FRESH COMMAND MULTI-FAMILY CONTROL

Model: FCMC

FIELDCONTROLS

READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION

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.

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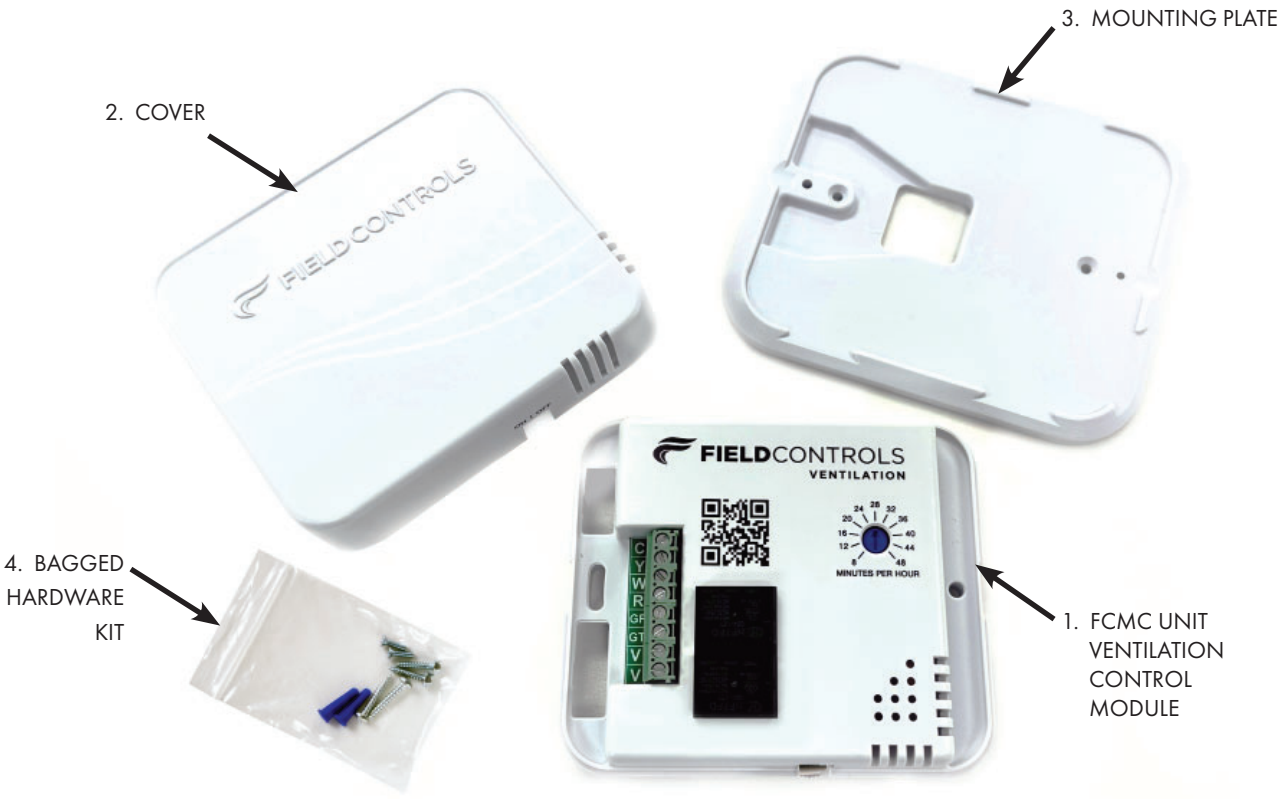
PRODUCT OVERVIEW

The Field Controls Fresh Command MultiFamily Control (FCMC) is designed to provide fresh air ventilation year-round, keeping energy conservation, indoor air quality and comfort in mind. The FCMC delivers ventilation along with many additional features:

- Complies to ASHRAE 62.2 2010; 2013; 2016; 2019(+)
- Auto-senses 8 key factors to balance temperature and humidity regardless of climate zone
- Built-in temperature and humidity sensor with no additional wiring needed
- Quick-Start Test feature for an immediate test cycle
- Fast Click® lock cover deters tenant or renter interference
- Seeks to ventilate with a heating or cooling call for optimal comfort and efficiency
- One dial to adjust intermittent ventilation
- On/off switch with easy access that does not require cover removal

ITEMS INCLUDED WITH FCMC

1. FCMC Unit
2. Cover
3. Mounting Plate
4. Screws



SAFETY CONSIDERATIONS

Understand the signal words **DANGER, WARNING,** and **CAUTION.** These words are universally used for overall safety. **DANGER** identifies the most serious hazards which will result in severe personal injury or death. **WARNING** signifies hazards which could result in personal injury or death. **CAUTION** is used to identify unsafe practices resulting in minor personal injury or product and property damage.

