ISO9001:2015 REGISTERED

Alternate Energy Systems, Inc.

LPG Vaporizers - LP/Air Blenders - Gas/Gas Blenders - NatGas Backup Systems - PeakShaving Systems

UPDATE June 2019

Water Bath LPG Vaporizers

with "Smart" Liquid Carryover Protection

08-Series

WB-458 in standard Configuration

05-Series

WB-2505 with standard Extended Control Room (Maintenance House)

- Capacities 168 gph to 10000 gph (322 kg/h to 20 metric tons per hour)
- For Propane, Butane, and other LPG
- Forced Draft Power Burners Standard
- Low-Fire/High-Fire Modulation
- Small Footprint, High Efficiency
- Conforms to ASME, NFPA, PED/CE
- FM approved, CE Mark available
- Utility Grade Construction
- All-Welded Design
- Step-in Control Room for small models
- Walk-in Control Room for larger models
- PLC Controls with First-Out Monitor
- Color LCD Touch Screen

- Many Standard Options:
  - ⇒ Extended Control Room (Maintenance House)
  - ⇒ Remote Monitoring and Operation (Ethernet) via Web Browser
  - ⇒ Integration with LPG/Air Mixers for Standby Systems and PeakShaving Systems
  - ⇒ Siemens or Allen-Bradley PLC
  - ⇒ High-Pressure up to 400 psi
  - ⇒ Integration into Plant Monitoring
  - ⇒ Wireless Access
  - ⇒ Multi-Language Operator Interface
  - ⇒ Gas Leak Monitor

What are LPG Vaporizers ?

LPG vaporizers apply heat to Propane, Butane, or another LPG (Liquefied Petroleum Gas). This heating converts liquid LPG into superheated LPG Vapor. It may sound strange that heat is required to vaporize LPG when Propane will boil at -44°F (-42°C) and Butane at 32°F (0°C), but, when LPG vaporizes by expansion alone, it causes a refrigeration action. In applications with high LPG flow, the uncontrolled vaporization could freeze pipe, valves, regulators, and even burner nozzles. Therefore, controlled heat input is required to offset the refrigeration action.

Standard Features and Options 05-Series and 08-Series

- Multi-Pass High-Efficiency LPG Vapor Tube with welded heat transfer fins rated for 250 psig @ 650 °F (higher pressure available on request).
- Designed and manufactured per ASME Pressure Vessel Code, Section VIII, Division 1, and latest edition of NFPA 58.
- Fully Integrated Power Burner with Honeywell Electronic Flame Safeguard.
- High-Capacity Water Circulation Pump with internal Diffuser.
- All models are FM approved. CE Configuration available.
- "Smart" Liquid Carryover Protection.
- UL listed Safety Pressure Relief Valve.
- UL listed Solenoid Valve (Liquid Inlet).
- Safety Controller or Safety PLC
- Vaporizer Control Panel with PLC, Electronic Operator Interface with color LCD display and Touch Screen; First-Out Monitor; TrendLine recording, Alarm History and EventLogs in real time and on USB-Stick with storage space for 2+ years; remote access via Ethernet/Internet standard on all models.
- Electronic Thermostat with multi-point burner modulation standard on all 05-Series models.
- Operational from the Artic Circle to the Arabian Peninsula. (-40°F to +130°F; -40°C to +55°C)
- Factory Primed, Painted, and Tested.

Options:

- ASME "U" Stamp for Vaporization Tubes
- Control Panel with UL 508A certification or CE Mark
- High-Pressure Heat Exchangers
- Custom Control Panels and System Integration
- Wireless Remote Monitoring and Control
- Remote Monitoring and Control via cellular modem
- Hydrocarbon Detector (Gas Leak Monitor)

Standard Control Panel with Siemens S7-1200F Safety PLC, automatic circuit breakers, Ethernet Switch, and Honeywell Flame Safeguard.

Applications

AES Water Bath Vaporizers have been continuously manufactured since 1974 and have seen continuous design improvement. This has lead to the most versatile and most reliable line of Water Bath Vaporizers on the market today. AES currently manufactures the 08-Series for capacities from 168 gph (322 kg/h) to 508 gph (1000 kg/h); and the 05-Series for capacities from 455 gph (873 kg/h) to 10000 gph (20 metric tons per hour).

Installations around the world include Peak Shaving Plants for Gas Utilities, Standby Plants for large industrial users, Backup Systems for government and defense installations, Primary Fuel Source for areas without natural gas supply or for areas preparing for connection to natural gas, Power Plants, Glass and Brick Manufacturing, Metal Processors, Chemical Plants, Food Processing, etc.

AES Water Bath Vaporizers can be used "stand-alone", or in combination with LPG/Air mixing systems, producing Synthetic Natural Gas (SNG) that is directly interchangeable with natural gas.

How do Alternate Energy Systems' Water Bath Vaporizers work ?

Water Bath Vaporizers are available in standard capacities from 168 gallons per hour (gph), to 10,000 gph. From the outside, they differ primarily in their size. Inside, the burner capacity, the amount of heat exchange medium, and the active heat exchange areas of the vapor tube and the burner tube determine their vaporization capacity.

The drawing below shows a typical configuration of a 1000 gph vaporizer. The main components of the vaporizer are the Burner Tube (D) with the Exhaust Stack (A), the Vapor Tube (B) with Welded Fins (C), the Steel Shell (K) with the integral Burner and Control Room (Q), the Liquid Inlet Train (F, G, I, J), the Vapor Outlet Header (E) with "Smart" Liquid Carryover Protection (K, L), and the Gas Train (H, W) for the Power Burner (Z).

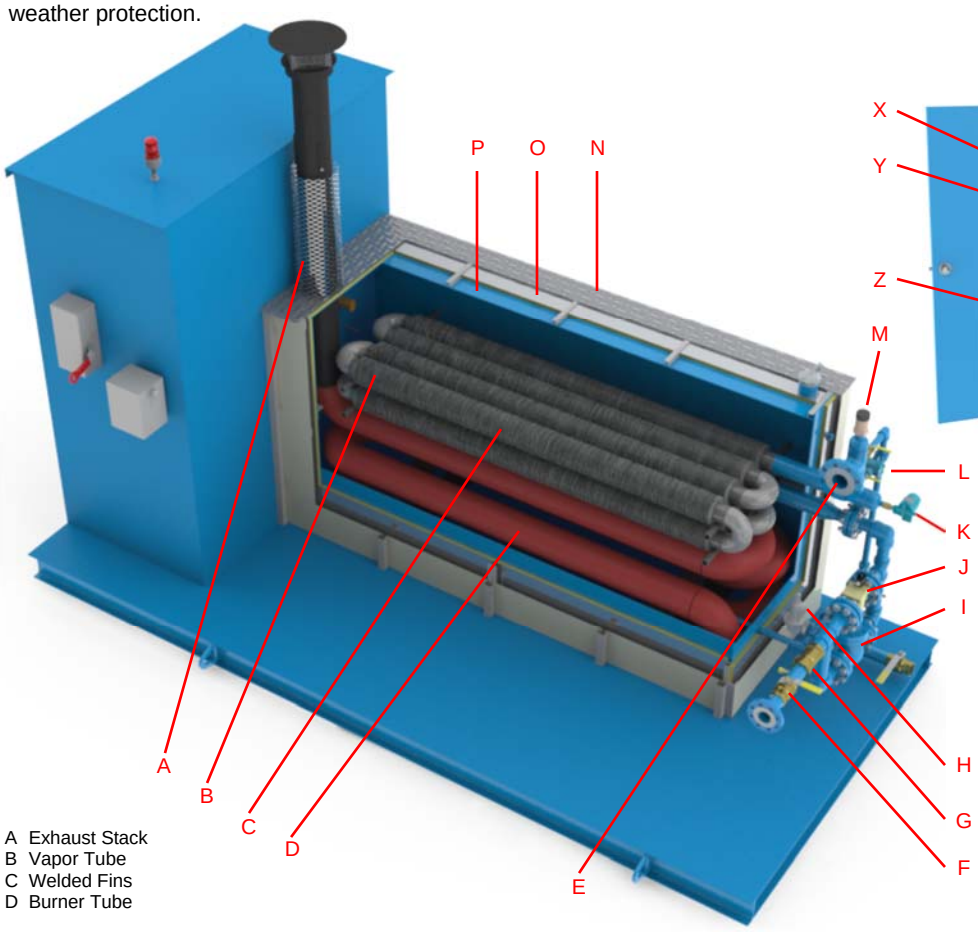
Also shown on the drawing are the Water Tank Insulation (O), the Outer Sheet Metal Shell (N), the Vaporizer Control Panel (T), the Main Fuel Gas Valve (W), the Water Circulation Pump (U), and the controls for Water Bath Temperature (X) and Low Water Level (R).

