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## Model FFU-2 FAN HEPA Filter Modules - Part Numbers

**Typ String:** FFU-2 / U / R / 244 / G / C / 12 / B / 04 / 4P / 04 / ML

<table>
<thead>
<tr>
<th>Field</th>
<th>Field Description</th>
<th>Input Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Model</td>
<td>FFU-2</td>
<td>Fan Filter Hepa Unit - 2” HEPA Filter</td>
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<tr>
<td>2</td>
<td>Installation</td>
<td>U</td>
<td>Universal for Surface or 1” T-Bar Applications</td>
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<tr>
<td>3</td>
<td>Filter Replacement Type</td>
<td>R</td>
<td>Room Side Replaceable Filter</td>
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<tr>
<td></td>
<td></td>
<td>B</td>
<td>Bench Replacement (Removal from Ceiling Req’d)</td>
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<tr>
<td>4</td>
<td>Nominal Unit Size</td>
<td>242</td>
<td>24” x 24”</td>
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<tr>
<td></td>
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<td>243</td>
<td>24” x 36”</td>
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<td>244</td>
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<td>245</td>
<td>24” x 60”</td>
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<td>5</td>
<td>Filter Seal</td>
<td>G</td>
<td>Gel (Room Replaceable Only)</td>
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<tr>
<td>6</td>
<td>Filter Type</td>
<td>C</td>
<td>99.99% @ .3u (HEPA Filter - Ships Separate)</td>
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<td></td>
<td></td>
<td>E</td>
<td>99.999% @ .12u (ULPA Filter - Ships Separate)</td>
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<td>7</td>
<td>Inlet/Duct Collar Size (TOP)</td>
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<td></td>
<td>10</td>
<td>10” Ø</td>
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<tr>
<td></td>
<td></td>
<td>10VS</td>
<td>10” OVAL - SIDE LOCATION</td>
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<tr>
<td></td>
<td></td>
<td>12VS</td>
<td>12” OVAL - SIDE LOCATION</td>
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<tr>
<td>12</td>
<td></td>
<td>12</td>
<td>12” Ø</td>
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<tr>
<td>14</td>
<td></td>
<td>14</td>
<td>14” Ø</td>
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<tr>
<td>8</td>
<td>Motor Voltage, 1Φ</td>
<td>A</td>
<td>115 vac (ECM - Speed Controller Attached to Unit)</td>
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<tr>
<td></td>
<td></td>
<td>B</td>
<td>208/230/240 vac (ECM - Speed Controller Attached to Unit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>277 vac (ECM - Speed Controller Attached to Unit)</td>
</tr>
<tr>
<td>9</td>
<td>Perforated Face Material</td>
<td>04</td>
<td>304 Stainless Steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>316 Stainless Steel</td>
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<tr>
<td></td>
<td></td>
<td>AL</td>
<td>Aluminum</td>
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<tr>
<td>10</td>
<td>Face Finish</td>
<td>4P</td>
<td>Satin Polished Finish</td>
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<td></td>
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<td>11</td>
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<td>16</td>
<td>316 Stainless Steel</td>
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<td>Fan/Filter Housing Finish</td>
<td>ML</td>
<td>Mill Finish</td>
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<td>13</td>
<td>Optional Features</td>
<td>BI</td>
<td>Backward Inclined Wheel</td>
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<td></td>
<td></td>
<td>F1</td>
<td>Insulation, External (Top Only)</td>
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<td></td>
<td></td>
<td>LA</td>
<td>Light Alert LED Filter Loading Indicator</td>
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<td></td>
<td></td>
<td>MC</td>
<td>Manifold for PAO Challenge from Face</td>
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<tr>
<td></td>
<td></td>
<td>PD</td>
<td>Pressure Xducer (Filter Pressure Drop) via Network</td>
</tr>
<tr>
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<td>PF</td>
<td>Expanded Aluminum Pre-Filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RC</td>
<td>Room side removable Motor/Blower Assembly, and Controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM</td>
<td>Room side removable Motor/Blower Assembly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WS</td>
<td>Wall Speed Switch (Rotary Knob)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99</td>
<td>Special Construction - See Details</td>
</tr>
</tbody>
</table>
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:

