

READ AND SAVE THESE INSTRUCTIONS

VAPORSTREAM[®]

Models VLC and VLDI

ELECTRIC STEAM HUMIDIFIERS

Operation and Maintenance Manual

For toll-free technical support
call 1-800-328-4447
or
952-949-2415



DRISTEEM[®]
HUMIDIFIER COMPANY

A SUBSIDIARY OF RESEARCH PRODUCTS CORPORATION



General information

In this document

This document contains the following:

VLC/VLDI start-up procedure	2
VLC/VLDI operation information	3
VLDI water requirements	3
VLC water quality recommendations	3
VLC maintenance information	4, 5
VLDI maintenance information	6
Tank replacement parts	7, 8
Control cabinet replacement parts	9, 10
Maintenance service record form	11
Warranty	12

Troubleshooting

The *VAPOR-LOGIC₃ Installation and Operation Manual* is a comprehensive operation manual — refer to it for troubleshooting information.

VLC/VLDI start-up procedure

CAUTION: Only qualified electrical personnel should perform start-up procedure.

Verify that the VAPORSTREAM humidifier, controls, piping, electrical connections, steam supply, and dispersion unit(s) are installed according to the following:

- *VAPOR-LOGIC₃ Installation and Operation Manual*
 - Installation section
 - Installation checklist
- *VAPORSTREAM® General Installation Instructions: Models VLC and VLDI*
- Ladder style wiring diagram (inside control cabinet)
- External connections wiring diagram (inside control cabinet)
- Heater connections wiring diagrams (inside heater terminal cover)
- All governing codes

Verify that electrical connections in the control cabinet and at the humidifier are secure before applying power. (Torque requirements are in the *VAPORSTREAM® General Installation Instructions: Models VLC and VLDI*.)

IMPORTANT: Make sure that all electrical covers are closed and secure before turning on electrical power. These include the following:

- Heater terminal cover on humidifier
- Control cabinet door

Verify that the humidifier is mounted level and securely supported before filling with water (see the operating weights in the *VAPORSTREAM® General Installation Instructions: Models VLC and VLDI*). Verify that the humidifier is level front to back and side to side after it is full of water.

Refer to the following sections in the *VAPOR-LOGIC₃ Installation and Operation Manual*:

- Operation section
- Start-up checklist (it is critical that the installer follow this checklist)

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

Monitor humidifier operation through multiple fill cycles — the humidifier operating status appears on the keypad/display.

Water skims from the humidifier after every fill cycle. Adjust the amount of skim by increasing or decreasing the skim time (see the *VAPOR-LOGIC₃ Installation and Operation Manual*). However, at start-up, DRI-STEEM recommends initially running the humidifier with the factory default setting for skim time. (See the “VLC/VLDI operation information” section on the next page.)

VLC/VLDI operation information

The VAPOR-LOGIC₃ *Installation and Operation Manual* is a comprehensive operation manual — refer to it for information regarding the following features:

- Keypad/display, setup, and menu information
- Control input signals and functions
- Water level control systems
- Drain, flush, and skim
- Safety features
- Alarm screens and fault message

VLDI water requirements

- No regular cleaning (regular inspections are advised)
- No regular skimming or drain and flush cycles
- Regular verification that water processing equipment is operating correctly. The presence of chlorides in improperly processed DI water eventually causes pitting and failure of the tank and its components.

VLC water quality recommendations

The best way to determine how often your particular system needs maintenance is to remove the tank cover and inspect it for mineral deposits after three months of duty. Potable water carries a variety of minerals and other materials in a mix that varies from location to location. This variation in water quality, combined with the hours of operation and duty cycle, will determine your own unique maintenance schedule.

Water quality makes a difference

- Light to moderately hard water (2 to 10 grains hardness per gallon [35 mg/L to 170 mg/L]) requires:
 - Annual cleaning
 - Regular skimming
- High mineral content water (more than 10 grains hardness per gallon [more than 170 mg/L]) requires:
 - Cleaning frequency determined by use and water quality
 - Regular skimming
 - Periodic drain and flush cycles
- Softened water, which dramatically reduces mineral accumulation inside the standard water models, requires:
 - Increased skim time
 - No drain and flush cycles(Note: solids, like silica, are not removed in the softening process.)

Adjusting skim duration

The skim time duration determines the quantity of water skimmed with each fill cycle. The skim time is field adjustable using the VAPOR-LOGIC₃ keypad.

