



**WaterFurnace.**  
Smarter from the Ground Up™

Geothermal Comfort System  
High Temp Hydronic Heat Pump

**5 Series**  
502W12





## The 5 Series

*Smarter from the Ground Up™*

As the upgrade to our popular Envision product line, the 5 Series represents some of our best features and efficiencies. Its advanced components offer a level of comfort and savings that's far greater than any ordinary system and among the geothermal industry's highest.

The 502W12 High Temperature Hydronic Heat Pump is our geothermal solution for boiler replacement. Capable of delivering 150°F leaving hot water, this system is perfect for baseboard radiator systems, underfloor radiant applications, overfloor radiant applications, and fan coils. It's never been easier to upgrade an outdated boiler system with a water heating system that uses the earth as its fuel source.



### Why Geothermal?

Geothermal is perfect for those who want to dramatically reduce their energy usage, save money on bills, and enjoy a more even, consistent comfort in their home. Over the next few pages we'll tell you a little more about geothermal and show you how you can benefit from a technology that's *Smarter from the Ground Up™*.



# Comfort that gives back

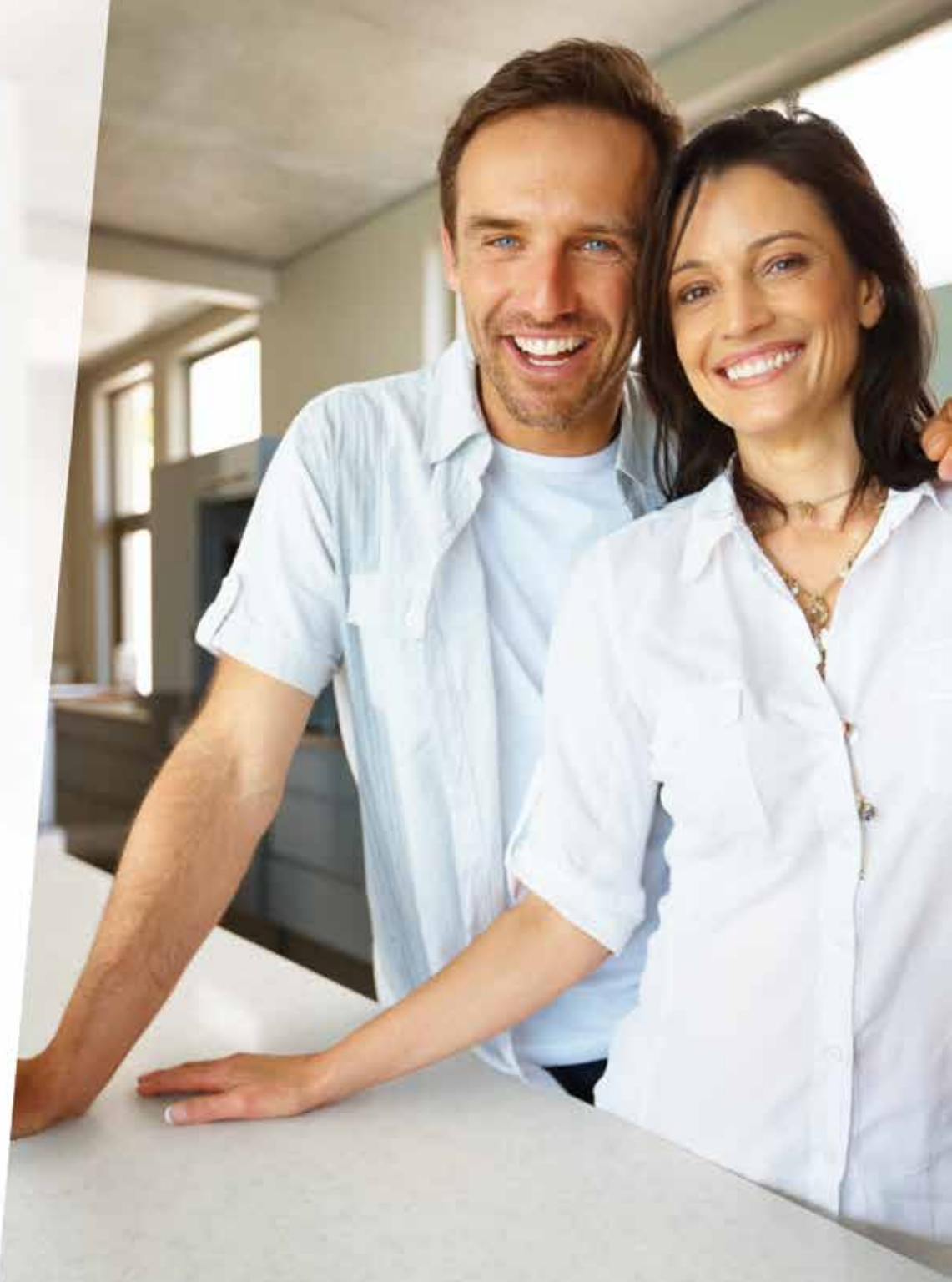
## Geothermal's benefits

Geothermal heat pumps are not only the most comfortable way to heat and cool, they're also the most cost effective. They're versatile enough to excel in almost any home or any environment, and you'll find geothermal in more than 1 million households across Canada and all 50 U.S. states. They can be scaled for single-family homes to entire college campuses. In fact, we heat and cool our entire 110,000 square-foot headquarters with WaterFurnace equipment. Here are a few reasons why geothermal is one of the fastest growing technologies available for your home.

### QUALIFIES ✓ 30% TAX CREDIT

#### Extra savings for geothermal

A 30% tax credit on equipment and installation costs is currently available to U.S. homeowners who install an Energy Star rated geothermal system. The credit, which is scheduled to last until the end of 2016, can be used to offset both AMT and regular income taxes and can be carried forward into future years. Thanks to this amazing opportunity, there's never been a better time to make the switch to geothermal.



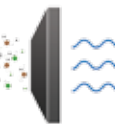
#### Energy Efficient

WaterFurnace systems are rated number one in energy efficiency because they can deliver almost five units of energy for every one unit of electrical energy used. Compare that to even the best ordinary system that delivers less than one unit of energy for every unit it consumes. That translates into an efficiency rating approaching 500%, compared to the most efficient gas furnace which rates only 98%.



