



Truflow-TC Touchscreen



Installation And Operating Manual

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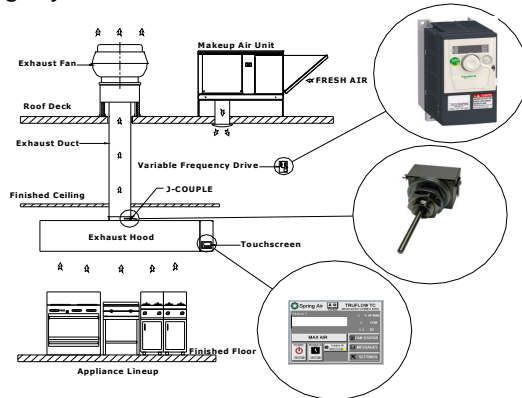
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Truflow-TC Touchscreen

Installation & Operating Manual

Introduction

The average commercial kitchen exhaust system operates 12 to 18 hours per day. Today's kitchen systems exhaust at 100% capacity whenever they are turned on regardless of that number of appliances or amount of cooking that is going on under the hood. The cook will arrive at 7:00 a.m. in the morning and switch the system on for the day. The system is not shut off until the last person leaves the kitchen at the end of the day. The reality is that the amount of actual high capacity cooking is a very small part of the total operating day.



The Truflow-TC System

Unfortunately when the exhaust runs continuously at full volume all day, so will the fresh air supply unit heating and cooling fresh air to replace the exhaust from the kitchen.

The Truflow-TC system reduces the amount of air exhausted from the kitchen to match the amount of cooking. As more appliances are used the exhaust and supply volume increases, as less appliances are used the exhaust and supply volume decreases.

What does Truflow-TC Do?

Truflow-TC will automatically reduce the exhaust and supply air into the kitchen whenever appliances are not used at full capacity. The Truflow-TC is a simple, inexpensive way to achieve energy savings by reducing the exhaust and supply volume required for your commercial kitchen. When the appliances are not used and the related heat is turned down or off, the Truflow-TC automatically senses this reduction and decreases the amount of exhaust and supply to match exactly what is happening under the exhaust hood. The Truflow-TC duct mounted J-Couple monitors the hood exhaust temperature, which fluctuates based on the amount of appliances operating under the exhaust hood. As the amount of cooking increases, the exhaust duct temperature rises and reaches equilibrium temperatures.

The duct temperature could reach as high as 150F and as low 65F depending on the following factors:

- Kitchen room temperature
- Total exhaust volume
- BTU rating of each appliance
- Total Volume of makeup
- Temperature of Makeup air
- Where the makeup air is introduced back into the kitchen,
- Type of hood over the appliance.

Truflow-TC automatically changes the exhaust and supply to suit the actual cooking operation at any given time during the cooking day.

Automatic Design

The TRUFLOW-TC is an automatic design that will modulate the fan speed based on the rise and fall of the duct-collar air temperature. If at any time during the cooking operation, the exhaust volume of air does not keep up to smoke generated simply touch the MAX AIR button on the DASHBOARD screen. This situation could occur when:

- Large quantities of greasy foods are tossed on the grill at one time or
- A large tilting skillet or kettle is opened quickly or
- A combination oven door is opened without releasing steam slowly at door or
- A draft from a door or window opening.

Minimum duct velocity in the Building Code

The National Fire Protection Association, NFPA-96 2001, code changed to provide for a reduction of the exhaust air from a commercial kitchen during low demand periods. The minimum duct velocity in the NFPA-96 2001 has been reduced from 1500 fpm to 500 fpm. In addition, the International Mechanical Code, IMC, was changed in 2003 to allow for the reduction in exhaust from a commercial kitchen during low demand periods. The building and fire departments have these codes in their possession and will have no reason not to allow a Truflow-TC installation anywhere in North America.

NFPA-96, 2001
8.2 Airflow

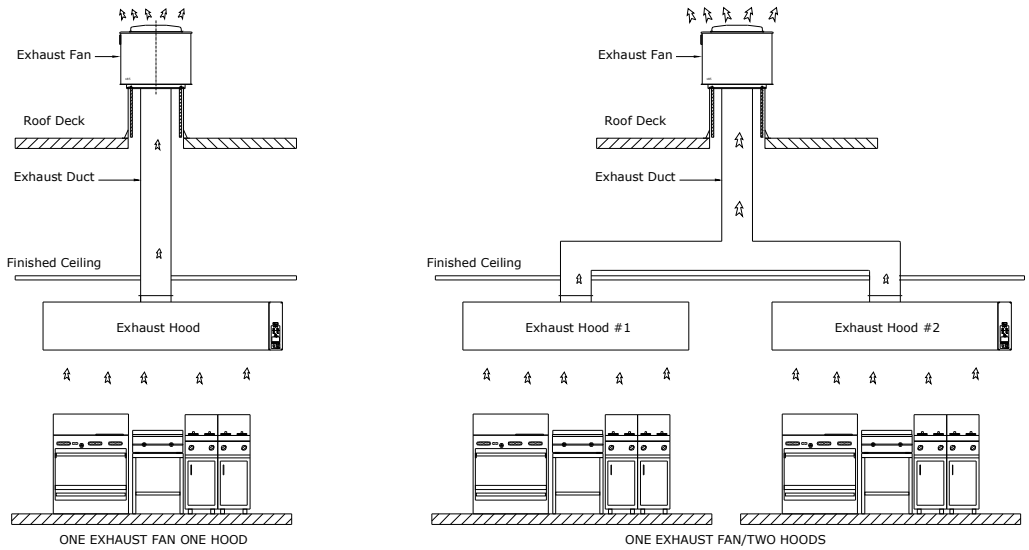
**International Mechanical
Code. 2003**
Section 507 Commercial
Kitchen Hoods

Sizing the Exhaust Ductwork

We recommend that the engineer size the exhaust ductwork for 1670 fpm velocity. The NPFA-96 code allows for a reduction in duct velocity to 500 fpm. By sizing the ductwork at 1670 for 100% exhaust and duct velocity will be 500 fpm at 30% exhaust volume.

How many hoods can be connected to each exhaust fan?

The Truflow-TC is available for connecting up to two exhaust fans with two supply fans and, a total of 12 exhaust hoods. You could have two fans with six hoods each or one fan with twelve hoods. Maximum energy savings will be achieved with two fans and six hoods each arrangement, because the fans would operate as independent kitchens.



One and Two hoods with one exhaust/supply fan

TRUFLOW-TC MODEL NUMBER

RPD-P	1	1	W	TC	1	SC
One exhaust fan connected to panel (up to 2)						
One supply fan connected to panel (up to 2)						
W- Wall mounted panel H – Hood mounted panel						
TC- Truflow Cost-Effective - Variable Speed						
1-Number of exhaust duct collars (up to 12 collars)						
SC–Supply control signal SV – supply variable speed drive						

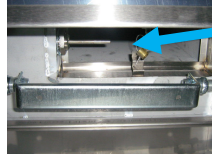
How does the Truflow-TC Work?

The Truflow-TC consists of three primary components:

1. J-Couple.
2. Micro Processor/HMI
3. Variable Frequency Drives.

1. J-COUPLE

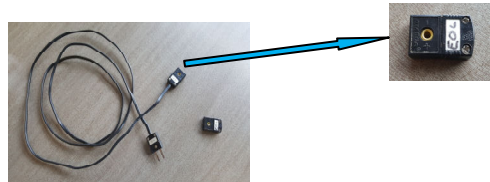
The J-Couple assembly is mounted in the exhaust duct collar of each hood, threaded through a UL/ULC listed hood penetration fitting in the center of the duct collar. The J-Couple wiring is terminated in a special factory supplied J-Box. Where there are multiple hoods, the J-Couples are connected in series. The last J-Couple assembly requires an EOL plug to complete the control circuit.



