Oven Operation & Maintenance Manual
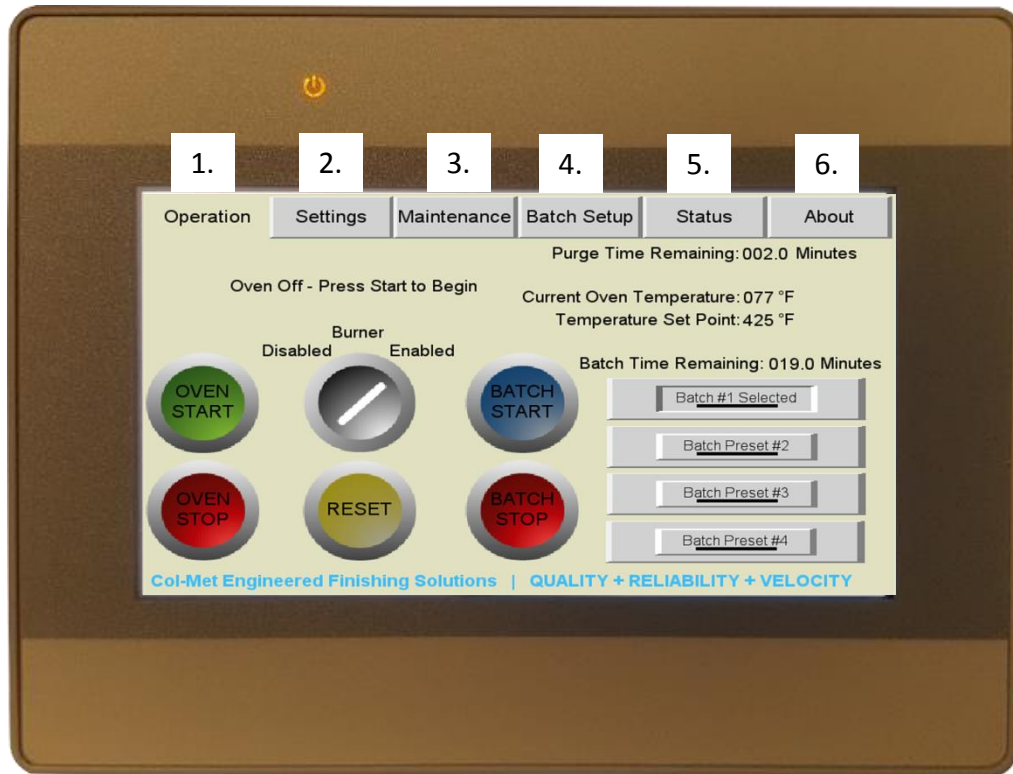
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1

Table of Contents

Tabs

The tabs located at the top of the screen allow for easy navigation between menus.

1. **Operation** – This tab is where the controls to start/stop the oven or enable/disable the burner are located.
2. **Settings** – This tab is where various timer and system parameters can be adjusted. System settings are passcode protected to help prevent unauthorized changes to the system.
3. **Maintenance** – This tab is where you can find details about how long each fan has been running (hour meters) and other useful information such as spare parts list and PM schedule.
4. **Batch Setup** – This tab is where the operator can adjust temperature and time values for the desired cure process.
5. **Status** – This tab is where critical information is shown about each of the interlocks on the oven. This is also where the troubleshooting guides are located.
6. **About** – This tab is where you can locate the job number of the machine, detailed information about fuel requirements, date of manufacture, and other various information.

Operation Tab

This tab is where the controls to start/stop the oven or enable/disable the burner are located.

1. **Oven Start Button** – Pressing this button will cause the fans to sequence on and begin the sequence of starting the purge cycle to get the oven to the point where it is ready to ignite the burner.
2. **Oven Stop Button** – Pressing this button will cause the safe shutdown procedure to being. If the oven is below the safe shut down temperature, the fans turn off.
3. **Burner Toggle Switch** – Pressing this toggle switch will enable or disable the burner. The switch will only function if all interlocks are proven, so it is OK to leave the switch in the "Enable" position all the time, unless you wish to turn the burner off while the fans are running.
4. **System Reset** – If there is a fault, pressing this button will reset the fault so that the oven can re-attempt to ignite or re-purge.
5. **Batch Start** – Pressing this button will start the batch timer. If the operator has selected "Auto Batch Start" then the button will automatically energize after the oven reaches the desired temperature set point.
6. **Batch Stop** – Pressing this button will stop and reset the batch timer.
7. **Oven Status** – Displays what the oven is currently doing.
8. **Temp and Time Values** – Displays the current temperature and batch time settings.
9. **Batch Presets** – Presets allow different temperature and time values to be entered for different coatings. The operator can then select which preset to run for the desired part.

Settings Tab

This tab is where various system timers and settings can be adjusted. The settings are passcode protected to help prevent unauthorized setting changes.
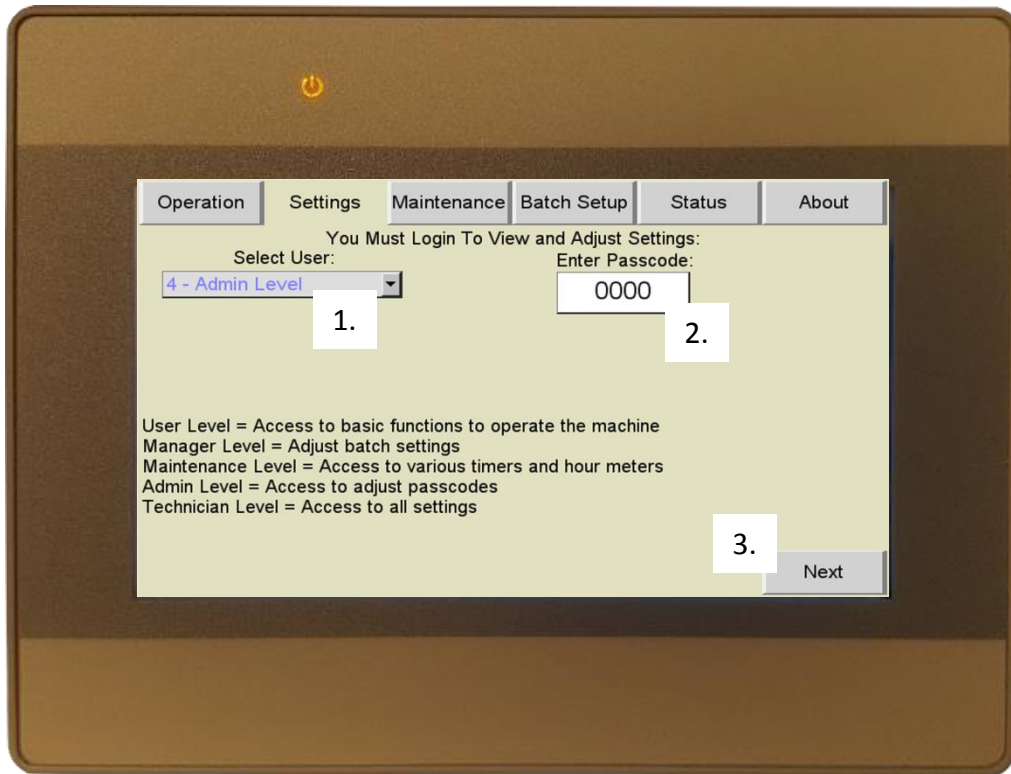
1. **User Level** – Dropdown menu so that the operator can select which user is logging in.
2. **User Passcode** – Select this box and a pop-up keypad will allow the operator to enter the passcode for the selected user.
3. **Next** – After the selected user has logged in, this button will allow the operator to begin adjusting oven settings.

Default Passcodes:
User Level = 4321
Manager Level = 1234
Maintenance Level = 1111
Admin Level = 1635

Maintenance Tab

This tab is where the operator can find details about how long each fan has been running (hour meters) and other useful information such as spare parts list and PM schedule.

1. **Hour Meters** – Press to view/reset hour meters for each fan and burner on the oven.
2. **Preventative Maintenance Schedule** – Click to view generic PM schedule for common parts on the oven.
3. **Recommended Spare Parts** – Click to view a list with part numbers of the most common items that may fail. Keeping these items in stock can reduce downtime.

Batch Setup Tab

This tab is where the operator can adjust temperature and time values for the desired cure process. By default, the batch settings are not passcode protected but are setup to appear as though they are passcode protected. This can help prevent unauthorized batch settings changes. If batch settings need to be protected, login as maintenance level and then click the batch settings button to enable the lock. This is detailed in the "Settings" section of this manual.
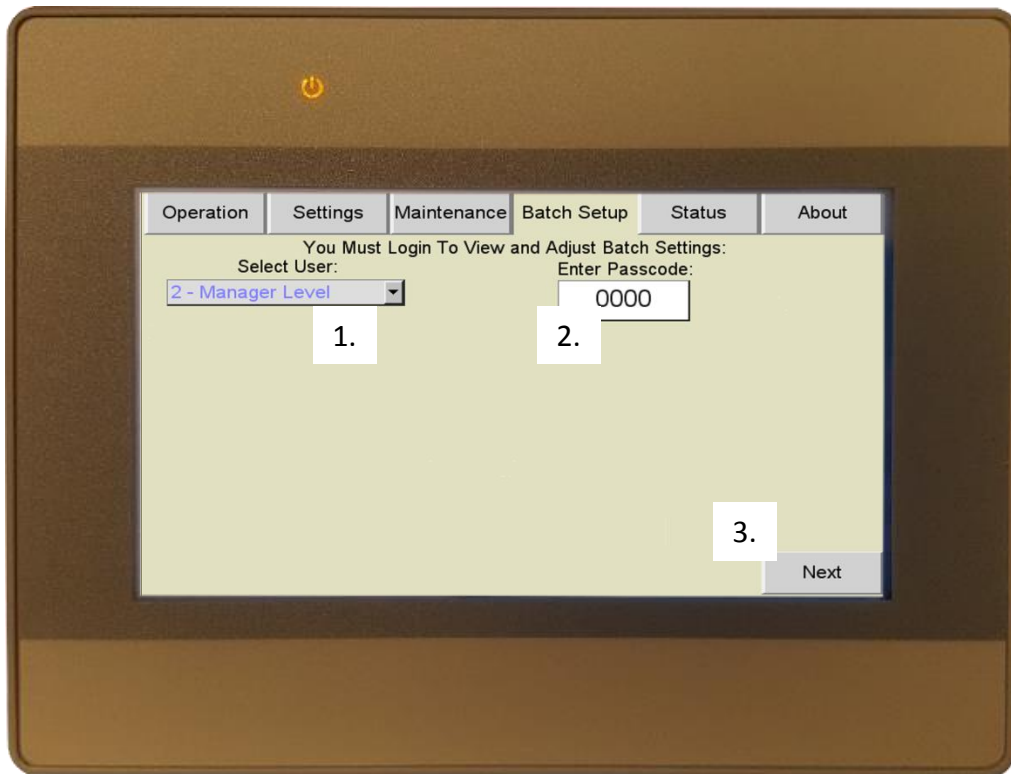
1. **User Selection** – If batch settings are locked, the operator must login as "Manager" to adjust the settings.
2. **Passcode** – Click to open a pop-up keypad to enter the manager passcode.
3. **Next** – If batch settings are locked, the next button will only function if the correct passcode has been entered.

Status Tab

This tab is where critical information is shown about each of the interlocks on the oven. This is also where the troubleshooting guides are located.

1. **List of Interlock Devices** – All devices that are required to ignite the burner are listed here.
2. **Status of Interlock** – When the oven is operating, the status of each interlock will be shown here.
3. **Help Buttons** – If there is a fault with an interlock, use the help buttons to begin a slide show of possible solutions to the problem.
4. **More Button** – Click to go to the next page of interlocks.

About Tab

This tab is where you can locate the job number of the machine, detailed information about fuel requirements, date of manufacture, and other various information.
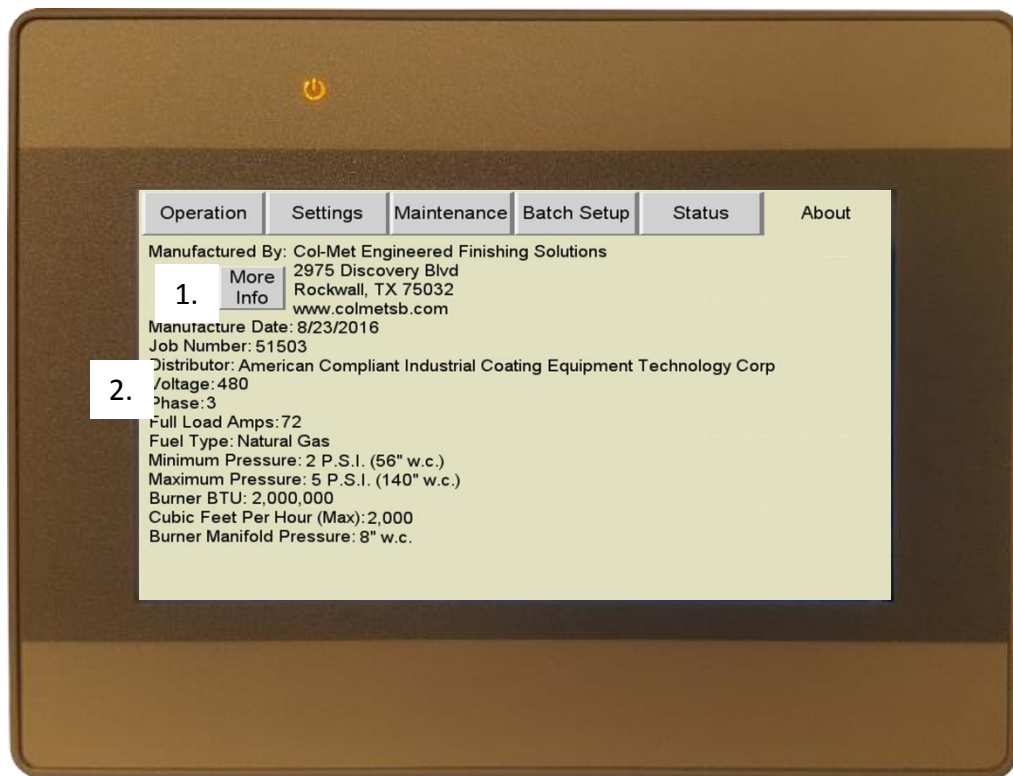
1. **More Info** – Click to learn more about RTT Engineered Solutions
2. **List of Information** – Lists all of the details about when the oven was manufactured, the job number (serial number) voltage, phase, amps, and fuel requirements.

Typical Operation

Press "Batch Setup" to begin setting up the batch.

