GREAT LAKES GUARDIAN™ AUTO DRAW-OFF SYSTEM 2ND EDITION INSTRUCTION GUIDE

MAKE AWESOME MAPLE SYRUP.

QUICKER.

Vital information, such as stack and syrup temperatures, will now be available at a glance. The stack temperature reading will help you maintain an even boil for increased fuel efficiency. The syrup temperature reading will indicate how close your syrup is to finishing, eliminating the need for tedious hydrometer readings. When the syrup is ready, draw-off is automatic and effortless.

SAFER.

Overcooking a pan full of syrup — or worse, scorching and warping a pan — is a costly mistake. With the Great Lakes Guardian Auto Draw-Off System, an alarm will sound if the syrup temperature exceeds your safety setting, and a status light will alert you if you've reached your stack temperature's high limit. Also, the Accessory Outlet can be used to activate additional warning systems or can even add emergency sap to your pan. Peace of mind is a beautiful thing.

SMARTER.

Smoky Lake Maple Products has built a reputation for itself through unparalleled quality, beautiful craftsmanship and intelligent design. We confidently stand behind every one of our auto draw-off units with a two-year limited warranty and personal customer support. You have made a smart investment.

This Is What It Boils Down To™..

TABLE OF CONTENTS

WARNINGS

WARNINGS

- Electrical hazard. Keep moisture away from the electrical outlets.
- Never immerse electrical components in water. To clean, unplug and wipe with a clean, damp rag.
- Never put fingers or other foreign objects into the opening of the Automated Draw-Off Valve or into any electrical outlets.
- Extreme heat can damage the Command Center and/or the Automated Draw-Off Valve's Control Head. Position both the Command Center and Automated Draw-Off Valve's Control Head as far from the heat as possible.
- In your first draw off of the day, it is recommended to verify the density of the syrup with a hydrometer and Murphy Compensation Cup.
- Make sure that sap is fully covering the floor of your pans at all times. Lack of liquid during a boil will damage your pans.
- Wear protective gloves, apron, goggles, etc., to prevent burns while working near hot maple sap/syrup and hot equipment.
- Opening or tampering with internal mechanisms of the Command Center or making other alterations to this equipment will void warranty.
- The Great Lakes Guardian Auto Draw-Off System may cause feelings of invincibility. However, never leave your evaporator unattended. You are still in command. The Great Lakes Guardian is your assistant.
- Smoky Lake Maple Products, LLC can not be held responsible for malfunctions, damages, injuries or loss of revenue occurring as a result of improper usage of the equipment or general lack of supervision of the evaporator. For details of warranty and coverage, visit us at SmokyLakeMaple.com or see the Warranty section on page 46.

COMPONENTS

COMPONENTS

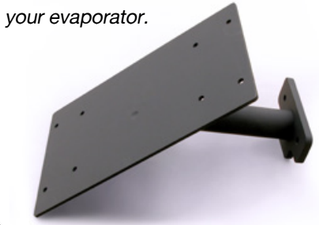
1. **Command Center**
   Durable, customizable and easy to use.
2. **Syrup Probe**
   Designed and assembled by Auber Instruments; known and trusted worldwide for their high-quality precision instruments. Construction is food grade stainless steel and the cord offers 20' of reach.
3. **Syrup Probe Fitting**
   Durable stainless steel. Locks the Syrup Probe into the perfect position in your pan.
4. **Automated Draw-Off Valve (Model SL3P)**
   Stainless steel, full port and available in two sizes: 1" or 3/4" NPT. Unlike traditional solenoid valves, the SL3P valve operates using controlled power. This subdues syrup surging when it opens and ensures a reliable seal when it closes.
5. **Stack Probe**
   Constantly measures the temperature in your smoke stack. Tested and calibrated for optimal performance. Please note some discoloration on the metal is normal and occurred during testing.
6. **Stack Probe Fitting**
   Attaches your Stack Probe to your smoke stack.

OPTIONAL VALVE ASSEMBLY

For more details, see page 14 of this manual or contact us at SmokyLakeMaple.com.

OPTIONAL EVAPORATOR MOUNT

Conveniently secures your Command Center onto your evaporator.



9 | THE CUPOLA AT WHATAVIEW FARM IN PHELPS, WISCONSIN

GENERAL SETUP

GENERAL SETUP

Gather These Tools:

- Four screws or hooks *(Used to fasten your Command Center to the wall. A Smoky Lake Evaporator Mount will come with necessary hardware.)*
- Handheld drill with 1/4" and 1/8" drill bits
- Phillips screwdriver
- Wrench
- Marker
- Teflon plumber's tape

1 **Mount the Command Center near your evaporator's finishing pan.**

- ✔ See Figures A and B on page 12 for mounting examples.
- ✔ Position within your line of sight
- ✔ Within reach for the Syrup Probe, Stack Probe, and the Automated Draw-Off Valve
- ⃠ Keep away from moisture
- ⃠ Keep away from excessive heat

2 **Connect Syrup Probe to the Command Center.**

- Loosen the three center screws on the Probe Connection Bracket on the Command Center.
- Slide each wire from the Syrup Probe underneath its corresponding screw. *(The two red wires are **interchangeable**. In some cases, the white wire is **blue**.)*
- Retighten the screws.

