

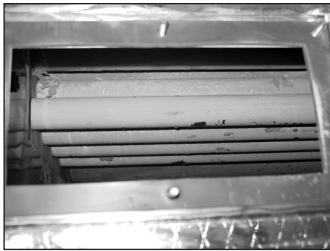
IMPORTANT: Read and save these instructions.

Humidifier De-scaling Solution and Neutralizer

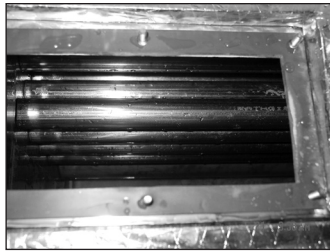
Usage Instructions

DRISTEEM[®]
The humidification experts

Before
Humidifier De-scaling Solution



After
Humidifier De-scaling Solution



Safety instructions

Humidifier De-scaling Solution



CAUTION!

- Humidifier De-scaling Solution contains sulfamic acid and citric acid.
- May be harmful if swallowed.
- Avoid contact with skin and eyes. Avoid breathing mist.
- Use with adequate ventilation.
- Keep container closed.

FIRST AID

- **Eyes:** Flush immediately with cool water for 15 minutes. Contact physician immediately.
- **Skin:** Flush immediately with cool water for 15 minutes. Call physician immediately.
- **Inhalation:** Remove to fresh air. If any irritation persists, call physician immediately.
- **Ingestion:** DO NOT INDUCE VOMITING. If conscious, give large amounts of water. Call physician immediately.

Storage and handling instructions

- Wear all protective equipment.
- Store away from and do not mix with strong bases.
- Use with adequate ventilation.
- Keep container closed when not in use.
- Wash thoroughly after handling product.
- Do not smoke near containers.
- Store away from food.
- Wash contaminated clothing before reuse.

Keep from freezing

- If frozen, allow slow return to room temperature and mix thoroughly before using.

Refer to MSDS for additional information.

For industrial use only.

Keep out of reach of children.

Humidifier De-scaling Neutralizer

CAUTION!

- Humidifier De-scaling Neutralizer contains soda ash.
- Irritates eyes.
- Avoid eye or prolonged skin contact.
- Avoid breathing dust.
- Use with adequate ventilation.
- May form caustic when combined with lime in presence of moisture.
- May be harmful if ingested.

FIRST AID

- **Skin:** Flush with water.
- **Eyes:** Flush with plenty of water for at least 15 minutes and get medical attention.
- **Ingestion:** Drink plenty of water to dilute; DO NOT induce vomiting and get medical attention
- **Inhalation:** Remove to fresh air and get medical attention.

Storage and handling instructions

- Wear gloves, goggles, and dust mask when handling
- When dissolving, add to stirred water slowly to minimize heat evolution.
- Store in closed drum in dry area away from acid. May absorb moisture from air.

Refer to MSDS for additional information.

For industrial use only.

Keep out of reach of children.

CAUTION!

DRI-STEEM® is not responsible for improper handling, any health side effects, or humidifier damage due to use of the de-scaling agent or neutralizer. See the product label and material safety data sheet (MSDS) for specific directions related to handling, usage, and disposal. Follow all governing codes regarding discharging into drains.

Usage instructions

The following are instructions for using DRI-STEEM Humidifier De-scaling Solution and DRI-STEEM Humidifier De-scaling Neutralizer to remove scale and other related deposits in industrial and commercial humidifiers.

Safety gear

Use proper safety gear including the following:

- Rubber or neoprene gloves
- Anti-splash goggles
- Rubber apron and/or boots
- Dust mask when using Humidifier De-scaling Neutralizer

Supplies required

- Humidifier De-scaling Solution
- Humidifier De-scaler Neutralizer, if required by federal, state or local codes
- pH meter or indicator strips (pH test strips are included with the De-scaling Solution)
- Portable mixer (optional) (e.g., cordless drill with mixer attachment or stir stick)
- Humidifier Installation, Operation, and Maintenance manuals (IOMs) for reference
- Tools for servicing
- Additional water source (e.g., plastic bucket and hose)

IMPORTANT: These products are not to be used for cleaning DRI-STEEM XT humidifiers. XT humidifiers have disposable evaporating chambers that do not require cleaning.

