

Electric Humidifiers

COMPUTER ROOMS

HOSPITALS

LIBRARIES

PRINTING PLANTS

OFFICES

RESIDENCES

FOOD PROCESSING

ETC.



HUMIDIFICATION

By definition, humidification is the addition of water vapor to the air in order to attempt to control the drying out of substances. Most substances are hygroscopic, which means they absorb or hold moisture such as wood, leather, plaster and the human body. Metals for example are non hygroscopic. Moisture flows from a substance with a higher moisture content to one which is lower. Consequently, dry air draws the moisture out of substances.

The dryness of air depends on its moisture content and temperature, thus the definition of relative humidity (R.H.) which is the ratio of the amount of moisture in the air over the amount that the same air can hold at a certain temperature. With proper humidification a balance between the moisture content of the air and substances in the air including the human body is maintained thereby eliminating problems such as:

- Dry nasal passages and skin.
- Cracking and deterioration of furniture and finishes.
- Errors in computers as a result of static electricity in the tapes or punch cards.
- Production interruptions in printing plants as a result of static filled paper.
- Inaccuracies in printing because of the lack of dimensional stability of the paper with varying moisture conditions.
- Fires caused by static electricity arcs.

HOW IT WORKS

The low voltage humidistat closes the control circuit on a demand for humidity, thus energizing the power relay or relays putting power to the immersion element and blower simultaneously. As the water in the tank, which is maintained at constant level by the float valve, is heated the surface vapor pressure reduces and the blower forces the vapor laden air out the discharge into the space or duct system. When the humidistat opens the control circuit the blower and heating element are de-energized. There is a time delay of approximately 1 minute on the "on" cycle and 15 seconds on the "off" cycle. In the event that the blower fails or the humidifier runs dry the high limit cuts out and must be manually reset.

WHY AND WHERE—ALLADIN-AIR

Although Alladin-Air humidifiers can be used in almost any humidification application there are some areas where the quality and price is more justified, such as:

- Computer rooms where accuracy of R.H. is necessary and mineral dust deposits are intolerable.
- Home or apartments which are heated by hot water, steam or electricity.
- Where mineral dust is undesirable.
- Where self contained humidifiers are needed to operate independent of other building systems.

ADVANTAGES OF ALLADIN-AIR HUMIDIFIERS

- Self contained and requires no other fan system.
- Accurate to the limit of the humidistat.
- Long life as a result of stainless steel construction.
- Minimum maintenance and ease of cleaning.
- Reliability of few moving parts.
- Provides water vapor free from mineral salts, which remain in stainless steel tank.
- Capacity is constant since scale is shed from element on cycling, dropping to the tank bottom, leaving the effective water surface unobstructed.

MOISTURE CONTENT OF AIR — TABLE No. 1

Grains per cu.ft. at various relative humidities (W)

