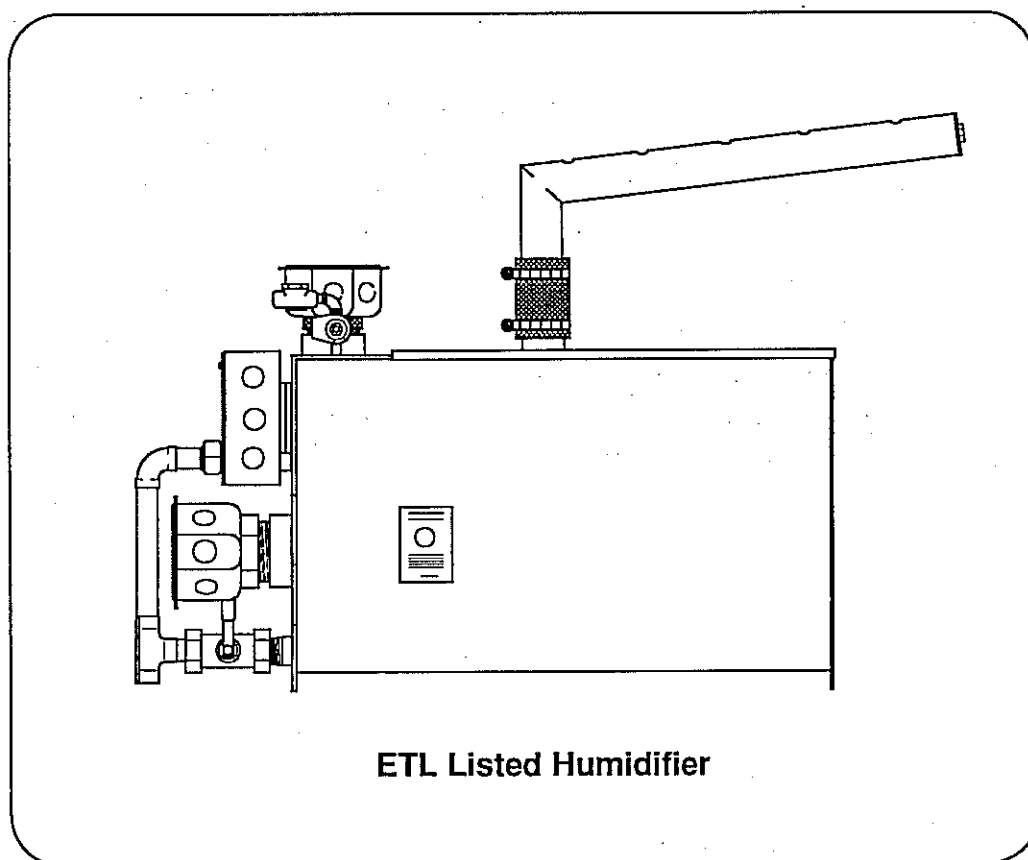


*Standard Water*

# *"PS" Series Electric Humidifier*

**Installation Instructions**

**Operation and Maintenance Manual**



*Our results are comforting*

**To the user of PURE Humidifier Company's 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 "PS" Series Electric Humidifier utilizes a tri-probe conductive type 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.

PURE Humidifier Company's "PSDDR" Series should be installed on applications that require demineralized, deionized or reverse osmosis water.

**The PURE Humidifier Company Warranty**

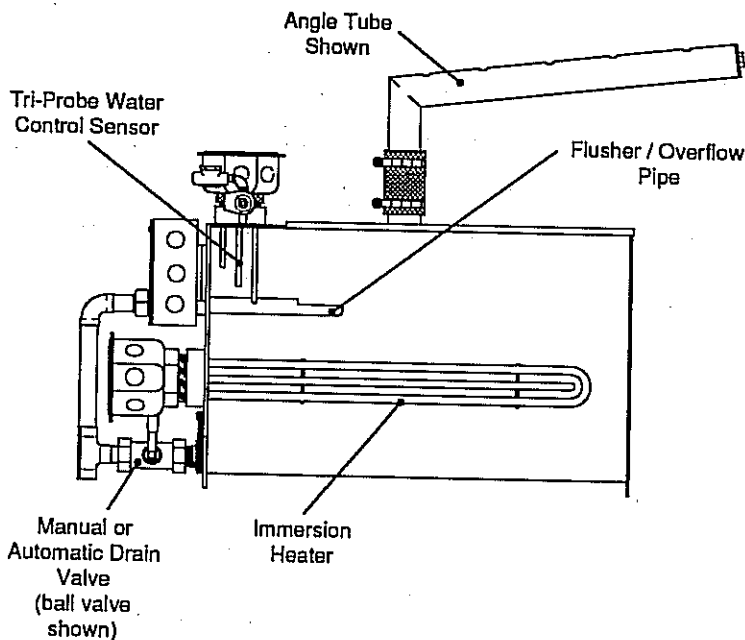
Pure Humidifier Co. guarantees its products to be free from defects in material and workmanship for a period of one year from the date of shipment; provided the product is properly installed, serviced and put into the service for which it was intended.

Pure Humidifier Co. is obligated under the terms of this warranty to the repair or replacement of the defective part(s), excluding any labor changes, 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 warranties, expressed or implied.

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**Internal Features of the PURE Humidifier Company "PS" Series Electric Humidifier**



