






RTS® HUMIDIFIER RX SERIES SERVICE KIT MANUAL

RESISTIVE-TO-STEAM

 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	
	<p>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.</p> <p>DriSteem Technical Support: 800-328-4447</p> <p>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.</p> <p>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.</p>
 	<p>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 4 before performing service or maintenance procedures on any part of the system.</p>



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 49 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 DriSteam 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.

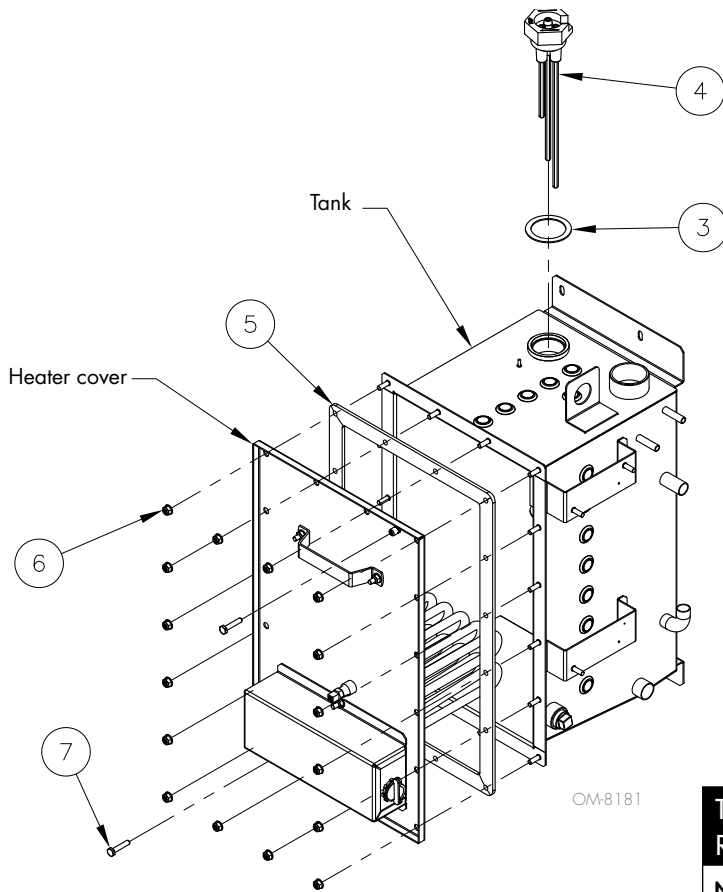
Humidifiers equipped using internal water tempering or an external water tempering device need fresh make-up water in order to function properly. Make sure the water supply to the humidifier remains open during draining.

Excessive supply water pressure

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

Service kits

FIGURE 3-1: RTS HUMIDIFIER



This service kit contains the replacement parts called out in the parts drawing to keep your DriSteem humidifier operating at peak performance. This Service Kit Manual provides important safety and service instructions; it is intended to supplement — not replace — the humidifier’s Installation, Operation, and Maintenance Manual. Please see Read all warnings and instructions on page 1.

While performing service and maintenance procedures, replace existing parts with the new parts provided in the service kit.

**Table 3-2:
RX-XX-2 Service Kit No. 900100-452**

No.	Description	Qty.	Part No.
1	Probe tool (see Figure 6-1)	1	406201
2	Silicone, clear (not shown)	1	320000
3	Probe gasket	1	309750-004
4	Probe rod assembly	1	406303-116
5	Tank gasket	1	600676
6	Flange nut	18	700300-030
7	Hex bolt	2	700300-028

**Table 3-1:
RX-XX-1 Service Kit No. 900100-451**

No.	Description	Qty.	Part No.
1	Probe tool (see Figure 6-1)	1	406201
2	Silicone, clear (not shown)	1	320000
3	Probe gasket	1	309750-004
4	Probe rod assembly	1	406303-116
5	Tank gasket	1	600752
6	Flange nut	16	700300-030
7	Hex bolt	2	700300-028

**Table 3-3:
RX-XX-3 and RX-XX-4 Service Kit No. 900100-453**

No.	Description	Qty.	Part No.
1	Probe tool (see Figure 6-1)	1	406201
2	Silicone, clear (not shown)	1	320000
3	Probe gasket	1	309750-004
4	Probe rod assembly	1	406303-116
5	Tank gasket	2	600676
6	Flange nut	36	700300-030
7	Hex bolt	4	700300-028

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

NOTE: Complete this section if water temperature is above room temperature.

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 valve may activate to assist in cooling if water temperature is above 140°F and internal water tempering is selected.
3. Change the mode back to Auto; the fill valve opens and the humidifier cools down with the additional cool water.
4. When the water level on the display shows full, go back into Drain mode, and allow the tank to drain completely. The humidifier should be cool enough to work on. The internal tank temperature is shown on the display.

