

Aprilaire®

Steam Humidifier



Model 800 Residential Steam Humidifier Owner's Manual

Includes Safety & Operating Instructions
and Warranty Information

READ AND SAVE THESE INSTRUCTIONS

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SAFETY CAUTIONS

CAUTION

ATTENTION INSTALLER

Read this manual before installing. This product must be installed by qualified HVAC and electrical contractors and in compliance with local, state, federal, and governing codes. Improper installation can cause property damage, severe personal injury, or death as a result of electric shock, burns, or fire.

Read all cautions and instructions.

Read this manual before performing service or maintenance procedures on any part of the system. Failure to follow all cautions and instructions could produce the hazardous situations described, resulting in property damage, personal injury, or death.

Failure to follow the instructions in this manual can cause moisture to accumulate, which can cause damage to structure and furnishings.

CAUTION

HOT SURFACES AND HOT WATER

This steam humidification system has extremely hot surfaces. Water in steam canister, steam pipes, and dispersion tube can be as hot as 212°F (100°C). Discharged steam is not visible. Contact with hot surfaces, discharged hot water, or air into which steam has been discharged can cause severe personal injury. To avoid severe burns, follow procedures in this manual when performing service or maintenance procedures on any part of the system.

DISCONNECT ELECTRICAL POWER

Disconnect electrical power before installing supply wiring or performing service or maintenance procedures on any part of the humidification system. Failure to disconnect electrical power could result in fire, electrical shock, and other hazardous conditions. These hazardous conditions could cause property damage, personal injury, or death.

Contact with energized circuits can cause property damage, severe personal injury, or death as a result of electrical shock or fire. Do not remove access panels until electrical power is disconnected.

Follow the shutdown procedure in this manual before performing service or maintenance procedures on any part of the system.

ELECTRICAL SHOCK HAZARD

If the humidifier starts up responding to a call for humidity during maintenance, severe bodily injury or death from electrical shock could occur. Follow the procedures in this manual before performing service or maintenance procedures on this humidifier.

EXCESSIVE SUPPLY WATER PRESSURE

Supply water pressure greater than 120 psi may cause the humidifier to overflow.

SHARP EDGES

Sharp edges may cause serious injury from cuts. Use care when cutting plenum openings and handling ductwork.

EXCESS HUMIDITY

Do not set humidity higher than recommended. Condensation may cause damage.

INTRODUCTION

Thank you for your recent Aprilaire® humidifier purchase. We appreciate your business and are pleased to add your name to our growing list of customers. You have invested in the highest quality equipment available. Aprilaire manufactures whole-house indoor air quality products and is a recognized leader in the heating and air conditioning industry.

Your humidifier will require periodic maintenance to assure continued consistent performance. See page 14.

Please take a few minutes and read this booklet. This will familiarize you with the benefits you will receive from the humidifier and help you understand the routine maintenance that will be required.

Be sure to register your humidifier warranty online at:
www.aprilaire.com/warranty.

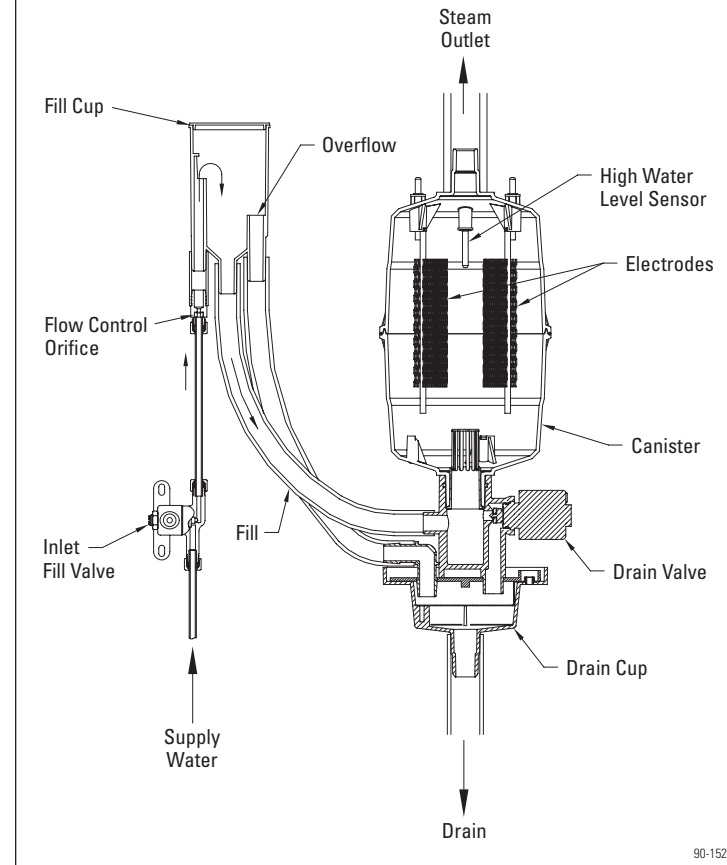
Genuine Aprilaire Replacement Model 80 Steam Canisters are available from your installing contractor or from most other heating and air conditioning contractors in your area. Use the dealer locator on our web site (www.aprilaire.com) or look in the Yellow Pages under Humidifying Apparatus or Heating & Air Conditioning Contractors.

