Failure To Read Instructions Will Void Warranty

INSTALLATION INSTRUCTIONS

MODELS 600HS, 1200HS, 2000HS PLUS "BCU Wireless Controller"

600HS "L" Housing

600HS "S" Housing

1200/20**00HS** "S" **Housing**

1200/20**00HS** "L" **Housing**

ASSEMBLY INSTRUCTIONS BCU
WIRERLESS VERSION

STEP 1. Unpack your unit and remove all packing from the blower and motor assembly.

STEP 2. Remove both housing access doors.

STEP 3. VERY IMPORTANT NOTE! MAKE SURE THE BLOWER WHEEL SPINS FREELY.

For 1200/2000 "S" version units skip to Step 8.

STEP 4. From the filter section, remove the wire framed pre-filter and carbon filter.

STEP 5. Locate the two HEPA filter holding strips that also act as a tray for the carbon filter and pre-filter. Remove the two hex nuts and associated screws on both holding trays and remove the trays from the housing.

STEP 6. Remove the hex head screws that are in the gasket material on the BOTTOM (motor) section of your unit. The BOTTOM & TOP (filter) sections are symmetrical, so they can be rotated 360 degrees so the discharge can be pointed in four different directions to accommodate any installation configuration. This allows for best directional location for the TOP section filter access door. MAKE SURE THE DISCHARGE DIRECTION IS CORRECT FOR YOUR APPLICATION BEFORE ASSEMBLING. Align the sections as desired. Place the TOP section on the BOTTOM section, align the holes and tighten the hex head screws.

STEP 7. Insert HEPA filter. BE CAREFUL TO NOT PUNCTURE THE HEPA MEDIA. The gasket should be toward the motor unit. Center the gasket over the knife-edges so that it is even on all four sides. Replace the two HEPA holding trays.

STEP 8. Remove the wrapping from the carbon filter and slide the carbon filter and pre-filter back into the trays and replace the access door.

IF YOU ARE USING YOUR SYSTEM AS A STAND ALONE, YOU MAY SKIP TO ELECTRICAL WIRING SECTION.

Please look at the attached "typical installation" drawings. The inlet duct should be connected to the main return air duct leading to the heating/cooling system, and the discharge duct should be connected to the point where the return air duct enters the heating/cooling fan area.

ALWAYS INSTALL THIS SYSTEM IN A BY-PASS CONFIGURATION.

MATERIALS NEEDED FOR COMMON HVAC INSTALLATIONS

1.) Section of 12" (14" for 1200/2000 units) diameter sheet metal (recommended) or flex duct. You will need 3' to 6' for most installations.

2.) Section of 10" (14" for 1200/2000 units) diameter sheet metal (recommended) or flex duct. You will need 6" to 24" for most installations.

3.) 12" collar (14" for 1200/2000 units) for connection to return air duct.

4.) 10" collar (14" for 1200/2000 units) for connection to fan return side of HVAC unit.

5.) 4" by 18" (4" by 24" for 1200/2000 units) piece of sheet metal for Air Scoop. Or a prefabricated damper. This is recommended to be installed with every unit.

6.) Sheet metal screws, duct tape or metal tape. 12 gauge electrical wire for power to unit.

7.) Thermostat wire.

INSTALLATION OF THE DUCTING

Select the proper location for the attachment of the inlet and discharge ducts. Try to keep a minimum of 6 feet between the inlet and discharge openings. This will prevent the Pure Air Systems' filtration unit from recycling the same air. Cut the openings in the existing return air duct. We recommend an air scoop be placed inside of the return air duct so that it directs air into the inlet duct of your filtration system. You can use a damper as an air scoop. Make sure the damper is angled to direct the air from the return air duct into the inlet duct of your filtration system.

Use sheet metal screws, duct tape or aluminum tape to attach the duct sections to the collars on the inlet of the unit and the air return. Make sure there are no air leaks. Repeat this same procedure for the discharge duct. Make sure all connections are tight and taped.

ELECTRICAL WIRING & POWER CONNECTION

WIRING FROM 240 VOLT

For 240 volt operation you will need to cut the "black jumper wire" that connects pin 1 to pin 2 on the 5 pin white power connector attached to the back end of the motor. You will also need to insure the transformer is a 240V to 24V and 10VA.

FAILURE TO COMPLETE THIS WIRING CHANGE WILL RESULT IN DAMAGE TO THE MOTOR.

NOTE: ALWAYS FOLLOW ELECTRICAL CODES FOR YOUR AREA. We recommend a dedicated 15 amp service for all of our air filtration systems. The conduit connector is designed for EMT conduit or Romex cable. Wire the black, white and green (ground) wires through the conduit connector to the black, white and green wires inside the unit.

BCU CONTROLLER

The BCU speed controller will allow you to adjust the speed from 0 -100% in 1% increments. The App will show the speed in percent of air volume capacity. See attached EVO BCU data sheets. Always turn the power off at the lighted rocker on/off switch when the unit is not in use.

TESTING THE UNIT

To insure that the VCU controller is wired correctly, check that the controller is illuminated. Turn on the lighted rocker switch on the unit. The VCU controller should now be capable of adjusting the speed of the motor in the unit. If it does not, please check that the wiring between the terminal strips is correct.

ODOR ADSORPTION MODELS

All Odor Adsorption models are identical to the regular models except there is no HEPA filter. In-lieu of the HEPA filter there is a carbon cannister.

