

Humidifier Application Guide

Aprilaire® humidifiers can be installed on many different types of HVAC equipment and controlled to provide optimum humidity levels for each application. This Application Guide is to assist installers in selecting which Aprilaire humidifier is appropriate for a particular application and how to configure the controls to deliver optimum humidity.

To use this guide, select the application (type of HVAC equipment) and humidifier model then turn to the appropriate reference page. The reference pages will give you guidelines for installation, when and how to use blower activation, and how to connect third party controls.

Page	Application		Plenum Temperature (°F)	Recommended Model Series	Control	
					Automatic	Manual
3	Gas or Electric Heat	Air Handling Unit with accessible supply and return plenums	120-140	400, 500, 600,700, 800	60, 62, 8910, 8620	65, 4655 with model 50 or 4851
6	Boiler		120-140	400, 500, 600,700, 800	60, 62, 8910, 8620	65, 4655 with model 50 or 4851
9	Heat Pump		90-100	400, 500, 600,700, 800	60, 62, 8910, 8620	65, 4655 with model 50 or 4851
12	Air Conditioning		Below 90	800 and 800 with 850 Fan Pack	62, 8910, 8620	65, 4655 with 4851 and 8024
15	No forced air system			800 with 850 Fan Pack	8910, 8620	65, 4655
16		Air Handling Unit with no return duct		700, 800	60, 62, 8910, 8620	65, 4655 with model 50 or 4851
19		Alternate configurations and wiring diagrams		400, 500, 600, 700, 800	60, 62	

ITEMS NOT FURNISHED

Mounting screws (sheet metal screws)

Water supply line (1/4" OD copper)

18AWG low voltage wire

Bypass duct (bypass units only)

Model 50 or 4851 relays (to be used with manual humidistats only)

Note:

- Do not install where freezing temperatures can occur.
- Installation must be done by qualified contractor.
- Installations must conform to local codes.

TOOLS NEEDED

1/2" and 7/16" combination wrench

1/8" by 2" flathead screw driver

Tin snips

Wire stripper

^{*}See Installation Instructions for more information



APRILAIRE® HUMIDIFIER SPECIFICATIONS

		A. Unit Size <i>(inches)</i> B. Plenum Opening <i>(inches)</i>	Capacity gpd = gallons per day	Electical Data
and the second s	Model 700*/700M** Powered Unit — Built-in fan that pulls heated air directly from the furnace.	A. 15-29/32W x 18H x 10-11/32D B. 14-3/4W x 14-5/16H	18 gpd	120V-60Hz 0.8 AMP
GE .	Model 600*/600M** Bypass Unit – Uses the furnace blower to move air through a Water Panel®.	A. 15-3/8W x 15-3/4H x 10-1/4D 6" dia. round opening B. 10W x 12-3/4H	17 gpd	24V-60Hz 0.5 AMP
No.	Model 400*/400M** Bypass Unit – Uses 100% of water and evaporative technology that eliminates the need for a drain. Aprilaire	A. 15-3/8W x 15-3/4H x 10-1/4D 6" dia. round opening B. 10W x 12-3/4H	17 gpd	24V-60Hz 0.5 AMP
	Model 500*/500M** Bypass Unit – Designed for smaller homes.	A. 15-5/8W x 13H x 10-1/4D 6" dia. round opening B. 9-1/2W x 9-1/2H	12 gpd	24V-60Hz 0.5 AMP
	Model 800 Steam Humidifier – For applications when evaporative units are less practical (attics, crawl spaces, closets, milder winter	A. 10-1/8W x 20-7/8H x 7-1/8D B. N/A	11.5 gpd 16.0 gpd	120V-60Hz 11.5 amp 16 amp
-	climates, non-forced air heating source).		20.5 gpd 30.0 gpd	208V-60Hz 11.5 amp 16 amp
			23.3 gpd 34.6 gpd	240V-60Hz 11.5 amp 16 amp

^{* =} Automatic Digital Control (shown)

Warranty - All Aprilaire models are warranted for five (5) years from date of installation for parts.

Heat pumps – Plumbing the humidifier to hot water is recommended on all heat pump installations or if it is installed to operate independently of a call for heat.

Bypass humidifiers can be installed on the supply or return plenum.

Water usage rate - Model 700: 6GPH; Models 500, 600: 3GPH; Model 400: 0.7GPH; Model 800: 0.6-1.8GPH depending on voltage, amp draw and water quality.

