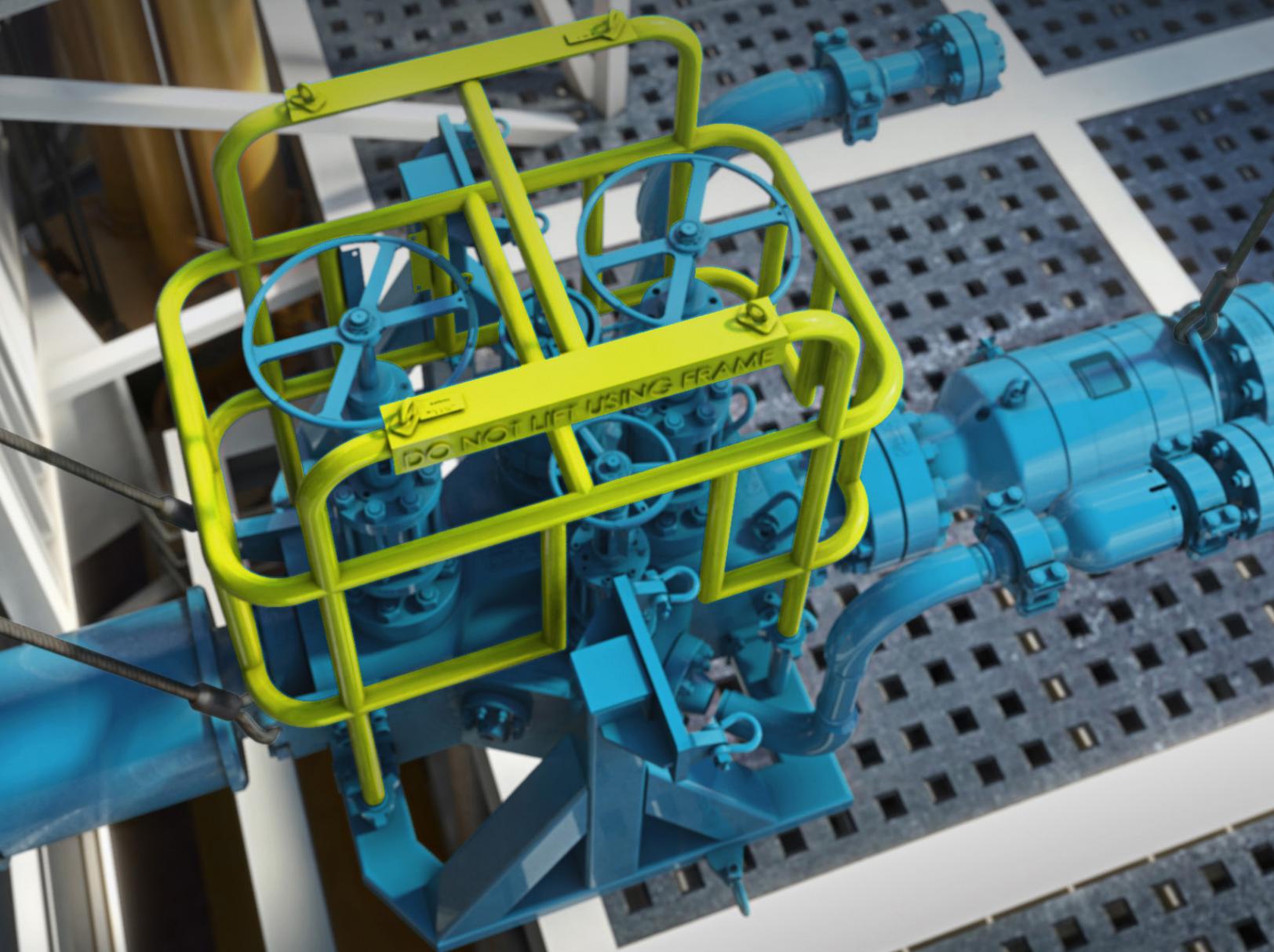


Surface well test equipment

A unique combination of well testing solutions and aftermarket support



Completion &
Production Solutions



About NOV

National Oilwell Varco (NOV) is a worldwide leader in the design, manufacture and sale of equipment and components used in oil and gas drilling and production operations and the provision of oilfield services to the upstream oil and gas industry.

Through our broad capabilities and vision, our family of companies is positioned and ready to serve the needs of this challenging, evolving industry. We have the technical expertise, advanced equipment and readily available support necessary for our customers' success.

NOV Completion & Production Solutions

NOV Completion & Production Solutions integrates technologies for well completions and oil and gas production. We design, manufacture and sell equipment and technologies needed for well stimulation, well intervention and artificial lift systems. In addition, we focus on offshore production with floating production systems and subsea production technologies.

In every type of environment, we bring together engineering operational expertise and field-proven solutions with a foundation of safety and risk management that helps you control costs and achieve lasting success.

Intervention and Stimulation Equipment (ISE)

Our engineering, manufacturing and service expertise delivers field-proven solutions that help you control costs, increase service value and achieve success. We partner with you to address your operational challenges and apply extensive research, testing, state-of-the-art engineering and manufacturing to deliver the field-proven equipment and performance you demand.

It isn't often that you find everything you are looking for in one place. At the Intervention and Stimulation Equipment (ISE) business unit of NOV, we combine years of experience with trusted brand names to deliver complete solutions that maximize efficiency, improve your service value and increase your bottom line.

Pressure Performance Systems (PPS)

We are a group within the Intervention and Stimulation Equipment (ISE) business unit, servicing the global upstream oil and gas industry. We have grown our product offering and sales channels with a diverse workforce in 14 countries around the world.

