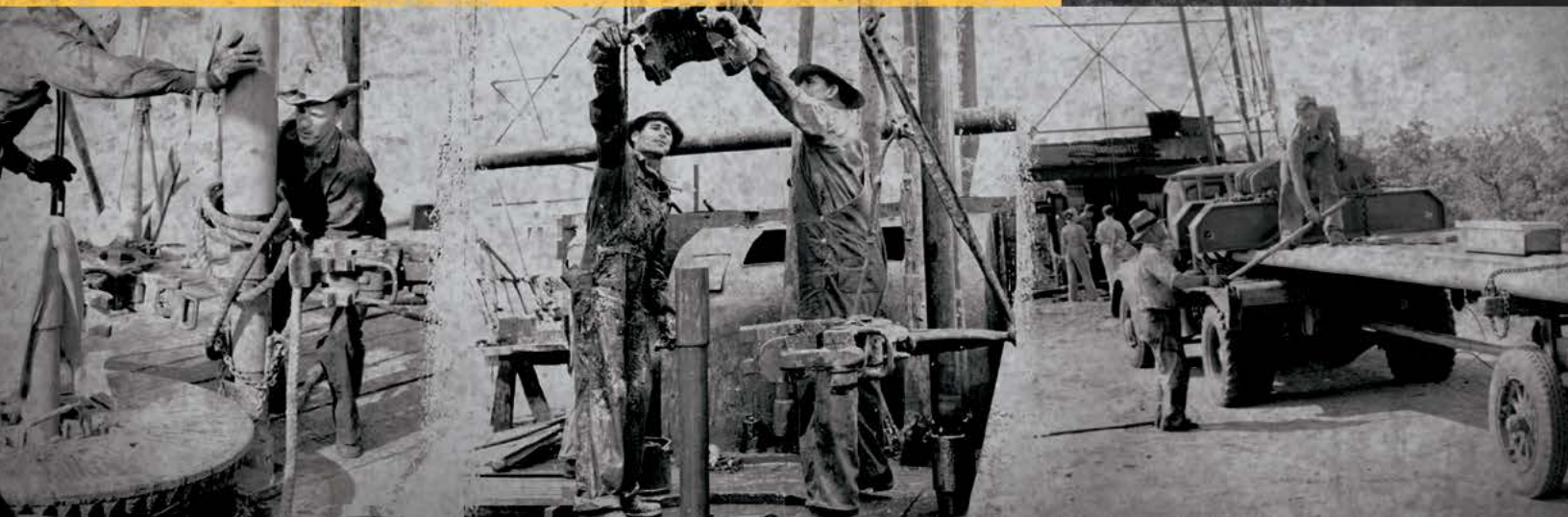


# PRODUCT CATALOG

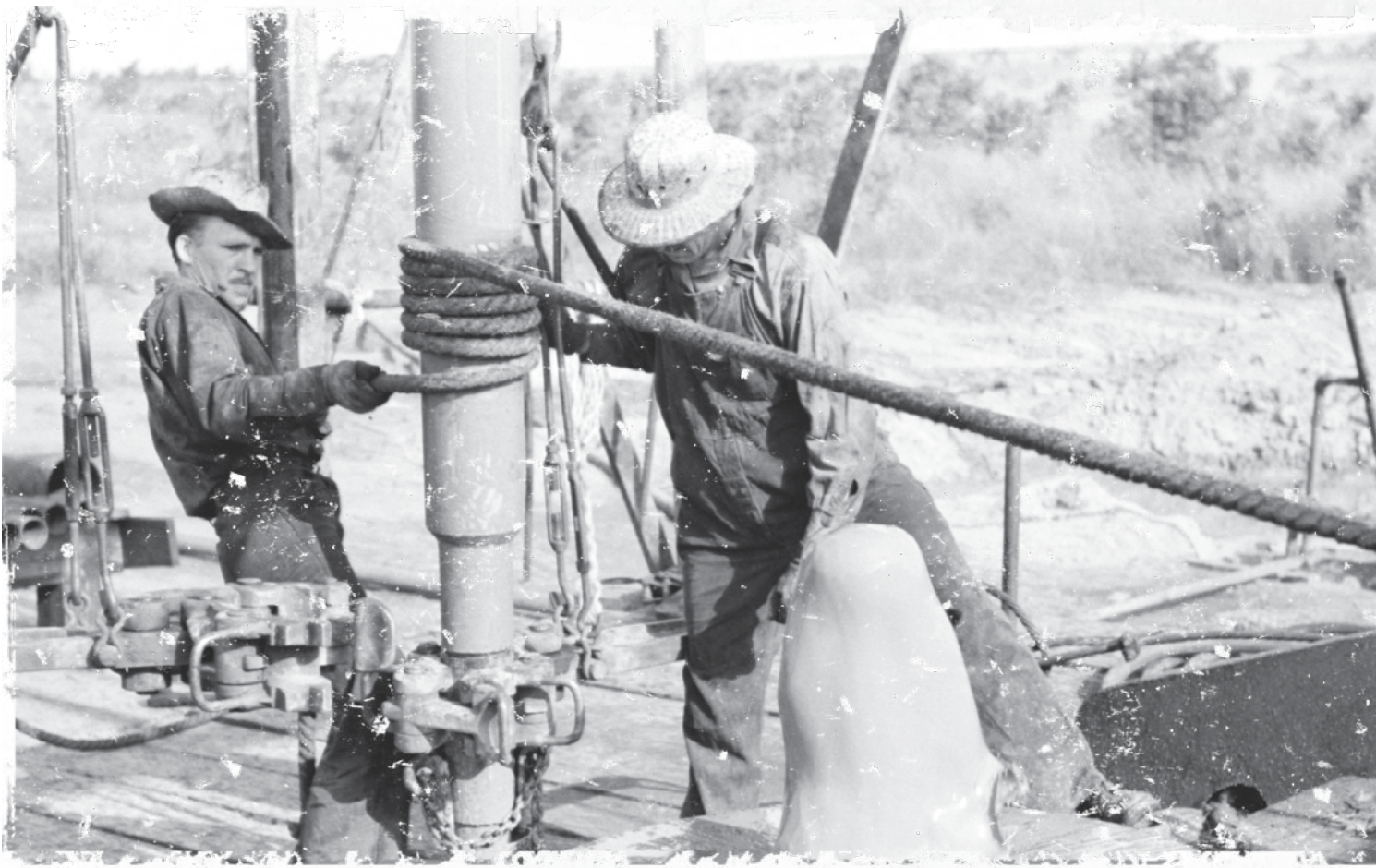


Innovative pressure control equipment built for the field. FHE demonstrates hard work, innovation and a defining dedication to customer satisfaction. Refined through decades of experience, we engineer and build practical, reliable pressure control equipment.



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# EXCEPTIONAL & DURABLE PRESSURE CONTROL EQUIPMENT

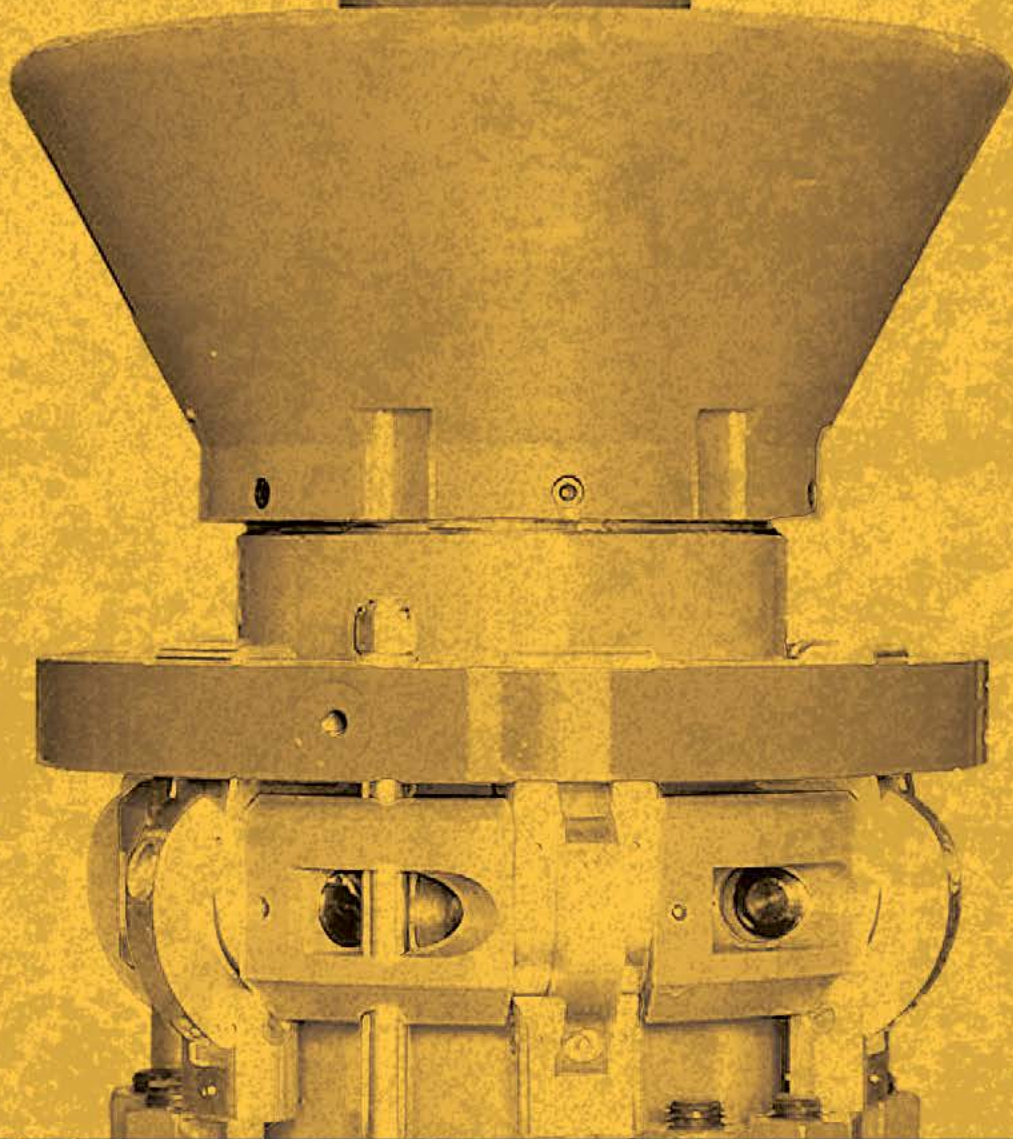
At FHE, we pour our hearts and souls into pressure control equipment that helps you succeed.



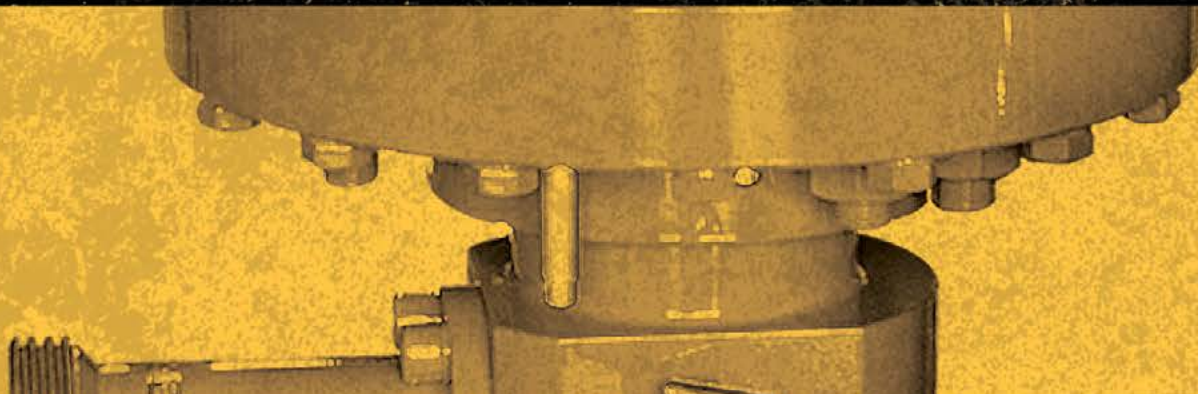
FHE facilities in Fruita, Colorado.

FHE displays hard work, innovation and a defining dedication to customer service. Refined through decades of experience, we manufacture practical and durable tools and equipment for your wireline operations.

We never back down from a challenge. Whether it's a seemingly impossible deadline or improbable configuration, we jump at the opportunity to get you the equipment and tools you need to succeed.

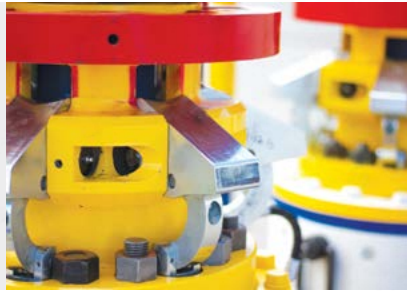


**RIGLOCK**



**RIGLOCK®**





## **The FHE RigLock® Safely and Quickly Connects Pressure Control Equipment to the Wellhead.**

---

The FHE RigLock® safely and quickly connects your pressure control equipment to the wellhead. With a unparalleled design, the RigLock® makes rigging up and down more efficient while adding unmatched safety measures to protect your team from costly injuries.



### **Improved Safety Through Innovation**

Safety is the underlying core value at FHE. Every piece of equipment we design, engineer, and manufacture is created to ensure the safety of those working at the well site. The RigLock® is no exception. Through our research, FHE calculated a high number and frequency of injuries that occurred during the rig up and down processes.



To help improve this situation and save your team from devastating and costly injuries, FHE developed the RigLock®, a safe, quick wellhead connection.

The RigLock® removes individuals from the dangerous and compromised position of connecting by hand unsecured equipment to the wellhead. The RigLock® securely attaches these tools and equipment with remote hydraulic actuation. The locking connection maintains the pressure for you beginning your wireline operations.



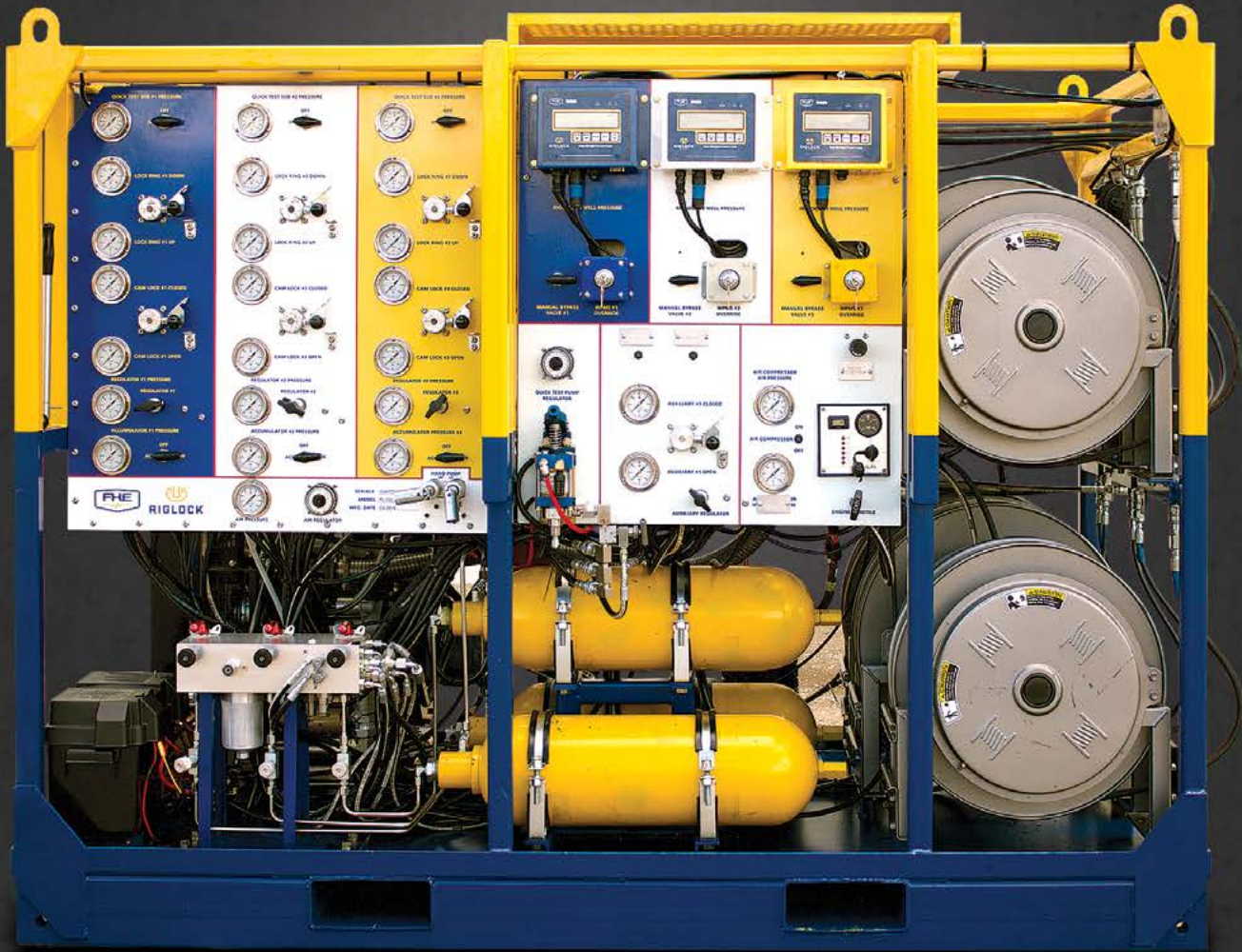
### **Tremendous Gains in Efficiency**

The RigLock® speeds up all well work by quickly connecting and disconnecting your equipment string and the wellhead. The RigLock® adapter drops in easily to the oversized, highly visible entry guide. The six hydraulic cams seals the connection remotely. The locking ring drops to mechanically secure the cams locks.



This innovative process eliminates time consuming activities including carefully positioning a technician in place to make this difficult and dangerous connection.

# RigLock® Control Unit



**With Its Own Built-In Safety Measures, the RigLock® Control Unit Remotely Manages Pressures and the Functions of the Remote Quick Connection.**

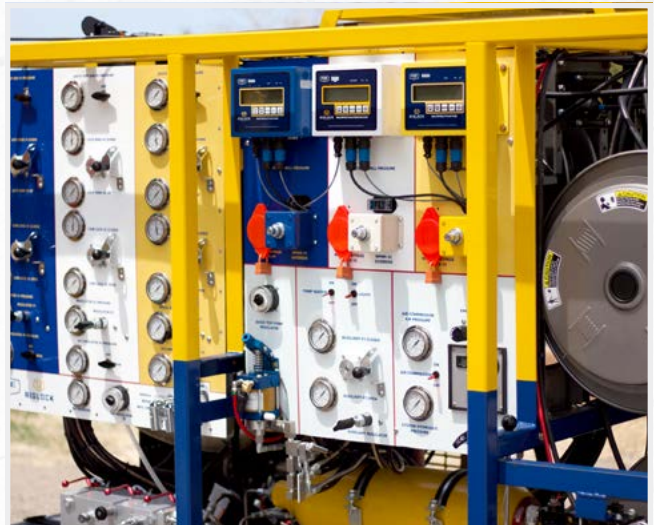
The RigLock® with specifically designed control unit are an integrated system engineered to work seamlessly together to provide the greatest measure of safety in the field.

Operators can manage the pressure and function of the cam locks, locking ring, quick test sub, and regulators.

The well monitoring system prevents operators from inadvertently releasing RigLocks® while the well is still under pressure.



Cam locks secure equipment connection and reinforced with the lock ring.



The RigLock® is controlled with a uniquely designed hydraulic control unit.



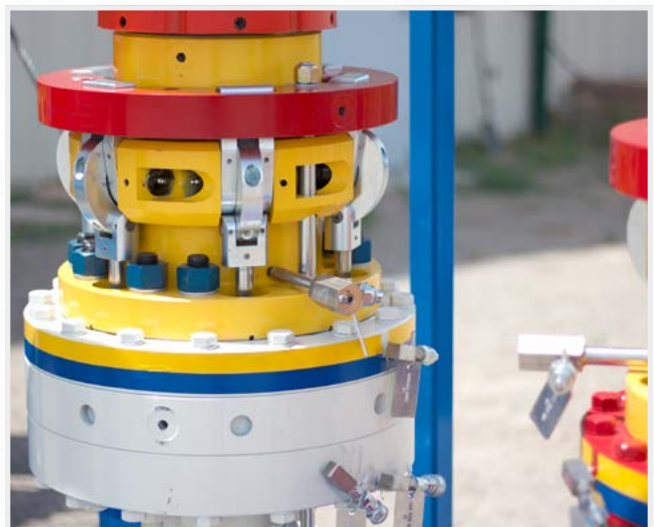
The Riglock® replaces the pump in sub with large auxiliary port.



