

INSTALLATION INSTRUCTIONS

MODELS

WERV-A2A

WERV-A3A

WERV-C3A

WALL MOUNT ENERGY RECOVERY VENTILATORS WITH EXHAUST

**FOR USE WITH BARD 1-1/2 THRU 3 TON
WALL MOUNT AIR CONDITIONERS
AND HEAT PUMPS**

DATE: 04-12-94

**MANUAL 2100-230 REV. B
SUPERSEDES REV. A
FILE VOL. III, TAB 19**

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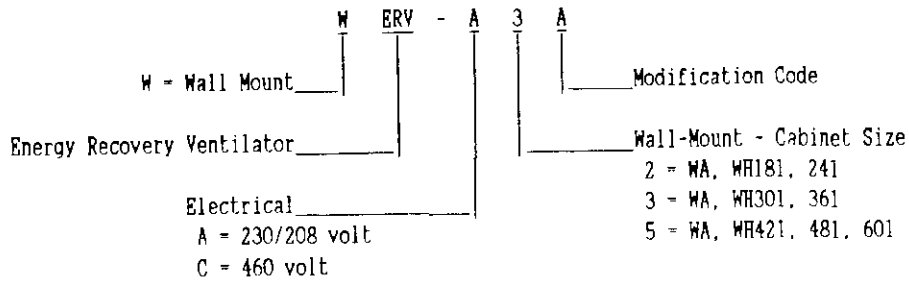
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Manufactured under the following U.S. patent numbers:
5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,936; 4,432,409.
Other patents pending.

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BARD MANUFACTURING COMPANY
BRYAN, OHIO USA 43506

MODEL NOMENCLATURE LEGEND



ELECTRICAL SPECIFICATIONS

Model	Voltage	Amps	Control Voltage
WERV-A2A	230/208	2.2	24V
WERV-A3A	230/208	2.2	24V
WERV-C3A	460	1.2	24V
WERV-A5A	230/208	2.2	24V
WERV-C5A	460	1.2	24V

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 exchange state-of-the-art 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-*3A has two 13 inch diameter heat transfer wheels, and the WERV-A2A has one 13 inch wheel 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 pressuring the building. The rotating energy wheels provides the heat transfer effectively during both summer and winter conditions. 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.

PERFORMANCE AND APPLICATION DATA -- WERV-A2A

Summer Cooling Performance
(Indoor Design Conditions 75°DB/62°WB)

Ambient O.D.	VENTILATION RATE -- 250 CFM 62% Efficiency						VENTILATION RATE -- 225 CFM 63% Efficiency						VENTILATION RATE -- 200 CFM 63% Efficiency						
	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	
75	11925		1325	7394		822	10727		3441	6758		2168	9540		3060	6010		1928	
105	70	8100	8100	0	5022	5022	0	7287	7287	0	4591	4591	0	6480	6480	0	4082	4082	0
65	8100		0	5022		0	7287		0	4591		0	6480		0	4082		0	
80	17550		10800	10881		6696	15788		9716	9946		6121	14040		8640	8845		5443	
75	11925		5175	7394		3209	10727		4655	6758		2933	9540		4140	6010		2608	
100	70	6863	6750	113	4255	4185	70	6173	6072	101	3889	3826	64	5490	5400	90	3458	3402	56
65	6750		0	4185		0	6072		0	3826		0	5400		0	3402		0	
60	6750		0	4185		0	6072		0	3826		0	5400		0	3402		0	
80	17550		12150	10881		7533	15788		10930	9946		6886	14040		9720	8845		6124	
75	11925		6525	7394		4046	10727		5870	6758		3698	9540		5220	6010		3289	
95	70	6863	5400	1463	4255	3348	907	6173	4858	1315	3889	3060	829	5490	4320	1170	3458	2722	737
65	5400		0	3348		0	4858		0	3060		0	4320		0	2722		0	
60	5400		0	3348		0	4858		0	3060		0	4320		0	2722		0	
80	17550		13500	10881		8370	15788		12145	9946		7651	14040		10800	8845		6804	
75	11925		7875	7394		4883	10727		7084	6758		4463	9540		6300	6010		3969	
90	70	6863	4050	2813	4255	2511	1744	6173	3643	2530	3889	2295	1594	5490	3240	2250	3458	2041	1417
65	4050		0	2511		0	3643		0	2295		0	3240		0	2041		0	
60	4050		0	2511		0	3643		0	2295		0	3240		0	2041		0	
80	17550		14850	10881		9207	15788		13359	9946		8416	14040		11880	8845		7484	
75	11925		9225	7394		5720	10727		8298	6758		5228	9540		7380	6010		4649	
85	70	6683	2700	4163	4255	1674	2581	6173	2429	3744	3889	1530	2359	5490	2160	3330	3458	1361	2098
65	2700		0	1674		0	2429		0	1530		0	2160		0	1361		0	
60	2700		0	1674		0	2429		0	1530		0	2160		0	1361		0	
75	11925		10575	7394		6557	10727		9513	6758		5993	9540		8460	6010		5330	
80	70	6863	1350	5513	4255	837	3418	6173	1214	4959	3889	765	3124	5490	1080	4410	3458	680	2778
65	2363		1013	1465		628	2125		911	1339		574	1890		810	1190		510	
60	1350		0	837		0	1214		0	765		0	1080		0	680		0	
70	6863		6863	4255		4255	6173		6173	3889		3889	5490		5490	3458		3458	
75	65	2363	0	2363	1465	0	1465	2125	0	2125	1339	0	1339	1890	0	1890	1190	0	1190
60	0		0	0		0	0		0	0		0	0		0	0		0	

Winter Heating Performance
(Indoor Design Conditions 70°F DB)

Ambient O.D.	VENTILATION RATE					
	250 CFM 74% Eff		225 CFM 75% Eff		200 CFM 75% Eff	
DB°F	WVL	WHR	WVL	WHR	WVL	WHR
65	1350	999	1214	911	1080	810
60	2700	1998	2429	1822	2160	1620
55	4050	2997	3643	2733	3240	2430
50	5400	3996	4858	3643	4320	3240
45	6750	4995	6072	4554	5400	4050
40	8100	5994	7287	5465	6480	4860
35	9450	6993	8501	6376	7560	5670
30	10800	7992	9716	7287	8640	6480
25	12150	8991	10930	8198	9720	7290
20	13500	9990	12145	9108	10800	8100
15	14850	10989	13359	10019	11880	8910

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

NOTE: Sensible performance only is shown for winter application.

