



**WARNING**

Indicates a hazardous situation that could result in death or serious injury if instructions are not followed.



**CAUTION**

Indicates a hazardous situation that could result in damage to or destruction of property if instructions are not followed.

mc\_051508\_1145



**WARNING**



**Read all warnings and instructions**

This page provides important safety instructions; it is intended to supplement—not replace—the humidifier's Installation, Operation, and Maintenance Manual (IOM). Read the IOM that was provided with the humidifier 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 here and in the IOM, resulting in property damage, personal injury, or death.

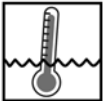
If the IOM is missing, go to [http://www.dristeem.com/ds\\_lit.jsp](http://www.dristeem.com/ds_lit.jsp) to download a replacement.

mc\_071608\_0910



**Hot surfaces and hot water**

Steam humidification systems have extremely hot surfaces, and water in tanks, electrode cylinders, steam pipes, and dispersion assemblies can be as hot as 212 °F (100 °C). To avoid severe burns, allow the entire humidification system to cool.



Follow the cool-down procedure in the humidifier's IOM before performing service or maintenance procedures on any part of the system.

mc\_071608\_0911



**Shut down the energy source**

Before performing service or maintenance procedures on any part of the humidification system, verify that all energy sources are off. Energy sources can be electricity, gas, steam, or hot liquid. Failure to shut down the energy source could result in carbon monoxide poisoning, fire, explosion, 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 the shroud/cover, electrical panel cover/door, access panels, or heater terminal cover until electrical power is disconnected.



Follow the shutdown procedure in the humidifier's IOM before performing service or maintenance procedures on any part of the system.



mc\_050808\_1551

## Board removal and replacement

### Tools required:

- Needle nose pliers / wire cutter
- Wire stripper
- #2 Phillips screwdriver
- 3/16" and 1/8" flat-tip screwdrivers
- 5/8" nut driver

Make sure all parts listed in Table 2-1 are included before beginning the upgrade.

**Table 2-1:  
Vapor-logic3 (VL3) to Vapor-logic4 (VL4)  
adaptor board kits**

Part No. 183503-001  
GTS04 indoor and  
GTS99 indoor or outdoor

No.	Description	Qty.
1	VL3 to VL4 adaptor board	1
2	Mounting stand-off* for VL4 adaptor board	6
3	VL4 keypad	1
4	Molex® plug (installed on adaptor board)	2
5	Jumper for configuring safety alarms	1
6	Field conversion label**	1

Part No. 183503-002  
GTS04 outdoor with 46.5" (1180 mm) enclosure  
door height (before March 2007)

No.	Description	Qty.
1	VL3 to VL4 adaptor board	1
2	Mounting stand-off* for adaptor board	6
3	VL4 keypad, fan, and bracket assembly	1
4	Molex® plug (installed on adaptor board)	2
5	Jumper for configuring safety alarms	1
6	Outdoor enclosure replacement door	1
7	Field conversion label**	1

Part No. 183503-003  
GTS04 outdoor with 51" (1295 mm) enclosure  
door height (March 2007 and later)

No.	Description	Qty.
1	VL3 to VL4 adaptor board	1
2	Mounting stand-off* for adaptor board	6
3	VL4 keypad, fan, and bracket assembly	1
4	Molex® plug (installed on adaptor board)	2
5	Jumper for configuring safety alarms	1
6	Outdoor enclosure replacement door	1
7	Field conversion label**	

\* For extra stand-offs, order Part No. 409595.

\*\* For extra field conversion labels, order Part No. 800076.

Before disconnecting power:

- Verify that the humidifier is operating correctly; check the Vapor-logic3 display for alarms and messages.
- Write down the Vapor-logic3 configuration string. This may help during start-up and commissioning after upgrading to Vapor-logic4. See the *Vapor-logic3 Installation and Operation manual* for details on how to obtain the configuration string.
- If upgrading an outdoor GTS, verify that the new enclosure door is the same height as the old door.



### Shut down humidifier

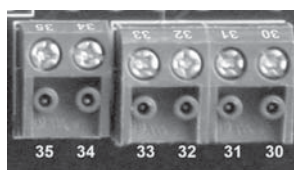
Before you begin, shut off all electrical power to the humidifier using the field-installed fused disconnect, lock all power disconnect switches in the OFF position, and close the gas shut-off valve.

