Fulton®

INVICTUS

Gas Fired Absorption Heat Pump Systems

- Hydronic Heating and Cooling Applications
- Thermal Efficiencies up to 149%
- Utilization of Renewable Energy
- Air Source, Water Source, Geothermal
- Natural Refrigerants

INVICTUS • Gas Absorption Heat Pump

Leverage the Power of Nature:

The impressive performance of the newest generation of Fulton's engineered systems allows customers to take advantage of renewable energy alongside advanced heating system technologies.

10%
Heat Flue Loss

Up to 59%
Renewable Energy
from a Natural Source
(Ground, Water, Air)

Up to 149%
Energy Available

100%
Inlet Primary Energy
For Combustion

Invictus Heat Pump Overview:

The Invictus is a gas absorption heat pump designed for commercial hydronic heating and cooling applications. Incorporating Invictus units into a system with hydronic boilers yields the ultimate heating performance for the most demanding of climates.

Free and Renewable Energy:

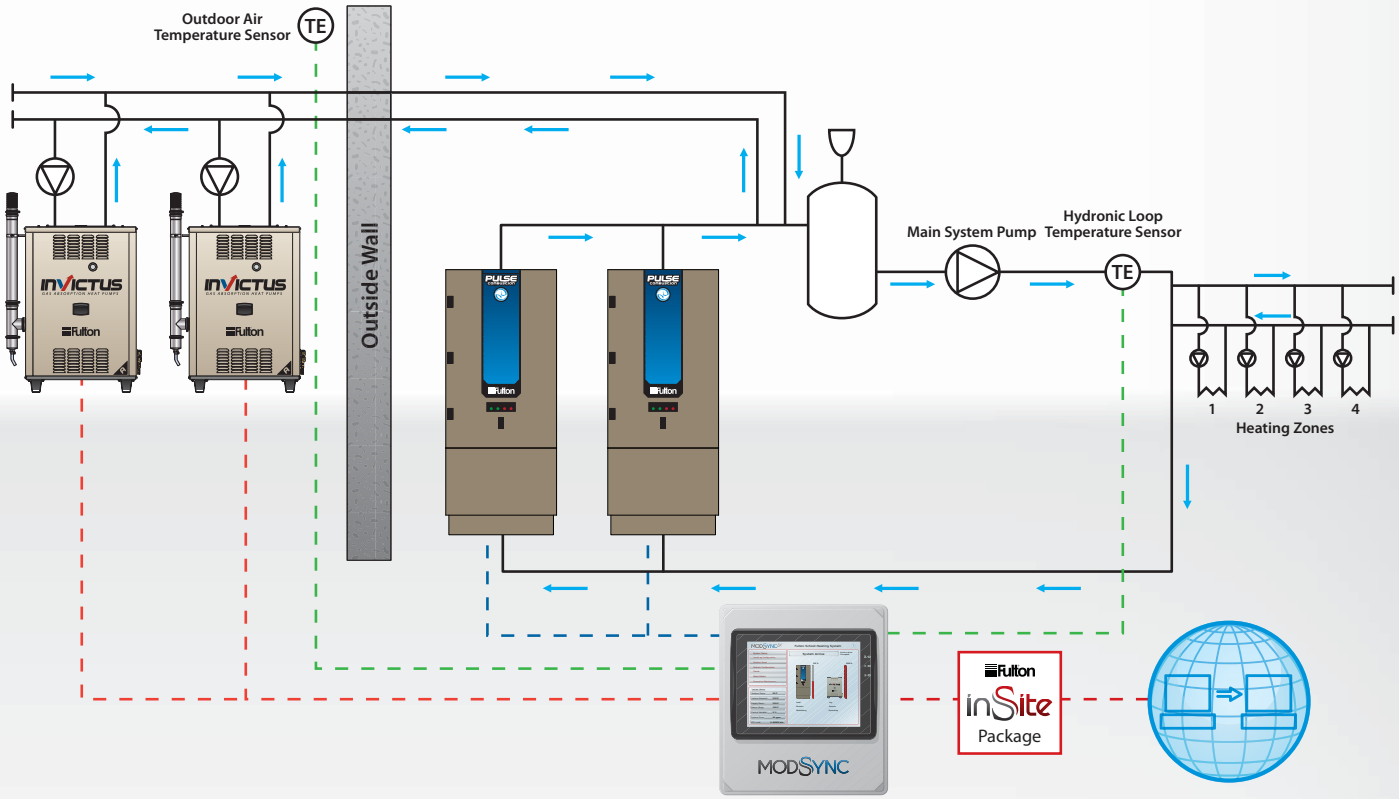
Capturing free energy from a natural source (outdoor air, geothermal, body of water) is accomplished by the Invictus through the use of the ammonia absorption cycle. Ammonia is a natural refrigerant, with no ozone depletion potential or global warming potential concerns.