#### Cost Effective

Because of the extraordinary efficiency of a WaterFurnace system, most homeowners save more on monthly bills than they pay for the system when installation costs are added to the mortgage. Any added investment over traditional equipment is usually recovered in just a few years, and many homeowners see a return on investment of 10-20% over the life of the system.



#### Clean

Since no fossil fuels are used, 5 Series units are perfect for clean and virtually maintenance free operation.



#### Environmentally Friendly

Geothermal systems are recognized by the United States Environmental Protection Agency as the most environmentally friendly, cost effective and energy efficient heating and cooling technology available. These systems also minimize the threats of acid rain, air pollution, the greenhouse effect and global warming — problems directly linked to the burning of fossil fuels. In fact, installing a single geothermal unit is the environmental equivalent of planting 750 trees or removing two cars from the road.



#### Flexible

Available as heating-only or a reversible model, the 502W12 is perfect for boiler replacement or chilled water applications. Paired with our Envision Air Handler, it can also offer efficient, dehumidified cooling.



#### Safe

Because natural gas, propane, or oil isn't required to operate a WaterFurnace system, there's no combustion, flames, or fumes and no chance of carbon monoxide poisoning.



#### Quiet

WaterFurnace systems don't require noisy outdoor units that can disturb your peaceful surroundings or create unsightly additions to your home's appearance. We've taken great steps in keeping your unit as quiet as possible.



#### Reliable

Because geothermal units aren't subjected to the punishing effects of outdoor weather or fuel combustion, they last longer than nearly any other heating and cooling system. According to the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, geothermal units have an average equipment life of 25 years while the underground loop system has a rated material life of more than 100 years. Ordinary air conditioners, furnaces and heat pumps are rated for only 12-18 years.



#### Comfortable

5 Series units provide consistent, comfortable heating and can better match the needs of the home during changing outdoor weather.

# Using the earth to heat & cool

## The geothermal difference

A geothermal heat pump (GHP) taps into the renewable solar energy stored in the ground to provide savings up to 70% on bills. Using a series of underground pipes, it exchanges heat with the earth instead of outdoor air. While air temperatures can vary greatly from day to night or winter to summer, the temperature just a few feet below the earth's surface stays an average 55°-70°F year-round.

