

READ AND SAVE THESE INSTRUCTIONS

VAPORFAN[®]

ELECTRIC STEAM HUMIDIFIERS

**FOR APPLICATIONS NOT SERVED
BY A CENTRAL DUCT SYSTEM**

INSTALLATION INSTRUCTIONS & MAINTENANCE OPERATIONS MANUAL

DRI STEEM
HUMIDIFIER COMPANY

Box 128, Hopkins, MN 55343

TABLE OF CONTENTS

TO THE PURCHASER AND THE INSTALLER

We have done our best to provide a product that will give many years of satisfactory service. We request that you spend a few moments to familiarize yourself with these tips for installation and maintenance. Doing so may prove to pay big dividends over the years to come in the form of better performance and easier maintenance.

DRI-STEEM HUMIDIFIER COMPANY

DRI-STEEM Warranty	12
Installation - Location	3
Maintenance Procedure	9
Maintenance Service Record	12
Mechanical/Electrical Specifications	5
Operation	6-8
Replacement Parts	10, 11
Wiring Diagrams	4

PLEASE NOTE: Standard unit requires water conductivity to function and therefore will not operate on water treated by the reverse osmosis or deionizing process. Consult factory for assistance if you plan to use these water types.

DRI-STEEM
HUMIDIFIER COMPANY

DRI-STEEM Humidifier Company
Box 128 - Hopkins, Minnesota 55343
1-800-328-4447
In MN Call: 612-935-6986
Fax: 612-935-4831

INSTALLATION

Mounting Location of the VAPORFAN

When deciding where to locate the unit within the room or space, several considerations should be borne in mind. Among these are ease of providing services (electrical and piping), vapor distribution, and noise.

Services

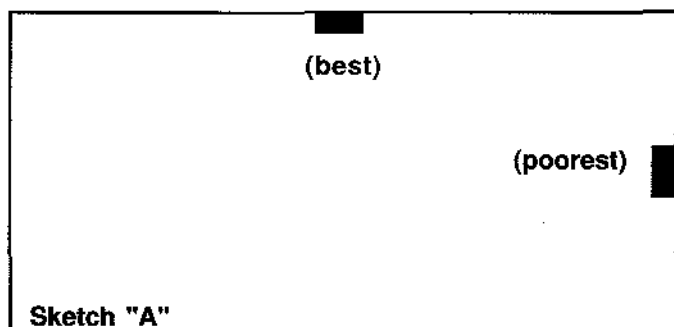
Usually ease of wiring and providing water supply and drain piping to the VAPORFAN will head the priority list in the choice of a mounting location. The outside service connections (electrical, water supply and drain) are made at the lower right rear corner of the unit. Also keep in mind that a mounting location should be selected that provides convenient access to the front of the unit for vaporizing chamber removal.

Air and vapor movement

The air inlet to the unit must not be obstructed. At least 3" of clearance must be maintained between the air inlet grille and nearby surfaces. Starvation of the air supply will result in incomplete absorption of the water vapor within the VAPORFAN and could cause condensation on the vanes of the air discharge grille.

No auxiliary air movement

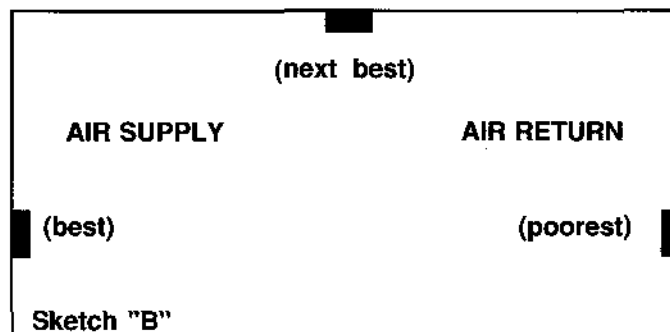
The vapor pressure in the immediate area of the humidifier tends to build up and this causes the vapor to migrate to the remote parts of the room or space because pressures tend to equalize. These pressure differences are very slight however, so migration is by no means instantaneous. For that reason the location selected should favor the center of the room. For example, in the case of a long narrow room, the center point of one of the two long walls would be most ideal. See sketch "A".



With auxiliary air movement

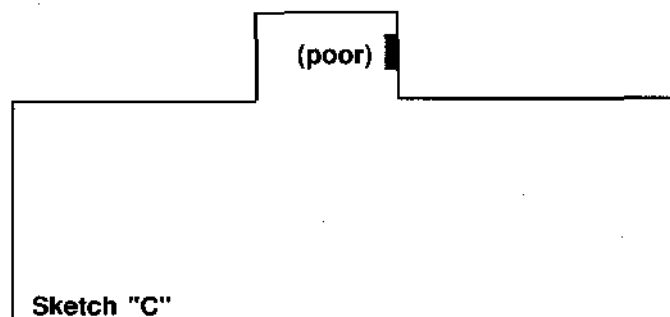
In cases where air movement is created within the room or space due to an air handling system (furnace or air conditioner), the path or direction of air flow should be considered. Since water vapor will be car-

ried by the air in motion, the humidifier location should favor the upstream or source of the incoming air thus using the air movement as an assistance for achieving dispersion of the vapor. See sketch "B".



Confined spaces

The VAPORFAN should not be located in a confined cubicle adjacent to a larger space. Doing so could result in humidity buildup in the cubicle faster than it can migrate away. This could result in the VAPORFAN shutting itself off before satisfying the needs of the adjacent larger space. See sketch "C".



