# WELL MASTER Plunger Lift Solutions & Services



# TABLE OF CONTENTS

- ABOUT WELL MASTER
- PRODUCTS & SERVICES
- INNOVATION LEADER
- DYNAMIC SEAL™ TECHNOLOGY
- TRAINING PROGRAMS
- CONTINUOUS RUN PLUNGERS
  - TALON PLUNGERS Continuous Run, Bypass Plunger, Ball & Sleeve
  - SCREAMIN' EAGLE<sup>TM</sup> PLUNGER Clutched, Continuous Run, Bypass Plunger
  - THE OSPREY The Original Flow/Shift Sliding Sleeve Bypass Plunger
- VENTURI PLUNGERS
  - **VENTURI VIPER** Bridges gap between continuous and convention run
  - PADDED VENTURI Bridges gap between continuous and convention run
- VIPER & MINI VIPER PLUNGERS High performance, all-purpose, extended life plunger
- SIDEWINDER PLUNGER Durable, low maintenance, economical solid plunger
- HOLLOW POINT PLUNGERS Lightweight economical plunger

#### • ECONOMICAL PLUNGERS

- CARBON COBRA Durable, low maintenance, economical hollow plunger
- CARBON BAR Durable, low maintenance, economical solid plunger
- CARBON PAD Economical, high efficiency, dual pad plunger

#### PADDED PLUNGERS

- VORTEX JETTED PLUNGERS
  - VORTEX JETTED DUAL PAD & VORTEX JETTED DIAMOND PAD PLUNGERS - High performance, extended life, dual pad plunger
  - **VORTEX JETTED SINGLE PAD PLUNGER** High performance, extended life, single pad plunger
- XCEL PADDED PLUNGERS
  - XCEL DUAL PAD Extended life, dual pad plunger
  - XCEL SINGLE PAD Extended life, single pad plunger



# **TABLE OF CONTENTS**

#### • SPECIALTY PLUNGERS

- CLEANOUT PLUNGER Solid Cleanout Plunger
- BRUSH PLUNGER Superior Sealing & Sweeping Tool
- POGO PLUNGERS Shock Absorbing Plunger
- **SHEARMASTER** Floating downhole stop & "scale buster"

#### • SPRINGS

- **RHINO** Bottom Hole Bumper Spring
- **PRESSURE RELIEVING STANDING VALVE** Bottom Hole Pressure Relieving Standing Valve
- RHINO HD Heavy Duty Bumper Spring
- RHINO HZ Horizontal Spring
- SPRING CONFIGURATION MATRIX

#### • HOLD DOWN METHODS

- TUBING STOP downhole stop, A-Type, Fish Neck
- COLLAR STOP downhole stop, F-Type, Fish Neck

#### • LUBRICATORS

- 3K PREMIUM LUBRICATOR Durable, Dual-Outlet Lubricator
- UNIBODY LUBRICATOR Unibody Lubricator ideal for higher pressure wells
- **MODULAR LUBRICATOR** Weld free, drop-in lubricator for maximum customization
- **SUPER-E<sup>TM</sup> SPRING** Innovative, energy absorbing, durable elastomer spring

#### • SENSORS

- **SENTRY™ SENSOR** Plunger arrival sensor with magnetic shut-off (MSO)
- HAWKEYE IS & HAWKEYE XP Plunger sensors with self calibration

#### • CONTROLLERS

- MODEL 550 Economical plunger lift controller with pressure override
- MODEL 650 Premium plunger lift controller with built in optimization

#### • ACCESSORIES

- **FISHING TOOL KIT** Fishing tool kit for retrieving all types of downhole equipment
- PULLERS & GAUGE RINGS Pullers assists in plunger retrieval and gauge rings help determine if plunger needs to be replaced

#### • VALVES

- AUTOMATED CHOKE VALVE Side-entry threaded control & choke valve
- WELL MASTER SERVICE MAP



# **ABOUT WELL MASTER**

### **COMPANY OVERVIEW**

Well Master Corporation based in Golden, CO and founded as a Colorado Company in 1984, designs and manufactures premium artificial lift systems for the oil & gas industry. Well Master focuses on optimizing oil & gas production utilizing plunger lift systems by minimizing total cost of ownership and maximizing return on investment for customers using Well Master products and services.



### VISION

**PEOPLE:** Well Master's people build internal and external relationships that are meaningful and lasting. Their people are inspired, motivated, and are provided a great place to work.

**PRODUCTS:** Well Master's products are innovative, durable, reliable, and exceed customer expectations by providing exceptional value.

**PROCESSES:** Well Master's processes are efficient and support the expectations of the customers. They strive to continuously improve their processes and eliminate waste with the ultimate goal of customer delight.

**PARTNERS:** Well Master's partners are made up of a network of suppliers and customers who are aligned with their Mission and provide value-added products/services to their respective customers/end users.

### VALUES

Well Master prides its achievements by compiling an entrepreneurial and visionary leadership team focused on delivering service and value to its customers, channel partners, and employees. Employees are engrained in the corporate values of "trust", "respect", and the authority to "do the right thing" in all relationships. Corporate social responsibility remains a core commitment of the organization.



# **PRODUCTS & SERVICES**

#### INNOVATION IN DESIGN

Innovation in the industry is an ongoing goal. Well Master has a large number of patents to its name covering various solutions used for artificial lift. The company utilizes proprietary modeling software to assess well efficiency and is a pioneer in the industry utilizing this approach. The company is known through the plunger lift market as the innovative company to watch with over a dozen major new products being launched each year.

#### PERFORMANCE

Well Master's plungers are uniquely crafted from hardened steel and plated to maximize time between plunger changes. Operators help design our tools so you know our products work where it counts - the field. In fact, our customers report Well Master artificial lift solutions outlast other plungers, typically lasting 100% to 200% longer. This extends the time between replacements, increasing your wells' profits and productivity.

### WELL OPTIMIZATION SERVICES

Least owners, operators and procurement professionals are being challenged to deliver high productivity with fewer resources.

Well you partner with Well Master, you benefit from decades of hands-on production experience.

**INSTALL** - Well Master can provide, oversee and assist on installation of downhole and surface equipment.

**TROUBLESHOOTING AND REPAIR** - Well Master's experts can get you up and running quikcly, so you don't lose valuable time or profit.

**TEACH** - Well Master can partner with you to increase well function and performance on even the most challenging natural gas wells.

**ADVISE** - Well Master is your trusted adviser in tackling the most pressing artifical lift challenges and getting your wells to meet your performance expectations.

**OPERATIONAL SERVICES** - With your three decades of experience, we can help run your wells optimally.





# **INNOVATION LEADER**

#### NEW PRODUCT DEVELOPMENT

Well Master introduces on average more than a dozen new products each year and prides itself on being one of the most innovative in the industry. Our in hour engineering team consists of Design, Process, and Applications engineers.

#### QUALITY

Well Master upholds premium quality standards for all of our products on the market. Well Master follows ISO 9001 and API 6A standards for all plunger lift products. Well Master's Corporate Officers have also served on the API 11PL Lubricator committee.

#### FIRST REAL-TIME PLUNGER VELOCITY CONTROL SYSTEM

Well Master has developed the first real-time plunger velocity control system, Advanced Flow Control (AFC). The traditional approach to understanding desired plunger velocity is based on operating within the "ideal" target range. However, the problem is, the control systems only measure the average velocity from the start of the rise cycle to the end. Plunger velocity can vary enormously from bottom to top of the well, this control system assists in tackling this obstacle.

### PLUNGER FALL RATE CALCULATOR APP

#### **AVAILABLE FOR IPHONE & ANDROID**

Designed to make well optimization a lot easier and more efficient by calculating the plunger fall rate, the rate at which the Well Master plunger is falling through gas and liquid.

This information is used to provide the minimum off-time for a specific plunger at your operating conditions.

Download the Plunger Fall Rate Calculator app by simply scanning the QR code below.







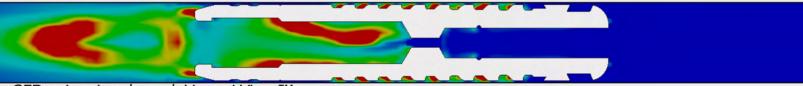




# DYNAMIC SEAL™ TECHNOLOGY

Well Master introduces Dynamic Seal<sup>™</sup> technology. Traditionally, plunger lift has been used in vertical oil and gas well production. However, today's operators need an all-inclusive solution including directional and horizontal wells.

Well Master's Dynamic Seal<sup>™</sup> technology was developed as a solution for directional and horizontal wells without giving up on performance.



CFD animation through Venturi Viper™

#### PLUNGER RIB AND VARIABLE GROOVE DESIGN

The design represents a circular airfoil whereby gas attempting to bypass the plunger between the plunger OD and the ID of the tubing wall is drawn into each groove. As this occurs, the gas being drawn into the groove accelerates and is prayed from under the next rib against the tubing wall creating a high degree of turbulence (high Reynolds number). This scours the tubing wall of liquid and keeps the liquid pushed up and on top of the plunger.

#### COMPRESSION SEAL

As the bypassing gas migrates up towards the fishing neck on the plunger, the groove roots become more and more shallow. This allows for the compression of the gas between the groove root and the tubing wall which has the effect of tightening the seal.

#### TANGENTIAL HOLES

The tangential holes in the body of the plunger act as a pressure washer scouring the tubing wall with gas to further enhance the turbulent gas seal. These jets induce a rotation on the plunger keeping the wear even throughout, eliminating flat wear spots on the plunger form tubing deviations or through the heel on horizontal wells.

#### FLUTED BOTTOM

The fluted bottom of the plunger further adds to the unique rotation of the plunger particularly during its fall. The sharp edges of the flutes are used to control paraffin, scale, and salt. The Dynamic Seal<sup>™</sup> plunger is well suited in pad drill deviated wells and horizontal wells since the fluid load is not lost during plunger rise in the inclined portions of the tubing. Many operators have experienced this effect and thus prefer this plunger.



**TRAINING PROGRAMS** 

# 2-day Plunger Lift Program

#### Day 1: Fundamentals of Gas-Driven Well Loading/ Unloading and Application to Plunger Lift Optimization

#### **Description:**

This course addresses the challenges of deliquifying gas-driven wells by first explaining the fluid mechanics of two phase flow in well piping as it applies to the wellbore. Application of fundamental knowledge is then used to explore optimization options for plunger lift based on the life cycle of the well and well readiness. Good for all levels of operator, optimizer and engineer as "industry standard" rules of thumb and textbook solutions are challenged, debunked or explained so the student has a much better understanding of the options to improve well performance. Well Master brings our services to you so your training dollars become more effective! The scope of the program can be summarized as follows:

- Review basics of well loading
- IPR Curves and Bottomhole Pressure Management

WELL MASTER

Produce more. Spend less.

