SMOKIN BROTHERS ®

"A FAMILY TRADITION"

WOOD PELLET BBQ GRILLS

OWNER'S MANUAL

Premier PID Controller

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WELCOME TO THE SMOKIN BROTHERS FAMILY

Thank you for purchasing a Smokin Brothers Wood Pellet BBQ Grill. Your family BBQ will never be the same.

Your Smokin Brothers grill is a very versatile cooking machine. As you would expect, you can **GRILL** burgers and steaks. Not only grill, but **SMOKE** pulled pork, ribs, turkeys, and seafood. Plus **BAKE** pizzas and deserts to perfection. Also **ROAST** beef, pork, and poultry on this amazing grill.

Prepare every meal on your Smokin Brothers Grill. Even cook breakfast biscuits, eggs and bacon. Don't forget to cook vegetables and fruit. Making jerky is simple.

With regular maintenance and care, the Smokin Brothers Grill will last for years of trouble free grilling. It will become a permanent choice for your daily use replacing other appliances. This residential grill is for outdoor use only.

Authorized Smokin Brothers Dealers are available to provide additional Smokin Brothers products. We recommend to use Smokin Brothers 100% unblended pure wood pellets designed to be used in Smokin Brothers Grills. DO NOT USE a heating fuel pellet to cook your food. Smokin Brothers Rubs, Sauces and Accessories are available to enhance your grilling experience. Check the website for a local dealer near you. www.smokinbrothers.com

At the top of the priority list, is our commitment to manufacture the Smokin Brothers Wood Pellet Grill in the U.S.A.

This manual has been prepared to provide the necessary information to give you confidence to use your new grill to become a grand champion master griller.

Congratulations, you are the newest Smokin Brothers Grill Owner.

SECTION 1:

INTRODUCTION

Residential Wood Pellet Grill

Smokin Brothers Grills are proudly Made in America. The major body of this grill has been designed, engineered and manufactured in the United States.

Heavy duty American steel has been used for the body of this grill. All components, used to complete the finished product, are being assembled by American workers.

Smokin Brothers believes in our Country and are proud to support it by keeping jobs here in the U.S. and doing our part to sustain American traditions.

We are dedicated to providing quality barbeque products that help bring families together whether it is around the dinner table, the picnic table or just standing over the grill.

CONTACT INFORMATION

Smokin Brothers is based out of Sikeston, Missouri.

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Mail to Address: P.O. Box 1767, Sikeston, MO 63801

Distributor for Smokin Brothers Products: Double D Supply Company

COMPONENTS

Grill Parts

Meat Probe	Digital Control	Cooking Grid Sections
Auger	RTD Temperature Detector	Long Top Cooking Grid
Power Cord	Igniter Hot Rod	Drip Pan
Wheels	Combustion Draft Fan	Deflector
Bucket	Auger Motor	Fire Pot

INTERNAL PARTS ASSEMBLY

Order of Part Assembly

- Place the deflector over the fire pot located in the bottom of the grill
- Secure the drip pan at an angle on the braces located at each end of the grill
- Insert the long upper cooking grid
- Insert the lower cooking grid sections
- Hang the grease bucket on the outside hook

Parts for Premier Grills Model SB-G024P, SB-G030P, SB-G036P:
4 castors; with lock
1 handle & screws for grill lid   1 smoke cap

Assembly for Premier Grills Model SB-G024P, SB-G030P, SB-G036P:

Tools required for assembly: Phillips screwdriver #3, 3/4 inch wrench

1. Remove from the box and take everything out of the grill.
2. Remove the pallet screws that hold the grill to the pallet.
3. Move the left side of the grill to the edge of the pallet so that two of the legs are off the edge of the pallet. If you have a 2nd person they can tilt the grill back to allow for extra room to slide the castors in or you can squat and use your knee to prop the grill up allowing for more clearance to insert the castors. You can lay the grill on its back to insert all four castors, but be sure to place cardboard or something soft underneath the grill.
4. Insert one caster into each leg. Hand tighten the bolt/nut by turning the top of the castor counter clockwise and finish using the wrench to secure expanding adaptor into the leg tube..
5. You can now do the right side by removing the pallet and propping the grill up with assistance or with your knee to allow for clearance to insert the two remaining casters.
6. Install the handle on grill lid.
7. Place the smoke cap on the smoke stack and tighten the nut. Leave at least 1½ inch opening to allow the air to escape.

SECTION 2:

FIRING INSTRUCTIONS

Initial Firing Instructions

Test the internal parts of the grill to be working properly.
- Set the Cook Control Switch to the OFF position.
- Remove the grids, drip pan and deflector to expose the fire pot, auger and igniter hot rod.
- Plug the grill into AC power.
- Press the power button on the controller.
- Look into the pellet hopper to verify the auger is turning.
- Place your hand above the fire pot and verify air movement from the draft fan.
- Verify the igniter hot rod, located in the base of the fire pot, is getting hot by visual observance. DO NOT TOUCH THE IGNITER.
- Fill the hopper with Smokin Brothers pellets and place 1 cup of pellets into the firepot..
- When the grill passes the test, the parts are working properly, reassemble the internal parts. If not refer to the "Trouble Shooting" section.

You have successfully filled the auger tube with pellets and are now ready to begin the initial firing. **Recommended not to put food on the grill the first time the grill is fired**. Press the power button and allow IGN light to turn off before turning the grill to 325. Allow the grill to burn for approximately 60 minutes at 325. After completing the initial firing process you are ready to turn the grill on and begin normal cooking.

Keep an ample supply of pellets in your hopper. If pellets run out, repeat the process to fill the auger tube with pellets and turn the Cook Control Switch to the OFF position. You are once again ready to turn the grill on and begin normal cooking.

Lighting of your Smokin Brothers Grill

- Check the hopper for adequate amount of pellets.
- Set the Cook Control Switch to the OFF position.
- Plug the grill into AC power.
- Turn the Cook Control on by pressing the power button. The red ignitor light will come on and remain on until it is safe to turn your grill to your desired cooking temperature.
- Ready to begin normal cooking.

Shutting down of your Smokin Brothers Grill

- Remove all food from the Smokin Brothers Grill.
- Press the power Key to turn the grill off and open your grill.
- Allow your Smokin Brothers Grill to cool down.
- Smokin Brothers digital control is equipped with a built in cool down sequence that runs the combustion fan until the grill has reached the internal temperature of 130 degrees. It will flash "hot" then turn off when this is met.
- After the shut down sequence has concluded and your grill is completely cooled, unplug your Smokin Brothers Grill to protect from lightning and power surges.