Mounting methods

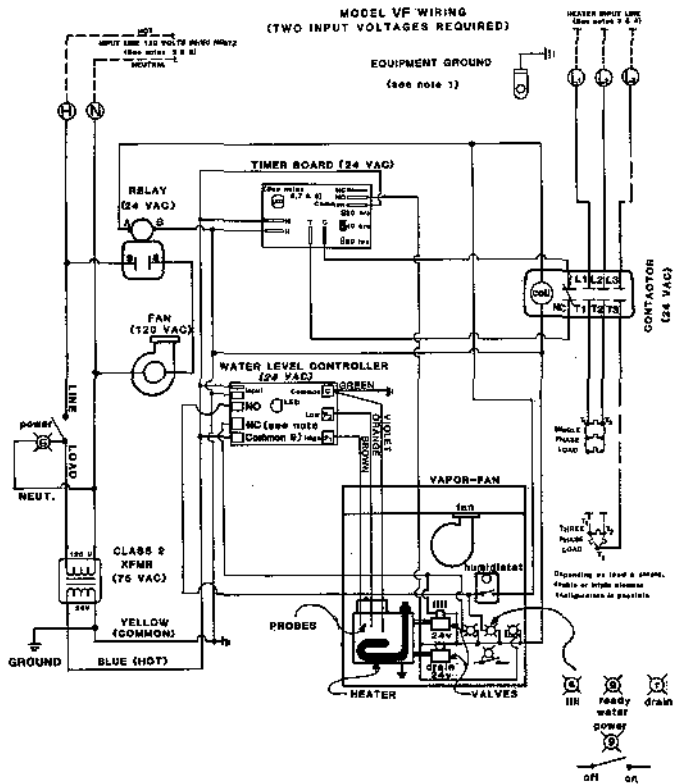
The VAPORFAN can be either set directly on the floor or wall mounted at a suitable elevation above the floor. When wall mounting, the hanging bracket is required. The wall mounting bracket and two 3/8 inch lag bolts are provided with each unit.

Studded Wall Mounting (16 inch on center studs)
Locate studs and position mounting bracket in place so the two 16 inch on center holes will catch a stud. Mark hole location and pre-drill 1/4 inch diameter pilot holes. Secure bracket to wall with provided lag bolts.

Hollow Block or Poured Concrete Wall Mounting
Position mounting bracket in place and mark the second hole from each end. Drill appropriate pilot hole for two 3/8 inch toggle bolt or two 3/8 inch machine bolt lead anchor. Secure bracket in place using select method.

WIRING DIAGRAM

VAPORFAN EVAPORATIVE HUMIDIFIER WIRING DIAGRAM NUMBER VF

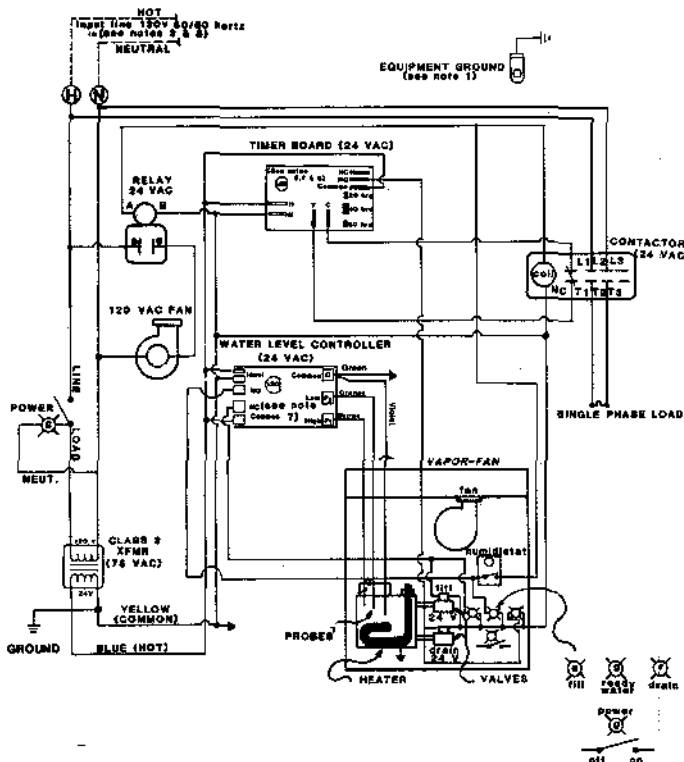


Notes:

1. Equipment ground and all wiring to be per local and national electrical codes.
 2. Input line 120 volts, single phase, for fan and low voltage control; operates on 50/60 hertz.
 3. Input line 24 volts, single phase, for heater(s) circuit; operates on 50/60 hertz.
 4. For wire sizing, heater circuit line amps: L1 16.7 L2 16.7 L3 16.7
- Recommended line fusing: 20 amps.
5. Fan and control circuit recommended line fusing 15 amps or less.
 6. Light emitting diode "on" during drain cycle.
 7. Jumper pin connector selects timer/drain down cycle (20-40-80 hours).
 8. Drain duration of ten minutes.
 9. Light emitting diode "on" in ready water condition.

JOB: _____ MODEL: VF ORDER NO: _____

VAPORFAN WIRING DIAGRAM NUMBER VF 112 (120 volt supply only.)

