

## MMM-R Series Side Pocket Mandrels

High-pressure side pocket mandrels for 1.5-in [38.1-mm] valves

### APPLICATIONS

- Gas lift production
- Chemical injection, waterflood, or circulation operations
- Single-string completions
- Sweet or sour service

### BENEFITS

- Higher pressure ratings than comparable oval side pocket mandrels
- Precise alignment and insertion of side pocket devices, minimizing the opportunity for hang-up during slickline operations
- Field-proven reliability

### FEATURES

- Positioning sleeve orientation system
- Machined tool discriminator that deflects large tools into the tubing bore
- Integral machined pocket
- Smooth internal and external shoulders
- Availability in a variety of materials

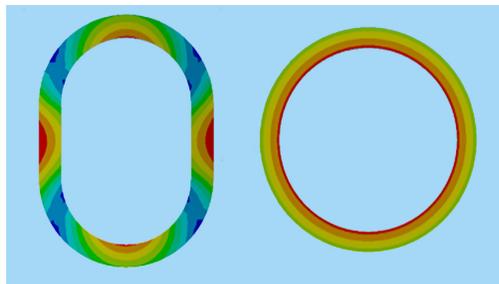
Camco gas lift MMM-R series side pocket mandrels accept 1.5-in [38.1-mm] OD flow control devices and are made up as part of the tubing string when preparing a well for gas lift production, chemical injection, waterflood, or other special applications. MMM-R mandrels have a round body, which provides a strong, robust design with better, more uniform stress concentrations when compared to the traditional oval-body mandrel designs. The MMM-R mandrels are available in a variety of tubing sizes and connection thread types.

The MMM-R mandrel also incorporates a new body and pocket window design, which reduces overall welding.

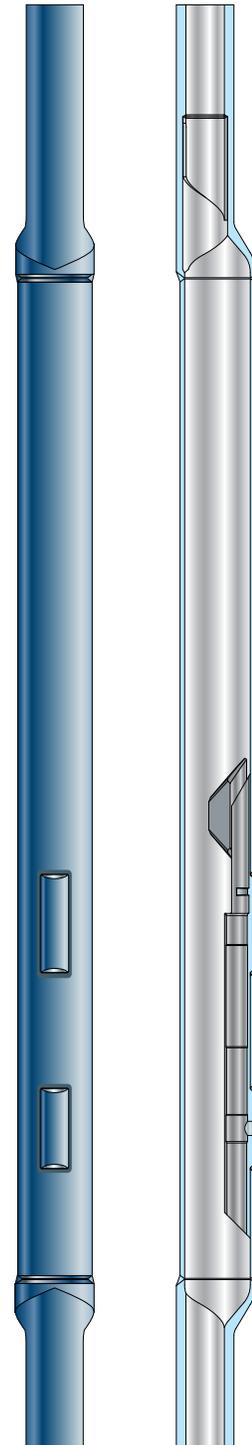
### Design

MMM-R mandrels feature a one-piece pocket and a tool discriminator that keep larger slickline tools from entering the pocket area while guiding the smaller side pocket devices into the pocket. An orienting sleeve located in the mandrels's upper swage helps ensure precise alignment and operation of positive kickover tools in highly deviated wells.

Schlumberger standard side pocket mandrels are manufactured from high-quality low-alloy steel, the metallurgical properties of which are closely controlled through rigid specifications. These mandrels are heat-treated for both sweet and sour ( $H_2S$ ) service, and the mandrels for  $H_2S$  service conform to NACE standard MR0175 for sulfide-stress-cracking-resistant metallic materials.



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*MMM-R series side pocket mandrel.*

# MMM-R Series Side Pocket Mandrels

## Operation

Valves are assembled to the appropriate Camco systems RK series top latch and can be run under pressure by slickline methods into the pocket of the mandrel. When the

valve has been installed into the mandrel pocket, the latch locks under the latch lug, securing the valve in the pocket. In regular gas lift operations, high-pressure injection gas is injected down the casing

annulus. From the casing, gas enters the mandrel, flows through the valve and into the tubing, aiding fluid production.

## MMM-R Series Side Pocket Mandrel Specifications

Tubing Size, in [cm]	Min ID, in [cm]	Drift ID, in [cm]	Major OD, in [cm]	Drift OD, in [cm]	Pressure Rating for Sour Service <sup>†</sup>		Pressure Rating for Standard Service <sup>†</sup>		Latch type	Kickover tool
					Internal, psi [kPa]	External, psi [kPa]	Internal, psi [kPa]	External, psi [kPa]		
2.375 [6.03]	1.935 [4.91]	1.901 [4.83]	4.673 [11.87]	4.767 [12.11]	7,000 [48,263]	6,000 [41,369]	8,000 [55,158]	7,000 [48,263]	RK Series	OM, TP
2.875 [7.30]	2.366 [6.01]	2.347 [5.96]	5.500 [13.97]	5.666 [14.39]	6,500 [44,816]	5,500 [37,921]	8,000 [55,158]	6,500 [44,816]	RK Series	OM, TP
3.500 [8.89]	2.915 [7.40]	2.867 [7.28]	5.968 [15.16]	6.059 [15.39]	7,000 [48,263]	6,000 [41,369]	8,000 [55,158]	7,000 [48,263]	RK Series	OM, TP

<sup>†</sup>Pressure ratings listed are all for low-alloy steel which has been heat-treated for sour service (80,000 psi [552 MPa] yield) or standard service (95,000 psi [655 MPa] yield). These pressures may be reduced due to end connection limitations.

## MMM-R Series Side Pocket Mandrel Accessories

Gas Lift Valve	Gas Lift Orifice	Dummy Valve	Equalizing Dummy	Shear Orifice	Circulating	Chemical Injection	Water Flood
R20-02	RDO-20	RD	CEV	SO2-30R	RKFS	C-31R	RWF-B
R-25P	O-21R		RKED		RCS	RCB-2	RWF-D
RP-6	O2-30R				RGR-2		
WF-14R	NOVA-15				SCS-15		

[slb.com/gaslift](http://slb.com/gaslift)