INSTALLATION INSTRUCTIONS

WALL MOUNT
ENERGY RECOVERY VENTILATOR
WITH EXHAUST

MODELS:
WERV-A5B
WERV-C5B

For Use With Bard
3-1/2 Thru 5 Ton
Wall Mount™ Air Conditioners
and Heat Pumps
MODEL NOMENCLATURE LEGEND

W = Wall Mount
ERV - A
Energy Recovery Ventilator
Electrical
A = 230/208 volt
B = 460 volt

Modification Code
Wall Mount™ = Cabinet Size
3 = WA, WH301, 361
5 = WA, WH421, 601

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Amps</th>
<th>Control Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>WERV-A6B</td>
<td>230/208</td>
<td>2.2</td>
<td>24V</td>
</tr>
<tr>
<td>WERV-C5B</td>
<td>460</td>
<td>1.2</td>
<td>24V</td>
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Provides required ventilation to meet the requirements of ASHRAE 62-1989 standard.

NOTE: During operation below 5 degrees F outdoor temperature, freezing of moisture in the heat transfer wheel can occur. Consult the factory if this possibility exists.

GENERAL DESCRIPTION

The Wall Mount Energy Recovery Ventilator was designed to provide energy efficient, cost effective ventilation to meet I.A.Q. (Indoor Air Quality) requirements while still maintaining good indoor comfort and humidity control for a variety of applications such as schools, classrooms, lounges, conference rooms, beauty salons and others. It provides a constant supply of fresh air for control of airborne pollutants including CO₂, smoke, radon, formaldehyde, excess moisture, virus and bacteria.

The ventilator incorporates patented rotary heat exchanger technology to remove both heat and moisture.

It is designed as a single package which can be easily factory or field installed for new installations or retrofit to the new Bard WA and WH series wall mounted units. The package consists of a unique rotary Energy Recovery Cassette that can be easily removed for cleaning or maintenance. The WERV®SB has two 15 inch diameter heat transfer wheels for efficient heat transfer. The heat transfer wheels use a permanently bonded dry desiccant coating for total heat recovery.

Ventilation is accomplished with (2) blower/motor assemblies each consisting of a drive motor and dual blowers for maximum ventilation at low sound levels. Air is exhausted at the same rate that fresh air is brought into the structure thus not pressing the building. The rotating energy wheels provide the heat transfer effectively during both summer and winter conditions.

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 following:

1. Energy Recovery Ventilator
2. Service Door
3. Rain Hood and Mist Eliminator
4. 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.
### PERFORMANCE AND APPLICATION DATA – WERV.*5B

#### Summer Cooling Performance

(Indoor Design Conditions 75°F/62°F WB)

| Ambient O.D. | DB WB | F | VLT | VLS | VLL | HRT | TRS | HRL | VLT | VLS | VLL | HRT | HRS | HRL |
|--------------|-------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 75           | 21465 | 14580 | 0  | 13952 | 9477 | 4475 | 17887 | 12150 | 5737 | 11805 | 8018 | 3786 | 14310 | 9720 | 4590 | 9567 | 6512 |
| 75           | 14580 | 14580 | 0  | 9477  | 9477 | 0    | 12150 | 12150 | 0    | 8018  | 8018 | 0    | 9720  | 9720 | 0    | 5512 | 6512 |
| 65           | 14580 | 14580 | 0  | 9477  | 9477 | 0    | 12150 | 12150 | 0    | 8018  | 8018 | 0    | 9720  | 9720 | 0    | 6512 | 6512 |

#### Winter Heating Performance

(Indoor Design Conditions 70°F F DB)

<table>
<thead>
<tr>
<th>Ambient O.D.</th>
<th>VENTILATION RATE</th>
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<tr>
<td>DB F</td>
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<td>65</td>
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<tr>
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<td>24300</td>
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<td>15</td>
<td>26730</td>
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</table>

### LEGEND:
- VLT = Ventilation Load – Total
- VLS = Ventilation Load – Sensible
- VLL = Ventilation Load – Latent
- HRT = Heat Recovery – Total
- HRS = Heat Recovery – Sensible
- HRL = Heat Recovery – Latent
- WVL = Winter Ventilation Load
- WHR = Winter Heat Recovery
BASIC INSTALLATION (Field Installation)

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

2. Remove exhaust blower assembly from back of ventilator and discard shipping plate. (See Figure 1.)

3. Remove the existing exterior blower access and service access panels on the Bard Wall Mount unit. Save the blower access panel and discard service access panel. (See Figure 2.)