PRINCIPLES OF OPERATION

The Aprilaire® Model 800 Canister Steam Humidifier delivers humidity in the form of steam to the conditioned space via the HVAC system duct or optional Aprilaire Model 850 Fan Pack. The humidifier generates steam by energizing two electrodes that extend into a canister of water. Current flowing between the electrodes causes the water to boil, creating steam. Water is introduced to the humidifier through a fill valve to a fill cup located in the top of the cabinet. The fill cup serves as an overflow reservoir and provides an air gap between the humidifier and water source. The steam canister is filled from the bottom. The canister is seated in a drain cup assembly which includes a drain valve. The drain and fill valves work together to maintain water level in the canister to deliver the rated steam capacity based on the electrical conductivity of the water and to temper drain water. See **Figure 1** for representation of fill and drain system and canister.

Steam is delivered into the airstream through a dispersion tube mounted in the HVAC system ductwork. Openings in the dispersion tube are fitted with “tubelets” which extend into the center of the tube. The design of the dispersion tube and tubelets distribute steam over a wide area in the duct and direct any condensed moisture back into the steam hose.

FIGURE 1 – Fill and Drain System and Canister



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SEQUENCE OF OPERATION

When the Automatic Digital Humidifier Control (ADHC) detects humidity below the set point, and provided the humidifier is turned on and the HVAC system blower is operating, the internal controller in the humidifier energizes the electrodes and measures the current flowing through the water between them. The controller adjusts water level in the canister via a fill valve and a drain valve to maintain a constant current. The operating water level in the canister depends on the mineral content of the water which determines conductivity.

The ADHC has the ability to turn on the HVAC system blower if the homeowner or installer chooses to utilize that feature. See ADHC installation manual.

INSTALLATION OPTIONS AND EFFECT OF WATER CHARACTERISTICS

Your Model 800 Steam Humidifier can be installed to operate using 120 Volts, 208 Volts or 240 Volts. The higher the voltage, the higher the potential output:

Voltage	Rated Output
120 Volts	4 lbs./hour (11.5 gallons/day maximum)
208 Volts	7 lbs./hour (20.5 gallons/day maximum)
240 Volts	8 lbs./hour (23.3 gallons/day maximum)

It may take several days for the humidifier to reach rated capacity depending on the input voltage and the electrical conductivity of the water. 120 volt systems take longer to reach rated capacity than 240 volt systems. The humidifier should always be plumbed to cold water but the water can be softened or unsoftened. "Hard" water, which has a high mineral content, and softened water generally have higher conductivity than naturally soft water. Systems plumbed to higher conductivity water will reach capacity sooner than systems plumbed to low conductivity water. As the humidifier operates, minerals build up in the canister, which increases the conductivity of the water. With a new canister, allowing the humidifier to operate continuously (along with the HVAC system blower) will allow it to reach rated capacity in the shortest amount of time.

OPERATING MODES

When the humidifier is powered and turned on, the "On/Off" light is illuminated green.

