
INSTALLATION INSTRUCTIONS

COMMERCIAL ROOM VENTILATORS WITH EXHAUST

MODELS
CRV-2
CRV-3

**For Use with Bard 1-1/2 thru 3 Ton
Wall Mount Air Conditioners
and Heat Pumps**



Bard Manufacturing Company
Bryan, Ohio 43506

Since 1914...Moving ahead just as planned.

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CONTENTS

General

General Information	1
Unpacking	1
Description	1

Installation

Basic Installation	2
Blade Adjustment for Desired Ventilation Air	7
Commercial Room Ventilator – WA, WH & WL Series	14

Figures

Figure 1	Removal of Exterior Panels	2
Figure 2	Removal of Exhaust Cover Plate	3
Figure 3	Re-Routing Wires Left Hand Units	4
Figure 4	Inverting Ventilator Into Unit	5
Figure 5	Top View of Control Panel	6
Figure 6	Wiring Diagram	7
Figure 7	Call for Blower Operation	14
Figure 8	Call for Cooling Operation	15

Tables

Table 1	CRV-2 Ducted System	8 & 9
Table 2	CRV-2 Non-Ducted System	10
Table 3	CRV-2 Total Delivered Air	10
Table 4	CRV-3 Ducted System	11 & 12
Table 5	CRV-3 Non-Ducted System	13
Table 6	CRV-3 Total Delivered Air	13

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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, 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 CRV-2 and CRV-3 ventilators are designed to be used with Bard 1-1/2 through 3 ton wall mount series heat pumps and air conditioners. They are electromechanical vent systems designed to provide fresh air to meet indoor air quality standards.

MODELS:

ALL MODELS EXCEPT THOSE LISTED BELOW

When installed in the above listed models, the CRV 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.

MODELS:

WH261, WH311

When installed in the above listed units, **a separate barometric relief damper may need to be installed to provide exhaust.** These units use a "draw-through" condenser air system. A blank off plate is installed on the exhaust opening unit and must not be removed. If the blank off plate were to be removed, the condenser fan will blow air through the exhaust opening into the return air stream. This will not provide any exhaust capability, and may tend to pressurize the indoor room.

