The Ideal ESP Blowout Preventer! The Torus Annular BOP is designed to close around multiple objects in the wellbore including electric submersible pump (ESP) cable, tubing and even chemical injection lines without damage. In addition, the Torus will close over open hole and hold up to one-half of its working pressure.

Unlike conventional piston operated annular BOPs, whose packers are almost 80% metal fingers that can crush or cut ESP cable and chemical injection lines, the Torus inner packer is almost entirely rubber and whose hydraulic diaphragm operation allows for precise control of closing pressure that forces the packer to seal around the objects in the wellbore.

Standard end configuration is a flanged bottom by studded top RTJ connections. Other configurations available upon request.

Standard body & bonnet material is ASTM A352 LCC carbon steel for 2,000 psi BOPs, and AISI 4130 75K alloy steel for 3,000 psi BOPs.

Features
- Most compact annular BOP on the market - ideal for short sub-structures.
- Interchangeable Internal parts between API 2,000 & 3,000 C.W.P. preventers
- Inner packer is almost 95% rubber and is not subject to shear stresses between the elastomer and metal “fingers” found in other annular BOP’s
- Packers have been closed 120+ times without failure
- Sizes: 7-1/16”, 9” and 11”
- 2,000 psi and 3,000 psi
- Single and dual annular configurations
- Dual packer design: The outer packer acts as a diaphragm - isolating the hydraulic pressure that closes the inner Packer and is never directly exposed to the well-bore
- Only two moving parts
- Operation: Closure is achieved by direct hydraulic pressure on the diaphragm outer packer diaphragm design, requiring only one hydraulic line. To open the Torus, simply vent the hydraulic pressure and the packer will resume its original shape.

Flanged bottom on the 2,000 psi Torus Annulars have an elongated hole pattern to mate with API 2,000 & 3,000 RTJ connections.

Standard packer material is Nitrile. Other packer material is available upon request.

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Special Designs

The blowout preventer above was a special design request for a LNG storage facility in Livorno, Italy. Each of the three storage caverns used a Byron-Jackson® electric submersible pump at the end of a 9-5/8" casing string to pump LNG from the cavern to trucks and rail cars.

The customer required two annular blowout preventers per cavern for well servicing in a configuration that was as short as possible. Our solution was a “dual annular” Torus with two complete packer sets in one body eliminating the space needed for flanged connections between two single annular preventers.

The customer required “bubble tight” sealing around the 9-5/8" casing and a 4"x1" rectangular flat ESP electric cable. The Torus Blowout Preventers exceeded customer expectations.
Size Matters
Compare the size and weight savings between the Torus 7 1/16" 3M annular BOP VS. other manufacturers below.

Manufacturer A
• 34% Shorter
• 11% Smaller OD
• 24% Lighter

Manufacturer B
• 28% Shorter
• 2% Smaller OD
• 29% Lighter

9" 2000 psi C.W.P. Torus on top of a drilling spool & production valve.

Torus Annular Blowout Preventer

Parts and Model Numbers

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Bore (In.)</th>
<th>C.W.P. (psi)</th>
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Type “K” Stripper Blowout Preventer

THE ORIGINAL ROD AND TUBING STRIPPER THAT IS A TRUE BLOWOUT PREVENTER

The Type “K” performs two important functions on any well servicing operation - the cleaning of sucker rods or tubing when pulling the string out of the well, and well control during that operation. The Type “K” is a blowout preventer capable of sealing around rods or tubing and holding bore pressure to its full rated working pressure, and will close over open hole and hold one-half its rated working pressure.

“Sensitive” Design • The diaphragm design of the Type "K" allows the operator to control the amount of pressure to close the packer against pressure, reducing the friction between the string and the BOP. To open the Type “K”, simply release the pressure and the packer returns to its original shape.

Simple To Use and Maintain • The Type “K” has only one moving part, the packer. It is closed by either hydraulic or pneumatic pressure applied to the O.D. of the packer. Open simply by releasing the pressure. The Packer is easily replaced by removing the studs & nuts and separating the two body parts.

Available Sizes
- 7"
- 8-5/8"
- 9-5/8"
- 10-3/4"
- 11-3/4"
- 13-3/8"

High temperature packers available.

Sizes and working pressures are nominal 3", 4", 5" and 7" available in 1,500 psi, 2,000 psi, and 3,000 psi C.W.P. High temperature packers available.

3" 3,000 psi C.W.P. Type “K” with our 2” I.D. “hour glass” packer for rod stripping

Wide variety of end connections include threaded, API RTJ flanged, ANSI RF flanged, API RTJ studded, and ANSI RF studded. Other connections available.
Torus Series “DS” Annular Blowout Preventer

Security Without Damage

The Torus Annular BOP is designed to close around multiple objects in the wellbore - including electric submersible pump (ESP) cable, tubing, and even chemical injection lines, without damage to them. In addition, the Torus will close over open hole to one-half its working pressure.

DESIGNED FOR UNDER-BALANCED APPLICATIONS

The Torus Series “DS” Annular Blowout Preventer has an outer packer design that uses static seals to prevent pressure from leaking to the environment even without external hydraulic pressure. This feature allows the “DS” blowout preventer to be used in snubbing operations, and other situations where the wellbore is pressurized, and the Series “DS” is not closed.

Flanged bottom on the 2,000 psi Torus Annulars have an elongated hole pattern to mate with API 2,000 & 3,000 RTJ connections.

Standard inner packer material is Nitrile. Other packer material is available upon request.

toruspressurecontrol.com
Torus Series “DS” Annular Blowout Preventer

Parts and Model Numbers

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Dimensions and Weights

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<td></td>
<td>O 22 1/2</td>
<td>26 3/4</td>
<td>32 3/4</td>
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</table>
Well Control Packaging

A Complete System. Torus Pressure Control offers complete work-over well control packages that can include a Torus Annular BOP, self-contained hydraulic accumulator system, and other necessary valves & fittings and mount it all on a tandem axle trailer for ease of delivery to and from the well-site.

Well Control Accessories

To compliment our line of annular blowout preventers, Torus manufactures a wide variety of adapter spools for mounting your Torus to your casing string. These spools are available in multiple custom side outlets to specifically meet our customer’s needs. Additionally, we offer the following products through our master distributor “Piper Oilfield Products”.

- Choke & Kill Manifolds
- B-7 Studs & Nuts
- Accumulators
- Ring Gaskets
- Flow Valves
- Kill Valves

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