

EPA verified savings up to 75% using renewable energy

EarthLinked® Commercial Water Heating

The EarthLinked® Water Heating system delivers the highest efficiency of any powered water heating system. It is a heat pump that harvests abundant renewable energy directly from the earth. The systems have been heating water since 1983, primarily as an optional feature of heat pumps for space heating and cooling. Their most economic water heating application is to heat or preheat water for large users such as motels, multi-family dwellings, health care facilities, food processors and restaurants. Field testing by U.S. EPA verified up to 75% energy savings and avoidance of the emission of up to 7,000 pounds of CO₂ and 50 pounds of NO_x per ton of heat pump capacity each year as compared to electric resistance water heating (up to 42,000 pounds of CO₂ and 300 pounds of NO_x each year by a 6 ton system).

How the System Works

EarthLinked® transfers heat by circulating ozone friendly refrigerant in copper earth loops that are trenched or bored into the earth. The liquid refrigerant transfers heat from the constant temperature of the ground, through a patented flow control device to the compressor. The compressor raises the refrigerant pressure and temperature, and routes the hot vapor to a heat exchanger. The refrigerant vapor, passing through sealed channels, transfers heat to circulating water. The water is heated and delivered to the hot water storage tank. The refrigerant condenses to a liquid and is recirculated via a proprietary flow control through the earth loops to absorb more heat.

Application of the EarthLinked® System

The most economic application of the EarthLinked® system is to preheat large quantities of cold water to 110-120°F for commercial applications. Typically, the system provides preheated water to standard 120-gallon water heater tanks. As hot water is used in the facility, the preheated water is transferred to one or more commercial water heaters that further heat the water to the required use

temperature, maintain that level and provide redundancy. It becomes a powerful hybrid that increases system capacity and reliability.

Environmental Benefits

Burning fuels to create heat wastes diminishing natural resources and can never achieve 100% efficiency. The process pollutes the environment with carbon dioxide and nitrogen oxides that are greenhouse gases. The U.S. EPA and DOE have determined that, in most applications, geothermal heat pumps are the most energy efficient and environmentally clean heating systems. Due to its superior design, the EarthLinked® system delivers renewable energy with higher efficiency than any other powered water heating system.

Constantly Available Renewable Energy Source

The constant earth heat source is always available and is not dependent upon sunlight hours or temperate climate. This creates the ability to use heat pumps to deliver heat in cold climates, shift demand off-peak and thereby use lower

electric rates for water heating, including pools, radiant hydronic heating and thermal storage.

Benefits of EarthLinked® Over Electric Water Heating

- Up to 75% energy savings due to reduced electricity consumption
- Reduced emissions of greenhouse gases
- Reduced electric demand and possible reduced demand charge
- Decreased energy dependence

Benefits of EarthLinked® Over Air Source Heat Pump Water Heating

- Higher efficiency due to favorable earth heat source
- Does not lose efficiency as ambient air temperature drops
- Can be located in mechanical room because of no need to circulate air over an exterior coil
- Quiet operation resulting from total system enclosure and elimination of exterior fan and motor
- Not subject to freezing; no defrost cycle required
- Eliminates the exterior coil, fan, fan motor and capacitor, defrost timer, and ancillary wiring, making it mechanically and electrically simpler
- Has greatly improved reliability and service life because of its simplicity and stable temperature source



Benefits of EarthLinked® Over Gas Water Heating

- Lower energy cost and lower consumption combine to reduce operating cost up to 50%
- No on-site fossil fuel firing
- No combustion air supply needed
- No flue gas venting
- No explosion or asphyxiation hazard
- No gas main needed

