

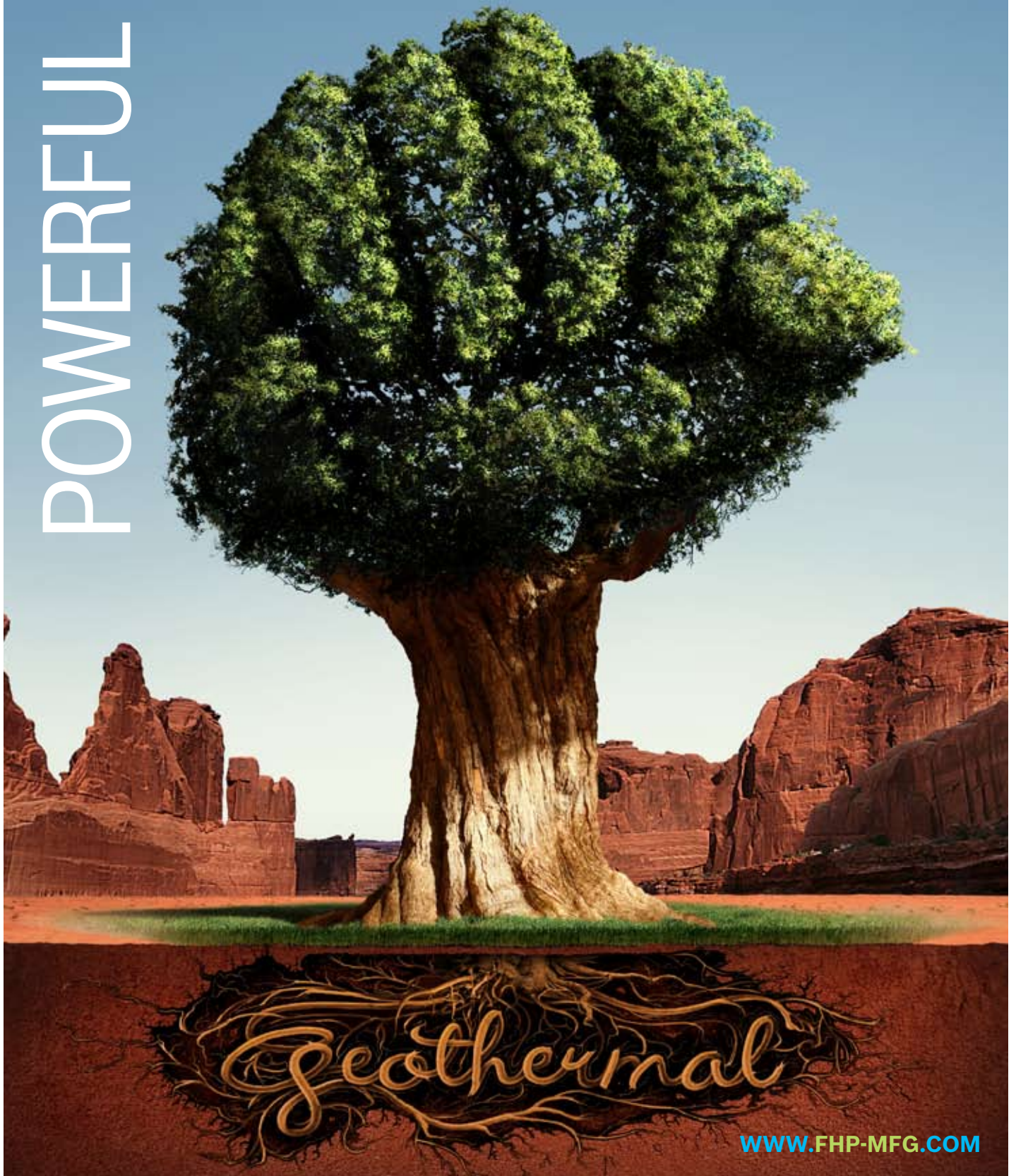


RESIDENTIAL | WATER2AIR | ES 2 STAGE SERIES

Reinventing Energy Efficiency



POWERFUL



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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 residential heating and cooling products, FHP is one of the leading manufacturers of Geothermal and Water Source heat pumps, which assures that you are buying a unit that you can trust. We are part of Bosch Thermotechnology Ltd., a Robert Bosch Group unit dedicated to provide highly efficient heating and cooling solutions to the private and public sectors.

