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# INSTALLATION INSTRUCTIONS

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## Commercial Room Ventilator with Exhaust and CO<sub>2</sub> Modulation (Optional)

Models:

WGCRVS-3C

WGCRVS-5C

For Use with Bard  
Single Stage W\*\*G4 Units



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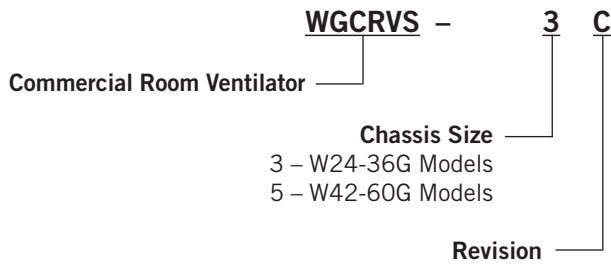
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## Commercial Room Ventilator Model Nomenclature



### General Information

The ventilator should only be installed by a trained heating and air conditioning technician. These instructions serve as a guide to the technician installing the ventilator package. They are not intended as a step-by-step procedure with which the mechanically inclined owner can install the package.

The ventilator housing is shipped in one carton which contains the electrical harness, miscellaneous hardware and installation instructions.

### Unpacking

Upon receipt of the equipment, be sure to compare the model number found on the shipping label with the accessory identification information on the ordering and shipping document to verify that the correct accessory has been shipped.

Inspect the carton housing of each ventilator as it is received. Before signing the freight bill, verify that all items have been received and that there is no visible damage. Note any shortages or damage on all copies of the freight bill. The receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent. Concealed damage not discovered until after loading must be reported to the carrier within 15 days of its receipt.

### Description

The ventilators are designed to be used with Bard 2 – 5 ton single stage wall mount gas electric units. They are electromechanical vent systems designed to provide fresh air to meet indoor air quality standards with built in exhaust provisions.

### Features

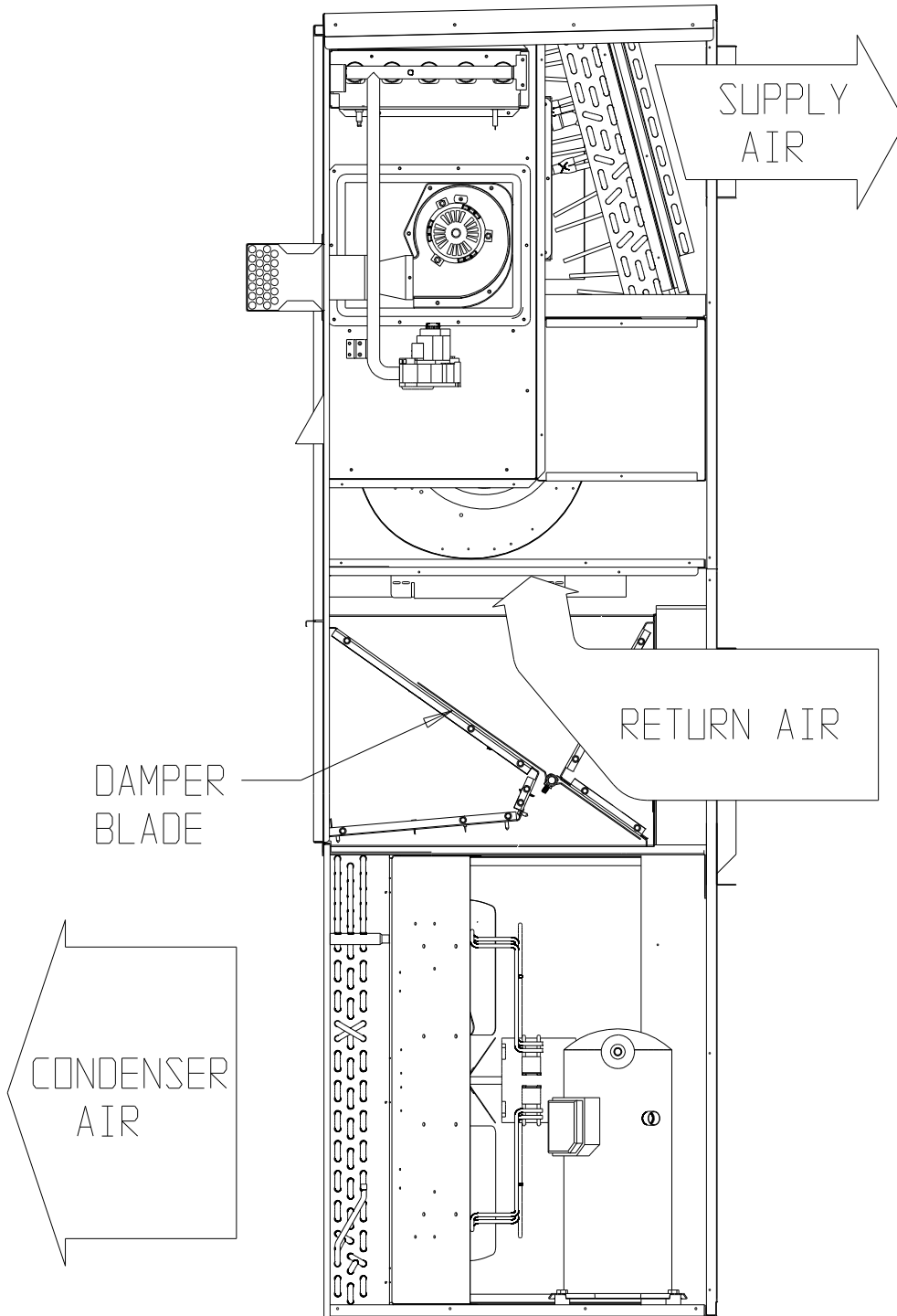
- One piece construction: Easy to install with no mechanical linkage adjustment required.
- Exhaust air damper: Built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.
- Actuator motor – 24 volt, power open, spring return with built-in torque limiting switch.
- Solid state control board – can be used for ON/OFF or 2-10VDC operation. Timed pre-purge feature to provide increased ventilation before occupancy. Potentiometers used to set blade position for ON/OFF ventilation amount.
- Provides up to 75% of outside air.

### Sequence of Operation

When no ventilation call is present, ventilation damper remains closed and conditioned air is 100% return air (see Figure 1 on page 4).

