

Installation, Operation and Maintenance Manual

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



WARNING

Electrical shock hazard. Can cause equipment damage, personal injury, or death. Service must be performed only by personnel that are knowledgeable in the operation of the equipment being controlled.

CAUTION

It is the responsibility of the installer to make sure both electrical and gas appliances shut down in the event of a fire or in the event of a power loss to the building when this sequence is required by the authority having jurisdiction.

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General Description

Description

The kitchen fan control center, or KFCC, is a pre-engineered package designed to control the operation of fans in a constant-volume kitchen. The package consists of a cabinet encasing one or more fan motor starters interlocked together for on/off operation. Different fan, light and thermal switch combinations may be provided to operate the kitchen hood fan(s), light(s), and heating/cooling capabilities of the supply air. The control center as a standard is equipped with additional relays prewired to the fan starter(s). These additional relays are capable of turning on the kitchen exhaust and shutting down supply regardless of the present state of the fans via integration of a fire system microswitch with factory terminals. The control center can be equipped with temperature interlock, designed to automatically start kitchen fans and keep them running while heat is being generated from the cooking appliances. Hood systems should always be manually started before the cooking equipment is turned on, but if forgotten the interlock will safely trigger the fans to start once heat is detected. Other options are available.

Purpose

The purpose of the KFCC is to provide a complete control center to provide and house all fan starters. The control center provides a common connection point to interlock kitchen exhaust, supply, and hood lights with the hood's fire suppression system. The cabinet is pre-engineered with terminal blocks for most field wiring connections. The control center can also be equipped with interlock between the exhaust fans and cooking equipment, as to meet International Mechanical Code (IMC) 2006 section 507.2.1.1. In this case, the system will utilize a temperature sensor in the exhaust duct collar or capture area in the hood to detect heat generated from cooking operations and automatically activate the exhaust fans if not already running.

Product Application

The KFCC is designed for both Type I and Type II (grease and non-grease) constant-volume hood systems, where starters are needed to activate fans. The control center can operate both single and three phase fans. Greenheck recommends using one KFCC per hood system (activates all fans simultaneously). When temperature interlock is provided in this package, it is not to be used in conjunction with exhaust fire dampers.

Receiving and Handling

Receiving

Upon receiving the product, check to make sure all items are accounted for by referencing the bill of lading to ensure all items were received. Notify the carrier if any damage is noticed. The carrier will make notification on the delivery receipt acknowledging any damage to the product. All damage should be noted on all of the copies of the bill of lading which is countersigned by the delivering carrier. If damaged upon arrival, file a claim with the carrier. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts.

Storage

If a kitchen fan control center must be stored prior to installation, it must be protected from dirt and moisture. Indoor storage is highly recommended. For outdoor storage, cover the control package with a tarp to keep it clean, dry, and protected from UV (ultraviolet) radiation damage.

NOTE

Improper storage which results in damage to the unit will void the warranty.

Handling

Make sure the equipment does not suffer any heavy vibration or knocks.

Installation

NOTE

All field installation of electrical equipment must be done to meet all NEC and electrical codes.

Control Box Mounting

NOTE

Control box may be factory mounted. If so, continue to the next section.

Locate an area with enough space to mount the control box and securely fasten to the wall. Use appropriate type fasteners depending on the mounting location. Avoid installing the control box in environments with high magnetic and/or radio frequency interference.

Switch Mounting

NOTE

If the switches were NOT shipped loose, provided in a separate junction box, continue to the next section.

Locate an area with enough space to mount the switches junction box and fasten to the wall.

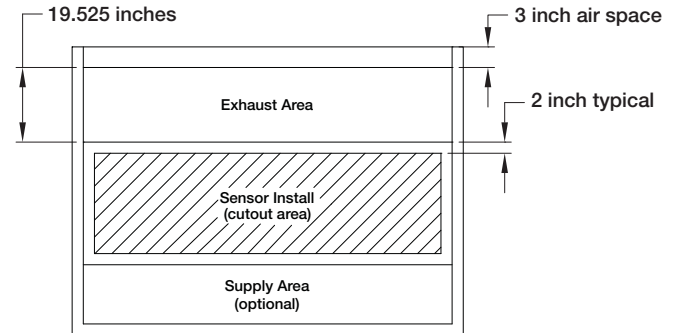
Resistive Temperature Detector(s) - Hood Mounting

NOTE

The resistive temperature detector(s), or RTD(s), will be provided only if the digital temperature interlock option was configured/ordered with the unit. If it wasn't, continue to the next section.

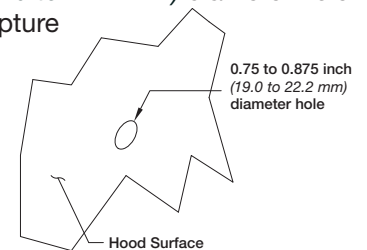
Resistive temperature detector(s) may be factory installed. If so, continue to the next section.

1. Locate flat area(s) at the top interior of the hood in front of the filters, towards the front of the hood.

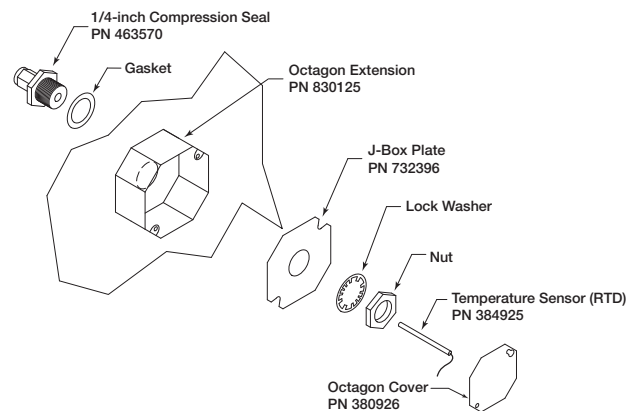


Top View of Exhaust Hood

2. Cut a 3/4 to 7/8-inch (19.0 to 22.2 mm) diameter hole in the flat spot of the capture tank. Make sure the resistive temperature detector(s) will not interfere with fire system nozzles and is not within 12 inches of light fixtures.



3. Place the J-box plate inside of the octagon extension ring and place over the hole.
4. Disassemble the compression seal and place through hole and J-box plate as shown. Tighten the nut inside the octagon extension ring.



5. Place the resistive temperature detector through the compression seal and tighten the compression fitting.
6. Refer to Electrical Connections section for instructions on wiring the temperature sensor.
7. Install the cover for the octagon box.

