

THE SMART SOLUTION FOR ENERGY EFFICIENCY
ENGINEERING DESIGN GUIDE:
GENESIS LARGE WATER-TO-WATER (GLW) SERIES
30 TON WATER-TO-WATER UNITS

The Smart Choice for Energy Efficiency

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ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

COMMERCIAL HVAC

The ever-changing environment of commercial construction offers exciting breakthroughs in technology and materials, but it is not without some heartburn. Today, owners, architects, and contractors face many challenges in the design and construction of their projects. Challenges such as usable space, indoor air quality, energy efficiency, maintenance costs, building longevity, and the LEED® program all come to the forefront of the design process. When considering the solutions to these challenges, the type of HVAC system chosen directly affects each one.

USABLE SPACE

It has been said that the reason real estate grows in value is because no one is making any more. As cities continue to grow and spread out, the value of maximizing usable space becomes increasingly important. When selecting an HVAC system, you positively or negatively impact the usable space on a project. As an example, VAV (Variable Air Volume) systems utilize complicated ductwork systems along with extensive equipment rooms to deliver conditioned air into the building space. Additionally, VAV duct systems many times require more ceiling height which increases floor-to-floor space thus increasing building costs. By comparison, ClimateMaster Water-Source and Geothermal Heat Pump systems require little to no equipment room space and use a very simple, compact, and independent ductwork system.



INDOOR AIR QUALITY

As important as the actual temperature of a building space is, the quality of air within that space is equally important. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) has implemented Standard 62, which requires significantly higher amounts of fresh outdoor air for buildings. The challenge now becomes how to properly introduce, condition, and deliver this fresh air into the building space. Traditional options like two- and four-pipe Fan Coil systems must be up-sized significantly to handle the additional conditioning load. This means larger, more expensive units, larger, more expensive piping, and larger more expensive boilers and chillers. In comparison, ClimateMaster systems offer a variety of options that can actually lower the overall system size, introduce 100% outdoor air, and lower system usage cost.

ENERGY EFFICIENCY

Today's offices equipped with computers, copiers and other office tools can dramatically affect the heating and cooling load of a given space. When considering heating and cooling loads, rising energy costs demand an HVAC system that is efficient while building designs require a system that is also flexible. ClimateMaster has a solution for practically any application, and does so with some of the most energy efficient HVAC systems available on the market today. In fact, all of ClimateMaster's products either meet or exceed the new federal mandated efficiency minimums.

MAINTENANCE COSTS

Complex systems such as two- and four-pipe fan coils and VAV systems require advanced maintenance and the trained personnel to perform it. Large equipment rooms filled with chillers, air handlers, or large-scale boilers require personnel for monitoring and maintenance, which consume building space and leasing profits. The effect to the bottom line becomes significant when considering the potential of a complete system failure along with costly parts and equipment replacement. However, Water-Source and Geothermal Heat Pumps require very little monitoring and maintenance - aside from routine filter changes. With factory installed DDC controls, the entire building can be accessed via any web-enabled computer for monitoring and set point control. No muss, no fuss, no worries.

BUILDING LONGEVITY

New innovations offer longer life expectancies for today's buildings. You should expect the same from the HVAC systems being placed inside these buildings. However, when it comes to longevity, not all systems are created equal. Complex chillers and air handling systems often have a large number of moving parts that will wear out over time. Water-Source and Geothermal Heat Pumps offer the advantage of very few moving parts. Fewer moving parts lower the occurrence of parts replacement and extend equipment life. This simplicity of design allows ClimateMaster systems to provide average life spans of 20 years or more. In fact, there are a number of ClimateMaster units that are still performing after 50 years - providing the continual comfort our customers have come to expect.



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MANY CHOICES, ONE SOLUTION

When choosing a HVAC system for a project, there are four basic types from which to choose.

FAN COILS

Fan coil systems are comprised of water-to-air coil air handlers connected via a two- or four-pipe insulated water loop. Fan coils require complex chillers and boilers to provide water loop fluid in a particular temperature range (i.e. chilled water for cooling and hot water for heating). Two-pipe fan coils have a major disadvantage as control is substantially limited to whatever mode the system is currently set at (i.e. cooling or heating). A four-pipe version can be installed that requires both chilled and heated water to be available at the same time. Four-pipe systems also require twice the piping and twice the circulation equipment of a two-pipe system, which makes a four-pipe system one of the most expensive systems to install.

VARIABLE AIR VOLUME (VAV)

Variable Air Volume, or VAV, is one of the most common types of HVAC systems used in large commercial buildings today. A typical system is usually comprised of a large air handler, central ductwork system, and a relatively large equipment room. Conditioned air is distributed throughout the building via a central ductwork system and is regulated via dampers in each space. VAV systems typically have a higher first cost than Water-Source Heat Pumps, and may have similar operating costs, resulting in overall increased life cycle costs.

ROOFTOP

Rooftop systems are similar to VAV systems in that they use a central ductwork system to distribute conditioned air into the building space. However, instead of one central unit, the system is comprised of multiple units which can be tasked for different conditioning requirements. Rooftop systems usually require additional structural reinforcement as well as cranes or other lifting equipment to place the units. Control in a particular zone is limited to what the system is currently set to (i.e. cooling or heating). Rooftop installation costs are low to moderate, but operating costs are typically 50% higher than Water-Source Heat Pumps. Additionally, the systems are exposed to the elements and are subject to damage and vandalism.

WATER-SOURCE AND GEOTHERMAL HEAT PUMPS

Water-Source and Geothermal Heat Pump systems are comprised of individual packaged units that transfer heat via a single- or two-pipe water loop. Each unit can be used in either heating or cooling mode year-round and loop temperature is maintained via a boiler/tower combination or earth-coupled loop. Each zone has complete control of its heating/cooling mode and each unit is independent from the others. This means if one unit goes down, the whole system is not affected. Controls can be as simple as one unit, one thermostat. Water-Source and Geothermal Heat Pump systems are the most energy, cost, and space efficient of any system in the industry.

SYSTEM COMPARISON

System	Ease of Design	Ease of Installation	Installation Space	Installation Cost	Maintenance Requirements	Maintenance Costs	Future System Expansion	Sound Levels	Operating Costs	Total Zone Failure Chance	Individual Tenant Control	Options	Additional Auxiliary Equipment Needed	Structure Modification Needs	System Longevity
Two-Pipe Fan Coils	Low	Low	High	Med	High	High	Low	Low	Med	High	Low	Low	High	High	Med
Four-Pipe Fan Coils	Low	Low	High	High	High	High	Low	Low	High	High	Low	Low	High	High	Med
PTAC / PTHP	Low	Low	Low	Low	High	High	Med	High	High	Low	Med	Low	Med	High	Low
VAV	Low	Low	High	Med	High	High	Low	Med	Med	High	Low	Low	High	High	Med
Rooftop	Low	Low	High	Low	Med	High	Low	Med	Med	High	Low	Low	Med	High	Med
Water-source Heat Pumps	High	High	Low	Low	Low	Low	High	Low	Low	Low	High	High	Low	Low	High
Geothermal Heat Pumps	High	High	Low	Low	Low	Low	High	Low	Low	Low	High	High	Low	Low	High

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

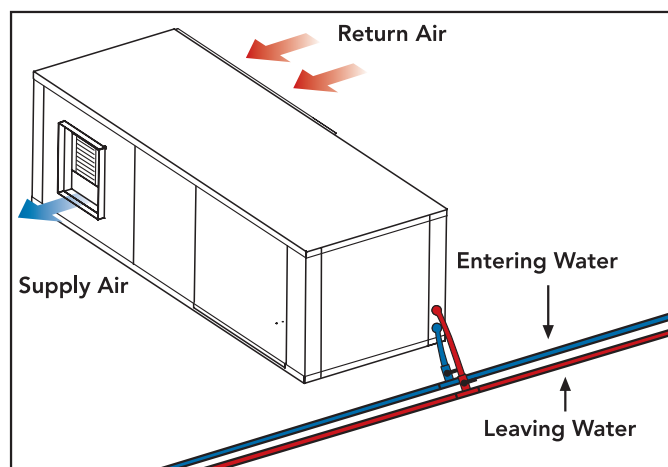
WATER-SOURCE HEAT PUMPS

As the most energy efficient HVAC systems on the market, Water-Source Heat Pumps are uniquely simple in design. Heat is moved through an interconnected water loop and either rejected through a cooling tower, or put to work in other areas. Each unit is an independent, packaged system, eliminating the chance of a total system failure. If one unit goes down, the other units are not affected. Conveniently located above the ceiling or in a closet, units can be easily accessed.

SYSTEM MODES

Water-Source Heat Pump systems can operate in one of four modes depending on the space conditioning requirements. The versatility of operation allows Water-Source Heat Pumps to show their full potential as a solution for customized comfort and flexibility.

COOLING MODE

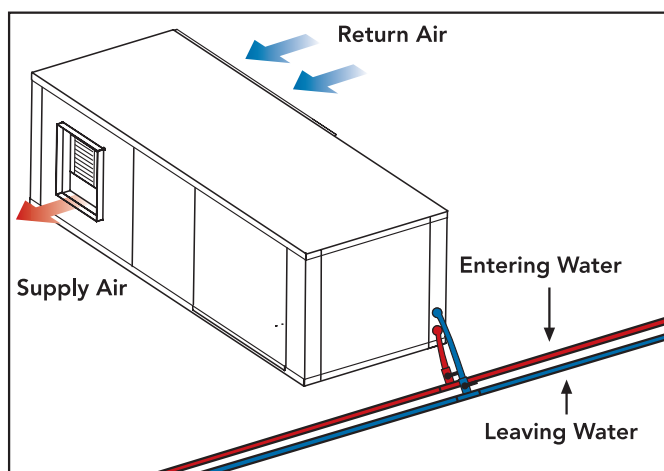


The system extracts heat from the air and rejects it into the water loop through the coaxial refrigerant-to-water heat exchanger. This heat can either be moved to a different part of the building to satisfy a heating mode requirement, or be rejected out of the building via a cooling tower.

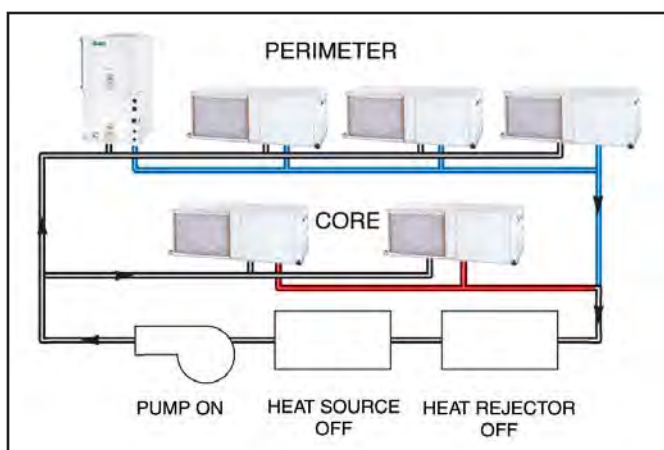
HEATING MODE

The system extracts heat from the water loop through the coaxial heat exchanger and compresses it to a higher temperature. This heat is then transferred into the air through the air coil and used to condition the building space. A nominally sized boiler is often used

to maintain a constant temperature of 60 to 70°F in the water loop during high heating demand months. Within this temperature range, the units can operate in either heating or cooling mode.



BALANCED MODE



A mixture of units in heating mode and units in cooling mode create a constant temperature in the water loop. In Balanced Mode, there is no need for heat injection or rejection via the boiler or cooling tower. The heat is simply moved from one zone to another.

DEHUMIDIFICATION MODE

The system, using a multi-speed blower and separate humidistat, slows the air movement across the air-coil to extract moisture and provide a more comfortable space. An additional reheat coil is available on select products for those climates where high humidity is a problem.

