
INSTALLATION INSTRUCTIONS

COMMERCIAL ROOM VENTILATOR WITH PLUG-IN CONNECTIONS AND EXHAUST

Models:

WCRVPS2 WCRVPS3 WCRVPS5

For Use with Bard Single Stage Wall Mount Air
Conditioner and Heat Pump Models:

WCRVPS2: W18A/L*, W24A/L*, W18H*, W24H*

WCRVPS3: W30A/L*, W36A/L*, W30H*, W36H*

WCRVPS5: W42A/L*, W48A/L*, W60A/L*, W72A/L*,
W42H*, W48H*, W60H*



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CONTENTS

General Information

Commercial Room Ventilator Model Nomenclature...	3
Unpacking	3
General	3
Description	3
Models	3

Installation of Field-Installed WCRVPS*

Basic Installation	4
Control System Notes	7
Blade Adjustment for Desired Ventilation Air	12
Commercial Room Ventilator.....	15

Figures

Figure 1	Wall Mount Unit Access Panels	4
Figure 2	Condenser Exhaust Plate with Screen.....	5
Figure 3	Extension Cable Installation	5
Figure 4	Damper Assembly Installation	6
Figure 5	Vent Hood Assembly.....	7
Figure 6	CRV Control Board	8
Figure 7	Required Control Connections for CRV with Air Conditioners	9
Figure 8	Required Control Connections for CRV with Heat Pumps	10
Figure 9	CO ₂ Sensor Default and Final Settings Bard Part #8403-067 CO ₂ Controller ...	11
Figure 10	Call for Ventilation With or Without Compressor Operation	15
Figure 11	Call for Compressor or Fan Only with Ventilation Off	16

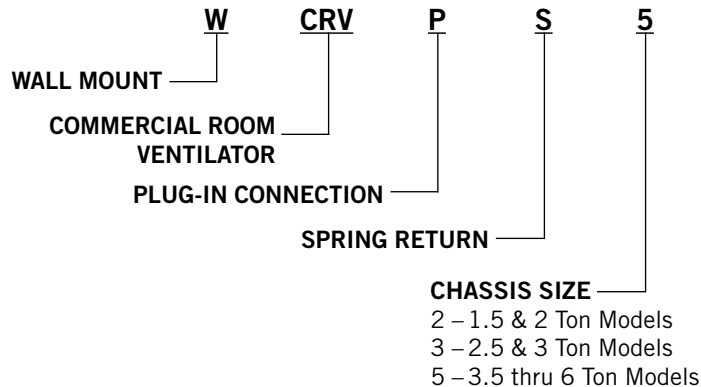
Graphs

Graph 1	W18 and W24 Ventilation Delivery	12
Graph 2	W30 and W36 Ventilation Delivery	13
Graph 3	W42 and W48 Ventilation Delivery	13
Graph 4	W60 Ventilation Delivery	14
Graph 5	W72 Ventilation Delivery	14

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GENERAL INFORMATION

COMMERCIAL ROOM VENTILATOR MODEL NOMENCLATURE



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, and 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.

GENERAL

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.

DESCRIPTION

The WCRVPS* ventilator is designed to be used with the specific models with "letter" revision codes as designated on the front page of this installation instructions manual.

The ventilator is an electromechanical vent system designed to provide fresh air to meet indoor air quality standards.

MODELS

When installed in the models listed on the front page, the WCRVPS* provides built-in exhaust provisions. When the damper blade opens to bring fresh air in, the damper also opens an exhaust relief. The exhaust air will flow into the condenser section of the unit. The condenser fan will help draw exhaust air out when it is operating with compressor in cooling or heat pump mode.

INSTALLATION OF FIELD-INSTALLED WCRVPS*

BASIC INSTALLATION

WARNING

Electrical shock hazard.

Disconnect remote electrical power supply or supplies before servicing.

Failure to do so could result in electric shock or death.

Preparing Unit for WCRVPS* Installation

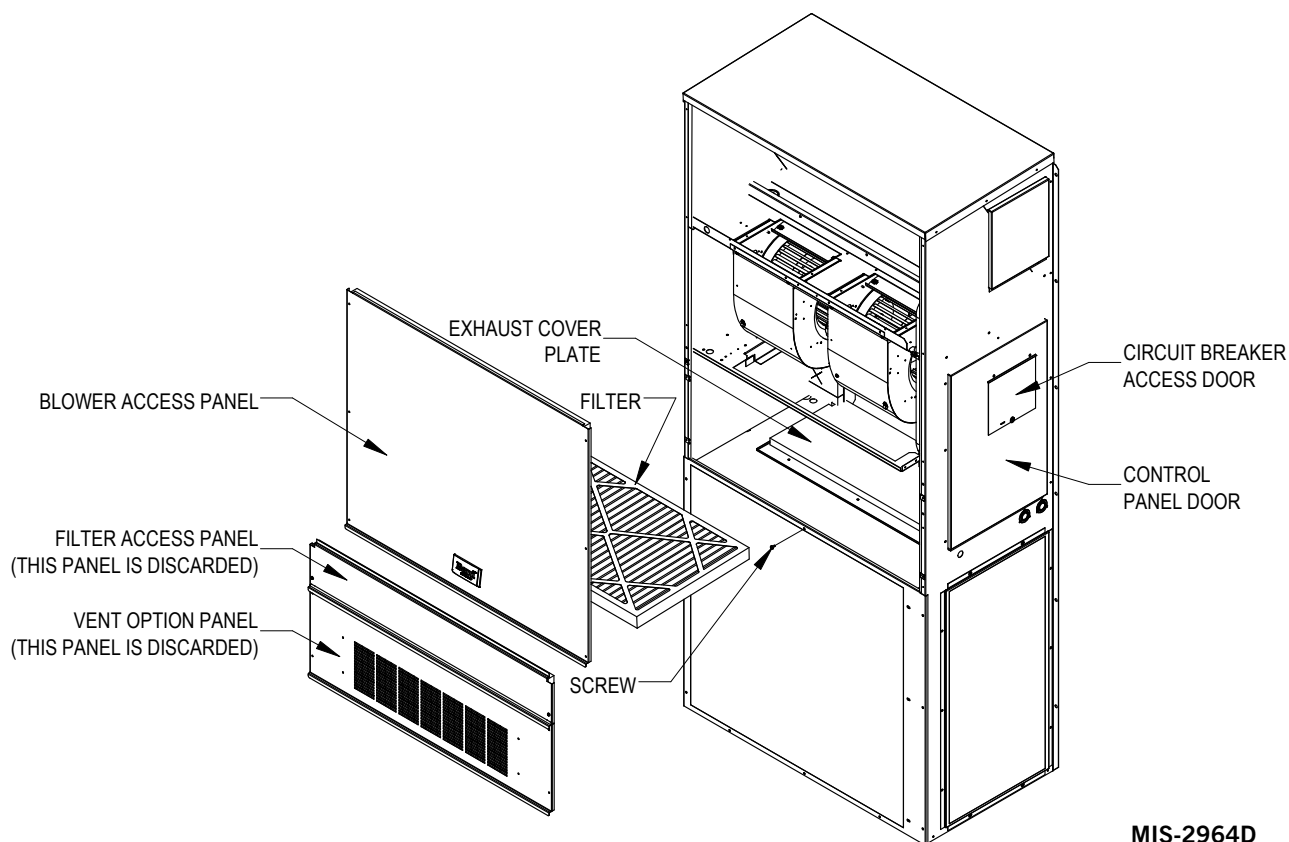
1. Disconnect power to unit.
2. Unpack the WCRVPS* assembly, which includes the integral controls and electrical harness, body panels, miscellaneous hardware and installation instructions.

3. From existing wall mount unit, remove and save (or discard) as directed (see Figure 1):
 - Ventilation option panel (discard)
 - Filter access panel (discard) if applicable
 - Filter (save)
 - Outer and inner control panel doors (save)
4. Remove and discard the exhaust cover plate.
5. Install new condenser exhaust plate with screen over opening into condensor section (see Figure 2).

