
INSTALLATION INSTRUCTIONS

COMMERCIAL ROOM VENTILATORS WITH EXHAUST

MODEL
CRVMP-5

**For Use with Bard 3 through 5 Ton
Wall Mount Air Conditioners
and Heat Pumps**



CLIMATE CONTROL SOLUTIONS

Bard Manufacturing Company
Bryan, Ohio 43506
Since 1914...Moving ahead just as planned.

Manual : 2100-457
Supersedes:
File: Volume III Tab 19
Date: 10-25-05

CONTENTS

General

General Information	3
Unpacking	3
Description	3
Models	3

Installation

Basic Installation	4, 5, 6-8
Blade Adjustment for Desired Ventilator Air	10
Adding Optional CO2 Control Sensor	13
Commercial Room Ventilator Sequence	15

Figures

Figure 1	Removal of Exterior Panels	4
Figure 2	Remove Air Filter and Exhaust Cover Plate	5
Figure 3	Install Ventilator	6
Figure 4	CRVMP-5 Lead Connections	7
Figure 5	Step Control Installation	8
Figure 6	Damper Control Board	9
Figure 7	CO2 Sensor Set-Up	14
Figure 8	Call for Blower Operation	15
Figure 9	Call for Cooling Operation	16

Tables

Table 1		4
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Graphs

WA3S Ventilation Airflow	11
WA4S Ventilation Airflow	11
WA5S Ventilation Airflow	12

**Manufactured under U.S. Patent number 5,301,744
Other patents pending**

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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, step control assembly, 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, 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.

DESCRIPTION

The CRVMP-5 ventilator is designed to be used with Bard 3 through 5 ton wall mount series step capacity air conditioners. It is an electromechanical vent system designed to provide fresh air to meet indoor air quality standards. It automatically adjusts to the mode of operation to maintain consistent fresh air intake levels. Examples are blower only, stage 1 cooling and stage 2 cooling, which are all set for different total airflows.

MODELS

When installed in the above-listed models, the CRVMP-5 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.

INSTALLATION

BASIC INSTALLATION

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

WARNING

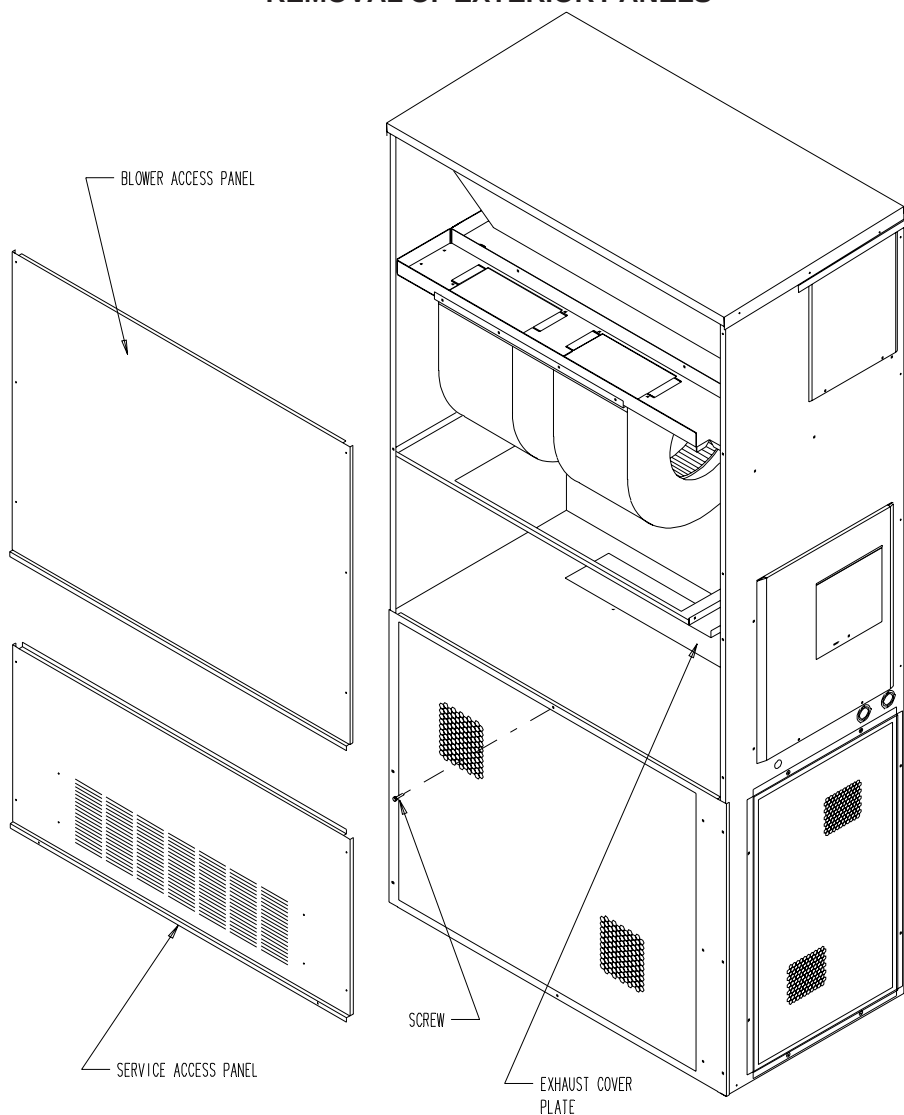
Open and lock unit disconnect switch before installing this accessory to prevent injury or death due to electrical shock or contact with moving parts. Turn thermostat to off.

TABLE 1

MODEL	FOR USE WITH FOLLOWING UNITS
CRVMP-5	WA3S WA4S WA5S

2. Remove and save the existing exterior blower access and service access panels on the Bard wall mount unit. (See Figure 1.)