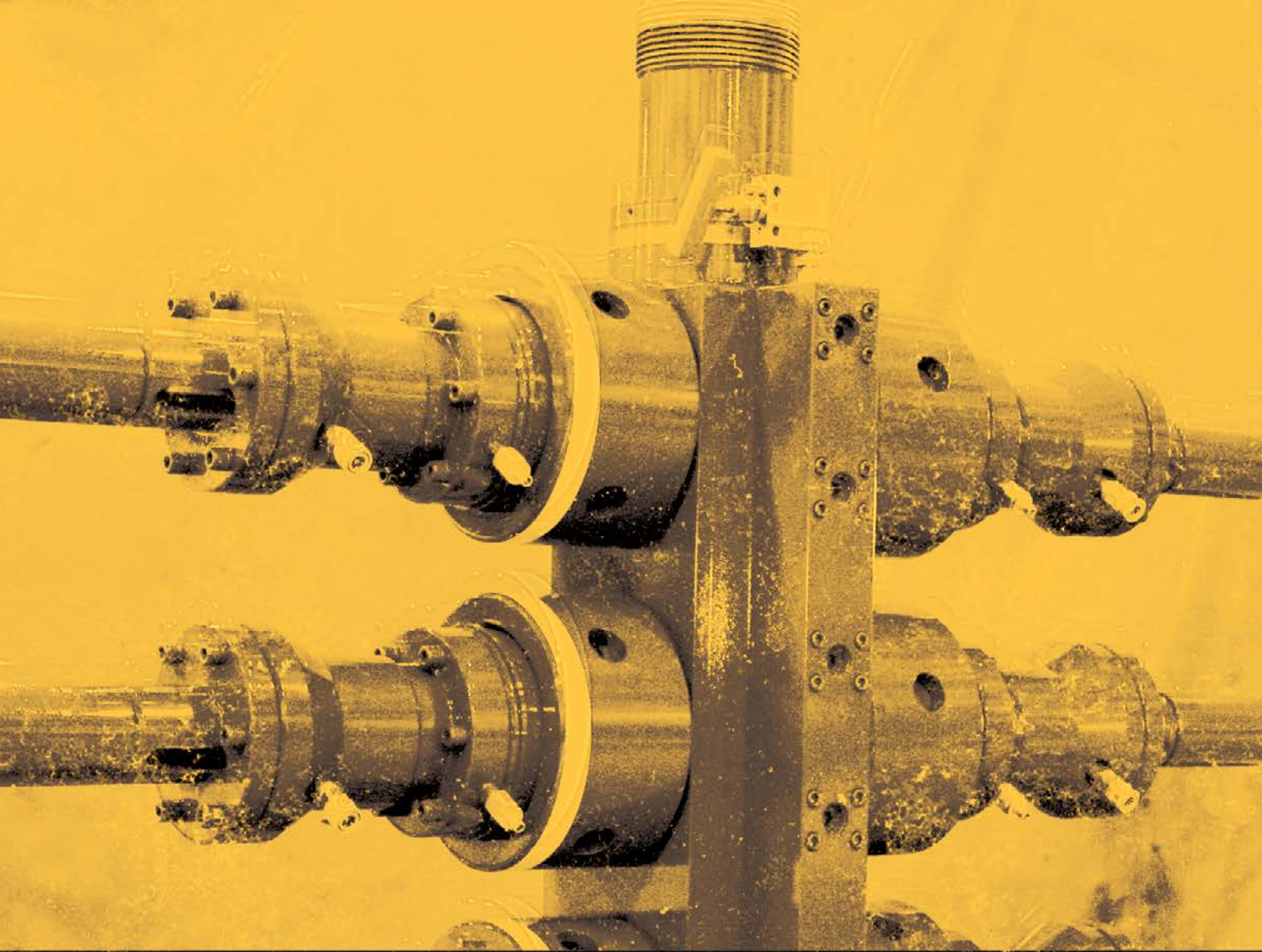
All the necessary accessories are stored conveniently in the RigLock® toolbox.



Speed up wireline operations by using multiple RigLocks® on one well pad.



With an integrated regulator, the RigLock® can replace the quick test sub.



# **PRESSURE CONTROL EQUIPMENT**



# PERFORMANCE IN THE FIELD

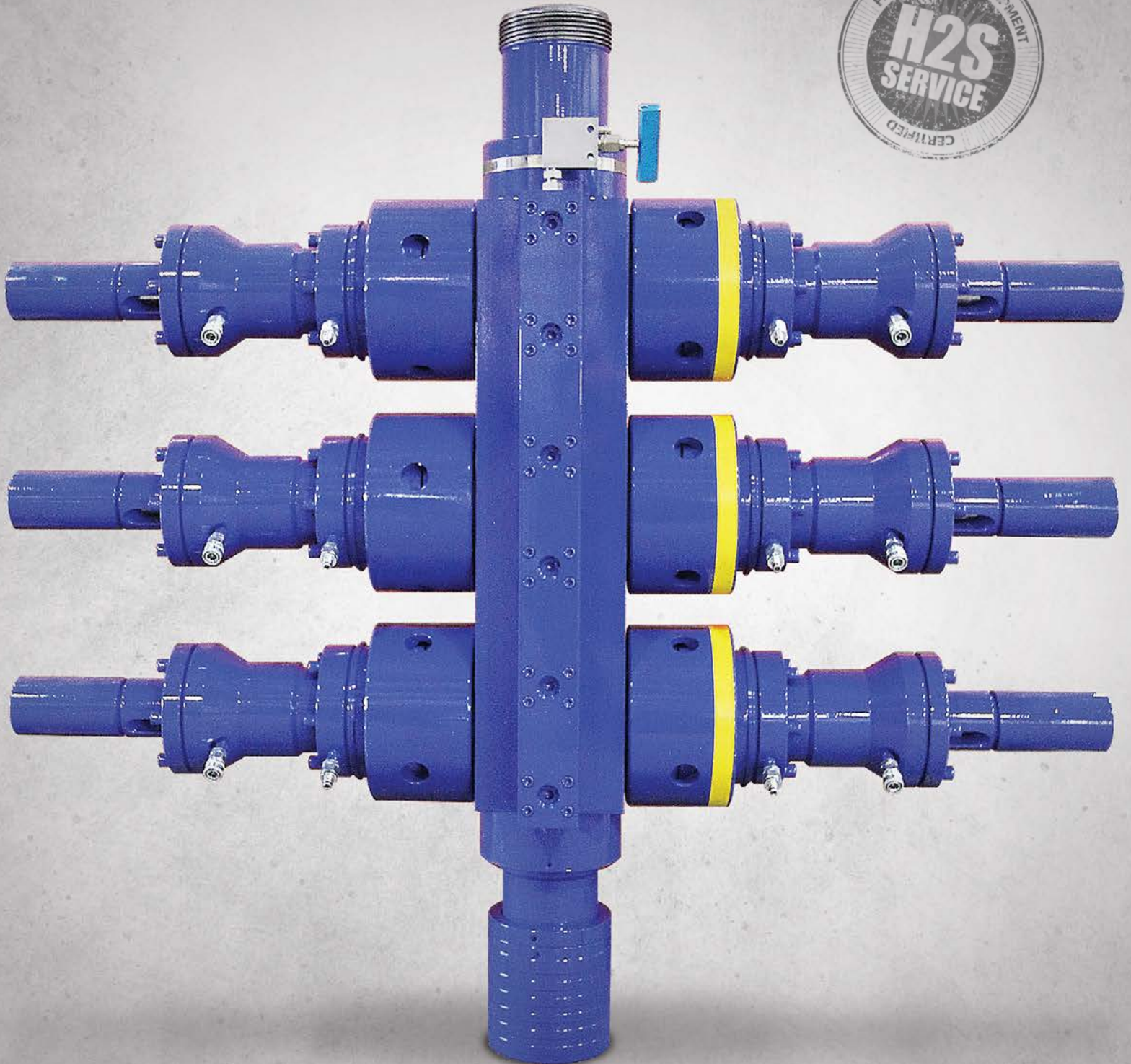
## **FHE's Pressure Control Equipment is Designed, Engineered, and Manufactured to Perform in the Field.**

Each piece of pressure control equipment is meticulously constructed under strict guidelines and systems. Your equipment is then custom painted with your company colors. Each is banded and stenciled with company name, working pressures and test pressures.

Your pressure control equipment has been tested, certified and ready for the field. The certifications for all your equipment, are delivered with it. Also, with FHE's new "CORE" web application (read more on page 73), your certs are easily available 24/7 at [www.fhecerts.com](http://www.fhecerts.com).



# TRIPLE WIRELINE VALVE





Interchangeable subs to fit your current system.

## Triple Wireline Valve for High Pressure Operations and Wells

The Triple Wireline Valve shuts in well pressure securely. It's engineered construction makes this valve durable and easy to maintain. With a multitude of sub sizes, threads, and dimensions, the Triple Wireline Valve will fit perfectly with your wireline operation.



Accurate equalization with unified manifold.

### Triple Wireline Valve Features

- Reliable hydraulic actuators
- Convenient equalizing and bleed-off valves
- Recommended for high-pressures
- Strong uni-body construction
- H<sub>2</sub>S service

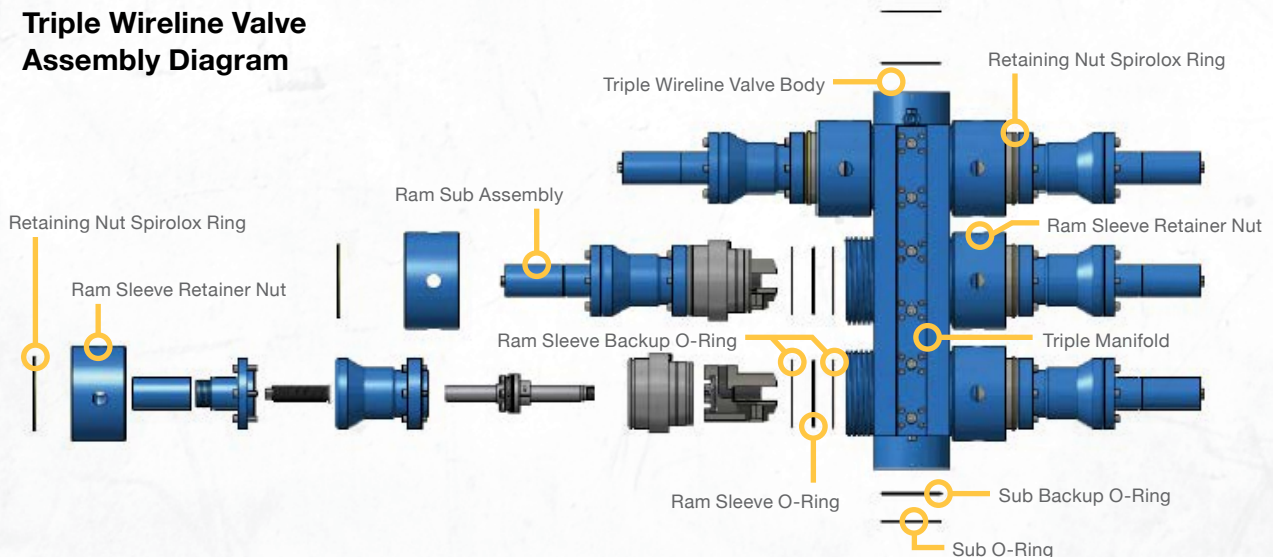


Swivel port for a gauge, valves, etc.

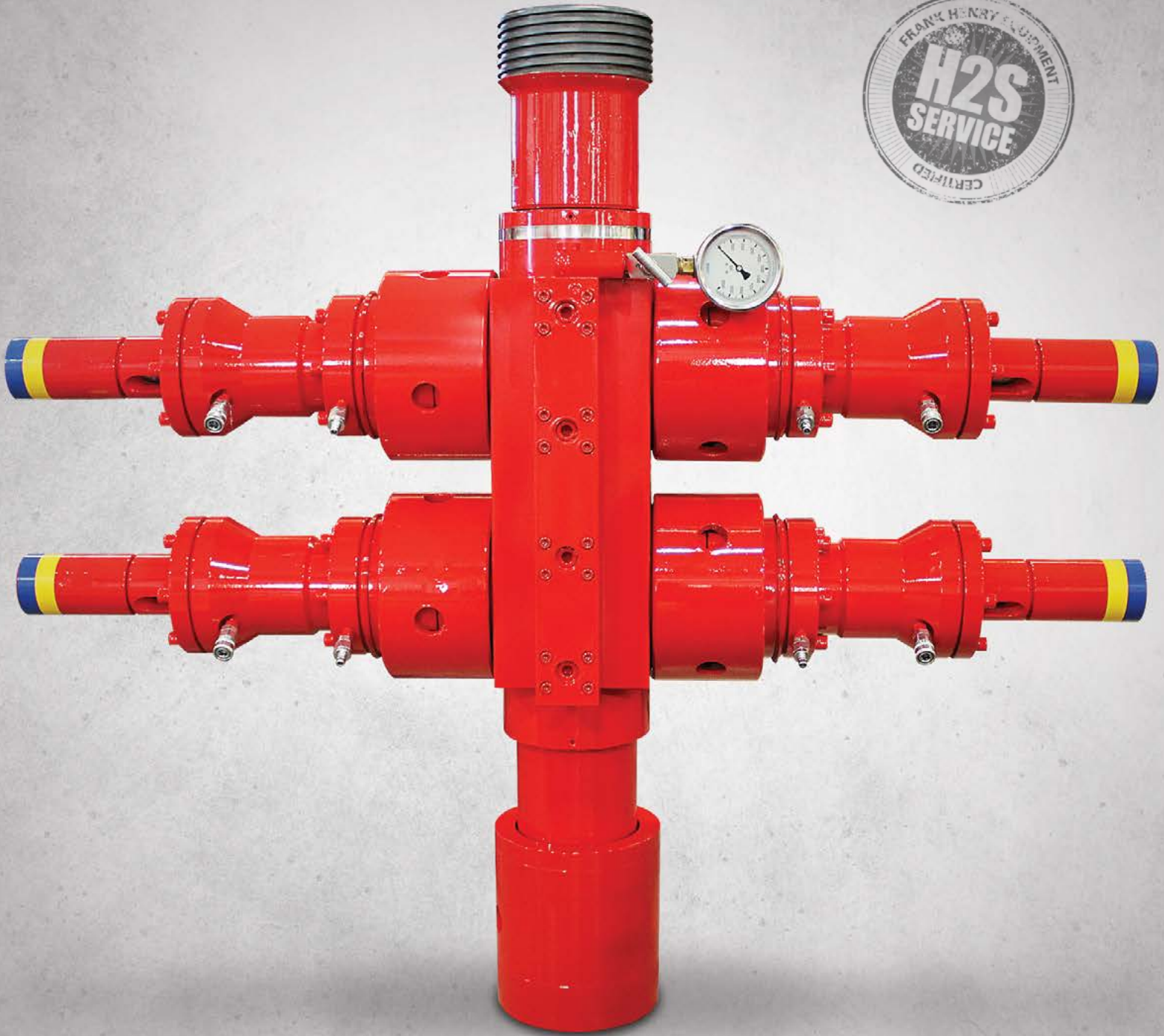
### Triple Wireline Valve Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K						
5K	•	•	•	•	•	
10K	•	•	•	•		
15K						•

### Triple Wireline Valve Assembly Diagram



# DUAL WIRELINE VALVE





Solid uni-body design for increased durability.



Accurate equalization with unified manifold.



Swivel port for a gauge, valves, etc.

## Powerful, Dependable and Available In Every Configuration You Can Think Of

The FHE Dual Wireline Valve can be constructed in any configuration you might need. It has numerous applications and advantages on the job site. Like all our equipment, it's engineered and built with the best possible materials. It's lightweight, easy to operate, and dependable. The Dual Wireline Valve performs faithfully to help your team.

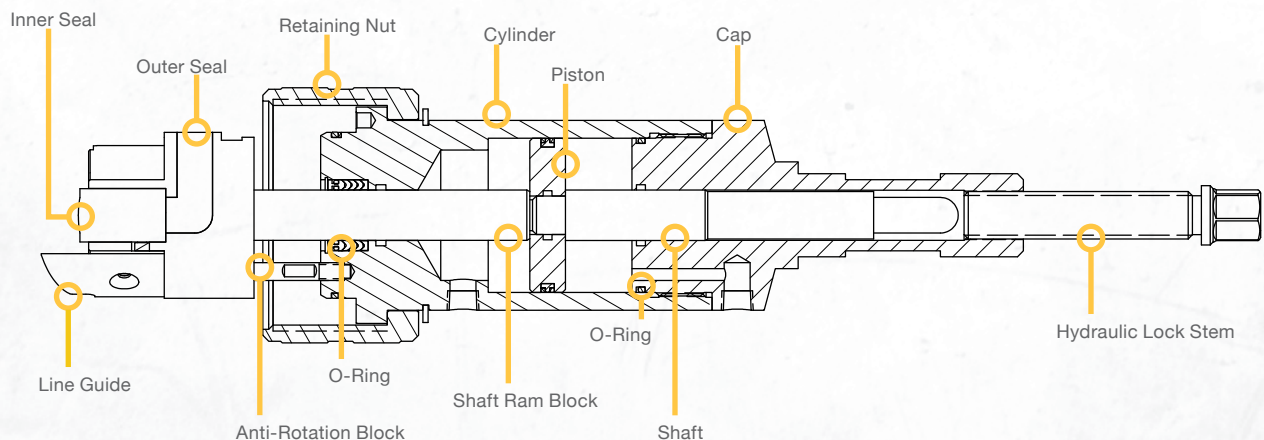
### Dual Wireline Valve Features

- Hydraulic or manual actuators
- Equalizing and bleed-off valves
- Recommended for high-pressures
- Strong uni-body construction
- H<sub>2</sub>S service

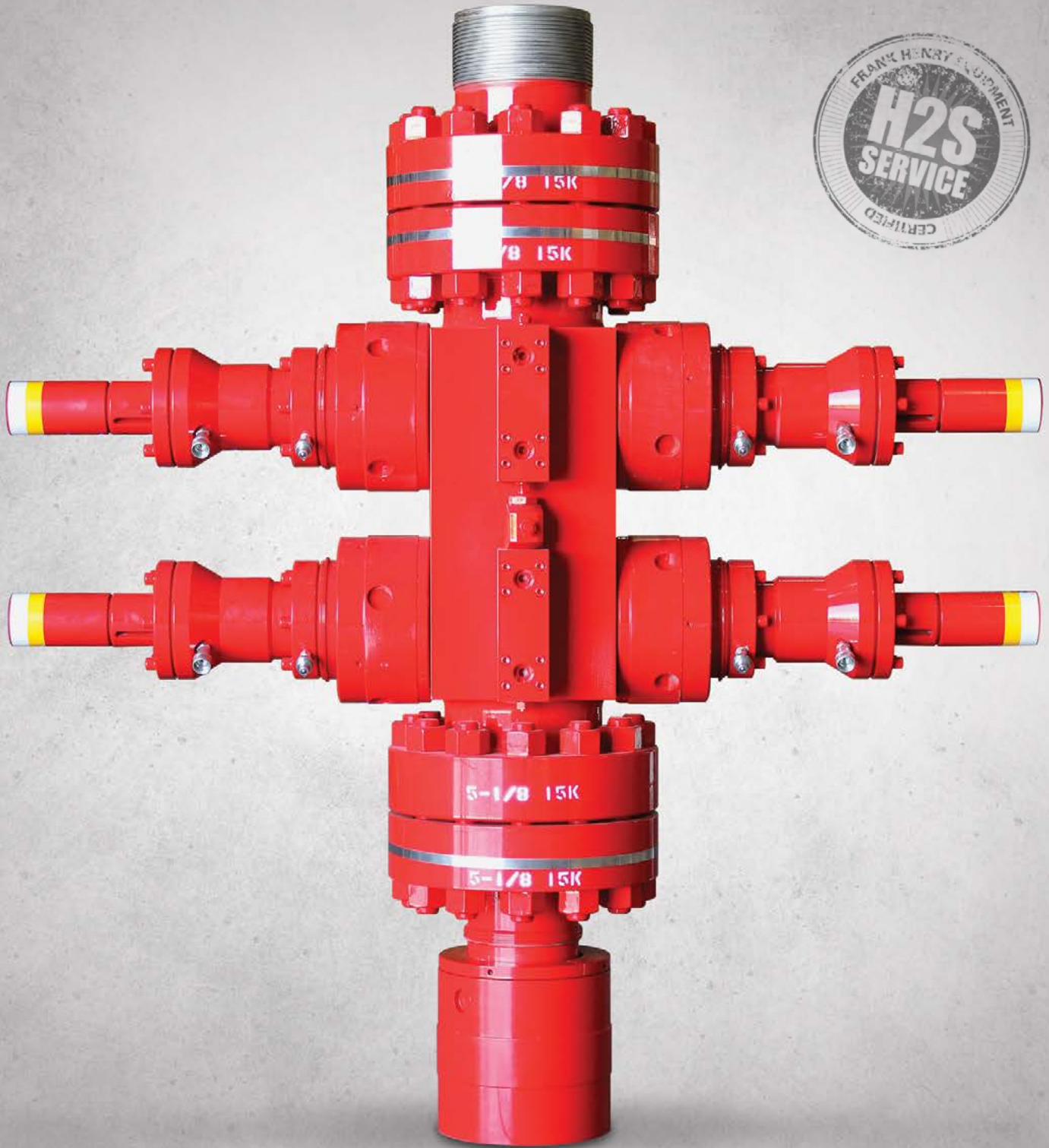
### Dual Wireline Valve Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K						
5K	•	•	•	•	•	
10K	•	•	•	•	•	
15K						•

### Dual Wireline Valve Hydraulic Ram Arm Cross Section



# 15K WIRELINE VALVE





Flanged sub connections.