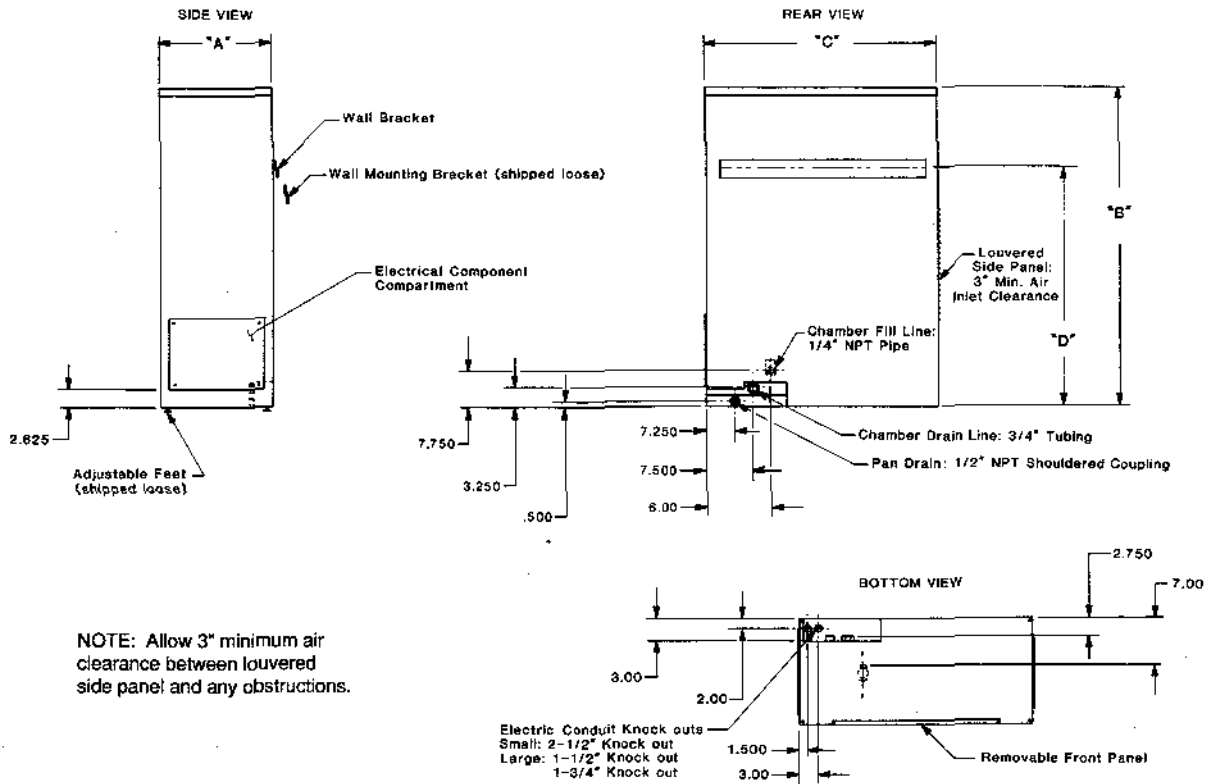


NOTES:

1. Equipment ground and all wiring to be per local and national electrical codes.
 2. Input line 120 volts, 1 phase, for heater(s) circuit; operates on 50/60 hertz.
 3. For wire sizing, heater circuit line amps: L1 16.7 L2 16.7 L3 16.7
- Recommended line fusing: 20 amps.
4. Light emitting diode "on" during drain cycle.
 5. Jumper pin connector selects timer/drain cycle.
 6. Drain duration of ten minutes.
 7. Light emitting diode "on" in ready water condition.

JOB: _____ MODEL: VF-20 ORDER NO: _____

MECHANICAL/ELECTRICAL SPECIFICATIONS



MECHANICAL SPECIFICATIONS

	VF 20		VF 40		VF 60		VF 85	
	inches	mm	inches	mm	inches	mm	inches	mm
Dim. A	12.875	327	12.875	327	15.875	403	15.875	403
Dim. B	30.000	762	30.000	762	35.000	889	35.000	889
Dim. C	25.875	657	25.875	657	29.375	746	29.375	746
Dim. D	20.000	508	20.000	508	23.250	591	23.250	591
Fan Output	290	8.2	435	12.3	980	27.8	980	27.8
	cfm	cmm	cfm	cmm	cfm	cmm	cfm	cmm
Tip Speed	1225	373	1838	560	2337	712	2337	712
	ft/min	m/min	ft/min	m/min	ft/min	m/min	ft/min	m/min
Op. Weight	130 lb	59 kg	130 lb	59 kg	198 lb	90 kg	198 lb	90 kg
Shp. Weight	125 lb	57 kg	125 lb	57 kg	165 lb	75 kg	165 lb	75 kg
AMPS 120/1	17.0		-		-		-	
□ 208/1	9.6		19.2		28.8		43.3	
□ 240/1	8.3		16.7		25.0		37.5	
□ 480/1	4.2		8.3		12.5		18.8	
□ 208/3	-		16.7*		25.0*		25.0	
□ 240/3	-		14.4*		21.7*		21.7	
□ 480/3	-		7.2*		10.8*		10.8	
KW	2		4		6		9	
Output/hour	6/1.7/2.7		12/1.4/5.4		18/2.2/8.2		27/3.2/12.2	
lb/gal/kg								

APPROXIMATE HUMIDIFYING CAPABILITY

8' - 0" Ceiling Height
 VF20 - 2000 Square Feet
 VF40 - 4000 Square Feet
 VF60 - 6000 Square Feet
 VF85 - 8500 Square Feet

NOTE: Above estimates based on the following:

- Indoor conditions = 70 degrees F. and 40% R.H.
 Outdoor conditions = 0 degrees F and 80% R.H.
- One air change per hour, which is:
 - average for a space that has no air conditioning or ventilation system.
 - average for a space that is air conditioned but has no outside air intake.
- Above capacity capabilities are merely "rule of thumb" estimates. Actual requirements will vary.

* For wire sizing. Highest leg draw is shown due to current unbalance in some cases.

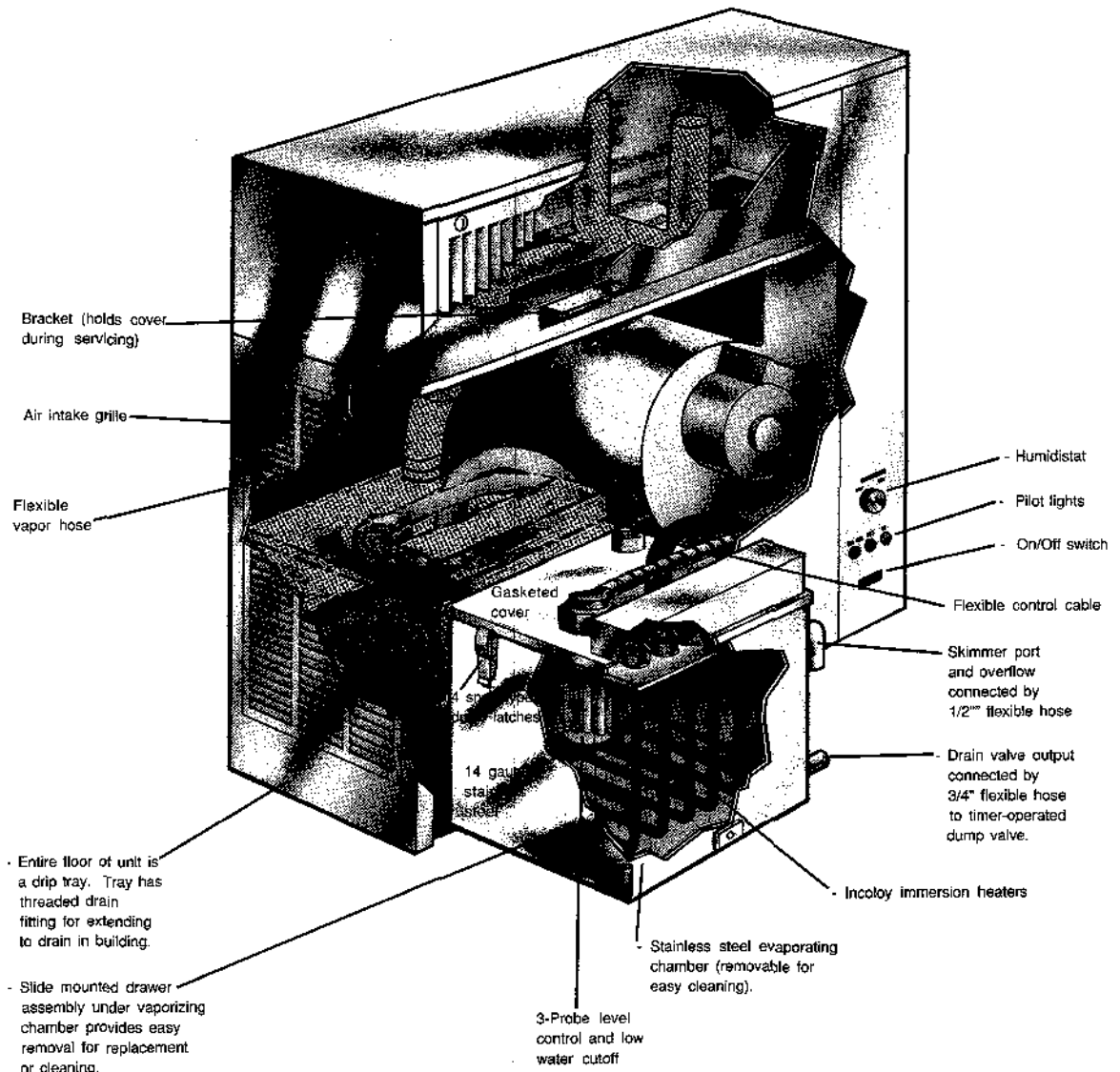
□ All VAPORFANS operate on 50/60 Hz and require 120 volt single phase control circuit and fan supply in addition to heater circuit. When heater current is other than 120/150-60, a second circuit of that current is required.

