

Gas Lift Application Guide

Tubing-Retrievable/Wireline-Retrievable Selection Tables

<https://www.smemex.com/>



- December 15, 2023

Table of Contents

1	Introduction to Gas Lift	Page 4
2	Types of Gas Lift Systems	Page 5
3	Advantages, Applications & Requirements	Page 6
4	Tubing-Retrievable and Gas Lift Equipment Gas Lift Valves & Specification Guide	
	Gas Lift Mandrels	Page 7
	JR and SR Series Mandrels	
	Injection-Pressure Operated Valves	Page 8
	TP Series Valves	
	Check Valves	Page 8
	TC Series Valves	
	Injection-Pressure-Operated Gas Lift Valves	Page 9
	WP Series Gas Lift Valves	
8	Wireline-Retrievable and Gas Lift Equipment Gas Lift Valves & Specification Guide	
	Orifice Valves	Page 10
	WO Series Valves	
	Dummy Valves	Page 11
	WD and WD-C Series Valves	
	Equalizing Dummy Valves	Page 12
	WED Series Valves	

Table of Contents

8 Wireline-Retrieveable and Gas Lift Equipment Gas Lift Valves & Specification Guide

Circulating Valves	Page 13
WCS Series Valves	
Latches 180 and 360 Profile Pockets	Page 14
BK-2, RK, T2, RA Latches	
Side Pocket Mandrels	Page 15
Introduction	Page 15
M and F Series Mandrels (Oval-Body)	Page 16
R, H, and U Series Mandrels (Round-Body)	Page 17-18

INTRODUCTION

SME Gas Lift

Efficient production facilities rely on maximizing natural reservoir energy. However, this energy is often insufficient to generate the necessary reservoir pressure for independent well flow or optimal oil volume. In these cases, artificial lift or secondary recovery processes are necessary to supplement the natural reservoir energy.

Gas lift is an artificial method of lifting that closely mirrors the natural flow process. It operates as an augmentation or extension of the natural flow process and is applicable to a wide range of wells. The primary requirement for this secondary recovery technique is a cost-effective supply of pressurized injection gas. In wells operating under natural flow conditions, produced fluids rise up the production string, causing natural gas to emerge from solution and expand on its ascent to the surface.

The expanding gas displaces the fluid in the production tubing, reducing the hydrostatic pressure against the formation and lightening the produced fluid column. This reduction in pressure drives the well to continue flowing autonomously. However, if the reservoir pressure falls below the hydrostatic pressure of the fluid column, the well stops flowing autonomously.

Types of Gas Lift Systems

The oil and gas industry uses two types of gas lift systems: continuous flow and intermittent flow. Intermittent lift is best suited for wells that produce at low rates due to their cyclic nature. On the other hand, continuous lift is usually more efficient and less expensive for wells that produce at higher rates, as it can be maintained without excess use of injection gas.

Continuous Flow Gas Lift

The prevalent approach in gas lift wells is continuous flow gas lift, and it stands as the most widespread method, closely mimicking the natural flow of a well. Employing a continual injection of compressed gas into the well serves to diminish flowing bottomhole pressure, consequently increasing production rates.

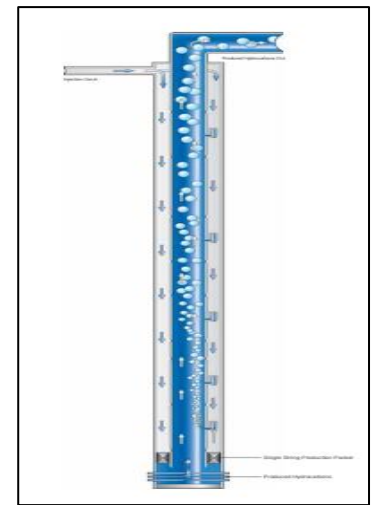
In the continuous flow gas lift procedure, gas at elevated pressure is injected downhole into the produced fluid column. The injected gas combines with the formation gas to elevate the fluid to the surface through one or more of the ensuing methods:

Reduction of fluid density results in a decrease of fluid column hydrostatic pressure. This condition allows the reservoir pressure to surpass the produced fluid column hydrostatic pressure, enabling the flow of reservoir fluids to the surface.