Manifold design.



Hydraulic actuators.

## 15K WLV Protects Tools and Crew from Well and Operational Pressures

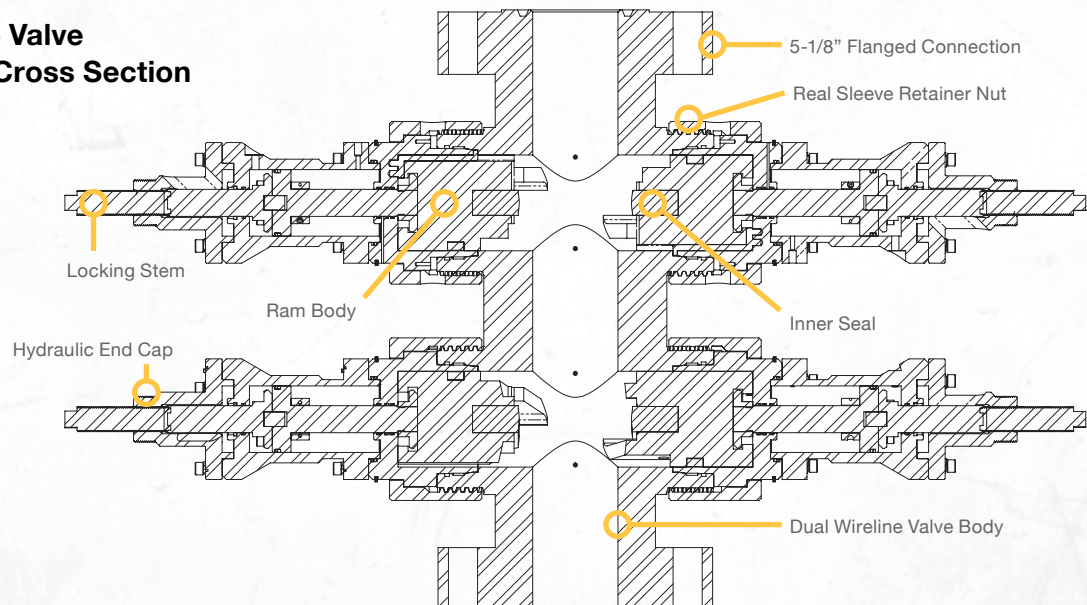
The FHE 15K Wireline Valve is engineered, built and reinforced to successfully contain the high-pressures created to push equipment or originating from the well. With powerful and reliable hydraulic actuators, the 15K Wireline Valve efficiently closes well-flow when necessary.

This 15K Wireline Valve is recommended for unpredictable and high-pressure wireline operations. Flanged connections, uni-body design, and tough construction are just a few of the features of this beefy piece of equipment.

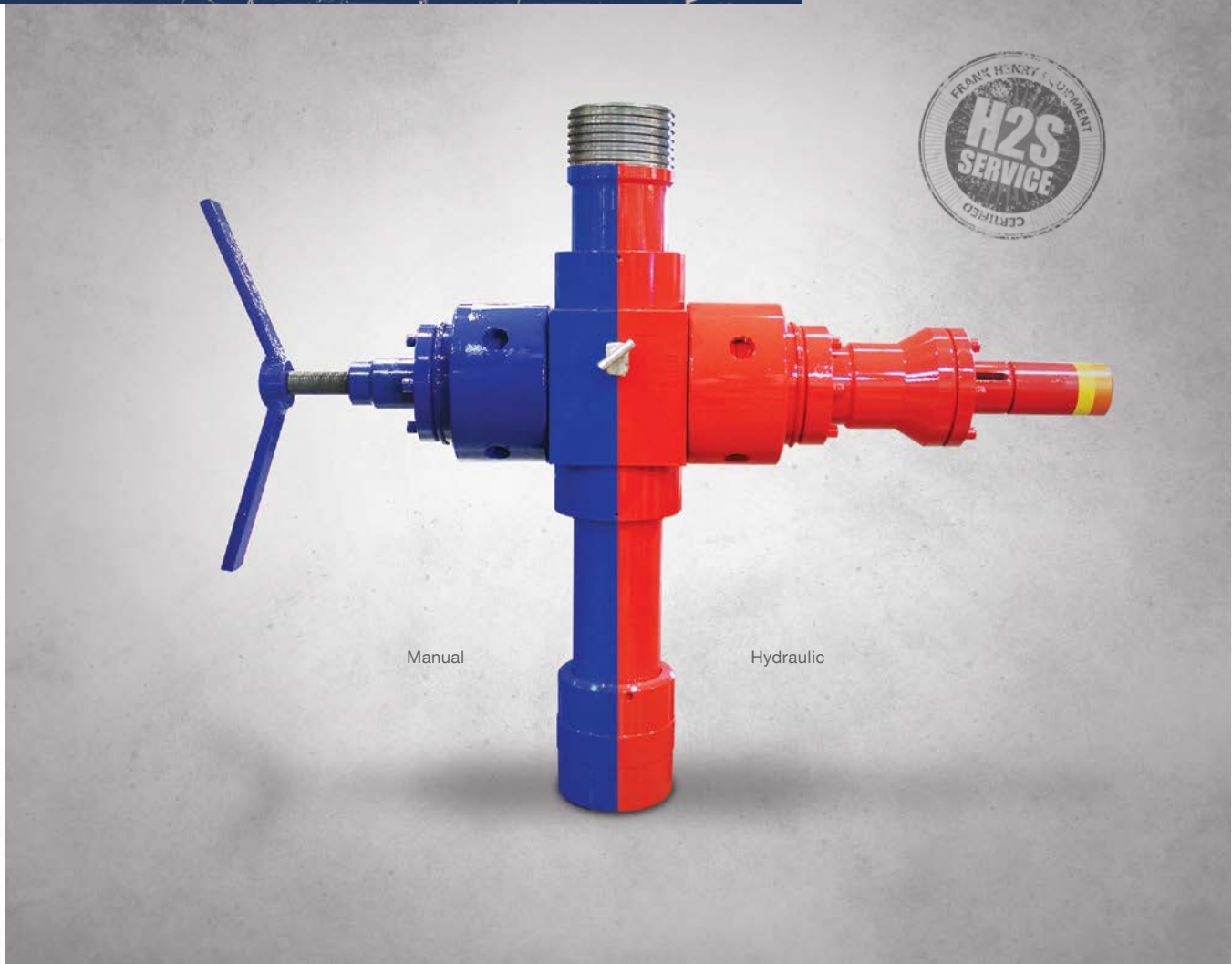
### 15K Wireline Valve Features

- Hydraulic actuators
- Flanged unions
- Equalizing and bleed-off valves
- Recommended for high-pressures
- Available as dual or triple configurations
- Quick-connect unions available
- Strong uni-body construction
- Fits your wireline system with various unions and IDs
- H<sub>2</sub>S service

### 15K Wireline Valve Open Valve Cross Section



# SINGLE WIRELINE VALVE



## Straightforward Solution for Holding Well Pressures

The simplest solution to enclose well pressure and formation gas and fluids. This lightweight unit is easy to use and gets the job done.

### Single Wireline Valve Features

- Controls pressure during well intervention
- Durable construction
- Hydraulic or manual configurations
- Easy to setup, operate, and maintain
- Uni-body design with internal equalizing ports
- H<sub>2</sub>S service

### Single Wireline Valve Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K	•					
5K	•	•	•	•	•	
10K	•	•	•	•		
15K						

# 3 IN. WIRELINE VALVE



Manual or hydraulic actuators.



Solidly constructed wireline valve body.

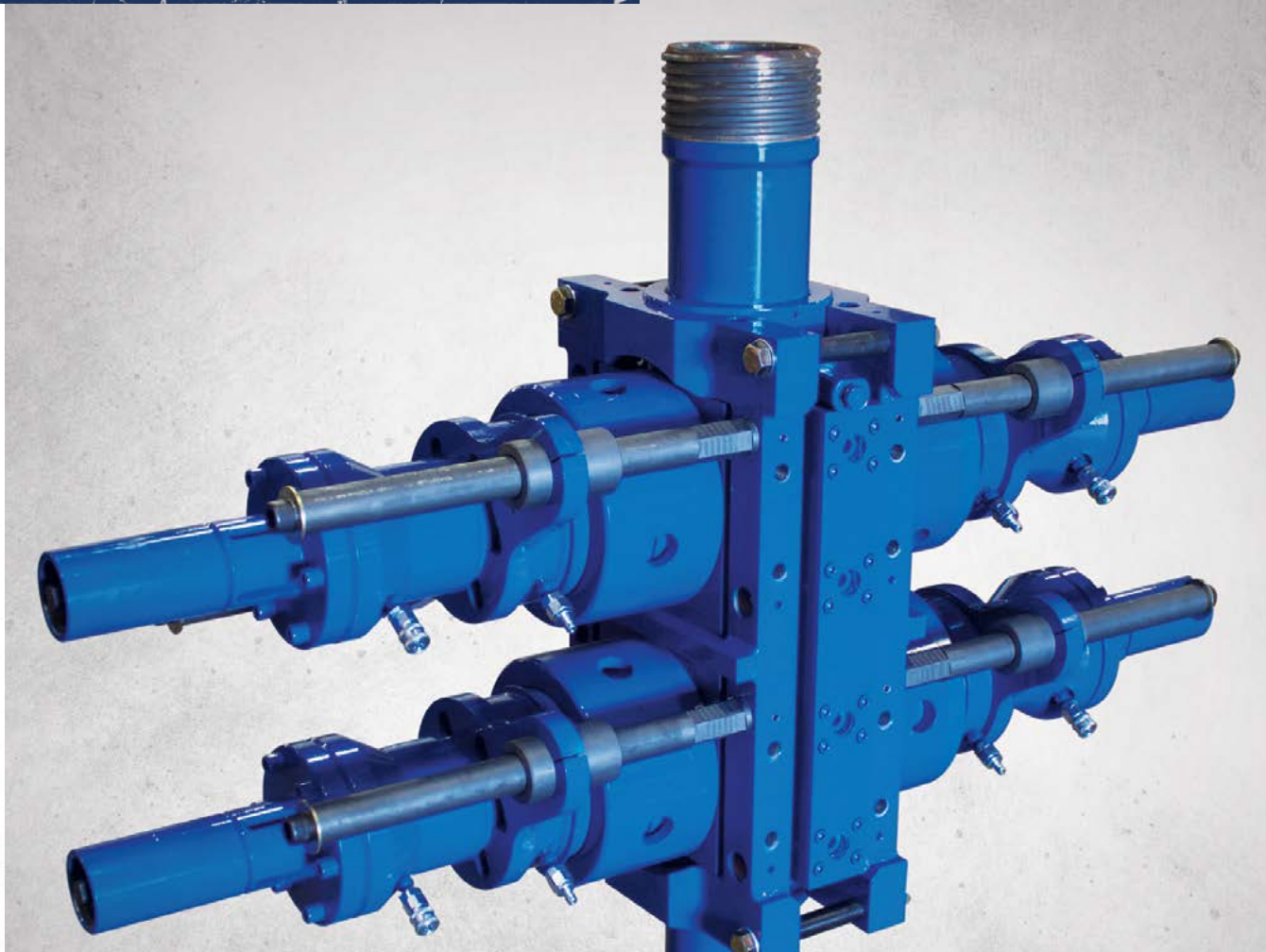
## Simple Equipment for Low-Pressure Wireline Well Services and Operations

Small and lightweight 3 in. Wireline Valve is easy and convenient. It's available with hydraulic or manual actuators. The durable body and components work well in harsh conditions.

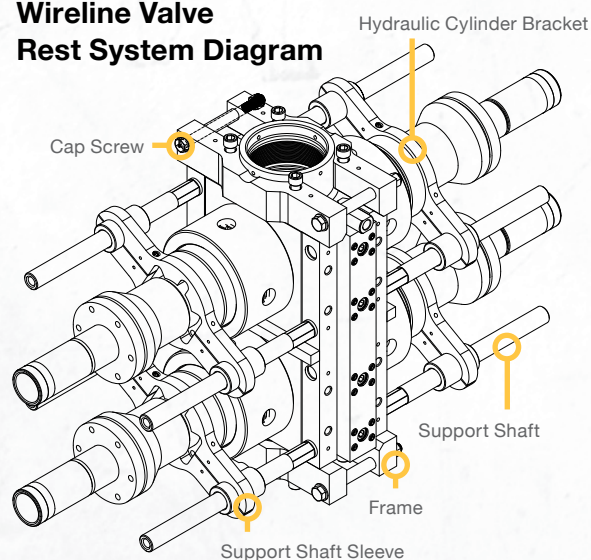
### 3 In. Wireline Features

- Small and lightweight
- Durable construction
- Easy to setup, operate, and maintain
- 10K or 5K working pressure
- H<sub>2</sub>S service

# WLV REST SYSTEM



**Wireline Valve Rest System Diagram**



## **Easily Supports Ram Sub Assemblies During Routine Maintenance and Repairs**

A lightweight structure that supports the weight and maintains the position of your wireline valve ram sub assemblies during maintenance and repairs. The FHE Wireline Valve Rest System speeds up routine seal replacement and various other regular procedures and tasks.

### **Wireline Valve Rest System Features**

- Speeds up wireline valve maintenance and repairs
- Lightweight and durable

# WIRELINER VALVE EXTRAS



## Inner Seals

Made from HNBR rubber compound to better withstand high temperatures, wear, extrusion, and chemicals like Co<sub>2</sub> and H<sub>2</sub>S. Available in all line sizes and specialty designs. Creates a secure seal around your wireline and safely contains well pressure.

## Multi-Blind Seals

Seals from blind to 5/16 in.

## Multi-Line Seals

Seals from 7/32 in. to 5/16 in.

## Line Specific Seals

All sizes and configurations.



## O-Ring Rebuild Kits



## Outer Seals

# QUICK TEST SUB

## Makes Your Team Quicker and Saves Tons of Time

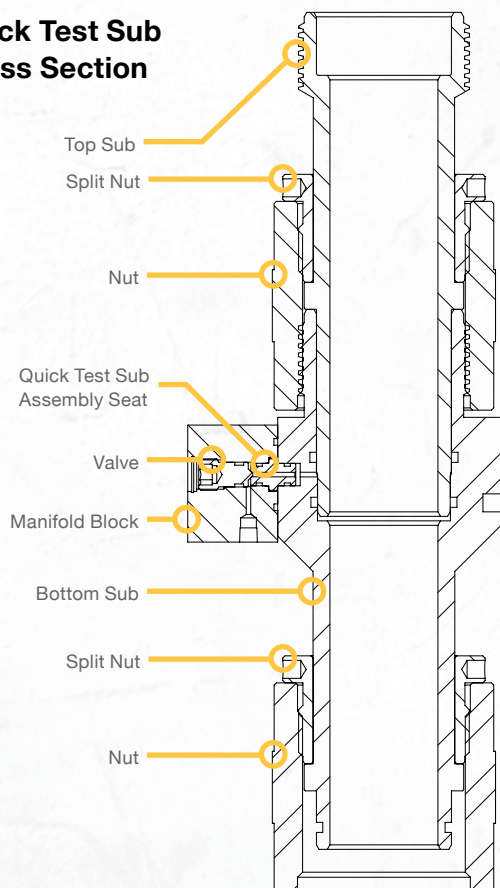
The Quick Test Sub makes it easy to change your tool string during multiple runs. It maintains the integrity of your wireline stack and eliminates the need to re-test the entire string. You'll only need to re-test the separated connection.

### Quick Test Sub Features

- Saves time on multiple well pads
- Re-test only the separated connection
- Available in all IDs, union types, and sizes
- H2S service



### Quick Test Sub Cross Section



# TOOL TRAP



## Reliably Prevents the Loss of Tools Down-hole

The FHE Tool Trap prevents the loss of valuable tool strings down-hole. Losing your tool string can halt production, be very costly, and ruin business relationships.

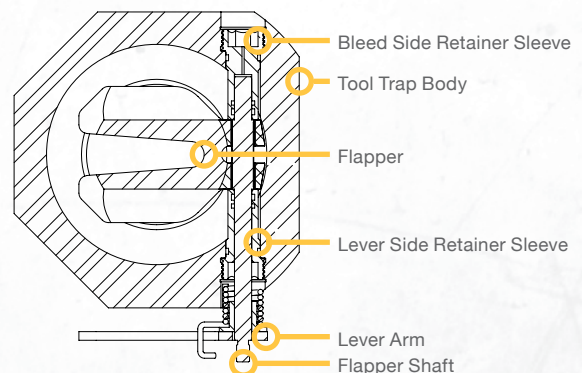
### Tool Trap Features

- Prevents loss of tool string
- Remote hydraulic powered with manual backup
- Steel cage protects hydraulics
- H2S service

### Tool Trap Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K						
5K	•	•	•	•		
10K	•	•	•	•		
15K						•

### Tool Trap Cross Section



# PUMP IN SUB

## Bleed-off Fluids and Gases or Pump-in Crucial Additives

The Pump-In Sub gives you a 2 in. 1502 port to bleed-off well gases and fluids from your pressure control stack. It also gives you an inlet to equalize equipment and add helpful fluids that can change viscosity or remove damaging crystal formations from your equipment.

### Pump In Sub Features

- Bleed-off excess well fluids or formation gases
- Add supportive fluids to protect equipment and increase production
- Equalize well pressure with pressure control equipment stack
- Flanged or standard side ports available
- Auxiliary side ports for a gauge or valve
- Used for multiple operations
- Available in all IDs, union types and sizes
- H2S service

### Pump In Sub Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K						
5K	•	•	•	•	•	
10K	•	•	•	•		
15K						•



Options for flanged sub connections.



# LUBRICATOR



## Houses Wireline Tool Strings Under Equalized Pressure

Lubricators stack above your wireline valve and hold your tool string before it's sent into the well to get to work. They are available in various lengths to ensure they contain your entire tool string.

### Lubricator Features

- Hand-tightened unions
- Various lengths available
- H2S service

### Lubricator Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K		•	•			
5K	•	•	•	•	•	
10K	•	•	•	•		
15K						•

# LIGHTWEIGHT LUBRICATOR



## Lightweight Lubricator Specifications

	3"	4-1/16"	5-1/8"	5-1/2"	7-5/8"	8-1/2"
3K						
5K						
10K	•	•	•			
15K						

## Better Mobility; Lifting and Lowering the Wireline String

The FHE Lightweight Lubricators are easier to setup and maneuver while on location. Manufactured with lightweight alloy your entire wireline string is contained and deployed from your Lightweight Lubricator.

