

TECHNICAL DATA SHEET

GFED ALPHA 1/2/3

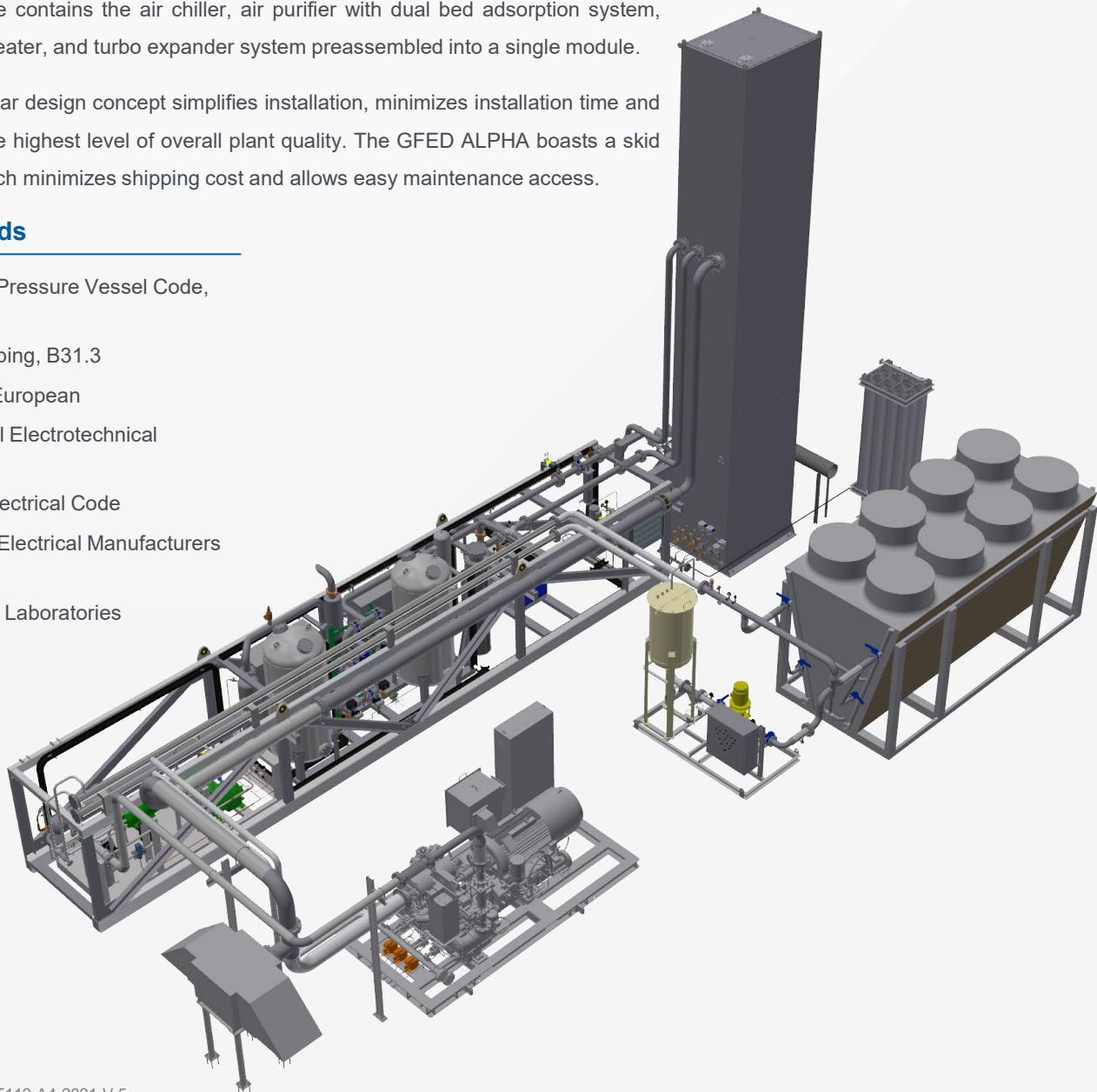
The GFED series are state-of-the-art modular air separation plants. These plants produce high purity liquid oxygen and liquid nitrogen by cryogenic distillation of atmospheric air. The plants also produce high purity gaseous oxygen which can be used for future liquefaction or an on-site pipeline. Structurally ideal for emerging markets and remote locations, the GFED plants are simple and robust, and have been proven in over 45 locations worldwide.

