

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

These instructions cover fan filter unit models:

HLC-FPS(R)-STD (Standard, top side access) and HLC-FPS(R)-MEA (Motor/Electronics Accessible, room side access)

HLC-FPS model shown



Critical Operation Conditions of the Fan Filter Unit

DO NOT TOUCH the HEPA filter media. Damage to filter media may void the filter warranty. The screen is to protect against accidental contact with the filter. Never place objects on the filter. Always transport or lift the filter by its frame.

Prior to powering the unit, verify that it is wired to the correct power supply. The rating plate label located on the electrical box shows the electrical data.

For replacement parts refer to the model number and serial number on the rating plate label located on the electrical box.

Replacement Part Numbers

Please contact Greenheck or your local Greenheck representative for replacement parts. Please include the unit model and serial number and sales order number if available.

WARNING

To reduce the risk of fire, electric shock, or injury to persons, allow only qualified technicians to install and service the unit. All persons should observe the following:

- a) Use this unit only in a manner intended by the manufacturer. If you have questions, contact the manufacturer.
- b) Before servicing or cleaning unit, switch power off at the service panel and lock-out the service in accordance with OSHA (LOTO) practices and procedures to prevent power from being accidentally switched on avoiding accidental electric shock and injury. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
 - Installation work and electrical wiring must be completed by qualified personnel in accordance with all applicable codes and standards, to include fire-rated constructions.
 - When cutting or drilling into walls and ceilings, be careful not to damage electrical wiring and other hidden utilities.
 - If this unit is to be installed within close proximity to water, mark the unit in accordance with applicable codes and standards.
 - This unit is to be used only as intended by the manufacturer. If you have any questions regarding the use, installation, or operation of this unit, contact the manufacturer.

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Installation Checklist

The following provides a general overview of what steps should be taken to achieve a successful installation of the fan filter diffuser. These steps should be performed in the order listed. For more detail see the applicable section in this instruction manual. Read the entire manual before beginning installation.

- ☐ Prepare the installation site with appropriate power, data cabling, support structure, and openings as needed.
- ☐ Unbox and inspect the fan filter diffuser.
- ☐ Install the fan unit into the ceiling. Support its weight from structure above.
- ☐ Connect duct work to fan filter diffuser (if applicable).
- ☐ Seal the fan filter unit to the ceiling using gasketing and caulking.
- ☐ If the unit is to be ducted, set upstream air device to produce 0.0 in. wg static pressure at the fan unit inlet. Use dampers if necessary if installing multiple fan units on the same duct line.
- ☐ Verify incoming power matches the rating plate then connect main power wiring.
- ☐ Connect control wiring (if applicable).
- ☐ Run the unit and/or upstream air device to flush out construction debris.
- ☐ Install the pre-filter (if applicable).
- ☐ Install the HEPA/ULPA filter.
- ☐ Turn unit on and adjust airflow to design CFM.
- ☐ Turn on the upstream airflow device.
- ☐ Leak test the fan unit and filter per local codes and building procedures.
- ☐ Calibrate airflow sensor, if equipped, to flow hood.
- ☐ Install the perforated face screen.

Installation

Step 1 - Carefully remove the unit from the shipping carton and inspect for damage that may have occurred during shipping. If shipping damage is found, do not install. Call the supplier to report damage.

Step 2 - Wipe down unit to remove shipping dust and debris.

Step 3 - Raise unit into position and secure using the hanger tabs. Alternately it can be secured in a framed opening through the frame if care is taken not to damage the knife edge and all penetrations are sealed. Any gasket should be a closed-cell material approved for the environmental conditions. Sealant used to seal the unit to the ceiling should be approved for the application and conditions.

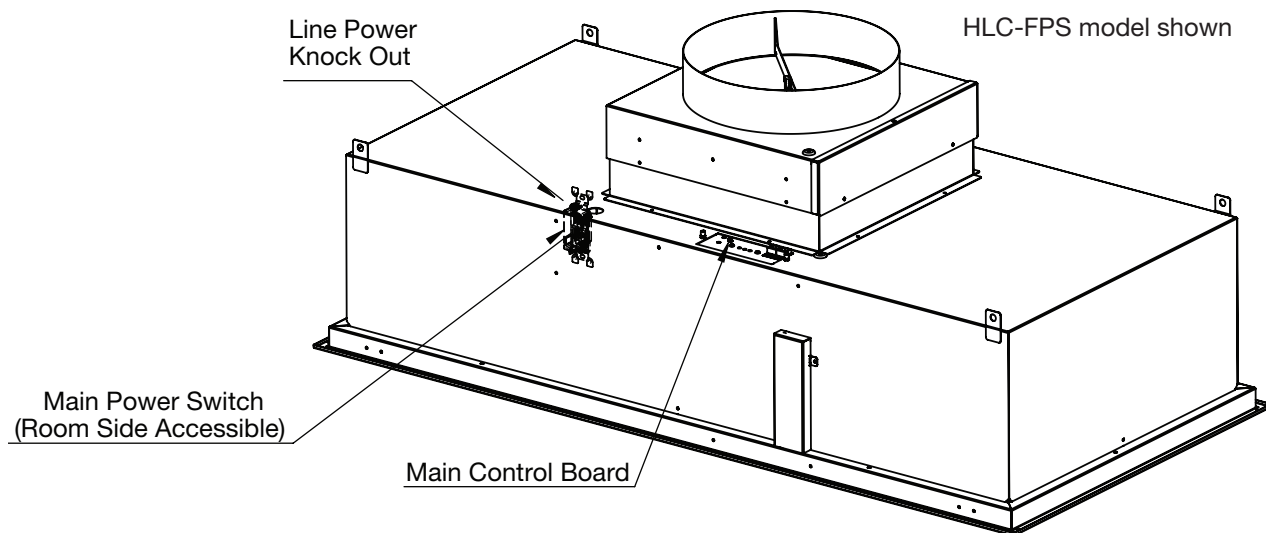
Step 4 - A qualified technician should connect the unit to the appropriate power supply per applicable codes and standards. Verify circuit and rating plate voltages match. Refer to the wiring diagrams included in these instructions. Standard units: the electrical box will be accessible from the plenum side. MEA units: the electrical box will be accessible from the room side.

Fan Filter Diffuser FLA: 120V - 2.8 FLA, 208V - 2.6 FLA, 240V - 2.3 FLA, 277V - 1.9 FLA

Step 5 - Blow out / clean entire duct system leading to unit to remove construction debris. This is especially important for motor accessible units as they do not have a pre-filter. Wash pre-filter if applicable per "Cleaning the Fan Filter Unit Pre-filter."

Step 6 - Install the primary filter per the "Removal and Replacement of the Filter with Gel Seal" section.

NOTE: An additional disconnect should be added by others per applicable codes and regulations. For ducted installations, it is recommended that primary air balancing to achieve 0.0 in. wg inlet static pressure be done before the fan filter unit is connected to the duct system.

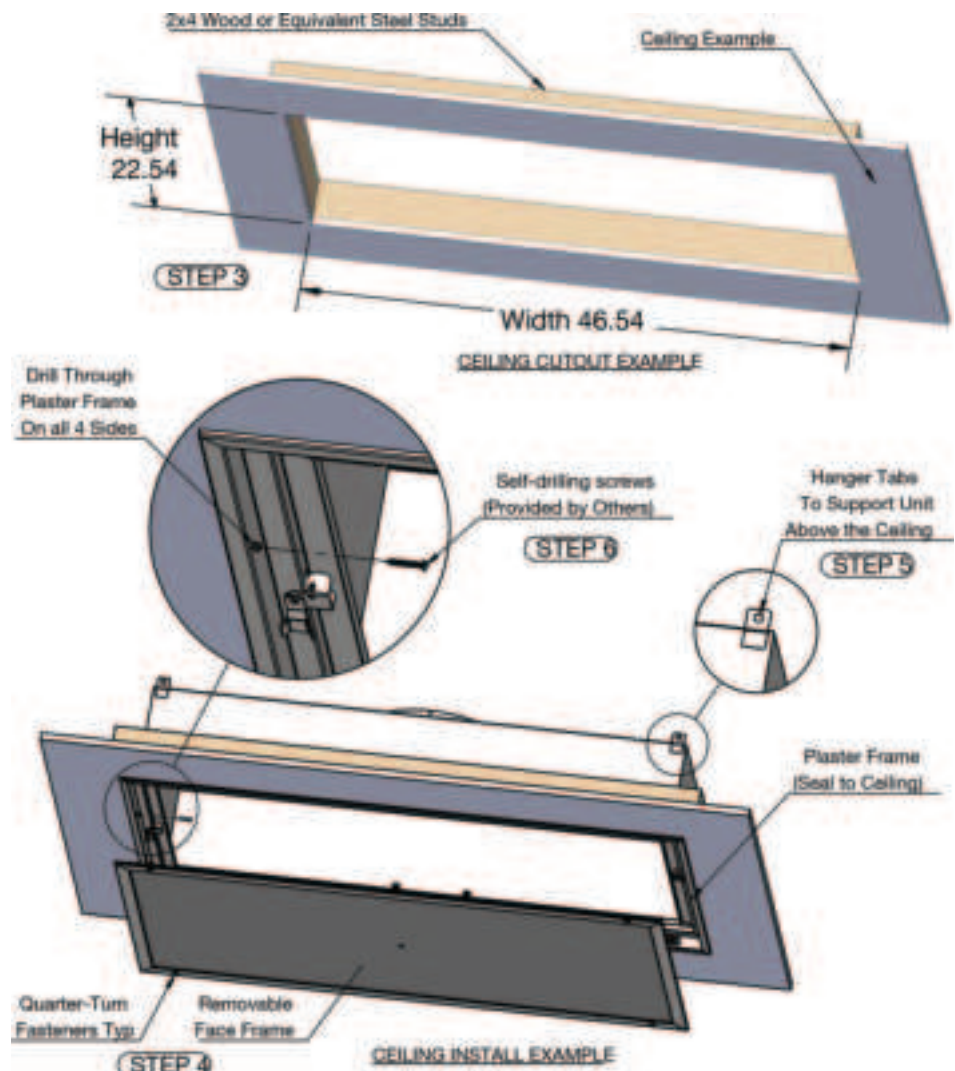


Surface Mount Installation

The diffuser is fully assembled from the factory, with the exception of the filter option. The filter is shipped separately.

NOTE: These instructions are for surface mounting to a sealed ceiling. Some installations require custom mounting and/or custom diffusers. In those cases be sure to seal the unit to the ceiling and seal all penetrations through the plenum walls.