### Removing Vapor-logic3, installing Vapor-logic4 adaptor board

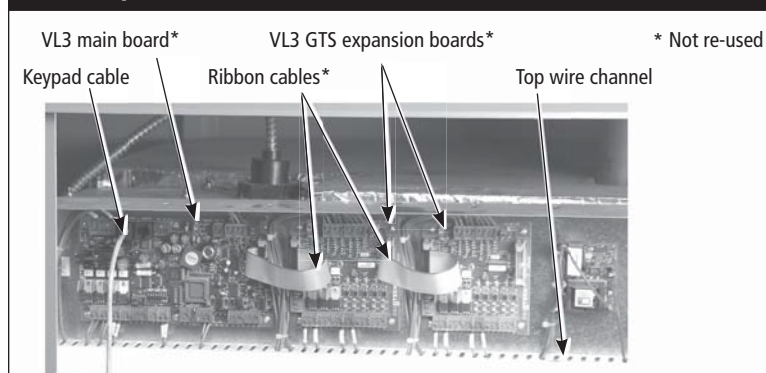
Do not disconnect wires from terminal blocks. Terminal blocks connect to pin locations with matching pin numbers (see Figure 2-1). Match the numbers to avoid reversing the terminal blocks.

1. If upgrading an outdoor GTS, complete Steps 1 through 3 in *GTS with outdoor enclosure* on page 5 before proceeding.
2. Remove the GTS humidifier's control access panel to uncover the humidifier subpanel, shown in Figure 2-2.
3. Disconnect the Vapor-logic3 keypad cable and ribbon cables from the Vapor-logic3 main board and expansion board(s). The ribbon cables will not be re-used.