PERFORMANCE AND APPLICATION DATA -- WERV-*3A

Summer Cooling Performance
(Indoor Design Conditions 75°DB/62°WB)

Ambient O.D.	VENTILATION RATE -- 400 CFM 63% Efficiency						VENTILATION RATE -- 325 CFM 64% Efficiency						VENTILATION RATE -- 250 CFM 65% Efficiency								
	DB/WB°F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL		
75	19080			6120	12020		3855	15502			4972	9921		3182	11925			3825	7751		2486
105 70	12960	12960	0	8164	8164	0		10530	10530	0	6739	6739	0		8100	8100	0	5265	5265	0	
65	12960			0	8164	0		10530			6739		0		8100			0	5265		0
80	28080			17280	17690		10886	22815			14040	14601		8985	17550			10800	11407		7019
75	19080			8280	12020		5216	15502			6727	9921		4305	11925			5175	7751		3363
100 70	10980	10800	180	6917	6804	113		8921	8775	146	5709	5616	93		6862	6750	112	4460	4387	73	
65	10800			0	6804	0		8775			5616		0		6750			0	4387		0
60	10800			0	6804	0		8775			5616		0		6750			0	4387		0
80	28080			19440	17690		12247	22815			15795	14601		10108	17550			12150	11407		7897
75	19080			10440	12020		6577	15502			8482	9921		5428	11925			6525	7751		4241
95 70	10980	8640	2340	6917	5443	1474		8921	7020	1901	5709	4492	1216		6862	5400	1462	4460	3510	950	
65	8640			0	5443	0		7020			4492		0		5400			0	3510		0
60	8640			0	5443	0		7020			4492		0		5400			0	3510		0
80	28080			21600	17690		13608	22815			17550	14601		11232	17550			13500	11407		8774
75	19080			12600	12020		7938	15502			10237	9921		6552	11925			7875	7751		5118
90 70	10980	6480	4500	6917	4082	2835		8921	5265	3656	5709	3369	2340		6862	4050	2812	4460	2632	1828	
65	6480			0	4082	0		5265			3369		0		4050			0	2632		0
60	6480			0	4082	0		5265			3369		0		4050			0	2632		0
80	28080			23760	17690		14968	22815			19305	14601		12355	17550			14850	11407		9652
75	19080			14760	12020		9298	15502			11992	9921		7675	11925			9225	7751		5996
85 70	10980	4320	6660	6917	2721	4195		8921	3510	5411	5709	2246	3463		6862	2700	4162	4460	1755	2705	
65	4320			0	2721	0		3510			2246		0		2700			0	1755		0
60	4320			0	2721	0		3510			2246		0		2700			0	1755		0
75	19080			16920	12020		10659	15502			13747	9921		8798	11925			10575	7751		6873
80 70	10980	2160	8820	6917	1360	5556		8921	1755	7166	5709	1123	4586		6862	1350	5512	4460	877	3583	
65	3780			1620	2381	1020		3071		1316	1965		842		2362		1012	1535		658	
60	2160			0	1360	0		1755		0	1123		0		1350		0	877		0	
70	10980			10980	6917	6917		8921		8921	5709		5709		6862		6862	4460		4460	
75 65	3780	0	3780	2381	0	2381		3071	0	3071	1965	0	1965		2362	0	2362	1535	0	1535	
60	0			0	0	0		0		0	0		0		0		0	0		0	

Winter Heating Performance
(Indoor Design Conditions 70°F DB)

Ambient O.D.	VENTILATION RATE					
	400 CFM 75% Eff		325 CFM 76% Eff		250 CFM 77% Eff	
DB°F	WVL	WHR	WVL	WHR	WVL	WHR
65	2160	1620	1755	1333	1350	1039
60	4320	3240	3510	2667	2700	2079
55	6480	4860	5265	4001	4050	3118
50	8640	6480	7020	5335	5400	4158
45	10800	8100	8775	6669	6750	5197
40	12960	9720	10530	8002	8100	6237
35	15120	11340	12285	9336	9450	7276
30	17280	12960	14040	10670	10800	8316
25	19440	14580	15795	12004	12150	9355
20	21600	16200	17550	13338	13500	10395
15	23760	17820	19305	14671	14850	11434

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

NOTE: Sensible performance only is shown for winter application.

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.

BASIC INSTALLATION (Field Installation)

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

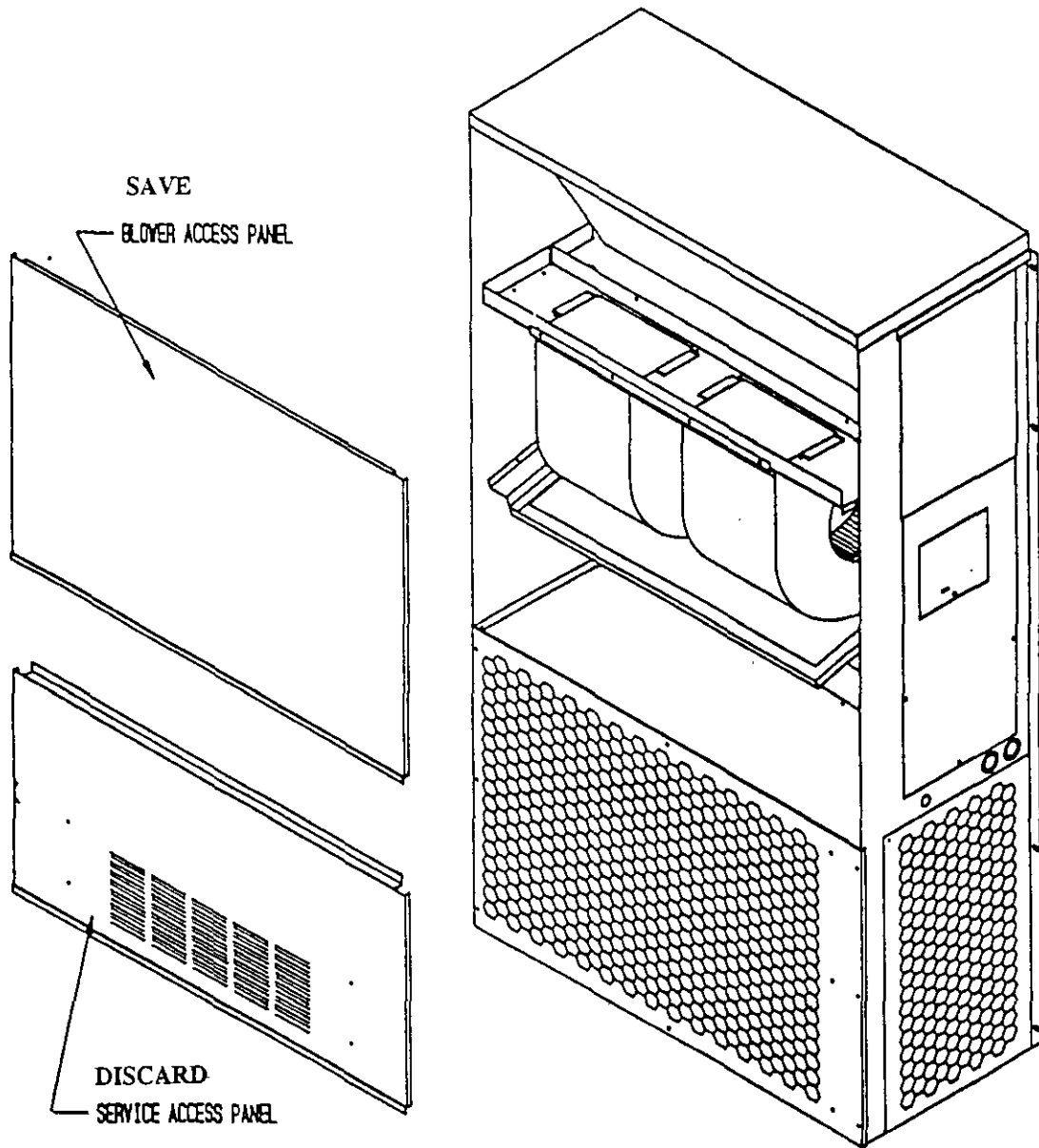
WARNING		
Open and lock unit disconnect switch before installing this accessory to prevent injury or death due to electrical shock or contact with moving parts. Turn thermostat to off.		