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GEOHERMAL SYSTEMS

These “Boilerless/Towerless” Heat Pump systems use the natural thermal properties of the Earth to dissipate or capture heat for the water loop. Geothermal Heat Pumps operate in an identical fashion to Water-Source Heat Pump units. However, without the need for a boiler or cooling tower, they save substantial energy costs and space. The water loop system is underground and the units are inside the building. Thus, the environmentally friendly geothermal system preserves the architectural design of a building naturally.

GEOHERMAL EARTH LOOPS

Geothermal Earth Loops come in several different configurations depending on space availability and soil properties. Chances are at some point you have either stood over, or walked across a geothermal loop field. Loop fields can be located under parking lots, landscaped areas, or any number of other locations. All earth loops use high-density polyethylene pipe to circulate either water or an antifreeze mixture. All joints and connection fittings are thermally fused to prevent leaks and most piping comes with a 25-year or longer warranty.

VERTICAL LOOPS

Vertical loops utilize bore holes drilled to an average depth of 250 feet. Once the loop pipe is inserted into the bore, it is grouted using a Bentonite mixture for maximum thermal conductivity. When space is a limited, vertical loops are the most common type of geothermal loop installed.



HORIZONTAL LOOPS

Horizontal loops utilize trenches dug to an average depth of four to six feet. As one of the more cost effective loops to install, horizontal loops are commonly found in open fields, parks or under parking lots.



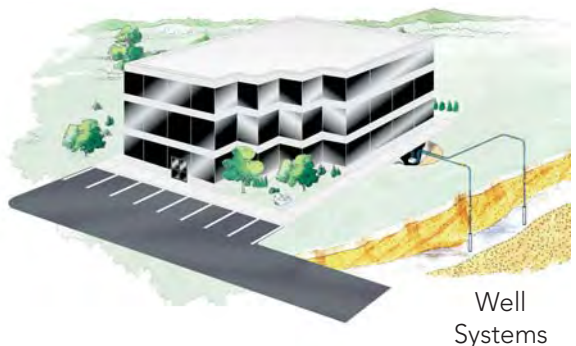
LAKE LOOPS

Lake loops utilize a “slinky” assembly of geothermal loop piping placed at the bottom of a pond, lake, or other large body of water. An extremely cost effective loop system, lake loops are an easy alternative if the option is available.



WELL SYSTEMS

Most commonly known as “Open Loop”, well systems pump water out of a nearby body of water or water well, and then discharge the water into another body of water or water well. Well systems usually employ a plate heat exchanger inside the building to keep the building water loop separated from the well water. This prevents any contaminants from affecting unit performance and extends system life. Well systems are often the most efficient as the well water is always at the same temperature year-round.



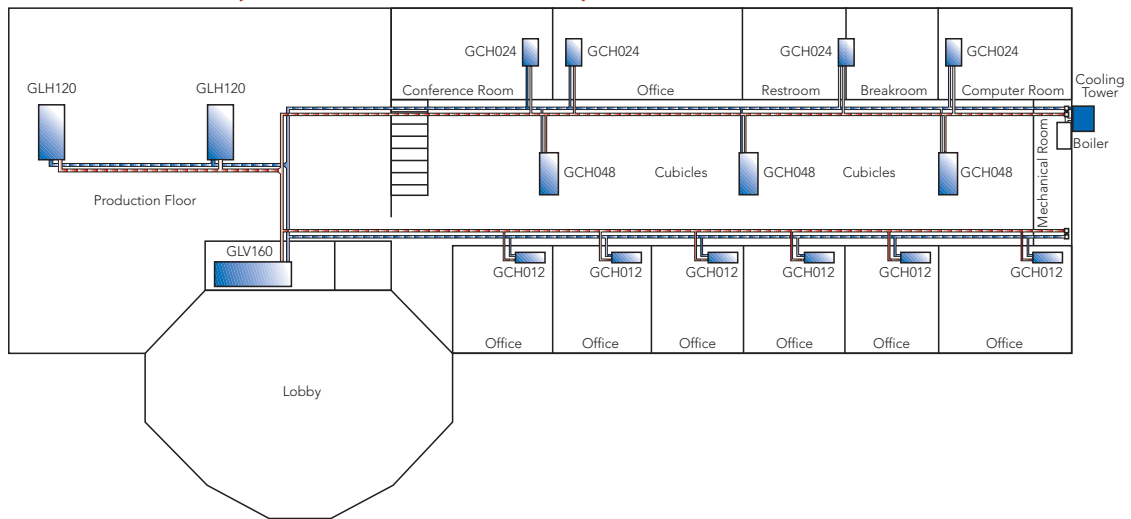
ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

A WATER-SOURCE EXAMPLE

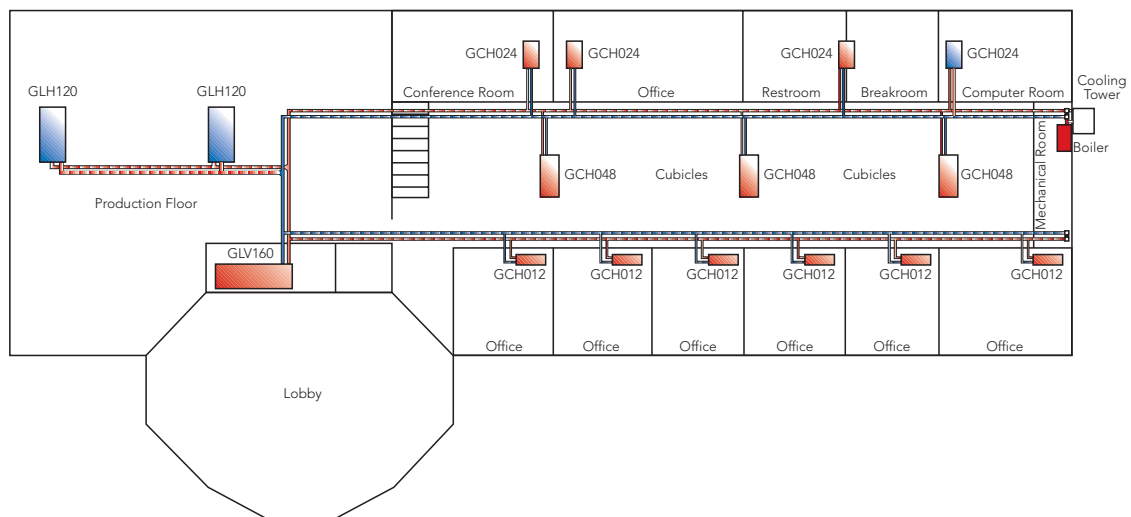
As an example of how Water-source Heat Pumps can handle a variety of different applications, the building shown to the right is a fictional bronze statue foundry company in the midwest portion of the United States. The first floor comprises their production floor and office space. The second floor of the building is reserved for future use. The cooling tower and boiler work as needed to maintain an average loop temperature between 60 to 95°F. Water-source Heat Pumps can efficiently operate in either heating, or cooling mode under these conditions. This gives individual and specialized zone control for maximum comfort and the ability to change operation modes as needed.

A mixture of units in heating mode and units in cooling mode create a constant temperature in the water loop. In Balanced Mode, there is no need for heat injection or rejection via the boiler or cooling tower. The heat is simply moved from one zone to another.

WARM WEATHER (HIGH COOLING DEMAND)



COOL WEATHER (HIGH HEATING DEMAND)

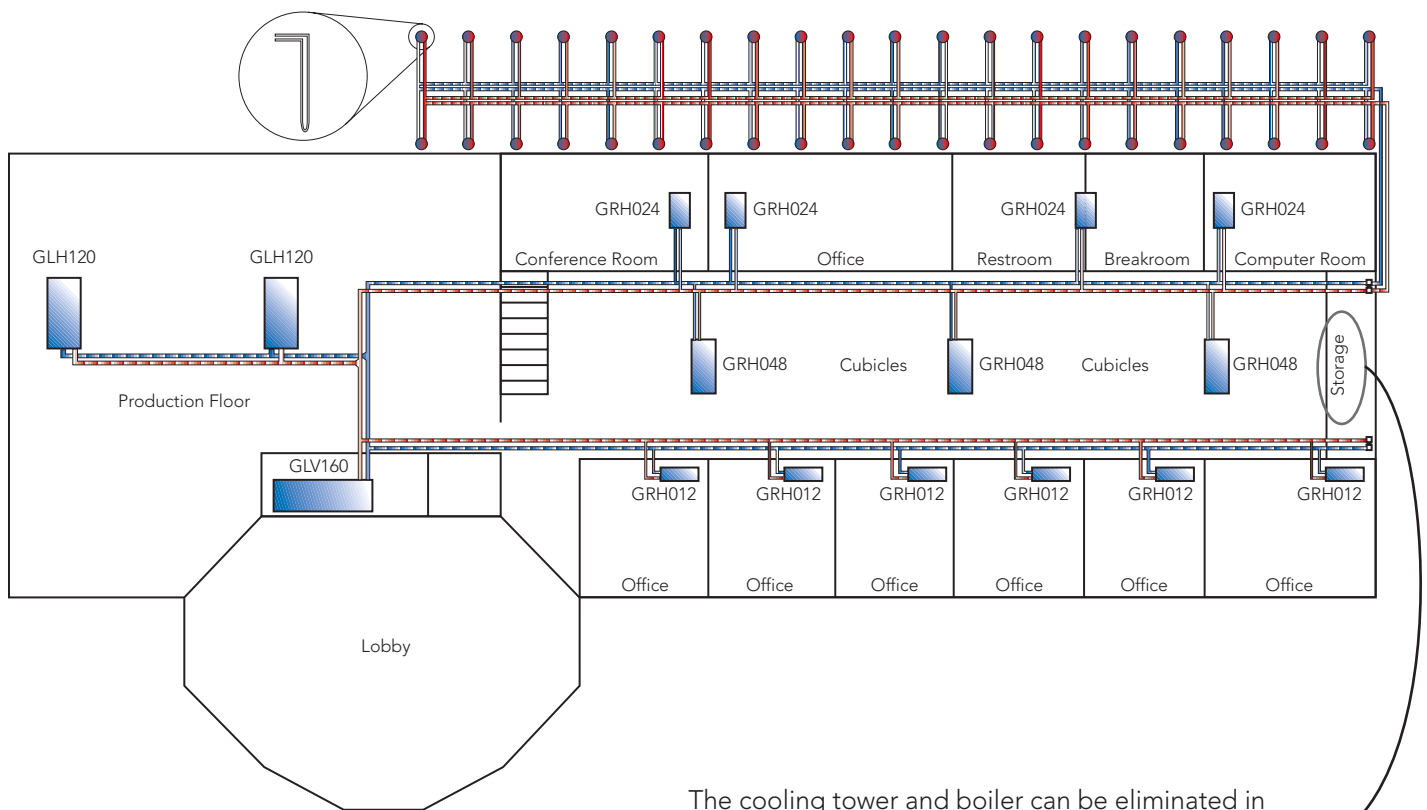


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A GEOTHERMAL EXAMPLE

Using the same building model, the cooling tower and boiler are replaced with a geothermal vertical loop field. Identical in overall zone operation, the building benefits by having less overall equipment and reduced operation costs. Building aesthetics are also improved by eliminating outdoor equipment and additional space is gained by eliminating the boiler and additional support equipment.

WARM WEATHER (HIGH COOLING DEMAND)



The cooling tower and boiler can be eliminated in the geothermal application freeing up space used for equipment for other use. Only a small amount of room is needed for loop circulation equipment.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

THE CLIMATEMASTER ADVANTAGE

WHO IS CLIMATEMASTER?

Who is ClimateMaster? ClimateMaster emerged from the marriage of several Water-Source heat pump companies in a blending of strengths to form a focused organization. For over 50 years, we have been focused on enhancing business and home environments around the world. Our mission as the world's largest and most progressive leader in the Water-Source and geothermal heat pump industry reveals our commitment to excellence - not only in the design and manufacture of our products, but in our people and services.