Expansion of the injection gas induces a forward displacement of liquid, diminishing the weight of the produced fluid column. This action amplifies the differential between the reservoir and the wellbore.

Intermittent Gas Lift

In cases of low reservoir pressure and low production rates, intermittent gas lift emerges as a viable option. This method involves cyclic injection of high-pressure gas to displace liquid slugs to the surface, specifically designed for tubing flow. While intermittent gas lift relies on high injection rates from the compressor, the formation gas contributes minimally to the lifting process in most wells.



Continuous Flow Gas Lift

With casing (annular) flow, the gas is injected down the tubing string and fluids are produced out of the tubing/casing annulus. Higher gas lift injection rates must be available to prove efficient in this application and surface facilities must be set up to handle higher fluid volumes.



Intermittent Gas Lift

Advantages, Applications & Requirements

Gas Lift Advantages:

- Cost-effective installation
- Efficient lifting performance
- Surface control over production rates
- Simple design with few moving parts
- Versatile lifting options, near the surface or deep within the wellbore

Gas Lift Applications:

- Suitable for nearly all wells requiring artificial lift for production
- Enables production to depletion, regardless of low production rates
- Initiates flow in wells that will naturally produce once heavier completion fluids are removed
- Efficiently unloads water from gas wells, preventing hindrance to gas production

Gas Lift System Requirements:

- Installation of suitable gas lift equipment on both in the wellbore and the surface
- Requires an available and economically viable supply of pressurized injection gas

TUBING-RETRIEVABLE

JR and SR Series GAS LIFT MANDRELS

The JR and SR Series mandrels represent tubing-retrievable gas lift mandrels seamlessly integrated as components of the tubing string. These mandrels feature an external ported lug, serving as a secure attachment point for gas lift devices.

JR Mandrel Series

This mandrel has a lug configured for 1" O.D. tubing-retrievable gas lift equipment.

SR Mandrel Series

This mandrel has a lug configured for 1.5" O.D. tubing-retrievable gas lift equipment.

Applications

Installed as part of the tubing string to accept tubing-retrievable gas lift equipment for producing wells requiring gas lift. Both mandrels can be used in either a single or dual string completions. JR and SR mandrels may be installed in the casing drift I.D. while maintaining post-completion operations through the bore of the mandrel.

Features

- Full tubing I.D.
- Guard plates on side of mandrel protect valve from damage while running in hole
- Tubing-string connection threaded on both upper and lower ends with appropriate terminal threads
- Various ported-lug configurations for specialized applications
- Drift I.D. compatible with tubing connection drift in most tubing thread types, sizes and weights
- Available in various materials for standard, H2S service and hostile well environments
- Special clearance available on request

Tubing Retrievable Gas Lift Mandrels Series Specification Guide

Tubing Size (in.)	Mandrel Lug I.D. (in.)	Mandrel Model	Mandrel O.D. (in.)	Drift I.D. (in.)**	Mandrel Length (in.)*
2-3/8"	1.00	JR	3.78	1.901	51.00
	1.50	SR	4.28	1.901	51.00
2-7/8"	1.00	JR	4.34	2.347	51.00
	1.50	SR	4.84	2.347	51.00
3-1/2"	1.50	SR	5.56	2.867	51.00

** Mandrel Drift I.D. may vary according to the type of thread connection

* O.D. and Length dimensions include coupling



SR Series



WIRELINER RETRIEVABLE

TP Valve Series

INJECTION PRESSURE OPERATED GAS LIFT VALVES

TP Valve Series

- The TP-1 model in this series is a 1" O.D. valve.
- The TP-1.5 model is a 1-1/2" O.D. valve.

Applications

Used for intermittent or continuous flow applications with tubing-retrievable gas lift mandrels. Smaller size valves are available for use with the IM and CT-IM special application mandrels for packoff, special clearance and smaller diameter installations.