Commercial Room Ventilator (CRV) Installation

1. Installed onto the WCRVPS* are two 12-pin extension jumpers. One is 12" in length for right-hand models and the other is 72" in length for left-hand models. Lock the appropriate length jumper into the corresponding lower tab on the front of the ventilation package (see Figure 3).

FIGURE 1
Wall Mount Unit Access Panels



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FIGURE 2
Condenser Exhaust Plate with Screen

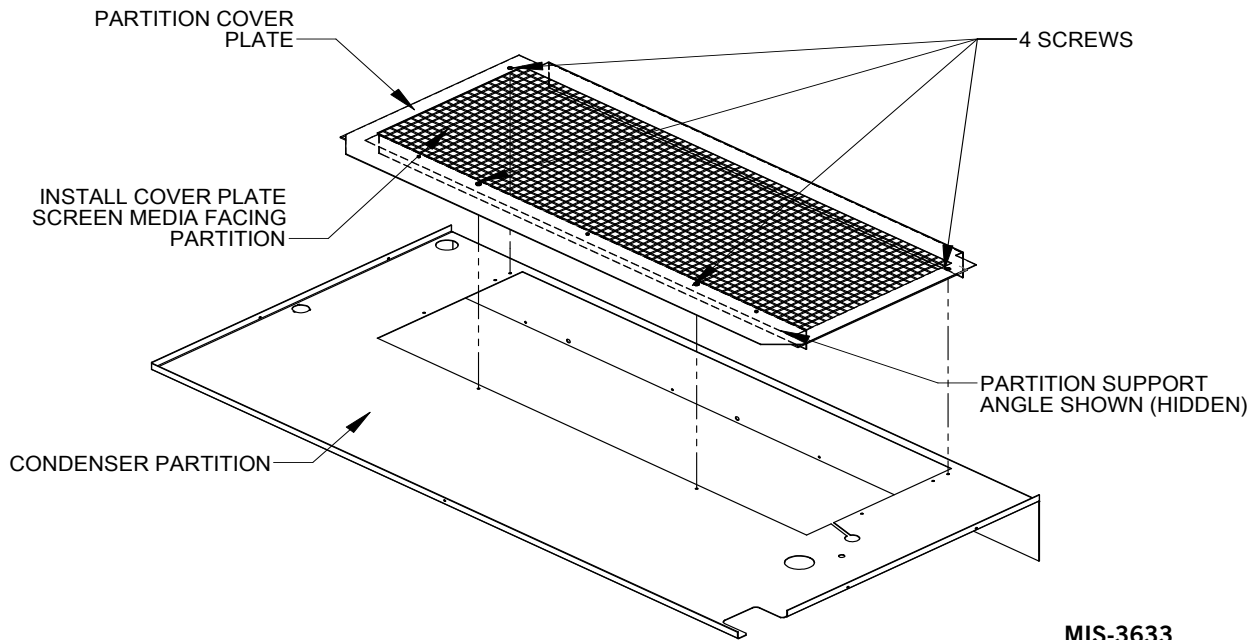
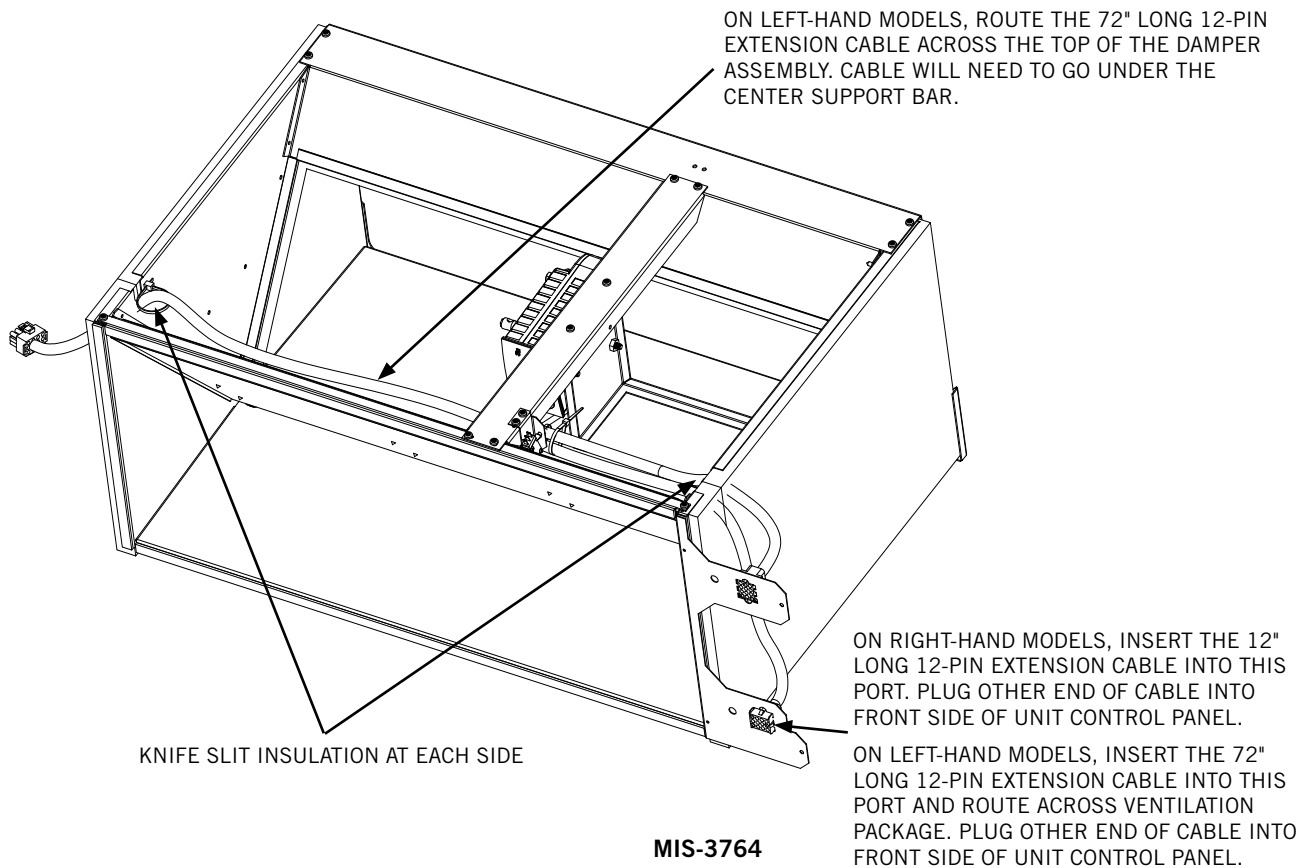
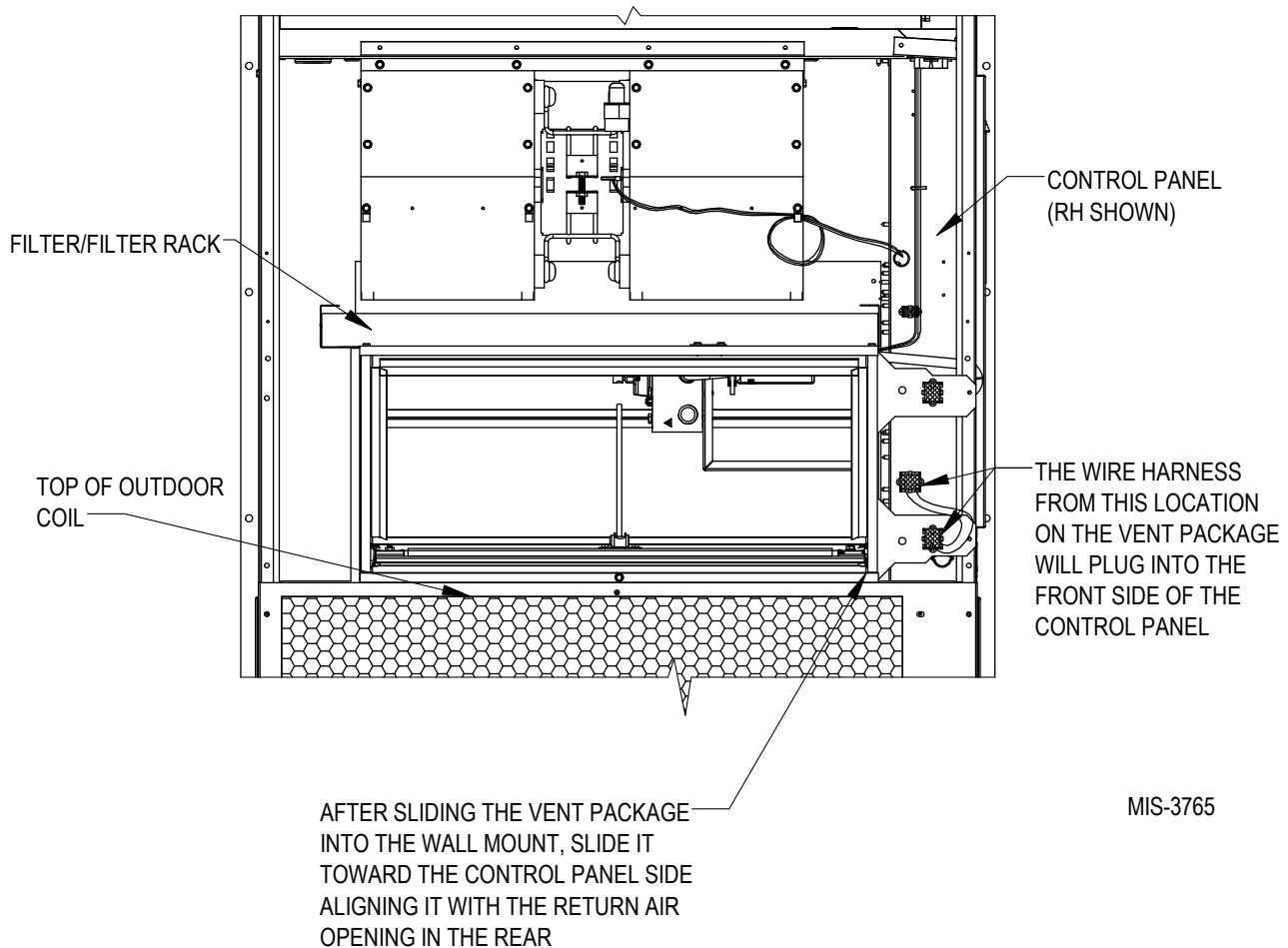