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 in order to provide 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 homes or retrofit residential buildings.

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 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 homes 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 as needed – efficiently and without any negative impact on the environment.

## Cost And Payback

Geothermal heat pumps not only provide dependable, natural heat, they also provide you 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 up to 70% in your energy bill depend on location and which GSHPs you use
- Will normally cost more than a conventional system, but will pay back that cost difference in a short period of time
- Local and Federal tax credits and rebates decrease your installation cost, which decreases the payback period
- Extra money to invest on quality family time
- Considered the technology of choice by the Department of Energy and the Environmental Protection Agency



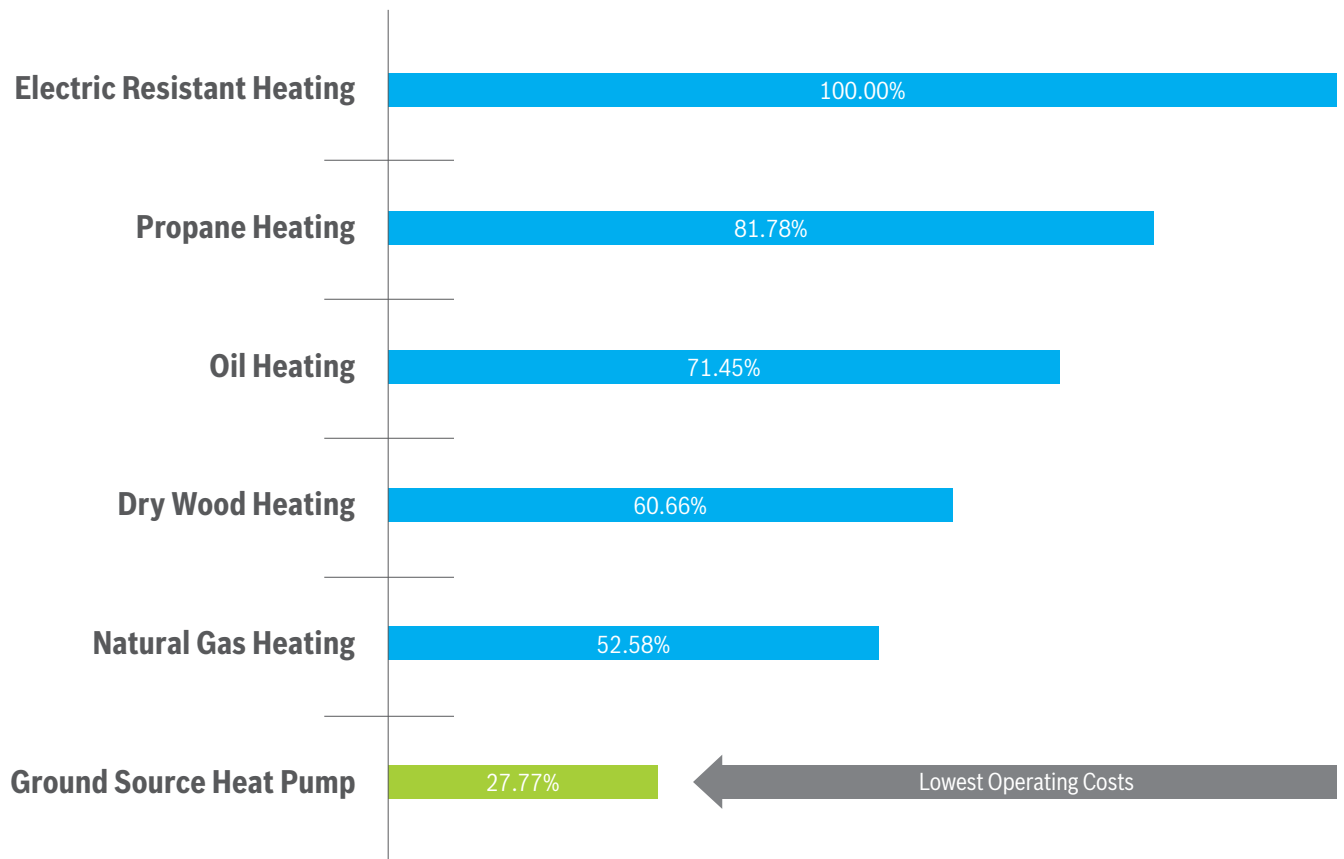
# Heating Operating Cost Estimate

Estimated heating costs of operation for a building with 54,000 Btu/hr Design Heat Loss at -3 F.