The Burner Tube and the Vapor Tube are fully immersed in a heat transfer solution (water/glycol). LPG vapor from naturally occuring vaporization is taken from the Vapor Outlet Header (E) and fed through a Pressure Regulator (H) to the Burner (Z). The Burner heats the heat transfer solution through the Burner Tube (D). Adjustable temperature controls (X) maintain a constant water temperature. The heat from the water is transferred through the Vapor Tube (B) to the LPG, which then evaporates and exits the system through the Vapor Outlet Header (E). The Sensor of a Temperature Transmitter (K) is inserted deep into the Vapor Outlet Header (E). Its signal is processed together with the signal from a dedicated pressure transmitter (L) by the "smart" Liquid Carryover protection function. "Smart" constantly compares the pressure and temperature signals against the vapor pressure/temperature saturation curve of the LPG that is being vaporized. The properties of the LPG (Propane/Butane percentage), and the "safety margin" (how close the pressure/temperature are allowed to come to the saturation curve) can be entered through the operator interface. If the safety margin is "breached", the liquid inlet valve (J) is closed after an adjustable alarm delay period has elapsed. This prevents liquid from being carried over to the distribution system.

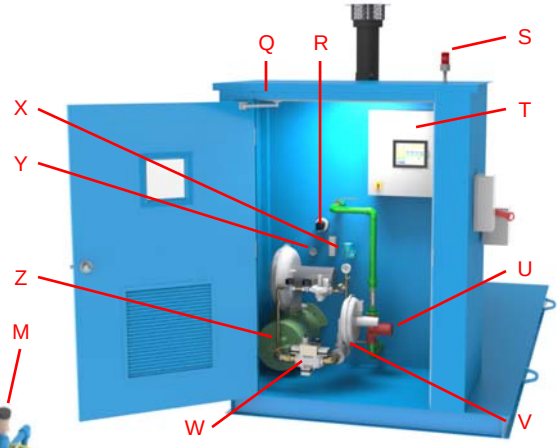
The signal from the vapor temperature transmitter is also used to keep the Liquid Inlet Valve closed until the LPG vapor at the vaporizer outlet has reached an adjustable minimum temperature.

Other components in the Liquid Inlet Train are the manual Liquid Shutoff Valve (F), the Strainer (G), and the Check Valve (I), allowing excess LPG pressure in the Vapor Tube to vent back through the liquid supply line into the storage tank.

The insulation of the water bath tank and the thorough corrosion protection allow the vaporizer to be installed outside without any further weather protection.



A Exhaust Stack
B Vapor Tube
C Welded Fins
D Burner Tube



E Vapor Outlet Header
F Liquid Inlet Train
G Strainer
H First-Stage Fuel Regulator
I Check Valve
J Solenoid Valve
K Temperature Transmitter
L Pressure Transmitter
M Relief Valve
N Outer Sheet Metal Shell
O Water Tank Insulation
P Steel Shell
Q Burner and Control Room
R Low Water Level Cutoff
S Alarm Beacon
T Vaporizer Control Panel
U Water Circulation Pump
V 2nd-Stage Fuel Regulator
W Main Fuel Gas Valve
X Temperature Controls
Y Thermometer
Z Burner

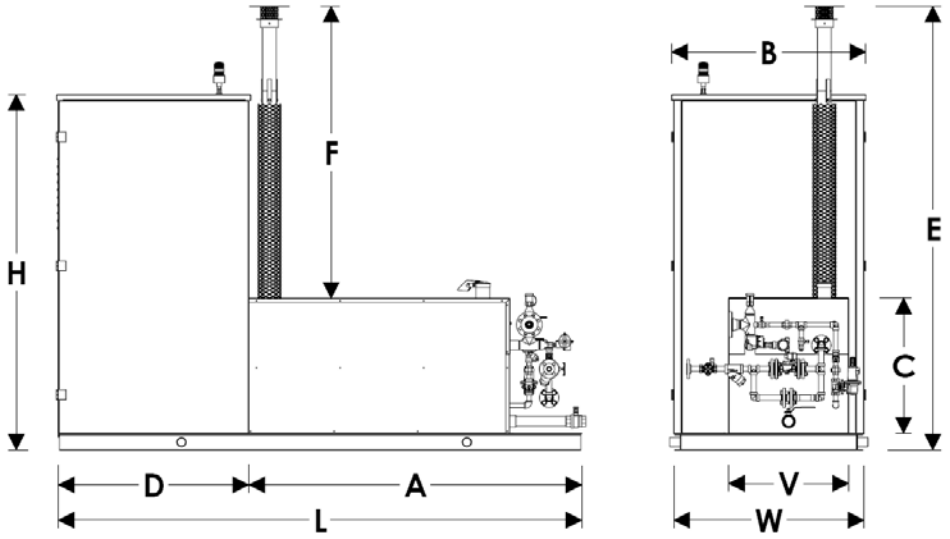
Specifications - 08-Series - WB-168 to WB-508