Air Temp.	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	75%	100%
80	.55	1.11	1.65	2.22	2.78	3.33	3.88	4.44	5.00	5.54	6.10	6.66	7.21	8.30	11.10
78	.52	1.04	1.56	2.08	2.60	3.12	3.63	4.15	4.67	5.19	5.71	6.24	6.76	7.80	10.40
76	.48	.97	1.45	1.95	2.44	2.93	3.41	3.90	4.39	4.87	5.36	5.85	6.34	7.30	9.75
75	.47	.95	1.42	1.89	2.37	2.84	3.31	3.79	4.25	4.72	5.20	5.68	6.16	7.10	9.46
74	.46	.92	1.38	1.83	2.29	2.75	3.21	3.67	4.13	4.59	5.04	5.50	5.96	6.87	9.17
73	.45	.89	1.33	1.78	2.22	2.67	3.10	3.55	3.99	4.43	4.88	5.33	5.78	6.66	8.89
72	.43	.86	1.29	1.72	2.15	2.59	3.02	3.45	3.87	4.30	4.74	5.18	5.60	6.45	8.62
71	.42	.84	1.26	1.67	2.09	2.51	2.92	3.34	3.75	4.17	4.60	5.02	5.45	6.26	8.36
70	.40	.81	1.21	1.61	2.02	2.42	2.83	3.23	3.63	4.04	4.44	4.85	5.25	6.05	8.07
65	.34	.68	1.02	1.37	1.71	2.06	2.40	2.74	3.08	3.42	3.76	4.11	4.45	5.13	6.85
60	.29	.58	.87	1.16	1.45	1.74	2.03	2.32	2.61	2.90	3.19	3.48	3.77	4.35	5.80
50	.20	.41	.61	.82	1.02	1.23	1.44	1.64	1.85	2.05	2.26	2.46	2.66	3.07	4.10
40	.15	.29	.43	.57	.71	.86	1.00	1.15	1.29	1.43	1.57	1.72	1.86	2.14	2.86
30	.09	.19	.28	.39	.48	.58	.68	.78	.87	.97	1.07	1.16	1.26	1.45	1.94
20	.06	.12	.18	.25	.31	.37	.43	.50	.56	.62	.68	.75	.81	.93	1.24
10	.04	.08	.12	.15	.19	.23	.27	.31	.35	.39	.42	.46	.50	.58	.77
0	.02	.05	.08	.10	.12	.14	.17	.19	.21	.24	.26	.28	.31	.35	.47
-10	.01	.03	.04	.06	.07	.08	.10	.11	.13	.14	.15	.17	.18	.21	.28
-20	.01	.02	.02	.03	.04	.05	.06	.07	.07	.08	.09	.10	.10	.12	.16
-30	.00	.01	.01	.02	.02	.03	.03	.04	.04	.05	.05	.05	.06	.07	.09

NOTE:

$$\text{Humidifier capacity required} = \text{CFM} \times .0086 (W_r - W_e)$$

Where: (a) CFM is the cubic feet per minute of air entering the room, through supply fans or infiltration.

(b) .0086 is a conversion constant to lbs. per hour.

(c) $(W_r - W_e)$ is the grains of moisture to be added which is the difference between the moisture content of the air at desired room conditions and that of the entering air, both taken from Table No. 1.

HUMIDIFIER SIZING

From the notes at the bottom of Table No. 1 it is evident that the determination of the cfm fresh air entering the room is necessary to size a humidifier.

Case I

If a room or building (such as a home) has no powered fresh-air supply or exhaust system the cfm air entering is the infiltration through the windows, doors and cracks and is usually related to air changes depending on the "tightness" of construction, as follows:

- very tight 1/2 air change per hour
- average 1 air change per hour
- loose 1 1/2 air changes per hour
- very loose 2 air changes per hour

Example: A building with loose construction tightness, having 2,000 square feet and a ceiling of 10' requires humidity levels of 35% at 72°F. Outdoor air in winter has 75% R.H. at -10°F.

$$\begin{aligned} \text{Humidifier capacity required} &= \text{cfm} \times .0086 (W_r - W_e) \\ \text{CFM (by air change method)} &= 1.5 \text{ changes} \times 2000 \text{ sq.ft.} \times 10' \text{ ceiling} \\ &= 30,000 \text{ cfm} \\ &= 500 \text{ cfm} \end{aligned}$$

$$= 500 \times .0086 (3.02 - .21) = 12.08 \text{ lb./hr}$$

Select an Alladin-Air Humidifier Model 2E-3M2 with 16.8 #/hr. capacity.

For additional methods of determining fresh air infiltration see the A.S.H.R.A.E. Guide.

CASE II

If the room is being supplied with air through a supply duct system or drawn in as a result of powered exhaust, this cfm may be greater than the natural infiltration and should therefore be used instead in the capacity equation. Also if this powered air is not coming from outdoors, as may be the case of a computer room in the interior of a larger building, the humidifier is only required to boost the R.H. to the desired level.

