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# Alternate Energy Systems, Inc.

A Company devoted to Your Energy Needs



## AES i-Blend™

### Fully Integrated LP/Air Blending System

- Natural Gas Backup System
- Standby System for Interruptible Customers
- Synthetic Natural Gas for New Developments
- PeakShaving for Industry and Utilities
- Vaporizer / Blender / Compressor combined in Weatherproof and Stormproof Enclosure
- Low-Pressure / High-Pressure (up to 250 psi / 16 bar)
- Propane, Butane, Propane/Butane Mixtures
- Automatic Gas Properties Controller (GraviBlend / AccuBlend)
- ASME, NFPA, FM, UL, CSA, PED, CE, ...
- 110-230-277-380-400-440-460-480 V 50/60 Hz
- Choice of Controllers: Allen-Bradley (MicroLogix / CompactLogix) Siemens (S7-200 / S7-300), GE-Fanuc (90-30 / VersaMax), ...
- Multi-Language Operator Interface: English, Spanish, French, German, Polish, Portuguese, ...

# AES i-Blend™

## Fully Integrated LP/Air Blending System

The AES i-Blend™ is the first fully integrated LP/Air blending system on the market that is available as a “standard product”, and not as a one-off special design. It combines a horizontal water bath vaporizer with a POM LP/Air blender and a rotary compressor in a single weatherproof and stormproof enclosure. Hundreds of each of these components have been supplied individually for a wide variety of applications to customers worldwide. For the first time they are now available as a fully integrated, pre-assembled, pre-tested, easy-to-ship, easy-to-install system that meets the requirements of customers worldwide.

Ordering an i-Blend™ system is as simple as selecting system capacity, sendout pressure, available LPG feedstock, supply voltage, and additional equipment and features from a list. Alternate Energy Systems will then manufacture the system to these specifications, and will ship it in 8 weeks or less after it has been fully tested on our test stand. Systems for export customers will be tested with their country-specific voltage and frequency (i.e. AC 400V 50Hz 3-phase).

Upon arrival at the installation site, the i-Blend™ system can be placed on a level surface and will be fully functional within a few hours after making the piping connections at the integrated bulkhead, and making a single electrical connection.

All i-Blend™ systems are equipped with long-life infrared GasLeak monitors, Electronic Operator Interface (EOI) with color LCD touch screen, and Programmable Logic Controller (PLC). The operator can select the EOI language (English, Spanish, French, German, Polish, Portuguese, ...), and the Engineering Units (standard US units or metric SI units).

