



ES Series Standard Water Electric Humidifier

SHEET NO.

ES-1



The ES Series Electric Humidifier from PURE Humidifier Co. is loaded with features and options. All you need is tap water, electricity, and a sanitary drain—the humidifier does the rest.

These units feature a Tri-Probe sensor made up of three Teflon®-coated stainless steel probes. The lower probe prevents the heating elements from energizing when the water level is too low. The middle probe electrically activates the water control valve to fill the reservoir. The top probe shuts off the water control valve when the water level reaches the proper height. A control panel with an INTAC® PLC controller mounted on the panel door constantly monitors the humidifier cycle for efficient operation. The INTAC® PLC controller is a touchscreen that provides humidifier status, and easy access to make parameter changes. High efficiency immersion water heaters (up to twelve) heat the water to provide steam. Furthermore, a flusher serves to constantly remove surface water mineral buildup and doubles as a water overflow safety pipe to the drain. A standard accumulative timed drain cycle performs automatic draining and flushing, thus reducing mineral buildup within the reservoir.

When it comes to installation, you have a choice with the ES Series Electric Humidifier. The humidifier can be free-standing with a simple (optional) flexible hose connecting the unit to the stainless steel injection tube inserted through the duct wall. You can also mount the unit on the wall with wall brackets, or floor-mounted with support legs (both optional). For mounting under a duct you simply need hangers and support brackets.

Fast-Pac or Insty-Pac tube assemblies can be provided for short dissipation in any built-up or manufactured air handling system.

The versatility of the ES Series Electric Humidifier, with its unique side entry heater assembly, allows you to design these easy-to-clean units into any system simply, efficiently, and reliably.

Our results are comforting



Capacities & Weights

ES Series

SHEET NO.

ES-2

Standard Water Unit Model No.	Steam Output Capacity †		KW	Humidifier Reservoir Weight*				Control Cabinet Weight Δ	
	lbs/hr	kg/hr		Empty		Full		lbs	kg
				lbs	kg	lbs	kg		
ES-3	9.0	4.1	3	50.5	22.9	130.5	59.2	32.0	14.5
ES-4.5	13.5	6.1	4.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-5.5	18.0	8.1	6	50.5	22.9	130.5	59.2	32.0	14.5
ES-7.5	22.5	10.2	7.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-11	31.5	14.2	10.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-14	40.5	18.4	13.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-15	45.0	20.4	15	50.5	22.9	130.5	59.2	32.0	14.5
ES-16.5	49.5	22.5	16.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-19.5	58.5	26.5	19.5	50.5	22.9	130.5	59.2	32.0	14.5
ES-22	63.0	28.6	21	61.0	27.7	177.0	80.3	55.0	25.0
ES-28	81.0	36.7	27	61.0	27.7	177.0	80.3	55.0	25.0
ES-30	90.0	40.8	30	61.0	27.7	177.0	80.3	55.0	25.0
ES-33	99.0	45.0	33	61.0	27.7	177.0	80.3	55.0	25.0
ES-39	117.0	53.1	39	61.0	27.7	177.0	80.3	55.0	25.0
ES-42	126.0	57.2	42	61.0	27.7	177.0	80.3	55.0	25.0
ES-45	135.0	61.2	45	65.5	29.7	181.5	82.3	72.0	32.7
ES-49.5	148.5	67.4	49.5	65.5	29.7	181.5	82.3	72.0	32.7
ES-58.5	175.5	80.0	58.5	65.5	29.7	181.5	82.3	72.0	32.7
ES-63	189.0	85.7	63	65.5	29.7	181.5	82.3	72.0	32.7
ES-66	198.0	89.8	66	88.0	39.9	243.0	110.2	72.0	32.7
ES-78	234.0	106.1	78	88.0	39.9	243.0	110.2	72.0	32.7
ES-84	252.0	114.3	84	88.0	39.9	243.0	110.2	72.0	32.7
ES-102	306.0	138.8	102	88.0	39.9	243.0	110.2	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.