The comprehensive scope of supply includes five pre-assembled skid mounted modules and all necessary interconnecting materials. Plant modules include feed air compressor, air treatment module, cold box module, cooling water pump skid, and cooling water tower. The air treatment module contains the air chiller, air purifier with dual bed adsorption system, regeneration/thaw heater, and turbo expander system preassembled into a single module.

The compact, modular design concept simplifies installation, minimizes installation time and cost and ensures the highest level of overall plant quality. The GFED ALPHA boasts a skid mounted design which minimizes shipping cost and allows easy maintenance access.

Design Standards

- ASME Boiler and Pressure Vessel Code, Section VIII, Div 1
- ASME Process Piping, B31.3
- CE – Conformity European
- IEC – International Electrotechnical Commission
- NEC – National Electrical Code
- NEMA – National Electrical Manufacturers Association
- UL – Underwriters Laboratories



TDS-CDY-GFED ALPHA-T112-A4-2021 V.5

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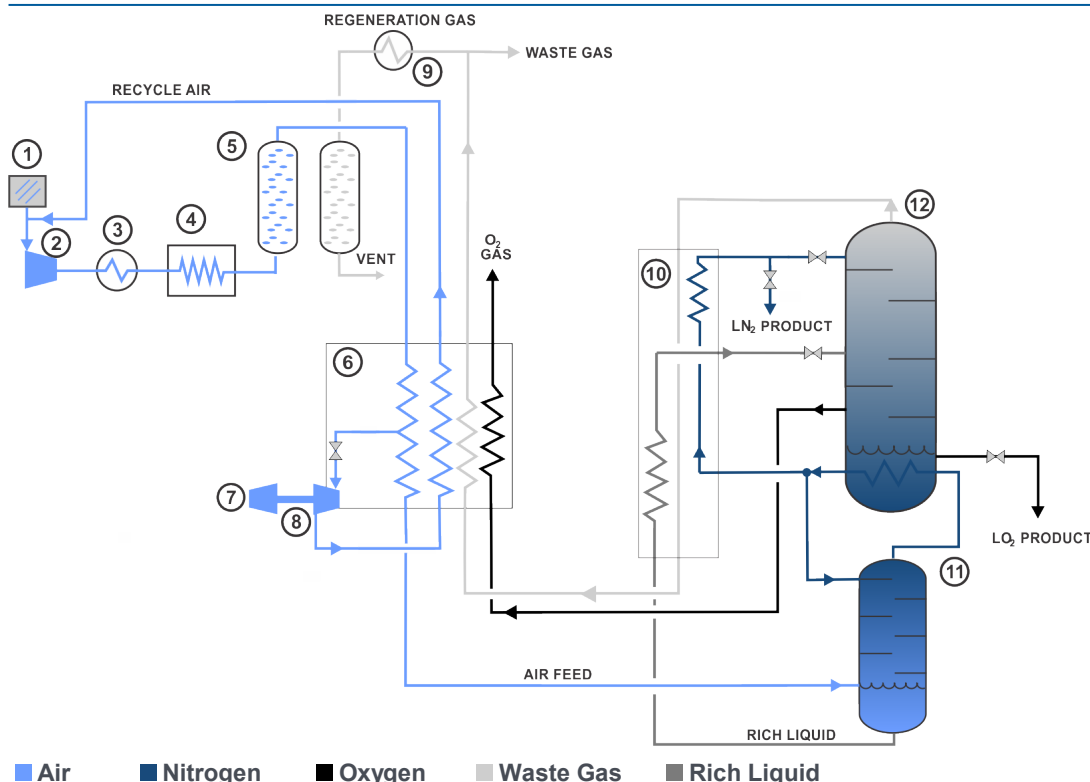
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Model		GFED 1		GFED 2		GFED 3	
		MAX LOX	MAX LIN	MAX LOX	MAX LIN	MAX LOX	MAX LIN
Operating Mode							
Production							
Liquid Nitrogen	Nm ³ /hr	0.0	137	0.0	184	0.0	242
	MTPD	0.0	4.1	0.0	5.5	0.0	7.3
Liquid Oxygen	Nm ³ /hr	126.9	3.0	156.6	2.0	202	7.0
	MTPD	4.4	0.1	5.4	0.1	6.9	0.2
Total Liquids	Nm ³ /hr	126.9	140	156.6	186	202	249
	MTPD	4.4	4.2	5.4	5.6	6.9	7.5
Oxygen Gas	Nm ³ /hr	0.0	28	0.0	77	0.0	84
	MTPD	0.0	1.0	0.0	2.6	0.0	2.9
Product Purity							
Oxygen	% O ₂	99.6		99.6		99.6	
Nitrogen	% N ₂	99.9		99.9		99.9	
Pressure							
Nitrogen	barg	4.8		4.8		4.8	
Oxygen	barg	0.55		0.55		0.55	
Power							
	kW	299	297	362	359	449	447
Specific Power	kWh/Nm ³	2.36	2.13	2.31	1.93	2.22	1.80

