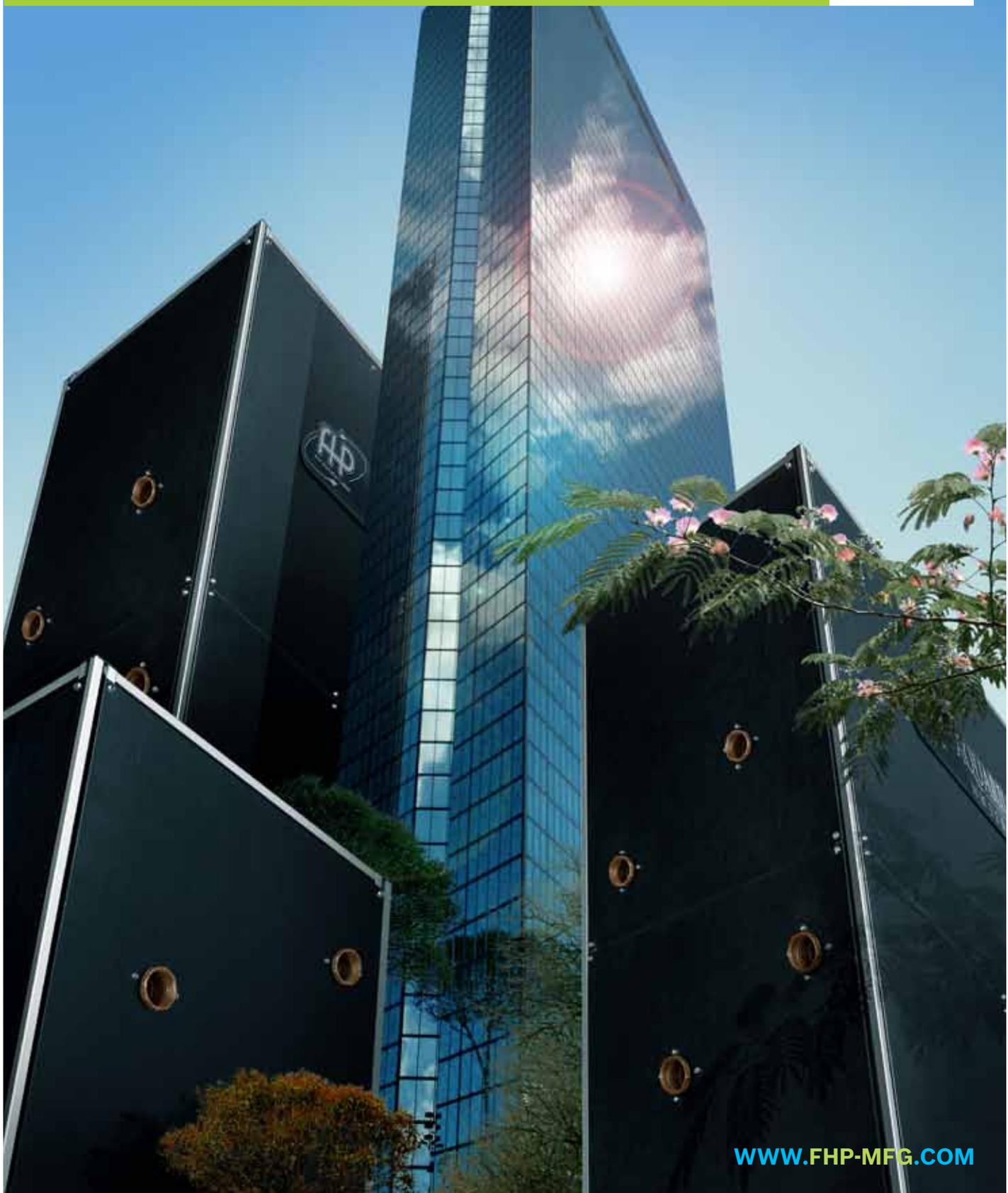


COMMERCIAL | WATER2WATER | WW SERIES

Reinventing Energy Efficiency



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“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.”

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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.

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

WW Series - Superior Efficiency

FHP's one- and two-stage WW Series water-to-water units cooled modular reverse cycle chillers are designed to meet all your needs and requirements.

