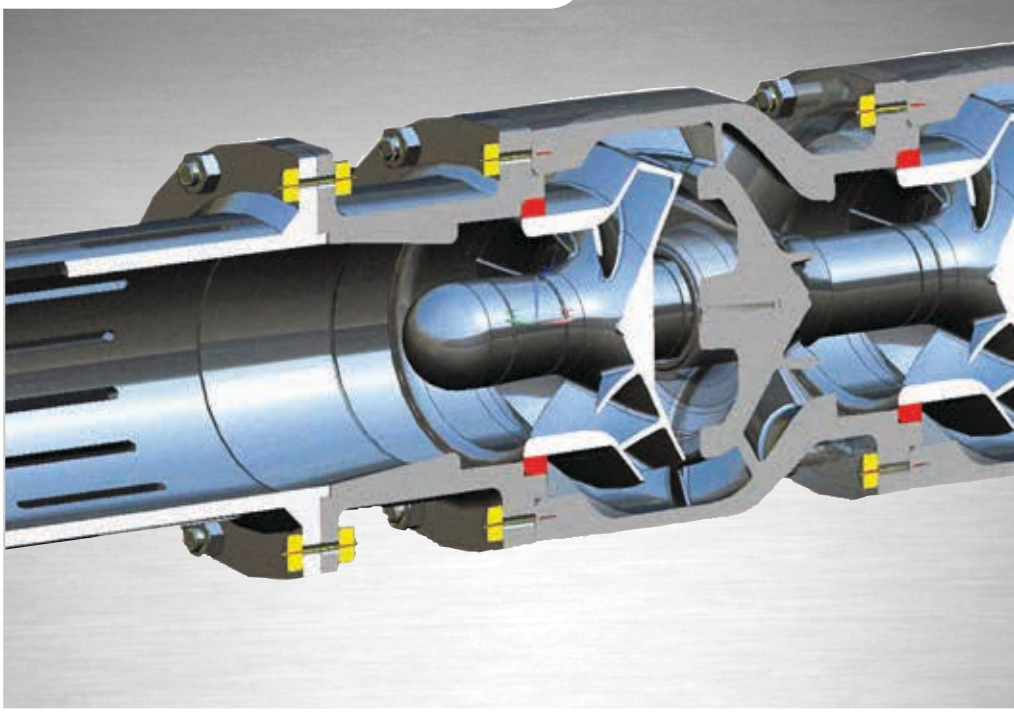
KSB SupremeServ

Replacement pump for geothermal power plant



Geothermal power plant

An enhanced geothermal system (EGS) generates geothermal electricity without the need for natural convective hydrothermal resources. After initial hydraulic stimulation the permeability of the sediments is enhanced.

Designed for extreme conditions

As a test facility for research into geothermal power generation, the hot dry rock process is applied. Water is pumped down through fractures in the rock, capturing the rock's heat until forced out of a second borehole as very hot water. The water's heat is converted into electricity using a steam turbine.
The line shaft pump installed for this purpose and supplied by another pump manufacturer kept failing as it had been designed for conventional well applications and not as production pump in a geothermal power plant.

KSB was given the challenge of designing and supplying a pump unit for a 9 5/8" well suitable for handling aggressive thermal water with a temperature of 170°C and extremely high salinity. A further requirement was the need to connect the pump to the existing periphery (riser, intermediate pipe and drive shaft).

The design also incorporated a very large axial clearance (>40 mm) to ensure reliable operation. KSB had a total of just four months to complete the task.

Solution:

- Hydraulic system design based on a proven submersible borehole pump
- Design adapted to the existing interfaces
- Fast availability of parts thanks to the rapid casting method
- Fast installation, quality control and functional testing

All of these aspects ensured that supervision, installation and commissioning were carried out within the short time frame. The design and the materials selected allow the pump to be used in these extreme operating conditions and ensure its service life is markedly improved.
The fact that it was possible to use the existing periphery means that further investment was unnecessary.

More information

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Installation on site

Scope of supply and services	Technical data
Selection of a suitable hydraulic system (UPA 200-130B) and creation of the operating manual	GTV geothermal pump
Use of the rapid casting method	Hydraulic system based on UPA 200-130B
Functional test, installation and commissioning	21 stages
	Installation depth: 300 m

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