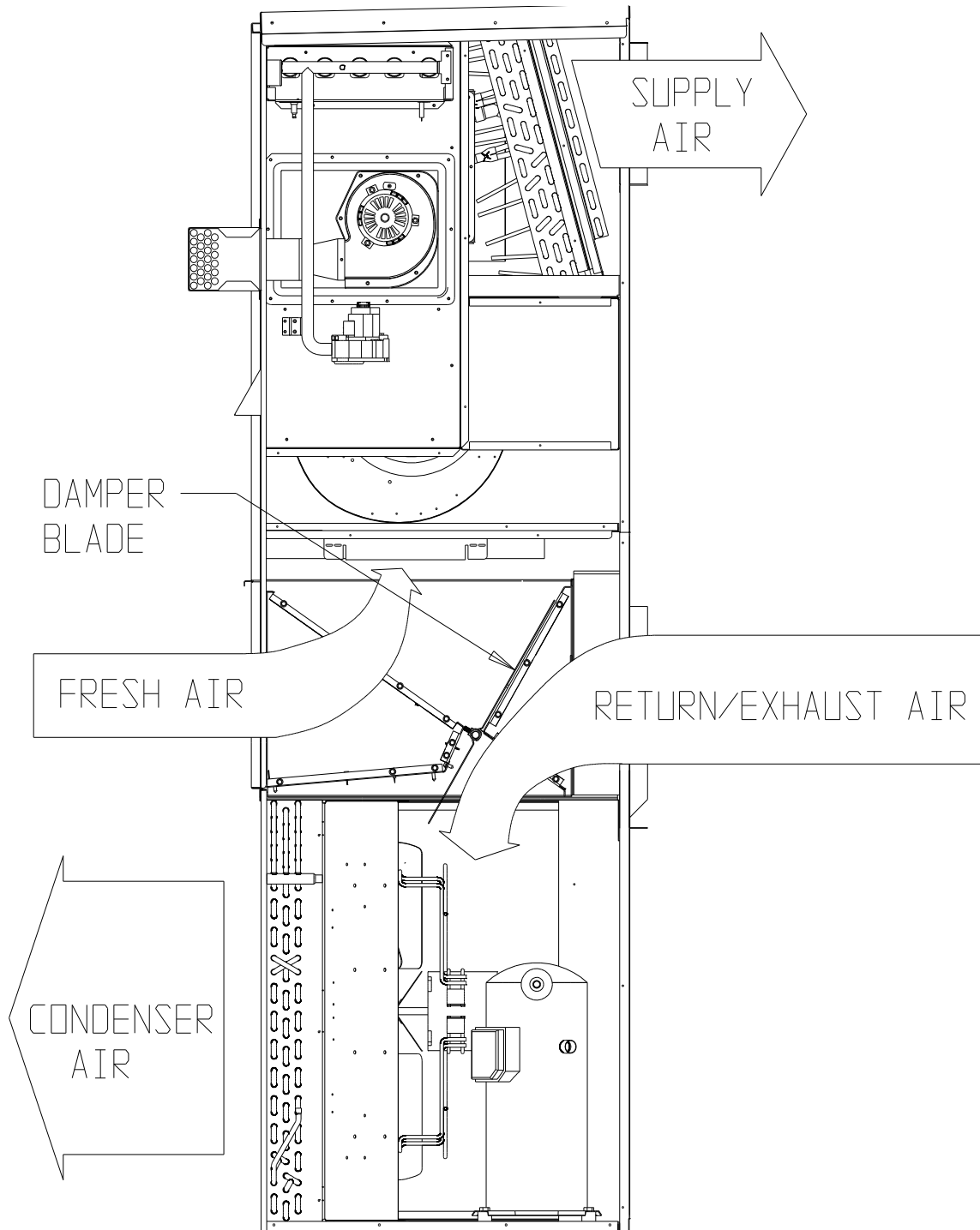
On a call for ventilation, commercial room ventilator (CRV) opens to position set by minimum position potentiometer and energizes comfort air blower (see Figure 2 on page 5).

**FIGURE 1**  
**Call for Blower Operation**  
**without Ventilation**



MIS-2412 A

**FIGURE 2**  
**Call for Ventilation**



MIS-2413 A

# INSTALLATION

## Basic Installation

1. Unpack the ventilator assembly which includes the integral ventilator with attached electrical harness and miscellaneous hardware.

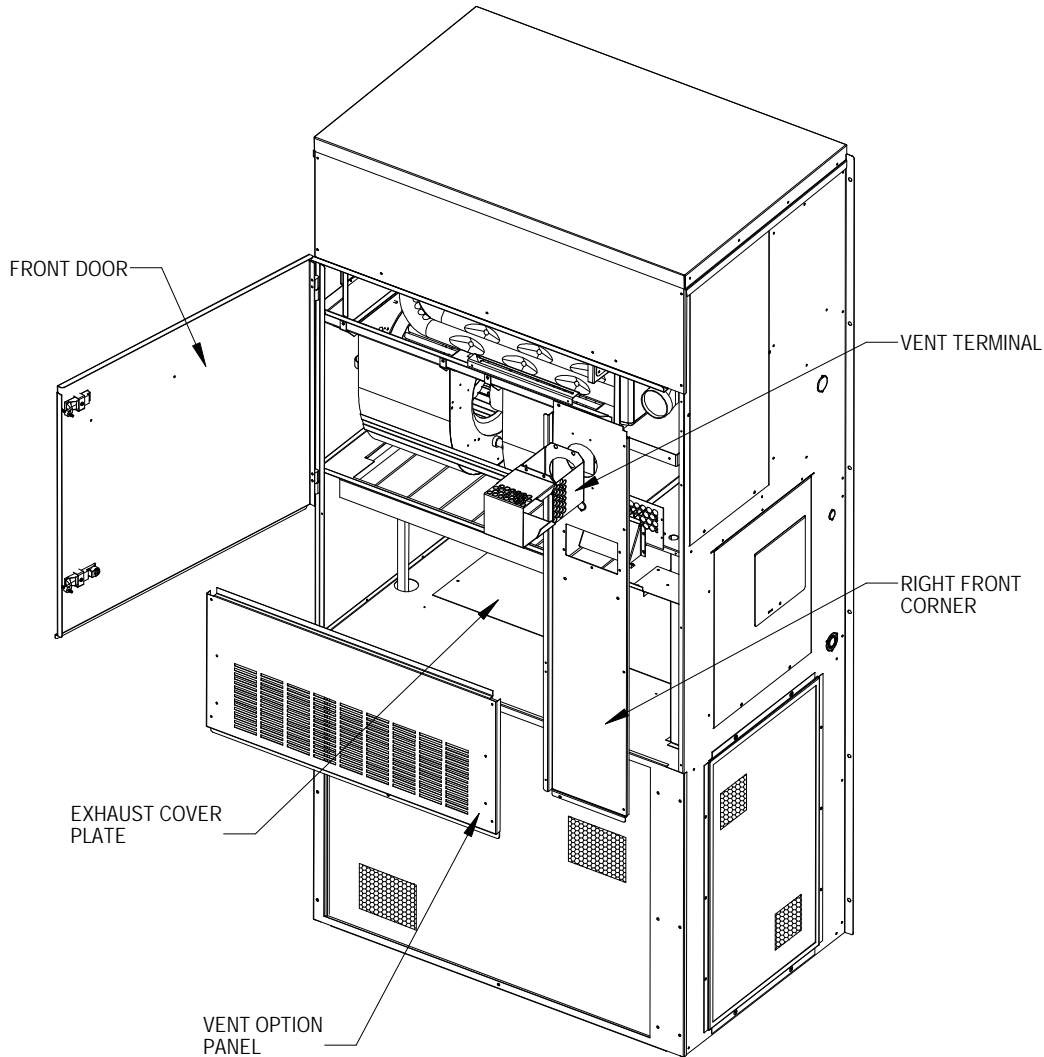


## WARNING

*Open and lock unit disconnect switch before installing this accessory to prevent injury or death due to electrical shock or contact with moving parts. Turn thermostat to off.*