Estimates based on the following energy costs:

Electricity - 9.5 cents per kilowatt hour; Natural Gas - \$1.20 per therm; Propane - \$1.75 per gallon; Oil - \$2.25 per gallon; Dry Wood - \$230 per full cord.

Source: Phoenix Energy Supply; FHP Manufacturing



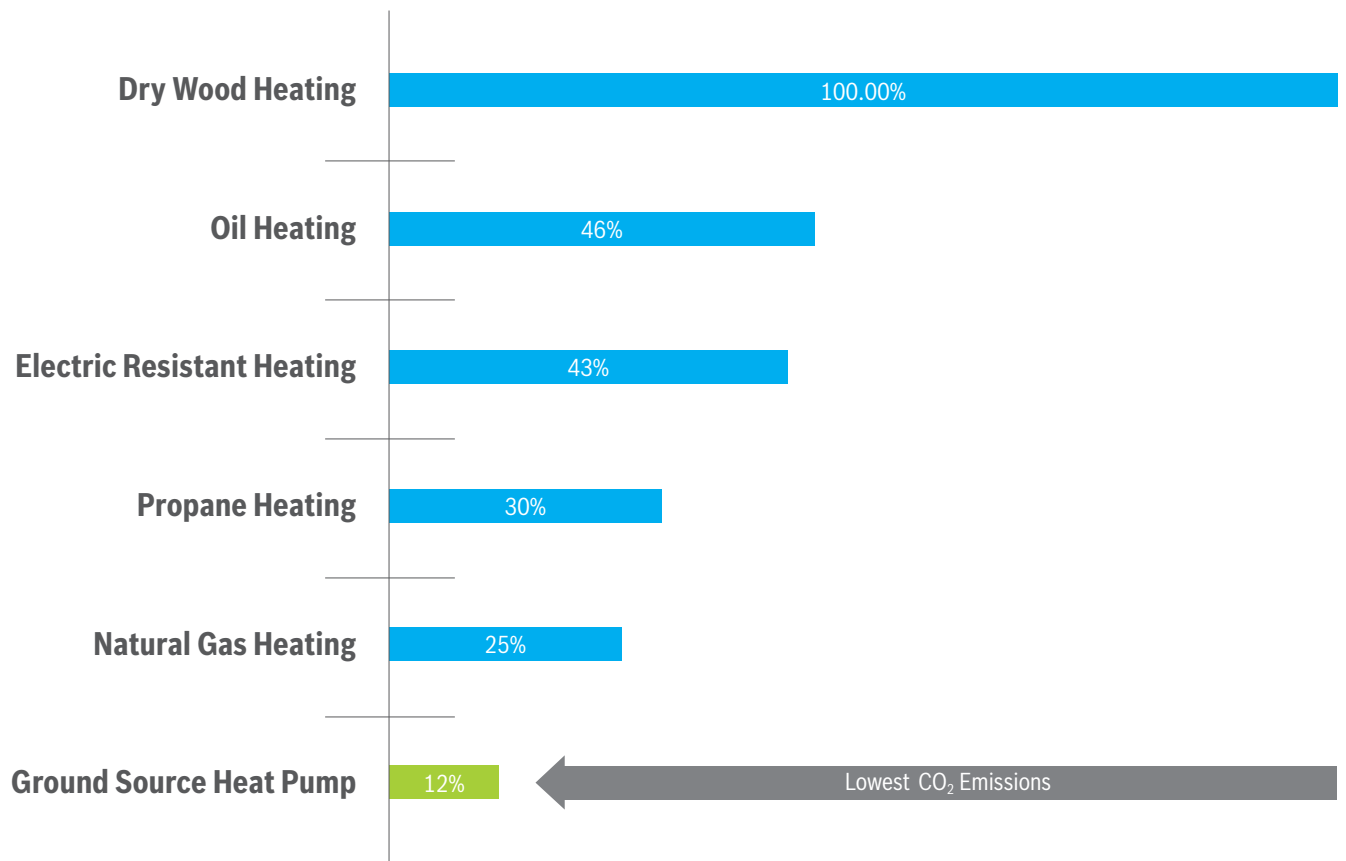
# CO<sub>2</sub> Emissions Estimate

Estimated CO<sub>2</sub> emissions for a building with 54,000 Btu/hr Design Heat Loss at -3 F.