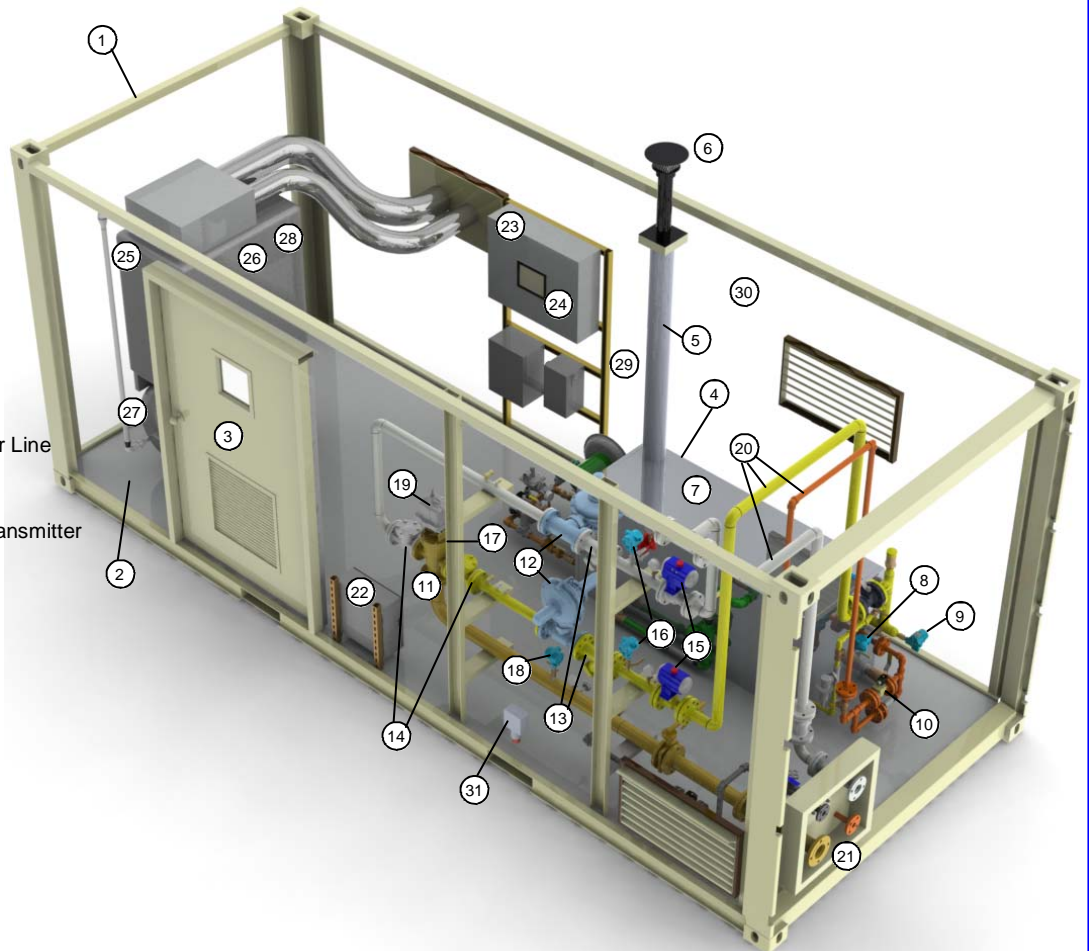
i-Blend™ systems up to 50 MMBTU/h (1130 m<sup>3</sup>/h NatGas) can be installed in 20-ft enclosures. Larger systems have 40-ft enclosures (up to 100 MMBTU/h / 2800 m<sup>3</sup>/h NatGas). Multiple i-Blend™ systems can be combined for even larger capacities. Each i-Blend™ system in multi-system installations has its own control system, and its own EOI. All i-Blend™ systems in multi-system installations can be operated from any EOI.

i-Blend™ systems that will be installed in extreme climates can be equipped with hydronic heaters (warm water supplied by vaporizer), and/or with A/C units.

To make integration into existing plant monitoring systems easier, i-Blend™ systems can be equipped with PLCs from Siemens (S7-1200 or S7-200 or S7-300), Allen-Bradley (MicroLogix or CompactLogix), GE-Fanuc (VersaMax Micro or 90-30), and others.

### Legend

- 1 Modified ISO Container
- 2 Steel Floor
- 3 Lockable Personnel Door
- 4 WB Vaporizer
- 5 Insulated Exhaust Stack
- 6 Removable Rain Cap
- 7 Bath Insulation
- 8 Vapor Pressure Transmitter
- 9 Vapor Temperature Transmitter
- 10 Flanged Liquid Inlet Valve
- 11 POM Blending Valve
- 12 On-Skid Regulators
- 13 On-Skid Strainers
- 14 Check Valve in Air Line and Vapor Line
- 15 Pneumatic Valves in Inlet Lines
- 16 Inlet Pressure Transmitters
- 17 Vapor/Air Differential Pressure Transmitter
- 18 Outlet Pressure Transmitter
- 19 AccuBlend™ Positioner
- 20 Color-Coded Piping
- 21 Bulkhead Connection
- 22 GraviBlend®-3 Gravimeter
- 23 Control Panel Enclosure
- 24 Electronic Operator Interface
- 25 Screw-Type Compressor
- 26 Integrated Dryer
- 27 Integrated Air Receiver Tank
- 28 Integrated Afterfilter
- 29 Wall Outlet
- 30 Overhead Lighting
- 31 GasLeak Monitor



# AES i-Blend™

## Main System Components

**Horizontal Water Bath Vaporizer**, for Propane, Butane, and other LPG. All Models WB-168 to WB-1205 utilize Forced Draft Power Burners. Standard Safety Features in accordance with NFPA # 58. Vapor Tube Bundle in accordance with ASME Boiler & Pressure Vessel Code, Section VIII, Division I; or European PED. Approvals: Factory Mutual (FM) and Canadian Standards Association (CSA); suitable for Industrial Risk Insurers (IRI) installations; CE approval.

