
INSTALLATION INSTRUCTIONS

**MODEL:
ERV-R-A3C**

**RETROFIT
ENERGY RECOVERY VENTILATOR
WITH EXHAUST**

**FOR USE WITH BARD
WAG SERIES
COMBINATION GAS ELECTRIC
WALL MOUNT UNITS**



**BARD MANUFACTURING COMPANY
Bryan, Ohio 43506**

Since 1914...Moving ahead, just as planned.

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ELECTRICAL SPECIFICATIONS

**TABLE 1
SPECIFICATIONS**

Model	Voltage	Amps	Control Voltage
ERVR-A3C	230/208 1 PH or 2 PH	2.2	24V

NOTE: Ampacity supplied to an existing installation must be reviewed for adequacy to handle the additional 2.2 amps of the ERVR-A3C in accordance with all local and national electrical codes.

GENERAL DESCRIPTION

The Bard Energy Recovery Ventilator was designed to provide energy efficient, cost effective ventilation to meet Indoor Air Quality (I.A.Q.) 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 field installed for new installations or retrofit to Bard WAG series units. The package consists of a unique rotary Energy Recovery Cassette that can be easily removed for cleaning or maintenance. The ERVR-A3C has two 13 inch diameter heat transfer wheels. 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 provide 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.

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 and Upper Door
3. 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)

Unpack the ventilator assembly which includes the integral ventilator with attached electrical harnesses 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".

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. Failure to do so may cause damage to the unit.

PERFORMANCE AND APPLICATION DATA – ERVR-A3C

**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	12960	6120	12020	8164	3855	15502	10530	4972	9921	6739	3182	11925	8100	3825	7751	5265	2486	
105	70	12960	12690	0	8164	8164	0	10530	10530	0	6739	6739	0	8100	8100	0	5265	5265	0
65	12960	12960	0	8164	8164	0	10530	10530	0	6739	6739	0	8100	8100	0	5265	5265	0	
80	28080	10800	17280	17690	6804	10886	22815	8775	14040	14601	5616	8985	17550	6750	10800	11407	4387	7019	
75	19080	10800	8280	12020	6804	5216	15502	8775	6727	9921	5616	4305	11925	6750	5175	7751	4387	3363	
100	70	10980	10800	180	6917	6804	113	8921	8775	146	5709	5616	93	6862	6750	112	4460	4387	73
65	10800	10800	0	6804	6804	0	8775	8775	0	5616	5616	0	6750	6750	0	4387	4387	0	
60	10800	10800	0	6804	6804	0	8775	8775	0	5616	5616	0	6750	6750	0	4387	4387	0	
80	28080	8640	19440	17690	5443	12247	22815	7020	15795	14601	4492	10108	17550	5400	12150	11407	3510	7897	
75	19080	8640	10440	12020	5443	6577	15502	7020	8482	9921	4492	5428	11925	5400	6525	7751	3510	4241	
95	70	10980	8640	2340	6917	5443	1474	8921	7020	1901	5709	4492	1216	6862	5400	1462	4460	3510	950
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80	28080	6480	21600	17690	4082	13608	22815	5265	17550	14601	3369	11232	17550	4050	13500	11407	2632	8774	
75	19080	6480	12600	12020	4082	7938	15502	5265	10237	9921	3369	6552	11925	4050	7875	7751	2632	5118	
90	70	10980	6480	4500	6917	4082	2835	8921	5265	3656	5709	3369	2340	6862	4050	2812	4460	2632	1828
65	6480	6480	0	4082	4082	0	5265	5265	0	3369	3369	0	4050	4050	0	2632	2632	0	
60	6480	6480	0	4082	4082	0	5265	5265	0	3369	3369	0	4050	4050	0	2632	2632	0	
80	28080	4320	23760	17690	2721	14968	22815	3510	19305	14601	2246	12355	17550	2700	14850	11407	1755	9652	
75	19080	4320	14760	12020	2721	9298	15502	3510	11992	9921	2246	7675	11925	2700	9225	7751	1755	5996	
85	70	10980	4320	6660	6917	2721	4195	8921	3510	5411	5709	2246	3463	6862	2700	4162	4460	1755	2705
65	4320	4320	0	2721	2721	0	3510	3510	0	2246	2246	0	2700	2700	0	1755	1755	0	
60	4320	4320	0	2721	2721	0	3510	3510	0	2246	2246	0	2700	2700	0	1755	1755	0	
75	19080	2160	16920	12020	1360	10659	15502	1755	13747	9921	1123	8798	11925	1350	10575	7751	877	6873	
80	70	10980	2160	8820	6917	1360	5556	8921	1755	7166	5709	1123	4586	6862	1350	5512	4460	877	3583
65	3780	2160	1620	2381	1360	1020	3071	1755	1316	1965	1123	842	2362	1350	1012	1535	877	658	
60	2160	2160	0	1360	1360	0	1755	1755	0	1123	1123	0	1350	1350	0	877	877	0	
70	10980	0	10980	6917	0	6917	8921	0	8921	5709	0	5709	6862	0	6862	4460	0	4460	
75	65	3780	0	3780	2381	0	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	0	0	0	0	0	0	