<u>MODEL</u>	<u>For Use With Following Units</u>		<u>Electrical</u>
WERV-A2A	WA181-A WA241-A,-B	WH181-A,-B WH241-A,-B	230/208-1 or 3 phase
WERV-A3A	WA301-A,-B WA361-A,-B	WH301-A,-B WH361-A,-B	230/208-1 or 3 phase
WERV-C3A	WA301-C WA361-C	WH301-C WH361-C	460-3 phase

CAUTION: Be sure the correct model and voltage Energy Recovery Ventilator is used with the correct air conditioner or heat pump to insure correct voltage compatibility.

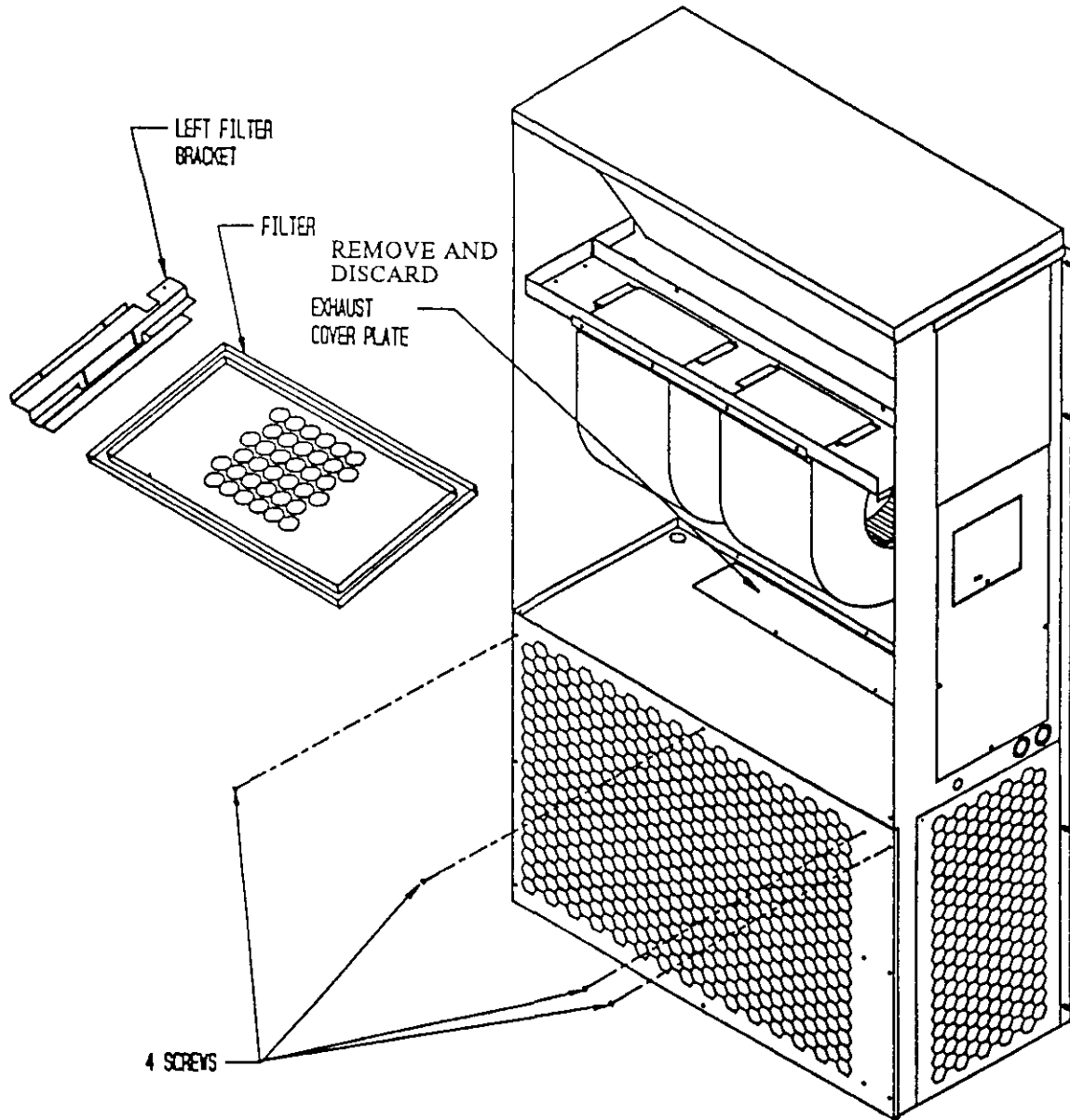
2. Remove the existing exterior blower access and service access panels on the Bard wall mount units. Save the blower access panel and discard service access panel. (See Figure 1)

FIGURE 1



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

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 under front grille and on top of 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. (Insure all power is off prior to opening the control panel.)
7. Route two (2) low voltage electrical 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 Figure 4 on Page 8 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.

9. Remove female plug of high voltage wiring harness from the heat recovery assembly and snap into unit control panel from the inside of the control panel in the hole provided. Wire to terminal block. See Figure 4 and wiring diagram.
10. Plug male plug from WERV assembly into female connector at back of control panel. (See Figures 3 and 4)
11. Replace inner and outer control panel cover.
12. Replace left filter bracket, filter and four (4) screws in condenser grille. (See Figure 2)
13. 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 slowing (49 RPM). Intake and exhaust blowers should run.
 - D. De-energize evaporator blower. Energy recovery heat transfer wheels and fresh air and exhaust air blowers should stop.
 - E. This completes ventilator checkout.
14. Reinstall the blower access panel at top of unit and secure with sheet metal screws.
15. Replace the lower service access panel with the new panel provided. Attach air intake hood with screws provided. (See Figure 5) Be sure to insert the top flange of the air intake hood into and thru the slot in the service door and between the door and insulation to prevent bowing of the door.
16. Ventilator is now ready for operation.

