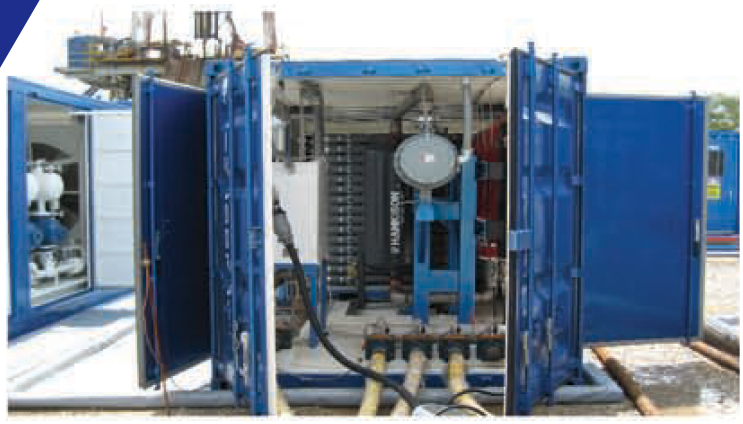
ON-SITE NITROGEN GENERATOR

HPNGU containerized

High Pressure Nitrogen Generating Unit (2000 HPNGU-95-5000) is a containerized nitrogen generator complete with compression equipment, ideal for underbalanced drilling or pipeline and specialty services.



Characteristics	Value / Description
Flow rate	Up to 2000 scfm I 56 scmm
N_2 Purity	95%, up to 99%
Pressure	Up to 5000 psig I 35 MPa
Containerized	Electric or diese
High temperature membranes	Up to 180° F (82° C)
Best in class membrane separation	Feed air to N_2 output up to 57%

Containerized HPNGU 2000 HPNGU-95-5000

PCI is pleased to introduce our turnkey nitrogen generation plants for the Oil & Gas market. The HPNGU uses proven components and can be configured for offshore use.

These systems are best used for remote locations where the cost of delivered liquid nitrogen (LIN) is high, when the scheduling and delivery of nitrogen takes a long time, or when the requirement calls for continuous mobility. Never run out of nitrogen or have to terminate a job prematurely while waiting on a **nitrogen bulk transport for supplemental LIN**.

Benefits

- Fully integrated mobile nitrogen generator
- Designed for reliability and rapid deployment
- Containerized and stackable
- Most compact configuration
- Easy to operate and maintain
- Field proven globally

Applications

- Pipeline / refinery
  - Purging
  - Testing
- Underbalance Drilling (UBD)
- Enhanced Oil Recovery (EOR)

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OIL AND GAS APPLICATIONS

PCI is the leading manufacturer of integrated mobile and portable nitrogen generation equipment for the oil & gas industry. Our innovative nitrogen systems are specifically designed with the operator and applications in mind – ease, efficiency, and reliability of operation.

Oil and Gas Nitrogen Applications Performance Ranges

Application	Description	Flow scfm | scmm	Pressure psig | MPa	Purity (%N_2)
COILED TUBING OPERATIONS	Coiled tubing is a flexible coil of piping that is run down a well and used in workovers, drilling operations, and fracturing. Nitrogen is sent down the hole to stimulate production, clean out debris, etc.	350 to 3000 | 10 to 85	1000 to 10000 | 7 to 69	95%+
PIPELINE PURGING & DRYING	Dry nitrogen is used to displace hydrocarbons in a pipeline or push a "pig" down a pipeline during cleaning. Nitrogen is also used to dry chemical pipelines to very low dew points, or for general inerting during plant turnarounds.	100 to 3000 | 3 to 85	300 to 3000 | 2 to 20	95%+
UNDERBALANCED DRILLING (UBD) **MANAGED PRESSURE DRILLING (MPD)**	Drilling operation where the pressure in the wellbore and bottomhole is less than the formation, allowing for production during drilling as well as protection of the formation. Nitrogen is commonly used because of combustion issues, and to far lesser extent, corrosion issues.	500 to 3000 | 14 to 85	1000 to 5000 | 7 to 35	95%+
WELL COMPLETIONS & WORKOVERS	Wells are sometimes capped off after drilling operations are concluded. Perforating the production string and displacement of the hydrostatic fluid head must be done to get the well to flow on primary pressure. Workovers are subsequent cleanouts performed on a regular basis to remove hydrostatic fluids.	350 to 3000 | 10 to 85	1000 to 5000 | 7 to 35	95%+
GAS LIFT	Introducing nitrogen in the produced oil product lightens the fluid, and the gas helps carry the lighter fluid to the surface. This is a secondary or enhanced oil recovery technique.	300 to 3000+ | 8 to 85+	1000 to 5000+ | 7 to 35+	95%+
ENHANCED OIL RECOVERY (EOR) **NITROGEN FLOODING**	When the primary pressure of the reservoir is gradually depleted over time, additional energy must be added to the reservoir to drive the reservoir products to the surface. Nitrogen or natural gas is used to provide this additional pressure. Injection of nitrogen is used to push a miscible front through a reservoir which pushes banks of displaced oil to production wells.	1000 to 3000+ | 28 to 85+	1000 to 5000+ | 7 to 35+	95%+
STIMULATION	Nitrogen is used as a carrier gas for a number of chemicals, including acids, and various proppants used to fracture a reservoir to increase the permeability and total oil recovery of the well.	1000 to 5000 | 28 to 140	2000 to 10000 | 13 to 69	95%+