Water-to-water units can be utilized for hydronic heating, make-up air applications or swimming pool heating just to mention a few of their potential applications. The modular design gives you the flexibility to install units individually or in any combination to match the exact load requirement for your commercial project.

The single-stage WW Series is available for commercial applications from 2 to 10 tons. The two-stage WW Series is available in 10 tons and from 20 to 35 tons.

Quiet Operation

Our chillers have a fraction of the refrigerant charge of central station chillers and operate at a significantly reduced sound level. If you need to replace an old chiller or install a new quieter one, FHP has the most versatile design. The units fit easily through a standard 36" door.

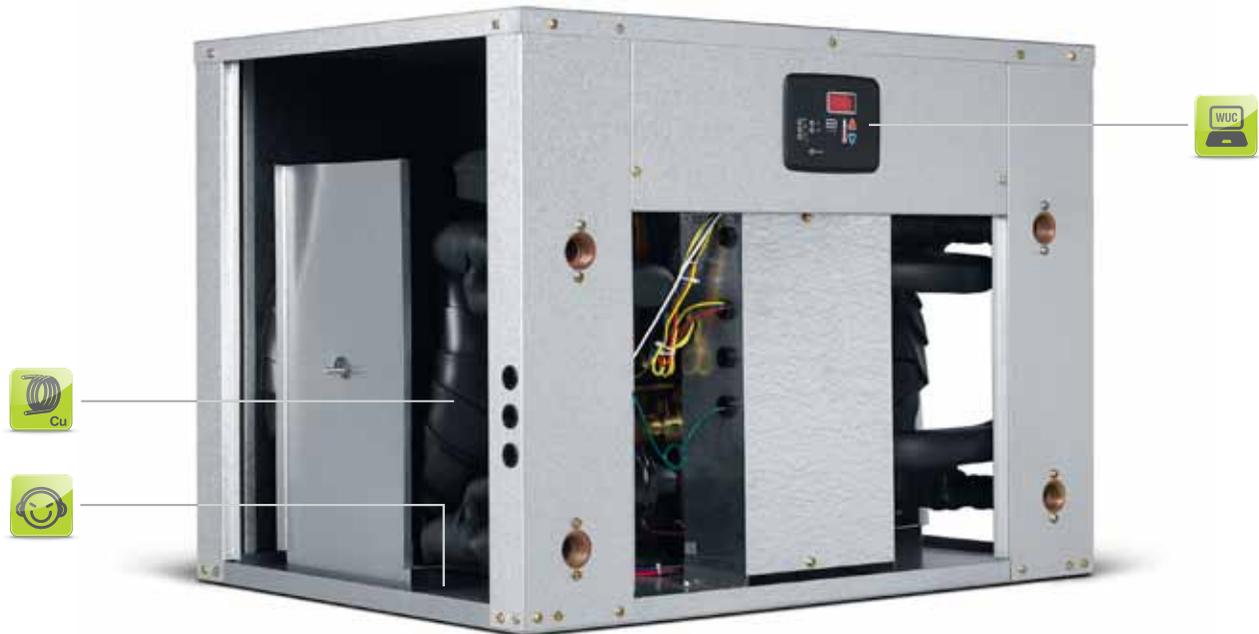
Environmentally Friendly

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. FHP's ISO 9001:2000 certified facilities provide consistent quality in every unit we build.





Key Features

Standard

-  Geothermal
-  Scroll Compressor
-  R410-A Refrigerant
-  Coaxial Heat Exchanger Copper
-  Floating Base
-  Unit Protection Module 1
-  Compressor Blanket

Optional

-  Coaxial Heat Exchanger Cupronickel
-  Solid State Water to Water Unit Control
-  Desuperheater
-  Comfort Alert Diagnostics Module