Bluetooth® Control Unit

The Evolution Controls Bluetooth® Control Unit[1] provides a means to wirelessly adjust the output of an EC Motor by using Android or iPhone mobile apps. It monitors the motor RPM and air filter conditions and alerts the user accordingly.

Applications

- System solution for small cleanroom fan filter arrays
- Indoor air filter units for schools and hospitals
- Whole house fans
- Fan installed at hard-to-reach locations

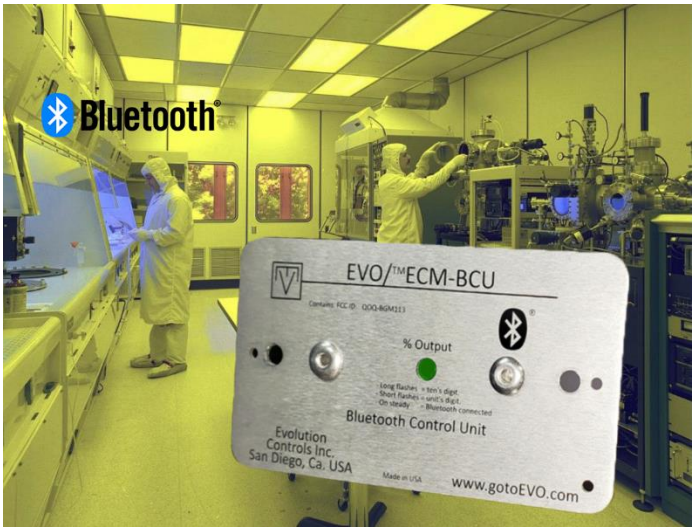
The 0 to +10V output option allows the control to be applied to other controlled devices, such as damper actuators.

Ordering

EVO/ECM-BCU	Control without plate
EVO/ECM-BCU-MP	Control with plate

Accessories

EVO/ECM-CBL-??	EC Motor control cable.
EVO/USM-CBL-??	US Motor control cable
EVO/ECM-PBL-??	Power Cable. ?? = Length in ft.
EVO/ECM-SBL	3' USB cable used with BT Configurator for factory configuration



EVO/ECM-BCU

Features[2]

- Adjustable and scannable RPM alarm
- Monitors up to three air filters
- Access Protection
- PWM[3] or 0 to +10 V Output
- Pilot Pulse Enable/Disable
- Adjustable low and high output limits

Specifications

Power ~24V±20% 50/60 Hz, 6 VA NEC Class 2[USA]
+24V ±20% 3W IEC Class II
Maximum 2 motors

Outputs
- Go +15V @ 10 mA
- Motor Control
  - PWM +15V @ 10 mA
  - 0 to +10 V @ 10 mA

PWM Supports Pilot Pulse (Autoswitch) Function
Adjustable 0% low output limit and 100% high output limit
(See BT Configurator PC software User Guide)

[1] This datasheet applies to ECM-BCU with firmware V3.
[2] Configurable in BT Configurator
[3] Pulse Width Modulation (PWM) = Vspd

Input

Motor RPM	0-2000 RPM ± 1RPM 36 ppt[4] or 18 ppt or 1 ppt

Adjustable and scannable out-of-window latching RPM alarm (See BT Configurator PC software User Guide)

Therm. Stability	< 0.01%/ºF
Operating Environment	0ºF to 130 ºF (-18ºC to 55ºC) 10-80% rh
Configuration Port	Serial port with proprietary command set

Radio

Receive Sensitivity	-92 dBm sensitivity
Output Power	+3 dBm
Range	50 m (150ft)

(*Actual range may vary depending on the mounted location)*

Mobile Device Requirements

Platforms	Android phones, tablets, and iPhone
Operating System	Android Ver 7.0 or higher iOS Ver 14.4 or higher
Bluetooth	Ver 4.2 or higher

Operation

The ECM-BCU allows adjustment of the control output from 0 to 100%. The mobile app, *EVO Devices*, running on Android mobile phones, tablets, and iPhone, remotely controls the output and monitor the alarm status through the Bluetooth wireless connection.

A control cable connects each ECM-BCU to an EC motor. The motor control output signal can be 0 - +10V or 0 to 100% PWM. All controls are shipped with the same device name, ECM-BCU. In applications with more than one controller, each ECM-BCU must be renamed with an unique device name.

A green LED provides the power and the control output status by continuously flashing out the output percentage. When powered up, the green LED stays on for three seconds, then repetitively flashes out the output percentage. After a pause, the lamp flashes out the tens digit, then the units digit of a number between 0 to 100%. Long flashes represent the tens digit, and short flashes represent the units digit. For example, output of 23% flashes two longs, then three shorts. A steady heartbeat of flashes indicates output of 0%. An extra-long flash and ten short flashes indicates an output of 100%.

The LED turns solid green when the ECM-BCU is connected to the *EVO Devices* mobile app.

RPM Alarm

RPM from the motor is continuously monitored. When the RPM alarm is enabled, the alarm is latched when the RPM is outside the normal thresholds. The control will remain in alarm until the problem is fixed and is reset using the mobile app.

Air Filter Monitors

The ECM-BCU control can monitor up to three air filter lives. The equipment manufacturer enters the name and maximum air filter life of each new air filter into the control using the BT Configurator software. The control tracks each filter life using Time Based Filter Life (TBFL) and/or Air Volume Based Filter Life (AVBFL). When AVBFL is enabled, the filter life is tracked according to the selected control output. The % remaining life of each filter can be read in the mobile app. The control enters alarm mode when one of the air filter life monitors reaches 0%. It will stay in alarm mode until the corresponding filter life monitor is refreshed by pressing the reset button in the mobile app.