Standard Specifications		WB-168	WB-208	WB-258	WB-308	WB-358	WB-408	WB-458	WB-508
Nominal Vaporization Capacity [1]	gph	168	208	258	308	358	408	458	508
	kg/h	322	399	495	585	687	783	879	975
	MMBTU/h	15.5	19.1	23.7	28.1	32.9	37.5	42.1	46.8
	kW	4500	5600	6900	8200	9600	11000	12300	13700
Water Tank Capacity	gal	165 to Fill Plug							
	m^3	0.625 to Fill Plug							
Burner Capacity	MMBTU/h	0.200	0.250	0.310	0.370	0.430	0.490	0.550	0.610
	kW	59	73	91	108	126	144	161	179
Burner Type		Compact Forced-Draft Power Burner, fully integrated; DUNGS Main Gas Valve with PoC							
Design Temperature	°F	650							
	°C	343							
Design Pressure	psi	250							
	bar	17.2							
Standard Safety Features									
Electronic Flame Safe Guard		Honeywell 7800-Series; PLC Input with Status Indication at Operator Interface; Alarm History.							
Low Burner Fuel Gas Pressure		All Burner Safety Interlocks, optional Gas Leak Monitor contacts, and ESD circuits are connected to inputs at the agency-approved Safety Controller (or Safety PLC). The Safety System energizes agency-approved force-guided expansion relays only if all safety circuits are “okay”. The expansion relays supply control power to the outputs of the PLC. If the Safety System detects a problem, the expansion relays are de-energized, effectively taking control power away from the outputs of the PLC. This configuration makes the safety functions independent from the general-purpose PLC functions and elevates the safety classification of the vaporizer control system to Performance Level 4 (formerly known as SIL 3). The Safety Status is indicated at the Operator Interface and recorded in the Alarm History.							
High Burner Fuel Gas Pressure									
Low Water Level Cutoff									
High Bath Temperature Limit									
Gas Leak Monitor in Control Room	40% LEL								
Gas Leak Monitor in Control Room	Trouble								
Dual E-Stop Circuits									
Liquid Carryover Protection		“Smart”; Press. and Temp. transmitter in Vapor Outlet; selectable LPG Type; adjustable Safety Margin; Alarm History.							
Relief Valve for Vaporization Tubes		X	X	X	X	X	X	X	X
Relief Valve for Burner Gas Train		X	X	X	X	X	X	X	X
Liquid Inlet Connection		1-inch 300# Raised Face ANSI Flange (DN25 PN40 DIN Flange available at no additional charge)							
Liquid Inlet Valve		1-inch 250 psi Flanged Solenoid Valve; 110/220 VAC; with Check Valve Bypass; Globe Valve for Manual Shutoff.							
Vapor Outlet Connection		2-inch 300# Raised Face ANSI Flange (DN50 PN40 DIN Flange available at no additional charge)							
PLC and Electronic Operator Interface (EOI)									
Standard PLC / EOI		Siemens S7-1200F PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.							
Optional PLC / EOI		Allen-Bradley MicroLogix-1400 PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); Ethernet Interface; 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.							
Optional PLC / EOI		Contact AES for other PLC/EOI configurations (Siemens, Allen-Bradley, GE, Bristol-Babcock, …)							
Electrical Requirements (other Voltages available)		110/220/230VAC 50/60Hz; 15A Circuit; 1-Phase; galvanically isolating step-up/step-down transformer included.							
Circuit Protection		Automatic Circuit Breakers with Manual Reset for all AC and DC Circuits; Main Breaker/Disconnect.							
Design Criteria									
Vaporizer		Designed and manufactured to comply with the latest edition of NFPA Pamphlet 58; FM approved. European CE Mark available (third-party examination by Notified Body).							
LPG Heat Exchanger		Designed and manufactured in compliance with Boiler and Pressure Vessel Code Section VIII, Division 1. ASME “U”-Stamp available. CE-marked vaporizers comply with European PED.							
Control Panel		General-purpose wiring, compliant with National Electric Code (NEC; NFPA #70). UL-508A available. CE-marked vaporizers comply with all applicable European Directives.							
Mechanical Construction									
Skid		1/4-inch (6.35mm) Steel Deck Plate on all-welded 4-inch (100mm) Tubular Frame with Cross-Members; Lifting Lugs; Stainless Steel grounding Lugs; mechanically cleaned, primed, and painted (dark-gray, RAL 7043).							
Bath Box		1/4-inch (6.35mm) all-welded steel walls with internal stiffeners and supports for LPG Heat Exchanger.							
Water Circulating Pump		Wet-Cartridge-Type Hot-Water Circulator installed inside Vaporizer Control Room; Diffuser in Water Bath.							
Insulation		Fiber board insulation with Aluminum backing on side walls, top plate, and front and rear walls.							
Bath Box Cover		16-gauge (1.5mm) Sheet Metal, pre-formed, powder-coated (beige RAL 1015).							
Control Room		16-gauge (1.5mm) Sheet Metal, pre-formed, powder-coated (beige RAL 1015); lockable double-door; window insert.							
Dimensions [2]	inches	Overall: 48(W) x 132(L) x 110(H) Control Room: 48(W) x 48(L) x 82(H) Shipping Height: 86 (removable exhaust)							
	m	Overall: 1.22(W) x 3.35(L) x 2.79(H) Control Room 1.22(W) x 1.22(L) x 2.08(H) Shipping Height: 2.18m							
Shipping Weight [2]		3700 lbs 1700 kg (can be shipped inside standard 20-ft ISO Container)							

(1) Nominal Capacity for Vaporization of HD-5 @ 0°F (-18°C) Liquid Temperature (2) Dimensions and weights are approximate Specifications subject to change without notice

Drawings, 08-Series

Full-Size Step-in Control Room on all 08-Series Models.



Dimensions for all 08-Series Vaporizers with Full-Size Step-in Control Room

		W	L	H	V	A	B	C	D	E	F	Concrete Slab
WB-168 to WB-508	inches	48	132	86	30	84	48	34	48	108	70	8' x 15'
	m	1.22	3.35	2.18	0.76	2.13	1.22	0.86	1.22	2.74	1.77	2.44m x 4.58m

Cut-Away of a 08-Series Vaporizer

Safety Controller for Performance Level 4 (SIL 3)

In recognition of already implemented international standards, and in anticipation of future US-requirements, all AES vaporizers of the 08-Series and the 05-Series are now equipped with Agency-approved Safety Controllers or Safety PLCs (per EN ISO 13849-1).

Safety Controllers/PLCs are self-diagnosing, self-monitoring, dual-redundancy, multi-channel electronic devices that monitor inputs from fail-safe safety-circuits. If any of the monitored channels detects a problem, the output of the safety relay is immediately turned OFF.

In 08-Series and 05-Series vaporizers the "permissive" outputs of the Safety Controller must be energized before the Burner can be started, or the Liquid Inlet Valve can open. If one or more inputs to the safety relays are de-energized while the Burner is operating, or while the Liquid Inlet Valve is open, the burner is stopped and the Liquid Inlet Valve is closed.

Two expansion relays provide independent control power to the outputs of the PLC for the burner controls, and for all other safety-related functions.

The use of Safety Controllers elevates the safety of AES vaporizers to "Performance Level 4" (SIL 3).

Gas Leak Monitor (Optional)

All AES vaporizers of the 08-Series and the 05-Series are prepared for optional Gas Leak Monitors (GLM) with long-life infrared sensors (expected sensor life 10+ years) in the Vaporizer Control Room. The GLM issue a Warning Alarm if gas levels above 20% LEL (Lower Explosive Limit) are detected or if the self-diagnostics of the GLM detect a sensor failure. If the gas concentration reaches 40% LEL a System Shutdown Alarm is issued.

All GLM have a graphic LED display that shows the current gas level and provides overall status information (see picture). The Vaporizer's HMI repeat the LEL display and the status of the alarm channels at the Electronic Operator Interface.

Alternate Energy Systems has selected the MSA Ultima X5000 as our standard GLM for its superior quality, reliability, ease-of-use and wide range of approvals (FM, CSA, ATEX, IECEx, INMETRO, …). All setup and maintenance can be performed without opening the transmitter or declassifying a hazardous area trough EZ touch buttons or integrated Bluetooth interface from any Android or Apple device.

The GLM communicates with the vaporizer controls by means of three static relay signals (40% LEL CH1; 40% LEL CH2; Sensor Trouble), and a 4-20mA analog signal (for on-screen LEL indication).

All menu items and messages are displayed in plain English (can also be switched to French, Portuguese, Spanish, Russian, Chinese, and German).

LPG with High Butane Content or Low Liquid Temperature

The vaporization capacity of all vaporizers in this brochure is given for "HD-5" commercial Propane at 0°F (-18°C), for pressures up to 200 psi (14 bar).