From concept to completion, we deliver best-in-class solutions through alignment with our customers. We aim for exceptional customer service by anticipating needs while continuing to create shareholder value.

We serve the following market segments:

- Well Stimulation
- Workover
- Well Testing and Flowback
- Well Intervention
- Exploration and Production (E&P)

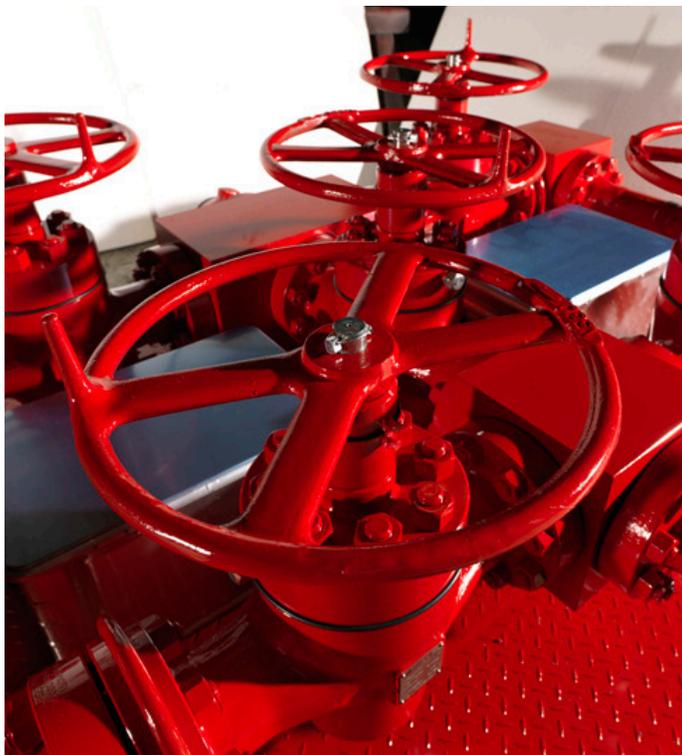


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Performance under pressure

We are a team of experienced professionals delivering quality products and solutions, and continually meeting our customers' requirements while striving to exceed expectations.



Pressure Performance Systems (PPS)

With PPS manufacturing facilities located in the USA, UK and Asia Pacific, we have the technology, professional expertise and innovative capabilities to deliver quality products that achieve maximum life and value. Through our broad capabilities and vision, our PPS group is positioned and ready to serve the needs of this challenging, evolving industry.



Pressure Performance Systems

NOV offers comprehensive solutions for well testing, including well control, pressure control, sand management, heat transfer, separation and storage vessels required for surface well testing both on land and offshore.

These solutions are backed by our global support and services team. To complement our standardized well testing products, we offer customized process equipment solutions to operators and well testing contractors. Our engineering, design and project execution teams are strategically located around the globe.

These integrated teams support our API-certified manufacturing and ASME code pressure vessel fabrication facilities. We provide customized modular well testing equipment requiring international third-party certification for offshore applications, as well as trailer and skid mounted onshore well test systems. Our equipment is backed by certified and capable service teams using OEM spares and replacement parts.

Surface Test Tree (STT)



The Surface Test Tree (STT) comes with dynamic string swivel.



6 3/8" API 15,000 psi surface test tree

Features include a fully actuated compact 3-valve block design with dynamic string swivel and lower master valve with hydraulic live center communication.

The Surface Test Tree (STT), composed of API 6A manual or actuated gate valves and a dynamic string swivel, provides a means of surface well control during testing or intervention on a production well. The configuration of the tree can be dictated by the customer or by design code requirements. All hydraulic lines can be terminated in a flowhead block mounted hydraulic bulkhead or stab plate.

Any electrical cabling (from pressure, temperature or valve position indication) can also be terminated locally in a suitably rated electrical enclosure. Hydraulic umbilicals from the rig floor to the flowhead block bulkhead can be supplied on request as part of the STT package.

- Dual production bore isolation valves (master and swab) that can be located on the flowhead block allow full bore passage of coil tubing or wireline tools. Common sizes are from 3 1/16" to 7 3/8" bore.
- The wing valves (flow and kill), located between the master and swab valves, isolate the STT from the well test choke manifold and kill pump and pipework. They are used to allow the flow of well bore fluids and injection of kill fluids into the well bore respectively. Common sizes are from 3 1/16" to 4 1/16" bore.
- The kill line into the STT can be supplied complete with an inline nonreturn valve to prevent return of any well bore fluid to the kill pump.
- Sizes and pressure ratings: 3 1/16" through 7 3/8" up to 20,000 psi.
- Skid frame supplies: DNV 2.7-3 rated transportation basket or containerized with certified lifting set when requested.
- Standard use of stainless steel/corrosion-resistant alloys for pressure-controlling parts.
- Minimal use of elastomers throughout (No service-limiting elastomeric seals are used in NOV PPS valve sealing technology.)
- Design: API 6A, DNV OS E101, Norsok D-007, NACE MR-01-75, DNV2.7-1 and DNV 2.7-3 (lifting and handling), ISO13628-7 on request.
- Circulation head/pump in tee configurations for well kill applications available on request.

Gate valve technology

Our well service products can offer the use of the field-proven Anson™ E-Type valve technology or our legacy T3 HPT valve technology for use in the STT, depending on customer preference. Each of these premium valve brands comes with market-leading qualification pedigree, and both have a strong history of service and reliability in well service.

