

# FRESH AIR POWER VENTILATOR

Model: FAPV180-AC



## ITEMS INCLUDED:

- FAPV inline fan unit
- MERV-6 washable filter
- Mounting Brackets (2)
- #10 sheet metal screws, blunt point (4)
- Instruction Booklet



**WARNING: READ AND SAVE THESE INSTRUCTIONS.** Read these instructions carefully and entirely before attempting to assemble, install, operate, or maintain this product and related equipment. Protect yourself and others by observing all safety cautions, warnings and information. Failure to comply with instructions could result in personal injury and/or property damage.

The FAPV Power Ventilator is an inline duct-connected fan intended for use to provide fresh outdoor air for the purpose of meeting indoor ventilation code requirements and occupant preferences. Fresh outdoor air is brought in through an outdoor intake air hood and ducted into the ventilator, which discharges the fresh air either by duct connection to HVAC ductwork (see further instructions), or directly into the space to be ventilated, such as a mechanical closet.



**WARNING: Do not use the FAPV ventilator as an exhaust fan for range hoods, combustion appliances or equipment, damp locations such as spaces with bathtubs, pools or showers, or hazardous or explosive gases or vapors.**



**WARNING: 115 VOLTS MAY CAUSE SERIOUS INJURY OR DEATH FROM ELECTRICAL SHOCK. DISCONNECT AND TAG ELECTRICAL SERVICE BEFORE STARTING INSTALLATION OR FIELD SERVICE. LEAVE ELECTRICAL SERVICE DISCONNECTED UNTIL INSTALLATION OR FIELD SERVICE IS COMPLETE.**

This device MUST be installed by a qualified agency in accordance with the manufacturer's installation instructions. The definition of a qualified agency is: any individual, firm, corporation or company which either in person or through a representative is engaged in, and is responsible for, the installation and operation of HVAC appliances, who is experienced in such work, familiar with all the precautions required, and has complied with all the requirements of the authority having jurisdiction.

Please retain these instructions after installation.

Installed By: \_\_\_\_\_ Phone: \_\_\_\_\_ Installation Date: \_\_\_\_\_



**FIELD CONTROLS**

*Improving Indoor Environments*

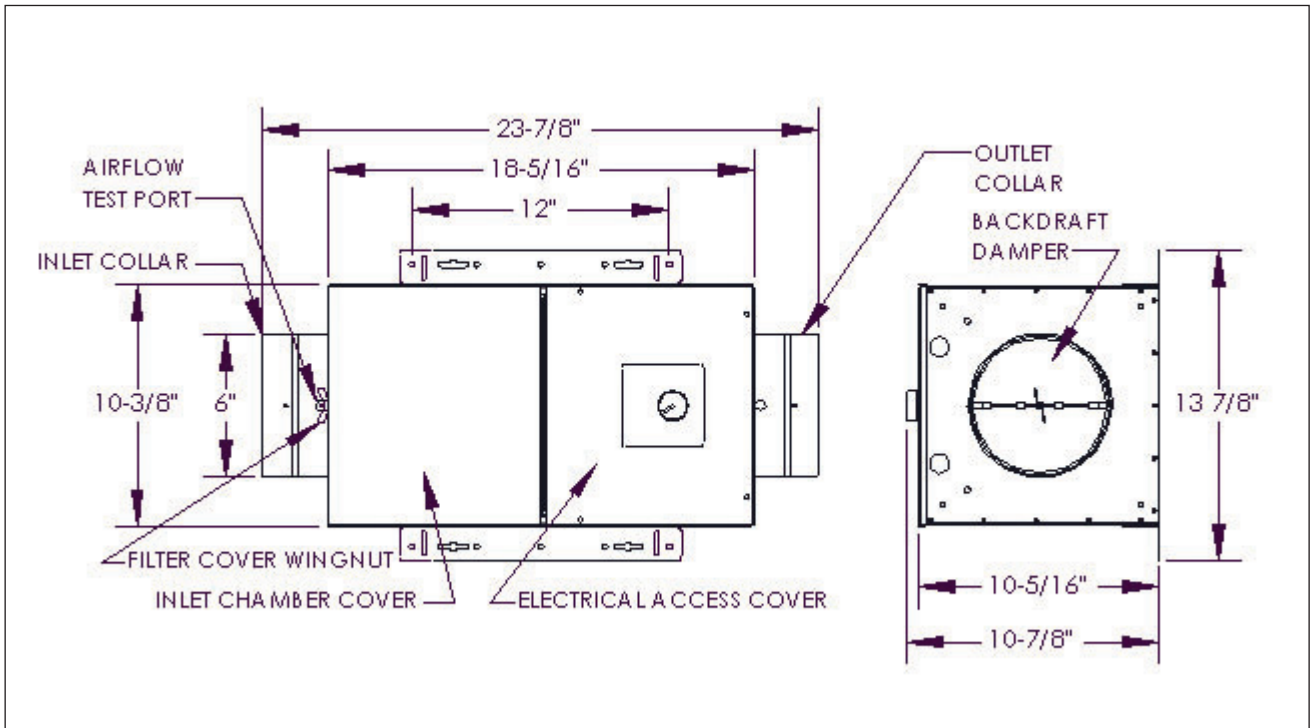
[www.fieldcontrols.com](http://www.fieldcontrols.com)

P/N 780104900 Rev A 09/20

(THIS PAGE LEFT INTENTIONALLY BLANK)

# SPECIFICATIONS

Motorized Impeller Specifications	PSC Motor Class F Insulated Thermally protected UL, CSA recognized Impeller rated UL 94-5VA flammability Sealed ball bearings Nominal RPM: 2600
Power Supply	115 VAC, 60 Hz
Watts (mx speed)	85W
Amps (max speed)	0.90A
Temperature Range	-22 to 140°F Ambient Outdoor Temperature
Control Voltage (optional)	24 VAC
Air Flow Range	30 to 220 cfm @ 0.20 Static Pressure
Filtration	MERV6, Washable, UL-900 rated



DIMENSIONAL DATA

# OPERATIONAL MODES AND PRODUCT FEATURES

The FAPV Power Ventilator may be set up to run either continuously on 115 VAC 60 Hz power alone, or to run intermittently as controlled by a fresh air ventilation controller (not included) such as the Field Controls model FAVC Ventilation Control (or programmable thermostat) that is configurable to provide 24 VAC low-voltage output for use in controlling ventilation. The FAPV includes an electronic speed control with a readily-accessible Off switch that may be used to meet either the continuous ventilation rate or equivalent intermittent ventilation rate as required by fresh air ventilation standards such as ASHRAE 62.2, the International Residential Code, International Mechanical Code, California Energy Commission Title 24 and others. When set up for intermittent ventilation, the speed control feature may also be used to reduce the outdoor air flowrate and help meet the minimum return temperature requirements of HVAC systems, see Mixed Air Plenum Temperature Table on page 8.