CLIMATEMASTER DESIGN

From concept to product, ClimateMaster's Integrated Product Development Team brings a fusion of knowledge and creativity that is unmatched in the industry today. Drawing from every aspect of our business: Engineering, Sales, Marketing, and Manufacturing, our Development Team has created some of the most advanced, efficient, and versatile products available.



INNOVATION, CONCEPT, NEEDS

Great products are born from necessity. Whether it is a need to reduce sound, fit in a smaller space, make easier to service, achieve better efficiencies, or due to changing technologies, or new government regulations, ClimateMaster leads the industry in advancing the form, fit and function of Water-Source and geothermal heat pumps. Our Design Team continually strives for even the slightest improvement to our products. It is this continual drive for excellence that sets ClimateMaster apart from all other manufacturers.

START TO FINISH

At ClimateMaster, every product development project begins with a comprehensive set of specifications. These specifications are a culmination of input from the market, a specific need, or a number of other factors. From these detailed specifications, prototypes are constructed and testing begins. After a rigorous testing period in ClimateMaster's own state-of-the-art lab facility, the data is compared to the project specifications. Once the Design Team is satisfied that all of the specs are met, the unit is sent to the production department for pilot runs. After the

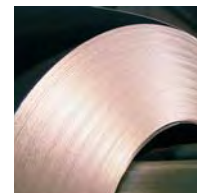
pilot runs are completed, unit literature is finalized and the product is released to the marketplace. Every unit we produce follows this strict and sequenced path insuring no stone is left unturned, and no detail is missed.

CLIMATEMASTER PRODUCTION

Innovative products demand innovative manufacturing processes. ClimateMaster's integrated production process combines every aspect of the manufacturing of our equipment into an organized, balanced, and controlled whole.

FABRICATION

Every sheet-metal component of a ClimateMaster unit is produced in our fabrication department. Panels are precisely constructed of galvanized or stainless steel using computerized cutting, punching, and forming equipment. This precise fabrication means a tighter fit that makes for a more solid unit and reduced vibration, which equals reduced noise. On certain series, an optional epoxy powder coating is then applied to increase corrosion resistance and enhance the look of the unit. The final step is the addition of fiberglass insulation to the inside as an additional layer of sound deadening. This insulation meets stringent NFPA regulations, and includes antibacterial material.



ASSEMBLY

ClimateMaster's 250,000 square foot production facility produces over 50,000 units per year using the most stringent quality control standards in the industry. Each unit is assembled under the close supervision of our Integrated Process Control System or ECI. This multi-million dollar computer system watches each unit as it comes down the assembly line. To back up the ECI system, our Quality department is stationed on each line and performs random audits not only on the units, but also on component parts. All component parts must pass each and every quality checkpoint before a unit is packaged and shipped. These systems and processes are maximized due to the comprehensive and ongoing training every employee receives from the date they are hired.



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COMPONENT PARTS

To produce a quality unit, you have to start with quality components. ClimateMaster's purchasing department is relentless in its search for the best components for our products - while securing these components at prices that keep costs low. Any new component must go through a grueling testing phase before it ever sees the production line. Working closely with vendors and their engineers, we continually find new ways to not only improve our units, but to ensure component quality as well. Sister companies like KOAX, who produce our coaxial heat exchangers, allow ClimateMaster to provide components specifically designed for our applications



CLIMATEMASTER CERTIFICATION

ClimateMaster leads the industry in product awards and certifications. From 100% Air-Conditioning and Refrigeration Institute (ARI) performance ratings to industry awards for innovation, ClimateMaster applies cutting-edge technology to every product we design and manufacture.



ClimateMaster's new Tranquility 27™ series has won multiple awards and is taking the industry by storm. Hot off the heels of winning The News Bronze Dealer Design Award, the Tranquility 27™ won Best of Show at ComforTech in September 2004. You know you are doing great things when a lot of people tell you so.

ENGINEERING LAB FACILITIES

ClimateMaster has one of the largest testing facilities of any Water-Source heat pump manufacturer. Innovation and product improvements are a mainstay of the ClimateMaster Engineering Lab. Our people are what make the difference in the development of superior products in a timely manner. Our certified facility has six automated test cells capable of testing a wide variety of unit types under varying conditions. These cells are capable of producing data twenty-four hours a day, seven days a week. The development time of equipment is significantly reduced allowing ClimateMaster Engineers and Lab Technicians to spend more time on the actual development process. This team effort has

allowed us to maintain a high degree of competence in our industry. Our test cells and test equipment are calibrated and certified periodically, per recognized industry standards, to insure the data is accurate and repeatable. In addition to testing new concept units, the lab continually audits production units throughout the year to insure quality performance and reliability.

INDUSTRY AFFILIATIONS AND ASSOCIATIONS

ClimateMaster works closely with the International Standards Organization (ISO), the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), the Canadian Standards Association (CSA-US), the Electrical Testing Laboratories (ETL), and Conformité Européene (CE) to insure that our equipment not only meets the highest performance standards, but meets the highest industry standards as well. In a recent milestone, **ClimateMaster celebrated three consecutive years of 100% success rate in ARI's performance certification program.** An uncommon feat in the industry, this award is a testament to the craftsmanship, design, and construction of every ClimateMaster unit.



CUSTOMER SERVICE

ClimateMaster has gone to great lengths to meet our customers' business-to-business needs. ClimateMaster provides great products and our customer support is second to none. Our highly trained and experienced Customer Service department is available to assist you. Visit our on-line Business Center or contact Tech Services for any information you may need.

WWW.CLIMATEMASTER.COM

Our web site has become the central hub for all of our customers' information needs. Current literature, specifications, presentations, and other resources are readily available in an intuitive, easy-to-navigate format. At the click of a mouse, our new on-line Business Center allows you to check the status of your orders, lookup sales history, manage contact information, and even order literature, accessories, and units. Combined with our unique EZ-ORDER and EZ-SEND software, we take all the effort and guesswork out of unit orders.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

ENGINEERING DESIGN SPECIFICATIONS

Advanced units need advanced specifications. ClimateMaster's new Engineering Design specifications provide the most detailed information for your next project.

LITERATURE

At ClimateMaster, Innovation never sleeps. As new advances are made, and new products are released, the need for accurate literature becomes critical. Every piece of technical literature that ClimateMaster produces is printed in our state-of-the-art on-demand printing facility. What this means is that we print only the literature we need at the time we need it. This insures that only the most current and accurate data is in the field.

SHIPPING

When you need that critical service part or piece of literature for your next presentation, you may rest assured that ClimateMaster has a shipping option for you. Networked with a variety of carriers such as FedEx, Watkins, Estes, Central Freight, Dugan, and many others, we provide fast and reliable shipping to anywhere in the world.

THE FUTURE OF CLIMATEMASTER

Our long history of innovation has paved the way for future endeavors with a solid platform of success. Growing markets in Europe and Asia demand a different way of not only manufacturing our products, but also successfully marketing them. New government regulations will phase out R-22 refrigerant at the beginning of 2010 paving the way for new R-410a, a much more environmentally friendly refrigerant. Additionally, new federally mandated efficiency increases of 30% becomes effective in January of 2006. In looking ahead, we continually strive for better processes, better designs, and better innovations that will keep ClimateMaster as the Global Leader in Water-Source and Geothermal Heat Pumps.

ADVANTAGE EXCLUSIVES

Being a leader in innovation, ClimateMaster brings industry firsts, as well as industry exclusives, to our family of products.

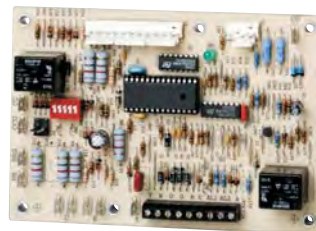
CONTROLS

ClimateMaster offers two levels of solid-state digital controls; the CXM and DXM control board.

CXM

Our standard CXM control board comes programmed with ClimateMaster's Unit Performance Sentinel (UPS) which monitors unit performance and notifies the owner of potential unit problems before a lockout occurs. Additionally, the CXM's eight standard safeties protect the unit from damage.

- Anti-Short Cycle
- Low Voltage
- High Voltage
- High Refrigerant Pressure
- Low Refrigerant Pressure (Loss of Charge)
- Air Coil Freeze (Excluding GC Series)
- Water Coil Freeze
- Condensate Overflow



DXM

Our enhanced controls option, the DXM control board offers all of the advantages of the CXM board but adds the following additional features:

- Multi-Stage Operation
- Night Setback
- Emergency Override
- Reheat Control
- Boilerless Electric Heat



DDC CONTROLS

Factory mounted LONWorks or Multi-ProtoCol (MPC) DDC controllers are an available option on all ClimateMaster products. These controllers give owners the ability to implement a variety of building automation systems such as BACnet, ModBus, and Johnson N2. Through a web enabled PC, individual units, unit zones, and entire building systems can be monitored and controlled with the click of a mouse. The systems provide unit status, set-point control, performance curves, and fault indications.



CONFIGURATIONS

No other manufacturer provides as many size,

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performance, configuration, and cost options as the ClimateMaster family of products offers. From our smallest horizontal unit in the GCH006, to our largest vertical in the GLV300, to our Rooftop series with available 100% make-up air (when mated with the Rx ERV), to the console, water-to-water, and two-stage Tranquility 27™, we have a unit to fit your application.

SOUND

Prior to the recently adopted sound standard ARI 260-2000 there had been no standard for the evaluation of Water-Source heat pump sound performance. Also, those manufacturers who did generate and publish their own sound data, did so in their own labs making it difficult to have the data independently certified and accurate comparisons were therefore, impossible. Now that a standard has been established, it is critical to compare the data correctly. If data from two manufacturers is compared using different test procedures, results are not comparable. ClimateMaster has tested its product line for both ducted discharge and free inlet air combined with case radiated tests. Comfort has never been so quiet with our intelligent sound design. Our products use a variety of technologies to maintain our lead as the quietest units in the industry.

DUAL LEVEL VIBRATION ISOLATION

ClimateMaster units use an exclusive double isolation compressor mounting system. This dual level isolation deadens vibration and provides quiet operation.



TORSION-FLEX BLOWERS

Blower motors, on select models, are mounted with a unique torsion-flex mounting system which not only allows for easy service, but also reduces vibration from the blower motor during operation.



ULTRAQUIET

ClimateMaster's optional additional sound suppression package enhances our already excellent sound performance through the use of dual density acoustical insulation and other strategically placed sound attenuating materials. No other manufacturer's mute package comes close to matching the performance of the UltraQuiet package.

E-COATED AIR COILS

All ClimateMaster Water-Source heating and cooling systems (excluding the RE series rooftop) are available with an E-Coated air-coil option. This process provides years of protection against coil corrosion from airborne chemicals resulting from modern building material outgassing and most airborne environmental chemicals. In fact, ClimateMaster's exclusive E-Coated air-coils enhance corrosion protection to nearly 20 times that of a traditional uncoated coil.*



* Test based upon ASTM B117 Salt Spray test hours.

CLIMADRY REHEAT

Continuing to lead the industry in IAQ (Indoor Air Quality) solutions, select ClimateMaster units are available with an innovative method (patent pending) of reheating the air. The ClimaDry microprocessor-controlled option will automatically provide 100% reheat by adjusting the amount of reheat capacity based upon supply air temperature. This new approach to reheat provides dehumidified, neutral temperature supply air, while eliminating the problem of overcooling the space when loop temperatures drop. All components are internal to the unit, saving space and keeping installation costs low. A simple humidistat or DDC controls activates the option.

VOLTAGES

ClimateMaster units are available in a wide variety of commercial voltages, providing maximum flexibility in building design. Available voltages are as follows:

- 208-230/60/1
- 208-230/60/3
- 265/60/1
- 460/60/3
- 575/60/3
- 220-240/50/1
- 380-420/50/3

* Not all units are available with every voltage combination shown above.

