

Industry: Sewage and waste water treatment

Products Used: Frequency inverter drives

Inverters reduce operating and servicing costs

Variable-speed drive solutions are now used in all branches of modern industry. The aha Zweckverband Abfallwirtschaft Region Hannover in Germany has also benefited from the many advantages of modern asynchronous three-phase AC motors powered by frequency inverter drives. The installation of FR-F 740 frequency inverter drive systems from Mitsubishi Electric has drastically reduced the operating and servicing costs at the association's leachate water treatment plant, recouping the investment costs of around €70,000 in the space of just two years.



The aha has been responsible for waste management in the Greater Hanover region since the beginning of 2003. It was established by merging the former separate organisations responsible for waste management in the Hanover city and surrounding region, the Abfallwirtschaftsbetrieb Hannover and the Abfallentsorgungsgesellschaft Region Hannover mbH. The new organisation is continuing the strong traditions of outstanding performance established by its predecessors. The around 1,500 employees of the aha Region Hannover are committed to sustainable environmental protection, economy and safe and efficient waste disposal.

Twelve rotary piston pumps, each with a pumping capacity of 35 cubic metres per hour, are installed at the aha's leachate sedimentation facility, where they operate round the clock, 365 days a year. The twelve pumps feed the water into the sludge separation basins and remove the biologically-purified water from the facility. This is followed by the final treatment phase, in which the water is run through six activated charcoal filters that absorb compounds like COD and AOX that are otherwise difficult to break down. After this the pre-treated water is pumped to the communal sewage treatment plant in Hanover-Herrenhausen, where it is mixed with the household sewage prior to treatment.

During the first months of operation aha Hanover did not use controlled drive systems to power the pumps at the leachate plant. All twelve rotary piston pumps were connected directly to the mains power supply. This meant that the pumps were subject to extreme mechanical stresses, because when they were powered on the full mains voltage was applied immediately – controlled acceleration was not possible, and this naturally resulted in frequent damage to the bearings, and also seal problems, leaks in the pump housings and problems in the entire piping network of the pumping system. Every two to three months new bearings costing around €700 each had to be installed. In addition to this the rapid pressure rises on power-up caused frequent ruptures in the membranes of the ultra-filtration system. To counter these problems, twelve FR-F 740 frequency inverter drives with a total rated capacity of 66kW were installed by Fritsche Industrievertretungen GmbH, a Mitsubishi Electric Automation Network partner. The new drive systems are also connected to a Profibus DP network and a central process control system.

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Now we haven't only solved the mechanical problems, we have also improved the efficiency of the entire plant by between 4 and 5 percent.”

Frank-Dieter Schulz
Works manager aha

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Application story first released in February 2007