



PROMAR INTERNATIONAL

COILED TUBING PRODUCTS

Annular Blow Out Preventer

The Annular BOP will close and seal on any size coiled tubing or tool string and will seal at complete shut off. Designed for use during tool string deployment and as a secondary seal system for complex jobs the ABOP also allows stripping out of the well under emergency conditions. Sizes for the PROMAR ABOP range from 3-1/16" through 7-1/16" I.D. with rated working pressures up to 10,000 psi.

The compact design makes the ABOP suitable for use below the quad bop during onshore operations. Due to the cylindrical design the ABOP can be installed immediately above the production tree when utilized on offshore production platforms.

When used below the quad BOP the ABOP serves as a redundant or backup seal for both the pipe and blind rams.

Sealing is possible on irregular tool string crosssections and even collapsed tubing providing the crosssection will not itself allow fluid by-pass.

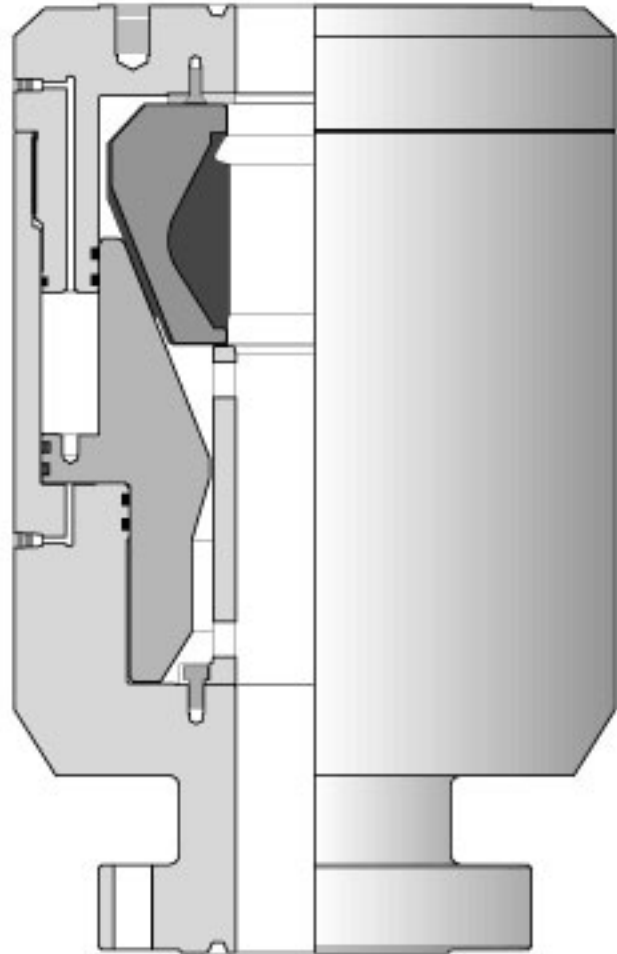
The ABOP is operated with two way hydraulics, assuring full piston retraction and element returning to full bore.

Double seals are used on all hydraulics and weep holes are provided to prevent contamination from well fluids.

The ABOP can also be utilized during hazardous wireline fishing jobs as a safe guard in the event that the tool string becomes stuck across the tree.

The ABOP is available with an optional bracket mounted Debooster assembly.

For additional information regarding the PROMAR ABOP and other coil tubing related products please contact PROMAR INTERNATIONAL, Houston, Texas.



ABOP standard sizes	Operating Pressures (psi)	Max. O.D. *	Min. I.D.	Overall Length *
3-1/16"	10,000	11.5"	3-1/16"	22"
4-1/16"	10,000	16"	4-1/16"	28"
5-1/8"	10,000	19.5"	5-1/8"	33.5"
6-3/8"	5,000	24"	6-3/8"	35.75"
7-1/16"	5,000	28.5"	7-1/16"	38"

* These dimensions are based upon the standard API flange by flange connections. These dimensions are approximations and vary depending upon the connection types.