1. Carefully remove the unit from the shipping carton and inspect for damage that may have occurred during shipping. If shipping damage is found, do not install. Call the rep, salesperson, or manufacturer to report damage.
2. Wipe down unit to remove shipping dust and debris.
3. Prepare the ceiling: Cut a rectangular hole in the desired location 1.46 in. smaller than the nominal size of the diffuser. Frame the hole with 2x4 wood or equivalent steel studs. Always measure the units to verify dimensions before making cuts.
4. Using a flat screw driver, release the face frame by rotating the quarter-turn fasteners counterclockwise. Unhook the safety cables from the unit. Set the frame aside.
5. Raise the unit into the framed opening until the unit is tight against the ceiling. It is recommended to further support the unit from above using the tabs welded to the plenum.
6. Secure the unit in the ceiling by installing self-drilling screws through the plaster frame into the opening frame. Alternately, pre-drill holes and install wood or sheet metal screws.
7. Install ductwork as required. Clean installation debris from the unit and surrounding ceiling.
8. Using approved caulk, seal the outer perimeter of the diffuser to the ceiling. Also seal around the mounting screws and any other holes made in the diffuser.
9. If applicable, install the filter per the "Removal and Replacement of the Filter with Gel Seal" section.
10. Wait at least 30 minutes after filter install and ensure there is a positive pressure in the room before performing any challenge leak testing.
11. Raise the face frame back into place, reattach the safety chains, and secure the quarter-turn fasteners.



Standard Unit Sizes		
Nominal Unit	Cutout Width	Cutout Height
24 x 24	22.54	22.54
36 x 24	34.54	22.54
48 x 24	48.54	22.54

A Note About VAV Boxes and Ducted Applications

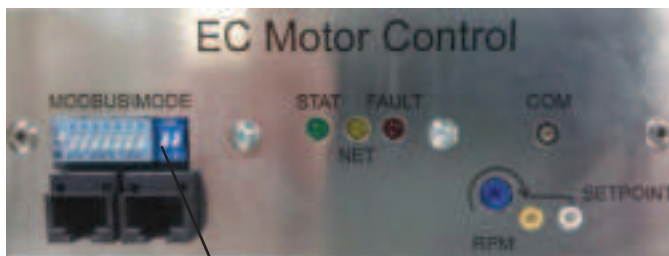
In applications where the fan filter unit will be installed downstream of variable airflow devices such as VAV boxes, air valves, or variable air handlers, proper care in unit set-up needs to be taken.

In these applications the unit should not be programmed to run as constant airflow when ordered with the Airflow Sensor.

Two variable controllers trying to reach their respective set point will continuously adjust. This will cause issues such as surging, starving, and eventual shut down of the fan filter unit. In these applications the unit should be placed into “open-loop” control by turning off the S1-1 dip switch (see image below). This will no longer keep constant airflow automatically. It will also remove the dirty filter ramp-up feature and the HEPA Alert dirty filter indicator (if applicable) will be set as a static timer of 4400 hours (about 6 months). The set point will now be a percentage of motor speed instead of CFM but it will still display CFM during normal operation. The unit in this setting is still preferable to a PSC system due to the energy efficiency of an ECM versus a PSC motor and all control options are still applicable.

Ducted Applications

If ordered with the Airflow Sensor option the condition immediately before the inlet can impact the CFM reading. Use the “C” up and down arrows on the face control to calibrate the airflow sensor to match the balancer’s flow hood to ensure accurate airflow control. This calibration is best done as near to the operating point as possible. Recalibrating may be required if the set point changes more than 25%. In extreme cases the inlet conditions may not be able to be compensated for using the calibration adjustment. In these cases CFM controlled operation may have to be forfeit and the unit run in open-loop mode S1.



S1-1

Cleaning the Fan Filter Unit Pre-Filter: HLC-FPS Models (when applicable)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Note: For maximum performance, wash pre-filter every three to six months at a minimum.

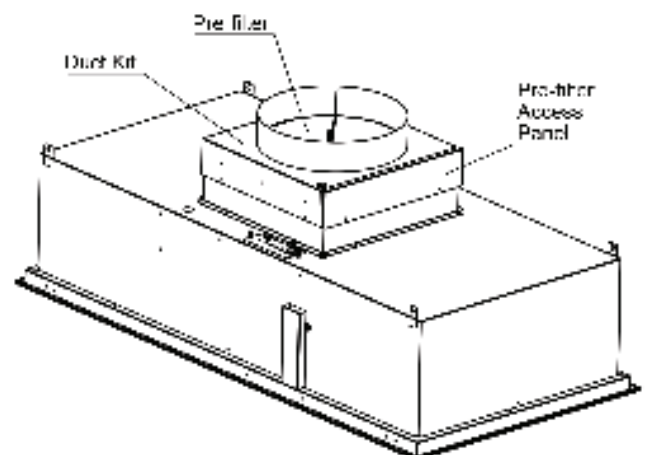
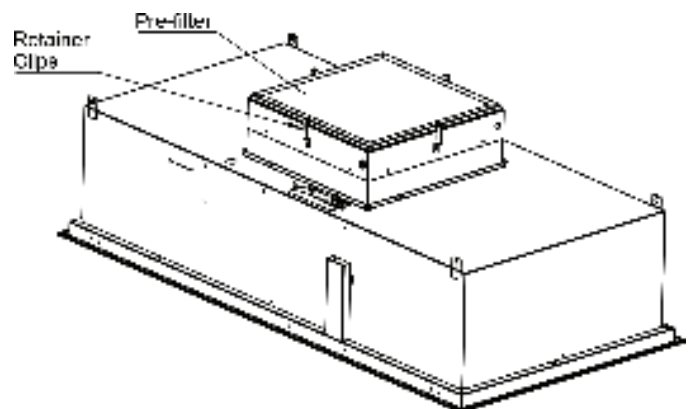
Step 1 - Turn the unit off with the toggle switch located on the unit.

Step 2 - Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.

Step 3 - For ducted applications, use a driver to remove the screws holding the access panel. Slide the pre-filter out of the duct kit. If the unit is non-ducted, remove the pre-filter from the retainer clips. For plenum applications, slide the filter diagonally against two of the retaining clips. This should free the opposite sides. Lift the free corner above the clips and pull the filter out of the remaining two clips.

Step 4 - Wash the filter with hot water and a mild detergent and rinse thoroughly. Do not use a caustic solution to clean the filter. Blow dry or let air dry. Filter should be completely dry before reinstalling into unit.

Step 5 - Filter installation is the reverse of the removal procedure.



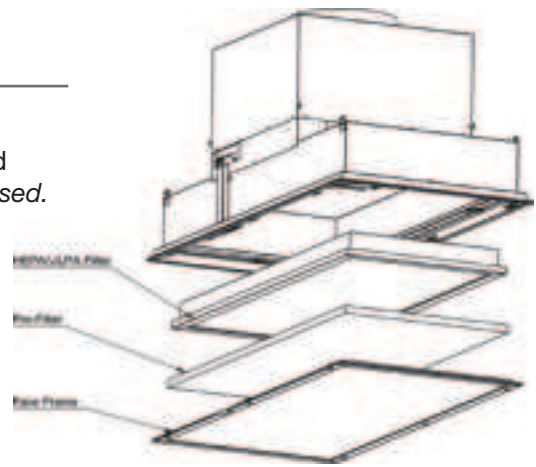
Criti-Clean Ultra Reverse Flow Fan Filter Units

Replacing the Fan Filter Unit Pre-Filter: HLC-FPR Model

The unit ships with a frameless disposable pre-filter between the face and the gel seal filter. **It is not recommended that this filter be washed or re-used.*

Replacement filters are available from Greenheck

Nominal Unit Size	Part Number
48 x 24	U4A1
24 x 24	U4A2



Removal and Replacement of the Gel Seal Filter

NOTE: The manufacturer recommends two people to remove and install the gel seal filter in the unit.

Step 1 - Using a flat screwdriver, release the face frame by rotating the four (4) fasteners a 1/4-turn counterclockwise. Unhook the safety cables from the filter clips. Set the frame aside.

Step 2 - Turn the unit off with the switch located on the face of the unit (round, black button).

Step 3 - Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.

Step 4 - USE TWO PEOPLE TO SUPPORT THE FILTER and rotate the swing arm filter clips off of the filter until clip is clear of the filter.

Step 4 ALT (if stud style filter clips) - Using a 7/16" nut-driver, evenly loosen the nuts holding the filter retaining clips by working your way around the unit loosening the nuts a little at a time. To make installing the new filter easier, loosen the nuts until flush with the end of the threaded stud. **USE TWO PEOPLE TO SUPPORT THE FILTER** and rotate the filter clips toward the offset hole until clip is clear of the filter.

Step 5 - Allow gravity to pull the filter away from the unit. If installing a new filter discard the filter in an appropriate manner.

Step 6 - Unpack the new filter and inspect for shipping damage. If damage is found, do not install in unit; call the vendor for replacement arrangements.

Step 7 - Using two people, raise the filter into place in between the filter guides (or threaded posts if stud style) assuring the seal edge is approximately in the center of the gel channel.

Step 8 - While supporting the filter by its frame, rotate the filter clips so that the clips are supporting the frame and are at 90° to the frame. (ALT-Evenly tighten the nuts by working your way around the unit tightening the nuts a little at a time. Stop tightening when the aluminum filter frame contacts the housing of the diffuser.)

DO NOT OVERTIGHTEN. Wait at least 30 minutes before performing any challenge testing to allow the gel to fully adhere to the unit.

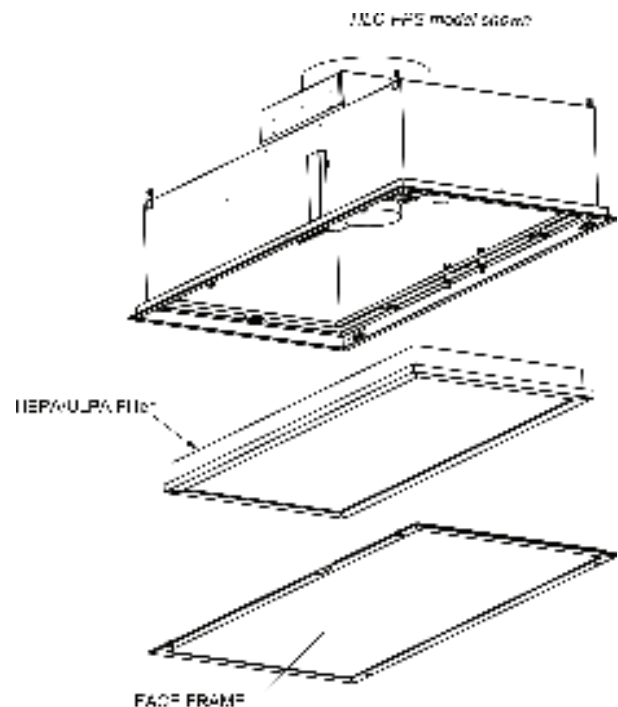
Step 9 - Inspect all gaskets and seals for integrity. Reconnect power and turn unit power on.