Dimensions

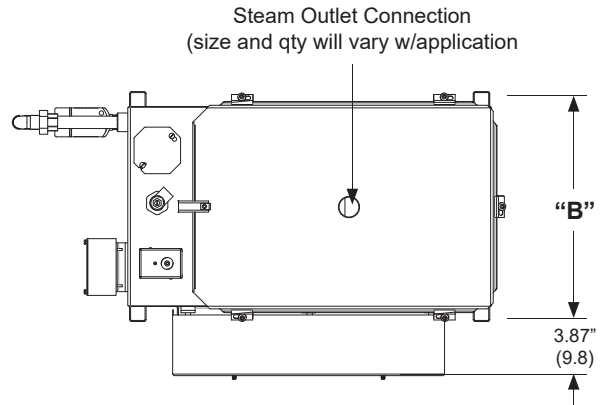
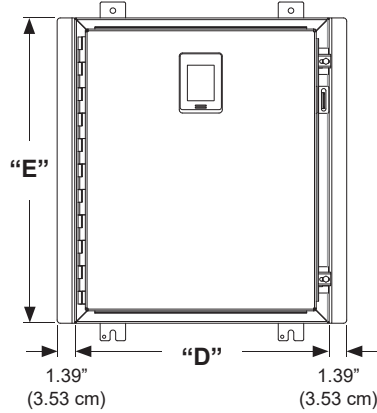
ES Series

SHEET NO.

ES-3

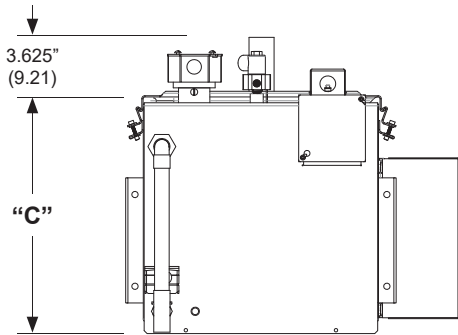
NEMA 12 Humidifier Control Cabinet

(reference control cabinet notes)

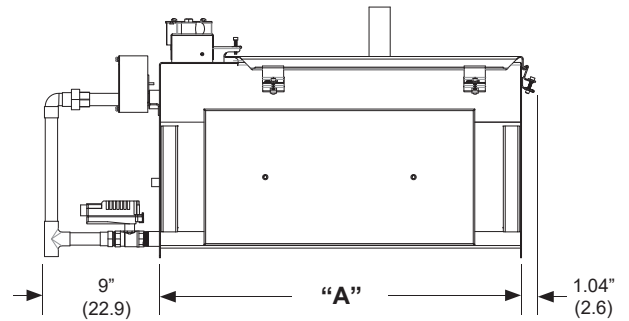


Top View

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.
4. Heatsinks located on both sides of cabinet for all units except ES-3 through ES-19.5.



Front View



Right Side View

Unit Dimensions in inches (cm)

Model Number	Dim. "A"	Dim. "B"	Dim. "C"
ES-3 thru ES-19.5	17.68" (44.9)	16.21" (41.2)	13.84" (35.2)
ES-22 thru ES-63	25.68" (65.2)	16.21" (41.2)	13.84" (35.2)
ES-66 thru ES-102	34.18" (86.8)	20.46" (52.0)	13.84" (35.2)

Control Cabinet Dimensions in inches (cm)

Model Number	Dim. "D"	Dim. "E"	Dim. "F"
ES-3 thru ES-19.5	14.00" (35.6)	16.00" (40.6)	6.00" (15.2)
ES-22 thru ES-63	20.00" (50.8)	20.00" (50.8)	7.00" (17.8)
ES-66 thru ES-102	20.00" (50.8)	24.00" (61.0)	7.00" (17.8)
ES-*	24.00" (61.0)	30.00" (76.2)	7.00" (17.8)

*Control panel for use with units having 123 amps or higher



Electrical Specifications

ES Series

SHEET NO.