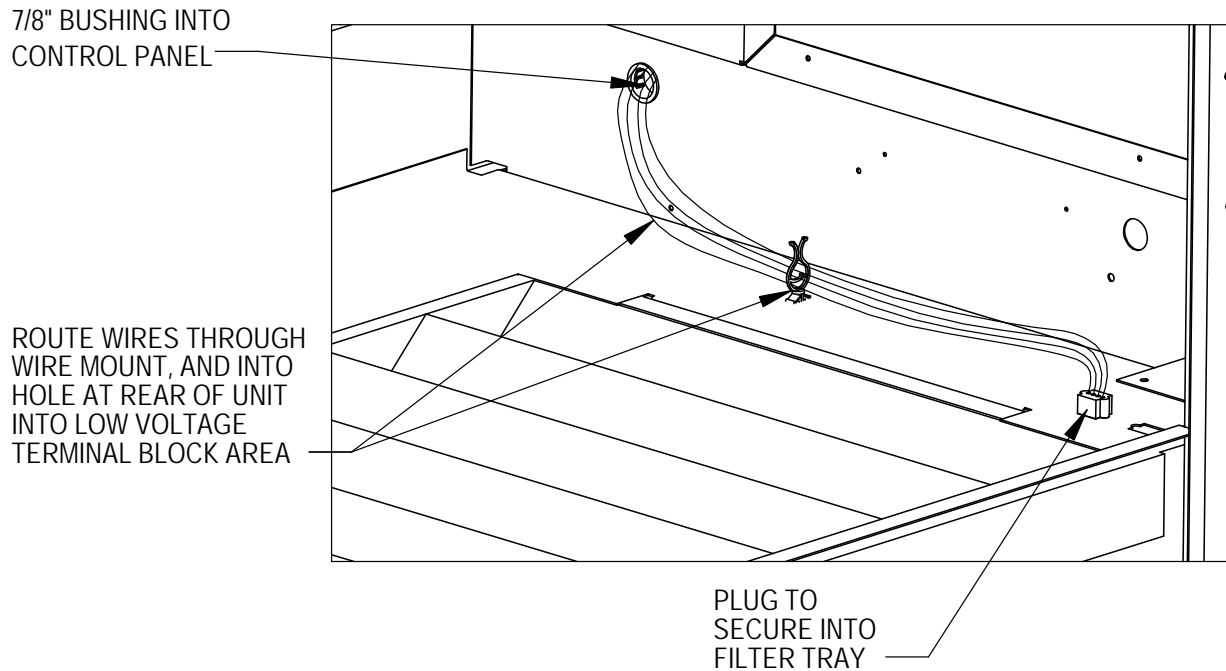
2. Open the front door. Remove and save vent option panel from wall mount unit (see Figure 3).
3. Remove and save existing unit air filter and screw from front center grille (see Figure 5 on page 8 for screw location).
4. Remove and discard the exhaust cover plate.
5. Replace the exhaust cover plate with screen that is included with the kit.
6. Install loose piece wire harness shipped with kit (as shown in Figure 4).

**FIGURE 3**  
Removal of Vent Option Panel



MIS-2416

**FIGURE 4**  
**Loose Piece Wire Harness Plug Install**



MIS-2415

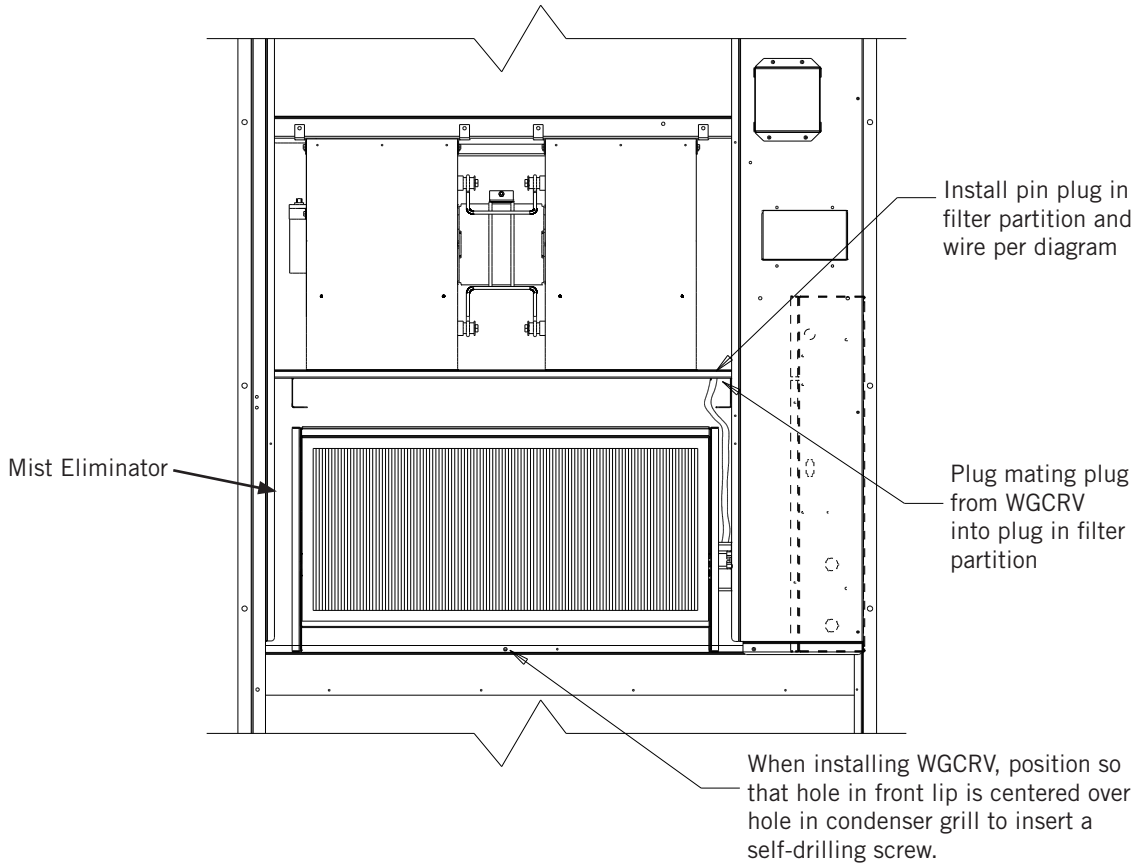
7. Open control panel to gain access to unit low voltage terminal block.
8. Route electrical harness leads through the 7/8" bushing in control panel (Figure 4) into low voltage control box.
9. Connect leads with fork terminal to corresponding points on terminal strip. (See wiring diagrams later in this manual or on ventilator.) Plug connector into corresponding hole in filter rack (see Figure 4).
10. Close control panel cover.
11. Insert ventilator into the unit (see Figure 5).

**IMPORTANT:** Position front lip of ventilator on top of front grille and condenser partition (see Figure 5 inset). This is important to ensure proper drainage of any water entering damper assembly.

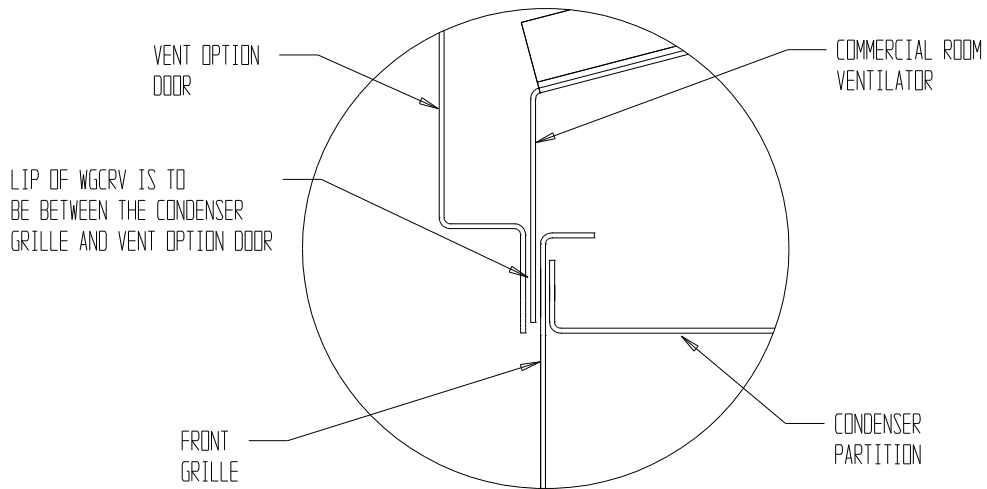
12. Plug mating connector from CRV into connector in filter rack (see Figure 5).