WW SERIES Performance Data

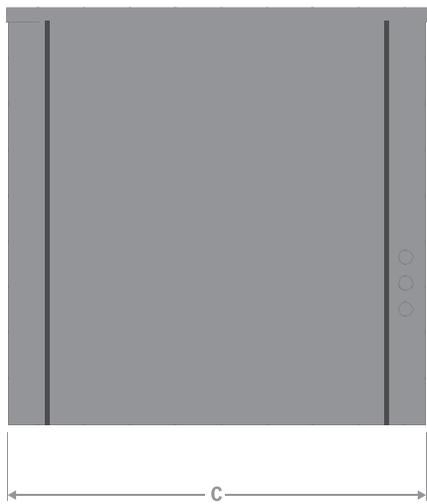


MODEL	ALL UNITS RATED IN ACCORDANCE WITH AHRI/ISO/ASHRAE/ANSI 13256-2												
	LOAD TEMPERATURE												
	Water Loop (WLHP)				Ground Water (GWHP)				Ground Loop (GLHP)				
	53.6°F		104°F		53.6°F		104°F		53.6°F		104°F		
	SOURCE TEMPERATURE												
	86°F		68°F		59°F		50°F		77°F		32°F		
	CAPACITY AND EFFICIENCY DATA												
	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	
	WW024	23,900	12.8	35,000	4.3	26,500	20.0	29,000	3.6	25,000	14.9	23,500	3.0
	WW036	25,500	13.3	37,000	4.4	28,500	20.9	30,000	3.7	26,500	15.5	24,500	3.0
WW048	39,300	12.8	57,000	4.3	44,000	19.9	47,000	3.6	41,000	14.8	38,500	2.9	
WW060	51,300	12.7	75,500	4.4	56,000	19.2	62,000	3.6	53,000	14.6	50,500	3.0	
WW072	55,100	13.2	80,000	4.4	61,000	20.4	65,000	3.6	57,500	15.3	52,000	2.9	

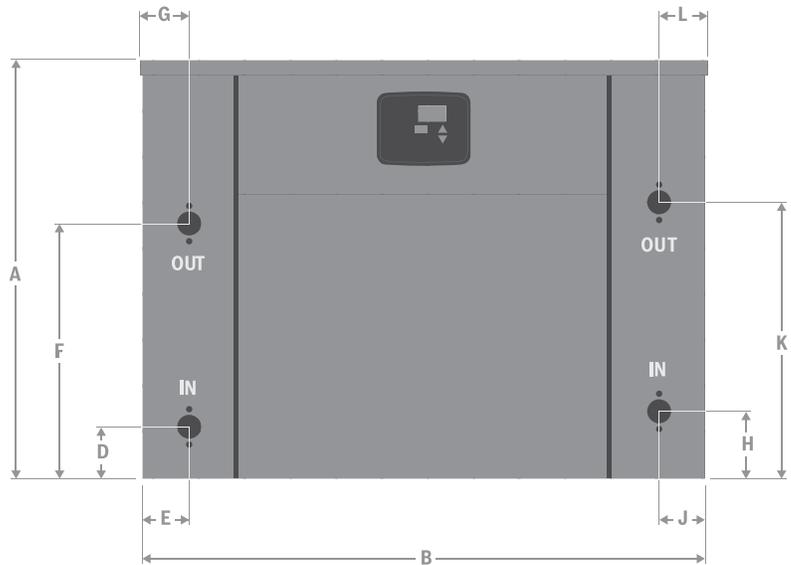
WW 024 - 072 SERIES | DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	L	Condenser Water Connections
	Height	Width	Depth									
WW024,036	24.25	32.50	24.00	2.50	2.00	14.88	2.25	2.50	8.25	14.88	2.25	0.75" F.P.T.
WW048	24.25	32.50	24.00	3.00	2.50	15.00	2.25	4.00	3.38	16.00	3.38	1.00" F.P.T.
WW060	24.25	32.50	24.00	3.00	2.50	17.00	2.25	4.00	3.38	18.00	3.38	1.00" F.P.T.
WW072	24.25	32.50	24.00	3.38	2.50	22.75	4.38	3.38	4.38	22.75	2.50	1.00" F.P.T.

LEFT SIDE



UNIT FRONT



NOTES: All dimensions within +/- 0.125". Specifications subject to change without notice.



