO-400 series is NEMA 1.

Components overview (50Hz)

Table 7-1:
Adiatec high-pressure pump station specifications (50Hz)

Model	250	500	1000	1750	2500	3500	5500
System capacity, lbs/hr (kg/h)	250 (113)	500 (227)	1000 (454)	1750 (794)	2500 (1134)	3500 (1588)	5500 (2495)
System voltage/phase, Amp draw	230/1, 5.2 400/3, 1.9	230/1, 9.2 400/3, 3.3	230/1, 16.9 400/3, 6	400/3, 8.1	400/3, 10.6	400/3, 14.7	400/3, 20.6
Fuse size (see Note 1)	230/1, 25 400/3, 15	230/1, 35 400/3, 15	230/1, 50 400/3, 20	400/3, 30	400/3, 35	400/3, 40	400/3, 50
Dimensions (W/D/H), inches (mm)	24/24/60 (610/610/1524)	24/24/60 (610/610/1524)	24/24/60 (610/610/1524)	24/30/60 (610/762/1524)	24/30/60 (610/762/1524)	24/36/60 (610/915/1524)	24/36/60 (610/915/1524)
Dimensions (W/D/H) with redundant high-pressure pump option, inches (mm)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	24/30/76 (610/762/1930)	Consult factory	Consult factory
Operating weight, lbs (kg)	275 (125)	325 (147)	350 (159)	375 (170)	400 (181)	450 (204)	525 (238)
Operating weight with redundant high-pressure pump option, lbs (kg)	375 (170)	425 (193)	480 (218)	510 (231)	575 (261)	Consult factory	Consult factory
Shipping weight, lbs (kg)	295 (133)	349 (158)	376 (170)	403 (182)	430 (195)	485 (220)	564 (255)
Shipping weight with redundant high-pressure pump option, lbs (kg)	403 (182)	456 (206)	516 (234)	548 (248)	618 (280)	Consult factory	Consult factory
Supply water connection diameter, inches with metric adapter (see Note 2)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	3/4 (18 mm)	3/4 (18 mm)	3/4 (18 mm)
High-pressure water connection diameter, inches with metric adapter (see Note 2)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)	1/2 (12 mm)
5-micron prefilter diameter x height, inches (mm)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)	2.5 x 40 (64 x 1016)
High-pressure pump flow rate, gpm (L/m)	0.5 (1.89)	1.0 (3.78)	2.0 (7.57)	3.5 (13.2)	5 (18.9)	7 (26.5)	11 (41.6)
High-pressure pump motor power, hp (kW)	1 (0.75)	2 (1.5)	4 (3)	5.5 (4)	7.5 (5.5)	10 (7.5)	15 (11)
High-pressure pump motor rpm	1000–1500	1000–2550	1000–2250	1000–2550	1000–2250	1000–2550	700–2450

Notes:

1. Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with NEC requirements.
2. High-pressure compression fittings. Metric adapter attached to system (optional).
3. Unit ships with 36" x 1/2" high-pressure flexible hose and a 1/2" union for easy connection to dispersion piping.
4. 25 psi (170 kPa) supply water pressure at 125% of maximum flow rate, 60 psi (415 kPa) maximum
5. The standard enclosure on the RO-400 series is NEMA 1.

Components overview

ATOMIZING NOZZLES

Atomizing nozzles (Figure 8-1) operate in ducts, air handlers, and open space.

FINAL EVAPORATION MEDIA

The final evaporation media (Figure 8-2), installed in the AHU downstream from the atomizing nozzles, removes unabsorbed water droplets from the air.

CONTROL TRANSMITTERS AND SWITCHES

A system of temperature, humidity, and airflow transmitters/switches installed upstream and downstream from the atomizing nozzles and/or in affected space(s) allow the system to quickly respond to demand while avoiding over-saturation.

FIGURE 8-1: ATOMIZING NOZZLE



FIGURE 8-2: FINAL EVAPORATION MEDIA

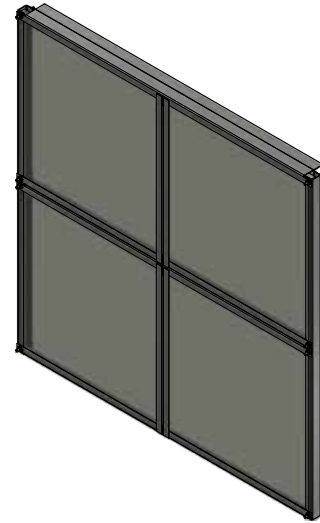


Table 8-1:
Atomizing nozzle specifications

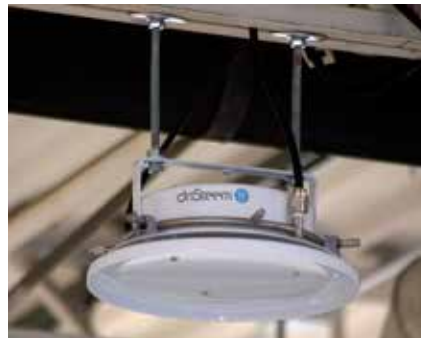
Model	Capacity lbs/hr (kg/h)	Nozzle pressure psig	Material	Connection thread UNC	Spray angle
270010-006	6.0 (2.7)	500-1200	316 stainless steel	10 - 24	60°
270010-010	10. (4.5)				
270010-015	15.0 (6.8)				

* at 1000 ±250 psi (6.9 ±1.72 MPa)

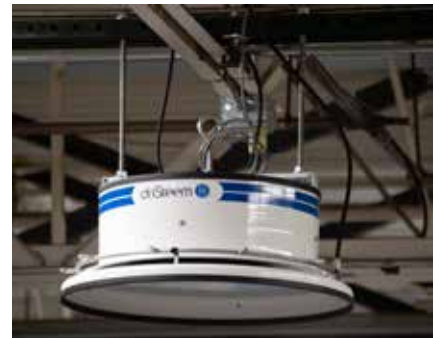
FIGURE 8-3: FAN-ASSISTED DISPERSION



Model FA-2



Model FA-3



Model FA-4

Components and tools needed

System configuration may not include all components.

TYPICAL TOOLS/SUPPLIES NEEDED

- PTFE-tape
- Adjustable wrench for water fittings
- Screwdrivers for power connections and cabinet access
- Precision screwdrivers for signal connections
- Stainless-steel tube bender (recommend Swagelok® Model MS-HTB-8 for 1/2" stainless-steel tubing)
- PTFE-tape
- Three-wire shielded cable
- Hex key wrench for pump bleed fittings
- Two adjustable crescent wrenches for compression fittings
- Tubing cutter (for stainless steel)
- Dial type tire pressure gauge
- Feeler gauge (for compression fittings)
- 1/4" socket torque wrench (25 lb/in setpoint)
- Depth tool for tube fittings

WARNING

All DriSteem high-pressure pump stations must be bolted to the floor or permanently attached to the building structure. Use the shipping brackets that come with the system to anchor the system to the floor or use the attachment points on the underside of the top frame rail on the back of the system to secure the system to the building structure. Ensure adequate anchors and/retaining means are used. Failure to install according to instructions can result in serious injury or death.

WARNING



Crushing hazard

Verify system is on a stable and secure surface before un-crating, operation and performing maintenance. Failure to follow instructions could result in death or serious injury.

Components and tools needed

TYPICAL FIELD-SUPPLIED COMPONENTS

- Code approved electrical disconnect.
- Gauges, fittings, and interconnecting piping as shown in Figure 27-1 or 28-1 (depending on your model).
- Pipe supports/hangers (if needed)
- Reducing fittings for water connections (if needed)
- Mounting brackets for dispersion
- Drain line and clamp for flush valve
- Interconnecting piping and fittings
- Angular support (if sway occurs)

System configuration may not include all components.

TYPICAL COMPONENTS SUPPLIED BY OR AVAILABLE FROM DRISTEEM

- Duplex water softener
- Brine tank
- Dechlorinator
- Reverse osmosis system
- Pumping station
- Stainless-steel tubing (or field supplied)
- Compression-type unions (or field supplied)
- Pipe supports/hangers (see Figure 10-1)
- Distribution manifold(s)
- Atomizing nozzles
- Flexible nozzle extenders (open space applications only)
- High-pressure shut-off valve(s), 1 per zone (or field supplied)
- Controls (transmitter(s), airflow switch) (or field supplied)
- Fan-assisted dispersion
- Nylon high-pressure tubing
- Nylon tubing ready quick connect fittings
- Torque bit adapter for nozzle connection to 1/4" drive (torque wrench not provided)

**FIGURE 10-1: PIPE CLAMP
(PART #: 407145)**



Placing components

When placing components, consider the following:

- Dry environment and easy access for maintenance.
- Minimum ambient temperature is 40 °F (4 °C).
Maximum ambient temperature is 104 °F (40 °C).
- Clearance recommendations (see Figure 12-1).
- Electrical connections: Power, control, and safety circuits
- Plumbing connections: Supply water and drain piping.
- Avoid locations above critical equipment or processes.
- Avoid locations close to sources of electromagnetic emissions, such as power distribution transformers and high horsepower motors controlled by variable frequency drives.
- Interconnecting piping is installed in a controlled space. If installed in freezing conditions, insulated piping and heat trace is needed (design by others)

DECHLORINATOR, SOFTENER, AND PUMPING STATION

- Select a location near a water supply, power supply, and drain.
- Minimize distance between pumping station and dispersion assemblies.
- Note clearances recommendations in Figure 12-1.

NOISE

When placing components, noise considerations should be taken while using high pressure atomization. The list of potential, mechanical, noise sources are:

- pump
- motor
- unloader
- solenoid valves
- and water velocity through the pipe

The pump station and other components generate a noise of at least 80 dB (at 1 meter), during normal operation. These pump stations should not be located in areas that may be noise sensitive or in an adjacent space that doesn't have noise mitigation technologies.

Important:

Installation must comply with governing codes.

Consult DriSteem if installing at altitudes of 6500' (2000 m) or greater.

For VDI compliant installation, must comply with VDI 6022.



WARNING

Installation requirements

The humidifier must be installed by a qualified technician and meet the requirements of all governing codes. Failure to follow these instructions could cause severe bodily injury or death.

For VDI compliant, reference must be made to the corresponding personnel qualification for work on ventilation systems or humidifiers according to VDI 6022.

Placing components

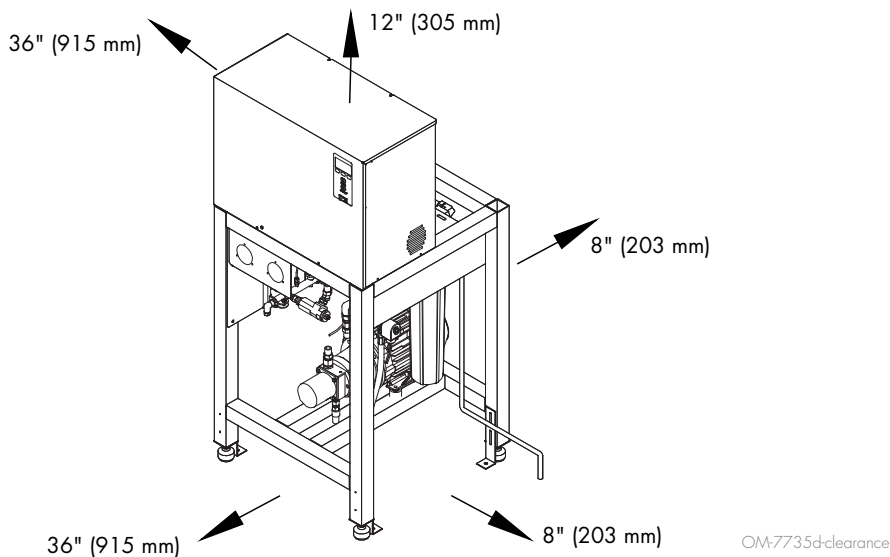
Table 12-1:
High pressure specifications

Equipment component	Minimum obstruction-free clearance allowance inches (mm)						Maximum distance from drain (if applicable) inches (mm)
	Front face (upstream)	Back face (downstream)	Left side	Right side	Top	Bottom	
Softener(s)	15 (381)	—	—	—	15 (381)	—	—
Dechlorinator	15 (381)	—	—	—	15 (381)	—	—
Brine tank	15 (381)	—	24 (610)	24 (610)	15 (381)	—	—
Softener/ dechlor/brine skid (only applies to skidded water treatment systems)	20 (508)	—	—	—	15 (381)	—	—
RO generation station	36 (915)	—	—	—	48 (1219)	—	—
RO storage tank	18 (457) from front of plumbing	—	—	—	—	—	—
Pump station	36 (915)	8 (203)	36 (915)	8 (203)	12 (305)	—	240 (6096)
AHU dispersion manifold/nozzles	12 (305)*	Minimum: 24 (610) Maximum: 96 (2438) Recommended: 48 (1219)	—	—	6 (152)	6 (152)	—
Sensors	24 (610)	—	—	—	—	—	—
Solenoid valves	24 (610)	—	—	—	—	—	—
Final evaporation media	24 (610)	12 (305)	—	—	—	—	—

* 24 (610) if airspeed is below 400 fpm.

Note: Wet section of duct/AHU needs to encompass upstream clearance of dispersion to downstream clearance of final evaporation media panel.

FIGURE 12-1: MINIMUM RECOMMENDED CLEARANCES



Placing components

PUMPING STATION

- Select a location where electrical components will remain dry and the temperature remains above freezing. Minimum ambient temperature is 40 °F (4 °C). Maximum ambient temperature is 104 °F (40 °C).

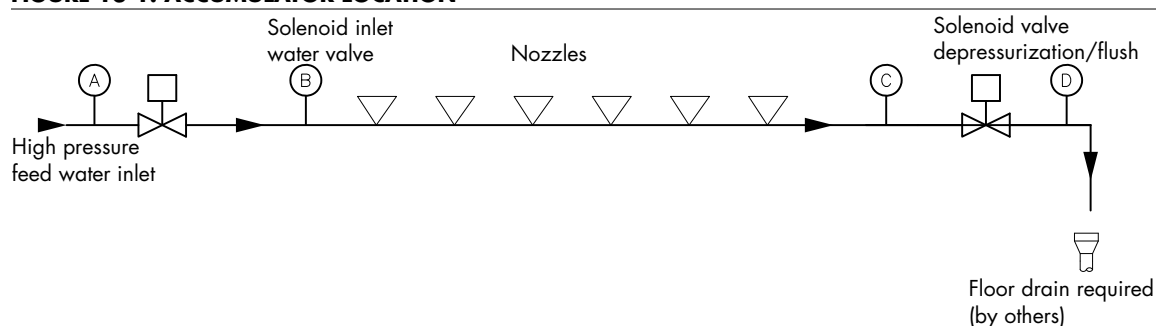
DISPERSION PIPING AND MANIFOLDS

Vibration-dampening mounting hardware (field supplied) is recommended (see Figure 10-1).

For area-type (non fan-assist) applications:

- Dispersion tube manifolds need to be rigidly supported so motion does not occur when valves open and close.
- Do not locate over electrical equipment.
- Avoid obstructions such as piping and/or lighting. Use the flexible nozzle extenders to direct spray to its optimal direction. Do not locate in alcoves, closed corridors or behind curtains.
- Consider any bends that might be required.
- Dispersion must be located in a space where there is enough clearance for maintenance.
- When mounting staging valves, ensure that they are properly supported.
- A drain is required at the end of the distribution piping.
- Do not bend extensions beyond a bend radius of 1.38" (35 mm).
- Add plug(s) where items are critical to be dry or extensions don't direct mist far enough away.
- Orient manifold at a slight upward angle in relation to the ceiling/floor.
- Rigidly mount area type zone valves beyond the pipe support mounting.
- Do not remove the pressure accumulator and flexible hydraulic hose on the area type zone inlets as this will prevent potential water hammer.
- Persons must not be affected.
- Humidifiers must not be installed in areas where increased air pollution is to be expected.

FIGURE 13-1: ACCUMULATOR LOCATION



- A location that absorbs pulsation before any components. Pulsation is caused by pump or valve shutting off.
- Typical placement, this location helps prevent shock when unit is first turned off and shock wave is traveling back.
- Placement for applications where shock is caused by the shutting down of the depressurization valve.
- Not used for high-pressure system applications since no shock is typically produced from an open drain.

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Placing components

For AHU applications:

- Many factors affect evaporation efficiency, especially temperature and RH rise. Ensure that system specifications match design.
- Ensure that the entire dispersion section of air handler is constructed of or lined with stainless steel to prevent corrosion. Pitch this dispersion section in the same direction as the airflow to a drain at or after the final evaporation media.
- Air velocities in the area should be between 250 fpm and 750 fpm (1.3 m/s and 3.8 m/s).
- Ensure design of the water drain.
- Ensure interior lighting that can be switched from the outside (Switch-on status must be recognizable from the outside).
- Ensure viewing window to be darkened.
- Compliance with the specified length of the humidification distance.
- Compliance with the distances to the other systems components.

For fan-assist applications (additional to area-type above):

- Maintain 18 - 24 in (457 - 610 mm) above unit for air movement from ceiling.
- Consider the throw and drop distance shown on page 19.
- Place fans according to diagrams on page 20 and 19. Do not overlap spray as it will conglomerate and fall to the ground.
- Before placement on the fan-assist device, flush the nozzle ring to remove any construction debris. This shall be done without nozzles installed. Construction debris can clog nozzles or can affect the spray pattern.
- Ensure the surface these are mounted to support the weight of the system.
- Position the fan as shown on page 20 and 19 avoiding obstacles such as ductwork, beams, equipment, conflicting airflow such as large doors, cold air inlets, or fans. Do not position the nozzles at cold parts in the building as condensation can occur (i.e. windows, cold pipes or equipment).
- Place the fan-assist unit in a way that it can be serviced in the future.

SOLENOID VALVES

- For AHU applications, install the solenoid valves close to the dispersion manifolds.
- Position the valves in places where they are sheltered from damage.
- Dispersion control valves are pump station mounted for single-stage, single-zone applications.
- For fan-assist dispersion, the inlet and depressurization valve are an assembly mounted near the pump station.

Placing components

SENSORS

- For area-type applications:
 - Position the RH sensor near where the conditions must be controlled.
 - Position the RH sensor away from where the system is likely to influence them.
 - Position the sensor away from any other conflicting source of humidity or temperature.
 - Position the sensor must not be exposed to any heat source.

HIGH LIMIT SENSORS

- RH high limit sensors will reduce over spray and water waste.
- Locate the RH high limit downstream of the final evaporation media panel. Recommended max RH set point is 70% RH. Set RH high limit set point 5% above calculated supply RH %.

SPACE CONTROL SENSORS

- Select locations where there is minimal mechanical or environmental risk of damage to the sensors.
- For AHU applications (space control):
 - Position RH sensor in the return air section where the air conditions are most similar to the space conditions being controlled.
 - Position the air flow switch at least 3' (1 m) upstream of the dispersion manifolds, in the same airstream.
 - In the return duct is ideal. Ensures the best uniform mix of dry and moist air with stable temperature control.
 - In the space is acceptable, but room environment may affect controllability, such as when sensor is too close to air grilles, registers, or heat radiation from room lighting.
 - In the space is acceptable, (behind wall or partition) for sampling entire room if sensor is near an air exhaust return outlet. Typical placement for sampling a critical area.
 - Best sensing location for a high-limit humidistat or humidity transmitter and airflow proving switch.

Placing components

SENSOR LOCATION

Sensor location has a significant impact on system performance. See the recommendations below and Figure 16-1.

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

Recommended humidity control (transmitter/humidistat) locations:

- A. Ideal. Ensures the best uniform mix of dry and moist air with stable temperature control.
- B. Acceptable, but room environment can affect controllability, such as when sensor is too close to air grilles, registers, or heat radiation from room lighting.
- C. Acceptable. Provides uniform mixture of dry and moist air. If extended time lag exists between humidity generation and sensing, extend sampling time.
- D. Acceptable (behind wall or partition) for sampling entire room if sensor is near an air exhaust return outlet. Typical placement for sampling a critical area.
- E. Not acceptable. These locations might not represent actual overall conditions in the space.
- F. Not acceptable. Do not place sensors near windows, door passageways, or areas of stagnant airflow.

Recommended safety (airflow and high limit) sensor location:

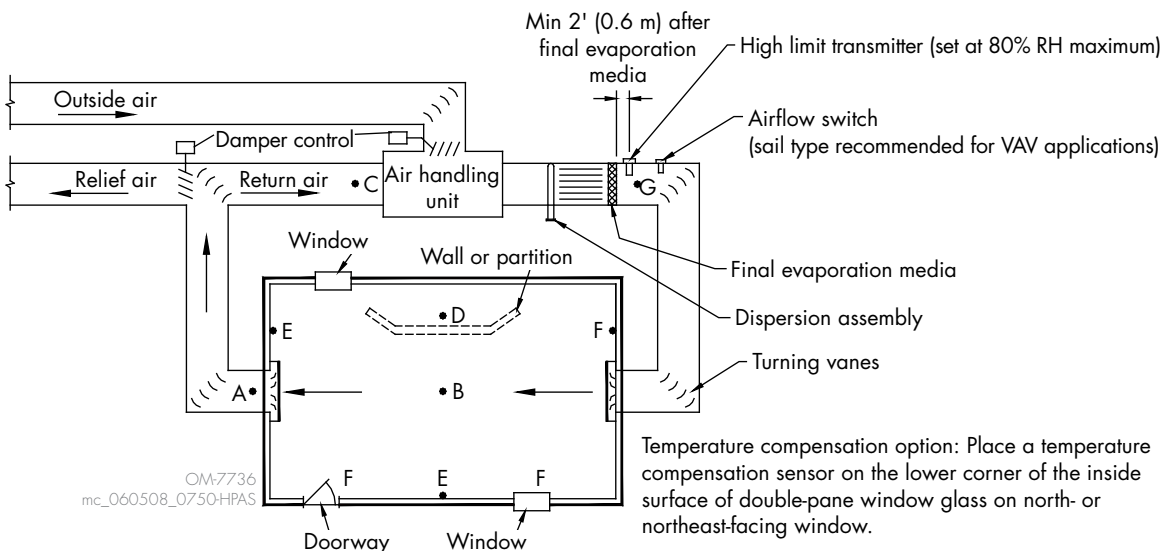
- G. Best sensing location for high limit humidistat or humidity sensor and airflow proving switch.