ACCESSORIES

ClimateMaster offers a complete line of accessories to complete any project, including hoses, thermostats, valves, pumps, fittings, controllers, sensors, filters and more.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

THE GENESIS LARGE WATER-TO-WATER (GLW) SERIES

The GLW water-to-water series offers high efficiency and high capacity with advanced features, quiet operation and application flexibility at competitive prices. As ClimateMaster's largest water-to-water unit, the GLW series can be used for radiant floor heating, snow/ice melt, chilled water for fan coils, industrial process control, potable hot water generation, hot/chilled water for make-up air, and many other types of HVAC and industrial applications that require cost effective heated or chilled water.

Available in 30 ton capacity (106 kW), the GLW series provides high capacity in a small footprint, which saves mechanical room space. The GLW has an extended range refrigerant circuit (refrigerant and water circuit insulation is standard), capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Standard features are many. Microprocessor controls, G90 galvanized steel cabinet, epoxy powder coat paint and TXV refrigerant metering device are just some of the features of the flexible GLW series. The brazed plate heat exchangers with stainless steel plates are designed for many years of reliable operation.

ClimateMaster's heavy gauge steel cabinet helps make the GLW series the quietest large capacity water-to-water unit on the market. Two 15-ton scroll compressors operate quietly, and provide part load operation for capacity control. Options such as DDC controls and UltraQuiet™ sound attenuation package allow customized design solutions.

The GLW Series water-to-water heat pumps are designed to meet the challenges of today's HVAC demands with a high efficiency, high value solution.

UNIT FEATURES

- Size 360 (30 ton, 106 kW)
- Two 15-ton Copeland scroll compressors
- Dual independent refrigeration circuits
- Exceeds ASHRAE 90.1 efficiencies
- Heavy gauge G90 galvanized steel construction with epoxy powder coat paint
- Insulated compressor compartment
- Small footprint
- Compressor access from the front of the unit
- TXV metering devices
- Extended range (20 to 110°F, -6.7 to 43.3°C) operation
- Microprocessor controls standard (optional DXM and/or DDC controls)
- LonWorks, BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Compressor "run" and "fault" lights on the front of the cabinet
- Seven Safeties Standard
- Options include UltraQuiet™ sound attenuation package

The Smart Choice for Energy Efficiency



Copeland scroll compressors



Extended range insulated water/ refrigerant circuit standard (shown with optional UltraQuiet sound package)



Advanced digital controls with Remote Service Sentinel and compressor "run" and "fault" LED. Optional Enhanced controls (DXM) & DDC Controllers

Easy service access from three sides



Dual compressor refrigeration circuit

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

ARI/ISO/ASHRAE 13256-2 Data

ASHRAE/ARI/ISO 13256-2. English (IP) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling		Heating		Cooling		Heating		Cooling		Heating	
	Indoor 53.6°F Outdoor 86°F		Indoor 104°F Outdoor 68°F		Indoor 53.6°F Outdoor 59°F		Indoor 104°F Outdoor 50°F		Indoor 53.6°F Outdoor 77°F		Indoor 104°F Outdoor 32°F	
	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
GLW360	283,000	12.4	424,000	4.4	310,000	17.2	342,000	3.7	293,000	13.9	270,000	3.0

All ratings based upon 208V operation
Indoor coil also called "Load" and outdoor coil also called "Source"

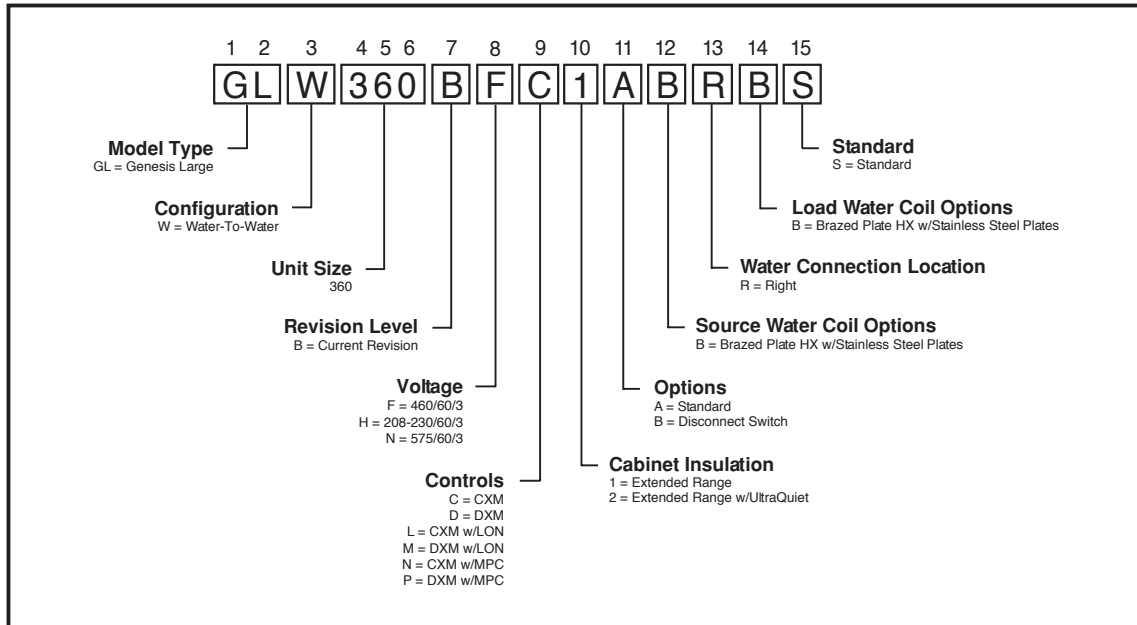
ASHRAE/ARI/ISO 13256-2. Metric (SI) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling		Heating		Cooling		Heating		Cooling		Heating	
	Indoor 12°C Outdoor 30°C		Indoor 40°C Outdoor 20°C		Indoor 12°C Outdoor 15°C		Indoor 40°C Outdoor 10°C		Indoor 12°C Outdoor 25°C		Indoor 40°C Outdoor 0°C	
	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP
GLW360	82,943	3.6	124,267	4.4	90,858	5.0	100,234	3.7	85,873	4.1	79,132	3.0

All ratings based upon 208V operation
Indoor coil also called "Load" and outdoor coil also called "Source"

The Smart Choice for Energy Efficiency

Model Nomenclature



Rev.: 10/04/05D

Reference Calculations

Heating

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Cooling

$$LWT = EWT + \frac{HR}{GPM \times 500}$$

Legend and Glossary of Abbreviations

BTUH = BTU(British Thermal Unit) per hour
 COP = coefficient of performance = BTUH output/BTUH input
 EER = energy efficiency ratio = BTUH output/Watt input
 EWT = entering water temperature
 GPM = water flow in U.S. gallons/minute
 HE = total heat of extraction, BTUH
 HC = heating capacity, BTUH
 HR = total heat of rejection, BTUH
 HWC = hot water generator (desuperheater) capacity, Mbtuh

KW = total power unit input, kilowatts
 LOAD = heat exchanger used as evaporator in cooling, condenser in heating
 LWT = leaving water temperature, °F
 MBTUH = 1000 BTU per hour
 SOURCE = heat exchanger used as condenser in cooling, evaporator in heating
 TC = total cooling capacity, BTUH
 WPD = waterside pressure drop (psi & ft. of hd.)

Conversion Table - to convert inch-pound (English) to SI (Metric)

Water Flow	Water Pressure Drop
Water Flow (L/s) = gpm x 0.0631	PD (kPa) = PD (ft of hd) x 2.99

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

Unit Model Number Designation
GLW = Genesis Large Water-to-Water Heat Pump

Capacity Table Index
GLW360 - See Page 17-18.

Glossary of Terms
See Page 15.

Selection Procedure

Step 1: Determine the actual heating and/or cooling loads at the applicable source (building loop) water temperature/flow rate and load water temperature/flow rate. The source heat exchanger is the condenser in cooling/evaporator in heating; the load heat exchanger is the evaporator in cooling/condenser in heating.

Step 2: Obtain the following design parameters: Entering source/load water temperature, source/load water flow rate in GPM and water flow pressure drop. Water flow rate is generally between 2.25 and 3.00 GPM/ton for closed loop (boiler/tower and geothermal) systems, and between 1.5 and 2.0 GPM/ton for open loop (well water) systems. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. Go to the appropriate tables and find the proper indicated water flow and water temperature.

Step 3: Determine application requirements. Water-to-water applications are almost always designed for a particular installation, which will change how the data tables are used for unit selection. For example, a water-to-water unit used for radiant floor heating on a geothermal closed loop is significantly different in unit selection from a water-to-water unit on a boiler/tower application used for generating chilled water for fan coil units. It is especially important to note that the load water flow rate must be maintained above minimum flow rates as shown in the data tables for proper refrigerant circuit operation and unit longevity. For example, most radiant floor applications require buffer (storage) tanks because the flow rate through the floor is usually lower than the minimum flow rate for the water-to-water unit. Therefore, selection of the heat pump is dependent upon maintaining a certain tank temperature and unit load flow rate. There would be a pump between the heat pump and the buffer tank, and a pump(s) between the buffer tank and radiant floor to maintain design flow rate on both sides.

Step 4: Enter tables at the design source water temperature and flow rate. Choose the appropriate load water temperature and flow rate. Read the total heating or cooling capacities (Note: interpolation is permissible; extrapolation is not).

Step 5: If the units selected are not within 10% of the load calculations, then review what effect changing the GPM and water temperature would have on the capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure.

Example Equipment Selection for Heating

Step 1 Load Determination:

Assume we have determined that the application will be heating only (radiant floor) for a large commercial warehouse, and that the appropriate heating load at design conditions is as follows:

Total heating..... 240,000 BTUH

Step 2 Design Conditions:

Entering source temperature 30°F (geothermal closed loop)
Source flow rate 67.5 GPM
Entering load temperature..... 100°F
Load flow rate 67.5 GPM

Steps 3, 4, 5 HP Selection:

We enter the tables at design source water temperature and flow rate, and select the appropriate load water temperature and flow rate. A GLW360 at design conditions supplies 251,000 BTUH, which meets the design heating load requirement.

