Kitchen Ventilation Systems

Controls and Energy Management

- Relay Box
- Fan Control Center
- Temperature Interlock
- Variable Volume Systems

GREENHECK
Building Value in Air.

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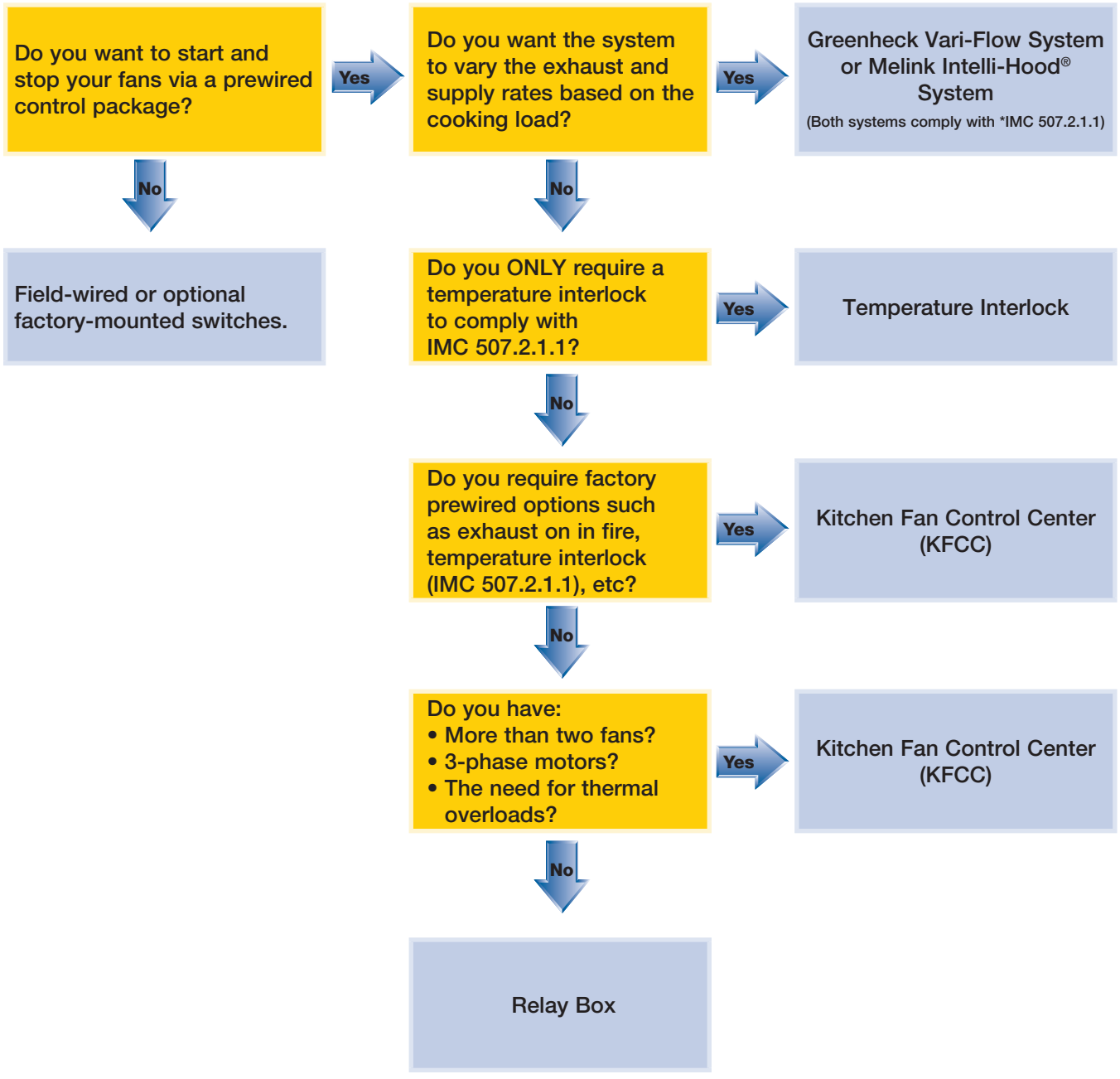
Which Control is Right For Your Application?



IMC International Mechanical Code

All Greenheck controls are UL Listed to Standard 891 or 710 as it applies.

c UL US LISTED

Relay Box

Greenheck's relay box is compact, prewired and offers a low-cost method of starting one or several single-phase fan motors. The relay box can be used in place of larger, more expensive starters.