See page 9 to proceed to ventilator checkout procedure.

**FIGURE 5**  
**Ventilator Installed in Unit**



**FIGURE 5 INSET**



**MIS-1464B**



## Ventilator Checkout

### Blade Adjustment for Desired Ventilator Air

The amount of ventilation air supplied by the commercial room ventilator is dependent on four factors.

- a. Return air duct static pressure drop
- b. Supply air duct static pressure drop
- c. Indoor blower motor speed
- d. Damper blade open position setting

To determine the amount of fresh air that will be supplied to the structure, first determine the pressure drops of the supply and return air ducts. For free blow application with return air filter grille and supply grille, assume .05 supply static and .10 return static.

Determine on what speed the evaporator motor is running.

Refer to the graphs found on pages 12-14 to determine the blade setting necessary to achieve the ventilation air required at the supply and return static duct pressure drops that are applicable.

**NOTE:** *The ventilation air shown in the graphs on pages 12-14 is without the condenser fan running. When the condenser fan is running, the ventilation air will increase slightly.*

### WGCRVS Model Checkout

1. Open blower door and remove filters to gain access to the CRV control board (8201-167) located behind the front fill partition on top of the ventilator.
2. Resupply power to unit.
3. Energize the evaporator blower by switching thermostat to the manual fan position with heat/cool in OFF position.
4. Ventilator should open to the position set by the OCC potentiometer on the CRV control board (see Figure 6 on page 10). Cycle OCC potentiometer to full open through full close. Observe damper blade operation throughout travel to assure free, unobstructed movement.
5. Adjust OCC potentiometer until desired blade setting is reached with power applied to unit. See the graphs found on pages 12-14 for required blade setting versus ventilator air for the unit installed.
6. De-energize the evaporator blower. Damper blade should close.
7. Re-install filter.

## WGCRVS Sequence of Operation

This ventilation option includes a control board with blade positioning potentiometers along with an input for a 2-10V input signal (see Figure 6 on page 10).

Adjustable potentiometers:

**“PP” Potentiometer setting:** This potentiometer can be used to adjust the blade setting for outdoor air intake during a pre-purge cycle. The pre-purge cycle time is based on the setting of the pre-purge timer.

**“OCC” Potentiometer setting:** This potentiometer can be used to adjust the blade setting for outdoor air intake when the “A” terminal is energized on the low voltage terminal strip indicating occupancy or demand.

**“Y1” Potentiometer setting:** *Not applicable on this model.*

**“Y2” Potentiometer setting:** *Not applicable on this model.*

### Pre-Purge Feature

Pre-purge is used to ventilate a specified CFM amount before occupants enter the room or structure. The control board has a built-in pre-purge timer that can be set to 30, 60 and 90 minute intervals by moving the jumper (see Figure 6 on page 10). This timer will start when the jumper is installed and the A terminal is energized on the low voltage terminal strip. Blade adjustment can be made on the PP potentiometer. Once the timer has timed out, the board will default to the occupied setting and this blade position can be adjusted on the OCC potentiometer. If the timer is set to 0 (off—shipped position), the occupied setting is instantaneous and the pre-purge setting (PP) is no longer in the sequence.

### Occupied Setting

Occupied is used to ventilate a specified CFM amount when occupants enter the room or structure. The control board will energize the occupied setting after the pre-purge cycle, or if pre-purge is disabled immediately when the A terminal is energized on the low voltage strip. Blade adjustment can be made on the OCC potentiometer.

### Y1 Setting

*Not applicable on this model*

### Y2 Setting

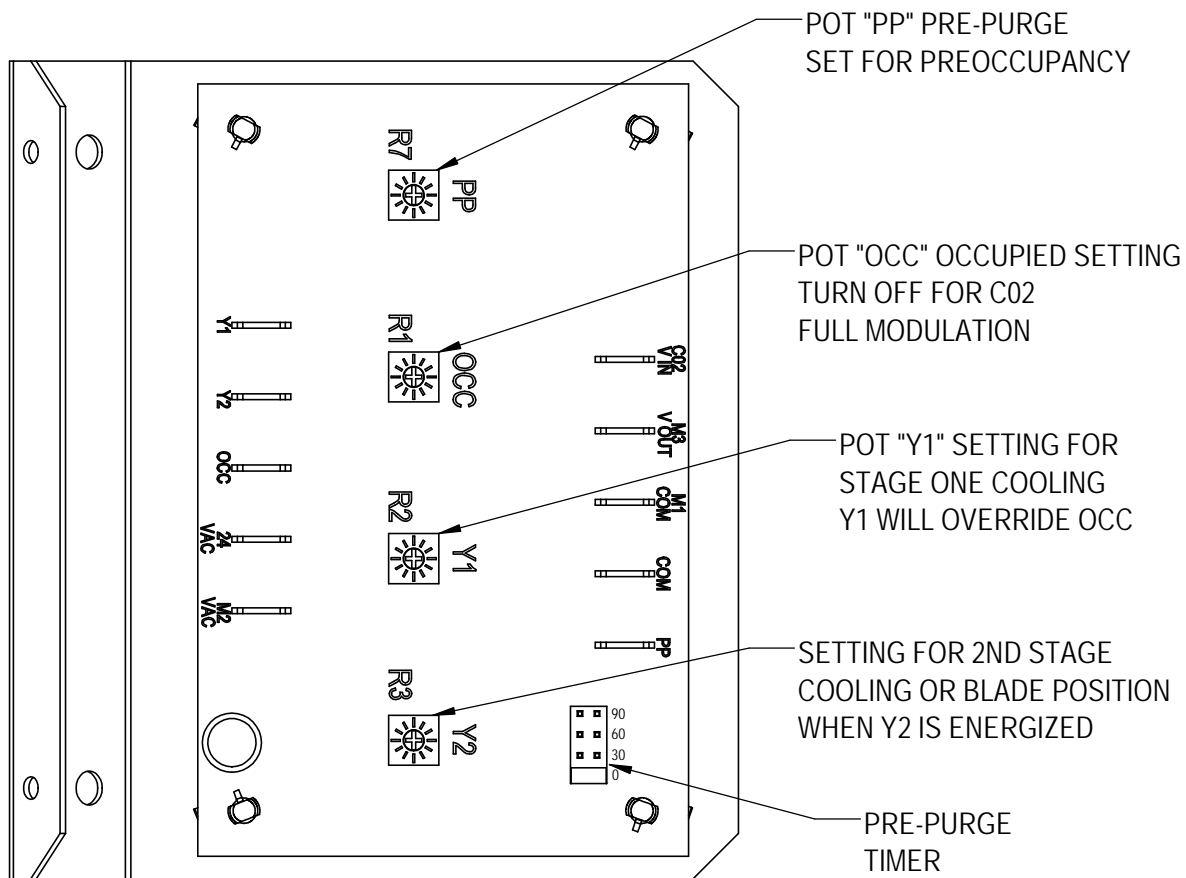
*Not applicable on this model*

### 2-10V Operation

A CO<sub>2</sub> sensor or other device sending a 2-10V signal can be used to control the damper motor. Two control methods are available to control the damper motor:

- Method 1: The control board will accept a 2-10VDC signal with a resistive load greater than 5000 ohms. Bard CO<sub>2</sub> sensor part #8403-096 can be used when the 2-10V output is connected to