INVICTUS • Designing the Perfect Heating System

Engineered Systems with Hydronic Boilers and Heat Pumps:

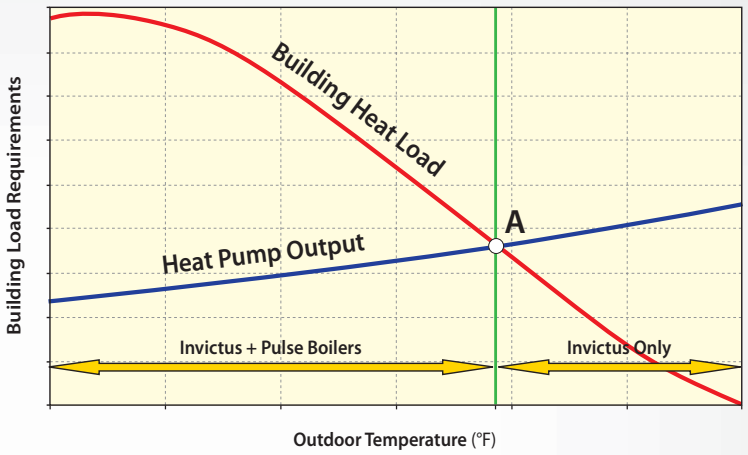
Combine Invictus heat pumps with hydronic boilers and a custom controls system to create the ultimate heating solution yielding **seasonal thermal efficiencies >100%**!

- Utilize Fulton's engineering support and design tools to make key determinations.
- Balance initial capital investment with payback based on savings due to high operating efficiencies.
- Operate system components based on efficiencies and operational capabilities as determined by hydronic loop energy requirements and outdoor air temperature.



Energy Demand Management:

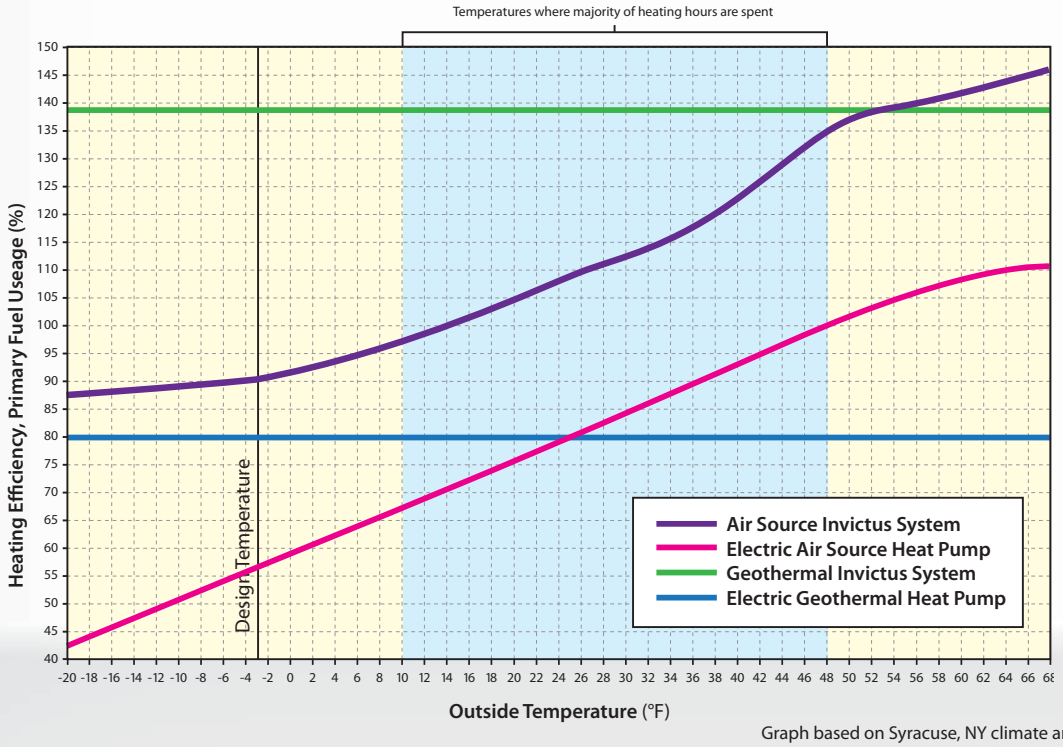
When outdoor temperatures fall below point "A", heat pumps and boilers work together to manage the load. When outdoor temperatures are above point "A" heat pumps can handle heat load on their own.



INVICTUS • Performance Comparisons

Invictus System Performance vs. Other Heating Technologies:

There are many ways to heat a building. Climate data, design temperatures, and the cost of energy should be evaluated when selecting ideal equipment for your system.

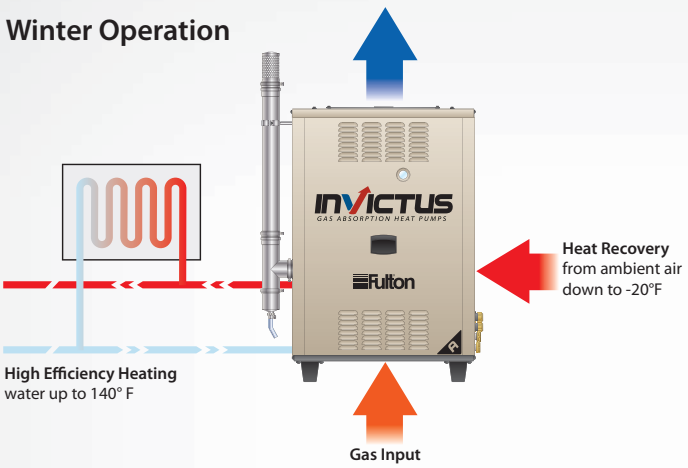


Graph based on Syracuse, NY climate and performance data.
- Geothermal Invictus System: Inlet Cold Water 32°F, Outlet Hot Water 140°F
- Air-Air Heat Pump: Indoor Dry Bulb Temperature 70°F
- Air Source Invictus System: Outlet Hot Water Temperature 140°F