**Figure 2-1:  
Matching pin numbers on board and terminal block**



**Figure 2-2:  
GTS subpanel**



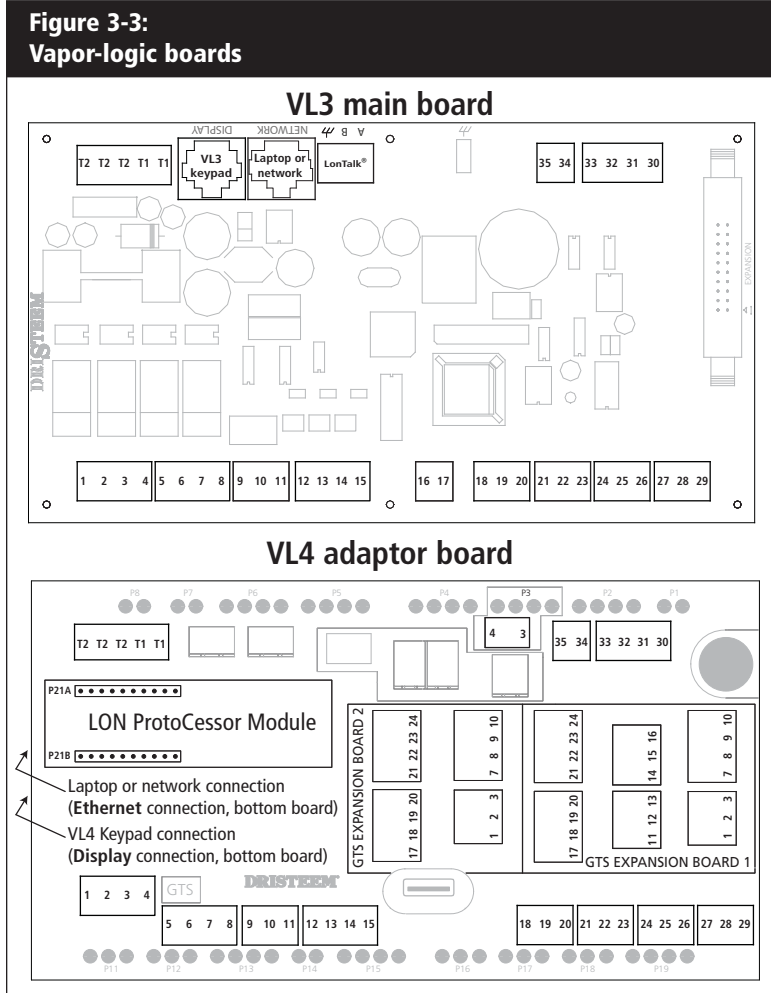
# Board removal and replacement

- Torque all terminal block screws to 2.5 in-lbs (0.28 N-m) to prevent wires from pulling loose in Step 5.
- Mark the location of the Vapor-logic3 main board by making corner marks on the subpanel with a felt-tipped marker.
- Use pliers to pull the terminal blocks from the Vapor-logic3 main board. Unscrew the stand-offs, and remove the board and stand-offs (they will not be re-used).
- Leaving the adhesive backing paper on the six nylon stand-offs packaged with the Vapor-logic4 adaptor board, push the stand-offs into the adaptor board mounting holes, as shown in Figure 3-1.
- Plug the Vapor-logic4 keypad cable into the Display connection on the Vapor-logic4 adaptor board (shown in Figure 3-3). If present, plug the laptop or network cable into the Ethernet connection on the adaptor board.
- If upgrading to Vapor-logic4 **without** LonTalk® interoperability (see Figure 3-2), skip to Step 10. If upgrading to Vapor-logic4 with LonTalk interoperability, disconnect the wires from the Vapor-logic3 LonTalk pins and land them as instructed in Table 3-1.

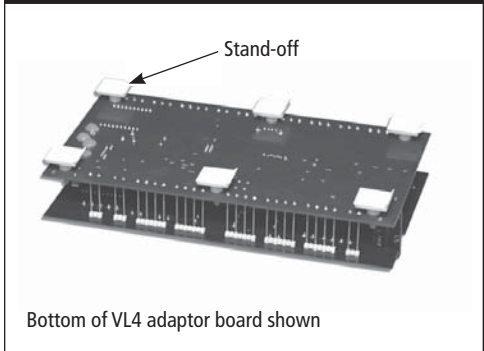
See Table 8-1 for Vapor-logic4 adaptor board pin descriptions.

Do not disconnect wires from terminal blocks. Simply move the terminal blocks from the Vapor-logic3 pins to the matching Vapor-logic4 adaptor board pins.

See Optional safety circuit wiring on pages 6 and 7.

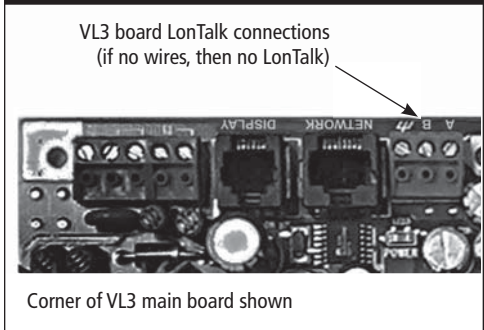


**Figure 3-1:**  
VL4 adaptor board stand-offs



Bottom of VL4 adaptor board shown

**Figure 3-2:**  
Determining LonTalk interoperability

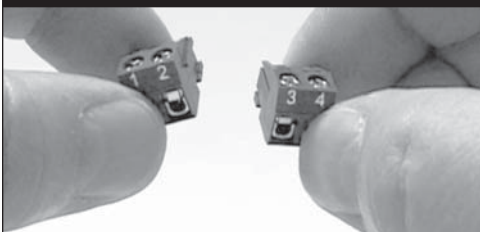


Corner of VL3 main board shown

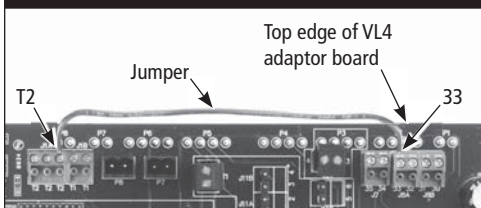
Table 3-1 Landing LonTalk wires	
Disconnect wire from Vapor-logic3 board LonTalk pin	Connect to Vapor-logic4 adaptor board LON ProtoCessor Module pin
Ground	Any ground pin: P1-2, P2-4, P4-3, P6-3, or P19-3
A	P21A
B	P21B

## Board removal and replacement

**Figure 4-1:**  
**Splitting interlocked terminal blocks**



**Figure 4-2:**  
**Jumpering terminals T2 and 33**



### Configuring duct high limit

Pins 24, 25, and 26 on the Vapor-logic3 main board are used to configure the field-wired duct high limit. See Table 4-1 to configure on-off or modulating duct high limit on the Vapor-logic4 adaptor board.