- Cover the grill when not in use or move the grill inside to keep the pellets dry until you are ready to use again. DO NOT ALLOW PELLETS TO BECOME WET.

MANUAL LIGHTING INSTRUCTIONS

When the hot rod igniter has failed to operate by lighting the pellets, use a fire gel to manually light them to continue cooking until a replacement igniter can be installed.

WARNING!
- **Always disconnect the grill from AC power before accessing the control for service or working under the grill.**
- **Removing the control from the grill, installing the control into the grill, or working under the grill while the grill is connected to AC power could result in shock or could damage the control.**
- **AC power is present on the control at all times and is a shock hazard unless the grill is unplugged from the wall socket or AC line.**
- **Protect yourself from injury and protect the control.**

SECTION 3:

COOKING TIPS

Your Smokin Brothers Grill is an extremely versatile cooking machine. If it can be smoked, baked, grilled or roasted, you can do it on your Smokin Brothers Grill! Use only one grill to do everything.

Here are some Basic principles to remember when cooking on your Smokin Brothers Grill.

- **Similar Function** – Smokin Brothers Grills function similar to a convection oven; smoke and heat are circulated inside the grill with the use of a fan. When the lid is open the smoke and heat escape and do not allow the food to cook. Raise the lid minimally to check on the progress of your food. Thanks to the grease pan placed under your cooking grids, you do not have to worry about nasty flare ups causing unwanted fires. The grease and food drippings are drained into a bucket.

- **Smoking** – Smoking is done at the lower temperature settings of the digital control. Cooking low allows the pellets to smolder and produce significant amounts of smoke. Smoke will penetrate the meat, providing a gorgeous smoke ring and flavor. Also by cooking slow, the meat's temperature is gradually increased, which will help keep its tenderness. To reduce the amount of smoke flavor turn your grill to a higher temperature setting.

- **Baking** – Baking on your Smokin Brothers Grill is similar to baking in your conventional oven. Set the temperature to the appropriate setting at the higher end of the controller (300-350). When the appropriate temperature is achieved place your item on the grill. We have found that metal pans work better than glass and that you may have to add a few extra minutes to the cooking time.

- **Grilling -** When cooking steaks on your Smokin Brothers Grill allow the cooking grids to heat up thoroughly. You can do this by letting your Smokin Brothers Grill warm up for 20 minutes prior to placing the steaks on the grill.

Grilling Tip –
- On smoke expect to use ½ lb of pellets per hour
- On medium temperature (300-350) expect to use 1 lb of pellets per hour
- On high temperature expect to use 2 lbs of pellets per hour
- Each hopper is designed to hold a minimum of 18 lbs of pellets giving a maximum of 30 hours of cooking depending on the temperature setting and weather conditions

Questions and Answers – Smokin Brothers is available to answer questions for your cooking needs with several options –
- Contact your dealer retail outlet
- Refer to our Smokin Brothers Owner's Manual
- Refer to our Smokin Brothers Cookbook
- Contact Smokin Brothers through our contact information on the web

We take great pleasure in supporting our Smokin Brothers Family on their desire to be adventurous in their cooking and grilling experience with our wood pellet grill. Share with Smokin Brothers your grilling accomplishments and be rewarded if your recipes are used and shared on the Smokin Brothers website.

MANTAINING AND CLEANING

You will have years of trouble free grilling with our Smokin Brothers Grill, however some minor maintenance will lengthen the life or your grill.

Following are some basic maintenance items that should be performed regularly:

- The drip pan should be cleaned regularly along with the lower brace the drip pan rests on. This will reduce the risk of continued buildup of grease that can cause a fire at high temperatures. Cover the drip pan with aluminum foil for easy clean up. The foil should not overlap the sides of the drip pan blocking air flow for proper operation inside the grill.

- The grease bucket should be emptied on a regular basis to ensure no overflow and cause a significant mess on your deck or patio. For easy clean up, line the bucket with foil for grease removal.

- The grill should be vacuumed to remove ash residue. Disassemble the grill by removing the grids, drip pan, and heat deflector. Use a shop vacuum to remove the ash from the fire pot and inside of grill after cooking approximately 20 hours or consuming one 20 pound bag of pellets. This will ensure many years of care free service.

- The temperature detector inside the grill should be cleaned after each cooking along with cleaning the grids. This will ensure the proper temperature reading and will increase the life of the temperature detector.

- Wipe the over all surface of the grill with a non abrasive cleaner and cloth to remove any baked on food and grease residue.

WARRANTY DISCLAIMER

WARRANTY SHALL BE VOID IF THE FOLLOWING…

- Unit has not been operated according to manual instructions.

- Resold or traded to another owner.

- User has abused or failed to maintain the unit under normal residential use.

- Failure to disconnect electric before storing or repairing the unit.

- metal materials and protective coatings can be compromised by surface scratches or exposure to substances and conditions beyond Smokin Brothers control. Among other things, chemicals, chlorine, industrial fumes, fertilizers, extreme humidity, lawn pesticides, and sodium chloride are some of the substances that can corrode paint and finish on metal coatings. For these reasons, the Warranty on Metal, Stainless Steel and Cast Iron Components DOES NOT COVER RUST, OXIDATION, FADING, DISCOLORING, BLEMISHES or REPLACEMENT DUE TO ADJUSTMENT OR ALIGNMENT OF PARTS OR COMPONENTS"

Smokin Brothers shall not be held liable under this or any implied warranty for incidental or consequential damages.

User's Guide

SMOKIN BROTHERS PELLET GRILL

And Savannah Stoker Digital Control

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Foreword

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Product Reference   **Smokin Brothers, Inc.** Digital Controller
Product Number: H151
Applicable Software Versions: IV
Copyright: Smokin Brothers, Inc.

