



INSTALLATION & OPERATING INSTRUCTIONS

Model VCM

Digital Ventilation Controller

Installed By:	Installer Phone:	Date Installed:
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READ AND SAVE THESE INSTRUCTIONS

Product Info &
Digital Manual

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SAFETY INSTRUCTIONS

WARNING

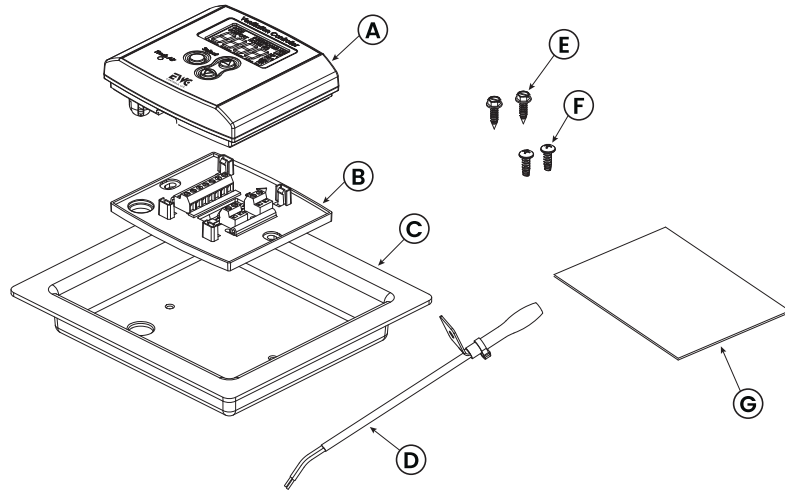
120 volts can cause serious injury from electric shock. Disconnect electrical power to the HVAC system before proceeding.

Sharp metal edges can cause serious injury from cuts. Use gloves when cutting openings in sheet metal.

NOTICE

1. When installing the Ventilation Controller on downflow furnaces, ensure that the furnace blower continues to run sufficiently long after the heat call is satisfied to prevent temperatures from exceeding the maximum operating temperature.
2. Do not mount the Ventilation Controller downstream from any fresh air intake port, humidifier bypass or zone control bypass. False humidity conditions will cause the Ventilation Controller to operate incorrectly.

PACKAGE CONTENTS



- A. CONTROL
- B. WALL PLATE
- C. DUCT BOARD BRACKET
- D. OUTDOOR TEMP SENSOR
- E. #8 X 5/8" HEX HEAD SCREW (2)
- F. #8 X 1/2" PAN HEAD TYPE 25 SCREW (2)
- G. INSTALLATION MANUAL

SPECIFICATIONS

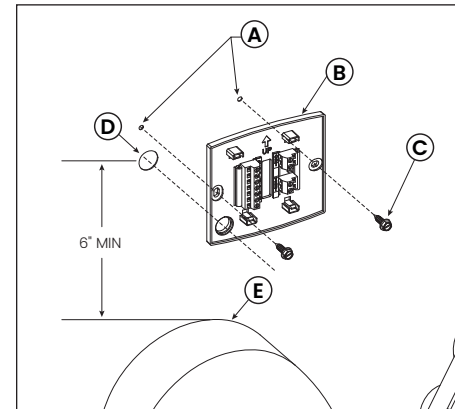
Operating Temperature Range	20°F – 140°F
Maximum Load on VENT and Gh Outputs	10VA @ 30 VAC max
Input Voltage	18-30 VAC
Controller Power Consumption	2.0VA

MOUNTING THE CONTROLLER AND OUTDOOR TEMPERATURE SENSOR

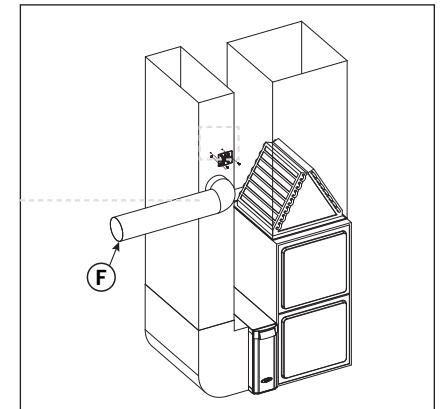
MOUNTING THE CONTROLLER TO THE RETURN DUCTWORK

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.