**Table 4-1**  
**Duct high limit wiring**

Duct high limit	Wiring instructions
On-off	Connect the wires from Pins 25 and 26 on the VL3 board to Pins 24 and 25 on the VL4 adaptor board.
Modulating	Connect the wires from Pins 24 and 25 on the VL3 board to Pins 24 and 25 on the VL4 adaptor board.

10. Make sure the subpanel surface is clean and dry. Remove the adhesive backing paper from the new stand-offs, and press the adaptor board into the exact location where the Vapor-logic3 board was mounted.

11. Land the loose Vapor-logic3 terminal blocks on the corresponding pin locations of the Vapor-logic4 adaptor board.

**Notes:** Some 4-pin terminal blocks are two interlocked 2-pin blocks that will need to be split. See Figure 4-1.

Not all Vapor-logic3 wire connections will be used for this upgrade. Cap the bare ends of unused wires with wire nuts, and tuck them into the wire channel.

12. Cut an 18-gauge, stranded wire long enough to jumper terminals T2 and 33 on the Vapor-logic4 adaptor board (Figure 4-2). Strip the ends of the wire, land the ends at terminals T2 and 33, and torque the terminal screws to 2.5 in-lbs (0.28 N-m).

13. Configure *on-off* or *modulating* duct high limit for Vapor-logic4 according to the choices in Table 4-1.

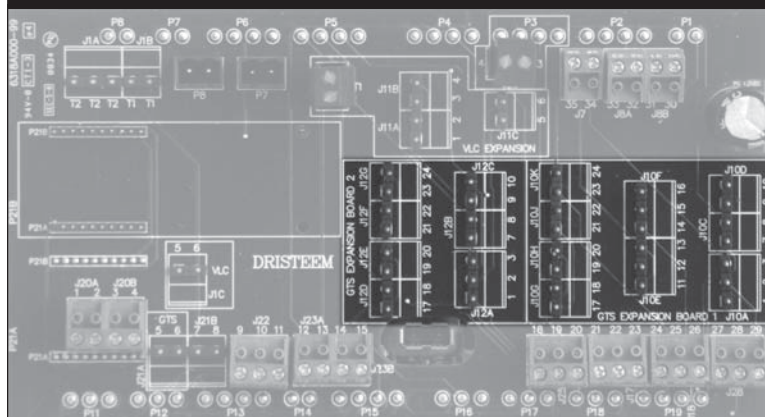
### Landing Vapor-logic3 expansion board terminal blocks on Vapor-logic4 adaptor board

**Note:** To facilitate wire re-routing, remove the top wire channel cover. Snip wire ties and unbundle wires as necessary to provide slack.

GTS humidifiers have one or two Vapor-logic3 expansion boards (see Figure 2-2). If upgrading from Vapor-logic3 with two expansion boards, land the terminal blocks from first one expansion board, then the other.

The Vapor-logic4 adaptor board pin locations for Vapor-logic3 expansion board terminal blocks are labeled **GTS EXPANSION BOARD 1** and **GTS EXPANSION BOARD 2**, as shown in Figure 4-3.

**Figure 4-3:**  
**Expansion board pin locations on VL4 adaptor board**



# Vapor-logic3 keypad removal and replacement

## Indoor GTS

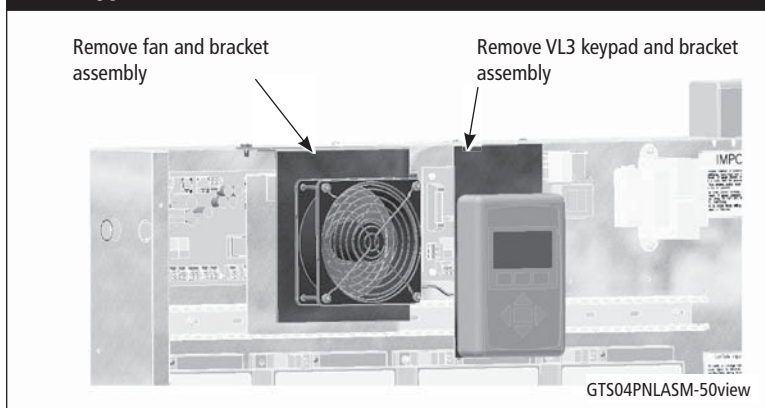
1. Remove the GTS end panel (see Figure 5-1) to access the keypad mounting screws.
2. Remove the four keypad mounting screws, and disconnect the cable from the Vapor-logic3 keypad. The Vapor-logic3 keypad will not be re-used.
3. Plug the cable into the Vapor-logic4 keypad, position the Vapor-logic4 keypad over the opening, and tighten the mounting screws.
4. Replace the end panel on the humidifier.

