Technical Procedure:

Troubleshooting Electric Stoves

1.0 Purpose: To determine and troubleshoot common failure modes in order to provide technical support to customers and meet necessary quality standards for successful operation of Electric Stoves.

2.0 Procedure:

1. Firstly, it is critical to determine what type of stove the customer has. Since Savage Bros. manufactures both gas and electric stoves, by obtaining the customer's serial number and model number, you will be able to locate the type of stove they have. Please see the below chart for a list of our various Electric Stove Model Numbers/Part Numbers:

Electric Stoves and Cookers	***Model Number/Part Number***
Electro Stove #20 - *415V/3Ph/50/60Hz*	0100-80
Electro Stove #20 - *7 KW 208V/3Ph/ETL - ETL Certified to UL Standard*	0101
Electro Stove #20 - *4KW 208-240V/3Ph - Built to UL Standard*	0103
Electro Stove #20 - *7KW 230V/1Ph/ETL - ETL Certified to UL Standard*	0105
Electro Stove #20 - *230V/1Ph/50/60Hz*	0105-80
Electro Stove #20 - *7KW 230V/1Ph/ETL - ETL Certified to UL Standard*	0105-99
Electro Stove #20 - *7KW 208V/1Ph/ETL - ETL Certified to UL Standard*	0106
Electro Stove #20 - *4KW 208-240V/1Ph - Built to UL Standard*	0108
Electro Stove #20 - *4KW 208-240V/1Ph/50/60Hz - Built to UL Standard*	0108-80

2. ***Determine the Common Failure Mode:***

Failure Mode # 1 – *Exterior Corrosion*
Failure Mode # 2 – *Exterior Heat Tint*
Failure Mode # 3 – *Sensor error on Omron Digital Controller*
Failure Mode # 4 – *Error message "S.Err" appears on the Omron Digital Controller*
Failure Mode # 5 – *Temperature reading appears to be incorrect*
Failure Mode # 6 – *Heating Elements will not heat*
Failure Mode # 7 – *Red Temperature Display is not accurate*

Please Note:

- It is strongly recommended that a qualified electrician perform all electrical work. Maintenance should be performed only when the machine is properly locked out.

- Before performing any maintenance or troubleshooting, always be sure to follow all safety procedures and disconnect the power source.
- Use proper tools for the inspection and/or maintenance required, as it is extremely dangerous to use broken tools or tools designed for another purpose.

3. **Failure Mode # 1 –** *Exterior Corrosion*

Possible Root Cause: Marred surfaces from baked on grease, food splatters and/or condensed vapors can cause an increased possibility or likelihood of corrosion.

Initial Troubleshooting Key Points:

- To remove dirt, clean exterior parts with ordinary soap and water (with or without detergent) applied with a cloth or sponge. Be sure to dry thoroughly with a clean cloth.
- To remove baked on grease, food splatters and/or condensed vapors, apply a cleanser to a damp cloth or sponge. Be sure to rub the cleanser on the metal *in the direction of the polish lines*, as gently as possible. Be mindful *not* to rub in a circular motion, as this could result in further marring of the finish.
- If the above solutions do not work, rub the surface with a **3M SCOTCH-BRITE** Heavy Duty Scour Pad or Stainless-Steel Scrubbers. Be mindful *not* to use ordinary steel wool.

4. **Failure Mode # 2 –** *Exterior Heat Tint*

Possible Root Cause: At times darkened areas may appear on Stainless-Steel due to the area(s) being subjected to excessive heat.

Initial Troubleshooting Key Points:

- First, try using the above cleaning processes for **Failure Mode # 1**.

- If these do not produce the desired results, you may need to use a **3M SCOTCH-BRITE** Heavy Duty Scour Pad *or* Stainless-Steel Scrubbers, *in conjunction with* a powdered cleanser, such as Bar Keepers Friend. Again, it's important to vigorously scour *in the direction of the polish lines*.