BASIC INSTALLATION (FACTORY INSTALLED MODELS)

1. Remove blower access door and service door. Room filter located above air circulating blowers. Install filter. Remove filter bracket from shipping location and install on left side.
2. Remove air intake hood from shipping location and install air intake hood on service panel.
3. Replace all panels.

FIGURE 3

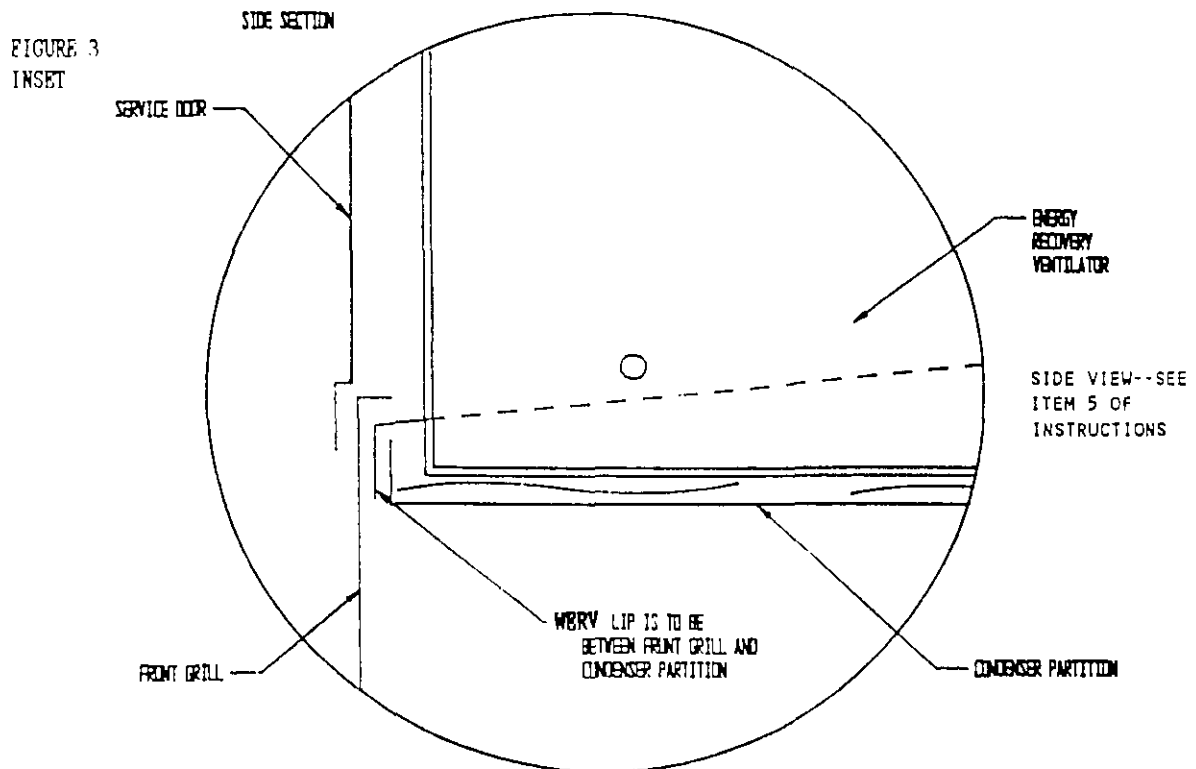
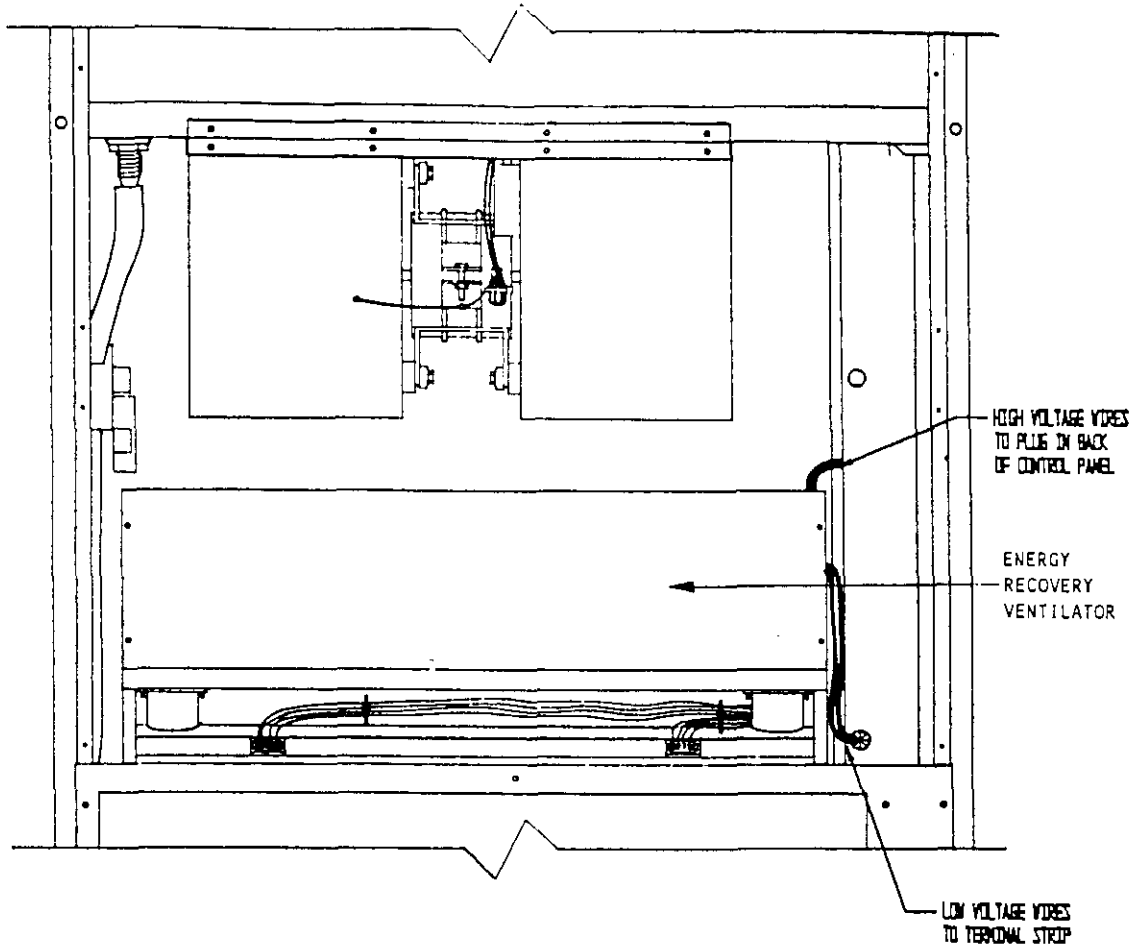
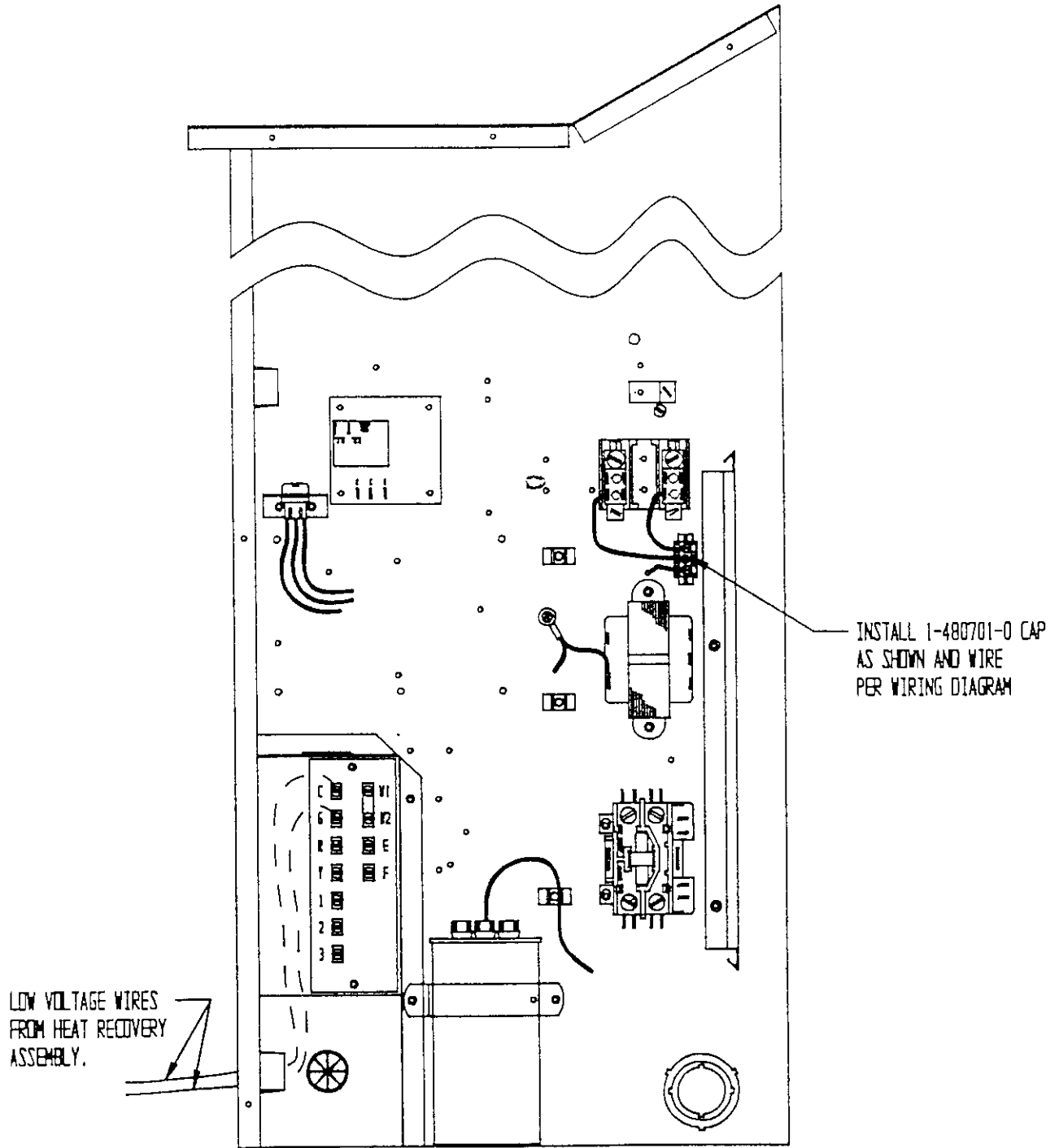
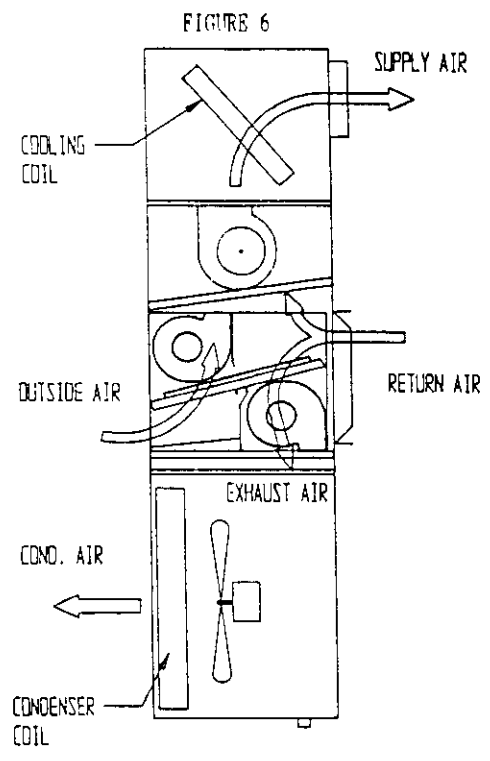
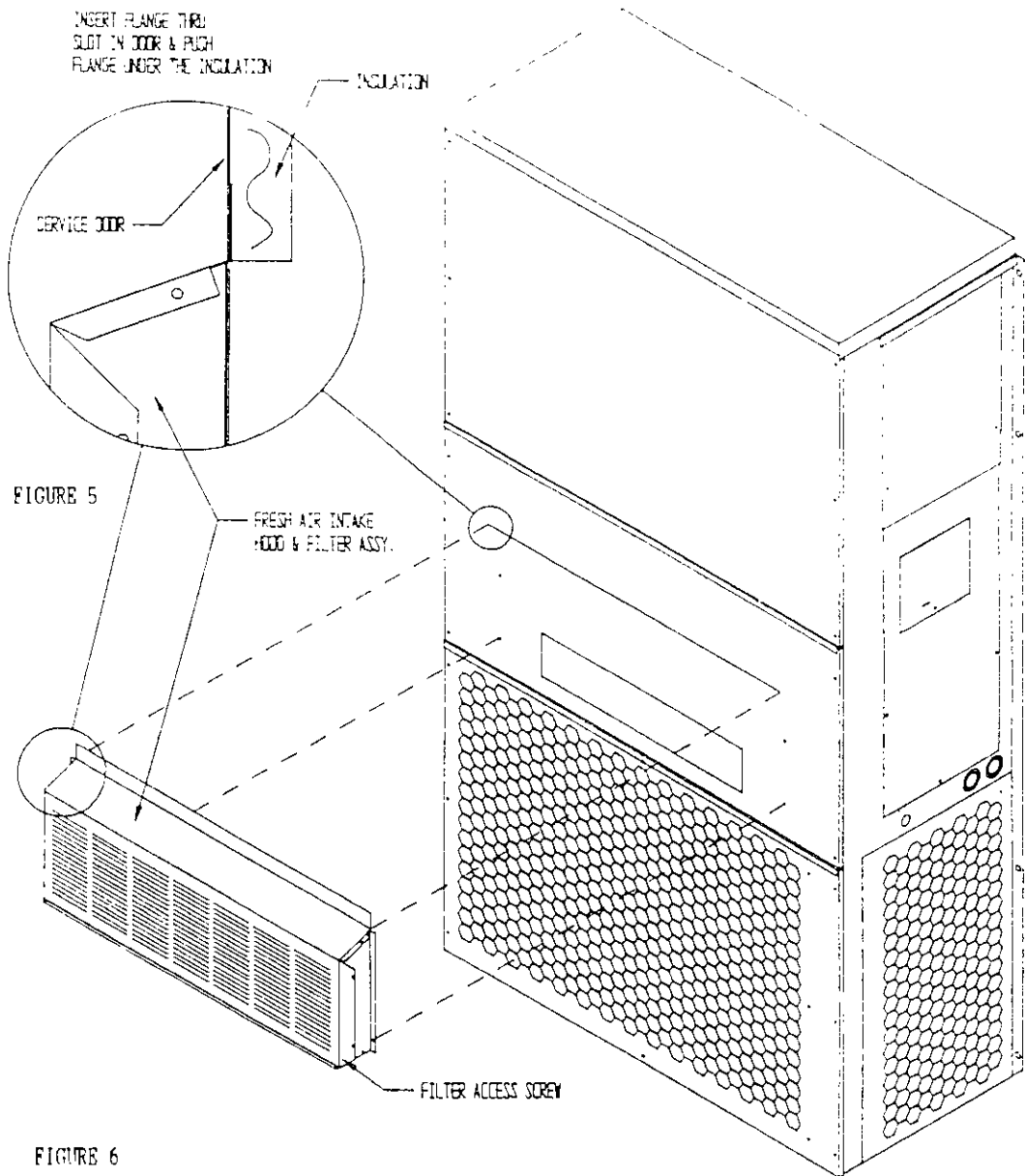