## GTS with outdoor enclosure

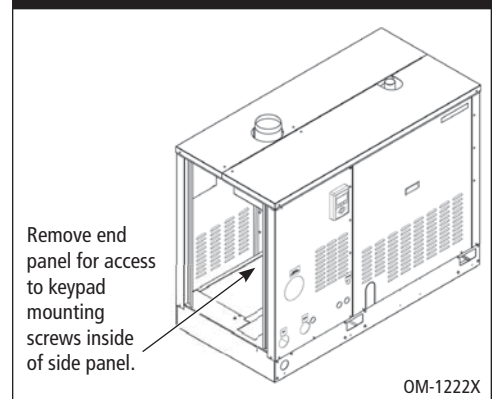
Outdoor GTS humidifiers require the following hardware changes to provide clearance for the ventilation fan:

1. Remove the outdoor enclosure door matching the height of the replacement door shipped with the upgrade kit. The screws will be re-used, but not the door.
2. Unplug the power connection at the fan, and remove the fan and bracket (Figure 5-2). The fan and bracket will not be re-used.
3. Unclip the Vapor-logic3 keypad from the bracket, unplug the keypad cable, and remove the bracket. The bracket and Vapor-logic3 keypad will not be re-used.
4. Mount the Vapor-logic4 keypad, fan, and bracket assembly on the subpanel. Use the mounting screws provided and the existing mounting screw holes (see Figure 5-3).
5. Unclip the Vapor-logic4 keypad from the bracket, plug in the keypad cable, and replace the keypad on the bracket.
6. Connect the fan power using the plug from Step 2, above.
7. Replace the outdoor enclosure door with the new door that is included in the upgrade kit. Re-use the screws from Step 1.

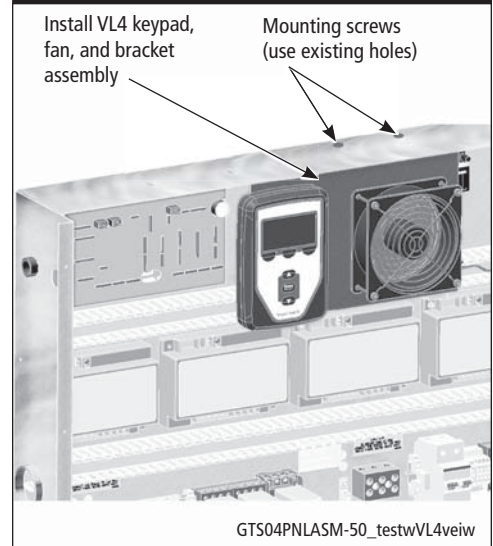
**Figure 5-2:**  
**VL3 keypad, fan, and brackets (outdoor GTS)**



**Figure 5-1:**  
**Keypad mounting screws (indoor GTS)**



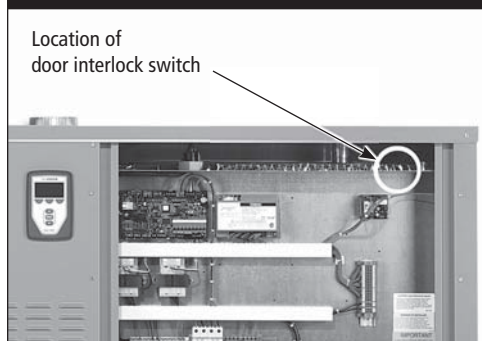
**Figure 5-3:**  
**VL4 keypad, fan, and bracket assembly (outdoor GTS)**