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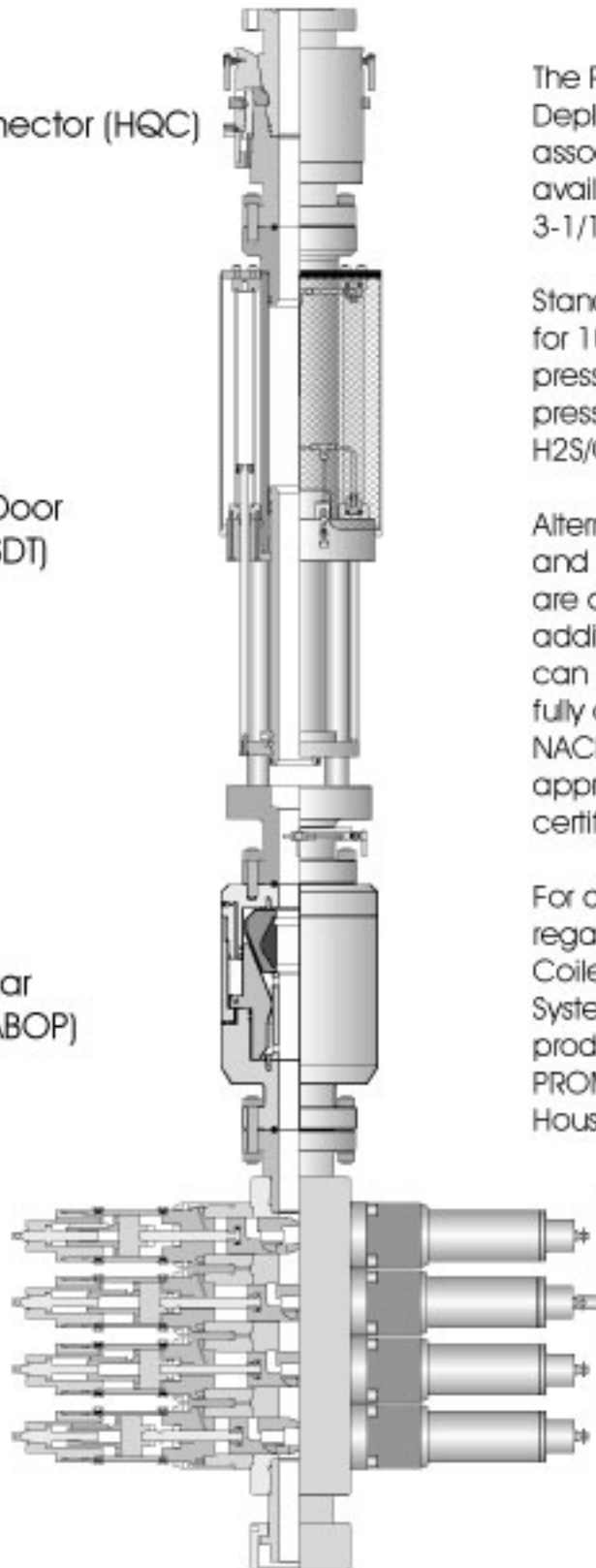
COILED TUBING DEPLOYMENT SYSTEM

Hydraulic Quick Connector (HQC)

Coiled Tubing Side Door
Deployment Tool (SSDT)

Coiled Tubing Annular
Blowout Preventer (ABOP)

Quad Blowout
Preventer (QBOP)

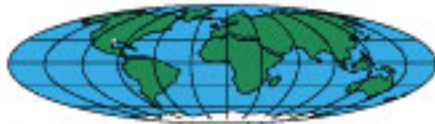


The Promar Coiled Tubing Deployment System and associated components are available in standard sizes: 3-1/16", 4-1/16", 5-1/8".

Standard equipment is rated for 10,000 psi working pressure, 15,000 psi test pressure and for use in H₂S/CO₂ environments.

Alternate sizes, connections, and service ratings are available upon request. In addition, Promar International can provide the entire system fully certified to API and NACE requirements and approved by a third party certifying authority.

For additional information regarding the PROMAR Coiled Tubing Deployment System or other related products please contact PROMAR INTERNATIONAL, Houston, Texas.



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COILED TUBING PRODUCTS

Failsafe Valve (FSV)

ProMar offers a wide range of cylindrical ball type Failsafe Valves (FSV's). These FSV's are high integrity Ball Valves designed to cut wireline or coiled tubing and provide a bubble tight seal in an emergency.