Estimates based on the following CO<sub>2</sub> emission rates:

Electricity - 0.76 CO<sub>2</sub>/KWH; Natural Gas - 110 lb CO<sub>2</sub>/MBTU; Propane - 126.7 lb CO<sub>2</sub>/MBTU; Oil - 188.6 lb CO<sub>2</sub>/MBTU; Dry Wood - 323.8 lb CO<sub>2</sub>/MBTU.

Source: Phoenix Energy Supply; FHP Manufacturing



## ES 2 Stage Series - Powerful

Considered one of the industry's most ultra efficient units, the ES 2 Stage Series provides you with powerful performance. In addition to the UltraTech™ Scroll Compressor, it comes equipped with an ECM (Electronically Commutated Motor) fan. The ECM is factory programmed to vary the airflow based on the stages of compressor operation resulting in additional energy savings up to 60% and a greater level of comfort in the living space.

Available in Vertical, Horizontal, Counter flow and Split system configurations from 2 to 6 tons in various configurations, there is a unit to meet your every need.

### Quiet Operation

Both the UltraTech™ Scroll Compressor and ECM have been engineered for sound reduction making the ES 2 Stage Series one of the quietest ever. With the standard FHP sound package, the compressor is mounted on a floating base pan that reduces sound to an absolute minimum.

### Environmentally Friendly

We are the industry leader in the development of the environmentally friendly technology that is used in the design of the ES 2 Stage Series. This gives you protection from potentially skyrocketing maintenance costs associated with less environmentally friendly refrigerants used in other companies' products.

### Quality

The ES 2 Stage Series units feature coated evaporator coils and stainless steel drain pans as standard equipment to ensure a long and trouble free life. Rigorous factory testing virtually guarantees no hassle from the start while FHP's thirty 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

-  Coated Air Coils
-  Four Sided Filter Rack
-  Stainless Steel Drain Pan
-  Filter Drier
-  Floating Base
-  TXV Valve
-  R410-A Refrigerant
-  Coaxial Heat Exchanger Copper
-  Geothermal
-  Scroll Compressor 2 Stage
-  Unit Protection Module 1
-  Motor Control Interface
-  ECM Motor

### Optional

-  Electrical Heater
-  Coaxial Heat Exchanger Cupronickel
-  Desuperheater
-  DDC Controls
-  Comfort Alert Diagnostics Module



### Coated Air Coils

All FHP Evaporator coils are baked enamel coated with a corrosion resistant material. This coating protects against most airborne chemicals that can lead to accelerated corrosion and premature failure of the coil. All coatings are factory applied for total coil coverage and must pass the equivalent of a 1000-hour salt spray test.



### Floating Base

The floating base pan isolates the compressor from the cabinet and absorbs the vibration energy so that it does not get transmitted to the space. Even under normal operating conditions vibration may be transmitted to the building and introduced into the space as noise. This feature, unique to FHP is standard in all of our units to ensure quiet operation.



### ECM Motor

FHP's premium AP series offers a standard variable speed GE / Regal-Beloit 2.3 ECM blower motor. This programmable motor has 80% mechanical efficiency and will maintain constant airflow even if there are changes in the air distribution system.



### Scroll 2 Stage Compressor

FHP's water source heat pumps employ the industry's most reliable and efficient compressors on the market. Two stage scroll compressors give units up to 60% greater efficiency when compared to a 10 SEER systems and will reduce your energy bills. Two stage units improve temperature and humidity control by over 50% giving a higher level of comfort and lower operating costs. An additional advantage of two stage compressors is that they are up to 4 times quieter than a traditional compressor.





## Comfort Alert Diagnostics Module

The Alert Diagnostics module is installed in the electrical box of our units. It is an available option on almost all FHP units. The tool monitors data from the thermostat and compressor and records any malfunction of the system. LED lights provide the alert code and lead the service technician to the cause of the malfunction. The Alert Diagnostics module can significantly reduce maintenance by improving system technician by up to 75% over systems without this feature.

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## 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.