Other factors affecting control

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

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

FIGURE 16-1: RECOMMENDED SENSOR LOCATIONS

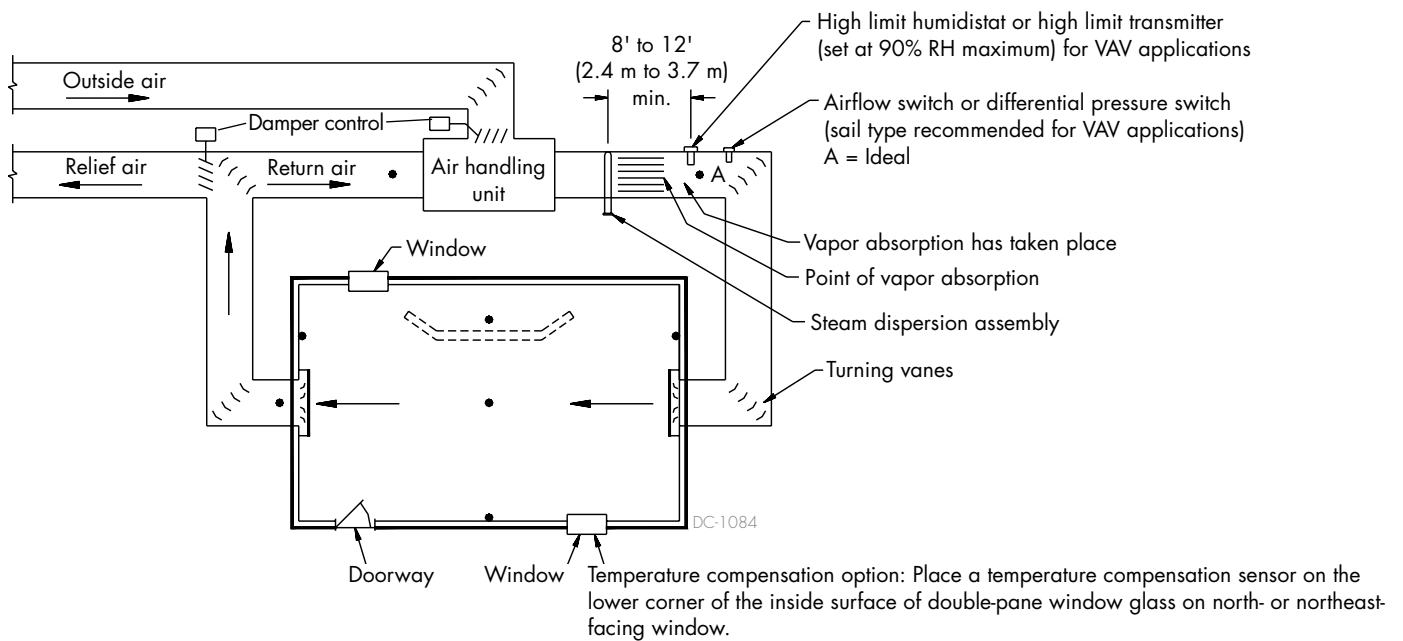


Placing components

DISCHARGE CONTROL SENSORS

- Select locations where there is minimal mechanical or environmental risk of damage to the sensors.
- For AHU applications (discharge control) (See Figure 17-1):
 - Position dewpoint sensor in the supply duct for best discharge control.
 - Position high limit as far downstream of the dispersion assemble as possible.

FIGURE 17-1: RECOMMENDED SENSOR LOCATION FOR DISCHARGE (DEWPOINT)



Placing components

ZONE CONTROL CABINETS

A ground wire is necessary from the machine ground lug in the control cabinet to earth ground. The bonding machine ground wire should be no less than 14-gauge AWG (1.63 mm dia.) or sized per National Electrical Code (NEC) or IEC 60364 requirements.

ATOMIZING NOZZLES

For area-type applications:

- Select a location below the piping manifolds with accessibility for a lift truck or ladder to allow for replacement or cleaning of the nozzles.
- Support the dispersion piping every 5' (1.5 m).
- Allow 2" (51 mm) clearance from nozzle and pipe support.
- Select a location where electrical components will remain dry.
- Position the piping manifold with the threaded connections pointing slightly up, approximately 15° angle to the horizontal.
- Direct the nozzles so that they have at least 10" (254 mm) clearance above to prevent condensation on the ceiling.

For fan-assisted dispersion applications:

- Place 24" (610 mm) from ceiling (Models FA-3 and FA-4).
- Select location where nozzles have 10' (3 m) horizontal clearance.
- Plug saddles where mist will not have clearance.

For AHU applications:

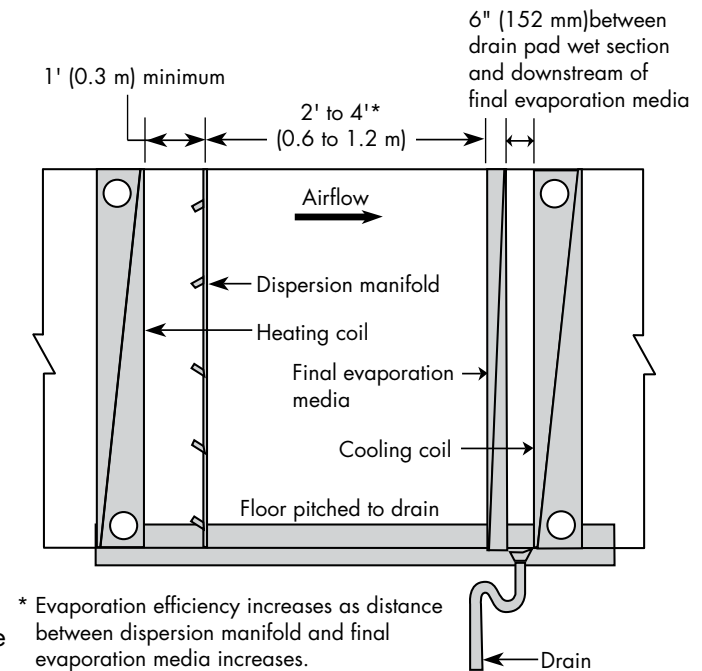
- Select a location for the nozzles that allow space for an operator to check or replace them. See Figure 18-1.
- Allow for piping support every 8' (2.4 m).
- Select a location where electrical components will remain dry.
- Orient each nozzle manifold stick so that the nozzles are directed back into the airflow at a 30-45 degree angle to the horizontal. The top half of the manifolds should point downward and the bottom half up.

FINAL EVAPORATION MEDIA (AHU APPLICATIONS ONLY):

- Install final evaporation media in stainless steel duct section. See Figure 18-1.
- Locate as far as possible downstream of the dispersion manifolds.
- Assemble the final evaporation media panel as shown in the installation drawing that shipped with your High-Pressure System.
- Slide the final evaporation media panel up into the top rail and allow to drop down into the bottom rail. Slide in other panels to cover entire cross section of the AHU/duct.

Important: Pitch the AHU/duct floor towards the final evaporation media and locate drain after the assembly.

FIGURE 18-1: FINAL EVAPORATION MEDIA



Placing components

FIGURE 19-1: PLACEMENT OF FAN-ASSISTED (FA-2) FOR WALL OR CEILING ARRANGEMENT

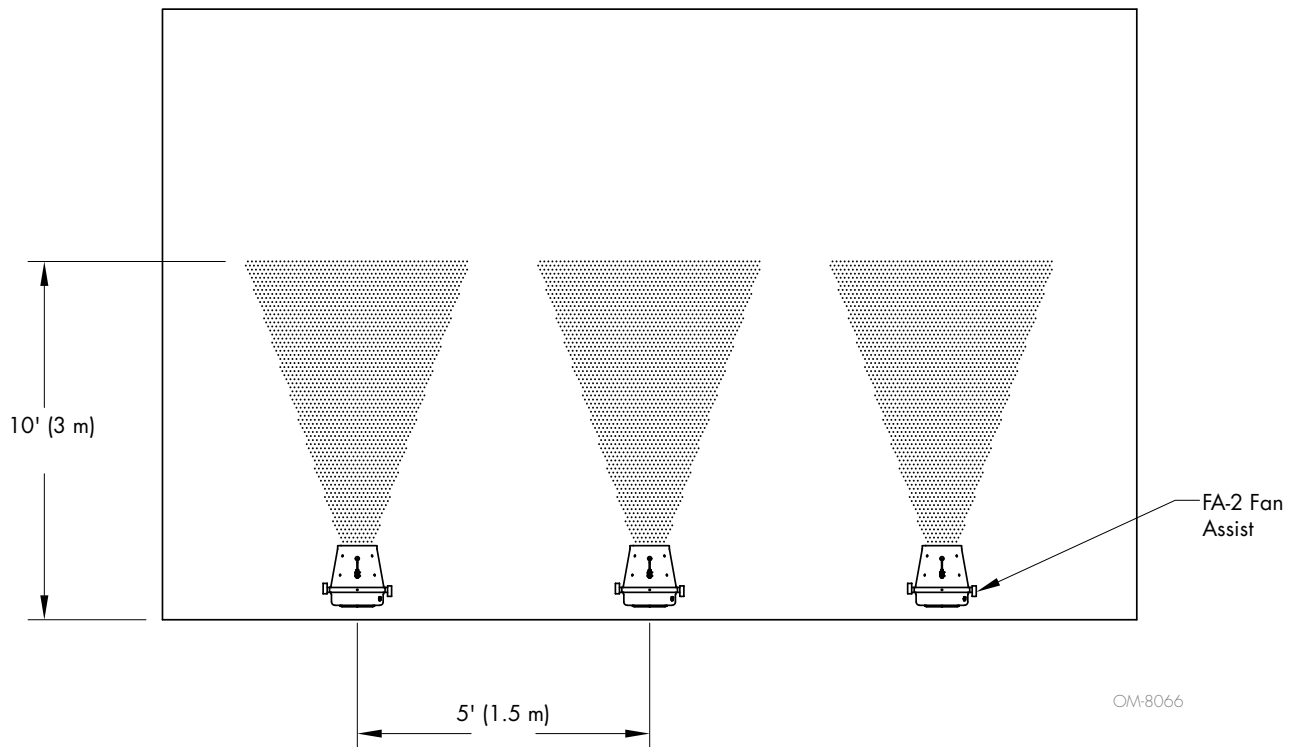
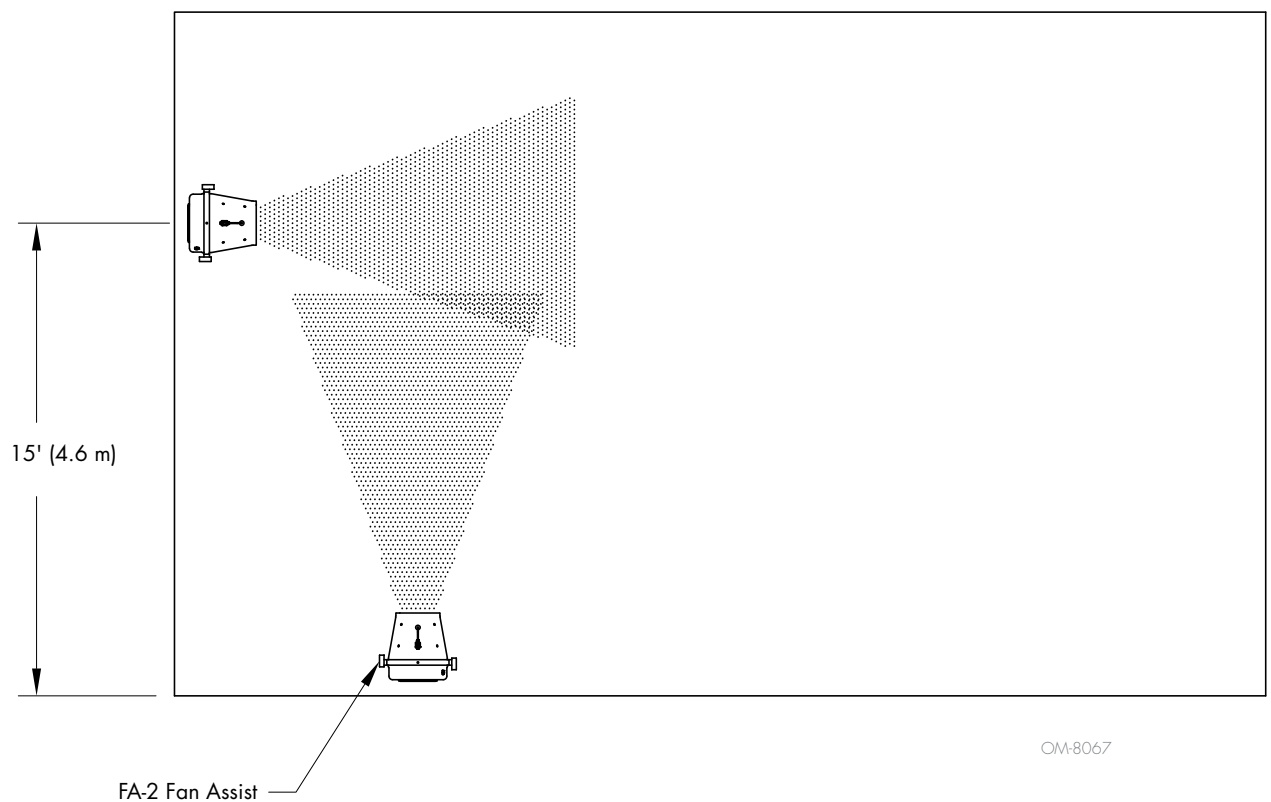
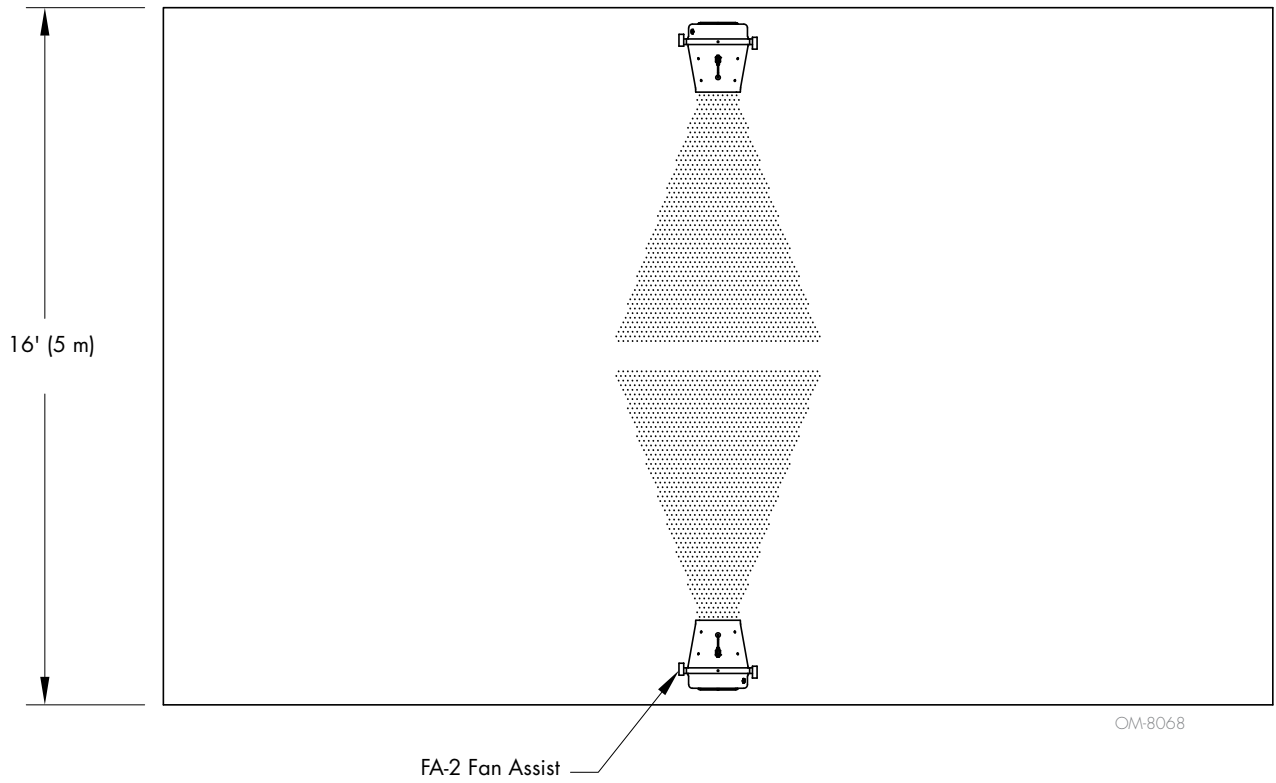


FIGURE 19-2: PLACEMENT OF FAN-ASSISTED (FA-2) FOR WALL OR CEILING ARRANGEMENT



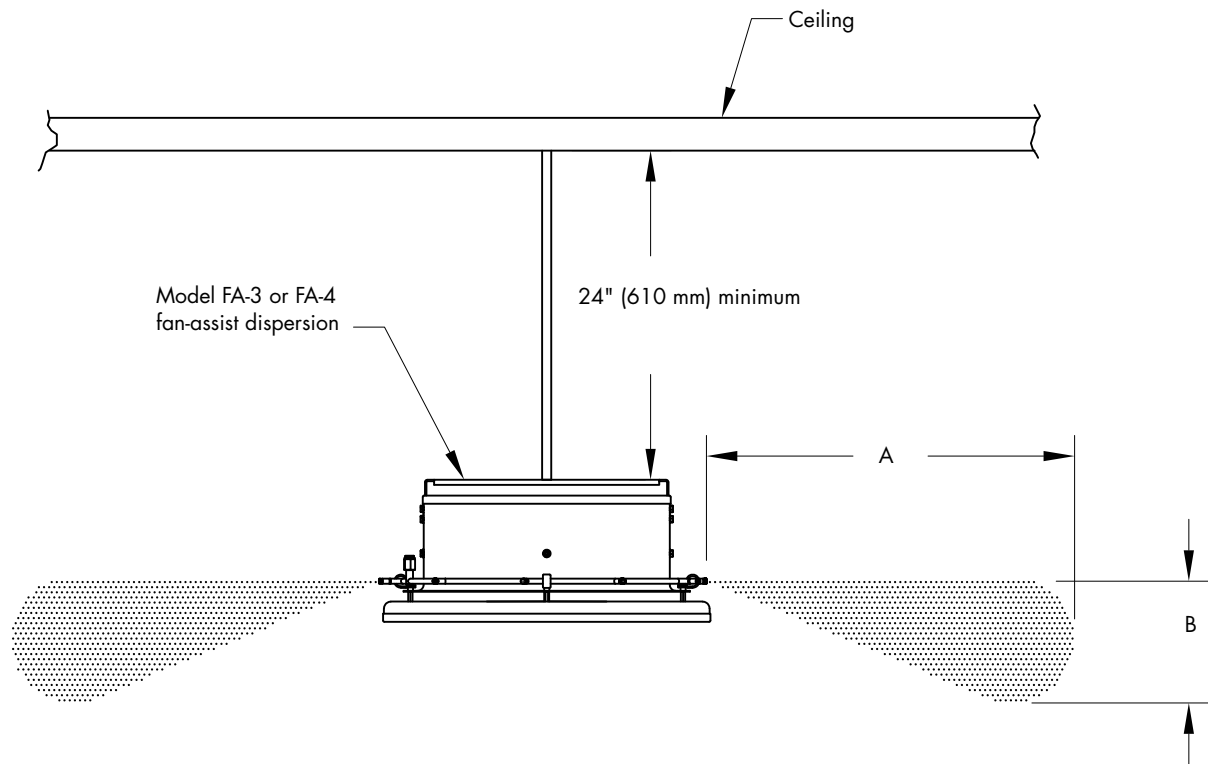
Placing components

FIGURE 20-1: PLACEMENT OF FAN-ASSISTED (FA-2) FOR WALL OR CEILING ARRANGEMENT



Placing components

FIGURE 21-1: PLACEMENT OF FAN-ASSISTED (FA-3 AND FA-4) FOR WALL OR CEILING ARRANGEMENT

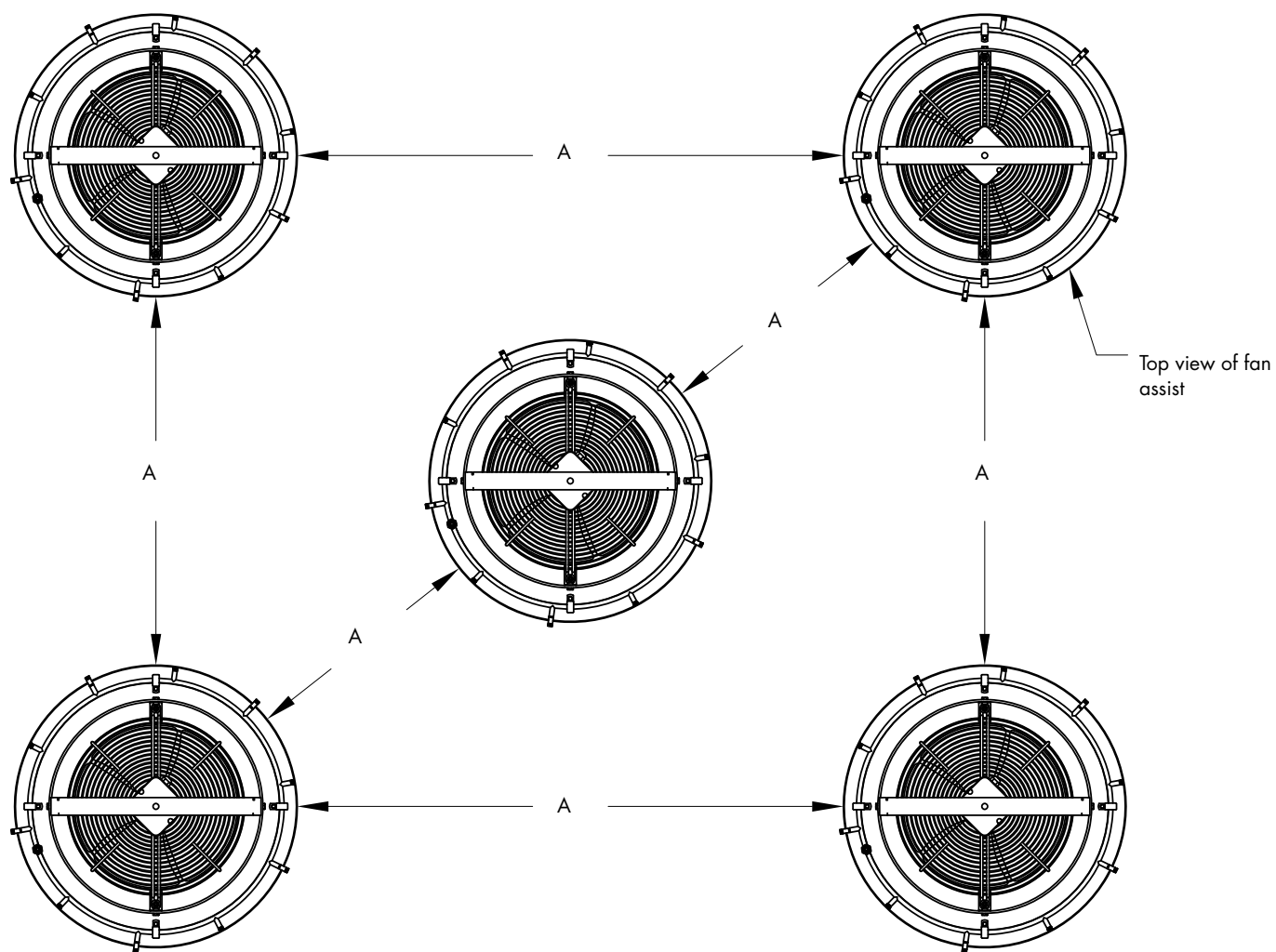


		NOZZLE CAPACITY (PPH)		
		6	10	15
DIMENSION	A	10'	10'	10'
	B	6'	7'	8'

