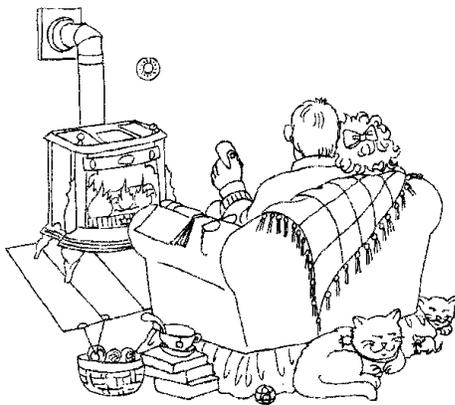


Gas Stove Basics

How A Direct-Vent Gas Stove Works

For some of our customers, the concept of being able to sit in front of a cheerful fire without having to split or stack firewood is wonderful, but mysterious; especially when the fireplace works “off the grid” and during power outages. Yet, it really is possible to enjoy the radiant warmth of a real fire without the work of wood or dependence on the electric company. If you are a new owner of a Woodstock Soapstone gas stove, or thinking of purchasing one, and have found yourself asking “How do they do that?” the following guide is designed to help you understand how it all works.



1. Radiant Heat 101

Radiant heat is transferred directly from warm objects to colder objects through invisible wavelengths of energy (infra-red waves). It is easy to imagine how radiant heat works when you think about standing in front of a campfire. In the case of a radiant stove, the outer surfaces of the stove get hot and transfer that heat to other objects in the room - furniture, people, walls, ceilings, etc. The end result is that same soul-satisfying feeling of warmth that only comes from radiant heat.

Both our wood stoves and our gas stoves burn fuel and generate heat inside a firebox. The soapstone that surrounds the firebox absorbs the heat and radiates it outward to objects in the living space. Soapstone has a very high *specific heat* (or heat capacity per pound of material). The soapstone slowly releases heat and re-charges itself from the fire in a fairly even and continuous cycle.

While the radiant heat from our gas stoves feels very much like the heat from our woodstoves, there are a few substantial differences. In a wood stove, the fuel, wood, has to be loaded and re-loaded by hand. A wood fire has a natural cycle - from start up to a period of high burn, fading out to a gradual bed of coals and ash. In a gas stove, the fuel is delivered automatically to the stove

and the burn rate is much more constant. The maximum heat output of a woodstove is much greater than that of a gas stove but the overall heat output over a twenty-four period is actually about the same. The output of a gas stove stays relatively constant over a given period of time, enabling it to heat the same size space as a wood stove.

The automatic delivery of fuel to the firebox opens up a world of possibilities that don't exist for woodstoves. A gas stove can be connected to a thermostat that can regulate the amount of heat produced through the use of temperature settings, or timers, or both!

2. How It Works When the Power Goes Out

The gas used in the stove is delivered under pressure. If you have natural gas, the amount of pressure is controlled by your utility company at the source. If you have propane, the tank itself is pressurized and controlled by a regulator located in the piping between the tank and your home. It is adjusted for your particular appliance by another regulator in the appliance itself. No pumps or other electrical devices are necessary, which is why a gas stove can operate without electrical power.

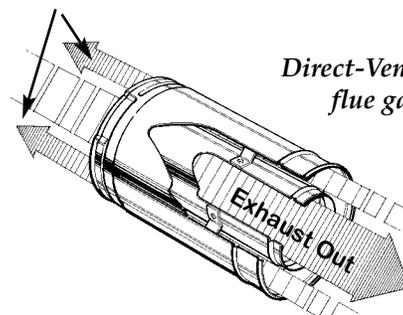
The wall thermostat and remote control actually do require some electrical power, but such a small amount that it can be generated by household batteries. Aside from the thermostat, the controller in the stove generates its own millivoltage from the pilot flame itself, and operates the valves to the pilot and main burner, shutting them off in the event that the pilot goes out.

3. Direct Vent For Safety & Indoor Air Quality

The flue for direct vent stoves is made up of concentric pipes. The inner pipe carries hot flue gasses outside. The outer ring draws fresh air from the outdoors into the stove for combustion.

