



MS Series Ovens
Gas and Wood Fired
Service Manual



November, 2005

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Wood Stone

Wood Stone Oven Service Manual

This manual covers all WS-MS-4,5,6,7 and 8 models.

This manual is for use only by *Trained and Qualified Service Personnel*.

It is recommended that this oven be installed, maintained and serviced by qualified professionals.

WARNING: Improper installation, adjustment, alteration, service or maintenance can result in property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment.

Installation/Operation manuals and additional information available at www.woodstone-corp.com

or

Call Wood Stone at 1-800-988-8103



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Important Information

- Introduction
- Product Overview
- Service Department and Warranty Information
- Venting and Installation Information

Wood Stone Oven Service Manual Introduction

This manual primarily covers the Mountain Series (MS) wood, wood/gas and gas fired ovens. Most of the general and troubleshooting information applies to other Wood Stone Models as well. For specific information regarding other models, please contact the Wood Stone Service Department. This manual is for use only by ***Trained and Qualified Service Personnel***.

WARNING! Improper installation adjustment, alteration, service or maintenance can result in property damage, injury or death. Please read and understand all pertinent instructions before attempting to install or perform any kind of service on this equipment. BE SAFE.

Service Department and Warranty Information

If you have any questions please call the Wood Stone Service Dept. at 1-800-988-8103. Normal hours are 8a.m. to 4:30 p.m. West Coast time Monday through Friday. After hours and on weekends call and follow the instructions to leave a message on the emergency service voice mail. A Wood Stone technician will be paged and return your call promptly.

You must contact Wood Stone before proceeding with any Warranty service. We encourage you to call whenever *any* service is performed. By doing this we can direct you towards the best solution to the problem. It also allows us to check and update the service history we keep for each oven. Our goal is to help you service the equipment correctly and as efficiently as possible.

Parts are available through Wood Stone. Please contact the factory for pricing. Additional Service Manuals, Owners Manuals and Installation Manuals are also available. Owner's Manuals and installation information may also be downloaded from the Wood Stone web site at www.woodstone-corp.com.

Product Overview

There are four categories of ovens in the Mountain series:

W-Models use wood as the only heat source.

RFG-Models have a radiant flame burner located at the rear or either side of the oven. This burner is designed to give the appearance of a wood-fire type flame. The burner runs continuously when the oven is turned on. The oven has a manually controlled throttle valve to raise and lower the flame to control the oven temperature.

RFG-IR, GG: These models have a radiant flame burner as well as a thermostatically controlled underfloor infrared (IR) support burner. The radiant burner is the main heat source in this oven. This burner is designed to give the appearance of a wood-fire type flame. The burner runs continuously when the oven is turned on. The oven has a manually controlled throttle valve to raise and lower the flame to control the oven temperature. The underfloor burner is designed to assist in initial heat-up and periods of high production.

W-IR, IR-W, WG: These are wood-fired models with a thermostatically controlled underfloor infrared (IR) support burner. The wood fire is the main heat source. The underfloor burner is designed to assist in initial heat-up and periods of high production.

Gas fired ovens that include a '-W' in the model number are configured to allow the burning of wood in addition to the gas burners. See the Installation and Operation manual for specific information regarding the burning of wood.

Venting and Installation Information

Complete installation and venting information can be found in the Installation and Operation Manual supplied with the oven. Additional copies are available online at: **woodstone-corp.com** or call Wood Stone. Below is a brief overview.

Oven Venting

The Wood Stone Mountain Series ovens may be installed under a hood, or direct connected. All ductwork must be constructed and installed to the specifications of a grease duct. If a hood is used it must be a Type 1 hood (grease-rated). A power ventilator listed for restaurant exhaust applications must be provided.



Woodfired Ovens

Temperature Readout
Readout Troubleshooting
Electrical Diagram

Wood Fired Ovens

Temperature Readout

The only electrical components on the wood fired ovens are in the temperature readout display at the front of the oven. Be aware that these displays are often relocated to an area beside the oven etc. The assembly is made up of three components:

1. A thermocouple that is installed into the floor of the oven from below.
2. A temperature readout – available in Fahrenheit or centigrade.
3. A transformer – available as 120vac or 240vac. Outputs 12vac to power the temperature readout.



Readout Assembly



Faceplate



Readout



Thermocouple

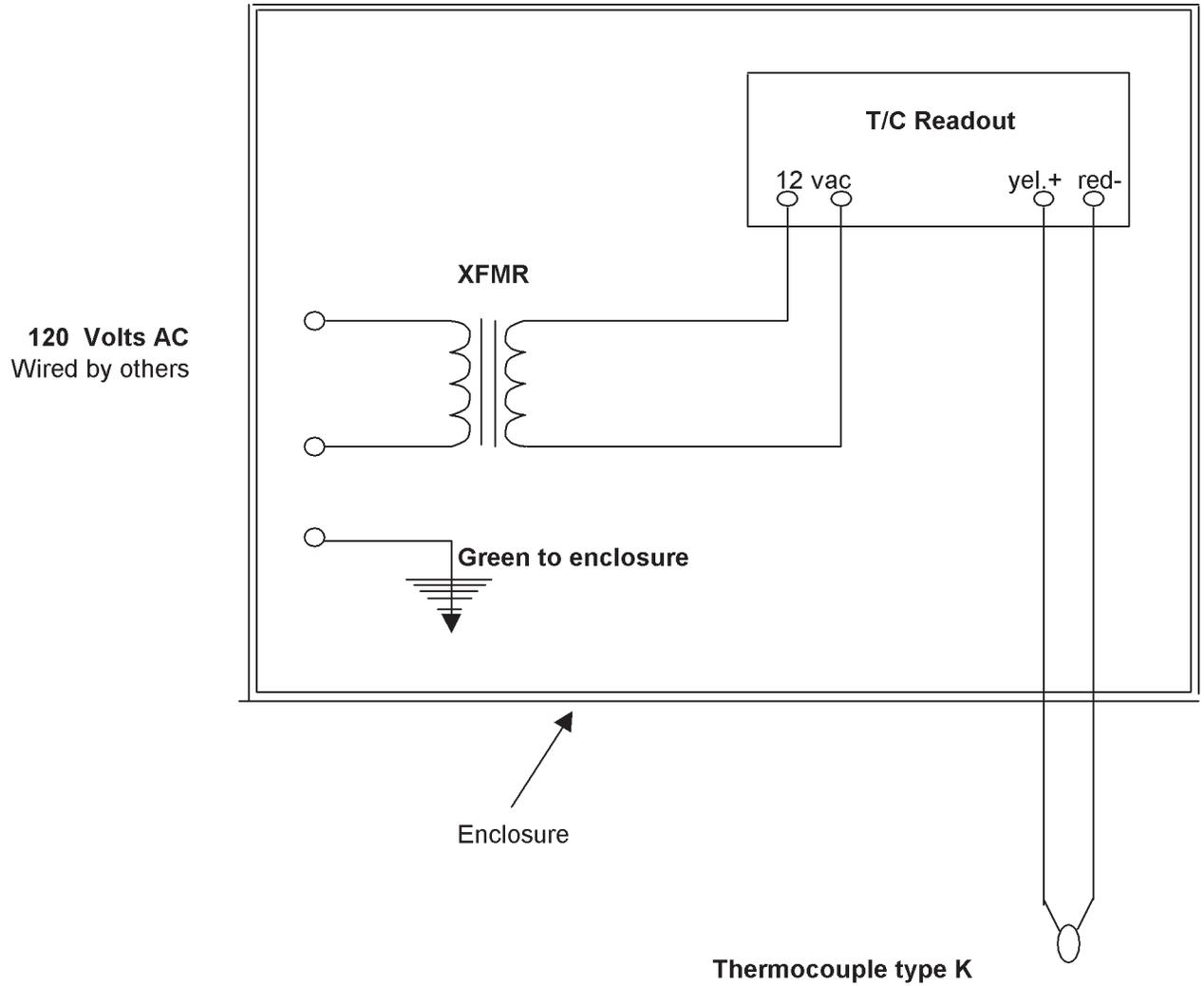
Wood Readout Troubleshooting

Symptom	Cause and/or Solution
Display does not light	<ol style="list-style-type: none"> 1. Breaker to oven tripped or turned off 2. If the breaker is fine, verify proper incoming power at input side of transformer. If incoming power is present, verify 12vac at output of transformer. If 12vac present replace temperature readout. If 12vac is not present replace the transformer.
Display lights but readout is erratic or displays "EEE"	<p>Check that the thermocouple connections on the readout module are correct (red to TC-(negative), yellow to TC+(positive).</p> <p>If the connections are good, remove the thermocouple wires from the display. Jumper between TC+ and TC- on the display; the display should show the ambient temperature. If it does not display the ambient temperature, replace the readout. If the readout displays the ambient temperature (when jumpered), replace the thermocouple.</p> <p>Note: Some models may include a plug connection between the readout box and the thermocouple. If applicable, check this connection. If this connection is defective, remove and wire the thermocouple directly.</p>

Cracking in the floor or dome of the oven

Some cracking of the oven refractory, especially hairline cracking, is completely normal and in no way degrades the performance of the oven. Any abnormal or extreme cracking (larger than 3/16 inch) should be brought to the attention of the Wood Stone Service Department. Do not attempt any type of repair to the oven refractory unless specifically instructed to do so by the factory, and then, only with materials supplied by Wood Stone.

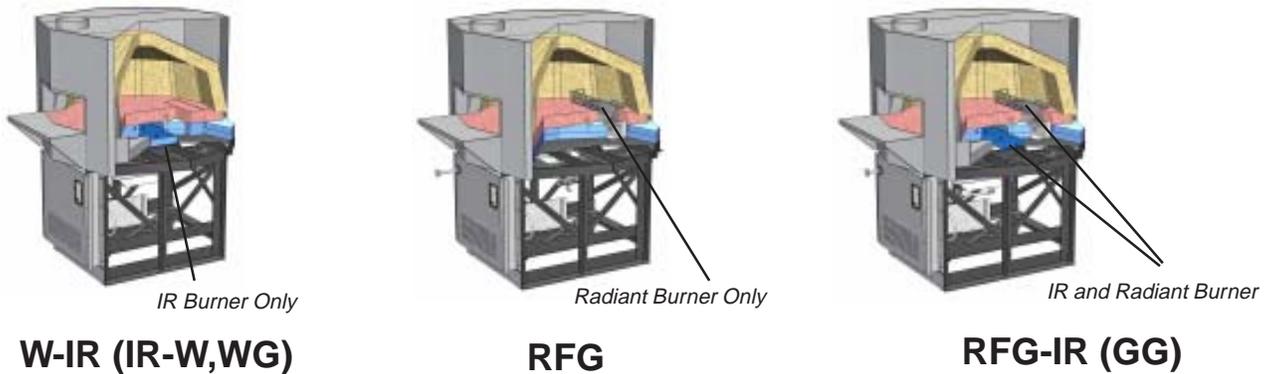
Wood Oven Electrical Diagram





Gas Ovens - Operational Overview and Components

Operational Overview
Operation Sequences
Gas Oven Components
Gas System Components



Gas Fired Ovens

Operational Overview

Wood Stone manufactures three different model types of gas fired ovens :
RFG-Models have a radiant flame burner located at the rear or either side of the oven. This burner is designed to give the appearance of a wood-fire type flame. The burner runs continuously when the oven is turned on. The oven has a manually controlled throttle valve to raise and lower the flame to control the oven temperature.

RFG-IR, GG: These models have a radiant flame burner as well as a thermostatically controlled underfloor infrared (IR) support burner. The radiant burner is the main heat source in this oven. This burner is designed to give the appearance of a wood-fire type flame. The burner runs continuously when the oven is turned on. The oven has a manually controlled throttle valve to raise and lower the flame to control the oven temperature. The underfloor burner is designed to assist in initial heat-up and periods of high production.

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Gas fired ovens that include a ‘-W’ in the model number are configured to allow the burning of wood in addition to the gas burners. See the Installation and Operation manual.

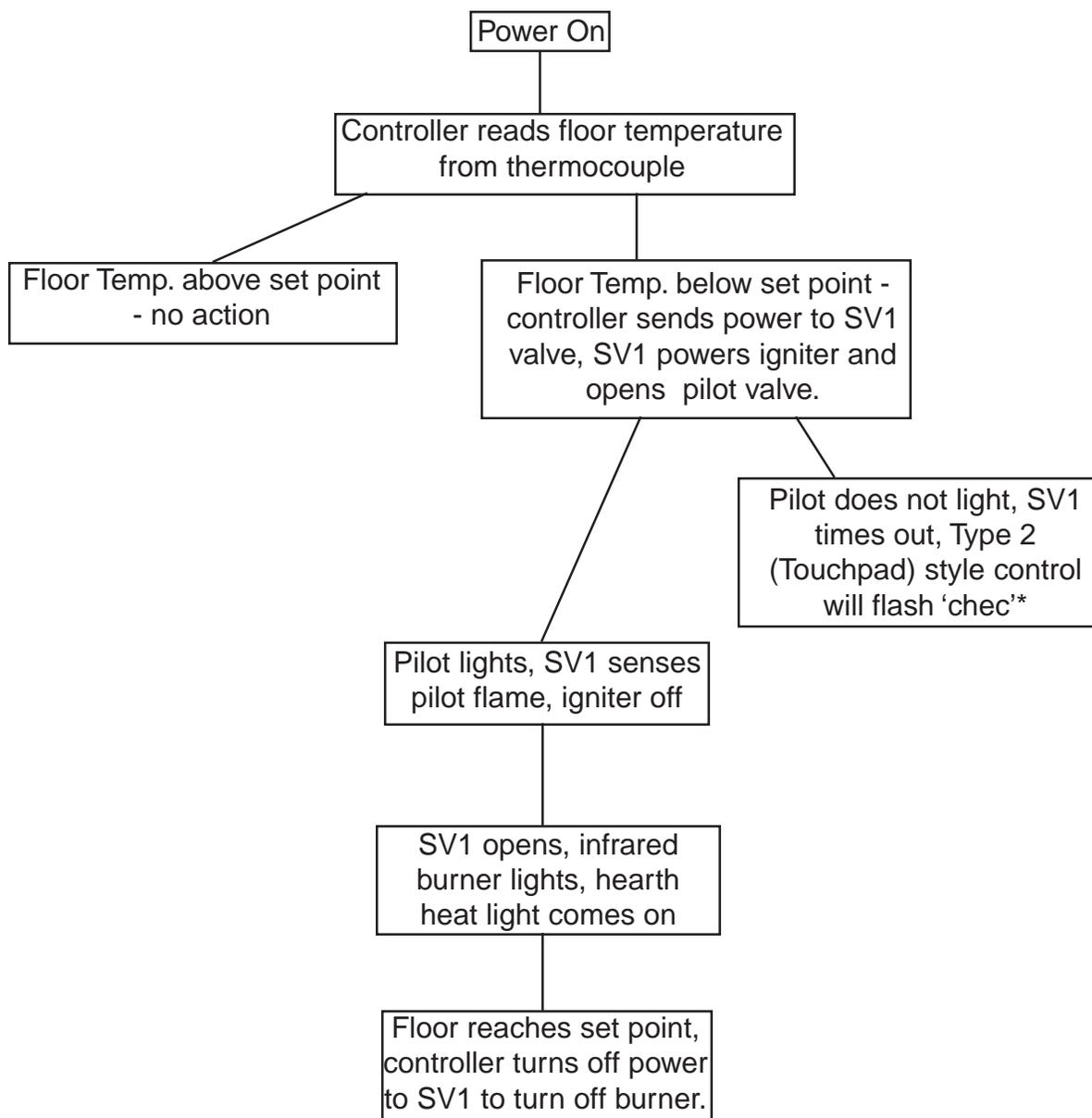
Burner Function

Radiant Flame Burner – The radiant burner is the main heat source for the oven, and it runs continuously when the oven is turned on. The control for this burner is the throttle knob located on the front of the oven, left side. **There is no thermostatic control for the radiant burner; the operator manually adjusts the flame height with the throttle knob to control the temperature of the oven.**

Infrared Burner (IR)- The IR is installed beneath the floor of the oven. It is controlled independently of the radiant burner by a temperature control located in the oven control box. This box is usually located on the front of the oven on the right side, but sometimes this might be moved to a different spot to accommodate the type of installation. The control incorporates a programmable set point and a floor temperature display. Remember the IR is not the primary heat source for the oven.