The Smart Choice for Energy Efficiency

Performance Data GLW360 - Cooling

SOURCE				LOAD																								
EWT °F	Flow			EWT °F	Flow 45 gpm						Flow 67.5 gpm						Flow 90 gpm											
	GPM	WPD			TC MBtuh	Power kW	HR MBtuh	LWT °F	EER	WPD PSI	FT	TC MBtuh	Power kW	HR MBtuh	LWT °F	EER	WPD PSI	PSI	TC MBtuh	Power kW	HR MBtuh	LWT °F	EER	WPD PSI	PSI			
		PSI	FT																									
50	45	2.4	5.5	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	298	15.3	350	43.4	19.5	8.2	18.9	
				60	323	15.7	377	45.7	20.6	340			15.9	394	50.0	21.3	348	16.0			402	52.3	21.7					
				70	371	16.4	427	53.6	22.6	391			16.7	448	58.5	23.4	401	16.9			459	61.1	23.8					
				80	421	17.2	479	61.3	24.5	445			17.6	505	66.8	25.4	458	17.8			518	69.8	25.8					
				90	473	18.0	534	69.0	26.3	503			18.5	566	75.1	27.2	518	18.7			582	78.5	27.6					
	67.5	5.1	11.8	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	302	14.7	352	43.3	20.5	8.2	18.9	
				60	328	15.0	379	45.5	21.8	344			15.3	397	49.8	22.6	353	15.4			406	52.2	22.9					
				70	376	15.7	430	53.3	23.9	397			16.0	452	58.3	24.8	408	16.2			463	61.0	25.2					
				80	428	16.5	484	61.0	26.0	454			16.8	511	66.6	27.0	467	17.0			526	69.6	27.4					
				90	482	17.3	541	68.6	27.9	514			17.7	574	74.8	29.0	530	18.0			592	78.2	29.5					
	90	8.7	20.1	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	304	14.4	353	43.3	21.1	8.2	18.9	
				60	330	14.7	380	45.4	22.4	347			15.0	398	49.8	23.2	356	15.1			407	52.1	23.6					
				70	379	15.4	432	53.2	24.6	401			15.7	454	58.2	25.5	412	15.9			466	60.9	26.0					
				80	431	16.1	487	60.9	26.7	458			16.5	515	66.4	27.7	472	16.7			529	69.5	28.2					
				90	487	17.0	544	68.4	28.7	519			17.4	579	74.6	29.8	536	17.7			597	78.1	30.3					
	70	45	2.4	5.5	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	280	18.6	344	43.8	15.1	8.2	18.9
					60	305	18.9	370	46.5	16.1	319			19.1	384	50.6	16.7	326	19.2			392	52.8	16.9				
					70	349	19.6	416	54.5	17.8	367			19.8	434	59.2	18.5	375	20.0			444	61.7	18.8				
80					396	20.3	465	62.4	19.5	417	20.6			488	67.7	20.2	428	20.8	499			70.5	20.6					
90					445	21.1	517	70.2	21.1	471	21.5			544	76.1	21.9	484	21.7	558			79.2	22.3					
67.5		5.1	11.8	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	285	17.8	345	43.7	16.0	8.2	18.9	
				60	310	18.0	371	46.3	17.2	324			18.2	387	50.4	17.8	332	18.3			394	52.7	18.1					
				70	355	18.6	419	54.3	19.1	374			18.8	438	59.0	19.9	383	18.9			448	61.5	20.2					
				80	404	19.2	469	62.1	21.0	426			19.5	493	67.4	21.9	438	19.7			505	70.3	22.3					
				90	455	19.9	523	69.8	22.9	482			20.3	552	75.7	23.8	497	20.5			566	79.0	24.3					
90		8.7	20.1	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	287	17.3	346	43.7	16.5	8.2	18.9	
				60	312	17.6	372	46.2	17.7	327			17.8	388	50.3	18.4	335	17.9			396	52.6	18.7					
				70	358	18.1	420	54.1	19.8	377			18.3	440	58.9	20.6	387	18.5			450	61.4	21.0					
				80	408	18.7	471	61.9	21.8	431			19.0	496	67.3	22.7	443	19.1			508	70.2	23.1					
				90	459	19.3	526	69.6	23.7	488			19.7	555	75.5	24.7	503	19.9			571	78.8	25.2					
90		45	2.4	5.5	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	258	23.1	337	44.3	11.2	8.2	18.9
					60	283	23.5	363	47.5	12.1	295			23.6	376	51.3	12.5	301	23.7			382	53.3	12.7				
					70	324	24.1	407	55.6	13.5	339			24.3	422	60.0	13.9	347	24.5			430	62.3	14.2				
	80				368	24.8	453	63.7	14.8	386	25.1			472	68.6	15.4	395	25.3	482			71.2	15.6					
	90				414	25.6	502	71.6	16.2	436	26.0			525	77.1	16.8	448	26.2	537			80.1	17.1					
	67.5	5.1	11.8	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	263	22.0	338	44.2	12.0	8.2	18.9	
				60	289	22.3	365	47.2	13.0	301			22.4	378	51.1	13.4	307	22.5			384	53.2	13.7					
				70	331	22.8	409	55.3	14.5	347			23.0	425	59.7	15.1	355	23.1			434	62.1	15.4					
				80	377	23.4	456	63.3	16.1	396			23.6	477	68.3	16.8	406	23.7			487	71.0	17.1					
				90	425	24.0	506	71.1	17.7	448			24.3	531	76.7	18.4	460	24.5			544	79.8	18.8					
	90	8.7	20.1	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	266	21.5	339	44.1	12.4	8.2	18.9	
				60	291	21.7	365	47.1	13.4	304			21.9	379	51.0	13.9	311	21.9			385	53.1	14.2					
				70	335	22.2	410	55.2	15.1	351			22.3	427	59.6	15.7	359	22.4			435	62.0	16.0					
				80	381	22.7	458	63.1	16.8	401			22.9	479	68.1	17.5	411	23.0			490	70.9	17.9					
				90	430	23.2	509	70.9	18.5	454			23.5	534	76.6	19.3	467	23.7			548	79.6	19.7					
	110	45	2.4	5.5	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	231	28.8	330	44.9	8.0	8.2	18.9
					60	256	29.3	356	48.7	8.8	266			29.5	367	52.1	9.0	271	29.6			372	54.0	9.2				
					70	295	30.1	398	56.9	9.8	307			30.3	411	60.9	10.1	314	30.5			418	63.0	10.3				
80					336	30.9	442	65.1	10.9	351	31.2			458	69.6	11.3	359	31.4	466			72.0	11.4					
90					379	31.8	488	73.1	11.9	398	32.1			508	78.2	12.4	407	32.3	518			81.0	12.6					
67.5		5.1	11.8	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	238	27.5	331	44.8	8.7	8.2	18.9	
				60	263	27.9	358	48.4	9.4	273			28.0	369	51.9	9.8	279	28.1			374	53.8	9.9					
				70	303	28.4	400	56.6	10.7	316			28.6	414	60.7	11.0	323	28.7			421	62.8	11.2					
				80	346	29.1	445	64.7	11.9	362			29.3	462	69.3	12.4	370	29.4			470	71.8	12.6					
				90	391	29.7	492	72.7	13.1	411			30.0	513	77.8	13.7	421	30.2			524	80.7	14.0					
90		8.7	20.1	50	Operation Not Recommended						2.2	5.1	Operation Not Recommended						4.8	11.1	241	26.8	332	44.7	9.0	8.2	18.9	
				60	266	27.2	359	48.2	9.8	277			27.3	370	51.8	10.1	282	27.4			376	53.8	10.3					
				70	307	27.7	401	56.4	11.1	320			27.8	415	60.5	11.5	327	27.9			422	62.7	11.7					
				80	350	28.2	446	64.5	12.4	367			28.4	464	69.1	12.9	376	28.5			473	71.7	13.2					
				90	396	28.7	494	72.4	13.8	417			29.0	516	77.7	14.4	427	29.1			527	80.5	14.7					

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

Performance Data GLW360 - Heating

SOURCE				LOAD																																					
EWT °F	Flow			EWT °F	Flow 45 gpm							Flow 67.5 gpm							Flow 90 gpm																						
	GPM	WPD			HC MBtuh	Power kW	HE MBtuh	LWT °F	COP	PSI	FT	HC MBtuh	Power kW	HE MBtuh	LWT °F	COP	PSI	FT	HC MBtuh	Power kW	HE MBtuh	LWT °F	COP	PSI	FT																
		PSI	FT																																						
20	90	10.4	24.0	60	219	15.1	167	69.7	4.24	2.2	5.1	219	14.6	169	66.5	4.38	4.8	11.1	218	14.4	169	64.8	4.45	8.2	18.9	80	220	18.9	155	89.8	3.41	220	18.3	157	86.5	3.53	220	18.0	159	84.9	3.58
				100	217	23.4	137	109.6	2.71			217	22.7	140	106.4	2.81			218	22.4	141	104.8	2.85																		
				120	210	28.8	111	129.3	2.13			211	28.0	115	126.3	2.21			211	27.6	117	124.7	2.24																		
				60	246	15.5	193	70.9	4.65			245	14.9	194	67.2	4.82			245	14.6	195	65.4	4.91																		
				80	246	19.3	180	90.9	3.74			246	18.6	183	87.3	3.88			246	18.3	184	85.5	3.95																		
30	45	2.6	6.0	100	244	24.0	162	110.9	2.98	245	23.2	166	107.3	3.09	245	22.8	167	105.5	3.15																						
				120	239	29.8	138	130.7	2.35	240	28.8	142	127.1	2.44	241	28.4	144	125.4	2.49																						
				60	253	15.6	200	71.2	4.76	253	15.0	202	67.5	4.94	253	14.7	203	65.6	5.03																						
				80	253	19.4	187	91.2	3.82	253	18.7	189	87.5	3.96	253	18.4	190	85.6	4.04																						
	67.5	5.6	12.9	100	250	24.2	168	111.1	3.03	251	23.3	171	107.4	3.15	251	22.9	173	105.6	3.21																						
				120	244	29.9	142	130.9	2.39	245	28.9	146	127.3	2.48	246	28.5	149	125.5	2.53																						
				60	257	15.6	203	71.4	4.82	257	15.0	205	67.6	5.00	257	14.8	206	65.7	5.10																						
				80	256	19.5	190	91.4	3.86	256	18.7	192	87.6	4.01	256	18.4	194	85.7	4.09																						
	90	9.5	21.9	100	253	24.2	170	111.3	3.06	254	23.4	174	107.5	3.18	254	23.0	176	105.6	3.24																						
				120	246	30.0	144	131.0	2.41	248	29.0	149	127.4	2.50	248	28.5	151	125.5	2.55																						
				60	287	16.0	232	72.7	5.25	287	15.4	234	68.5	5.47	287	15.1	236	66.4	5.58																						
				80	285	19.9	217	92.7	4.20	286	19.1	220	88.5	4.38	286	18.7	222	86.3	4.48																						
40	45	2.4	5.5	100	282	24.8	197	112.6	3.33	283	23.8	201	108.4	3.48	283	23.4	203	106.3	3.55																						
				120	277	30.9	172	132.3	2.63	278	29.7	177	128.3	2.74	279	29.2	179	126.2	2.80																						
				60	296	16.1	241	73.1	5.38	297	15.5	244	68.8	5.61	297	15.2	245	66.6	5.73																						
				80	293	20.0	225	93.0	4.30	294	19.2	229	88.7	4.49	294	18.8	230	86.5	4.59																						
	67.5	5.1	11.8	100	289	25.0	204	112.9	3.40	290	23.9	208	108.6	3.55	291	23.4	211	106.5	3.63																						
				120	283	31.0	177	132.6	2.67	284	29.9	182	128.4	2.79	285	29.3	185	126.3	2.85																						
				60	301	16.2	246	73.3	5.44	302	15.5	248	68.9	5.68	302	15.2	250	66.7	5.81																						
				80	297	20.1	229	93.2	4.34	298	19.2	233	88.8	4.55	299	18.8	234	86.6	4.65																						
	90	8.7	20.1	100	293	25.0	207	113.0	3.43	294	24.0	212	108.7	3.59	294	23.5	214	106.5	3.67																						
				120	286	31.1	180	132.7	2.69	287	29.9	185	128.5	2.81	288	29.3	188	126.4	2.88																						
				60	328	16.6	272	74.6	5.81	329	15.9	275	69.7	6.09	330	15.5	277	67.3	6.23																						
				80	324	20.5	255	94.4	4.65	325	19.5	259	89.6	4.88	326	19.1	261	87.2	5.00																						
50	45	2.4	5.5	100	320	25.5	233	114.2	3.67	321	24.4	238	109.5	3.86	321	23.8	240	107.1	3.95																						
				120	314	31.9	205	134.0	2.89	315	30.5	211	129.4	3.03	316	29.8	214	127.0	3.11																						
				60	341	16.7	284	75.1	5.97	342	16.0	287	70.1	6.26	343	15.7	289	67.6	6.41																						
				80	335	20.6	265	94.9	4.77	336	19.7	269	90.0	5.02	337	19.2	271	87.5	5.14																						
	67.5	5.1	11.8	100	329	25.7	241	114.6	3.75	330	24.5	247	109.8	3.95	331	23.9	249	107.4	4.05																						
				120	322	32.0	212	134.3	2.94	323	30.6	219	129.6	3.09	324	29.9	222	127.2	3.17																						
				60	347	16.8	290	75.4	6.05	348	16.1	294	70.3	6.35	349	15.7	296	67.7	6.50																						
				80	340	20.7	270	95.1	4.82	342	19.7	275	90.1	5.08	343	19.3	277	87.6	5.21																						
	90	8.7	20.1	100	333	25.8	246	114.8	3.79	335	24.6	251	109.9	4.00	336	24.0	254	107.5	4.10																						
				120	325	32.1	216	134.5	2.97	327	30.7	222	129.7	3.12	328	30.0	226	127.3	3.20																						
				60	373	17.2	315	76.6	6.37	375	16.4	319	71.1	6.70	376	16.0	321	68.3	6.87																						
				80	366	21.0	295	96.3	5.10	368	20.0	300	90.9	5.39	369	19.5	302	88.2	5.54																						
60	45	2.4	5.5	100	360	26.2	270	116.0	4.02	361	24.9	276	110.7	4.25	362	24.3	279	108.1	4.37																						
				120	353	32.8	241	135.7	3.16	354	31.2	248	130.5	3.33	355	30.4	251	127.9	3.42																						
				60	389	17.4	330	77.2	6.56	391	16.6	335	71.6	6.91	393	16.2	337	68.7	7.09																						
				80	380	21.2	307	96.9	5.24	382	20.2	313	91.3	5.56	383	19.7	316	88.5	5.71																						
	67.5	5.1	11.8	100	371	26.4	281	116.5	4.12	373	25.0	288	111.1	4.37	374	24.4	291	108.3	4.50																						
				120	362	33.0	250	136.1	3.22	364	31.3	258	130.8	3.41	365	30.6	261	128.1	3.50																						
				60	397	17.5	337	77.6	6.65	400	16.7	343	71.8	7.02	401	16.3	346	68.9	7.20																						
				80	387	21.3	314	97.2	5.31	389	20.2	320	91.5	5.64	390	19.7	323	88.7	5.80																						
	90	8.7	20.1	100	377	26.5	287	116.8	4.17	379	25.1	294	111.3	4.43	381	24.5	297	108.5	4.56																						
				120	367	33.1	254	136.4	3.25	370	31.4	262	131.0	3.45	371	30.6	266	128.3	3.55																						
				60	421	17.8	360	78.7	6.92	424	17.0	366	72.5	7.31	426	16.6	369	69.4	7.51																						
				80	411	21.7	337	98.3	5.56	414	20.5	344	92.3	5.91	415	20.0	347	89.2	6.09																						
70	45	2.4	5.5	100	402	26.9	310	117.9	4.38	404	25.4	318	112.0	4.66	406	24.7	321	109.0	4.81																						
				120	393	33.7	279	137.5	3.43	396	31.8	287	131.7	3.64	397	31.0	291	128.8	3.75																						
				60	441	18.1	379	79.5	7.13	445	17.3	386	73.1	7.55	447	16.9	389	69.9	7.77																						
				80	428	21.9	353	99.0	5.72	431	20.7	361	92.8	6.10	433	20.2	364	89.6	6.30																						
	67.5	5.1	11.8	100	416	27.1	324	118.5	4.50	419	25.6	332	112.4	4.80	421	24.9	336	109.4	4.96																						
				120	405	33.9	290	138.1	3.50	408	32.0	299	132.1	3.73	410	31.2	303	129.1	3.85																						
				60	451	18.3	389	80.0	7.24	455	17.4	396	73.5	7.67	458	17.0	400	70.1	7.89																						
				80	437	22.0	361	99.4	5.81	440	20.8	369	93.0	6.20	442	20.3	373	89.8	6.40																						
	90	8.7	20.1	100	424	27.3	331	118.9	4.55	427	25.7	339	112.7	4.87	429	25.0	344	109.5	5.03																						
				120	411	34.0	295	138.3	3.54	415	32.1	305	132.3	3.78	416	31.2	310	129.3	3.90																						

