

# Smarter power for civil engineering applications



# The drive to build a better solution

Civil engineering works involve heavy machinery, but they differ from heavy machines. The projects are complex, site-specific and expected to last for decades, which puts different demands on a drive system. The combination of power and reliability they require can be found in a drive that does things differently.

## Häggglunds drives from Bosch Rexroth

Häggglunds hydraulic direct drives are a smart alternative to the electromechanical drive systems typically used in civil engineering works. With no foundations, no gearboxes and no sensitive couplings, they offer flexibility and reliability beyond the ordinary. But they also deliver exceptional power, with control over speed and torque no other drive solution can match.

A direct drive system is based on one or more Häggglunds hydraulic motors, which are mounted directly on the driven shaft. The force and direction of rotation is determined by fast-acting hydraulic pumps, which are located in a flexibly placed drive unit. Overseeing it all is a control and monitoring system, ensuring safe, smooth and optimized drive function.

## Drive benefits for civil engineering

### ► Reliability

Reliability is key when a project will last for decades. Even if it operates just once or twice a year, the drive's function is critical when it does.

Häggglunds drives have no gears or couplings to fail, nor are they sensitive to torque stresses. High starting torque can be sustained indefinitely, while effective torque limiting prevents damage from external forces.

### ► Redundancy

For safety and reliability, Häggglunds drives can be configured with redundancy. By dividing the capacity over multiple motors and pumps, operation is secured in the unlikely event of a component failure.



### ► Ease of installation

Compact and lightweight, Häggglunds drives simplify design work and are easy to get in place. Because they often reduce installation weight by many tons, the lifting, maneuvering and securing all become easier.

### ► Ease of maintenance

Häggglunds drives have an intelligent, modular construction that facilitates maintenance work. All parts are standard, which makes them easy to obtain and install.

### ► Ease of exchange

Because Häggglunds drives are modular systems, everything can be ordered from stock – or even kept on hand. This allows fast and economical 1:1 replacement, not only of parts but of an entire drive if necessary.

## Other advantages in brief

- Full torque throughout the speed range – without oversizing
- Smooth acceleration and deceleration
- Highly accurate drive positioning
- Unlimited starts and stops without overheating
- Nearly instantaneous emergency stops
- Perfect load sharing between multiple motors

# Dam gate hoists



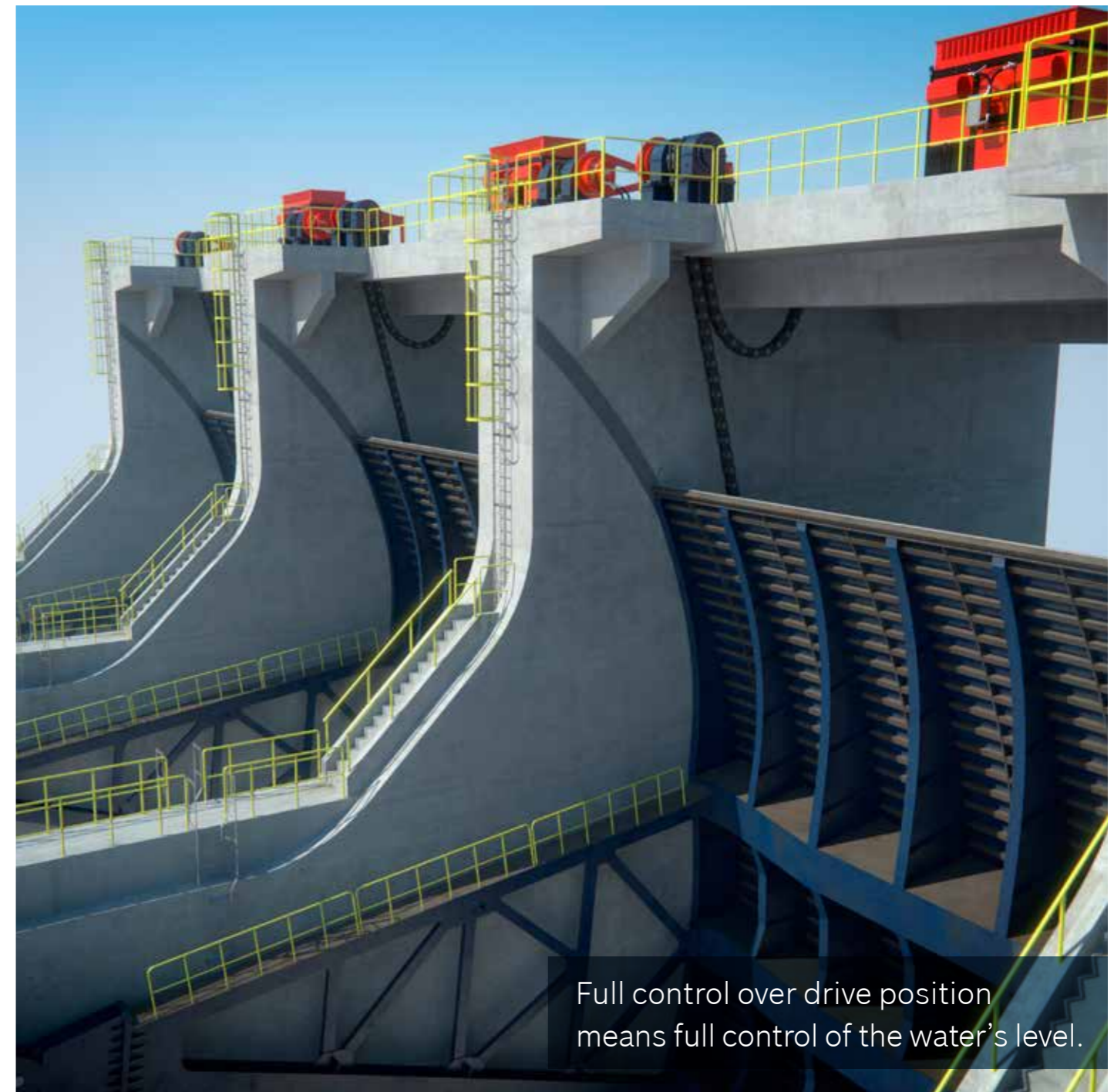
Malpaso dam, Mexico.