Burner Operation Sequences

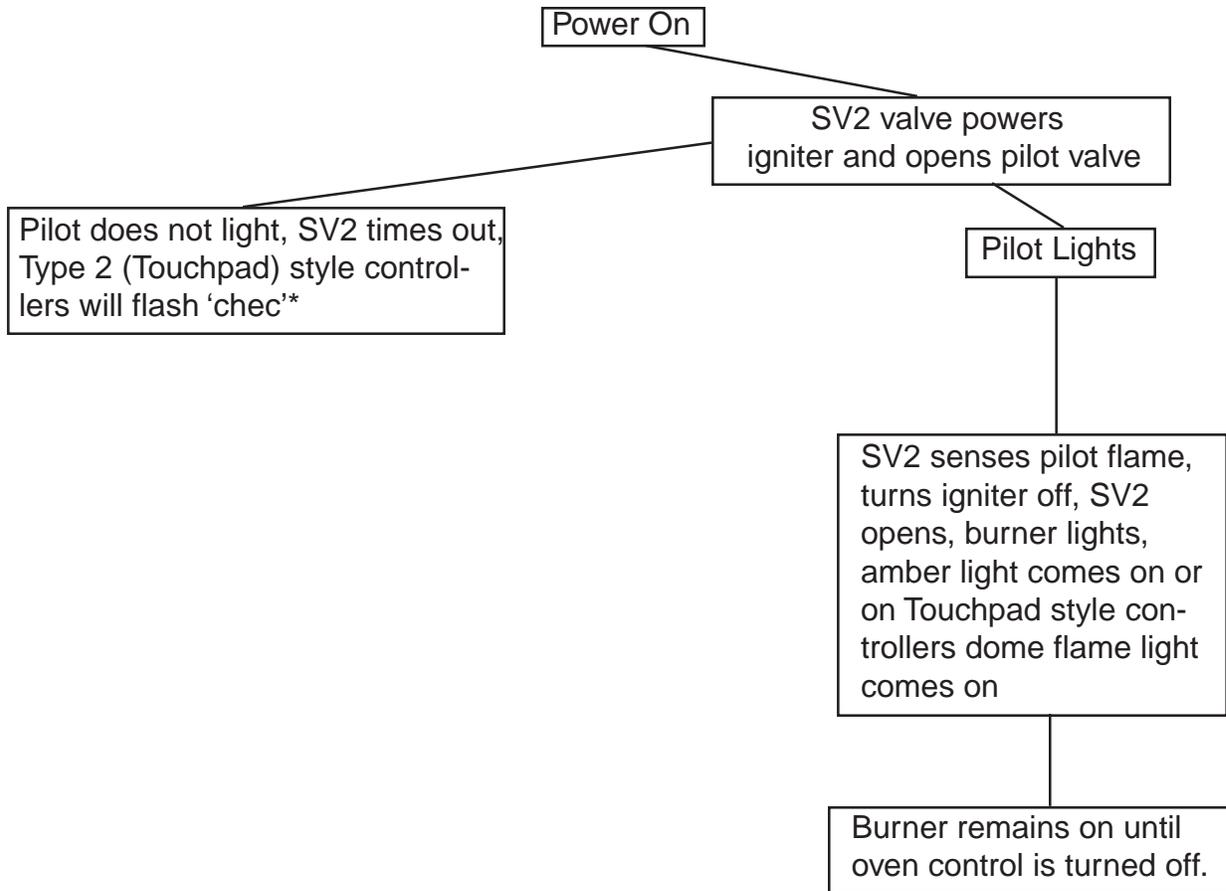
W-IR, IR-W or WG Oven - All Controllers



* Note: On ovens equipped with the Honeywell Smart Valves that have a round on/off control knob (instead of a slide switch) the valve will not time out if the pilot fails to light. The valve will remain powered and the igniter will remain on indefinitely until the pilot lights or power is turned off.

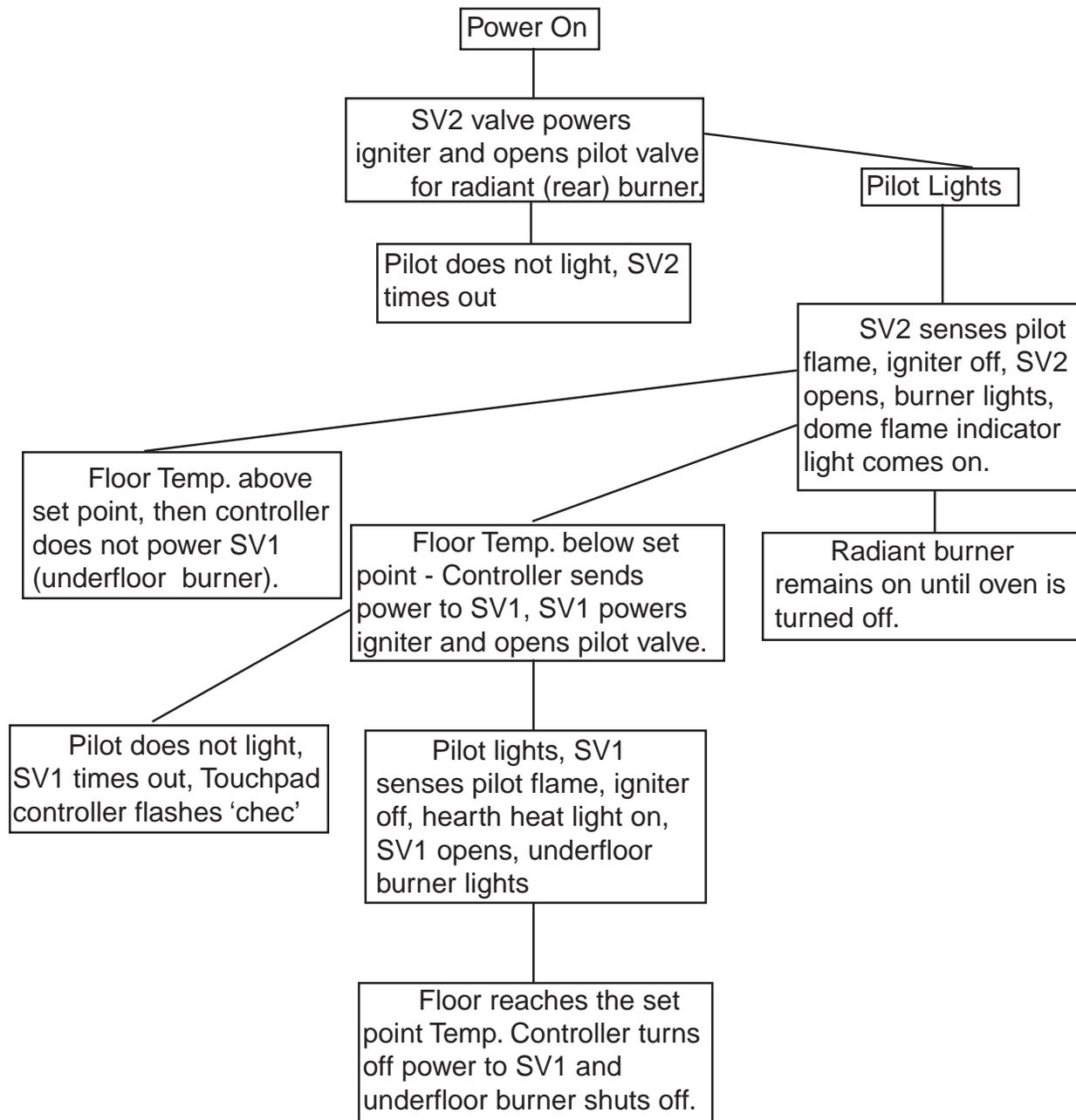
Burner Operation Sequences Cont.

RFG Oven - All Controllers



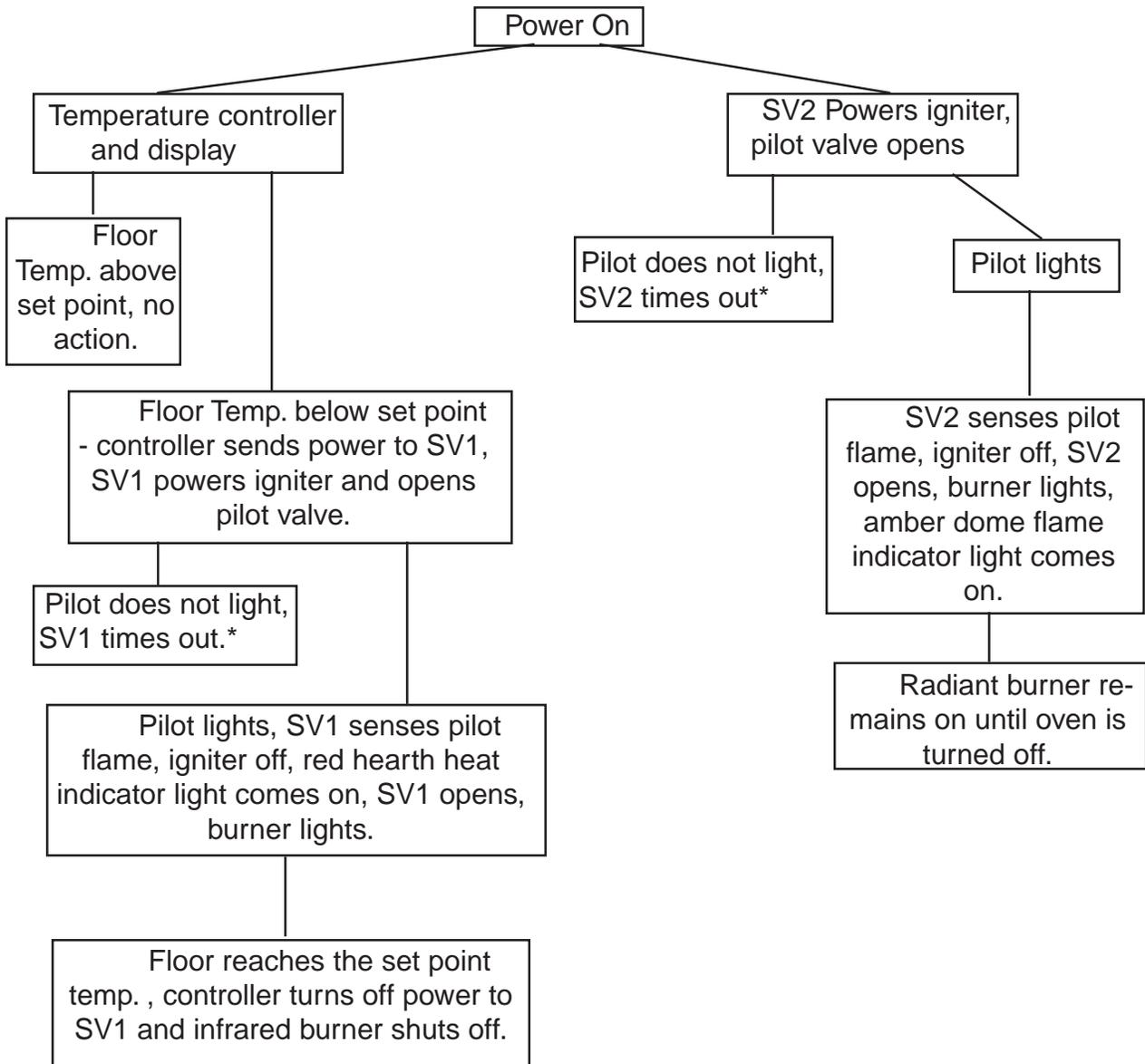
* Note: On ovens equipped with the Honeywell Smart Valves that have a round on/off control knob (instead of a slide switch) the valve will not time out if the pilot fails to light. The valve will remain powered and the igniter will remain on indefinitely until the pilot lights or power is turned off.

Burner Operation Sequences Cont.
GG or RFG-IR Oven - Type 2 (Touchpad) Controller



Burner Operation Sequences Cont.

GG Oven - Type I Controller



* Note: On ovens equipped with the Honeywell Smart Valves that have a round on/off control knob (instead of a slide switch) the valve will not time out if the pilot fails to light. The valve will remain powered and the igniter will remain on indefinitely until the pilot lights or power is turned off.

Gas Oven Components

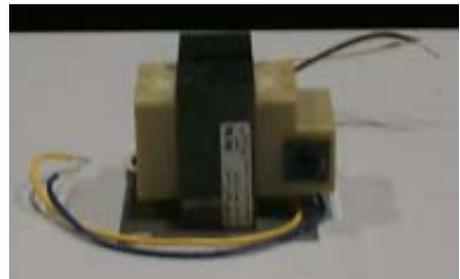
The following is a list of the key electrical and gas components found in Wood Stone gas ovens, accompanied by information about the individual parts:

24 volt transformer - This is the power supply for all of the electrical components on the oven. There are two styles in use:

ACME Multi-tap Transformer - Wiring is preconfigured at the factory for the correct voltages. The incoming power connection is made to the red and white taped leads and the green ground wire that are found inside the transformer case. Do not alter any of the other wiring within the transformer case. 24vac output can be tested in the adjacent junction box. 24vac should be present between terminal P (pink wire) and terminal 8 (white wire). Some models may have a fuse mounted on this transformer.

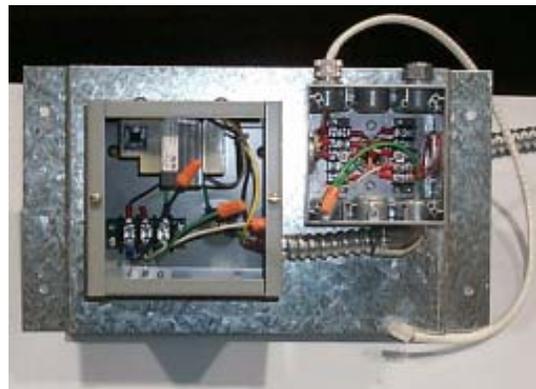


Class 2 Transformer - This transformer that incorporates a circuit breaker on its output. This unit is installed inside a junction box on the left side of the transformer plate. Incoming power is connected to the terminal strip (marked L N G) inside this box. L=line. N=neutral. G=ground. 24vac output can be measured in the adjacent junction box. 24vac should be present between terminal P (pink wire) and terminal 8 (white wire).



Transformer Plate Assembly

The transformer plate is located beneath the oven in the front on the right hand side. It consists of one of the two types of transformers and a 4x4 junction box. All wiring within the 4x4 junction box is low voltage. It allows voltage testing to various oven components for troubleshooting. All wiring harnesses and the thermocouple are routed through terminal strips within this box. Do not alter any wiring within this box or on the oven. Never connect 120v or 240v high voltage wiring within this box. **No external equipment should be connected to the low voltage wiring of the oven. This may effect the operation of the oven and void the oven warranty.** High voltage connections are to be made only within the transformer case-ACME, or the transformer junction box –Class 2. The Class 2 transformer may only be used where the incoming power is 120v. Never connect 240v to this Class 2 transformer.

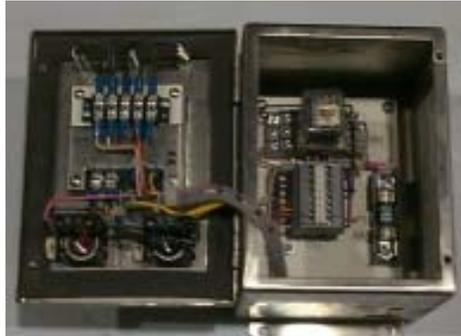


Gas Oven Components (continued)

Oven Controllers

There are currently five types of controllers found on Wood Stone Gas-fired ovens. A brief overview for each of them follows; detailed troubleshooting instructions will be found in the Troubleshooting section of this manual.

Type 1 Controller - This controller was used on WG and GG ovens built prior to March 2000. This unit is comprised of a control box that has one green and one red push button on the front. There are two or three indicator lights across the top, and a digital display with four touch pads – prog., arrow up, arrow down followed either by temp/adv or floor temp.



The green button is a 'normally open' switch that turns the oven on. The red button is a 'normally closed' switch that shuts the oven off. The lights across the top indicate the following: **green**-power on, **amber**-unit is sensing flame rectification at the radiant burner inside the oven, **red**-unit is sensing flame rectification at the under floor IR burner.