HUMIDIFIER SIZING CHART (8' CEILINGS)

House Size	1000 ft²	1500 ft²	2000 ft²	2500 ft²	3000 ft²	4000 ft²	5000 ft²
Structural Tightness	Humidity needed (GPD per AHRI)*** Guideline F						
Tight	4.3	6.4	8.5	10.6	12.7	17	21.2
Average	8.6	12.8	17	21.3	25.4	34	42.6
Loose	12.7	19.1	25.5	31.8	38.1	51	63.6

^{*** =} AHRI Air Conditioning, Heating, and Refrigeration Institute GPD = Gallons Per Day Guideline F

- A family of 4 will add 2 gallons of humidity per day through everyday activities like breathing, cooking, bathing and washing.
- Evaporative capacities assume blower is active 100% of the time, plenum temperature is at 120°F and water is cold.

^{** =} Manual Control — For those rare occurrences where an automatic control is not practical, Aprilaire digital control can be installed in manual mode while still delivering the accuracy and information you need for optimum performance.

GAS OR ELECTRIC FURNACE – AIR HANDLING UNIT WITH ACCESSIBLE SUPPLY AND RETURN PLENUMS

Recommended Series: 400, 500, 600, 700, 800

Plenum Temperature

Gas and electric furnaces typically have plenum temperatures between 120 and 140°F which will maximize the evaporation process during a heat call. To optimize the performance of your evaporative humidifier, use blower activation in conjunction with HOT water.

Inlet Water Temperature

Hot or cold water can be used with evaporative humidifiers. To maximize evaporative performance plumb to HOT Water (140°F Max) and use Blower Activation.

The Model 700 series Fan Powered Humidifier must be plumbed to HOT water when installed on a return duct.

Model 400 Water Saving Humidifier can be plumbed to HOT water but the benefit is minimal.

Model 800 Steam Humidifier MUST be plumbed to COLD water only.

Variable Speed Blowers

The more HOT air delivered to the humidifier, the more humidity is delivered into the air stream. Systems with low continuous fan speeds will have reduced evaporation or absorption unless the fan speed setting is increased. Set the continuous fan speed to approximately the same speed as a heat call setting.

Plumbing evaporative humidifiers to HOT water can increase evaporation at low fan speeds.

Blower Activation

The Blower Activation feature on Model 60 and 62 humidifier controls will sample the household air if the HVAC system has been idle for one hour and will energize the HVAC fan to allow the humidifier to run for two hours or until the desired humidity level is reached, whichever comes first. If humidity levels are not reached during a normal heating call, the Blower Activation feature will extend the blower call for two hours or until the humidity call is satisfied, whichever comes first.

When using Blower Activation, plumb evaporative humidifier to HOT water. The Model 800 Steam Humidifier must be plumbed to COLD water only, in order to temper drain water.

The Blower Activation Relay (Model 4851) will activate the HVAC blower on a call for humidity when used in conjunction with a manual humidistat; plumb evaporative humidifiers to HOT water.

Third Party Controls

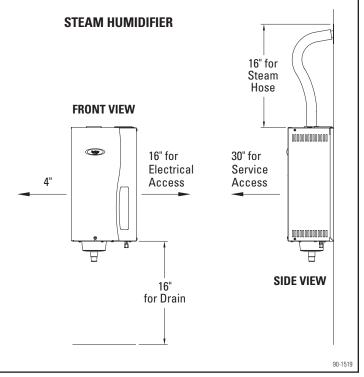
All current Aprilaire controls use a dry contact to switch 24VAC on and off. Ensure that third party controls are applied in the same manner. If a third party control provides 24VAC (10VA minimum) do not use the included 10VA transformer when installing evaporative humidifiers.

BYPASS HUMIDIFIERS RETURN RETURN RETURN SUPPLY SUPPLY SUPPLY

Series 700 mounted with AC "A" coil

DO NOT install series 700 humidifiers on horizontal duct runs.

Recommended

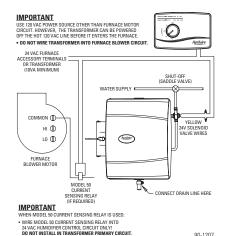


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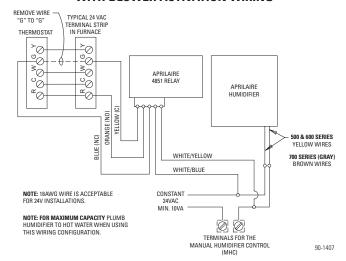
Plumb to hot water if mounted on return duct.