**Right Side View**  
Side Removed For Clarity



Standard Water Unit Model No.	Steam Output Capacity †			No. of Heaters	Humidifier Reservoir Weight *				Control Cabinet Weight Δ	
	lbs/hr	kg/hr	KW		Empty		Full		lbs.	kg
					lbs.	kg.	lbs.	kg		
PS-2.5 (S)	7.5	3.4	2.5	Single	42.2	19.1	46.5	21.1	32.0	14.5
PS-3.5 (S)	10.5	4.8	3.5	Single	42.2	19.1	46.5	21.1	32.0	14.5
PS-4.5 (S)	13.5	6.1	4.5	Single	42.2	19.1	46.5	21.1	32.0	14.5
PS-5.5 (S)	16.5	7.5	5.5	Single	49.3	22.4	56.5	25.6	32.0	14.5
PS-6.5 (S)	19.5	8.8	6.5	Single	49.3	22.4	56.5	25.6	32.0	14.5
PS-7.5 (S)	22.5	10.2	7.5	Single	49.3	22.4	56.5	25.6	32.0	14.5
PS-8.5 (S)	25.5	11.6	8.5	Single	49.3	22.4	56.5	25.6	32.0	14.5
PS-9.5 (S)	28.5	12.9	9.5	Single	49.3	22.4	56.5	25.6	32.0	14.5
PS-10.5 (S)	31.5	14.3	10.5	Single	57.6	26.1	68.0	30.8	32.0	14.5
PS-12.5 (S)	37.5	17.0	12.5	Single	57.6	26.1	68.0	30.8	32.0	14.5
PS-14.5 (S)	43.5	19.7	14.5	Single	57.6	26.1	68.0	30.8	32.0	14.5
PS-16.5 (S)	49.5	22.5	16.5	Single	66.9	30.3	80.7	36.6	32.0	14.5
PS-18.5 (S)	55.5	25.2	18.5	Single	66.9	30.3	80.7	36.6	32.0	14.5
PS-20 (S)	60.0	27.2	20	Single	66.9	30.3	80.7	36.6	32.0	14.5
PS-2.5 (D)	15.0	6.8	5	Double	47.2	21.4	52.5	23.8	55.0	25.0
PS-3.5 (D)	21.0	9.5	7	Double	47.2	21.4	52.5	23.8	55.0	25.0
PS-4.5 (D)	27.0	12.2	9	Double	47.2	21.4	52.5	23.8	55.0	25.0
PS-5.5 (D)	33.0	15.0	11	Double	59.3	26.9	68.2	30.9	55.0	25.0
PS-6.5 (D)	39.0	17.7	13	Double	59.3	26.9	68.2	30.9	55.0	25.0
PS-7.5 (D)	45.0	20.4	15	Double	59.3	26.9	68.2	30.9	55.0	25.0
PS-8.5 (D)	51.0	23.1	17	Double	59.3	26.9	68.2	30.9	55.0	25.0
PS-9.5 (D)	57.0	25.9	19	Double	59.3	26.9	68.2	30.9	55.0	25.0
PS-10.5 (D)	63.0	28.6	21	Double	73.0	33.1	86.0	39.0	55.0	25.0
PS-12.5 (D)	75.0	34.0	25	Double	73.0	33.1	86.0	39.0	55.0	25.0
PS-14.5 (D)	87.0	39.5	29	Double	73.0	33.1	86.0	39.0	55.0	25.0
PS-16.5 (D)	99.0	44.9	33	Double	87.5	39.7	104.8	47.5	55.0	25.0
PS-18.5 (D)	111.0	50.3	37	Double	87.5	39.7	104.8	47.5	55.0	25.0
PS-20 (D)	120.0	54.4	40	Double	87.5	39.7	104.8	47.5	55.0	25.0
PS-2.5 (T)	22.5	10.2	7.5	Triple	54.5	24.7	61.5	27.9	72.0	32.7
PS-3.5 (T)	31.5	14.3	10.5	Triple	54.5	24.7	61.5	27.9	72.0	32.7
PS-4.5 (T)	40.5	18.4	13.5	Triple	54.5	24.7	61.5	27.9	72.0	32.7
PS-5.5 (T)	49.5	22.5	16.5	Triple	68.2	30.9	79.8	36.2	72.0	32.7
PS-6.5 (T)	58.5	26.5	19.5	Triple	68.2	30.9	79.8	36.2	72.0	32.7
PS-7.5 (T)	67.5	30.6	22.5	Triple	68.2	30.9	79.8	36.2	72.0	32.7
PS-8.5 (T)	76.5	34.7	25.5	Triple	68.2	30.9	79.8	36.2	72.0	32.7
PS-9.5 (T)	85.5	38.8	28.5	Triple	68.2	30.9	79.8	36.2	72.0	32.7
PS-10.5 (T)	94.5	42.9	31.5	Triple	83.8	38.0	100.6	45.7	72.0	32.7
PS-12.5 (T)	112.5	51.0	37.5	Triple	83.8	38.0	100.6	45.7	72.0	32.7
PS-14.5 (T)	130.5	59.2	43.5	Triple	83.8	38.0	100.6	45.7	72.0	32.7
PS-16.5 (T)	148.5	67.4	49.5	Triple	100.2	45.5	122.7	55.7	72.0	32.7
PS-18.5 (T)	166.5	75.5	55.5	Triple	100.2	45.5	122.7	55.7	72.0	32.7
PS-20 (T)	180.0	81.6	60	Triple	100.2	45.5	122.7	55.7	72.0	32.7
PS-14.5 (Q)	174.0	78.9	58	Quad.	96.3	43.7	117.8	53.4	72.0	32.7
PS-16.5 (Q)	198.0	89.8	66	Quad.	115.0	52.2	143.6	65.2	72.0	32.7
PS-18.5 (Q)	222.0	100.7	74	Quad.	115.0	52.2	143.6	65.2	72.0	32.7
PS-20 (Q)	240.0	108.9	80	Quad.	115.0	52.2	143.6	65.2	72.0	32.7

\* When calculating the total dry weight of the humidifier, the control cabinet weight must be added to the reservoir weight.

Δ The control cabinet is shipped loose unless optional factory mounting is specified. Reference the "Dimension Sheet" for control cabinet dimensions.