INSTALLATION

BASIC INSTALLATION

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

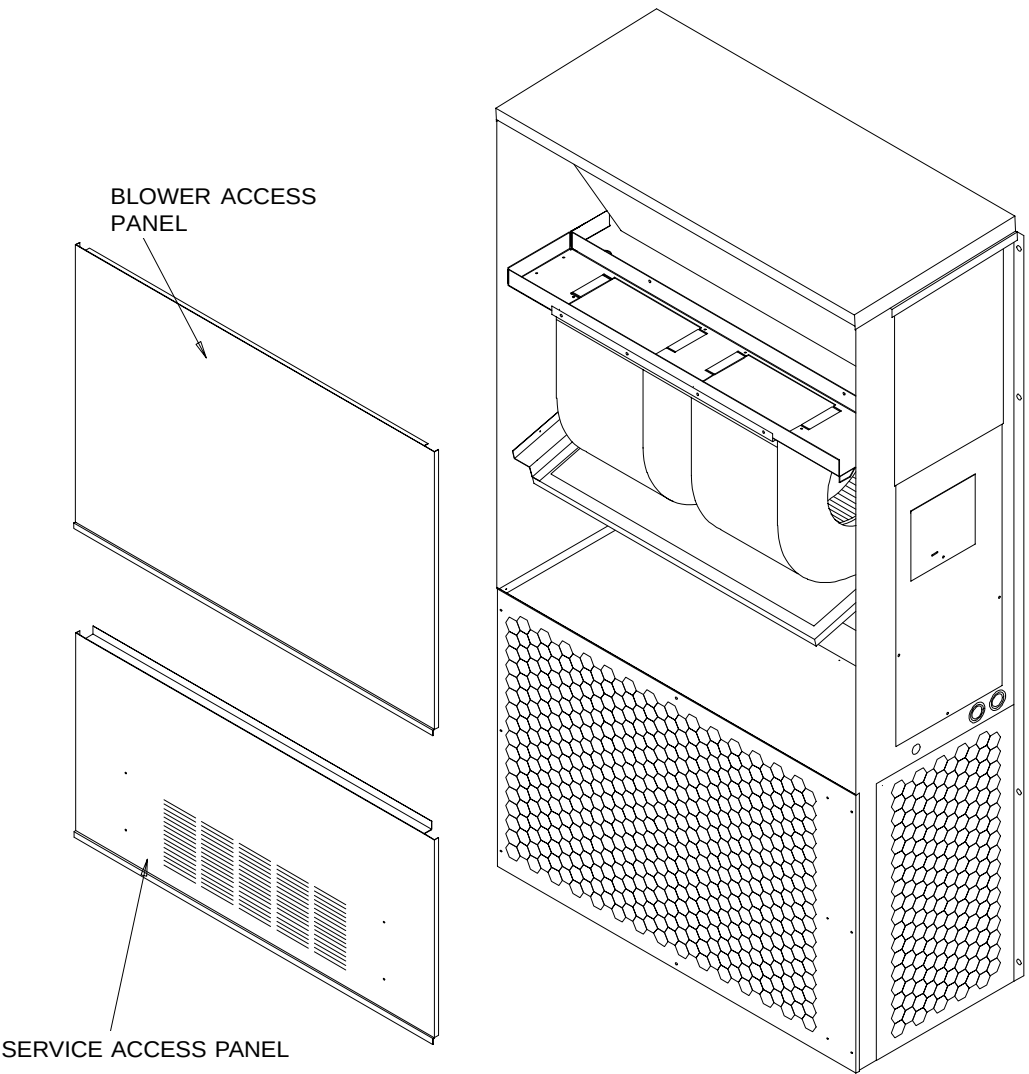
WARNING

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.

MODEL	FOR USE WITH FOLLOWING UNITS		
	WA182 WA242 WA252	WH181 WH241 WH261	WL182 WL242 WL252
CRV-2			
CRV-3	WA301 WA361 WA371	WH301 WH311 WH361	WL301 WL361

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**



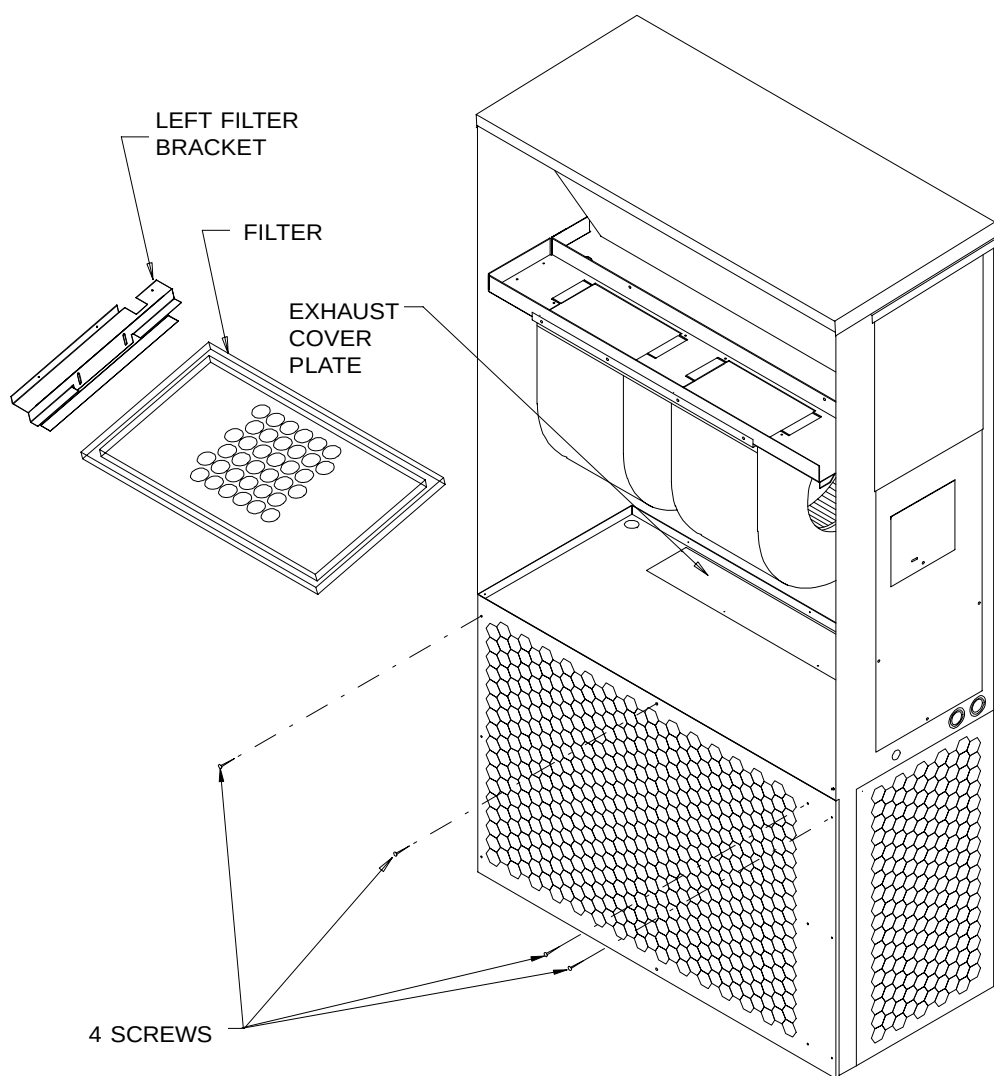
MIS-344

3. Remove and save existing unit return air filter and left side filter support bracket by removing two (2) screws from front side of unit. Remove and save top four (4) screws from grille. (See Figure 2.)

