RX SERIES

Resistive-to-Steam Humidifier

Installation, Operation, and Maintenance Manual

Read and save these instructions

driSteem

Warnings and cautions

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

⚠ WARNING

Attention installer

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

DriSteem Technical Support: 800-328-4447

Read all warnings and instructions

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

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

Hot surfaces and hot water

This steam humidification system has extremely hot surfaces. Water in tanks, steam pipes, and dispersion assemblies can be as hot as 212 °F (100 °C). Discharged steam is not visible. Contact with hot surfaces, discharged hot water, or air into which steam has been discharged can cause severe personal injury. To avoid severe burns, follow the cool down procedure on page 52 before performing service or maintenance procedures on any part of the system.

Warnings and cautions

WARNING

Disconnect electrical power

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

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

Follow the shutdown procedure on page 52 before performing service or maintenance procedures on any part of the system.

Electric shock hazard

- If the humidifier starts up responding to a call for humidity 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 humidifier (after the tank has cooled down and drained):

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

- The appliance is not to be used by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children being supervised not to play with the appliance.
- Thermal cut-out component is critical to the safety of this equipment: use only DriSteem replacement part.

CAUTION

Hot discharge water

Discharge water can be as hot as 212 °F (100 °C) and can damage some drain plumbing.

To prevent such damage from humidifiers with water tempering disabled, allow the tank to cool before draining.

Humidifiers equipped using internal water tempering or an external water tempering device need fresh make-up water in order to function properly. Make sure the water supply to the humidifier remains open during draining.

Excessive supply water pressure

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

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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 web site:

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

- RTS Catalog and Brochure
- RTS Humidifier Installation, Operation, and Maintenance manual (IOM)
- Vapor-logic touchscreen controller (includes humidifier operation and troubleshooting) IOM

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

DriCalc® sizing and selection software:

DriCalc, our software for humidification system sizing and selection, can be ordered at www.dristeem.com.

Call us at 800-328-4447

Obtaining documents from our web site or from DriCalc is the quickest way to view our literature.

Learn More

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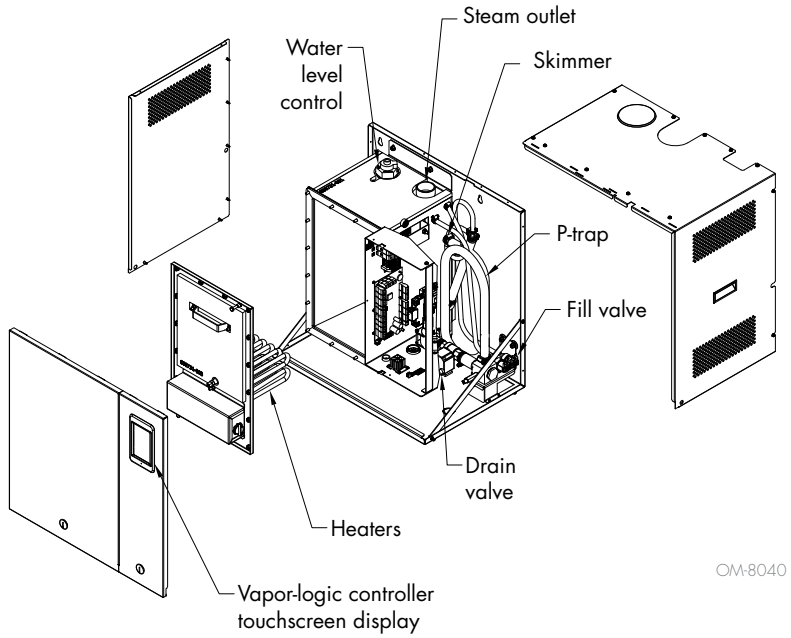
Product overview

From providing comfort humidity to meeting the strictest clean-room requirements, the RTS electric humidifier is designed to meet the humidification demands of any building environment. The RTS humidifier RX series is an electric humidifier that uses resistive heating elements to boil water into steam. While RO/DI water will grant you the best accuracy with the RTS, any water type can be used. Drain rates are automatically determined per the quality of your water, and integrated drain water tempering is standard on every unit.

FIGURE 2-1: RTS HUMIDIFIER

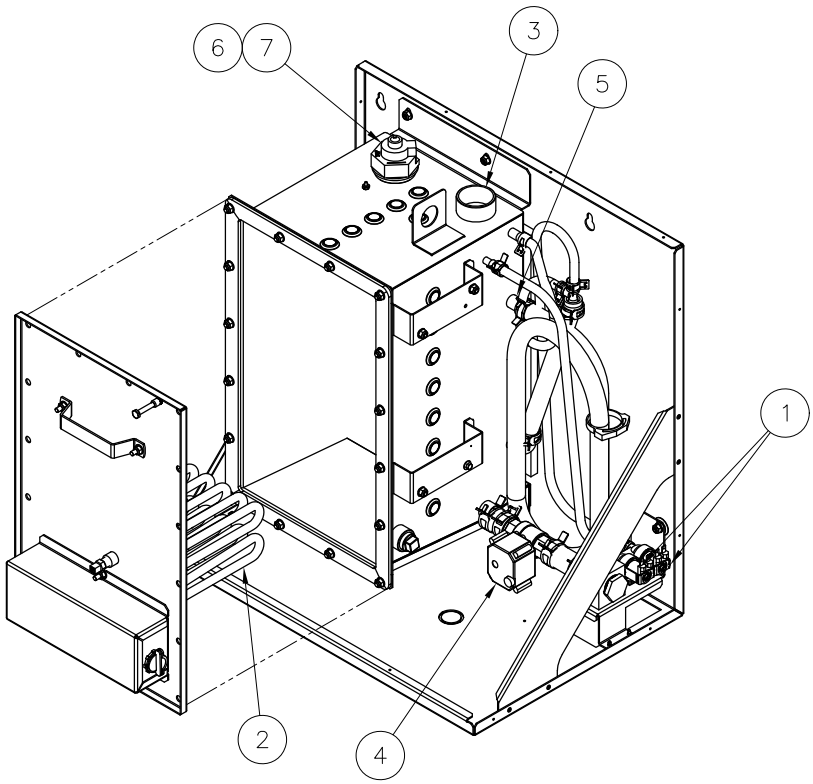


SAFETY FEATURES

- **Tank Temperature Sensor and Fuse:** The tank temperature sensor and fuse is mounted in the tank above the heaters. When the tank temperature exceeds safe operating temperatures, Vapor-logic controller will shut the unit down. As a redundant safety, the fuse is also tied directly to the contactor coils of all stages.
- **Drain Temperature Sensor:** The drain temperature sensor is in the drain manifold. When tempering is enabled, the sensor ensures that the drain water is below 140°F (60°C). This protects drain pipes that are not rated for higher temperatures.
- **Foam Detection:** The top probe of the three-probe system detects foam that may form in the tank. In the case of a foam event, the tank will drain and then continue operation. This protects the heating outputs from over-heating.
- **End-of-Season Drain:** The humidifier will automatically drain after 72-hours of non-use. This is a user-adjustable setting. See the Vapor-logic controller operation manual for instructions on how to adjust this feature.
- **Freeze Protection:** If, for any reason, the tank temperature falls below 40°F (4°C), the humidifier will drain.

Principle of operation

FIGURE 3-1: RTS HUMIDIFIER PRINCIPLE OF OPERATION



OM-8050

1. When the system is first activated, the fast fill valve opens, the precision fill valve opens, and the tank fills with water to the operating level.
2. On a call for humidity, the heating elements are energized, causing the water to boil. The precision fill valve opens and closes as needed to maintain the operating water level between the middle and bottom probes.
3. Steam created in the evaporating chamber flows through vapor hose or piping to the dispersion assembly, where it is discharged into the airstream.
4. Over time, the tank will drain. Steam humidifiers drain to remove chlorides and minerals from the tank.
   - As the humidifier drains, the water will be tempered to under 140°F (60°C). Drain water tempering can be turned off in Settings. See page 28 for more information on drain water tempering.
   - There are a few options when it comes to draining. The Smart Drain setting (default) will detect the cleanliness of the water and drain accordingly. By selecting the User Drain setting, humidifier drain frequency can be programmed. Both Smart Drains and User Drains can be scheduled to happen at a specific time in the day (default is 12:00am). The user can also specify Full Drain or Mini-drain. A Full Drain will drain the tank completely. A Mini-drain will partially drain the tank. If full tank drains are not permitted, Mini-drain shuts the electronic drain water tempering off. An external mechanical tempering device would need to be installed to maintain drain water tempering.
5. After the tank drains and refills, a portion of the surface water is skimmed off, carrying away precipitated minerals.
6. If foam is sensed in the tank, the unit will drain and start over with fresh water – regardless of scheduled drain times.

Models, capacities, and electrical specifications

Table 4-1:
RTS humidifier capacities, electrical specifications

RTS model	Maximum steam capacity		Power	Stages	Total max current draw (amps)										
					Single-phase						Three-phase				
	lbs/hr	kg/h	kW	Contactors	120V	208V	240V	277V	480V	600V	208V	240V	380V	480V	600V
RX-6-1	6	2.7	2	1	16.7	9.6	8.3	21.7	4.2	3.3	—	—	—	—	—
RX-12-1	12	5.4	4	1	33.3	19.2	16.7	21.7	8.3	6.7	16.7	14.4	9.10	7.2	5.8
RX-18-1	18	8.2	6	1	—	28.9	25	21.7	12.5	10	16.7	14.4	9.10	7.2	5.8
RX-24-1	24	10.9	8	1	—	38.5	33.3	43.3	16.7	13.3	25	21.7	13.70	10.8	8.7
RX-30-1	30	13.6	10	1	—	—	41.7	43.3	20.8	16.7	33.3	28.9	18.20	14.4	11.6
RX-36-1	36	16.3	12	1	—	—	—	43.3	25	20	33.3	28.9	18.20	14.4	11.6
RX-42-1	42	19.0	14	1	—	—	—	—	29.2	23.3	41.6	36.1	22.80	18	14.4
RX-48-1	48	21.8	16	1	—	—	—	—	33.3	26.7	—	43.3	27.40	21.7	17.3
RX-63-1	63	28.6	21	1	—	—	—	—	43.8	35	—	—	34.2	27.1	21.7
RX-75-1	75	34.0	25	1	—	—	—	—	—	45	—	—	41	32.5	26
RX-30-2	30	13.6	10	2	—	57.7	—	—	—	—	—	—	—	—	—
RX-36-2	36	16.3	12	2	—	57.7	50	—	—	—	—	—	—	—	—
RX-48-2	48	21.8	16	2	—	76.9	66.7	86.6	—	—	50	—	—	—	—
RX-63-2	63	28.6	21	2	—	—	91.7	86.6	—	—	66.6	57.7	—	—	—
RX-75-2	75	34.0	25	2	—	—	—	—	54.2	—	83.2	72.2	—	—	—
RX-90-2	90	40.8	30	2	—	—	—	—	62.5	50	—	86.6	54.7	43.3	34.6
RX-102-2	102	46.3	34	2	—	—	—	—	70.8	56.7	—	86.6	54.7	43.3	34.6
RX-126-2	126	57.1	42	2	—	—	—	—	87.5	70	—	—	68.4	54.1	43.3
RX-144-2	144	65.3	48	2	—	—	—	—	—	80	—	—	82	65	52
RX-162-2	162	73.5	54	2	—	—	—	—	—	90	—	—	82	65	52

- All RTS humidifier models operate at 50/60 Hz.
- For wire sizing, the highest leg draw is shown due to current imbalance.
- See Table 70-1 for heaters.
- Maximum amps is determined based on the heaters used by each model. Some voltage/kW combinations show higher amperage values than what the unit capacity will allow.
- The standard Short Circuit Current Rating (SCCR) for the RTS humidifier is 5kA. A 65kA rating is available as an option.

Models, capacities, and electrical specifications (continued)

Table 5-1:
RTS humidifier capacities, electrical specifications (continued)

RTS model	Maximum steam capacity		Power	Stages	Total max current draw (amps)										
					Single-phase						Three-phase				
	lbs/hr	kg/h	kW	Contactors	120V	208V	240V	277V	480V	600V	208V	240V	380V	480V	600V
RX-63-3	63	28.6	21	3	—	115.4	—	—	—	—	—	—	—	—	—
RX-75-3	75	34.0	25	3	—	129.8	112.5	130	—	—	—	—	—	—	—
RX-90-3	90	40.8	30	3	—	—	125	130	—	—	99.9	—	—	—	—
RX-102-3	102	46.3	34	3	—	—	—	130	—	—	99.9	—	—	—	—
RX-126-3	126	57.1	42	3	—	—	—	—	—	—	124.9	108.3	—	—	—
RX-144-3	144	65.3	48	3	—	—	—	—	100	—	—	129.9	—	—	—
RX-162-3	162	73.5	54	3	—	—	—	—	112.5	—	—	129.9	—	—	—
RX-189-3	189	85.7	63	3	—	—	—	—	137.5	110	—	—	102.6	81.2	65
RX-216-3	216	98.0	72	3	—	—	—	—	—	120	—	—	123.1	97.4	77.9
RX-243-3	243	110.2	81	3	—	—	—	—	—	135	—	—	123.1	97.4	77.9
RX-102-4	102	46.3	34	4	—	173.1	150	—	—	—	—	—	—	—	—
RX-126-4	126	57.1	42	4	—	—	183.3	173.3	—	—	—	—	—	—	—
RX-144-4	144	65.3	48	4	—	—	—	173.3	—	—	133.2	—	—	—	—
RX-162-4	162	73.5	54	4	—	—	—	—	—	—	166.5	—	—	—	—
RX-216-4	216	98.0	72	4	—	—	—	—	150	—	—	173.2	—	—	—
RX-264-4	264	119.7	88	4	—	—	—	—	183.3	146.7	—	—	164.1	129.9	103.9
RX-288-4	288	130.6	96	4	—	—	—	—	—	160	—	—	164.1	129.9	103.9
RX-324-4	324	146.9	108	4	—	—	—	—	—	180	—	—	164.1	129.9	103.9

- All RTS humidifier models operate at 50/60 Hz.
- For wire sizing, the highest leg draw is shown due to current imbalance.
- See Table 70-1 for heaters.
- Maximum amps is determined based on the heaters used by each model. Some voltage/kW combinations show higher amperage values than what the unit capacity will allow.
- The standard Short Circuit Current Rating (SCCR) for the RTS humidifier is 5kA. A 65kA rating is available as an option.

Models, capacities, and electrical specifications (Europe)

Table 6-1:
RTS humidifier capacities, electrical specifications (Europe)

RTS model	230V Single Phase					400V Three Phase				
	Maximum Steam Capacity		Power	Total Maximum Current Draw	Heater Configuration*	Maximum Steam Capacity		Power	Total Maximum Current Draw	Heater Configuration
	lbs/hr	kg/hr	kW	amps		lbs/hr	kg/hr	kW	amps	
RX-6-1	5.5	2.5	2	8	1-103	—	—	—	—	—
RX-12-1	11	5.0	4	16	1-109	12	5.4	4	8.70	2-105
RX-18-1	16.5	7.5	6	24	1-116	18	8.2	6	8.70	3-105
RX-24-1	22	10.0	8	31.9	2-109	24	10.9	8	13.00	2-105, 1-111
RX-30-1	27.6	12.5	10	39.9	1-109, 1-116	30	13.6	10	17.30	1-105, 2-111
RX-36-1	33.1	15.0	12	47.92	2-116	36	16.3	12	17.30	3-111
RX-42-1	—	—	—	—	—	42	19.0	14	21.70	2-111, 1-119
RX-48-1	—	—	—	—	—	48	21.8	16	26.00	1-111, 2-119
RX-63-1	—	—	—	—	—	63	28.6	21	32.5	2-119, 1-125
RX-75-1	—	—	—	—	—	75	34.0	25	39	3-125
RX-48-2	44.1	20.0	16	63.9	4-109	—	—	—	—	—
RX-63-2	66.1	30.0	21	95.8	4-116	—	—	—	—	—
RX-90-2	—	—	—	—	—	90	40.8	30	52	2-111, 4-119
RX-102-2	—	—	—	—	—	102	46.3	34	52	6-119
RX-126-2	—	—	—	—	—	126	57.1	42	65	4-119, 2-125
RX-144-2	—	—	—	—	—	144	65.3	48	77.9	2-119, 4-125
RX-162-2	—	—	—	—	—	162	73.5	54	77.9	6-125

- All RTS humidifier models operate at 50/60 Hz.
- For wire sizing, the highest leg draw is shown due to current imbalance.
- *600931 are the first digits of the heater part number.
- Maximum amps is determined based on the heaters used by each model. Some voltage/kW combinations show higher amperage values than what the unit capacity will allow.
- Short Circuit Current Rating (SCCR): 5kA

Models, capacities, and electrical specifications (Europe)

Table 7-1:
RTS humidifier capacities, electrical specifications (Europe)

RTS model	230V Single Phase					400V Three Phase				
	Maximum Steam Capacity		Power	Total Maximum Current Draw	Heater Configuration	Maximum Steam Capacity		Power	Total Maximum Current Draw	Heater Configuration
	lbs/hr	kg/hr	kW	amps		lbs/hr	kg/hr	kW	amps	
RX-75-3	74.4	33.7	25	107.8	3-123	—	—	—	—	—
RX-90-3	90.9	41.2	30	131.8	3-103, 3-123	—	—	—	—	—
RX-102-3	99.2	45.0	34	143.8	6-116	—	—	—	—	—
RX-189-3	—	—	—	—	—	189	85.7	63	97.4	6-119, 3-125
RX-216-3	—	—	—	—	—	216	98.0	72	116.9	3-119, 6-125
RX-243-3	—	—	—	—	—	243	110.2	81	116.9	9-125
RX-126-4	121.2	55.0	42	175.7	4-103, 4-123	—	—	—	—	—
RX-144-4	132.3	60.0	48	191.7	8-116	—	—	—	—	—
RX-264-4	—	—	—	—	—	264	119.7	88	155.9	4-111, 8-125
RX-288-4	—	—	—	—	—	288	130.6	96	155.9	4-119, 8-125
RX-324-4	—	—	—	—	—	324	146.9	108	155.9	12-125

- All RTS humidifier models operate at 50/60 Hz.
- For wire sizing, the highest leg draw is shown due to current imbalance.
- *600931 are the first digits of the heater part number.
- Maximum amps is determined based on the heaters used by each model. Some voltage/kW combinations show higher amperage values than what the unit capacity will allow.
- Short Circuit Current Rating (SCCR): 5kA

Weights: RX-XX-1 and RX-XX-2

Table 8-1:
RTS humidifier (RX-XX-1 and RX-XX-2) weights

RTS model	Indoor Enclosure				Outdoor Enclosure				No Enclosure			
	Dry Weight* (Empty)		Operating Weight		Dry Weight* (Empty)		Operating Weight		Dry Weight* (Empty)		Operating Weight	
	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
RX-6-1	92.9	42.2	137.1	62.3	357.7	162.6	401.5	182.5	91.3	41.5	135.5	61.6
RX-12-1	94.1	42.8	138.3	62.9	358.5	163.0	402.7	183.0	92.5	42.0	136.7	62.1
RX-18-1	95.3	43.3	139.5	63.4	359.7	163.5	403.9	183.6	93.7	42.6	137.9	62.7
RX-24-1	95.3	43.3	139.5	63.4	359.7	163.5	403.9	183.6	93.7	42.6	137.9	62.7
RX-30-1	95.3	43.3	139.5	63.4	359.7	163.5	403.9	183.6	93.7	42.6	137.9	62.7
RX-36-1	95.3	43.3	139.5	63.4	359.7	163.5	403.9	183.6	93.7	42.6	137.9	62.7
RX-42-1	95.7	43.5	139.9	63.6	360.1	163.7	404.3	183.8	94.1	42.8	138.3	62.9
RX-48-1	96.1	43.7	140.3	63.8	360.5	163.9	404.7	184.0	94.5	43.0	138.7	63.0
RX-63-1	97.0	44.1	141.2	64.2	361.4	164.3	405.6	184.4	95.4	43.4	139.6	63.5
RX-75-1	98.0	44.5	142.2	64.6	362.4	164.7	406.6	184.8	96.4	43.8	140.6	63.9
RX-30-2	132.6	60.3	246.9	112.2	397.6	180.7	511.9	232.7	131.6	59.8	245.9	111.8
RX-36-2	132.6	60.3	246.9	112.2	397.6	180.7	511.9	232.7	131.6	59.8	245.9	111.8
RX-48-2	136.6	62.1	250.9	114.0	401.6	182.5	515.9	234.5	135.6	61.6	249.9	113.6
RX-63-2	136.6	62.1	250.9	114.0	401.6	182.5	515.9	234.5	135.6	61.6	249.9	113.6
RX-75-2	140.6	63.9	254.9	115.8	405.6	184.4	519.9	236.3	139.6	63.5	253.9	115.4
RX-90-2	138.2	62.8	252.5	114.8	403.2	183.3	517.5	235.2	137.2	62.4	251.5	114.3
RX-102-2	139.0	63.2	253.3	115.1	404.0	183.6	518.3	235.6	138.0	62.7	252.3	114.7
RX-126-2	140.0	63.6	254.3	115.6	405.0	184.1	519.3	236.0	139.0	63.2	253.3	115.1
RX-144-2	141.0	64.1	255.3	116.0	406.0	184.5	520.3	236.5	140.0	63.6	254.3	115.6
RX-162-2	142.0	64.5	256.3	116.5	407.0	185.0	521.3	236.9	141.0	64.1	255.3	116.0

* Add approximately 46 lbs (21 kg) for packaging material for shipping weight.

Weights: RX-XX-3 and RX-XX-4

Table 9-1:
RTS humidifier (RX-XX-3 and RX-XX-4) weights

RTS model	Indoor Enclosure				Outdoor Enclosure				No Enclosure			
	Dry Weight*		Operating Weight		Dry Weight*		Operating Weight		Dry Weight*		Operating Weight	
	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
RX-63-3	193.5	88.0	450.4	204.7	476.3	216.5	733.1	333.2	166.0	75.5	422.9	192.2
RX-75-3	192.6	87.5	449.5	204.3	475.4	216.1	732.2	332.8	165.1	75.0	422.0	191.8
RX-90-3	197.1	89.6	454.0	206.4	479.9	218.1	736.7	334.9	169.6	77.1	426.5	193.9
RX-102-3	197.1	89.6	454.0	206.4	479.9	218.1	736.7	334.9	169.6	77.1	426.5	193.9
RX-126-3	198.3	90.1	455.2	206.9	481.1	218.7	737.9	335.4	170.8	77.6	427.7	194.4
RX-144-3	199.5	90.7	456.4	207.4	482.3	219.2	739.1	336.0	172.0	78.2	428.9	194.9
RX-162-3	200.7	91.2	457.6	208.0	483.5	219.8	740.3	336.5	173.2	78.7	430.1	195.5
RX-189-3	202.5	92.0	459.4	208.8	485.3	220.6	741.8	337.2	175.0	79.5	431.9	196.3
RX-216-3	203.7	92.6	460.6	209.4	486.5	221.1	743.3	337.9	176.2	80.1	433.1	196.9
RX-243-3	205.2	93.3	462.1	210.0	488.0	221.8	744.8	338.6	177.7	80.8	434.6	197.5
RX-102-4	196.2	89.2	453.1	205.9	479.0	217.7	735.8	334.5	168.7	76.7	425.6	193.4
RX-126-4	201.0	91.4	457.9	208.1	483.8	219.9	740.6	336.6	173.5	78.9	430.4	195.6
RX-144-4	202.2	91.9	459.1	208.7	483.4	219.7	741.8	337.2	174.7	79.4	431.6	196.2
RX-162-4	203.8	92.6	460.7	209.4	486.6	221.2	743.4	337.9	176.3	80.1	433.2	196.9
RX-216-4	207.0	94.1	463.9	210.9	489.8	222.6	746.6	339.4	179.5	81.6	436.4	198.4
RX-264-4	209.4	95.2	466.3	211.9	492.2	223.7	749.0	340.5	181.9	82.7	438.8	199.4
RX-288-4	211.0	95.9	467.9	212.7	493.8	224.4	750.6	341.2	183.5	83.4	440.4	200.2
RX-324-4	213.0	96.8	469.9	213.6	495.8	225.3	752.6	342.1	185.5	84.3	442.4	201.1

* Add approximately 46 lbs (21 kg) for packaging material for shipping weight.

Water

SUPPLY WATER GUIDELINES

Supply water quality is an important component of humidifier reliability and maintenance.

Examples:

- Corrosive water can significantly decrease the service life of the humidifier due to tank or heat exchanger failure.
- Excessive water hardness can increase the humidifier maintenance requirements.

To maximize humidifier service life and minimize humidifier maintenance, DriSteem has established guidelines for supply water. See Table 11-1.

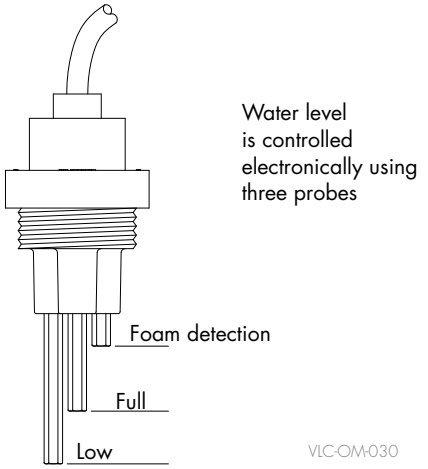
WATER LEVEL CONTROL

DriSteem's RTS humidifier controls water level using a three-probe conductivity system (see Figure 10-1). The Vapor-logic controller automatically provides a steady steam output while maintaining the water level between the bottom and middle probes. The top probe is used for foam detection, and the humidifier will drain if that probe detects conductivity. If water falls off the bottom probe, power will be cut to the heating elements to prevent the humidifier from operating with no water and over-heating.

