Model 8120X Digital Ventilation Controller

Installation and Operation Manual

READ AND SAVE THESE INSTRUCTIONS

TABLE OF CONTENTS

WARNINGS AND CAUTIONS

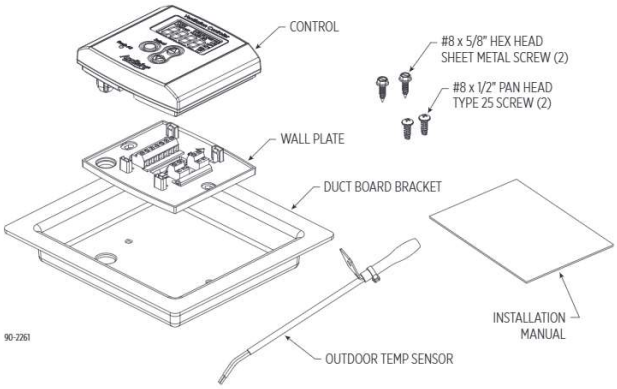
⚠ WA

- 120 volts can cause serious injury from elect HVAC system before proceeding.
- Sharp metal edges can cause serious injury in sheet metal.

NO

- When installing the Ventilation Controller or blower continues to run sufficiently long aft temperatures from exceeding the maximum
- Do not mount the Ventilation Controller dov humidifier bypass or zone control bypass. Fa Ventilation Controller to operate incorrectly.

PACKAGE CONTENTS



SPECIFICATIONS

Operating Temperature Range	20°F – 140°F
Maximum Load on VENT and Gh Outputs	10 VA @ 30 VAC max
Input Voltage	18-30 VAC
Controller Power Consumption	2.0 VA

MOUNTING THE CONTROLLER AND

MOUNTING TO AN 8140NC VENTILATOR

NOTE: In hot/humid climates where limiting ve
mount the control to the return duct and mount
pages 6-9.

If humidity limits will not be used, then the contr
8140NC and the outdoor temperature sensor doe

1. Remove the wall plate from the control and put the rest of the control in a safe location until after wiring is completed.
2. Remove the sensor hole plug from the cover of the Model 8140NC.
3. Use the supplied #8 x 1/2" hex head sheet metal screws to mount the wall plate to the cover of the Model 8140NC.

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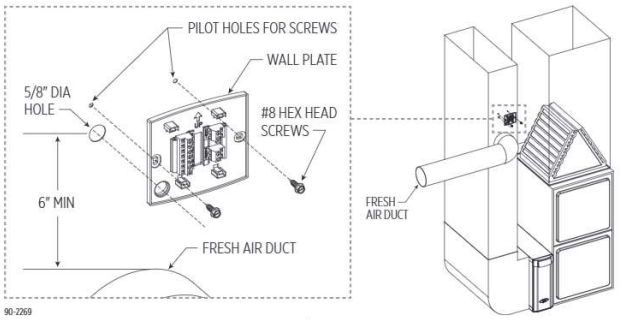
MOUNTING THE CONTROLLER TO THE RETURN DUCTWORK

NOTE: Mount the controller to the return ductwork at a location where the temperature and humidity in the duct is most representative of the home. Keep the controller at least 6" upstream from the point where the fresh air duct enters the return duct, and 6" upstream from a humidifier outlet.

Sheet Metal Installation

1. Remove the wall plate from the control and put the rest of the control in a safe location until after wiring is completed.
2. Mark the location of the wall plate sensor hole on the duct. Use a step-drill bit to create a 5/8" (.625") hole for the sensor.
3. Center the sensor hole in the wall plate over the hole in the duct, level the wall plate and mark the locations of the two mounting slots. Drill a small pilot hole using a #36 (.106") or smaller drill bit at the two mounting locations.
4. Use the supplied #8 standard hex head sheet metal screws to mount the wall plate to the duct.