4. Remove and save existing unit air filter. Remove and discard the exhaust cover plate and remove center screw from condenser grille. (See Figure 3.)

5. Install exhaust blower assembly in exhaust opening and secure with four (4) screws. Position 4 pin connector so it is accessible. (See Figure 4.)

6. Install ventilator into the unit to the left side. 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 5.)

7. Remove access panel and plug in exhaust blower. (See Figure 5.) Replace access panel.

8. Open control panel to gain access to unit low voltage terminal block. (Insure all power is OFF prior to opening the control panel.)

9. Route electrical harness leads through the 7/8” bushing in control panel (Figure 5) into low voltage box.

10. Temporarily connect leads with fork terminal to corresponding points on terminal strip to terminals C and G. (See Figure 6 and wiring diagram.)

NOTE: These 24 volt control wires control the starting and stopping of the Energy Recovery Ventilator and can be independently controlled by an energy management control or timer. See separate section on Control Wiring for suggested control schemes.

11. Remove female plug of high voltage wiring harness from the heat recover assembly and snap into unit control panel. Wire to terminal block. (See Figure 6 and wiring diagram.)

12. Plug male plug from female at side of control panel. (See Figures 5.)

13. Close control panel cover.

14. Replace filter and one (1) screw in condenser grille. (See Figure 3.)

15. Ventilator checkout
   A. Resupply power to unit.
   B. Energize the evaporator blower by switching thermostat to the manual fan position with Heat/Cool in OFF position.
   C. Ventilator heat transfer wheels should rotate slowly (49 RPM). Intake and exhaust blowers should run. (See Figure 8.)
   D. De-energize the evaporator blower. Energy Recovery wheels, and fresh air and exhaust air blowers should stop.
   E. This completes ventilator checkout.

16. Disconnect the wires temporarily connected in Step 10.

17. Reinstall the blower access panel at top of unit and secure with sheet metal screws. (See Figure 2.)

18. Replace the lower service access panel with the new panel provided. Attach air intake hood with screws provided. (See Figure 7.) Be sure to insert the top flange of the air intake hood into and through the slot in the service door and between the door and insulation to prevent bowing of the door.

19. Ventilator is now ready for operation.
FIGURE 3

REMOVE AND DISCARD EXHAUST COVER PLATE

FILTER

SCREW
FASTEN LOWER BLOWER ASSY. TO COND. PARTITION WITH (4) SCREWS

RIGHT SIDE REMOVED FOR CLARITY

CONDENSER PARTITION CUT AWAY TO SHOW ERV LOWER BLOWER ASSY. RELATIONSHIP TO UNIT.

IMPORTANT MITERED EDGE TOWARDS CONDENSER COIL
FIGURE 5

HIGH VOLTAGE WIRES TO PLUG IN SIDE OF CONTROL PANEL

WHEN INSTALLING WERV POSITION SO THAT HOLE IN FRONT LIP IS CENTERED OVER HOLE IN CONDENSER GRILLE TO INSERT A SELF DRILLING SCREW

ROUTE WERV WIRES THROUGH HOLE AND INTO CONTROL PANEL

REMOVE ACCESS PANEL AND PLUG IN EXHAUST BLOWER. REPLACE ACCESS PANEL

CAUTION: HOLE IN WERV MUST BE USED TO INSURE CLEARANCE FROM CONDENSER COIL TUBING.

