LEAFLET

ABB low voltage permanent magnet motors

Highest efficiency for low speed and high torque applications

Developed from synchronous motors, ABB's low voltage permanent magnet motors combine the high speed accuracy of synchronous technology with the robust design of induction motors. They have the capability to deliver very high torque from small motor sizes at low speed, eliminating the need for gearboxes. Additionally, use of synchronous motor technology ensures high efficiency.

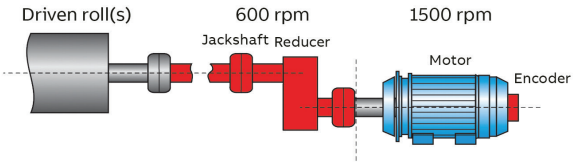
ABB low voltage permanent magnet motors are designed for control by ABB frequency converters only, and they cannot be operated direct on line.

What are the benefits of using ABB low voltage permanent magnet motors?
Standard induction motors are not particularly well suited for low-speed operation as their efficiency drops with the reduction in speed. They may also be unable to deliver sufficiently smooth torque across the lower speed range.

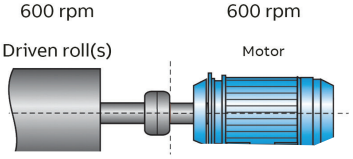
This is normally overcome by using a gearbox.

The ABB low voltage permanent magnet motor drive solution provides a high torque and low speed drive system coupled directly to the pump. Eliminating the gearbox - or belts and pulleys – also eliminates the losses caused by mechanical transmission equipment and significantly reduces the maintenance needs of the system. This also gives more freedom in the layout design.

Traditional solution: induction motor with gearbox



Permanent magnet solution



The combination of fewer components and more straightforward configuration not only saves energy but also reduces plant engineering hours, pump skid and foundation size, maintenance costs, and spare part inventories. At the same time installation becomes easier and system reliability is increased.

As the permanent magnet motors are synchronous motors driven by frequency converters, they can be very accurately controlled without the need for feedback devices like pulse encoders. The speed accuracy is as high as that of induction motors in variable speed drive applications with feedback devices.

Summary of benefits:
- Lower maintenance cost
- Reduced spare parts inventories
- Easier system installation
- Higher “system reliability”
- No mechanical power transmission losses

Highest efficiency
Compared to other low speed direct drive motors ABB low voltage permanent magnet motors deliver the highest efficiency in the market and – because the motor powers the application directly - the drivetrain system also provides the highest possible efficiency. The payback time for the drivetrain system is typically from 12 to 24 months, and in some cases even less.

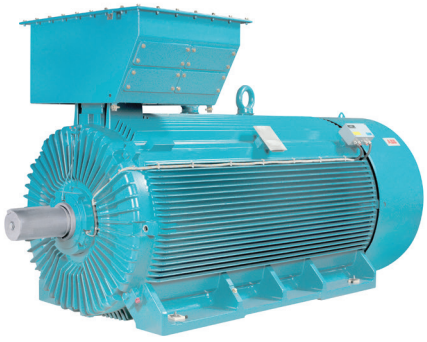
Technical information
ABB low voltage permanent magnet motors are synchronous motors. The stator incorporates a conventional three-phase winding, as in a squirrel cage motor, while the rotor uses powerful permanent magnets. The magnets in the rotor create a constant flux in the air gap, thereby eliminating the need for the rotor winding and brushes normally used for excitation in a synchronous motor.

Externally, the motors are similar to totally enclosed fan cooled (TEFC) induction motors. They use the same cast iron frame, bearings, seals, main terminal box and accessories as conventional induction motors.

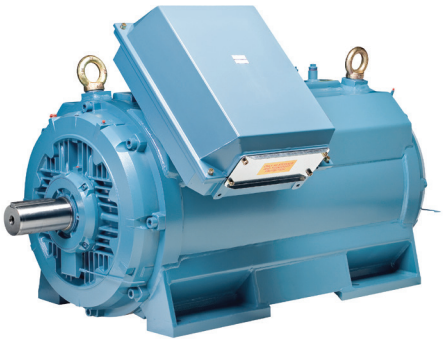
Main features
Power: 17 to 2 500 kW
Torque: 1 000 to 50 000 Nm
Voltage: 400 to 690 V
Standard: IEC
Frame size: 280 to 560 mm
Protection: IP55, IP56
Cooling form: IC411, IC416, IC417, IC71W
Starting method: ABB frequency converter

Speed and Output:
1 020 kW at 220 rpm
1 390 kW at 300 rpm
1 970 kW at 430 rpm
2 490 kW at 600 rpm

Low voltage Permanent magnet motor, frame size 560



Low voltage Water-cooled permanent magnet M3LJ motor, frame size 400



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