Drill Force
AC Power Systems
Drill Force AC Power Systems
A worldwide reputation of reliability

We are the leading provider of drive solutions to the worldwide drilling industry. NOV has maintained focus on drilling drives coupled to drilling machinery and ensuring interface with control systems to provide seamless integration and operations.

Our Power Systems engineering staff is highly experienced and are ready to work with you. ATEX certification, CE marking, CSA, DNV, and ABS approvals, harmonic analysis, and extensive documentation are readily available. NOV has a drilling division compromised of several known brand name companies, which add to its breadth of drilling drives experience, including Baylor, Ross Hill Controls, IPS-Integrated power systems, and Tech Power Controls. Through our comprehensive knowledge and vast experience of drilling machinery, instrumentation, and controls, we offer the most comprehensive drilling system integration in the industry.

Drill Force VFD systems
Drill Force is the latest product offering in NOV's innovative line of power systems. Leading the charge of the Drill Force power system family is the Drill Force LT and LS (air-cooled) which were developed from the original Drill Force and are type-tested to internationally recognized EC 61493-1 standards. The Drill Force product line design meets the requirement of all rig types.

Along with the modular design, the system is highly configurable for the smallest drilling machinery requirements and is easily expandable to meet the requirements of the largest drilling installation. Drill Force is designed in accordance with ABS and DNV rules for offshore electrical installations and is compatible with Cyberbase™ and Amphion™ systems.

The system integrates seamlessly with our innovative control systems and industry leading drilling machinery to provide complete closed loop rig control and the most reliable performance for the life of the rig.

The Drill Force system is offered in three versions:
1. LT and LS (Air-cooled, land applications)
2. AC (Air-cooled, offshore or high specification)
3. WC (Water-cooled, offshore or high specifications)

Features and benefits
- Rugged, robust construction
- Enhanced safety, installation and serviceability
- Isolated main bus and motor cable terminations sections
- Optimized for integration with oilfield/marine machines and controls
- Advanced diagnostic monitoring
- Centralized on board documentation system
- Plug-in Inverter Modules
- System is IP41 with doors closed; IP20 with doors open

Distribution switchgear
Our 480V switchgear is designed to meet the latest global international requirements. Using years of know-how in each switchboard, we use the latest in circuit breaker and arrangements to get the most flexibility in the smallest space required. The switchboards can be designed to meet the latest IEC, NEMA, ABS and other third-party regulatory bodies.
Drill Force sections, capabilities, and ratings

<table>
<thead>
<tr>
<th>Air-cooled section</th>
<th>Size(s) and ratings</th>
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<tbody>
<tr>
<td>Segregated DC bus system</td>
<td>4000/8000A capacity, 220kA fault bracing</td>
</tr>
<tr>
<td>Rectifier (air-cooled)</td>
<td>2500A, 3200</td>
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<tr>
<td>Inverter cubicles (air-cooled)</td>
<td>315 to 3200 kW</td>
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<tr>
<td>Chopper cubicle</td>
<td>1200kW, One/Two per cubicle</td>
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<tr>
<td>Optional cable termination cubicle</td>
<td>Top and bottom cable entry</td>
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<tr>
<th>Water-cooled section</th>
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<tr>
<td>DC bus system</td>
<td>4000/8000A capacity, 220kA fault bracing</td>
</tr>
<tr>
<td>Liquid-cooled rectifiers</td>
<td>3200A</td>
</tr>
<tr>
<td>Liquid-cooled VFD cubicles</td>
<td>355 to 3000 kW sizes, 690 VAC</td>
</tr>
<tr>
<td>Liquid-cooled chopper cubicle</td>
<td>1200 kW, one or two per cubicle</td>
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Drill Force design considerations

- IEC 61439: Short circuit, EMC, impulse voltage, temp
- Drill Force Air-Cooled: Rise, Creepage/Clearance
- IEC 61800-1, -2, -3: General requirements and EMC requirements for DC and AC drive <1kV
- IEC 61892-1, -2, -3: General requirements for electrical installation
- ABS MODU Part 4: Rules for building and classing mobile offshore drilling units
- DNV D201: Electrical installations

600/690V Generator controls and switchgear

Drill Force generator controls are an evolution of proven engine/generator control experience. The generator controls system is built with flexibility in mind. The controls can utilize the field proven Ross Hill™ control module or the Woodward generator control module depending on the needs of the rig. These units are designed for use around the world in the most challenging applications. The cubicle is designed for front access in land applications and can be outfitted for rear access in marine applications.

Training and Aftermarket services

As the Original Equipment Manufacturer (OEM), NOV provides comprehensive aftermarket product and service solutions to support the lifetime of your equipment through an integrated network of strategically located facilities worldwide.

NOV Safety 24/7 culture is the guiding principle by which the company operates. Technical support is one phone call away to an NOV Technical Support Center, which initiates a technical support team of multi-skilled backgrounds to troubleshoot and resolve your worldwide equipment needs, 24/7/365. Contact NOV at: +1-281-569-3050 or houstonservicdept@nov.com.

Field Support from our staff of proven field service personnel is available. NOV’s highly skilled shop technicians overhaul, repair, rebuild, and re-certify a wide range of NOV equipment to NOV Quality Assurance and OEM specifications, using only OEM parts. In addition, eHawk™ remote support provides faster issue response time, reduces service personnel visits to the field, and allows NOV to remotely handle issues at reduced cost. Contact: ehawk@nov.com or 281-569-3051 phone 24/7.
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