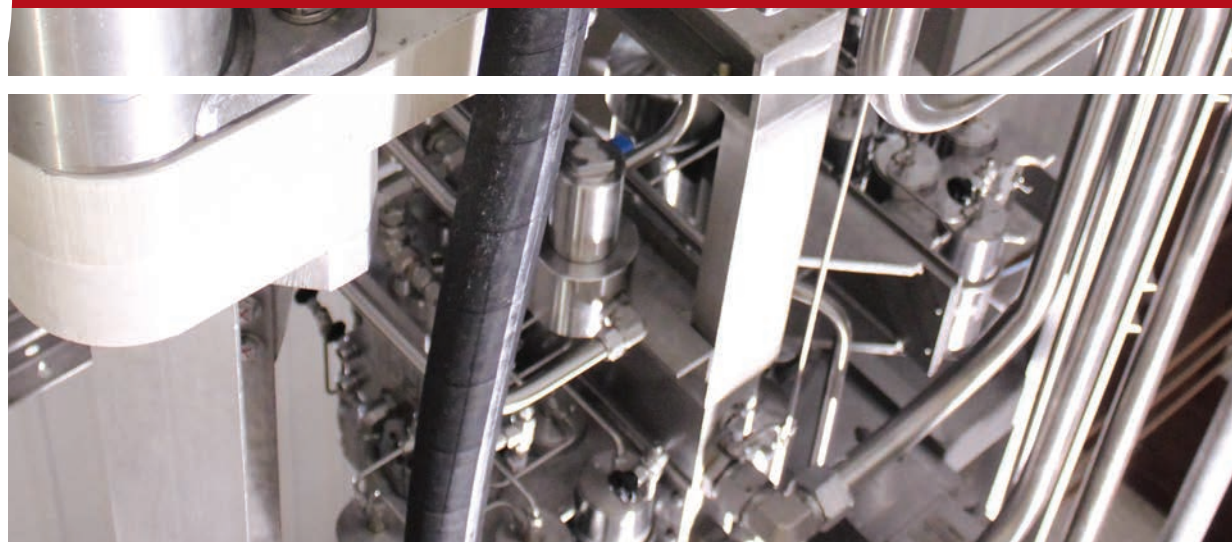


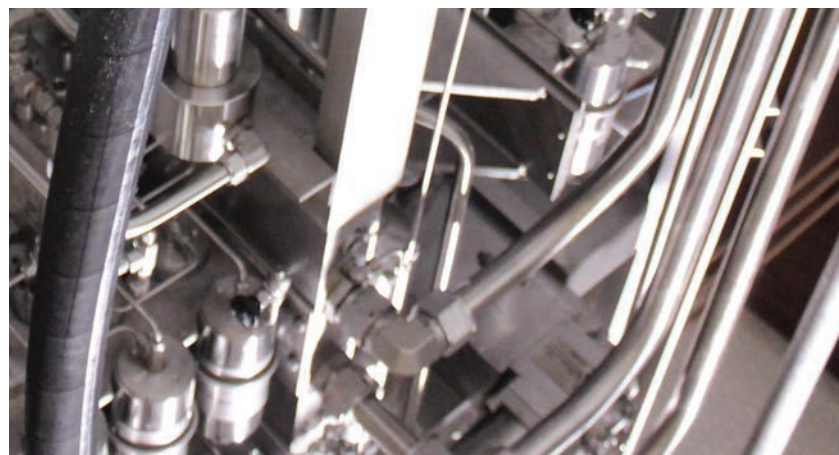
TM  
**TYPE '80**

**AXON** | ENERGY PRODUCTS

# BOP CONTROL SYSTEMS



**AXON TYPE '80™**  
is the legacy of  
**PAUL KOOMEY'S**  
industry-leading  
**SURFACE + SUBSEA**  
drilling innovations





# CORPORATE OVERVIEW

AXON Energy Products is a global oilfield equipment manufacturer, engineering provider, and service company driven by Alternative Thinking™.

