



EHU-800 SERIES HUMIDIFIERS



How the Series EHU-800 Works

An Armstrong Series EHU converts ordinary tap water to steam and distributes it to bring the relative humidity up to the desired level. It's ideal for providing humidification where no steam is available or where a steam source is too remote for easy or economical piping.

The humidity demand, sensed by the transmitter, is indicated by the EHU demand display. A microprocessor converts this demand signal into an amperage requirement. The internal power contactor closes, applying voltage to the electrodes, and the fill valve begins to fill the tank.

Water enters the bottom of the steam generator tank and rises until it reaches the electrodes. Upon contact, electrical current flows through the water, causing it to boil and produce steam (Figure 1).

When the water level rises, as shown in Figure 2, increased electrical current flows through the water, producing more steam. This increase will continue until the required output of steam (i.e. amperage requirement) is reached.

At this point, the fill valve will cycle to maintain the required amperage. When the transmitter senses the added moisture in the air, the demand for humidity begins to drop. As the demand falls, the output of the unit modulates down by decreasing amperage, and therefore steam flow. The fill valve can then cycle at the lower steam output (amperage) requirement.

Figure 3 shows what happens when the humidistat demand signal drops below a minimum demand: The contactor is de-energized, and steam output stops.

A duct high-limit humidistat or an air flow interlock switch may also stop steam output. These devices prevent excess moisture and condensation in the duct. The Series EHU may also be used in combination with an Armstrong EHF-2 or EHF-3 Fan Package for direct area discharge of steam. A high-water float switch prevents water carryover into the duct due to a high water level in the tank. An automatic drain cycle blows down mineral-laden water to extend tank life and reduce maintenance. An overcurrent protection circuit will drain water from the tank to reduce current flow and then de-energize the contactor to stop current flow if overcurrent still exists. After a period of no demand on the Series EHU-800, an "End of Season" drain is initiated to eliminate the potential for stagnant water to remain in the tank.

Figure 1. 100% demand. Filling with water. Low, increasing steam output.

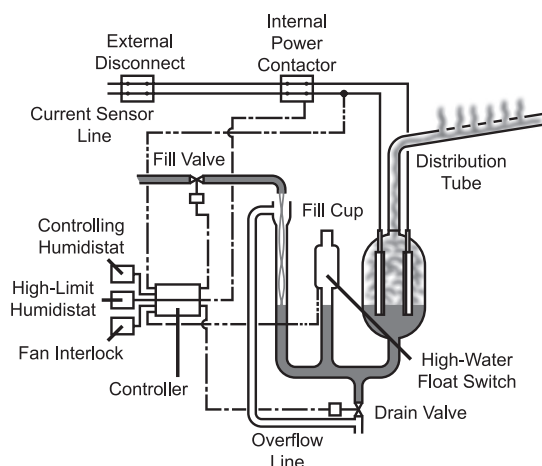


Figure 2. 100% demand. Fill valve cycling to maintain output. High water level. High, constant steam output.

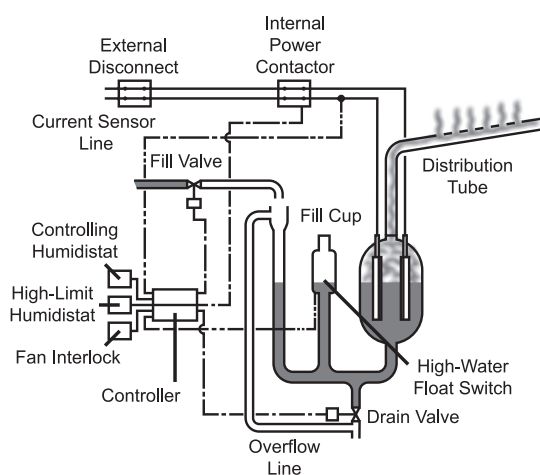
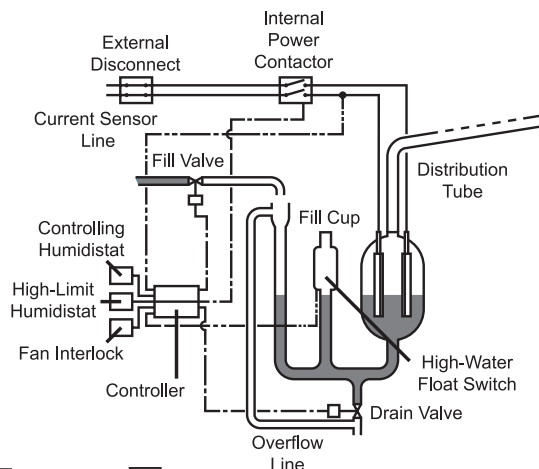