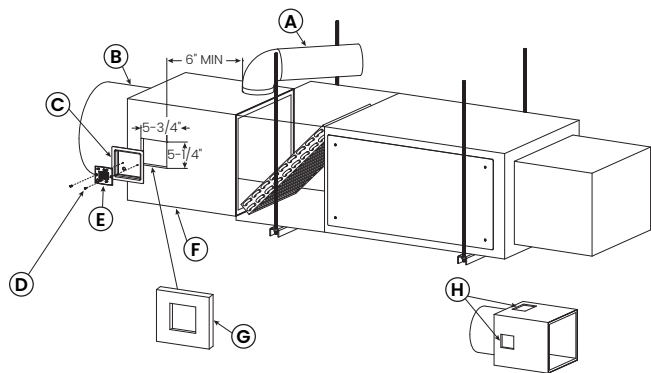
- A. PILOT HOLES FOR SCREWS
- B. WALL PLATE
- C. #8 HEX HEAD SCREWS



- D. 5/8" DIA. HOLE
- E. FRESH AIR DUCT
- F. FRESH AIR DUCT

DUCT BOARD INSTALLATION

1. Take out the duct board mounting bracket, remove the wall plate from the control and put the rest of the control in a safe location until after wiring is completed.
2. Cut a 5.75" x 5.25" rectangular opening in the return plenum. Save the piece cut out to insulate the duct board bracket around the controller. The display of the control will run parallel with the long dimension. **DO NOT MOUNT THE CONTROL IN A POSITION WHERE IT IS FACING DOWN.**
3. Use the supplied #8 x 1/2" type 25 pan head screws to mount the control wall plate to the duct board mounting bracket.
4. Place the bracket in the cut out and seal in place using metal foil tape and/or mastic.
5. Insulate the duct board bracket around the wall plate using the plug cut out of the duct board.

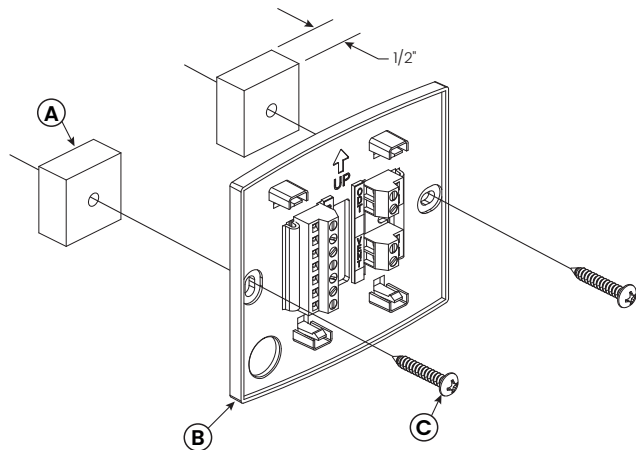


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|------------------------------|--|
| A. FRESH AIR DUCT | E. WALL PLATE |
| B. RETURN DUCT | F. DUCT BOARD RETURN PLENUM |
| C. DUCT BOARD BRACKET | G. USE CUT-OUT INSULATION TO INSULATE DUCT BOARD BRACKET AROUND CONTROLLER |
| D. #8 PAN HEAD TYPE 25 SCREW | |

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.