4. *Models WH261 and WH311:* Do not remove exhaust cover plate. If it is removed on these models, the condenser fan will blow air in the return air opening.

On all other models: Remove and discard the exhaust cover plate.

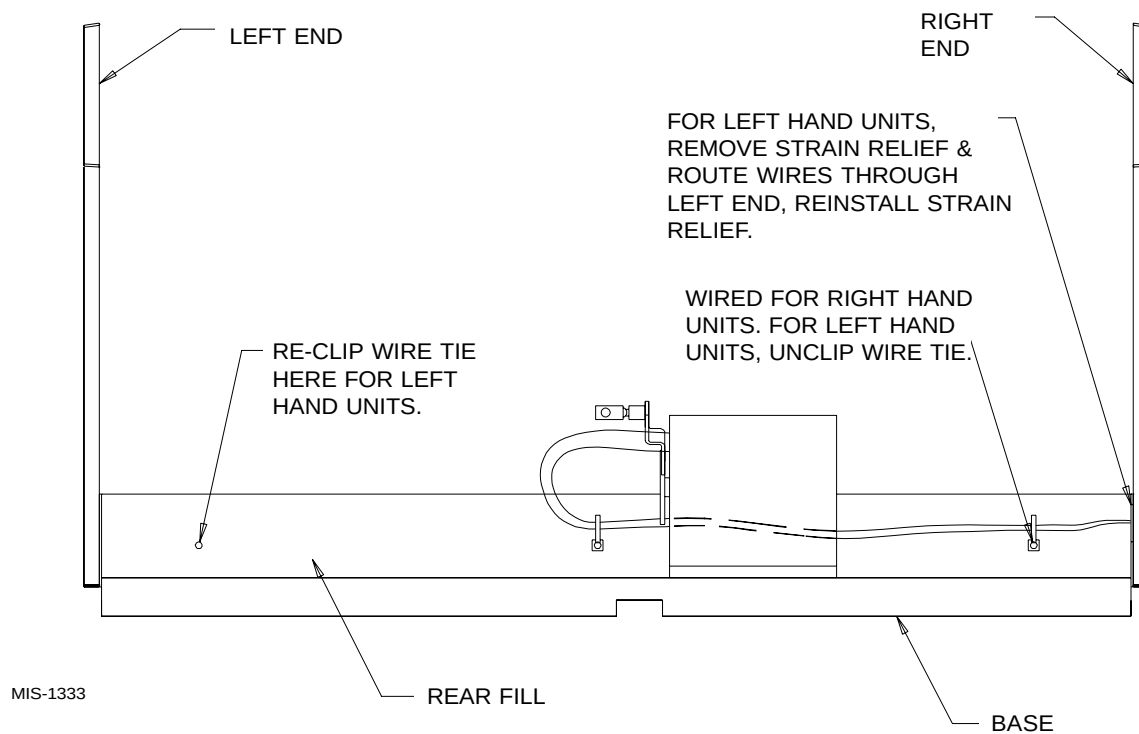
FIGURE 2
REMOVAL OF EXHAUST COVER PLATE
ALL MODELS EXCEPT WH261 AND WH311



MIS-345

5. For Installation of Left Hand Units Only – Remove strain relief in right side of CRV. Un-clip the right side wire tie holding the wire harness. Reroute wires to left side of CRV. Reinstall wire tie in left side hole. Route wires through left side and reinstall strain relief. (See Figure 3.)
6. Install ventilator 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 4.)

FIGURE 3
REROUTING WIRES FOR LEFT HAND UNIT INSTALLATION



IMPORTANT: Position front lip of ventilator under front grille and on top of condenser partition. (See Figure 4 inset.) This is important to ensure proper drainage of any water entering damper assembly.

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 box.