Features

- Large dome volume improves operating efficiency of valve
- Optional reverse-flow check valve (TP-1 and TP-1.5 models)
- Mechanical travel stop increases the cycle life of the bellows
- Three-ply Monel® bellows
- Silicon fluid bellows protection
- Replaceable floating Monel® seat (tungsten seat available)
- Silver-brazed bellows connections
- Stainless steel or Monel® materials available
- Pressure rating up to 1800 psi PTRO maximum
- Temperature rating of 250° F (standard service)
- Port sizes from 1/8" to 1/2"

TP Series Specification Guide

Valve Series Model	Ab Effective Bellows Area (sq. in.)	Port Size (in.)	Ap ² Area of Port (sq. in.)	Ap/Ab Ratio	1-(Ap/Ab)	PPEF Ap/Ab 1-(Ap/Ab)
TP-1	0.31	1/8	0.014	0.044	0.956	0.046
	0.31	5/32	0.021	0.067	0.933	0.072
	0.31	3/16	0.029	0.095	0.905	0.105
	0.31	1/4	0.052	0.166	0.834	0.199
	0.31	5/16	0.080	0.257	0.743	0.346
	0.31	3/8	0.114	0.368	0.632	0.582
TP-1.5	0.77	3/16	0.029	0.038	0.962	0.040
	0.77	1/4	0.052	0.067	0.933	0.072
	0.77	5/16	0.080	0.104	0.896	0.115
	0.77	3/8	0.114	0.148	0.800	0.174
	0.77	7/16	0.154	0.200	0.739	0.250
	0.77	1/2	0.201	0.261	0.632	0.353

TP Valve

WIRELINER RETRIEVABLE

TC Valve Series

GAS LIFT CHECK VALVES

TC Valve Series

- The TC-1 model in this series is a 1" O.D. valve.
- The TC-1.5 model is a 1-1/2" O.D. valve.

Applications

These valves are used with tubing-retrievable gas lift valves that do not have an integral check valve, such as the TP-1 and TP-1.5 gas lift valves. A primary application for these valves is preventing back flow from the injection valve which damages casing. Other applications include preventing production commingling in dual gas lift installations and improving pressure integrity during acidizing and circulation operations.

Features

- Stainless steel or Monel® materials available
- Inconel® spring
- Eliminates need to re-unload annulus liquid since valve prevents annulus fill up during shut down periods
- Elastomeric and metal-to-metal seat for bubble tight seal
- Seal system options available
- Valves can be stacked for additional protection

TC Series Specification Guide

Valve Series	Valve Series Model	Valve O.D. (in.)	Port Size (in.)	Connection Thread Type	Mandrel
TC SERIES	TC-1	1.00	7/16	1/2" NPT	JR Series
	TC-1.5	1.50	1/2	1/2"-3/4" NPT	SR Series



TC Check valve



TC Check valve

WIRELINE RETRIEVABLE

Injection-Pressure-Operated Gas Lift Valves

WP SERIES GAS LIFT VALVES

SME Production Solutions introduces the WP Series gas lift valves, retrievable injection-pressure-operated valves featuring a nitrogen-charged dome and bellows configuration. Given the influence of temperature on the charge pressure, precise operating depth temperature information is crucial for accurate set pressure calculations. The nitrogen dome pressure, initially set at a reference temperature, is adjusted to the operating depth temperature for optimal application. The valve is secured on seat through the downward force exerted by the nitrogen charge within the bellows, ensuring reliable and precise operation.

WP Valve Series

- The WP-1 model is a 1" O.D. valve.
- The WP-1.5 model is 1-1/2" O.D. valve.

Applications

For intermittent or continuous gas lift, and tubing or casing flow applications depending on pocket porting configurations.

