

Schlumberger



REDA Continuum

Unconventional Extended-Life ESP

Challenge: Unpredictable Flow Behavior

Steep flow decline along with stage erosion caused by solids and gas production are common in unconventional wells. Due to these conditions, ESPs are forced to operate outside recommended operating ranges, leading to failures and lost production. However, ESP technology is continually evolving to improve production in these challenging environments.

Challenges in unconventional wells

- Steep production decline
- High gas volume fraction
- Abrasive conditions
- High operating costs



Solution: REDA Continuum ESP System

The REDA Continuum* unconventional extended-life ESP system provides continuous production during flow changes found in these challenging environments. Designed to be installed early in the production phase, the Continuum ESP optimizes flow throughout the reservoir's life cycle. Its preconfigured plug-and-play design

drastically reduces rig time and improves system reliability in extreme all-weather conditions.

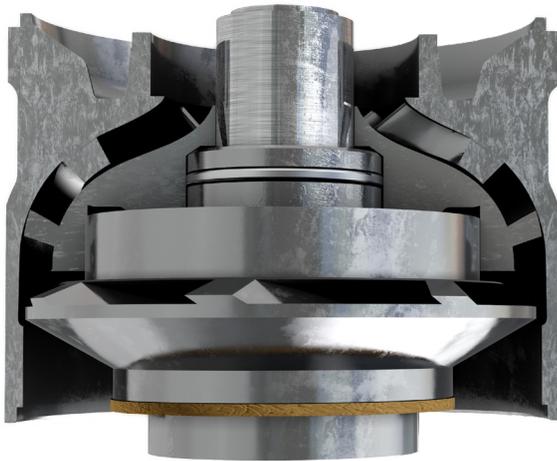
Its re-engineered compression design decreases stage erosion, making it capable of handling abrasive conditions and production of gas or solids. With wider vanes, the Continuum ESP also accommodates high gas volume fraction to maximize performance, efficiency, and run life.

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Benefits of the Continuum ESP System

- Wide operating flow range
- Continuous operation as flow declines
- Enhanced reservoir recovery with maximum drawdown
- Real-time monitoring capabilities
- Reliable plug-and-play design
- Ability to handle solids



Wide operating flow range

The Continuum ESP is available in three flexible sizing options covering a wide operating range from 200 bbl/d to 7,000 bbl/d, the primary flow range found in unconventional plays. It yields higher initial production than seen with natural flow and allows for faster drawdown.

Continuous operation

As flow declines, its wide operating envelope enables the Continuum ESP to continue functioning with improved uptime and reliability. Its ability to run even at rates beyond its recommended range decreases operating costs and eliminates the expense of transitioning to a new system.

Enhanced reservoir recovery

The ESP features mixed-flow stage pumps with wider vane openings to optimize production when there is a high percentage of free gas. The system can also be installed with a helico-axial pump, which makes it capable of handling up to 90% free gas at the intake before separation.

Real-time monitoring

Real-time monitoring of the Continuum ESP system enables early detection of pump events and downhole conditions. Proactive ESP management prevents downtime, further reducing well intervention costs and increasing overall production.

Plug-and-play design

Assembly traditionally completed onsite is performed in Schlumberger manufacturing and service centers. The Continuum ESP system arrives at the wellsite ready for installation, reducing rig time and eliminating risks and failures caused by human errors.

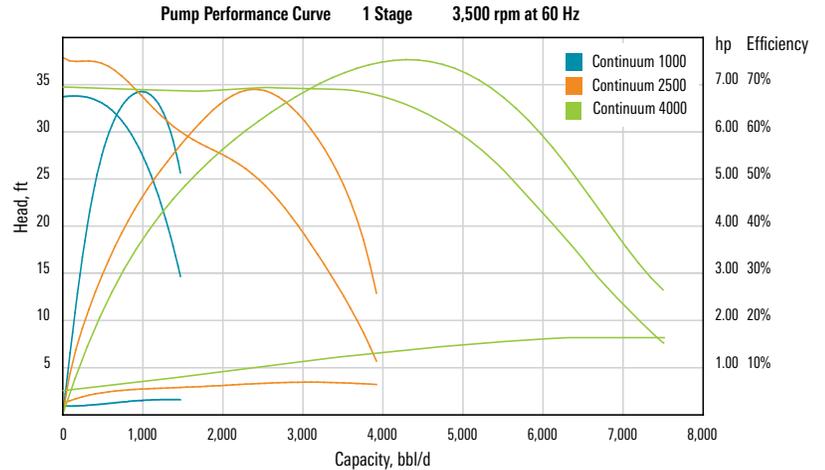
Solids production

The Continuum ESP's unique stage design uses a harder material on the impeller hub to aid against the erosion caused by solids production during hydraulic fracturing. The Continuum ESP's distinct design mitigates the effects of erosion and temperature increases on the pump.



Stage Design

The Continuum ESP's stage was designed to mitigate stress on the pump during slugging and gas production as flow declines. The enhanced compression design ensures the increased downthrust is properly distributed, enabling operation outside the flow range.



Pump Stage	Stage Abbreviation	Operating Flow Range
REDA Continuum 1000	RC 1000	200 to 1,350 bbl/d
REDA Continuum 2500	RC 2500	1,000 to 3,200 bbl/d
REDA Continuum 4000	RC 4000	3,500 to 7,000 bbl/d



System Components

The Continuum ESP features field-proven technologies in one system designed specifically for unconventional plays and harsh environments.

Phoenix xt 150

High-temperature ESP monitoring system

Poseidon

Multiphase gas-handling system

Motor and Protector

Preconfigured and factory filled

LiftWatcher

Real-time surveillance service

Motor and Protector

The plug-and-play design of the preconfigured, factory-filled motor and protector reduces the risks associated with wellsite contamination.

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Poseidon system

The Poseidon multiphase gas-handling system is designed to avoid gas lock and handles more than 90% gas volume fraction at the intake and up to 75% through the pump. It offers greater drawdown capability and the ability to further lower reservoir pressure.

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The REDA Maximus system is compatible with all existing pumps and accessories, along with all existing REDA intakes, gas separators, and gas-handling devices.



Phoenix xt150 system

The Phoenix xt150* high-temperature ESP monitoring system's gauge provides accurate downhole data in real time, helping you adjust to changing well conditions and optimize ESP performance.

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LiftWatcher service

The LiftWatcher* real-time surveillance service enables remote monitoring and control of multiple wells across several fields simultaneously. Dedicated surveillance engineers process alarm data and communicate their recommendations to the field within minutes.

slb.com/liftwatcher



REDA Continuum

Unconventional Extended-Life ESP

The REDA Continuum unconventional extended-life ESP is engineered for unconventional flow behavior and challenging environments. Using optimized geometry, unique architecture, and high-quality material selection enables the Continuum ESP to operate at high efficiency through a wide operating range.



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