FIGURE 3
Extension Cable Installation



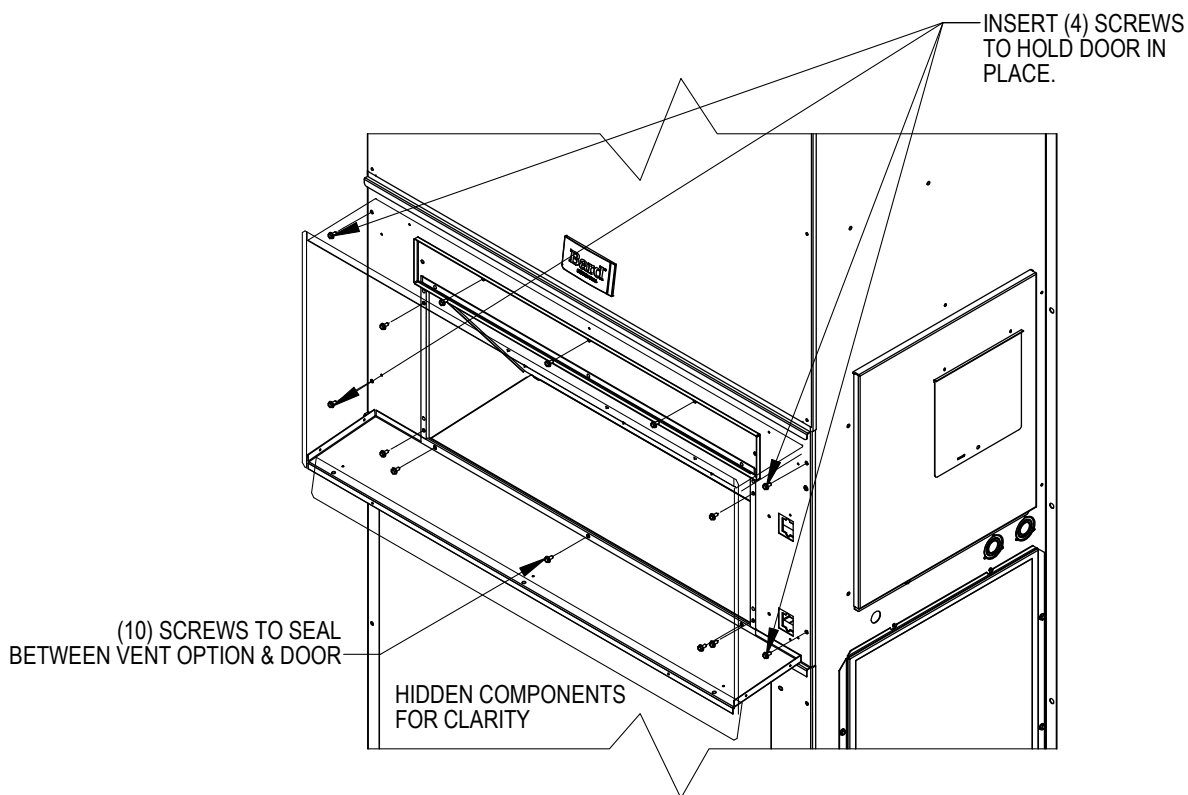
2. Insert CRV into opening in the wall mount unit between the filter rack and the condenser section, being careful not to tear the unit insulation. Fully seat CRV assembly to rear of the cavity. Slide the CRV toward the control panel so that it lines up with the return air opening in the rear of the wall mount unit (see Figure 4).
3. Insert and lock in the 12-pin extension cable installed in Step 1 into the front side of the control panel within the ventilation package section.
4. Replace the air filters if they were removed (airflow direction is up).
5. The next step involves installing the lower service panel, filter access cover and hood assembly that are included in the WCRVPS* package. The front slotted vent hood cover and mist eliminator filter must be removed to access several mounted screws located behind them. Replace the mist eliminator and vent hood cover after the lower service panel, filter access cover and hood assembly have been installed (see Figure 5).
6. Remove the vent control panel cover on the right-hand side of the vent hood.
7. Make all the required thermostat connections per the applicable connection diagram found on pages 9 or 10, and restore power to the unit.
8. Make any necessary changes required to the potentiometers to achieve the minimum continuous airflow and demand airflow desired.

FIGURE 4
Damper Assembly Installation



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FIGURE 5
Vent Hood Assembly



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CO₂ Control

For CO₂-based control, add a CO₂ sensor/controller (Bard part #8403-067) to the wall and run additional optional wires as shown in the wiring diagrams on pages 9 and 10.

The CO₂ controller must also be reconfigured from the standard default settings as shipped from the factory. See page 11 for complete details.

Control System Notes

This ventilation package is set to meet the current ASHRAE specifications for minimum occupied airflow rates, with extended capability to meet demand ventilation requirements. There are two different provisions to optimize this control path. One is the utilization of switch closures (occupancy and CO₂ demand) and the other is the utilization of occupancy (switch closure) and modulating CO₂.

Two Switch Application

Energizing the A terminal in the low voltage connection box during occupied conditions will allow the minimum occupied airflow rate to be set to meet ASHRAE requirements. This can be accomplished by adjusting

Potentiometer R1 on the CRV control board by aligning the damper position per the charts included on pages 13-15 (see Figure 6 on page 8). The factory default blade position for this condition is set to position 3.

