Permanent Magnet Motor for Rotaflex® Long-Stroke Pumping Units (PMM-RF)

Provides Economic, High-Torque Power with Less Energy Consumption

Applications

- Rotaflex long-stroke pumping units

Features and Benefits

- AC synchronous motor leverages strong rotor-surface magnets for continuous, beltless power on reciprocating rod-lift systems
- Beltless, direct-drive system eliminates sheaves, belt-guards, maintenance, HSE hazards, and downtime related to belt tensioning, slippage, misalignments, and strokes-per-minute (SPM) adjustments
- Adjustable SPM settings, from 0.6 to any maximum rate allowed by the pumping unit
- Variable upstroke/downstroke speeds help reduce sucker-rod wear and extend overall run life
- Low-torque ripple generates steady torsion at low speeds
- Low-profile housing provides 15% smaller footprint and reduced noise factor of less than 80 dB(A)
- Stator winding system eliminates brushes for reduced heat generation
- High overload capacity handles 200% of rated torque for 60 seconds for minimized risk of pump failure
- SCADA-system connectivity provides full remote control

Tool Description

Weatherford PMM-RFs provide an AC synchronous, direct-drive motor that uses magnets imbedded on the surface of the motor rotor to create a continuous magnetic field. The PMM-RF delivers up to 95.2% efficiency with a 0.95 power factor than can provide up to 30% less energy consumption, compared to conventional induction motor systems. With torque ratings up to 1,794 Nm, frequencies as low as 0.2 Hz, and shaft speeds as low as 0.6 rpm, the PMM-RF motor directly drives the load—eliminating needs for belts and sheaves. The standard PMM-RF unit may also be retrofitted to fit any new or existing pumping units with universal-shaft couplers with +/- 3-degree offsets.

Weatherford PMM-RFs provide a unique solution for oil and gas artificial lift systems. They supply up to 1,325.81 lbs/ft (1,784 Nm) of torque at frequencies as low as 0.2 Hz and shaft speeds as low as 0.6 rpms and are directly mounted to the high-speed shaft, avoiding belts and losses due to slippage.

PMM-RF profile

Weatherford®

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Specifications

Power rating	50 hp to 200 hp/ 37 kW to 150 kW
Power factor	0.95
Voltage range	380 V to 1,140 V
Potential annual energy savings	15% (49,275 kWh)*
Potential annual carbon-emissions savings	22,970 kg CO_2**
Insulation class	H (356°F/180°C)
Ingress protection	IP55
Cooling method	IC410 (Natural)
Altitude derating limit	Totally Enclosed Force Ventilated (TEFV)
Ambient temperature rating	-40°F to +131°F/ -40°C to +55°C
Duty class	S1
Service factor	1.00
Certifications	ETL-US, IECEx
Variable-speed drive	Required

*Savings based on 75 kW power-rated motor running 24/7/365 at 50% load capacity.
**Emissions based on retrofit installation of 75 kW PMM-RF on a Rotaflex 950 pumping unit using Texas equivalent electricity factor of 0.433 kg/kWh according to US EPA.

Output Ratings

Model ID* (DDPM-RF-torque power-hp)	Gear-reducer torque power		Variable-speed drive horsepower (hp) vs pumping unit strokes per minute (SPM)								Max SPM
			220 hp	180 hp	150 hp	125 hp	100 hp	75 hp	60 hp	50 hp	
DDPM-RF-1160-XXX	41.67 ft-lbs	56.5 Nm	7 SPM	6 SPM	5 SPM						11 SPM
DDPM-RF-950/1100/1150-XXX	29.13 ft-lbs	39.5 Nm		8.5 SPM	7 SPM	6 SPM	5 SPM				12.5 SPM
DDPM-RF-800-XX(X)	20.79 ft-lbs	28.2 Nm					10 SPM	7.5 SPM	6 SPM		15 SPM
DDPM-RF-700-XXX	18.95 ft-lbs	25.7 Nm						10.5 SPM	8.5 SPM	7 SPM	15.5 SPM

*Complete Model ID "XXX" by matching VFD hp vs. Pumping Unit SPM.

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