DANGER

- **To prevent serious injury from electrical shock, this product must be installed by a qualified agency.**
- **Associated voltage potential inside if air handler wiring compartments has the potential to cause serious injury or death from electric shock. Some installations may require electrical connections to high voltage sources.**
- **Before installing the FCMC, turn off all power to your HVAC system.**
- **When servicing FCMC system or components attached to FCMC system, turn off all power to these items.**

CAUTIONS

- **Read entire manual and follow all instructions carefully.**
- **Follow all local electrical codes during installation.**
- **All wiring must conform to local and national electrical codes.**
- **Use caution when mounting components to surfaces that may have concealed wiring beneath the surface.**
- **Do not use the ventilation system for removal of flammable fumes or gases.**
- **Do not install ventilation controller in an outdoor location and/or wet location.**
- **Do not obstruct or cover the fresh air intake or air outlet of the ventilation system.**
- **Provisions should be made for make-up air requirements based on recommendations set forth by governing agency to meet applicable building codes and ventilation standards.**

WARNING

- **Sharp metal edges (ductwork) can cause serious injury from cuts.**
- **Wear appropriate gloves when cutting, drilling and grinding plenum openings and handling ductwork.**
- **Wear appropriate eye protection when drilling, grinding and/or cutting ductwork.**

FCMC PRODUCT SPECIFICATIONS:

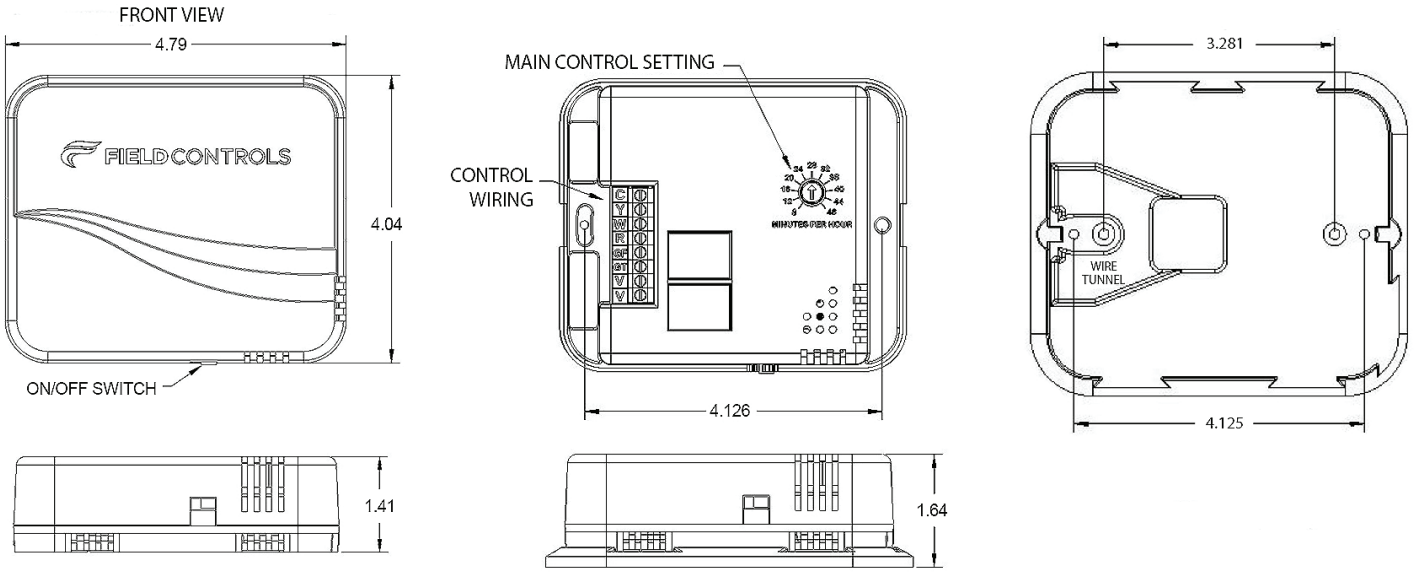
Power Requirements (Class 2 Appliance)

Power	
Input Voltage	16-32 VAC
Full Load Power	1.28W @ 27.4VAC
Idle Power	270mW @ 27.4 VAC
Wiring Requirements	18-22 AWG, 24 VAC (Min)
Operating Temperature Range	10°F to 160°F
Operating Humidity Range	5 to 95% RH (non-condensing)

