

Installation, Operation and Maintenance Manual

Please read and save these instructions. 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! Retain instructions for future reference.



Product Specification

Temperature Interlock

International Mechanical Code (IMC) 2006 section 507.2.1.1 Compliant Electrical Package

Provide Accurex temperature interlock electrical package as shown on plans and in accordance with the following specification:

The temperature interlock(s) consists of an adjustable thermostat, junction box, fire proof/leak proof threaded fitting (Evergreen Quik-Seal[®] and/or Evergreen Compression Seal), and shall be a self-contained unit or as part of another pre-engineered electrical control package.

The temperature interlock package shall close a relay powering the fans when the set temperature is reached at the thermostat. The interlock shall hold the circuit closed upon fan switch being turned off until the temperature at the sensor decreases below the set point at which point the timed relay will begin a countdown. Once the countdown has expired and as long as the temperature has remained below the set point, the fans shall shut down.

The temperature interlock package shall be constructed by Accurex in accordance with International Mechanical Code. The manufacturer shall provide, upon request, the necessary data that confirms compliance with the code listed above.

Due to continuous research, Accurex reserves the right to change specifications without notice.

General Description

Description

The temperature interlock is designed to automatically start kitchen hood exhaust fans and keep them running while heat is being generated from the cooking appliances. Hood systems should always be manually started before equipment is turned on. If the fans are forgotten to be turned on, the interlock will turn the fans on once heat is detected. The interlock consists of an adjustable thermostat, junction box, Evergreen Quik-Seal threaded fitting, and is contained in a stand alone box or can be added to a pre-engineered fan control center.

Purpose

To meet IMC 2006 section 507.2.1.1, interlock between exhaust fans and cooking equipment. This system will utilize a temperature sensor in the exhaust duct collar or in capture area of hood to detect heat generated from cooking operations and automatically activate the exhaust fans if not already turned on. Field wiring may be required depending on location of components.

Product Application

The temperature interlock is designed to be used with Type I and Type II Hoods. It is not to be used in conjunction with exhaust fire dampers. Accurex recommends using one interlock per hood system (activates all fans linked to system simultaneously).

Performance Goals

Automatically energize the exhaust fans when cooking equipment generates heat. Basic controls will be provided with a thermostat and will consist of an 8 x 8 electrical box with controls and a labeled terminal strip to hook-up incoming power and fan starters. An adjustable delay is used to keep the exhaust fans running when the thermostat initially closes to prevent the fan from cycling on and off at startup and shut down. Fans will shut down automatically 20 minutes after the thermostat opens its contact. The time delay can be adjusted from 1-100 minutes based on jobsite requirements.

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Receiving and Handling

Upon receiving the equipment, check for both obvious and hidden damage. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are accounted for.

Storage

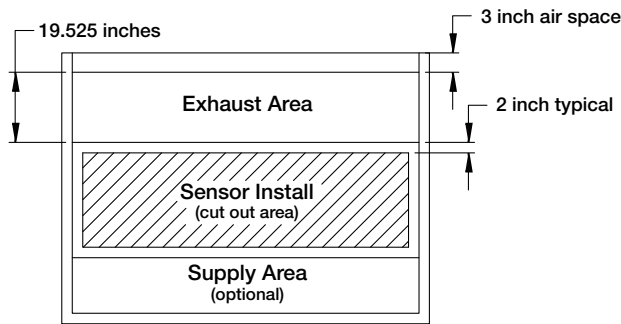
If a temperature interlock must be stored prior to installation it must be protected from dirt and moisture. Indoor storage is recommended. For outdoor storage, cover the hood with a tarp to keep it clean, dry, and protected from UV (ultraviolet) radiation damage.

