

Hydra Rig™

Nitrogen Products



Table of Contents

Nitrogen Pumping Units

Non-Fired Skid-Mounted Nitrogen Pumping Unit	3
Non-Fired Trailer-Mounted Nitrogen Pumping Unit	4
Nitrogen/Fluid Combination Pumping Unit	5
Non-Fired Chassis (Truck)-Mounted Nitrogen Pumping Unit	6
Quad BOP/Nitrogen Pumping Combination Unit	7
Direct-Fired Trailer-Mounted Nitrogen Pumping Unit	8
Direct-Fired Chassis (Truck)-Mounted Nitrogen Pumping Unit	9

Nitrogen Components

Pump Power Ends	11-12
Liquid Nitrogen Boost Pumps	13
Liquid Nitrogen Cold Ends	14
Nitrogen Vaporizer Systems	15

Nitrogen Service and Aftermarket

Service and Aftermarket	17
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We are a leading manufacturer of nitrogen pumping equipment.

At Hydra Rig, we proudly manufacture the world's most advanced nitrogen pump and vaporizer systems for coiled tubing, fracturing, and industrial nitrogen applications. While most manufacturers of nitrogen pumping units purchase the major components for this highly specialized equipment, we meet the demands of oilfield, industrial, and pipeline service by designing and manufacturing our own cryogenic cold ends, warm ends, boost pumps, fired vaporizers, and heat-recovery vaporizers to ensure that you receive a fully engineered system with one-point responsibility.

We have built a reputation of providing top-quality equipment and aftermarket services to our customers worldwide. Certified in-house quality assurance programs follow the products before, during, and after construction.

We stand behind our equipment with qualified engineering, technical, and service support, gaining a reputation envied by our competitors. The ability to meet our customers' needs with both standard and specialized equipment has kept our product line innovative and expanding.



Nitrogen Pumping Units

Non-Fired Skid-Mounted Nitrogen Pumping Unit



Our extensive range of skid-mounted nitrogen units is built to meet your global demands. Units are available in single- or split-skid designs. Options for soundproofing the unit also exist when an open-framed unit is not desired.

These units are self-contained, complete with bundled skid design, and are perfectly suited for the offshore market. Our unique design provides equipment flexibility with the ability to be trailer-mounted using the unit's ISO locks.

Our skid-mounted nitrogen units are available in a wide range of pressure and output capacities. The standard output maximum pressure is 10,000 psi, but 15,000 psi is also possible. Units can be provided with output flow rates from 27,000 up to 320,000 SCFH.

Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
SK90NF	1.250 in. (31.75 mm)	90,000 SCFH (2365 m ³ /hr)	15,000 psi (103 MPa)
SK180NF	1.625 in. (41.275 mm)	180,000 SCFH (4730 m ³ /hr)	10,000 psi (69 MPa)
SK270NF-DBL	1.250 in. (31.75 mm)	270,000 SCFH (7096 m ³ /hr)	10,000 psi (69 MPa)
SK270NF-DBL	1.625 in. (41.275 mm)	270,000 SCFH (7096 m ³ /hr)	10,000 psi (69 MPa)
SK320NF	1.875 in. (47.625 mm)	320,000 SCFH (8410 m ³ /hr)	15,000 psi (103 MPa)

DNV-certified 270K skid-mounted nitrogen unit

Our DNV-certified 270K skid-mounted nitrogen unit is designed for use on stimulation vessels and has completed the rigorous testing and certification process of DNV Rules of Ships.

This DNV certification ensures that you can get your equipment on most, if not all, platforms and boats including, but not limited to, our low-pressure and high-pressure systems, high-pressure nitrogen vaporizer, centrifugal pump, and cold ends.

Offshore corrosion-protection package

The purpose of the corrosion-protection package is to provide additional protection against the harsh corrosive environments associated with offshore applications. The design goal for these options is to provide a seven-year life for the skid in offshore environments.

This package includes protection for drip pan and brackets and several alternative stainless design options.