UNIVERSAL WATER

DriSteem's RTS humidifier RX series incorporates universal water control for use with any water type (well, tap, softened, DI or RO water). There is no need to change control configurations based on water type when ordering equipment or retrofitting to fit new water sources in the field. The water level control algorithm monitors water quality and any changes over time to assure the user of accurate control no matter the type of water that is used.

FIGURE 10-1: WATER LEVEL CONTROL



Water

Table 11-1: DriSteem supply water guidelines

Chlorides*	
Tap water	< 50 ppm
RO/DI water	< 5 ppm
Softened water	< 25 ppm
* Damage caused by chloride corrosion is not covered by your DriSteem warranty.	
Total hardness	
Tap water	< 500 ppm (29 gpg)
pH	
Tap water	6.5 to 8.5
RO/DI, softened water	7.0 to 8.0
Silica	< 15 ppm

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

Table 11-2: Supply water requirements

Supply water pressure (static and dynamic)	25-80 psi at 6.0 gpm flow rate	172-552 kPa
Supply water flow rate	6.0 gpm	21 L/min
Supply water temperature	34°F to 70°F*	1°C to 21°C

* If integral drain water tempering is disabled, maximum water temperature is 90°F (32°C).

Table 11-3: Fill and drain rates*

RTS tank size	Maximum drain rate (gpm)	Drain time, un-tempered (minutes)	Drain time, tempered (minutes)	Fill rate (gpm)	Fill time to mid probe (minutes)	Operating water volume	
						Tank volume (gallons)	Tank volume (liters)
RX-6-1, RX-12-1, RX-18-1, RX-24-1, RX-30-1, RX-36-1, RX-42-1, RX-48-1, RX-63-1, RX-75-1	8	2	4	3.3	2	5	18.9
RX-30-2, RX-36-2, RX-48-2, RX-62-2, RX-75-2	11	4	8	3.3	4	13.5	51.1
RX-90-2, RX-102-2, RX-126-2, RX-144-2, RX-162-2	11	4	8	3.5	4	13.5	51.1
RX-63-3, RX-75-3	12	8	16	3.3	9	29.5	111.7
RX-90-3, RX-102-3, RX-126-3, RX-144-3, RX-162-3, RX-102-4, RX-126-4, RX-144-4, RX-162-4	12	8	16	3.5	8	29.5	111.7
RX-189-3, RX-216-3, RX-243-3, RX-216-4, RX-243-4	12	8	16	3.8	8	29.5	111.7
RX-264-4, RX-288-4, RX-324-4	12	8	16	4.3	7	29.5	111.7

*Fill and drain rates are approximate and based on 60 psi supply water pressure.

Water

SIZING A REVERSE OSMOSIS (RO) SYSTEM FOR YOUR DRISTEEM STEAM HUMIDIFIER

DriCalc® sizing and selection software uses the following method to properly size RO systems and RO permeate storage tanks for humidification applications. Under sizing your RO system will result in humidifiers that are slow to fill – potentially alarming out due to "Excessive fill time." On the flip side, over-sizing your RO system could result in water sitting stagnant in the system for unsafe amounts of time. The example given below is carried through to all three steps.

1. To begin, gather these three pieces of information:
   a. Maximum steam capacity of humidifier (lbs/hr or kg/hr)
      - For multiple humidifiers, add the capacities of each humidifier together
   b. Humidifier tank size (water capacity) (gallons or liters)
      - For multiple humidifiers, use the largest single tank size. Ensure tank drain times are staggered to allow for proper RO water regeneration. This setting is user-adjustable in the Vapor-logic controller.
   c. Determine if the humidifier/s will be using integral tempering. Integral tempering is only an option on the GTS LX series humidifier and RTS RX series humidifier. Using integral drain water tempering will drive a larger permeate storage tank.

   Example: Qty 3 RX-102-2 humidifiers:

   - Max steam capacity = 3qty x 102 lbs/hr (46.3 kg/hr) = 306 lbs/hr (138.9 kg/hr)
   - Tank size of an RX-102-2 humidifier = 13.5 gallons (51.1 liters)
   - Integral tempering = Yes

Water

2. Determine RO system size using the following calculation: [humidifier capacity x 1.3]. Select an RO system with the capacity equal to or greater than this number.

   Example: 306 lbs/hr (138.9 kg/hr) x 1.3 = 397.8 lbs/hr (180.57 kg/hr)

   The RO system with enough capacity is DriSteem's RO-401 water treatment system. The RO-401 has a capacity of 498 lbs/hr (226 kg/hr) at 50° F.

3. Determine permeate storage tank size using the following calculation. This will ensure any DriSteem humidifier will fill with water in ten minutes or less.

   a. Using integrated tempering: [(2 x humidifier tank size) - (selected RO capacity x 10 min ÷ 60min/hr ÷ 8.35lb/gal)]

      Metric: [(2 x humidifier tank size) - (selected RO capacity x 10 min ÷ 60min/hr)]

   b. Not using integrated tempering: [humidifier tank size - (selected RO capacity x 10 min ÷ 60min/hr ÷ 8.35lb/gal)]

      Metric: [humidifier tank size - (selected RO capacity x 10 min ÷ 60min/hr)]

   Example:

   = (2 x 13.5 gallons – (498 lbs/hr x 10 min ÷ 60 min/hr ÷ 8.35 lb/gal)
   Metric: = (2 x 51.1 liters – (296 kg/hr x 10 min ÷ 60 min/hr)

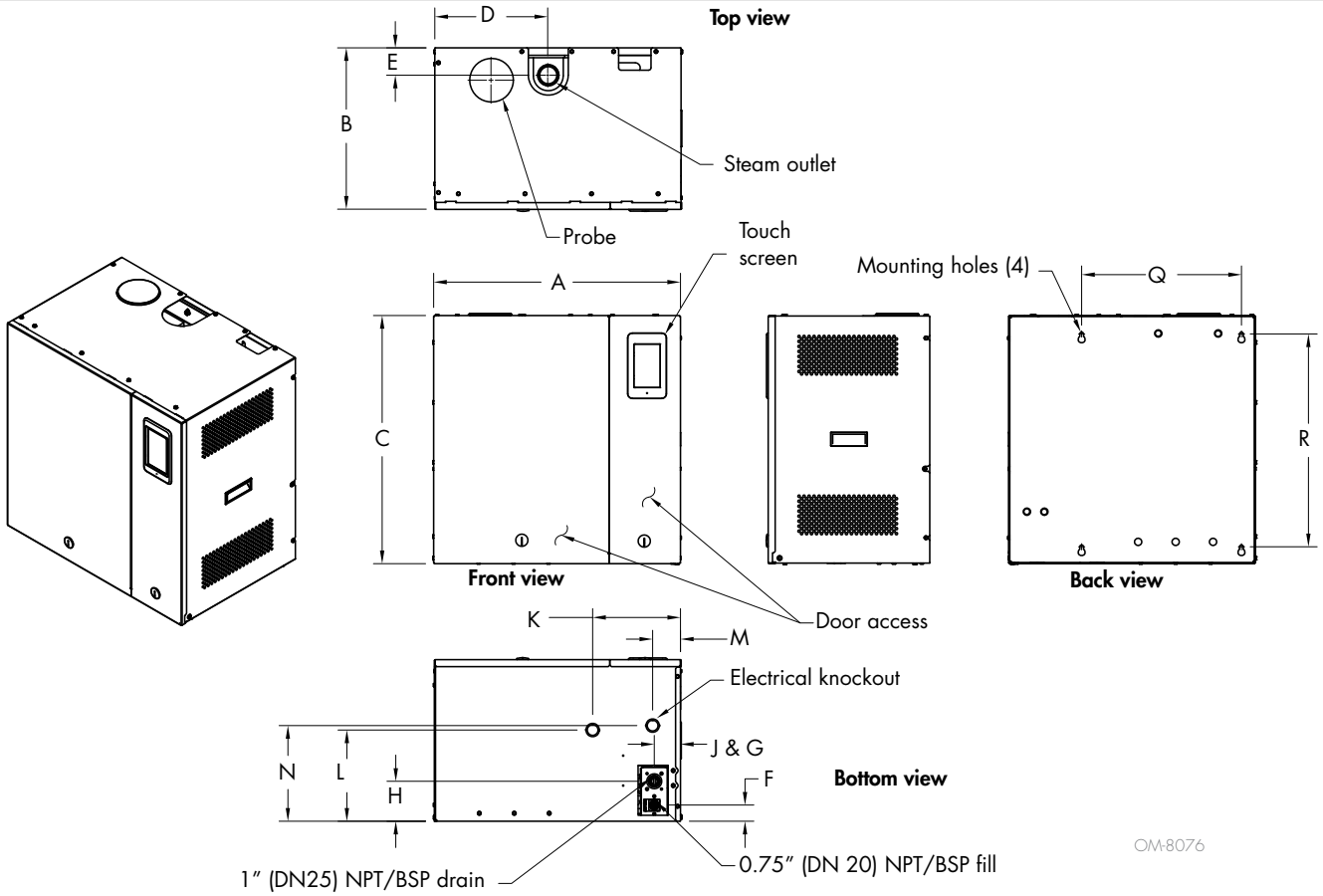
   = 27 gallons – 9.9 gallons
   Metric = (102.2 liters – 49.3 liters)

   = 17 gallon active permeate storage capacity required for this application
   Metric = 52.9 liters active permeate storage capacity required for this application

   DriSteem's 80-gallon (303-liter) pressurized storage tank has the capacity for this application with an 80-gallon (303-liter) total capacity and a 24-gallon (89-liter) active capacity. "Active" means the actual amount of water the storage tank can hold.

Indoor and no enclosure dimensions (RX-XX-1 and RX-XX-2)

FIGURE 14-1: RTS HUMIDIFIER DIMENSIONS



See Table 15-1 for dimension.

Indoor and no enclosure dimensions (RX-XX-1 and RX-XX-2)

Table 15-1:
Indoor unit dimensions

	Description	RX-XX-1		RX-XX-2	
		inches	mm	inches	mm
A	Overall length	24.8	629	26.1	663
B	Overall width	16.4	416	21.0	533
C	Overall height	24.9	632	31.4	798
D	Steam outlet	11.3	286	11.9	301
E		2.8	70	3.3	83
F	Supply water	1.6	41	3.0	76
G		2.6	66	1.6	41
H	Drain water	4.0	102	3.0	76
J		2.6	66	4.0	102
K	Electrical knockout (Control)	8.8	224	2.8	71
L		9.1	231	10.1	256
M	Electrical knockout (Power)	2.8	71	8.8	224
N		9.6	244	9.4	239
Q	Mounting holes	16.0	406	16.0	406
R		21.3	541	28.0	711

Indoor and no enclosure dimensions (RX-XX-3 and RX-XX-4)

FIGURE 16-1: RTS HUMIDIFIER DIMENSIONS

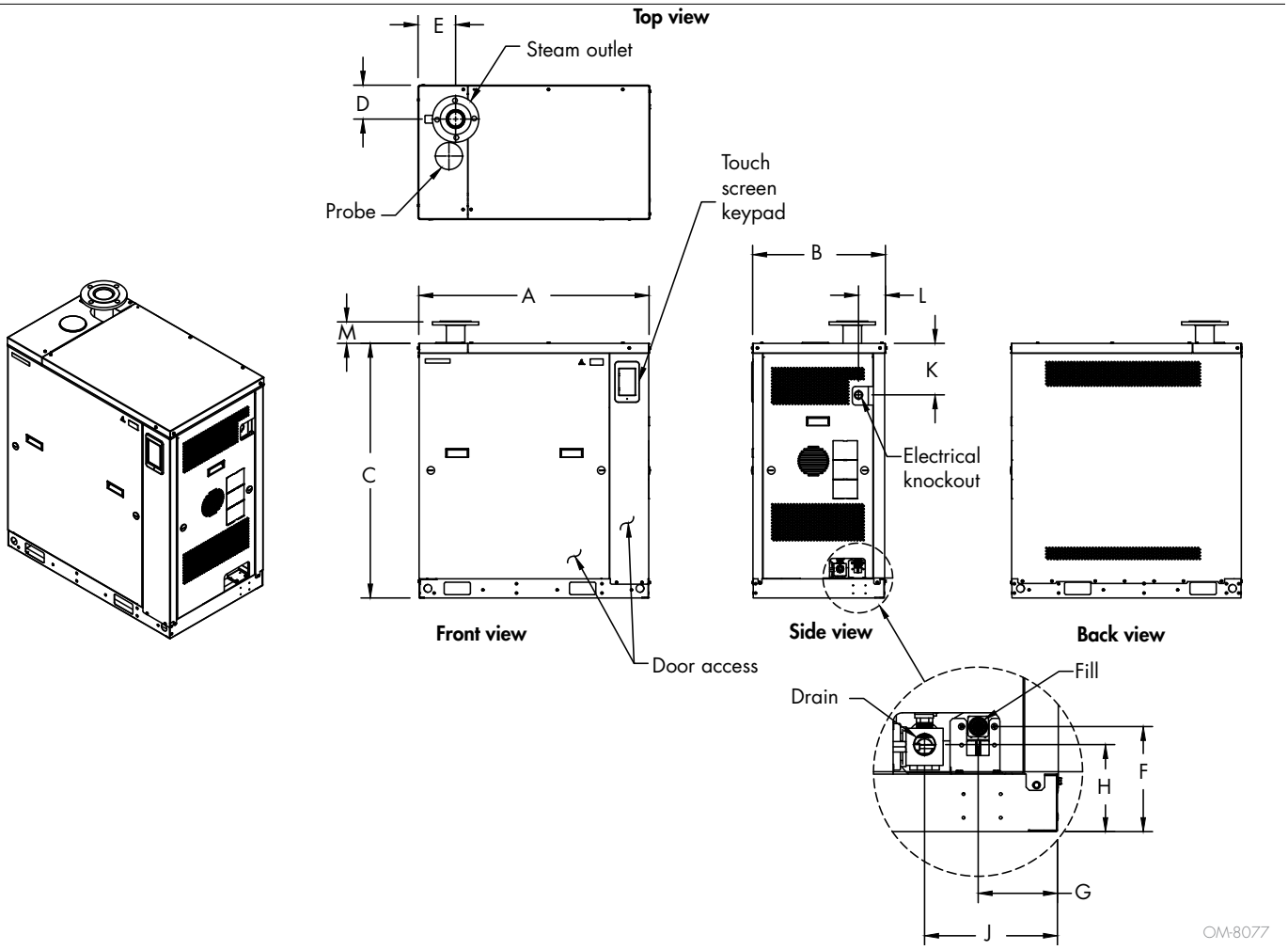


Table 16-1:
Indoor unit dimensions

	Description	RX-XX-3 & RX-XX-4	
		inches	mm
A	Overall length	37.4	950
B	Overall width	21.6	549
C	Overall height	41.3	1049
D	Steam outlet	5.3	135
E		5.9	150
F	Supply water	5.7	145
G		4.3	109
H	Drain water	4.7	119
J		7.2	183
K	Electrical knockout	8.3	211
L		4.2	107
M	Steam outlet (flange connection only)	3.5	89

Selecting a location

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

PROXIMITY TO THE DUCT

Install the humidifier near the air duct system where the dispersion assembly will be located. The maximum recommended length for steam hose connecting a single humidifier to a dispersion assembly is 10' (3 m). Refer to the DriSteem Interconnecting piping instructions for information regarding steam pipe length and best practices for steam pipe installation.

The RX series humidifier is not plenum rated.

ELEVATION OF THE INSTALLED DISPERSION ASSEMBLY

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

Before installing a dispersion assembly or interconnecting piping, review all pitch requirements.

REQUIRED CLEARANCES

See Figures 18-1 and 19-1.

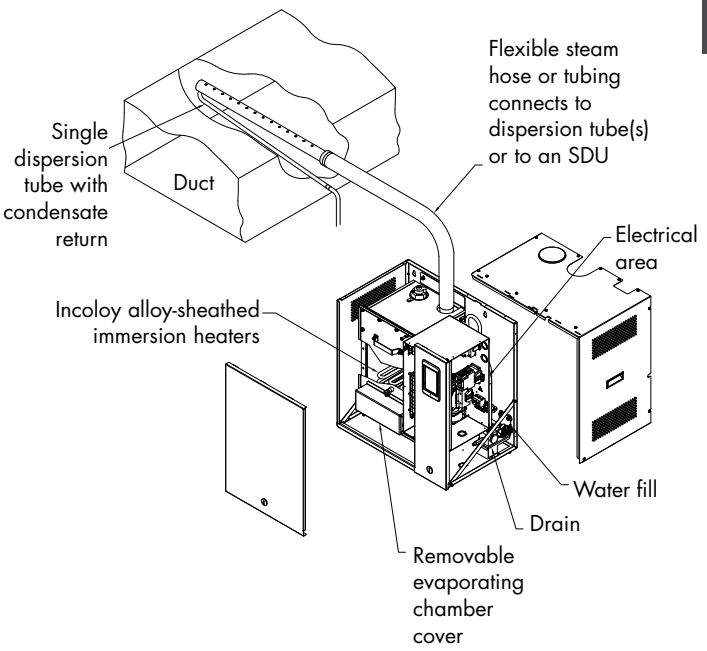
ELECTRICAL CONNECTIONS

Electrical power supply connections are at the lower right side of the unit. See "Wiring" on Page 35.

SUPPLY WATER AND DRAIN PIPING CONNECTIONS

Water supply piping and drain connections are at the lower right rear corner of the unit. See the piping illustrations and instructions starting on Page 22.

FIGURE 17-1: INSTALLATION OVERVIEW



EXTERIOR WALL INSULATION

Install the humidifier on an exterior wall only if the wall is properly insulated. Applies to wall mounted models only.

DISPERSION CONTROL DEVICES

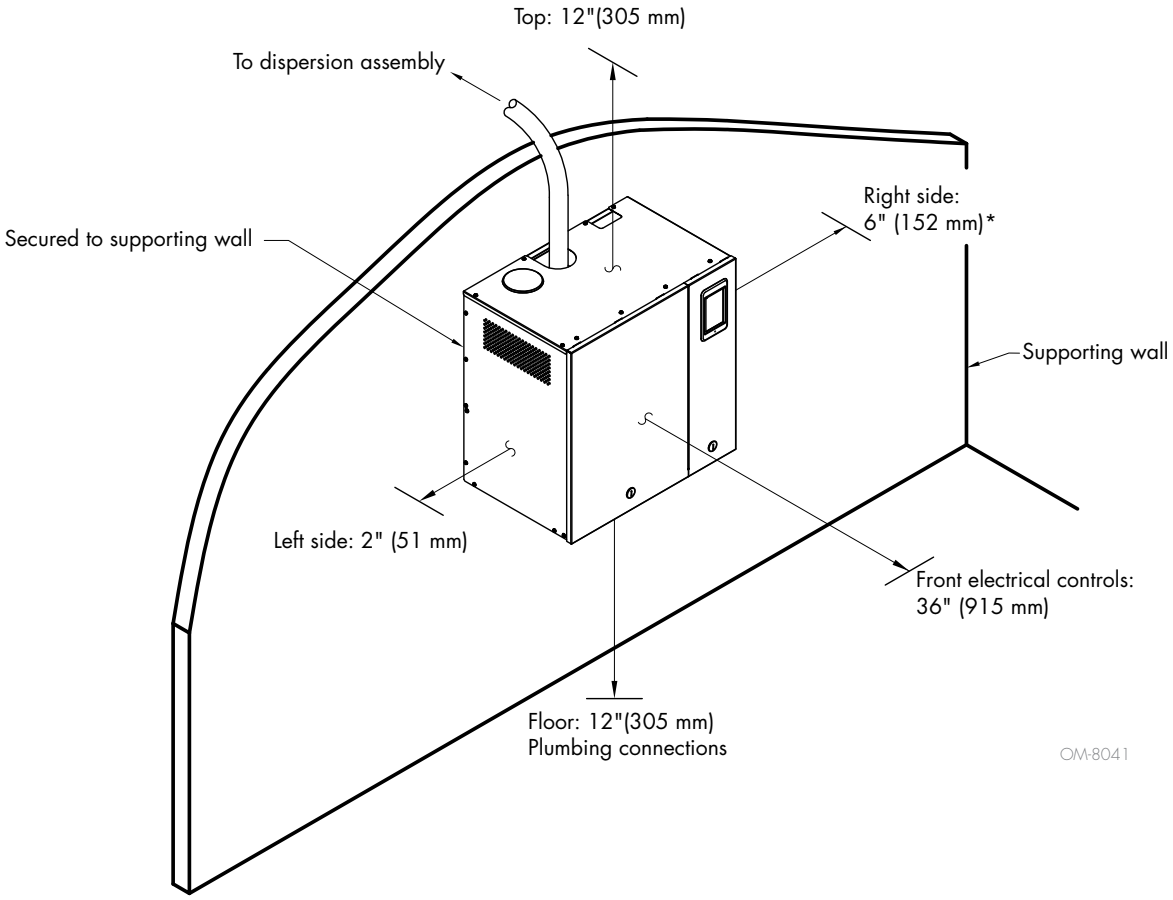
See the specific dispersion installation, operation, and maintenance manual for recommended installation locations for the dispersion assembly and associated control devices.

NOTE: For space distribution, the RTS humidifier can only be used with the SDU-RX.

Location and clearance recommendations (Indoor and no enclosure)

FIGURE 18-1: RX SERIES CLEARANCE RECOMMENDATIONS FOR -1 AND -2 MODELS (INDOOR AND NO ENCLOSURE UNITS)

Maintain these clearances for service and maintenance.

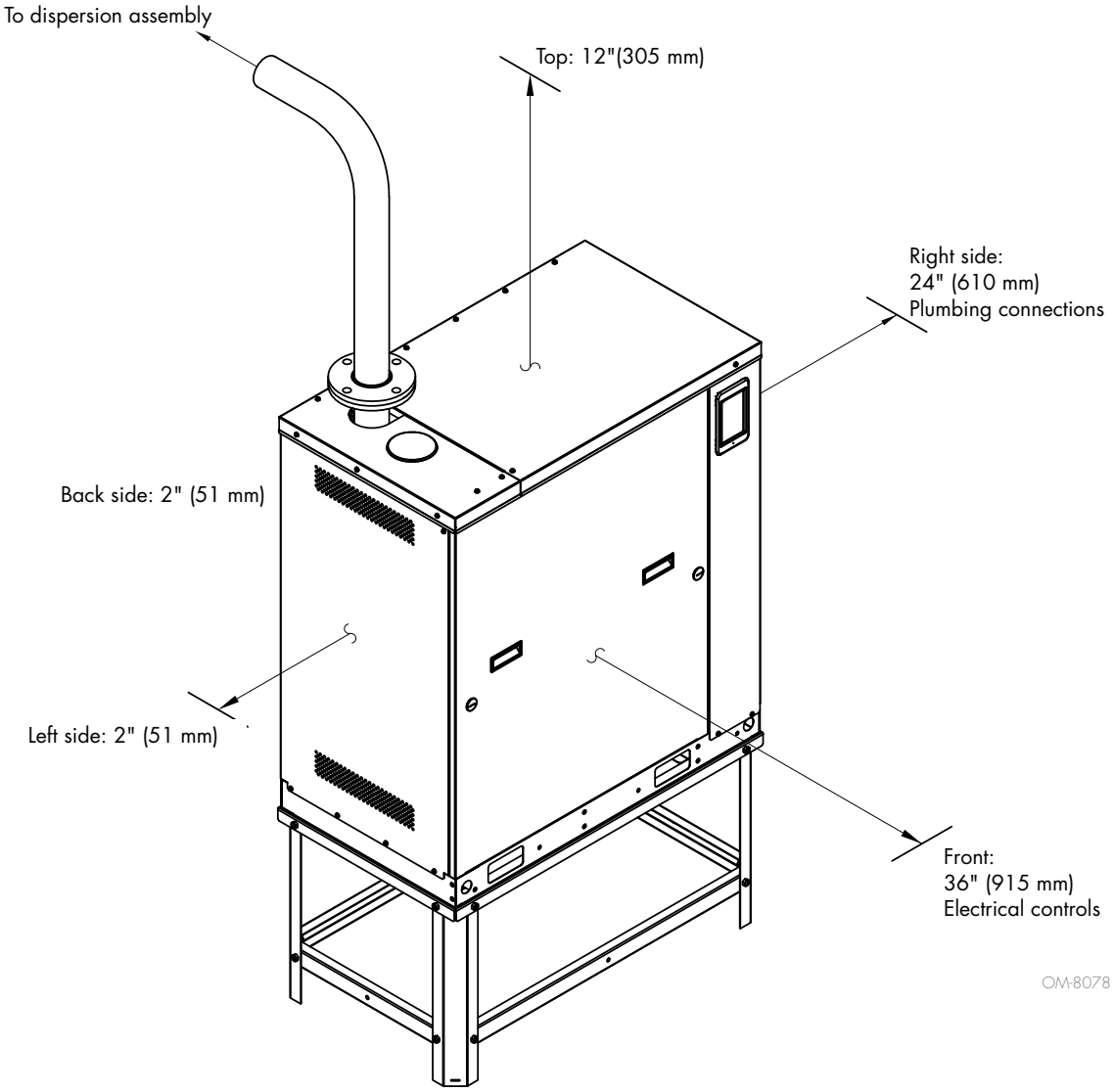


* If there is more space available, increase the clearance on this side of the unit. Infrequent access may be required to the hoses behind the electrical cabinet.

Location and clearance recommendations (Indoor and no enclosure)

FIGURE 19-1: RX SERIES CLEARANCE RECOMMENDATIONS FOR -3 AND -4 MODELS (INDOOR AND NO ENCLOSURE UNITS)

Maintain these clearances for service and maintenance.