The digital display is the temperature control module for the under floor IR burner. *It does not control the radiant burner.* The red 'heat on' light indicates that the control is calling for IR burner operation. The number shown on the display when the oven is running is the thermostatic set point for the IR burner. To display the actual floor temperature press the rightmost pad marked either temp/adv or floor temp, (depending on the unit). To change the set point, press and hold the **prog** button until the display flashes SEt then Pnt. At this time adjust to the desired set point using the up or down arrows; when the desired set point is reached, press the **prog** button again to "lock in" the new temperature

There are actually two slightly different versions of this temperature control module. One will have 'NCC National Controls Corporation' written on the front and the right most button reads temp/adv. The second version reads 'Wood Stone Corp.' on the front and the right most button reads floor temp. The only difference is that the unit that reads 'NCC' has programmable hysteresis parameters and the 'Wood Stone' version has these locked. It is critical that the factory settings on the NCC model are not altered. See the Troubleshooting section for information on the hysteresis settings.

Additional components – Located inside the control box are a 5 amp fuse, an 'ice cube' relay, a terminal strip and a wiring diagram for the oven.

Type 2 (Touchpad) Controller - This style of controller is the standard on all gas ovens produced after March 2000. RFG models produced after August 2005 use the Type 4 control. On the front of the control is a touch-pad overlay with a hearth temperature display, and depending on the oven model – a hearth set point display, and dome flame and hearth heat indicator lights.

Also included on the touch-pad are on/off, F/C and up and down adjustment arrows. Other than the controller board there are no other parts inside the box. The DIP switches on the controller board are preset at the factory and are used to configure the board for the type of oven-RFG-IR(GG), W-IR(WG, IR-W) or RFG. There should be no reason to alter these settings.



DIP SWITCH SETTINGS

RFG-IR (GG) - Both ON

W-IR (WG, IR-W) - #1 OFF, #2 ON

RFG - Both OFF

Type 4 Controller - This control is used on RFG models produced after August 2005, Bistro series ovens, and some field conversion ovens. It has, a temperature display, ON/OFF and F/C functions.



RFG Controller - This control is found on the RFG type ovens manufactured prior to March of 2000, and on previously installed ovens that have been converted from wood-fired only (W) to RFG gas by Wood Stone. Ovens built after March of 2000 use the Type 2 (see previous page) or Type 4 controller. The function of this controller is to turn the radiant burner on or off, and to display the current floor temperature. RFG ovens are equipped with only a radiant flame burner, which runs at all times when the oven is turned on. This controller housing is smaller than the Type 1 or the Touchpad. On the front it has a temperature display, ON button, OFF button, green power indicator light, and an amber flame rectification indicator light. Mounted to a bracket on the back of the faceplate are a relay and a terminal strip. It should be noted that on this control the temperature readout only is powered by 12vac output of the ACME transformer. The readout remains on as long as incoming power is supplied to the oven. The other components in the control and on the oven are still powered by the 24vac output of the ACME transformer. When this controller is used, it is accompanied by a 3-amp fuse mounted to the transformer box.



8-Foot RFG Controller - This control differs slightly from the standard RFG control because this oven is equipped with three radiant burners. It utilizes a larger box than the controller described above. It does not have a power 'on' indicator light. The three lights across the top are indicators for each of the three burners - they are on when the respective burner has lit and is running. This unit uses a temperature readout that is powered by 12vac coming from a tap on the ACME transformer. This display is lit whenever incoming power is supplied to the oven, regardless of whether the oven is turned on or not.

Just below this display is a red over-temperature light. This light indicates that the over temperature module located in the junction box on the transformer plate has tripped and shut off 24vac power to the relay and start switch. All of the other components on the oven and control are powered by the 24vac output of the ACME transformer. Additional parts inside the control box are a relay, terminal block, four 2amp fuses (one for each gas valve and one for the temperature readout) and a 5 amp fuse for the entire 24 volt circuit. **NOTE:**

The over temperature module will trip if the oven temperature exceeds 800 degrees F and the red indicator below the temperature readout will light. To reset, the oven floor temp must drop below 800 degrees. Then turn the control off, then back on to reset and run the oven.



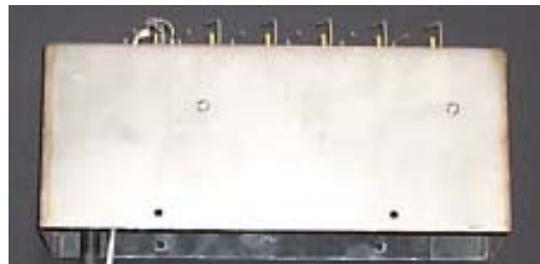
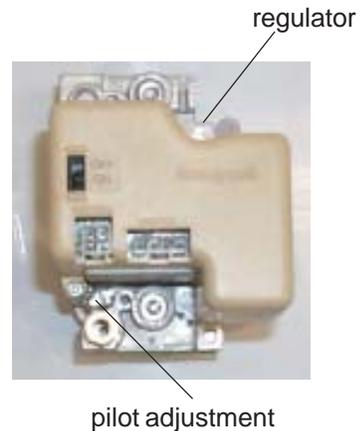
Gas System Components

Gas Valves - Wood Stone uses a 'smart' type gas valve to control gas flow to each burner. These valves do not require the use of a separate ignition module, the ignition control system is integrated into the circuitry of the valve itself. Electrical connections are made via Molex connectors. The same valve is used regardless of oven size or model, IR or radiant burner. When used on the IR burner it is referred to as **SV1**. When used on the radiant burner it is referred to as **SV2**. An adjustable pressure regulator is incorporated into the valve. There is also an adjustment on the valve for the pilot flame height. **Note:** Maximum incoming line pressure must not exceed 14" W.C.(34.8mbar). Use an external regulator if line pressure exceeds 14"W.C.

Pilot Igniter Assembly - The pilot/igniter is used in conjunction with the smart valve to ignite the burner and provide flame sensing (flame rectification) for the gas valve. It uses a tungsten glow coil for hot surface ignition. This coil is fragile. Flame rectification is achieved from the flame rod to ground through the pilot tubing. The pilot/igniter assembly wiring is connected to the gas valve via Molex connector. On the connector the two wires closest to each other supply power to the glow coil.

Radiant Burner Assembly - This is the burner typically located at the rear of the oven and produces the flames visible inside the dome, but may also be located on one or both sides. It consists of a stainless steel burner housing, a cast iron burner manifold, the burner jets and the flame retention springs that are attached to each jet. There is an opening in the burner housing through which the pilot igniter assembly is mounted.

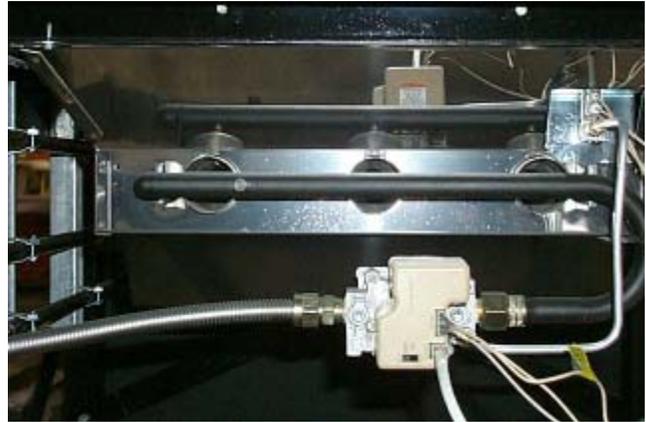
Throttle Control Valve - This valve is located on the left side of the oven in front, or at the rear left. The control knob is always at the front of the oven. This is what the operator uses to control the flame height of the radiant burner only. It is not a shutoff valve. Do not remove, or replace this valve with anything but a valve supplied by Wood Stone. Replacing this valve with any part not supplied by Wood Stone could create a DANGEROUS operating condition. Shown below with the control rod and cotter pin. Some ovens are equipped with a butterfly style valve that does not require the control rod shown below. The handle (wings) are cast as part of the valve stem. On newer ovens the throttle valve is located at the rear of the oven above the SV-2 gas valve. The knob assembly is clamped to an EMT extension beneath the oven, which is then in turn connected to the valve with a cotter key.



See gas component diagrams and piping layouts, pages 36 and 37.



Infrared Burner Assembly - This is the burner located beneath the floor of the oven. The tubes on the outside of the burner are used to supply air to the burner. You will not see flame in these tubes. **DO NOT ATTEMPT TO LIGHT THIS BURNER MANUALLY!** To visually verify that the burner is running look through the gap next to the pilot assembly and you should see a reddish glow over the ceramic burner elements. This burner operates only when the hearth temperature is lower than the controller's hearth set point.



Thermocouple - A Type K thermocouple is used to sense the temperature of the oven floor (hearth) about 1 inch beneath the hearth surface. It is located slightly to the rear of the center of the oven (behind the IR, on an IR equipped oven). It is mounted into the floor of the oven, but is easily replaceable.



SV1 and SV2 Wire Harnesses

These harnesses supply the voltage needed to activate and power the ignition system on the respective valves. They also send flame verification voltage from the valve back to the controller.



Controller Wire Harness

This harness carries low voltage to and from the oven controller. It also contains the thermocouple wires.





Gas Ovens - Troubleshooting

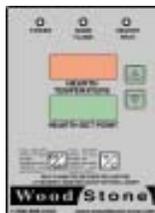
Type 1 Controllers
Touchpad Controllers
Other Controllers
Radiant Burner
Infrared Burner

Gas Oven Troubleshooting Part 1 - Controllers

Type 1 Controller Troubleshooting



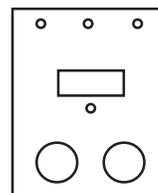
Type 1



Type 2



Type 4



8RFG



Pre-March2000 RFG

The Type 1 controller is most easily identified by a large red pushbutton and a large green pushbutton on the face of the stainless steel controller housing. In the center there will be a gray touch-pad that says 'Temperature Controller'. You will also see either two or three indicator lights across the top. Additional information can be found in the previous Oven Components-Oven Controllers section of this manual.

Symptom	Probable Cause/Solution
Oven does not turn on. Display is blank and green power light is off. (also see below)	<ol style="list-style-type: none"> 1. Is incoming power turned off at breaker or wall switch etc? 2. If incoming power supply to ovens is on, check fuse F-1 located in the control box, if the fuse is bad, find the short and replace fuse. The short may be outside the control box (i.e. a gas valve, thermocouple, etc). 3. If the fuse is good, verify 24V between the fuse and the white wire (TB-1 terminal 8). If 24 V is present proceed to step 4. If there is no voltage, go to the J-box located below the oven on the transformer plate. Test between the pink and the white wires (terminal 8 and terminal P). If 24V present, fix loose connection at control or J-box. If no voltage recheck incoming power at transformer. If 120V present check for loose wires and replace transformer if necessary. 4. If voltage present between pink and white wires in control box, verify that 'ice cube' relay is seated in its socket. If oven still does not come on check that the NO and NC (start and stop) switches are functioning correctly. Verify that all wiring connections to the switches, relay socket and terminal block are good. If this all checks out replace relay.
Oven does not turn on, no display, and no power on light. But if start button is held in oven and display come on.	Loose 'ice cube' relay in control box-push in on relay to reseat it. Loose connection in control box Bad relay
Oven intermittently shuts off, display goes blank, and power light goes off.	See above Loose wire (pink or white) in junction box on transformer plate below oven. Problem with 120v circuit supplying oven
Power light comes on, radiant flame comes on (if equipped), but display is blank.	Check for 24v at the input on the NCC control module. If 24v present control is bad. If 24v not present find bad wire connection.
Display reads 'PROB'	This indicates an open thermocouple, check connections on control and in J-box below oven before replacing
Display reads 'FAIL'	Turn the oven off then back on, if display still reads 'FAIL' replace the temperature control module.

Type 1 Controller Troubleshooting (continued)

Symptom	Probable Cause/Solution
<p>Display scrambles and/or is erratic when displaying the actual floor temp, an audible hum may be noticed at the transformer</p>	<p>The thermocouple is grounding out - there should be no continuity to ground from either of the thermocouple leads. Check thermocouple connections in control box and J-box below the oven. Remove thermocouple leads at J-box and retest to verify that it's bad, and not a damaged thermocouple wire in the control harness.</p>
<p>Product is over cooking. Control is displaying a floor temp. that is considerably lower than the setpoint and the IR burner is running.</p>	<p>Thermocouple may be shorted - When this happens the controller reads the temperature at the point where the two thermocouple wires are shorted together. Look for damage to the thermocouple wire. If there is heat damage to the thermocouple wire, it is usually caused by excessive airflow under the oven that pulls the heat from the IR back onto the wiring. This needs to be corrected.</p> <p style="text-align: center;">or</p> <p>Operational Problem-Call Wood Stone.</p>
<p>Product is cooking inconsistently, under and/or over. The gray label on the control says 'NCC' not 'Wood Stone'. Control is calling for heat and IR is running and floor temp is above the setpoint.</p> <p style="text-align: center;">Or</p> <p>Floor temp is more than two degrees below the setpoint and the control is <u>not calling</u> for heat.</p>	<p>Hysteresis settings on the control have been changed from the factory settings. To enter the correct parameters do the following: Hold the 'PROG' button in until the words 'SET and PNT' are displayed. It will then flash the current setpoint. Now press the 'TEMP/ADV' button. The display will now flash 'dead band', then 'on' then '-1'(minus 1). If this number is other than '-1'(minus 1) use the arrows to change it. Press 'TEMP/ADV' again. The display will read 'OFF' and then '0'. If it's other than zero use the arrows to set it to zero. Press 'TEMP/ADV' again. The display will read 'OFF' and 'SET'. This number should be '0' also. With some units the parameters may appear in a different sequence than above. Make sure that the setting for each of the three parameters is correct. Press the 'PROG' button to save these changes. This must be done within 15 seconds or the control will default back to the previous settings.</p>
<p>Controller displays in degrees Celsius rather than Fahrenheit or vice versa.</p>	<p>Press both arrows on the control simultaneously to change the display between Fahrenheit and Celsius.</p>

Part 1-Controllers

Gas Oven Troubleshooting

Type 2 (Touchpad Controllers)

Type 2 controllers have been in use as gas oven controllers since mid-2000. There are no push button switches on the outside of this control. All versions of this control use a Lexan touch-pad (overlay) on the face of the control to operate the unit. It has power and flame indicator lights and a hearth temperature display. IR equipped ovens will also have a set point display. Additional information can be found in the Oven Components-Oven Controllers section of this manual.