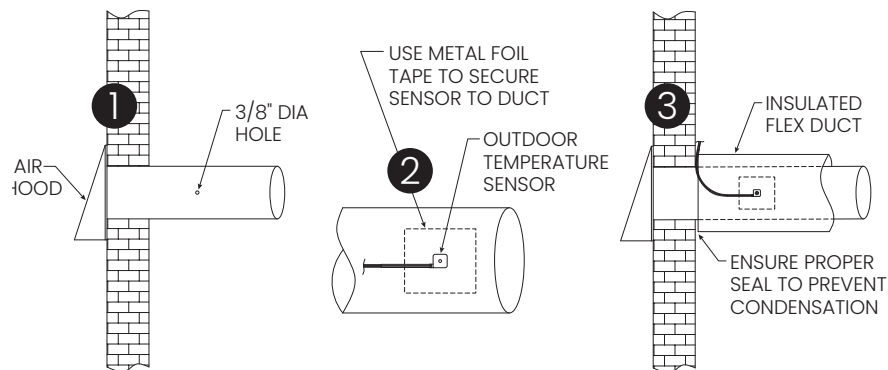
1. Remove the wall plate from the control and put the rest of the control in a safe location until after wiring is complete.
2. Use spacers or brackets to mount the controller to an interior wall surface or return plenum/duct surface that is at room temperature (i.e. do not mount to supply ductwork or to the air handler/furnace) to space the wall bracket a minimum of 1/2" 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.**



- | |
|---|
| A. SPACER |
| B. WALL PLATE |
| C. #8 SCREW (2) DO NOT USE FLAT HEAD SCREWS |

MOUNTING THE OUTDOOR TEMPERATURE SENSOR

1. Drill a 3/8" diameter hole in the duct of the fresh air inlet hood.
2. Install the outdoor temperature sensor into the duct and use metal foil tape to secure it in place and seal the opening. Run the wire toward the inside of the exterior wall.
3. Secure ductwork to the inlet hood duct while allowing the wire of the sensor to extend outside of the insulation. Tape and/or mastic the duct as needed and properly insulate.



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 the damper in Model VCM installations.