### Lightweight Lubricator Features

- Made with lightweight alloy
- Easier to setup, maneuver, and tear down
- Hand unions
- O-ring connections
- H2S service

# GREASE HEAD

## Prevents Well Bore Fluids and Gases from Escaping

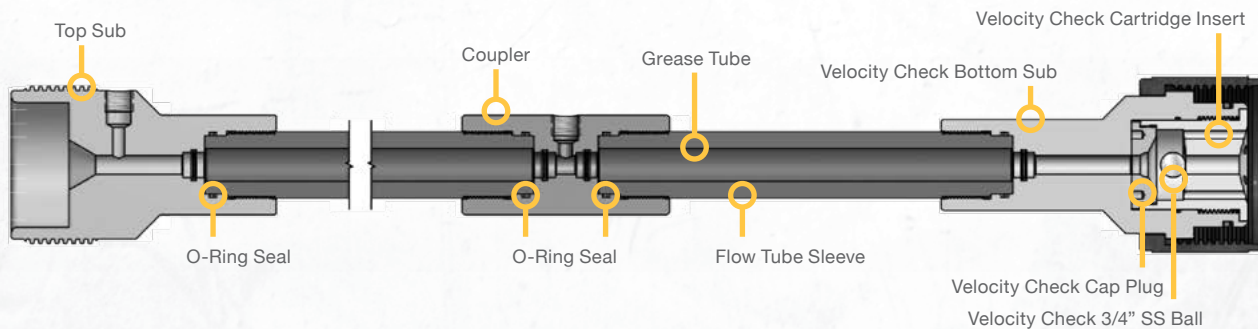
The Grease Head creates a reliable seal between the interior grease tubes and the outer diameter of the wireline. Grease is pumped and controlled in the Grease Head from the Grease Injection System.

### Grease Head Features

- Compensates for various pressure ratings with additional sections
- Velocity check option available
- Confines well pressure, gases, and fluids
- Available in 5K, 10K, and 15K
- H2S service



### Grease Head Section Diagram



# ECO-SAVER

## Wipes Your Line Clean While Holding in Pressure

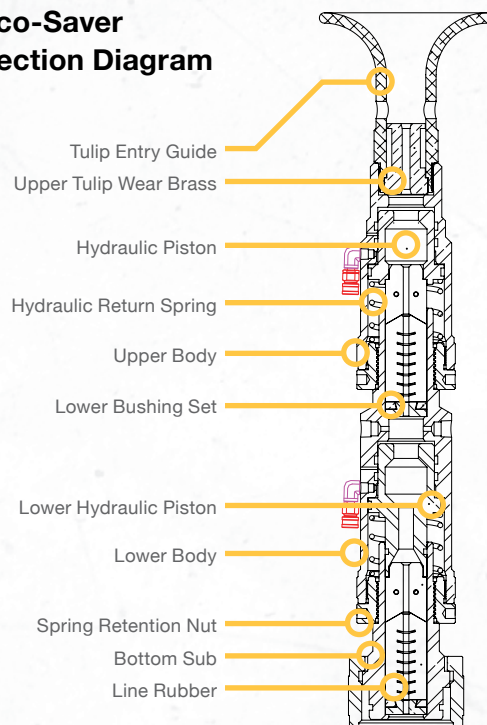
The FHE Eco-Saver provides a seal around your wireline. The secured seal is initiated with a durable bushing and completed with viscous grease. Well fluids and gases remain contained within the equipment. Promotes a safe and clean work environment.

### Eco-Saver Features

- Seals static wireline
- Strips fluid from wireline
- Bushings and guides available in all wireline sizes
- Helps to maintain a clean job site
- H2S service



### Eco-Saver Section Diagram



# SINGLE LINE WIPER

## Seals Around Wireline to Maintain Well Fluids

The Single Line Wiper allows well intervention access to wells under pressure. It prevents well bore fluids and gases from escaping while the wireline moves in and out of the well.

### Single Line Wiper Features

- Provides an initial seal around your wireline
- Allows well intervention while still under pressure
- Helps maintain a clean working area
- Available in most unions, IDs, and sizes
- CL and C types available
- H2S service



# FLANGE



## Secure Connections for Your Pressure Control Equipment to Wellhead

Flanges provide a secure connection to assemble your wireline tools and equipment. Flange connections are a stronger alternative to threaded connections. Available in all IDs, union types, bolt hole patterns, and sizes.

### Flange Features

- Available in all IDs, union types, and sizes
- Custom or standard bolt configurations
- H2S service



Various diameters, union types, and sizes.



Custom or standard bolt configurations.

# WELLHEAD ADAPTER

## Strong Connection to Your Tools and Equipment

Wellhead adapters provide a secure connection and access point for all your pressure control equipment.

### Wellhead Adapter Features

- 1/2 in. NPT option available.
- Available in all IDs, union types, and sizes
- SRD, EUE, LP, NUE



# SPOOL

## Changes and/or Extends Wellhead Connection

Spools change and extend wellhead to make it easier to connect wireline valve to the wellhead. You can customize the sizes, height, and bolt configuration to fit your specific needs.

### Spool Features

- Available in all IDs, union types, and sizes
- Custom or standard bolt configurations
- H2S service



# TOP ADAPTER



## Transition Piece Between Lubricator and Grease Head

Top Adapters allow you to connect your larger diameter riser to the narrower grease head.

### Top Adapter Features

- Secure transition between lubricator and grease head
- Available in all IDs, union types, and sizes
- H<sub>2</sub>S service

# CROSSOVER



## Conveniently Changes from One ID to Another

The perfect piece of equipment to transition between smaller or larger diameters.

### Crossover Features

- Transitions between IDs
- Wing nuts for easier tightening and loosening
- Available in all IDs, union types, and sizes
- H<sub>2</sub>S service

# LIFTING CAP

## Threaded Caps to Help You Maneuver Your Equipment

---

### Lifting Cap Features

- Easily move your equipment around
- Available in all IDs, union types, and sizes
- Safe work load of 13,200 lbs.
- Proof load of 26,400 lbs.



# NIGHT CAP

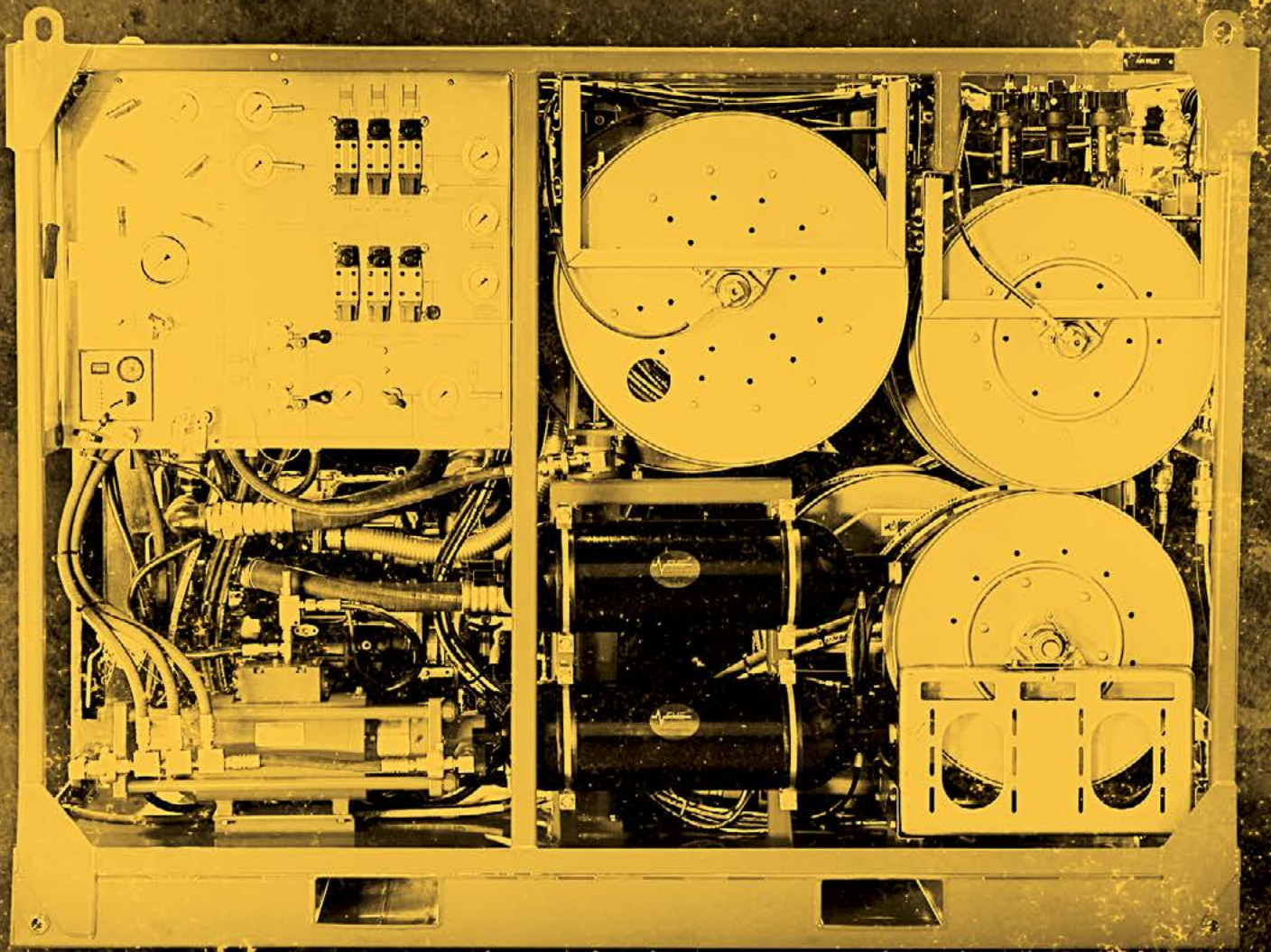
## Protects Your Well from Debris that Can Damage Equipment

---

### Night Cap Features

- Protects against debris falling into well
- Needle valve allows you to bleed off excess pressure before opening well
- Available in all IDs, union types, and sizes
- Safe work load of 13,200 lbs.
- Proof load of 26,400 lbs.
- H2S service





# GREASE INJECTION



# 15K GREASE INJECTION SYSTEM





Fold-down control panel to easily access all hydraulic valves.



Powerful Perkins 54 HP diesel engine.

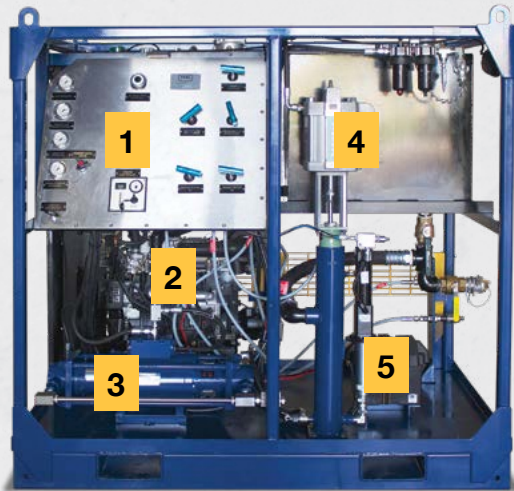
## Pushes Grease for High Pressure Well Intervention in All Possible Conditions

FHE's 15K Grease Injection System is engineered and built to perform high pressure well intervention processes in the tough conditions present on location.

### 15K Grease Injection System Features

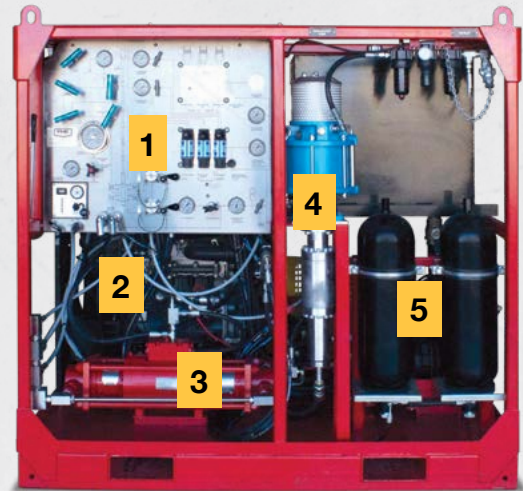
- Perkins 54 HP diesel engine that runs quiet and excels in harsh conditions.
- McFarland hydraulic-driven 15K primary grease pump
- Lincoln or Wiwa 15K backup grease pump
- 10-gallon accumulator system cycles the wireline valve 3 times (hydraulic)
- Fold-down control panel gives easy access to all hydraulic valves
- Labeled bulkhead
- 100 gallon grease tank
- Dual safety step for tank access
- Hand pump backups for convenience or emergencies (hydraulic)

### 15K FEATURES GREASE ONLY

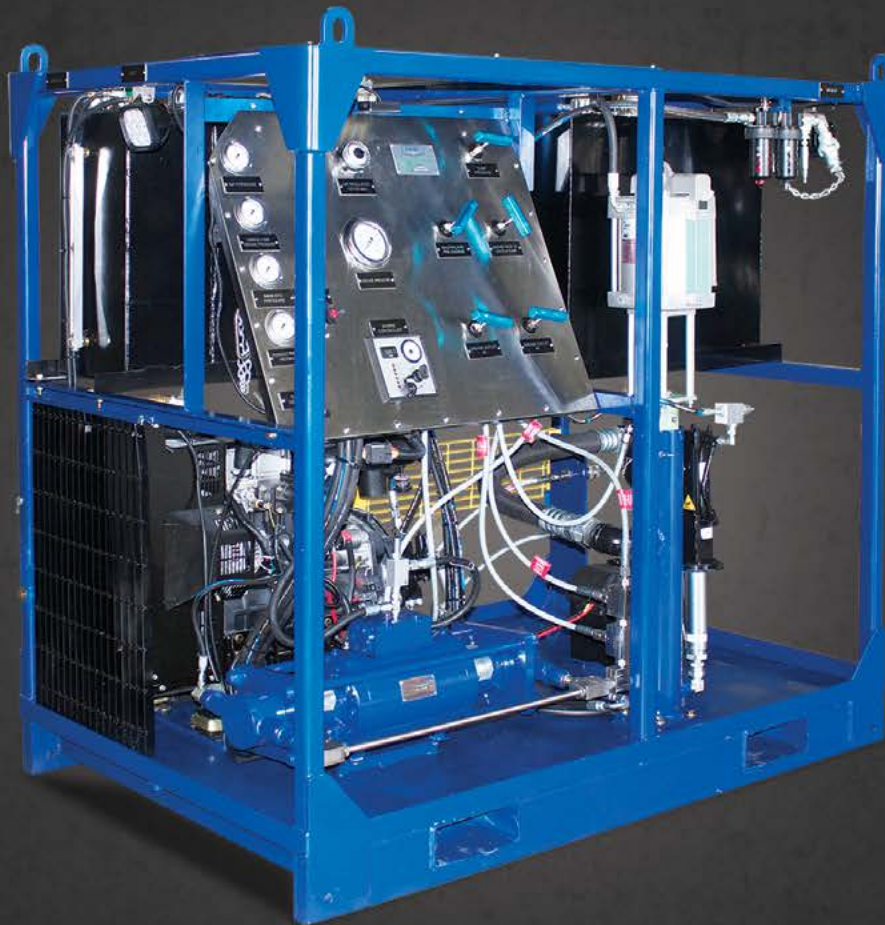


- 1** Fold-Down, Graphic Control Panel
- 2** Perkins 54 HP Diesel Engine
- 3** McFarland Hydraulic Grease Pump
- 4** Lincoln 15K Backup Pump with Dynastar Charge Pump
- 5** Open Floor Design for Easy Maintenance and Repairs

### 15K FEATURES HYDRAULIC & GREASE



- 1** Fold-Down, Graphic Control Panel
- 2** Perkins 54 HP Diesel Engine
- 3** McFarland Hydraulic Grease Pump
- 4** Lincoln 15K Backup Pump with Dynastar Charge Pump
- 5** 10 Gallon Accumulator System



## 15K Grease Injection System Specifications

### DIMENSIONS

Size:	48"x96"x72"
Weight:	6,000 lbs. (dry weight)
Finish:	Custom-painted with gloss finish or powder-coated

### POWER SYSTEM

Engine:	Perkins 400 series, 4 cylinder liquid-cooled diesel with electric start & low oil pressure shutdown
Tanks:	15 gallon diesel tank
Horse Power:	54 hp
RPM:	2,000 operating rpm, 3,000 max rpm

### GREASE SYSTEM

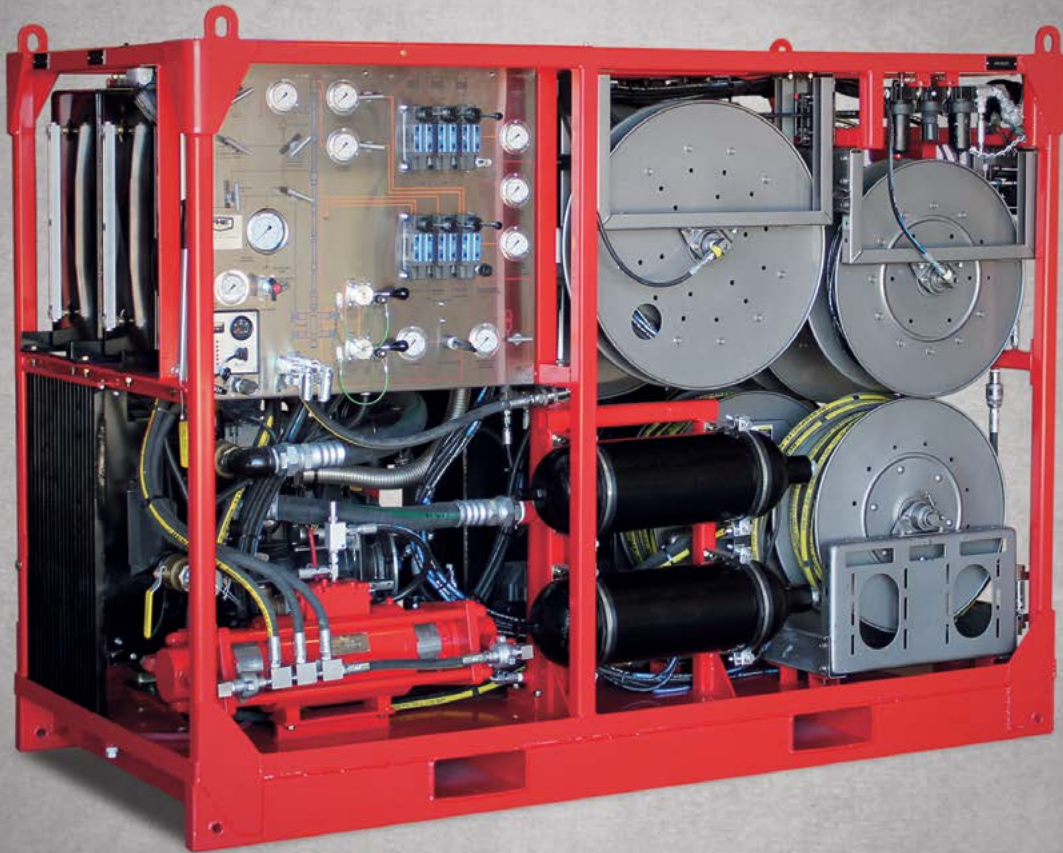
High Pressure Pump:	McFarland MAC-26 hydraulic powered grease injection pump with dual 1 3/4" plungers with 6" power cylinder and 2" stroke
PSI:	15,000 max grease psi, 1,500 max hydraulic psi
Pressure Capacity:	15,000 psi
Pump Capacity:	.75 gallons/minute
Reservoir Capacity:	Single 50-gallon, double-50 gallon, or single 100-gallon
Backup Pump:	Lincoln 15,000 max grease air pump, Wiwa 15,000 max grease

### HYDRAULIC SYSTEM\*

Hydraulic Tank:	30-gallon hydraulic tank (AW42)
Hydraulic Pump:	Pressure compensation load piston pump (15 gpm at 1,800 rpm)
Pressure Capacity:	3,000 max psi
Hose Reels:	Hannay high pressure hydraulic rewind and Hannay spring rewind
Accumulators:	Dual accumulators - 5 U.S. gallons ea. (1,350 psi charge), 5 U.S. gallons (10-gallons total usable oil)

\*Included in the Hydraulic 15K Grease Injection Systems only.