When in alarm, an ECM-BCU control appears in red in the mobile app scan list.

User Privileges

The **User** and **Admin** passwords allow different levels of user privileges.

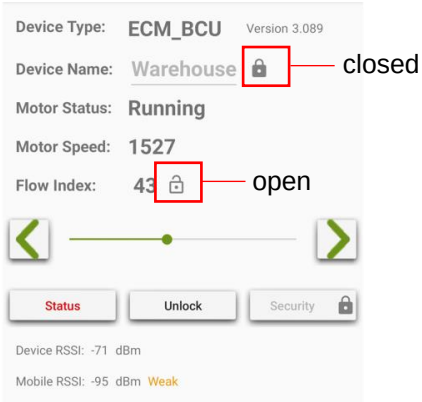
When enabled, the correct **User** password allows the user to modify the output, reset RPM alarm and reset air filter monitors.

When enabled, the correct **Admin** password allows the user to modify the device name, password settings and access all **User** privileges.

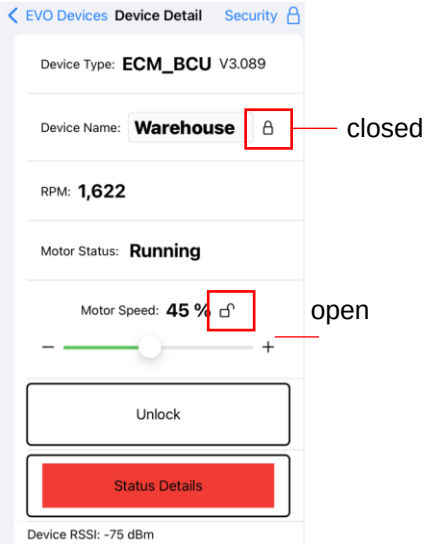
[4] ppt = Pulses Per Turn, configurable in BT Configurator

Padlock icons indicate password protected fields in the mobile app. The field is read only when the accompanying pad lock is in the closed position. The pad lock changes from closed to open position when the correct password has been verified.

Android App



iPhone App



All fields return to protected state after the mobile app is no longer connected to the control.

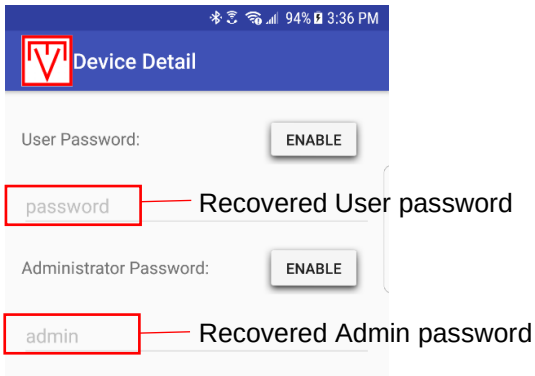
User and **Admin** passwords are disabled by default from the factory. They can be enabled according to the need of the application using the mobile app and BT Configurator.

Password Recovery

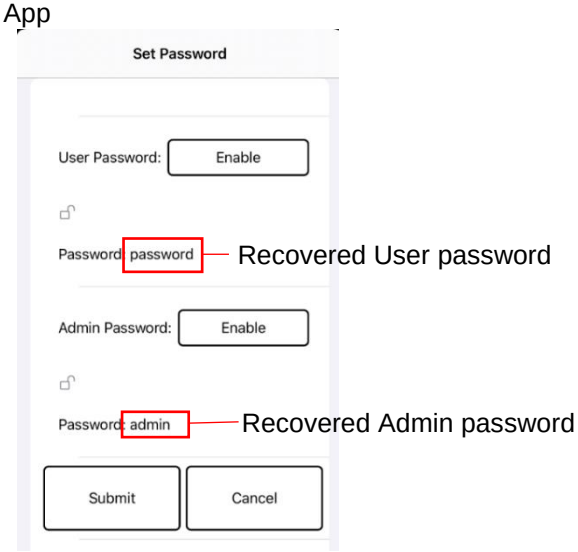
Password recovery disables the passwords so they can be read in the mobile app's **Security** settings user interface. Password recovery is activated when the controller detects a jumper being inserted in the header position highlighted below.

Insert a jumper to activate password recovery. If a jumper is already inserted, pull it out then re-insert to activate password recovery. After the jumper is detected, the green LED flashes rapidly for 5 sec. before password recovery is activated. If the jumper is removed during the 5 sec. rapid flashing, password recovery is cancelled. When password recovery is complete, the green LED returns to normal operation, flashing out the output percentage.

Android App



iPhone App



Reminder: re-enable the passwords after you are done reading the passwords.

Wired Configuration

The ECM-BCU is configured by using the Evolution Control's BT Configurator Windows® PC software. An ECM-SBL cable is used to connect between a PC's USB port and the controller's serial port. See the BT Configurator User Guide for details.