Example: An interior computer room is being supplied with 1400 cfm of air from the main building system at 60°F and a minimum of 15% R.H. by virtue of the main humidifier sprays. The computer room requires 45% R.H. at 70°F.

$$\begin{aligned} \text{Booster capacity required} &= \text{CFM} \times .0086 (W_r - W_e) \\ &= 1400 \times .0086 (3.63 - .87) \\ &= 33.23 \text{ #/hr.} \end{aligned}$$

Select (2) Alladin-Air Humidifiers, Model 2E-3M2 @ 16.8 #/hr. each.

CASE III

If in Case II the computer room had a separate cooling system with an air capacity of say, 3,000 cfm of which 2,000 was recirculated and the remaining 1000 cfm being drawn from the main system for ventilation, only the 1000 cfm of new air need be considered in sizing the booster humidifier since the recirculated air will be at desired R.H. and adds no load.



COMMERCIAL SERIES—1E & 2E

INPUT WATTS	Model No.		Water Capacity		Amps.	
	115V-1Ph	230V-1Ph	lbs./hr.	kgs./hr.	115V	230V
	800	1E-0X5M1		1.4	.63	5.2
1100	1E-1M1	1E-1M2	2.8	1.27	9.6	4.6
1600	1E-1X5M1	1E-1X5M2	4.2	1.90	13.8	6.9
2100	1E-2M1	1E-2M2	5.6	2.54	18.2	9.1
3100		1E-3M2	8.4	3.81		13.5
4100		1E-4M2	11.2	5.09		17.8
6100		2E-3M2	16.8	7.63		28.5
8100		2E-4M2	22.4	10.18		35.2

Approximate Weight: 22 lbs. dry; 40 lbs. operating.
10 kgs. dry; 18.2 kgs. operating.

INPUT WATTS	Model No.		Water Capacity		Amps.	
	115V-1Ph	230V-1Ph	lbs./hr.	kgs./hr.	115V	230V
	550	R1E-0X5M1	R1E-0X5M2	1.4	.63	4.8
1050	R1E-1M1	R1E-1M2	2.8	1.27	9.2	4.6
1550	R1E-1X5M1	R1E-1X5M2	4.2	1.90	13.6	6.8
2050	R1E-2M1	R1E-2M2	5.6	2.54	17.8	8.9

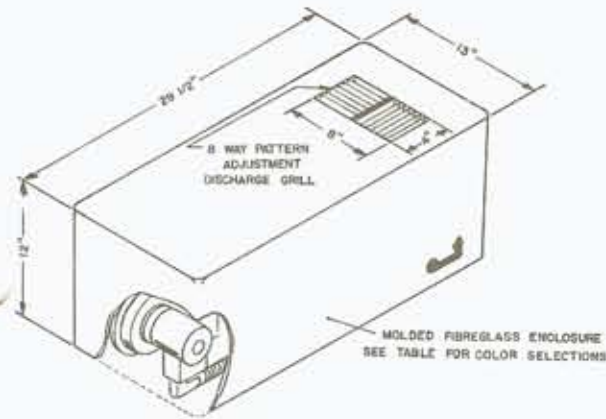
Approximate Weight: 12 lbs. dry; 22 lbs. operating.
5.4 kgs. dry; 10 kgs. operating.

ENCLOSURE COLORS

Standard enclosure color is white. Also available red, yellow, pale blue, salmon and turquoise. For special colors consult Alladin-Air.



RESIDENTIAL SERIES—R1E



ENCLOSURE SUITABLE FOR SERIES 1E & 2E HUMIDIFIERS (WALL MOUNTING ONLY)

