

# Merlin 15K Batch Roasters



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**OPERATION MANUAL**  
**MERLIN A-15 KILO ROASTER**  
**By LORING SMART ROAST**

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# MERLIN A15

## 15KG BATCH ROASTER

### IMPORTANT SAFETY INSTRUCTIONS

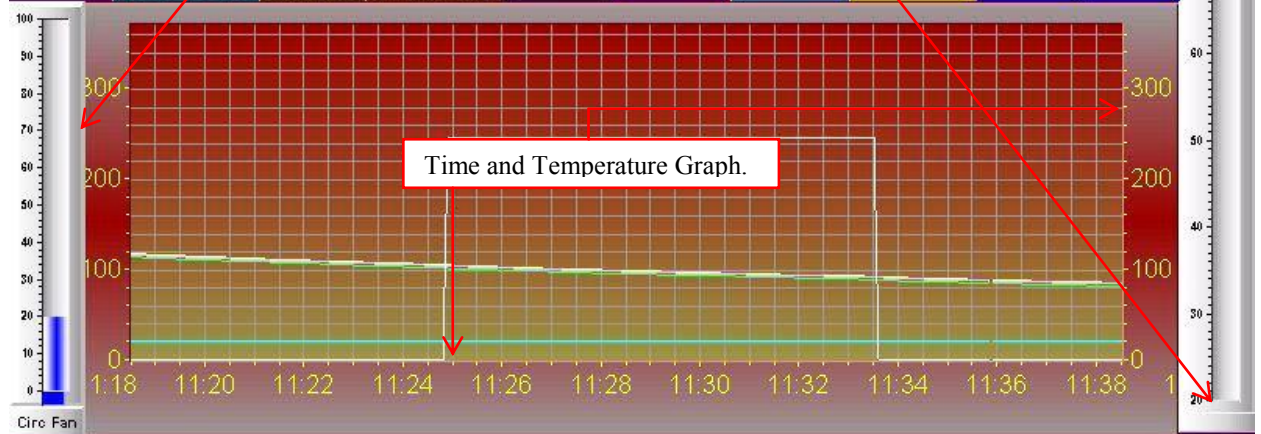
- The roaster **MUST** be placed on a flat level surface capable of supporting its weight.
- Keep area around roaster clean and dry and clear of obstructions as required by local safety regulations.
- Do not **REMOVE** safety covers or **DEFEAT** safety interlocks at any time.
- There are many **HOT** surfaces when the roaster is in operation, use caution around the roaster at all times.
- **NEVER** reach inside the roaster's main hopper while it is hot, excessive heat could cause severe injury.
- **NEVER** reach inside cooler tray when mixer is running or injury may result. **NEVER** reach inside the mixer when the power is on as the mixer can start automatically at any time.
- All cooler ducting and the cooler fan can be **EXTREMELY HOT**. Allow to cool before disassembly for cleaning.
- The sample tryer has sharp edges and may be quite hot, hold by wooden handle only.
- Be very careful when wearing loose clothing or having long, unbound (loose) hair around the roaster. Hair and clothes can become caught in moving equipment and cause severe injury.
- Turn off power and close all utility valves when the roaster is not in use.

Thermal Coupler Temperatures are indicated on the Graph by their given color.

- Circulation Fan Adjustment Slide
- Burner Percentage
- Burner Adjustment Up and Down Buttons
- Burner Adjustment Slide

### General Information

<b>BEAN TEMP °C</b> <span style="font-size: 2em; font-weight: bold;">83.9</span>	<b>STACK °C</b> 44.4	<b>IDLE</b> <b>ROAST TIME</b> <span style="font-size: 1.5em; font-weight: bold;">28:50</span>		<b>BURNER</b> Remote access <span style="font-size: 2em; font-weight: bold;">20 %</span>				
	<b>INLET AIR °C</b> 80.6				<b>2.5kg Batch</b>			
	<b>RETURN AIR °C</b> 82.8	<b>TimeSinceCrack</b> 00:00	<b>CHANGE RATE</b> 1.7 °C / MINUTE					
	<b>ENDPOINT °C</b> 245.0	<b>LAST ENDPOINT</b> 91.1	<b>LAST ROAST</b> 00:16					
	<b>GOTO COOL DOWN</b>	<b>TREND DISPLAY</b>	<b>ROAST LOG COMMENTS</b>	<b>PLOT DISPLAY</b>	<b>RECIPE / PROFILE</b>	<b>MANUAL AIR-COOL</b>	<b>AUTO-COOL ON</b>	<b>WATER QUENCH</b>



ABCD1234 **MANUAL ROASTING MODE**

<b>BURNER</b> OFF	<b>CIRC FAN</b>	<b>LOAD GREEN</b>	<b>DROP GREEN</b>	<b>DOORS</b>	<b>MIXER</b>	<b>COOLER FAN</b>
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Picture

001

LOAD GREEN button indicates to the computer that the Green has been loaded for the Automatic Modes of Recipe and Profile.

Manual Button for dropping Green Beans into the Roasting Hopper

ON and OFF button for the Cooler Paddle Drive

ON and OFF button for the Cooler Fan

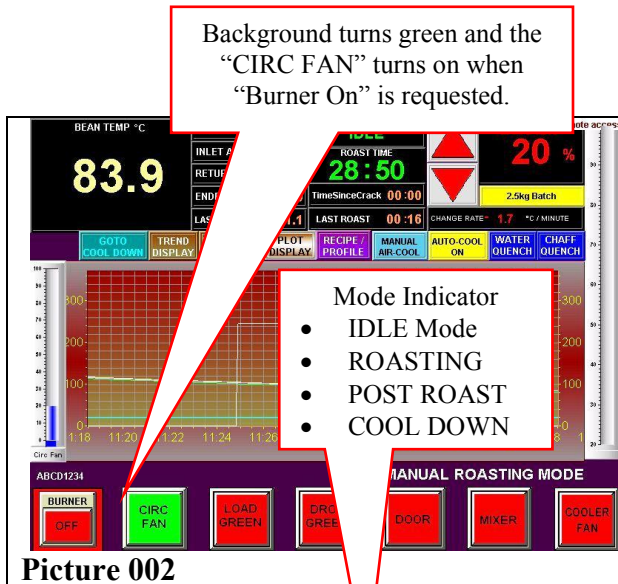
- Mode line indicates in which mode you are operating:
- *MANUAL ROASTING MODE*
  - *BURNER RECIPE RUN MODE*
  - *TEMPERATURE PROFILE RUN MODE*

## START-UP

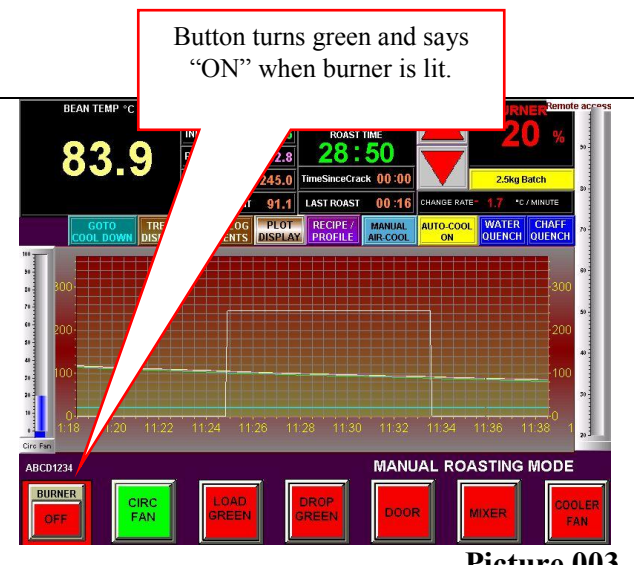
- Empty the chaff collector drum. Reinstall the chaff drum and be sure that the locking clamps are securely latched.
- Be sure all cooler ducting is installed with gaskets and clamps are latched tight.
- Check to see that the cooling hopper is empty and close the cooler discharge gate.
- Close the roaster door.
- Open the utility valves for air, water and gas.
- Turn roaster “POWER-ON/OFF” switch to the ON position, momentarily. The power will come on and the switch will spring back to center. The display screen will boot.
- Make the necessary adjustments required to satisfy any fault conditions that may be indicated on the startup screen once it boots.

## WARM-UP

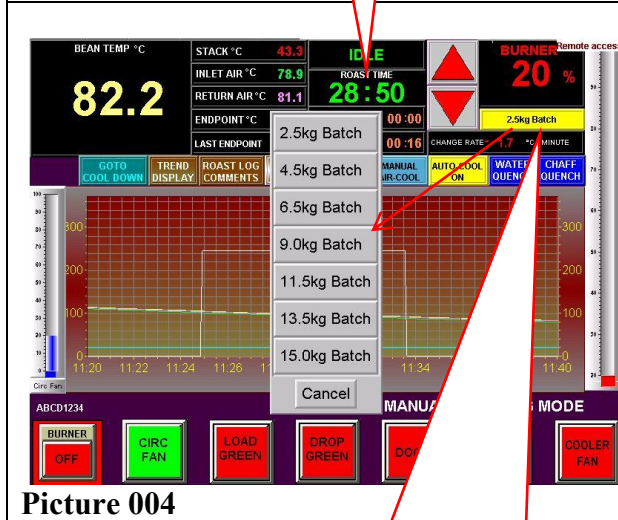
- Push the “BURNER” button in the lower left hand corner of the display screen. The frame of the button will switch to green (see Picture 002). The roaster will automatically purge the system and then the burner will ignite. When ignition starts, the center of the burner button will turn green and the green “burner on” light will light on the front of the control console (see Picture 003).
- The roaster will begin to warm-up.
- The roaster will warm up to the preset “Idle Mode” (see Picture 004) high temp value, usually around 450 degrees F., and the burner will be turned off by the system. At this time, the roaster will indicate that it is in Idle Mode. By turning the burner on and off between two preset temperatures, the roaster temp can be maintained within a narrow band. If the burner is left on at low fire when the roaster is empty, the temp would continue to climb and the roaster would get too hot. By cycling the burner, the temp is maintained at an appropriate level. The burner will reignite at the Idle Mode low temp setting (based on return air temp). The process takes from 20 to 30 minutes depending on the temp in the room and the target values chosen by the operator on the setup page for Idle Mode High and Low Set point values. See section on the “Setup” page screen.
- A roast may be started at any time but many roast masters wait for the Idle Mode to “porpoise” a couple of times to fully preheat the roaster so the first roast won’t be too much longer than subsequent roasts. This porpoise cycle takes about 10 minutes.
- “LOAD GREEN” button is needed to activate the automatic modes, Recipe Mode and Profile Mode. Once the beans are loaded, push this button to send the signal that the beans are ready to automatically drop when the roaster reaches “Drop Temperature”. This button is not used in Manual Mode.
- Select the batch size that you wish to roast. To select the batch size, touch the yellow button located under the burner percentage reading at the top right of the screen (see Picture 004).



Picture 002

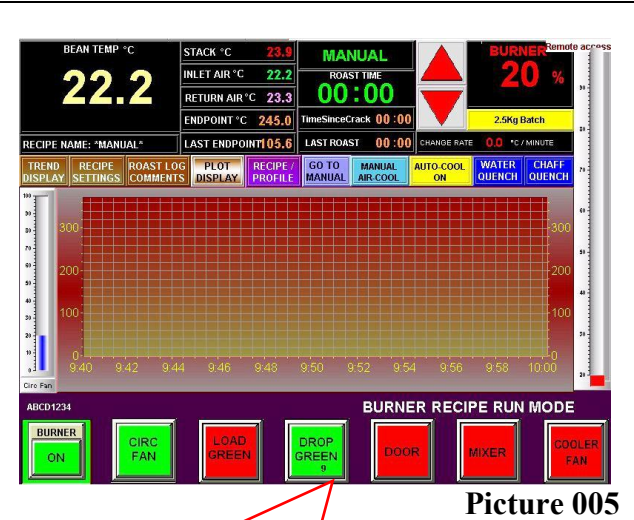


Picture 003



Picture 004

Touch Yellow "Batch" size button will open the batch size dialog box. The size will determine fan speeds necessary for the size of batch.



Picture 005

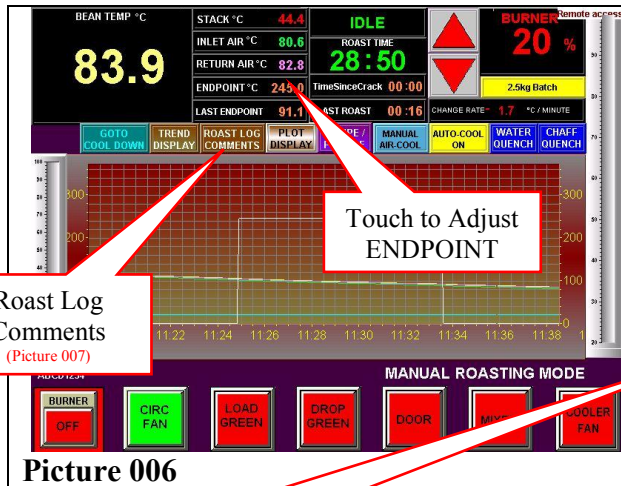
Drop Green shows the seconds that the Green Bean Hopper door will be open when dropping green according to batch size.

### MANUAL MODE: STARTING A ROAST

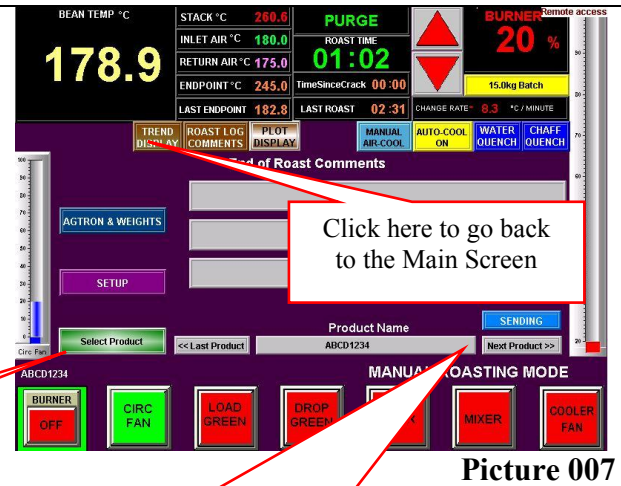
- A roast may be started at any time after the door is closed from the previous roast. It can be started during "POST-ROAST" or you can wait and start it once the machine has entered "IDLE".

- Select the name of the product you are about to roast from the list of product names you entered under the “SELECT PRODUCT” button of the “ROAST LOG COMMENTS” tab. It will now appear on the main “MANUAL ROAST” screen (see Picture 006, 007, 008).
- At this time, you may also select a “BASELINE” if you want to monitor the roast progress relative to one from memory. You will be able to view the actual (current) bean temp. as it progresses, on top of the graph of the historical baseline on the “PLOT SCREEN” (see Picture 010) accessed by a tab on the main screen. You can roast by manually adjusting the burner from this screen to keep the roast on track. The red line on the plot represents the actual process value (bean temperature) and the white LINE is the historical graph of a roast from memory. While in this screen you may use the “TREND” tab to view a larger version of the normal trend display with most buttons minimized and some missing to make room. Use “PREVIOUS” to return to the normal trend screen.
- To select a baseline from memory touch the purple “RECIPE / PROFILE” button on the main “MANUAL ROAST” screen. Touch the red “BASELINE PLOT” button top center on the screen and it will turn green. Use the “LOAD PROGRAM FROM MEMORY” to select the baseline you want to use and confirm with a “YES”. The baseline will now be available from the “PLOT” tab on the main “MANUAL ROAST” screen (see Picture 009).
- The endpoint temperature must be set or changed each time a new value is desired. Touch the “ENDPOINT” digital indicator (see Picture 006) grouped with the other digital temperature indicators at the top of the screen to set the desired endpoint for the new batch. The endpoint you set here will be used to signal the end of roast approach both visually and audibly.
- If in “IDLE” mode, and the burner is off, it’s usually best to start the burner, so the temperature will be rising in the roaster, then drop the beans at the desired drop temperature by pushing the “DROP GREEN” button which will turn from red to green while the beans are dropping. If the roaster is already above your desired drop temperature, open the roaster door till the temperature falls 10 degrees or so below the desired drop temperature, then close it and drop the beans at the desired temperature while it is rising.
- You may adjust the burner as soon as the drop green gate is closed, as evidenced by the green “DROP GREEN” button turning back to red. A timer will show on the button (see Picture 011), counting down the seconds that Green Hopper will be open which varies according to batch size.
- You may adjust the Circulation Fan speed, using “Slide” (see Picture 011) adjuster on the left side of the touch screen, as soon as the drop green gate is closed. This function allows you to control the movement of the beans.

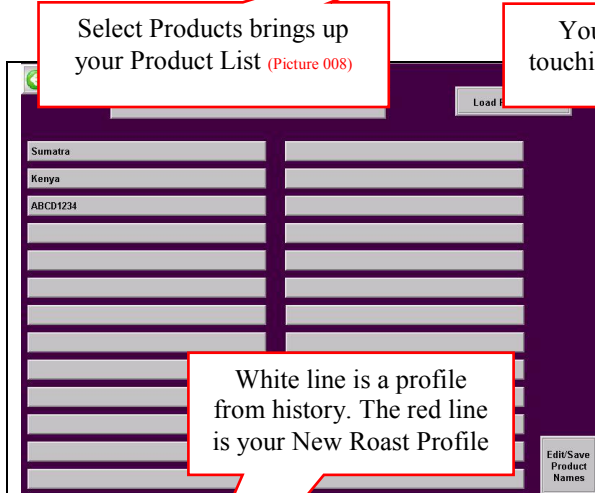




Picture 006



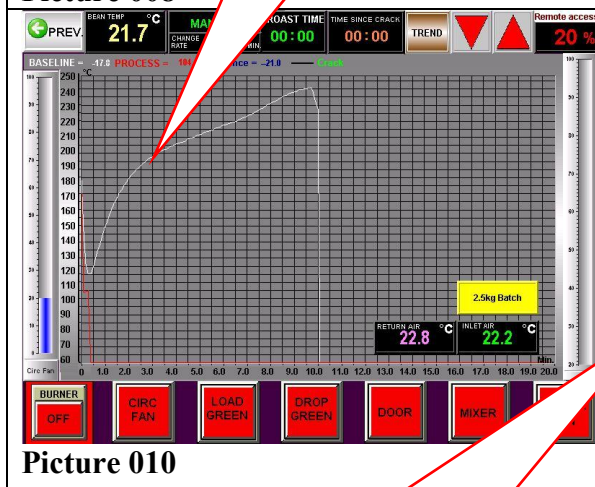
Picture 007



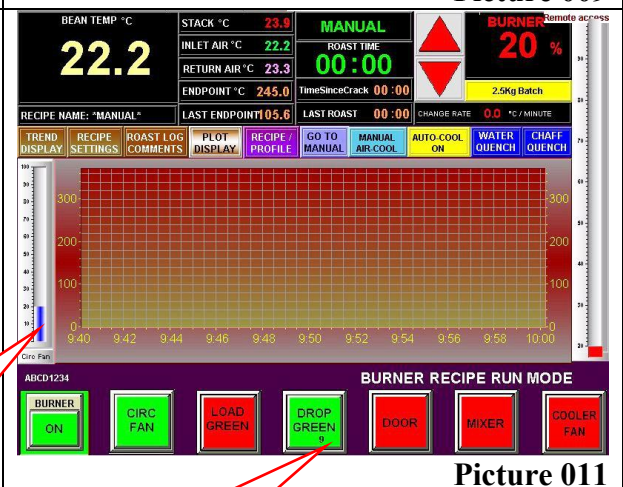
Picture 008



Picture 009



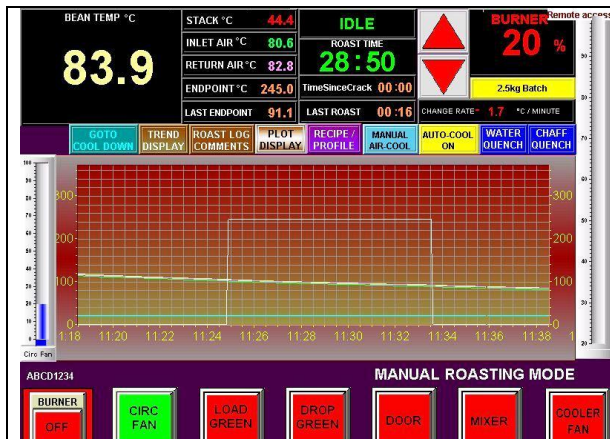
Picture 010



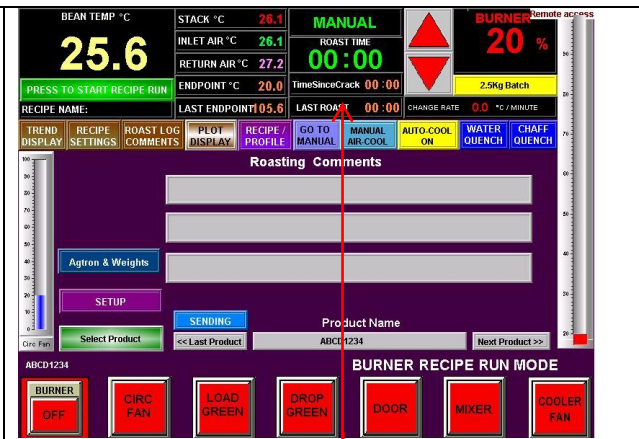
Picture 011

## MANUAL MODE: DURING THE ROAST

- During the roast, you may jump between the “TREND DISPLAY”, “ROAST LOG COMMENTS”, and the “PLOT” tabs (see Picture 012, 013, 014 and 015). You may also enter “SETUP” and make changes to some of the basic values and parameters of the roaster.
- On the “ROAST LOG COMMENTS” screen, you may attach notes from the on screen keyboard that pops up when you touch the comment bar (see Picture 013). You may also type them in from a physical keyboard on any PC on your LAN after you create a clone of your roaster screen. Open a browser on your networked PC and type in “HTTP://” then your roasters I.P. address, then “:5800” and hit enter. Your roasters I.P. Is most likely 192.168.1.200 but you can check on the information tab of the “SETUP” screen if that doesn't work. You may also try another browser. They don't all support this but IE and Firefox usually work. A Tight VNC password dialog box will open and you then enter one of your two passwords. One is for viewing only and one is for interacting. You will need to interact to enter your notes but be very careful, the screen is live and if you click on something, it is just like touching it while standing at the roaster. Be careful with this!! (but don't be afraid of it)
- You may start the “TIME SINCE CRACK” timer manually (see Picture 013 and 015), and its value will be recorded with the other roast data e-mailed at the end of the roast. Touch the digital display of the timer to activate it.
- 20 degrees F (9 deg C) before the endpoint is reached the amber flasher on the front of the console will start flashing. As the endpoint approaches the flasher will flash faster. At 10 degrees F (4 deg C) prior to the endpoint, the horn will sound off one time for about a second. The volume of the horn can be adjusted by rotating the bezel of the horn. At 5 degrees F (~2 deg C) below endpoint, the horn will sound off several times.