FIGURE 1: WIRING TO FURNACE

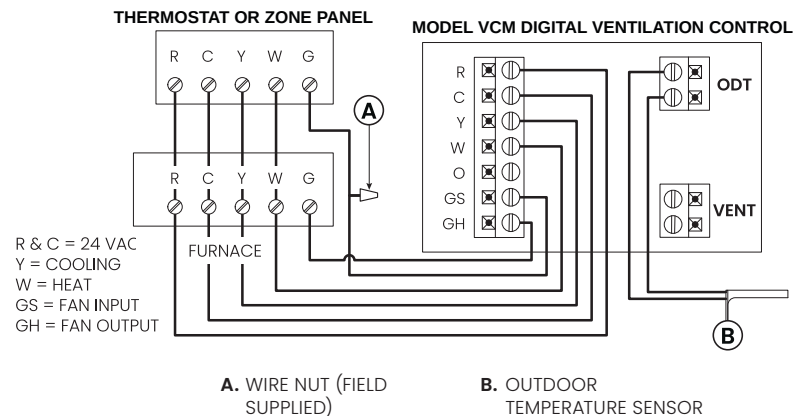


FIGURE 2: WIRING TO HEAT PUMP

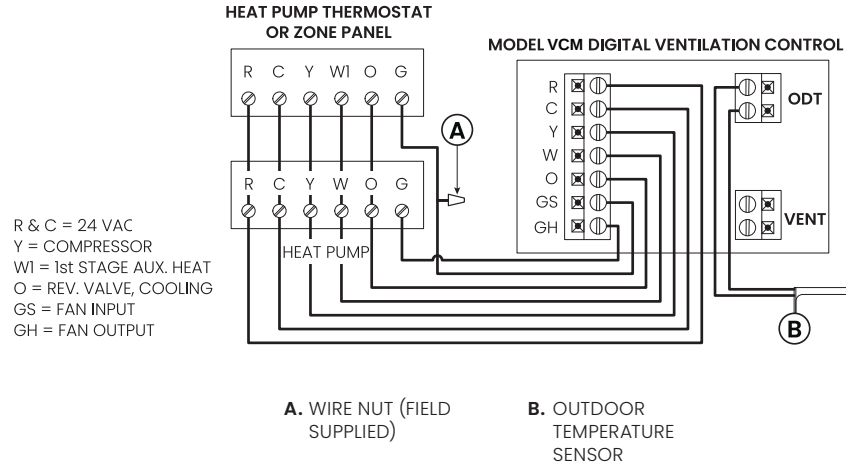
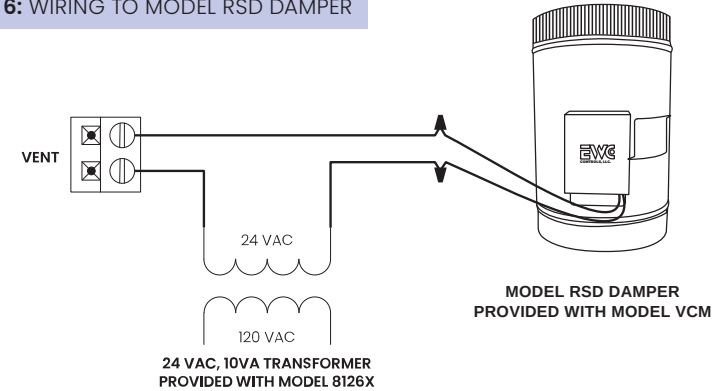
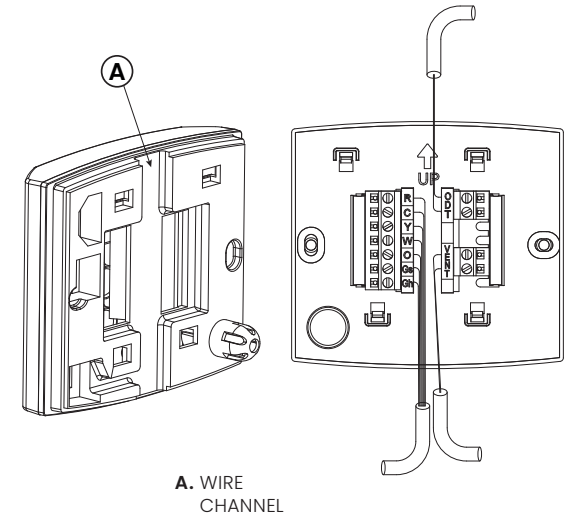


FIGURE 6: WIRING TO MODEL RSD DAMPER



(continued from page 9)

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.



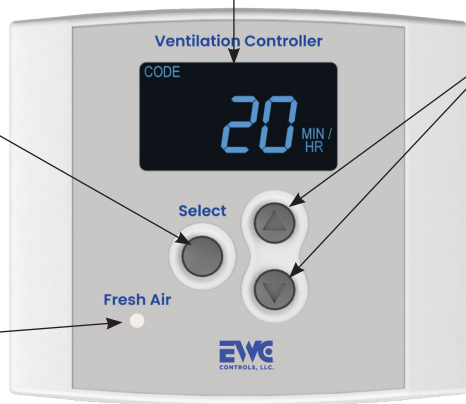
OPERATION

NOTE: The display will appear faint normally; the first press of any button will turn on the display at full power.

Shows the ventilation time setting (minutes/hr), mode of operation (Code or Comfort) and whether the HVAC fan has been turned on when ventilating.

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

Lights green when ventilating.



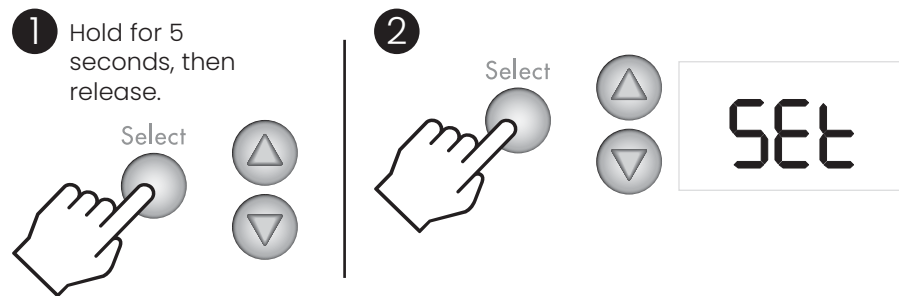
Use to override the calculated ventilation time setting (6 – 60 minutes/hr). Press and hold ▼ to turn ventilation OFF.

To return to the calculated setting, go completely through the Set Up Menu.

SET UP MENU

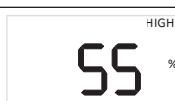
NOTICE

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 to enter the value and move on to the next Set Up Menu item.

