Weatherford®

WellPilot® Variable Speed Drive for Progressing Cavity Pumping

Precision control—to maximize run time under dynamic conditions


Weatherford
WellPilot®
Variable Speed Drive

Performance. Reliability. Simplicity.

The one PCP controller with all the enhanced features you're looking for.

When you're looking to enhance recovery and optimize production in wells with high-viscosity fluids or high sand production, the progressing cavity pump (PCP) is often your most reliable and efficient solution. But not all PCP systems are created equal—and changes in well control can wreak havoc on the pump, adding considerable downtime and cost to your operation.

So how do you maintain the proper balance between production supply and pump speed?

The Weatherford WellPilot® variable-speed drive (VSD) is the answer.

It offers an unmatched combination of built-in features to give you optimum production control:

- Flexible programming to give you fast, easy access and precise control—calibrated to your unique well characteristics
- Exclusive firmware to minimize backspin-related downtime
- An improved enclosure—to set the standard for safe operation
- The most reliable inverter on the market
- Enhanced monitoring tools to track measurements such as flow accumulation, power usage, pump revolutions, and maintenance schedules

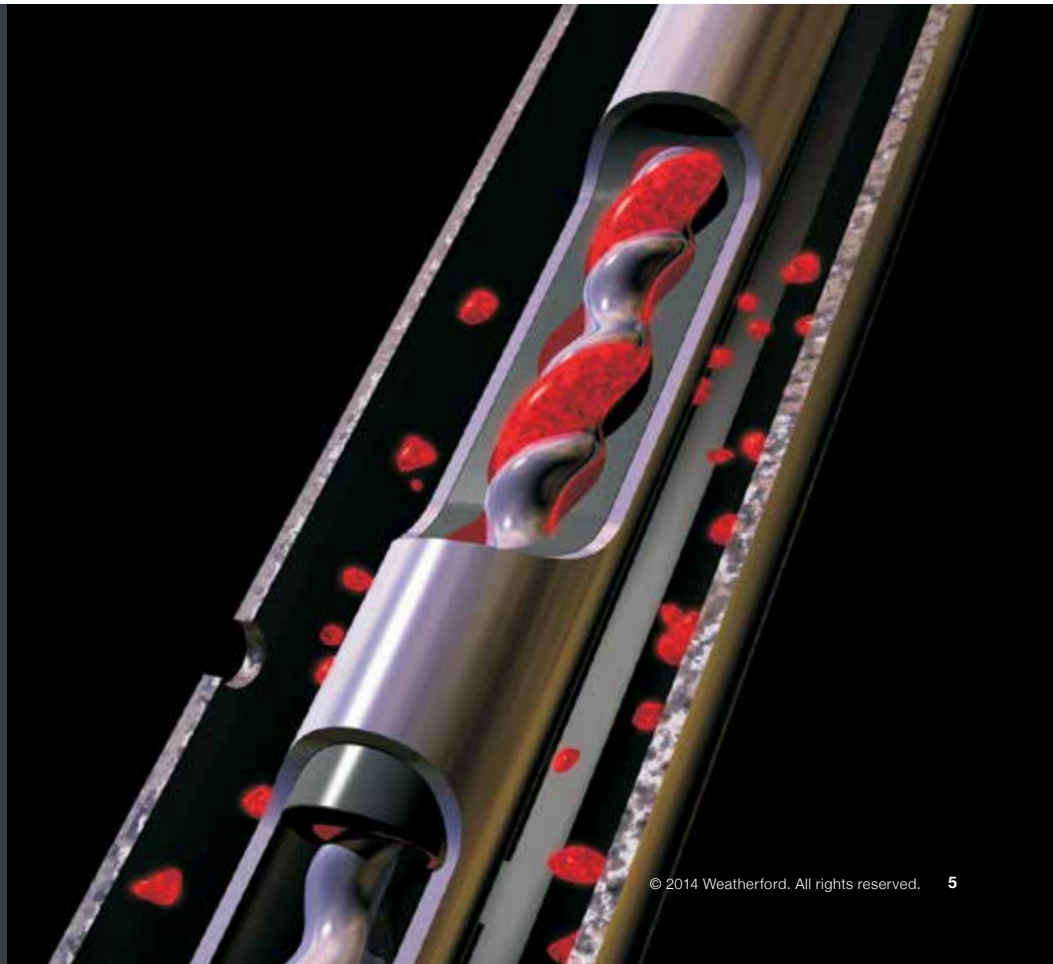
Better control of your PCP means better control of your profit margin.

