

CREST ENERGY SERVICES

Onsite Nitrogen Generation Services

Equipment and services for:

- Pipeline Purging, Drying and Layup
- Coiled Tubing Applications
- Under balanced Drilling (UBD)
- UBD Surface Equipment Inerting
- Well Completions and Workovers
- Gas Lift
- Nitrogen Flooding
- Reservoir Pressure Control and Maintenance
- Formation Fracturing
- Nitrogen Stimulation

Membrane Nitrogen & Compression Services



Crest Energy Services (CES) provide onsite Nitrogen Production and Boosting Services throughout the Middle East, North Africa and the Sub Continent. Our core areas of operations are Saudi Arabia, UAE, Oman and India.

Service delivery is our key focus bringing a safe, reliable continuous supply of Nitrogen at the worksite in a cost effective manner bringing added value to all of our clients. Our services are fully backed by the field proven equipment, personnel, technical solutions and safety systems.



One of the key mandates for Crest is to support our clients with quality Membrane Nitrogen, Compression and Boosting equipment that will meet their specific project requirements anywhere in the region.

This includes minimizing transport costs, rig up/rig down time and environmental footprint, while maximizing the Nitrogen delivery, fuel efficiency and ease of maintenance.

Crest offers Membrane Nitrogen, Compression and Boost equipment that is capable of operating in ambient conditions ranging from -50C to over 55C. Our equipment is tested to 60C to ensure continuous operations in the harsh Middle East environment.

As pressure and volume requirements can differ from project to project we are capable of delivering up to 3000 scfm of nitrogen to a final discharge pressure of up to 10,000 psi. We are also unique in the fact that our equipment can be arranged to be trailer mounted, oilfield skidded, or sea framed complete with the four-point lift.

Our Nitrogen Production and Boosting Services offer spread capacities ranging from 750 to 3,000 scfm of Nitrogen @ 95% - 99.99% purity.

Crest can also supply Cryogenic Nitrogen solutions, please contact us for further details.



2,000 SCFM Nitrogen Generation Unit GENERAL EQUIPMENT SPECIFICATIONS



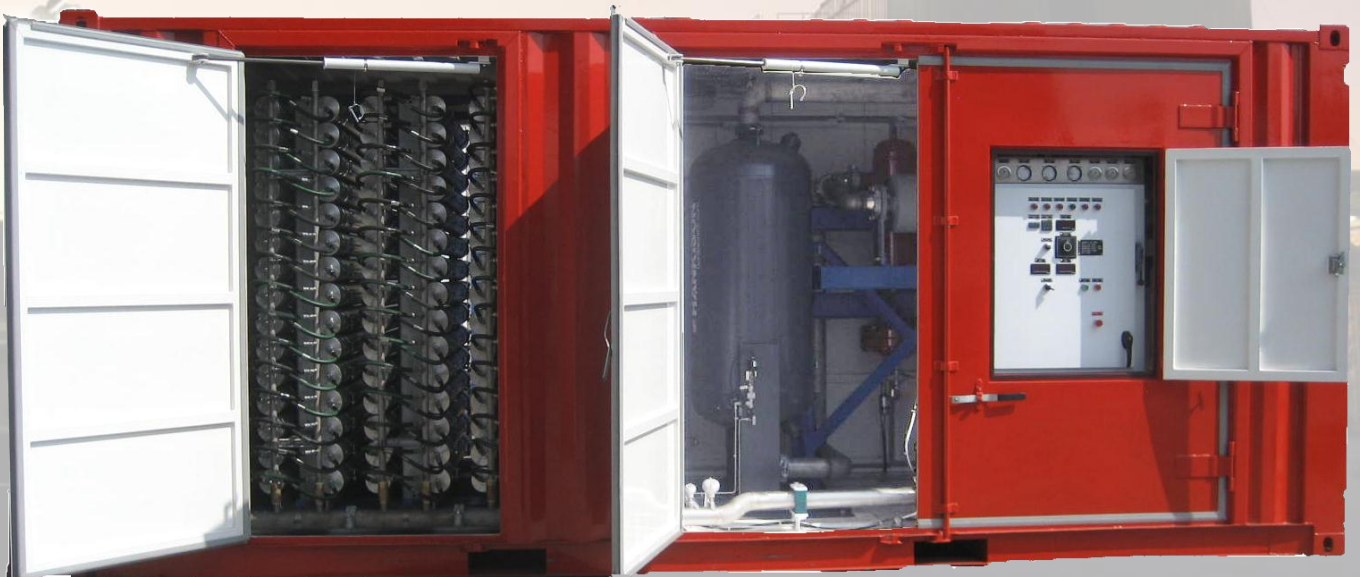
Nitrogen Production Unit		
Manufacturer:	PCI, Riverside, CA	
Model:	2000HPNGUBB	
Maximum N2 product flow rate: @ 95% purity (N2 + Inerts)	2,000 scfm	57 scmm
Maximum primary air pressure:	350 psi	42 bar; 2,413 Kpa
Maximum primary air flow:	3550 scfm	100 Nm3/min
Ambient temperature range: Min / Max	-20° F / 130° F	-29° C / 55° C
Air pre-treatment:	Coalescing, particulate/ carbon filters	
Air re-heater:	Electric 480V, 3-phase, 60 Hz	
Electric instrumentation:	Non-hazardous, NEMA-4	
Nitrogen flow meter:	Local, 4-20mA output data acquisition	
Alarms:	Low purity alert	
Reheater is preset at:	48.9° C to 54.4° C (120° F to 130° F) to operate in ambient temperatures below 37.8° C (100° F)	
Recommended Diesel generator:	350 kVA, 480V, 3-phase, 60Hz	
Container classification:	Class 1CC, DNV 2.7.1 certified	