NOTES

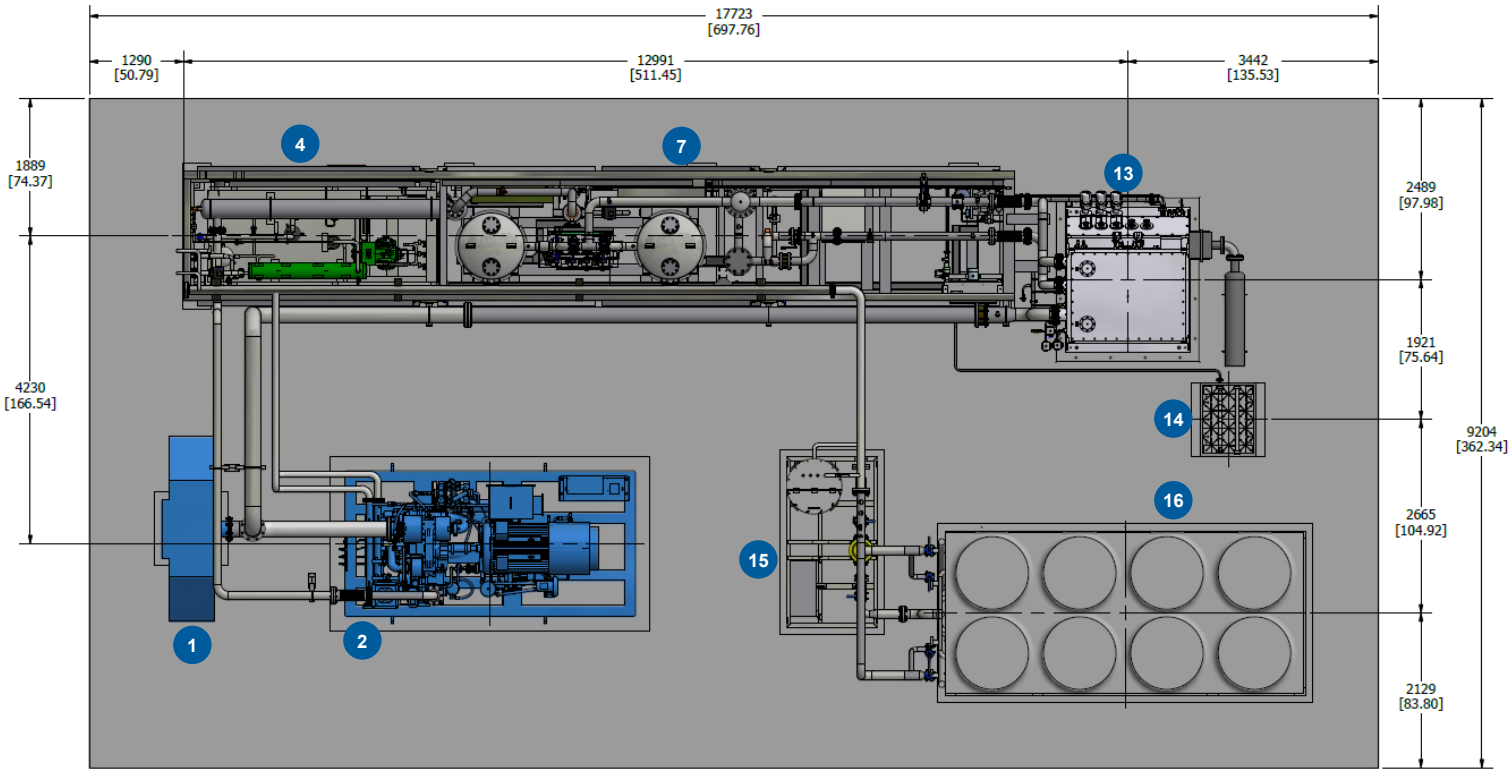
1. Performance is based on STP (20 °C, 50% RH, Sea Level, Cooling water 24 °C)
2. Nm³ is measured at 1.0 Atmospheres and 0 °C
3. Nitrogen purity to 1ppm O₂ in N₂ possible
4. Liquid N₂ subcooled to -188°C