Key Features

Standard

-  Filter Drier
-  TXV Valve
-  Service Connections
-  R410-A Refrigerant
-  Unit Protection Module 1
-  Scroll Compressor
-  4-Way Reversing Valve
-  Coaxial Heat Exchanger Copper
-  Geothermal
-  Aluminum Framing

Optional

-  Coaxial Heat Exchanger Cupronickel
-  DDC Controls
-  Compressor Blanket
-  Solid State Water to Water Unit Control
-  Comfort Alert Diagnostics Module
-  Desuperheater

WW SERIES

Performance Data



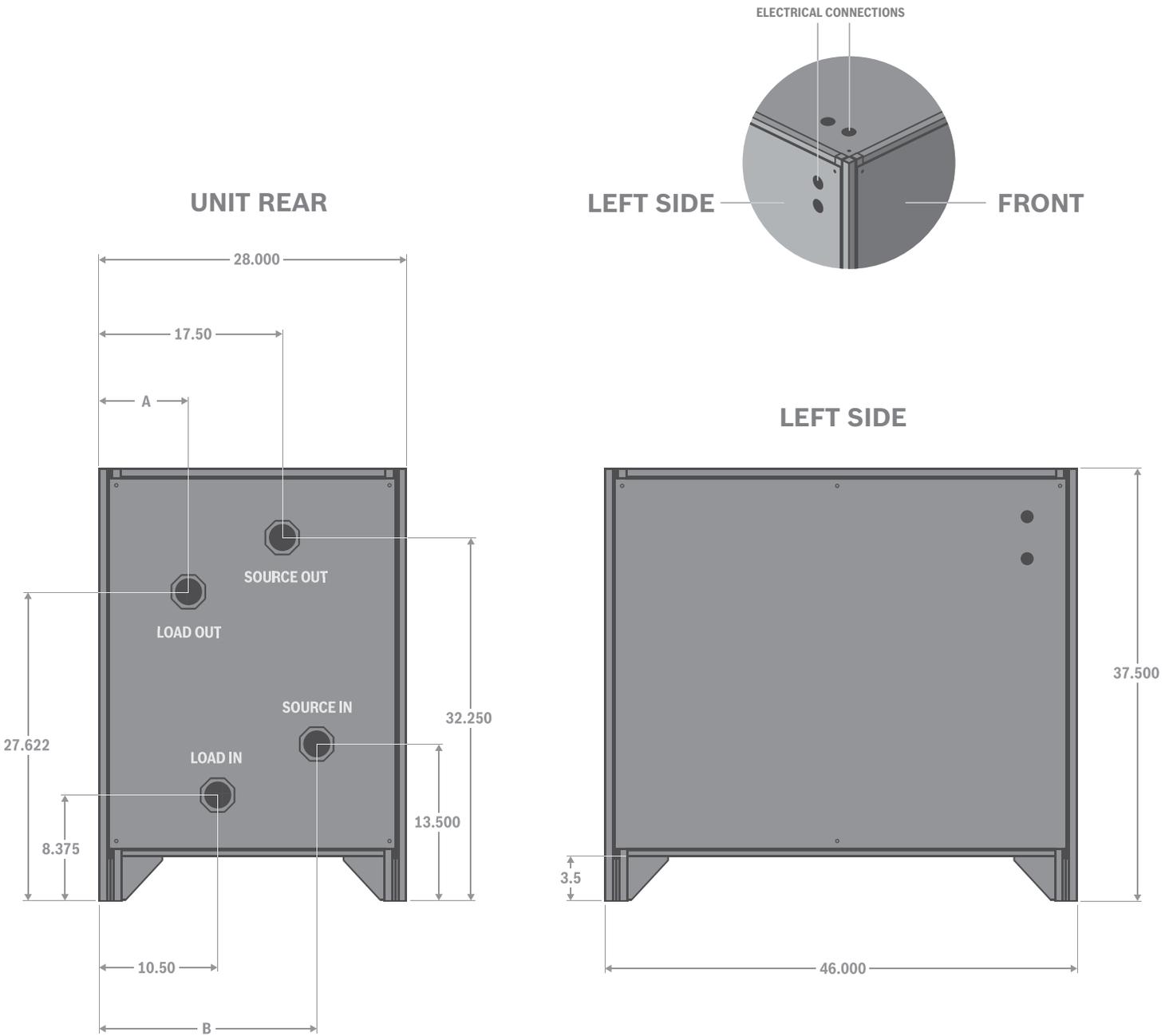
MODEL	ALL UNITS RATED IN ACCORDANCE WITH AHRI/ISO/ASHRAE/ANSI 13256-2												
	LOAD TEMPERATURE												
	Water Loop (WLHP)				Ground Water (GWHP)				Ground Loop (GLHP)				
	53.6°F		104°F		53.6°F		104°F		53.6°F		104°F		
	SOURCE TEMPERATURE												
	86°F		68°F		59°F		50°F		77°F		32°F		
	CAPACITY AND EFFICIENCY DATA												
	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	
	WW120	110,100	13.5	160,000	4.4	125,000	19.2	129,000	3.7	116,000	15.5	103,500	3.0
	WW122*	114,600	13.3	168,000	4.5	127,000	20.5	135,500	3.6	119,500	15.5	108,000	2.9
WW180	127,000	13.8	180,500	4.5	143,000	20.7	148,500	3.8	132,500	15.9	121,000	3.2	
WW210	164,200	13.2	239,500	4.4	185,500	19.1	194,000	3.7	171,500	15.1	156,000	3.0	

