

READ AND SAVE THESE INSTRUCTIONS

LW310/LW320

Control Module

*For Controlling Water Level and the
(optional) Automatic Drain/Flush Feature
with DRI-STEEM Humidifiers*

Installation and Operation Manual



UL Recognized Component .E79221

DRI STEEM[®]
HUMIDIFIER COMPANY

A SUBSIDIARY OF RESEARCH PRODUCTS CORPORATION



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TO THE PURCHASER AND THE INSTALLER

Thank you for deciding to purchase DRI-STEEM equipment. We have applied our best efforts to design and develop this level control to give you total satisfaction and many years of trouble free service. Avoiding certain pitfalls during installation and observing proper operating practices thereafter will assure you of achieving that objective. We therefore respectfully urge you to familiarize yourself with the contents of this manual.

DRI-STEEM Humidifier Company

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STARTUP & CHECKOUT PROCEDURES

1. **Mounting** - Check mounting to see that unit is level and securely supported before filling with water.
2. **Piping** - Verify that all piping connections have been completed as recommended and that water pressure is available.
3. **Electrical** - Verify that all wiring connections have been made in accordance with the wiring diagram.
4. **Control circuits**
 - a) Adjust humidistat to "call" setting.
 - b) Open shut off valve on water supply line.
 - c) Set control module switch to "standby" position.
 - d) Set main disconnect switch to "on" position; control module "power" lamp should now light.
 - e) Set control module switch in "normal op." position. (For unit with LW320, set module switches to "auto" and "normal op." positions.) The "fill" lamp should now light and the makeup valve should now open.
 - f) When water level reaches the lowest probe, the "ready water" lamp should light and the heating elements (contactors) should pull-in. Filling should continue until the uppermost electrode has been in water contact for two seconds. At that point, the "fill" lamp should go out.
 - g) Check low water out off circuit:
 1. Close manual stop valve on water supply.
 2. Open ball valve and start draining unit. For units equipped with automatic drain down, open drain valve by moving drain valve lever to manual position.
 3. As water level drops past center electrode "fill" lamp will light; when water level drops past lowest electrode "ready water" light will go out and the heating elements contactor(s) will drop out.

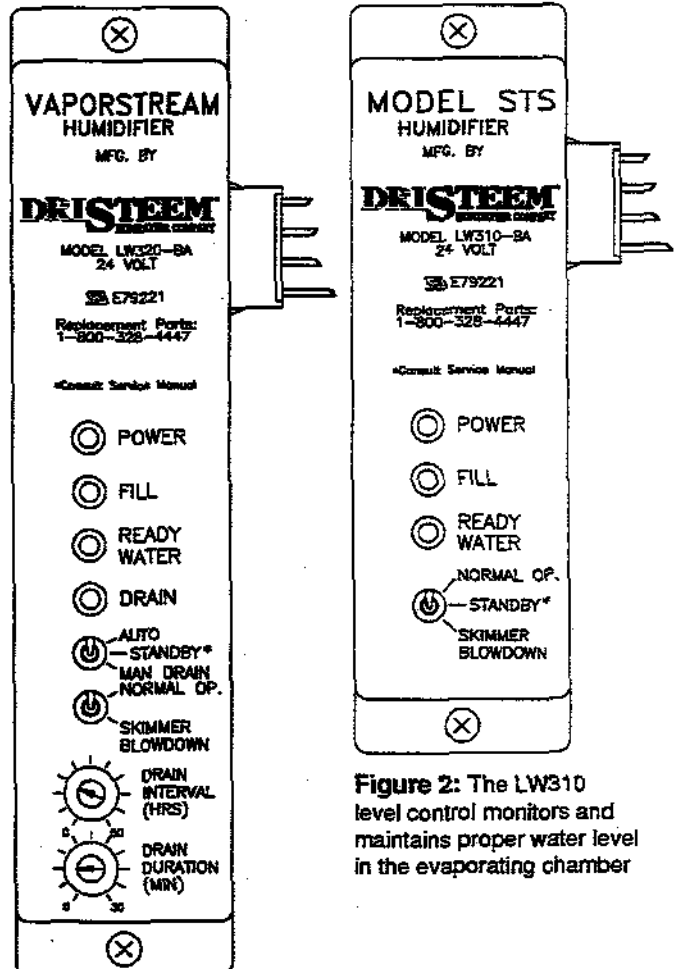


Figure 1: The LW320 level control monitors and maintains proper water levels in the evaporating chamber, including the auto-drain feature.