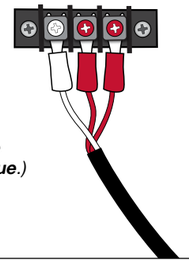


FIG. A)
The Command Center can be secured to the side of your evaporator using a Smoky Lake Evaporator Mount.This puts all valves and instrumentation in one line of sight.

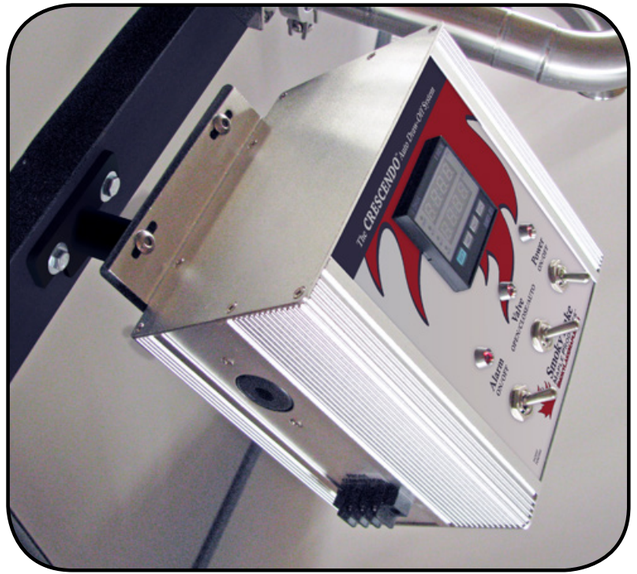
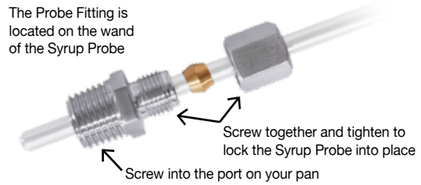


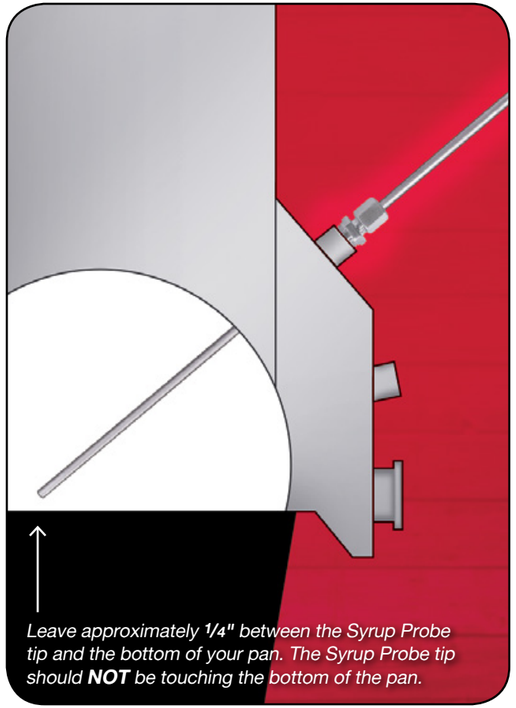
FIG. B) *The Great Lakes Guardian Command Center could be mounted to a nearby wall as shown above.*

3 Connect the Syrup Probe to your evaporator.

- The Probe Fitting is made up of three parts. Arrange these parts on your Syrup Probe as shown below.



- Insert the stainless steel wand of the Syrup Probe into your pan's thermometer port or auto draw-off port. (The port is located where the syrup is drawn off of the evaporator.) Then screw the bottom of the Probe Fitting into the port.
- Make sure the tip of the wand is within 1/4" of the bottom of your pan, but NOT touching the bottom of the pan. Then screw the top and bottom stainless steel pieces of the Probe Fitting together. Tighten gently with a crescent wrench to secure the Syrup Probe's position. Overtightening will result in lack of adjustability.



4 Mount the Automated Draw-Off Valve to your evaporator pan's draw-off port.

(Mounting configurations may vary based on different evaporators or personal preferences. Regardless of your configuration, please note the below points.)

- Remove and discard the white, plastic plug(s) located on your Automated Draw-Off Valve (if applicable).
- Use plumber's tape on all connection threads to enhance seal and prevent thread binding.
- Your mounting configuration should include a Master Open/Close Valve and Manual Bypass *(see illustration on right).*
- Using the Master Open/Close Valve as a throttle, strive to draw off syrup in a slow, controlled stream. Make your draws as long and continuous as possible. This will help boost syrup quality and efficiency of operation. It will also help stabilize the evaporator, making it easier and more enjoyable to operate.

