SPECTRA™

Owner's Manual

WaterFurnace®

Geothermal Heating • Cooling • Hot Water

Contents

Geothermal System Benefits **1**
How Geothermal Systems Work **2-3**
Geothermal System Types **3**
WaterFurnace Quality Commitment 4
Warranty **4**
Thermostat Operating Procedures **5-9**
Premier2 Status Lights **9-10**
System Maintenance **10-11**
Resetting the Unit **12**
Operation Service Hints **12**
Quick Reference Card **13**

Your WaterFurnace Spectra Series... The best in geothermal heating and cooling

Thank you for purchasing a WaterFurnace Spectra series geothermal heating and cooling system. You have joined hundreds of thousands of smart customers all over the world who have discovered that geothermal systems are ideal for heating, air conditioning and hot water. The only system that does it all in one unit!

Geothermal technology is ideal because it delivers what you want and what our world needs:

- lowest operating cost of any heating and cooling system
- most energy efficient system available
- very comfortable with even temperature and humidity control
- quiet operation with no noisy outside equipment
- precise temperature control
- highly reliable with industry-proven components
- safe and clean with no flame, chimney and odors
- backed by the industry's best warranties
- low maintenance requirements
- betters the environment by not burning fuel

Energy efficient...

Geothermal systems are extremely energy efficient since they only use electricity to power the pump, compressor and fan. These components *transfer* heat stored within the earth rather than *produce* it. As a result, geothermal systems use far less electricity than outdoor air-to-air heat pumps and conventional systems. In fact, they typically deliver about 3 to 4 times more energy than they consume.

Environmentally beneficial...

Geothermal systems are also environmentally advantageous because they don't burn fuel, eliminating "greenhouse gas" emissions into the air. They also contain no Chloroflourocarbons, use far less refrigerant than air-to-air heat pumps or air conditioners, and are factory sealed to prevent leakage. And, they reduce the need for more coal-fired or nuclear power plants by placing less energy demand on our current capability to produce electricity.

You've made the ideal choice for everyone!

How does geothermal energy keep me warm in winter and cool in summer with savings of 30 to 60% over my current energy costs?

No matter where you live, the underground temperature stays relatively constant all year, even though outdoor temperatures vary widely. Geothermal systems harness that free, renewable, natural supply of energy stored below the ground...and use it for heating, air conditioning and hot water. One system keeps you comfortable both in winter and summer.

The basic principle of a geothermal system is to transfer the heat produced by the sun and stored within the earth into the structure during winter, and to remove heat from indoors in summer and return it to the cooler earth. Water is used to carry this heat either by circulating through an underground closed loop piping system or by directly pumping ground water.

During the heating season...

Water circulating through a "loop" of underground pipe absorbs heat from the earth and carries it to the Spectra unit which extracts the heat, compresses it to a higher temperature and distributes it throughout the building via a duct system.

During the cooling season...

The Spectra unit extracts heat from the air indoors and transfers it to the circulating water in the underground loop system where it is dissipated into the cooler earth.

Hot water option...

Depending on the options you have chosen, your Spectra geothermal unit can also provide a portion of your domestic hot water needs. Anytime your Spectra unit is heating or cooling it will remove a portion of the heat from the system and transfer it to your hot water tank.

Is there more than one way to install geothermal?

There are several different methods used to install a geothermal system. Your WaterFurnace dealer will assist in choosing the right one. Our independent dealers have been thoroughly trained on geothermal applications and are supported by the industry's best computer software to ensure that you receive the right system.

Closed loop systems...

The geothermal closed loop system is an underground network of sealed, high strength plastic pipe filled with a water/antifreeze solution. When cooling requirements cause the loop liquid temperature to rise, heat is dissipated into the cooler earth. Conversely, if space heating demands cause the loop temperature to fall, heat is absorbed from the earth. A closed loop system uses a small, low-wattage pump to circulate the liquid. Closed loops can be installed in the ground horizontally in a trench, vertically in drilled holes, or submerged in a pond or lake. All three are sealed airtight and, when designed properly, produce similar efficiencies.

Open loop systems...

A geothermal open loop system uses ground water as a direct energy source when good quality well water is available at a reasonable pumping depth. A good water discharge system is also required, such as a ditch, field tile, pond or stream. An open loop system may require periodic inspection/cleaning to prevent build-up of mineral deposits.

What about quality?