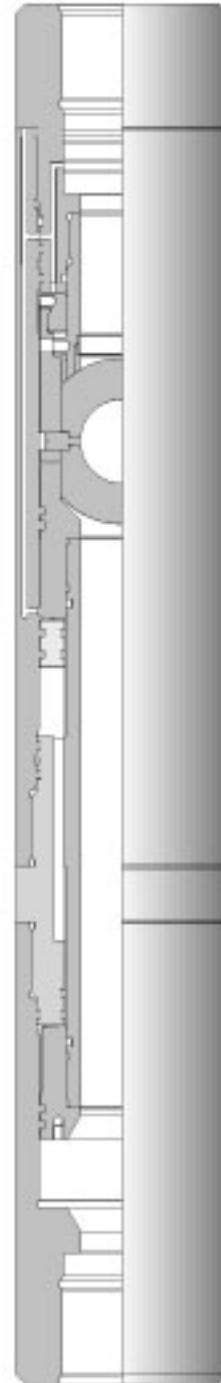
FSV's are offered in several models including the model 'H' Hydraulically actuated, the model 'S' Spring assisted, and the model 'N' Nitrogen assisted.

Failsafe Valves are utilized for additional well control and safety. These cylindrically designed tools are hydraulically operated from a Surface Control Unit (SCU) and are capable of shearing both wireline and coiled tubing either individually or simultaneously while maintaining a pressure tight seal after cutting.

Failsafe Valves are "Failsafe Close" with pump thru capability allowing kill fluids to be pumped into the well if necessary.

FSV's are ideally suited for use in production services to provide emergency shut-in during wireline or coiled tubing well service operations. During well servicing operations the FSV is designed to be directly mounted to the production wellhead. Additionally, a wireline only FSV (Model FWCV) is available.

For additional information regarding the ProMar Failsafe Valves and other coil tubing related products, please contact ProMar International, Houston, Texas.



FSV Size	2.5"	3.0"	4.0"	5.0"	6.3"
I.D.	2.56	3.06	4.06	5.13	6.38
O.D. (Mod. 'H')	7.25	8.25	10.5	11.5	15.5
O.D. (Mod. 'S')	8.25	9.25	11.5	12.5	N/A
O.D. (Mod. 'N')	9.25	9.25	11.5	12.5	N/A
* Length	31"	35"	46"	52"	63"
Working Pres.	10,000 psi	10,000 psi	10,000 psi	10,000 psi	10,000 psi
Service	H2S	H2S	H2S	H2S	H2S

* These dimensions are estimates and may vary for specific tools.



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COILED TUBING PRODUCTS

Hydraulic Quick Connector

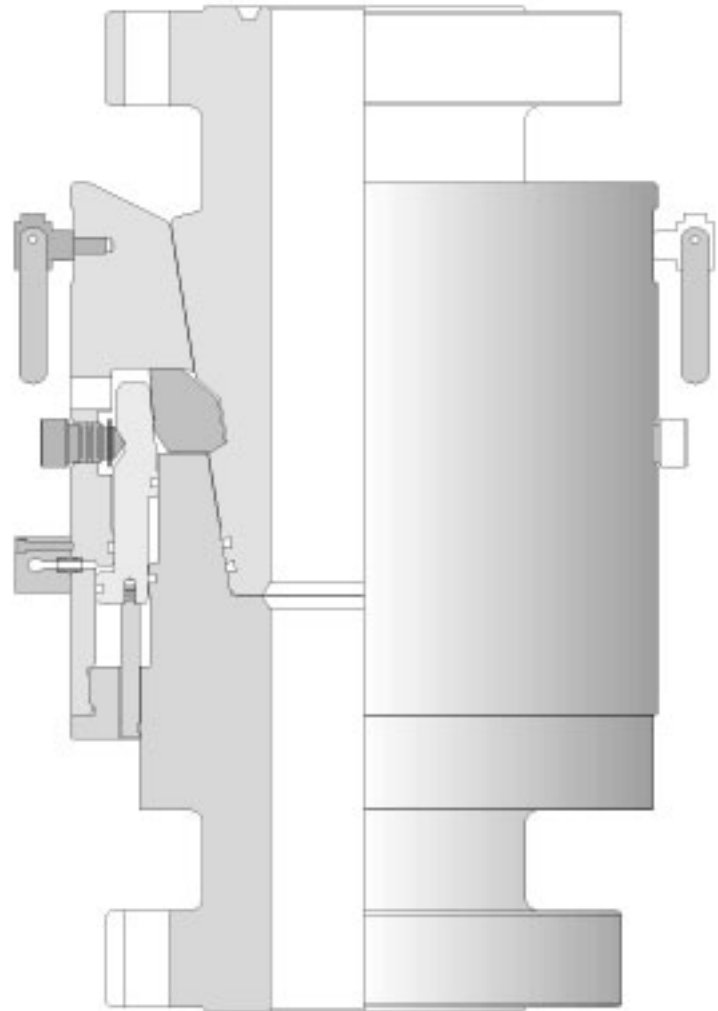
The Promar Hydraulic Quick Connector is a hydraulic latch mechanism designed for use during Coiled Tubing services. The tool allows rapid make-up of the Injector Head to the BOP saving rig time and dramatically increasing safety.