# 10K GREASE INJECTION SYSTEM

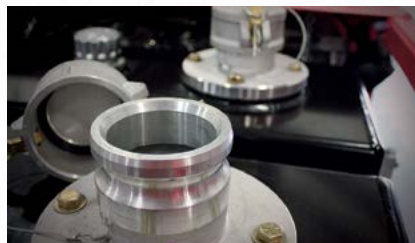


## Easy To Operate and Built To Perform

With an innovative design, the FHE 10K Grease Injection System is built for superior performance. It's easy to operate, reliable, and built with the highest-quality parts and components. With this system, you can increase the effectiveness and efficiency of your crew in the field.



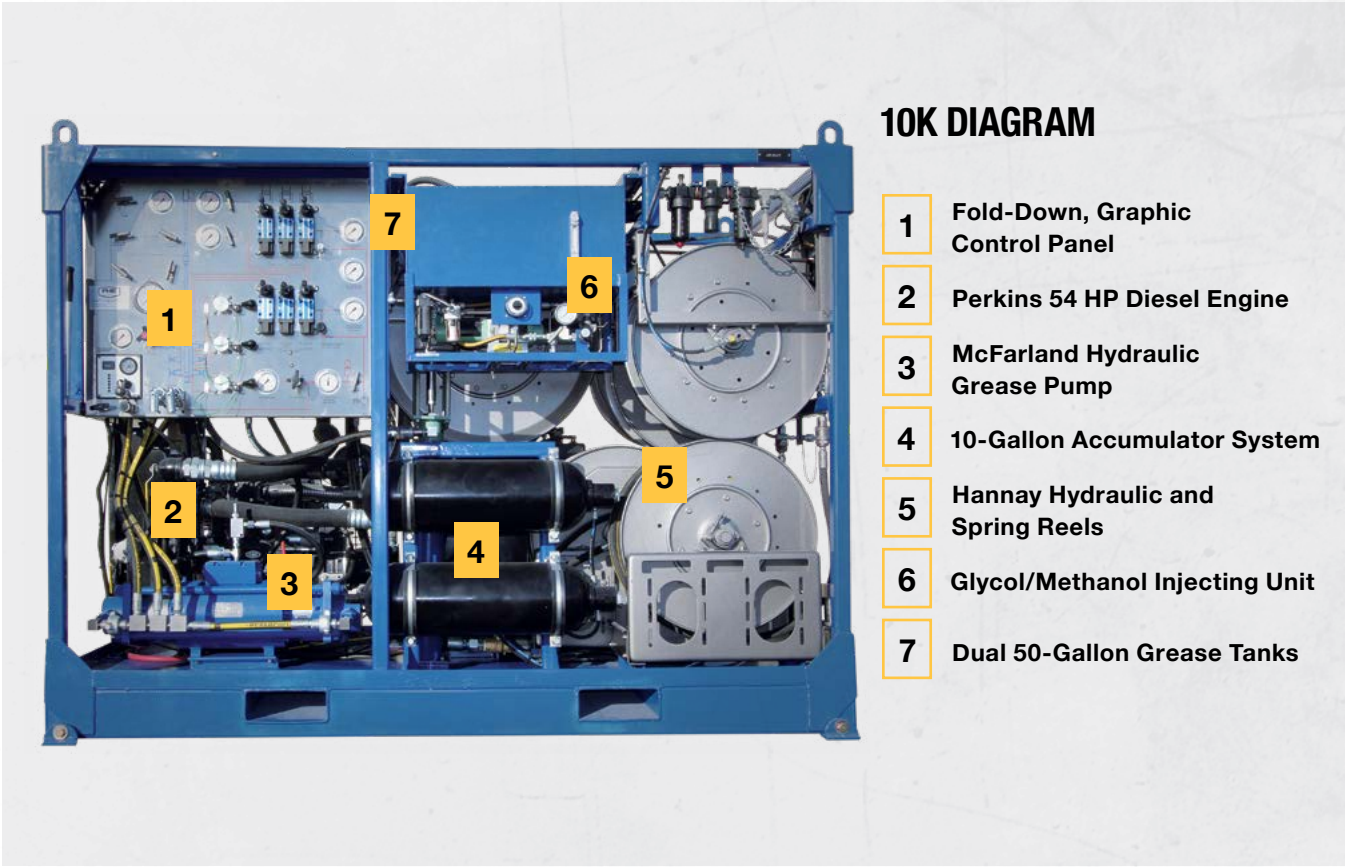
Fold-down control panel to easily access all hydraulic valves.



Dual 50-gallon grease tanks hold different grease viscosities for changing conditions.

## FEATURED COMPONENTS

- Perkins 54 HP diesel engine that runs quiet and excels in harsh conditions.
- McFarland hydraulic-driven 12K primary grease pump
- Lincoln pneumatic-driven 12K backup grease pump
- 10-Gallon accumulator system cycles the wireline valve 3 times.
- Fold-down control panel gives easy access to all hydraulic valves.
- Graphic control panel makes operation simple and easy.
- Labeled hoses at storage bar and at the wellhead.
- Hand pump backups for emergencies or convenience.



### 10K DIAGRAM

- 1** Fold-Down, Graphic Control Panel
- 2** Perkins 54 HP Diesel Engine
- 3** McFarland Hydraulic Grease Pump
- 4** 10-Gallon Accumulator System
- 5** Hannay Hydraulic and Spring Reels
- 6** Glycol/Methanol Injecting Unit
- 7** Dual 50-Gallon Grease Tanks



Accumulator system automatically charges and recharges.



Hannay hydraulic and spring reels with adjustable speed.



1,596 Lumen LED lights over your control panel and your work area.



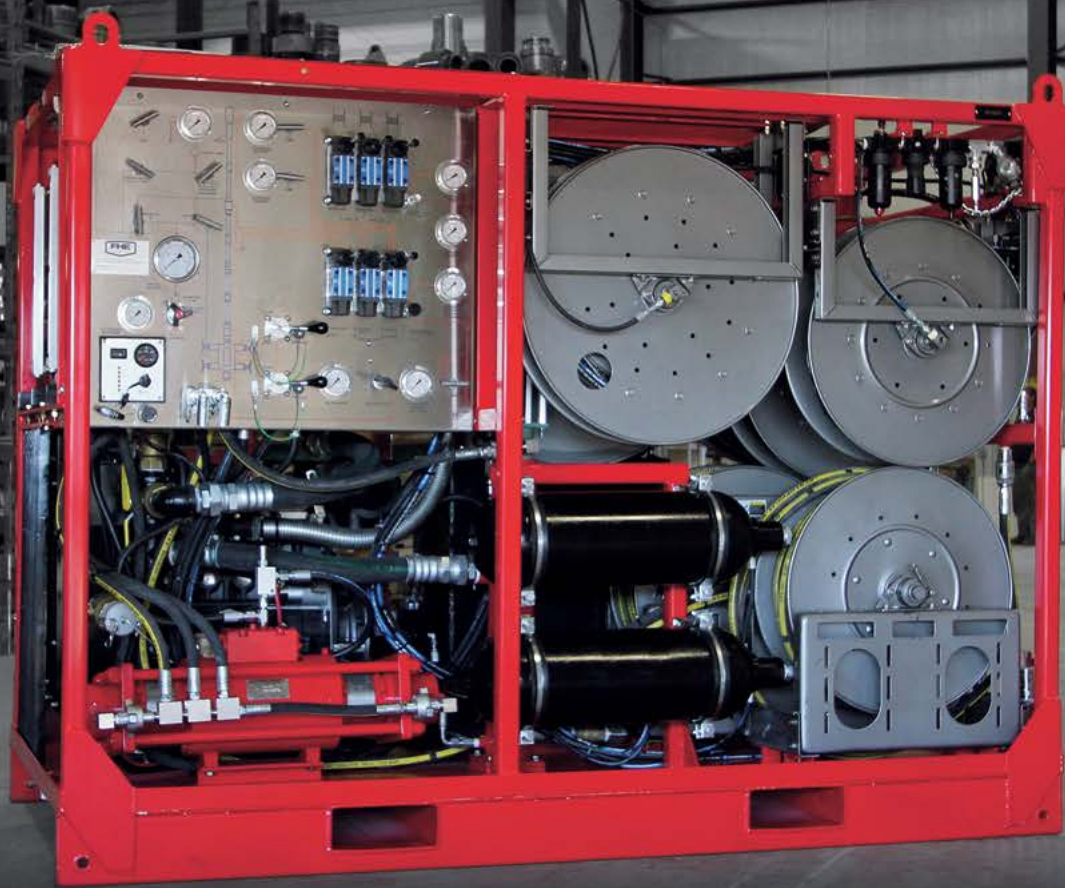
Storage bar prevents thread damage, spills, and unraveling hoses.



These all-in-one units are designed to power your entire system.



The most reliable 54 HP engine for harsh conditions.



## 10K Grease Injection System Specifications

### DIMENSIONS

Size:	48"x96"x72"
Weight:	6,000 lbs. (dry weight)
Finish:	Custom-painted with gloss finish or powder -coated

### POWER SYSTEM

Engine:	Perkins 400 series, 4 cylinder liquid-cooled diesel with electric start & low oil pressure shutdown
Tanks:	15 gallon diesel tank
Horse Power:	54 hp
RPM:	2,000 operating rpm, 3,000 max rpm

### GREASE SYSTEM

High Pressure Pump:	McFarland MAC-26 hydraulic powered grease injection pump with dual 1 3/4" plungers with 6" power cylinder and 2" stroke
PSI:	12,500 max grease psi, 1,200 max hydraulic psi
Pressure Capacity:	12,000 psi
Pump Capacity:	.75 gallons/minute
Reservoir Capacity:	Single 50-gallon, double-50 gallon, or single 100-gallon
Backup Pump:	Lincoln 12,000 max grease psi air pump

### HYDRAULIC SYSTEM

Hydraulic Tank:	30-gallon hydraulic tank (AW42)
Hydraulic Pump:	Pressure compensation load piston pump (15 gpm at 1,800 rpm)
Pressure Capacity:	3,000 max psi
Hose Reels:	Hannay high pressure hydraulic rewind and Hannay spring rewind
Accumulators:	Dual accumulators - 5 U.S. gallons ea. (1,350 psi charge), 5 U.S. gallons (10-gallons total usable oil)

# 5K GREASE INJECTION SYSTEM



## Compact and Custom Designed

The FHE 5K Grease Injection System is built in a compact, virtually indestructible steel frame with many standard options available. This unit is outfitted with a reliable hydraulic FHE intensifier primary grease pump and a secondary Lincoln Pump-Master III. This system is simple and easy to operate with a clearly labeled control panel and quick connect bulkhead. This machine is built tough and will work as hard as you do.

### 5K Grease Injection System Features

- Compact design, extra-large lifting eyes, and forklift pockets make for convenient transportation.
- FHE hydraulic-driven primary pump
- Lincoln 5K pneumatic-driven backup grease pump
- Clearly labeled control panel
- Many custom options including hydraulics, dual tanks, hose and reels, etc. are available
- Marked bulkhead with quick connects



Labeled control panel makes using this unit easy and straightforward.



Powerful primary and secondary pumps continuously supply grease.



Fuel efficient diesel engine engineered to increase power and reduce fuel waste.



Dual 50-gallon grease tanks hold different grease viscosities for changing conditions.



Quick connect bulkhead supply grease and methanol with quick connections.



## 5K Grease Injection System Specifications

### DIMENSIONS

Skid size:	50"x48"x64"
Weight:	2,600 lbs. (dry weight)
Finish:	Custom-painted with gloss finish or powder-coated

### POWER SYSTEM

Engine:	Kohler, 1 cylinder air cooled diesel with electric start and low oil pressure shutdown
Tanks:	15-gallon diesel tank
Horse Power:	10 hp

### GREASE SYSTEM

High Pressure Pump:	5K FHE hydraulic operated grease pump
Backup Pump:	5K Lincoln air operated grease pump

# GREASE INJ. ACCESSORIES

## Triple Closing Unit



Gives you precise control of closing and opening triple wireline valves. This Closing Unit also operates dual tool traps, pack off, and line wiper. It features an easy to operate graphic control panel and 2.5-gallon accumulator with zero leak valves.

### Triple Closing units Features

- Air-driven hydraulic pump
- Easy to operate graphic control panel
- Solid aluminum manifold block connects all directional valves
- Hydraulic valves prevent over pressure
- 10,000 psi hand pump
- Lightweight and compact custom frame

## Dual Closing Unit



Maintain complete and accurate control of opening and closing wireline valves with FHE's portable hydraulic powered closing unit.

### Dual Closing Units Features

- Air-operated hydraulic pump
- 2.5-gallon accumulator with zero leak valves
- Easy to operate graphic control panel
- Convenient portable size of 24"x20"x22"

## Grease Barrels/Totes

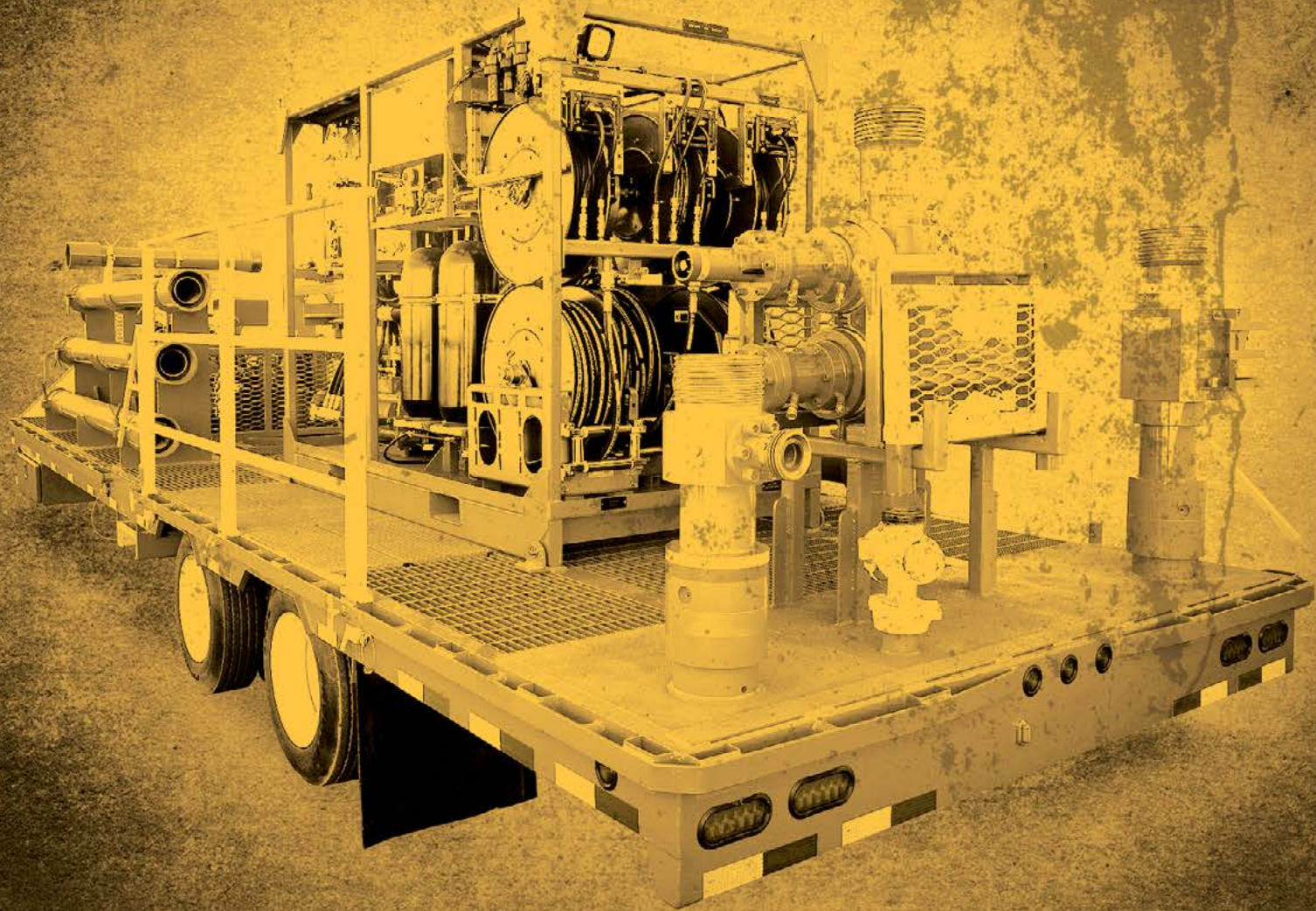


Grease specifically engineered to withstand the torturous wireline environments of high pressures and high temperatures. Specific grease formulas for all types of weather and conditions. Quantity discounts are available.

## Glycol/Methanol Injectors



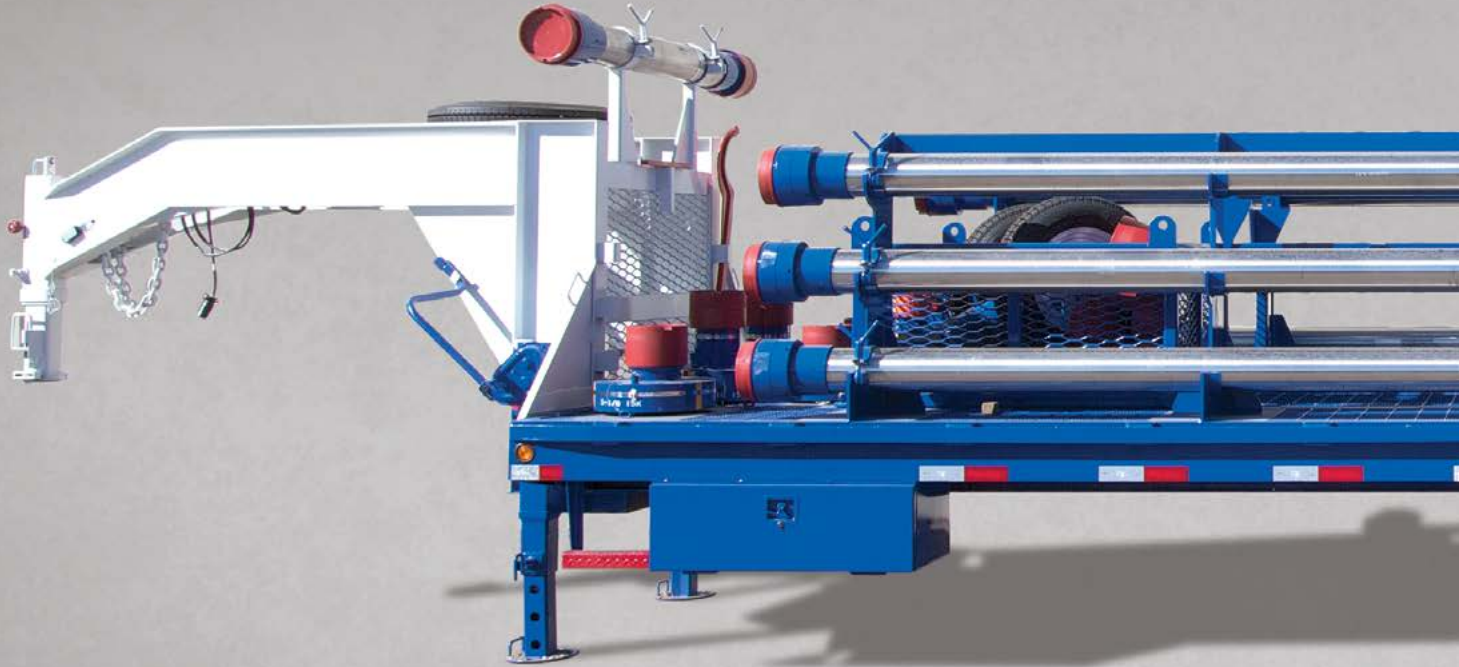
Glycol/Methanol injectors precisely eliminate hydrate formations that can halt production and damage wirelines. Pneumatic-driven Texsteam pump with 10,000 psi and 12-gallon tank fits within a 28"x13"x23" frame.



# TRAILERS



# EQUIPMENT TRAILERS



## **Make a Lasting Impression in the Field**

Arrive in the field with the most impressive equipment trailer in the industry. These trailers really show off your equipment, team and company. Your equipment will be kept safe and secure while traveling from one job to another. Each piece will stay right where you put it without any straps. Once you arrive on the job, the equipment can easily be unloaded with minimal risk of injury or damage. Call today and the FHE sales team will help custom design a trailer just for you.



Secure lubricator rack protects the risers from damage during transportation and unloading.