Standard Construction Features

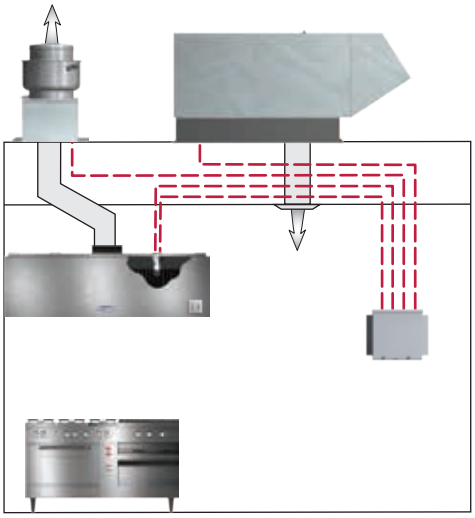
- Prewired from factory
- Wiring diagram included in control box
- Interface to shut off supply fan in fire mode is included

Requirements:

- All motors must have thermal overloads
- Two fans maximum, both operating from one switch (For more than two fans, use model KFCC)
- Each fan must have its own power source

Limitations:

- No additional options
- Single phase power only (120, 208 or 230 volt)



When switches are moved to the on position, lights turn on and relays close to start fans.

Temperature Interlock

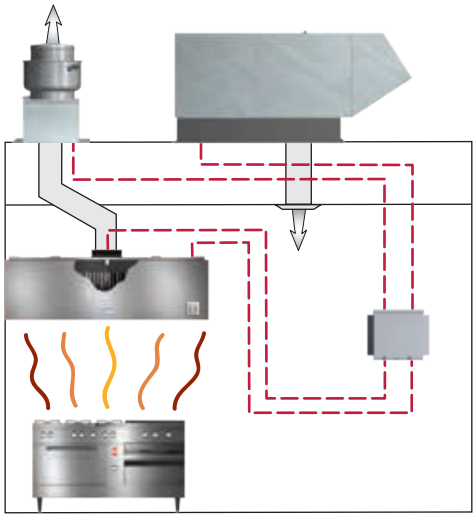
International Mechanical Code (IMC 507.2.1.1) requires the kitchen ventilation system to automatically start when cooking operations occur in the case where they have not been started manually. Greenheck satisfies this requirement through their temperature interlock as illustrated below. This solution is also available on Greenheck's kitchen fan control center (KFCC) and is part of the variable volume systems discussed on pages 4-7.

Standard Construction Features

- Temperature sensor to detect heat from the cooking operations is used to signal the control to start the fans.
- Automatically turns off fans when heat is no longer present and prevents fan cycling by means of set point temperature differential (digital temperature interlock) or 1-100 minute time delay relay (thermostat control option).
- Meets IMC code 507.2.1.1
- UL Listed

Temperature Control Options

- **Digital temperature interlock** includes a micro controller with LED display that can be remote mounted. This option provides easy access and accurate control when making seasonal adjustments to the temperature setting, eliminating the need to access the hood top.
- **Thermostat control** utilizes a sensor with set dial screw on the back to adjust the temperature. This can be advantageous when trying to control several sensors, as they can be connected in parallel back to one small control.



Heat from the equipment is sensed by the temperature probe. Control automatically starts fans if not already started manually.

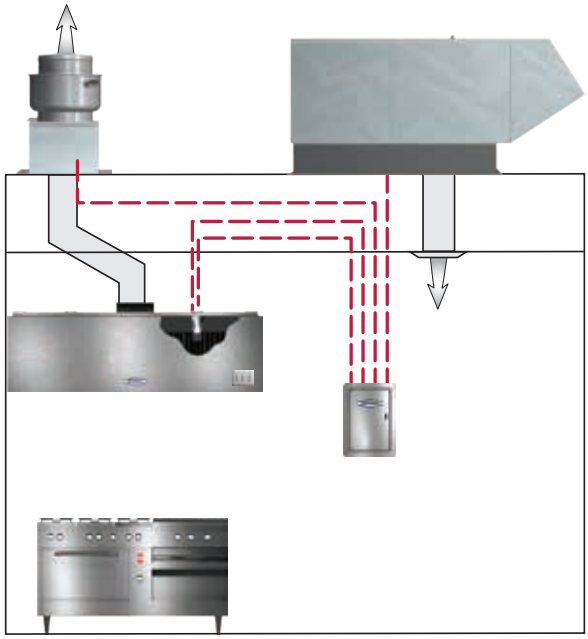
Digital Temperature Interlock

Kitchen Fan Control Center (KFCC)

Greenheck's kitchen fan control center (KFCC) allows you to manage power for your kitchen ventilation system from one location, with well-labeled connections and a variety of options to reduce installation and coordination time at the jobsite. The KFCC is prewired other than the main power and connections to fans and lighting in the field. The KFCC offers clean, safe, and dependable control for the kitchen fans, hood lights and a variety of control options discussed below.

