Modernisation of a drinking water well of the municipal water supply

A deep well belonging to the municipal water supply was modernised so that it can now be operated more cost-effectively and flexibly in line with current requirements.

Cost savings through permanent magnet technology

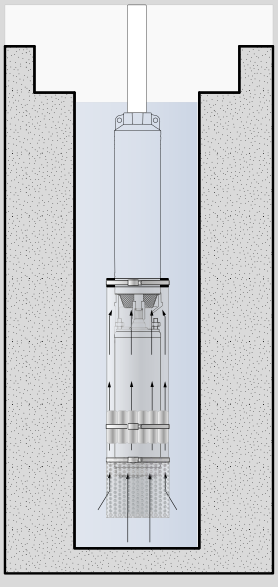
A local customer of the municipal drinking water supply in Germany operates several drinking water wells. The Franklin Electric Service team recently assisted in the installation and modernisation of a new pump system in a 40 metre deep well.

The pump system is positioned at a depth of approx. 25 metres and now includes a complete system consisting of a permanent magnet motor (PM motor), submersible pump and Variable Frequency Drive (VFD).

The municipal water supplier still had an unused permanent magnet motor from 2016 in storage. This was inspected and carefully serviced by the Franklin Electric Service team. After cleaning, the seals were replaced and the motor was ready for operation again.

The motor was paired with a submersible pump and supplemented with a cooling jacket. This separate cooling jacket is sealed above the pump inlet. The water is sucked in from below and channelled past the motor in order to dissipate the heat generated by the motor (convection) and generate sufficient cooling.

Firstly, the old motor-pump unit was lifted out of the well. The existing motor had been in use for more than 10 years and was now replaced by the 6-inch permanent magnet motor from Franklin Electric.



Vertical installation of the cooling jacket

Components of the cooling sleeve kit

1 Cooling sleeve tube (Stainless steel)
2 Pump sealing ring (EPDM) with drinking water approval
3 Motor spacer
4 Pipe clamps
5 Filter strainer (accessories)
6 Console (accessory for horizontal mounting)

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More than motors – Optimisation of the system with Variable Frequency Drive and PT100 temperature sensor

When operating a PM motor, a Variable Frequency Drive is essential. This not only allows the pump system to be utilised and controlled more efficiently, but also helps save energy and significantly extends the system's service life.

Previously, the system could only be switched on or off, which often resulted in an excessive water flow that had to be manually regulated using sliders. The motor was consistently operating at full load.

Now with a Variable Frequency Drive, precise control of the system's requirements is possible. Individual parameters such as constant water pressure, flow rate, and level control can be conveniently selected and adjusted via the display.

The system also offers robust protection against various sources of interference, including short circuits, underload, overload, overheating, undervoltage, overvoltage, phase failure, phase imbalance, overpressure, and sensor errors.

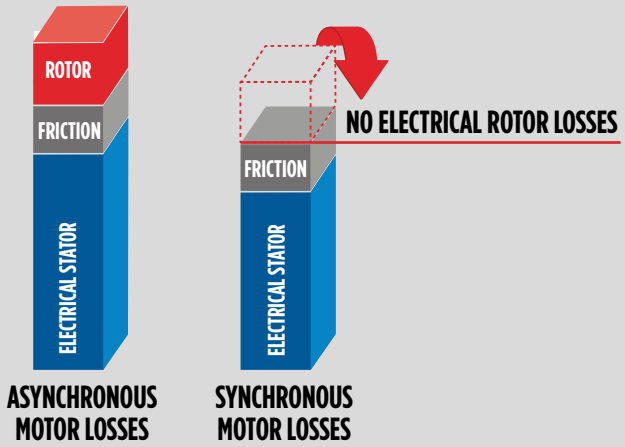
Additionally, a PT100 sensor has been integrated into the submersible motor. Installed in the upper end shield, this sensor measures the temperature above the winding head and continuously monitors the winding temperature.

When the unit was lowered into the deep well, the leads of the motor and the PT100 were tightened opposite each other to avoid interference. Franklin Electric's PT100 temperature sensor is equipped with a 4-wire shielded cable, available in multiple lengths, which provides additional protection against high frequency interference that can occur in applications with Variable Frequency Drive.

The pump system is located at a depth of 25 metres.

The Franklin Electric service team installed a 6-inch permanent magnet motor, submersible pump, cooling jacket, Variable Frequency Drive and PT100 sensor.

The key factor for energy savings and superior efficiency is the permanent magnet technology of the motor. Instead of a short-circuit induction type rotor, the high efficiency motor contains a permanent magnet rotor design with buried magnets.



Further information on Franklin Electric pump systems can be found at franklinwater.eu.

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