Larger tubing sizes can cause the Injector Head to hang off center making stabbing unusually difficult. However, the tapered profile of the HQC allows stabbing of the Injector Head with up to eight degrees of offset and automatically aligns the Injector Head as it is lowered into position. The tool is locked into position by hydraulically actuating the locking piston upwards. Lock dogs locate on the connector mandrel and force the tapered profiles together. This action eliminates the seal extrusion gap that is present with standard quick unions, subsequently this improves seal reliability and reduces potential seal failure due to movement of the Injector Head.

When connected the operating piston provides a positive lock on the lock dogs and actuates an external constant position indicator pin. Once connected the hydraulic pressure can be bled off. Locking pins are provided to lock the piston in the closed position. Releasing the connector mandrel requires downward hydraulic actuation of the operator piston.

The HQC is available with various end connections, however, standard connections are an integral Union Pin by Collar providing permanent installation on the BOP and minimizing height.

For additional information regarding the PROMAR HQC and other coiled tubing related products please contact PROMAR INTERNATIONAL, Houston, Texas.



HQC standard sizes	Operating Pressures (psi)	Max. O.D. *	Min. I.D.	Overall Length *
3-1/16"	10,000	12"	3-1/16"	21"
4-1/16"	10,000	14"	4-1/16"	23"
5-1/8"	10,000	16"	5-1/8"	31"

* These dimensions are based upon the standard API flange by flange connections. These dimensions are approximations and vary depending upon the connection types.



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Mod. 'S' Stripper Head

The ProMar Model 'S' Coiled Tubing Stripper Head allows the coil tubing to be deployed into live wells with wellhead pressures up to 10,000 psi. The design has been simplified from conventional strippers to minimize the number of components and seals.

When it becomes necessary to change out the packing, the top retainer is simply extracted after the retaining pins have been removed. The hydraulic piston can be used to pump the packing free of the body and all upper components are split to allow element replacement with the coil in place.

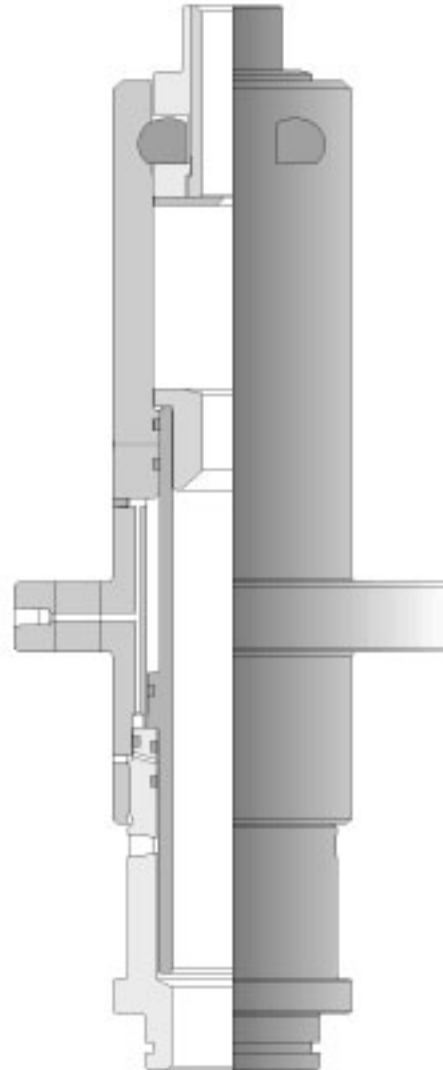
Brass wear sleeves are used above and below the packing to extend element life and centralize the tubing without the risk of damage. Weep holes are provided in the design of the hydraulic seals to prevent contamination from well fluids.

The Stripper Head is mounted to the Injector Head with an industry standard mounting flange and has been designed for correct space-out below the injector head chains.

The Stripper Head is provided with a quick union connection down for rapid makeup to other well control equipment.

The standard Stripper Head can be easily converted for use with any size tubing from 1.00" O.D. to 2.375" O.D. Larger sizes of coiled tubing can be accommodated using the ProMar Model "L" Stripper Head designed to meet those particular requirements.