* 2 Stage unit

WW 120 - 210 SERIES | DIMENSIONS

MODEL	A	B
WW120	8.50	19.50
WW122*	8.50	19.50
WW180	4.50	23.50
WW210	4.50	23.50

* 2 Stage unit



WW 240 - WW 420



Key Features

Standard

-  Filter Drier
-  TXV Valve
-  Service Connections
-  R410-A Refrigerant
-  Geothermal
-  Scroll Compressor
-  4-Way Reversing Valve
-  Unit Protection Module 2
-  Aluminum Framing

Optional

-  Coaxial Heat Exchanger Cupronickel
-  DDC Controls
-  Compressor Blanket
-  Solid State Water to Water Unit Control
-  Comfort Alert Diagnostics Module

WW 2 STAGE SERIES

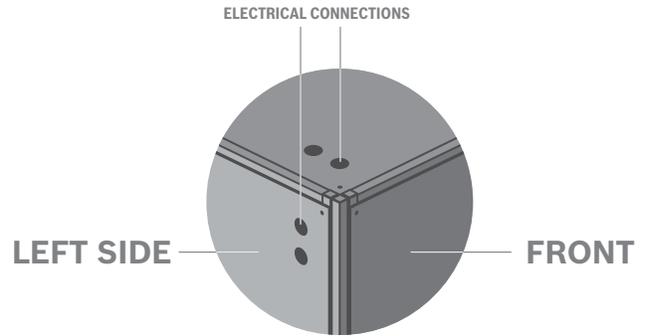
Performance Data



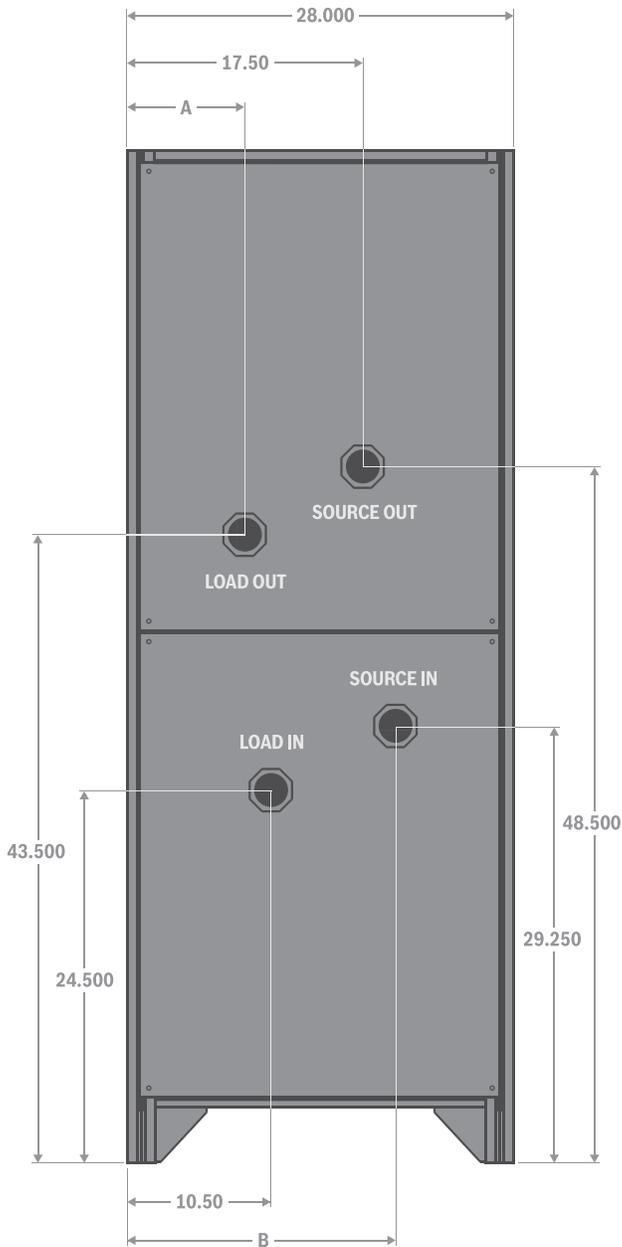
MODEL	ALL UNITS RATED IN ACCORDANCE WITH AHRI/ISO/ASHRAE/ANSI 13256-2												
	LOAD TEMPERATURE												
	Water Loop (WLHP)			Ground Water (GWHP)				Ground Loop (GLHP)					
	53.6°F		104°F	53.6°F		104°F		53.6°F		104°F			
	SOURCE TEMPERATURE												
	86°F		68°F		59°F		50°F		77°F		32°F		
	CAPACITY AND EFFICIENCY DATA												
	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	
	WW240	222,000	13.5	320,000	4.4	249,500	19.2	258,500	3.7	232,500	15.5	206,500	3.0
	WW360	254,000	13.8	361,500	4.5	286,500	20.7	297,000	3.8	265,000	15.9	242,000	3.2
WW420	328,300	13.2	479,000	4.4	370,500	19.1	387,500	3.7	343,000	15.1	312,000	3.0	

