



PURE
Humidifier
Company

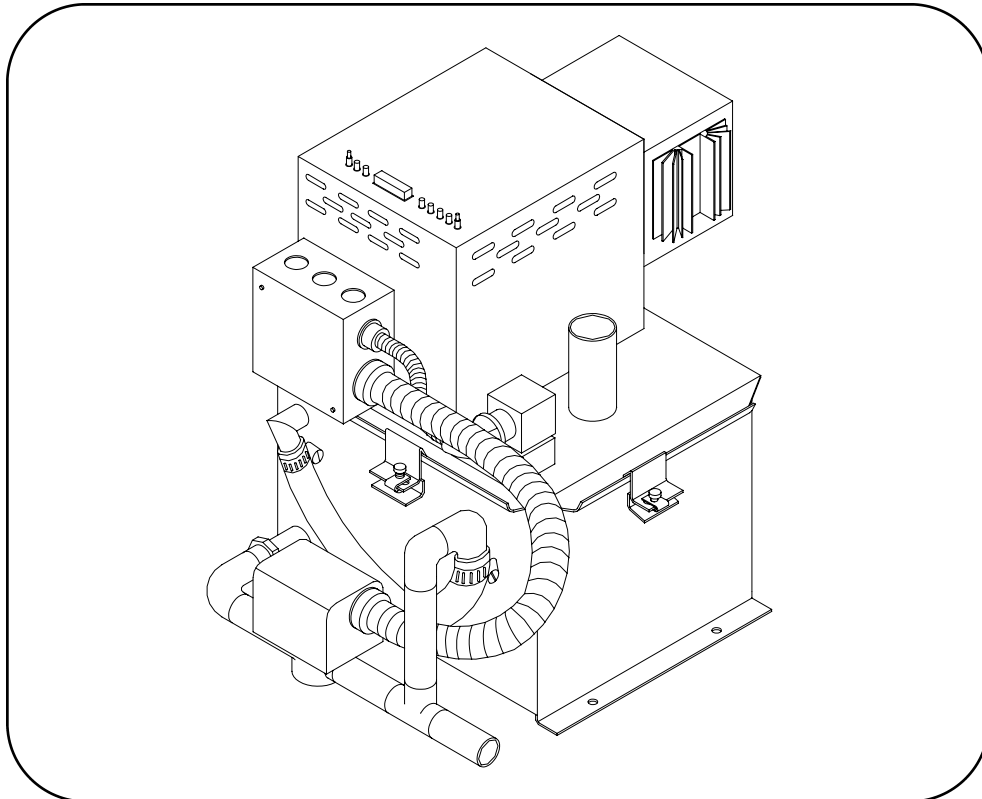
“Read and Save These Instructions”

Standard Water

“ER” Series
(Environmental Room)
Electric Humidifier

Installation Instructions

Operation and Maintenance Manual



Our results are comforting

Form No: EROM-06-05



To the user of PURE Humidifier Company's "ER" Series Electric Humidifiers

We at PURE Humidifier Company thank you for choosing one of our quality products. PURE Humidifier Company electric humidifiers are models of simplicity to install, operate and maintain. However, they must be maintained to provide maximum operating efficiency.

PLEASE READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY. PROPER OPERATION AND HUMIDITY CONTROL IS POSSIBLE ONLY WITH PROPER INSTALLATION AND MAINTENANCE.

The "ER" Series Electric Humidifier utilizes a tri-probe conductive water control system which is designed for use with standard (hard or soft) tap water.

Use of demineralized, deionized or reverse osmosis water will cause a failure of the water level control system and void the warranty