For additional information regarding the PROMAR Model 'S' Stripper Head and other coil tubing related products, please contact PROMAR INTERNATIONAL, Houston, Texas.



Stripper standard sizes	Operating Pressures (psi)	Max. O.D. *	Min. I.D.	Overall Length *
2-9/16"	10,000	8"	2-9/16"	22"
3-1/16"	10,000	11"	3-1/16"	32"
4-1/16"	10,000	14"	4-1/16"	40"

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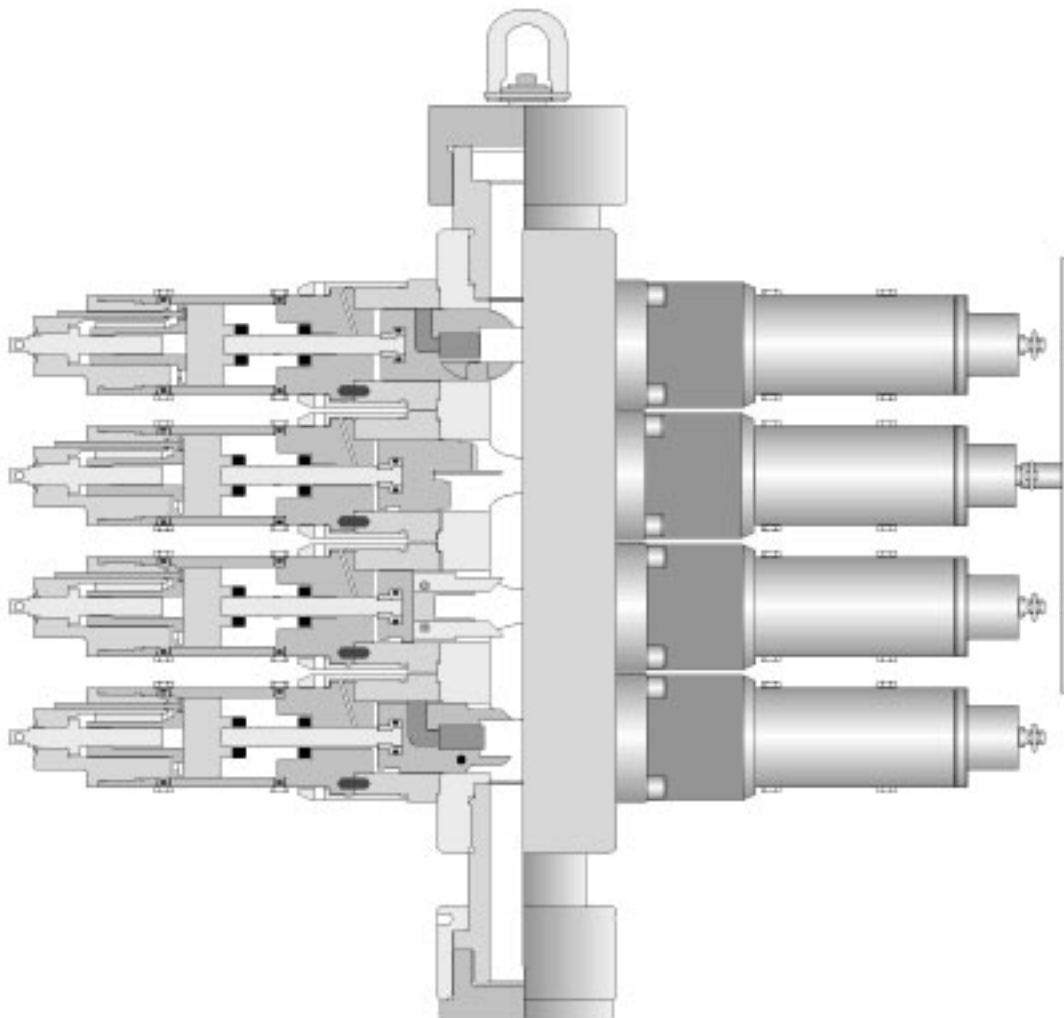
Coiled Tubing Quad BOP

The ProMar Quad Bop is designed to provide a compact BOP system suited for use with coiled tubing sizes from 1" thru 3-1/2" O.D.

ProMar's Quad BOPs are available in sizes 2-9/16" thru 7-1/16" I.D. for up to 10,000 psi working pressure. All sizes feature ; non-rising stems, indicator pins, integral pump-in sub, and integral equilizing valves. The Quad BOP is normally provided with a Quick Union connection up and an Integral Flange down, however, it can be configured to customer requirements.