If the lowest expected ambient temperature is below 0°F (-18°C), or if the Propane content in the LPG is less than 80%, more heat is required to vaporize the LPG.

When more heat is required for the desired vaporization rate, the burner capacity and the heat transfer area must both be increased. In most cases, our vaporizers can be re-configured without changing their physical dimensions.

Please make certain that you include all relevant operating parameters with your request for quotation. This includes LPG composition, lowest expected ambient temperature, and required discharge pressure.

Examples: Apprx. heat input to vaporize 1000 gal (2000 kg) LPG at 50 psi (3.5 bar)
(Superheat 30°F / 16°C - Heat Exchanger Efficiency 80%)

Ambient (Liquid) Temperature	Burner Input	100/0 P/B	70/30 P/B	50/50 P/B	30/70 P/B	0/100 P/B
-40°F (-40°C)	MMBTU kWh	1.17 344	1.21 355	1.25 366	1.29 378	1.38 404
0°F (-18°C)	MMBTU kWh	1.09 320	1.13 330	1.16 341	1.20 352	1.29 377
32°F (0°C)	MMBTU kWh	1.03 300	1.06 310	1.09 320	1.13 331	1.21 356
50°F (10°C)	MMBTU kWh	0.99 290	1.02 299	1.05 309	1.09 319	1.17 344
68°F (20°C)	MMBTU kWh	0.95 279	0.98 288	1.02 298	1.05 308	1.13 332

Specifications - 05-Series - WB-455 to WB-1805

Standard Specifications		WB-455	WB-555	WB-655	WB-755	WB-855	WB-1005	WB-1205	WB-1505	WB-1805
Nominal Vaporization Capacity [1]	gph	455	555	655	755	855	1005	1205	1505	1805
	kg/h	873	1065	1257	1449	1641	1929	2312	2888	3464
	MMBTU/h	42	51	60	69	79	92	111	139	166
	kW	12,300	14,950	17,590	20,220	23,150	26,960	32,530	40,730	48,650
Water Tank Capacity	gal	220			385		495			990
(to Fill Plug)	m^3	0.83			1.46		1.87			3.75
Burner Capacity	MMBTU/h	0.54	0.66	0.78	0.9	1.02	1.2	1.44	1.8	2.16
	kW	158	193	229	264	299	352	422	528	633
Burner Type		Forced-Draft Power Burner, Maxon or similar; Low-Fire/High-Fire Modulation; DUNGS Main Gas Valve with PoC.								
Burner Configuration		4-inch TOT with integrated Blower			6-inch TOT with integrated Blower					8" TOT
Design Temperature	°F	650								
	°C	343								
Design Pressure	psi	250								
	bar	17.2								
Standard Safety Features										
Electronic Flame Safe Guard		Honeywell 7800-Series; PLC Input with Status Indication at Operator Interface; Alarm History.								
Low Burner Fuel Gas Pressure		All Burner Safety Interlocks, optional Gas Leak Monitor contacts, and ESD circuits are connected to inputs at the agency-approved Safety Controller (or Safety PLC). The Safety System energizes agency-approved force-guided expansion relays only if all safety circuits are "okay".								
High Burner Fuel Gas Pressure										
Low Water Level Cutoff		The expansion relays supply control power to the outputs of the PLC. If the Safety System detects a problem, the expansion relays are de-energized, effectively taking control power away from the outputs of the PLC.								
High Bath Temperature Limit										
Gas Leak Monitor in Control Room	40% LEL	This configuration makes the safety functions independent from the general-purpose PLC functions and elevates the safety classification of the vaporizer control system to Performance Level 4 (formerly known as SIL 3).								
Gas Leak Monitor in Control Room	Trouble									
Dual E-Stop Circuits		The Safety Status is indicated at the Operator Interface and recorded in the Alarm History.								
Liquid Carryover Protection		"Smart"; Press. and Temp. transmitter in Vapor Outlet; selectable LPG Type; adjustable Safety Margin; Alarm History.								
Relief Valve for Vaporization Tubes		X	X	X	X	X	X	X	X	X
Relief Valve for Burner Gas Train		X	X	X	X	X	X	X	X	X
Liquid Inlet Connection		1-inch 300# Raised Face ANSI Flange (DN25 PN40 DIN Flange)					2-inch 300# RF ANSI (DN50 PN40 DIN Flange)			
Liquid Inlet Valve		250 psi Flanged Solenoid Valve; with Check Valve Bypass; Globe Valve for Manual Shutoff.								
Vapor Outlet Connection		2-inch 300# Raised Face ANSI Flange (DN50 PN40 DIN Flange)					3-inch 300# RF ANSI (DN80 PN40 DIN Flange)			
PLC and Electronic Operator Interface (EOI)										
Standard PLC / EOI		Siemens S7-1200F PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.								
Optional PLC / EOI		Allen-Bradley MicroLogix-1400 PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); Ethernet Interface; 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.								
Optional PLC / EOI		Contact AES for other PLC/EOI configurations (Siemens, Allen-Bradley, GE, Bristol-Babcock, …)								
Electrical Requirements (other Voltages available)		380/400/480VAC 50/60Hz; 20A Circuit; 3-Phase; galvanically isolating transformer for control power included.								
Circuit Protection		Automatic Circuit Breakers with Manual Reset for all AC and DC Circuits; Main Breaker/Disconnect.								
Design Criteria										
Vaporizer		Designed and manufactured to comply with the latest edition of NFPA Pamphlet 58; FM approved. European CE Mark available (third-party examination by Notified Body).								
LPG Heat Exchanger		Designed and manufactured in compliance with Boiler and Pressure Vessel Code Section VIII, Division 1. ASME "U"-Stamp available. CE-marked vaporizers comply with European PED.								
Control Panel		General-purpose wiring, compliant with National Electric Code (NEC; NFPA #70). UL-508A available. CE-marked vaporizers comply with all applicable European Directives.								
Mechanical Construction										
Skid		1/4-inch (6.35mm) Steel Deck Plate on all-welded 6-inch (150mm) Tubular Frame with Cross-Members; Lifting Lugs.								
Bath Box		1/4-inch (6.35mm) all-welded steel walls with internal stiffeners and supports for LPG Heat Exchanger.								
Water Circulating Pump		Wet-Cartridge-Type Hot-Water Circulator installed inside Vaporizer Control Room. Diffuser in Water Bath.								
Insulation		Mineral Fiber insulation with Aluminum backing on side walls, top plate, and front and rear walls.								
Bath Box Cover		Siding: 16-gauge (1.5mm) Sheet Metal Panels, powder-coated gray (RAL 9002); Top-Cover: Aluminum Diamond Plate.								
Control Room		12-gauge (2.7mm) Sheet Metal, primed and painted blue (RAL 5015) or beige (RAL 1015); lockable door.								
Dimensions [2] (W x L x H)	inches	72 x 138 x 91			72 x 142 x 91		78 x 164 x 91			see
(W x L x H)	m	1.83 x 3.51 x 2.31			1.83 x 3.61 x 2.31		1.98 x 4.17 x 2.31			WB-2005
Shipping Weight [2]	lbs (kg)	5400 (2500)			6200 (2900)		9500 (4300)			