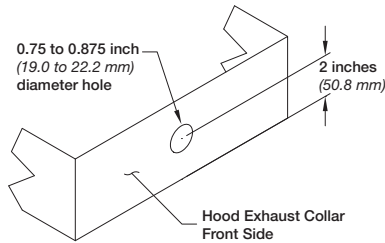
Resistive Temperature Detector(s) - Duct Collar Mounting

NOTE

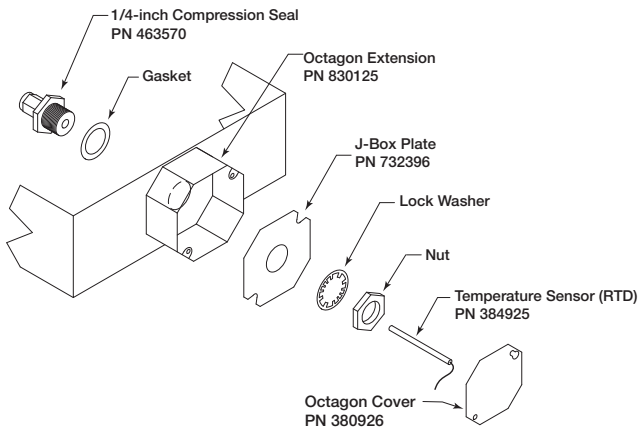
The resistive temperature detector(s), or RTD(s), will be provided only if the digital temperature interlock option was configured/ordered with the unit. If it wasn't, continue to the next section.

Resistive temperature detector(s) may be factory installed. If so, continue to the next section.

1. Locate the exhaust duct on top of the hood. A 3/4 to 7/8-inch (19.0 to 22.2 mm) diameter hole must be cut into the duct 2 inches (50.8 mm) above the hood top. Center the hole along the side of the duct. Make sure that the resistive temperature detector will not interfere with any fire system nozzles, or other items installed in the exhaust duct. If an exhaust fire damper is present the hood exhaust collar, it must be removed prior to temperature sensor installation.



2. Place the J-box plate inside of the octagon extension ring and place over the hole in the exhaust collar.



3. Disassemble the compression seal and place through hole in duct collar and J-box plate as shown. Tighten the nut inside the octagon extension ring.
4. Place the resistive temperature detector through the compression seal and tighten the compression fitting.
5. Refer to Electrical Connections section for instructions on wiring the temperature sensor.
6. Install the cover for the octagon box.

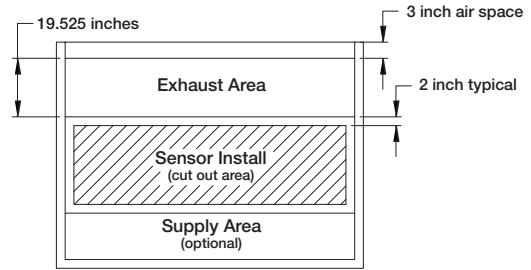
Thermostat - Hood Mounting

NOTE

The thermostat will be provided only if the thermostat style temperature interlock option was configured/ordered with the unit. If it wasn't, continue to the next section.

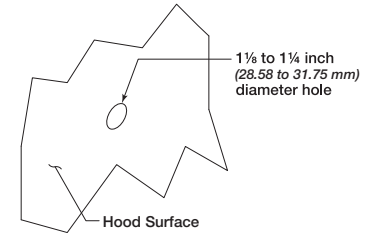
The thermostat may be factory installed. If so, continue to the next section.

Recommended thermostat mounting location is in the flat interior of the hood and at least 8 inches (20.32 cm) from light fixture.

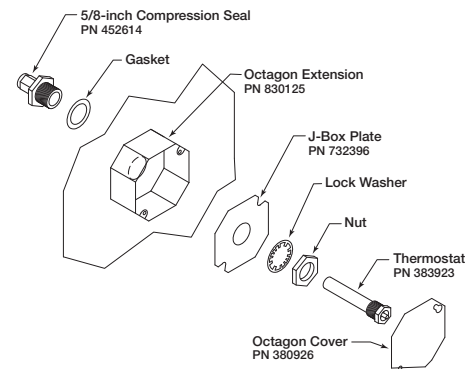


Hood Plan View

1. Locate the flat area(s) at the top interior of the hood in front of the filters, towards the front of the hood. A 1 1/8 to 1 1/4 inch (28.58 to 31.75 mm) diameter hole must be cut into the top of the capture tank. Make sure the thermostat will not interfere with the fire system nozzles and is not within eight inches (20.32 cm) of the light fixtures.



2. Place the J-box plate inside of the octagon extension ring and place over the hole.
3. Insert the Evergreen compression seal fitting into the hole from the inside the hood, making sure the gasket is placed on the fitting before inserting it into the hole. Install the J-box plate, lock washer, and 1-1/2 inch (38 mm) nut over the threaded portion of the compression seal fitting and tighten securely.



4. Place the thermostat detector through the compression seal and tighten the compression fitting to 35 ft-lbs.
5. Refer to Electrical Connections section for instructions on wiring the thermostat.
6. Install the cover for the octagon box.

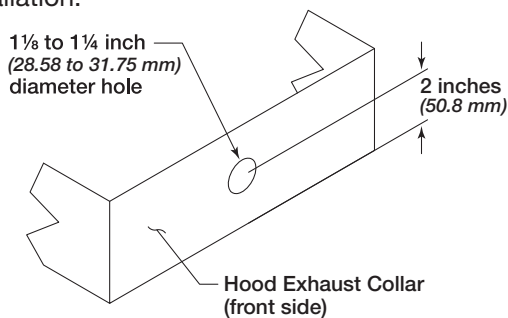
Thermostat - Duct Collar Mounting

NOTE

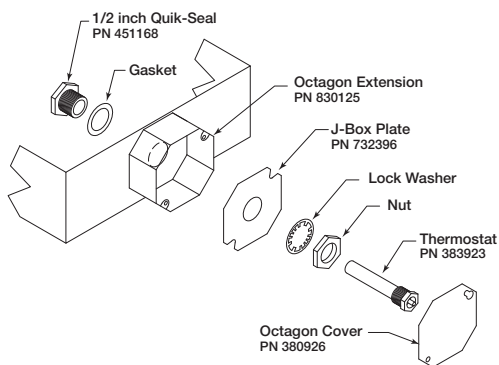
The thermostat will be provided only if the thermostat style temperature interlock option was configured/ordered with the unit. If it wasn't, continue to the next section.

The thermostat may be factory installed. If so, continue to the next section.

1. Locate the exhaust duct on top of the hood. A $1\frac{1}{8}$ to $1\frac{1}{4}$ -inch (28.58 to 31.75 mm) diameter hole must be cut into the duct 2 inches (50.8 mm) above the hood top. Center the hole along the side of the duct. Make sure that the thermostat will not interfere with any fire system nozzles, or other items installed in the exhaust duct. If an exhaust fire damper is present the hood exhaust collar, it must be removed prior to thermostat installation.



2. Place the J-box plate inside of the octagon extension ring and place over the hole.
3. Insert the Evergreen Quik-Seal fitting into the hole from the inside of the duct, making sure the gasket is placed on the fitting before inserting it into the hole. Install the J-box plate, lock washer, and 1-1/2 inch (38 mm) nut on the threaded portion of the Evergreen Quik-Seal fitting and tighten securely.



4. Thread the thermostat through the Quick-Seal and tighten to 35 ft-lbs.
5. Refer to Electrical Connections section for instructions on wiring the thermostat.
6. Install the cover for the octagon box.

Electrical Connections

NOTE

All field wiring of electrical equipment must be done to meet all NEC and electrical codes.