De-scaling process for GTS, STS, LTS, Vaporstream humidifiers

IMPORTANT: See the section titled “De-scaling process for Vapormist, CRUV, Humidi-tech, and VT humidifiers” for instructions regarding these humidifiers.

1. Review MSDS sheet for safe handling and proper use of Humidifier De-scaling Solution and Humidifier De-scaling Neutralizer, in addition to instructions provided in this document.
2. Remove the humidifier from service before beginning to clean the humidifier. This can be accomplished by turning off power to the humidifier.

IMPORTANT: If the humidifier has a normally open drain valve (typical on units installed in outdoor enclosures), the humidifier must remain powered to keep the drain valve closed. To remove from service a humidifier with a normally open drain valve, use the Vapor-logic keypad/display to change the control mode from Auto to Standby.

3. Refer to your humidifier IOMs for specific information regarding how to prepare the humidifier for service.

IMPORTANT!

Scale buildup on humidifier heaters and heat exchangers acts as an insulator, reducing humidifier performance while increasing energy costs.

Inspect humidifier tanks regularly and perform humidifier de-scaling maintenance as needed to keep humidifiers operating at peak efficiency.

Usage instructions

4. Remove the humidifier tank cover. If you have a GTS04 humidifier, access the tank through the probe plate.
5. Drain the humidifier to remove loose deposits and test for any draining issues prior to adding Humidifier De-scaling Solution. Use the manual override or ball valve for draining.
IMPORTANT: If the humidifier has a normally open drain valve, change the control mode using the Vapor-logic keypad/display from Standby to Manual Drain.
6. When draining is complete, close drain valve.
IMPORTANT: If the humidifier has a normally open drain valve, change the control mode using the Vapor-logic keypad/display from Manual Drain to Standby.
7. If the humidifier is in an air handler, shut down air handler prior to cleaning.
CAUTION! Using the Humidifier De-scaling Solution can result in off-gassing of carbon dioxide and/or non-hazardous fumes.
8. See the table on the last page of this document for recommended amount of Humidifier De-scaling Solution.
9. Fill the humidifier with cold water halfway to the overflow port.
10. Turn power off to the humidifier if not already done, or place in Standby Mode for humidifiers with a normally-open drain valve.
11. **CAUTION!** Remove probe assembly from humidifier before adding Humidifier De-scaling Solution to prevent damaging probe.
12. Add the amount of Humidifier De-scaling Solution to the half-full tank per the table on the back cover of this document.
13. After the Humidifier De-scaling Solution is added, finish filling the humidifier with water manually (e.g., using a bucket) to 1" (25 mm) below the overflow port.
CAUTION! Be careful to avoid splashing solution on skin or in eyes while adding the remaining water. Use proper safety gear.
14. Use a portable mixer or similar device to agitate and mix the solution.
15. Place the cover on the humidifier slightly ajar to allow the solution to be vented.
16. Maintain a solution pH between 2 and 4 by adding additional De-Scaling Solution as needed. Use proper safety gear.
17. De-scaling duration depends on several factors including: quantity of scale, type of scale, and the pH of the solution. The de-scaling process can last up to 8 hours.

Usage instructions

18. Allow the solution to dissolve scale while checking on the progress every 2 hours up to a maximum of 8 hours. For increased performance, continue agitation throughout the de-scaling process and maintain a pH close to 2.
19. De-scaling is complete when the majority of scale has been dissolved or after 8 hours has passed.
20. After de-scaling is complete, dilute the solution to a pH between 5 and 9. This can be accomplished by either manually filling the humidifier while allowing diluted solution through the overflow port, or by adding Humidifier De-scaling Neutralizer (see instructions below).

CAUTION! Do not leave humidifier unattended while diluting or neutralizing to avoid spills or overflowing.

21. For neutralization use the following steps:
 - a. Measure the pH of the solution in the humidifier tank.
 - b. Measure out 1 lb of Humidifier De-scaling Neutralizer per 1 gallon of Humidifier De-scaling Solution used (see the table on the last page of this document for reference).
 - c. **SLOWLY**, add the Humidifier De-scaling Neutralizer to the humidifier while monitoring the level of solution in the humidifier.