Non-Fired Trailer-Mounted Nitrogen Pumping Unit



Our non-fired trailer-mounted pumping units come standard with a diesel engine, gear box, NP-200 nitrogen pump, nitrogen boost pump, water bath vaporizer, hydraulics, liquid nitrogen storage tank, and necessary piping and controls. Our sales and engineering teams work closely with you to ensure your operational needs are met and custom changes can be made.

Options

- Cabin location: rear/center
- Controls: touch/manual
- Domestic versus export
- Actuated versus manual valves
- TCRN

Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
TR90NF	1.250 in. (31.75 mm)	90,000 SCFH (2365 m ³ /hr)	15,000 psi (103 MPa)
TR180NF	1.625 in. (41.275 mm)	180,000 SCFH (4730 m ³ /hr)	10,000 psi (69 MPa)
TR270NF	2.000 in. (50.8 mm)	270,000 SCFH (7096 m ³ /hr)	6,000 psi (41 MPa)
TR360NF	1.625 in. (41.275 mm)	360,000 SCFH (9461 m ³ /hr)	10,000 psi (69 MPa)



6

Nitrogen/Fluid Combination Pumping Unit



Our combination nitrogen and fluid pumping unit was designed to meet a specific demand in the coiled tubing service industry. On many types of coiled tubing jobs, there are requirements for pumping both fluid and nitrogen, but not always in extremely large volumes. Previously, this required two separate pieces of equipment to be brought to the job site, even though one or the other might see limited use. This typically means an extra truck or trailer, an extra driver, and more rig-up time to rig up two separate units, which adds cost to the job.

Our units require only one piece of equipment be brought to do the job of pumping both nitrogen and fluid. The fluid side of the unit consists of an independent power unit, triplex fluid pump, 10-bbl tank, two centrifugal pumps, and discharge manifolds. The nitrogen side of the unit consists of an independent power unit, liquid nitrogen storage tank, nitrogen boost pump, nitrogen triplex pump, water bath vaporizer, and discharge manifolds. Both the nitrogen and fluid sides of the unit are controlled from a common, climate-controlled cabin located on the unit. The unit is on a purpose-built drop-deck rail trailer for reduced weight.

Options

- Chemical additive system features twin chemical feeder pumps, actuated valves, controls, and two 20-gallon chemical tanks
- Standard, single-chamber fluid tub divider divided into two equal halves, and the plumbing is modified to allow for "mix and slug" functionality
- Remote control is custom configured to accommodate customer requirements for remote functionality
- TCRN

General features

- Climate-controlled operator's control cabin
- Maintenance-friendly design
- Drop-deck design

Fluid system features

- 10-bbl open-top fluid tank
- Capable of pressures up to 15,000 psi
- Capable of flow rates from 12 to 500 gpm
- Actuated valves allow for system control from operator's cabin

Nitrogen system features

- Non-fired nitrogen vaporization, utilizing proprietary exhaust and water bath vaporizers
- Liquid nitrogen storage tank
- Capable of pressures up to 15,000 psi
- Unit equipped with storage accommodations for customer's treating iron

7



Designed with a condensed footprint for hard-to-access locations, our non-fired chassis-mounted nitrogen units come standard with a main engine, transmission, reduction/drop box, triplex nitrogen pump, nitrogen boost pump, non-fired hot water bath vaporizer, hydraulics, liquid nitrogen storage tank, and necessary piping and controls. Our sales and engineering teams work closely with you to ensure your operational needs are met and custom changes can be made. These models can be built on any major brand of truck chassis.

Options

- Cabin style: Sleeper versus center mount
- Actuated versus manual valves
- Chassis: Kenworth, Peterbilt, Western Star, and more
- Domestic versus export

Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
CH90NF	1.250 in. (31.75 mm)	90,000 SCFH (2365 m ³ /hr)	15,000 psi (103 MPa)
CH180NF	1.625 in. (41.275 mm)	180,000 SCFH (4730 m ³ /hr)	10,000 psi (69 MPa)
CH220NF	2.00 in. (50.80 mm)	220,000 SCFH (5782 m ³ /hr)	6,000 psi (41 MPa)

Customized to meet your needs, with cold weather, paint scheme, and discharge line options available.