TYPICAL WIRING DIAGRAMS - GAS OR ELECTRIC HEAT

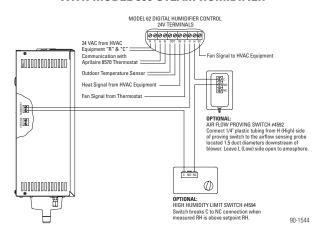
MANUAL HUMIDIFIER CONTROL WIRING



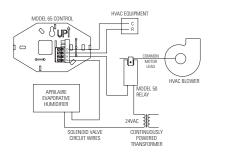
MANUAL CONTROL WITH BLOWER ACTIVATION WIRING



AUTOMATIC DIGITAL HUMIDIFIER CONTROL WITH MODEL 800 STEAM HUMIDIFIER

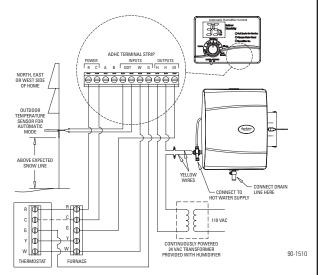


DIGITAL MANUAL CONTROL WIRING

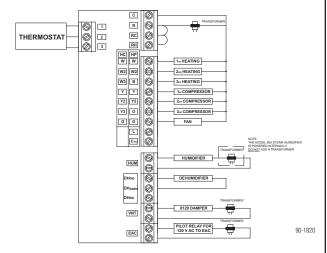


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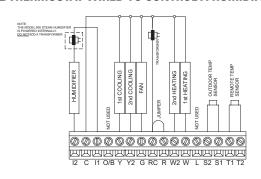
AUTOMATIC DIGITAL CONTROL WIRING



HOME COMFORT CONTROL™ WIRING



IAQ THERMOSTAT WIRED TO CONTROL A HUMIDIFIER



90-1822

BOILER – AIR HANDLING UNIT WITH ACCESSIBLE SUPPLY AND RETURN PLENUMS

Recommended Series: 400, 500, 600, 700, 800

Plenum Temperature

Boilers typically produce plenum temperatures between 120 and 140°F which will maximize the evaporation process during a heat call. To optimize the performance of your evaporative humidifier, use Blower Activation in conjunction with HOT water. Mount humidifier or bypass duct downstream of the hot water coil.

Inlet Water Temperature

Hot or cold water can be used with evaporative humidifiers. To maximize evaporative performance plumb to HOT Water (140°F Max) and use Blower Activation

The Model 700 series Fan Powered Humidifier must be plumbed to HOT water when installed on a return duct.

Model 400 Water Saving Humidifier can be plumbed to Hot water but the benefit is minimal.

Model 800 Steam Humidifier MUST be plumbed to COLD water only.

Variable Speed Blowers

The more HOT air delivered to the humidifier, the more humidity is delivered into the air stream. Systems with low continuous fan speeds will have reduced evaporation or absorption unless the fan speed setting is increased. Set the continuous fan speed to approximately the same speed as a heat call setting.

Plumbing evaporative humidifiers to HOT water can increase evaporation at low fan speeds.

Blower Activation

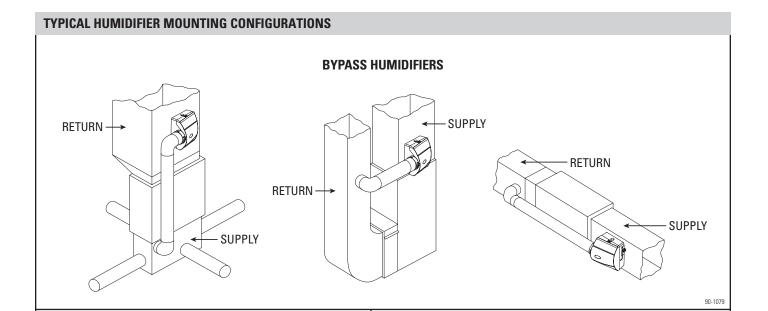
The Blower Activation feature on Model 60 and 62 humidifier controls will sample the household air if the HVAC system has been idle for one hour and will energize the HVAC fan to allow the humidifier to run for two hours or until the desired humidity level is reached, whichever comes first. If humidity levels are not reached during a normal heating call, the Blower Activation feature will extend the blower call for two hours or until the humidity call is satisfied, whichever comes first.

When using Blower Activation, plumb evaporative humidifier to HOT water. The Model 800 Steam Humidifier must be plumbed to COLD water only, in order to temper drain water.

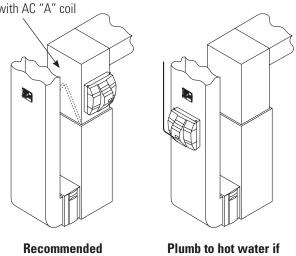
The Blower Activation Relay (Model 4851) will activate the HVAC blower on a call for humidity when used in conjunction with a manual humidistat; plumb evaporative humidifiers to HOT water.

Third Party Controls

All current Aprilaire controls use a dry contact to switch 24VAC on and off. Ensure that third party controls are applied in the same manner. If a third party control provides 24VAC (10VA minimum) do not use the included 10VA transformer when installing evaporative humidifiers.



