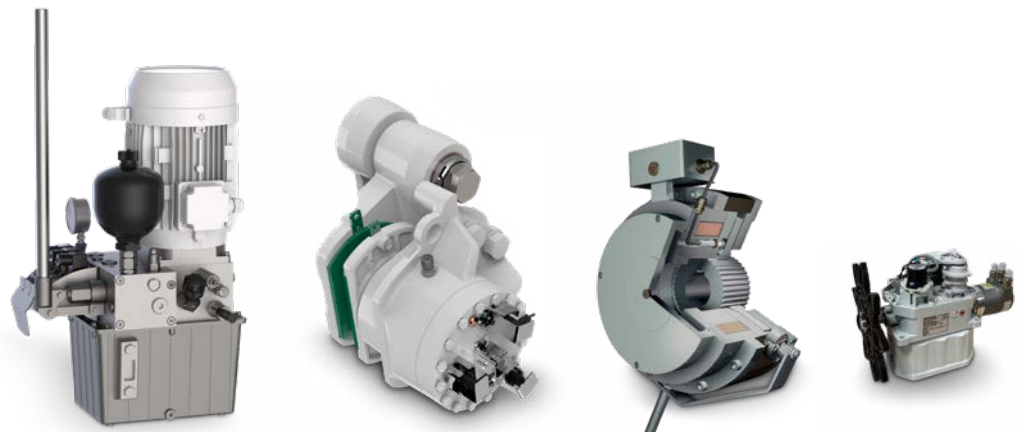


Photo courtesy of RECOM

BRAKING SYSTEMS

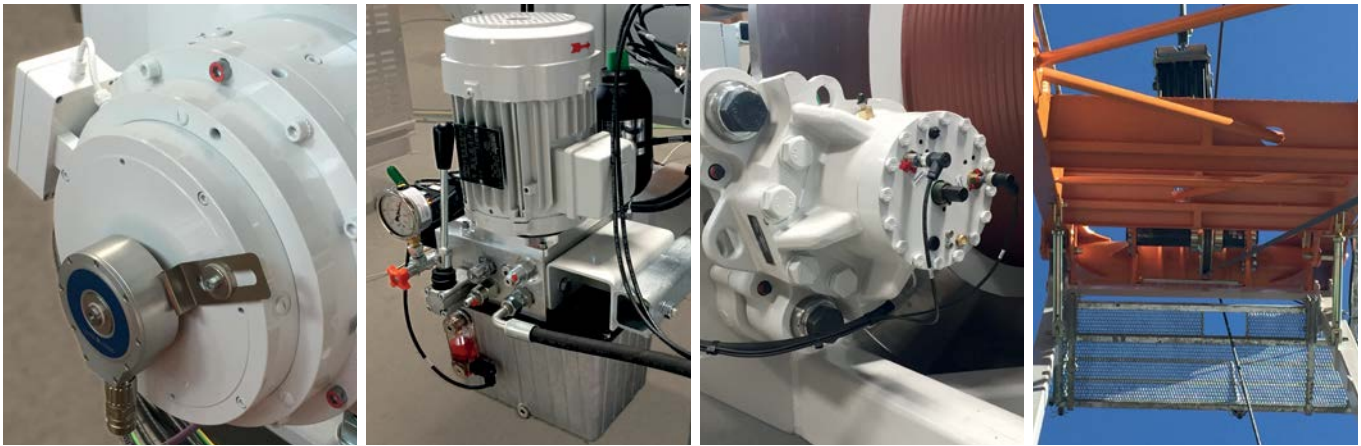
FOR FLAT-TOP AND LUFFING
CRANES



STROMAG PROVIDES COMPLETE BRAKING SYSTEMS FOR FLAT-TOP AND LUFFING TOWER CRANES

Stromag offers standard or fully customized braking system solutions to meet the safety requirements of the hoisting cranes.

Stromag develops and provides a large range of technically advanced brakes, hydraulic power packs, controls and sensors to ensure safety of modern concept cranes as flat-top cranes and luffing-jib tower cranes.



Tower cranes are configured in a wide variety of ways to perfectly adapt to the needs of each application such as building or offshore. Configurability and versatility of Stromag products provide braking system solutions adapted to each tower crane whatever their capacity or working conditions:

- Robustness and reliability of our brakes systems enable very low maintenance costs.
- For specific applications as offshore cranes, the crane driver can pilot different braking modes through the remote-control panel of the installation: the Stromag™ SHPU Hydraulic Power Packs allow modular braking force application and can be delivered with an electrical control unit specifically adapted to the customer request.
- Stromag offers turnkey braking systems:
 - Service brakes: NFF brakes directly mounted on the motor shaft
 - Emergency brakes: SHD9 or SHD5A brakes mounted on the rope drum(s) for hoisting and boom controls
 - Hydraulic Power Packs: SHPU HPP associated to SHD calipers, with electrical control unit on request
 - Gear Cam Limit Switches: Light Cam™ to control the lifting positions.