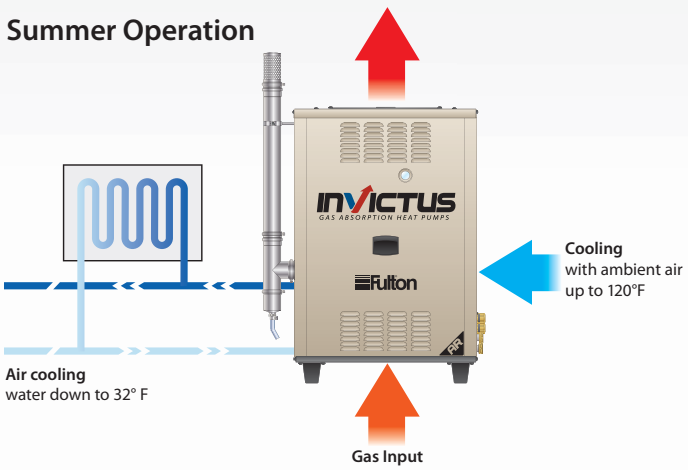
Invictus A and AR Series

Fulton's Invictus A and AR series heat pumps take advantage of renewable energy available in ambient air. There is still enough energy present in ambient air at -20°F to maintain 100% heating efficiency. The A model is used specifically for hydronic heating applications, where the AR model is able to reverse the heat pump cycle and provide cooling in the warmer months of the year.

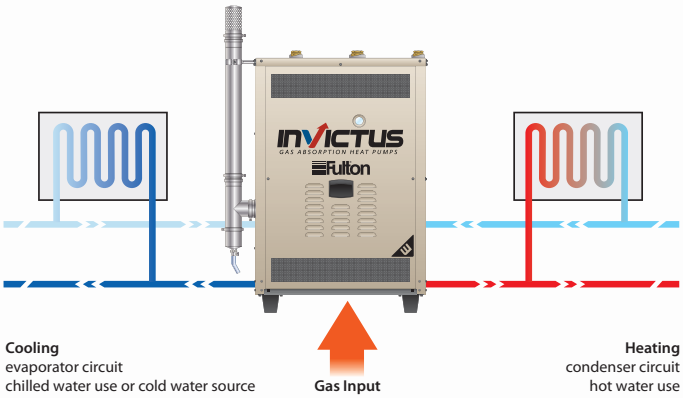
Winter Operation



Summer Operation

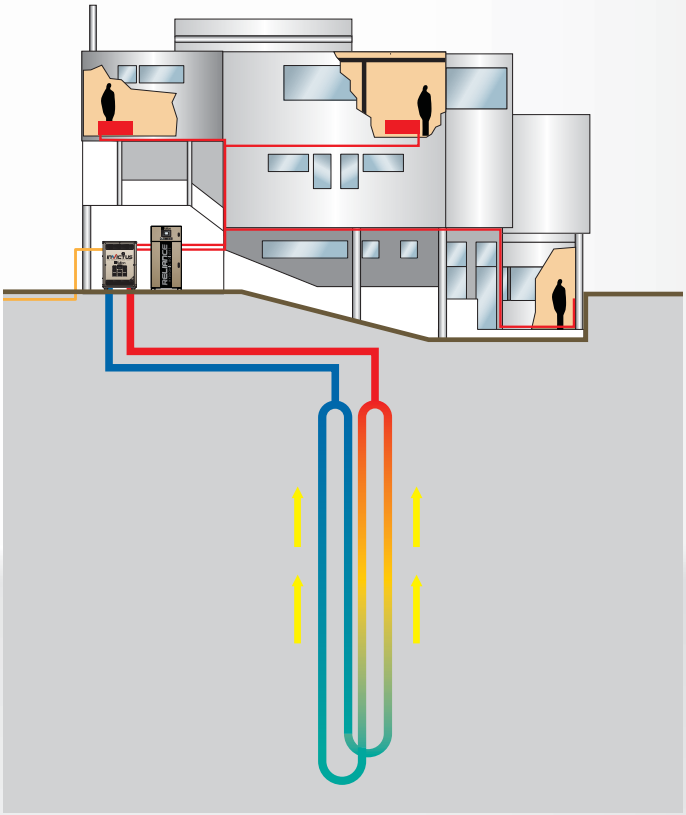


INVICTUS • Renewable Energy



Invictus W and WLB Series

Fulton's Invictus W and WLB series are able to provide heating and cooling simultaneously while still taking advantage of various renewable water resources available such as pools, ponds, underground water tables and the earth itself.