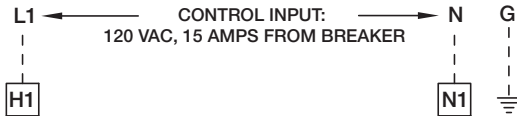
The extent of field wiring required will depend on the options and general configuration of the KFCC. Each option is broken out in the next portion of this manual. Each option will either be factory wired or will require field wiring. Use 14 AWG, 60°C copper wire unless otherwise specified.

Power for KFCC

The KFCC needs a power source to operate all inner components. This power source cannot be on a shunt trip breaker; the power must remain constant to the panel, even in the event of a kitchen fire.

Power for KFCC

- 120 VAC, 15 amp circuit to terminals H1 and N1



Power for Hood Lights (Optional)

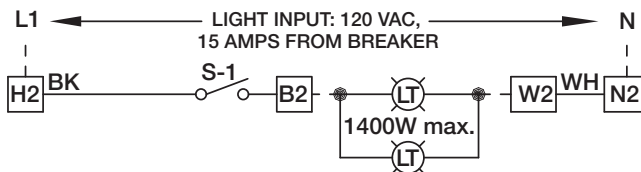
If the KFCC is configured for hood light control, a separate power source for each light circuit will need to be run to the panel as well to power the lights. The KFCC can provide up to three light circuits.

Power for Hood Lights

- 120 VAC, 15 amp circuit to terminals H2 and N2 (first light circuit)
- 120 VAC, 15 amp circuit to terminals H3 and N3 (second light circuit)
- 120 VAC, 15 amp circuit to terminals H4 and N4 (third light circuit)

Hood Lights

- To terminals B2 and W2 (first light circuit)
- To terminals B3 and W3 (second light circuit)
- To terminals B4 and W4 (third light circuit)



NOTE

Light circuit must not exceed 1400W maximum.

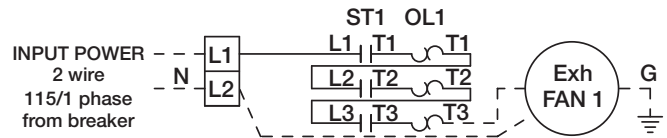
Hood lights may be directly wired to light switch, creating unoccupied terminals B2, B3 and B4. Please refer to the wiring diagram specifically created for the panel on the inside door of the control center.

Power for Starters and Fans

The KFCC is equipped with contactors that may have thermal overloads attached to them. Each fan should have a designated power source. The breaker size (amps), wire gauge, phase, and voltage for each fan is specified on the KFCC wiring diagram. Two speed fans will require two separate starters.

115 VAC Single Phase Fan(s) Power Wiring

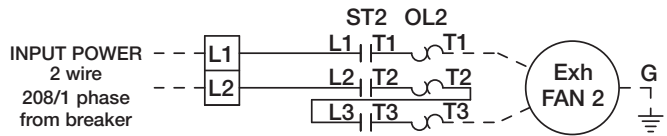
- LINE - from breaker to terminals L1 and L2
- LOAD, 115 VAC - from terminal block L1 and T3 on the bottom of contactor/overload to fan disconnect



Single phase, 115 VAC
Wiring Connection Example

200/208/230/277 VAC Single Phase Fan(s) Power Wiring

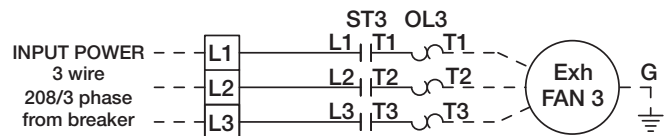
- LINE - from breaker to terminals L1 and L2
- LOAD, 200/208/230/277 VAC - from T1 and T3 on the bottom of contactor/overload to fan disconnect



Single phase, 200/208/230/277 VAC
Wiring Connection Example

Three Phase Fan(s) Power Wiring

- LINE - from breaker to terminals L1, L2 and L3
- LOAD - from T1, T2 and T3 on the bottom of contactor/overload to fan disconnect



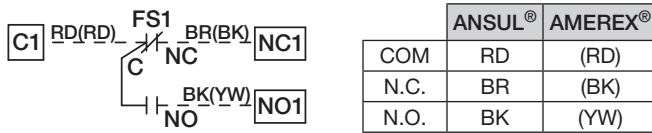
Three phase, Wiring Connection Example
200V, 208V, 230V, 460V, and 575V also available

Fire System Integration

A dedicated fire system microswitch needs to be wired into the KFCC. During a fire, this will disengage supply starters, and therefore turn off corresponding supply fans. If KFCC is configured with “Exhaust in Fire” option, the KFCC will also engage the exhaust starters, therefore turning on exhaust fans in the event of a fire.

Dedicated Fire System Microswitch

- Common to terminal C1
- Normally-closed to terminal NC1
- Normally-open to terminal NO1



NOTE

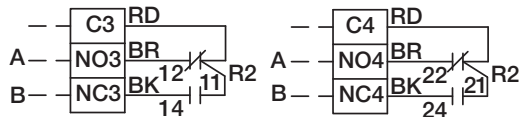
C2, NC2, and NO2 terminals are provided for a second fire system microswitch. These terminals are not wired to any components; they are simply provided for a connection point only.

Spare Fire Relay

The KFCC includes additional fire relay contacts standard for shunt trips, alarms, or additional utilities that need control signals to be sent in the event of a kitchen fire. The additional relay's state will only be changed if the dedicated fire system is wired into the KFCC. Wiring from added relays to terminals will be done in the factory.

Fire Relay

- Power to terminal C3
- From terminal NO3 (normally open; closes in fire) to device
- From terminal NC3 (normally closed; opens in fire) to device
- Power to terminal C4
- From terminal NO4 (normally open; closes in fire) to device
- From terminal NC4 (normally closed; opens in fire) to device



NOTE

Relay contacts will be dry unless otherwise noted on the panel's specific wiring diagram.

Do not use additional relay contacts for power interruption to appliances. Contacts are rated up to 250 VAC and 8 amps maximum.

Switches (Optional)

A switch panel may be supplied to operate lights, fans, heating/cooling capabilities of a tempered supply, a damper, or another component of the kitchen exhaust system. If selected, the switch(es) will be provided one of four ways:

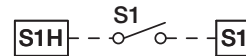
1. Shipped loose for remote mounting
2. Mounted on the hood
3. Mounted on the hood utility cabinet
4. Mounted on a wall utility cabinet

If the switches and the KFCC are both mounted on the same hood, wiring to the fan switches will be done in the factory.

Fan, 1-Speed

- To terminals S1H and S1* (first fan switch)
- To terminals S2H and S2* (second fan switch)
- To terminals S3H and S3* (third fan switch)

*S1N, S2N and S3N used if lighted toggle switches are utilized.