J-couple probe in exhaust duct collar as seen from below hood.

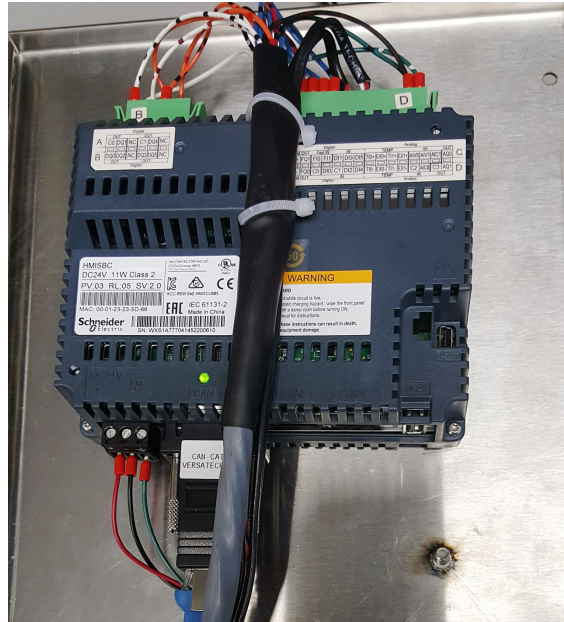


UL/ULC Listed
Duct Seal
Adaptor

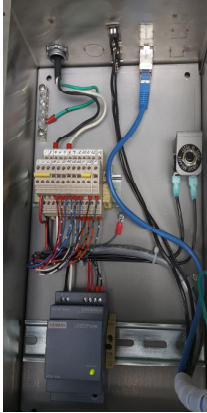


J-Couple Wire (Hood to Hood) and End of Line (EOL) plug

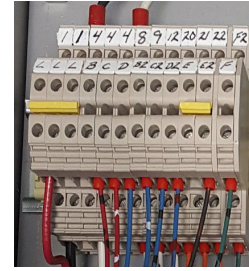
2. MICRO PROCESSOR/HMI



The Micro Processor is a programmable logic controller (PLC) located in the RPD-P-TC control panel. The sequence of operation, overrides, MAX AIR, and panel annunciation functions are all managed through the PLC. The integral HMI (Human Machine Interface) works as the command center for the TruFlow TC system.



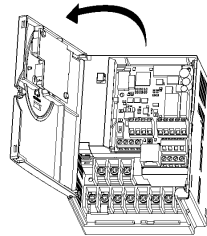
View inside RPD enclosure showing the terminal strip connections, power supply and circuit protector.



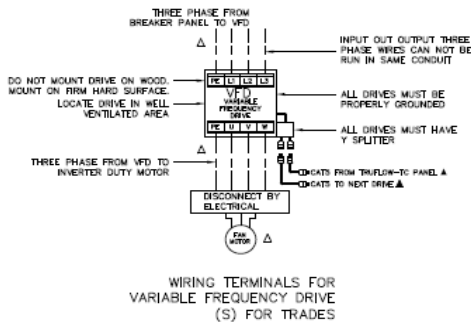
Terminal Strip and Power Supply

3. VARIABLE FREQUENCY DRIVE

The variable Frequency drives for the exhaust and/or supply fan are either located on the wall beside RPD-P-TC panel or in a cabinet mounted on the side of the hood or in the mechanical or electrical room near the roof fans. The frequency that the VFD's run at is derived from the hood temperatures as measured by the J-couples.



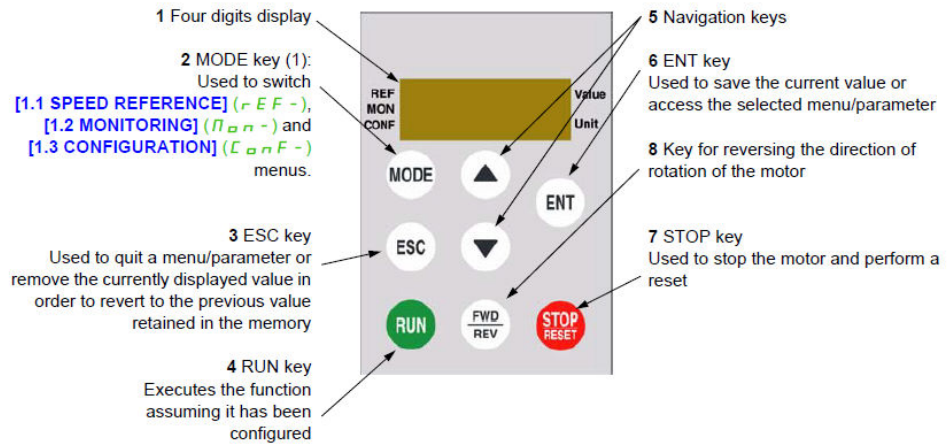
Variable Frequency Drive (VFD)



Variable Frequency Drive control wiring

Description of the remote display terminal

This remote display terminal is a local control unit which can be mounted on the door of the wall-mounted or floor-standing enclosure. It has a cable with connectors, which is connected to the drive serial link (see the documentation supplied with the remote display terminal). With this remote display terminal, up and down arrows are used for navigation rather than a jog dial.



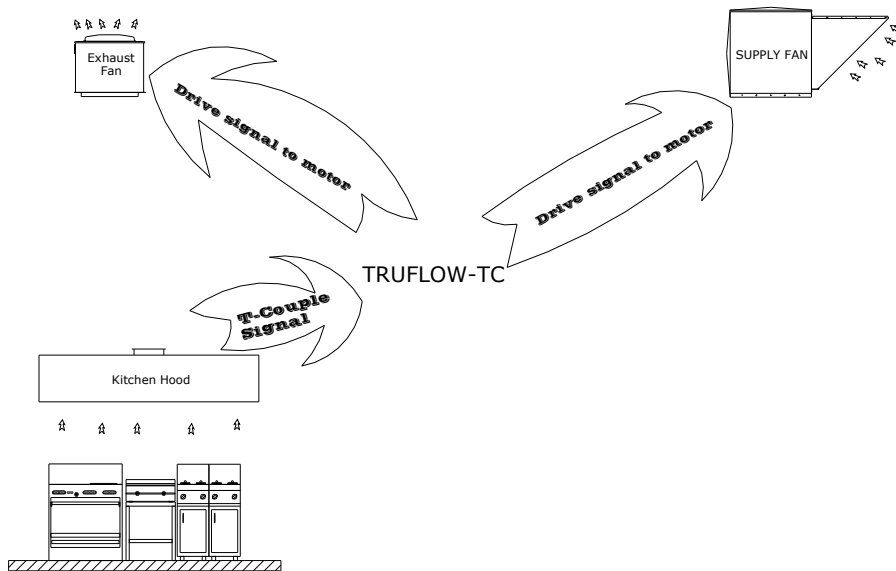
(1) If the drive is locked by a code ([PIN code 1] (C O d) page 300), pressing the MODE key enables you to switch from the [1.2 MONITORING] (M O N -) menu to the [1.1 SPEED REFERENCE] (r E F -) menu and vice versa.

To activate the keys on the remote display terminal, you first have to configure [Ref.1 channel] (F r I) = [HMI] (L L C). For more information, see page 154.

