Providing Reliable, Engineered Solutions for Multi-Industry Applications

CES offers reliable industrial nitrogen services solutions for routine maintenance, turnarounds, and shutdowns in multi-industry applications.

The large volume capacity of our equipment helps minimize transportation costs and traffic congestion by allowing scheduled deliveries and providing continuous pumping during replenishment. Each piece of equipment is designed to safely adapt to low and high pressure, high-volume environments, and is equipped with temperature and pressure safety shut-down systems.

Our industrial nitrogen services are supported by certified personnel, with years of industrial operations experience. Each operation is managed by a knowledgeable, IADC certified supervisor who provides on-site supervision throughout the job. All service line employees hold a Transportation Worker Identification Credential (TWIC®) certification. In addition, we adhere to the federal Operator Qualification (OQ) Program and all DOT regulations.

Benefits

• Versatile across a range of industries and applications
• Adaptable to open-flamed and flameless environments
• Provide low-pressure and high-pressure capabilities
• High-capacity equipment improves process efficiency and reduces downtime for reloads
Cudd Energy Services offers safe, efficient nitrogen solutions to support routine maintenance, turnarounds and shutdowns for a wide range of industries: refinery and petrochemical, pipeline processing, marine, mining, disposal well, utility and steam generation.

Applications
- Purging Operations
- Drying Operations
- Pressure Testing
- Cool-Down Operations
- Heat-Up Operations
- Pigging Operations
- Blanketing Operations
- Evacuation of Storage Caverns
- Cleaning and Backwashing Operations
- Testing Operations
- Inerting Operations
RELIABLE, INNOVATIVE EQUIPMENT

Cudd Energy Services’ industrial nitrogen equipment provides added support for a wide range of industrial applications, including reactor heat up and cool down, drying, catalyst regeneration, pressure testing, pipeline pigging, purging and production transfer and unloading.
QUEEN STORAGE VESSEL

The 52-foot storage unit helps minimize transportation costs and facility congestion with its large capacity and pumping capabilities. In combination with our fleet of nitrogen transport units, the queen storage vessel ensures product availability and superior job logistics. The queen storage vessels are strategically located throughout North America.

KEY FEATURES:

- Safely stores over 1.5 MMscf onsite to help reduce on-site traffic for reloads
- Provides high-rate product requirements in industrial operations
- Provides 24 hours of pumping at 1,000 scf per minute, and allows transport unloads without interrupting pumping operations
The dual mode pump is the versatile solution for refinery and plant facilities. The dual mode pump is compliant with C.A.R.B/E.P.A. Tier 2 emission standards, is adaptable to both open-flame and flameless environments and provides a wide range of pump rates and pressures. The heat recovery system delivers up to 180,000 scf per minute, providing significant fuel savings.

**KEY FEATURES:**
- Equipped with emergency shut-down devices for high-pressure, high-temperature environments
- Has spark arrestors to eliminate potential ignition sources
- Contains hydraulically driven pumps for smoother, more efficient movements
- Handles pressure rates up to 10,000 psi

**Applications**
- Oil and Gas Operations
- Hydrocarbon Plants
- Petrochemical Plants
- Gas Storage Facilities
- Well Site Operations
- Pipeline Purge/Drying
HEAT RECOVERY UNIT

180K | 360K

The nitrogen heat recovery unit captures heat from high energy content safely and efficiently. The unit delivers flameless heat recovery for a range of applications. Our personnel receive extensive internal and external training to ensure proper handling and operation of the equipment.

KEY FEATURES:

• Maximum pumping rate of 180,000 scf per minute for liquid nitrogen at working pressures up to 10,000 psi
• Liquid nitrogen storage capacity range of 2,000 - 3,000 gallons on mounted unit
• Temperature-controlled operating cabin
• Available in trailer-mounted and bobtail options
• Safety shutdown for low and high temperatures (+190°F)
• Safety shutdown for low and high pressures
• Data logging for pressure, flow rate and temperature variables

Specifications

<table>
<thead>
<tr>
<th>180K</th>
<th>360K</th>
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</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong> – H x L x W (in)</td>
<td>158 in x 504 in x 102 in</td>
</tr>
<tr>
<td><strong>Weight (lb)</strong></td>
<td>80,000</td>
</tr>
<tr>
<td><strong>Engine (lb)</strong></td>
<td>Cummins Diesel</td>
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<tr>
<td><strong>Engine rating</strong></td>
<td>520 BHP</td>
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<tr>
<td><strong>Maximum working pressure (psi)</strong></td>
<td>10,000</td>
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<tr>
<td><strong>Maximum pumping rate (scfh)</strong></td>
<td>180,000</td>
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<tr>
<td><strong>Liquid storage capacity (gal)</strong></td>
<td>2,000 and 3,000</td>
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