FIGURE 5 (INSET)

SERVICE DOOR

LIP OF WERV IS TO BE BETWEEN THE CONDENSER GRILLE AND SERVICE DOOR

HEAT RECOVERY VENTILATOR

CONDENSER PARTITION

FRONT GRILLE

SIDE SECTION
INSTALL 1-489701-0CAP
AS SHOWN AND WIRE
PER WIRING DIAGRAM
FIGURE 7

INSERT FLANGE THROUGH SLOT IN DOOR AND PUSH FLANGE UNDER THE INSULATION

INSULATION

SERVICE DOOR

FRESH AIR INTAKE HOOD AND FILTER ASSEMBLY

FILTER ACCESS SCREW

REPLACE SERVICE ACCESS PANEL AND INSTALL FRESH AIR INTAKE HOOD ASSEMBLY AS SHOWN
BASIC INSTALLATION (FACTORY INSTALLED VERSIONS)

1. Remove blower access door and service door. Room filter located above air circulation blower. Install filter.
2. Remove and install air intake hood. Refer to Item 16 of Basic Installation (Field Installation).
3. Refer to Control Wiring section for suggested control schemes for the WERV.
4. After wiring, replace all panels.

CONTROL WIRING

The WERV comes from the factory with the low voltage control wires not wired into the wall mount low voltage terminal strip. Care must be taken when deciding how to control the operation of the ventilator. When designing the control circuit for the ventilator the following requirements must be met.

CONTROL REQUIREMENTS

1. Indoor blower motor must be run whenever the WERV is run.
2. Select the correct motor speed tap in the WERV. Using Table 1 of the WERV Installation Instructions determine the motor speed needed to get the desired amount of ventilation air needed. For instance, do not use the high speed tap on a WERV-ASB if only 200 CFM of ventilation air is needed. Use the low speed tap. Using the high speed tap would serve no useful purpose and significantly affect the overall efficiency of the air conditioning system. System operating cost would also increase.
3. Run the WERV only during periods when the conditioned space is occupied. Running the WERV during unoccupied periods wastes energy, decreases the expected life of the WERV, and can result in a large moisture buildup in the structure. The WERV removes 60 to 70% of the moisture in the incoming air, not 100% of it. Running the WERV when the structure is unoccupied allows moisture to build up in the structure because there is little or no cooling load. Thus, the air conditioner is not running enough to remove the excess moisture being brought in. Use a control system that in some way can control the system based on occupancy.

** IMPORTANT **

Operating the WERV during unoccupied periods can result in a build up of moisture in the structure.

RECOMMENDED CONTROL SEQUENCES

Several possible control scenarios are listed below:

1. Use a programmable electronic thermostat with auxiliary terminal to control the WERV based on daily programmed occupancy periods. Bard markets and recommends the White-Rodgers 1F95-80 (Bard Part No. 8403-034) programmable electronic thermostat for air conditioner applications, and the White-Rodgers 1F94-80 (Bard Part No. 8403-034) programmable electronic thermostat for heat pump applications. (See Figure 9.)
2. Use a motion sensor in conjunction with a mechanical thermostat to determine occupancy in the structure. Bard markets the CS2000 for this use. (See Figure 10 and Figure 11.)
3. Use a DDC control system to control the WERV based on a room occupancy schedule to control the WERV.
4. Tie the operation of the WERV into the light switch. The lights in a room are usually on only when occupied.
5. Use a manual timer that the occupants turn to energize the WERV for a specific number of hours.
6. Use a programmable mechanical timer to energize the WERV and indoor blower during occupied periods of the day.

VENTILATION AIR FLOW

The WERV-ASB and WERV-CSB are equipped with a 3 speed motor to provide the capability of adjusting the ventilation rates to the requirements of the specific application by simply changing motor speeds.

| TABLE 1 |
| VENTILATION AIR (CFM) |
| Model | High Speed (Black) | Medium Speed (Blue) | Low Speed (Red) |
| CFM   | 450                | 375                 | 300              |

The units are wired from the factory on Low speed. The speed can be changed by rotating the speed switch on the side of the WERV to the desired speed on the 240 volt models. The speed can be changed by disconnecting the red wire and reconnecting the black or blue wire on the intake or exhaust blower motor on the 460 volt models. If desired, the fresh air motor can be wired on one speed and the exhaust motor on another if needed for a specific requirement.