The FAPV also includes a MERV-6 washable air filter, as well as an internal slot for easy slide-in installation of a standard-sized 10" x 10" x 2" air filter (not included) of higher particulate removal efficiency as may be desired.

The FAPV also includes a passive airflow-operated backdraft damper as may be required by code for installation of a ventilation system air inlet duct.

 **WARNING: All air filters installed in the FAPV Power Ventilator must be certified and marked for compliance to UL 900 Standard for Air Filter Units. Use of an uncertified air filter may result in a fire and/or smoke hazard.**

## PLANNING FOR INSTALLATION

 **CAUTION: Review the following installation guidelines carefully before beginning the installation.**

### Air Inlet:

Air inlets (intake air hoods or terminations) must be located at least 10 feet away from known contaminant sources, such as chimneys, dryer, central vacuum and other appliance vents, fuel-burning appliance exhaust terminations, barbecue grills, vehicle exhaust, garbage bins etc.

The air intake hood or termination must have an insect screen of maximum ¼" mesh size. The Field Controls model IAH-6 meets this specification.

Air inlets must be installed according to the manufacturer's instructions and be at least 12" above ground or the expected maximum snow level, whichever is highest.

 **WARNING: Fresh air inlets must comply with all applicable local and national codes, to the satisfaction of the local Authority Having Jurisdiction (AHJ).**

### FAPV Power Ventilator:

The FAPV Power Ventilator must be located in a dry and protected area, and be protected from moisture, condensation, potential water drips or spray and excessive low or high ambient temperatures (see Specifications).

The FAPV Power Ventilator must be located and positioned such that access for service and maintenance (such as filter cleaning or replacement) is safe and adequate. At least 10" of clearance above the filter compartment cover is required for filter cleaning and/or replacement.

The FAPV Power Ventilator requires a 115VAC, 60Hz power source of minimum 20A ampacity and maximum circuit protection of 15A. A dedicated power supply circuit is recommended.

The FAPV Power Ventilator may be controlled for intermittent operation by a ventilation controller (not included) having a 24VAC control output for ventilation, such as the Field Controls model FAVC or HHSC+ ventilation controller. If used, the controller must be installed in compliance with the manufacturer's instructions.

 **WARNING: Electrical installation, wiring and connections must be performed by qualified person(s) and in compliance with all applicable local and national codes and standards to the satisfaction of the local Authority Having Jurisdiction (AHJ).**

## Air Inlet Hood and Ducts:

The ducting from this fan to the outside of the building has a strong effect on the air flow, noise, and energy use of the fan. Use the shortest straightest duct routing possible for best performance and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

An air inlet (intake hood or termination) with an insect screen (max. 1/4" mesh size recommended) and minimum 6" outlet duct connection is required, although larger hoods may be used with a reducer to connect with the inlet air duct. The inlet and outlet air ducts must be insulated (check code requirements) and be minimum 6" diameter or equivalent size. Rigid smooth-walled pipe is recommended, although flex duct may be used if installed for minimum pressure drop. Larger size duct/pipe may be used to further reduce pressure drop and increase fan performance if desired, with a reduction to 6" diameter at the FAPV.

If the outlet duct is to be connected to the return ducting of the HVAC system and the FAPV is set up for intermittent ventilation, installation of a 24 VAC powered air damper such as the Field Controls model FAD-6 is strongly recommended to prevent incoming air flow during periods when the HVAC fan is active but the FAPV is not active. See wiring diagrams for wiring connection of the FAD to the FAPV and ventilation controller.

## INSTALLATION OF FAPV VENTILATOR



### CAUTION: DISCONNECT ELECTRICAL POWER BEFORE BEGINNING INSTALLATION.

1. Review the Planning for Installation section of these instructions and choose a location for securing the FAPV to the mounting surface. The FAPV ventilator fan unit may be mounted in any position that allows access to both removable panels for service and maintenance.
2. The FAPV is of rugged construction and requires adequate support for mounting. Install 2x4 bridging or min. 3/4" thick plywood platform if required for secure mounting; see Figure 2.
3. Attach the mounting brackets to the FAPV fan unit in any of the opposing positions shown in Figure 1, using the supplied #10 blunt-tipped sheet metal screws. The brackets must either be on opposite sides or opposite ends of the FAPV fan unit for secure mounting.



**WARNING: DO NOT USE INSTALLER-SUPPLIED SCREWS TO ATTACH THE MOUNTING BRACKETS TO THE FAPV. An electrical hazard may result, possibly causing bodily injury, fire hazard, and/or equipment damage. The use of longer and/or sharp-pointed screws may cause damage to electrical wiring and/or components inside the FAPV fan unit. Contact Field Controls Technical Support for instruction if alternate fastening methods must be used.**

4. Mount the FAPV fan unit securely onto the mounting surface, wall studs, joists, rafters or trusses using appropriate fasteners, See Figure 2. Do not fasten to drywall or thin paneling alone.



**WARNING: Use extreme caution to avoid contact with or damage to plumbing, electrical wiring, or other objects that may be hidden behind the mounting surface when cutting, drilling or installing hardware!**

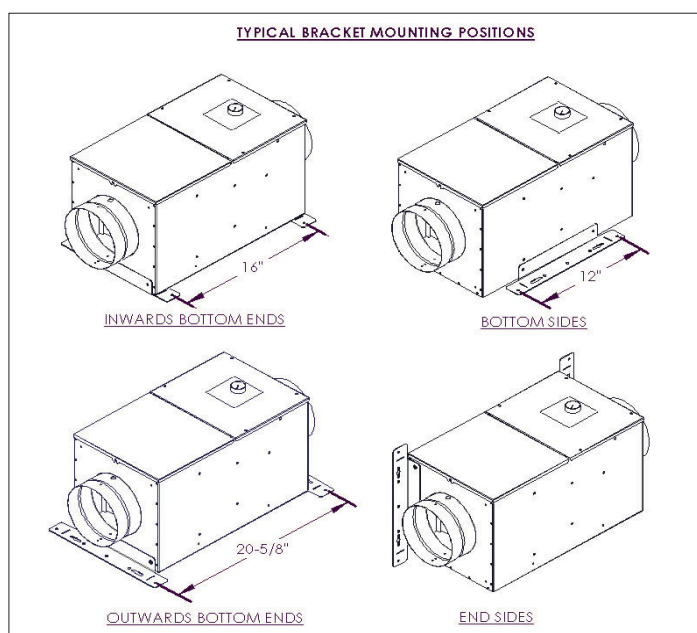


Figure 1 - TYPICAL BRACKET MOUNTING POSITIONS

NOTE: The FAPV fan unit may also be hanger bar mounted, using a minimum of 4 x 3/8" threaded rod using appropriate mounting hardware (rod and hardware not included); see Hanger Bar Mounting, Figure 3.

