

INDUSTRIAL CRANES

NUCLEAR CRANES

PORT CRANES

HEAVY-DUTY LIFT TRUCKS

SERVICE

MACHINE TOOL SERVICE

KONECRANES®

Lifting Businesses™

The crane with a brain

SMARTON®



KONECRANES®

30t

T



OVER 50 YEARS OF EXPERIENCE

in heavy lifting industrial applications

Konecranes has over 50 years of experience with heavy-duty lifting applications across a wide range of process industries. Working in the production frontline of industrial customers on every continent, we are there when lifting needs evolve. Our R&D efforts are directly connected to customer needs in industries like yours.

SMARTON® has been adopted by many of the world's leading industrial companies because it offers the right mix of mechanical excellence, lifting intelligence and service support. In the Total Cost of Ownership equation, SMARTON® as backed by Konecranes' Service is a crane that works intelligently for your business.



If you just need a basic heavy-duty crane, SMARTON® is also for you. In its basic form it comes with many standard features that will benefit your production process today. And if your load handling needs become more sophisticated in future you can buy lifting intelligence, Smart Features, as needed.

KONECRANES®



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STANDARD**OPTIONAL**

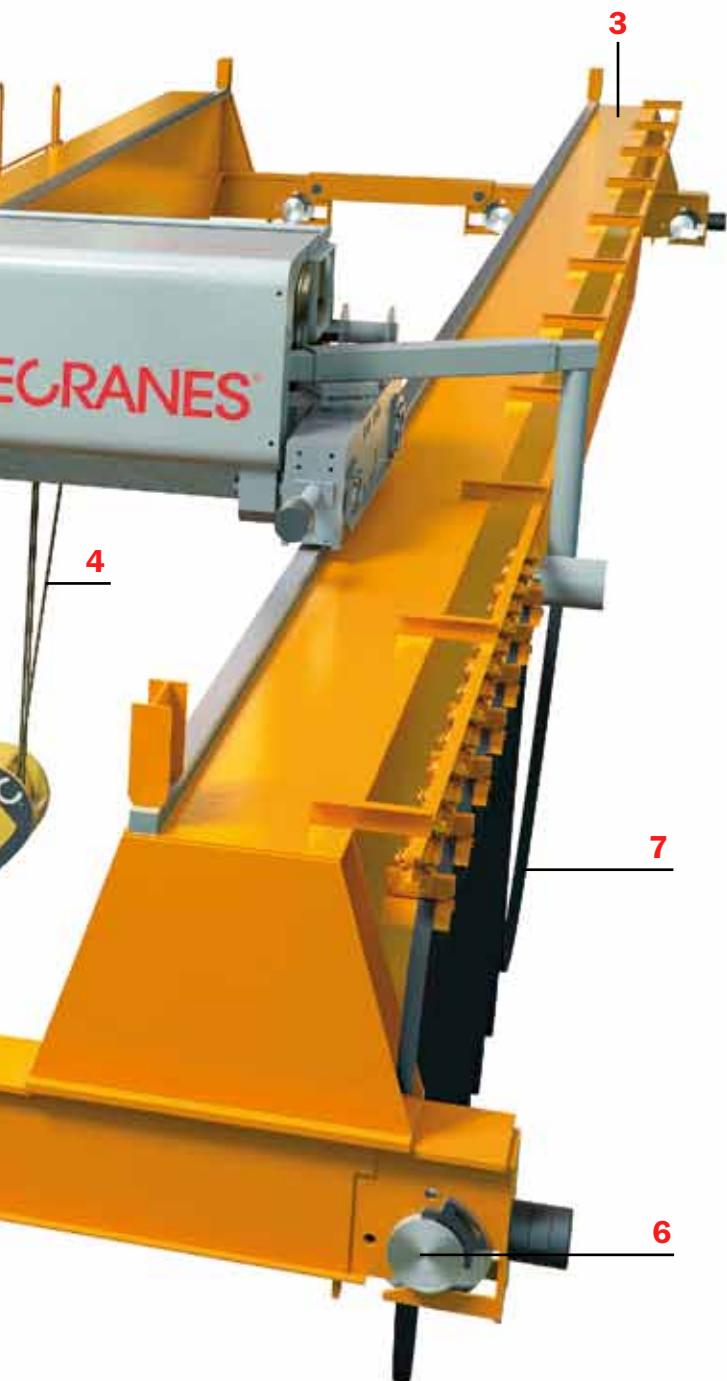
AS SMART AS YOU NEED IT TO BE

SMARTON® is available as a basic crane that comes with a wide range of valuable standard features. When you see this tag, **STANDARD**, a standard SMARTON® feature is described. When you see this tag, **OPTIONAL**, an optional feature is described.

All of the Smart Features available with SMARTON® are optional and tagged as such in the pages that follow. We focus here on certain Smart Features that we highly recommend in the vast majority of applications, but others are available and worth investigating in the context of your production process.