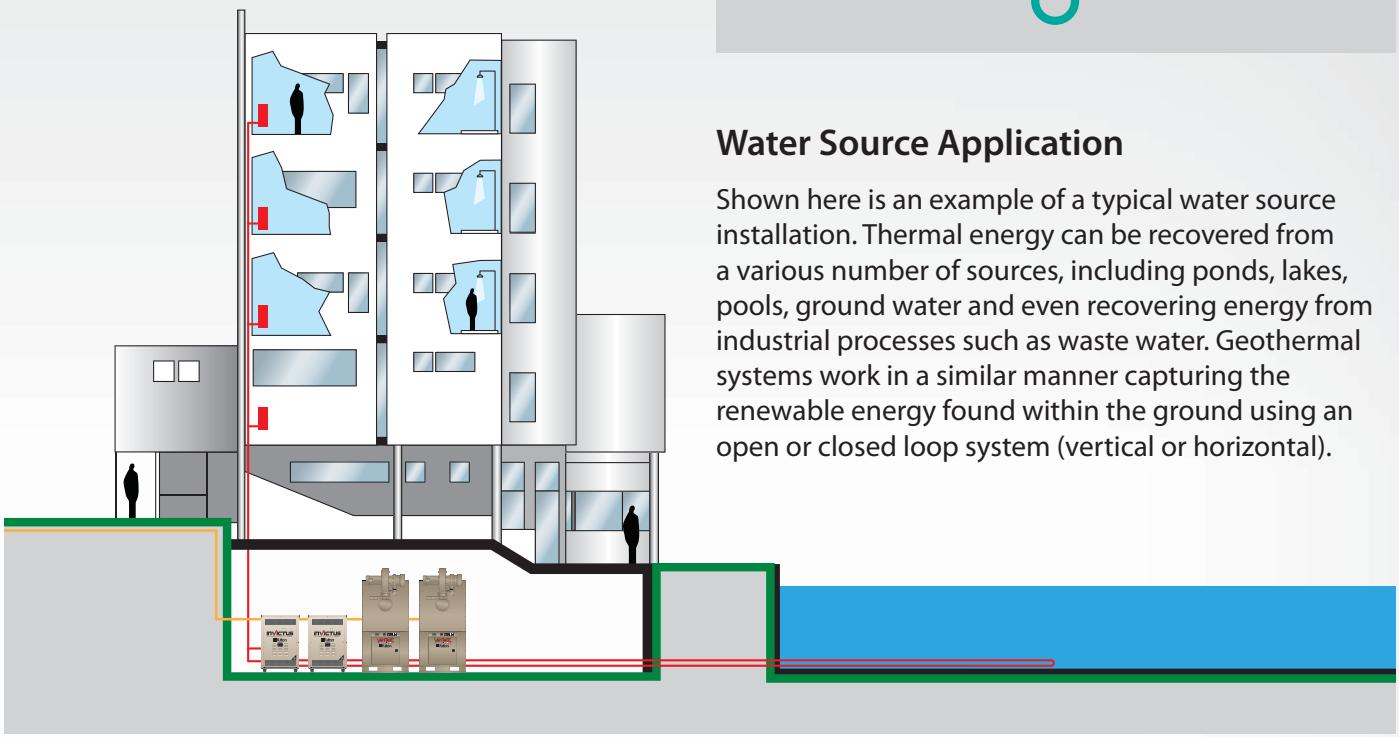


Ground Source / Geothermal Applications

The Invictus WLB geothermal heat pump offers the ultimate in efficiencies.

-Significant efficiency gain over electric heat pump geothermal heating systems.

-Well field 40% smaller than electric geothermal systems.



Water Source Application

Shown here is an example of a typical water source installation. Thermal energy can be recovered from a various number of sources, including ponds, lakes, pools, ground water and even recovering energy from industrial processes such as waste water. Geothermal systems work in a similar manner capturing the renewable energy found within the ground using an open or closed loop system (vertical or horizontal).