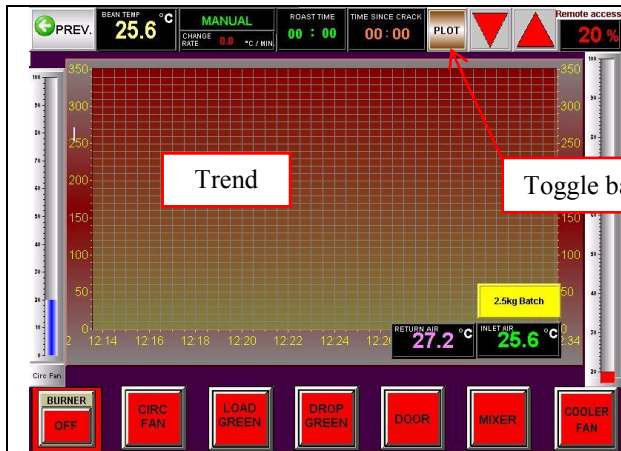


Picture 012

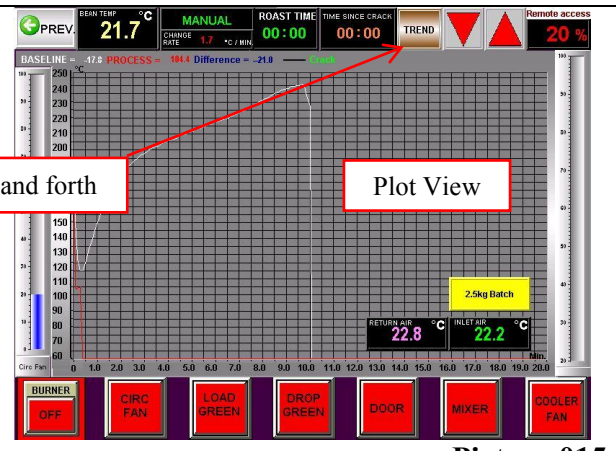


Picture 013

“Time Since Crack” is a timer you start when you detect 1<sup>st</sup> or 2<sup>nd</sup> crack. This is only a timer; it does not detect “Crack”.



Picture 014



Picture 015

## MANUAL MODE: ENDING THE ROAST

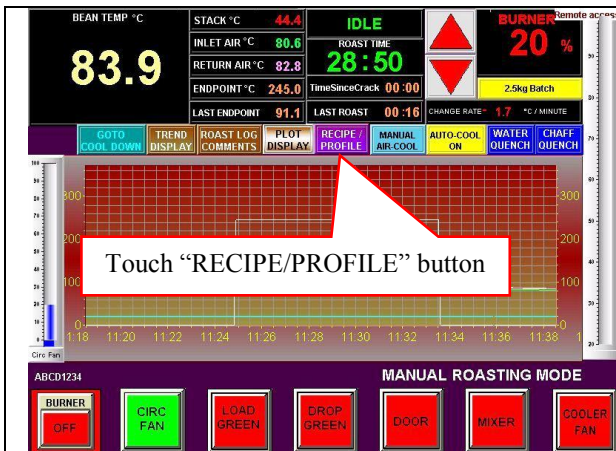
At the end of the roast the screen will flash “END OF ROAST” and the horn will sound till the door is opened. The horn may be silenced with the “SILENCE HORN” button on the screen. You may also disable the end of roast horn signal in setup.

## MANUAL MODE: POST ROAST & IDLE MODE

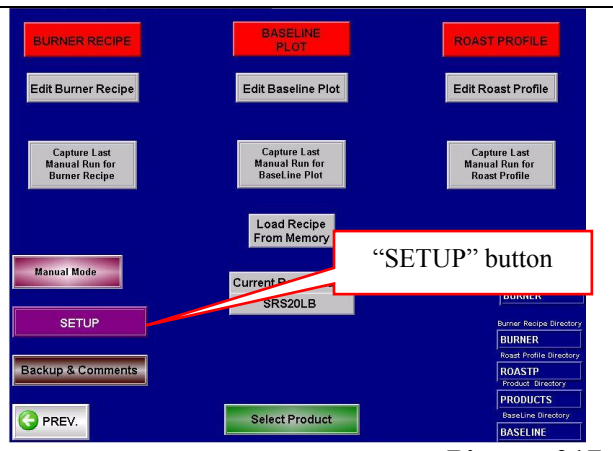
- “POST-ROAST” exists because there is residual smoke in the roaster after the coffee is out of the roaster hopper. The burner remains on for 3 minutes after the end of the roast to eliminate this smoke and this time is called “POST-ROAST”. After the 3 minutes, if you don't start a roast, the roaster switches to “IDLE MODE”, and the burner is turned off and then back on between the two temps set for “IDLE HI LIMIT TEMP” and “IDLE LOW LIMIT TEMP” as established on the setup screen (see Picture 018 and 019). The roaster will remain in “IDLE-MODE” till a roast is started, and the burner will cycle on and off between these two temps which takes about 10 minutes per cycle depending on settings. This is often referred to as “porpoising”.
- The e-mail of the roast data is sent about 30 seconds after the end of the roast cycle, so be sure all roast log notes are typed in prior to that time. The "ROAST LOG COMMENTS" tab of the main screen accesses the roast log screen during the roast.
- Agtron data collected after the roast may be sent in a separate e-mail after the roast data e-mail has already been sent. The batch number is incremented automatically so it should correspond to the batch it came from if it is done in the same order. However, you may not keep Agtron data on every batch or for other reasons the batch number may get out of sync, so it is adjustable on the Agtron screen (see Picture 020 and 021). The screen is accessible from the “AGTRON & WEIGHTS” button of the “ROAST LOG COMMENTS” tab of the Main Run Recipe screen.
- Capturing data from a manual roast can create a recipe. To save the data from a manual roast, click the purple “ROAST / PROFILE” button above the trend graph on the main screen (see Picture 016). A new screen will appear allowing you to choose between “BURNER

RECIPE”, “BASELINE”, and “ROAST PROFILE MODES” (see Picture 017). Click the “BURNER / RECIPE” button and it will turn green. Press the “CAPTURE LAST MANUAL RUN FOR BASELINE PLOT” to capture the baseline, then “CAPTURE LAST MANUAL RUN FOR BURNER RECIPE” button to capture the recipe. You **must** now name the recipe and save it under the **new name**. To do this select “EDIT BURNER RECIPE”. Create a name and save the recipe (see Picture 022 and 23). If you save it with the same name as a previously saved recipe, you can overwrite the recipe in memory, thus modifying it. A roast profile is created in much the same way but by activating the “ROAST PROFILE” button instead of the “BURNER RECIPE” button.

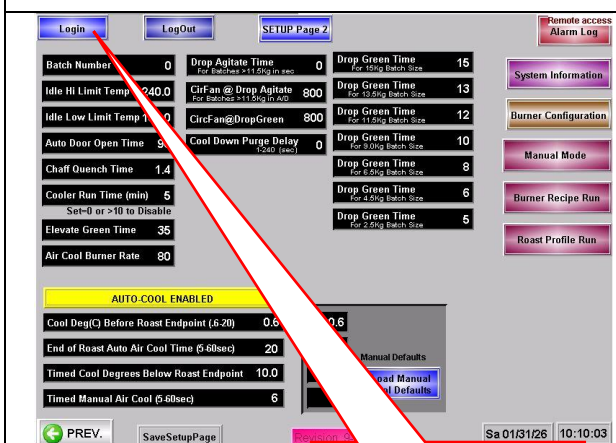
- A baseline can be created by capturing data from the last roast in much the same way a recipe is saved; by activating the “BASELINE PLOT” button turning it green (see Picture 024) and then touch “CAPTURE LAST MANUAL ROAST FOR BASELINE PLOT”. Now “EDIT BASELINE PLOT”, give it a name, and then save it. In this way, a baseline is captured independent of recipe functionality. If used in manual mode it is simply displayed (graphed) in the plot screen and can be used as a template for controlling a manual roast using the manual burner controls (see Picture 025). Need an accurate picture here and I need a BASELINE PLOT picture.e



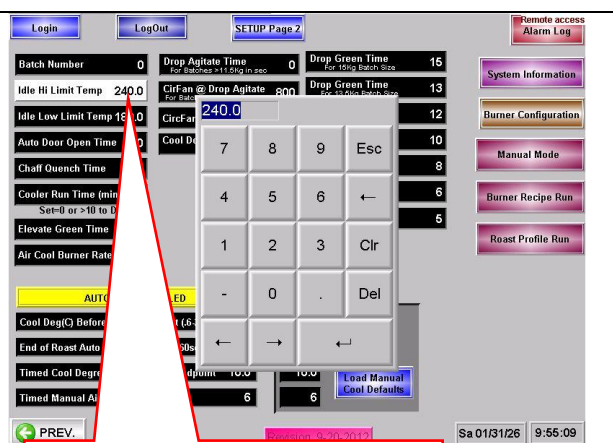
Picture 016



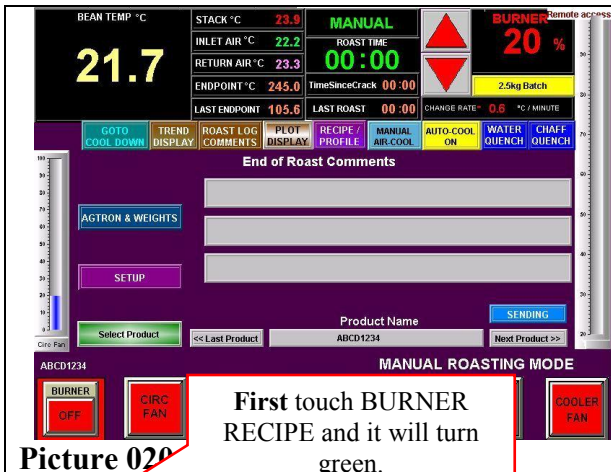
Picture 017



Picture 018



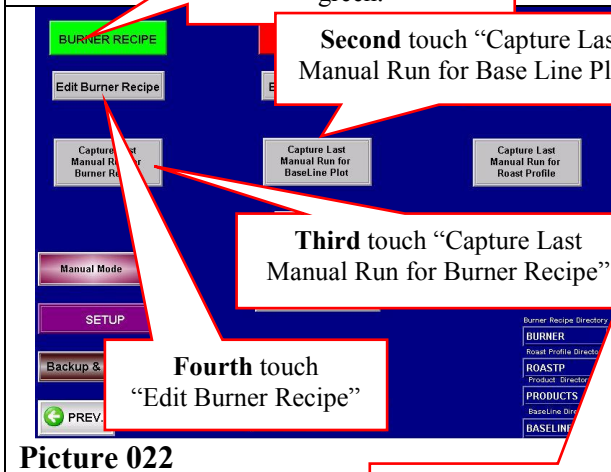
Picture 019



First touch BURNER RECIPE and it will turn green.



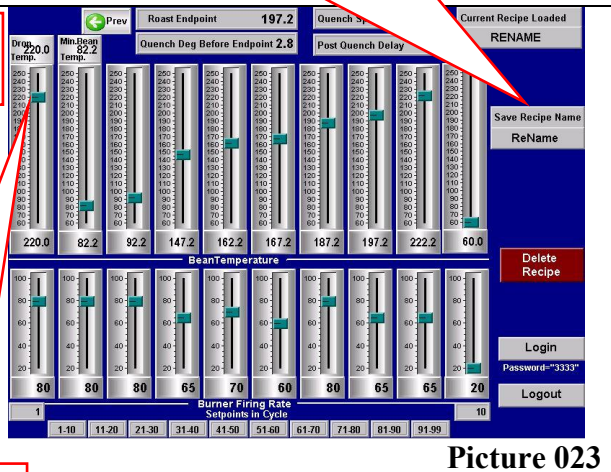
Touch here to name your recipe. Then touch "Save Recipe" button.



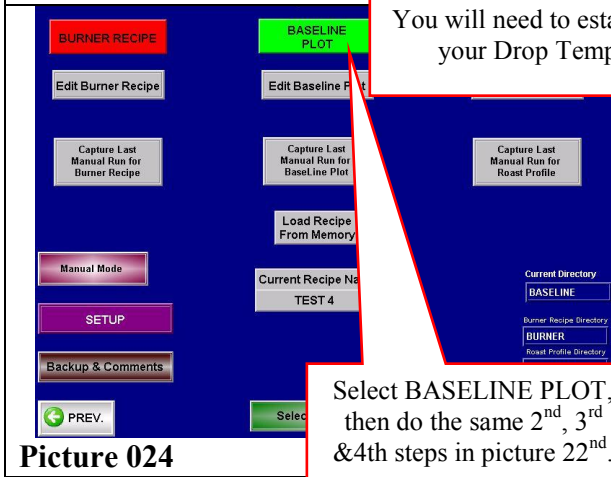
Second touch "Capture Last Manual Run for Base Line Plot"

Third touch "Capture Last Manual Run for Burner Recipe"

Fourth touch "Edit Burner Recipe"

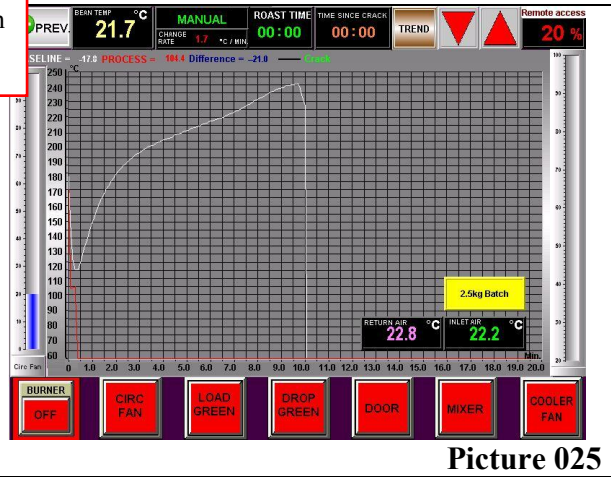


Picture 203



You will need to establish your Drop Temp.

Select BASELINE PLOT, then do the same 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> steps in picture 22<sup>nd</sup>.



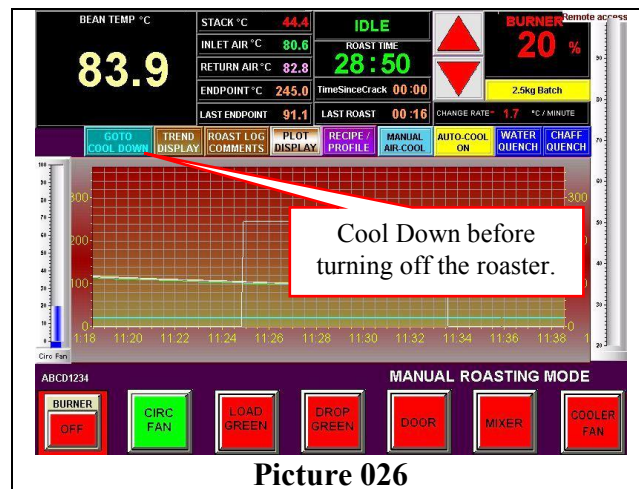
Picture 205

## MANUAL MODE: COOL DOWN

- At the end of the day, or even on long breaks from roasting, when the roaster is in "IDLE" or "POST ROAST" you can switch the roaster to "COOL DOWN" (see Picture 026). In cool down, the burner is shut off along with all other motors except the circulating fan. The

circulating fan actually speeds up a little. Air is circulated and after a short time the purge gate is opened so all the air is replaced with cool room air constantly.

- If you touch “GO TO COOL DOWN” while in “POST ROAST”, you will see “COOL DOWN REQUESTED”. We must let the “POST ROAST” cycle end before going to “COOL DOWN” or we run the risk of allowing some smoke from the end of the last roast to escape.
- At the end of “POST ROAST”, the roaster will automatically switch to “COOL DOWN” instead of “IDLE”.
- The roaster takes 20 to 30 minutes to cool down. It is important so the heat does not “seep” through to the bearings of the Circulation Fan Motor.
- At the end of “COOL DOWN”, the roaster will turn off the circulation fan and return the roaster to the initial startup screen. This happens when the return air temperature gets down to 150 deg. F or 66 deg. C. At this point, you only need to turn off the power to the roaster and close the utility valves for air, water and gas.



Picture 026

## RECIPE MODE: SOME FACTS ABOUT RECIPES

- To create or change a recipe (or profile) you must first Login. By default, the password is 3333. This may be changed at startup or later via the Internet or, by a field service engineer from LORING SMART ROAST.
- A recipe can only be “captured” from a batch that you roast in “MANUAL MODE”, but can be created in other ways like creating from scratch using the “EDIT BURNER RECIPE” screen, loading and editing an existing one, or importing one saved by someone else, or one created in Excel and FTP'd into the screen via Ethernet.
- A recipe is a record of the bean temperatures at which burner adjustments were made during a roast, the new burner setting at each temperature, and the record (at 6 second intervals) of the bean temperature graph generated during that roast. When the recipe is “captured from last manual run”, the baseline from that roast is captured with it.
- If a recipe is created by going to the “EDIT BURNER RECIPE” button from the “RECIPE / PROFILE” (see Picture 027) tab and creating one from scratch, there will be no

baseline associated with it until the program is run and the baseline thus generated is saved with the recipe using the same name.

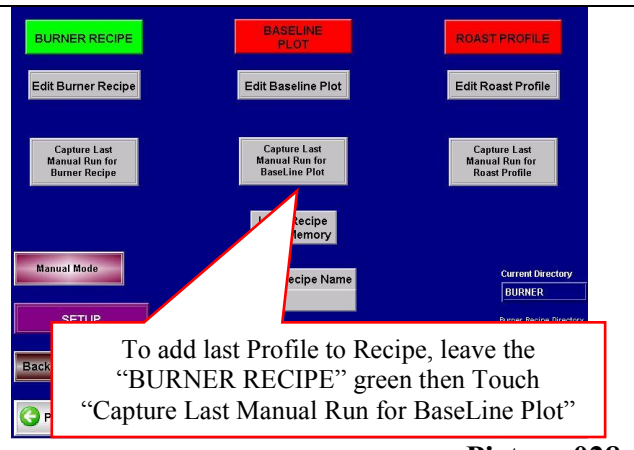
- You must have just run (or you must load) the recipe to which you want to add the baseline before changing the name or saving the recipe.

**Do not** turn the "BASELINE PLOT" button green. Leave "BURNER RECIPE" green. Touch "Capture last run for Baseline Plot" (see Picture 028), then touch "Edit Burner Recipe" and on that screen make any changes you want to the recipe, including the name (or leave the name) and hit enter (see Picture 029 and 30).