WW 240 - 420 SERIES | DIMENSIONS

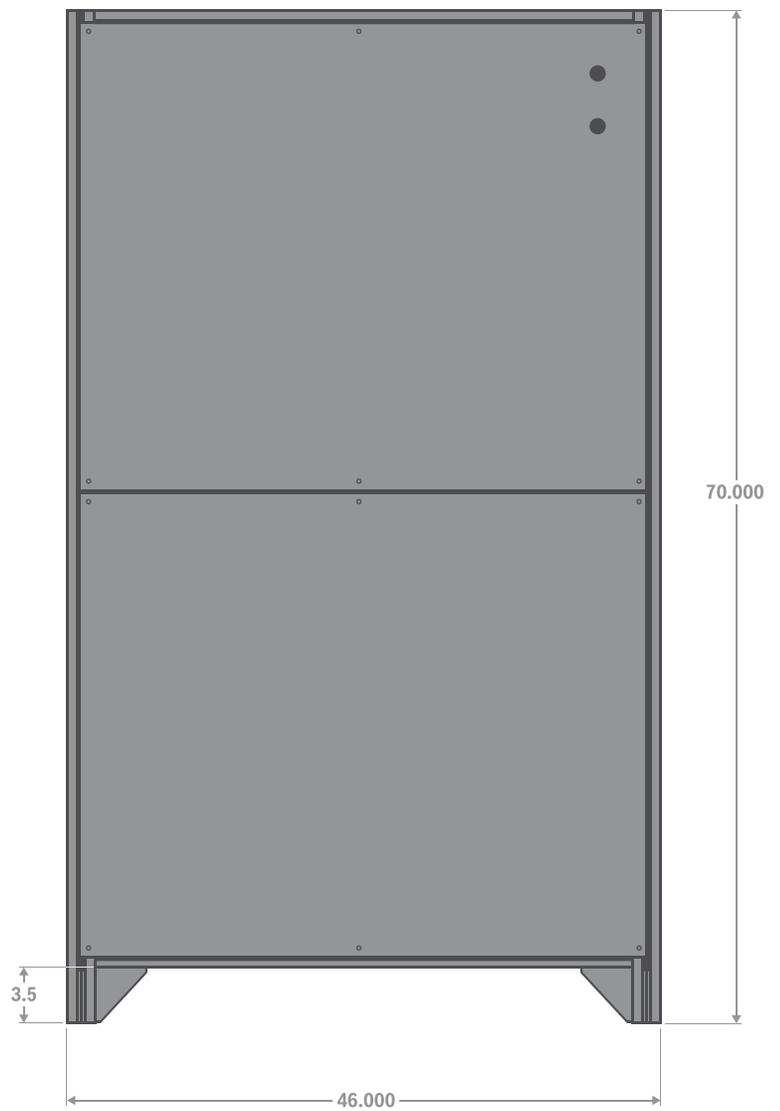
MODEL	A	B
WW240	8.50	19.50
WW360	4.50	23.50
WW420	4.50	23.50



UNIT REAR



LEFT SIDE





Geothermal

All WW Series units come ready for geothermal applications.