Each time the VLC refills, it fills to an elevation near the lip of the skim overflow fitting. A portion of the refill water then flows to the drain carrying most of the minerals left by the previous evaporating cycle. This reduces the mineral concentration, thereby reducing the frequency of cleaning needed.

The heated water that flows to the drain is a cost of operation. Cleaning the humidifier is also an operational cost. Therefore, DRI-STEEM recommends that the user observe and adjust the skimming quantity to achieve a balance between minimizing mineral buildup and conserving hot water.

VLC maintenance information

Cool down

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 is less than room temperature (Set Up screens) so the heaters do not energize while cooling down the tank.
- **Standard drain valve:**
 - Manually open the drain valve by moving the valve lever located on the back of the drain valve to the manual open position.
 - The fill valve eventually opens.
 - Let the fill water run until the tank is cooled; then shut off the field-installed manual supply water shut-off valve.
 - Let the tank drain; then manually close the drain valve.
- **Alternative drain valves:**
 - For drain valves without the manual open lever, use the keypad to perform the cool down process. Refer to *VAPOR-LOGIC₃ Installation and Operation Manual*.
 - Go into the control modes screen and select **Manual Drain**.
 - Allow approximately half the water to drain out of the tank.
 - In the control modes screen select **Auto**; the fill valve opens and the humidifier cools down.
 - When the fill valve closes, select **Manual Drain** in the control modes screen and let the tank drain dry. The humidifier should be cool enough to work on.

Safety

IMPORTANT: When performing maintenance on the VLC humidifier,

- Always switch the keypad 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.

Inspection

Annual (also recommended when maintenance is performed)

- Inspect tank and gaskets for leaks.
- Measure current draw of heaters and verify amp values per stage by comparing to the wiring diagram located inside the control cabinet. This identifies any burned out heaters. (Only qualified electrical personnel should perform this task.)
- All safety devices in the control circuit should be cycled on and off to verify they are functioning. These include:
 - High limit
 - Airflow proving switch
 - Low water level probe — pullout probe plugs and heaters should de-energize.

Seasonal (or as required, depending on water quality)

Cleaning tank

- Remove cleanout plate; slide the cleanout tray out (when provided) and dispose of any loose scale that has collected in the tray.
- Remove any additional scale that has accumulated on the bottom of the humidifier tank — this should be done before the scale buildup reaches the bottom of the heaters.
- Inspect the area inside the tank in front of the drain valve fitting and thoroughly clean all scale and mineral buildup from that area.

continued . . .

VLC maintenance information, continued

Cleaning the probes

- The probe assembly is located under the heater terminal cover. Access the probe assembly through the probe cover located on the end of the heater terminal cover.
- Disconnect the probe plug and cable assembly and unscrew the probe rod assembly from the VLC humidifier probe housing.
- Inspect the probe housing and clean, ensuring that all the housing passageways are clear. You can remove the housing from the holding bracket by removing the humidifier cover and sliding the housing horizontally toward the open end of the bracket.
- The scale should flake off easily from the probe assembly rods.
- The bottom 3/8" (10 mm) is the sensing portion of the probe rod; it should be brushed clean with a wire brush, abrasive pad, or steel wool.
- Inspect the composite plastic probe rod assembly for any signs of cracking, roughness, or deterioration. If found, replace probe assembly.
- Reassemble the probe assembly.

Cleaning skim overflow port

- Water should drain from the skimmer drain pipe after each fill cycle. This should be verified visually by a weekly inspection.
- Loosen deposits in and around the skimmer overflow port with a long tool such as a screwdriver.
- If flow through the water seal/ P-trap is diminished due to mineral accumulation,
 - Remove the water seal piping from the humidifier and flush out.
 - Replace the water seal with new piping if the minerals have hardened in the water seal.
 - Installing a union at the base of the water seal will help for cleaning purposes if water quality causes the water seal to become clogged with scale often.

When the maintenance requirements are complete,

- Slide cleanout tray back into the tank.
- Hook the tab on the backside of the cleanout plate over the edge of the cleanout tray and slide the cleanout plate over the tank studs.
- Tighten down the nuts on the cleanout plate.
- Verify that the probe rod holder is secure and that the probe plug and cable assembly is plugged into the probe rod holder.
- Replace and secure all covers and doors.
- Verify that the drain valve assembly is in the closed position.
- Turn on the water supply.
- Turn on the electrical power.
- Do not leave humidifier unattended. Allow the humidifier to cycle through multiple fill cycles and verify that the humidifier cover, cleanout plate, and probe holder gasket are not leaking.