FIGURE 1
REMOVAL OF EXTERIOR PANELS

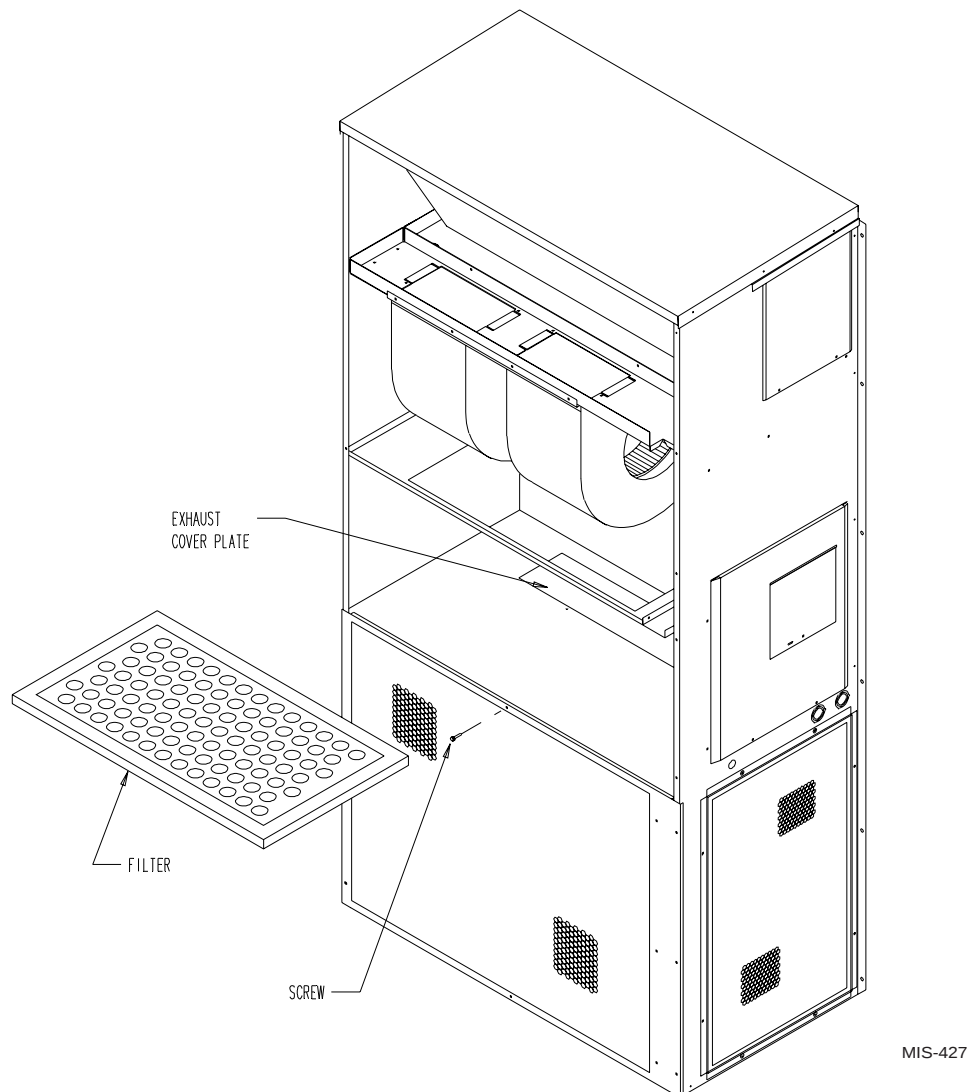


MIS-425

3. Remove and save existing unit air filter and screws from front center grille. (See Figure 2.)

4. Remove and discard the exhaust cover plate.

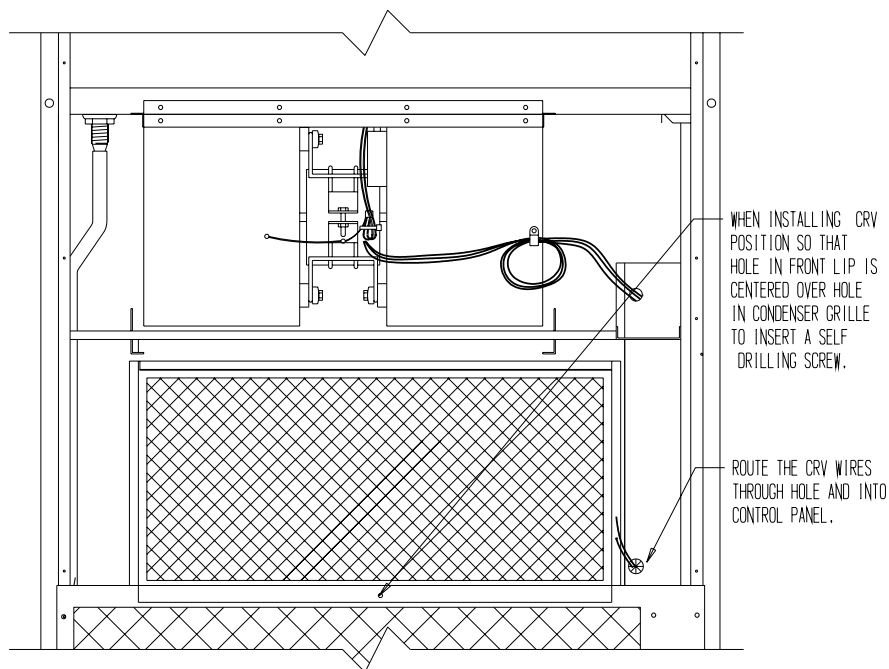
FIGURE 2
REMOVE AIR FILTER AND EXHAUST COVER PLATE



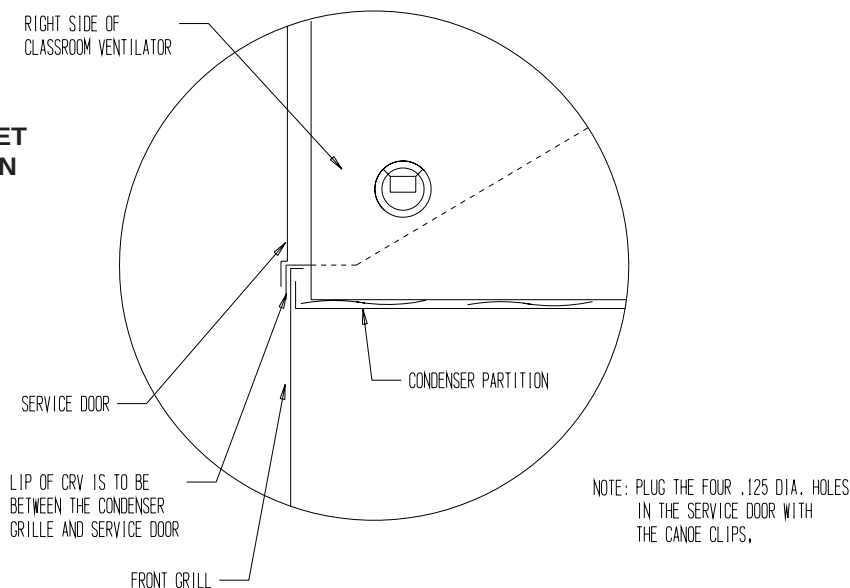
5. Install ventilator sheet metal assembly by inserting the ventilator into the unit to the far left side clearing the right filter bracket. Once the ventilator is fully inserted, slide the ventilator to the right until it is tight against the back of the control panel. (See Figure 3.)
6. Open control panel to gain access to unit low voltage terminal block.
7. Route electrical harness leads through the 7/8" bushing in control panel (Figure 3) into low voltage box.

