

# Permanent Magnet Motors Offer Energy Savings

Bauer Gear Motor offers its range of PMSM (permanent magnet synchronous motors) that already fulfill the requirements of the soon-to-be-implemented IE4 (super premium efficiency) classification. This is evidenced



by their potential to achieve energy savings of up to 40 percent compared to an IE2 inverter-driven squirrel cage motor. The PMSM series employs a highly efficient design of rotor that integrates embedded permanent magnets made from the rare-earth material, instead of the squirrel-cage rotor found in induction motors. This design helps reduce heat losses from the rotor by 100 percent, total losses by approximately 25 percent, and increases total efficiency by 10 percent or more. PMSM synchronous motors also have considerably higher power density, which, for geared motors, yields higher system efficiency with minimal installation volume. The synchronous design of the PMSM motors means that not only are they superior at converting electrical energy into mechanical power, but also offer the added benefit of maintaining constant speed independent of the load. This means that motor speed does not vary, despite overload variations, or cases of voltage drop, as long as the main frequency is kept constant. PMSM motors are available in ventilated and non-ventilated configurations across the power range from 0.55kW to 15kW. They operate on 380-volt to 500-volt power supplies, and are rated for inverter duty, offering an extended speed range with constant torque.

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