Energizing Terminal 5 in the low voltage connection box will then drive the damper open to the CFM rate as set by Potentiometer R2 on the CRV control board (see Figure 6). Refer to the proper chart on pages 13-15 for the airflow to damper position correlation. The factory default blade position for this condition is set to position 4.5.

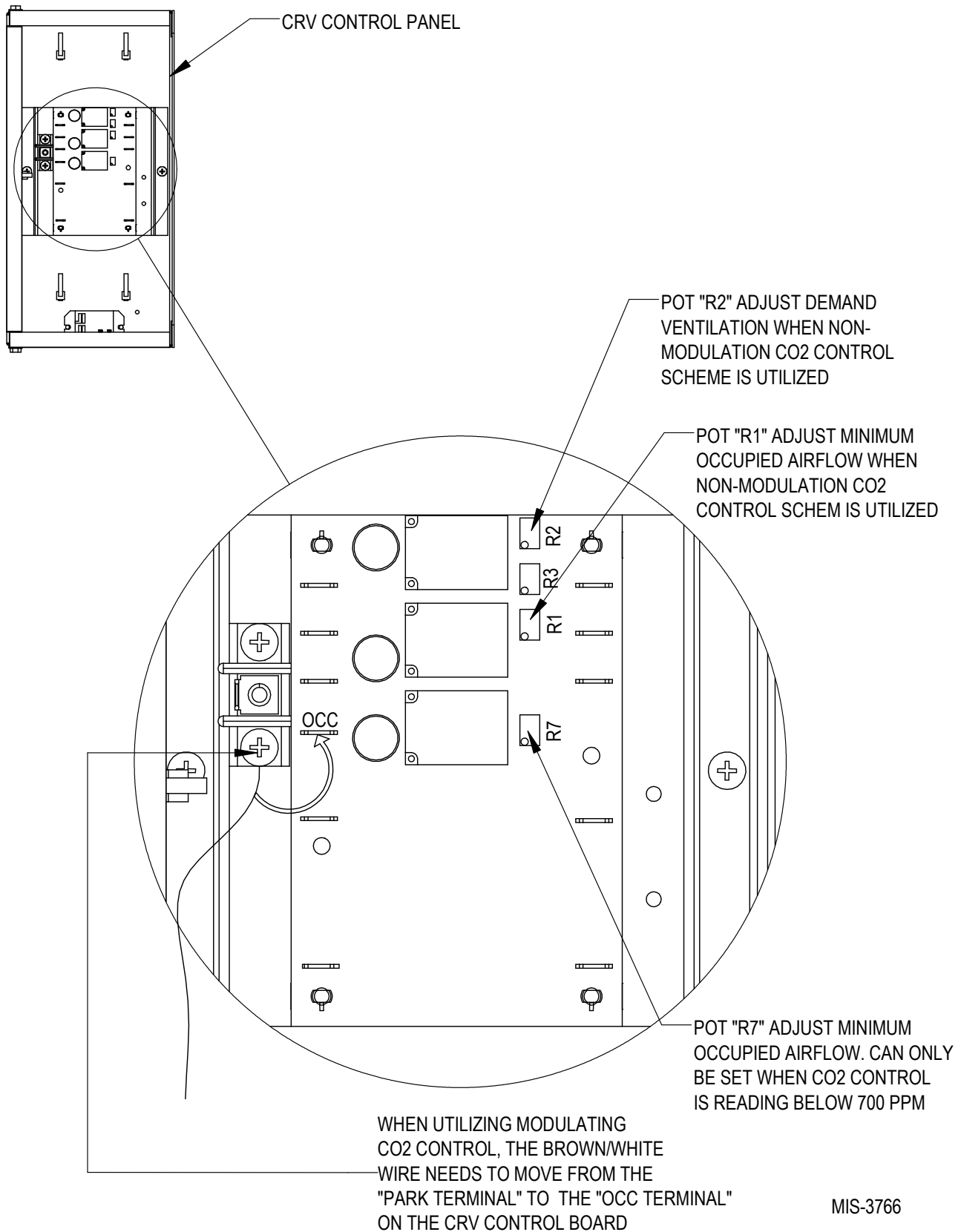
Modulating CO₂ Control

Wire the R power wire of the CO₂ control to A of the low voltage terminal block, then energize A based upon occupancy.

Connect the brown/white wire that is landed on the PARK terminal in the CRV control board to the OCC terminal of the CRV control board.

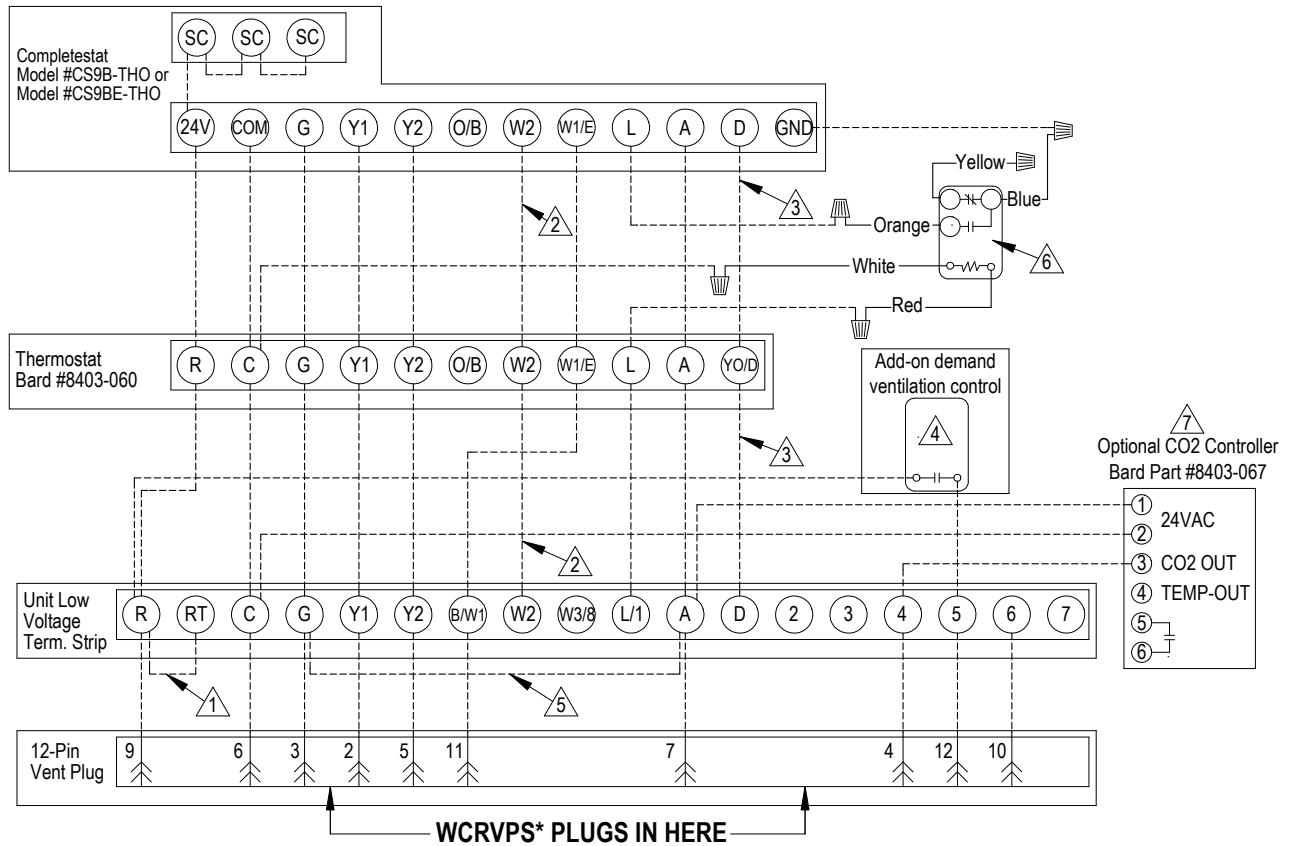
Once things are powered up and the CO₂ control has equalized, adjust Potentiometer R7 to the minimum damper open position to yield the desired occupied airflow rates. The CO₂ control will then take over in modulating the damper position to maintain the proper CO₂ rates.