When the canister is being filled or replenished with water, the "Fill" light illuminates green.

When the canister is being drained, the "Drain" light illuminates green.

During initial start up with a new canister, the humidifier may run through a series of fill/drain cycles until the conductivity of the water is in a range that allows normal operation. During this time, the "Steam" light illuminates green. If the humidifier cannot produce steam at the rated level after trying for 168 hours, the "Steam" light illuminates yellow. The humidifier continues to operate in this state until the rated output is reached.

The conductivity of naturally soft water, hard water, and softened water changes as the water heats up, but the internal controller adjusts the water level to maintain a nominal current between the electrodes. Over the life of the canister, minerals that build up on the electrodes will reduce their effective surface area and affect the resistance between them. The

operating water level will increase with use until it reaches the high water level probe. At that point, the "Service" light will flash red indicating that the canister needs to be replaced. The humidifier will continue to operate but with reduced output.

When the humidifier begins a drain cycle, the fill valve opens to introduce cold water into the canister. This is done to prevent hot water from entering the drain. The drain valve remains open for four minutes to allow all water to drain from the canister.

Any time power is disconnected or humidifier is turned off, the internal timer for start-up and drain cycles is reset.

If the humidifier has operated 168 hours without a drain cycle, the drain valve will open and drain the canister. Normal operation will continue.

If the humidifier is operating and a power failure occurs, once power is restored, the "On/Off" light will flash green for one minute, then the humidifier will turn on.

END OF SEASON/PERIOD OF INACTIVITY SHUT-DOWN

If the humidifier does not receive a call to operate in 72 hours, the humidifier controller drains the canister. The drain light will remain on until there is a humidity call or 24 hours has elapsed. The humidifier will resume normal operation when a call for humidity is made.

DISPLAY PANEL

TABLE 1 – Display Panel






Indicator	Light	Function
 On/Off	Off	Humidifier is turned off or not receiving power.
	Solid Green	Humidifier is turned on.
	Flashing Green	Humidifier is preparing to turn on. Occurs if power is disconnected, then restored with switch ON. Flashes for one minute.
 Fill	Solid Green	Normal Operation. Fill valve is energized allowing water to flow into canister via fill cup. (Does not illuminate when tempering water during drain cycle.)
	Flashing Green	Fill and Drain Valves are pulsing to dislodge mineral build-up in canister. Flashes 10 times in four seconds.
	Solid Red	Fault Mode. Indicates canister needs water but cannot fill. Humidifier shuts down. (Occurs if high water probe does not detect water after fill valve is energized for 40 minutes.)

TABLE 1 – Display Panel (continued)

Indicator	Light	Function
 Steam	Solid Green	Normal Operation. Humidistat is calling for steam and humidifier is operating.
	Solid Yellow	Humidifier is operating but is not delivering steam at rated capacity. Occurs if humidifier has operated for 168 hours at less than rated capacity due to low water conductivity. Light will turn green once water conductivity increases and humidifier is delivering rated capacity.
 Drain	Flashing Green	Humidifier is preparing to drain. (Fill valve is open tempering water in canister.) Occurs when humidifier is turned off, at end of season drain (72 hours with no operation) and during forced drain down (168 hours of operation with no drain activity.)
	Solid Green	Fill and Drain Valves are pulsing to dislodge mineral build-up in canister. Flashes 10 times in four seconds.
		Drain valve is energized and open, draining canister. Valve remains energized for four minutes.
 Service	Flashing Red	Canister has reached the end of its life and needs to be replaced. Occurs after humidifier has operated for at least 168 hours and for an additional 24 hours at a current level below 75% of the maximum operating current. Humidifier continues to operate, but at reduced capacity.
	Solid Red	Operational problem with humidifier. Humidifier shuts down. Occurs when unit detects over-current which can be caused by failure to drain or other system failures. Call your heating and air conditioning dealer for service.

OPERATING INSTRUCTIONS – DIGITAL HUMIDIFIER CONTROL

The Digital Humidifier Control offers two modes of operation, Automatic or Manual. An explanation of both modes follows. (See **Figure 2** on page 10 for Automatic Mode. See **Figure 3** on page 11 for Manual Mode.)