Mounting

WALL MOUNTING THE HUMIDIFIER (MODELS -1 OR -2 STAGE UNITS)

Mount the humidifier level and plumb, using the lag bolts provided. Follow the instructions below for mounting on a stud wall with wood studs 16" (406 mm) on center.

1. Mark hole locations at centers of studs, and predrill 1/4" (6 mm) diameter pilot holes.
2. Secure cabinet to wall with lag bolts provided. See mounting keyholes in Figure 20-1.

Notes:

- Use the appropriate mounting methods and mounting hardware for other wall types.
- Ensure the selected mounting location and humidifier orientation provides adequate maintenance clearances and is at an easily serviceable height.
- Install a drain pan where appropriate to prevent equipment or building water damage.
- A structural engineer must ensure the wall mounting surface and fasteners are suitable and properly installed for the weight of the RX humidifier. See weights on pages 8 - 9.
- Arrange appropriate lifting mechanism and personnel to mount the RTS RX humidifier on the wall. See Warning.
- Single stage units are not designed to be base mounted.

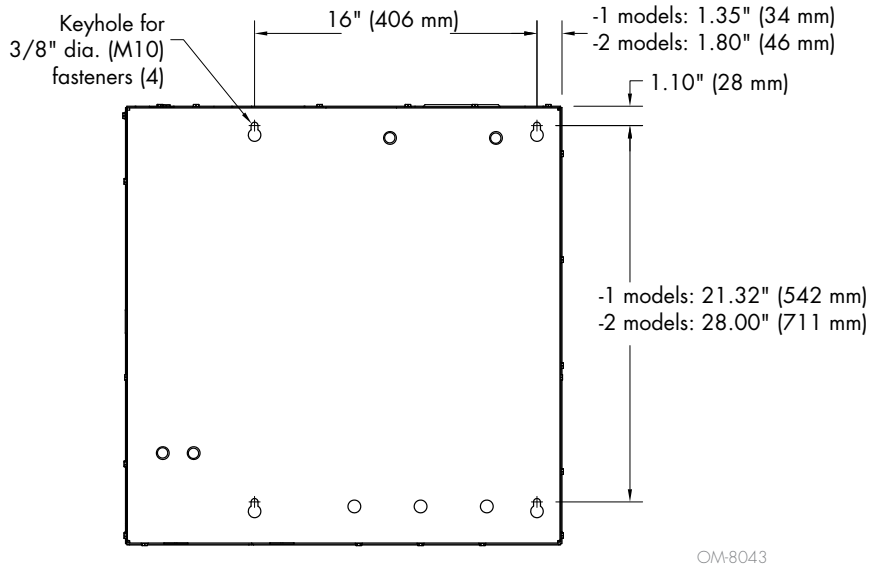
⚠ WARNING

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

⚠ WARNING

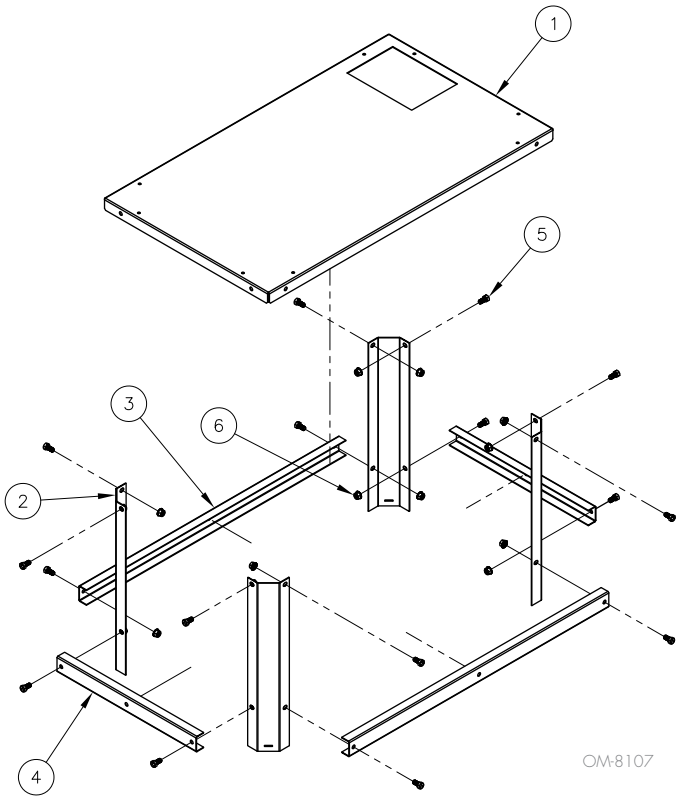
HEAVY OBJECT
To avoid muscle strain or back injury, use lifting aids and proper lifting techniques when removing or replacing.

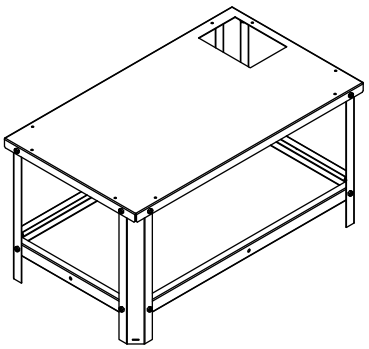
FIGURE 20-1: RTS HUMIDIFIER MOUNTING KEYHOLE LOCATIONS AND DIMENSIONS



Mounting

FIGURE 21-1: OPTIONAL FLOOR STAND ASSEMBLY (MODELS -2, -3, AND -4)





1. Place platform (item 1) face down with flanges up.
2. Attach legs (item 2) in corners with 3/8-16 x 3/4" bolts (item 5) and 3/8" flange nuts (item 6) as shown. Orient so slotted end is away from platform. Bolts and nuts should be snug.
3. Attach cross-supports (items 3 and 4) with remaining bolts (item 5) and nuts (item 6). Cross-supports must sit inboard of legs. Bolts and nuts should be snug.
4. Torque all fasteners to 20 lb-ft (27 N-m).
5. Ensure floor stand assembly is level (shim plates can be used under legs).
6. Center the RTS humidifier frame/base on floor stand assembly, aligning all through holes.
7. From underside of floor stand top plate, use 1/4 - 20 x 3/4" screws to secure frame/base to floor stand assembly.

Notes:

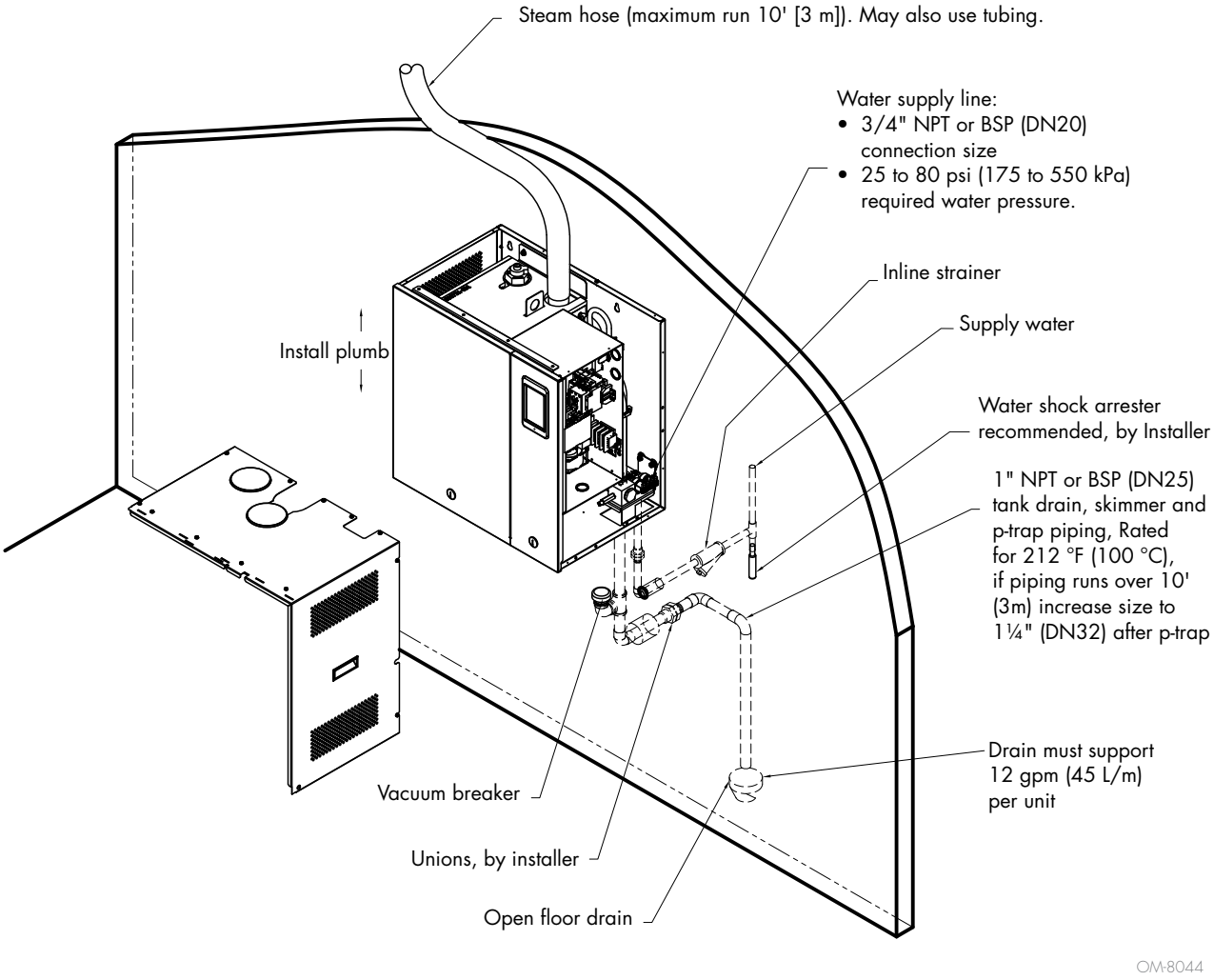
- The floor stand allows for condensate piping/pump.
- Ensure the floor stand is level and shim as necessary.
- Floor stand is not seismic rated.
- RX-XX-3 and RX-XX-4 models are setup for side water connections. These models can be adapted to allow for bottom supply and drain connections.
    - Drain Adaptation: Remove 1" NPT plug from bottom of drain block and reinstall on side port. Use thread sealant on plug.
    - Fill Adaptation: Remove two screws holding fill valve to bracket. Move valve to alternate location on bracket and orient valve with 3/4" inlet downward and dual 3/8" outlets toward rear of unit. Reinstall two screws to secure valve to bracket.

Table 21-1:
Floor stand weights and height (for indoor enclosures)

Part number	Unit size	Weight configuration				Height	
		Assembled		Shipping		inches	mm
		lbs	kg	lbs	kg		
600935	-2 stage	26.8	12.2	30.8	14.0	19.25	489
600670	-3 & -4 stage	35.1	16.0	41.1	18.7		

Piping Overview

FIGURE 22-1: RTS HUMIDIFIER FIELD PIPING OVERVIEW FOR -1 AND -2 UNITS

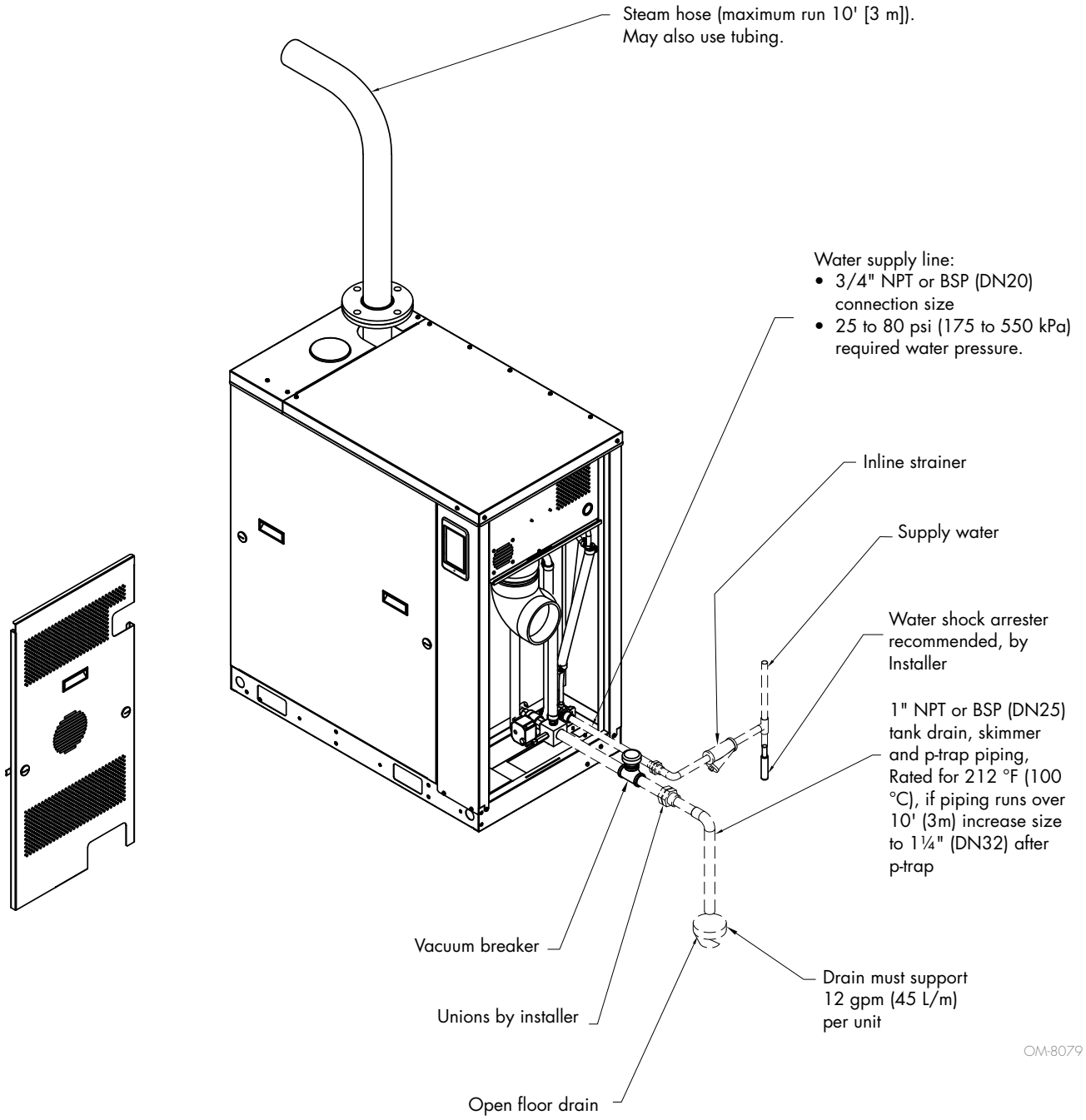


Notes:

- Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
- Offset humidifier from spill funnel or floor drain to prevent flash steam from rising into the cabinet.
- Dashed lines indicate provided by installer.
- The water supply inlet is more than 1" (25 mm) above the overflow port, eliminating the possibility of backflow or siphoning from the tank. No additional backflow prevention is required; however, governing codes prevail.
- Install a union in the water supply and drain lines as shown to allow tank removal.

Piping Overview

FIGURE 23-1: RTS HUMIDIFIER FIELD PIPING OVERVIEW FOR -3 AND -4 UNITS



Notes:

- Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
- Offset humidifier from spill funnel or floor drain to prevent flash steam from rising into the cabinet.
- Dashed lines indicate provided by installer.
- The water supply inlet is more than 1" (25 mm) above the overflow port, eliminating the possibility of backflow or siphoning from the tank. No additional backflow prevention is required; however, governing codes prevail.
- Install a union in the water supply and drain lines as shown to allow tank removal.

Piping: Steam

DriSteem humidifiers operate with several types of dispersion assemblies for open spaces, ducts, and air handling units. Information on placement, sizing, support, and best practices for interconnecting piping can be found in the Installation and Operation Manual for the dispersion device operating with this humidifier and in the DriSteem Interconnecting piping instructions.

- Dispersion assemblies in ducts and air handling units must be positioned where the water vapor being discharged is carried off with the airstream and is absorbed before it can cause condensation or dripping.
- The steam outlet on the humidifier is sized to the output of the humidifier. Do not use steam hose or interconnecting tubing with an inside diameter smaller than the humidifier steam outlet.
- Support interconnecting piping between the humidifier steam outlet and the dispersion system with pipe hangers. Failure to properly support the entire steam piping weight can cause damage to the humidifier tank and void the warranty.
- Maximum recommended length for steam hose is 10' (3 m). Longer distances can cause kinking or low spots.
- Pitch steam piping away from the humidifier if the total developed length is greater than 20' (6m)
- Use thread sealant for NPT/BSP connections.

FIGURE 24-1: STEAM OUTLET CONNECTIONS

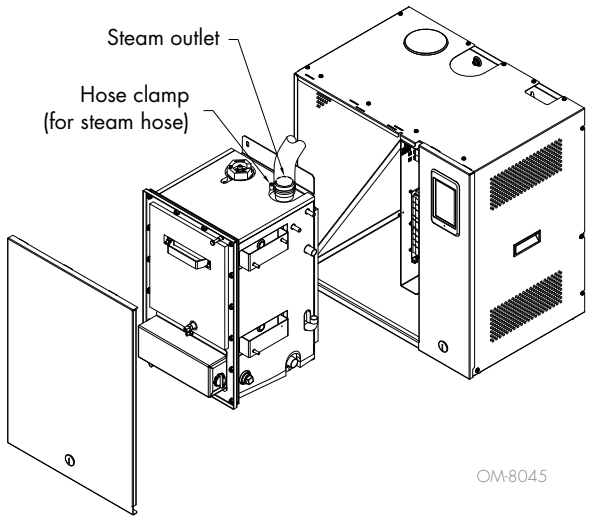


Table 24-1:
Steam outlet connection sizes

RX model	1 ½" (DN40)	2" (DN50)	3" (DN80)
RX-XX-1	Hose NPT coupling BSP nipple	Hose NPT coupling BSP nipple	-
RX-XX-2*	Hose NPT coupling BSP nipple	Hose NPT coupling BSP nipple	-
RX-XX-3	-	Hose NPT coupling BSP nipple	Hose*** Welded flange BSP nipple
RX-XX-4**	-	Hose NPT coupling BSP nipple	Hose*** Welded flange BSP nipple
*RX-162-2 is only available with a 2" (DN50) steam outlet			
**RX-264-4, RX-288-4, RX-324-4 are only available with a 3" (DN80) steam outlet			
***3" (DN80) hose connection is only available in Europe			

Piping: Supply water piping

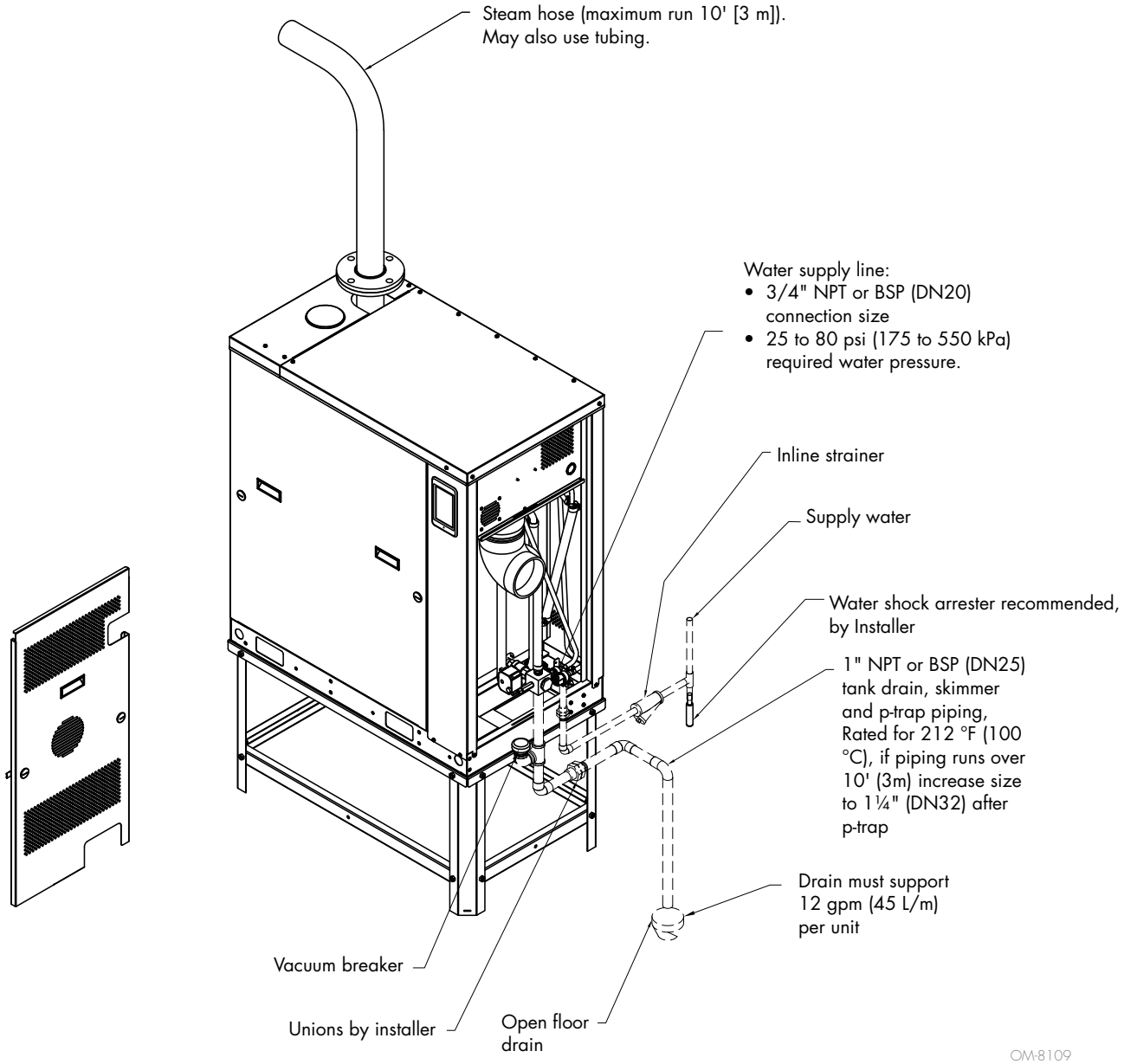
Supply water piping may be of any code-approved material (copper, steel, or plastic). The fill valve connection size is a 3/4" pipe thread (DN20) fitting. In cases where water hammer may be a possibility, consider installing a shock arrestor. Water pressure must be between 25 psi and 80 psi (175 kPa and 550 kPa). Provide a shutoff valve in the supply water line to isolate the humidifier from the water system while servicing.

Important: Install unions in the water supply and drain lines as shown in Figure 22-1 to allow tank removal.

CAUTION

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

FIGURE 25-1: RTS HUMIDIFIER FLOOR STAND PIPING OVERVIEW FOR -3 AND -4 UNITS



Piping: Drain

DRAIN

Note: Follow governing code requirements regarding size of drain pipe.

The drain line piped from the humidifier must be run to an approved sanitary waste or suitable drain. Although the RTS humidifier is equipped with integral water tempering, if nonmetallic drain pipe or hose is used, it should be rated for 212 °F (100 °C) minimum continuous operating temperature.

An open drain with a 1" (25 mm) air gap between the drain piping and the building drain is required. Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise,condensing on nearby surfaces may occur.

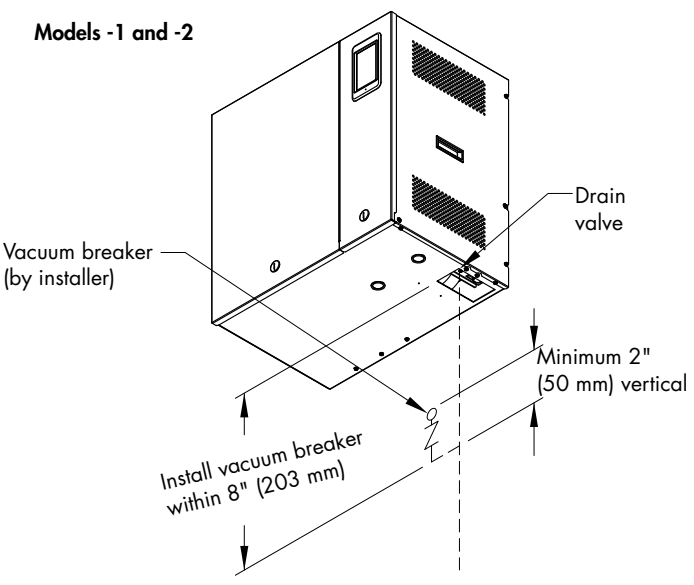
A vacuum breaker must be installed on the drain line within 8 vertical inches (203 mm) or 24 horizontal inches (610 mm) of the unit. Even in horizontal drain installs, the vertical drop of the drain line cannot exceed 8" (203 mm) prior to the vacuum breaker. Failure to follow this instruction will create a siphon during drain events, disrupting normal drain operation and allowing steam to enter the drain through the overflow p-trap outlet (see Figure 26-1).