1 Introduction

1.0 Major Features

- Set the desired cooking/smoking temperature from 160°- 500°F or the max temperature your grill can reach in 1° increments.
- Cool-down cycle. Fan runs until the grill temperature drops below 120°F.
- **Auto-relight**. The controller will energize the igniter to attempt to relight the fire if the grill temperature drops too low below the set temperature. If the fire does not relight; the cool down cycle automatically starts. Detects if the cooking chamber door is open and will pause the relight program until the door has been closed and temperature has recovered.
- **3 phase Cooking Program: Smoke, Cook, Hold.** Set the time and temperature for each phase in the cooking process. The controller will automatically advance to the next step and adjust the temperature.
- **Food Probe:** For use with the cooking program to cook the food to a specific internal temperature or standalone to monitor the food temperature.
- 3 Speed Fan selectable by the user. High for cooking; Medium for Smoking, and Extra Low for cold smoking.
- Auger Bypass: Press a button and the auger runs 100% to get to grilling temperatures faster.
- Indicating lights for working components in use.

2 The Front Panel

① Stand by indicator: Light is on when the controller is connected to a power source but not running. When the controller is running the light will go off and the displays will be on.

② PV display: The temperature inside the cooking chamber; commonly referred to as Process Variable or Process Value (PV).

③ SV display: When in normal operation mode this is the target temperature; it is commonly referred to as Setpoint Value (SV). When in display mode 2, it indicates the mode the controller is in (Automatic or Manual) and the output value (%).

④ FAN indicator: Light blinks when in "Cool Down".

⑤ IGN indicator: Light is on when the IGNITER is on.

⑥ A/M indicator: Light is on when the controller is in MANUAL MODE.

⑦ AUG indicator: Light is on anytime the AUGER is running.

⑧ A/M KEY: Automatic/Manual function KEY; Data shift KEY

⑨ Decrement KEY ▼: Decreases numeric value of the SV display.

⑩ Increment   KEY ▲: Increases numeric value of the SV display.

⑪ SET KEY: Pressed momentarily, the controller switches the lower display (SV) between setpoint value and percentage of output. When pressed and held for two seconds the controller will enter the parameter setting mode.

⑫ AUG KEY: When engaged, the auger runs continuously.

⑬ Power KEY : When the controller is off and the Stand by indicator is RED, press the Power KEY to start the controller. When the controller is ON, pressing the Power KEY will start the "Cool Down" cycle.

3 Quick Start

3.1   Start-up.

NOTE: Refer to your smoker's owner manual for recommended start-up and safety procedures. Always start with a clean smoker for best results.

1) Plug the smoker to a GFCI protected AC outlet, it's a safety thing. The Stand-by indicator will illuminate RED indicating power is present at the controller.
2) Press the Power KEY ⏻ . The Stand-by indicator will go OFF. Both displays will flash, and then the top display (PV) will show the current temperature inside the cooking chamber. The bottom display (SV) will be 225. If both displays continue to FLASH the temp sensor is not properly connected. If the temperature in the top display is bouncing around, then you have a bad temp sensor or a loose connection at the terminal screws. The AUG and IGN indicator lights will be ON.
3) After several minutes the pellets will start to smolder and whitish-gray smoke will billow out then change color to that thin blueish smoke. You've seen this before.
4) When the cooking chamber reaches 130°+ the IGN indicator will go OFF, so did the Igniter.
5) The AUG indicator light will cycle ON and OFF.
6) It is normal to overshoot the start-up temperature by 20°+. It will take several cycles for the temperature to stabilize.
7) It's time to cook something! While you're just sitting and watching the controller's displays and smelling the smoke for the next hour or so you could cook some sausage for tomorrow's breakfast.

3.2   Setting the Cooking/Smoking Temperature (SV)

At start-up the temperature (SV) is set to 225° to preheat the grill. After the controller is ON the temperature can be set between 150° - 550°F in one (1°) degree increments. To change the Setpoint Value (SV) press/release the ▼ or ▲ KEY. The decimal point on the lower right corner of the display will start to flash. Press the ▼ or ▲ KEY to change SV until the desired temperature is displayed. The decimal point will stop flashing after no KEY is pressed for 3 seconds. You can press the **A/M KEY** to move the flashing decimal point to the desired digit that needs to change. Then press the ▼ or ▲ KEY to change SV starting from that digit.

3.3   Shut down

1) Set the cooking temperature (SV) to 225° or lower.
2) Once the grill temperature is below 250°, Press the POWER KEY ⏻ . The top display will flash "HOT" and the FAN indicator will blink until the temperature (PV) drops below 120°.
3) Open the cooking chamber door during the cool down cycle.
4) The controller will power-off and the Stand-by indicator will illuminate RED indicating power is present at the controller.
5) Disconnect the power source.
6) Store the grill & cover. The controller should be protected from the elements. Water damage is not covered under the warranty.

4 Basic Operations

5.1 Turning the Controller On/Off

To turn the Controller ON:

Connect the smoker to a GFCI protected AC outlet. The Stand-by indicator will illuminate RED indicating power is present at the controller.   Press the Power KEY ⏻ . The Stand-by indicator will go OFF. Both displays on the controller will flash. The top display (PV) will show the current temperature inside the cooking chamber. The bottom display (SV) is the desired cooking temperature.

To turn the Controller OFF:

Press the POWER KEY ⏻ , the controller will start the "COOL DOWN' cycle. Open the Grill lid. The top display will flash "HOT" and the fan light will blink until the cooking chamber temperature drops below 120°

(the value of Fant). The controller will power-off and the Stand-by indicator will illuminate RED indicating power is present at the controller.

5.2 Changing the Cooking Temperature

Recommended start-up temperature is 225° to preheat the grill, but any start-up temperature can be set between 160° - 550°F in one (1°) degree increments. To change the Setpoint Value (SV) press/release the ▼ or ▲ KEY. The decimal point on the lower right corner of the display will start to flash. Press the ▼ or ▲ KEY to change SV until the desired temperature is displayed. The decimal point will stop flashing after no KEY is pressed for 3 seconds. You can press the **A/M KEY** to move the flashing decimal point to the desired digit that needs to change. Then press the ▼ or ▲ KEY to change SV starting from that digit.

5.3 Changing the Display Mode

Display Mode 1
When the controller is first turned ON it will be in **Display Mode 1.** The PV display (top) shows the temperature inside to cooking chamber. The SV display (bottom) shows the target temperature of the cooking chamber. If the Food Sensor is connected it will display the Food Temperature. When the Cook Program is running the display will alternate between Display Mode 1 and the Cook Program displays.
Refer to Section 6 for using the Cook Program.