Menu Item	Values ▲ ▼	Description
	HP or HC	HP if wiring to a heat pump. HC if wiring to furnace and AC.
	A 10 or A 13	ASHRAE code year. A 10 for ASHRAE 62.2 2010 A 13 for ASHRAE 62.2 2013
	1 – 10	Number of bedrooms – used to calculate required continuous ventilation rate.
	500 – 7500 ft ²	Square footage – used to calculate required continuous ventilation rate.
	30 – 250 CFM	Measured outdoor airflow delivered during ventilation.
	OFF, 85°F – 105°F	Ventilation high temperature limit. Ventilation is limited when the outdoor temperature exceeds the setting. Turn OFF if no high limit is desired.
	OFF, -10°F – 40°F	Ventilation low temperature limit. Ventilation is limited when the outdoor temperature falls below the setting. Turn OFF if no low limit is desired.
	On, “bLnd”, OFF	ON HVAC fan turns on whenever ventilation occurs. bLnd (blend) HVAC fan turns on with ventilation only when the outdoor temperature is outside a set range. OFF HVAC fan is not turned on with ventilation.

Menu Item	Values ▲ ▼	Description
	OFF, 60°F to 5°F less than Vent. High Temp. Limit	Only available when bLnd is selected. When the outdoor temperature is above the setting, the HVAC fan will be turned on to mix (blend) outdoor air with indoor air for tempering.
	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. 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, Test Mode can be used to verify that all components in the ventilation system function and that wiring to the HVAC system fan is correct.



Test Sequence	Description
76 °F	Shows outdoor temperature as measured by the sensor wired to the ODT terminals. If - - - °F shows, no outdoor temperature has been installed.
tEst	tEst shows on the display, the green Fresh Air LED will light and either the damper will open or the power ventilator will turn on depending on what has been wired to the VENT terminals.
tEst FAN	After 15 seconds, the HVAC fan will turn on if it has been wired and set up to do so. The display will show FAN along with tEst.
CODE 17 MIN/HR	After 45 seconds Test Mode automatically completes and the display returns to 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):

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

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

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

SEQUENCE OF OPERATION – “CODE” SETTING

The control will turn on ventilation with a heating, cooling or fan call for the set number of minutes during a one-hour cycle period.

- If outdoor temperature is above the high temperature limit, ventilation will not occur with a call for cooling or fan call.
- If outdoor temperature is below the low temperature limit, ventilation will occur with a heat call.
- If outdoor air temperature is between the high and low temperature limits and the HVAC equipment does not turn enough to meet ventilation time within the hour, the control will turn on ventilation without a heating, cooling or fan call.
- The control will also turn on the HVAC blower if wired to do so.

If the outdoor temperature exceeds the limits set at the end of the first hour, then no additional ventilation will occur for another 60 minutes, and the cycle period will automatically adjust to four hours.

- When the ventilator starts again, it will sample the air temperature and if in range, will meet the set amount of ventilation during the four-hour cycle period.
 - For example, if Vent Time was set to 25 minutes per hour and the temperature fell below the low limit, ventilation would only occur during a heating call.
 - If the heating only operated for 10 minutes during the hour, the control will automatically change the cycle period to four hours and work to provide the additional 90 total minutes of ventilation ($25 \text{ min/hr} \times 4 \text{ hours} = 100 \text{ minutes}$, minus the 10 minutes of ventilation that occurred during heating) during the four-hour cycle period.
- If the air temperature is still out of range, the control will automatically switch to an 8-hour cycle period, then a 12-hour cycle period and finally a 24-hour cycle period. During 8, 12 and 24 hour cycle periods, the total ventilation time increases to compensate for ventilation effectiveness as defined in ASHRAE Standard 62.2-2010. When the cycle period automatically adjusts to 24-hours, the control will turn on ventilation to meet the requirements even if the temperature is outside of the set limits.

SEQUENCE OF OPERATION – “COMFORT” SETTING

The control will turn on ventilation with a heating, cooling or fan call by the HVAC equipment, if the outdoor air temperature is within the high and low ventilation temperature limits and the indoor RH is within the high and low RH limits, for the set number of minutes during a one-hour cycle period. If the HVAC equipment does not turn on enough to meet the ventilation time within the hour, the control will turn on ventilation without a call, if the outdoor air temperature and indoor RH is within the set limits. The control will also turn on the HVAC system blower, if wired and set up to do so. If the outdoor temperature or indoor RH are outside of the set limits, then no ventilation will occur.