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



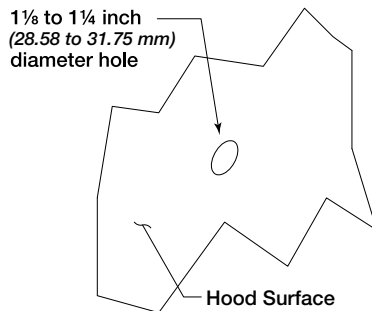
Installation – Hood Mounting

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

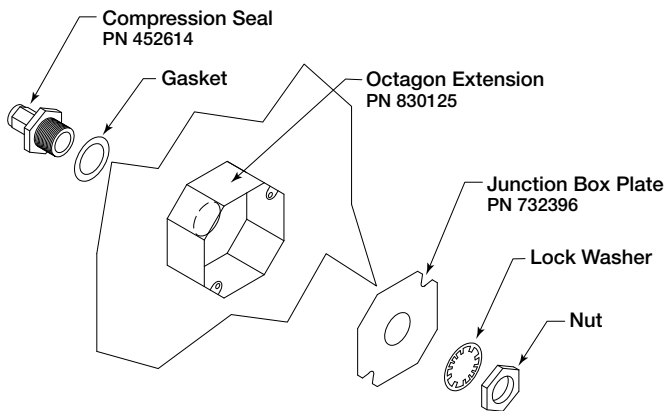


Hood Plan View

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 $1\frac{1}{8}$ to $1\frac{1}{4}$ 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 8 inches (20.32 cm) of the light fixtures.



2. Insert the Evergreen Compression Seal fitting into the hole from the inside of the hood, making sure the gasket is placed on the fitting before inserting it into the hole. Install the lock washer and $1\frac{1}{2}$ inch (38 mm) nut on the threaded portion of the compression seal fitting and tighten securely.

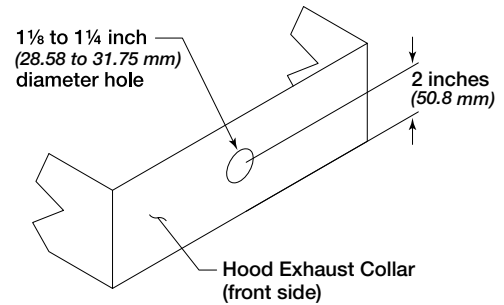


Exploded View (Components)

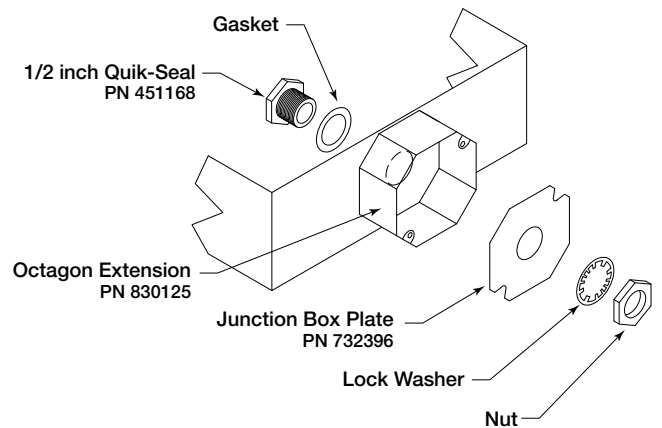
3. Place the junction box provided over the fitting on top of the hood, keeping the fitting centered in the box.
4. Thread the thermostat into the compression seal fitting and tighten to 35 ft-lbs. (4.84 m-kgs).

Duct Collar Mounting

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. 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 lock washer and $1\frac{1}{2}$ inch (38.1 mm) nut on the threaded portion of the Evergreen Quik-Seal fitting and tighten securely.



Exploded View (Components)

3. Place the junction box provided over the fitting and tack weld the junction box to the exhaust duct keeping the fitting centered in the box. (Welding optional).
4. Thread thermostat into Evergreen Quik-Seal fitting and tighten to 35 ft-lbs (4.84 m-kgs).

Electrical Connections

Thermostat Connections

1. Run two 14 awg, 90° minimum conductors, black, in conduit from each thermostat to the appropriate electrical circuit connections. (See Step 3 for connection options).
2. In junction box, connect leads on thermostat to the 14 awg conductors using appropriate size wire nuts.
 - Wires are interchangeable with one another.
 - Wire thermostats in parallel if there are multiple exhaust ducts.
3. Choose the final connection based on:
 - Terminals T1 & T2 in fan control center (KFCC).
 - Terminals 5 & 6 in control box on top of hood/utility cabinet.