Features

- Maximum travel stop increases the cycle life of the bellows
- Integral reverse-flow check valve to prevent tubing-to-casing communication
- Three-ply Monel® bellows
- Compatible with all common top latches
- Silicon dampening fluid minimizes throttling effects
- Replaceable floating Monel® or tungsten carbide seat
- Silver-brazed bellows connections
- Guidance system designed to prevent corkscrew of the bellows
- Stainless steel or Viton® materials available
- Pressure rating up to 1,800 psi Pressure Tested Open Rack (PTRO) maximum
- Temperature rating of 250° F (standard service)
- Port sizes from 1/8" to 1/2"
- Standard Viton® packing element system with other packing materials available

WP Series Specification Guide

Valve Series Model	Ab Effective Bellows Area (sq. in.)	Port Size (in.)	Ap* Area of Port (sq. in.)	Ap/Ab Ratio	1-(Ap/Ab)	PPEF Ap/Ab 1-(Ap/Ab)
WP-1	0.31	1/8	0.014	0.044	0.956	0.046
	0.31	5/32	0.021	0.067	0.933	0.072
	0.31	3/16	0.029	0.095	0.905	0.105
	0.31	1/4	0.052	0.166	0.834	0.199
	0.31	5/16	0.080	0.257	0.743	0.346
WP-1.5	0.77	3/16	0.029	0.038	0.962	0.040
	0.77	1/4	0.052	0.067	0.933	0.072
	0.77	5/16	0.080	0.104	0.896	0.115
	0.77	3/8	0.114	0.148	0.800	0.174
	0.77	7/16	0.154	0.200	0.739	0.250
	0.77	1/2	0.201	0.261	0.632	0.353



Gas Lift Orifice Valves

WO SERIES ORIFICE VALVE

SME Production Solutions presents the WO Series valves, retrievable single-point-injection orifices. These valves feature a replaceable orifice that precisely regulates the gas volume entering the production conduit when the valve is open. The design also includes a spring-loaded, integral reverse-flow check valve for enhanced functionality.

WO Series Orifice Valves

- The WO-1 model is a 1”O.D. valve.
- The WO-1.5 model is a 1-1/2”O.D. valve.

Applications

These valves have no closing function and are commonly used to control stable injection at the operating valve depth.

Features

- Stainless steel or Monel® materials available
- Orifices sizes from 1/8” to 1/2” diameter ports (WO Series)
- Flow capacity governed by orifice size
- Replaceable floating orifice
- Spring-loaded, reverse-flow check valve (WO Series)

WO Series Specification Guide

Valve Series	Valve Series Model	Valve O.D. (in.)	Latch h* Type	Max Port Size (in.)
WO SERIES	WO-1	1.00	BK-2	5/16
	WO-1.5	1.50	RK, RA, T-2	1/2

*Compatible running and pulling tool information available upon request.



Gas Lift Dummy Valves

WD and WD-C SERIES DUMMY VALVE

WD-1C Dummy Valves

The SME Production Solutions WD and WD-C Series dummy valves are retrievable, isolation tools installed in a side pocket mandrel to block the mandrel's injection ports. The valve with appropriate latch may be installed or retrieved prior to or after completion for various procedures.

WD Series Dummy Valve

The WD-1 model is a 1" O.D. valve.
The WD-1.5 model is a 1-1/2" O.D. valve.

WD-1C Series Dummy Valves

This series includes an integral bottom collet latch and is typically used when a retrievable latch will not engage in the latch-pocket profile of a side pocket mandrel.

The WD-1C model is a 1" O.D. valve with integral bottom collet latch.

Applications

Used to seal off the pocket of a side pocket mandrel, preventing communication between the casing and tubing. These valves are also used to blank off the tubing for production until gas lift valves are required. Other applications include pressurizing the tubing in various procedures, isolating tubing and casing flow during single-alternative production, and isolating tubing and casing flow for test purposes during multi-point water or gas injection floods.

Features

- Stainless steel or Monel® materials available
- Two sets of packing to straddle and pack off casing ports
- Accepts most common top latches
- Installs in most mandrel pockets depending on valve model
- Integral bottom collet latch (WD-C Series)

WD and WD-C Series Specification Guide

Valve Series	Valve Series Model	Valve O.D. (in.)	Latch* Type	Pulling Neck O.D. (in.)	Running Neck O.D. (in.)
WD SERIES	WD-1	1.00	BK-2	--	--
	WD-1.5	1.50	RK, RA, T-2	--	--
WD-C SERIES	WD-1C	1.00	Bottom Collet	0.875	0.875

*Compatible running and pulling tool information available upon request.