INVICTUS • A and AR Series • Specs and Dimensions

Invictus IVS-095-A • Specs

EFFICIENCY		Up To	146%
PERFORMANCE RATINGS - HEATING [1]			
Heating capacity [2]		BTU/h	123,500
Gas input (HHV)		BTU/h	95,500
Ambient operating temperature	maximum	°F	113
	minimum	°F	-20
Hot water temperature	maximum outlet (to hydronic system)	°F	140
	maximum inlet (to unit)	°F	122
ELECTRICAL RATINGS			
Required voltage, 60 Hz, single phase		V	208 - 230
Operating consumption [4]		kW	0.9

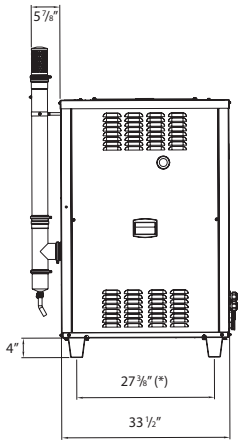
Invictus IVS-095-AR • Specs

EFFICIENCY		Up To	141%
PERFORMANCE RATINGS - HEATING [1]			
Heating capacity [3]	nominal	BTU/h	120,400
Gas input (HHV)	nominal	BTU/h	95,500
Ambient operating temperature	maximum	°F	95
	minimum	°F	-20
Hot water temperature	maximum outlet (to hydronic system)	°F	140
	maximum inlet (to unit)	°F	122
PERFORMANCE RATINGS - COOLING [1]			
Cooling capacity [2]		BTU/h	57,700
Gas input (HHV)		BTU/h	95,500
Chilled water temperature	maximum outlet (to hydronic system)	°F	32
	maximum inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage, 60 Hz, single phase		V	208 - 230
Operating consumption [4]		kW	0.75

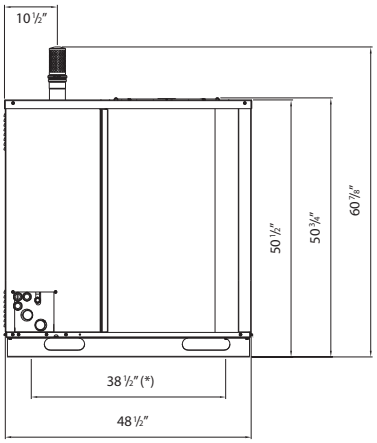
[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.
[2] Heating capacity at standard conditions of 44.6°F ambient temperature. Hot water outlet temperature of 122°F, hot water inlet temperature of 104°F.
[3] Cooling capacity at standard conditions of 95°F ambient temperature. Chilled water outlet temperature of 45°F, chilled water inlet temperature of 55°F.
[4] May vary by ± 10% as function of both power supply and electrical motor input tolerance.
Due to continuous product innovation and development, Fulton reserves the right to change product specifications without prior notice.

Invictus A and AR Series: Dimensions

Dimensions	width	inches	33 1/2
	length	inches	48 1/2
	height	inches	50 3/4

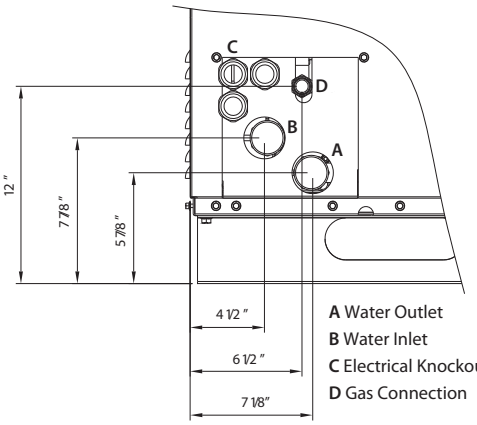


Front View



Right Side View

Connection Panel View



A Water Outlet Ø 1" FPT
B Water Inlet Ø 1" FPT
C Electrical Knockouts Ø 7/8" FPT
D Gas Connection Ø 1/2" FPT