Display Mode 2
If you want to watch the controller in action press/release the **SET KEY** to enter **Display Mode 2.** The SV display changes to show the auger's output as a % of the cycle time (t). Example: If the SV display is "A 60", the "A" indicates the controller is in the "Automatic Control Mode", and "60" indicates the auger is running 60% of the cycle time. This value typically changes at the start of each cycle.
When in **Display Mode 2**, press/release the **A/M KEY** and the "A" in the SV display will change to what looks like an "M" to indicate **Manual Control Mode** and the "**A/M" indicator light will be on**. Press/release the A/M KEY to change back to **Automatic control mode.** Press/Release the SET KEY to return to Display Mode 1.

Refer to the Section 5.2 on the use of "Manual Control Mode".

5.4 Changing the Fan Speed

A wood pellet grill is not known for imparting a deep smoky flavor to food. Even at the lowest temperature setting where more smoke is produced it's just not enough for some people. Many have resorted to using a smoke enhancing device like the A-Maze-N Tube Smoker. While these devices do help, similar results can be achieved by reducing the airflow when smoking below 200°.

How to change the fan speed:
PRESS/HOLD the SET KEY for 8 seconds until the top display (PV) changes to **"IGN"** and the bottom display (SV) to **"130".** The top display shows the operation parameter name for the Igniter "**ING**". Now, Press/Release the SET key to page to the parameter "**FanS**", the value is "3". Use the ▼key to lower the value to 2 for smoking below 200°.

There are 3 different fan speeds.
3= Normal fan speed (anytime cooking about 225°)
2= Medium Fan Speed (best used for smoking below 200°)
1= Low Fan Speed **(only use when cold smoking)**

⚠️ **Caution: Always set the fan speed to 3 when cooking above 225° and before turning the controller off. Failure to do so increases risk of have a major fire. Only use fan speed 1 for cold smoking.**

5.5 Using the Auger Bypass Feature

Press/release the **AUG KEY** to run the Auger continuously bypassing the Control Modes. The (SV) display will flash "ACC" and the last set temperature when the Auger Bypass feature is being used. Press/release

again to return to normal operation. The Auger Bypass feature is typically used for high temp grilling or to raise the grill's temperature more quickly than Automatic Mode.

> **Caution: When using Auger Bypass Mode the cooking chamber, drip tray, and the grease drain system should be clean. Cooking at high temperatures increases the risk of having a grease fire. Never leave the grill unattended. Always return the auger to normal operation before turning off the grill.**

5.6 Using the Food Probe.

The Food Probe can be used with the Cook Program or independently to monitor the food temperature. The probe can be connected or disconnected at any time to the jack on the faceplate just below the POWER KEY ⏻ . When connected to monitor the Food Temperature the displays will cycle between the Grill and the Food Temperatures

5.7 Running Auto-tune.

In most cases the controller is very adaptive and works well with the default parameter values, but every grill and cooking condition are different. If temperature swings at 225°F are consistently greater than 10-15° then running Auto-tune may improve the controller's performance. To start Auto-tune, let the grill's temperature stabilize for 20-30 minutes @225°. With the temperature above 225° but descending, Press and Hold the SET KEY for 8 seconds; the top display changes to "IGN" and the bottom display to "130". Press/release the SET KEY twice to advance to the "AT" parameter. Use ▲ or ▼ KEYS to change the lower display value to 2. This will start Auto-Tune. During the process the displays will flash. Once complete the displays return to normal operation. This could take 30 minutes or longer.
Refer to the Section 7.3.2 on the use of "Auto-tune".

5 Control Modes

The controller operates in 4 different Control Modes:

AUTOMATIC: The controller maintains the set temperature.
MANUAL: The user manually sets the auger feed rate (runtime).
PROGRAMABLE COOK: Unattended 3 phase cooking process.
COLD SMOKE: Fan only operation

5.1 Automatic Mode
Automatic Control Mode is the normal operational mode of the controller. Every time the controller is turned on it will be in Automatic Control Mode where the controller maintains the desired temperature typically within 5-10°F when cooking above 225°F and 10-15°F when smoking below 200°F. Every grill and cooking environment is different so your results may vary.

How it works, if you really want to know.
   The controller measures the temperature of the sensor in the grill, compares it to the target temperature, and then runs the auger a percentage of the cycle time (t) to maintain the target temperature. The controller uses "PID control Software" to determine the auger runtime %. The controller also runs the auger a minimum amount each cycle time to maintain the fire much like a pilot light.

Cycle Time Defined.
   Cycle time is a time period (in seconds) the controller uses to calculate the auger's runtime. Example: When the cycle time parameter is set to t=20, and the controller has determined the output for the next cycle should be 25%, the auger will run for 25% of the cycle time, being 5 seconds at the start of the next cycle and will be off for the remaining 15 seconds of the cycle. The default cycle time is 20 seconds.

What is "PID"?

A PID controller is a loop feedback mechanism widely used in automated processes like the cruise control on your car. As the name implies, the controller involves three separate constant parameters: the Proportional, the Integral and Derivative values. Simply put, these values can be interpreted in terms of temperature: "P" depends on the present "error", "I" on the accumulation of past "errors", and "D" is a prediction of future "errors", based on current rate of change over a period of time. The weighted sum of the PID values is used to calculate the auger runtime to maintain the temperature. This adjustment is made at the start of each cycle time.
Refer to 7.3.3 for information about the PID parameters.

5.2   Manual Mode.

Manual Control Mode allows the user to manually adjust the auger runtime as a percentage of the cycle time (parameter "t") between the values of parameters OutL and OutH.

Placing the controller in Manual Control Mode
This is best done in 2 steps.
First with the controller in Display Mode 1 press/release the SET KEY to enter Display Mode 2. The SV display changes to show the auger's output as a % of the cycle time (t). Example: If the SV display is "A 60", the "A" indicates the controller is in the "Automatic Control Mode", and "60" indicates the auger is running 60% of the cycle time. This value typically changes at the start of each cycle.
Now press/release the A/M KEY to place the controller in Manual Control Mode. The "A" in the SV display will change to what looks like an "M" to indicate Manual Control Mode and the "A/M" indicator light will be on. Pressing the ▼ or ▲KEYs will lower or raise the auger runtime %.
Press/release the A/M KEY to change back to Automatic control mode.

Notes: Manual mode will be running the last output value when the controller was in Automatic Mode.
The auger's runtime % cannot be set lower than the OutL parameter value.
The A/M Key has 2 functions. It places the controller in Manual Mode or is used as a data shift key if press after either ▼ or ▲KEYs were pressed to change the data.