SMARTER WHERE IT MATTERS

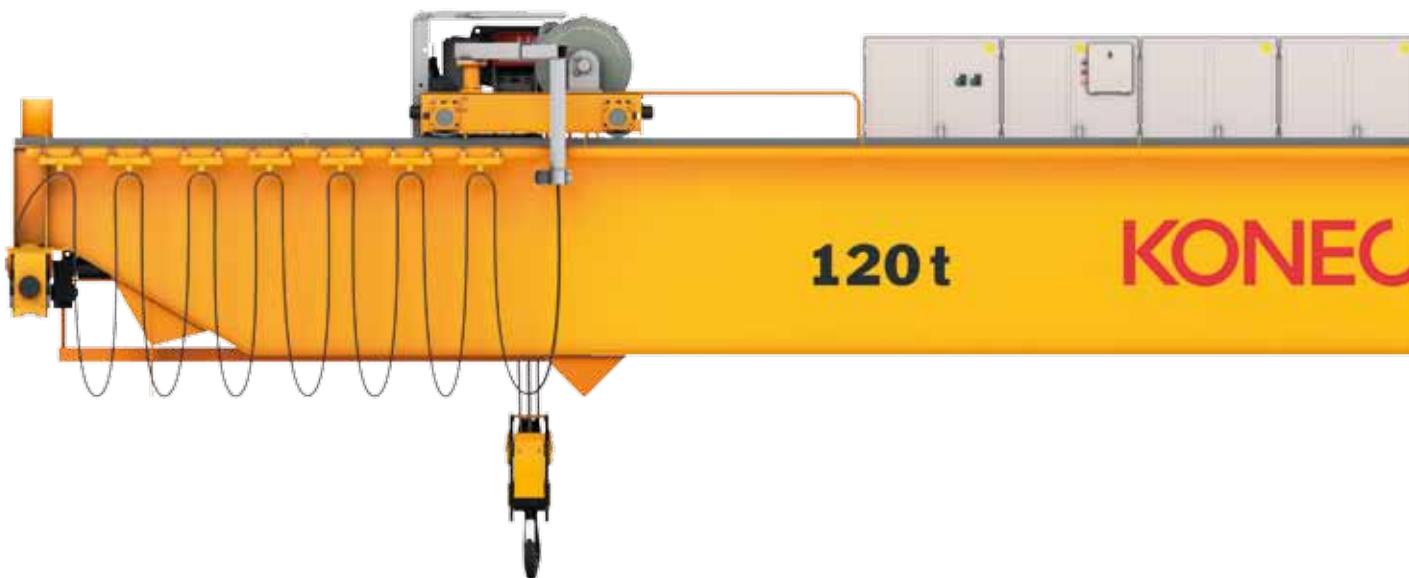
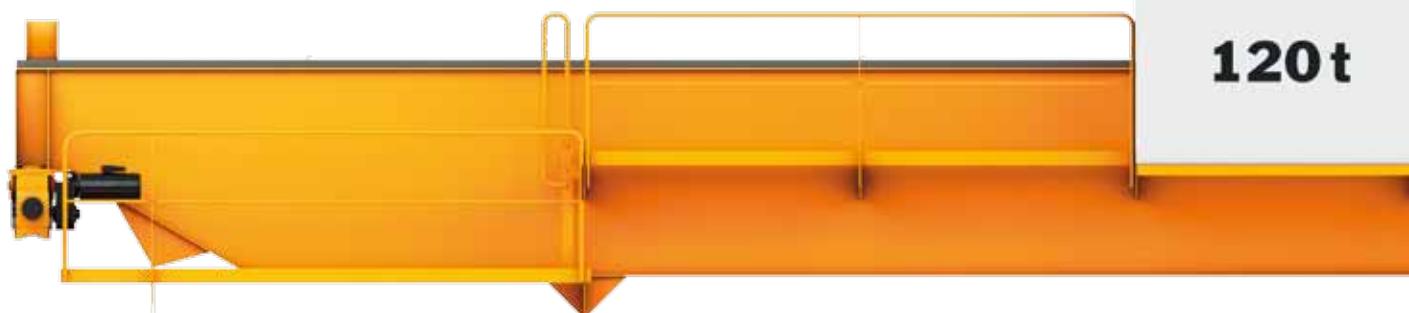
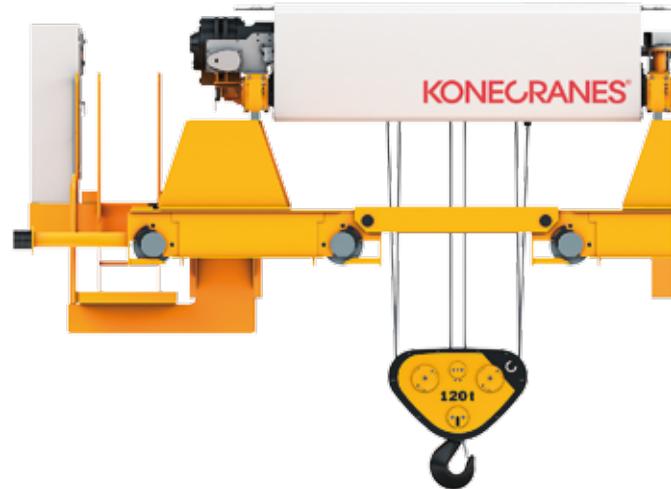


SMARTON® is made of standard components developed by and for Konecranes specifically for use in cranes. These components are in serial production under strict quality control, backed by Konecranes' global delivery process. As a result you get a good price-to-performance ratio, fast delivery, and smooth commissioning and operation from day one.

- 1 **STANDARD** **The trolley** contains a host of innovations built around its electro-mechanical heart, the SMARTER CORE OF LIFTING (the motor/gearbox/control unit).
- 2 **STANDARD** **The electrical cabinets** house the control functions and lifting intelligence of the crane.
- 3 **STANDARD** **The steel structure** is based on a box construction which provides much better resistance to torsion than open-section designs. The box girders are built with a positive camber that decreases the uphill effect as the trolley moves towards the end carriage truck.
- 4 **STANDARD** **True vertical lift** is provided by a twin-rope configuration that minimizes horizontal movement when the load is lifted or lowered. This increases load positioning accuracy and decreases wear on the ropes, rope sheaves and rope drums.
- 5 **STANDARD** **The hook block** has a rope reeving configuration that eliminates the reverse bending that causes rope fatigue and premature failure. Two hook types are available: a single hook and a ramshorn hook. Both types are available with either manual or motorized turning.
- 6 **STANDARD** **The traveling wheels** of the crane are easily realigned with the runway rails if misalignment occurs. This reduces wear on both the trolley wheels and runway rails.
- 7 **STANDARD** **The power and signal cables** are attached to the crane girder as a festoon system that moves alongside the trolley. The power cables and signal cables are kept separate, preventing interference.