FIGURE 1





REPLACE SERVICE ACCESS PANEL
AND INSTALL FRESH AIR INTAKE
HOOD ASSY. AS SHOWN.

CONTROL OPTIONS

The unit comes from the factory wired to provide ventilation whenever the indoor blower of the air conditioner or heat pump is operating. Continuous ventilation can be obtained by setting the wall thermostat on continuous fan.

For many applications such as schools, it may be more desirable and will reduce the operating cost, to shut the ventilation system off during periods of time when the building or room is not occupied.

This can be accomplished by providing a means to interrupt the orange wire from control relay CR1 (see wiring diagram) to "G" on the unit 24 volt terminal block. This can be accomplished with a manual switch, timer, programmable thermostat, Bard CS2000 or separate energy management system.

VENTILATION AIR FLOW

The WERV-A2A, WERV-A3A and WERV-C3A 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

CFM	VENTILATION AIR (CFM)		
	High Speed (Black)	Medium Speed (Blue)	Low Speed (Red)
WERV-A2A	250	225	200
WERV-A3A, WERV-C3A	400	325	250

The units are wired from the factory on high speed. The speed can be changed by disconnecting the black wire and reconnecting the blue or red wire on the intake or exhaust blower motor. 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.

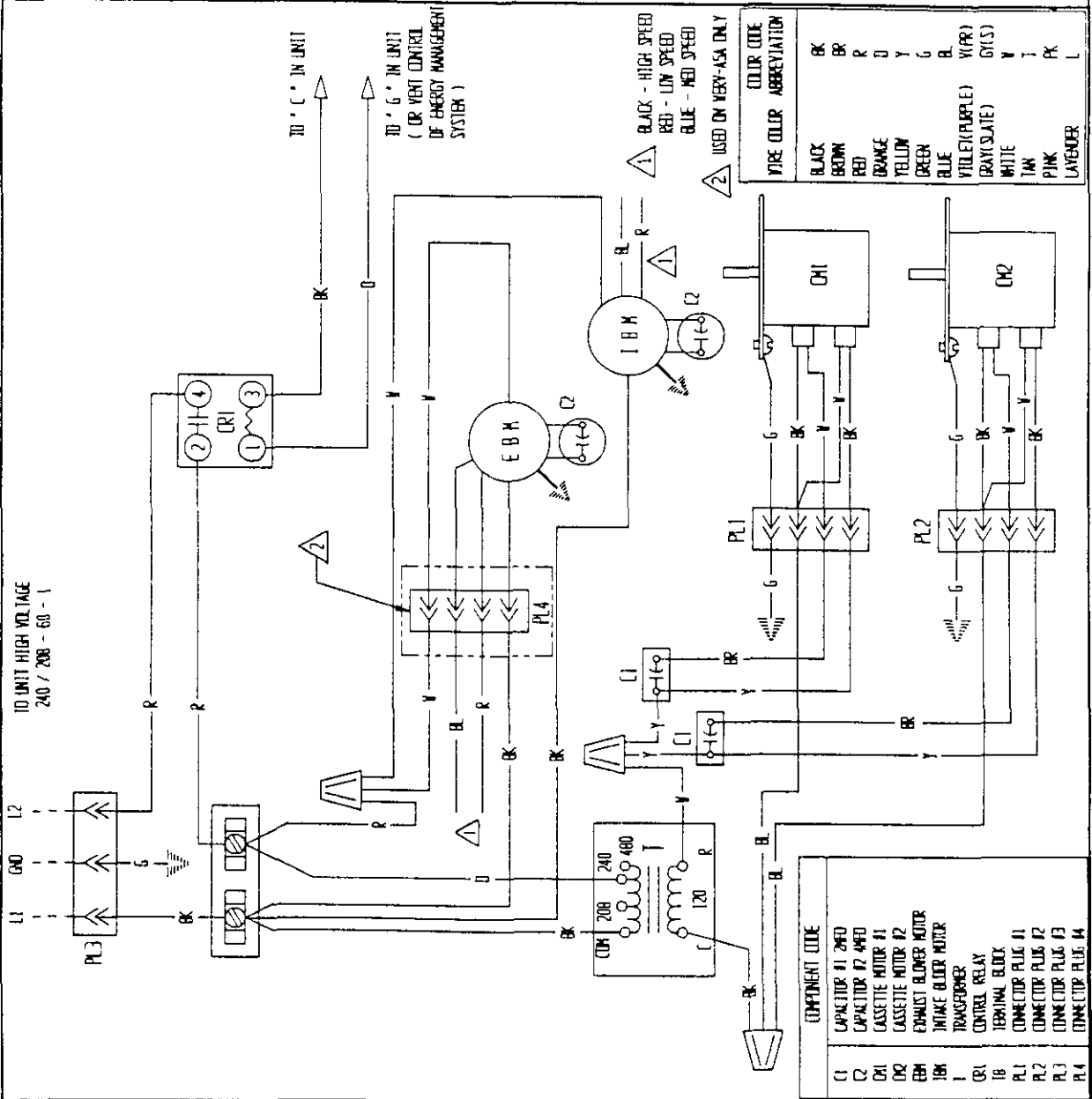
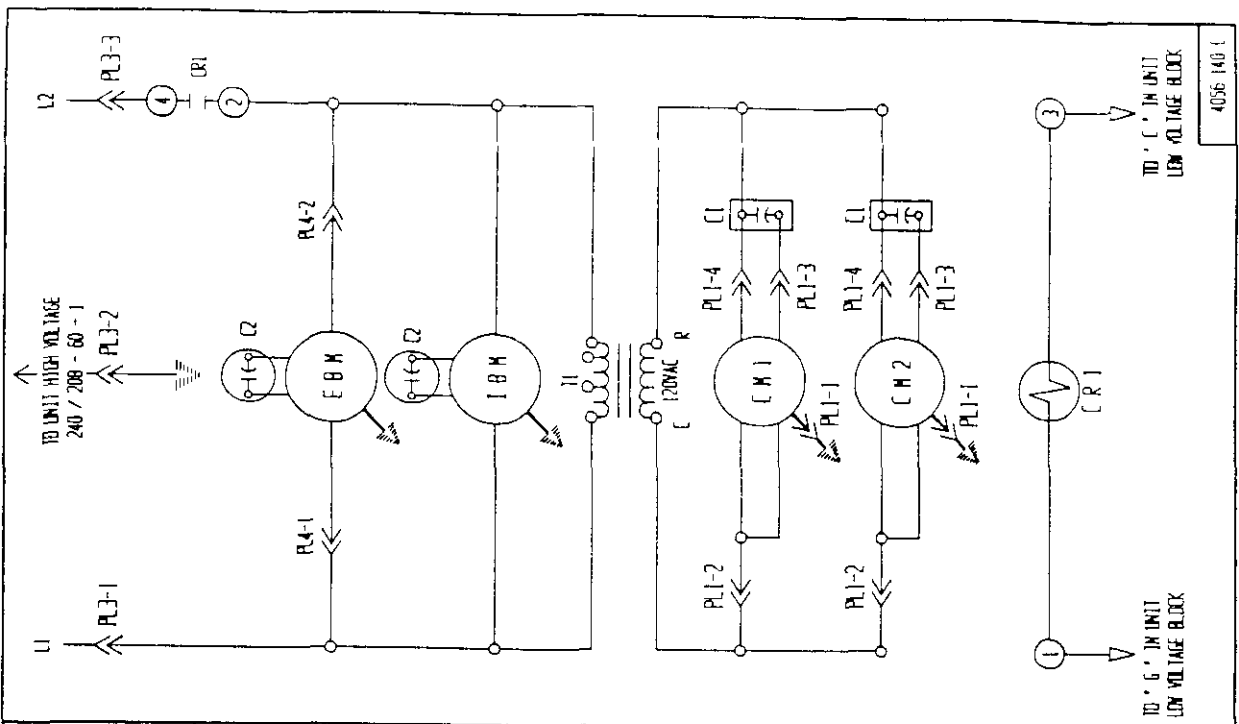
SERVICING THE WERV SYSTEM