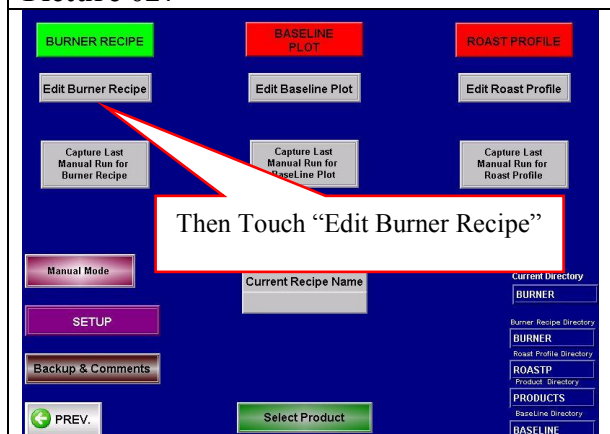
- This will add the current baseline (from the last roast) to the recipe. Then you must save it, with the same name, or a new name.
- Touch "Save Recipe" and wait to see the name change (if any) indicated (see Picture 031).
- A recipe may be created spontaneously by loading an existing one, modifying it, then renaming it. It will retain the baseline of the recipe you modified until you run the recipe (creating new current baseline data) and then saving that baseline to the recipe as described above.
- or going to the "EDIT BURNER RECIPE" button from the "RECIPE / PROFILE" tab and creating a recipe from scratch. A burner recipe may contain up to 99 burner adjustments based on bean temperature, or it may contain as few as 4.



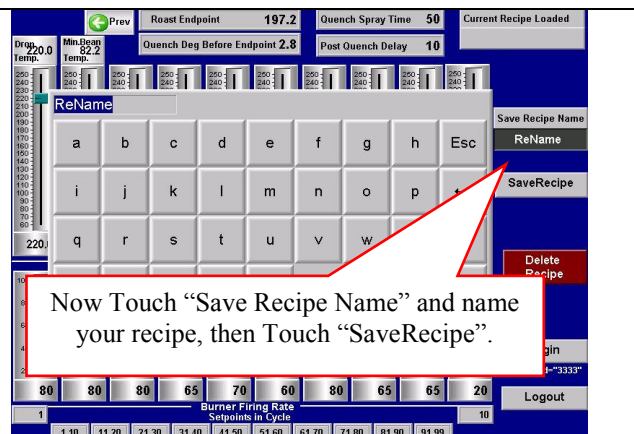
Picture 027



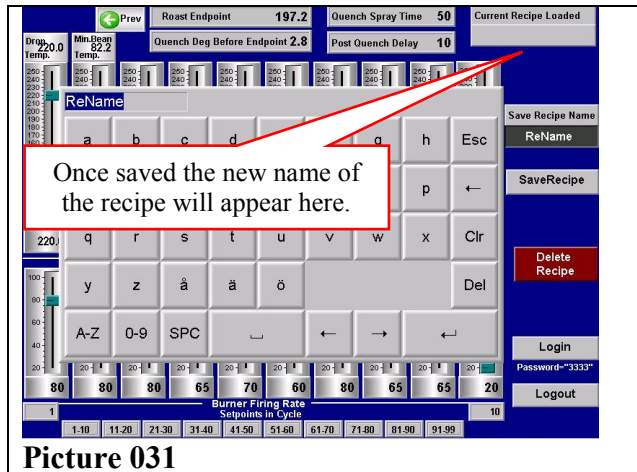
Picture 028



Picture 029



Picture 030



Picture 031

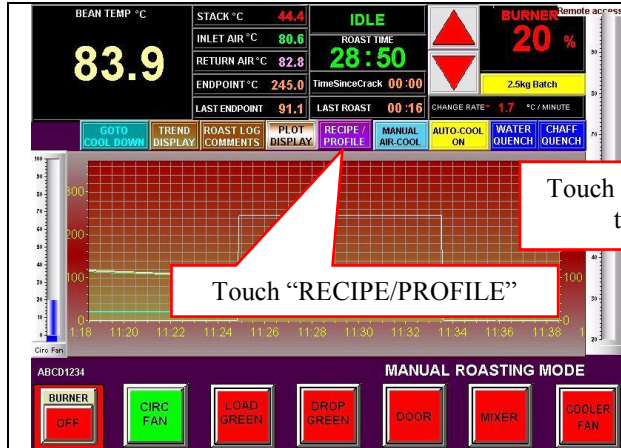
## RECIPE MODE: STARTING A ROAST

- Click the purple “ROAST / PROFILE” button above the trend screen on the main screen (see Picture 032). A new screen will appear allowing you to choose between Burner Recipe, Baseline, and Roast Profile modes.
- To select a previously saved recipe, select the red “BURNER RECIPE” button which turns it green. Once the central “LOAD FILE FROM MEMORY” button appears touch it and select your chosen recipe from the drop down list, then confirm it with “YES” (see Picture 033, 034 and 035).
- While you are here, you can select the name of the product you will be running with this recipe. Do so and then push the green “RECIPE / PROFILE RUN” button (see Picture 036 and 037).
- You will be switched to the “MAIN RECIPE RUN SCREEN” where the name of the current recipe and the current product are listed (see Picture 038).
- If your last roast was in recipe mode and you haven't changed modes, you will still be in recipe mode. The same recipe will continue to run, batch after batch, till you load a different one.
- The endpoint temperature is best chosen right after returning to the “MAIN RECIPE RUN SCREEN” after choosing the recipe and the product name. But it can be changed at any time during the roast. Touch the “ENDPOINT” digital indicator grouped with the other digital temperature indicators at the top of the screen to set the desired endpoint for the new batch or change it on the recipe settings screen (see Picture 038).
- A roast may be started at any time after the door is closed from the previous roast. It can be started during “POST-ROAST” or you can wait and start it once the machine has entered “IDLE MODE”.
- To start a roast cycle press the green “PRESS TO START RECIPE RUN” button under the digital Bean Temperature indicator.
- The roaster will compare the recipes drop temperature to the current roaster temperature. If the roaster is above it, a yellow flashing text block will ask you to open the roaster door till the temperature drops below the required drop temperature. When it does, you can shut the door and then a “WAITING TO DROP GREEN” message will appear. When the roaster temperature reaches the (recipe specified) drop temperature, the green will drop

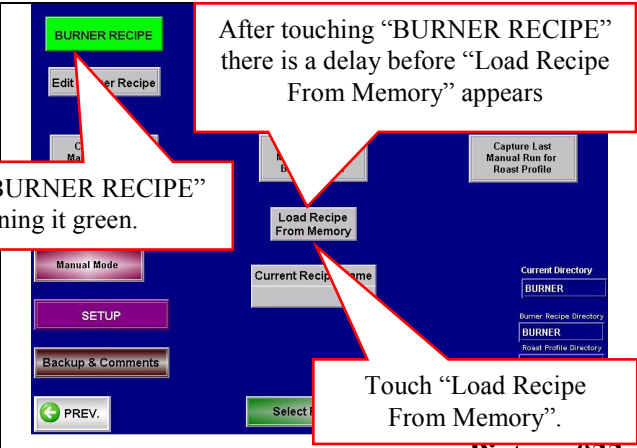


automatically. The roast timer will start at this time and the drum drive will start automatically if it is not already on.

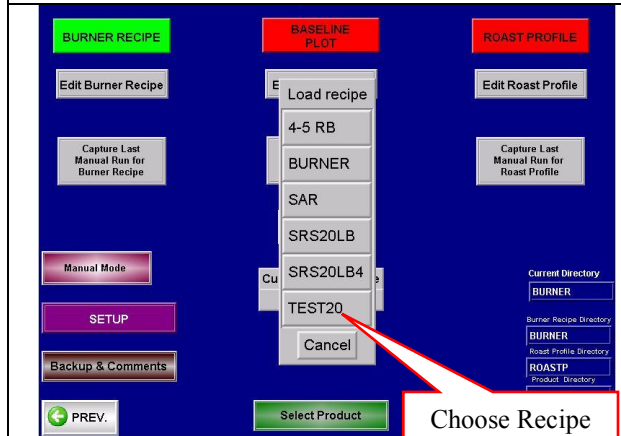
- Once the green bean drop valve closes, the burner will go to the first burner set point of the recipe. The length of the drop time can be fine-tuned in the setup screen, usually about 15 seconds.



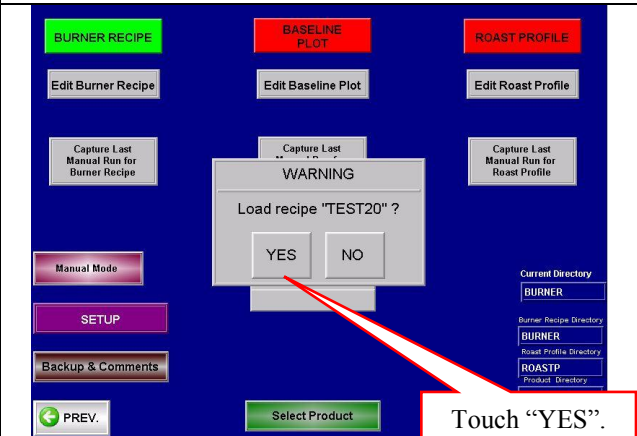
Picture 032



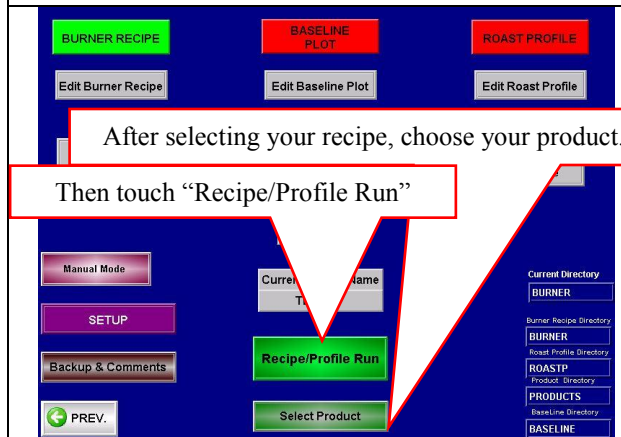
Picture 033



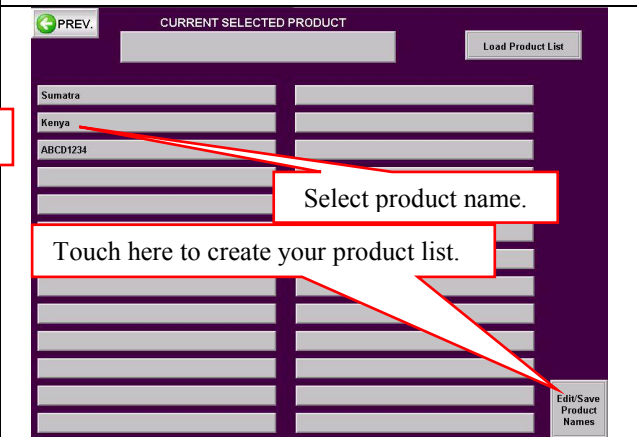
Picture 034



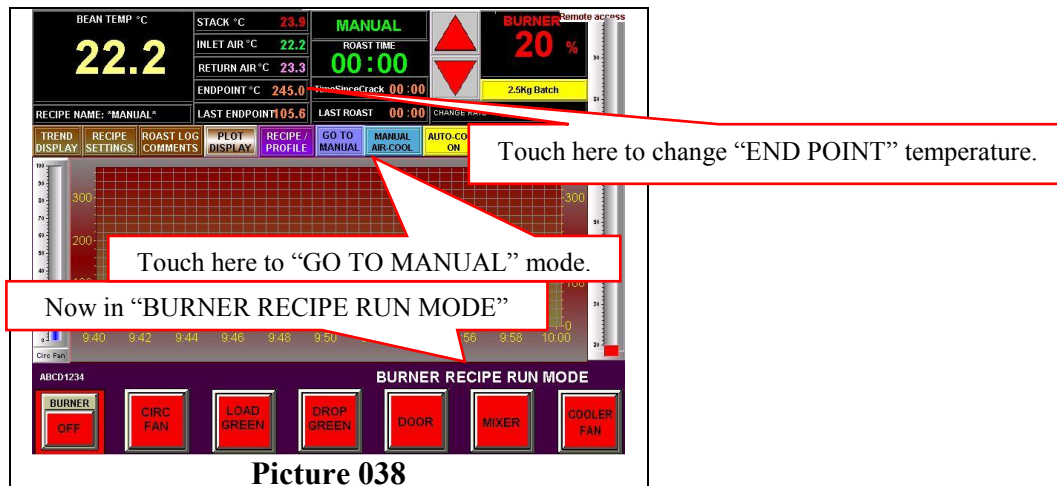
Picture 035



Picture 036



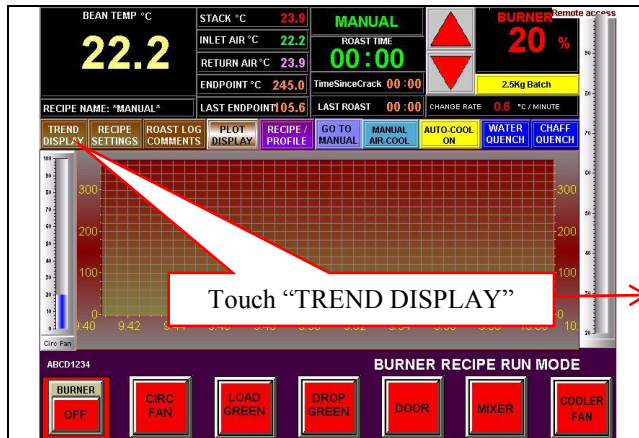
Picture 037



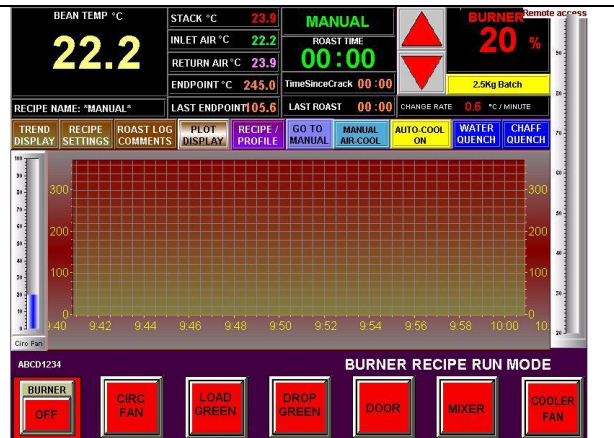
Picture 038

## RECIPE MODE: DURING THE ROAST

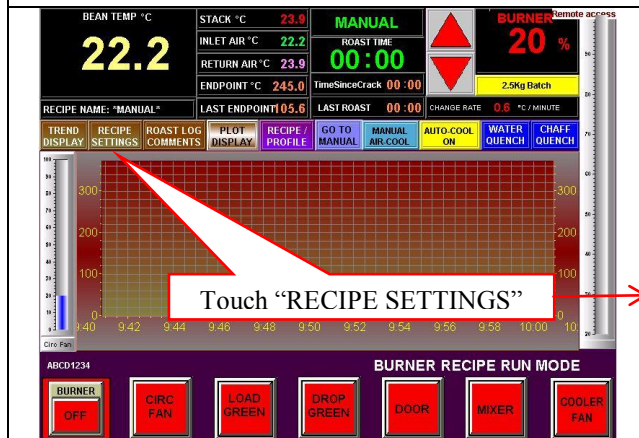
- The recipe software is now in control of the roast. Manual burner adjustments can be made and will remain in affect till the recipe reaches the next control point. At that temperature, it will make the scheduled burner adjustment.
- During the roast, you may jump between the “TREND DISPLAY”, “RECIPE SETTINGS”, “ROAST LOG COMMENTS” and the “PLOT” tabs (see Picture 039-046). You may also enter “SETUP” and make changes to some of the basic values and parameters of the roaster (see Picture 047).
- The Magnehelic gage is mounted behind the control screen. It is a direct and physical measure of the burner firing rate (see picture 048).
- On the “ROAST LOG COMMENTS” screen, you may attach notes from the on screen keyboard that pops up when you touch the comment bar. You may also type them in from a physical keyboard on any PC on your LAN after you create a clone of your roaster screen. Open a browser on your networked PC and type in “HTTP:// ” then your roasters I.P. address, then “ :5800 ” and hit enter. Your roasters I.P. Is most likely 192.168.1.200 but you can check on the information tab of the “SETUP” screen if that doesn't work. You may also try another browser. They don't all support this but IE and Firefox usually work. A Tight VNC password dialog box will open and you then enter one of your two passwords. One is for viewing only and one is for interacting. You will need to interact to enter your notes but be very careful, the screen is live and if you click on something, it is just like touching it while standing at the roaster. Be careful with this!! (but don't be afraid of it)
- You may start the “TIME SINCE CRACK” timer manually, and its value will be recorded with the other roast data e-mailed at the end of the roast. Touch the digital display of the timer to activate it. Many roast masters use this timer to keep track of how long the roast proceeds after the start of the first crack.
- You may switch to “MANUAL CONTROL” of the roast at any time but may not reenter “BURNER RECIPE MODE” during that batch. You will have to complete the batch in “MANUAL MODE”, the plot screen will not assist you, and the roast timer will stop.