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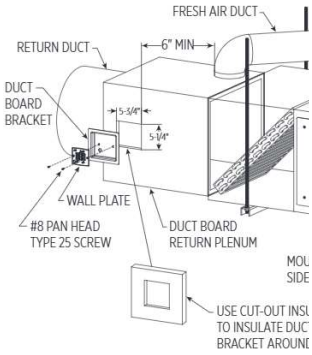
Duct Board Installation

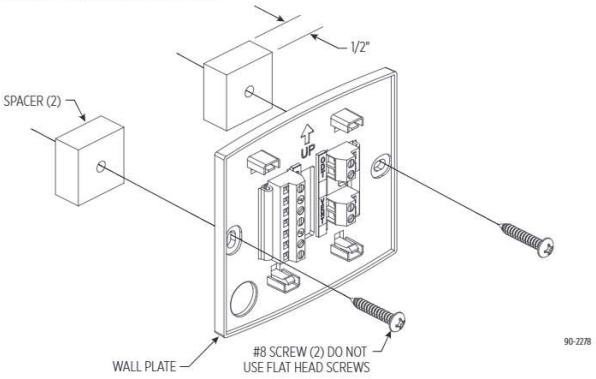
1. Take out the duct board mounting bracket, re
   rest of the control in a safe location until after
2. Cut a 5.75" x 5.25" rectangular opening in the
   insulate the duct board bracket around the co
   parallel with the long dimension. DO NOT MO
   FACING DOWN.
3. Use the supplied #8 x 1/2" type 25 pan head s
   duct board mounting bracket.
4. Place the bracket in the cut out and seal in pl
5. Insulate the duct board bracket around the w



MOUNTING THE CONTROLLER IN A CLOSET RETURN PLENUM

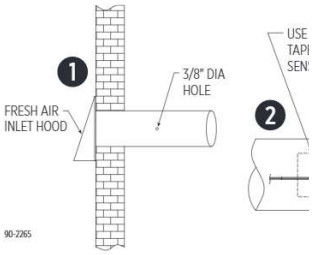
NOTE: Do not mount directly in the path of the outdoor air. Mount the control where it will sense the relative humidity of the return air.

1. Remove the wall plate from the control and put the rest of the control in a safe location until after wiring is complete.
2. Use spacers or brackets to mount the controller to an inside wall surface or return plenum/duct surface that is at room temperature (i.e. do not mount to supply ductwork or to the air handler/furnace) to space the wall bracket a minimum of ½" away from the surface.
3. Mount the wall bracket to the surface using #8 screws (field supplied – **do not use flat head screws)** and wall anchors (field supplied) if mounting to drywall. Ensure that there is room for air to flow behind the wall bracket. **DO NOT install screws in the wall bracket anywhere except intended mounting holes.**



MOUNTING THE OUTDOOR TEMPERATURE SE

1. Drill a 3/8" diameter hole in the duct of the fr
2. Install the outdoor temperature sensor into th and seal the opening. Run the wire toward th
3. Secure ductwork to the inlet hood duct while of the insulation. Tape and/or mastic the duct



WIRING

Disconnect power to the HVAC system to prevent electrical shorts while wiring.

1. Run a 2-conductor cable from the control to the outdoor temperature sensor (if installed) and wire to the controller ODT terminals.
2. Run an 8-conductor thermostat cable from the control to the HVAC equipment. Wire the controller to the HVAC equipment in accordance with **FIGURE 1** or **FIGURE 2** diagram below. Contact customer service if wiring assistance is needed for other equipment configurations.
3. Run a 2-conductor cable from the control to either the damper in Model 8126X installations or to the Model 8140NC Fresh Air Ventilator and wire according to **FIGURE 3** or **FIGURE 4**.