Figure 2: The LW310 level control monitors and maintains proper water level in the evaporating chamber

STARTUP & CHECKOUT PROCEDURES

4. When steps 1-3 has been satisfactorily completed, close manual drain valve or return dump valve lever to automatic position and refill unit as in step e.
- h) Fill water seal in drain line by setting control module switch in "skimmer blowdown" position until water flows from drain pipe, reset to "normal op." and unit is ready to operate.
- i) Check out function of field installed safety controls such as high limit humidistat, fan proving switch; contractor(s) should drop out when proving switch is "open."
- j) Check heater draw by testing and recording voltage and amperage in each phase. Readings should match nameplate readings - nameplate is located on the humidifier housing.
- k) Inspect installation for leaks by operating the humidifier. Any steam or air leaks should be sealed.

Setting the Drain Interval Timer

Your humidifier was shipped from the factory with the "drain interval" timer set for 20 hours. This means that at the end of 20 hours of actual humidifying time, the unit will go through the drain/flush cycle.

If you know the hardness of the water being supplied to your humidifier, you should reset the "hours" dial in accordance with the grains/gallon information found in Table 3-1. If you can't get this information, start with it set at 20. Because of the many variables involved, trial and error may be the next most reliable means of arriving at the proper "hours" setting for your particular humidifier installation.

The objective is to make sure the drain/flush cycle does the job, but without wasting water. It should drain/flush only often enough to keep the unit free of rapid build-up. (The drain/flush cycle may not totally eliminate mineral build-up.)

Additional LW320 Startup and Checkout Procedures

The LW320 level control with Timer-Operated Drain/Flush cycles has an integral electronic timer that accumulates the "on" or actual humidifying time of the unit. When this accumulated time reaches the hours pre-selected by the user (field adjustable between 5 and 50 hours), an electronic programmer automatically activates the drain/flush cycle.

When this cycle, which is also field adjustable (between 1 and 30 minutes), is activated, the drain valve opens, beginning the drain-off of the humidifier water. When 50% of the pre-set drain duration time has elapsed, the fill valve opens for the remainder of the time, completing the flushing action.

At the end of the flushing time the control module closes the drain valve, keeps the fill valve open (which refills the unit), restarts the cumulative timer, and allows the humidifier to resume normal operation.

When draining the humidifier prior to servicing, the "manual drain" feature of this control module is used. Placing the three-position switch in the "manual drain" position deactivates the fill valve and opens the drain valve.

Table 3-1: Drain Internal Settings

Grains/Gal.	Hours of Operating Time
14	24
16	22
18	19
20	18
22	16
24	14
26	13
28	12
30	11
32	10

This chart shows recommended hours of operation for various water hardness levels. Due to unlimited possible water conditions, these are only starting points. Field adjustments may be made to suit a particular water condition. When softened water is available, set the Hours of Operating Time to the maximum setting.

Table 3-2: Drain Duration Settings

Total KW	Drain Duration (minutes)
2-8	5
9-24	10
28-40	15
42-60	20
64-80	25

STARTUP & CHECKOUT PROCEDURES

Note: After a week or two of operation, loose scale will begin to accumulate on the floor of the humidifier chamber. This is scale that forms on the heating elements. When it gets thick enough (about 3/32"), it flakes off. This is normal and need not be removed until the top of the accumulation approaches the underside of the electric heaters (usually once per season). **The use of softened water will greatly minimize the rate at which scale formation occurs.**

Setting the Drain Duration Timer (Minutes)

This setting is affected by the size (gallons capacity) of the various VAPORSTREAM models. Large units require more drain time and vice versa. This setting is made before the humidifier leaves the factory. It is always a good idea to check and make sure the setting of your unit agrees with the "drain duration" recommended in Table 3-2 on page 3.

Testing the Drain/Flush System

As a part of final checkout the installer should always

verify the operation of the (optional) drain/flush system. To test:

1. Set the "drain interval" timer dial to "0" hours, or fully counter clockwise. (Be sure to pass "0" once before setting the dial to "0".)
2. Set the "drain duration" timer dial to "10" minutes. In 30 to 45 minutes (varies) the drain valve should open; 5 minutes later the fill valve should open (which creates the flushing action). After an additional five minutes, the drain valve should close. The fill valve should remain open until the unit is refilled to the level of the top probe and then it should also close.

If all of the above takes place as described, the drain/flush system is functioning correctly. The drain interval timer dial (hours) should then be returned to 20 hours and the drain duration timer dial (minutes) should be set to agree with Table 3-2 on page 3. The unit will then be ready to resume humidifying.