⚠️ WARNING ⚠️

Open disconnect to shut all power OFF before doing this. Failure to do so could result in injury or death due to electrical shock.
FIGURE 10

HEAT PUMP CONNECTION DIAGRAM

WARNING: THIS WIRE MUST BE PROPERLY GROUNDED.

RECOMMENDED SWITCH SETTIMG SHOWN BELOW:
THIS SYSTEM MAY BE CUSTOMIZED TO INDIVIDUAL INSTALLATIONS. REFER TO COORD TECHNICAL DATA. REFERENCE MANU FOR CUSTOMIZATION OPTIONS.

<table>
<thead>
<tr>
<th>FUNCTION SWITCHES</th>
<th>TEMPERATURE SWITCHES</th>
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<tr>
<td>LEARN/MAIO</td>
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<tr>
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<tr>
<td>DEMAND 3</td>
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</tr>
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</table>

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MAINTENANCE PROCEDURES

MONTHLY

1. Inspect mist eliminator/prefilter and clean if necessary. This filter is located in the fresh air intake hood on the front of the unit. This is an aluminum mesh filter and can be cleaned with water and any detergent not harmful to aluminum.

2. Inspect wall mount unit filter and clean or replace as necessary. This filter is located either in the unit or in a return air filter grille assembly. If in the unit it can be accessed by removing the lower service door on the front of the unit. If in a return air filter grille, by hinging the grill open to gain access.

3. Inspect energy recovery ventilator for proper wheel rotation and dirt buildup. This can be done in conjunction with item 2 above. Energize the energy recovery ventilator after inspecting the filter and observe for proper rotation and/or dirt buildup. Clean as necessary. Clean as follows: Disconnect all power to unit. Remove the lower service door of the wall mount unit to gain access to the energy recovery ventilator. Remove the front access panel on the ventilator. Unplug Amp connectors to cassette motors. Slide energy recovery cassette out of ventilator. Use a shop vacuum with brush attachment to clean both sides of the energy recover wheels.

NOTE: Discoloration and staining of the wheel does not affect its performance. Only excessive build up of foreign material needs to be removed.

SEMIANNUALLY

1. Inspect condenser coil for dirt and clean if necessary. Clean all loose dirt, plant matter, cobwebs and/or insects from both sides of the coil with a shop vacuum. Take care not to damage or bend coil fins. For grease or tough dirt a commercial foaming coil cleaner suitable for use on aluminum fins should be used. Follow instructions on the coil cleaner. Do not use a high pressure hose or power cleaner.

2. Inspect and re-oil center wheel bearing of energy recovery ventilator wheels (sleeve bearing models only).

Inspect as follows: Disconnect all power to unit. Remove the lower service door of the unit to gain access to the energy recovery ventilator. Remove the front access panel on the ventilator. Unplug Amp connectors to cassette motors. Slide energy recovery cassette out of ventilator. Remove center shaft screw from top of cassette wheel. Remove wheel retaining washer. Push from underneath to slide wheel off shaft. Check for tar-lie deposits. If present clean shaft and bearing with rag soaked with 20 weight oil. Lightly oil shaft and bearing and reassemble. Add oil to re-soak felt washer. Use non-detergent 20 weight oil. Reassemble. (See Figure 12.)
FIGURE 12

HUB ASSEMBLY WITH SLEEVE BEARING

- SCREW #6 x 32 x 3/4
- DUST COVER
- SCREW #10 x 32
- WASHER
- NUT #10 x 24
- FELT WASHER (OIL WITH 20 WT. NON DETERGENT OIL)
- SPACER
- LOCK RING

HUB PLATE

HEAT EXCHANGER WHEEL

HUB PLATE WITH BOLTS

BUSHING

SHAFT (OIL WITH 20 WT. NON DETERGENT OIL)

LOCK WASHER

NUT 1/4 x 20