Intelligence built in the Unico VSD drive offer sophisticated ESP control of induction or permanent motor (PM) systems.

- Patented pump intake pressure and fluid level sensing without downhole sensors.
- Patented AHD™ technology to minimize input harmonics with autotransformers.
- Transducerless backspin monitor for quicker restarts
- Time-stamped event (300) and fault (300) logging
- Optional high-speed multi-parameter data logging

Control modes and display variables available with or without downhole and surface sensors

- Fluid level monitor and control
- Pump intake pressure monitor and control
- Pump discharge pressure monitor
- Pump differential pressure monitor and limiter

Downhole Sensors supported

<table>
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<th>A Well</th>
<th>Ace</th>
<th>Novomet</th>
<th>Generic Modbus</th>
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<tbody>
<tr>
<td>Zenith</td>
<td>Scout</td>
<td>BHI</td>
<td>Analog(4-20mA)</td>
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<tr>
<td>GRC</td>
<td>SPS</td>
<td>Oxford</td>
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</tbody>
</table>

Sensor Options

- Fluid flow sensor
- Gas flow sensor
- Suction pressure sensor
- Discharge pressure sensor
- Casing pressure sensor
- Motor temperature
- Fluid temperature
- Tubing pressure sensor
- Motor vibration
- Multiple user defined

Speed References

- Analog potentiometer
- Keypad/display presets
- Serial communications

Optimization Controllers

- Fluid level control
- Pump off control
- Gas flow optimizer
- Power demand limiter
- Power flow optimizer
- Time of use optimizer
- Cyclic energy optimizer

Starting Algorithms

- Auto restarts
- Remote start/stop
- Backspin detection
- Stuck pump rocking start
Unico® ESP VSD Functions & Features

ESP Protection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Protection</th>
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<tr>
<td>Motor under load</td>
<td>Motor current limiter</td>
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<tr>
<td>Motor over load</td>
<td>Motor torque limiter</td>
</tr>
<tr>
<td>Low speed</td>
<td>Casing pressure limiter</td>
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<tr>
<td></td>
<td>Tubing pressure limiter</td>
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<tr>
<td></td>
<td>Pump differential pressure limiter</td>
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<tr>
<td></td>
<td>Low torque detector</td>
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</table>

ESP Display Features

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Display Feature</th>
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</thead>
<tbody>
<tr>
<td>Motor and surface voltage</td>
<td>Fluid level</td>
</tr>
<tr>
<td>Motor current</td>
<td>Fluid production</td>
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<tr>
<td>Motor frequency</td>
<td>Gas flow</td>
</tr>
<tr>
<td>Drive voltage</td>
<td>Gas production</td>
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<tr>
<td>Drive current</td>
<td>Pump velocity</td>
</tr>
<tr>
<td>Tubing pressure</td>
<td>Pump torque</td>
</tr>
<tr>
<td>Casing pressure</td>
<td>Suction pressure</td>
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<tr>
<td>Fluid flow</td>
<td>Discharge pressure</td>
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<td></td>
<td>Differential pressure</td>
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<td>Power meter</td>
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<td>Input power</td>
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<tr>
<td></td>
<td>Motor power</td>
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<td></td>
<td>Lift power</td>
</tr>
<tr>
<td></td>
<td>System efficiency</td>
</tr>
</tbody>
</table>

Serial Communications

- Local and remote serial ports
- Standard Modbus RTU
- Windows, iPhone, or iPad
- Optional 900 MHz and 2.4 GHz wireless radio
- Optional Local Wireless WIFI
- Optional ControlNet, Profibus, ProfiNet, Ethernet, etc

Embedded Models and Parameters

- Drive
- Transformer
- Cable
- Electric motor
- Tubing
- Casing
- Downhole pump
- Fluid column
- Reservoir
- Drive Specifications
- Transformer specifications
- Cable specifications
- Motor specifications
- Tubing configuration
- Casing configuration
- Pump characteristics
- Fluid properties
- Reservoir properties