Operation | Settings | Maintenance | Batch Setup | Status | About

Purge Time Remaining: 002.0 Minutes

Oven Off - Press Start to Begin

Current Oven Temperature: 077 °F
Temperature Set Point: 425 °F

Burner
Disabled   Enabled

Batch Time Remaining: 019.0 Minutes

OVEN START

BATCH START

Batch #1 Selected

Batch Preset #2

OVEN STOP

RESET

BATCH STOP

Batch Preset #3

Batch Preset #4

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By default, the batch settings are not passcode protected. Click next to continue.

If you wish to lock the batch settings, see the "Settings" section of this manual. The default manager level passcode is 1234.

Operation | Settings | Maintenance | Batch Setup | Status | About

You Must Login To View and Adjust Batch Settings:
Select User: Enter Passcode:
2 - Manager Level   0000

Next
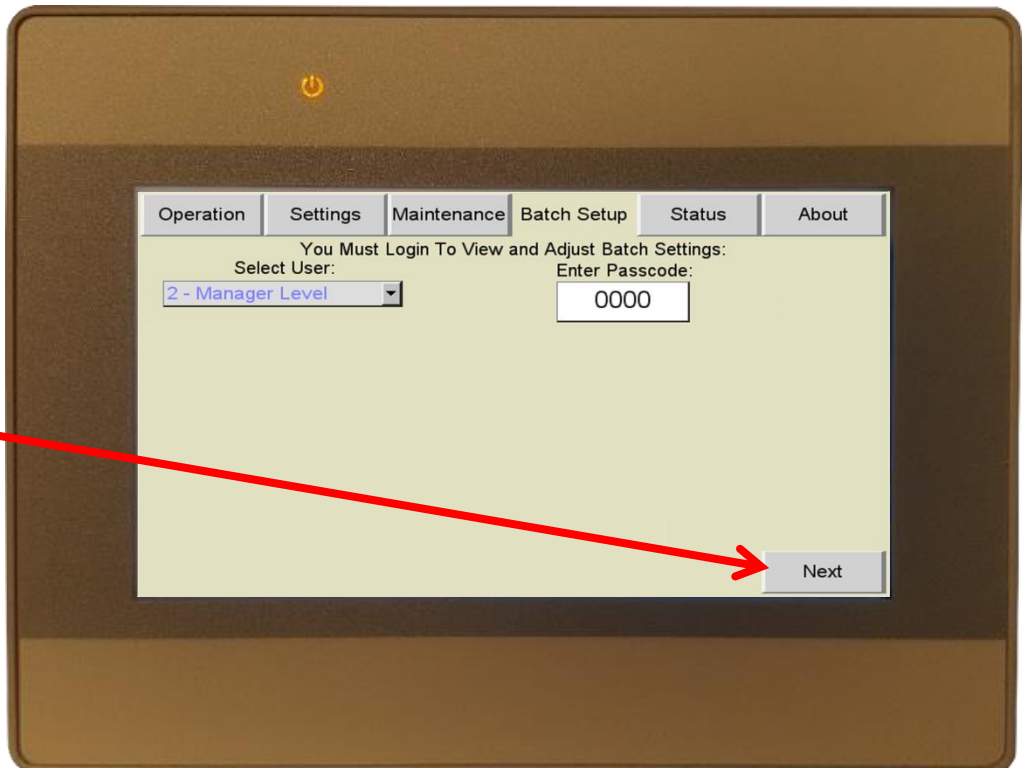
Typical Operation

Press "Step By Step" button to begin batch wizard.

Tip - After you become familiar with the oven, you can quickly adjust batch settings by selecting Manual Setup instead of Step By Step setup.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

How do you wish to proceed?

Step By Step
Batch Setup
(Beginners)

Manual Setup
(Advanced Users)

Batch Presets allow you to quickly recall settings for different coatings that may have different temperature and time values.

Select "Preset #1" button to adjust the preset 1 batch settings, or select a different preset number if you wish to adjust a different preset.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Select Which Preset You Would Like To Setup:

#1 SELECTED   Preset #2

Preset #3   Preset #4

Previous Screen

Presets allow the batch settings to be quickly recalled at a later time. Presets are useful when you use different types of coatings that require different temperature and time values.

Typical Operation

Operation | Settings | Maintenance | Batch Setup | Status | About

At what temperature does the oven need to operate?

425 °F

Click above to enter temperature in Fahrenheit

If you are unsure of what temperature to cure at, see the specification sheet of the application product you are using.

Previous Screen

Next Step

Batch Preset #1 Temp Setting

Click the temperature set point box to open a keypad where you can then enter the temperature at which the oven should operate to cure the coating.

Tip - The minimum and maximum values that can be set are displayed at the top of the keypad.

Enter the desired cure temperature on the keypad, then press "ENT" to accept

Operation | Settings | Maintenance | Batch Setup | Status | About

At what does the ove rate?

MAX: 500   MIN: 100

425

7 8 9 —
4 5 6 CR
1 2 3 ES
. 0 ENT

Click ture

If you are unsu cure at, see the specification she uct you are using.

Previous Screen

Next Step

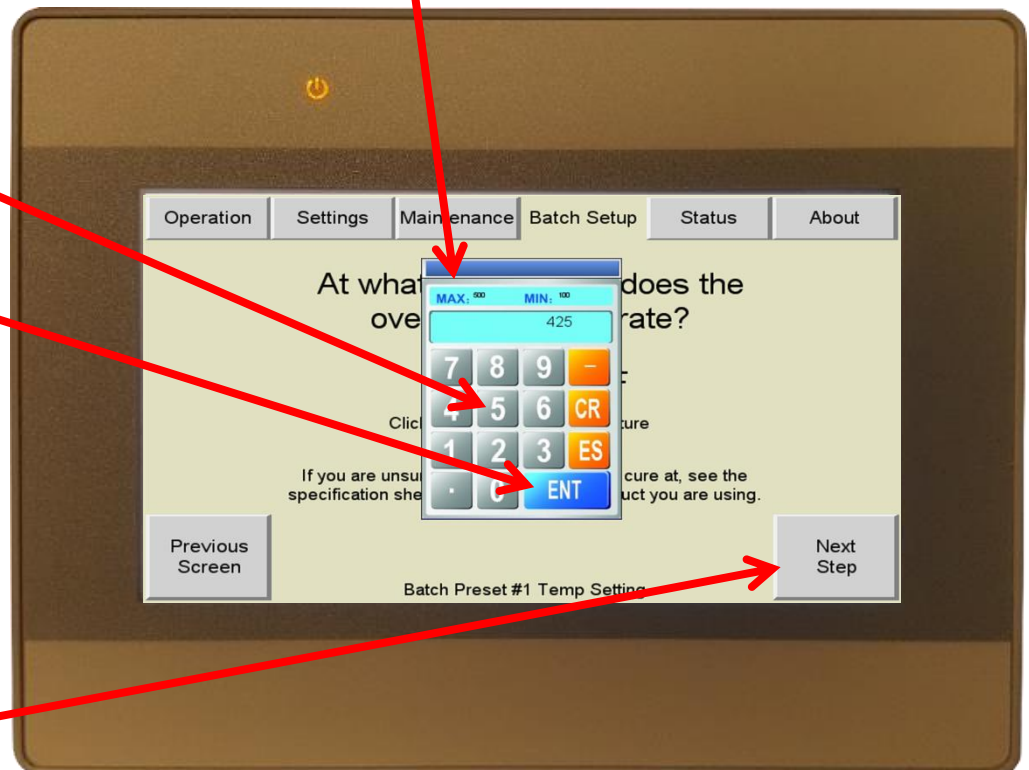Batch Preset #1 Temp Setting

Press "Next Step" to continue to the next screen.

Typical Operation

Click the time set point box to open a keypad where you can then enter the time at which the oven should operate to cure the coating.
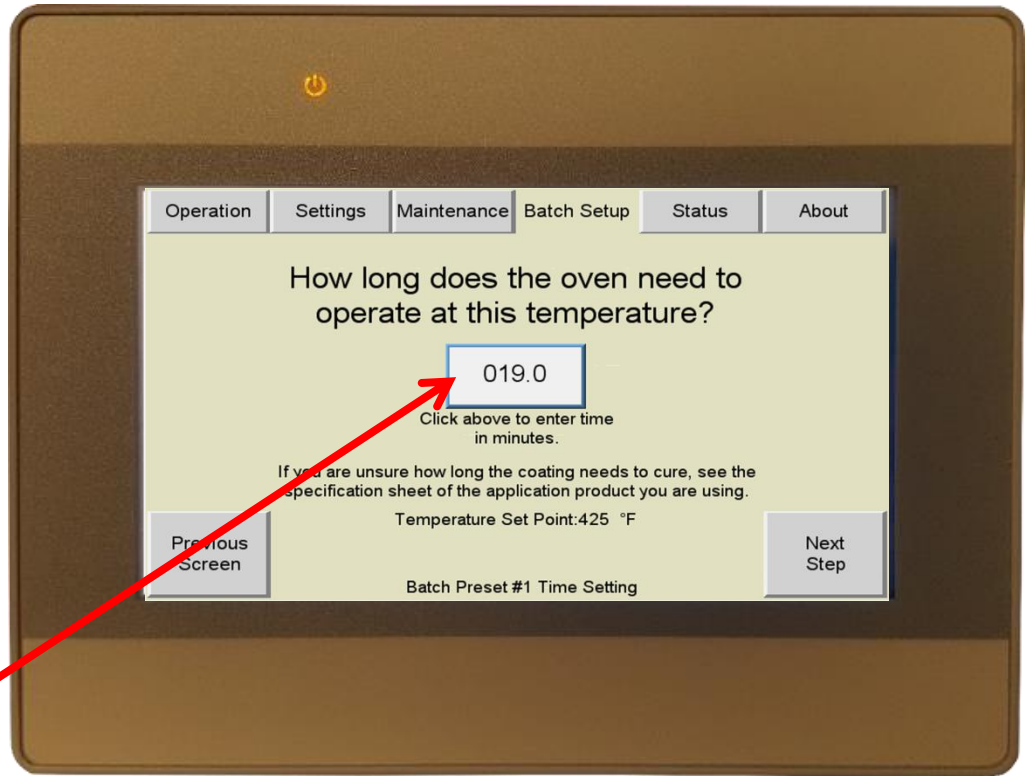
Enter the desired batch time on the keypad, then press "ENT" to accept

Press "Next Step" to continue to the next screen.

Typical Operation

After the batch timer expires, the oven can perform different functions. It can just sound the alarm buzzer and do nothing else. It can sound the alert buzzer then switch to a second temperature set point. Or it can sound the alert buzzer then safely shut the oven down.

Most batch shops will use the second set point option, which will allow the oven to operate throughout the day without shutting down and purging again. At the end of the day, the user might select the auto shutdown mode so that the oven can shutdown without input from the operator.

Select which option works best for your application, then press "Next Step" to continue to the next screen.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

What does the oven need to do after the batch time expires?

Alert Buzzer Only — Sound the alert buzzer, and continue to operate at the same temperature set point.

SELECTED — Sound the alert buzzer, then switch to a 2nd temperature set point.

Auto Shutdown — Sound the alert buzzer, then turn the burner off and allow the oven to cool to the safe shutdown temperature, then turn off the fans. (Auto Shutdown)

Temperature Set Point: 425 °F
Time Set Point: 019.0 Minutes

Previous Screen   Next Step
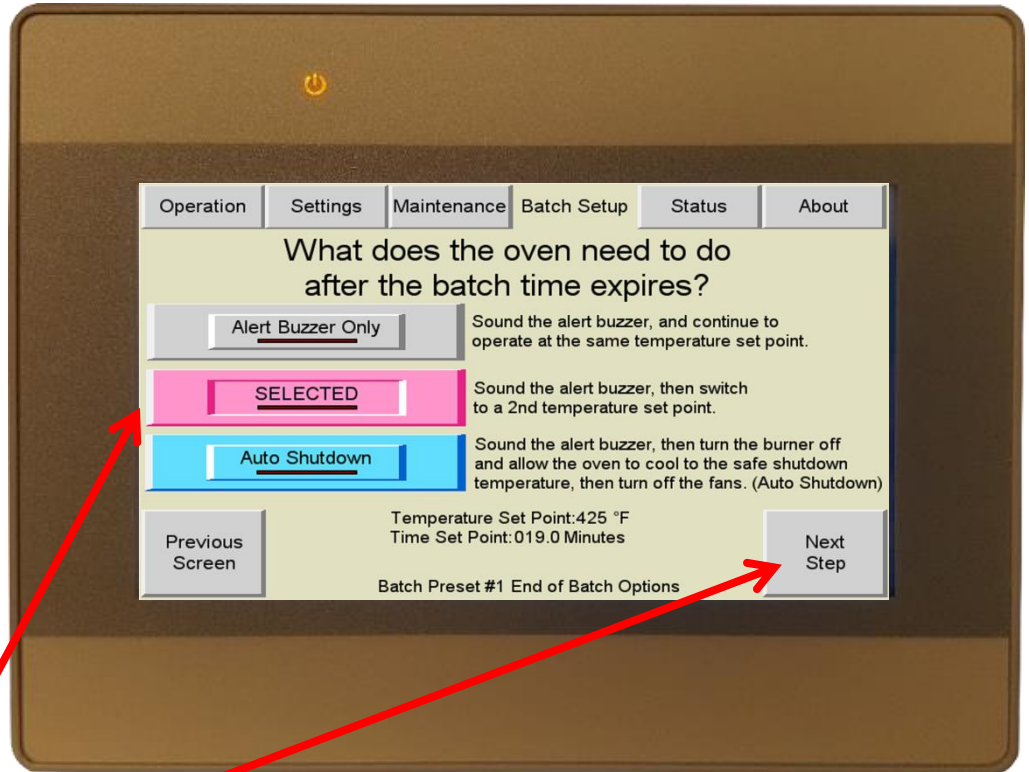
Batch Preset #1 End of Batch Options

The Batch Timer can be started by two methods; auto or manual. When Auto is selected, the batch timer will begin after the oven reaches the temperature set point.
When Manual is selected, the batch timer will start as soon as the operator presses the Batch Start button.
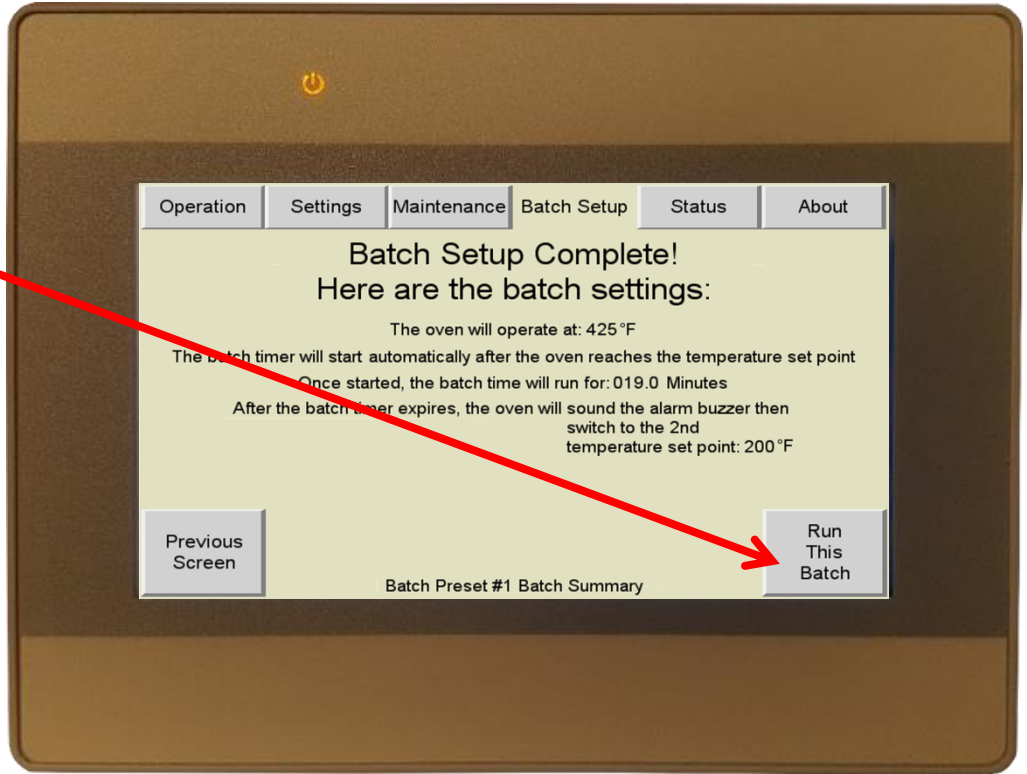Most shops will use the auto mode.
Select the option that works best for your application.