⚠ **Never pull or put pressure on the Valve Control Head. Instead, grip the stainless steel part of the Automated Draw-Off Valve with a wrench to tighten.**

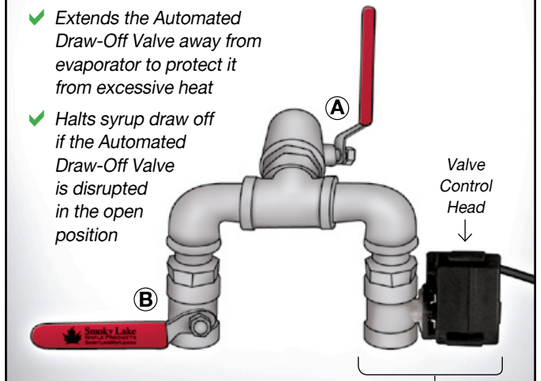
SAMPLE CONFIGURATION

A) Master Open/Close Valve

- *Connects to your evaporator's draw-off port*
- *Throttles back the draw-off speed to help subdue syrup surging and mixing*
- *Extends the Automated Draw-Off Valve away from evaporator to protect it from excessive heat*
- *Halts syrup draw off if the Automated Draw-Off Valve is disrupted in the open position*

B) Manual Bypass

- *Allows you to draw off syrup when the Command Center is off*
- *Take density samples while boiling*



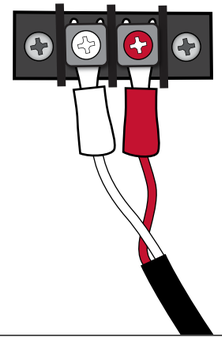
To learn more about this Optional Valve Assembly, visit SmokyLakeMaple.com.

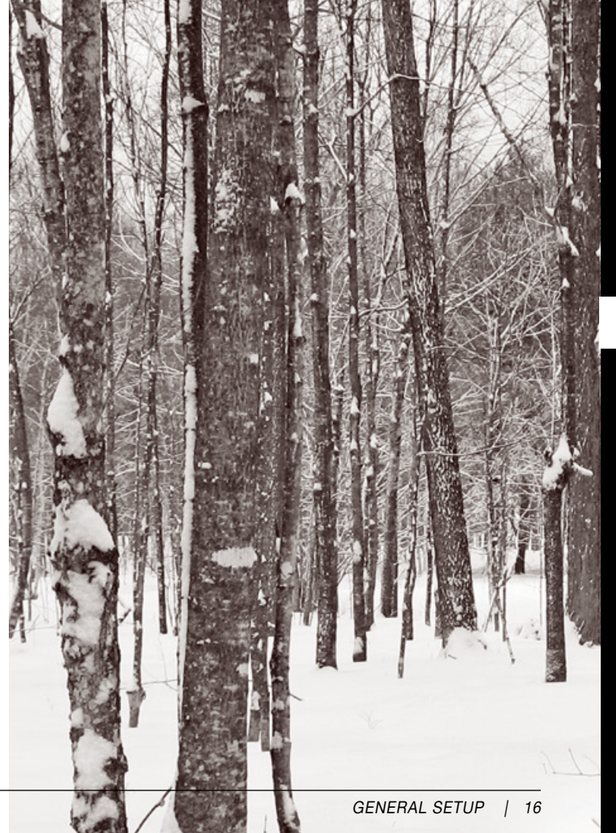
A) *Connection for Stack Probe*
B) *Connection for Syrup Probe*
C) *Connection for Automated Draw-Off Valve (Model SL3P)*
D) *Command Center connects to power outlet*
E) *Accessory Outlet which activates with alarm*

5 **Connect the Automated Draw-Off Valve to the Command Center.**

- Unscrew the cap covering the SL3P outlet on the Command Center.
- Line up the three pins inside the plug with the three holes inside the outlet and insert until snug.
- Secure the plug to the Command Center by pushing the plug's outer sheath forward and screwing it onto the outlet. **WARNING: Overtightening will result in internal damage of the Command Center.**

6 **Connect the Stack Probe to the Command Center.** The connection is similar to that of the Syrup Probe except this time there is only one white wire and one red wire.





NOTE: We strongly recommended reading steps 7 and 8 completely before proceeding.

7

Attach the Stack Fitting to your smoke stack.

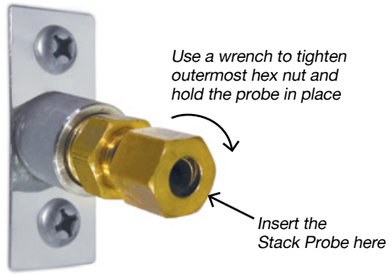
- Identify the best location to install your Stack Probe *(see the illustration on page 18)*.
  - ✔ Between 18" – 4' above the top of your arch.
  - ✔ If possible use the cylindrical section of your smoke stack rather than the rectangular base.
  - ✔ The location must allow the Stack Probe tip to reach the center point of the smoke stack.
  - 🚫 If you have a Concentric Exhaust System, install the stack probe near the top of your tappered Base Stack; NEVER tap into the Concentric Exhaust Hub or Pipes.
- Drill a 1/4" hole in the stack where you want your Stack Probe to be inserted.
- Align the Stack Fitting over the center of this first hole and mark the location of the smaller holes with a marker.
- Set the Stack Fitting aside. Using a 1/8" drill bit, drill the two holes you just marked.
- Attach the Stack Fitting to the smoke stack using the stainless steel screws provided.

