

**SMARTER  
WHERE IT  
MATTERS**

# KONECRANES: PRIDE OF THE PORT

**Dear Customer,**

We've created this special book to give you a clear, no-nonsense tour of the best fleet of container handling equipment in the world today. From Hamburg to Los Angeles – and a thousand points in between – Konecranes technology and services play a key role in the world's leading shipping ports and intermodal terminals.

Yet this book is also meant to share something more than the hard facts and practical excellence of what we do. It's about the real pride we take in the machines we build – and in the global industry we support. When we say "Smarter Where It Matters", what we're saying is that we're dedicated to delivering the innovations that enhance our customers' success – and our planet's future.

Sincerely,



Tuomas Saastamoinen

Sales & Marketing Director, Port Cranes  
[www.konecranes.com](http://www.konecranes.com)



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# **SMARTER WHERE IT MATTERS**

A guide to the worlds best  
container handling equipment



# THE CRUCIAL LINK

**Konecranes is proud to be a technology leader in this vital industry.**

World trade keeps growing, and container handling equipment and systems are ever more crucial to this growth. Around the globe, ports and intermodal terminals continue to increase investment in higher capacity and efficiency, primarily by utilizing more reliable, integrated and automated solutions. It's well understood that, when made correctly, these investments will enhance profitability for years and even decades to come.

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We Move Containers



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You Don't Move Partial Containers –  
We Don't Offer Partial Solutions



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Brilliantly Combined



### **Straddle Carriers –**

Designing the Difference Between Good and Great



### **Lift Trucks and Reach Stackers –**

Flexible, Cost-effective... May Even Walk on Water



### **Container Positioning –**

Get Smart – or Get Lost



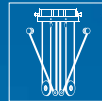
### **Environment –**

Greener Means Smarter



### **People –**

at the Heart of It



### **Technical Information**



# WE MOVE CONTAINERS

**Konecranes is a major global player** in the design, manufacture, delivery and servicing of container handling equipment. Our ship-to-shore quay gantry cranes, rubber tired gantry cranes, rail mounted gantry cranes and automated stacking cranes are world-class in every sense of the word. In addition to cranes, we complete our customers' fleets by supplying highest quality lift trucks, reach stackers, and straddle carriers.

## **The Innovation Leader**

What every product in Konecranes' container handling equipment fleet has in common is innovative, efficiency-enhancing technology based on our own modular technology platforms. Plus, our container positioning products ensure that your entire fleet functions as an integrated whole to truly maximize performance.

## **Service is Our DNA**

But that's only the half of it. All our technology has been designed to be fully supported by the best service network in the industry, with hundreds of thousands of maintenance contracts. We emphasize the importance of preventive maintenance and continuous modernization of equipment. To back this up we have a global division, Konecranes Port Service, which provides high-quality service for all makes and brands of port and harbor cranes.

## **A Solid Partner**

Our long history in the crane business has given us the foundation to move forward confidently, with a clear vision and strategy. And our sound financial position means our clients know they can count on us – both now and in the future – to help build their businesses.

**WE HAVE ALL THE RESOURCES,  
TECHNOLOGIES AND ATTITUDE TO  
DELIVER OUR CUSTOMER PROMISE –  
LIFTING BUSINESSES™.**





# KONECR

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# INES



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# THE BOTTOM LINE

Every member of our port equipment fleet is designed and constructed with the practical intelligence built into all Konecranes equipment. Our designs draw upon the knowledge gained from our extensive maintenance experience and utilize proven Konecranes components and drive technology. We combine these in logical ways that ensure minimum maintenance, maximum reliability, and lower costs – while providing a level of daily performance our customers have a right to expect.

## **Konecranes – There When You Need Us**

By combining state of the art technology with expert know-how and a responsive service attitude we deliver the Highest Lifecycle Value in a way that affects each customer's entire value chain. Support after delivery is not only about getting a failure repaired as soon as possible after it has occurred. Konecranes Port Services maintenance activities focus on preventing failures, thus increasing uptime and availability – thereby the profitability – of each customer's core business.

Our approach to maintenance strongly emphasizes early trouble prevention. Problems generally do not occur at random. Instead, there are numerous indicators from which a trained eye may draw conclusions, predict future performance, and spot risks.

## **What's the Real Cost of Your Equipment?**

Over the lifetime of any major port equipment, its original purchase price is just the tip of the iceberg. And while some operational costs are quite fixed, costs such as scheduled and on call maintenance, spare parts, and modernization, can be wisely controlled with Konecranes' services.

The result is a lower cost over the lifecycle of the equipment. The bottom line is truly just the starting line when it comes to calculating your port equipment investment.

**YOU DON'T  
MOVE PARTIAL  
CONTAINERS  
– WE DON'T  
OFFER PARTIAL  
SOLUTIONS**







## Ship-to-Shore **A PROUD HISTORY**

**Konecranes has over 40 years of experience** in the design, manufacture and delivery of Ship-to-Shore container cranes – with over 120 units delivered. Our cranes range in size from Panamax through Super Post Panamax and we offer Semi-rope or BoxHunter trolleys on any size. We have a strong reputation for excellent crane design, in-house manufactured key components, high-quality manufacturing and committed customer care. Our cranes are an essential part of our customers' operations around the world and are often required to fulfill the most demanding requirements. Regarding delivery, our cranes can be site erected or arrive fully erected, depending on customer location.

### **BoxHunter Sets the Pace**

Konecranes technology leads the way in innovation and the new improved version of the Ship-to-Shore crane, the BoxHunter, is no exception. With the latest technology and design superior performance is ensured. The handling equipment comes complete with Konecranes' AC drives, Active Load Control and Horizontal Fine Positioning Systems that includes sway prevention and horizontal fine positioning systems.

Together these features have a productivity boosting effect for our customers. The new design improves the crane operator's control over the positioning of the spreader and container on the chassis, in the cell or on the deck compared to existing cranes. Dwell times are also decreased substantially.













**WELL-PROVEN  
COMPONENTS,  
BREAK-  
THROUGH  
INNOVATIONS,  
BRILLIANTLY  
COMBINED**





KONECRANES

CSU 236394  
42G1  
70

6CKNU  
42G1

2,9m  
9'6"

MSKU  
32034  
2G1

CA XU 2



## Rail Mounted Gantry **ROCK STEADY**

**The new design** of RMG cranes introduced by Konecranes builds on decades of experience in crane design and manufacturing. The new RMG technology provides all of the key elements of value; high performance, reliability, easy and accurate steering, low operating costs and energy consumption. It takes advantage of a number of innovations, of which where some are recent, while others have already proven themselves over millions of on-the-job hours of use.

**Our RMG crane technology was developed with the goal of meeting RMG owners' needs** to serve their customers efficiently and reliably while operating their business profitably. To maximize performance a range of tailor-made solutions are available for specific customer operations. For example, crane size can vary from no outreaches to both side outreaches, and both rotating and non-rotating trolley concepts have been designed to lift all types of boxes and trailers.

## **LIGHTER WHERE IT MATTERS**

Due to intelligent trolley and steel structure design, Konecranes yard cranes are lighter, which means less cost when it comes to how much reinforcing your yard requires. Over time, our lighter design means significant savings in energy costs.

Budapest, Hungary





## Active Load Control **PRECISION HIGH PERFORMER**

Our patented Active Load Control (ALC) provides the most effective sway prevention system in the market – and the horizontal fine positioning means the spreader can be moved up to 300 mm in trolley/gantry travel direction without moving the trolley/gantry. Additionally, spreader skew up to 5 degrees is possible. With ALC our yard cranes are extremely easy to operate even for new and inexperienced crane drivers. They will rapidly achieve your required production goals.

Detailed information on ALC for each of our port cranes can be found in the technology section.

### **When Speed is Crucial**

In all operations, whether intermodal or yard, the key element is the fast positioning of the load. Especially in train loading and unloading, turnaround time is crucial to meeting train schedules.

This is where Konecranes ALC offers a significant advantage. Positioning is done with the ALC rather than by moving the large gantry and trolley structures, which both reduces cycle time and saves energy with every move.



## Automated Stacking Cranes

# THE NEXT BIG STEP

The automatic moving and stacking of containers is the next step in the evolution of crane control technology that began with the introduction of containerized shipping in the 1960's. Konecranes' Automated Stacking Crane (ASC) innovations offer significant advantages in an ever-more automated industry. For example, in ASC operations where the productive moves are done remotely, one operator can safely operate several cranes, thus significantly increasing each driver's performance.

### Inspired by Experience

The starting point for Konecranes' ASC was to design a highly efficient automated container handling machine that would be responsive to ever-changing yard conditions. Our ASC design premise drew upon actual rail and yard conditions that are the daily reality in ports around the world, and also relied on the proven technologies of our existing RTGs. Thus, Konecranes ASC is built specifically to handle yard and rail configurations and work practices. The well-proven result is a light and intelligent structure in combination with Active Load Control (ALC) and integrated positioning that together delivers fast, accurate container stacking over a range of real-world conditions.

### Delivery by Design

Konecranes can handle the complete delivery for ASC solutions for your yard operation. Our delivery process has been carefully thought through – beginning with how the equipment is designed, all the way to the hand-over. Our ASCs are modularized in order to be efficiently site-erected. With care taken to ensure that all aspects of delivery are streamlined and rationalized, your operation can start on schedule – as planned.











# THE ADVANTAGES REALLY STACK UP

Beyond the clear bottom-line savings in operations, it has become clear that a range of other factors can increase bottom-line operating productivity at least as much:

## **Increased Safety**

A yard served by automated stacking cranes is normally off-limits to operational personnel, and access for maintenance purposes is tightly controlled and monitored by the system itself. Overall safety is increased due to the reduction of interfaces between ASCs and humans (and other machines as well).

## **Reduced operational Variability**

ASCs pick and place containers exactly as they are instructed by the Terminal Operating System (TOS). Thus, the chance of error due to misunderstanding an instruction is practically zero, thereby eliminating a source of tracking uncertainty that exists when containers are moved manually.

## **Reduced Crane and Load Damage**

ASC's control systems produce very smooth and precise crane motions, practically eliminating hard landings, collisions, and topples. Because of this, spreader damage is practically non-existent on automatically controlled yard cranes.

## **Improved asset utilization**

Further productivity gains can be made due to the fact that ASCs move on optimum paths, don't require any operating boarding/deboarding time, and offer an increase in land utilization efficiency.



# Rubber Tired Gantry FEATURES AIMED AT YOUR BALANCE SHEET

The Konecranes RTG crane is a stellar example of Konecranes equipment being truly 'Smarter Where it Matters'. Our RTG design uses well-proven Konecranes components combined in a simple, rational way to ensure minimum maintenance and maximum reliability – as well as providing performance that can handle each customer's requirements. Our 16 wheel version comes with Active Load Control and our 8 wheel version has electric anti-sway, ensuring a working environment that's both safer and more efficient.

## **Innovations Come Standard**

In addition to the traditional RTG crane specifications, our crane includes as standard several innovative features that significantly increase performance and reliability while decreasing maintenance costs.

## **Smoothing the Bumps**

What's the value of an RTG's ability to handle greater variation in yard surface levels? And how much is it worth to cut your yard reinforcement costs?

Konecranes cranes are designed to tolerate significantly less smooth yards. While other RTGs can only handle 5 cm of variation in yard surfaces, a Konecranes RTG can handle up to 36 cm.

## **HYDRAULICS-FREE HIGH PERFORMANCE**

A very significant feature of Konecranes yard cranes is that they do not have any hydraulic systems – not even for gantry wheel turning (RTG), sway-prevention or spreader micro motions. Especially in harsh marine conditions this is a big advantage offering higher reliability as well as lower maintenance and spare parts costs, as well as less downtime.





CRANES

ARSA

ARKAS  
ARKU 831637  
45G1  
MAX GROSS 30,480 KGS  
71,200 LBS  
TARE 3,890 KGS  
8,575 LBS  
NET 26,590 KGS  
58,625 LBS  
CU CAP 76.4 CBM  
2,899 CUFT

CAI  
CAXU 461525  
45G1  
MAX GROSS 30,480 KGS  
71,200 LBS  
TARE 3,890 KGS  
8,575 LBS  
NET 26,590 KGS  
58,625 LBS  
CU CAP 76.4 CBM  
2,899 CUFT

ARKAS  
ARKU 900004  
45G1

ARKAS  
ARKU 830929  
45G1  
MAX GROSS 30,480 KGS  
67,200 LBS  
TARE 3,890 KGS  
8,575 LBS  
NET 26,590 KGS  
58,625 LBS  
76.4 CBM  
2,899 CUFT

ARKAS  
MAX GROSS 30,480 KGS  
71,200 LBS  
TARE 3,890 KGS  
8,575 LBS  
NET 26,590 KGS  
58,625 LBS  
CU CAP 76.4 CBM  
2,899 CUFT  
OUTER 2.4M WIDE  
5 HIGH STACK ONLY



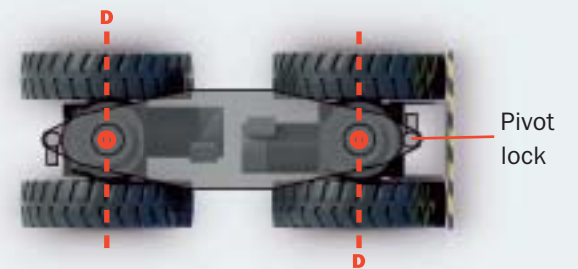


# A SMARTER RTG

- **Konecranes ALC** combines our unique sway prevention system with horizontal fine positioning. See technology section for more information.
- **Sixteen gantry wheels** with low wheel loads making significant savings in civil works costs of the container yard possible.
- **Wheel turning with the crane** travel machinery eliminates the maintenance intensive separate hydraulic mechanisms for wheel turning.
- **Direct gantry drive** without any chains and sprocket wheels resulting in smooth and accurate gantry travel motion and minimum maintenance.
- **Spreader trim** with hoist machinery units eliminating separate special trim mechanisms.
- **Eight wheel model** with electronic anti-sway also available.
- **Power source options** include diesel or cable, depending on customer preference.

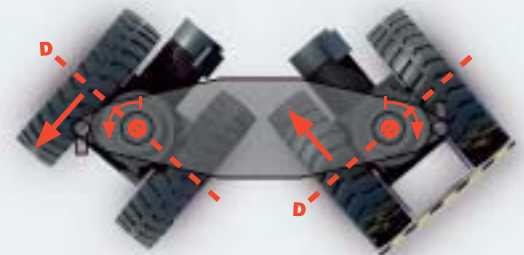
## Normal Driving Mode

Wheel pair locked for normal driving.



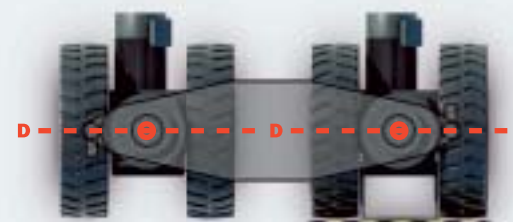
## Turning in Progress

Wheel pair unlocked to rotate in unforced, tire-saving pivot mode. The driving wheel "D" is turning the wheel pair.



## Cross Driving Mode

Wheel pair locked for cross-driving.