- Critical Rate and Tubing Flow Stability
- Load Factor, Foss and Gaul
- Using afterflow effectively
- Plunger selection criteria based on well Life Cycle
- Plunger fall rates and what influences these
- Matching plunger selection to cycle rates/well readiness
- The importance of gas velocity in plunger selection
- Challenges and solutions for Horizontal/Directional wells





#### Day 2: Advanced Plunger Lift Concepts and Application

**Description:** Building upon Well Master's Day 1 Plunger Lift Concepts course, the scope of Day 2 can be summarized as follows:

- Impacts of line pressure variation on tubing performance
- Gas expansion in tubing and implications on operating parameters
- Tubing placement considerations
- Control system options and parameter selection
- GAPL/PAGL system options and example cases
- Troubleshooting via SCADA
- Troubleshooting via Echometer
- Customer case specific examples and Well Master evaluation process



#### EQUIPPED WITH INNOVATIVE TECHNOLOGIES TO CREATE MORE TRIPS PER DAY AND FALLS AGAINST MORE FLOW TO INCREASE PRODUCTION EARLIER IN THE LIFE OF THE WELL

### APPLICATIONS

Used in wells that are in the initial stage of liquid loading which produce high gas and liquid volumes

#### FEATURES AND BENEFITS

- The Patented TALON Aerodynamic Vents allow the sleeve to fall against more flow and achieve more trips/day to produce more oil and gas
- Reliability through the Dual Surface Seal on the ball and sleeve interface
- **Sealing Technology** is specifically designed for fast fall while maintaining sealing properties
- Longevity is achieved by proprietary advanced metallurgy and surface treatment
- Available in 6", 9", and 12" sleeve lengths in steel, Stainless Steel, Titanium and ACTII extended life versions
- Multiple ball materials available
- TALON <sup>TS (Turbulent Seal)</sup> version is available for applications that require premium seal



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PBS2000BN9



# Talen

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6.2

6.2

6.9

12.3

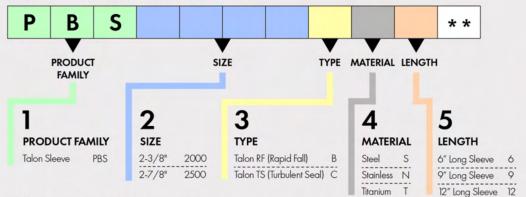
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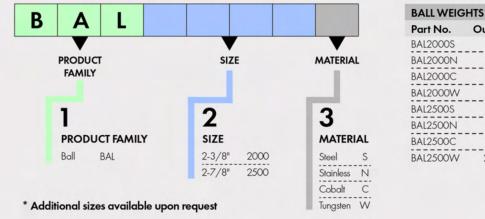
#### **Sleeve Customization Matrix**

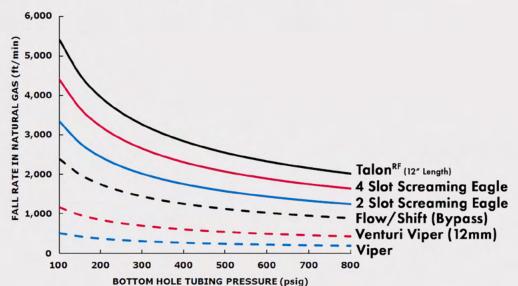


\* Additional sizes available upon request

\*\* Add "ii" to the end of the part code of the steel (S) material for ACTII advanced coating technology treatment (i.e. PBS2000BSii)

#### **Ball Customization Matrix**





Contact Well Master today to find out how we can help optimize your oil and gas well production. Call 303.980.0254 Email info@wellmaster.com Visit www.wellmaster.com 16201 Table Mountain Parkway, Suite 100 | Golden, CO 80403 | Fax 303.980.0355 ©2023 Well Master Corporation, All rights reserved.



#### EQUIPPED WITH INNOVATIVE TECHNOLOGIES TO MAINTAIN FAST FALL SPEED AND INCREASE PRODUCTION

#### APPLICATIONS

Used in wells that are in the initial stage of liquid loading which produce high gas and liquid volumes

### FEATURES AND BENEFITS

- Turbulent Sealing Technology is specifically designed for high sealing properties in fast falling well applications
- The Patented TALON Aerodynamic Vents allow the sleeve to fall against more flow and achieve more trips/day to produce more oil and gas
- **Reliability** through the Dual Surface Seal on the ball and sleeve interface
- Longevity is achieved by proprietary advanced metallurgy and surface treatment
- Available in 6", 9", 12", and 18" sleeve lengths in steel, Stainless Steel, Titanium and ACTII extended life versions
- Multiple ball materials available
- **TALON RF** (Rapid Fall) version is available for applications that require falling against more flow



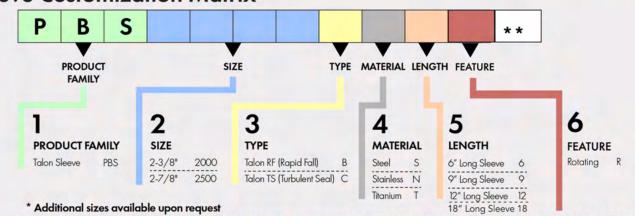
PBS2500CS9

TS

TOST



#### **Sleeve Customization Matrix**



TS

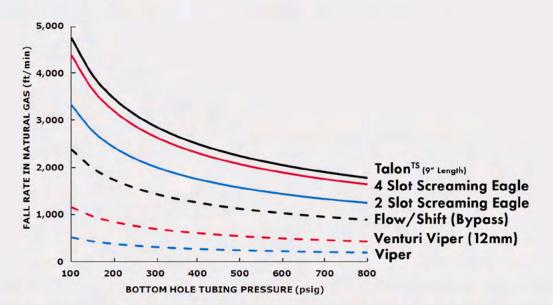
\* Additional sizes available upon request

\*\* Add "ii" to the end of the part code of the steel (S) material for ACTII advanced coating technology treatment (i.e. PBS2000BSii)

#### **Ball Customization Matrix**



\* Additional sizes available upon request



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# WELL MASTER Produce more. Spend less.

# PADDED TALON

#### EQUIPPED WITH INNOVATIVE TECHNOLOGIES TO MAINTAIN FAST FALL SPEED AND INCREASE PRODUCTION THROUGH WELL MASTER'S SEAL TECHNOLOGY

#### APPLICATIONS

- Used in wells that are in the initial stage of liquid loading which produce high gas and liquid volumes, and are showing signs of struggling with the produced liquid volume compared to traditional sleeves.
- PBS2000AS is designed to run through an x-nipple.

#### FEATURES AND BENEFITS

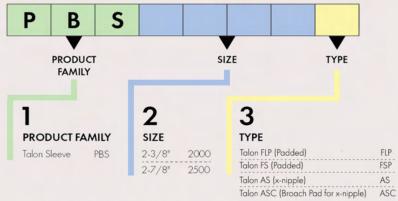
- Flow/shift pad technology is specifically designed for exceptional sealing properties in fast falling well applications
- Aerodynamic Vents allow the sleeve to fall against more flow and achieve more trips/day to produce more oil and gas
- Longevity is achieved by proprietary advanced metallurgy and surface treatment
- Machined from combination of Steel and Stainless Steel for maximum performance
- Enhanced geometry to remove liquid with a 30% higher seal efficiency
- Reliability through the Dual Surface seal on the ball and sleeve interface
- PBS2000AS efficiently runs through x-profile nipple and tight spots
- Multiple ball materials available





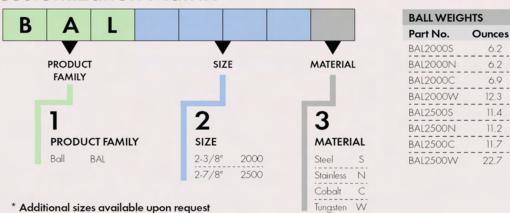
# PADDED TALON

#### **Sleeve Customization Matrix**

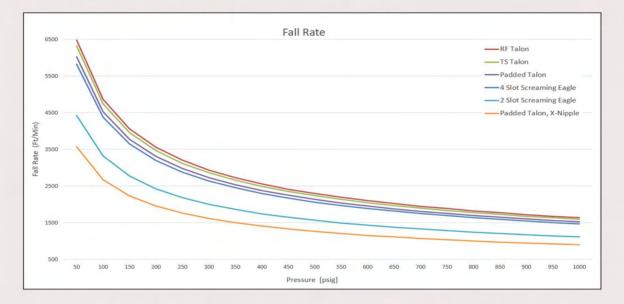


- \* Additional sizes available upon request
- \*\* Padded Talon only available for 9" long sleeve (Additional sizes available upon request)

#### **Ball Customization Matrix**



\* Additional sizes available upon request



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# SCREAMIN' EAGLETM

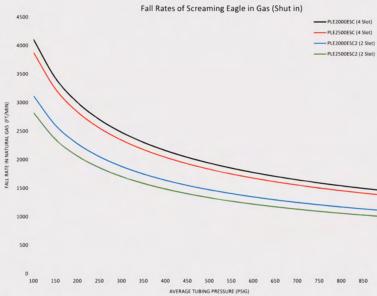
### CLUTCHED, CONTINUOUS RUN, BYPASS PLUNGER

#### **APPLICATIONS**

- Wells in the initial stages of liquid loading
- Deep, fast flowing wells with high gas or liquid volumes
- Ideal for deviated and horizontal wells
- High producing gas injected wells
- Wells moving 150+ BBLS/day

### FEATURES AND BENEFITS

- Robust High Strength Alloy clutch spring design prevents premature valve actuation
- Enclosed spring provides extra protection for moving parts
- Designed for high cycle rates for optimal deliquification
- Clutched and non-clutched versions for multiple applications
- Fall-against-flow rate rivals ball and sleeve designs
- Valve closes on contact with bottom spring assembly
- Bypass design features 2 or 4 large ports for efficient fall time