All models are equipped with Honeywell Flame Safeguard Controls, and with Temperature and Pressure Transmitters in Vapor Outlet for “smart” Liquid Carryover Protection, based on pressure/temperature correlation and LPG type (Propane/Butane/...). Detailed equipment description can be found in AES brochure “Water Bath Vaporizers”.

**POM LPG-Vapor/Air Blenders** are designed in accordance with ASME and NFPA 58/59, and European PED/ATEX. They are FM listed and are available with CE approval. Pneumatically operated ball valves in vapor inlet and compressed air inlet are standard. Vapor inlet, air inlet, strainers, check valves, and regulators are “flanged”. Detailed equipment description can be found in AES brochure “LPG-Vapor / Air Mixing Systems”.

POM blenders are known for their reliability, immediate response to load changes, high turn-down, stable gas properties and sendout pressure, and their low maintenance requirements.

**Compressed Air** in all i-Blend™ systems is provided by a rotary (screw-type) compressor with integrated aftercooler, integrated air dryer, integrated oil/water separator, integrated air receiver tank with ASME stamp, and 1-Micron afterfilter. All compressors (Atlas Copco or Sullair) comply with US regulations and are CE approved.

The PLC in the **System Control Panel** is used to monitor and control all vaporizer and blender functions. The PLC communicates with an Electronic Operator Interface (EOI) with color LCD and touch screen, indicating system status, pressures, temperatures, and any trouble conditions that may occur. First-Out monitor (Alarm History) and graphic trend recording functions are standard. Plant Monitoring Systems can be connected via the standard Ethernet Interface (Siemens and Allen-Bradley), or via Profibus DP (Siemens PLCs only).

**GraviBlend®-3E** gravitometer and **AccuBlend™** positioner are available as a standard option. Together, they form the **Automatic Gas Properties Controller**. This option is recommended for installations where the LPG properties could change from delivery to delivery, or where the LPG composition (Propane/Butane ratio) is different in summer and winter. The Gas Properties Controller compensates for these changes by automatically adjusting the LP/Air blending ratio.

The **Weatherproof and Stormproof Enclosure** is based on a modified ISO shipping container. The original wooden floor is replaced with an all-welded steel floor, a lockable personnel door is installed, and framed openings are added for compressor cooling air discharge, ventilation, etc. The enclosures are equipped with long-life infrared GasLeak monitor, ample lighting, power outlets with country-specific sockets, etc.

All **Piping** is color-coded (standard RAL colors). A bulkhead provides flanged connections for liquid LPG inlet, MixGas outlet, test flare connection, and flare pilot. Also available are flanged connections for compressed air (from a backup compressor or to other i-blend™ modules), and vapor outlet (to-and-from other i-blend™ modules).



## Vaporizer Specifications

i-Blend™ Model		i-20	i-30	i-40	i-50	i-60	i-70	i-80	i-90	i-100
Based on Vaporizer Model		WB-258	WB-358	WB-458	WB-555	WB-755	WB-855	WB-1005	WB-1005	WB-1205
Nominal Vaporizer Capacity	gph	258	358	458	555	755	855	1005	1005	1205
	kg/h	495	687	879	1065	1449	1641	1929	1929	2312
Water Tank Capacity	gal	165	165	165	220	220	385	495	495	495
	m <sup>3</sup>	0.625	0.625	0.625	0.83	0.83	1.46	1.87	1.87	1.87
Burner Design		European-style forced draft Power Burner with Combustion Air Blower.			Forced Draft Power Burner with Electric Combustion Air Blower Maxon TurboTherm or similar					
Burner Control		Honeywell Aquastat with ON/OFF Control			Electronic Thermostat (Temperature Transmitter) with 3-Point Modulation (OFF – Low-Fire – High-Fire)					
Burner Capacity (1)	MMBTU/h kW	0.3-0.4	0.4-0.6	0.5-0.8	0.7-0.9	0.9-1.3	1.0-1.4	1.2-1.7	1.2-1.7	1.4-2.0
		88-123	123-172	158-222	193-270	260-370	300-420	350-490	350-490	420-590
Design Temperature	°F	650	650	650	650	650	650	650	650	650
	°C	343	343	343	343	343	343	343	343	343
Design Pressure	psi	250	250	250	250	250	250	250	250	250
	bar	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Test Pressure	psi	375	375	375	375	375	375	375	375	375
	bar	25	25	25	25	25	25	25	25	25