When in the Automatic Mode, this system offers the following benefits:

- **You will receive the optimum amount of humidity so that your home and its furnishings are protected from the damaging effects of excess condensation or low humidity during the heating season.** The Control automatically adjusts your home’s humidity based on the outdoor temperature, increasing the time maximum comfort is maintained.
- **Simple operation with few adjustments.** In the Automatic Mode, the Control eliminates the need to manually adjust the control when outdoor temperature changes. It also eliminates the need to turn the dial setting to “OFF” during the summer season.

DIGITAL HUMIDIFIER CONTROL INDICATOR LIGHTS

Call Dealer for Service: The red light indicates that the control is not operating normally and that service is required.

Humidifier On: The green light indicates that the control is operating normally and sending a call for humidity to the humidifier.

BLOWER ACTIVATION

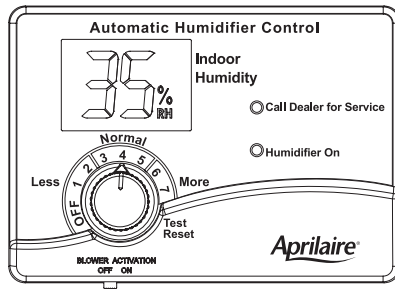
Set the ADHC Blower Activation Switch to “ON” to allow the Humidifier Control to activate the furnace fan for additional humidification. Refer to **TABLE 4 – Operation Guide**. This may be required if the humidifier is mounted on a heat pump or a furnace with short run cycles.

When the Blower Activation switch is “ON”, the Humidifier Control will turn on the HVAC blower when humidity is required. In the “OFF” position, the humidifier will only operate if humidity is required and the HVAC system is operating.

When the Blower Activation switch is “ON”, the Humidifier Control may periodically turn the HVAC blower on to sample the humidity of the air.

AUTOMATIC MODE

FIGURE 2 – Automatic Mode



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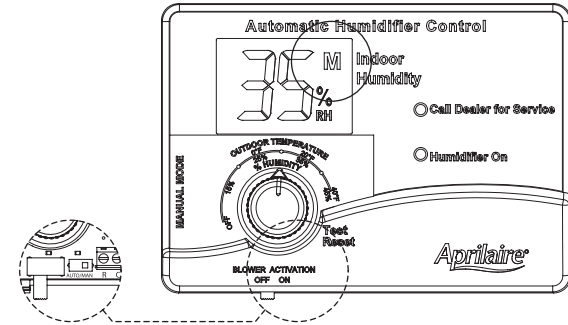
Your Aprilaire Humidifier Control must be installed in the cold air return duct. **During the first heating season**, your Humidifier Control needs to be set initially to match your home's condition. Please follow these steps when adjusting your control (refer to **Figure 2**).

1. Turn the dial setting knob to "5", which is within the normal range. During the next 24-48 hours it may be necessary to adjust the dial for more or less humidity, depending on your personal comfort and home's requirements. Refer to **TABLE 4 – Operation Guide**.
2. During the coldest portion of the first heating season, minor adjustments may be necessary. This is dependent upon your home's construction. Refer to **TABLE 4 – Operation Guide**.

The humidity in your home will now be accurately controlled to meet your needs and should not need further adjustment during future heating seasons. Make note of the dial setting in the event you temporarily move the knob to "OFF" when performing annual maintenance of your Aprilaire humidifier.

MANUAL MODE

FIGURE 3 – Manual Mode



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When installed in the Manual Mode (see **Figure 3** – internal switch in "MAN" position and "M" in the display), it is important to anticipate a drop in outdoor temperature and reduce the setting accordingly to avoid excessive condensation. For example, with an outdoor temperature of 20°F the correct setting will be 35%. If the temperature is expected to fall to 0°F that evening, then merely reduce the setting to 25% several hours prior to the temperature change.