The PURE Humidifier Company Warranty

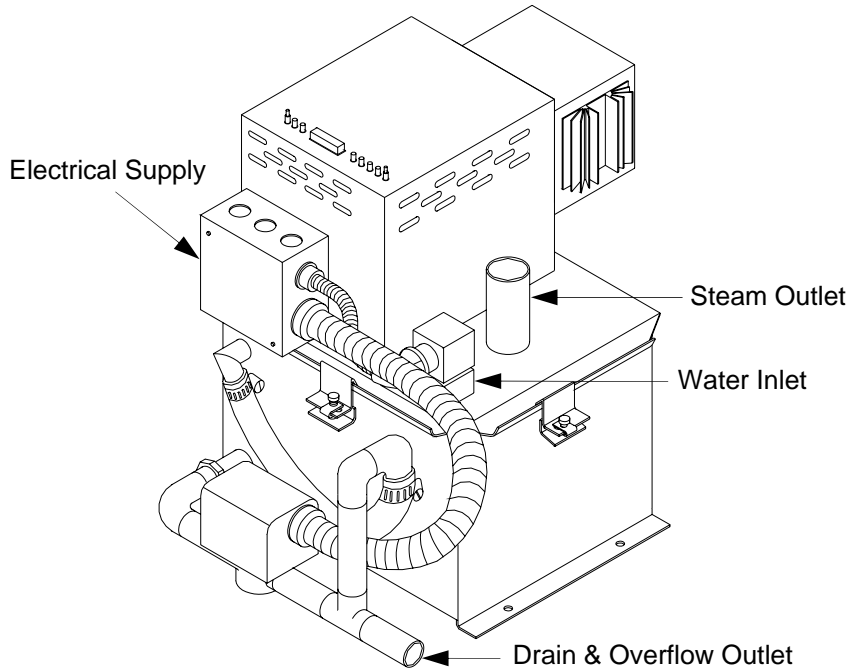
PURE Humidifier Co. guarantees its products to be free from defects in material and workmanship for a period of one year from the date of shipment; provided the product is properly installed, serviced and put into the service for which it was intended.

PURE Humidifier Co. is obligated under the terms of this warranty to the repair or replacement of the defective part(s), excluding any labor charges, or to refund the purchase price at our option. PURE Humidifier Co. assumes no obligation for incidental or consequential damages. The above provisions are in lieu of all other guarantees, obligations, liabilities or warranties, expressed or implied.

Table of Contents

Introduction	1
External Humidifier Features	1
Capacity & Weights	2
Electrical Specifications	2
Dimensions & Layout	3
Humidifier Layout	4
Dispersion Methods	5
Mounting/Location	6
Hose Kit Installation	7
Piping	8
Start-Up Procedure	9
Maintenance & Wiring Instructions	10
Trouble Shooting	11

Field Connections of the PURE Humidifier Company "ER" Series Electric Humidifier (comes pre-wired and self contained)





Capacity & Weights

“ER” Series

Standard Water Unit Model No.	Steam Output Capacity †		Humidifier Weight			
			Empty		Full	
	lbs./hr	kg./hr	lbs.	kg	lbs	kg
ER-1.5	4.5	2.0	36	16.3	55.5	25.2
ER-2.5	7.5	3.4	36	16.3	55.5	25.2
ER-3	9	4.1	36	16.3	55.5	25.2
ER-3.5	10.5	4.8	36	16.3	55.5	25.2
ER-5	15	6.8	36	16.3	55.5	25.2
ER-7	21	9.5	36	16.3	55.5	25.2
Tank Volume						
		2.3 Gallons	10.5 Liters			

Single Phase Amperage

“ER” Series

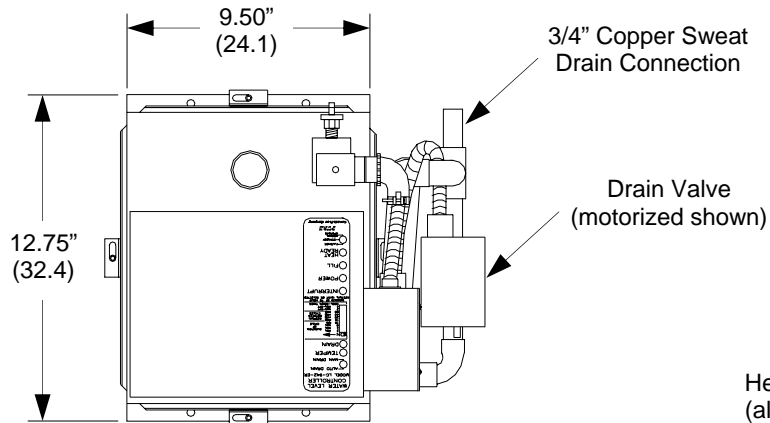
Standard Water Unit Model No.	KW	No. of Heaters	120V	208V	240V	380V	480V	600V
ER-1.5	1.5	Single	12.5	7.2	6.3	4.0	3.2	2.5
ER-2.5	2.5	Single		12	10.4	6.6	5.2	4.2
ER-3	3	Double	25.0	14.4	12.5	7.9	6.3	5.0
ER-3.5	3.5	Single			14.6	9.2	7.3	5.9
ER-5	5	Double		24.0	20.8	13.2	10.4	8.3
ER-7	7	Double			29.2	18.4	14.6	11.7