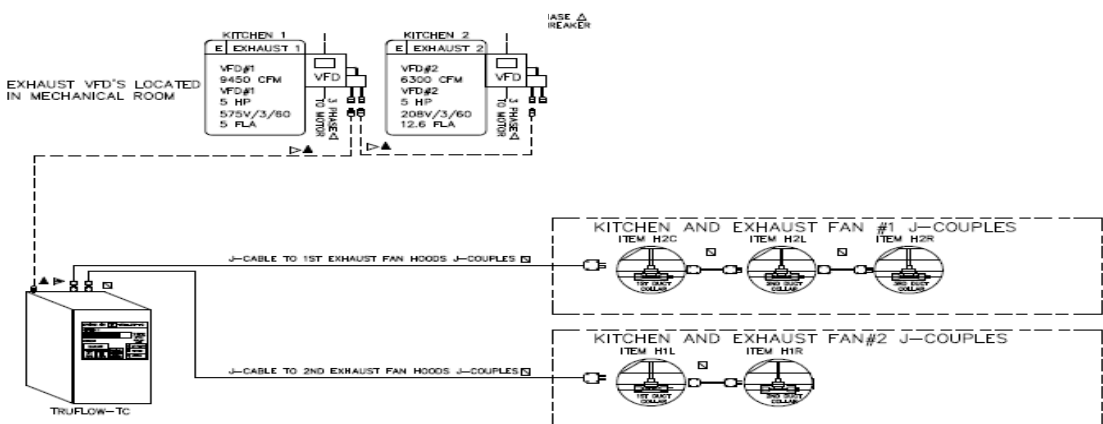
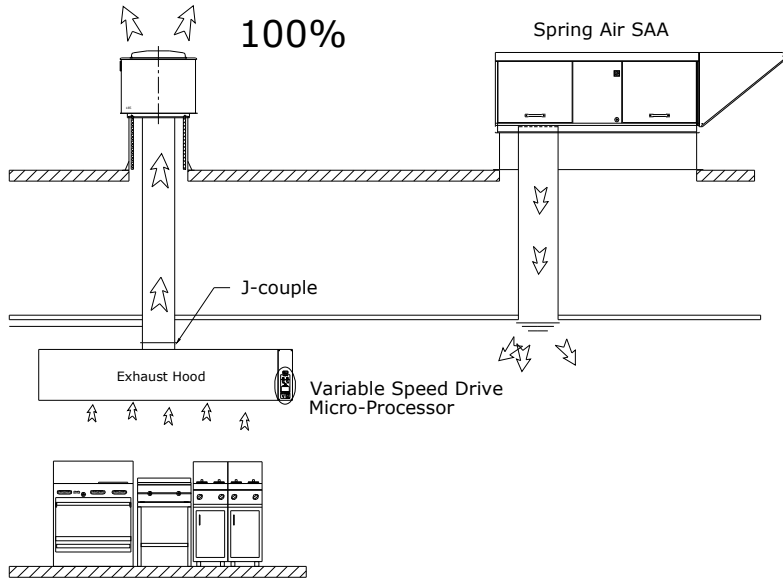
Variable Frequency Drive display and keys

TRUFLOW-TC Operation

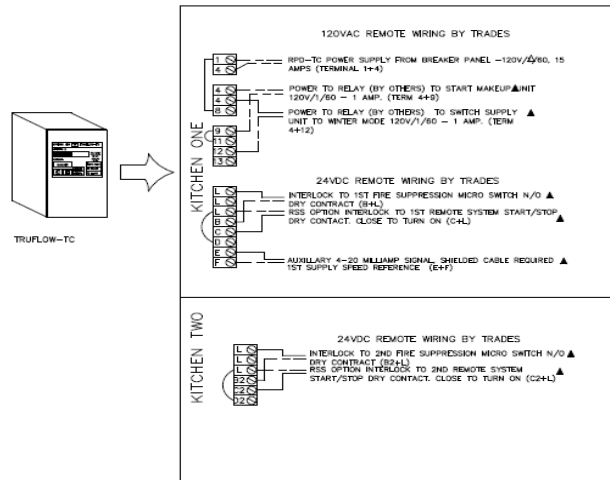
The Microprocessor receives signals from the duct mounted J-Couple sensor and transmits a speed signal to the VFD(s). The exhaust and supply motor Variable Frequency Drives (VFD) slows or speeds up the exhaust and supply fans to maintain the required volume depending on the amount of cooking.



Supply Volume Control with Variable Speed Supply Drive (VFD's)

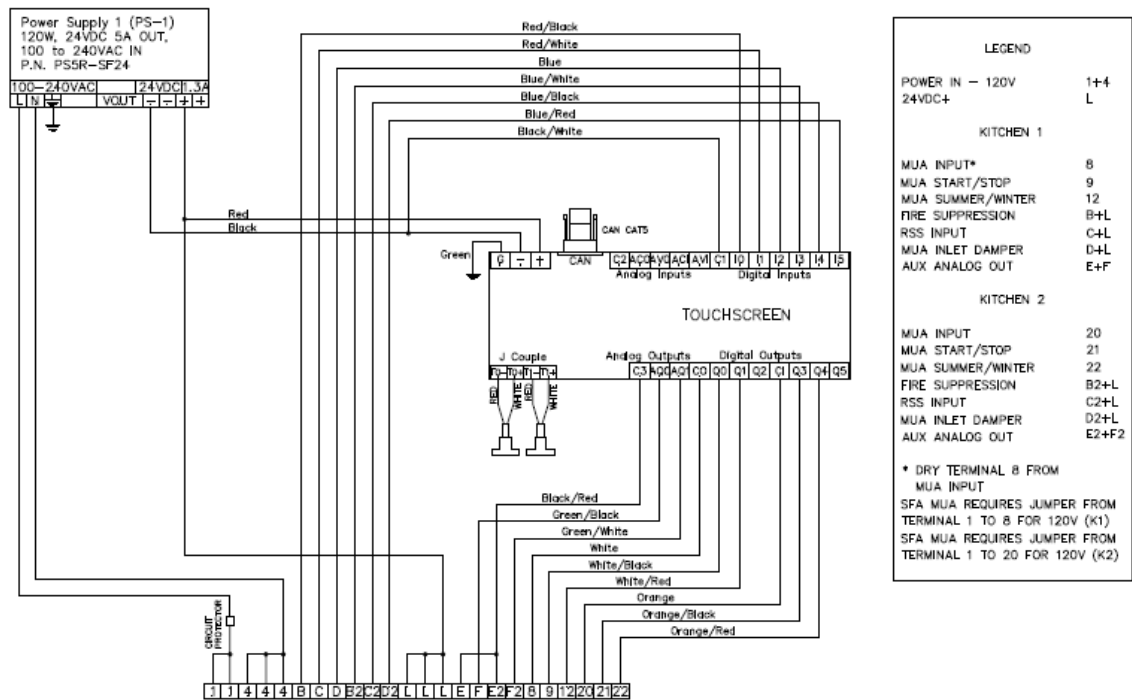


Truflow-TC panel with two kitchens, 5 hood collars, two exhaust VFD and supply fan Control signal only



Truflow-TC panel with two kitchens, two exhaust VFD and supply fan Control signal only

RPD-TC-MASTER



Factory Wiring for RPD-TC Panel

Sequence of Operation (Spring Air System supply unit- SFA)

OPERATION

At the start of the cooking day: Switch the on/off toggle switch to the ON position to activate the ventilation system.

Exhaust Fan(s): The exhaust fan(s) will start immediately in low speed

Supply Unit: The Spring Air supply unit will start after a one minute delay while the fresh air damper opens. Not all supply units have dampers. supply fan will start at low speed.