You can rest easy knowing that each Spectra unit is computer run-tested in all operating modes to ensure efficiency and reliability. Each unit carries an exclusive Quality Assurance emblem personally signed by the final assembly and quality-test technicians. Your Spectra unit is also built with the industry's highest quality components and meets the quality standards of industry regulatory bodies, such as:

Air Conditioning and Refrigeration Institute

ETL Testing Laboratories

What about my warranty?

WaterFurnace International provides each Spectra purchaser with a standard warranty which provides 5-year coverage on all parts for residential applications. Installations in commercial buildings and accessories like thermostats and flow centers carry seperate warranties.

The standard WaterFurnace International pipe warranty covers GEOLINK™ pipe and tubing against rust, rot, electrolytic corrosion and defects in materials and workmanship for 55 years from the date of manufacture.

Please read all warranty certificates carefully to familiarize yourself with the terms of the warranty so that you obtain full benefits and avoid misunderstandings. If you have any questions about warranty coverage, contact your WaterFurnace dealer.

Your Spectra warranty registration card must be returned to WaterFurnace International immediately after installation to receive full warranty benefits.

Operating Procedures…

To enjoy all the benefits of your Spectra geothermal system, please review the following operating procedures, service tips and information. You'll find your system easy to operate and simple to maintain at its peak performance. However, if you have any questions or problems, contact your local independent WaterFurnace dealer.

What do I need to know about my thermostat?

Your digital thermostat has been designed to provide highly accurate control of room temperature. In addition, it will display information relating to your system's operation. The clearly marked buttons and informative display make it easy to understand and simple to operate.

Note: Your Spectra series geothermal unit will work with almost any 24 VAC thermostat on the market. For obvious reasons, we cannot highlight the features of all the thermostats. The instructions that follow apply only to the type of thermostat pictured here. For operating instructions of other thermostats, contact your WaterFurnace dealer.

General information...

The thermostat normally displays room temperature, mode of operation selected and current system status. The six buttons on the front allow complete control of the system.

You may select different heating and cooling set points for the system to maintain, e.g. 70ºF in heating and 75ºF in cooling. Raising and lowering the set points in heating or cooling is as simple as pushing a button. In addition you may choose ºF or ºC for the display by pushing the ⌃ and ⌄ buttons simultaneously. Repeating the process will revert to the original display.

Important: Always allow the system at least 5 minutes to respond to any changes in settings. The thermostat has been programmed to start the heating or cooling cycle in stages.

Note: ***The electronic thermostat cannot be set closer than 2º between heating and cooling.***

How do I set my thermostat?

Mode Button

Push and release the **MODE** button to select the desired mode of operation. Each time the mode button is pushed and released, the thermostat will select a different mode. The different modes are as follows:

COOL ❄	-Cooling operation only
HEAT 🔥	-Heating operation only
AUTO 🔥 ❄	-Heating or cooling operation
E HT 🔥	-Heat with auxiliary heat only
OFF	-System will not operate

Heat

Push and release the **MODE** button until the display reads **HEAT**, and shows the 🔥. Your system is now in the heating mode. To review the heating set point, momentarily press either the ⌃ or ⌄ button and you will see your current set point displayed along with the 🔥 symbol.

To adjust the set point, press and hold either the ⌃ or ⌄ button until the desired temperature is displayed. **Note:** *As the heating set point is adjusted, the word* ***HEAT*** *will be displayed.*

The 🔥 symbol will be animated when the system is operating in the heating mode. The heating cycle starts with the fan and compressor on.

During extreme cold weather, additional heating capacity may be required. At such times, the thermostat will automatically request auxiliary heating assistance, and illuminate the **AUX** light on the top of the thermostat.

Note: ***if your system is not equipped with auxiliary heat, the thermostat may still indicate a request for auxiliary heat.***

At the end of the heating cycle, the fan will remain on for approximately 30 seconds, unless continuous fan has been selected.

Cool

Push and release the **MODE** button until the display reads **COOL** and shows the ❄ symbol. Your system is now in the cooling mode.

To review the cooling set point, momentarily press either the ◡ or ◠ button and you will see your current set point displayed along with the ❄ symbol.

To adjust the set point, press and hold either the ◡ or ◠ button until the defined temperature is displayed. *Note: As the cooling set point is adjusted, the word **COOL** will be displayed.*

The ❄ symbol will flash when the system is operating in the cooling mode. The cooling cycle starts with the fan and compressor on.