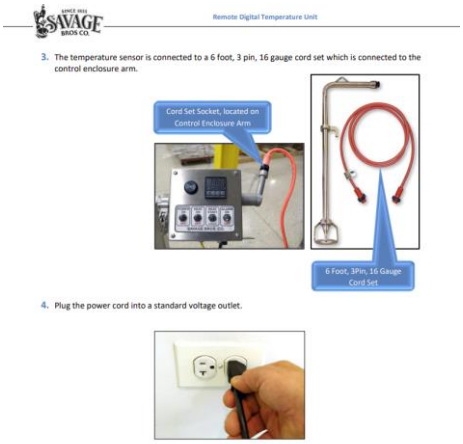
Preventative Measures to Take: Heat Tint may be lessened by reducing the amount of heat *or* not applying heat to the equipment during scheduled downtime or slack periods.

7. **Failure Mode # 3** – *Sensor error on Omron Digital Controller*

   Possible Root Cause: Temperature sensor is not properly plugged in

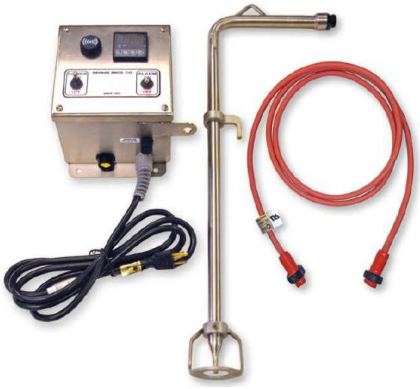
   Initial Troubleshooting Key Points:

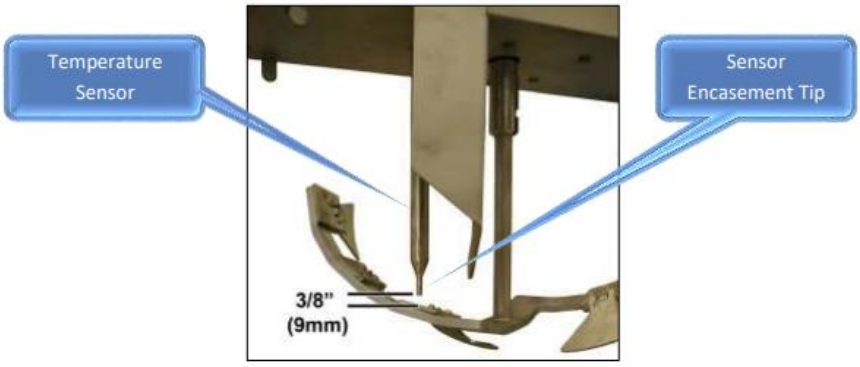
   - Check whether the cord set is plugged in correctly on the temperature sensor side and the control enclosure side. For guidance, please see the below excerpt from p. 7 of the PDF Document Remote Digital Temperature Unit – Email Ready:



8. **<u>Failure Mode # 4</u> –** *Error message "S.Err" appears on the Omron Digital Controller*

<u>Possible Root Cause</u>: 1. Tip of the temperature sensor may be damaged, 2. Loose or bad electrical connection to the temperature sensor, 3. Moisture collected inside the temperature controller.





<u>Initial Troubleshooting Key Points</u>:

- Check for any dents or bends on the tip. If damaged, the customer will need to replace their sensor with **P/N *1100-14-209.***
- Check the sensor lead wires that connect to the terminals behind the temperature controller by grasping the controller face and pulling the controller out of the box. From there, tighten all terminal connections.
- Moisture can collect over time due to careless wash downs of the machine or a high humidity environment. Follow the steps below to resolve and prevent this issue from occurring in the future:

    - ❖ Grasp the controller face and pull the controller out of the box.
    - ❖ Allow for time to air dry or use a hair dryer to fully dry the components.

- ❖ If large volumes of steam are coming off the batch, use a fan to push the steam away from the control panel.
- ❖ Cover the control panel with a plastic bag during cooking and cleaning.
- ❖ If the machine is older, contact production for a possible upgrade to a more moisture resistant controller.

9. **Failure Mode # 5 –** *Temperature reading appears to be incorrect*

   Possible Root Cause: The temperature sensor is not properly calibrated.