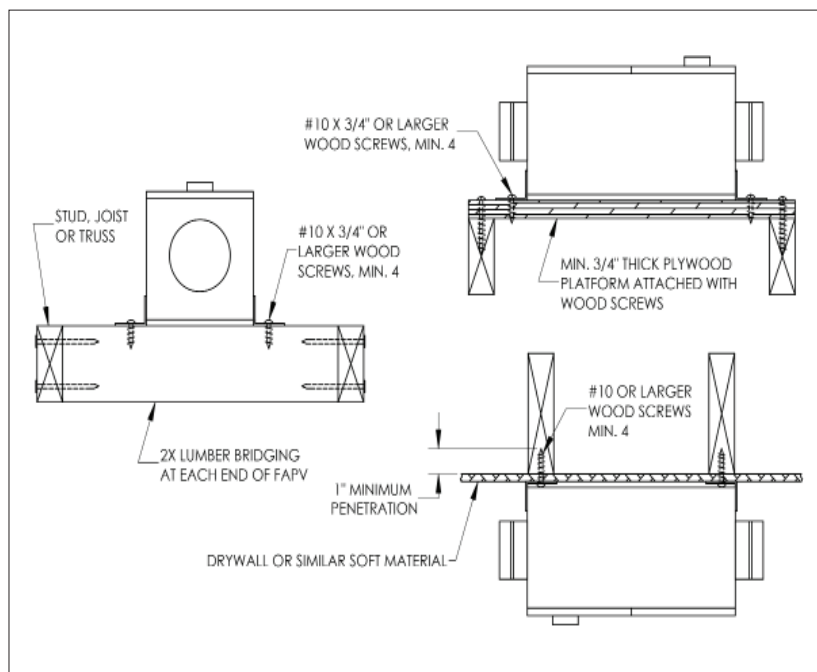


Figure 2 - TYPICAL MOUNTING

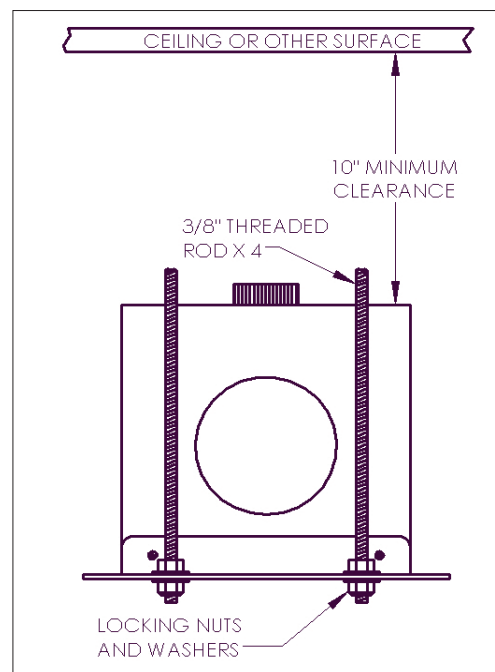


Figure 3 - HANGER BAR MOUNTING

## AIR INLET (INTAKE) HOOD INSTALLATION



**CAUTION: DISCONNECT ELECTRICAL POWER BEFORE BEGINNING INSTALLATION.**

1. Review the section PLANNING THE INSTALLATION, Air Inlet Hood and Ducts for proper sizing and location of the air intake hood (not included). Ensure that duct type, insulation, installation and joining methods comply with all applicable local and national building codes.
2. Cut a hole through the exterior wall that is just large enough to fit the insulated duct through.



**WARNING: Use extreme caution to avoid contact with or damage to plumbing, electrical wiring, or other objects that may be hidden behind the mounting surface when cutting, drilling or installing hardware!**

3. Install appropriate flashing around the hole if necessary and pull the duct through the hole.
4. Fasten the duct securely to the intake hood using code-compliant methods such as screws and/or appropriately rated tape, and seal with mastic if required.
5. Pull the duct insulation and vapor barrier almost up to the intake hood mounting plate, secure it in place using approved tape or zip tie(s), and seal with properly rated tape or mastic to prevent condensation from entering.
6. Apply exterior sealant to the backside of the intake hood mounting flange and fasten the intake hood to the exterior wall using appropriate fasteners. Apply additional sealant to the edges of the mounting flange and to the fasteners to prevent water entry into the wall structure.
7. Replace wall insulation that may have been disturbed during the installation, and finish around the air inlet duct as required.

## DUCTWORK INSTALLATION

1. Connect the inlet air duct to the inlet collar of the FAPV fan unit, using code-compliant methods such as screws, zip ties and/or rated tape, and seal with mastic if required.

**NOTE:** if a ventilation controller having an outdoor air temperature sensor that may be mounted on the inlet air duct is to be used (such as Field Controls model FAVC), follow the manufacturer's instructions to mount the outdoor temperature sensor on the inlet air duct, as close to the intake air hood as is reasonably convenient, see Figures 4 and 5. **DO NOT** mount the sensor on the duct connected to the outlet of the FAPV ventilator fan unit.



2. Inspect the factory-installed backdraft damper vanes and their seal in the outlet collar of the FAPV fan unit and verify proper operation of the damper. Air flow through the FAPV will cause the damper vanes to open; spring pressure/air pressure will cause the vanes to close when air flow ceases or tends to go back out of the FAPV towards the inlet air hood.
3. Taking care to avoid damage or obstruction to the back draft damper, connect 6" insulated duct (or larger if an increaser is used) to the outlet collar of the FAPV fan unit and to the supply or return side of the HVAC system, using methods described in the Air Inlet (Intake Hood) Installation section (see Figure 5) If the furnace or fan center is installed in a mechanical closet without a return side plenum or duct, the outlet of the duct or FAPV fan unit may open directly into the mechanical closet space if allowed by code, see Figure 4.

**CAUTION:** Cold or freezing outdoor temperatures may cause pipes to rupture and/or subject mechanical equipment to temperatures below their rated minimum return or ambient temperatures. Do not discharge outdoor air directly at a pipe or water heater, or any other item at which unheated outdoor air may cause freezing. Ensure that the minimum return temperature rating of the HVAC unit is met by adjusting the FAPV fan speed to result in a sufficient mixed-air temperature (see Table on page 14 for flow rates and expected minimum temperatures of outdoor air, return air, and the resulting temperature of mixed outdoor and return air).

**WARNING:** Use extreme caution to follow all manufacturer's instructions, safety warnings and cautions if a duct heater is to be installed. Do not install a duct heater on the duct connected to the inlet of the FAPV.