With diverse product groups and multiple locations spanning eight countries, we can seamlessly deliver equipment package solutions for a full spectrum of oilfield needs, including:

- Pressure Products
- Well Intervention Products
- Drilling Products
- Rig Concept and Design
- Downhole Products
- Tubular Products

# PRESSURE PRODUCTS OVERVIEW

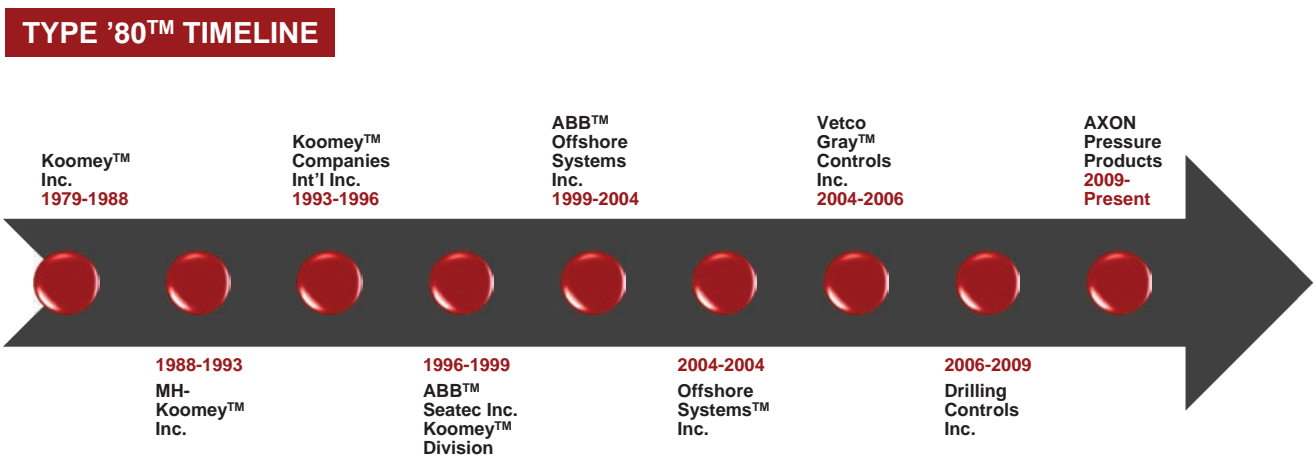
# BOP CONTROLS



AXON has a wide range of pressure control, flow control and wellhead/well test products for surface and subsea applications. From system designs and individual products to technical support, the pressure products group delivers exceptional pressure control solutions for your unique challenges.

## BOP Control Systems

Like all our pressure products, AXON's line of TYPE '80™ blowout preventer (BOP) control products are engineered for reliable performance and ease of maintenance. In particular, our TYPE '80™ BOP Control Systems stem from the original designs developed by Mr. Paul Koomey.



## 35+ Years of Field-Proven Performance

Since 1979, our BOP controls group has been committed to the same steadfast, customer-centric values. Several key members of our division have even been with the company since the early 1980s. This strong foundation, along with the dedicated folks that joined through the years, are the backbone behind consistently delivering the high-quality, reliable equipment that has come to be expected of the TYPE '80™ line.



# PRODUCT LINE

Our TYPE '80™ BOP Control Systems provide the reliability and control required for demanding offshore and land applications. From customized designs to global services, you can count on AXON for end-to-end expertise.



### PRODUCT LINE SUMMARY

- ➔ **CLOSING UNITS**  
for Surface & Shallow Water
- ➔ **PILOTED HYDRAULIC SYSTEMS**  
for Mid-depth Water
- ➔ **MULTIPLEX SYSTEMS**  
for Deep & Ultra-Deep Water

**A full range of auxiliary equipment,** including proprietary SPM valves, TR™ regulators and packer seals, adds to the overall reliability of our field-proven BOP control systems.

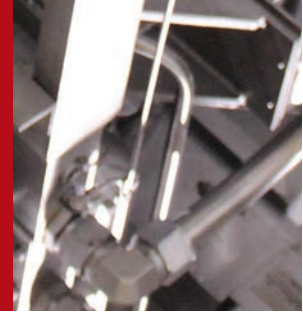


### Features / Benefits

- Both custom and standard designs are manufactured in accordance with API 16D (monogramming available)
- Choice of pump systems & accumulators (standard service, water service, 11-90 gal.)
- Pulse testing of systems during operations
- Through the use of a wide selection of standardized components, each system is custom-tailored to meet the customer's application and preferences
- Modular design eases maintenance
- Decades of field-proven reliability with industry-leading service life
- AXON proprietary SPM valves and TR™ regulators add value through readily available spare parts and industry-leading aftermarket support