FAN POWERED HUMIDIFIER Series 700 mounted with AC "A" coil



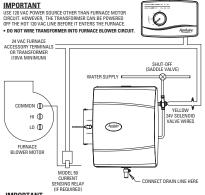
DO NOT install series 700 humidifiers on horizontal duct runs.

mounted on return duct.

STEAM HUMIDIFIER 16" for Steam Hose **FRONT VIEW** 30" for 16" for Electrical Service 4" Access Access 1000000000000000 **SIDE VIEW** 16" for Drain

TYPICAL WIRING DIAGRAMS - BOILER

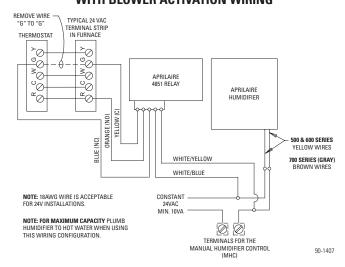
MANUAL HUMIDIFIER CONTROL WIRING



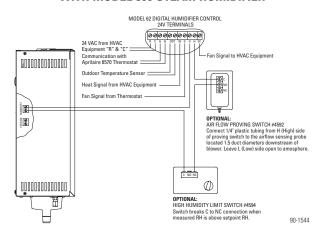
<u>IMPORTANT</u>

WHEN MODEL 50 CURRENT SENSING RELAY IS USED: WHEN MODEL 50 CORNEY SENSING RELAY INTO
24 VAC HUMIDIFIER CONTROL CIRCUIT ONLY!
DO NOT INSTALL IN TRANSFORMER PRIMARY CIRCUIT.

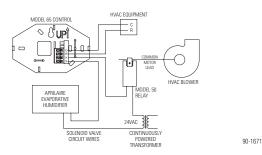
MANUAL CONTROL WITH BLOWER ACTIVATION WIRING



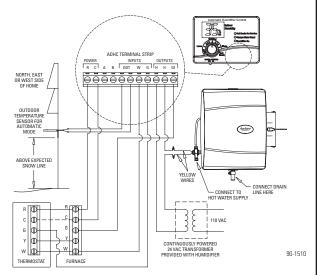
AUTOMATIC DIGITAL HUMIDIFIER CONTROL WITH MODEL 800 STEAM HUMIDIFIER



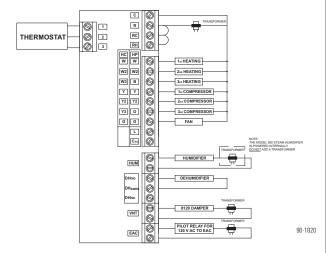
DIGITAL MANUAL CONTROL WIRING



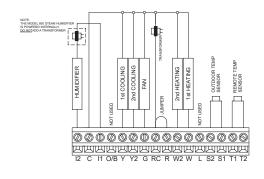
AUTOMATIC DIGITAL CONTROL WIRING



HOME COMFORT CONTROL™ WIRING



IAQ THERMOSTAT WIRED TO CONTROL A HUMIDIFIER



HEAT PUMP – AIR HANDLING UNIT WITH ACCESSIBLE SUPPLY AND RETURN PLENUMS

Recommended Series: 400, 500, 600, 700, 800

Plenum Temperature

Heat pumps typically have plenum temperatures between 90 and 100°F which require HOT water to aid in the evaporation process. Using Blower Activation will help maintain humidity levels in the home. Series 400 Humidifiers will perform at reduced capacity due to lower plenum temperatures.

Inlet Water Temperature

To maximize evaporative performance plumb to HOT Water (140°F Max) and use Blower Activation.

The Model 700 series Fan Powered Humidifier must be plumbed to HOT water when installed on a return duct.

Model 400 Water Saving Humidifier can be plumbed to Hot water but the benefit is minimal.

Model 800 Steam humidifier MUST be plumbed to COLD water only.

Variable Speed Blowers

The more HOT air delivered to the humidifier, the more humidity is delivered into the air stream. Systems with low continuous fan speeds will have reduced evaporation or absorption unless the fan speed setting is increased. Set the continuous fan speed to approximately the same speed as a heat call setting.

Plumbing evaporative humidifiers to HOT water can increase evaporation at low fan speeds.