Click "Next Step" to continue to the next screen.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

When should the batch timer start?

SELECTED — Start the batch timer automatically after the oven reaches the temperature set point.

Manual — Start the batch timer when the operator presses the "Batch Start" button.

Previous Screen   Next Step

Batch Preset #1 Timer Start Settings

Typical Operation

The Control Panel will now give a summary of the settings you've entered so that you can see exactly what the oven will do during the batch. If the settings look correct, click the "Run This Batch" button to continue to the next scree. If the settings need to be adjusted, use the "Previous Screen" button to go back and adjust the desired setting.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Batch Setup Complete!
Here are the batch settings:

The oven will operate at: 425 °F

The batch timer will start automatically after the oven reaches the temperature set point

Once started, the batch time will run for: 019.0 Minutes

After the batch timer expires, the oven will sound the alarm buzzer then switch to the 2nd temperature set point: 200 °F

Previous Screen

Run This Batch

Batch Preset #1 Batch Summary

Press oven start to begin running the selected batch.

The fans should energize and if all of the interlocks are proven, the oven will begin to purge.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Purge Time Remaining: 002.0 Minutes

Oven Off - Press Start to Begin

Current Oven Temperature: 077 °F
Temperature Set Point: 425 °F

Burner
Disabled   Enabled

Batch Time Remaining: 019.0 Minutes

OVEN START

BATCH START

Batch #1 Selected

Batch Preset #2

OVEN STOP

RESET

BATCH STOP

Batch Preset #3

Batch Preset #4

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Typical Operation

The oven will display its status here.

As the fans are turning on, it will display "Fan Sequencing On".

If there are any problems with an interlock, it will be displayed here. The oven will not be able to purge or operate until the problem is solved.

For more details on the issue, press the "Status" tab.

Typical Operation

The oven will display its status here.

After all interlocks are proven, the oven will begin to purge. The purge is a delay timer that allows any VOC that may be in the oven to be evacuated before the burner is allowed to ignite. The purge time will vary for each oven, but is typically between 6 and 10 minutes.

The remaining purge time is displayed at the top of the screen.
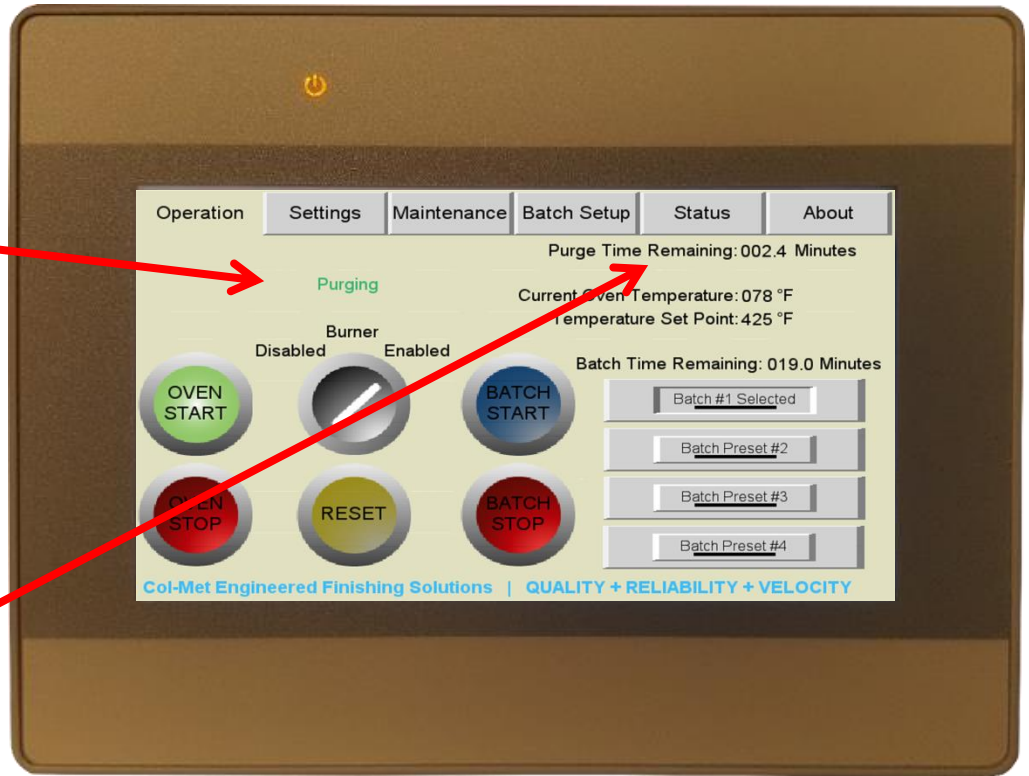
After the purge is complete, the ignition sequence will begin. Typically the burner will ignite within 60 seconds after the purge timer has expired.

Typical Operation

When the burner successfully ignites, the screen will display "Burner On" here.
The oven will then begin to increase in temperature up to the temperature set point.

Tip - Temperature controller output shows you how much capacity the burner is currently running at. This can give you an idea of how much fuel is being used for a batch. As the oven temperature nears the set point temperature, the temperature controller output should begin to reduce its value so that it can maintain the desired set point temperature.
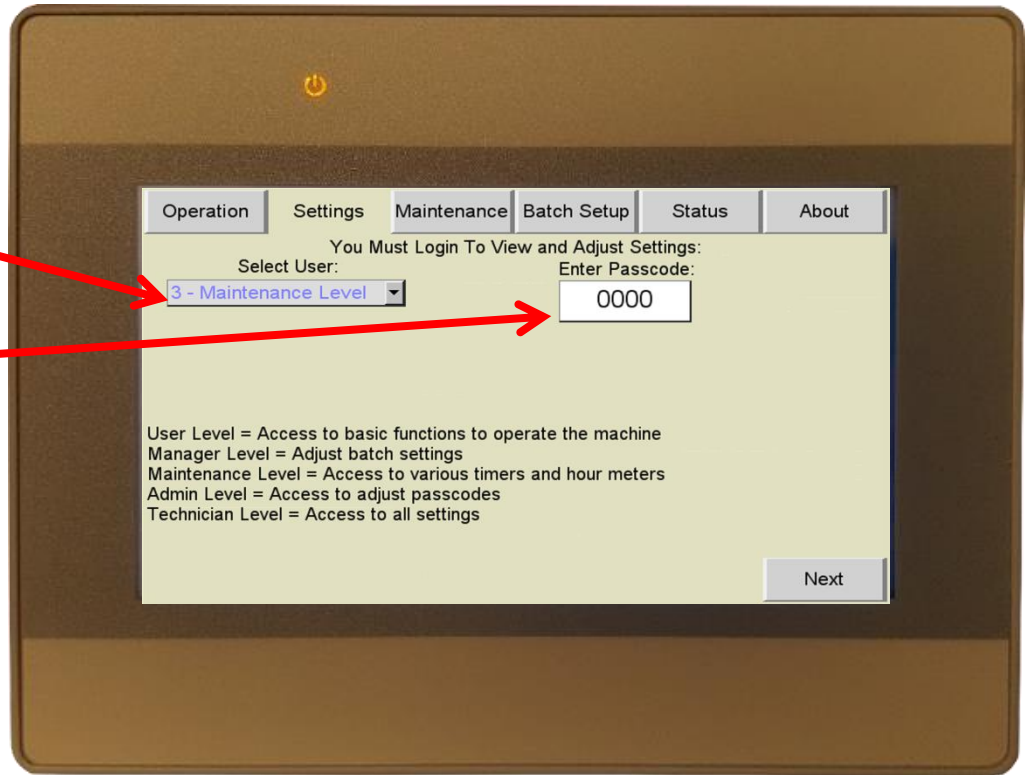

At this point, the selected batch will run. Depending on batch settings, the oven will come up to the temperature set point, start the batch timer, then safely shutdown.
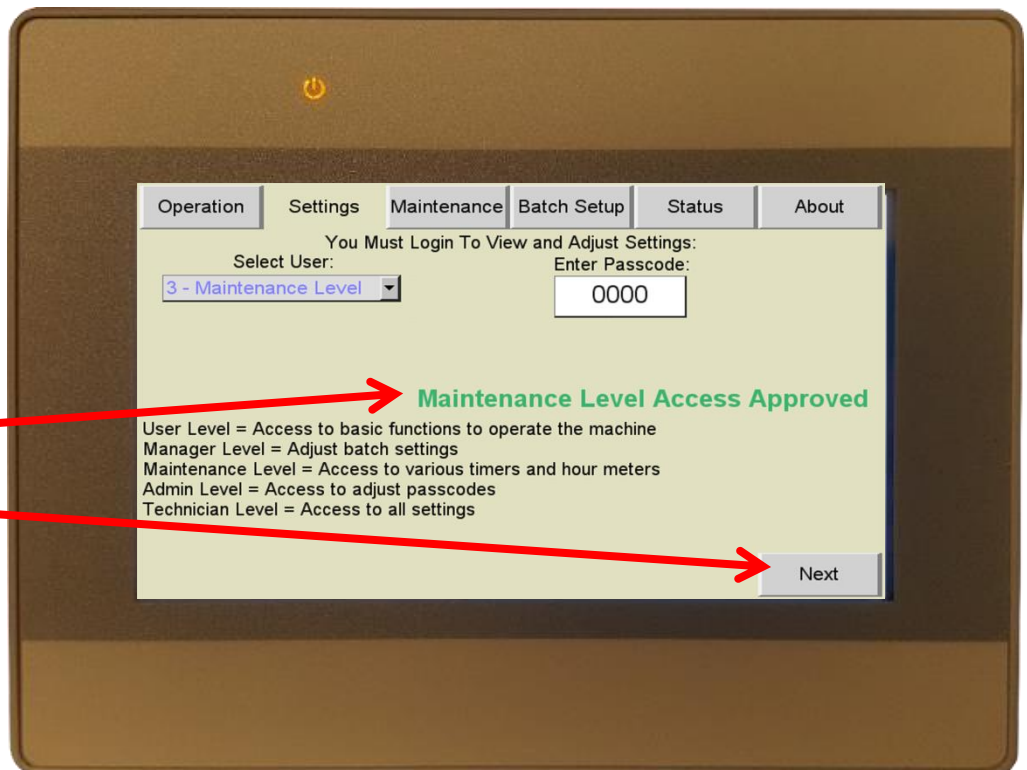
Settings – Maintenance Access Level

In order to adjust the system settings, the operator must login as maintenance or admin. Select the user level of maintenance or admin, then enter the passcode. The default maintenance passcode is 1111.

Operation | Settings | Maintenance | Batch Setup | Status | About

You Must Login To View and Adjust Settings:
Select User:
3 - Maintenance Level

Enter Passcode:
0000

User Level = Access to basic functions to operate the machine
Manager Level = Adjust batch settings
Maintenance Level = Access to various timers and hour meters
Admin Level = Access to adjust passcodes
Technician Level = Access to all settings

Next

After the correct passcode has been entered, the screen will display "Maintenance Level Access Approved". Click "Next" to continue to the next screen.

Operation | Settings | Maintenance | Batch Setup | Status | About

You Must Login To View and Adjust Settings:
Select User:
3 - Maintenance Level

Enter Passcode:
0000

Maintenance Level Access Approved

User Level = Access to basic functions to operate the machine
Manager Level = Adjust batch settings
Maintenance Level = Access to various timers and hour meters
Admin Level = Access to adjust passcodes
Technician Level = Access to all settings

Next

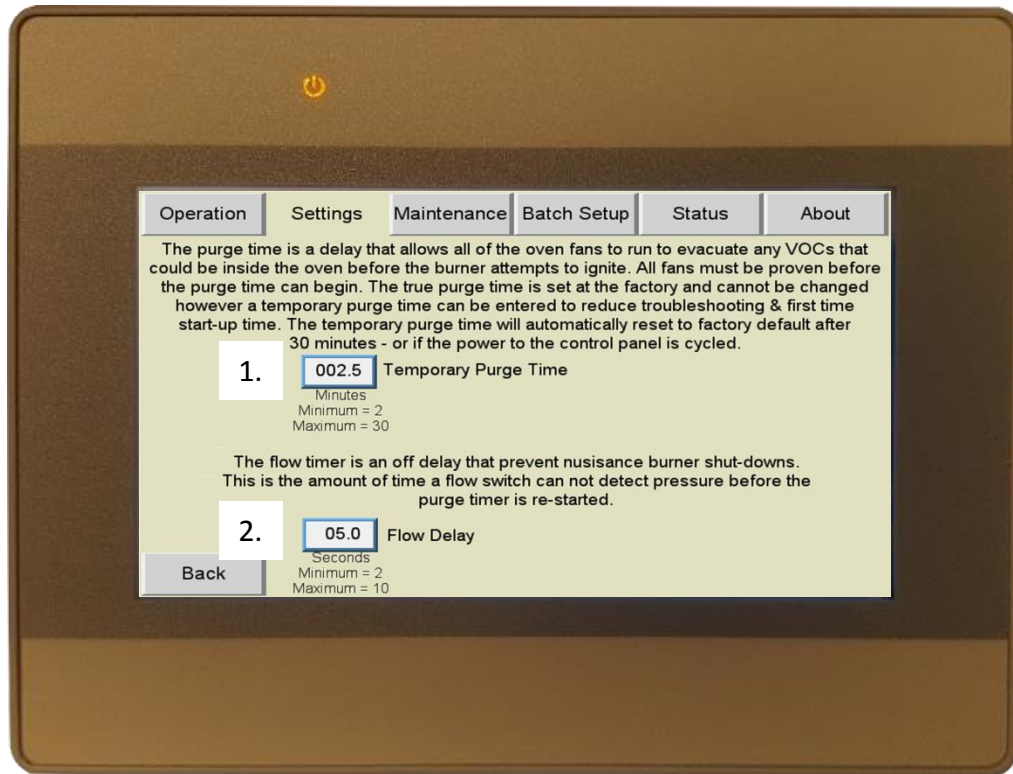# Settings – Maintenance Access Level

1. **Fan Delay Timers** – Allows for adjustment of the fan start-up sequence time. More time between fan starts will help reduce inrush current on the system.
2. **Purge Settings** – Allows the operator to temporarily increase or decrease the purge time. If the oven is having issues and the maintenance team is trying to solve problems, lowering the purge time can reduce downtime while the troubleshooting is taking place.
3. **Batch Mode Enable/Disable** – In some instances, a batch timer may not be needed for a process. The section allows the operator to disable the batch code to simplify oven operation and decrease the chance of operator error.
4. **Alert Timers** – Allows the operator to adjust how long the alarm buzzer sounds during various faults.
5. **HMI Settings** – Allows the operator to adjust the time/date and other HMI settings.
6. **Logout** – Allows the operator to logout to prevent unauthorized setting changes. If the operator does not logout, the system will automatically logout after 5 minutes of inactivity.