The elevation above the floor should be convenient for servicing the VAPORFAN and must permit adequate pitch of the drainage piping.

OPERATION

Designed to be attractive, efficient and quiet.

Steam is injected into the air stream generated by the blower. Specially designed steam dispersion system makes sure that vapor is completely absorbed by the air before reaching the exit grille on the front of the unit.



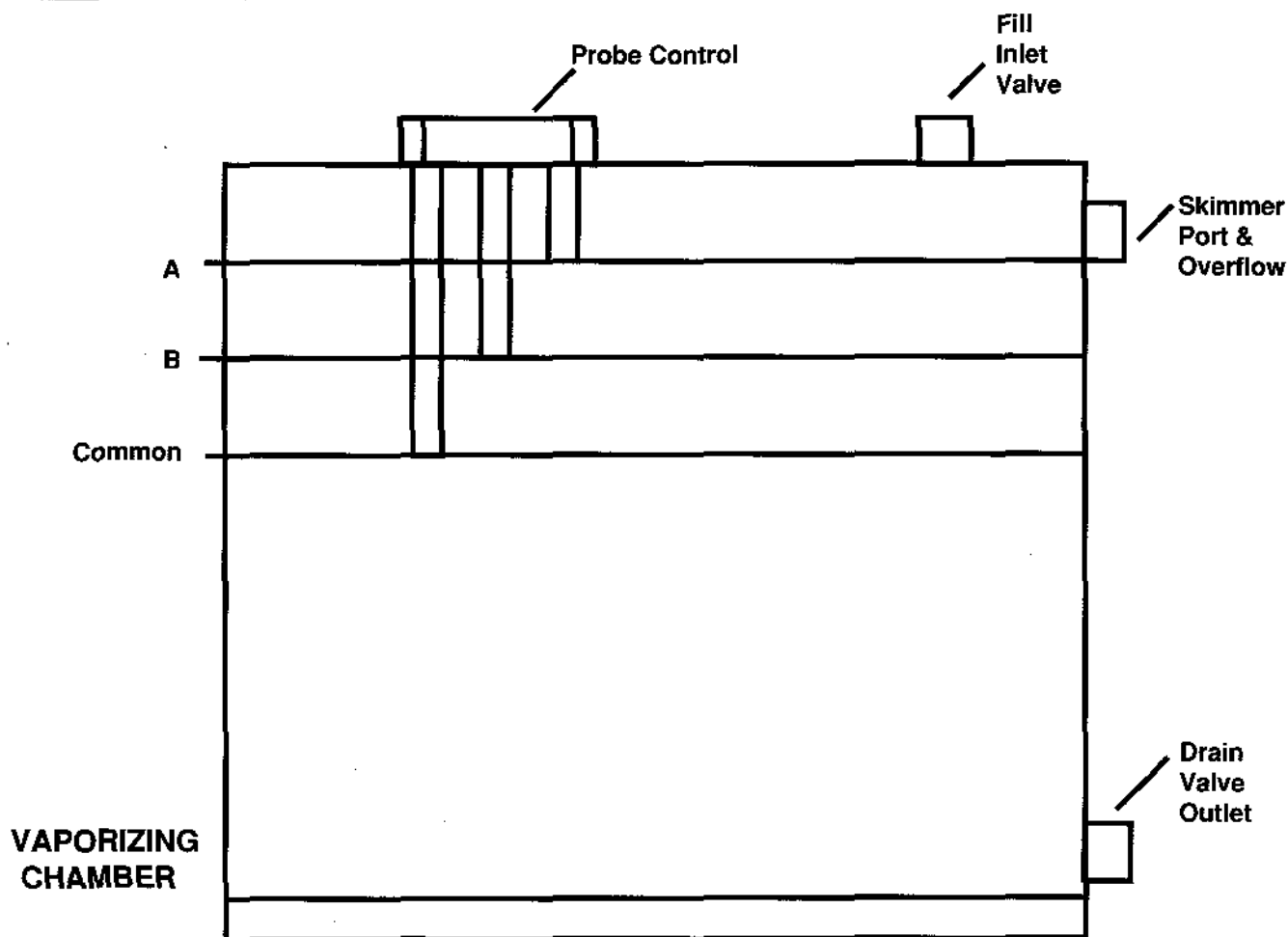
Reliable, electronic probe control of water level.

A simple 3-probe, conductivity sensor maintains water level and fill cycles through a solenoid operated water fill valve. Water conductivity: 100 micromhos/centimeter minimum (2 grain/gal).

Initial startup

When the power is turned on, the solenoid operated water fill valve opens and fills the vaporizing chamber. When the water reaches level "A", (see Figure 8-1, page 8) a call for humidity will start the fan, energize the heating element and close the fill valve.