Three Phase Amperage Distribution

“ER” Series

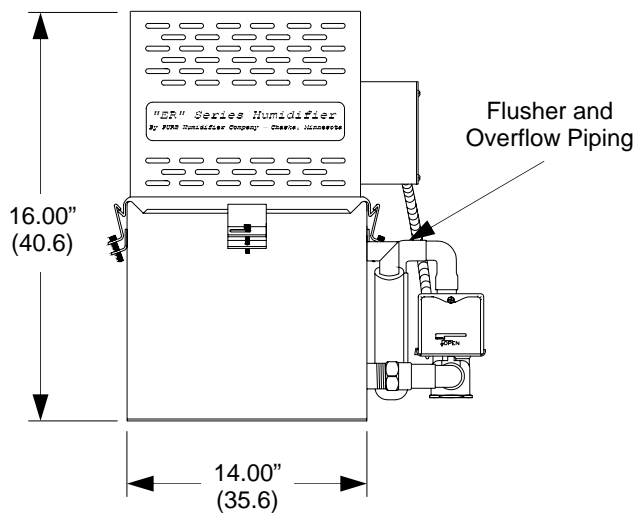
Standard Water Unit Model No.	KW	No. of Heaters	208V	240V	380V	480V	600V
ER-3	3	Double	14.4	12.5	7.9	6.3	5.0
ER-5	5	Double	24.0	20.8	13.2	10.4	8.3
ER-7	7	Double		29.2	18.4	14.6	11.7

† The above capacities are based on 100% efficiency. Actual humidifier capacity may vary due to the heat loss from the humidifier reservoir. The ambient air temperature, air velocity and injection tube system will affect the rate of heat loss from the humidifier reservoir.

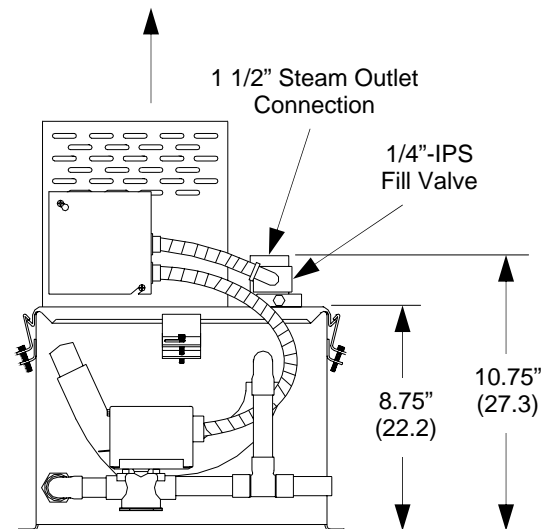


Top View

Heater Assembly Removal
(allow a minimum top clearance
equal to 8.75" (22.2))