CAUTION

Do not connect thermostat in series with fan power. On/off cycling of the fans will result during start-up and shutdown periods. Use the thermostat for control wiring only.

Breaker Panel to Control Box or Fan Control Center

1. Connect a Single Pole Single Throw (SPST) switch to one of the following based on application:
 - Terminals 3 & 4 in the control box.
 - Terminals S1 & S1H in the fan control center.

Circuit Connections

1. Standard Interlock Control
 - 120V, 10 or 15 amp circuit to terminals 1 & 2
 - Control voltage for fan starter activation
 - 120V, 24V or other control circuit (*drawing on page 8*)
 - Control circuit power to terminal 7
 - Terminal 8 to fan starter coils
 - 120V only control circuit (*drawing on page 9*)
 - Terminals 7 & 8 to fan starter coils
2. Fan Control Center Integration (KFCC)
 - Power to H1 & N1 in fan control center
 - No additional control circuits are required fan starters are factory wired

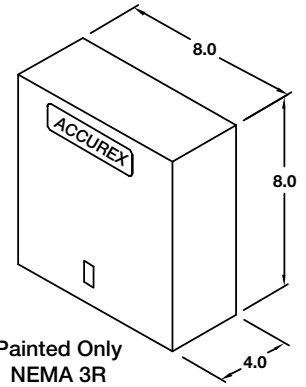
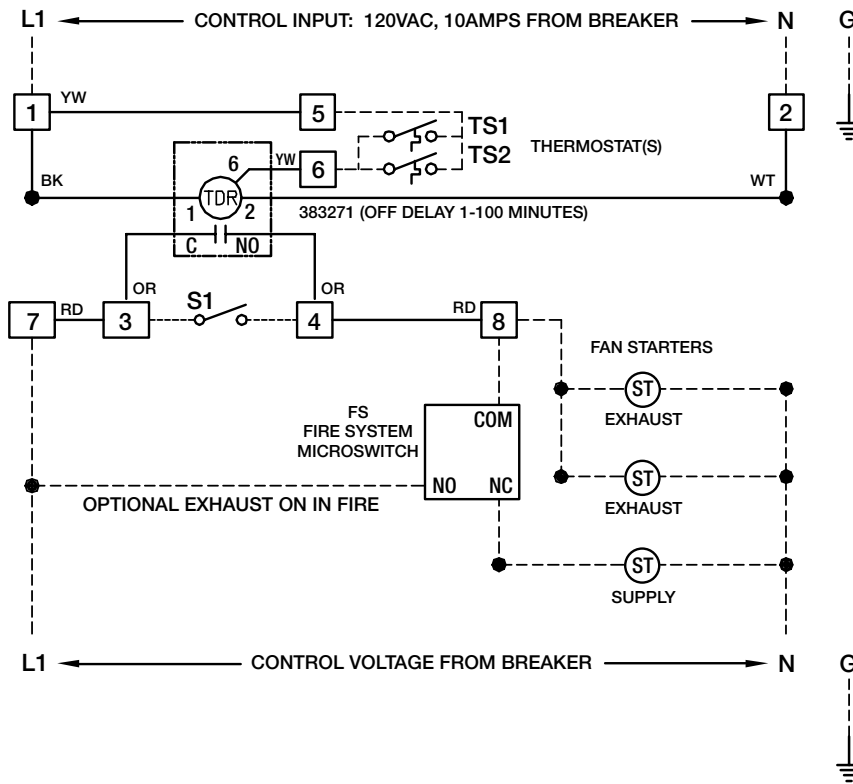
Calibration

Thermostat is preset by factory to 95°F and has a 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.

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



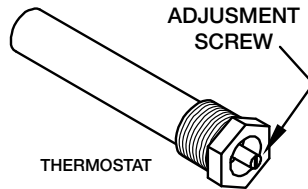
Control Circuit Diagram (Standard Control)