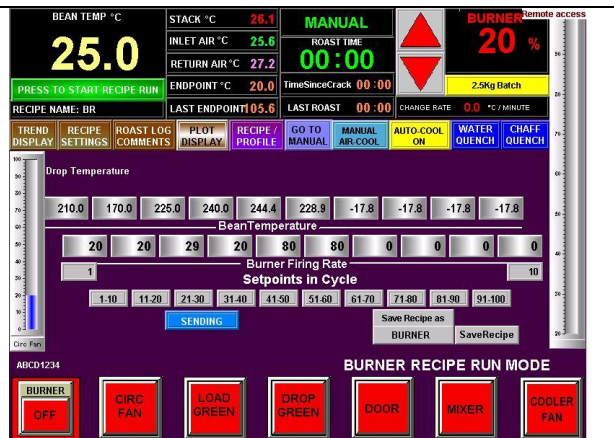
Picture 039



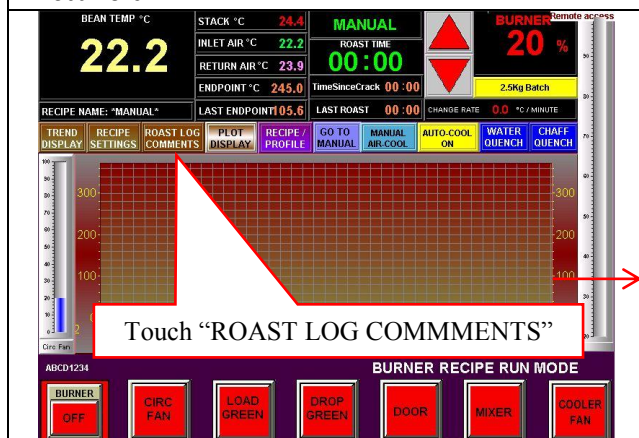
Picture 040



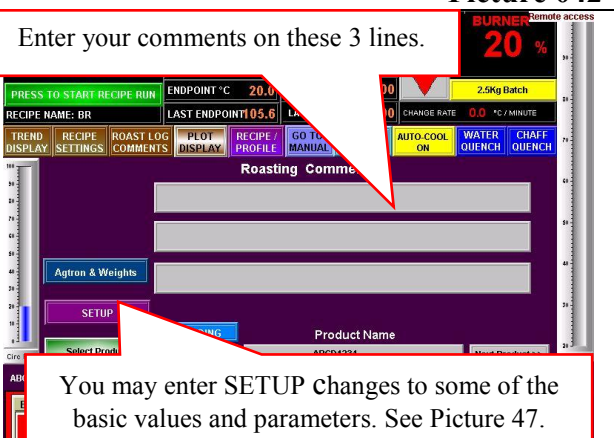
Picture 041



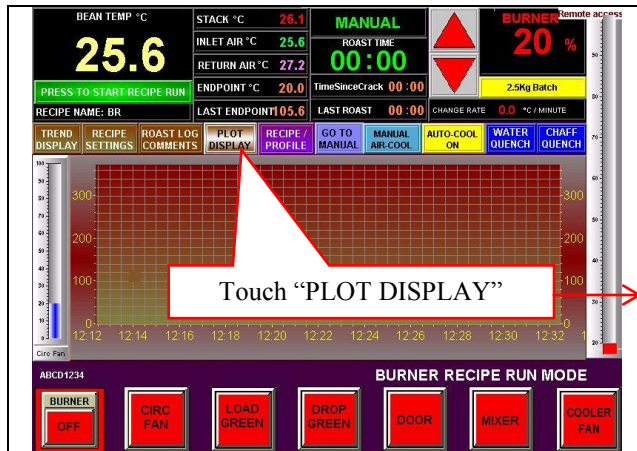
Picture 042



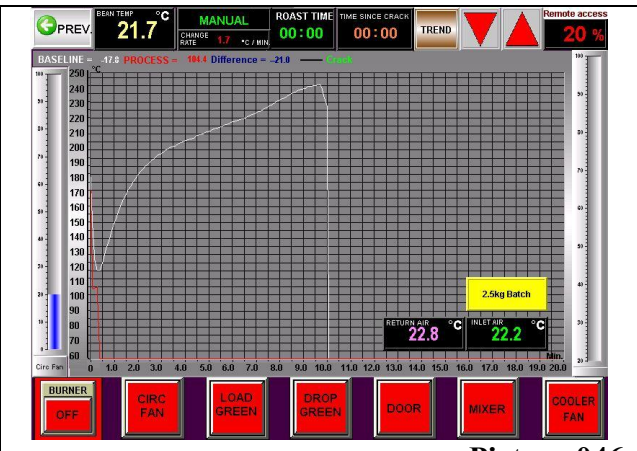
Picture 043



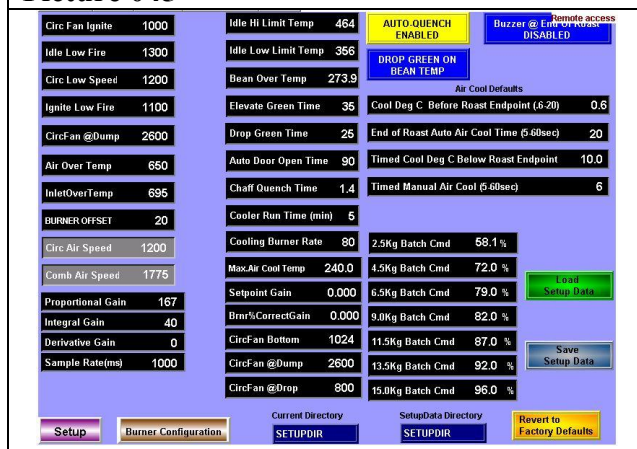
Picture 044



Picture 045



Picture 046



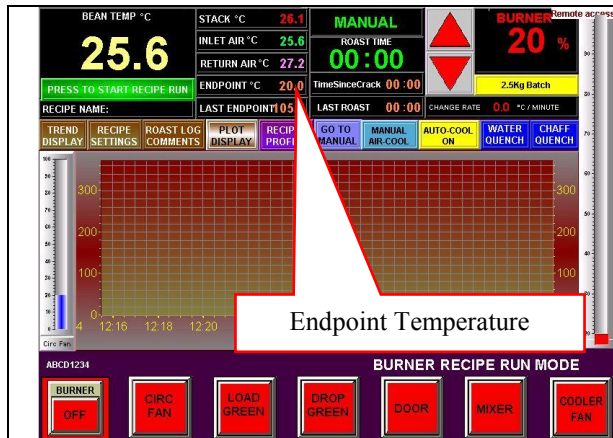
Picture 047



Picture 048

## RECIPE MODE: ENDING THE ROAST

- The endpoint temperature is part of the recipe (see Picture 049). The Amber light on the front of the console will flash @ 20 degrees F (9 deg C) before it has reached the endpoint temperature (Picture 050). As the endpoint approaches the Amber flasher will flash faster. At 10 degrees F (4 deg C) prior to the endpoint, the horn will sound one time for about a second. At 5 degrees F (~2 deg C) below endpoint, the horn will sound several times.
- At the end of the roast, the screen will flash "END OF ROAST" and the horn will sound until the door is opened (Picture 051). The horn may be silenced with the "SILENCE HORN" button on the main screen (Picture 052). The volume of the horn can be adjusted by rotating the bezel of the horn (Picture 053). You may also disable the end of roast horn signal in setup (see Picture 054).
- The e-mail of the roast data is sent about 30 seconds after the end of the roast cycle, so be sure all roast log notes are typed in prior to that time. The "ROAST LOG COMMENTS" tab of the Main Run Recipe screen accesses the roast log screen during the roast (Picture 043).

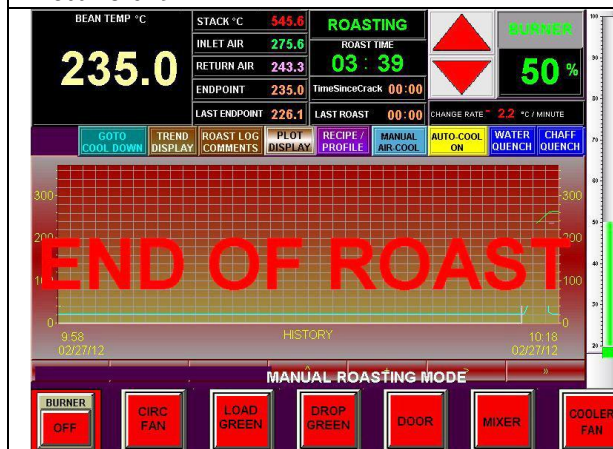


Picture 049

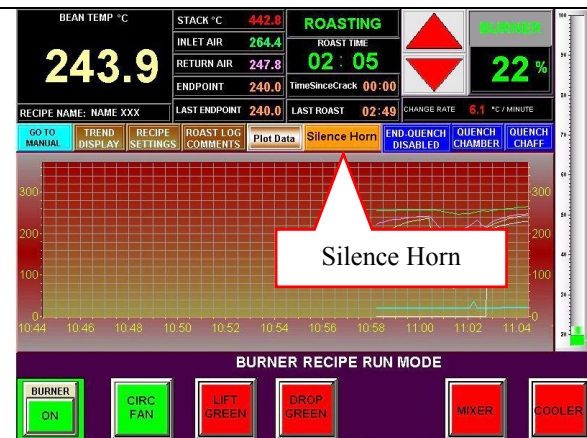


Amber Flasher

Picture 050



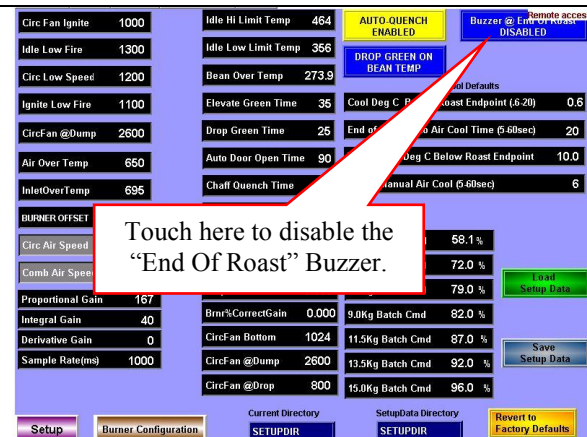
Picture 051



Picture 052



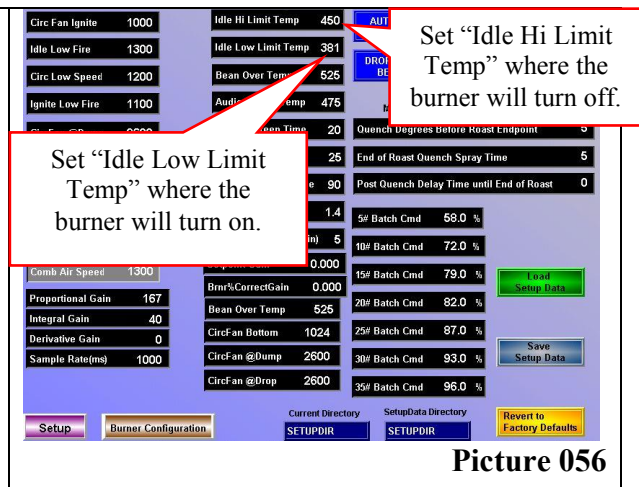
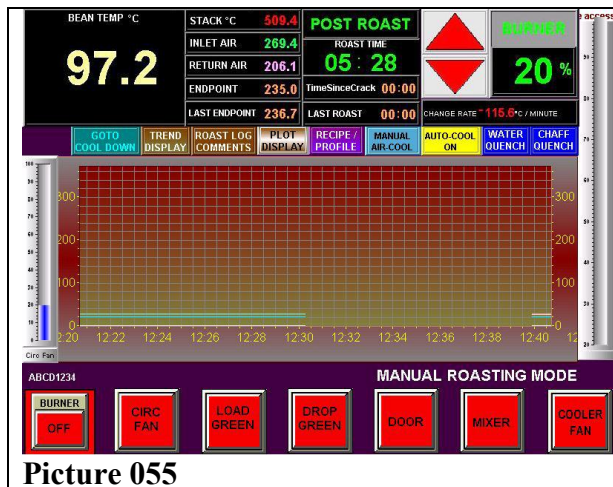
Picture 053

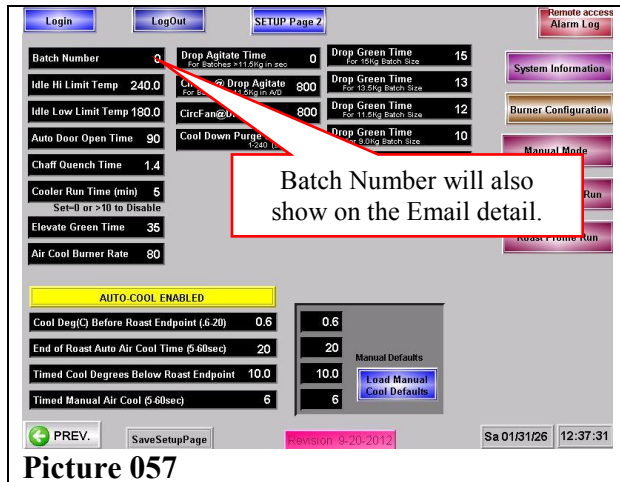


Picture 054

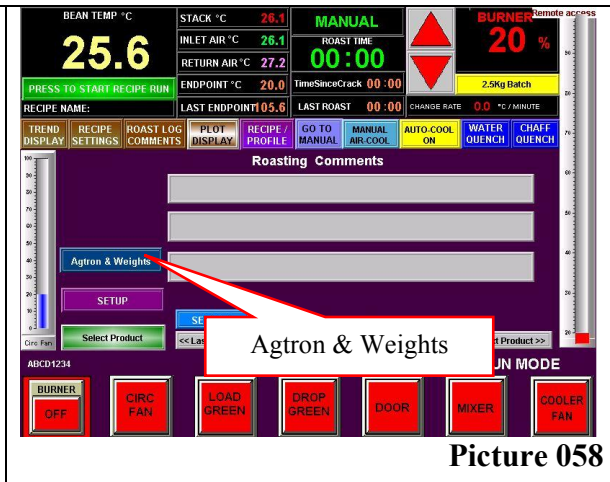
**RECIPE MODE: POST ROAST & IDLE MODE**

- “POST-ROAST” exists because there is residual smoke in the roaster after the coffee is out of the roaster drum. The burner remains on for 3-minutes after the end of the roast to eliminate it and this time is called “POST-ROAST” (picture 055). After the 3-minutes, if you don't start a roast, the roaster switches to “IDLE MODE”, and the burner is turned off and then back on between the two temps “IDLE HI LIMIT TEMP” and “IDLE LOW LIMIT TEMP” as established on the setup screen (see Picture 056). The roaster will remain in “IDLE-MODE” till a roast is started, and will cycle on and off between these two temps which takes about 11 minutes per cycle. This is often referred to as “porpoising”.
  - You may close the roaster door and start a new batch as soon as the coffee is out of the roaster. Agrtron data collected after the roast may be sent in a separate e-mail after the roast data e-mail has already been sent. The batch number is incremented automatically so it should correspond to the batch it came from if it is done in the same order (see Picture 057). However you may not keep Agrtron data on every batch, or, for other reasons, the batch number may get out of sync, so it is adjustable on the Agrtron screen accessible from the “AGTRON & WEIGHTS” button of the “ROAST LOG COMMENTS” tab of the Main Run Recipe screen (see Picture 058). You can enter Agrtron values and weights as well as more notes for that batch. You may not have entered all the notes in time to go with the main e-mail so this would be a useful second opportunity.
- The cooler fan, which started automatically at the end of the roast, can be set to turn off automatically after a preset (operator adjustable) amount time. See the setup screen to set this value in minutes. Note that a value of 0 or 10 both result in disabling the auto off feature of the cooler fan.





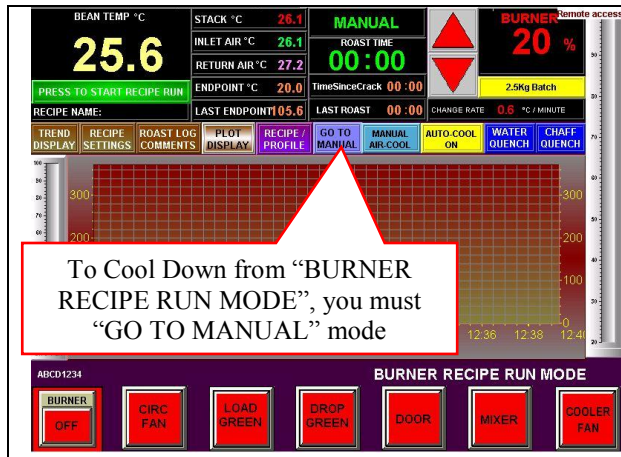
Picture 057



Picture 058

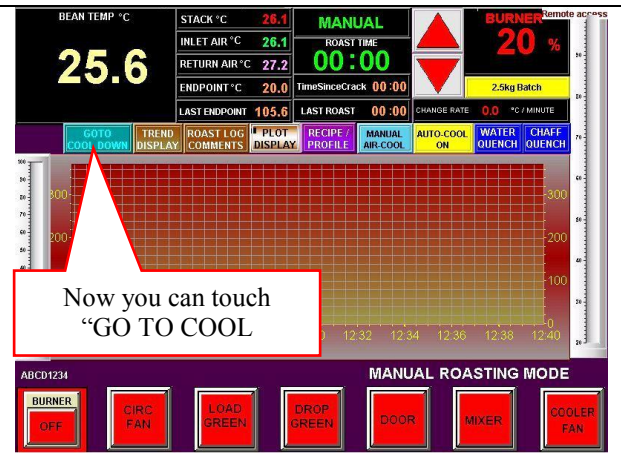
## RECIPE MODE: COOL DOWN

- At the end of the day, or even on long breaks from roasting, when the roaster is in “IDLE” or “POST ROAST” you can switch the roaster to “COOL DOWN”. In cool down, the burner is shut off along with all other motors except the circulating fan. The circulating fan is actually speeds up little. Air is circulated and after a short time the purge gate is opened so all the air is replaced with cool room air constantly.
  - The “GO TO COOL DOWN” button is only accessible from “MANUAL MODE” so if you are not in Manual mode you must first touch “GO TO MANUAL” then “GO TO COOL DOWN” (see Picture 061, 062).
  - If you do this while in “POST ROAST”, you will see “COOL DOWN REQUESTED”. We must let the “POST ROAST” cycle end before going to Cool Down or we run the risk of allowing some smoke from the end of the last roast to escape.
  - At the end of “POST ROAST”, with “COOL DOWN REQUESTED” being displayed the roaster will automatically switch to “COOL DOWN” instead of “IDLE”.
  - The roaster takes 20 to 30 minutes to cool down.
- At the end of “COOL DOWN”, the roaster will turn off the circulation fan and return the roaster to the initial startup screen. This happens when the return air temperature gets down to 150 deg. F. At this point, you only need to turn off the power to the roaster and close the utility valves for air, water and gas.



Picture 61

To Cool Down from "BURNER RECIPE RUN MODE", you must "GO TO MANUAL" mode



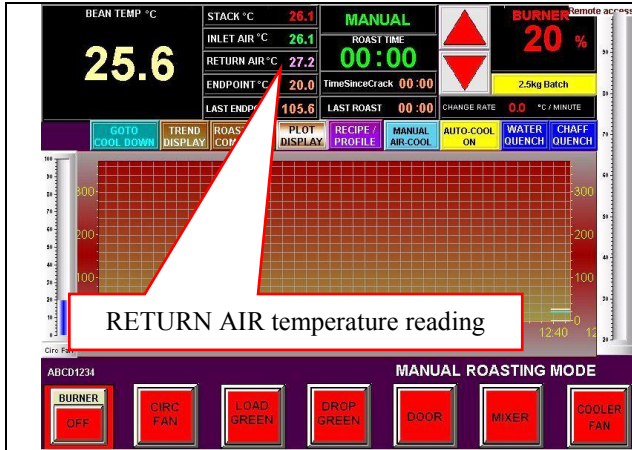
Picture 62

Now you can touch "GO TO COOL"

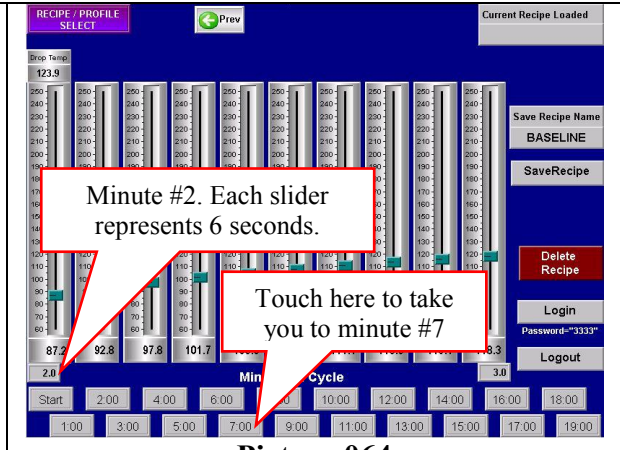


## ROAST PROFILE MODE: SOME FACTS ABOUT PROFILES

- To create or change a profile (or recipe) you must first Login. By default, the password is 3333. A field service engineer from LORING SMART ROAST may change this at startup or later via the Internet. Login on the Setup Page from the Roast Log Comments tab.
- A profile can only be “captured” from a batch that you roast in “MANUAL MODE”, however it can be created by modifying an existing one using the “EDIT ROAST PROFILE” screen, or importing one that was saved and sent to you in an e-mail, or one created in Excel and FTP'd into the screen via Ethernet.
- A profile is a record of the return air temperature taken every 6-seconds. Return air temperature is used because it can fluctuate much more rapidly than bean temperature and responds quickly and accurately to changes in burner firing rate (see Picture 063). A mathematical algorithm known as PID control is used to keep the return air temperature of the batch as close as possible to that of the recorded value of the profile. The bean temperature reacts too slowly to be of use for control but the results you get using return air produce an almost exact copy of the bean temp curve even if the batch size varies. When the recipe is “captured from last manual run”, the baseline from that roast is also captured.
- All roast profiles are 20 minutes long and controlled in 6-second intervals. If your roast is 15 minutes and 6 seconds long you will use 151 sliders, all the sliders after that time will remain at the default value of 20% (see Picture 64).
- You may choose whether to drop the green into the roaster at your chosen drop temperature based on either return air temperature (the dial thermometer) or the bean temperature (down on the door). The toggle switch for this is on the “Save Setup Page” button accessible at the bottom of the Setup page (see Picture 65).
- If a profile is created by going to the “EDIT ROAST PROFILE” button from the “RECIPE / PROFILE” tab and creating one from scratch, there will be no baseline associated with it until the program is run. Running, it generates a natural baseline. You must then capture the baseline and re-save the profile using the same name (see Picture 066).
- You must have just run (or you must load) a profile to which you want to add the baseline before changing the name or saving the profile.  
**Do not** turn the "BASELINE PLOT" button green. Leave "ROAST PROFILE" green. Touch "Capture last run for Baseline Plot", then touch "Edit Roast Profile" and on that screen make any changes you want to the recipe, including the name (or not) and touch enter (see Picture 067).
- This will add the current baseline (from the last roast) to the profile. Then you must save it, with the same name, or a new name.
- Touch "Save Profile" and wait to see the name change (if any) indicated.
- A profile may be created spontaneously by loading an existing one, modifying it, then renaming it. It will retain the baseline of the profile you modified until you run the profile (creating new current baseline data) and then saving that baseline to the profile as described above.
- You could also go to the “EDIT ROAST PROFILE” button from the “RECIPE / PROFILE” tab and create one from scratch. Because even a short profile contains many points, this is a very time consuming way to do it and may not create a realistic profile.