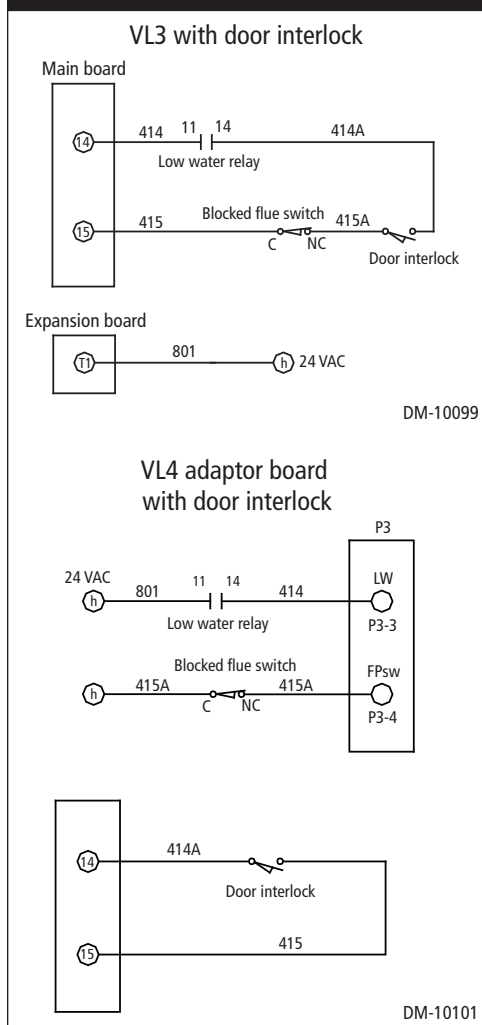
## Optional safety circuit wiring

If needed, refer to the Vapor-logic3 wiring diagram and the Vapor-logic4 Installation and Operation Manual for more wiring information.

**Figure 6-1:**  
**Door interlock switch**



**Figure 6-2:**  
**VL4 adaptor board low water relay and blocked flue switch circuits (with door interlock switch)**



Vapor-logic3 alarm points for the following signals are wired in series and register as “Interlock Disable” when any one of them is tripped: door interlock, blocked flue, or low-water.

**If separate alarm messages are not desired**, perform only the procedure in *To leave the safety circuit wired in series*.

**If separate alarm messages are desired**, perform the appropriate procedure:

- For humidifiers with a door interlock switch (Figure 6-1), follow Steps 1 to 8 in *To separate the alarm signals (GTS with door interlock switch)*.
- For humidifiers without a door interlock switch, start at Step 1 in *To separate the alarm signals (GTS without door interlock switch)*.

**Note:** Torque terminal block screws to 2.5 in-lbs (0.28 N-m).

Torque all other terminal connections to 7 in-lbs (0.79 N-m).

### To leave the safety circuit wired in series

1. See Figure 7-1. Make sure the gray-handled jumper supplied with the upgrade kit is inserted into terminals P3-3 and P3-4 on the Vapor-logic4 adaptor board.
2. Locate wire 801 that runs to the T1 terminal on the expansion board, land it at P3-3 on the Vapor-logic4 adaptor board. If wire 801 does not reach P3-3, use a longer 18 gauge, stranded wire.

### To separate the alarm signals (GTS with door interlock switch)

#### Door interlock switch

1. See Figure 6-2. Remove wire 414 from terminal 14 on the Vapor-logic3 main board. Remove the other end of this wire from position 11 on the low water relay, and keep for later use. It will be reused in *Low water circuit* later in this subsection.
2. Remove wire 414A from position 14 on the low water relay. Land this wire at terminal 14 on the Vapor-logic4 adaptor board.
3. Locate wire 415A running between the door interlock switch and the blocked flue switch. Remove this wire from both termination points, and keep for later use.
4. Locate wire 415 running between terminal 15 on the Vapor-logic3 main board and the blocked flue switch. Remove the fork connector end from the blocked flue switch, and connect it to the door interlock switch where wire 415A was located.

#### Blocked flue switch

5. Locate wire 415A that was removed in Step 3: Connect one fork terminal to the NC (normally closed) contact. Run the wire to the P3-4 connector at the top of the Vapor-logic4 adaptor board. Cut the wire to length, strip the end, and land it at the P3-4 terminal on the Vapor-logic4 adaptor board.

## Optional safety circuit wiring

- Using the other end of wire 415A that was removed in Step 3: Land the remaining fork terminal to the C (common) contact on the blocked flue switch. Strip the other end, land it at one of the *h* terminals (24 Vac) on the terminal strip at the bottom of the subpanel.

