

Model Number: BD NC 02

Manufacturer: Black Diamond Well Services

Compact Nitrogen Pump: Black Diamond Well Service's Compact Nitrogen Pump is a complementary component for lightweight well intervention. The unit, which can be supplied together with various LN2 tanks including 3MT 500gal liquid nitrogen tanks, offers the opportunity to use high pressure nitrogen injection in locations that were previously inaccessible to nitrogen converters due to weight and or space limitations. The unit is commonly used alongside Compact Coiled Tubing Packages and in standalone applications.

Mounted in a DNV 2.7-1 certified and fully enclosed skid frame, the unit is driven by a hazardous area certified diesel engine rated for a peak power of 80HP. The unit uses a hydraulically driven cryogenic triplex pump raise the pressure of liquid nitrogen before the liquid is heated using waste heat to produce a high pressure gaseous output.

The unit will deliver a nominal discharge nitrogen flow rate of 27Kscf/hr (450scf/min) at pressures up to 10,000psi.

Designed as a true compact unit, the NPU-01 requires no onsite assembly saving valuable rig up time and reducing crew requirements.



Weight: Normal Transport Weight 3.5MT (MGM 5.8MT)

Dimensions: L x W x H = 1900 x 1700 x 2600mm

Specifications:

- Containerized design with rigid skid and full opening access doors on both sides. Louvers are installed to provide required airflow and allow the unit to be operated with the three of the four access doors closed.
- DNV 2.7-1 certified skid frame with sealed base and supplied with certified slings and fitted with forklift pockets.
- An hazardous area compliant, normally aspirated charged, diesel engine certified to Zone II (Class 1 Div 2 BCD T3) and rated at 80HP (Peak) is the prime mover.
- The engine and pump systems are controlled and monitored from a local panel mounted within the containerized frame of the pump unit.
- The Engine's pneumatic / oil Zone 2 Automatic Emergency Shut Down system (air and fuel shut off) is configured to independently stop the engine in the event of;
 - Engine Over speed
 - High Exhaust Gas Temperature
 - High Coolant Water Temperature
 - Low Engine Oil Pressure
 - Or, if manually tripped by operator locally
- The engine is additionally supplied with stainless steel flame traps, spark arrestor exhaust, air compressor and an air starter package.
- 40gal / 6hr stainless steel fuel tank with sight glass and drain facility
- The unit includes two engine mounted hydraulic pumps; A variable displacement high pressure open loop hydraulic pump which both drives and allows control of the triplex pump speed and is used to “load” the engine to extract additional heating capacity needed to warm the liquid nitrogen. The second PTO mounted pump supplies auxiliary hydraulic power and control pressure to the unit.
- The unit has a 50gal stainless steel hyd. tank complete with breather, suction strainer and return line filter(s).
- The high pressure nitrogen pump is protected by both over pressure systems within the hydraulic control system, operator adjustable discharge over pressure shut down and pressure relief valves on the discharge pipe work.
- All discharge pipe work is rated to a minimum of 10,000psi
- The unit includes a cryogenic pressurizing pump that both ensures adequate feed to the cryogenic triplex pump and allows LN2 recirculation at low discharge rates.
- The pump has minimal pipework and associated manifold to reduce unit weight.
- Suction and discharge lines are terminated at a common stainless steel engraved bulkhead with industry standard fittings:
 - Liquid Nitrogen Inlet and Tank Return: NIT150 Male
 - Gaseous Nitrogen Outlet: Fig 1502 Female

For More Information on this and other Black Diamond Products and Services please contact:

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