NOV PowerBlade is an innovative technology suitable for drilling and hoisting systems. It preserves energy to reduce fuel costs and lower emissions while increasing operational safety and reliability.

During operation, the PowerBlade system captures regenerated electrical energy when the drawworks, crane or winch slows and stops the load on the hook. Previously, this energy was dissipated as heat using braking resistors.

The PowerBlade stores this as kinetic energy using a flywheel that accelerates and gathers speed, capturing energy from vessel rising and block lowering during active heave compensation. This energy is then recycled and utilized to put power back onto the power grid when needed. The spinning flywheel rotates between 1,000 and 2,000 RPMs, charging and discharging energy in a safe fashion.

### Main Components
- Asynchronous motors
- Flywheel
- Controls cabinet (not pictured)
- Drives cabinet (not pictured)

### Features
- PowerBlade is easily integrated into the power grid and recaptured energy can be distributed as both DC and AC power
- Modular design allows flexibility to adapt to varying rig equipment capacities and vessel configurations
- Seamless interface with rig generator control, power management system, equipment controls and the driller operation system

### Benefits
- Preserve energy to reduce operating costs by lowering peak power demand and leveling load
- Reduce generator/engine maintenance cost as a result of less consumption demand
- Provide full power supply if one main generator fails and a full power backup in case of ship black out
- Recover up to 65%-70% system energy from vessel rising and block lowering in active heave compensation

### Successful Full Scale Test Results

<table>
<thead>
<tr>
<th>Flywheel Speed (rpm)</th>
<th>Grid Power (kW)</th>
<th>Winch Power (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1350</td>
<td>150</td>
<td>0</td>
</tr>
<tr>
<td>1500</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>1650</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>1800</td>
<td>150</td>
<td>550</td>
</tr>
</tbody>
</table>

### Dimensions and Weight Estimates (excluding service area)

<table>
<thead>
<tr>
<th>Item</th>
<th>Size (L X W X H)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flywheel</td>
<td>605 mm x (800 mm + 800 mm + 600 mm) x 2405 mm</td>
<td>650 kg</td>
</tr>
</tbody>
</table>

### Performance Estimates

- Flywheel charging: 1700 rpm
- Flywheel discharging: 1350 rpm

### Cooling Data Total

- Cooling of VFD cabinets: Minimum air flow rate 6 (m³/min) per VFD
- Cooling of PowerBlade: Minimum air flow rate 10 (m³/min) per VFD
- seawater temperature and pressure: N/A
- Minimum water temperature: 37 °C; Pmax = 5 bar
- Design temperature (ambient): -25°C to +45°C Celsius

### Contact Information

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*For reference only, please contact your local sales contact for more information.

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