PERFORMANCE AND APPLICATION DATA – ERVR-A3C

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

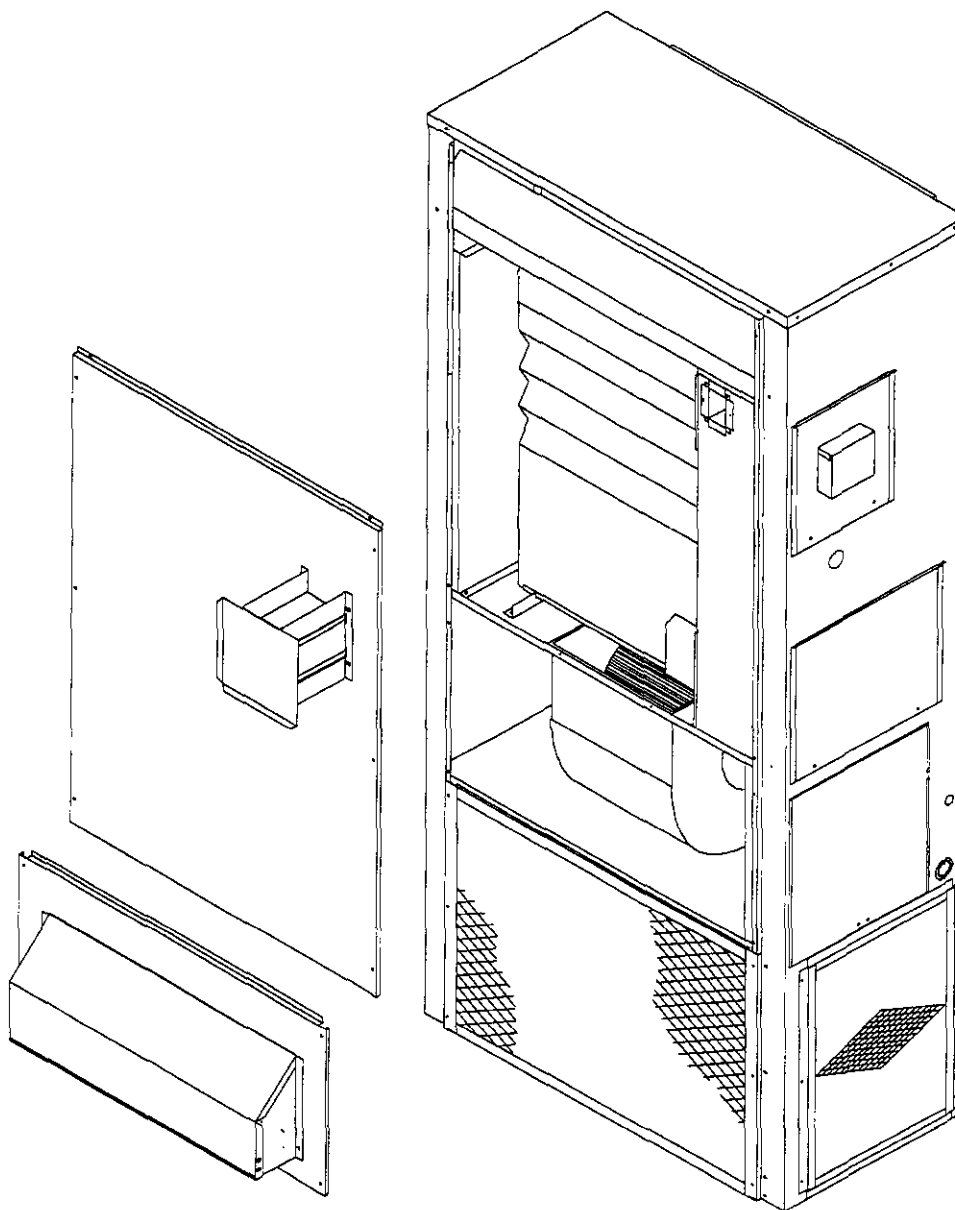
for Performance and Application
Data Charts:

- 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

WAG SERIES INSTALLATION INSTRUCTIONS

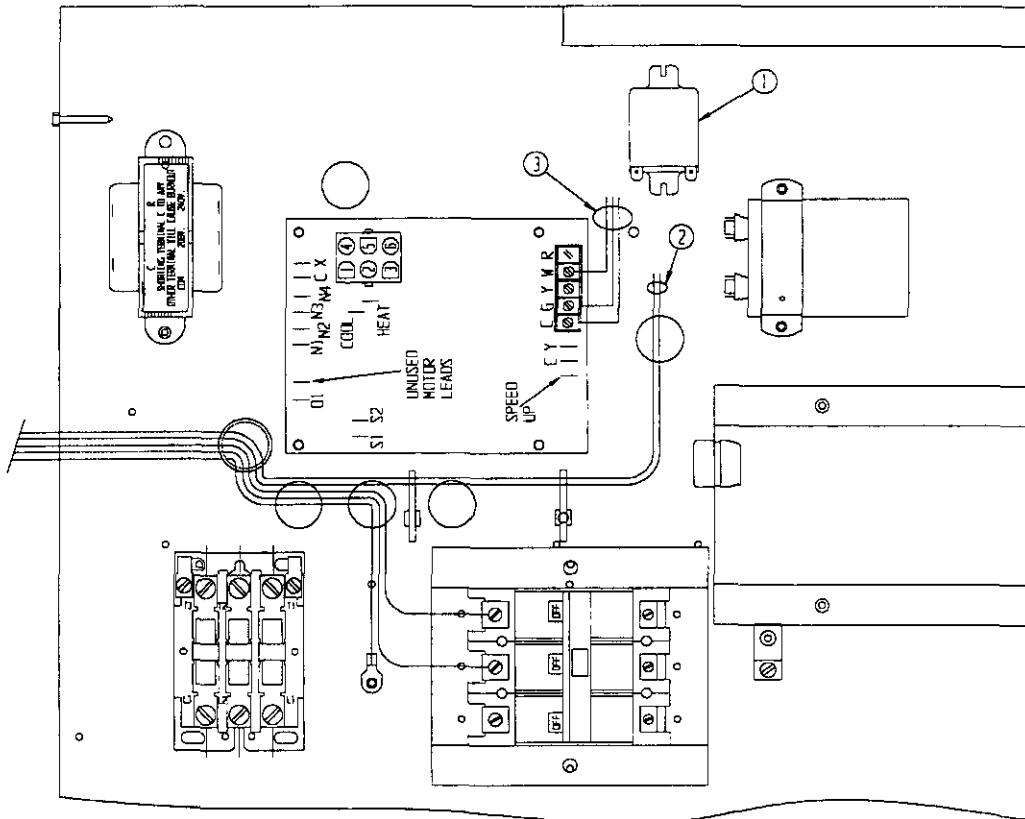
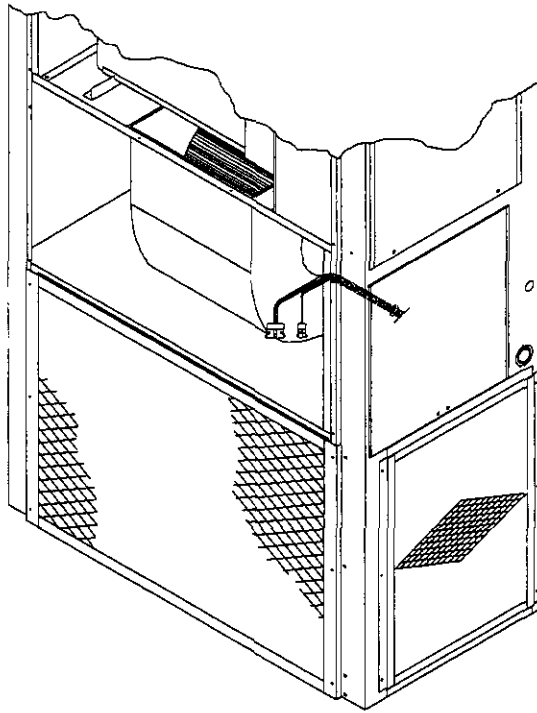
1. Remove vent terminal and save. Remove upper and lower service doors and discard. (See Figure 1.)
2. Install wiring harness and wire per wiring diagram. (See Figures 2 and 5.)
3. Install ERVR-A3C on WAG and secure with self drilling screws provided. (See Figure 3.)
4. Plug wiring harness into back of ERVR, (See Figure 3.)
5. Remove ERVR top and plug in ERVR-A3C to harness.
6. Install new lower and upper doors. Reattach vent terminal. (See Figure 4.)
7. Go to Ventilator Check out on Page 8.