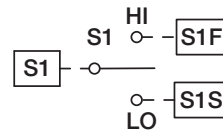
Ship Loose
Fan Switch Example



Control Cabinet Mounted, Fan Switch Example
(Factory Wired)

Fan, 2-Speed

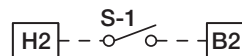
- To terminals S1F, S1, and S1S (first 2-speed fan switch)



Ship Loose, 2-Speed
Fan Switch Example

Lights

- To terminals H2 and B2 (first light switch)
- To terminals H3 and B3 (second light switch)
- To terminals H4 and B4 (third light switch)



Tempered Supply, Heat Only

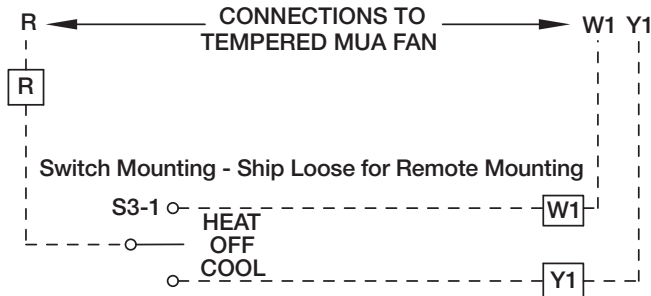
- To terminals R and W1

Tempered Supply, Cool Only

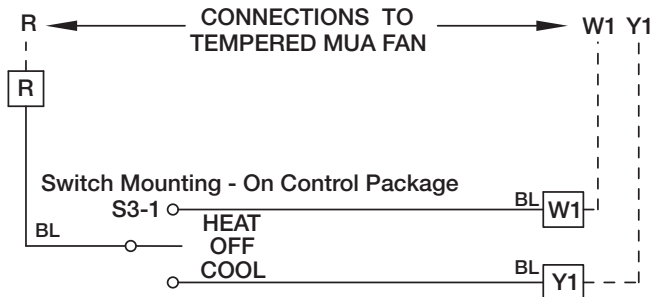
- To terminals R and Y1

Tempered Supply, Heat and Cool

- To terminals R (common), W1 (heat), and Y1 (cool)



Shipped Loose
Make-Up Air Tempering Switch Example



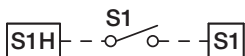
Mounted on Control Package
Make-Up Air Tempering Switch Example

Connections from these terminals will have to be made to the respective supply fan terminals R, W1 (if used), and Y1 (if used). Use proper gauge wire for field wiring depending on the voltage used.

When connecting to manufacturer's tempered unit, connect R, W1 (if used), and Y1 (if used) up to the supply unit and land on R, W1 (if used), and Y1 (if used). This will be 24 VAC power, so 18 AWG wire should be utilized.

Combination Fan/Light Switch

- To terminals S1H and S1

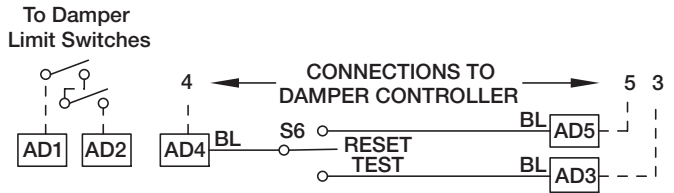


NOTE

For combination light/fans option, light circuit must not exceed 900W maximum.

Auto-Damper Switch on KFCC (mounted in hood)

- From limit switch to terminals AD1 and AD2
- From terminal 3 in auto-damper controller to AD3 in KFCC
- From terminal 4 in auto-damper controller to AD4 in KFCC
- From terminal 5 in auto-damper controller to AD5 in KFCC

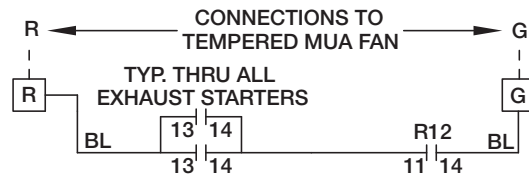


Make-Up Air (MUA) Interface (Optional)

When the KFCC is interfaced with another Greenheck supply air unit, this option will omit the redundant starter in the KFCC, as the supply air unit will already be provided with one. This will be 24 VAC voltage; so 18 AWG, shielded control wire can be utilized.

Make-Up Air Unit

- From terminal R in MUA control center to terminal R in KFCC
- From terminal G in MUA control center to terminal G in KFCC

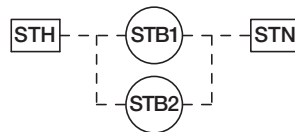


Power for Shunt Trip (Optional)

If the KFCC is configured with the power for shunt trip option, the KFCC will have terminals to connect an externally provided shunt trip breaker coil to allow the breakers to be tripped in the event of a fire. Connections include:

(Externally provided) shunt trip breakers

- To terminals STH and STN



Audible Alarm (Optional)

With this option, an alarm will be provided and mounted on the panel that will sound in the event of a kitchen fire. This option will be factory-mounted and wired if selected.

Lights Out In Fire (Optional)

This option will turn off the kitchen hood lights in the event of a fire without the use of a shunt trip breaker. If provided, this option will be factory wired. Normal light circuit wiring should be followed. Please see either **Switches (Optional)**, **Lights** on page 7 or **Combination Light/Fan Switch** on page 8 for additional wiring information.

NOTE

For lights out in fire option, light circuit must not exceed 900W maximum.

Extra Fire Relay (Optional)

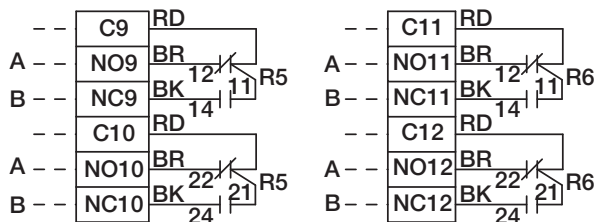
The KFCC can include additional fire relays for shunt trips, alarms, or additional utilities that need control signals to be sent in the event of a kitchen fire. The additional relay's state will only be changed if the dedicated fire system is wired into the KFCC. Wiring from additional relays to terminals will be done in the factory.

First Additional Fire Relay

- Power to terminal C9
- From terminal NO9 (normally open; closes in fire) to device
- From terminal NC9 (normally closed; opens in fire) to device
- Power to terminal C10
- From terminal NO10 (normally open; closes in fire) to device
- From terminal NC10 (normally closed; opens in fire) to device

Second Additional Fire Relay

- Similar to what is displayed above regarding terminals C11, NO11, NC11 and C12, NO12 and NC12.



NOTE

Relay contacts will be dry. Power will need to be provided to the common terminal on each set.

Do not use additional relay contacts for power interruption to appliances. Contacts are rated up to 250 VAC and 8 amps maximum.

Extra Exhaust Relay (Optional)

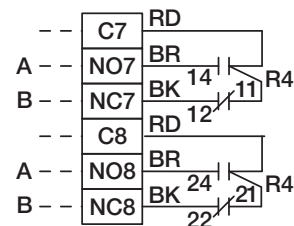
The KFCC can include additional relays for devices that activate when the exhaust fan is running. Wiring from additional relays to terminals will be done in the factory.

First Additional Exhaust Relay

- Power to terminal C7
- From terminal NO7 (normally open; closes with exhaust) to device
- From terminal NC7 (normally closed; opens with exhaust) to device
- Power to terminal C8
- From terminal NO8 (normally open; closes with exhaust) to device
- From terminal NC8 (normally closed; opens with exhaust) to device

Second Additional Exhaust Relay

- Similar to what is displayed above regarding terminals C15, NO15, NC15 and C16, NO16, and NC16.