Simplified Flow Diagram



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1. Air inlet filter
2. Feed air compressor
3. Compressor aftercooler
4. Air chiller
5. Adsorber vessels
6. Main heat exchanger
7. Airbreak
8. Cold turbo expander
9. Regen heater
10. Subcooler
11. Nitrogen column
12. Oxygen column

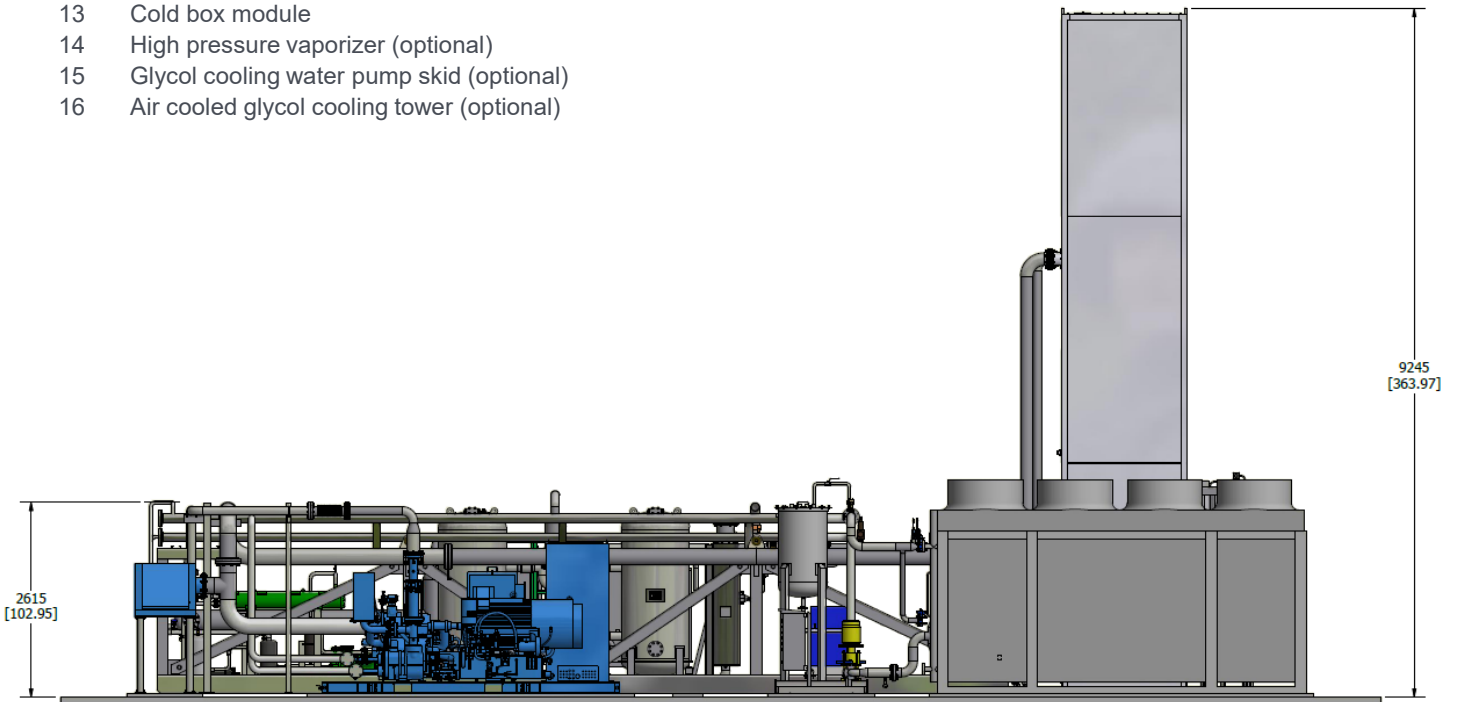


PLAN VIEW

Units of Measure: mm[in]

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- 1 Air inlet filter
- 2 Feed air compressor
- 4 Air chiller
- 5 Adsorber vessels
- 7 Warm end skid
- 13 Cold box module
- 14 High pressure vaporizer (optional)
- 15 Glycol cooling water pump skid (optional)
- 16 Air cooled glycol cooling tower (optional)