TRU-FLOW -TC Demand Ventilation: The TRUFLOW-RC adjusts the amount of exhaust automatically as more appliances are operating under the exhaust hood(s). The exhaust will increase from a mid range to high volume. The supply volume will increase as the exhaust fan(s) volume increase.. Switch the HI toggle to increase the volume of all fans to HI for 15 minutes.

At the end of the cooking day: Switch the ON/OFF toggle switch to the OFF position to shut off the ventilation system.

Inspect the exhaust hood baffle filters or inserts daily. Clean when necessary. Refer to the maintenance manuals for additional information.

Enclosures



Truflow-TC RPD wall mount panel

Installation and Remote Wiring

Installation

The Truflow-TC system can be easily retrofit into existing kitchens or supplied with new hoods. The recommended location for the RPD TC panel is in the kitchen within view of the cooking operation. The enclosure is typically surface mounted but can also be recessed into the wall with a wall flange. The VFD's can be located in mechanical or electrical rooms, pantries or above in the ceiling space in the kitchen.

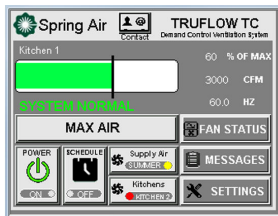
Both VFD's and RPD-TC panels must be easily accessible for service and maintenance.

A. Electrical Requirements (RPD-P-TC) and Variable Frequency Controllers hood mounted)

- Power supply to the RPD-P-TC panel 120V/1/60- 15 amps
- Interlock to the wet chemical system Dry Contact (optional)
- Power wiring from the breaker panel to the exhaust variable Frequency drive.
- Power wiring from the breaker panel to the supply variable Frequency drive. (For SV controlled supply unit)
- Power wiring from the exhaust variable Frequency drive to the exhaust fan disconnect switch

- Power wiring from the supply variable Frequency drive to the exhaust fan disconnect switch (For SV controlled supply unit).
- Interlock (dry contract) to the supply air unit 120V/1/60 (for Spring Air supply units only for SC controlled supply unit)
- Interlock to the supply fan motor starter 120V/1/60 (for SC controlled supply units)
- Supply fan inlet damper end switch dry contact connection proving inlet damper open
- Dry contact for summer/winter switch for supply air fan
- J-Couple wires in series from RPD-P-TC to each exhaust duct collar
- Auxiliary analog output signal speed reference or by-pass damper modulation 4-20 mA
- RSS Remote Start/Stop dry contact for interlock with BMS or remote switch

B. Touch Screen Information











The HMI (Human Machine Interface) is the point of contact for operating the TruFlow TC system. The information displayed is the normal operating condition.

There are several sub-screens that provide additional information or selections.



The main screen is the DASHBOARD. It displays system status, percentage of Max system, calculated CFM's, running Hertz of the VFD along with a visual status bar. The color of the status bar indicates the amount of savings in energy that the kitchen is operating to. GREEN represents at or below the target savings setting, YELLOW indicates at or just above the target and RED indicates that the kitchen is not achieving savings but this is normally due to the cooking load that may dictate that the system is operating at peak cooking condition. However, if the cooking load is not at peak and the bar is RED, this would serve to identify that heating equipment should be turned down or off and allow for energy savings.

The lower portion of the screen has icons as follows:

- Turning the system ON and OFF 
- Overriding the current speed setting to MAX AIR 
- Setting up and enabling the scheduled START/STOP function 
- Switching between SUMMER/WINTER conditions for the Supply Air fan 
- Toggling between Kitchen 1 and Kitchen 2 
- FAN STATUS sub screen 
- MESSAGES sub screen 
- SETTINGS sub screen 

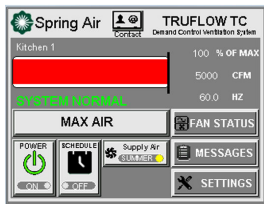
i. DASHBOARD Icons



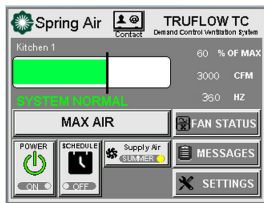
This picture shows a single kitchen TruFlow TC panel with the fan power OFF.

The SCHEDULE function for automatically starting and stopping the system is not enabled (Green).

The Supply fan is set to SUMMER condition.



This picture shows the POWER is ON for single Kitchen (Green). Systems is running at 100% speed and CFM. (Bar is RED. 100% of MAX and 60.0 Hz)



This picture shows the POWER is on for single kitchen (GREEN). Fan status is 60% of MAX.

- ii.** Touching this icon will set the exhaust and supply fans to maximum airflow setting for an adjustable span of time. Factory setting is 20 minutes. The override can be stopped by touching the icon a second time.



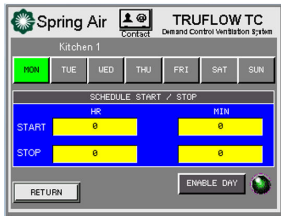
Setting the automatic Opening and Closing Times




An automatic time schedule for the TruFow - TC system to turn on and off can be set up for each day of the week. The system will need to set to Automatic via the **SCHEDULE** icon for the schedule to run.

Touch **Automatic Schedule** icon to set automatic opening and closing times.


The Automatic Schedule window will become available.




Touch the **DAY**  icon to set the time for the kitchen exhaust system to turn on and off for that day.


Touch the yellow field to open the pop-up keyboard and adjust the hour and minute for the kitchen exhaust system to turn on and off.

Press the ENABLE DAY button. 

A green line  will be displayed under each day that has been enabled.

Continue to set start and stop time for each day of the week.

Touch **RETURN** to  return to the **Automatic Schedule** window.

Auto schedule will be active if the schedule icon is ON  and GREEN.

Switching between SUMMER/WINTER conditions for the Supply Air fan



This button toggles between **SUMMER** with a YELLOW pilot light and



WINTER with a BLUE pilot light.

Toggling between Kitchen 1 and Kitchen 2

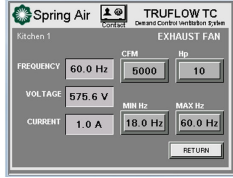


Touching the Kitchens button will toggle between Kitchen 1 and Kitchen 2. The number displayed on this button is for the non-active kitchen. Active kitchen is always displayed at the top of the screen over the status bar.

Secondary Screens



When you touch the **FAN STATUS** icon, the following screen is visible:



This screen displays the running frequency of the VFD, the actual voltage at the VFD and the running amps for Kitchen 1. The CFM is the design CFM and the HP is the motor size on Horse Power.

The MIN Hz and MAX Hz are the lower and upper limits for the VFD speed settings.

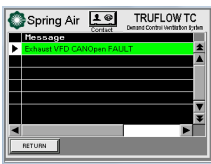
RETURN will return to dashboard screen.

When there is a second Kitchen, this screen is displayed for the Exhaust Fan 2 when the dashboard is in Kitchen 2.

When the system has SV designation, the Supply Air fan status screen will be available for access from this screen.

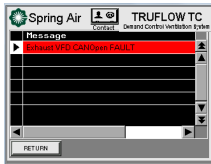



The following sub-screen displays when the **MESSAGES** icon is touched.



Whenever there are any faults or issues with the hardware or software, this screen will display a message identifying the occurrence, along with a date and time stamp.

The message will be RED. When the cause of the message has either self-corrected or has been addressed by service technician the message turns GREEN.



When the control panel senses an input for any reportable alarm or message, the **EXCLAMATION** screen  will pop up and a chirping alarm will sound.