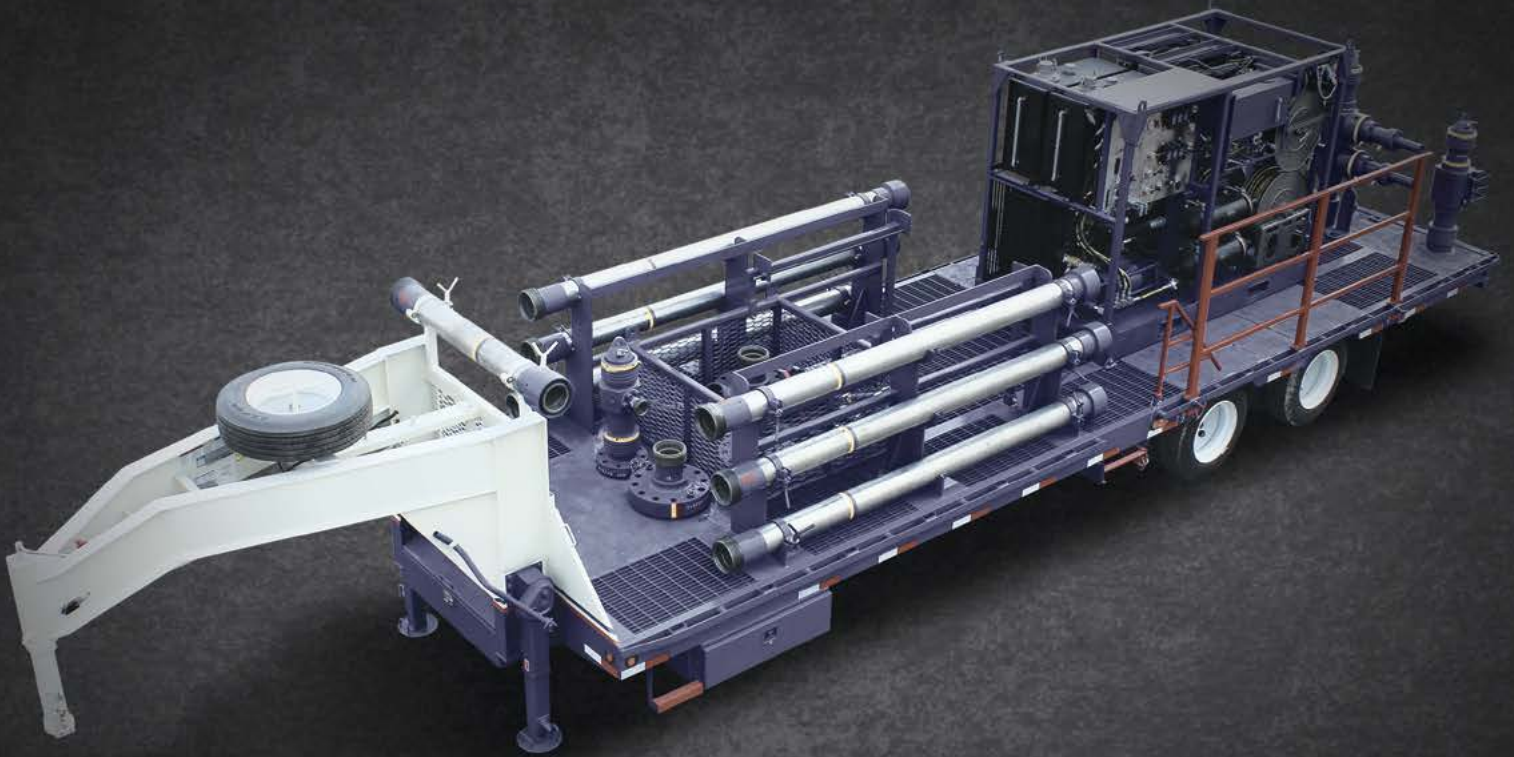
Custom layout puts every tool and piece of equipment right where you need it for your specific job.



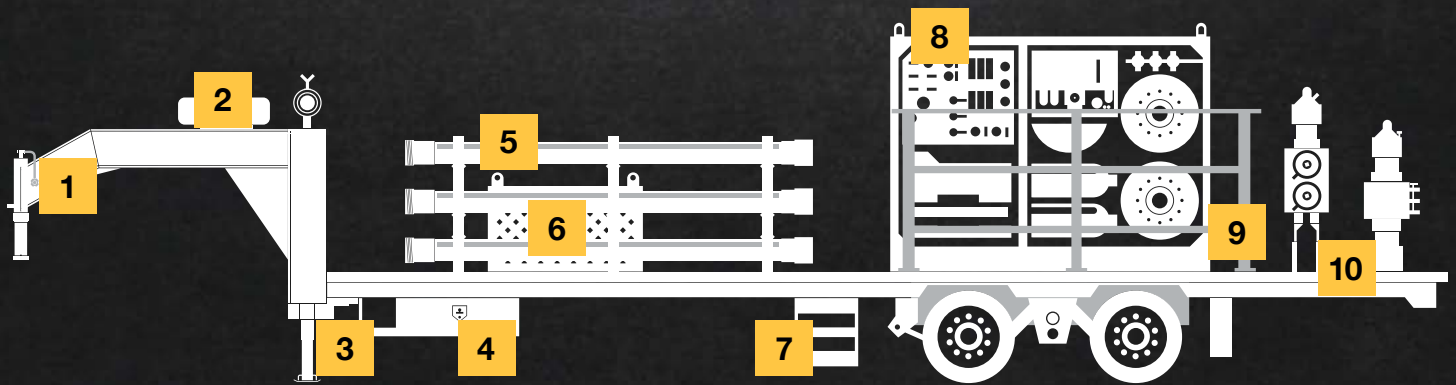
Equipment basket keeps your trailer organized and stores your equipment for easy access.



Safety features keep your team safe and prevent injuries with strategically placed railings and steps.



## Equipment Trailer Features



- |  |   |
|--|---|
| <p><b>1</b> Goose neck design for better stability and control</p>         | <p><b>6</b> Equipment basket for extra gear</p>                       |
| <p><b>2</b> Spare tire to ensure your equipment gets in the field fast</p> | <p><b>7</b> Fold out step</p>   |
| <p><b>3</b> Side steps for easy access to equipment</p>                    | <p><b>8</b> Grease injection system</p>                               |
| <p><b>4</b> Lockable tool boxes for secure storage</p>                     | <p><b>9</b> Safety hand rails</p>                                     |
| <p><b>5</b> Secure riser rack reduces damage and risk of injuries</p>      | <p><b>10</b> Upright stands for wireline valves, tool traps, etc.</p> |

# PUMP DOWN TRAILERS

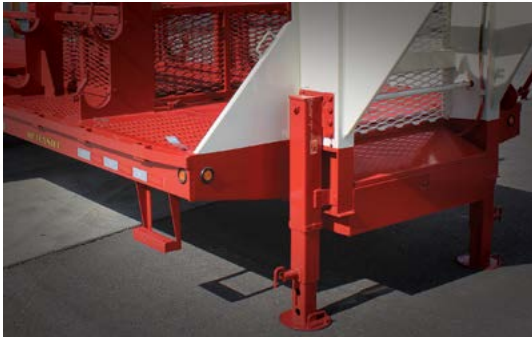


## **The FHE pump down trailers have all the features to provide a safe and convenient environment to assemble perforating guns and charges.**

Our pump down trailers give you plenty of room to easily assemble guns and charges for your well work. The entire trailer and components are powered by a reliable and efficient diesel-powered generator. The trailers feature interior and exterior lights that illuminate working spaces. There is plenty of storage space for parts, tools, and equipment. Large counters give everyone ample room to work without interference.



# TRAILER ACCESSORIES



## Trailer Hardware

Need to add some extra pieces, parts, and/or restraints. Just let us know and we'll set you up. You can add brackets, braces, fixtures, etc. More ways to customize your lubricator trailer.



## Safety Equipment

Keep your team safe while transporting, loading, and unloading your valuable equipment with safety rails, steps and storage systems. Placement can be customized based on your specific circumstances.



## Tie Down Straps

Simple to use retractable (spring loaded) ratchet tie down straps are available. They keep your load secure between each job. Various lengths available for different size loads.



## Ratchet Load Binders And Chains

Versatile load binders made from forged steel hold your equipment in place without spreading or stretching. Reliable ratcheting system keeps items securely held with steel welded chains.



# PERFORATION PRODUCTS



# SHAPED CHARGES



## Boost Well Performance with Accurate & Consistent Entry-Hole Diameters & Depth Penetration

Shaped Charges from FHE are engineered to provide consistent entry holes and industry-leading penetration. They produce clean entry holes that maximizes well performance in all conditions. Each charge is scrutinized under the most stringent manufacturing standards. Shaped Charges from FHE are available in 16, 19 and 23 grams and RDX, DP RDX or HMX explosive types.

### Shaped Charge Features

- Engineered for consistent performance
- Works seamlessly with perforating system
- Available in RDX and HMX
- Available in 19 and 23 grain weights

### Recommended Gun System

Gun Size	3-1/8 in	3-1/8 in	3-3/8 in	3-3/8 in
	79 mm	79 mm	86 mm	86 mm
Shot Density	4 spf	6spf	4 spf	6 spf
	13 spm	20 spm	13 spm	20 spm
Phasing	120°	60°	120°	60°

# SHAPED CHARGES SIZES



16 Gram



19 Gram



23 Gram

# RDX CHARGES

## Accurate & Consistent Performance

Engineered and precisely built for dependability in all conditions.

Product Name	Explosive Load		Entrance Hole	Penetration
	Grams	Explosive	Inches	Inches
16 GR GH RDX	16	RDX	0.39	27.00
19 GR GH RDX	19	RDX	0.45	20.46
23 GR GH RDX	23	RDX	0.45	19.17



# DP RDX CHARGES

## Reaches Deeper for Maximum Well Production

Get a 43% deeper hole that pierces formations for top well production.



Product Name	Explosive Load		Entrance Hole	Penetration
	Grams	Explosive	Inches	Inches
19 GR GH DP RDX	19	RDX	0.41	31.17
23 GR GH DP RDX	23	RDX	0.40	33.72

# HMX CHARGES

## Effective & Powerful Charges with High Temperature Stability

Opens a clean, clear perforation tunnel to access fluid formations.



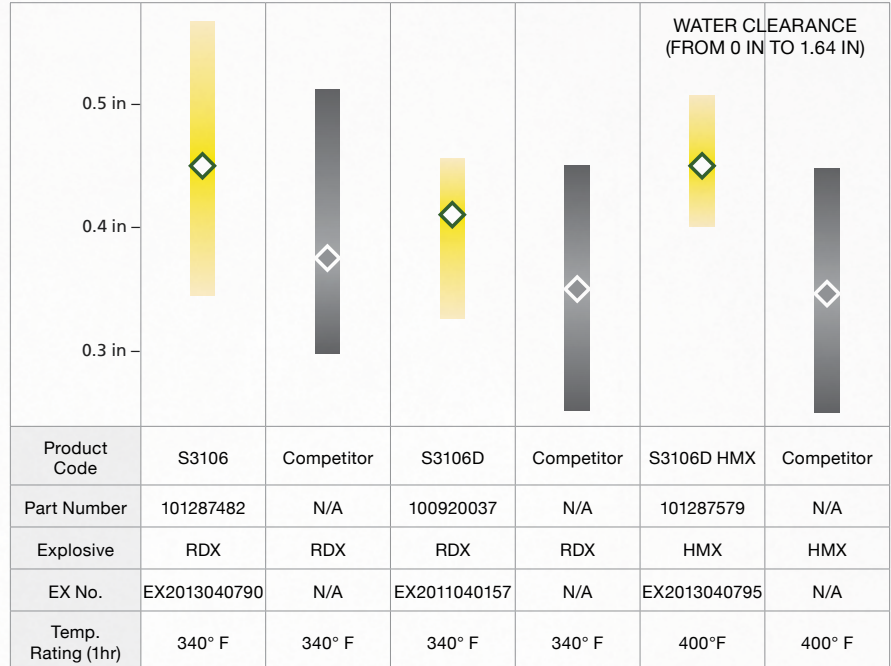
Product Name	Explosive Load		Entrance Hole	Penetration
	Grams	Explosive	Inches	Inches
16 GR GH HMX	16	HMX	0.39	27.00
19 GR GH HMX	19	HMX	0.45	31.80
23 GR GH HMX	23	HMX	0.47	33.42

# 19 Grain Shaped Charges

API-19B Section 1 Results

Charge	S3106D RDX	
Penetration	35.40 in	89.09 cm
Entrance Hole	0.40 in	10.16 mm
EH Standard Deviation	2.82%	
L-80 Casing	4.50 in	114.3 cm
Target Compressive Strength	6,559 psi	41.35 MPa

Entrance Hole Variation

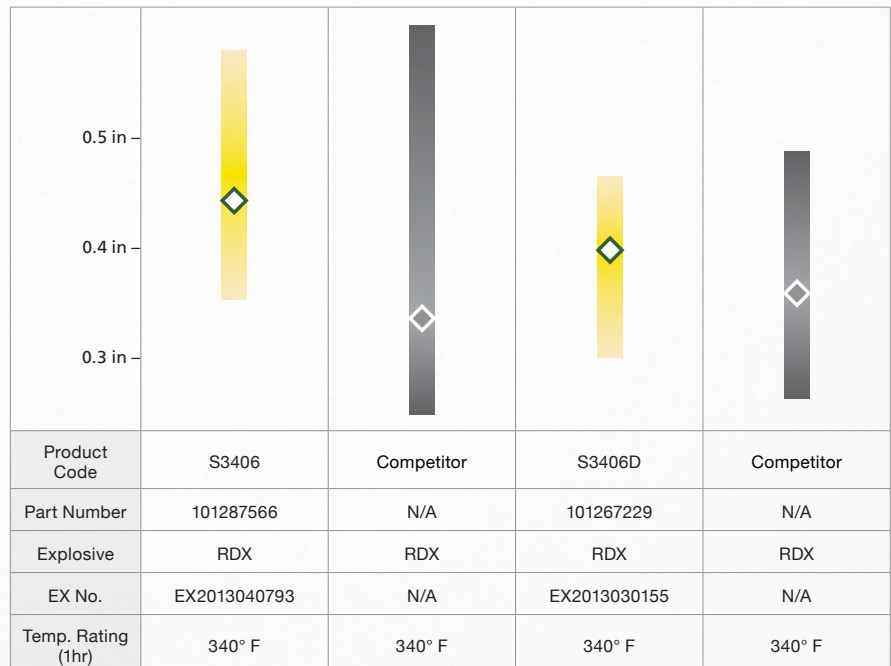


# 23 Grain Shaped Charges

API-19B Section 1 Results

Charge	S3406D RDX	
Penetration	35.60 in	90.42 cm
Entrance Hole	.042 in	10.67 mm
EH Standard Deviation	6.20%	
L-80 Casing	5 in	127 mm
Target Compressive Strength	5,997 psi	45.22 MPa

Entrance Hole Variation



# PERFORATING GUNS



## Engineered for Superior and Consistent Performance

Designed for reliable and consistent performance while punching holes in the casing, Perforating Guns prepare the well for optimal performance. The advanced engineering of our Perforating Guns give you greater control, increased accuracy, and reliable results. They are available in different configurations, lengths, and diameters.

### Perforating Gun Features

- Scalloped and slick guns available
- Engineered for maximum effectiveness and minimal debris
- Available in various configurations, lengths, and diameters



## Scalloped Guns

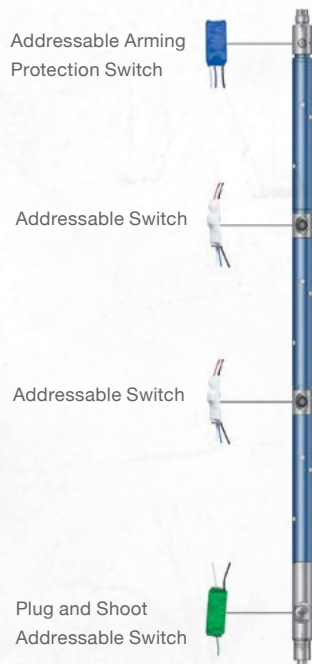


## Slick Guns

# ADDRESSABLE SWITCH SYSTEM



## Addressable Switch System Diagram



## Controlling Each Detonator with Uniquely Addressed Electronic Switch

The FHE addressable switch firing system is run within explosive devices. The system is a series of microprocessors attached to the initiators. Digital communication is used to operationally check and arm the switches. Each microprocessor has a unique address to individually identify the associated explosive device. All circuits, gun wiring, and connections can be checked at surface with the Integrated Perforating Device Tester (IPDT); while running in hole, checking is done with the perforation acquisition system.

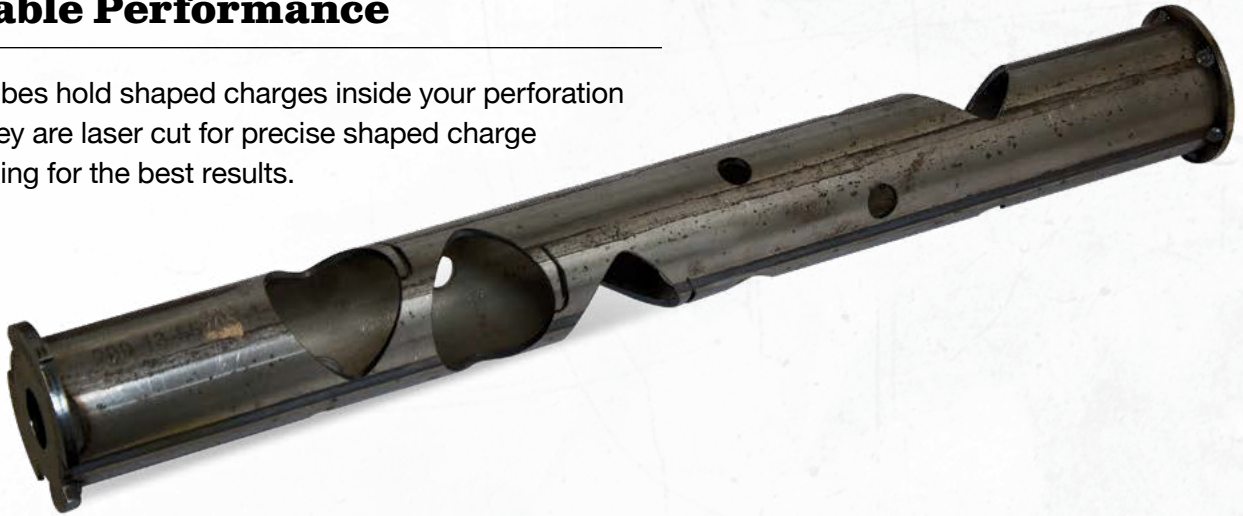
### Addressable Switch system Features

- One-trip perforating of long intervals with up to 40 guns per descent
- Increased safety and efficiency from complete skip-over capability, allowing operational continuity in case of a misfire or switch failure
- Real-time positive shot indication
- Entire gun string can be operationally checked at surface and while running-in-hole using surface to switch communications
- Compatibility with leading industry standard logging systems

# INNER TUBES

## Easily Setup Shaped Charges for Reliable Performance

Inner Tubes hold shaped charges inside your perforation gun. They are laser cut for precise shaped charge positioning for the best results.