As the hot exhaust and the cold outside air pass by each other, the incoming air is warmed and the outgo-

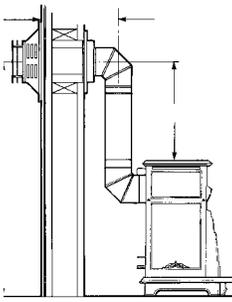
Fresh Air To Stove



Direct-Vent pipe exhausts flue gas and brings in fresh air

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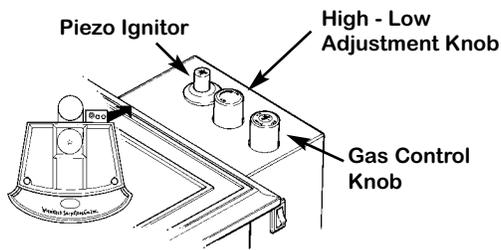
ing exhaust is cooled. This heat exchange is the reason that direct vent gas stoves do not need chimneys. A direct vent gas stove can be vented directly through an outside wall. See our article "Direct Vent System" for complete details about planning and installing a direct vent system.

4. Meet the Controls

Several components work together in a gas stove to make up a safe, efficient system that is simple to operate. First we'll give you an overview of how the system works, then we'll break down the components for you.

Gas stoves rely on a valve to control the flow of natural gas or propane into the stove. In our stoves, there are two ports for the gas. One port leads to a **pilot** light. The other leads to the **main burner**. The pilot is lit by a **piezo** ignitor and must be on for the main burner to turn on. The pilot flame heats up a **thermocouple** and a **thermopile** (two important safety features of your gas stove). As long as the pilot is lit, the main burner can be turned off or on as needed and the flame height can be adjusted. As the gas burns in the main burner, the flames rise up through a ceramic **log set** to create the look of a real wood fire. The flames create the heat that is radiated out from the firebox and absorbed by the soapstone. The air that's required for combustion is drawn in through a **direct vent** system that also exhausts flue gases at the same time.

Now let's look at each of the components one by one to get an idea of how the system works. A complete step-by-step guide to stove operation can be found in the Owner's Manual that is included with every new stove.



Piezo: This is an igniter that lights the pilot by creating a spark. It is the same type of lighter that's found on home barbecue grills. A match or flame is not required to light the pilot.

High-Low Knob: A knob to adjust the flame height and heat output from High (100% power) down to Low (70%).

Gas Control Knob: A knob that controls gas flow to the pilot and the main burner. It is turned to the "pilot" position to light the pilot, and then turned the rest of the way

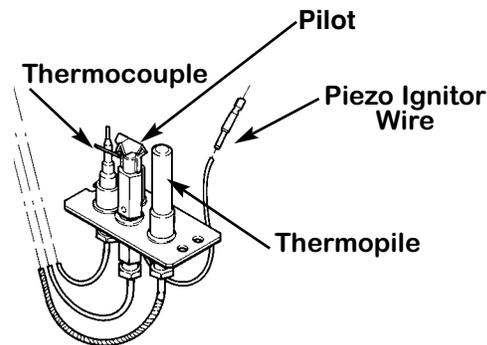
to the "on" position to allow flow of gas to the main burner. The main burner can be operated manually by simply pressing an "On-Off" rocker switch, or automatically, by means of a pre-set thermostat.

On-Off Switch: A toggle switch that will allow (or interrupt) the flow of gas to the main burner. When turned "off", the pilot will remain lit and the burner will go out.

Main Burner (or Burner Pan): A stainless steel pan located under the log set where the gas and air are mixed and ignited. Flames rise up through the log set that sits on top of the Main Burner.

Pilot: A small flame that burns continuously once lit. The pilot must be lit for the stove to operate.

Thermocouple and Thermopile: Small bi-metal devices that produce DC voltage when heated by the pilot. While the pilot is on, low voltage activates an electromagnet which keeps the gas supply valve open. Should the pilot go out, the supply of gas to the stove is shut off — an important safety feature.



Fireside Pilot Assembly

Wall Thermostat (Optional—Fireside Franklin only): A battery-operated, wireless controller that opens the gas control valve by means of a radio signal. Set the temperature you want on the thermostat and that's it. The main burner will come on and off based on your setting.

Remote Control (Optional): A battery-operated, wireless controller that can be placed anywhere in the room to operate the stove. Unlike the wall thermostat, it contains a programmable timer to allow the user to set the stove to come on or shut off at certain times of the day. On certain models, the remote control can also adjust the flame height - bringing the flame height down as it nears the set temperature, and up when the temperature of the room drops below your comfort zone.

All of the components that go into our gas stoves are designed to create radiant heat and a life-like flame that mimics a real wood fire. Questions? Just give us a call at 1-800-866-4344 Monday through Friday from 9 am to 5 pm Eastern Time.