Touching this screen will take you to the message screen. All active alarms or messages are displayed in RED. The triangular boxes allow cursor movement to read the date and time of the event and to move up or down each event or pages of events. A few of the recorded alarms are filters requiring changing, power outages, and high temperature. Users will need to go to this screen to clear an alarm.

What to do in the event of an alarm:



When an alarm occurs, the window will change to red with a yellow exclamation mark.

Touch the screen anywhere to go to the **MESSAGE STATUS** window.

To clear the variable speed drive, follow these steps:



1. Turn the disconnect on the KES unit to the OFF position.
2. Leave the disconnect off until all lights and the display on the VFD turn off.
3. Turn the disconnect back on.
4. Turn the KES unit back on using the Touchscreen.

For any messages not shown in the list please contact Spring Air Systems Service department for assistance.

Common alarms reported by Touchscreen:

Message on screen:	Cause:	What to do:
EXHT1 VFD CANOpen Fault	Communications fault between PLC and VFD.	Check CAT5 cables for proper connection and pinning.
MUA1 VFD CANOpen Fault	Communications fault between PLC and VFD.	Check CAT5 cables for proper connection and pinning.
Exhaust High Amp Alarm	Exhaust motor over maximum FLA rating.	Check motor for blockage or seized pulleys. May have burnt wirings
Exhaust Low Amp Fault	Exhaust motor under minimum amp set point.	Check circuit breaker for full voltage. Check wiring connections. Check for broken belts.
Fire Suppression Alarm	Wet Chemical fire suppression system activated.	Check Fire Suppression micro switch for annunciation to RPD panel. Should be on Normally Open contact. Reset at message screen.
Kitchen AutoStart	Exhaust fan auto starts if heat is detected under hood without turning on the system.	Touch the START icon on the dashboard to turn system ON.
J-Couple Trouble	J-couple cable may have become disconnected or has been damaged. Alarm set point has been exceeded.	Check j-couple wire connections at panel and hood exhaust collar. Possible blockage in exhaust flue. Check probe and clean.
EXHT Motor Overload Fault	Exhaust motor has exceeded maximum FLA setting.	Check for motor blockage, seized pulleys or burnt wiring.
MUA Motor Overload Fault	Supply motor has exceeded maximum FLA setting	Check for motor blockage, seized pulleys or burnt wiring.
EXHT Motor Phase Fault	Exhaust motor lost one or more phases.	Check all wiring connections between VFD and motor. Check winding continuity.
MUA Motor Phase Fault	Supply motor lost one or more phases.	Check all wiring connections between VFD and motor. Check winding continuity.
EXHT Main Overvoltage Fault	Exhaust line feed has exceeded maximum voltage allowances.	Call electrician for further investigation of overvoltage.
MUA Main Overvoltage Fault	Supply line feed has exceeded maximum voltage allowances.	Call electrician for further investigation of overvoltage.
EXHT Main Phase Fault	Exhaust fan line feed has lost one or more phases.	Call electrician for further investigation of Phase loss.
MUA Main Phase Fault	Supply fan line feed has lost one or more phases.	Call electrician for further investigation of Phase loss.
EXHT Motor Short Circuit Fault	Exhaust motor has an open disconnect or contactor or loose wiring between VFD and motor	Check motor for burnt windings, open contactors or disconnects or loose connections inside motor
MUA Motor Short Circuit Fault	Supply motor has an open disconnect or contactor or loose wiring between VFD and motor	Check motor for burnt windings, open contactors or disconnects or loose connections inside motor
EXHT Main Under voltage Fault	Exhaust fan line feed has insufficient voltage to run motor.	Call electrician for further investigation of under voltage.
MUA Main Under voltage Fault	Supply fan line feed has insufficient voltage to run motor.	Call electrician for further investigation of under voltage.



Touching this icon allows access to internal settings and adjustment features. Access to the settings and options is by user and password. The local authorized service technician has access capability. There are no settings that need to be accessed by the end user.

Logging in and out of the Touchscreen

In order to make any changes to the system setup, the service technician must log in.

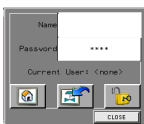


Touch the **SETTINGS** icon.

The login name is case sensitive. If the CAPS key is Green, the CAPS LOCK is on. Touch the CAPS button to release lock.



Touch the **Login** icon. (UN-LOCKED PADLOCK)



Touch the white field beside **Name**.



Type your username in the pop-up keyboard.
Touch **Enter** key.

Screen returns to the Login window.

The password is also case sensitive.



Touch the white field beside **Password**.



Type your password in the pop-up keyboard.
Touch **Enter** key. Screen returns to Login window.

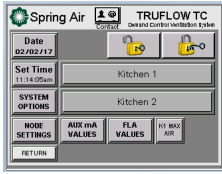


Touch the **UNLOCK** icon.



Touch the word **Close** to close the login box.

You have completed the login.



This is the new screen displayed after logging in.

Logout

The Touchscreen will automatically log out users after a pre-set length of time. You can also manually log out with following instructions.



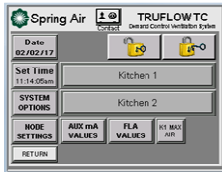
Touch the **Settings** window button.



Touch the **LOCK** button (LOCKED PADLOCK). Touch the **LOCK** button again to confirm.

You are now logged out.

Settings Screen - Options



This screen allows for adjustments and optional selections depending on the equipment supplied and or connected.



The date has been hard-coded and cannot be changed. It will automatically adjust for Leap Years.



The time function has been set for the time zone where the unit is to be installed. It does not automatically adjust for Daylight Savings time. This feature must be adjusted manually.

Changing Time

The Touchscreen will update itself for Leap Years; however, a user will need to adjust the time for daylight savings and the local time zone for the location that the unit is installed in.



Touch the field with the HOUR.






Enter the correct hour of day (uses 24 hour format for entry).




Touch the field with the MINUTES. Enter the correct minutes.


Touch the **CONFIRM**  button to lock in the new setting.

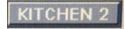
  These icons will allow specific site designation of the two kitchens. Touching the bar, will pop-up an input screen that will allow custom labels, i.e. PREP BROILER or FRY.


 From the SETTINGS screen press the SYSTEMS OPTIONS button

 There are several options available; **RSS** (Remote Start Stop), **KITCHEN 2** (second kitchen), **SUPPLY 1** (Supply fan with VFD for 1st kitchen), **SUPPLY 2** (Supply fan with VFD for 2nd kitchen), **SUPPLY AVERAGE** (**Averages 2 kitchens for single supply fan VFD**), **AUTO START** (**Thermal activation of fan system**), **DFMUA** (**Direct-fired make up air interlock**) **MUA MS** (**motor starter for MUA unit**).


These options are explained in more detail below.

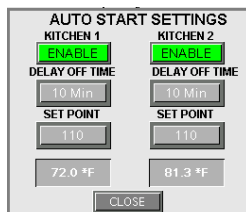
 The **RSS** Remote Start/Stop icon allows the systems to be started and stopped from a location away from the panel. Touching this icon turns it GREEN and enabled.

 **Kitchen 2** activates the second kitchen settings and inputs for exhaust fan. Enables the Kitchen switch on the main dashboard.

 This icon allows the MUA speed to be controlled by a VFD on the CANOPEN network. When this icon is enabled, the Fan Status will show Supply Fan settings.

  These icons enable a **SUMMER/WINTER** switch on the touchscreen for MUA1 and MUA2

 The **AUTO START** function allows the TruFlow system to activate automatically when the set temperature is reached without manually turning on the system. The activation setting is adjustable as well as the delay off timer.




Touching the **ENABLE**  icon activates the Auto Start turning the button GREEN.


To set the Delay Off Time, touch the Icon. 