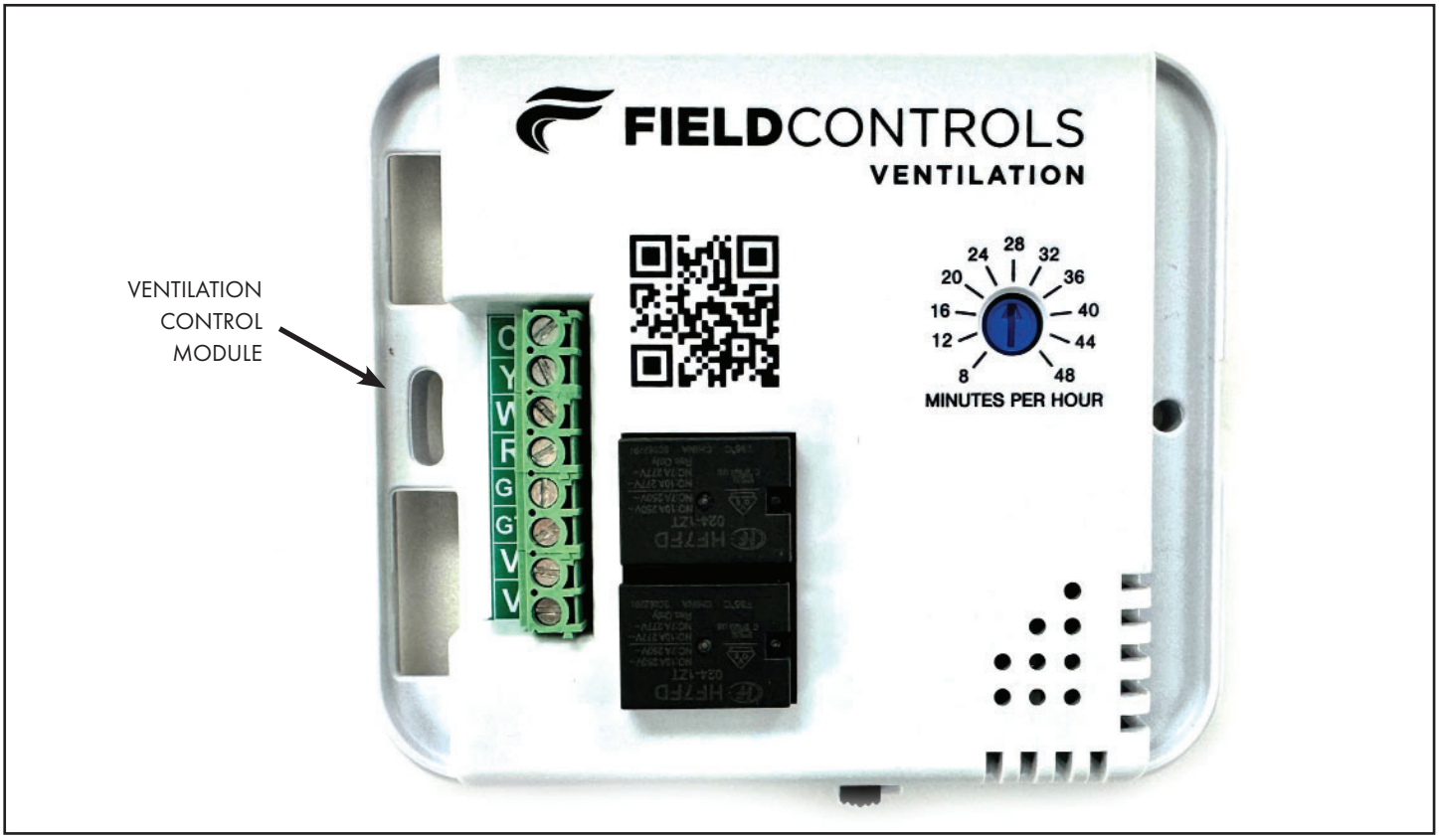
Outputs	
Fan Output GF (Maximum Load Current)	8A inductive @30VAC
Vent (V,V) (Maximum Load Current)	8A inductive @30VAC, or 30VDC

Packaging	
Unit Weight/Carton Size	2 lbs; 6-1/2” x 5” x 2”
Full Skid Quantity	643 total

