



## Product

## EtaK2.0 Geared Motors

## Application

## Wastewater Sedimentation Tanks

## Highlights

- EtaK2.0 geared motors are a combination of helical, shaft-mounted, bevel or worm geared motors and a decentral variable frequency drive (VFD)
- IE3 Permanent magnet synchronous motor (PMSM)
- Compact design – VFD mounted directly on the motor
- Remote communication via CANopen, ProfiBus, ProfiNet, EtherCAT, EtherNet/IP or AS-i
- Various power ratings available up to 7.5 kW
- IP65 Enclosure

After 19 years of dependable service, a wastewater facility in Germany wanted to upgrade the Bauer geared motors on its large sedimentation tanks. The operators original plan was to replace the existing motors with standard IE3 induction motors. However, after a site review and audit, Bauer engineers recommended installing highly-efficient permanent magnet synchronous motor (PMSM) technology.

The utilization of inverter-duty motors to reduce the line frequency without influencing the mixing behavior was also explored. A frequency of 50-60 Hz was required for starting the mixing process within the tank. After the wastewater was in motion and the sludge was suspended in the water, the speed could be reduced to 34 Hz. This speed reduction, while retaining the same mixing result and treatment quality, offered a potential saving of over 260.000 kW/h in energy consumption and € 52,000 in annual energy costs.

Ultimately, Bauer supplied EtaK2.0 geared motors that combine a permanent magnet synchronous motor (PMSM) and a variable frequency drive (VFD). The new motors were sized to fit within the footprint of the existing motors. This allowed the original mountings and BF Series shaft-mounted gearboxes to be retained – helping to further minimize project costs.

By connecting all the EtaK2.0 combination motor/variable frequency drives in series versus a single VFD for all the motors, if one unit were to fail, the other motors would continue to operate, minimizing plant downtime and maintenance costs. Additionally, the built-on inverters in the EtaK2.0 eliminated the need for shielded cables and powered the motors in a decentralized way, so inverters in control cabinets were not needed. The EtaK2.0 technology allowed plant operators to control and monitor all gear motors remotely from the office via the ProfiNet Bus system.

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