Step 10 - Raise the face frame back into place, reattach the safety chains, and secure quarter-turn fasteners.

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

The gel seal filter may be protected by an expanded metal screen. The screen prevents accidental contact with the filter media. It is not meant to allow handling of the filter by the media. Handle the filter **ONLY** by the frame.



Removal and Installation of the Variable Speed Motor (STD Construction)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Step 1 - Turn the unit off with the switch located on the face of the unit.

Step 2 - Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.

Step 3 - Remove the HEPA filter and set aside. See sections 2 and 3 for instructions.

Step 4 - Disconnect the 3-pin power plug and the 4-pin data plug from the electrical box.

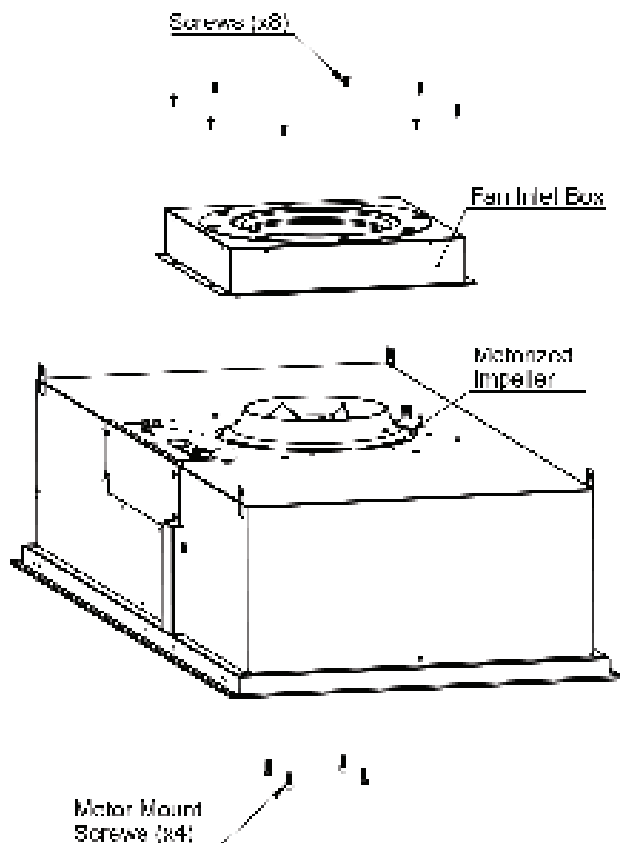
Step 5 - Use a 4 mm hex driver to remove the four (4) screws holding the motor to the motor bracket inside the unit.

Step 6 - Remove the duct from the unit, if applicable.

Step 7 - Use a 5/16" driver to remove the eight (8) screws holding the Fan Inlet Box. Remove Fan Inlet Box and set aside.

Step 8 - Lift the motorized impeller out of the unit.

Step 9 - Reverse above steps to reassemble the motor/fan/ring assembly into the unit.



Removal and Installation of the Variable Speed Motor (MEA Construction)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Step 1 - Using a flat screwdriver, release the face frame by rotating the four (4) fasteners a 1/4-turn counterclockwise. Unhook the safety cables from the filter clips. Set the frame aside.

Step 2 - Turn the unit off with the switch located on the frame of the unit.

Step 3 - Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.

Step 4 - Remove the HEPA filter and set aside. See sections 2 and 3 for instructions.

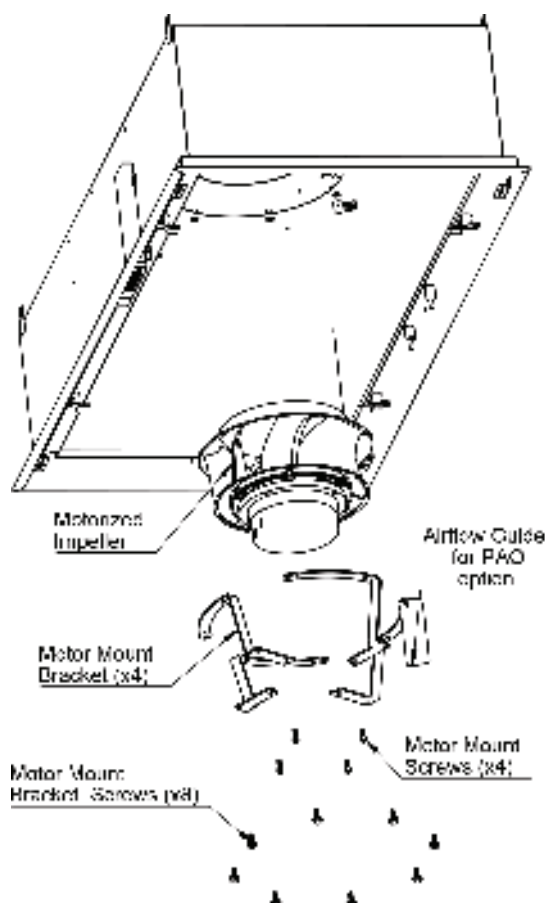
Step 5 - Disconnect the 3-pin power plug and the 4-pin data plug from the electrical box.

Step 6 - Use a 7/16" driver to remove the eight (8) motor mount bracket screws.

Step 7 - Lower the motor/bracket assembly out of the unit.

Step 8 - Use a 4 mm hex driver to remove the four (4) screws holding the motor brackets to the motor.

Step 9 - Reverse above steps to reassemble the motor/fan/ring assembly into the unit.



Removal and Installation of the Variable Speed Motor (HLC-FPR)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Step 1 - Using a flat screwdriver, release the face frame by rotating the fasteners a quarter-turn counterclockwise. Unhook the safety cables from the filter clips. Set the frame aside.

Step 2 - Turn the unit off with the black button located on the face of the unit next to the display.

Step 3 - Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.

Step 4 - Remove the HEPA filter and set aside. See sections 2 and 3 for instructions.

Step 5 - If equipped with an Airflow Sensor, make note of the plug into the sensor. Cut any zip ties holding the wire to the sensor bracket. Unplug the wire and move out of the way.

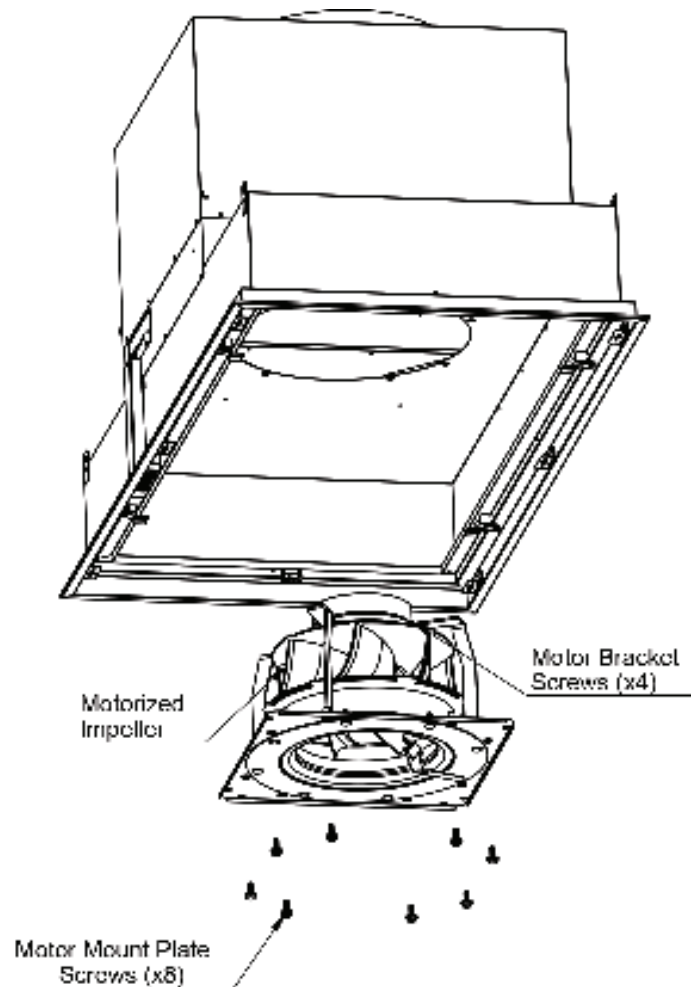
Step 6 - Support the weight of the fan assembly and use a 7/16" driver to remove the eight (8) motor mount plate screws.

Step 7 - Carefully lower the motor assembly and disconnect the 3-pin power plug and the 4-pin data plug.

Step 8 - Remove the assembly from the unit. Remove the nuts holding the motor brackets to the motor plate.

Step 9 - Use a 4 mm hex driver to remove the four (4) screws holding the motor brackets to the motor.

Step 10 - Reverse above steps to reassemble the motor/fan/ring assembly into the unit.



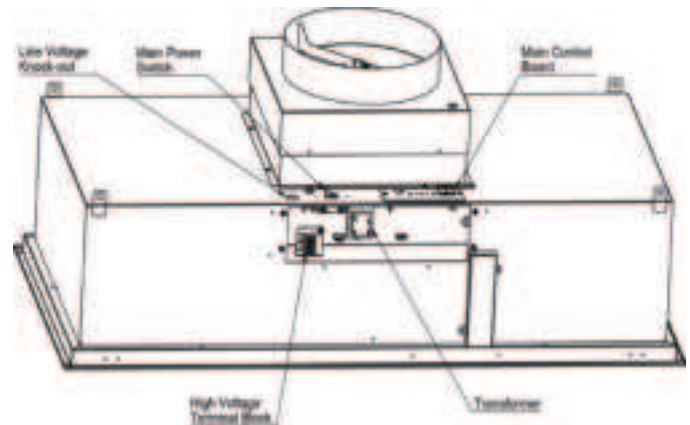
Access to Electrical Components (HLC-FPS Standard Construction)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Turn the unit off with the switch located on the electrical box.

Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.



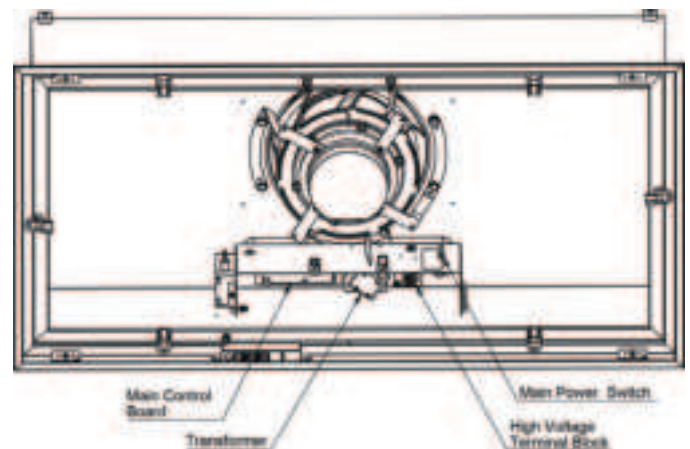
Access to Electrical Components (HLC-FPS MEA Construction)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Turn the unit off with the switch located on the electrical box.

Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.



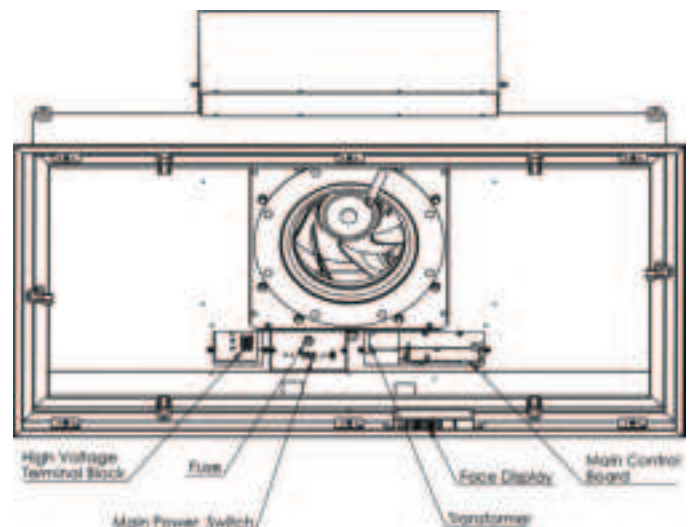
Access to Electrical Components (HLC-FPR)

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Turn the unit off with the main power switch located on the electrical box.

Disconnect the unit at the power source or at the service panel in accordance with OSHA (LOTO) practices and procedures.



Removal of Main Control Board

WARNING

Disconnect the unit from the electrical power source before attempting to service the unit.

Step 1 - Access the unit's electrical box per instructions based on the model you have.

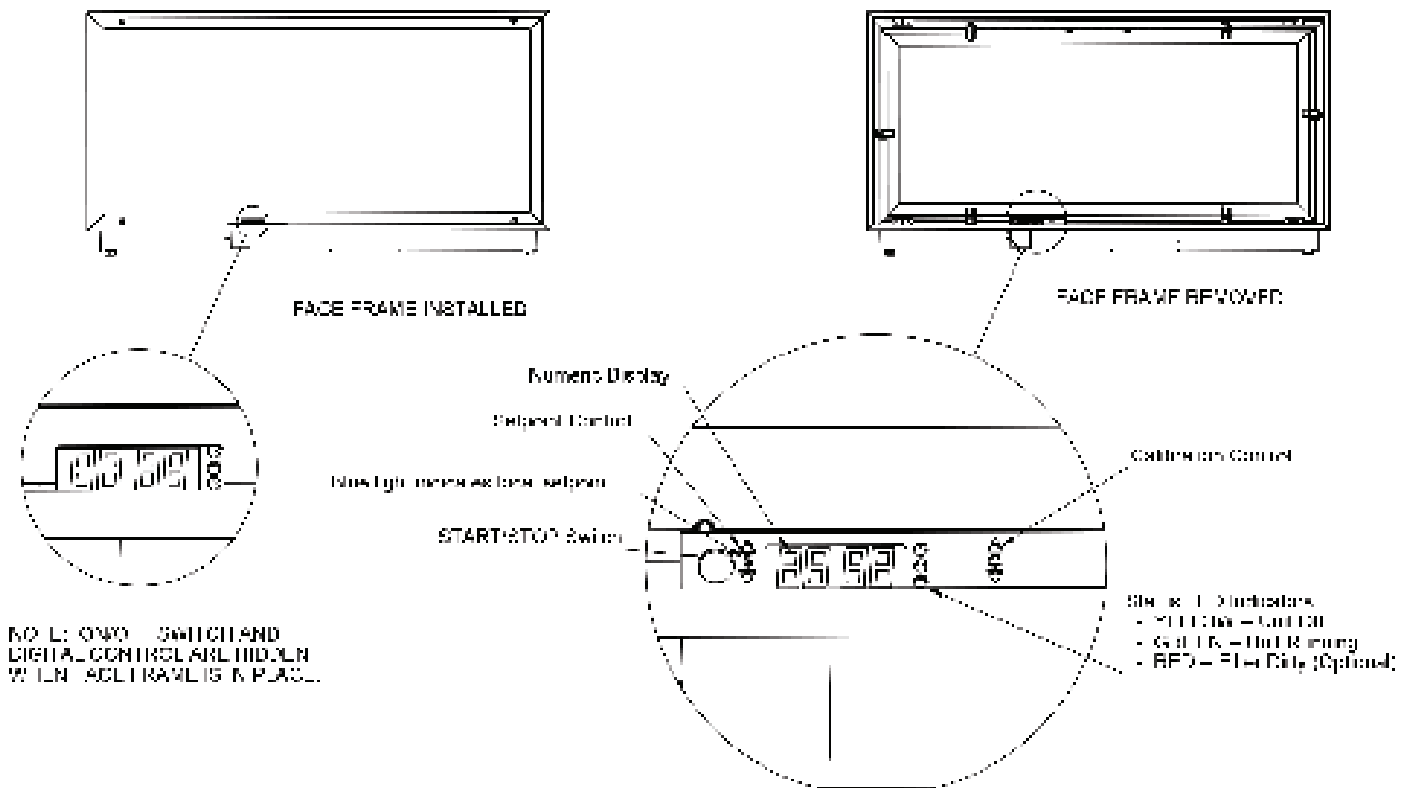
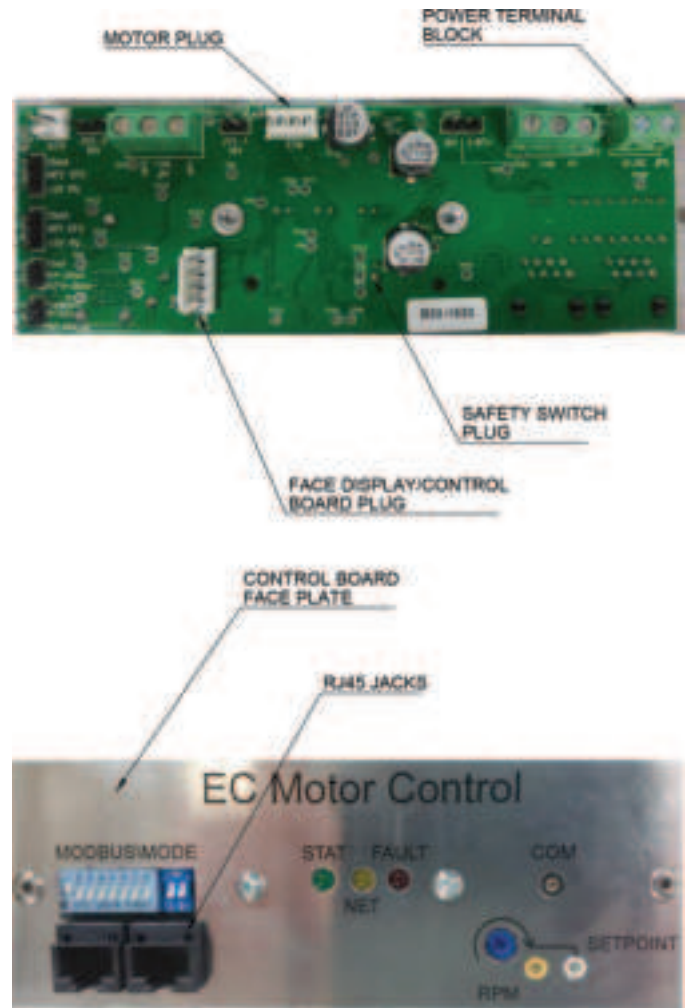
Step 2 - Remove the two screws holding the control board face plate to the fan filter unit.

Step 3 - If applicable, disconnect the CAT5e cables from RJ45 jacks on the front of the board.

Step 4 - Disconnect the motor (red 4-pin plug), the face control board (red 5-pin plug), and the safety switch (red 2-pin plug) from the main control board by pulling the plug straight out from the board.

Step 5 - Using a small blade screwdriver, disconnect power supply wires from the control board terminal block.

Step 6 - To install a new board, repeat above steps in reverse order.



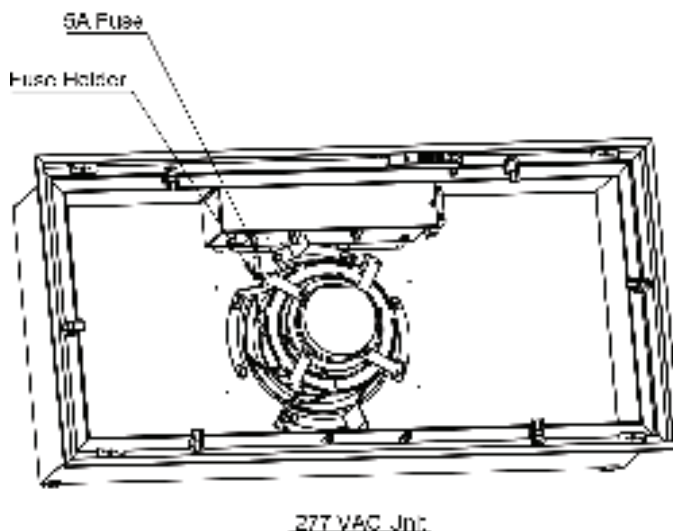
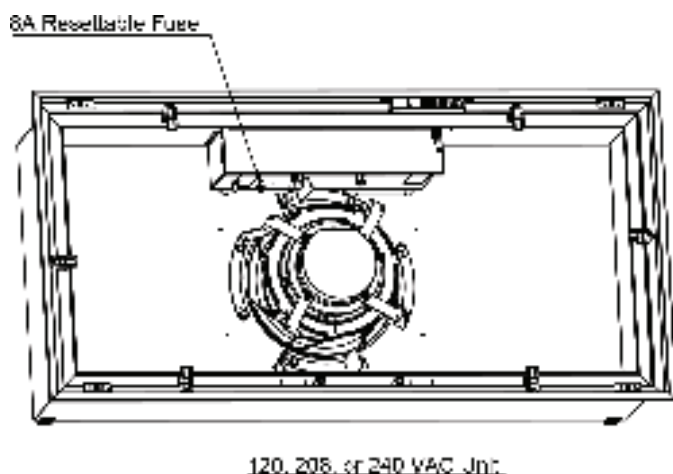
Fuse Details and Access: HLC-FPS

Each fan filter is equipped with an 8 Amp resettable or 5 Amp cartridge fuse to protect the unit from electrical spikes. The fuse is located on the plaster frame close to the display board.

The cartridge fuse can be removed by turning the fuse holder counterclockwise a quarter-turn. Remove the fuse from the fuse holder and discard. Insert new fuse and replace fuse holder.