Figure 3. No demand. Contactor opens. No steam output.



■ Steam ■ Water

EHU-800 Series Features and Benefits

Armstrong has been producing an EHU series for over 35 years with over six different series upgrades. We can truly say the 800 series is the smartest of them all. The brains of this unit is the 24VAC main PC board with an on board controller. The PC board is connected to the digital display and keypad, making the unit user friendly as well as making a plethora of information visible on the display. Taking it one step further, this unit also comes standard with native Modbus Controls, which creates a gateway for the information to be visible on your desktop. See below for some of the Features & Benefits that can be found in the EHU-800 series.

Digital Display w/ Keypad: Digital display that has the capability to see 50 different screens from current amp draw to when the unit will drain again, etc.

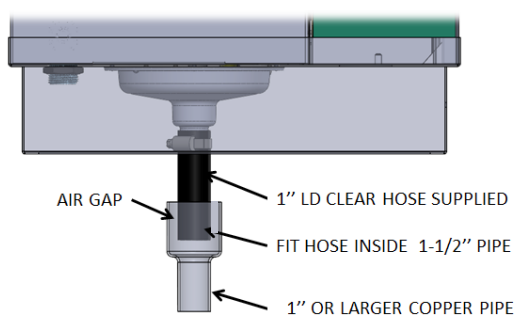
Self Diagnostics: The unit continuously monitors the operation through self-diagnostics. If it sees an issue the unit first tries to fix it itself and then if the problem persists it will display one of eight messages to indicate the condition.

Adjustable Output: The EHU-800 series units are fully modulating, but the unit also has the ability to limit the maximum output. If anything in your system is to change such as the CFM, temp, ect, the output of the unit can be capped to accommodate each application.

Cleanable Tank: The tank provided with the EHU-800 series combines economical maintenance and convenience. You can easily disassemble and inspect the steam generator tank. The digital display will also alert when maintenance is needed. The onboard controller will analyze the amount of run time based on demand. When it is necessary, you have the option to clean the tank or replace it entirely.

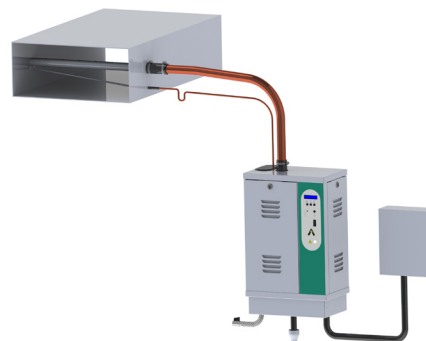
Standard Communications: As mentioned above, all EHU-800 series units come standard with Modbus communications (RS485 connection). This allows the user to communicate with the humidifier through the Building Management System (BMS). The humidifier can be controlled and monitored from a remote location. Everything that is accessible through the front display of the humidifier, will be visible through the BMS. With being native Modbus, the unit can be easily converted to BACnet or Lonworks with the use of a protocol translator.

Onboard Controller: This series also features an onboard controller, which gives the user the capability to install sensors instead of a standard humidistat or modulating high limit. This makes wiring easier as the sensors that are used to monitor the space conditions with the BMS can also be used to control the humidifier.



External connections: The water and drain connections are easily accessible points on the bottom of the unit to make installation much simpler and easier. This also eliminates some connection points inside the cabinet to help reduce the risk of electric failure due to moisture in the cabinet.

