BARD WA/WH ECM Constant Airflow Motor Replacement Kits for Enhanced Indoor Air Filtration

Bard Indoor Air Quality Improvement Solutions

Our Classroom Preferred™ systems have built-in capabilities and design features that address many recommendations for enhanced IAQ including ventilation. In addition to built-in features, we offer several field-installed options to further enhance IAQ with your existing Bard product. Constant airflow motors using ECM technology are available to increase the ability of existing equipment to filter indoor air and reduce the amount of particulates in a room.

ECM Indoor Fan Motor Technology Kits:

- Allows for MERV13 filter use in existing WA and WH products.
- Improve indoor fan efficiency for products with PSC motors.
- Increases fan torque when needed to provide constant airflow as filter static increases.
- Provides an optional reduced sound low fan speed for continuous fan operation.
- Is available as a field installed kit for WA and WH 230V unit models.

Bard® SINCE 1914

FIELD INSTALLED UPGRADE MOTOR KIT DESCRIPTION

With today's increasing indoor air quality requirements, customers are often required to review the filtration performance of existing heating and air conditioning equipment. Filters with a higher MERV rating are often required for occupied areas. Replacement of existing equipment can often be expensive and time consuming. Bard field upgrade motor kits offer the following features:

- Existing legacy WA and WH Bard Wall Mounts that are not in need of replacement can use the upgrade motor kit to replace older low efficiency PSC motors with new ECM constant airflow motors. Constant airflow ECM technology uses a torque curve developed by Bard to provide a constant airflow amount when MERV13 filters are used.
- Newer standard WA and WH Bard Wall Mounts that do not already include constant airflow ECM technology can be upgraded. This will allow the indoor fan to provide a constant airflow amount as premium filters up to MERV13 begin to load with dust, dirt, and debris. Constant airflow or continuous airflow, means air is continuously circulated through the room allowing for greater comfort and constant removal of particles and contaminates by air passing through enhanced filtration. An optional low fan speed can be used for reduced sound levels during continuous fan operation.

UPGRADE MOTOR KIT CONTENTS

The ECM motor kits contain the following components:

- A dual shaft Electronically Commutated Motor (ECM) that provides increased performance and allows for unit operation with up to a MERV13 filter.
- A control mounting bracket, needed wires, relay, wire clamps and wire ties, screws, and other miscellaneous wiring components.
- A new adhesive-backed wiring diagram to show wiring changes made to the unit.
- Installation instructions that explain how to install the motor and revise unit wiring. The instructions for the motor kit can be saved and inserted into the literature assembly that shipped with the product.

UPGRADE MOTOR KIT PART NUMBERS

Motor Upgrade Kit Description					
Kit #	**Motor Part #**	**Motor HP**	**Amps**	**Programmed Speeds**	**Voltage**
8620-345	8107-017-0236	3/4 HP	6.8	3	230 Volt - 1 or 3 Phase
8620-346	8107-017-0235	3/4 HP	6.8	3	230 Volt - 1 or 3 Phase
8620-347	8106-052-0232	1/2 HP	4.3	3	230 Volt - 1 or 3 Phase
8620-348	8105-060-0233	1/3 HP	2.8	3	230 Volt - 1 or 3 Phase

EC MOTOR SPEEDS

The EC Motor provides 3 separate motor speeds that can be used. Each motor speed produces a different CFM airflow amount:

- **Fan operation for Ventilation (Low)**: This is the lowest airflow speed that can be used with the motor upgrade kit. When used with fan only operation for ventilation or continuous air circulation, the unit will provide a low indoor sound level and energy efficient air filtration. Compressor cooling does not operate at this fan speed. Vent speed is not required for single speed unit operation.
- **Balanced Climate Speed (Med)**: This is a lower cooling airflow speed that can be used with the motor upgrade kit. When used to lower the unit airflow, additional moisture will be removed (latent capacity increased) and less actual cooling will take place (sensible capacity decreased). Balanced Climate speed is not required and can only be used with the 11EER WA and WH units produced after October 2019.
- **Full Cooling Speed (Hi)**: This is the standard speed for cooling and heating use.

UNIT NOMENCLATURE DESCRIPTION

The following tables are provided to select the correct motor kit for Bard Wall Mount products.