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Placing components

FIGURE 22-1: PLACEMENT OF FAN-ASSISTED (FA-3 AND FA-4) FOR CEILING ARRANGEMENT

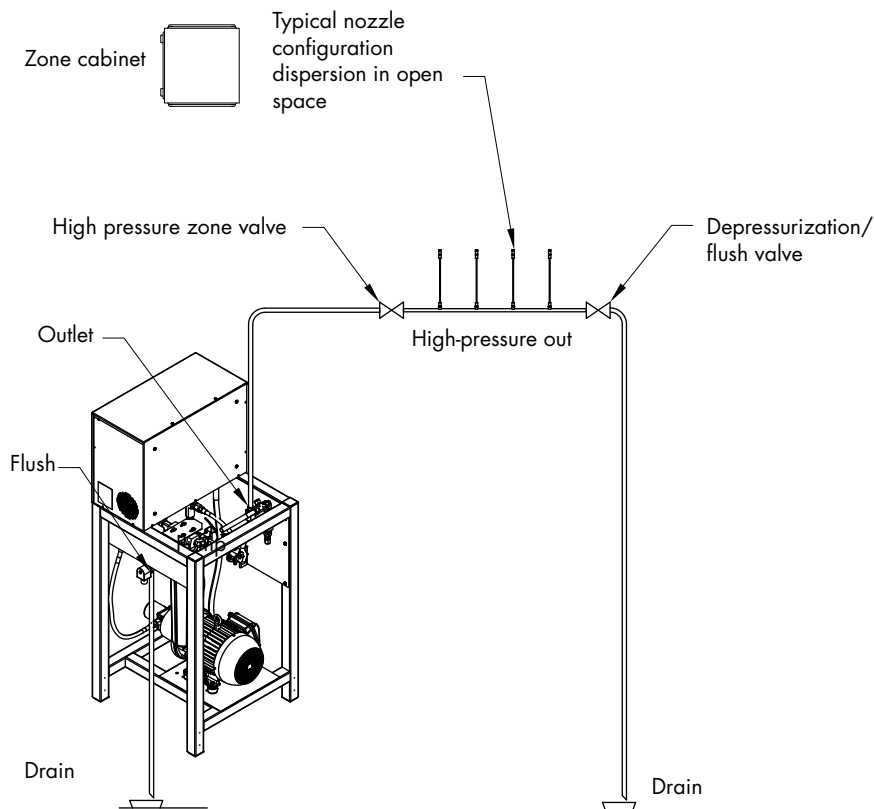
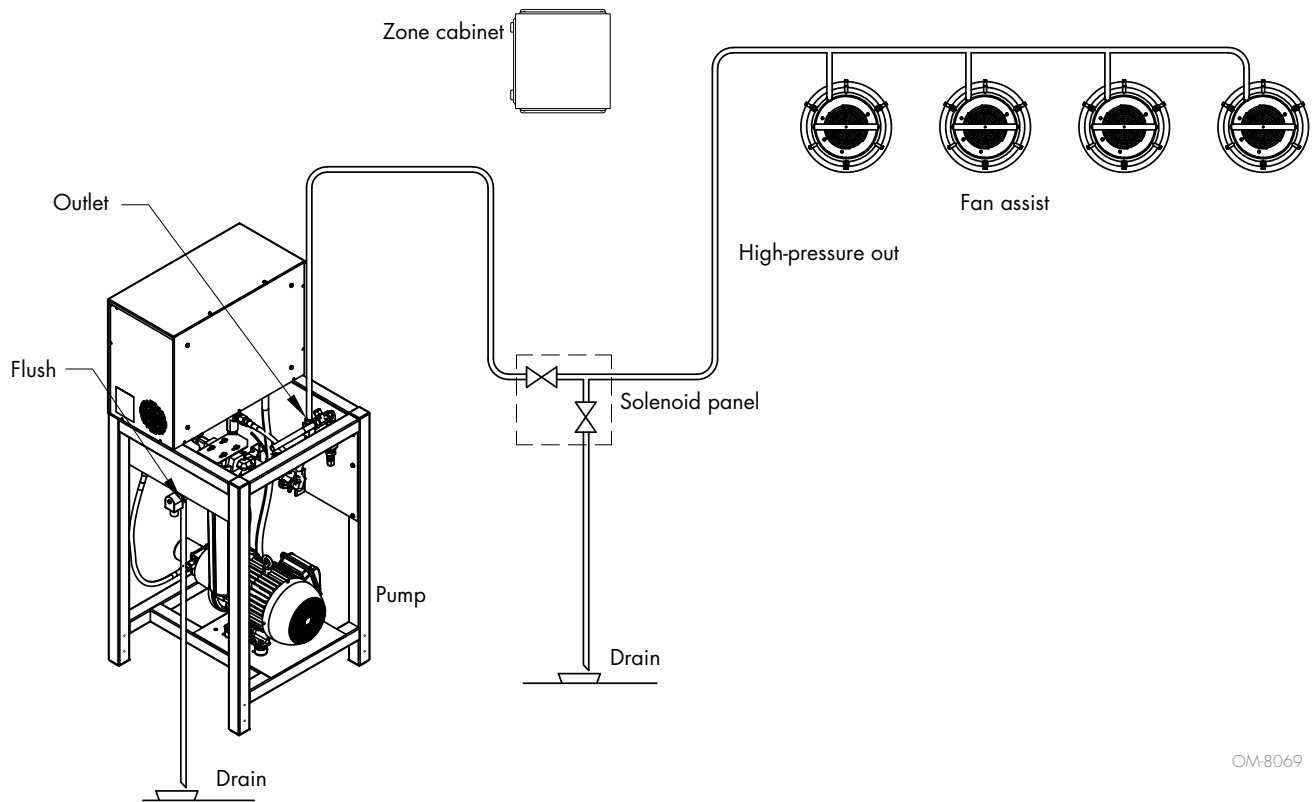


A = minimum feet of distance between units 25' (7.6 m)

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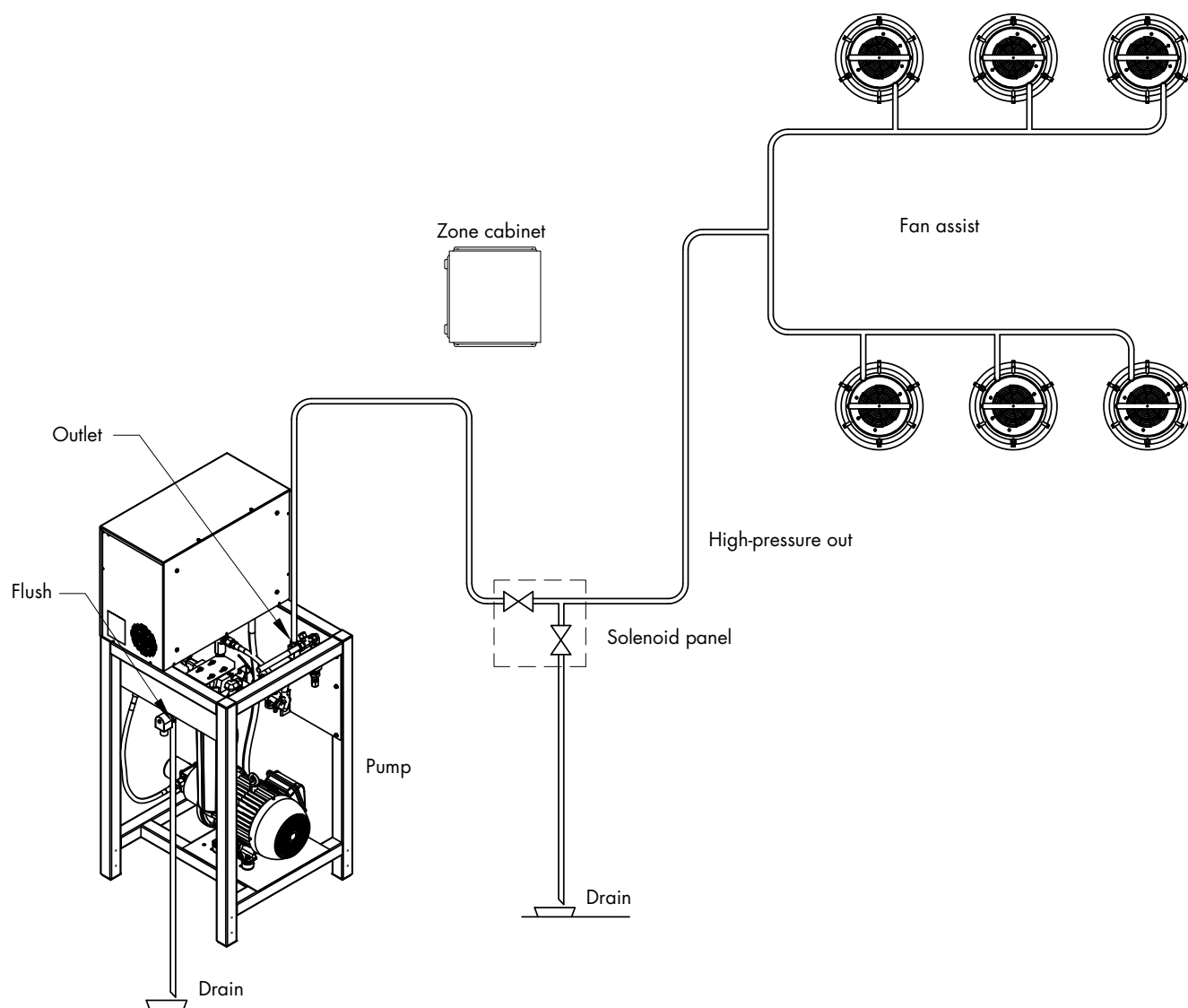
Pump station/dispersion/zone valves layout