#### Maximum Recommended Flow (Ft/min)

	2-3	/8"	2-7	/8"
Pressure	ESC	ESC2	ESC	ESC2
(PSI)	4-Slot	2-Slot	4-Slot	2-Slot
100	847	630	1,193	846
200	1,209	891	1,700	1,192
300	1,469	1,076	2,064	1,434
400	1,678	1,221	2,355	1,624
500	1,855	1,342	2,600	1,780
600	2,009	1,446	2,813	1,912
700	2,145	1,536	3,002	2,027
800	2,269	1,617	3,172	2,128
900	2,381	1,689	3,326	2,218

- Plunger will fall at any continuous rate less than the # in the box





# SCREAMIN' EAGLE™

#### **TECHNICAL SPECIFICATIONS**

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	-	Dia. (in.)	Weight (lbs.)
PLE1500ES	1 1/2	1.625	2.36	13.63	1.500	3.96
PLE1500ESC	1 1/2	1.650	2.36	13.63	1.500	3.96
PLE1700ES	2 1/16	1.751	3.25	23.60	1.641	4.42
PLE1700ESC	2 1/16	1.751	3.25	23.60	1.641	4.42
PLE2000ES	2 3/8	1.995	4.70	19.16	1.900	8.21
PLE2000ES2	2 3/8	1.995	4.70	19.16	1.900	8.21
PLE2000ESC	2 3/8	1.995	4.70	19.16	1.900	8.21
PLE2000ESC2	2 3/8	1.995	4.70	19.16	1.900	8.21
PLE2000EN	2 3/8	1.995	4.70	19.16	1.900	8.64
PLE2000ENC	2 3/8	1.995	4.70	19.16	1.900	8.64
PLE2000ENC2	2 3/8	1.995	4.70	19.16	1.900	8.64
PLE25000ES	2 7/8	2.441	6.50	19.58	2.335	14.01
PLE2500ESC	2 7/8	2.441	6.50	19.58	2.335	14.01
PLE2500ESC2	2 7/8	2.441	6.50	19.58	2.335	14.01
PLE2500EN	2 7/8	2.441	6.50	19.58	2.335	14.01
PLE2500ENC	2 7/8	2.441	6.50	19.58	2.335	14.01
PLE2500ENC2	2 7/8	2.441	6.50	19.58	2.335	14.01
Options Available:	All sizes available i	ed options available n cluthes or non-clu				
Materials of	Stainless steel opt Valve assembly an		ucted of stainless st	teel heat-treat	ed to H1150M condition	on for corrosive
Construction:		ened and nickel pla				



# THE OSPREY

-

PSS2000FSC

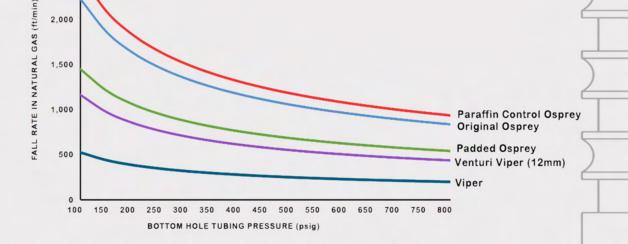
### THE ORIGINAL FLOW/SHIFT SLIDING SLEEVE BYPASS PLUNGER

### APPLICATIONS

Used in the initial onset of loading and early intervention in the life of a well with high paraffin, solids and/or liquid production. Designed for continuous run applications without the use of a trip rod.

#### FEATURES AND BENEFITS

- Patented Flow/Shift sliding sleeve bypass plunger
- Advanced turbulent sealing ability due to high efficiency rib design
- Designed to run continuously without the use of a trip rod
- Advanced metallurgy and weld free design
- Engineered flow areas keep bypass open during plunger descent downhole
- Removes high volumes of liquid and debris
- Adjustable fall rate capability through removable plugs
- Available in multiple size and material options



2,500



#### **TECHNICAL SPECIFICATIONS**

\*\*Additional sizes and materials available upon request

Description	Part No.	Outside Tubing Dia. (in.)	Material	Nominal Inside Tubing Dia. (in.)	Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)
2.2/01 0-1-1-0	PSS2000FL	2 3/8"	L80 Steel	1.995	4.7	13.3	1.899
2 3/8" Original Osprey Sliding Sleeve		2 3/8"	Hardened Steel	1.995	4.7	13.3	1.899
2 3/8" Osprey Sliding	PSS2000FLC	2 3/8"	L80 Steel	1.995	4.7	15.5	1.889
Sleeve with Paraffin Control	PSS2000FSC	2 3/8"	Hardened Steel	1.995	4.7	15.5	1.889
	PSS2000FLP	2 3/8"	L80 Steel	1.995	4.7	13.3	1.951
2 3/8" Osprey Padded Sliding Sleeve		2 3/8"	Hardened Steel	1.995	4.7	13.3	1.951
2.7/01 0 :	PSS2500FL	2 7/8"	L80 Steel	2.441	6.5	13.3	2.339
2 7/8" Original Osprey Sliding Sleeve		2 7/8"	Hardened Steel	2.441	6.5	13.3	2.339
2 7/8" Osprey Sliding	PSS2500FLC	2 7/8"	L80 Steel	2.441	6.5	15.5	2.339
Sleeve with Paraffin Control	PSS2500FSC	2 7/8"	Hardened Steel	2.441	6.5	15.5	2.339
2 7/9" Osprav Peddad	PSS2500FLP	2 7/8"	L80 Steel	2.441	6.5	13.3	2.397
2 7/8" Osprey Padded Sliding Sleeve	and the second	2 7/8"	Hardened Steel	2.441	6.5	13.3	2.397



# **VENTURI VIPER<sup>TM</sup>**

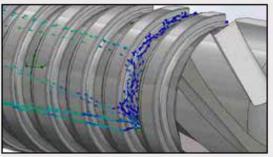
#### **BREAKTHROUGH INNOVATION**

#### **APPLICATIONS**

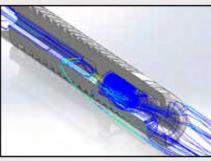
- Patented Innovative design bridges gap between continuous and conventional run plungers
- Dynamic Seal ™ provides an ideal solution for horizontal and directional wells
- Proven in a wide range of wells from low to high rates
- Very effective in Low Gas-Liquid Radio (GLR) wells

### FEATURES AND BENEFITS

- Fast fall and efficient lift with no moving parts
- Behaves like a traveling gas lift valve
- Supersonic gas flow through venturi lightens liquid load
- Spin-Cleaning action works on plunger fall and upstroke
- Variable groove depth and spin turbulence increases sealing efficiency
- Hardened steel plated with electroless nickel for **extended life**
- Titanium versions available for **safe, low impact** on lubricators
- Exterior connecting holes direct spinning turbulent gas to tubing wall acting like a pressure washer causing an **enhanced seal**



Gas traveling through the Venturi Viper™ plunger





PLS2000SV\*



# **VENTURI VIPER<sup>TM</sup>**

#### **TECHNICAL SPECIFICATIONS**

Part No.	Outside Tubing Dia. (in.)	Nominal Inside Tubing Dia. (in.)	Nominal Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)	Plunger Weight (lbs.)
PLS1500SV	1 9/10	4.7	2.40	9.30	1.500	2.8
PLS1700SV	2 1/16	4.7	3.25	9.63	1.641	3.5
PLS2000SV2*	2 3/8	2.0	4.70	10.30	1.890	5.4
PLS2000SV*	2 3/8	4.7	4.70	10.30	1.890	5.4
PLS2000SV6*	2 3/8	6.0	4.70	10.30	1.890	5.4
PLS2000SV8*	2 3/8	7.0	4.70	10.30	1.890	5.4
PLS2000SV10*	2 3/8	10.0	4.70	10.30	1.890	5.4
PLS2000SV12*	2 3/8	12.0	4.70	10.30	1.890	5.4
PLS2000SV14*	2 3/8	14.0	4.70	10.30	1.890	5.3
PLS2000SVL2	2 3/8	2.0	4.70	15.00	1.890	7.9
PLS2000SVL	2 3/8	4.7	4.70	15.00	1.890	7.9
PLS2000SVL6	2 3/8	6.0	4.70	15.00	1.890	7.9
PLS2000SVL8	2 3/8	8.0	4.70	15.00	1.890	7.9
PLS2000SVL10	2 3/8	10.0	4.70	15.00	1.890	7.9
PLS2000SVL12	2 3/8	12.0	4.70	15.00	1.890	7.8
PLS2000SVL14	2 3/8	14.0	4.70	15.00	1.890	7.8
PLS2500SV*	2 7/8	4.7	6.50	10.30	2.335	8.4
PLS2500SVL	2 7/8	4.7	6.50	15.00	2.335	12.3
Materials of Construction:			troless nick plated	-	as service	
	CO2: As above b	ut in lower hardne	stainless stee o ess for improved pe for corrosive envire	erformance Add		

Add 2, 6, 8, 10, 12 to the end of **PLS1500SV** for those options on orifice sizes

Add 2, 6, 8, 10, 12, 14 to the end of **PLS1700SV, PLS2500SV & PLS2500SVL** for those options in orfice sizes.

#### PATENT INFORMATION

Protected by Copyright, US Patents 7,395,865; 7,793,728 and 8,607,880

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# PADDED VENTURI

### **BREAKTHROUGH INNOVATION**

### APPLICATIONS

- Patented Innovative design bridges gap between continuous and conventional run plungers
- Very effective in Low Gas-Liquid Ratio (GLR) wells

#### FEATURES AND BENEFITS

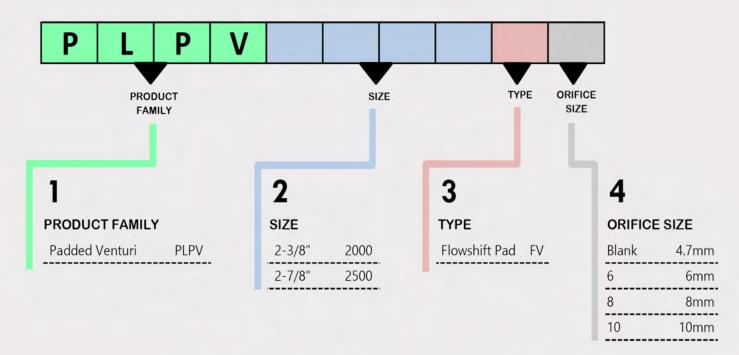
- Simplified design means low part count
- Fast fall and efficient lift
- Behaves like a traveling gas lift valve
- Supersonic gas flow through venturi lightens liquid load
- Pads stay at smaller diameter until gas flow begins
- Extra long sealing surface
- Crimped, non-threaded robust design
- Inconel inner spring for corrosion resistance
- Machined pads for superior durability
- Rifling for added longevity
- Pad wear indicator



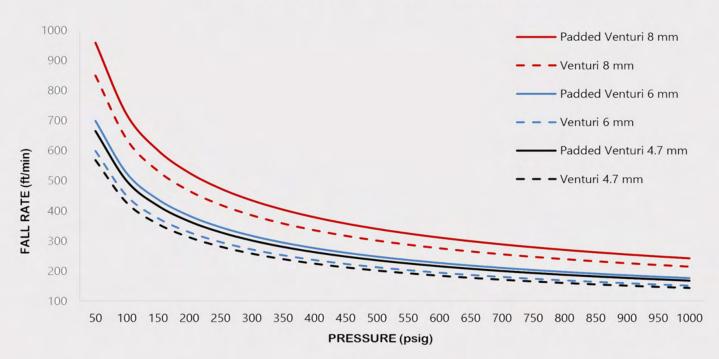


# PADDED VENTURI

#### PLUNGER CUSTOMIZATION MATRIX



#### Padded Venturi vs. Venturi Fall Rate



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# VIPER<sup>™</sup> MINI VIPER<sup>™</sup>

PLS2000S\*

PLS2000MV\*

### HIGH PERFORMANCE, ALL-PURPOSE, EXTENDED-LIFE PLUNGER

#### APPLICATIONS

Well suited for a variety of applications including horizontal and directional wells and those that produce sand, paraffin, and coal fines.