Motor Profiles

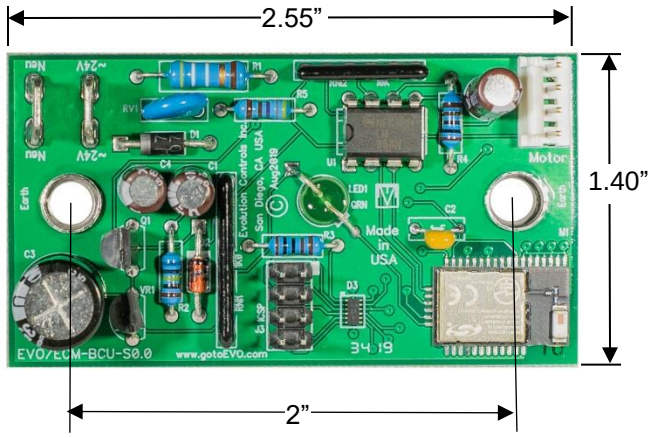
Motor profiles are unique to each manufacturer and motor. Refer to the motor manufacturers instructions to develop the motor profile. The following are a few considerations important to operation with the ECM-BCU:

- ☑ PWM or 0 -10V control
- ☑ Status to RPM only
- ☑ Motor start/stop points if motor does not use the GO signal from the ECM-BCU for the on/off control.

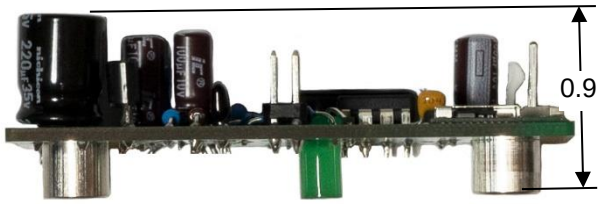
Mounting

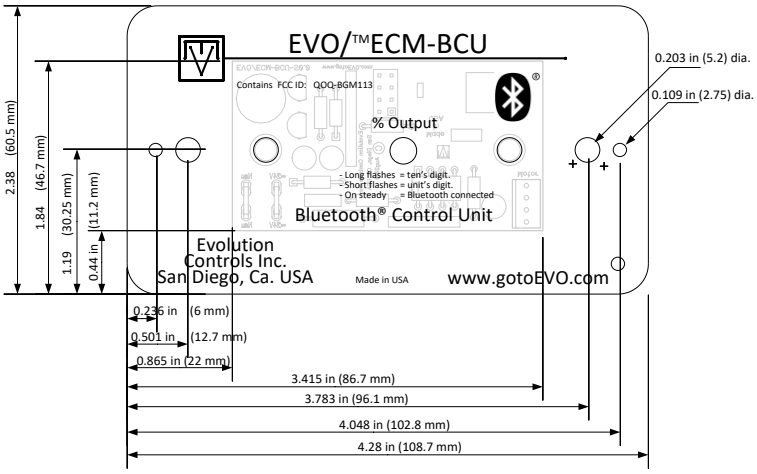
Mount the controller with clearance for the power wires and control cable connector. The mounting post must be fastened to an earthed metal surface. The transformer may be located near the motor or near the control.

When mounted inside an enclosure, the minimum recommended distance of metallic and/or conductive objects is 10 mm (~ 0.4") in any direction. The mounting plate must be visible from the outside. In general, the signal is strongest in the direction which the faceplate is facing.



EVO/ECM-BCU

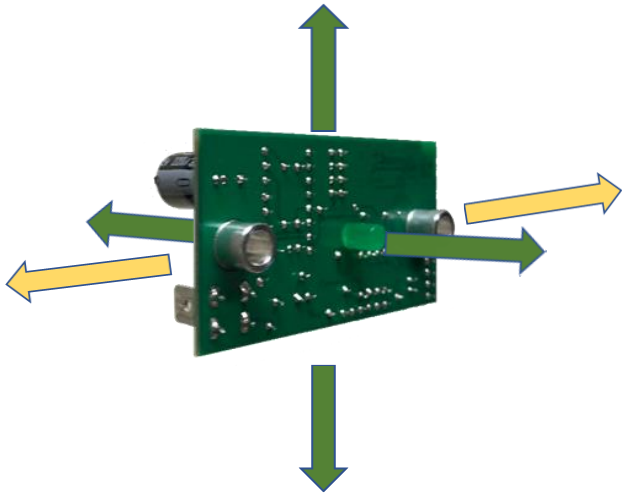




EVO/ECM-BCU-MP

The label "Contains FCC ID:DOQBGM113" must be in a visible area.

Signal Strength



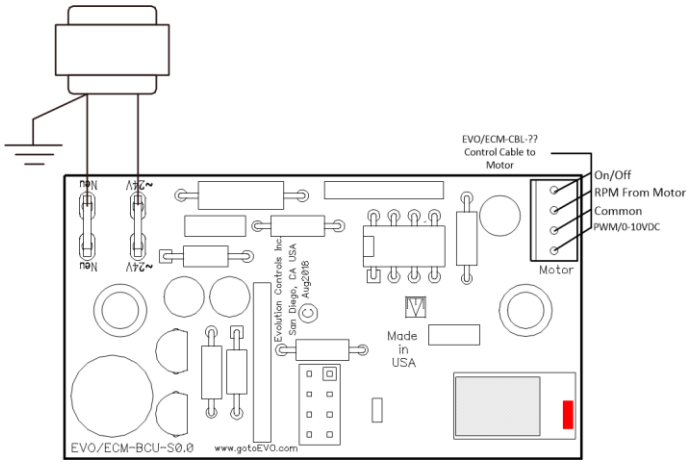
Best signal strength directions

Wiring

Power the EVO/™ECM-BCU controller with a ~24V NEC UL 1310 Class 2 USA power source. DC voltages from +20V to +30V may also be used to power the control. Observe all code requirements and follow all safety practices regarding low voltage power supplies and circuits to insure a safe, reliable installation.