Note: A core extension is required for the WD-1C model to keep the skirt from shouldering on the pocket, allowing for a shear release feature



WD Dummy Valve

Dummy Valves

WED SERIES EQUALIZING DUMMY VALVES

The WED Series equalizing valves with integral latches from SME Production Solutions are designed as virtual dummy valves. These valves are engineered to deliver controlled equalization or circulation between the casing and tubing.

The downward shifting of the latch opens the communication port, allowing circulation or equalization. Once shifted, the valve can be pulled in the same trip as the integral top latch and redressed, if needed.

WED Valve Series

- The WED-1 model is a 1” O.D. valve.
- The WED-1.5 model is a 1-1/2” O.D. valve.

Applications

Primarily used to equalize casing and tubing pressure, the most common application is multiple water flood zones isolated by packers. After equalization, the valve must be pulled and redressed, if needed, to prevent communication between the casing and tubing. The valve may also be used to blank off the tubing for production until gas lift valves are required. Other applications include pressurizing the tubing in various procedures, isolating tubing and casing flow during single-alternative production, and isolating tubing and casing flow for test purposes during multi-point water or gas injection floods.

Features

- Stainless steel or Monel® materials available
- Two sets of packing to straddle and packoff casing ports
- Integral top latch to equalize tubing and casing pressure
- Fluid circulation after equalization
- Equalizing feature for controlled flow during equalization prior to removing
- One trip equalizing and pulling operation can be performed in one trip
- Standard Viton® packing element system with other packing materials available

WED Series Specification Guide

Valve Series	Valve Series Model	Valve O.D. (in.)	Latch * Type
WED SERIES	WED-1	1.00	Integral
	WED-1.5	1.50	Integral

*Compatible running and pulling tool information available upon request.



WED-1 Equalizing Dummy Valve

Circulating Valves

WCS-1 SERIES CIRCULATING VALVES

SME Production Solutions introduces the WCS-1 Series circulating valves, specifically engineered to safeguard the seal bores of side pocket mandrels from erosion and abrasion during the circulation of fluids or gases through the mandrel's ports. The double check valves within this series ease one-way flow, allowing fluid movement only from the annulus to the tubing. The installation of these valves with a ported latch enhances circulating rates.

WCS-1 Valve Series

- The WCS-1 model is a 1”O.D. valve.
- The WCS-1.5 model is a 1-1/2”O.D. valve.

Applications

Installed in 1” and 1-1/2” side pocket mandrels to prevent circulated gases or fluids from damaging the side pocket seal bores. These valves are designed for high gas or fluid rate passage requirements during circulation.

Features

- Stainless steel or Monel® materials available
- Standard Viton® packing element system with other packing materials available
- Abrasion-resistance overlays available
- Increased flow area since flow permitted from both nose and latch ends
- Integral double-check valve design to prevent tubing-to-casing annulus flow
- Installed with a ported latch for increased circulation rates

WCS-1 Series Specification Guide

Valve Series	Series Model (in.)	Valve O.D. (in.)	Latch* Type
WCS SERIES	WCS-1	1.00	BK-2-P
	WCS-1.5	1.50	RK-P, T-2-P

*Compatible running and pulling tool information available upon request.



WCS-1 Circulating Valve

Latches

SME Production Solutions provides an extensive selection of latches designed for the installation of wireline-retrievable gas lift, chemical injection, and waterflood valves inside pocket mandrels. These precision-engineered latches are specifically designed to secure in place within 180° or 360° latch pocket profiles.

180° G-Type Latch Pocket Profile

Latches for 180° latch pocket profile have a spring-loaded, ring style locking mechanism. A ported I.D. is included in some designs for applications requiring a communication path between the latch and attached valve.