NOTE: 277VAC units have a 5 A cartridge fuse. Others have a 8 A resettable fuse.

NOTE: If the unit is installed in an area with no access above the ceiling, the main power switch must be turned on before installing into the ceiling.



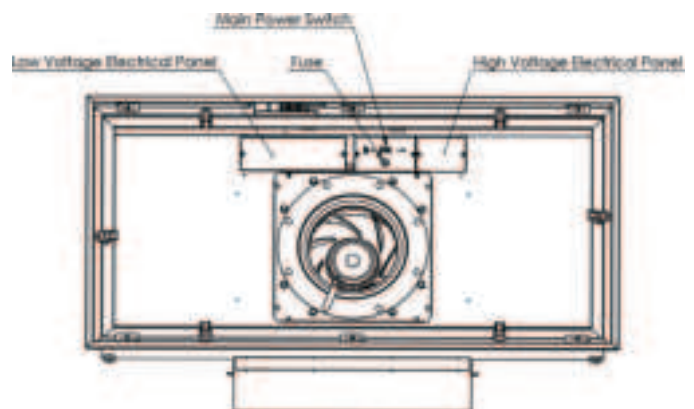
Fuse Details and Access: HLC-FPR

Each fan filter is equipped with an 8 Amp resettable or 5 Amp cartridge fuse to protect the unit from electrical spikes. The fuse is located in the electrical box accessible behind the filter.

NOTE: Before servicing fuse, cut power to the unit at the disconnect. Turning off the main power switch will not disconnect power from the fuse.

The cartridge fuse can be removed by turning the fuse holder counterclockwise a quarter-turn. Remove the fuse from the fuse holder and discard. Insert new fuse and replace fuse holder.

NOTE: 277VAC units have a 5 A cartridge fuse. Others have a 8 A resettable fuse.



Aerosol Distribution Manifold (ADM): HLC-FPS

The ADM is provided as a reliable, convenient method of performing a challenge test of the fan filter unit at the face.

***These instructions are to assist a qualified technician in testing the leakage of the fan filter unit. Filter should be installed for a minimum of 30 minutes before test is performed.*

Step 1 - Use a flat screwdriver to release the face frame by rotating the four (4) fasteners a quarter-turn counterclockwise. Unhook the safety cables from the filter clips. Set the frame aside.

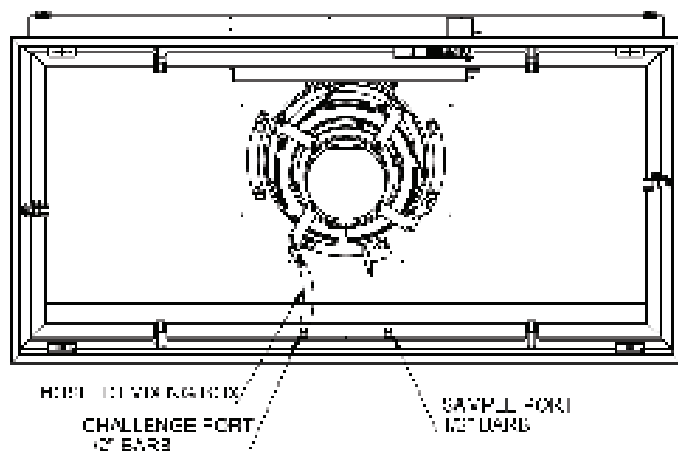
Step 2 - Remove the cap from the concentration test port (labeled "Concentration"). Attach UPSTREAM hose (1/2" ID; thin wall) from photometer to ADM concentration port.

Step 3 - Remove the cap from ADM challenge supply port (labeled "Challenge"). Attach DOWNSTREAM hose (1/2" ID; thin wall) from aerosol generator to ADM supply port.

Step 4 - Conduct the challenge test per the site requirements. Equipment is designed to pass the efficiency/leakage test procedures as outlined in the most current version of IEST-RP-CC034.

Step 5 - Disconnect hoses from ports and securely replace caps.

Step 6 - Raise the face frame back into place, reattach the safety chains, and secure quarter-turn fasteners.



Controls

The fan filter unit can be controlled through various inputs:

1. Local set point control (blue light behind S will be lit on face display)
 - Adjust airflow from the face. When adjusting the set point will be displayed and the four decimal points will be lit to indicate set point.
 - Local set point, no face display. If not equipped with a face display and locally controlled, the POT on the EC Motor Control Board is used.
 - To toggle between local control and external control hold the Start/Stop button for 10 seconds. When released the blue light will turn off.
2. Individual unit wall-mounted control (must be determined before ordering).
3. 0 - 10V/0 - 5V DC Control
4. 0 - 20mA/4 - 20mA Control
5. Full range of network controls including connection to BAS/BMS through MODBUS RTU RS485 control
 - BACNet IP, BACNet MS/TP, & LONWorks available with additional hardware. Additionally, monitoring and control of the FFD can be done through closed loop control from sensors such as pressure transducers, thermostats, partial counters, etc.

This manual will give basic information on how to connect controls and sensors to the unit. For more details refer to the instructions included with the controller or sensors.

Signal Behavior

The network CFM set point is read and written directly in units of CFM.

External analog signals are scaled to a minimum and maximum airflow when in CFM control mode.

IE: 0-5VDC 2.5VDC=0.5 of full range. =
0.5*unit maximum CFM.

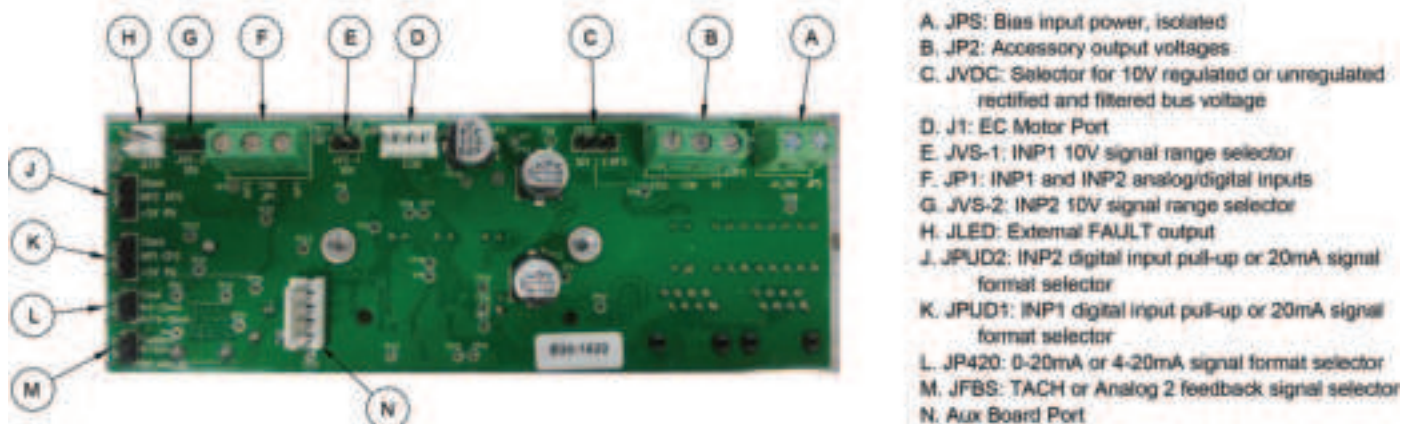
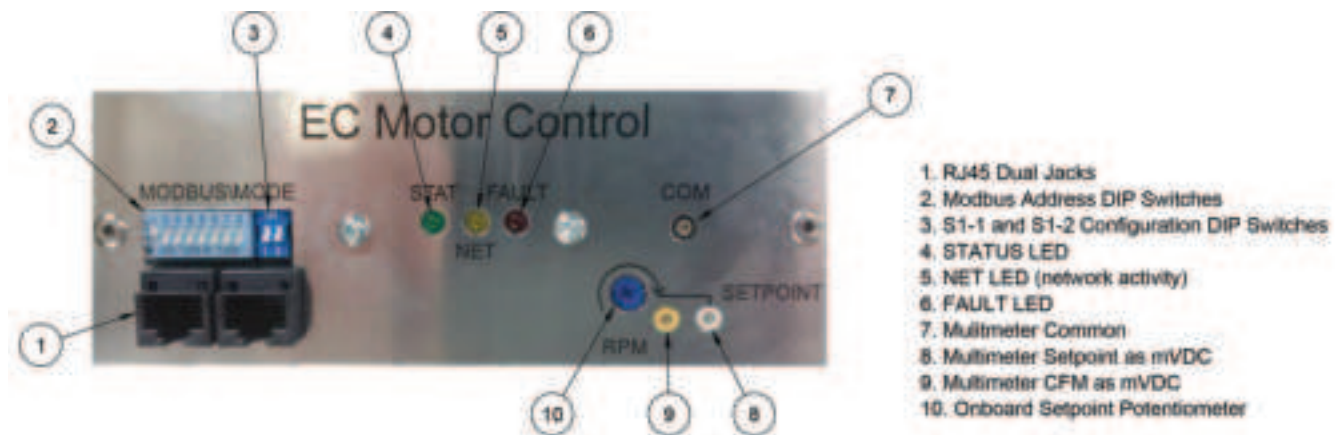
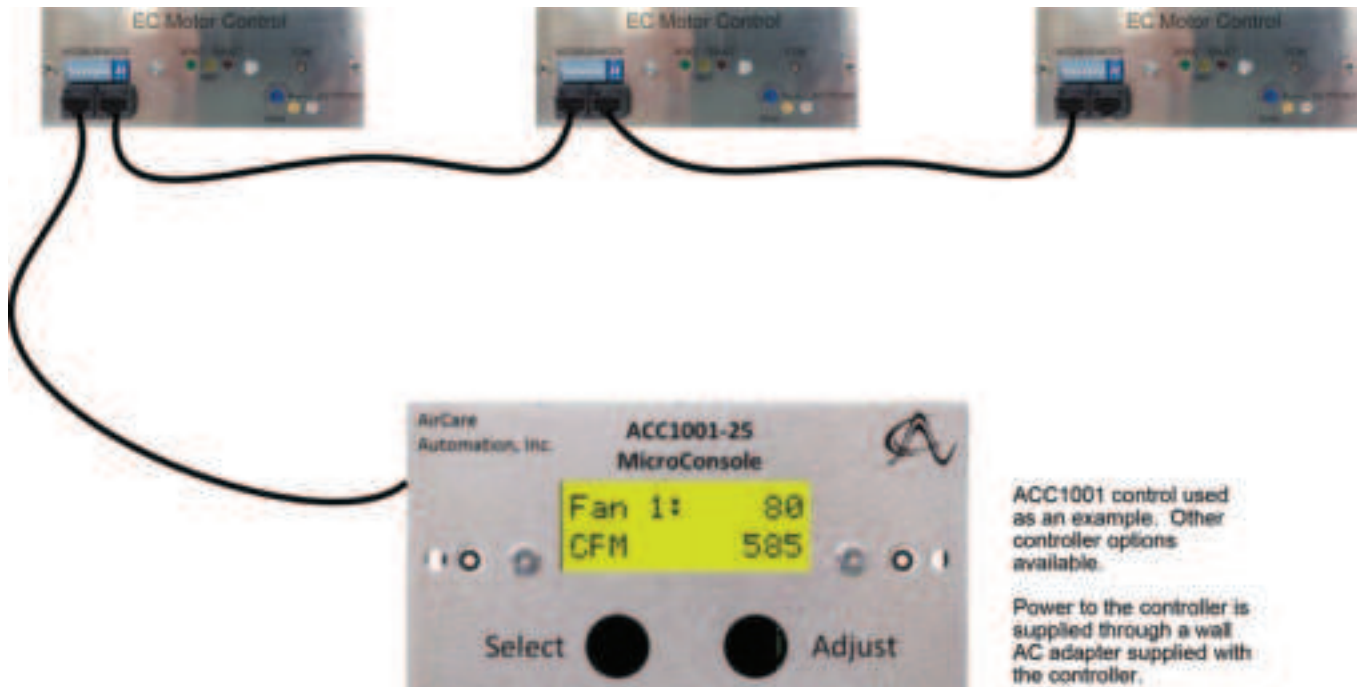
When operated from an external set point or network value 0-10% is reserved for local override of the EC Motor Control board POT so the unit can be adjusted from the main control board. 10%-20% is reserved for the remote Off Signal.