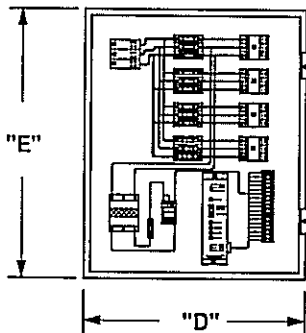
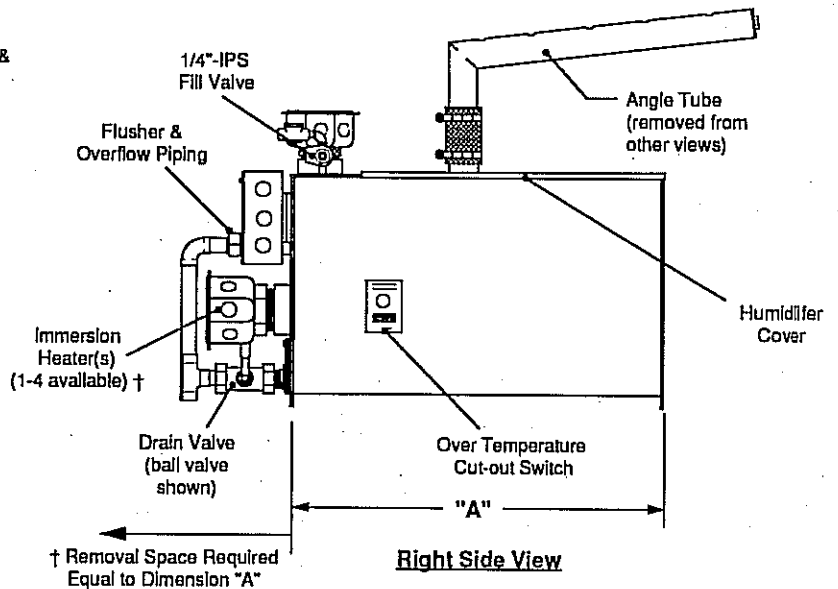
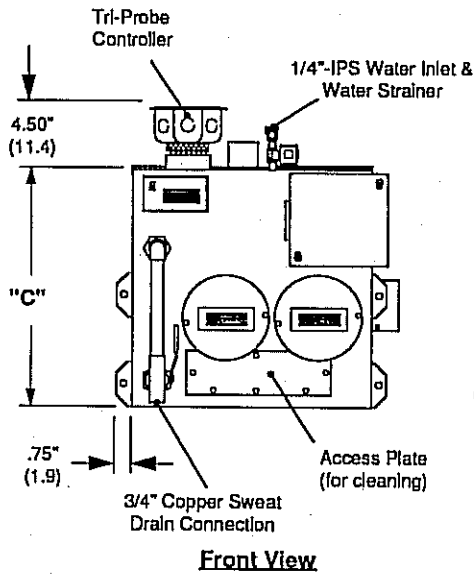
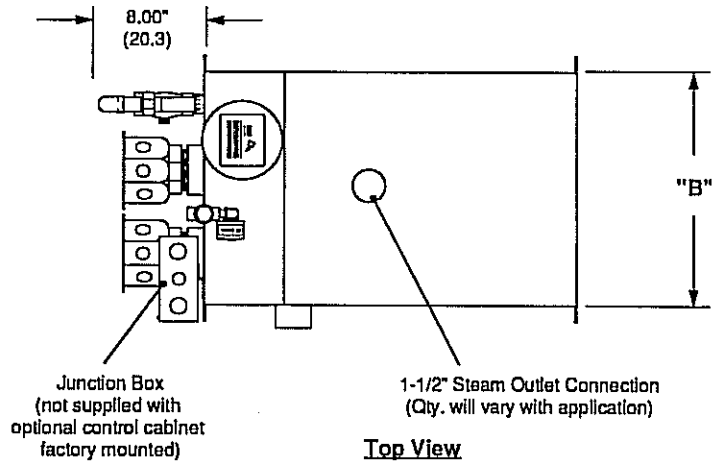
† The above capacities are based on 100% efficiency. Actual humidifier capacity may vary due to the heat loss from the humidifier reservoir. The ambient air temperature, air velocity and injection tube system will affect the rate of heat loss from the humidifier reservoir.



**Unit Dimensions in Inches (cm)**

Model No. Prefix	Dim. "A"
PS-2.5 thru 4.5	10.50" (26.7)
PS-5.5 thru 9.5	17.50" (44.5)
PS-10.5 thru 14.5	25.50" (64.8)
PS-16.5 thru 20	34.00" (86.4)

Qty of Heaters Model No. Suffix	Dim. "B"	Dim. "C"
1 = Single (S)	11.25" (28.6)	13.75" (34.9)
2 = Double (D)	14.00" (35.6)	13.75" (34.9)
3 = Triple (T)	18.25" (46.4)	13.75" (34.9)
4 = Quad. (Q)	23.25" (59.1)	13.75" (34.9)



**NEMA-12 Humidifier Control Cabinet**  
(reference control cabinet notes)

**Control Cabinet Notes**

- 1.) Door has been removed from the drawing for clarity.
- 2.) Control cabinet is shipped loose for field mounting unless optional factory mounting is specified.
- 3.) Dimension "F" = Control cabinet depth.

**Control Cabinet Dimensions in Inches (cm)**

Qty of Heaters Model No. Suffix	Dim. "D"	Dim. "E"	Dim. "F"
1 = Single (S)	14.00" (35.6)	16.00" (40.6)	6.00" (15.2)
2 = Double (D)	20.00" (50.8)	20.00" (50.8)	7.00" (17.8)
3 = Triple (T)	20.00" (50.8)	24.00" (61.0)	7.00" (17.8)
4 = Quad. (Q)	20.00" (50.8)	24.00" (61.0)	7.00" (17.8)



Standard Water Unit Model No.	KW	Single Phase Amperage †				Three Phase Amperage †			No. of Heaters	Control Circuit Voltage	Control Cabinet Size *	
		120V	208V	240V	480V	208V	240V	480V			Inches	Centimeters
PS-2.5 (S)	2.5	20.8	12.0	10.4	5.2	6.9	6.0	3.0	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-3.5 (S)	3.5	29.2	16.8	14.6	7.3	9.7	8.4	4.2	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-4.5 (S)	4.5	37.5	21.6	18.8	9.4	12.5	10.8	5.4	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-5.5 (S)	5.5	45.8	26.4	22.9	11.5	15.3	13.2	6.6	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-6.5 (S)	6.5		31.3	27.1	13.5	18.0	15.6	7.8	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-7.5 (S)	7.5		36.1	31.3	15.6	20.8	18.0	9.0	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-8.5 (S)	8.5		40.9	35.4	17.7	23.6	20.4	10.2	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-9.5 (S)	9.5		45.7	39.6	19.8	26.4	22.9	11.4	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-10.5 (S)	10.5			43.8	21.9	29.1	25.3	12.6	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-12.5 (S)	12.5				26.0	34.7	30.1	15.0	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-14.5 (S)	14.5				30.2	40.2	34.9	17.4	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-16.5 (S)	16.5				34.4	45.8	39.7	19.8	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-18.5 (S)	18.5				38.5		44.5	22.3	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-20 (S)	20				41.7		48.0	24.1	Single	24 vac	14" x 16" x 6"	35.6 x 40.6 x 15.2
PS-2.5 (D)	5	41.7	24.0	20.8	10.4	13.9	12.0	6.0	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-3.5 (D)	7	58.3	33.7	29.2	14.6	19.4	16.8	8.4	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-4.5 (D)	9	75.0	43.3	37.5	18.8	25.0	21.7	10.8	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-5.5 (D)	11	91.7	52.9	45.8	22.9	30.5	26.5	13.2	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-6.5 (D)	13		62.5	54.2	27.1	36.1	31.3	15.6	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-7.5 (D)	15		72.1	62.5	31.3	41.6	36.1	18.0	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-8.5 (D)	17		81.7	70.8	35.4	47.2	40.9	20.4	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-9.5 (D)	19		91.3	79.2	39.6	52.7	45.7	22.9	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-10.5 (D)	21			87.5	43.8	58.3	50.5	25.3	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-12.5 (D)	25				52.1	69.4	60.1	30.1	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-14.5 (D)	29				60.4	80.5	69.8	34.9	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-16.5 (D)	33				68.8	91.6	79.4	39.7	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-18.5 (D)	37				77.1		89.0	44.5	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-20 (D)	40				83.3		96.0	48.1	Double	24 vac	20" x 20" x 7"	50.8 x 50.8 x 17.8
PS-2.5 (T)	7.5	62.5	36.1	31.3	15.6	20.8	18.0	9.0	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-3.5 (T)	10.5	87.5	50.5	43.8	21.9	29.1	25.3	12.6	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-4.5 (T)	13.5	112.5	64.9	56.3	28.1	37.5	32.5	16.2	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-5.5 (T)	16.5	137.5	79.3	68.8	34.4	45.8	39.7	19.8	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-6.5 (T)	19.5		93.8	81.3	40.6	54.1	46.9	23.5	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-7.5 (T)	22.5		108.2	93.8	46.9	62.5	54.1	27.1	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-8.5 (T)	25.5		122.6	106.3	53.1	70.8	61.3	30.7	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-9.5 (T)	28.5		137.0	118.8	59.4	79.1	68.6	34.3	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-10.5 (T)	31.5			131.3	65.6	87.4	75.8	37.9	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-12.5 (T)	37.5				78.1	104.1	90.2	45.1	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-14.5 (T)	43.5				90.6	120.7	104.6	52.3	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-16.5 (T)	49.5				103.1	137.4	119.1	59.5	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-18.5 (T)	55.5				115.6		133.5	66.8	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-20 (T)	60				125.0		144.0	72.2	Triple	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-14.5 (Q)	58				120.8	161.0	139.5	69.8	Quad.	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-16.5 (Q)	66				137.5	183.2	158.8	79.4	Quad.	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-18.5 (Q)	74				154.2		178.0	89.0	Quad.	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8
PS-20 (Q)	80				166.7		192.0	96.2	Quad.	24 vac	24" x 20" x 7"	61.0 x 50.8 x 17.8