Earth one side of the power source. Connect the neutral connection to the earthed side of the ~24V Class 2 power source. Earth the negative when DC power supplied is used.

Some applications may require an isolated power supply or alternative earthing scheme. Follow code requirements and observe all safety practices concerning unearthed low voltage circuits.



Connect the ~24V to the hot side of the Class 2 power source or to the positive of the DC power source. You may interrupt this connection to turn off the controller and stop the EC Motor. Many automation controllers will power the ECM-BCU controller directly from an on/off output.

One end of the control cable is fitted with a 4-pin connector. Fit this connector into the mating socket on the edge of the EVO/ECM-BCU controller. Plug the connector in with the cable exiting away from the board.

Configurable Parameters and Defaults

Parameters	Defaults
Device Name	ECM-BCU
Control Output	50%
User Password	password
User Password Status	Disable
Admin Password	admin
Admin Password Status	Disable
RPM Type	36PPT
Output Type	PWM
Pilot Pulse	Disable
High Output Limit	100%
Low Output Limit	0%
RPM Alarm	Disable
RPM Alarm High	2000 RPM
RPM Alarm Low	0 RPM
Air Filter 1 Name	Filter1
Air Filter 1 TBFL	0 Months = Disable
Air Filter 1 AVBFL	0 Months = Disable
Air Filter 2 Name	Filter2
Air Filter 2 TBFL	0 Months = Disable
Air Filter 2 AVBFL	0 Months = Disable
Air Filter 3 Name	Filter3
Air Filter 3 TBFL	0 Months = Disable
Air Filter 3 AVBFL	0 Months = Disable

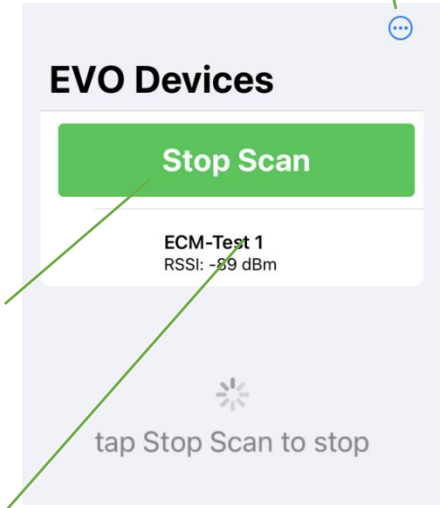
TBFL = Time Based Filter Life
AVBFL = Air Volume Based Filter Life based on 100% output.

Scan QR code for app

Apple App Store to install app in iPhones.