### FEATURES AND BENEFITS

- Patented Dynamic Seal<sup>™</sup> technology provides variable groove depth and spin turbulence that keeps the plunger centered in the tubing resulting in lower lifting costs and extending plunger life
- **Spin-Cleaning** flutes work on cutting debris during plunger downstroke, extending the lift of the plunger and reducing wear
- Uniquely crafted from hardened steel and plated with electroless nickel providing superior durability by extending the time between replacements, increasing your wells' profits and productivity
- Consistent run times help fine tune wells on automation



#### **TECHNICAL SPECIFICATIONS**

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger		
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (in.)	Weight (lbs.)		
PLS1500S*	1 9/10	1.650	2.40	12.57	1.5	4.0		
PLS1500MV	1 9/10	1.650	2.40	9.30	1.5	3.0		
PLS1700S*	2 1/16	1.751	3.25	13.13	1.641	5.2		
PLS1700MV	2 1/16	1.751	3.25	9.30	16.41	3.4		
PLS2000S*	2 3/8	1.995	4.70	15.00	1.89	7.6		
PLS2000MV*	2 3/8	1.995	4.70	10.60	1.89	5.6		
PLS2500S*	2 7/8	2.441	6.50	15.35	2.335	12.0		
PLS2500MV*	2 7/8	2.441	6.50	10.60	2.335	8.8		
PLS2500S	3 1/2	2.992	9.30	16.83	2.865	21.0		
PLS3500S	3 1/2	2.750	12.70	16.70	2.615	17.2		
Materials of		Constructed of hardened and electroless nickel plated steel for sweet gas service in low hardness and stainless steel options.						



# **SIDEWINDER**<sup>TM</sup>

#### DURABLE, LOW MAINTENANCE, ECONOMICAL SOLID PLUNGER

#### APPLICATIONS

- Designed for wells with deviated tubing
- Effective against paraffin, salt, and scale producing wells
- Used in high liquid producing wells

### FEATURES AND BENEFITS

- **Spin-cleaning** flutes work on cutting debris during plunger downstroke, extending the life of the plunger and reducing wear
- Variable groove depth and spin turbulence increases sealing efficiency
- Hardened solid plunger with grooves designed to remove liquids in wells with moderate to high gas volumes
- Uniquely crafted from hardened steel and plated with electroless nickel providing superior durability, extending the time between replacements, increasing your wells' profits and productivity

## PLS2000SW

	Outside Tubing Dia.	Nominal Inside Tubing Dia.	Nominal Tubing Weight	Plunger	Nominal Plunger Dia.	Plunger Weight
Part No.	(in.)	(in.)	(lbs./ft.)	Length (in.)	(in.)	(lbs.)
PLS1250SW	1 3/5	1.380	2.33	9.60	1.265	2.5
PLS1500SW	1 9/10	1.650	2.36	9.30	1.500	3.2
PLS1500SWL	1 9/10	1.650	2.36	12.57	1.500	4.5
PLS1700SW	2 1/16	1.751	3.25	10.60	1.641	3.8
PLS1700SWL	2 1/16	1.751	3.25	13.13	1.646	5.6
PLS2000SW*	2 3/8	1.995	4.70	10.60	1.900	6.1
PLS2000SWL	2 3/8	1.995	4.70	15.00	1.900	8.9
PLS2500SW*	2 7/8	2.441	6.50	10.60	2.335	10.0
PLS2500SWL	2 7/8	2.441	6.50	15.35	2.335	13.9
Materials of Construction:	*Available in stai	nless steel options	oless nickel plated			t number

## TECHNICAL SPECIFICATIONS

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PLS004-2C3



# **HOLLOW POINT<sup>™</sup>**

#### LIGHTWEIGHT ECONOMICAL PLUNGER

### APPLICATIONS

- Designed for marginal wells
- Effective in paraffin, salt, and scale producing wells
- Ideal for pressure sensitive wells

### FEATURES AND BENEFITS

- Spin-cleaning flutes work on cutting debris during plunger downstroke, extending the life of the plunger and reducing wear
- Hardened hollow plunger with grooves designed to remove liquids in wells with low to moderate gas volumes.
- Uniquely crafted from hardened steel providing superior durability, extending the time between replacements, increasing your wells' profits and productivity
- Weld free design eliminates associated stress cracking and failure.



PLS2000MH PLS2000H\*

#### **TECHNICAL SPECIFICATIONS**

	0					
	Outside Tubing Dia.	Nominal Inside Tubing Dia.	Nominal Tubing Weight	Plunger	Nominal Plunger Dia.	Plunger
Part No.	(in.)	(in.)	(lbs./ft.)	Length (in.)	(in.)	Weight (lbs.)
PLS1500H	1 9/10	1.650	2.36	12.57	1.50	3.00
PLS1700H	2 1/16	1.751	3.25	15.00	1.65	5.00
PLS2000MH	2 3/8	1.995	4.70	10.60	1.90	3.50
PLS2000H*	2 3/8	1.995	4.70	15.00	1.90	4.20
PLS2500H*	2 7/8	2.441	6.50	15.00	2.34	6.70

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PLS005-2C3



# **CARBON COBRATM**

### DURABLE, LOW MAINTENANCE, ECONOMICAL HOLLOW PLUNGER

#### APPLICATIONS

- Suited for a variety of applications including horizontal and directional wells
- Effective against, paraffin, salt, and scale producing wells
- Used in moderate to high liquid producing wells

#### FEATURES AND BENEFITS

- **Dual Spin-cleaning** flutes work on cutting debris during plunger downstroke, extending the life of the plunger and reducing wear
- Variable groove depth and spin turbulence increases sealing efficiency
- Hardened solid plunger with grooves designed to remove liquid in wells with moderate to high gas volumes
- Hollowed out core reduces weight by 15%
- Economical, high quality plunger made of hardened alloy steel

PLS2000CC

#### **TECHNICAL SPECIFICATIONS**

Part No.	Outside Tubing Dia. (in.)	Nominal Inside Tubing Dia. (in.)	Nominal Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)	Plunger Weight (lbs.)
PLS2000CC	2 3/8	1.995	4.70	15.0	1.90	8.8
PLS2000MCC	2 3/8	1.995	4.70	10.6	1.90	5.8
Materials of	Constructed of h	ardned alloy steel	for sweet gas service	e		
Construction:	Black zinc plated	for extended life				

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PLS006-2C3



# CARBON BAR<sup>TM</sup>

PLS2000CBAR

### DURABLE, LOW MAINTENANCE, ECONOMICAL SOLID PLUNGER

#### APPLICATIONS

- Suited for a variety of applications including horizontal and directional wells
- Effective against, paraffin, salt, and scale producing wells
- Used in moderate to high liquid producing wells

### FEATURES AND BENEFITS

- **Dual Spin-cleaning** flutes work on cutting debris during plunger downstroke, extending the life of the plunger and reducing wear
- Variable groove depth and spin turbulence increases sealing efficiency
- Hardened solid plunger with grooves designed to remove liquid in wells with moderate to high gas volumes
- Economical, high quality plunger made of hardened alloy steel

#### **TECHNICAL SPECIFICATIONS**

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger	
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (in.)	Weight (lbs.)	
PLS2000CBAR	2 3/8	1.995	4.70	15.0	1.90	8.8	
PLS2500CBAR	2 7/8	2.441	6.50	15.0	2.34	10	
Materials of	Constructed of har	Constructed of hardned alloy steel for sweet gas service					
Construction:	Black zinc plated for extended life						

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# **CARBON PAD**

### ECONOMICAL, HIGH EFFICIENCY, DUAL PAD PLUNGER

#### APPLICATIONS

- Mature wells later in their life-cycle
- Wells with low Gas to Liquid Ratios
- Ideal for wells with tight spots and downhole restrictions

### FEATURES AND BENEFITS

- Simple, durable design
- Solid one piece CNC-machined mandrel
- Robust fishneck design to disperse force adding strength
- Dual pads and turbulent seal rings for more efficient seal
- Captured Alloy Springs to prevent binding or breakage
- Pad wear indicators on each pad
- Heat-treated for longevity
- Assembled, loc-tited, torqued and pinned for rigidity
- Black Zinc coating for corrosive resistance
- Each tool laser etched for traceability

#### PLPA2000CP

#### **TECHNICAL SPECIFICATIONS**

Part No.	Outside Tubing Dia. (in.)	Nominal Inside Tubing Dia. (in.)	Nominal Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)	Plunger Weight (lbs.)
PLPA2000CP	2 3/8	1.995	4.70	11.9	2.07	7.2
Materials of Construction:			el for sweet gas se Ind surface corrosi			

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### WELL MASTER Produce more. Spend less.

