FHP Manufacturing. Top quality products to improve your savings and help create a better world.

Specializing in efficient green technology for commercial heating and cooling products, FHP is one of the leading manufacturers of Geothermal and Water Source heat pumps, which assures you that you are buying a unit that you can trust. We are part of Bosch Thermotechnology Ltd., a Robert Bosch Group unit dedicated to providing highly efficient heating and cooling solutions to the private and public sector.

FHP has always been on the forefront of product development and innovative design to optimize the performance of our units. Our products are designed and manufactured to the highest quality, reflecting the no-compromise standards for which FHP and Bosch are renowned which provides our customers with the highest level of satisfaction and comfort. The variety of options, energy efficiency and uncompromising quality of all FHP units makes them the ideal choice for either new construction or retrofit commercial projects.

“Environmental stewardship is a core philosophy for FHP Manufacturing from design to production to the reduction in our customers’ energy bills. At FHP, we are working on a better future every day.”

WWW.FHP-MFG.COM
FHP’s engineering efforts have been focused on providing a greener world for future generations. Faced with today’s tough environmental challenges and with global warming, we are more committed than ever to develop solutions which utilize sustainable energy sources in order to conserve our planet’s non-renewable reserves of fossil fuels. With our heat pumps, you not only will save money on energy bills but also help to create a better world.

**What Is A Geothermal Heat Pump?**

Geothermal heat pump technology collects the natural energy of the earth to provide heating in the winter and cooling in the summer. At the depth of 6 feet the earth’s temperature remains relatively constant all year long, which is the perfect vehicle to keep buildings at a more consistent, moderate temperature.

A geothermal energy system circulates water or another fluid into the ground through a series of non corrosive pipes, where it is warmed or cooled by the ambient temperature of the ground. The fluid is then brought back to the heat pump which then provides heating or cooling for your home or business as needed — efficiently and without any negative impact on the environment.

**A Pleasant Living And Working Environment**

Geothermal heat pumps remove many of the negative factors that are associated with traditional dirty energy sources. Not only will the general environment of the building be improved, but you will also be able to remove bulky and loud boiler room equipment, improving the aesthetics of your building.

- Natural and increased indoor air quality
- No rooftop or ground mounted equipment to be damaged by the weather, vandalism or roof leaks
- When installed properly, geothermal equipment is as quiet as a refrigerator
- With no boilers, smoke stacks or fuel tank, they use about one-third of the space of a traditional boiler room
- Unlimited architectural creativity for attractive exterior and roof designs
Cost And Payback

Geothermal heat pumps not only provide dependable, natural heat, they also provide commercial buildings with more financial independence through the money the heat pumps can save.

- Geothermal heat pumps have the lowest life cycle cost today – 25% to 50% less than a conventional system
- Savings depend on location and which GSHPS you use
- Will normally cost more than a roof top or split system, but will pay back that cost difference in approximately two years
- Considered the technology of choice by the Department of Energy and the Environmental Protection Agency
MC Series - Big-Ultra Efficiency

Efficiency
With the MC Series, FHP can satisfy your needs up to 60 tons with these large R-410A capacity units. The many features and energy efficiency of the MC Series make them the ideal choice for either new construction or retrofit projects. The unit is available in cooling only or with reverse cycle heating with either constant or variable air volume discharge to provide a highly efficient operating system. Water-side economizer packages are available to take advantage of free cooling. Hot gas bypass allows the unit to operate under a wide variation of conditions and the hot gas reheat option provides a means of controlling humidity, a major concern in the interior environment of a building. The MC unit is available from 30 to 60 nominal tons in two-stage or four-stage compressor configurations.

Environmentally Friendly
These highly efficient units not only will reduce your operating costs but play their part in reducing CO₂ emissions, a leading cause of global warming.

Quality
Rigorous factory testing virtually guarantees no hassle from the start while FHP’s almost 40 years of experience in designing heat pumps for commercial applications is your assurance of a state of the art quality product. Multiple refrigerant circuits provide redundancy in the event of component failure. FHP’s ISO 9001:2000 certified facilities provide consistent quality in every unit we build.
## Key Features

### Standard
- Four Sided Filter Rack
- Filter Drier
- TXV Valve
- Service Connections
- R410-A Refrigerant
- Geothermal
- Scroll Compressor 2 Stage
- Scroll Compressor 4 Stage
- 4-Way Reversing Valve
- Blower Housing Class 2
- Coaxial Heat Exchanger Copper
- Unit Protection Module 2

### Optional
- Stainless Steel Drain Pan
- Hot Gas Bypass
- Hot Gas Reheat
- Coaxial Heat Exchanger Cupronickel
- DDC Controls
- Comfort Alert Diagnostics Module

### Additional options
- Hot Water Coil
- VFD controlled variable Air Volume
- 65% Efficiency Filters
- Water Side Economizer
**Geothermal**
All MC Series units come ready for geothermal applications.