Off-season maintenance

- Perform complete inspection and cleaning of the following:
 - Heaters
 - Probe rods
 - Skimmer port and water seal
 - Cleanout tray and humidifier tank
- After cleaning, the humidifier should remain empty until humidification is required.

VLDI maintenance information

Cool down

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 is less than room temperature (Set Up screens) so the heaters do not energize while cooling down the tank.
- **Standard drain valve:**
 - Manually open the drain valve.
 - The float valve opens.
 - Let the fill water run until the tank is cooled; then shut off the field-installed manual supply water shut-off valve.
 - Let the tank drain; then manually close the drain valve.
- **End-of-season drain option:**
 - Use the keypad to perform the cool down process. Refer to *VAPOR-LOGIC₃ Installation and Operation Manual*.
 - Go into the control modes screen and select **Manual Drain**.
 - Allow approximately half the water to drain out of the tank.
 - In the control modes screen select **Auto**; the fill valve opens and the humidifier cools down.
 - When the fill valve closes, select **Manual Drain** in the control modes screen and let the tank drain completely dry. The humidifier should be cool enough to work on.

Safety

IMPORTANT: When performing maintenance on the VAPORSTREAM humidifier,

- Always switch the keypad 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.

Inspection

Annual (also recommended when maintenance is performed)

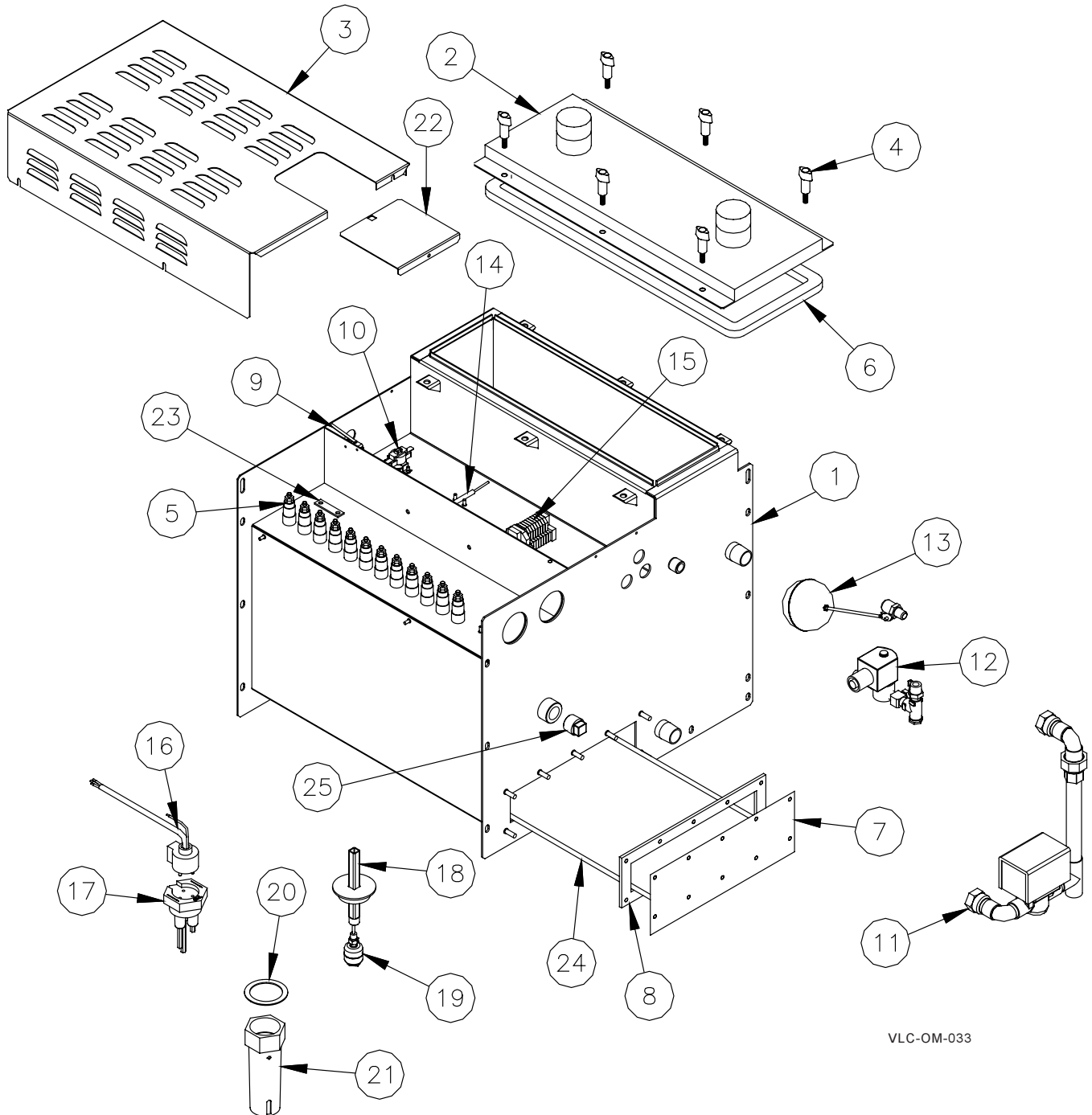
- Inspect tank and gaskets for leaks.
- Measure current draw of heaters and verify amp values per stage by comparing to the wiring diagram located inside the control cabinet. This identifies any burned out heaters. (Only qualified electrical personnel should perform this task.)
- All safety devices in the control circuit should be cycled on and off to verify they are functioning. These include:
 - High limit
 - Air flow proving switch
 - Low water cut-off switch
- Verify that the float valve is closing off. If the float valve will not shut off, there may be particulate on the valve seat, or the stopper may be worn and need replacing.