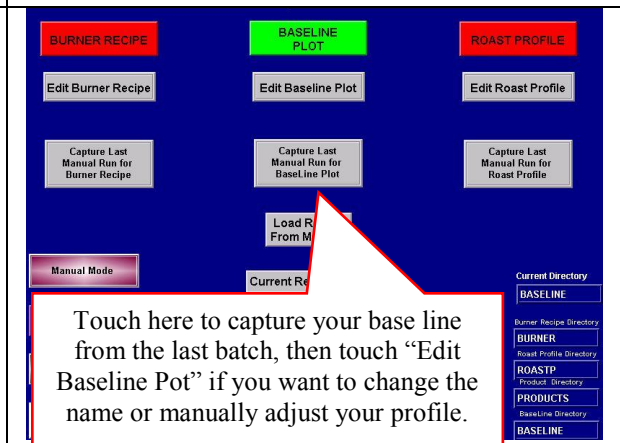
Picture 063



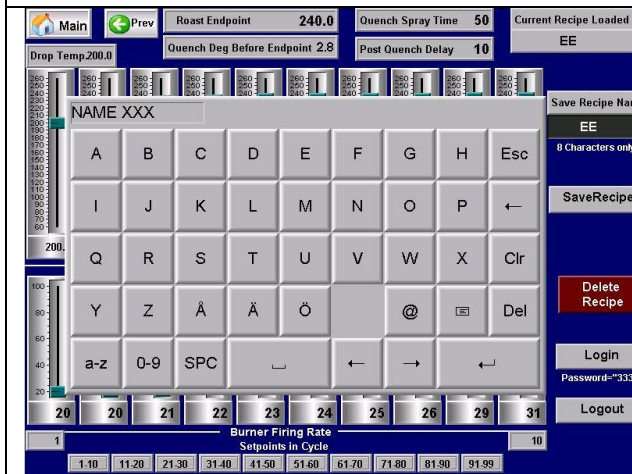
Picture 064



Picture 065



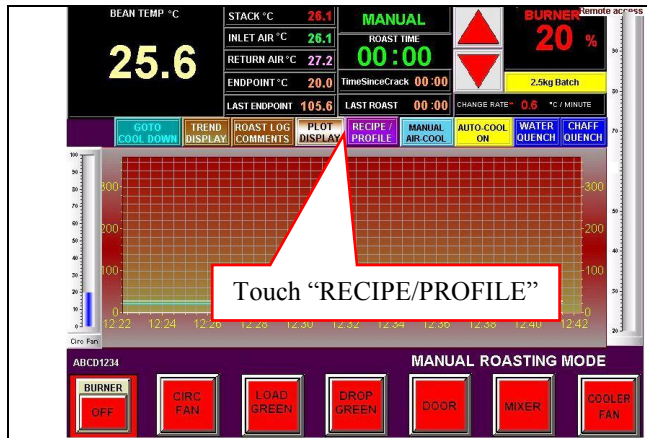
Picture 066



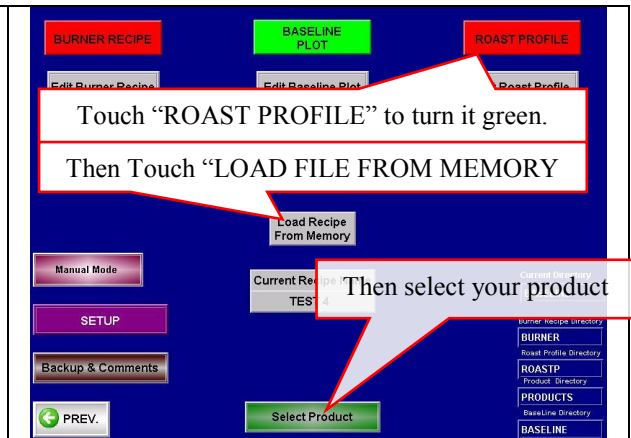
Picture 067

ROAST PROFILE MODE: STARTING A ROAST

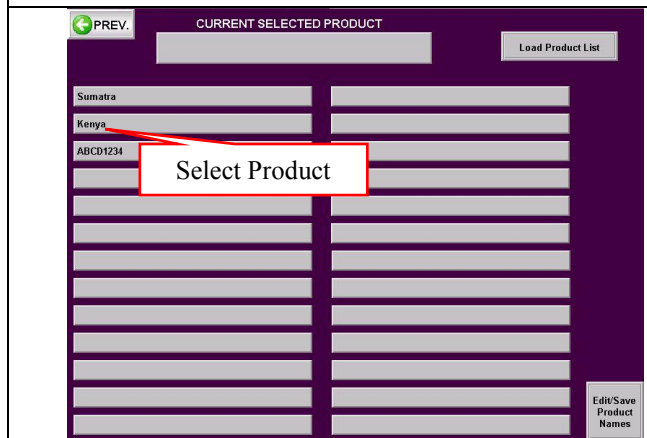
- Click the purple “RECIPE / PROFILE” button above the trend screen on the main screen (see Picture 068). A new screen will appear allowing you to choose between Burner Recipe, Baseline, and Roast Profile modes (see Picture 069). Click the “ROAST PROFILE” button at the top of the right hand column and it will turn green.
- To select a previously saved profile, when the “LOAD FILE FROM MEMORY” button appears in the center of the screen, touch it and select your chosen profile from the drop down list, then confirm it with “YES”.
- Before leaving this screen you should also select the name of the product, you will be running with this profile (see picture 069). Touch “SELECT PRODUCT” and choose the current product (see picture 070), then push the green “RECIPE / PROFILE RUN” button (see picture 071). You will be switched to the “ROAST PROFILE RUN SCREEN” where the name of the current profile and the current product will be listed (see picture 072).
- Touch “EDIT ROAST PROFILE” then touch “SETUP” and check that you have set the initial burner firing rate and the maximum burner firing rate.
- NOTE: A profile may also be created spontaneously by modifying an existing one and renaming it, or going to the “EDIT ROAST PROFILE” button from the “RECIPE / PROFILE” tab and creating one from scratch.
- If your last roast was in profile mode and you haven't changed modes, you will still be in profile mode. The last profile you ran is still loaded, and will remain so, batch after batch, till you load a different profile or change to manual or recipe mode.
- The endpoint temperature is best chosen right after returning to the main “PROFILE RUN SCREEN” after choosing the profile and the product name (see picture 072). However, it can be changed at any time during the roast. Touch the “ENDPOINT” digital indicator grouped with the other digital temperature indicators at the top of the screen to set the desired endpoint for the new batch or change it on the profile settings screen (picture 073).
- A roast may be started at any time after the door is closed from the previous roast. It can be started during “POST-ROAST” or you can wait and start it once the machine has entered “IDLE MODE”.
- To start a roast cycle press the green “PRESS TO START PROFILE RUN” button under the digital Bean Temperature indicator (picture 074).
- The roaster will compare the profile drop temperature to the current roaster temperature. If the roaster is above it, a yellow flashing text block will ask you to open the roaster door till the temperature drops below the required drop temperature (picture 075). When it does, you can shut the door and then a “WAITING TO DROP GREEN” message will appear (picture 076). When the roaster temperature reaches the (profile specified) drop temperature, the green will drop automatically. The roast timer will start if it is not already on.
- Once the green bean drop valve closes, the burner will go to the first burner set point of the profile.



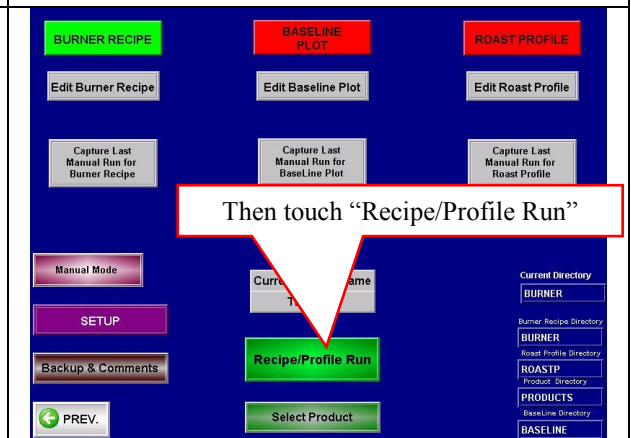
Picture 068



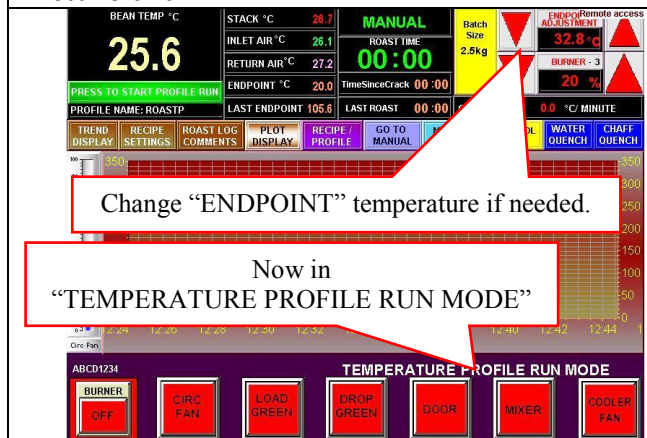
Picture 069



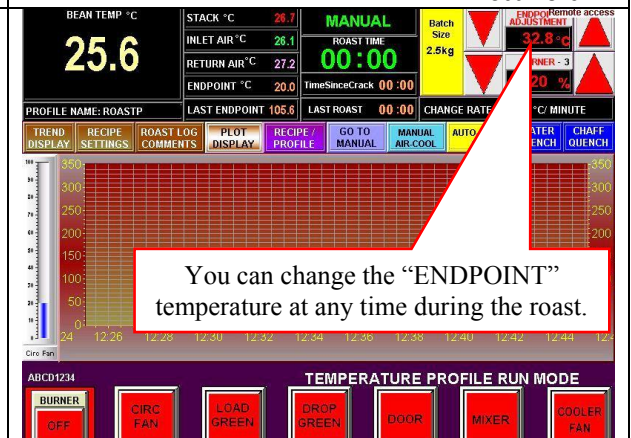
Picture 070



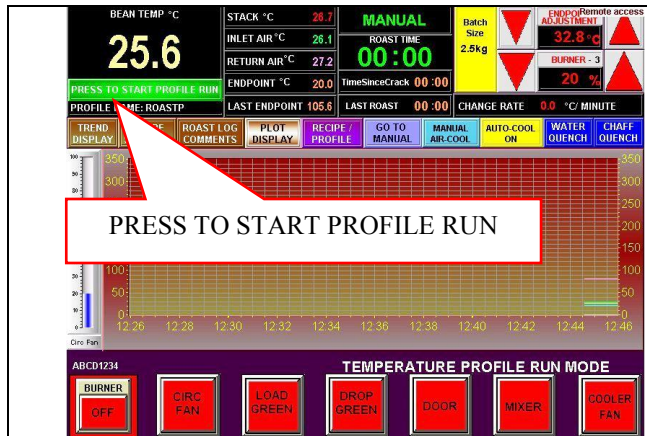
Picture 071



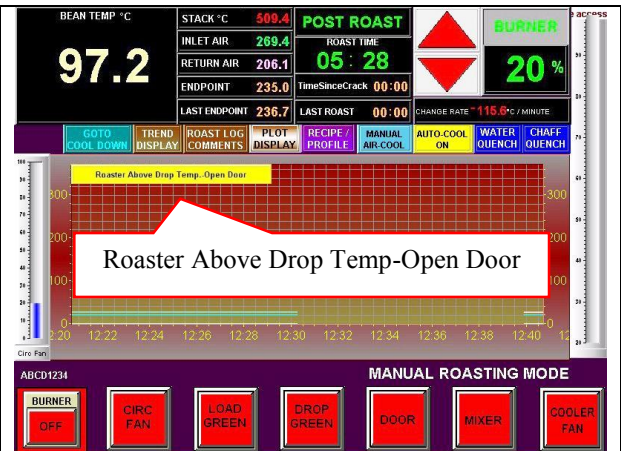
Picture 072



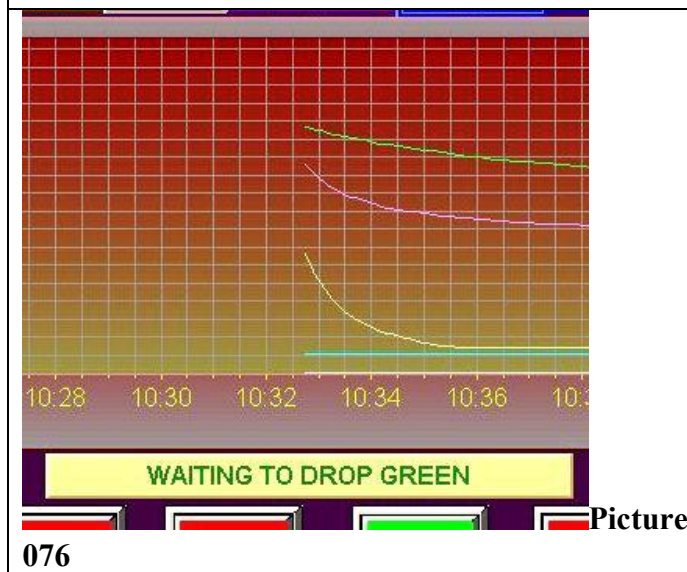
Picture 073



Picture 074



Picture 075



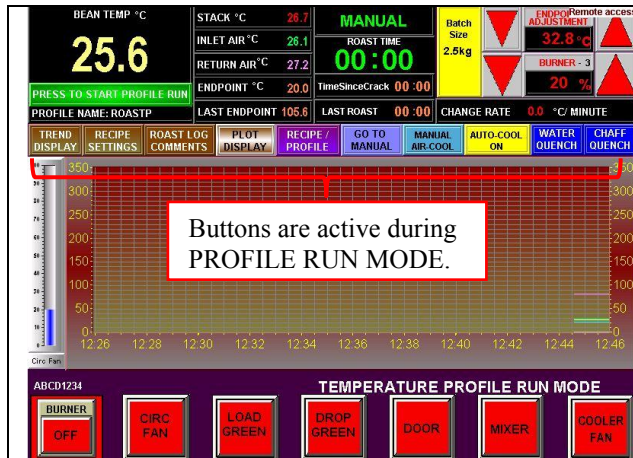
Picture 076

## ROAST PROFILE MODE: DURING THE ROAST

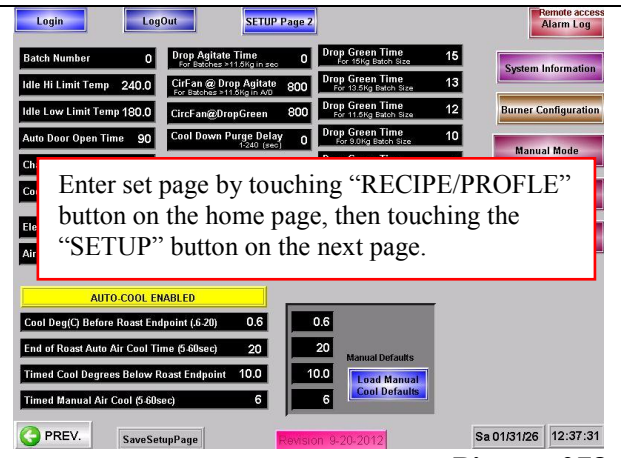
- The profile software is now in control of the roast.
- During the roast, you may jump between the “TREND DISPLAY”, “PROFILE SETTINGS”, “ROAST LOG COMMENTS” and the “PLOT” tabs (see picture 077). You may also enter “SETUP” and make changes to some of the basic values and parameters of the roaster (see picture 078).
- The Magnehelic gage is mounted behind the control screen. It is a direct and physical measure of the burner firing rate. It is actually the air pressure of the burner blower (see picture 079).
- On the “ROAST LOG COMMENTS” screen, you may attach notes from the on screen keyboard that pops up when you touch the comment bar (SEE picture 080). You may also type them in from a physical keyboard on any PC on your LAN after you create a clone of your roaster screen. Open a browser on your networked PC and type in “HTTP:// ” then your roasters I.P. address, then “:5800” and hit enter. Your roasters I.P. is most likely

192.168.1.200 but you can check on the information tab of the “SETUP” screen if that doesn't work. You may also try another browser. They don't all support this but IE and Firefox usually work. A Tight VNC password dialog box will open and you then enter one of your two passwords. One is for viewing only and one is for interacting (refer to [instruction to find pw](#)). You will need to interact to enter your notes but be very careful, the screen is live and if you click on something, it is just like touching it while standing at the roaster. Be careful with this!! (but don't be afraid of it)

- You may start the “TIME SINCE CRACK” timer manually, and its value will be recorded with the other roast data e-mailed at the end of the roast. Touch the digital display of the timer to activate it (see [picture 081](#)). Many roastmasters use this timer to keep track of how long the roast proceeds after the start of the first crack.
- You may switch to “MANUAL CONTROL” of the roast at any time but may not reenter “ROAST PROFILE MODE” during that batch. You will have to complete the batch in “MANUAL MODE”, the plot screen will **not assist you, and the roast timer will stop.**



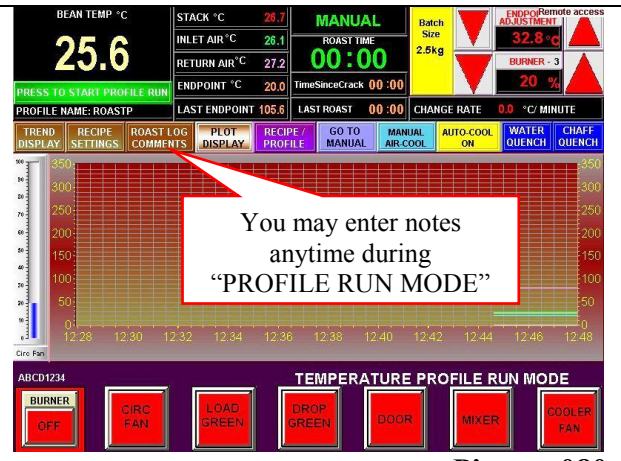
Picture 077



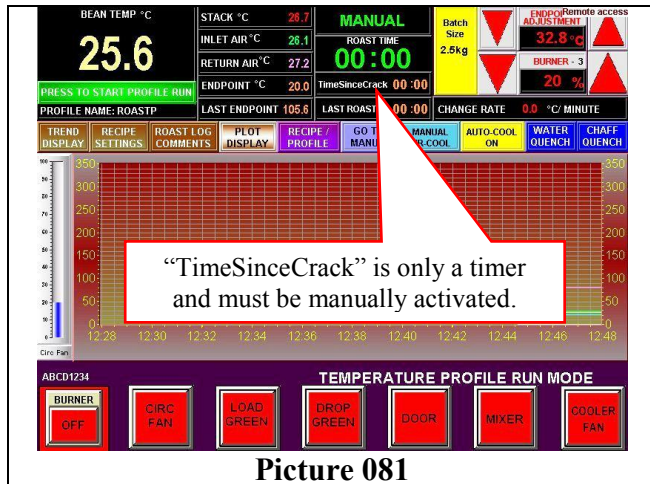
Picture 078



Picture 079

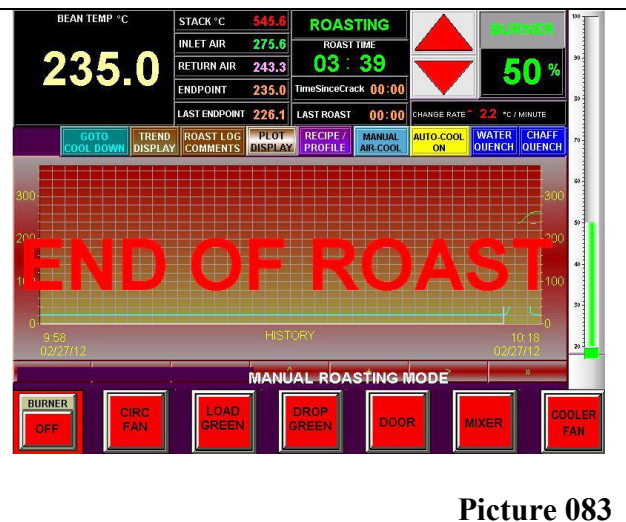
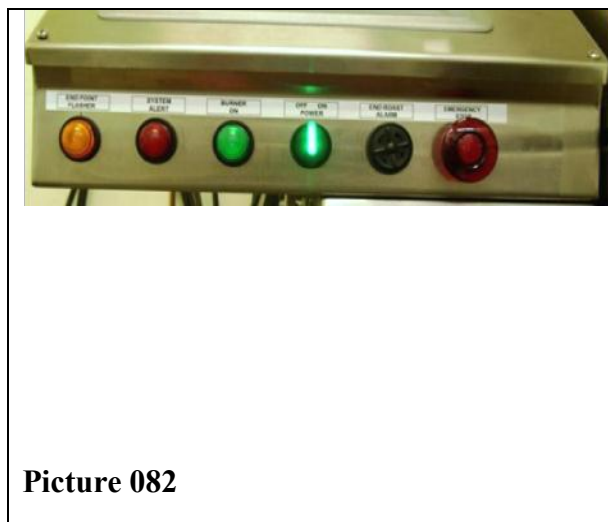


Picture 080

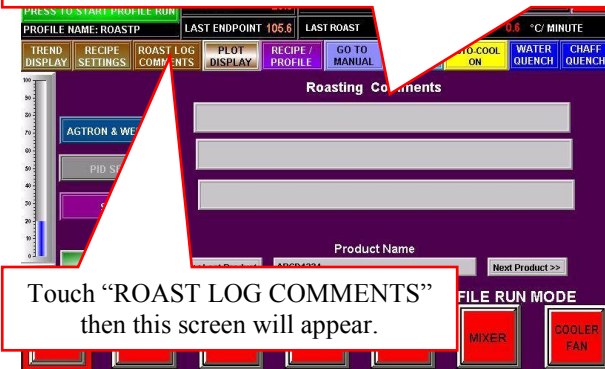


## ROAST PROFILE MODE: ENDING THE ROAST

- The endpoint temperature is set manually and is not part of the profile. 20 degrees F (9 deg C) before it is reached the amber flasher on the front of the console will start flashing. As the endpoint approaches the flasher will flash faster (see picture 082). At 10 degrees F (4 deg C) prior to the endpoint, the horn will sound one time for about a second. The volume of the horn can be adjusted by rotating the bezel of the horn. At 5 degrees F (~2 deg C) below endpoint, the horn will sound several times.
- At the end of the roast the screen will flash “END OF ROAST” and the horn will sound till the door is opened (see picture 083). The horn may be silenced with the “SILENCE HORN” button on the screen. You may also disable the end of roast horn signal in setup.
- The e-mail of the roast data is sent about 30 seconds after the end of the roast cycle, so be sure all roast log notes are typed in prior to that time. The "ROAST LOG COMMENTS" tab of the Main Run Profile screen accesses the roast log screen during the roast (see picture 084).