### VORTEX JETTED DUAL PAD & VORTEX JETTED DIAMOND

PLPA2000VP PLPA2000VPC

# INCREASES PERFORMANCE THROUGH INNOVATIVE SEALING

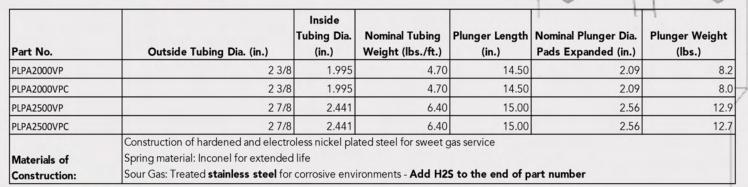
### APPLICATIONS

Engineered with an enhanced seal & life designed for horizontal and directional wells with low Gas-Liquid Ratio (GLR).

### FEATURES AND BENEFITS

- Innovative Jetted Ports
  - Provides additional mechanical seal
  - Eliminates fluid bypass under pads
- High alloy springs create consistent sealing and longevity
- Assist in lowering Lease Operating Expense (LOE)
- Machined steel pads for precision mechanical seal
- Lower lifting costs with high performance and longer wear life
- Superior design uses hardened tool steel and is plated for extended life
- Dual pad wear indicators at .015" and .030"
- Diamond Vortex (PLPA2000VPC) provides paraffin control on the way up, while maintaining seal with bottom set of vortex pads

#### **TECHNICAL SPECIFICATIONS**



#### PATENT INFORMATION

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# VORTEX JETTED SINGLE PAD

PLPA2000VS

### HIGH PERFORMANCE, EXTENDED LIFE, SINGLE PAD PLUNGER

#### APPLICATIONS

- Proprietary innovation for wells that need enhanced seal and lift
- Designed for marginal wells and wells with low Gas-Liquid Ratio (GLR)
- Ideal for wells with tight spots and downhole restrictions
- Used where standard pad plungers experience high wear or highly depleted wells
- Perfect for horizontal and directional wells

#### FEATURES AND BENEFITS

- Innovative Jetted Ports
  - Provides additional turbulent seal
  - Eliminates fluid bypass under pads
  - Aerates liquid load to enhance surface separation requiring less lifting pressure
- Machined tool steel pads for precision mechanical seal
- Lower lifting costs with high performance and longer wear life
- Co-designed by skilled and experienced Field Operators
- Standard design uses hardened tool steel and is plated for extended life
- Pad wear indicators at .015" and .030"
- Highly articulated pads allow for 128 degrees/100 ft. dogleg severity
- Efficiently runs through profile nipples and tight spots
- Stress relieved fishing neck adds strength

#### **TECHNICAL SPECIFICATIONS**

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Pl	lunger	Plunger	
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (i	in.)	Weight (lbs.)	
PLPA2000VS	2 3/8	1.995	4.70	10.38		2.08	5.3	
PLPA2500VS	2 7/8	2.441	6.40	10.99		2.53	9.0	
Materials of Construction:	Constructed of ha	Constructed of hardened and electroless nick plated steel for sweet gas service						
Spring Material:	Inconel, for extend	ded life						

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# XCEL<sup>™</sup> DUAL PAD

PLPA2000AXL

### **EXTENDED LIFE, DUAL PAD PLUNGER**

#### APPLICATIONS

- Designed for marginal wells and wells with low Gas-Liquid Ratio (GLR)
- Ideal for wells with tight spots and downhole restrictions
- Used where standard pad plungers experience high wear
- Designed to run through an x-nipple

### FEATURES AND BENEFITS

- Machined tool steel pads for precision mechanical seal
- Lower lifting costs with high performance and longer wear life
- Co-designed by skilled and experienced Field Operators
- Standard design uses hardened tool steel and is plated for **extended life**
- Pad wear indicators at .015" and .030"
- Highly articulated pads allow for up to 49 degrees/100 ft. dogleg severity
- Efficiently runs through profile nipples and tight spots
- Stress relieved fishing neck adds strength

#### **TECHNICAL SPECIFICATIONS**

		Inside							
		Tubing Dia.	Nominal Tubing	Plunger Length	Nominal Plunger Dia.	Plunger Weight			
Part No.	Outside Tubing Dia. (in.)	(in.)	Weight (lbs./ft.)	(in.)	(in.)	(lbs.)			
PLPA1700AXL	2 1/16	1.751	3.25	13.24	1.82	5.0			
PLPA2000AXL	2 3/8	1.995	4.70	14.50	2.08	8.4			
PLPA2500AXL	2 7/8	2.441	6.40	15.00	2.53	13.2			
Materials of Constructi	Constructed of hardened and electro	less nickel pla	ted steel for sweet g	as service		0	1		
	*Available in stainless steel								
Spring Material:	Sour Gas: Treated stainless steel for corrosive environments - Add H2S to the end of part number								

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# XCEL<sup>™</sup> SINGLE PAD

### EXTENDED LIFE, SINGLE PAD PLUNGER

#### APPLICATIONS

- Designed for marginal wells and wells with low Gas-Liquid Ratio (GLR)
- Ideal for wells with tight spots and downhole restrictions
- Used where standard pad plungers experience high wear
- Excellent for low pressure and low liquid volume wells, where plunger weight is critical
- Designed to run through an x-nipple

#### FEATURES AND BENEFITS

- Machined tool steel pads for precision mechanical seal
- Lower lifting costs with high performance and longer wear life
- Co-designed by skilled and experienced Field Operators
- Standard design uses hardened tool steel and plated for long life
- Pad wear indicators at .015" and .030"
- Highly articulated pads allow for up to 128 degrees/100 ft. dogleg severity
- Efficiently runs through profile nipples and tight spots
- Stress relieved fishing neck adds strength

PLPA2000AS

#### **TECHNICAL SPECIFICATIONS**

Part No.	Outside Tubing Dia. (in.)	Nominal Inside Tubing Dia. (in.)	Nominal Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)	Plunger Weight (lbs.)
PLPA2000AS	2 3/8	1.995	4.70	10.38	2.08	5.8
PLPA2500AS	2 7/8	2.441	6.40	10.99	2.53	9.0

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# **CLEANOUT**

### THE WORKHORSE FOR WELL CLEANUP

### APPLICATIONS

Ideal for wells that product sand, paraffin, and coal fines or wells with tight spots.

### FEATURES AND BENEFITS

- Spin-cleaning flutes work on cutting debris
- One piece, solid design makes plunger durable and economical
- Wide and deep grooves help **move large amounts of solids** while trapping gas to maximize seal
- Undersized O.D. and slightly shorter length to enable the plunger to **pass through tight spots** or slight bends
- Uniquely crafted from hardened steel and zinc plated for superior durability

#### **TECHNICAL SPECIFICATIONS**

PLS2000CO

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (in.)	Weight (lbs.)
PLS1500CO	1 9/10	1.650	2.40	14	1.475	4.33
PLS1700CO	2 1/16	1.751	3.25	14	1.615	5.16
PLS2000CO	2 3/8	1.995	4.70	14	1.875	7.12
PLS2000CO190	2 3/8	1.995	4.70	14	1.900	7.25
PLS2000COH	2 3/8	1.995	4.70	14	1.875	7.25
PLS2000COH190	2 3/8	1.995	4.70	14	1.900	7.25
PLS2500CO	2 7/8	2.441	6.50	14	2.335	10.66
PLS3500CO	3 1/2	2.750	9.30	14	2.865	16.27
Materials of						
Construction:	Constructed of ha	dened alloy steel a	nd clear zinc plated	d and stainless	steel to resist corrosio	n

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# **BRUSH PLUNGER**

### **SUPERIOR SEALING & SWEEPING TOOL**

#### APPLICATIONS

- Deliquification of very marginal or low pressure wells
- Wells that require superior seal efficiency
- Wells that produce sand, salt, and/or coal fines
- Wells with tubing irregularities
- Wells with coated tubing strings

#### FEATURES AND BENEFITS

- Provide exceptional seal efficiency
- Sweeps off sand, salt, and coal fines that adhere along the inside diameter of the tubing wall
- Designed with high heat, temperature resistant, nylon bristles for extended life and performance
- Designed with **flexible**, **nylon brush material** allowing solids to pass while traveling in tubing
- Assembly joints secured with loc-tite and reinforces with spring pins
- Robust fishing neck for added strength

#### **TECHNICAL SPECIFICATIONS**

PLB2000R	
----------	--

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (in.)	Weight (lbs.)
PLS1500R	1 1/2	1.65	2.4	13.42	1.53	4.99
PLB1700R	2 1/16	1.751	3.25	13.49	1.67	6.03
PLB2000R	2 3/8	1.995	4.7	14.69	1.92	8.77
PLB2500R	2 7/8	2.441	6.5	15.19	2.36	13
Materials of Construction:	SAE 4140 alloy steel mandrel, shoe, and fishing neck Sprial-bound brush section				Nylon	

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# **POGOTM PLUNGERS**

### SHOCK ABSORBING PLUNGERS

### APPLICATIONS

- Used where no downhole stop or spring assembly is installed
- Effective against paraffin, salt, and scale producing wells

# FEATURES AND BENEFITS

- Self-contained bumper spring eliminates the need for a downhole stop
- No-Go shoe has cutter to remove salt, scale, and paraffin
- Economical solution compared the conventional spring assembly
- Eliminates the need for servicing of downhole spring
- No downhole restriction of conventional spring

### AVAILABLE IN TWO SIZES

- Solid body with patented high-life rib design (2 3/8" and 2 7/8")
- Xcel<sup>™</sup> Dual Pad with oversize pads and extended life (2 3/8" and 2 7/8")

#### **TECHNICAL SPECIFICATONS**

PLPA2000AST

0

PLS2000AST

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger
Part No.	Dia. (in.)		Weight (lbs./ft.)	-	-	Weight (lbs.)
PLS2000AST	2 3/8	1.995	4.70	22.13	1.890	12.8
PLPA2000AST	2 3/8	1.995	4.70	21.50	2.080	12.2
PLS2500AST	2 7/8	2.441	6.50	22.25	2.340	17.0
PLPA2500AST	2 7/8	2.441	6.50	23.25	2.530	18.0
Materials of Construction:	Constructed of ha	rdened and electrol	ess nickel plated st	eel for sweet	gas service	

#### PATENT INFORMATION

Protected under US Patent 8,162,053

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# **SHEARMASTER<sup>TM</sup>**

#### FLOATING DOWNHOLE STOP AND "SCALE BUSTER"

#### **APPLICATIONS**

- Excellent paraffin and scale control
- Used in high liquid producing wells in place of bottom hole spring assembly