## Autosteering **ALWAYS ON THE RIGHT TRACK**

Konecranes RTG autosteering delivers a range of decisive advantages, including improved worker safety and increased driver productivity. It keeps the RTG gantry on a pre-programmed path without driver steering inputs, allowing your driver to stay focused on other tasks. More precise steering means a more precisely optimized stack alignment that permits greater stack density and also helps prevent collisions caused by loose, unpredicted configurations.

### **Accuracy Matters**

Konecranes offers the most accurate, most reliable autosteering system available in the world today. It's dual antenna in combination with proprietary RAAS technology minimizes signal loss and provides measurement accuracy of +/- 1 inch. Our GPS positioning solution has been specifically developed and optimized for RTGs and provides gantry heading monitoring in real time, even when standing still – something not possible with one antenna systems.

### **Efficiency at Every Turn**

The same GPS technology used with Konecranes autosteering can also be linked with your container positioning network. And you can further upgrade to give your driver the productivity tools he needs for maximum efficiency, including AutoStop, AutoMove, AutoSlowDown, and AutoGrab.

- Twin dual-frequency DGPS receiver for accuracy and redundancy.
- Dual DGPS receiver antennas on the opposite ends of the gantry for accurate heading determination.
- Full integration to PLC systems, including AC drive encoders.
- Graphical Deviation Display in the operator cabin.
- Automatic slow-down/fast ramp down in the event of excessive deviation.

#### **RAAS READY - DGPS TECHNOLOGY**

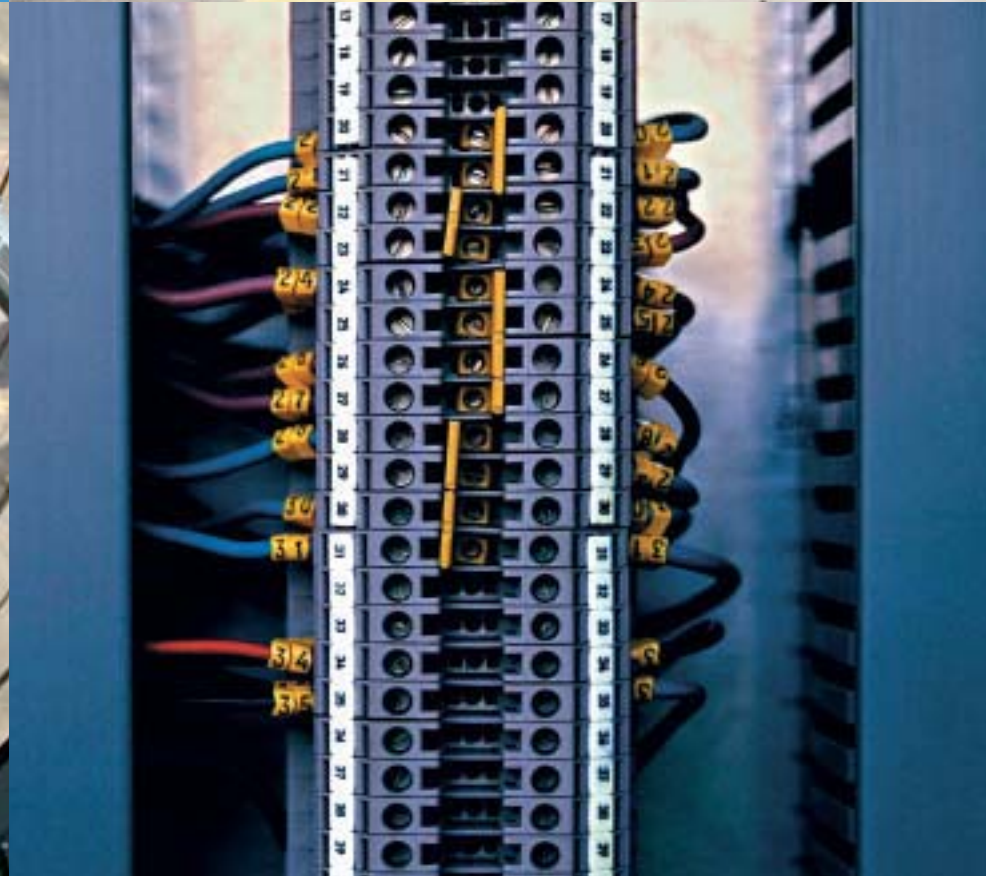
Konecranes proprietary RAAS technology (patent pending) achieves superior container positioning performance by utilizing more satellite data than commercial general purpose GPS applications and combining the information with yard con-figuration data. In addition, the RAAS intelligent use of two antennas eliminates signal loss to achieve uninterrupted, very accurate positioning for Autosteering applications. RAAS is the only GPS solution developed and optimized for container handling purposes!





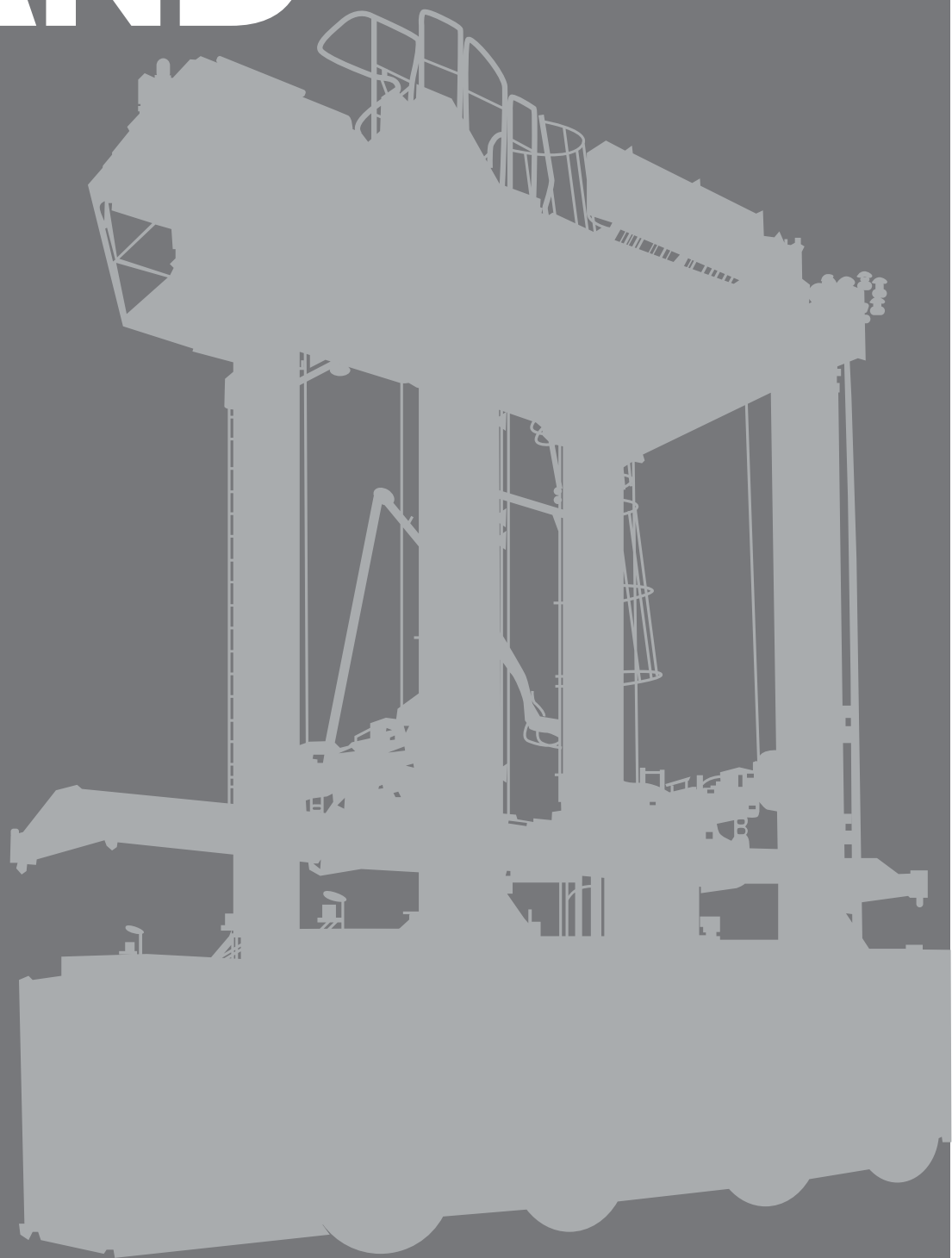








# DESIGNING THE DIFFERENCE BETWEEN GOOD AND GREAT





## Straddle Carrier

# A LIFETIME OF HIGH PERFORMANCE

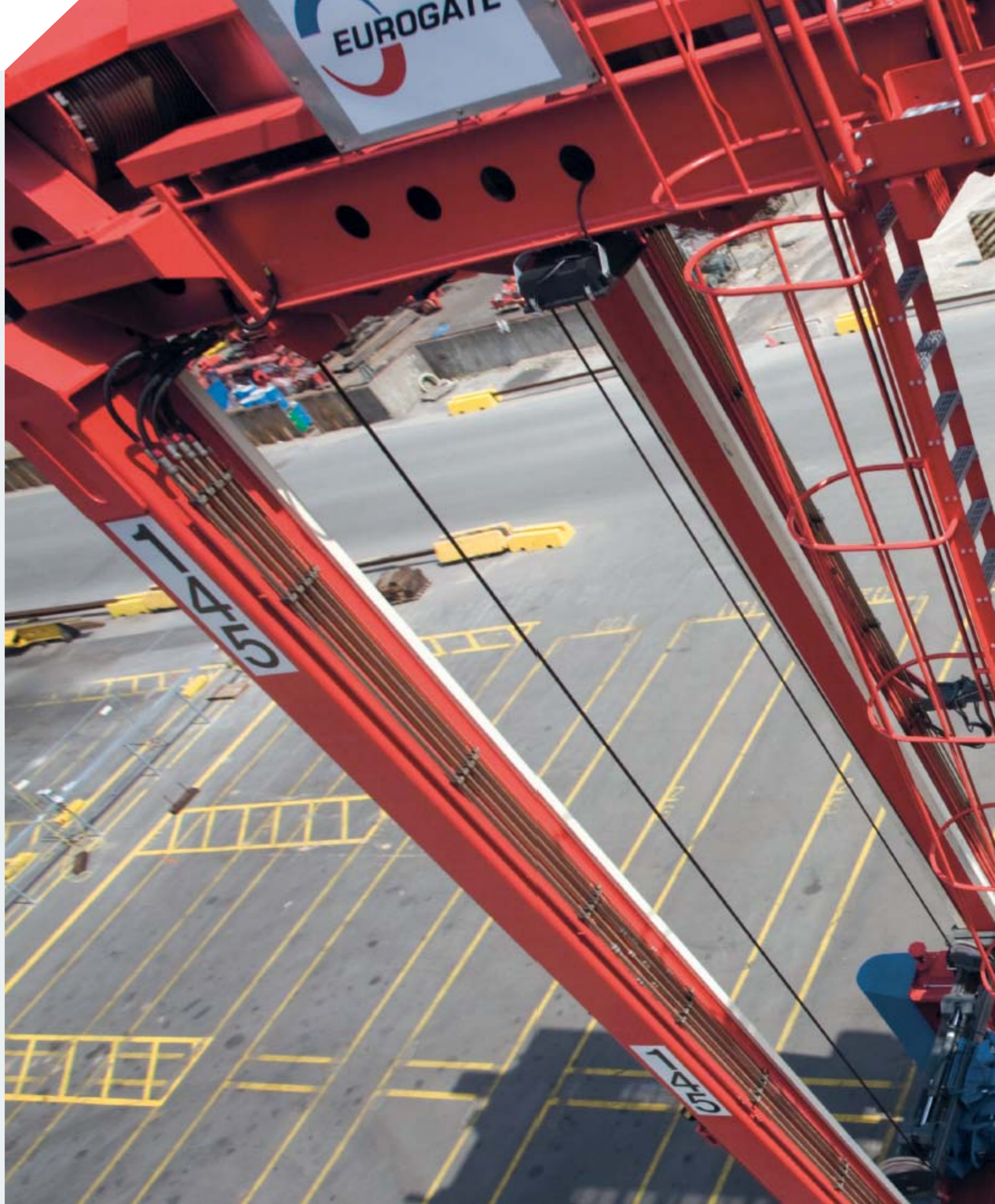
**The Konecranes Straddle Carrier** is truly innovative technology that offers you a full range of intelligent solutions required by modern cargo handling centers of the world.

From the earliest stages of its development we included operators and suppliers in the design process, repeatedly asking ourselves and them: “What performance qualities are intrinsic to the world’s best straddle carrier?”

And by “performance” we not only mean that we focused on how it would performed on day one – but also how reliable, durable, and maintenance-friendly our straddle carrier would be over time.

### Comprehensive Design Approach

Our final result is a straddle carrier that offers both the toughest-built, smartest technological systems in the industry, and the most minimal maintenance expenses. In short: the highest life cycle value and the lowest life cycle cost. We achieved this by focusing on our straddle carrier’s various systems and features worked together. And the outcome is a clear example of the whole being greater than the sum of its parts.





145

145



# FLEXIBLE PRECISION

Our steering system's precise wheel alignment means faster operation, perfect execution of driver commands, and less tire wear. We designed our steering so that wheel alignment is controlled through an angle transmitter and is permanently synchronized.

## **Konecranes Design = Less Maintenance**

Our steering design is service-friendly, meaning fewer spare parts and less maintenance. And the heavy-duty cylinders and rods are well situated within the internal frame of the travel girder to protect them against possible collision and soiling. Also, thanks to the emergency steering pump, it is still possible to steer during towing in the case of engine failure.

## **World Class Ride**

Our chassis is equipped with eight independently suspended wheels, each equipped with its own maintenance-free suspension assembly. The suspension system's design is based on a special alignment of its spring elements and bearings, a combination of elements that effectively controls nod movement during braking and driving, thus ensuring stability in all driving situations. In fact, the stability of the vehicle is guaranteed even in the case of a flat tire.

## **Born to Lift**

Our Straddle Carrier hoisting system's large drum and pulley diameters deliver superior rope endurance, and many of the hoist components are identical to those used on Konecranes' successful RTG and RMG equipment, meaning they've proven themselves during use by real drivers under actual working conditions.













**FLEXIBLE,  
COST-  
EFFECTIVE....  
MAY EVEN  
WALK ON  
WATER**





MAERSK  
EALAND

MAERSK  
EALAND

WVCU  
536 584 3  
15R1

MAX. WT.  
PAYLOAD  
MAX. WT.  
TARE

25000 KG  
25000 KG  
25000 KG  
25000 KG



TINU 992564  
45G1



WVCU  
522 151 9  
15R1

MSKU  
6936796  
4261



MAERSK

MAERSK





## Lift trucks

# REAL-TIME RESPONSIVE- NESS

**Our fork lift trucks are built to get the job done** as efficiently and cost-effectively as possible. We therefore often adapt each lift truck so that it is ideally suited to carry out the heavy-duty task that awaits it. A rigid, box-section chassis and a load-sensing hydraulic system provide the platform for a selection of optional equipment that is ideally matched to your needs. The result is a fork lift truck with outstanding performance, cost-effectiveness and working life.