CAUTION! The combination of the two chemicals will cause bubbling and release of carbon dioxide. If the neutralizer is added too quickly, the humidifier can overflow.

- d. Alternately, agitate the solution to ensure proper mixing.
 - e. Once the neutralizer has been added and bubbling has stopped, measure the pH. Neutralized pH should be between 6 and 8.
 - f. If pH is not between 6 and 8, add acid (De-Scaling Solution) to lower pH, or add base (De-Scaling Neutralizer) to raise pH until pH is in the range of 6 to 8.
22. After dilution has been completed, drain the humidifier while abiding by federal, state, and local codes.
23. Rinse the humidifier thoroughly by refilling and draining until humidifier water pH matches pH of incoming water (typically pH 6-8).
24. If significant scale remains, remove manually or repeat the cleaning process. Note that some residual scale may remain.
25. After cleaning is complete and humidifier properly rinsed, re-install probe assembly and return humidifier to service.

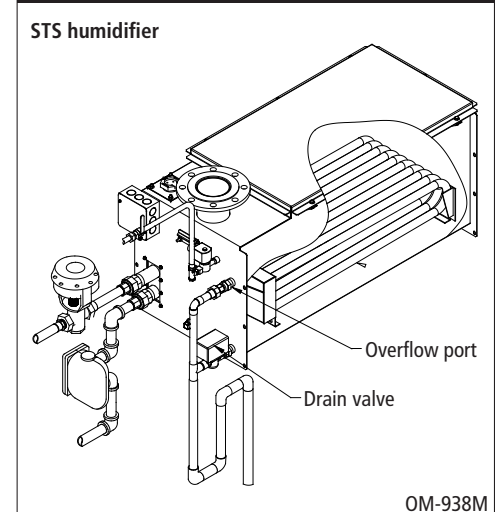
Measuring pH

Measure pH by using a pH meter and probe, or by using pH paper strips with a color key (provided with De-scaling Solution).

If using a pH meter and probe, follow the instructions that came with your pH meter and probe.

If using pH paper strips, insert a strip into the tank water and remove. Compare the color of the strip to the color key to determine pH.

Figure 5-1:
Typical overflow port, drain locations



Usage instructions

De-scaling process for Vapormist, CRUV, Humidi-tech and VT humidifiers

1. Review MSDS sheet for safe handling and proper use of Humidifier De-scaling Solution and Humidifier De-scaling Neutralizer, in addition to instructions provided in this document.
2. Turn off power to the humidifier at the main disconnect.
3. Remove the shroud from the humidifier (VT and Vapormist only).
4. Allow the humidifier to cool to room temperature.
5. Drain the humidifier using either manual override switch on drain valve or ball valve.
6. After the humidifier has drained, remove the tank from the humidifier. Refer to the humidifier IOM for questions.
7. Place the tank on a level surface and in an isolated location (preferably near a drain).
8. **CAUTION!** Remove probe assembly from humidifier before adding Humidifier De-scaling Solution to avoid potential damage.
9. Determine the amount of De-Scaling Solution to be used. See the table on the last page of this document for amount.
10. Fill the humidifier with water halfway to the overflow port.
11. Add the pre-determined amount of Humidifier De-scaling Solution to the half-full tank.
12. After the Humidifier De-Scaling Solution is added, finish filling the humidifier with water manually (e.g., using a bucket) to 1" (25 mm) below the overflow port.
CAUTION! Be careful to avoid splashing solution on skin or in eyes while adding the remaining water. Use proper safety gear.
13. Use a portable mixer or similar device to agitate and mix the solution.
14. Place the cover on the humidifier slightly ajar to allow the solution to be vented.
15. Maintain a solution pH between 2 and 4 by adding additional De-Scaling Solution as needed. Use proper safety gear.
16. De-scaling duration will depend on several factors including: quantity of scale, type of scale, and the pH of the solution. The de-scaling process can last up to 8 hours.
17. Allow the solution to dissolve scale while checking on the progress every 2 hours up to a maximum of 8 hours. For increased performance, continue agitation throughout the de-scaling process and maintain a pH close to 2.