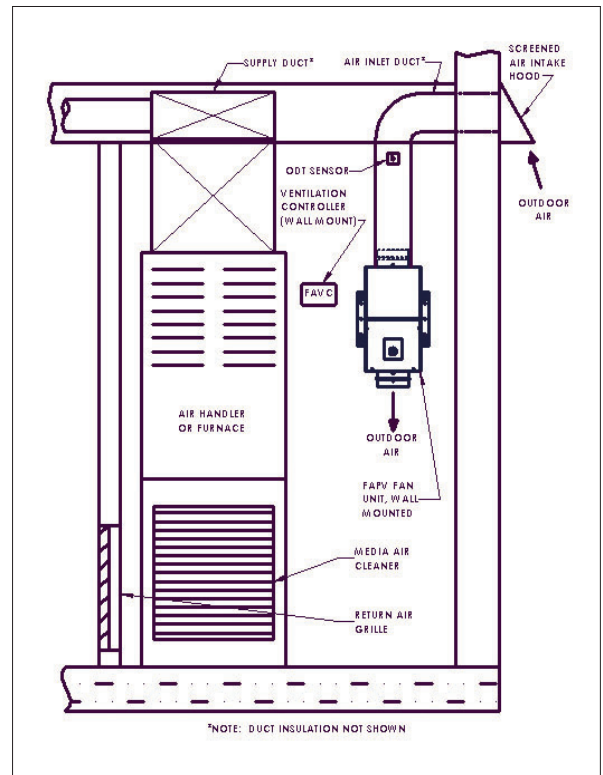


Figure 4 -  
MECHANICAL CLOSET TYPICAL INSTALLATION

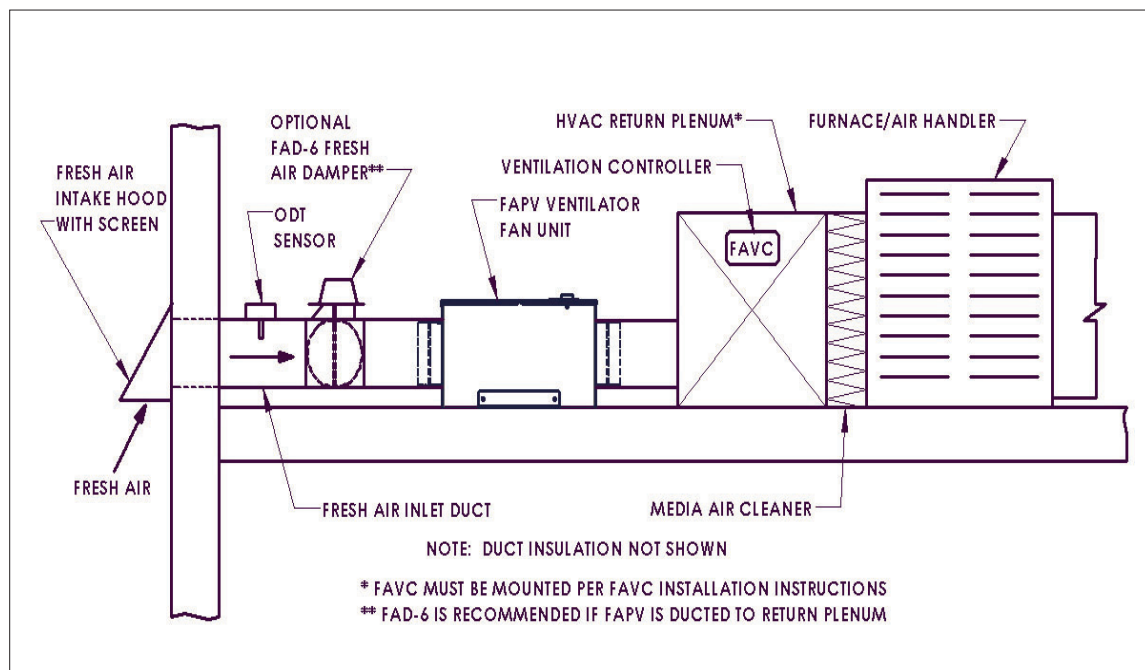


Figure 5 - HVAC PLENUM TYPICAL INSTALLATION

**RESULTING PLENUM TEMPERATURES WHEN MIXING FRESH AIR  
IN °F, ASSUMING AN AVERAGE RETURN DUCT TEMPERATURE OF 66° F  
% of Fresh Air in Total Fan Flow**

OUTDOOR AIR TEMPERATURE	% of Fresh Air in Total Fan Flow								
	3.0%	5.0%	7.5%	10.0%	12.0%	14.0%	16.0%	20.0%	25.0%
50	65.5	65.2	64.8	64.4	64.1	63.8	63.4	62.8	62.0
45	65.4	65.0	64.4	63.9	63.5	63.1	62.6	61.8	60.8
40	65.2	64.7	64.1	63.4	62.9	62.4	61.8	60.8	59.5
35	65.1	64.5	63.7	62.9	62.3	61.7	61.0	59.8	58.3
30	64.9	64.2	63.3	62.4	61.7	61.0	60.2	58.8	57.0
25	64.8	64.0	62.9	61.9	61.1	60.3	59.4	57.8	55.8
20	64.6	63.7	62.6	61.4	60.5	59.6	58.6	56.8	54.5
15	64.5	63.5	62.2	60.9	59.9	58.9	57.8	55.8	53.3
10	64.3	63.2	61.8	60.4	59.3	58.2	57.0	54.8	52.0
5	64.2	63.0	61.4	59.9	58.7	57.5	56.2	53.8	50.8
0	64.0	62.7	61.1	59.4	58.1	56.8	55.4	52.8	49.5
-5	63.9	62.5	60.7	58.9	57.5	56.1	54.6	51.8	48.3
-10	63.7	62.2	60.3	58.4	56.9	55.4	53.8	50.8	47.0
-15	63.6	62.0	59.9	57.9	56.3	54.7	53.0	49.8	45.8
-20	63.4	61.7	59.6	57.4	55.7	54.0	52.2	48.8	44.5
-25	63.3	61.5	59.2	56.9	55.1	53.3	51.4	47.8	43.3
-30	63.1	61.2	58.8	56.4	54.5	52.6	50.6	46.8	42.0
-35	63.0	61.0	58.4	55.9	53.9	51.9	49.8	45.8	40.8
-40	62.8	60.7	58.1	55.4	53.3	51.2	49.0	44.8	39.5

**Finding the resulting Plenum Temperature when mixing outdoor air with HVAC return air:**

Example:

HVAC Fan Rated Flow at System Pressure: 1200 CFM

Minimum Predicted Outdoor Air Temp: 0° F

Fresh Air Flow Rate: 150 CFM

% Fresh Air = Fresh Air CFM ÷ Blower CFM x 100% = 150 ÷ 1200 x 100% = 12.5%

From the table column closest to 12.5% (12%), find the value corresponding to the outdoor temperature (0°): 58.1°F. Use the next lower outdoor temperature if inbetween the given outdoor temperatures on the scale. This will be the approximate minimum temperature of the air entering the HVAC heating appliance.