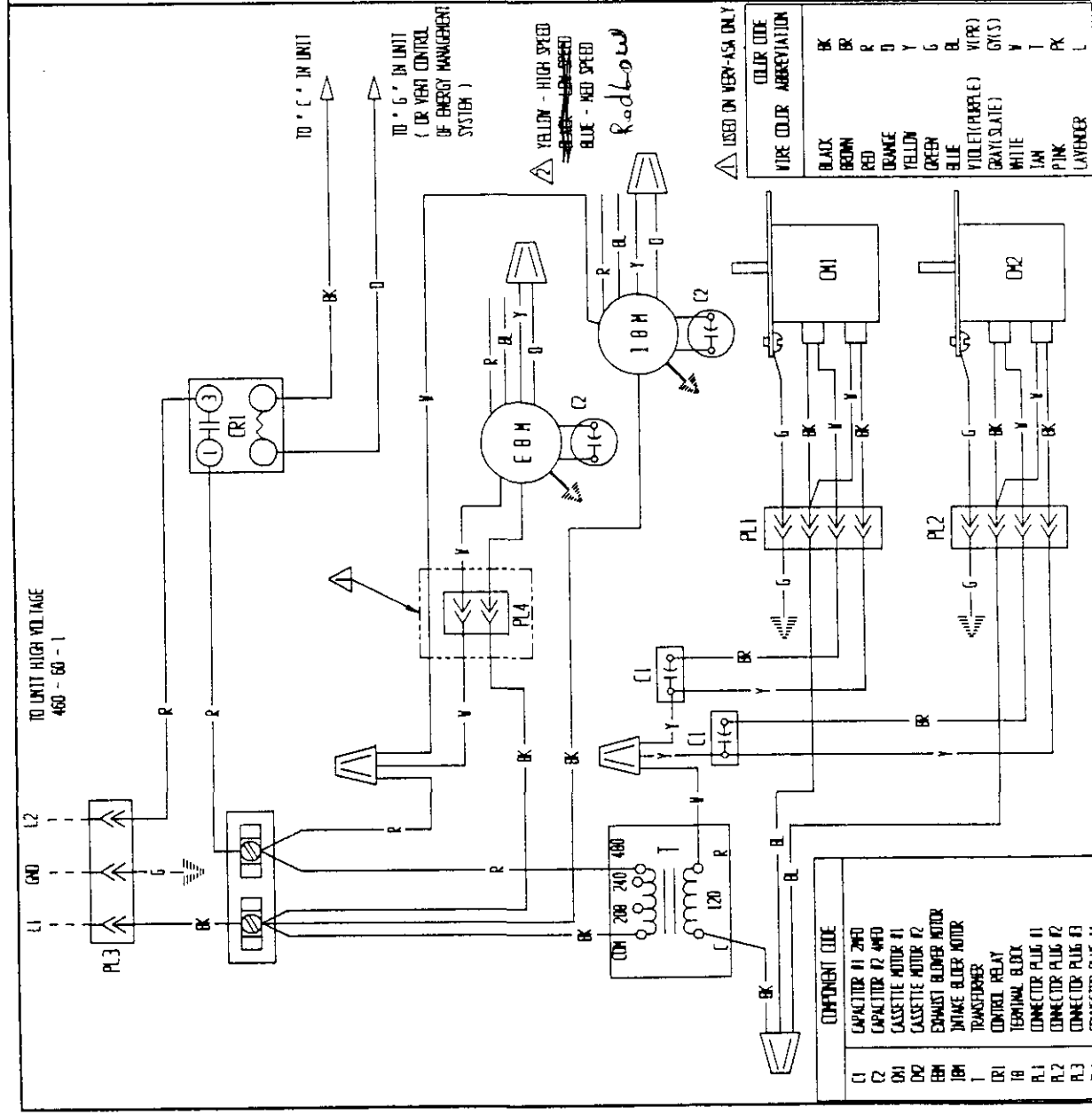
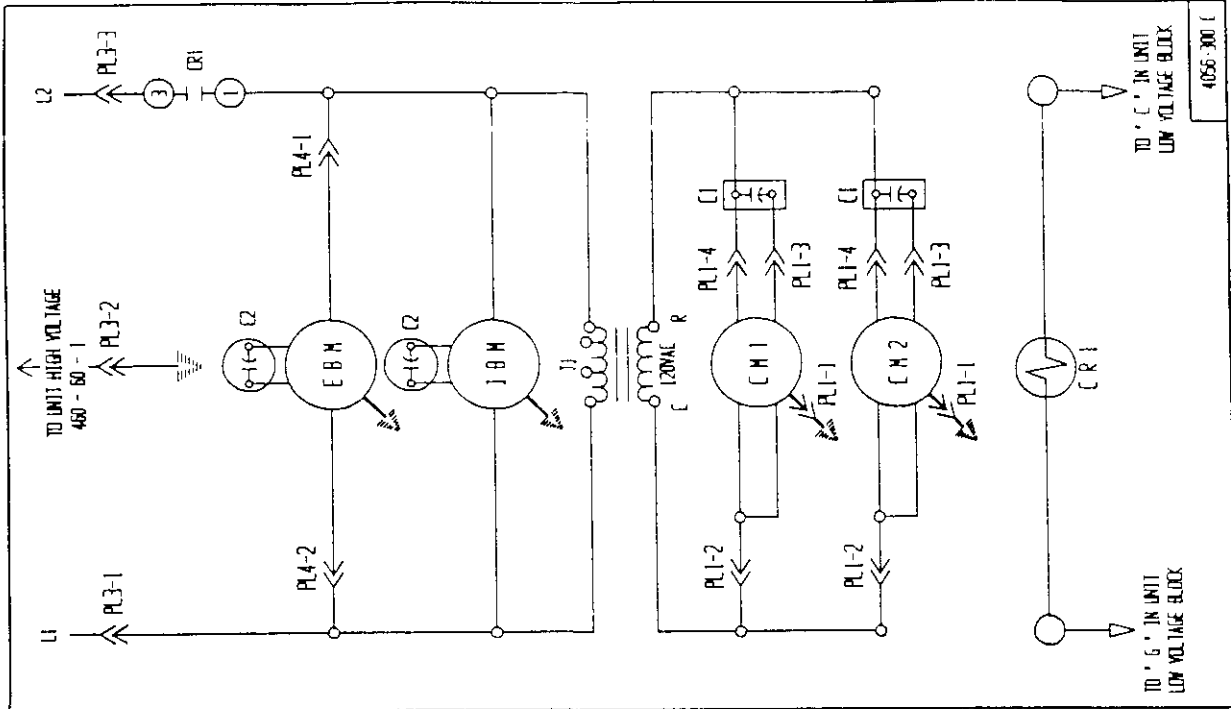
1. Room air filters in the air conditioner should be cleaned or replaced periodically to maintain an adequate amount of total circulated air thru the air conditioning system. The frequency of changing or cleaning is dependent on the application.
2. Fresh air filter. The unit is equipped with a fresh air filter and mist eliminator located in the fresh air hood. (See Figure 5) This can be removed by removing the filter access screw from the side of the fresh air hood and removing the filter from the bottom of the assembly. This filter is constructed of an aluminum frame and mesh and can be cleaned by washing periodically. The frequency is determined by the amount of dust, pollen and other outdoor airborne particles in the area. A periodic visual inspection is recommended to insure it is clean and free of dust, debris, leaves, snow etc.

ENERGY TRANSFER WHEEL

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

If the wheels appear excessively dirty, they should be cleaned to insure maximum efficiency. To clean the wheels, remove the service access panel (see Figure 1). Remove the sheet metal access panel on the front of the Energy Recovery Ventilator. Unplug the (2) wheel drive motors at the plug-in connectors located below the heat transfer