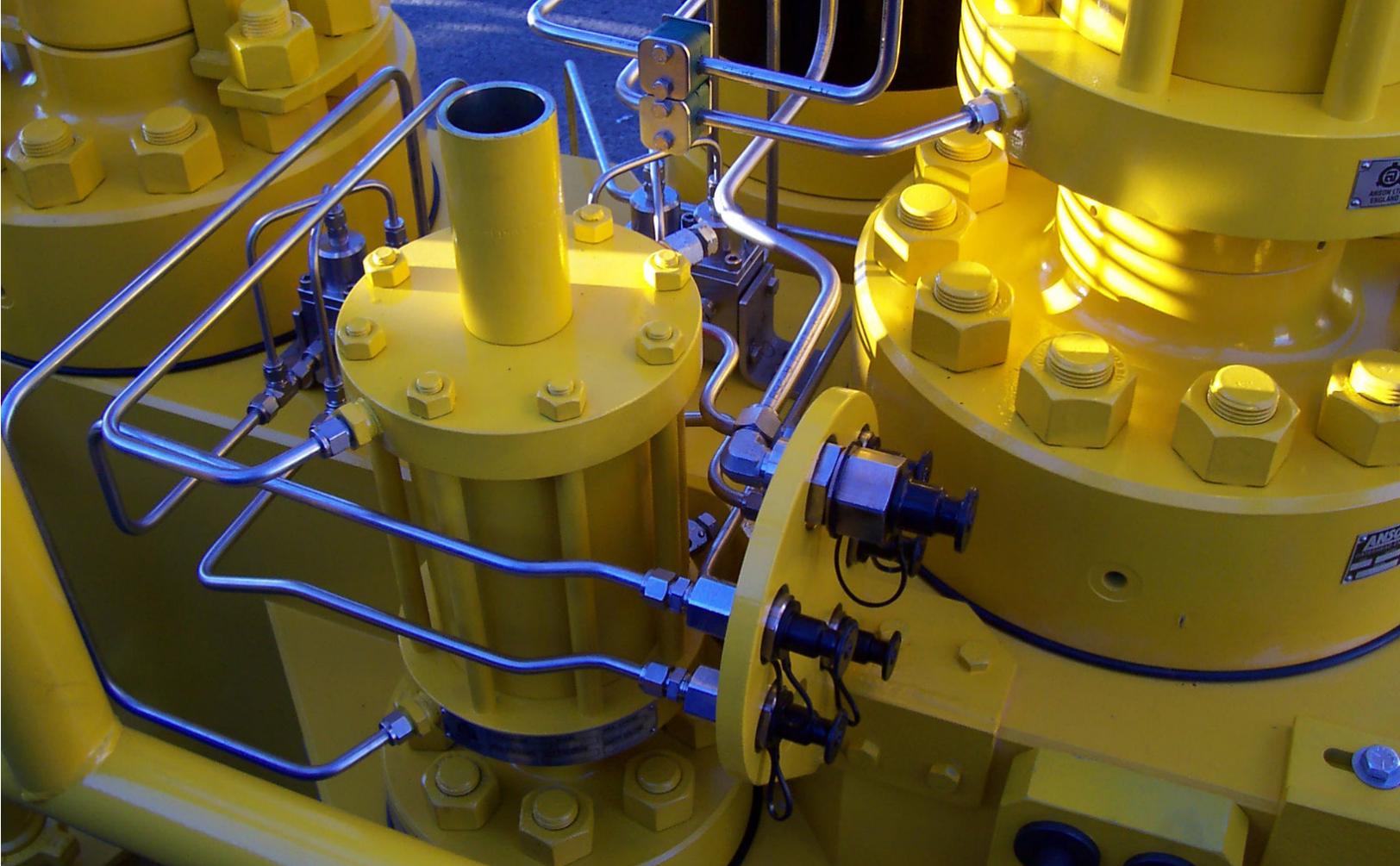
E-Type gate valve technology

The Anson E-Type gate valve from NOV was developed to satisfy the need for a high-quality, high-specification valve that is reliable and reasonably priced. The valve conforms to international design requirements and quality assurance programs. This valve uses no performance-limiting elastomers in its sealing technology. The valve is a monogrammed API 6A valve, and while the initial cost is very competitive, the long-term cost saving results makes it the most cost-effective valve on the market today.

- Manufactured and tested in accordance with API 6A
- Forged steel body and bonnet
- A true bidirectional valve
- Low operating torque
- Shear pin protected internal works
- Available for service down to -75 degrees F or up to 400 degrees F
- Quick release hand wheel
- API 6A PSL, 1, 2, 3 or 4
- Supplied with full certification



Anson E-Type gate valve



Actuator technology

The actuation technology used on the STT is our well service product design, ensuring reliability and performance validated by performance qualification testing to API 6A PR2 (Annex F). Closure times on the safety critical flow wing valves can be enhanced by inclusion of a quick exhaust valve in the hydraulic return line, reducing shutdown time to less than five seconds for specific applications.

Handling and lift sub

The handling/lift sub attached to the top of the flowhead block is used to suspend the weight of the STT, riser and landing string from the rig elevators during operations. The handling sub can be used to interface with wireline or coil tubing equipment as required.

Dynamic string swivel

The dynamic string swivel is located below the flowhead block and above the lower master valve (if included). The swivel allows industry-leading, low-torque rotation of the STT and rig structure around the riser or landing string. This swivel design has been validated for combinations of pressure, tension, bending and temperature recording breakout torque throughout. For applications where the lower master valve is hydraulically actuated and positioned below the swivel, We offer our “live center” swivel design, which provides hydraulic communication between the rotating and static sections of the STT.