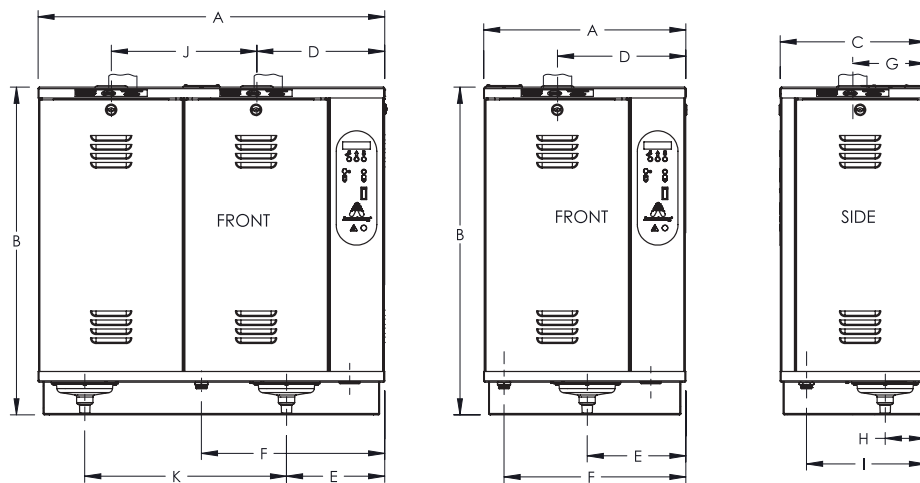
Smaller footprint: Over the years the EHU series has been the smallest of all the atmospheric steam generators. The width of the EHU-800 is slightly smaller than its predecessors, making it even easier to install.



EHU-800 Series Dimensions and Weights



Model	Dimensions in mm (inches)											Weight kg (lb)	
	Humidifier			Steam Outlet (X)	Drain Outlet (X)	Water Inlet (X)	Steam Outlet (X)	Drain Outlet (X)	Water Inlet (X)	Steam Outlet Spacing	Drain Outlet Spacing	Emptying	Operating
	A	B	C	D	E	F	G	H	I	J	K		
EHU 801	413 (16.3)	647 (25.5)	253 (9.96)	274 (10.8)	243 (9.56)	93 (3.66)	126 (4.96)	96 (3.78)	188 (7.40)			19 (42)	25 (55)
EHU 803	498 (19.6)	807 (31.8)	358 (14.1)	316 (12.4)	236 (9.29)	451 (17.5)	179 (7.05)	99 (3.90)	293 (11.5)			32 (70)	57 (126)
EHU 804	854 (33.6)	807 (31.8)	358 (14.1)	316 (12.4)	236 (9.29)	451 (17.5)	179 (7.05)	99 (3.90)	293 (11.5)	358 (14.1)	518 (20.4)	50 (110)	100 (220)



Output		Single Phase							
lbs/hr	kg/hr	120		208		240		277	
		Amp	kW	Amp	kW	Amp	kW	Amp	kW
EHU 801 (One small generator)									
4.4	2	12.5	1.5	7.2	1.5	6.3	1.5	5.4	1.5
6.6	3	18.8	2.3	10.8	2.3	9.4	2.3	8.1	2.3
11.0	5			18.1	3.8	15.7	3.8	13.6	3.8
17.6	8							21.7	6.0
EHU 803 (one large steam generator)									
11.0	5	31.3	3.8						
17.6	8			28.9	6.0	25.1	6.0		
22.0	10			36.1	7.5	31.3	7.5	27.1	7.5
33.1	15			54.2	11.3	47.0	11.3	40.7	11.3
44.1	20					62.7	15.0	54.3	15.0
55.1	25							67.9	18.8
EHU 804 (two large steam generators)									
44.1	20			72.3	15.0				
55.1	25			90.4	18.8	78.3	18.8		
66.1	30			108.4	22.6	94.0	22.6	81.4	22.6
77.2	35					109.6	26.3	95.0	26.3