TABLE A: MIXED AIR PLENUM TEMPERATURE

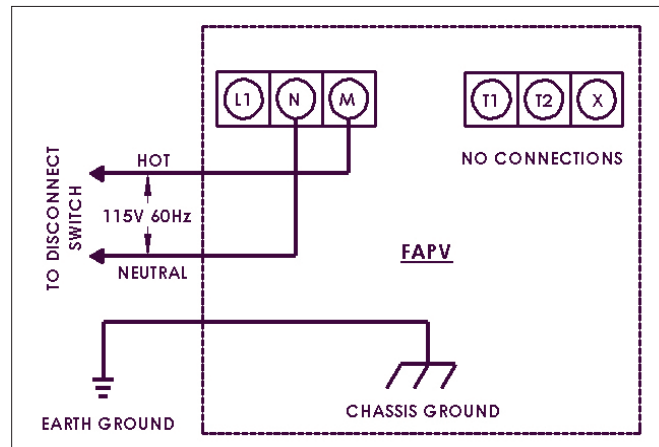


# ELECTRICAL POWER AND CONTROL WIRING

The FAPV Power Ventilator may be set up to operate continuously with a 115 VAC power source alone, or to operate intermittently as controlled by a ventilation controller having 24VAC output, such as the Field Controls model FAVC Ventilation Control.



**CAUTION: DISCONNECT AND TAG OUT ELECTRICAL POWER BEFORE BEGINNING INSTALLATION.**



Wiring Diagram A: STANDALONE OPERATION

## For Continuous (Standalone) Operation, refer to Wiring Diagram A:

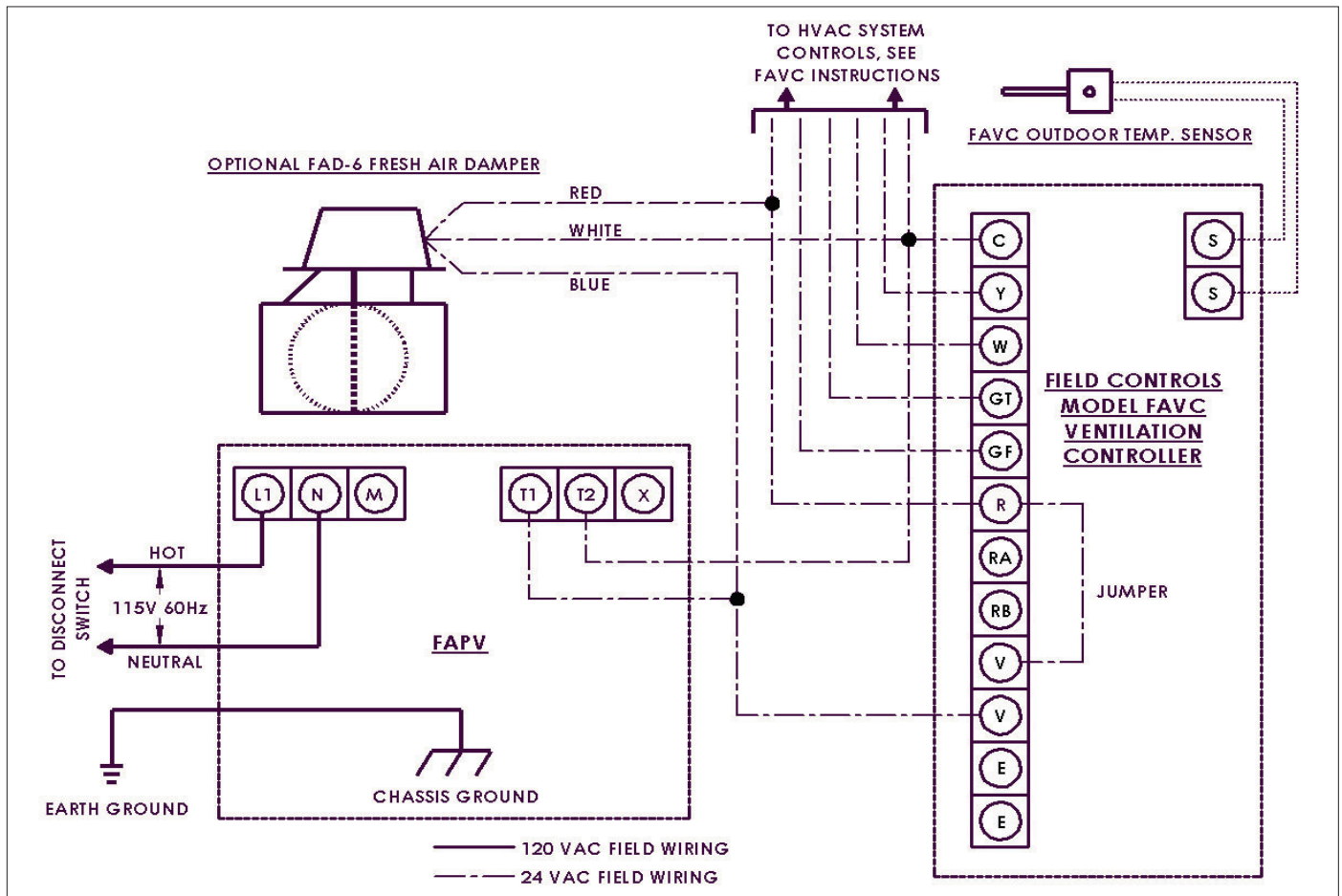
1. Run electrical service to the FAPV fan unit installation area and install an electrical disconnect switch located as required by all applicable national and local building and electrical codes.
2. Label or mark the disconnect switch as “Mechanical Ventilation” to identify the switch as required by ventilation codes.
3. Remove the FAPV filter compartment cover by loosening the wingnut near the inlet collar. Lift the wingnut end of the cover away from the fan unit and pull it away from the electrical access cover to disengage the filter compartment cover from the electrical access cover.
4. Remove the speed control knob on the FAPV fan unit by pulling it straight away from the FAPV electrical access cover. Do not twist the knob while pulling.
5. Remove the FAPV electrical access cover by removing the four #8 blunt-tipped screws from the cover.
6. Run the electrical circuit from the disconnect switch to the FAPV fan unit through the strain relief/conduit connector on the FAPV marked for 115 VAC wiring access and into the electrical compartment of the FAPV (see Wiring Diagram A). If conduit is used on the electrical circuit, make sure to use an anti-short bushing on the end of the conduit as required.
7. Connect the ground conductor wire to the green grounding screw of the FAPV.
8. **Connect the 115V hot lead conductor wire to the M terminal of the FAPV (continuous ventilation only).**
9. Connect the 115V neutral conductor wire to the N terminal of the FAPV.
10. Verify that the blower wheel spins freely and is free from obstruction, and that the interior of the FAPV fan unit is free of debris and other foreign objects.
11. Tighten the conduit/strain relief connector clamp onto the electrical cable or conduit.
12. Replace the electrical access cover of the FAPV fan unit using only the original factory blunt-tipped screws that were removed from the cover.