FIGURE 23-1: SERIES LAYOUT



Pump station/dispersion/zone valves layout

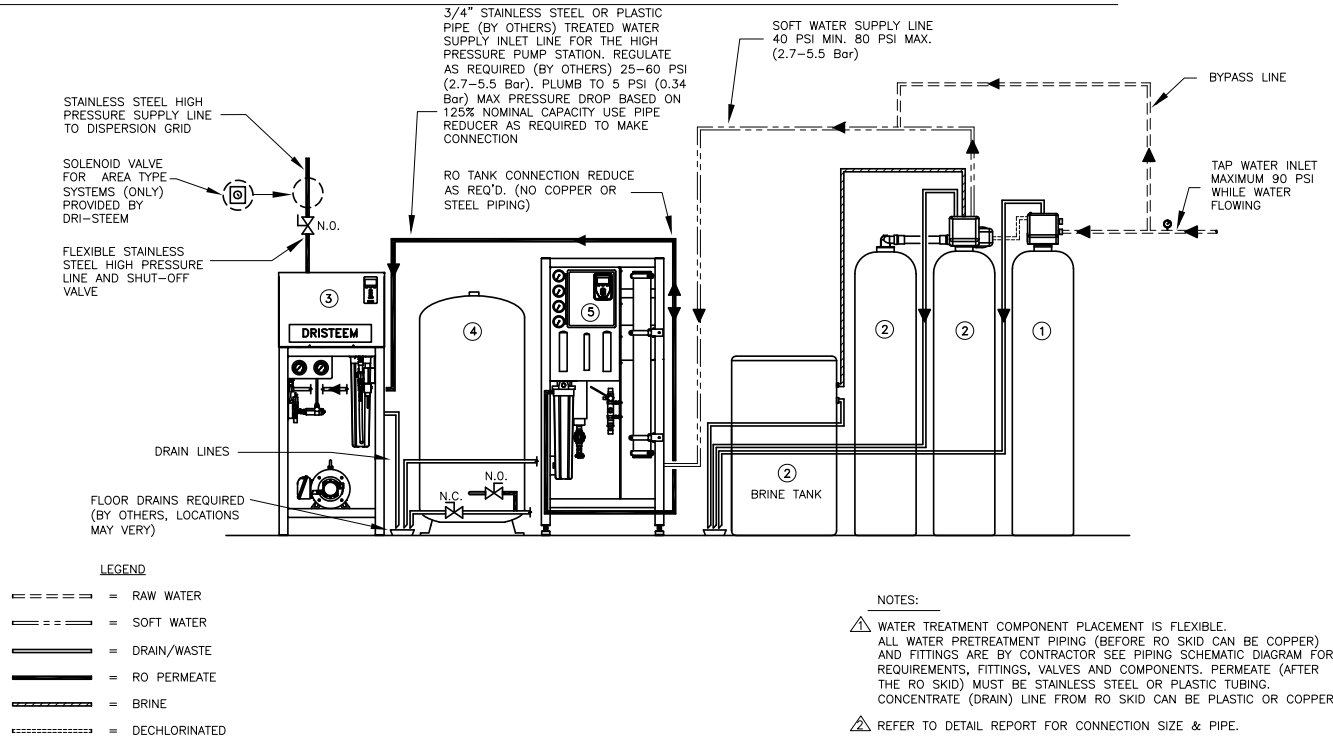
FIGURE 24-1: PARALLEL LAYOUT



OM-8070

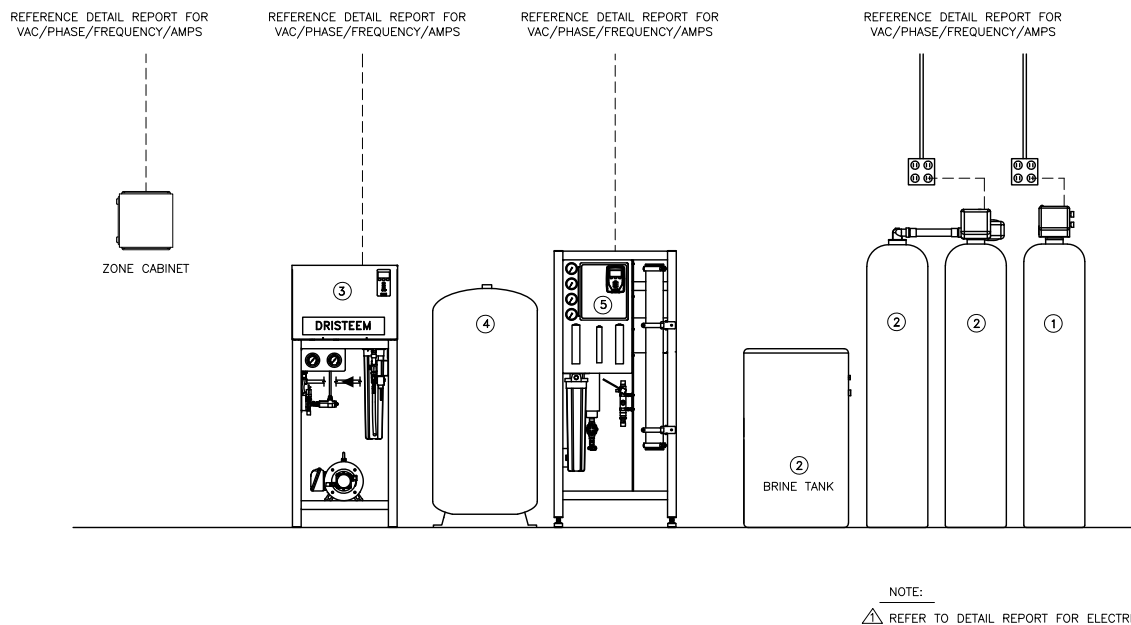
System piping

FIGURE 25-1: ADIATEC HIGH-PRESSURE SYSTEM GENERIC MECHANICAL PIPING



DM-16346

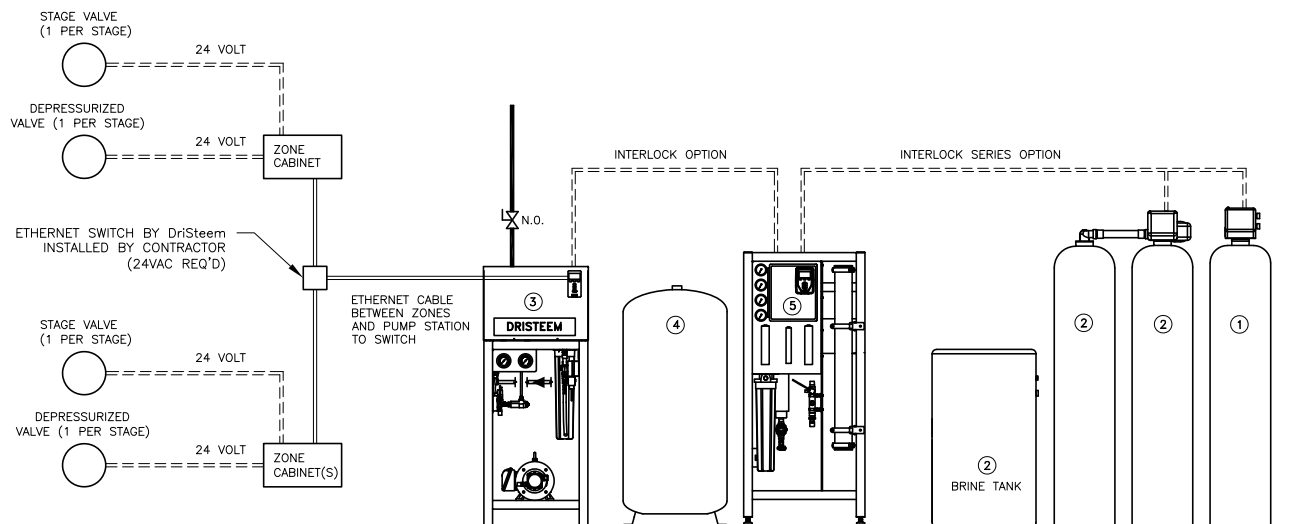
FIGURE 25-2: HIGH-PRESSURE SYSTEM GENERIC ELECTRICAL SUPPLY



DM-16347

System piping

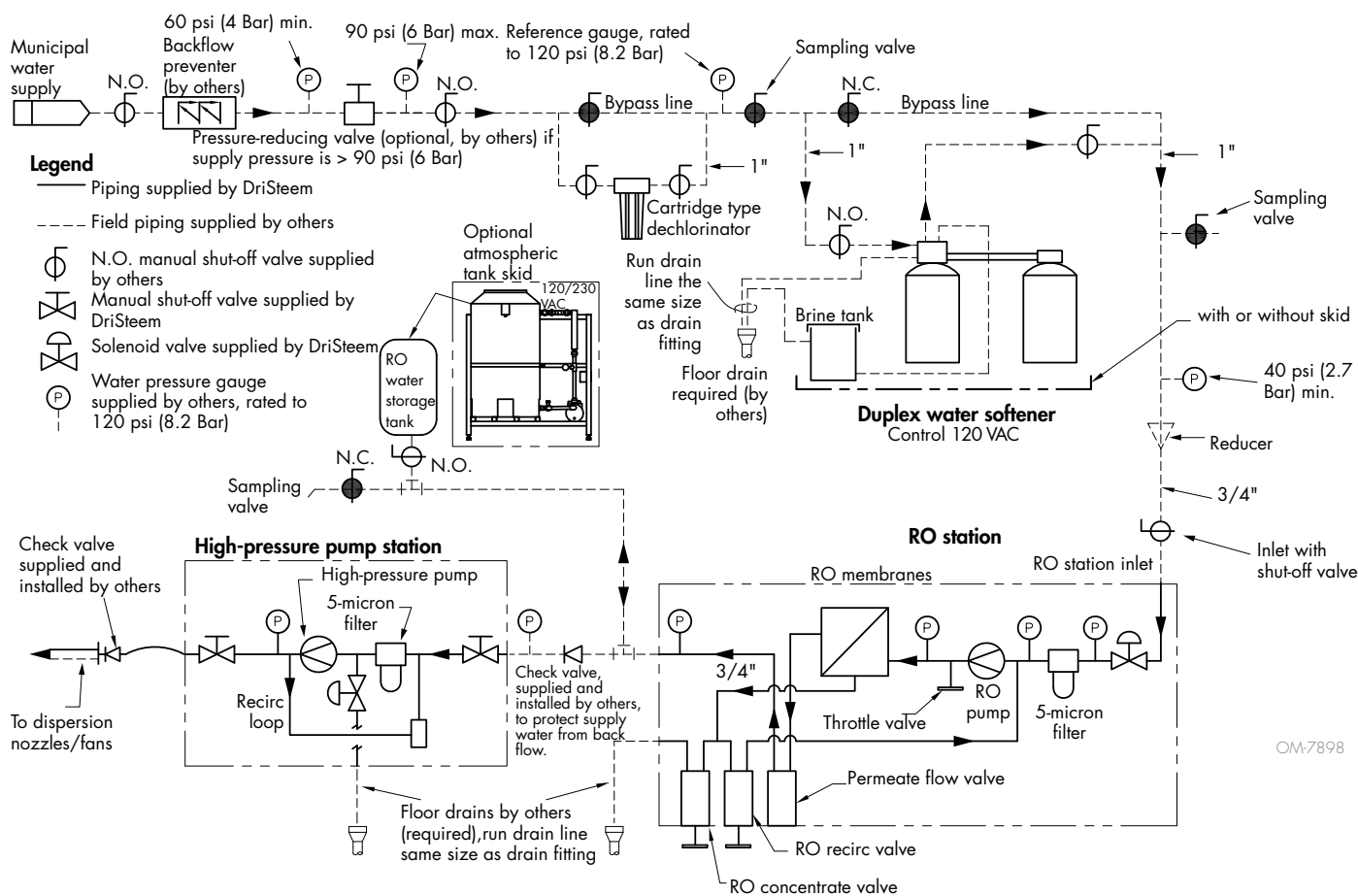
FIGURE 26-1: HIGH-PRESSURE SYSTEM GENERIC INTERCONNECTING WIRING/SIGNAL



DM-16348

Piping and instrumentation arrangement

FIGURE 27-1: PIPING AND INSTRUMENTATION ARRANGEMENT, MODELS 250 AND 500

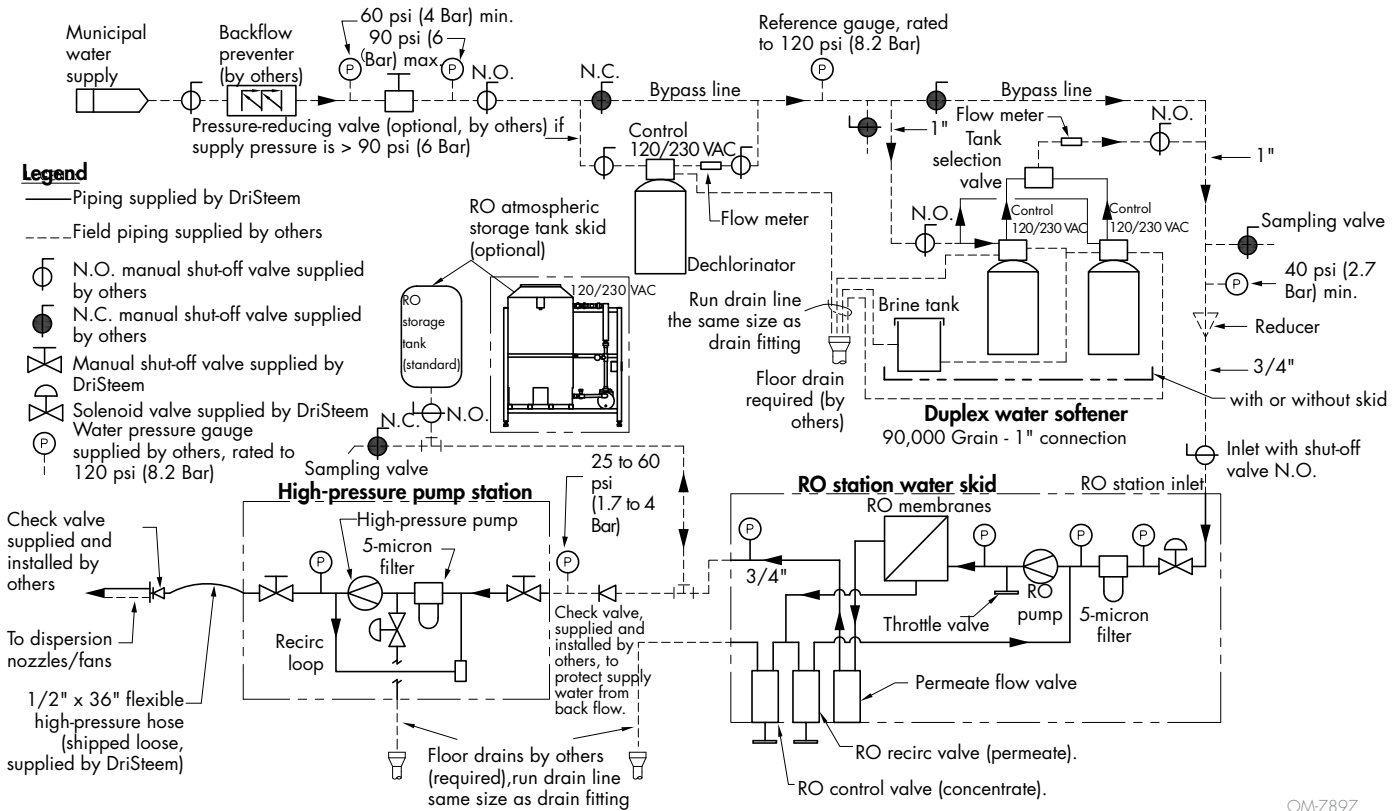


Note:

Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with International Electrical Code.

Piping and instrumentation arrangement

FIGURE 28-1: PIPING AND INSTRUMENTATION ARRANGEMENT, MODELS 250 THROUGH 5500



QM-7897

Note: Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with International Electrical Code.

Adiatec high-pressure system piping

HIGH-PRESSURE PUMP STATION

Refer to Figures 27-1 and 28-1 for arrangement of piping and instrumentation. Inlet water pressure must be 25 to 60 psi (170 to 415 kPa). See note at left.

1. Connect RO water to high-pressure pump station inlet.
2. For single-zone, single-stage applications, plumb high-pressure solenoid drain relief to nearby drain.
3. Using the DriSteem-supplied 1/2" x 36" flex hose, complete the connection between pumping station and distribution manifold.
4. Apply bends and pipe supports as required to get plumbing in/out of pump station.
5. Pipe supports to be a maximum of 8' (2.4 m) apart to eliminate movement during operation.
6. A check valve is required on the outlet of the pump station.
7. A check valve is required between the RO skid and pump skid.
8. Tighten all unions.
9. Plumb RO flush valve to accessible open drain.
10. Plumb high-pressure water outlet to dispersion assembly.
11. Plumb vent valve for prefilter to drain, if desired.

DISPERSION PIPING AND MANIFOLDS

General instructions:

- Included in dispersion installation kit are compression fittings or quick connect fitting for nylon tubing. Use these fittings along with a compression tube bender (Model MS-HTB-8) to complete dispersion and interconnecting piping installation.
- Best practice is to run entire length of interconnecting piping and dispersion manifolds first, then connect compression fittings hand-tight until entire installation is completed.
- Vibration-dampening mounting hardware (field supplied) is required.
- Do not bleed system by loosening fitting nut or fitting plug.
- Do not assemble or tighten fittings when system is pressurized.
- Make sure tubing rests firmly on shoulder of tube fitting body before tightening nut. See fitting installation instructions below.
- Always use proper thread sealants on tapered pipe threads.
- Never turn fitting body. Instead, hold fitting body and turn nut.
- Avoid unnecessary disassembly of unused fittings.
- Use instrument, seamless grade tubing only. Needs to be oil and dirt free.

High-pressure system piping

Initial installation instructions – compression fittings:

1. Fully insert tube into fitting and against shoulder, rotate nut finger-tight.
2. Mark nut at the 6 o'clock position.
3. While holding fitting body steady, tighten nut one and one-quarter turns until mark made in step two is located at the 9 o'clock position.

Reassembly installation instructions – compression fittings:

You may disassemble and reassemble compression tube fittings many times.

Prior to disassembly, mark tube at back of nut; mark a line along nut and fitting body flats.

1. Insert tube with preswaged ferrules into fitting until front ferrule seats against fitting body.
2. While holding fitting body steady, rotate nut with wrench to previous position.

Adiatec high-pressure system piping

PUSH-CONNECT FITTINGS

(USED WITH NYLON TUBING FOR FAN-ASSIST DISPERSION)

1. Inspect tube to make sure the thickness is uniform when cutting.
2. Cut tubing to length with tube cutter. (Make sure not to flatten tube).
3. Fully insert tube to fitting.
4. Pull on tube to make sure fitting is fully installed.

WARNING

Do not hold the tube in a vise at the place where it will be inserted into the fitting (the vise will leave a mark on the tube that may cause leaks, and might cause ovality).

TUBE FITTINGS

Tube fitting are supplied assembled and finger tight. Disassembly before use can allow that entry of dirt or other particles.

1. Insert the tubing into the fitting. Check that the tube rests firmly on the fitting shoulder and that the nut is finger tight.
2. Tighten the nut. 1 ¼ turns of the nut are required for ¼" (6mm) and higher.

REASSEMBLY INSTRUCTIONS

Fitting connections may be disconnected and remade repeatedly without loss of the leak tight seal.

1. Before disconnecting, mark the position of the nut in relation to the fitting body.
2. To reassemble, use a wrench to tighten the nut to original position.
3. Tighten slightly with a wrench until there is a slight rise in torque.

High-pressure system piping

TUBE CUTTING

There is only one way to cut tubes for use in high-pressure applications:

1. Tube cutter

To attain a leak-free connection, cut the tubing squarely. Use a good quality tube cutter with the appropriate blade for the tubing.

Do not try to reduce the time of cutting by taking deep cuts with each turn of the cutter. This will work-harden the tube. Deburr the end of the tube avoid damage to the fitting and to ensure that the tube reaches the bottom of the fitting.

TUBE HANDLING

Scratches on the tube might cause leaks. Therefore, use caution in handling the tube in order to reduce the possibility of leaks.

Some precautions to be taken:

1. Tubes must not be dragged on the floor.
2. Tubes must not be dragged out of a tubing rack, especially in case of large OD tubes.
3. Leave tube caps on until ready for installation. This will help keep the tubing free of debris.

PRESSURE TEST/LEAK TEST

Cap both ends of the supply line. Be sure that the dispersion manifold, pump station, and valves are not connected to the piping. These components can be put under a pressure test.

Charge the supply line with 50 psi of nitrogen. Allow the pressure to sit for an hour and check the gauge. If you have lost any pressure, use a bubble solution to check for leaks at your connection points. Once the system can hold the pressure for an hour, you can relieve the pressure and finish your connections to the rest of the system.

Adiatec high-pressure system piping

GAP INSPECTION GAUGES

Gap inspection gauges assure the installer or inspector that the fitting has been sufficiently pulled up on initial installation with wrench tightening. All metal tube fittings are gaugeable.

DEPTH MARKING TOOLS

Depth marking tools help ensure that tubing is bottomed on the shoulder inside the tube fitting body.

FOR FAN-ASSIST DISPERSION APPLICATIONS

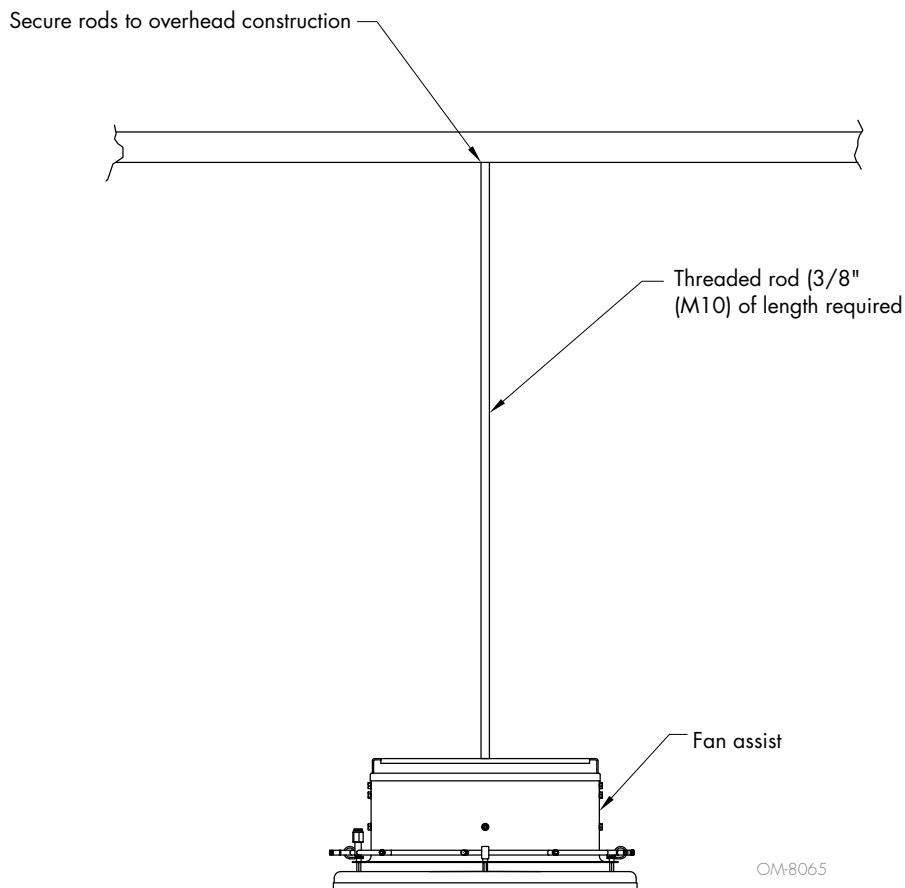
The FA series dispersion systems are typically hung from a ceiling via chains or threaded rod, and water is fed via the high-pressure tubing and electricity is fed via cables.

1. Adjust the chains/rod so the unit is level. After flushing and bleeding of the FA unit, remove the excess chain and close S-hooks.
2. Confirm the chains/rod as been fastened to the ceiling with appropriate material (screws, raw plugs, concrete screw anchors, etc).
3. Fan assist does flushing different than other types, the depressurization valve can be placed anywhere in the line. It tends to be most convenient next to the supply valve.

CAUTION

Avoid u-bends in the tubing. This can cause air entrapment that will not be fully removed and cause compression. Failure to install correctly, can lead to dripping from the nozzles during depressurization.

FIGURE 33-1: FA-4 AND THREADED ROD INSTALLATION



NOTE:
Depending on application length, a cross bar may be needed to prevent swaying.

Adiatec high-pressure system piping

FOR AREA-TYPE APPLICATIONS

1. Place pipe supports and/or hangers where distribution manifold will be placed. Place pipe supports no more than 6' (1.8 m) apart.
2. Place first section of distribution manifold into place using pipe supports.
3. Rotate the manifolds slightly upward at approximately 15° angle from the horizontal.
4. Measure and make any bends that are required to avoid obstructions.
5. Place a compression union on each end of distribution piping.
6. Place next section of distribution manifold.
7. Connect sections using union.
Note: Make union connections hand-tight only until distribution system is fully assembled.
8. Continue until entire zone manifold is in place.
9. Rigidly mount area type zone valves beyond the pipe support mounting.
10. Do not remove the pressure accumulator and flexible hydraulic hose on the area type zone inlets as this will help mitigate potential water hammer.
11. Tighten all unions.

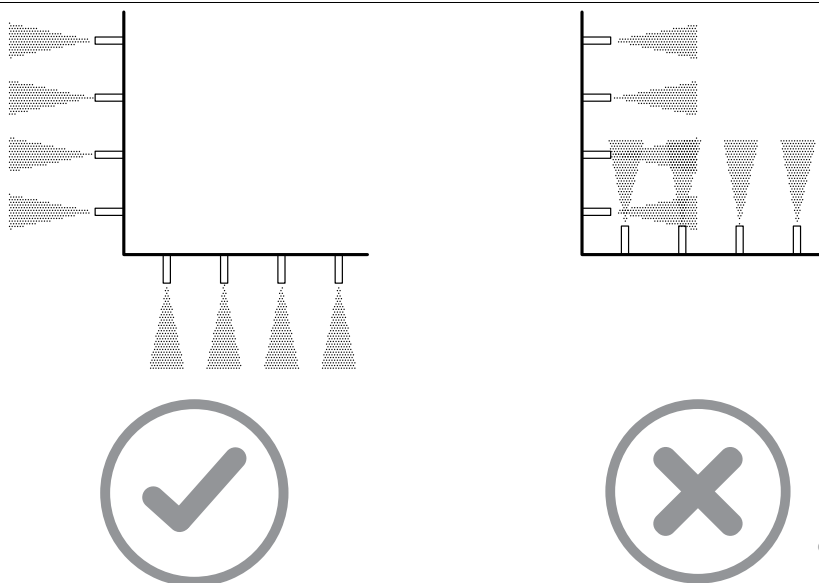
See Page 47 for dispersion nozzle installation instructions.

Important: Refer to the dispersion assembly drawing that shipped with the dispersion assembly. Replace nozzles with supplied stainless steel plugs as indicated or as needed to avoid critical wetting areas. Ensure that all plugs are tight before conducting the leakage test (Page 56).

FIGURE 34-1: DRAIN VALVE AND DRAIN PIPING AT END OF MANIFOLD SECTION



FIGURE 34-2: INSTALLATION OF NOZZLES



Do not install nozzles where mist pattern will intersect.

Note: Intersecting mist patterns will cause the water droplets to coalesce and drip to the floor.

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High-pressure system piping

FOR AHU APPLICATIONS

Refer to the dispersion and final evaporation media installation drawings that shipped with your High-Pressure System.

For multiple dispersion assemblies refer to manifold drawings supplied with the unit.

1. Install support system for each manifold (typical unistrut), unistrut bolted feet or welding done in field by installing contractor.
2. Mount each manifold into place while maintaining spacing via end connectors using the as-built drawing to identify different stage manifolds, c-bends, and staging valve size.
3. Place compression union on each side of distribution piping.
Note: Make union connections hand-tight only until distribution system is fully assembled.
4. Connect high-pressure solenoid valve on supply side of manifold. Stage valves have different orifices to control flow. Best practice for maintenance access is to have valving outside of AHU/duct. Customers typically chose to leave depressurization valve in AHU for drain to pan. This tends to be easier to install but harder to maintain.
5. Connect depressurization valve to end of manifold section.
6. Arrange manifolds so nozzles in top half of AHU angle down, and nozzles in bottom half of AHU angle up. See Figure 35-1.
7. Adjust remaining rows of manifold to point upwards at a maximum of 45 degrees from horizontal.
8. Tighten all unions.

Important: Refer to the dispersion assembly drawing that shipped with the dispersion assembly. Replace nozzles with supplied stainless steel plugs as indicated or as needed to avoid critical wetting areas. Ensure that all plugs are tight before conducting the leakage test (Page 56).