Our new and innovative combination unit, pairing a Hydra Rig 180K heat-recovery nitrogen pumping unit with a Texas Oil Tools™ quad BOP unit, is a non-fired unit that uses an 800-horsepower diesel engine with pumping rates up to 180,000 SCFH and pressure up to 10,000 psi. The nitrogen system includes our NP-200 triplex pump, cold ends, and boost pump. The Hydra Rig water bath vaporizer heats the liquid nitrogen for vaporization. The Texas Oil Tools blowout prevention unit is a quad BOP design, which seals off the BOP bore, shears tubing, strips tubing, and seals around tubing. The trailer also boasts a climate-controlled cabin for operator comfort and convenience.



Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
TR90NF	1.250 in. (31.75 mm)	90,000 SCFH (2365m ³ /hr)	15,000 psi (103 MPa)
TR180NF	1.625 in. (41.275 mm)	180,000 SCFH (4730 m ³ /hr)	10,000 psi (69 MPa)

Direct-Fired Trailer-Mounted Nitrogen Pumping Unit



Our direct-fired trailer-mounted nitrogen pumping units provide a platform for super high-rate flows, and its high-volume capabilities allow for reduced equipment requirements on large volume jobs.

The pumping unit is fabricated on a drop-deck trailer. The unit consists of a trailer complete with a main engine, auxiliary engine, transmission, triplex nitrogen pump, nitrogen boost pump, direct-fired vaporizer, hydraulics, nitrogen storage tank, and all necessary piping and controls.

Options

- Cabin style: Sleeper versus center mount
- Actuated versus manual valves
- Chassis: Kenworth, Peterbilt, Western Star, and more
- Domestic versus export
- Direct drive versus hydraulic drive
- TCRN

Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
TR320DF	1.875 in. (47.63 mm)	320,000 SCFH (8410 m ³ /hr)	15,000 psi (103 MPa)
TR360DF	2.00 in. (50.80 mm)	360,000 SCFH (9461 m ³ /hr)	13,000 psi (103 MPa)
TR400DF	2.00 in. (50.80 mm)	400,000 SCFH (10 512 m ³ /hr)	15,000 psi (103 MPa)
TR640DF	2.52 in. (64.00 mm)	640,000 SCFH (16 819 m ³ /hr)	15,000 psi (103 MPa)
TR840DF	2.875 in. (73.03 mm)	840,000 SCFH (22 075 m ³ /hr)	11,200 psi (77 MPa)
TR920DF	3.00 in. (76.20 mm)	900,000 SCFH (23 652 m ³ /hr)	10,000 psi (69 MPa)
TR1MDF	3.25 in. (82.55 mm)	1,000,000 SCFH (26 280 m ³ /hr)	8,800 psi (61 MPa)

10

Direct-Fired Chassis (Truck)-Mounted Nitrogen Pumping Unit



Designed with a condensed footprint for hard-to-access locations, our direct-fired chassis-mounted nitrogen units are ideal for fracturing applications or any situation where a high flow rate is required. They come standard with a main engine, transmission, reduction/drop box, triplex nitrogen pump, nitrogen boost pump, direct-fired vaporizer, hydraulics, liquid nitrogen storage tank, and necessary piping and controls. These models can be built on any major brand of truck chassis.

Options

- Control cabin versus ground controls
- Cold ends/rates
- TCRN

Rates and pressures

Model	Cold end diameter	Maximum flow	Maximum pressure
CH400DF	2.00 in. (50.80 mm)	400,000 SCFH (10 512 m ³ /hr)	15,000 psi (103 MPa)
CH640DF	2.52 in. (64.00 mm)	640,000 SCFH (16 819 m ³ /hr)	15,000 psi (103 MPa)
CH840DF	2.875 in. (73.03 mm)	840,000 SCFH (22 075 m ³ /hr)	11,000 psi (77 MPa)

11



Nitrogen Components



Hydra Rig nitrogen pumps satisfy market requirements for high-pressure pumping rates up to 1,828,00 SCFH. Our pumps are specifically designed to deliver high flow rates at high pressure while providing exceptional low flow rate turndown.