When the WellPilot VSD controller is on the job, out of sight doesn't mean out of mind.

That's because, while your PCP is hard at work downhole, WellPilot VSD is always on watch, continuously managing your entire PCP system. It's robust, packed with features, and easy to use. And on top of all that, it delivers the most reliable inverter operation in the industry.

You can custom-configure the controller with precision parameters for all applications and well conditions—with infinitely variable speed control that delivers controlled torque throughout the speed range. As a result, you're able to match pump speeds to well conditions, the system operates at the proper torque when fully loaded, and the well pumps only as fast as necessary to maintain production. Plus, it automatically monitors and manages motor and external field data, taking preventive steps to ensure that the system doesn't exceed safe operating conditions.

WellPilot VSD gives you the certainty that your motor and pump are communicating, coordinated, and operating at optimum performance. That means your PCP system will run more efficiently and with less mechanical stress.



Customized pump control that's intuitive, effective, and at your fingertips.

With the WellPilot VSD, you're in control.

It's designed to be extremely flexible and user friendly—so your PCP system can be up and running smoothly with minimal time and effort. Based on your preferences, well conditions, and production goals, it's ready to be configured to your unique specifications.

Key features and benefits of the WellPilot VSD controller:

Quick-start menu setup
significantly decreases startup time

Adjustable torque-control limits
safely control torque through the entire speed range

Flexible configurations
power-loss auto-restart, online programmable logic controller (PLC), and adjustable input/output (I/O) configurations that enable you to set customized, detailed parameters that determine how the controller reacts to specific changes and conditions

PCP-specific firmware
so you can quickly and easily configure the system to fit the specific needs of your well

Customizable interfaces
easy-access keypad, multiple readouts, Modbus RTU serial with extended RTU addressing, and optional Transmission Control Protocol/Internet Protocol (TCP/IP) to deliver clear communication and quick access to the information you need

High-speed operation up to 120 Hz
enhances production by increasing motor speed, with no need to reconfigure sheave setup

Cost-conscious features designed to save you time and money.

- User-set torque limits – defend against downhole breakage by enabling you to set your own, customized torque parameters
- Backspin reduction – minimizes backspin while controlling torque on system
- Power-loss ride through – uses system inertia to maintain operation during short power outages
- Configurable auto-restart – based on your specifications, quickly and automatically restores PCP operation after a power loss or fault
- Underspeed detection – protects the motor from overheating in torque-foldback situations
- Low-torque detection – indicates a rod break, belt failure, or plugged sand screen
- Low-flow detection – provides enhanced pump protection (requires surface flow meter input)

Low-torque monitoring
protects the pump by detecting and making adjustments to manage downhole loss of fluid into the pump

Power-loss ride through
avoids backspin and continues to rotate pump in the forward direction during very short power outages, eliminating downtime and the need for restarts

Dual-motor capability
so you can operate large PCPs with a single drive

Backspin reduction algorithm
reduces post-power-outage downtime up to 95 percent, by smoothly interrupting and reversing backspin cycle when power is restored

Built-in monitoring and accumulative software
provides timely historical performance data about flow, power, and RPMs

Variety of available downhole gauges
readily compatible and easily configurable to work with Weatherford downhole-gauge systems

Packed with self-protective features.