TROUBLESHOOTING

TABLE 1: TROUBLESHOOTING GUIDE

Code	Explanation	Correction
E1	Sensor failure. Non-recoverable fault. Not field-correctable.	Power cycle the control/unit. If error does not resolve itself, call technician to inspect HVAC equipment for damage. If no damage found, replace control.
E2	External temperature sensor was detected at start-up, but has failed when the control is configured to use it. The control will continue as though the temperature limits are set to OFF.	Inspect the ODT sensor connection for loose or broken wires. If no issue found, follow the instructions for testing the ODT sensor resistance on page 22. If the ODT sensor functions correctly, replace control.

TABLE 1: TROUBLESHOOTING GUIDE

Code	Explanation	Correction
E4	Invalid vent input – can be caused by bad ventilation setup variables or sensor error.	Re-enter installer setup by pressing and holding the Select button to check the installer setup. If the installer variables are correct, replace control.
Ventilator or Fresh Air Damper does not operate in Test Mode	Incorrect installation.	Review wiring diagrams and ensure proper control installation.
Ventilator or Fresh Air Damper only operates in Test Mode	Measured conditions are outside programmed limits.	Ventilation should not occur when outdoor temperature and humidity are outside programmed limits. If outdoor conditions are confirmed within programmed limits, follow the instructions for testing the ODT sensor resistance on page 22.
Ventilator or Fresh Air Damper operates constantly	Ventilation run time is set to 60 min/hr.	You can re-enter installer setup by pressing and holding the Select button to check the installer setup. Ensure Number of bedrooms, Square footage, and Measured airflow are entered correctly.
Ventilator or Fresh Air Damper control "chatters" or clicks ON and OFF rapidly	Improper wiring between controller (GH), thermostat (G), and furnace or heat pump (G).	Separate controller GH and thermostat G wires if connected. Refer to diagram in WIRING section for proper wiring.

TABLE 2

Outdoor Temperature (°F)	Resistance (kΩ) ±10
-30	231.8
-20	163.4
-10	117.3
0	84.8
10	62.2
20	46.1
30	34.4
40	26.1
50	19.9
60	15.3
70	11.9
80	9.3
90	7.3
100	5.8

TESTING ODT SENSOR RESISTANCE

Disconnect the ODT sensor leads from the control terminals and measure the resistance across the wires with an ohmmeter. Confirm the reading with the temperature in **TABLE 2**. Reconnect the ODT sensor leads. If the resistance value (+/- 10 kΩ) does not match the temperature value, replace the ODT sensor.

LIMITED WARRANTY

Your EWC Controls® Fresh Air Ventilator is expressly warranted for five (5) years from date of installation to be free from defects in materials or workmanship. Any modifications to the product voids the warranty.

The exclusive obligation of EWC Controls under this warranty shall be to supply, without charge, a replacement for any component 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 EWC Controls, 385 HWY 33, Englishtown, New Jersey 07726, together with the installation date of the ventilator.

THIS WARRANTY SHALL NOT OBLIGATE EWC CONTROLS FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY YOUR INSTALLER AS CONTRASTED TO DEFECTS IN THE VENTILATOR ITSELF.

IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE AFORESAID FIVE YEAR PERIOD. THE APRILAIRE 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 DEFECTS(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.

(Zoned Comfort Control also includes this sentence) This equipment if installed in strict accordance with the manufacturer's instructions, complies with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules.

WARRANTY REGISTRATION

Visit us online at ewccontrols.com to register your EWC Controls product. If you do not have online access, please mail a postcard with your name, address, phone number, email address, product purchased, model number, date of purchase, and dealer name and address to: EWC Controls, 385 HWY 33, Englishtown, New Jersey 07726.

Your warranty registration information will not be sold or shared outside of this company.

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EWC Controls reserves the right to change specifications without notice.