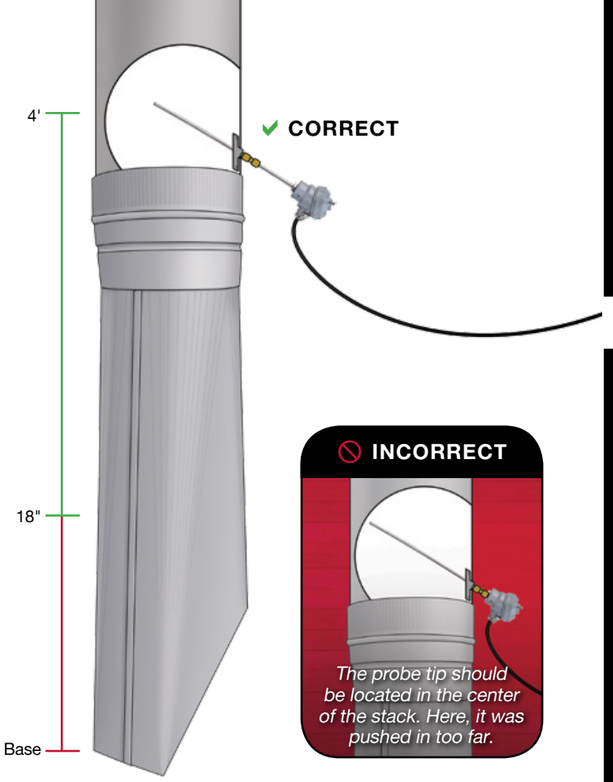
8

Insert the Stack Probe into the Stack Fitting.

- If necessary, twist the outermost brass hex nut on the Stack Fitting counter-clockwise to loosen.
- Insert the Stack Probe through the brass hex nut so that its tip extends to the center of the stack pipe.
- Tighten the outermost brass hex nut on the Stack Fitting clockwise with a wrench to secure it in place.

⚠ **Do NOT allow the Stack Probe's cord to touch the Stack Pipe or Arch. Extreme heat can melt the cord.**





9 **Plug the Command Center into a power outlet and flip the power switch to the ON position.** Then wait 10 seconds as it boots up and runs through its calibration screens.

10 **Flip the VALVE switch on the Command Center to AUTO for automatic operation.** *(Check your system's draw-off setting before relying on the AUTO mode. See pages 23 – 24 for more information.)*

11 **Customize the safety setting and flip the ALARM switch on the Command Center to the ON position.** *(See pages 27 – 28 for more information.)*

12 **Customize the efficiency settings.** *(See pages 31 – 33 for more information.)*

Maintenance Tip: Between boils, clean the Syrup Probe tip and the Automated Draw-Off Valve with a clean rag dampened with warm water. For stubborn residue on the probe tip, soak the tip in vinegar to loosen. Flushing the valve with warm water as you open and close it will ensure long service life.

LOCATION OF SETTINGS AND SWITCHES

A) *Customize efficiency settings*

B) *Customize draw-off and safety settings*

C) *ALARM switch in the ON position*

D) *VALVE switch in the AUTO position*

E) *POWER switch in the ON position*

21 | MAPLE SAPLING ADORNED WITH A FRESH BLANKET OF SNOW

DRAW-OFF SETTING

DRAW-OFF SETTING

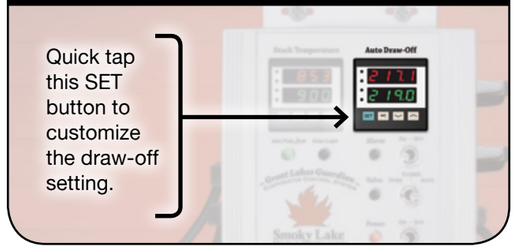
Your Great Lakes Guardian Auto Draw-Off System came from the factory with a draw-off setting of 219°F (displayed in green). In most cases this will be a good starting point for your draw-off temperature. However, personal preferences as well as environmental factors can make the ideal temperature fluctuate.

The easiest way to determine your ideal temperature is to use a hydrometer or refractometer to test the density of your first syrup drawn off and then make adjustments accordingly.

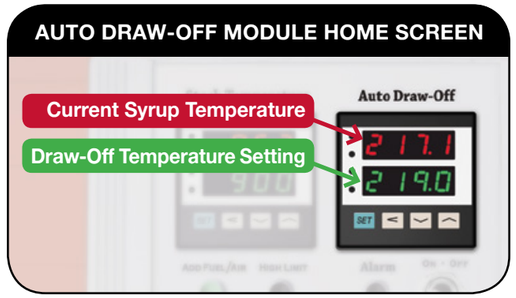
For example, if you draw syrup off at 219°F and then determine that the syrup is more dense than desired, customize your draw-off setting to be **lower** than 219°F.

NOTE: To reclaim perfect density of syrup that has been boiled a little too long, slowly mix sap or distilled water into it until its density meets your satisfaction.

LOCATION OF AUTO DRAW-OFF MODULE



AUTO DRAW-OFF MODULE HOME SCREEN



To customize draw-off temperature:

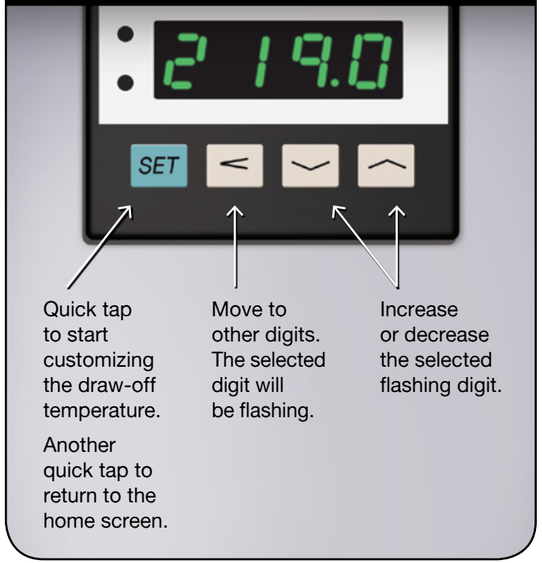
NOTE: Perform the General Setup before customizing your draw-off setting. See pages 11 – 19.