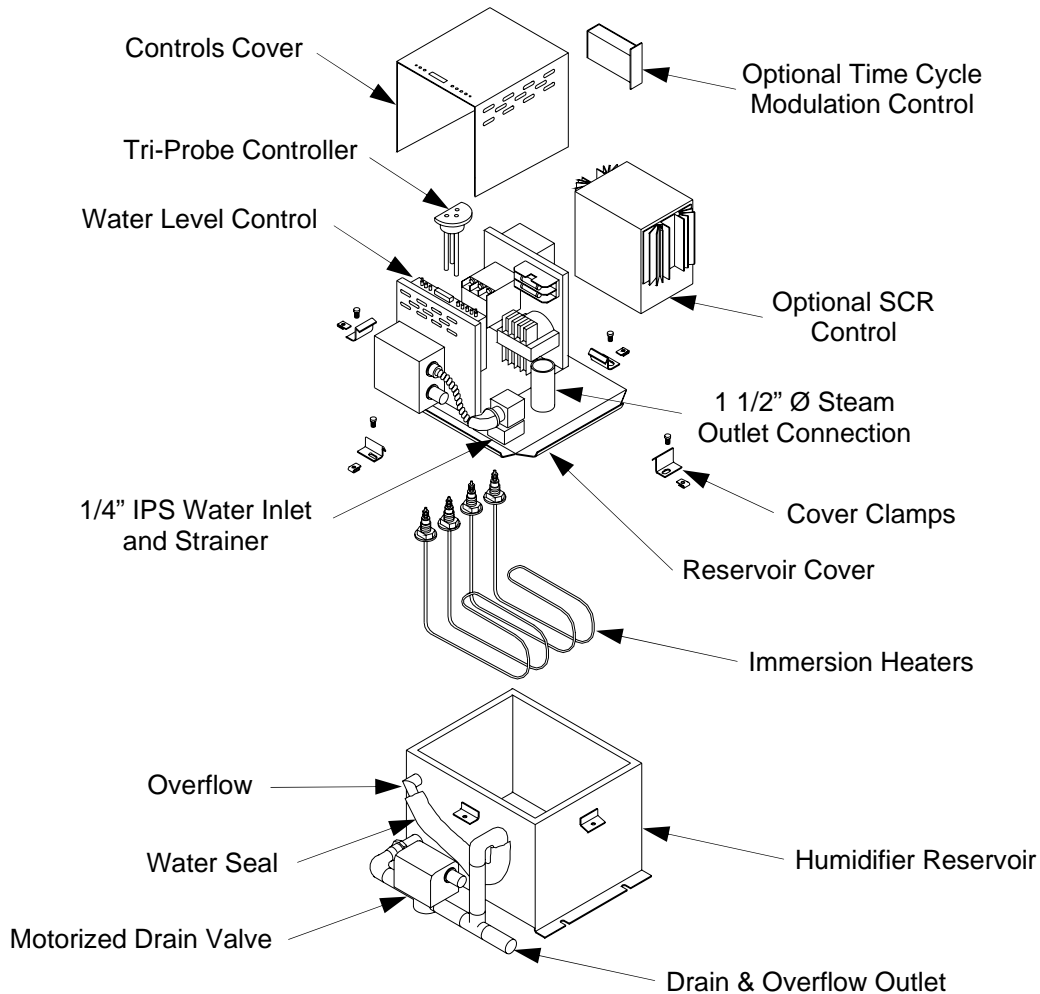
Left Side View



Front View



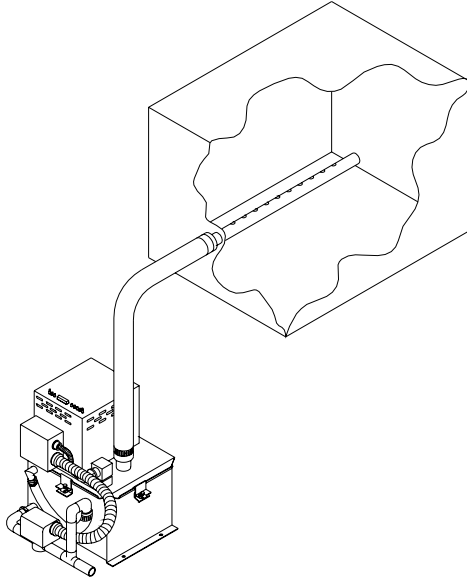
“ER” Humidifier Layout



Humidifier Features

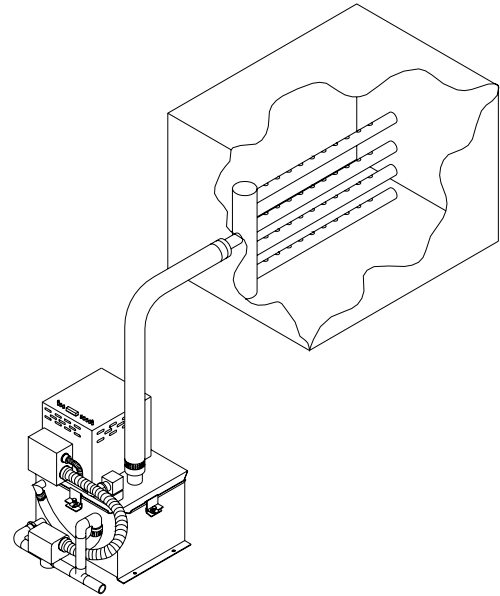
- On/Off, Time Cycle Modulation* or SCR * control
- Visible status and diagnostic LED indicator lights
- Electronic water level control system
- Accumulative automatic timed drain system*
- High efficiency incoloy immersion heating elements (80 watts per inch)
- heating elements (80 watts per sq. inch)
- Simple installation and wiring
- Simple installation and wiring
- Dispersion methods include Flexible Hose Kit, *Insty-Pac*, multiple tube assembly** or blower pack assembly for room distribution. Flexible Steam Hose may be required*
- Manual reset over-temperature safety switch
- 14 Gauge 304 stainless steel evaporating reservoir and cover