The pumps utilize a new design involving low-friction roller bearings and a pressure-feed lubrication system for positive lubrication, insuring increased pump life over conventional pumps. This new design approach starts by utilizing low-friction roller bearings rather than journal bearings. This greatly enhances durability, particularly at low speeds where other pumps using journal bearings are most vulnerable. This design also operates at a much cooler temperature. This means the system requires less lube oil, which saves weight without sacrificing unit durability.

Overall specifications

Model	NP-200	NP-400	NP-1000	NP-1600
Number of pistons	3	3	3	5
Stroke length	1.375 in. (3.49 cm)	2.00 in. (5.80 cm)	2.25 in. (5.72 cm)	2.25 in. (5.72 cm)
Weight with cold ends and lube oil	1,750 lb (793.79 kg)	1,975 lb (898 kg)	2,550 lb (1,156.7 kg)	*5,000 lb (2,268 kg)
Length	25.625 in. (65.10 cm)	35.0 in. (88.9 cm)	37.25 in. (94.62 cm)	70 in. (177.80 cm)
Width	39.625 in. (100.66 cm)	39.0 in. (99.1 cm)	40.5 in. (102.87 cm)	40.5 in. (102.87 cm)
Height	23.5 in. (59.69 cm)	21.0 in. (53.3 cm)	21.94 in. (55.73 cm)	39 in. (99.06 cm)
Gearbox	Standard	Standard	Standard	Standard
Maximum RPM	975	900	900	900

*Includes weight of gearbox

NP-200

The NP-200 triplex nitrogen pump satisfies the market requirement for high-pressure pumping rates up to 270,000 SCFH.

Operational characteristics*

Cold end diameter	1.25 in. (3.175 cm)	1.625 in. (4.275 cm)	2 in. (5.08 cm)
Maximum flow	19 gpm (73 L/min)	32 gpm (123 L/min)	49 gpm (186 L/min)
Maximum flow	90,000 SCFH (2365 m ³ /hr)	180,000 SCFH (4730 m ³ /hr)	270,000 SCFH (7096 m ³ /hr)
Maximum pressure	15,000 psi (103 MPa)	10,000 psi (69 MPa)	6,000 psi (41 MPa)

*90% volumetric efficiency and 900 RPM



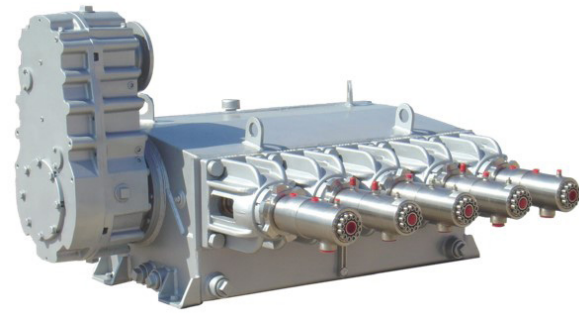
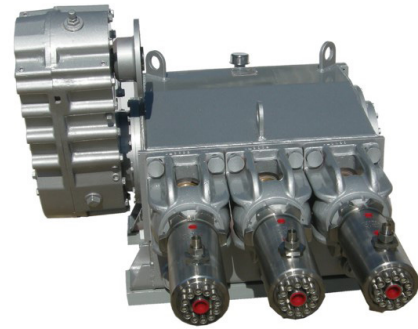
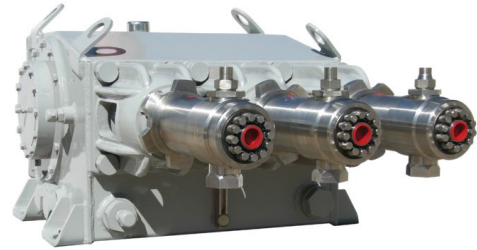
NP-400

The NP-400 triplex nitrogen pump satisfies the market requirement for high-pressure pumping rates up to 467,000 SCFH.