**FIGURE 35-1: TOP HALF OF MANIFOLDS
ANGLE DOWNWARDS, OTHER HALF
ANGLE UPWARDS**



High-pressure system pressure loss: 0.125" Nylon

Table 36-1:
High-pressure loss (0.125" Nylon)

Developed length of tubing	Maximum humidification load (lbs/hr)							
	5	10	15	20	25	30	35	40
20	1	4	9	16	24	34	45*	58*
40	2	9	19	32	49	68	90	116
60	4	13	28	48	73	102	136	174
80	5	18	38	64	97	136	181	232
100	6	22	47	80	121	170	226	290
125	8	28	59	100	152	212	283	362
150	9	33	71	120	182	255	339	434
200	12	44	94	160	243	340	452	579
250	15	56	118	201	303	425	565	724
300	18	67	141	241	364	510	678	869
400	25	89	188	321	485	680	905	1158
500	31	111	235	401	606	850	1131	1448
750	46	167	353	602	910	1275	1696	2172
1000	62	222	471	802	1213	1700	2262	2896
2000	123	444	942	1604	2426	3400	4523	5792
3000	185	667	1413	2407	3638	5100	6785	8688
4000	246	889	1884	3209	4851	6800	9046	11584
5000	308	1111	2354	4011	6064	8499	11308	14480

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

High-pressure system pressure loss: 0.25" Nylon

Table 37-1:
High-pressure loss (0.25" Nylon)

Developed length of tubing	Maximum humidification load (lbs/hr)												
	10	20	30	40	50	60	70	80	90	100	150	200	250
20	0	0	0	0	0	1	1	1	1	2	3	6	9
40	0	0	0	1	1	1	2	2	3	3	7	11	17
60	0	0	1	1	1	2	2	3	4	5	10	17	26
80	0	0	1	1	2	2	3	4	5	6	13	23	34
100	0	0	1	1	2	3	4	5	6	8	17	28	43
125	0	1	1	2	3	4	5	7	8	10	21	36	54
150	0	1	1	2	3	5	6	8	10	12	25	43	65
200	0	1	2	3	4	6	8	10	13	16	33	57	86
250	0	1	2	4	5	8	10	13	16	20	42	71	108
300	0	1	3	4	7	9	12	16	19	24	50	85	129
400	0	2	3	6	9	12	16	21	26	32	67	114	172
500	1	2	4	7	11	15	20	26	32	39	84	142	215
750	1	3	6	11	16	23	31	39	49	59	125	214	323
1000	1	4	8	14	22	31	41	52	65	79	167	285	431
2000	2	8	17	29	44	61	82	104	130	158	334	570	861
3000	3	12	25	43	66	92	122	157	195	237	502	855	1292
4000	4	16	34	58	87	123	163	209	260	316	669	1140	1723
5000	6	20	42	72	109	153	204	261	325	395	836	1424	2153

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

High-pressure system pressure loss: 0.375" Nylon

Table 38-1:
High-pressure loss (0.375" Nylon)

Developed length of tubing	Maximum humidification load (lbs/hr)													
	50	100	150	200	250	300	350	400	450	500	750	1000	1250	1500
20	0	0	0	1	1	2	2	3	4	4	9	16	24	33
40	0	0	1	2	2	3	4	6	7	9	18*	31*	47*	66*
60	0	1	1	2	4	5	7	9	11	13	27*	47*	71*	99
80	0	1	2	3	5	7	9	11	14	17	37*	62*	94	132
100	0	1	2	4	6	8	11	14	18	22	46*	78*	118	165
125	0	1	3	5	7	10	14	18	22	27	57*	97	147	206
150	0	2	3	6	9	13	17	21	27	32	69*	117	177	248
200	1	2	5	8	12	17	22	29	36	43	91	156	236	330
250	1	3	6	10	15	21	28	36	44	54	114	195	294	413
300	1	3	7	12	18	25	33	43	53	65	137	234	353	495
400	1	4	9	16	24	34	45	57	71	86	183	312	471	660
500	2	5	12	20	30	42	56	71	89	108	229	389	589	825
750	2	8	17	30	45	63	84	107	133	162	343	584	883	1238
1000	3	11	23	40	60	84	111	143	178	216	457	779	1178	1651
2000	6	22	46	79	120	168	223	285	355	432	914	1558	2355	3301
3000	9	33	70	119	179	251	334	428	533	647	1372	2337	3533	4952
4000	12	44	93	158	239	335	446	571	710	863	1829	3116	4711	6603
5000	15	55	116	198	299	419	557	714	888	1079	2286	3895	5888	8253

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

High-pressure system pressure loss: 0.5" Stainless Steel

Table 39-1:
High-pressure loss (0.5" Stainless Steel)

Developed length of tubing	Maximum humidification load (lbs/hr)													
	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500
20	0	1	3	6	10*	15*	20*	27*	35*	43*	53*	63*	74*	86*
40	0	1	5	11	19*	29*	41*	54*	70*	87*	105	126	148	171
60	1	2	8	17	29*	44*	61*	82*	105	130	158	189	222	257
80	1	3	11	23	39*	58*	82*	109	140	174	211	252	296	343
100	1	4	13	28	48*	73*	102	136	174	217	264	315	370	429
125	1	5	17	35	60*	91	128	170	218	271	330	393	462	536
150	2	6	20	43	72*	110	154	204	262	325	396	472	555	643
200	2	7	27	57	97	146	205	272	349	434	527	629	739	857
250	3	9	33	71	121	183	256	341	436	542	659	787	924	1072
300	3	11	40	85	145	219	307	409	523	651	791	944	1109	1286
400	4	15	54	113	193	292	410	545	698	868	1055	1259	1479	1715
500	5	19	67	142	242	365	512	681	872	1085	1319	1573	1848	2144
750	8	28	100	213	362	548	768	1022	1308	1627	1978	2360	2773	3216
1000	10	37	134	284	483	731	1024	1362	1745	2170	2637	3147	3697	4287
2000	21	74	268	567	967	1461	2048	2725	3489	4340	5275	6293	7393	8575
3000	31	111	402	851	1450	2192	3072	4087	5234	6509	7912	9440	11090	12862
4000	41	148	535	1135	1933	2922	4096	5449	6978	8679	10549	12586	14787	17150
5000	51	185	669	1418	2416	3653	5120	6812	8723	10849	13187	15733	18483	21437

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

High-pressure system pressure loss: 0.75" Stainless Steel

Table 40-1:
High-pressure loss (0.75" Stainless Steel)

Developed length of tubing	Maximum humidification load (lbs/hr)													
	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500
20	0	0	0	1	1	2	3	4	5	6	7	9*	10*	12*
40	0	0	1	2	3	4	6	7	9	12	14	17*	20*	23*
60	0	0	1	2	4	6	8	11	14	18	21	26*	30*	35*
80	0	0	1	3	5	8	11	15	19	24	29	34*	40*	46*
100	0	1	2	4	7	10	14	18	24	29	36	43*	50*	58*
125	0	1	2	5	8	12	17	23	30	37	45	53*	63*	73*
150	0	1	3	6	10	15	21	28	35	44	54	64*	75*	87*
200	0	1	4	8	13	20	28	37	47	59	71	85*	100	116
250	0	1	5	10	16	25	35	46	59	73	89	107	125	145
300	0	2	5	12	20	30	42	55	71	88	107	128	150	174
400	1	2	7	15	26	40	55	74	95	118	143	170	200	232
500	1	3	9	19	33	49	69	92	118	147	179	213	250	290
750	1	4	14	29	49	74	104	138	177	220	268	320	376	436
1000	1	5	18	38	65	99	139	185	236	294	357	426	501	581
2000	3	10	36	77	131	198	277	369	473	588	714	852	1001	1161
3000	4	15	54	115	196	297	416	554	709	882	1072	1279	1502	1742
4000	6	20	73	154	262	396	555	738	945	1176	1429	1705	2003	2323
5000	7	25	91	192	327	495	694	923	1182	1470	1786	2131	2504	2904

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

High-pressure system pressure loss: 1.0" Stainless Steel

Table 41-1:
High-pressure loss (1.0" Stainless Steel)

Developed length of tubing	Maximum humidification load (lbs/hr)													
	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500
20	0	0	0	0	0	0	1	1	1	1	2	2	2	3
40	0	0	0	0	1	1	1	2	2	3	4	4	5	6
60	0	0	0	1	1	1	2	3	3	4	5	6	7	9
80	0	0	0	1	1	2	3	4	5	6	7	8	10	11
100	0	0	0	1	2	2	3	5	6	7	9	10	12	14
125	0	0	1	1	2	3	4	6	7	9	11	13	15	18
150	0	0	1	1	2	4	5	7	9	11	13	16	18	21
200	0	0	1	2	3	5	7	9	12	14	18	21	25	29
250	0	0	1	2	4	6	9	11	15	18	22	26	31	36
300	0	0	1	3	5	7	10	14	17	22	26	31	37	43
400	0	0	2	4	6	10	14	18	23	29	35	42	49	57
500	0	1	2	5	8	12	17	23	29	36	44	52	62	71
750	0	1	3	7	12	18	26	34	44	54	66	79	92	107
1000	0	1	4	9	16	24	34	45	58	72	88	105	123	143
2000	1	2	9	19	32	49	68	91	116	145	176	210	246	286
3000	1	4	13	28	48	73	102	136	174	217	264	314	269	428
4000	1	5	18	38	64	97	136	181	232	289	351	419	492	571
5000	2	6	22	47	80	122	171	227	291	361	439	524	616	714

NOTES:

Developed length includes piping and fitting.

Shaded cells are strongly not recommended, due to excessive pressure drop.

* Cells signify pipe velocities over 7 ft/sec and are not recommended.

Connecting communication components

CONTROL INPUT DEVICES

Refer to wiring diagrams supplied with the unit for wiring requirements and connection points.

High-pressure units supplied with DriSteem RO systems:

- A motor starter switch on the RO system is provided to interlock the high-pressure skid. The interlock will reset on the high-pressure system skid automatically when the motor starter has been fixed.

Area-type applications:

- Install a room RH transmitter or dew point transmitter mounted to a standard 4" x 4" electrical junction box that can be insulated in any unconditioned space. Do not mount directly under mist, supply air return, open doors, etc.
- Wire transmitter to pumping station control cabinet or zone control cabinet.
- Run Ethernet cable from zone control to pump control.

AHU applications:

- Install airflow-proving switch at least 10' (3 m) upstream of dispersion manifolds.
- See Figure 16-1 for control sensor installation recommendations.
- Install high limit sensor at least 8-12' (2 - 3 m) downstream of final evaporation media.
- Wire control devices to pumping station or zone control cabinet per system.
- Connect high-pressure solenoid valves to pumping station or zone control cabinet, as indicated for this system.
- Run Ethernet cable from zone control to pump control.

NOTE:

Max distance, without switch, on Ethernet run is 300' (91 m). If necessary add switch between zone control and pump station.

Fan-assist dispersion applications:

- Install a room RH or dewpoint transmitter mounted to a standard 4" x 4" electrical junction box can be insulated in any unconditioned space. Do not mount directly under mist, supply air return, open doors, etc.
- Wire transmitter to pumping station control cabinet or zone control cabinet.
- If applicable, for fan control option selected at sizing, run wire from power circuit relay (24V, supplied by Others) to the Vapor-logic zone control cabinet.
- Run Ethernet cable from zone control to pump control.

Connecting components

WIRING

- Ladder style wiring diagrams (included with unit, separate from this manual) show power, control, and equipment-to-control-cabinet interconnection requirements.
- External connections diagrams (included with unit, separate from this manual) show connection points to the microprocessor-based controller and wire terminals for external safety and control devices, airflow proving switches, high limits, transmitters, fan-assist dispersion, or humidistats.

Note: External connections shown in the wiring diagrams refer to the pump-station-mounted controller for single-zone, single-stage systems; they refer to the individual zone controllers for all other systems.

All wiring must be in accordance with all governing codes and with wiring diagrams.

ELECTRICAL INSTALLATION

Wiring and branch circuit protection is provided by the installer per NEC (or IEC 60364 in Europe) requirements.

For power supply and machine ground connections, size the wire using the 75 °C wiring table, per NEC (or IEC 60364 in Europe) requirements. Then use copper conductors rated for a 105 °C environment. The wiring from the control cabinet to the equipment must be rated for 105 °C.

Verify electrical current characteristics (voltage, phase and amp draw) and capacity requirements against those listed on the name plate.

SERVICE DISCONNECT

A service disconnect must be installed per NEC requirements and governing codes.

PREVENTING ELECTRICAL NOISE

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

Most electrical noise problems can be prevented by using proper wiring practices and techniques to prevent coupling or inducing of electrical interference into control circuits. The following wiring practices should minimize interaction of noise and controls:

- Connect unit and control cabinet to a code approved earth ground.
- Separate the line voltage wiring from low voltage control circuit wiring when routing electrical wiring inside the control cabinet.

WARNING

Electric shock hazard

Only qualified electrical personnel should perform field wiring installation procedures. Improper wiring or contact with energized circuits can cause property damage, severe personal injury, or death as a result of electric shock and/or fire.

Do not open control cabinet or remove heater terminal or subpanel access panels until electrical power is disconnected.

CAUTION

Damage from debris

When drilling penetrations in the control cabinet, protect all internal components from debris, and vacuum out the control cabinet when finished. Failure to comply with this directive can damage sensitive electronic components, cause erratic operation or failure, and void your DriSteem warranty.

Important:

Failure to follow these wiring procedures can result in erratic operation or failure.

This product has been tested at the factory for proper operation. Product failures resulting from faulty handling, incorrect wiring, or shorting of wires together on external components are not covered under your DriSteem warranty. Review information and diagrams before proceeding.

Connecting components

When wiring external electrical connections to humidistats, humidity and temperature transmitters, or control signal input connections from a building control system, use 18-gauge minimum (1 mm²) plenum-rated twisted pair wire with cable shielding and drain wire for grounding.

- Use separate electrical conduits for line and low voltage wiring to the unit.
- Ensure proper supply line voltage wiring on three-phase units. See Caution at right.
- Do not use chassis or safety grounds as current-carrying commons. A safety ground should never be used as a conductor or neutral to return circuit current.
- Return all shielded cable connections to the control cabinet for grounding. **Do not ground shield at the device end.**

CONTROL WIRING

The following wiring methods for external low-voltage control wiring should minimize electrical noise problems:

- Humidistat, room/duct transmitter, and temperature transmitter wiring must be minimum 18-gauge (1 mm²) plenum rated, shielded, twisted pair wire with a bare drain wire for grounding.
- Airflow proving switch wiring must be minimum 18-gauge (1 mm²) stranded wire run in conduit. The airflow proving switch can be wired using minimum 18-gauge (1 mm²) plenum rated, shielded, twisted pair wire with a bare drain wire for grounding.
- The shield wire should be connected to the shield ground terminal/lug in the panel with a length less than 2" (51 mm). Do not ground the shield wire on the humidistat or transmitter end.

GROUNDING REQUIREMENTS

The approved earth ground must be made with solid metal-to-metal connections and must be a good conductor of radio frequency interference (RFI) to earth (multistranded conductors).

Ground wire should be the same AWG (mm²) size as the power wiring or sized per NEC requirements (in Europe, IEC 60364 requirements).

When the control cabinet is mounted remotely from the unit, a ground wire is necessary from the machine ground lug on the unit to the machine ground lug in the control cabinet. The bonding machine ground wire should be the same AWG (mm²) as the largest heater wire or sized per NEC or IEC 60364 requirements.

CAUTION

On three-phase units ensure proper supply line voltage wiring. Incorrect wiring will cause the high-pressure pump to run backwards and void your DriSteem warranty.



WARNING

Excessive moisture hazard

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

Important:

Installing the keypad/display

If the keypad/display has been shipped loose, mount it in a convenient location for easy access, but not inside the control cabinet.

Mount the keypad/display using a field-supplied network phone wall plate. To mount, slide the keypad/display onto the tabs on the phone plate.

Note that the keypad/display requires an ambient temperature range of 32 °F to 122 °F (0 °C to 50 °C) to operate properly. Exceeding these limits results in a poor reading or no reading. Install the keypad/display in a non-condensing environment.

Connecting components

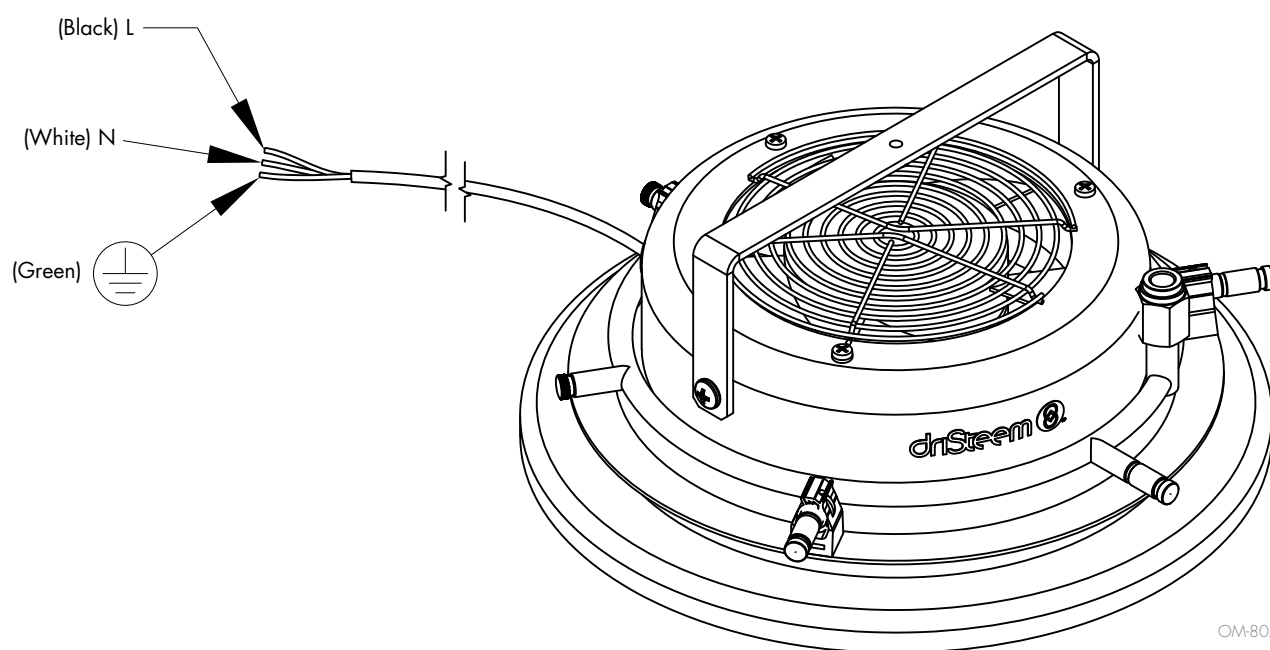
FA-2 AND FA-3 WIRING INSTRUCTIONS

1. Unscrew electrical box.
2. Use the appropriate size insulated cord to wire fan.
3. Land black wire with power terminal or plug.
4. Land white wire on neutral plug or terminal.
5. Green wire shall properly be landed to ground.
6. Replace cover and tighten screws.

NOTE: The fan must be connected to power supply by a licensed electrician. Follow federal, state, and local code.

The fan is normally connected for continuous operation. The air is constantly moving.

FIGURE 45-1: FA-2 AND FA-3



Connecting components

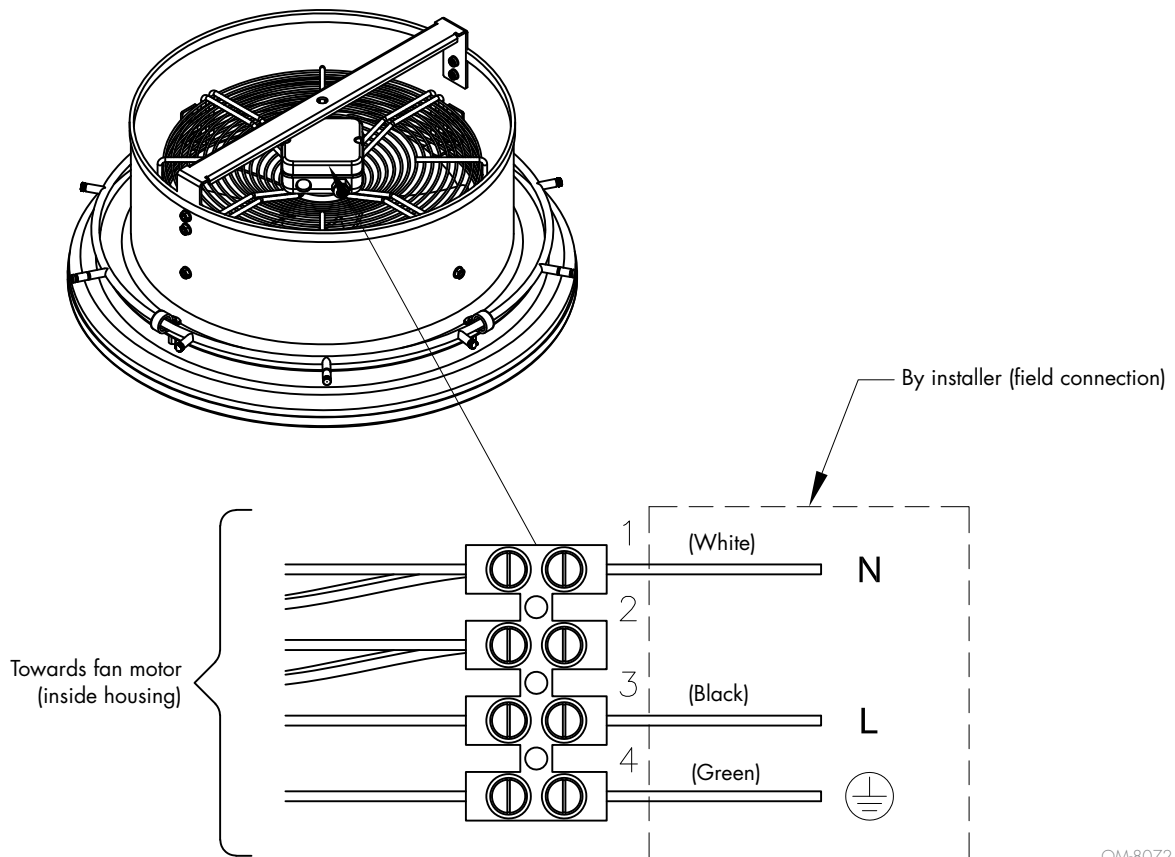
FA-4 WIRING INSTRUCTIONS

1. Unscrew electrical cover.
2. Use the appropriate size insulated cable to wire fan.
3. Remove the cover from the hosing on top of the fan.
4. Attach black wire from the power cord in terminal block #1, the white wire in terminal block #3, and the green wire in terminal block #4 by loosening the set screws, inserting wires, and tightening the set screws. Do not overtighten.
5. Replace cover and tighten screws.

NOTE: The fan must be connected to power supply by a licensed electrician. Follow federal, state, and local code.

The fan is normally connected for continuous operation. The air is constantly moving.

FIGURE 46-1: FA-4 (VIEW OF WIRING WITH HOUSING COVER REMOVED)



OM-8072

Connecting components

NOZZLE INSTALLATION

Area-type dispersion:

Nozzles are installed directly to the manifold before shipping. After the manifolds have been installed, remove each nozzle in a clean space/ environment before proceeding.

1. Connect nozzle to flexible nozzle extension. Handle nozzles carefully, as impacts may affect performance. Do not over-tighten (torque to 25 in-lb.).
2. Install nozzle extension into each saddle. Do not over-tighten (torque to 25 in-lb.).
3. Adjust nozzle orientation using flexible connector to avoid obstacles. Hold flexible nozzle extension tubing at manifold end to avoid overstressing welded connection. Do not bend extensions beyond a bend radius of 1.38" (35 mm).
4. Repeat until all nozzle assemblies are installed.

AHU dispersion:

AHU dispersion manifolds come with nozzles pre-assembled. Refer to the supplied dispersion assembly drawing for proper manifold order and assembly instructions.

Note: Nozzles have been installed at the factory to a torque of 25in-lbs. Torque adapter is provided one per pump station and is used with standard torque tool drive.

Connecting components

FLUSH DISPERSION PIPING AND MANIFOLDS

Verify that pressurized RO storage tank is full and pressurized to approximately 50 psi (345 kPa).