† Other voltages available upon request, please consult factory for specific availability.  
 \* The control cabinet is shipped loose unless optional factory mounting is specified.  
 Reference the "Capacity & Weight Sheet" for control cabinet weight.



## Location

The location selected must provide for electrical service, cold or hot deionized, demineralized or reverse osmosis water supply and 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 condense 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.

Reference the following two pages of "typical humidification systems" for further injection tube mounting locations.

## 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. PURE Humidifier Company recommends that the humidifier be mounted in one of the following three methods: (ref. pages 8 & 9).

1. Mounted beneath the duct with support angles. The humidifier can be mounted under a duct with "U" channel and all-thread rod from the ceiling. To simplify humidifier cover removal for maintenance, it is important to leave approximately 8-10 inches (20-25 cm) between the duct and top of the humidifier.
2. Mounted from the wall. PURE Humidifier Company offers wall mounting brackets as an option. The wall bracket installation sheet should be followed when installing the brackets.
3. Mounted off the floor with floor legs. PURE Humidifier Company offers floor support legs as an option. The humidifier is mounted 24" (61 cm) up from the floor. Simple floor legs can be constructed from 1-1/4" x 1-1/4" x 1/4" angle iron. The support legs should be secured to the humidifier side mounting holes.

## Drain Pan Mounting

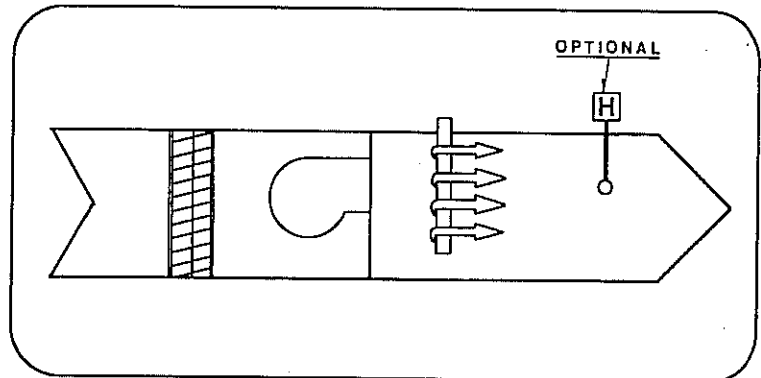
A drain pan is an additional safety feature which would be required to be supplied in the field.

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.

### System 1

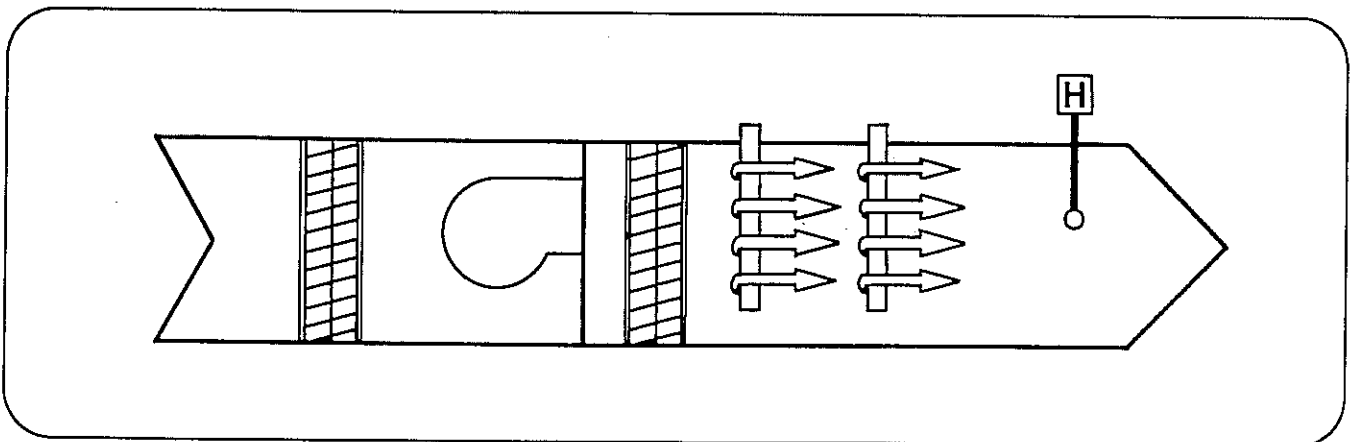
In this simple heating/-ventilating system the desired location of the humidifier is downstream from the fan. The use of a high limit duct humidistat is recommended if operating conditions are such that saturation could be reached in the duct. The high limit humidistat should be 12 to 14 feet (365-427 cm) downstream from the humidifier injection tube. A space humidistat controls the humidifier.



### System 2

This is a 100% outside air system with preheat and reheat coils. The desired location of the primary humidifier is down-stream from the reheat coil where air temperature is highest. Where operating conditions vary considerably from design, two humidifiers may be used; controlled in sequence from a single space or exhaust air duct humidistat. The first humidifier will deliver one-third of the total capacity. The second humidifier is sized for two-thirds of the total capacity. When control is sequenced in this manner, much closer control is achieved.