To make day-to-day work easier for our customers we also offer a range of innovative solutions. One example is our Spectra series, which has the lift mast positioned behind the front axle – a unique solution that not only means better visibility and hence better safety for the operator, but also gives improved driving comfort and unbeatable access for servicing.

### **The Payoff: More Efficient Goods Handling**

We carry out constant development to ensure that our fork lift trucks attain the highest scores of all for quality, productivity and cost-effectiveness. As a consequence we have developed solutions that make our lift trucks faster and more efficient. These are benefits that you will appreciate in the form of faster lifting and lowering speeds, direct and accurate maneuvering and excellent accessibility for servicing.

### **Smarter Ergonomics**

In order to work efficiently and safely over long shifts the operator must have a really good working environment. Our fork lift trucks therefore have what is probably the best cab on the market in terms of visibility, ergonomic design and comfort. The cab is designed with large windows that give the best possible visibility in all directions, and all controls are positioned comfortably within reach and view of the operator.



Bremen, Germany







## Reach Stackers **EXCELLENCE – OPTIMIZED**

**Our latest generation** of reach stackers builds on many years of development work and close partnership with our customers. This means that we can offer a highly modern lift truck based around carefully selected components and a fuel-efficient engine that delivers high torque even at low rpm. You also get access to a string of innovative solutions to simplify your work. One example is the load-sensing hydraulic system with variable piston pumps, which ensures the optimum balance between engine power and hydraulic demand for any given lift.

### **Flexibility Drives Profits**

By combining the best components in the optimum way we achieve a well-balanced relationship between the engine and hydraulic systems. This is something that you will appreciate in the form of superb maneuverability and the way in which all functions are carried out quickly and with the greatest precision. As a result our reach stackers can lift and lower goods at a faster speed than most of our competitors' machines. Another benefit is that our reach stackers can easily be adapted to handle different types of goods with the aid of a range of optional equipment.

### **Driver Inspired Design**

We've given special attention to the design of our operator's cabs. Our machines probably have the best cabs on the market in terms of visibility, ergonomic design and comfort. The cab is designed so that your driver can easily reach all the controls and check all functions at a glance. This allows them to concentrate on getting their job done more effectively.





**GET SMARTER —  
OR GET LOST**





## Container Positioning **MAXIMUM SPEED, 100% ACCURACY**

An efficient and precise operation means happy customers, which in the long run is the key to keeping your terminal profitable.

Konecranes container positioning technology is on the leading edge of the revolution to increase the precision and automation of container terminals.

### **Every Time and Everywhere**

We're committed to helping container terminal operators improve the efficiency and quality of their operations – day in, day out, and whatever the specific needs may be – through the deployment of highly accurate, real-time positioning and wireless communications innovations.

### **Zero Tolerance for Loss**

Our aim is to ensure that your container yard inventory is 100% accurate, and to completely eliminate the problem of lost containers. Our approach is to maximize your terminal operating system (TOS) performance by monitoring what really takes place in the yard – in real time and at every crucial point in the chain.

### **Breaking the Bottlenecks**

Around the world port terminals lose significant income every day due to misplaced containers. How much could your operation save if this problem were eliminated? And what are the critical features of a system that will allow you to eliminate lost containers and achieve a 100% accurate container yard?

## **SMARTER WHERE IT MATTERS**

The Konecranes solution starts with the idea that all container handling equipment is connected to your TOS system and that there is two-way communication between them, so that all container moves are logged in the TOS in real time.

This approach enables your TOS to maximize the efficiency of your entire fleet, minimizing empty driving by precisely defining the optimal route for all equipment.

Barcelona, Spain





## Speed and Precision **THE WINNING COMBINATION**

Where other technologies often fail is in the accuracy and reliability of their satellite positioning technology. Konecranes' proprietary technology delivers sufficient (sub-meter) positioning accuracy to ensure correct, real time, container identification. As importantly for maintaining inventory accuracy, our system is designed to recover quickly if the satellite signal is temporarily lost.

### **Every Move You Make**

Also ensuring absolute accuracy is that your driver receives an instant warning whenever he makes a move not aligned with the TOS generated schedule. Likewise, no key-in from the driver is needed to document which moves have been made, thanks to automatic detection of container pick-ups via twist-lock activation. In this way the precise location of any container pick-up and drop-off can always be determined by combining the container handling equipment position fix with the twist-lock activity signal.

#### **RAAS READY - DGPS TECHNOLOGY**

Konecranes proprietary RAAS technology (patent pending) achieves superior container positioning performance by utilizing more satellite data than commercial general purpose GPS applications and combining the information with yard configuration data. In addition, the RAAS intelligent use of two antennas eliminates signal loss to achieve uninterrupted, very accurate positioning for Autosteering applications. RAAS is the only GPS solution developed and optimized for container handling purposes!





**GREENER  
MEANS  
SMARTER**







## Environment

# WHAT WE MEAN BY "GREEN"

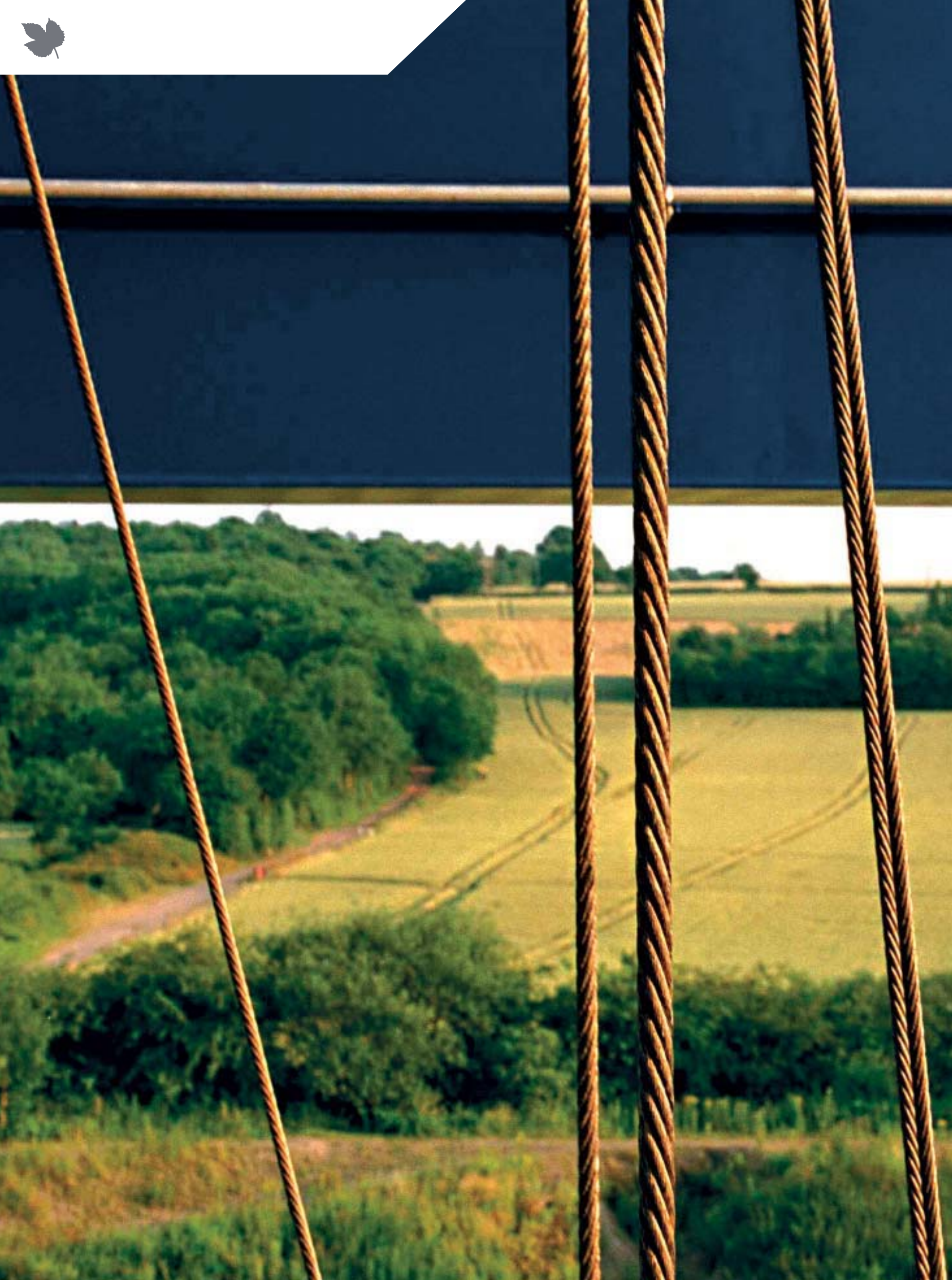
At Konecranes, we think operating in an environmentally sound manner is more than just a nice idea. We view it as a crucial commitment – a commitment that means we are continually making our own production processes more material and energy efficient. And we're also working hard to reduce the environmental impact of our products and services.

### **Green Business Makes for Smarter Business**

Key factors in environmentally sound product development include reusability, the efficient use of materials, and a product's energy efficiency during its lifetime of use. We favor products and materials that have a low environmental impact and low levels of energy consumption. With this approach, more than 98% of the materials used to build our cranes can be recycled. Similarly, when it comes of the efficiency of our electric motors, our modern inverters are unequalled. And increasingly, our equipment is used to transfer braking energy back into the grid, thus significantly reducing energy consumption.

### **Set for Tomorrow**

Konecranes continues developing the sustainability of its lifting equipment by, for example, improving the design of cranes and crane components, and by enhancing software for fleet management. Maintenance is a crucial part of the whole package for the equipment to function efficiently.





**Three Ways Konecranes Helps**

# CUT YOUR EMISSIONS

## **More Throughput – Less Equipment**

The most effective way to cut emissions is to constantly match the fleet size to your operations. This means that you mobilize only the minimum number of the most effective equipment needed. To increase your yard's throughput it's important to make sure the equipment is always in the right place at the right time. In order to reduce the non-value-added activities that also cause unnecessary fuel burn, it's good to know how your fleet navigates while performing the tasks.

## **Fuel Savings by Design**

Several factors contribute to lowering Konecranes equipment fuel consumption, including eliminating hydraulics, quicker load positioning, overall weight, smarter basic design, and a dedicated drive system.

## **More Power – Greater Efficiency**

Additionally, when producing energy, big units have a better efficiency ratio than small ones, such as a combustion engine, and burning fossil fuels is not the only option for generating the energy needed in RTG yard operations. Konecranes has developed a method enabling RTG container handling with energy taken from the national grid, where it is produced economically in big power plants that take advantage of economies of scale. With the help of DGPS, the benefits of an RMG can now be applied to RTGs also.

## **More Environmental Credits – Fewer Emissions**

Emission control is a vital part of the crane design and manufacturing process. International legislation is leading the way and our operations are guided by the off-road emissions regulations, which will become stricter over the coming years.

## **SAVE TRUCKLOADS OF FUEL**

In close collaboration with diesel engine manufacturers, Konecranes has developed a system for RTGs that yields fuel savings of 25-30%. The Konecranes Fuel Saver optimizes the efficiency and the diesel generator fuel consumption by adjusting the engine's RPMs according to the variable power requirement. The diesel engine is driven with optimal efficiency at all operating points, which eliminates high-speed idling completely, and guarantees constant, full-scale productivity. Just as important, crane performance is not compromised with the Konecranes Fuel Saver – standard speeds still apply.

Birmingham, UK



# PEOPLE AT THE HEART OF IT









## ASK YOUR DRIVER

**Your driver is a genuine expert**, and the safety, comfort and efficient command of his machine are of vital importance. Because of this, our cabins provide a precise balance between vehicle suspension and seat suspension, resulting in the most stable, smoothest possible ride and lowest body vibration. Likewise, all operation and information displays are carefully and logically arranged, and the electronic- steering system combined with smart container handling (Active Load Control on yard cranes and STS) delivers the fastest, most accurate moves. All controls are arranged to each customer's special requirements.