Antifreeze Correction Table

Antifreeze Type	Anitfreeze %	Cooling			Heating		WPD Corr. Fct. EWT 30°F
		EWT 90°F			EWT 30°F		
		Total Cap	Sens Cap	Power	Htg Cap	Power	
Water	10	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.995	0.995	1.003	0.989	0.997	1.070
	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
Methanol	5	0.997	0.997	1.002	0.989	0.997	1.070
	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.140
	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
Ethylene Glycol	5	0.998	0.998	1.002	0.993	0.998	1.040
	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

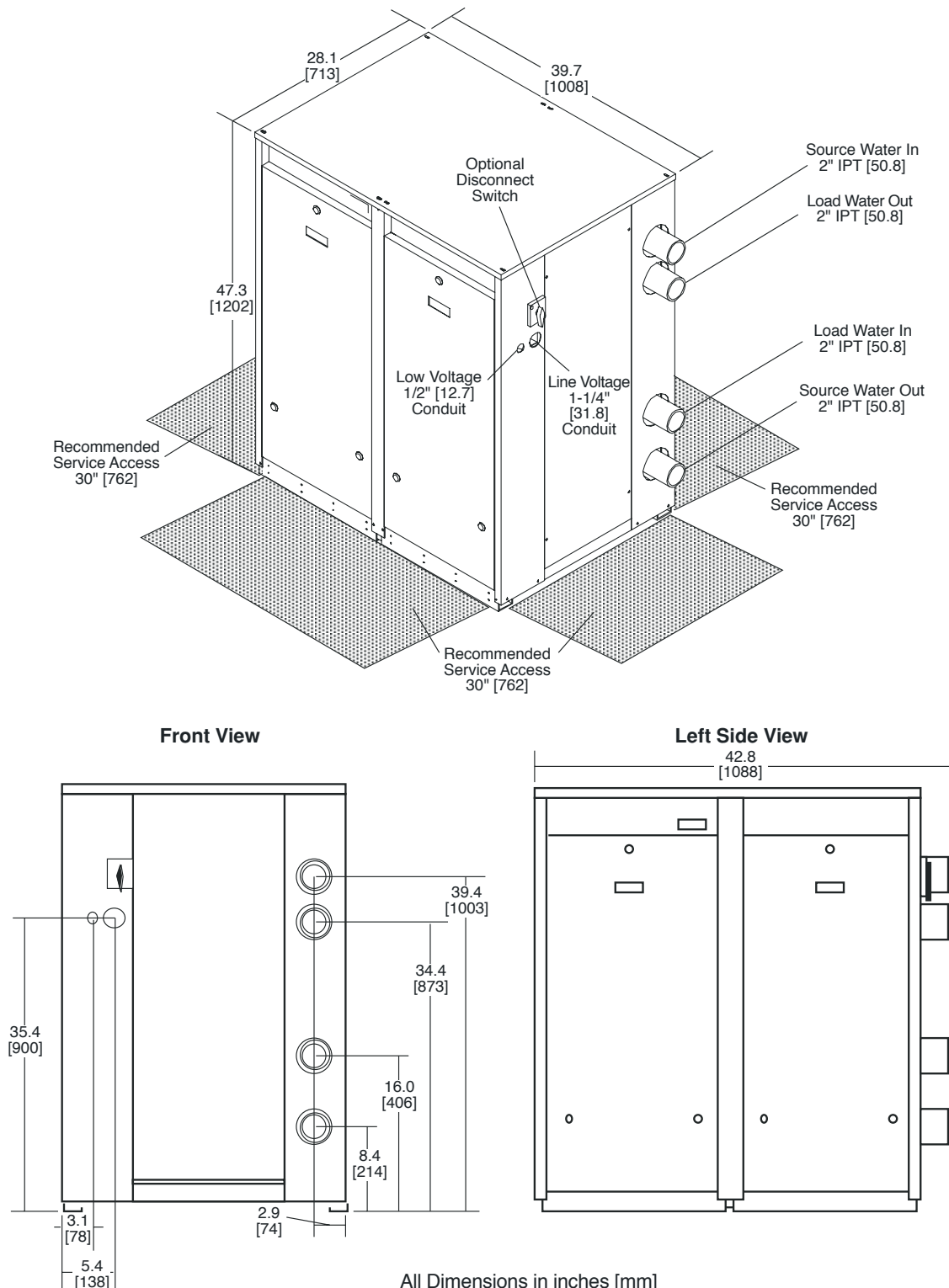
Physical Data

Model	360
Compressor (qty)	Scroll (2)
Factory Charge R22 (lbs) [kg]	9 [4.1]
Indoor/Load Water Connection Size	
IPT (in)	2
Outdoor/Source Water Connection Size	
IPT (in)	2
Weight - Operating, (lbs) [kg]	955 [434]
Weight - Packaged, (lbs) [kg]	1005 [457]

Spring mounted compressor
Dedicated heating and cooling expansion valves with filter drier
Insulated Source and Load Water Coils with brazed plate heat exchangers
Check serial plate for refrigerant type

The Smart Choice for Energy Efficiency

Cabinet Dimensions - GLW360



ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

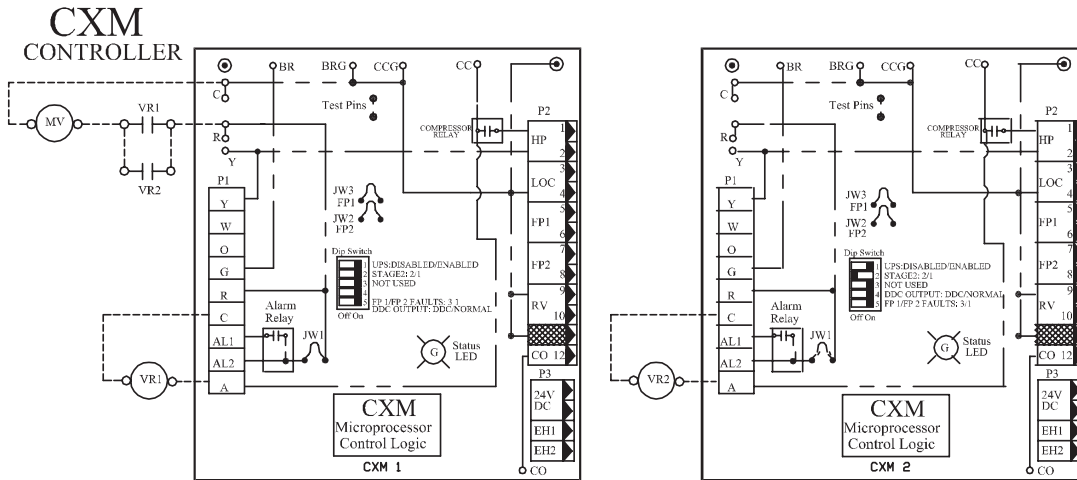
Unit Electrical Data

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Total Unit FLA	Min Circuit Amps	Max Fuse/HACR
				QTY	RLA	LRA			
GLW360	H	208-230/60/3	197/254	2	41.0	350.0	82.0	92.3	125
	F	460/60/3	414/506	2	21.8	158.0	43.6	49.0	70
	N	575/60/3	518/633	2	17.3	125.0	34.6	38.9	50
	U	380-420/50/3	342/462	2	21.8	167.0	43.6	49.0	70