# PERFORATION ACCESSORIES

## Det. Cord

### Options

- 80gr HMX
- 80gr RDX
- 80gr PETN
- 40gr RDX
- 40gr HMX



## Det. Blocks



## Power Charges

### Options

- #5 slow set
- #10 slow set
- #10 standard
- #20 standard
- 2-1/2 shorty
- 3-1/2 standard
- 3-5/8 compact

## Detonators

### Options

- A85
- A140F
- A140S
- A84
- A105

## Igniter

### Options

- Go Style Igniter
- Bp 3
- Bp 4
- Secondary Igniter

# PERFORATION ACCESSORIES



## Setting Tools

### Options

- Baker 5
- Baker 10
- Baker 20
- 2-1/2 shorty
- 3-1/2 shorty
- 3-5/8 compact
- Bleeder wrench

## Wire

### Through Wire

- Stranded
- Braided

### Ground Wire

### Dual Diodes

### Double insulated

- Single strain
- Double twisted



## Setting Tools Rebuild Kits



## Blue Tamale



## Dart Hardware

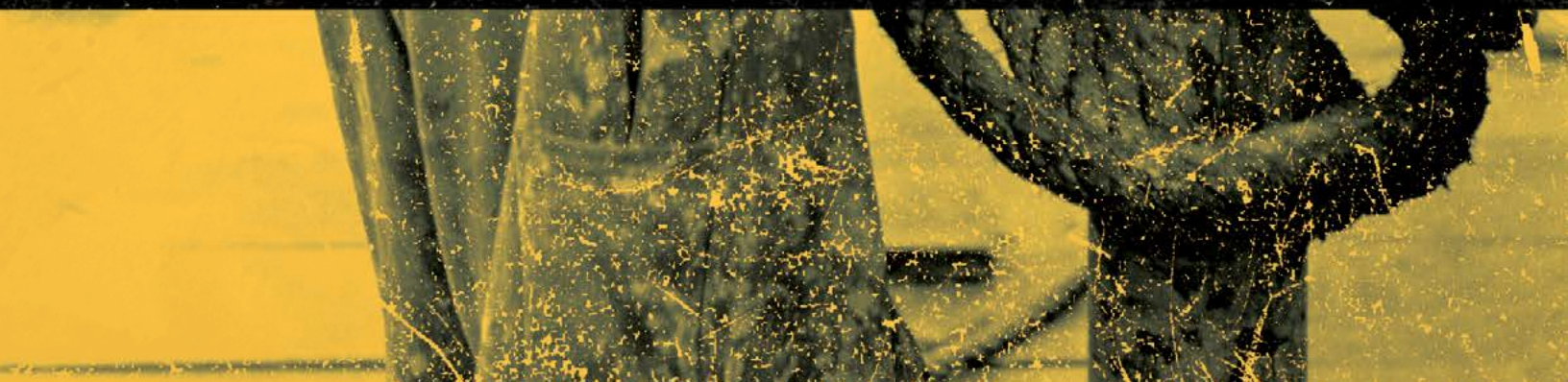


## Retaining Nuts & Port Plugs





# DEPTH & WEIGHT INDICATORS



# DD WEIGHT INDICATOR



## The Rugged DD Weight Indicator Acquires and Displays Process Data in Both Digital and Analog

Digital Dial (DD) weight indicators are flexible tools for acquiring and displaying process data. The DD consists of an analog to digital capture system with both digital and analog displays. Digital capture ensures precise measurements with flexible processing and the analog display ensures simple readability in critical situations.

Devices in the DD series have the same feature set and available options. They differ only in their enclosure/face size - 6", 8", 10" and 12" (nominal).

### DD Weight Indicator Features

- Resolution, sensitivity, and increments are user programmable
- Selectable mV (Load Cell) or mA (4-20mA Current Loop) signal input
- Field adjustable calibration
- High speed sampling for rapid response to weight changes
- Optional Quadrature Encoder interface for depth and speed measurement
- Optional analog output (4-20mA or 0-5VDC) tracks the digital display
- RS-232 port (optional 2nd RS-232) for computer interfacing, data-logging or remote display
- Dial Face with custom ranges available

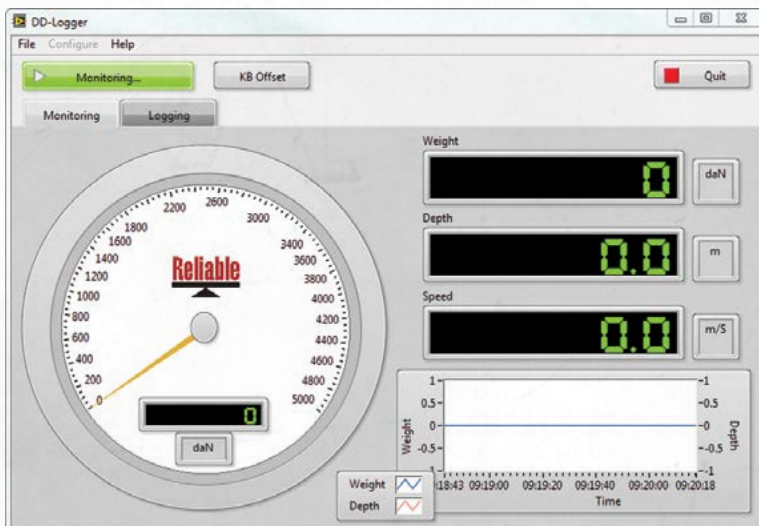
# DIGITAL WEIGHT INDICATOR



## Digital Weight Indicator Features

- Resolution, sensitivity, and increments are user programmable
- Low profile indicator uses minimal “dashboard” space
- Responsive analog output (4-20mA or 0-5VDC) tracks the digital display
- Output Ports provide multiple alarms for equipment shutdowns
- Real time clock provides time and date with weight for computer interface
- Field programmable for use with most strain gage load cells and transducers
- High speed sampling for quick and accurate response to weight changes
- Over/High/Low alarm outputs for system overload protection

# DD-LOGGER DATA LOGGER



## DD-Logger Data Logger Features

- Monitor Digital Dial output in Real-time
- Works with Reliable Scale DD Series\*
- Log data to spreadsheet compatible files
- Easy to use interface
- Microsoft Windows® based application
- \* Existing DD Series devices need to be upgraded to work with DD-Logger

# WIRELIN MEASURING HEAD



## Compact and Lightweight Design that Measures Line Tension and Line Payout with Superior Accuracy



Shaft connections included for encoder and/or mechanical counter.

### Wireline Measuring Head Features

- Measures both line tension and line payout
- Measuring wheels for 1 ft and 1/3 m circumference are available
- Designed for one or two lines up to 5/16" dia
- Load cell capacity up to 10,000 lb / 4,536 kg line pull
- Shaft connections included for encoder and/or mechanical counter
- Top or bottom mount
- Easy access for line change
- Guides rollers at front & back
- Compatible with Reliable Scale Corporation Digital Dial series indicator with tension, depth and speed monitoring

# WIRELIN TENSION MONITORING



## Features

- Wireline load cell and compact wheel assembly installs easily into any system
- Change lines easily without disconnecting from tool
- Sheaves are interchangeable to accommodate different line sizes
- Dual or single line sheaves available
- Ultra sensitive load cell responds to even the smallest shift in load
- Excellent performance in even the harshest climatic conditions

# SLICK-LINE TENSION MONITORING



## Features

- Slick-line load cell and compact wheel assembly installs easily into any system
- Change lines easily without disconnecting from tool
- Sheaves are interchangeable to accommodate different line sizes
- Dual or single line sheaves available
- Ultra sensitive load cell responds to even the smallest shift in load
- Excellent performance in even the harshest climatic conditions

# LOAD CELLS



## C05 Tension Link Load Cell

### Features

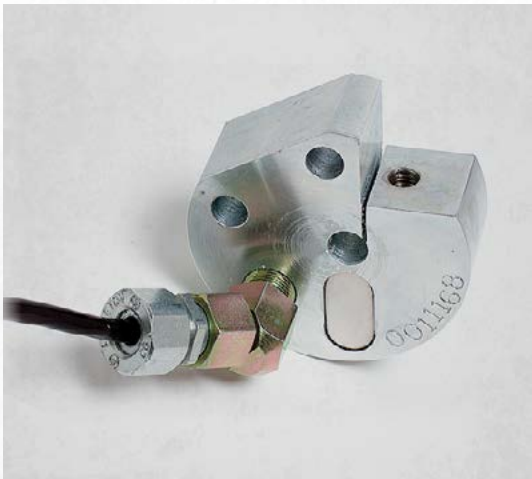
- Ruggedly built for harsh environments
- All weather operation
- Compatible with most digital weight indicators
- Numerous industrial applications
- Easy installation and connections
- Custom designs and capacities available



## C06 Pancake Style Load Cell

### Features

- Compact, low profile compression style load cell
- Some models can be used in tension and compression
- Available with Solid, Hollow, or Threaded “Load Button”
- Sealed against moisture and chemical attack
- High accuracy and signal linearity
- Custom designs available



## Wireline Measuring Head Load Cell

### Features

- Custom designed to install directly into a “Gerhart Owen” style measuring head
- Load cell is a direct replacement for older hydraulic style units
- High sensitivity and excellent linearity provide years of trouble free operation
- Eliminates cumbersome hydraulic hoses in the truck
- Temperature compensated electronics are not affected by severe climate changes

## FHE-LT-150K Deadline Load Cell

### Features

- Light-weight design is easy to install
- Specifically designed for Drilling Dead Line tension applications
- Integral aluminum load cell with steel saddles
- Stainless steel handle and hardware
- Integrated loop-powered 4-20mA output



## C04A Donut Style Load Cell

### Features

- Provides reliable signals for well monitoring and pump-off control systems
- Designed and built to operate in severe field conditions
- Redundant environmental sealing ensures long life in demanding locations
- Available with customer specific connector



## C09A Horseshoe Style Load Cell

### Features

- Provides reliable signals for well monitoring and pump-off control systems
- Designed and built to operate in severe field conditions
- Three point loading system
- Locking quick-release pin for easy and secure mounting
- Available with customer specific connector





# RIGGING EQUIPMENT



# SHEAVES

## Smoothly Runs Wireline Tools into the Well Bore

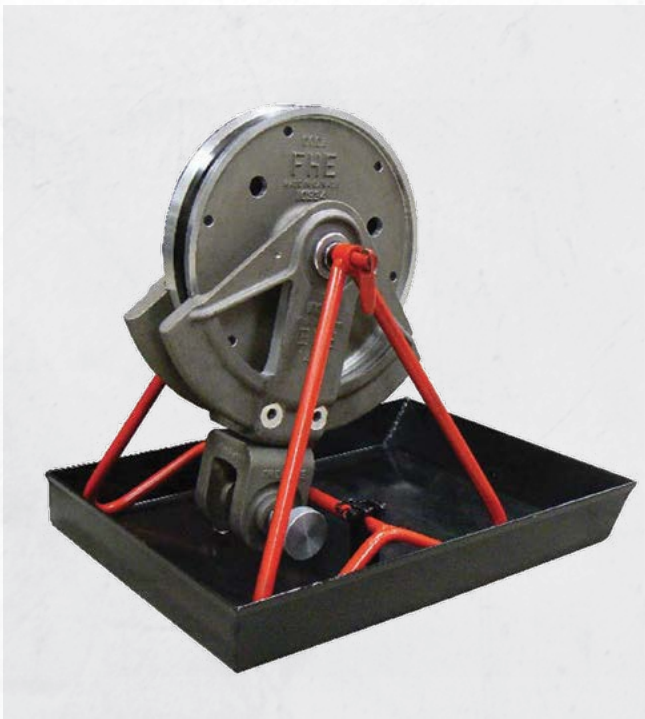
FHE's Sheaves effortlessly runs your wireline tools into and out of the well bore. Specifically designed for your wireline diameter, the sheave wheel prevents damage and reduces wear on your wireline.

### Sheave Features

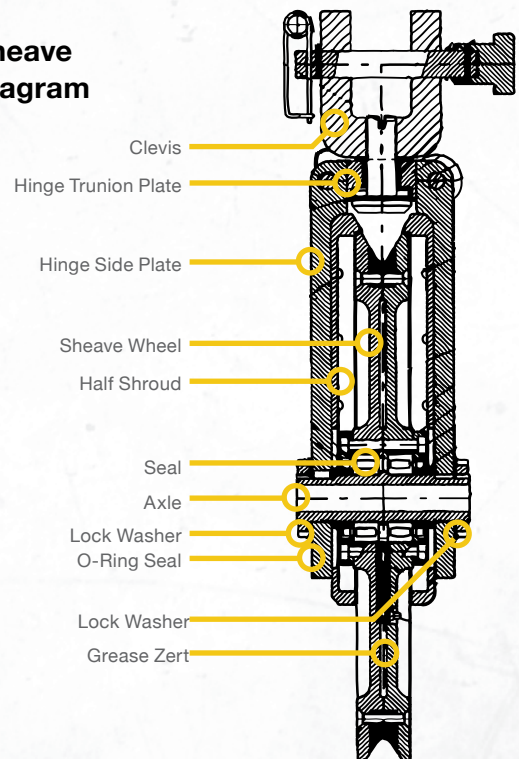
- Available in 14 in. and 20 in. diameter
- Easy to open clevis freely swivels for changing angles
- Jump-less design extends the wireline life
- Safe tested to 13,200 lbs.
- Proof load to 26,400 lbs.



## Sheave Stand with Enviro-Pan



### Sheave Diagram



# RIGGING EQUIPMENT

## Lifting Clamps

### Features

- Lifting clamps securely grip around risers
- Pull tested and rated
- Available in all sizes
- One-piece available



## Rigging Shackles

### Features

- Securely connect your rigging slings to your spreader bar and clamps
- Rated for load bearing



## Rigging Slings

### Features

- Braided metal cable to suspend equipment
- Size and length based on your specs
- Safe work load of 20,000 lbs.
- Proof load of 40,000 lbs.

# RIGGING EQUIPMENT



## Spreader Bars

### Features

- Works well with both 14 in. and 20 in sheaves
- Keeps your slings straight and untangled
- Safe load of 20,000 lbs.
- Proof load of 40,000 lbs.



## T-Clamps

### Features

- Secures wireline over the well when needed
- Corner eyelets connect to clevis or shackles
- Available in various line sizes



## Derrick Staff

### Features

- Secures your sheaves to the drilling or work over blocks
- Safe load of 13,200 lbs.
- Proof load of 26,400 lbs.

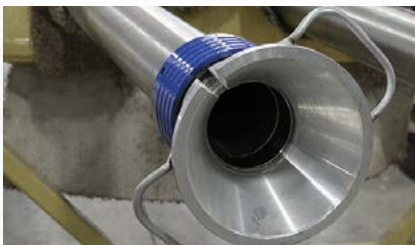


# **FHE ACCESSORIES**

# LUBE ENTRY GUIDE



Convenient wire channel for easy installations and removals.



Protects wireline from excessive wear and eliminates hangups.

## **Protects Your Crew from Injury and Your Wireline from Excessive Wear**

FHE's Lube Entry Guide stops tool hangups by eliminating square edges. It smooths entry of tools and perforating guns and reduces cable damage by eliminating sharp turns. All while protecting the operator by using handles to guide riser and hold bottom nut in line slot for easy installation and removal (optional).

### **Lube Entry Guide Features**

- Eliminates hangups of tools and equipment
- Protects wireline from excessive wear
- Reduce risks of injury
- Available in all thread sizes

# FHE ACCESSORIES



## Lube Stand

### Features

- Keeps equipment off the ground
- Reduces debris in risers
- Speeds up setup and tear down
- Available in all sizes



## Lay Down Dolly

### Features

- Moves heavy equipment around the job site
- Reduces risk of injury
- Available in all sizes



## Thread Protectors

### Features

- Prevents damage to thread
- Easy to remove and apply
- Lightweight polymer construction
- Available in most sizes

# FHE ACCESSORIES



## Manual Hydraulic Pump

### Features

- Lightweight and easily portable
- Durable and efficient
- Available in 5K and 10K



## Ram Lock Wrench

### Features

- Locks rams closed so hydraulic pressure can be discharged
- Protects wireline valve hydraulic system from damage



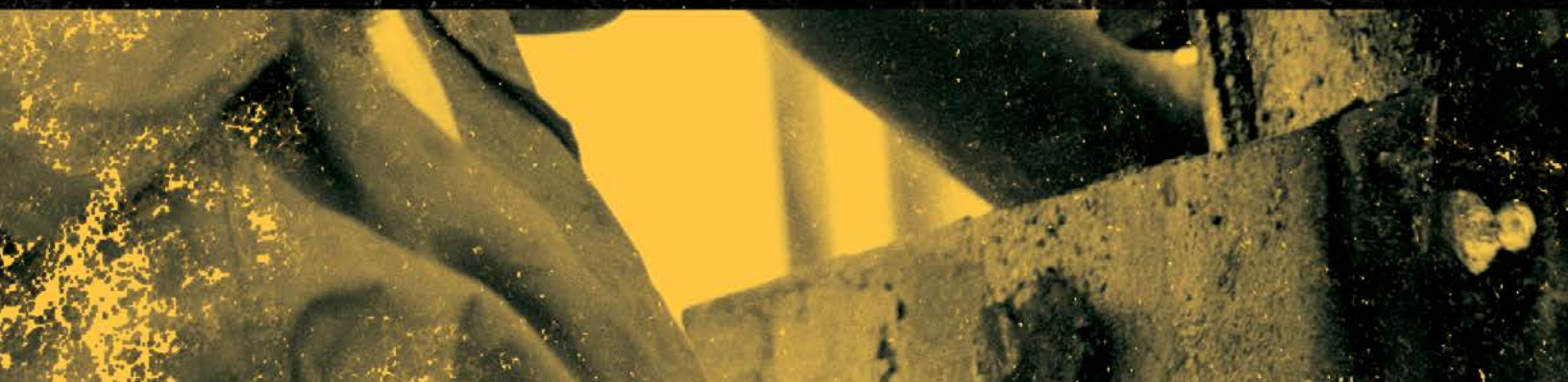
## Union Wrench

### Features

- Tighten or loosen unions without damage
- Exact fit for your union
- Available for all union types



# **FHE EXPENDABLES**



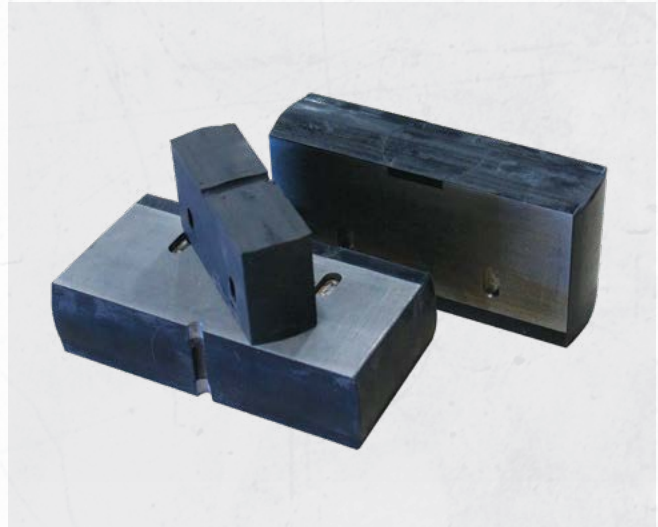
# FHE EXPENDABLES



## O-Rings

### Features

- Superior seal of pressure control equipment
- Multiple compounds and durometers
- All conventional sizes available



## Inner Seals

### Features

- Creates a seal around wireline
- Made from HNBR rubber compound
- Available in all line sizes
- Multi-blind, multi-line, line specific



## Outer Seals

### Features

- Made from HNBR rubber compound
- Seals wireline valve body
- Available in all wireline valve body sizes



## Pack Off & Line wiper Rubbers

### Features

- Multiple compounds and durometers
- Easy to replace and service
- Available in all wireline sizes

# FHE EXPENDABLES



## Grease Tubes

### Features

- Precise diameter for complete seal
- Available in steel or ceramic



## Brass Bushings

### Features

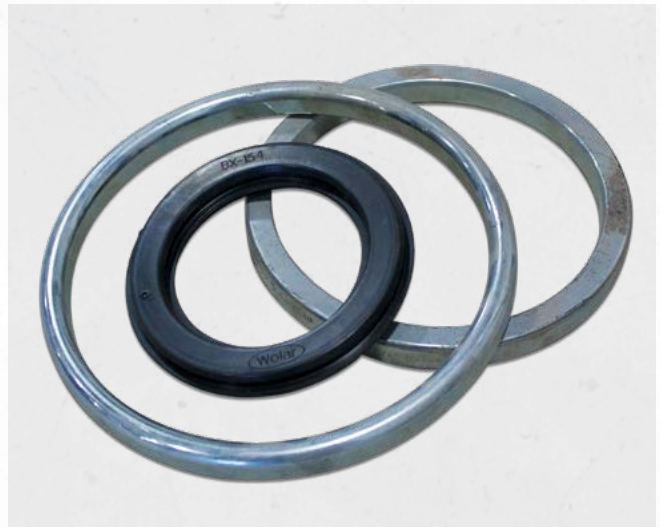
- Available in all wireline sizes
- Accurately machined for excellent fit



## Flange Bolts

### Features

- Secures flange connections
- Available in various sizes



## Ring Gaskets

### Features

- Creates a reliable seal within wireline equipment
- Available in rubber coated or metal

# FHE EXPENDABLES



## Absorbent Pads

### Features

- Absorbs harmful contaminants
- Promotes a clean work environment



## Rebuild Kits

### Features

- Made with temperature, chemical and oil resistant materials
- Available in all sizes



## Grease Totes/Barrels

### Features

- Specific formulas for varying weather conditions
- Quantity discounts available



## Glycol

### Features

- Eliminates hydrate formations that damages equipment and tools
- Highly viscous with a high boiling point



# FHE SERVICE INSPECTIONS & CERTIFICATIONS

## Equipment Completely Serviced & Back to the Field, Fast

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FHE not only builds top-quality wireline tools and equipment, but we service, repair, and certify all manufacturer's pressure control equipment. Based on API 6A Specifications, FHE services all pressure control equipment and quickly gets it to the field as good as new.