# BOP CONTROL SYSTEMS OVERVIEW

# DESIGN BENEFITS



## CUSTOMIZATION

- ➔ Standard and custom designs available
- ➔ Choice of pump system and accumulator configurations

## QUALITY

- ➔ High-quality, North American and Western European components
- ➔ Industry-standard proprietary components, such as TR™ Regulators
- ➔ Dependable quality, delivery and aftermarket service

Engineered + manufactured  
in accordance with API 16D



API 16D-007  
API ISO 9001:2008 ISO-2359  
API Spec Q1 Q1-2263  
API ISO/TS 29001 TS-2142

## PERFORMANCE

- ➔ Reliable position indication using pressure switches
- ➔ Superior filtration utilizing Absolute Micron filters

## SAFETY

- ➔ Pressure transducers for safe remote indication
- ➔ Lockable cylinder to ensure safety during drilling operation





# SURFACE & SHALLOW WATER

AXON offers a wide variety of equipment for surface and shallow water applications, including:

- Surface Closing Units
- Shear-Boost Assemblies
- Dedicated Shear Circuits
- Diverter Control Panels & Unitized Modules
- Surface Accumulator Racks
- Remote Control Panels
- UPS Battery Backup Assemblies
- Data Logging Equipment & Software

# SURFACE & SHALLOW WATER CLOSING UNITS



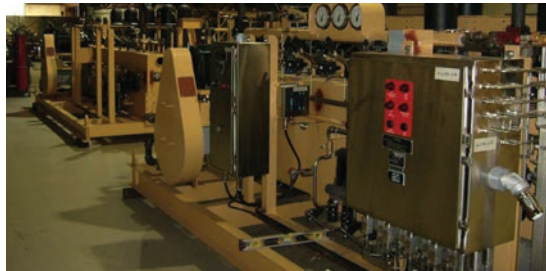
ELECTRO-PNEUMATIC, REMOTE OPERATED UNIT



ELECTRO-HYDRAULIC, REMOTE OPERATED UNIT



DIESEL WORKOVER UNIT WITH CE APPROVAL



MANUFACTURE & ASSEMBLY

AXON's surface closing units feature a modular design with standardized components, dimensions and weights. This proven design features industry-standard components utilizing high-quality materials sourced from North America and Western Europe. Features are also incorporated for superior reliability, such as pressure switches for dependable readback.

## Interface Options

### Pneumatic

- Pneumatic Position Indication
- Pneumatic Alarms
- Electric Position Indication
- Electric Alarms

### Electric Pneumatic

- Discrete Electric Communication
  - Electric Pushbutton Remotes
- PLC-Based Communication
  - Electric Pushbutton Remotes
  - Touchscreen Remotes

### Electric Hydraulic

- Discrete Electric Communication
  - Electric Pushbutton Remotes
- PLC-Based Communication
  - Electric Pushbutton Remotes
  - Touchscreen Remotes

## Pump Options

- Pneumatic
- Electric Triplex
- Diesel





# MID-DEPTH WATER

AXON's piloted hydraulic BOP controls system offers field proven, dependable operation for mid-depth applications. Components of this system are available both individually and packaged:

- Hydraulic Power Units
- Hydraulic Piloted Points of Distribution (PODs)
  - Hose-Down-Riser
  - Hose-Down-Wireline
- Fluid Mixing Systems
- Hydraulic Control Manifolds
- Remote Control Panels
- Deadman Autoshear
- Reels
- Umbilicals
- UPS Battery Backup Assemblies
- Diverter Control Panels
- Surface Accumulator Racks
- Stack-Mounted Accumulators



# MID-DEPTH WATER PILOTED HYDRAULIC



## Hydraulic Power Unit

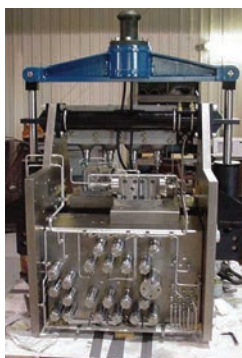
AXON automatic HPUs allow you to rapidly charge accumulator banks with the electric motor driven, positive displacement, hydraulic pumping modules. Designed to meet customer specifications and applicable regulations, each of these AXON HPUs operates at 3,000 or 5,000 psi and offers ease of use and long service life.