- FPH-RP11 FPH 48 x 24 HEPA filter
- FPH-RP12 FPH 16 x 16 x 3/8 expanded aluminum pre-filter
- FPH-RP13 FPH 24 x 24 HEPA filter
- FPH-RP14 FPH 14 x 14 x 3/8 expanded aluminum pre-filter
- FPH-RP16 FPH 36 x 24 HEPA filter
- FPH-RP21 FPH Programmable variable speed motor (120, 208/240VAC)
- FPH-RP22 FPH Programmable variable speed motor (277VAC)
- FPH-RP31 FPH Visual control circuit board
- FPH-RP32 FPH 0-10VDC control circuit board
- FPH-RP33 FPH Network control circuit board
- FPH-RP34 FPH Fan verification kit
- FPH-RP35 FPH LED filter indicator Kit
- FPH-RP36 FPH 120/24VAC transformer
- FPH-RP37 FPH 208/240/24VAC transformer
- FPH-RP38 FPH 277/24VAC transformer
- FPH-RP39 FPH Network power control circuit board
- FPH-RP40 FPH Face mounted airflow display board
- FPH-RP41 FPH Multi-input control board
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:
Installation Checklist

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

☐ Unbox and inspect the fan filter unit.
☐ If the unit is to be ducted, set upstream air device to produce 0.0" W.C. static pressure at the fan unit inlet. Use dampers if necessary if installing multiple fan units on the same duct line.
☐ Install the fan unit into the ceiling. Support its weight from structure above.
☐ Connect ductwork to fan unit (if applicable).
☐ Seal the fan filter unit to the ceiling using gasketing and caulking.
☐ 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.
☐ Install the perforated face screen.
☐ Verify airflow with a flow hood.
Installation

The terminal unit is fully assembled from the factory with the exception of the HEPA filter and lamps (as applicable) which is shipped in a separate box.

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 Anemostat representative.

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

Step 3 -- Raise unit into ceiling and lower onto gasketed opening. Gasket should be a closed-cell material approved for the environmental conditions. It is highly recommended to further support the unit from above using the tabs welded to the plenum.

Step 4 -- A qualified technician should connect the unit to the appropriate power supply per applicable codes and standards. Refer to the wiring diagrams included in these instructions. Note that Model FFU-2 can be ordered with the controls/electronics room-side accessible where the electrical box will be accessible from the room. Otherwise, the electrical box will be accessible from the plenum side.

NOTE: If the FFU-2 is installed in an area with no access above the ceiling, the main power switch must be turned on before installing the unit.

NOTE: An additional disconnect should be added by others per local codes and regulations.

NOTE: Supply voltage to FFU-2 units can be ordered for 120vac, 208/240vac, or 277vac power supply.

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” on page 7.

Step 6 -- Install the HEPA filter per the “Removal and Replacement of the HEPA Filter with Gel Seal” section.

NOTE: FOR DUCTED INSTALLATIONS, IT IS RECOMMENDED THAT PRIMARY AIR BALANCING TO ACHIEVE A 0.00" WC INLET STATIC PRESSURE BE DONE BEFORE FAN FILTER UNIT IS CONNECTED TO DUCT SYSTEM.
Removal and Replacement of the HEPA Filter with Gel Seal

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

WARNING!
The HEPA 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.

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

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

Step 2 -- Turn the unit off with the switch located on 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 swingarm 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 manor.

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 stainless steel housing frame of the unit. DO NOT OVER TIGHTEN). 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 1/4-turn fasteners.
Removal and Installation of the Variable Speed Motor (Plenum Side)

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 the pre-filter and set aside. See sections 2 and 3 for instructions.

Step 4 -- Use a 1/8" drill bit and drill to remove the six (6) rivets located around the motor housing cover. Set cover aside. Clean out metal shavings and rivet parts from the unit. NOTE: if duct is attached to cover, be careful not to damage duct. Disconnect duct if necessary.

Step 5 -- Disconnect the 6-pin power cable and the 4-pin data cable from the motor.

Step 6 -- Using the 7/16" nut driver, remove the six nuts holding the motor.

Step 7 -- Lift the motor/fan/ring assembly out of the unit.

Step 8 -- Use a 5/32" hex driver to loosen set screw and slide fan off the motor shaft.