### Standard Safety Features

Electronic Flame Safeguard Honeywell 7800-series or similar	x	x	x	x	x	x	x	x	x	x
Ignition Failure Shutdown	x	x	x	x	x	x	x	x	x	x
Low Burner Fuel Pressure	x	x	x	x	x	x	x	x	x	x
High Burner Fuel Pressure	x	x	x	x	x	x	x	x	x	x
Low Water Level Cutoff	x	x	x	x	x	x	x	x	x	x
High Bath Temperature Limit	x	x	x	x	x	x	x	x	x	x
Liquid Carryover Protection	"Smart" Liquid Carryover Protection with Pressure Transmitter and Temperature Transmitter in Vapor Outlet. Liquid Inlet Valve will be closed if Pressure/Temperature correlation indicates saturation is imminent.									
Relief Valve on Burner Train	x	x	x	x	x	x	x	x	x	x
Relief Valve on Vapor Tubes	x	x	x	x	x	x	x	x	x	x
External Alarm Input (ESD)	x	x	x	x	x	x	x	x	x	x
Liquid Inlet Connection (Flange at Bulkhead)	1" 300# Raised Face ANSI/ASME (domestic models) DN25 PN40 DIN 2635 (export models)						2" 300# Raised Face ANSI/ASME DN50 PN40 DIN 2635			
Liquid Inlet Valve (controlled by PLC)	1-inch Solenoid, flanged						2-inch Solenoid, flanged			
Liquid Inlet Valve (manual)	1-inch Ball Valve, flanged						2-inch Ball Valve, flanged			
Vapor Outlet Connection (Flange at Bulkhead)	2" 300# Raised Face ANSI/ASME (domestic models) DN50 PN40 DIN 2635 (export models)						3" 300# Raised Face ANSI/ASME DN75 PN40 DIN 2635			
Vapor Outlet Valve (manual)	2-inch Ball Valve, flanged						3-inch Ball Valve, flanged			

(1) Burner Capacity (and heat transfer area of vapor heat exchanger) will be adjusted according to LPG type (Propane/Butane ratio) and sendout pressure.

## Blender Specifications

i-Blend™ Model		i-20	i-30	i-40	i-50	i-60	i-70	i-80	i-90	i-100
Based on Blender Model	10 psi / 0.7 bar	POM-30	POM-40	POM-40	POM-40	POM-40	POM-40	POM-40	POM-40	POM-60
	20 psi / 1.4 bar	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-40
	30 psi / 2.1 bar	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-40
	40 psi / 2.8 bar above 40 psi	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30	POM-30
System Capacity	MM BTU/h	20	30	40	50	60	70	80	90	100
	MM kcal/h	5.0	7.5	10	13	15	18	20	23	25
	MJ/h	21000	32000	42000	53000	63000	74000	84000	95000	105000
	NatGas m <sup>3</sup> /h	570	850	1130	1400	1700	2000	2300	2550	2800
Design Temperature	°F	180	180	180	180	180	180	180	180	180
	°C	82	82	82	82	82	82	82	82	82
Design Standards		Conforms to ASME Boiler & Pressure Vessel Code; FM Listed European CE Approval including PED, ATEX, LVD, MD, etc.								
Standard Safety Features										
High / Low MixGas Pressure		Electronic Pressure Transmitter in MixGas Outlet. Setpoints adjustable through input at touch screen EOI.								
High / Low LPG Vapor Pressure		Electronic Pressure Transmitter in Vapor Inlet. Setpoints adjustable through input at touch screen EOI.								
High / Low Compressed Air Pressure		Electronic Pressure Transmitter in Compressed Air Inlet. Setpoints adjustable through input at touch screen EOI.								
High Vapor/Air Differential Pressure		Electronic Pressure Transmitter downstream of Vapor and Air Regulators. Setpoint adjustable through input at touch screen EOI.								
Safety Valves in Vapor and Air Inlets		Air-operated ball valves close on all high-pressure alarms. Fail-safe design with spring-return closes valves on power-loss.								
Vapor Supply Connection (inside container)		2" 300# Raised Face ANSI/ASME DN50 PN40 DIN 2635								
Air Supply Connection (inside container)		2" 150# Raised Face ANSI/ASME DN50 PN16 DIN 86030								
MixGas Outlet Connection (Flange at Bulkhead)		POM-30 3" 150# Raised Face ANSI/ASME DN80 PN16 DIN 86030			POM-40 4" 150# Raised Face ANSI/ASME DN100 PN16 DIN 86030			POM-60 6" 150# Raised Face ANSI/ASME DN150 PN16 DIN 86030		