Blower Activation

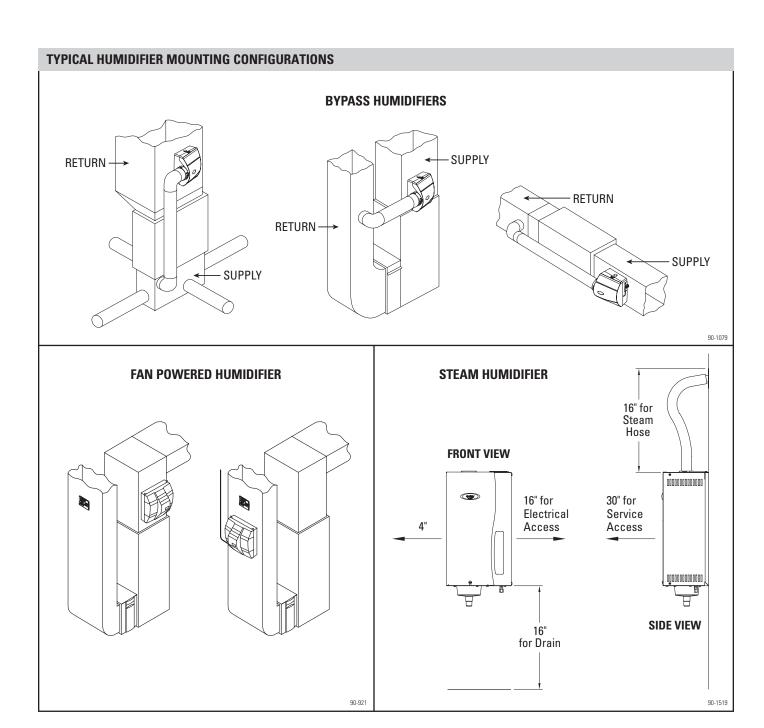
The Blower Activation feature on Model 60 and 62 humidifier controls will sample the household air if the HVAC system has been idle for one hour and will energize the HVAC fan to allow the humidifier to run for two hours or until the desired humidity level is reached, whichever comes first. If humidity levels are not reached during a normal heating call, the Blower Activation feature will extend the blower call for two hours or until the humidity call is satisfied, whichever comes first.

When using Blower Activation, plumb evaporative humidifier to HOT water. The Model 800 Steam Humidifier must be plumbed to COLD water only, in order to temper drain water.

The Blower Activation Relay (Model 4851) will activate the HVAC blower on a call for humidity when used in conjunction with a manual humidistat; plumb evaporative humidifiers to HOT water.

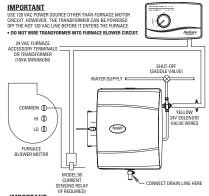
Third Party Controls

All current Aprilaire controls use a dry contact to switch 24VAC on and off. Ensure that third party controls are applied in the same manner. If a third party control provides 24VAC (10VA minimum) do not use the included 10VA transformer when installing evaporative humidifiers.



TYPICAL WIRING DIAGRAMS – HEAT PUMP

MANUAL HUMIDIFIER CONTROL WIRING



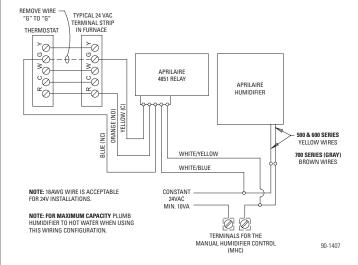
IMPORTANT

WHEN MODEL 50 CURRENT SENSING RELAY IS USED:

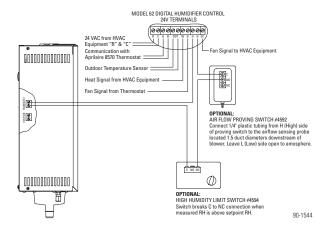
WIRE MODEL 50 CURRENT SENSING RELAY INTO 24 VAC HUMIDHIER CONTROL CIRCUIT ONLY DO NOT INSTALL IN TRANSFORMER PRIMARY CIRCUIT.

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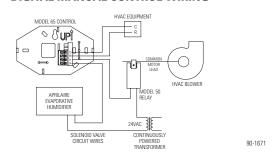
MANUAL CONTROL WITH BLOWER ACTIVATION WIRING



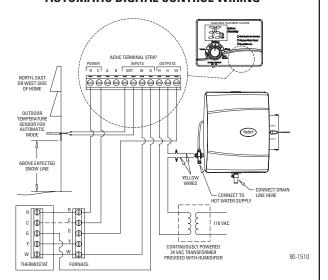
AUTOMATIC DIGITAL HUMIDIFIER CONTROL WITH MODEL 800 STEAM HUMIDIFIER



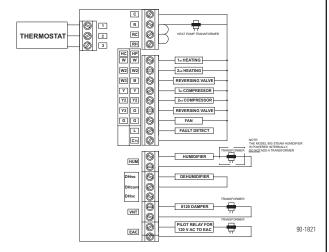
DIGITAL MANUAL CONTROL WIRING



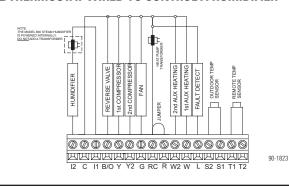
AUTOMATIC DIGITAL CONTROL WIRING



HOME COMFORT CONTROL™ WIRING



IAQ THERMOSTAT WIRED TO CONTROL A HUMIDIFIER



AIR CONDITIONING – AIR HANDLING UNIT WITH ACCESSIBLE SUPPLY AND RETURN PLENUMS

Recommended Series: 800, 800 with 850 Fan Pack

A CAUTION – Condensation Damage.