5.3   Programmable Cook Mode

Programmable Cook Mode provides unattended cooking through a 3 phase cooking process: **Smoke, Cook,** and **Hold**. Since a pellet smoker produces more smoke at lower temperatures the **Smoking Phase** is used to smoke the food for several hours to impart that wonderful smoke flavor to the food. After the food is smoked at the specified temperature and time the controller will start the **Cooking Phase**. The smoker's temperature is automatically increased to the higher cooking temperature where the food is cooked for a set time or to a specific food temperature when using the Food Probe. After the cooking phase is complete the controller will change to the **Hold** temperature to keep the food warm.

COOK MODE Parameter Values.

Access the Cook Program by Holding the SET key for 3 seconds until the top display (PV) shows "**CPro**". Use the ▼ or ▲ KEYs to select one of the 3 options in SV display: **OFF, UPDATE**, or **RUN** then press the SET key to select that option.

OFF   =   Turns the Cook Program OFF, and exits the menu.

RUN   =   Used to start the Cooking Program. The user will set the time and temperature for the 3 phases in the program. Once all of the parameters are set, the Cooking Program will immediately start the Smoking Phase.

UPDATE= Allows the user to review and update the time and temperature parameter values for the 3 phases in the Cook Program without starting the program. If the Cook Program is running the values are updated.
If **RUN** or **UPDATE** were selected the **Cooking Parameters** menu is displayed. The (PV) display shows the parameter name, the (SV) display is the current value. Use ▲ and ▼ to modify the current value. Press/release the SET KEY to advance to the next parameter. After the last parameter is displayed, press/release the SET KEY to exit. If RUN was selected the cooking program will start.
The parameter values are retained in memory and are not lost when the controller is turned OFF.

The parameters will appear in the following order.

Stp   = Smoking temperature (160-180°)
Stt   = Smoking time in minutes
FanS   = Fan Speed: 3= normal, 2=medium
Ctp   = Cooking temperature
Ctt   = Cooking time in minutes
Food   = Food temperature
Hold   = Hold Temperature (150-160°)

Refer to table #3 for suggested smoking times and temperatures to help get you started.

Notes about Table 3:
1) The temperature is in degrees Fahrenheit, time is in minutes.
2) The above Smoking and Cooking times and temperatures are approximate and should be adjusted to your cooking methods and desired level of doneness.
3) When cooking using the food probe it is best to undercook the food by several degrees because it can take 10-15+ minutes for the cooking chamber temperature to drop to the Hold temperature. All food should be cooked to the minimum food temperature as recommended by the USDA.

Table 3

Food	Smoking Phase		Cooking Phase		Food	Hold Warm
	Temperature	Time	Temperature	Time	Sensor	Temperature
Whole Brisket	170°F	420	250°	480	203°	150°-160°
Pork Butt 7-10 lbs	180°	240	225°	600	202°	150°-160°
Brisket and Pork	180°	360	240°	480	203°	150°-160°
Full Slab Ribs	180°	60	250°	240	N/A	150°-160°
St. Louis Cut Ribs	180°	60	275°	180	N/A	150°-160°
Baby Back Ribs	180°	60	275°	150	N/A	150°-160°
Whole Chicken	180°	30	325°	120	165°	150°-160°

Key points:

The Cooking Program can be stopped by setting Cook Mode "CPro" to OFF or cycling the controller OFF for 3+ seconds, then back ON. Once started, the Cooking Program cannot be paused, only Stopped. .

When the Cook Program is running the displays will cycle between the smoker's temperature and the time remaining in the current cooking phase or the food temperature if the food sensor is connected. When the Hold phase starts, the displays will cycle between the smoker's temperature and the elapsed time since Hold started.

When the controller is turned ON the Cook Program will be set to "OFF" and elapsed times of the cooking phases are reset to zero.

If the Food Probe is not connected to the controller the Cook Phase defaults to cooking by time.

The Food Probe can be connected to the controller at any time during the Smoking or Cooking Phase. The controller will automatically recognize the Food Probe and cook to the specified food temperature.

When cooking by food temperature it is best to undercook the food by several degrees because it can take 10-15+ minutes for the cooking chamber to drop to the hold temperature.

The time of the Smoking or Cooking phase can only be changed through the cooking parameters by setting "CPro" to "UPDATE" and paging though the parameter list to the parameter value to be changed. Once changed, the program will use the new value.

The temperature of the current phase can be changed by using the ▲ and ▼ KEYS on the front panel or through "CPro" as outlined above.

5.4 Cold Smoke Mode

If you want to smoke fish, cheese, or other foods which require **Cold Smoking** technics then this is the mode to use. This mode only runs the fan. You will use a smoking tube or similar devise to create smoke, along with a Pan of ice to keep the temperature cold and the grills fan will circulate so you don't get stale smoke.

Start with a clean grill, then prepare your food and have it ready on a rack or frog mat. Light the smoke tube and place it in the left rear corner of the grill running parallel to the back side. Then if needed, place a pan of ice on the left side of the grill. Now to start place the grill in **Cold Smoke Mode**,

With the controller OFF, Press/Hold the Power KEY ⏻ for 5 Seconds. The top display will show "Cold" and the bottom display will show "Off". Using the arrow keys you can select the desired fan speed 1-3 or off then press the SET KEY. To exit Cold Smoke Mode, Press/Release the Power KEY ⏻ .

Options:
Off = Exits the program
FS-3 = high speed fan
FS-2 = medium speed fan (recommended for cold smoking)
FS-1 = low speed fan

6 Operational Parameters

6.1 Operational Parameters.
The Savannah Stoker has various operational parameters. The default values will control most pellet grills with satisfactory results. In some instants the values may need to be changed to achieve better results. Some users may also want to tweak the parameters. One example is changing the cycle time when smoking at 180°. Increasing the cycle time (t) will produce more smoke but will also increase temperature swings. Other parameters the user needs to access: "AT" to start Auto-Tune, "OutL" to change the auger's minimum runtime; OutH to change the maximum auger runtime; and FanS to change the fan speed.