Step 9 -- Use a driver to remove the motor mount harness from the motor.

Step 10 -- Reverse above steps to reassemble the motor/fan/ring assembly into the unit. The fan collette should be even with the end of the motor shaft. Either rivets or sheet metal screws can used to secure the motor housing cover.
Removal and Installation of the Variable Speed Motor (Room-Side Removable Option)

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 counter clock-wise. Unhook the safety cables from the filter clips. Set 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 the pre-filter and set aside. See sections 2 and 3 for instructions.

Step 5 -- Using a flat screwdriver, release the mid panel by rotating the three (3) fasteners a 1/4-turn counter clock-wise. Allow panel to swing down to vertical and remove from unit. Set aside.

Step 6 -- Use a 5/32” hex driver to loosen set screw and slide fan off the motor shaft.

Step 7 -- Disconnect the 6-pin power cable and the 4-pin data cable from the motor.

Step 8 -- Using the 7/16” nut driver, remove the six (6) nuts holding the motor.

Step 9 -- Lower the motor/ring assembly out of the unit.

Step 10 -- Use a driver to remove the motor mount harness from the motor.

Step 11 -- Reverse above steps to reassemble the motor/fan/ring assembly into the unit. The fan collar should be even with the end of the motor shaft.
Access to Electrical Components (Plenum Side Access)

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 electrical box.

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

Step 3 -- Use a 5/16” hex driver to remove screws holding electrical access panel. Swing panel up to release from the tabs.

Step 4 -- To remove transformer:  
Step 4a -- Disconnect all wires from terminals. See wiring diagram for replacing wires.  
Step 4b -- Using a 1/8” drill bit, drill out the two rivets. Clean debris.  
Step 4c -- Use new 1/8” rivets or #6 screws to install replacement transformer.

Step 5 -- To remove control board:  
Step 5a -- Using a 1/8” drill bit, drill out the two rivets holding control board to electrical box. Clean debris.  
Step 5b -- Remove the two red plugs and use a small screwdriver to remove power wires.  
Step 5c -- Use new 1/8” rivets or #6 screws to install replacement board.

Step 6 -- Reverse above steps to replace electrical components and to replace panel.
Access to Electrical Components (Room-Side Accessible Option)

**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 counter clock-wise. 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 the pre-filter and set aside. See sections 2 and 3 for instructions.

Step 5 -- Using a flat screwdriver, release the mid panel by rotating the three (3) fasteners a 1/4-turn counter clock-wise. Allow panel to swing down to vertical and remove from unit. Set aside.

Step 6 -- Use a 5/16" hex driver to remove screws holding electrical access panel (Find them in the ø1/4" round holes in foam). Slide panel over to release from the slots.

Step 7 -- To remove transformer:
   Step 7a -- Disconnect all wires from terminals. See wiring diagram for replacing wires.
   Step 7b -- Using a 1/8" drill bit, drill out the two rivets. Clean debris.
   Step 7c -- Use new 1/8" rivets or #6 screws to install replacement transformer.

Step 8 -- To remove control board:
   Step 8a -- Use a 5/16" hex driver to remove screws holding control board bracket.
   Step 8b -- Remove the two red plugs and use a small screw driver to remove power wires.
   Step 8c -- Using a 1/8" drill bit, drill out the two rivets holding control board to bracket. Clean debris.
   Step 8d -- Use new 1/8" rivets or #6 screws to install replacement board.

Step 11 -- Reverse above steps to replace electrical components and to replace panels.
DUCTED APPLICATIONS & USE WITH VAV AIR TERMINALS

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.

The unit should not be programmed to run as constant airflow in this application. 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. The units should be ordered with a constant torque program. This will remove the dirty filter ramp-up feature and the CFM display will no longer be accurate. However, this is still preferable to a PSC system due to the energy efficiency of an ECM versus a PSC motor.

Ducted applications While the fan filter unit can handle some positive or negative static pressure, optimal performance and reliability will be achieved with an inlet static pressure of 0.0"WC or slightly negative.

To reach an accurate 0.0"WC inlet static, it is recommended that the primary air balancing of the duct system be done before installing the fan filter unit. When the duct is at optimal static, install the unit per these instructions and adjust the airflow to the design setting. Verify the airflow with an airflow hood.