IMPORTANT: Position front lip of ventilator on top of front grille and condenser partition. (See Figure 3 inset.) This is important to ensure proper drainage of any water entering damper assembly.

**FIGURE 3
INSTALL VENTILATOR**



**FIGURE 3 INSET
SIDE SECTION**



TO SET CRV AIRFLOW FOR BLOWER ONLY, JUMPER R,G,F. ADJUST POT #1.
TO SET CRV AIRFLOW FOR 1ST STAGE COOLING, JUMPER R,G,Y1,F. ADJUST POT #2.
TO SET CRV AIRFLOW FOR 2ND STAGE COOLING, JUMPER R,G,Y1,Y2,F. ADJUST POT #3.

THIS WIRE CONNECTS FOR CO2 SENSOR APPLICATIONS ONLY

DM

TR
TRI
T
TI
P
PI

BK
PR
PK

ALTERNATE CONNECTION FOR CONSTANT VENTILATION

COLOR CODE
WIRE COLOR ABBREVIATION

BLACK	BK
BROWN	BR
RED	R
ORANGE	O
YELLOW	Y
GREEN	G
BLUE	BL
VIOLET(PURPLE)	V(PR)
GRAY(SLATE)	GY(S)
WHITE	W
TAN	T
PINK	PK
LAVENDER	L