FCMC DIMENSIONAL DATA



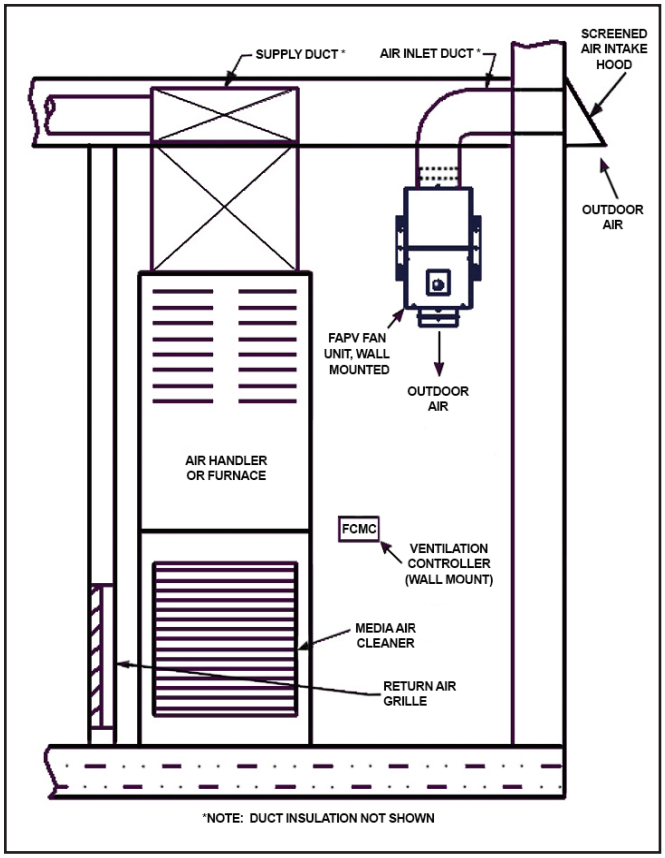
FCMC LAYOUT - OVERVIEW



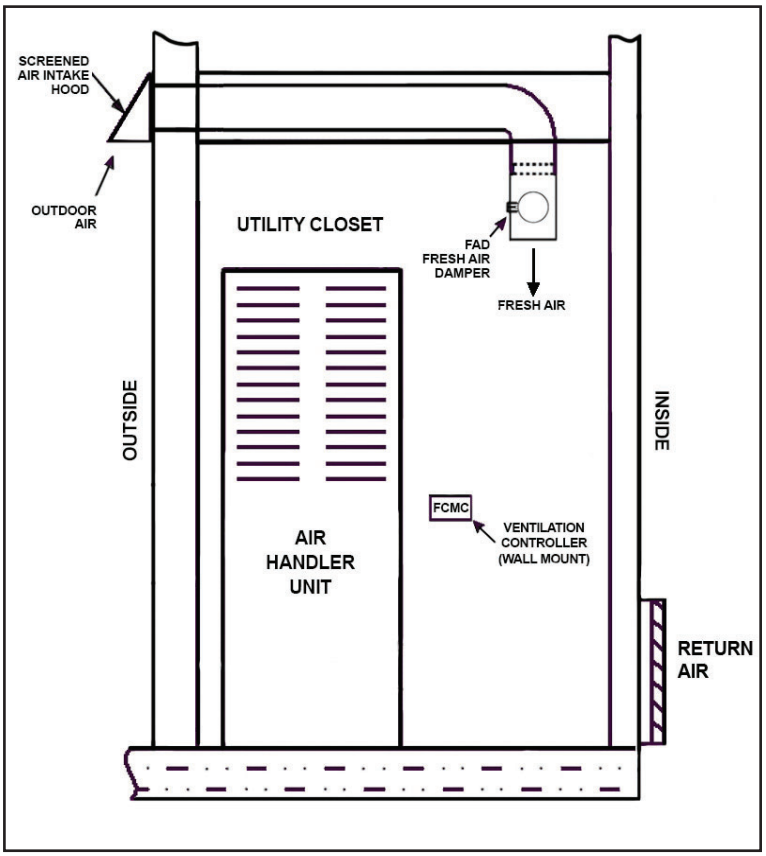
INSTALLATION

Installation Location

The FCMC has been designed to install directly to the wall in the mechanical utility closet. Refer to the below installation diagrams for additional information.



FCMC INSTALLATION WITH FAPV



FCMC INSTALLATION WITH FAD

The FCMC will perform best if the control is mounted where both outside air and return air can blend. Mounting the FCMC away from the return or too close to the fresh air discharge may result in reduction of fresh air ventilation.

FCMC Mounting

The FCMC can be mounted directly or with the optional mounting adapter plate. If mounting to a mud ring or single junction box, the mounting adapter plate should be used. It has two beveled holes for flat #6 screws for securing to a standard junction box.

1. If using the adapter plate – Route the wires through the opening in the adapter plate. Mount the adapter plate to the wall. (Figure 1)
2. Pass the wires through one of the two rectangular cut outs on the left side of the control's base. (Figure 2)
3. Secure the Ventilation Control Module to the adapter plate/wall using included screws. Keep the wires/cable in the wire trough/raceway while securing. (Figure 3) It is possible to connect the wires to the terminal block before securing the control if that is easier.
4. Connect the wires to the terminal block (Figure 4) per the "Wiring & Connections" section below.
5. Set the Ventilation Time dial (marked "MINUTES PER HOUR") per the "Setting Ventilation Time" section of this manual, on page 9. (Figure 5)
6. Once testing is complete, place cover on Ventilation Control Module.
7. Set ON/OFF switch to ON for unit to begin functioning. (Figure 6)