TROUBLE-SHOOTING GUIDE

PROBLEM	CONTROL MODULE LIGHTS			POSSIBLE CAUSE	RECOMMENDED ACTION
	POWER	FILL	READY WATER		
Humidifier will not heat	Off	Off	Off	No control transformer output	<u>VPC:</u> Verify control voltage across terminals 6 & 7. <u>STS/LTS:</u> Verify control voltage.
	On	Off	On	Humidistat is not calling	Set humidistat to call. Inspect for faulty humidistat.
				Safety controls open (high limit, air proving, etc.)	Check safety controls.
				Faulty control module	<u>VPC:</u> Verify control voltage between terminals 6 & 8. <u>STS/LTS:</u> Verify control voltage and probe. Wires are connected correctly.
				Probe head deterioration	Replace probe head.*
				Steam stop valve closed	<u>STS/LTS:</u> Verify valve is opened.
				Steam trap plugged	<u>STS/LTS:</u> Clean trap body.
				Low or no steam	<u>STS/LTS:</u> Verify steam is present.
Steam strainer plugged	<u>STS/LTS:</u> Clean strainer.				
Humidifier will not fill	On	On	Off	No water pressure at valve	<u>VPC:</u> Check water supply. Shut off valves. <u>STS/LTS:</u> Verify manual water supply valve open.
				Faulty water fill valve	<u>VPC:</u> Verify action of fill water solenoid valve by turning control module switch from standby to normal operation. Audible click should be heard as solenoid operates. <u>STS/LTS:</u> Verify action of fill water solenoid valve; verify control voltage present at coil. Audible click should be heard as solenoid operates.
				Plugged water strainer	Check strainer; clean and open.
				Plugged valve	Check the fill valve for obstructions; clean.
				Faulty level control module	<u>VPC:</u> Verify control voltage across terminals 5 & 6. <u>STS/LTS:</u> Verify control voltage.

* Probe rod corrosion or probe head material aging may cause level control system failure. This generally does not occur in the first two years of operation.

TROUBLE-SHOOTING GUIDE

CONTROL MODULE LIGHTS				POSSIBLE CAUSE	RECOMMENDED ACTION
PROBLEM	POWER	FILL	READY		
Humidifier does not stop filling	On	On	Off	Lack of tank-to-probes electrical continuity water conductivity 100 micromhos/cm minimum (2 grains per gallon)	<u>VPC</u> : Jumper terminals 1 & 4. If water stops, verify tank ground to terminal 4; check water supply conductivity, consult factory. <u>STS/LTS</u> : Jumper terminals 1 & 3. If water stops, verify tank ground to terminal 3; check water supply conductivity, consult factory.
				Fill valve is stuck open	Check the fill valve for obstructions; clean.
				Drain valve not closed	Check the drain valve for obstructions; clean.
				Fill valve installed backward	Check for correct water flow through valve. (Note arrow.)
			Drain valve is in the Manual Open position	Reset.	
Unit short circuits				Probes may be incorrectly wired or need cleaning	Confirm that unit is wired per diagram. Clean probe rod tips with steel wool.

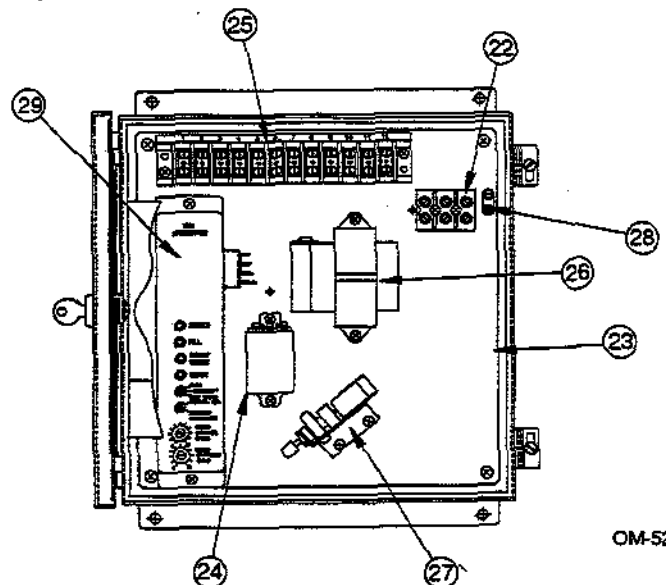
REPLACEMENT PARTS

STS/LTS Control Cabinet

No.	Description	Part No.
22	Power Block	408300-001
23	11" x 11" Subpanel	165720-002
24	Relay 1	407900-001
25	Terminal Block (9 or 12)	408250
26	Transformer	408960
27	Pneumatic Electric Switch	408100
28	Ground Lug	409250-017
29	LW320 Level Control 1	408520
29	LW310 Level Control 1	408510

Note: When ordering specify humidifier model and serial numbers.