Operational characteristics*

Cold end diameter	1.875 in. (4.7625 cm)	2 in. (5.08 cm)	2.25 in. (5.715 cm)
Maximum flow	64 gpm (244 L/min)	73 gpm (278 L/min)	93 gpm (352 L/min)
Maximum flow	320,000 SCFH (8410 m ³ /hr)	360,000 SCFH (9461 m ³ /hr)	460,000 SCFH (12 089 m ³ /hr)
Maximum pressure	15,000 psi (103 MPa)	13,000 psi (89.6 MPa)	10,000 psi (68.9 MPa)

*90% volumetric efficiency and 900 RPM



NP-1000

The NP-1000 triplex nitrogen pump satisfies the market requirement for high-pressure pumping rates up to 1,000,000 SCFH.

Operational characteristics*

Cold end diameter	2 in. (5.08 cm)	2.5 in. (6.35 cm)	2.875 in. (7.303 cm)	3 in. (7.62 cm)	3.25 in. (8.255 cm)
Maximum flow	74 gpm (281 L/min)	116 gpm (440 L/min)	153 gpm (581 L/min)	167 gpm (633 L/min)	196 gpm (743 L/min)
Maximum flow	400,000 SCFH (10 512 m ³ /hr)	640,000 SCFH (16 819 m ³ /hr)	840,000 SCFH (22 075 m ³ /hr)	900,000 SCFH (23 652 m ³ /hr)	1,000,000 SCFH (26 280 m ³ /hr)
Maximum pressure	15,000 psi (103 MPa)	15,000 psi (103 MPa)	11,200 psi (77 MPa)	10,000 psi (69 MPa)	8000 psi (61 MPa)

