

Modular Luffing Crane Offers Unique User Benefits – Thanks to Control Techniques Drives

Unlike other crane control systems, the NTK-Technik system weighs the load during the smooth S-ramp lift, using the 55 kW hoist drives internal torque measurement. This eliminates the need for static weighing by a load cell after the initial lift, making the process more comfortable for the operator without the usual jolt caused by the start-stop-start of the hoist.



Crane control software incorporated into Unidrive SP AC drives from Control Techniques has enabled crane control specialists NTK Technik GmbH to build in unique operational features into a new design of crane recently launched by Jost Cranes of Germany.

“We have worked closely with Control Techniques to produce sophisticated crane control software that runs in the drives’ application modules,” explains NTK Technik GmbH managing director Bernd Niehoff. “This incorporates two completely new features that include a new method of assessing load during the lift to eliminate the weighing delay - and its accompanying jolt – and a selectable operating mode that gives a constant load height irrespective of the luffing position of the crane.”



KEY BENEFITS

- INCREASED PRODUCTIVITY – BY ELIMINATING THE LOAD WEIGHING TIME
- OPTIMISING THE MAXIMUM HOIST SPEED – DEPENDING ON LOAD
- OPERATOR CABIN MODULE – INCLUDES ALL DRIVES AND CRANE CONTROLS
- AC DRIVE (UNIDRIVE SP) PROVIDES ADVANCED PLC FUNCTIONALITY



The unique constant load height feature makes the crane operation both easier and safer. The 30 kW luffing (jib) drive can lift the jib from horizontal (0°) up to 89°. This would normally change the height of the load above the ground. During cargo loading and unloading, there is a need to keep the load at a constant height. This is achieved by operator key selection, at which point the drives take-over.

The hoist and luffing drives operate in digital lock mode, with feedback from absolute encoders on both motors directly into the application module software, which then calculates, the take-up or payout of the hoist cable, as the jib drops or lifts, to maintain load height throughout the operation.

The third Unidrive SP, again 30 kW, provides the 360° slewing movement of the crane.

Another software generated mode is the joystick-selected 'constant power hoisting mode'. This instructs the hoist drive to increase the speed of the motor over its nominal speed when a part-load is detected, giving more efficient lifts without any increase in maximum power consumption.

“The Unidrive SP has many features that are ideal for crane control,” says Herr Niehoff. “Its vector control, integrated space-saving braking and its superb dynamic response are all important, of course. But what makes it the best for our needs are the application modules with pre-loaded crane specific software, which make the process of design much easier. They are a key part of our double-redundancy ultra-safe design that meets grade 4, the very highest level of crane safety. Because the drives are compact and programmable, we can also keep the panel size to a minimum, which has been important in the overall crane design.”

“We initially chose Control Techniques’ drives because of the company’s experience in the lift and hoist market, and we have total confidence in the back-up they give us at every stage from design to worldwide after-sales support” concludes Herr Niehoff.

The tower crane company Jost has adopted the NTK-Technik system for their new generation of topless luffing cranes which are destined to become the backbone of the companies product line. A key feature of the new series of cranes is a compact cabin that houses all of the drive electronics, for ease of access, as well as the driver’s cockpit. The task of designing a compact drives solution to meet the demanding control requirements was fulfilled by NTK-Technik, who works as a preferred partner with Jost.

The crane, the world’s first topless design, is rated at four tonnes at 60m, 8 tonnes at 50m and 16 tonnes at 22.1 m. Its modularity simplifies erection, with the upper crane being installed in just two lifts. These comprise the central turntable section with the cabin platform, with controls, the hoist unit hydraulics and tower top. The second section comprises the complete pre-rigged jib and counterweight unit.



**New Operator
Cabin Module**



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