1. Give the SET button on the AUTO DRAW-OFF module one quick tap. Then use the up and down arrow buttons to adjust the draw-off temperature (shown in green) in increments of a tenth of a degree.

2. To make larger adjustments to temperature, use the left arrow button to move to other digits. You can then adjust those digits with the up and down arrow buttons.

3. Give the SET button a quick tap to return to the home screen.

CUSTOMIZING THE DRAW-OFF SETTING

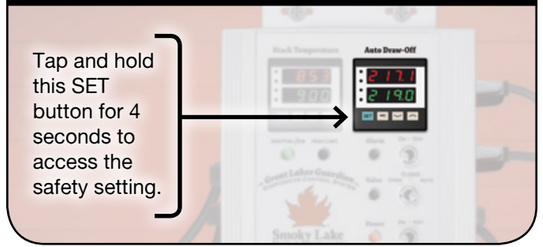


25 | SNOWSHOEING IN THE SUGAR BUSH, IRON RIVER, MICHIGAN

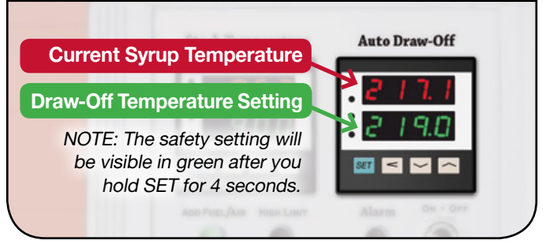
SAFETY SETTING

SAFETY SETTING

LOCATION OF AUTO DRAW-OFF MODULE



AUTO DRAW-OFF MODULE HOME SCREEN



All Smoky Lake Maple Products Auto Draw-Off Systems come with a built-in audible alarm. The factory preset will sound the alarm if your syrup's temperature exceeds your draw-off setting by 3ºF or more. You can, however, easily customize this safety setting to sound the alarm at a different temperature.

To customize the alarm safety setting:

NOTE: Perform the General Setup before customizing your safety setting. See pages 11 – 19.

1 First, take note of your draw-off temperature setting, displayed in green on the AUTO DRAW-OFF module on the Command Center *(see the illustration to the left).*

Then, hold the AUTO DRAW-OFF module's SET button for 4 seconds. The number that will appear is the differential between your draw-off temperature and your alarm temperature. For example, if your draw-off temperature setting is 219ºF and your alarm setting is 3, that means the alarm will sound at 222ºF (219º + 3 = 222º).

2 Adjust the differential as you desire using the up and down arrow buttons.

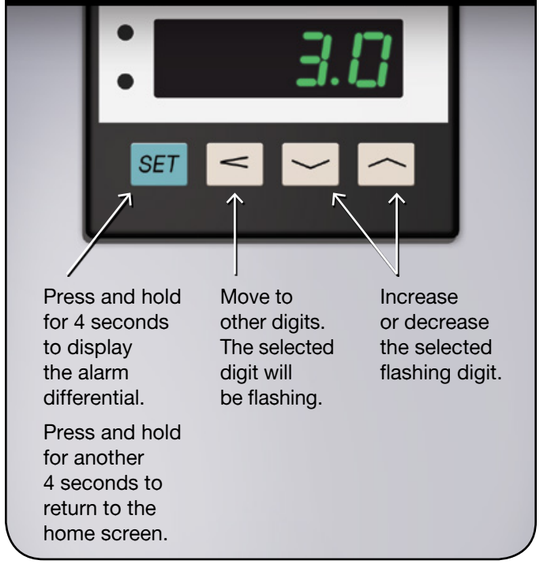
NOTE: Setting the differential to 0 will make the alarm sound whenever syrup is being drawn off.

3 Hold the SET button for 4 seconds to return to the home screen OR after 30 seconds, the computer will automatically return to the home screen on its own.

*NOTE: If you quick tap the SET button, you will toggle to the LCY mode. Do NOT make changes to the LCY mode. It should **always be zero**. To return to the auto draw-off module's home screen from the LCY mode, hold SET for 4 seconds.*

⚠ **If the audible alarm sounds while you are boiling, give your evaporator immediate attention.** *See page 42.*

CUSTOMIZING THE SAFETY SETTING



29 | YOUNG MAPLE CROWNED WITH SNOW

EFFICIENCY SETTINGS

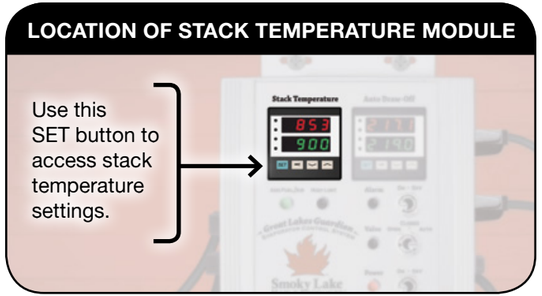
EFFICIENCY SETTINGS

Your Great Lakes Guardian will diligently monitor the temperature in your stack so that you can maintain your heat within a target zone. This will help you maintain a nice even boil for great fuel savings.