Bluetooth pairing code 529413

iPhone app version



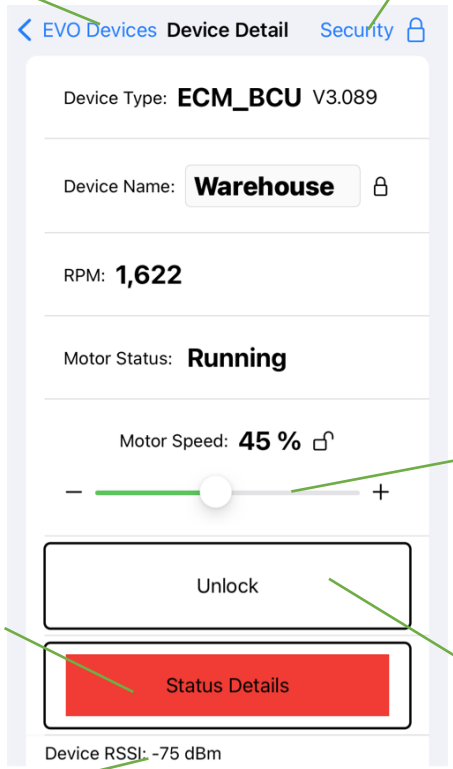
1.Start/Stop Scanning

2. Tab to connect to a control in the scan list

Return to scan list

Enable/Disable password protection and edit passwords

Connected with selected control



Output Control

Click to view status. Need user attention when in red

Enter password to unlock password protected fields

Bluetooth receive signal strength

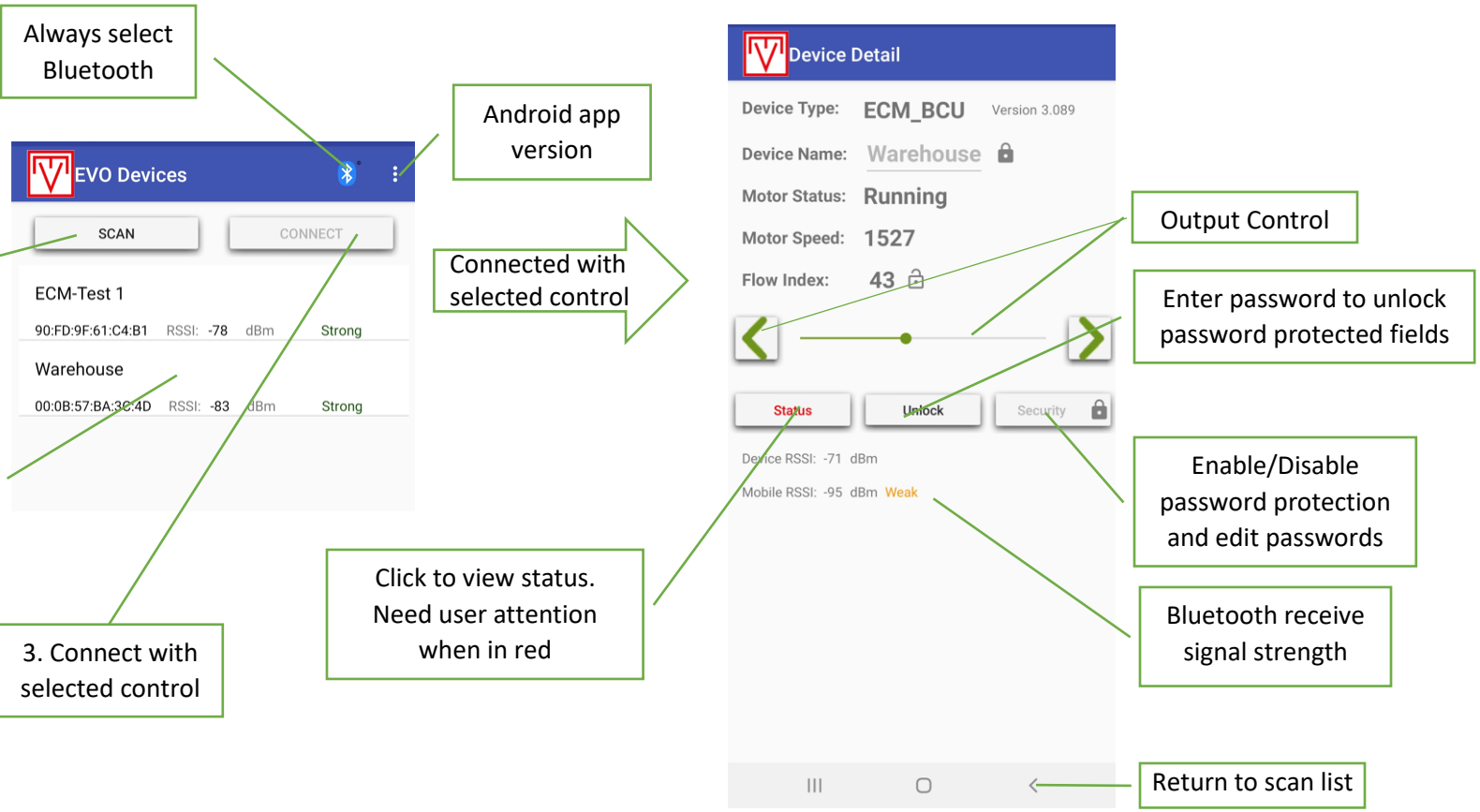
Field is protected by password

Field is available for modification

Evolution

Bluetooth® Control Unit Mobile App Quick Start Guide **CONTROLS INC.** EVO Devices

Scan QR code for app Google Play to install app in Android mobile devices.



Field is protected by password

Field is available for modification

WIRING SCHEMATIC FOR PLUS UNITS
VARIABLE SPEED CONTROLLER

For Models 600HS, 1200HS, 2000HS PLUS UNITS

The variable speed BCU controller for the PerfectSpeed motor is simple to operate. The only wiring requirement is to bring 120V or 240V (optional) power to the wiring harness. Simply connect the black, white and green wires in the power harness to the incoming power. The systems are wired for 120V power at the factory. Should you want to use 240V power then you need to do the following:

WIRING FROM 240 VOLT

For 240V operation you will need to cut the **"black jumper wire"** that connects pin 1 to pin 2 on the 5 pin white power connector attached to the back end of PerfectSpeed motor. **FAILURE TO COMPLETE THIS WIRING CHANGE WILL RESULT IN DAMAGE TO THE PERFECTSPEED MOTOR.**

Operation of the controller is easy. The BCU controller will allow you to vary the speed in 1% increments. The BCU controller will always remember the last setting should you turn the power off. Turning the BCU controller to 0 will stop the motor but will NOT turn off the power. To turn the power off you must turn off the lighted rocker, on/off, switch and breaker in your electrical breaker box. **ALWAYS TURN OFF THE POWER TO THE SYSTEM BEFORE CHANGING FILTERS OR WORKING ON THE SYSTEM.**

INTRODUCTION OF OUTSIDE, FILTERED FRESH AIR FOR VENTILATION AND PRESSURIZATION OF INDOOR ENVIRONMENTS USING MODELS 600HS, 1200HS AND 200HS UNITS

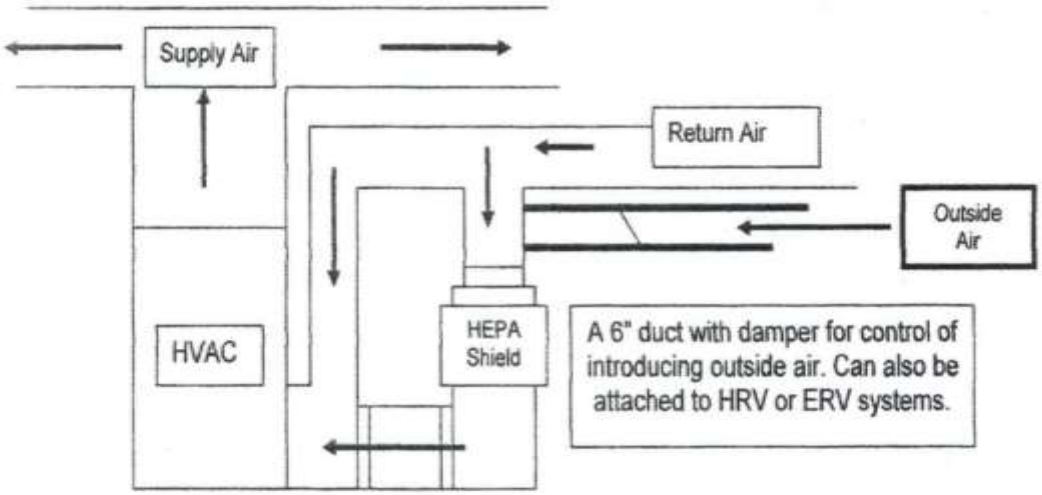
THE MOST COST-EFFECTIVE COMBINATION FILTER AND FRESH AIR ENTRY SYSTEM ON THE MARKET TODAY!