The cylinders of the Quad BOP are attached to the body using conventional style Quick Unions to allow speedy removal of the cylinders for redressing the rams. Rams are of the keyless integral guide type and can be configured to customer preference. Any combination of; Shear, Blind, Slip, Pipe, or Shear/Blind combination rams can be used in the Quad BOP.

For additional information regarding the PROMAR Quad BOP and/or other coiled tubing related products please contact PROMAR INTERNATIONAL, Houston, Texas.





Side Door Deployment Tool

The Side Door Deployment Tool (SDDT) has been developed for use with a coiled tubing injector head in conjunction with the Promar Hydraulic Quick Connector (HQC), as well as, the Annular BOP (ABOP).

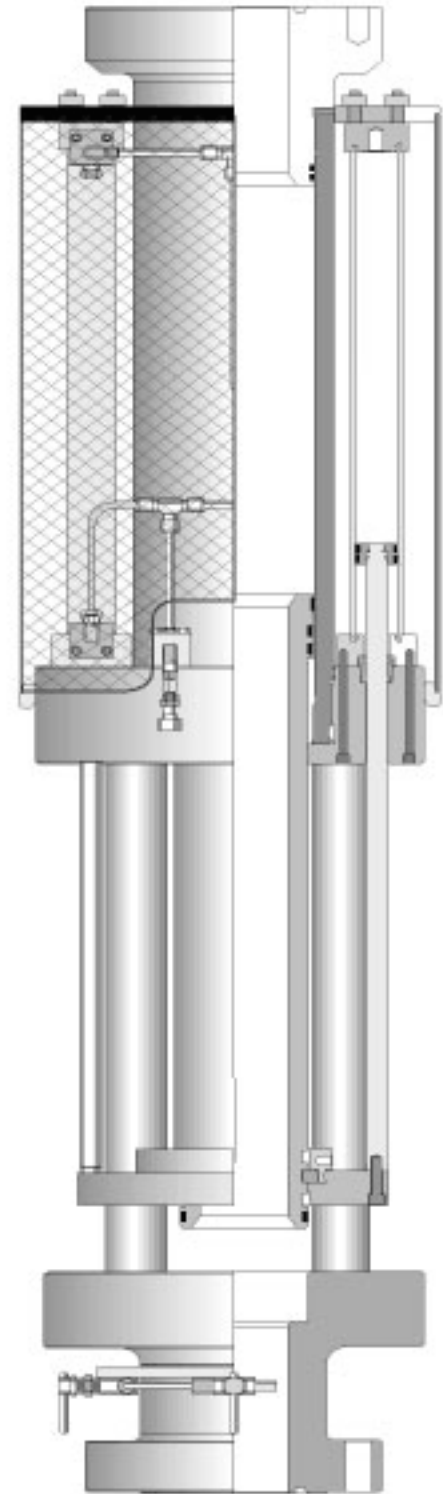
The SDDT is suitable for use in sour gas service conditions and is equipped with a 24.0" minimum opening. The SDDT operates using two double acting hydraulic cylinders with dual upper injection valves and dual lower bleed valves. In addition, the SDDT has been designed with a sliding mandrel position lock.

The SDDT allows the tool string being used to be disconnected from the wireline tool by closing the BOP on the top of the tool string, purging all fluid from the SDDT via nitrogen injection, and opening the side door allowing access to the tool string.

Coiled tubing operations can be carried out by using the Hydraulic Quick Connector to attach the coiled tubing injector head above the SDDT. While the BOP seal rams hold the tool string in place, tubing can be lowered down thru the SDDT and connected to the tool string. Finally, the side door is closed, the BOP rams release the tool string and tubing operations can begin.

To remove the tool string, the operation is simply carried out in reverse.

For additional information regarding the PROMAR SDDT and other coiled tubing related products please contact PROMAR INTERNATIONAL, Houston, Texas.



SDDT standard sizes	Operating Pressures (psi)	Max. O.D. *	Min. I.D.	Overall Length *
3-1/16"	10,000	15.5"	3-1/16"	83"
4-1/16"	10,000	19.5"	4-1/16"	88"
5-1/8"	10,000	19.5"	5-1/8"	88"

* These dimensions are based upon the standard API flange by flange connections.
These dimensions are approximations and vary depending upon the connection types.