**FIGURE 4
INSERTING VENTILATOR INTO THE UNIT**

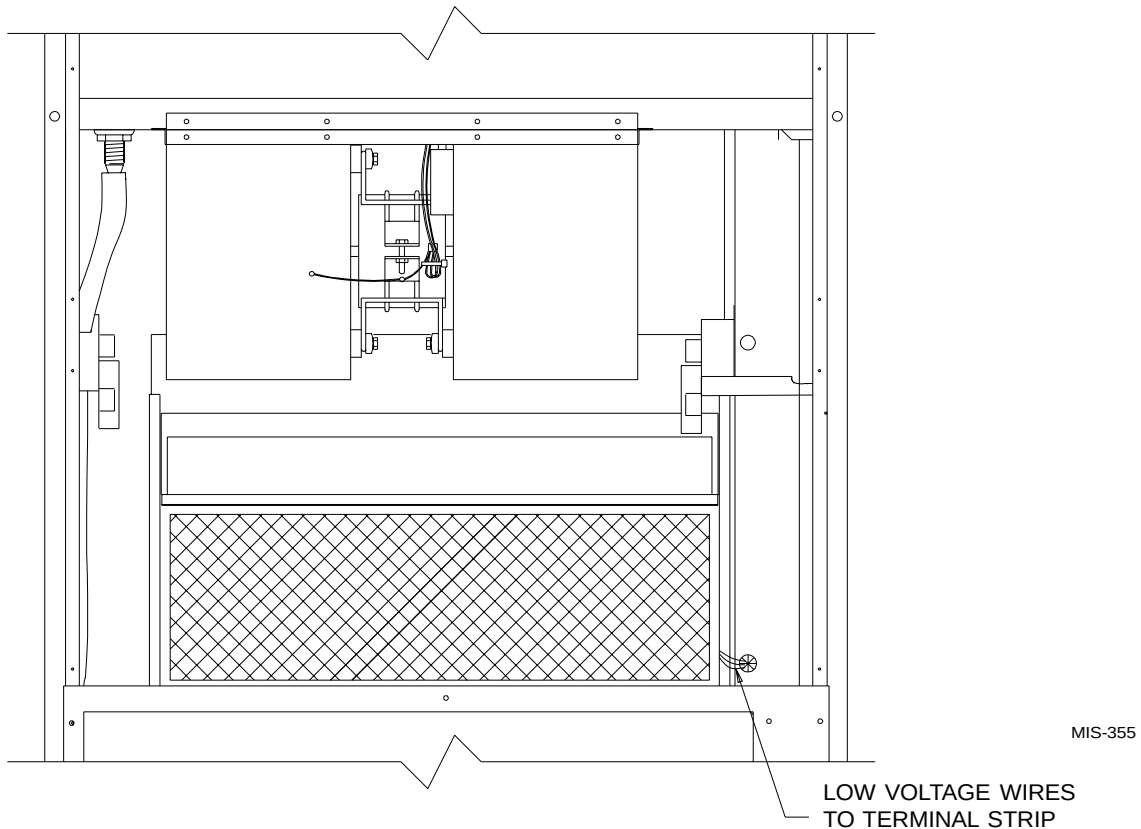


**FIGURE 4 INSET
SIDE SECTION**

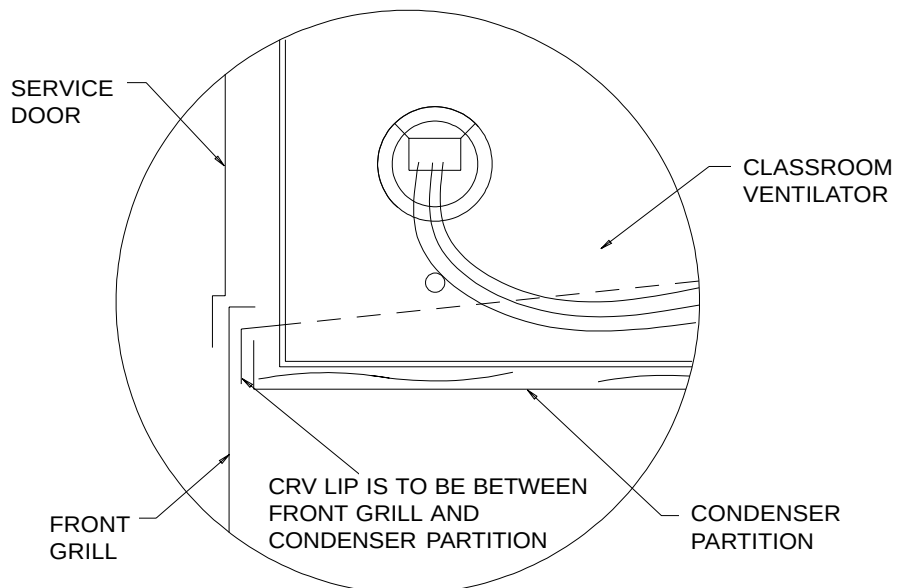
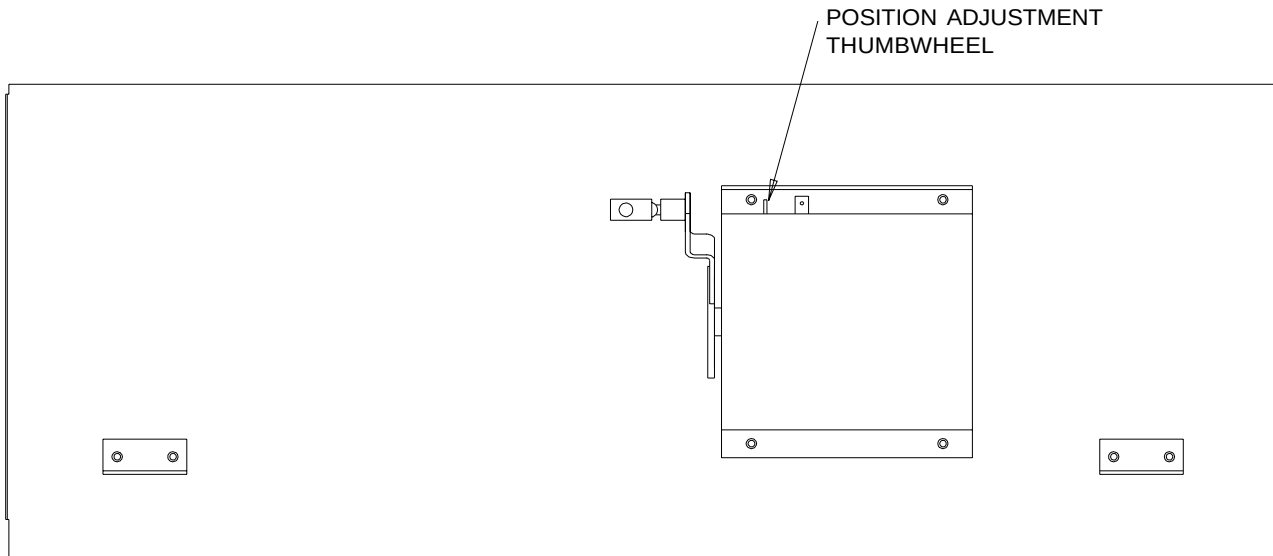