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TORQUE:		FIELD WIRING:	
GROUNDING BAR = 20 IN/LB.		use minimum 60" Copper Wire	
LABEL	DESCRIPTION	FACTORY WIRING	FIELD WIRING
EF	Exhaust Fan	—	—
SF	Supply Fan	—	—
ST	Starter	—	—
OL	OverLoad	ALL WIRING 90°C 14 GA. UNLESS SPECIFIED	
C	Contact		
G	Ground		
S	Switch		
LT	Light		
FS	Fire Switch		
R	Relay		
AF	Air Flow Switch		
SV	Gas Solenoid		
STB	Shunt Trip Breaker		
D	Damper		
PB	PushButton		
N	Neutral		
TS	Thermostat		
TDR	Time Delay Relay		
FS	Fire System Microswitch		

Thermostat factory set at 95°F (35°C)

- Do not turn adjustment screw more than 1/2 revolution in either direction.
- 1/8 turn equals 12°F (6.7°C)
- Counterclockwise = increase temperature setting
- Clockwise = decrease temperature setting

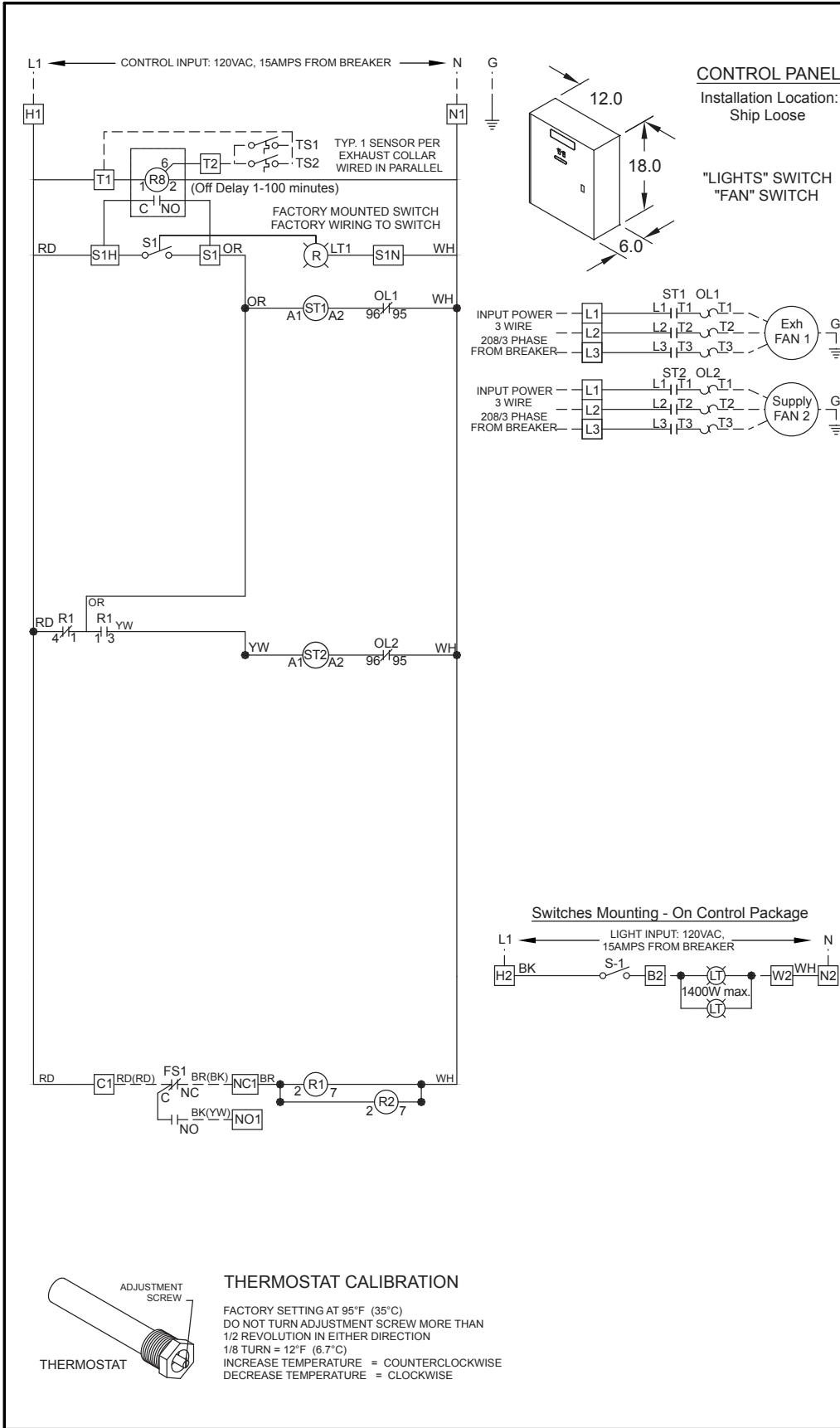


FIELD CONNECTIONS	
Torque to 18 in-lbs.	
Control Circuit	120/1 - 10 A 1 NEUTRAL 2
Fan Switch Connection	3 4
Thermostat Connection	5 6
Fan Starter Control Circuit	7 8