SPECIFICATIONS

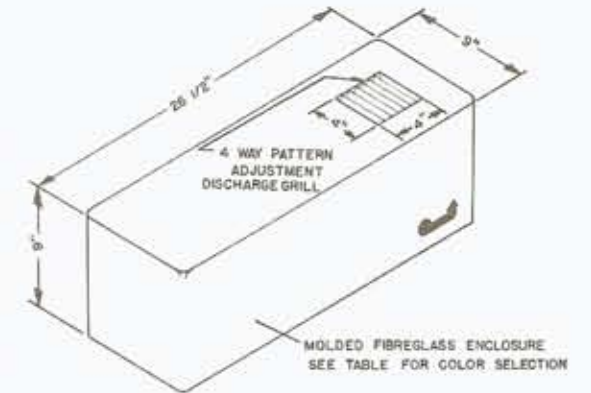
Humidifier shall be Alladin-Air Model _____ as manufactured by Alladin-Air Manufacturing Ltd., of Calgary, Alberta. The humidifier will be self contained and have a capacity of _____ lbs. water vapor per hour when drawing _____ amps of 1 ph power at _____ volts. Unit shall be C.S.A. approved. It shall be of the electric evaporative type and have an integral control system including control relays, fused blower, manual re-set high limit, low voltage transformer and 24 volt terminal strip for humidistat connection.

Tank and cover shall be of stainless steel and all other components coming in contact with the water to be copper or brass. Internal parts of humidifier shall be accessible through removable cover for cleaning without disturbing any part of the hook-up. Humidifier shall have drain, overflow, and fill line connections.

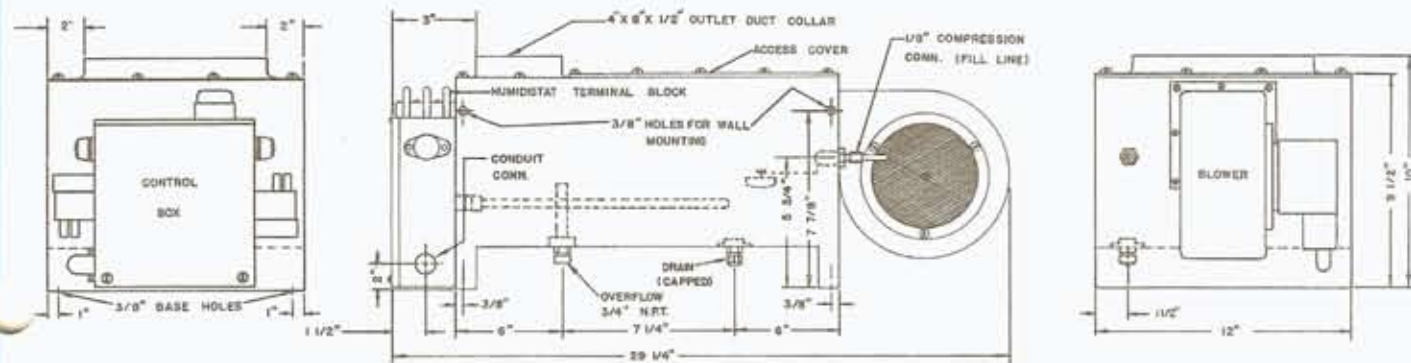
The following optional items shall also be furnished: (Select those required.)

- (a) Alladin-Air spacer type wall brackets.
- (b) Low voltage humidistat.
- (c) Fiberglass enclosure.
- (d) Non Ferrous discharge grille (used with "C").
- (e) Length of 1/4" nylon fill line (8 ft.).
- (f) Saddle valve for quick connection of fill line to 3/4" copper water pipe.
- (g) Pressure Switch (supply water failure).
- (h) Inlet collar for duct mounting.
- (i) Auto flush system.