Symptom	Probable Cause/Solution
Oven does not turn on, control is blank	<p>Is the breaker and/or wall switch supplying power to the oven on?</p> <p>Is the circuit breaker on the 24v. transformer tripped?</p> <p>The transformer is located in the rear-most junction box located on the transformer plate, beneath the oven in the front on the right side. If the breaker on the transformer is tripped, eliminate the short and reset the breaker. <i>In addition to a bad gas valve, wiring etc., a thermocouple that is grounding out can also cause the breaker to trip.</i></p> <p>Check for 24V between the pink and the white wires at the terminal block on the oven control board-inside the control box. If 24V is present, make sure that the four nuts attaching the circuit board to the face of the box are tight. DO NOT OVERTIGHTEN; they should be snug enough that pressure on the touch pad activates the switches on the circuit board.</p> <p>If the controller is still not coming on, carefully remove all wires except the pink and white from the circuit board terminal block. If the controller comes on, it is OK but there is a defective component or damaged and/or incorrect wiring elsewhere. If with just the pink and white wires connected (and 24V present), the controller still does not come on, replace the controller circuit board. Turn off the incoming power to the oven before removing the wires to prevent damage to the board. Replace the overlay as well if it is damaged.</p>
Temperature display reads 'open'	<p>Indicates an open thermocouple. Check for loose thermocouple connections at the control board and at the J-box on the transformer plate below the oven before replacing. Check for continuity between the 2 thermocouple wires. There should be NO continuity to ground through either thermocouple lead. If there is heat damage to the thermocouple it is usually caused by excessive airflow beneath the oven that blows the heat from the IR back onto the thermocouple wire. This should be corrected - call Wood Stone.</p>
Temperature display scrambles and/or is erratic (may precede the transformer circuit breaker tripping).OR Display is fine, but the transformer circuit breaker trips instantly and/or intermittently.	<p>Thermocouple is shorting to ground. There should be no continuity between the thermocouple leads and ground. Check thermocouple connections at control board and J-box below the oven. Remove thermocouple leads at J-box and retest to confirm damaged thermocouple and not bad wire in the control harness.</p>
Product is overcooking and the control is displaying a hearth temperature that is considerably lower than the hearth set point and the IR burner is running.	<p>1. Thermocouple may be shorted causing it to read the temp. at the point of the short. Look for damage to the thermocouple wire. If there is heat damage it is usually caused by excessive airflow under the oven blowing heat from the IR back onto the wiring. This needs to be corrected.</p> <p>2. Operational problem-contact Wood Stone.</p>
Product is overcooking and the floor temperature is higher than the set point. The IR burner should not be running.	<p>Operational problem. The operator is leaving the radiant at too high a setting for too long and as a result, is driving up the oven temperature by using too high of a radiant flame. The radiant flame by itself can easily drive the oven temperature well above the set point if it is turned up too high. The restaurant should call Wood Stone for operational assistance.</p>

Type 2 Controllers (continued)

Symptom	Probable Cause/Solution
<p>RFG-IR(GG) Oven – Control is on, but dome flame does not come on, IR burner does not come on. RFG Oven – Control is on, but dome flame is not coming on. Wood-Gas Oven-Control is on but IR is not coming on.</p>	<p>Control is fine, See Radiant and Infrared Burner Troubleshooting section of this manual. Note: On RFG-IR(GG) ovens with this control, the control will not signal the infrared burner to light until after the dome flame has lit.</p>
<p>RFG-IR(GG) Oven-Dome flame comes on, a short time later the display flashes ‘check’ and the hearth heat indicator light flashes.</p>	<p>Control is fine. It is indicating that the control called for IR heat, but the IR burner did not fire within the time allowed by the control. See Radiant and Infrared Burner Troubleshooting section of this manual.</p>
<p>9690 Model RFG-IR(GG) Oven-Display is on, no burners are lighting hearth temp.is above 800F. or 9690 RFG-IR(GG) Oven-All burners go out, display remains lit, hearth temp. is above 800F or 9690 RFG-IR(GG) Oven-No burners are lit, hearth temp. is below 800F</p>	<p>Some versions of this oven incorporate an over-temperature control that shuts off power to the gas valves. Once the oven floor temperature has dropped below 800F; it may be reset by turning the oven off and then back on.</p>

Part 1-Controllers

Gas Oven Troubleshooting

Type 4 Controller for RFG ovens. Used on RFG models shipped after August 2005 and ovens converted in the field to gas from wood.

Additional information can be found in the Oven Components-Oven Controllers section of this manual.

Symptom	Probable Cause/Solution
Oven does not turn on, control is blank	<p>Is the breaker and/or wall switch supplying power to the oven on?</p> <p>Is the circuit breaker on the 24v. transformer tripped? The transformer is located in the rear-most junction box located on the transformer plate, beneath the oven in the front on the right side. If the breaker on the transformer is tripped, eliminate the short and reset the breaker. <i>In addition to a bad gas valve, wiring etc., a thermocouple that is grounding out can also cause the breaker to trip.</i></p> <p>Check for 24V between the pink and the white wires at the terminal block on the oven control board-inside the control box.</p> <p>If the controller is still not coming on, carefully remove all wires except the pink and white from the circuit board terminal block. If the controller comes on, it is OK but there is a defective component or damaged and/or incorrect wiring elsewhere. If with just the pink and white wires connected (and 24V present), the controller still does not come on, replace the controller circuit board. Turn off the incoming power to the oven before removing the wires to prevent damage to the board. Replace the overlay as well if it is damaged.</p>
Temperature display reads 'open'	<p>Indicates an open thermocouple. Check for loose thermocouple connections at the control board and at the J-box on the transformer plate below the oven before replacing. Check for continuity between the 2 thermocouple wires. There should be NO continuity to ground through either thermocouple lead.</p>
Temperature display scrambles and/or is erratic (may precede the transformer circuit breaker tripping).OR Display is fine, but the transformer circuit breaker trips instantly and/or intermittently.	<p>Thermocouple is shorting to ground. There should be no continuity between the thermocouple leads and ground. Check thermocouple connections at control board and J-box below the oven. Remove thermocouple leads at J-box and retest to confirm damaged thermocouple and not bad wire in the control harness.</p>
Product is overcooking or undercooking.	<p>Operational issue. Temperature in the oven is controlled using the flame height control knob on the front of the oven. Flame height should be adjusted accordingly. Call Wood Stone for assistance. Detailed operational information can also be found online at www.woodstone-corp.com</p>
Display reads 'LO'	<p>This is normal. Controller will display 'LO' whenever the oven floor temperature is below 100 degrees F.</p>

Part 1-Controllers

Gas Oven Troubleshooting

Pre-March2000 RFG Controls and 8 Foot RFG Controls

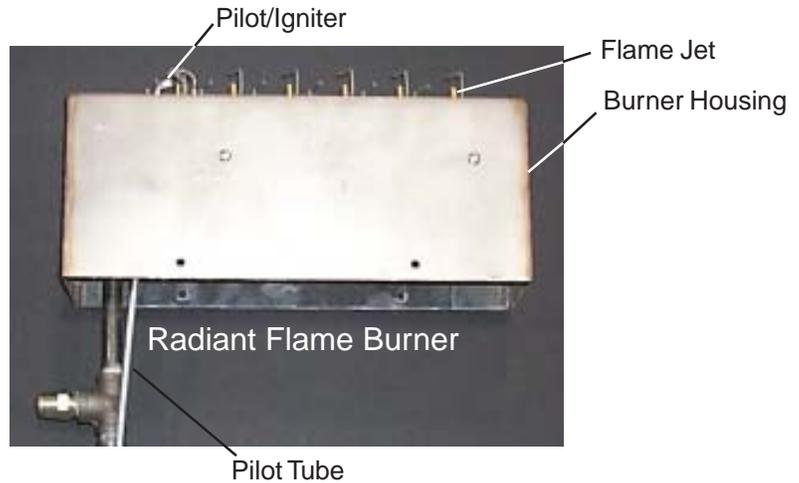
These controls are found on ovens that are equipped with a radiant burner only. This includes ovens that have been converted by Wood Stone from wood burning to gas. *RFG ovens built after March 2000 utilize the Type 2 or Type 4 controllers discussed previously in this manual. Additional information can be found in the Oven Components-Oven Controllers section of this manual.*

Symptom	Probable Cause/Solution
Temperature Readout is blank, no green or amber light, flame does not come on.	<p>Incoming power has been turned off, i.e. breaker, wall switch etc.</p> <p>Fuse on transformer has blown, replace fuse. Find short and correct.</p> <p>Loose wire in J box on transformer plate or in control box - look at the white wire especially, and the pink and the purple wires.</p> <p>Check for power from transformer - First check for incoming power at the connections to the transformer. Then, measure 24V between pink and white in J Box. Measure 12V. between purple and white. If there is no voltage, replace the transformer.</p>
Temperature Readout is blank, but oven comes on normally.	<p>Check for 12v. going in to the temp. display module. If 12v. present, replace the temp. display. If not check for loose wire connection (purple and white wires) in control box and J Box on transformer plate.</p> <p>On 8 Foot RFG only: Check Temp. Readout fuse in control box</p>
Temperature Readout remains lit even when oven is turned off.	<p>This is normal-the readout is lit whenever incoming power is supplied to the oven.</p>
Temperature Readout is lit, but no green power on light and oven is not turning on. NOTE: There is no power 'on' light on the 8 Foot RFG Controls.	<p>Verify that 24V is being supplied to the controller (pink and white wires).</p> <p>If 24V is not present, find bad wire connection.</p> <p>If 24V is present, check that the rubber boot on the stop switch has not caused the switch to remain depressed.</p> <p>Check all wire connections and make sure that the relay is securely seated.</p> <p>On 8 Foot RFG Only: Check 5-amp fuse in control box. If the fuse is blown correct the short and replace fuse. Check wire connections at each switch.</p>
Temperature Readout is lit, oven will only come on if start button is held in.	<p>Check that rubber boot on stop switch is not causing the switch to remain depressed.</p> <p>Check for loose wires and check that relay is securely seated in its socket.</p> <p>Verify that the start (NO) and stop (NC) switches are functioning correctly.</p> <p>If all above check out ok, replace relay.</p>
Oven will not turn off when stop switch is depressed.	<p>Rubber boot on start switch is causing the start switch to remain depressed or defective stop switch.</p>
Temperature Readout displays“EEE” or is erratic.	<p>Check thermocouple connections on the back of readout- red to TC-(negative), yellow to TC+(positive). If connections are good, remove the thermocouple wires from the Temperature Readout. Jumper between TC+ and TC-. Display should show ambient temperature. If it does not, replace the readout. If readout is good, reconnect thermocouple and check thermocouple connections at readout and in the J box on the transformer plate. Check for continuity and that the thermocouple leads are not shorted to ground. If a break or short is found determine if it is in the harness lead or the wire coming directly from the thermocouple.</p>

Symptom	Probable Cause/Solution
No burners are lighting, none of the 3 indicator lights across the top of the control are lit. The red light below the temperature readout is lit.	The temperature of the oven floor has exceeded 800F and the overtemp limit switch has shut off the oven. Once the temperature drops below 800F, press the stop button to reset the limit switch, then restart the oven.
One of the three burners is not lighting.	Check gas valve fuses in the control box. Check the Burner Troubleshooting section of this manual.

Gas Oven Troubleshooting Part 2 - Gas Burners

Operational Overview - Wood Stone gas ovens utilize 'smart' type gas valves. With these valves the ignition module circuitry is incorporated into the valve itself-there is no separate ignition module. Burner ignition is achieved via a hot surface (glow coil) to pilot ignition system. The unit will attempt pilot ignition for 90seconds – 30 seconds glow, 30 seconds purge and then 30 seconds with the glow coil again. Pilot gas will flow for the entire 90-second trial. The system will then lockout and retry after 5 minutes. Flame rectification is sensed through the flame rod on the pilot/igniter to ground via the pilot tube.



Radiant Flame Burner Troubleshooting

The radiant flame burner is the burner located at the rear of the oven (in some cases on the side of the oven). It is the main heat source in all ovens equipped with this burner. Flame height is controlled at the throttle control (valve) on the front of the oven, left side.

Symptom	Probable Cause/Solution
<p>Burner does not light, oven controller is on, and switch on the gas valve (SV2) is in the on position, no visible glow from the side of the burner.</p> <p>Note: On any call where the complaint is that the radiant burner will not light, stay lit or is going out intermittently- the radiant burner should be removed for inspection and cleaning. The majority of radiant burner problems can be traced to debris in the burner. See the "Common Repair Procedures" section of this manual.</p>	<ol style="list-style-type: none"> 1. Wire connections at the SV-2 gas valve are loose or unplugged. Verify that the MOLEX connectors for the SV2 wire harness and the igniter wires are securely plugged into the gas valve. Make sure that the pins are locked into the connector body. 2. Moisture. If the valve has gotten wet replace it. Also, the pilot/igniter will not function correctly if igniter wires have gotten wet. If the igniter wires are wet, turn the oven off and carefully uncoil the wires and separate them so there is as little contact between them as possible, then restart oven. 3. Abrasion of the pilot igniter wires. If there is a wire tie on the igniter wires, carefully remove it and uncoil the wires and separate them so there is as little contact as possible between them. 4. Broken glow coil on the pilot igniter. Test for continuity at the igniter MOLEX connector. Between the two adjacent wires on the connector you should read about 3.5 ohms. If circuit is open replace the igniter. If this is the case, the burner should be removed for cleaning and inspection. See the Common Repair Procedures section of this manual. If igniter tests ok, verify 24 volts going to the gas valve. This can be tested at the MOLEX connector on the wiring harness. Disconnect the wiring harness from the gas valve before checking voltage. DO NOT ATTEMPT TO CHECK FOR VOLTAGE WHILE IT IS CONNECTED TO THE GAS VALVE. With the oven on you should read 24V between the brown and white wires. If the voltage is fine replace the gas valve. <p>Warning - Do not attempt to read voltages at the connectors on the Honeywell gas valve; Doing so may damage the electronics in the valve.</p> <p><i>Any time it is necessary to replace a gas valve or igniter, the burner should be removed for inspection and cleaned if necessary. Most valve and igniter failures are caused by debris, either through physical damage to the igniter or causing a short to the valve.</i></p>

Radiant Flame Burner Troubleshooting (continued)

Symptom	Probable Cause/Solution
<p>Burner does not light, there is a visible glow on one side of the burner. Dome flame indicator light on controller is not lit. On older controllers this will be the amber indicator light.</p>	<p>1. Gas supply to the oven has been turned off. Check manual shutoffs, fire suppression system resets etc.</p> <p>2. There may be air in the gas line. On a new oven start-up there may be air in the gas line. Turn the oven on for about 30 seconds. Turn it back off and then back on for 30 seconds. Repeat this up to five times. If you begin to smell gas and the oven is still not lighting, proceed to step 3. If oven does not light and you are not smelling gas continue with this step. It will be necessary to remove the inlet plug on the gas valve which will enable the air to be bled more quickly from the line. This can be done on the IR gas valve if equipped. TURN OFF THE OVEN AT THE CONTROLLER. EXTINGUISH ALL OPEN FLAMES BEFORE BLEEDING THE GAS LINE. Remove the plug on the inlet side of the gas valve using a 3/16" hex key wrench. Allow the air to bleed out until you smell gas. Re-install plug. Allow the gas to dissipate and then turn the oven on. If oven does not light after 30 seconds, turn it off and back on again, it may still be necessary to do this a few times. DO NOT LEAVE THE OVEN UNATTENDED WHILE THE INLET PLUG IS REMOVED FROM THE GAS VALVE!</p> <p>3. Verify that the switch on the gas valve is in the 'ON' position. The valve will power the igniter even if the switch is in the 'OFF' position.</p> <p>4. Check for loose wire connections at the SV2 gas valve. Verify that the MOLEX connectors for the SV2 wire harness and igniter wires are securely plugged into the gas valve. Make sure that the pins are securely locked in to the connector body.</p> <p><i>If burner still does not light, proceed with the following:</i></p> <p>5. Try to determine if the pilot is actually lighting. DO NOT CLIMB INTO THE OVEN OR PLACE FACE OVER BURNER! <i>It can be difficult to see and can be confused with the glow from the igniter, use an inspection mirror if possible.</i> If the pilot is actually lighting, make sure flame rod is clean and that no debris is interfering with the flame. Make sure pilot gasket is in place.</p> <p>Pilot flame should envelop $\frac{3}{8}$" to $\frac{1}{2}$" of the flame rod, and make continuous contact with the forked ground electrode. If the flame is not making good contact, gas pressure is low or pilot orifice is dirty. If flame is overshooting, the pilot orifice may be missing, or pilot may be adjusted too high at the gas valve. If pilot is not lighting make sure pilot orifice is not plugged. <i>See the Common Repair Procedures section of this manual.</i></p> <p>If flame is good, recheck igniter wires, make sure pins are seated etc. If rectification light still does not come on and burner is not lighting replace pilot/igniter. If after replacing pilot/igniter the burner still does not light, replace the gas valve.</p>
<p>Burner is not lighting, dome flame light is on or amber light on older controls. Pilot appears to be lighting.</p>	<p>1. Verify that gas is going to the burner using a manometer at the port below the burner. Check the Equipment Dataplate beneath the oven for the specified pressure. Adjust the regulator on the gas valve if necessary. If pressure is extremely low or non-existent, verify that there is sufficient pressure at the inlet side of the gas valve. If inlet pressure is good, check that all the pins are locked securely in the MOLEX connector attaching the wire harness to the valve and that the connector is firmly in place. Check for damage to the wire harness. If these are all good, the gas valve is defective and needs to be replaced.</p> <p>2. If proper gas pressure is found at the burner, drop the burner and clean, make sure all jets are clean and that pilot/igniter has not been knocked out of position. The base of the pilot/igniter assembly should be horizontal, even with the top of the burner. Check that pilot flame is not set too low, and that the oven is not over vented.</p>

Radiant Flame Burner Troubleshooting (continued)