REQUIRED FIELD WIRING FOR OPTIONAL CO2 CONTROL

PART ABBREVIATION LIST

CCB	CRV CONTROL BOARD
CO2	CARBON DIOXIDE SENSOR
COO	CHANGE OVER RELAY
DM	DAMPER MOTOR

UNIT LOW VOLTAGE TERMINAL STRIP

F C R G Y1 Y2 W1 W2

AIR CONDITIONER CONNECTION DIAGRAM

CO2

Y
BR
BK
R

COO

9 3 PR 6 PR
7 1 Y 4 BL BR
A B

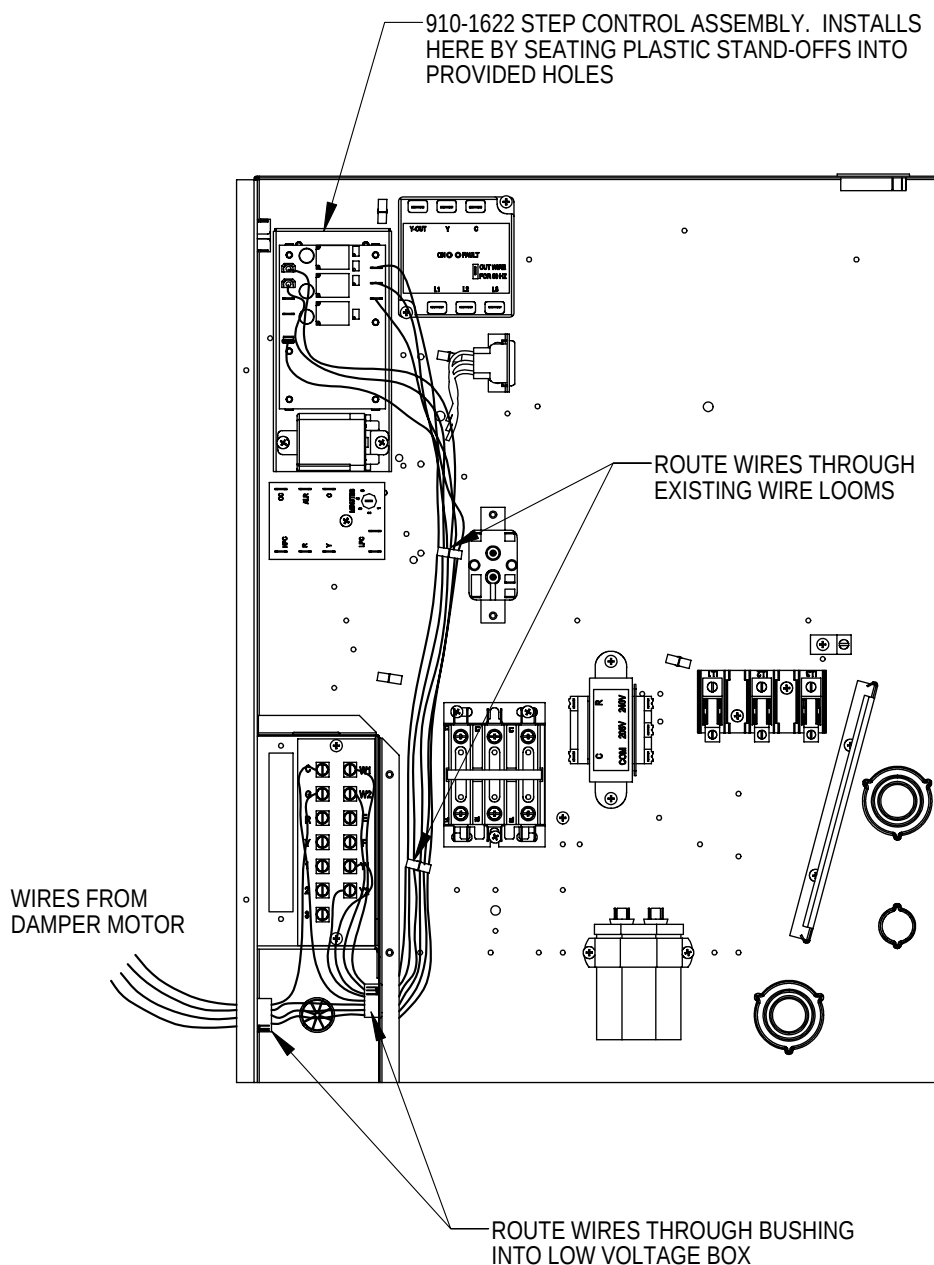
CO2

Y
BR
BK
R

- Manual 2100-457
Page 7 of 16

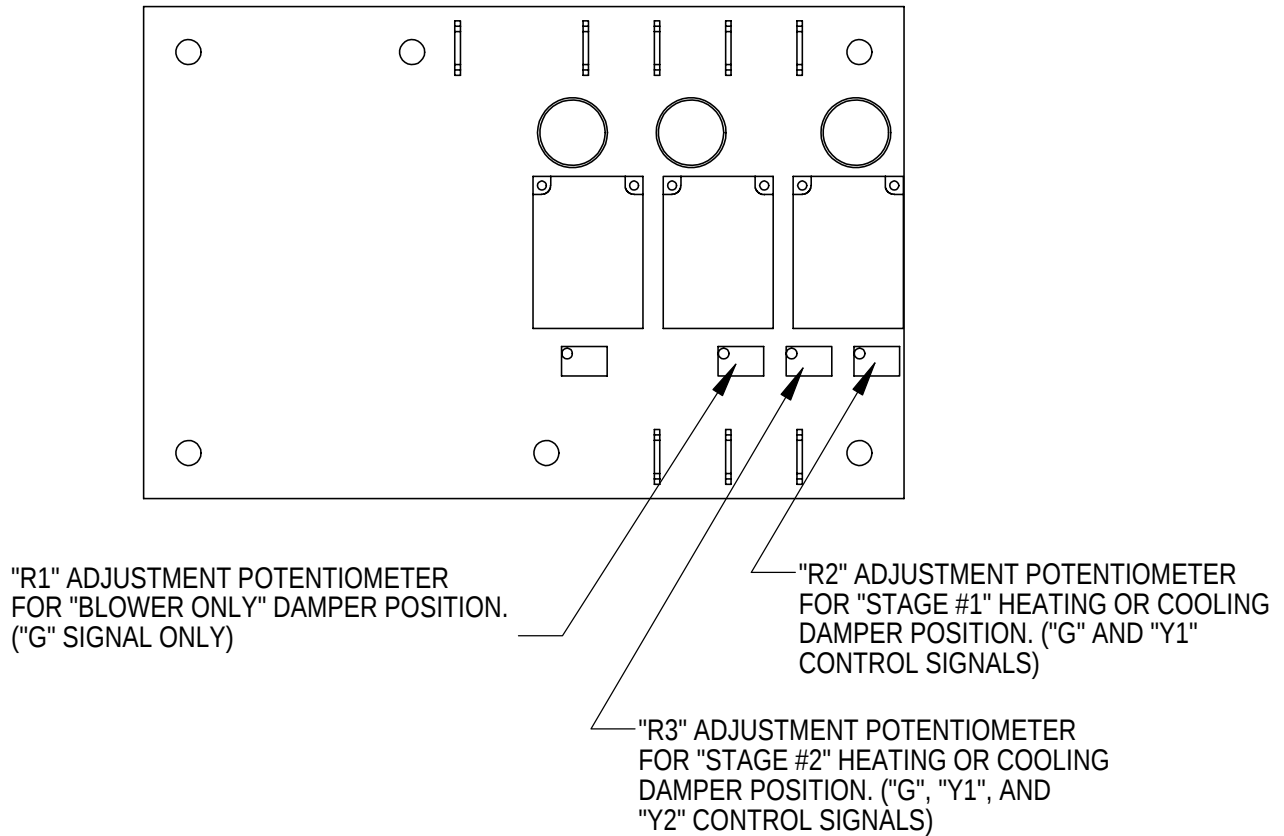
- F. Now energize the Stage #2 cooling/heating by increasing the thermostat setting to a greater offset than the actual room temperature.
(Jumper “R” to “G”, “Y1” and “Y2”)
- G. Ventilator should now open to the position set by “R3” potentiometer on step control board. (See Figure 6.)
- H. Now turn the heat/cool selector to OFF, and set the fan switch back to AUTO. The damper blade should close. **(Remove all jumper connections.)**
- I. This completes the ventilator checkout.
15. Adjust damper blade for required ventilation. (See next section.)
16. Replace mist eliminator filter. Be sure that it is installed with the drain holes to the bottom.
17. Remove blank off plate or barometric fresh air damper installed on service access door. Plug four (4) mounting holes with the plastic plugs provided with the ventilator.
18. Replace service access panel.
19. Close control panel cover.
20. Ventilator is now ready for operation.