OPERATION



Low water protection

During operation, the water line eventually drops to level "B", at this time the fan and heater are de-energized and the water fill valve opens. The fan and heater will remain "off" until the water line has been restored to level "A". This then also provides low water protection in the event of water supply failure.

This "idle during refill" feature results in the unit being inactive about 3% of the "on" time.

Surface skimming

Each time the vaporizing chamber refills, the previously formed floating mineral residue is skimmed off through the skimming port. This port is located about 1/4" below level "A". Each time the unit refills, the upper 1/4" of water is immediately drained off. The waterline continues to drop by evaporation to level "B" at which time the refill process is repeated. This skimming action reduces mineral concentration in much the same way as the surface blow down on a steam boiler and reduces the frequency of cleaning.

Selecting the installation location

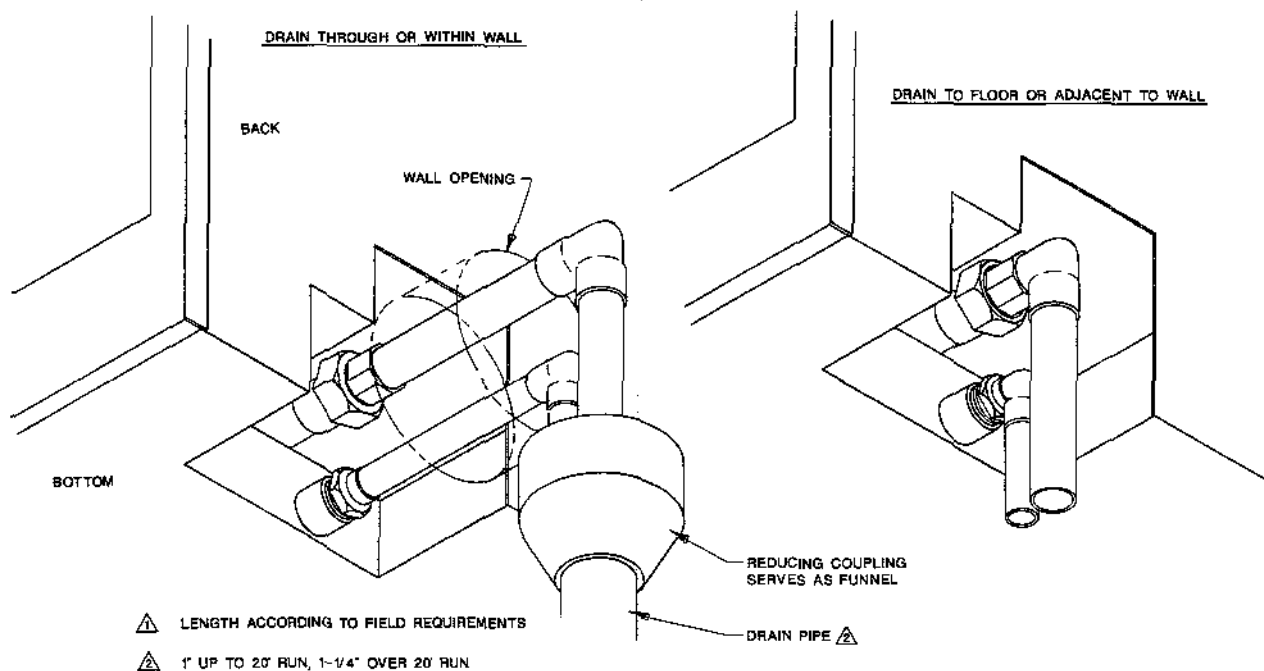
The VAPORFAN has an attractively designed cabinet intended for installation in finished rooms or spaces and can be either floor mounted or wall mounted. Four adjustable legs and a hanger bar are furnished.

Electrical and piping

The VAPORFAN is a self contained factory assembled and wired humidifier unit. It can be installed in any location where 1/4" copper or plastic water supply and 3/4" minimum copper (or plastic, rated 212 degrees F.) drain piping and power wiring can be connected to the unit.

The fan motor and control circuit requires 120 V, 50/60 C, 1 ph. supply. On installations where the heater circuit is of another voltage, an additional supply circuit of that voltage is required.

OPERATION



NOTE VIEWS ARE FROM BACKSIDE BOTTOM LEFT CORNER

Drain/flush feature

The control module contains an integral electronic timer which accumulates the "on", or "humidifying" time of the VAPORFAN. When this accumulated time reaches the setting of the timer, the drain/flush cycle is activated.

Upon activation, the following sequence occurs:

1. The drain valve opens and the mineral-rich contents of the evaporator chamber begins draining.
2. When this water drops to the "refill" level, the fill valve opens.
3. Both fill and drain valves remain open for ten more minutes, thus flushing the tank.
4. The drain valve then closes, the tank refills, the fill valve closes, the timer begins accumulating time and the VAPORFAN resumes normal operation.

The electronic timer comes factory-set at 40 hours. Alternate times of 20 hours and 80 hours can be made. See wiring diagram on page 4 for timer board location and instructions for changing the set times.

Test cycling the drain/flush system

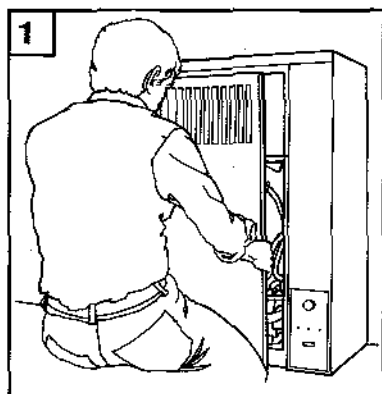
The timer board contains four pairs of terminal pins which are marked 20, 40, 60, 80 and "T" (for test).

To test:

1. Pull the pin block off whichever pair of pins is in use; move it to the "T" pair and push it in.
2. Set the humidistat high enough so the VAPORFAN will remain "on call" for at least one hour.
3. After about 35 minutes of running time, activation will take place, causing the drain valve to open. The water level will then drop and cause the "fill" valve to open. Both valves will remain open for about 10 minutes.
4. The "drain" valve will then close and the water level will rise, causing the "fill" valve to close.
5. Once the test cycle is completed, move the pin block back to the appropriate hourly pair of pins. Failure to do so will result in a drain/flush cycle every 35 minutes.