Symptom	Probable Cause/Solution
<p>Burner goes out intermittently. Note: Do not run oven with night doors in place!</p>	<p>1. Debris in the burner causing the pilot to lose rectification. Remove the burner and clean, <i>see the Common Repair Procedures section of this manual.</i> Make sure the igniter is not damaged and that the flame rod is clean.</p> <p>2. Gas supply to oven is being interrupted or is inadequate, or burner gas pressure is set incorrectly. Verify the burner gas pressure <u>with all burners running</u>. There should not be a significant pressure drop at the burner when the other burner(s) turn on. If a drop is noted, the gas supply to the oven is inadequate and needs to be increased.</p> <p>3. Check that the igniter wires are not wire-tied, coiled, or wrapped together. Spread the igniter wires apart to minimize contact between them. Check the MOLEX connectors on the wire harness and the igniter.</p> <p>4. Incorrect pilot adjustment. Adjust pilot height at the gas valve. Turn the adjustment screw in until the pilot goes out. Then back the screw out to just beyond the point where the pilot relights.</p> <p>5. Excessive airflow from beneath the oven causing the pilot flame to lift away from the flame rod. <i>Correct the airflow problem and make sure the igniter gasket is in place.</i> Ideally there should be no discernible draft below the oven. Make sure pilot/igniter gasket is in place.</p> <p>6. Defective pilot/igniter, replace.</p> <p><i>If the burner is still going out, replace the gas control valve.</i></p>
<p>Flame height is low. The flame should be approximately 12-15 inches tall at full-throttle.</p>	<p>1. The burner gas pressure is low; adjust the regulator on the gas valve to obtain the specified pressure. If the specified pressure cannot be obtained, verify that incoming gas pressure is sufficient; <i>check this with the oven running.</i></p> <p>2. Debris in the burner. <i>Remove and clean; see Common Repair Procedures section of this manual.</i></p>
<p>Soot is forming near the burner. Note: Do not run oven with night doors in place!</p>	<p>1. Some sooting is normal when the oven is cold. This will burn away when the oven reaches operating temperature.</p> <p>2. Check for debris in the burner; remove burner and clean. <i>See the Common Repair Procedures section.</i> If a log set is installed, verify that it is positioned correctly.</p> <p>3. If burner is clean, check that the oven is properly configured for the gas being supplied. Call Wood Stone.</p>
<p>Burner doesn't light or goes out, and the igniter wires are burned.</p>	<p>1. Loose pilot tube-tighten and replace igniter</p> <p>2. Inadequate venting or negative air-see oven installation instructions.</p>
<p>Radiant Flame height is much higher on the igniter side of the burner,(usually the left side).The flame on this side does not decrease when the operator turns down the flame height.</p>	<p>Pilot orifice is damaged or missing. Remove pilot/igniter. Orifice fits between the brass compression fitting attaching the pilot tube and the igniter body. Replace with new pilot orifice.</p>
<p>Flame height (throttle) knob difficult to turn.</p>	<p>1. Check that throttle rod is not binding.</p> <p>2. Replace throttle valve.</p>

Infrared Burner Troubleshooting

Many Wood Stone ovens are equipped with an underfloor infrared (IR) burner. **THIS IS NOT THE PRIMARY HEAT SOURCE FOR THE OVEN.** The IR burner is designed to assist the radiant burner or the wood fire during start-up and during times of heavy usage. It is thermostatically controlled. The IR burner’s gas valve and pilot/igniter are identical to those used on the radiant burner.

Symptom	Probable Cause/Solution
<p>RDF-IR (GG) models IR burner is not lighting. On touch-pad style controls, the display may be flashing ‘check’. <i>NOTE: You will not see flame at the black tubes on the front of the burner.</i> CAUTION - NEVER ATTEMPT TO LIGHT THIS BURNER MANUALLY. To visually confirm that the burner is lit, look through the gap next to the pilot/igniter.</p> <p>NOTE: On Type 1 controllers the red ‘heat on’ light next to the display indicates the IR burner should be on whenever the actual floor temperature is below the set point. The red indicator light above the display indicates that the pilot flame for the IR has been detected. If the light is not coming on, but visual confirmation shows burner is running, replace lamp or fix bad wire connection as necessary.</p>	<p>Is the radiant burner running? If not, proceed first with radiant burner troubleshooting – See previous pages of this manual NOTE: On RFG-IR(GG) ovens with the Touch-pad style control, (see <i>Controllers section of this manual</i>), the IR burner will not light until the controller has verification that the radiant burner has lit. If the radiant burner is running, and the control is calling for IR heat, it will allow the IR burner 90 seconds to light. If the burner has not lit after this time the control will flash ‘check’. <i>Turn the oven off and then back on to reset.</i></p> <p>1. If the radiant burner is running, is the controller calling for heat? (Hearth Temperature lower than Hearth Setpoint). Note: on Type 1 controllers, the small ‘Heat On’ light should be on if the actual hearth temperature is below the set point.</p> <p>2. Is the switch on the Honeywell gas control valve in the ‘on’ position?</p> <p>3. Visually check for igniter glow. If the igniter does not come on when the IR burner is called for, check that the MOLEX connectors are securely plugged into the gas control valve. Make sure that the pins are securely locked into the connector body. Remove any wire ties and uncoil the igniter wires so that there is minimal contact between them. Check the continuity of the glow coil at the two adjacent wires on the igniter connector; <i>this should be approximately 3.5 ohms.</i> If the circuit is open, replace the igniter. If glow coil tests OK, disconnect the SV1 wire harness from the gas valve and with the control calling for heat, test for 24 volts between the yellow and white wires, and brown and white wires. <i>Do not test for voltage at the connectors on the gas valve; damage to the valve may result.</i> If voltage is not present, see <i>Controllers Troubleshooting section of this manual.</i> If voltage is present replace the igniter. If there is still no glow, replace the gas valve.</p> <p>4. If the igniter is glowing and the gas supply to the oven is good, but pilot is still not lighting - disconnect the pilot tube, then turn the oven back on. If the controller is trying to activate the burner, there should be gas at the pilot tube. If no gas is coming from the tube, replace the gas control valve. If gas is present, remove the igniter and inspect for damage and/or a plugged orifice. <i>Replace if necessary.</i></p>
<p>Burner will not light or shuts off sometimes, and, the igniter wires appear to be burned.</p>	<p>1. Loose pilot tube – tighten and replace igniter 2. Inadequate oven venting or negative air pressure - see <i>installation instructions. Call Wood Stone for information.</i></p>

Part 2 - Gas Burners

Gas Oven Troubleshooting

Infrared Burner Troubleshooting

Symptom	Probable Cause/Solution
<p>W-IR, IR-W and WG models IR burner does not come on. NOTE:On Type 1 controllers the red 'heat on' light next to the display indicates the IR burner should be on whenever the actual floor temperature is below the set point. The red indicator light above the display indicates that the pilot flame for the IR has been detected. If this light is not coming on, but visual confirmation shows burner is running, replace lamp or fix bad wire connection as necessary.</p>	<ol style="list-style-type: none"> 1. Verify that gas is being supplied to the oven and that all the air has been bled from the gas line. If necessary, the gas line may be bled by removing the inlet plug on the gas control valve. Reinstall the plug when you smell that gas is present. Allow gas to dissipate before restarting oven. <i>Do not leave the oven unattended while the inlet plug is removed!</i> Verify that the hearth setpoint is above the hearth temperature. If the burner does not come on, proceed to step 3 of the RFG-IR (GG) IR troubleshooting (previous pages)
<p>IR burner goes out intermittently when controller is calling for IR heat.</p>	<ol style="list-style-type: none"> 1. Check wire connections at the gas valve and the igniter. Remove any wire ties and uncoil igniter wires to minimize contact between the wires. Also check for loose connections at the controller. 2. Inspect the igniter - clean it if necessary; replace it if damaged. 3. Check for excessive air movement below the oven. This can cause the pilot flame to lift away from the flame rod and cause the burner to go out. Contact Wood Stone for assistance. 3. Check the burner gas pressure, adjust the valve to achieve the specified pressure (Equipment Dataplate). Check the incoming gas pressure with the burner running. If the incoming pressure is OK, but burner the pressure is low and will not adjust as high as the pressure specified on the Equipment Dataplate OR if the burner pressure is erratic, replace the gas control valve. 4. If pressures are OK, replace the igniter. If problem recurs, replace gas valve.
<p>Burner will not light or shuts off sometimes, and, the igniter wires are burned.</p>	<ol style="list-style-type: none"> 1. Loose pilot tube – tighten and replace igniter 2. Inadequate oven venting or negative air pressure - <i>see installation instructions.</i> Contact Wood Stone for further assistance.



Repair Procedures and Diagrams

Common Repair Procedures
Gas Component Diagrams
Gas Oven Electrical Diagrams

Common Repair Procedures

NOTE: Remove the front panel on the oven to access all non-controller components.

Checking burner gas pressures.

Proper gas pressure settings and an adequate incoming gas supply are critically important for any gas fired Wood Stone oven to operate correctly. All burner gas pressure measurements should be taken at the port on the respective burner manifold. When taking a measurement of radiant burner manifold pressure, make sure that the throttle valve is fully open (maximum flame height). Pressure readings should be taken with both burners running; This will reveal if the incoming gas supply is adequate. Where it is suspected that the incoming pressure is inadequate, test the incoming pressure with the oven off and then with the oven on and all burners running. If the incoming pressure drops significantly with the oven running, and the proper pressures cannot be obtained at the burner(s), the gas supply is inadequate. Look for regulators external to the oven that are set too low, partially closed valves or undersized piping. The piping and shutoff valves supplying the oven must have a minimum I.D. the same as that of the inlet connection on the oven, and depending on the length of the run it may need to be larger. Depending on the model this will be 1" or 3/4". Consult a qualified gas piping installer to deal with any supply piping issues. *Use of flex piping to supply gas to the oven is discouraged.* The specified pressure for each burner may be found on the Equipment Dataplate, located beneath the oven.

Removal and Cleaning of Radiant Burner.

This procedure may be performed while the oven is hot. We strongly recommend that the technician wear heat protective gloves and safety glasses/goggles when removing the burner.

1. For burner removal first turn the oven off. Turn off the gas supply to the oven.
2. Unplug the MOLEX connector for the igniter from the gas valve.
3. Disconnect the pilot tube at the gas valve, or union if equipped.
4. Disconnect the flexible gas piping where it attaches below the burner.
5. Carefully remove the four bolts holding the burner can in place and lower the burner out of the well.

Caution – Watch out for falling debris while removing the burner.

6. Clean off any debris on the burner.
7. Check that burner jets are not blocked, and that pilot/igniter assembly is not dirty or damaged. If removing igniter, be aware of the pilot orifice, which slips into the igniter where the pilot tube is attached and can fall out if you are not careful. Any burner jets that are clogged should be removed from the burner manifold to prevent debris entering the manifold while cleaning. To remove the jets, first remove the flame retention spring attached to each jet by gripping the spring with a pair of pliers and pulling away from the burner while turning the spring clockwise. Then remove the two brackets that hold the burner manifold in place. Remove the manifold, then remove the individual jets. Use a piece of wire (a paper clip works great!) to clean out the jet. Make sure to reinstall so the hexagonal part of the jet is closest to the burner manifold. *Make sure to reinstall the flame retention spring.*
8. To reinstall burner follow the removal steps in reverse.
9. Check for gas leaks using soap solution with the burner running. *Avoid getting soap solution on valve or igniter wires.*

Pilot/Igniter Replacement – Infrared Burner

To replace the pilot/igniter assembly on an IR burner, first turn the oven off. Then remove the pilot tube from the igniter – be careful not to lose the pilot orifice. Next remove the screw holding the igniter in place. Slide the igniter out of the burner. Install the new igniter. New igniters are shipped with the pilot orifice already installed between the igniter and the brass compression fitting attached to the igniter. Note that for the infrared burner, an igniter gasket is not necessary

Pilot/Igniter Replacement – Radiant Burner

If replacing an igniter on a radiant burner, we recommend removing the burner – *see Removal and Cleaning of Radiant Burner above.* While the igniter can be replaced without burner removal, we find that the cause for the igniter failure is commonly debris in the burner. Be aware of the pilot orifice located between the brass compression fitting and the igniter. The igniter is attached to the burner can with a right angle bracket. Remove the screw holding the bracket to the burner can, and remove the igniter. Remove the bracket from the old igniter. Attach the bracket to the new igniter and reinstall. *Whenever you are removing or replacing the radiant burner igniter you should also replace the igniter gasket.*

Common Repair Procedures (continued)

Gas Valve Replacement

Make certain that the replacement valve is properly configured for the gas being used.

To remove the SV2 valve on old style manifolds, loosen and separate the union located forward of the valve. Rotate the valve in towards the center of the oven, it may be necessary to loosen some of the unistrut clamps, then remove the the piping connected to the valve, then the valve itself. To replace the SV-2 valve on a new style manifold. Disconnect the flex pipe and pilot tube, remove the unistrut clamps and rotate the pipe towards the center of the oven. To replace the SV1 valve a ½" Allen wrench is necessary for removing the union from the valve. After installing the new valve always check the burner gas pressure and make the proper adjustments as necessary. The specified manifold pressures for the SV1 (IR), and SV2 (radiant) can be found on the Equipment Nameplate beneath the oven. Leak check all joints and fittings with an approved soap solution.

Thermocouple Replacement

1. Disconnect the thermocouple wires at the junction box located on the transformer plate below the oven. *These will be the red and yellow wires that have the brown sleeve.* Note: Wood fired only, the thermocouple wires are connected directly to the temperature readout at the front of the oven.
 2. Cut the wire off at the base of the bad thermocouple.
 3. Mark the thermocouple where it enters the fitting; *use this mark as a reference for the depth of the new thermocouple.*
 4. Loosen the retaining nut that secures the thermocouple to the bottom of the oven.
 5. Slide the thermocouple out and remove the old fitting from the oven floor.
 6. Using the compression fitting supplied with the new thermocouple, slide the new unit in as far as it will go, then check your reference mark. Hold the thermocouple so that it is bottomed out in the hole before tightening the compression fitting.
 7. Retighten the nut to compress the fitting on to the thermocouple. *Again, make certain the thermocouple is properly located before tightening the nut, as it will be impossible to relocate once the nut is tightened.*
- NOTE: On models equipped with the underfloor IR burner, the end of the thermocouple will need to be bent slightly at the tip toward the infrared burner to fit into the floor casting.
8. Attach the wire end of the new thermocouple to the cut wire of the old thermocouple and pull the new wiring into the conduit as the old wire is pulled out at the J – Box (readout box on wood fired ovens) end. Connect the new thermocouple leads.

