INSTALLATION INSTRUCTIONS

MODEL
CRV-5

COMMERCIAL ROOM VENTILATORS
WITH EXHAUST

FOR USE WITH BARD 3-1/2 THRU 5 TON
WALL MOUNT AIR CONDITIONERS
AND HEAT PUMPS
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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 technically 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-5 ventilator is designed to be used with Bard 3-1/2 thru 5 ton wall mount series air conditioners and heat pumps. They are electro-mechanical vent systems designed to provide fresh air to meet indoor air quality standards with built in exhaust provisions.

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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>For Use With Following Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRV-2</td>
<td>WA181 MB181</td>
</tr>
<tr>
<td></td>
<td>WA241 MB241</td>
</tr>
<tr>
<td>CRV-3</td>
<td>WA301 MB301</td>
</tr>
<tr>
<td></td>
<td>WA361 MB361</td>
</tr>
<tr>
<td>CRV-5</td>
<td>WA421 MB421</td>
</tr>
<tr>
<td></td>
<td>WA481 MB481</td>
</tr>
<tr>
<td></td>
<td>WA601 MB601</td>
</tr>
</tbody>
</table>

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. Remove and save the existing exterior blower access and service access panels on the Bard wall mount units. (See Figure 1)
3. Remove and save existing unit air filter and screw from front center grille. (See Figure 2)
When installing CRY position so that hole in front lip is centered over hole in condenser grille to insert a self drilling screw.

Route the CRY wires through hole and into control panel.

**Figure 3** Right side of classroom ventilator

*Condenser Partition*

*Lip of CRY is to be between the condenser grille and service door*

*Front Grill*

*Note: Plug the four .125 dia. holes in the service door with the canoe clips.*
TOP VIEW OF CONTROL PANEL

NOTE: Rotate thumbwheel up to open, down to close.
4. Remove and discard the exhaust cover plate. (Figure 2)

5. 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. (Figure 3)

   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.

6. Open control panel to gain access to unit low voltage terminal block.

7. Route electrical harness leads thru the 7/8" bushing in control panel (Figure 3) into low voltage box.

8. Connect leads with fork terminal to corresponding points on terminal strip to terminals C and G. (See wiring diagram, Figure 5, on Page 7 or on ventilator.)

9. Close control panel cover

10. Replace left filter support, filter and four (4) screws in condenser grille.

11. Reinstall the blower access panel at top of unit and secure with sheet metal screws.

12. Ventilator Checkout

   A. Remove mist eliminator to allow access to minimum position thumbwheel. (See Figures 3 and 4)

   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 4)

   E. Adjust position adjustment thumbwheel until desired blade setting is reached with power applied to unit. See Tables 1 - 6 for required blade setting versus ventilator air.

   F. De-energize evaporator blower. Damper blade should close.

   G. This completes ventilator checkout.

13. Replace mist eliminator. Be sure it is installed with the drainholes to the bottom.

14. Remove blank off plate or barometric fresh air damper installed on service access door. Plug 4 mounting holes with the plastic plugs provided with the ventilator.

15. Replace service access panel.

16. Ventilator is now ready for operation.
BLADE ADJUSTMENT FOR DESIRED VENTILATOR AIR

The amount of ventilation air supplied by the commercial room ventilator is dependent on 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 application with return air filter grill and supply grill, assume .05 supply static, .10 return static. See application Table 3 or 6.

Determine on what speed the evaporator motor is running.

Refer to the tables on the next 5 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.

FIGURE 5
TABLE 1

<table>
<thead>
<tr>
<th>HIGH SPEED</th>
<th>0.00 SUPPLY AIR STATIC</th>
<th>.Virtual Air (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper A</td>
<td>185 270 350 390 425 490 550</td>
<td></td>
</tr>
<tr>
<td>Position B</td>
<td>345 425 460 500 540 595 650</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>500 535 570 615 660 710 755</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>660 685 715 740 770 805 840</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>820 835 855 870 885 910 930</td>
<td></td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0 .05 .10 .15 .20 .25 .30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HIGH SPEED</th>
<th>0.20 SUPPLY AIR STATIC</th>
<th>Ventilation Air (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper A</td>
<td>175 260 350 390 430 490 550</td>
<td></td>
</tr>
<tr>
<td>Position B</td>
<td>325 385 450 495 540 590 645</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>480 515 550 600 650 695 740</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>630 660 690 720 750 785 820</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>780 805 830 840 850 875 900</td>
<td></td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0 .05 .10 .15 .20 .25 .30</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
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<th>0.30 SUPPLY AIR STATIC</th>
<th>Ventilation Air (CFM)</th>
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</thead>
<tbody>
<tr>
<td>Damper A</td>
<td>185 255 330 380 430</td>
<td></td>
</tr>
<tr>
<td>Position B</td>
<td>320 375 435 485 535</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>460 500 540 590 640</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>600 625 655 690 730</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>745 755 770 795 820</td>
<td></td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0 .05 .10 .15 .20 .25 .30</td>
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</table>

<table>
<thead>
<tr>
<th>HIGH SPEED</th>
<th>0.40 SUPPLY AIR STATIC</th>
<th>Ventilation Air (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper A</td>
<td>195 255 315</td>
<td></td>
</tr>
<tr>
<td>Position B</td>
<td>320 365 420</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>440 480 525</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>575 595 620</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>710 710 715</td>
<td></td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0 .05 .10 .15 .20 .25 .30</td>
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</tr>
<tr>
<td>Low Speed</td>
<td>Ventilation Air (CFM)</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>Damper A</td>
<td>200  260  320  380  440</td>
<td></td>
</tr>
<tr>
<td>Position B</td>
<td>235  345  395  460  525</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>390  430  470  540  610</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>520  550  585  630  680</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>650  675  700  725  750</td>
<td></td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0  .05  .10  .15  .20  .25  .30</td>
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</table>