When Pure Air Systems, Inc. first introduced the 60OHS unit in 1985 we offered the option of introducing outside, filtered fresh air with the unit. Today, the ability to introduce filtered, fresh outside air provides for better ventilation and pressurization for homes and commercial facilities.

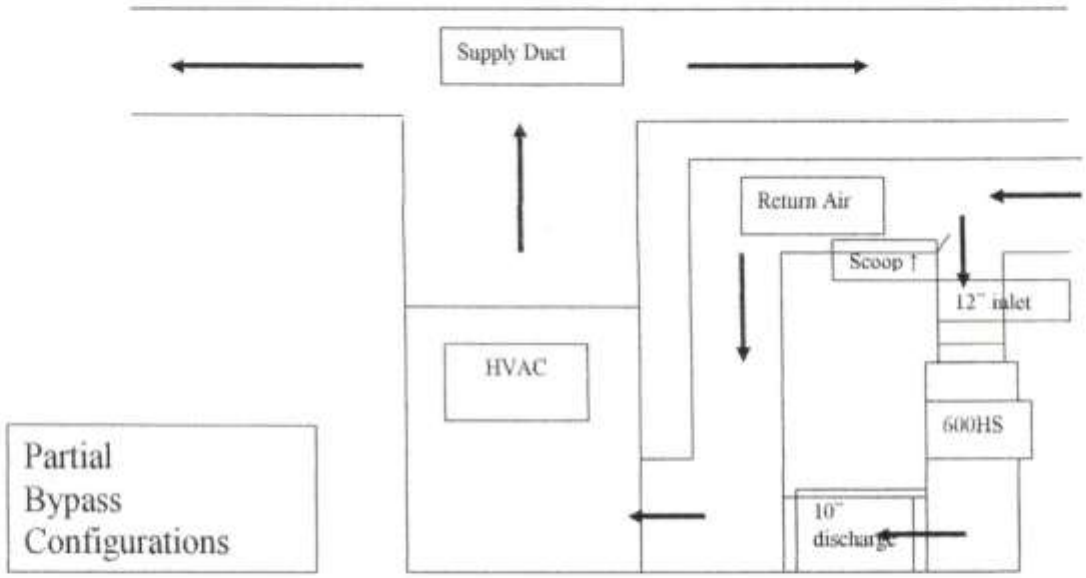
EASY TO DO

Simply by adding a 6" duct from the outside to the inlet of the HEPA Shield units, you can now have both the best filtration system and the ability to introduce outside, fresh filtered air. You can introduce from 50 CFM to 100 CFM (depending upon the HEPA Shield unit you choose) of outside air providing for 72,000 to 144,000 cubic feet of air into the home or indoor environment PER DAY. This approach allows for pressurization of the home or indoor environment which eliminates the entry of fine particulate, gases and odors whenever your HVAC system fan is running.

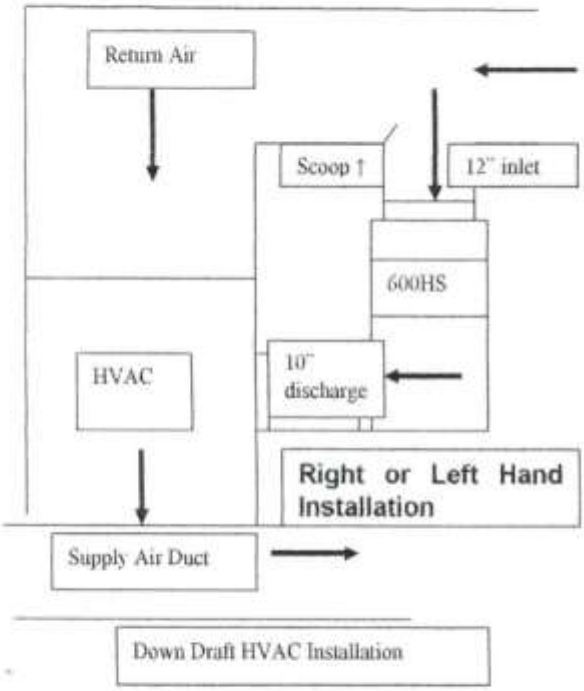
Introducing 50 CFM of outside air (3000 cubic feet per hour) has no negative affect on the performance of the HVAC system as it represents approximately 3% to 5% of the total air volume going through the HVAC unit. If you want to introduce more air you can open the damper up or install a larger infiltration duct. Call us for more information on this application.