Standard Construction Features

- Prewired
- UL Listed to Standard 891
- Magnetic motor starters (including thermal overloads)
- Light & fan switch mounted on door (can be remote mounted)
- Color coded wiring with diagram mounted inside door



When switches are moved to the on position, motor starters close to start fans. Lights and other control options are also wired into the KFCC for single point connections.

Kitchen Fan Control Center Options

Exhaust on in Fire Mode — Keeps the exhaust fans running after fire suppression has been activated to exhaust smoke from the space.

Trim Ring — Cosmetic feature designed to trim out the KFCC when recessed into the wall.

Removal of Starter When Supplied in Unit — Option used when the starter for the fan is already supplied.

Up to Two Status Lights — Lights that indicate a specific function is on. These lights can be either 24 volt or 120 volt.

Up to Two Extra Fire Relays — Two optional fire relays to hook-up to other features as needed.

Lights Out in Fire — Connecting lights with this option will shut lights off in the event of a fire.

Supply Fan Failure Indicator Light — Lights up if the supply fan fails.

Exhaust Fan Failure Indicator Light — Lights up if the exhaust fan fails.

Single Light/Fan Switch — One switch that turns on all lights and fans.

Power For Shunt Trip — Prewired at the factory to provide power to shunt trip. This option eliminates the need for field hook-up.

Automatic Damper Switch — Reset switch that opens the damper up again after fire triggered the damper to close.

Temperature Interlock — Designed and installed to automatically activate the exhaust fan, if not manually started whenever cooking operations occur. (See temperature interlock on page 3 for details).

Variable Volume

Greenheck offers variable volume ventilation systems that track the cooking load and vary the exhaust and supply ventilation based on demand. Since the cooking load varies throughout the day, your exhaust system doesn't need to run at the maximum exhaust air volume all day. Greenheck understands that by varying the speed of the fans based on the cooking load, you will save money by reducing power and heating and cooling costs. See figures 1 and 2 below.

Standard Construction Features

- The system monitors the cooking operation and adjusts the exhaust and supply unit fans so that when the cooking load is reduced, the fans operate at a reduced level providing energy savings
- Satisfies International Mechanical Code 507.2.1.1 requirement to start fans when cooking operations occur
- System is prewired, UL Listed and includes wiring diagrams

Payback:

- Typical payback of 1 to 3 years
- Improved efficiency by reducing fan speed

Additional Benefits:

- Ventilation equipment life is extended by soft-starting starting fans, therefore reducing stress on belts and bearings
- Reduced sound levels to improve customer and employee comfort

The charts below are an example of how the cooking load in a typical restaurant varies throughout the day and how the variable volume system can generate money savings.

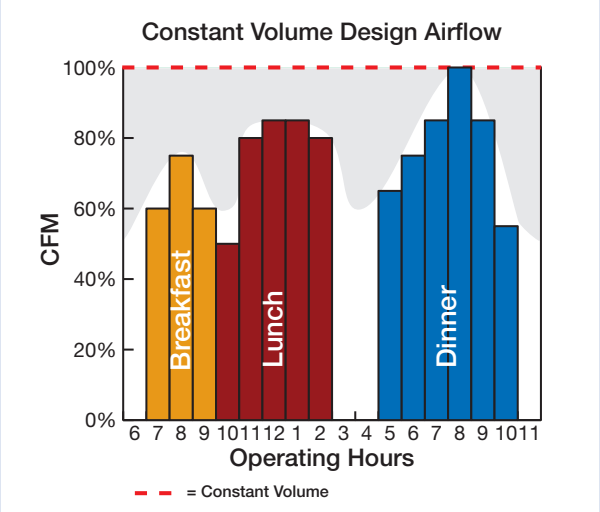


Figure 1 — The cooking load throughout the day varies significantly. However, the kitchen only requires maximum ventilation for a small percentage of the day. The shaded area represents the savings potential for a variable volume system. The dashed red line is showing fan operation at 100% regardless of cooking load.

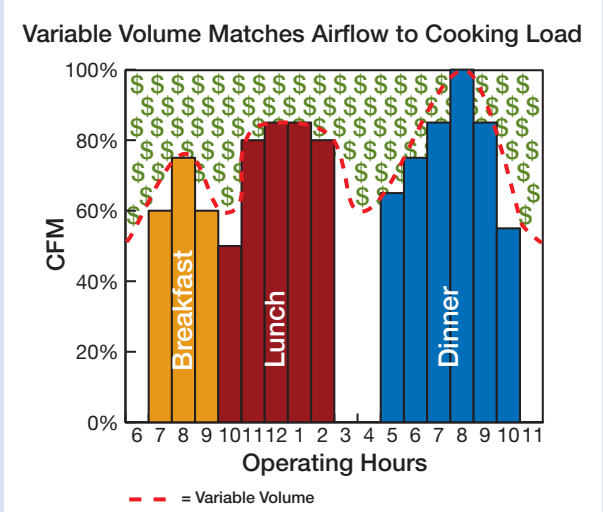
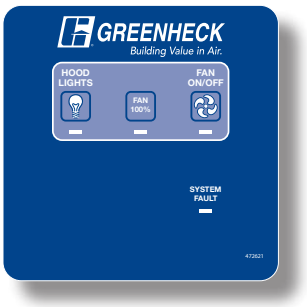


Figure 2 — A variable volume system will track the cooking load (dashed red line) and vary the exhaust and supply ventilation. The area above the red line represents energy savings.