wheels. (Squeeze the side tabs on the connector and pull gently--do not pull on the wires.) Remove the heat transfer cassette by grasping the tray and sliding out of the unit. Remove the wheels from the cassette assembly. Grasp the wheel by the rim and thoroughly spray the wheel windings with a household spray cleaner such as Fantastic or the equivalent. Gently rinse with warm water and use a soft brush (such as a paint brush) to remove any heavy accumulation. Shake the excess water from the wheel and reinstall in reverse order. Operate the unit to confirm proper operation.





4056-300 E

TO 'G' IN UNIT
LOW VOLTAGE BLOCK

TO 'G' IN UNIT
LOW VOLTAGE BLOCK

TO UNIT HIGH VOLTAGE
460 - 60 - 1

TO 'G' IN UNIT

TO 'G' IN UNIT
(OR VENT CONTROL
OR ENERGY MANAGEMENT
SYSTEM)

YELLOW - HIGH SPEED
BLUE - MED SPEED
Red below

USED ON VERY-ASA ONLY

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

COMPONENT CODE	DESCRIPTION
C1	CAPACITOR #1 2MFD
C2	CAPACITOR #2 4MFD
O1	CASSETTE MOTOR #1
O2	CASSETTE MOTOR #2
EBH	EXHAUST BLOWER MOTOR
1.0 H	INTAKE BLOWER MOTOR
T	TRANSFORMER
CR1	CONTROL RELAY
CR2	CONTROL RELAY
CR3	CONTROL RELAY
CR4	CONTROL RELAY
CR5	CONTROL RELAY
CR6	CONTROL RELAY
CR7	CONTROL RELAY
CR8	CONTROL RELAY
CR9	CONTROL RELAY
CR10	CONTROL RELAY
CR11	CONTROL RELAY
CR12	CONTROL RELAY
CR13	CONTROL RELAY
CR14	CONTROL RELAY