Part #471503

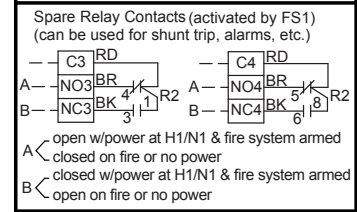
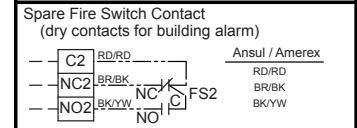


Control Circuit Diagram (Fan Control Center)



Panel Mark:	Mark 1						
Hood Mark(s):							
Motor	Fan Mark	HP	Volt	PH	FLA	Wire	Breaker
F1-E	EF-1	1.5	208	3	5.7	14 ga	15 amp
F2-S	SF-1	1	208	3	4.6	14 ga	15 amp

<input type="checkbox"/> Qty. Fan Switches (0-3)	<input type="checkbox"/> Exhaust in Fire
<input type="checkbox"/> Qty. Light Switches (0-3)	<input type="checkbox"/> MUA Interface
<input type="checkbox"/> Qty. Temp. Switches (0-1)	<input type="checkbox"/> Lights Out in Fire
<input type="checkbox"/> One Switch for L & F	<input type="checkbox"/> Fire Relay (#1)
<input checked="" type="checkbox"/> Temperature Interlock	<input type="checkbox"/> Extra Fire Relay (#2)
<input type="checkbox"/> Mounted Sensors - Factory	<input type="checkbox"/> Extra Fire Relay (#3)
<input type="checkbox"/> Mounted Sensors - Field	<input type="checkbox"/> DPDT Relay w/SF
<input type="checkbox"/> Heat Switch / Tempering SW	<input type="checkbox"/> DPDT Relay w/EF
<input type="checkbox"/> Cool Switch / Off Delay Relay	<input type="checkbox"/> Off Delay Relay
<input type="checkbox"/> AD Switch	<input type="checkbox"/> SF Failure Light
<input type="checkbox"/> Remote Switches	<input type="checkbox"/> EF Failure Light
<input type="checkbox"/> Audible Alarm	<input type="checkbox"/> Fan Failure Light (Appl.)
<input type="checkbox"/> Gas Reset	<input type="checkbox"/> Damper
<input type="checkbox"/> Power for Gas Solenoid	<input type="checkbox"/> Aux. Supply Contact
<input type="checkbox"/> Power for Shunt Trip	<input type="checkbox"/> Tie in WWCP



TORQUE: TERMINAL STRIPS = 18 IN/LB. GROUNDING BAR = 20 IN/LB.	FIELD WIRING: USE MINIMUM 60" Copper Wire
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LABEL DESCRIPTION	
EF Exhaust Fan	FACTORY WIRING
SF Supply Fan	FIELD WIRING
ST Starter	ALL WIRING 90°C 14 GA UNLESS SPECIFIED
OL OverLoad	
C Contactor	
G Ground	
S Switch	
LT Light	WIRE COLOR
FS Fire Switch	BK - black
R Relay	BL - blue
AF Air Flow Switch	BR - brown
SV Gas Solenoid	OR - orange
STB Shunt Trip Breaker	PR - purple
D Damper	RD - red
PB PushButton	YW - yellow
EC Evap Cooler	WT - white

NOTES:
Drawing shown de-energized at L1 (term. #H1), w/ Fire System armed (non-fire mode).
(normal operation, R1 & R2 are energized) If wall mounted prewire, or field installed fire system, the fire system microswitches must be field wired.