EF Relay #2 contacts on R8 on terminal groups 15/16

NOTE

Relay contacts will be dry. Power will need to be provided to the common terminal on each set.

Extra Supply Relay (Optional)

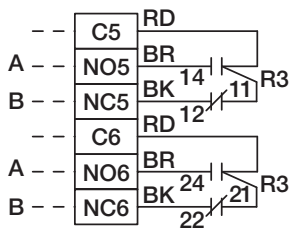
The KFCC can include additional relays for devices that activate when the supply fan is running. Wiring from added relays to terminals will be done in the factory.

First Additional Supply Relay

- Power to terminal C5
- From terminal NO5 (normally open; closes in fire) to device
- From terminal NC5 (normally closed; opens in fire) to device
- Power to terminal C6
- From terminal NO6 (normally open; closes in fire) to device
- From terminal NC6 (normally closed; opens in fire) to device

Second Additional Supply Relay

- Similar to what is displayed above regarding terminals C13, NO13, NC13 and C14, NO14, and NO6



SF Relay #2 contacts on R7 on terminal groups 13/14

NOTE

Relay contacts will be dry. Power will need to be provided to the common terminal on each set.

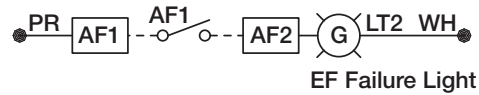
Exhaust Fan Failure Indicator (Optional)

This option will provide a small indicator light on the front panel of the KFCC. A field provided air proving switch located in the exhaust duct needs to be wired to a set of terminals, which will illuminate this light and provide a visual if the exhaust fan is not operating when the fans are on.

Air Flow Switch (field provided)

- To terminals AF1 and AF2

EXHAUST AIR FLOW SWITCH FIELD WIRED



EF Failure Light

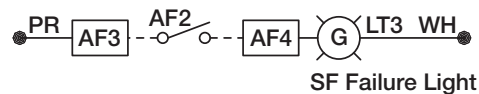
Supply Fan Failure Indicator (Optional)

This option will provide a small indicator light on the front panel of the KFCC. A field provided air proving switch located in the supply duct needs to be wired to a set of terminals, which will illuminate this light and provide a visual if the supply fan is not operating when the fans are on.

Air Flow Switch (field provided)

- To terminals AF3 and AF4

SUPPLY AIR FLOW SWITCH FIELD WIRED



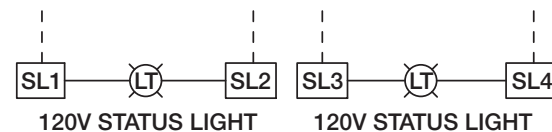
SF Failure Light

Status Lights (Optional)

The option adds status lights to the face of the KFCC. They will be either 120 VAC or 24 VAC status lights and will be noted on the wiring diagram. Power will have to be provided for each light in the field.

Status light(s)

- Bring power to SL1 and a neutral to SL2 (1st status light)
- Bring power to SL3 and a neutral to SL4 (2nd status light)



Example of two 120 VAC Status Lights

Water Wash Control Panel (WWCP) Interface

The KFCC may have to be interfaced with a Greenheck Water Wash Control Panel (WWCP). In these cases, the WWCP “Start Fan” and “Stop Fan, Start Wash” push buttons should be used for manual fan operation.

WWCP

- From terminals 3 and 4 in the WWCP to terminal S1H and S1 in KFCC

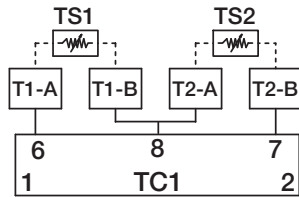
Temperature Interlock – Digital (Optional)

When configured with digital temperature interlock, the KFCC will include RTD sensors and digital controllers. Wiring from terminal blocks to controllers will be done in the factory. Use two 18 AWG stranded thermostat wires from each temperature sensor to the appropriate terminal blocks in the KFCC. (See the table below for connection options). In temperature sensor junction box, connect leads on RTD to the 18 AWG conductors using appropriate size wire nuts. These conductors for each sensor are not polarity sensitive.

RTD Sensors

Choose the final connection option based on the table.

Sensor	Terminals
First Sensor	T1-A and T1-B
Others (if applicable)	T2-A and T2-B T3-A and T3-B T4-A and T4-B T5-A and T5-B T6-A and T6-B T7-A and T7-B T8-A and T8-B T9-A and T9-B T10-A and T10-B T11-A and T11-B T12-A and T12-B



Wiring example of first two Digital Temperature Interlock Sensors

NOTE

Do not connect temperature sensors in series.

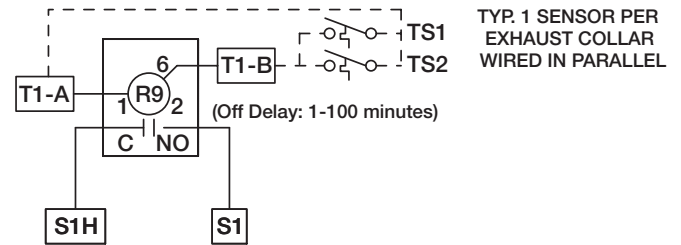
Separate as much as possible the probe and digital input cables from inductive loads and power cables, to avoid any electromagnetic disturbances. Never lay power and probe cables in the same cable conduits (including those for the electrical panel). Loosen every screw and insert the cable end. Next, tighten the screws and gently pull the cables to check their tightness.

Temperature Interlock – Thermostat (Optional)

When configured with thermostat style, temperature interlock, the KFCC will include thermostat(s) and a time delay relay. Wiring from terminal blocks to the time delay relay will be done in the factory. Use two 14 AWG 90°C minimum conductors from each thermostat to the appropriate terminal blocks in the KFCC. In the thermostat junction box, connect leads on the thermostat to the 14 AWG conductors using appropriate size wire nuts. These conductors for each thermostat are not polarity sensitive.

Thermostat(s)

- To terminals T1-A and T1-B



NOTE

Wire thermostats in parallel if multiple thermostats are utilized.

Do not connect thermostats in series with each other.

Digital Style Temperature Interlock Configuration

NOTE

This section only applicable if the KFCC is configured with digital temperature interlock option.

Calibration

The temperature controller is preset by the factory to turn the fans on at 95°F. This is controlled by the set point on the temperature controller. The temperature set point may have to be adjusted slightly depending on both ambient and cooking conditions. The adjustment is made through the buttons on the temperature controller. The controller is capable of monitoring two separate sensors. If more than one sensor is utilized with a single controller, two set points can be adjusted. To adjust, follow these instructions:

1. If setting set point 1 (St1), press **Set**. The display shows St1 and then the current value of St1.
If setting set point 2 (St2), press **Set** twice, slowly. The display shows St2 and then the current value of St2.
2. Press the ▲ or ▼ to change the set point.
3. Press **Set** to confirm the new value of either St1 or St2.
4. Check system operation before making additional adjustments.