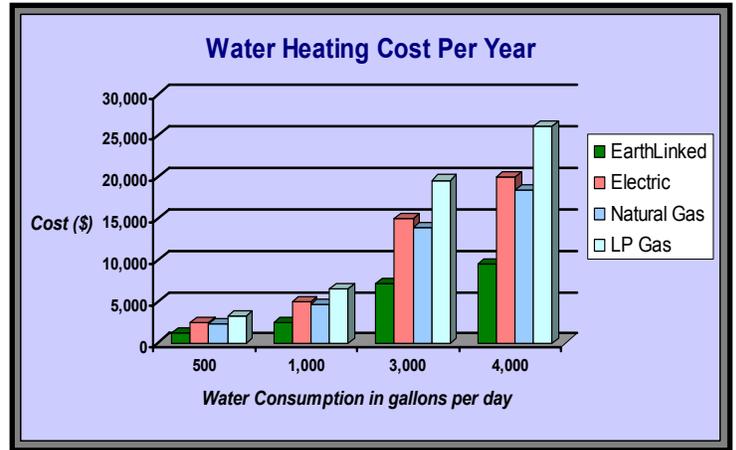
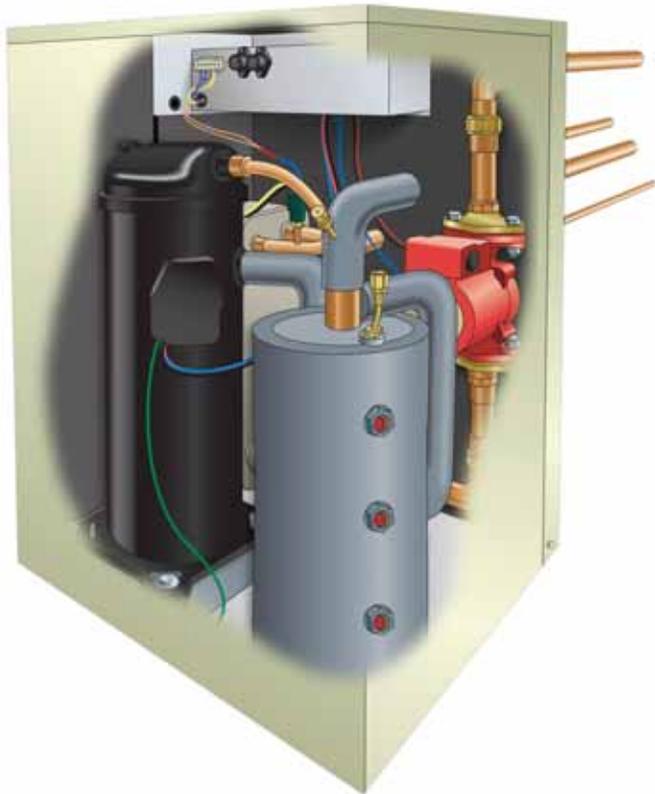
EarthLinked® delivers up to 400% efficiency compared to 80% for commercial gas water heating. For every Watt of electricity consumed by the EarthLinked® compressor, the system delivers three to four times that amount of heat energy to the water tank because it is primarily transporting renewable energy.

Rapid Cost Recovery

Even though the installed cost of the EarthLinked® system is greater than traditional water heaters, the monthly energy savings in commercial applications are so large that the system quickly pays for itself.

A commercial user with an EarthLinked® water heating system installed at a cost of \$15,000, using 2,000 gallons of hot water per day, an electric rate of \$0.10/kWh, an earth temperature of 65°F where the EarthLinked® system raises the water temperature to 115°F and the electric resistance element raises it to 125°F, in comparison with an electric water heater saves \$6,681 annually. The cost recovery period in that case is 2.2 years, for a Return On Investment of 45.4%. Even if the installation cost was \$20,000, payback would be within 3 years and Return On Investment would be 33.9%.

Commercial Leasing Options are available to eliminate cash investment and payments are made from savings.



Features

- **Independently documented hot water heating savings up to 75%.**
- **Powerful hybrid increase Efficiency, Capacity and Reliability.**
- **Patented refrigerant flow control assembly.**
- **Warranty: 5-year limited warranty on compressor unit, and limited lifetime warranty on earth loops.**

Compressor Type	Bristol Benchmark™
Circulating Pump	Grundfos UP26-116BF
Voltage	208-230/400/460
Phase	Single or Three-phase
Power Supply	50Hz or 60Hz
Ozone Friendly Refrigerant	R-407C
Dimensions	17"D x 21" W x 28" H
Heating Capacity	33,800-94,000 BTU/hr.
Shipping Weight	250-310 lbs.

EarthLinked® CWH systems are specially designed for commercial water heating. The unit includes the compressor, heat exchanger and water circulating pump in one cabinet. This system can raise the temperature of water up to 125°F. Traditional gas burners or electrical resistance elements can then raise the temperature to any desired level and provide a backup heating source. The standard water heater thermostat controls the ultimate delivered temperature of the water in the customary manner.

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