Radial gate hoists are very seldom operated, and then only for a few degrees of drive rotation. Generally used for irrigation and water storage, they have an important function in regulating the water's level.

Here the high controllability of a hydraulic direct drive system makes a difference, because accurate drive positioning makes this regulation very precise. Steered by a simple flow of oil, the drive stops almost instantaneously when the gate reaches the desired position.



Malpaso dam, Mexico.



Full control over drive position means full control of the water's level.

# Barrier gates

Please note:  
This is an example illustration that shows a potential drive solution for these types of barrier gates



Multiple motors offer shared strength  
– and far greater security.



Maeslant storm surge barrier, Netherlands.  
Photo: Rijkswaterstaat.

Barrier gates can prevent storm water and high tides from causing damage inland. Or they may serve the opposite function, preventing water from escaping during dry periods. Either way, their operation is usually intermittent – but often critical.

A hydraulic direct drive system offers valuable security. The drive duties are shared across multiple Hägglunds hydraulic motors, all contributing equally during normal operation. If necessary, the gate can operate with fewer motors.



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# River weirs



Modular drives are a smart solution that bears repeating.

Drum gates are generally found on rivers, where they support traffic by regulating the speed and depth of the flow. Since they usually form part of a multi-lock system, the same solution is often repeated up and down the river.

As rotary drives with outstanding torque control, hydraulic direct drives are a logical choice for the winch-like drum gate operation. But a further advantage is their modular construction from lightweight and standardized components. Exchanges and repairs are simpler when components are easy to move and can be used anywhere within the lock system.



Ship Lock, River Main, Germany.

# Ship locks

Ship locks are among the few civil engineering works that experience frequent operation. Used several times daily to let ships pass, they must offer constant availability – even when service is needed.

Rotary drives are already used in a number of locks, with rolling gates, mitre gates and ship arrestor systems. Hydraulic direct drives provide the same movement, but are so compact that a spare unit can be stored on site. By quickly swapping it in, operation can continue even during a major drive overhaul.



Operations can be maintained, even during service.



Ship Lock, River Neckar, Germany.  
Photo: Wasser- und Schifffahrtsamt Heidelberg.

# Movable bridges

Movable bridges of many types can benefit from hydraulic direct drives. In this example with rope winches, the lightweight motors are easily lifted into place and mounted without gearboxes or other bulky equipment. Braking occurs on the winch drums themselves, and there are no couplings or other sensitive drive train components between motor and winch.

For further safety, the capacity can be divided over several smaller motors and pumps. This solution lets the bridge move at reduced speed – or at least be held in position – if a failure occurs.



Simplicity and redundancy lift safety to new levels.



Bascule Bridge, Lowestoft, UK.

# Knowledge to build on Service to count on






Bosch Rexroth can draw on experience from civil engineering applications worldwide, both in drive systems and beyond. By listening closely to your challenges and making full use of our knowledge, we bring you reliable, long-term solutions that minimize risk and maximize peace of mind.

### Service for peace of mind

Most civil engineering works will last for decades. That demands a lot from a drive, but even more from a drive partner. Bosch Rexroth provides complete support throughout your drive system's life cycle.

From Häggglunds original spare parts to expert field service and cutting-edge upgrades, everything you require for drive performance is available through our global organization. For full peace of mind, we can tailor the right mix of support and services in a performance agreement for your specific needs.

### Range of Rexroth Services for Machinery Applications and Engineering

 <b>Spare Parts</b>	 <b>Preventive and Predictive Services</b>
 <b>Repairs</b>	 <b>Retrofit and Modernization</b>
 <b>Field Service</b>	

**Detailed information**  
[www.boschrexroth.com/service/haggglunds](http://www.boschrexroth.com/service/haggglunds)



**Bosch Rexroth AB**

SE-895 80 Mellansel  
tel: +46 (0)660 870 00  
[www.boschrexroth.com](http://www.boschrexroth.com)

**For more information:**

[www.boschrexroth.com/](http://www.boschrexroth.com/)

**Find your local contact person here:**

[www.boschrexroth.com/contact](http://www.boschrexroth.com/contact)