- BK-2 Latch Series**

This series includes a BK-2 and a BK-2-P model used to secure a 1” valve or dummy valve in a side pocket mandrel with a 1” I.D. pocket. The BK-2-P model has a ported I.D.

- RK Latch Series**

Used to secure a 1.5” valve or dummy valve in a side pocket mandrel with a 1.5” I.D. pocket, this series includes a RK and a RK-P model. The RK-P model has a ported I.D.

360° A-Type Latch Pocket Profile

Latches for a 360° latch pocket profile have either a collet-type locking mechanism or a spring-loaded rotating cam lock with debris barrier. A ported I.D. is included in some designs for application requiring a communication path between the latch and attached valve.

- T-2 Latch Series**

The latches in this series have a collet-type locking mechanism and are used to secure a 1.5” O.D. valve or dummy valve in a side pocket mandrel with a 1.5” I.D. pocket. Models available are the T-2 and the T-2-P with ported I.D.

- RA Latch**

Used to secure a 1.5” valve or dummy valve in a side pocket mandrel with a 1.5” I.D. pocket, this latch has a rotating cam lock and an o-ring style debris barrier.



BK-2 Latch BK-2-P Latch



RA Latch RK-P Latch



T-2 Latch

Latch Specification Guide

Valve Pocket I.D. Inches	Latch Pocket Profile Inches	Latch Model	Latch Mechanism	Ported I.D.	Pulling Neck O.D. Inches	Running Neck O.D. Inches	Max. Value O.D. Inches
1.00	180°	BK-2	Lock-Ring	No	0.875	0.750	1.359
	180°	BK-2-P	Lock-Ring	Yes	0.875	0.750	1.359
1.50	180°	RK	Lock-Ring	No	1.187	0.937	1.786
	360°	T-2	Collett	No	1.375	1.000	1.750
	360°	RA	Cam	No	1.375	1.359	1.750

Side Pocket Mandrels

SME Production Solutions presents an extensive range of side pocket mandrels tailored for diverse well completion applications. Our top-quality side pocket mandrels boast enhanced features and specifications, meeting the most stringent requirements in the industry.

Within our family of side pocket mandrels, we offer both oval and round body designs to cater to a variety of needs. Oval-body mandrels, available with machined and forged pocket designs, are well-suited for single and dual string completions. On the other hand, round-body mandrels, recognized for their full-opening design, find common use in high-pressure environments and special-clearance applications.

Each mandrel is equipped with a standard side pocket profile, to receive gas lift valves, chemical injection valves, circulating valves, dummy valves, dump kill valves, and related equipment. Several pocket porting configurations are available to support applications such as water flood injection, chamber lift, chemical injection, and annular flow. SME Production Solutions provides comprehensive solutions that address the diverse challenges of well completions with precision and reliability.