(1) Nominal Capacity for Vaporization of HD-5 @ 0°F (-18°C) Liquid Temperature

(2) Dimensions and weights are approximate

Specifications subject to change without notice

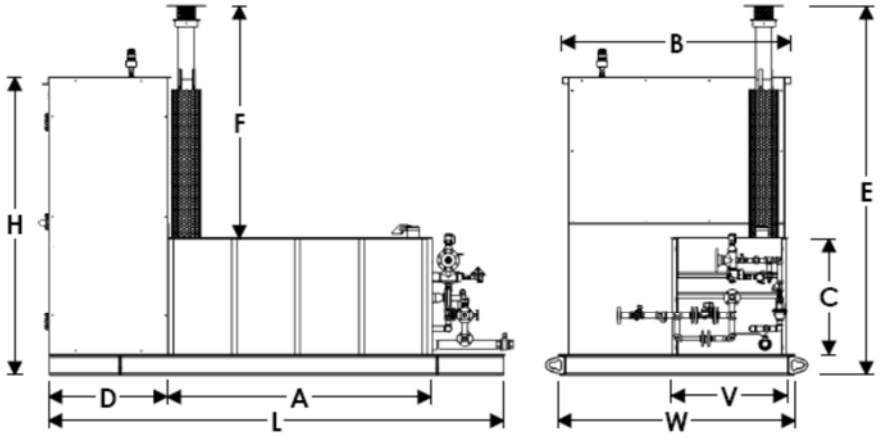
Specifications - 05-Series - WB-2005 to WB-10005

Standard Specifications		WB-2005	WB-2205	WB-2505	WB-3005	WB-3505	WB-4505	WB-5505	WB-7005	WB-10005
Nominal Vaporization Capacity [1]	gph	2005	2205	2505	3005	3505	4505	5505	7005	10005
	kg/h	3847	4231	4807	5766	6726	8645	10564	13442	19199
	MMBTU/h	185	203	231	277	323	415	507	645	921
	kW	54,220	59,490	67,700	81,180	94,660	121,620	148,590	189,030	269,920
Water Tank Capacity	gal	990			2035		2420		contact Factory	
(to Fill Plug)	m^3	3.75			7.71		9.16		contact Factory	
Burner Capacity	MMBTU/h	2.400	2.640	3.000	3.750	4.200	5.400	6.600	8.400	12.000
	kW	703	774	879	1099	1231	1583	1934	2462	3517
Burner Type		Forced-Draft Power Burner, Maxon or similar; Low-Fire/High-Fire Modulation; DUNGS Main Gas Valve with PoC.								
Burner Configuration		8-inch TOT with integrated Blower			8-inch TOT with external Blower				contact Factory	
Design Temperature	°F	650								
	°C	343								
Design Pressure	psi	250								
	bar	17.2								
Standard Safety Features										
Electronic Flame Safe Guard		Honeywell 7800-Series; PLC Input with Status Indication at Operator Interface; Alarm History.								
Low Burner Fuel Gas Pressure		All Burner Safety Interlocks, optional Gas Leak Monitor contacts, and ESD circuits are connected to inputs at the agency-approved Safety Controller (or Safety PLC). The Safety System energizes agency-approved forve-guided expansion relays only if all safety circuits are “okay”. The expansion relays supply control power to the outputs of the PLC. If the Safety System detects a problem, the expansion relays are de-energized, effectively taking control power away from the outputs of the PLC. This configuration makes the safety functions independent from the general-purpose PLC functions and elevates the safety classification of the vaporizer control system to Performance Level 4 (formerly known as SIL 3). The Safety Status is indicated at the Operator Interface and recorded in the Alarm History.								
High Burner Fuel Gas Pressure										
Low Water Level Cutoff										
High Bath Temperature Limit										
GasLeak Monitor in Control Room	40% LEL									
GasLeak Monitor in Control Room	Trouble									
Dual E-Stop Circuits										
Liquid Carryover Protection		“Smart”; Press. and Temp. transmitter in Vapor Outlet; selectable LPG Type; adjustable Safety Margin; Alarm History.								
Relief Valve for Vaporization Tubes		X	X	X	X	X	X	X	X	X
Relief Valve for Burner Gas Train		X	X	X	X	X	X	X	X	X
Liquid Inlet Connection		2-inch 300# Raised Face ANSI Flange (DN50 PN40 DIN Flange)							3-inch 300#RF (DN80 PN40)	
Liquid Inlet Valve		250 psi Flanged Solenoid Valve; Check Valve Bypass; Globe Valve for Manual Shutoff.								
Vapor Outlet Connection (Raised Face Flange)		3-inch 300# ANSI (DN80 PN40 DIN)			4-inch 300# ANSI (DN100 PN40 DIN)				6-inch 300# (DN150 PN40)	
PLC and Electronic Operator Interface (EOI)										
Standard PLC / EOI		Siemens S7-1200F PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.								
Optional PLC / EOI		Allen-Bradley MicroLogix-1400 PLC with Ethernet Interface; high-resolution Color LCD Touch Screen (1024x768); Ethernet Interface; 96-hr Trend Recording; Trend Data for 2 years is saved on standard USB stick and can be displayed in Microsoft Excel format; Remote Access to built-in VNC Server allows Monitoring and Control of all Vaporizer Functions; unlimited license for VNC Client Software is included and can be installed on multiple Laptops or PCs.								
Optional PLC / EOI		Contact AES for other PLC/EOI configurations (Siemens, Allen-Bradley, GE, Bristol-Babcock, …)								
Electrical Requirements (other Voltages available)		380/400/480VAC 50/60Hz; 20A Circuit; 3-Phase; galvanically isolating transformer for control power included.								
Circuit Protection		Automatic Circuit Breakers with Manual Reset for all AC and DC Circuits; Main Breaker/Disconnect.								
Design Criteria										
Vaporizer		Designed and manufactured to comply with the latest edition of NFPA Pamphlet 58; FM approved. European CE Mark available (third-party examination by Notified Body).								
LPG Heat Exchanger		Designed and manufactured in compliance with Boiler and Pressure Vessel Code Section VIII, Division 1. ASME “U”-Stamp available. CE-marked vaporizers comply with European PED.								
Control Panel		General-purpose wiring, compliant with National Electric Code (NEC; NFPA #70). UL-508A available. CE-marked vaporizers comply with all applicable European Directives.								
Mechanical Construction										
Skid		1/4-inch (6.35mm) Steel Deck Plate on all-welded 6-inch (150mm) Tubular Frame with Cross-Members; Lifting Lugs.								
Bath Box		1/4-inch (6.35mm) all-welded steel walls with internal stiffeners and supports for LPG Heat Exchanger.								
Water Circulating Pump		Wet-Cartridge-Type Hot-Water Circulator installed inside Vaporizer Control Room. Diffuser in Water Bath.								
Insulation		Mineral Fiber insulation with Aluminum backing on side walls, top plate, and front and rear walls.								
Bath Box Cover		Siding: 16-gauge (1.5mm) Sheet Metal Panels, powder-coated gray (RAL 9002); Top-Cover: Aluminum Diamond Plate.								
Control Room		12-gauge (2.7mm) Sheet Metal, primed and painted blue (RAL 5015) or beige (RAL 1015); lockable door.								
Dimensions [2] (W x L x H)	inches	84 x 204 x 91			80 x 240 x 91		80 x 310 x 91		80 x 460 x 113	
(W x L x H)	m	2.13 x 5.18 x 2.31			2.03 x 6.10 x 2.31		2.03 x 7.87 x 2.31		2.03 x 11.68 x 2.87	
Shipping Weight [2]	lbs (kg)	11500 (5200)			16500 (7500)		20000 (9100)		38000(17300) 47000(21400)	