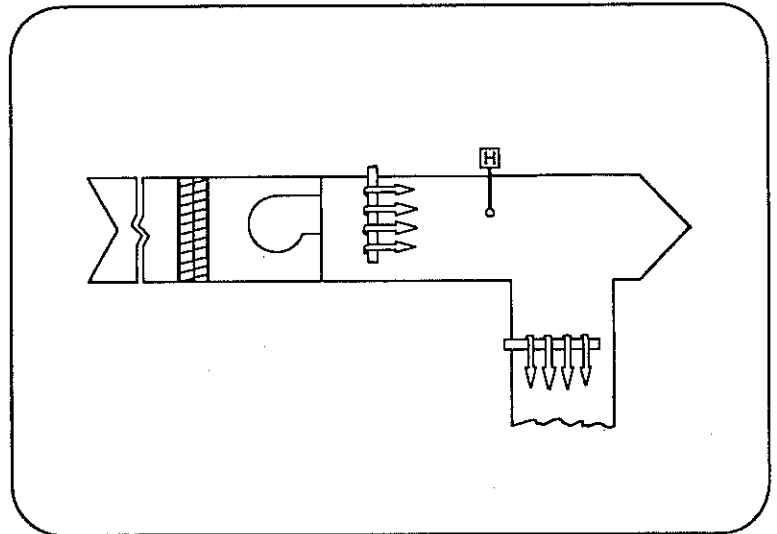
When outdoor air conditions are milder, the first humidifier will satisfy the space conditions by supplying a portion of the total design capacity. As the outside air becomes colder and humidity demand increases, the second unit begins to open in response to the additional demand. When the humidifiers are so sequenced, much closer control is achieved over a wide range of outside air conditions and super saturation of the duct at minimum humidification load is avoided. Use of a high-limit controller is desirable.





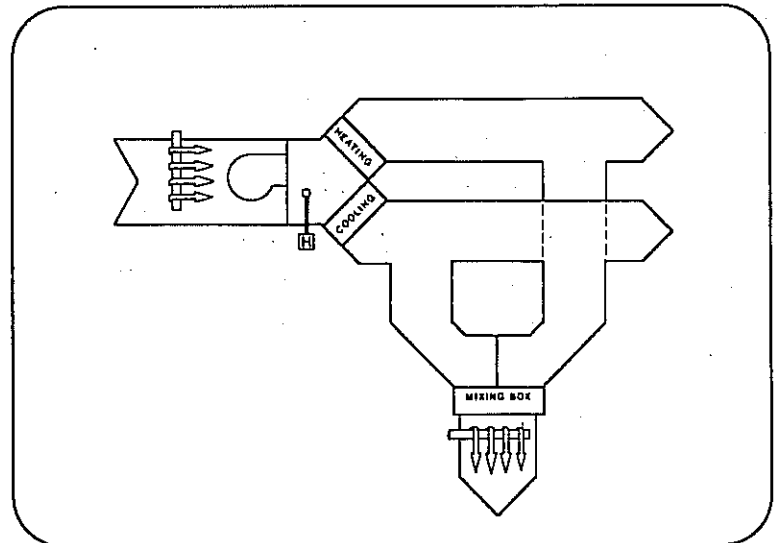
### System 3

Shown here is a 100% outside air system using a primary and secondary humidifier. In this system, the primary humidifier is controlled by a duct humidistat 12 to 14 feet (366-427 cm) downstream from the humidifier and at a level that maintains a space condition of about 35% R.H. at 70 deg. F. The secondary humidifier is controlled by a space humidistat. The secondary unit can be sized to boost space R.H. from 35% R.H. to a higher level such as 55% R.H. Combining humidifiers in this manner allows humidity for each zone to be controlled at a level higher than would otherwise be possible.



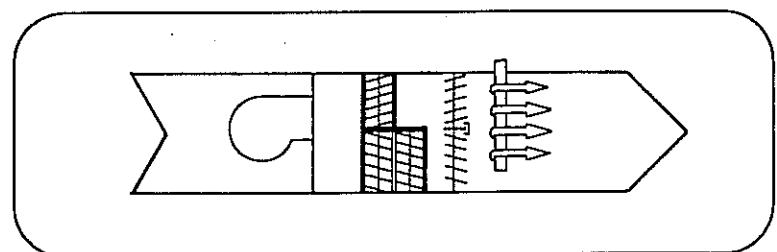
### System 4

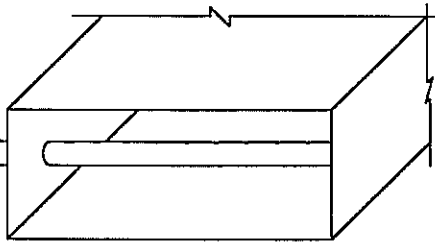
Here is a high velocity dual duct system. In this system, best results are achieved with primary and booster humidification. The primary humidifier is located as far upstream as possible from the fan and is controlled by a duct humidistat located ahead of the hot and cold deck coils. The booster humidifier is located downstream from the mixing box and is controlled by a humidistat in the space. The primary humidifier should be located no closer than 3 feet (91 cm) from the fan and the booster humidifier no closer than 3 feet (91 cm) from the grill. In both cases, the use of multiple injection tube units should be considered.



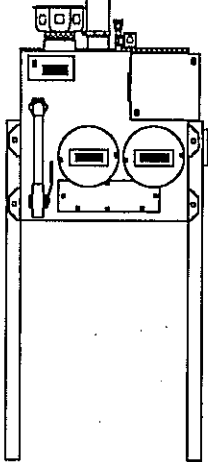
### System 5

System 5 is a simple face and by-pass unit. The humidifier is located downstream from the damper section so moisture enters the air stream in the area where best mixing and air temperature conditions exist.





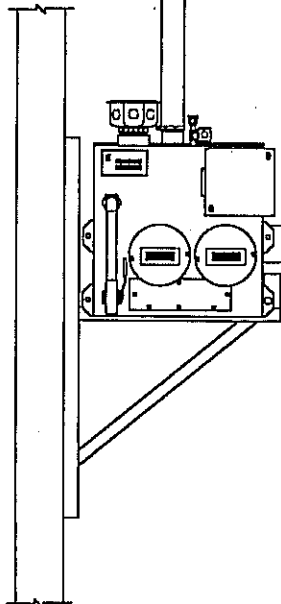
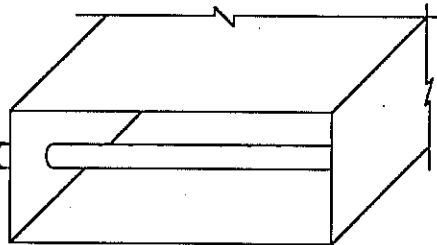
The "PS" Series Electric Humidifier offers a wide variety of mounting applications. The standard mounting application allows the humidifier to be mounted beneath the duct with "Angle or Universal Tubes". If the duct is remote from the humidifier reservoir, free standing floor support legs or wall brackets (both optional) are available. The humidifier can even be mounted directly within an air handling unit. (Local codes may require moisture proof construction of certain components).