**FIGURE 5
TOP VIEW OF CONTROL PANEL**

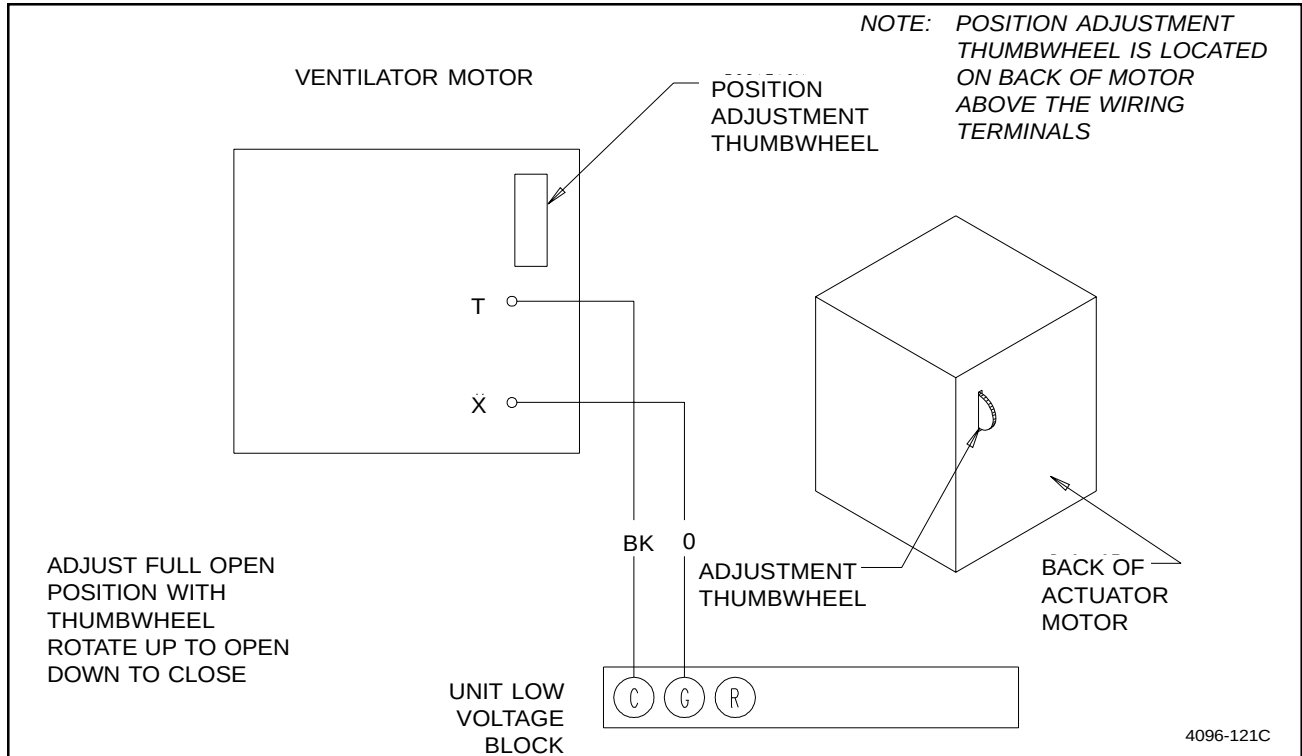


NOTE: Rotate thumbwheel up to open; down to close.