TYPICAL INSTALLATION CONFIGURATIONS



Partial Bypass Configurations



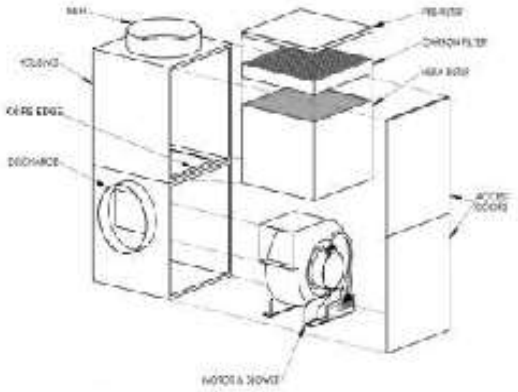
Down Draft HVAC Installation

800.869.8025 or 317.291.4341
pas@pureairsystems.com

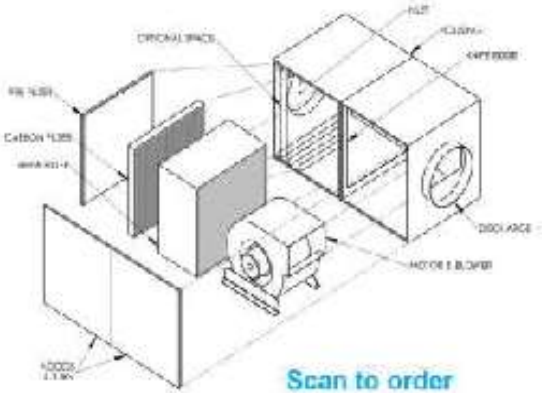
General Guidelines For Replacing Filters

Series	**500, 600, 1200, 2000**	**600, 1200, 2000**	**500, 600, 1200, 2000**
	Pre-filter	**Carbon Filter**	**HEPA Filter**
Residential	**3 Months**	**9 Months**	**2.5 Years**
Commercial	**Monthly**	**4 Months**	**Yearly**

****Chemically sensitive customers should use the Commercial guidelines****



6115 Guion Rd.
Indianapolis, IN 46254
800.869.8025
317.291.4341
e-mail: pas@pureairsystems.com
www.pureairsystems.com



Scan to order

Replacement Filters

FILTER MAINTENANCE

WARNING

(Before changing any filters always turn power off to unit by switching the lighted rocker switch located on the discharge or motor section of the unit to the off or down position.)

PREFILTER: (change every 3 to 4 months unless used in commercial applications.)

1.) Ring panel prefilter is located on top or next to the carbon filter. Simply slide the prefilter out and replace with new prefilter. Make sure white side is facing up or toward the airflow. Replace filter door and turn lighted rocker switch back to the on or up position.

CARBON FILTER: (change every 9 to 12 months unless used in commercial applications.)

1.) Carbon filter is located just under the prefilter or between prefilter and HEPA filter. Some housings you'll have to remove prefilter before you can remove and replace carbon filter. Replace prefilter on top of carbon filter. Replace filter door and turn lighted rocker switch back to the on or up position.

HEPA FILTER: (change every 2.5 to 3 years unless used in commercial applications.)

1.) Remove prefilter and carbon filter.

2.) Remove nuts and bolts (two on each side) that attach hold down channels. On some housings you'll need to loosen the set screws (top and bottom) and remove the bolts to the compression brackets. Remove both channels and or brackets. Lift HEPA filter out of housing.

3.) Carefully place new HEPA filter back in housing. Lift and position HEPA filter with gasket side facing down sitting evenly on metal knife edge on all four sides.

4.) Replace channels and or brackets with bolts, nuts or set screws to their original locations and tighten them. Replace carbon and prefilter.

5.) Replace filter door and turn lighted rocker switch back to the on or up position.

Pure Air Systems Limited Warranty

Your Pure Air Systems product has been manufactured tested and inspected in accordance with carefully specified engineering requirements and is warranted to be free from defects and workmanship in accordance with the terms and conditions as set forth below.

Duration of Warranty and To Whom Extended

This Limited Warranty shall be for one year on the motor and three years for the other electrical components and blower. It does not cover the filters in the system as they are a standard maintenance item.

Exceptions and Exclusions from Warranty

Those products which incorporate an electrical motor are required to be used on electrical current as indicated on the rating plate. This Limited Warranty does not apply to products which have been subject to use on electrical current other than indicated on the rating sticker of the product.

This Limited Warranty does not apply to products which have been subject to improper, unreasonable or negligent use, abuse, or the use of parts or accessories which are not approved by Pure Air Systems.

If repair is done on your equipment by anyone other than those designated as authorized to perform such work, Pure Air Systems at its sole option, may determine that this Limited Warranty will not apply.

Procedure to be taken to obtain Performance of Warranty

To secure repair of the product or any warranted parts under the Limited Warranty, the following procedures shall be taken:

- Contact Pure Air Systems or the dealer that installed your system
- It is important that the model number and serial number of the system be provided to Pure Air Systems to ensure the product falls within the warranty time frame.
- The inoperative component(s) or warranted parts, together with satisfactory evidence of the purchase date, must be delivered, with shipping and delivery charges prepaid to Pure Air Systems.
- Upon compliance with the above procedure, all warranted defected parts will be repaired or replaced. Pure Air Systems will pay for return shipping and cost of replacement parts.

NO REFUND OF PURCHASE PRICE

Pure Air Systems will not, as a matter of its Warranty Policy, refund the customer's purchase price. This limited warranty gives you specific legal rights and you may also have other rights which vary from state to state.

NO CLAIMS FOR CONSEQUENTIAL OR OTHER DAMAGHES WILL BE ALLOWED AND THERE ARE NO OTHER EXPRESS WARRANTIES EXCEPT THOSE EXPRESSLY STIPULATED HEREIN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRATNY LASTS OR THE EXCLUSION OR LIMITATION OR INCIDENTAL OR CONSEQUENTIAL DAMAGES. THEREFORE, THE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

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