DATA SHEET

HALLIBURTON

ELECTRIC SUBMERSIBLE PUMPS

GeoESP® Solutions for Geothermal Energy Production

Comprehensive fluid production technology engineering the future of alternative energy

Overview

Summit ESP®, A Halliburton Service, has developed GeoESP as a uniquely qualified, innovative, flexible, safe, and efficient offering. Leveraging more than 70 years of extensive experience with other geofluids, our engineering, manufacturing, reliability, and quality teams have collaborated extensively with our operations teams to tackle the issues prevalent in geothermal applications: scale and the impact of thermal cycling on equipment. We proactively offer advanced solutions to enhance your geothermal equipment's run life and reduce energy consumption for lifting geothermal fluids at the highest efficiency. Coupled with the Intelevate™ 24/7/365 digital platform, we help you meet your geothermal needs efficiently and responsibly.

GEOESP FEATURES - BENEFITS

Efficient

- GeoESP Intake inlet design protects against solids and scale development and minimizes pressure drops for added power savings
- Intelevate, our digital platform which leverages machine learning, and GeoController® surface package create operational efficiency and reduce power consumption

Flexible, modular, safe pump design

- Standardized dimensions with all pumps 9-1/2 in. outer diameter (OD) for rapid customization
- Flanged, modular interfaces to easily add more centralizers on the system
- Adaptable for different well conditions, minimizing backup inventory for use in multiple wells
- High pressure pump housings enhance safety over bolted bowl designs

Innovative, top-tier technology

- Heat-resistant materials 150 - 250°C (320 – 482°F) BHT
- High quality materials resist scale, corrosion, and abrasion
- Wide operating range customized to well conditions
- GeoESP® Skid increases safety and speed of ESP execution, protecting the GeoESP equipment during storage, transportation, and wellsite preparation

SUMMIT ESP

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Experience and Expertise

Our commitment to meeting and exceeding your expectations leads to collaboration, faster response times, and superior testing capabilities. This approach allows us to improve our technology and overcome unique challenges with innovative end-to-end GeoESP® solutions that are proven, safe, streamlined, and reliable.

Manufacturing and R&D

- Extensive network of global service centers with high-volume, high-power testing facilities in Tulsa, Oklahoma and in Emmen, Netherlands
- Critical build capabilities for enhanced quality control and assurance
- Full system integration testing of all geothermal ESP systems
- Up to ~1120 kW (1500 hp) motor dynamometer testing
- Up to ~185 l/s (100,000 BPD) downhole pump testing
- High volume test loop up to 260 l/s (140,000 BPD)
- High temperature cable test vessel up to 340°C (644°F)
- Horizontal test well up to 270°C (520°F)
- Slurry sand loop
- Multiphase gas and flow visualization loop
- Fully automated R&D control center

The opening of a new service center in Emmen, Netherlands, demonstrates our unwavering global commitment to geothermal energy initiatives.

Summit ESP® Vertical Testing Facility located in Tulsa, Oklahoma combines experienced scientists and engineers with full system integration testing for all geothermal ESP systems.

Our global team includes specialists who bring more than 70 years of experience in geothermal development.

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PRODUCT / COMPONENT	DESCRIPTION
High efficiency fluid lifting system designed to resist scale, corrosion, abrasion, thermal damage, and cycling	Maximize run life in extreme geothermal environments
Tiger Shark® pump with Ring Lock XT™, Erosion Buster® pump diffusers and spiral tungsten carbide bushings	Designed with enhanced diffusers to protect pump against scale and erosion, enhanced bushings for radial support to protect against thermal cycling and further mitigate scale development
DuraHard® 3 coating	Protect equipment from calcium carbonate scaling, abrasives and corrosives, as well as increasing pump efficiency
GeoESP® Intake	Easily interchangeable, modular pump intake design with screened housing protects against small sized solids and debris. Optimized inflow geometry reduces pressure drop for increased energy savings and further mitigates the development of scale and casing erosion around the pump inlet.
Corsair™ Motor with Bigfoot™ Bearings	Improves heat transfer and reduces vibration with wide-profile bearings and 58% greater radial support. Active spring mechanical lock adapts to differences in rotor and stator expansion during thermal cycling
Avenger® Motor Lead Extension (MLE)	Protects against harsh gas and high temperature environment with tape-in connection, thermal rating up to 232°C (450°F); 90% less rubber to mitigate swelling during thermal cycling.
Defender® Seal	Six chamber Super Sand Seal for more expansion volume; more shaft horsepower, higher thrust capacity; side dual venting for redundancy; no rubber bladders and thermal cycle bushing lock
Triton® Gauge	Superior asset surveillance tested for high temperature applications.
Intelevate™ Digital Platform	24/7/365 digital platform uses machine learning and offers monitoring and remote optimization with scale detection, optimized power consumption, and backup virtual parameters: pump intake pressure (PIP), flow rate, temperature, and total dynamic head
GeoController® Surface Package	Facilitates seamless communication between various systems, enabling efficient data processing, real-time sensor monitoring, and remote interventions for advanced GeoESP operations, protections and optimized power consumption
GeoESP® Box Test Container	Saves time and money with simple, plug-and-play surface solution for inflow performance testing which can be used as a final, long-term solution that continues to save well costs related to surface plant construction, project engineering, and time to operation
GeoESP® Skid	Designed to increase safety and speed of ESP execution while protecting the GeoESP equipment during storage, transportation and wellsite preparation, assuring the quality of all ESP components. With built-in safety features, the ESP arrives at the wellsite ready-for-assembly and rig-up preparation can be performed by one person without forklift or crane additional assistance. GeoESP Skid enables long-term storage including oil flushing, stacking and oil leakages control
Hercules™ Horizontal Pumping System (HPS)	Multistage centrifugal surface pump designed for re-injection, mounted securely on a modular skid, powered by a two-pole motor, and protected by a robust thrust chamber

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com