**WARNING: DO NOT USE INSTALLER-SUPPLIED SCREWS TO ATTACH THE ELECTRICAL ACCESS COVER TO THE FAPV. An electrical hazard may result, possibly causing bodily injury, fire hazard, and/or equipment damage. The use of longer and/or sharp-pointed screws may cause damage to electrical wiring and/or components inside the FAPV fan unit. Contact Field Controls Technical Support for instruction if alternate fastening methods must be used.**

13. Replace the speed control knob by aligning the flat on the speed control stem with the flat in the knob, and use light pressure to push the knob fully down onto the speed control stem.
14. Turn the speed control knob to the Max position.
15. If an additional 10" x 10" x 2" air filter is to be installed (not included), refer to the Maintenance and Filter Installation section in this manual and install the additional filter in the FAPV.
16. Replace the filter access cover by inserting the cover's two "fingers" fully into the corresponding slots in the electrical compartment cover, push the cover down firmly onto the FAPV and tighten the wingnut to secure the cover in place.

**For Intermittent Operation as Controlled by a 24 VAC-output Ventilation Controller  
(Field Controls model FAVC recommended, sold separately):**



Wiring Diagram B: INTERMITTENT OPERATION

1. Complete steps 1 through 6 as given in the section for continuous standalone operation.
2. Connect the ground conductor to the green grounding screw of the FAPV.
3. **Connect the 115V hot lead conductor wire to the L1 terminal of the FAPV (intermittent operation only).**
4. Connect the 115V neutral conductor wire to the N terminal of the FAPV.
5. Run minimum 18 gauge low-voltage wiring such as thermostat cable (min. 2 conductor wires are required) from the ventilation controller location to the FAPV fan unit (See Wiring Diagram B). Run the low-voltage wiring through the plastic bushing marked for 24 VAC wiring access.
6. Connect two separate low-voltage conductor wires to the T1 and T2 terminals on the FAPV (See Wiring Diagram B). Note the colors/markings of the conductors used; the polarity of the conductors and terminals can be arbitrary (it doesn't matter which wire goes on which terminal).
7. **Install the ventilation control, and configure the control for 24 volts AC output** on a command for ventilation, if necessary. Follow the manufacturer's instructions for remaining connections to the HVAC control system.

**Tip:** If the ventilation controller or thermostat's output for ventilation consists of two V or Vent terminals that are internally connected by dry contacts only, simply jumper the HVAC terminal R to one of the two V terminals, connect T1 to the other V terminal, and connect T2 to the HVAC terminal C.

8. Connect the two low-voltage conductor wires from terminals T1 and T2 to the two appropriate terminals on the ventilation controller.

**NOTE:** For the FAPV to operate when wired for intermittent operation, 24 volts AC must be present on the two terminals of the ventilation controller connected to T1 and T2 during a call for ventilation by the controller. If unsure about control wiring connections, contact Field Controls Technical Support for assistance.

9. Verify that the blower wheel spins freely and is free from obstruction, and that the interior of the FAPV fan unit is free of debris and other foreign objects.
10. Tighten the conduit/strain relief connector clamp onto the electrical cable or conduit.
11. Replace the electrical access cover of the FAPV fan unit using only the original factory blunt-tipped screws that were removed from the cover.



**WARNING: DO NOT USE INSTALLER-SUPPLIED SCREWS TO ATTACH THE ELECTRICAL ACCESS COVER TO THE FAPV. An electrical hazard may result, possibly causing bodily injury, fire hazard, and/or equipment damage. The use of longer and/or sharp-pointed screws may cause damage to electrical wiring and/or components inside the FAPV fan unit. Contact Field Controls Technical Support for instruction if alternate fastening methods must be used.**

12. Replace the speed control knob by aligning the flat on the speed control stem with the flat in the knob, and use light pressure to push the knob fully down onto the speed control stem.
13. Turn the speed control knob to the Max position.
14. If an additional 10" x 10" x 2" air filter is to be installed (not included), refer to the Maintenance and Filter Installation section in this manual and install the additional filter in the FAPV.
15. Replace the filter access cover by inserting the cover's two "fingers" fully into the corresponding slots in the electrical compartment cover, push the cover down firmly onto the FAPV and tighten the wingnut to secure the cover in place.

## TESTING AND AIRFLOW ADJUSTMENTS

**Taking Air Flowrate Measurements:** Several methods of measuring the ventilation air flowrate as provided by the FAPV ventilation system may be used, see Figure 6:

- **Air Flow Capture Hood:** Use of an air flow capture hood (balometer) capable of measurement from 20 cfm to 250 cfm is recommended for the most accurate measurement of air flowrate.
  1. Turn on the flow hood and perform any "zero" procedure as directed by the manufacturer.
  2. Set the flow hood for cfm (cubic feet per minute) measurement using the capture hood.
  3. Press the flow hood against the wall over the air intake hood, being careful not to obstruct the inlet of the air inlet (intake) hood, and take an airflow reading.

- **Pitot Tube Measurement using a Manometer with flow measurement capability (HVAC air pressure/flow measurement instrument), see Figure 6:**
  1. Turn on the manometer and perform the “zero” procedure in an area without air currents.
  2. Set the manometer to measure air flow in a round 6” duct and connect the pitot tube ports with rubber tubing. The center port on the pitot tube should connect to the port marked + or POS on the manometer, while the side port on the manometer should connect to the port marked NEG or –.
  3. Remove the test port plug from the inlet collar of the FAPV fan unit, insert the pitot tube such that the tip of the tube is in the center of the inlet collar and facing upstream (away from the FAPV fan unit, towards the intake hood), allow the reading to become steady and take an airflow reading.