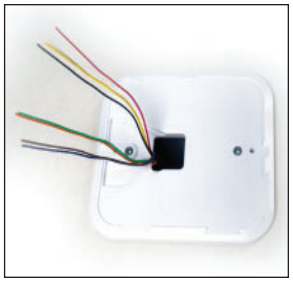


Figure 1

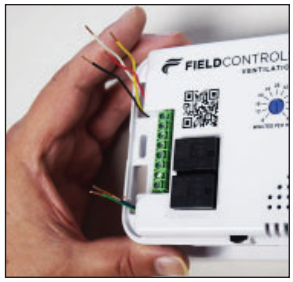


Figure 2


Figure 3

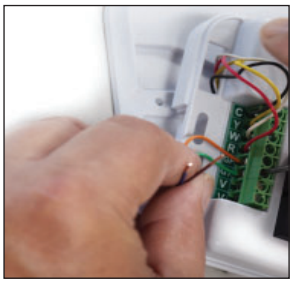


Figure 4

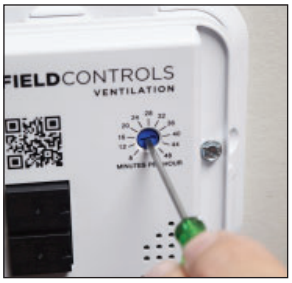


Figure 5

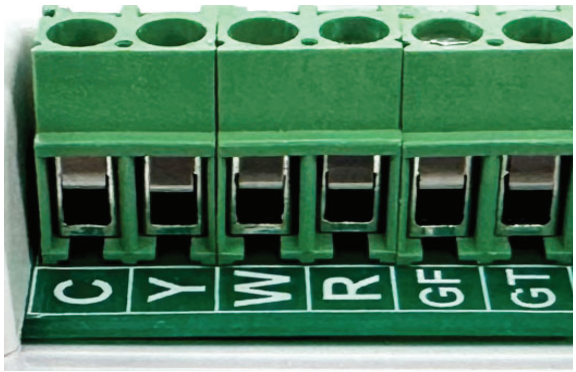

Figure 6

WIRING & CONNECTIONS

Thermostat & Air Handler Connections

The FCMC has 6 terminals to interface between the thermostat and (AHU) air handler unit. The terminal designations are as follows:

- C is the common from AHU
- Y is the compressor signal from the thermostat and AHU
- W is the heat signal from the thermostat and AHU
- R is the 24VAC hot from AHU
- GF is the fan signal to the AHU
- GT is the fan signal from the thermostat



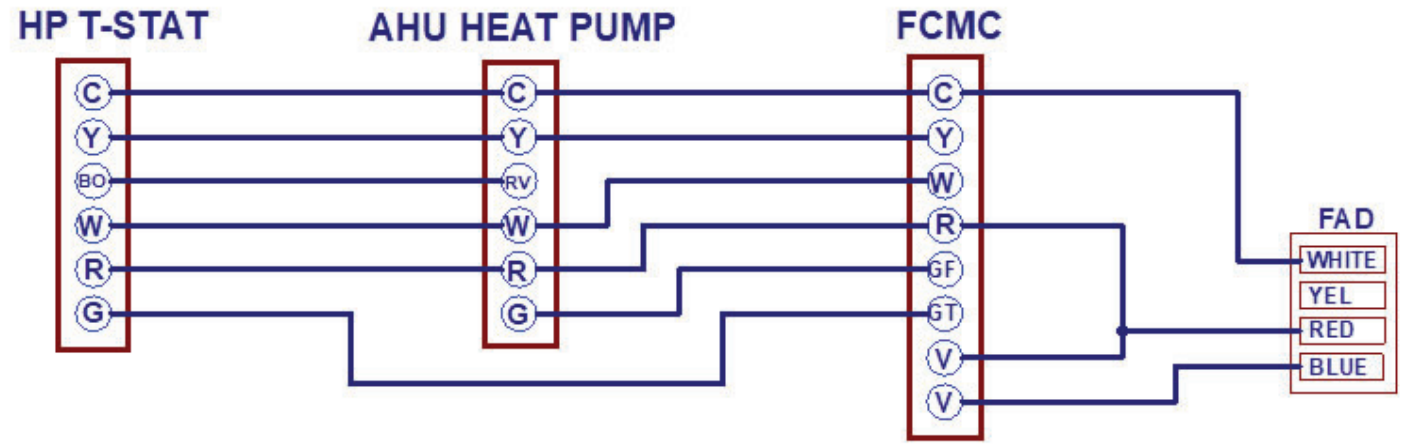
- Heat Pump: Connection to "Y" terminal is required to allow ventilation during heating/cooling, FCMC does not require connection to the B or O signal lines
- Dual Fuel Heat Pump: "W" terminal is used to monitor heating
- Conventional Heat/Cool Unit: Requires both "Y" & "W" terminals to be connected