<table>
<thead>
<tr>
<th>Low Speed</th>
<th>Ventilation Air (CFM)</th>
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<tbody>
<tr>
<td>Damper A</td>
<td>185  250  310  375  435</td>
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<tr>
<td>Position B</td>
<td>280  335  385  450  515</td>
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<tr>
<td>C</td>
<td>380  425  465  520  595</td>
</tr>
<tr>
<td>D</td>
<td>505  540  570  620  665</td>
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<tr>
<td>E</td>
<td>635  660  680  710  740</td>
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<tr>
<td>Return Static Pressure</td>
<td>0  .05  .10  .15  .20  .25  .30</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Low Speed</th>
<th>Ventilation Air (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper A</td>
<td>180  240  300  365  430</td>
</tr>
<tr>
<td>Position B</td>
<td>275  325  380  445  510</td>
</tr>
<tr>
<td>C</td>
<td>370  415  465  530  595</td>
</tr>
<tr>
<td>D</td>
<td>490  525  560  610  655</td>
</tr>
<tr>
<td>E</td>
<td>615  635  660  690  720</td>
</tr>
<tr>
<td>Return Static Pressure</td>
<td>0  .05  .10  .15  .20  .25  .30</td>
</tr>
</tbody>
</table>
## NON-DUCTED BLOW APPLICATION VENTILATION AIR WITH RETURN AIR FILTER GRILL AND SUPPLY AIR GRILL

### TABLE 2

<table>
<thead>
<tr>
<th>Damper Position</th>
<th>Ventilation Air (CFM)</th>
<th>High Speed</th>
<th>Low Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>350</td>
<td>315</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>460</td>
<td>390</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>575</td>
<td>465</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>720</td>
<td>575</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>870</td>
<td>690</td>
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</tbody>
</table>

## CRV-5 TOTAL DELIVERED AIR WH601 and WA601

### TABLE 3

<table>
<thead>
<tr>
<th>HIGH SPEED BLOWER</th>
<th>TOTAL DELIVERED AIR (CFM)</th>
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<tbody>
<tr>
<td>Damper Close</td>
<td>2040 1955 1870 1775 1680 1585</td>
</tr>
<tr>
<td>Position A</td>
<td>2030 1950 1870 1775 1680 1585</td>
</tr>
<tr>
<td>B</td>
<td>1995 1910 1830 1740 1645 1550</td>
</tr>
<tr>
<td>C</td>
<td>1960 1875 1790 1700 1610 1520</td>
</tr>
<tr>
<td>D</td>
<td>1885 1750 1615 1575 1535 1490</td>
</tr>
<tr>
<td>E</td>
<td>1810 1725 1640 1550 1460 1370</td>
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<tr>
<td>Total Static Pressure</td>
<td>0 .10 .20 .30 .40 .50</td>
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</tbody>
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### LOW SPEED BLOWER

<table>
<thead>
<tr>
<th>Total Delivered Air (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper Close</td>
</tr>
<tr>
<td>Position A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>Total Static Pressure</td>
</tr>
</tbody>
</table>
**TABLE 3**

**CRV-5 TOTAL DELIVERED AIR**  
WA481, WH481, WA421, WH421

<table>
<thead>
<tr>
<th>Damper Position</th>
<th>TOTAL DELIVERED AIR (CFM)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1560 1530 1500 1460 1425 1390</td>
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<tr>
<td>Close</td>
<td>1545 1515 1480 1445 1415 1380</td>
</tr>
<tr>
<td>A</td>
<td>1530 1495 1460 1430 1400 1365</td>
</tr>
<tr>
<td>B</td>
<td>1510 1485 1455 1420 1385 1350</td>
</tr>
<tr>
<td>C</td>
<td>1480 1450 1420 1385 1345 1310</td>
</tr>
<tr>
<td>D</td>
<td>1445 1415 1380 1345 1305 1270</td>
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<tr>
<td>Total Static Pressure</td>
<td>0 .05 .10 .15 .20 .25</td>
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**LOW SPEED BLOWER**

<table>
<thead>
<tr>
<th>Damper Position</th>
<th>TOTAL DELIVERED AIR (CFM)</th>
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<tbody>
<tr>
<td>Close</td>
<td>1965 1775 1685 1585 1485 1485</td>
</tr>
<tr>
<td>A</td>
<td>1860 1770 1685 1585 1485 1385</td>
</tr>
<tr>
<td>B</td>
<td>1850 1755 1660 1560 1460 1360</td>
</tr>
<tr>
<td>C</td>
<td>1840 1740 1655 1555 1455 1355</td>
</tr>
<tr>
<td>D</td>
<td>1770 1680 1590 1490 1390 1290</td>
</tr>
<tr>
<td>E</td>
<td>1700 1610 1525 1425 1325 1225</td>
</tr>
<tr>
<td>Total Static Pressure</td>
<td>0 .10 .20 .30 .40 .50</td>
</tr>
</tbody>
</table>
COMMERCIAL ROOM VENTILATOR -- (WA & WH 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 full open position as set by minimum position potentiometer. See Figure 6.
A call for cooling cycles the compressor and dampers remain in the ventilation mode. On loss of blower operation, CRV closes fully. See Figure 7.

FIGURE 7

- Supply Air
- Cooling Coil
- Damper Blade
- Return Air
- Cond. Air
- Condenser Coil