Cold surfaces of cooling coils and ductwork will cause condensation.

Size the Model 800 absorption distance appropriately for the cold temperatures or lock out humidifier during AC calls.

Plenum Temperature

For plenum temperatures below 90°F.

For more effective humidification, lock out the humidifier during an AC call and run with Blower Activation only.

Inlet Water Temperature

Model 800 Steam humidifier MUST be plumbed to COLD water only.

Variable Speed Blowers

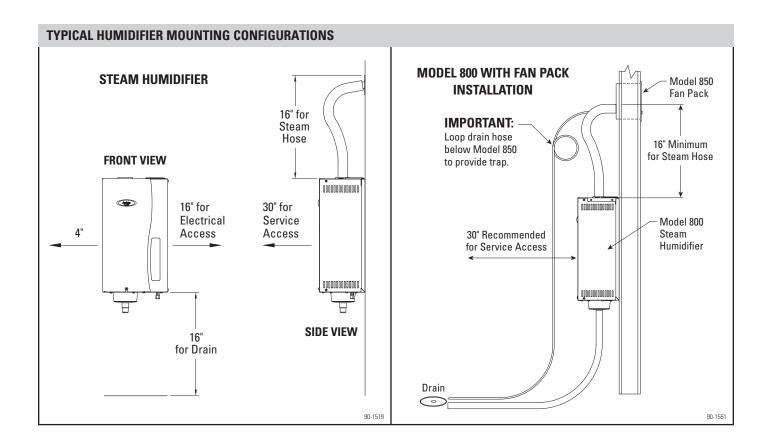
The more hot air delivered to the dispersion tube, the faster steam is absorbed into the air stream. Systems with low continuous fan speeds will have reduced absorption unless the fan speed setting is increased. Set the continuous fan speed to approximately the same speed as a heat call setting.

Blower Activation

The Blower Activation feature on the Model 62 humidifier control will sample the household air if the HVAC system has been idle for one hour and will energize the HVAC fan to allow the humidifier to run for two hours or until the desired humidity level is reached, whichever comes first. If humidity levels are not reached during a normal heating call, the Blower Activation feature will extend the blower call for two hours or until the humidity call is satisfied, whichever comes first.

The Model 800 Steam Humidifier must be plumbed to COLD water only, in order to temper drain water.

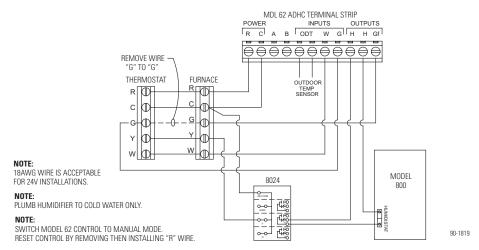
Third Party Controls



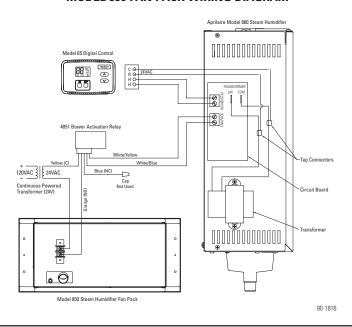
TYPICAL WIRING DIAGRAMS - AC ONLY

When configuring the humidifier control to run during the AC season, switch control to manual mode. Reset the humidifier control by removing then reinstalling the R wire on the control terminal.

MODEL 800 WITH MODEL 62 ADHC CONTROL CONFIGURED TO RUN OUTSIDE AC CALL



MODEL 850 FAN PACK WIRING DIAGRAM



SYSTEMS WITHOUT DUCTWORK

Recommended Models: 800 with 850 Fan Pack

Inlet Water Temperature

Model 800 Steam Humidifier MUST be plumbed to COLD water only.

Drain Trap Assembly

Condensate in the steam line can cause gurgling as it runs back into the canister during normal operation, adding a Drain Trap Assembly (part number 4028) to the steam hose as it leaves the Model 800 housing can alleviate problematic noises.

Model 65 control

The model 65 control must be mounted on a wall at least four feet away from the fan pack in the space that the fan pack discharges into.