Dynamic string swivel

ESD valves, controls and instrumentation



STT control system

Control system

Capable of controlling all STT hydraulically actuated valves and Emergency Shutdown (ESD) valves on request, the control system is constructed from stainless steel, with dedicated lifting eyes and forklift pockets for ease of maneuverability. Zero-leakage control valves allow operation of the double-acting hydraulically actuated valves with pressure, temperature and valve position readouts as required. Integral ESD functionality can be included if requested by the customer.

- Stainless steel enclosure
- Combined ESD optional
- Pneumatic driven HPU comes with 30 ltr or 45 ltr reservoir
- Manual control valves
- Valve position indication
- Internal relief devices
- Pneumatic position indicators
- Emergency hand pump



Emergency Shut Down (ESD) valve

Emergency Shutdown (ESD) valve

The stand alone Emergency Shutdown (ESD) valve is used to safely isolate the low pressure downstream equipment from the high pressure well bore fluids. The ESD valve consists of Anson E-Type fail close API 6A actuated gate valve technology, inlet and outlet crossovers, all mounted on a robust skid frame. Closure times on the safety-critical ESD valve can be enhanced by inclusion of a quick exhaust valve in the hydraulic return line.

- The inlet and outlet crossovers can be flanged, hammer union or hubbed for hookup to interconnecting pipework.
- Skid frame supplies: DNV 2.7-1 / DNV2.7-3 designed and certified with lifting set when requested
- Design: API 6A, DNV OS E101, Norsok D-007, NACE MR-01-75, DNV2.7-1 and DNV 2.7-3 (lifting and handling)



ESD control system

Emergency shutdown controls

For dedicated control of the flow wing valve on the STT and the ESD valve upstream of the choke manifold, the ESD control system is responsive on shutdown within industry requirements and can be further enhanced with the inclusion of a quick exhaust valve in the hydraulic return line. The ESD communication loops that facilitate shutdown are pneumatically powered and can be supplied with combinations of either manual shutdown or automatic low/high pressure, pilot operated shutdown stations. The hydraulic power supply is provided by an air driven hydraulic pump and can include energy storage hydraulic accumulators on request.

- Stainless steel enclosure
- Combined ESD optional
- Pneumatic driven HPU comes with 30 ltr or 45 ltr reservoir
- Manual control valves
- Valve position indication
- Internal relief devices
- Pneumatic position indicators
- Emergency hand pump
- <5 second shutdown capability



Data headers

High and low pressure

The data headers are used to allow monitoring of pressure, temperature and sand content as well as facilitating chemical injection and sampling of well fluids. They are usually fitted upstream (high pressure) and downstream (low pressure) of the choke manifold.

Available with all stainless steel instrumentation, the data headers can be supplied with flange, hammer union or hubbed ends as required.

Instrumentation ports for pressure ratings over 10,000 psi will be high pressure autoclave style as standard.



Data header

Chemical injection

To allow fluid to be injected into the surface test tree wellbore via injection points on the flowhead block, the air driven compact chemical injection units are available with numerous combinations of pressure and fluid delivery to suit customer requirements.

Desanders/sand filters



Spherical sand trap



Vertical sand trap

Sand traps

High pressure wellhead/well stream sand traps allow wells to be flowed under sand producing conditions that would normally damage standard production equipment. The sand traps capture sand upon:

- Start-up when stimulated wells produce proppant until the well stabilizes
- Rock/formation failure where wells produce sand

The sand trap allows well operation with less than perfect well cleanup, saving on-site well cleanup costs. Sand production causes erosion of standard well site equipment, which:

- Compromises field staff safety
- Possibly results in uncontrolled emissions, lost production and regulatory reporting issues
- Requires downtime, expensive cleanup and repairs

How it works

The sand traps may be installed close to the wellhead to remove solids upstream of surface equipment. The well fluid flow is directed into the sand trap where solids are disengaged from the gas stream. The removed solids accumulate in the bottom of the vessel, while the solids-free gas overflows the outlet. Periodically, the vessel may be isolated from the incoming well fluids flow and the accumulated solids flushed out.

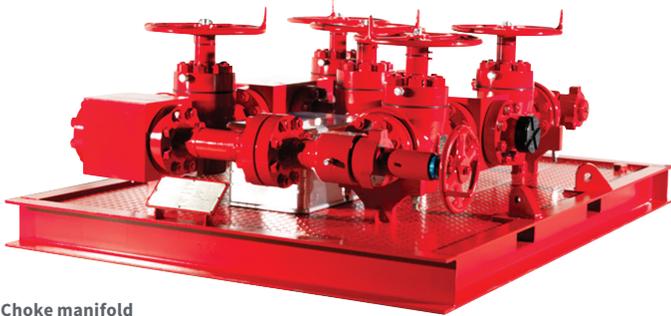
- ASME pressure vessels
- Skid mounted for ease of transport
- Inlet and outlets 2" or 3"
- Standard pressure rating 5,000 psi
- Available pressure rating 10,000 psi
- Standard 20" and 24" O.D. vertical sand traps
- Standard 36" and 48" spherical sand traps
- Low back pressure design allowing high flow rate
- Compact size
- Minimal service/cleanout time
- Drain line can be fitted with NOV adjustable choke or inline pressure reducing cartridge
- Allows monitoring of sand production

Heat exchangers

High and low pressure

In many cases it is necessary to preheat the wellstream fluids prior to separation and to minimize the risk of hydrate formation downstream. NOV provides high pressure heat exchangers to accomplish this. Unlike typical shell and tube heat exchangers, which have small diameter tubes, the NOV well test heaters consist of high pressure pipe coils available in 5,000 psi and 10,000 psi working pressure. This design insures a durable, robust heat exchanger that is resistant to plugging and fouling. Coils are designed and fabricated to meet applicable ASME codes and API standards. Low pressure coils are available for heating applications where lower operating pressures are encountered. Heat exchangers can be supplied complete with a steam generator unit where requested.