Type 1 Control Module Replacement

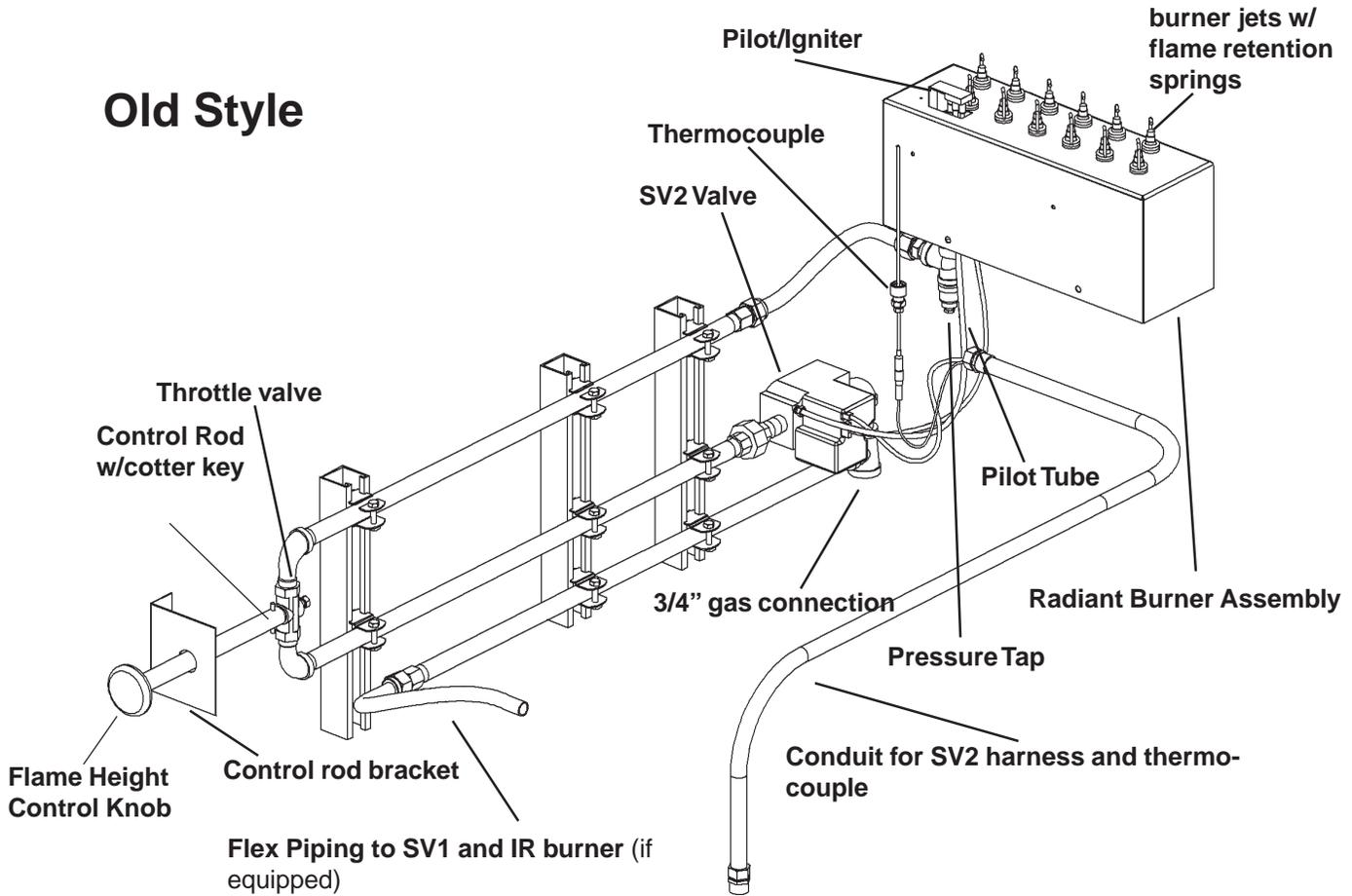
To remove the Type 1 Control Module, **first turn off power to the oven.**

1. Remove the 6 wires attached to the terminals at the bottom of the control module. *Do not remove the wires from the terminal block at the top of the control module.*
2. Detach the complete terminal block from the controller by removing the two slotted screws in the upper corners of the temperature controller.
3. Remove the screw in the lower right corner of the temperature to detach the harness retaining clip and harness.
4. Remove the two Phillips head screws from the front of the control module and remove it by sliding it out of the controller enclosure.
5. Replacement is the reverse of removal. Make sure the rubber gasket is properly installed between the controller flange and the control box faceplate.
6. Restart the oven and confirm operation.