**FIGURE 6  
CRV Control Board**



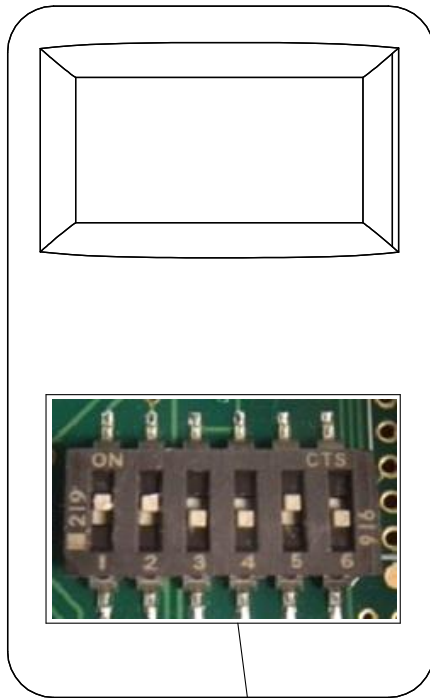
MIS-4362 B

terminal 4 on the unit low voltage terminal strip. The occupied OCC potentiometer setting must be set to the off position for total modulation. The OCC potentiometer can be used to maintain a minimum blade position when A is energized.

- Method 2: The damper motor will accept a 2-10VDC signal with a resistive load less than 5000 ohms. This method involves bypassing the control board and powering the motor directly from the device providing the 2-10VDC modulating signal. The gray wire connected to CO2 V IN on the control board must be spliced with the white wire ran to the damper motor (V OUT on control board).

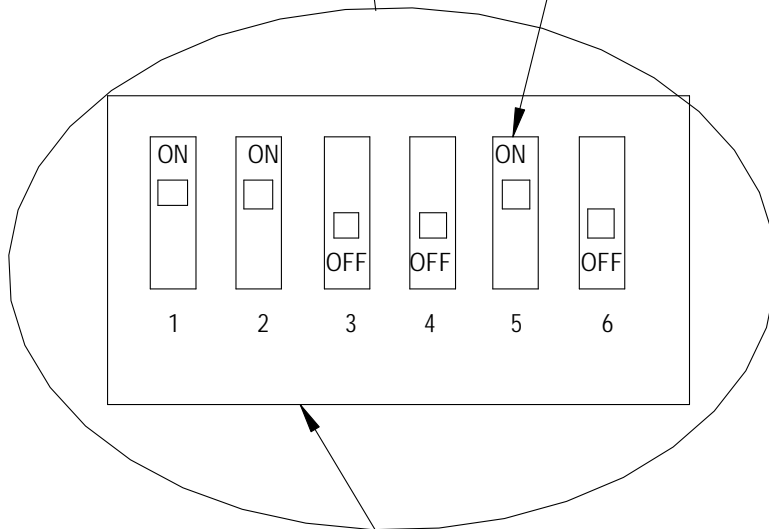
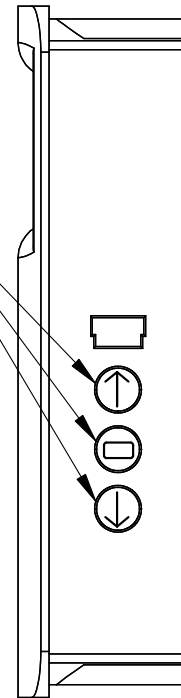
During 2-10VDC operation with A energized and pre-purge timed operation active, DC voltage signaling occupancy from a source such as a CO<sub>2</sub> sensor will increase ventilation amounts as needed.

**FIGURE 7**  
**8403-096 CO<sub>2</sub> Sensor Set Up**



PRESS UP AND DOWN  
 ARROWS TO ENTER  
 CONFIGURATION MODE  
 USE ARROWS TO SELECT  
 SETTING. PUSH MIDDLE  
 BUTTON TO CHANGE.  
 CONTROLLER WILL  
 SHOW SET.

NOTE: MENU  
 DIP SWITCH MUST  
 BE IN "ON" POSITION #5  
 TO CHANGE ANY  
 SETTINGS WITH  
 THE SIDE BUTTONS.  
 TO LOCK THE CO2  
 CONTROLLER MOVE  
 DIP SWITCH TO "OFF" AFTER  
 IT HAS BEEN CONFIGURED.

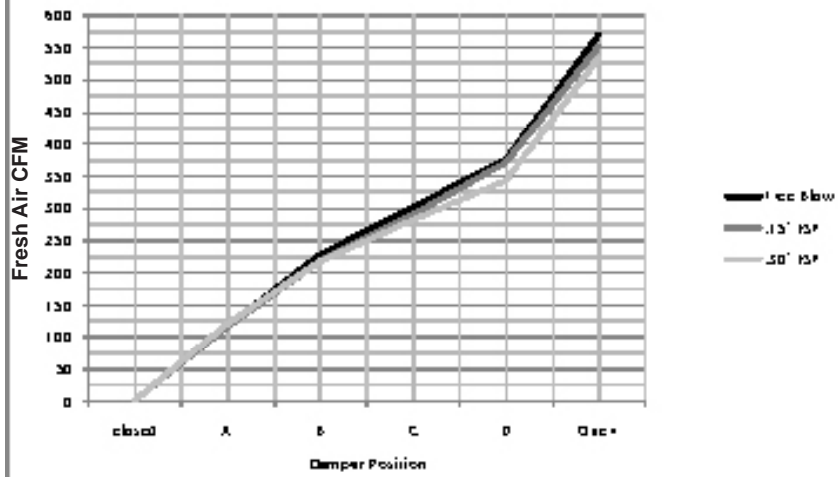


DIP SWITCHES MUST BE  
 POSITIONED AS SHOWN  
 FOR PROPER OPERATION

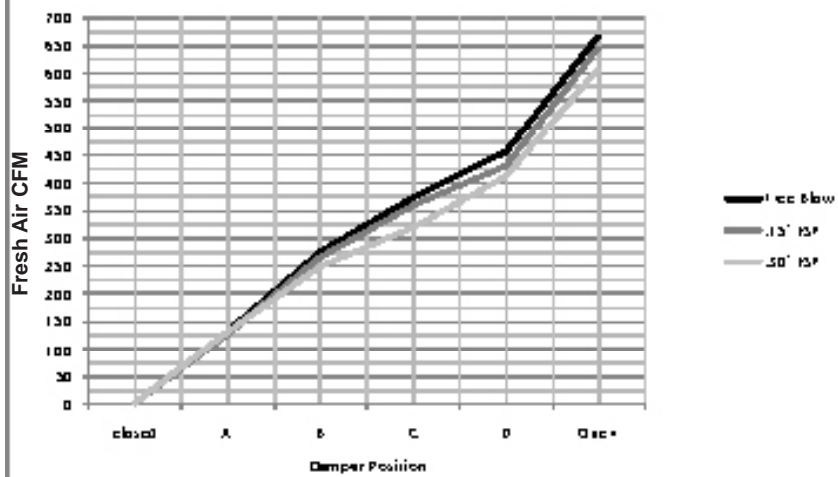
Settings	Recommended	Default
RON (RELAY ON SET POINT)	725	
ROF (RELAY OFF SET POINT)	700	
DSP (DISPLAY CONFIGURATION)	C	CT
UNI (UNITS SELECTION)	US	US
COL (CO2 LOW OUTPUT RANGE)	700	0
COH (CO2 HIGH OUTPUT RANGE)	1500	2000
TOL (TEMP. LOW OUTPUT RANGE)	Not Used	
TOH (TEMP. HIGH OUTPUT RANGE)	Not Used	
BAR (BAROMETRIC PRESSURE)	See Instructions with Controller For High Altitude Installations	
CAL (CALIBRATION)	Used for Field Calibration	