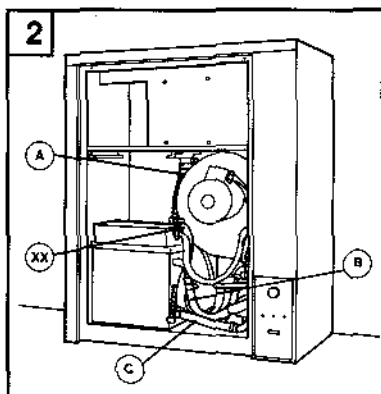
MAINTENANCE PROCEDURE

Unique design for minimum maintenance - easy as 1-2-3-4.

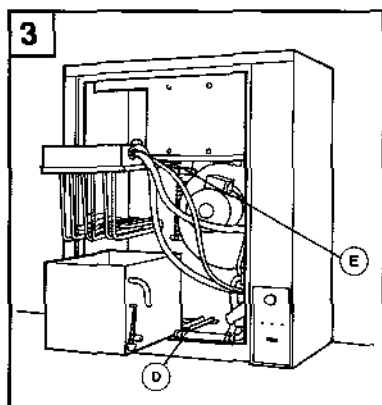


1. Shut off electrical power to unit. Using key, unlock and remove large front panel.

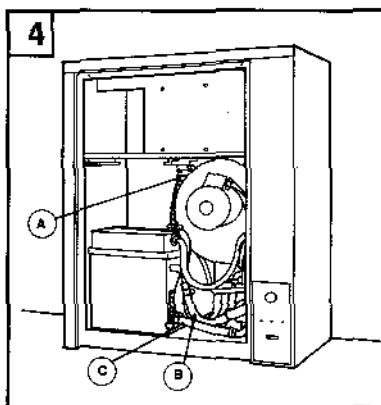
Drain the evaporating chamber by manually opening the "drain" valve. Do this by pushing open lever on valve to "manual" position and lock in place.



2. Disconnect flexible vapor hose (A) on top of evaporating chamber. Do not disconnect any of the electrical conduits (XX). Disconnect the flexible hose from the overflow pipe (B), and the flexible hose from the evaporating chamber (C). All disconnects can be made at the evaporating chamber.



3. Pull evaporating chamber out of unit on sliding track (D). Remove cover of chamber, raise and slide into holding slots (E) above upper part of unit. Remove soiled evaporating chamber and clean, or replace with alternate (if purchased), clean chamber. Replace chamber cover and slide chamber back into unit.



4. Reconnect flexible steam hose (A). Reconnect overflow hose (B), drain hose (C), replace front panel. Turn on electrical power. VAPORFAN is again ready to humidify. Return drain valve lever to "auto" position.

MAINTENANCE PROCEDURE

- 1) Clean Vaporizing Chamber, skimmer tube and probes, as required.
- 2) VAPORFAN, Fan Motor - Oil annually.
- 3) Check fill and drain hoses - annually.

Minerals precipitate

As evaporation takes place in the VAPORFAN, some of the minerals dissolved in water precipitate (come out of the solution) and float on the water surface. If not removed, this precipitate mineral will eventually form a sludge and settle to the bottom of the vaporizing chamber.

Removes floating precipitated mineral

Each time the make-up valve opens, the unit refills to a point just above the skimmer opening. A portion of the make-up is then "skimmed" (flows to drain), carrying the floating mineral with it. This action reduces the mineral concentration in the VAPORFAN which, in turn, reduces the required frequency of cleaning. Cleaning once or twice a season is usually adequate assuming water having hardness of up to 10 grains of dissolved mineral per gallon. In addition to the skimmer, a timer and drain/flush system is incorporated into the operating system (see page 8 for operation description). The timer is field adjustable for 20, 40, 80 hour drain/flush system intervals. Drain/flush duration is 10 minutes.

Cleaning the evaporating chamber

The heating element itself is usually self cleaning. The mineral buildup on the element flakes off after reaching a thickness of about 1/16", and settles to the bottom of the chamber. Before scale accumulation builds up to the underside of the heating element, it must be removed. Failure to do so will result in premature heater burn-out.

To remove loose scale, simply scoop it out. Scale adhering to the walls of the chamber can be loosened by using a scraper.

Note: An additional evaporating chamber may be ordered. This allows quick change out at mounted location. The used chamber may then be taken to maintenance for cleaning.

Probe assembly

Unscrew plastic probe housing and remove any mineral build-up that may have accumulated.

Electro-rod assembly

Being TEFLON® coated, except for the tip, the scale flakes off easily. The build-up on the tips should be brushed or scraped off.