SMARTON® VITAL STATISTICS

SMARTON® lifts from 6.3 to 250 tons with a single trolley and up to 500 tons with two trolleys. Duty classes range from assembly use to the heaviest process use.





STANDARD **SMT17, SMT18, SMT19, SMT20** trolleys

Lifting capacities 6.3 to 250 tons

Rail gauges: 2400, 3400, 4200 mm



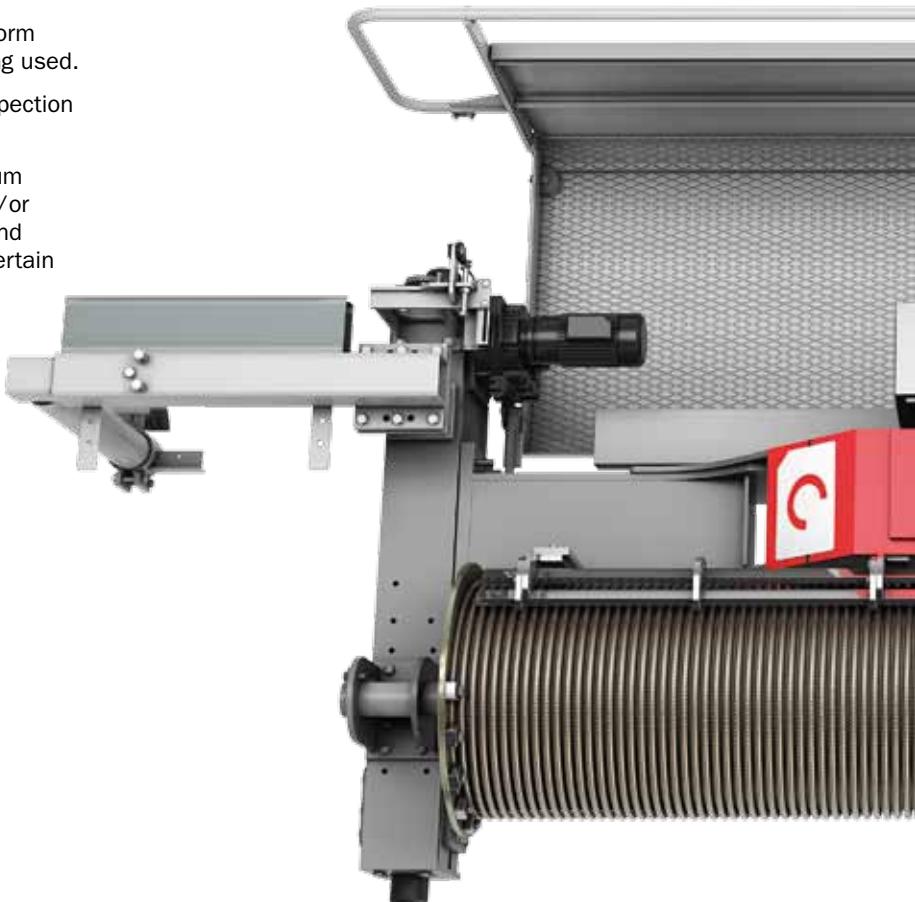
KONECRANES®

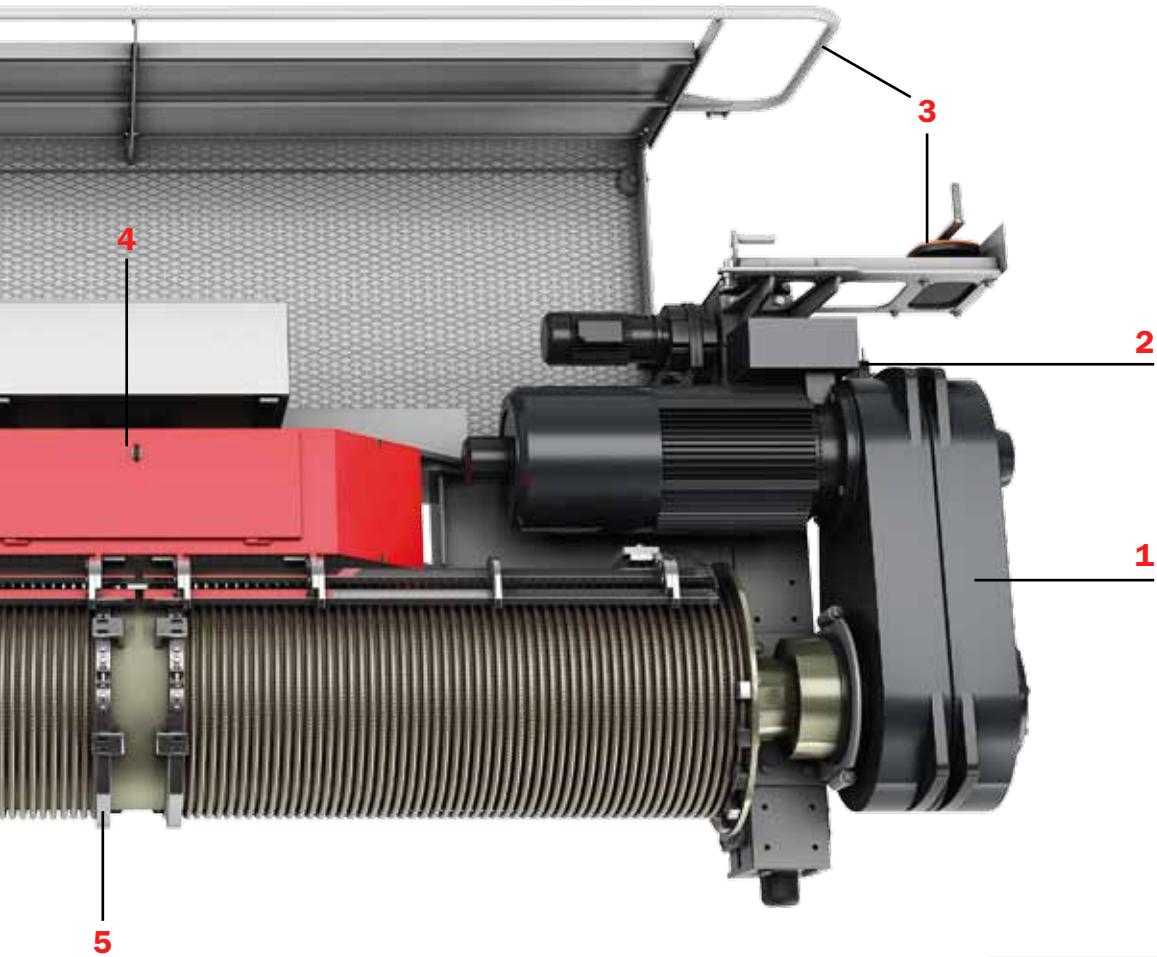
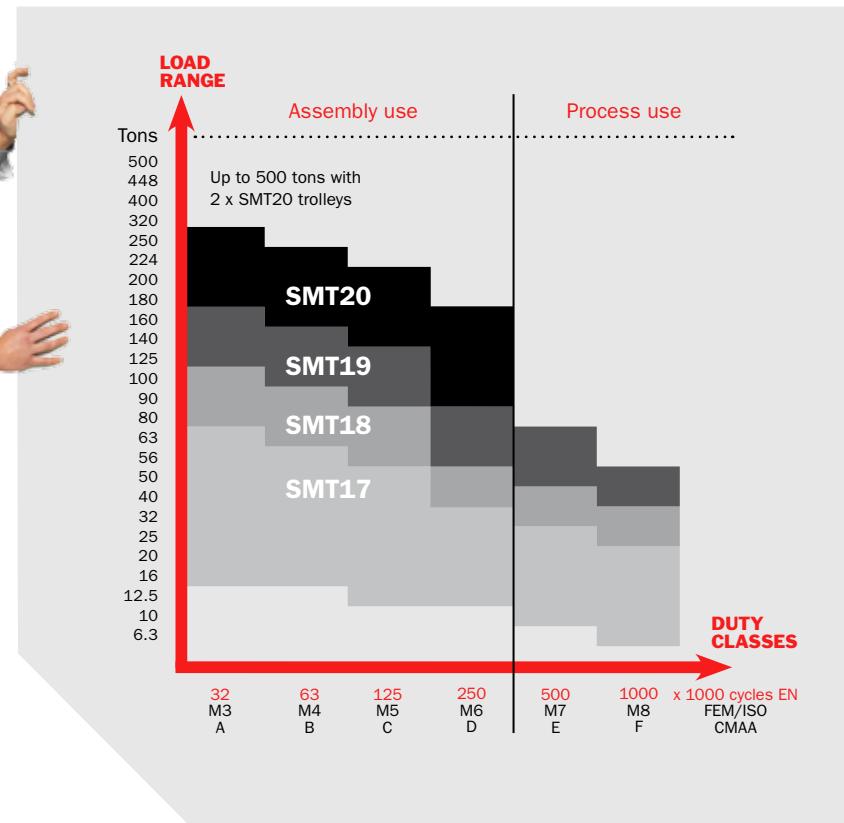
Remote controlled crane

THE SMART TROLLEY

The innovations and refinements seen in the SMARTON® trolley are the direct result of experience drawn from customers in heavy process industries.

- 1 **STANDARD SMARTER CORE OF LIFTING** (motor/gearbox/control unit) designed and manufactured by Konecranes in-house to ensure excellent lifting performance and long life in your application.
- 2 **STANDARD Flange-mounted motors with integrated brakes** ensure correct alignment of the machinery. There is no component misalignment due to flexing of the rope drum, steel structure or crane runway. Safety is increased: there are no exposed rotating parts. Mechanical components last longer and need less maintenance.
- 3 **STANDARD Service platform and hand crank** for opening and closing it. When closed, the platform protects the machinery when the crane is being used.
- 4 **STANDARD Easy-access hatch** for hoist rope inspection and maintenance.
- 5 **STANDARD Rope guides** keep the rope in the drum groove, also under reasonable load swing and/or side pull. Maximizes the lifetime of the rope and drum. Rope over-wrap protection is used for certain rope reeving instead of rope guides.





TECHNOLOGY HIGHLIGHTS

OPTIONAL HIM REMOTE CONTROLLER

The HIM (Human Interface to Machine) remote controller is a prime example of form meeting function in industrial design. When your crane drivers get the HIM in their hands, they'll be very reluctant to use other controller types again. Nevertheless, if you don't want to introduce a new controller type to your production process, your existing controller type can be used with SMARTON®.



DYNA FAMILY OF INVERTER CRANE CONTROLS

The Dyna inverter crane controls used in SMARTON® reduce cycle time, improve load positioning accuracy and increase productivity by providing the optimum speed and acceleration in different lifting situations. Konecranes has more experience in this area than any other crane supplier. We deliver over 20,000 inverter crane control systems every year.

