It takes guts, know-how and experience to install a drilling rig in the open sea, because these heavy and cumbersome platforms can only be safely positioned on the seabed with the help of complex and highly advanced systems. Often jack-up systems are used in which truss type triangular legs are forced downwards by means of rack and pinion system. Once the rig is at the correct air gap, the raised platform or rig has to be mechanically locked to the legs. It’s a job that requires power and precision, and there’s no room for error.

GustoMSC has designed a system for anchoring the legs, in which toothed steel chocks are pressed into the rack of the legs. Bosch Rexroth engineers developed an energy-efficient and dependable drive and control solution for it. Despite the high power density of hydraulics as a power medium, the system employs no hydraulics, but instead an electric drive, comprising a total of 72 frequency-controlled IE2 class AC electric motors. The frequency controller enables full control of both the speed and power of the motor. Moreover, electric motors can be easily connected into the platform electric grid.

**Drive & Control**

Of course, in addition to the electric drive, Bosch Rexroth also took responsibility for development of the control system and associated software. A control system that, in combination with the structural

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**Fixation system**

**ELECTRIC DRIVE LOCKS VERTICAL POSITION OF OFFSHORE PLATFORM**

For many years now, Bosch Rexroth has achieved important advances in the field of electric drives. And no less in the offshore industry. The electrically driven locking systems, used to lock the vertical position of the legs of drilling rigs or accommodation platforms, are a perfect example. Bosch Rexroth customer GustoMSC has already taken delivery of 46 systems, and they’ve never looked back.

**Tough application**

Locking system for truss legs on jack-up platforms.

**Ingenious solution**

Design, construction and commissioning of 72 IE2 AC electric motors with precision control, thanks to use of frequency controller

**Exactly**

- 72 motors with matching gearbox and integrated brake
- Motors with gearbox and brake suitable for immersion in seawater
- 3 motor control centres with frequency controllers
- 3 portable consoles for local operation
- Solution contributes to increased safety
- Electric drive can be precision-controlled
- 46 systems already delivered
- Configurable concept

**Frequency controlled electric motor**

GustoMSC has designed a system for anchoring the legs, in which toothed steel chocks are pressed into the rack of the
solution, contributes to maximum continuity, reliability and safety. Using a portable operator console, the control system can be made to run through different movement patterns, so that the locking system will always engage the teeth of the rack at the desired position. A special coating was applied to all sensitive components, including the electric drive units, enabling them to withstand the harsh conditions offshore. The system can be customized for compliance with non-standard, higher protection classes. In such cases, on request, Bosch Rexroth will develop and also perform an appropriate test in order to demonstrate compliance.

**Configurable concept**
To achieve maximum flexibility, Bosch Rexroth has developed a configurable concept that can be adapted in a number of areas, according to the design specifications. For example, the required speed, transmission ratios, control system and protection class are all configurable. This configurability has an influence on both hardware and software. Moreover, whenever a new system is ordered (GustoMSC has already taken delivery of 46), Bosch Rexroth checks each time whether it still represents the best proven technology available. If necessary, the design is modified.

**Certification**
The electrically driven vertical locking system is certified according to the requirements of relevant inspection bodies for offshore applications. This would typically be ABS, DNV, or possibly NORSOK.

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**Solved with**
- Three legs with rack and pinion system, equipped with 72 motors and three frequency-controlled control units.
- Easily controlled by means of frequency controller.
- Electric drives perfectly suited for offshore applications.
- Configurable locking system.

**Electric drives**
Electric drives are also perfect for offshore work. With comprehensive protection from moisture, salt and weather, they never miss a beat, even in the harshest conditions.

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*Pictures with courtesy of GustoMSC design*