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# CONTACT INFORMATION

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ABOUT PRUITT

Pruitt has provided quality equipment for the oil and gas industry since 1958. With a dedication to service in the field as well as the ability to quickly provide custom engineered products, Pruitt continues to deliver the same high quality standards our customers have received for decades.

Pruitt Optimal MPD Services is dedicated to innovative Managed Pressure Drilling (MPD) equipment design and system control. The Pruitt Optimal MPD Services team has developed the optimal MPD solution with the Optimal MPD Lite™ product line.

With service centers located across the world, we are committed to providing prompt, professional service, whether operating in one of the many prominent shale plays or drilling discovery wells.

Engineering / Technical Support & Project Management:

Pruitt can support all of your engineering and technical requirements. Our service-oriented personnel have extensive experience working for operating companies in roles of MPD technical lead, project management and well-site supervision. Coupling this experience with a customer service approach results in our ability to offer a thorough understanding of our customers’ needs.

PRCD 3000 IN HIGH PRESSURE BOWL WITH 13-5/8"-5m MOUNTING FLANGE, 7-1/16"-5m STUDDED OUTLET, 6" FLOWLINE ISOLATION VALVE, AND OPTIONAL WORK PLATFORM
The Modular MPD Lite™ Choke system is designed to be configurable to the customer's needs. The full system is comprised of separate bolt-on units; two 3” electrically actuated linear drilling chokes, one 4” programmable Pressure Relief Valve (PRV), and one 4-1/16” full-bore bypass. The full system incorporates two HMI (human machine interface)/PLC (programmable logic controller) control systems that provide 100% back up in functionality.

The Modular MPD Lite™ Choke system can be supplied as a full system or individual components. Example: basic Set Point Pressure Control could be one 3” electrically actuated drilling choke and the full-bore bypass. In this configuration, only one HMI/PLC control system is supplied as standard.

The intelligent PRV can be set up to have both a Hi-Hi (max set point) and a tracking Pressure Variable set point to protect both surface equipment and the formation.
MODULAR MPD LITE™

- Design Working Pressure 5000 psi [344 bar]
- Dimensions: Variable (Modular System)
- NACE MR-0175 Sour Service Compliant
- Design Temperature: -40°C to 180°C
- ASME B31.1 and ASME B16.5 Piping
- API-16C 3” Drilling Chokes w/Electric Actuators
- API-6A PSL-3 Gate Valves
- USA Class I / Div I, EU ATEX Zone 2 Electrical System

The level of control provided by the modular system is configurable from basic set point control, via remote HMI on the rig floor, to fully automated MPD, via the Optimal control room.
The Optimal MPD Lite™ choke manifold is significantly smaller and lighter than conventional MPD choke manifolds. It can be positioned closer to the rig's BOP, which reduces the overall length of high-pressure piping and improves safety by reducing the high-pressure envelope during the drilling process.

- Design Working Pressure 3000 psi [207 bar]
- NACE MR-0175 Sour Service Compliant
- Dimensions: L-9.8 ft [3.0 m] x W-6.4 ft [1.9 m] x H-6.6 ft [2.0], Weight-9259 lb [4200 kg]
- Incorporates four diaphragm-sealed pressure transducers for redundancy
- SCADA PC control isolation valves & chokes
- Dual Redundant 4” nominal bore flow paths
- Inbuilt overpressure relief system
- Advanced valve and choke diagnostics monitoring (real-time asset management)
- Removable upper frame & full opening panels give access and protection
- Dual redundant power supply able to run system independent of rig power
- Independent pneumatic control available in the event of total power failure
- Operator friendly interface for use with reduced manpower crews
- Configured to suit the requirements of both MPD / UBD operations
- Utilizes adaptive Self-Tuning PID Controller
The Optimal MPD System can operate from our own supplied control room (shown at left). The team can also operate the system from the client supplied office, portable office or mobile A60 unit. If required, we are able to utilize a wifi-connected ATEX laptop to control the system from the rig floor, allowing for face-to-face communication with the driller. Optimal benefits from EMERSON global product support and is working exclusively with EMERSON Process Management to develop a compact, fully automated SCADA MPD control system.

OPERATOR CONSOLE

Pruitt’s Optimal HMI (Human Machine Interface) is an intuitive console for the MPD equipment operators to monitor, operate and control the MPD system.
All equipment is designed for ease of use, field inspection and repair, thereby minimizing NPT. Optimal MPD Services uses advanced, real-time diagnostic systems routinely utilized in the downstream side of the petroleum industry to give real-time valve, choke and flow conditions.