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

EHU-800 Series Capacity Tables



Output		Three Phase									
lbs/hr	kg/hr	208		240		380		480		600	
		Amp	kW	Amp	kW	Amp	kW	Amp	kW	Amp	kW
EHU 801 (One small generator)											
6	3	6.3	2.3	5.4	2.3						
11	5	10.4	3.8	9.0	3.8	5.7	3.8	4.5	3.8	3.6	3.8
17	8	16.7	6.0	14.5	6.0	9.1	6.0	7.2	6.0	5.8	6.0
22	10	20.9	7.5	18.1	7.5	11.4	7.5	9.0	7.5	7.2	7.5
33	15					17.1	11.3	13.6	11.3	10.9	11.3
44	20					22.8	15.0	18.1	15.0	14.5	15.0
EHU 803 (one large steam generator)											
33	15	31.3	11.3	27.1	11.3						
44	20	41.7	15.0	36.2	15.0						
55	25			45.2	18.8	28.6	18.8	22.6	18.8	18.1	18.8
66	30					34.3	22.6	27.1	22.6	21.7	22.6
77	35					40.0	26.3	31.7	26.3	25.3	26.3
88	40					45.7	30.1	36.2	30.1	28.9	30.1
99	45							40.7	33.8	32.6	33.8
110	50							45.2	37.6	36.2	37.6
EHU 804 (two large steam generators)											
55	25	52.2	18.8								
66	30	62.6	22.6	54.3	22.6						
77	35	73.0	26.3	63.3	26.3						
88	40	83.5	30.1	72.3	30.1						
99	45	93.9	33.8	81.4	33.8	51.4	33.8				
110	50			90.4	37.6	57.1	37.6				
121	55					62.8	41.4	49.7	41.4	39.8	41.4
132	60					68.5	45.1	54.3	45.1	43.4	45.1
143	65					74.3	48.9	58.8	48.9	47.0	48.9
154	70					80.0	52.6	63.3	52.6	50.6	52.6
165	75					85.7	56.4	67.8	56.4	54.3	56.4
176	80					91.4	60.2	72.3	60.2	57.9	60.2
187	85							76.9	63.9	61.5	63.9
198	90							81.4	67.7	65.1	67.7
209	95							85.9	71.4	68.7	71.4
220	100							90.4	75.2	72.3	75.2
231	105							95.0	78.9	76	78.9
242	110									79.6	82.7

Recommended Branch Circuits												
Rating Amp		1-12	13-15	16-20	21-24	25-32	33-40	41-48	49-64	68-80	81-100	101-120
Wire	(AWG)	14	12	10	10	8	8	6	4	3	1	0
	(mm ²)	3	4	6	6	10	10	16	25	35	50	50
Circuit Breaker		15	20	25	30	40	50	60	80	100	125	150

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Master SECTION 15810

HUMIDIFIER

PART 1, GENERAL

- 1.01 WORK INCLUDED
 - A. Steam Humidifier, Control Cabinet, Piping and Controls.
- 1.02 RELATED WORK
 - A. Electrical distribution Division 16000
 - B. Plumbing water distribution and drainage. Section 15400
 - C. Ductwork Insulation. Section 15290
 - D. Air Handling Section 15850
- 1.03 SUBMITTALS
 - A. Submit shop drawings and product data under provisions of Section 01300.
 - B. Shop drawings shall indicate assembly, dimensions, weights, construction details and all field connection details and all mounting and housing details.
 - C. Product data shall indicate dimensions, weights, capacities, ratings, construction details, electrical characteristics.
 - D. Submit manufacturer's installation instructions and operating and maintenance manuals.
- 1.04 DELIVERY, STORAGE AND HANDLING
 - A. Deliver products to site in factory fabricated protective containers.
 - B. Store in a clean dry place and protect from weather and construction traffic, handle carefully to avoid damage to components, enclosures and finish.
- 1.05 ENVIRONMENTAL CONDITIONS
 - A. Do not operate unit for any purpose, temporary or permanent until all water supply and drainage connections have been made and all safety controls are functioning properly.
- 1.06 WARRANTY
 - A. Provide manufacturer's two year standard warranty.