## Piloted Hose-Down-Wireline POD

Our TYPE '80™ subsea control POD provides maximum dependability and response during offshore drilling operations. This AXON control POD is designed to accommodate the high fluid volumes required by today's large subsea BOP stacks.

The overall POD assembly consists of three sections: the retrievable valve block, riser-mounted blocks permanently mounted on the lower marine riser package, and stack-mounted blocks permanently mounted on the BOP stack.



## Piloted Hose-Down-Riser POD

The AXON hose-down-riser POD can be run or retrieved without the hydraulic hose bundle which is clamped to the riser instead of the POD wirelines.



# DEEP & ULTRA-DEEP WATER

AXON supplies integrated packages of pressure control components for deep to ultra-deep water applications, such as:

- Multiplex Control POD
- Acoustic Control POD
- Central Control Unit
- Power Distribution Panel
- Uninterruptable Power Supply
- Remote Control Panels
- Accumulator Racks
- Reels
- Umbilicals
- Deadman Autoshear
- Charge & Dump Assemblies
- Fail-Safe Assist Assemblies
  - Fail-Safe Open
  - Fail-Safe Close

# DEEP & ULTRA-DEEP WATER MULTIPLY SYSTEMS



## Multiplex Control POD

AXON's subsea MUX control POD assembly consists of a male POD, and a female receiver mounted on the Lower Marine Riser Package. Our compact design features subplate mounted control valves and pressure regulators assembled on the subsea valve control manifold to operate up to 96 subsea hydraulically controlled functions.



## Acoustic Control POD

Our acoustic control system has a separate, stack-mounted acoustic POD for performing emergency disconnect operations. This secondary control method uses an acoustic link from the surface rather than the electric hydraulic MUX communication utilized by the MUX PODs.

## Central Control Unit

AXON's CCU is the communications interconnect for all control panels and the subsea electronics. Designed to operate in safe, non-hazardous areas, this unit includes control computers and network equipment.



## Power Distribution Panel

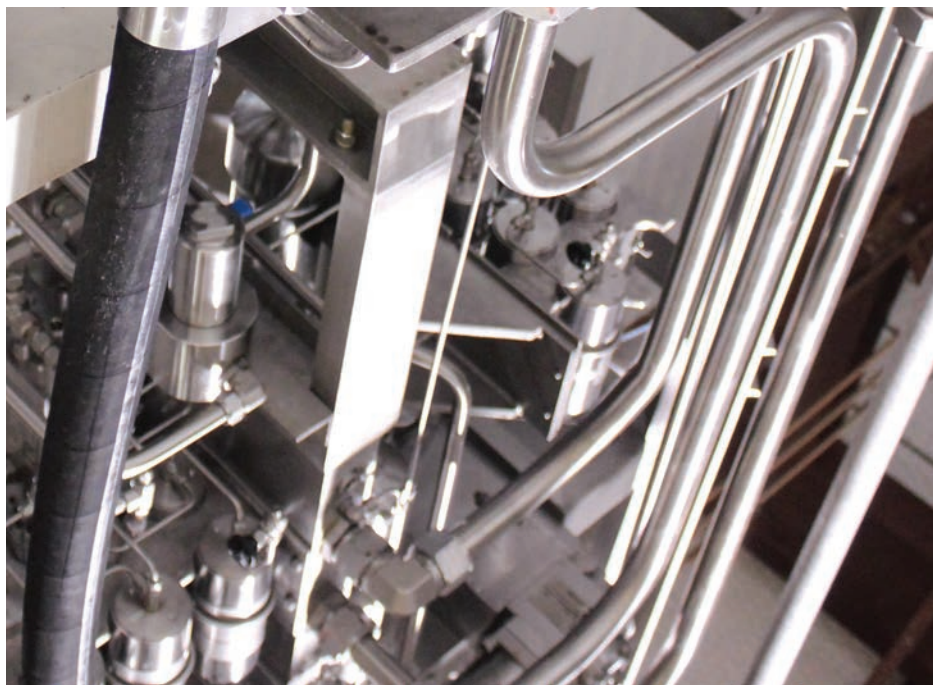
Designed for maximum reliability and serviceability, our PDP provides high-quality electric power to the entire MUX control system.