Choke manifolds



Choke manifold

The well test choke manifold, located between the high pressure upstream equipment (STT and ESD valve) and the low pressure downstream equipment (separators, tanks, etc.), is used to generate the required pressure drop for the separation equipment.

Consisting of API 6A gate valves, API 6A or 16C choke valves (fixed and adjustable), API 6A studded blocks and spools, with inlet and outlet crossovers, the well test choke manifold is available in various configurations depending on the customer or specification requirements.

Traditional configurations are flat 4-valve or 5-valve (with full flow bypass line).

Enhanced configurations include dual isolation on each of the two choke lines with the option for a dual isolation bypass line. Double block and bleed configurations (8-valve and 10-valve) are available for HPHT applications. Arranging the valves in these enhanced configurations vertically allows for a smaller footprint with a larger quantity of valves.

The choke manifold can be unitized on request with upstream and downstream data headers and an ESD valve.



Choke manifold shown with ESD valve and data headers installed on same skid



Choke technology

HXE choke



HXE choke

Using its modular body design, the HXE choke can be configured into many inlet and outlet arrangements by changing spools. The worm gear-driven designs are engineered to withstand 15,000 psi through the outlet bore into closed choke without the use of shear pin or any other safety device. In addition, the worm gear actuator design is modular and can be simply converted from manual operator to hydraulic motor or even Servo driven. The gate and seat are designed to direct high velocity wear away from the positive sealing surface, a feature that extends the life of the choke trim.

- Field proven for use in conventional drilling- UBD/MPD and frac/flowback applications
- Suitable for land drilling and offshore operations
- Available in all API flanges and hammer union connections
- Unique operator designed to take full back pressure load
- External nut for quick and easy trim changes
- Gantry device for easy trim changes
- Available with manual, hydraulic or electric Servo actuation



MPX-40D drilling choke

MPX-40D choke

The MPX-40D is an adjustable drilling choke available with interchangeable linear orifice sizes and tungsten carbide flow control components. Its pressure balanced plug reduces operating force and stem loads. Its nonthreaded seat requires fewer parts, less downtime and ease of maintenance. The bolted bonnet design increases safety and uses a metal bonnet seal.

- Large body reservoir, minimal erosion
- API-6A annex F PR2 qualified
- API-16C flow tested qualified
- ANSI class V shutoff capability
- Manual or automated designs
- PTFE lip seal stem, plug and cage
- Internal plug and cage design for increased well control
- Forged integral flange bodies



H2 adjustable choke

H2 choke

Adjustable and positive

The adjustable choke valve is of the conventional tried and tested needle and seat design, available with orifice sizes of $\frac{3}{4}$ " through 3" depending on the body style selected. The valve stem is of stainless steel/CRA with a tungsten carbide tip.

The positive choke valve accepts a replaceable fixed orifice flow bean (supplied separately) that is measured in 64ths of an inch. H2 adjustable chokes can be converted to positive chokes and vice versa by replacing the bonnet assembly and the seat or bean.

NOV manufactures 3 basic body styles

- **H2 choke** — The H2 is the most widely used type within the field, available in 1" to 3" maximum orifice and end connections up to size $4\frac{1}{16}$ ".
- **D2 choke** — The D2 is a $\frac{3}{4}$ " orifice (1" to special order) valve with union end connections, usually fig. 1502. The D2M is the same as the D2 but has nonstandard leg lengths, which allow it to be used as a direct replacement for competitors' valves in an existing assembly.
- **R2 choke** — The R2 is a $\frac{3}{4}$ " orifice (1" to special order) valve developed for a working pressure up to 6,000 psi maximum. Also available with a long or short series body with 2" fig. 602 union end connections. A threaded line pipe option is also available.



H2 positive choke



Downstream equipment

Three-phase separator

The essence of well testing is used to separate produced water, oil, and gas during well testing, and our separator is available as standard with ASME U stamp and CE PED certified where required. This is readily accomplished by NOV's high pressure three-phase test separator. Designed and built to the most stringent industry codes and standards, each separator can be customized to match the customer's preferences and requirements. Maximum performance is assured by use of advanced internal elements such as cyclonic inlet diverters and high-performance mist eliminators. Instrumentation and fluid measurement devices are selected to match flow conditions and customer requirements.

Four-phase separator with Tore™ fluidizer solids handling technology available upon request.



Three-phase separator

Surge tank

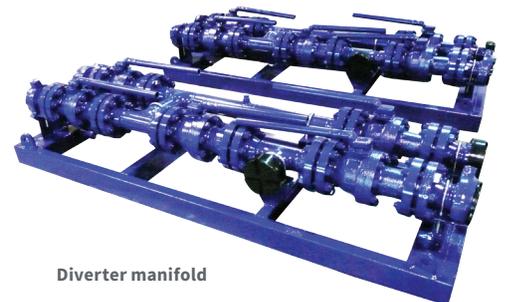
Oil exiting the high pressure test separator enters the surge tank, where additional gas is evolved as the pressure is reduced to stock-tank pressure. The surge tank is calibrated and equipped with sight glasses and calibration bars so that oil shrinkage factors can be accurately determined. Our surge tanks are designed and built to the most stringent industry codes and standards. Valves, piping and instrumentation are designed to match the customer's preferences and requirements.