FIGURE 1 – WIRING TO FURNACE

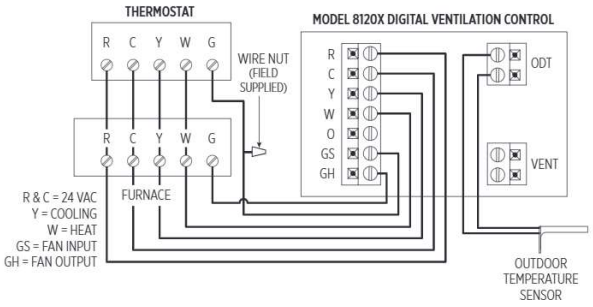


FIGURE 2 – WIRING TO HEAT PUMP

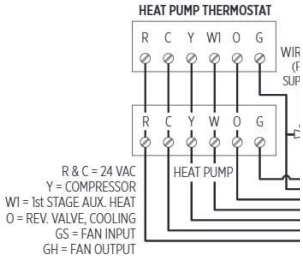


FIGURE 3 – WIRING TO MODEL 8140NC FRESH A

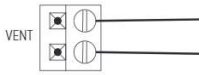
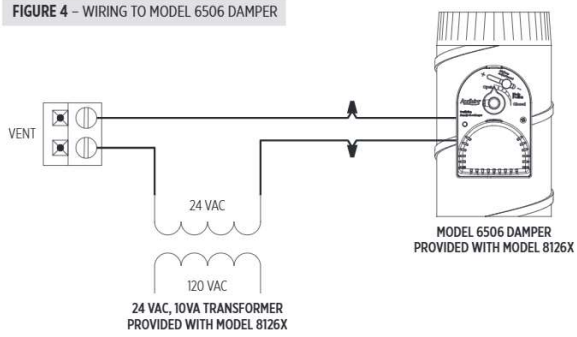
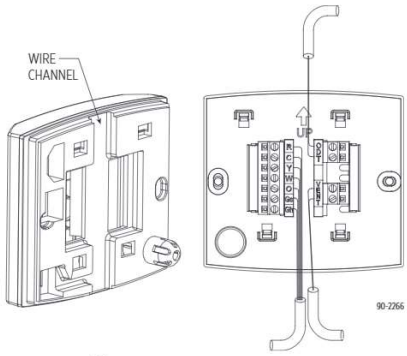


FIGURE 4 – WIRING TO MODEL 6506 DAMPER



4. Route the wires into the channels in the back of the control to either the top or bottom of the control and snap the control onto the wall plate.
5. Restore power to the HVAC system when complete.



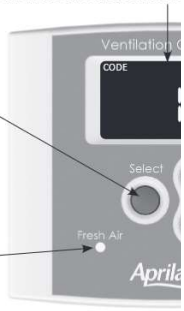
OPERATION

The display will appear faint normally; the first pr
power.

Shows the ventilation time
mode of operation (Code or
the HVAC fan has been turne

Use for
Rater/Inspector
Verification.
Press and hold
for 5 seconds to
enter Test Mode
or Set Up Menu.

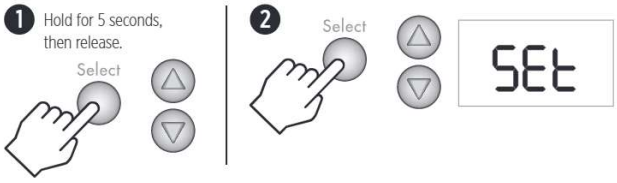
Lights green
when ventilating.



SET UP MENU

NOTICE

Before setting up the control for use, the amount of ventilation air being delivered (CFM) by the installed ventilation system must be measured.



Throughout the Set Up Menu, the ▲ and ▼ buttons are used to change values, the **Select** button is used enter the value and move on to the next Set Up Menu item.

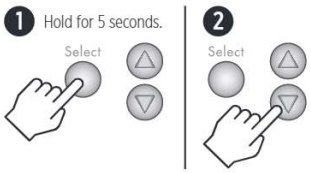
Menu Item	Values ▲▼	Desc
HC (HP / HC)	HP or HC	**HP** if **HC** if
# BEDROOMS 3	1 – 10	**Numl** conti
HOUSE (FT²) 2500	500 – 7500 ft2	**Squa** ventil
120 MEAS CFM	30 – 250 CFM	**Meas**
HIGH °F 95	OFF, 85°F – 105°F	**Venti** when OFF i
LOW °F 20	OFF, -10°F – 40°F	**Venti** when Turn
On FAN	On, "bLnd", OFF	**ON** H **bLnd** when **OFF**
HIGH °F 60 FAN	OFF, 60°F to 5°F less than Vent. High Temp. Limit	Only temp turne temp