INP1/ANA1 Input		Control Function: % of Input Range		
Range	Units	ECM Control Pot 0-10%	Remote Off 10-20%	External Set point 20-100%
0-5	Volts	0 to 0.5	0.5 to 1.0	1.0 to 5.0
0-10	Volts	0 to 1.0	1.0 to 2.0	2.0 to 10.0
0-20	mA	0 to 2.0	2.0 to 4.0	2.0 to 20.0
4-20	mA	0 to 5.6	5.6 to 7.2	7.2 to 20.0

Networking

When networking the fan filter units either in a local area network (LAN) or connecting to a BAS/BMS system, each unit is connected in a “straight-through” daisy chain using Cat5e or Cat6 network cables and the onboard RJ45 connectors.

If field cutting network cables, it is important for each end of the cable to be wired identically. However, assembled network cable is available; field assembled cables are the leading cause of problems in new systems.



Dip Switch Settings

Each fan filter unit in a network must be set to a unique address between 1 and 247.

Addresses 248 - 255 are declared reserved per Modbus protocol. A dip switch block of eight switches are used for addressing. The control board supports Modbus Broadcast Address Zero for single and multiple register write commands (Modbus Function Codes 6 and 16).

Address settings are checked by the board controller only at power-up, so power must be cycled before any changes take effect.

Analog input set point modes preserve the ability to monitor and modify register values using a suitable controller console or PLC. Therefore, addressing may be relevant for configuration, monitoring and/or troubleshooting even when units are intended to be used with analog set point input.

Address Selection

When adjusted to the ON position, each dip switch pole represents a value as follows:

Dip Switch Pole	Value
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

Calculate the address value of existing switch settings by adding the values of each dip switch pole in the ON position, per the table at left.

Construct switch settings for a desired address value by successively subtracting the largest pole value that is less than the desired address value, repeating with each remainder until the remainder is zero. An example is provided below.

Example: Desired address is 114

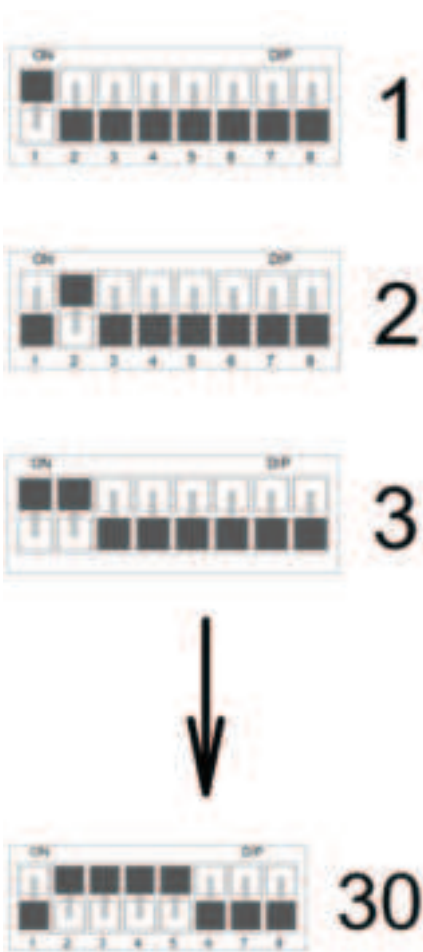
114 - 64 = 50 SW1-7 ON

50 - 32 = 18 SW1-6 ON

18 - 16 = 2 SW1-5 ON

2 - 2 = 0 SW1-2 ON

64+32+16+2 = 114



Configuration Dip Switches S1-1 and S1-2

Switch	S1-1	S1-2
	Control Loop Mode	Set point Source
OFF	Open-Loop Control	Analog Set point
ON	Closed-Loop Control	Network Set point

Open-Loop - Fan filter unit is controlled by a controller, i.e., on-board potentiometer or network controller.

Closed-Loop - A sensor is used to maintain airflow i.e., room pressure, room temp, or a particle counter.

Analog Set point - Unit is controlled with an analog controller, i.e., on-board potentiometer or individual wall-mounted controller (must be determined before ordering).

Network Set point - Unit is controlled with a networked controller, i.e., ACC1 or ACM7052 touchscreen controller.

Notes:

- JP1 is for signal input
- JP2 is for output power
- Connect COM/5V --> 5V power supplied
- Connect COM/VSEL with 10V shunt --> 10V power supplied
- Connect COM/VSEL with V.RFU shunt --> Full wave rectified power supplied (~33VDC)
- INP1 on JP1 wiring block is for monitoring only
 - 0 - 10VDC
 - 0 - 5VDC
 - 0 - 20mA
 - 4 - 20mA
- INP2 on JP1 wiring block is for closed-loop feedback or monitoring
- Controlling airflow by room pressure or particle counter

Sensor Shunt Table				
Shunt	JP420	JFBS	JVS-1*	JVS-2*
OUT	0 - 20mA	ANALOG	0 - 5VDC	0 - 5VDC
IN	4 - 20mA	N/A	0 - 10VDC	0 - 10VDC
*Leave shunt out if using a 0-20mA or 4-20mA sensor.				

Shunt Table for JP1 wiring block		
Center Pin to...	JPUD1:INP1	JPUD2:INP2
No connection	Analog 5V or 10V	Analog 5V or 10V
20mA	Analog 20mA	Analog 20mA
+5V PU	Digital 10kΩ pull-up TO 5V	Digital 10kΩ pull-up TO 5V

Shunt Table for JP2 wiring block	
Center Pin to...	JVDC
No Connection	VSEL = no connection; open
10V	VSEL = 10V regulated
V.RFU	VSEL = DC filtered, unregulated, ~33VDC

Dip switch settings for up to 30 fan filter units. For more units see below.

Calculate the address value of existing switch settings by adding the values of each dip switch pole in the ON position, per the table.

Construct switch settings for a desired address value by successively subtracting the largest pole value that is less than the desired address value, repeating with each remainder until the remainder is zero. An example is provided below.