6.2 Accessing and Changing Parameter Values.
Access to the operational parameters is gained by Pressing and Holding the SET KEY for 8 seconds until the top display (PV) changes to "IGN" and the bottom display (SV) to "130". The PV display shows the parameter name, the SV display is the current value. Use ▲ and ▼ KEYS to modify the current value. Press/release the SET KEY to advance to the next parameter. After the last parameter is displayed, press/release the SET KEY to exit. All of the new parameter values are automatically stored.

6.3 Operational Parameters Defined.
Figure 3 below shows the system Operational Parameters in order as they appear when paging through them as outlined above (6.2). Beside each parameters name is a brief Description, Setting Range, Initial

NAME	Description	Setting Range	Initial Setting	Remarks
IGN	Ignitor OFF temp	100-200 °C or °F	130	See 6.3.1
Hy	ReLite Hy Band	0~50 % of SV	10	See 6.3.1
At	Auto tuning	0~3	3	See 6.3.2
I	Integral	0~9999 Seconds	141	See 6.3.3
P	Proportional	1~9999 °	53	See 6.3.3
d	Derivative	0~2000 Seconds	35	See 6.3.3
t	Cycle time	2~125 Seconds	20	See 6.3.4
Pb1	Grill Sensor Cal	-50+50 °F or °C	0	See 6.3.5
Pb2	Food Probe Cal	-50+50 °C or °F	0	See 6.3.5
OutL	Output low limit	0~100 %	15	See 6.3.6
OutH	Output high limit	0~100 %	85	See 6.3.6
C-F	Temp Display	C, F	F	See 6.3.7
ASCH	Food Sensor Display	SV or PS2	PS2	See 6.3.8
Fanb	Fan Speed	1,2,3	3	See 6.3.9
Fant	Fan off Temperature	100-150	120	See 6.3.10
PuSt	Power on temperature	160-300	180	See 6.3.11
rSn	reset to defaults	Y/N	N	See 6.3.12

Setting value, and Remarks. There is no retrieval of the default values once changed. If you need to restore the default values they have to be reset manually.

6.3.1 "IGN" and "HY" Control the Igniter's ON/OFF Temperatures

The parameters IGN and HY are used together to control the igniter's functions.

IGN parameter: Value is in degrees. This is the grill temperature the igniter will turn off after startup.
HY parameter: Value is a percentage of the set temperature and is used in the relight program. A value of zero (0) will disable the relight program.

How it works:

Every time the controller is turned ON the Igniter comes ON for 4 minutes and will remain ON until the cooking chamber temperature reaches the value of parameter "IGN". Once the grill's temperature (PV) is above the set temperature (SV) the relight program automatically starts monitoring the temperature drop. If the temperature (PV) drops lower than the set temperature by (SV*HY) the igniter will come back ON. If the temperature does not recover within 12 minutes the controller will start the cool down cycle. The controller detects if the cooking chamber door has been opened for an extended time and pause the relight program.

6.3.2 "At"Auto-Tune

Parameter **"AT"** is used to start the Auto-tune process.

At=1 Sets Auto-Tune in delayed start. The Auto-tune process is delayed until the A/M KEY is pressed. This is the preferred method to start auto-tune.
At=2 Auto-tune will start in 10 seconds.
At=3 Normal controller operation. After auto-tune is complete the controller automatically sets the value to 3.

In most cases the controller is very adaptive and works well with the default parameter values for P,I,D, but every grill and cooking conditions are different. If temperature swings at 225°F are consistently greater than 10-15° then running Auto-tune may improve the controller's performance by determining new values for the PID parameters.

Preferred Method to Start Auto-tune:
1) Write down you current values for I, P, and D for future reference.
2) Set the temperature (SV) to 225°F.
3) Let the grill's temperature stabilize for 20-30 minutes.
4) Set Parameter At=1
5) Start Auto-tune by pressing the "A/M" KEY when the temperature reading (PV) is <u>above</u> the target temperature but is <u>descending.</u>
6) The "At" symbol will blink in the lower display (SV) during the Auto-tune process.
7) If you need to stop the Auto-tuning process, press and hold the "A/M" KEY for about 2 seconds until the "At" symbol stops blinking in the lower display window.

During the Auto-tune process the controller will execute 2-3 cycles. The microprocessor in the controller will analyze the period, amplitude, and waveform of the temperature oscillations and calculate the optimal PID control parameter values. When Auto-tune is complete the controller will return to performing accurate artificial intelligence control using the new values.

If the Auto-tune results are not satisfactory, you can manually fine-tune the PID constants for improved performance. Or perform auto tune again. Sometimes the controller will get better parameters.

6.3.3 PID Control Parameters Explained.
Please note the controller uses an enhanced version of PID control algorithms. Tuning of the controller is different than traditional PID controllers. The parameters are explained below.

If you are having issues with your grill holding the temperature within 5-10° when cooking above 225° or 10-15° when smoking below 200° then you should run auto-tune before adjusting the P,I, or D parameters.

Before making adjustments to the PID parameters make a record of your current settings. After making changes let the grill stabilize for 30-45 minutes and evaluate the results. What works best at 250° may not give the same result @180°. Keep good notes.

Proportional Band "P"
The unit is in degrees.
This parameter controls the output of the controller based on the difference between the measured and set temperatures. The larger the "P" value means the weaker the action (lower gain). For example, if P=20, the proportional band is 20 degrees. When the PV reading is 20 degrees or more below the set point (SV), the controller will have 100% output (or the value of OutH, see 6.3.7). When the temperature is 10 degrees below the set point, the output is 50%. When the temperature is equal to the setting, the controller will have 0% output (assuming integral and derivative functions are turned off). This constant also affects both integral and derivative action. Smaller P values will make both integral and derivative action stronger.
Typical values for "P" would be in the range of 20-40°F
If you change from Fahrenheit to Celsius, divide "P" by 1.8.
When changing "P" use small steps of 1 or 2.

Integral time "I"
The unit is in seconds.
This parameter controls the output of controller based on the difference between the measured and set temperature integrated with time. Integral action is used to eliminate temperature offset (both above and below set point, SV). A larger number means slower action. e. g. assuming the difference between the measured and set temperature is 10 degrees and remains unchanged, the output will increase continuously with time until it reaches 100%. When the temperature fluctuates more than 15° (when above 250°) an increase of the integral time may be needed. Decrease if the controller is taking too long to eliminate the temperature offset.
When I=0, the system becomes a PD controller.

Typical values for "I" would be in the range of 80-300 seconds, but the recommend setting for "I" is 4 times the value of "D", I=Dx4.