A pop-up screen with a number pad will appear. Enter the number of the minutes of delay so the hood will have a chance to cool down with the exhaust fan running.

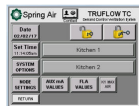
To adjust the SET POINT, touch  button. Enter the desired temperature setting in

Degrees Fahrenheit.

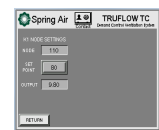
 Touching this icon will ENABLE the PLC to average two exhaust fans for one output speed reference for the MUA.


 This feature allows for a double interlock of the exhaust and supply fans. In this mode, the exhaust fan will not start until the supply fan proves that it is running. Once the supply and exhaust are running, the supply heater will only activate if the exhaust fan is running. This is usually only required with Direct-fired Supply heaters. To enable this feature *TOUCH* the **DOUBLE i** button and it will turn **GREEN** when active.

Temperature Node Setting




In order to access the temperature **NODE** settings you need to access the settings screen and touch the **NODE SETTINGS** icon. 

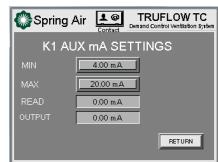


The **NODE** window displays the temperature received from the J-couple on the hood. The **SET POINT** icon  is used to adjust the starting point for the speed to begin increasing. The set point represents 4 mA or the lowest speed for the VFD. The **OUTPUT** window displays the mA reference that is used for the VFD speed.

Setting Auxiliary mA Values



In order to access the Auxiliary mA value for output to the MUA VFD as a speed reference, you need to access the settings screen and touch the **AUX mA VALUES** icon. 

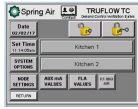


Touching the **K1 AUX mA** icon displays the setting screen. From here, you can adjust the **MIN** and **MAX** mA settings that are sent to the Auxiliary Output on terminals E and F in the RPD panel.

Touching the number box for **MIN** or **MAX** will open a pop-up window that will allow entering a number between 4.0 and 20.0. This will override the **READ** value and change the **OUTPUT** number.



Setting the FLA Limits



From the **SETTINGS** screen Press the **FLA**



VALUES icon.

This will access the **FLA SETTINGS** screen. Settings are done for each kitchen separately.



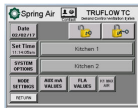
During the start-up of the exhaust fan, the minimum amps setting is to be determined by running VFD at minimum Hz. Record the actual **RUNNING AMPS** and enter the value recorded into the **MIN FLA**.

This setting aides in detecting the actual running of the VFD at lower than minimum set point or if the belt breaks.

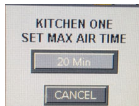
The **MAX** amps should be equal to the FLA as marked on the exhaust fan motor.



Setting MAX Air Run Time



The **MAX AIR** (override) run time is adjusted from the **SETTINGS** screen by touching the **K1 MAX AIR** or **K2 MAX AIR** icons.



This pop-up screen displays when you touch the **K1 MAX AIR** icon. The active box allows you to set the **MAX AIR** duration to any value. Factory setting is 20 minutes. When performing the airflow checks at startup this is usually set to 60 minutes.



Surface Fire Alarm



In the event of the exhaust hood surface fire suppression system activating, the TC touch screen will display as shown to the left. Touching the Yellow exclamation icon will take you to the **DASHBOARD**.

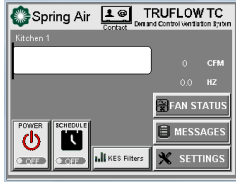


It will show the system has shut down and a banner will read “**SYSTEM ALARM**”. If you touch the **MESSAGES** button, you will see the message “**Fire Suppression Alarm**”.



To resume normal operation, the fire suppression system and TC panel unit will need to be reset. The fire suppression contractor will need to reset the suppression release to open the micro switch that signals the tripped status. Once this has been reset, you will need to go to the **MESSAGE** screen. You will see the **Surface Fire Suppression RESET** button. Touching this button will reset and allow normal operation of the TC system.

Local Service Company Contact Information



The touchscreen has the capability of storing and displaying the contact information of the authorized local service company in the area where the KES unit is located.

On the dashboard screen touch the



icon. This will pop up the screen shown below.

A screenshot of a contact information form titled 'NEED SERVICE?'. The form is displayed on a touchscreen interface. It includes the following fields and information:

- Local Service: Local Company Name
- Contact Name: Tech Name
- Phone No: 555-123-4567
- Email: service@company.com
- Project ID: 111111

There is a 'CLOSE' button at the bottom right of the form. The background of the form is a light gray with a subtle grid pattern.

The local service company that was contracted to perform the initial start-up and any warranty work within the warranty period, should have input their company name, technician that performed the start-up, phone number and e-mail address for the service dispatcher.

The Project ID will be input at the factory and should be used whenever contacting Spring Air Systems for information or alerting about any operating issues.

Touching the CLOSE icon returns to the dashboard.

APPENDIXES

A. VFD Models Installation Manuals

Spring Air Systems has used various VFD's through the history of TruFlow Demand Ventilation systems. Please refer to the various VFD Installation Manuals for details for each VFD model and manufacturer as found on Spring Air Systems web site at

www.springairsystems.com

VFD Manufacturer and models used for 2021:

- Altivar 320

B. Truflow - TC Startup Report



TRUFLOW TC – TS STARTUP REPORT

**BEFORE ATTEMPTING TO SERVICE THE VARIABLE SPEED DRIVES
PLEASE READ APPENDIX J IN OPERATION & MAINTENANCE MANUAL
CAREFULLY.**

General Information

Job Name/Serial Number	
Date	
Customer	
Location	
Spring Air Service Company	

Truflow Model No.	
Number of Hoods connected	
Supply SV or SC	

Variable Frequency Exhaust Drive #1 Kitchen 1

Exhaust Fan #1 Model No.	
Exhaust Fan #1 Manufacturer	
Exhaust Fan #1 HP	
Up blast Discharge	YES <input type="checkbox"/> NO <input type="checkbox"/>

Variable Frequency Exhaust Drive #2 or Kitchen 2 (If applicable)

Exhaust Fan #2 Model No.	
Exhaust Fan #2 Manufacturer	
Exhaust Fan #2 HP	
Up blast Discharge	YES <input type="checkbox"/> NO <input type="checkbox"/>

Variable Speed Supply Drive Kitchen 1 and 2

Supply inlet 10' clear from exhaust discharge	YES <input type="checkbox"/> NO <input type="checkbox"/>
Supply Fan Model No.	

Supply Fan Manufacturer	
Supply fan HP	
Variable Speed Supply Drive Kitchen 2 (If applicable)	
Supply inlet 10' clear from exhaust discharge	YES <input type="checkbox"/> NO <input type="checkbox"/>
Supply Fan Model No.	
Supply Fan Manufacturer	
Supply fan HP	

Fan Site Data Chart

Fan Item #	L1 Voltage	L2 Voltage	L3 Voltage	Design CFM	Design HP	Motor FLA	Verify Fan Rotation
Kitchen 1							
EF-1							
EF-2 (Optional)							
MUA-1							
Kitchen 2							
EF-2							
MUA-2 (Optional)							