* Optional features



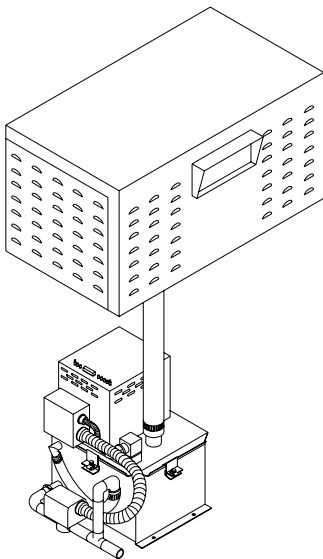
Flexible Hose Kit

Allows remote mounting of the humidifier reservoir from the duct.



**Insty-Pac and Fast-Pac Injection
Tube Assemblies**

For applications where you need a short dissipation distance. Allows remote mounting of the humidifier reservoir from the duct.



Blower Pack for Direct Room Humidification

Allows humidifier to be mounted directly on the wall within the space to be humidified.



Location

The location selected must be able to provide for electrical service, cold or hot water supply and a sanitary drain.

When selecting a location, try to keep the humidifier within 10 feet (305 cm) of the duct to avoid unnecessary heat losses and condensation within the steam supply line.

Visible “fog” will saturate and condensate when it contacts objects such as turning vanes, filters, fans, elbows or take-offs. The warmer the air the more easily it will dissipate the visible steam. The most active and warmest portion of the duct will provide better mixing of the steam and air. The injection tube should be mounted a minimum of 2 feet (61 cm) downstream from an elbow or other turbulent air flow area.

Avoid mounting the injection tube closer than 8-10 feet (244-305 cm) upstream of objects which could become saturated and condense the steam (reference the paragraph above). If the duct layout does not provide a straight unobstructed run of 8-10 feet (244-305 cm), a multiple injection tube system should be considered to reduce the visible steam travel distance.

Location of Controls

It is important to avoid mounting any controls within the visible steam. The controls should be mounted a minimum of 8-10 feet (244-305 cm) downstream from the humidifier injection tube. Due to the temperature rise that exists within the visible steam dissipation area, thermostats should not be mounted near the injection tube. High-limit humidistats should be installed before any duct obstruction to make sure the humidifier is interrupted before saturation can occur on the object. The high-limit should be mounted a minimum of 8-10 feet (244-305 cm) downstream from the injection tube.

Mounting

The humidifier should be mounted dead level in both directions and secured. Use the mounting holes or the slide rails provided at the bottom of the tank for easy installation.

Drain Pan Mounting

A drain pan is an additional safety feature which would be required to be supplied in the field. In a proper humidifier installation a drain pan is not required. However, if the humidifier and injection tube are located in an area which contains valuable equipment or is a water sensitive area, PURE Humidifier Company recommends the addition of a drain pan under the humidifier and under the injection tube. The drain pan should extend past all edges of the humidifier and if installed in the duct, it should extend a minimum of 3 feet (91 cm) downstream from the injection tube. The pan should be of a size which is sufficient to retain sudden drainage of the contents of the humidifier. The pan should be drained to a sanitary drain.

Injection Tube Installation

For single tube units the injection tube needs to be installed in the center of the duct. With multiple tube units, the tubes need to be staggered with the duct (see multiple hose kit installation).

The injection tube should be pitched two inches (5 cm) per foot (31 cm), back to the humidifier. If proper pitch can not be maintained, or the injection tube is mounted lower than the humidifier, a drain “tee” will be required.