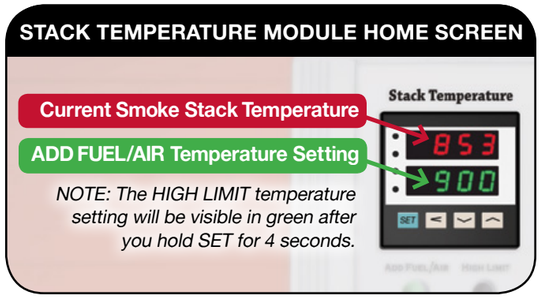
The ADD FUEL/AIR status light on the Command Center tells you when to add more heat (factory preset is 980ºF). The HIGH LIMIT status light tells you when your evaporator is being run too hot (factory preset is 1500ºF). These temperature settings can be easily customized to suit your personal preferences.

NOTE: Perform the General Setup before customizing your efficiency settings. See pages 11 – 19.

LOCATION OF STACK TEMPERATURE MODULE



STACK TEMPERATURE MODULE HOME SCREEN



NOTE: The HIGH LIMIT temperature setting will be visible in green after you hold SET for 4 seconds.

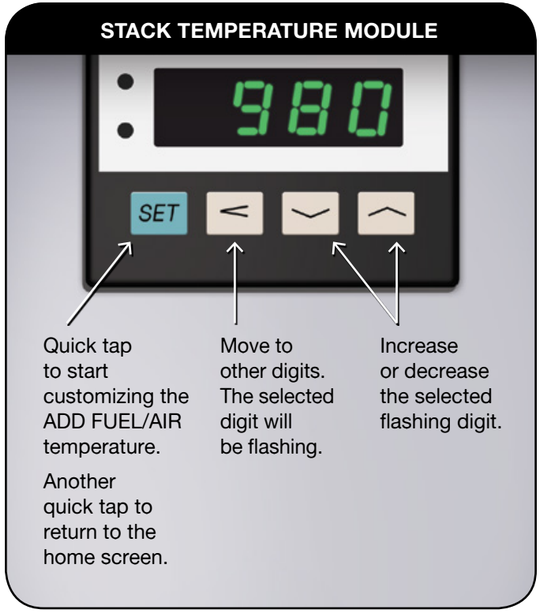
To customize the ADD FUEL/AIR setting:

1. Give the SET button on the STACK TEMPERATURE module one quick tap. Then use the up and down arrow buttons to adjust the flashing digit.

2. To make larger adjustments to temperature, use the left arrow button to move to other digits. You can then adjust those digits with the up and down arrow buttons.

3. Give the SET button a quick tap to return to the home screen.

STACK TEMPERATURE MODULE



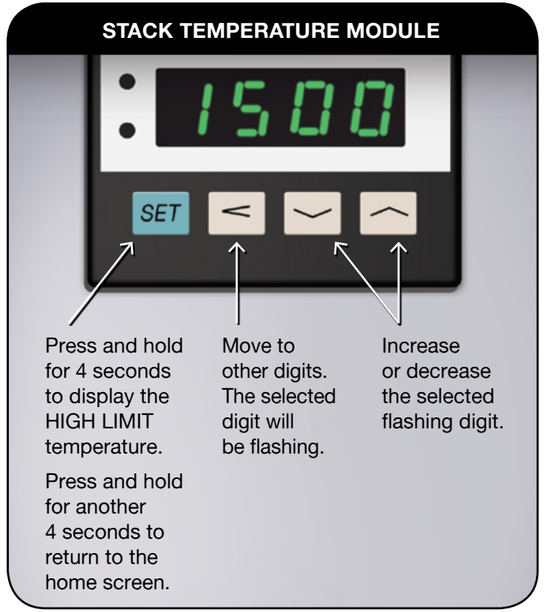
To customize the HIGH LIMIT setting:

1. Press and hold the SET button on the STACK TEMPERATURE module for 4 seconds. Then use the up and down arrow buttons to adjust the flashing digit.

2. To make larger adjustments to temperature, use the left arrow button to move to other digits. You can then adjust those digits with the up and down arrow buttons.

3. Press and hold the SET button for 4 seconds to return to the home screen OR after 30 seconds, the computer will automatically return to the home screen on its own.

*NOTE: If you quick tap the SET button, you will toggle to the LCY mode. Do NOT make changes to the LCY mode. It should **always be zero**. To return to the stack temperature module's home screen from the LCY mode, hold SET for 4 seconds.*



ACCESSORY OUTLETS

ACCESSORY OUTLETS

As discussed in the previous chapter, an audible alarm will sound whenever temperatures in your syrup pan reach or exceed your safety setting. In addition to the audible alarm, your Great Lakes Guardian's ALARM/ACCESSORY outlet can activate an auxiliary safety device as well. You can use this feature to perform a multitude of helpful functions. We offer two great ideas on page 36. However, the outlet's use is limited only by your imagination.

To activate an auxiliary device with your safety setting:

1. Adjust your safety setting to determine when your auxiliary device will activate (*see pages 27 – 28).*
2. Plug your desired auxiliary device into the ALARM/ACCESSORY outlet on the right side of the Command Center *(see illustration to the right).*
3. Flip the ALARM switch on the front of the Command Center to the ON position.