Fan-assist zone valves:

Run parallel directions

1. Remove fan unit from box.
2. Connect city water to the ring (nozzles not installed).
3. Flush fan ring with city water for five minutes to remove construction debris.
4. Install nozzles with hands.
5. Tighten nozzles to 25 in-lb using torquing bit and drive.

DriSteem-controlled zone valves:

For each zone, perform the following procedure:

1. Using zone control cabinet keypad/display change the mode to one of the four modes listed below.
2. Select the zone flush time depending on interconnecting piping and manifold length:
 - 4 minutes (100 ft)
 - 16 minutes (500 ft)
 - 24 minutes (1000 ft)
 - 30 minutes (1500 ft)

Zone controller display will indicate that staging valve cycles on to begin flush, and off to end flush.

3. After zone flush is complete, return system to Auto mode.

Equipment pre-startup checklist

PRIOR TO THE TECHNICAL SUPPORT START -UP VISIT, PLEASE ADVISE DRISTEEM OF ANY SECURITY DOCUMENTS OR PROCEDURES THAT MUST BE MET.

When all items noted here within are complete and ready for installation start-up, please sign the checklist below and forward to DriSteem Technical Services Manager. Once received, DriSteem will proceed with scheduling the site visit.

Note: Failure to complete the below tasks prior to our arrival or changes to the below after our arrival will result in an additional service charge of **\$3,500** per day. Failure to include owners training at the time of start-up will result in an additional charge of **\$3,500** for an additional trip.

Job Site Name _____

Address _____

Installing Contractor _____

Date Installed _____



The camera icon indicates that a photo must be submitted of the equipment along with the checklist when scheduling a site visit from DriSteem Technical Services.

HIGH-PRESSURE ATOMIZING SYSTEM EQUIPMENT INFORMATION

DriSteem Model # _____ Serial # _____ Year Built _____

DriSteem RO Station: Y___ N___ Model # _____ Serial # _____ Year built _____

DriSteem Water Softener: Y___ N___ Model # _____ Serial # _____ Year built _____

DriSteem Dechlorinator.: Y___ N___ Model # _____ Serial # _____ Year built _____

Other source of water treatment serving atomization system: Y___ N___ Notes _____

Location of pumping station unit _____

Number of zones and stages per zone _____

Number of dispersion manifolds _____

Location of dispersion manifolds (Inside AHU, Area Type, etc.) _____

☐ Clearance available for adequate maintenance of pump station-Y___ N___ Notes _____

☐ Clearance available for adequate maintenance of Area Type -Y___ N___ Notes _____

☐ Access is available to the wet section of the duct or AHU dispersion grid(s)-Y___ N___

Notes _____

Pumping station unit properly labeled with nameplates – Y___ N___ Notes _____

Equipment secured: Pumping station-Y___ N___ Dispersion grids-Y___ N___

Evaporation distance downstream from dispersion grids to first obstruction _____

Area drainage for to the wet section of the duct or AHU dispersion grid installed - Y___ N___

Drain piping for area drainage installed – Y___ N___

Location of Humidity/Dew Point/High Limit sensor(s) _____

Equipment pre-startup checklist

LOW PRESSURE WATER TREATMENT PIPING (IF APPLICABLE)


- ___ Perform a water test analysis and forward to DriSteem
- ___ Load dechlorinator and softener media if not factory pre loaded
- ___ ☑ Motorized tank selection valve for duplex water softener is installed and plumbed correctly
- ___ Verify minimum supply water inlet pressure water of 60-90 psi to water treatment components
- ___ Backflow preventer serving entire water treatment system is installed and calibrated
- ___ Inlet service valve installed before water pre-treatment
- ___ Inlet water pressure gauge installed
- ___ ☑ Drain line plumbed from RO pump station to open air gap drain
- ___ ☑ Dechlorinator Inlet/Outlet plumbing is correct
- ___ ☑ Field plumbed dechlorinator bypass piping is installed
- ___ ☑ Dechlorinator drain connection installed and run to floor drain (maintain equip. drain size to floor drain)
- ___ ☑ Softener Inlet/Outlet plumbing is correct
- ___ ☑ Field plumbed softener bypass piping is installed
- ___ ☑ Softener drain connection installed and run to floor drain (maintain equip. drain size to floor drain)
- ___ Brine tank connected to water softener head
- ___ Have salt on site and ready for start-up for brine tank
- ___ Brine tank overflow drain connection installed and run to floor drain (if present)
- ___ Sampling port installed after softener
- ___ 5-micron cartridge filter is installed on RO station
- ___ ☑ RO storage installed in location near RO skid
- ___ ☑ Piping, sample port, and valving between RO skid and RO storage is complete
- ___ Piping to high pressure pump station has check valve installed
- ___ ☑ RO storage has isolation valve installed
- ___ ☑ Piping from RO skid has isolated path to drain including valving with hose connection fitting
- ___ RO pressurized storage pressurized to 28 psi (if used)

Equipment pre-startup checklist

RO STATION, WATER SOFTENER AND DECHLORINATOR CONTROL AND POWER

- ___ Electrical power connected to the RO station
- ___ Electronic meter valves (heads) for water softener & dechlorinator (if tank type) are installed
- ___ Electrical power connected to the RO pump station
- ___ Motorized tank selection valve wiring is connected to the duplex water softener as in IOM
- ___ Electrical outlets for dechlorinator and softener head installed and powered

HIGH-PRESSURE PUMP STATION CONTROL AND POWER

- ___ Enable Main cut-off on panel (if provided)
- ___ Electrical power connected to the high pressure pump station
- ___ Verify the Vapor-logic controller field connections are wired properly
- ___ All solenoid valves are wired and connected in proper stage sequence
- ___ Verify that solenoid valves are connected to the correct AHU
- ___ Verify DDC/BAS control network is wired and complete (if used)
- ___  Zone control boxes are mounted in a dry, controlled temperature condition. See note on page 44.
- ___ Verify Ethernet communication network is installed and functional

Equipment pre-startup checklist

HIGH-PRESSURE PUMP STATION, INTERCONNECTING SUPPLY PIPING, AND DISPERSION GRID

- ___ Verify pump station is level and bolted down
- ___ Verify check valve is installed on HPA outlet
- ___ If dual redundant system, check valves are installed
- ___ ☑ High-pressure line from pump station is connected to the stainless steel interconnecting supply tubing
- ___ All piping connections are tightened
- ___ ☑ Drain lines installed from high pressure pump station
- ___ ☑ All piping supports for interconnecting supply tubing are installed and secure
- ___ Nozzles installed and in proper orientation towards air stream (do not torque nozzles over 25-in.)
- ___ ☑ Supply solenoid valves and manual valves are installed for each zone and each stage
- ___ ☑ End of line depressurization/drain solenoid valves are installed for each zone and each stage
- ___ Saddle plugs (if used) are installed in the required nozzle saddles
- ___ Nozzles mounted at the unistrut supports are plugged
- ___ Dispersion grid C-bends are mounted minimum 1" away from AHU/duct walls
- ___ Verify that each dispersion grid stage line is not touching each other
- ___ AHU drains are installed and connects to base drains
- ___ ☑ Verify dispersion for AHU or duct installation is installed in a wet section
- ___ ☑ Verify Final Evaporation Media (Mist Eliminator) positioned and installed over drain pan
- ___ Final Evaporation Media (Mist Eliminator) rails and filters (if provided) are installed
- ___ Air pressure test on interconnecting tubing complete (Don't open manual shut-off valve at pump station)
- ___ ☑ Interconnecting piping is installed in a controlled space. If installed in freezing conditions, insulated piping and heat trace is needed (design by others)

Form Completed By _____ Date _____

System start-up checklist

For start up of other system components, see relevant equipment IOM.

If an item in the Start-up checklist below does not apply to your system, skip to the next item and continue the process.

- ___ Verify RO quality water is supplied to unit.
- ___ Check for leaks/cracks at all valves, piping and fittings on all supply water plumbing
- ___ Check for leaks/cracks at all fittings and piping on all drainage plumbing
- ___ Turn on power to the unit, and confirm the Main menu is displayed on the keypad/display.
The display may take several seconds to appear as the controller powers up.
- ___ Verify minimum incoming RO pressure is 25 psi (172 kPa).
- ___ All control & power wiring functioning properly
- ___ All sensors installed, connected and functioning properly
- ___ All AHU flow switches (if provided) connected and functioning properly
- ___ Check that Vapor-logic display is on and reading properly
- ___ Supply water purged using small ball valve
- ___ Bleed HP pump
- ___ Start & check HP pump for proper rotation direction
- ___ Check that supply and return sensor readings are accurate and correspond for each AHU
- ___ Check for air-flow switch reading (if provided)
- ___ Check DDC/BAS control network is complete and communicating properly
- ___ Check Demand signal is accurate
- ___ Install cartridge filter and check for leaks. (See "System Piping" on Page 20.)
- ___ Confirm high-pressure tubing has been installed and tested for appropriate fitting alignment.
- ___ **Important:** Flush the High-pressure system before proceeding with start-up by placing the system into "Flush" mode to avoid nozzles becoming clogged.
- ___ Confirm in the Main Menu that the mode is "Auto" and that unit status is "Idle."
- ___ When "Idle" appears in main menu, confirm that the inlet pressure is at least 25 psi (172 kPa) on the display.
- ___ In the Status screen, confirm that the Duct Airflow Switch is closed.
- ___ In the Status screen, confirm that the high limit humidistat input is closed or the high limit transmitter is connected.
- ___ With sufficient water available, the airflow switch closed, the high limit closed, the safety interlock closed, and the unit getting a call for humidity/cooling, verify that the pump is activated.
- ___ If you experience difficulties, have the keypad/display information available along with the serial number and unit Model, and call DriSteem Technical Support at 800-328-4447.

System start-up

START-UP PROCEDURE

Check component installation per the layout shown in Figures 27-1 and 28-1 (depending on your model). After all components are installed and connected properly:

1. Perform all applicable "Start-up checklist" items on Page 57.
2. Read and follow instructions in the Vapor-logic section and "Operation" section of *Vapor-logic Installation and Operation Manual*.
Note: During start-up, do not leave the system unattended.
3. Ensure that pump station unloader valve is operating at correct pressure. See "Confirming unloader valve pressure setting" on page 55.

SEQUENCE OF OPERATION

1. Water stored in the pressurized RO storage tank is pumped by the high-pressure pump, which increases the water pressure in the high-pressure distribution lines to approximately 1000 psig (6.9 MPa).
2. On a demand from the control system, a solenoid valve opens and lets pressurized water flow to the atomizing nozzles.
3. Inside each atomizing nozzle is a mini-turbine that fragments water before it is forced through the nozzle orifice.
4. These very fine fragmented droplets quickly evaporate and are absorbed into the air, increasing the relative humidity and cooling the air.

System start-up

CONFIRMING UNLOADER VALVE PRESSURE SETTING

1. Ensure that there is RO water in pressurized RO holding tank.
2. Ensure that pump station inlet water valve is open, and that water can flow to high-pressure pump.
3. Ensure system is bled and flushed.
4. Bump the pump/motor for three seconds while slowly unscrewing pump end plugs (see Figure 55-2). Bleed until only water is coming out.

NOTE: Do not unthread too much at a time.

5. Close high-pressure outlet valve on pump station.
6. Using pump station keypad/display, enter Test Run mode in Test Run section of Diagnostics menu.
7. Set Test Run duration for 60 seconds.
8. While system is running and recirculating, pump pressure should be in the range of 1200 to 1300 psi (8.3 to 8.9 MPa). If outside this range, use procedure below to set unloader valve pressure to 1225 psi (8.5 MPa):
 - a. Loosen the locknut on end of unloader valve (see Figure 55-1).
 - b. If necessary, start a new 60-second Test Run duration (Step 4 above).
 - c. Using a metric hex key wrench, turn hex key screw on end of unloader valve until pressure reading on pump is approximately 1225 psi (8.5 MPa).
 - d. Tighten locknut that was loosened in Step a.
 - e. Rerun Test mode to ensure output valve opens at set point.
 - f. Put system in Auto mode.

NOTE: The unloader is designed to minimize noise. The design considers flow rate range to unloader model, sequence of operation to minimize pump pressure spike to opened drain valve, and the use of flexible hoses. However, some noise will occur when the unloader is in transition.

FIGURE 55-1: UNLOADER VALVE ON PUMP STATION

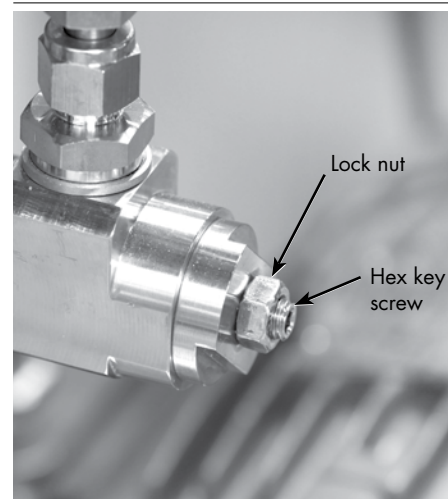


FIGURE 55-2: PUMP PLUG



Start-up

TEST OPERATION

Using the keypad/display or web interface, place the zone controllers (if DriSteem controlled) and pump station in Auto mode. For each zone, perform the following procedure:

1. Create a call for humidity by either increasing RH set point or overriding BMS with a 100% control signal.
 - If using a DriSteem-supplied RH transmitter, increase set point until demand is over 100%.
 - If control signal by others, supply a 100% demand signal.
 - To test system operation, you may need to bypass high limit and airflow proving switch. In such cases, test run will proceed regardless of conditions in zones. To avoid saturation, keep test runs brief, and return safety devices to their proper configurations.
2. Monitor dispersion nozzle performance, and watch for leaks.
3. If a leak is found:
 - a. Remove demand signal, and put zone in Standby mode.
 - b. Tighten any loose connections (including nozzles).
 - c. Return zone to Auto mode, and restart high-pressure pump.
 - d. If a nozzle leak persists, replace nozzle or nozzle assembly.
4. Adjust set point or demand signal to desired value.
5. After all zones have been tested, set pump station in Auto mode.
6. Put system in Auto mode.

Adiatec high-pressure atomizing system checklist

High-pressure pump station

- ☐ Drain solenoid is connected to open drain
- ☐ Level high-pressure pump station using adjustable feet

Instrument panel gauges and operating ranges

_____ PSI RO inlet

High-pressure dispersion gauge reading at full operation

_____ PSI

** Stainless steel pumps are water cooled therefore do not have an oil level to maintain**

High-pressure dispersion

How many stages per zone

How many rows of nozzles per stage

How many zones per atomization pump station unit

- ☐ Final evaporation media/mist eliminator (per drawing)
- ☐ Verify the nozzles maintain proper direction as related to the air flow
- ☐ Nozzles are hand tight and secure to manifold and free of leaks
- ☐ Make sure nozzle caps are removed before starting the unit
- ☐ If parts are replaced the high-pressure lines must be flushed and drained
- ☐ Do not drain lines during humidification season - always maintain pressure in the system

Controls and control cabinet readings and operation

- ☐ Verify operation of main cut-off
- ☐ Verify the touchscreen display is on and reading
- ☐ Run through the key pad menus and functions
- ☐ Verify the supply and return sensors readings are accurate and corresponds to each AHU
- ☐ Verify installation readings of flow switch and zone valves
- ☐ Check that the solenoid valves correspond to the correct AHU
- ☐ Verify the DDC/BAS control network is communicating
- ☐ Verify the demand control reading is accurate

Adiatec high-pressure sequence of operation

For the operation of the humidification equipment, further requirements from the currently valid version of VDI 6022 must be observed.

HIGH-PRESSURE SYSTEM PUMP STATION

1. Demand signal generate by zone controller (zone wants to open valves so tells pump to make pressure) and passed back through Ethernet switch to the pump station.
2. High pressure pump turns on and is controlled by a VFD.
3. VFD maintains outlet pressure of 1,000 psig via a pressure transducer.
4. VL displays demand and output percentages.
5. Pump station monitors inlet pressure and alarms off below 5 psig to protect the water cooled pump.
6. Pump station has internal recirculation, through an unloader valve, when all downstream zone valves are closed.
7. Pump station monitors water temperature and activates a solenoid valve to drain if it gets above 110°F (43.33°C) setpoint.
8. Pump has a run time to signal pump maintenance at 1,000 hours.
9. Pump station after a period of no demand, pump recirculates internally for variable seconds (defined system size dependent, valve type, and communications timing) via an unloader valve.
10. VFD is at minimum RPM's to minimize recirculation.
11. Allows the system to react effectively for precise control.
12. Pump turns off (pump model variable time).
13. High-pressure system has inactivity flush sequence that is user defined but defaulted for every 72 hours of inactivity (helps prevent biological growth by keeping water moving).
14. Flushes for 34-68 minutes depending on system volume/size.

Note:

Per VDI 6022, If operating temperature of the drinking water (< 25°C) cannot be maintained: "In the event of non-compliance, actions must be presented as part of the risk assessment".

Adiatec high-pressure sequence of operation

For the operation of the humidification equipment, further requirements from the currently valid version of VDI 6022 must be observed.

HIGH-PRESSURE SYSTEM ZONE CONTROLLER

1. RH transmitter sends signal to zone controller (Or any of our other demand types).
2. Zone controller reads signal and compares to user defined setpoints.
3. If the RH is below setpoint, the zone sends signal to pump station there is demand.
4. The zone controller energizes the zone inlet valve to the open position (NC valve).
5. The zone will pulse the valve proportional to the demand until the setpoint is met. When the valve is closed it will depressurize depending on valve type (pump model variable time).
6. Zone controller will communicate 0% demand to the pump station.
7. Zone controller will initiate a flush at 72 hours of inactivity to purge any stagnant water, it will flush for 30 minutes.

Note:

- If reset is more frequent than air changes, the control of the high-pressure zone dispersion will chase the setpoint.
- The high-pressure zone will control based on the transmitter location and overall system performance can be affected by equipment downstream (i.e. VAV boxes with reheat, mechanical cooling coils, etc).

Fan-assist dispersion:

1. Fan will turn on as demand is called for (if field provided relay is landed on the zone control box).
2. The valve will open 10 seconds later to humidify.
3. The fan will turn off after 30 seconds of no demand.
4. Fan-assist will flush periodically in small increments to remove stagnant water. It will turn over the volume every 24 hours.

HIGH-PRESSURE SYSTEM RECLAIM SYSTEM

1. Condensate pump float switch closes and the pump turns on to send water back to a reclaim storage tank.
2. The storage tank is filled until the pump float switch closes.
3. Overflow from the reclaim storage tank is sent to an open drain via an overflow port.
4. Upon the activation of the tank float switch the city supply feed valve will close and the reclaimed storage tank supply valve will open to send water to RO system .
5. Water in the storage tank is circulated continuously with the forwarding pump .
6. As long as water is circulating, a tank float switch, will initiate the UV light.

Note:

- Condensate pump has end-switch for alarm, if desired.

Vapor-logic keypad/display:High-pressure system

CONNECTING TO THE NETWORK

The High-Pressure System controller and zone controllers are configured to be connected to a router with a DHCP server available. The controllers are configured to automatically go out and find IP addresses on the network. If a DHCP server is not available, the controllers will need to be configured with a unique static IP address. Go to Setup/Communications/Network IP address on the keypad/display to change the IP address.

WEB INTERFACE COMMUNICATION

Utilizing the Vapor-logic Web interface is optional. The High-Pressure System can be operated using the keypad/display and/or the Web interface. When using the Web interface, the system can be accessed through a network.

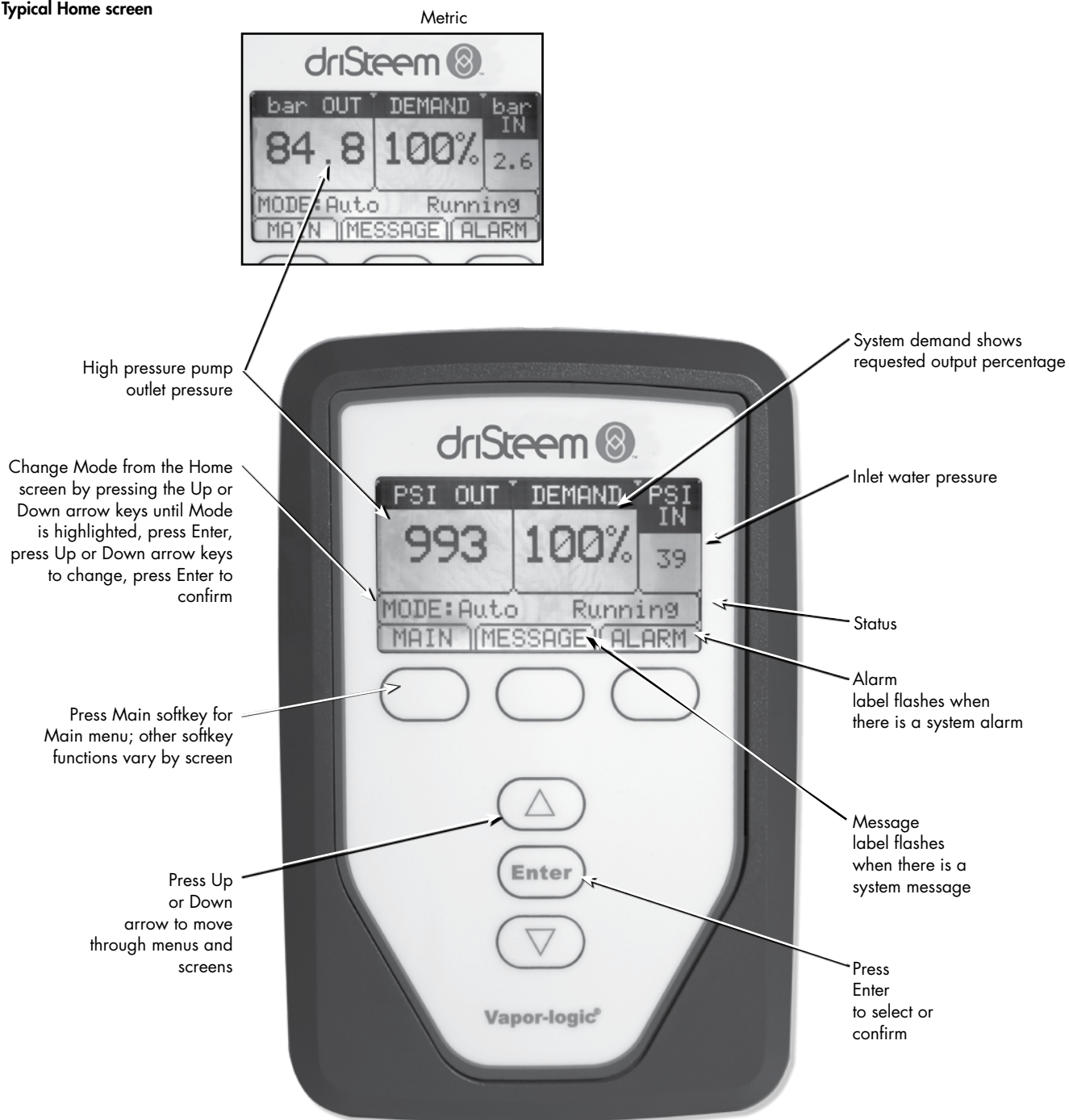
Static IP addresses

See the Vapor-logic Controller Installation and Operation Manual shipped with the High-Pressure System for more information about configuring IP addresses.