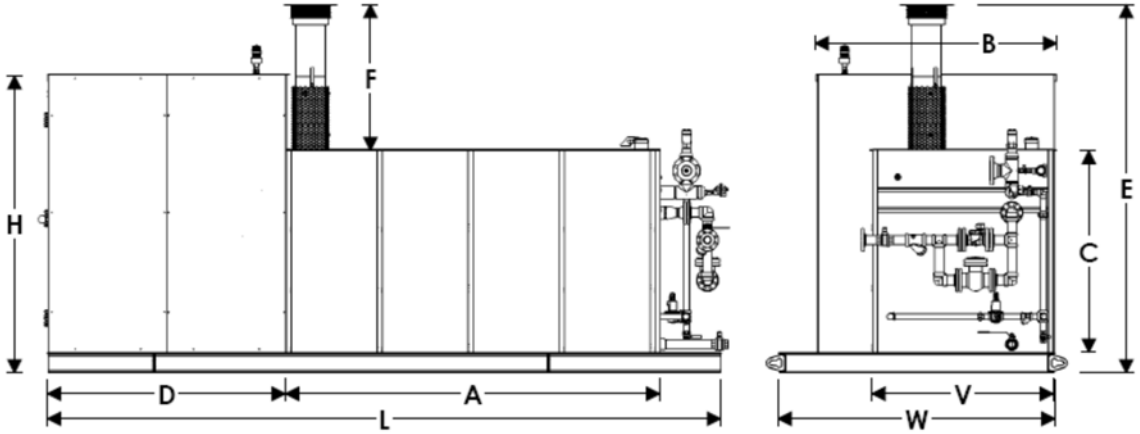
(1) Nominal Capacity for Vaporization of HD-5 @ 0°F (-18°C) Liquid Temperature (2) Dimensions and weights are approximate Specifications subject to change without notice

Drawings, 05-Series

Full-Size Control Room:
Standard on WB-455 to WB-1505.



Extended Control Room:
Standard on WB-1805 to WB-10005, optional for WB-455 to WB-1505.



Dimensions, 05-Series

Dimensions for Vaporizers with Full-Size Control Rooms

(Dimensions are subject to change without notice)		W	L	H	V	A	B	C	D	E	F	Concrete Slab
WB-455, WB-555, WB-655	inches	72	138	91	35	80	66	36	36	112	70	8' x 14'
	m	1.83	3.51	2.30	0.89	2.03	1.68	0.91	0.91	2.85	1.78	2.50 x 4.30
WB-755, WB-855	inches	72	142	91	36	93	66	51	36	112	56	8' x 14'
	m	1.83	3.61	2.30	0.91	2.36	1.68	1.30	0.91	2.85	1.42	2.50 x 4.30
WB-1005, WB-1205, WB-1505	inches	78	164	91	40	105	66	54	36	112	52	8' x 16'
	m	1.98	4.17	2.30	1.02	2.67	1.68	1.37	0.91	2.85	1.32	2.50 x 4.90

Dimensions for Vaporizers with Extended Control Rooms (Maintenance House)

(Dimensions are subject to change without notice)		W	L	H	V	A	B	C	D	E	F	Concrete Slab
WB-455, WB-555, WB-655 (Option)	inches	72	174	91	35	80	66	36	72	112	70	8' x 17'
	m	1.83	4.42	2.30	0.89	2.03	1.68	0.91	1.83	2.85	1.78	2.50 x 5.00
WB-755, WB-855 (Option)	inches	72	178	91	36	93	66	51	72	112	56	8' x 17'
	m	1.83	4.52	2.30	0.91	2.36	1.68	1.30	1.83	2.85	1.42	2.50 x 5.10
WB-1005, WB-1205, WB-1505 (Option)	inches	78	200	91	40	105	66	54	72	112	52	8' x 19'
	m	1.98	5.08	2.30	1.02	2.67	1.68	1.37	1.83	2.85	1.32	2.50 x 5.80
WB-1805, WB-2005, WB-2205, WB-2505	inches	84	204	91	55	116	80	61	72	112	45	9' x 19'
	m	2.13	5.18	2.30	1.40	2.95	2.03	1.55	1.83	2.85	1.14	2.80 x 5.80
WB-3005, WB-3505	inches	80	240	91	78	144	80	65	84	112	41	9' x 22'
	m	2.03	6.10	2.30	1.98	3.66	2.03	1.65	2.13	2.85	1.04	2.80 x 6.70
WB-4505, WB-5505	inches	80	310	91	77	204	80	59	84	112	48	9' x 28'
	m	2.03	7.87	2.30	1.96	5.18	2.03	1.50	2.13	2.85	1.22	2.80 x 8.60
WB-7005, WB-10005	inches	82	460	113	79	289	80	80/100	144	138	28	9' x 41'
	m	2.08	11.68	2.87	2.01	7.34	2.13	2.13/2.54	3.66	3.51	0.71	2.80 x 12.50

PLC Control Panels, First-Outage Monitor, Remote Access

All AES Water Bath Vaporizers are equipped with safety devices in accordance with NFPA 58, FM, and/or CE (see specifications on pages 4, 6, and 7). The safety devices are connected to an Agency-approved Safety Controller (EN ISO 13849-1) or Safety PLC and are independent of the general-purpose PLC controls. This configuration elevates the safety classification of the vaporizer to “Performance Level 4” (formerly classified as SIL 3). Safety for the combustion system is provided by the electronic Honeywell Flame Safe Guard.

In addition to the connection to the Safety System, the vaporizer safety devices are also connected to the PLC, which provides status indication at the Electronic Operator Interface (EOI/HMI). All HMIs have a color LCD display with touchscreen, and provide operator guidance through intuitive screen layouts and clearly labeled pushbuttons, indicators, numeric displays, etc. The HMIs also provide an Alarm History (First-Out Monitor), and graphic trend recording (96 hours). Alarm History and Trend Data are also recorded on a standard USB-Stick with a storage capacity of more than two years. Alarm History and Trend Data can be displayed on-screen, or can be retrieved for processing in Microsoft Excel format.

The standard PLC in all AES vaporizers is a Siemens S7-1200F with Ethernet communications interface. The standard HMI is a 9-inch high-resolution touchscreen with 1024x768 color LCD display.

The standard HMI has a built-in VNC server for remote access and monitoring via its Ethernet interface. An unlimited license of the VNC Client is included and can be installed on multiple Laptops or PCs.

Also available is an Allen-Bradley MicroLogix-1400 PLC (no additional charge), combined with the same type 9-inch high-resolution touchscreen with 1024x768 color LCD display.

PLC/HMI Options include:

⇒ 10”, 12”, or 15” High resolution HMI.

⇒ Siemens S7-1500, Allen Bradley CompactLogix, GE Rx3i, etc.

⇒ Wireless or Cellular remote monitoring.

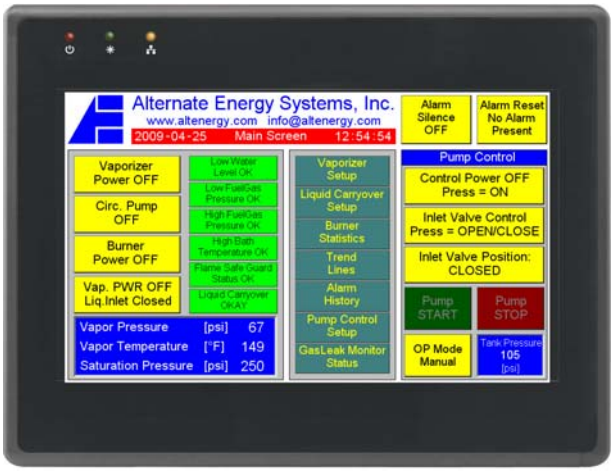
⇒ Fiber Optic interface.