Startup Procedure

Item	Description	Y / N
1	Turn off all Cooking equipment	
2	Check all electrical connections. Tighten as necessary	
3	Check for power to the RPD-P panel on terminals 1 & 4 from breaker panel	
4	Check all remote wiring to ensure it has been connected as per the wiring drawing provided.	
5	Check power wiring from breaker to exhaust fan variable speed drive(s).	
6	Check power wiring from exhaust fan variable speed drive(s) to exhaust fan disconnect(s)	
7	Check the CAT5 shielded cable from the Truflow-TC panel to the Kitchen 1 Exhaust VFD. Ensure it is shielded cable. Pinning is to T568B standard.	
7a	Check the CAT5 shielded cable from the Kitchen 1 Exhaust VFD to Kitchen 2 exhaust VFD. Ensure it is shielded cable. Pinning is to T568B standard. (If applicable)	
8a	For DFMUA supplied by SAS: Check power wiring from breaker to supply fan disconnect switch. VFD has been factory wired.	
8b	For IDFMUA supplied by SAS: Check power wiring from breaker to supply fan disconnect switch.	
8c	For all MUA units supplied by others: It is very important when adding a VFD to MUA units by others to ensure that the VFD is connected to the fan motor after any control transformers. DO NOT MODULATE THE FREQUENCY OF THE POWER SUPPLY TO ANY CONTROL TRANSFORMERS ON MUA.	
9	Turn on power to all exhaust and MUA fan units. Take voltage readings on all phases either at VFD inputs or disconnects and record in FAN SITE DATA chart above.	
10	Check VFD parameter settings for Asynchronous motor settings per motor nameplate information.	
11a	Press VFD dial once until rEF displays. Rotate dial until CO nF displays. Press dial once. Rotate dial until FULL displays. Press dial once until Sin- displays. Rotate dial until drC- displays. Press dial until ASY- displays. Press dial once until nPr displays.	
11b	With display showing nPr , press dial once and then enter the motor horse power rating from name plate. Press dial once to enter the HP rating. Press Esc once and rotate dial until unS is displayed.	
11c	With display showing unS , press dial once and enter the motor voltage rating from the	

	name plate. Press dial once to enter the voltage rating. Press Esc once and rotate dial until nCr is displayed.	
11d	With display showing nCr , press dial once and enter the motor amperage rating (FLA rating) from the name plate. Press dial once to enter the amperage rating. Press Esc once and rotate dial until FrS is displayed.	
11e	With display showing FrS , press dial once and enter the motor frequency rating from the name plate. Press dial once to enter the frequency rating. Press Esc once and rotate dial until nSP is displayed.	
11f	With display showing nSP , press dial once and enter the motor speed RPM rating from the name plate. Press dial once to enter the speed rating. Press Esc 5 times until display shows rDy or nSt .	
11g	Power down the VFD for 1 minute to ensure settings are retained. Power VFD back on.	
11h	Repeat step 18 for all Spring Air System supplied VFD 's for exhaust and supply fans.	
12	Check for wiring to surface fire suppression - Normally Open contact to terminals B and L on RPD panel.	
13	Check for wiring connections for Remote Start Stop switch to terminals H and L on RPD panel. (Optional)	
14	Check J-Couples are installed at each hood exhaust duct collar	
15	Connect J-Couple from each duct-to-duct collar in each Kitchen to the RPD panel with J-couple wire provided. Confirm the EOL (End of Line) plug is installed on the last J-couple.	
16	Confirm the breakers for all exhaust and MUA units are off.	
17	Turn on breaker to the Truflow-TC control panel	
18	Turn on exhaust fan(s) disconnect switches	
19	Turn on supply fan disconnect switch	

IT IS VERY IMPORTANT TO TURN THE EXHAUST FAN DISCONENCT ON BEFORE THE BREAKER. TURNING THE EXHAUST FAN DISCONNECT SWITCH ON OR OFF WHILE THE EXHAUST FAN VFD IS POWERED MAY CAUSE DAMAGE TO THE VARIABLE SPEED DRIVE

Item	Description	Y / N
20	Turn on the exhaust fan Kitchen1 breaker for the variable frequency drive.	
21	Turn on the exhaust fan Kitchen 2 breaker for the variable frequency drive. (If applicable).	
22	Turn on the supply fan breaker for the Kitchen 1 supply unit and/or drive.	
23	Turn on the supply fan breaker for the Kitchen 2 supply unit and/or drive.(If applicable)	
24	Touch SETTINGS button	
25	Log into Settings/Options section. a) Touch UNLOCKED padlock. b) Touch USERNAME box. c) Confirm that keyboard is in LOWER CASE (CAPS button is not GREEN). d) Enter service username as provided by SAS Service Coordinator and press ENTER e) Touch PASSWORD box f) Enter password as provided by SAS Service Coordinator and press ENTER . g) Touch unlocked padlock in middle of screen and then touch CLOSE . New access buttons should appear.	
26	Touch SET TIME button and enter current local time. Press CONFIRM to set and exit box.	
27	Return to MAIN screen. Touch KITCHENS button to toggle between Kitchen 1 and 2. Make sure " Kitchen 1 " is displaying above the status bar. Touch the FAN STATUS button	
28	Confirm CFM and HP values are the same as the design CFM's and HP from the project drawing.	
29	Enter the Motor FLA value as displayed on the motor nameplates for both exhaust and supply units on the FAN SITE DATA CHART above.	
30	Repeat steps 25 to 27 for Kitchen 2.	

31	Check fan rotation as follows: <ul style="list-style-type: none"> a) Turn on the main disconnect to the Ex Fan VFD b) Open the fan access door and prop open. c) Touch the “System ON” button on the RPD-TC panel. d) Touch the Off button. e) Go to fan box and observe direction of rotation. <i>Note: You may need an assistant to observe the fan wheel rotation. You must see the fan wheel direction.</i> f) If rotation is backwards, turn off disconnect at fan and change two of the output leads on the VFD. If using magnetic contactors, switch any two leads on the contactor output wires. Repeat steps a) through e). g) Repeat for all exhaust and supply fans. h) If all fan rotations are correct, continue with start up. 	
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Max Hertz Setting for Kitchen 1 Exhaust VFD/Motor

Item	Description	Y / N
32	Check the <i>Motor nameplate MAX FLA</i> rating and record value here	A
33	Make sure “ Kitchen 1 ” is displaying above the status bar. Press Kitchens button to alternate between kitchens. Press SYSTEM ON button. Allow 1 minute for systems to stabilize.	
34	Press FAN STATUS button. Record actual running Hz.	Hz
35	Record actual running amps.	A
36	Set MAX HZ to 70.0. Press MIN HZ and change to running Hz (Step 32) + 10 Hz. Check Running Amps.	
37	If lower than MAX FLA from motor nameplate, increase MIN HZ by 1.0 Hz increments until running amps equals MAX FLA .	
38	If higher than MAX FLA from motor nameplate, decrease MIN HZ by 1.0 Hz increments until running Amps equals MAX FLA .	
39	When Running Amps equals MAX FLA record the MIN HZ value here.	Hz
40	Set MIN HZ back to 18.0 and MAX HZ to 2 Hz lower than the recorded Hz in Step 37	
41	Record Final MAX HZ setting Return to Main Screen.	Hz

Max Hertz Setting for Kitchen 2 VFD/Motor (If applicable)

Item	Description	Y / N
42	Check the <i>Motor nameplate MAX FLA</i> rating and record value here	A
43	Make sure “ Kitchen 2 ” is displaying above the status bar. Press Kitchens button to alternate between kitchens. Press SYSTEM ON button. Allow 1 minute for systems to stabilize.	
44	Press FAN STATUS button. Record actual running Hz.	Hz
45	Record actual running amps.	A
46	Set MAX HZ to 70.0. Press MIN HZ and change to running Hz (Step 42) + 10 Hz. Check Running Amps.	
47	If lower than MAX FLA from motor nameplate, increase MIN HZ by 1.0 Hz increments until running amps equals MAX FLA .	
48	If higher than MAX FLA from motor nameplate, decrease MIN HZ by 1.0 Hz increments until Running Amps equals MAX FLA .	
49	When Running Amps equals MAX FLA record the MIN HZ value here.	Hz
50	Set MIN HZ back to 18.0 and MAX HZ to 2 Hz lower than the recorded Hz in Step 46.	
51	Record Final MAX HZ setting Return to Main Screen.	Hz