Surge tank

Diverter manifold

To divert oil or gas after separation to their respective locations (burner booms and tanks), the diverter manifold typically consists of isolation ball valves and fabricated tee and crossovers. Available in sizes 2" through 6" with pressure ratings in accordance with ANSI class 600 through 1500. Skid mounted available as required.



Diverter manifold

Downstream equipment



Atmospheric gauge tank

Atmospheric gauge tank

- Atmospheric tank that is used as temporary storage before sending oil to the burners
- Can be used to calibrate the flow meters on the separator oil lines and measure low flow rates
- Pressure rating- atmospheric (tank), 1,440 psi at inlet
- Liquid capacity- 100 BBLs or 200 BBLs typical
- Single or dual compartment designs. Dual design allows for one compartment to be drained while one is being filled



Knock-out pots

Knock-out pots

Knock-out pots are used to slow down gases and allow liquids to “fall out” of the gas stream. Knock-out pots can be installed either in the waste gas header or in the flare stack base itself. They can be configured in either a horizontal, or vertical arrangement. We offer optional high efficiency internals to ensure maximum performance. Nozzles, man-ways, controls and accessories are selected to meet the customer’s specific requirements.



Magnum XP pump

Centrifugal transfer pumps

Our centrifugal pump line has proven to be the best centrifugal design for handling abrasive fluids. It offers a broad selection of innovative features for a variety of routine, demanding, abrasive, corrosive and general applications. Our pumps are designed for a wide range of flow rates, from a few gallons per minute to thousands of gallons per minute. Our pumps are the standard choice for the well service industry for applications such as blender suction, blender discharge, supercharging service and fluid transfers.



Storage tank

Storage tank

We manufacture a full line of API 12F monogrammed storage tanks in capacities from 210 BBL to 1000 BBL. For offshore well testing applications where space is generally scarce, NOV offers custom designed rectangular storage tanks in dimensions and capacities to meet the customer’s requirements.

Flowline equipment

The Anson™ brand of flowline equipment is designed for today's extreme well servicing environment. NOV offers, but is not limited to, pup joints, swivels, plug valves, check valves and hammer unions. Anson flowline equipment is built to meet customer fracturing and well servicing requirements.

Hammer unions

Sour gas unions

Anson hammer unions are available in hydrogen sulfide and standard service trim (sour gas, H₂S) with either threaded or butt weld ends. Sour gas unions are manufactured in accordance with NACE standard MR-01-75. All unions are subjected to rigorous inspection checks throughout manufacture. Sour gas unions have their part numbers prefixed by the letters SG and for ease of identification are painted olive green unless otherwise requested by the customer.



Sour gas union



Butt weld union

Butt weld unions

Anson hammer lug unions are available in all Figure (Fig.) numbers as butt weld unions. When ordering butt weld unions, it is necessary to state the pipe schedule required.

Threaded unions

A full range of API line pipe threaded unions are available from Fig. 50 through to Fig. 1502. Threads are gauged with calibrated working API gauges, which, in turn, are checked regularly with API master gauges. In addition, unions with BSP or NPT threads can be supplied upon request.



Threaded union

Union fittings

We offer over 2,500 designs of integral and fabricated union fittings, which include union ended tees, laterals, wye's, goat heads, crows foot and crossovers with sizes up to 6" and pressure ratings up to 20,000 psi.

All fittings can be supplied suitable for standard and sour gas service, and they come fully pressure tested, traceable and certified.

Also available are Anson brand full flow and block manifold fittings: elbows (long sweep, double back and block), tees and crosses (long sweep, full flow and block), laterals and goosenecks. Most fittings are manufactured from closed die forgings, offering high material integrity.



Union fittings

Flowline equipment

Anson™ all-steel hammer unions

Fig. no.	Color key for standard service	Pressure rating (PSI)				Normal pipe sizes inches (mm)									
		Standard service		Sour gas service		1" (25)	1.1/4" (32)	1.1/2" (40)	2" (50)	2.1/2" (65)	3" (80)	4" (100)	5" (125)	6" (150)	7" (200)
		Cold working	Test	Cold working	Test										
200		2,000	3,000	2,000	3,000	●	●	●	●	●	●	●	●	●	●
206		2,000	3,000	2,000	3,000	●	●	●	●	●	●	●	●	●	●
207		2,000	3,000	2,000	3,000						●	●		●	
602		6,000	9,000	6,000	9,000	●		●	●	●	●	●			
1002		10,000	15,000	7,500	11,250	●		●		●	●	●	●	●	
1502		15,000	22,500	10,000	15,000	●		●	●		●	●	●	●	
2002		20,000	30,000	n/a	n/a				●		●	●	●	●	
2202		n/a	n/a	15,000	22,500				●		●	●	●	●	

Notes:

1. Hammer unions also available in Fig. 50, 100, 600, 1003, 1004
2. These sizes and figure ratings available in butt weld only: Fig. 2002-2202, 4", 5", and 6", Fig. 1502, 5" and 6", Fig. 1002-1004 and 5" Fig. 1003
3. Pressure ratings are dependent upon type and wall thickness of pipe used.
4. For standard service, Fig. 1003 4" and 5" and Fig. 1002 5" and 6" are pressure rated at 7,500 psi cwp and 11,250 psi test. For sour gas service, these unions are rated at 5,000 psi CWP with 7,500 psi test.