Derivative time "D"

The unit is in seconds.

Derivative action contributes to the output power based on the rate of temperature change. Derivative action can be used to minimize the temperature overshoot by responding to the rate of change. The larger the number, the faster the action will be, e.g. when the cooking chamber door is opened, the temperature will drop at very high rate. The derivative action will change the controller output based on the rate of change rather than the net amount of change. This will allow the controller to act sooner. Increases to "D" will decrease overshoot, and improve settling time,

Typical values for "D" would be in the range of 20-75 seconds. When changing "D" use small steps of 2-3. If you change "D" also change "I" to 4 times the value of "D", I=Dx4.

6.3.4 "t" Cycle time

Cycle time **"t"** is a time period (in seconds) the controller uses to calculate the auger's runtime. This is also known as the duty cycle. Default is 20 seconds.

Example: If the cycle time parameter is set to **t=20**, and the controller has determined the output for the next cycle should be 25%, the auger will run for 5 seconds at the start of the next cycle and will be off for the remaining 15 seconds of the cycle.

Notes: The default value for the cycle time is 20 seconds. This gives the best performance for most stock configured grills. The controller also runs the auger a minimum amount each duty cycle to maintain the fire much like a pilot light. The minimum amount is controlled by parameter "**OutL**", and the maximum limit is controlled by parameter "**OutH**".

If the cycle time is less than 20 seconds the auger may not run long enough during each duty cycle to maintain the fire. Before lowering the value of either the cycle time or OutL, refer to section 6.4 "How to Determine the Lowest Stable OutL Value".

Larger cycle times typically give larger temperature swings except on large insulated cookers where a cycle time of 45 or 60 may give the best performance.

6.3.5 "Pb" Sensor Calibration Offset

Pb1 is used to calibrate GRILL temperature sensor.
Pb2 is used to calibrate the FOOD probe.

Test the sensor against a reference sensor known to be accurate in slow boiling water or in an ice/water surly.

If the sensor is reading lower than the reference sensor, enter this as a positive value; reading higher, enter this as a negative value.

6.3.6 "OutL" and "OutH" Auger Runtime Limiters

OutL and **OutH** are runtime limits of the auger. The value is a percentage of the total cycle time, parameter "t".

OutL is the minimum % of the cycle time the auger will run at the start of each cycle. Default is 15%. A minimum run time is required to maintain the fire. See the top of the next column. Example: With a cycle time t=20, and **OutL**=15, the auger will run for 15% of the 20 second cycle time or 3.0 seconds.

OutH is the maximum % of the cycle time the auger will run.
Default is 100%. The high limit is used to help reduce temperature overshoots that will occur at start-up, after the cooking chamber door is opened, and after the target temperature is increased. The default value works well with most grills. On small grills better performance is achieved with a lower value of 70 or 80.

CAUTION:

A pellet grill requires a minimum amount of fuel feed per cycle time to maintain the fire.

If **OutL** is too low the fire will go out; too high and the smoking temperature will be too hot on very hot days. The default value will give satisfactory results with most stock pellet grills. **If you need to change the OutL value refer section 7.4.**

6.3.7 "C-F" Selecting Fahrenheit or Celsius

Parameter **C-F** is used to change between Celsius and Fahrenheit.
F= Fahrenheit (default)
C= Celsius
If changing to Celsius, Change the value of "P", See Section 6.3.3

6.3.8 ASCH Food probe display.

This is used to control the display of the food probe reading when using the food probe without the cooking program.

6.3.9 "FAnS" Fan Speed

FAns is used to change the fan speed.

3= Normal fan speed

2= Medium Fan Speed (use for smoking below 200°)

1= Low Fan Speed. (only use when cold smoking)

6.3.10 "Fant" Fan Shut Off Temperature

The unit is degree. When the controller is turned off, the fan will continue to run until the cooking chambers temperature is cools down to the temperature set by **Fant**. For example, if the **Fant** is set to 120, the display will flash between "Hot" and "current smoker temperature", until the smoker temperature drops to below 120 degree.

6.3.11 "PuST" Power on Temperature

When you turn on your grill this is the initial startup temperature shown in the SV display. The default is 180°. You can change the default to any value, but we recommended to keep a temperature between 170-325°. You can also change the startup temperature after turning on the controller; you do not have to wait for the grill to reach the initial startup temperature.
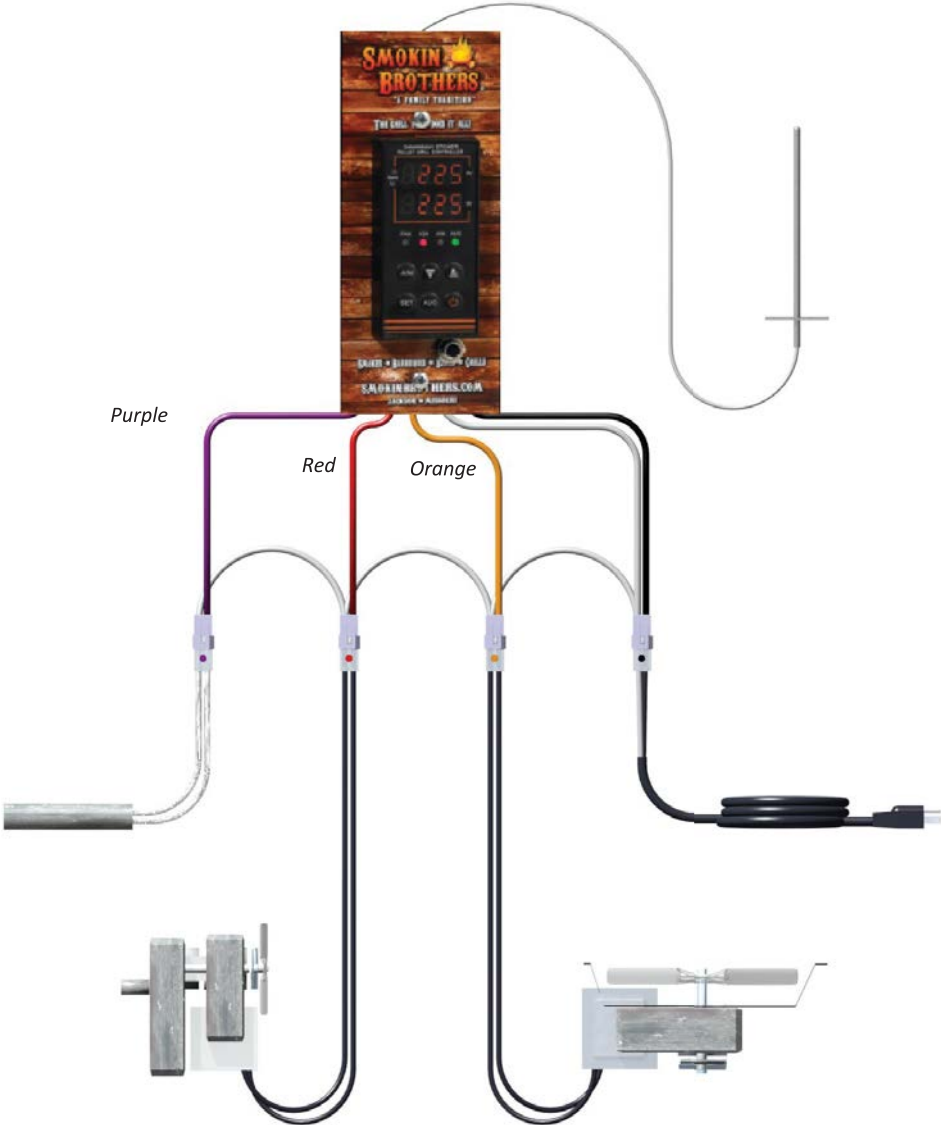
6.3.12 "rSn" Reset