i-Blend™ Model		i-20	i-30	i-40	i-50	i-60	i-70	i-80	i-90	i-100
Enclosure is based on		Modified 20-ft ISO Container				Modified 40-ft ISO Container				
Enclosure Dimensions (outside)	in	19 ft 4 in (232 in)				39 ft 6 in (474 in)				
	m	5.9 m				12.30 m				
Approximate Weight (standard configuration)	lbs									
	kg									
Maintenance Access Panels		n/a	n/a	n/a	1	1	2	2	2	2
Overhead Lights		2	2	2	4	4	4	4	4	4
Wall Outlets		2	2	2	4	4	4	4	4	4
GasLeak Monitors		1	1	1	2	2	2	2	2	2
Enclosure Insulation		Available as an option for all i-Blend systems.								
Hydronic Heating System		Available as an option for all i-Blend systems; warm water supplied by vaporizer; requires option "Enclosure Insulation".								
Air Conditioning System		Available as an option for all i-Blend systems; wall-mount unit; requires option "Enclosure Insulation".								

## Compressor Specifications

i-Blend™ Model		i-20	i-30	i-40	i-50	i-60	i-70	i-80	i-90	i-100
For installations in 60Hz countries										
Compressor Model	Atlas Copco Sullair	GA22+ 1800	GA30+ 3000	GA37+ 3700	GA45+ 4500P	GA55+ 5500	GA75+ 7500	GA75+ 7500	2xGA45+ 2x4500P	2xGA45+ 2x4500P
Compressor Motor	Atlas Copco hp Sullair hp	30 25	40 40	50 50	60 60	75 75	100 100	100 100	2 x 60 2 x 60	2 x 60 2 x 60
Compressor Capacity	Atlas Copco acfm Sullair acfm	149 119	203 184	248 250	303 303	373 376	519 490	519 490	604 606	604 606
	Atlas Copco m <sup>3</sup> Sullair m <sup>3</sup>	4.2 3.4	5.8 5.2	7.1 7.1	8.6 8.6	10.6 10.6	14.7 13.9	14.7 13.9	17.2 17.2	17.2 17.2
For installations in 50Hz countries										
Compressor Model	Atlas Copco Sullair	GA22+ 1800	GA30+ 3000	GA37+ 3700	GA45+ 4500P	GA55+ 5500	GA75+ 7500	GA75+ 7500	2xGA45+ 2x4500P	2xGA45+ 2x4500P
Compressor Motor	Atlas Copco hp Sullair hp	30 25	40 40	50 50	60 60	75 75	100 100	100 100	2 x 60 2 x 60	2 x 60 2 x 60
Compressor Capacity	Atlas Copco acfm Sullair acfm	134 119	203 184	250 250	303 303	375 376	519 490	519 490	604 606	604 606
	Atlas Copco m <sup>3</sup> Sullair m <sup>3</sup>	4.1 3.4	5.7 5.2	7.0 7.1	8.6 8.6	10.6 10.6	14.4 13.9	14.4 13.9	17.2 17.2	17.2 17.2

## Request Quotation

**To Request a Quotation** for an i-Blend™ system, use the tables above to provide us with basic information about your application. The choices shown in each category 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 [i-blend@altenergy.com](mailto:i-blend@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.