## Warranty Information

### FHP's limited warranty includes the following components:

- Compressor: 10 years
- Refrigerant Circuit: 10 years
- All other parts: 5 years

### FHP's limited warranty is available for the following product types:

- Sizes from 2 tons to 6 tons with 208/230 single phase voltage

# ES SERIES

2 STAGE

## Performance Data



Horizontal



Vertical



Counter-Flow



Split Systems

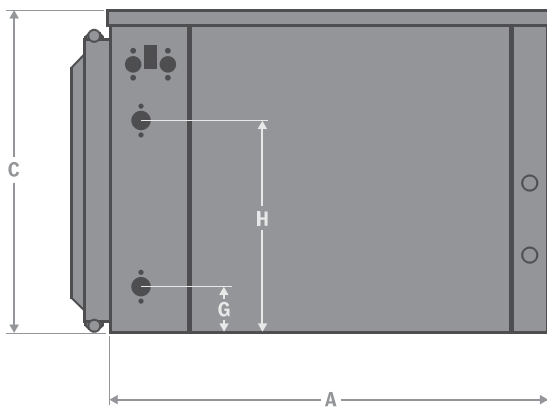
MODEL	ARI / ISO 13256-1 PERFORMANCE DATA											
	ENTERING WATER TEMPERATURES											
	Water Loop (WLHP)				Ground Water (GWHP)				Ground Loop (GLHP)			
	86°F		68°F		59°F		50°F		77°F		32°F	
	CAPACITY AND EFFICIENCY DATA											
	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP	COOLING CAPACITY	EER	HEATING CAPACITY	COP
<b>ES 025</b>												
<b>Part Load</b>	18,800	17.5	20,500	5.1	21,000	30.0	18,000	4.6	20,000	24.5	15,500	4.0
<b>Full Load</b>	26,000	16.0	30,000	5.0	29,000	24.0	25,000	4.6	27,500	18.7	19,000	3.8
<b>ES 035</b>												
<b>Part Load</b>	24,000	17.0	27,000	5.3	27,000	28.0	22,500	4.5	27,000	24.5	20,500	4.0
<b>Full Load</b>	36,000	14.6	43,000	4.8	42,000	21.6	36,000	4.2	38,000	17.2	28,000	3.8
<b>ES 049</b>												
<b>Part Load</b>	34,000	16.0	39,000	5.4	38,000	24.0	32,000	4.6	36,000	21.8	28,500	4.0
<b>Full Load</b>	48,000	13.5	58,000	4.8	54,000	19.0	48,000	4.2	49,000	15.5	38,000	3.6
<b>ES 061</b>												
<b>Part Load</b>	42,000	17.0	48,000	5.4	48,000	26.0	40,000	4.6	45,000	23.5	36,500	4.0
<b>Full Load</b>	60,000	14.0	72,000	4.7	68,000	19.7	61,000	4.3	62,000	15.7	49,000	3.6
<b>ES 071</b>												
<b>Part Load</b>	51,000	15.8	55,000	4.4	57,000	25.2	47,000	4.0	56,000	21.8	42,000	3.6
<b>Full Load</b>	72,000	14.5	80,000	4.5	77,000	19.6	68,000	4.2	74,000	16.3	53,000	3.7

Energy Star Rated Products. 

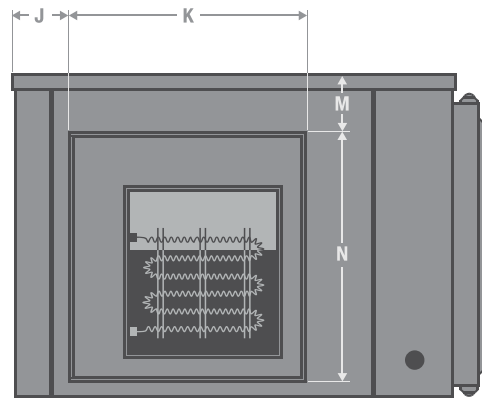
## ES 2 STAGE 025 - 071 SERIES | HORIZONTAL DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	M	N	P	Q	Condenser Water Connections	Recommended Replacement Nominal Filter Size
	Width	Depth	Height		R/A Duct Flg Width								Filter Rack Height	R/A Duct Flg Height		
<b>ES 025, 035</b>	26.00	54.50	21.75	2.00	30.00	22.50	5.25	15.25	4.50	13.75	3.00	15.75	20.50	18.50	3/4" F.P.T.	18X20X1(2)
<b>ES 049</b>	30.00	68.00	21.75	2.50	33.50	32.00	5.25	16.25	5.81	15.75	3.00	15.75	20.50	18.50	1" F.P.T.	18X20X1(2)
<b>ES 061</b>	30.00	68.00	21.75	2.50	33.50	32.00	5.25	18.50	7.66	17.75	2.00	17.75	20.50	18.50	1" F.P.T.	18X20X1(2)
<b>ES 071</b>	30.00	78.00	21.75	2.50	44.00	44.00	5.25	18.50	3.50	16.75	3.75	16.75	20.25	18.50	1" F.P.T.	20x24x1(2)