Example: Desired address is 114

$114 - 64 = 50$ SW1-7 ON

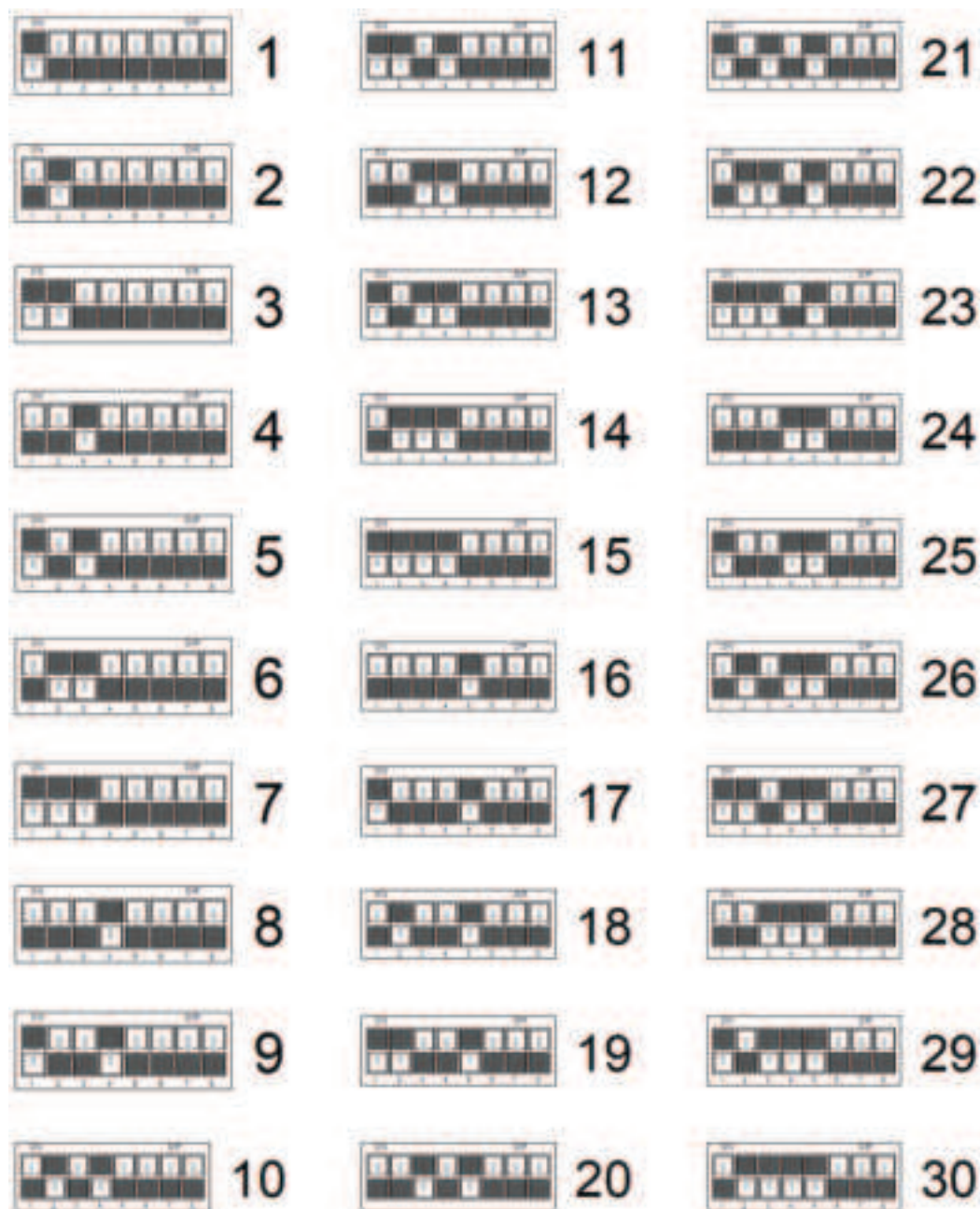
$50 - 32 = 18$ SW1-6 ON

$18 - 16 = 2$ SW1-5 ON

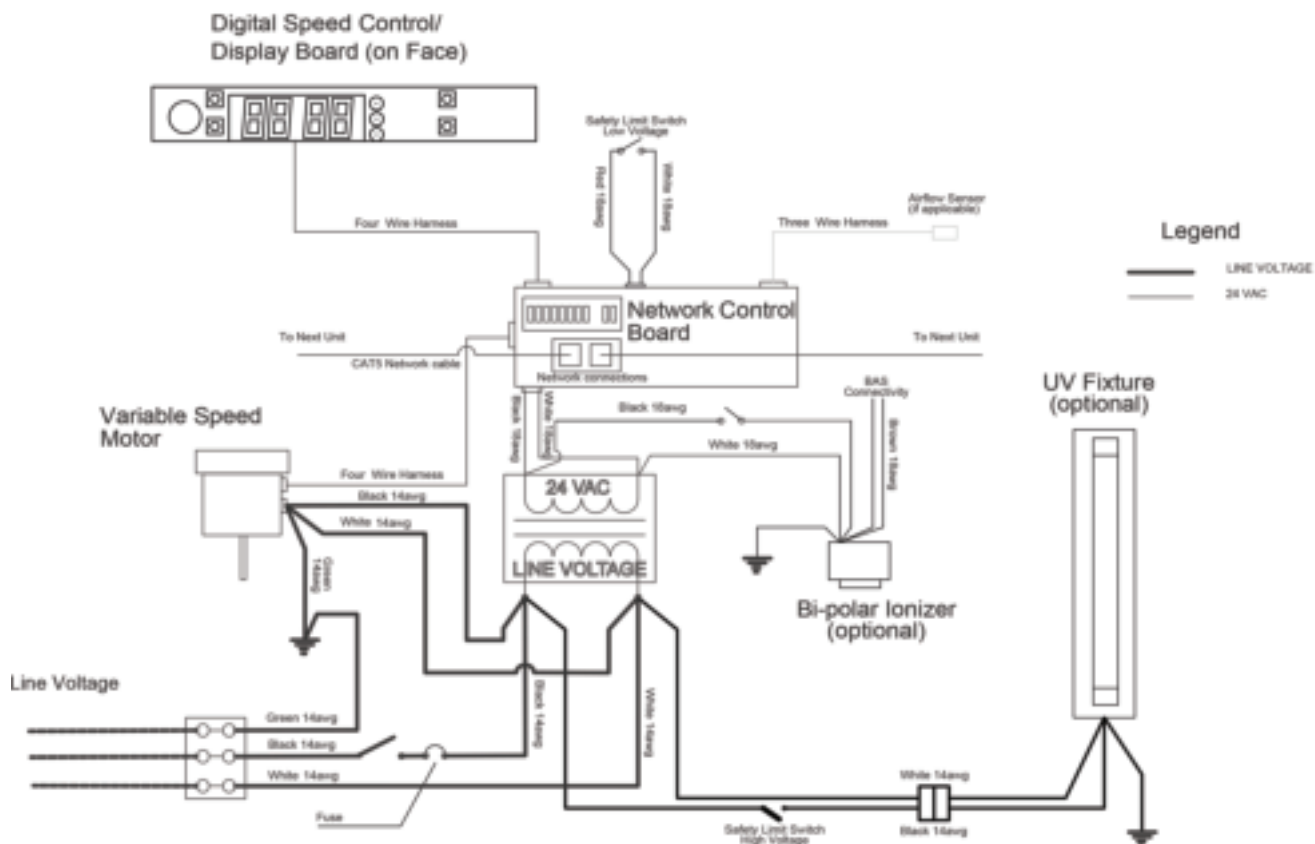
$2 - 2 = 0$ SW1-2 ON

$64 + 32 + 16 + 2 = 114$

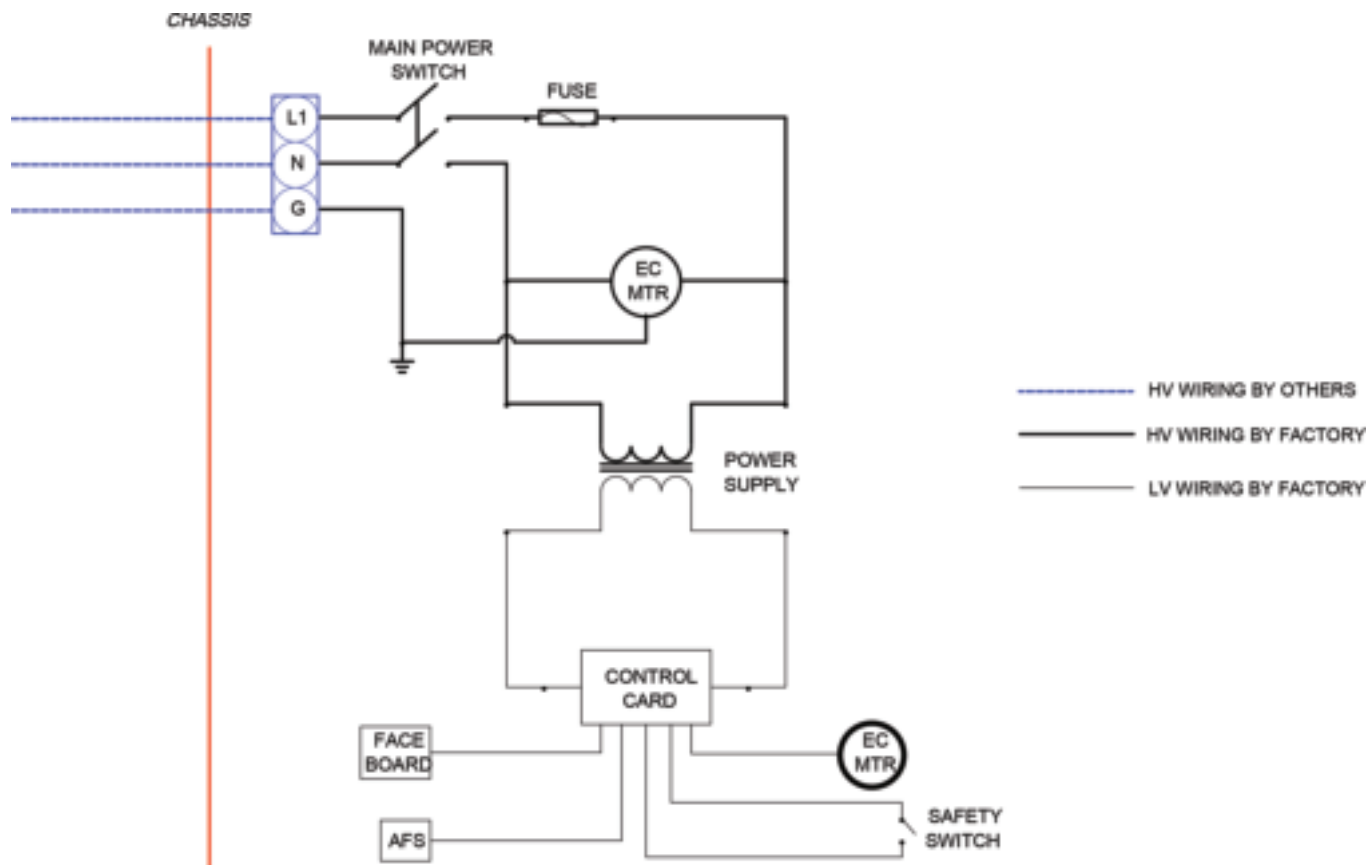
Dip Switch Pole	Value
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128