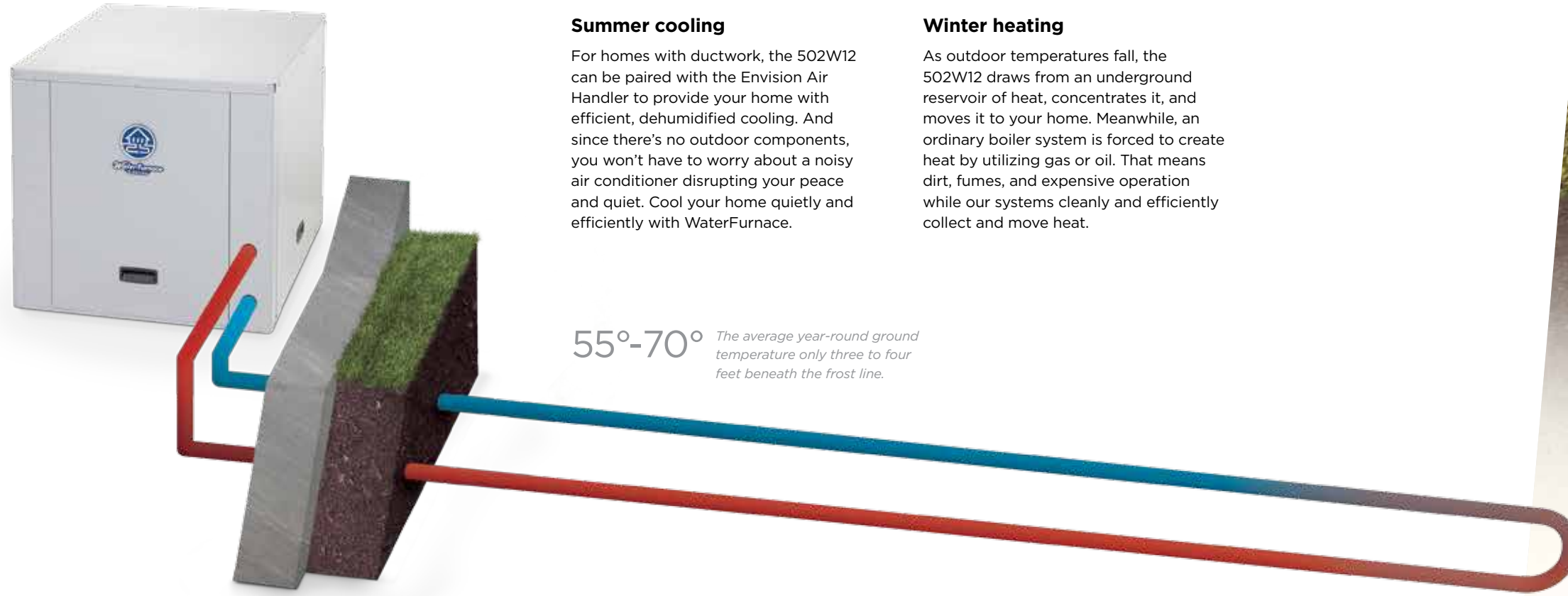
### Summer cooling

For homes with ductwork, the 502W12 can be paired with the Envision Air Handler to provide your home with efficient, dehumidified cooling. And since there's no outdoor components, you won't have to worry about a noisy air conditioner disrupting your peace and quiet. Cool your home quietly and efficiently with WaterFurnace.

### Winter heating

As outdoor temperatures fall, the 502W12 draws from an underground reservoir of heat, concentrates it, and moves it to your home. Meanwhile, an ordinary boiler system is forced to create heat by utilizing gas or oil. That means dirt, fumes, and expensive operation while our systems cleanly and efficiently collect and move heat.

55°-70° *The average year-round ground temperature only three to four feet beneath the frost line.*



Note: Illustration represents how geothermal works and is not to scale. Loops are generally 4-6 feet below the earth's surface and between 150-400 feet long.



### Traditional Air Conditioner

Summer air is already saturated with heat and is less willing to accept more. Thanks to the constant temperature of the earth, geothermal is more than twice as efficient at cooling than any ordinary heat pump or air conditioner.