ES-4

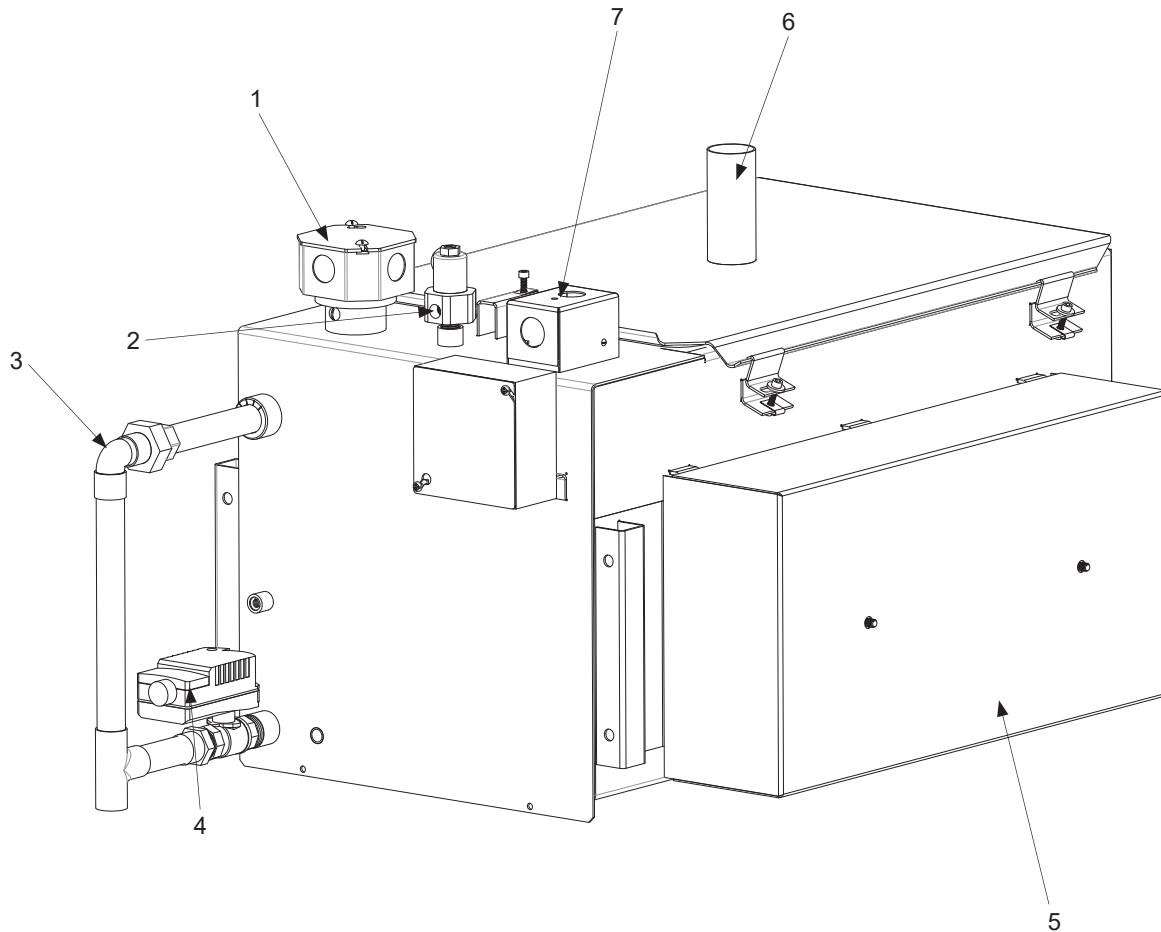
Single Phase Amperage†

Standard Water Unit Model No.	Unit KW	120V	208V	240V	480V	600V	No. of Heaters	Heater KW	Control Circuit Voltage
ES-3	3	25	14.4	12.5	6.3	5	3	1	24 vac
ES-4.5	4.5	37.5	21.6	18.8	9.4	7.5	3	1.5	24 vac
ES-5.5	6		28.8	25	12.5	10	3	2	24 vac
ES-7.5	7.5		36.1	31.3	15.6	12.5	3	2.5	24 vac
ES-11	10.5				21.9	17.5	3	3.5	24 vac
ES-14	13.5				28.1	22.5	3	1.5	24 vac
ES-15	15				31.3	25	3	5	24 vac
ES-16.5	16.5				34.4	27.5	3	5.5	24 vac
ES-19.5	19.5				40.6	32.5	3	6	24 vac
ES-22	21				43.8	35	6	3.5	24 vac
ES-28	27				56.3	45	6	4.5	24 vac
ES-30	30				62.5	50	6	5	24 vac
ES-33	33				68.8	55	6	5.5	24 vac
ES-39	39				81.3	65	6	6.5	24 vac
ES-42	42				87.5	70	6	7	24 vac
ES-45	45				93.8	75	9	5	24 vac
ES-49.5	49.5				103.1	82.5	9	5.5	24 vac
ES-58.5	58.5				121.9	97.5	9	6.5	24 vac
ES-63	63				131.3	105	9	7	24 vac
ES-66	66				137.5	110	12	5.5	24 vac
ES-78	78				162.5	130	12	6.5	24 vac
ES-84	84				175	140	12	7	24 vac
ES-102	102					170	12	8.5	24 vac

Three Phase Amperage†

Standard Water Unit Model No.	Unit KW	208V	240V	480V	600V	No. of Heaters	Heater KW	Control Circuit Voltage
ES-3	3	8.3	7.2	3.6	2.9	3	1	24 vac