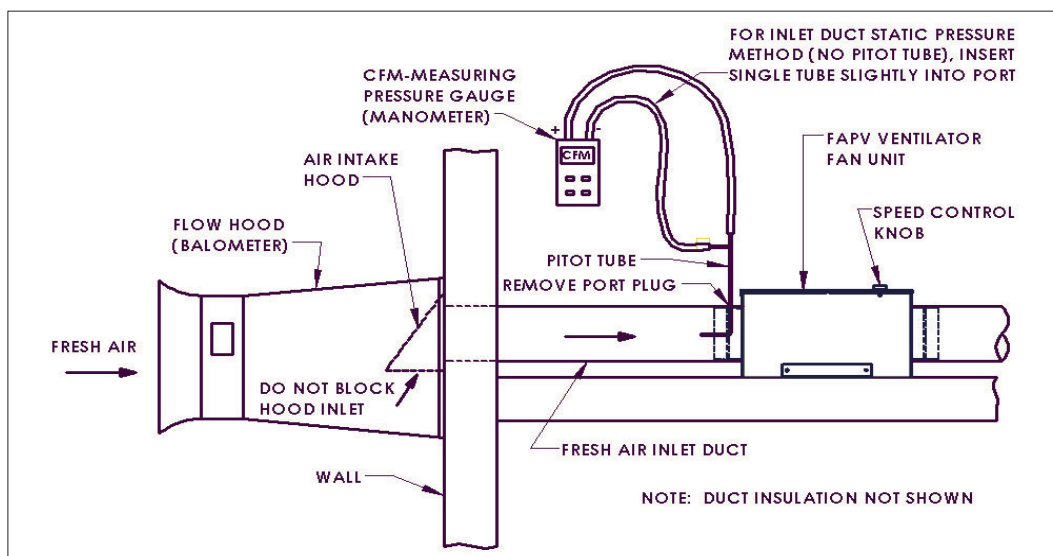


Figure 6, AIR FLOW TUBE MEASUREMENT METHODS

- **Inlet Duct Static Pressure Measurement using a simple Manometer (air pressure gauge), see note on Figure 6.**
  1. Measure the length of duct that is used. Add 12 feet for every 90° bend or elbow; this will be the approximate “equivalent length” of the duct system for use in determining the approximate air flow rate. NOTE: the flow rate table to be used includes the effects of typical intake air hoods in the estimates given on the table; do not add any extra feet to the equivalent length for the intake hood.
  2. Turn off all exhaust fans, central vacuum systems, fireplaces etc. and open doors or windows from the FAPV area to the outdoors if possible.
  3. Ensure that there are no air currents in the area where measurements are to be taken.
  4. Make sure the speed control knob is set to the MAX position.
  5. Turn on the manometer, set it to read in inches of water (“wc, or inH<sub>2</sub>O for example) and perform the “zero” procedure in an area without air currents.
  6. Connect a rubber air pressure tube to the manometer port marked NEG or –.
  7. Remove the test port plug from the inlet collar of the FAPV fan unit and insert the end of the pressure tube very slightly into the port and use tape to temporarily seal the tube to the port. Allow the reading to become steady and take a pressure reading (ignore a minus sign on the reading if present).
  8. Find the desired intake duct static pressure on page 14 for the type and length of duct used, find which horizontal row on the table corresponds to the intake hood size, duct size and length for the installation. For duct lengths more than 9 feet longer than a row’s duct length, use the row for the next longest length. On that row, find the nearest value to the desired ventilation airflow rate (cfm), and at the top of the vertical column that the flow rate is found, find the approximate static air pressure corresponding to that flowrate.

9. Adjust the speed control knob on the FAPV until this static pressure is measured. NOTE: the static pressure more closely matching the actual desired flowrate may be “interpolated” from adjacent column cfm values if desired. Contact Field Controls Technical Support for assistance if needed for help with interpolation.
10. Example: 50 cfm of ventilation flow rate while the FAPV operates is desired to meet ventilation requirements. A model IAD-6 6” intake hood with 27 feet of flex duct is installed, with one 90° bend:
  - “Equivalent length” is  $27 + 12 = 39$  feet
  - The row for 6” hood and duct, 50 feet should be used
  - The column for Flex Duct having the closest value to 50 cfm has the value of 47 cfm (closer to 50 than 40 or 57).
  - The static pressure at the top of this column is 0.035. Adjust the speed knob until slightly over this value is achieved, since 50 is greater than 47.



Inlet Duct Pressure Drop Flow Rate tables:

Inlet Collar Duct Static Pressure		0.005		0.01		0.015		0.025		0.035		0.05	
Inlet Hood & Duct Size	Equivalent Ft. of Duct Length	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe
6" Intake Hood and Duct	10 feet or less	23	29	32	40	40	50	51	64	61	76	72	90
	30 feet	20	25	28	35	34	43	45	56	53	66	63	79
	50 feet	18	22	25	32	31	39	40	50	47	59	57	71
7" Intake Hood and Duct	10 feet or less	39	49	55	69	67	84	87	109	103	129	123	154
	30 feet	33	41	46	58	57	71	73	91	86	108	103	129
	50 feet	29	36	41	51	50	62	64	80	76	95	91	113
8" Intake Hood and Duct	10 feet or less	44	55	62	78	76	95	98	123	116	145	139	174
	30 feet	39	49	55	69	68	84	87	109	103	129	123	154
	50 feet	35	44	50	63	61	76	79	99	94	117	112	140

TABLE B: INLET DUCT PRESSURE DROP FLOW RATE - LOW FLOW RATES

Inlet Collar Duct Static Pressure		0.075		0.1		0.15		0.2		0.25		0.3		0.35	
Inlet Hood & Duct Size	Equivalent Ft. of Duct Length	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe	Flex Duct	Smooth Pipe
6" Intake Hood and Duct	10 feet or less	89	111	102	128	126	157	145	181	162	202	177	221	191	239
	30 feet	77	96	89	111	109	136	126	157	141	176	154	193	166	208
	50 feet	69	87	80	100	98	122	113	141	126	158	138	173	150	187
7" Intake Hood and Duct	10 feet or less	151	188	174	218	213	266	246	308	275	344	301	377	326	407
	30 feet	126	158	146	183	179	224	207	258	231	289	253	316	273	342
	50 feet	111	139	128	160	157	196	181	227	203	254	222	278	240	300
8" Intake Hood and Duct	10 feet or less	170	213	197	246	241	301	278	348	311	389	341	426	368	460
	30 feet	151	188	174	218	214	267	246	308	275	344	302	377	326	407
	50 feet	137	171	158	197	194	242	223	279	250	312	274	342	295	369

TABLE C: INLET DUCT PRESSURE DROP FLOW RATE - HIGH FLOW RATES

## AIR FLOWRATE ADJUSTMENT PROCEDURE

1. Restore power and turn on the electrical disconnect switch if installed.
2. If the FAPV ventilator outlet is connected to the HVAC ductwork, set the indoor thermostat to a setting resulting in operation of the HVAC circulation fan.
3. Adjust the FAPV fan unit speed control knob to the Max setting (fully counterclockwise without turning to OFF position). Note that the FAPV fan unit may be turned off to prevent fan operation, but the FAPV fan unit will remain energized by 115 VAC.
4. Take air flow readings by the methods described above and adjust the FAPV speed control knob until the desired air flowrate or inlet collar static pressure is obtained. Turn the knob to the right (clockwise) to decrease the flowrate. NOTE: The FAPV speed control has a minimum fan speed adjustment screw that may be adjusted if desired. Remove the Electrical Access Cover and access the adjustment screw by inserting a very small Phillips screwdriver through the hole behind the small circle at the 4 o'clock position on the speed scale label (see Figure 8).

**TIP:** Use a ballpoint pen or permanent marker to make a mark on the speed scale of the FAPV label beside the pointer on the speed control knob, and write the measured flowrate in cfm on the label, for future reference.

5. If removed, replace the test port plug on the inlet collar of the FAPV, and pull the duct insulation up over the entire collar and seal to prevent condensation in the ducts.