The chart above represents our most popular hammer unions. For all other sizes and types, please contact your sales representative for more information, or email us at pps@nov.com.

Flowline equipment

Pup joints

Anson brand union pup joints are used as interconnecting pipework between major equipment. We offer the industry's most extensive range of pup joints, including forged integral, welded, API threaded and NPST styles. All Anson brand pup joints are available for standard or sour gas service (NACE MR-01-75/ISO 15156) and are supplied with full material traceability and certification.

Applications

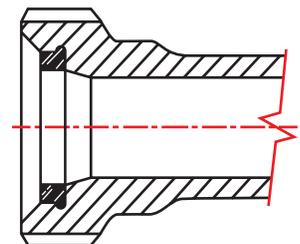
- Well Testing
- Cementing
- Fracturing
- Acidizing



Pup joints

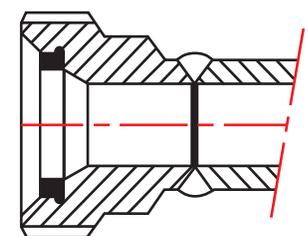
Specifications

Integral forged	One-piece construction, no welds or threads; smooth, uninterrupted bore (inside diameter)
Range	Fig. 602 to Fig. 2202
Size	2" to 4"
Pressure Rating	6,000 psi WP to 20,000 psi WP
End Connections	Hammer union
Materials	AISI 4140 (alloy steel)
Temperature Range	Operating temperatures as low as -50° F (-46° C) and as high as 350° F (+177° C)



Integral forged

Welded	Welded by ASME IX/BS EN287-1 coded welders
Range	Fig. 206 to Fig. 2202
Size	2" to 6"
Pressure Rating	2,000 psi WP to 20,000 psi WP
End Connections	Hammer union
Materials (low pressure)	Union: ASTM A105, A350 LF2 (low carbon) Pipe: ASTM A333 Grade 6, A106 Grade B (low carbon)
Materials (high pressure)	Union: ASTM A350 LF2 – mod (low carbon), AISI 4130 (alloy steel) Pipe: ASTM A333 Grade 6 (low carbon), AISI 4130 (alloy steel)
Temperature Range	Operating temperatures as low as -50° F (-46° C) and as high as 350° F (+177° C)



Welded

Flowline equipment

Plug valves

Anson brand flowline equipment is designed for today's extreme well servicing environment. We offer a large range of Anson brand extra high pressure plug valves, available from 1" to 4" full bore for pressures up to 20,000 psi. All Anson plug valves manufactured by NOV are of the pressure balanced type and have replaceable metal liners between the body and plug.

All Anson brand plug valves can be supplied with hydraulic or pneumatic actuators, either double-acting or spring return. Manual-operated valves with high stem torques are fitted with manual gearboxes as standard. Each valve is thoroughly tested before dispatch, comes complete with its own unique serial number and is fully traceable.

We manufacture three types of Anson brand plug valves: the compact, the premier and the DB series.



Compact plug valve



Sour gas service premier plug valve



DB plug valve

Compact

The compact valve is designed to meet the needs of the service companies that encounter high erosion rates as a result of having to pump such compounds as cement, sand and slurry mixtures. It is available with hammer union ends, sizes 1" and 2" for service up to 15,000 psi standard service or 10,000 psi for sour gas service.

Premier

The premier valve is available with hammer union ends for use with portable flowline equipment; sizes available are 1" to 4" with pressures up to 15,000 psi, for standard or sour gas services. The premier is also available with API flanged end connections in accordance with API 6A, with either regular or full bore with corresponding face to face dimensions. Manufactured from closed die forged steel, they can be supplied in any of the API material classes suitable for temperature classification P through to U as standard or K, L or X to order. Other end connections, such as hub ends, can be supplied to order.

DB series

The subcompact, lightweight DB series plug valve range (patent pending) is ideal for single-person manual handling and truck mounting applications. The DB series plug valve is available in standard and sour service trims with either 2" Fig. 602 or 2" Fig. 1502 Mx F hammer union end connections.



Check valves

We manufacture Anson brand check valves that suit many customer applications that range from temporary flowlines to valves suitable for inline maintenance in fixed applications.

All check valves have a unique identifying number and are supplied with full material traceability as standard at no extra charge.

Top entry union ended swing check valve

Manufactured from a cast steel body and fitted with rubber-coated materials, this valve is designed for use with portable temporary flowlines where a highly cost-effective valve is required. It is suitable for standard service applications up to 15,000 psi working pressure and comes with Fig. 1502 female x male union ends as standard.

Check valves are used in different areas in well testing, such as on STT's and on connecting pipework lines. They can be API flanged, hubbed or hammer union ended. Lock open designs are available with manual/remote hydraulic lock open options.



2" Fig. 1502 FxM inline flapper style check valve

PPS aftermarket offerings

Our products are backed by the quality, reliability and responsiveness of our Aftermarket Services team. We have service centers strategically located globally to support all of your well testing needs.

Equipment recertification

We provide comprehensive recertification programs in all of our service centers. Our technicians are certified to international standards and are ready to provide complete inspection and repair service to meet your specifications. Utilizing our Track-A-Tool* web-based asset management program in conjunction with our recertification processes, we will prolong the life of your equipment and maximize your return on investment. We offer four standard levels of recertification that cover all aspects of the recertification process. We also accommodate any customer special requirements.