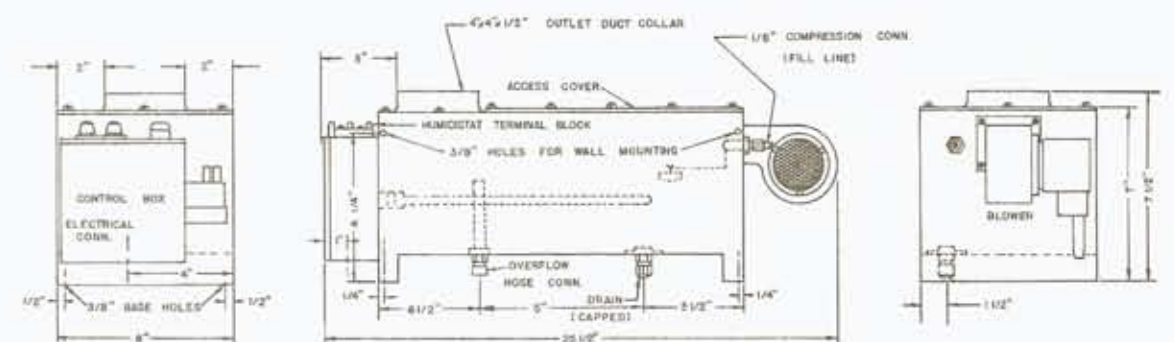
Humidifier shall be installed according to manufacturer's instruction label.



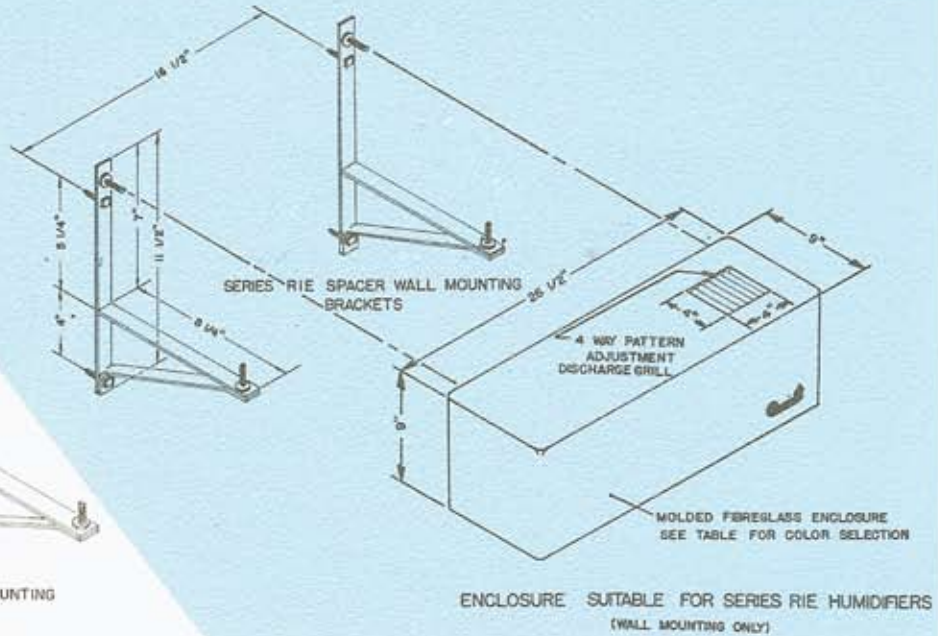
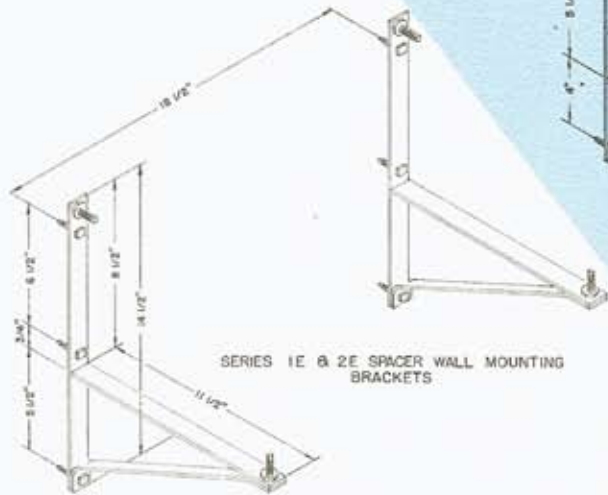
ENCLOSURE SUITABLE FOR R1E HUMIDIFIERS (WALL MOUNTING ONLY)