**Coriolis Meter**
- Design Working Pressure 1440 psi [100 bar]
- Dimensions: L-5.9 ft [1.8 m] x W-5.2 ft [1.6 m] x H-9.5 ft [2.9 m], Weight 6217 lb [2820 kg]
- SCADA / PC real-time communication flow & density
- Advanced diagnostics monitoring (real-time asset management)
- Advanced monitoring of drilling mud returns containing entrained gas

**Vent / Flare Stack**
- Design Working Pressure 285 psi [19.7 bar]
- Dimensions: L-20 ft [6.1 m] x W-8 ft [2.4 m] x H-9 ft [2.7 m], Weight 14330 lb [6500 kg]
- 12” or 8” nominal bore piping
- Incorporates monitored Flame Arrestor when used as atmospheric MGS or bypassed when used with pressure vessel
Drill Thru Degasser

- Design Working Pressure 185 psi [12.8 bar]
- ASME VIII, ZONE 1
- Maximum wind speed loading of 120 mph [193 km/h]
- Designed to be used as either an atmospheric drill thru degasser or as a pressurized vessel suitable for UBD or 2-Phase MPD operations
- Vessel incorporates all necessary flanges for pressurized operations
- Dimensions: Vessel Transport, L-21 ft [6.4 m] x W-7.5 ft [2.3 m] x H-7.5 ft [2.3 m], Weight 16000 lb [7257 kg] (dry)
- Dimensions: Support Transport, L-16.5 ft [5.0 m] x W-7.5 ft [2.3 m] x H-7.5 ft [2.3 m], Weight 8500 lb [3855 kg]
- Dimensions: In Use, H-37.5 ft [11.4 m] x W-7.5 ft [2.3 m] x L-7.5 ft [2.3 m], Weight 24500 lb [11113 kg]
- Incorporates diaphragm sealed pressure transducers for SCADA control & monitoring
- Four-part assembly for ease of transportation
- 4" 150 psi inlet and 12" gas outlet
- 22 ft [6.7 m] liquid u-seal for atmospheric operations
- Additional single skid drill thru degasser available with a 16ft liquid u-seal

www.pruitt.com
Advances in drilling technologies have driven Pruitt’s development of higher pressure rated RCDs that are designed for utilization in Managed Pressure and Underbalanced Drilling applications. The pressure ratings and high RPM capabilities provide the necessary performance range required in modern drilling operations. Pruitt’s PRCD 2000 and PRCD 3000 series were the basis for the creation of the new PRCD 3016 model which has successfully fulfilled the requirements to meet API Specification 16RCD – Rotating Control Devices and received the authority for use of the official API Monogram.

### PRCD 3016 SPECIFICATIONS

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<tr>
<th>SINGLE/DUAL ELEMENT</th>
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<tr>
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<td>MAXIMUM DYNAMIC RATING psi [bar]</td>
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<tr>
<td>PASS THRU DIAMETER WITHOUT BEARING inch [mm]</td>
<td>13.625 [346.1]</td>
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The Pruitt High Pressure Series RCDs are designed for utilization in Managed Pressure and Underbalanced Drilling applications. The pressure ratings and high RPM capabilities provide the necessary performance range required for modern drilling operations. The Pruitt design allows for flexibility in the sizing of mounting flanges while outlet sizes are adaptable as well. Additionally, the Pruitt HP systems can be used with all 500 Series bearing assemblies for quick transition between high pressure and low pressure scenarios.
PRUITT HIGH PRESSURE SERIES RCDs

**HIGH PRESSURE SERIES SPECIFICATIONS**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PRCD 3000</th>
<th>PRCD 2000</th>
<th>PRCD 1509</th>
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<td>7.0&quot; [177.8]</td>
<td>9.0&quot; [228.6]</td>
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</table>

**APPLICATIONS**
- Managed Pressure Drilling
- Under Balanced Drilling
- High Pressure, High Temperature Applications
- Geothermal Drilling

**FEATURES & BENEFITS**
- Fully Automated High Pressure Power Unit
- Remote Operated Hydraulic Clamp minimizes NPT
- Seal Elements for all mud types and drill pipe sizes
- API 6A Flange Connections

**AVAILABLE OPTIONS**
- Swivel Bottom Mount Flange
- Snubbing Adapter
- RCD Work Platform
- Multiple Outlet Sizes
- Dual Outlets
- Pruitt Fluid Containment System

PRCD 2000 IN HIGH PRESSURE BOWL WITH HYDRAULIC CLAMP. SHOWN WITH 13-5/8”-5M MOUNTING FLANGE AND 7-1/16”-5M STUDDED OUTLET.
The PRCD 500 series is based on the time tested, patented design that has been the cornerstone of Pruitt’s success in the drilling industry. The 500 Series RCDs are compatible with any flange or surface conductor pipe. Advances in R & D have led to the availability of the PRCD 508-G which requires no external lubrication, eliminating the need for maintenance by rig crew. The 500 Series RCDs come with a remote hydraulic clamp, but manual clamps remain available.
PRUITT 500 SERIES RCDs

500 SERIES RCD SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PRCD 508</th>
<th>PRCD 508-G</th>
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<td>LUBRICATION</td>
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<td>13.625 [346.1]</td>
<td>13.625 [346.1]</td>
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</tbody>
</table>

APPLICATIONS

- Air Drilling
- Conventional Drilling
- Geothermal Drilling

FEATURES & BENEFITS

- Manual or Remote Operated Hydraulic Clamp
- PRCD508-G Eliminates Maintenance by Rig Crews
- Compatible with Pruitt High Pressure Mounting Bowls
- Seal Elements for all mud types and drill pipe sizes

AVAILABLE OPTIONS

- API 6A Flanged Connection
- Weld-On Conductor
- Overshot Connection
- Swivel Mount Flanges
- Custom Bowls
- Pruitt Fluid Containment System

www.pruitt.com
RCD Mounting Bowls can be manufactured to work in conjunction with virtually any size Annular BOP or Conductor Pipe. Flowline outlets can also be sized to meet customer requirements. Dual outlet bowls are available for use in collaboration with MPD drilling or any situation when an additional flowline is desired.