   Initial Troubleshooting Key Points:

   - Remember, the temperature sensor settings are factory adjusted, thus, various programming functions have been "locked out" at the factory.
   - If an incorrect product temperature reading is suspected, you will need to measure the product temperature by using an accurate certified thermometer.
   - Immerse the thermometer into at least 3 inches of the product.
   - Do *not* use a laser thermometer, as this will cause an incorrect reading for the application.
   - Accuracy of the temperature can be determined by placing the thermometer in boiling water.
   - Since water boils at 212 °F (100 °C) at sea level, the customer will need to determine the elevation of their location in order to determine the proper boiling point.
   - This can be located by using an online search engine and typing in the zip code of the location along with the word elevation. As an example, Chicago's elevation is 660 ft., and the boiling temperature is 210.9 °F (99.39 °C).

10. **Failure Mode # 6 –** *Heating Elements will not heat*

    Possible Root Cause: Lack of routine cleaning and proper maintenance.

Initial Troubleshooting Key Points:

- Check that the **HEAT** button is energized. Turn the heat ***"ON"*** by pulling the **HEAT** button out (the probe anchor needs to be in the ***UP*** position).

Electro Stove:

Gas Stove/Cooker:

Probe Anchor (UP position):

Preventative Measures to Take:

- Perform daily cleaning of the Stove Top section to remove spillovers, grease, etc. using burlap or another grease absorbing material.

11. **Failure Mode # 7** – *Red Temperature Display is inaccurate*

Possible Root Cause: The tip of the temperature probe may not be making continuous contact with the cooking product. The "Input Shift" offset value may need to be changed.

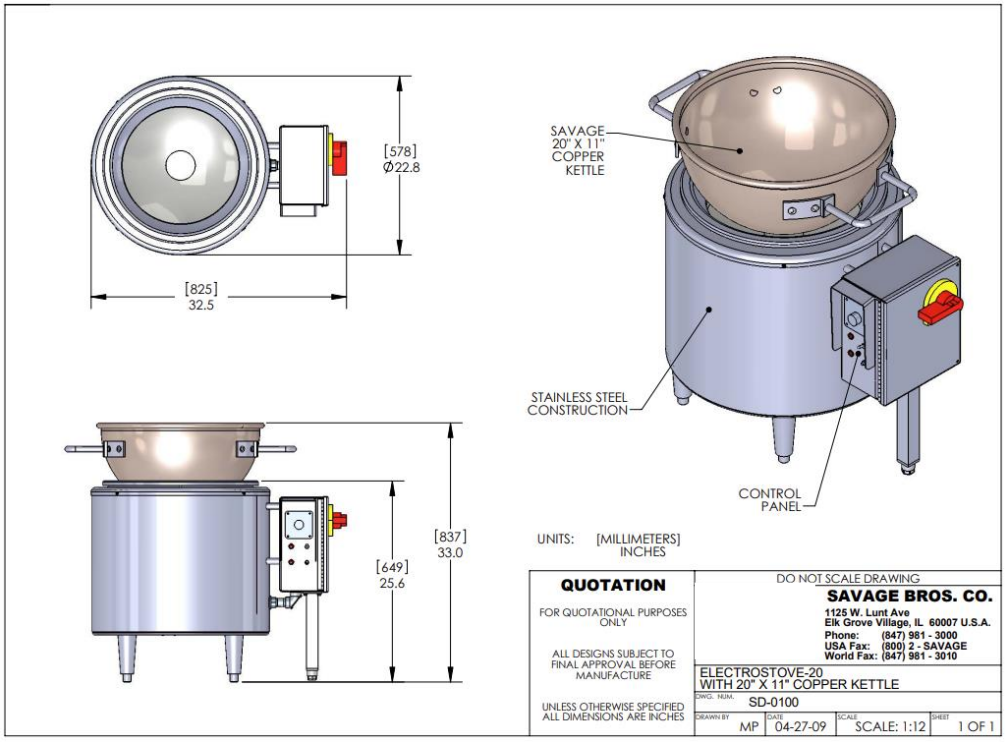
Please Note: The method for changing the accuracy of the RED Temperature display value is by changing the "Input Shift" offset value. For example, if you need to raise the red display value by +1.4 degrees, and the current value in the input shift register is -0.3, then you will need to add the two numbers to get the new input shift value of +1.1.