Factory Selected Parameters

The factory will pre-program the controllers to be properly integrated into the control panel. Except for the set points, the other parameters shouldn't need adjusting. However, there are three different types of parameters that are accessible on the controller. Access differs depending on the type: set point; frequently used parameters (P); and configuration parameters (c, d, F).

NOTE

The controller is pre-programmed at the factory to operate with the digital temperature interlock components. No further parameter changes should be necessary.

Setting type P parameters

Type P parameters (frequently) are indicated by a code beginning with the letter P, followed by one or two numbers.

1. Hold the $\frac{\text{Prg}}{\text{mute}}$ button, after 3 seconds the display shows the firmware revision code (e.g. r2.1) is shown, after 5 seconds (in the event of alarms, first the buzzer is muted) the code of the first type P modifiable parameter, P1.
2. Press ▲ or ▼ until reaching the desired parameter.
3. Press **Set** to display the associated value.
4. Increase or decrease the value using ▲ or ▼ respectively, until reaching the desired value.
5. Press **Set** to **temporarily** save the new value and return to the display of the parameter code.
6. Repeat operations from 4 to 5 to set other parameters.
7. To **permanently** save the new values of the parameters, press $\frac{\text{Prg}}{\text{mute}}$ for 5 seconds, thus exiting the parameter setting procedure.

Setting type c, d, F parameters

Type c, d or F (configuration) parameters are indicated by a code beginning with letters c, d, F respectively, followed by one or two numbers.

1. Press $\frac{\text{Prg}}{\text{mute}}$ and **Set** together for more than 5 seconds. The display shows the number 0.
2. Press ▲ or ▼ until displaying the password: 77
3. Confirm by pressing **Set**
4. If the value entered is correct, the first modifiable parameter cO will be shown, otherwise the standard display will resume.
5. Press ▲ or ▼ until reaching the parameter to be modified.
6. Press **Set** to display the associated value.
7. Increase or decrease the value using ▲ or ▼ respectively, until reaching the desired value.
8. Press **Set** to **temporarily** save the new value and return to the display of the parameter code.
9. Repeat operations from 5 to 8 to set other parameters.
10. To **permanently** save the new values of the parameters, press $\frac{\text{Prg}}{\text{mute}}$ for 5 seconds, thus exiting the parameter setting procedure.

Factory Selected Parameters		
Parameter	Description	Factory Setting
St1	Set Point 1	95
St2	Set Point 2	95
c0	Operating Mode	1
P1	Set Point Differential	5.0
P2	Set Point Differential	5.0
P3	Dead Zone Differential	0
c6	Delay between two outputs	0
c9	Minimum relay on time	5
c10	Probe alarm output status 1	1
d10	Probe alarm output status 2	1
c11	Output Rotation	4
c13	Probe Type	3
P14	Probe 1 Calibration	0
P15	Probe 2 Calibration	0
c18	Unit of Measure	1
c19*	Function of probe 2	0 or 7

*Parameter c19 is factory set at 0. If controller is connected to two sensors, then the parameter is factory set at 7.

Displaying the Inputs

- Press ▼. The current input will be displayed, alternating with the value:
 - b1 : probe 1
 - b2 : probe 2
 - di1 : digital input 1
 - di2 : digital input 2
 - St1 : set point 1
 - St2 : set point 2
- Press ▲ or ▼ to select the input to be displayed.
- Press **Set** for three seconds to confirm.

Thermostat Style Temperature Interlock Configuration

NOTE

This section only applicable if the KFCC is configured with thermostat style temperature interlock.

Calibration

Thermostat(s) will be preset by factory to 95°F and will have slow make and break contact. It will make contact on a temperature rise and break contact on temperature fall. The temperature set point may have to be adjusted slightly depending of both ambient and cooking conditions. The adjustment knob is located on the back of the thermostat. Use a small blade screwdriver to make the adjustments.

- Turn counterclockwise to increase the temperature set point, turn clockwise to decrease the temperature set point.
- Quarter revolution in either direction corresponds to a 22.5°F adjustment. Be sure to make small adjustments, about 1/16 of a turn (~6°F) or less at one time.
- Do not exceed more than one-half revolution in either direction.
- Check system operation before making additional adjustments.

KFCC Field Connection Checklist

Power to KFCC Cabinet and Lights

- 115 VAC power for controls (terminals H1, N1)
- 115 VAC power for hood lights, one per light circuit (terminals H2, N2 | H3, N3 | H4, N4)
- Connect lights, one per light circuit (terminals B2, W2 | B3, W3 | B4, W4)
(Lights may be directly wired to switch)

Power for Fans

- 115/200/208/230/277 VAC power, single phase fans from breaker (terminals L1, L2)
- 208/230/277/460/575 VAC power, three phase fans from breaker (terminals L1, L2, L3)
- 115 VAC power for single phase to fan (contactor/overload T3, terminal L1 is neutral)
- 208/230/277/460 VAC power to single phase fan (contactor/overload T1, T3)
- 208/460/575 VAC power to three phase fan (contactor/overload T1, T2, T3)

Fire System

- Microswitch C, N.O., and N.C. (terminals C1, NO1, NC1)

Spare Fire Relay

- Spare, dry relay contact (terminals C3, NO3, NC3)
- Spare, dry relay contact (terminals C4, NO4, NC4)

Switches - if equipped

- Fan, 1-Speed (terminals S_H, S_ ; S_N is neutral if lighted)
- Fan, 2-Speed (terminals S_H, S_N, S_)
- Light (terminals H2, B2 or H3, B3 or H4, B4; may be directly wired to hood lights)
- Thermal, heat only (terminals R, W1)
- Thermal, supply only (terminals R, Y1)
- Tempered (terminals R, W1, Y1)
- Auto-Damper (terminals AD1, AD2, AD3, AD4, AD5)

MUA Interface - if equipped

- To MUA Control Center (terminals R, G)

Power for Shunt Trip - if equipped

- Shunt trip breaker coil (terminals STH, STN)

Extra Fire Relay (1) - if equipped

- Spare, dry relay contact (terminals C9, NO9, NC9)
- Spare, dry relay contact (terminals C10, NO10, NC10)

Extra Fire Relay (2) - if equipped

- Spare, dry relay contact (terminals C11, NO11, NC11)
- Spare, dry relay contact (terminals C12, NO12, NC12)

Extra Exhaust Relay (1) - if equipped

- Spare, dry relay contact (terminals C7, NO7, NC7)
- Spare, dry relay contact (terminals C8, NO8, NC8)

Extra Exhaust Relay (2) - if equipped

- Spare, dry relay contact (terminals C15, NO15, NC15)
- Spare, dry relay contact (terminals C16, NO16, NC16)

Extra Supply Relay (1) - if equipped

- Spare, dry relay contact (terminals C5, NO5, NC5)
- Spare, dry relay contact (terminals C6, NO6, NC6)

Extra Supply Relay (2) - if equipped

- Spare, dry relay contact (terminals C13, NO13, NC13)
- Spare, dry relay contact (terminals C14, NO14, NC14)

Exhaust Fan Failure Indicator - if equipped

- Airflow switch (terminals AF1, AF2)