It is recommended that all FFUs in the system be energized before any upstream devices to prevent the FFU blower wheel from spinning backwards. While the motor can generally overcome this, if the airflow needed to overcome high static is too great, it may not. This will cause the motor to shut down. Continual running of the motor backward may result in reduced reliability of the EC motor.
NOTE: ON/OFF SWITCH AND DIGITAL CONTROL ARE HIDDEN WHEN FACE FRAME IS IN PLACE.

- ON/OFF SWITCH
- DIGITAL CONTROL
- AIRFLOW DISPLAY
- STATUS LED INDICATORS
  - YELLOW -- UNIT OFF
  - GREEN -- UNIT RUNNING
  - RED -- FILTER DIRTY (OPTIONAL)

FACE FRAME ON

FACE FRAME REMOVED
PAO CHALLENGE SYSTEM

An optional PAO Challenge Manifold System is available to provide 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 -- Using a flat screwdriver, release the face frame by rotating the four (4) fasteners a 1/4-turn counter clockwise. Unhook the safety cables from the filter clips. Set the frame aside.

Step 2 -- Remove cap from PAO concentration port (brass). Attach UPSTREAM hose (1/4" ID) from photometer to PAO concentration port.

Step 3 -- Remove cap from PAO challenge supply port (aluminum). Attach DOWNSTREAM hose (3/8" ID) from photometer to PAO concentration supply port.

Step 4 -- Conduct the challenge test per equipment specifications and IEST-RP-CC034.3.

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.

---

PAO manifold blows oil into airstream for maximum mixing (both ends)

PAO Concentration / Static pressure port 1/2" barb fitting

PAO challenge supply port 1/2" barb fitting
CONTROLS

The fan filter unit can be controlled through various inputs:

1. Local potentiometer control
   - Adjust airflow from the face
   - Adjust flow from back of unit (disabled if face control present)
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 FFU can be done through closed loop control from sensors such as pressure transducers, thermostats, particle 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.

WALL MOUNT POTENTIOMETER CONTROL

Potentiometer and wall plate are provided with this option. It is factory hard wired and tested.

Signal is 0-10VDC. Potentiometer is 0-10K Ohms.

To relocate the potentiometer cut the wires leaving enough lead to make new connections. Run 3 conductor wire rated for the requirements of the installation and meeting all relevant codes. If possible, use strain relief at the fan filter unit.

Connect wires like to like at each end of the extension leads. Retest unit to verify operation.
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 on-board RJ45 connectors.

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

ACC1001 control used as an example. Other controller options available.

Power is supplied to controller by a wall AC adapter supplied with controller.
1. RJ45 Dual Jacks
2. Modbus Address DIP Switches
3. S1-1 and S1-2 Configuration DIP Switches
4. STATUS LED
5. NET LED (network activity)
6. FAULT LED
7. Multimeter Common
8. Multimeter Setpoint as mVDC
9. Multimeter CFM as mVDC
10. Onboard Setpoint Potentiometer

A. JPS: Bias input power, isolated
B. JP2: Accessory output voltages
C. JVDC: Selector for 10V regulated or unregulated rectified and filtered bus voltage
D. J1: EC Motor Port
E. JVS-1: INP1 10V signal range selector
F. JP1: INP1 and INP2 analog/digital inputs
G. JVS-2: INP2 10V signal range selector
H. JLED: External FAULT output
J. JPUD2: INP2 digital input pull-up or 20mA signal format selector
K. JPUD1: INP1 digital input pull-up or 20mA signal format selector
L. JP420: 0-20mA or 4-20mA signal format selector
M. JFBS: TACH or Analog 2 feedback signal selector
N. Aux Board Port
NETWORKING

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 setpoint 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 setpoint input.