Settings – Maintenance Access Level
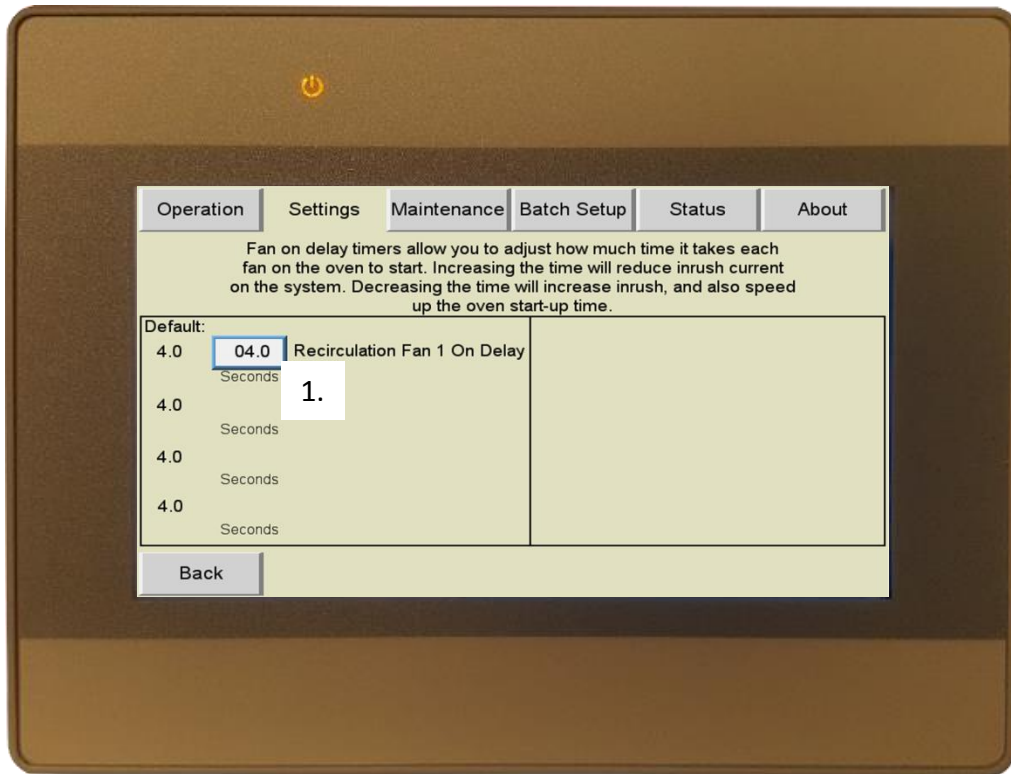
1. **Recirculation Fan 1 On Delay** – Click the box to open a keypad where a new value can be entered. Lower HP fans will require less time due to lower inrush current. Larger HP fans will require more time due to higher inrush current. Typically this value is set at 4 seconds.

Settings – Maintenance Access Level

| Operation | Settings | Maintenance | Batch Setup | Status | About |

The purge time is a delay that allows all of the oven fans to run to evacuate any VOCs that could be inside the oven before the burner attempts to ignite. All fans must be proven before the purge time can begin. The true purge time is set at the factory and cannot be changed however a temporary purge time can be entered to reduce troubleshooting & first time start-up time. The temporary purge time will automatically reset to factory default after 30 minutes - or if the power to the control panel is cycled.

1. 002.5 Temporary Purge Time
Minutes
Minimum = 2
Maximum = 30

The flow timer is an off delay that prevent nusisance burner shut-downs. This is the amount of time a flow switch can not detect pressure before the purge timer is re-started.

2. 05.0 Flow Delay
Seconds
Back   Minimum = 2
Maximum = 10

1. **Temporary Purge Time** – Allows operator to temporarily reduce the purge time for troubleshooting purposes. It is not recommended to reduce the purge time if there is product in the oven.
2. **Flow Delay** – Allows the operator to adjust the amount of time an air pressure switch must be open before the burner is shut down and a fault is issued. Adjust the setting to a higher value if the oven is experiencing random shutdowns with automatic re-purge (no alarm buzzer).

Settings – Maintenance Access Level
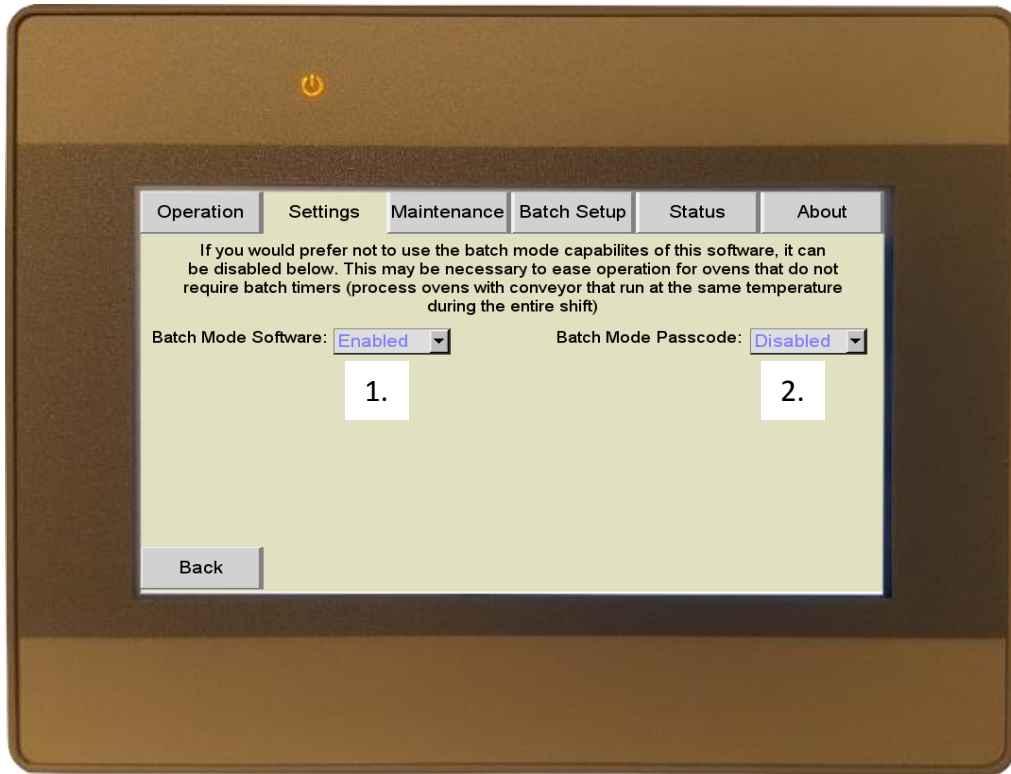
1. **Batch Mode Enable/Disable** – If the batch timer is not required for your process, select "Disabled" to disable the batch timer code. This will simplify oven operation and help prevent operator error.
2. **Batch Settings Lock** – If you would like to passcode protect your batch settings, select "Enabled". The operator will need to login at "Manager Level" or higher to adjust batch settings.
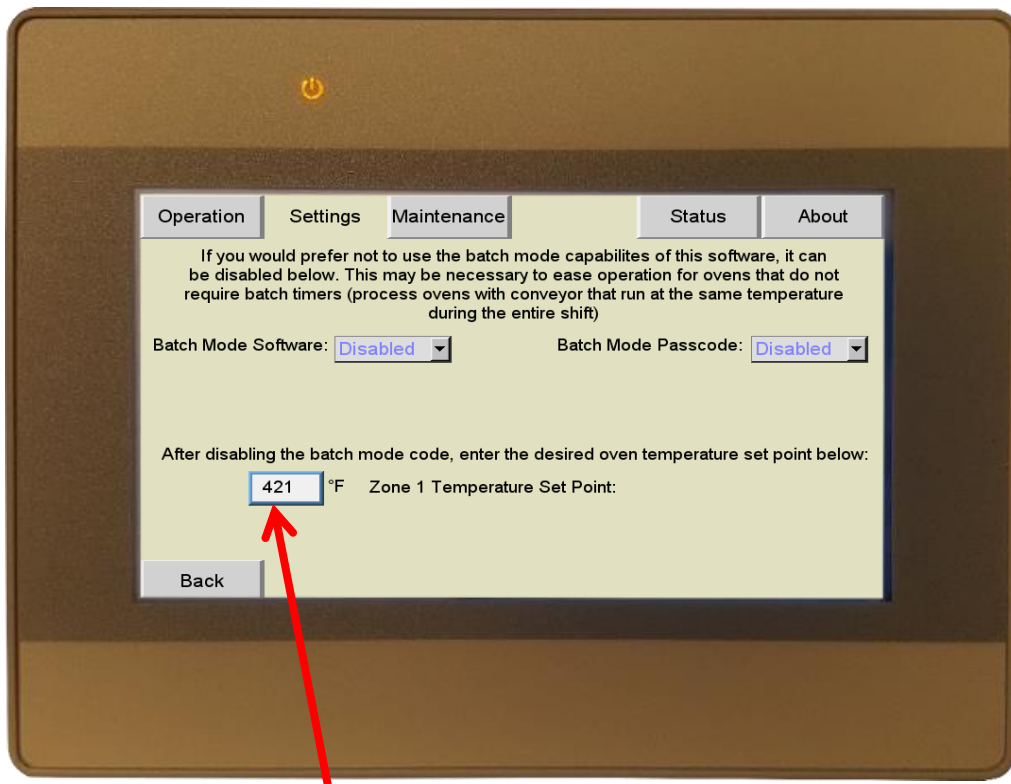
If the batch mode settings are disabled, a box will appear at the bottom of the screen where you can set the oven temperature set point. After this value is set, the user must login as "Maintenance Level" or higher to change the setting. This will help reduce operator error.

Settings – Maintenance Access Level

After the batch modes have been disabled, the operation screen will no longer have the batch preset buttons

Temperature set point changes must be done from the settings screen.

# Settings – Maintenance Access Level
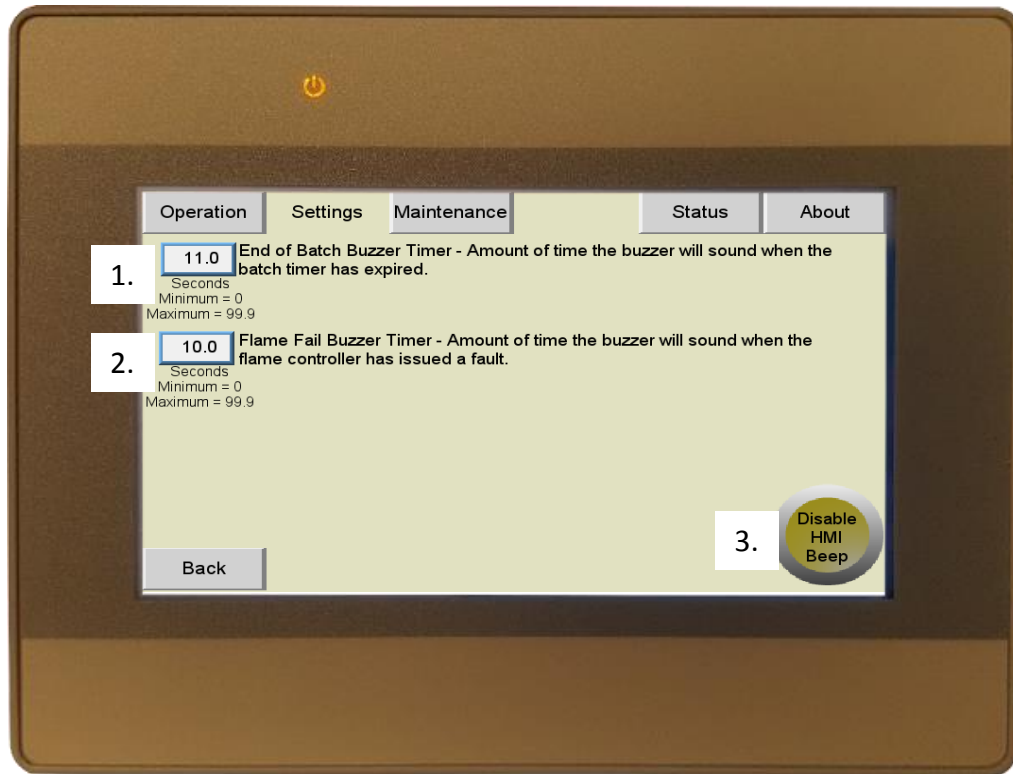
1. **End of Batch Buzzer Timer** – Allows the operator to adjust how long the alert buzzer will sound after the batch timer expires.
2. **Flame Fail Buzzer Timer** – Allows the operator to adjust how long the alert buzzer will sound if there is a flame fault.
3. **Disable/Enable HMI Beep** – Allows the operator to turn off the beep sound that the HMI makes any time a button is pressed.

Settings – Temperature Limits

The temperature set points of the oven can be limited using the "Temperature Limits" button in the settings section of the touch screen.