**FIGURE 5
STEP CONTROL INSTALLATION**



MIS-2116

FIGURE 6
SETTING 3-POSITION CRV DAMPER CONTROL BOARD
(Utilize the charts for your specific model on the following pages)



MIS-2117

BLADE ADJUSTMENT FOR DESIRED VENTILATOR AIR

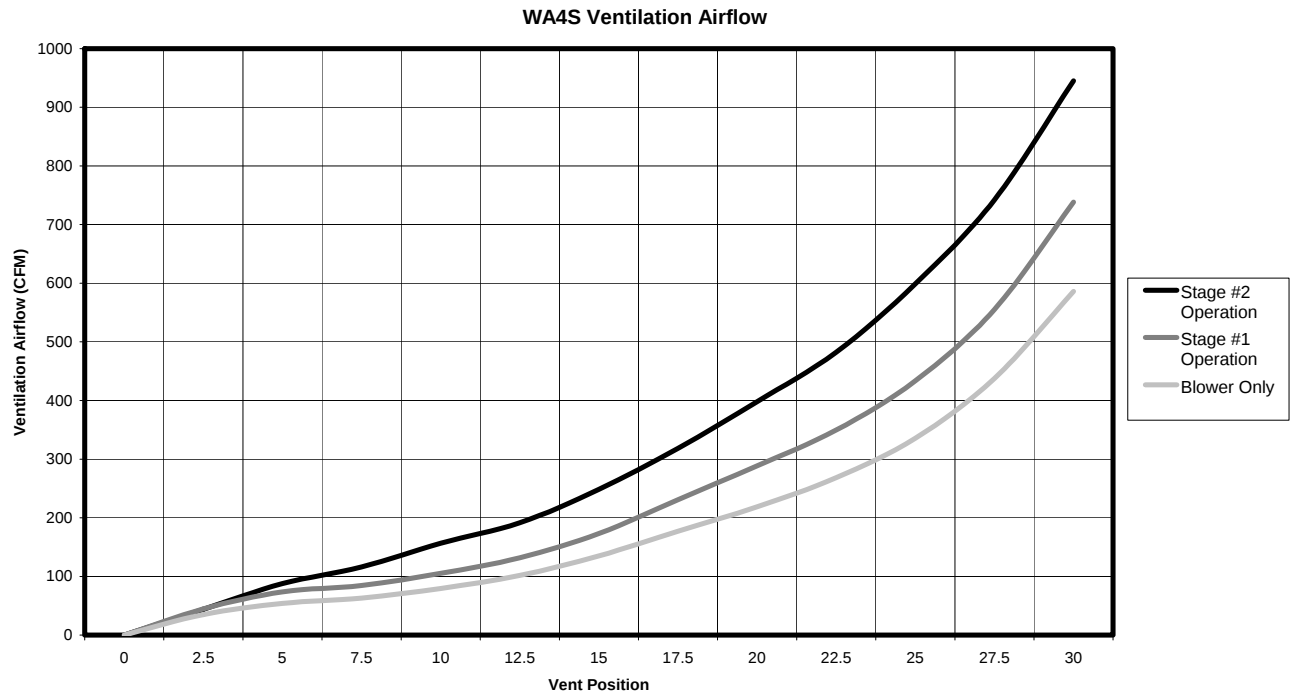
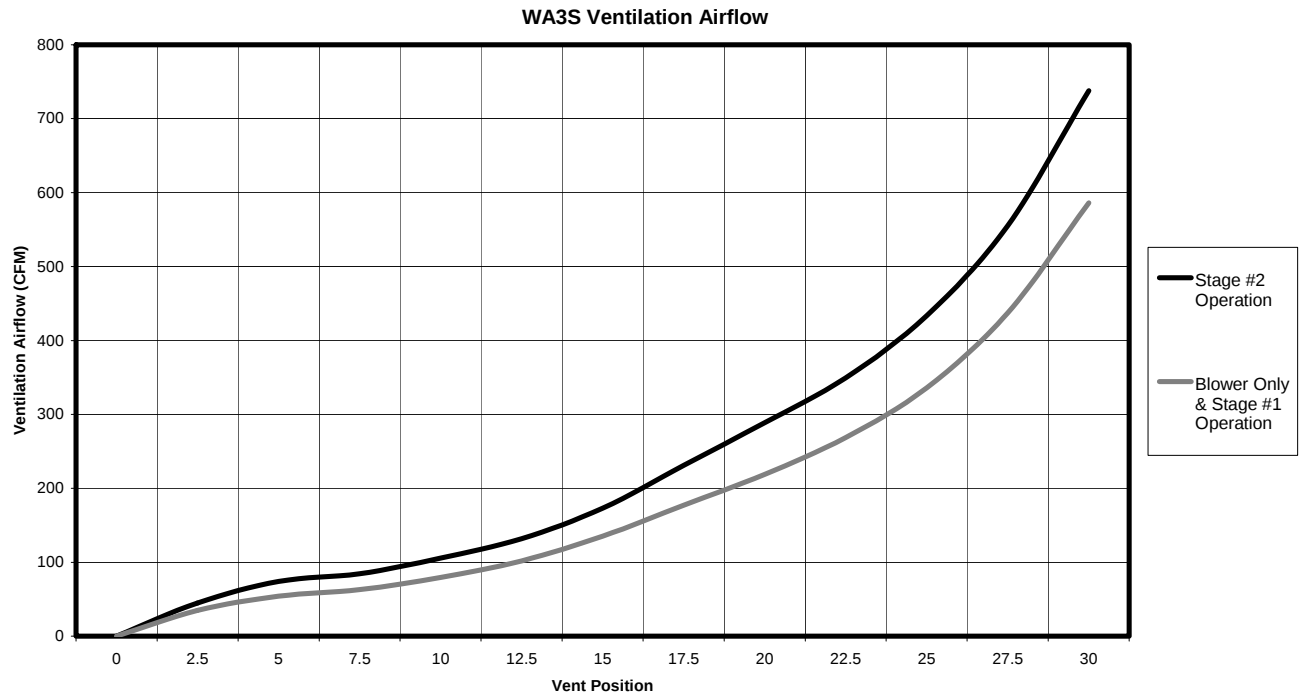
The amount of ventilation air supplied by the commercial room ventilator is dependent on five (5) factors.