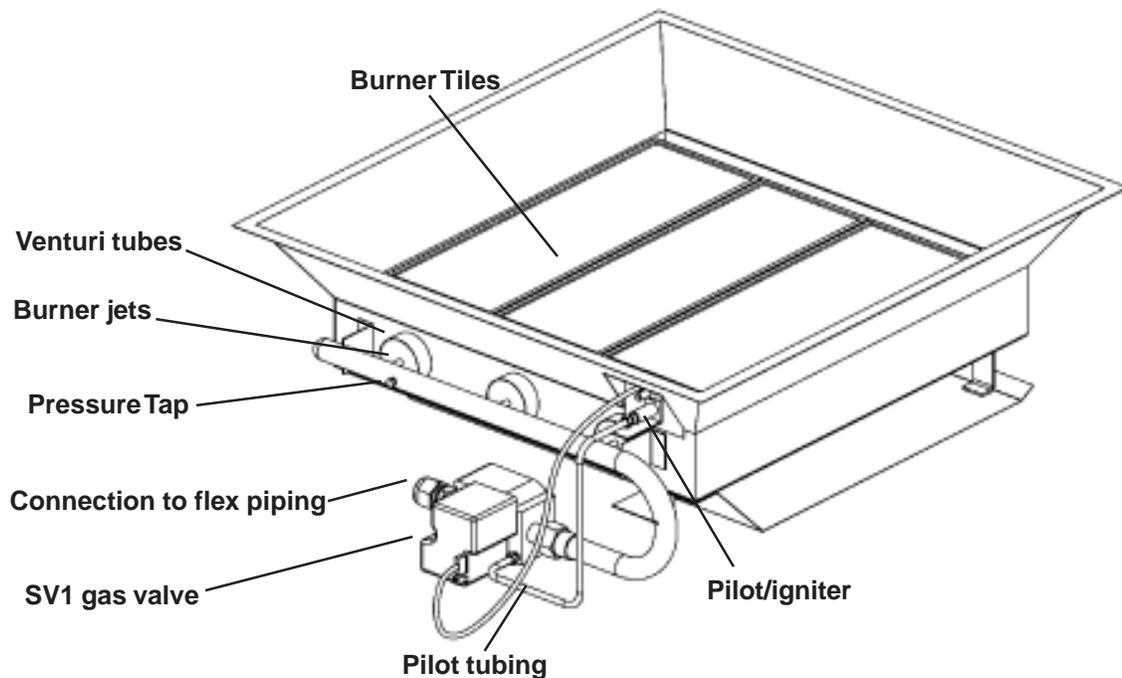
Gas Component Diagrams

Piping and Radiant Burner

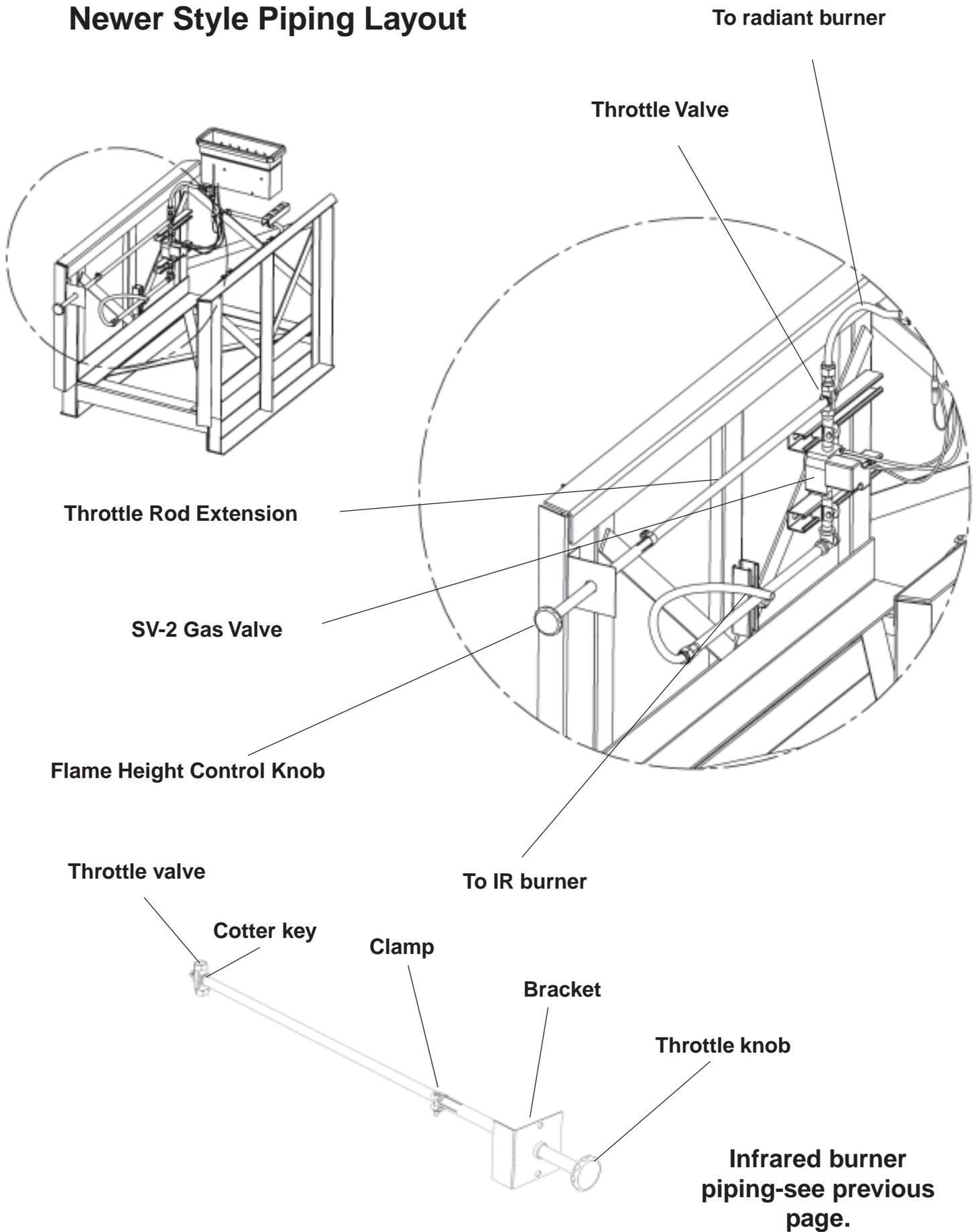
Old Style



Infrared Burner

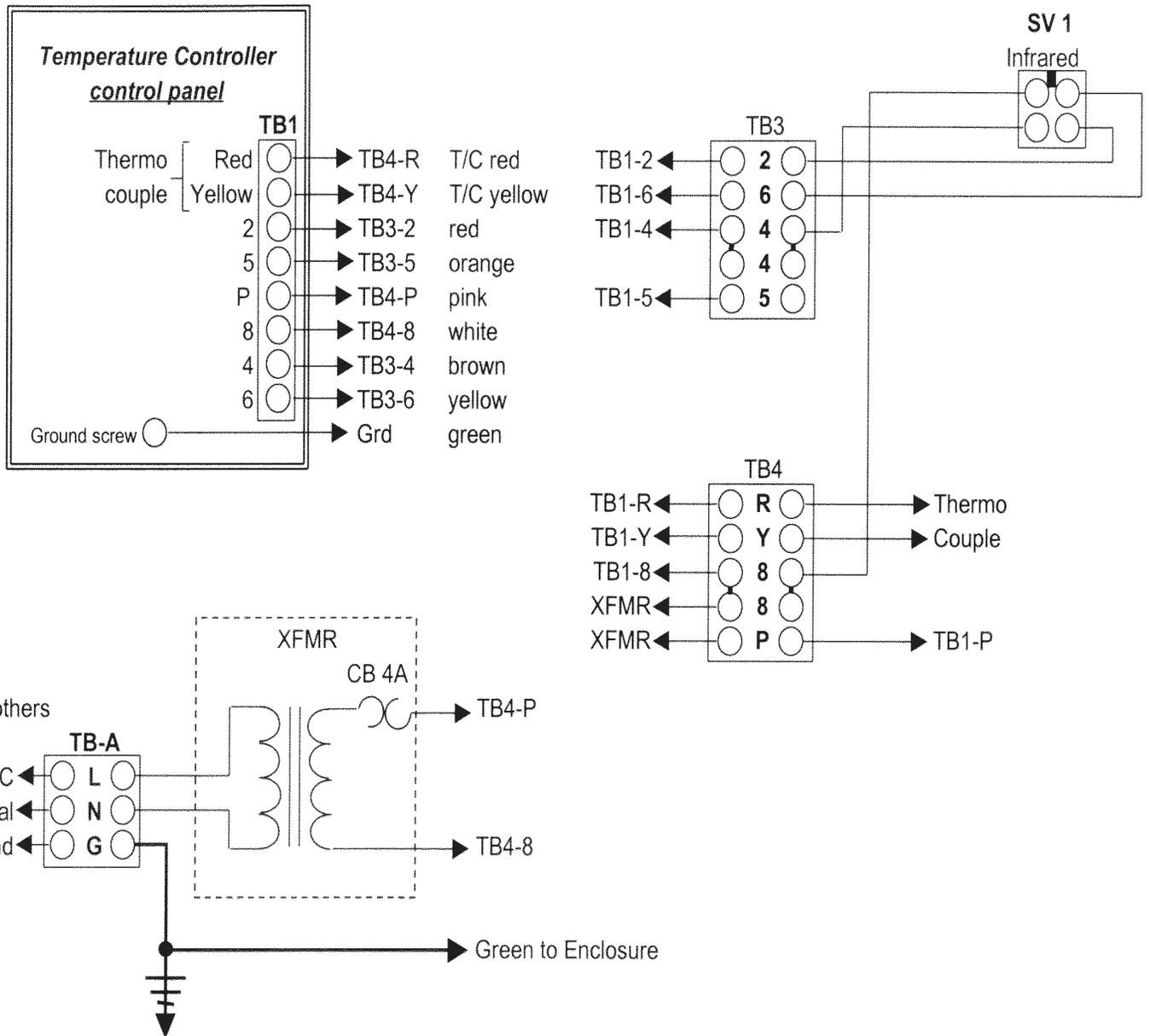


Newer Style Piping Layout

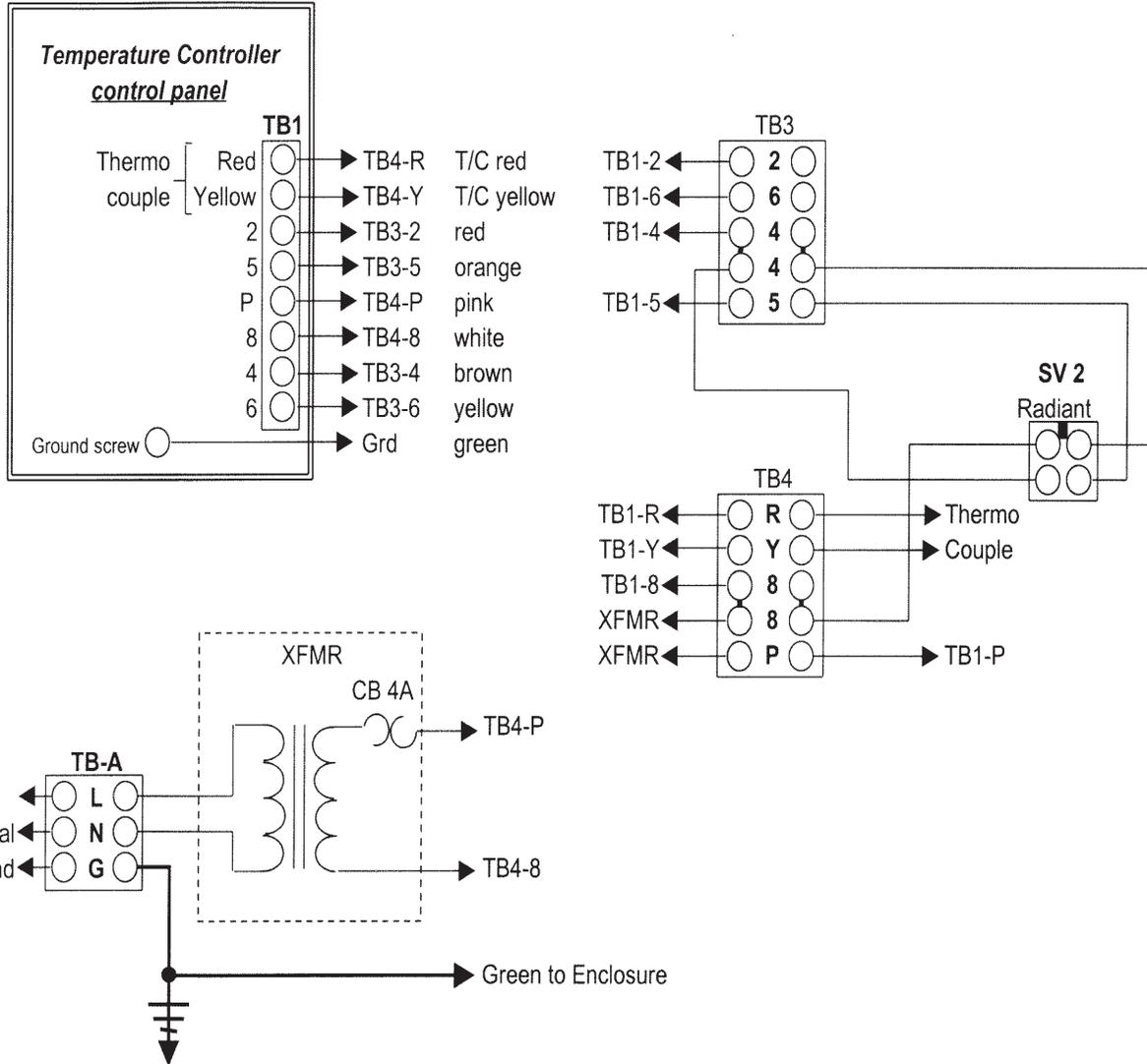


Gas Oven Electrical Diagrams

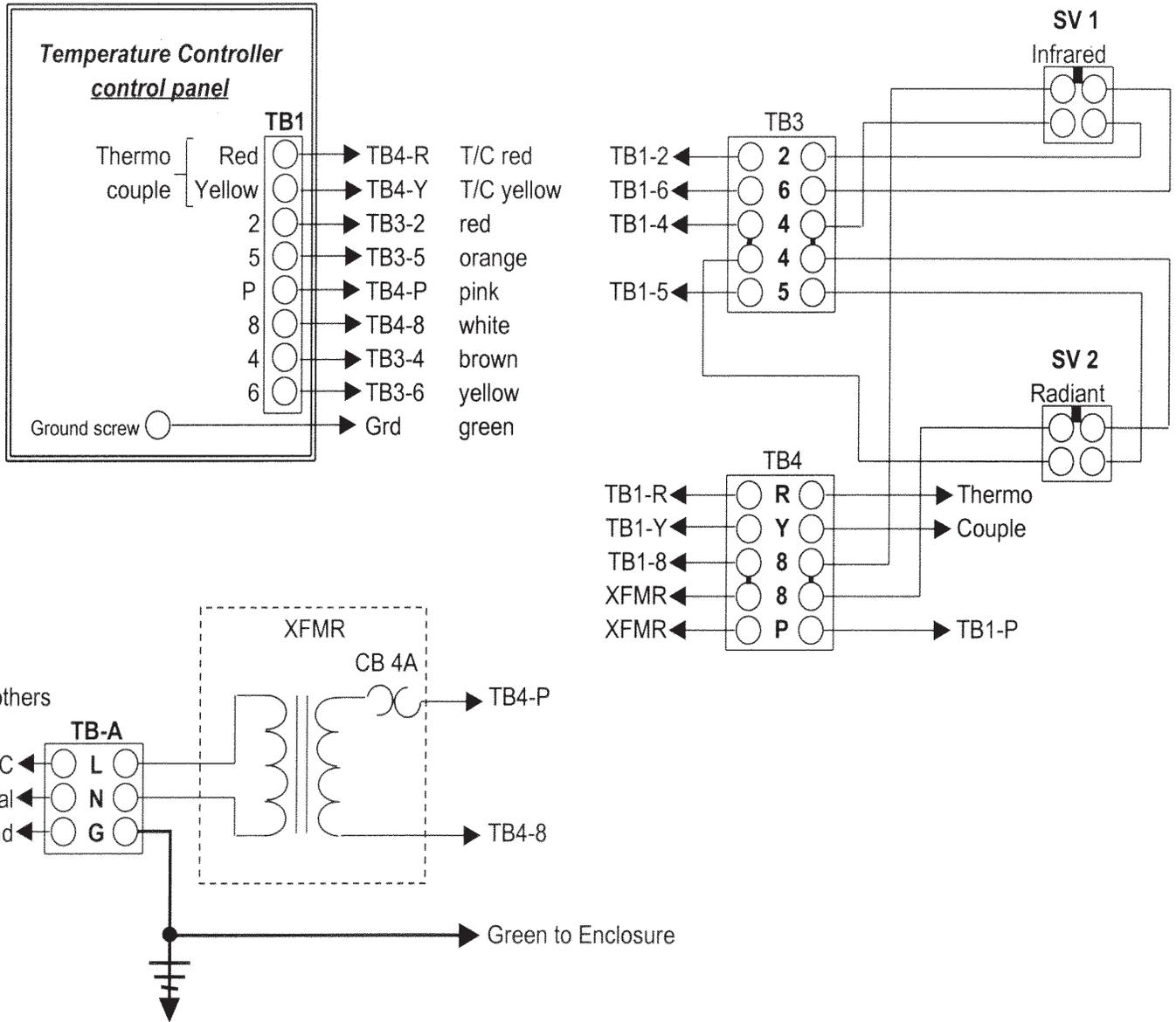
100/120 VAC W-IR, IR-W, WG Ovens - Type 2 Controller



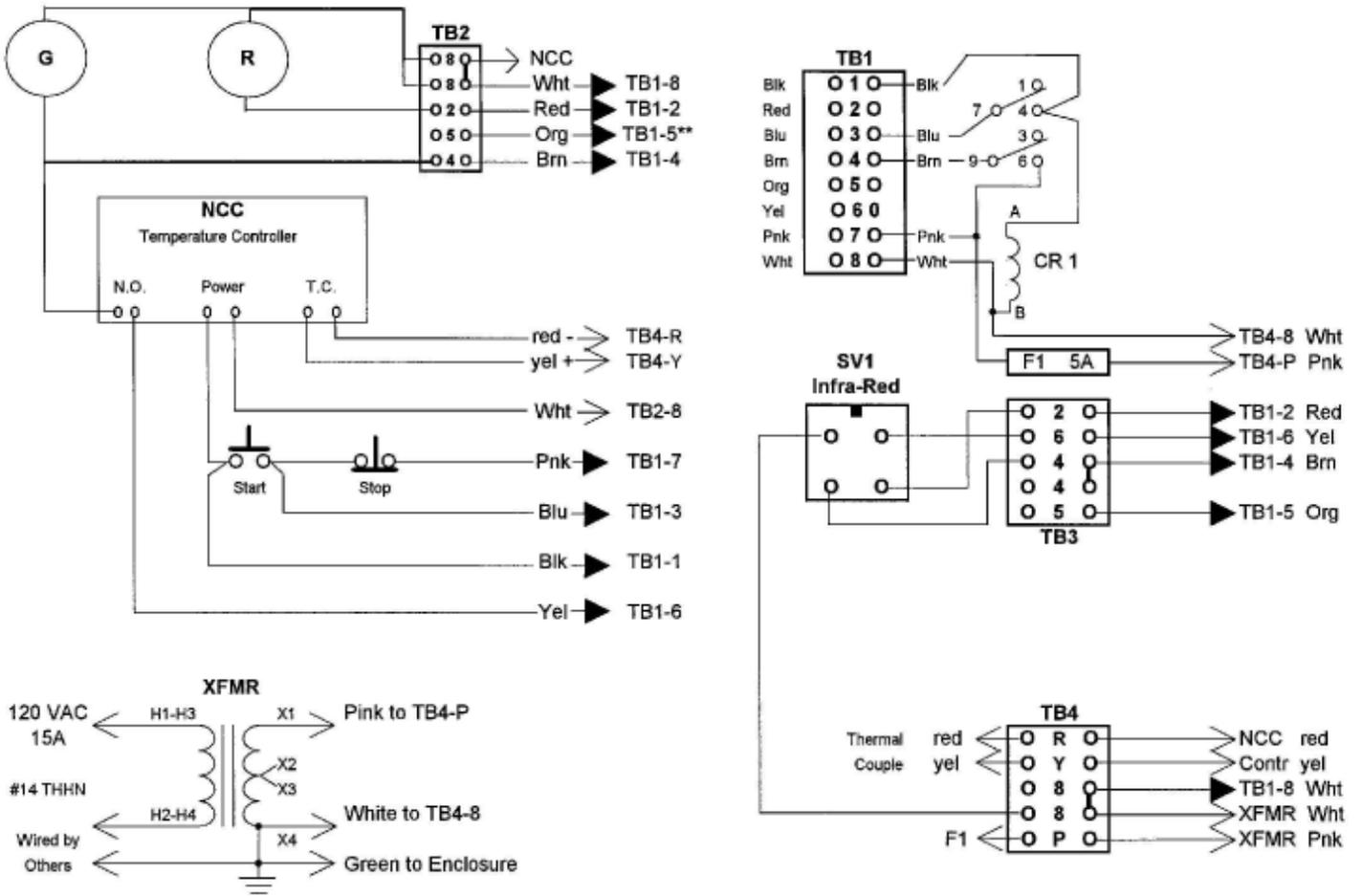
100/120 VAC RFG Ovens - Type 2 Controller



100/120 VAC RFG-IR, GG ovens - Type 2 Controller

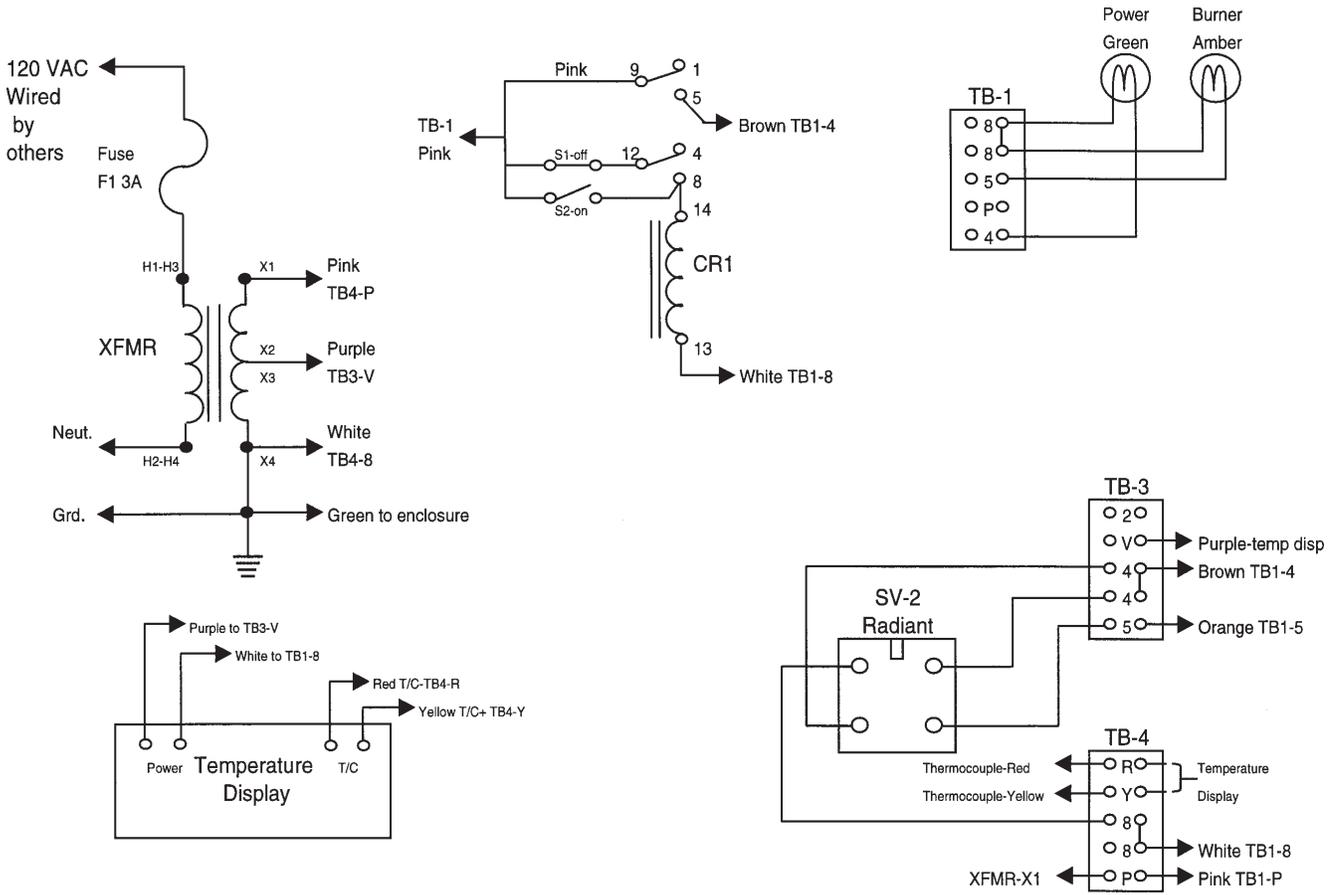


WG Oven - Type 1 controller

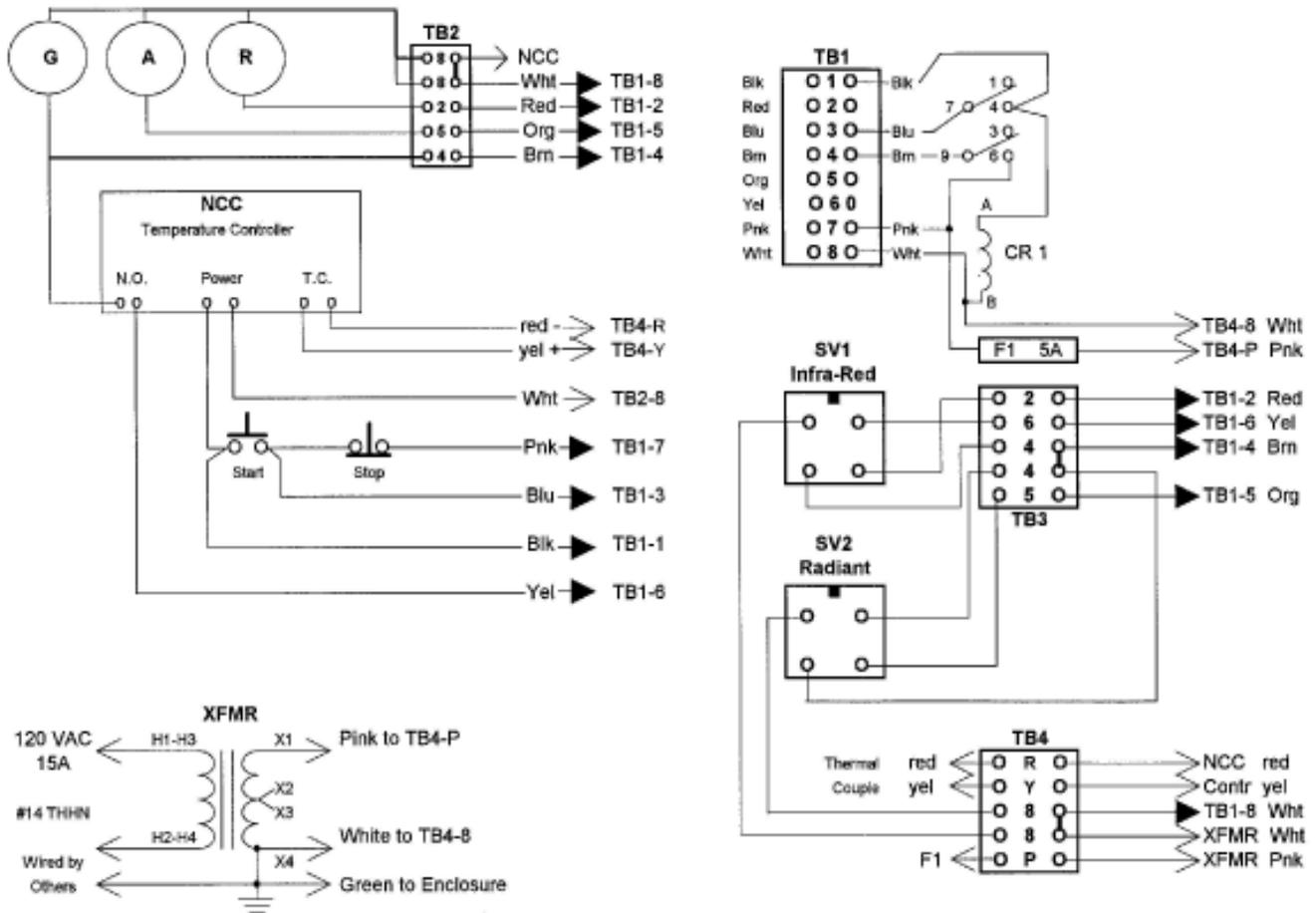


RFG Controller - Non Touchpad Style

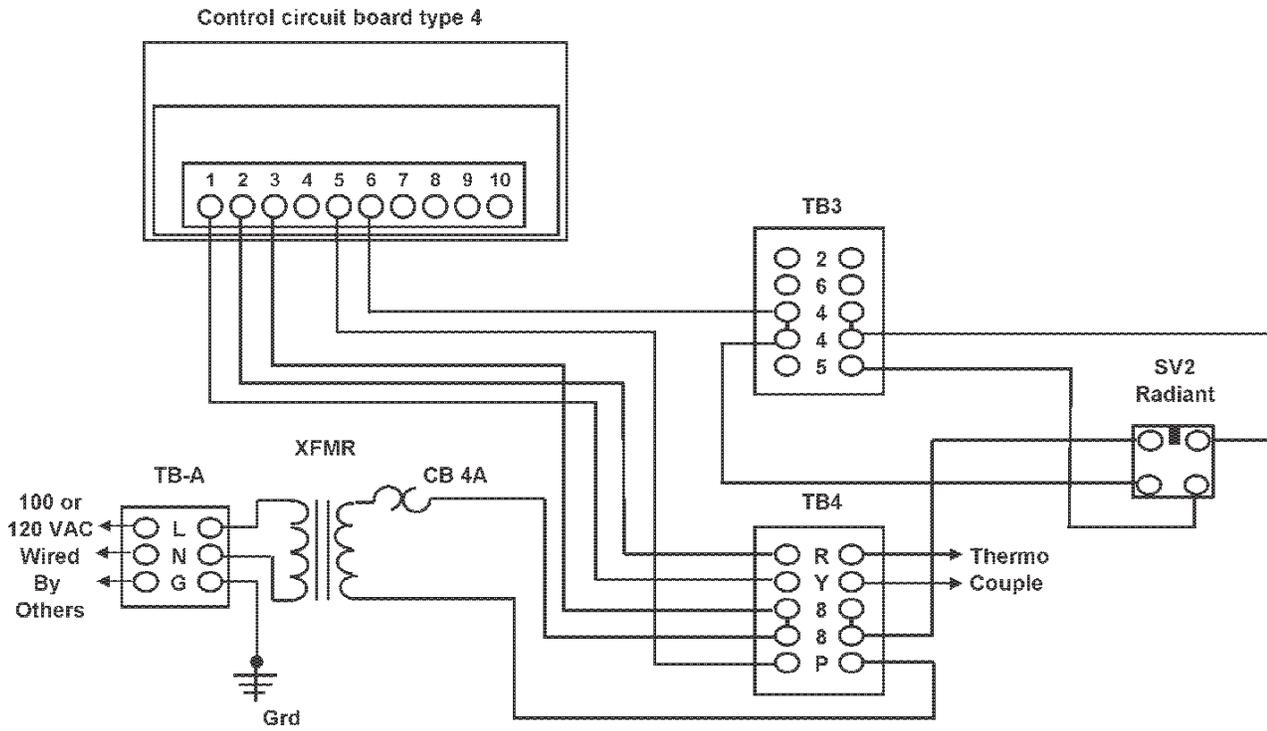
(used on pre March 2000 RFG ovens and some field conversions)