STANDARD DYNATHOIST

Designed specifically for hoisting applications. Has a speed supervision unit that is kept separate from the inverter with special circuitry for monitoring motor speed. Includes thermal protection for the motor as standard.

STANDARD DYNAC

Ensures smooth starts and stops, reducing mechanical stresses and prolonging crane lifetime. Allows acceleration and deceleration ramps to be adjusted.

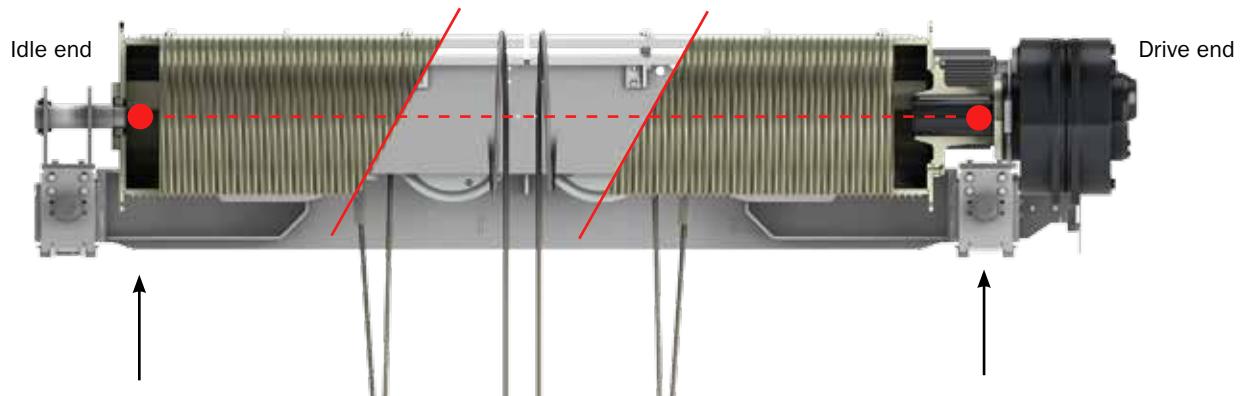
OPTIONAL DYNAREG

A regenerative network braking system that feeds energy back into the power supply network, reducing energy consumption. It also suppresses harmonic distortion and eliminates the need for braking resistors along with the excess heat they produce.



STANDARD THE COMPACT CRANE

If you're planning to build a new production facility, SMARTON® can help to cut structural costs considerably thanks to its low headroom requirement. You can reduce the overall height of your building with all the resulting cost savings.



STANDARD TWO-POINT DRUM SUSPENSION

SMARTON® has a unique design for mounting the hoist machinery: two-point drum suspension. It allows the gearbox to articulate when the rope drum bends under load. Structural deflections of the rope drum do not cause misalignment in the connection between the drive end and gearbox. There are no high-frequency stress reversals in the drum/gearbox connection when the loaded drum rotates.

Therefore, there is no fatigue failure point at the drive end of the rope drum, and the lifetime of the gearbox bearings is extended. This design is field-proven in hundreds of Konecranes process duty trolleys.

The simplicity of the drum connection also makes maintenance easier.

SMARTON® IS MADE OF 98% RECYCLABLE MATERIALS

SMARTER CORE OF LIFTING

The motor/gearbox/control unit is the electro-mechanical heart of SMARTON®. We call this unit the SMARTER CORE OF LIFTING because it works as a package, that is designed and manufactured specifically for cranes. It is perfectly integrated for lifting.

The SMARTER CORE OF LIFTING is so important that we keep every aspect of its design and most of its manufacture in-house. It features many technologies unique to Konecranes: a motor specifically for lifting that we design ourselves; special gears for lifting that we manufacture ourselves; a control system specifically for lifting that we design ourselves.

Important safety features are built-in and provided as standard: hoist overspeed supervision and hoist brake slip and opening supervision, for example.

The SMARTER CORE OF LIFTING is the foundation of the excellent performance, safety, reliability and long life of SMARTON®.





30t

IMPROVE OPERATOR PRODUCTIVITY

Your first smart lift

Where most cranes are only as productive as their operators, SMARTON® makes its operators more productive. The HIM remote controller is a productivity and safety tool for novice and experienced crane operators alike. Its twin joysticks provide a precise, intuitive connection to the load at every moment of the load handling cycle.

We offer optional lifting intelligence, Smart Features, which increase the efficiency and safety of load handling in your production process. The following are recommended for your first smart lift:

OPTIONAL Shock Load Prevention ensures smooth load pick-up. The hoist drive monitors the load. If it is picked up roughly, the hoisting speed is automatically reduced until the load is in the air. This prevents shocks to the load and shocks to the crane, extending the lifetime of the crane's steel structure and mechanical parts.

OPTIONAL Slack Rope Prevention is an important safety and productivity feature when lifting devices such as lifting beams are used. When the load is lowered, the hoist drive detects when it touches the floor and stops the movement. The hoist ropes do not slacken. The ropes do not slip out of the hook block. The lifting device does not fall over.

OPTIONAL Extended Speed Range allows higher lifting and lowering speeds when light loads are handled. When the load is less than 20% of the maximum rated load, for example, the hoist can be driven at up to twice the maximum rated speed. This Smart Feature significantly reduces load cycle and waiting times and therefore improves efficiency.