For well testing equipment specifically, we provide recertification services for flowline equipment, surface test trees and valves. Our processes include:

- NORM inspection
- Identification
- Visual inspection (external)
- UT wall thickness inspection
- Unbuild
- Steam clean/parts wash
- Visual inspection (internal)
- Magnetic particle inspection
- Hardness testing
- Rebuild with new parts/kits
- Function and pressure tests
- Painting
- NOV certificate of conformity
- Track-A-Tool Database update*

*Track-A-Tool availability varies by location



Mobile recertification fleet

As an extension of our service centers' capabilities, we also have our mobile recertification fleet delivering on-site solutions. Our field service technicians are certified to internationally recognized standards and are ready to provide complete inspection and repair services to meet your specifications. Our containerized and mobile systems are designed to enable inspection, repair, pressure testing and recertification in a controlled environment.

Two standard 20 ft. ISO containers designed, built and certified in accordance with DNV 2.7-1 with one pressure test unit and one workshop unit per set.

Container features

- 30K Bear™ test pump
- Digital chart recorder
- Camera system c/w DVR
- NDT equipment
- 1-ton Gorbelt overhead crane c/w hoist
- 10,000 lbs. rated workbench c/w vise
- Chemical parts wash station
- Heavy-duty storage cabinets for replacement parts



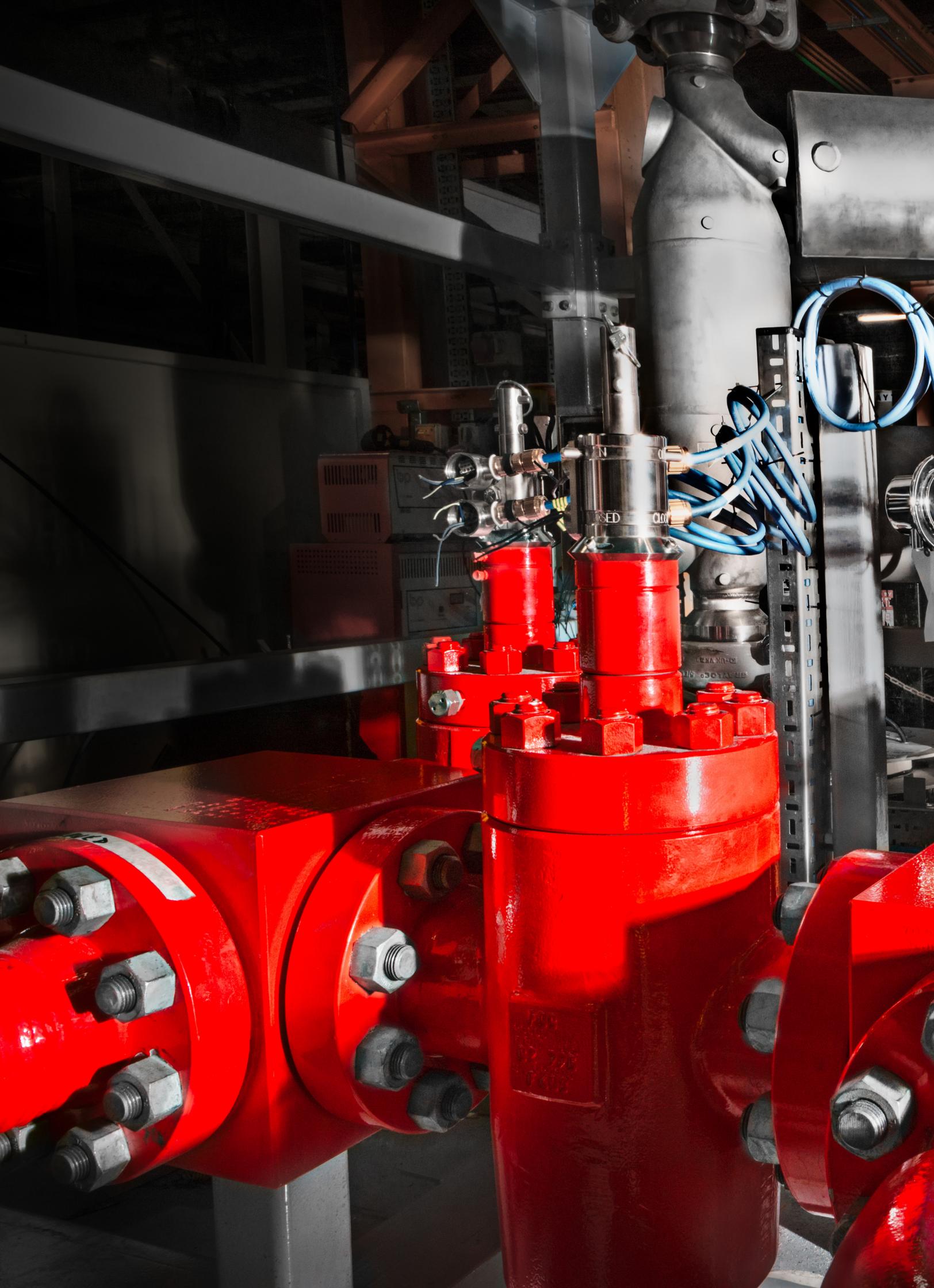
Field service unit

Trailer features

- Generator/compressor combo
- 30K NOV Bear test pump
- Digital chart recorder
- Camera system c/w DVR
- NDT equipment
- 1/2 ton Gorbelt jib crane c/w hoist
- 10,000 lbs. rated workbench c/w vise
- Chemical parts wash station
- Blast cabinet
- Heavy-duty storage cabinet for replacement parts



Field service trailer





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