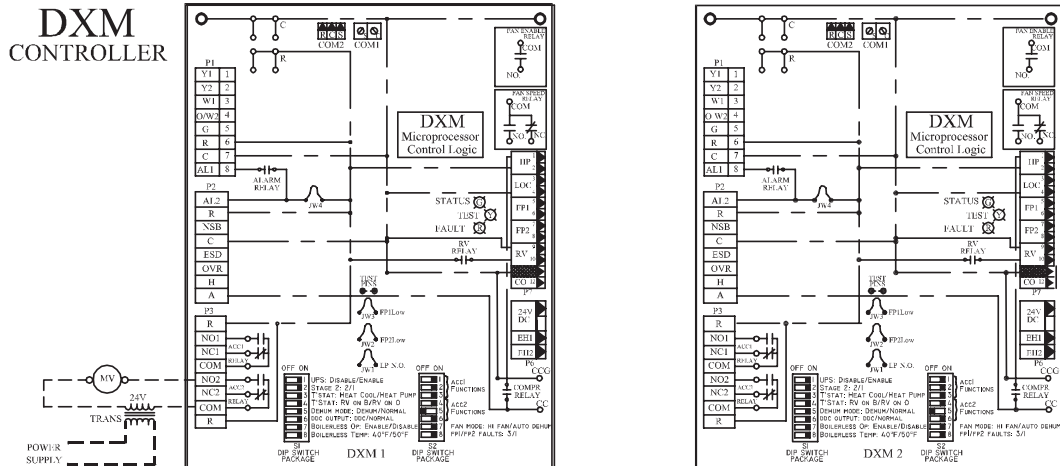
HACR circuit breaker in USA only

The Smart Choice for Energy Efficiency

Motorized Water Valve Wiring Diagram



----- FIELD WIRING (24 VOLT)
 MV - MOTORIZED VALVE
 VR1, VR2 - VALVE RELAY 1 AND 2



NOTE: SET DIP SWITCH PACKAGE S2 FOR
 MOTORIZED VALVE AS PER TABLE

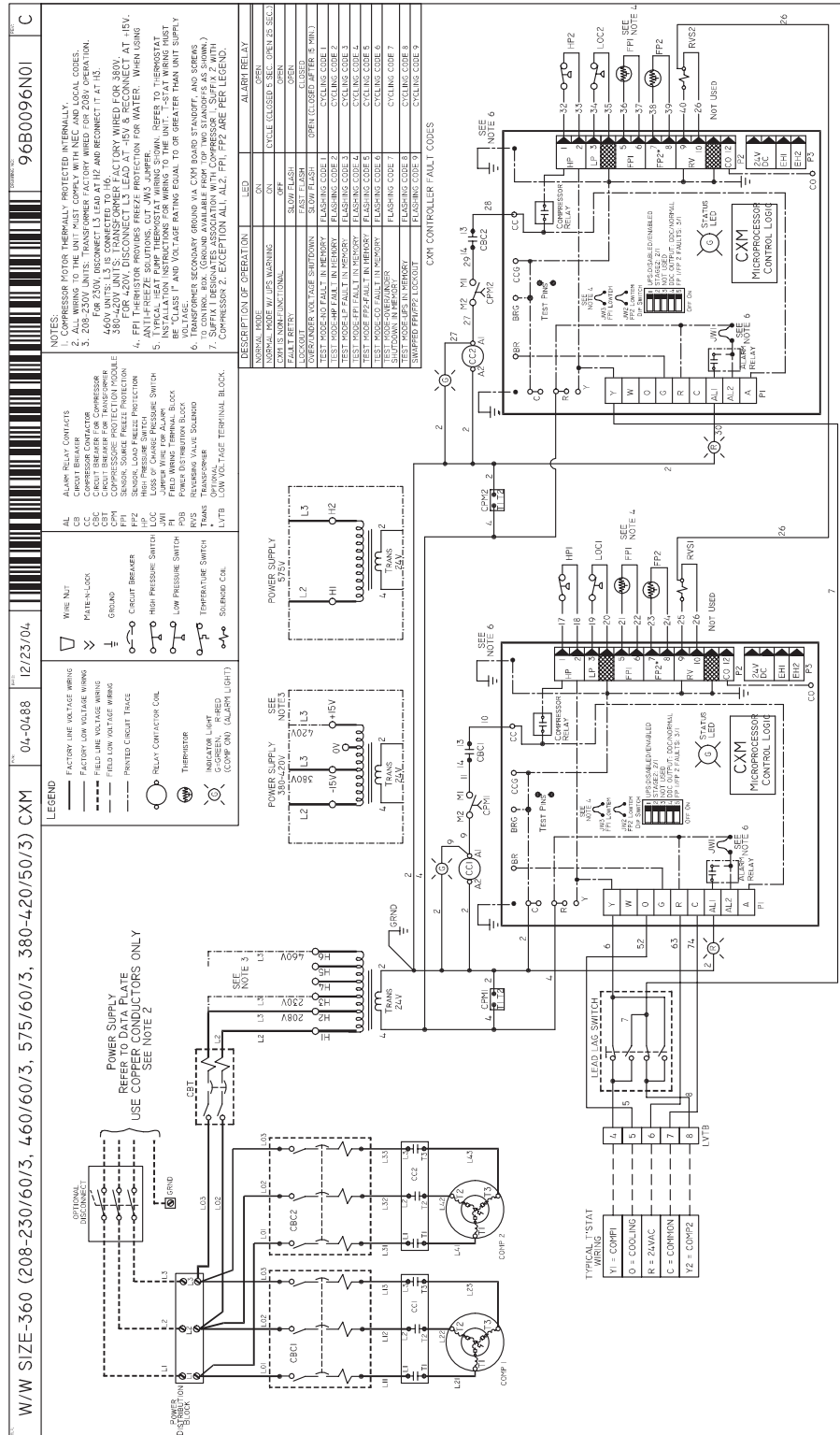
2.4	2.5	2.6
ON	OFF	ON

⚠ WARNING

Never jumper terminal "A" from CXM or DXM board #1 to CXM or DXM board #2.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

Typical Wiring Diagram - CXM Controls - GLW360





Typical Wiring Diagram - CXM & LON Controls - GLW360





ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

CXM AND DXM SERIES CONTROLLERS

The CXM and DXM Series Controllers are designed to enhance Water-Source Heat Pump unit performance with the ability to coordinate complete systems. CXM Series controllers offer complete stand-alone unit control. DXM Series controls add advanced unit operation and system control features. Either control can allow you to connect your heat pump system to a LonWorks or MPC (Multiple ProtoCol -- BACNET, N2, Modbus) DDC control system which includes lighting and other energy saving controls. The CXM and DXM Series are the most advanced controllers made by any heat pump manufacturer today.

STANDARD CXM CONTROL FUNCTIONS

The CXM controller package offers all of the basic features available with electromechanical systems, plus 15 additional standard functions. This group of added features includes condensate overflow (except water-to-water units), anti-short cycle, random start, aircoil low temperature limit (except GC Series and water-to-water units), under/over voltage protection, and intelligent reset, designed to automatically restart a unit within a specific period of time following a fault, given the fault has been adequately corrected. Also included are LED fault and status indication to aid in diagnostics and troubleshooting. These added features, and the many others provided, are specifically designed to improve the life expectancy, reliability, and serviceability of Water-Source Heat Pumps. The CXM is compatible with most heat pump thermostats.

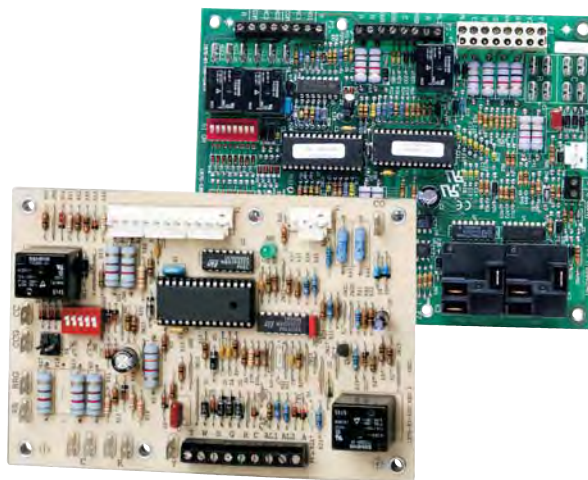
ADDITIONAL DXM CONTROL FUNCTIONS

The DXM controller adds system functions such as emergency shutdown and night setback with override to the stand-alone capability provided by the CXM. Fully configured, the DXM offers 17 additional features over the CXM, including advanced system control capabilities such as intelligent fan speed, reheat control, two-stage compressor, and boilerless electronic heat (some features not applicable on all product lines). The DXM is compatible with almost any type of thermostat, whether heat pump or heat/cool.

UNIT/SYSTEM OPERATING EFFICIENCY

Emergency shutdown, night setback, pump restart and advanced unit functional control all work to enhance the performance of your system. These features are standard on DXM Series Electronic Controllers.

DXM Control Board



CXM Control Board

COMFORT CONTROL

User selectable or intelligent control of fan speed, dehumidification modes, outdoor air damper control, and a complete offering of accurate electronic thermostats add up to increased comfort through superior unit control.

DIAGNOSTICS

ClimateMaster controls provide on-board diagnostics which highlight eight (seven for GC Series and water-to-water units) different reasons for unit malfunction, speeding up service time, eliminating unnecessary service charges, and minimizing down time. The exclusive UPS (Unit Performance Sentinel) provides an early warning of inefficient operating conditions before unit shutdown actually occurs. Fault types are not only indicated at the control, but are kept in memory after a user reset for future service use. And another ClimateMaster exclusive, fault types can be displayed on a conventional thermostat if equipped with a fault LED, or can be remotely communicated with the DDC option. The fault is displayed at the unit for water-to-water units.

The Smart Choice for Energy Efficiency

OPEN-PROTOCOL DDC CAPABILITY

The CXM and DXM Series can be upgraded with the addition of a separate LonMark or MPC (Multiple ProtoCol -- BACNET, N2, Modbus) DDC module, either as a factory option, or field installed at a later date.

LonWorks is an open protocol DDC network, which can be integrated with most third-party building automation systems. In addition, the MPC controller offers the other popular building management system protocols (BACNET, N2, Modbus). ClimateMaster's DDC options provide the flexibility to upgrade your control system as your demands require, and gives you the freedom to interface with most any DDC system vendor. Leaving air (water-to-air units) and leaving water temperature sensors are factory mounted, for remote monitoring, and a wide range of wall sensors are available. The wall sensors utilize a simple interface and can provide digital display and the unit control capability found in conventional thermostats.



ASW Wall Sensors for Lon or MPC DDC Systems



ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

Basic Features	CXM	CXM-Lon	CXM-MPC	DXM	DXM-Lon	DXM-MPC
High and Low Refrigerant Pressure Protection	S	S	S	S	S	S
Water Coil Low Temperature Limit	S	S	S	S	S	S
True 24VA Thermostat Signals	S	S	S	S	S	S
Thermostat Inputs Compatible with Triacs	S	S	S	S	S	S
Condensate Overflow Sensor	S	S	S	S	S	S
Anti-Short-Cycle Time Delay	S	S	S	S	S	S
Random Start	S	S	S	S	S	S
Alarm (selectable dry contact or 24VA)	S	S	S	S	S	S
Water Valve Relay	S	S	S	S	S	S
Water Valve Relay with Compressor Delay	N/A	N/A	N/A	S	S	S
Emergency Shutdown	N/A	DDC	DDC	S	DDC	DDC
Night Setback with Override	N/A	DDC	DDC	S	DDC	DDC
Outdoor Air Damper Control	N/A	N/A	N/A	S	S	S
Advanced Features						
Intelligent Reset	S	S	S	S	S	S
High and Low Voltage Protection	S	S	S	S	S	S
Air Coil Low Temperature Limit	S	S	S	S	S	S
Antifreeze Setpoint Field Select (water, antifreeze)	S	S	S	S	S	S
Electric Heat Control Outputs	S	S	S	S	S	S
Boilerless Electric Heat Control	N/A	N/A	N/A	S	S	S
Intelligent Reversing Valve Operation	N/A	DDC	DDC	S	S	S
High/Low Fan Speed Outputs	N/A	N/A	N/A	S	S	S
Intelligent Fan Speed Control	N/A	N/A	N/A	S	S	S
Thermostat Type Select (Y,O or Y,W)	N/A	N/A	N/A	S	N/A	N/A
Reversing Valve Signal Select (O or B)	N/A	N/A	N/A	S	N/A	N/A
Dehumidistat Input	N/A	N/A	N/A	S	S	S
Reheat Dehumidification Control*	N/A	N/A	N/A	O	O	O
Multiple Units on One Thermostat/Wall Sensor	N/A	DDC	DDC	S	DDC	DDC
Service and Reliability Features						
Service Test Mode	S	S	S	S	S	S
LED Fault and Status Lights	S	S	S	S	S	S
Fault Memory after Reset	S	S	S	S	S	S
Unit Performance Sentinel	S	S	S	S	S	S
Harness-Type Factory Wiring Connections	S	S	S	S	S	S
Fully Noise-Tested Design	S	S	S	S	S	S
CE Approval	S	S	S	S	S	S
Removable Low Voltage Connector	N/A	N/A	N/A	S	S	S
DDC / Energy Management Features						
Echelon LonMark Compliant	N/A	S	N/A	N/A	S	N/A
BACNET Compliant	N/A	N/A	S	N/A	N/A	S
Johnson N2 Compliant	N/A	N/A	S	N/A	N/A	S
Modbus Compliant	N/A	N/A	S	N/A	N/A	S
Leaving Air and Water Temperature Sensor	N/A	S	S	N/A	S	S
Digital Wall Sensor	N/A	O	O	N/A	O	O
S = Standard O = Optional DDC = Feature can be provided by DDC System CXM-Lon = CXM with LonMark Module DXM-Lon = DXM with LonMark Module CXM-MPC = CXM with MPC Module DXM-MPC = DXM with MPC Module * = Check with your Factory Representative for model availability MPC = Multiple ProtoCol (BACNET, N2, Modbus)						

CORROSION RESISTANCE OF COPPER AND STAINLESS STEEL IN CBEs; POINTS TO MEASURE AND CHECK IN A WATER ANALYSIS

The resistance guide below is an attempt to give a picture of the corrosion resistance of stainless steel of type **AISI 316** and pure **Copper** (99.9%) in water, to a number of important chemical factors. The actual corrosion is however a very complex process influenced by many different factors in combination. This table is therefore a considerable simplification and should not be overvalued!