KONECRANES®



The **HIM** remote controller displays the essential data for every lift:



Total load weight and specific load weights on up to three hooks



Overload warning



Load weight and selected sling length





**HOW
VALUABLE
IS YOUR
LOAD?**

TOTAL LOAD CONTROL

We offer a set of optional Smart Features with the SMARTON® crane that give you total load control in your production process. For a move such as the one at right, where there is no margin for error, the following are recommended:

OPTIONAL Sway Control takes the operator's speed command at the controls and brings the load to the required speed while preventing sway caused by acceleration and deceleration. This quite indispensable Smart Feature makes load positioning very precise and reduces load cycle times.

OPTIONAL Inching provides another way to approach the load destination with great accuracy. It can be activated for both hoisting and traveling motions. "Inching increments" can be preset, ranging from 2 to 100 mm. This Smart Feature boosts productivity and safety when very accurate load placement is required.

OPTIONAL Microspeed makes load control more precise. It can be activated for both hoisting and traveling motions, turning large joystick movements at the controls into slow and precise load movements. This Smart Feature helps the operator control the load precisely in tight spaces, increasing safety and protecting the load.





TOTAL POSITIONING AND AREA CONTROL

We offer a set of optional Smart Features with SMARTON® that give you unparalleled control over lifting in your specific production facility.

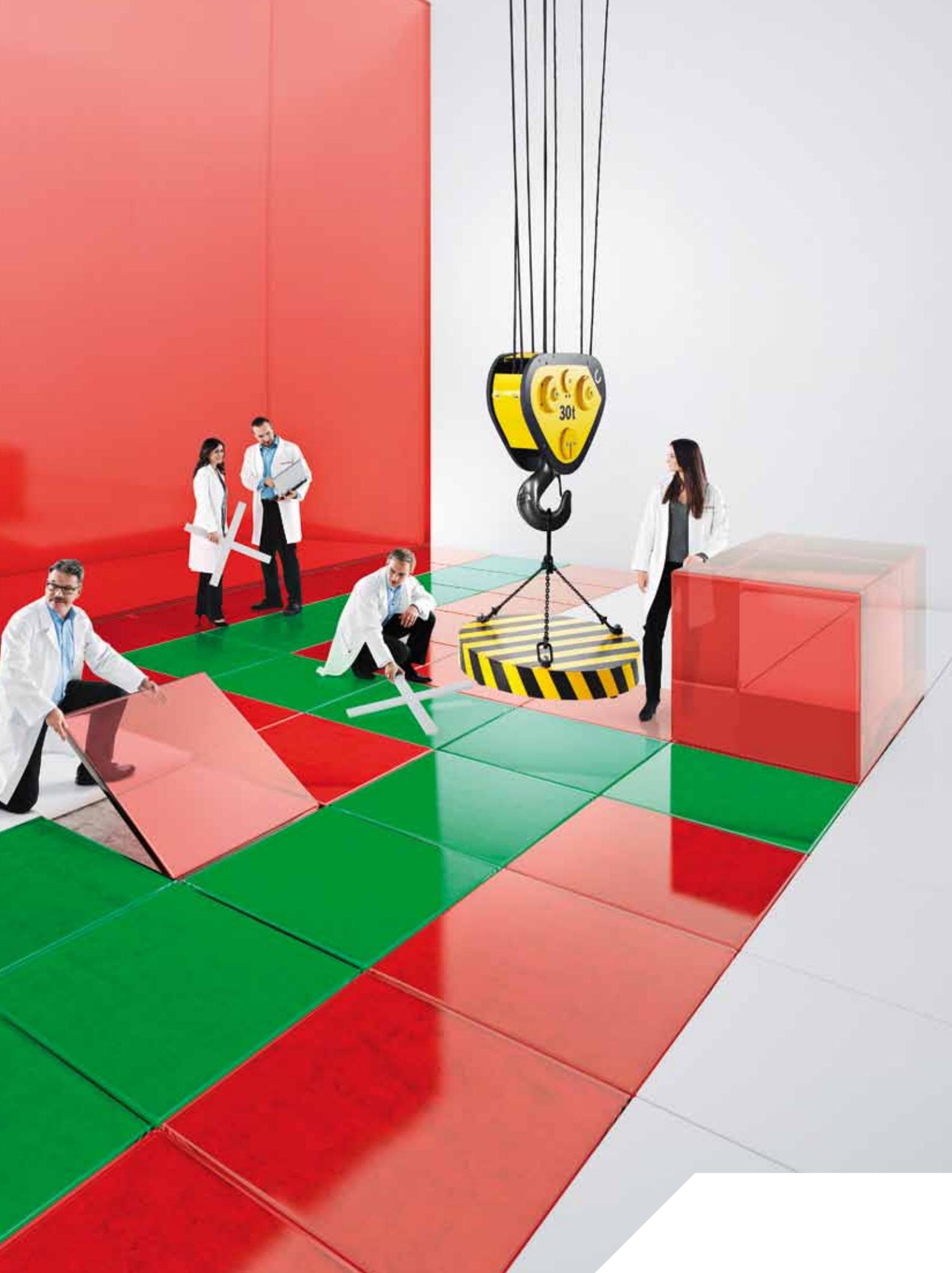
OPTIONAL Working Limits can be thought of as temporary “virtual walls” at which the crane stops automatically. Working from the controls, the crane operator sets a limit on trolley, bridge or hoist motions thus creating a virtual wall. Several Working Limits can be defined according to the task at hand — protecting a temporary walkway or a truck to be loaded, for example. This Smart Feature protects goods, machinery, vehicles etc. that are temporarily in the crane’s working area.

OPTIONAL Protected Areas are no-go areas which the crane operator cannot override or adjust. Up to 16 rectangular protected areas can be defined, allowing you to protect e.g. valuable production machinery or busy working areas from possible driver error. This Smart Feature increases safety and protects infrastructure.