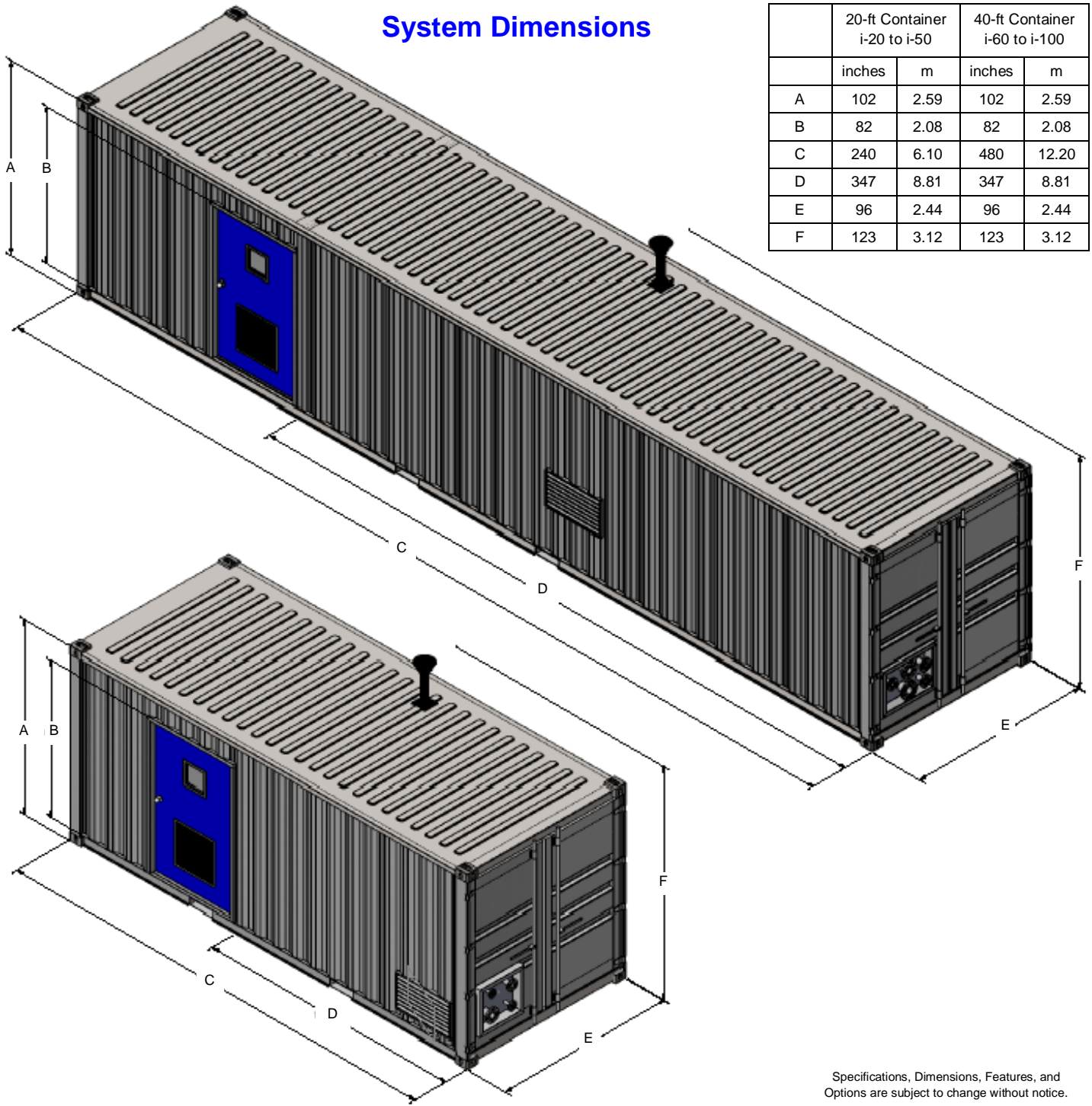
EXAMPLE

i-40	2.2 bar	70%P 30%B	AC415V3Ph	Sullair	S7-300	1
<b>System Size</b>	<b>Sendout Pressure</b>	<b>LPG Feedstock</b>	<b>Electrical Supply</b>	<b>Compressor Manufacturer</b>	<b>PLC Manufacturer</b>	<b>Gravimeter Positioner</b>
i-20	10 psi   0.7 bar	95% P 5% B	AC 120V 1Ph	NONE	Siemens	0 NONE
i-30	15 psi   1.0 bar	90% P 10% B	AC 220V 1Ph	Sullair	S7-200	1 Gravimeter GraviBlend-3 only
i-40	20 psi   1.5 bar	85% P 15% B	AC 230V 1Ph	Atlas Copco	S7-300	2 Gravimeter GraviBlend-3 and AccuBlend Positioner
i-50	25 psi   2.0 bar	80% P 20% B	AC 277V 1Ph		Allen-Bradley MicroLogix CompactLogix	
i-60	30 psi   2.5 bar	75% P 25% B	AC 220V 3Ph	other	GE-Fanuc VersaMax Micro 90-30	3 Other
i-70	35 psi   3.0 bar	70% P 30% B	AC 380V 3Ph			
i-80	40 psi   3.5 bar	65% P 35% B	AC 400V 3Ph			
i-90	45 psi   4.0 bar	60% P 40% B	AC 415V 3Ph			
i-100	50 psi   4.5 bar	55% P 45% B	AC 440V 3Ph			
(see Page 5 for System Capacities)	60 psi   5.0 bar	50% P 50% B	AC 460V 3Ph			
	65 psi   5.5 bar	45% P 55% B	AC 480V 3Ph			
	70 psi   6.0 bar	40% P 60% B	other			
	other	35% P 65% B			other	
		30% P 70% B				
		25% P 75% B				
		20% P 80% B				
		15% P 85% B				
		10% P 90% B				
		other				

Specifications, Dimensions, Features, and Options are subject to change without notice.

# System Dimensions

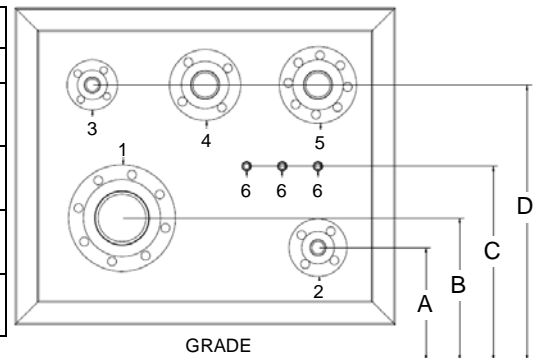
	20-ft Container i-20 to i-50		40-ft Container i-60 to i-100	
	inches	m	inches	m
A	102	2.59	102	2.59
B	82	2.08	82	2.08
C	240	6.10	480	12.20
D	347	8.81	347	8.81
E	96	2.44	96	2.44
F	123	3.12	123	3.12



Specifications, Dimensions, Features, and Options are subject to change without notice.

