APPLICATION NOTE

High voltage rib cooled motors for water applications

From clean water extraction, through treatment and distribution, to wastewater treatment plants, ABB motors offer reliable and highly efficient solutions for your pumps and other applications. They are also the ideal choice for desalination plants, irrigation systems, district heating and cooling systems, and industrial water applications.

Next generation HXR
ABB's high voltage rib cooled motors are based on the successful rib cooled HXR motor range, which has built a solid track record for high reliability and performance in water applications. The motors offer a significantly lower cost of ownership together with smaller size, higher power density, lower losses and easier maintenance. They incorporate the know-how and experience ABB has gained over more than 125 years of manufacturing electric motors.

The motors' proven insulation system and high quality bearings offer excellent reliability and availability, which are essential in critical services like water and wastewater systems. Reliability is further improved by the innovative cooling design, which keeps internal temperatures more balanced for longer lubrication intervals, increased bearing lifetime and less thermal stress.

The high efficiency of the motors reduces operating costs in energy-intensive processes. The motors are optimized for variable speed drive (VSD) use. By controlling the motor with a variable speed drive, you can optimize the motor's performance, minimize energy consumption and control your process more accurately.

More know-how per kilogram
ABB's high voltage rib cooled motors set a benchmark for the industry, offering more watts per kilogram than has ever been achieved before with rib cooled motors. The high power density means that for a given output you can often use a motor one frame size smaller than with conventional products. This helps to save space and enables more compact installations.

High power density has been achieved by improving the coil design for increased power and optimizing internal and external airflows for maximum cooling effect. A cable tray for auxiliary wiring ensures clear cable routing, which keeps the airflow free and ribs easy to clean.

General purpose and engineered motors
ABB's high voltage rib cooled motors are available as N-series general purpose motors (type NXR) and A-series engineered motors (type AXR).

N-series general purpose motors combine cost-efficient standardized designs and short lead times with safety, productivity, energy efficiency and reliability. They are targeted at applications where a highly customized motor is not needed.

A-series engineered motors are highly customized, fine-tuned to the customer's precise needs, and offer a high degree of engineering flexibility.

Built-in serviceability maximizes uptime
Built-in serviceability makes maintenance straightforward, and therefore reduces downtime. You can easily remove the fan cover for fast access, and check the coil end and bearings with an endoscope without removing the end shields.

The flexible mounting system cuts the service time needed for repositioning the terminal box. The cable tray ensures that the cables are clearly routed and always secured in the same position, making maintenance easy.

To maintain maximum performance over the entire life cycle, pre-designed fixing points enable easy mounting of ABB condition monitoring systems. These systems collect and analyze operating data from the motors, providing early warnings of problems before failures can occur. This enables the utility operator to take corrective action during a scheduled outage.

ABB motors for water and wastewater applications are built for high levels of performance, quality and reliability in demanding conditions and remote locations. Our extensive global network ensures local service delivery whenever and wherever you need it. The worldwide network includes over 60 service centers and more than 150 authorized service providers.

Main specifications	
Output power:	100 to 1800 kW
Frame size:	315 to 500
Number of poles:	2 to 12
Voltages:	Up to 11.5 kV
Frequency:	50/60 Hz, VSD
Cooling:	IC411, IC416
Protection:	IP55 (optionally IP56, IP65 and IP66)
Enclosure material:	Cast iron
Bearings:	Antifriction or sleeve
Motor types:	NXR and AXR
Mounting:	Horizontal or vertical
Ex protection types:	Ex ec (previously Ex nA), Ex eb (previously Ex e), Ex tb, Ex pxb, Ex pzc
Standards:	IEC (electrically NEMA feature available)

Main features for water applications
Standard accessories
Stator winding protection
6 x PT-100 temp. sensors provided (2 per phase, 3 for monitoring, 3 spares)
SPM nipples for motors with antifriction bearings
Vertical jacking screws
Dowel holes
Auxiliary terminal box IP66
Painting system C3
Built and tested according to ISO 12944
VSD packages
Optimized ABB motor and VSD packages for even lower energy consumption

Key features and benefits
- Higher power density means smaller overall size, saving space and making installation easier
- High efficiency for reduced energy consumption and emissions
- Rigid cast iron frame with wider feet for enhanced stability and low vibration levels
- High reliability due to innovative cooling design, which keeps internal temperatures more balanced for longer lubrication intervals, increased bearing lifetime and less thermal stress
- Well-proven insulation system, high quality bearings and higher coil quality due to improved design and manufacturing
- Flexible positioning of main terminal box reduces need for spare motors
- Extra flexibility in location of auxiliary terminal box and mounting of accessories
- Designed for easy use of ABB condition monitoring systems
- High availability due to built-in serviceability (eg, coil ends can be checked with an endoscope without removing the end shields, quick access for re-lubrication)
- ABB's extensive global network provides local service and fast response
- 3D models available on request
- Optimized ABB motor and drive packages offer easy installation and operation and even greater energy savings
- Based on more than 125 years of experience manufacturing electric motors

For more information please visit:
abb.com/motors&generators

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