MIS-4025 C

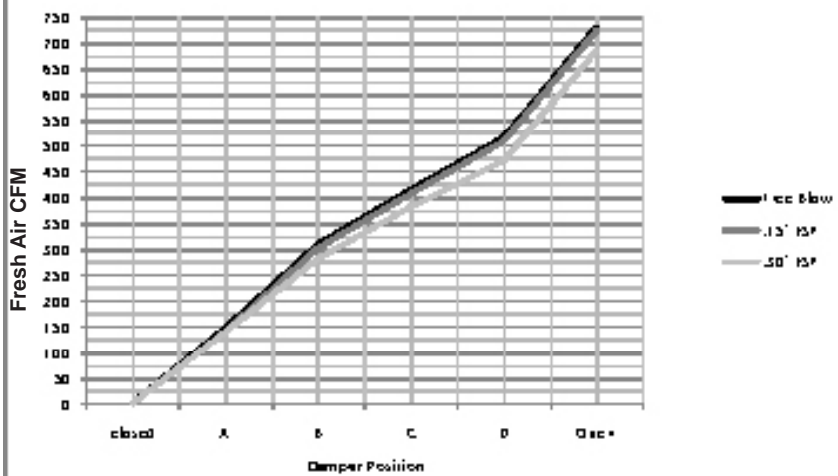
**W24G CRV Airflow Versus Position - Low Speed**



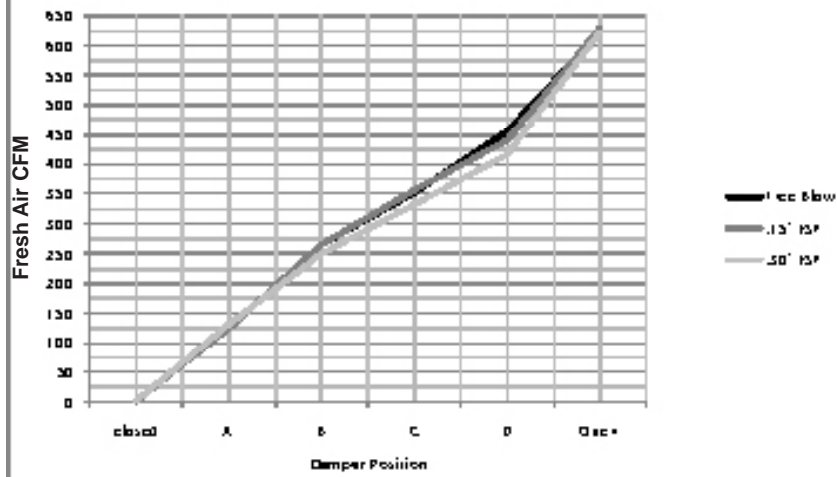
**W24G CRV Airflow Versus Position - Medium Speed**



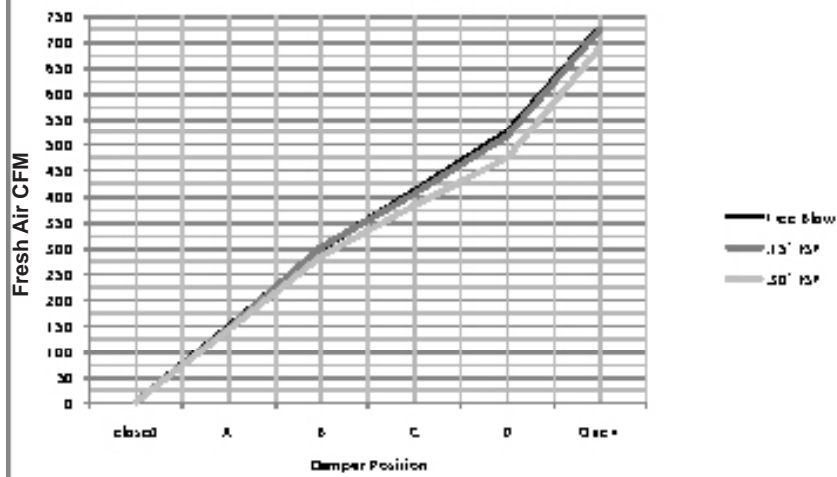
**W24G CRV Airflow Versus Position - High Speed**



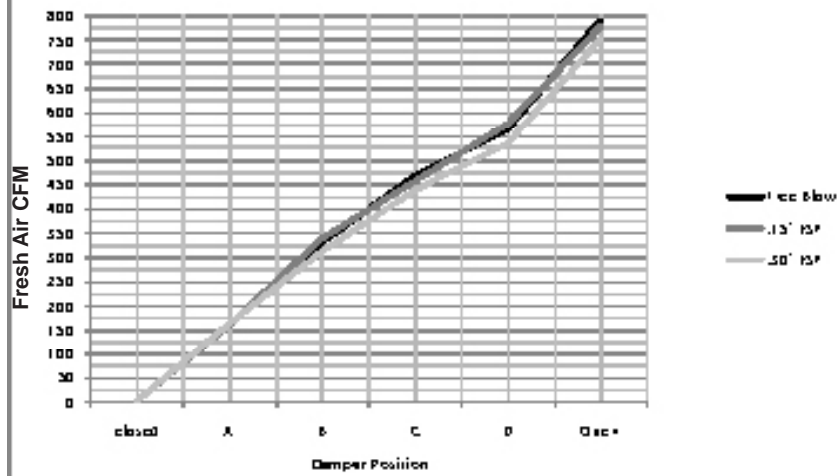
**W30-36G CRV Airflow Versus Position - Low Speed**



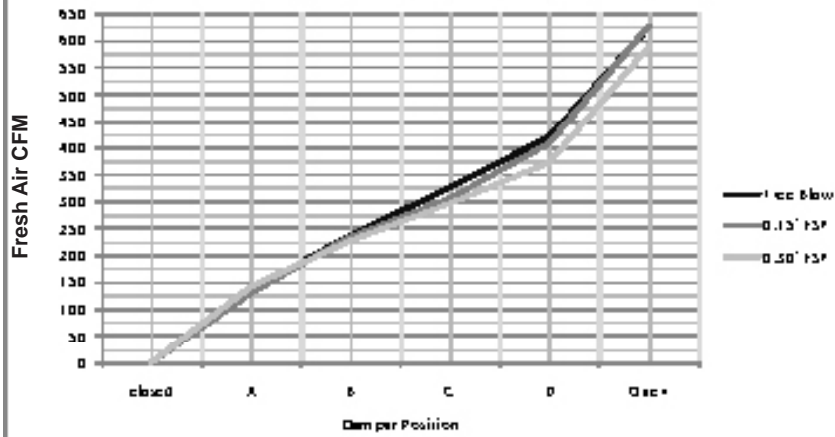
**W30-36G CRV Airflow Versus Position - Medium Speed**