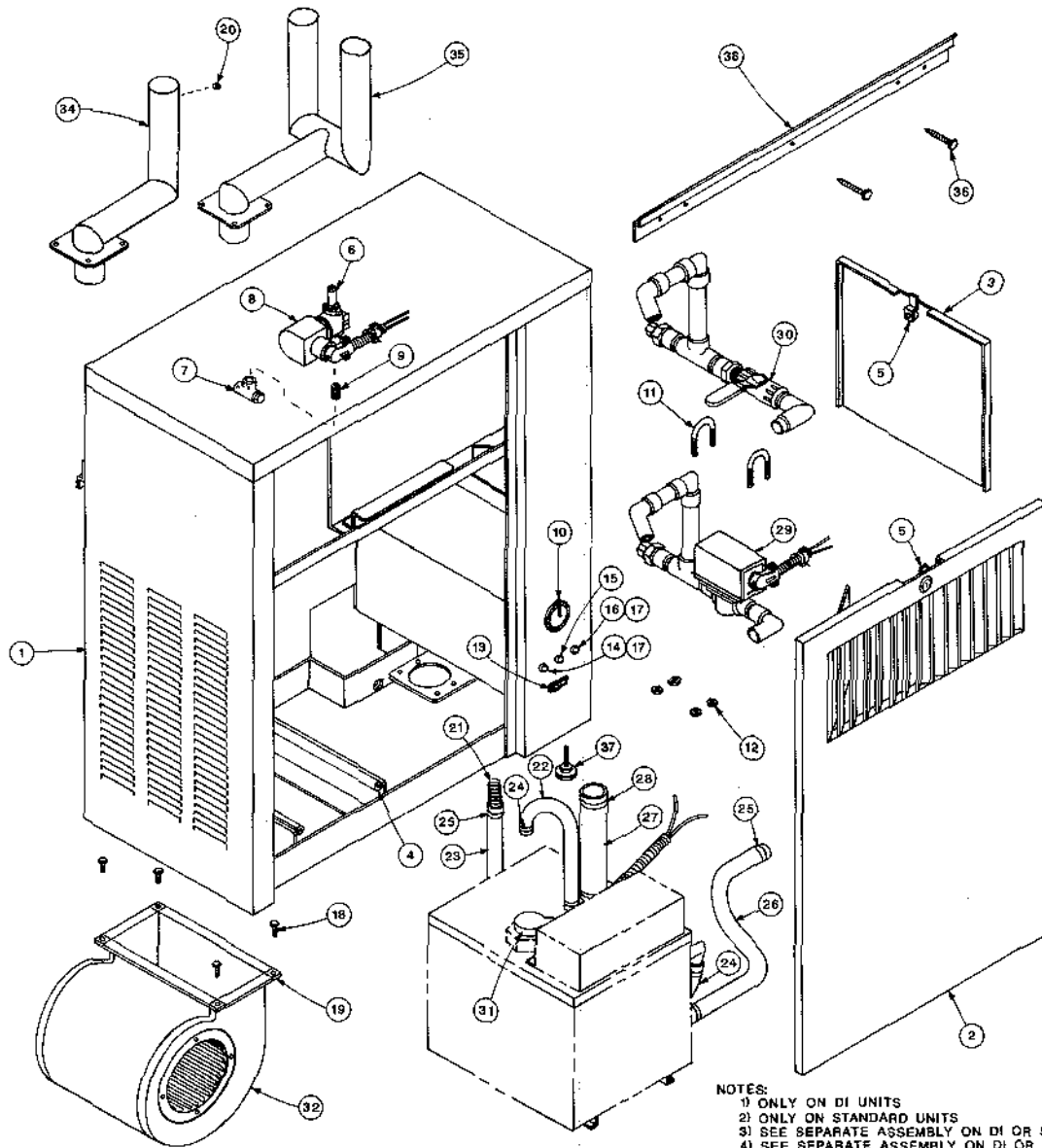
Re-assemble VAPORFAN in reverse order, making sure chamber cover is re-sealed and all hose clamps are fastened.

Off season shut down

- a. Switch off power.
- b. Turn off water supply to make-up valve.
- c. Drain evaporating chamber (step 1, page 9) and remove scale accumulation.
- d. Leave chamber empty, power off and valve closed until the next humidification season.

REPLACEMENT PARTS

VAPORFAN DIAGRAM



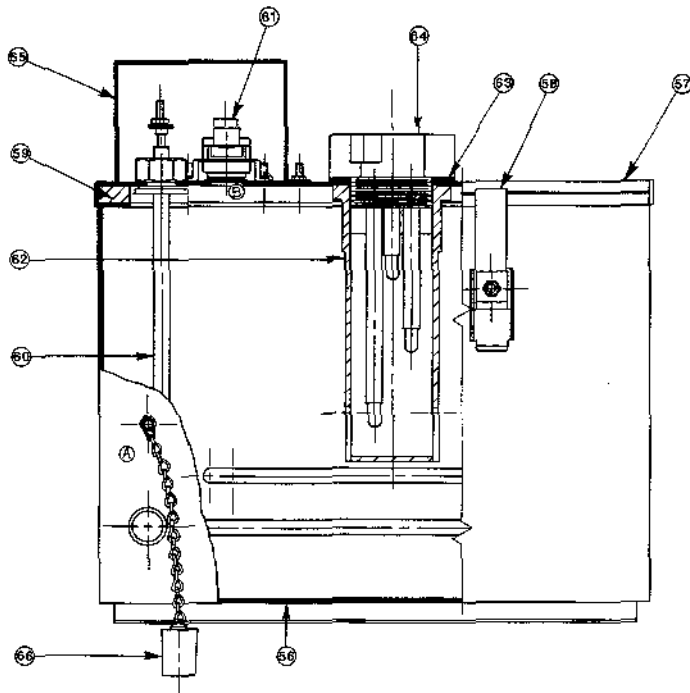
NOTES:
 1) ONLY ON DI UNITS
 2) ONLY ON STANDARD UNITS
 3) SEE SEPARATE ASSEMBLY ON DI OR STANDARD TANK.
 4) SEE SEPARATE ASSEMBLY ON DI OR STANDARD SUB PANEL.

20	1/4" TUBE ORIFICE (VF/VFDI-20,40)	6	203500-007
19	1/4"-20 NUT RETAINER	4	700650
18	1/4"-20 x 3/4"	4	700300-001
17	CAP PLUG SEE NOTE 1	2	409526
16	RED LIGHT W/ CLIP SEE NOTE 2	1	409520-001
15	GREEN LIGHT W/ CLIP	1	409520-002
14	AMBER LIGHT W/ CLIP SEE NOTE 2	1	409520-003
13	POWER SWITCH	1	409500-007
12	1/4"-20 HEX NUT	4	700300-003
11	#4-1/4" x 1-3/4" U-BOLT	2	700550
10	HC-101-801 HUMIDISTAT AND KNOB	1	405880
9	1/4" BRASS CLOSE NIPPLE SEE NOTE 2	1	203560
8	24 V. FILL VALVE SEE NOTE 2	1	505080-001
7	SEDIMENT STRAINER SEE NOTE 2	1	300050
6	1/16" RESTRICTOR SEE NOTE 2	1	203530
5	KEY LOCK	2	700700
4	VAPORIZING TANK SLIDES	2	309980
3	ELECTRICAL PANEL (VF/VFDI-60,85)	1	160100-102
3	ELECTRICAL PANEL (VF/VFDI-20,40)	1	160100-101
2	FRONT PANEL (VF/VFDI-60,85)	1	160030-102
2	FRONT PANEL (VF/VFDI-20,40)	1	160030-101
1	BODY/MAIN FRAME (VF/VFDI-60,85)	1	160000-102
1	BODY/MAIN FRAME (VF/VFDI-20,40)	1	160000-101
NO.	DESCRIPTION	REQ'D	PART NO.