Select the "Temperature Limits" button
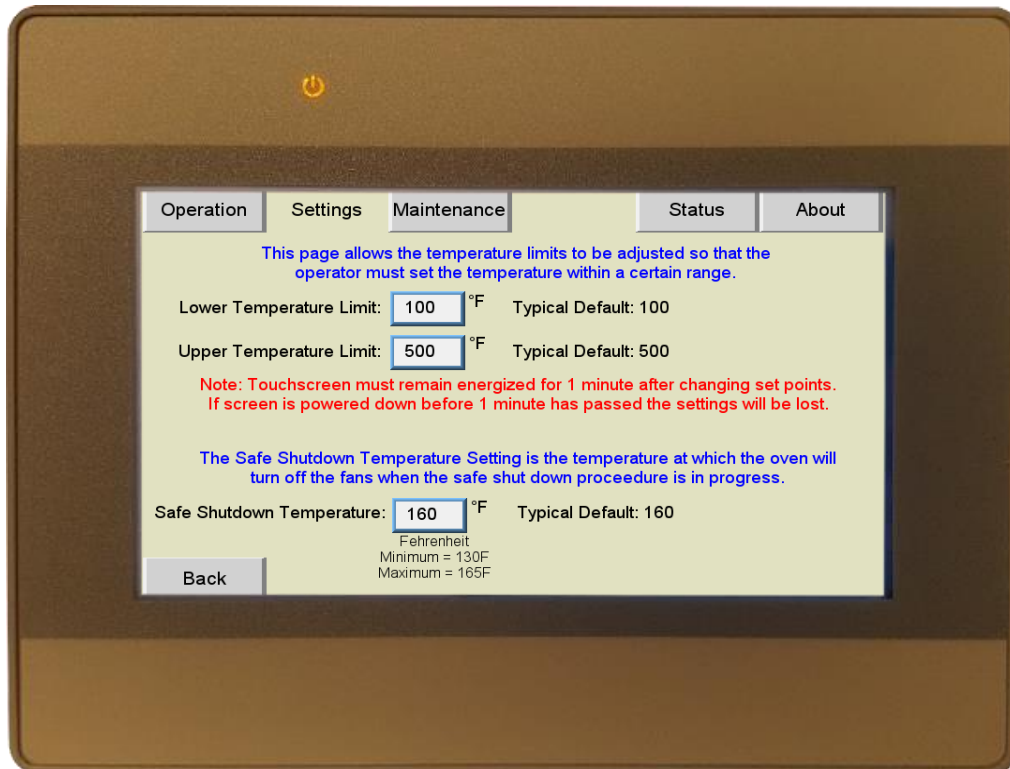
Select the box of the limit you would like to adjust. Use the pop-up keypad to adjust the limit, then press enter. Note the Minimum and Maximum values are displayed at the top of the keypad.

Settings – Admin Access Level

To adjust passcode settings, login to the setting menu as "Admin". A "Passcodes" button will appear at the bottom of the screen where you will be able to change the passcodes for each user level.

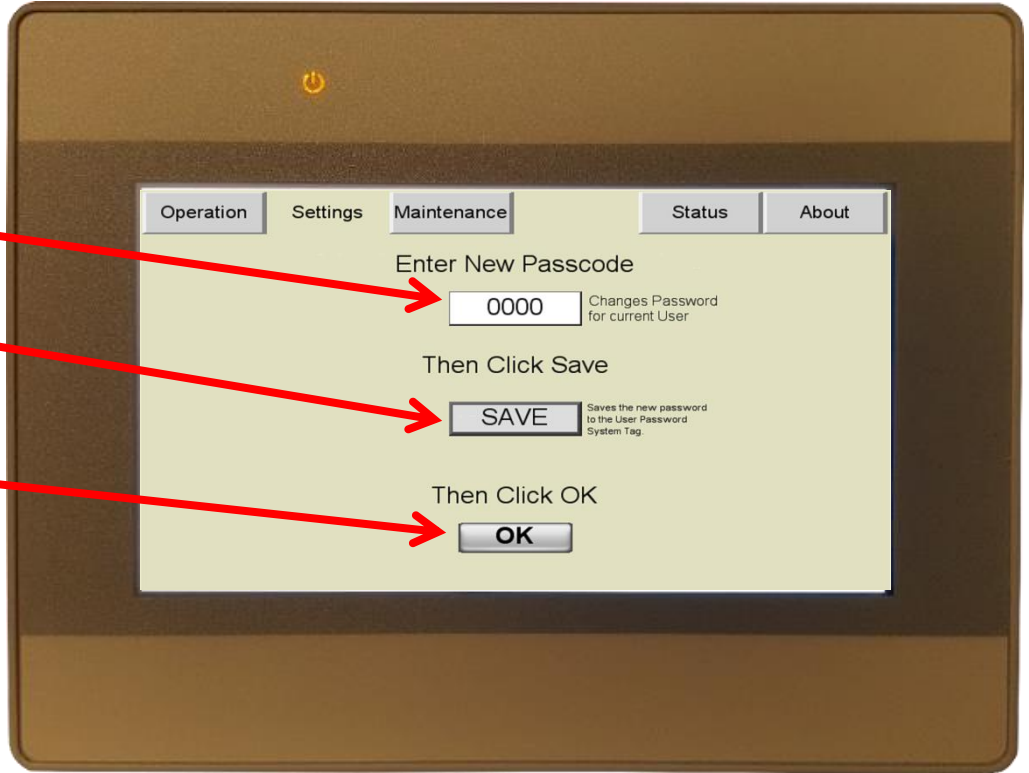Select the user level you wish to change, then press "Change User Passcode"
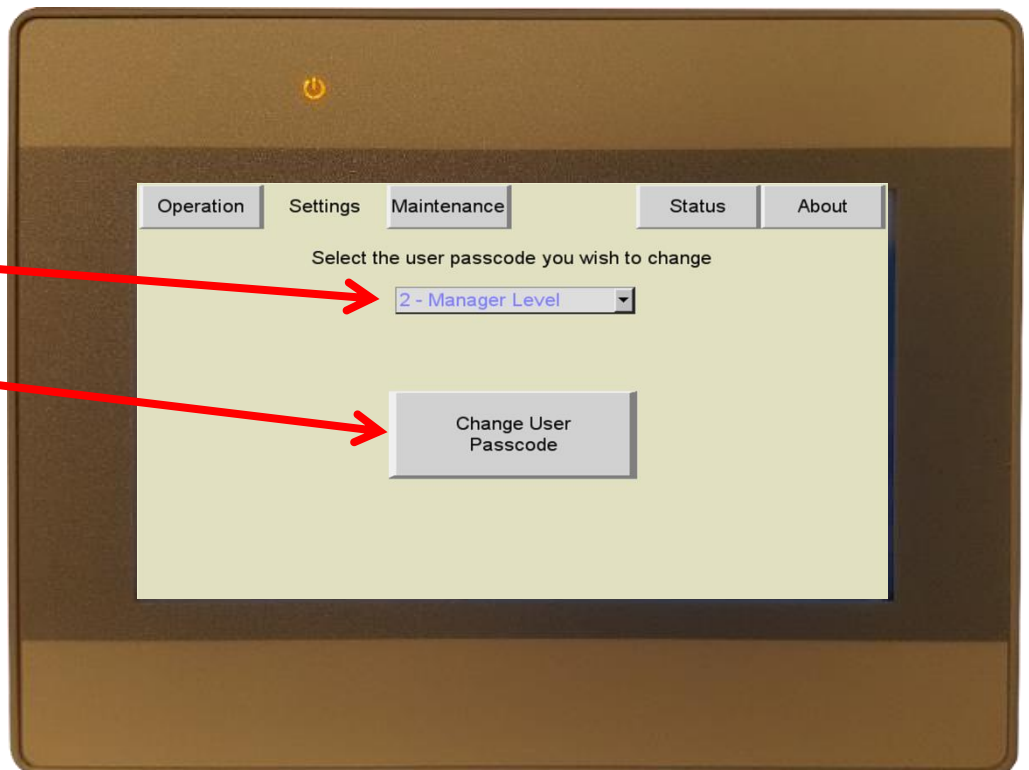
Settings – Admin Access Level

Click the box to open a pop-up keyboard, then enter a new passcode.

Press the save button to save the new passcode.
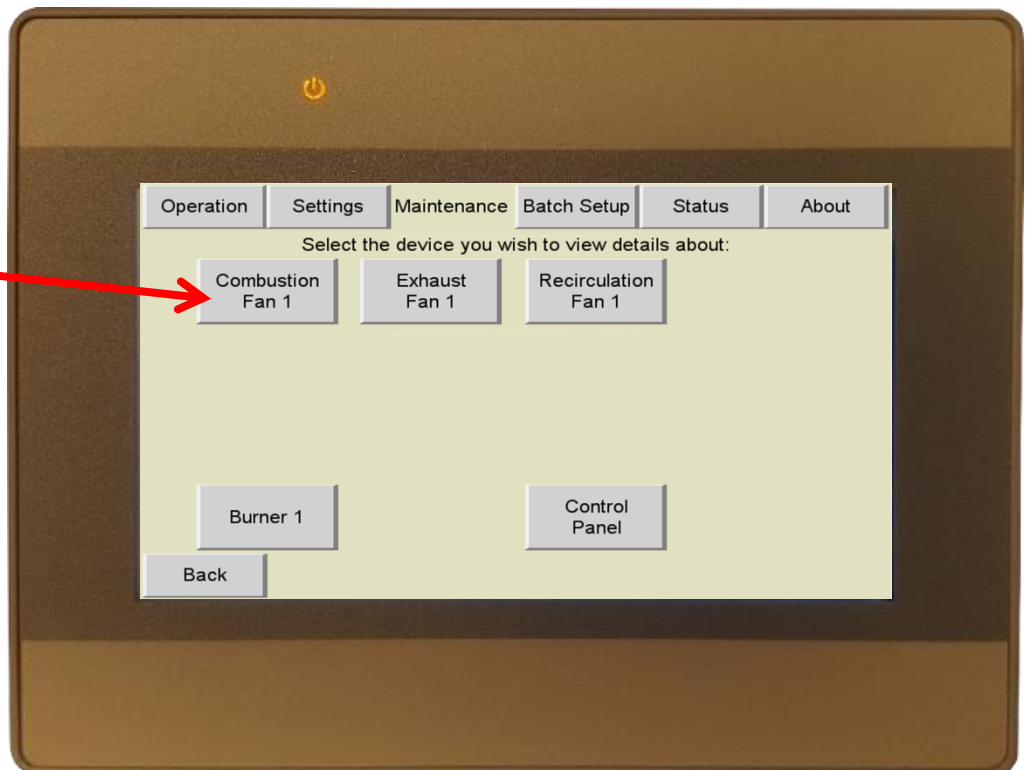
Click OK to continue to the next screen.

| Operation | Settings | Maintenance | | Status | About |

Enter New Passcode

0000   Changes Password for current User

Then Click Save

SAVE   Saves the new password to the User Password System Tag.

Then Click OK

OK

Maintenance Features

Click the "Hour Meters" button to access the system hour meters.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Hour Meters

Preventative Maintenance Schedule

Recommended Spare Parts

Select the device you wish to view.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Select the device you wish to view details about:

Combustion Fan 1   **Exhaust Fan 1**   **Recirculation Fan 1**

Burner 1   **Control Panel**

Back

Maintenance Features

The touchscreen will display how long the device has operated.

There is also a maintenance timer that can be reset. This timer should be reset after maintenance is performed on the device so that the maintenance team will know how long it has been since work was done to the device.

Operation	Settings	Maintenance	Batch Setup	Status	About

	Years	Days	Hours	Minutes	Seconds
Combustion Fan 1 Total Run Time:	0	0	0	42	2
Combustion Fan 1 Run Time Since Last Maintenance Reset:	0	0	0	42	2

Back

Reset the Combustion Fan 1 Maintenance Run Timer
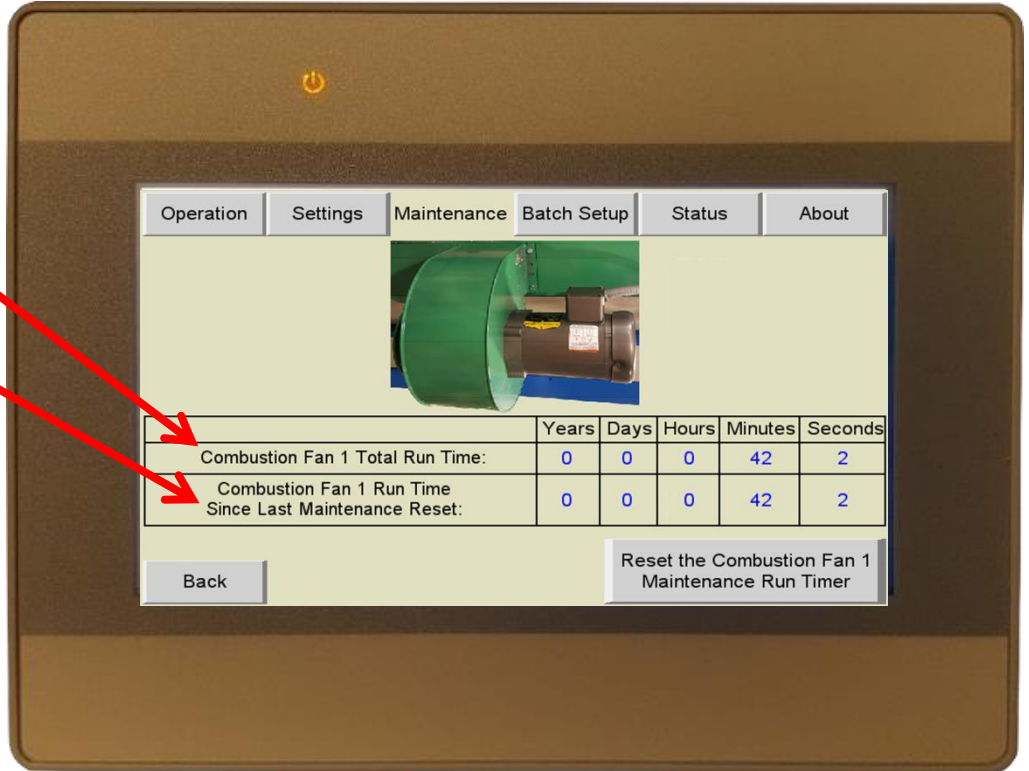
To reset the maintenance timer, click the reset button. This will guide the operator through the reset process.

Operation	Settings	Maintenance	Batch Setup	Status	About

	Years	Days	Hours	Minutes	Seconds
Combustion Fan 1 Total Run Time:	0	0	0	42	2
Combustion Fan 1 Run Time Since Last Maintenance Reset:	0	0	0	42	2

Back

Reset the Combustion Fan 1 Maintenance Run Timer

Maintenance Features

Maintenance hour meters are passcode protected to prevent unauthorized resets. You must login as maintenance or higher to reset the timer.

Select maintenance level or higher.