ES-4.5	4.5	12.5	10.8	5.4	4.3	3	1.5	24 vac
ES-5.5	6	16.6	14.4	7.2	5.8	3	2	24 vac
ES-7.5	7.5	20.8	18	9	7.2	3	2.5	24 vac
ES-11	10.5	29.1	25.3	12.6	10.1	3	3.5	24 vac
ES-14	13.5	37.5	32.4	16.2	13	3	1.5	24 vac
ES-15	15	41.6	36.1	18	14.4	3	5	24 vac
ES-16.5	16.5	45.8	39.7	19.8	15.9	3	5.5	24 vac
ES-19.5	19.5			23.5	18.8	3	6	24 vac
ES-22	21	58.3	50.5	25.3	20.2	6	3.5	24 vac
ES-28	27	75	64.9	32.5	26	6	4.5	24 vac
ES-30	30	83.3	72.2	36.1	28.9	6	5	24 vac
ES-33	33	91.6	79.4	39.7	31.8	6	5.5	24 vac
ES-39	39			46.9	37.5	6	6.5	24 vac
ES-42	42			50.5	40.4	6	7	24 vac
ES-45	45	124.9	108.3	54.1	43.3	9	5	24 vac
ES-49.5	49.5	137.4	119.1	59.5	47.6	9	5.5	24 vac
ES-58.5	58.5			70.4	56.3	9	6.5	24 vac
ES-63	63			75.8	60.6	9	7	24 vac
ES-66	66			79.4	63.5	12	5.5	24 vac
ES-78	78			93.8	75.1	12	6.5	24 vac
ES-84	84			101	80.8	12	7	24 vac
ES-102	102			122.7	98.2	12	8.5	24 vac

† Other voltages available upon request. Please consult factory for specific availability.



Features

- 1. Tri-Probe Sensor
- 2. 1/4" NPT Fill Inlet Connection
- 3. Overflow Piping
- 4. Automatic Drain Valve
- 5. Heater Assembly Access
- 6. Humidifier Steam Outlet Connection
- 7. Over Temperature Cut-Out Switch