Install the tube with steam ports injecting steam up. NOTE: If narrow ducts (6” / 15 cm or less, in height) are utilized, install the tube with the steam ports injecting slightly with the air flow (2 o'clock position).

Galvanized steel duct plates are provided with the tubes to seal the opening where the tube enters the duct.



“ER” Flexible Hose Kit Installation

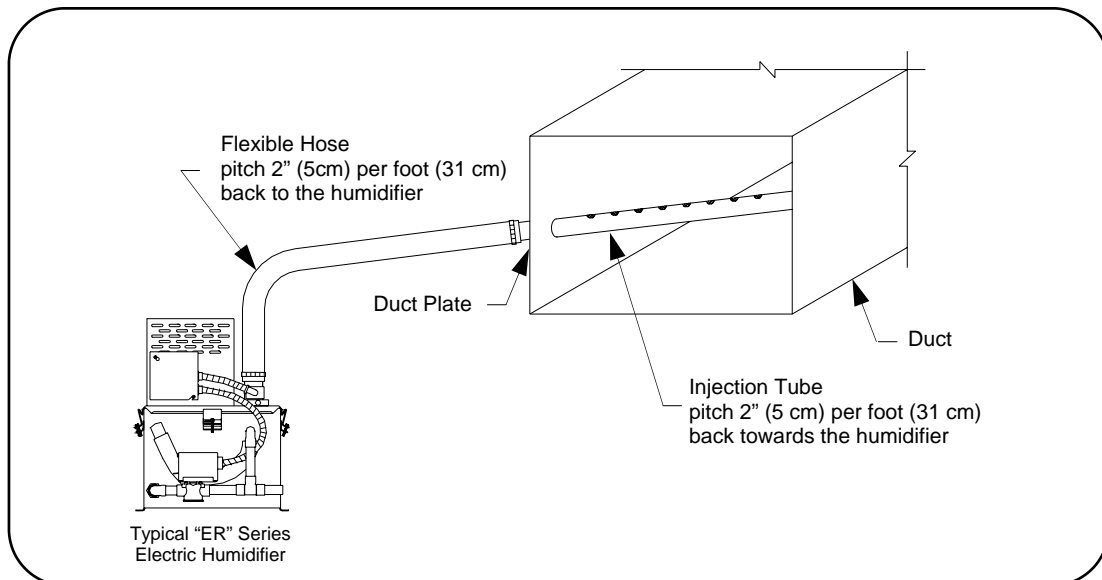
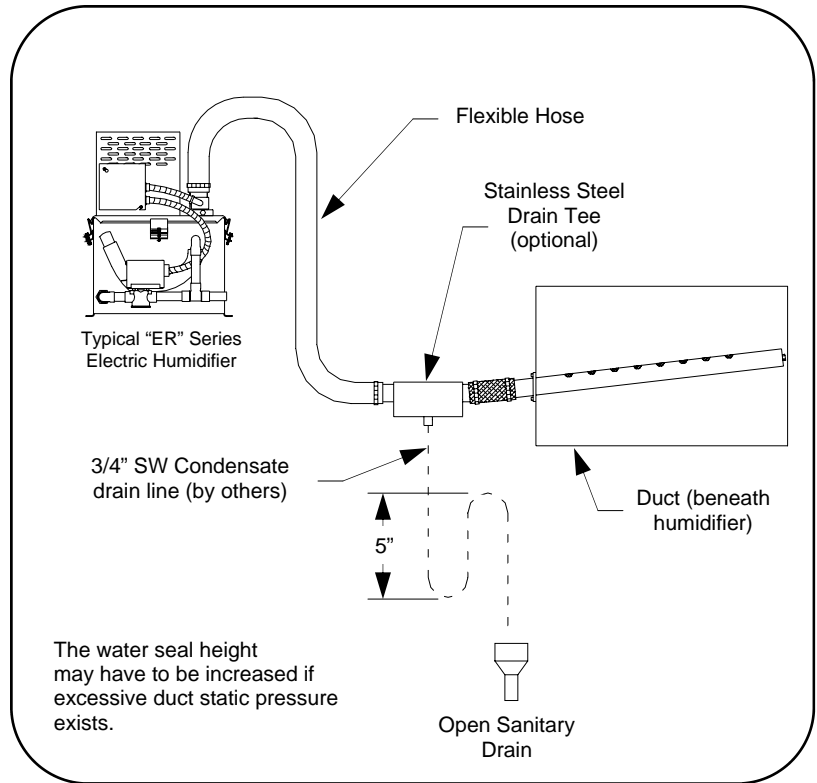
Flexible Hose Kit Installation