Wiring Diagram: HLC-FPS - Supply Flow Fan Filter Units



Wiring Diagram: HLC-FPR - Reverse Flow Fan Filter Units



Airflow Sensor Warning

SHUNT INP2 CFG FROM CENTER PIN TO +5V PU

RED WIRE FROM SENSOR TO INP2

BLACK WIRE FROM SENSOR TO 5V

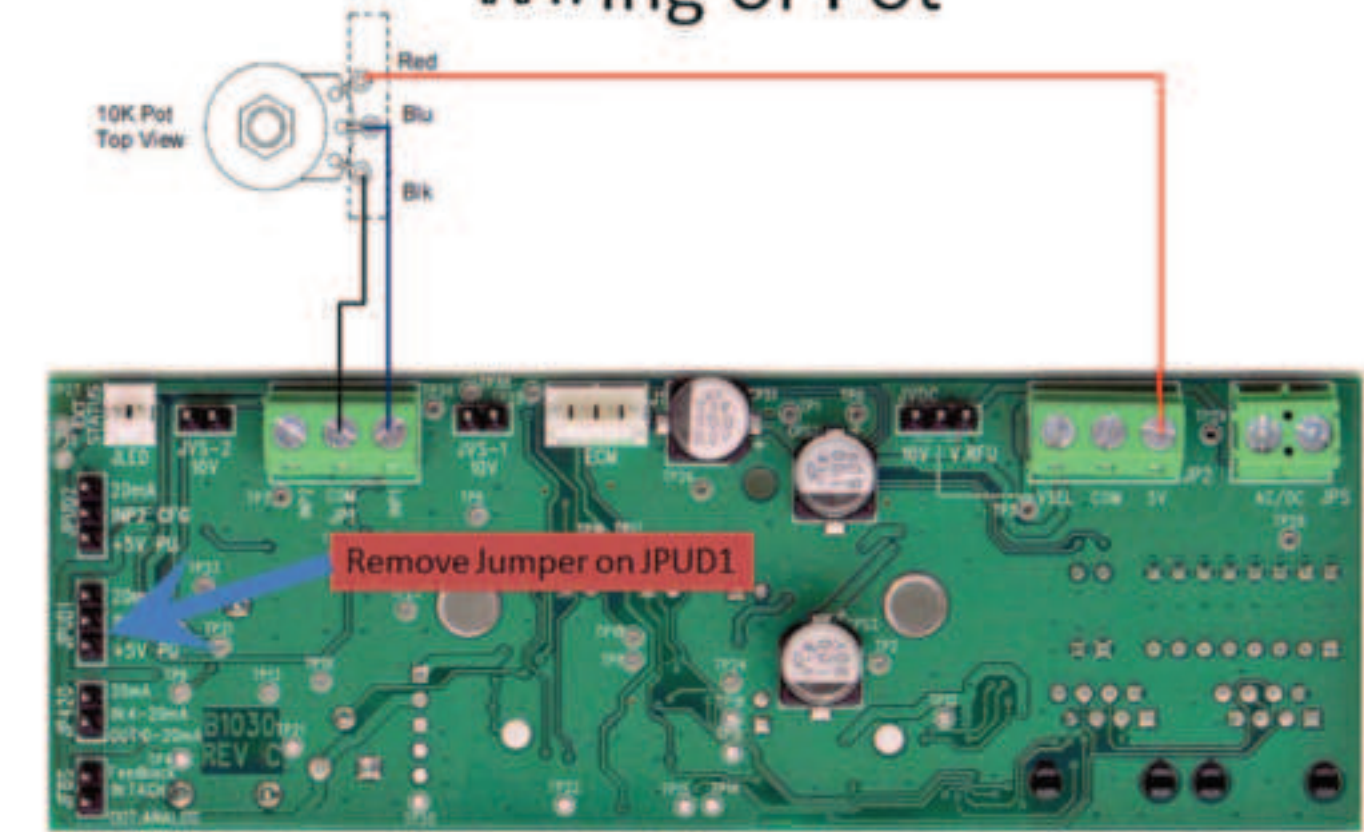
WHITE WIRE FROM SENSOR TO COM



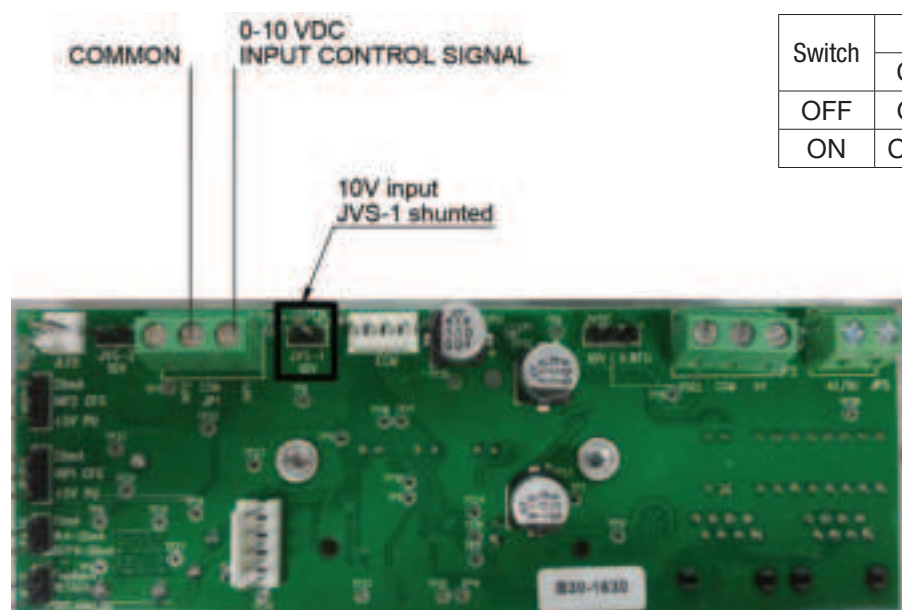
Switch	S1-1	S1-2
	Control Loop Mode	Set point Source
OFF	Open-Loop Control	Analog Set point
ON	Closed-Loop Control	Network Set point

Wiring a Remote-Mounted Pot to Control Board

Wiring of Pot



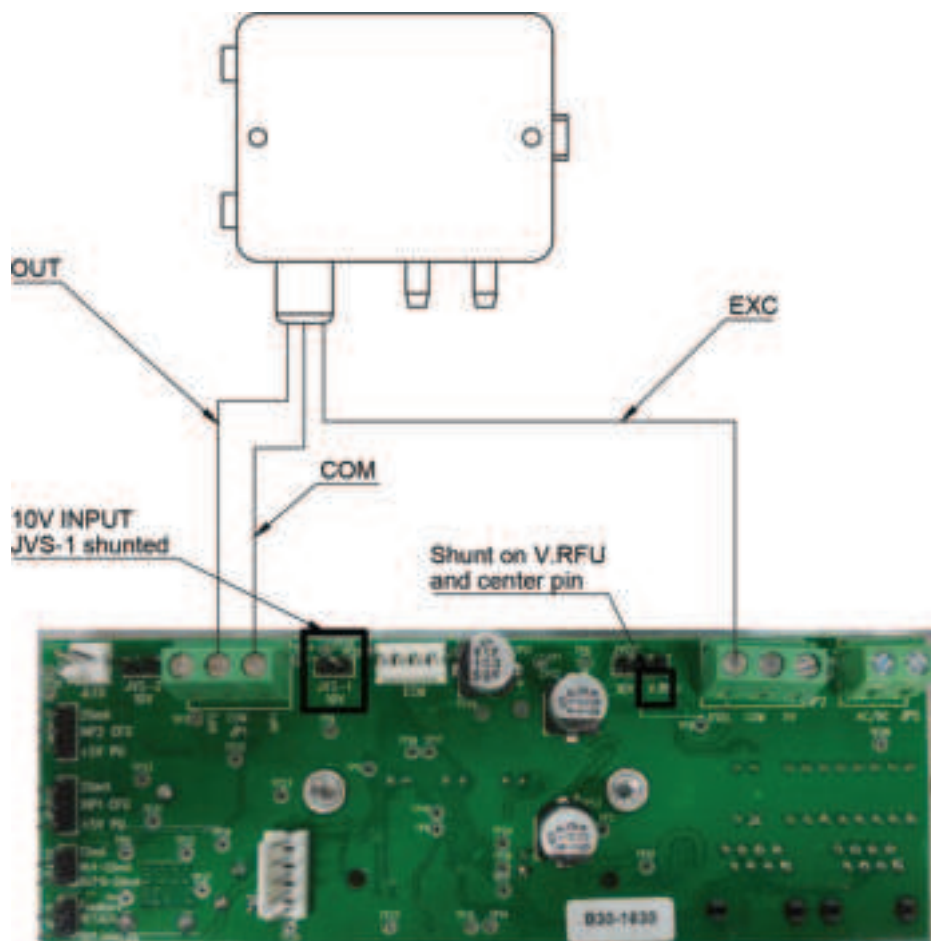
Wiring of 0 - 10 VDC Input Signal to Control Fan Speed



Switch	S1-1	S1-2
	Control Loop Mode	Set point Source
OFF	Open-Loop Control	Analog Set point
ON	Closed-Loop Control	Network Set point

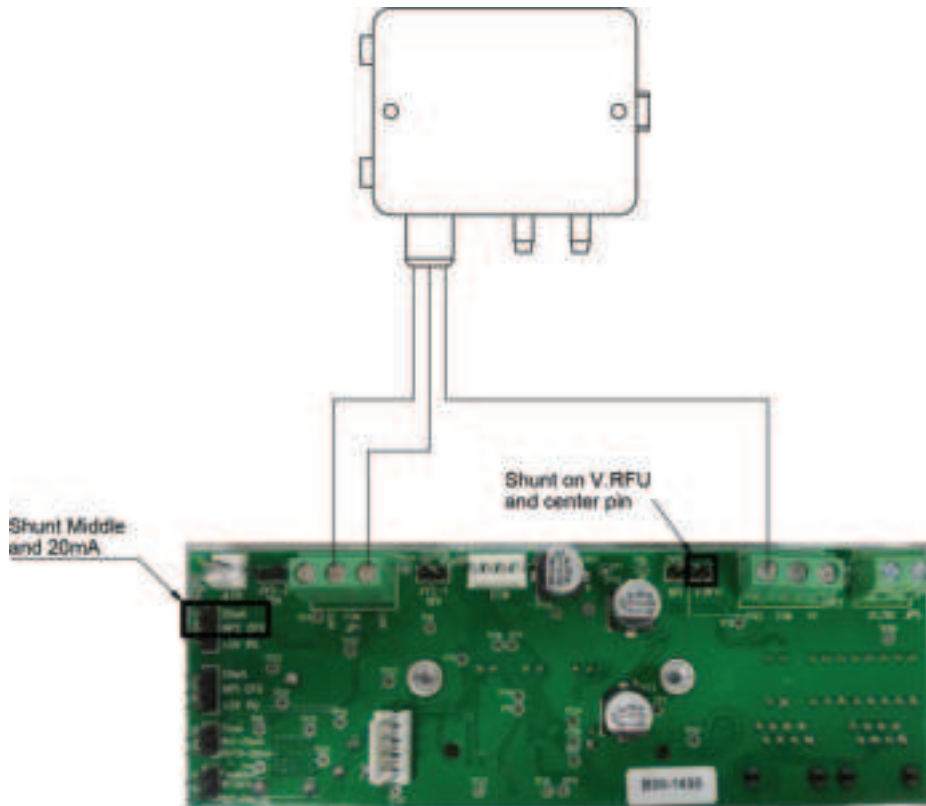
Example of Wiring a Pressure Transducer to Control Board for Feedback or Monitoring Through Controller

- Pressure transducer provides 0-10VDC output signal
- Powered by ~33VDC supply



Example of Wiring a Sensor to Control Board for Feedback or Monitoring Through Controller

- Pressure transducer provides 4-20mA output signal
- Powered by ~33VDC supply



Testing

Each fan filter unit is thoroughly tested at the factory before shipment. However, many codes and standards require testing for bypass leakage after installation. The manufacturer encourages that the customer contact an independent, certified testing organization with technicians that are trained and experienced in performance, evaluation, and maintenance of clean air equipment.

The manufacturer recommends at least 30 minutes lapse after HEPA/ULPA filter installation before performing any type of challenge leak testing. The unit should be sealed to the ceiling and the room should have a positive pressure held during testing and normal operation.

Troubleshooting

Low Airflow

- ☐ If optional red HEPA Alert LED light is on, replace the gel seal filter.
- ☐ Inspect the pre-filter. Clean or replace as necessary.
- ☐ Adjust the digital speed control for higher airflow output.
- ☐ Check the power supply for proper voltage, amperage, and distribution frequency.
- ☐ Verify dip switches are correct for type of controls used.
- ☐ Replace filter if airflow remains low.

High Airflow

- ☐ Adjust digital speed control for lower output.
- ☐ Verify dip switches are correct for type of controls used.

Non-Laminar Airflow and/or Excessive Contamination

- ☐ Ensure that upstream airstream is clear of large obstructions.
- ☐ Ensure that no other air moving devices are operating in such a way to disrupt the room's airflow pattern.
- ☐ Check airflow, and if not desired airflow, see above.
- ☐ Conduct smoke or photometer test on filter and gel seal. Seal or replace the filter as necessary.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

