The Baker Hughes Electrospeed Advantage™ variable speed drive (VSD) with advanced production software increases the uptime and reliability of your electrical submersible pumping (ESP) system.

The Advantage VSD’s control system software helps reduce power and downtime costs while optimizing production. Our engineers designed this VSD to solve the most common ESP problems you experience daily: gas locking, difficulty starting, power consumption, and power sags.

Backed by 30 years of VSD innovation for the oil and gas industry, the Electrospeed Advantage drive is offered as part of the next generation of ESP control products.

The Advantage drive features Real-Time Torque Command (RTTC), which delivers the exact amount of torque that the pumping applications require.

**Applications**
- ESPs, PCPs, and surface pumps
- Geothermal, SAGD, and other elevated temperature applications
- Arctic, tropical, and desert conditions
- Shale plays with challenging production profiles

**Features and Benefits**
- Real-time cable compensation
  - Ensures the proper applied voltage at the surface, dynamically, as loads change
- Power Ride Through™ software
  - Maximizes well uptime and mitigates intermittent power supply
- MaxRate™ software
  - Enhances production by reducing gas lock and pump off
- Intuitive color display and external USB/Ethernet ports
  - Easy and safe software updates and data downloads
- Integrated filter section for FPWM output
  - Improves reliability and reduces downtime
- TUV-certified NEMA 4
  - Third-party certified for environmental and safety assurance

**All the time-tested features of the Electrospeed 3 such as:**
- MaxStart™ software for hard start applications
  - Best-in-class starting characteristics in harsh downhole environments
- MaxPoint™ software for frequency sweep capabilities
  - Ensures minimal shock to the reservoir during startup and rate change events
- Either Filtered Pulse Width Modulated (FPWM) or ESP output
  - FPWM delivers a near-perfect sine wave to the ESP motor, reducing heat and potentially-damaging torque oscillations
  - Promotes increased ESP uptime. System can automatically run in proven ESP (6-step) output in the event of a filter problem.
load requires at any given instant. With torque being calculated in real time, this allows for precise control and protection in the presence of varying loads. With the capability to load modular, built-for-purpose production-assisting software, the Advantage VSD will improve the performance of your ESP system. Built based on the effective foundation of the Electrospeed 3, we offer a complete control system to optimize your ESP operations and boost system reliability.

The Electrospeed Advantage VSD offers plug-and-play compatibility with our downhole sensors. This enables a holistic view of both the downhole and surface conditions.

Our Baker Hughes Vision™ monitoring and automation service is seamless with the Advantage drive. It connects with Vision services to deliver data from the well site while Vision applications turn this data into a decision-making tool in your office.

Finally, our intelligent production software within the Advantage VSD offers specific solutions to reoccurring ESP problems:

- **MaxRate** software mitigates gas locking and pump off by determining when a pump is approaching these unfavorable conditions and varies pump speed to prevent them. This allows the well to produce longer, thereby increasing the ESP system uptime and reliability.

- **Power Ride Through** software: power sags have always been a nuisance and result in considerable downtime. Our upgraded Power Ride Through software keeps your system on for as long as one second** through a power interruption. This makes the ESP system able to withstand the majority of power sags.

- **Real-time cable compensation** calculates the appropriate surface voltage (at the output of the VSD) based on changing loads, dynamically. This assures that the proper motor voltage is being applied at all times for most efficient operation.

- **Back spin detection** and restart without a separate module. By accurately monitoring the torque of the ESP system, the Advantage VSD can sense a backspinning pump and restart the system when torque levels are safe. This gets wells online faster, increasing production.

- **Power monitoring.** The Advantage VSD now includes, with optional current transformers (CT’s) and potential transformers (PT’s), power monitoring functions such as instantaneous kW, power factor, efficiency, and kW-hours, helping the user to monitor the energy used in producing fluid to optimize their expenses.

Contact your Baker Hughes representative today or visit www.bakerhughes.com/Advantage to find out how the Electrospeed Advantage variable speed drive can increase uptime and reliability in your ESP system.

* MaxRate and Power Ride Through are completing the field qualification process.
** 150ms on 3-phase loss

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### Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
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<tbody>
<tr>
<td>Input/output voltage</td>
<td>380 and 480 V</td>
</tr>
<tr>
<td>Input configuration</td>
<td>6 and 12 pulse</td>
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<tr>
<td>I/O modules</td>
<td>1 to 3</td>
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<tr>
<td>Output waveforms</td>
<td>6-step, Hybrid PWM, PWM and FPWM (sine wave Filtered PWM)</td>
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<tr>
<td>Indicator lights</td>
<td>Optional run and shutdown</td>
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<tr>
<td>Auxiliary power</td>
<td>115 V</td>
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<tr>
<td>Output current</td>
<td>79 to 624 A</td>
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<tr>
<td>Output power</td>
<td>66 to 518 kVA</td>
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<tr>
<td>Output frequency</td>
<td>10 to 120 Hz</td>
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<tr>
<td>Input frequency</td>
<td>50 to 60 Hz</td>
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<tr>
<td>Efficiency</td>
<td>≥98% @ rated load</td>
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<tr>
<td>Worldwide certifications</td>
<td>UL, CE and CSA</td>
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<tr>
<td>Enclosures</td>
<td>NEMA 4</td>
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<tr>
<td>Arctic/Cold weather package</td>
<td>Opt (CE)</td>
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<tr>
<td>Safety shielding</td>
<td>IP10 and IP20</td>
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<tr>
<td>Temperature rating</td>
<td>-40°F to 131°F (-40°C to 55°C)</td>
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