Supply Fan Failure Indicator - if equipped

- Airflow switch (terminals AF3, AF4)

Status Lights (24 VAC or 120 VAC) - if equipped

- Status light one (terminals SL1, SL2)
- Status light two (terminals SL3, SL4)

Water Wash Control Panel (WWCP) Interface - if equipped

- From terminals 3 and 4 in WWCP (terminals S1H, S1)

Digital Style Temperature Interlock - if equipped

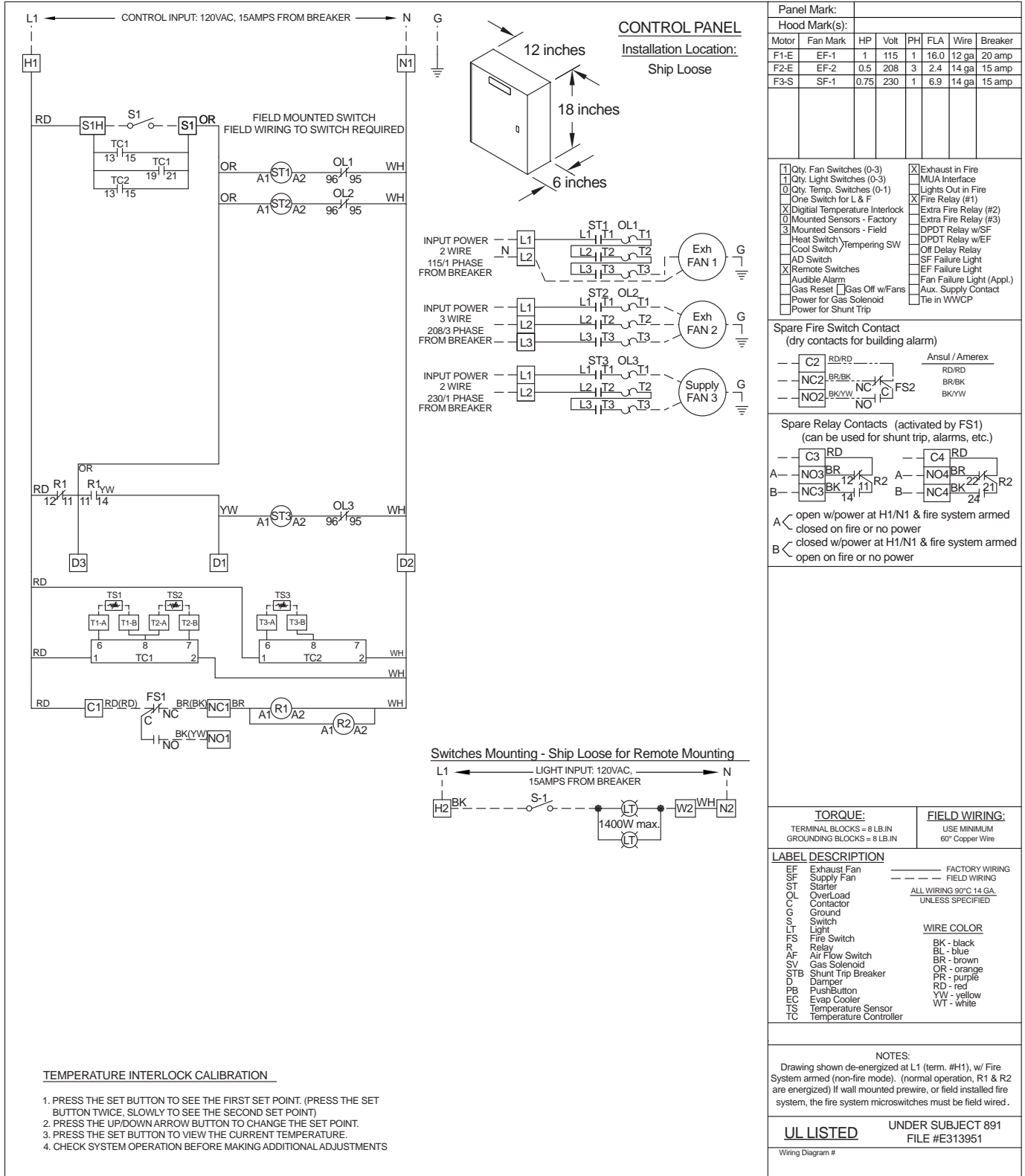
- RTD sensor(s) (terminals T_-A, T_-B)

Thermostat Style Temperature Interlock - if equipped

- Thermostat(s) (wired in parallel between terminals T1-A, T1-B)

General Wiring Diagram

This is an example of a generic wiring diagram of a KFCC. The KFCC is configured with two exhaust fans and one supply fan, as well as three digital interlock sensors. To see your job specific drawing, look on the inside panel of the KFCC.



Testing

1. Turn the fan switch(es) on, then off to ensure proper fan operation before cooking equipment is started. Once this is verified, testing can proceed.
2. If applicable, turn the light switch(es) on, then off to ensure proper light operation in the hood. Once this is verified, testing can proceed.
3. Press and hold down the fire suppression switch connected to the KFCC and verify that the corresponding exhaust and/or supply fan(s) react appropriately when in the fire state. Verify all shunt trip breakers, alarms, and other components utilizing any of the spare relay contacts in the KFCC are activated properly.
4. **If the KFCC is configured with thermostat style temperature interlock, please follow steps 5 through 9 below. If the KFCC is configured with digital temperature interlock, please follow steps 10 through 12.**
5. For testing only, locate the time delay relay. Turn the time adjustment knob counterclockwise to the first mark in order to expedite the testing process. Make a note as to where the timer was originally set.
6. Heat up cooking equipment with fans off. Once the temperature reaches the set point of the thermostat the fans will start, preferably within 5 minutes. If the fans take more than 5 minutes to start, decrease the temperature set point by turning the adjustment screw 1/16 turn clockwise. Do not apply direct flame to the thermostat.
7. If an adjustment was made in Step 6, repeat now.
8. After verification of fan start-up, shut down cooking equipment. The fan switch should still be in the off position. Once cooking equipment has cooled, the thermostat will open triggering the timer to begin. Once time has expired, the fans will shut down. Thermostat operation can be verified by checking voltage (120 VAC) between T1-B and neutral on the KFCC. 120 VAC will be present when the thermostat senses heat.
9. Once proper operation has been verified, set the dial on the timer relay to its original setting (approximately 20 minute delay).
10. Heat up cooking equipment with fans off. Once the temperature reaches the set point +5°F. the fans will start. If the fans take more than 5 minutes to start, decrease the temperature set point by adjusting the set point on the temperature controller (see Calibration).
11. If an adjustment was made in Step 10, repeat now.
12. After verification of fan start-up, shut down cooking equipment. The fan switch should still be in the off position. Once cooking equipment has cooled below the set point and the fans have been on for a minimum of 5 minutes, the fans will shut down.

CAUTION

Both the RTD sensors and the thermostat probes provided in temperature interlock options should never be exposed to direct flame. **EXPOSING THE SENSOR TO DIRECT FLAME MAY RENDER THE SENSOR INOPERABLE AND WILL VOID THE WARRANTY.**

NOTE

If the KFCC was configured with temperature interlock and during testing the fans do not start automatically in the first 10 minutes of cooking equipment activation, manually start fans to avoid accidental fire system dump due to heat build-up.