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 for each mode of operation.
5. Tightness or looseness of building envelope.

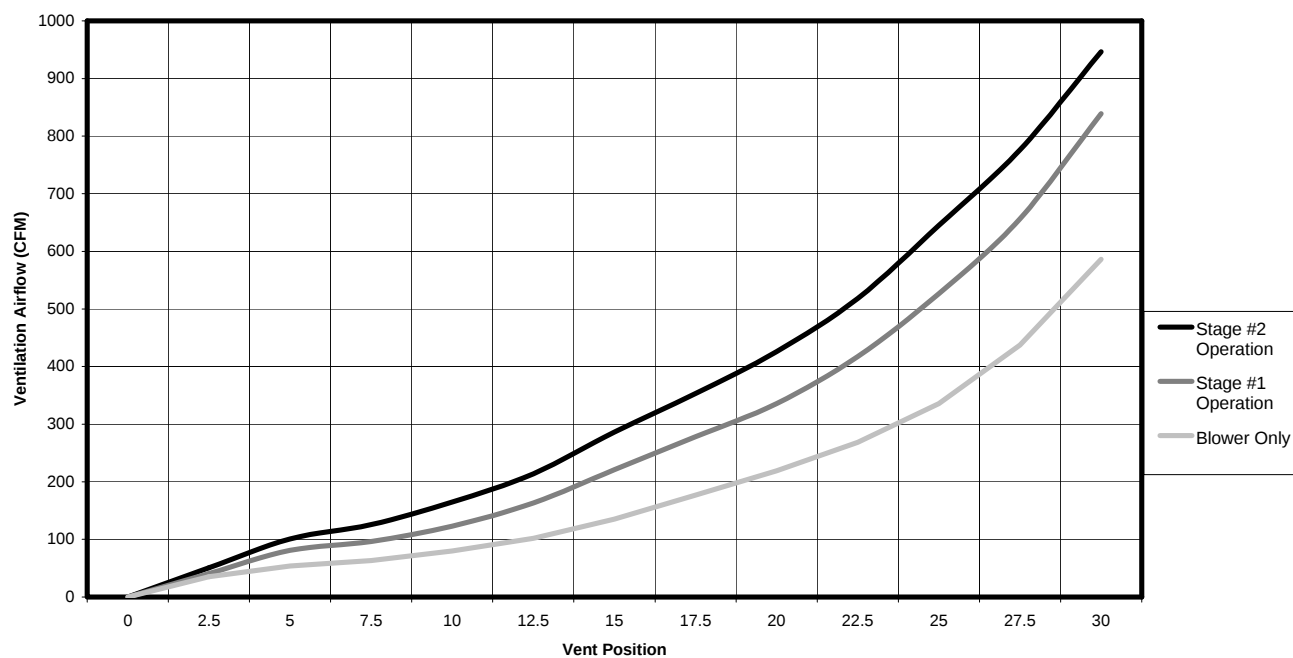
You will have to set the damper position for each mode of operation using the set-point potentiometers on the Damper Position Step Control Board. See Figure 6.

Refer to the graphs on the following pages to determine the necessary blade setting to achieve the ventilation air required based upon blower only, Stage #1 and Stage #2 modes of operation. These charts are model specific, so you will have to match the chart to the specific model you are working with.

1. Set the damper position for blower only operation.
 - A. Energize the evaporator blower by switching thermostat to the manual fan position with heat/cool in OFF position (**or Jumper “R” to “G” with thermostat disconnected at unit**).
 - B. Locate potentiometer “R1” on the Damper Position Step Control Board. See Figure 6.
 - C. Using a small screwdriver, adjust potentiometer until damper position aligns with numerical location on the label interior of the sheet metal damper assembly.
2. Set the damper position for Stage #1 cooling/heating operation.
 - A. Energize the evaporator blower and compressor by switching thermostat to the heat or cool mode, and setting it to a minimal offset to the room temperature to engage the mode of operation desired (**or Jumper “R” to “G” and “Y1” with thermostat disconnected at unit**).
 - B. Locate potentiometer “R2” on the Damper Position Step Control Board. See Figure 6.
 - C. Using a small screwdriver, adjust potentiometer until damper position aligns with numerical location on the label interior of the sheet metal damper assembly. (Make sure there is not a call on “Y2” or “W2”.)
3. Set the damper position for Stage #2 cooling/heating operation.
 - A. Energize the evaporator blower and compressor by switching thermostat to the heat or cool mode and set a large temperature offset to the room temperature to engage the mode of operation desired (**or Jumper “R” to “G”, “Y1” and “Y2” with thermostat disconnected at unit**).
 - B. Locate potentiometer “R3” on the Damper Position Step Control Board. See Figure 6.
 - C. Using a small screwdriver, adjust potentiometer until damper position aligns with numerical location on the label interior of the sheet metal damper assembly per the chart.