MIS-354

9. Connect leads with fork terminal to corresponding points on terminal strip to terminals C and G. (See wiring diagram, Figure 6 on page 7, or on ventilator.)
10. Close control panel cover
11. Replace left filter support, filter and four (4) screws in condenser grille.
12. Reinstall the blower access panel at top of unit and secure with sheet metal screws.
13. Ventilator Checkout
 - A. Remove mist eliminator to allow access to minimum position thumbwheel. (See Figures 4 & 5.)
 - B. Resupply power to unit.
 - C. Energize the evaporator blower by switching thermostat to the manual fan position with heat/cool in OFF position.
 - D. Ventilator should open to the position set by position adjustment thumbwheel. Cycle position adjustment thumbwheel to full open through full close. Observe damper blade operation throughout travel to assure free, unobstructed movement. (See Figure 5.)
 - E. Adjust position adjustment thumbwheel until desired blade setting is reached with power applied to unit. See Tables 1 through 6 for required blade setting versus ventilator air.
 - F. De-energize evaporator blower. Damper blade should close.
 - G. This completes ventilator checkout.
14. Replace mist eliminator. Be sure it is installed with the drain holes to the bottom.
15. 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.
16. Replace service access panel.
17. Ventilator is now ready for operation.

**FIGURE 6
WIRING DIAGRAM**



BLADE ADJUSTMENT FOR DESIRED VENTILATOR AIR

The amount of ventilation air supplied by the commercial room ventilator is dependant on four (4) 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.

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

blow application with return air filter grille and supply grille assume .05 supply static, .10 return static. See Application Table 1 or 4.

Determine on what speed the evaporator motor is running.

Refer to the tables on the following pages to determine the blade setting necessary to achieve the ventilation air required at the supply and return static duct pressures drops that are applicable.

**COMMERCIAL ROOM VENTILATOR – CRV-2
VENTILATION AIR WITH DUCTED SYSTEM**

TABLE 1

		0.00 SUPPLY AIR STATIC						
		Ventilation Air (CFM)						
Damper Position	A	120	145	175	210	245	275	305
	B	175	195	220	250	280	309	335
	C	225	245	260	290	320	340	360
	D	285	300	310	325	345	360	380
	E	345	355	360	365	370	385	400
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.10 SUPPLY AIR STATIC						
		Ventilation Air (CFM)						
Damper Position	A	110	145	175	210	240	275	310
	B	165	185	215	245	270	300	330
	C	210	230	250	280	305	330	350
	D	265	280	290	310	330	345	365
	E	320	330	335	345	355	365	380
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.20 SUPPLY AIR STATIC						
		Ventilation Air (CFM)						
Damper Position	A	103	140	177	206	234		
	B	150	179	209	235	262		
	C	197	219	240	265	290		
	D	247	260	273	293	313		
	E	296	301	305	320	335		
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

TABLE 1 (CONTINUED)

		0.30 SUPPLY AIR STATIC						
		Ventilation Air (CFM)						
Damper Position	A	95	135	175				
	B	135	165	200				
	C	175	200	220				
	D	221	235	250				
	E	268	275	280				
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.40 SUPPLY AIR STATIC						
		Ventilation Air (CFM)						
Damper Position	A	87						
	B	120						
	C	152						
	D	196						
	E	239						
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

**NON-DUCTED BLOW APPLICATION VENTILATION AIR
WITH RETURN AIR FILTER GRILLE AND SUPPLY AIR GRILLE**

TABLE 2

		Ventilation Air (CFM)
Damper Posiiton	A	175
	B	215
	C	255
	D	300
	E	345

CRV-2 TOTAL DELIVERED AIR

TABLE 3

		TOTAL DELIVERED AIR (CFM)				
Damper Position	Close	1006	946	886	789	691
	A	1001	943	884	785	685
	B	990	931	873	775	677
	C	978	920	862	765	668
	D	945	888	832	738	645
	E	912	857	801	711	621
Total Static Pressure		.00	.10	.20	.30	.40

**COMMERCIAL ROOM VENTILATOR – CRV-3
VENTILATION AIR WITH DUCTED SYSTEM**

TABLE 4

		0.10 SUPPLY AIR STATIC						
HIGH SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	130	150	180	225	275	320	365
	B	220	240	265	300	340	375	410
	C	310	325	350	375	400	425	450
	D	390	405	420	440	450	470	485
	E	470	480	485	495	505	515	520
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.20 SUPPLY AIR STATIC						
HIGH SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	115	140	180	225	280	325	365
	B	205	230	255	295	335	370	405
	C	290	310	335	360	385	410	440
	D	365	385	400	415	425	445	470
	E	435	445	450	460	465	480	490
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.30 SUPPLY AIR STATIC						
HIGH SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	110	140	180	235	290		
	B	185	215	250	290	330		
	C	260	285	315	340	405		
	D	330	350	370	385	400		
	E	400	410	415	430	435		
Return Static		.00	.05	.10	.15	.20	.25	.30

		0.30 SUPPLY AIR STATIC						
HIGH SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	100	140	180				
	B	160	200	240				
	C	225	260	295				
	D	295	315	340				
	E	365	370	380				
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