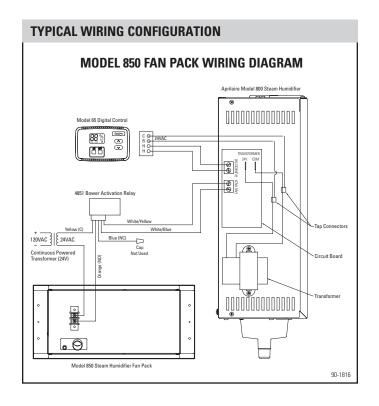
Fan Pack

The Model 850 Fan Pack will energize when the Model 800 Steam Humidifier receives a call for humidity. The Fan Pack will remain energized for two minutes after the humidity call is satisfied.

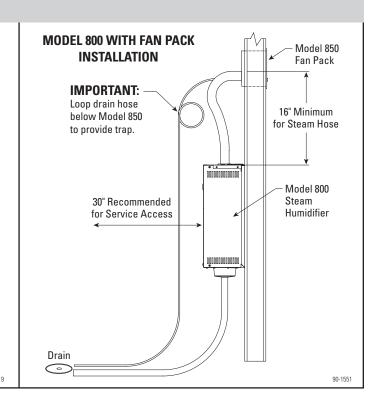
Third Party Controls

The Model 850 Fan Pack is supplied with a Model 65 digital manual control. If a third party control is used, ensure it dry contact to switch 24VAC On and Off.

The Model 800 supplies 24VAC internally. If a third party control that supplies 24VAC is used with the Model 800, use an isolation relay to switch power. DO NOT apply 24 VAC to the HUMIDISTAT terminals.



AUTOMATIC DIGITAL HUMIDIFIER CONTROL WITH MODEL 800 STEAM HUMIDIFIER FRONT VIEW 16" for Electrical Access 16" for Drain



AIR HANDLING UNIT WITH AN INACCESSIBLE SUPPLY OR RETURN PLENUM

Recommended Series: 700, 800

Plenum Temperature

Plenum temperatures between 120 and 140°F will maximize evaporation or steam absorption, plenum temperatures less than 120°F require a supply mounted Series 700 humidifier to be plumbed HOT water to aid in the evaporation process. Return duct mounted Series 700 must be plumbed to HOT water.

Inlet Water Temperature

Hot or cold water can be used with Series 700 humidifiers. However to maximize evaporative performance plumb to HOT Water (140°F Max).

The Model 700 series Fan Powered Humidifier must be plumbed to HOT water when installed on a return duct.

Model 800 Steam Humidifier MUST be plumbed to COLD water only.

Variable Speed Blowers

The more HOT air delivered to the humidifier, the more water is absorbed into the air stream. Systems with low continuous fan speeds will have reduced evaporation or absorption unless the fan speed setting is increased. Set the continuous fan speed to approximately the same speed as a heat call setting.

Plumbing Series 700 humidifiers to HOT water can increase evaporation at low fan speeds.

Blower Activation

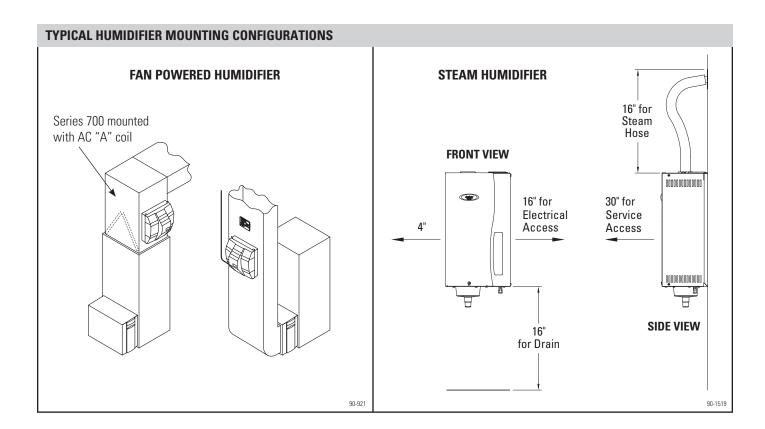
The Blower Activation feature on Model 60 and 62 humidifier controls will sample the household air if the HVAC system has been idle for one hour and will energize the HVAC fan to allow the humidifier to run for two hours or until the desired humidity level is reached, whichever comes first. If humidity levels are not reached during a normal heating call, the Blower Activation feature will extend the blower call for two hours or until the humidity call is satisfied, whichever comes first.

When using Blower Activation plumb Series 700 humidifier to HOT water; the Model 800 Steam Humidifier must be plumbed to COLD water only, in order to temper drain water.

The Blower Activation Relay (Model 4851) will activate the HVAC blower on a call for humidity when used in conjunction with a manual humidistat; plumb Series 700 humidifiers to HOT water.