Specification Sample ES Series

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ES-6

1. The humidifier shall be an electrically heated immersion heater type manufactured by PURE Humidifier Co. of Chaska, Minnesota.
2. The humidifier shall be tested and approved by ETL/ETL-C Testing Laboratories, Inc.
3. The humidifier shall have an evaporating reservoir with a gasket sealed cover which is capable of operating at pressures of at least 19"-48 cm (W.C.) without steam or water leaks. The reservoir shall be made of type 304L stainless steel with welded joints. The reservoir shall be mounted on slide rails for easy removal from the cabinet.
4. The humidifier shall be designed to facilitate easy removal of the heater assembly for periodic scale removal and inspection. The cover and heater assembly shall be secured to the unit by the use of quick release clamps. The heater assembly shall be removable from the side of the humidifier without disturbing the cover or injection tube system's steam supply piping.
5. Humidifier shall be field convertible from an electric immersion heater style ES humidifier to a steam heat exchanger style SX humidifier with a simple change of the side entry assembly.
6. A surface water flusher shall be included to drain away a portion of the water upon each refill cycle. This is to allow mineral deposits produced by earlier evaporation cycles to be removed.
7. The immersion heater(s) shall be incoloy sheathed and designed for a maximum of 80 watts per sq. inch. They shall be attached to the reservoir cover and be easily removed for cleaning and inspection. Expansion and contraction of the heater(s) sheath allows mineral buildup to flake off.
8. A solenoid-operated water fill valve with internal strainer shall be factory-mounted on the cover of the humidifier reservoir. A bottom fill system shall be utilized to prevent any collapse of the steam head during the fill process. The fill valve shall be located to allow a minimum air gap of 1½" (3.81 cm).
9. The humidifier shall have a manual reset over-temperature switch factory installed on the humidifier reservoir. The temperature switch shall provide humidifier over-temperature protection.
10. The INTAC® Programmable Logic Controller (PLC) shall be factory-mounted within the control panel and shall electronically control the automatic refilling, low water cut-off, high water cut-off, manual surface water flushing, and safety switch interlock functions. The INTAC® PLC performs self-diagnostics and controls all water level, fill, drain and safety circuit interlocks with fault indication.
11. The INTAC® PLC has an adjustable tank water temperature control to maintain a set temperature when the humidifier is not actively humidifying.
12. The INTAC® PLC shall perform Automatic drain downs. The drain period is field adjustable from 0.1 to 500 hours with the drain duration adjustable from 0.01-120 minutes. During the drain period, the humidifier reservoir will drain, and the fill valve will be energized to provide a thorough rinsing action. After the drain period is completed, the drain valve will close, and the humidifier will refill to provide humidity on demand.
13. The INTAC® PLC shall perform a Seasonal "End-Of-Use" humidifier drain. The humidifier will automatically drain the reservoir after a non-use time period, which is field adjustable. Upon receiving a call for humidity, the system automatically refills the reservoir and allows the humidifier to operate in "Normal Mode".
14. The INTAC® PLC has a local HMI display to indicate Drain Valve Open, Safety Circuit Open, Over-temp Open, Fill Valve Status, Water Level Status, Drain Valve Status and Power Output. The INTAC® PLC shall control all water level control functions through a Tri-Probe sensor mounted on the cover of the humidifier reservoir. The Tri-Probe sensor with stainless steel shield shall electrically sense the water level within the reservoir.
15. The INTAC® PLC also employs an intuitive color touchscreen interface, comes with BACnet communications, contains a webserver, is capable of data logging, maintains a fault history and uses a real time clock.
16. SCR Modulation, 100% solid state power controller shall be provided in the control panel. The SCR power controller will modulate the humidifier between 0-100% of its rated capacity according to humidistat demand.
17. The humidifier shall be provided with a JIC NEMA 12 control cabinet, shipped loose (reference factory mounting option). The control cabinet shall be made of 14-gauge steel with ANSI 61 gray polyester powder coating, continuous hinge and oil-resistant gasket. The panel shall include a factory wired subpanel with a magnetic contactor, INTAC® PLC, fused control circuit transformer, numbered terminal blocks and heater fuses. The modulating control voltage shall be field adjustable to match the controlling input signal.

Reference the "Options" page for a description of the options which can be added to the base specification.



Options

ES Series

SHEET NO.

ES-7

Humidifier

Insulation. Unit shall be covered (except top cover) with $\frac{3}{4}$ " (1.9 cm) thick fiberglass duct insulation. Insulation material shall have aluminum foil facing.