*90% volumetric efficiency and 900 RPM

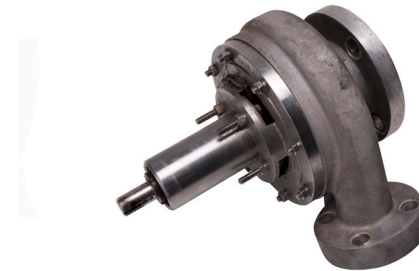
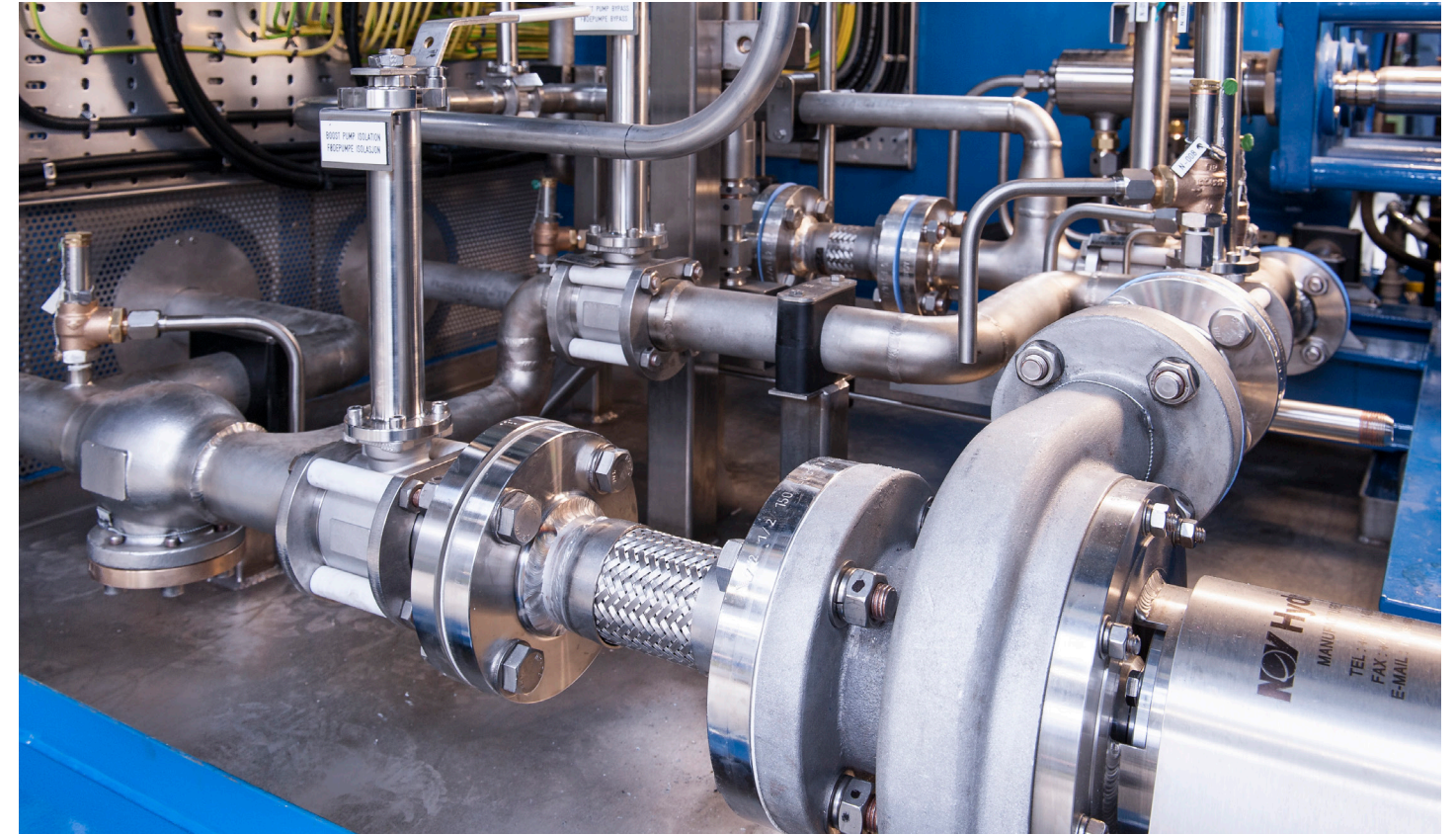
NP-1600

The NP-1600 triplex nitrogen pump satisfies the market requirement for high-pressure pumping rates up to 1,600,000 SCFH.

Operational characteristics*

Cold end diameter	2 in. (5.08 cm)	2.5 in. (6.35 cm)	2.875 in. (7.303 cm)	3 in. (7.62 cm)	3.25 in. (8.255 cm)
Maximum flow	124 gpm (469 L/min)	193 gpm (733 L/min)	255 gpm (969 L/min)	279 gpm (1055 L/min)	327 gpm (1238 L/min)
Maximum flow	660,000 SCFH (17 345 m ³ /hr)	1,000,000 SCFH (26 280 m ³ /hr)	1,400,000 SCFH (36 792 m ³ /hr)	1,500,000 SCFH (39 420 m ³ /hr)	1,600,000 SCFH (42 048 m ³ /hr)
Maximum pressure	15,000 psi (103 MPa)	15,000 psi (103 MPa)	11,200 psi (77 MPa)	10,000 psi (69 MPa)	8,800 psi (61 MPa)

*90% volumetric efficiency and 900 RPM



We manufacture two boost pumps, sized perfectly to meet the supply requirement through the range of cold ends, from the low-flow 1¼-in. diameter to the high-demand 3¼-in. diameter. The 1.5×2.5×6 in. pump provides the necessary flow and pressure for outputs up to 540,000 SCFH, and the larger 2×3×6 in. pump provides the necessary flow and pressure for outputs up to 1,000,000 SCFH.

Installed on our own and other manufacturers' equipment worldwide, the design of our boost pump brings together the reliability of field-proven components and unique concepts such as the double lip seal and replaceable sleeve. Together, these features ensure a reliable and user-friendly pump, easy to maintain in the field without the need for special tools, minimizing downtime and reducing repair costs.