*Low water circuit* (see Figure 6-2)

- Locate wire 801 that runs to the T1 terminal on the expansion board that was directly to the right of the Vapor-logic3 main board. Remove the end of this wire, land it at position 11 on the low water relay.
- Locate wire 414 that was removed in Step 1. Land one end of this wire at position 14 on the low water relay. Land the other end at the P3-3 terminal on the Vapor-logic4 adaptor board.

### To separate the alarm signals (GTS without door interlock switch)

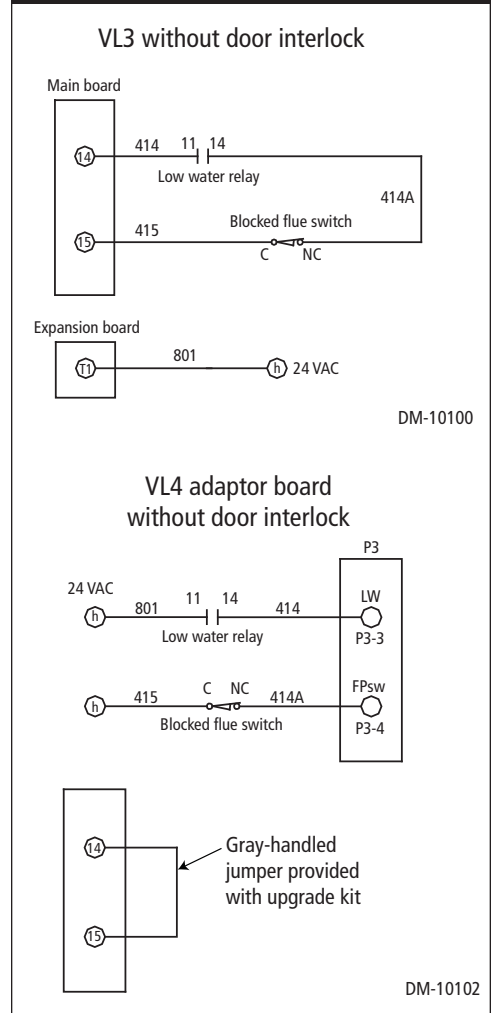
*Blocked flue switch*

- See Figure 7-2. Remove wire 414A from position 14 on the low water relay. Land this wire at the P3-4 connector at the top of the Vapor-logic4 adaptor board.
- Remove wire 415 from terminal 15 on the Vapor-logic3 main board. Land the wire at one of the *h* terminals (24 Vac) on the terminal strip at the bottom of the subpanel.

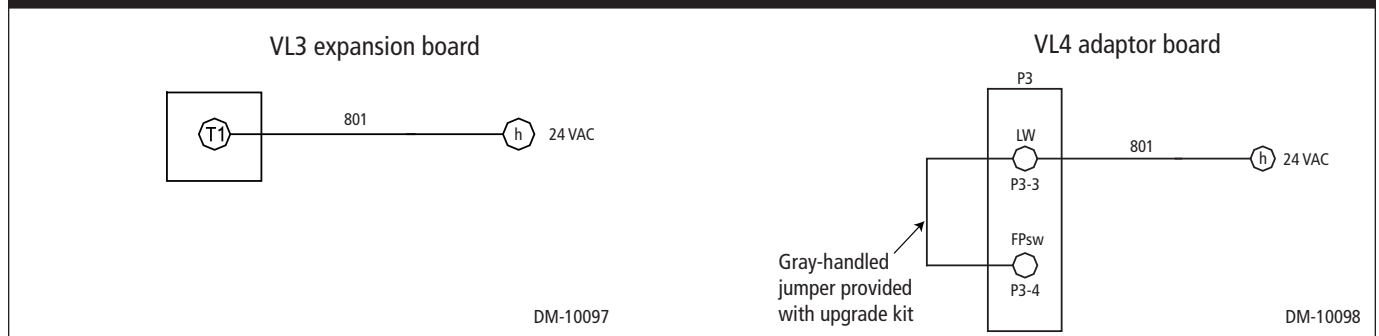
*Low water circuit*

- Remove wire 414 from terminal 14 on the Vapor-logic3 main board. Remove the other end of this wire from position 11 on the low water relay. Land one end of this wire at position 14 on the low water relay. Land the other end of this wire at terminal P3-3 at the top of the Vapor-logic4 adaptor board.
- Locate wire 801 that runs to the T1 terminal on the expansion board that was directly to the right of the Vapor-logic3 main board. Remove the end of this wire, and land it at position 11 on the low water relay.
- Insert the gray-handled jumper that is supplied with this upgrade kit into terminals 14 and 15 on the Vapor-logic4 adaptor board.