**Four Sided Filter Rack**
FHP units include either a 1” or 2” air filter. Four sided filter racks minimize unfiltered air from entering the unit. Filter doors allow for easy routine maintenance and changing of the air filter. MERV 11 high efficiency filters are available on most units.

**Stainless Steel Drain Pan**
All FHP units utilize stainless steel drain pans. A stainless steel drain pan prevents corrosion and allows for easier cleaning. It will not deteriorate over the life of the unit.

**Unit Protection Module UPM1**
The Unit Protection Module UPM 1 is standard on most single compressor FHP units and was developed to enhance their operation. The (optional) freeze protection will prevent unit operation below 35°F (1.7°C) leaving fluid temperature. The condensate overflow option prevents unit operation in the event the drain pan clogs and there is a potential for condensate overflow. Each controller has a random start feature programmed into its microprocessor ranging from 270 - 300 seconds preventing the simultaneous starting of multiple units. An anti-short cycle timer allows a 5 minute delay on break timer to prevent compressor short cycling. A low pressure bypass timer switch prevents nuisance lockouts during cold start up. The high pressure switch delay of one (1) second provides switch stabilization on start up to prevent nuisance lockouts.

The Unit Protection Modules monitor the operating condition of the unit by providing:

- A Brownout / Surge / Power Interruption Protection - This allows for the water pumps to restart and establish water flow to prevent nuisance lockouts during brief power interruptions.
- Malfunction Output - The controller has a set of 24 volt contacts for remote fault indication.
- Test / Service pin - A jumper is provided to reduce all time delay settings to 6 seconds during troubleshooting or operation verification.
- L.E.D. Indicators
- Intelligent Reset
DDC Controls
The FHP factory mounted DDC Controller is preprogrammed and installed in the unit to be jobsite ready to run. The Unit will operate in a 100% stand-alone control mode or connect to a Building Automation System (BAS) using open protocols BACnet, Modbus, N2 or LonWorks. Zone temperatures, leaving air temperatures and water temperatures can be monitored from the central control computer and unit fault indication displayed. An attractive wall sensor is available in three configurations. A Back view hand held diagnostic tool is available to allow local access to display and modify user defined properties without any computer software.

Hot Gas Bypass
The Hot Gas Bypass (HGB) option is designed to allow for applications where there can be a wide variation in the load. As the entering air temperature decreases, so does the temperature and pressure of the refrigerant. It is possible that as the evaporating temperature falls ice can form on the coil. The build up of ice can lead to the eventual failure of the compressor. Hot gas bypass routes some of the hot discharge gas from the compressor directly to the evaporator, bypassing the condenser. This helps in preventing excessive compressor cycling and allows the unit to more closely match the system capacity.

Hot Gas Reheat - Dehumidification
Hot Gas Reheat (HGR) is an available option on all FHP units. This option allows the user to not only control space temperature, but also space humidity levels. An excess of moisture in the space can allow mold growth, leading to damage to the structure or interior surfaces, as well as reducing the air quality and creating an unhealthy environment. By utilizing a humidistat the unit is able to monitor the humidity levels in the space. The HGR option allows cooling and dehumidification to satisfy both the thermostat and humidistat. Once the thermostat reaches set point and the humidity is above set point the unit will cool and dehumidify the air. It is then reheated by hot refrigerant gas and delivered to the space at around room temperature. The unit is operating as a dehumidifier. This option offers significant energy savings over the traditional means of reheating air with electric heating coils.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Voltage</th>
<th>MC Series</th>
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<tbody>
<tr>
<td>MC 360</td>
<td>208-230/3/60</td>
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<tr>
<td>MC 480</td>
<td>208-230/3/60</td>
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<tr>
<td>MC 600</td>
<td>208-230/3/60</td>
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</tr>
<tr>
<td>MC 720</td>
<td>208-230/3/60</td>
<td>460/3/60</td>
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MC Design
The MC Series is available in two different configurations.

VH Configuration
The VH design concept is to provide a unit that will facilitate on site handling and can be installed in locations difficult to access. All units can be broken down into separate modules that can pass through a 36” wide standard door or service elevator. The 30 ton module can be easily broken down into three separate modules—the fan module, main heating/cooling module and the economizer/filter bank. The 40 through 60 ton units can be broken into 6 separate modules, two each as previously mentioned. Very few competitive equipment manufacturers have this capability.

VL Configuration
The VL is designed for those applications where there is a restriction in the height of the unit. In this model, the blower is dropped into the main coil section reducing the unit’s overall height and increasing unit depth. MC360 can be split into two sections, the main refrigeration and blower section and the filter/economizer section. Unit sizes MC480 through MC720 can be split into four sections for transportation and access into the plant room.
For further information on the MC Series, please contact your FHP representative.

### ARI / ISO 13256-1 PERFORMANCE DATA

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<th>MODEL</th>
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<td>Ground Loop (GLHP)</td>
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Vertical
Horizontal
MC Horizontal 1

REAR VIEW

LEFT SIDE VIEW

TOP VIEW
MC Horizontal 2

**REAR VIEW**

**LEFT SIDE VIEW**

**TOP VIEW**