**Free Standing Support  
Legs (optional)**

Allows remote mounting of the humidifier reservoir from the duct. The humidifier is supported 24" from the floor.

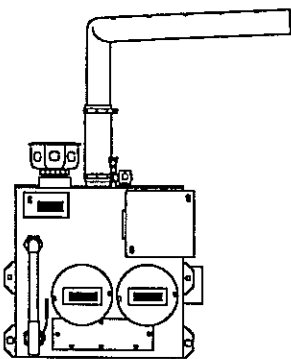
Single or multiple injection tubes can be used to custom fit any duct or air handler size. Pure Humidifier Company's unique "Universal Tubes" provide accurate installation within various sizes of duct widths by simply rotating the tube to adjust the tube arc within the duct. (Reference the "Universal Tube" description sheet).



**Wall Mounting  
Brackets (optional)**

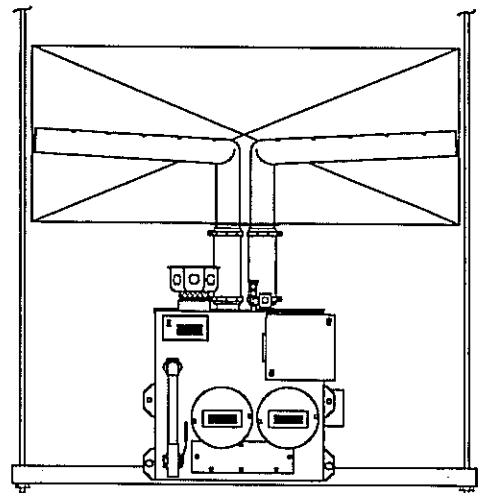
Allows remote mounting of the humidifier reservoir from the duct. Or can be used to mount the humidifier beneath a wall mounted duct.

**Angle Tube  
(shown below)**



**Beneath Duct Mounting  
(hanger brackets by others)**

Allows the humidifier to be mounted directly beneath a duct. "Angle or Universal Tubes" are available. "Universal Tubes" shown.





## Universal Tube Specifications

The Universal Tube system from Pure Humidifier Company, allows the "PS" Series Electric Humidifier to be mounted beneath ducts of various widths. Two stainless steel Angle Tubes installed at opposite directions, create one (1) Universal Tube set. The tubes are connected to the humidifier with flexible connectors and stainless steel clamps. By simply loosening the clamps, the injection tubes can be rotated

towards the air flow, thus the Universal Tube system allows the standard angle tubes to fit various duct sizes (reference the minimum and maximum duct chart below)†. The Universal Tube system can be used with any humidifier mounting application such as floor legs or wall brackets (both optional). If the reservoir is to be mounted remote from the duct, reference the Flexible Hose Kit specification sheet.

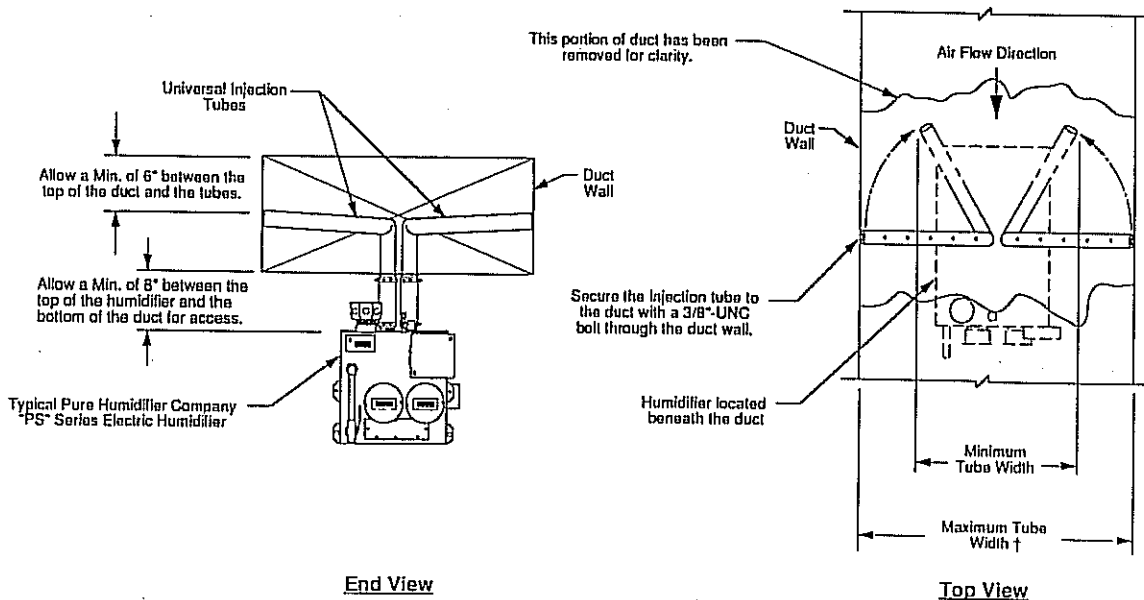
Minimum and Maximum Duct Size † in inches (cm)

Qty. of Heaters Model No. Suffix	Model Number Prefix							
	PS-2.5 thru 4.5		PS-5.5 thru 9.5		PS-10.5 thru 14.5		PS-16.5 thru 20	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1 = Single (S)	8.0" (20.3)	11.5" (29.2)	11.0" (27.9)	15.5" (39.4)	16.5" (41.9)	23.5" (59.7)	26.5" (67.3)	37.5" (95.3)
2 = Double (D)	8.0" (20.3)	11.5" (29.2)	11.0" (27.9)	15.5" (39.4)	16.5" (41.9)	23.5" (59.7)	26.5" (67.3)	37.5" (95.3)
3 = Triple (T)	8.0" (20.3)	11.5" (29.2)	11.0" (27.9)	15.5" (39.4)	16.5" (41.9)	23.5" (59.7)	26.5" (67.3)	37.5" (95.3)
4 = Quad. (Q)	---	---	---	---	16.5" (41.9) *	23.5" (59.7) *	26.5" (67.3)	37.5" (95.3)

† The dimensions provided in the above chart are the maximum and minimum widths when the standard Universal Tube systems are used. Optional, special length Universal Tube systems can be ordered; contact the factory for details.  
\* PS-10.5 & PS-12.5 are not available with Quad. (4) heaters.