The hose and injection tube must be pitched back two inches (5 cm) per foot (31 cm), back towards the humidifier. If proper pitch cannot be maintained, or the injection tube is mounted lower than the humidifier, a drain “tee” will be required (reference drain “tee” illustration).

Install the tube in the center of the duct with the steam ports facing **UP**. **NOTE:** If narrow ducts 6”/15 cm or less, in height) are utilized, install the tube with the steam ports facing slightly down air flow (2 o’clock position).

The hose connects to both the injection tube and humidifier with stainless steel hose clamps.

Galvanized steel duct plates are provided with the tubes to seal the opening where the tube enters the duct.





“ER” Piping

Water Supply Piping

The “ER” humidifier utilizes a tri-probe conductive sensor for controlling the water level which is designed for use with standard (hard or softened) tap water only. (Use of demineralized, deionized or reverse osmosis water will cause failure to the water level control system and void the humidifier warranty.)

Cold or hot standard tap water can be supplied to the humidifier. A minimum water pressure of .5 psi (.03 Bar) needs to be maintained to provide the proper water level within the humidifier. If the water pressure is above 50 psi (3.5 Bar), water hammer could occur and the use of a pressure reducing valve or shock arrester is necessary. The humidifier has a factory built-in 1.5” (4 cm) air gap between the water inlet and the overflow. Local codes should be checked to see if the addition of a vacuum breaking device is required. Water connection is made at the fill valve located on the tank cover using the 1/4” male NPT connection.

Drain Piping

The “ER” style humidifier requires one 3/4” SW drain piping connection run to an open drain.

The drain piping needs to be hard copper, steel or stainless steel. The use of PVC piping is not recommended as the humidifier temperature may cause the PVC to soften and fail.

The “ER” humidifier has a factory piped water seal. The water seal must be filled (primed) prior to operation. Placing the unit in the “Flusher” mode until the unit overfills will prime the water seal.



Introduction

Before starting the “ER” PURE Humidifier Company Electric Humidifier, check the following installation procedures:

1. **MOUNTING** - Verify that the humidifier evaporating chamber (tank) is securely mounted using the four (4) 1/4” inch mounting holes and checking the level in both directions.
2. **INJECTION TUBE** - Verify that the humidifier injection tube is mounted within the duct with the proper pitch back to the humidifier (2” / 5 cm per foot / 31 cm). **NOTE:** If the humidifier evaporating chamber or the flexible hose (optional) is mounted higher than the injection tube, a drain “tee” is required to drain the condensate out of the injection tube and steam line.
3. **ELECTRICAL** - Verify that all wiring connections have been connected in accordance with the wiring diagram. **CAUTION: Live power exists under the control cover, turn off the main power at the disconnect switch before verifying the electrical connections and/or when servicing the humidifier!**
4. **PIPING** - Verify that all piping connections have been completed as recommended and that water pressure is available to the humidifier.

Start Up Procedure

1. With the power “off”, set the switch on the level controller into the “Standby” position (switches are located on top of the humidifier cabinet).
2. Check the automatic drain valve to make sure the manual drain valve lever (located on the back side of the drain valve) is in the automatic position.
3. Turn the controlling humidistat to the lowest setting (no call for humidity).
4. Turn the electric power “on” to the humidifier. The green “Power” LED light on the controller should be illuminated.
5. **Switch the level controller to the “Normal Operate” position. If the optional automatic drain system is used, make sure the drain switch on the controller is in the “Auto Drain” position.**
6. Open the water supply valve (by others) and allow the humidifier to fill to its proper level.
7. After the humidifier is full of water, the red “HEAT READY” LED will illuminate. Turn the humidistat up to call for humidifier demand.
8. Verify the low water safety circuit by opening the humidifier drain valve (auto-drain systems require that the manual drain lever on the drain valve be opened). As the humidifier tank is draining, the “FILL” LED should illuminate. The humidifier should drain to a level where the “HEAT READY” LED turns off; this indicates that the low water safety circuit is operational.
9. Close the drain valve and allow the humidifier to fill to the proper level.
10. Make sure all the optional safety switches are satisfied (air flow proving switch, high-limit humidistat, etc.).
11. The heater(s) should energize with call from the humidistat or BMS.
12. Check operation of optional field installed safety switches (air flow switch, high-limit humidistat, etc.) to make sure they turn off the power to the control circuit. The safety switches should shut-off the humidifier heaters when ever one or more of the optional safety switches create an “open circuit”.
13. Check heater amperage draw by testing and recording voltage and amperage in each phase. Readings should match the factory heater nameplate.
14. Inspect installation for leaks by operating humidifier. Any leaks should be sealed.