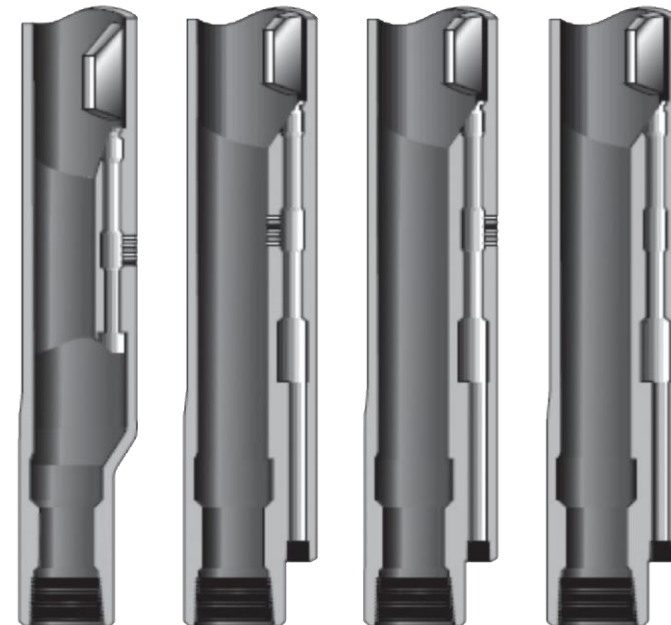
Standard Porting Configuration

Tubing Flow

Casing Flow

Chamber Lift

Waterflood Injection



Side
Pocket
Mandrel

M and F Series Side Pocket Mandrels

SIDE POCKET MANDRELS

SME Production Solutions proudly presents the M and F series Side Pocket Mandrels, characterized by an oval-body design seamlessly integrated into the tubing string. The mandrel's pocket, strategically offset from the tubing bore, and facilitates unimpeded passage of post-completion tools.

Our mandrels offer diverse configurations, including an integral orienting sleeve for precise alignment and installation of devices using a kickover tool. Notably, mandrels with an orienting sleeve are versatile, suitable for both straight and deviated wellbores, while those without are exclusively designed for straight wellbores. This design sophistication underscores SME's commitment to technical excellence in petroleum engineering.

M Series Side Pocket Mandrels

The mandrels in this series feature machined pockets and guards. Several mandrel configurations with 1" and 1-1/2" I.D. pockets are available.

- 1D and 1.5D models with 1" and 1-1/2" I.D. pockets and no orienting sleeves. The 1.5D model has a 360° A-type latch pocket profile.
- 1D-SO and 1.5D-SO models with 1" and 1-1/2" I.D. pockets and integral orienting sleeves. The 1.5D-SO model has a 360° A-type latch pocket profile.
- 1.5 DG and 1.5 DG-SO models with 1-1/2" I.D. pockets and 180° G-type pocket profiles. The 1.5 DG-SO model includes an integral orienting sleeve.

F Series Side Pocket Mandrels

This series features a one-piece forged pocket/deflector, 1" pocket I.D., and a 180° latch pocket profile.

- 1F model with a 1" I.D. pocket and no orienting sleeve
- 1F-SO model with a 1" I.D. pocket and an integral orienting sleeve

Applications

Used as an internal receiver for the installation and retrieval of gas lift valves and related equipment without having to pull or rerun the tubing string. Can be installed in deviated or straight well bores depending upon the mandrel model type. The external shape of these oval-body mandrels makes them ideal for dual completion applications.

Features

- Oval-body design
- Machined pocket and guards (M Series)
- One-piece forged pocket/deflector (F series)
- Models with and without a slotted orienting sleeve to accommodate setting and retrieving in straight and deviated wellbores.
- Tubing-string connection threaded on both swaged sections with appropriate terminal threads.
- Accepts standard gas lift equipment for pocket configuration.
- Variety of pocket configurations for specialized applications.
- Drift I.D. compatible with tubing connection drift in most tubing thread types, sizes and weights.
- Available in standard or H2S service.
- 4130 material is standard and with other materials are available upon request



M-Series F-Series

R, H, and U Side Pocket Mandrels

SIDE POCKET MANDRELS, ROUND BODY

SME Petroleum Solutions introduces the advanced R, H, and U Series Side Pocket Mandrels for enhanced petroleum production. Featuring a precision-engineered round body design with machined pockets and guards. These mandrels integrate into the tubing string, where the pocket acts as a landing nipple for retrievable gas lift equipment, ensuring operational efficiency. The mandrel pocket offset from the tubing bore allows unrestricted passage for post-completion tools, enhancing operational flexibility.

Notably, our round-body design surpasses oval-body alternatives, offering superior "burst and collapse" pressure ratings. Tailored features in specific series and models address diverse application needs. Additionally, our mandrels provide configurations with an integral orienting sleeve for precise alignment of the kickover tool and installation of devices, highlighting SME's commitment to delivering high-performance solutions in the petroleum industry.

Mandrels with an orienting sleeve can be installed in both straight and deviated wellbores. Mandrels without an orienting sleeve can only be installed in straight wellbores.

R Series Side Pocket Mandrels

These round-body mandrels with 1" and 1-1/2" I.D. pockets are available in several configurations.