WA5S Ventilation Airflow



ADDING OPTIONAL CO2 CONTROL SENSOR

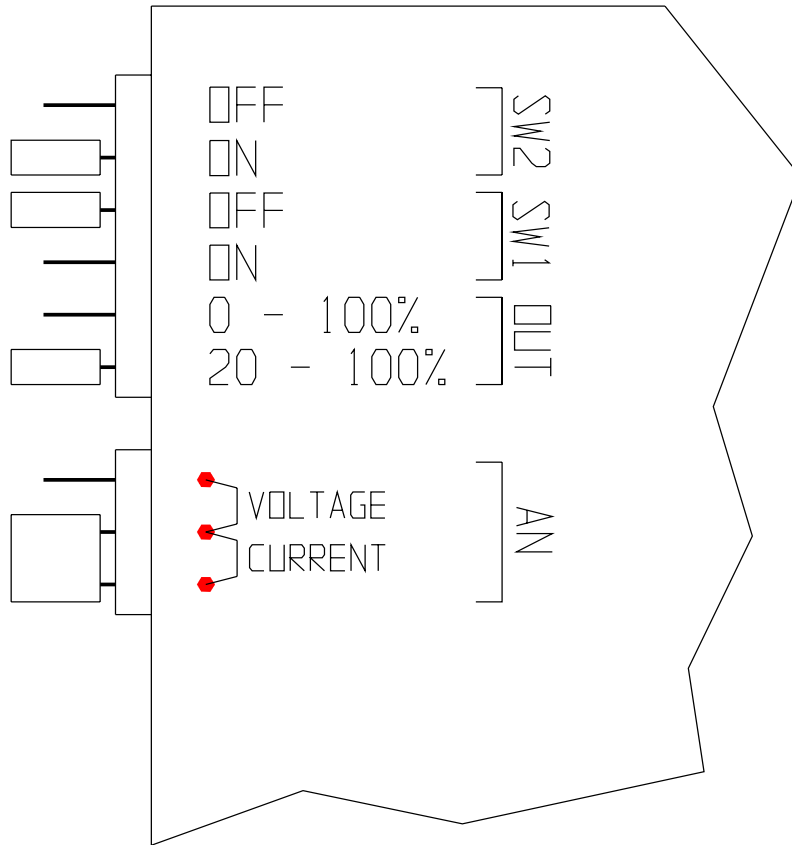
Adding an optional Bard Part #8403-056 to this control will maximize the capabilities of this vent by only supplying fresh air intake to maintain CO2 levels. This has multiple benefits.

- Minimizes ventilation load on structure as it only brings in what is required to maintain CO2 levels lowering reconditioning requirements (not having to heat/cool as much outside air).
- Will self-adjust for various occupancy levels so that you are not bringing in fresh air beyond need. For example, if a room is designed for a maximum occupancy of 40 persons (the standard ventilation control would have to be set for that occupancy), but the room typically only contains 25 persons. This control will self-adjust the amount of fresh air intake from 600 to 375 CFM automatically (based upon 15 CFM per person standard rate to ASHRAE standards).

Basic Installation

1. Make sure power is turned off to the unit
2. Follow steps beginning on page 2 for installation for standard control and vent assembly, then proceed with the following steps.
3. Run (4) wire thermostat wire from the unit to the desired CO2 sensor location.
4. Follow Figure 7 to configure the CO2 sensor for proper operation. This set-up includes:
 - Setting control for 500-1500 ppm CO2 control band (damper will be in full closed position @ 5000 ppm CO2, and will be at full position if CO2 levels reach 1500 ppm). This is accomplished by setting “SW1” to the “OFF” position and “SW2” to the “ON” position.
 - Setting control for 4-20 MA control by installing the jumper for the 20-100% range.
 - Setting control for current (rather than voltage) output.
5. Connect the thermostat wiring from the CO2 sensor to step control assembly following the wiring diagram in Figure 4, or the one on the ventilator assembly.
6. Connect the orange wire from the “F” terminal of the units low voltage connection strip to the “OCC” terminal on the step control board.
7. To check operation, restore power to the unit.
8. Make sure that thermostatic control is in “occupied” mode of operation calling for ventilation.
9. Have someone stand in front of the CO2 sensor and breath on it. The display should show an increase in CO2 ppm, and the damper blade in the ventilation package should increase (may be good to have a helper - one to breath on control and one to observe damper).

FIGURE 7
8403-056 CO2 SENSOR SET UP



MIS-2121

COMMERCIAL ROOM VENTILATOR – WA*S SERIES

FEATURES

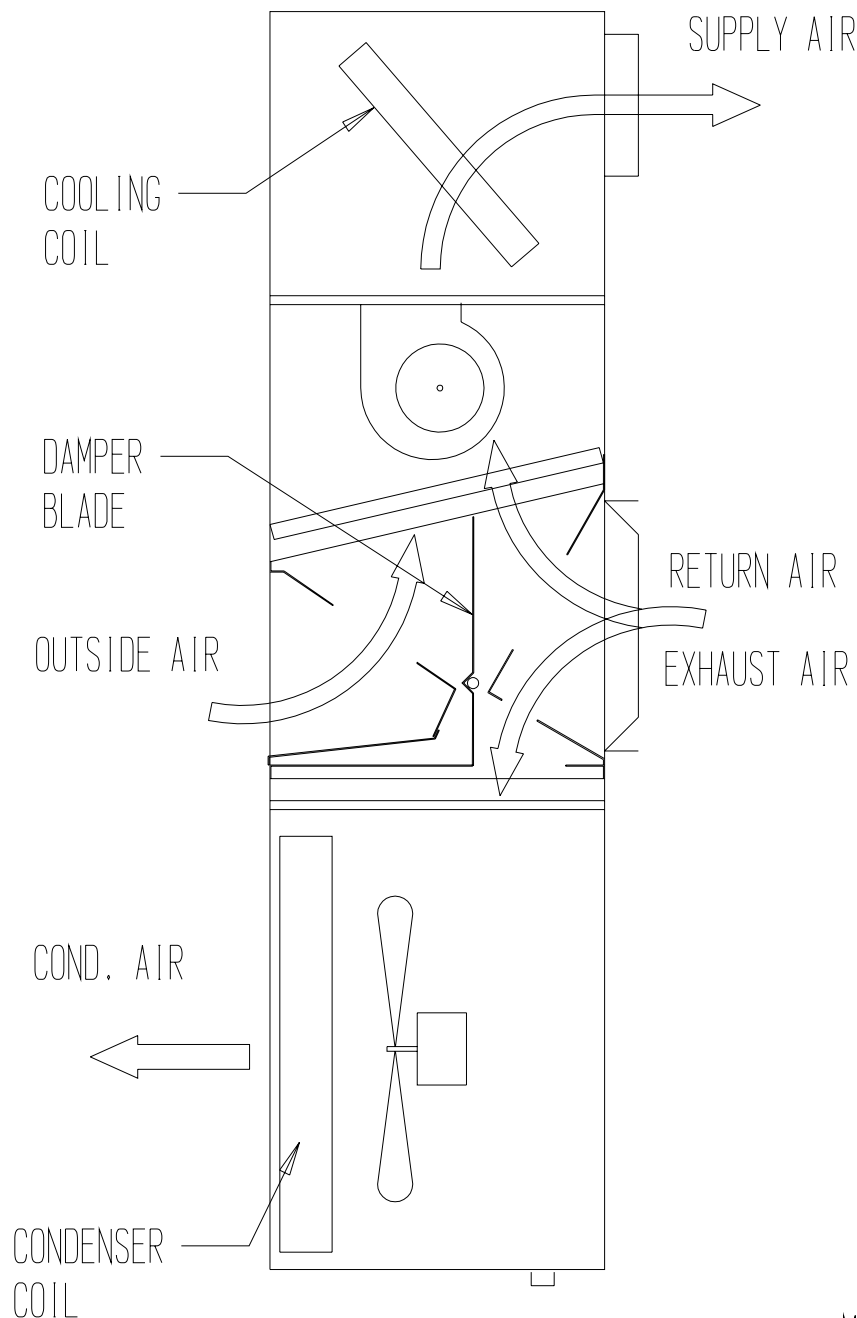
- One piece construction – easy to install with no mechanical linkage adjustment required.
- Exhaust air damper – built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.