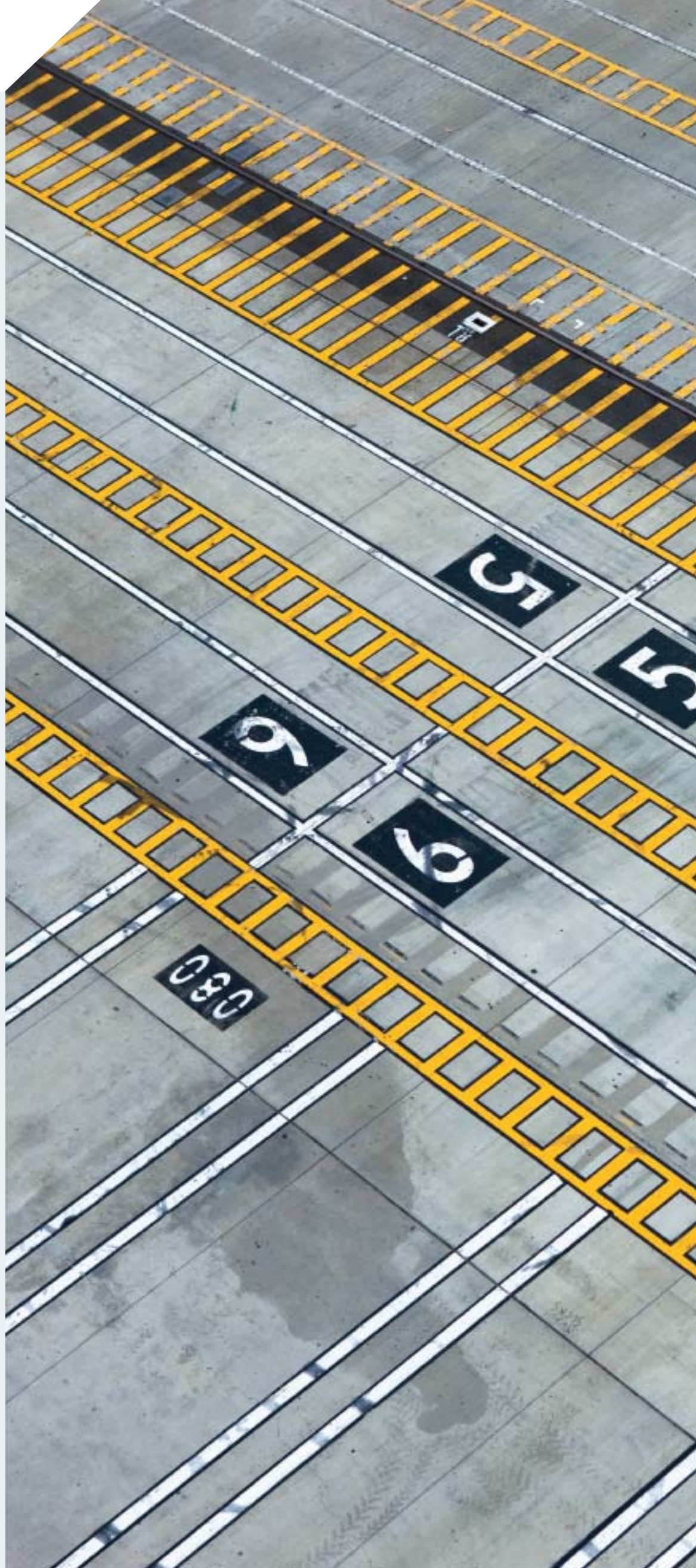
### **Stability Means Safety**

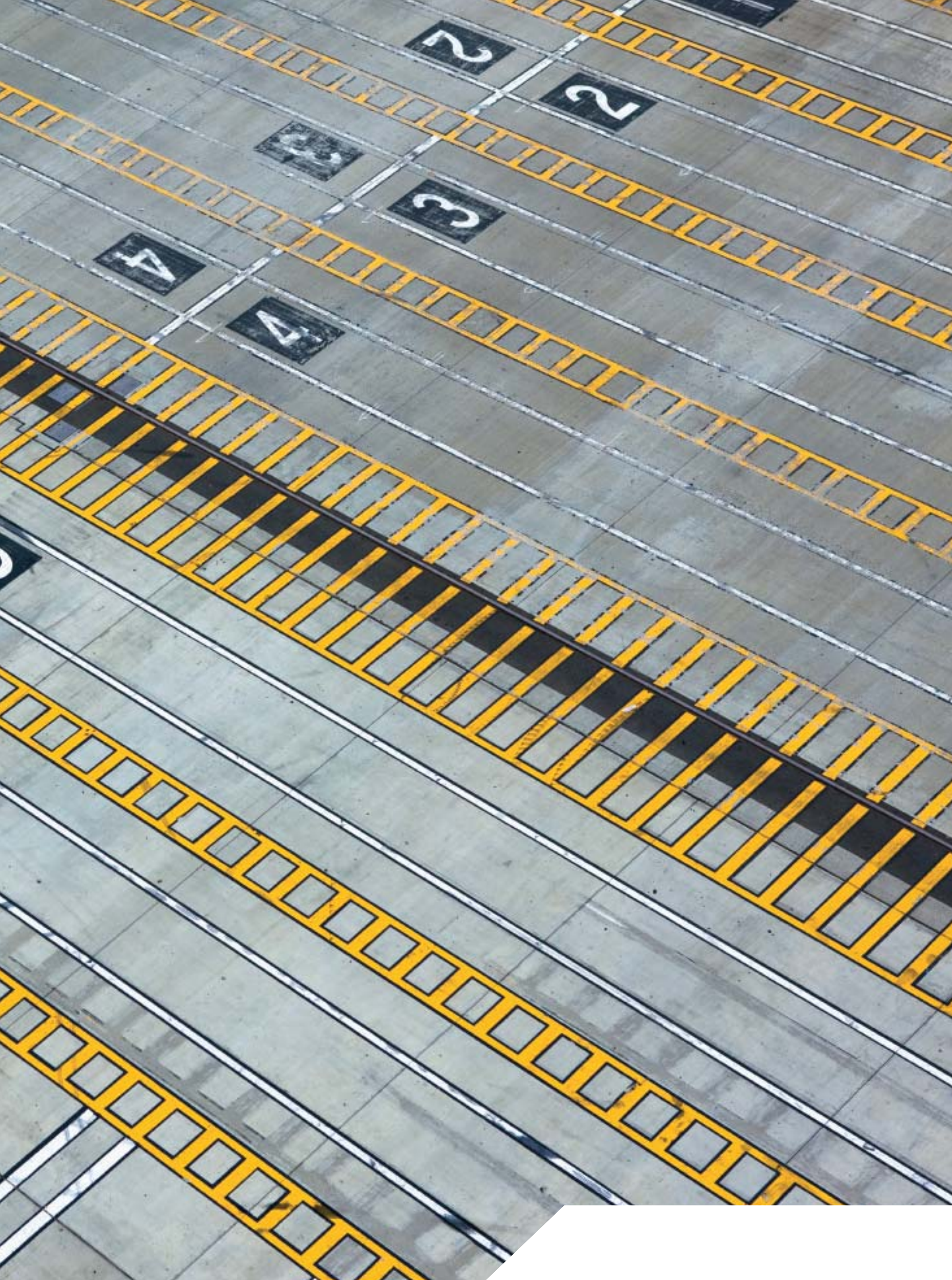
Our container equipments' overall stability and ease-of-control under even the most demanding conditions means your driver can focus on maximizing his work performance. Driver noise exposure has been significantly reduced through comprehensive sound isolation of both the cabin and the drive system. Advanced heating and air-conditioning systems give your driver optimal control of the cabin climate – regardless of weather conditions.



# INNOVATING WHILE PLAYING IT SAFE

Every product and service provided to our customers by Konecranes is delivered with the safest possible technologies and processes built-in – from the ground up. All our products are manufactured in accordance with rigorous standards, both current and anticipated. Konecranes has become a recognized leader in workplace safety, and in 2002 and 2004, Konecranes was awarded the “Green Cross for Safety Excellence Achievement” by The National Safety Council (USA). These, along with numerous other workplace safety awards that have been presented to us in recognition of our performance, demonstrates just how seriously we take safety issues.









## **OUR PEOPLE MAKE THE DIFFERENCE – EVERY DAY**

Our people are the face of our business. We strive to make every encounter with a Konecranes employee a positive one.

With operations in almost 50 countries, Konecranes has the people power and resources to help you run your container handling operations as efficiently as possible. We have technicians permanently on site in many different container-handling facilities around the globe, and our close relationships with our customers mean that wherever we implement solutions, that's our home.





## DEDICATED – WORLDWIDE

Konecranes container handling equipment and services keep businesses running around the globe. Our worldwide presence means you receive local know-how acquired on a global scale.

This allows us to continuously meet your high-end demands of increased uptime, reliability, safety, performance and cutting-edge technology while reducing overall lifetime costs, wherever you're located.

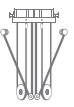


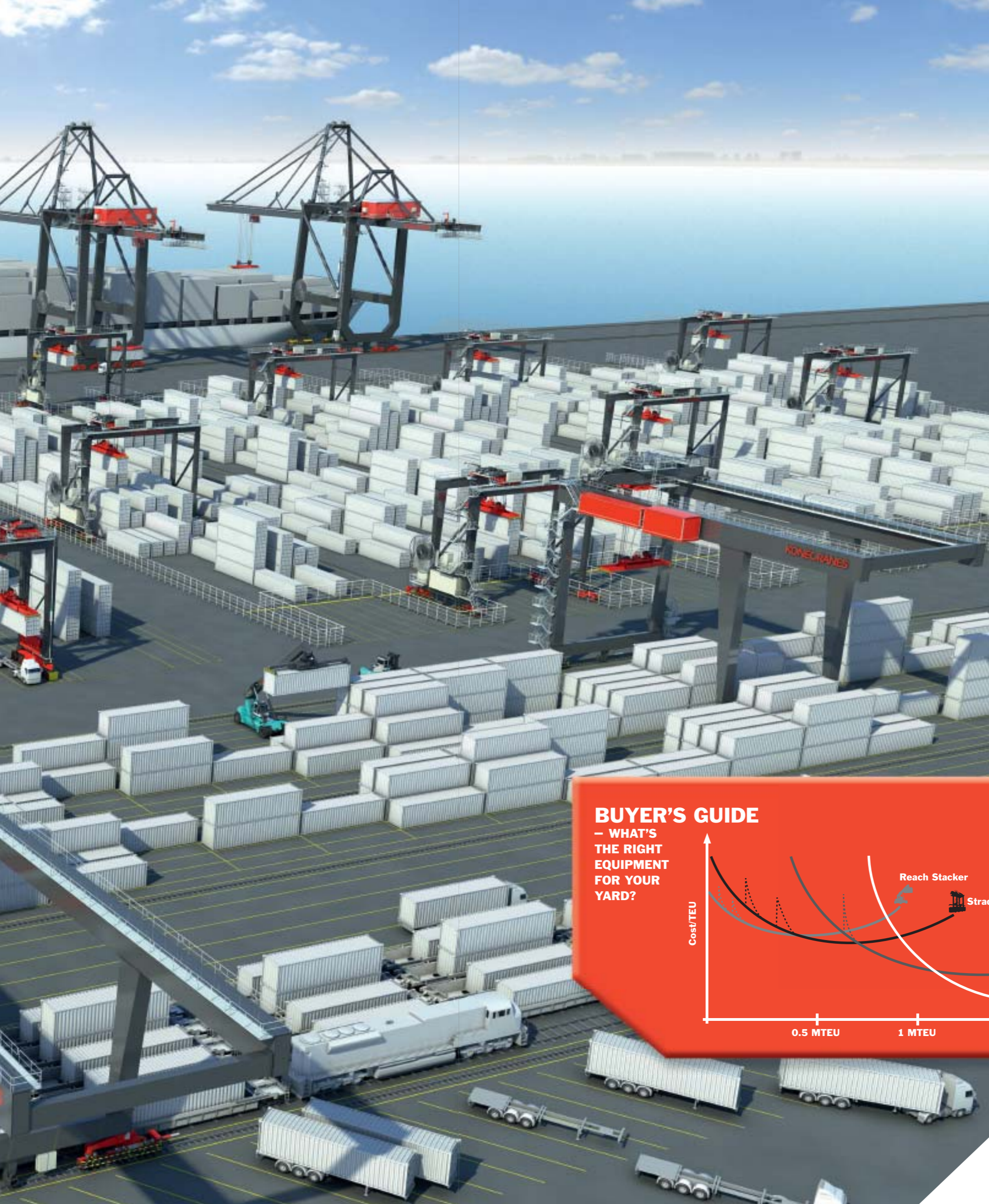




# TECHNOLOGY

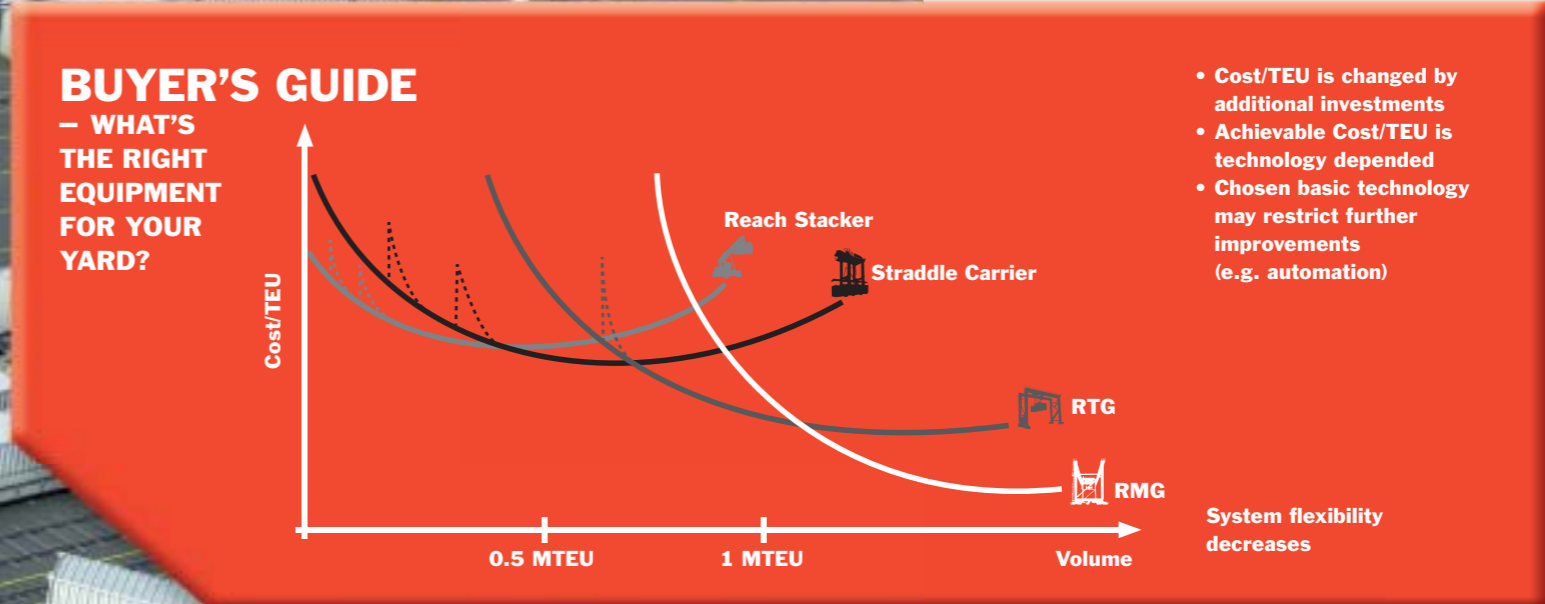




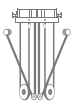


# SUCCESS IS A MOVING TARGET

Choosing the right equipment for your container operation depends not just on knowing your yard's needs today – but tomorrow as well. As your operations grow, the most effective and efficient type of equipment changes. A class of equipment that was once a real money maker can become a real budget buster – so give careful thought to your yard's future needs. At Konecranes, this kind of thinking is what we call being 'smarter where it matters'.



Konecranes container handling fleet controlled by RAAS technology



## ACTIVE LOAD CONTROL

### Hoist Rope Drum

Reeved hoist and auxiliary ropes.

### True Vertical Lift

Excellent rope fleet angles and true vertical lift enables longest rope lifetime.