TABLE 4 (CONTINUED)

		0.00 SUPPLY AIR STATIC						
LOW SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	100	135	175	225	275		
	B	165	205	245	285	325		
	C	240	275	310	345	375		
	D	315	345	375	400	415		
	E	400	420	440	450	455		
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.10 SUPPLY AIR STATIC						
LOW SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	100	135	180	225	280		
	B	160	200	240	280	325		
	C	230	265	300	335	370		
	D	310	335	360	285	405		
	E	395	410	425	430	435		
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

		0.20 SUPPLY AIR STATIC						
LOW SPEED BLOWER		Ventilation Air (CFM)						
Damper Position	A	100	140	190	240	295		
	B	160	200	245	290	330		
	C	220	260	300	330	360		
	D	290	320	350	370	390		
	E	365	380	394	405	420		
Return Static Pressure		.00	.05	.10	.15	.20	.25	.30

**NON-DUCTED BLOW APPLICATION VENTILATION AIR
WITH RETURN AIR FILTER GRILLE AND SUPPLY AIR GRILLE**

TABLE 5

		Ventilation Air (CFM)	
		High Speed	Low Speed
Damper Position	A	180	175
	B	265	245
	C	360	305
	D	430	370
	E	495	450

CRV-3 TOTAL DELIVERED AIR

TABLE 6

HIGH SPEED BLOWER

		TOTAL DELIVERED AIR (CFM)					
Damper Position	Close	1370	1300	1230	1133	1035	935
	A	1360	1293	1225	1124	1022	920
	B	1355	1289	1223	1223	1016	913
	C	1350	1285	1220	1220	1010	905
	D	1325	1258	1190	1190	980	875
	E	1300	1230	1160	1160	950	845
Total Static Pressure		.00	.10	.20	.30	.40	.50

LOW SPEED BLOWER

		TOTAL DELIVERED AIR (CFM)				
Damper Position	Close	1027	1009	990	930	869
	A	1016	998	979	918	856
	B	994	984	972	907	841
	C	972	969	966	896	825
	D	962	945	928	856	783
	E	951	921	890	816	741
Total Static Pressure		.00	.05	.10	.15	.20