**Figure 7-2:**  
VL4 adaptor board low water relay and blocked flue switch circuits (without door interlock switch)



**Figure 7-1:**  
VL4 adaptor board - Safety circuit wired in series, and  
- Low water circuit (with door interlock switch)



# Start-up and validation

**Figure 8-2:  
Field conversion label**

When the upgrade is complete, fill out the Field Conversion Label included with the upgrade kit, and install it on the humidifier subpanel near the unit label.

FIELD CONVERSION LABEL	
• This humidifier has been field converted	
From:	<u>Vapor-logic3</u>
To:	<u>Vapor-logic4</u>
• Date of Installation:	<u>11 Nov 08</u>
• Installed by:	<u>Bruce Abby</u>
800076	

## DRI-STEEM Corporation

An ISO 9001: 2000 certified corporation

U.S. Headquarters:

14949 Technology Drive

Eden Prairie, MN 55344

800-328-4447 or 952-949-2415

952-229-3200 (fax)

European office:

Marc Briers

Grote Hellekensstraat 54 b

B-3520 Zonhoven

Belgium

+3211823595 (voice)

+3211817948 (fax)

E-mail: marc.briers@dristeem.com

Continuous product improvement is a policy of DRI-STEEM Corporation; therefore, product features and specifications are subject to change without notice. For current product information, please see the literature section of our web site: [www.dristeem.com](http://www.dristeem.com)

DRI-STEEM, GTS, and Vapor-logic are registered trademarks of DRI-STEEM Corporation and are filed for trademark registration in Canada and the European community.

Drane-kooler is a trademark of DRI-STEEM Corporation.

Product and corporate names used in this document may be trademarks or registered trademarks. They are used for explanation only without intent to infringe.

© 2009 DRI-STEEM Corporation

Form No. VL3-VL4-Convert-0109

Part No. 890000-720 Rev B

## Start-up

See the Start-up commissioning checklist in the humidifier's Installation, Operation, and Maintenance Manual. Before resuming operation, verify that the current humidifier configuration matches the Vapor-logic4 controller configuration. Refer to the *Vapor-logic4 Installation and Operation Manual*, and validate every parameter in the Vapor-logic4 Setup menu.

When resuming operation, do not leave the humidifier unattended; allow it to cycle through multiple fill cycles to verify that the humidification system is functioning properly.

## Test outputs

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

## Test run

Vapor-logic4 has a test run capability to confirm system functionality. This capability allows a technician to simulate a demand for steam production when there isn't one (such as when performing routine maintenance). To confirm functionality, go to the test run section of the Diagnostics menu. Set system demand percent and set test run time duration. During testing, the humidifier mode changes to Standby and the tank status changes to Test.

mc\_102108\_1350

**Table 8-1  
Vapor-logic4 adaptor board connections**

Pin #	Function
1, 2	Fill valve
3, 4	Drain valve
5, 6	Power vent
9	Fault Relay, N.C.
10	24 Vac, 1 amp max, COM
11	Connected by others, N.O.
12	Air flow switch input
13	Measure 24 Vac when opened
See pages 6 and 7	Door interlock alarm (and blocked flue and low water alarm options)
16, 17	24 Vac input, not used
18	+21V dc, supply
19, 20	Tank temp sensor input
21	+21V dc, supply
22	RH/demand input
23	Common
24, 25, 26	On-off or modulating Duct High Limit (see Table 4-1)
27	+21V dc, supply
28	Temp comp input
29	Common
30	Top probe
31	Center probe
32	Bottom probe
33	Ground
34	Pos analog output 0-15V dc, SSR, steam valve
35	Common
P21A, P21B	LonTalk (see Table 3-1)

DRI-STEEM products are warranted according to the terms and conditions of the standard two-year Limited Warranty effective when the humidifier was purchased. See the literature that was shipped with the humidifier for warranty information.

mc\_081308\_1405