1 Varies with specific order.



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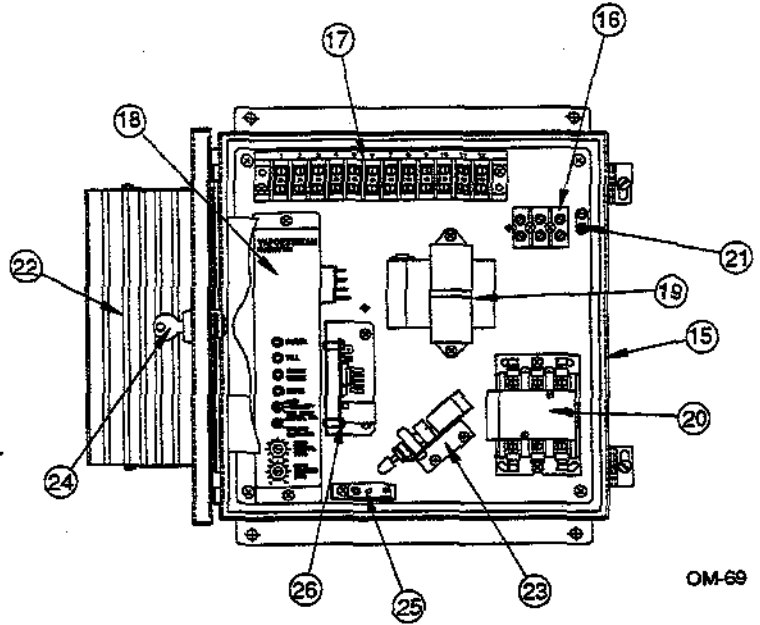
REPLACEMENT PARTS

VAPORSTREAM VPC Single Heater Control Cabinet

No.	Description	Part No.
15	Control Cabinet	4
16	Power Block	4
17	Terminal Strip	408250
18	Level Control Box	4
19	Transformer	408970-001, 002
20	Contactor	407001
21	Ground Lug	409250-017
22	SCR Master (2, 3)	4
23	P.E. Switch (3)	408100
24	Keylock (3)	407100-009
25	Door Interlock Switch (3)	408470
26	S-10 TP Modulator Board (2, 3)	408680
27	Pneumatic Transducer (1, 3)	501490

Note: When ordering specify humidifier model and serial numbers.

- 1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
- 2 Specify component part number when ordering.
- 3 Optional
- 4 Varies with specific order.



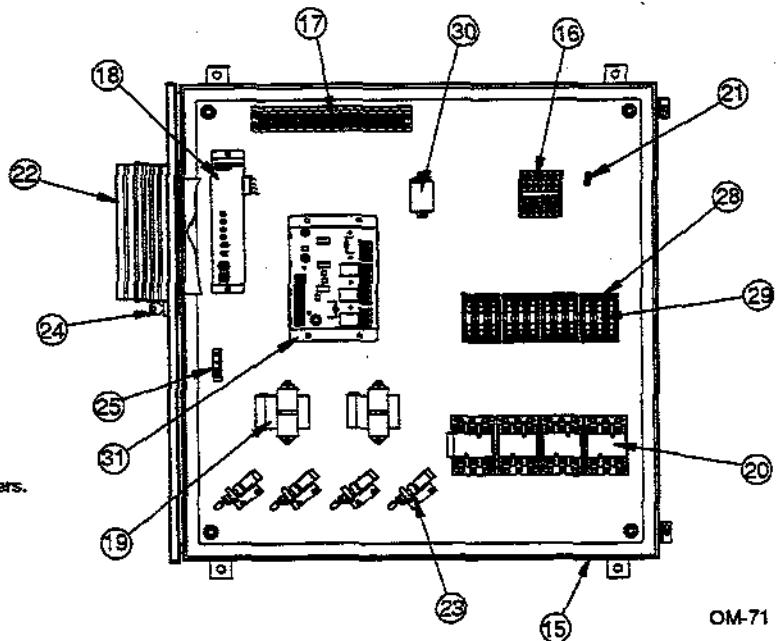
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VAPORSTREAM VPC Multiple Heater Control Cabinet

No.	Description	Part No.
15	Control Cabinet	4
16	Power Block	4
17	Terminal Strip	408250
18	Level Control Box	4
19	Transformer	408970-001, 002
20	Contactor	407001
21	Ground Lug	409250-017
22	SCR Master (2, 3)	4
23	P.E. Switch (3)	408100
24	Keylock (3)	407100-009
25	Door Interlock Switch (3)	408470
27	Pneumatic Transducer (1, 3)	501490
28	Fuse Block	4
29	Fuse	4
30	Delta Relay (5)	407950-001, 003
31	TP Modulation (3, 5)	400680-002, 003

Note: When ordering specify humidifier model and serial numbers.

- 1 Not Shown. Transducer is mounted on control cabinet door exterior at SCR location.
- 2 Specify component part number when ordering.
- 3 Optional
- 4 Varies with specific order.
- 5 Specify S-20, S-71, S-81 or CC-8104
- 6 Supplied with some options and high current output conditions.
- 7 Two supplied when control load exceeds rating of one transformer.



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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 re-installation 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.

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

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HUMIDIFIER COMPANY

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