Touch each line and enter your notes, or use your VPN connection and use your PC to enter your notes.



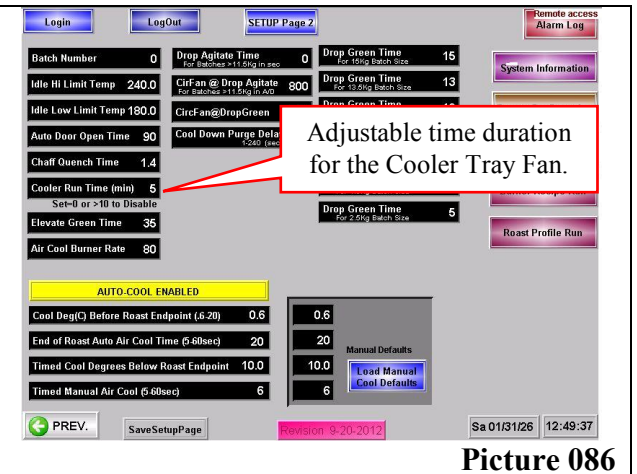
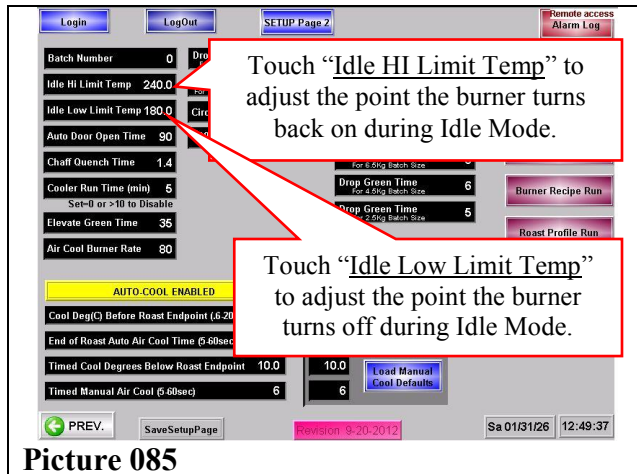
Touch “ROAST LOG COMMENTS” then this screen will appear.

**Picture 084**

## ROAST PROFILE MODE: POST ROAST & IDLE MODE

- “POST-ROAST” exists because there is residual smoke in the roaster after the coffee is out of the roaster drum. The burner remains on for 3-minutes after the end of the roast to eliminate it and this time is called “POST-ROAST”. After the 3-minutes, if you don't start a roast, the roaster switches to “IDLE MODE”, and the burner is turned off and then back on between the two temps “IDLE HI LIMIT TEMP” and “IDLE LOW LIMIT TEMP” as established on the setup screen (see picture 085). The roaster will remain in “IDLE-MODE” till a roast is started, and will cycle on and off between these two temps which takes about 10 minutes per cycle, depending on those values. This is often referred to as “porpoising”.
- You may close the roaster door and start a new batch as soon as the coffee is out of the roaster.
- Agtron data collected after the roast may be sent in a separate e-mail after the roast data e-mail has already been sent. The batch number is incremented automatically so it should correspond to the batch it came from if it is done in the same order. However you may not keep Agtron data on every batch, or, for other reasons, the batch number may get out of sync, so it is adjustable on the Agtron screen accessible from the “AGTRON & WEIGHTS” button of the “ROAST LOG COMMENTS” tab of the Main Run Profile screen. You can enter Agtron values and weights as well as more notes for that batch. You may not have entered all the notes in time to go with the main e-mail so this would be a useful second opportunity.
- The cooler fan, which started automatically at the end of the roast, can be set to turn off automatically after a preset (operator adjustable) amount time. See the setup screen to set this value in minutes (see picture 086). Note that a value of 0 or 10 both result in disabling the auto off feature of the cooler fan.





## **ROAST PROFILE MODE: COOL DOWN**

- At the end of the day, or even on long breaks from roasting, when the roaster is in “IDLE” or “POST ROAST” you can switch the roaster to “COOL DOWN”. In cool down, the burner is shut off and the circulating fan speeds up. Air is circulated and after a short time the purge gate is opened so all the air is replaced with cool room air constantly.
- The “GO TO COOL DOWN” button is only accessible from “MANUAL MODE” so if you are not in Manual mode you must first touch “GO TO MANUAL” then “GO TO COOL DOWN”.
- If you do this while in “POST ROAST”, you will see “COOL DOWN REQUESTED”. We must let the “POST ROAST” cycle end before going to Cool Down or we run the risk of allowing some smoke from the end of the last roast to escape.
- At the end of “POST ROAST”, with “COOL DOWN REQUESTED” being displayed the roaster will automatically switch to “COOL DOWN” instead of “IDLE”.
- The roaster takes 20 to 30 minutes to cool down.
- At the end of “COOL DOWN”, the roaster will turn off the circulation fan and return the roaster to the initial startup screen. This happens when the return air temperature gets down to 150 deg. F (~80 deg C). At this point, you only need to turn off the power to the roaster and close the utility valves for air, water and gas.

## “SETUP SCREEN” OPTIONS

The screenshot shows the 'SETUP Page 2' interface with the following parameters and controls:

- Navigation:** Login, LogOut, SETUP Page 2, Remote access Alarm Log
- Parameters:**
  - Batch Number: 0
  - Idle Hi Limit Temp: 240.0
  - Idle Low Limit Temp: 180.0
  - Auto Door Open Time: 90
  - Chaff Quench Time: 1.4
  - Cooler Run Time (min): 5 (Set=0 or >10 to Disable)
  - Elevate Green Time: 35
  - Air Cool Burner Rate: 80
  - Drop Agitate Time (For Batches >11.5Kg in sec): 0
  - CirFan @ Drop Agitate (For Batches >11.5Kg in A/D): 800
  - CircFan@DropGreen: 800
  - Cool Down Purge Delay (1-240 (sec)): 0
  - Drop Green Time (For 15Kg Batch Size): 15
  - Drop Green Time (For 13.5Kg Batch Size): 13
  - Drop Green Time (For 11.5Kg Batch Size): 12
  - Drop Green Time (For 9.0Kg Batch Size): 10
  - Drop Green Time (For 6.5Kg Batch Size): 8
  - Drop Green Time (For 4.5Kg Batch Size): 6
  - Drop Green Time (For 2.5Kg Batch Size): 5
- Function Buttons:** System Information, Burner Configuration, Manual Mode, Burner Recipe Run, Roast Profile Run
- Auto-Cool Section:**
  - AUTO-COOL ENABLED (Yellow banner)
  - Cool Deg(C) Before Roast Endpoint (.6-20): 0.6
  - End of Roast Auto Air Cool Time (5-60sec): 20
  - Timed Cool Degrees Below Roast Endpoint: 10.0
  - Timed Manual Air Cool (5-60sec): 6
  - Manual Defaults: 0.6, 20, 10.0, 6
  - Load Manual Cool Defaults (Button)
- Footer:** PREV., SaveSetupPage, Revision 9-20-2012, Sa 01/31/26, 12:49:37

Your needs can be better suited by Customizing the Roaster.

- A log in procedure helps to insure that only authorized employees make changes to key things like roast profiles and burner recipes. The default log in password is 3333 and can be changed at the customer's request.
- The batch number increments automatically once each batch. If for some reason it gets out of sync with the actual batch number, you can reset it here. This could happen, for example, if you “fake a roast” by dropping green when there is none elevated, then end the fake roast by opening the roast discharge door.
- The Elevate Green Time is set at 35 seconds by default. This is a good value for full batches but can be reduced for smaller batches. If you roast mostly smaller batches you may change this value to something perhaps as low as 15 seconds, or leave it at a higher value and simply turn it off early, by using the Elevate Green button on the touch screen.
- The Drop Green timer controls how long the vacuum receiver green drop valve is open according to Batch size selected.
- Auto Door Open time sets the time for the roaster discharge door to remain open after a roast. Available only with the automatic door option.

- Chaff Quench timer allows you to fine tune the amount of quench that is sprayed on the chaff inside the chaff drum at the end of each roast, automatically. The Quencher is adjustable in 1/10<sup>th</sup> of a second increments. Default is 2.5 seconds. Chaff will be unburned and have a crusty layer followed by a fluffy layer. You don't want it to be wet, and at the end of the day it will be dry but in a layer pattern. This is to assure there will be no smoldering embers.
- The cooler fan and mixer drive start automatically at the end of each roast, if they are not already on. The cooler fan will turn off automatically if the time is set between 1 minute and 9 minutes. Values of 0 or above 10 will disable the automatic stopping of the cooler fan with this timer
- The Automatic Quench System (not to be confused with the chaff drum quench) can be enabled with this toggle switch. The quench sprays water into the cyclone at a rate of one gallon / minute for a matter of seconds, not a lot of water. It flashes to water vapor, which creates a cooler environment inside the roaster, this then returns to the beans (because of our re-circulating system) to cool them somewhat in the drum, before discharge into the cooler. No water gets anywhere near the beans! This switch toggles this feature on and off.
- Quench Degrees Before Endpoint sets the number of degrees below the operator set endpoint at which the quench spray will actuate. Probably something like 5 degrees when used.
- Quench Spray Time is set in seconds and 8 to 20 seconds would be good starting values.
- Post Quench Delay Time Till end of Roast is the time the roast will continue before the roaster signals the end of the roast, or where applicable, opens the automatic door. The endpoint may never be reached, the timer will end the roast and the endpoint value will be ignored for purposes of the automatic door and the record of the roast time.
- The System Information tab will give you some useful information about the system most notably the I.P. Of the screen on the local area network (LAN). This most commonly set to 192.168.1.200 and as a static I.P. But it depends on your network. It is set at the original start up of the roaster, after installation, and isn't changed unless something about your network is changed.
- Idle High and Low Limit Temperature settings control the burner in "IDLE MODE". The burner in a SMART ROASTER will cycle on and off between roasts after the "POST ROAST" cycle is completed (about 3 minutes), to keep the temperature in the roaster from getting too high. It will cycle indefinitely, till you start another roast or go into "COOL DOWN MODE". The burner goes off at the high value and comes on at the low value. A typical cycle between say, 450 degrees and 380 degrees, takes about 11 minutes. By choosing these values carefully, the roast master is able to maintain the temperature in the roaster within a narrow temperature band between roasts or during brakes, or at warm-up prior to the first roast. The closer they are the shorter the cycle time will be. They should be at least 20 degrees apart.
- Buzzer at End of Roast (Enable / Disable). As the end of roast approaches, 20 degrees below the endpoint, the amber light on the front of the control panel will start flashing slowly. It will flash faster as the roast progresses closer to the endpoint and is on steady at the endpoint. At 10 degrees below the endpoint, the buzzer on the front of the panel "sounds" a note to let you know it is getting close. At 5 degrees below, it "sounds" a series of notes, and at the endpoint, it comes on solid till the roast is ended by dropping the coffee into the cooler. This last part, the buzzer on solid part, can be irritating if you decide to take

the roast further than you had planned when you set the endpoint. Therefore, a button will appear on the screen at the end of the roast that allows you to turn off the buzzer, but it will be back the next roast unless you decide to disable it here on the setup screen.

- Burner Configuration is accessible only by LSR field service technicians.

## RECOMMENDED MAINTENANCE

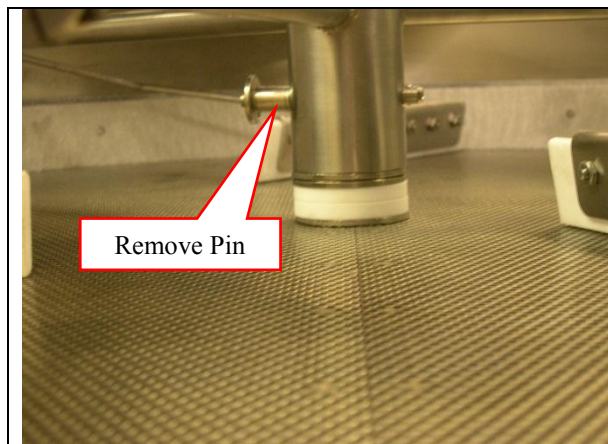
### MAINTENANCE: DAILY

- It is important to get to know your roaster so you know how long, how many batches you may roast, before the chaff barrel needs to be emptied. It should be done at least once a day, but may be required more often if your production level is high. The chaff level should never exceed 2/3 of the height of the drum.

### MAINTENANCE: WEEKLY

#### CLEANING THE COOLER TRAY AND SCREEN

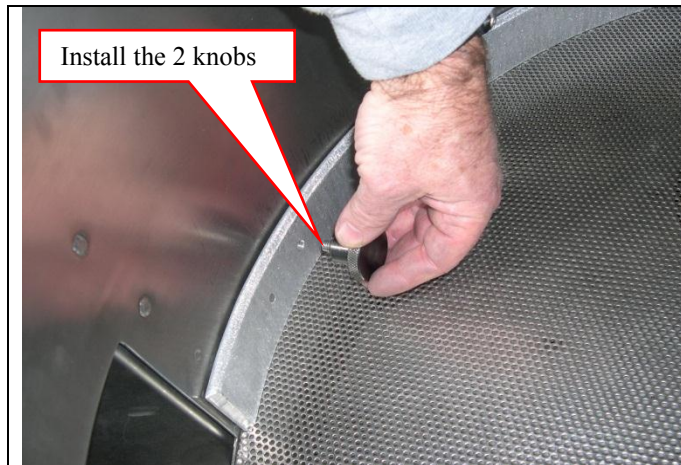
- Turn power off at main disconnect on the front of the enclosure before disassembling the cooler tray.
- Remove the pin from the mixer paddle hub and remove the paddle assembly along with the associated stack of washers. There is a foam washer on top of the stack then two Teflon washers, then a bronze washer on the bottom (Picture 001).
- Remove the two knobs on the outside of the cooler hopper that secure the screen hold-down stay in place and replace them in the same holes but from the inside of the stays. Grasp them both and pull them together and in toward the center of the cooler hopper and the stay will pop out of the slots in the side of the hopper and lift out completely (Picture 002, 003).
- Using a small tool rotate the screen so that one end of the piano hinge that runs down the center of the screen is centered in the middle of the discharge gate.
- Using this small tool lift the edge of the screen so you can get your hand under the edge, lift up, and the screen will fold down the middle and lift out of the hopper (Picture 004, 005).
- You can now vacuum out the cooler pan and scrub it down to the shine without having to remove the hopper from the roaster.
- Assembly is simply the reverse order of disassembly.



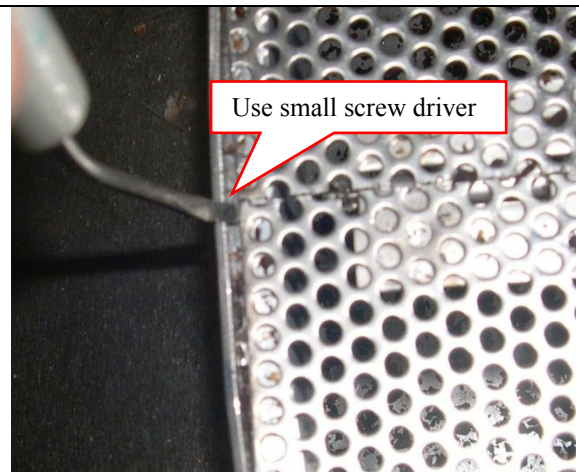
Picture 001



Picture 002



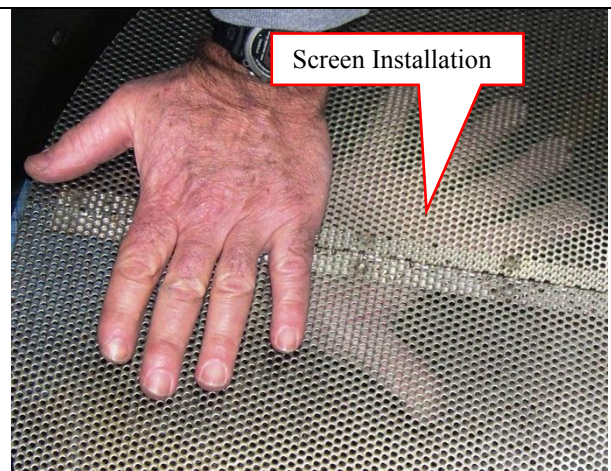
Picture 003



Picture 004



Picture 005



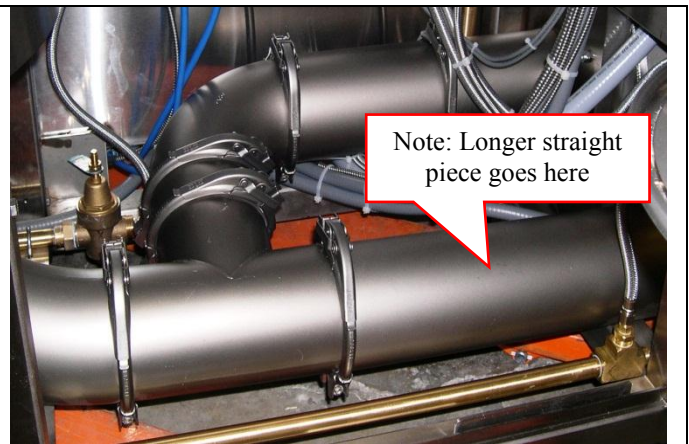
Picture 006

#### VACUUM PARTICULATE MATER FROM COOLER DUCTING UNDER ROASTER

- Lift off the right side panel of the roaster under the drum (Picture 007) and place it in a safe place where it will not be knocked over and scratched.
- Make sure ducting is cool and remove the clamp securing the end plate of the long straight section of Jacob Tubing (Picture 009). After confirming, no hot embers are present, vacuum out the fines that are slung into this particulate trap when the cooler fan is running. Note the condition of the vent piping to know when a more thorough cleaning of the ducting will be necessary.



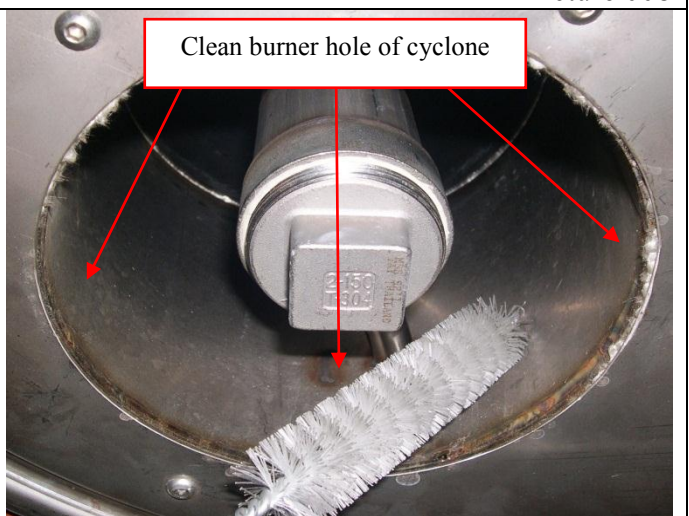
Picture 007



Picture 008



Picture 009



Picture 010

### CLEAN THE CHAFF BARREL

- Remove the chaff barrel and after emptying the chaff, clean the underside of the barrel lid. Wipe / scrape clean to remove combustible material (Picture 011).
- Use a large bottle type brush to clean up around the burner hole of the cyclone (Picture 010).
- Check chaff quench spray nozzle to be sure it is functioning properly (Picture 012).





Picture 011



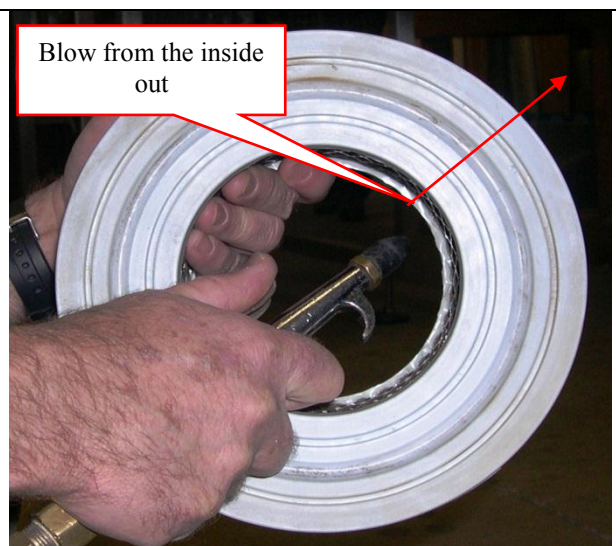
Picture 012

### CLEAN VACUUM ELEVATOR FILTER

- If the vacuum elevator seems slow or turns off before all the beans are lifted and you have to start it again, chances are that the filter needs cleaning. The vacuum elevator filter is made of potted silicone over stainless steel paper so it can take the heat should it ever be required to. It is an expensive filter so take care to avoid damage when working with it. An 8-foot stepladder is required to access the filter. Disconnect the power to the vacuum motor with the special power connector at the motor. Grasp the handles on top of the lid and carefully lift the lid off, vacuum motor and all, and hand it down to an assistant (Picture 013). Set the assembly down, upside down in the top of the vacuum motor, and disconnect the three springs holding the filter in place. To clean the filter, shake it, and blow the green coffee beans out from the inside using an air nozzle (Picture 014). It can also be washed or even boiled to give it a deeper cleaning.