Crest provides state of the art Nitrogen Membrane technology from PCI to generate continuous Nitrogen onsite. Our units are rated for the high ambient conditions found in the region.

Each 2,000cfm unit is housed in a 20ft ISO DNV certified package for ease of transport.

Once onsite, the Nitrogen unit and associated Compression can be set up and fully operational in under 6 hours.

System Performance Table		
Each containerised system will produce up to 2000 scfm (56.6 scmm) of 95% pure nitrogen if supplied with a minimum of 3550 scfm primary feed air @ 350psi (24 bar). Maximum inlet capacity 5400 scfm @ 350 psi (24bar)		
Discharge pressure:	Estimated at 320 psi (22 bar)	
Discharge temperature:	5.6° C - 8.3° C (above ambient)	
Primary Air Feed	Nitrogen Delivery	Nitrogen Purity
3547 scfm @ 340 psi	2,000 scfm	95%
3055 scfm @ 340 psi	1,500 scfm	97%
2748 scfm @ 340 psi	1,200 scfm	98%
Dimensions & Weight		
Maximum container length:	20 ft	6.1 m
Maximum container width:	8 ft	2.44 m
Maximum container height:	8ft 6 in	2.59 m
Approx. weight:	28,000 lbs	12,72 kg



Primary Compression GENERAL EQUIPMENT SPECIFICATIONS



Crest Energy Services uses Atlas Copco air compressors which are highly regarded as “world class” drilling units with a global support system that enables replacement parts and service techs to be available in most regions in the world.

In addition to having a strong service record, Atlas Copco compressors are whisperized and as such have sound attenuation levels that are unmatched in the industry.

As a by product of the enclosures that allow the dampening of sound, these units are better equipped to handle harsh environments such as extreme cold, extreme heat, and sand or windblown solids invasion. Atlas Copco TwinAir XRVS945- XRVS 2000 scfm compressors, with the new generation C-13ACERT engines run quieter and with greater fuel efficiency than the competitors

Primary Feed Compressors ISO – DNV 20ft Containerised Option 2 Units Supplied to Feed 2000 scfm N2 Unit	
Compressor Specifications	
Make and Model	Atlas Copco XRVS 2000 CD6
Type	Screw
No. of stage	2
Rated Air Delivery	1975 scfm
Rated Operating pressure	365psi
Engine Specifications (2 Engines per Unit)	
Make and Model	CAT C-13ACERT
Type	Diesel
Number of Cylinders	6 Inline
Bore and Stroke	5.12 x 6.18
Rated Horsepower	440 BHP
Full Load Speed	2,100 rpm
Idle Speed	1,100 rpm
Crankcase Oil Capacity	11.62 US Gallon
Coolant System Capacity	15.85 Gallons
Starter	24V Electric
Environmental Data (per Engine)	
Fuel Consumption	190 lb/hr (@100% FAD)
Sound Power Level (LWA)*	104 dB(A)
Sound Pressure Level (LPA)** at 7m acc. To ISO 2151	76 dB(A)
Weight and Dimensions	
Shipping Weight	(approx) 14986kg
Width	8ft
Length	20ft
Height	8.5”