### Fossil Fuel Boiler

Ordinary boilers are expensive to operate and can be detrimental to the environment, since they burn fossil fuels. A geothermal system uses the heat from the earth and returns up to five dollars of heat for each dollar spent on electricity. That's because our units don't create heat through combustion. They simply collect and move it.





# The heart of a geothermal system

## Geothermal earth loops

A geothermal system uses a series of underground pipes called a “loop.” The earth loop eliminates the need for fossil fuels. It’s the heart of a geothermal system and its biggest advantage over ordinary heating and cooling technologies. The type of loop used is based on available land space and installation costs for specific areas.



### Horizontal Loop

Used where adequate land is available, horizontal loops involve one or more trenches that are dug using a backhoe or chain trencher. High density polyethylene pipes are inserted, and the trenches are backfilled. A typical home requires 1/4 to 3/4 of an acre for the trenches.



### Vertical Loop

Vertical loops are used when space is limited. Holes are bored using a drilling rig, and a pair of pipes with special u-bend fittings is inserted into the holes. A typical home requires three to five bores with about a 15-foot separation between the holes.



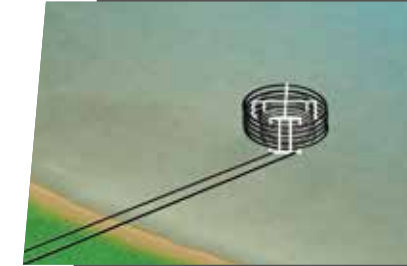
### Pond Loop

If an adequately sized body of water is close to your home, a pond loop can be installed. A series of coiled, closed loops are sunk to the bottom of the body of water. A 1/2 acre, 8-foot-deep pond is usually sufficient for the average home.



### Open Loop

An open loop is used where there is an abundant supply of quality well water. The well must have enough capacity to provide adequate flow for both domestic use and the WaterFurnace unit. 5 Series units require 3 - 10 GPM, depending on size.



### HyperLoop - Pond

Perfect for pond and lake geothermal applications, this prefabricated and compact loop greatly reduces loop build and installation time.



### HyperLoop - Ground

For hot water applications, this prefabricated and compact loop can be simply installed with reduced landscape disruption. Please note that HyperLoop ground is not intended for heating and cooling your home.



### Directional Bore

Perfect for homeowners who need minimal landscape disruption, these loop types take advantage of the space available below ground. A directional bore loop can be installed either vertically or horizontally depending on yard space.

# High temperatures for more options

*Water temperatures up to 150°F*

Hydronic heating is a versatile, energy efficient solution for conditioning your home. It uses tubing to distribute hot water under the floor, through baseboard radiators, or through larger cast iron radiators. Heat is gently transferred throughout the room in a consistent, even manner. Hydronic heat can also be paired with forced air systems and fan coil units.

Fossil fuel hydronic systems were generally designed to work with higher temperatures than output by most geothermal hydronic units. The 5 Series 502W12 has been designed specifically to meet these higher temperature requirements and makes upgrading to a WaterFurnace system easier.



## Baseboard Radiation

Baseboard units are typically copper pipe with aluminum fins covered with a decorative shell to hide the piping. The operation of a baseboard radiation system depends on creating convection currents in the room. Air is warmed by the fin tube, rises and displaces cool air. This process is difficult to sustain with the 130° water most hydronic geothermal systems generate. The 502W12 changes that.



## Cast Iron Radiation

In many retrofit applications, the replacement system is required to work with existing cast iron radiators. These systems also rely on convection currents and typically operate with water temperatures of 125° to 160°F. The 502W12 is capable of 150°F water output making it perfect for upgrades.



## Radiant Floor Heating

In a building with a radiant floor heating system, the entire floor acts as a heat source for the room. Many people consider this method of heating the most comfortable available. With its higher water temperatures, the 502W12 is able to be installed between joists under the floor which removes the need to alter existing flooring.



## Fan Coils and Air Handlers

Fan coils and air handlers typically have one or two coils and a blower. Air is heated by hot water circulated through the hot water coil. Chilled water is circulated through the coil if air conditioning is needed. Blowers can be provided to fit various applications, with or without ductwork.