Enter the required passcode.
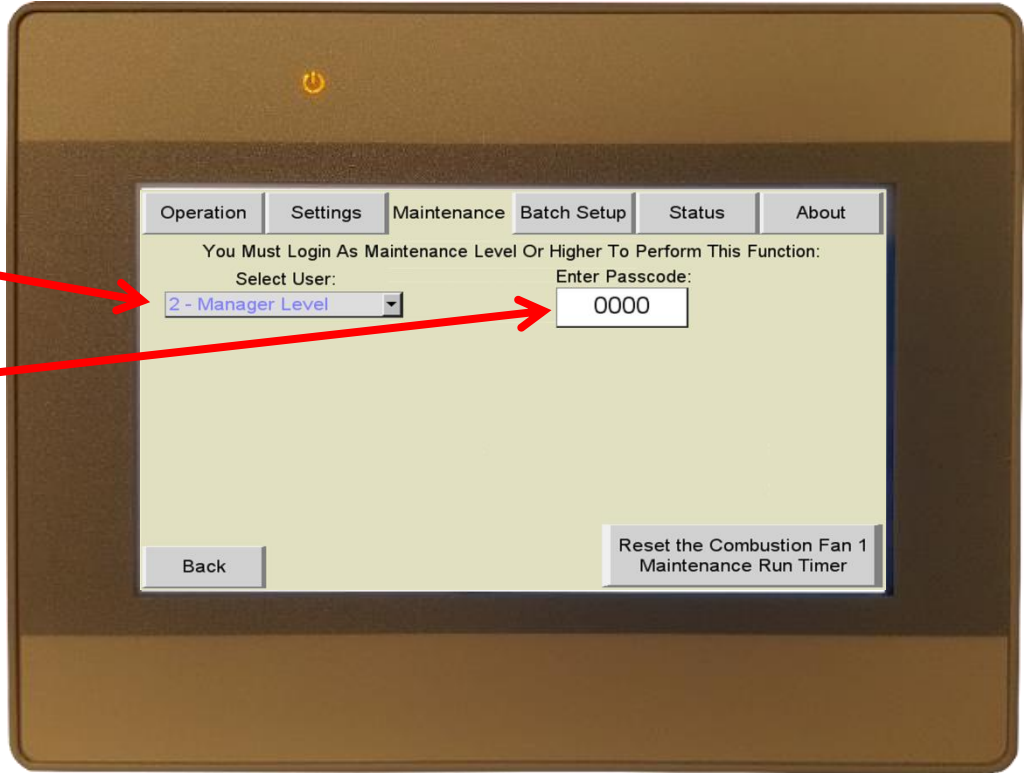
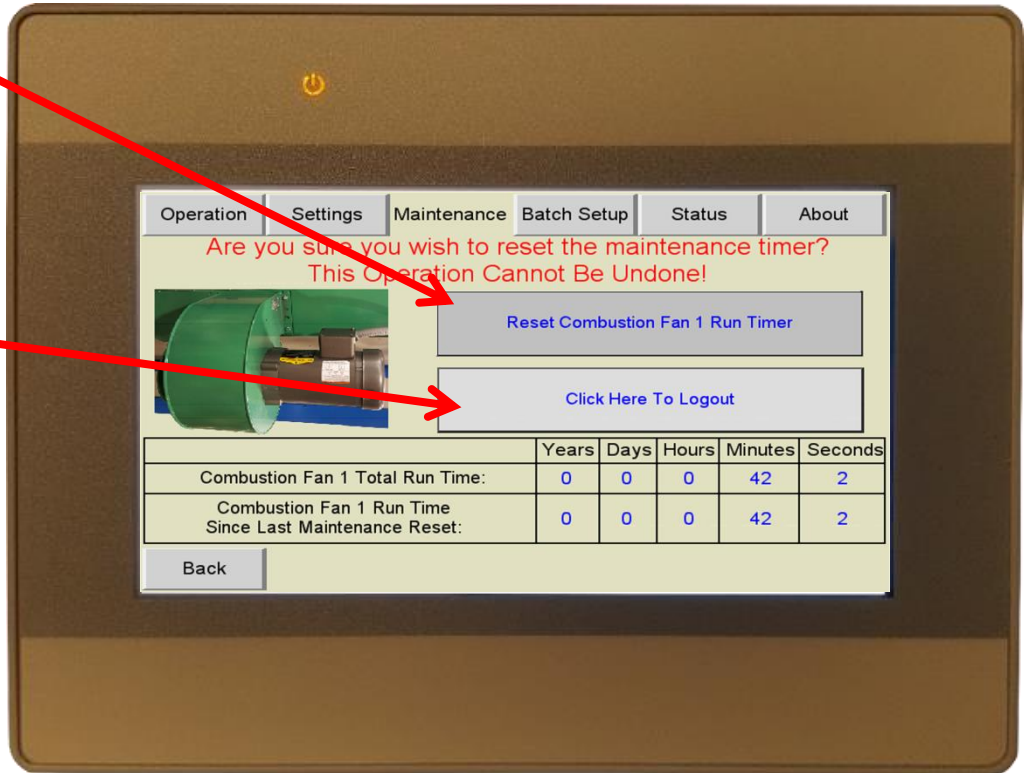After the passcode is approved, click the "Reset Run Timer Button".

Maintenance Features

Click "Reset Run Timer" button.

The numbers at the bottom of the screen will reset to 0.

To reset other timers, click the back button.

To exit, click logout then select a tab at the top of the screen.

| Operation | Settings | Maintenance | Batch Setup | Status | About |

Are you sure you wish to reset the maintenance timer?
This Operation Cannot Be Undone!

Reset Combustion Fan 1 Run Timer

Click Here To Logout

	Years	Days	Hours	Minutes	Seconds
Combustion Fan 1 Total Run Time:	0	0	0	42	2
Combustion Fan 1 Run Time Since Last Maintenance Reset:	0	0	0	42	2

Back

Troubleshooting Features

If there is an issue with the oven, the operator can use the built in troubleshooting screen which contains slide shows on the more common faults that can occur.

To access the troubleshooting features, click the "Status" tab then locate the device that's causing the fault.

Click the "Click Here For Help" button for the associated fault.

Operation	Settings	Maintenance	Batch Setup	Status	About

More

Gas Pressure: Fault - Check Incoming Gas Pressure	Click Here For Help
Combustion Fan 1 Starter: Off	Click Here For Help
Combustion Fan 1 Flow:	Click Here For Help
Exhaust Fan 1 Starter: Off	Click Here For Help
Exhaust Fan 1 Flow:	Click Here For Help
Recirculation Fan 1 Starter: Off	Click Here For Help
Recirculation Fan 1 Flow:	Click Here For Help

The slide show will begin to give the operator information about the fault and the most common fixes for the fault. Use the "Back" and "Next" buttons to navigate through the slide show.

The Gas Pressure switches monitor incoming and outgoing gas pressure to the oven. If there is ever a loss of gas pressure or the gas pressure is too high, then the switch will trip, shut down the burner, and prevent the oven from purging until the problem is fixed.

High Pressure Switch
P/N: BRN-364

Low Pressure Switch
P/N: BRN-363

Back

Next
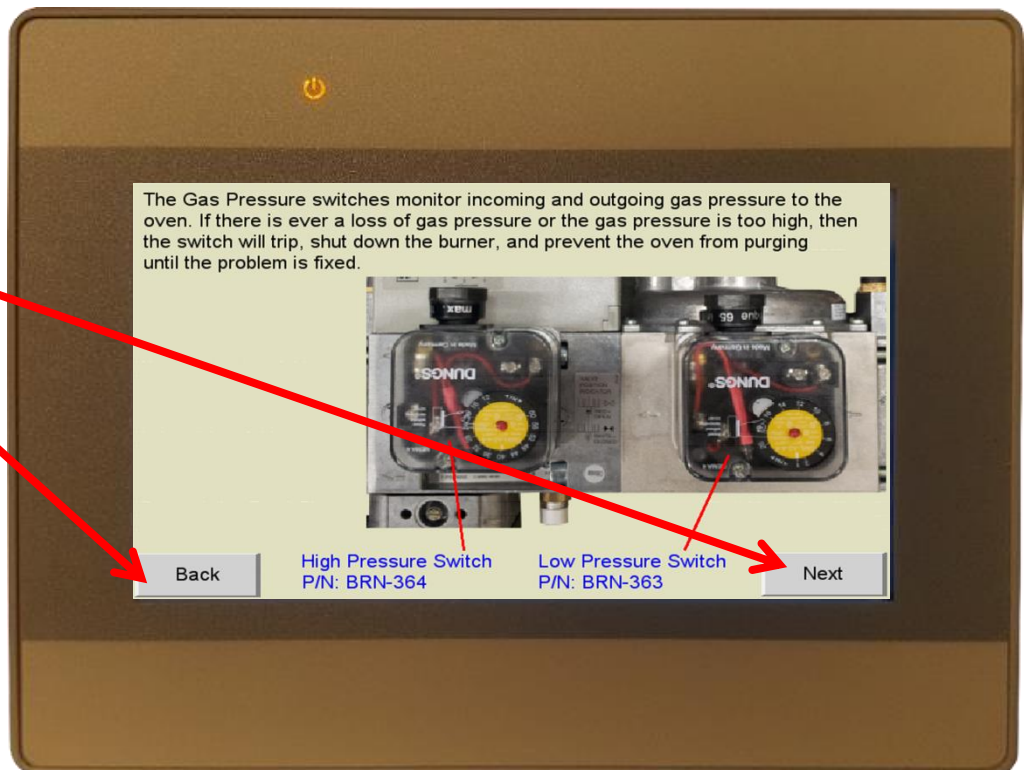
Troubleshooting Features

Follow the steps in the troubleshooting guide using the instructions and built in photos.

Locate the valve train which is usually mounted to the heater box within a few feet of the burner. Ensure the incoming gas ball valve is turned on (yellow handle parallel with the gas pipe).
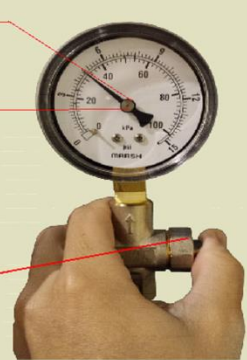
Turn ball valve so that handle is parallel with gas pipe.

Turn ball valve so that handle is parallel with gas pipe.

Back   Next

Possible Solutions:

Ensure the oven has gas pressure by pressing the silver button on the incoming gas pressure gauge mounted to the valve train. The pressure should be between 2 P.S.I and 5 P.S.I. If there is no pressure then make sure all ball valves leading up to the oven are on. If the oven is in operation and then shuts down on a gas pressure fault, this means you may not have enough pressure for the oven to function properly.

5 P.S.I. Max

2 P.S.I. Min

Press button to detect pressure. When button is released, gauge will fall to Zero.

Back   Next

Troubleshooting Features

Temperature Controller Auto Tune:

Occasionally it may be necessary to perform an auto tune procedure on the temperature controller so that it can more accurately control the temperature in the oven. Follow the steps to perform the auto tune function:

Open the door on the main control panel, then energize the panel. Go to the touch screen and start the oven. Allow the burner to ignite and the temperature to come up to within 30 degrees of the set point. Locate the temperature controller in the main control panel. Press and hold the P button on the controller.

The controller will begin to flash "tUNE" and "no" at the bottom.

Tap the up arrow to change the "no" to "yes".

Tap the P button several times until the display reads "End".

A small "AT" indicator will begin to flash under the "OUT2" indicator. The oven will now overshoot and undershoot the temperature set point 4 times so that the controller can learn how long it takes the temperature to rebound. After the process is complete, the "AT" will stop flashing, and the oven should hold the temperature within a few degrees of the desired set point.

Remote Control

Your Smart Touch Controller features a built in VNC server. This allows the touch screen to be viewed and controlled remotely by connecting it to your local area network (LAN) via Ethernet. Once connected you will be able to access the system from a computer or wifi enabled mobile device.
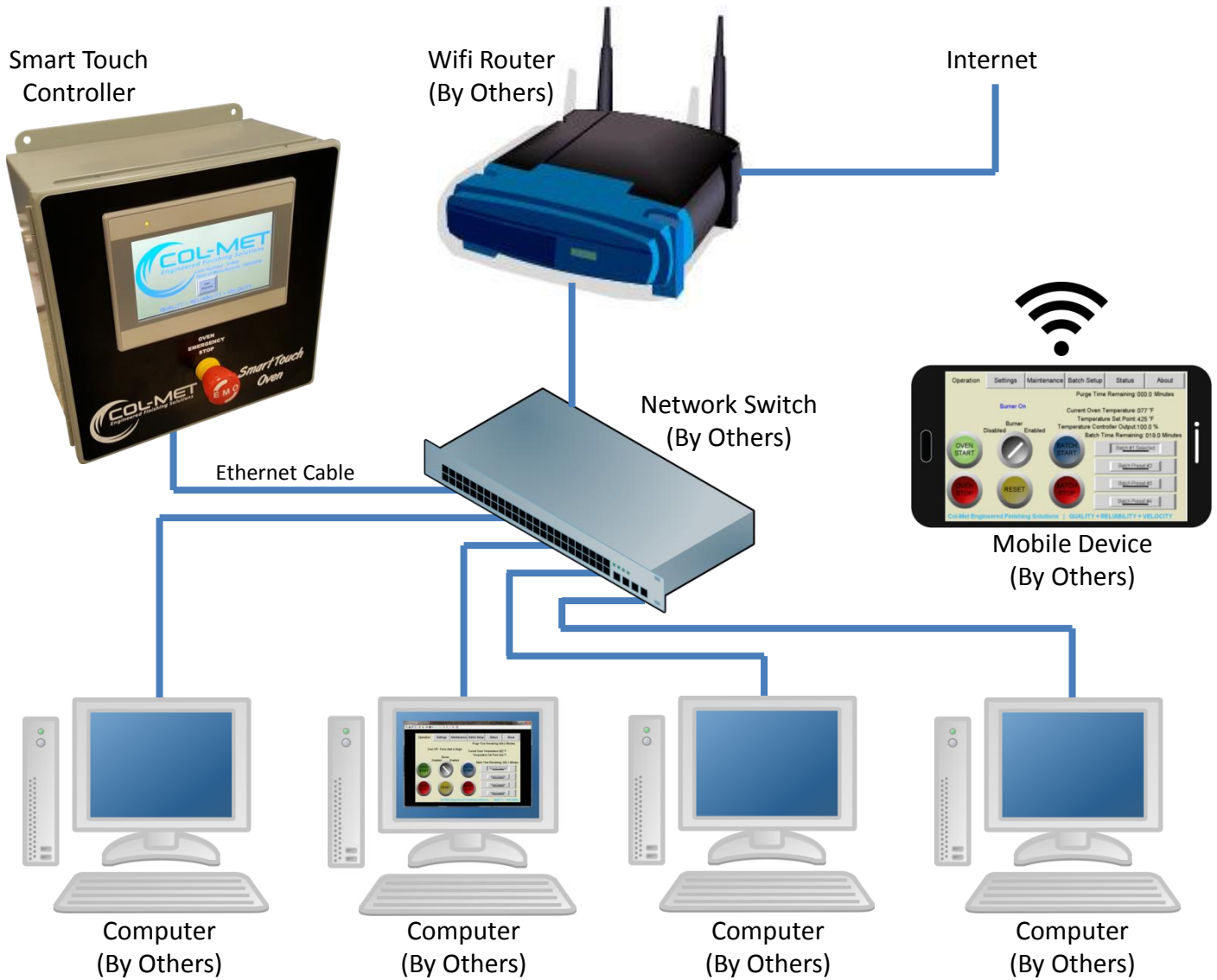
Step 1: Install an ethernet cable (Cat5 or Cat6) from your network switch to the RJ45 port on the back of the touch screen.
Step 2: Setup the ip address of the touch screen
Step 3: Download and install a VNC viewer program on your computer (internet download)
Step 4: Connect to the touch screen using the VNC viewer