At the end of the cooling cycle, the fan will remain on for approximately 30 seconds, unless continuous fan has been selected.

Auto

Push and release the **MODE** button until the display reads **AUTO**, and shows both the ❄ and 🔥 symbols. Your system is now in the automatic mode, with either heating or cooling operation available.

To review the heating and cooling set point, momentarily press either the ◡ or ◠ button. The thermostat will then either display the current heating set point and the 🔥 symbol, or the current cooling set point and the ❄ symbol. If the heating set point and the 🔥 symbol are displayed, pressing the **MODE** button within 5 seconds will display the cooling set point and ❄ symbol. If the cooling set point and ❄ symbol are displayed, pressing the **MODE** button within 5 seconds will display the heating set point and 🔥 symbol.

To adjust the heating set point, press and hold either the ◡ or ◠ button while reviewing the heating set point.

*Note: As the heating set point is adjusted, the word **HEAT** will be displayed.*

To adjust the cooling set point, press and hold either the ◠ or ◡ button while reviewing the cooling set point.

Note: *As the cooling set point is adjusted, the word **COOL** will be displayed.*

Emergency Heat

Push and release the **MODE** button until the display reads E HT, and shows the symbol. Your system is now in the emergency heat mode. Emergency heat mode uses only the auxiliary heat to maintain comfort. This should only be used if for some reason your Spectra unit is inoperable. **Note: *If your system is not equipped with auxiliary heat, do not select the emergency heat mode.***

Off

Push and release the **MODE** button until the display reads **OFF**. When the word **OFF** is displayed the system will not provide heating or cooling.

The display still shows room temperature and the fan is operable. Avoid using the **OFF** mode during extremely cold weather to prevent damage to your home from freezing.

How do I set the fan?

To select continuous fan operation, press and release the **FAN** button and the display will show the animated fan symbol. Continuous fan operation circulates the air in your home.

Continuous fan operation is useful when using an air cleaner for continuous air filtering or to help maintain even air temperatures throughout a multilevel or large home. (Using continuous fan does consume more energy.) The fan will come on automatically whenever the system is operating, but there will be no indication of this on the thermostat display.

How does the setback feature of my thermostat work?

Day/Night Button

Built in to your thermostat is an optional setback feature. By pressing the Day/Night button, alternate set points may be selected. When the primary (daytime) set points are selected, the symbol will be displayed. When the secondary (nighttime) set points are selected, the symbol will be displayed.

Adjusting Secondary Set Points

To adjust the secondary set points, press the Day/Night button to select the secondary (nighttime) mode. The secondary heating and cooling set points may now be adjusted. (See *"How do I set my thermostat?" on page 6*).

Why does my thermostat have an outdoor button?

Outdoor Button

An optional temperature sensor may be connected to your thermostat. By pressing the **OUTDOOR** button the current outdoor temperature will be displayed. If the optional sensor is not connected, the thermostat will display **--.**

What are the indicator lights for?

AUX Light

When the **AUX** light is illuminated, the thermostat is requesting auxiliary heat. This generally occurs during extreme cold weather conditions.

FAULT light

The **FAULT** light is used to indicate the following problems:

Continuously on- system has shut down due to a protective device (see *"Resetting the Unit" on page 12*). The auxiliary heat, if installed, will automatically come on to keep your home comfortable.

Slow flashing (1 flash/sec)- the unit is not receiving valid thermostat signals (call your independent WaterFurnace dealer). Your unit will operate normally during this time if possible.

Fast flashing (3 flashes/sec)- system has shut down due to improper airflow and the entire system (including auxiliary heat) has been shut off (see *"Resetting the Unit"* on page 12).

Note: *There is an additional indicator light on the thermostat which is normally not used by the Spectra system.*

What do I do in case of a power failure?

DON'T WORRY! Your Spectra thermostat employs the latest developments in solid-state electronic technology. One of its unique features is the elimination of the battery required to maintain your selected set points in the event of a power loss. With your thermostat the memory is unaffected by power failures of any duration. When power is restored the thermostat will continue operating as if the power had never shut off. However, there will be no heating or cooling during the outage.

What if my unit stops working?

Your Spectra unit has been equipped with self-protection devices and controls. Should you suspect that heating or cooling operation has ceased, look at the thermostat to see if a **FAULT** signal is illuminated. Your Spectra is designed to be trouble free and reliable.