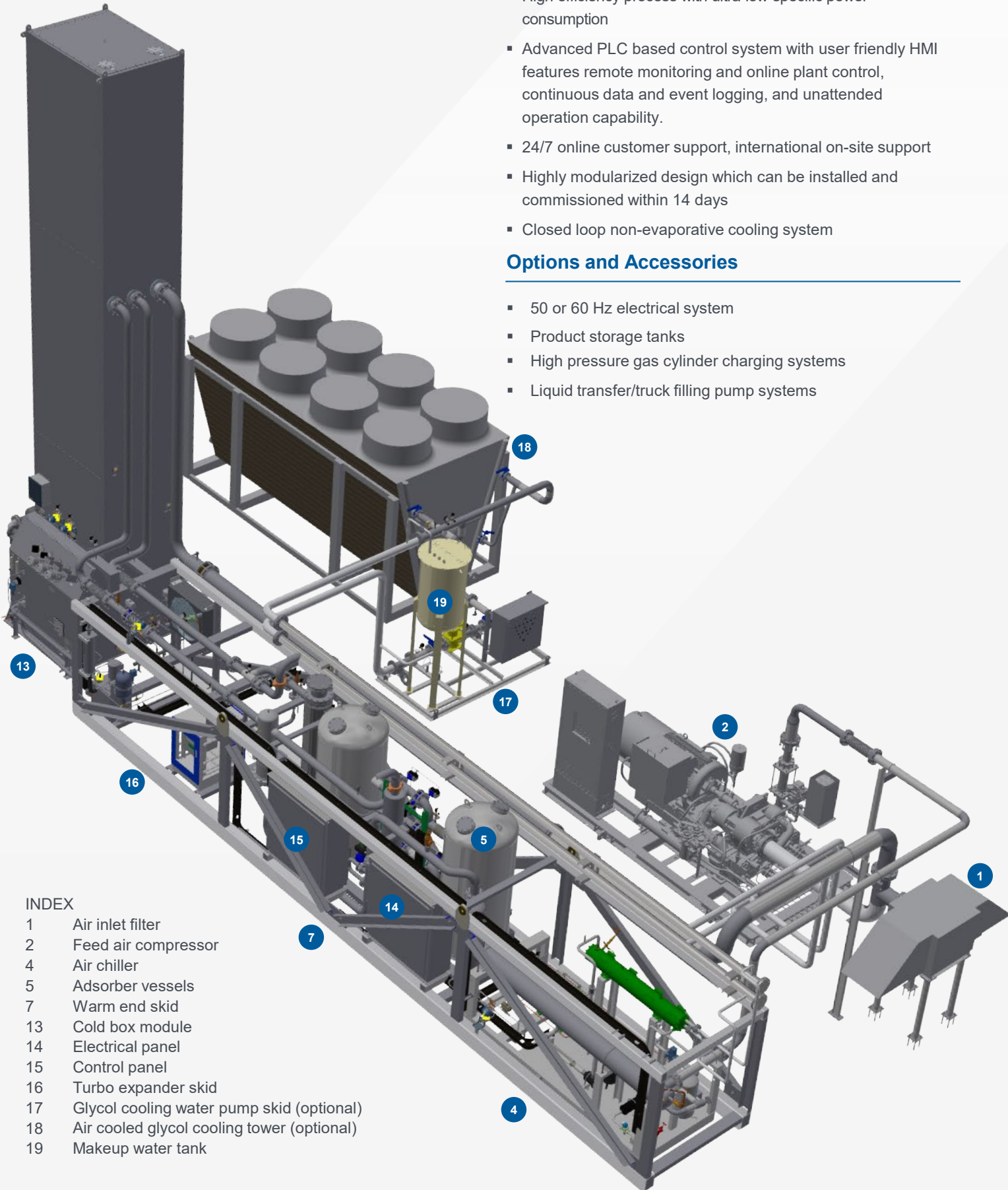
ELEVATION VIEW

Units of Measure: mm[in]

- High efficiency process with ultra-low specific power consumption
- Advanced PLC based control system with user friendly HMI features remote monitoring and online plant control, continuous data and event logging, and unattended operation capability.
- 24/7 online customer support, international on-site support
- Highly modularized design which can be installed and commissioned within 14 days
- Closed loop non-evaporative cooling system

Options and Accessories

- 50 or 60 Hz electrical system
- Product storage tanks
- High pressure gas cylinder charging systems
- Liquid transfer/truck filling pump systems



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- 1 Air inlet filter
- 2 Feed air compressor
- 4 Air chiller
- 5 Adsorber vessels
- 7 Warm end skid
- 13 Cold box module
- 14 Electrical panel
- 15 Control panel
- 16 Turbo expander skid
- 17 Glycol cooling water pump skid (optional)
- 18 Air cooled glycol cooling tower (optional)
- 19 Makeup water tank