- 1R and 1.5R models which have 1" and 1-1/2" I.D. pockets and no orienting sleeves. The 1.5R model has a 360° A-type latch pocket profile.
- 1R-SO and 1.5R-SO models which have 1" and 1-1/2" I.D. pockets and integral orienting sleeves. The 1.5R-SO model has a 360° A-type latch pocket profile.
- 1.5RG and 1.5RG-SO models which have 1-1/2" I.D. pockets and 180°

G-type Pocket Profiles

The 1.5RG-SO mandrel includes an orienting sleeve while the 1.5RG mandrel does not.

H Series Side Pocket Mandrels

These high-pressure mandrels have a 1" pocket I.D. and feature an enhanced "burst-and-collapse" pressure rating design for compatibility with most heavy-weight tubulars. This series is primarily used for deep and/or high-pressure applications.

- 1H high-pressure model with a 1" I.D. pocket and no orienting sleeve
- 1H-SO high-pressure model with a 1" I.D. pocket and an integral orienting sleeve

U Series Side Pocket Mandrels

These mandrels have a 1" pocket I.D. and feature a special clearance O.D. for installation in small casing sizes where standard O.D. mandrels many are not practical.

- 1U special-clearance model with a 1" pocket I.D. and no orienting sleeve
- 1U-SO special-clearance model with a 1" pocket I.D. and an integral orienting sleeve

Applications

- Receptacle for the installation and retrieval of gas lift valves and related equipment without having to pull or rerun the tubing string
- Deviated or straight well bores based on inclusion of an orienting sleeve
- Side pocket mandrels are primarily used in single completions
- Special applications
- High burst-and-collapse pressure ratings
- Deep or high-pressure applications
- Special clearance requirements.



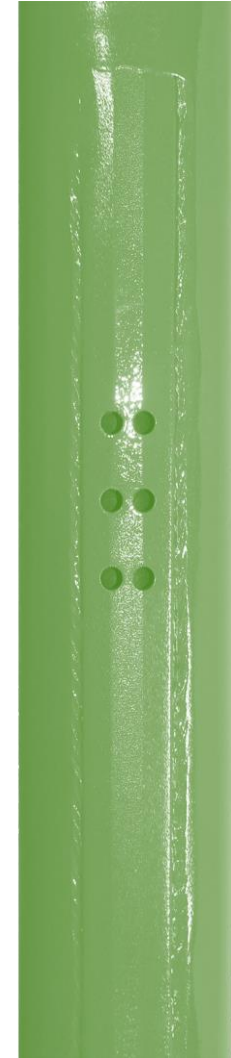
R, H, & U-Series

R, H, and U Side Pocket Mandrels

SIDE POCKET MANDRELS ROUND BODY

Features and Special Applications

- Round-body design ideal for special applications
- Machined pocket and guards
- Models available with and without a slotted orienting sleeve to accommodate setting and retrieving in straight and deviated well bores
- Deep and/or high-pressure applications (H Series)
- Special clearance O.D. for installation in small casing sizes where standard O.D. mandrels may not be practical (U Series)
- Tubing-string connection threaded on both swaged sections with suitable terminal threads. Special clearance applications may require special thread connections
- Variety of pocket configurations for specialized applications
 - Drift I.D. compatible with tubing-connection drift in most tubing thread types, sizes, and weights
 - 4130 materials for standard and H2S service, with other materials available upon request



R, H, & U-Series

Contact

Address:

MERIDA

Conkal, Yucatan, CP 97345, México

VILLAHERMOSA

Carretera Villahermosa a Reforma km 0.5, Colonia Río Viejo, Villahermosa, Centro Tabasco, CP 86127, Mexico

Email:

contact@smemex.com

Web page:

<https://www.smemex.com/>

Phone:

HQ: +52 999 6885105

O: +52 993 4011177

Upstream Chemical - Gas Lift

Reservoir - Production Solutions

Perforation Modeling - Completion Production Design

Characterization of the Nature of the Oil - Well Testing Analysis

Sand Control Design - Well Modeling