Digit #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	W	6	0	A	1	-	A	0	Z	X	N	X	X	X	X

Bard Model #

Voltage Options. Kit is available for 208/230V units only
A = 208/230V - 1ph - 60hz
B = 208/230V - 3ph - 60hz

Legacy Unit (Before the End of November 2019) Motor Upgrade Kit Matrix							
Bard Model #	**Unit Voltage**	**Motor Kit #**	**Vent Speed CFM (LO)**	**Balanced Climate CFM (MED)**	**Full Load Cooling CFM (HI)**	**Motor Kit Installation Manual**	**MERV13 Filter Size and Part #**
W24A1/W24L1 W24A2/W24L2 W24AA/W24LA W24H1 W24H2 W24HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-348	400	Not Available	800	7960-903	(1) 16 x 25 x 2 Part #7004-061
WA30*/WL30* W30A1/W30L1 W30A2/W30L2 W30AA/W30LA WH30* W30H1 W30H2 W30HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-347	550	Not Available	1000	7960-903	(1) 16 x 30 x 2 Part #7004-062
WA36*/WL36* W36A1/W36L1 W36A2/W36L2 W36AA/W36LA WH36* W36H1 W36H2 W36HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-347	550	Not Available	1100	7960-903	(1) 16 x 30 x 2 Part #7004-062
WA42*/WL42* W42A1/W42L1 W42A2/W42L2 W42AA/W42LA WH42* W42H1 W42H2 W42HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-346	800	Not Available	1400	7960-903	(1) 20 x 30 x 2 Part #7004-064
WA48*/WL48* W48A1/W48L1 W48A2/W48L2 W48AA/W48LA WH48* W48H1 W48H2 W48HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-346	800	Not Available	1550	7960-903	(1) 20 x 30 x 2 Part #7004-064
WA60*/WL60* W60A1/W60L1 W60A2/W60L2 W60AA/W60LA WH60* W60H1 W60H2 W60HA	A (208/230V 1 PH) B (208/230V 3 PH)	8620-345	750	Not Available	1650	7960-903	(1) 20 x 30 x 2 Part #7004-064

Production Unit (After November 2019) Motor Upgrade Kit Matrix							
Bard Model #	**Unit Voltage**	**Motor Kit #**	**Vent Speed CFM (LO)**	**Balanced Climate CFM (MED)**	**Full Load Cooling CFM (HI)**	**Installation Manual**	**MERV13 Filter Size and Part #**
W24AB/LB W24HB	A (208/230V 1 PH) B (208/230V 3 PH)	8620-348	400	560	800	7960-915	(1) 16 x 25 x 2 Part #7004-061
W30AB/LB W30HB	A (208/230V 1 PH) B (208/230V 3 PH)	8620-347	550	700	1000	7960-915	(1) 16 x 30 x 2 Part #7004-062
W36AB/LB W36HB	A (208/230V 1 PH) B (208/230V 3 PH)	8620-347	550	770	1100	7960-915	(1) 16 x 30 x 2 Part #7004-062
W42AC W42HC	A (208/230V 1 PH) B (208/230V 3 PH)	8620-345	750	980	1400	7960-915	(2) 20 x 20 x 2 Part #7004-063
W48AC W48HC	A (208/230V 1 PH) B (208/230V 3 PH)	8620-345	750	1085	1550	7960-915	(2) 20 x 20 x 2 Part #7004-063
W60AC W60HC	A (208/230V 1 PH) B (208/230V 3 PH)	8620-345	750	1155	1650	7960-915	(2) 20 x 20 x 2 Part #7004-063

/////// *Indoor Airflow Static and Unit Performance*

The airflow amount that passes through the unit is very important when considering cooling capacity and proper unit operation. Restriction of the amount of air passing through the unit is called external static pressure (ESP). Constant CFM EC motors increase torque to compensate for increased unit static up to .50" ESP. It is important to have a professional HVAC contractor, distributor, or technician complete a duct static calculation if supply or return ducts are used with the Wall Mount unit. Unit filter static must also be calculated into the total ESP value.

Supply Duct Static: Supply duct static will include duct work connected to the unit supply opening, supply registers, filtration installed in the supply duct, or any other device in the supply air stream that will restrict airflow. All ducts must be sealed to reduce duct air leakage, and flex duct work must not include restriction due to installation. Duct static must be calculated by a HVAC professional and include all factors of the duct design.

Return Duct Static: Return duct static will include duct work connected to the unit return opening, return registers, filtration installed in the return duct, or any other device in the return air stream that will restrict airflow. All ducts must be sealed to reduce duct air leakage, and flex duct work must not include restriction due to installation. Duct static must be calculated by a HVAC professional and include all factors of the duct design.