See **Table 2** for the recommended settings. These settings, which are based on years of research, represent a compromise between humidity levels that would be most desirable for comfort and humidity levels that are suitable for protection of your home and to avoid condensation on your windows. For example, a wintertime indoor humidity of 50% may be considered ideal for comfort, but unfortunately, it probably would result in condensation, which can cause damage to your home. Observing the recommended humidity levels on your Humidifier Control is an important safeguard. Condensation of water on the inside surface of windows in the form of fogging or frost is usually an indication of too much humidity. This same condensation can occur in other areas in your home, possibly resulting in damage.

TABLE 2 – Outdoor Temperature/Indoor Relative Humidity

Outside Temperature	Recommended RH
+40°F	45%
+30°F	40%
+20°F	35%
+10°F	30%
0°F	25%
-10°F	20%
-20°F	15%

TEST/RESET

The Test/Reset feature allows the humidifier operation to be checked even if there is no call for humidity. See “Check the Humidifier Operation” on page 13.

ADDITIONAL INFORMATION – AUTOMATIC MODE

Your humidifier is a precision system that will accurately maintain the humidity in your home. For every 2°F change in outdoor temperature, the Digital Humidifier Control will automatically adjust the indoor humidity by 1%.

The Digital Humidifier Control will accurately control the humidity in your home to a maximum of 45%.

The humidity Values in **Table 3** are targets based on outdoor temperature and the Digital Humidifier Control setting. The actual humidity may vary due to conditions in the home (cooking, showering, etc.).

		Outdoor Temperature (°F)						
		-10°F	0°F	10°F	20°F	30°F	40°F	
Dial Setting	1	10%	10%	10%	15%	20%	25%	Relative Humidity (%)
	2	10%	10%	15%	20%	25%	30%	
	3	10%	15%	20%	25%	30%	35%	
	4	15%	20%	25%	30%	35%	40%	
	5	20%	25%	30%	35%	40%	45%	
	6	25%	30%	35%	40%	45%	45%	
	7	30%	35%	40%	45%	45%	45%	

TABLE 4 – Automatic Humidifier Control Operation Guide

Condition	Solution
Condensation on windows.	Reduce the setting on the control dial by 1 increment.
Lack of humidity.	Increase the setting on the control dial by 1 increment.
Humidifier does not turn on.	Make certain HVAC blower is operating. Turn dial to “Test/Reset”. If unit still does not operate, consult a heating contractor.
Humidifier won’t shut off.	Turn control dial to “Off”. If unit continues to produce steam (steam light on), disconnect main power to turn off the humidifier and consult a heating contractor.
Test mode.	Make certain HVAC blower is operating. System operation is checked by setting the knob to “Test/Reset”. Humidifier will operate for one minute.
Red “Call Dealer for Service” light flashes (Figure 2).	Note the error code on the display (E1, E2, E3 or E4) and call your heating and air conditioning dealer for service.

CHECK THE HUMIDIFIER OPERATION

DIGITAL HUMIDIFIER CONTROL

Set the knob to “Test/Reset”, make sure that the water saddle valve is open and that the humidifier is on. The HVAC fan must be running for the humidifier to function. The humidifier will only operate for 1 minute in test mode. Reduce the Humidifier Control setting to the recommended inside humidity, depending on the outside temperature. **DO NOT LEAVE IN TEST MODE AS HUMIDIFIER WILL NOT OPERATE.**

ADDITIONAL INFORMATION

Be sure to keep fireplace dampers closed when not in use. They provide an excellent escape route for heat, as well as humidity.

On occasion, indoor moisture producing activities such as clothes drying, cooking, showers, etc., may raise the humidity level higher than it should be, even though the Aprilaire humidifier is not operating. Telltale indications are condensation or frost on cold surfaces such as windows, doors, walls, etc. If such condensation persists for several hours, your home should be ventilated to dissipate the potentially damaging excess moisture.

MAINTENANCE

Turn humidifier off and allow humidifier to drain. Disconnect power before servicing.

Inspect Humidifier at approximately 500 hour intervals or several times during the humidification season.

- Check system operation and inspect all plumbing connections and piping for signs of cracks or leaks.
- Inspect drain line to make sure it is not blocked and has constant downward slope. Clean or replace if necessary.
- Inspect steam hose to make sure it has no low spots and has constant upward slope from humidifier to dispersion tube in duct. If dispersion tube is mounted below humidifier, inspect drip tee drain.