GG Oven Type 1 Controller



RFG Oven - Type 4 Controller





Parts Lists

Woodfired Oven Replacement Parts
Gas Oven Replacement Parts

Parts List

All information subject to change. Please contact Wood Stone to confirm part numbers and pricing.

Wood Oven Replacement Parts

Description	Part Number
Complete readout assembly 120v/Fahrenheit	002 - 900
Complete readout assembly 120v/celsius	002 - 900 - 2
Digital readout - Fahrenheit	7000 - 0726
Digital readout - celsius	7000 - 0774
Transformer - 120v/12v	7000 - 0725
Transformer - 240v/12v	7000 - 0775
Thermocouple	7000 - 0727

Gas Oven Replacement Parts

Please verify the controller type and gas type on the oven before ordering parts. Please contact Wood Stone if you have any questions.

Description	Part Number
<u>GAS PARTS</u>	
Smart Valve, SV1 or SV2 - specify gas type	7000 - 0750
Pilot/igniter assembly for Natural Gas	7000 - 0749
Pilot/igniter assembly for Propane (LP)	7000-0749-LP
Pilot gasket (for radiant burner)	7000 - 0777
Pilot tube - specify model and burner	Contact Wood Stone
Pilot tube compression fitting	7000 - 0251
Pilot orifice - LP	7000 - 0748
Pilot orifice - NG	7000 - 0748 NG
IR burner jet - LP	Call Wood Stone
IR burner jet - NG	Call Wood Stone
Radiant burner jet - LP	Call Wood Stone
Radiant burner jet - NG	Call Wood Stone
Flame retention spring	RP-0017
Throttle (flame height) control valve - NG	7000-0182
Throttle (flame height) control valve - LP	7000-0183
LP valve conversion kit	7000 - 0747
NG valve conversion kit	7000 - 0747NG
<u>TYPE 1 CONTROLLER PARTS</u>	
Fuse - 5A for Type 1 controller	RP 7000 - 0711
Relay - for Type 1 controller	RP 7000 - 0721
ON switch (green) for Type 1 control	RP-0015
OFF switch (red) for Type 1 control	RP-0016
Temperature control module (for Type 1 Controller)	RP 7000 - 0716
Power ON Lamp (green) Type 1 controller	RP7000 - 0714
IR Lamp (red) Type 1 controller	RP7000 - 0715
Radiant Lamp (amber) Type 1 controller	RP7000 - 0740
Transformer - used on Type 1 and non-Touchpad control RFG ovens	RP7000 - 0732
<u>TYPE 2 CONTROLLER PARTS</u>	
Control Circuit Board (For Type 2 Control)	7000 - 0099
RFG-IR,GG keypad overlay for Type 2 controller	7000 - 0900

Parts list continued on next page.

Gas Oven Replacement Parts Cont.

Description	Part Number
<u>TYPE 2 CONTROLLER PARTS continued</u>	
W-IR, IR-W,WG keypad overlay for Type 2 controller	7000 - 0901
RFG keypad overlay for Type 2 controller	7000 -0902
Class 2 Transformer - for Type 2, Type 4 control ovens	7000-0734
<u>Type 4 Controller Parts</u>	
Control Circuit Board (For Type 4 Control)	7000-0103
RFG keypad overlay for Type 4 controller	7000-0905
<u>Other Electrical Parts</u>	
Thermocouple (All MS models)	7000 - 0727
Thermocouple for Firedeck model FD8645, FD6045	7000 - 0727 - 8645
Thermocouple for model FD9690, FD9660	7000 - 0727 - 9690
Calibrated thermocouple for 9690, 8RFG over temp. control	7000 - 0727 - 9690c
Wire harness for SV1 valve -MS 4,5,6,7 Ovens	002 - 702
Wire harness for SV2 valve - MS 4,5,6,7 ovens	002 - 701



Specifications, Start-up Information and Warranty

Gas Oven Specifications

Startup Information

Wood Stone Limited Warranty

Gas Ovens-Specifications and Additional Information

Gas and LP Specifications

The Wood Stone Gas ovens are equipped with a 3/4" NPT gas connection. Have a licensed gas installer provide the hook-up and test all fittings and pipe connections for leaks. **Use approved gas leak detectors (soap solutions or equivalent) over and around the fittings and pipe connections.** DO NOT USE FLAME TO TEST FOR LEAKS!

SV-1 and SV-2 are the gas control valves that operate the under floor infrared burner and the interior radiant burner, respectively. SV-1 is located directly behind the service/intake panel and in front of the under floor infrared burner. SV-2 is located under the oven to the rear left. The manifold pressure test port for the infrared burner is a 1/8" NPT plugged tapping located near the left end of the burner manifold. The manifold pressure test port for the radiant burner is a 1/8" NPT plugged tapping located at the base of the T-Junction between the SV-2 and the radiant burner, directly below the radiant burner.

The burner manifold pressures have been adjusted at the factory. A variety of factors can influence these pressures, so be sure to test the individual burner manifold pressures and adjust the valves as necessary to achieve the required pressures.

Factory specified burner manifold pressures and gas input rates for models equipped to burn Natural Gas (NG).

NOTE: RFG ovens are only equipped with the SV-2 valve ; W-IR, IR-W,WG ovens are only equipped with the SV-1 valve; RFG-IR,GG ovens are equipped with both SV-1 and SV-2.

MODEL		SV-1	SV-2	RFG-IR (GG)	(RFG)	W-IR (WG)
				Hourly BTU Input Rate	Hourly BTU Input Rate	Hourly BTU Input Rate
WS-MS-4-	NG	3.5"	5"	115,000	68,000	47,000
WS-MS-5-	NG	3.5	4.75"	188,000	105,000	83,000
WS-MS-6-	NG	3.5"	4.75"	188,000	105,000	83,000
WS-MS-7-	NG	3.5	4.6"	220,000	123,000	97,000

The maximum Natural Gas orifice size(at sea level) for the radiant/interior burner is #55 (0.0520)

The maximum Natural Gas orifice size (at sea level) for the infrared underfloor burner is #42(0.0935)

Factory specified burner manifold pressures and gas input rates for models equipped to burn Propane (LP).

NOTE: RFG ovens are only equipped with the SV-2 valve ; W-IR, IR-W,WG ovens are only equipped with the SV-1 valve; RFG-IR,GG ovens are equipped with both SV-1 and SV-2.

MODEL		SV-1	SV-2	RFG-IR (GG)	(RFG)	W-IR (WG)
				Hourly BTU Input Rate	Hourly BTU Input Rate	Hourly BTU Input Rate
WS-MS-4-	LP	9"	7"	102,000	60,000	42,000
WS-MS-5-	LP	9"	8"	159,000	94,000	65,000
WS-MS-6-	LP	9"	8"	159,000	94,000	65,000
WS-MS-7-	LP	9.2"	9.5"	227,000	142,000	85,000

The maximum Propane(LP) orifice size (at sea level) for the radiant/interior burner is #65 (0.0350)

The maximum Propane (LP) orifice size(at sea level) for the infrared/underfloor burner is #53 (0.0595).

!!! IF YOU ARE CONVERTING A WOOD STONE OVEN FROM LP TO NATURAL GAS, OR NATURAL GAS TO LP, CONTACT THE WOOD STONE SERVICE DEPARTMENT TO OBTAIN THE NECESSARY PARTS TO CARRY OUT THIS PROCEDURE! THIS PROCEDURE ENTAILS CHANGING THE BURNER JETS, PILOT ORIFICES, AND GAS VALVE REGULATOR SPRINGS, AND ADJUSTING THE BURNER MANIFOLD PRESSURES AS SPECIFIED FOR THE NEW GAS TYPE !!!

All shutoffs and connections to the oven must have a minimum I.D. the same as the inlet connection on the oven - (3/4" or 1" depending on the model.) For longer runs it may be necessary to use larger piping to supply the oven.

Electrical

The incoming **120v 15amp** electrical connection is made at the terminal strip inside the transformer box, or at the leads attached to the transformer itself depending on the model. Electrical diagrams are located directly to the right, behind the removable service/intake panel, as well as inside the control box. Export models may have different electrical requirements, which will be clearly marked on the wiring diagrams and the transformer plate.

Electrical Code Limitations

Electrical Grounding: This appliance must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical code, ANSI NFPA 70 or the Canadian Electrical Code, CSA C22.1 as applicable.

Interlocking

If it is necessary to interlock the oven with an exhaust fan, Wood Stone recommends the following: Wire the installation in such a way that incoming 120v power to the oven is supplied only when the exhaust fan is turned on. The easiest way to do this is to have the same switch that turns on the exhaust fan also turn on the power supplying the oven. A qualified electrician should do this. **Do not attempt to wire into the oven control box or low voltage junction box. ADDING TO OR ALTERING ANY OF THE WIRING IN THE OVEN CONTROL BOX OR LOW VOLTAGE JUNCTION BOX WILL VOID THE WARRANTY.** Please call Wood Stone if you have any questions.

Start Up Information

Wood Stone ovens should not normally require any start up procedures to be performed by a service technician. The gas installer is responsible for making sure the gas supply to the oven is properly purged (bled) and that the piping and pressure is adequate for the BTU requirements of the oven. Burner gas pressures are preset at the factory. The electrical connection to the oven should be made by a licensed electrician. A Wood Stone representative may be available to visit the site to verify that the oven is functioning correctly and address any questions the customer may have. We do understand that in some situations a customer may request a service technician to perform an additional start up on the oven for peace of mind etc. Typically this additional start up will not be covered by Wood Stone, unless it was necessary due to a defect on the oven itself. Problems arising from improper installation will be the owner's responsibility. See the complete warranty in this manual. It can also be found in the owner's manual. Please call the factory if you have any questions.

Technician's Start Up Checklist for Gas Ovens

1. Incoming gas piping properly sized - minimum 3/4" or 1" I.D.(depends on oven model-must be same size as inlet on oven-minimum,) unrestricted to oven. _____
2. Gas line shut off valve is minimum 3/4" or 1" ID.(Depends on oven model-must be same size as inlet on oven-minimum.) _____
3. Static (no load) incoming gas pressure is... _____
4. Verify that all burners are lighting. Incoming gas pressure under load with all burners running is..._____
5. Radiant burner manifold pressure with all burners running and throttle full on is... _____
Adjust if necessary.
6. Radiant burner manifold pressure with all other gas appliances fired (if possible) is ... _____
7. Is the lower surround (if equipped) properly installed and sealed to the floor and the oven? _____
8. Check all control board wires for tightness at the terminal strip. _____
9. If controller wire harness was lengthened by the installers, was correct color coding used and was thermocouple wire used to make the thermocouple connection. Correct as necessary. _____
10. Verify all controller functions working correctly. _____
11. Visually inspect igniter wires and wiring harnesses for damage. _____
12. Check that pilot/igniter mounting screws are tight. Verify tightness of pilot tubes and check for leaks. _____
13. Leak check all gas fittings including incoming gas connection. _____
14. Check tightness of burner mounting bolts and screws. _____
15. Verify that all leg bolts and nuts, X brace bolts and nuts, unistrut mounting bolts, and pipe clamps are tight. _____
16. If equipped, is the fire log set and guard in place? _____
17. Verify that the customer has the Owners manual. Make sure the customer understands:
 - To remove the night doors when the oven is running.
 - The throttle control operation and its use.
 - Controller functions and programming.
 - The importance of keeping debris out of the radiant burner, and that this is their responsibility.
 - The Initial Oven Start Up (break in) procedure as found in the owners manual. It is not necessary for the technician to be present for this procedure.
 - The warranty and what is and is not covered. Call Wood Stone if you have any questions!

Wood Stone Limited Warranty

Wood Stone warrants its equipment to the original purchaser against defects in material or manufacture for a period of one year from the original date of purchase, subject to the following exclusions and limitations.

EXCLUSIONS

The warranties provided by Wood Stone do not apply in the following instances:

1. In the event that the equipment is improperly installed. Proper installation is the responsibility of the installer; proper installation procedures are prescribed by the Wood Stone installation manual.
2. In the event the equipment is improperly maintained. Proper maintenance is the responsibility of the user; proper maintenance procedures are prescribed in the Wood Stone installation manual.
3. In the event that the failure or malfunction of the appliance or any part thereof is caused by abnormal use or is otherwise not attributable to defect in material or manufacture.
4. In the event that the appliance, by whatever cause, has been materially altered from the condition in which it left the factory.
5. In the event that the rating plate has been removed, altered or obliterated.
6. On parts that would be normally worn or replaced under normal conditions.
7. Normal cracking due to expansion and contraction stress relief in either the dome or floor.
- 8. In the event that pressed log products of any type have been burned in the equipment.**

If any oral statements have been made regarding this appliance, such statements do not constitute warranties and are not part of the contract of sale. This Limited Warranty constitutes the complete, final and exclusive statement with regard to warranties.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OR WARRANTY AGAINST LATENT DEFECTS.

LIMITATIONS OF LIABILITY:

In the event of warranty claim or otherwise, the sole obligation of Wood Stone shall be the repair and/or replacement, at the option of Wood Stone, of the appliance or component or part thereof. Such repair and/or replacement shall be at the expense of Wood Stone with the exception of travel over 100 miles or two hours, overtime, and holiday charges which shall be at the expense of the purchaser. Any repair or replacement under this warranty does not constitute an extension of the original warranty for any period of the appliance or for any component or part thereof. Parts to be replaced under this warranty will be repaired or replaced at the option of Wood Stone with new or functionally operative parts. The liability of Wood Stone on any claim of any kind, including claims based on warranty, expressed or implied, contract, negligence, strict liability or any other theories shall be solely and exclusively the repair or replacement of the product as stated herein, and such liability shall not include, and purchaser specifically renounces any rights to recover, special, incidental, consequential or other damages of any kind whatsoever, including, but not limited to, injuries to persons or damage to property, loss of profits or anticipated profits, or loss of use of the product.

TO SECURE WARRANTY SERVICE:

If you claim a defect covered by this Limited Warranty, direct your claim to:
Wood Stone Corporation, 1801 W. Bakerview Rd. Bellingham, WA 98226 USA Attn: National Service Manager