

# ON-SITE NITROGEN GENERATOR

## HPNGU single drive

- **High Pressure Nitrogen Generation Unit** (C650 HPNGU-95-4500) is a compact, containerized and stackable system with dual use as stand alone air package.



| Characteristics                   | Value / Description                         |
|-----------------------------------|---|
| Flow rate                         | 650 scfm   18 scmm                          |
| N <sub>2</sub> Purity             | 95%, up to 99%                              |
| Pressure                          | 4500 psig   31 MPa                          |
| Drive                             | Single diesel engine                        |
| High temperature membranes        | Up to 180° F (82° C)                        |
| Best in class membrane separation | Feed air to N <sub>2</sub> output up to 57% |

### Single Drive HPNGU C650 HPNGU-95-4500

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 location has limited space and requires a minimal footprint. Never run out of nitrogen or have to terminate a job prematurely while waiting on a nitrogen bulk transport for supplemental LIN. PCI's nitrogen generators eliminate the troublesome logistics and timing of LIN supply while delivering nitrogen at a portion of the cost of hauled in LIN.

#### Benefits

- Fully integrated mobile nitrogen generator
- Local or remote control and display
- Designed for reliability and rapid deployment
- Containerized and stackable
- Most compact containerized configuration
- Easy to operate and maintain
- Field proven global

#### Applications

- Well servicing
  - Coiled tubing applications
  - Well cleanouts
  - Stimulation
- Gas lift
- Underbalance Drilling (UBD)
- Pipeline / refinery
  - Purging and testing

## 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                |                 | Pressure            |                | Purity (%N <sub>2</sub> ) |
|---|---|---------------------|-----------------|---------------------|----------------|---------------------------|
|   |   | scfm                | scmm            | psig                | MPa            |                           |
| <b>COILED TUBING OPERATIONS</b>   | 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<br>to<br>3000   | 10<br>to<br>85  | 1000<br>to<br>10000 | 7<br>to<br>69  | 95%+                      |
| <b>PIPELINE PURGING &amp; DRYING</b>  | 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<br>to<br>3000   | 3<br>to<br>85   | 300<br>to<br>3000   | 2<br>to<br>20  | 95%+                      |
| <b>UNDERBALANCED DRILLING (UBD)</b><br><br><b>MANAGED PRESSURE DRILLING (MPD)</b> | 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<br>to<br>3000   | 14<br>to<br>85  | 1000<br>to<br>5000  | 7<br>to<br>35  | 95%+                      |
| <b>WELL COMPLETIONS &amp; WORKOVERS</b>   | 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<br>to<br>3000   | 10<br>to<br>85  | 1000<br>to<br>5000  | 7<br>to<br>35  | 95%+                      |
| <b>GAS LIFT</b>   | 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<br>to<br>3000+  | 8<br>to<br>85+  | 1000<br>to<br>5000+ | 7<br>to<br>35+ | 95%+                      |
| <b>ENHANCED OIL RECOVERY (EOR)</b><br><br><b>NITROGEN FLOODING</b>                | 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<br>to<br>3000+ | 28<br>to<br>85+ | 1000<br>to<br>5000+ | 7<br>to<br>35+ | 95%+                      |
| <b>STIMULATION</b>  | 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<br>to<br>5000  | 28<br>to<br>140 | 2000<br>to<br>10000 | 13<br>to<br>69 | 95%+                      |