

Novel ferrite SMDS spoke-type BLDC motor for PV borewell submersible water pumps



Stator, rotor, end-flanges and the fabricated ferrite magnet based spoke-type submersible BLDC motor

A novel ferrite based semi-modular dual-stack (SMDS) spoke-type BLDC motor is designed and fabricated for a photovoltaic (PV) powered submersible water pump. A new rotor is designed with minimum flux leakage and without the use of a separate non-magnetic hub for the rotor. The proposed flux barrier arrangement uses the bottom bridge of the conventional spoke rotor, and despite being magnetic reduces flux leakage. The use of ferrite magnets makes the motor more economical compared to the rare-earth magnet based motors.



Submersible pump and pump side coupling of the fabricated BLDC motor



Submersible BLDC motor coupled with the borewell pump