**FIGURE 1
REMOVAL OF SERVICE DOORS**



MIS-684

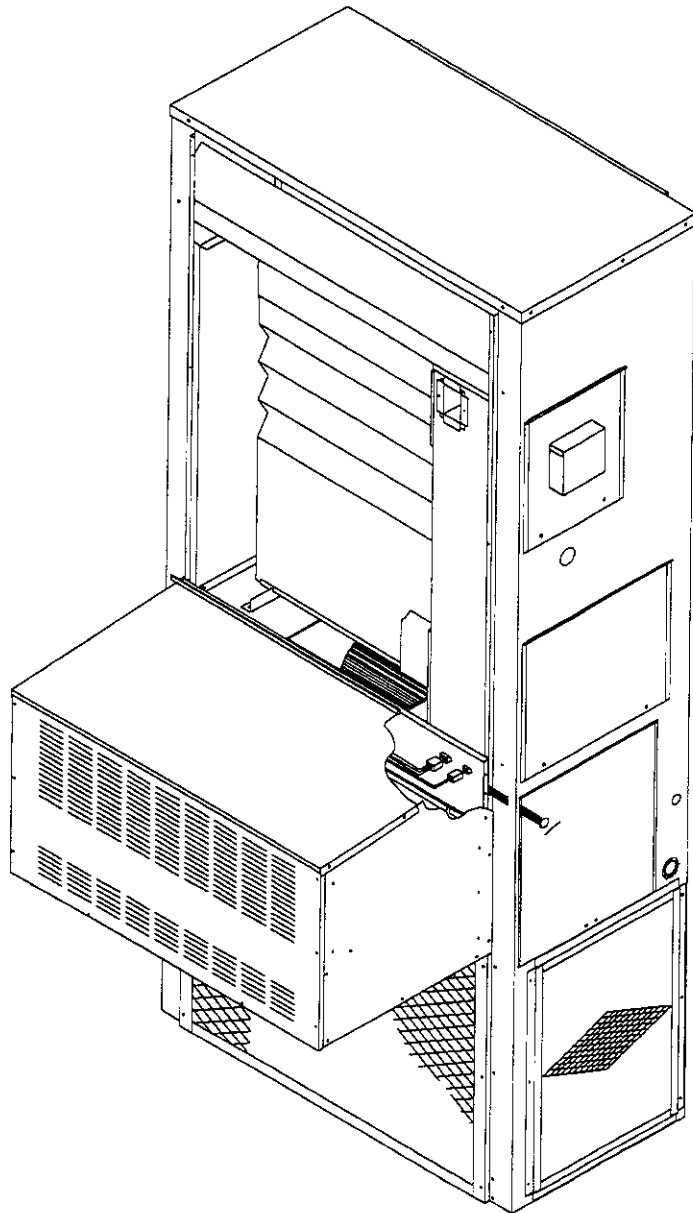
FIGURE 2
WIRING HARNESS AND DIAGRAM



MIS-685

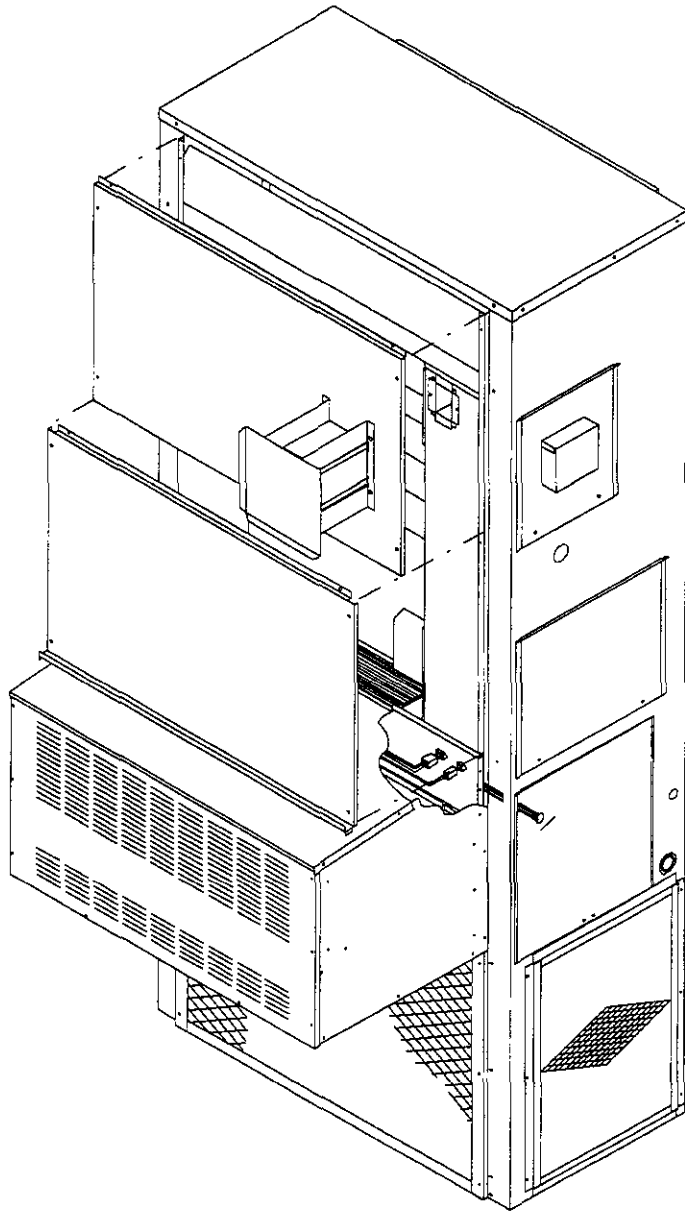
1. LOCATE RELAY ASSEMBLY IN THIS AREA AND SECURE WITH SCREWS PROVIDED.
2. ATTACH STRIPPED WIRES FROM WIRE HARNESS TO WIRES FROM RELAY WITH WIRE NUTS PROVIDED. ORANGE TO ORANGE AND BLACK TO BLACK.
3. ATTACH FORK TERMINAL WIRES FROM RELAY ASSEMBLY TO CONTROL. BLACK TO "C" TERMINAL, ORANGE TO "G" TERMINAL AND BLUE TO "W" TERMINAL.

FIGURE 3
INSTALLING ERVR-A3C TO WAG UNIT



MIS-686

FIGURE 4
INSTALLING NEW DOORS



MIS-687

VENTILATOR CHECKOUT

1. Resupply power to unit.
2. Energize the evaporator blower by switching thermostat to the manual fan position with heat/cool in "OFF" position.
3. Ventilator heat transfer wheels should rotate slowly (49 RPM). Intake and exhaust blowers should run.
4. De-energize evaporator blower. Energy recovery heat transfer wheels and fresh air and exhaust air blowers should stop.
5. Reinstall top on ERVR-A3C.
6. This completes ventilator checkout.

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.

* * IMPORTANT * *

Operating the ERVR during unoccupied periods can result in a buildup of moisture in the structure.

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 ERVR-A3C is 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 2
VENTILATION AIR TABLE

VENTILATION AIR (CFM)			
Model	High Speed (Black)	Medium Speed (Blue)	Low Speed (Red)
ERVR-A3C	400	325	250

These units come from the factory with a three position switch for selecting the blower speed. Both motors will run at the same speed.