ACCESSORY OUTLET ACTIVATES WITH ALARM

If the auxiliary device activates while you are boiling, give your evaporator immediate attention.
See page 42 for more information.

Ideas for usage*:

Automatically add more sap whenever the alarm sounds.

If your syrup gets much too dense or if there is not enough liquid covering the floor of your pan, this could result in serious damage to your pan. In either scenario, it would be imperative to add more sap to the pans right away to help prevent warping or scorching.

- Using plumber's tape, attach a power-activated valve to the draw-off port on a feed tank *(sold separately).*
- Plug the power-activated valve into the Accessory Outlet on the Command Center.
- Fill the feed tank with raw sap or water. Position the tank so that if the Command Center's safety setting is activated, the sap or water will be released into the evaporator pan.

Automatically activate a *visual* alarm — such as a bright light — whenever the alarm sounds.

This solution is perfect in scenarios where an audible alarm cannot be heard easily.

- Overcome environments containing other loud noises.
- Assist operators who are hearing impaired.
- Alert helpers who are outside the boiling room (assuming you mount the light in a place where it can be seen).

** Above are just two ideas for enhancing safety with the ALARM/ACCESSORY outlet. However, your Accessory Outlet can activate any device with a standard 120V plug.*

37 | ANDREW DOLSEN AND HIS SON MAKING SYRUP IN MADISON, OHIO

FREQUENTLY ASKED QUESTIONS

FREQUENTLY ASKED QUESTIONS

GENERAL QUESTIONS...

How do I purchase extra fittings or spare parts?

If there is a fault in any component that is under warranty, see page 46 of this manual. If you are seeking additional fittings or spare parts, contact your dealer or visit us at SmokyLakeMaple.com.

What can I be doing to properly maintain my Great Lakes Guardian during and after the maple season?

Clean the Syrup Probe with a piece of emory cloth to remove all sugar sand deposits. This will ensure continued accuracy.

Clean the Automated Draw-Off Valve by removing the valve from the Control Head and soaking it. This will keep the valve operating freely, and reduce strain on the Automated Draw-Off Valve's Control Head. NEVER immerse the Control Head in water.

Why does the Great Lakes Guardian Auto Draw-Off System monitor syrup temperature?

Boiling temperature is an indicator of your syrup's density. Maple syrup finishes at 7ºF above the boiling point of water, about 66.9% sugar density. Note that the boiling point of water can fluctuate based on elevation, aeration and other variables.

Why isn't my auto draw-off showing the correct syrup temperature?

To narrow down the problem, select one of the following three symptoms shown in bold.

1) **The number on the Command Center is bouncing around.**
   - Clean the Syrup Probe
   - Adjust the Syrup Probe's position so that its tip is within 1/8 to 1/4 inch of the bottom of the pan. Note that it should NOT be touching the bottom of the pan.
   - Adjust the depth of the sap in your evaporator pan so that at least 1 – 2 inches of the Syrup Probe is immersed at all times.
   - Remove any other tools or elements which could be influencing or creating the temperature fluctuations.
   - Make sure the Syrup Probe is connected to the command center securely.
   - Make sure the Syrup Probe's cord is not leaning up against the evaporator or is not otherwise damaged/melted.

2) **The temperature is just consistently higher or lower than what I believe it should be.**

   The boiling point of your syrup is influenced by barometric pressure, altitude, etc. This means your syrup will NOT always reach perfect density at 219ºF. You may need to make adjustments to your draw-off setting each day due to the way atmospheric pressures are affecting the boiling point. Use a Murphy Compensation Cup and hydrometer to verify density and draw-off temperature.

   That being said, the auto draw off temperature reading is customizable and can be adjusted to your preference. See our instructional video at tinyurl.com/adjust-temp

3) **The screen is showing dashes at high temps.**

   This could be a problem with the connection. Flip flop the connection wires. In other words, instead of connecting the red wire into the red screw. Try connecting the red wire to a white screw. This will determine whether or not the colored screws had been seated in the opposite connection port by accident.

   If and only if you have ruled out any problem with the connection, there is a possibility that the probe may need to be replaced. Smoky Lake Maple Products offers a 2-year limited warranty. Contact us at SmokyLakeMaple.com for personal technical support. Please note that you may need to provide a dated copy of your receipt to receive replacement parts.

DRAW-OFF QUESTIONS...

Why is my syrup temperature rising during draw off?

It is very common for the temperature to rise about 2ºF above the set point on the first draw off of the day due to some mixing that may have occurred since your last boiling day. The temperature may rise slightly during subsequent draw offs too, but not as much.
If the syrup temperature consistently rises too high for your preferences, lower the system's draw-off temperature setting so that it starts drawing off syrup sooner.

When does the Automated Draw-Off Valve close?

The valve will automatically close when the syrup temperature is 0.2ºF below your draw-off setting. This is the factory preset and is in place to prevent short cycling.

ALARM QUESTIONS...

How do I know if the syrup is too hot?

Your syrup's current temperature is displayed in red on the Command Center. The boiling temperature of maple syrup gets higher as it becomes more dense. It is done boiling when it reaches 7ºF above the boiling point of water. *(Note that the boiling point of water will fluctuate based on environmental factors.)*

An audible alarm will sound when your syrup temperature reaches or exceeds your safety setting. The factory preset for this safety setting is 3ºF above your draw-off temperature.

How do I silence the alarm?