Quantity of Universal Tubes (2 tubes = 1 set)

Qty. of Heaters Model No. Suffix	Model Number Prefix			
	PS-2.5 thru 4.5	PS-5.5 thru 9.5	PS-10.5 thru 14.5	PS-16.5 thru 20
1 = Single (S)	1	2	2	2
2 = Double (D)	1	2	2	2
3 = Triple (T)	1	4	2	4
4 = Quad. (Q)	--	--	4 *	4





**Flexible Hose Kit Installation**

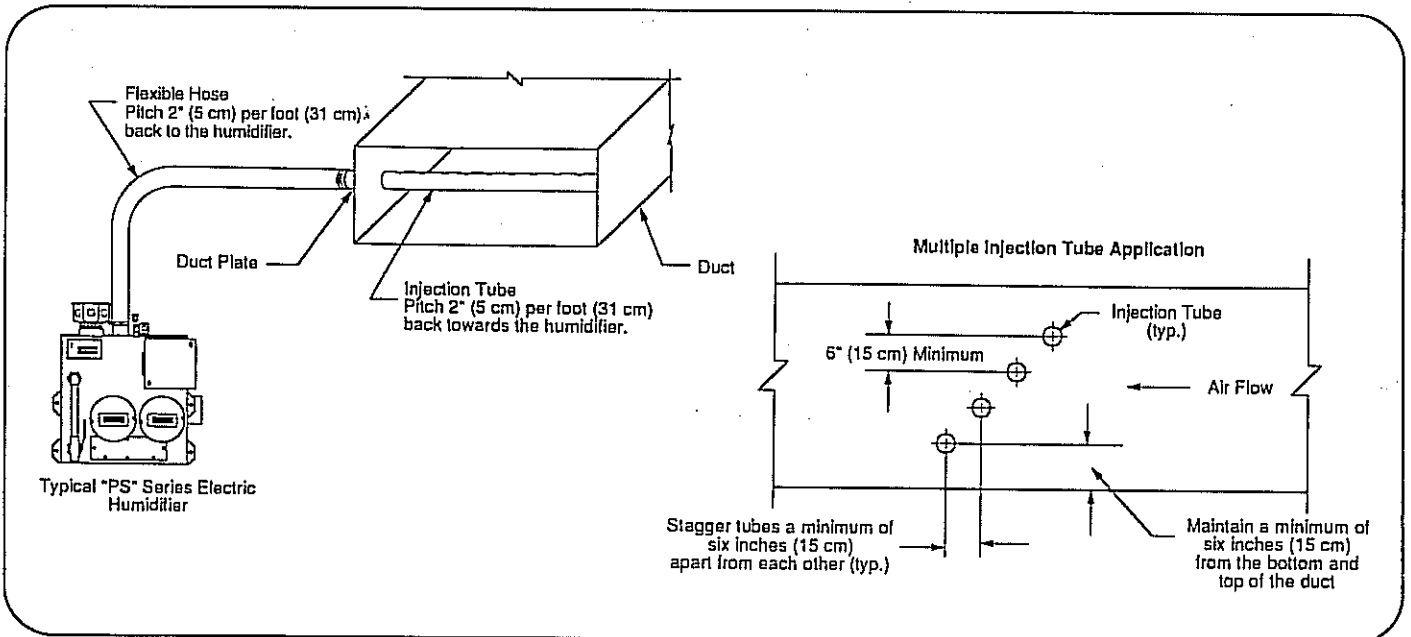
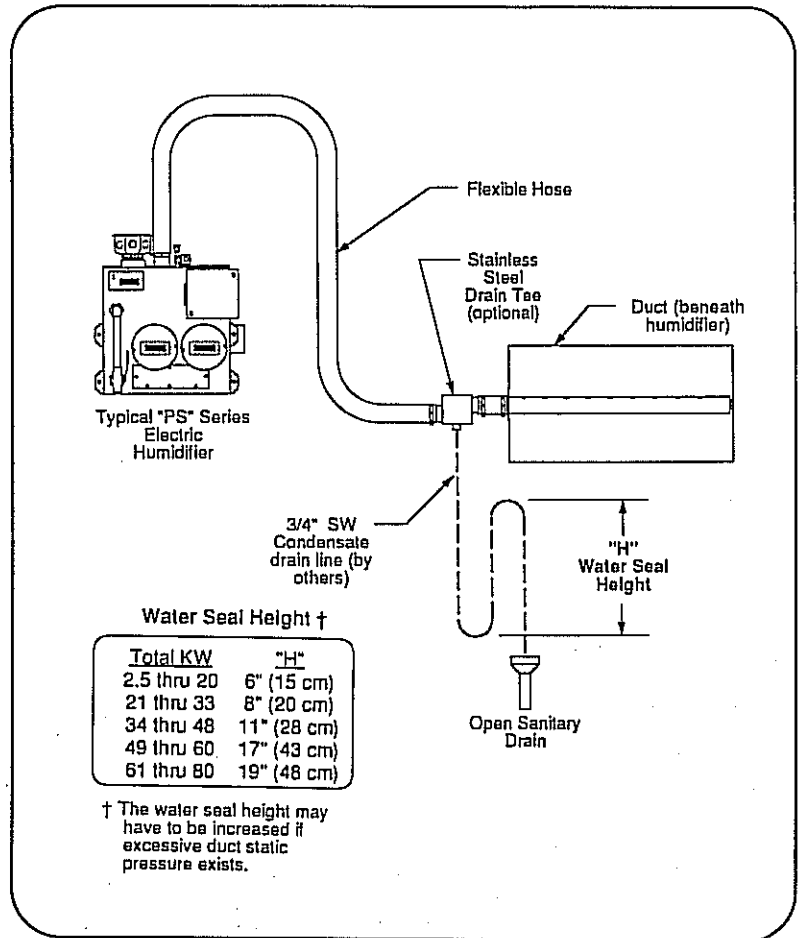
Single tube hose kits should have the injection tube installed in the center of the duct. Multiple tube hose kits should have the tubes staggered within the duct as shown in the illustration.

Hose and 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 (reference drain "tee" illustration).

Install the tube with the 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 into the air flow.

The hose connects to the injection tube and humidifier with stainless steel hose clamps (by PURE Humidifier Company).

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



## Water Supply Piping

This style humidifier utilizes a tri-probe conductive type water control system which is designed for use with standard (hard or softened) tap water. Use of demineralized, deionized or reverse osmosis water will cause failure of the water level control system and void the humidifier warranty.