FIGURE 6
CRV Control Board



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FIGURE 7
Required Control Connections for CRV with Air Conditioners



① Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.

② Not needed below 15KW.

③ Additional wire required for dehumidification models.

④ Demand ventilation control, which could include switched CO2 control, or secondary motion activated switch. Would be negated with option 7 (CO2 with 0-10VDC modulating output)

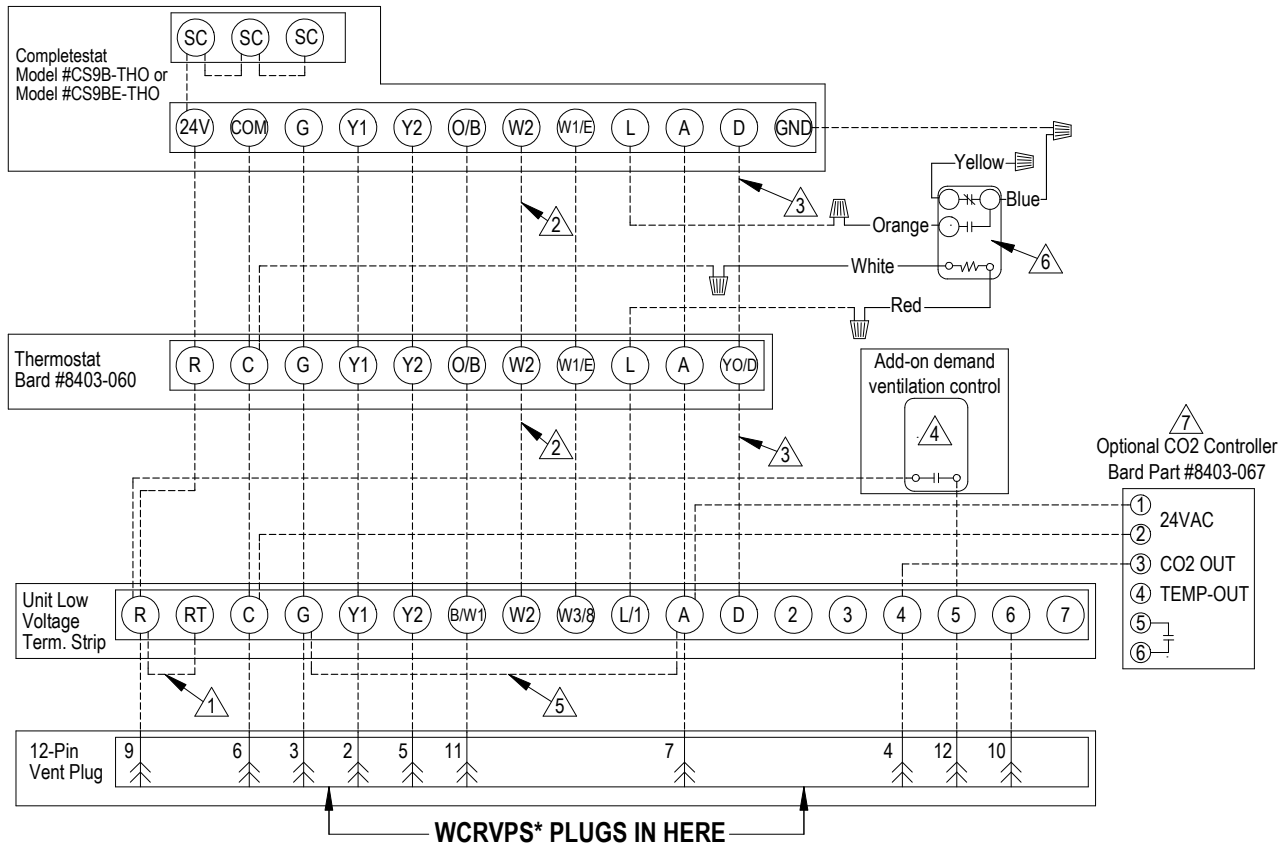
⑤ Install a jumper between "G" and "A" only when thermostat without "Occupancy Signal" is used.

⑥ Relay Provided with Completestat

⑦ 0-10 VDC Modulating CO2 control for modulating ventilation control

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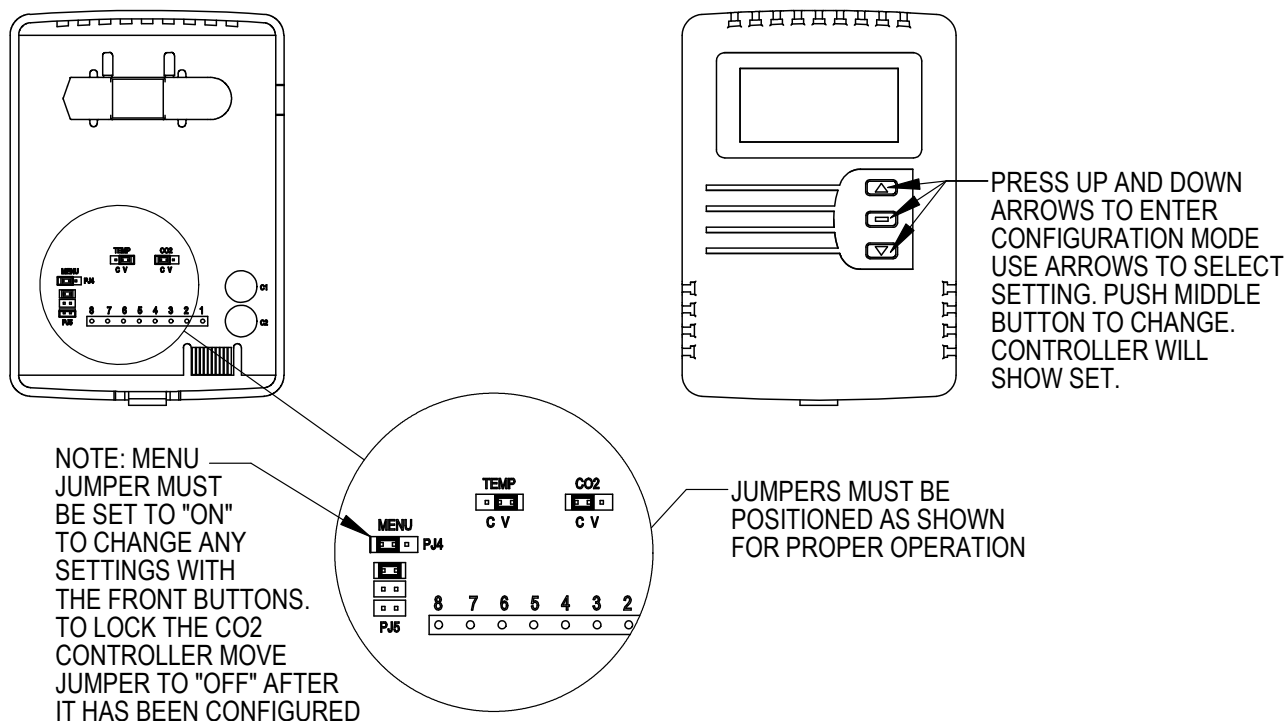
FIGURE 8
Required Control Connections for CRV with Heat Pumps



- ① Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.
- ② Not needed below 15KW.
- ③ Additional wire required for dehumidification models.
- ④ Demand ventilation control, which could include switched CO2 control, or secondary motion activated switch. Would be negated with option 7 (CO2 with 0-10VDC modulating output)
- ⑤ Install a jumper between "G" and "A" only when thermostat without "Occupancy Signal" is used.
- ⑥ Relay Provided with Completestat
- ⑦ 0-10 VDC Modulating CO2 control for modulating ventilation control