38	WALL BRACKET	1	160150-102	
37	ADJUSTABLE LEG	4	700530	
36	3/8" x 2" LAG BOLT	2	700540-002	
35	DISPERSION TUBE (VF/VFDI-60,85)	1	160050-002	
34	DISPERSION TUBE (VF/VFDI-20,40)	1	160050-001	
33	SOUND FOAM (VF/VFDI-60,85)	1	809845-002	
32	BLOWER 935 CFM (VF/VFDI-60,85)	1	409540-002	
32	BLOWER 280/435CFM (VF/VFDI-20,40)	1	409540-001	
31	PROBE PLUG CAP-24"	SEE NOTE 2	1	406050-002
30	SST BALL VALVE 3/4"	SEE NOTE 1	1	505000-001
29	ELEC DRAIN VALVE 24 V. SEE NOTE 2	1	505400-001	
28	1-1/2" HOSE CLAMP	2	700560-003	
27	1-1/2" x 10" VAPOR HOSE (VF/VFDI-60,85)	1	305390-003	
27	1-1/2" x 8" VAPOR HOSE (VF/VFDI-20,40)	1	305390-002	
26	3/4" x 7-1/4" HOSE (VF/VFDI-60,85)	1	307020-002	
26	3/4" x 5-1/2" HOSE (VF/VFDI-20,40)	1	307020-002	
25	3/4" HOSE CLAMP	4	700560-002	
24	1/2" HOSE CLAMP SEE NOTE 2	2	700560-001	
23	3/4" x 10" HOSE (VF/VFDI-20,40)	1	307020-002	
23	3/4" x 15" HOSE (VF/VFDI-60,85)	1	307020-002	
22	1/2" FILL HOSE-21" SEE NOTE 2	1	307020-001	
21	OVER FLOW HOSE SPRING	1	307025	
20	1/4" TUBE ORIFICE (VF/VFDI-60,85)	16	203500-007	

REPLACEMENT PARTS

VAPORIZER REPLACEMENT PARTS

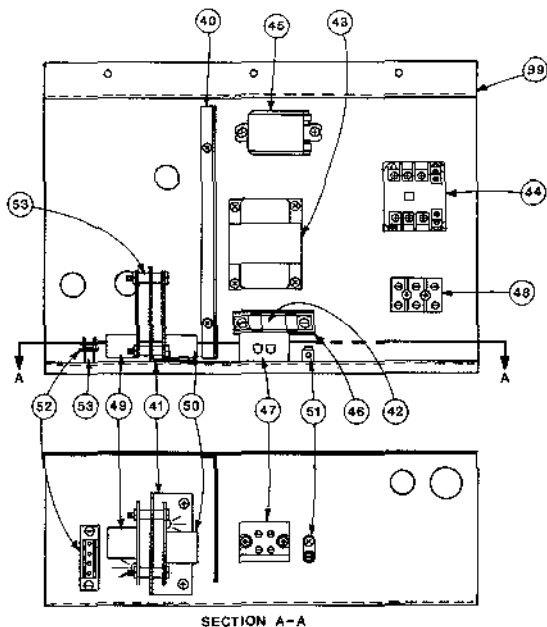


NOTES:
 1) SPECIFY HUMIDIFIER MODEL AND SERIAL NUMBERS WHEN ORDERING
 2) PARTS NOT ITEMIZED ARE TYPICAL HARDWARE STOCK ITEMS

△ VARIES WITH SPECIFIC ORDER
 △ FOR DI OPTION REFER TO SHEET 4
 △ NOT INCLUDED WITH DI OPTION
 △ HOSES, CLAMPS AND GASKETS AVAILABLE IN KIT FORM.

66	RUBBER STOPPER	309960
65	HEATER TERMINAL COVER △	160110
64	PROBE ASSEMBLY △	406220
63	PROBE GASKET △ △	309750-003
62	PROBE HOUSING △	308500
61	THERMO CUT-OUT	406560
60	HEATING ELEMENT △	409600
59	COVER GASKET △	309950
58	DRAW LATCH	700455
57	VAPORIZER COVER △ △	160020/21
56	VAPORIZER TANK △	160010
NO.	DESCRIPTION	PART NO.

SUB-PANEL REPLACEMENT PARTS



NOTES:
 1) SPECIFY HUMIDIFIER MODEL AND SERIAL NUMBERS WHEN ORDERING.
 2) SPECIFY CURRENT RATING.

54	WIRE HARNESS (NOT SHOWN)	1	403960
53	BRADY SPACER	10	409590
52	KWIK DISCONNECT TERM. BOARD	1	409580-002
51	GROUND LUG	1	403250-017
50	LW406 TIMER BOARD	1	408620
49	LW400 LEVEL CONTROL BOARD	1	408600
48	3 POLE POWER BLOCK	1	408300-002
47	2 POLE POWER BLOCK	1	408300-001
46	1 POLE FUSE BLOCK	1	407460-002
45	24 V. RELAY	1	407900-001
44	CONTACTOR	SEE NOTE 2	1 407000
43	TRANSFORMER 120/24	1	409960
42	VF-60,85 7 AMP FUSE	1	408740-007
42	VF-20,40 3 AMP FUSE	1	406740-006
41	P.C. BOARD BRACKET	1	165610
40	ELECTRICAL BARRIER	1	160130
39	VF-60,85 ELECTRICAL PANEL	1	160100-002
39	VF-20,40 ELECTRICAL PANEL	1	160100-001
NO.	DESCRIPTION	REQ'D	PART NO.

MAINTENANCE SERVICE RECORD

DATE INSPECTED	PERSONNEL	OBSERVATION	ACTIONS PERFORMED

THE DRI-STEEM WARRANTY

1. Warranty.

DRI-STEEM Humidifier Company (the "Company") guarantees its products to be free of defects in materials and workmanship under the service for which they are intended. The Company will repair or replace, without charge except for labor charges, products or parts which are found to be defective within one year from the date of shipment or, at the option of the Company, will refund the purchase price.

2. Exclusions of other warranties.

The warranty described in the above paragraph shall be **IN LIEU OF** any other warranty, express or implied, including but not limited to any implied warranty of MERCHANTABILITY or fitness for a particular purpose.

3. Limitation of Remedies.

By purchasing the Company's products, the purchaser agrees with the Company that the purchaser's sole and exclusive remedy shall be for the repair or replacement of defective parts or products, without charge except for labor charges, as described in paragraph 1, above. The purchaser agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available to him.

DRI-STEEM
HUMIDIFIER COMPANY

BOX 128, 11300 WEST 47TH STREET
HOPKINS, MINNESOTA 55343
TELEPHONE: 1-800-328-4447
IN MN, CALL (612) 935-6986
FAX: (612) 935-4831