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

<table>
<thead>
<tr>
<th>DIP Switch Pole</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
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<td>8</td>
</tr>
<tr>
<td>5</td>
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<tr>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>7</td>
<td>64</td>
</tr>
<tr>
<td>8</td>
<td>128</td>
</tr>
</tbody>
</table>

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

*See page 23 for more examples
CONFIGURATION DIP SWITCHES S1-1 & S1-2

<table>
<thead>
<tr>
<th>Switch</th>
<th>S1-1</th>
<th>S1-2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Loop Mode</td>
<td>Setpoint Source</td>
</tr>
<tr>
<td>OFF</td>
<td>Open-Loop Control</td>
<td>Analog Setpoint</td>
</tr>
<tr>
<td>ON</td>
<td>Closed-Loop Control</td>
<td>Network Setpoint</td>
</tr>
</tbody>
</table>

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 Setpoint -- Unit is controlled with an analog controller, i.e. on-board potentiometer or individual wall mounted controller (must be determined before ordering)
Network Setpoint -- Unit is controlled with a networked controller, i.e. ACC1 or ACM7052 touchscreen controller

SENSOR SHUNT TABLES

<table>
<thead>
<tr>
<th>Shunt</th>
<th>JP420</th>
<th>JFBS</th>
<th>JVS-1*</th>
<th>JVS-2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT</td>
<td>0 - 20mA</td>
<td>ANALOG</td>
<td>0 - 5VDC</td>
<td>0 - 5VDC</td>
</tr>
<tr>
<td>IN</td>
<td>4 - 20mA</td>
<td>N/A</td>
<td>0 - 10VDC</td>
<td>0 - 10VDC</td>
</tr>
</tbody>
</table>

*Leave shunt out if using a 0-20mA or 4-20mA sensor.

Shunt Table for JP1 wiring block

<table>
<thead>
<tr>
<th>Center Pin to...</th>
<th>JPUD1:INP1</th>
<th>JPUD2:INP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>No connection</td>
<td>ANALOG 5V or 10V</td>
<td>ANALOG 5V or 10V</td>
</tr>
<tr>
<td>20mA</td>
<td>ANALOG 20mA</td>
<td>ANALOG 20mA</td>
</tr>
<tr>
<td>+5V PU</td>
<td>DIGITAL 10kΩ pull-up TO 5V</td>
<td>DIGITAL 10kΩ pull-up TO 5V</td>
</tr>
</tbody>
</table>

Shunt Table for JP2 wiring block

<table>
<thead>
<tr>
<th>Center Pin to...</th>
<th>JVDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Connection</td>
<td>VSEL = no connection; open</td>
</tr>
<tr>
<td>10V</td>
<td>VSEL = 10V regulated</td>
</tr>
<tr>
<td>V.RFU</td>
<td>VSEL = DC filtered, unregulated, ~33VDC</td>
</tr>
</tbody>
</table>

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)
- INP2 on JP1 wiring block is for closed-loop feedback or monitoring
  - Controlling airflow by room pressure or particle counter
- INP1 on JP1 wiring block is for monitoring only
  - 0 - 10VDC
  - 0 - 5VDC
  - 0 - 20mA
  - 4 - 20mA
EXAMPLE OF WIRING A PRESSURE TRANSUDER 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
RESETTABLE FUSE/MAIN POWER SWITCH

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

The main power switch is located on the electrical on the backside of the unit. An additional disconnect can be added by others per local codes and regulations.

NOTE: If 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.
TYPICAL FFU-2 ELECTRICAL WIRING (Plenum Side)

Legend

---
LINE VOLTAGE (By Others)
---
LINE VOLTAGE
---
24 VAC
TYPICAL ELECTRICAL WIRING DIAGRAM (MOTOR / ELECTRONICS ROOM-SIDE ACCESSIBLE)
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 below.
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

<table>
<thead>
<tr>
<th>DIP Pole</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>32</td>
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<td>7</td>
<td>64</td>
</tr>
<tr>
<td>8</td>
<td>128</td>
</tr>
</tbody>
</table>
Cleaning the Fan Filter Unit Pre-filter
(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 rocker 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 -- Using a driver, remove the screw holding the hinged door. This allows access to the pre-filter. Slide the pre-filter out of the motor enclosure. This step is not applicable if unit is non-ducted.

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 and slide the filter back into the motor enclosure. Filter should be completely dry before reinstalling into unit.

Step 5 -- Using the driver, re-secure the cover with the screw.
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 elapse 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.

Trouble Shooting
Low Airflow
- If optional red HEPA-lert LED light is on, replace the HEPA 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 HEPA 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
- Insure 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 HEPA filter and gel seal. If fail seal or replace the HEPA filter as necessary.