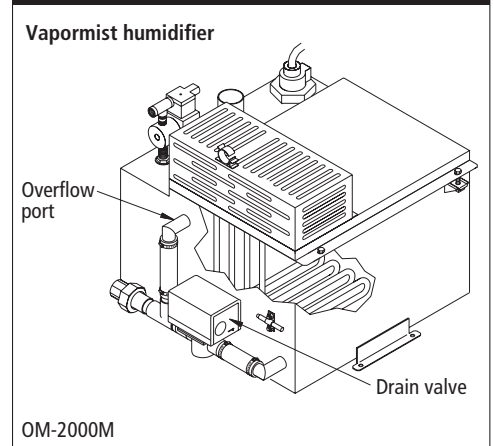
Usage instructions

18. De-scaling is complete when the majority of scale has been dissolved or after 8 hours has passed.
19. After de-scaling is complete, dilute the solution to a pH between 5 and 9. This can be accomplished by either manually filling the humidifier while allowing diluted solution through the overflow port, or by adding Humidifier De-scaling Neutralizer (see instructions below).

CAUTION! Do not leave humidifier unattended while diluting or neutralizing to avoid spills or overflowing.
20. For neutralization use the following steps:
 - a. Measure the pH of the solution in the humidifier tank.
 - b. Measure out 1 lb of Humidifier De-scaling Neutralizer per 1 gallon of Humidifier De-scaling Solution used (see the table on the last page of this document for reference).
 - c. **SLOWLY**, add the Humidifier De-scaling Neutralizer to the humidifier while monitoring the level of solution in the humidifier.

CAUTION! The combination of the two chemicals will cause bubbling and release of carbon dioxide. If the neutralizer is added too quickly, the humidifier can overflow.
 - d. Alternately, agitate the solution to ensure proper mixing.
 - e. Once the neutralizer has been added and bubbling has stopped, measure the pH. Neutralized pH should be between 6 and 8.
 - f. If pH is not between 6 and 8, add acid (De-Scaling Solution) to lower pH, or add base (De-Scaling Neutralizer) to raise pH until pH is in the range of 6 to 8.
21. After dilution has been completed, drain the humidifier while abiding by federal, state, and local codes.
22. Rinse the humidifier thoroughly by refilling and draining until humidifier water pH returns to incoming water pH (typically pH 6-8).
23. If significant scale remains, remove manually or repeat the cleaning process. Note that some residual scale may remain.
24. After cleaning is complete and humidifier properly rinsed, reinstall probe assembly, reinstall humidifier tank, make all connections, and return humidifier to service.

Figure 7-1:
Typical overflow port, drain locations



Expect quality from the industry leader

For over 40 years, DRI-STEEM has been leading the industry with creative and reliable humidification solutions.

For more information

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 Technical support
 800-328-4447

For the most current product information, visit our Web site: www.drsteem.com

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

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Table 8-1: Humidifier De-scaling Solution and Humidifier De-scaling Neutralizer recommended amounts			
DRI-STEEM humidifier name	DRI-STEEM humidifier model	Humidifier De-Scaling Solution amount	Humidifier De-Scaling Neutralizer amount
		gallons	lbs
Vaporstream (VLC)	2-1, 3-1, 4-1, 5-1	1.5	1.5
	6-1, 9-1, 12-1, 16-1, 21-1, 25-1	2.5	2.5
	12-2, 18-2, 24-2, 32-2, 42-2, 50-2	4	4
	18-3, 27-3, 36-3, 48-3, 63-3, 75-3	5.5	5.5
	24-4, 36-4, 48-4, 64-4, 84-4, 100-4	7.25	7.25
STS or LTS	25	2.5	2.5
	50	3.75	3.75
	100	13.75	13.75
	200	25	25
	400	25	25
	800	35.75	35.75
GTS	100/200	12	12
	300/400	13	13
	600	19	19
	800	22	22
Vapormist (VM), CRUV, or Humidi-tech (HT)	2-4	0.75	0.75
	6-8	1.5	1.5
	10-16	1.75	1.75
	21-34	2.25	2.25
VT	2-4	0.5	0.5
	6-8	0.75	0.75
	10-16	1	1