MIS-3727

FIGURE 9
CO₂ Sensor Default and Final Settings
Bard Part #8403-067 CO₂ Controller



4-20mA	AN (ppm)	Damper (1)	Approx. Blade Position (2)
4	700	MIN. OCC. VENTILATION	0
5	750		.6
6	800		1.3
7	850		1.9
8	900		2.5
9	950		3.1
10	1000		3.8
11	1050		4.4
12	1100		5
13	1150		5.6
14	1200		6.3
15	1250		6.9
16	1300		7.5
17	1350		8.1
18	1400		8.8
19	1450		9.4
20	1500	FULLY OPEN	10

Settings	Recommended	Default
RON	Not Used	
ROF	Not Used	
DSP	C	CT
UNI	US	US
COL	700	0
COH	1500	2000
TOL	Not Used	
TOH	Not Used	
BAR	See Instruction with Controller For High Altitude Installations	
CAL	Used for Field Calibration	

(1) Damper should be at the required minimum occupied ventilation rate when the CO₂ control is at 700 ppm. Potentiometer R7 can be adjusted clockwise (CW) to close it down, or counter clockwise (CCW) to open it to the required setpoint.

(2) Blade as referenced to the Blade Position Label.

MIS-3763

BLADE ADJUSTMENT FOR DESIRED VENTILATOR AIR

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

1. Return air duct static pressure drop.
2. Supply air duct static pressure drop.
3. Indoor blower motor speed.
4. Damper blade open position setting.

Refer to the appropriate graph below and on the following pages to determine the blade setting necessary to achieve the ventilation air required for each operating mode.

Factory Default Settings

Potentiometer R1 3

Potentiometer R2 6

For more accurate adjustment, use a flowhood over the intake opening to measure and adjust the airflow operation.

Potentiometer R1 Adjusts the minimum constant airflow during occupied conditions

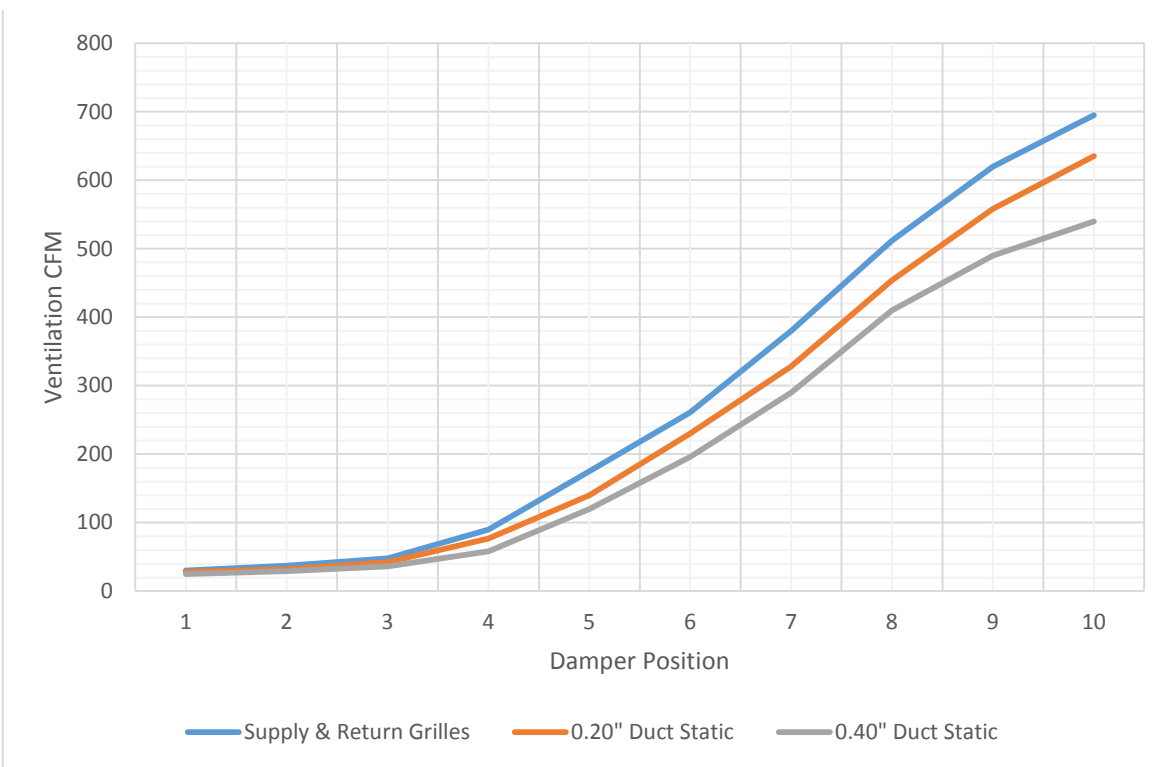
Potentiometer R2 Adjusts the airflow on a contact closure for demand ventilation

Energize occupied condition mode and adjust #1 Potentiometer to desired airflow.

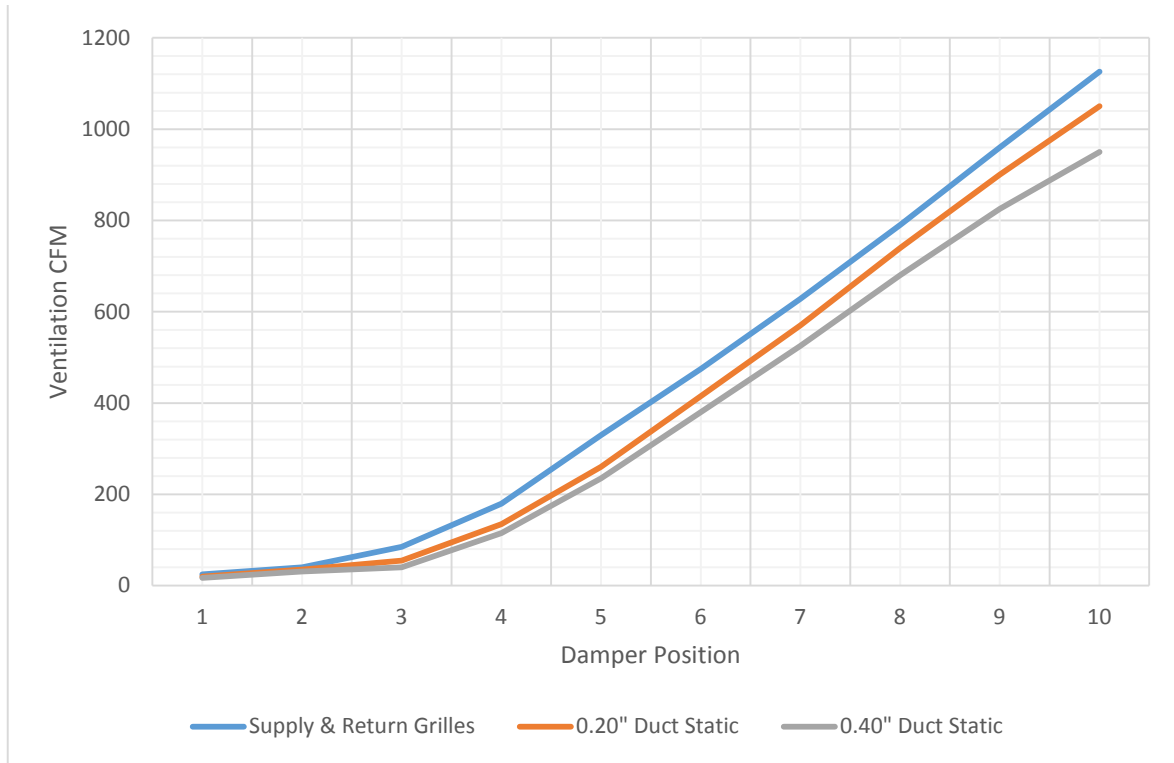
Energize demand ventilation mode and adjust #2 Potentiometer to desired airflow.