Remote Control – IP Address Setup

After connecting the touch screen to your network, go to the settings tab, then login as Maintenance Level or higher

Select the HMI Settings button
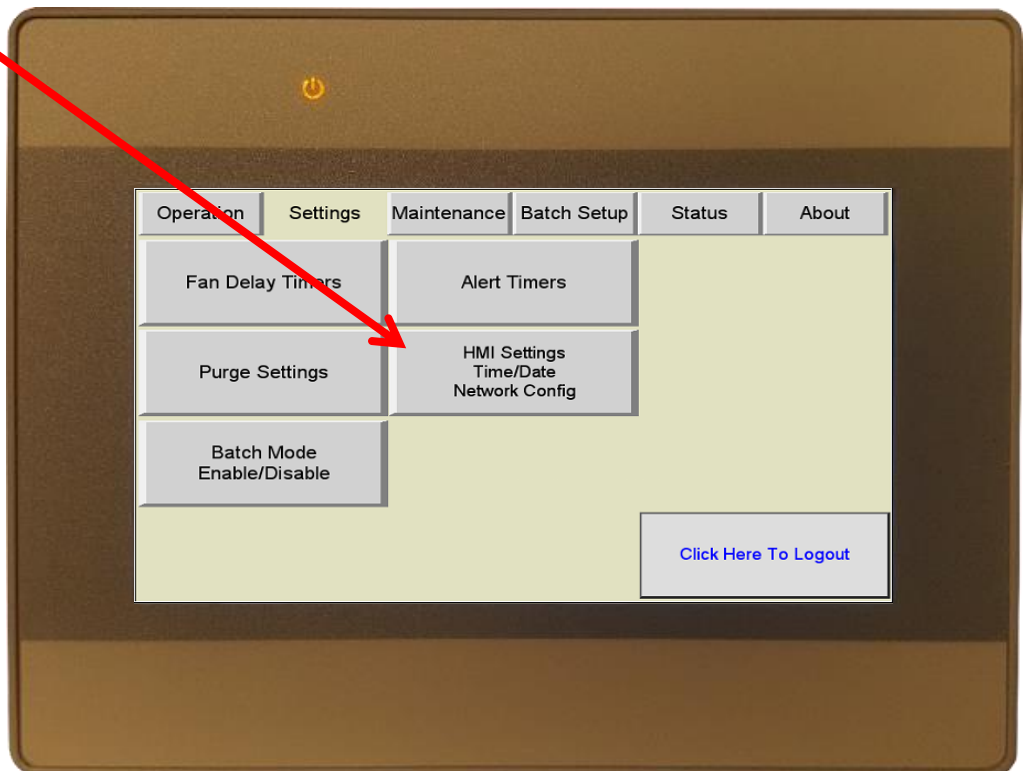
Remote Control – IP Address Setup

A keyboard and password prompt will open. Enter the HMI password 111111 – the system settings window will open.

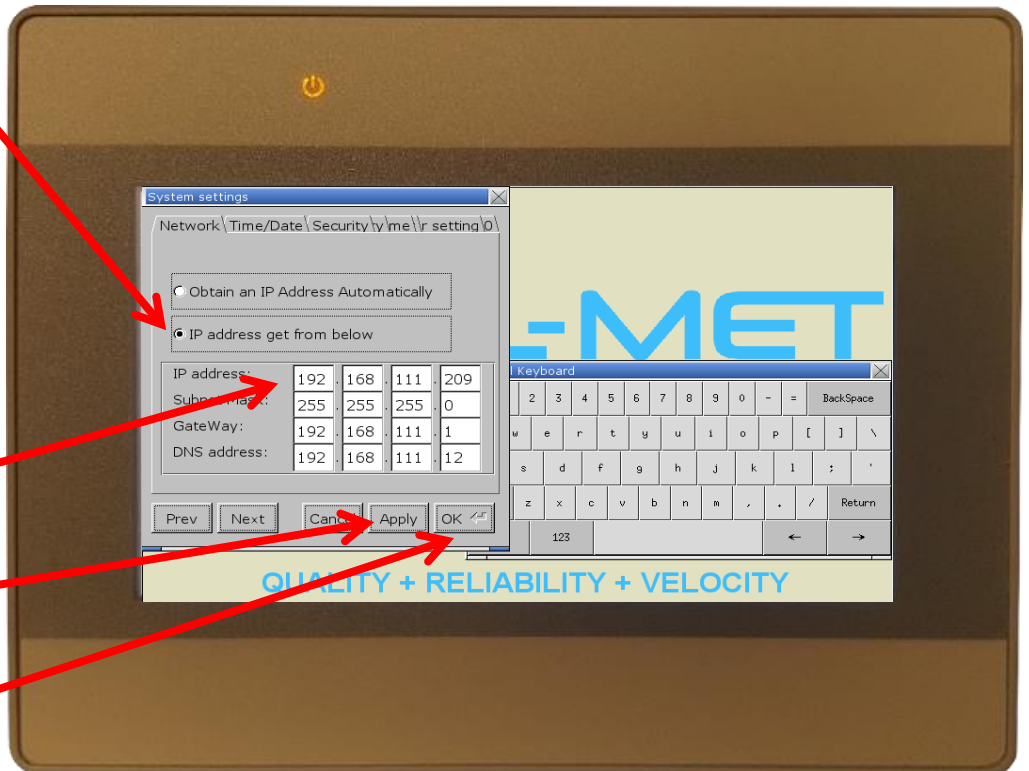Select "Obtain an IP Address Automatically"
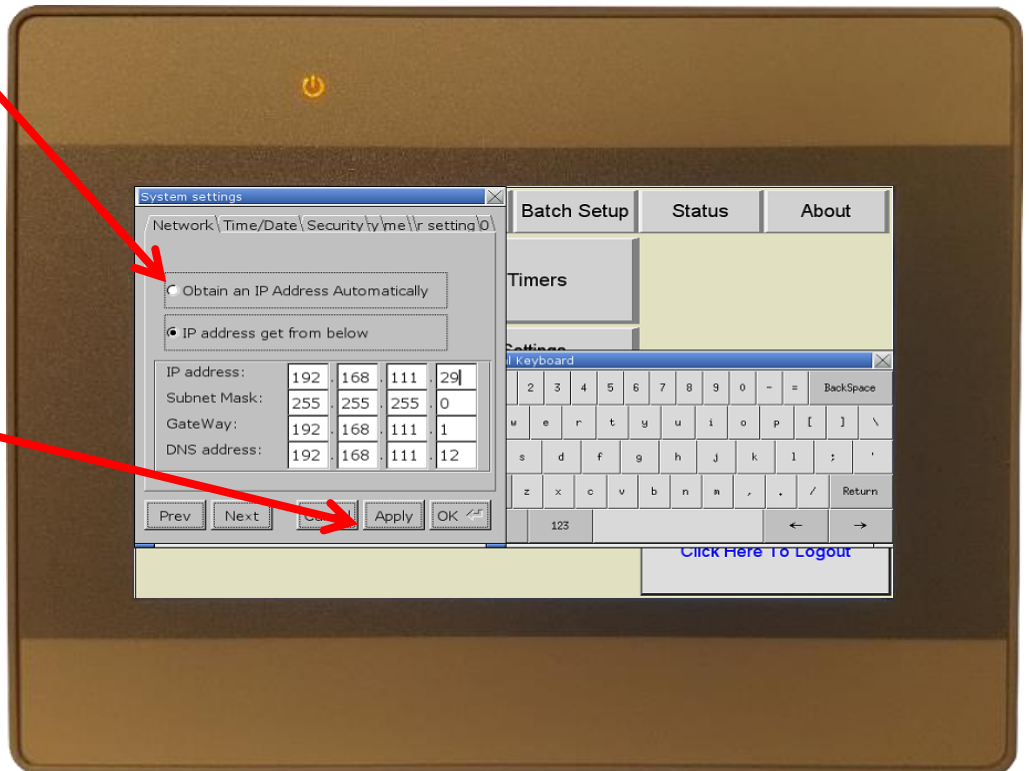
Click "Apply"

Remote Control – IP Address Setup

A new IP address will be assigned to the touch screen.

Select "IP address get from below" This will ensure the IP address does not change.

Write the IP address down. This will be used later to connect.

Click "Apply"

Click "OK"

Remote Control – VNC Connecting

From your computer, download and install a VNC viewer program of your choice. These programs are available as a free download from the internet. RTT tests with TightVNC viewer for PC use or Remote Ripple for mobile devices.

Enter the ip address of your touch screen. This will be the address that was written down from the previous step. If needed, the default port number is 5900.
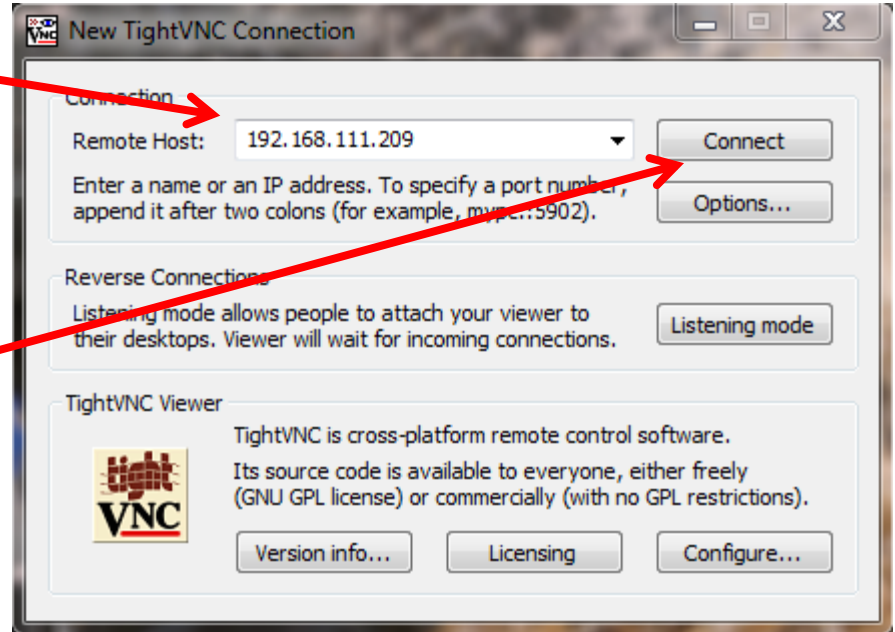
Click "Connect".

After the touch screen is found, a prompt will open requesting the password. The default password is 1635
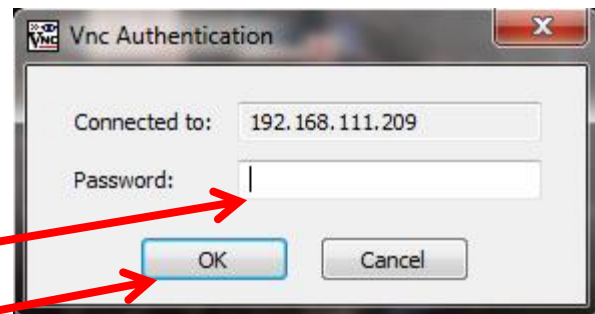
Click "OK"

The same process applies for mobile devices. Download a VNC viewer of your choice (ex: Remote Ripple). Enter the ip address of the touch screen into the app. Ensure the mobile device is connected to the same wifi network as the touchscreen then connect.

NOTE The mobile device will only connect to the touch screen if it is on the same wifi network.

Remote Control – VNC Connecting

After the connection and password are verified, the touch screen will appear in the VNC window. You can now view/control the Smart Touch controller from your PC.

Tip Clicking the auto zoom button will allow you to resize/rescale the window to make the screen larger.
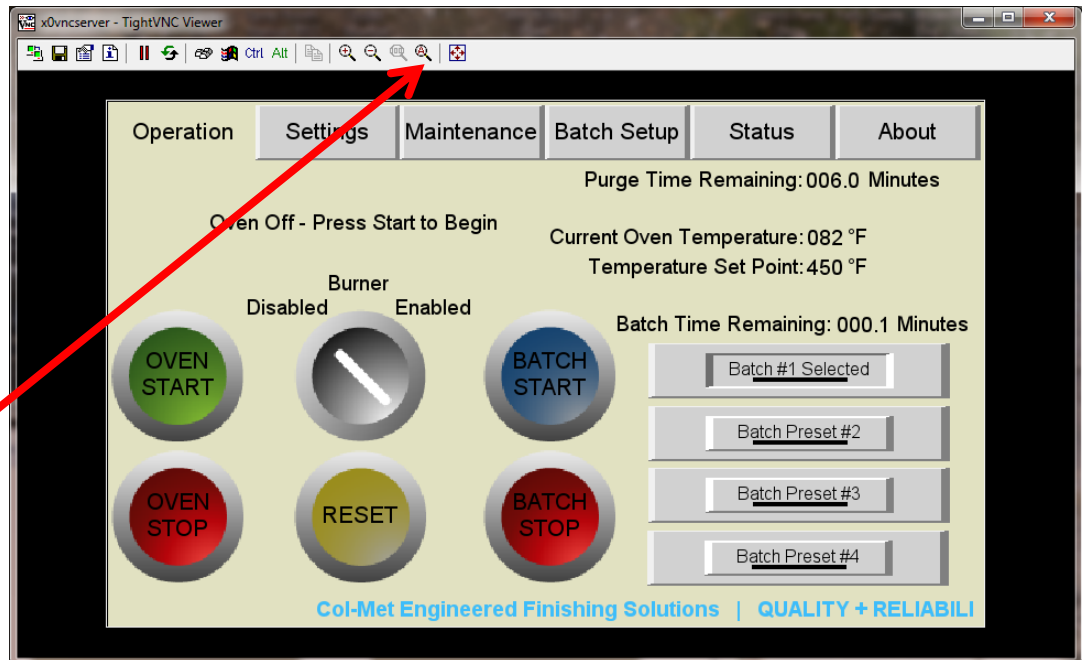
Maintenance

<u>Introduction</u>

Proper maintenance contributes not only to the service life and efficiency of the oven but also to a safe workplace. In addition to performing as-needed repairs to the oven, it is important that qualified personnel perform scheduled maintenance.