Operation

1. Turn fans on and off using the fan switch.
2. **If KFCC is configured to control hood lights**, turn hood lights on and off using the light switch.
3. **If KFCC is configured with digital style temperature interlock**, it is normal for the fan(s) to remain running after the switch is turned off. The exhaust temperature controller(s) contacts will open after heat is no longer present underneath the hood(s), the temperature is below the set point and the fan(s) have at least been running for 5 minutes. When the controller contacts opens, the fan(s) shall shut down. In the event that the cooking equipment is started without turning the fan(s) on manually, the fan(s) will turn on automatically and remain running with the presence of heat under the hood. The temperature plus a 5°F hysteresis in order to turn on. Once the temperature is below the set point and the fan(s) have at least been running for 5 minutes, the fan(s) will shut down.
4. **If KFCC is configured with thermostat style temperature interlock**, it is normal for the fan(s) to remain running after the fan switch is turned off. The exhaust thermostat(s) will open after heat is no longer present under the hood, which will activate the timer to begin its countdown. Once the time has expired, fan(s) will shut down. The timer is adjustable from 1-100 minutes. The recommended time delay setting is approximately 20 minutes. In the event that the cooking equipment is started without turning the fan(s) on manually, the fan(s) will turn on automatically and remain running with the presence of heat underneath the hood. The exhaust thermostat(s) will open after heat is no longer present under the hood, which will activate the timer to begin its countdown. Once time has expired, fan(s) will shut down.

Troubleshooting

1. Fan(s) do not turn on automatically upon cooking equipment activation

- Confirm that the KFCC has been configured with temperature interlock, either thermostat style or digital style.
- Check wiring to control panel. With thermostat style interlock, thermostats must be wired in parallel. With digital style interlock, sensors must be wired to the control panel separately.
- Temperature set point is too high, decrease set point.
- No power to fan(s), check breakers/starters/relays.

2. Controller(s) in KFCC display E01 or E02 and fan(s) will not shut off.

- E01 and E02 represent sensor faults.
- Check wiring connections between the sensor and control cabinet.
- Check probe resistance between the two leads coming off the sensor when disconnected from the system. At room temperature (77°F) the probe will read approximately 1025 ohms.

3. Fan(s) do not shut off.

- Manual fan switch must be in the off position.
- If the KFCC is configured with digital style temperature interlock, check the controller to determine if there is a probe error of E01 or E02. If yes, refer to the controller display error message, item 2 above.
- Cooking equipment is still hot, and the KFCC is configured with temperature interlock. Wait for the equipment to cool.
- Temperature set point for temperature interlock is set too low; increase set point.
- Ensure wires are connected to appropriate control circuit.

4. Exhaust fan(s) will not shut off, and supply fan(s) will not turn on.

- Check hood for fire system dump.
- If no fire system dump has occurred, check fire system wiring between fire system microswitch and control panel.

5. Fan(s) do not turn on quick enough.

- Decrease temperature set point

Maintenance

Daily

If KFCC is configured with temperature interlock, clean thermostat or sensor with cloth and degreaser. Keep clean for best performance. (Can clean weekly depending upon grease accumulation).

Weekly

Depending on grease production and grease filter type in the hood, temperature thermostats or sensors can be cleaned weekly.

Seasonal

If KFCC is configured with temperature interlock, may have to change temperature settings if ambient kitchen temperatures fluctuate between summer and winter seasons.

Whom to call

Contact your local manufacturer's representative.

What to have ready for the call

Sales order, serial number and description of product.

Sales Order Number _____

Serial Number _____

Frequently Asked Questions Regarding Temperature Interlock

What temperature is the thermostat set from the factory?

95° Fahrenheit

How do I determine if the KFCC is configured with thermostat style or digital style temperature interlock?

Thermostat style interlock uses 5/8-inch diameter probe(s) mounted in either the hood capture area or exhaust collar(s). The KFCC will include a solid-state relay with a 1-100 minute off-delay dial. Inspect the probe diameter or look inside the KFCC for this solid-state relay.

Digital style interlock uses 1/4-inch diameter probe(s) mounted in either the hood capture area or exhaust collar(s). The KFCC will include a controller with a digital read out, capable of displaying different temperature values. Inspect the probe diameter or look inside the KFCC for this digital-displaying controller.

Will the temperature interlock automatically start/stop the fans?

When connected properly to the fan starters the temperature interlock will automatically control the fans without input from the user. However, it is intended to be used as a back up to manual control.

With thermostat style interlock, what is the purpose of the timer in the KFCC?

The timer is used to delay the shut down of the fans, to prevent fan on/off cycling while the temperature in the exhaust duct can reach steady state. Without the delay, cycling could occur both on startup or shutdown of cooking equipment. The delay is typically set at 20 minutes.

How many individual breakers does the KFCC require?

The number of individual breakers depends the number of fans controlled and options included in the KFCC. Each individual fan typically requires its own breaker. The KFCC main power requires its own breaker. Each light circuit is typically put on individual breakers.

Can I still turn my fan on and off?

Yes, the temperature interlock is designed to operate with a typical on/off switch. The fan may not turn off immediately after turning the fan switch off, it will sense when the cooking operations have cooled and then turn off.

Replacement Parts

Part Number	Description
384905	Terminal Block, Single Pole, DIN-RAIL MT, ABB ZS6
384908	Jumper, DIN-RAIL Terminal Block 2 Pole ABB JB6-2
383559	DPDT Relay Base Finder 95853
383560	DPDT Relay Finder 40528120000 120 VAC DPDT Relay
Resistive (Digital Style) Temperature Interlock	
384925	Temperature Sensor (RTD) MAMAC TE-700-D-3-A
384920	Temperature Controller CAREL iR33-DN33 DN33W7HR20
830125	Extension, Octagon (drilled) SC55151-1/2 (380928)
732396	J-Box Plate
380926	Cover, Octagon Box SC#54-C-1RACO 722
463570	Evergreen Compression Seal 1/4-inch, #302
Thermostat Style Temperature Interlock	
383923	Thermostat, Vulcan 1C2B9 5/8-inch Type C
451168	Evergreen Quik-Seal, 1/2-inch #171 (1-1/8 inch hole size)
830125	Extension, Octagon (drilled) SC55151-1/2 (380928)
380926	Cover, Octagon Box SC#54-C-1RACO 722
383271	Timer SSAC #KRDB424 SPST 1-100 min.
452614	Evergreen Compression Seal, 5/8-inch, #302
732396	J-Box Plate

Codes and Standards Compliance

- UL 710 and UL 891
- National Fire Protection Association (NFPA 96)
- National Electrical Code (NEC)
- Canadian Electrical Code (CEC)

With Temperature Interlock Option Included:

- International Mechanical Code (IMC) 2006 Section 507.2.1.1

Our Commitment

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

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

Greenheck's Kitchen Ventilation Systems, Controls and Energy Management catalog, provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.