OPTIONAL Target Positioning allows work cycles to be carried out using only two buttons on the HIM controller. Up to 120 target positions and 8 home positions can be defined. The operator selects the load’s target address and presses the “target positioning” button. As long as the button is pressed, SMARTON® drives itself towards the selected target position. The hoist can automatically raise the load to a defined travel height. When the load reaches the target position, the hoist automatically lowers the load to a pre-defined height. This Smart Feature increases safety and reduces work cycle times.

OPTIONAL End Positioning speeds up the set-down phase of the load handling cycle. It is especially useful in work cycles involving stationary machines or structures where the operator must repetitively position loads in exactly the same places. Up to 16 “end positions” can be defined by the operator. When the load is moved into a positioning window around the target and the “end positioning” button is pressed, the crane moves the load to the center of the window. Then the operator takes over manually and lowers the load. This Smart Feature increases safety and reduces work cycle times.







CONTACT



CONDITION



CARE



COMMITMENT



COMPLETE

KONECRANES SERVICE

On a level suited to you

From first **CONTACT**, to our professional evaluation of the **CONDITION** of your equipment, to preventive maintenance and consultation services for optimal **CARE**, Konecranes will tailor a program to lift your business.

When a mutual **COMMITMENT** to performance-based maintenance or **COMPLETE** material handling outsourcing is required, Konecranes has the experience and resources to help you reach your business objectives.







BEFORE YOU BUY A SMARTON®

OPTIONAL CRANE RELIABILITY SURVEY

The Crane Reliability Survey (CRS) is an engineering assessment designed to give reliable information about the current condition as well as the future maintenance and modernization needs of a crane.

If you are considering a new crane, it might be a good time to take a complete inventory of the cranes you already have. Konecranes CRS is a logical place to start. Typical CRS modules are:

Inspection and analysis

Overall inspection and analysis of the crane and its runway.

Working conditions

Assessment of the crane's current condition and operating environment.

Structures

Structural and cumulative fatigue assessment.

Components

Detailed assessment of the present condition of the crane's key components: electrical components, motors, ropes, gears and hooks.

Maintenance and reliability

Identification of the most critical elements that may cause downtime.

BETTER PLANNING THROUGH INFORMED DECISIONS





AFTER YOUR SMARTON® IS INSTALLED

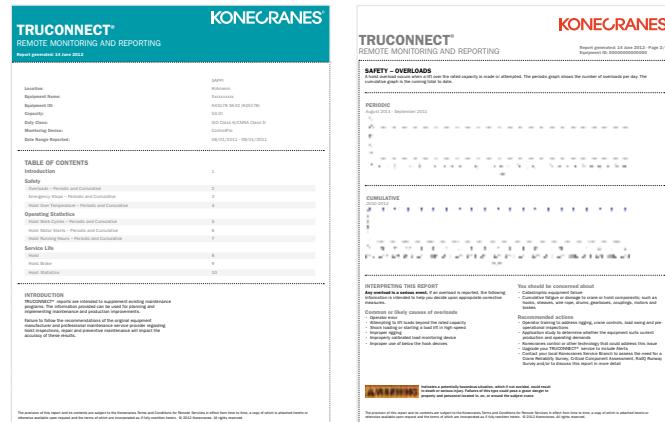
STANDARD TRUCONNECT® REMOTE MONITORING AND REPORTING

Remote Monitoring and Reporting service enables you to track the real usage of your equipment through a remote connection. With the available usage data we provide you with easy-to-interpret graphical reports, including information about:

- Actual crane usage
- Safety information
- Remaining design working period of the different crane components

With TRUCONNECT® Remote Monitoring and Reporting:

- Safety issues are captured and brought to your attention
- Maintenance activities can be adjusted to suit actual crane usage
- You are able to see and record how your crane is used



**TRUCONNECT®
REMOTE MONITORING AND REPORTING**
Report generated: 14 June 2012 - Page 2/10
Equipment ID: 40010402 (KONECRANES)

KONECRANES®

SAFETY - OVERLOADS
A load limit occurs when a lift over the rated capacity is made or attempted. The periodic graph shows the number of overloads per day. A daily average shows what is typical for the selected period.

PERIODIC
Report date: 01 June 2012

DAILY
Report date: 01 June 2012

OPERATING STATISTICS
Report date: 01 June 2012

SERVICE LIFE
Report date: 01 June 2012

INTERPRETING THIS REPORT
This report is designed to help you monitor the health of your equipment to help you decide when maintenance is required. It is also designed to help you identify potential safety issues before they become a problem.

COMMON OR DAILY CAUSES OF OVERLOADS
• Crane lifting too much weight at once.
• Crane lifting or carrying a load in its high speed.
• Crane lifting or carrying a load in its low speed.
• Crane lifting or carrying a load in its medium speed.
• Crane lifting or carrying a load in its high speed.

RECOMMENDED ACTIONS
• Check the load limit of the crane to make sure it is not being exceeded.
• Check the load limit of the crane to make sure it is not being exceeded.
• Check the load limit of the crane to make sure it is not being exceeded.

WARNING
Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury. It is important to take appropriate action to prevent the hazard.



A smart crane for automobile production

RENAULT AND SMARTON®

Renault presses vehicle body parts in its Douai and Sandouville factories in France. In both factories the cranes that unload steel coils from trucks or wagons, and move the coils to the stamping presses, had reached the end of their lifecycle. They required a great deal of corrective maintenance. Moreover, two roller tracks were old and caused abnormal wear to the crane rollers.