Filter Code	Filter MERV Rating	Filter Static IN. WC.	Filtration Level
X	**MERV 2**	0" WC	Low Filtration, 1" Thickness Disposable Media.
W	**MERV 2**	-.02" WC	Low Filtration, 1" Thickness Permanent Media.
P	**MERV 8**	.03" WC	Average Filtration, 2" Thickness Pleated Disposable Media.
M	**MERV 11**	.05" WC	Above Average Filtration, 2" Thickness Pleated Disposable Media.
N	**MERV 13**	.08" WC	High Filtration, 2" Thickness Pleated Disposable Media.
A	**MERV 13**	.08" WC	High Filtration, 2" Thickness Pleated Media, UV-C LED Light.

Calculating Total External Static Pressure: Supply duct static, return duct static, unit filter static, and any other source of additional static pressure are added together. Once this is calculated, the actual unit airflow amount can be reviewed by using the Indoor Airflow CFM charts provided.

Total External Static Pressure Calculation:

Supply Duct Static + Return Duct Static + Filter Static + Additional External Static = Total External Static Pressure (ESP)

The constant CFM motor provided in the motor upgrade kit can be used in installations with an ESP value up to .50" WC. The information above is provided to estimate the static pressure increase when replacing a low MERV rated filter with a with a high MERV rated filter. Make sure to review the unit installation and ensure static levels will not exceed a maximum .50" WC ESP measurement before installing the motor upgrade kit.

/////// Unit Inspection of Existing Installed Equipment Before Kit Installation

The constant airflow EC motor kit allows a higher MERV rated filter to be used. However, it is important to inspect the unit to ensure existing components are functioning normally. Disconnect unit power and review all functional components of the unit. Before installing the motor upgrade kit, it is necessary to review and inspect functional components including the following:

- Verify the outdoor condenser coil is clean and free from corrosion and fin damage. Inspect both the front surface of the coil behind the front condenser grille, and also the coil back side of the coil by looking inside the fan shroud with the unit power disconnected. Coil cleaning is necessary if dirt and debris is seen on condenser coil surfaces or between the coil fins.
- Verify the indoor evaporator coil is clean and free from corrosion and fin damage. Inspect the indoor evaporator coil by removing the unit upper front panel with the unit power disconnected. Coil cleaning is necessary if dirt and debris is seen between the coil fins.
- Inspect the indoor blower fan blades and the outdoor fan blade with the power disconnected. Make sure all surfaces are clean and free from damage. Inspect the indoor fan blower motor and outdoor fan motor for lubricant leakage or other signs of damage or wear.
- Make sure filter brackets are set for the 2" filter option. Normally this requires bending a tab down on each bracket to convert from a 1" filter to a 2" filter. Review filter tray sealing and seal off any bypass around the unit filter.
- Review service ports and copper connections. Look for signs of refrigerant leakage including oil with dirt buildup around service ports. Also look for signs of other copper damage.
- Ventilation options may be installed in the wall mount unit. Verify damper motors are operational and damper linkage is not damaged or worn. Replace any components that are non-functional or are showing signs of wear. Energy Recovery Ventilator (ERV) media should be inspected and cleaned if necessary. Ventilation option pre-filters and screens must be inspected and cleaned if necessary.

Signs of damage and excess wear indicate that components or the unit must be replaced to ensure the product provides reliable heating, cooling, and ventilation throughout the year. Component replacement parts are listed in the parts manual that was provided with the product, can be found online at www.bardhvac.com or can be ordered from your local Bard distributor.

/////// Motor Kit and Filter Maintenance

Routine maintenance keeps your wall mount product operating efficiently and avoids future service repair calls. It is always important to remember the following after installing the EC motor kit:

- The EC motor provided with the motor upgrade kit is maintenance free and does not require oiling. Follow all other maintenance procedures supplied with the product in the user guide and installation manual.
- Higher MERV rating filters may require a change in filter replacement frequency. Plan ahead to make sure filter changes are scheduled at regular intervals. When first used, the higher rated filter may load at an accelerated rate as dust and dirt in the room and air stream are captured by the new filter. Inspect filters for dirt, dust, and debris loading and adjust the filter maintenance schedule accordingly.
- Always keep pre-filter screens and media clean and free of debris. As with all HVAC equipment, outdoor condenser coils must be cleaned annually or as needed. Indoor evaporator coils must be inspected and cleaned as needed.
- Always keep the documentation that ships with your motor upgrade kit with the other documentation for the product to reference in the future.