### Hoist Rope Load Cells

### Auxiliary Winches

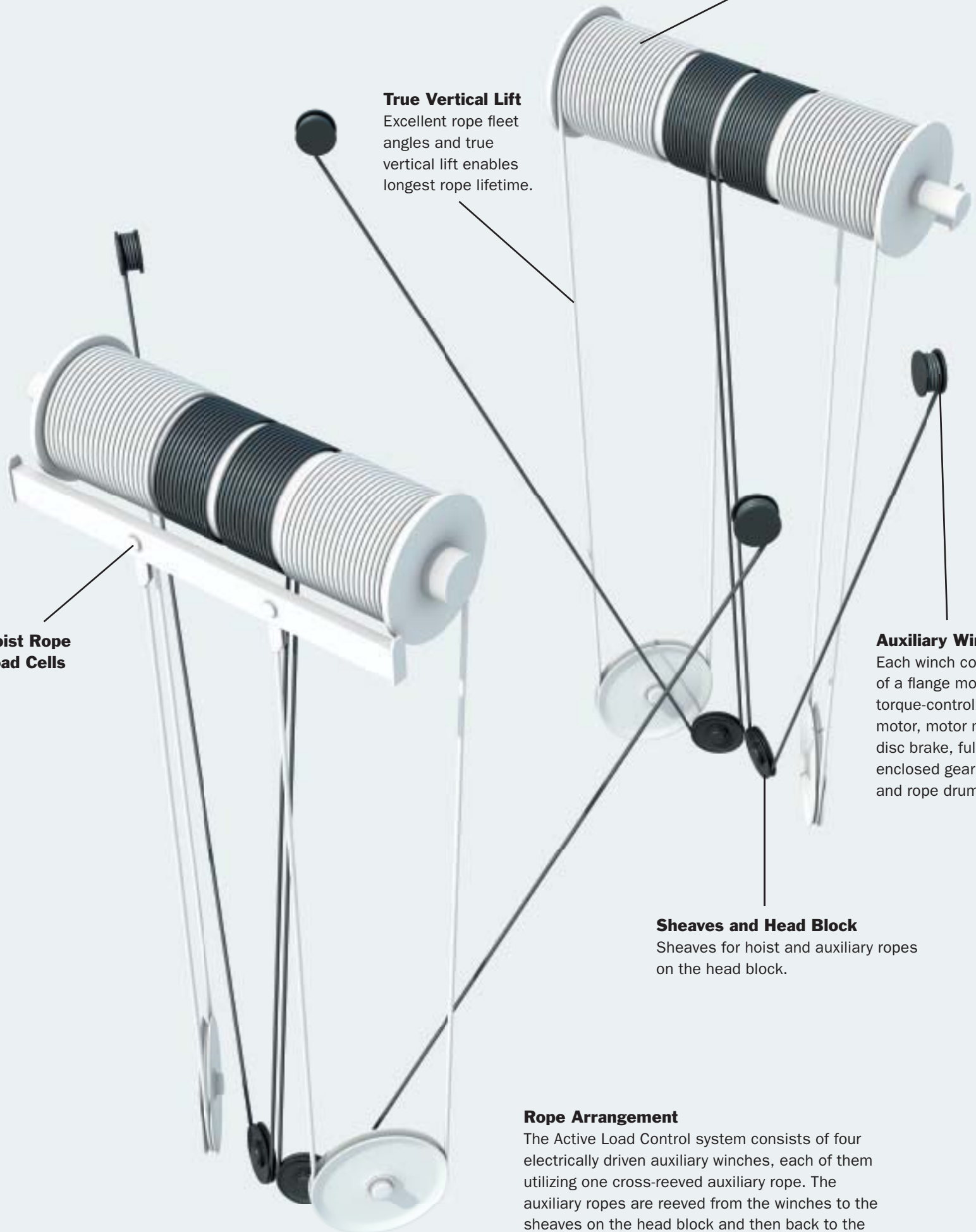
Each winch consists of a flange mounted, torque-controlled AC motor, motor mounted disc brake, fully enclosed gear reducer and rope drum.

### Sheaves and Head Block

Sheaves for hoist and auxiliary ropes on the head block.

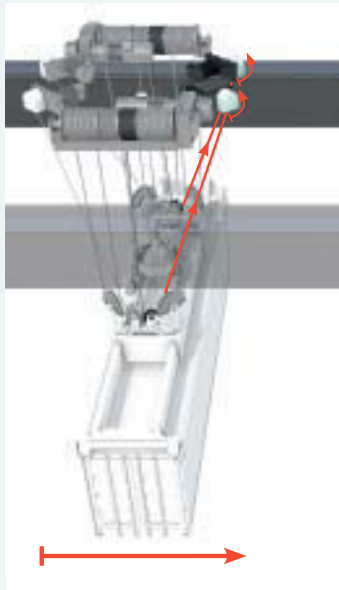
### Rope Arrangement

The Active Load Control system consists of four electrically driven auxiliary winches, each of them utilizing one cross-reeved auxiliary rope. The auxiliary ropes are reeved from the winches to the sheaves on the head block and then back to the trolley on the main hoist rope drums.



## Sway Prevention with Smooth Trolley

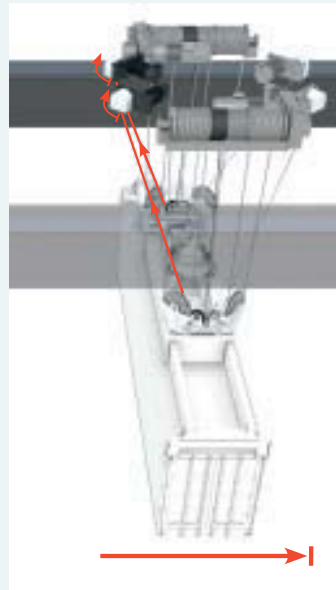
Moving of container starts towards right



Moving of container in progress, travelling speed is stable

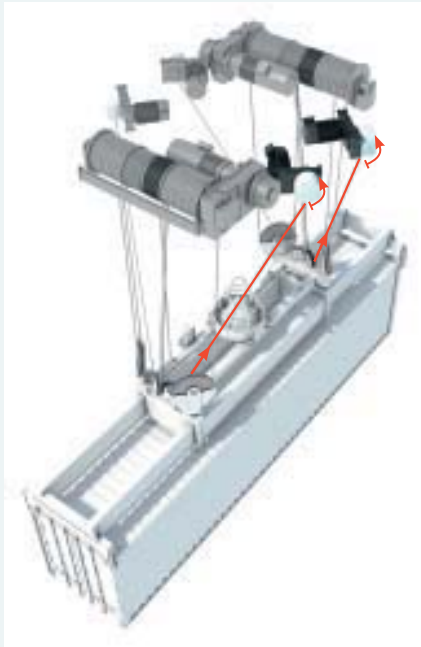


Slow down to stop in progress



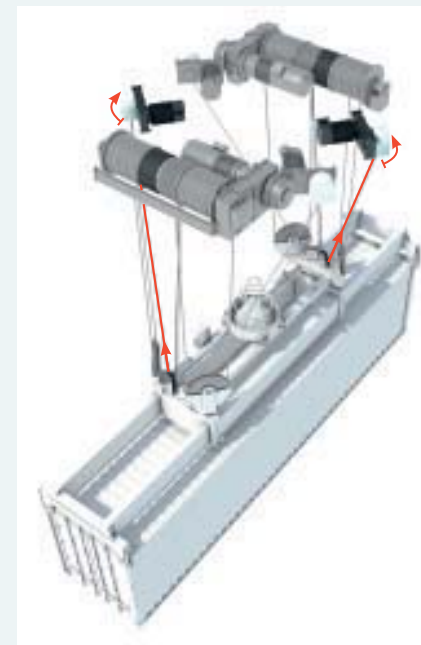
## Horizontal Fine Positioning without Moving the Trolley or Gantry

Example: movement to the right



## Spreader Skewing with $\pm 5^\circ$ Range

Example: clockwise rotation



# Active Load Control THE CORE OF PERFOR- MANCE

The patented Konecranes Active Load Control (ALC) is an integrated sway prevention and horizontal fine positioning system. ALC allows optimum cycle times to be reached in all operating conditions – even with an inexperienced driver.

## Constant Sway Prevention with Smooth Trolley

While electrical anti-sway systems extend ramps by manipulating the trolley acceleration, Konecranes sway prevention system instantly follows your driver's commands without shaking the trolley. It is constantly active, making instant corrections via four auxiliary winches – each controlling one corner of the container – to effectively counter all unwanted movements, including those caused by wind or other external forces.

The system functions in both gantry and trolley traverse direction and also minimizes torsional sway.

The sway prevention is achieved by adjusting tension in each individual cross-reeved auxiliary rope by controlling the torque of the auxiliary winches.

## Quick and Effective Positioning without Hydraulics

While rigid rope tower arrangements lose their performance under typical operational load and height conditions, the performance of the Konecranes dynamic sway prevention system is constant – meaning it works equally well for loaded and empty containers.

Further, with the Konecranes fine positioning system the operator can move the spreader 250 mm in any direction on the horizontal plane without moving the trolley or gantry. Positioning is achieved by shortening and lengthening the cross-reeved auxiliary ropes by means of the auxiliary winches. Plus, skewing the spreader up to 5 degrees is included as standard. Skewing is achieved by shortening two diagonally opposite cross-reeved auxiliary ropes and lengthening the other two by means of the auxiliary winches. The result is a system that delivers faster performance so smoothly it goes almost unnoticed. The Konecranes ALC will improve your operation's performance, whether your system is automated or driver operated.



# SHIP-TO-SHORE

Konecranes semi-rope trolley or BoxHunter trolley with Active Load Control for best performance (see ALC page for detailed description).

Flange mounted direct drive on all travelling and trolley machinery enables quick changes and better structure deflection tolerance.

Back pylon and back stay provide greater main girder stiffness.

Remote connection to Crane Management System as standard (GPRS or WLAN) .

Konecranes control system with Crane Management System for controlling and monitoring the entire crane.

Electromechanical trim list skew offers higher precision, yet requires less maintenance than a hydraulic system.

With Konecranes AC drive's optimized torque patterns, every lift consumes less energy.

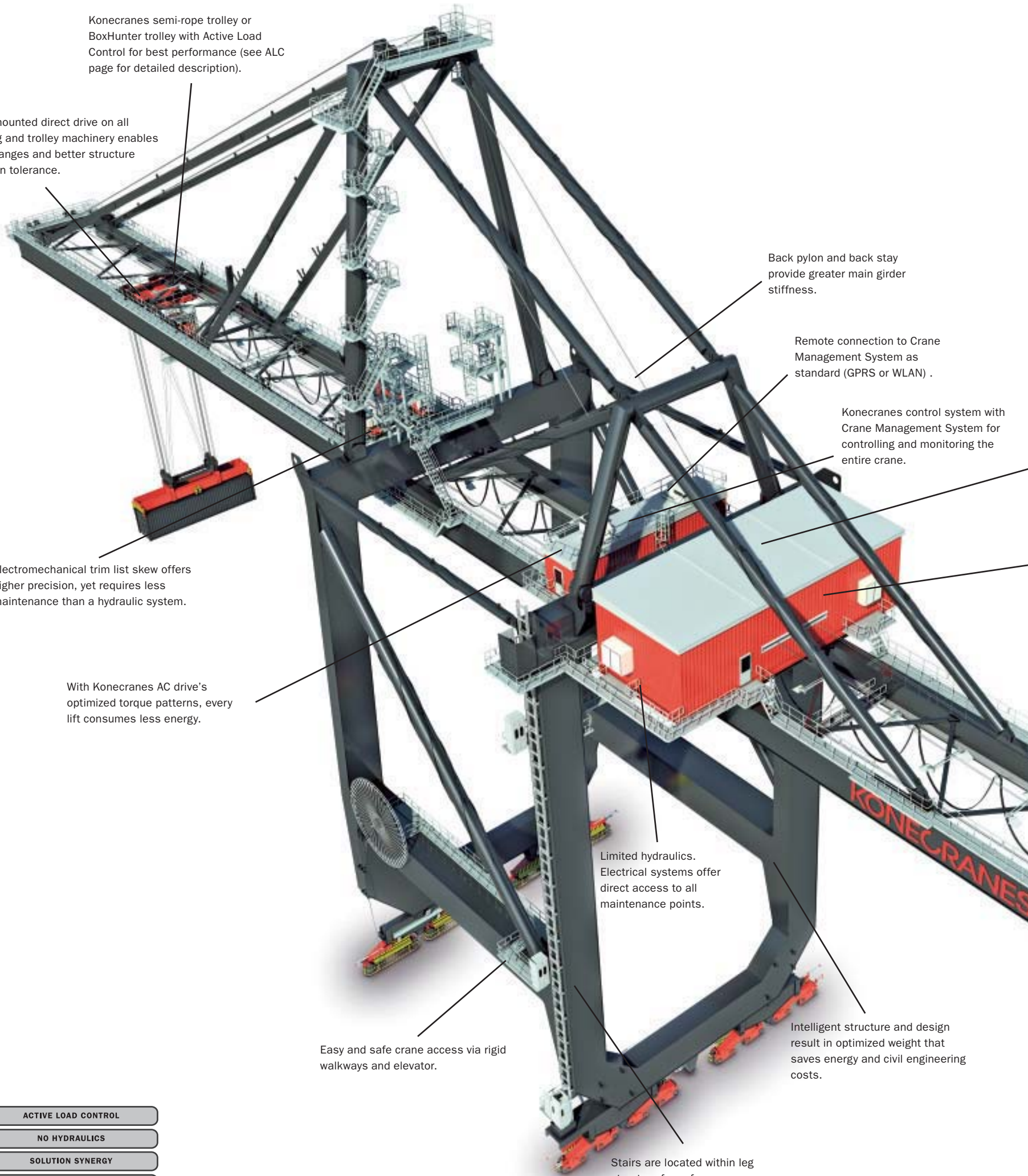
Limited hydraulics. Electrical systems offer direct access to all maintenance points.

Easy and safe crane access via rigid walkways and elevator.

Intelligent structure and design result in optimized weight that saves energy and civil engineering costs.

Stairs are located within leg structure for safer access.

- ACTIVE LOAD CONTROL
- NO HYDRAULICS
- SOLUTION SYNERGY
- SERVICE MODULARITY
- INTELLIGENT STRUCTURE



# SMARTER FROM EVERY PERSPECTIVE

## Operations

### RELIABILITY AND PERFORMANCE

- Commitment to root cause support
- On BoxHunter trolley Active Load Control for quick load positioning
- Service Modularity applied for quick crane recovery
- All key components from industry-leading suppliers, no copies used
- Intelligent structure for excellent stability and improved duty cycle

## Maintenance

### EASIER, LESS FREQUENT MAINTENANCE

- Reduced hydraulics, mechanical anti-slag protection, electro-mechanical trim, list and skew.
- Solution Synergy applied reducing the amount of separate machineries and components (anti-sway & side shift & skew, trim)
- Service Modularity applied for quick and less frequent maintenance (direct gantry and trolley drives, flange mounted motors)
- Direct access to maintenance points

## Driver

### SAFETY AND ERGONOMY

- 'All-in-Controllers' for absolute driver's focus and uninterrupted load handling
- Safe crane access all the way to the top via rigid walkways and platforms or by elevator.
- Enclosed machineries

## Finances

### LOWEST LIFECYCLE COST

- Dedication to long-term partnership
- Equipment truly designed based on the Total Cost of Ownership approach
- Reduced hydraulics enabling dramatic operational cost savings
- Low energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)

## Community

### ENVIRONMENTALLY FRIENDLIER

- Reduced hydraulics
- With BoxHunter Quick and precise load positioning without moving the weight of trolley or gantry
- Optimized equipment weight due to intelligent structure and trolley design
- Energy saving Konecranes drives designed for crane use
- Regenerative power feedback for lowest energy consumption and emissions

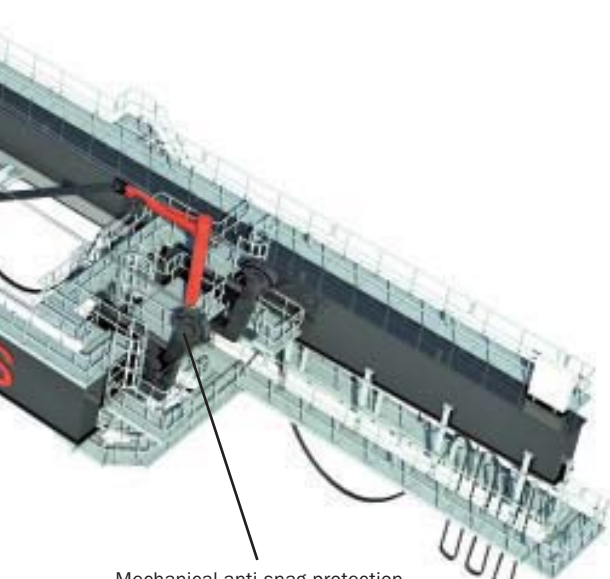
## Terminal Manager

### BEST PERFORMER IN EVERY RESPECT

- Quick vessel turnaround times
- Safely
- With lower emissions and cost

Main components and control systems supported by in-house Konecranes knowledge, both during the delivery process and after sales.