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FILE #E200616

Wiring Diagram # T110-2-311



Testing

1. Turn fan switch on, then off to ensure proper fan operation before cooking equipment is started. Once this is verified, testing can proceed.
2. 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.
3. Heat up cooking equipment with fans off. Once the duct 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
4. If an adjustment was made in Step 3, repeat now.
5. 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 (120V) between T2 and neutral on either the control box or KFCC. 120V will be present when the thermostat senses heat.
6. Once proper operation has been verified, set the dial on the timer relay to its original setting (approximately 20 minute delay).

NOTE

During testing, if 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. It is normal for the fans to remain running after the switch is turned off. The exhaust duct thermostat will open after heat is no longer present under the hood which will activate the timer to begin its countdown. Once time has expired, fans will shut down. The timer is adjustable from 1-100 minutes. The recommended time delay setting is approximately 20 minutes.
2. In the event that the cooking equipment is started without turning the fans on manually, the fans will turn on automatically and remain running with the presence of heat under the hood. The exhaust duct thermostat will open after heat is no longer present under the hood which will activate the timer to begin its countdown. Once time has expired, fans will shut down.

Troubleshooting

Fans do not turn on automatically upon cooking equipment activation.

- Check wiring to control panel or relay box, thermostats must be wired in parallel
- Temperature set point to high, decrease set point
- No power to fans, check breakers/starters/relays

Fans do not shut off.

- Switch must be in the off position
- Cooking equipment hot, wait for it to cool
- Temperature set point too low, increase set point
- Ensure wires connected to appropriate control circuit
- Time delay too great, turn down timer

Fans cycle off to on when turned off.

- Cooking equipment not cooled enough, retry in 5 minutes

Fans do not turn on quick enough.

- Decrease temperature set point

Maintenance

Daily

Clean thermostat with cloth and degreaser. Keep clean for best performance. (Can clean weekly depending upon grease accumulation).

Weekly

Dependant on grease production and grease filter type, clean thermostat.

Seasonal

May have to change temperature setting on back of thermostat if ambient kitchen temperatures fluctuate between summer and winter seasons.

Whom to call

Contact your local Accurex representative.

What to have ready for the call

Sales order, serial number and description of product.

Sales Order Number _____

Serial Number _____



Frequently Asked Questions

What temperature is the thermostat set from the factory?

95° Fahrenheit.

Will the temperature interlock automatically start/stop the fans?

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

May I connect the power going to my fan directly through the control box?

No, the control box should only use control voltage only (24-120V), and a separate 120V power source is required to run the temperature interlock controls. Accurex recommends the use of starters sized for each fan.

What is the purpose of the timer in the control box?

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.

Can I use one control box for multiple hood systems?

This can be done, however, it is not recommended. Any one of the thermostats would turn on all hoods running on that control box. It is better to have one hood/fan per control box, plus a significant energy savings can be obtained if one or more of the hoods is not in operation.

Can I still turn my fan on and off?

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

Warranty

Accurex 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 Accurex prove defective during this period, they should be returned to the nearest authorized motor service station. Accurex will not be responsible for any removal or installation costs.

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

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.



Phone: (800) 333-1400 • Fax: (715) 241-6171 • Web site: www.accurex-systems.com

Replacement Parts

Quantity	Part Number	Description
1	383923	Thermostat, Vulcan 1C2B9 5/8-inch Type C
1	451168	Evergreen Quik-Seal, 1/2-inch #171 (1-1/8 inch hole size)
1	830125	Ext, Octagon (drilled) SC55151-1/2 (380928)
1	380926	Cover, Octagon Box SC#54-C-1RACO 722
1	381460	Encl, 8X8X4 NEMA3R ELMATE RC-884-SC3R
3	382859	Terminal Block, 3 pole, DIN-RAIL MT, BUS NDN3-WH
2	382858	Jumper, DIN-RAIL Terminal Block #JNDN3
1	383271	Timer SSAC #KRDB424 SPST 1-100 min.
1	452614	Evergreen Compression Seal, 5/8-inch, #302

Codes and Standards Compliance

- UL 710
- National Fire Protection Association (NFPA 96)
- International Mechanical Code (IMC) 2006 Section 507.2.1.1