⇒ Broad range of communications protocols (Modbus, Profibus, Profinet, LonWorks, BACnet, etc.)

⇒ Various Language and Units combinations.

Please contact the factory if you require a specific configuration of the control system.

All AES Control Panels can be UL-508a stamped!
All AES Control Panels are available with CE Mark!



Standard HMI for Siemens S7-1200F or Allen-Bradley MicroLogix-1400.

9-inch high-resolution (1024x768) display with first-out monitor (Alarm History) 96-hour graphic TrendLine recording, trend data recording on standard USB-stick and remote access for monitoring and control via

Control Room Sizes

All AES Water Bath Vaporizers have a compartment (vaporizer control room) in the front of the unit, holding burner, burner gas train, vaporizer control panel, temperature controls, water circulation pump, etc. The size of the vaporizer control room varies with the vaporizer size and the space required to accommodate the various sizes of burners and controls.

08-Series (WB-168 to WB-508)

The 08-Series vaporizers have a 48” x 48” (1.22m x 1.22m) Step-In Control Room with two wide-opening access door panels (40”; 1.02m). The access doors have louvers for the combustion-air intake, a window-insert, and can be locked.

The control room in 08-Series vaporizers is equipped with light fixture, country-specific AC wall outlet, and optional gas leak monitor .

05-Series (WB-455 to WB-1505) Full-Size Control Room

The smaller 05-Series vaporizers have a 36-inch (0.91m) deep control room with 48-inch (1.22m) wide access door. The access door has louvers for the combustion-air intake, a window-insert, and can be locked.

The control room in 05-Series vaporizers is equipped with light fixture, country-specific AC wall outlet, and optional gas leak monitor.

WB-455 to WB-1505 vaporizers are also available with the optional Extended Control Room (see next).

05-Series (WB-1805 to WB-5505) Extended Control Room

The control room of 05-Series vaporizers WB-1805 and above has been extended to a depth of 72 inches (1.83m) to form a Walk-in Maintenance House. This provides additional weather protection for operating and maintenance personnel, and provides additional space for control components such as starters for the motors of liquid transfer pumps etc.

Extended Control Rooms are equipped with light fixture, country-specific AC wall outlet, and optional gas leak monitor.

Extended Control Rooms are also available as an option for WB-455 to WB-1505 vaporizers.

05-Series (WB-7005 and up) Control Room w/ Blower Compartment

In Vaporizer models WB-7005 and above, the combustion air blowers are installed in a separate compartment (noise reduction). This configuration is also available as an option for models WB-4505 and WB-5505.

Country-Specific Configuration

Vaporizers for export customers will be equipped with AC wall outlets and light fixtures that are common in their respective countries.

Wall-Mounted Exhaust Fan, Heaters, Air Conditioning

All Control Rooms can be equipped with a thermostat-controlled fan to improve air circulation in warm climates. They can also be equipped with vinyl-backed insulation, and with electric heaters and/or air conditioning units.

Specification-Summary, 08-Series, WB-168 to WB-508

	Nominal Vaporization Capacity				Burner Capacity		Water Tank Capacity		Dimensions in inches			Dimensions in m			Shipping Weight	
	gph	kg/h	MM BTU/h	kW	MM BTU/h	kW	gal	m^3	W	L	H	W	L	H	lbs	kg
WB- 168	168	322	15.5	4,500	0.200	59	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 208	208	399	19.1	5,600	0.250	73	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 258	258	495	23.7	6,900	0.310	91	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 308	305	585	28.1	8,200	0.370	108	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 358	358	687	32.9	9,600	0.430	126	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 408	408	783	37.5	11,000	0.490	144	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 458	458	879	42.5	12,300	0.550	161	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700
WB- 508	508	975	46.8	13,700	0.610	179	165	0.625	48	132	108	1.22	3.35	2.74	3700	1700

Specifications are subject to change without notice

Specification-Summary, 05-Series, WB-455 to WB-10005

	Nominal Vaporization Capacity				Burner Capacity		Water Tank Capacity		Dimensions in inches			Dimensions in m			Shipping Weight	
	gph	kg/h	MM BTU/h	kW	MM BTU/h	kW	gal	m^3	W	L	H	W	L	H	lbs	kg
WB- 455	455	873	42	12,300	0.54	158	220	0.830	72	138	112	1.83	3.51	2.84	5400	2500
WB- 555	555	1065	51	14,950	0.66	193	220	0.830	72	138	112	1.83	3.51	2.84	5400	2500
WB- 655	655	1257	60	17,590	0.78	229	220	0.830	72	138	112	1.83	3.51	2.84	5400	2500
WB- 755	755	1449	69	20,220	0.90	264	385	1.460	72	142	112	1.83	3.61	2.84	6200	2900
WB- 855	855	1640	79	23,150	1.02	299	385	1.460	72	142	112	1.83	3.61	2.84	6200	2900
WB- 1005	1005	1928	92	26,960	1.20	352	495	1.870	78	164	112	1.98	4.17	2.84	9500	4300
WB- 1205	1205	2312	111	35,530	1.44	422	495	1.870	78	164	112	1.98	4.17	2.84	9500	4300
WB- 1505	1505	2888	139	40,730	1.80	528	495	1.870	78	164	112	1.98	4.17	2.84	9500	4300
WB- 1805	1805	3463	166	48,650	2.16	633	990	3.750	84	204	112	2.13	5.18	2.84	11500	5200
WB- 2005	2005	3847	185	54,220	2.40	703	990	3.750	84	204	112	2.13	5.18	2.84	11500	5200
WB- 2205	2205	4231	203	59,490	2.64	774	990	3.750	84	204	112	2.13	5.18	2.84	11500	5200
WB- 2505	2505	4807	231	67,700	3.00	879	990	3.750	84	204	112	2.13	5.18	2.84	11500	5200
WB- 3005	3005	5766	277	81,180	3.75	1099	2035	7.710	80	240	112	2.03	6.10	2.84	16500	7500
WB- 3505	3505	6726	323	94,660	4.20	1231	2035	7.710	80	240	112	2.03	6.10	2.84	16500	7500
WB- 4505	4505	8645	415	121,620	5.40	1583	2420	9.160	80	310	112	2.03	7.87	2.84	20000	9100
WB- 5505	5505	10534	507	148,590	6.60	1934	2420	9.160	80	310	112	2.03	7.87	2.84	20000	9100
WB- 7005	7005	13442	645	189,030	8.40	2462	6200	23.5	82	460	138	2.08	11.68	3.51	38000	17300
WB-10005	10005	19199	921	269,920	12.0	3517	8600	32.6	82	460	138	2.08	11.68	3.51	47000	21400

Specifications are given for standard configurations and are subject to change without notice.

Request Quotation

To Request a Quotation for a vaporizer, use the format below to provide us with basic information about your application. The specifications shown in this brochure and the options shown on the opposite page are only a small selection of all available options — you can substitute (almost) everything with your own preference.

If you are unclear how to specify the system, or if you have any additional questions, please contact us by email at sales@altenergy.com, or by phone at +1 770 487 8596. Once we receive your RFQ, we will respond within one business day with a price and an available manufacturing slot, and within two business days with estimated shipping costs to your location.