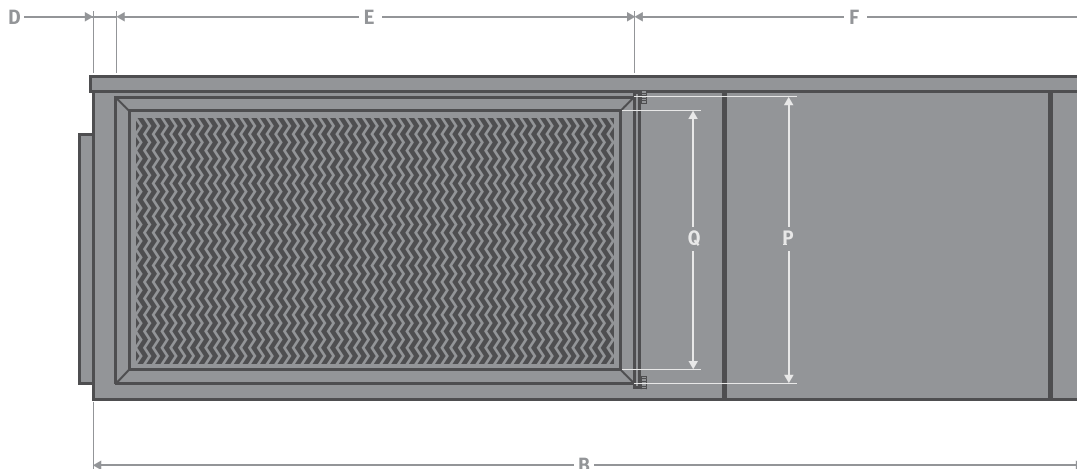
### UNIT FRONT



### UNIT BACK



### LEFT HAND RETURN

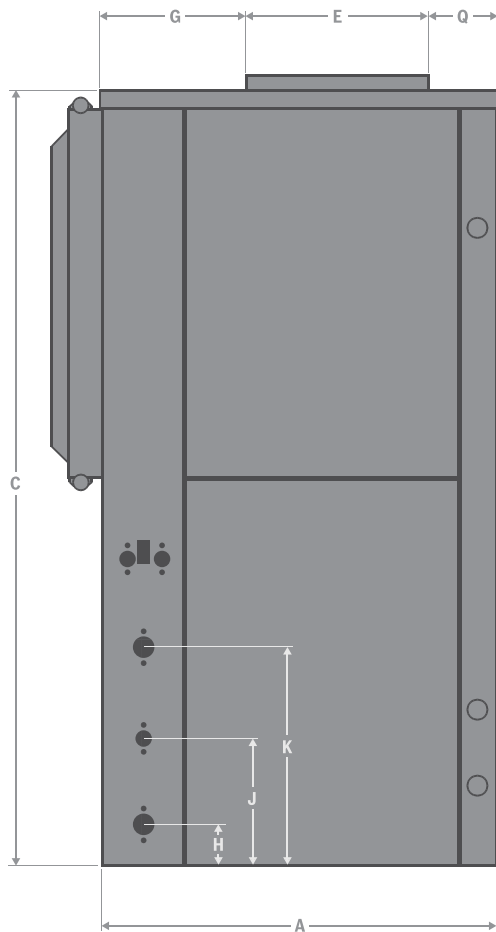


**NOTES:** All dimensions within +/- 0.125". All condensate drain connections are 3/4" FPT. All Heat Recovery connections are 1/2" FPT.  
 Internal electric heat available on 208-230 volt units only. Internal Loop Pump available on 208-230 volt units only.  
 Internal Heat Recovery Kit available on 208-230 volt units only. Units can be field converted between end blow and straight through supply air configurations.  
 Specifications subject to change without notice.