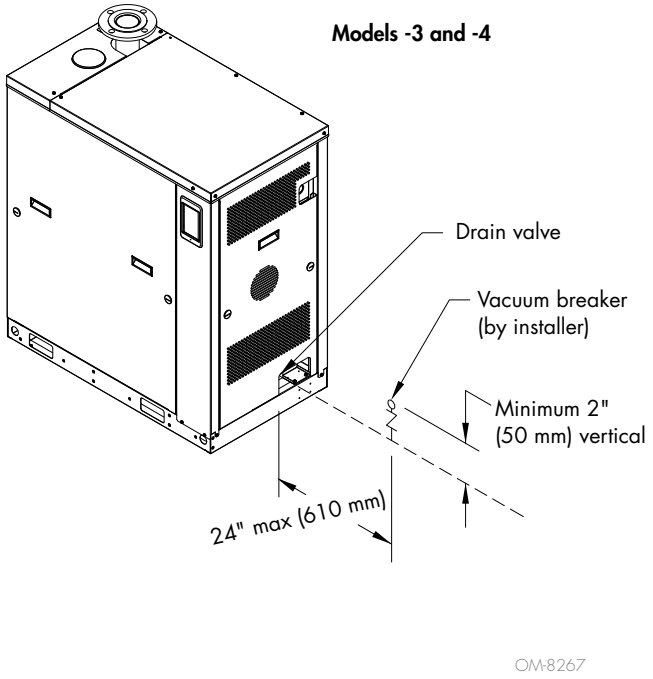
Ensure the drain piping configuration (diameter, length, slopes, elbows, hangers, etc.) supports a 12 gpm (45 L/m) flow rate per unit for proper drain operation and to prevent overflow and spillage from an open drain with air gap. If combining multiple drain lines together, ensure proper common pipe sizing practices are used.

Do not locate the humidifier directly above a floor drain — skim and drain water dumped into the drain will cause flash steam. This steam will rise and saturate electrical components, adversely affecting component life and performance.

There is a water seal built into the RTS humidifier, therefore one does not need to be installed in the field. See Table

FIGURE 26-1: VACUUM BREAKER INSTALLATION





Piping: Drain

27-1 for water seal heights.

Drain piping after the water seal must be pitched a minimum of 1/8"/ft (1%) toward the drain. Governing codes may require more pitch.

If the proximity of a drain requires the humidifier drain and skim water to be lifted, use a water pump with capacity of at least 12 gallons per minute (gpm) or 45.4 litres per minute (L/m). A check valve is required on the discharge of the pump. Electrical power for the pump is independent of the humidifier.

The drain connection is a 1" pipe thread (DN25) aluminum fitting. Do not reduce this connection size.

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

Table 27-1:
Water seal height per model

Model	Height
RX-XX-1	13" (330 mm)
RX-XX-2	19.5" (495 mm)
RX-XX-3	19.5" (495 mm)
RX-XX-4	19.5" (495 mm)

Piping: Drain water tempering

INTEGRATED DRAIN WATER TEMPERING

Governing codes may require that the 212 °F (100 °C) drain and skim/overflow water from the humidifier be tempered before it is discharged into the building drain piping. The RTS humidifier RX series is shipped with drain water tempering enabled. This feature can be disabled in the Vapor-logic controller. When drain water tempering is enabled, the following steps will take place to ensure drain water is less than 140°F (60 °C):

1. Water greater than 140°F (60 °C) is detected in the drain assembly with a temperature sensor.
2. Fill valves open, directing cool water to the drain port within the tank.
3. Hot and cold water mix in the tank near the drain port.
4. Drain port valve opens and sends tempered water to the drain manifold.
5. The Vapor-logic controller controls the drain and fill valves using input from the drain temperature sensor to enable closed-loop control of drain water temperature, thus ensuring it does not exceed 140°F (60°C) while minimizing water usage.

MECHANICAL TEMPERING DEVICE

There are instances where an alternate mechanical tempering device (see Figure 31-1) may be needed. Outdoor units have the tempering device installed inside the enclosure. For all other units the device ships separate and must be installed in the field.

- All outdoor enclosure units ship with the mechanical tempering installed. This is to allow for drain water tempering during a power outage. Outdoor humidifiers ship with normally open drain valves.
- If drain water tempering is required, the mechanical tempering device is required when using mini-drain operating mode.
- The RTS humidifier is not set up to allow for tempering to be done with an alternate water source that feeds to the humidifier. If such an install is desired, the mechanical tempering device can be used. Ensure that the automatic drain water tempering is turned off on the Vapor-logic controller.

CAUTION

Hot discharge water

Discharge water can be as hot as 212 °F (100 °C) and can damage the drain plumbing.

Most RTS units are shipped with integrated drain water tempering turned on. Validate the status of drain water tempering by using the Vapor-logic display. See the Vapor-logic touchscreen IOM for instructions.

Piping: Optional external mechanical drain water tempering

HOW IT WORKS: HOT + COLD = TEMPERED

1. Hot water discharged from a humidifier enters the device through piping/ hose connected to the top (-1 and -2 stage RTS) or side (-3 and -4 stage RTS) connection. A vacuum breaker prevents backflow into potable water systems.
2. Cold water enters through the temperature-actuated valve. The valve and the tempering device's straightforward design ensure efficient mixing of hot and cold water. The valve's sensor, located near the outlet, ensures that water leaving the device is 140 °F (60 °C) or less before entering the municipal sewer system.
3. Tempered water at 140 °F (60 °C) or less exits through the side outlet for safe discharge into a municipal sewer system or PVC pipe.

MOUNTING OPTIONS

The mechanical tempering device can be mounted by attaching the integral mounting plate to a wall or directly to the RTS humidifier.

Table 29-1:
Mechanical tempering device connections

Hot water inlet	1" NPT	1" Hose*
Cold water inlet	3/4" NPT/BSP	3/8" NPT**
Tempered water outlet	1" NPT/BSP	N/A
*For remote applications, use hose connection at tempering device		
**For independent tempering water supply, connect at thermostatic valve		

Table 29-2:
Mechanical tempering device weights

	lbs	kg
Dry weight	7.1	3.2
Shipping weight	7.6	3.4
Operating weight	9.8	4.4

Table 29-3:
Mechanical tempering device capacities

	Maximum flow rate		Maximum temperature	
	gpm	L/m	°F	°C
Hot water inflow	6	22.7	212	100
Cold water inflow**	6	22.7	70	21
Tempered water outflow	12	45.4	140	60

Note:
- Table applicable with one humidifier connected to one tempering device, with no more than 10' (3m) vertical distance between humidifier and tempering device
- If necessary, the device restricts humidifier drain rate to 6gpm to allow for proper tempering.

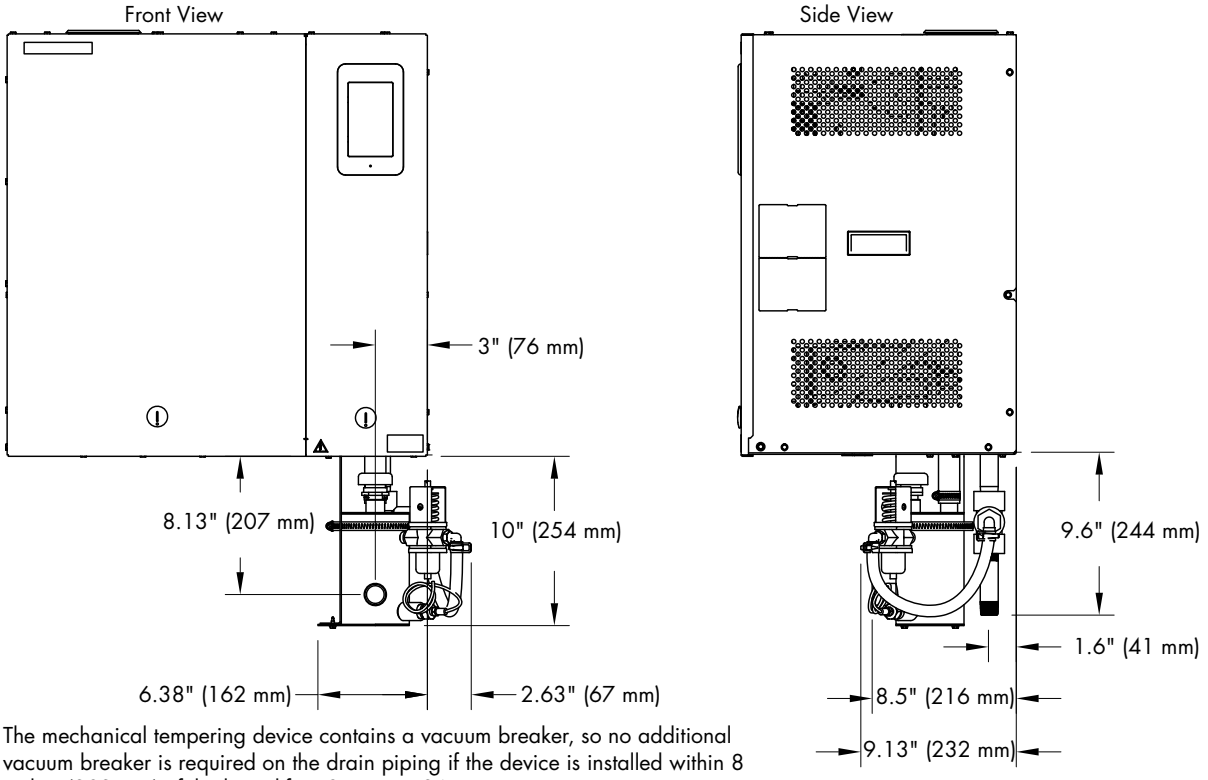
** Cold water inflow pressure between 25 - 80 psi (172 - 552 kPa)

Table 29-4:
Mechanical tempering device material

Component	Material
Tempering chamber	304 stainless steel
Valve body	Bronze
Vacuum breaker	Brass

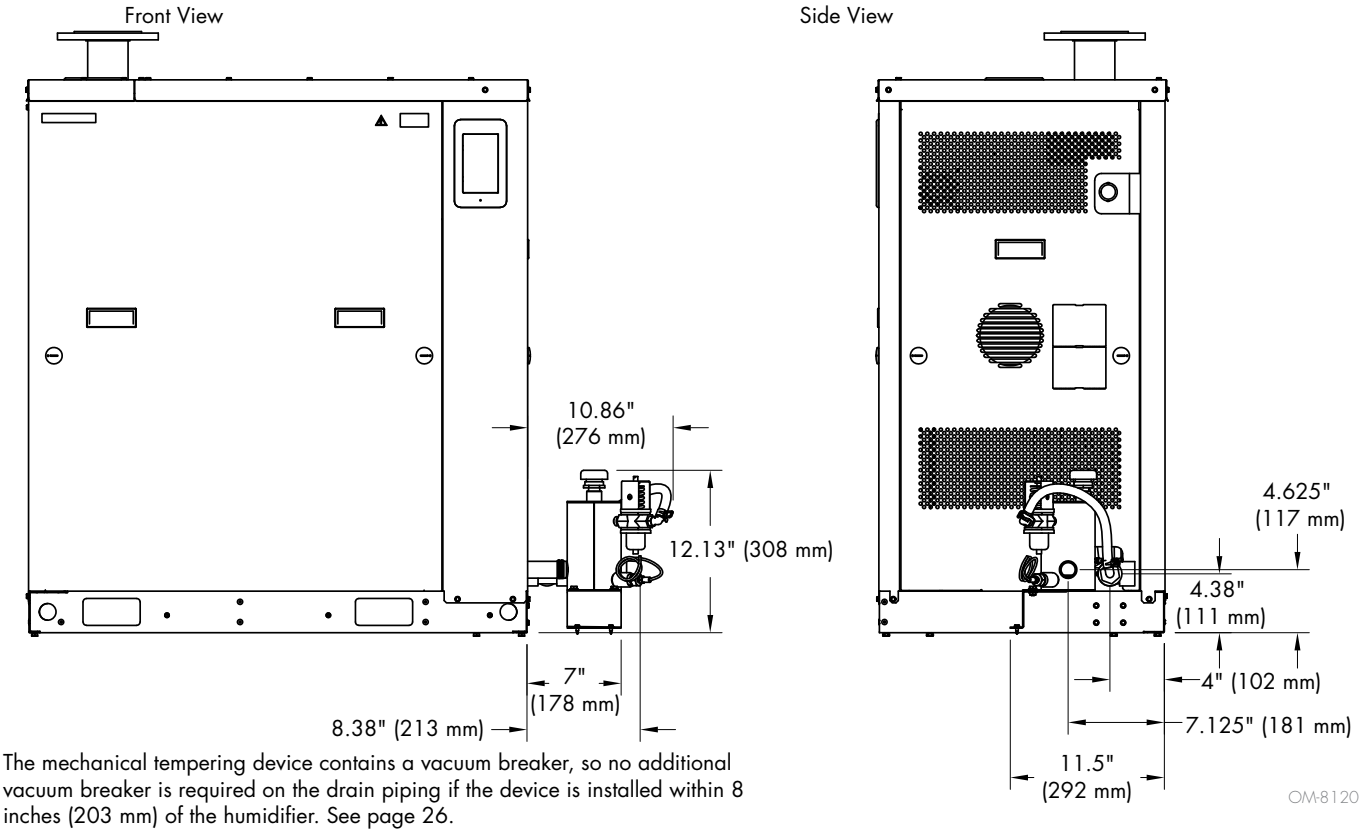
Piping: Optional external mechanical drain water tempering

FIGURE 30-1: DRAIN WATER TEMPERING DIMENSIONS FOR MODELS -1 AND -2



The mechanical tempering device contains a vacuum breaker, so no additional vacuum breaker is required on the drain piping if the device is installed within 8 inches (203 mm) of the humidifier. See page 26.

FIGURE 30-2: DRAIN WATER TEMPERING DIMENSIONS FOR MODELS -3 AND -4



The mechanical tempering device contains a vacuum breaker, so no additional vacuum breaker is required on the drain piping if the device is installed within 8 inches (203 mm) of the humidifier. See page 26.

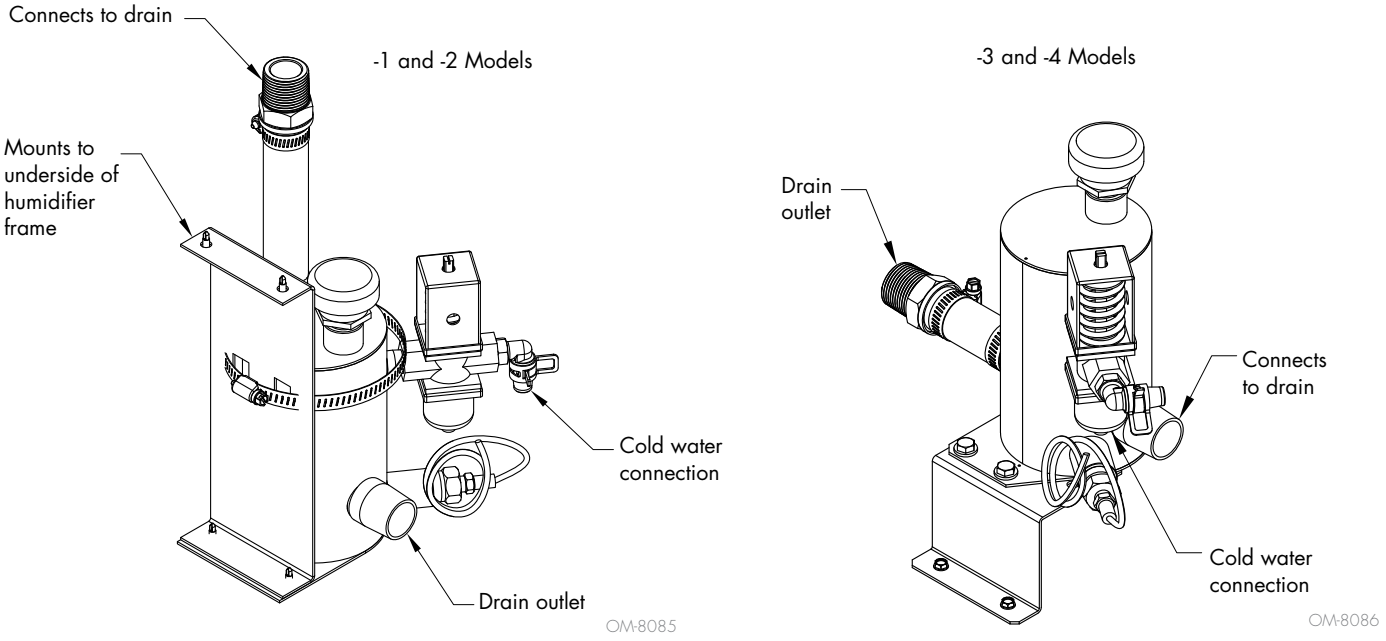
Piping: Optional external mechanical drain water tempering

STEP-BY-STEP INSTALLATION INSTRUCTIONS

1. Confirm you are using a mechanical tempering device designed for an RTS humidifier. This device reduces the flow of hot water from the RTS humidifier, allowing the device to properly cool drain water. The standard Drane-kooler™ water tempering device does not do this.
2. Note that there are three connections to be made:
   - Cold water supply
   - Hot water inlet from RTS
   - Tempered water piping to drain
3. Position unions on all connections as close to the device as possible to make cleaning and maintenance easier.
4. Cold water supply connection instructions:
   - Cold water supply connection on valve is 3/8" (DN10) pipe thread (for dedicated tempering water source).
   - Pipe a 3/8" (DN10) line directly to the device from the main water supply line (for dedicated tempering water source)

     To ensure adequate water pressure to the mechanical tempering device, do not connect to a supply water line that is dedicated to other appliances.
   - For single source water connection, use supplied tee on supply line to feed cold water supply on tempering device.
   - Verify that the supply water pressure to the valve is at least 25 psi (172 kPa) and not more than 80 psi (552 kPa).
   - Install a cold water supply union as close to the device as possible.
   - Install a cold water shut-off valve before the union in the cold water supply line.

FIGURE 31-1: MECHANICAL TEMPERING DEVICE



Piping: Optional external mechanical drain water tempering

5. Hot water inlet connection instructions:
   - Hot water inlet connection is 1" (DN25) at the drain block. This hose and fitting is supplied.
   - Locate a union as close to the connection as possible (hard pipe remote)
   - For hard pipe remote, run 1" (DN25) pipe as directly as possible from the humidifier to the mechanical tempering device. If the piping to the hot water inlet has a horizontal run, maintain a pitch to the device of at least 1/8"/ft (1%). If extending the drain hose, only use hose rated to at least 250°F (121°C).
6. Tempered water (to drain) connection instructions:
   - Tempered water outlet connection is 1" NPT or BSP (DN25) pipe thread.
   - Install a union as close to the device as possible.
   - Run a 1" NPT or BSP (DN25) pipe as directly as possible from the mechanical tempering device to the drain. Maintain a pitch to drain of at least 1/8"/ft (1%).
   - Make sure there is a 1" NPT or BSP (25 mm) air gap between the drain piping and the drain.

STEP-BY-STEP MAINTENANCE INSTRUCTIONS

1. Shut off cold water supply.
2. Disconnect service unions as necessary.
3. Remove the device from piping and take to a service sink. Add water and, with pipe caps or hands covering the hot water inlet and tempered water outlet, shake the device to dislodge mineral deposits. Dump mineral deposits and rinse.
4. If severe mineral accumulation has occurred, remove the thermal sensor from the chamber and gently clean the sensor with an abrasive pad. Do not twist the capillary tube during removal or cleaning.
5. Reconnect service unions and open cold water supply valve to resume operation, as necessary.

FIGURE 32-1: MECHANICAL TEMPERING DEVICE MOUNTED UNDERNEATH HUMIDIFIER (-1 AND -2 STAGE)

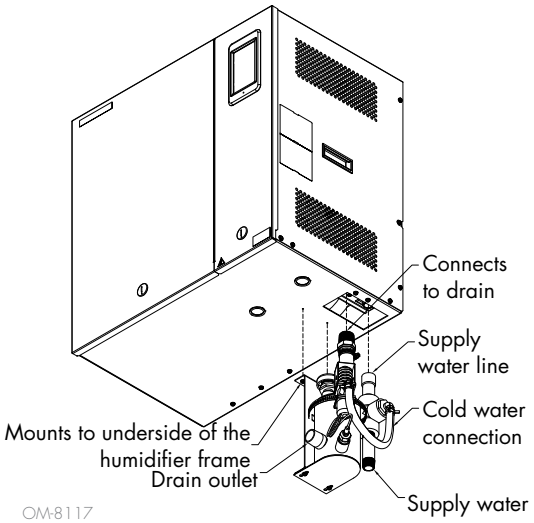
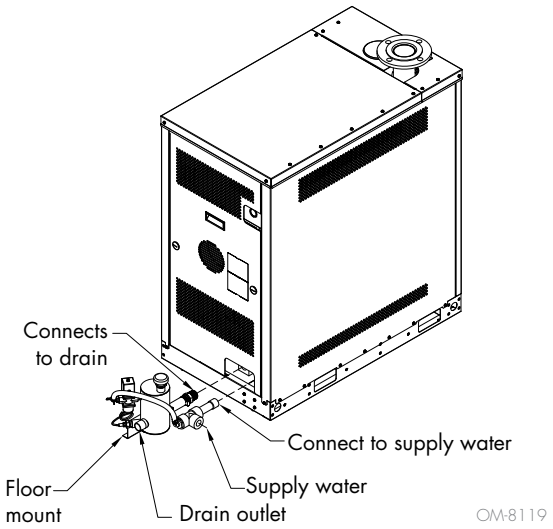


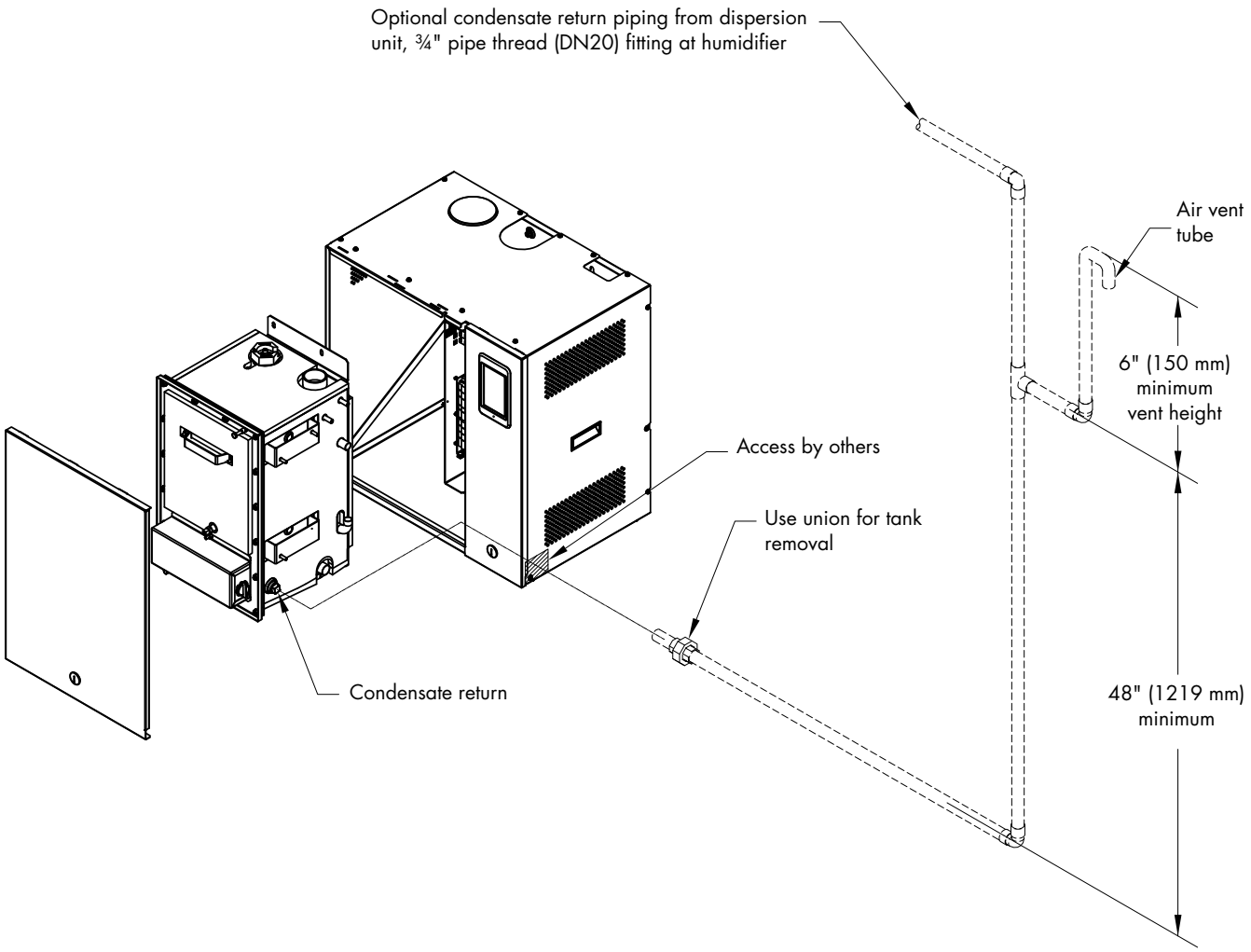
FIGURE 32-2: MECHANICAL TEMPERING DEVICE MOUNTED ON THE SIDE OF THE HUMIDIFIER (-3 AND -4 STAGE)



Piping: Optional condensate return

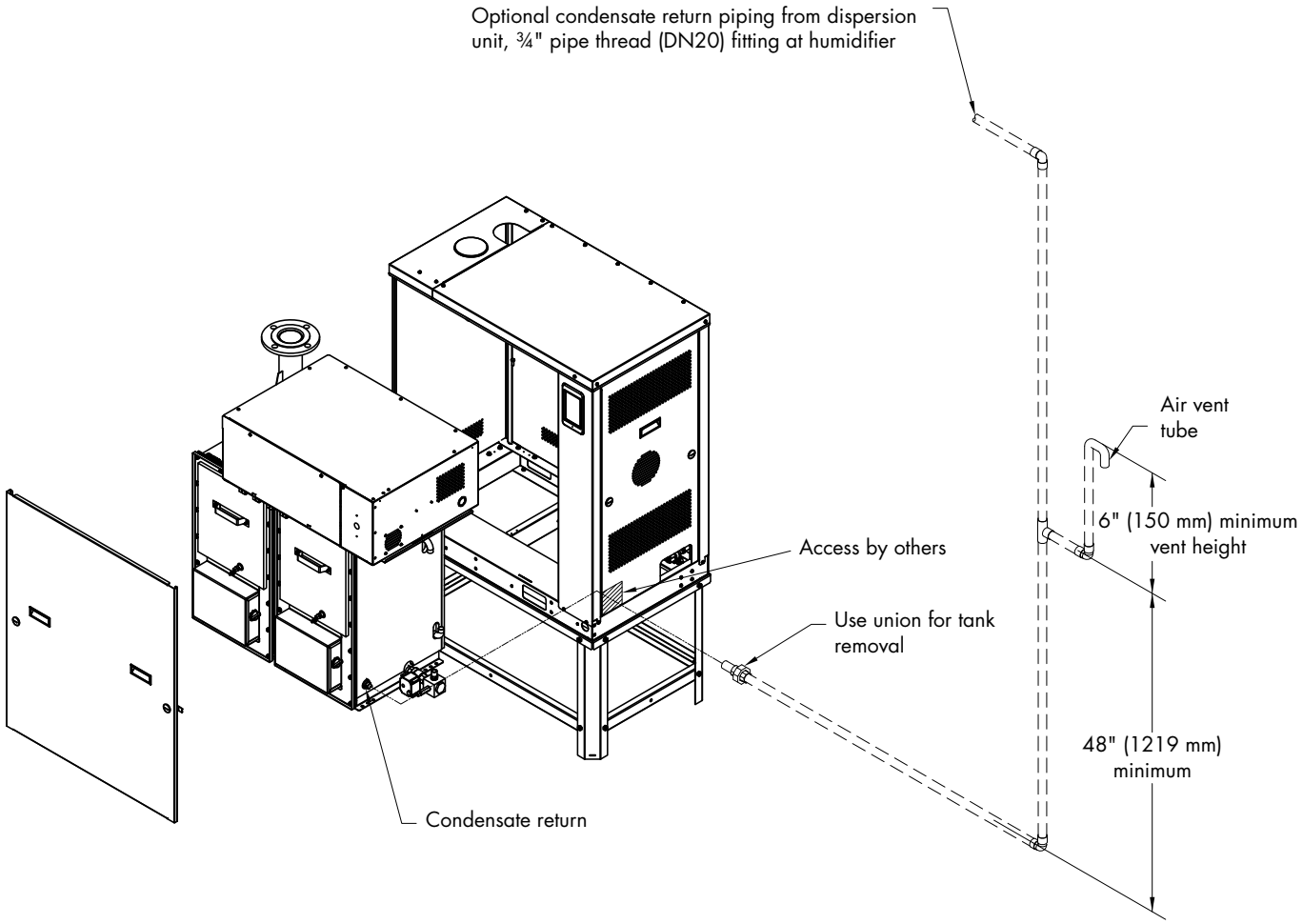
The purpose of the condensate return is to return condensate from the dispersion device instead of sending that condensate to drain. This is an optional connection.