# Engineered for efficiency

## Components of the 5 Series



### Design Components:

- 1. Cabinet:** The cabinet comes standard with a professional grade finish for long-lasting beauty and protection. The system is fully insulated for quiet operation with cleanable foil-backed insulation.
- 2. Waterline Connections:** The 502W12 cabinet is designed so the waterlines can face either the front or back so that you can install the system any way you need to. An added option is for factory installed top mounted waterline connections so the system will fit seamlessly into any installation.
- 3. Discharge Muffler:** A discharge muffler is standard on this system to limit noise even more than before. Add that to our double isolation plate mounted top-of-the-line compressors and you'll be able to enjoy the comfort of geothermal in peace and quiet.
- 4. Field Switchable Control Box:** The ultimate in versatility, the 502W12 features a field switchable control box so that the unit can be oriented two different ways. Your dealer can move the control box to the opposite end if that is the most accessible side of the system in your home.
- 5. Heat Exchangers:** Two brazed plate heat exchangers provide increased efficiency, performance, and reliability. Because they're much smaller than traditional coaxial exchangers, they allow the 502W12 to provide high capacity performance in a compact unit.
- 6. FX10 Controls:** Lead/lag compressor management, adjustable delayed start, advanced freeze sensing system, advanced fault detection and management, and alarm history reporting are major benefits of the 502W12's sophisticated control board.
- 7. IntelliStart®:** This optional soft starter reduces start-up amperage by 60% of normal draw to reduce noise, eliminate light flicker, and increase compressor life.
- 8. Compressor:** Two high efficiency scroll compressors are utilized to keep operating costs low and will provide years of reliable operation. Compressor blankets and double-isolation mounting plates are used to keep the system quiet.

ISO/AHRI 13256-1		Closed Loop		Open Loop	
		Cooling EER	Heating COP	Cooling EER	Heating COP
Single Speed	Model & Size				
	084	Full Load 16.0	3.1	20.3	3.8
	Part Load	19.0	3.5	20.8	4.0



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# Finishing touches

## Accessories

Choosing the right accessories can greatly improve the comfort levels in your home and can even allow you to expand the functions of your existing WaterFurnace system. Each item has been designed to work hand in hand with your system to allow flawless and convenient operation. Here are some of our most popular accessories. Visit [waterfurnace.com](http://waterfurnace.com) for more.



### HydroZone

By pairing the 502W12 with the WaterFurnace HydroZone System, you can experience the ultimate in comfort and savings. The HydroZone system was designed to operate with our GeoTank and offers advanced features like Outdoor Reset (adjusting tank temperatures based on outdoor conditions) and Unit Staging (sequencing multiple units to ensure peak performance). The optional Zoning Panel adds the ability to control temperatures for up to 12 independent areas throughout your home. This allows you to customize conditions in each room based on comfort and usage.



### TP32S02 Thermostat

Perfect for any system – single or dual stage, ECM or PSC blower motor, or dual fuel installations. This thermostat will provide you with the programmable functionality, winter humidity control, and the convenient features you need. High tech accessories add wireless convenience and personalization.

*\*Shown with optional RF Module (RFMSO1)*



### TP32W03 Thermostat

This thermostat is made for use with single or dual stage units that feature an ECM blower motor. It features 3 heat stages and 2 cool stages and dual fuel capabilities. With a sleek touch screen display this programmable thermostat will look great in any home.



### TP32U04 Thermostat

This powerful thermostat is great for any system – single or dual stage units with ECM or PSC blower motors. Dual fuel capability, winter humidity control, text based output and Comfort Talk are some of the features that make this thermostat a versatile and dependable choice.



### Envision Air Handler

For homes with ductwork, the 502W12 is the perfect solution for central air conditioning when paired with our Envision Air Handler. The Air Handler features a variable speed ECM fan motor for maximum comfort and efficiencies while maintaining a slim cabinet for ease of installation. Combining comfort with versatility, the Air Handler can enhance your 5 Series 502W12 to provide efficient, dehumidified cooling for your home.



### GeoTank™

The WaterFurnace GeoTank is simply the best way to capture free preheated water from your unit.





The WaterFurnace name has been synonymous with geothermal since we were founded in 1983. Over the years we've worked to innovate new technologies, integrate key trends and grow our core business to represent clean and sustainable solutions. Our units combine sound engineering with the highest levels of quality control to provide you with some of the most efficient heating and cooling systems on the planet. WaterFurnace—*Smarter from the Ground Up.*

ISO Accreditations:



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