As long as mineral-free water is used in the VLDI, no cleaning or flushing of the humidifier should be necessary.

Off-season maintenance

- Perform a complete inspection of the following:
 - Heaters
 - Float valve
 - Low water cut off switch
 - Humidifier tank and gaskets
- After inspection, the humidifier should remain empty until humidification is required.

Tank replacement parts



VLC-OM-033

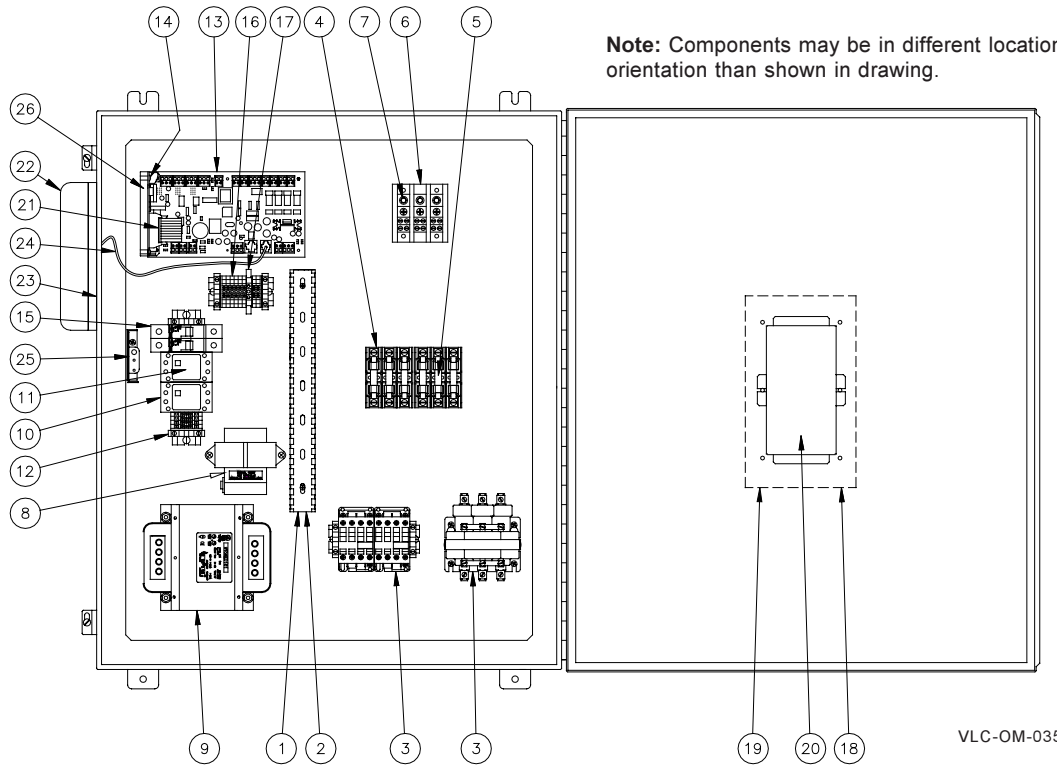
Tank replacement parts list

Note: Components may be in different location or orientation than shown in drawing on previous page.