FIGURE 33-1: RX SERIES CONDENSATE RETURN FIELD PIPING (-1 AND -2 STAGE UNITS)



Piping: Optional condensate return

FIGURE 34-1: RX SERIES CONDENSATE RETURN FIELD PIPING (-3 AND -4 STAGE UNITS)



Wiring

FIGURE 35-1: SHIELDED/SCREENED CABLE DRAIN WIRE CONNECTION TO LUG

Humidifier side view

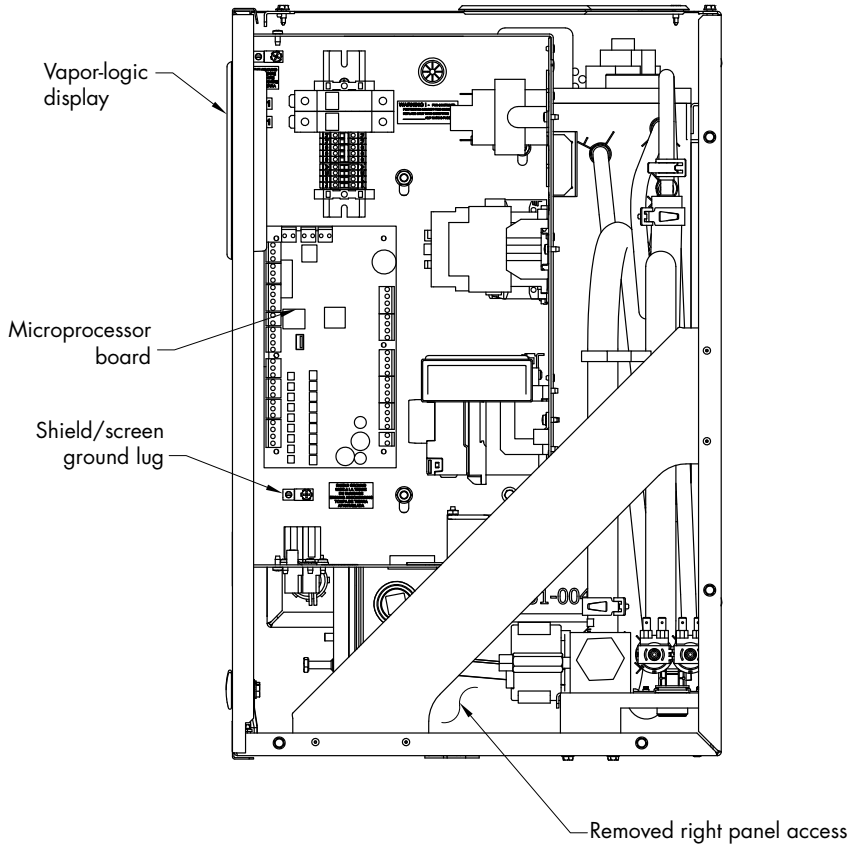


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Table 35-2:
European breaker requirements

I max. A	Breaker size
0 - 8.0	10
8.1 - 10.4	13
10.5 - 12.8	16
12.9 - 16	20
16.1 - 20	25
20.1 - 25.6	32
25.7 - 32	40
32.1 - 40	50
40.1 - 50.4	63
50.5 - 64	80
64.1 - 80	100
80.1 - 100	125
100.1 - 128	160
128.1 - 160	200

Table 35-1:
European wiring requirements

230 volt single phase			400 volt three phase		
Amps	**Wire size mm²**	**Ground wire size mm²**	**Amps**	**Wire size mm²**	**Ground wire size mm²**
0 - 18	2.5	2.5	0 - 15.7	2.5	2.5
18.1 - 24	4	4	15.8 - 21	4	4
24.1 - 30.7	6	6	21.1 - 27	6	6
30.8 - 42.7	10	10	27.1 - 37.5	10	10
42.8 - 57	16	16	37.6 - 51	16	16
57.1 - 75.7	25	16	51.1 - 66.7	25	16
75.8 - 93.7	35	16	66.8 - 82.5	35	16
93.8 - 113.2	50	25	82.6 - 100.5	50	25
113.3 - 144	70	35	100.6 - 128.2	70	35
144.1 - 174	95	50	128.3 - 155.2	95	50
174.1 - 201.7	120	70	155.3 - 179.2	120	70

Wiring

HUMIDIFIER FIELD WIRING

All wiring must be in accordance with all governing codes, and with the humidifier wiring diagrams. The diagrams are located inside the removable subpanel cover on the right side of the humidifier cabinet. Power supply wiring must be rated for 220 °F (105 °C).

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

The fill valve, drain valve, probes, and temperature sensors use Class 2, 24 VAC power.

The use of semiconductor fusing sized per the National Electric Code is recommended.

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 (mm^2) size as the power wiring or sized per NEC requirements (in Europe, IEC 60364 requirements).

PROPER WIRING TO PREVENT ELECTRICAL NOISE

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

Important:

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

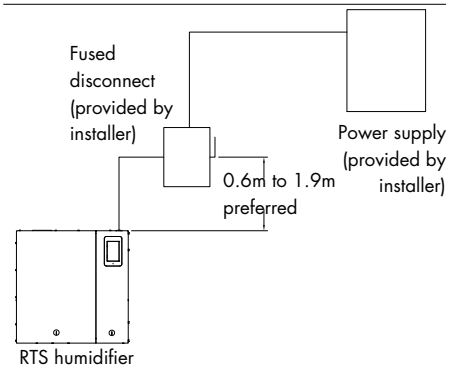
⚠ WARNING

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 remove the humidifier electrical panel cover or the heater terminal cover until electrical power is disconnected. Contact with energized circuits can cause property damage, severe personal injury, or death as a result of electrical shock.

FIGURE 36-1: FIELD WIRING REQUIREMENTS



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Notes:

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

Outdoor enclosure: Overview

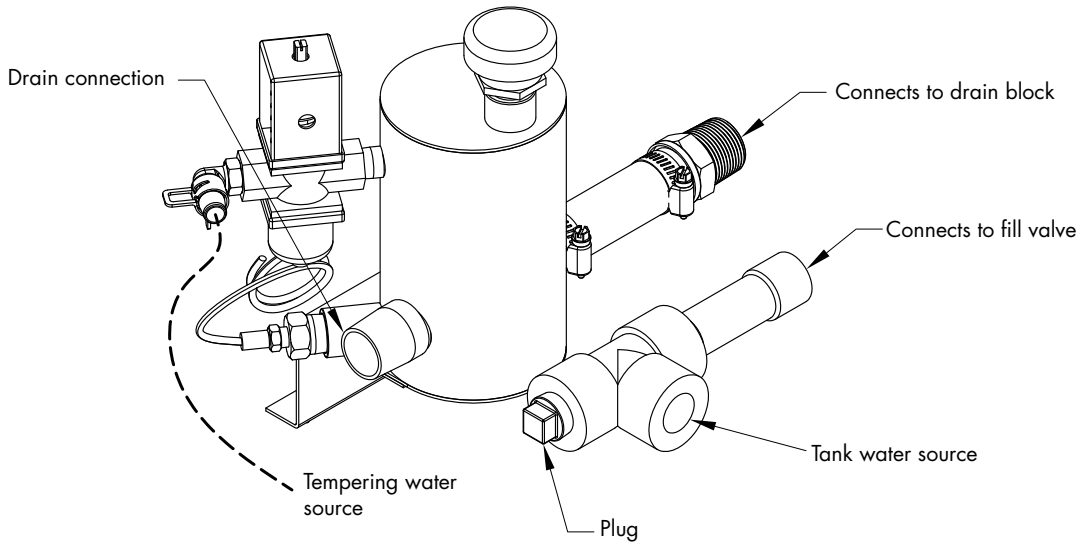
GENERAL DESCRIPTION

- The outdoor RTS humidifier is CSA/ETL approved for installation outdoors. It uses an optional heater and fans to properly operate in temperatures of -40 °F to 122 °F (-40 °C to 50 °C). The unit is intended to be mounted on a concrete pad or rooftop curb. Properly sized curbs are available from DriSteem.
- Knockouts are located in various locations for electrical and plumbing connections. There is also a pipe chase located inside the enclosure to be used when applicable.
- An emergency drain is provided on two walls (the front and rear) of the unit. In case of a water leak, water drains onto the roof through this emergency drain. The drain is intended to have a field installed water seal.
- If constant monitoring of the unit is desired, or if the unit is located in a severe climate, install a remote mount display. Additional cable lengths up to 500' (152 m) are available as an option.
- In cold climates, Freeze Protection Piping (see page 46), is an important component to the proper operation of the outdoor humidifier.
- A separate 10 amp, 120 VAC service must be brought to the Outdoor Enclosure to power the enclosure heaters and fans. The outdoor enclosure is 230 VAC when generator is specified as 230 VAC or 400 VAC.
- The mechanical tempering device is setup from the factory to accept one water supply line to feed tank filling and drain water tempering. If a separate water source is desired specifically for drain water tempering, disconnect the hose connecting the fill tee (near fill valve) and thermostatic valve (on tempering chamber). Plug fill tee and install specific supply line to thermostatic valve.
- Outdoor enclosure weights: see pages 8 - 9.

CAUTION

Keep the control cabinet covers and ducting in place. This allows the control cabinet to be cooler than the rest of the enclosure.

FIGURE 37-1: ALTERNATE TEMPERING WATER SOURCE



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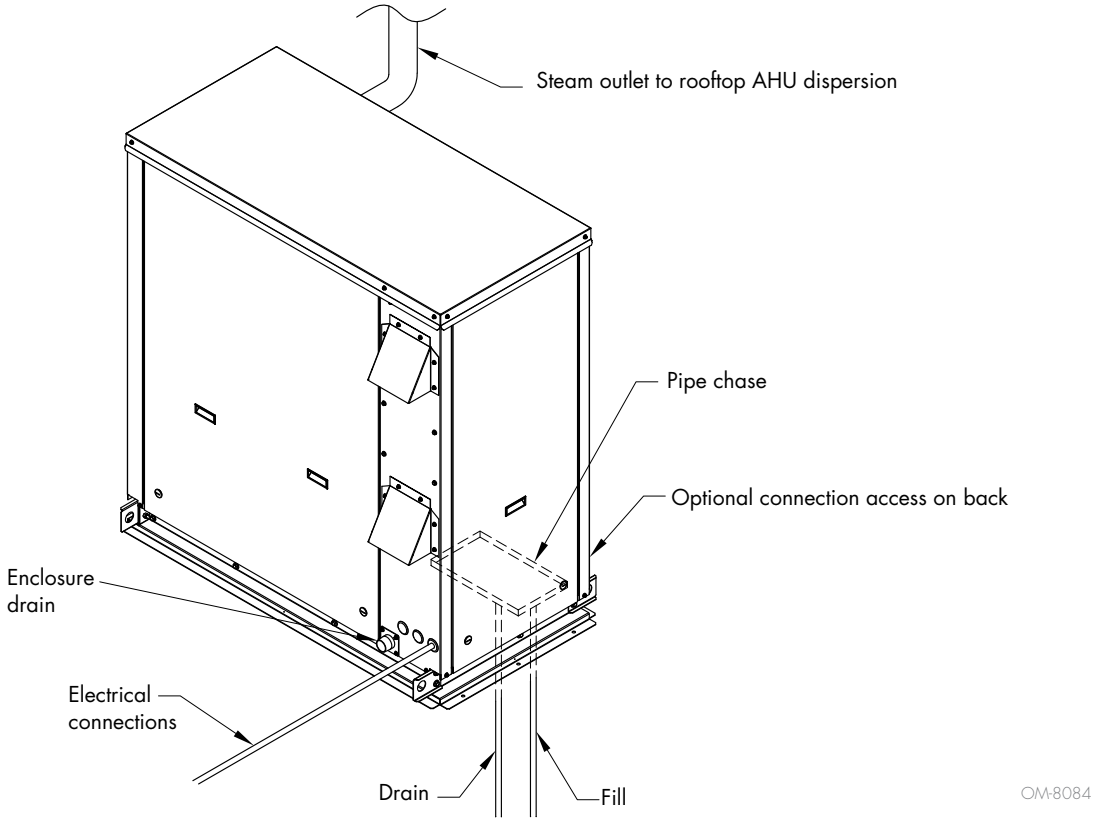
Outdoor enclosure: Overview

FIGURE 38-1: OUTDOOR ENCLOSURE TYPICAL INSTALLATION OVERVIEW



Outdoor enclosure: Operation and location

OPERATION

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

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

In the event of a power loss, the drain valve will open and drain the tank to prevent the water from freezing. The water will be cooled by the mechanical tempering device that is installed on all outdoor RTS humidifiers. See page 28 for more information.

LOCATION

- The following information is not intended to supersede any requirements of federal, state, or governing codes having jurisdiction; prior to locating the unit, authorities having jurisdiction should be consulted.
- The RTS humidifier must be level and located so there is enough clearance for opening the access panels (see recommended clearances on Page 43).
- The unit should be located so prevailing winds do not blow into the air intakes.
- When located on the roof, the air intakes must be a minimum of 14" (360mm) off the roof to prevent intake of snow or splashed rain.
- Locate unit so air intakes are not too close to other exhaust fan outlets, gasoline storage, or other contaminants that could potentially cause dangerous situations. Using and storing gasoline or other flammable vapors and liquids in open containers near this appliance is hazardous.

Outdoor enclosure: Dimensions

FIGURE 40-1: OUTDOOR ENCLOSURE DIMENSIONS

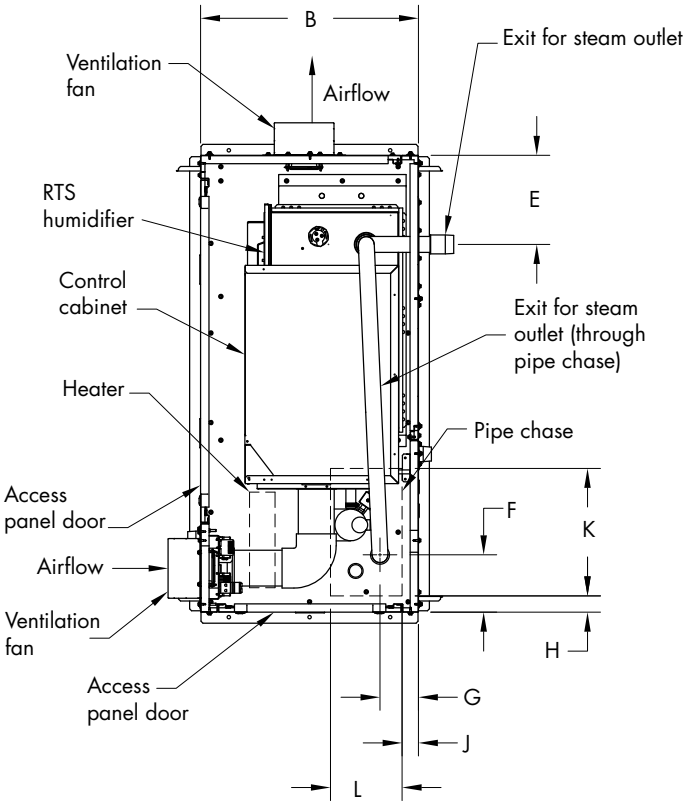


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Table 40-1:
Outdoor enclosure dimensions

	Description	RX-XX-1		RX-XX-2		RX-XX-3 and RX-XX-4	
		inches	mm	inches	mm	inches	mm
A	Overall length	53.6	1361	53.6	1361	62.8	1595
B	Overall width	32.8	833	32.8	833	32.8	833
C	Overall height	62.0	1575	62.0	1575	62.0	1575
D	Steam outlet (external)	55.0	1397	55.0	1397	55.0	1397
E		19.5	495	18.9	480	11.1	282
F	Steam outlet (internal)	5.6	142	6.1	155	8.6	218
G		6.7	170	6.7	170	6.2	157
H	Pipe chase position	4.4	112	4.4	112	4.4	112
J		4.4	112	4.4	112	4.4	112
K	Pipe chase dimensions	14.0	356	14.0	356	14.0	356
L		7.0	178	7.0	178	7.0	178

Outdoor enclosure: Mounting

FIGURE 41-1: OUTDOOR ENCLOSURE MOUNTED FLUSH

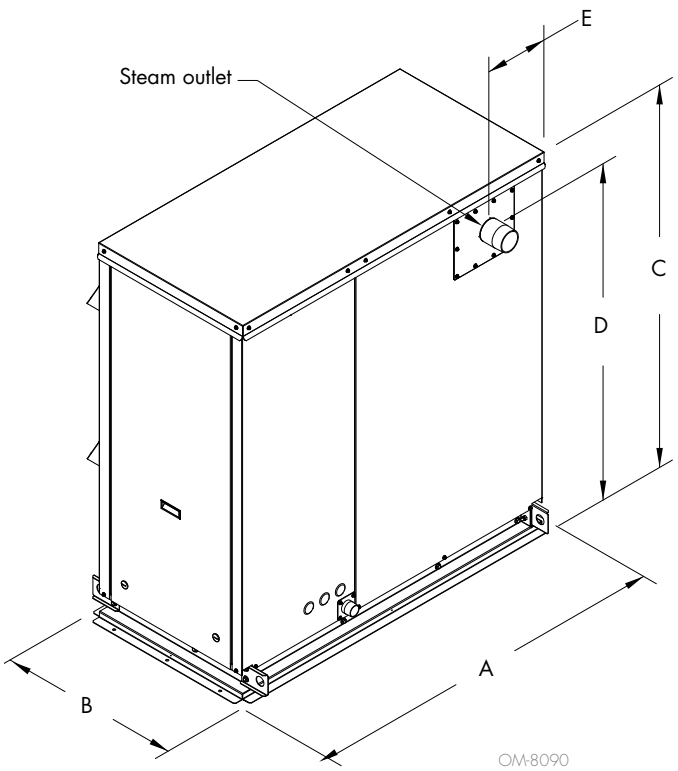
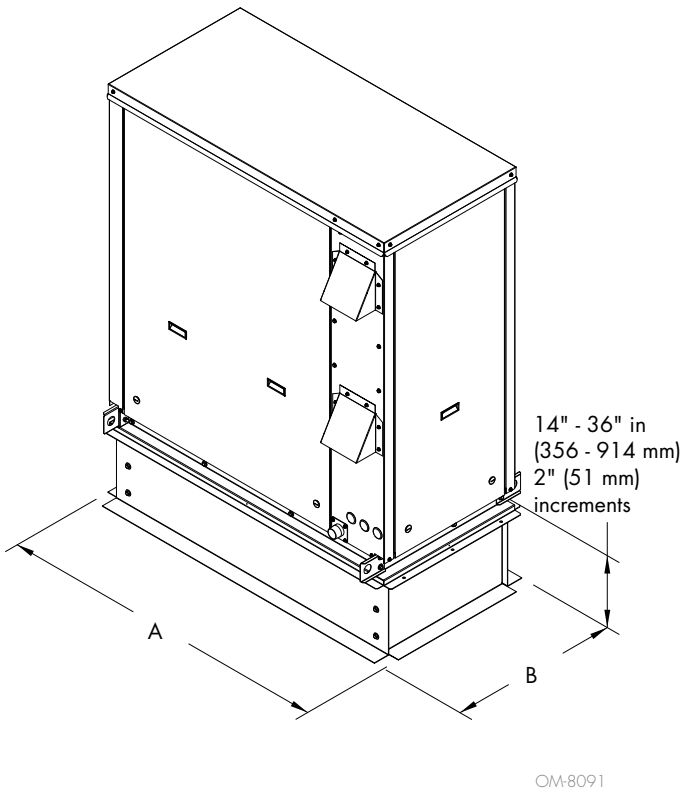


FIGURE 41-2: OUTDOOR ENCLOSURE MOUNTED ON A CURB



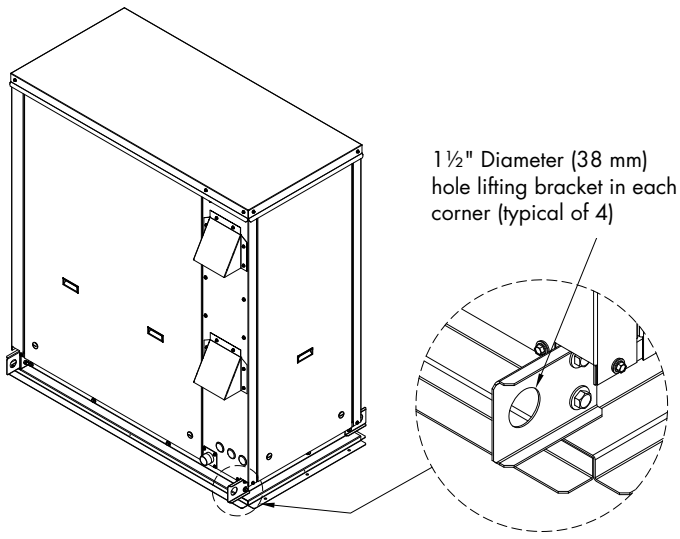
DIMENSIONS

- For outdoor unit weights, see pages 8 - 9.
- For clearances, see Figure 43-1.

Outdoor enclosure: Mounting

- Verify that the position of the pad, curb, or wall (when applicable) properly supports the unit and that support structure dimensions coincide with unit dimensions.
- DriSteem rooftop curbs are shipped knocked down for ease of transporting to the roof. The curb is manufactured out of 14-gauge galvanized steel and is shipped with all hardware for bolt-together assembly, a curb gasket for sealing between the curb and the unit, and an installation drawing. All holes are matched before leaving the factory.
- Roof curbs supplied by others must be at least 14" high, and there must be a gasket between the top of the curb and the base surface of the unit to prevent moisture from leaking into the building from either driving rain or melting snow.
- Prior to installation, remove all of the unit packaging.
- The RTS outdoor enclosure must be lifted by the designated lift points as shown in Figure 42-1. It must be lifted in a fashion that holds it level and keeps it from tipping, falling, or twisting.
    - If the unit is severely twisted during handling, permanent damage can occur.
    - It is the installer's responsibility to verify the handling equipment's capability to safely handle the unit.
    - All lifting operations must be accomplished with a load spreader of sufficient width to ensure that the lifting cables clear the side of the unit.