The Hydraulic Clamp is designed with user safety and simplicity in mind, as remote operation minimizes both time and manual intervention beneath the rig floor. However, manual clamping bowls are available if required.

**ANNULAR MOUNTING OPTIONS**
- API 6A Flanged Connection
- Swivel Mount Flange

**CONDUCTOR MOUNTING OPTIONS**
- Weld-On Conductor
- Overshot Connection

**500 SERIES CLAMPING OPTIONS**
- Manual Bolting Clamp
- Remote Operated Hydraulic Clamp

Safety and convenience are the driving forces behind the design of the Pruitt Fluid Containment System (PFCS). The PFCS can be utilized during operations to prevent drilling fluid from contacting personnel and assist in maintenance of a clean and safe working environment. When arriving on location, the PFCS comes installed on the Pruitt bowl for quick and easy installation. The vertically adjustable barrier support rods provide a customized installation under the rig structure.

- Heavy duty barrier compatible with various drilling fluids
- Multiple drain outlets allow for various mounting orientations and vessel placement
- Self-contained system that requires no connection to the rig structure
- Trapped fluid may be diverted to a containment vessel or rig cellar to be reclaimed or disposed of properly
- Available for all RCD models
PRUITT ACCESSORIES

RCD WORK PLATFORM
The RCD Work Platform provides a sturdy, secure work platform while containing spillage from above. Installed atop the Annular BOP, the RCD Work Platform works in conjunction with our RCD Bowl and requires no additional mounting hardware. The RCD Platform is compatible with most 11”-5M or 13-5/8”-5M Annular BOPs.

SNUBBING ADAPTER
When snubbing operations are required, simply retrieve the RCD Bearing and in its place, install the Pruitt Snubbing Adapter, thus reducing the time rig crews are required to work on a shut-in BOP.

CASING STRIPPER
Replace the RCD Bearing with the Casing Stripper when running casing. The Casing Stripper is especially useful in containing cement or drilling fluid returning to the surface. Sizes of the Casing Stripper range from 4-1/2” to 18-5/8”.

PIPE WIPER BOX
While tripping out of the hole, the Pruitt Pipe Wiper will contain drilling mud in the wellbore.
TERMS & CONDITIONS

GENERAL CONDITIONS UNDER WHICH PRUITT OPTIMAL MPD SERVICES ARE RENDERED AND EQUIPMENT IS RENTED

It is agreed that Pruitt Optimal MPD Services shall not be liable or responsible for loss, damage or injury to a well for which equipment or services are supplied or responsible for use of equipment supplied or from acts of any person engaged in performing services on or to a well. Excessive refurbishing costs caused by customers’ misapplication, destruction, or abuse of rented equipment are to be borne by the party for whom such equipment is furnished. Party for whom such equipment and services are furnished assumes all responsibility while equipment is furnished and/or services rendered, and agrees to hold Pruitt Optimal MPD Services or its assigns harmless for injuries to persons or property resulting from said services. Said party for whom such equipment and services are furnished assumes all incidental expenses such as telephone, freight, express, and drayage charges.

WARRANTY

The only warranty made by Pruitt Optimal MPD Services in connection with any products, or parts thereof, furnished or rented to customers, is that the same shall be free from defects of workmanship and material. The liability of Pruitt Optimal MPD Services or its assigns for breach of such warranty, when such is shown, shall be limited to the replacement of, or the allowance of credit for, the part or parts shown to be defective when used for which they were intended.

RESPONSIBILITY

It is expressly understood that Pruitt Optimal MPD Services shall not be responsible for damages or losses whether direct, indirect, special, consequential or any other kind whatsoever occasioned by or incidental to the use of any products, or parts thereof, whether resulting from the negligence of Pruitt Optimal MPD Services or any of its agents, servants, or employees. No agent, employee or representative of Pruitt Optimal MPD Services is authorized to alter or amend in any fashion the provisions contained in the conditions.

TAXES

All Federal, State or Municipal taxes, except income or ad valorem taxes now or hereafter imposed with respect to services rendered or rental of equipment, and/or the processing, manufacture, repair, delivery, transportation, and/or proceeds of the merchandise or equipment rented herein specified shall be for the account of the buyer. The amount thereof shall be added to and become part of the price payable by the buyer.

TERMS

Unless otherwise specified, published and quoted prices are due and payable thirty (30) days net cash. Interest at the highest percent per annum allowed by law will be charged after due date. All settlements are subject to approval of the Accounts Receivable Department.