INVICTUS • W and WLB Series • Specs and Dimensions

Invictus IVS-095-W • Specs

EFFICIENCY		Up To	149%
PERFORMANCE RATINGS - HEATING [1] [2]			
Heating capacity		BTU/h	132,400
Gas input (HHV)		BTU/h	95,500
Ambient operating temperature	maximum	°F	113
	minimum	°F	10.4
Hot water temperature	maximum outlet (to hydronic system)	°F	149
	maximum inlet (to unit)	°F	113
PERFORMANCE RATINGS - COOLING [1] [2]			
Cooling capacity		BTU/h	54,600
Gas input (HHV)		BTU/h	95,500
Chilled water temperature	maximum outlet (to hydronic system)	°F	37.4
	maximum inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage, 60 Hz, single phase		V	208 - 230
Operating consumption [3]		kW	0.4

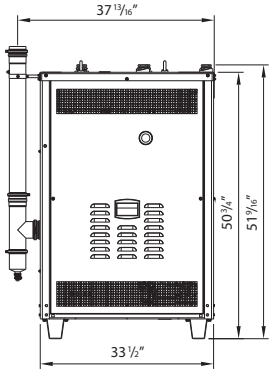
Invictus IVS-095-W LB • Specs

EFFICIENCY		Up To	140%
PERFORMANCE RATINGS - HEATING [1] [2]			
Heating capacity		BTU/h	119,400
Gas input (HHV)		BTU/h	95,500
Ambient operating temperature	maximum	°F	113
	minimum	°F	10.4
Hot water temperature	maximum outlet (to hydronic system)	°F	140
	maximum inlet (to unit)	°F	113
PERFORMANCE RATINGS - COOLING [1] [2]			
Cooling capacity		BTU/h	46,100
Gas input (HHV)		BTU/h	95,500
Chilled water temperature	maximum outlet (to hydronic system)	°F	23
	maximum inlet (to unit)	°F	113
ELECTRICAL RATINGS			
Required voltage, 60 Hz, single phase		V	208 - 230
Operating consumption [3]		kW	0.4

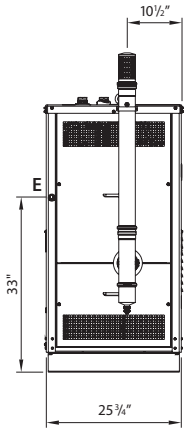
[1] All illustrations and specifications contained herein are based on the latest information available at the time of publication.
[2] Invictus-W standard test conditions: W50/W122. Invictus-W LB standard test conditions: B32/W122.
[3] May vary by ± 10% as function of both power supply and electrical motor input tolerance.
Due to continuous product innovation and development, Fulton reserves the right to change product specifications without prior notice.

Invictus W and W LB Series: Dimensions

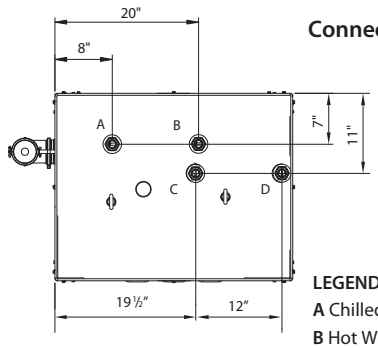
Dimensions	width	inches	33 1/2
	length	inches	25 3/4
	height	inches	50 3/4



Front View



Left Side View



Top View

Connection Panel View

LEGEND

A Chilled Water Inlet	Ø 1" FPT
B Hot Water Inlet	Ø 1" FPT
C Chilled Water Outlet	Ø 7/8" FPT
D Hot Water Outlet	Ø 1/2" FPT
E Electronic Knockouts	Ø 7/8" FPT
E Gas Connection	Ø 1/2" FPT

Fulton®

The heat transfer innovators.

Fulton Heating Solutions, Inc.
972 Centerville Road, Pulaski, NY 13142
Call: (315) 298-5121 • Fax: (315) 298-6390

www.fulton.com

invictus-bro-2010-0217