Connection Size		i-20 to i-70	i-80 to i-100
		Outlet Size is determined by Blender Model	
1	MixGas OUT	POM-30: 3" 150# ANSI/ASME DN80 PN16 (DIN 86030) POM-40: 4" 150# ANSI/ASME DN100 PN16 (DIN 86030) POM-60: 6" 150# ANSI/ASME DN160 PN16 (DIN 86030)	
2	Liquid IN	1" 300# RF ANSI/ASME DN25 PN40 (DIN 2635)	2" 300# RF ANSI/ASME DN25 PN40 (DIN 2635)
3	Flare Line OUT	2" 150# RF ANSI/ASME DN25 PN16 (DIN 86030)	2" 150# RF ANSI/ASME DN25 PN16 (DIN 86030)
4	Air IN/OUT	2" 150# RF ANSI/ASME DN50 PN16 (DIN 86030)	2" 150# RF ANSI/ASME DN50 PN16 (DIN 86030)
5	Vapor IN/OUT	2" 300# RF ANSI/ASME DN50 PN40 (DIN 2635)	3" 300# RF ANSI/ASME DN80 PN40 (DIN 2635)
6	Vent Lines	Compression Fittings for 1/4-inch tubing	

Bulkhead Dimensions		
	inches	mm
A	17.75	451
B	20.25	514
C	24.63	626
D	31.50	800



NOTE: Air IN/OUT and Vapor IN/OUT connections can be used to connect to other (redundant) i-blend modules.

# Who is Alternate Energy Systems, Inc. ?

**A**fter 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 Wolfgang Driftmeier. With his manufacturing background and his experience in sales and marketing, the company focus is clearly on "... offering the best product design, combined with quality workmanship, at a competitive price, to the full satisfaction of our customers, at all times ...".

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

Please visit our web site at [www.altenergy.com](http://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

Electric Vaporizers  
Electric Water Bath 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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## Your AES Distributor