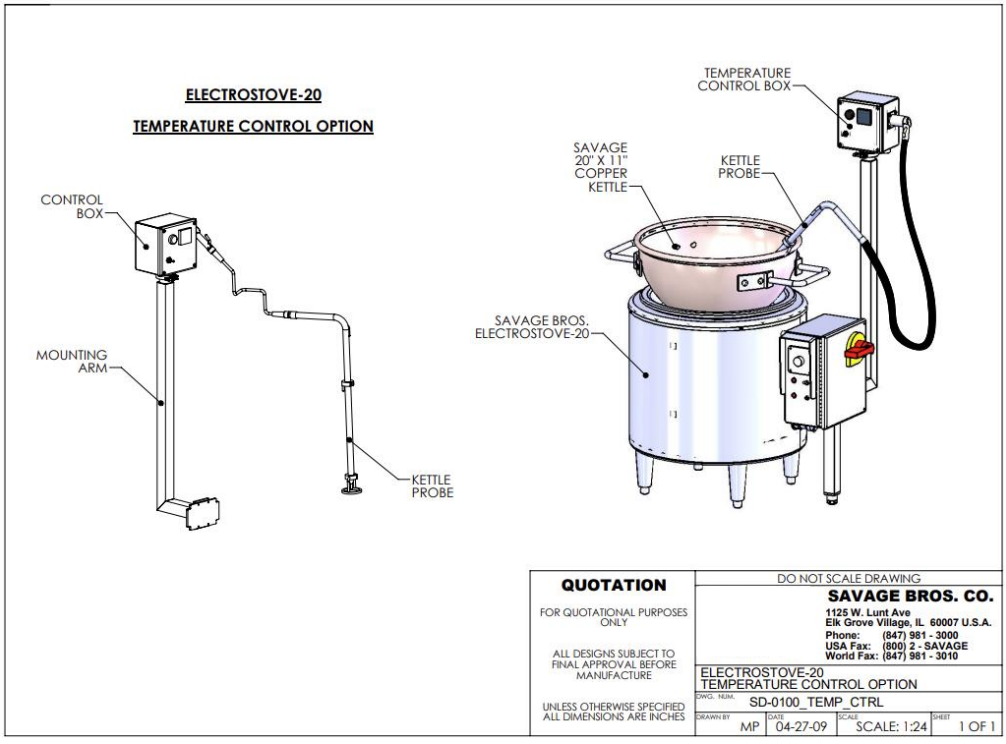
Initial Troubleshooting Key Points:

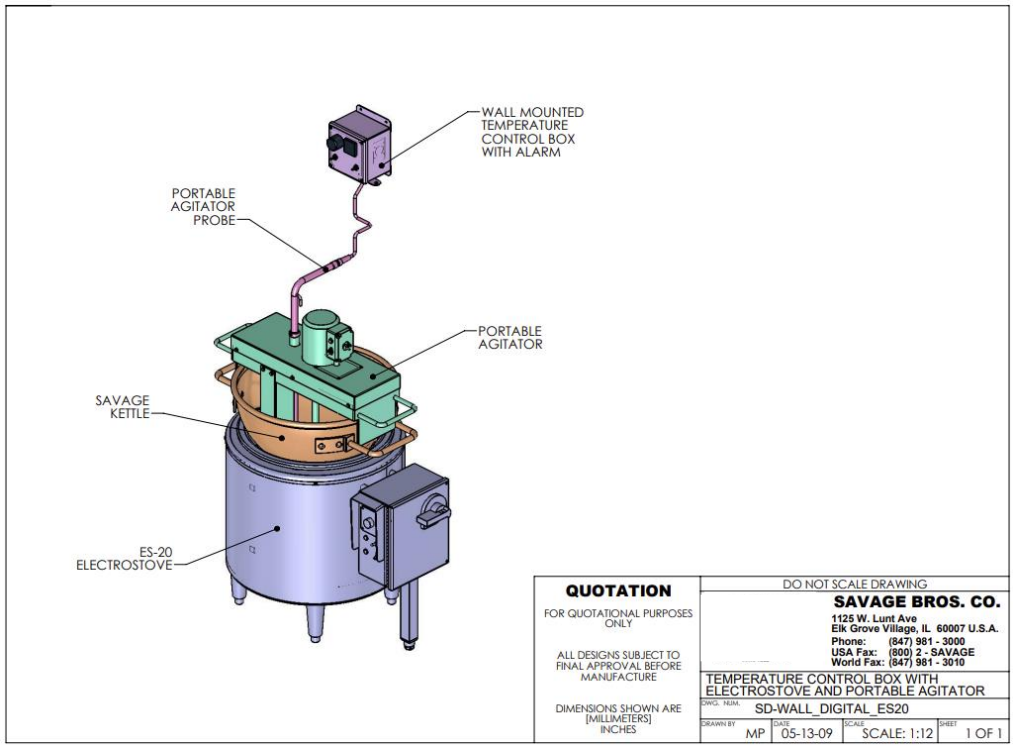
- Check the tip of the temperature probe to see if it is making continuous contact with the cooking product.

- Check that the product is moving *around* the temperature probe.
- Check the "Input Shift" setting of the temperature controller to see if it has been accidentally changed.
- In order to check the "Input Shift" setting: Press the “CYCLE ARROW” button twice  . The RED display should show a message that looks like “Cn—5.” This is the setting for the “Input Shift.” The offset temperature is displayed with green numbers. Generally, the shift value is between a minus 2 and a plus 2. If the “Input Shift” setting is *not* between plus and minus two, it will need to be set to zero. To do so, you will need to follow the steps below:
  - Press the “CYCLE ARROW” button  again and check the temperature on the RED display.
  - Determine the difference between the temperature at the tip of the probe and the temperature that is indicated on the RED display.
  - Add the difference to the current “Input Shift” offset to get the new “Input Shift” offset.
  - Press the “CYCLE ARROW” button  twice to get back to the “Cn—5” or “Input Shift” offset.
  - Press the “CYCLE ARROW” button  twice to get back to the “Cn—5” or “Input Shift” display mode.
  - Press the “UP” key  to make the offset more positive or press the “DOWN” key  to make the offset more negative.
  - Press the “CYCLE ARROW” button  again and check the temperature on the RED display.
  - Repeat the procedure, if necessary.