The Douai factory already had good experiences with Konecranes solutions so Renault brought Konecranes in to analyze the situation. The needs of both factories were met by two 34-ton SMARTON® cranes, duty class M8, with a cabin for the driver. The Dynatrack R system was installed in both cranes to ensure long service life. The faces of the rollers are protected and do not rub against the rails.

The Sandouville factory has a special layout and a crane was needed with special Area and Positioning intelligence. The SMARTON® crane, with its Smart Features, has proved to be an excellent fit. It is prevented from passing over certain "no-go" zones, ensuring the safety of personnel and protecting valuable machinery. The crane is equipped with telemetry lasers that prevent the hook from colliding with the access footbridge to the offices. A positioning aid was added so that the crane can supply the stamping machines faster, thereby improving output. The Sandouville crane drivers make full use of pre-positioning above the machines and automatic return above the trucks that deliver the coils.

SMARTON®'s scalability is a definite advantage: it will be easy to incorporate the Smart Features of the Sandouville SMARTON® in the Douai SMARTON® if and when the need arises.

**A CRANE WAS
NEEDED WITH
SPECIAL AREA
AND POSITIONING
INTELLIGENCE**



F240575

KONECRANES

34000kg

MB

2010



A smart crane for steel production

BLUESCOPE STEEL AND SMARTON®

BlueScope Steel is the leading steel company in Australia and New Zealand, specializing in the production of flat steel products. BlueScope and Konecranes started cooperation in 2009, when significant component failures were discovered in a 20-ton crane at the Wingfield steel distribution center. A SMARTON® crane replaced it — safely, within budget, and without interruption to the production schedule.

Several stakeholders were involved in the design and delivery of the new SMARTON® crane, taking into account how it would be used and the facility's future needs. An onsite session with the crane drivers was held to maximize the ergonomics of the crane's layout and ensure driving efficiency. A RailQ survey was carried out to investigate the condition of the existing rails. Problems were found: the rails were realigned and the support columns were raised to make them fit better. The runway beams also needed work: they were braced to make them stronger. The rails were replaced later during a planned shutdown of the facility.

The Wingfield SMARTON® crane is used in the coil storage area to load steel coils for processing. It handles about 100,000 tons per year over working weeks of 38 hours in two shifts. Service is carried out during the normal production schedule. "If the crane stops working, the entire production is immediately interrupted", says **Mr. Peter Terrison**, Maintenance Supervisor at the Wingfield facility.

The Wingfield SMARTON® has helped to increase the facility's productivity and work ergonomics while minimizing disturbances to production. The crane is very flexible, self-monitoring, and easy to upgrade. It reports directly to the Konecranes Service organization over a remote connection, a unique capability in the crane business.

"Throughout the project, Konecranes had a very professional approach. I am truly happy about the product, service and expertise provided. The project has been followed by other companies in Australia due to the known challenges, technology and high quality," concludes Mr. Terrison.

**THE CRANE IS
VERY FLEXIBLE,
SELF-MONITORING
AND EASY TO
UPGRADE**





KONECRANES

MRC = 16,000kg

A smart crane for wind turbine production

SIEMENS WIND POWER AND SMARTON®

Siemens Wind Power is the world's leading manufacturer of offshore wind turbines. The company is headquartered in Brande, Denmark, where it manufactures wind turbines of 2.3 MW and 3.6 MW consisting of nacelles, hubs and rotor blades — some of the latter up to 58.5 meters long and weighing 18 tons.

Siemens Wind Power has been a Konecranes customer for 30 years. Konecranes has delivered about 80 cranes to the company, most of them SM and CXT cranes with lifting capacities of 40, 50 or 80 tons. All of them are serviced by Konecranes four times a year.

The cranes are process-critical: 4 – 5 of them are often driven simultaneously in the company's vast manufacturing halls. Maximum reliability is an absolute requirement as well as efficiency, in both economic and ecological terms. Safety is no less important.

Siemens Wind Power will soon manufacture next-generation wind turbines with the help of SMARTON®, the next-generation industrial crane. "It wasn't difficult to persuade us to try the new SMARTON®, especially having seen its impressive list of product features", recalls **Mr. Klaus Gørrisen**, Production Manager.

SMARTON® product features include the HIM remote controller, which keeps the driver informed about the load weight, the load's position relative to the available workspace and to people working nearby. If a problem occurs, the driver gets guidance from the HIM's error detection diagnostics. Potential errors are detected before they occur.

Siemens Wind Power also appreciates the crane's higher lifting height and lifting speed: 4 meters per minute. "The Sway Control greatly improves safety and makes work easier for the crane drivers. Another interesting feature is how braking energy is fed back into the power supply network, considerably reducing energy consumption. We work in a green industry so these things are very important to us", Mr. Gørrisen stresses.

Siemens Wind Power and Konecranes have a very solid relationship and Mr. Gørrisen finds many reasons for keeping the relationship going: "Konecranes is a reliable and professional partner. The cranes work impeccably, and support and maintenance service are delivered immediately whenever needed. Deliveries have always been prompt. Even with these qualities, prices have remained at a competitive level. To sum up, we are more than satisfied."



SIEMENS WIND POWER HAS BEEN A KONECRANES CUSTOMER FOR 30 YEARS





INDUSTRIAL
CRANES



NUCLEAR
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HEAVY-DUTY
LIFT TRUCKS



SERVICE



MACHINE
TOOL
SERVICE



Konecranes is a world-leading group of Lifting Businesses™ offering lifting equipment and services that improve productivity in a wide variety of industries. The company is listed on NASDAQ OMX Helsinki Ltd (symbol: KCR1V). With over 11,500 employees at more than 600 locations in almost 50 countries we have the resources, technology and determination to deliver on the promise of Lifting Businesses™.

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