STROMAG BRAKING SOLUTIONS FOR FLAT-TOP AND LUFFING TOWER CRANES



Calipers Type SHD

SIME™ Brakes calipers type SHD are fail-safe Disc Brakes with spring application and hydraulic release. SHD9 and SHD5A calipers, associated with a Hydraulic Power Pack type SHPU, are an appreciated answer to the technological challenge imposed by lifting equipments.

Their robust construction and simplicity of operation bring high reliability to these calipers. Their compact and light weight design allows an easy mounting in a restricted space. A large braking force range enables the installation of these calipers on multiple equipments:

- SHD5A: Dynamic braking force from 15 to 56 kN - Weight: 108 kg
- SHD9: Dynamic braking force from 43 to 100 kN - Weight: 148 kg



SHPU Hydraulic Power Packs

The SHPU Hydraulic Power Packs are designed in different configurations to meet the installation requirements, they enable:

- Soft Braking for lifting and lowering the load: adjustable and progressive application of the braking force with non-application of the full braking force at the beginning of the braking.
- Full Braking for boom or hoisting movements with the possibility to open manually the caliper in case of mains failure.
- Manual Overload Protection System for offshore cranes.



NFF Brakes

Stromag NFF Brakes are Shaft holding and working Brakes. These electromagnetic brakes are fail-safe by spring application and electrically released.

- Comprehensive range 20 -10,000 Nm
- Simple assembly to motor, no dismantling of brake required
- No setting is required over maximum lining wear
- Sealed inspection holes for air gap and lining wear
- Positive feel hand release mechanism



Light Cam™

Stromag™ Light Cam series geared cam limit switches are universal mechanical switching devices which present a large number of input shaft revolutions on the rotation angle of one single revolution of the cam discs.

- Combined worm/spur gears for high gear reductions requiring less mounting space; different, precisely graduated gear reduction
- Cam discs with precise adjustment
- Available with 4 or 8 contacts
- Utilisation of switching contacts for switching voltages of 250 VAC, gold contacts on request
- Installation of potentiometer, incremental or absolute encoders possible.

STROMAG™ BRAKING SYSTEMS FOR FLAT-TOP TOWER CRANES



Photo courtesy of COMANSA

Flat-top cranes are designed in a large range of heights and capacities. The lack of hammerhead make them a better choice for sites with height restrictions as airports or congested sites where cranes need to overlap.

Stromag™ Braking systems modularity provides complete solutions for each crane configuration:

- **SHD5A** and **SHD9** calipers offer a large range of braking force
- **SHD** calipers and **SHPU** Hydraulic Power Packs can be mounted on a common support adapted to the configuration of the installation.

For offshore applications, the Stromag emergency brakes can be used for Manual Overload Protection System which can be activated in all normal working conditions, accordingly to the standard NF EN 13852.



STROMAG™ BRAKING SYSTEMS FOR LUFFING TOWER CRANES



Photo courtesy of RECOM

Luffing tower cranes are used in building projects where space is limited. A luffing crane can raise or lower its boom while the hook is positioned on the proper location. Moving the boom pulls the hook up and down or inwards and outwards.

This type of tower crane is equipped with 2 winches to control hoisting and boom movements: Stromag provides Braking systems and Limit Switches to ensure the safety of the crane operation.

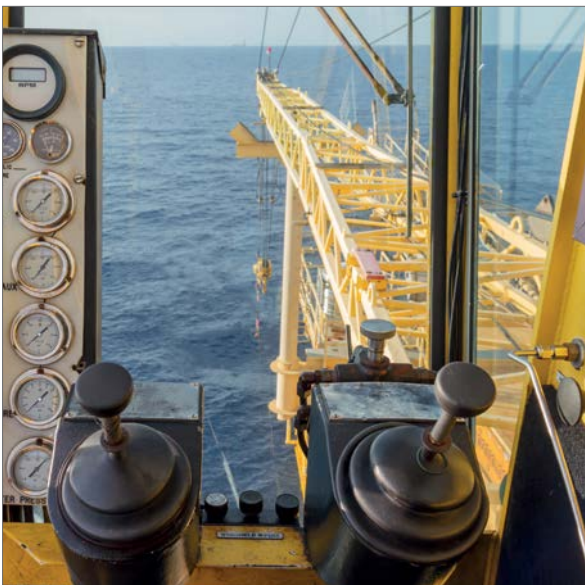
Each winch is fitted with a specific braking system composed of a **NFF** service brake, a **SHD** emergency disc brake, a **SHPU** Hydraulic Power Pack and a **Light Cam™** Limit Switch.