PART 2, PRODUCTS

- 2.01 ACCEPTABLE MANUFACTURERS
 - A. Armstrong
- 2.02 STEAM GENERATOR TYPE HUMIDIFIERS

Suggested Specification for EHU-800 Series

"Electrosw Type or Canister Humidifier":

- Steam humidifier for distribution of humidity (steam vapor) into air-handling system or directly into space shall be of the self-contained, electrically controlled design.
- A. Humidifier shall generate steam from ordinary tap water.
 - B. Humidifier shall have modulating control to provide 20% to 100% capacity. Maximum capacity of humidifier shall self regulate with no other manual adjustment.
 - C. Humidifier shall have tanks that can be taken apart for inspection, cleaning, and if needed, repair. Alternatively, the same tank can be disposed of and replaced. The humidifier shall monitor the tank and the digital display will indicate when it is dirty and needs cleaning or replacing.
 - D. Drain cycle will be self-regulating both in frequency and duration to maximize tank life while minimizing energy waste. The drain cycle will automatically control mineral buildup based on water conductivity, humidity demand history and steam output rate.
 - E. Drain water will be tempered by the fill valve.
 - F. Fill and drain connections to be located outside of the cabinet.
 - G. Digital display and keypad functions to include:
 - 1. Displayed diagnostics
 - 2. Ability to limit max output
 - 3. Error log
 - H. Humidifier shall have continuous self-diagnostics checking to monitor the operation of the unit.
 - I. The unit will shut down the tank (current to electrodes) to prevent unsafe operation and the display will indicate cause of failure. Causes of failure include drain system malfunction, fill system malfunction and overcurrent malfunction.
 - J. Humidifier shall incorporate a high-water float switch to mechanically sense a high water condition. A high-water probe that electrically senses high water will not be acceptable.
 - K. Humidifier will provide a relay contact closure to indicate a system failure or dirty tank condition. The contact closure will allow for activation of an external Class 2 alarm device (customer supplied). Circuit is rated to 1 ampere.
 - L. Humidifier will have a unit status menu that will display unit amperage draw, humidistat demand percentage, steam output (in lb/hr) as well as fill and drain valve operation and high water.
 - M. Humidifier shall incorporate electrical terminals for installation of controlling humidistat, high limit humidistat, fan interlock switch, and Class 2 alarm device.
 - N. Humidifier is interoperable through native MODBUS communications protocol. Upon request, humidifier may be supplied with BACnet or LonWorks communications protocol.
 - O. Humidifier is field adaptable to utilize onboard controller for use with 0-5Vdc, 0-10Vdc, 4-20mA sensors or can accept an input signal from external controller/humidistat (0-5Vdc, 0-10Vdc, 4-20mA or on/off).
 - P. The humidifier fill water line(s) shall have an air gap to prevent backflow (siphoning) of contaminated water into water supply system.

Optional points:

1. Humidifier(s) shall have all internal components contained in a steel cabinet with a key-locked access door to prevent unauthorized access.
3. Humidifier shall be supplied with two hose cuffs for connection to hard copper tube (customer supplied)
4. Dispersion Devices
 - a. Humidifier shall be supplied with stainless steel steam dispersion tube(s) which provide uniform steam distribution over the entire tube length and shall be supplied at various lengths (through 10') to adequately span the widest dimension of the duct.
 - b. Humidifier shall be supplied with HumidiPack prefabricated separator/header and multiple dispersion tube assembly designed for the application in order to shorten the non-wettable vapor trail.
 - c. When applicable, humidifier shall have provisions for discharging steam vapor directly into room area using factory-available fan distribution units as an accessory. These units shall be designed for remote mounting from the humidifier.

PART 3, EXECUTION

3.01 INSTALLATION

A. Install Armstrong humidifiers as indicated on drawings and as indicated in schedules in accordance with manufacturer's instructions.

3.02 MANUFACTURERS FIELD SERVICES:

A. Supply services of factory trained representative to check installation for compliance with manufacturer's requirements and to supervise start-up and testing of humidifiers.

3.03 DEMONSTRATION

A. Demonstrate all humidifiers to be fully functional. See 15990 for testing procedure.

END OF SECTION 15810



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