Our boost pumps are especially effective when used with Hydra Rig power ends and cold ends, providing a total cryogenic package for most nitrogen pumping applications.



Our cryogenic cold ends are designed to complement our NP-200 power end but are compatible with most other manufacturers' power ends using a 1.38-in. stroke. These are available in a range of sizes from 1¼ to 2 in. and working pressures up to 15,000 psi.

Large cryogenic cold ends used for high flow and pressure applications, like nitrified fracturing, foam cementing, and pipeline pigging, are also available. This larger range of Hydra Rig cryogenic cold ends are specifically designed for use with the NP-1000 and NP-1600 power ends, which are compatible with most other manufacturers' power ends using 2- and 2¼-in. stroke. These are available in a range of sizes from 1½ to 3½ in. and working pressures from 7,000 to 15,000 psi.

Features

- All available with DNV approval and designed to comply with the European Pressure Equipment Directive (P.E.D.)
- Cold end exchange program available
- Cold end repair service available on all brands and types of cold ends



Our direct-fired vaporizers have been in production at our Duncan facility since 1999. Their compact design and exceptional performance have been the key to their market acceptance. The same technology is used in all of our direct-fired vaporizers, enabling us to apply new innovations across the product line rather than being platform specific.

This proprietary diesel-fired burner assembly has a propane-assisted ignition system, integrated fuel/fan controls for simplified unit operation, single combustion chamber, and single flame detector. In order to improve efficiency, our direct fired vaporizers use ambient heat, fan speed sensors, and a quench air system for more uniform temperature. This also protects the heat exchanger from over heating.

Our direct-fired vaporizers satisfy market requirements for vaporization rates up to 1,200,000 SCFH.

Specifications – standard weights and dimensions

Model	Vaporization rate	Weight	Length	Width	Height
DF 360	360,000 SCFH (9461 m ³ /hr)	2,500 lb (1134 kg)	87 in. (221 cm)	43 in. (109 cm)	55 in. (140 cm)
DF 660	660,000 SCFH (17 345 m ³ /hr)	3,400 lb (1542 kg)	93 in. (236 cm)	47 in. (119 cm)	66 in. (168 cm)
DF 840	840,000 SCFH (22 075 m ³ /hr)	4,100 lb (1860 kg)	96 in. (254 cm)	52 in. (132 cm)	66 in. (168 cm)
DF 1200	1,000,000 SCFH (26 280 m ³ /hr)	4,920 lb (2232 kg)	100 in. (254 cm)	56 in. (142 cm)	66 in. (168 cm)

Features

- Integrated fuel/fan controls for simplified unit operation
- Stainless steel construction
- Burns clean; tested to CARB standard
- Easy maintenance due to hinged fan assembly for easy access, single igniter for simplicity, 12-V system, and reduced component count
- Inherent flame relight design
- Four viewports
- Flame sensor
- Two temperature sensors
- Standard 15,000-psi heat exchanger
- Optional diesel ignition system



Nitrogen Service and Aftermarket



We are capable of repowering and refurbishing any make or model of pumping equipment.

Convert high-rate direct-fired equipment to low-rate heat recovery equipment

Our service department has engineering support for converting direct-fired equipment to heat-recovery equipment, and vice versa. We are capable of repowering and refurbishing any make or model of pumping equipment.

Cold end and boost pump repair

We design and manufacture cryogenic cold ends and boost pumps in-house and offer worldwide service and support from strategically positioned service centers. The program is designed to help our customers with the routine servicing of their cold ends and boost pumps on a global footprint. We support cold end models from other suppliers, or can provide new Hydra Rig cold end replacements.

Additional services

- Remote unit-specific or general operational and safety training at customer's facility
- Repair or rebuild vaporizers
- Hydraulic troubleshooting and repairs
- Nitrogen power frame repairs
- Technical assistance for nitrogen-related equipment
- Field and other services

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