No.	Description	Models used	Part no.
1	Tank	All	*
2	Cover, one heater	One heater	167710- *
2	Cover, three heater	Three heater	167715- *
2	Cover, six heater	Six heater	167720- *
2	Cover, nine heater	Nine heater	167725- *
2	Cover, twelve heater	Twelve heater	167730- *
3	Cover, heater louvered	All	167745- *
4	Knob, T-handled utility	All	700725
5	Heater	All	409600- *
6	Gasket, cover	All	160691- *
7	Cleanout plate	All	165472
8	Gasket, cleanout plate	All	308225
9	Switch, door interlock	All	408475
10	Thermal cut-out	All	409560-001
11	Drain valve assembly	All	*
12	Fill valve assembly	VLC and EOSD	*
13	Float valve assembly	VLDI	*
14	Temperature sensor	All	405760-002
15	DIN rail mounted components	All	*
16	Probe plug assembly	VLC	406050-101
17	Probe assembly	VLC	406015
18	Low water tube	VLDI	167790
19	Low water cut-out switch	VLDI	408420-002
20	Gasket, probe	All	309750-004
21	Probe housing	All	308500
22	Probe cover	All	167746
23	Buss bar	All	*
24	Cleanout tray	6, 9, and 12 heater VLC	167770- *
25	Plug, ¾" NPT	All	250192-075

* Specify humidifier model and serial numbers when ordering.

Control cabinet replacement parts (See next page for European parts.)