rSn is used to reset the controller to the defaults.

Y= reset

n= leave un-changed.

Product Service and Support

Wiring Diagram

Purple

Red

Orange

Troubleshooting

WARNING! **Always disconnect the grill from AC power before accessing the control for service or working under the grill.**

Removing the control from the grill, installing the control into the grill, or working under the grill while the grill is connected to AC power could result in shock or could damage the control.

Error Codes, Troubleshooting, Commonly Ask Questions:

"OrAL" flashing in the PV display indicates there is no response from the grills temperature sensor (RTD). This usually occurs after installation of the controller or replacing the RTD. First check the RTD wire connections to the back of the controller verifying only bare wires are under the terminal screws 1 & 2. If this does not resolve the issue, trim ½" off the end of the wires, stripping back 3/8" of the installation and reconnect only the wires under the terminal screws. If this fails, the RTD or wiring has shorted and should be replaced.

No Power *Circuit breaker on AC outlet is tripped.*
Reset wall power outlet circuit breaker.

Control is disconnected from grill AC power.
Verify the control wiring harness plug with black wire is connected to AC power.

AC Power Plug
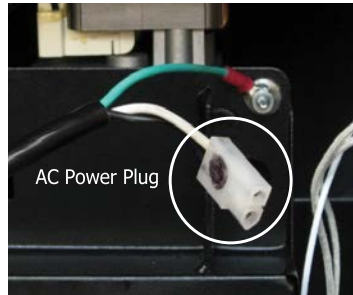
Control AC line fuse is blown.
Replace control's fuse F1 a replacement fuse. A blown AC line fuse may be caused by several conditions including shorted grill component lead wires, a jammed auger, or a failing igniter. Unless the faulty part is replaced the fuse will continue to blow

Fuse: *5A 250V mini spade*
Contact customer service.

Grill Will Not Ignite   *No fuel in firepot.*
Fill hopper with good, dry fuel.
Verify auger is properly connected to control.
Clear auger if jammed.
Replace auger and/or auger motor if defective.

No draft air flow.
Verify draft fan is properly connected to control and operating normally.
Replace draft fan if defective.

No ignition heat source.
Verify igniter is properly connected to control and operating normally. You can light the grill manually contact customer sevice.
Replace igniter if defective.

Fire Goes Out   *No fuel in hopper.*
Fill hopper with good, dry fuel.

No fuel in firepot.
Verify the control is properly connected to auger.
Clear auger if jammed.
Replace auger and/or auger motor if defective.

Unburned fuel in firepot.
Check the igniter to make sure functioning correctly.

No draft air flow.
Verify the control is properly connected to draft fan and operating normally.
Replace draft fan if defective.

Grill Temperature
Not matching Setpoint Temperature

Grill lid is open. Close grill lid. Grill is designed to operate with grill lid closed.

Grill is in manual mode (the red light above A/M is on)
Press the A/M button to put back to Automatic mode.

Damp fuel source.
Replace damp fuel with good dry fuel.

Adverse operating conditions.
Shield grill from cold wind and/or rain.
Grill may not be able to attain 450 degrees in an extremely cold operating environment.

Contacting Smokin Brothers

Customer Service   For product support and service, contact:

Double D Supply Company
1012 East US Hwy 62
P.O. Box 1767
Sikeston, MO 63801

Telephone: 1.573.471.5513
                    1.877.474.5536

On the Web: www.doubledbbq.com
                    www.smokinbrothers.com

By email: barbeque@smokinbrothers.com

Trained technicians are available to answer questions.
Excellent dependable, reliable, and efficient service will
be provided.

Another Source: Smokin Brothers Dealer Retail Outlet

WARRANTY

3 Year Limited Warranty

Smokin Brothers warrants this wood pellet barbecue grill against defects in material and workmanship under normal residential use and recommended maintenance for a period of three (3) years from the date of original purchase to the original owner.

Replacement parts will be provided for any original part found to be defective under normal conditions. Contact Smokin Brothers Customer Service to determine defective part and confirmation of replacement and credit. PROOF OF PURCHASING MUST BE SUBMITTED AT TIME OF WARRANTED REPLACEMENT TO RECEIVE CREDIT.

- -

PURCHASE INFORMATION

Date of Purchase: _____

Grill Model:_____   Serial Number #:_____

From:_____   Address:_____

Proof of purchase date required, retain sales slip and attach here.

- -

Defective parts must be returned for replacement and sent freight prepaid to Smokin Brothers.

Warranty does not include labor charges related to determination of or replacing defective parts and related shipping and handling charges.

This warranty shall be void if the unit has not been operated according to manual instructions, resold or traded to another owner, or the user has abused or failed to maintain the unit under normal residential use, or failed to disconnect electric before storing or repairing the unit. See Warranty Disclaimer.

Smoking Brothers shall not be held liable under this or any implied warranty for incidental or consequential damages.

SMOKIN BROTHERS®
"A FAMILY TRADITION"