Schlumberger

Permanent Magnet Motor

Energy-efficient solution for ESP applications

APPLICATIONS

- ESP systems across most applications and conditions
- Wells with casing diameters of 5½ in or larger

BENEFITS

- Reduces power costs because of its high energy efficiency compared with a conventional AC inductive motor
- Improves ESP performance in low-flow and deviated wells with wider load and frequency range compared with an inductive motor
- Facilitates design, installation, and retrieval because it is smaller and lighter than a comparable inductive motor

FEATURES

- Expanded operating range of 1,000–4,200 rpm
- Shorter and lighter than conventional induction motors
- Maximum motor winding temperature 190 degC [374 degF] for standard modification and to 220 degC [428 degF] for high temperature
- High overloading ability and torque
- Enhanced protection mechanisms

The Permanent Magnet Motor (PMM) is a three-phase, oil-filled motor with permanent magnets mounted in the rotor. An alternative technology in electrical downhole drives, it is assembled and run in the same way as a conventional ESP motor and is suited for most applications. Its unique rotor design enables superior performance, improved efficiency, and higher power factor, which leads to reduced power consumption when compared to standard induction motors.

Motor size and power

The standard PMM size has a 117 mm [4.61 in] OD, with other available lengths depending on required power. The PMM has higher power concentration per meter of length, which makes it shorter and lighter than conventional ESP motors while still offering the same level of power. With up to 200 kW per 8.5 m at 50 Hz or 320 hp per 28 ft at 60 Hz, the PMM reduces risks associated with the installation and application of long motors in deviated wells.

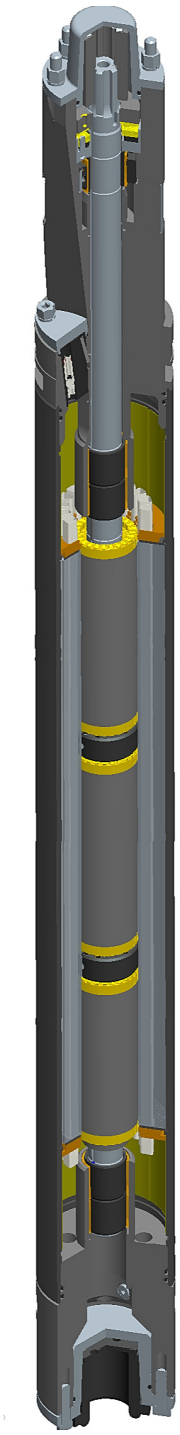
Synchronous operation

The PMM is able to reduce losses in the core through synchronous operation, which reduces heating and helps expand the operating envelope.

Stable, reliable ESP

In rapidly changing environments, higher torque capabilities enable stable ESP operation during increased solids or water cut production. When operating in underloaded conditions, the PMM's wide operating range offers higher efficiency and improved power savings.

Specifications	
Series	461
Motor OD, mm [in]	117 [4.6]
Max. motor winding temperature, degC [degF]	
Standard	190 [374]
HT	220 [428]
Max. power, kW at 50 Hz	200
Max. power, hp at 60 Hz	320
Efficiency, %	Up to 90.7
Power factor	0.96
Nominal rpm at 50 Hz	3,000
Number of poles	2



Permanent magnet motor.