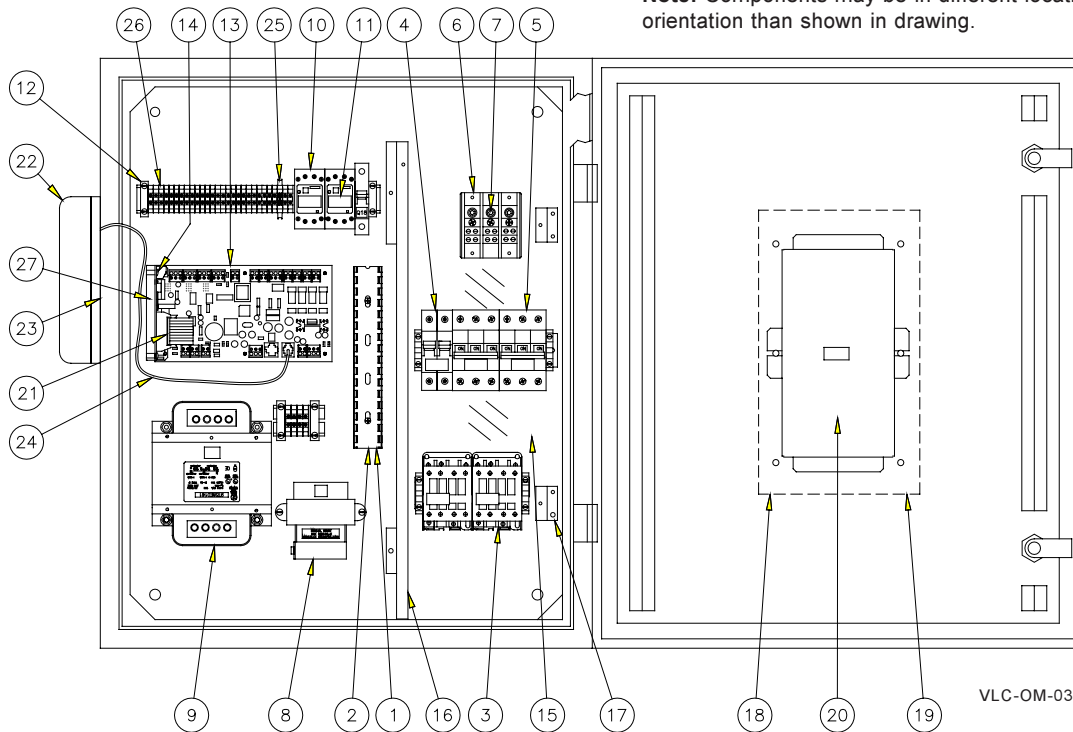


No.	Description	Models used	Part no.
1	Wire channel, 1" x 1"	All	408999-001
2	Wire channel, cover	All	408999-002
3	Contactor	Standard	407001-*
3	Contactor, 3-pole mercury	Mercury contactor option	407004-*
4	Fuse holder	Model and voltage dependent	*
5	Fuse	Model and voltage dependent	*
6	Power block	Model and voltage dependent	*
7	Cover for power block	Model and voltage dependent	*
8	Transformer, 24 V	All	*
9	Transformer, 120 V	SDU or AREA-TYPE™fan dispersion	*
10	Relay socket	All	407900-011
11	Relay, 24V DPDT	All	407900-016
12	Terminal end bracket	All	408252-006
13	Board, VAPOR-LOGIC ₃ main microprocessor	All	408491-001
14	Board, VAPOR-LOGIC ₃ VAPORSTREAM expansion	Multiple stage	408490-003
15	Circuit breaker, single pole	All	406775-*
16	20 amp DIN rail terminal	All	408252-001
17	Terminal ground	All	408252-010
18	SSR	SSR control	*
19	Gasket, SSR	SSR control	*
20	Cover, SSR	SSR control	165545
21	Ribbon cable	Multiple stage	408490-016
22	Board, VAPOR-LOGIC ₃ keypad	All	408491-002
23	VAPOR-LOGIC ₃ jack w/plate	Mounted keypad	408490-017
24	Cable assembly, VAPOR-LOGIC ₃ keypad	All	408490-*
25	Door interlock, electric switch	Door interlock option	408470
26	Expansion board bracket	Multiple stage	167748

* Specify humidifier model and serial numbers when ordering.

European control cabinet replacement parts

Note: Components may be in different location or orientation than shown in drawing.



VLC-OM-034

No.	Description	Models used	Part no.
1	Wire channel, 1" x 1"	All	408999-001
2	Wire channel, cover	All	408999-002
3	Contactor	All	407001- *
4	Circuit breaker, single pole	All	406775- *
5	Circuit breaker, three pole	All	406776- *
6	Power block	Model and voltage dependent	*
7	Cover for power block	Model and voltage dependent	*
8	Transformer, 24 V	All	408985
9	Transformer, 120 V	SDU or AREA-TYPE™fan dispersion	408996-011
10	Relay socket	All	407900-011
11	Relay, 24V DPDT	All	407900-016
12	Terminal end bracket	All	408252-006
13	Board, VAPOR-LOGIC ₃ main microprocessor	All	408491-001
14	Board, VAPOR-LOGIC ₃ VAPORSTREAM expansion	Multiple stage	408490-003
15	Clear acrylic shield, primary voltage	Plexiglass/voltage barrier option	406100- *
16	Voltage barrier	Plexiglass/voltage barrier option	167747- *
17	Voltage barrier, 4.25 x 1.50	Plexiglass/voltage barrier option	167747- *
18	SSR	SSR control	*
19	Gasket, SSR	SSR control	*
20	Cover, SSR	SSR control	165545
21	Ribbon cable	Multiple stage	408490-016
22	Board, VAPOR-LOGIC ₃ keypad	All	408491-002
23	VAPOR-LOGIC ₃ jack w/plate	Mounted keypad	408490-017
24	Cable assembly, VAPOR-LOGIC ₃ keypad	All	408490- *
25	Terminal ground	All	408252-010
26	20-amp DIN rail terminal	All	408252-001
27	Expansion board bracket	Multiple stage	167748

* Specify humidifier model and serial numbers when ordering.

Two-year limited warranty

DRI-STEEM Humidifier Company ("DRI-STEEM") 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 DRI-STEEM ships such product, whichever date is the earlier.

If any DRI-STEEM product is found to be defective in material or workmanship during the applicable warranty period, DRI-STEEM'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 DRI-STEEM's election. DRI-STEEM shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or reinstallation of any defective product.

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

DRI-STEEM's limited warranty is made in lieu of, and DRI-STEEM 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 DRI-STEEM has notice of the possibility of such damages.

By purchasing DRI-STEEM's products, the purchaser agrees to the terms and conditions of this limited warranty.

DRI-STEEM[®]
HUMIDIFIER COMPANY

A SUBSIDIARY OF RESEARCH PRODUCTS CORPORATION



Corporate Headquarters:

14949 Technology Drive • Eden Prairie, MN 55344
Phone: (952)949-2415 • (800) 328-4447 • Fax: (952)229-3200
E-Mail: sales@dristeem.com • Web: www.dristeem.com

Europe Office:

Bell Place, Bell Lane • Syresham, Brackley • NN13 5HP, U.K.
Phone: +44 1280 850122 • Fax: +44 1280 850124
E-Mail: 106277.1443@compuserve.com

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

DRI-STEEM, VAPORSTREAM, and VAPOR-LOGIC₃ are registered trademarks of DRI-STEEM Humidifier Company and are filed for trademark registration in Canada and the European community.