FIGURE 42-1: OUTDOOR ENCLOSURE MOUNTING WITH LIFT BRACKET



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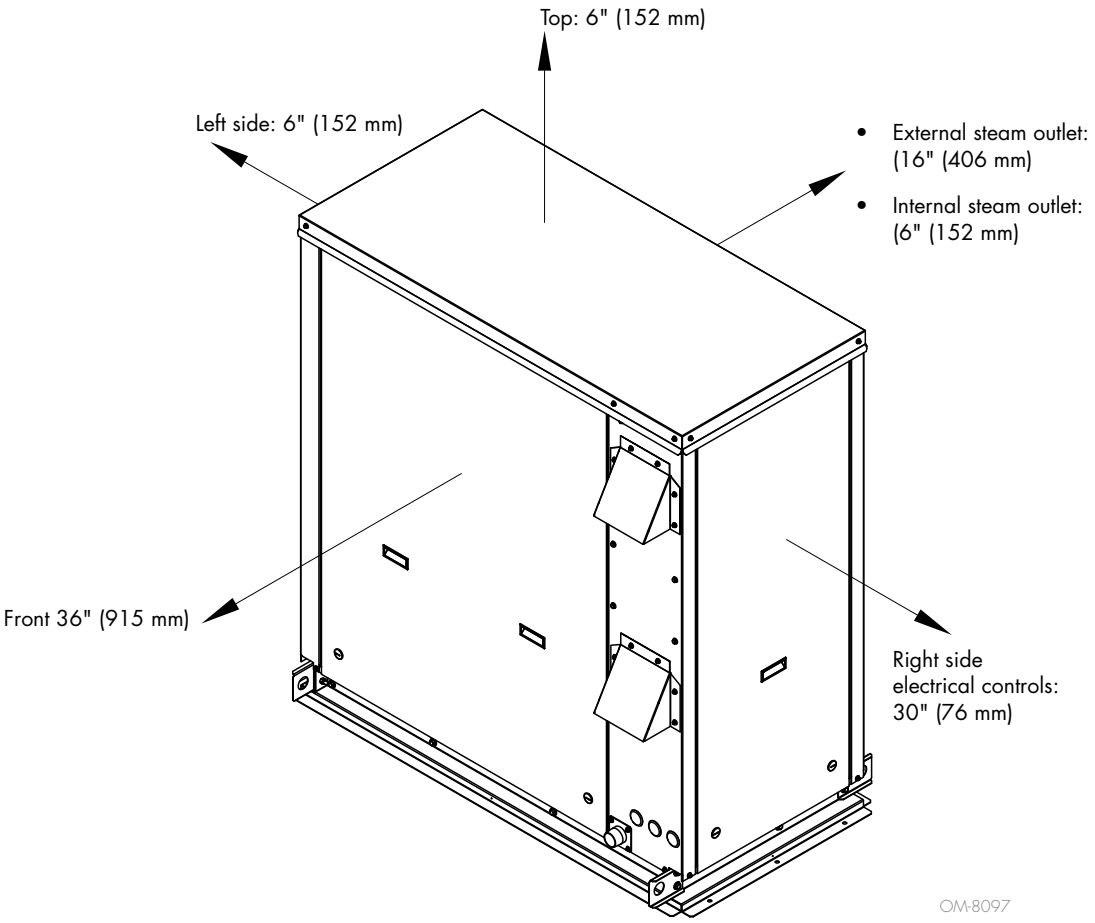
Outdoor enclosure: Clearances

FIGURE 43-1: RTS SERIES CLEARANCE RECOMMENDATIONS



Outdoor enclosure: Piping

See Piping beginning on Page 22 for directions on installing water and drain on the RTS humdifier RX series. For Outdoor Enclosure specific items, see below.

SUPPLY WATER AND DRAIN

- **Using the pipe chase**
  Use insulation to completely fill the area around the pipes in the chase to maintain proper enclosure pressure and protect unit components from elevated moisture levels within the building; insulation must serve as an effective vapor barrier.

  Use the provided pipe chase cover to seal off the pipe chase. Cut necessary holes, and seal after installation.
- **Using the designated knockouts that best fit the specific installation**
  Heat trace and insulate piping if freezing temperatures are a concern.
- **Insulate supply water piping** inside the unit to avoid dripping from condensation.
- For **cold climates**, see Freeze Protection Piping on Page 46.

STEAM

The humidifier has two available steam distribution configurations. The standard configuration has a steam outlet on the back side of the enclosure. The optional internal steam distribution configuration routes steam within the enclosure and down through the pipe chase into a building.

ELECTRICAL

The RTS humidifier and the outdoor enclosure require two separate electrical connections.

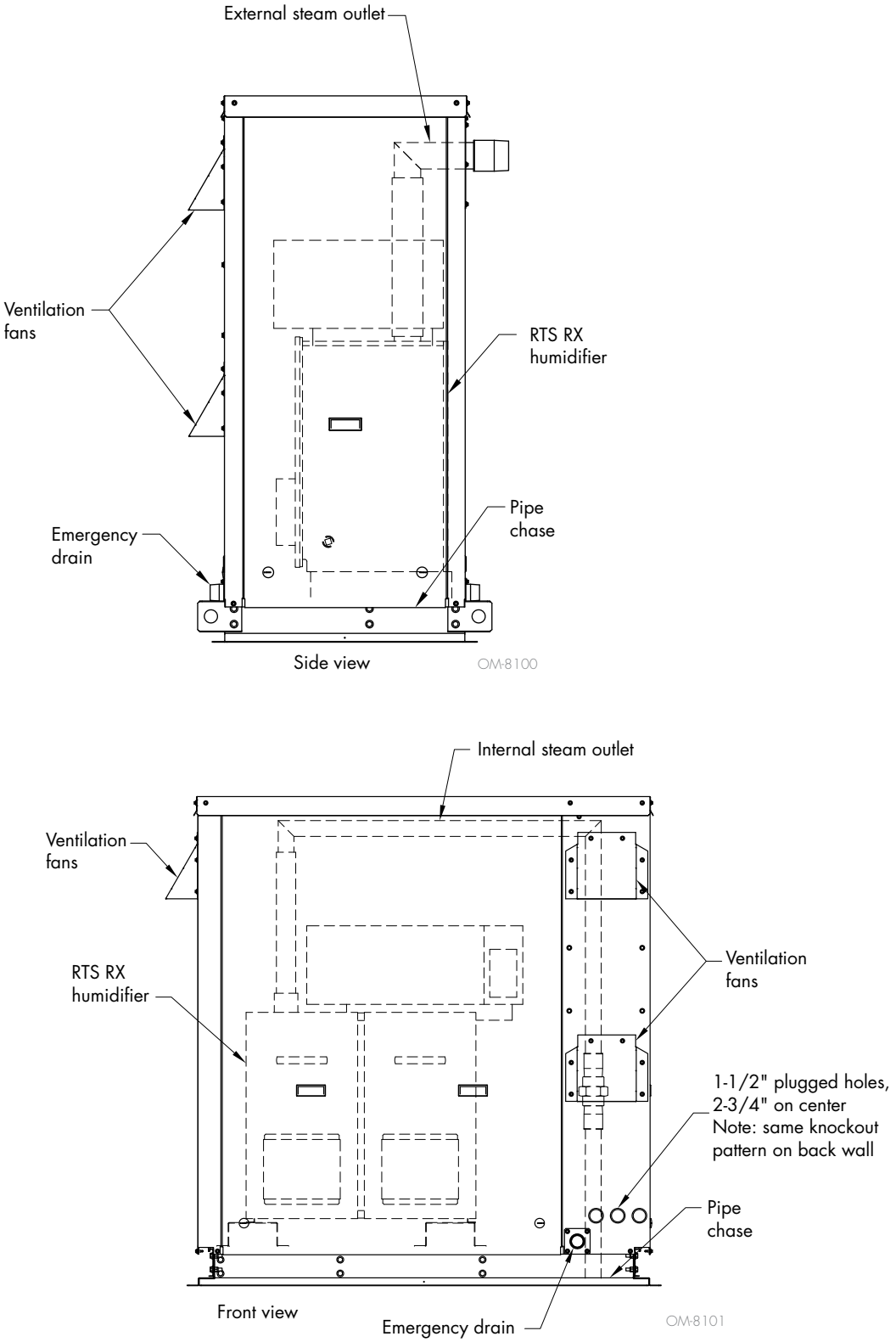
Table 44-1:
Outdoor unit amps (all models)

Full Load Amps (Heater Package)		Full Load Amps (No Heater Package)	
120V 60 Hz	**230V 50Hz**	**120V 60Hz**	**230V 50Hz**
7.0	3.7	0.3	0.2

Outdoor enclosure: Piping

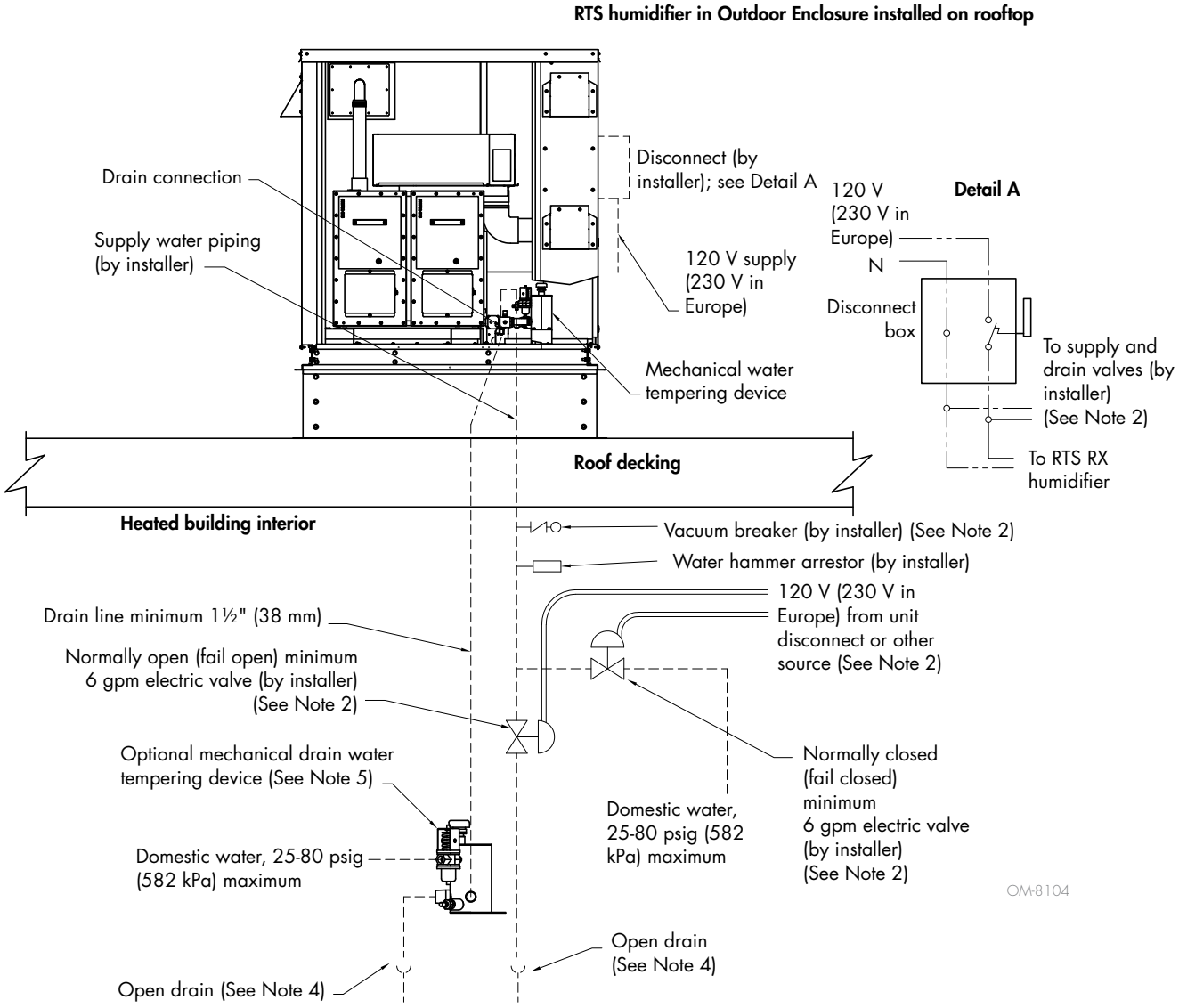
FIGURE 45-1: RTS OUTDOOR ENCLOSURE STEAM OUTLET OPTIONS

-3 and -4 stage units shown



Outdoor enclosure: Freeze protection piping

FIGURE 46-1: OUTDOOR ENCLOSURE FREEZE PROTECTION PIPING



Piping notes:

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

Start-up checklist

After the system is installed and connected to electrical, water supplies, controls, steam dispersion, and drain check the following items:

- ❑ Verify that the RTS humidifier, controls, piping, electrical connections, steam supply, and dispersion unit(s) are installed according to the following:
  - Installation instructions in this manual
  - *Vapor-logic Installation and Operation Manual* (shipped with the humidifier)
    - Installation section
    - Installation checklist
  - Interconnecting piping instructions
  - Associated dispersion installation instructions
  - Ladder style wiring diagram (shipped inside unit)
  - External connections wiring diagram (shipped inside unit)
  - All governing codes
- ❑ **Piping (steam, drain, supply water)**—Verify that all piping connections have been completed as recommended and that water pressure is available.
- ❑ **Electrical**—Verify that all wiring connections have been made in accordance with all governing codes and the RTS wiring diagrams.
- ❑ **Controls**—Verify that all control wiring has been completed as specified and required for correct and safe operation of the RTS humidifier. Refer to the Vapor-logic Installation and Operation Manual.
- ❑ Verify that the humidifier tank is securely installed and level before filling with water (see the operating weights on pages 8 - 9).

⚠ WARNING

Startup
Only qualified electrical personnel should perform the start-up procedure.

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

- Display setup and menu information
- Control input signals and functions
- Drain, flush, and skim features
- Safety features
- Alert screens and fault messages

The manual was shipped with your humidifier. Additional copies can be viewed, printed, or ordered on our website: www.dristeem.com

Start-up procedure

NOTE: During start-up, do not leave the humidifier unattended.

1. Complete the "Start-up Checklist" on Page 47 of this manual.
2. Turn on the water supply.
3. Turn on power to the humidifier. The display may take several seconds to appear as the controller powers up. When the humidifier is first powered up, the control cabinet fan will turn on. At this point, the humidifier is considered disabled, because it is in Standby mode.
4. Follow the Vapor-logic on-screen set-up steps, ensuring that wiring is accurate and that start-up and installation checklists have been followed.
5. Change mode from Standby to Auto in order for the humidifier to operate. The humidifier must also be showing a demand before it will start.
6. The humidifier will then perform several steps to prepare for humidification:
   - The RX will immediately begin a line flush with 5 gpm water running through the fill and drain lines. The purpose of this flush is to clean any debris out of the lines leftover from installation. The drain flush takes about one minute, and you may hear the humidifier draining.
   - Next, the humidifier will start to fill with water. At this time, the water will be skimmed off the surface to prime the p-trap. You may hear the unit draining. This process will take anywhere from six to eighteen minutes depending on the size of your humidifier.
   - After the probe check is complete, the contactor(s) will click, energizing the resistive heating elements. Once the unit starts humidifying, the solid state relay (SSR) will modulate the heaters in accordance with the humidification demand. The amount of time to boil varies depending on tank size and supply water temperature. (In multiple stage units, a click can be heard from the contactors when turning on/off a stage of heating elements).
7. Check the amp draw of the heaters. Refer to the humidifier wiring diagram for the proper rating.
8. If you experience difficulties, have the display information available along with the serial number and humidifier Model, and call DriSteem Technical Support at 800-328-4447.
9. See page 3 for continuous operation of the RTS humidifier.

Start-up commissioning checklist

Visit date _____

Model # _____

Serial # _____

Tag # _____

Important: Troubleshooting information for this humidifier is located in the *Vapor-logic Installation and Operation Manual* shipped with your humidifier. If you do not have this manual, go to www.dristeem.com to download or order a copy.

Supply water

- ❑ RO
- ❑ DI
- ❑ Softened
- ❑ Potable

Grains hardness _____

Water pressure (static and dynamic) _____ psi
(must be between 25 and 80 psi
[172 and 582 kPa] at 6.0 gpm)

- ❑ Supply water piping is sufficient size to maintain 25-80 psi [172-582 kPa] at 6.0 gpm (23 L/m) .

Drain water

- ❑ Drain pipe size, slope and fittings are sized to support 12gpm (45 L/m) maximum tank drain flow rate
- ❑ A vacuum relief valve is installed on the drain line to prevent siphoning of the internal p-trap
- ❑ Open drain installed between the humidifier drain line and the building drain

Job site representation:

_____

_____

_____

Job name _____

Program code _____

DriSteem rep _____

Required clearances

- ❑ As shown on pages 18 and 19

Wiring

- ❑ Control transmitter, humidistat or BAS demand signal
  - ❑ 18-gauge twisted pair shielded
- ❑ High limit duct transmitter or humidistat
  - ❑ 18-gauge twisted pair shielded
- ❑ Airflow proving switch
  - ❑ 18-gauge twisted pair shielded
- ❑ Optional external fault contact (qty 2)
  - ❑ 18-gauge twisted pair shielded
- ❑ Twisted pair communication connection between boards (multi-tank units only)

Continued

Start-up commissioning checklist

Steam pipe

Outlet size _____

❑ Hard pipe

❑ Insulated

❑ Steam hose (do not insulate)

Rise _____

Run _____

❑ Steam pipe pitched away from humidifier if greater than 20' (6.1 m) developed length

❑ 45° or long radius 90° elbows used in piping

❑ Steam piping is not smaller than outlet size

❑ Total developed length within allowable distance

Dispersion

❑ Ultra-sorb

❑ Rapid-sorb

❑ Single tube

❑ Single tube with drain

❑ Space distribution unit

❑ Area type fan

Appropriate height p-trap/water seal on the dispersion (should be 1" (25 mm) taller than duct static pressure) _____

Safety testing to verify function

Low water test _____

High humidity limit test _____

Airflow test _____

Aquastat test _____

Additional comments

_____

_____

_____

_____

_____

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Overview

The best way to determine how often your humidifier needs tank maintenance is to remove the heater plate and inspect it for mineral deposits after three months of operation. Hours of operation and duty cycle will determine your maintenance schedule, as will water quality.

WATER QUALITY AND MAINTENANCE

Maintenance requirements vary with water quality, because tap and softened water carry a variety of minerals and other materials in a mix that varies from location to location. Very hard (high mineral content) water requires more frequent cleaning and drain/flush cycles than water with low mineral content.

RO water and softened water significantly reduce mineral accumulation inside the humidifier.

Note: Solids, like silica, are not removed in the softening process.

⚠ WARNING

Thermal cut-out component is critical to the safety of this equipment: use only DriSteem replacement part.

⚠ WARNING

Electric shock hazard

Contact with energized circuits can cause severe personal injury or death as a result of electric shock. To prevent shock, disconnect electrical power before performing service or maintenance procedures on an part of the humidification system.

When performing maintenance on the humidifier:

- Always switch the Vapor-logic display control mode to Standby.
- Place all power disconnects in OFF position and lock in OFF position.
- Close the field-installed manual supply water shut-off valve.

Preparing for maintenance

Before performing any maintenance, allow the tank to cool down.

- Insulated and uninsulated tanks will have hot surfaces.
- Verify that there is no call for humidity and that the aquastat set point (adjusted using the display screens in Settings/Water Management) is less than room temperature (default setting is 50 °F [10 °C]) so the heaters do not energize while cooling down the tank.

COOL DOWN PROCEDURE

1. Go to the Home screen.
2. Change mode to Drain, and allow approximately half the water to drain out of the tank. The fill valves may also be on to temper the water.
3. Change the mode back to Auto; the fill valve opens and the humidifier cools down with the additional cool water.
4. When the fill valve closes, go back into Drain mode, and allow the tank to drain completely. The humidifier should be cool enough to work on.

Note: For more information about using the display, see the *Vapor-logic Installation and Operation Manual*.

⚠ WARNING

SHUTDOWN PROCEDURE

To prevent severe personal injury or death from electrical shock, fire, or explosion, follow this shutdown procedure before performing service or maintenance procedures on this humidifier.

1. Use Vapor-logic display, change the control mode to Standby.
2. Place all power disconnects in OFF position and lock in OFF position.
3. Close field-installed manual supply water shut-off valve.

⚠ WARNING

Hot surface and hot water hazard

Do not touch the tank or drain piping until the unit has had sufficient time to cool, or serious injury can occur.

Opening the drain valve when the tank is hot can discharge water with a temperature up to 212 °F (100 °C) into the plumbing system. This can cause damage to the plumbing system.

Inspection and maintenance

ANNUALLY

Before performing any maintenance Ensure the Cool Down Procedure and the Shut Down Procedure (page 52) have been followed. See "Electric shock hazard" Warning at right.

1. Inspect tank, gaskets, and hose connections for leaks.
2. Measure current draw of heaters and verify amp values per stage to identify any inoperable heaters. Only qualified electrical personnel should perform this task.
    - Reference the product label and identify Model Number and Unit Amperage. If unit is 1-stage (RX-xx-1), measured amps should equal specified amps. If unit is multi-stage, divide the total amps by the number of stages (RX-xx-2 = 2-stage, RX-xx-3 = 3-stage, RX-xx-4 = 4-stage) to determine current per stage. Each row of heaters per heater panel contains one stage. Each stage can have 1 to 3 heaters, depending on model.
3. Safety devices in the control circuit should be cycled on and off to verify they are functioning. These include:
    - High limit switch
    - Airflow proving switch

AS NEEDED BASED ON WATER QUALITY

Before performing any maintenance Ensure the Cool Down Procedure and the Shut Down Procedure (page 52) have been followed. See "Electric shock hazard" Warning at right.

1. Clean the humidifier tank, heater(s), and water level probes (exact frequency of this will depend on water quality and demand on the humidifier. See page 51 for more information.)
    a. Use the quarter-turn latches to remove the front enclosure panels. See "Electric shock hazard" Warning at right.
    b. Disconnect the electrical plug between the heaters and the bottom of the electrical panel. There is one connector per stage.

       Important: Disconnect by pulling on plug housing. Do not disconnect by pulling on cord or wires.
    c. Remove the tank heater plate. See page 55 for procedure.
    d. Clean the tank interior using a putty knife or similar flat instrument.

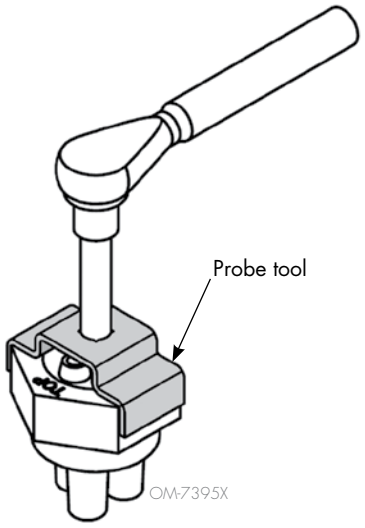
⚠ WARNING

Electric shock hazard

Do not remove humidifier electrical panel cover, heater terminal cover, or subpanel access panels until electrical power is disconnected. 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.

Only qualified electrical personnel should perform maintenance procedures.

FIGURE 53-1: PROBE TOOL



Remove and install probe assembly with probe tool. Attach a 3/8" square drive to the probe tool.

When installing, torque probe assembly to 30 in-lbs (2.5 ft-lbs; 3.4 N-m). Probe tools can be ordered from your DriSteem representative (Part No. 185101).

Inspection and maintenance

e. Clean heating elements.

f. Clean and inspect probe rod assembly.

- Unplug the probe plug assembly, and leave ground wire connected to tank.
- Unscrew probe rod assembly using the probe tool (see Figure 53-1), and clean probe housing, ensuring that all passageways for water flow are clear.
- Clean probe rods using steel wool or similar mild abrasive material.
- Replace probe assembly gasket.
- Install the probe and probe plug assembly. Torque probe housing to 30 lb-in. Verify ground wire is solidly connected to tank.

g. Replace heater plate/tank gasket.

h. Re-install the heater plate cover on the tank.

- Provide 60 lb-in torque for heater plate nuts during reinstallation

i. Reconnect the heater electrical plug.

2. Check and clean inlet screen on the fill valve (remove with pliers).
3. Verify electrical connections:
   - Verify that all DIN rail-mounted components are securely fastened to DIN rail.
   - Verify that all power terminal screws and lugs are tight from power block to heaters.
   - Verify that all plugs under the humidifier cover are completely plugged in.

OFF-SEASON SHUTDOWN PROCEDURE

1. If the tank is hot, perform the cool down procedure on page 52.
2. Follow the shutdown procedure on page 52.
3. If necessary, clean humidifier tank, heaters, and water level probes – following procedure on page 53.
4. Leave the evaporating chamber dry, the power off, and the water supply shut-off valve closed until the next humidification season.

Humidifier De-scaling Solution

Scale buildup on humidifier heaters acts as an insulator, reducing humidifier performance while increasing energy costs. To keep humidifiers operating as efficiently as possible, remove scale with DriSteem's Humidifier De-scaling Solution, available for purchase from your DriSteem representative.

The De-scaling Solution cleans without risk of corroding humidifier tanks or welds. The De-scaling Solution also cleans surfaces unreachable by hand scraping.

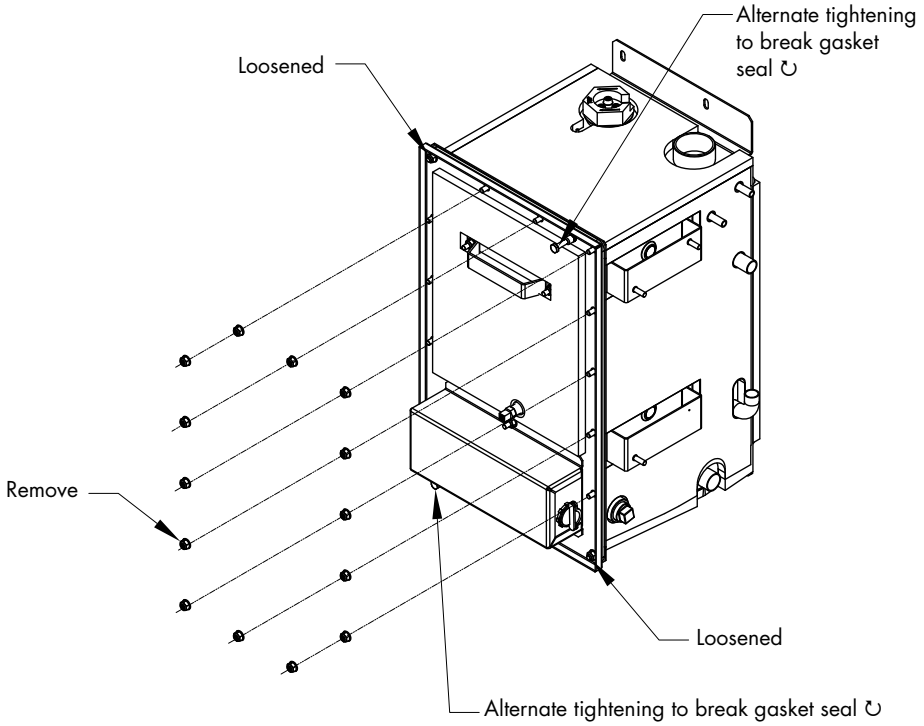
DriSteem's Humidifier De-scaling Solution is the only approved cleaner/de-scaler for use with DriSteem humidifiers. Use of other cleaners/de-scalers may void your DriSteem warranty.