Picture 013



Picture 014

## MAINTENANCE: MONTHLY

### CHECK QUENCH SPRAY NOZZLES

- Check that the quench spray nozzles are flowing freely. They can become plugged with coffee goop over time, especially the roast quench, because of the way many people choose to roast, it is often disabled for much of the time. The roast quench spray nozzle is located on the cyclone side of the flange that mounts the cyclone to the air circulating fan (Picture 015, 016). It is removed with four thumb knobs. Have someone hold it over a quart container and hold the manual quench button (on the touch screen) for 15 seconds. This should fill the quart container  $\frac{1}{2}$  full. The nozzle is rated  $\frac{1}{2}$  gallon/minute. It should project a solid 30deg conic spray pattern, if not the nozzle may be disassembled for cleaning. Don't lose the small turbulator vane inside the nozzle tip when cleaning. Once you are satisfied with the spray pattern and the flow rate, remount the nozzle plate with the nozzle oriented into the cyclone and tighten the knobs.



Picture 015



Picture 016

- Check the chaff drum quench in a similar manner. With the water valve off at the utility header, disconnect the stainless over-braided water line to the chaff quench spray valve. Then unscrew the spray mounting plug then reconnect the hose for the flow test. You will have to remove the zip ties that secure the wires to the surface mounted over temp. switch. Use a 5-gallon bucket and check the spray for a wide fan pattern, about 120 degrees. That's how it gets the side of the chaff bucket. This nozzle is designed to flow 1 gallon / minute, so it will only take 15 seconds to fill a quart container. Clean as above if necessary and reassemble. Do not forget to reconnect the wires to the over temperature switch when you are done.

## INSPECT AND CLEAN COOLER VENTING SYSTEM

- To clean the cooler fan, cool the roaster down then turn off the power at the control panel. Next, switch the power off at the fused disconnect on the front of the main electrical enclosure by rotating the handle 90 degrees to the left. Disconnect the power cable to the fan, at the fan motor, with the bayonet mounted power connector. Remove 8 ny-loc nuts, removing one of the top nuts last, as you lift the motor and fan wheel assembly clear of the roaster. The fan wheel can now be easily cleaned / scrapped. The housing can be easily cleaned as well. The more often this is done the better air will flow for efficient cooling and it will be that much less likely there could ever be a vent fire.
- By keeping an eye on the buildup in the cooler venting as you perform your weekly cooler tray cleaning, you will be better able to gage how often it will be necessary to really clean the vent ducting, including the vent stack and all associated ducting. All of these areas should be visually inspected every month and build-up should be removed. Clean ducting eliminates fires and produces faster and more energy efficient cooling.

## PROCESS DUCTING AND CYCLONE

- It is not necessary to clean the inside of the cyclone or the re-circulating ducting from the cyclone back to the roaster. No access is supplied because this area does not accumulate a build-up.

## FILTERS

- Combustion blower filters should be checked monthly and changed as needed. Use NAPA AUTO PARTS FILTER #6180 or equivalent.

## **MAINTENANCE: ANNUALLY OR AS NEEDED BASED ON YOUR PRODUCTION**

- It is important to get to know your roaster so you know how often you need to clean the cooler vent ducting, we recommend checking every 1 to 2 weeks . It can be inspected by removing sections of the duct from under the roaster. Inspect the cooler fan housing, fan wheel, and external ducting by removing the first section of duct above the fan. The procedure to clean the vent ducting between the fan and the roof cap, depends on the installation. Depending upon your installation, you may be able to clean down from the roof with a chimney brush, or maybe remove much of the ducting inside and clean it as separate pieces. If quick fit tubing was NOT installed, this may be a good time to do so.



[www.smartroaster.com](http://www.smartroaster.com)

3200 Dutton Ave. #413, Santa Rosa, CA 95407 Phone 707 526-7215, Fax 707 526-3815



Barclay Phelps CE Marking Consultants, 29/8 City Mill Lane, Gibraltar 646, Europe

## CERTIFICATE & DECLARATION OF CONFORMITY FOR CE MARKING

### Company contact details:

Loring Smart Roast, Inc.  
3200 Dutton Ave, #413, Santa Rosa, California, USA  
Tel: (707) 526-7215 Fax: (707) 526-3815  
Web: [www.smartroaster.com](http://www.smartroaster.com) Email: [info@smartroaster.com](mailto:info@smartroaster.com)

### Loring Smart Roast, Inc. declares that their:

Merlin A15 Coffee roaster, 15 kilogram / batch system, single burner,  
system weight approximately 950 Lbs.

### is classified within the following EU Directives:

EU Machinery Directive 98/37/EC & 2006/42/EC  
EU Low Voltage Directive 2006/95/EC  
EU Electromagnetic Compatibility Directive 2004/108/EC

### and further conforms with the following EU Harmonized Standards:

EN ISO 12100:2010 EN 60204-1:2006+A1:2009  
EN 61000-6-2:2005 EN 61000-6-4:2007+A1:2011

**Dated:** 09 September 2011

**Position of signatory:** CEO

**Name of Signatory:** Mark Loring Ludwig

**Signed:**

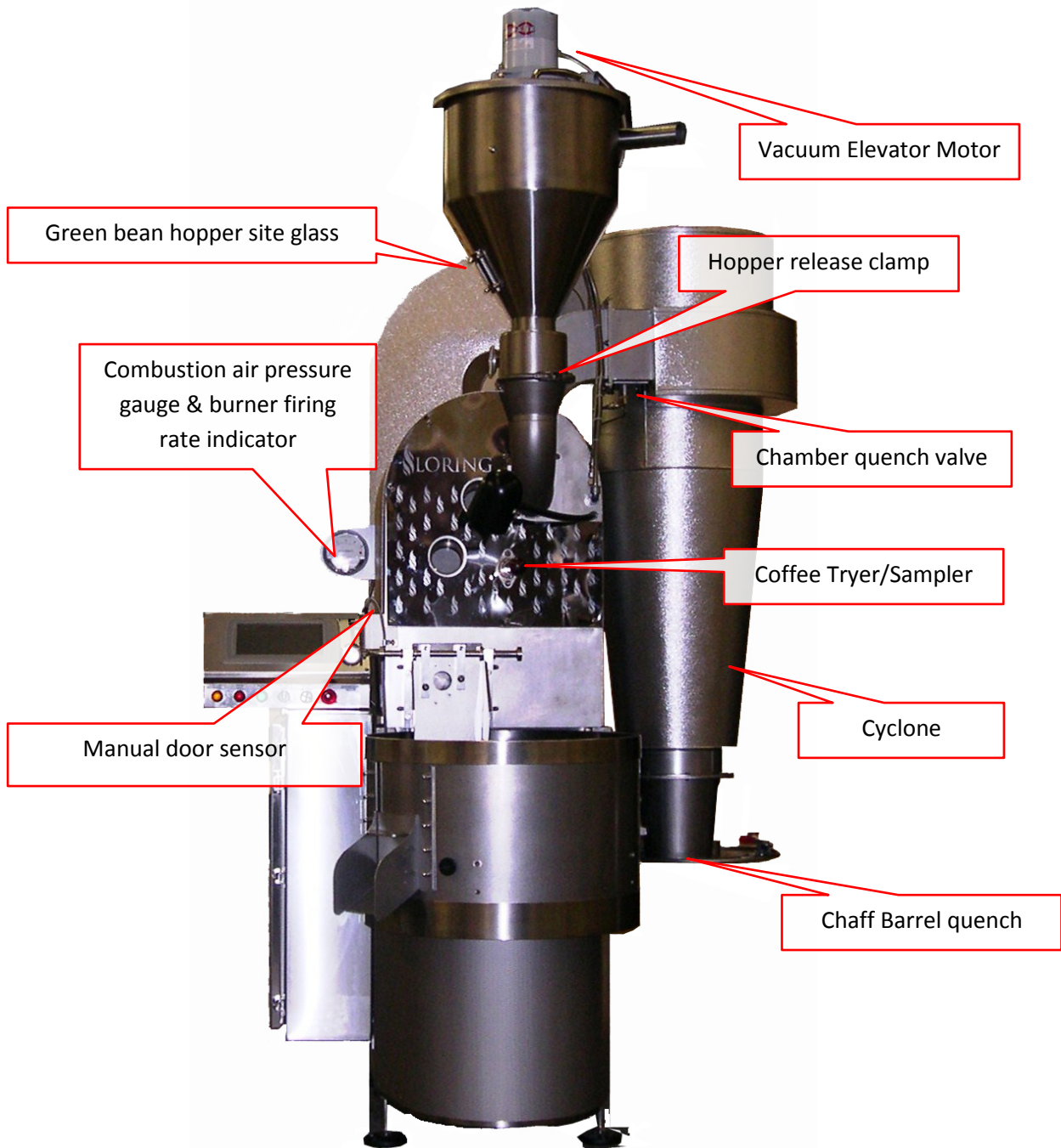
p.p. Loring Smart Roast, Inc.

In compliance with the Machinery Directive 200/42/EC the Technical File is held within the EU by  
Barclay Phelps, 196 High Road, London, N22 8HH, United Kingdom

## APPROVALS / CERTIFICATIONS

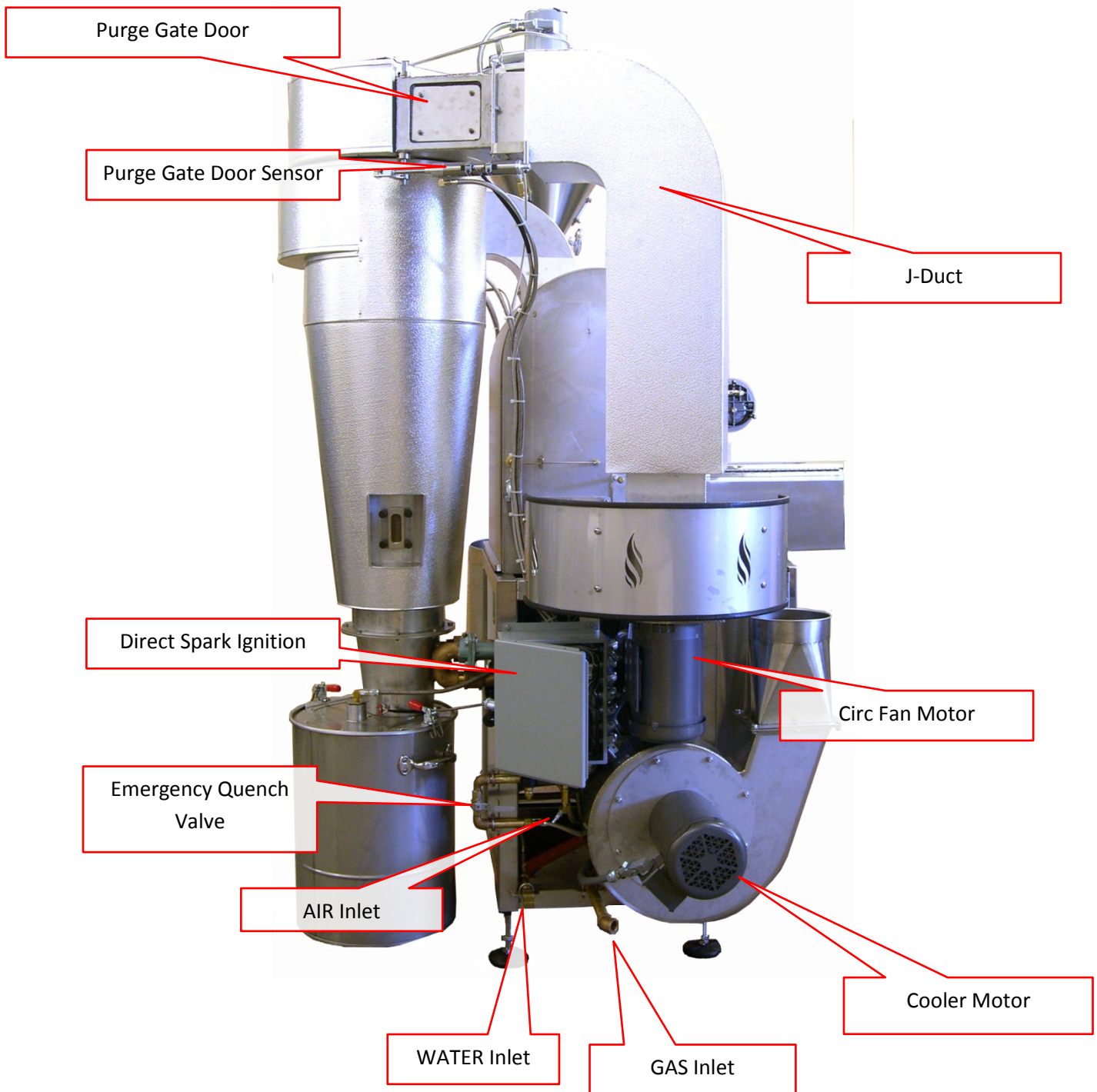
COMPONENT	MANUFACTURE	PART #	UL	CE	CSA	FM	RU	OTHER
<b>CONTROL ELECTRONICS:</b>								
Process Logic Controller	KOYO	250-1	X	X				
Touchscreen	BEIJER	T100	X	X				
Variable Frequency Drive	YASKAWA	J1000	X	X				
DC Power Supply	IDEC	PS5R-SF24	X	X				
Serial to Ethernet Converter	MOXA	Nport 5110	X	X				TUV
Ethernet Hub	MOXA	EDS-205A	X					CUL, IEC
Pushbutton Operators	IDEC	22mm HWI series	X	X	X			LVD
Flame Safeguard	HONEYWELL	S87B			X		X	
DC Power Supply	IDEC	PSM12-078s	X	X				TUV
<b>ELECTRICAL COMPONENTS:</b>								
Thermal Overload Block	AUTOMATION DIRECT	MS25-630	X	X				
AC Contactor	AUTOMATION DIRECT	GH15CN	X		X			
Control Relay	AUTOMATION DIRECT	Series 78	X	X	X			
MCCB	ASI	QL series	X	X	X		X	
MCCB	ASI	QZ series	X	X	X		X	
Disconnect Switch, Fused	SPRECHER & SCHUH	L45	X	X	X			
E-Stop Relay	AUTOMATION DIRECT	GH15ET	X		X			
Warning Buzzer	INGRAM	PW24D					X	
Control Relay	IDEC	RH Series	X	X	X			LVD/LLOYDS
Pressure Switch	NASON	NS-1A-20R/ELAV	X	X				
Goose Neck Light	ELECTRIX	7307-E006					X	
DIN Terminal Blocks	AUTOMATION DIRECT	DNT10		X	X		X	UDE
Wire Channel	PANDUIT	Type G		X	X		X	
Liquid Tight Flexible Conduit	ELECTRI-FLEX	Type LA	X		X			
Scale in Green Bean Lift	PELOUZE	4010		X				
Terminal Module	ZIPLINK	ZL-CM20		X				
<b>GAS, WATER, AND AIR PIPING TRAIN COMPONENTS:</b>								
Gas Pressure Regulator	MAXITROL	R500Z			X			
Automatic Gas Valve	HONEYWELL	VR8345M			X			
Hi, Low Gas Pressure Switches	DUNGS	A4-1 Series	X	X	X	X		
Air Pressure Switch	DUNGS	A4-1 Series	X	X	X	X		
Air Control Valves	MAC	45A Series	X		X			
Air Pressure Regulator	NORGREN	B07-202-A1EA		X				
Water Pressure Regulator	WATTS	N35B			X			ASSE/UPC
Water Control Solenoid Valves	PARKER	71215SN2MN00NOD100C2		X				
<b>DRIVE COMPONENTS:</b>								
Industrial Electric Motors	BALDOR				X		X	
Vacuum Elevator Motor	AMETEK LAMB	INFIN-A-TEK	X	X				
Combustion Air Blower	AMETEK ROTRON	WIND-JAMMER			X		X	

## COMPONENT IDENTIFICATION FRONT OF ROASTER A-15



3200 Dutton Ave. #413, Santa Rosa, CA 95407 Phone (707) 526-7215 [www.smartroaster.com](http://www.smartroaster.com)

## COMPONENT IDENTIFICATION REAR OF ROASTER A-15

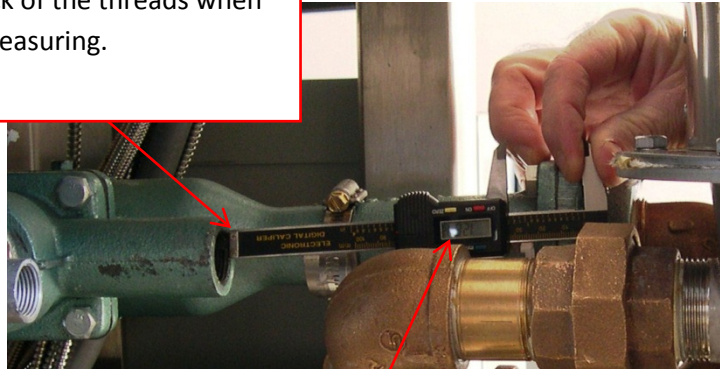


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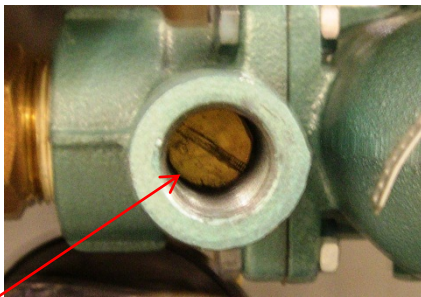
## ADJUSTING THE A15 GAS MIXER WITH A DIAL CALIPER

Note: ALWAYS take an accurate measurement and write it down before making any adjustments.

Hold the caliper vertical and flush/flat against the back of the threads when measuring.



Starting point for Gas Mixer is 1.210"

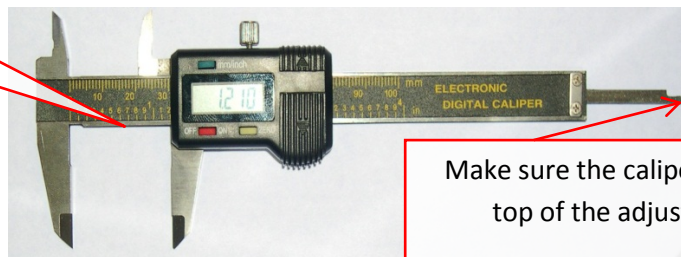


Gas Mixer adjustment screw



Do not tilt caliper when measuring

Starting point for Gas Mixer is 1.210"



Make sure the caliper is touching the top of the adjustment screw.



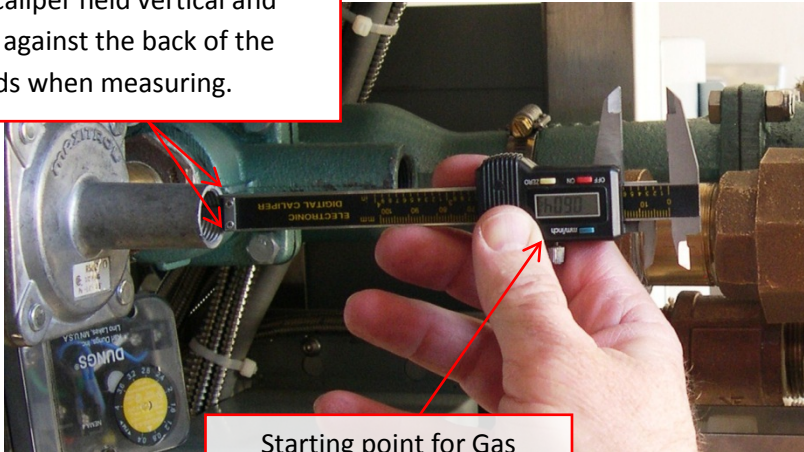
3200 Dutton Ave. #413, Santa Rosa, CA 95407 Phone (707) 526-7215 [www.smartroaster.com](http://www.smartroaster.com)



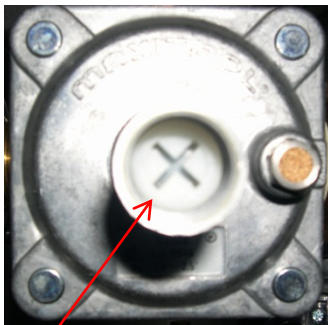
# ADJUSTING THE A15 GAS REGULATOR WITH A DIAL CALIPER

Note: ALWAYS take an accurate measurement and write it down before making any adjustments.

Make sure both corners are touching with the caliper held vertical and flush/flat against the back of the threads when measuring.