- For the hoisting movement, the emergency braking system allows a smooth braking force application with non-application of the full braking force at the beginning of the braking.
- For the boom movement, the emergency braking system allows application of the full braking force.



STROMAG™ BRAKING SYSTEMS FOR MANUAL OVERLOAD PROTECTION SYSTEM

Stromag™ braking systems bring solutions for **Manual Overload Protection (MOPS)** operations according to the standard NF EN 13852 with emergency braking solutions. Environmental conditions can lead to driving loads on the crane endangering the installation. The crane driver must be able to activate an emergency system to avoid these overload situations.



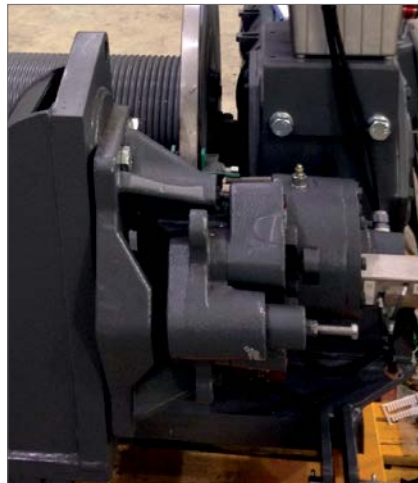
**Overload on the crane
Risk of crashing the crane**

**Activation of MOPS system
by the crane driver**

**Quick response in any
operation mode of the crane**

**Application of 10 to 20%
of the maximum load capacity**

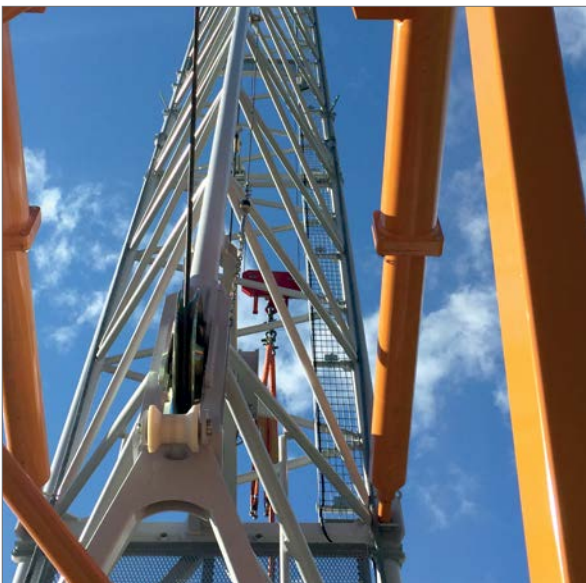
**Crane Safety - Maintain of a constant
tension on the hoisting wire**



STROMAG™ BRAKING SYSTEMS FOR SOFT AND PROGRESSIVE BRAKING

During hoisting operations (lowering or raising of the load), the Stromag™ braking systems enable the adjustable and progressive application of the braking force to reduce the dynamic amplification rate of the loads with non-application of the full braking force at the beginning of the braking.

Stromag electrical control units offer tailor-made solutions including the control of 3 different modes (**MOPS, soft-braking, full braking**).



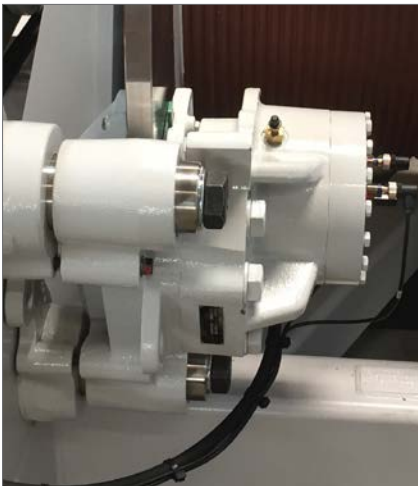
Risk of loads dynamic amplification during emergency braking

Hydraulic activation of the soft-braking

Application of a progressive and smooth braking force

Application of the full braking force at the end of braking

**Safety of the hoisting operation
Protection of the crane structure**





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