DIMENSIONS SERIES 1E & 2E

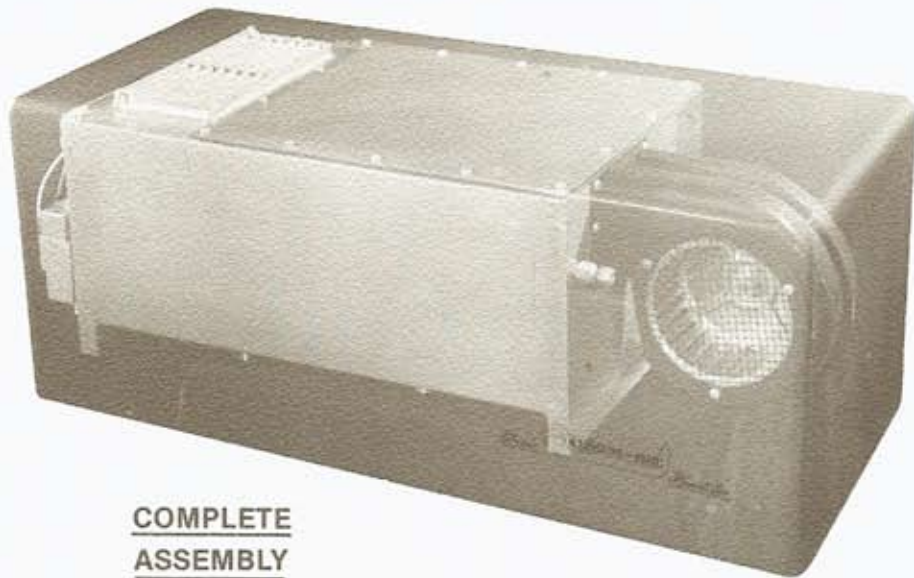


DIMENSIONS SERIES R1E

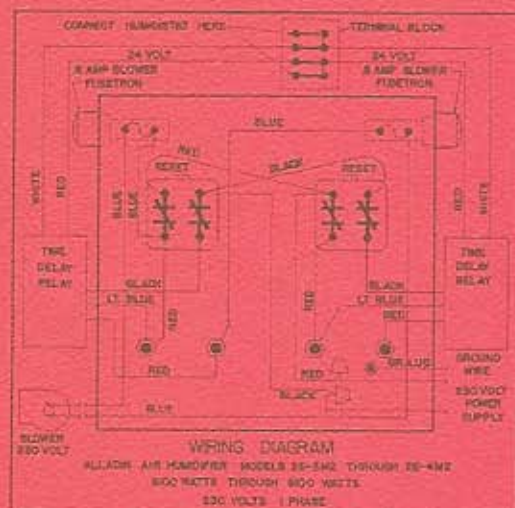
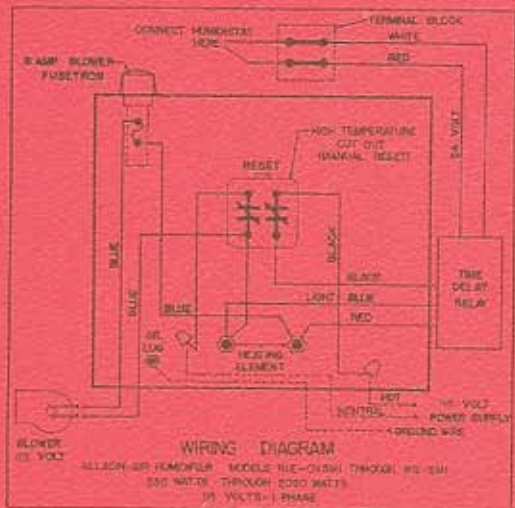


OPTIONS

- Wall Brackets
- Humidistat
- F.G. Enclosure
- Discharge Grille
- 1/4" Tubing (4 ft.)
- Saddle Valve
- Disconnect Sw.
- Spare Parts