#### FEATURES AND BENEFITS

- No setting required
- Square bottom as as a No-Go
- Easily retrieved with a fishing plunger
- Cleaning action works as the tool cycles in lower tubing
- Commonly used in combination with a Viper Plunger as a "scale buster" to remove scale above the downhole spring **OFTEN ELIMINATES ACID JOBS**
- Hardened steel plated with electroless nickel for extended life
- Reserve flutes eliminate spin while providing an effective shear mixing chamber
- Large open area of flutes and hollow core **minimize travel** during flow cycle



DHS2000SM

#### **TECHNICAL SPECIFICATIONS**

	Outside Tubing	Nominal Inside	Nominal Tubing	Plunger	Nominal Plunger	Plunger
Part No.	Dia. (in.)	Tubing Dia. (in.)	Weight (lbs./ft.)	Length (in.)	Dia. (in.)	Weight (lbs.)
DHS2000SM	2 3/8	1.995	4.7	8.10	1.90	2.6
DHS2500SM	2 7/8	2.441	6.5	8.89	2.35	3.7
Materials of						
Construction:	Constructed of hardened and electroless nickel plated steel for sweet gas service					

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#### **BOTTOM HOLE BUMPER SPRING**

#### THE SPRING DESIGNED FOR MODULAR FLEXIBILITY & EASE OF USE

#### **APPLICATIONS**

Used in **MOST** plunger lift wells that require a bottom hole spring/stop

#### FEATURES AND BENEFITS

- **PREVENTS** potential damage to the plunger by absorbing the plunger impact at the bottom of the well and holds fluid to prevent dry impact
- **ADDED STRENGTH** with our one piece rod design and stress relieved fish neck
- **CUSTOMIZABLE** to a variety of hold down methods including seating nipples, collar stops, tubing stops with available pack off swab cups
- **HEAT-RESISTANT** and standard fiber seat cups to prevent bumper spring from moving out of position (2 or 3 cup configurations)
- **AVAILABLE** in many fluid retention options including standing valve (STV) or multiple pressure relieving rating (SPR)
- ACCURATE placement of the tool in a tubing string

#### SEAT CUP SPRING ASSEMBLY

- PREVENTS the bumper spring from moving out of position
- Accommodates most leading seat nipple brands with multiple seat cup sizes available
- Enhanced seal with 2 seat cups
- Heat-resistant and standard fiber seal cups available

#### **COLLAR STOP/TUBING STOP SPRING ASSEMBLY**

- ACCURATE placement of the tool in tubing string
- **EXCELLENT** for use with gas lift assisted plunger lift (GAPL) with tubing & collar stop options
- FLEXIBILITY when location of downhole spring can vary

#### FLOATING SPRING ASSEMBLY

- EASY RETRIEVAL with a fishing plunger, saving money on wire line costs
- MOVEMENT DECREASES the chances of scale buildup and sand compaction



RHI001-2C3



SPR2000ALM ...

## WELL MASTER



Produce more. Spend less.

## PRESSURE RELIEVING STANDING VALVE

## APPLICATIONS

Used in wells with high gas to liquid ratio and wells with high-set tubing when liquid retention during the off-cycle is desired. The pressure relieving features prevent excess liquid retention which may stall or reduce plunger effectiveness.

## FEATURES AND BENEFITS

- 23 psi equates to approximately 45ft. of water or 70ft. of oil in 2" tubing
- 34 psi equates to approximately 68ft. of water or 100ft. of oil in 2" tubing
- Spring backed ball and seat help prevent dry run conditions by maintaining a small level of fluid
- Designed to prevent potential damage to plunger by absorbing the plunger impact at the bottom of the well
- Flow through maximized with extra-large throat.
- Stress Relieved fishing neck adds strength

#### SEAT CUP HOLD DOWN

- Designed to prevent the bumper spring from moving out of position
- Accommodates X & F [API] profile nipple with multiple seat cup materials and sizes available
- Enhanced seal with 2 seat cups
- Heat-resistant polymer and standard fiber seal cups available



#### THE HEAVY DUTY SPRING THAT CAN HANDLE ANY PLUNGER

**HEAVY DUTY BUMPER SPRING** 

#### **APPLICATIONS**

Engineered with a HIGH IMPACT ABSORBING spring for fast falling plungers to prevent wear and tear on plungers and stops

#### FEATURES AND BENEFITS

- MAXIMIZE gas/fluid production with a jumbo throat
- LOWERS lease operating expenses
- LARGE FLUID DISPERSION ports to minimize potential tubing erosion in high flowing wells
- EXTENDED LIFE with a nitride finished spring to decrease fatigue and improve overall longevity
- CUSTOMIZABLE to accommodate most leading seat nipple brands
- **HEAT-RESISTANT** and standard fiber seat cups to prevent bumper spring from move out of position (2 or 3 cup configurations)
- **AVAILABLE** in many fluid retention options including standing valve (STV) or multiple pressure relieving ratings (SPR)





#### THE HORIZONTAL SPRING THAT INCREASES PRODUCTION THROUGH A WIDER SET RANGE



#### **APPLICATIONS**

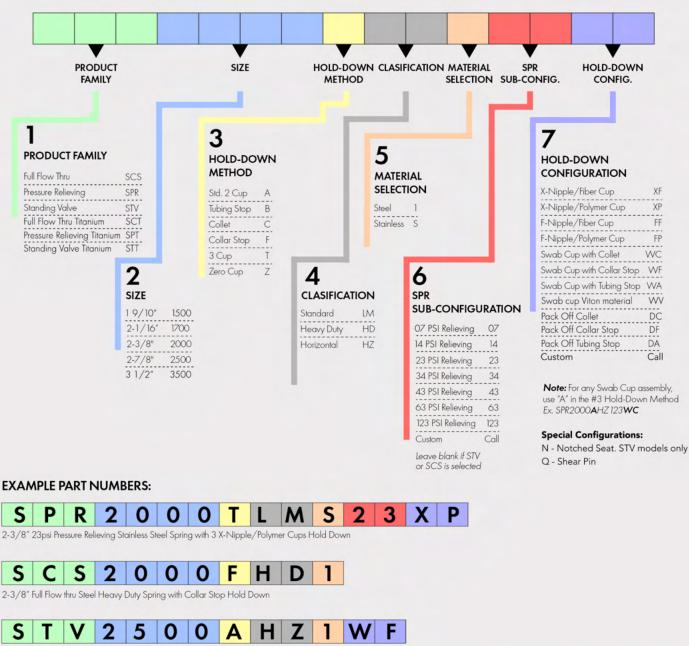
Engineered specifically for **HORIZONTAL WELLS** that can be set deeper and assist in increasing production and deliquifications

#### FEATURES AND BENEFITS

- HIGH RANGE of setting angles from 0° to 68° from vertical
- **INCREASED GAS PRODUCTION** due to a more efficient liquid removal design and an ability to reduce bottom hole pressure
- LARGER FLOW THROUGH AREA of 56% that allows for higher flow rates and less back pressure
- CUSTOMIZABLE to a variety of hold down methods including seating nipples, collar stops, tubing stops, and swab cups
- HEAT-RESISTANT and standard fiber seat cups to prevent bumper spring from moving out of position (2 or 3 cup configurations)
- AVAILABLE in many fluid retention options including standing valve (STV) or multiple pressure relieving ratings (SPR)



## SPRING CONFIGURATION MATRIX



2-7/8" Standing Valve Steel Horizontal Spring with Swab Cup and Tubing Stop Hold Down

Build your part number then contact your local salesman to order your customized spring.



# **TUBING STOP**

**TSP2000A** 

#### **APPLICATIONS**

The Tubing Stop (Type "A") is designed for use in integral joint tubing strings where a coupling recess is not available. It is used primarily as an anchoring device in packoff applications.

#### **TECHNICAL SPECIFICATIONS**

Size	1 1/2″	2 3/8″	2 7/8″	3 1/2"
WM Part Number	TSP1500A	TSP2000A	TSP2500A	TSP3500A
Fishneck O.D.	1.188″	1.375″	1.047″	1.500″
Max. O.D. Slips Retracted	1.438″	1.750″	1.750″	2.313″

Well Master has the ability to provide an integrated tubing stop and spring to eliminate wire line cost. See Spring Configuration Matrix to build a spring/stop combination.



# **COLLAR STOP**

#### APPLICATIONS

The Collar Stop (Type "F") is designed to locate in the collar recess of API upset and non-upset tubing. By lowering the stop to the desired depth and lifting upward, the latch spring are tripped allowing the stop arms to expand into the collar recess. Downward jarring on the inner mandrel pushing it down behind the collar stop arms locking them into place in the collar recess.

#### **TECHNICAL SPECIFICATIONS**

Size	2 3/8″	2 7/8″	3 1/2″
WM Part Number	CSP2000F	CSP2500F	CSP3500F
Fishneck O.D.	1.375″	1.047″	1.500″
Min. I.D.	0.875″	1.125″	1.625″

CSP2000F

Well Master has the ability to provide an integrated collar stop and spring to eliminate wire line cost. See Spring Configuration Matrix to build a spring/stop combination.



# 3K<sup>™</sup> PREMIUM LUBRICATOR

#### DURABLE, DUAL-OUTLET LUBRICATORS

## APPLICATIONS

- New Wellheads
- Retro-fit
- Replacement
- Interchange

## FEATURES AND BENEFITS

- Dual ported outlets **maximizes flow** and retains ball when using ball and sleeve plunger
- Innovative Super-E Spring option is energy absorbing and specially formulated with TeksPak®, a thermoplastic elastomer which is both cost effective and an excellent solution for eliminated spring breakage
- Constructed of DOM Seamless Tubing, which can withstand impact from potentially fast-rising plungers
- Additional features of the optional lubricator top with easy access and cap:
  - Improves well site operator equipment safety and productivity given by spring design and the ease of top removal
  - Maximizes serviceability, making inspections simple and more efficient
  - Springs can be replaced easily in minutes
  - Unique lubricator end cap designed for easier access to the plunger and spring including:
    - Acme square threads
    - O-Ring sealed
    - Removable by hand or a strap wrench

LUBD2000MP



#### **TECHNICAL SPECIFICATIONS**

Part No.	Nominal Tubing Dia. (in)	Nominal Lubricator Inside Dia. (in.)	Lubricator Length (in.)	Lubricator weight (Ibs.)	Thread Design	Spring Material
LUBD1500E	1 1/2	1.650	46.0	48	API EUE 10 rd	Steel Spring
LUBD1700E	2 1/16	1.751	46.0	50	API EUE 8 rd	Steel Spring
LUBD2000MP	2 3/8	2.000	44.7	52	API EUE 8 rd	Steel Spring
LUBD2000MPE	2 3/8	2.000	44.7	50	API EUE 8 rd	Elastomer Spring
LUBD2500MP	2 7/8	2.500	49.5	84	API EUE 8 rd	Steel Spring
LUBD2500MPE	2 7/8	2.500	49.5	80	API EUE 8 rd	Elastomer Spring



## UNIBODY<sup>TM</sup> LUBRICATOR

LUBD2000LPFFF

LUBD2000LPFTT

#### UNIBODY LUBRICATOR IDEAL FOR HIGHER PRESSURE WELLS

## **APPLICATIONS**

The 5000 psi Unibody Lubricator was designed for both standard & cold weather corrosive applications and is interchangeable with most lubricator installations.