Modulating Fill. For applications that require RH staying above a minimum threshold, a smaller fluctuation allows you to set the setpoint lower. Not only does this create a cost savings, but also saves on energy and water usage, making it a more economical option than the constant overflow method. Field-retrofitable on units that use our Tri-Probe water sensor.

Mounting

Support Legs. Provide support legs made of $1\frac{1}{4}$ " x $1\frac{1}{4}$ " x $\frac{1}{4}$ " (3.2 cm) angle iron and painted with enamel gray paint. Distance from humidifier bottom to floor shall be 24" (61 cm).

Wall Brackets. Provide two wall brackets made of $1\frac{1}{4}$ " x $1\frac{1}{4}$ " x $\frac{1}{4}$ " (3.2 cm) angle iron and painted with enamel gray paint.

Injection Tubes

Injection Tube(s) and Flexible Hose. Each unit shall include one or more 10-foot (305 cm) sections of $1\frac{1}{2}$ " (3.8 cm) I.D. flexible hose and a $1\frac{1}{2}$ " (3.8 cm) O.D. stainless steel injection tube long enough to extend across the duct. The reservoir cover shall have a matching connection so the flexible hose can be connected with two stainless steel hose clamps. A two-piece duct plate shall be provided to seal the duct opening.

Fast-Pac Tube Assembly. Tube assembly consists of a stainless steel supply/condensate header with a $\frac{3}{4}$ "-NPT drain connection and horizontal $1\frac{1}{2}$ " \varnothing stainless steel injection tubes.

Insty-Pac Tube Assembly. Tube assembly consists of a steam supply/seperator header constructed of stainless steel with steam inlet, condensate drain outlet, and steam jacketed injection tubes welded to header. Steam jacketed injection tubes constructed of stainless steel with punched steam ports of the proper size and spacing to deliver the maximum specified capacity.

High-Efficiency Insulated Tubes. Thermoplastic wrap reduces condensate loss and unwanted heat gain during cooling mode.

Blower Pack. Unit shall allow for direct space humidification without the use of ductwork. Unit shall be contained within a cabinet that is constructed of 18-gauge steel with a baked enamel paint finish. Unit shall have a two-speed field adjustable fan. The fan is controlled by a thermostat interlock mounted on the steam distributor, it shall activate the fan before steam is discharged and deactivate the fan after all residual steam has been discharged. One Blower Pack can be used per each 100 PPH.

Control Cabinet

Control Cabinet Factory Mounting. Humidifier control cabinet shall be factory-mounted and wired to the left side of the humidifier reservoir.

NEMA 4 Control Cabinet. A NEMA 4 weather-tight control cabinet shall be substituted for the standard NEMA 12 cabinet.

Control Panel Door Lock. Control cabinet shall be provided with a factory-installed key lock on the cabinet door.

Controls and Safety Devices

VAV Control. A supply duct humidity sensor shall be supplied to control critical variable air volume (VAV) air handling systems. The system shall automatically determine if the supply air or the room/return/control by others signal is dominant and slowly reduces the humidifier output capacity, thus preventing over-saturation of the supply air when the air volume changes.

Outdoor Air Temperature Setback. Provides automatic reduction of RH set point to prevent condensation on windows during extreme cold weather.

Airflow Proving Switch. A diaphragm operated air flow proving switch with adjustable control range of .05" W.C. to 12.0" W.C. shall be provided for field installation. Switch rating shall be at minimum 2.5 amps at 120V.

Duct High-Limit. A high-limit humidistat shall be provided for duct installation. The high-limit shall be field set to prevent over saturation within the supply duct.

Miscellaneous Accessories

DCT-927 Drain Tempering Kit. Provides cold water cooling of the 212°F drain water.

Condensate Pump. Used to lift condensate from the humidifier or tube assembly.

Outdoor Enclosure. Galvanized steel enclosure with tank freeze protection, control panel mounted, support legs, insulated tank, ventilation and hinged access doors. Enclosure is ready to be curb-mounted with the humidifier pre-installed. Ships as one piece. Roof curb is not included.

Reference the "Sample Specification" page for the humidifier base specification.