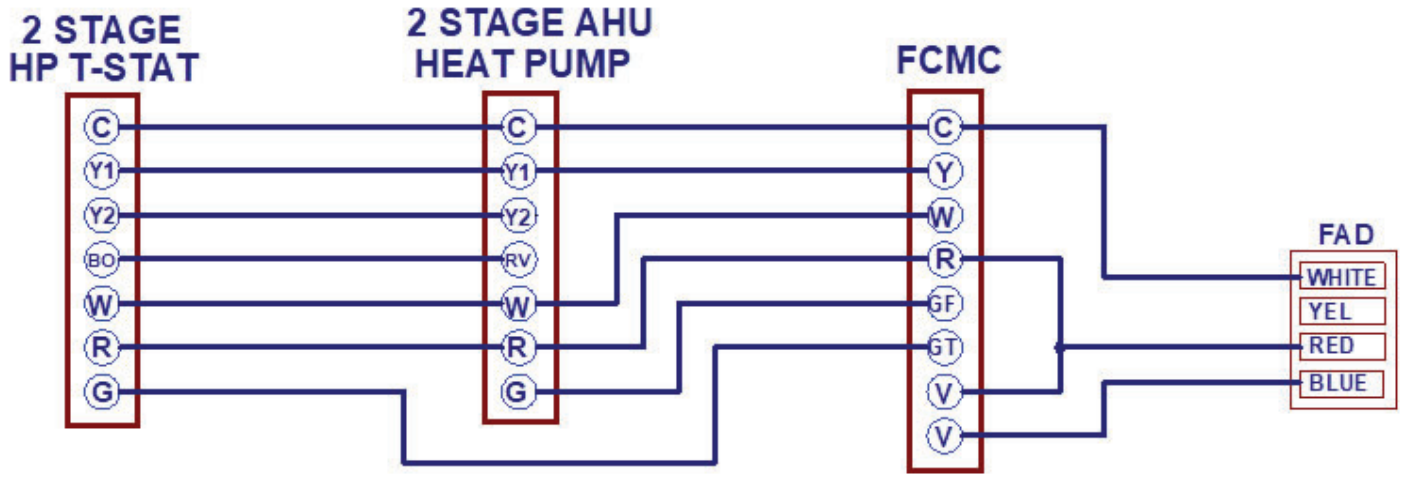
Ventilation Control Connections

- "V" Terminals are used to control a fresh air damper or powered ventilator
- Isolated from the 24VAC supply
- One terminal must be connected to the R (24VAC) power side of the supply transformer
- Active during ventilation calls

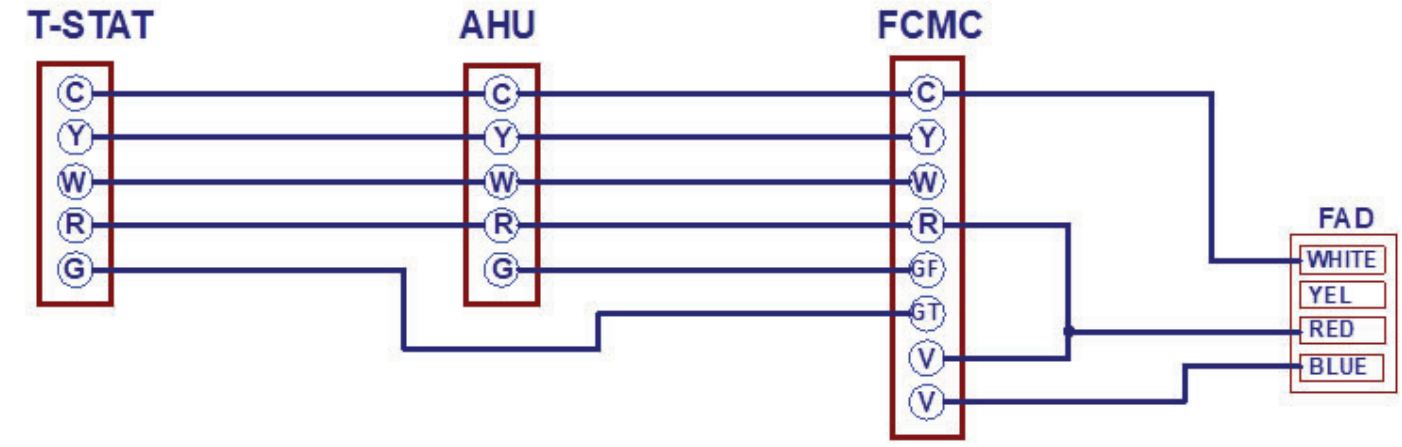
Under no circumstances shall line voltage (120 VAC) be wired to any FCMC terminals. This product is rated for Class 2 low voltage US. Ratings 30VAC (8A max load). The V terminals are dry contact compliant, and suitable for up to 30VDC (8A max load); 30 VAC (8A max load).