## FEATURES AND BENEFITS

- Lubricator constructed of AISI 4140-L80 alloy steel
- Meets API 6A wellhead spacing ensuring proper alignment and mechanical integrity improving operational efficiency and safety
- Heavy Duty, e-nickel plated catcher for extended life and corrosion resistance
- Unique slots designed to allow sensors to be mounted at the lowest entry point
- Additional material/wall thickness for added strength
- Heavy Duty Bowen Nut with handles for ease of use and factory greased with double O-Ring seal pockets
- Designed with large ported outlets that facilitate flow and debris removal
- Integral ported outlets to prevent unwanted material down the flow line
- Multiple 1/2" NPT threaded ports for:
  - Hydrostatic testing while on well head
  - Chemical injection
- Compatible with multiple trip rods and anvils



#### **TECHNICAL SPECIFICATIONS**

Part No.	Body Material	Flanged Inlet Base (in.)	Outlet	Inside Lubricator Dia. (in.)	Lubricator Length (in.)	Lubricator Weight (lbs.)	Working Pressure (psi)
LUBD1700LPFTT	4140	R24	Dual Ported, 2" NPT	1.75	41.6	147	5000
LUBD1700XPFTT	4140	BX-151	Dual Ported, 2" NPT	1.75	41.6	136	5000
LUBD2000LPFTT	4140	R24	Dual Ported, 2" NPT	2	45.1	154	5000
LUBS2000LPFF	4140	R24	Single Ported, R24 Flange	2	45.1	193	5000
LUBD2000LPFFF	4140	R24	Dual Ported, R24 Flanges	2	45.1	217	5000
LUBD2000XPFTT	4140	BX-151	Dual Ported, 2" NPT	2	45.1	149	5000
LUBD2000XPFFF	4140	BX-151	Dual Ported, R24 Flanges	2	45.1	215	5000
LUBD2500LPFTT	4140	R27	Dual Ported, 2" NPT	2.5	49	188	5000
LUBD2500LPFFF	4140	R27	Dual Ported, R24 Flanges	2.5	49	236	5000
LUBD2500XPFTT	4140	BX-153	Dual Ported, 2" NPT	2.5	49	184	5000
LUBD2500XPFFF	4140	BX-153	Dual Ported, R24 Flanges	2.5	50.9	249	5000
LUBD3500LPFTT	4140	R35	Dual Ported, 2" NPT	3	53.4	248	5000



# **MODULAR LUBRICATOR**

#### WELD FREE, DROP-IN LUBRICATOR SYSTEM FOR MAXIMUM CUSTOMIZATION AND EXPEDITED WELL HEAD INSTALLATION

## APPLICATIONS

The Modlube was designed for operations in a wide temperature range and corrosive applications and was created specifically to reduce the time and cost associated with higher pressure oil & gas well head installation thus lowering total installation expenses.

## FEATURES AND BENEFITS

- Available in multiple outlet configurations to fit most API well head designs
- Assemble to order designs specific to customer needs
- Body constructed of 4140-L80 alloy steel with powder coating for longevity and corrosion protection
- Meets API 6A wellhead spacing ensuring proper alignment and mechanical integrity improving operational efficiency and safety
- Heavy Duty, e-nickel plated catcher for extended life and corrosion resistance
- Additional material/wall thickness for added strength and safety
- Self greasing catcher design with duplicate O-rings to prevent leaks
- Heavy Duty Bowen Nut with Handles for ease of use
- Multiple 1/2" NPT threaded ports for:
  - Hydrostatic testing while on well head
  - Chemical injection
- Compatible with multiple trip rods and anvils



# **MODULAR LUBRICATOR**

#### PART NUMBER CONFIGURATOR

	<b>Part Number</b> Example		F V	V F	
] PRODUCT	Modular Lubricator LUBM			Ш	
2 SIZE	2000 2-3/8° 2500 2-7/8°			Ш	
3	5,000 PSI/-50°F to 180°F L 5,000 PSI/-20°F to 180°F P			ш	
PRESSURE/ TEMPERA	ATURE RATING				
<b>4</b> MODEL	Standard Model (No Merged Flange Assy) Internal Bypass (7.31°)	C			
5 PORTED	Ported/Adapters P No Ports Blank				LUBM2000TPFSS
6 INLET	Flange 5K F Flange 10K X			ш	
<b>7</b> FIRST OUTLET	Valve V   Spool S   Flange 5K F   Threaded T   Special Z				
8 SECOND OUTLET	Valve V   Spool S   Flange 5K F   Threaded T   Special Z				
9 MERGED FLANGE OUTLET	Flange 5K F Flange 10K X No Merged Assembly Blank				



# SUPER-E<sup>™</sup> SPRING

LUBX2001E

## **INNOVATIVE, ENERGY ABSORBING, DURABLE ELASTOMER SPRING**

#### **APPLICATIONS**

The Super-E Spring is specially formulated with Tecspak®, a thermoplastic elastomer which is cost effective and an excellent solution to eliminating spring breakage. It's also safer and 20 times more durable than polyurethane.

## FEATURES AND BENEFITS

- Designed as a direct replacement for steel or alloy metal springs
- Upgrade available on Well Master lubricators when purchased new or as a retrofit
- • Resistant to breakage in oil and gas wells with Co2 and H2S which cause breakage of steel springs
- Proprietary design does not expand on compression, eliminating hoop stress failures of lubricator caps
- Non-linear dynamic impact absorption
- Maximum surface temperature is 150°F



# **SUPER-E™ SPRING**

#### **TECHNICAL SPECIFICATIONS**

Part No.	Lubricator Size (in.)	Nominal Spring Dia. (in.)	Spring Length (in.)	Spring Weight (lbs.)	Spring Loading
LUBX2001E (3K)	2 3/8	2.40	11.35	0.65	Dynamic to 3000#
LUBX2008E (5K)	2 3/8	2.49	11.27	0.86	Dynamic to 3500#
LUBX2501E (3K & 5K)	2 7/8	2.70	12.60	0.85	Dynamic to 3500#
Materials of Construction:	Specifically formul ASTM D 4550	ated with TecsPak®	), a thermoplastic el	astomer	



# **SENTRY™ SENSOR**

#### PLUNGER ARRIVAL SENSOR WITH MAGNETIC SHUT-OFF (MSO)

#### **APPLICATIONS**

Well suited for plunger arrival sensing on most wells.

#### FEATURES AND BENEFITS

- Quick and easy installation with firm mounting, reducing vibration that can cause false triggering
- Built-in mounting, therefore no tape, ties or extra clamps are needed for a secure mount
- Extremely low power consumption that does not require power from a third wire, thereby reducing system battery load
- Dose not use internal batteries
- Reserve **polarity protected**, making the installation more foolproof



CONX010SM

#### **TECHNICAL SPECIFICATIONS**

Part No.	CONX010SM
Dimensions Without Mountain Clamp (WxDxH)	1.5"x1.5"1.5"
Weight (lbs)	0.5 lbs
Materials of Construction	Weatherproof/Sealed PVC Outer All connections encapsulated in UL 94V-0 rated Dow Corning® Sylgard® 160 Silicone Elastomer
Electrical Requirements	Power derived from input signal line +3 VDC -+15 VDC, 5uA standby current Proper wiring methods required to ensure Class I, Div 2 compliance
Trigger Capability	+3 VDC - + 15 VDC, including Optically Isolated Inputs Actuation time 3-5 seconds
Electircal Connections	10 feet, 2 conductor 22 AWG stranded cable (Alpha 1172C UL listed) Unit to be connected to signal lines only Red: Signal, Black: Ground Reverse polarity protected
Mounting	Built-in stainless steel clamp Mounts to pipes up to 3.5" diameter

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# HAWKEYE IS & HAWKEYE XP

#### BOTH THE HAWKEYE (INTRINSICALLY SAFE) IS AND HAWKEYE (EXPLOSION PROOF) XP ARE PLUNGER ARRIVAL SENSORS WITH SELF CALIBRATION AND THE HAWKEYE XP IS ALSO EXPLOSION PROOF

#### **APPLICATIONS**

Designed for reliable operation in extreme conditions

#### FEATURES AND BENEFITS

- Adjustable sensitivity levels allows for utmost accuracy
- Extremely low power consumption, drawing less than 700 μA of current
- Does not use internal batteries
- Protected by a rugged water-resistant aluminum encloser filled with hardened epoxy
- Features a **1/2" NPT port** that enable use of either a Teck connector & armored cable or a standard cable gland & instrumentation cable
- Detects plunger arrivals from up to three feet away
- Hawkeye IS and Hawkeye XP both Class 1, Div 1, Zone 0 certified
- ATEX Certification is available upon request





CONX010SETC





CONX010SETCX



# HAWKEYE IS & HAWKEYE XP

#### **TECHNICAL SPECIFICATIONS OF HAWKEYE IS**

Part No.	CONX010SETC
Operating Temp.	-40°F to +158°F (-40°C to +70°C)
Operating Valve	5V to 28V
Average Current	<700 µA
Interface	3 Wire (COM/SIG/PWR)
Operating Mode	Normally Open
Certifications	Class 1, Zone 0, Ex ia IIB T4 Class1, Zone 0, Aex ia IIB T4
Mounting	Stainless steel clamp Mounts to pipes up to 3.5" diameter

#### **TECHNICAL SPECIFICATIONS OF HAWKEYE XP**

Part No.	CONX010SETCX
Operating Temp.	-40°F to +158°F (-40°C to +70°C)
Operating Valve	5V to 28V
Average Current	<700 µA
Interface	3 Wire (COM/SIG/PWR)
Operating Mode	Normally Open
Certifications	Class 1, Zone 0, Ex ia IIB T4
	Class1, Zone 0, Aex ia IIB T4
Mounting	Stainless steel clamp
	Mounts to pipes up to 3.5 " diameter



# MODEL 550

CON5500

#### ECONOMICAL PLUNGER LIFT CONTROLLER WITH PRESSURE OVERRIDE

#### APPLICATIONS

Designed to withstand extreme conditions for plunger lift system control.