COMMERCIAL ROOM VENTILATOR – WA, WH AND WL SERIES

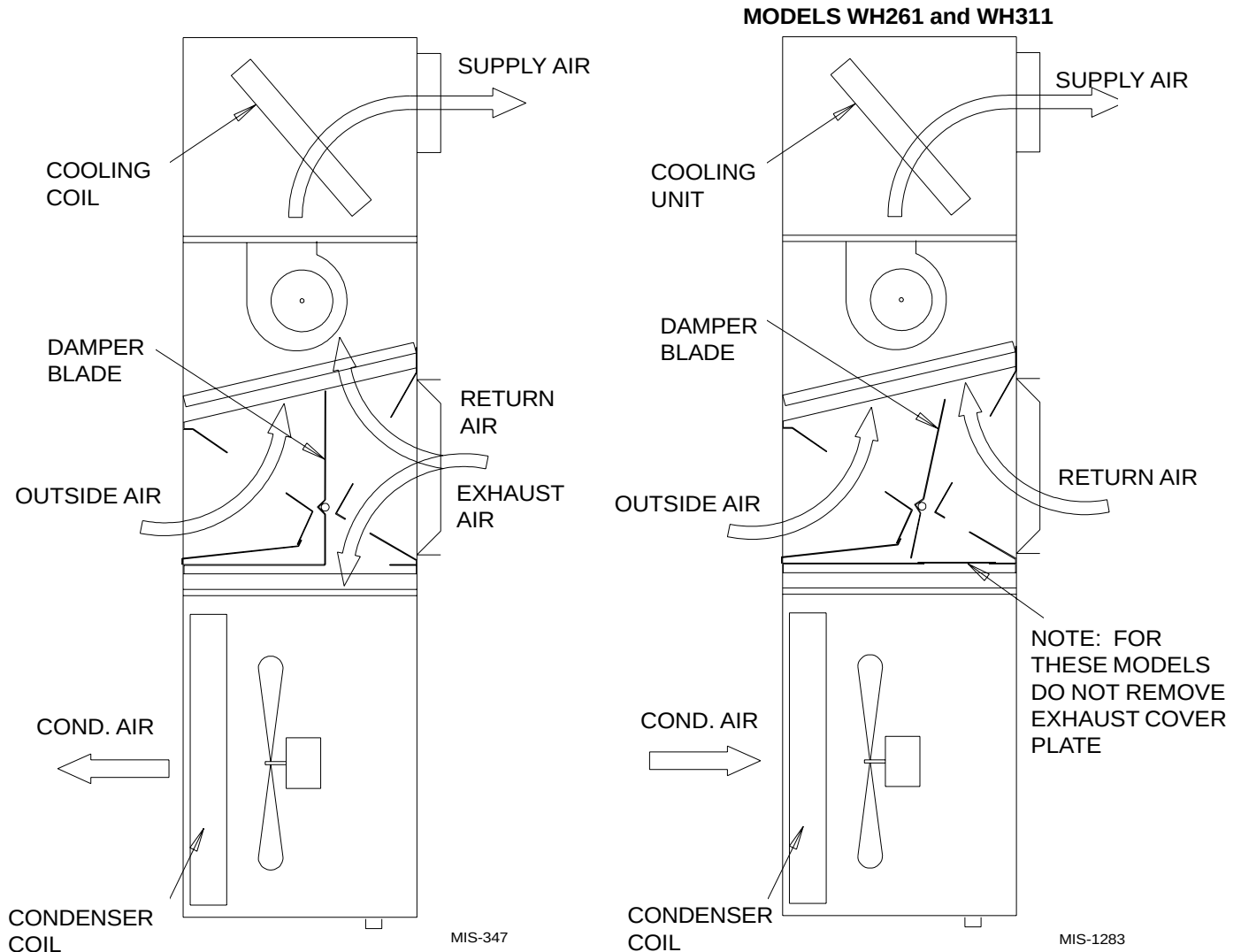
FEATURES

- 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 **except models WH261 and WH311.**
- 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 position as set by minimum position potentiometer. See Figure 7.

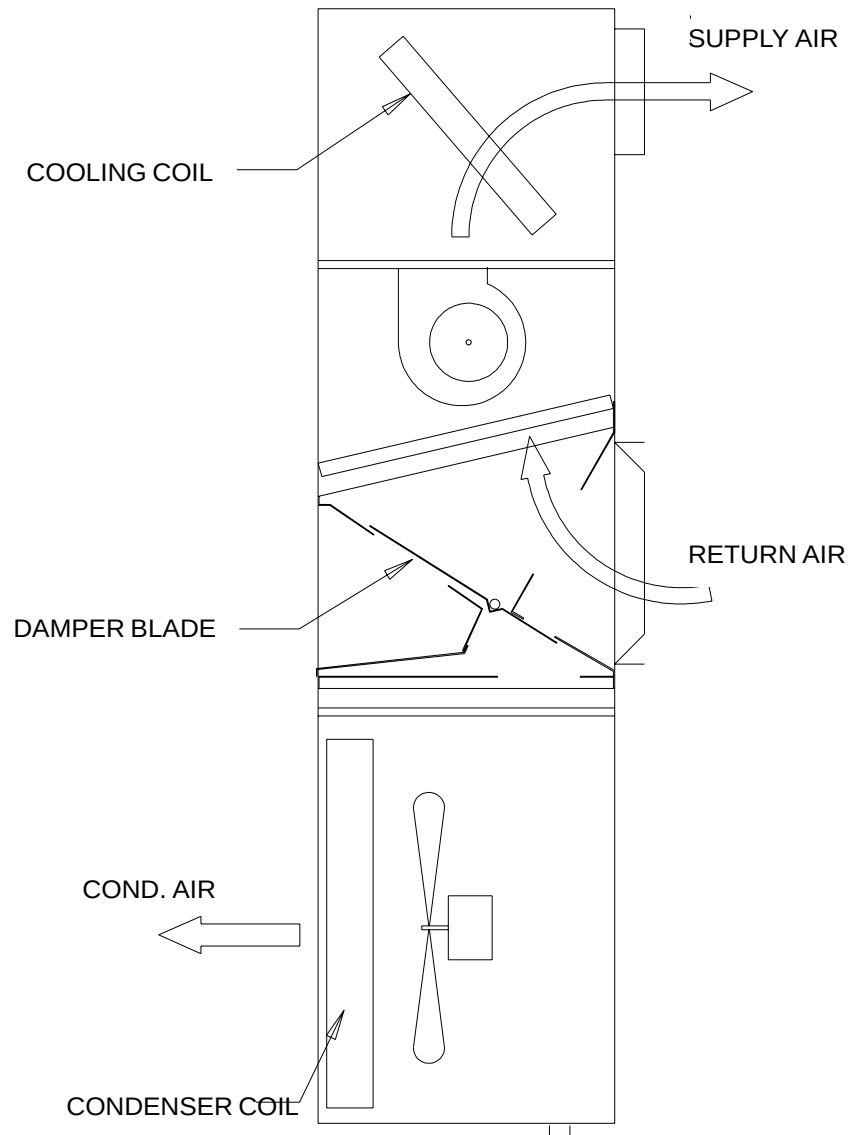
**FIGURE 7
CALL FOR BLOWER OPERATION**



For these models, a separate exhaust provision may be required as internal exhaust is **not** provided.

A call for cooling cycles the compressor, and dampers remain in the ventilation mode. On loss of blower operation, CRV closes fully. See Figure 8.

**FIGURE 8
CALL FOR COOLING OPERATION**



MIS-348