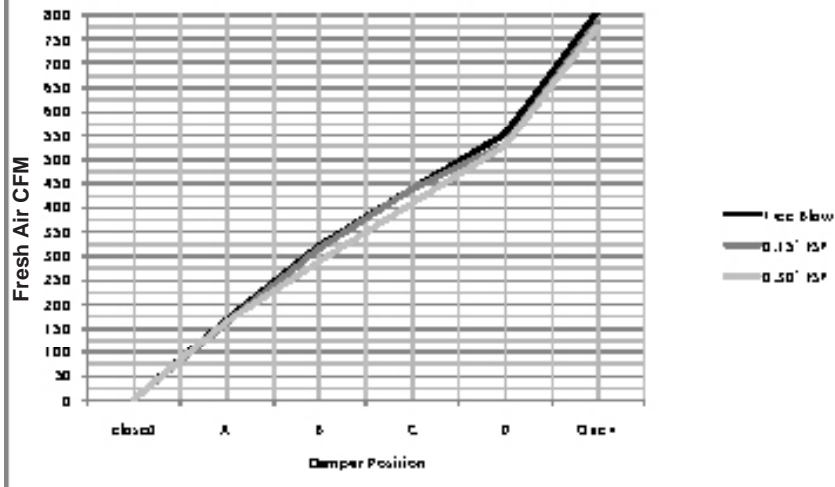
**W30-36G CRV Airflow Versus Position - High Speed**



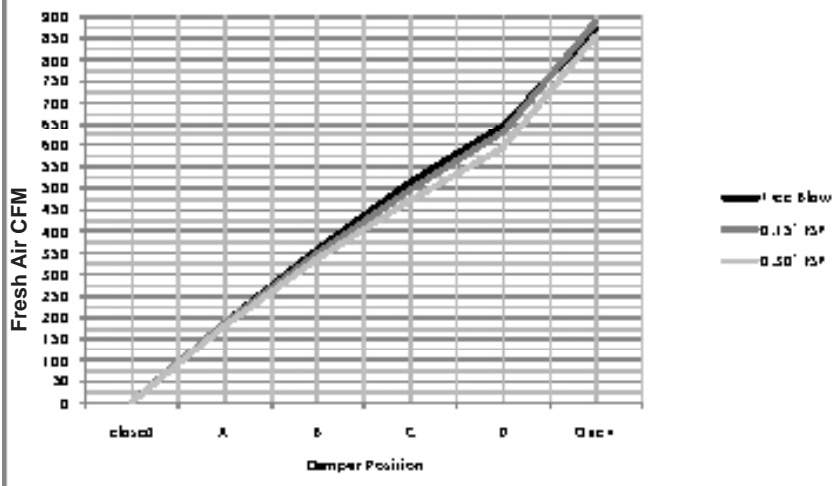
**W42-60G CRV Airflow Versus Position - Low Speed**



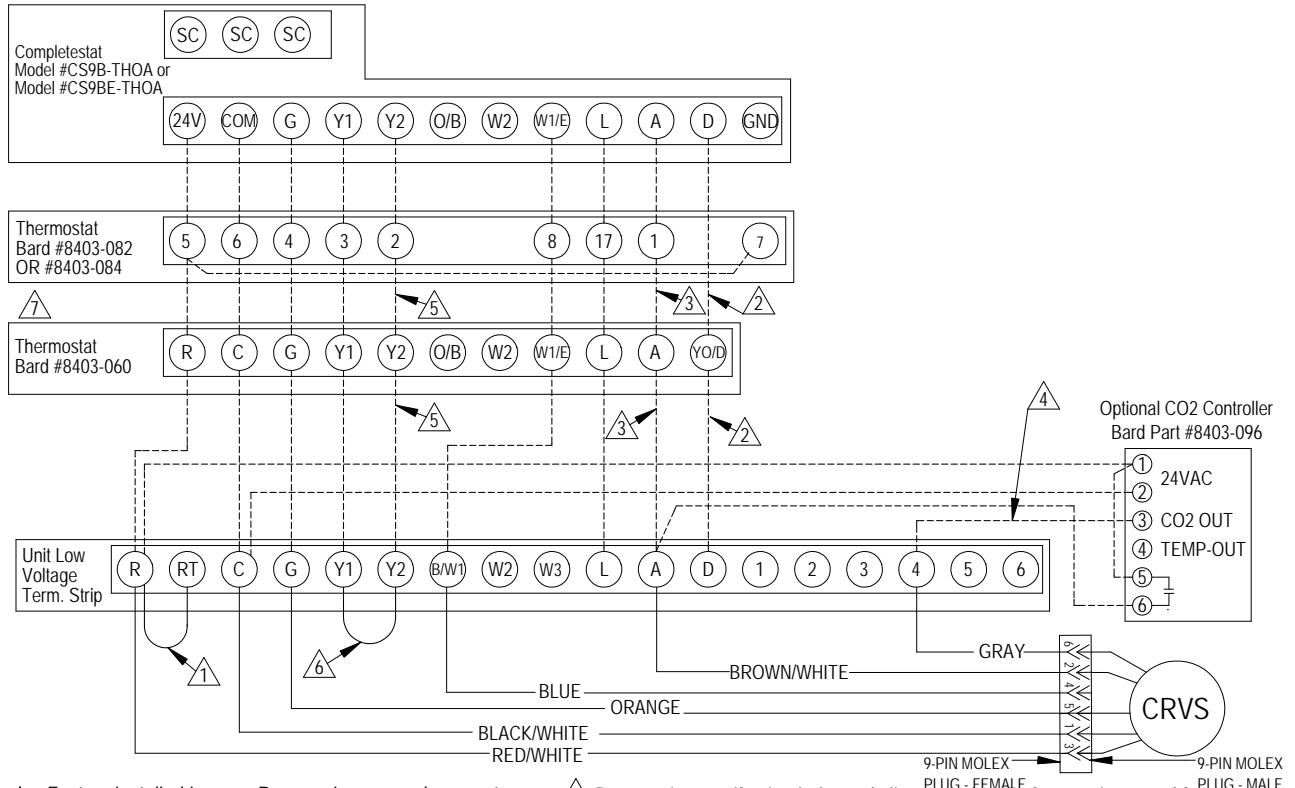
**W42-60G CRV Airflow Versus Position - Medium Speed**



**W42-60G CRV Airflow Versus Position - High Speed**



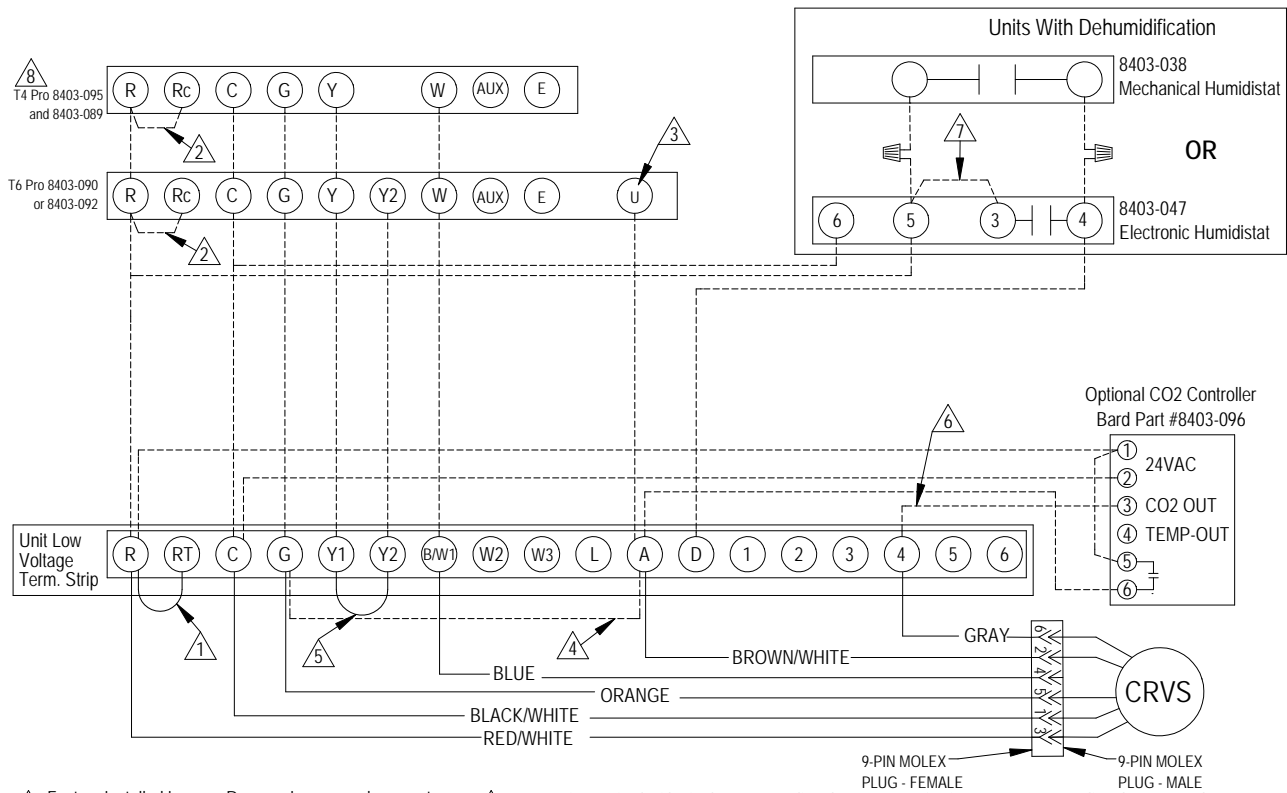
**FIGURE 8**  
**Thermostat Wiring Diagram**