Controls And Interface Options

Designed to enhance the unit operation with more flexibility, accurate control and operating modes, the FHP controllers and interface options provide an increased level of comfort in the conditioned space together with solid state reliability and ease of operation.



Unit Protection Modules UPM1 And UPM2

The Unit Protection Modules UPM1 and UPM2 are standard on most FHP units and were developed to enhance their operation. The UPM1 is designed for single compressor models while the UPM2 is designed for dual compressor models have the same features.



The (optional) freeze protection will prevent unit operation below 35° F (1.7° C) leaving fluid temperature.

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.

Water temperatures can be monitored from the central control computer and unit fault indication display. A Back view hand held diagnostic tool is available to allow local access to display and modify user defined properties without any computer software.



Aluminum Framing

All FHP Water2Water Series units are constructed with an aluminum frame for an appealing appearance, pleasant aesthetic and lightweight construction.

The high-strength extruded aluminum profiles have a natural color, anodized surface that's scratch and corrosion resistant and its durable finish won't rust. It never needs painting and the welding is maintenance free.



Solid State Water to Water Unit Control (WUC)

FHP's water to water heat pump controller offers a low cost, simple solution to the control of a water to water heat pump unit. The control is configurable to provide cooling only, heating only, or auto change over control strategies based on the application of the unit in a given system. Intelligent auto reset of a fault condition avoids nuisance hard lockouts

Features of the controller include:

- Adjustable temperature differential for heating and cooling set point.
- Adjustable auto changeover set point with adjustable dead band setting.
- LED display of control temperature and set points. °Fahrenheit or °Celsius Display.
- Pump operation configurable for continuous or cycling operation with the compressor.
- Compressor lead-lag operation on units with dual compressors.
- Malfunction output and service LED can be set to steady or pulsing to indicate fault condition.
- Color LED's indication of mode of operation.
- Set points retention in nonvolatile memory in the event of a power failure.
- Five minute delay on break or power interruption for compressor short cycling protection.
- Brown out low voltage protection.





Compressor Blanket

A high density compressor blanket is an available option on all WW units. This together with the unique floating base pan can reduce sound levels by up to 60%.



Desuperheater

A desuperheater or HRP (Hot Water Heat Recovery Package) is a feature that takes advantage of waste heat of the compressor and uses it to heat domestic water. Heating your water with FREE waste heat will reduce the use of your inefficient water storage tank heating elements. Hot water is produced by using a double wall coaxial heat exchanger coil. The hot refrigerant gas flows in the outer tubing while the domestic water flows in the inner pipe being heated by the hot refrigerant. The HRP heats water with superheated gas that is being produced by the compressor as you heat or cool your space, thus saving you money in your hot water production.



MODEL	WW 1 Stage Series Voltage				
WW024	208-230/1/60	265/1/60			
WW036	208-230/1/60		208-230/3/60	460/3/60	
WW048	208-230/1/60		208-230/3/60	460/3/60	
WW060	208-230/1/60		208-230/3/60	460/3/60	575/3/60
WW072	208-230/1/60		208-230/3/60	460/3/60	575/3/60

MODEL	WW 1 Stage Series Voltage			
WW120	208-230/3/60		460/3/60	575/3/60
WW180	208-230/3/60		460/3/60	575/3/60
WW210	208-230/3/60		460/3/60	575/3/60

MODEL	WW 2 Stage Series Voltage			
WW122	208-230/1/60	208-230/3/60	460/3/60	575/3/60
WW240		208-230/3/60	460/3/60	575/3/60
WW360		208-230/3/60	460/3/60	575/3/60
WW420		208-230/3/60	460/3/60	575/3/60



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