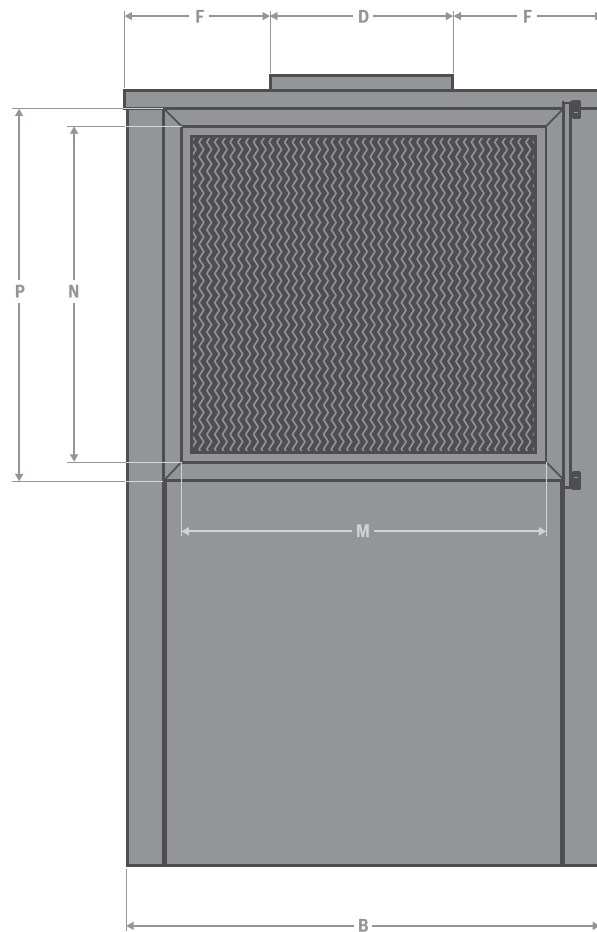
## ES 2 STAGE 025 - 071 SERIES | VERTICAL DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	M	N	P	Q	Condenser Water Connections	Recommended Replacement Nominal Filter Size
	Width	Depth	Height								R/A Duct Flg Width	R/A Duct Flg Height	Filter Rack Height			
<b>ES 025, 035</b>	21.50	26.00	47.25	13.75	15.75	6.13	5.25	5.25	8.00	15.25	22.00	22.25	24.00	4.00	3/4" F.P.T.	24X24X1
<b>ES 049</b>	24.00	32.75	47.25	15.75	15.75	8.38	5.50	5.25	8.00	16.25	28.50	22.25	24.00	4.00	1" F.P.T.	24X24X1
<b>ES 061</b>	26.00	33.25	51.25	17.75	17.75	7.13	6.25	5.25	8.00	18.50	28.50	22.25	24.00	4.00	1" F.P.T.	24X24X1
<b>ES 071</b>	26.00	33.25	58.25	17.75	17.75	8.00	7.75	5.25	8.00	18.50	28.50	30.25	32.00	1.50	1" F.P.T.	16X30X1(2)