SETTING MAXIMUM and MINIMUM AMPS LOAD POINT - Kitchen 1 Exhaust

Item	Description	Y / N
52	Make sure “ Kitchen 1 ” is displaying above the status bar. Press Kitchens button to alternate between kitchens. Press SYSTEM ON button. Allow 1 minute for systems to stabilize.	
53	Press FAN STATUS	
54	Touch Max Hz box and set to 0.1 Hz higher than Minimum setting.	
55	Record actual running Minimum Amps	A
56	Re-set Max Hz to value from Step 39	
57	Touch Min FLA and set to 2.0 Amps lower than value in Step 53. Return to MAIN screen.	A

58	Press SETTINGS button	
59	Press FLA VALUES button	
60	Touch MAX AIR button on main screen. Status bar should increase and change to RED .	
61	Press SETTINGS .	
62	Press FLA VALUES and enter MAX amps value plus 2.0 amps for Kitchen 1	A

SETTING MAXIMUM and MINIMUM AMPS LOAD POINT - Kitchen 2 Exhaust

Item	Description	Y / N
63	Make sure “ Kitchen 2 ” is displaying above the status bar. Press Kitchens button to alternate between kitchens. Press SYSTEM ON button. Allow 1 minute for systems to stabilize.	
64	Press FAN STATUS	
65	Touch Max Hz and set to 0.1 Hz higher than Minimum setting.	
66	Record actual running Minimum Amps	A
67	Touch Min FLA and set to 2.0 Amps lower than value in Step 64. Return to MAIN screen.	A
68	Re-set Max Hz to value from Step 49	
69	Press SETTINGS button	
70	Press FLA VALUES button	
71	Touch MAX AIR button on MAIN screen. Status bar should increase and change to RED .	
72	Press SETTINGS .	
73	Press FLA VALUES and enter MAX amps value plus 2.0 amps for Kitchen 2	A

SETTING MAX AIR DURATION TIMER

Item	Description	Y / N
74	From MAIN screen, touch SETTINGS button.	
75	Touch K1 or K2 MAX AIR button.	
76	Touch the box with the number in it. Change to 60. This will keep the Kitchen 1 or 2 exhaust and supply fans running at maximum speed for 60 minutes.	
77	Take airflow readings for both exhaust and supply as indicated in the Hood start up report portion of this start up.	
78	If the hood airflows are higher or lower than the design, press FAN STATUS and increase or decrease Max Hz by 2 Hz to raise or lower the fan speed.	
79	Enter final MAX Hz value for Kitchen 1 Exhaust fan here.	Hz
80	Enter final MAX Hz value for Kitchen 2 Exhaust fan here.	Hz
81	<p>If the max FLA of the motor has been reached and airflows remain low, call</p> <p><u>Spring Air Systems Service for further instructions.</u></p> <p><u>1-866-874-4504 or 1-905-338-2999 ext 28</u></p>	
82	Reset the K1 and K2 MAX AIR back to 20 minutes when airflow readings are completed.	

ALL FANS SHOULD BE RUNNING AT LOW SPEED BEFORE YOU PROCEED TO TEST THE J-COUPLE MODULATION OPERATION.

Item	Description	Y / N
83	Check J-couple wires from Kitchen 1 hoods are connected and the End of Line plug is installed on the last J-couple.	
84	Plug the Kitchen 1 J-couple plug into the RPD panel in the K1 receptacle. From the main screen, touch the SETTINGS button. Log in if necessary. Touch the NODE SETTINGS button.	
85	If NODE box is reading 0, Touch the number button beside SET POINT and lower the set point to 55 .	
86	The SET POINT value should be at or lower than ambient temperature.	
87	Turn on cooking equipment. The NODE value should increase with temperature. The OUTPUT value will also increase. This will cause the corresponding Exhaust and Supply VFD's to speed up.	
88	Turn off cooking equipment. VFDs should slow down as cooking equipment cools off.	

89	Record the SET POINT value for Kitchen 1	
90	Repeat steps 81 to 87 for Kitchen 2 (If applicable).	
91	Record the SET POINT value for Kitchen 2	

SETTING SCHEDULED START/STOP FUNCTIONS (OPTIONAL)

Item	Description	Y / N
92	Press SCHEDULE button.	
93	Press SETTINGS button.	
94	Touch each day that you want to set a scheduled start and stop time. Press ENABLE DAY button. A GREEN line will appear under all selected days.	
95	Touch the HOUR and MINUTE boxes to change the start and stop times to desired settings. (Clock function is 24 Hour format). When complete press RETURN .	
96	To activate the schedule, touch the CONFIRM button.	
97	The SCHEDULE button should change to GREEN and say ON if enabled. You cannot shut off system if the time of day is between the START and STOP times.	

SETTING AUX mA TRIM VALUES

Item	Description	Y / N
	<i>Use this feature to alter the minimum or maximum speed reference sent to the MUA VFD or modulating damper.</i>	
98	From the MAIN screen, touch SETTING button.	
99	Press AUX mA Values button.	
100	Adjust MIN or MAX setting by touching box beside the limit you want to change.	
101	Enter new value. Depending on what the trimmed setting is for, OUTPUT value should be altered to either a new minimum or maximum milliamp value.	
102	Press RETURN .	

SETTING AND TESTING AUTO START FEATURE

Item	Description	Y / N
	<i>This feature allows the TruFlow TC system to start automatically in the event of cooking equipment being turned on and the TruFlow TC system has not been activated either manually or outside of the scheduled start/stop times.</i>	
103	Turn system OFF	
104	Press SETTINGS button	
105	Press SYSTEMS OPTION button	
106	Press AUTO START button	
107	Press SET POINT button. Enter value that is 5 degrees lower than the bottom displayed value and press ENABLE	
108	Check that ENABLE button is GREEN . If not Press ENABLE again.	
109	Press DELAY TIME OFF button. Set to 1.0 minute and close screen to return to start screen	
110	Wait 1 minute. Unit should start running and message will read “ THERMAL START ACTIVE ”	
111	To remove this message Press START button.	
112	Re-set SET POINT to 110.0 and DELAY TIME OFF to 30 minutes.	

ENTERING LOCAL SERVICE COMPANY CONTACT INFORMATION

Item	Description	Y / N
113	Touch Service @ button at top center of touchscreen	
114	Touch LOCAL COMPANY NAME box and Enter your company name	
115	Touch TECH NAME box and enter primary contact name	
116	Touch PHONE # box and enter local phone number for service company	
117	Touch E-MAIL box and enter e-mail address for primary contact for local company	
118	Confirm that the PROJECT ID # is the same number as the File No at top of this form.	
119	Close Service Contact Information screen.	

You have completed the start up of the TruFlow TC system.

Please record any site conditions and/or any concerns about installation or operation in space provided below.

Comments:

Service

Technician: _____

Company: _____

Other Fine Products From



- RevLow Hoods
- DynaFlow Hoods
- TruFlow Energy Management Systems
- UL/ULC Listed Pollution Control Systems
- Dry Extractor Hoods
- Cartridge Hoods
- Filter Hoods
- Water Wash Ventilators
- Surface Fire Suppression
- Commercial Kitchen Exhaust Fans
- Commercial Kitchen Supply Units
- Utility Distribution Systems

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