Primary Feed Compressors Trailer Mounted Option 4 Units Supplied to Feed 2000 scfm N2 Unit	
Compressor Specifications	
Make and Model	Atlas Copco XRVS 476/1000 CD6
Type	Screw
No. of stage	2
Rated Air Delivery	1000 scfm
Rated Operating pressure	362psi
Engine Specifications	
Make and Model	CAT C15 ACERT
Type	Diesel
Number of Cylinders	6 Inline
Bore and Stroke	5.71 x 7.2
Rated Horsepower	575 BHP
Full Load Speed	1,800 rpm
Idle Speed	1,300 rpm
Crankcase Oil Capacity	9 Gallon
Coolant System Capacity	13.7 Gallons
Starter	24V Electric
Environmental Data	
Fuel Consumption	190 lb/hr (@100% FAD)
Sound Power Level (LWA)*	104 dB(A)
Sound Pressure Level (LPA) **at 7m acc. To ISO 2151	76 dB(A)
Weight and Dimensions	
Shipping Weight	(approx) 6,100 Kg
Width	5.8ft
Length with tow-bar Stowed	13ft
Height	8ft



High Pressure Boosters

GENERAL EQUIPMENT SPECIFICATIONS



Crest Energy Services uses Gardner Denver (Joy WB 12) boosters. They are smaller, lighter and still pack as much power as the larger and much heavier comparable units. Obviously volumes and pressures are project specific, and as such, Crest is building our fleet around versatility and flexibility. The small foot print of this equipment allows it to be placed on lease locations that in the past would have been very difficult to accommodate compression equipment.

Booster options are available ranging from 2,000 to 5,000 psi



JOY Booster	
Compressor Specifications	
Make and Model	Gardner Denver (JOY WB12)
Type	Two Stage Y Frame
No. of stage	2
Rated Air Delivery Single Stage	3,778 scfm @ 800 psi
Rated Air Delivery Two Stage	2,647 scfm @ 2000 psi
Cylinders Sizes	1st Stage: 6", 2nd Stage:4"
Engine Specifications	
Make and Model	Caterpillar C-18 ACERT
Type	Diesel
Number of Cylinders	6 Inline
Bore and Stroke	5.71 x 7.2
Rated Horsepower	630 BHP
Full Load Speed	1,800 rpm
Idle Speed	1,500 rpm
Crankcase Oil Capacity	11 Gallon
Coolant System Capacity	21 Gallons
Starter	24V Electric
Alternator	35 AMP
Battery	24 Volt Heavy Duty
Weight and Dimensions	
Shipping Weight	(approx) 34,000 lbs
Width	8.3"
Length	24.6"
Height	8.9"



Power Generator 250 kVA GENERAL EQUIPMENT SPECIFICATIONS



Crest Energy Services uses the fully waterproof FG Wilson sound attenuated enclosures accompanying the Perkins 1300 Series-powered generating unit.

An Emergency stop push button (red) is mounted on enclosure exterior and there is a Control panel viewing window in a lockable access door.

Cooling fan and battery charging alternator fully guarded. Fuel fill and battery can only be reached via lockable access doors. The exhaust silencing system is totally enclosed for operator safety.

It has a Tested and Certified single point lifting facility on baseframe



Power Generator	
Compressor Specifications	
Make	F G Wilson
Model	P250H2
Prime Power	240kVA / 192 kW
Standby Power	265kVA / 212kW
Input Voltage	480 / 277V / 3phase / 60HZ
Output Voltage	220/ 127V / 3phase / 60HZ
Engine Specifications	
Make and Model	Perkins 1306C-E87TAG4
Type	Diesel
Number of Cylinders	6 Inline
Induction	Turbocharged Air to Air Charge Cooled
Engine Speed	1800RPM
Gross Engine Power	246.8kW (331hp)
Fuel Consumption	61.2 litres / Hour
Fuel tank Capacity	350 litres / 92.5 Gallon(US)
Starter Motor	Battery / Electric Starter
Panel	Power Wizard 1.0
Alternator	LL5014H
Circuit Breaker type	3 pole MCCB
Weight and Dimensions	
Shipping Weight	(approx) 3500 kg
Width	1003mm (39.5")
Length	2960mm (116.5")
Height	1718mm (67.6")



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