### UNIT FRONT



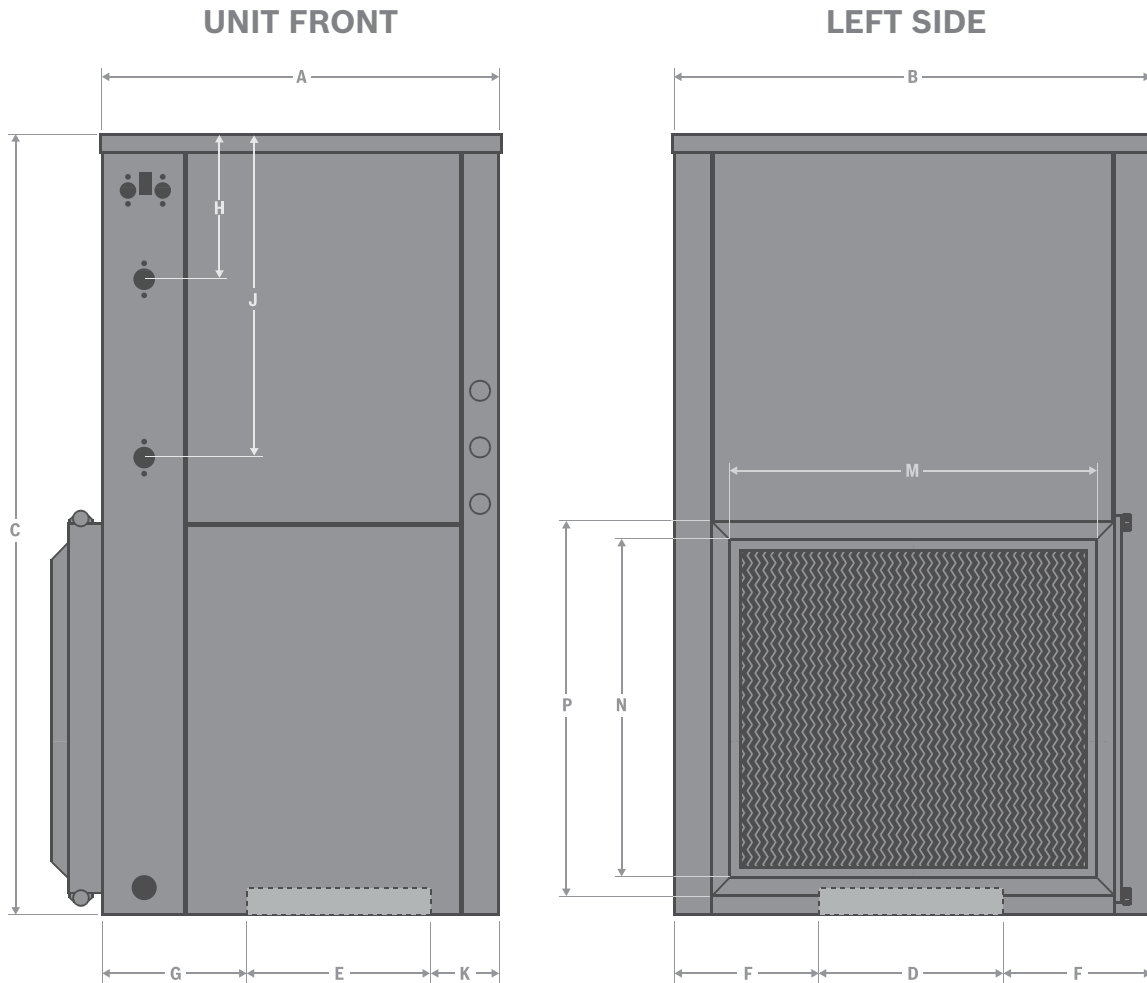
### LEFT SIDE



**NOTES:** All dimensions within +/- 0.125". All condensate drain connections are 3/4" FPT.  
 All Heat Recovery Kit connections are 1/2" FPT. Internal electric heat available on 208-230/1/60 top discharge units only.  
 Internal Loop Pump available on 208-230 volt units only. Internal Heat Recovery Kit available on 208-230 volt units only.  
 Specifications subject to change without notice.

## ES 2 STAGE 025 - 071 SERIES | COUNTERFLOW DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	M	N	P	Condenser Water Connections	Recommended Replacement Nominal Filter Size
	Width	Depth	Height	Blower Opening	Blower Opening						R/A Duct Flg Width	R/A Duct Flg Height	Filter Rack Height		
<b>ES 025, 035</b>	21.50	26.00	47.25	9.25	10.25	8.38	5.00	7.00	17.00	9.75	22.00	22.00	24.00	3/4" F.P.T.	24X24X1
<b>ES 049</b>	24.00	32.75	47.25	10.75	11.50	11.13	6.88	7.50	18.50	8.75	28.00	22.00	24.00	1" F.P.T.	24X30X1
<b>ES 061</b>	26.00	33.25	51.25	12.00	12.50	10.63	5.00	7.00	20.25	10.50	28.00	22.00	24.00	1" F.P.T.	24X30X1
<b>ES 071</b>	26.00	33.25	58.25	12.75	13.50	9.75	4.50	7.00	20.25	11.00	28.00	30.00	32.00	1" F.P.T.	16X30X1(2)



**NOTES:** All dimensions within +/- 0.125". All condensate drain connections are 3/4" FPT. All Heat Recovery Kit connections are 1/2" FPT. Internal electric heat available on 208-230/1/60 bottom discharge units only. Internal Loop Pump available on 208-230 volt units only. Internal Heat Recovery Kit available on 208-230 volt units only. Specifications subject to change without notice.

### How To Start Using Geothermal Energy In Your Home Or Business

You can tap into renewable energy for your home or business with our innovative geothermal heat pump systems by speaking directly with your local FHP-Bosch Group representative.

He can help you determine which system is the best fit for both your home or business and your financial needs. With new incentives available from federal, state and local governments, there has never been a better time to start saving money and doing your part to contribute to a greener, cleaner and better world.



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