High-pressure system keypad/display

FIGURE 61-1: USING THE VAPOR-LOGIC KEYPAD/DISPLAY

Typical Home screen



Keypad/display Home screens, Test outputs, Test run

FIGURE 62-1: PUMP STATION KEYPAD/ DISPLAY HOME SCREEN



FIGURE 62-2: ZONE CONTROLLER KEYPAD/DISPLAY HOME SCREEN



FIGURE 62-3: SPACE RH SCREEN



Vapor-logic returns to the Home screen on the keypad/display after a user-defined period of idleness. The Home screen displays the items most frequently viewed.

CHANGING MODE

Mode can be changed from the Home screen. Press the Up or Down arrow key until the Mode is highlighted, press Enter, press Up or Down arrow key to change value, press Enter to confirm. All other parameters shown on the Home screen are for viewing only and cannot be changed. Go to the Setup menu to change these items.

PUMP STATION CONTROLLER DISPLAY ACTIVITY DEFINITIONS (FIGURE 62-1)

RO flush: System is performing an RO flush.

Idle: No demand, or an active alarm is preventing operation.

Running: System is supplying high-pressure water to meet demand.

Alarm: System has an active alarm.

ZONE CONTROLLER DISPLAY ACTIVITY DEFINITIONS (FIGURE 62-2)

Zone flush: System is performing a zone flush.

TEST OUTPUTS

When completing an installation or repair, cycle all outputs, to verify operation. Go to the test outputs section of the Diagnostics menu and scroll through each connected output to verify operation. During testing, the unit mode changes to Standby and the tank status changes to Test.

TEST RUN

Vapor-Logic has a test run capability to confirm system functionality. This capability allows a technician to simulate a demand when there isn't one (such as when performing routine maintenance). To confirm functionality, go to the test run section of the Diagnostics menu. Set system demand percent and set test run time duration. During testing, the unit mode changes to Standby and the tank status changes to Test.

High-pressure system components

HIGH-PRESSURE PUMP

The all 316 SST high-pressure pump is designed for a minimum of 8000 hours of maintenance-free run time.

If the high-pressure pump fails to meet demand, contact DriSteem to rebuild or replace the high-pressure pump.

GAUGES AND VALVES

Verify proper operation by visual inspection during operation.

HIGH-PRESSURE PIPING SYSTEM

Every three months, verify that all joints are watertight.

SEDIMENT FILTER

Change filter if pressure drops below 10 psi, the minimum inlet pressure, or every one year, whichever comes first. After filter change out, bleed air from line/pump to return to normal operation.

CAUTION

Avoid forcing filter into housing. Forcing the filter can cause a decrease in flow due to channel being limited (See Figure 63-1).

NOZZLES

Nozzles are maintenance-free for many years when used with properly treated water.

Inspect every month to ensure proper operation:

1. **O-rings.** Nozzles are watertight because of o-rings located between nozzle and adapter. Inspect to ensure water tightness. When replacing, hand-tighten until nozzle seats on adapter. Never use tools, besides a torque wrench, to tighten nozzles, if O-ring is over-compressed it can crack or bend, causing leakage. Make sure all components are free of any dust, oil or grease when you install them. Flush and drain high-pressure lines after replacing parts.
2. **Filters.** If nozzles are not dispersing water, nozzle filter could be clogged. Remove nozzle filter and replace filter. Make sure replacement parts are free of any dust, oil or grease when installing them. Flush and drain high-pressure lines after replacing parts.

REPLACEMENT PARTS

When servicing or repairing this equipment, use only DriSteem-approved service replacement parts. Complete replacement part lists are on Pages 71 through 77. Refer to the rating plate on the high-pressure system for complete unit model number, serial number, and company address. Any substitution of parts or controls not approved by DriSteem will be at owner's risk and will void the warranty.

CAUTION

Over-tightened nozzles can cause O-rings to crack or bend leading to leakage. Only tighten nozzles by hand. Apply torque wrench to 25lb_f-in.

Important:

For VDI compliant installation, must comply with VDI 6022.

FIGURE 63-1: DAMAGED FILTER



Table 64-1:
System operating log

[illegible]

Notes

Table 64-2: Filter log

[illegible]

Notes

Hygiene

SCHEDULED HYGIENE MAINTENANCE REQUIREMENTS PER VDI 6022.

Per VDI 6022 required scheduled hygiene maintenance combined (Table 65-1) with microbiological contamination.

The use of biocide is typically needed to disinfect a contaminated system. The use of the biocide should follow local code for type of biocide.

A detailed procedure shall be created at the customer level to handle an event of biological contamination. The following steps are guidelines in relationship to VDI 6022 standard.

1. Evaluate the system for biological activity.
2. Remove system from operation if the biological counts are outside of the facilities planned limits.
3. Remove the biofouling and biofilm with a suitable cleaning method.
4. Cleaned area must be verified to have eliminated the risk to the appropriate threshold.
5. Determine root cause of fouling.
6. Remove the root cause via operation, design, or maintenance methods.
7. If the risk can not be eliminated, the system should be removed from service.

Important:

The user is responsible for operating and maintaining the provided system in accordance with city, state, and federal regulations. See Notice on page iii.

Table 65-1:
Hygiene maintenance

Activity	Action	1 Month	3 Months	6 Months
Check for contamination, damage, microbial growth and corrosion	Clean and repair		X	
Check for stagnant water that is undrained in the AHU/duct, in-space, or plenum.	Clean and repair steam humidifier	X		
Check atomized mist distribution system for deposits	Clean			X
Check spray nozzles for deposits	Clean or replace nozzles	X		
Check drain	Clean and repair		X	
Check bacteria levels (CFU's)	If number of CFUs > 1000 CFU/ml, clean, rinse, and dry the tray; disinfect; test quality of supply water			X
Function check control valve	Repair			X
Check high limit humidistat	Repair			X

Disinfect

Per VDI 6022 disinfection process and the combination of the scheduled maintenance (Table 66-1), the addition of biocides to decentralized humidification equipment is only permitted after a proven microbiological contamination.

- Reference local code and authority for the correct selection of biocide.
- Subsequent disinfection effectiveness must be proven by suitable microbiological methods.
- Only listed disinfectants and procedures are to be used (Robert Koch Institute, RKI)

When system is out of service (> 48Hrs), it will need to complete a draining and drying process.

1. Drain the system and remove any remaining liquid water.
2. Clean the system with an appropriate cleaning methodology.
3. Allow the humidification to dry fully.
4. Follow startup procedure for rinsing of the system.
5. Place unit back into service when needed.

Important:

The user is responsible for operating and maintaining the provided system in accordance with city, state, and federal regulations. See Notice on page iii.

Table 66-1:
Disinfect maintenance

Activity	1 Week	0.5 Months	3 Months	6 Months
Visual inspection by operator for biofilm, algae infestation, deposits, excessive water discharge.	X			
Odor testing by operator	X			
Determination of the total colony count in the circulating water by the operator using the dip-slides test analogous to VDI 6022 Sheet 1 < 100 CFU/ml (incubation at 30°C for 48 to 72 hours).		X		
Determination of the total colony count without circulating water by the operator using the dip-slides test analogous to VDI 6022 Sheet 1 < 100 CFU/ml (incubation at 30°C for 48 to 72 hours).			X	
Qualified sampl (Legionella: <100KBE/ml. Pseudomonas aeruginosa: <100KBE/10 ² ml. Total colony count at 20°C and 36°C each < 150KBE/ml).				X
Check atomizer nozzles for deposits				X
Check the circulation pump for dirt and deposits in the suction line, check the prefilter for condition and function.			X	
Functional test of the sterilization system				X
Complete draining and drying of the humidifier system (out of operation for more than 48 hours)		X		
Check drain and siphon			X	
Functional testing. Preventive maintenance				X
Testing humidistat/high limit humidistat				X

Adiatec high-pressure system troubleshooting

Table 68-1:
Troubleshooting

Issue	Action
The system turns on but it turns off after a certain period of time.	Verify that the low-pressure manual water supply valve is in the Open position.
	Verify that the water pressure is at least 25 psi (170 kPa).
	Verify that the cartridge filter is clean.
	Check for alarms.
	Verify that there are no leaks in the high-pressure network. Repair if needed.
	Verify that the zone depressurization valves are in the Off position.
	Verify that the high-pressure zone manual valves are in the On position.
	Verify that the high-pressure zone valve is not blocked and is in the On position.
	Verify that the pressure gauge on the pump indicates approximately 1000 psi (6.9 MPa).
	Verify that the humidifying nozzles and the filter are not clogged.
	Make sure that 10% of the pump flow capacity (gpm) is used.
Supply water over temperature	Verify that the RO flush valve is not enabled.
	In order to make the pump unit operate again, push the main switch on the power and control panel.
	Verify that the high-pressure staging valves are not blocked and are in the On position.
	Verify that the high-pressure zone manual valve is in the On position.
Some dispersion nozzles do not disperse enough or do not disperse at all.	Verify that the humidifying nozzles or line filter are not sealed off.
	Verify incoming water temperature.
	Make sure the nozzles or filters are not clogged. Replace if needed.
	Verify that the low-pressure manual water supply valve is in the Open position.
	Verify that water pressure is at least 25 psi (170 kPa).
	Verify that the cartridge filter is clean.
	Verify that the high-pressure pump gauge indicates approximately 1000 psi (6.9 MPa). If needed, adjust the operating pressure with the unloader valve. See "Confirming unloader valve pressure setting" on Page 55.
	Verify that the zone staging valves are not blocked and are in the On position.
High-pressure pump emits abnormal noises and excessive vibrations (cavitation)	Verify that the high-pressure zone manual valve is in the On position.
	Verify that the zone depressurization valves are not blocked and are in the Off position.
	Verify that the RO flush valve is not enabled.
	Verify that the low-pressure manual water supply valve is in the Open position.
	Verify that the water pressure is at least 25 psi (170 kPa).
	Verify that the cartridge filter is clean.
	Verify that the low-pressure water supply passage is not blocked.
	Verify that the water supply flow to the pump is adequate.
	Verify that the pump and motor are not exceeding recommended revolutions per minute (rpm).
	Verify that the ball valves are in the open position.
	Vent any air from the high-pressure network.

Adiatec high-pressure system troubleshooting

The following troubleshooting instructions are specific to the DriSteem High-Pressure System. For additional information, including messages and alarms, see the *Vapor-logic Control System High-Pressure System Addendum*.

Table 68-1:
Troubleshooting (continued)

Issue	Action
The system does not start manually or automatically.	Check supply voltage. Check circuit breakers. Check interlock switch.
	Verify that the low-pressure manual water supply valve is in the Open position. Verify that the water pressure is at least 25 psi (170 kPa). Verify that the cartridge filter is clean.
	Check for alarms.
	Check the control and power fuses located inside the control and power panel. Check the transformer voltage.
	Verify that actual relative humidity is lower than desired relative humidity. Verify that the device sending the humidity demand signal is operating. Verify that the humidity detection instrument is calibrated correctly.
	Verify that the Pump Enable switch is in the On position.
The system is operating but provides only low pressure or no pressure.	The pressure gauge on the pump should match the pressure set point. If needed, adjust the operating pressure with the unloader valve. See "Confirming unloader valve pressure setting" on Page 55.
	Check if there are any leaks in the high-pressure lines. Repair if needed.
	Verify that the depressurization valve is turned off.
	Verify that the low-pressure water supply is in the On position. Verify that the low-pressure water supply is at least 25 psi (170 kPa). Verify that the filter cartridge is clean.
	Verify that the RO flush valve is not open.
	Verify that the high-pressure lines are adequately drained with no air in the lines. See "Flush dispersion piping and manifolds" on Page 48.
VFD fault	Verify that the high-pressure supply ball valves are open.
	Make sure that there is adequate ventilation around the motor to keep it from overheating. Verify that the motor fan is operating and unobstructed.
	Verify that the voltage and amperage of the motor electrical supply is adequate and follows the specifications written on the motor.
	Verify that the pressure gauge located on the pump matches the pressure set point. If needed, adjust the operating pressure with the unloader valve. See "Confirming unloader valve pressure setting" on Page 55.
	Verify that the humidifying nozzles or line filters are not sealed off.
	Verify that the high-pressure staging valves are not blocked and are in the On position.
	Verify that the high-pressure zone manual valve is in the On position.

Adiatec fan-assist dispersion troubleshooting

Table 69-1:
Troubleshooting

Issue	Cause	Solution
Fan is not turning on	No power	fix power issue, ensure site wiring is correct/complete.
	Contact not made at controller	Confirm contact at Vapor-logic controller to "fan control contact" from circuit installer relay.
	Site circuit protection is tripped	Fix reason for protection tripping. Turn back on circuit.
	Circuit is on an independent switch	Find switch and turn on.
	Faulty motor	Replace fan unit.
Water is dripping from nozzles or fittings	Defective or clogged nozzle zone valve bypass	Replace nozzle.
	Zone valve bypass	Adjust valve packing or replace.
	Air is in system	Bleed system of air.
	System idle pressure between 100-400 psi (6.9 - 27.5 bar)	Check for system leaks, repair leaks. Check pump for issues and repair.
	Water is below 5 micro Siemens	Adjust water chemistry from RO/DI system.
	Nozzles not tightened	Tighten nozzles with torque tool.
Unit cycles on/off frequently	Humidistat directly under unit	Move humidistat to more uniform area away from unit.
	Humidistat near open door	Move humidistat away from door.
	Defective humidistat	Replace humidistat.
Humidification load not being met	Valve is stuck shut	Fix/replace valve and or coil
	Air change is too high	System evaluation needed compared to original scope.
	Defective humidistat	Replace humidistat.
	Spray nozzles clogged	Replace nozzles.
	System leaks	Find leaks and fix issue.
System needs humidification but is off	Valve is stuck shut	Fix/replace valve and or coil.
	Incorrect wiring	Check/fix wiring terminations to proper location.
	Defective humidistat	Replace humidistat.
	Incorrect zone setpoint	Change zone setpoint.
	Communication between zone controller and pump station is not happening.	Fix communication issue with a reset or add a switch if distance is too long (>300').
Water is condensing	Humidification setpoint too high	Change setpoint.
	Units are too close to each other	Move units to appropriate distances.

Adiatec troubleshooting

HIGH-PRESSURE SYSTEM TROUBLESHOOTING

Follow the procedure below to resolve issues with the high-pressure system:

1. Review possible causes and recommended actions in the Troubleshooting guide in the *Vapor-logic Installation and Operation Manual*.
2. If the Troubleshooting guide does not help you solve the issue, call DriSteem with the following information available:

Humidifier model number, serial number, and firmware version (see nameplate on side of the humidifier and steam blower)

To access firmware version:

Display: Select **Settings** from the home screen, select **Display**, select **Humidifier Info**, see **Firmware Version**

Web interface: Click **Diagnostics** in the toolbar, click **Humidifier info**, see Firmware version below.

When issue began

Example: Always, after remodel, after a change in weather, etc.

Issue description

Example: water leaking, low humidity, high humidity, etc.

System changes

Example: Pressure, new service, new controller, relocation, change in maintenance, etc.

DriSteem Technical Support

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

Humidifier model number

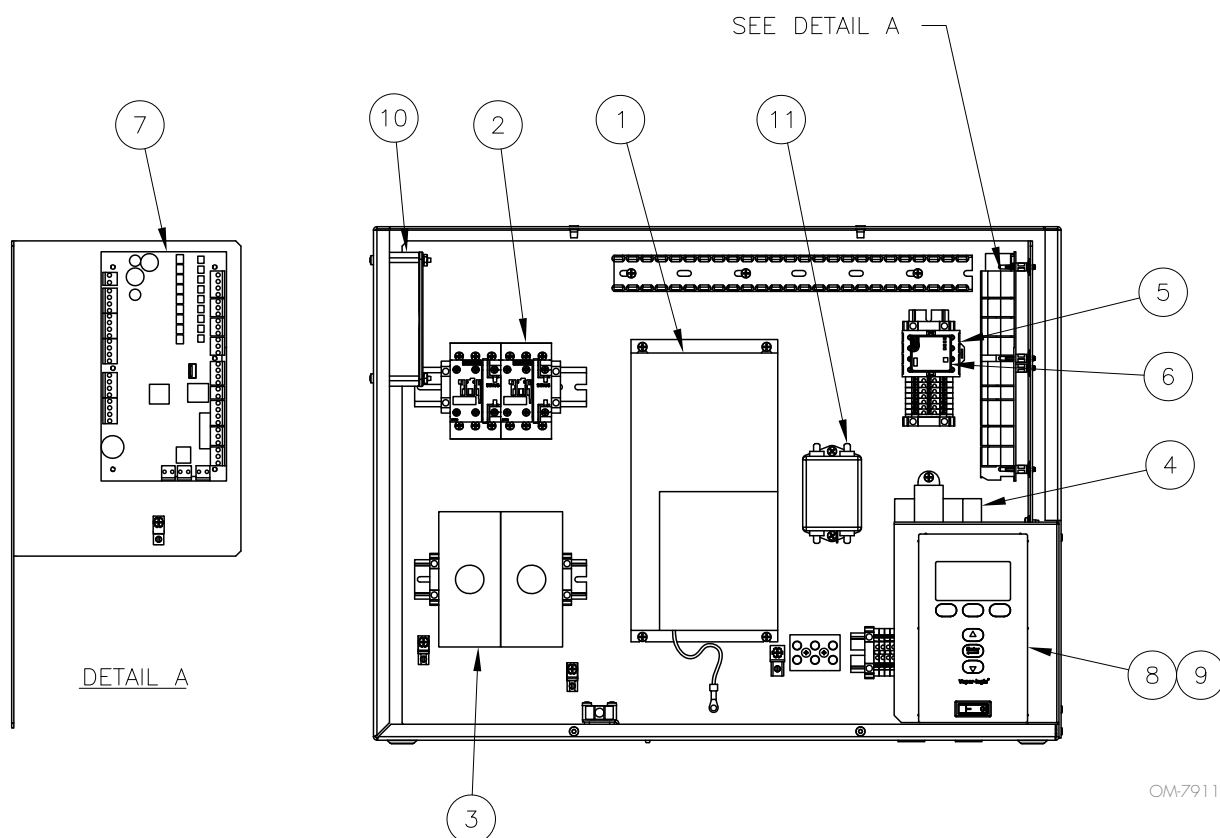
Humidifier serial number

Firmware version

When issue began

Issue description

High-pressure system, single/redundant (50/60 Hz)