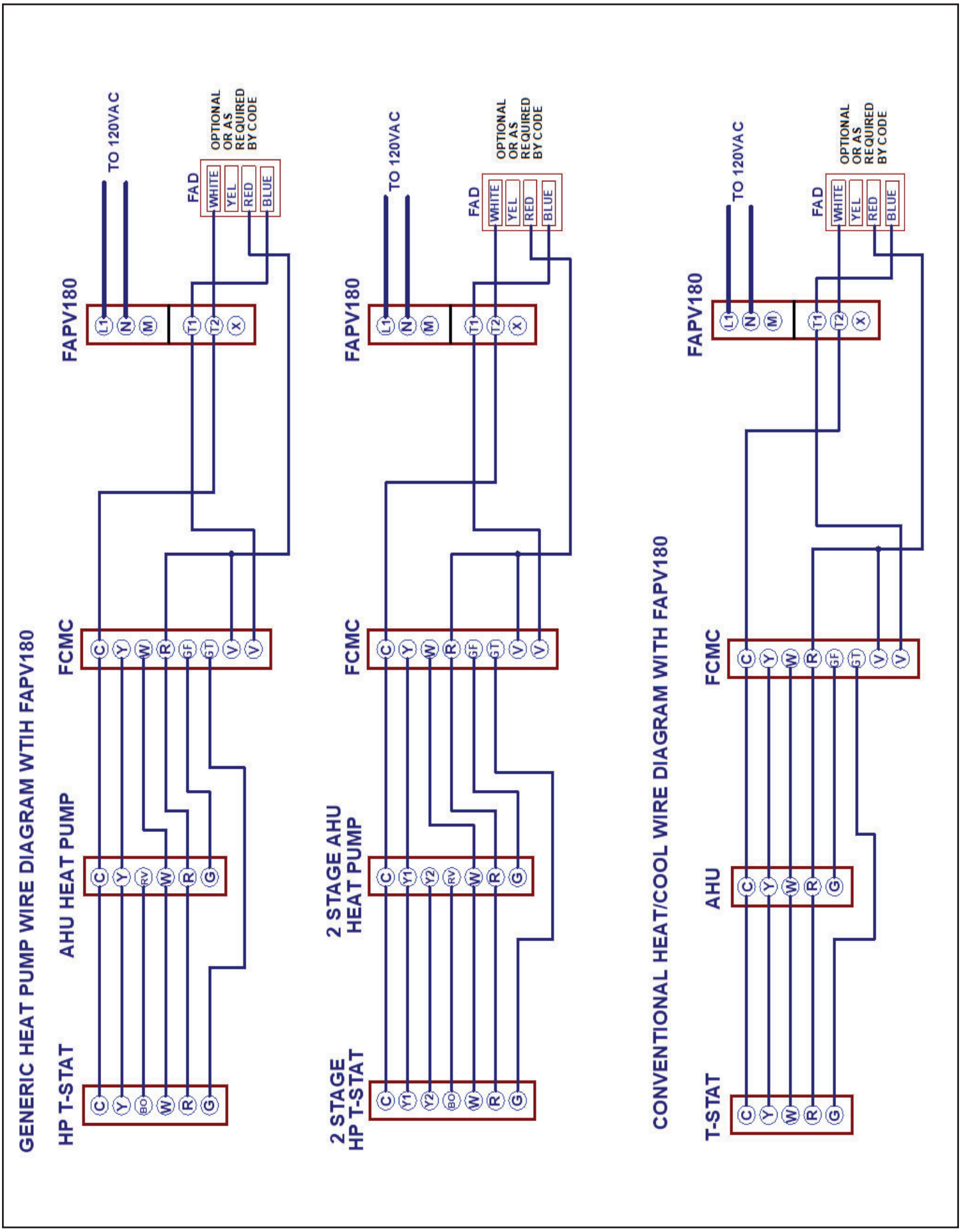
GENERIC HEAT PUMP WIRE DIAGRAM





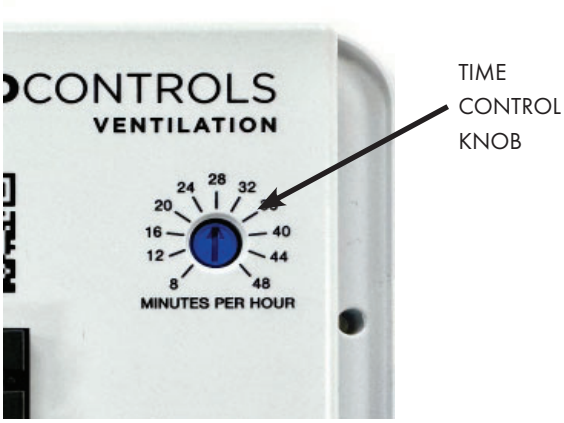
CONVENTIONAL HEAT/COOL WIRE DIAGRAM




GENERIC HEAT PUMP WIRE DIAGRAM WTIH FAPV180
HP T-STAT
AHU HEAT PUMP
FCMC
FAPV180
TO 120VAC
FAD
OPTIONAL OR AS REQUIRED BY CODE
WHITE
YEL
RED
BLUE
2 STAGE HP T-STAT
2 STAGE AHU HEAT PUMP
CONVENTIONAL HEAT/COOL WIRE DIAGRAM WITH FAPV180
T-STAT
AHU

SETTING THE VENTILATION TIME

If the ventilation time is already known, rotate the knob to the appropriate number.



If the ventilation time is NOT known:

1) Lookup or calculate the continuous ventilation rate Qtot (2013 to current):

$$Qtot=0.03\ (\text{floor sq.ft.}) + 7.5\ (\text{Nbr} +1)$$

2) Lookup* or measure the Intermittent ventilation flow rate (FAV rate)
If this is unknown, the flow rate can be measured with appropriate tools and should be done with the central fan operating. This can be initiated using the quick start method detailed later in the manual FAV rate can also be approximated using look-up tables if the duct length, diameter, and number of bends are known.

3) Calculate the ventilation Time:

$$\text{Time} = (Qtot \times 60) / (\text{FAV rate})$$

$$\textbf{Time} = \frac{\textbf{Qtot}}{\textbf{FAV Rate}} \textbf{ X 60} = \square$$

Set the knob to the appropriate number of minutes per the calculation above.

KEY

Qtot: Continuous Ventilation Rate
Nbr: Number of Bedrooms
FAV Rate: Intermittent Ventilation Rate (CFM)

*Lookup is in reference to architectual drawings that include an HVAC schedule, table, or defined FAV flow rates for each apartment size and their associated (AHU) Air Handler Unit equipment.