Menu Item	Values ▲▼	Description
	OFF, 5°F less than Vent. Low Temp. Limit to 55°F	Only available when **bLnd** is selected. When the outdoor temperature is below the setting, the HVAC fan will be turned on to mix (blend) outdoor air with indoor air for tempering.
	"codE", "cFrt"	**codE** No RH limits and any missed ventilation due to temperature is made up per ASHRAE 62.2-2010. **cFrt** (comfort) Adds indoor RH limits to ventilation; ventilation missed due to limits is not made up.
	OFF, 45% - 70% RH	Only available when **cFrt** is selected. When the indoor RH exceeds the setting, ventilation will not occur.
	OFF, 10% - 30% RH	Only available when **cFrt** is selected. When the indoor RH drops below the setting, ventilation will not occur.

When all Set Up Menu options have been entered, the control will display **donE**.

TEST MODE

After wiring and set up have been completed, Tes
components in the ventilation system function an



Test Sequence	Description
	Shows outdoor temperature terminals. If **- - - - °F** shows,
	**tESt** shows on the display, th damper will open or the pov been wired to the VENT terr
	After 15 seconds, the HVAC f so. The display will show **FA**
	After 45 seconds Test Mode the operating display.

RATER/INSPECTOR VERIFICATION

To verify the ventilation time setting, press the **Select** button to scroll through the calculated Required Continuous CFM and the Measured CFM for this installation. If any value does not match the expected value, the Set Up Menu must be entered to change the floor area, number of bedrooms or measured cfm.

The calculation used for the ventilation time setting is (all calculations compliant with ASHRAE Standard 62.2-2010):

$$Minutes\ per\ Hour = 60 * \left(\frac{Required\ Continuous\ CFM}{Measured\ CFM} \right)$$

Measured CFM is entered during set up and Required Continuous CFM is calculated according to the equation below:

$$Required\ Continuous\ CFM = \left((Floor\ Area\ ft^2 * .01) + (No.\ of\ Bedrooms + 1) * 7.5 \right)$$

SEQUENCE OF OPERATION – "COD

The control will turn on ventilation with a heating, c
during a one-hour cycle period. If the outdoor temp
limit, ventilation will not occur with a cool or fan cal
limit it will occur with a heat call. If the HVAC equipr
ventilation time within the hour, the control will turr
temperature is within the high and low ventilation t
HVAC system blower, if wired and set up to do so.

If the outdoor temperature exceeds the limits set at t
ventilation will occur for another 60 minutes, and the
hours. When the ventilator starts again, it will sampl
the set amount of ventilation during the four-hour cy
to 25 minutes per hour and the air temperature fell b
occur during a heating call. If the heating only opera
automatically change the cycle period to four hours a
of ventilation (25 min/hr * 4 hours = 100 minutes, m
during heating) during the four-hour cycle period.

If the air temperature is still out of range, the contro
period, then a 12-hour cycle period and finally a 24-h
periods, the total ventilation time increases to comp
ASHRAE Standard 62.2-2010. When the cycle period
turn on ventilation to meet the requirements even if

SEQUENCE OF OPERATION – "COM

The control will turn on ventilation with a heating, c
outdoor air temperature is within the high and low v
is within the high and low RH limits, for the set num
the HVAC equipment does not turn on enough to m
will turn on ventilation without a call, if the outdoor
limits. The control will also turn on the HVAC system
temperature or indoor RH are outside of the set limi

LIMITED WARRANTY

Your Research Products Corporation Aprilaire® Digital Ventilation Controller is expressly warranted for five (5) years from date of installation to be free from defects in materials or workmanship.

Research Products Corporation's exclusive obligation under this warranty shall be to supply, without charge, a replacement for the Controller 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 installation date of the controller.

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 CONTROLLER ITSELF.

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

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