•If it is on continuously, see "*Resetting the Unit" on page 12*.

What kind of safety controls does my unit have?

Your WaterFurnace Spectra is equipped with safety controls which are designed to protect the unit in case of improper water flow, airflow or refrigeration charge. These safety controls should not be bypassed by anyone. Doing so may void the warranty.

Caution: Before performing any maintenance to your system, turn off all electrical power to the unit. There may be separate supplies— one for the unit and one or two for the auxiliary heat.

How do I maintain my system?

Filters

- CHECK YOUR FILTERS EVERY 60 DAYS. A dirty filter will cause your unit to work harder than necessary, waste energy and may cause premature component failure.
- To achieve optimum performance and economical operation, change your "replaceable type" filter if you see a build-up of dust or dirt.

- If you have opted for a permanent electrostatic filter, wash it with a garden hose at least every 60 days. When placing the filter back in the slot, be sure that the arrow on the filter frame points toward the unit.
- **Never operate the unit without a filter.**

Water Supply for Well Water Systems

An adequate water supply to the unit is very important. Do not let anyone disrupt the water supply by rerouting the supply line or tapping into it without first checking with your independent WaterFurnace dealer. If the well pumping system requires service or is inoperable, your unit should be turned off until an adequate water supply is restored.

Water Supply for Closed Loop Systems

No regular maintenance is required. However, if you notice air noise within the piping or your loop is ever damaged by excavation, contact your independent WaterFurnace dealer.

Drain Pan

In the cooling mode, moisture removed from the air forms as condensation on the air coil and the resulting water runs down to the condensate drain pan. The drain pan can pick up lint and dirt, especially with dirty air filters. If overflow occurs, the system will shut down.

- If the water does not run freely, clean the drain pipe. Pour a capful of bleach in the drain pan once a year. This helps to prevent algae.
- To gain access to the drain pan for inspection: TURN ALL POWER OFF TO THE UNIT AND AUXILIARY HEAT. Remove the screw located above the top center of the fan compartment door. Lift the door up and pull out at the bottom. The drain pan is the black rectangular pan with the drain hole in the middle.

What about regular service?

Your Spectra system requires no regular maintenance. However, once a year or so, have the unit inspected by an independent WaterFurnace dealer. He will check the unit's performance and make sure that your Spectra unit is heating and cooling at its peak performance level. If your unit is using a well as its water supply, your unit may need periodic cleaning to remove mineral deposits.

If my unit shuts off, how do I reset it?

- To reset the unit, repeatedly push the **MODE** button on the thermostat until the display reads **OFF**.
- If **FAN ON** is displayed, it must also be turned off by pushing the **FAN** button.
- The red **FAULT** light will remain on for 2-3 seconds after turning the system and fan off.
- After the fault light goes out, turn the system back on to the desired **MODE** and re-select **FAN ON** if desired.
- Unit operation should resume within five minutes if heating or cooling is required.
- If the unit shuts down again, call your independent WaterFurnace dealer as soon as possible. Do not repeatedly reset your unit.

What if my unit doesn't operate properly?

Before you call your WaterFurnace dealer for service, check these service hints:

- Check air filters. Depending upon filter type, clean or replace if necessary. *See "Filters" on pages 10 and 11.*
- Make sure the thermostat is properly set.
- Check to make sure the electrical disconnect switches are in the **ON** position. Both the unit and auxillary heat (if present) must be powered for proper operation.
- Check for a tripped circuit breaker or a blown fuse in your home's main power box. Reset breaker or replace fuse.
- If either the disconnect switch or the circuit breaker continues to go off after you reset them, *call your independent WaterFurnace dealer immediately to prevent damage to your unit.*
- Check the thermostat indicator lights to ensure proper operation of the system.
- If you can't determine the problem, call your independent WaterFurnace dealer promptly.

For quick reference, write your independent WaterFurnace dealer's name and telephone number in the box below.

Dealer: _____

Telephone: _____

Date Of Purchase: _____

Type Of System:

❒ Closed Loop ❒ Well Water ❒ Pond Loop

Auxiliary Heat: ❒ Yes ❒ No If yes, kW _____

Loop Footage: _____

Unit Model #: _____ Serial #: _____

Options: _____

Extended Warranties: ❒ Equipment ❒ Loop

Once again, thank you for purchasing a WaterFurnace geothermal heating and cooling system... you've made the best choice for yourself and the environment.

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