FCMC OPERATION

The Fresh Command Multifamily Control (FCMC) automatically responds to environmental conditions to support indoor comfort and conserve energy while supplying fresh air ventilation. Based on AHU operation and measured air quality, the device will automatically adjust between free running and synchronized modes to prevent undesired temperature and humidity.

- Free running operation (Spring/Fall) - 30-minute fresh air cycle period
- Synchronized operation (Summer, Winter) – Device synchronized with AHU operation

VENTILATION SEQUENCE

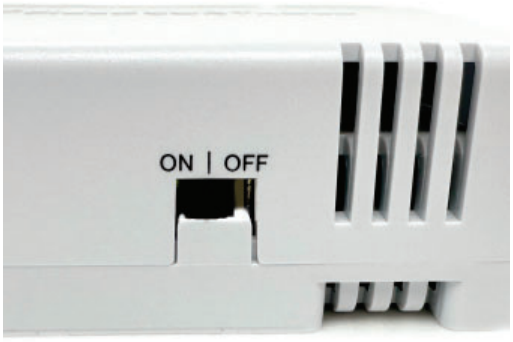
1. The ventilation sequence starts with controlling the central fan of the air handler unit (AHU).
2. The FCMC measures the indoor temperature and relative humidity before any ventilation activity begins.
3. If the equipment is active (heating, cooling, or constant fan), the starting sequence will be bypassed as the measured air flowing into the mixing plenum will be the room air.
4. If the equipment is inactive and the FCMC starts a ventilation function, it will operate in free-running operation as this does not require synchronization of FAV and AHU.

The table below is a simplified FAV time based on RH through the three seasons. The actual operation takes more than RH into account.

Mixed Plenum of room air and vented fresh air.

Summer		Spring/Fall		Winter	
Outdoor temperatures above 20°F				Outdoor temperatures 10°F to 20°F	
RH	FAV time	RH	FAV time	RH	FAV time
65.0%	12% or less	57.5%	25% or less	35.7%	100%
62.5%	25% or less	55.0%	50%	35.0%	75%
60.0%	35% to 50%	52.5%	75%	32.5%	50%
57.5%	50% to 60%	50.0%	100%	27.5%	25%
55.0%	60% to 75%	40.0%	100%	Outdoor temperatures 0°F to 10°F	
52.5%	75% to 80%	35.7%	75%	30.0%	100%
50.0%	80% to 100%	35.0%	50%	27.5%	75%
49.0%	100% to 110%	32.5%	25%.	25.0%	50%
42.5%	100% to 110%			22.5%	25%
40.0%	100%			Outdoor temperatures below 0°F	
35.7%	75%			25.0%	100%
35.0%	50%			22.5%	75%
32.5%	25%.			17.6%	50%
				15.0%	25%

QUICK START VENTILATION



On/Off Switch

- Functions as a “Soft Off”
- Does not break any power circuits to the control
- Disables the ventilation functions such that the FCMC will not activate the venting relay or turn on the central fan
- Continues to monitor indoor conditions when the equipment is operating and when it is not
- “Off” state does not interfere with fan control from the thermostat

Quick Start Ventilation Function

- Activates when the On/Off switch is moved to the “On” position after being set to “Off” for at least 5 seconds
- Can be used to validate the installation of the control and fresh air appliance
- Turns on the central fan, followed by ventilation activity within 10 seconds. Runs a full cycle and will operate normally after that point
- Temporary loss of power will not affect or enable this function

MAINTENANCE AND TROUBLESHOOTING

Follow individual exhaust fan device manufacturer’s troubleshooting and maintenance information.

There is no routine maintenance required for the FCMC (controller) other than making sure the wires connected to the FCMC terminals are secure and the unit mounting screws are tight.

Field Controls Technical Support is available Monday-Friday from 8:00 am to 5:00 pm (EST) at 800.742.8368 or by email at fieldtec@fieldcontrols.com for further assistance. To reprint a copy of the latest revision of this manual, visit www.fieldcontrols.com to download.

SYMPTOM	TROUBLESHOOTING PROCEDURE
Central fan turns on unexpectedly.	If ventilation requirement has not been met, the FCMC will activate the central fan. This is normal operation.
The fresh air damper does not open during call for ventilation.	• Damper is not plugged in or properly wired. Check connector and wiring connections.

OPTIONAL ACCESSORIES

MODEL	DESCRIPTION	FC P/N
FAD-4	4” FRESH AIR DAMPER	46590504
FAD-5	5” FRESH AIR DAMPER	46590505
FAD-6	6” FRESH AIR DAMPER	46590506
FAD-7	6” FRESH AIR DAMPER	46590507
FAD-8	8” FRESH AIR DAMPER	46590508
FAD-10	10” FRESH AIR DAMPER	46590510
FAD-12	12” FRESH AIR DAMPER	46590512
FAPV-180AC	FRESH AIR POWER VENTILATOR	602603700

This manual may be downloaded and printed from the Field Controls website:
www.fieldcontrols.com

WARRANTY
For warranty information about this or any Field Controls product, visit:
www.fieldcontrols.com

Field Controls Customer Service
252.522.3031

FIELDCONTROLS

AIR TREATMENT COMBUSTION VENTILATION PORTABLES

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