Inspection and maintenance

REMOVING THE TANK HEATER PLATE

1. Remove all but 2 heater plate nuts.
2. Loosen remaining two and use 1/4-20 bolts at weld nut locations to pry cover from tank.

FIGURE 55-1: HEATER PLATE REMOVAL



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Component replacement

DRAIN VALVE REPLACEMENT (RX-XX-1 AND RX-XX-2)

DISASSEMBLY:

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. If housed in an enclosure, remove front doors. Disconnect display cable if applicable.
3. Disconnect black wire from DRAIN terminal of connector P17 on the Vapor-logic board. Disconnect the paired red wire from the common terminal block. Feed the wires through the bottom of control cabinet.
4. Disconnect heater cable connector(s) from bottom of control cabinet.
5. With a knife, cut hoses (near center) on both sides of drain valve and pull valve out of unit.
6. Remove remaining hose clamps and hose cuffs from tank drain outlet and drain block fitting.

ASSEMBLY:

1. If not already equipped, install new hose cuffs and fittings to drain valve and tighten hose clamps to secure hose cuffs.
2. Install new drain valve assembly by sliding hose cuff over drain block fitting and tank drain outlet tube. Note, some wiggling and bending of hose cuffs may be required.
3. Tighten hose clamps at tank drain outlet and drain block fitting.
4. Fill tank with water to ensure no leaks are present on tank side. Then manually open drain valve to ensure no leaks are present downstream of drain valve. Reset valve manual override before operation.
5. Feed drain valve cable through bottom of control cabinet. Connect black wire to DRAIN terminal of connector P17 on the Vapor-logic board. Connect red wire to common terminal block.
6. Connect heater cable connector(s) to bottom of control cabinet.
7. Ensure all tools and other utensils are removed. Install front door(s) and reconnect display if applicable.

Component replacement

DRAIN VALVE REPLACEMENT (RX-XX-3 AND RX-XX-4)

DISASSEMBLY:

1. Fully drain tank and ensure tank is cool. All power and water sources must be turned OFF.
2. If housed in an enclosure, remove the front and right access panels.
3. Disconnect black wire from DRAIN terminal of connector P17 on the Vapor-logic board. Disconnect the paired red wire from the common terminal block. Feed the wires through the bottom of control cabinet.
4. If equipped with a mechanical tempering device, disconnect hose leading to drain block.
5. Disconnect from drain piping at site installed union.
6. Remove electrical connector from drain temperature sensor.
7. Disconnect overflow hose feeding into top of drain block.
8. In some cases, the fill valve assembly may need to be moved for clearance. Remove screws holding fill valve bracket to base if needed.
9. Remove drain valve assembly from tank by rotating counter-clockwise. Separate drain valve from block assembly.

ASSEMBLY:

1. Install new drain valve to block assembly using thread sealant. Ensure actuator of drain valve aligned with drain temperature sensor installed in drain block.
2. Use thread sealant at tank drain fitting and install drain valve assembly orienting drain valve actuator toward front of unit.
3. If fill valve assembly was moved, reinstall fill valve bracket.
4. Connect overflow hose to fitting at top of drain block.
5. Connect electrical connector for drain temp sensor.
6. Connect drain piping and/or mechanical tempering device.
7. Fill tank with water to ensure no leaks are present on tank side. Then manually open drain valve to ensure no leaks are present downstream of drain valve. Reset valve manual override before operation.
8. Feed drain valve cable through bottom of control cabinet. Connect black wire to DRAIN terminal of connector P17 on the Vapor-logic board. Connect red wire to common terminal block.
9. Ensure all tools and other utensils are removed. Install front and side access panels if applicable.

Component replacement

HEATER REPLACEMENT

Disassembly

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. If housed in an enclosure, remove the front door(s). Disconnect display cable if applicable.
3. Disconnect the heater cable connector(s) from the bottom of the control cabinet.
4. Disconnect the plug at the temperature sensor on the heater plate.
5. Refer to Figure 55-1 for heater plate removal.
   a. Remove all except two perimeter nuts.
   b. Loosen the remaining two nuts.
   c. Alternate tightening (clockwise) the two heater plate bolts until the gasket seal is broken.
   d. Remove the loosened heater plate nuts.
6. Remove two nuts securing heater terminal cover. Remove cover.
7. Disconnect cables and buss bars (if applicable) from heater terminals.
8. Remove heater mounting nut and slide heater out from opposite side.
9. Clean heater plate surface and ensure old gasket is removed completely.

Assembly

1. Ensure that a new gasket is installed on the new heater and slide terminals through heater plate.
2. From the outside, install a new safety washer (orientation - dome out) and heater mounting nut.
3. Torque all heater mounting nuts to 180 in-lbs and ensure heaters do not rotate during tightening sequence. Heating elements must not touch each other and remain untwisted.
4. Install buss bars and cables in the same orientation as removed. Terminal nuts are to be torqued to 25 in-lbs.
5. Install terminal cover and nuts. Torque to 60 in-lbs.
6. Clean gasket sealing surface on both the heater plate and the tank. Install a new heater plate gasket on the tank, using the weld studs to hold it in place.
7. Back out heater plate removal bolts and install heater plate on tank. Torque all heater plate nuts to 60 in-lbs in an alternating pattern.
8. Reconnect the heater cable(s) to the connectors at the bottom of the control cabinet.
9. Reconnect the plug at the temperature sensor on the heater plate.
10. Ensure all tools and cleaning utensils are removed. Install front door(s) and reconnect display if applicable.

Component replacement

CONTROL CABINET REMOVAL (RX-XX-1 AND RX-XX-2)

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. If housed in an enclosure, remove the front doors and top/right panel. Disconnect display cable if applicable.
3. Disconnect water level probe connector and ground cable (top of tank).
4. Disconnect plug from tank temperature sensor on heater plate.
5. Disconnect the heater cable connector(s) from the bottom of the control cabinet.
6. Disconnect spade connectors (4 total) from fill valve connections.
7. Disconnect plug from drain temperature sensor.
8. Disconnect black wire from DRAIN terminal of connector P17 on the Vapor-logic control board. Disconnect the paired red wire from the common terminal block. Feed the wires out through the bottom of the control cabinet.
9. Disconnect supply line cables from terminal block and remove from control cabinet.
10. If applicable, remove power cables routed to SDU.
11. Remove three (3) nuts securing control cabinet to tank. Lift control cabinet up and out from mounting studs.

CONTROL CABINET REMOVAL (RX-XX-3 AND RX-XX-4)

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. If housed in an enclosure, remove the front and side doors, and top panel. Disconnect display cable if applicable.
3. Remove front and top panels of control cabinet for full access.
4. Disconnect water level probe connector and ground cable (near steam outlet).
5. Disconnect both plugs from tank temperature sensors on heater plates.
6. Disconnect the heater cable connector(s) from the bottom of the control cabinet.
7. Disconnect spade connectors (4 total) from fill valve connections.
8. Disconnect plug from drain temperature sensor.
9. Disconnect black wire from DRAIN terminal of connector P17 on the Vapor Logic board. Disconnect the paired red wire from the common terminal block. Feed the wires out through the bottom of the control cabinet.
10. Disconnect supply line cables from terminal block and remove from control cabinet.
11. If applicable, remove ducting assembly from bottom of cabinet (4 screws).
12. Remove four (4) bolts securing control cabinet to tank. Cabinet can then be removed.

Component replacement

TANK REMOVAL (RX-XX-1 AND RX-XX-2)

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. Follow instructions for removing control cabinet.
3. Disconnect hoses from right side of tank.
   a. Two 3/8" hoses near top of tank
   b. Overflow hose (3/4")
   c. Bottom-fill hose (3/4")
   d. Drain hose (1")
4. If applicable, disconnect piping to condensate return port.
5. Disconnect steam outlet piping/hose.
6. Remove two (2) nuts at upper tank bracket.
7. Lift tank straight up (approximately 2") and pull out from frame.
8. See Heater Replacement instructions for heater plate removal process.

TANK REMOVAL (RX-XX-3 AND RX-XX-4)

1. Fully drain tank and ensure tank is cool. All power sources must be turned OFF.
2. If applicable, remove indoor enclosure panels for full access to tank assembly.
3. Follow instructions for removing control cabinet.
4. Disconnect hoses from right side of tank.
   a. Two 3/8" hoses near top of tank
   b. Overflow hose (3/4") (Remove at drain block as well)
   c. Bottom-fill hose (3/4")
5. If applicable, disconnect piping to condensate return port.
6. Disconnect drain water connection and unscrew drain valve assembly from tank.
7. Disconnect steam outlet piping/hose.
8. Remove eight (8) screws securing tank to base (4 each side)
9. Lift tank straight up (approximately 1" to avoid locator screws) and remove from base.
10. See Heater Replacement instructions for heater plate removal process.

Troubleshooting

Table 61-1:
Model RX humidifier troubleshooting guide

Problem	Possible cause	Action
Humidifier will not turn on	Field-wired terminal connections	Check all connections.
		Check wiring connections and settings on accessory items such as high limit switch and airflow proving switch.
	Internal connections	Follow the shutdown procedure on Page 52. Confirm electrical connections are powered off at terminal block, SSR, and heaters.
		Make sure ribbon cable from membrane switch is securely plugged into control circuit board.
		Check that terminals from internal components are securely attached to proper tabs on circuit boards.
	No power to humidifier	Check main power supply and switch.
		Check for proper voltage across all terminals.
	No power to 24V control circuit	Check reset switch on transformer.
		Check that the transformer line fuses (2) are in place and conductive (multi-stage).
Water constantly runs down drain.	Malfunctioning drain valve.	Check valve function using Test Mode.
	Debris in drain valve preventing it from closing	Remove drain block plug, and clean debris from drain valve.
	Water flowing from overflow port	Check internal hoses, and remove kinks or blockage.
		Check level probe function.
Water is leaking from humidifier.	Loose plumbing connections	Check supply water connection at fill valve inlet. Tighten as needed.
		Check internal hose clamp connections. Reposition clamps and tighten as needed.
		Check steam hose connection on top of tank. Tighten clamp or piping as needed.
Humidifier makes gurgling sound.	Excess condensate in steam hose	Make sure steam hose has constant downward slope to humidifier or to tees and traps in low spots of hose.
Fill valve makes banging sound.	Water hammer from line pressure	Make sure water supply line does not contact ductwork.
		Install shock arrestor.
		Install section of 1/4" braided fill line. Conform to governing codes.
Humidifier will not fill.	Field-installed supply water shut-off valve not open	Open valve.
	Malfunctioning fill valve	Check valve function using Test mode.
Humidifier will not drain.	Debris in drain valve blocking outlet port	Remove drain block plug and clean debris from drain valve.
	Malfunctioning drain valve	Check valve function using Test mode.
		Check the inlet screen on the fill valve to make sure it is not stuck open.
Humidifier draining hot water.	Malfunctioning drain tempering device.	Confirm that tempering is turned on.
		Check the fill and drain valves are operating correctly.
		Confirm the tempering sensor is operating correctly.

Continued

Troubleshooting

Table 61-1:
Model RX humidifier troubleshooting guide (continued)

Problem	Possible cause	Action
Humidifier is not satisfying demand.	Control setting too low	Adjust control to higher setting.
	Control mounted in wrong location	See installation instructions with control for correct mounting location.
	Heaters failing	Measure current draw of heaters and verify amp values per stage .
Excess humidity.	Control setting too high	Adjust control to lower setting.
	Control mounted in wrong location	See installation instructions with control for correct mounting location.

MODEL RX TROUBLESHOOTING

Follow the procedure below to resolve issues with RX series humidifiers:

1. Review possible causes and recommended actions in the Troubleshooting guide in the *Vapor-logic Installation and Operation Manual*.
2. If the Troubleshooting guide does not help you solve the issue, call DriSteem with the following information available:
   - Humidifier model number, serial number, and firmware version (see nameplate on side of the humidifier and steam blower)
   - To access firmware version:
     - 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.

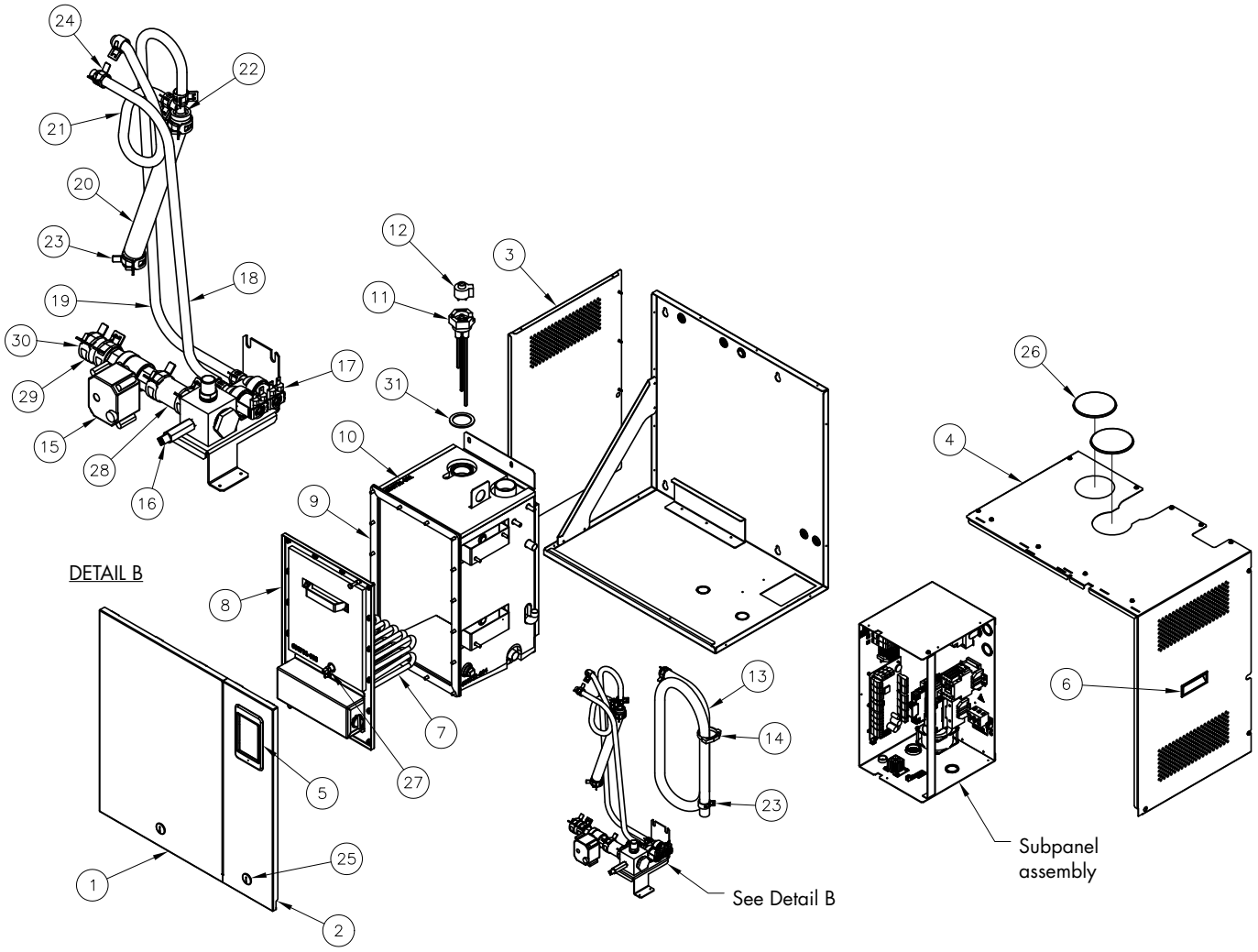
DriSteem Technical Support

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
_____ _____ _____

RTS Humidifier RX Series (-1 & -2)

FIGURE 63-1: RTS HUMIDIFIER REPLACEMENT PARTS



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RTS Humidifier RX Series (-1 & -2)

Table 64-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
1	PANEL FRONT TANK DOOR SM RTS RX	1	600773
	PANEL FRONT TANK DOOR MEDIUM RTS	1	600838
2	PANEL FRONT ELEC W/ DISPLAY SM RTS RX	1	600774
	PANEL FRONT ELEC W/ DISPLAY MEDIUM RTS RX	1	600839
3	PANEL LEFT IE SMALL RTS RX	1	600771
	PANEL LEFT IE MEDIUM RTS	1	600836
4	PANEL WRAP IE SMALL RTS RX	1	600770
	PANEL WRAP IE MEDIUM RTS	1	600835
5	DISPLAY TOUCHSCREEN KIT	1	183508-001
6	HANDLE DOOR PLASTIC BLACK	1	405805-003
7	HEATER TUBULAR RTS RX	*	600931-XXX
8	HEATER PLATE WELD 1 HTR 304SST SM RTS RX	*	600927-001
	HEATER PLATE WELD 2 HTR 304SST SM RTS RX	*	600927-002
	HEATER PLATE WELD 3 HTR 304SST SM RTS RX	*	600927-003
	HEATER PLATE WELD 1 HTR 316SST SM RTS RX	*	600927-101
	HEATER PLATE WELD 2 HTR 316SST SM RTS RX	*	600927-102
	HEATER PLATE WELD 3 HTR 316SST SM RTS RX	*	600927-103
	HEATER PLATE WELD 6 HTR 304SST MD/LG RTS RX	*	600587-003
	HEATER PLATE WELD 4 HTR 304SST MD/LG RTS RX	*	600587-006
	HEATER PLATE WELD 3 HTR 304SST MD/LG RTS RX	*	600587-007
	HEATER PLATE WELD 2 HTR 2 STG 304SST MD/LG RTS RX	*	600587-008
	HEATER PLATE WELD 2 HTR 1 STG 304SST MD/LG RTS RX	*	600587-009
	HEATER PLATE WELD 1 HTR MD/LG 304SST RTS RX	*	600587-010
	HEATER PLATE WELD 6 HTR 316SST MD/LG RTS RX	*	600587-103
	HEATER PLATE WELD 4 HTR 316SST MD/LG RTS RX	*	600587-106
	HEATER PLATE WELD 3 HTR 316SST MD/LG RTS RX	*	600587-107
	HEATER PLATE WELD 2 HTR 2 STG 316SST MD/LG RTS RX	*	600587-108
	HEATER PLATE WELD 2 HTR 2 STG 316SST MD/LG RTS RX	*	600587-109
	HEATER PLATE WELD 1 HTR MD/LG 316SST RTS RX	*	600587-110
9	GASKET MOLDED EPDM RTS SMALL	1	600752
	GASKET MOLDED EPDM RTS LARGE (MEDIUM)	1	600676

* Specify humidifier model and serial numbers when ordering.

Continued

RTS Humidifier RX Series (-1 & -2)

Table 65-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
10	TANK WELDMENT 304SST 1.5" TUBE SM RTS RX	1	600590-015
	TANK WELDMENT 304SST 1.5" NPT SM RTS RX	1	600590-016
	TANK WELDMENT 304SST 1.5" BSP SM RTS RX	1	600590-017
	TANK WELDMENT 316SST 1.5" TUBE SM RTS RX	1	600590-018
	TANK WELDMENT 316SST 1.5" NPT SM RTS RX	1	600590-019
	TANK WELDMENT 316SST 1.5" BSP SM RTS RX	1	600590-020
	TANK WELDMENT 304SST 2" TUBE SM RTS RX	1	600590-021
	TANK WELDMENT 304SST 2" NPT SM RTS RX	1	600590-022
	TANK WELDMENT 304SST 2" BSP SM RTS RX	1	600590-023
	TANK WELDMENT 316SST 2" TUBE SM RTS RX	1	600590-024
	TANK WELDMENT 316SST 2" NPT SM RTS RX	1	600590-025
	TANK WELDMENT 316SST 2" BSP SM RTS RX	1	600590-026
	TANK WELDMENT 304SST 1.5" TUBE MD RTS RX	1	600590-150
	TANK WELDMENT 304SST 1.5" NPT MD RTS RX	1	600590-151
	TANK WELDMENT 304SST 1.5" BSP MD RTS RX	1	600590-152
	TANK WELDMENT 316SST 1.5"TUBE MD RTS RX	1	600590-153
	TANK WELDMENT 316SST 1.5"NPT MD RTS RX	1	600590-154
	TANK WELDMENT 316SST 1.5"BSP MD RTS RX	1	600590-155
	TANK WELDMENT 304SST 2" TUBE MD RTS RX	1	600590-156
	TANK WELDMENT 304SST 2" NPT MD RTS RX	1	600590-157
	TANK WELDMENT 304SST 2" BSP MD RTS RX	1	600590-158
	TANK WELDMENT 316SST 2" TUBE MD RTS RX	1	600590-159
	TANK WELDMENT 316SST 2" NPT MD RTS RX	1	600590-160
	TANK WELDMENT 316SST 2" BSP MD RTS RX	1	600590-161
11	PROBE ASSY RTS RX	1	406303-116
12	PROBE PLUG ASSY W/COVERED CABLE 36" LONG	1	406050-200
13	HOSE 3/4" I.D. X 52" LONG (1-STAGE)	1	307020-002
	HOSE 3/4" I.D. X 70" LONG (2-STAGE)	1	307020-002
14	HOSE CLAMP 1-3/4" NYLON	1	700560-003
15	VALVE 3/4'' NPT SST (NC) (INDOOR)	1	505077-005
	VALVE 3/4'' NPT SST (NO) (OUTDOOR)	1	505077-006

* Specify humidifier model and serial numbers when ordering.

Continued

RTS Humidifier RX Series (-1 & -2)

Table 66-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
16	SENSOR TEMP DRAIN WATER RTS	1	600973
17	VALVE FILL DUAL FLOW .26 GPM (GRY) RTS	1	600568-101
	VALVE FILL DUAL FLOW .53 GPM (BLU) RTS	1	600568-102
18	HOSE 3/8" I.D. X 22" LONG (1-STAGE)	1	307020-004
	HOSE 3/8" I.D. X 26" LONG (2-STAGE)	1	307020-004
19	HOSE 3/8" I.D. X 30" LONG (1-STAGE)	1	307020-004
	HOSE 3/8" I.D. X 40" LONG (2-STAGE)	1	307020-004
20	HOSE 3/4" I.D. X 12" LONG (1-STAGE)	1	307020-002
	HOSE 3/4" I.D. X 20" LONG (2-STAGE)	1	307020-002
21	HOSE 3/8" I.D. X 18-1/2" LONG	1	307020-004
22	TEE 3/8" X 3/8" SST	1	600969
23	HOSE CLAMP 3/4" I.D.	4	700560-027
24	HOSE CLAMP 3/8" I.D.	6	700560-017
25	CAM LATCH ASSY, 1/4 TURN SLOTTED DRIVE	2	600379
26	PLUG 4" PANEL	1	405892-040
27	PROBE SENSOR/SWITCH TEMP N.C. NO RESET	1	600804
28	HOSE HEATER 1" I.D. X 2-3/4" LONG	1	307020-003
29	HOSE HEATER 1" I.D. X 1-3/4" LONG	1	307020-003
30	HOSE CLAMP 1" I.D.	4	700560-035
31	PROBE GASKET	1	600697-002

* Specify humidifier model and serial numbers when ordering.