Greenheck Vari-Flow Air Management System

The Greenheck Vari-Flow Air Management System senses the heat output of the appliance lineup and only exhausts and supplies only the amount of air necessary, thus providing valuable energy savings.

Standard Construction Features

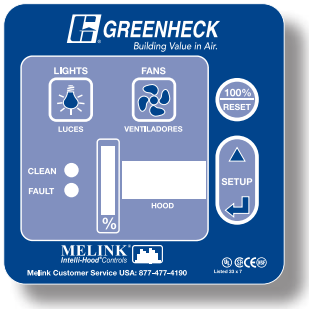


- **Exceptional Value —** The Vari-Flow system is an economical choice. Considering upfront costs, maintenance and ongoing payback, the Vari-Flow Air Management System is an all around cost-saver.
- **Space Pressure Control —** Greenheck's Vari-Flow system controls the make-up air unit by sensing static pressure in the space, independent of the exhaust fan speed, to ensure proper room pressurization at all times. Other similar systems control the make-up air unit proportionally with the exhaust. However, when direct-fired gas make-up air units are requiring a constant pressure drop across the burner, this tracking will not follow the blower curve, resulting in periods of imbalance.
- **5 Times Quicker Response —** Maintaining capture and containment of cooking effluent and heat is important, so it is critical for the variable volume system to respond quickly. The Vari-Flow system is designed with the temperature sensor in the capture tank versus in the duct collar where many other systems detect heat. Greenheck's placement provides a response that is ready 5 times faster than a duct mounted sensor for superior performance.
- **Fully Modulating Turndown up to 50% —** Idle cooking periods can realize up to 50 percent turndown with the Vari-Flow Air Management System.

Melink Intelli-Hood® System

Like the Vari-Flow System, the Intelli-Hood System senses the cooking activity and varies airflow to meet the demand.

Standard Construction Features



- **Secondary Optic Sensors —** In addition to a primary temperature sensor in the duct collar, the Intelli-Hood System includes optic sensors to sense steam and/or smoke being generated from the cooking process, regardless of the heat load. When as little as seven percent of the optics infrared beam is blocked, the exhaust fans will be brought up to full speed to capture the effluent. The system will return back to the required speed based on temperature when the hood has been cleared of smoke and steam.
- **Professional Start-Up in the Field —** Melink includes a factory start-up with the purchase of their system. This start-up includes a site visit from a Melink field technician to ensure that the system is installed correctly and programmed based on the application. The technician will also provide basic training to operators present during the start-up and answer any questions about the system.
- **Easily Accommodates Larger Systems —** The system is designed to easily handle larger systems and can be easily programmed and monitored from its keypad control.
- **Fully Modulating Turndown up to 50% —** Idle cooking periods can realize up to 50 percent turndown with the Melink Intelli-Hood System.

Which Variable Volume System is best for your application?

System Decision Matrix	Greenheck Vari-Flow System	Melink Intelli-Hood System	
Factory Installed System	■	■	*Fully Modulating Turndown up to 50%*
IMC 507.2.1.1 Compliant	■	■	
Full Fan Speed Override	■	■	
Supply Controlled by Space Static Pressure	■		
Supply Controlled Proportionally	Optional	■	
Professional Start-up by Factory Representative		■	
Lower Cost	■		
Secondary Optic Sensors for Smoke and Steam		■	
Small to Medium Size Applications	■		
Large or Steam Intensive Applications		■	

Looking to Decrease the Payback Period?

The Vari-Flow Air Management System and Melink Intelli-Hood System may qualify for many state and local government rebate and credit programs. Rebates can decrease the upfront cost of the systems.

Going for LEED™ Certification?

The Vari-Flow Air Management System and the Melink Intelli-Hood System align with the following LEED credits and may contribute toward earning LEED credits.

Innovation and Design Process

- ID Credit 1 – Innovation in Design

Energy and Atmosphere

- EA Credit 1 – Optimize Energy Performance

Kitchen Ventilation Systems

Building Value in Air

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time. And building owners and occupants value the energy efficiency, low maintenance and quiet dependable operation they experience long after the construction project ends.

Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the shipment date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

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

U.S. GREEN BUILDING COUNCIL MEMBER

Prepared to Support Green Building Efforts

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