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 4) 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 4) 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 6 for more information.)
 - a. Use the quarter-turn latches to remove the front enclosure panels (if applicable). See “Electric shock hazard” Warning at right.

Note: If the humidifier has an SDU mounted directly above it, remove the SDU cover before removing the humidifier cover.
 - 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.

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.

Inspection and maintenance

- c. Remove the tank heater plate. See page 10 for procedure.
 - d. Clean the tank interior using a putty knife or similar flat instrument.
 - e. Clean heating elements using a mildly abrasive wire brush.
 - 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 6-1), 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. Use a small amount of silicone between the gasket and tank.
 - Install the probe, and probe plug assembly. Torque to 120 lb-in (10 ft-lbs; 13.6 N-m). 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 4.
2. Follow the shutdown procedure on page 4.
3. If necessary, clean humidifier tank, heaters, and water level probes – following procedure on page 5.
4. Leave the evaporating chamber dry, the power off, and the water supply shut-off valve closed until the next humidification season.

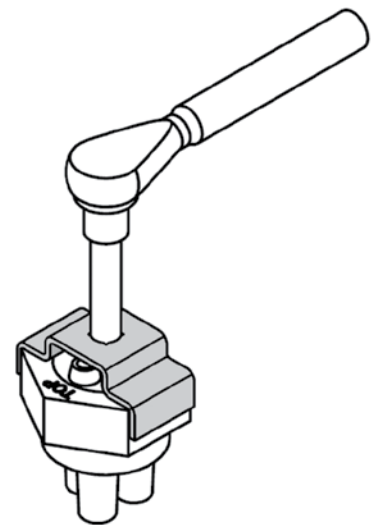
Humidifier De-scaling Solution

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.

FIGURE 6-1: PROBE TOOL



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

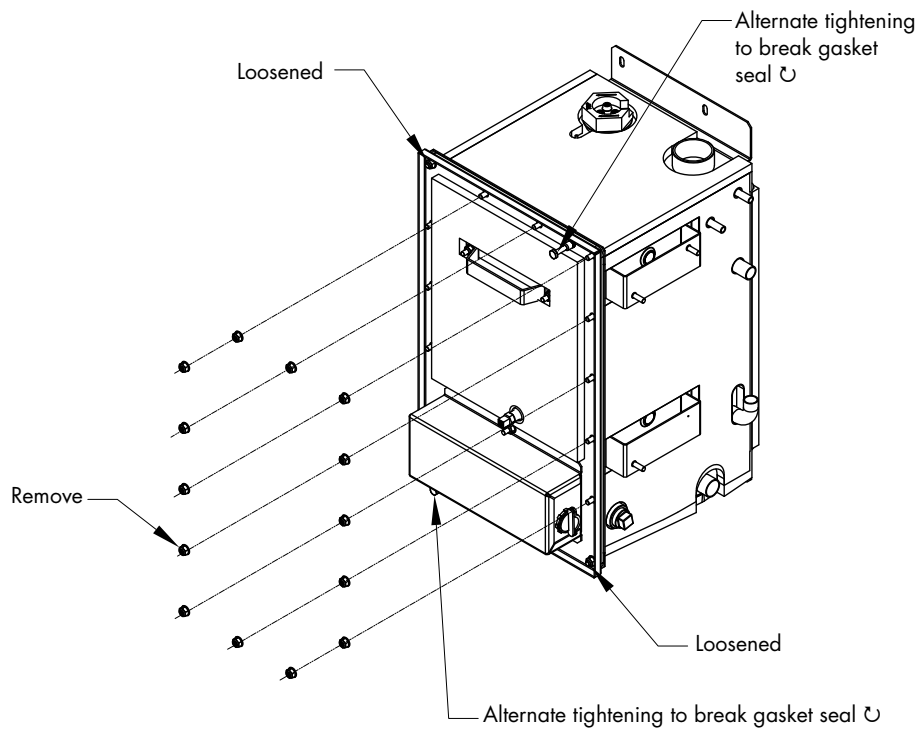
When installing, torque probe assembly to 120 in-lbs (10 ft-lbs; 13.6 N-m). Probe tools can be ordered from your DriSteem representative (Part No. 185101).

Inspection and maintenance

REMOVING THE TANK HEATER PLATE

1. Remove all but 2 heater plate nuts.
2. Loosen remaining two nuts and use 1/4-20 bolts at weld nut locations to pry cover from tank (see Figure 7-1).

FIGURE 7-1: HEATER PLATE REMOVAL



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 52-1 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.

Notes

**EXPECT QUALITY FROM THE
INDUSTRY LEADER**

Since 1965, DriSteem has been leading the industry with creative and reliable humidification solutions. Our focus on ease of ownership is evident in the construction of the RTS humidifier, which features cleanable, stainless steel construction. DriSteem leads the industry with a Two-year Limited Warranty and optional extended warranty.

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For the most recent product information visit our website: www.dristeem.com

DRI-STEEM Corporation

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