EXPLANATIONS

- + Good resistance under normal conditions
- 0 Corrosion problems may occur especially when more factors are valued 0
- Use is not recommended

GLW360

WATER CONTAINING	CONCENTRATION (mg/l or ppm)	Time Limits Analyze before	AISI 316	254 SMO	Copper Alloy	Nickel Alloy
Alkalinity (HCO ₃ ⁻)	<70 70-300 >300	Within 24 Hours	+ + +	+ + +	0 + 0/+	+ + +
Sulfate (SO ₄ ²⁻)	< 70 70-300 > 300	No limit	+ + 0	+ + 0	+ 0/- -	+ + +
HCO ₃ ⁻ / SO ₄ ²⁻	> 1.0 < 1.0	No limit	+ +	+ +	+ 0/-	+ +
Electrical Conductivity	< 10 µS/cm 10 - 500 µS/cm > 500 µS/cm	No limit	+ + +	+ + +	0 + 0	+ + +
pH	< 6.0 6.0 - 7.5 7.5 - 9.0 > 9.0	Within 24 Hours	0 0/+ + +	0 + + +	0 0 + 0	+ + + +
Ammonium (NH ₄ ⁺)	< 2 2-20 > 20	Within 24 Hours	+ + +	+ + +	+ 0 -	+ + +
Chlorides (Cl ⁻) Please also see table below	< 300 > 300	No limit	+ 0	+ +	+ 0/+	+ +
Free chlorine (Cl ₂)	< 1 1-5 > 5	Within 5 hours	+ + 0/+	+ + +	+ 0 0/-	+ + +
Hydrogen Sulfide (H ₂ S)	< 0.05 > 0.05	No limit	+ +	+ +	+ 0/-	+ +
Free (aggressive) Carbon Dioxide (CO ₂)	< 5 5-20 >20	No limit	+ + +	+ + +	+ 0 -	+ + +
Total Hardness (°dH)	4.0 - 8.5	No limit	+	+	+	+
Nitrate (NO ₃)	< 100 > 100	No limit	+ +	+ +	+ 0	+ +
Iron (Fe)	< 0.2 > 0.2	No limit	+ +	+ +	+ 0	+ +
Aluminum (Al)	< 0.2 > 0.2	No limit	+ +	+ +	+ 0	+ +
Manganese (Mn)	< 0.1 > 0.1	No limit	+ +	+ +	+ 0	+ +

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

SWEP's CHOICE OF CHANNEL PLATE MATERIAL

CHLORIDE CONTENT	MAXIMUM TEMPERATURE			
	60°C	80°C	120°C	130°C
= 10 ppm	SS 304	SS 304	SS 304	SS 316
= 25 ppm	SS 304	SS 304	SS 316	SS 316
= 50 ppm	SS 304	SS 316	SS 316	Ti / 254 SMO
= 80 ppm	SS 316	SS 316	SS 316	Ti / 254 SMO
= 150 ppm	SS 316	SS 316	Ti / 254 SMO	Ti / 254 SMO
= 300 ppm	SS 316	Ti / 254 SMO	Ti / 254 SMO	Ti / 254 SMO
> 300 ppm	Ti / 254 SMO	Ti / 254 SMO	Ti / 254 SMO	Ti / 254 SMO

Genesis Large Water-to-Water Series 60Hz Engineering Guide Specs. Rev.: 08/16/05

General:

Furnish and install ClimateMaster "Genesis" Water Source Heat Pumps, as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.

Water-to-Water Heat Pumps:

Units shall be supplied completely factory built for an entering source water temperature range from 20° to 110°F (-6.7° to 43.3°C) and entering (heating) load water temperature range from 60° to 120°F (15.6° to 48.9°C) or entering (cooling) load water temperature range of 50° to 90°F (10.0° to 32.2°C) as standard. Equivalent units from other manufacturers can be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated in accordance with American Refrigeration Institute / International Standards Organization (ARI / ISO) and Canadian Standards Association (CSA-US). All units shall be fully quality tested by factory run testing under normal operating conditions and water flow rates as described herein. Quality control system shall automatically perform via computer: triple leak check, pressure tests, evacuate and accurately charge system, perform detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail data base. **Units tested without water flow are not acceptable.**

Basic Construction:

All units must have a minimum of four access panels for serviceability of compressor compartment. **Units having only one access panel to compressor shall not be acceptable.**

The heat pumps shall be fabricated from heavy gauge steel with powder coat paint finish. Both sides of the steel shall be painted for added protection. All interior surfaces shall be lined with 3/8 inch (9.5mm) thick, acoustic type foam insulation.

Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. **Unit insulation must meet these stringent requirements or unit(s) will not be accepted.**

Cabinets shall have separate entrance connectors for line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper IPT fittings. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Unit(s) shall have exterior indicator lights showing, 1) compressor operation (on/off) and 2) unit "fault" status. An "A/B" switch shall allow the selection of compressor operation sequence. Contractor shall be responsible for providing control circuitry and indicator lights for units not providing these features.

Option: UltraQuiet package shall consist of sound attenuating blanket on both compressors to reduce radiated noise.

Refrigerant Circuit:

Units shall have two sealed, isolated refrigerant circuits, each including a high efficiency scroll compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, a reversing valve, two brazed plate refrigerant to water heat exchangers utilizing stainless steel plates, and safety controls including a high pressure switch, low pressure switch, and low water temperature sensors. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit.

Hermetic compressors shall be internally sprung. The compressor(s) shall be mounted on a large heavy gauge compressor base pan, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation. Compressor shall have thermal overload protection. Refrigerant to water heat exchangers shall be brazed plate type with stainless steel plates, rated to withstand 435 PSIG (2997 kPa) working refrigerant pressure and 435 PSIG (2997 kPa) working water pressure.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 110°F (-6.7° to 43.3°C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function.

Electrical:

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24 volt activated, 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volt and provide heating or cooling as required by the remote aquastat / sensor. A compressor solid state protection module shall be supplied on each circuit for compressor overload protection. Circuit breakers shall be provided on each compressor power circuit for short circuit protection.

Solid State Control System (CXM):

Units shall have a solid-state control system. **Units utilizing electro-mechanical control shall not be acceptable.** The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall interface with a heat pump type thermostat. The control system shall have the following features:

- a. Anti-short cycle time delay on compressor operation.
- b. Random start on power up mode.
- c. Low voltage protection.
- d. High voltage protection.
- e. Unit shutdown on high or low refrigerant pressures.
- f. Unit shutdown on low water temperature.
- g. Option to reset unit at thermostat or disconnect.
- h. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
- i. Ability to defeat time delays for servicing.
- j. Light emitting diode (LED) on circuit board to indicate high pressure, low pressure, low voltage, high voltage, freeze protection, condensate overflow, and control voltage status.
- k. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- l. 24V output to cycle a motorized water valve or other device with compressor contactor.
- m. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.
- n. Source water coil low temperature sensing (selectable for water or anti-freeze).
- o. Load water coil low temperature sensing.

NOTE: Units not providing the 7 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), source water coil low water temperature sensing and load water coil low water temperature sensing will not be accepted.

Option: Enhanced solid state control system (DXM)

Control shall have all of the above mentioned features of the CXM control system along with the following expanded features:

- a. Removable thermostat connector.
- b. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life.).
- c. Ability to work with heat pump or heat/cool (Y, W) type controls.
- d. Ability to work with controls using O or B reversing valve control.
- e. Emergency shutdown contacts.
- f. Relay to operate an external damper.
- g. Relay to start system pump.
- h. 75 VA control transformer. Control transformer shall have load side short circuit and overload protection via a built in circuit breaker.

The Smart Choice for Energy Efficiency

Option: Lonworks interface system

Units shall have all the features listed above (either CXM or DXM) and the control board will be supplied with a LONWORKS interface board, which is LONMark certified. This will permit all units to be daisy chained via a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. Source leaving water temperature
- b. Load leaving water temperature
- c. Command of temperature setpoint
- d. Cooling status
- e. Heating status
- f. Low temperature sensor alarm
- g. Low pressure sensor alarm
- h. High pressure switch alarm
- i. Hi/low voltage alarm
- j. Unoccupied / occupied command
- k. Cooling command
- l. Heating command
- m. Fault reset command
- n. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

This option also provides the upgraded 75VA control transformer with load side short circuit and overload protection via a built in circuit breaker.

Option: MPC (Multiple Protocol Control) interface system

Units shall have all the features listed above (either CXM or DXM) and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. Source leaving water temperature
- b. Load leaving water temperature
- c. Command of space temperature setpoint
- d. Cooling status
- e. Heating status
- f. Low temperature sensor alarm
- g. Low pressure sensor alarm
- h. High pressure switch alarm
- i. Hi/low voltage alarm
- j. Unoccupied / occupied command
- k. Cooling command
- l. Heating command
- m. Fault reset command
- n. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

This option also provides the upgraded 75VA control transformer with load side short circuit and overload protection via a built in circuit breaker.

Warranty:

Climate Master shall warranty equipment for a period of 12 months from start up or 18 months from shipping (which ever occurs first).

Option: Extended 4-year compressor warranty covers compressor for a total of 5 years.

Option: Extended 4-year refrigeration circuit warranty covers coils, reversing valve, expansion valve and compressor for a total of 5 years.

Option: Extended 4-year control board warranty covers the CXM/DXM control board for a total of 5 years.

ClimateMaster Water-Source Heat Pumps Genesis Large Water-To-Water (GLW) Series 30 Ton Water-To-Water Units

FIELD INSTALLED OPTIONS

Hose Kits:

All units shall be connected with hoses. The hoses shall be 2 feet (61cm) long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

Valves:

The following valves are available and will be shipped loose:

- a. Ball valve; bronze material, standard port full flow design, IPT connections.
- b. Ball valve with memory stop and PT Port; standard port full flow design, IPT connections.
- c. "Y" strainer with cap; bronze material, IPT connections.
- d. "Y" strainer with blowdown valve; bronze material, IPT connections.
- e. Motorized water valve; slow acting, 24v, IPT connections.

Hose Kit Assemblies:

The following assemblies ship with the valves already assembled to the hose described:

- a. Supply and return hoses having ball valve with PT port.
- b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve (Measureflo) with PT ports, and ball valve.
- c. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator (Measureflo) with PT ports, and ball valve.

Guide Revision History:

Date:	Page:	Description:
08/24/05	33	Specifications: Updated CXM Verbiage
5/26/05	All	New Layout

ClimateMaster Water-Source Heat Pumps
Genesis Large Water-To-Water (GLW) Series
30 Ton Water-To-Water Units



The Smart Choice for Energy Efficiency



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