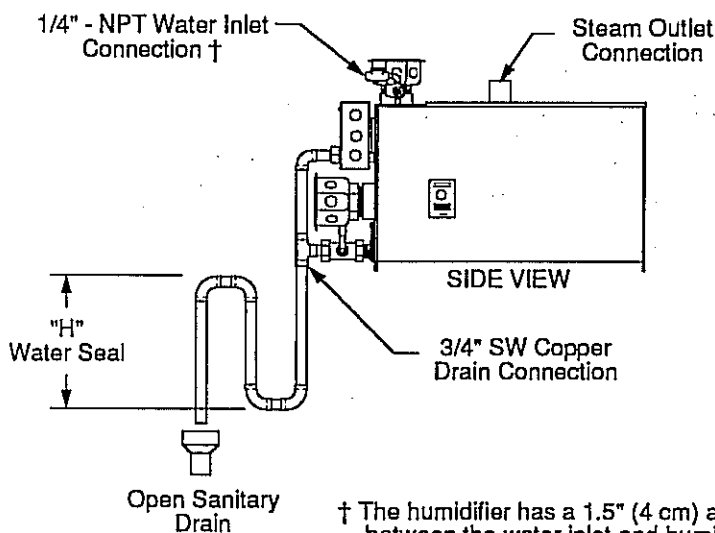
Cold or hot standard tap water can be supplied to the humidifier. A minimum water pressure of 25 psi (1.7 Bar) should be maintained to provide the proper water level within the humidifier. If the water pressure is above 95 psi (6.6 Bar), water hammer could occur and the use of a pressure reducing valve or shock arrester should be used. 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 braking device is required.

## Drain Piping

The "PS" style humidifier requires one 3/4" SW copper drain piping connection. The drain line should be piped to a water seal as shown in the drain piping illustration.

A water seal as shown in the piping illustration should be installed to prevent steam from escaping through the drain line. The water seal should be of sufficient height to overcome the pressure developed in the humidifier (reference water seal height table) and the duct static pressure.

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



† The humidifier has a 1.5" (4 cm) air gap between the water inlet and humidifier water level. Consult the local code to determine if a vacuum braking device is required.

### Water Seal Height Δ

Total KW	"H"
2.5 thru 20	6" (15 cm)
21 thru 33	8" (20 cm)
34 thru 48	11" (28 cm)
49 thru 60	17" (43 cm)
61 thru 80	19" (48 cm)

Δ The water seal height may have to be increased if excessive duct static pressure exists.

### NOTES

1. All drain piping is by others.
2. Drain and overflow piping are factory piped. One 3/4" SW copper drain connection is required.
3. Do NOT use PVC or other plastic piping that is not rated for 220° F. or higher.

## Introduction

Before starting the "PS" Pure Humidifier Company Electric Humidifier, check the following Installation procedures:

1. **MOUNTING** - Verify that the humidifier evaporating chamber is securely supported and that the evaporating chamber is 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 may exist in the control cabinet, turn off the main power at the disconnect switch before verifying the electrical connections!**
4. **PIPING** - Verify that all piping connections have been completed as recommended and that water pressure is available to the humidifier. Make sure a water seal of the proper height is provided in the drain line.

## Start Up Procedure

1. With the power "off", set the toggle switch on the level controller into the "Standby" position (the level controller is the blue controller located within the humidifier control panel).
2. Close the humidifier manual ball valve (located on the left side of the humidifier evaporating chamber faceplate). If the optional automatic drain system is utilized, 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 "Power" LED light, on the level controller, should be illuminated.
5. Switch the toggle switch on the level controller to the "Normal Operate" position. If the optional automatic drain system is used, make sure the drain toggle on the level controller is in the "Auto Drain" position.
6. Open the water supply on/off control valve (by others) and allow the humidifier evaporating chamber to fill to the proper level.
7. After the humidifier is full of water, the "Heat Ready" LED will illuminate.
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. Turn the humidistat up to a "call" for humidity. If a 4S-TCM modulator is installed (green control box within the control cabinet), make sure the toggle switch is in the "modulate heater" mode and the "cycle rate" dial is on number six (6) and the "sequence delay" dial is on number four (4). Reference modulator instructions.
12. The heater(s) should energize on a call from the humidistat.
13. Check operation of optional field installed safety switches (air flow proving switch, high-limit humidistat etc.) to make sure that they turn the power off to terminal number nine (9), which is the control circuit power. The safety switches should shut-off the humidifier heaters when ever one or more of the optional safety switches create an "open circuit".
14. Check heater amperage draw by testing and recording voltage and amperage in each phase. Readings should match the factory heater nameplate.
15. Inspect installation for leaks by operating humidifier. Any leaks should be sealed.



## PURE Humidifier Comapny "PS" Maintenance Instructions

The "PS" Series Electric 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 it's accessories. **PURE Humidifier Company recommends that the following items be inspected, and or, cleaned on a minimum basis of twice a year.** 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 heater

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

Humidifier cover / Tank

Inspect for any leaks. Repair as required. Remove the clean-out plate on the front of the humidifier faceplate and remove mineral deposits from floor of the humidifier reservoir. If excessive mineral 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

Inspect for cracks or leaks. It is normal for the hose to become hard and develop a "set".

### **Wiring Notes**

1. Main power disconnect is by others.
2. Humidifier to control panel wiring diagram is provided within the humidifier control panel door.  
All field wiring connections are shown on the wiring diagram.
3. All wiring to be per local and national electrical codes.
4. Humidifier is ETL Testing Laboratories tested and approved.
5. **All control circuit wiring should be ran within separate conduit from the main power wiring.**
6. If optional modulating control is used, modulating humidistat wiring must be ran within separate conduit from either the main power (heater) or control circuit wiring.



## Trouble Shooting

<u>Problem</u>	<u>Possible Cause</u>	<u>Recommended Action</u>
Humidifier will not heat	Blown heater fuse(s)	Check and replace
	Control transformer not producing 24 vac control voltage	Check transformer output Verify voltage across terminals #6 (comm.) and #7 (hot)
	Safety controls open (airflow proving, 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 humidistat	Verify voltage across terminals #6 (comm.) and #7 (hot)
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 back of drain valve, is closed.
	No power to the fill valve.	Check for 24 vac across terminals #6 (comm.) and #5 (hot).
Humidifier does not stop filling or is short cycling	Fill valve stuck open	Check for 24 vac across terminals #6 (comm.) and #5 (hot). 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 back of drain valve, is closed.
	Probes need cleaning	Remove tri-probe assembly and clean probe ends.
	Check probe wiring on terminals #1 thru #4.	Make sure tri-probe wiring is ran in separate conduit from power wiring.
	Incorrect panel to tank ground.	Make sure terminal #4 (ground) is a dedicated ground wire (conduit is not sufficient).
	Line noise or radio frequency	Shielded cable may be necessary.

### Maintenance Notes

Maintenance Performed

Date

By

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PURE Humidifier Company 4035 Norex Drive - Chaska, MN 55318  
Telephone: 612-368-9335 Fax: 612-368-9338