Minimum damper position when using CO₂ control damper should be at minimum occupied airflow at 700 ppm or lower; if not, Potentiometer R7 can be adjusted clockwise (CW) to close it. If it is fully closed at 700 ppm or lower, no adjustments are required.

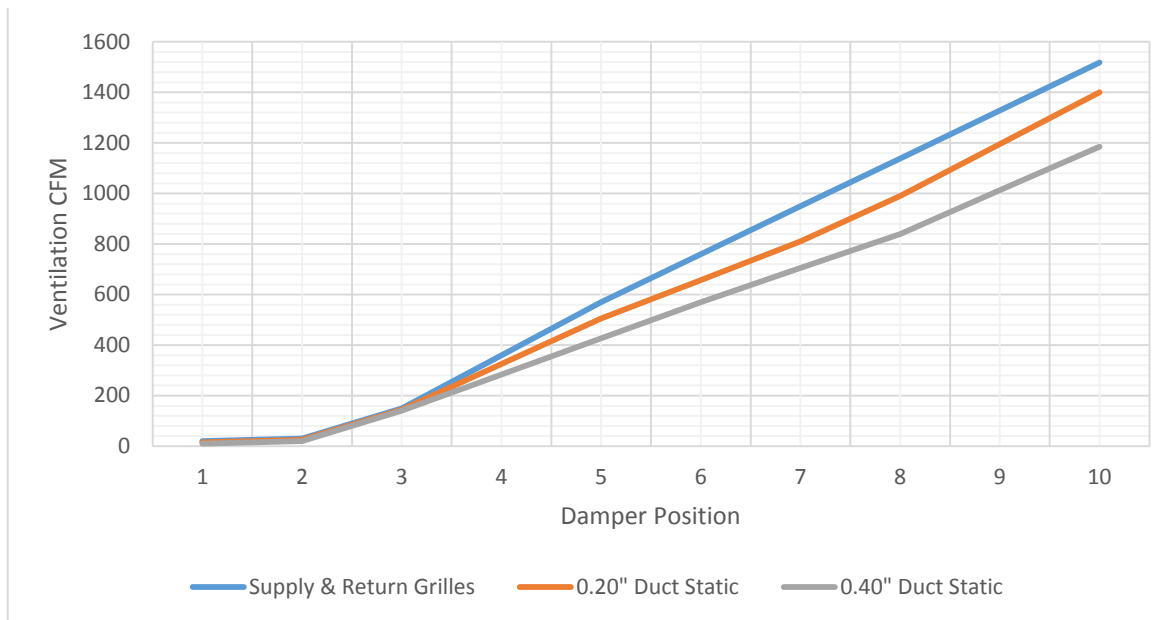
GRAPH 1
W18 and W24 Ventilation Delivery



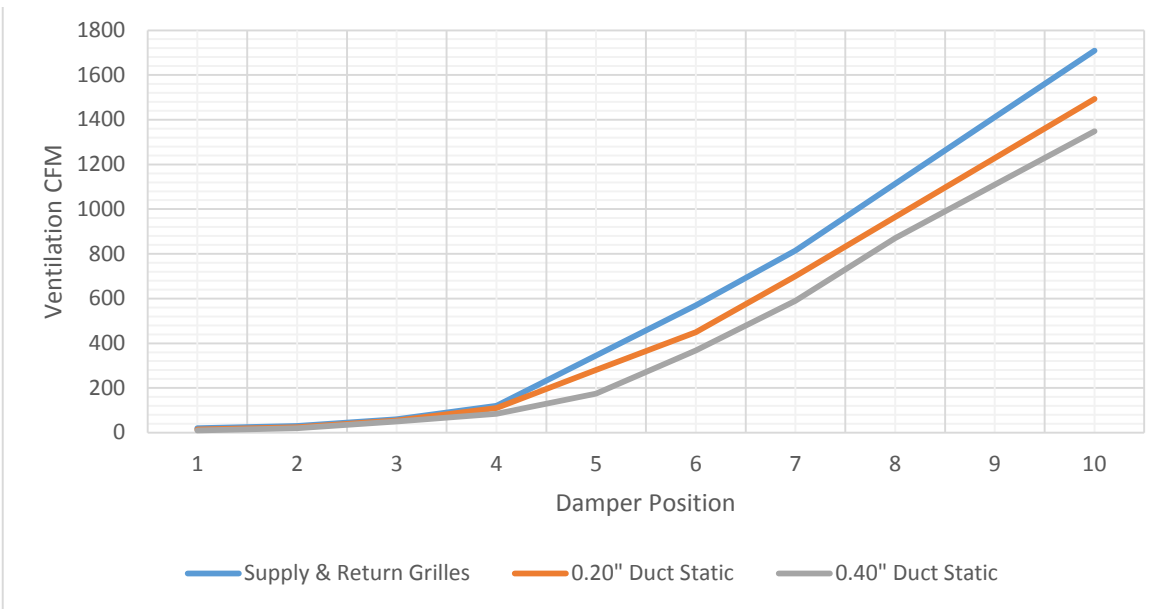
GRAPH 2
W30 and W36 Ventilation Delivery



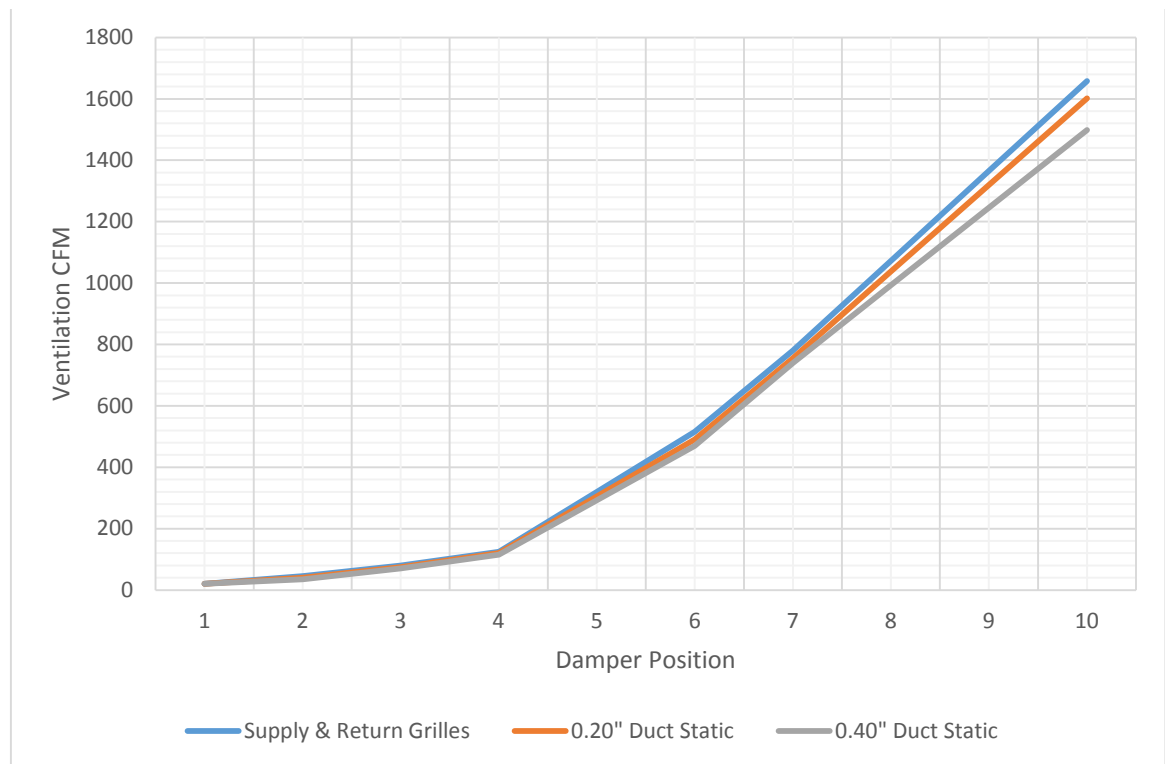
GRAPH 3
W42 and W48 Ventilation Delivery