- Actuator motor – 24 volt, power open, spring return with built in torque limiting switch.
- Provides up to 75 percent of outside air.

COMMERCIAL ROOM VENTILATOR SEQUENCE OF OPERATION

On a call for blower operation, CRV opens to a position as set by Step Control Position Assembly. See Figure 8

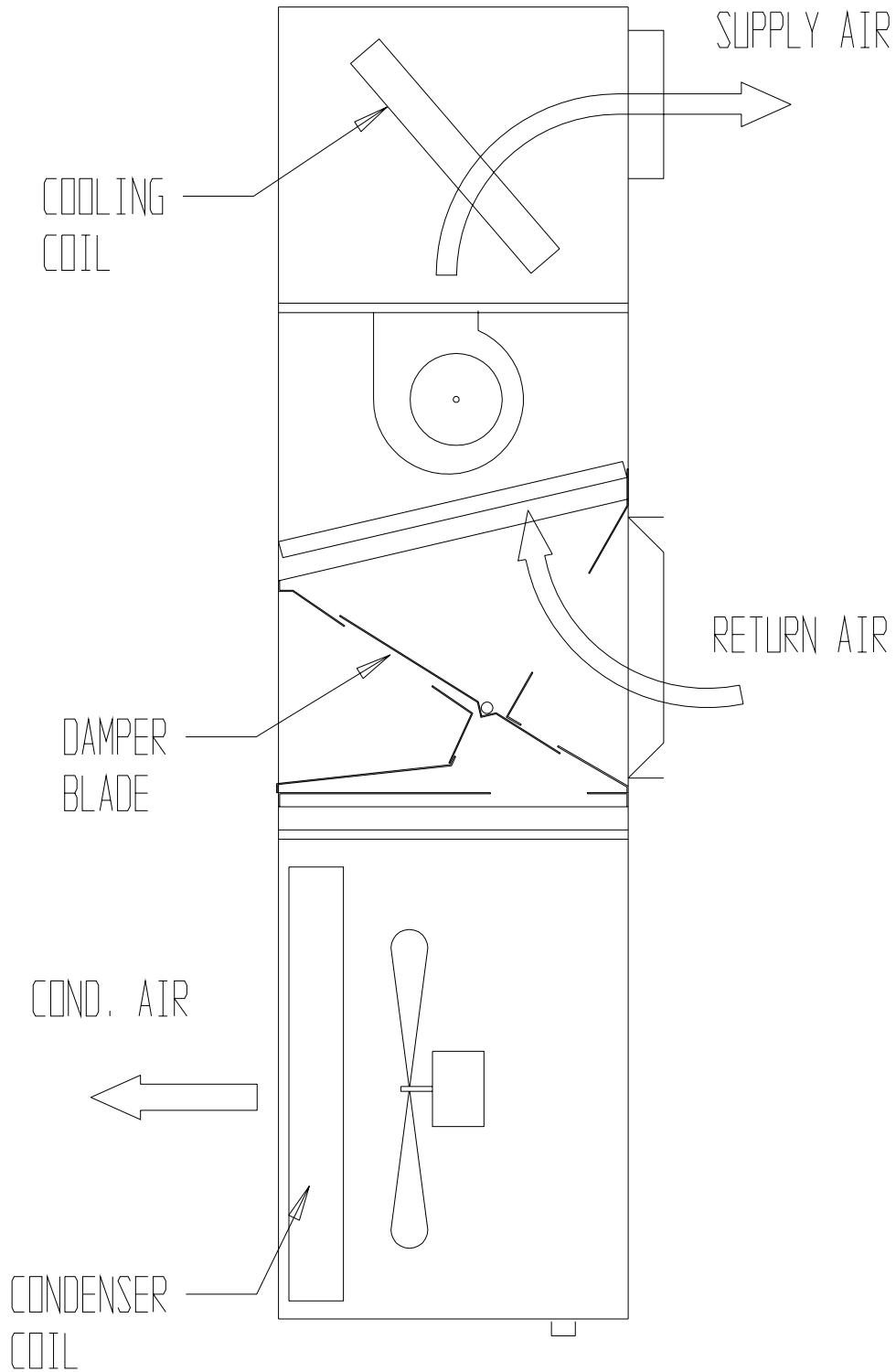
**FIGURE 8
CALL FOR BLOWER OPERATION**



MIS-347

A call for cooling cycles the compressor, and dampers remain in the ventilation mode. On loss of blower operation, CRV closes fully. See Figure 9.

FIGURE 9
CALL FOR COOLING OPERATION



MIS-348