<u>Preventative Maintenance Scheduling</u>

The recommended scheduled maintenance has been broken down into daily, monthly, quarterly, bi-annual and yearly needs.

<u>Daily Maintenance</u>

Outside of the daily checklist addressed in the operation instructions, there is no daily recommended scheduled maintenance for the oven. Operators are instructed to notify the appropriate personnel if any maintenance concerns arise during daily operation.

<u>Preventative Maintenance Schedule</u>

| Item	Timeframe (Whichever Comes First)
Check belt tension on all fans	150 to 200 Hours or Monthly
Lubricate fan bearings	150 to 200 Hours or Monthly
Inspect burner flame profile	600 to 650 Hours or Quarterly
Lubricate door hinges	600 to 650 Hours or Quarterly
Blow out motors	600 to 650 Hours or Quarterly
Clean UV scanner	1200 to 1300 Hours or Bi-Annually
Clean Igniter	1200 to 1300 Hours or Bi-Annually
Inspect all ductwork for cleanliness	1200 to 1300 Hours or Bi-Annually
Clean burner air foils	1200 to 1300 Hours or Bi-Annually
Clean all blower wheels and fans	1200 to 1300 Hours or Bi-Annually
Inspect door seals	1200 to 1300 Hours or Bi-Annually
Test operation of main gas shut-off valve at gas train	1200 to 1300 Hours or Bi-Annually
Clean air pressure switch sensing tubing	2500 to 2600 Hours or Annually
Clean thermocouples	2500 to 2600 Hours or Annually
Check and tighten all motor wire connections	2500 to 2600 Hours or Annually
Conduct full safety check	2500 to 2600 Hours or Annually
Lubricate Motors	2500 to 2600 Hours or Annually

Maintenance

Belt Tension

•The fan sheave (A) and motor sheave (B) must be in axial alignment. Shafts must be parallel in both vertical and horizontal planes.

•The sheaves must be in radial alignment.
Align with a straightedge (C). When sheaves are of unequal width, align center of sheaves.

•Check fan belts for proper tension and for signs of wear. Belt should sag slightly at bottom of sheaves. Belt (D) is properly adjusted. Belt (E) is too loose. Belt (F) is too tight.
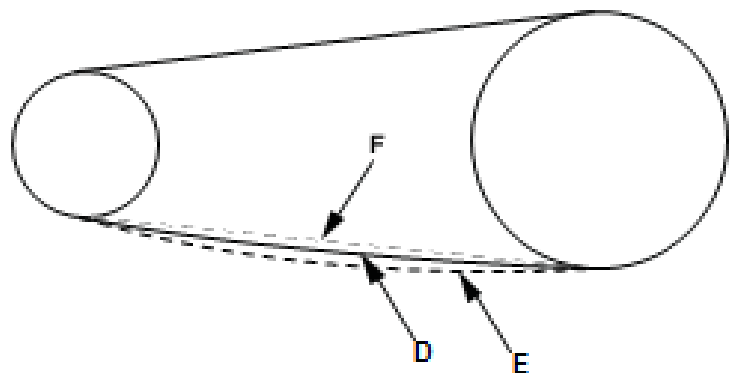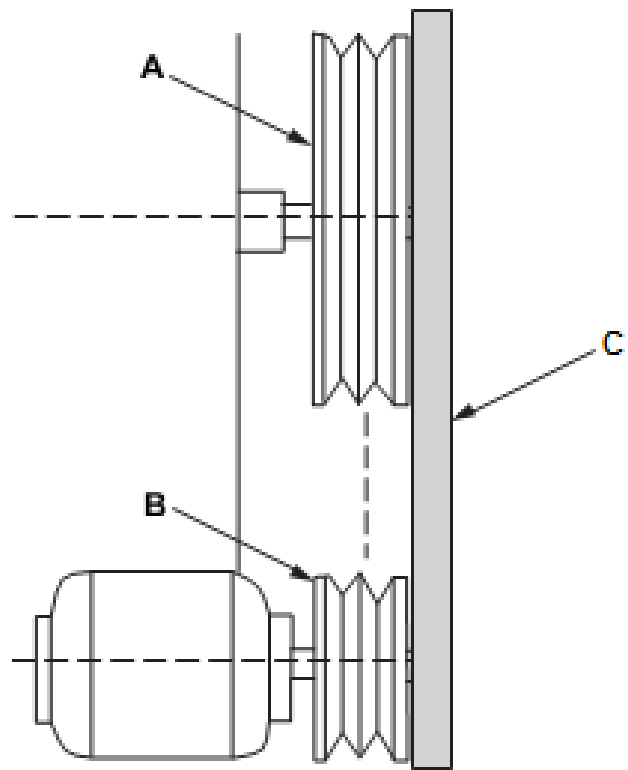
Lubricating Bearings

Ensure not to over grease the bearing as to not rupture the seal and create an area accessible to dust and grit, which can cause bearing failure. The fan may have a greasing chart by which should be followed in lieu of this manual if present.
Acceptable lubricants: Shell – Gadus S2 V100, Mobil – Mobilith SHC100, Exxon – Ronex MP, Mobil – Mobilith SHC220

Inspecting Burner Flame Profile

Inspect the burner flame profile by observing the flame while the oven is at high fire (coming up to temperature). The flame should be mostly blue with orange/yellow tips. If the flame is more yellow than blue, the combustion system should be checked by qualified technician to ensure proper air/fuel ratio is being achieved.

Lubricating Door Hinges

The door hinges can be lubricated by attaching a grease gun to the grease zerk on each hinge.
Acceptable lubricants: Shell – Gadus S2 V100, Mobil – Mobilith SHC100, Exxon – Ronex MP, Mobil – Mobilith SHC220

Maintenance

Blowing Out Motors
Blow dust and dirt out of motor windings with a maximum of 50 psi compressed air so that winding damage does not occur.

Cleaning UV Scanner
The UV scanner is an electrical device that monitors the status of the flame inside the burner by "looking" at the ultraviolet light produced by a flame. The scanner is mounted to the side of the burner next to the igniter (close to the gas pipe entry). The scanner has a glass lens that over time needs to be cleaned. The lens can be cleaned by using isopropyl alcohol and a soft lint free cloth.

Cleaning Igniter
The igniter is an electrical device that produces a spark inside the burner for approximately 10 seconds while the burner is attempting to ignite. Over time, the igniter can be fouled by soot and other debris. To clean the igniter, remove if from the burner and wipe off any build-up with a cloth. Inspect the igniter for cracks along the porcelain which could lead to ignition failure. Replace igniter if visible cracks are noted.

Ductwork Inspection
The ductwork inside the oven is used to evenly distribute the air from the re-circulation fan(s). Over time, debris can build up inside the ductwork which could present a potential fire hazard. Inspect the duct for any debris build-up and clean as needed. Also inspect the exhaust fan ductwork which is typically located on top of the oven, and allows hot air to leave the oven and exit the building.

Cleaning The Burner Airfoils
The airfoils are located inside the burner frame. There are two sets of foils (inner and outer). The outer foils can be accessed from inside the oven heater box. Clean the foils with a wire brush. If the foils appear to be clogged, use a small drill bit to open/clean the holes. The inner foils can be inspected from the back side of the burner by removing the combustion blower. After the blower is removed, use a flash light to inspect the holes in the foils. If the holes appear clogged, complete burner disassembly will be required to access the inner foils.

Inspecting Door Seals
The door seals surround the parameter of each door. Over time, the seals can become torn or worn to the point that they no longer create a seal between the oven frame and the door. Replace any sections that appear to be worn or not sealing properly against the door frame.

Testing Operation of Gas Shut-off Valve
The gas shut-off valve is an electrical device that turns on or off the flow of gas to the burner. The valve is an assembled part of the valve train which includes the pressure regulator, pressure switches, and proof of closure switch. To test the valves, turn the burner off, then close the downstream ball valve. Connect a manometer to the downstream test port. Allow the manometer to be connected to the test port for five minutes. After five minutes have passed, check the manometer reading – it should be zero.

Cleaning Air Pressure Switch Tubing
Remove the tubing from the + and – side of the pressure switch. Blow compressed air with a maximum pressure of 50 psi through the tubing into the oven. Do not blow compressed air into the pressure switch. The tubing should be inspected on the inside of the oven to ensure it has not broken off of its mounting locations. Replace any damaged tubing with 3/8" copper.

Maintenance

Cleaning The Thermocouples

Remove the thermocouples from the oven by disconnecting the 2 wires, removing the flexible conduit, and then unscrewing the thermocouple from the floor flange. The last 2 inches of the thermocouple can be cleaned with high grit sand paper.

Checking Wiring Connections

DISCONNECT AND LOCK OUT/TAG OUT ALL POWER BEFORE PERFORMING THIS PROCEEDURE. All wires throughout the control panel should be checked for tightness once per year. The power circuits to the motors are the most common wires to loosen up over time. Tighten all screw heads and gently tug each wire to ensure it does not come out of its terminal. This is also a good time to look for any damaged/frayed/discolored wires and replace as needed.

Lubricating Motors

Motor bearing lubrication, if required, must follow a rigorous schedule. Motors less than 10 hp running eight hours a day in a clean environment should be lubricated once every 5 years; motors 15 to 50 hp, every 3 years; and motors 50 to 150 hp, yearly. For motors in a dusty environment or running 24 hours per day, divide the service interval by 2. In an extremely dirty environment or under high temperatures, divide the service interval by 4. Check motor plate for additional details.

Recommended Spare Parts

UV Scanner	BRN-650
Igniter	BRN-SPK
Flame Controller	BRN-655
Air Pressure Switch	BRN-362
Gas Actuator	BRN-365
Type J Thermocouple	BRN-397
Low Gas Pressure Switch	BRN-363
High Gas Pressure Switch	BRN-364
High Temp Controller	ELE-DHTL-FDC1
Temp Controller	ELE-RL-TC-V2-010

Maintenance

Full Safety Check

Start oven and ignite burner as outlined in the operation guide.

Remove tubes from combustion air switch – burner should shut down within 5 seconds. Re-connect tubes then press reset button on touch screen to re-start the purge sequence.

Reignite burner. Remove tubes from exhaust air switch – burner should shut down within 5 seconds. Re-connect tubes then press reset button on touch screen to re-start the purge sequence.

Reignite burner. Remove tubes from recirculation fan air switch – burner should shut down within 3 seconds. When tubes are reconnected oven should purge before allowed to reignite. Repeat if multiple recirculation fans.

Reignite burner. Remove UV scanner from burner and cover with thumb – Burner should shut down within 4 seconds and sound continuous buzzer.

Reignite burner and slowly turn off the gas ball valve leading into the valve train – burner should shut down and all safety lights on the control panel should turn off. Turn the gas valve back on then press red button in the middle of the gas pressure switch to reset. Oven should purge before allowed to reignite.

Adjust high temperature limit set point to 200F. Change oven temp set point to 400F. Ignite burner and allow temperature to exceed 200F. Burner should shut off and alarm buzzer should sound. High temp limit should be displayed on touch screen. Set high temperature limit set point back to 675F.

Certifications

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File  E303498        Vol  1        Auth. Page 1            Issued:  2006-03-23
                                                          Revised:  2015-11-04
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                        FOLLOW-UP SERVICE PROCEDURE
                               (TYPE L)

                       INDUSTRIAL CONTROL PANELS
                              (NITW,NITW7)

          Manufacturer:       SEE ADDENDUM FOR MANUFACTURER LOCATIONS

                              629787 (Party Site)
             Applicant:       EKJ ENTERPRISES LP DBA COL-MET SPRAY BOOTHS
           (100094-750)       2975 Discovery Blvd
                              Rockwall TX 75032

                              629787 (Party Site)
   Listee/Classified Co.:     SAME AS APPLICANT
           (100094-750)
```

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking
specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting
Party, only on products when constructed, tested and found to be in compliance with the
requirements of this Follow-Up Service Procedure and in accordance with the terms of the
applicable service agreement with UL Contracting Party and any applicable Service Terms. The
UL Contracting Party for Follow-Up Services is listed on addendum to this Follow-Up Service
Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly
herein as "UL."

UL further defines responsibilities, duties and requirements for both Manufacturers and UL
representatives in the document titled, "UL Mark Surveillance Requirements" that can be
located at the following web-site: http://www.ul.com/fus and in the document titled "UL and
Subscriber Responsibilities" that can be located at the following website:
http://www.ul.com/responsibilities. Manufacturers without Internet access may obtain the
current version of these documents from their local UL customer service representative or UL
field representative. For assistance, or to obtain a paper copy of these documents or the
applicable Service Terms, please contact UL's Customer Service at
http://ul.com/aboutul/locations/, select a location and enter your request, or call the
number listed for that location.

The Applicant, the specified Manufacturer(s) and any Listee/Classified Co. in this Follow-Up
Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If
your applicable agreement is a Global Services Agreement ("GSA") with an effective date of
January 1, 2012 or later and this Follow-Up Service Procedure is issued on or after that
effective date, the Applicant, the specified Manufacturer(s) and any Listee/Classified Co.
will be bound to a Service Agreement for Follow-Up Services upon the earliest by any
Subscriber of use of the prescribed UL Mark, acceptance of the factory inspection, or
payment of the Follow-Up Service fees which will incorporate such GSA, this Follow-Up
Service Procedure and the Follow-Up Service Terms which can be accessed by clicking here:
http://www.ul.com/contracts/Terms-After-12-31-2011. In all other events, Follow-Up Services
will be governed by and incorporate the terms of your applicable service agreement and this
Follow-Up Service Procedure.

Certifications

ETL Authorization to Mark

Intertek

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	EKJ Enterprises, LP dba Col-Met Spray Booths, Inc.	**Manufacturer:**	EKJ Enterprises, LP dba Col-Met Spray Booths, Inc.
Address:	1635 Innovation Dr. Rockwall, TX 75032	**Address:**	1635 Innovation Dr. Rockwall, TX 75032
Country:	USA	**Country:**	USA
Contact:	Mr. Eric Jones	**Contact:**	Mr. Eric Jones
Phone:	972-772-1919	**Phone:**	972-772-1919
FAX:	972-772-1833	**FAX:**	972-772-1833
Email:	customerservice@colmetsb.com	**Email:**	customerservice@colmetsb.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Dallas, TX

Control Number: 3042756   **Authorized by:** _Ellen Bmialek_

for Thomas J. Patterson, Certification Manager

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545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	UL 508A Issue:12/20/2013 Ed:2 Rev:2014/01/13 Industrial Control Panels
Product:	Industrial Control Panel
Brand Name:	N/A
Models:	Col-Met Spray Booths, Inc. General coverage models