GRAPH 4
W60 Ventilation Delivery



GRAPH 5
W72 Ventilation Delivery



COMMERCIAL ROOM VENTILATOR

Features

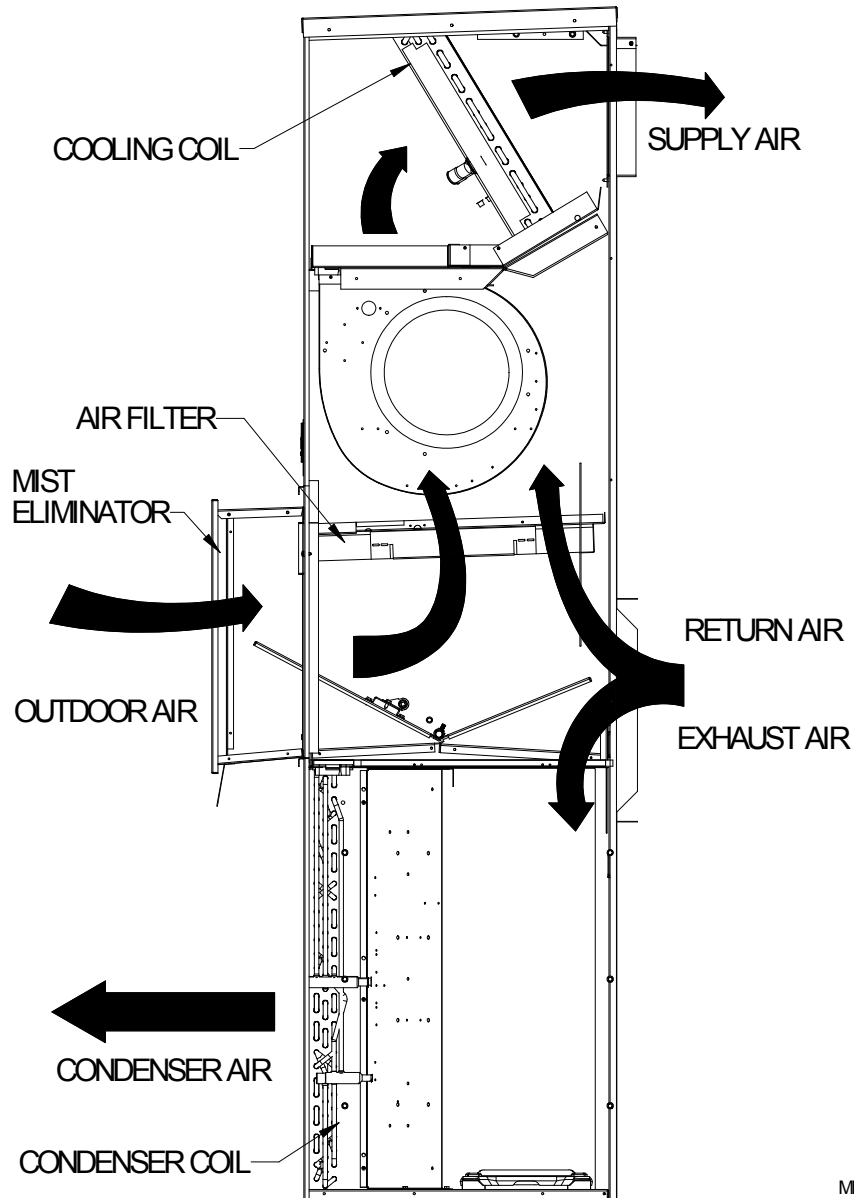
- One piece construction – easy to install with no mechanical linkage adjustment required.
- Exhaust air damper – built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.
- Actuator motor – 24 volt, power open, spring return with built in torque limiting switch.

Commercial Room Ventilator Sequence of Operation

On a call for occupied conditions, CRV opens to a position as set by #1 Potentiometer (see Figure 10).

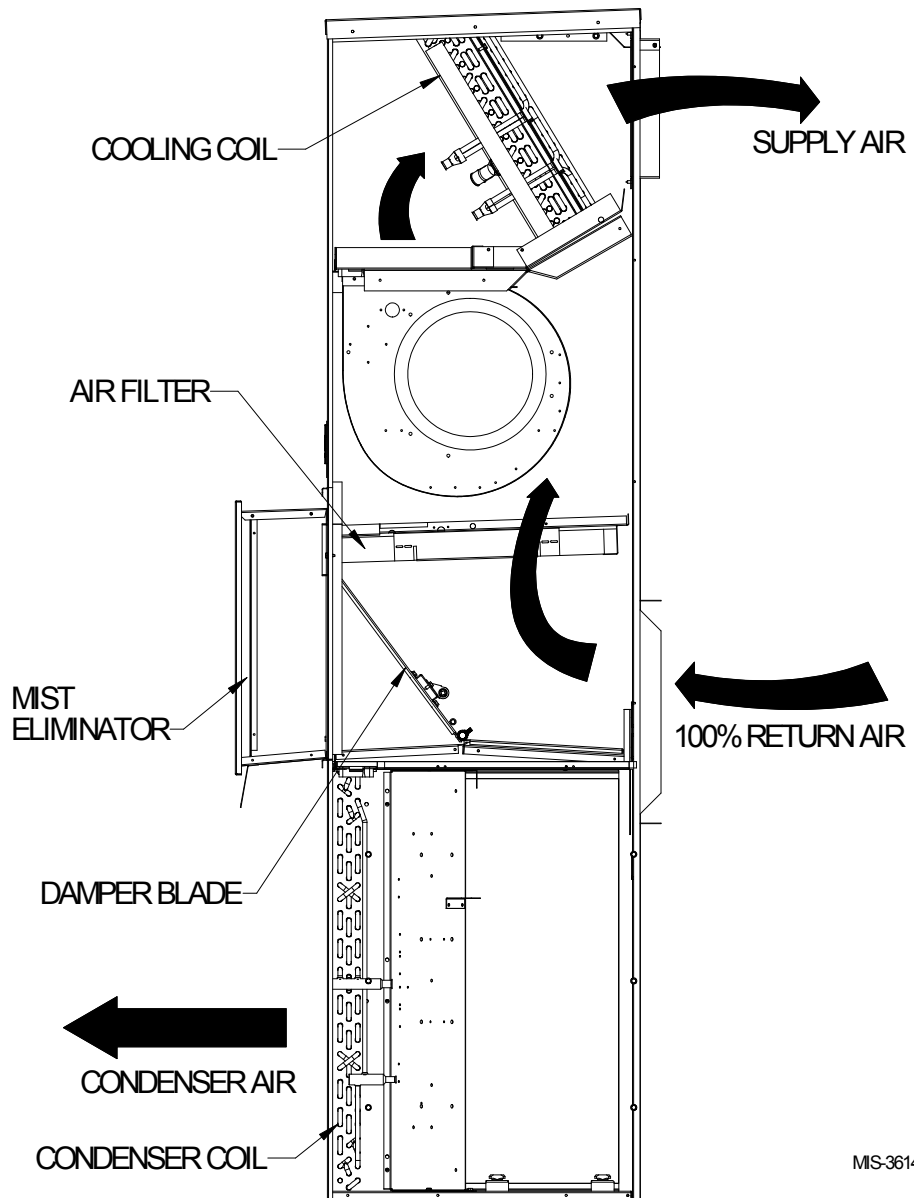
NOTE: These sequence descriptions do not apply if CO₂ controller is used. The CRV will control according to observed CO₂ levels in the conditioned space. Refer to information on page 11.

FIGURE 10
Call for Ventilation With or Without Compressor Operation



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FIGURE 11
Call for Compressor or Fan Only with Ventilation Off



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