- ⚠ Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.
- ⚠ Wire required for dehumidification models only.
- ⚠ Do not connect "A" from thermostat if optional CO2 controller is used
- ⚠ 0-10 VDC modulating CO2 control signal for modulating ventilation control (optional - see vent instruction manuals)
- ⚠ This wire is only required if using balanced climate option. Refer to unit manual for balanced climate details.
- ⚠ Remove jumper if using balanced climate option. Refer to unit manual for balanced climate details.
- ⚠ For vent operation thermostat must be configured for programmable, events per day must be 2 business, and fan must be set to programmed fan. The blower and vent will operate during the occupied period.

MIS-4343 A

**FIGURE 9**  
**Thermostat Wiring Diagram**



- ⚠️ Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.
- ⚠️ Position slider tab up for single transformer systems. No jumper is required.
- ⚠️ Move U slider to the up position. Connect wire to lower U terminal for vent operation. (Only applies to 8403-090)
- ⚠️ For vent operation, add jumper if optional CO2 controller is not used. Vent will open when G blower signal is energized. See Important Note at bottom of page to avoid latching blower on.
- ⚠️ Jumper is required with single stage cooling thermostats. If using a two stage cooling thermostat the jumper can be removed for Balanced Climate operation. Refer to unit manual for Balanced Climate details.
- ⚠️ 0-10 VDC Modulating CO2 control signal for modulating ventilation control - See vent installation manual.
- ⚠️ Jumper needs added when using 8403-047 humidistat

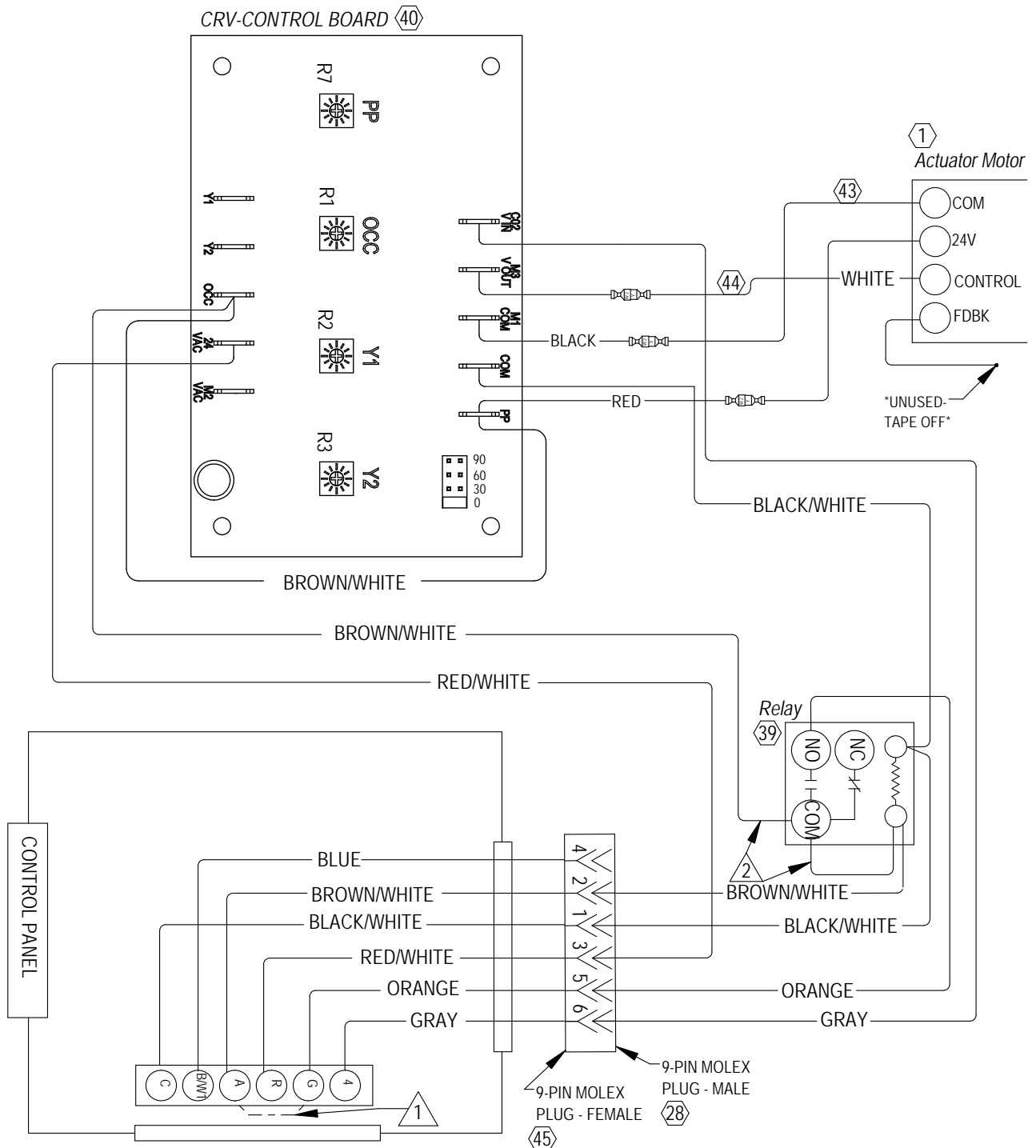
MIS-4345 A

**IMPORTANT NOTE**

An additional wire change is required if jumper **4** is used which connects "A" to "G" (shown in Figure 9). The brown/white wire on the blower interlock relay (located on the vent control plate) needs to be moved from the "common" terminal to the "normally closed" terminal. **If this change is not made, the relay will latch on once the "A" signal is received and the blower will not turn off.** Refer to Figure 10 to see the vent wiring diagram with this change called out.



**FIGURE 10**  
**CRVS Wiring Diagram**



1 Optional field jumper wire for constant ventilation with blower operation if occupied signal or CO2 demand or not used

2 Move Brown/White wire landing from COM to NC if 1 jumper is used from A to G.

4056-266 D