# AUXILIARY EQUIPMENT

Specifically designed to complement the TYPE '80™ product line, AXON's full range of auxiliary equipment adds to the overall reliability of our field-proven BOP control systems.

- Riser Fill Valve Systems
- TR™ Regulators
- SPM Valves
- Test Units
- Chart Recorders
- Crown Block Savers
- Status Indication Modules



# AUXILIARY EQUIPMENT



## Reels: Cable, Hotline, Piloted Hose, Riser Fill Valve

AXON's hose and cable reels are equipped for safe handling and storage of subsea hose and cable bundles. Our reels are operated by an air motor with a chain and sprocket drive. Moreover, a disc brake system stops the reel and a positive locking pin is used to keep the reel in place.

## Diverter Control System: Module, Stand Alone Panel

Our diverter control system actuates solenoids to control the pilot-operated diverter valves. Available as a stand-alone, skid-mounted panel, or unitized as a module of the BOP control unit, these units can be provided with automatic sequencing and safety interlock circuits.

## Remote Panels: Air, Electric, Touch Screen

AXON's driller's control panel provides full control of the BOP stack and selected auxiliary functions, even in adverse conditions. Units can also be certified to meet requirements for hazardous area operation, as well as numerous other specifications and regulations.



## Deadman Autoshear Systems: Multiplex, Piloted

The Type '80™ DMAS uses zero interflow hydraulic trigger valves to ensure instantaneous activation of the DMAS unit in the event of signal pressure loss. This results in minimal fluid loss from interflow during activation, ensuring a quick response time for closure of the wellbore. For added versatility, dual TR™ regulators operate the shear rams and other subsea equipment at varied pressures.



## TR™ Regulators

AXON's adjustable, pressure reducing & regulating valve is used to control and maintain an outlet pressure to a secondary circuit that is lower than or equal to the primary circuit's supply pressure. Our patented TR™ regulator senses any changes in the supply pressure and automatically compensates to maintain the constant function or outlet pressure as set by the operator. These modular, configurable valves may be manually, pneumatically or hydraulically operated.



TYPE '80™ BOP CONTROL SYSTEMS

# AUXILIARY EQUIPMENT



## SPM Valves

Our SPM valves are high-pressure, high-flow, two-position, three-way directional control valves that are configured to an un-actuated and default position as either normally open or closed. Upon actuation, the valve configuration immediately moves to the opposite position (either closing off or allowing full flow).

## Accumulator Racks: Auxiliary, Diverter, HPU, Subsea

The AXON skid-mounted accumulator racks provide flexibility when space limitations do not allow the accumulators to be mounted on the master skid. Additionally, our skid-mounted accumulator packages make it easier to increase the accumulator capacity when required by drilling program changes.

## Status Indication Modules

Available with newly manufactured equipment or as an upgrade to existing equipment, our status indication modules may be electrically operated or pneumatically operated. These modules can provide: audible and visible alarm indication, true BOP stack function position indication via pressure switches, or both.

## Uninterruptable Power Supply: Emergency Battery Power Packs

AXON's UPS provides at least two hours of dependable, emergency power for remote control panels, computers and instrumentation.



## BOP Test Equipment (Chart Recorders & Test Units)

This BOP Test Equipment is ideal for high-pressure testing BOP stacks, choke and kill lines and X-mas trees. Test units are available in unit-mounted, portable, skid-mounted & self-contained skid-mounted options. We also provide related accessories, including stand-mounted chart recorders and high-pressure hoses.



## Crown Block Savers

Our crown block saver product line prevents the travelling block from running into the crown block. These crown block savers are available in standard, retractable, high-low and long-toggle valve options.