You can silence the alarm by flipping the Command Center's alarm switch to the OFF position. If you do not do this, the alarm will turn itself off when the syrup temperature drops back below your safety setting.

Silencing the audible alarm will NOT deactivate your accessory device.

What should I do when the alarm sounds and/or my auxiliary device activates?

Immediately decrease the heat in the firebox — turn off air blowers, reduce draft and/or turn off the gas/oil burners — and then analyze the situation.

- First, make sure there is at least 1 – 2 inches of syrup depth in your front pan. If not, add sap immediately to prevent scorching.
- Inspect/open the draw-off valve.
- Check/increase your float box's sap depth (if applicable).
- Make sure all valves connecting the front and back pan are open and clear (if applicable).
- Make sure there is still sap in your head tank feeding the pans.

It is impossible to anticipate and address every possible scenario in this guide. Always monitor sap availability, sap/syrup depths and syrup/stack temperatures in order to protect your syrup and your equipment.

If your syrup is *NOT* excessively hot but the alarm is sounding anyway, you may need to adjust your alarm's safety setting as explained on pages 27 and 28. Also, check the connections between the Syrup Probe and the Command Center to make sure they are secure.

NOTE: Smoky Lake Maple Products, LLC offers sight glasses and other instruments which monitor sap depths and other crucial aspects of your evaporator. See SmokyLakeMaple.com or your local Smoky Lake dealer for details.

I am having trouble customizing my safety setting. What should I do?

From the home screen of the AUTO DRAW-OFF module, press and hold SET for 4 seconds to access the safety setting. From there, quick tap SET. The LCY mode will appear. Change the LCY mode to 0. Then, quick tap SET to return to the safety setting.

EFFICIENCY QUESTIONS...

How do I find my optimal efficiency setting?

You can ask ten different sugar makers what their preferred stack temperature is and you will likely get ten different answers. Everyone's setup is a little different, and there are a lot of variables which influence this answer.

Keeping all other variables the same, take note of the amount of wood required to achieve different stack temperatures as well as the evaporation rate at each of those stack temperatures. Divide the number of gallons evaporated in an hour by the amount of fuel used. Whichever yields the largest number is your most efficient stack temperature.

Other things to consider include:

- A rolling boil should not toss sap out of your pan. Keep sap contained.
- If you are low on sap, you may want to run at a lower temperature in order to be able to shut down quicker and/or maintain greater control.

I am having trouble customizing my efficiency setting. What should I do?

In order to customize the efficiency setting, the LCY mode must be set to 0. From the home screen on the STACK TEMPERATURE module, press and hold SET for 4 seconds. The efficiency setting will appear. From there, give the SET button another quick tap to toggle to the LCY mode. Change the LCY mode to 0. Then, quick tap SET to return to the efficiency setting.

Besides maintaining stack temperature, what other things can I do to run my evaporator more efficiently?

- Keep sap depth in a **drop flue pan** 1" – 2" above the top of the flues. In a **raised flue pan**, sap can be as low as 3/4" above the flues. Regardless of the style of your flue pan, the liquid in your **syrup pan** should always be about 1 1/2" deep.

List continued on next page.

- Consider adding blowers to your arch, both under the grates and over the fire.
- The floor of your arch should raise up to be within 1" from the bottom of the flues in order to force heat from your firebox up into the flues.
- Use a preheater to raise the temperature of raw sap before it enters your flue pan.
- Your pans' construction can also greatly influence efficiency. More flues = higher efficiency. Also, the thinner the stainless steel is, the better.
- Use wood with a higher BTU rating. BTU is a measurement of heat. Some species of wood such as Hickory will burn hotter than other species such as Basswood or Cottonwood. *See chart to the right.*[1]

[1]*Philbrick, F. & Philbrick, S. (2006).* The Backyard Lumberjack: The Ultimate Guide to Felling, Bucking, Splitting & Stacking. *(Page 152). North Adams: Storey Publishing.*

BTU RATINGS OF WOOD SPECIES

Wood Species	Million BTUs/cord
Hickory	27.7
Eastern Hornbeam	27.3
Black Birch	26.8
Black Locust	26.8
Apple	26.5
White Oak	25.7
Sugar Maple	24.0
White Ash	23.6
White Birch	20.3
Cherry	20.0
Black Ash	19.1
Red Maple	18.7
Box Elder	17.9
Alder	17.6
Aspen	14.7
Basswood	13.5
Cottonwood	13.5

WARRANTY

For two years from the original date of purchase, your Great Lakes Guardian Auto Draw-Off System is covered by a limited warranty against manufacturing defects. Smoky Lake Maple Products, LLC will repair or replace components which prove to be defective in materials or workmanship. For full details, please contact Smoky Lake Maple Products, LLC at **SmokyLakeMaple.com**.

Important Information:

Please fill in the following information. Also, keep a receipt/delivery slip as proof of the purchase date.

Purchase Date: _____

Purchased From: _____

Model Number: _____
(Located on the back of the Command Center.)

Serial Number: _____
(Located on the back of the Command Center.)

To Request Service:

Contact us at **SmokyLakeMaple.com** or **(920) 202-4500**. You will need the information/documentation listed in the “Important Information” column to the left. Repairs or replacements under warranty will be provided by Smoky Lake Maple Products, LLC of Wisconsin, USA.

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