3.0 Reference Diagrams & Drawings:







QUOTATION

FOR QUOTATIONAL PURPOSES ONLY

ALL DESIGNS SUBJECT TO FINAL APPROVAL BEFORE MANUFACTURE

DIMENSIONS SHOWN ARE [MILLIMETERS] INCHES

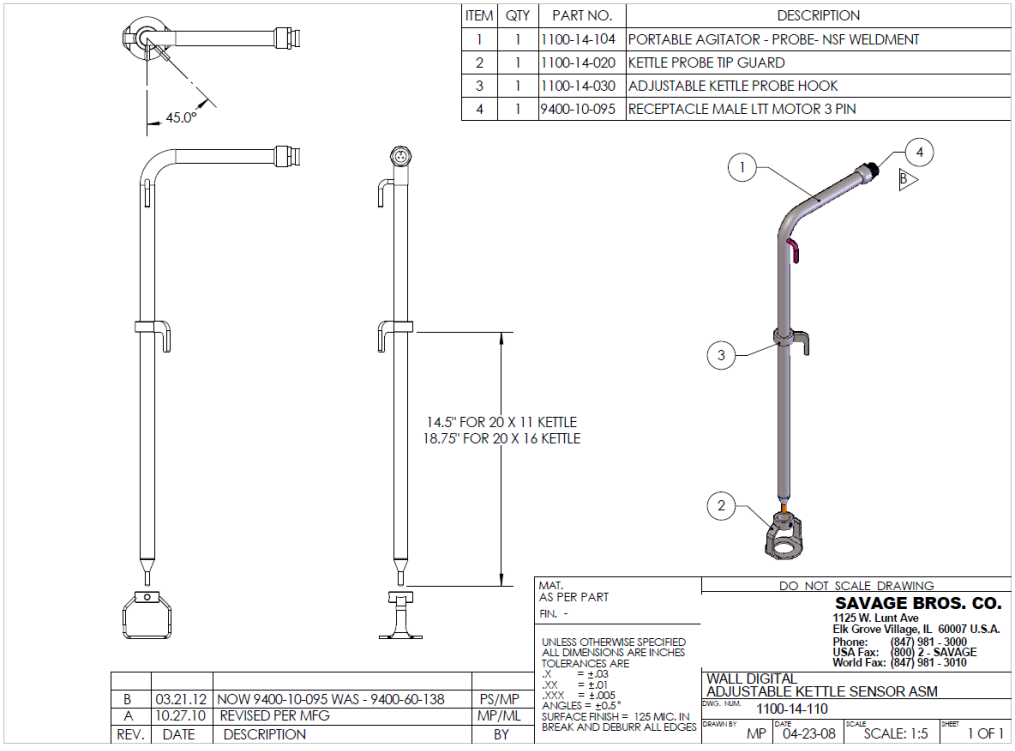
DO NOT SCALE DRAWING

SAVAGE BROS. CO.
1125 W. Lunt Ave
Elk Grove Village, IL 60007 U.S.A.
Phone: (847) 981 - 3000
USA Fax: (800) 2 - SAVAGE
World Fax: (847) 981 - 3010

TEMPERATURE CONTROL BOX WITH ELECTROSTOVE AND PORTABLE AGITATOR

DWG. NUM.: SD-WALL_DIGITAL_ES20

DRAWN BY	DATE	SCALE	SHEET
MP	05-13-09	SCALE: 1:12	1 OF 1



ITEM	QTY	PART NO.	DESCRIPTION
1	1	1100-14-104	PORTABLE AGITATOR - PROBE- NSF WELDMENT
2	1	1100-14-020	KETTLE PROBE TIP GUARD
3	1	1100-14-030	ADJUSTABLE KETTLE PROBE HOOK
4	1	9400-10-095	RECEPTACLE MALE LTT MOTOR 3 PIN

REV.	DATE	DESCRIPTION	BY
B	03.21.12	NOW 9400-10-095 WAS - 9400-60-138	PS/MP
A	10.27.10	REVISED PER MFG	MP/ML

MAT.
AS PER PART

FIN. -

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE INCHES
TOLERANCES ARE
.X = ±.03
.XX = ±.01
.XXX = ±.005
ANGLES = ±0.5°
SURFACE FINISH = 125 MIC. IN
BREAK AND DEBURR ALL EDGES

DO NOT SCALE DRAWING

SAVAGE BROS. CO.
1125 W. Lunt Ave
Elk Grove Village, IL 60007 U.S.A.
Phone: (847) 981 - 3000
USA Fax: (800) 2 - SAVAGE
World Fax: (847) 981 - 3010

WALL DIGITAL
ADJUSTABLE KETTLE SENSOR ASM

DWG. NUM.: 1100-14-110

DRAWN BY	DATE	SCALE	SHEET
MP	04-23-08	SCALE: 1:5	1 OF 1

Electro Stove w/Stainless Steel Kettle, Agitator & Stand Mount Thermometer

(220-240V, 3 Phase, 7200W)

Electro Stove w/Stainless Steel Kettle, Agitator & Stand Mount Thermometer

(208-240V, 3 Phase, 5300W)

Electro Stove w/Copper Kettle, Agitator & Stand Mount Thermometer

(208-240V, 1 Phase, 5300W)

Digital Probe Thermometer w/Stand

(120V)

4.0 Revisions:

Revision	Description	Date	Approved By:
A	Website Version	8/9/2024	BB