Figure 8, SPEED CONTROL SCALE LABEL DETAIL

## MAINTENANCE AND FILTER INSTALLATION: CLEANING AND REPLACEMENT

**WARNING:** DISCONNECT POWER TO THE FAPV FAN UNIT BEFORE SERVICING OR REMOVING ACCESS PANELS FROM THE FAPV FAN UNIT.

- The FAPV fan unit has a motorized impeller that has sealed and permanently-lubricated ball bearings; no maintenance or lubrication of the motor is required.
- The FAPV fan unit also includes a washable 1" thick self-supporting prefilter, and a slot for installation of a user-supplied 10 x 10 x 2" standard-size pleated filter if desired, in addition to the factory-installed prefilter. The prefilter should be inspected and cleaned 3 months after initial installation. The regular cleaning period may then be extended to up to every 6 months, depending on how much dirt, dust and other matter has accumulated on the filter.

**WARNING:** All air filters installed in the FAPV Power Ventilator must be certified and marked for compliance to UL 900 Standard for Air Filter Units. Use of an uncertified air filter may result in a fire and/or smoke hazard.

- If installed, a user-supplied 10" x 10" x 2" air filter should be replaced at regular intervals as recommended by the manufacturer.
- Clean and inspect the insect screen in the air intake hood at least every 6 months, and ensure the area around the intake hood remains free of excessive leaf litter, debris, and any sources of air contamination. Inspect the caulking or sealant and flashing around the hood and repair as necessary.

**WARNING:** Use care when inspecting and/or cleaning the air intake hood. Wasps, bees, or hornets etc. may sometimes nest inside protected areas such as the external part of the hood.

### **Cleaning the prefilter and installing or replacing a 10 x 10 x 2" air filter in the FAPV::**

1. Switch off the electrical disconnect switch supplying power to the FAPV fan unit.
2. Remove the FAPV filter compartment cover by loosening the wingnut near the inlet collar, see Dimensional Data on Page 3.) Lift the wingnut end of the cover away from the fan unit and pull it away from the electrical access cover to disengage the filter compartment cover from the electrical access cover.
3. Pull the blue plastic foam 10 x 10 x 1" washable filter out of its installation slot.
4. Wash the filter using a mild dish soap or laundry detergent, rinse well and dry thoroughly.



**WARNING: DO NOT use any type of organic solvent such as acetone, paint thinner, kerosene, spray cleaners or other cleaners that may break down or damage the plastic filter material.**

5. Make sure the prefilter is completely dry and free of residue and push the prefilter back into place in the 1" filter slot. Make sure the flanges of the filter slot completely surround the edges of the prefilter.
6. Remove an existing 10 x 10 x 2" filter (if installed) by pulling it upward out of the 2" filter slot. Replace with or install a new 2" filter by gently pushing the new filter down into the 2" slot until completely seated in the slot. Make sure the air flow direction arrow on the new filter is pointing towards the entrance to the motorized impeller (fan blade).
7. Replace the filter access cover by inserting the cover's two "fingers" fully into the corresponding slots in the electrical compartment cover, push the cover down firmly onto the FAPV and tighten the wingnut to secure the cover in place.
8. Restore power and turn on the electrical disconnect switch if installed.

# TROUBLESHOOTING

- **FAPV fan does not operate:**

- o For 115 VAC hot lead connected to M terminal (continuous standalone operation, no controller):
  - > check for nominal 115 VAC line voltage from N terminal (neutral) to M terminal (115 VAC).
  - > Make sure speed control is not in the OFF position.
  - > Make sure the disconnect switch is turned on.
- o For 115 VAC hot lead connected to L1 terminal (for intermittent control by ventilation controller or programmable thermostat):
  - > check for nominal 115 VAC line voltage from N (neutral) to L1 (115 VAC)
  - > Make sure speed control is not in the OFF position
  - > Make sure the disconnect switch is turned on
  - > check for nominal 24 VAC (with voltmeter set to read volts AC) from terminals T1 to T2 when controller or thermostat is calling for ventilation. When the 115 VAC hot lead is connected to L1, there must be nominally 24 VAC present as measured from T1 to T2, for the fan to operate.
  - > Check for 24 V relay coil resistance (Ohms):
    - Shut off power to the HVAC system and ventilation controller, and disconnect wires from terminals T1 and T2.
    - With a multimeter set to Ohms ( $\Omega$ ), touch probes to T1 and T2. The reading should be around 100 to 200 Ohms. If no reading is given:
      - o Check wiring from T1 and T2 to 24VAC relay coil terminals.
      - o Probe the relay coil terminals. Excessive voltage applied to terminals T1 and T2 can cause failure of the relay coil.

- **Fan runs continuously when intermittent operation by ventilation controller is desired:**

- o Ensure the 115 VAC hot wire is connected to L1, and NOT M.
- o Ensure that no or very little AC voltage is present on T1 and T2 when there is no ventilation call by the controller. Some controllers may allow sufficient electronic “bleed voltage” to cause the FAPV to run when there is no intended call for heat. Use a dry-contact type ventilation controller if necessary, such as Field Controls models HHSC, HHSC+ or FAVC.
- o Check ventilation controller for proper 24V ventilation output configuration.

- **Fan speed control does not allow motor to slow down:**

- o Adjust minimum fan speed adjustment screw. Access the adjustment screw by inserting a small Phillips screwdriver through the hole behind the small circle at the 4 o'clock position on the speed control knob scale (see Figure ??).

- **Fan runs but does not blow air:**

- o Check for obstruction of inlet air hood



**WARNING: Use care when inspecting and/or cleaning the air intake hood. Wasps, bees, or hornets etc. may sometimes nest inside protected areas such as the external part of the hood.**

- o Check for foreign objects and filter condition in the FAPV filter compartment
- o Check operation of backdraft damper in the FAPV outlet collar.

- **Fan motor hums but does not run:**

- o Check for obstruction of the fan blade
- o Check motor capacitor for wiring and capacitance using multimeter with capacitance measurement capability. Capacitor should measure nominal 8 microfarad, 250 VAC.

(THIS PAGE LEFT INTENTIONALLY BLANK)



# REPLACEMENT PARTS

Description	Model Number	Part Number
Prefilter, FAPV	Prefilter FAPV	800108700
Motorized Impeller	Motorized Fan CAS-3,4	46274100
Electronic Speed Control	Control Mod KBWC-14 Mtr Apd	04312200
24 VAC Relay	Relay 24V DPDT Surface Mount	46161400
8 microfarad Motor Capacitor	Capacitor CAS-3,4	46256300

This manual may be downloaded and printed from the Field Controls website ([www.fieldcontrols.com](http://www.fieldcontrols.com))

#### WARRANTY

For warranty information about this or any Field Controls product, visit:  
[www.fieldcontrols.com](http://www.fieldcontrols.com)

Field Controls Technical Support  
1.800.742.8368  
[fieldtec@fieldcontrols.com](mailto:fieldtec@fieldcontrols.com)



9154 Stellar Court, Corona, CA 92883  
Phone: 951.277.0304

2630 Airport Road, Kinston, NC 28504  
Phone: 252.522.3031