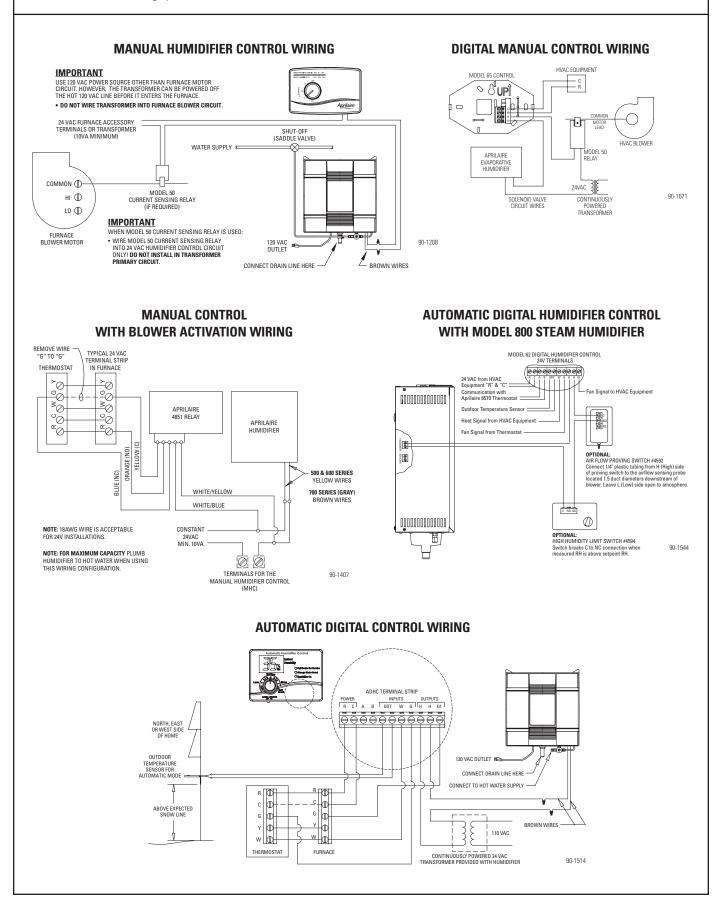
Third Party Controls

All current Aprilaire controls use a dry contact to switch 24VAC on and off. Ensure that third party controls are applied in the same manner. If a third party control provides 24VAC (10VA minimum) do not use the included 10VA transformer when installing Series 700 humidifiers.

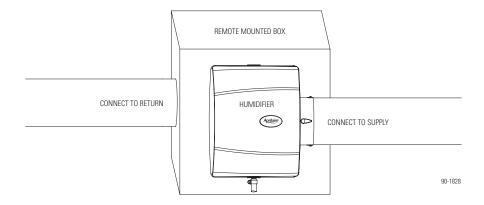


TYPICAL WIRING DIAGRAMS - INACCESSIBLE SUPPLY OR RETURN PLENUM

NOTE: Humidifier controls should only be mounted on the return plenum. If the return plenum is inaccessible, mount a manual or digital manual control in the living space to be humidified.

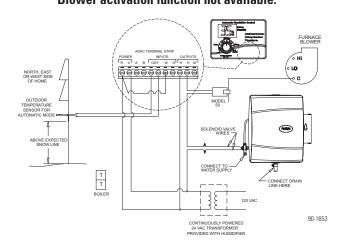


AIR HANDLING UNIT ALTERNATE MOUNTING FOR TIGHT SPACES

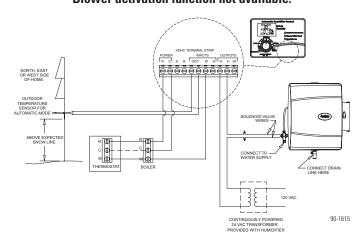


ALTERNATE WIRING DIAGRAMS

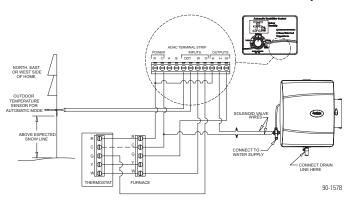
MODEL 60 WIRING FOR MODEL 400, 500, 600 & 700 SERIES HUMIDIFIERS Boiler (T,T) or Oil Furnace with Model 50 Blower activation function not available.



MODEL 60 WIRING FOR MODEL 400, 500, 600 & 700 SERIES HUMIDIFIERS Boiler (R,C,W) or Oil Furnace Blower activation function not available.



MODEL 60 WIRING FOR MODEL 400, 500, 600 & 700 SERIES HUMIDIFIERS Humidistat & Solenoid Powered from Furnace Furnace Transformer must have a minimum of 10 VA to spare.



MODEL 60 WIRING FOR MODEL 400, 500, 600 & 700 SERIES HUMIDIFIERS TO COMMUNICATING HVAC SYSTEM Blower activation function not available.