PURE Humidifier Company “ER” Maintenance Instructions

The “ER” Series Humidifier is designed to provide the best possible operation with minimum maintenance. However, the humidifier should be inspected and placed on a dedicated maintenance schedule to ensure continued operation of the humidifier and its accessories. **PURE Humidifier Company recommends that the following items be inspected and/or cleaned on a minimum basis of twice yearly.** If excessive mineral build-up occurs, the maintenance schedule should be increased.

Inspect / Maintenance Item

Procedure to Follow

Water Fill Valve

Check to make sure the fill valve is operating properly. If the valve appears to continually fill, check the valve seat and seal (see trouble shooting instructions).

Safety Interlocks
(air flow, high-limit)

Check to make sure the safety interlocks (air flow, high-limit, etc.) will shut down the humidifier.

Immersion Heaters

Verify the correct amperage is being drawn by the heating element. Reference the wiring diagram for the correct amperage.

Humidifier Cover / Tank

Inspect for any leaks. Repair as required. Remove the mineral deposits from floor of the humidifier reservoir. If excessive build-up is found, the cover may need to be removed to facilitate complete cleaning of the humidifier.

Tri-Probe

Remove tri-probe assembly from humidifier (set-screw and o-ring seal) and inspect for excessive mineral build-up. Probe ends should be cleaned and the probe assembly re-installed.

Drain Valve & Drain Piping

The drain valve seat and seal should be inspected and cleaned as required. The drain line and water seal should be inspected and cleaned to ensure free flow of the overflow and drain line.

Flexible Hose

Wiring Notes

1. **Main power disconnect switch and circuit protection is provided by others.**
2. Humidifier wiring diagram is provided under the electrical cover. All field wiring connections are shown on the wiring diagram.
3. All wiring needs to be in accordance with local and national electrical codes.
4. Humidifier is ETL Testing Laboratories tested and approved.
5. **All control circuit wiring needs to run within a separate conduit from the main power wiring.**
6. If optional modulating control is used, modulating humidistat wiring must be run within separate conduit from either the main power (heater) or control circuit wiring.



“ER” Trouble Shooting

<u>Problem</u>	<u>Possible Cause</u>	<u>Recommended Action</u>
Humidifier will not heat	Blown heater fuse	Check and replace.
	Control transformer not producing 24 vac control voltage	Check transformer output. Verify voltage across terminals #5 (hot) and #4 (comm).
	Safety controls open (air flow switch, high-limit, etc.)	Verify that all safety controls are completing the safety circuit.
	Faulty immersion heater	Check and verify heater voltage and amperage. Compare to diagram or nameplate label ratings.
	Faulty humidity sensor	Verify voltage to and from humidity sensor.
Humidifier will not fill	No water pressure	Check water supply.
	Drain valve open	Close drain ball valve. If auto drain system is utilized, verify that the manual drain lever on the front of the drain valve is closed.
	No power to the fill valve	Check for 24 vac across terminals #9 (hot) and #10 (comm).
Humidifier will not stop filling or is short cycling	Fill valve stuck open	Check for 24 vac across terminals #9 and #10. If no voltage, check for dirt under valve seat.
	Drain valve open	Close drain ball valve. If auto drain system is utilized, verify that the manual drain lever on the front of the drain valve is closed.
	Probes need cleaning	Remove tri-probe assembly and clean probe ends.

Maintenance Notes

Maintenance Performed

Date

By