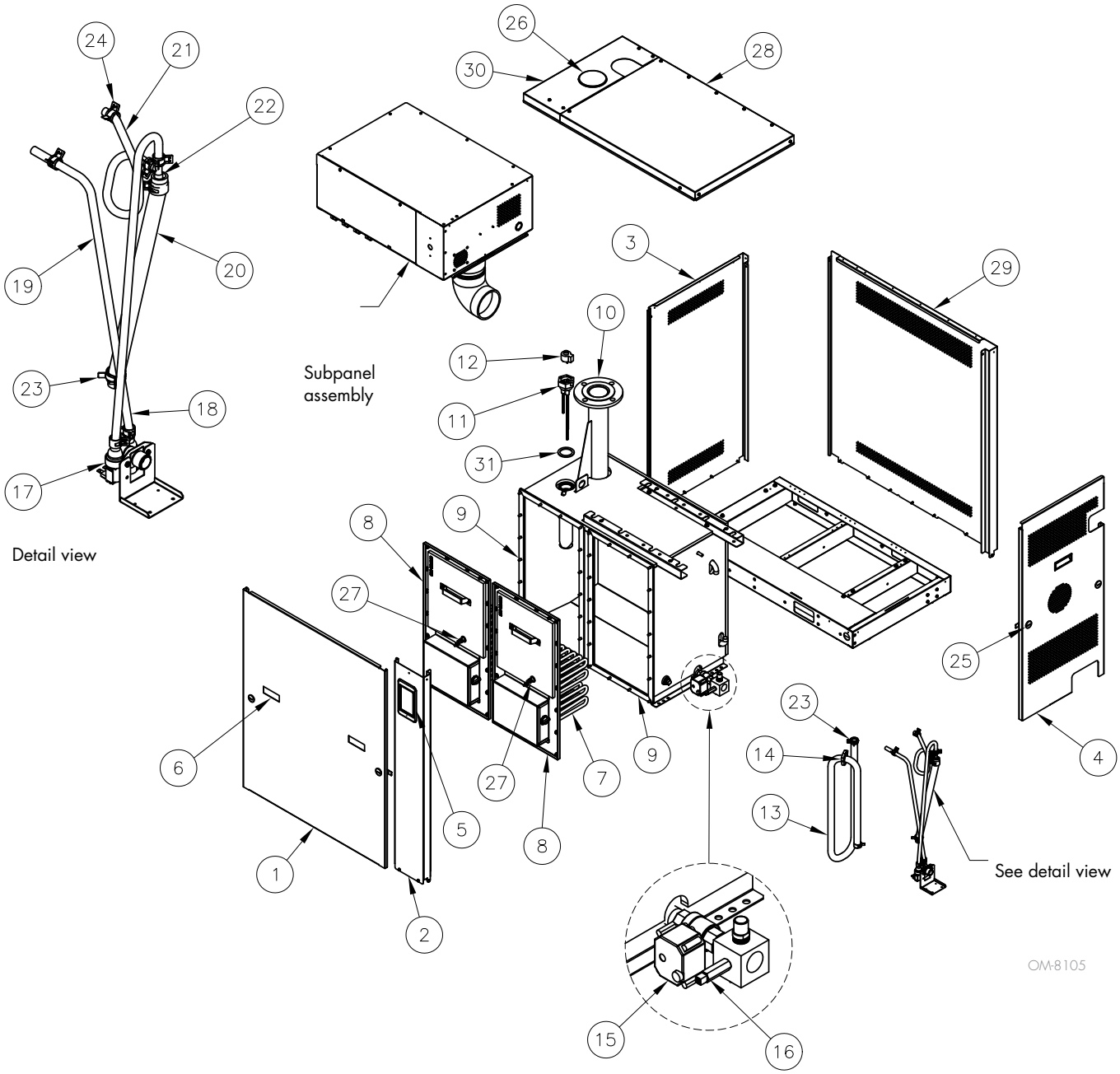
Continued

⚠ WARNING

Thermal cut-out component is critical to the safety of this equipment: use only DriSteem replacement part.

RTS Humidifier RX Series (-3 & -4)

FIGURE 67-1: RTS HUMIDIFIER REPLACEMENT PARTS



RTS Humidifier RX Series (-3 & -4)

Table 68-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
1	PANEL DOOR FRONT INDOOR ENCL LG RTS RX	1	600665-299
2	PANEL RIGHT FRONT W/ DISPLAY LG RTS RX	1	600880-299
3	PANEL LEFT LG INDOOR ENCL RTS RX	1	600642-299
4	PANEL RIGHT LG INDOOR ENCL RTS RX	1	600643
5	DISPLAY TOUCHSCREEN FINAL ASSEMBLY	1	183508-001
6	HANDLE DOOR PLASTIC BLACK	3	405805-003
7	HEATER TUBULAR RTS RX	*	600931-XXX
8	HEATER PLATE WELD 6 HTR 304SST MD/LG RTS RX	*	600587-003
	HEATER PLATE WELD 4 HTR 304SST MD/LG RTS RX	*	600587-006
	HEATER PLATE WELD 3 HTR 304SST MD/LG RTS RX	*	600587-007
	HEATER PLATE WELD 2 HTR 2 STG 304SST MD/LG RTS RX	*	600587-008
	HEATER PLATE WELD 2 HTR 1 STG 304SST MD/LG RTS RX	*	600587-009
	HEATER PLATE WELD 1 HTR 304SST MD/LG RTS RX	*	600587-010
	HEATER PLATE WELD 6 HTR 316SST MD/LG RTS RX	*	600587-103
	HEATER PLATE WELD 4 HTR 316SST MD/LG RTS RX	*	600587-106
	HEATER PLATE WELD 3 HTR 316SST MD/LG RTS RX	*	600587-107
	HEATER PLATE WELD 2 HTR 2 STG 316SST MD/LG RTS RX	*	600587-108
	HEATER PLATE WELD 2 HTR 1 STG 316SST MD/LG RTS RX	*	600587-109
	HEATER PLATE WELD 1 HTR 316SST MD/LG RTS RX	*	600587-110
9	GASKET MOLDED EPDM RTS LARGE	2	600676
10	TANK WELDMENT 304SST 2" TUBE LG RTS RX	1	600590-201
	TANK WELDMENT 304SST 2" NPT LG RTS RX	1	600590-202
	TANK WELDMENT 304SST 2" TUBE LG RTS RX	1	600590-203
	TANK WELDMENT 304SST 3" TUBE LG RTS RX	1	600590-301
	TANK WELDMENT 304SST 3" BSP LG RTS RX	1	600590-302
	TANK WELDMENT 304SST 3" FLANGE LG RTS RX	1	600590-303
	TANK WELDMENT 316SST 2" TUBE LG RTS RX	1	600590-204
	TANK WELDMENT 316SST 2" NPT LG RTS RX	1	600590-205
	TANK WELDMENT 316SST 2" BSP LG RTS RX	1	600590-206
	TANK WELDMENT 316SST 3" TUBE LG RTS RX	1	600590-304
	TANK WELDMENT 316SST 3" BSP LG RTS RX	1	600590-305
	TANK WELDMENT 316SST 3" FLANGE LG RTS RX	1	600590-306

* Specify humidifier model and serial numbers when ordering.

Continued

⚠ WARNING

Thermal cut-out component is critical to the safety of this equipment: use only DriSteem replacement part.

RTS Humidifier RX Series (-3 & -4)

Table 69-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
11	PROBE ASSY RTS RX BLACK SHORT	1	406303-116
12	PROBE PLUG ASSY W/COVERED CABLE 36" LONG	1	406050-200
13	HOSE 3/4" I.D. X 60" LONG	1	307020-002
14	HOSE CLAMP 1-3/4" NYLON	1	700560-003
15	VALVE 3/4'' NPT SST (NC) (INDOOR)	1	505077-005
	VALVE 3/4'' NPT SST (NO) (OUTDOOR)	1	505077-006
16	SENSOR TEMP DRAIN WATER RTS	1	600973
17	VALVE FILL DUAL FLOW .26 GPM (GRY) RTS	1	600568-101
	VALVE FILL DUAL FLOW .53 GPM (BLU) RTS	1	600568-102
	VALVE FILL DUAL FLOW .80 GPM (GRN) RTS	1	600568-103
	VALVE FILL DUAL FLOW 1.30 GPM (RED) RTS	1	600568-104
18	HOSE 3/8" I.D. X 40" LONG	1	307020-004
19	HOSE 3/8" I.D. X 28" LONG	1	307020-004
20	HOSE 3/4" I.D. X 20" LONG	1	307020-002
21	HOSE 3/8" I.D. X 18-1/2" LONG	1	307020-004
22	TEE 3/8" X 3/8" SST	1	600969
23	HOSE CLAMP 3/4" I.D.	4	700560-027
24	HOSE CLAMP 3/8" I.D.	6	700560-017
25	CAM LATCH LOW PRO SLOTTED DRIVE BLACK	4	600976
26	PLUG 4" PANEL	1	405892-040
27	PROBE SENSOR/SWITCH TEMP N.C. NO RESET	2	600804
28	PANEL TOP LG INDOOR ENCL RTS RX	1	600644-289
29	PANEL BACK LG INDOOR ENCL RTS RX	1	600645-299
30	PANEL TOP FIXED LG INDOOR ENCL RTS RX	1	600644-299
31	PROBE GASKET	1	600697-002

* Specify humidifier model and serial numbers when ordering.

Heaters

Table 70-1:
RTS heaters

RTS model	Maximum steam capacity		Power	Heater quantity and part number (600931-XXX)										
				Single-phase						Three-phase				
	lbs/hr	kg/h	kW	120V	208V	240V	277V	480V	600V	208V	240V	380V	480V	600V
RX-6-1	6	2.7	2	1-101	1-102	1-103	1-117	1-106	1-107	-	-	-	-	-
RX-12-1	12	5.4	4	2-101	1-108	1-109	1-117	1-112	1-113	2-102	2-103	2-104	2-106	2-107
RX-18-1	18	8.2	6	-	1-114	1-116	1-117	1-120	1-121	3-102	3-103	3-104	3-106	3-107
RX-24-1	24	10.9	8	-	2-108	2-109	2-117	2-112	2-113	2-102, 1-108	2-103, 1-109	2-104, 1-110	2-106, 1-112	2-107, 1-113
RX-30-1	30	13.6	10	-	-	1-109, 1-116	2-117	1-112, 1-120	1-113, 1-121	1-102, 2-108	1-103, 2-109	1-104, 2-110	1-106, 2-112	1-107, 2-113
RX-36-1	36	16.3	12	-	-	-	2-117	2-120	2-121	3-108	3-109	3-110	3-112	3-113
RX-42-1	42	19.0	14	-	-	-	-	2-112, 1-120	2-113, 1-121	2-108, 1-114	2-109, 1-116	2-110, 1-118	2-112, 1-120	2-113, 1-121
RX-48-1	48	21.8	16	-	-	-	-	1-112, 2-120	1-113, 2-121	-	1-109, 2-116-	1-110, 2-118	1-112, 2-120	1-113, 2-121
RX-63-1	63	28.6	21					2-120, 1-128	2-121, 1-130			2-118, 1-124	2-120, 1-128	2-121, 1-130
RX-75-1	75	34.0	25	-	-	-	-	-	3-130	-	-	3-124	3 -128	3-130
RX-30-2	30	13.6	10	-	2 -114	-	-	-	-	-	-	-	-	-
RX-36-2	36	16.3	12	-	2-114	2-116	-	-	-	-	-	-	-	-
RX-48-2	48	21.8	16	-	4-108	4-109	4-117	-	-	4-102, 2-108	-	-	-	-
RX-63-2	63	28.6	21	-	-	2-103, 2-123	4-117	-	-	6-108	6-109	-	-	-
RX-75-2	75	34.0	25	-	-	-	-	2-112, 2-128	-	4-108, 2-114	4-109, 2-116	-	-	-
RX-90-2	90	40.8	30	-	-	-	-	2-120, 2-128	2-121, 2-130	-	2-109, 4-116	2-110, 4-118	2-112, 4-120	2-113, 4-121
RX-102-2	102	46.3	34	-	-	-	-	4-112, 2-128	4-113, 2-130	-	6-116	6-118	6-120	6-121
RX-126-2	126	57.1	42	-	-	-	-	4-120, 2-128	4-121, 2-130	-	-	4-118, 2-124	4-120, 2-128	4-121, 2-130
RX-144-2	144	65.3	48	-	-	-	-	-	2-121, 4-130	-	-	2-118, 4-124	2-120, 4-128	2-121, 4-130
RX-162-2	162	73.5	54	-	-	-	-	-	6-130	-	-	6-124	6-128	6-130

Notes:
- All RTS models operate at 50/60 Hz.
- 600931 are the first digits of the heater part number. Example: 1-106, 2-112 = One 600931-106 and two 600931-112 heaters.
- 230V and 400V heater part numbers are on page 6. They are in the models table.

Heaters

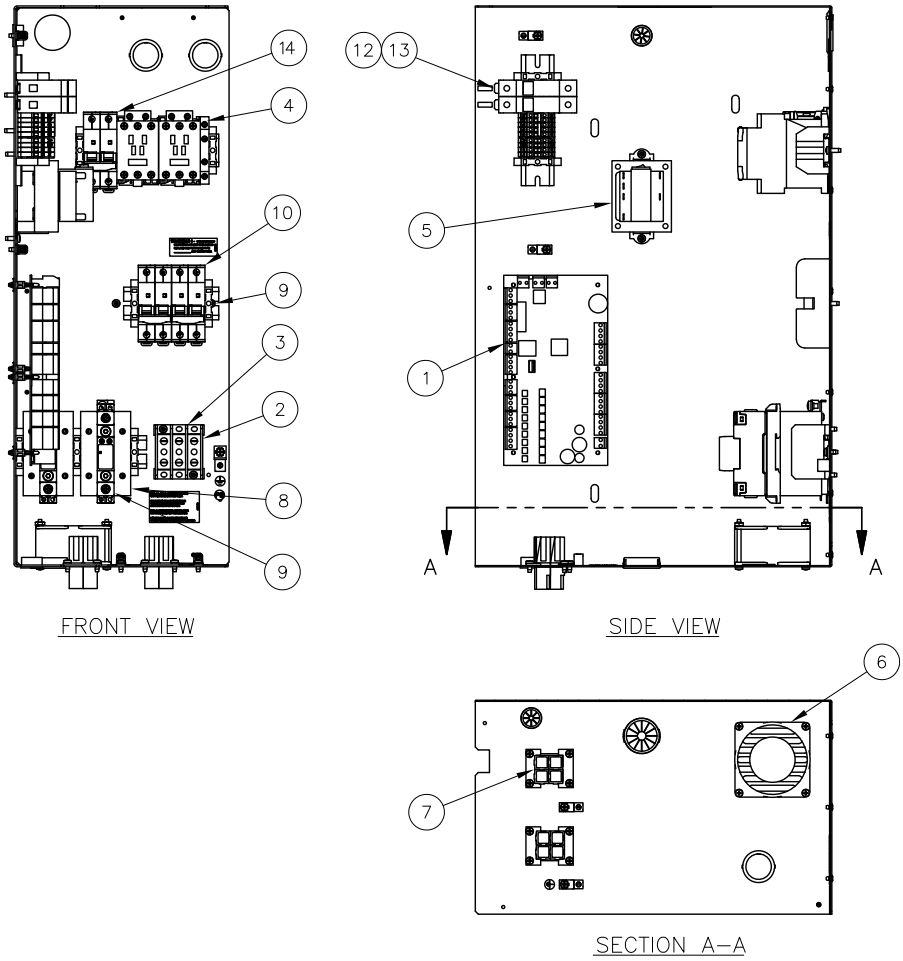
Table 71-1:
RTS heaters (continued)

RTS model	Maximum steam capacity		Power	Heater quantity and part number (600931-XXX)										
				Single-phase						Three-phase				
	lbs/hr	kg/h	kW	120V	208V	240V	277V	480V	600V	208V	240V	380V	480V	600V
RX-63-3	63	28.6	21	-	6-108	-	-	-	-	-	-	-	-	-
RX-75-3	75	34.0	25	-	3-122	3-123	6-117	-	-	-	-	-	-	-
RX-90-3	90	40.8	30	-	-	3-109, 3-116	6-117	-	-	3-102, 6-108	-	-	-	-
RX-102-3	102	46.3	34	-	-	-	6-117	-	-	9-108		-	-	-
RX-126-3	126	57.1	42	-	-	-	-	-	-	6-108, 3-114	6-109, 3-116	-	-	-
RX-144-3	144	65.3	48	-	-	-	-	3-112, 6-120	-		3-109, 6-116	-	-	-
RX-162-3	162	73.5	54	-	-	-	-	6-128	-	-	9-116			-
RX-189-3	189	85.7	63	-	-	-	-	3-112, 6-128	3-113, 6-130	-	-	6-118, 3-124	6-120, 3-128	6-121, 3-130
RX-216-3	216	98.0	72	-	-	-	-	-	3-121, 6-130	-	-	3-118, 6-124	3-120, 6-128	3-121, 6-130
RX-243-3	243	110.2	81	-	-	-	-	-	9-130	-	-	9-124	9-128	9-130
RX-102-4	102	46.3	34	-	4-122	4-123	-	-	-	-	-	-	-	-
RX-126-4	126	57.1	42	-	-	4-103, 4-123	8-117	-	-	-	-	-	-	-
RX-144-4	144	65.3	48	-	-	-	8-117	-	-	12 -108	-	-	-	-
RX-162-4	162	73.5	54	-	-	-	-	-	-	8-108, 4-114	–	-	-	-
RX-216-4	216	98.0	72	-	-	-	-	8-128	-	-	12-116	-	-	-
RX-264-4	264	119.7	88	-	-	-	-	4-112, 8-128	4-113, 8-130	-	-	4-110, 8-124	4-112, 8-128	4-113, 8-130
RX-288-4	288	130.6	96	-	-	-	-	-	4-121, 8-130	-	-	4-118, 8-124	4-120, 8-128	4-121, 8-130
RX-324-4	324	146.9	108	-	-	-	-	-	12-130	-	-	12-124	12-128	12-130

Notes:
- All RTS models operate at 50/60 Hz.
- 600931 are the first digits of the heater part number. Example: 1-106, 2-112 = One 600931-106 and two 600931-112 heaters.
- 230V and 400V heater part numbers are on page 6. They are in the models table.

Subpanel for -1 and -2 models

FIGURE 72-1: RTS HUMIDIFIER SUBPANEL



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Subpanel for -1 and -2 models

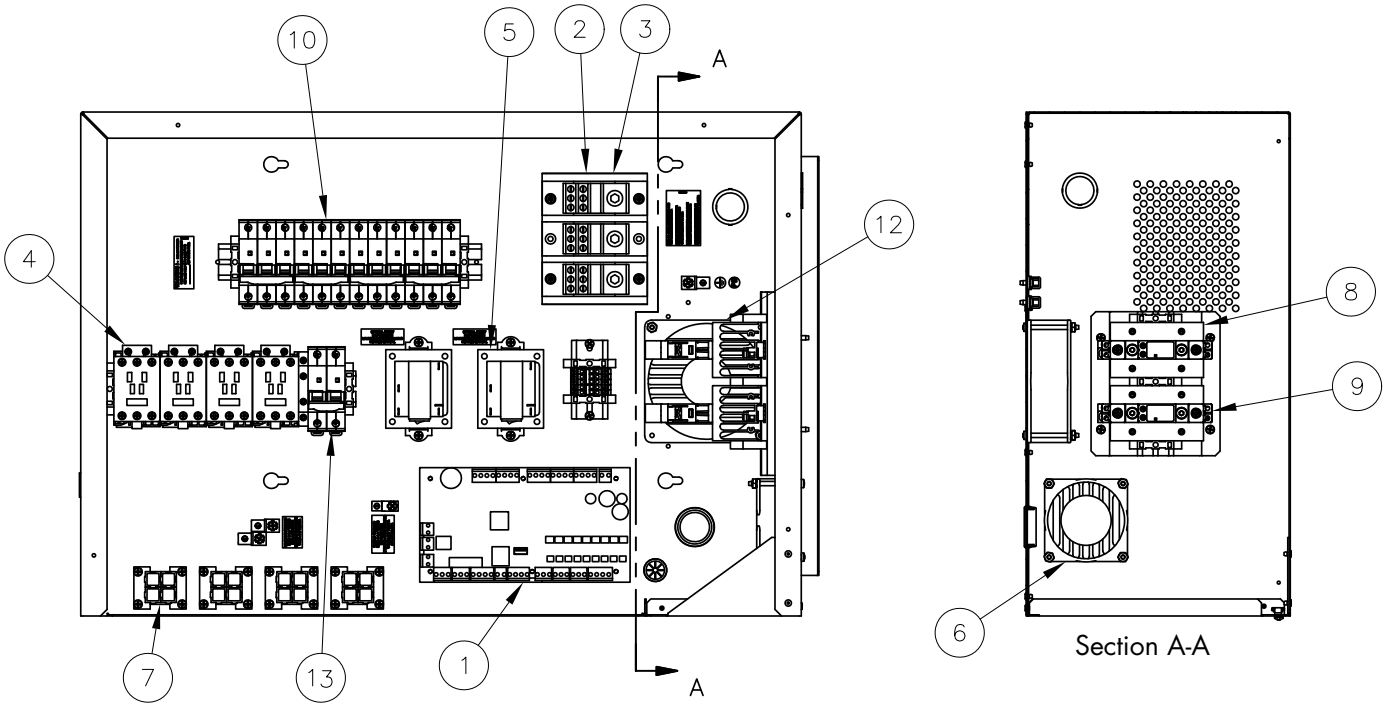
Table 73-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
1	MAIN CONTROLLER VL6	1	183504-014
2	TERMINAL BLOCK 3 POLE PRESSURE CONTACT	1	408300-002
	BLOCK POWER 175A 600V MARATHON 3 POLE	1	407600
	BLOCK POWER 115A 600V MARATHON 3 POLE	1	407603
3	COVER POWER BLOCK 407600 PLASTIC 175A	1	407600-100
	COVER POWER BLOCK 507600 PLASTIC 115A	1	407603-100
4	CONTACTOR	1	407010
5	TRANSFORMER, 120V, 24V SEC - QC	1	408965-101
	TRANSFORMER, 208/240/480V, 24V SEC - QC	1	408965-102
	TRANSFORMER, 230/380/400 VAC, 24V 50/60HZ	1	408980-003
	TRANSFORMER, 380/440V, 24V SEC - QC	1	408985-102
	TRANSFORMER, 277V, 24V SEC - QC	1	408982-101
	TRANSFORMER, 600V, 24V SEC - QC	1	408986-101
6	FAN COOLING 24" LEADS VM99	1	408677-001
7	HARNESS POWER CABLE RTS	1	600912-XXX
8	HEAT SINK SSR CARLO GAVAZZI ALUMN	1	600914
9	SSR CARLO GAVAZZI RGS1A60D50KKE 50A	1	600913
10	BREAKER CIRCUIT 3 POLE CG C -CRVE	1-2	406776-2XX
	BREAKER CIRCUIT 2 POLE CG C -CRVE	1-2	406775-2XX
	FUSE 35A 600V CF UL/CSA (-2 models) (FOR HIGH SCCR OPTION)	1-6	406756-006
	FUSE 40A 600V CF UL/CSA (-2 models) (FOR HIGH SCCR OPTION)	1-6	406756-007
	FUSE 45A 600V CF UL/CSA (-2 models) (FOR HIGH SCCR OPTION)	1-6	406756-008
	FUSE 50A 600V CF UL/CSA (-2 models) (FOR HIGH SCCR OPTION)	1-6	406756-009
	FUSE 60A 600V CF UL/CSA (-2 models) (FOR HIGH SCCR OPTION)	1-6	406756-010
11	FUSE HOLDER 60A 1 POLE CF CLASS (-2 models) (FOR HIGH SCCR OPTION)	1-6	406751-001
12	HOLDER FUSE 2 POLE MIDGET - ENCLOSED	1	407450-005
13	FUSE 4 AMP 600 VOLT ATM	1	406740-015
14	BREAKER CIRCUIT 2 POLE CG C -CURVE	1	406775-210

* Specify humidifier model and serial numbers when ordering.

Subpanel for -3 and -4 models

FIGURE 74-1: RTS HUMIDIFIER SUBPANEL



Subpanel for -3 and -4 models

Table 75-1:
RTS humidifier replacements parts

No.	Description	Qty.	Part No.
1	MAIN CONTROLLER VL6	1	183504-014
2	BLOCK POWER 175A 600V MARATHON 3 POLE	1	407600
	BLOCK POWER 335A 600V MARATHON 3 POLE	1	407920
3	COVER POWER BLOCK 407600 PLASTIC 175A	1	407600-100
	COVER POWER BLOCK 407920 PLASTIC 335A	1	407920-100
4	CONTACTOR 40 AMP SIEMENS 3RT-23	1	407010-202
	CONTACTOR 50 AMP SIEMENS 3RT-27	1	407010-203
5	TRANSFORMER, 120V, 24V SEC - QC	1	408965-101
	TRANSFORMER, 208/240/480V, 24V SEC - QC	1	408965-102
	TRANSFORMER, 230/380/400 VAC, 24V 50/60HZ	1	408980-003
	TRANSFORMER, 380/440V, 24V SEC - QC	1	408985-102
	TRANSFORMER, 277V, 24V SEC - QC	1	408982-101
	TRANSFORMER, 600V, 24V SEC - QC	1	408986-101
6	FAN COOLING 24" LEADS	1	408677-001
7	HARNESS POWER CABLE	1	600912-XXX
8	HEAT SINK SSR CARLO GAVAZZI ALUMN	1	600914
	HEAT SINK SSR CARLO GAVAZZI 72X110X75MM	1	600914-001
9	SSR CARLO GAVAZZI RGS1A60D50KKE 50A	1	600913
10	BREAKER CIRCUIT 3 POLE CG C -CRVE	3-4	406776-2XX
	BREAKER CIRCUIT 2 POLE CG C -CRVE	3-4	406775-2XX
	FUSE 35A 600V CF UL/CSA, (FOR HIGH SCCR OPTION)	6-12	406756-006
	FUSE 40A 600V CF UL/CSA, (FOR HIGH SCCR OPTION)	6-12	406756-007
	FUSE 45A 600V CF UL/CSA, (FOR HIGH SCCR OPTION)	6-12	406756-008
	FUSE 50A 600V CF UL/CSA, (FOR HIGH SCCR OPTION)	6-12	406756-009
	FUSE 60A 600V CF UL/CSA, (FOR HIGH SCCR OPTION)	6-12	406756-010
11	FUSE HOLDER 60A 1 POLE CF CLASS, (FOR HIGH SCCR OPTION)	6-12	406751-001
12	FAN SQ 24VAC 106CFM 4.68 X 1.5"	1	407109-005
13	BREAKER CIRCUIT 2 POLE CG C -CURVE	1	406775-210
* Specify humidifier model and serial numbers when ordering.			

Expect quality from the industry leader

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.

For more information
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For the most recent product information visit our Web site: www.dristeem.com

DRI-STEEM Corporation
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DriSteem U.S. operations are ISO 9001:2015 certified

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

DRISTEEM

Two-year Limited Warranty

DriSteem Corporation ("DriSteem") warrants to the original user that its products will be free from defects in materials and workmanship for a period of two (2) years after installation or twenty-seven (27) months from the date DriSteem ships such product, whichever date is the earlier.

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

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

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

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

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

Extended warranty

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

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

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

Form No. RTS-IOM-EN-REVD-1124
Part No. 890000–220 Rev D