EXAMPLE

WB-655	1200	kg/h	30Prop/70But	415V 50Hz	Ext.Contr.Room	A-B PLC	UL 508a Stamp	ASME U-Stamp	see Notes
Model Number [1]	Capacity [2]	Units [3]	LPG Type [4]	Electricity [5]	Option [6]	Option [6]	Option [6]	Option [6]	Option [7]

1 Select from list above, or leave blank, if you want AES to recommend model

2 Enter your connected load or your observed momentary LPG consumption

3 Enter Engineering Units

4 Enter HD-5 or actual LPG composition (Propane / Butane percentage)

5 Enter available electricity

6 Enter Option(s) from list on opposite page

7 Include additional notes to describe your particular application or non-standard configuration requirements.

This could include different inlet/outlet connections; software for remote communications; different paint colors; special shipping instructions; etc.

Standard Options and Standard Accessories, WB-168 to WB-10005

Option	Description	
ASME U-Stamp	LPG Heat Exchanger with ASME U-Stamp and Registration with the National Board of Boiler and Pressure Vessel Inspectors. Option includes UL-Stamped Relief Valve for LPG heat Exchanger.	
	WB-168 WB-208 WB-258 WB-308 WB-358 WB-408 WB-458 WB-508	optional
	WB-458 WB-508 WB-455 WB-555 WB-655 WB-755 WB-855	optional
	WB-1005 WB-1205 WB-1505 WB-1805 WB-2005 WB-2205	optional
	WB-2505 WB-3005 WB-3505 WB-4505 WB-5505	optional
	WB-7005 WB-10005	standard
Extended Control Room	Extended Control Room with Light Fixture and country-specific AC Wall Outlet	
	WB-455 WB-555 WB-655 WB-755 WB-855 WB-1005 WB-1205 WB-1505	optional
	WB-1805 WB-2005 WB-2205 WB-2505 WB-3005 WB-3505 WB-4505 WB-5505 WB-7005 WB-10005	standard
	Exhaust Fan - Electric Heater - Air Conditioner	optional
Control Panel 508a	UL-508a Stamp for Vaporizer Control Panel	
	WB-168 WB-208 WB-258 WB-308 WB-358 WB-408 WB-458 WB-508	optional
	WB-458 WB-508 WB-455 WB-555 WB-655 WB-755 WB-855 WB-1005 WB-1205 WB-1505	optional
	WB-1805 WB-2005 WB-2205 WB-2505 WB-3005 WB-3505 WB-4505 WB-5505	optional
	WB-7005 WB-10005	optional
Misc.	Miscellaneous Options (other options available upon request)	
	Custom PLC or HMI hardware (Allen-Bradley, Siemens, GE, Bristol Babcock, Phoenix Contact, etc.)	optional
	Communications Protocols (Profinet, Profibus, Modbus, LonWorks, BACnet, etc.)	optional
	Custom Paint Colors	optional
	Custom Configurations and Dimensions	optional
	Containerization (Inside standard ISO shipping container)	optional
	Integration of system components (ESD system, pumps, propane/air mixers, etc.)	optional
	Uninterruptable Power Supply (UPS; battery backup)	optional
	Wireless or Cellular remote monitoring; SMS alarm messages.	optional

ProCool™–50 Heat Transfer Solution

AES Water Bath Vaporizers use a mixture of buffered propylene glycol with corrosion inhibitors and deionized water as the heat transfer medium. The corrosion inhibitors in the buffered propylene glycol provide rust/corrosion protection to the carbon steel heat exchanger components and bath box of the WB series. Topping off the bath with small amounts of standard tap water to make up evaporation losses is acceptable, but AES recommends using pre-diluted ProCool™ or deionized/distilled water.

Under no circumstances should an automotive grade coolant or unbuffered glycol be used as the heat transfer fluid. Using standard automotive coolant or unbuffered glycol could cause premature deterioration of the heat exchangers. It is imperative that special attention be given to maintaining the quality of the water bath. AES recommends that quality be maintained via a regularly scheduled analysis by a qualified laboratory. We recommend a minimum of yearly testing, and preferably before and after every heating season.

Alternate Energy Systems recommends a 50/50 buffered Propylene Glycol/DI-Water solution for all installations. This mixture will provide burst protection to -60°F (-50°C), and will provide freeze protection to -30°F (-34°C), while providing the maximum level of corrosion protection. Also available is a 30/70 Propylene Glycol/DI-Water solution that provides freeze protection to 10°F (-12°C) best suited for installation locations where ambient conditions will not drop below freezing. For ambient conditions expected to drop below -20°F (-29°C), please contact AES for custom formulations.

In cooperation with a leading manufacturer of corrosion-inhibited Propylene Glycol, Alternate Energy Systems offers ProCool™ heat transfer solution for all WB-series Water Bath Vaporizers. We typically stock drums and totes of ProCool™-50 and ProCool™-30 in 55-gallon drums and 275-gallon totes. We can also source undiluted buffered propylene glycol and pails of corrosion inhibitor concentrate upon request.

AES Part #	Description	
HTS-5055-01-3	ProCool™-50 heat transfer solution in 55-gallon non-returnable plastic drum	available
HTS-5275-01-3	ProCool™-50 heat transfer solution in 275-gallon non-returnable plastic tote with steel-cage reinforcement	available
HTS-3055-01-3	ProCool™-30 heat transfer solution in 55-gallon non-returnable plastic drum	available
HTS-3275-01-3	ProCool™-30 heat transfer solution in 275-gallon non-returnable plastic tote with steel-cage reinforcement	available
HTS0004-00-3	Maintenance Sample Kit, including pre-addressed shipping box, sample bottle, and label for sample bottle. Lab analysis by manufacturer.	see note 1 available

Note 1: Available at no charge to customers who have purchased their Heat Transfer Solution through AES within the las 3 years. Contact AES for pricing if your Heat Transfer Solution is not ProCool™-50, or if it was not purchased from AES.

Who is Alternate Energy Systems, Inc. ?

After working for other manufacturers of LPG vaporizers and LPG / air systems for several years, John E. Hallberg founded Alternate Energy Systems, Inc. in 1974 in Peachtree City, located just 20 minutes south-west of the Atlanta airport. He successfully set out to design and manufacture products which were superior to those of his competitors. As a result, AES became very quickly known as the innovative manufacturer of quality products. Soon, the customer list included a representative cross-section of the Fortune 500 companies in the U.S.

Through the years, AES has constantly added new products, and has further improved the design of existing products, keeping us ahead of the competition. Several designs, including those for LPG/Air mixing systems, were awarded national and international patents.

Today, AES is owned by Steven Chambers. Mr. Chambers continues to build on the tradition of excellence and customer service at AES. At AES, "just good enough" is never good enough. AES is commited to both quality products and customer service. We strive to understand our customers and continuously improve so that we can exceed their needs and expectations .

AES is committed to serving customers in the U.S. and abroad through a network of sales specialists, technical support personnel, distributors and installers.

Please visit our web site at www.altenergy.com for updated versions of all data sheets, price lists, application notes, a list of authorized distributors, and other documents that are only available online.

Other Products from Alternate Energy Systems, Inc.

Water Bath Vaporizers
Hot Water Vaporizers
Steam Vaporizers

Venturi Type LPG / Air Mixers
Patented Piston Operated LPG / Air Mixers

Complete Vaporizer / Mixer Systems
Peak Shaving Plants
Gas Stabilization Systems

Accessories for LPG / Air Systems
LPG Pump Packages

Service
Maintenance
Trouble Shooting

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