High quality Konecranes components designed specifically for cranes.

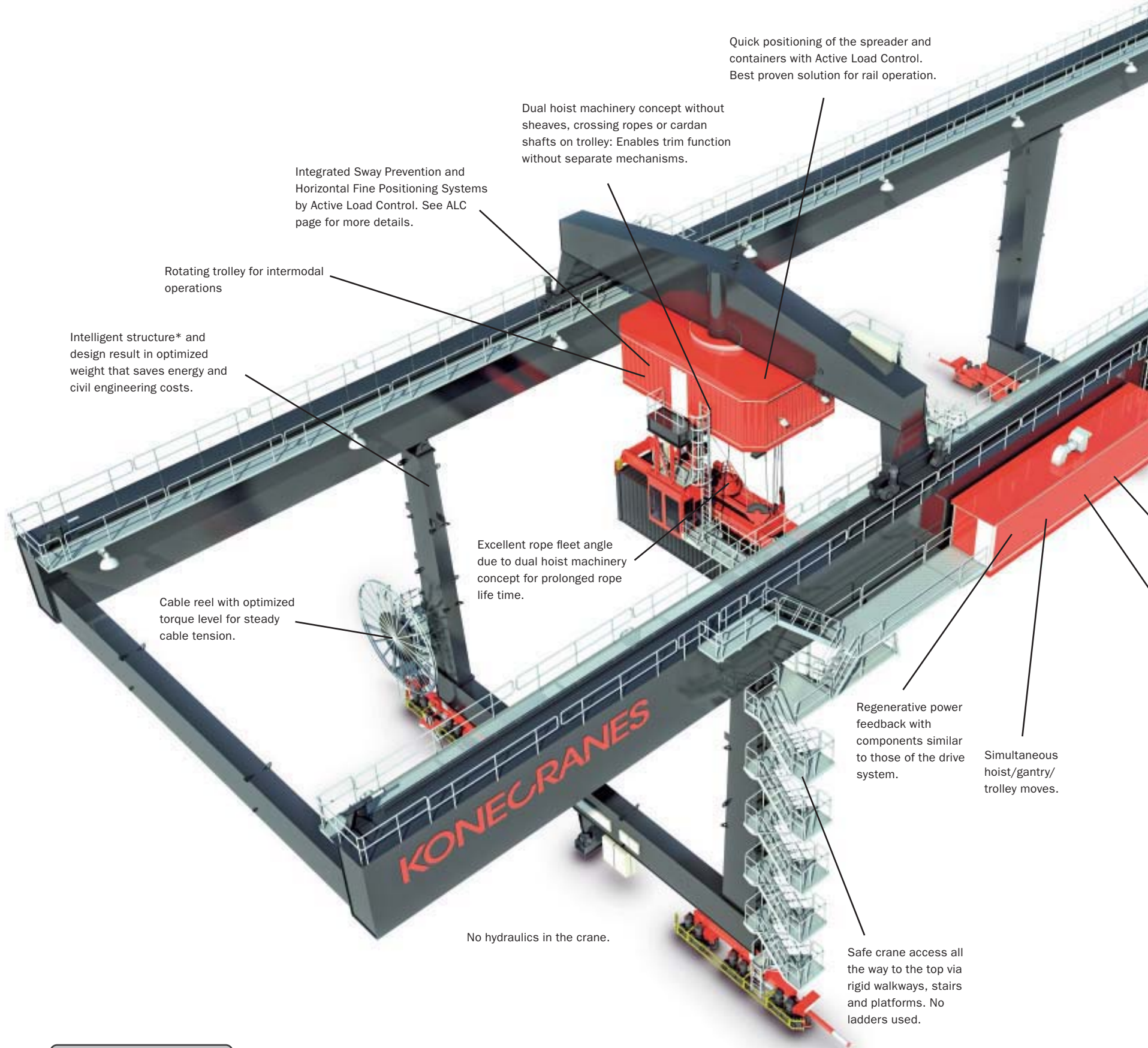


Mechanical anti-slag protection with friction pads. Reliable, maintenance-free and proven safe solution.

	Panamax	Post Panamax	Super Post Panamax
<b>Lifting Capacity</b>			
	40-50 ton	50-65 ton	50-70 ton
<b>Dimensions</b>			
Outreach	up to 13 rows	up to 18 rows	22-24 rows
Lifting height	28-32 m	32-36 m	36-40 m
<b>Spreader</b>			
Spreader drive	Electrical (Hydraulic)		
Floating twistlocks	ISO		
Positions	20 ft, 30 ft, 40 ft, 45 ft, twin, single, twin twenty and long twin		
<b>Speeds</b>			
Gantry travel speed	45 m/min		
Hoisting speed empty	120 m/min	150 m/min.	180 m/min
Hoisting speed laden	60 m/min.	75 m/min.	90 m/min
Trolley speed	150 m/min.	180 m/min.	210-240 m/min
<b>Power Supply</b>			
Cable reel power supply	50/60Hz, 7-20 kV		
Shore power supply	50/60Hz, 400V		
Drive system	Konecranes AC drives with Regenerative Braking		
<b>Trolley type</b>			
	Semi-rope trolley or BoxHunter (with Active Load Control)		
<b>Quay interface</b>			
Rail span	15-23 m	18-30,48 m	26-30,48 m
Bogie arrangements	8 wheels per corner, or more depending on maximum wheel admissible wheel loads		
<b>Typical wheel loads *</b>			
	35-45 T/wheel	45-70 T/wheel	46-90 T/wheel
	30-40 T/m	35-55 T/m	45-65 T/m
	* wheel loads are calculated case-by-case, according to the dimensions of crane and the local conditions.		
<b>Maintenance</b>			
	Konecranes Crane Management System		
	GPRS connection for Remote Diagnostics		



# RAIL MOUNTED GANTRY



Quick positioning of the spreader and containers with Active Load Control. Best proven solution for rail operation.

Dual hoist machinery concept without sheaves, crossing ropes or cardan shafts on trolley: Enables trim function without separate mechanisms.

Integrated Sway Prevention and Horizontal Fine Positioning Systems by Active Load Control. See ALC page for more details.

Rotating trolley for intermodal operations

Intelligent structure\* and design result in optimized weight that saves energy and civil engineering costs.

Excellent rope fleet angle due to dual hoist machinery concept for prolonged rope life time.

Cable reel with optimized torque level for steady cable tension.

Regenerative power feedback with components similar to those of the drive system.

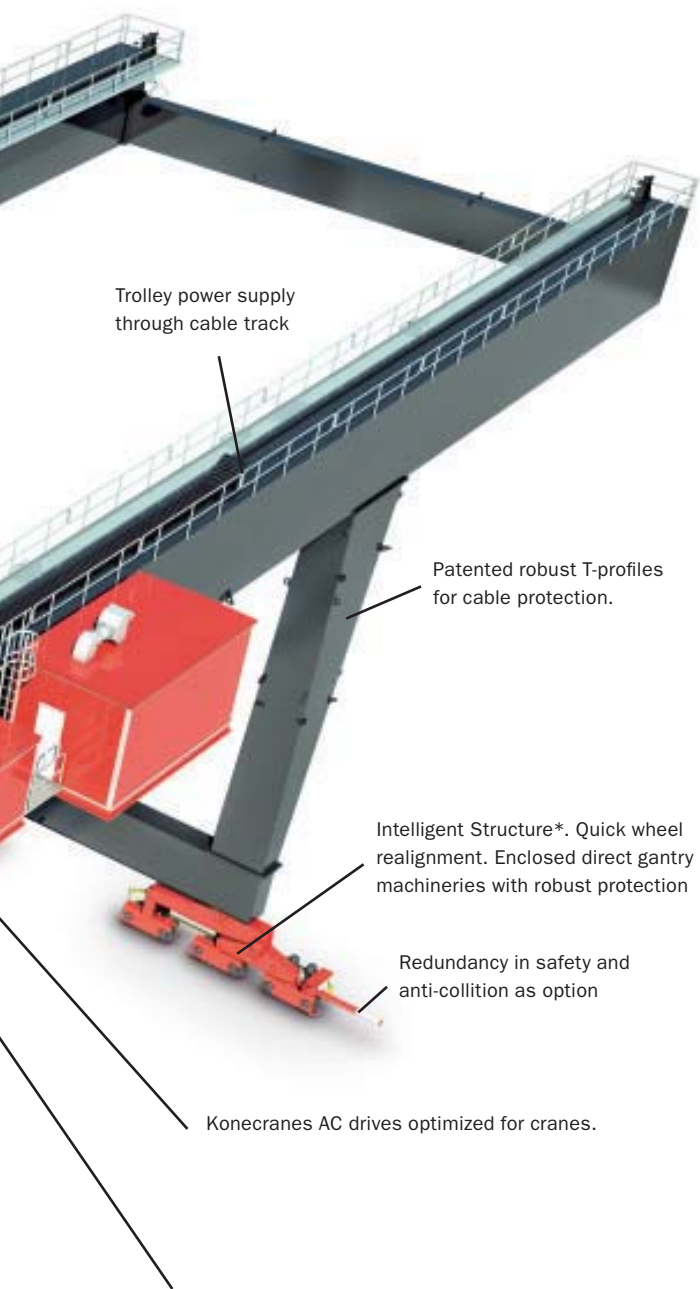
Simultaneous hoist/gantry/trolley moves.

No hydraulics in the crane.

Safe crane access all the way to the top via rigid walkways, stairs and platforms. No ladders used.

- RAAS READY - DGPS TECHNOLOGY
- ACTIVE LOAD CONTROL
- NO HYDRAULICS
- SOLUTION SYNERGY
- SERVICE MODULARITY
- INTELLIGENT STRUCTURE





Trolley power supply through cable track

Patented robust T-profiles for cable protection.

Intelligent Structure\*. Quick wheel realignment. Enclosed direct gantry machineries with robust protection

Redundancy in safety and anti-collision as option

Konecranes AC drives optimized for cranes.

Extensive Crane Management System for quick trouble shooting and performance monitoring.

**Intelligent Structure\***

Bogies with pinned joints, plus intelligent structure with pinned diagonals and dual hoist machinery trolley, enable large tolerance for rail and yard fluctuations.

# SMARTER FROM EVERY PERSPECTIVE

Operations

**RELIABILITY AND PERFORMANCE**

- Commitment to root cause support
- Active Load Control for quick load positioning
- Service Modularity applied for quick crane recovery
- All key components from industry-leading suppliers, no copies used
- Intelligent structure for excellent stability and improved duty cycle

Maintenance

**EASIER, LESS FREQUENT MAINTENANCE**

- No hydraulic design since 1995
- Solution Synergy applied reducing the amount separate of machineries and components (anti-sway & side shift & skew, trim)
- Service Modularity applied for quick and less frequent maintenance (direct gantry and trolley drives, flange mounted motors)
- Direct access to maintenance points

Driver

**SAFETY AND ERGONOMY**

- 'All-in-Controllers' for absolute driver's focus and uninterrupted load handling
- Safe crane access all the way to the top via rigid walkways and platforms. No ladders used.
- Enclosed machineries

Finances

**LOWEST LIFECYCLE COST**

- Dedication to long-term partnership
- Equipment truly designed based on the Total Cost of Ownership approach
- No hydraulics enabling dramatic operational cost savings
- Low energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)
- Lower civil works investment due to Intelligent structure enabling highest tolerance to yard surface variations

Community

**ENVIRONMENTALLY FRIENDLIER**

- No hydraulics
- Quick and precise load positioning without moving the weight of trolley or gantry
- Optimized equipment weight due to intelligent structure and trolley design
- Energy saving Konecranes drives designed for crane use
- Regenerative power feedback for lowest energy consumption and emissions

Terminal Manager

**BEST PERFORMER IN EVERY RESPECT**

- Quick truck turnaround times
- Quick rail service
- Safely
- With lower emissions and cost

Dimensions, mm	Max. 50 tons under Spreader
Max lifting height (1 over 6)/Max span	21000/50000
Cantilevers	Up to 15000 mm on one or both sides
Speeds, max, m/min:	
Hoist with 40 ton load/empty spreader	45/90
Trolley traverse standard/optional	70/74
Gantry travel with 40 ton load/empty spreader	140/150
Simultaneous hoist/trolley traverse/gantry moves possible	yes
Trolley	4 wheel drive
Type of anti-sway system included	by ALC
Type of micro motions	by ALC
	up to 250 mm radius
Skew/Trim angle, degrees	5/over 5
Spreader	
Standard positions, ft	20, 30, 40, 45
Special positions	twin twenty, long twin, WTP
Connection to head block	twist lock or pin
Bogies	up to 8 wheels /corner
Wheel size, mm	ø 630. 1360 spacing
Wheel material	Surface hardened chrome molybdeum steel
Cable reel power supply	
	Electricity 3 phase: 50/60 Hz, 10-15kV
Options	
Semi automation	
Rotating Trolley, max. skewing	2 rpm



# AUTOMATIC STACKING CRANE

## SMARTER FROM EVERY PERSPECTIVE

### Operations

#### RELIABILITY AND PERFORMANCE

- Commitment to root cause support
- Active Load Control for quick load positioning
- Service Modularity applied for quick crane recovery
- All key components from industry-leading suppliers, no copies used
- Intelligent structure for excellent stability and improved duty cycle
- Clear delivery scope and responsibility

### Maintenance

#### EASIER, LESS FREQUENT MAINTENANCE

- No hydraulic design since 1995
- Solution Synergy applied reducing the amount of separate machineries and components anti-sway & side shift & skew, trim)
- Service Modularity applied for quick and less frequent maintenance (direct gantry and trolley drives, flange mounted motors)
- Direct access to maintenance points

### Driver

#### SAFETY AND ERGONOMY

- 'All-in-Controllers' for absolute driver's focus and uninterrupted load handling
- Safe crane access all the way to the top via rigid walkways and platforms. No ladders used.
- Enclosed machineries

### Finances

#### LOWEST LIFECYCLE COST

- Dedication to long-term partnership
- Equipment truly designed based on the Total Cost of Ownership approach
- No hydraulics enabling dramatic operational cost savings
- Low energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)
- Lower civil works investment due to Intelligent structure enabling highest tolerance to yard surface variations

### Community

#### ENVIRONMENTALLY FRIENDLIER

- No hydraulics
- Quick and precise load positioning without moving the weight of trolley or gantry
- Optimized equipment weight due to intelligent structure and trolley design
- Energy saving Konecranes drives designed for crane use
- Regenerative power feedback for lowest energy consumption and emissions

### Terminal Manager

#### BEST PERFORMER IN EVERY RESPECT

- Quick truck turnaround times
- Quick Shuttle/AGV service
- Safely
- With lower emissions and cost

Dimensions with max 1 over 6 and max 10 wide, mm	40 tons under Spreader
Max lifting height (1 over 6)/Max span (10 + truck lane)	21000/32000
Max extension from hinged leg centerline	900 (bogie level)
Max extensions from leg centerline at crane access side	1929 (bogie level)/1983 (main girder level)
Distance to container side from center line of the legs	1415
Over width over bogie buffer to buffer	15600

Speeds, max, m/min:	
Hoist with 40 ton load/empty spreader	45/90
Trolley traverse standard/optional	70/74
Gantry travel with empty spreader standard/optional	240/300
Simultaneous hoist/trolley traverse/gantry moves possible	yes

Trolley	4 wheel drive
Type of anti-sway system included	by ALC
	by ALC
Target range with automatic final positioning by laser	up to 250 mm radius
Automatic skew angle, degrees	5

Bogies	4 wheels/corner
Wheel size, mm	ø 630. 1360 spacing
Wheel material	Surface hardened chrome molybdeum steel

Cable reel power supply	Electricity 3 phase: 50/60 Hz, 10-15kV
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Other features	
Remote operation with fast and responsive positioning	Included
Adaptable TOS interface	Included
Fully automatic, single or multimode operation at waterside	Included
Semi or fully automated landside operation	Included



Intelligent Structure\*.