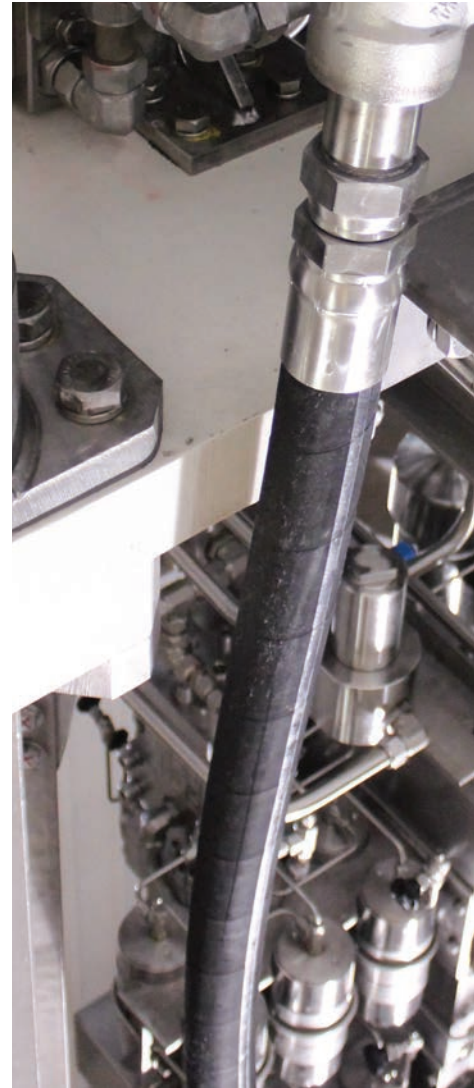
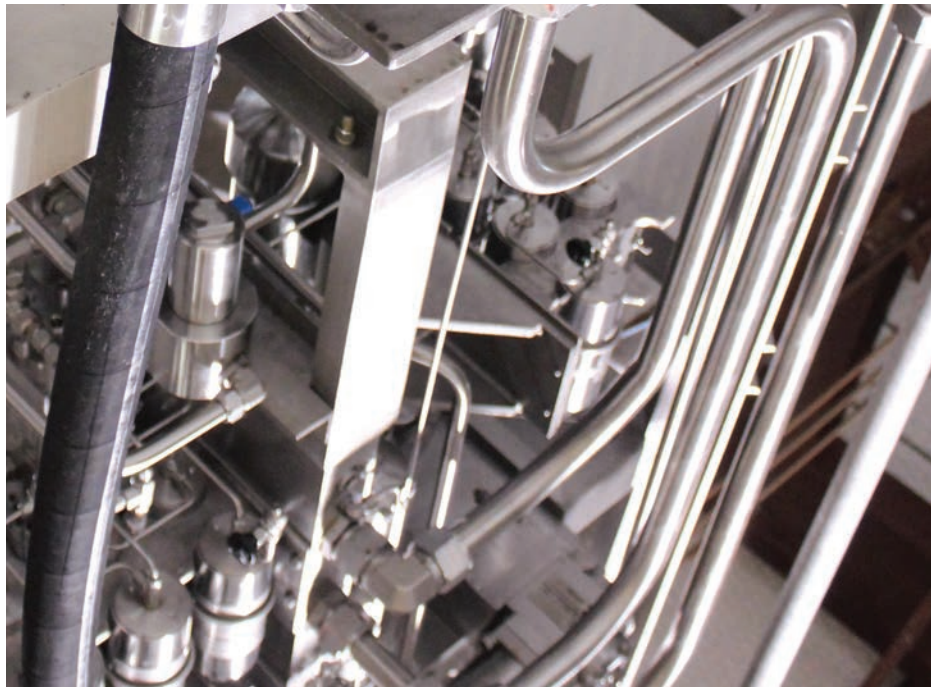


# AFTERMARKET SERVICES

AXON Pressure Products provides 24/7 field service and a large inventory of the most requested parts to minimize downtime on your site. In addition to an extensive global repair and service center network, our experienced technicians can repair all AXON OEM and most leading manufacturers' equipment.

Services include:

- Repair / Remanufacture
- Recertification
- Field Services
- Replacement Parts



## AXON Energy Products Corporate Headquarters

10343 Sam Houston Park Dr, Ste 210  
Houston, Texas 77064 USA

☎ 832.581.4100

🌐 axonep.com

✉ sales@axonep.com

## Pressure Products Controls Headquarters

8909 Jackrabbit Road  
Houston, Texas 77095

☎ 281.855.3200

24/7 Aftermarket Support

☎ 1.855.442.9660

## Aftermarket is not an Afterthought™

AXON's focus is to provide you with high-quality products that perform, as well as ensure you receive continued satisfaction through our aftermarket training, repair, and servicing.

## AXON TYPE '80™ BOP Control Products

The TYPE '80™ BOP Controls line is the legacy of Mr. Paul Koomey's surface & subsea drilling innovations. Dating back to 1979, our group has consistently delivered high-quality, reliable equipment worldwide.

