

Induction motors for oil and gas drilling applications



What can ABB offer the oil & gas industries?

ABB motors and generators are designed to meet the highest demands for efficiency, performance and availability. These reliable solutions have established themselves as the natural choice for critical applications in harsh conditions: they are providing dependable operation in severe environments ranging from offshore platforms in the Arctic to some of the hottest desert locations on earth.

Over 100 years of experience in producing motors and generators gives ABB unrivalled expertise in the requirements for specific applications. As a result ABB is well-placed to help customers increase their productivity while enhancing production safety.

The oil and gas industries operate in a complex regulatory environment, and ABB constantly monitors developments in international standards and regulations to ensure that its products not only comply but in many cases surpass the latest requirements. In particular, ABB has positioned itself at the forefront in the field of hazardous area motors, and was the first manufacturer in the world to supply ATEX certified motors.

What solutions does ABB deliver for drilling applications?

ABB is the world's number one supplier of drilling drives. The systems it delivers offer highly responsive and extremely accurate speed and torque control, as well as excellent dynamic characteristics over the entire range from zero to maximum speed.

Since the early 1990s – when it supplied the world's first commercial AC drilling drive - ABB has worked with all the major suppliers of mechanical drilling equipment. As a result, control interfaces are readily available for equipment from most suppliers.

ABB's induction motors for oil & gas drilling applications feature high efficiency, low noise and vibration, and enhanced safety. Straightforward construction means higher reliability with less maintenance. When servicing is required, ABB's global network can provide rapid response and comprehensive back-up, even for installations in remote locations.

ABB supplies products and systems for a range of drilling applications, including topdrive / DDM (Derrick Drilling Machine), mud pump, and drawworks motors.

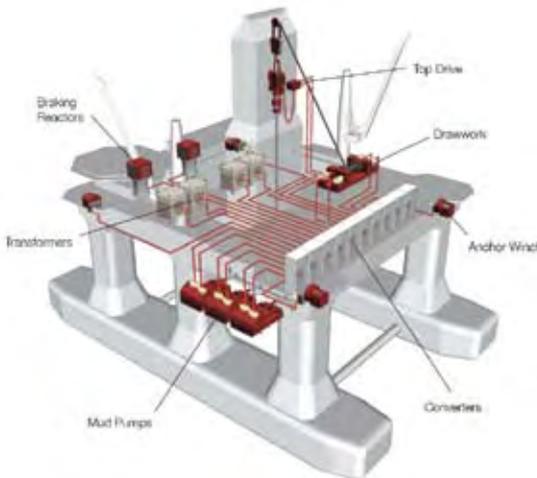
Topdrive motors

The topdrive rotates the drillstring end bit without the use of a kelly and rotary table. Electrically driven Derrick Drilling Machines are designed with a continuous shaft from the mud swivel through the gearbox and pipe handler, with the load hang-off nut at the lower end. One or two vertical AC topdrive motors are used to drive the gearbox. The topdrive is operated from a control console on the rig floor.

Main features

- operation VSD driven
- environment hazardous and corrosive
- fitting vertical but foot backed up, shaft pointing down
- cooling locally cooled by air or water
- typical power rating onshore: 400 - 800 HP, offshore: 1100 - 1800 HP
- speed 0 – 1800 rpm
- possible axial forces negative acceleration force (2-3g) in case of emergency stop for free ride

ABB topdrive motors are designed, tested and certified for offshore and VSD applications. Together with ABB drives they provide an optimum solution for the required speed range. The foot mounted and flange supported construction delivers a mechanically rigid solution. The specially selected bearing solution for vertical machines gives reliable operation and a long lifetime.



Mud pump motors

Mud pumps (MP) circulate the mud (drilling fluid) and maintain the correct pressure in the drilling well. Typical installations have two AC motors per pump, or one larger AC motor with two shaft extensions.

Main features

- operation VSD driven
- environment hazardous and corrosive
- fitting horizontal mounting on the top of the pump
- typical power rating 1100 - 2200 HP
- speed typically 0 – 1500 rpm
- cooling locally cooled by air or water
- force radial force typically < 80 kN at shaft end

ABB motors are extremely robust, especially with respect to the shaft and frame, and are designed for belt drive applications where significant radial forces are present.

Drawworks motors

The Drawworks (DW) is the electrically driven hoisting mechanism on a drilling rig. The DW reels the drilling line in and out to raise and lower the drillstem and bit.

Main features

- operation VSD driven
- environment hazardous and corrosive
- fitting horizontal (foot mounted)
- typical power 1100 HP
- speed 0 – 2200 rpm
- external forces typically no external forces, but may be present in some cases

ABB can offer a complete drive package with a tested and optimized motor and drive solution for the DW, which is a demanding drive application. The AC motors are compact in size, provided with a flange connection, and are foot supported. Special bearing solutions are available for cases where there are radial forces acting on the motor shaft.