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 ERVR SYSTEM

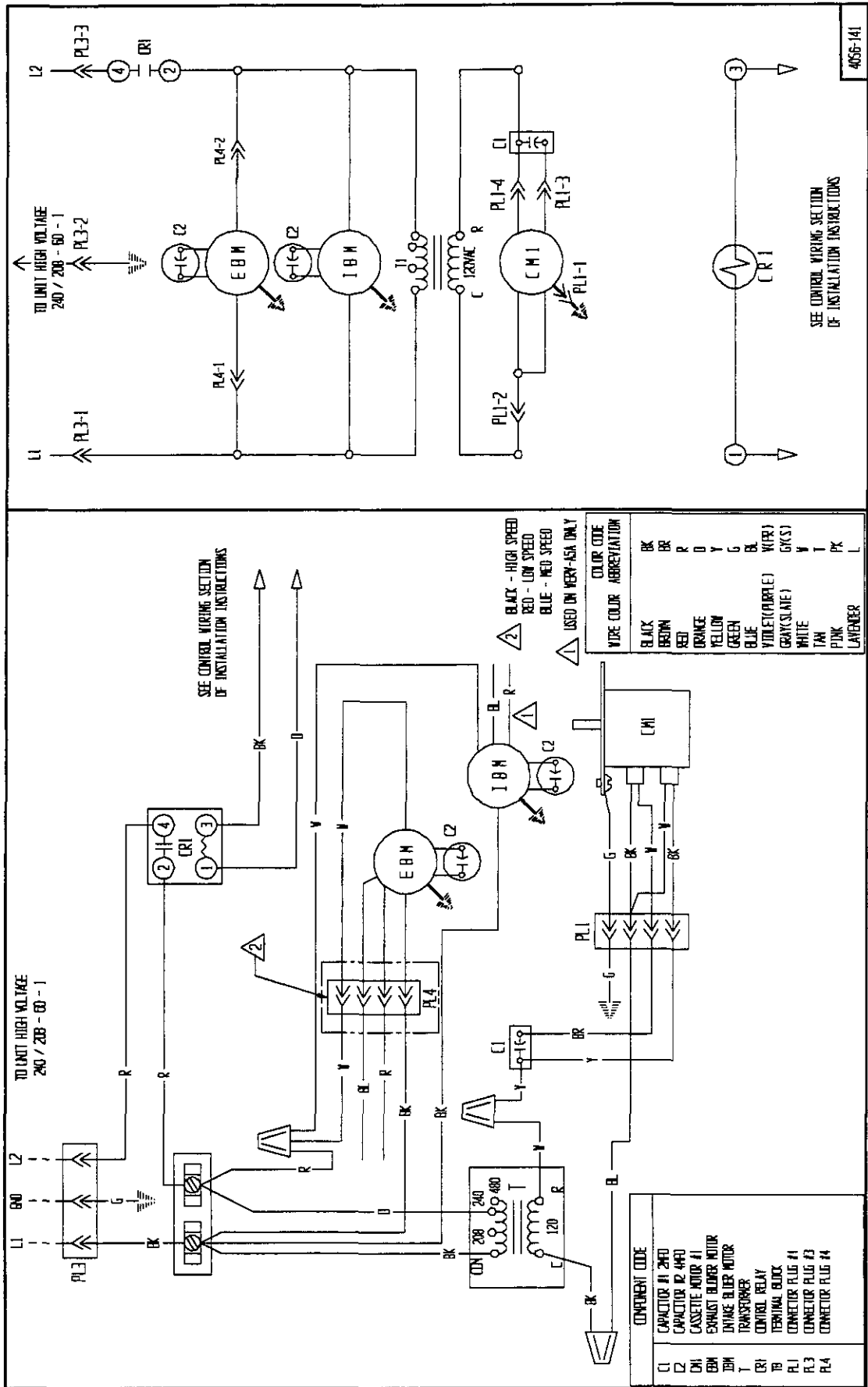
1. Room air filters in the air conditioner should be cleaned or replaced periodically to maintain an adequate amount of total circulated air through the air conditioning system. The frequency of changing or cleaning is dependent on the application.
2. Fresh air filter. The unit is equipped with a fresh air filter and mist eliminator located in the ERVR-A3C. This can be removed by removing the top from the ERVR and removing the filters from the top 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 buildup 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. Remove the sheet metal access panel on the front of the Energy Recovery Ventilator. Unplug the wheel drive motor at the plug-in connector 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.

**FIGURE 5
WIRING DIAGRAM**



4056-141

SEE CONTROL WIRING SECTION
OF INSTALLATION INSTRUCTIONS

WIRE COLOR	ABBREVIATION
BLACK	BK
BROWN	BR
RED	R
ORANGE	O
YELLOW	Y
GREEN	G
BLUE	BL
VIOLET/PURPLE	VL
GRAY/SLATE	GR
WHITE	W
TAN	T
PINK	PK
LAVENDER	L

BLACK - HIGH SPEED
RED - LOW SPEED
BLUE - MED SPEED
USED ON VERT-A-SH ONLY

COMPONENT CODE	DESCRIPTION
C1	CAPACITOR #1 240
C2	CAPACITOR #2 440
CM1	CASSETTE MOTOR #1
EBM	EXHAUST BLOWER MOTOR
IBM	INHAUST BLOWER MOTOR
T	TRANSFORMER
CR1	CONTROL RELAY
TR	TERMINAL BLOCK
PL1	CONNECTOR PLUG #1
PL2	CONNECTOR PLUG #2
PL3	CONNECTOR PLUG #3
PL4	CONNECTOR PLUG #4