Starting point for Gas Regulator is 0.500"

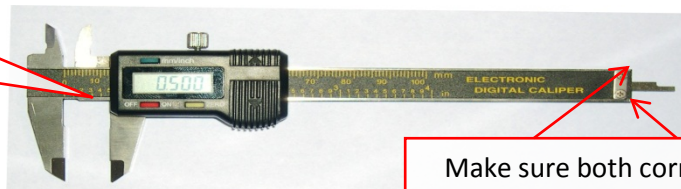


Gas Regulator adjustment screw



Do not tilt caliper when measuring

Starting point for Gas Regulator is 0.500"



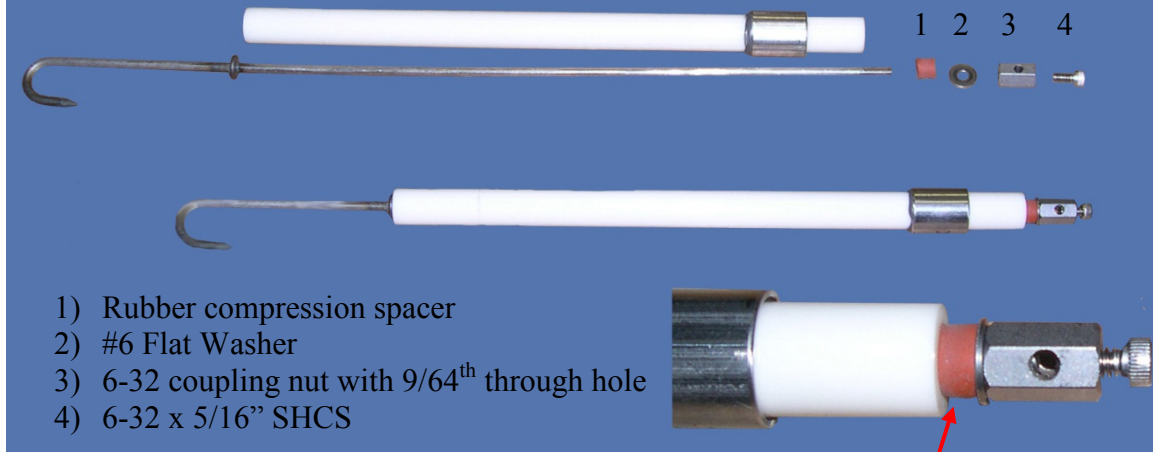
Make sure both corners are touching the top rim of the adjustment screw threads



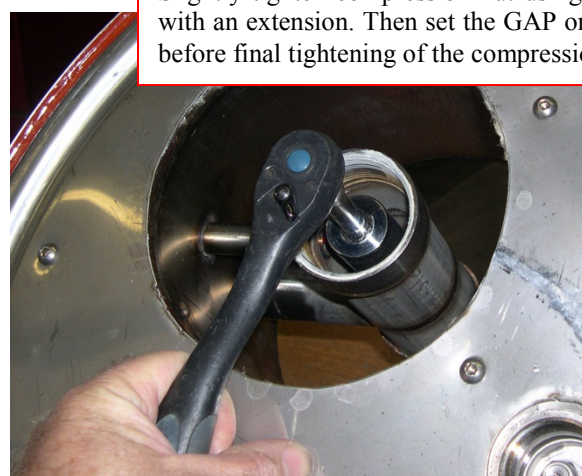
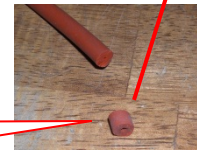
3200 Dutton Ave. #413, Santa Rosa, CA 95407 Phone (707) 526-7215 [www.smartroaster.com](http://www.smartroaster.com)

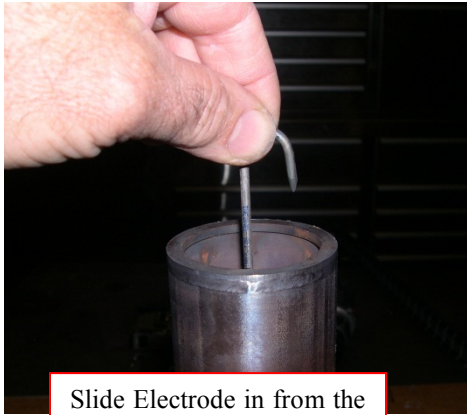
# Burner, Electrode and High Tension Wire

## Electrode Assembly Parts

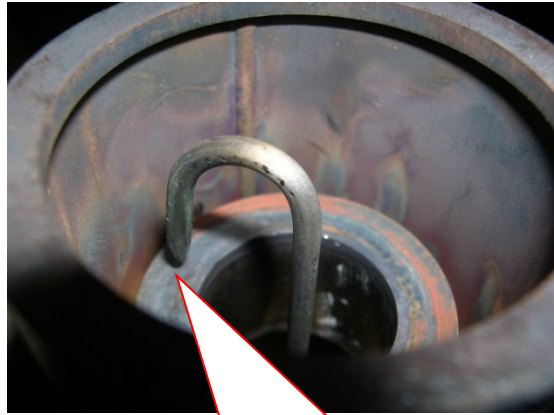


Cut rubber compression spacer long enough to keep tension on the electrode so that it will not rotate while in operation.



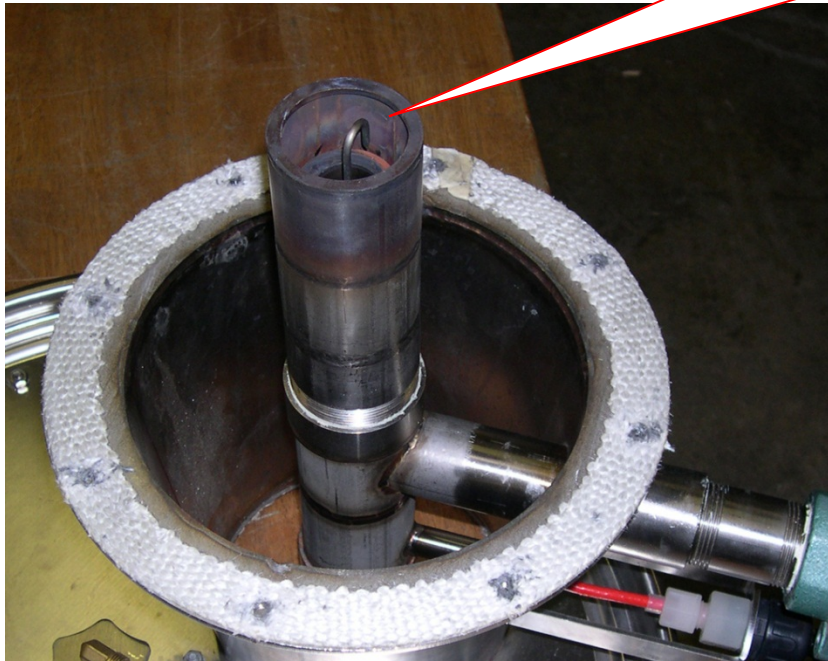


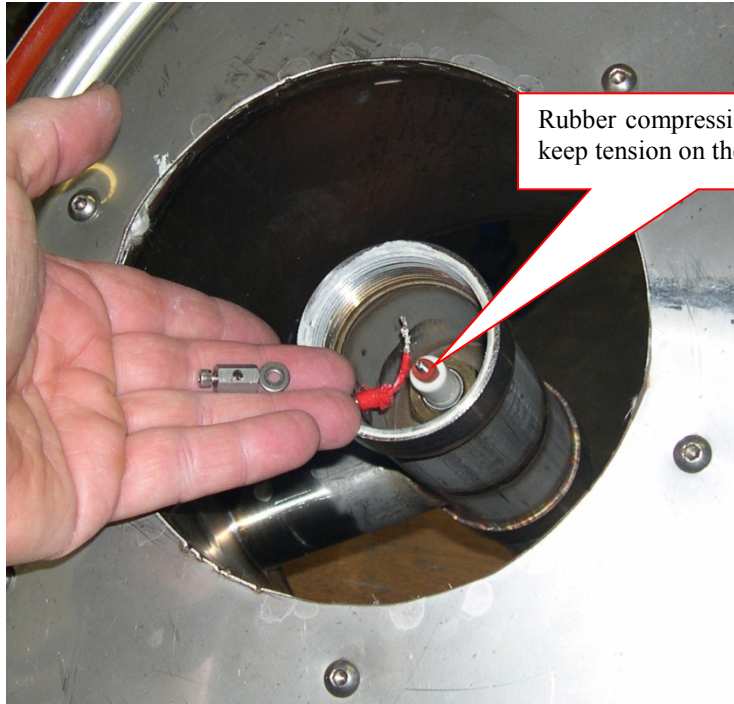
Slide Electrode in from the top through the Ceramic



Set Gap to .060" then tighten the brass compression nut on other end. Recheck the gap after tightening the nut.

Turn the hook of the Electrode away from view window on the Cyclone, as seen in picture.

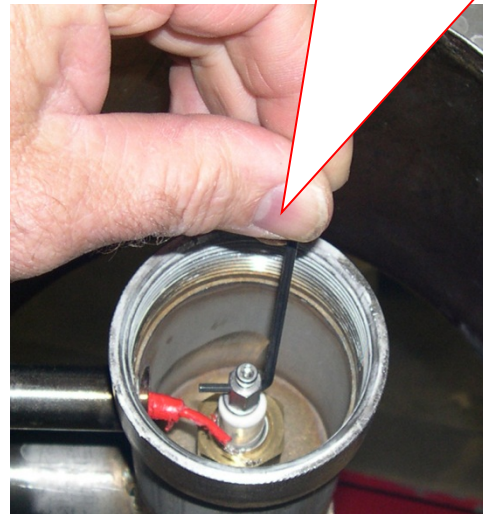
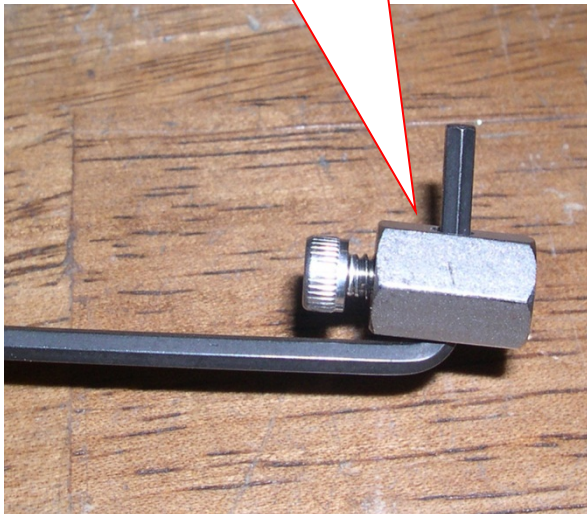




Rubber compression sleeve, used to keep tension on the Electrode nut.

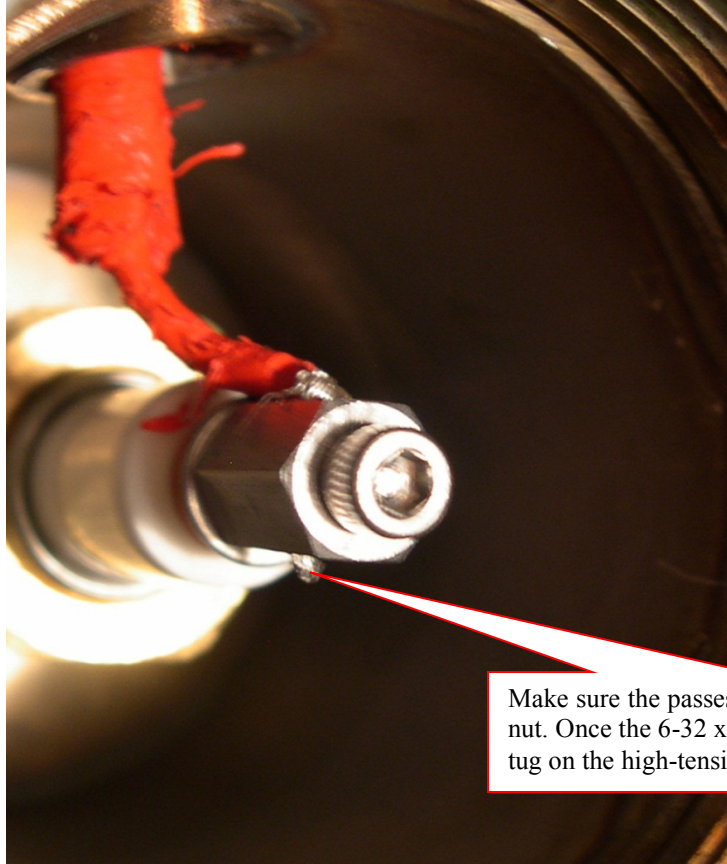
Tighten the 6-32 x 5/16" screw on an Allen wrench to set the coupler nut in place.

Using the Allen wrench turn the coupler nut onto the Electrode until it bottoms out. The rubber compression spacer should now be slightly compressed causing friction to hold the spark rod in the proper rotational position. If not enough friction, you will need to cut a longer compression spacer (from silicone spark plug wire). Loosen the screw and remove the wrench.

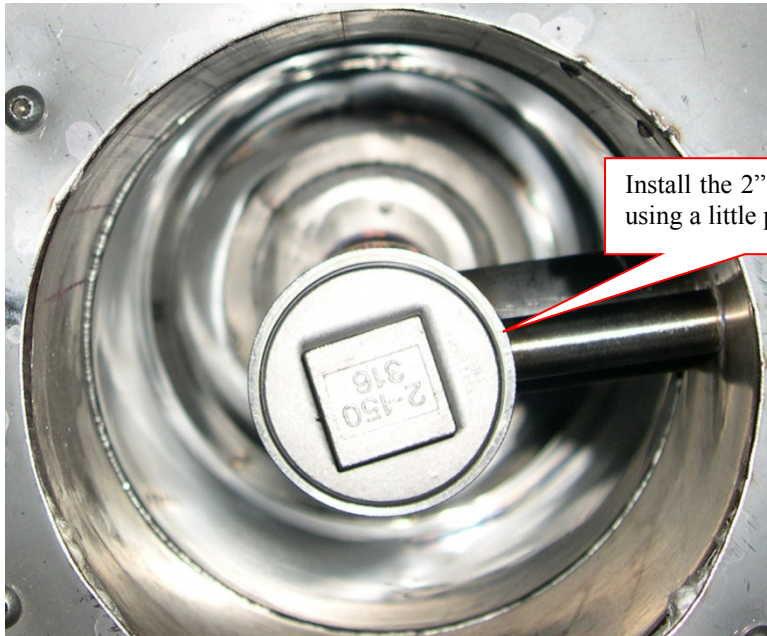




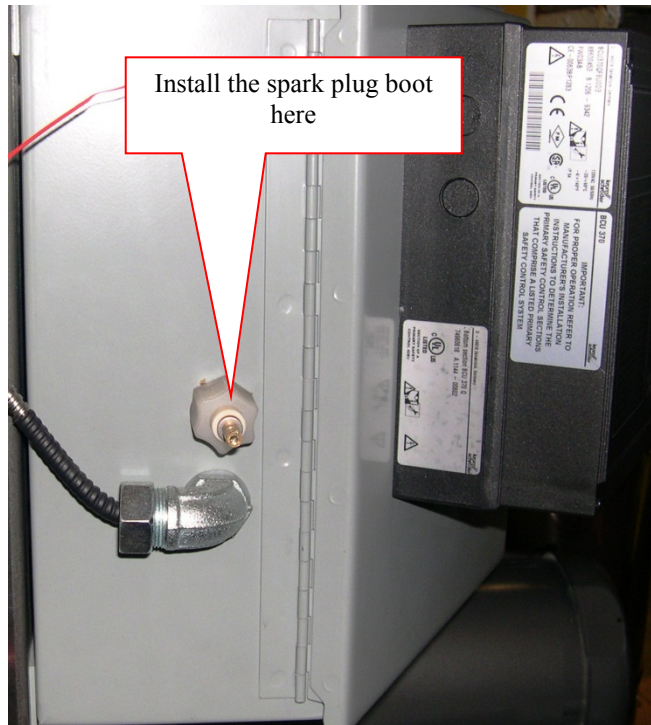
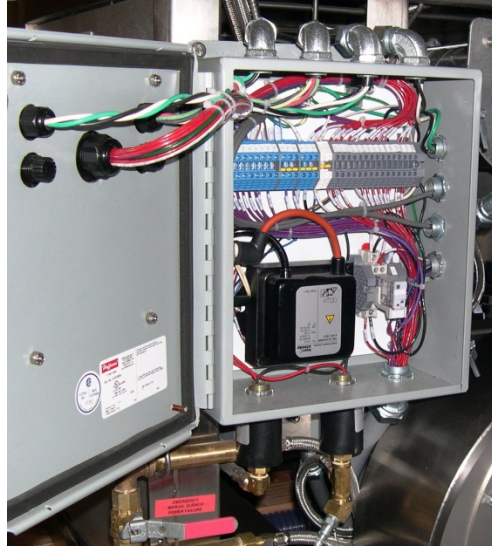
While holding the coupling nut from turning, tighten the 6-32 x 5/16 SHCS on the high-tension



Make sure the passes all the way through the coupling nut. Once the 6-32 x 5/16" SHCS is tight, give a slight tug on the high-tension wire making sure it is tight.

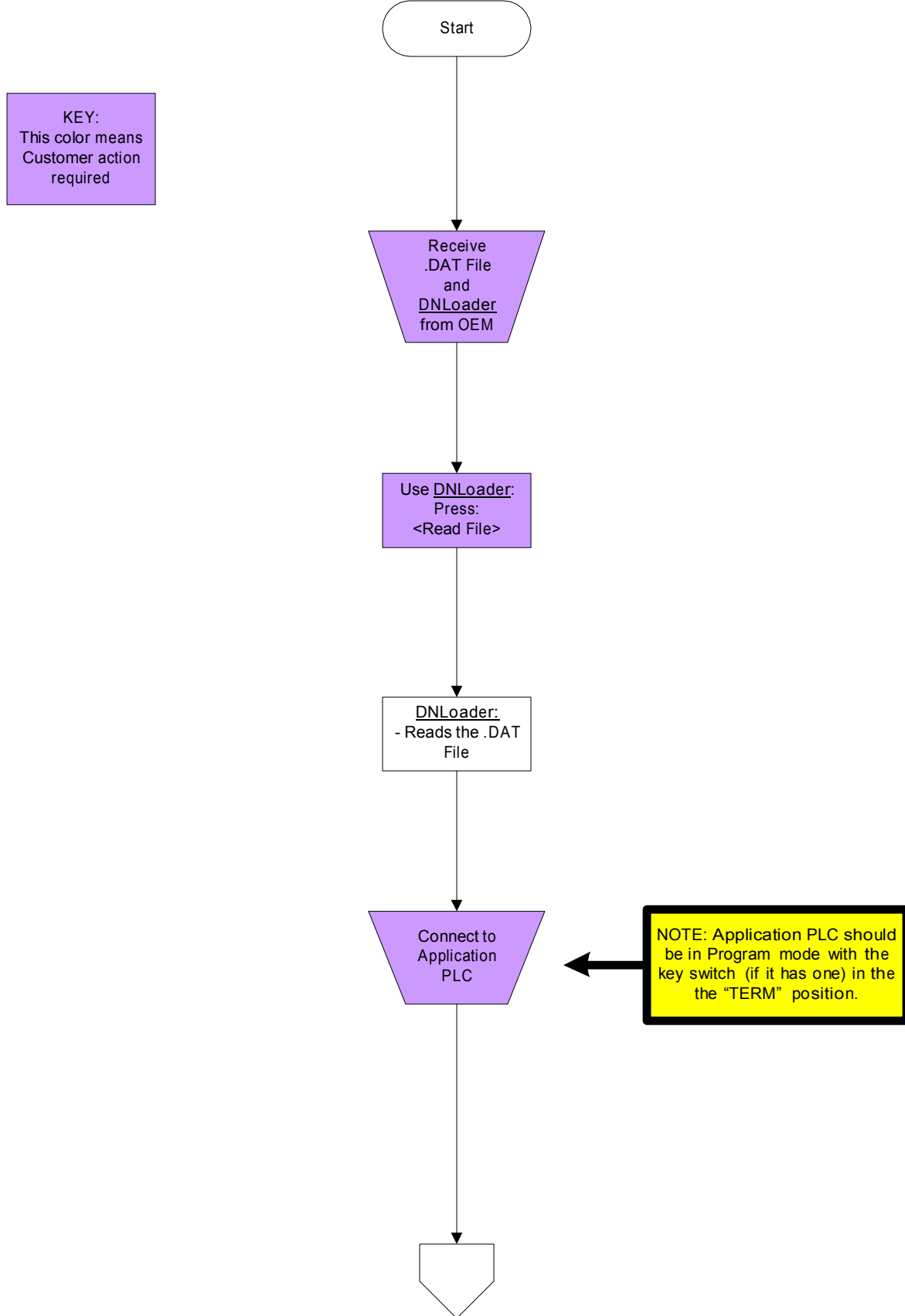


Install the 2" S/S pipe plug using a little pipe dope.



# CUSTOMER ACTION:

## Download DNLoader .DAT File to Application PLC





**KEY:**  
This color means  
Customer action  
required