Redundancy in safety and anti-collision as option

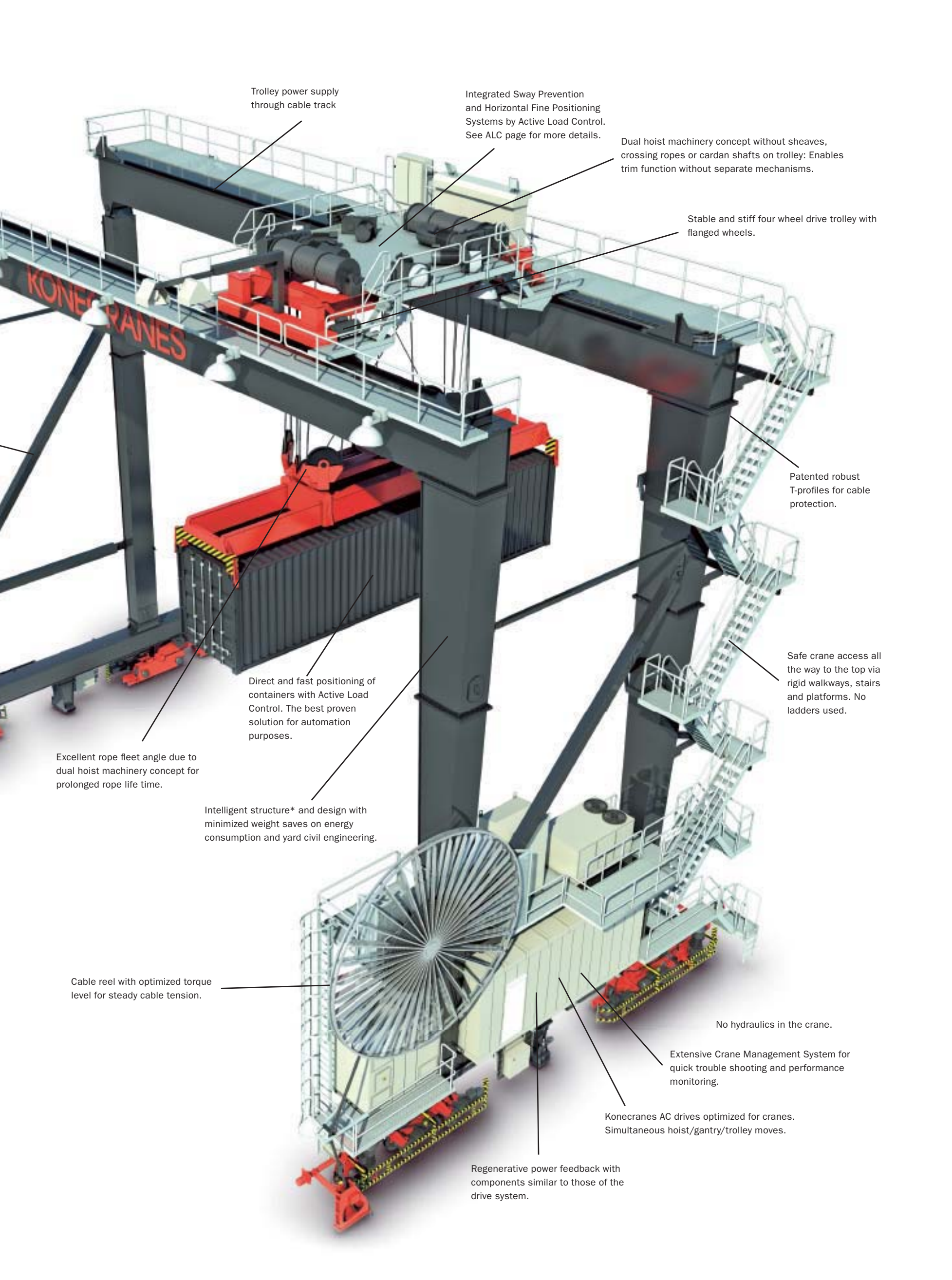
Intelligent Structure\*. Quick wheel realignment. Enclosed direct gantry machineries with robust protection

#### Intelligent Structure\*.

Bogies with pinned joints, plus intelligent structure with pinned diagonals and dual hoist machinery trolley, enable large tolerance for rail and yard fluctuations.

Remote operation with fast and responsive positioning included

- RAAS READY - DGPS TECHNOLOGY
- ACTIVE LOAD CONTROL
- NO HYDRAULICS
- SOLUTION SYNERGY
- SERVICE MODULARITY
- INTELLIGENT STRUCTURE



Trolley power supply through cable track

Integrated Sway Prevention and Horizontal Fine Positioning Systems by Active Load Control. See ALC page for more details.

Dual hoist machinery concept without sheaves, crossing ropes or cardan shafts on trolley: Enables trim function without separate mechanisms.

Stable and stiff four wheel drive trolley with flanged wheels.

Patented robust T-profiles for cable protection.

Safe crane access all the way to the top via rigid walkways, stairs and platforms. No ladders used.

Direct and fast positioning of containers with Active Load Control. The best proven solution for automation purposes.

Excellent rope fleet angle due to dual hoist machinery concept for prolonged rope life time.

Intelligent structure\* and design with minimized weight saves on energy consumption and yard civil engineering.

Cable reel with optimized torque level for steady cable tension.

No hydraulics in the crane.

Extensive Crane Management System for quick trouble shooting and performance monitoring.

Konecranes AC drives optimized for cranes. Simultaneous hoist/gantry/trolley moves.

Regenerative power feedback with components similar to those of the drive system.



# RUBBER TIRED GANTRY

Integrated Sway Prevention and Horizontal Fine Positioning Systems by Active Load Control. See ALC page for more details.

Dual hoist machinery concept without sheaves, crossing ropes or cardan shafts on trolley: Enables trim function without separate mechanisms.

Intelligent Structure\*

Stable and stiff four wheel drive trolley with flanged wheels.

Safe crane access all the way to the top via rigid walkways, stairs and platforms. No ladders used.

Konecranes AC drives optimized for cranes. Simultaneous hoist/gantry/trolley moves.

Excellent rope fleet angle due to dual hoist machinery concept for prolonged rope life time.

Canopy located at the ground level for quick engine maintenance and fueling. With cable reel alternative diesel engine and alternator are replaced by transformer.

Bogie wheel turning without separate turning mechanisms. See 'A Smarter RTG' page for details.

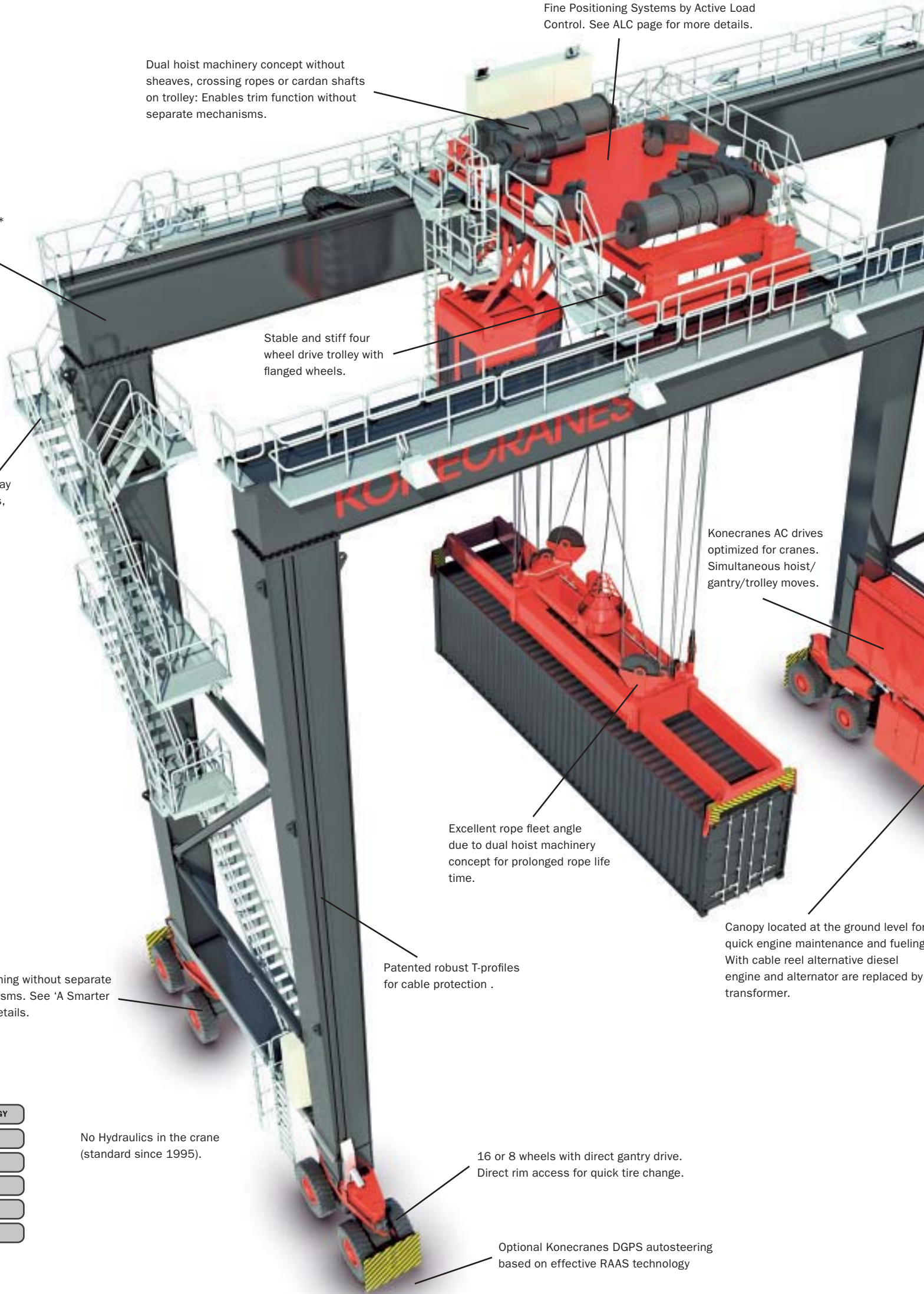
Patented robust T-profiles for cable protection .

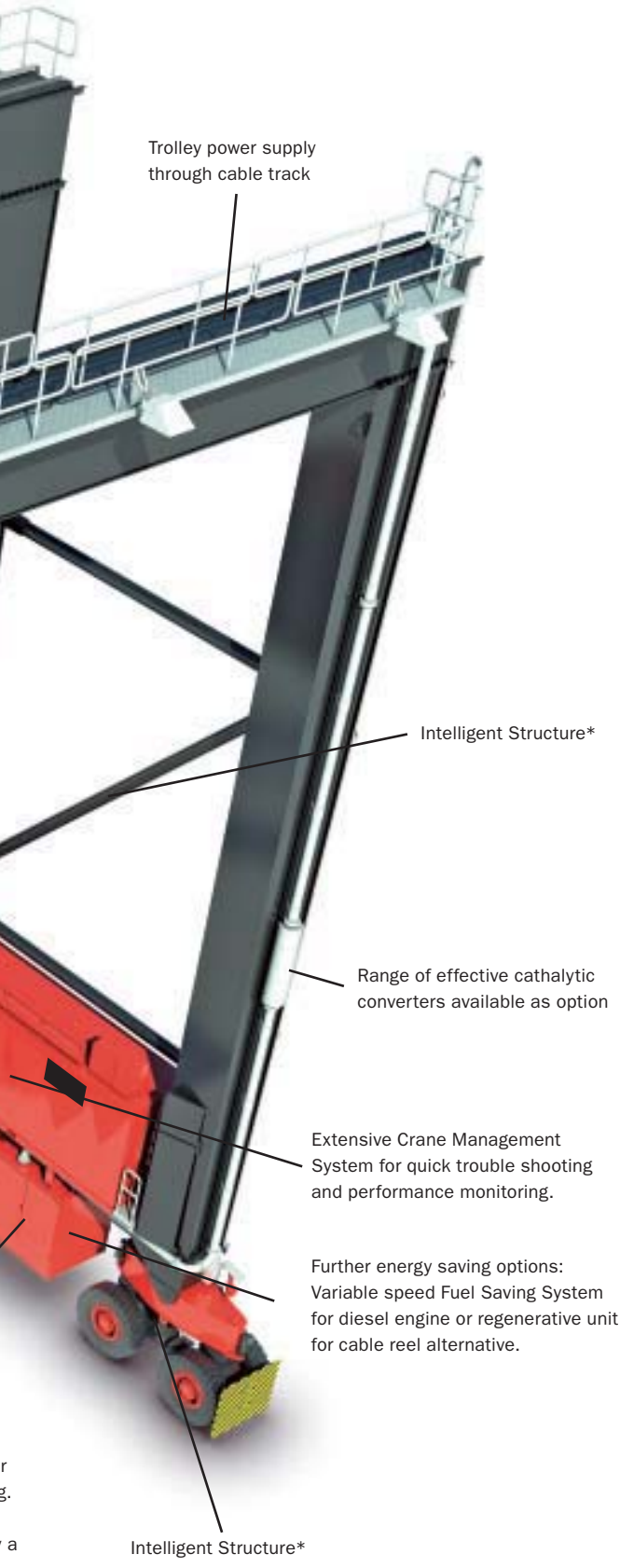
No Hydraulics in the crane (standard since 1995).

16 or 8 wheels with direct gantry drive. Direct rim access for quick tire change.

Optional Konecranes DGPS autosteering based on effective RAAS technology

- RAAS READY - DGPS TECHNOLOGY
- ACTIVE LOAD CONTROL
- NO HYDRAULICS
- SOLUTION SYNERGY
- SERVICE MODULARITY
- INTELLIGENT STRUCTURE





**Intelligent Structure\***

Bogies with pinned joints, plus intelligent structure with pinned diagonals and dual hoist machinery trolley, enable large tolerance for yard fluctuations.