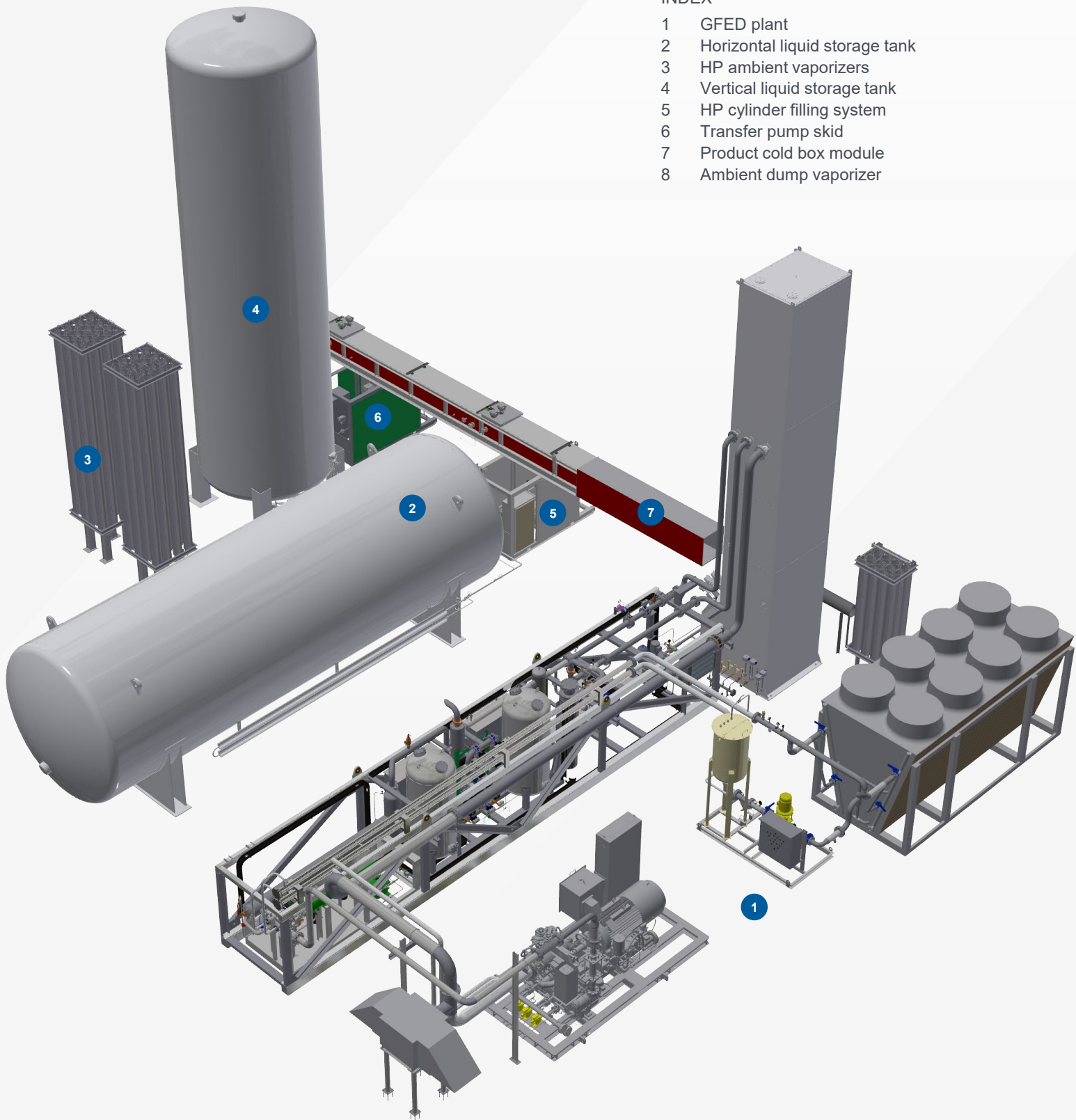
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- 1 GFED plant
- 2 Horizontal liquid storage tank
- 3 HP ambient vaporizers
- 4 Vertical liquid storage tank
- 5 HP cylinder filling system
- 6 Transfer pump skid
- 7 Product cold box module
- 8 Ambient dump vaporizer





Warm end module that is pre-wired and pre-piped



Warm end module that is pre-wired and pre-piped



Cold box module internals

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