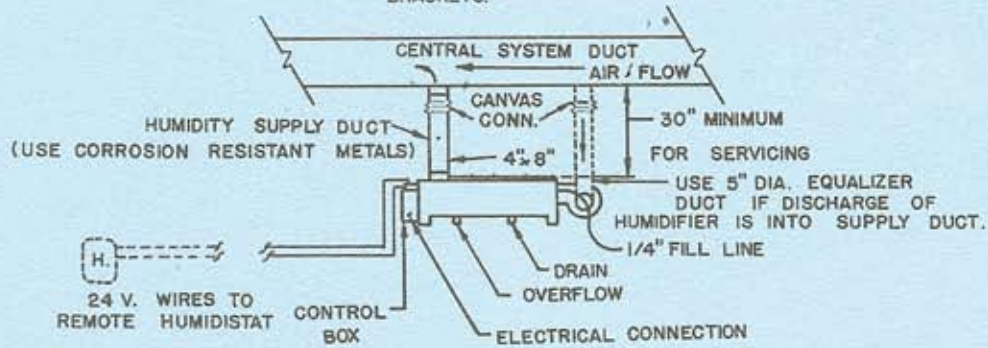


COMPLETE ASSEMBLY



TYPICAL WIRING DIAGRAMS

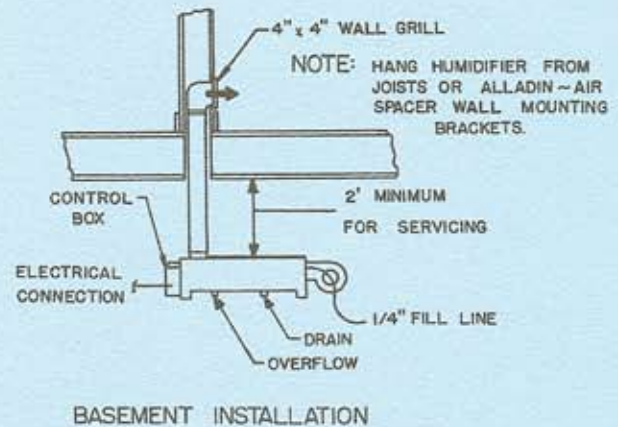
NOTE: HANG HUMIDIFIER FROM JOISTS OR ALLADIN~AIR SPACER WALL MOUNTING BRACKETS.



INSTALLATION WITH CENTRAL SYSTEM

INSTALLATION & OPERATING NOTES

1. BE SURE HUMIDIFIER IS LEVEL.
2. USE PRES. REDUCING VALVE FOR WATER PRESSURES OVER 60 PSI.
3. ADJUST FLOAT TO GIVE 2" DEPTH OF WATER IN TANK.
4. RESET THERMAL CUT OUT SWITCHES.
5. DO NOT CONNECT HUMIDIFIER DISCHARGE DUCT TO PRESSURE DUCT SYSTEMS WITHOUT EQUALIZER DUCT TO HUMIDIFIER FAN INTAKE.
6. RUN OVERFLOW CONN. TO NEAREST DRAIN.
7. USE ONLY ALLADIN AIR SPACER MOUNTING BRACKETS IF MOUNTING ON COMBUSTIBLE WALL.
8. WATERPROOF AND DRAIN ANY DISCHARGE DUCTS BACK TO HUMIDIFIER.
9. CHECK, CLEAN OR REPLACE FLOAT VALVE EVERY AUTUMN.
10. DRAIN AND CLEAN TANK PERIODICALLY.



BASEMENT INSTALLATION

DISTRIBUTOR

Alladin-Air Manufacturing Ltd.
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 Calgary, Alberta T2G 2A5
 Phone: (403) 243-2923
 Fax: (403) 287-9005

Guarantee

THE MANUFACTURER GUARANTEES THIS PRODUCT TO BE FREE FROM DEFECTS IN PARTS AND WORKMANSHIP FOR ONE YEAR, F.O.B. FACTORY.