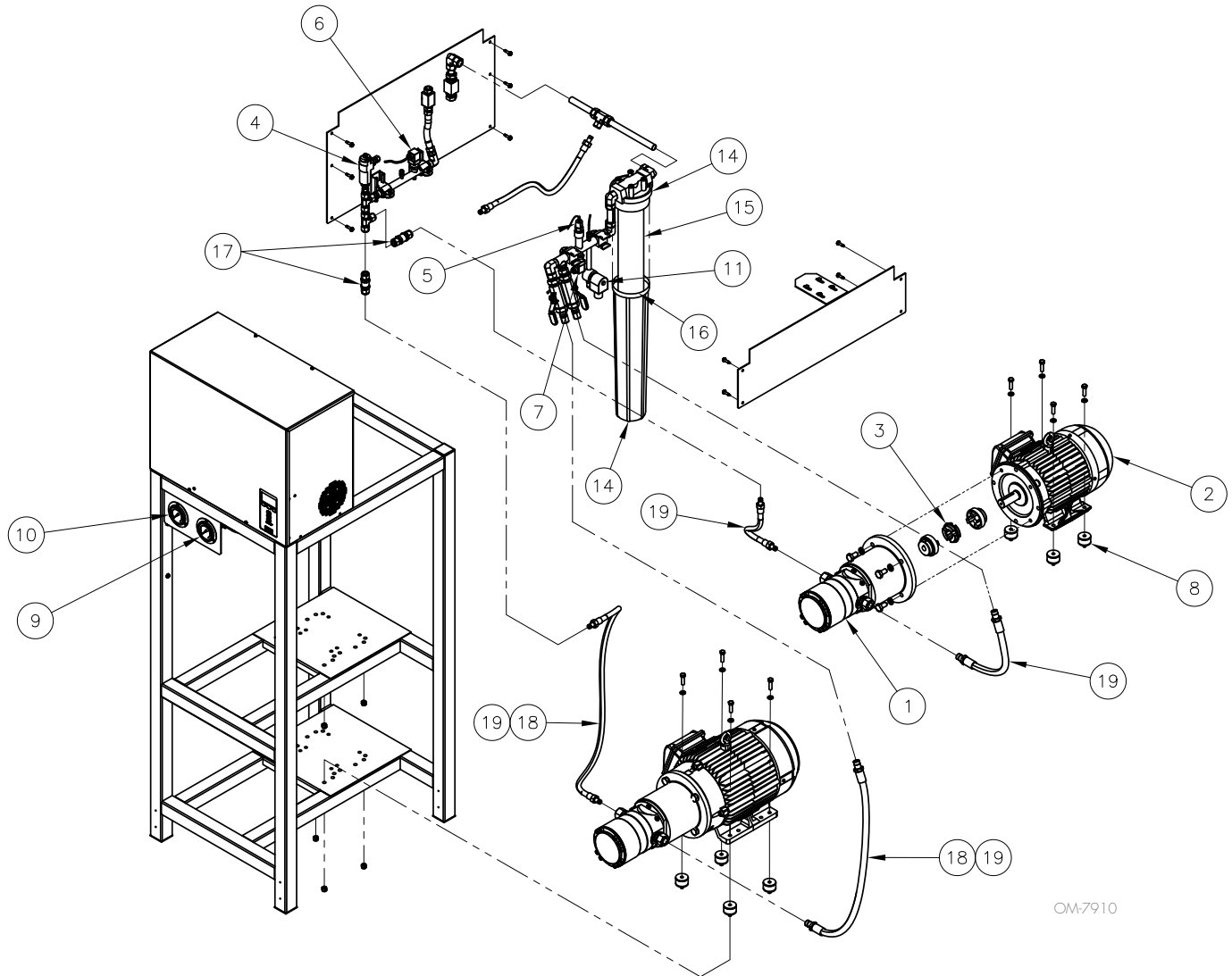
FIGURE 71-1: HIGH-PRESSURE SYSTEM REPLACEMENT PARTS

Table 71-1:
High-pressure system replacements parts

No.	Description	Qty.	Part No.	No.	Description	Qty.	Part No.
1	Drive variable freq 2HP 230 V 1 PH micro	1	407020-101	3	Starter motor manual 1-1.6 AMP rotary	1	407015-101
	Drive variable freq 2HP 480 V 3 PH micro	1	407020-103		Starter motor manual 1.6-2.5 AMP rotary	1	407015-103
	Drive variable freq 3HP 230 V 1 PH micro	1	407020-102		Starter motor manual 2.5-4 AMP rotary	1	407015-105
	Drive variable freq 3HP 480 V 3 PH micro	1	407020-104		Starter motor manual 4-6.3 AMP rotary	1	407015-107
	Drive variable freq 5HP 480 V 3 PH micro	1	407020-105		Starter motor manual 6.3-10 AMP rotary	1	407015-109
	Drive variable freq 7.5HP 480 V 3P micro	1	407020-106		Starter motor manual 11-16 AMP rotary	1	407015-111
	Drive variable freq 10HP 480 V 3PH micro	1	407020-107	4	Transformer 230/380/400 TO 24VAC 75V	1	408980-003
	Drive variable freq 15HP 480 V 3PH micro	1	407020-108	5	Socket relay DPDT without time delay	1	407900-019
	Drive variable freq 2HP 600 V 3 PH micro	1	407021-001	6	Relay 24V DPDT finder	1	407900-016
	Drive variable freq 3HP 600 V 3 PH micro	1	407021-002	7	Main controller VL6	1	408496-006
	Drive variable freq 5HP 600 V 3 PH micro	1	407021-003	8	Membrane VL XTP	1	408495-115
	Drive variable freq 7.5HP 600 V 3 PH micro	1	407021-004	9	Board display VL XT	1	408495-004
	Drive variable freq 10HP 600 V 3 PH micro	1	407021-005	10	Fan cooling 24" leads VM99	1	408677-001
	Drive variable freq 15HP 600 V 3 PH micro	1	407021-006	11	EMC power line filter single phase (50Hz)	1	408800
2	Contactor	1	407010-*		EMC power line filter 3 phase (50Hz)	1	408801

High-pressure system

FIGURE 72-1: HIGH-PRESSURE SYSTEM REPLACEMENT PARTS

Exploded view of the each unique replacement part for the High-pressure system.



OM-7910

High-pressure system

Table 73-1:
High-pressure system replacements parts

No.	Description	Qty.	Part No.	No.	Description	Qty.	Part No.
1	Pump high pressure - PAH 2CC/REV (Model-250/500)	1	400285-001	7	Control transducer low pressure 0-100PSI	1	405882-002
	Pump high pressure - PAH 4CC/REV (Model-1000)	1	400285-003	8	Mount 5/16"-18 vibration damping 55#	1	310171-001
	Pump high pressure - PAH 6.3CC/REV (Model-1750)	1	400285-004		Mount 3/8"-16 vibration damping 125#	1	310171-002
	Pump high pressure - PAH 10CC/REV (Model-2500)	1	400285-005	9	Gauge liquid filled panel mount 0-2000PSI	1	260004-005
	Pump high pressure - PAH 12.5CC/REV (Model-3500)	1	400285-006	10	Gauge liquid filled panel mount 0-100PSI	1	260004-004
	Pump high pressure - PAHT 20CC/REV (Model-5500)	1	400286-001	11	Valve, 1/4" 24V sol .281 orifice, epr seat, sst body	1	505086
2	Motor - 3 Phase 1 HP 208-230/460V	1	407025-001	14	Plumb housing filter 2.5" DIA X 20"	1	550028-002
	Motor - 3 Phase 1.5 HP 208-230/460V	1	407025-002	15	Plumb filter sediment 5 micron 2.5"X20"	1	550026-002
	Motor - 3 Phase 3 HP 208-230/460V	1	407025-004	16	O-ring 2.5" diameter filter housing	1	550028-005
	Motor - 3 Phase 5 HP 208-230/460V	1	407025-005	17	Valve check ½" 1/3PSI	1	505057
	Motor - 3 Phase 7.5 HP 208-230/460V	1	407025-006	18	Hose ½" X 28" TEFLON TSXTS (Single, low pressure, Model-250 thru 1750)	1	307022-028
	Motor - 3 Phase 10 HP 208-230/460V	1	407025-007		Hose ¾" X 28" TEFLON TSXTS (Single, low pressure, Model-2500 THRU 3500)	1	307023-028
	Motor - 3 Phase 15 HP 208-230/460V	1	407025-008		Hose ¾" X 26" TEFLON TSXTS (Single, low pressure, Model-5500)	1	307023-026
	Motor - 3 Phase 1 HP 575V	1	407025-101		Hose ½" X 18" TEFLON TSXTS (Single, high pressure, Model-250 thru 1750)	1	307022-018
	Motor - 3 Phase 1.5 HP 575V	1	407025-102		Hose ½" X 16" TEFLON TSXTS (Single, high pressure, Model-2500 THRU 3500)	1	307022-016
	Motor - 3 Phase 3 HP 575V	1	407025-104		Hose ½" X 12" TEFLON TSXTS (Single, high pressure, Model-5500)	1	307022-012
	Motor - 3 Phase 5 HP 575V	1	407025-105		Hose ½" X 24" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-250 THRU 1750)	1	307022-024
	Motor - 3 Phase 7.5 HP 575V	1	407025-106		Hose ¾" X 24" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-2500 THRU 3500)	1	307023-024
	Motor - 3 Phase 10 HP 575V	1	407025-107		Hose ¾" X 22" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-5500)	1	307023-022
	Motor - 3 Phase 15 HP 575V	1	407025-108		Hose ½" X 42" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-250 THRU 1750)	1	307022-042
3	Coupling insert small Hytrel	1	400303-001	19	Hose ¾" X 42" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-2500 THRU 3500)	1	307023-042
	Coupling insert medium Hytrel	1	400303-002		Hose ¾" X 40" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-5500)	1	307023-040
	Coupling insert large Hytrel	1	400303-003		Hose ½" X 16" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-250 THRU 1750)	1	307022-016
4	Valve pressure relief VRH30	1	300171-001		Hose ½" X 14" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-2500 THRU 3500)	1	307022-014
	Valve pressure relief VRH60	1	300171-002		Hose ½" X 10" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-5500)	1	307022-010
	Valve pressure relief VRH5	1	300171-004		Hose ½" X 38" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-250 THRU 1750)	1	307022-038
5	Sensor temperature ½" NPT 1K RTD	1	405760-003		Hose ½" X 36" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-2500 THRU 3500)	1	307022-036
6	Control transducer high pressure 0-2000 PS	1	405882-001		Hose ½" X 32" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-5500)	1	307022-032

High-pressure system

Table 74-1:
High-pressure system replacements parts

No.	Description	Qty.	Part No.
1	Pump high pressure - PAH 2CC/REV (Model-250/500)	1	400285-001
	Pump high pressure - PAH 4CC/REV (Model-1000)	1	400285-003
	Pump high pressure - PAH 6.3CC/REV (Model-1750)	1	400285-004
	Pump high pressure - PAH 10CC/REV (Model-2500)	1	400285-005
	Pump high pressure - PAH 12.5CC/REV (Model-3500)	1	400285-006
	Pump high pressure - PAHT 20CC/REV (Model-5500)	1	400286-001
2	Motor - 3 Phase 1 HP 230/380V	1	407025-201
	Motor - 3 Phase 2 HP 230/380V	1	407025-202
	Motor - 3 Phase 4 HP 230/380V	1	407025-204
	Motor - 3 Phase 5.5 HP 230/380V	1	407025-205
	Motor - 3 Phase 7.5 HP 230/380V	1	407025-206
	Motor - 3 Phase 10 HP 230/380V	1	407025-207
	Motor - 3 Phase 15 HP 230/380V	1	407025-208
3	Coupling insert small Hytrel	1	400303-001
	Coupling insert medium Hytrel	1	400303-002
	Coupling insert large Hytrel	1	400303-003
4	Valve pressure relief VRH30	1	300171-001
	Valve pressure relief VRH60	1	300171-002
	Valve pressure relief VRH5	1	300171-004
5	Sensor temperature ½" NPT 1K RTD	1	405760-003
6	Control transducer high pressure 0-2000 PS	1	405882-001
7	Control transducer low pressure 0-100PSI	1	405882-002
8	Mount 5/16"-18 vibration damping 55#	1	310171-001
	Mount 3/8"-16 vibration damping 125#	1	310171-002
9	Gauge liquid filled panel mount 0-2000PSI	1	260004-005
10	Gauge liquid filled panel mount 0-100PSI	1	260004-004
11	Valve, 1/4" 24V sol .281 orifice, epr seat, sst body	1	505086
14	Plumb housing filter 2.5" DIA X 20"	1	550028-002
15	Plumb filter sediment 5 micron 2.5"X20"	1	550026-002
16	O-ring 2.5" diameter filter housing	1	550028-005
17	Valve check ½" 1/3PSI	1	505057

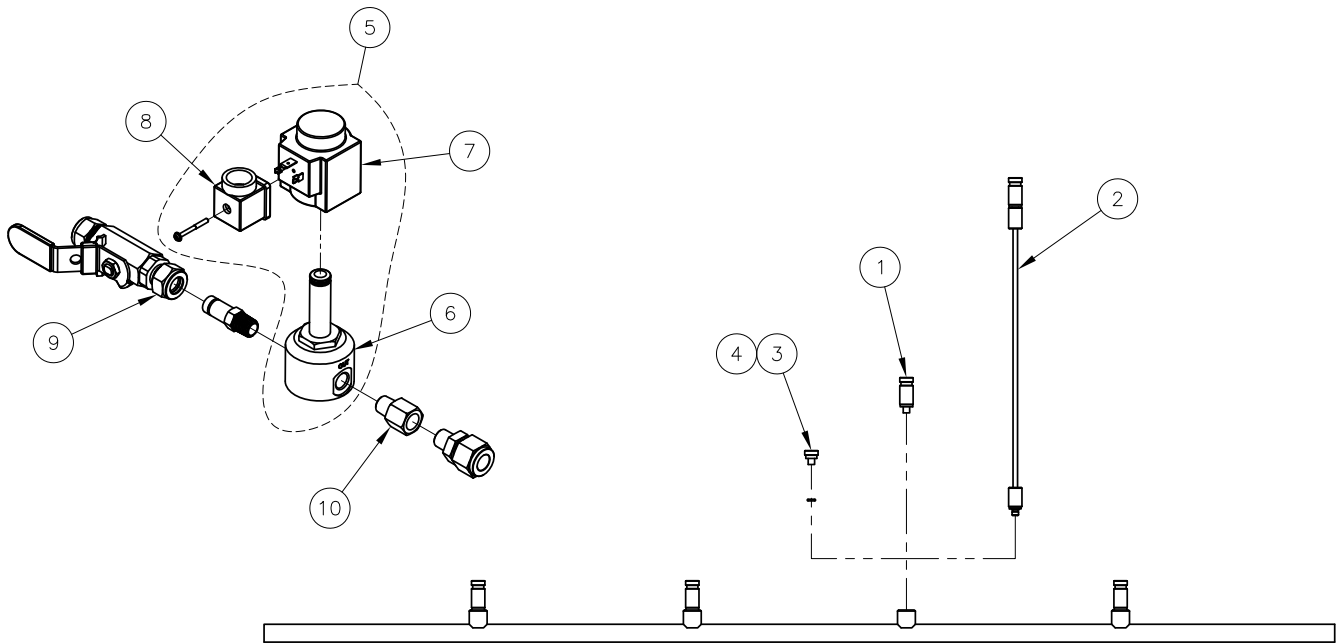
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High-pressure system (Europe/VDI)

Table 75-1:
High-pressure system replacements parts

No.	Description	Qty.	Part No.
18	Hose ½" X 28" TEFLON TSXTS (Single, low pressure, Model-250 thru 1750)	1	307022-028
	HOSE 1/2" X 28" DOUBLE BRAID 316 TSXTS	1	307022-228
	Hose ¾" X 28" TEFLON TSXTS (Single, low pressure, Model-2500 THRU 3500)	1	307023-028
	HOSE 3/4" X 28" DOUBLE BRAID 316 TSXTS	1	307023-228
	Hose ¾" X 26" TEFLON TSXTS (Single, low pressure, Model-5500)	1	307023-026
	HOSE 3/4" X 26" DOUBLE BRAID 316 TSXTS	1	307023-226
	Hose ½" X 18" TEFLON TSXTS (Single, high pressure, Model-250 thru 1750)	1	307022-018
	HOSE 1/2" X 18" DOUBLE BRAID 316 TSXTS	1	307022-218
	Hose ½" X 16" TEFLON TSXTS (Single, high pressure, Model-2500 THRU 3500)	1	307022-016
	HOSE 1/2" X 16" DOUBLE BRAID 316 TSXTS	1	307022-216
	Hose ½" X 12" TEFLON TSXTS (Single, high pressure, Model-5500)	1	307022-012
	HOSE 1/2" X 12" DOUBLE BRAID 316 TSXTS	1	307022-212
19	Hose ½" X 24" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-250 THRU 1750)	1	307022-024
	HOSE 1/2" X 24" DOUBLE BRAID 316 TSXTS	1	307022-224
	Hose ¾" X 24" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-2500 THRU 3500)	1	307023-024
	HOSE 3/4" X 24" DOUBLE BRAID 316 TSXTS	1	307023-224
	Hose ¾" X 22" TEFLON TSXTS (REDUN, PUMP-1, low pressure, Model-5500)	1	307023-022
	HOSE 3/4" X 22" DOUBLE BRAID 316 TSXTS	1	307023-222
	Hose ½" X 42" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-250 THRU 1750)	1	307022-042
	HOSE 1/2" X 42" DOUBLE BRAID 316 TSXTS	1	307022-242
	Hose ¾" X 42" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-2500 THRU 3500)	1	307023-042
	HOSE 3/4" X 42" TEFLON TSXTS	1	307023-242
	Hose ¾" X 40" TEFLON TSXTS (REDUN, PUMP-2, low pressure, Model-5500)	1	307023-040
	HOSE 3/4" X 40" DOUBLE BRAID 316 TSXTS	1	307023-240
	Hose ½" X 16" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-250 THRU 1750)	1	307022-016
	HOSE 1/2" X 16" DOUBLE BRAID 316 TSXTS	1	307022-216
	Hose ½" X 14" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-2500 THRU 3500)	1	307022-014
	HOSE 1/2" X 14" DOUBLE BRAID 316 TSXTS	1	307022-214
	Hose ½" X 10" TEFLON TSXTS (REDUN, PUMP-1, high pressure, Model-5500)	1	307022-010
	HOSE 1/2" X 10" DOUBLE BRAID 316 TSXTS	1	307022-210
	Hose ½" X 38" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-250 THRU 1750)	1	307022-038
	HOSE 1/2" X 38" DOUBLE BRAID 316 TSXTS	1	307022-238
	Hose ½" X 36" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-2500 THRU 3500)	1	307022-036
	HOSE 1/2" X 36" DOUBLE BRAID 316 TSXTS	1	307022-236
	Hose ½" X 32" TEFLON TSXTS (REDUN, PUMP-2, high pressure, Model-5500)	1	307022-032
	HOSE 1/2" X 32" DOUBLE BRAID 316 TSXTS	1	307022-232

High-pressure dispersion system

FIGURE 76-1: HIGH-PRESSURE DISPERSION SYSTEM (10-24 WELDED SADDLE)


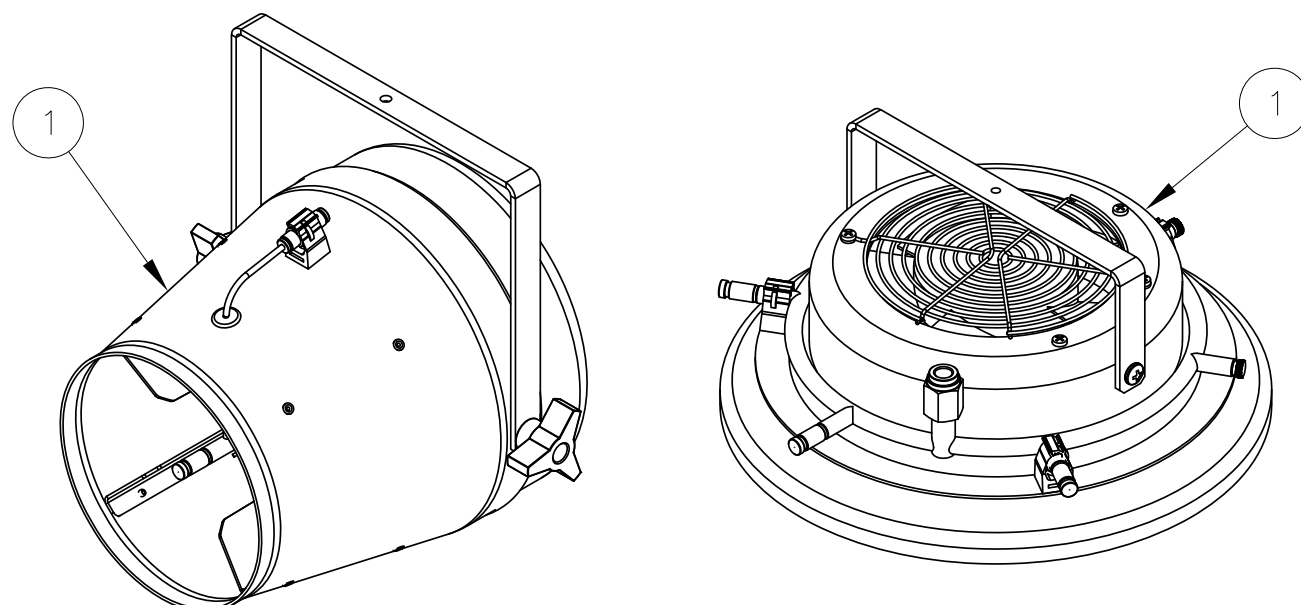
OM-8061

Table 76-1:
High-pressure system

No.	Description	Qty.	Part No.
1	Nozzle assembly 6 lb/hr 0.15 mm hole	1	197102-006
	Nozzle assembly 10 lb/hr 0.20 mm hole	1	197102-010
	Nozzle assembly 15 lb/hr 0.30 mm hole	1	197102-015
2	Nozzle extension assembly 6 pph service kit	1	197101-006
	Nozzle extension assembly 10 pph service kit	1	197101-010
	Nozzle extension assembly 15 pph service kit	1	197101-015
3	Plug manifold 10-24 mnpt nozzle tip	1	270013
4	O-ring 3.5 mm ID x 5.9 mm OD 70D Buna-N	1	300500-006
5	Valve assembly solenoid ¼" staging HPAS	1	184300-001
6	Valve ¼" solenoid high pressure	1	505086-008
7	Valve coil solenoid	1	505086-007
8	Valve coil cap conduit	1	505086-006
9	Valve ball 316SST H-700 ½" CMP	1	505005-001
10	½" Hydraulic hose, 18" L (Not Shown)	1	307022-08
11	Accumulator, ½" connection, 635 psi setpoint (Not Shown)	1	600780

Fan-assist dispersion

FIGURE 77-1: FAN-ASSIST



OM-8073

Table 77-1:
Fan-assist dispersion

No.	Description	Qty.	Part No.
1	High-pressure fan asst small dispersion unit FA-2 115VAC	1	600958
	High-pressure fan asst small dispersion unit FA-2 230VAC	1	600958-001
	High-pressure fan asst medium dispersion unit FA-3 115VAC	1	600959
	High-pressure fan asst medium dispersion unit FA-3 230VAC	1	600959-001
	High-pressure fan asst large dispersion unit FA-4 115VAC	1	600960
	High-pressure fan asst large dispersion unit FA-4 230VAC	1	600960-001

Notes

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For more than 55 years, DriSteem has been leading the industry with creative and reliable humidification control solutions. Our focus on quality is evident in the construction of all our products. DriSteem also leads the industry with an optional extended warranty.

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⁽¹⁾ 36 month extended warranty automatically included for all DriSteem Dehumidifiers.