#### FEATURES AND BENEFITS

- Proven to function reliably in temperatures as low as -20°F and up to 158°F
- Draws little energy from rechargeable battery, operating for more than 3+ months on a single charge from the solar panel
- Protected by a rugged water-tight steel encloser with a locking door latch
- Features several pre-punched ports to provide a variety of options for solenoid and wiring connector locations
- Can be configured as a simple well intermittent or used in conjunction with a plunger arrival sensor to optimize production

#### **TECHNICAL SPECIFICATIONS**

Part No.	CON5500
Operating Temp.	-20°F to +158°F
Battery	6 V, 4.5 Ah
Solar Panel	6V, 1.1 W
Standby Time	3+ Months
Valves Supported	1/1
Arrival Sensor	Well Master Plunger Arrival Sensor
Cycle History	Last 25 Plunger Cycles

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CON003-2C3



# MODEL 650

#### PREMIUM PLUNGER LIFT CONTROLLER WITH BUILT IN OPTIMIZATION

#### APPLICATIONS

Designed to withstand extreme conditions to optimize production operating up to 3 valves.

#### FEATURES AND BENEFITS

- Proven to function reliably in temperatures as low as -40°F and up to 158°F
- Draws little energy from rechargeable battery, operating for more than 8 months on a single charge from the solar panel
- Protected by a **rugged water-tight** steel encloser with a locking door latch
- Features several pre-punched ports to provide a variety of options for solenoid and wiring connector locations
- Can be configured as a simple well intermittent or used in conjunction with a plunger arrival sensor to optimize production
- Includes a standard Modbus communication port to allow remote monitoring and control
- Included intelligent and effective optimization algorithms help to achieve maximum production

#### **TECHNICAL SPECIFICATIONS**

Part No.	CON6500
Operating Temp.	-40°F to +158°F (-40°C to +70°C)
Battery	6 V, 8 Ah
Solar Panel	6V, 1.1 W
Valves Supported	1-3
Arrival Sensor	Hawkeye IS & Hawkeye XP
Other Inputs Line Pressure Switch/Sensor	
Cycle History	Last 25 Plunger Cycles
Daily History     Current Day + 14 Previous Days	
Communications RS-485 Modbus	
Certification	CSA Class 1, Zone 0, Ex/Aex ia (ia) IIB

ed in production allow remote CON6500

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CON004-2C3

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# **TACKLE BOX™**

#### **FISHING TOOL KIT**

#### **APPLICATIONS**

Ideal for retrieving all types of downhole equipment

#### FEATURES AND BENEFITS

- Kit includes: Fishing plunger, internal and external impression blocks, internal latch, overshot, 220 lb "Rare Earth" magnet and Allen wrench
- Comes in a durable Pelican<sup>™</sup> case to store and protect tools
- Cost savings! Pays for itself upon one successful retrieval
- Plunger has the Well Master patented high lift rib and groove design for **maximum lifting power**
- Stainless steel retrieval attachment to prevent rust after multiple uses

#### **MAGNETIC TYPE**

- Powerful "Rare Earth" magnet rated at 220 lbs. of pull force
- Used to fish all ferrous metal plungers

#### LATCH TYPE

- Collet type overshot and internal latch
- Internal stop prevents overshooting and damaging latch tines
- Latch is removable, replaceable, and is secured with a threaded connection
- Can be used to fish non-ferrous tools

#### **IMPRESSION BLOCKS**

- Determines shape and orientation of down-hole equipment to be retrieved
- Can use plumber putty and/or roofing tar to get impression
- Ideal for unknown objects down-hole

PLS2000FTK



#### **TECHNICAL SPECIFICATIONS**

Part No.	Outside Tubing Dia. (in.)		Nominal Tubing Weight (lbs./ft.)	Plunger Length (in.)	Nominal Plunger Dia. (in.)	Kit Weight (lbs.)	
PLS1700FTK	2 1/16		3.25		1.64		
PLS2000FTK	2 3/8	1.995	4.7	14	1.9	19	
PLS2500FTK*	2 7/8	2.441	6.5	14.7	2.34	23	
Materials of Construction:	Plunger constructed of hardened and electroless nickel plated steel Attachments made of Stainless Steel						

#### **FISHING KIT PARTS & ACCESSORIES**

Part No.	Description
PLS2000FTB	Pelican Storage Case
PLS1701F	2 1/16 Plunger with bottom threads for fishing attachments
PLS2001F	2 3/8 Plunger with bottom threads for fishing attachments
PLS2501F	2 7/8 Plunger with bottom threads for fishing attachments
PLS1700FTM	2 1/16 Magnetic Attachment
PLS2000FTM	2 3/8 Magnetic Attachment
PLS2500FTM	2 7/8 Magnetic Attachment
PLS1700FTO	2 1/16 Overshot Attachment
PLS2000FTO	2 3/8 Overshot Attachment
PLS1700FTI	2 1/16 Internal Latch Attachment
PLS2000FTI	2 3/8 Internal Latch Attachment
PLS2500FTI	2 7/8 Internal Latch Attachment
PLS1700FTIB	2 1/16 Impression Block Attachment
PLS2000FTIB	2 3/8 Impression Block Attachment
PLS1700FTIC	2 1/16 Impression Cone Attachment
PLS2000FTIC	2 3/8 Impression Cone Attachment
PLS2000FTG	2 3/8 Ball Retrieval Assembly (sold separately)
PLS2500FTG	2 7/8 Ball Retrieval Assembly (sold separately)
PLS2000FTA	Allen Wrench



# PULLERS & GAUGE RINGS

#### FEATURES AND BENEFITS OF PULLERS

Assists in plunger retrieval

WELL MASTER Produce more. Spend less.

- Magnetic attachment, collet type and internal stop latch available
- Aluminum rod helps with grounding of the puller
- Composite ends designed for extended life and ease of use

#### FEATURES AND BENEFITS OF GAUGE RINGS

- Designed to help determine if a plunger needs to be replaced
- ID chamfered for ease of measurement
- Helps eliminate any guesswork by identifying worn out plungers
- Made of heavy-duty durable stainless steel for extended life
- Precision machined ID held to a tolerance less than .0005"



PUL0001DE

PUL0003MC

GAU2305

GAU1900

PUL0001SE

GAU1860



# **PULLERS & GAUGE RINGS**

#### **TECHNICAL SPECIFICATIONS OF PULLERS**

Part No.	Description	Tool Size (in.)	Tool Length	Tool Weight (lbs.)
PUL0001SE	Single Ended, Magnet	Various	40	1.5
PUL0001DE	Double Ended, Overshot & Internal	Various	40	1.5
PUL0002DE	Double Ended, Magnet & Internal	Various	40	1.5
PUL0003SE	Single Ended, Magnet, Long	Various	49	2.0
PUL0003MC	Chain w/ Magnet	Various	63	2.0
Materials of Construction:	Aluminum rod with nylon ends; 220 l	bs. magnet also	available	

#### **TECHNICAL SPECIFICATIONS OF GAUGE RINGS**

Part No.	Tool Size (in.)	Tool Dia. (in.)	Tool Length	Tool Weight (lbs.)	Recommended Plunger Type
GAU1615	2 1/16	1.615	3.19	2.0	Solid
GAU1657	2 1/16	1.657	3.19	2.0	Pad
GAU1860	2 3/8	1.860	3.19	1.5	Solid
GAU1900	2 3/8	1.900	3.19	1.5	Pad
GAU2305	2 7/8	2.305	3.19	1.5	Solid
Materials of Construction:	Gauge Rings: Standard construction	303 stainless s	teel		



# AUTOMATED CHOKE VALVE

VAL2050SADC

11

#### SIDE-ENTRY THREADED CONTROL & CHOKE VALVE

## APPLICATIONS

Control a wide range of pressures and flow rates of gases and/or liquid with accurate control to get a long safe valve life.

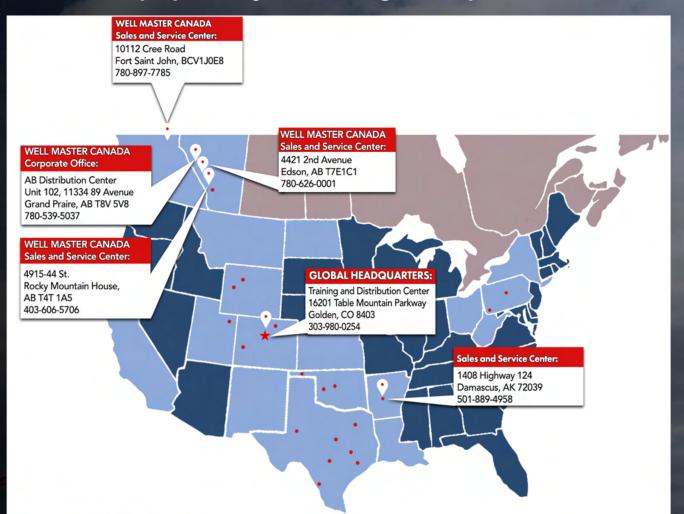
## FEATURES AND BENEFITS

- Field Lubricated Stem can be used with handle or actuator
- Actuation Friendly pre-drilled for simple in-line actuation changes, whether manual or automated
- Low Torque exclusive internal gear drive requires less torque, often allowing use of smaller, less expensive actuation.
- Side Entry Access Bonnet allows easy changeout of the discs to accommodate changing flow conditions, and for complete inspection and maintenance - all without taking the valve out of line, or removing the actuator
- In-Line Flow Path minimizes pressure drop, erosion and cavitation
- Tungsten Carbide control discs and extended downstream erosion protection

## **TECHNICAL DATA**

- Machined from solid bar stock; no porosity, limitless possible lengths
- Pressure ratings up to 5,000 psi MOP
- Xylan™ coated 17-4 stainless steel stem and disc driver
- Standard materials of API 4130 (75K) and 316SS, or customer specified materials
- ANSI B16.34 and/or API 6A wall thickness and bolt loading
- Manual, electric, hydraulic, or pneumatic actuation
- Open/close or modulating service
- Automated valves have selectable failure position

#### Contact Well Master today to find out how we can help optimize your oil and gas well production



#### Service Areas

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