The WellPilot VSD controller is actively protected against all of these production-robbing problems:

- Ground fault
- Phase loss
- AC input overvoltage (caused by regenerative loads)
- AC input undervoltage
- Instantaneous overcurrent
- Motor overload
- Excessive heat-sink temperature
- Power transistor fault
- Logic power undervoltage
- Inlet and outlet phase loss
- Motor runaway
- Memory malfunction
- Processor running fault
- Safe disable input circuits

Configurable options to deliver precise control and predictable performance.

Looking to further tailor the capabilities of your WellPilot VSD controller? These options make it easy to fine-tune its performance for your specific application.

- Communication (Ethernet TCP/IP or Modbus TCP/IP)
- IEEE-519 inlet harmonic package
- Sine wave DV/DT filters
- Inlet semiconductor fusing
- Analog-input expansion module
- Digital I/O expansion boards
- Multilevel transient-voltage surge suppressor
- Flow-control technology (FCT) surface-flow control
- Data logger with enhanced graphical display

Making a strong case for safe, secure operation.

From protecting the people on your team to safeguarding your data and PCP-system equipment, the WellPilot VSD has it covered. The newly designed enclosure gives technicians easy, complete access to all low-voltage controls—such as input/output and communications panels—while never exposing them to hazardous voltage. The enclosure also protects sensitive electronics from foreign material and extreme temperature variations.

Features of the WellPilot VSD enclosure:

- UL-listed package type 3R
- Engineered to withstand harsh conditions of the world's toughest production environments
- Front-mounted keypad and controls housed in secondary, low-voltage safety compartment
- Door interlocked breaker-main disconnect
- Control stepdown transformer to power external equipment
- Panel-mount enclosure (sizes 1 and 2)
- Floor-mount enclosure (size 3)

The **safety-minded design** of the WellPilot VSD enclosure delivers superior protection—for both your people and your PCP system.

Specifications

Electrical Specifications

Available Sizes

Horsepower	5 through 250

Input Supply

3-phase voltage	230, 380, 480, or 600 VAC (+10% to -15%)
Single-phase voltage	230 or 480 VAC (±10% to 15%)
Frequency	50 to 60 Hz (±5%)

Power Factor

Rated load and speed	0.97

Output Rating

Voltage	Zero to input voltage, 3-phase
Frequency	Zero to 120-Hz open-loop vector control
Switching frequency	Programmable, 2 to 15 kHz (varies with hp)
Overload rating	120% of rated for 1 minute (normal duty) 150% of rated for 1 minute (heavy duty)

Conversion

Rectifier unit	6-diode, 3-phase (6-pulse) full wave bridge
Inverter unit	6-IGBT (insulated-gate bipolar transistor), 4-quadrant, trap or sine wave output

Environmental Specifications

Operating temperature (°F, *°C*)	-40 to 112 *-40 to 45* *Optional high temp operation to 55°C*
Storage temperature (°F, *°C*)	-40 to 140 *-40 to 60*
Relative humidity	5 to 95%, noncondensing
Altitude	Zero to 3,300 ft (1,000 m) at full rating

Inputs and Outputs

Analog inputs	Three 12-bit analog inputs: one 4 to 20 mA, two 0 to 10 VDC
Pulse input	Zero to 32 kHz
Analog outputs	Two 12-bit analog outputs: each 4 to 20 mA
Pulse output	Zero to 32 kHz
Digital inputs	Eight digital inputs (requires sink of 1 mA to common)
Outputs	Three programmable relay outputs: each 1 A @ 250 VAC One Form C fault contact
Safe disable inputs	Two safe disable input circuits to disable output transistor operation

Discover how the Weatherford WellPilot VSD delivers precise, customizable control—to enhance recovery, optimize production, and protect your entire PCP system. Speak to your Weatherford representative, or contact us at **PO-Info@weatherford.com**.

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