During service, your equipment could be torn down, stripped, inspected for defects or damage, tested (non-destructive) to ensure proper integrity, elastomers replaced, hydro-tested, and beautifully repainted depending on the level of inspection and your specific needs.

# FHE TESTING AND CERTIFICATIONS

## Testing Levels for Pressure Control Equipment

FHE offers many different kinds of certifications, such as; Hydro Test & certify, Quarterly Inspections (also known as a minor), Annual Inspections, Five Year Inspections (also known as a major), sheave recertification.

Please read on to find out what is entailed in each certification process.

FHE upholds all API Spec 6A PSL-2 or PSL-3 standard requirements (whichever is applicable) for all inspections performed. Prior to testing all equipment is gauged to determine if it qualifies to meet OEM specifications.

To obtain Test pressure for equipment FHE uses API's standards & OEM'S testing specifications. The standard states that all equipment must be tested using the following established formula;

- OEM Specification states: 2 times the safe working pressure gives you the obtained Test pressure (but never exceed the equipment's capability).
- API Requirements states: 1.5 times the safe working pressure gives you the obtained test pressure, (but never exceed the equipment's capability)

FHE offers 4 levels of hydrostatic Testing and Certification. FHE provides a digitally produced certification package with all Hydrostatic tests.



**ANNUAL INSPECTION**

Frank Henry Equipment USA  
**EQUIPMENT RE-CERTIFICATION  
CERTIFICATE OF COMPLIANCE**



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**4. Five Year Inspection**

When given all of the above Annual Inspection passes, but differs in how non-destructive testing is performed. Below shows the additional steps that are added for a 5 year inspection.

**Ultrasonic Testing (UT)**  
In ultrasonic testing, high-frequency sound waves are transmitted into a material to detect imperfections or to locate changes in material thickness.

- Areas with an O-ring groove are tested in 3 different places.
- Areas with no O-ring groove are tested in 3 different places.

**Hardness (HB)**  
Frank Henry Equipment uses the Rockwell C scale to determine metal hardness. The metal is placed with a steel non-deformable ball or cone's tip on the specimen's surface. The penetration distance under the Rockwell scale under the metal's surface should be. The test is determined by the depth of which the ball or cone has sunk into the metal (shown below). The depth distance under the Rockwell's C scale the metal's length. The Rockwell hardness test is the most used and versatile of the hardness tests.

- Referenced all test equipment only (test results this documentation prior to testing)
- Metal must be between 18-22 Rockwell C to be HD
- Test 3 times tested on 3 areas of the body
- Weld are tested in 2 areas on the body and 1 area on each of the cylinders
- Welds required to meet HB tests
- All nuts and bolts from alloy material are HD tested
- Material can be tested for element composition upon customer request

**Five Year Inspection Certification Package Includes**  
\*Only Many Gas report in a professional Portfolio Binder

- Color tags that record all equipment Serial Numbers of each piece of equipment, Date
- Certification of Compliance
- Equipment Serial Inspection Certification
- Liquid Particle Inspection Certification
- Inspection Information Sheet
- Serial Number System Information Sheet
- Job Report
- Individual Serial Number Test Reports that include Hydro-Tests and Pull tests when applicable

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**EQUIPMENT RE-CERTIFICATION  
CERTIFICATE OF COMPLIANCE**

Customer:  
Cavell Hole Solutions  
San Angelo, TX

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**Serial Numbers:**

AS95117 SA 15822-0A SA 15822-0B SA 15822-0C SA 15822-0D SA 15822-0E SA 15822-0F SA 15822-0G SA 15822-0H SA 15822-0I SA 15822-0J SA 15822-0K SA 15822-0L SA 15822-0M SA 15822-0N SA 15822-0O SA 15822-0P SA 15822-0Q SA 15822-0R SA 15822-0S SA 15822-0T SA 15822-0U SA 15822-0V SA 15822-0W SA 15822-0X SA 15822-0Y SA 15822-0Z

Frank Henry Equipment USA has implemented a quality assurance program ensuring that our customers will receive the same high quality of workmanship now as well as in the future.

All testing performed at our facility is conducted to the manufacturer's specifications and, where applicable to the standards of Frank Henry Equipment USA.

Frank Henry Equipment USA certifies that all testing procedures have been properly followed and that any charts that are associated with this document are true and accurate.

---



**SA1/5822-0A  
DETAILED LUBRICATOR RECORD**

29 March 2013  
Job Number: SA1/5822  
Page 1 of 3

Signature \_\_\_\_\_

FHE | Office: (970) 243-0727

Serial #	SA15822-0A
Category	Lubricator
Equipment Type	Flange 1" X 1" 150# 150K X FHE018 (S) Union 150K FHE
Required Torque	N/A
Size	1 1/2" (38.1)
Union	510# 10K
Weight	600 (26.7)
Grade	4130-140-100
Internal Yield	600 (26.7)
Type Of Service	HD
Working Pressure	15,000 (psi)
Test Pressure	22,500 (psi)

**MAINTENANCE**

Job No.	Date	Size (I)	Serial (S)	Size (O)	Tested By	Tested To	Comments
SA15822	26 Feb 2013	N/A	N/A	N/A	Ryan Taylor	15,000 (psi)	New Assembly 1 1/2" ID 3 1/2" ODS Service/Standard Service 4 Class 111

**HISTORY**

Weight No.	Date	Location	Transfer To
26 Feb 2013	Conco		

**HEAT NUMBERS**

Component	Heat No.	FHE Part No.
Flange	827G1	FLG8158221810K

**HYDRO TEST RESULTS**



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**Associated Serial Numbers:**  
SA15822-2 SA15822-3A SA15822-3B

**Part Descriptions:**  
Upper Base 1/2" X FHE018 150# Alloy 150K FHE  
Upper Base 1/2" X FHE018 150# Alloy 150K FHE  
Upper Base 1/2" X FHE018 150# Alloy 150K FHE

Operator \_\_\_\_\_ Witness \_\_\_\_\_  
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FRUITA, COLORADO

FHE | 970-243-0727 | WWW.BUILTBYFHE.COM

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# FHE TESTING AND CERTIFICATIONS

## 1. HYDRO-TEST & CERTIFY

Used for equipment to demonstrate it can hold desired test pressures .

- Visually inspect and gauge
- Hydrostatic test
- Certification showing the hydrostatic test result

Does not include tear down, or elastomer change

### **HYDRO-TEST & CERTIFY CERTIFICATION PACKAGE INCLUDES;**

\*Color Hard Copy report in a professional Portfolio Binder

- Cover page that records Job number, serial numbers of each piece of equipment, date
- Certification of compliance
- Hydro-test information sheet
- Serial number system information sheet
- Job report
- Individual serial number test reports that include hydro-tests and pull tests when applicable

## 2. QUARTERLY INSPECTION

Quarterly Inspections are performed on equipment that requires general testing only.

- Visual Inspection to check for any noticeable defects
- External elastomer(s) change
- Hydrostatic test
- Certification

Does not include tear down, or internal elastomer change

### **QUARTERLY CERTIFICATION PACKAGE INCLUDES;**

\*Color Hard Copy report in a professional Portfolio Binder

- Cover page that records Job number, serial numbers of each piece of equipment, date
- Certification of compliance
- Hydro-test information sheet
- Serial number system information sheet
- Job report
- Individual serial number test reports that include hydro-tests and pull tests when applicable

## 3. ANNUAL INSPECTION

This level of service is required under the API guidelines; it is used for equipment that is due for complete re-certification.

Annual inspections will be completed in accordance with FHE Servicing Procedures.

- Equipment tear down
- Wash-down
- Visually inspect (prior to non-destructive test)
- Non-destructive test, magnetic particle or dye penetrant (using FHE inhouse Level 3 NDT Procedure)
- Wash-down (remove magnetic particle dust)
- Sandblast (to strip all paint)
- Visually inspect (for any defects, and part replacement)
- Equipment measured, documented and compared to OEM specifications
- Replace all elastomers
- Re-assemble
- Re-stamp serialization

- Digitally perform and record hydrostatic test
- Paint (according to the customer's paint code)
- Band (stainless steel banding, containing company name, serial number, type of service, working pressure, & test pressure)
- Tape (color coded to show PSI of equipment & type of service); color coding can be requested
- Stencil (Company Name, working pressure, test pressure & type of service)
- Quality assurance
- Digital and hard copy certification equipment booklet

**ANNUAL CERTIFICATION PACKAGE INCLUDES;**

\*Color Hard Copy report in a professional Portfolio Binder

- Cover page that records Job number, serial numbers of each piece of equipment, date
- Certification of compliance
- Magnetic particle inspection certification
- Liquid particle inspections certification
- Hydro-test information sheet
- Serial number system information sheet
- Job report
- Individual serial number test reports that include hydro-tests and pull tests when applicable

**4. FIVE YEAR INSPECTION**

Under goes all of the above Annual Inspection process, but differs in how non-destructive testing is performed. Below shows the additional steps that are added for a 5 year Inspection.

**ULTRASONIC TESTING (UT)**

In ultrasonic testing, high-frequency sound waves are transmitted into a material to detect imperfections or to locate changes in material thickness.

- Risers with an o-ring groove are tested in 5 different places
- Risers with no o-ring groove are tested in 3 different places

**HARDNESS (HD)**

FHE uses the Rockwell C scale to determine metals hardness. The metal is pierced with a small non-deformable ball or cone, the metal's resistance to penetration dictates under the Rockwell scale what the metal's hardness should be. The test is determined by the depth of which the ball or cone has sunk into the metal (shown below). The depth dictates under the Rockwell-C Scale the tinsel strength. The Rockwell hardness test is the most used and versatile of the hardness tests.

- Performed on H2S equipment only (must provide this documentation prior to testing)
- Metal must be between 18-22 Rockwell to be H2S
- Tool Trap is tested on 3 areas of the body
- WLV are tested in 2 areas on the body and 1 area on each of the cylinders
- Alloy material is not HD tested
- All nuts and unions (non-alloy material) are HD tested

Material can be tested for element composition upon customer request

**FIVE YEAR INSPECTION CERTIFICATION PACKAGE INCLUDES**

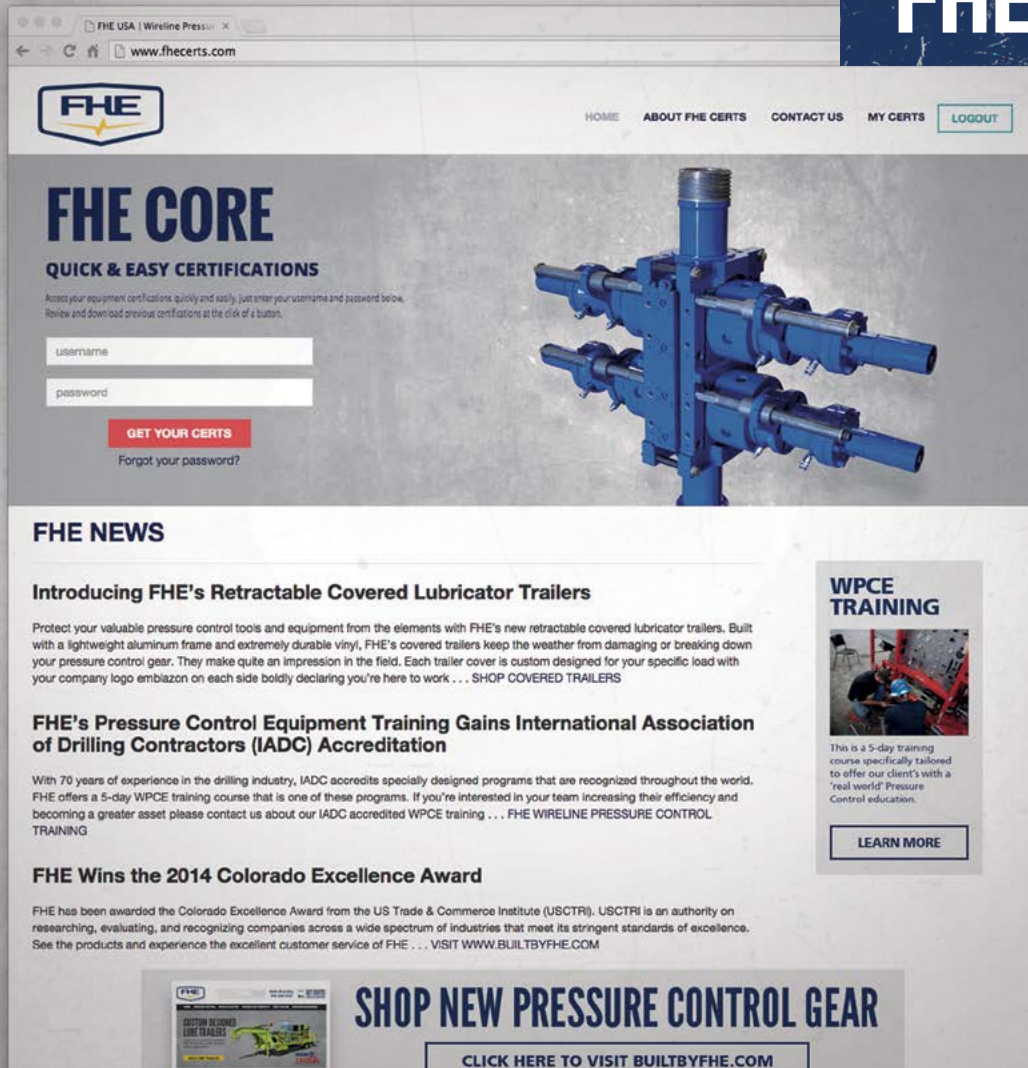
\*Color Hard Copy report in a professional Portfolio Binder

- Cover page that records job number, serial numbers of each piece of equipment, date
- Certification of compliance
- Magnetic particle inspection certification
- Liquid particle inspections certification
- Hydro-test information sheet

- Serial number system information sheet
- Job report
- Individual serial number test reports that include hydro-tests and pull tests when applicable

## **SHEAVE ANNUAL INSPECTION: FHE 14" SHEAVES**

- Entire sheave disassembled, clevis is cut off
- Body wash
- Sandblast wheel face, clevis, and shrouds
- Visually inspect for defective components
- Inspect that all serial numbers are stamped on shroud, clevis, and wheel
- Varsol cleaning
- Inspect for cracks using dye penetrate
- Wash off penetrate
- Paint wheel color with corresponding line color;
  - o 3/16"- White
  - o 7/32"- Red
  - o 1/4"- Yellow
  - o 9/32"- Dark Blue
  - o 5/16" -Black
- Deep inspection
- Reassemble
  - o Race
  - o Bearings repacked (if the bearings are rusted or damaged in any way they will be replaced)
  - o Clevis pin set and re-welded
  - o Parts replaced with every annual inspection;
  - o Teflon point setscrews
  - o Clevis bushing
  - o Clevis bushing pin
  - o Thrust washer
  - o Bearing seals
  - o Roll pins
  - o Name plate for sheave
- Proof load
- Work load
- Serial number
- Last inspection date
- Sheave pull test
  - o Proof load of 26,400 lbs.
  - o Older FHE Star sheaves and Gearhart sheaves have a proof load of 12,000 lbs.
- Sheave quality assurance inspection
  - o Information entered into the FHE certification database includes;
  - o Job number
  - o Company, location
  - o Serial number
  - o Sheave size, line size
  - o Manufacture
  - o The last annual inspection date
  - o Quality assurance information
- Shipping document



## Immediate Access to All Your FHE Pressure Control Equipment Records and Certifications with “CORE”

FHE Core is an asset management tool that helps you view, track, analyze, and optimize all your pressure control equipment. As an asset management tool, FHE Core allows you to view status of your equipment, track equipment records, and sort details for analysis.

The program displays cost-breakdowns to help see the value of properly maintained equipment and can show potential saving opportunities.

### FHE Core Features

- Easily access equipment certifications
- Asset management
- Invoice data report
- New order request



# FHE ACCREDITED TRAINING PROGRAM



In today's oil and gas industry, having trained, competent, confident personnel is critical. Quality trained teams will ensure that your field operations are delivered flawlessly each time, every time. We at FHE understand the importance and need for such training and are pleased to introduce...



CONTENT OF THE COURSE IS NOT VETTED  
AS PART OF THE DIT ACCREDITATION.

## **FHE'S ACCREDITED WIRELINE PRESSURE CONTROL OPERATIONS (WPCE) TRAINING**

This is a 5-day training course specifically tailored to offer our client's with a 'real world' Pressure Control education for today's diverse Wireline field operations. Our instructor and support staff are highly qualified and bring with them current, field proven experience that is essential to ensure a highly integral and robust curriculum.

First and foremost, FHE's Wireline Pressure Control Operations (WPCE) Training is specifically designed to ensure the safe and efficient operation of FHE manufactured Pressure Control Equipment. However, what sets us apart is the proven field experience of our highly trained staff who possess a vast and intimate knowledge of Pressure Control Equipment from a variety of manufactures. Therefore, our trainer and support staff will ensure your team are getting fit-for-purpose training regardless of your specific WPCE inventory.

We, at FHE, realize how disruptive, and costly sending personnel outside of the operational base for training can be. With that in mind, if you have the facility, the equipment and the need we'll come to your facility, utilize the WPCE your personnel use in their operations and work on your schedule.

### **FHE Training Objectives**

FHE's Wireline Pressure Control Operations Training offers a full curriculum that will include:

- **CLASS ROOM / THEORETICAL TRAINING (VIA INSTRUCTOR LEAD VIDEO PRESENTATION AND STUDENT ISSUED WORKBOOK/ NOTEBOOKS)**

- Identify and define the specific, individual WPCE components that make up a typical Wireline Pressure Control String. In this segment of the training the components are defined as to fit-form & function. (ie. How they work, what their intended purpose is and what their limitations are.)
- Define and explain the importance of the ancillary components that are required for proper function of the WPCE.
- Well site specific requirements inclusive of standard rig-up / rig down and operational procedures.
- Hazard / Failure mitigation and emergency response instruction.
- Open Discussion

- **HANDS ON / BASIC EQUIPMENT MAINTENANCE TRAINING**

- Full WPCE Rig-up and simulated Wireline deployment of a complete pressure control string.
- Various failure simulation ie. Lost Grease Seal, High Strand repair, etc.
- Proper operation of Grease Injection Skid
- Troubleshooting technics
- Pre / Post Operational basic equipment service & maintenance (This segment is heavily weighted due to the importance of routine maintenance of ALL WPCE).

- **WRITTEN EXAM**

- A written exam will be administered to gauge the understanding of the material by the personnel. (80% passing grade required)
- All successful personnel will be awarded an official training certificate and operational wallet card.
- 3 year re-certification
- FHE Certification Database will archive all training records for specific and secure visibility by our clients. The benefit to this database is not only will your training records be filed indefinitely but our clients will be prompted, via email notification when certifications are due.

**CALL US TO SCHEDULE YOUR TRAINING OR FOR ADDITIONAL DETAILS.**

# A hard day's work goes so much better with top-quality tools and equipment.

We engineer innovative, top-quality tools and equipment for your wireline projects. And we get your order to you on the double. We are dedicated to your success in the field. Contact our knowledgeable sales team for tools and equipment that gets in the field fast and stays there longer.

## **CUSTOMER SERVICE:**

Your success is our #1 goal. Let our knowledgeable staff help your team succeed.

## **QUICK DELIVERY:**

Fastest deliver times in the industry for high-quality tools and equipment.

## **DURABLE AND RELIABLE EQUIPMENT:**

Built to perform in harsh wireline environments.

## **HARD WORK AND INNOVATION:**

These values have historically made our industry great.



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[SALES@BUILTBYFHE.COM](mailto:SALES@BUILTBYFHE.COM)





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