TO REPLACE THE CANISTER

Replace the canister annually and when prompted by the "Service" light. Use Only Genuine Aprilaire Model 80 Canister.

1. Press On/Off switch to turn humidifier off. Humidifier will drain for four minutes.
2. Allow humidifier to drain. When the green "drain" LED stops flashing, disconnect main electrical power to humidifier.
3. Remove front panel.
4. Pull three wires off posts on top of canister. (Two large electrode conductors and one water level probe conductor.)
5. Loosen hose clamp at top of canister.
6. Slide hose off top of canister.
7. Slide canister up and out of drain assembly. Discard canister.
8. Remove o-ring from drain assembly using small screw driver.
9. Inspect drain assembly and remove any debris. See drain valve cleaning procedure in Installation & Maintenance manual.
10. Insert new o-ring into slot in drain assembly. (O-ring is provided with Model 80 canister.) Dampen o-ring with water before inserting canister. Do not use oil, grease, or any lubricant besides water.
11. Make sure strainer is inserted into bottom of new canister.
12. Insert canister into drain assembly. Position canister with label facing outward.
13. Slip steam hose over top of canister and tighten hose clamp.
14. Reattach three wires to posts on top of canister. (Larger electrode conductors are interchangeable.)
15. Replace front panel.
16. Inspect drain line to make sure it is not blocked and has constant downward slope. Clean or replace if necessary.
17. Inspect steam hose to make sure it has no low spots and has constant upward slope from humidifier to dispersion tube in duct. If dispersion tube is mounted below humidifier, inspect drip tee drain.
18. Restore electrical power to humidifier.
19. Turn humidifier on and verify green On/Off light is illuminated.
20. See Start-up procedure in Installation, Operation & Maintenance manual.

TO SERVICE FILL VALVE

If water flow from fill valve is restricted, disconnect inlet fitting and remove in-line strainer using small screw from inlet port. Clean or replace strainer.

LIMITED WARRANTY

Your Research Products Corporation Aprilaire® humidifier unit is expressly warranted for five (5) years from date of installation to be free from defects in materials or workmanship except, however, for the disposable steam canister which will have to be replaced from time to time depending upon the amount of use.

Research Products Corporation's exclusive obligation under this warranty shall be to supply, without charge, a replacement for any part of the humidifier which is found to be defective within such five (5) year period and which is returned not later than thirty (30) days after said five (5) year period by you to either your original supplier or to Research Products Corporation, Madison, Wisconsin 53701, together with the model number and installation date of the humidifier.

THIS WARRANTY SHALL NOT OBLIGATE RESEARCH PRODUCTS CORPORATION FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY YOUR INSTALLER AS CONTRASTED TO DEFECTS IN THE HUMIDIFIER ITSELF.

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFORESAID FIVE YEAR PERIOD. RESEARCH PRODUCTS CORPORATION'S LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, OTHER THAN DAMAGES FOR PERSONAL INJURIES, RESULTING FROM ANY BREACH OF THE AFORESAID IMPLIED WARRANTIES OR THE ABOVE LIMITED WARRANTY IS EXPRESSLY EXCLUDED. THIS LIMITED WARRANTY IS VOID IF DEFECT(S) RESULT FROM FAILURE TO HAVE THIS UNIT INSTALLED BY A QUALIFIED HEATING AND AIR CONDITIONING CONTRACTOR. IF THE LIMITED WARRANTY IS VOID DUE TO FAILURE TO USE A QUALIFIED CONTRACTOR, ALL DISCLAIMERS OF IMPLIED WARRANTIES SHALL BE EFFECTIVE UPON INSTALLATION.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above exclusion or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WARRANTY REGISTRATION

Visit us on-line at www.aprilaire.com to register your Aprilaire product.

If you do not have on-line access, please mail a postcard with your name, address, phone number, model number of product purchased and date of installation to:

Research Products Corporation, P.O. BOX 1467, Madison, WI 53701

**Your Warranty Registration information
will not be sold or shared outside of this company.**

Thank you!

Aprilaire®

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