## SMARTER FROM EVERY PERSPECTIVE

Operations

**RELIABILITY AND PERFORMANCE**

- Commitment to root cause support
- Active Load Control for quick load positioning
- Service Modularity applied for quick crane recovery
- All key components from industry-leading suppliers, no copies used
- Intelligent structure for excellent stability and improved duty cycle

Maintenance

**EASIER, LESS FREQUENT MAINTENANCE**

- No hydraulic design since 1995
- Solution Synergy applied reducing the amount of separate machineries and components (anti-sway & side shift & skew, trim, wheel turning)
- Service Modularity applied for quick and less frequent maintenance (diesel engine, direct gantry and trolley drives, flange mounted motors, direct rim access for quick tire change)
- Direct access to maintenance points

Driver

**SAFETY AND ERGONOMY**

- 'All-in-Controllers' for absolute driver's focus and uninterrupted load handling
- Safe crane access all the way to the top via rigid walkways and platforms. No ladders used.
- Enclosed machineries
- Optional Konecranes DGPS autosteering based on effective RAAS technology

Finances

**LOWEST LIFECYCLE COST**

- Dedication to long-term partnership
- Equipment truly designed based on the Total Cost of Ownership approach
- No hydraulics enabling dramatic operational cost savings
- Low energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)
- Lower civil works investment due to Intelligent structure enabling highest tolerance to yard surface variations

Community

**ENVIRONMENTALLY FRIENDLIER**

- No hydraulics
- Quick and precise load positioning without moving the weight of trolley or gantry
- Optimized equipment weight due to intelligent structure and trolley design
- Energy saving Konecranes drives designed for crane use
- Cable reel alternative with regenerative power feedback for lowest local emissions
- Variable speed diesel fuel saving system for further emission reduction (option)

Terminal Manager

**BEST PERFORMER IN EVERY RESPECT**

- Quick truck turnaround times
- Quick STS service
- Safely
- With lower emissions and cost

Dimensions with max 1 over 6 and max 8+lane, mm	16 wheels	8 wheels
Max lifting height (1 over 6)/Max span (8 + truck lane)	21500/29500	21500/29500
Extension from leg centerline at diesel/crane access side	950/1700	991/1660
Outside/inside clearance at bogie and e-house level	Span±1500	Span+2016, Span-1076
Crane width over bogie guards/wheel spacing in a bogie	12060/2100	12050/2100

Speeds, max, m/min:	16 wheels	8 wheels
Hoist with 50 ton load/empty spreader	31/62	31/62
Trolley traverse standard/optional	70/74	70/74
Gantry travel with empty spreader/50 ton load/Cross travel	135/90/50	135/90/50
Simultaneous hoist/trolley traverse/gantry moves possible	yes	no

Trolley	4 wheel drive	2 wheel drive
Type of anti-sway system included	by ALC	Electrical
Type of micro motions	by ALC	Spreader Side shift,
	up to 250 mm radius	optional
Skew/Trim angle, degrees	5/over 5	5/over 5

Bogies	8 wheels driven	4 wheels driven
Tire size/pressure, bar	14.00x24/9.5	18.00x25/9.5
Wheel load, tons with 1 over 5 and 6+lane, max load, no wind	15,9	30,5

Drives	Konecranes AC	Konecranes AC
Enhanced semi-automatic driver's assistance	included	included
Crane Management System (CMS)	InSQL industrial PC	InSQL industrial PC

Main Options for both 16/8 wheel	
DGPS Autosteering/Container Positioning Systems	With RAAS Technology
Variable speed diesel engine with Fuel Saving System	With readiness for energy storage
Cable reel power supply instead of diesel engine/alternator	3 phase, 50/60 Hz, 1-20 kV



# STRADDLE CARRIER

Clean and efficient diesel electric drive and hoist system.

Optional noise reduction kit significantly reduces noise level.

Operator room control layout to suit each customer's requirements.

Steering and braking by wire. (No hydraulics in the cabin).

Operator room with excellent visibility and highly ergonomic driver's environment. As option 180 degrees turning seat and control devices.

Very long 2000h and 4000h maintenance intervals for all components. (Exception: diesel engine, 1000 h.)

Highly rigid yoke beam with fast recovery: if carrier collides, the forces are transferred to standard size bolts which break in a controlled manner.

Easily interchangeable shear bolts with fast recovery as overload device designed to minimize collision damage.

Maintenance friendly suspension system with superior suspension and damping performance for each wheel.

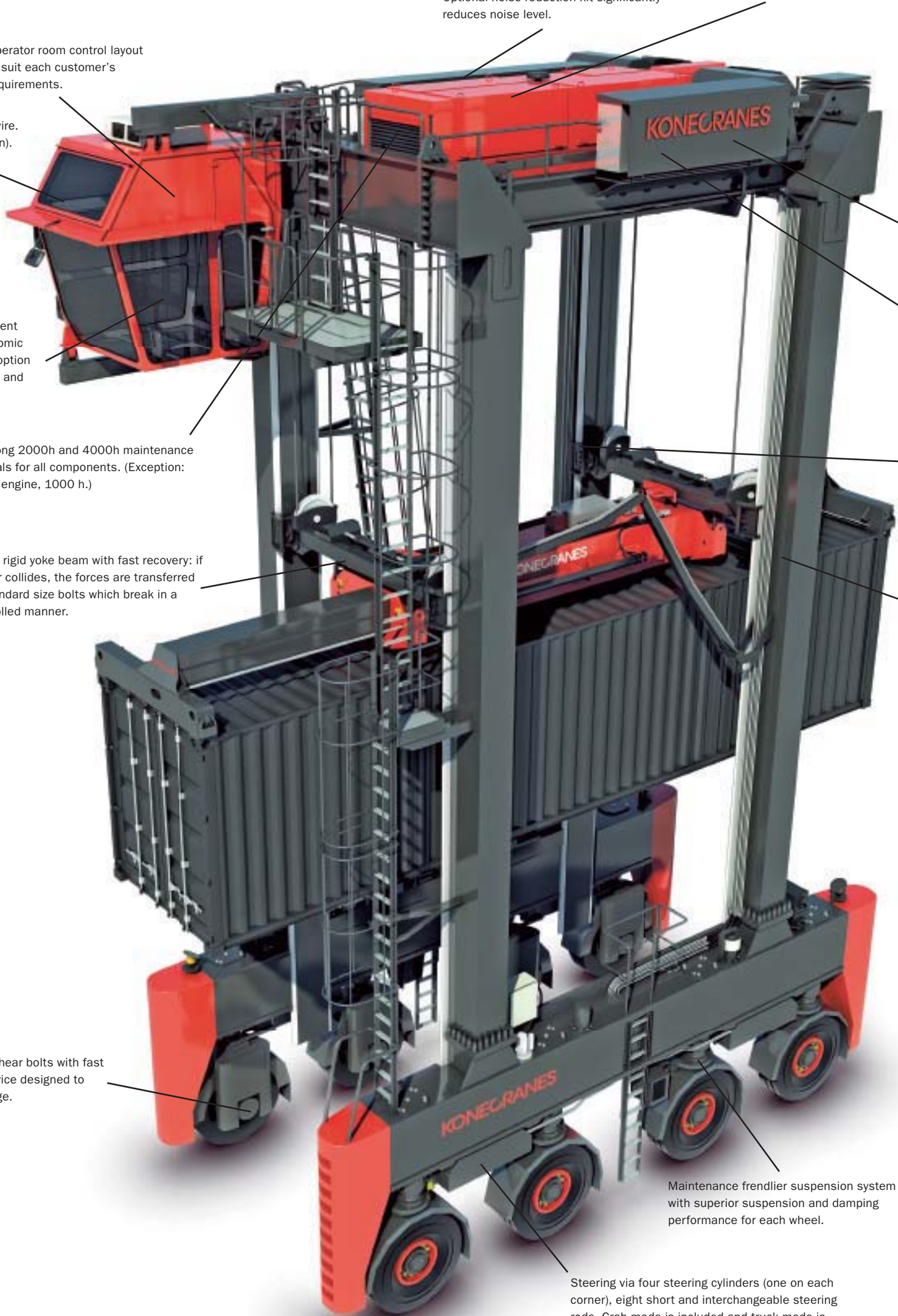
Steering via four steering cylinders (one on each corner), eight short and interchangeable steering rods. Crab mode is included and truck mode is offered as option.

RAAS READY - DGPS TECHNOLOGY

SOLUTION SYNERGY

SERVICE MODULARITY

INTELLIGENT STRUCTURE



# SMARTER FROM EVERY PERSPECTIVE

## Operations

### RELIABILITY AND PERFORMANCE

- Commitment to root cause support
- Service Modularity applied for quick recovery
- All key components from industry-leading suppliers, no copies used
- Intelligent structure for excellent stability and improved duty cycle
- Precise driving comfort: One steering cylinder per corner enabling direct steering.

## Maintenance

### EASIER, LESS FREQUENT MAINTENANCE

- Reduced hydraulics, electro-hydraulic steering
- 2000 h and 4000 h maintenance interval for all components (diesel engine 1000 h)
- Maintenance friendlier suspension and yoke beam slide bearings
- Direct access to maintenance points

## Driver

### SAFETY AND ERGONOMY

- 'All-in-Controllers' for absolute driver's focus and uninterrupted load handling
- Lower center of gravity for improved stability

## Finances

### LOWEST LIFECYCLE COST

- Dedication to long-term partnership
- Equipment truly designed based on the Total Cost of Ownership approach
- Reduced hydraulics enabling dramatic operational cost savings
- Low energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)
- Lower civil works investment due to Intelligent structure enabling highest tolerance to yard surface variations

## Community

### ENVIRONMENTALLY FRIENDLIER

- Reduced hydraulics
- Quick load positioning
- Optimized equipment weight - the most rigid SC in the market
- Energy saving Konecranes drives designed for lifting use

## Terminal Manager

### BEST PERFORMER IN EVERY RESPECT

- Quick truck turnaround times
- Quick STS service
- Safely
- With lower emissions and cost

Well-proven rope hoist technology from Konecranes RTG and RMG cranes with 50 tons SWL under Spreader.

High quality Konecranes motors, AC drives and cubicles designed for lifting equipment purposes.

Rope sheaves are set 90 degrees to yoke beam for best twistlocks visibility.

Extremely rigid steel structure delivers stable driving performance. designed for lifetime of 50 SWL and 50.000 working hours.

Max dimensions	Diesel Electric (DE54)
Capacity under spreader standard/optional, ton	50/60
Lifting height under spreader with load/min. pick up height, mm	12000/200
Overall height unloaded, mm	15450
Frame overall width without rubbing bars, mm	4940
Frame inside clearance without rubbing bars, mm	3500
Turning radius inside/outside without bumpers, mm	3700/9600
Service weight, ton	70 (67 with 12,65 m height)
Wheel load, ton	15

Spreader:	Single 20-40 ft & 45 ft in 40 ft castings
Special	2 x 20 ft and 2 x 20 ft extended
Spreader Side Shift/Swivel	+/- 280 mm/+ 6° degree

Max speeds:	
Travelling speed empty/with load, km/h	24/24 km/h (30/24 km/h with 12,65 m height)
Lifting speed empty/40/50 ton loads, m/min	24/20/18 m/min
Lowering speed empty/with load, m/min	22/18 m/min

Power unit:	330 kw rated power output
Displacement diesel engine, liters	11,7
Variable speed control diesel engine, rpm	800 - 1800
Environmental specification	Tier 3a/EURO 3
Tank capacity, liters	3 x 750

Misc	
Tires	8 x 16.00 R25 or optional 480/95 R25
Service brakes	4 x wet disc with oil cooling (optional 8)
Parking brakes	4 x spring actuated wet disc
PLC and bus systems	Siemens S 7 300 mobile/Profibus



# REACH STACKERS



## SMARTER FROM EVERY PERSPECTIVE

Terminal & Operations

### RELIABILITY & PERFORMANCE

- Robust mechanical design
- Precise load handling due to advanced load sensing system
- Service Modularity applied for quick recovery (unified spares across the truck fleet)

Maintenance

### COST-EFFICIENT MAINTENANCE

- Full access of the drive line and hydraulics
- Long service intervals on all systems
- Reduced wear and tear of hydraulics
- Service Modularity applied for reduced spares requirement (unified spares across the truck fleet)
- Optional Fleet Management System (FMS) for remote monitoring and trending

Finances

### HIGHEST LIFE CYCLE VALUE

- Dedication to long-term partnership
- Equipment designed based on the Total Cost of Ownership approach
- Lower energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Terminal and Operations)

Technical Data	Reach Stacker Trucks 10 – 45 – 80 tons (3 – 6 high stacking)			
	Small container Stacker	Container Stacker	Railroad / Barge Stacker	Industrial Stacker
Lifting & handling	Empty containers	Loaded containers	Containers, trailers & bulk	Industrial cargo
Stack density (TEU/hectar)	400 – 1.600	250 – 750	250 – 750	-
Main features	Versatile & fast	Versatile & fast	Versatile & fast	Versatile & fast
Investment/running cost	Low/low	Low/low	Low/low	Low/low
Lift capacity min (1-2-3 row)	10 – 8 – 5 tons	41 – 27 – 14 tons	41 – 23 – 9 tons	10 – 30 tons
Lift capacity max (1-2-3 row)	25 – 18 – 8 tons	45 – 45 – 45 tons	45 – 45 – 45 tons	30 – 80 tons
Container stacking	3 – 6 containers	5 – 6 containers	4 – 5 containers	8 – 16 m
Stacking height	10 – 16,4 m	15,3 – 16,4 m	12,0 – 15,0 m	8 – 16 m
Drive speeds	22 - 30 km/h	22 – 26 km/h	22 – 26 km/h	22 – 26 km/h
Spreaders	Top lift 20 – 40 ft (45 – 53 ft in 40 ft castings), trailer lift (combi), over height spreader, specials or industrial (steel grab, magnet, C-hook, lift hook-beam, vacuum etc)			
Spreader functions	Sideshift ± 800 mm, pile slope ±2/±6 deg, rotation 300 deg, telescopic 20-40 ft, lifting eyes/slings 4 x11,25 ton (45 tons)			
Control system	Electronic overload, safety & monitoring system (EMC Master)			
Engine approvals	EU stage 2 or 3a/US EPA Tier 2 or 3			
Engine types	6-cylinder, turbo-charged, intercooler, electronic controls, CanBus			
Transmission	Full automatic, electronic-hydraulic shift, reverse protection, CanBus			
Brake system	Maintenance-free Wet-Disc-Brakes on drive tyres, continuous oil cooling			
Hydraulics	Load-sensing, power-on-demand, low-energy, low fuel consumption			
Optional Controls	Remote service function (via GSM), Error code data log, ECO-driving, Multi-driver login, Mini-steering, Electronic weight scale, Fleet Management System (FMS)			

- RAAS READY - DGPS TECHNOLOGY
- SOLUTION SYNERGY
- SERVICE MODULARITY
- INTELLIGENT STRUCTURE





Powerful modern lift attachment for container handling optimizes trucks for your operation. Top lift for 20-40 ft containers, 300 degrees rotation, sideshifting, and 4 lift eyes for other goods. Option for power pile slope (side tilt), self-levelling power dampening (front/rear tilt), bottom lift, and other combinations.

Ergonomic cabin built for the ultimate in comfort, ergonomics, and visibility. The cab has low noise levels, minimum vibration, and a good overview of all instrument and controls.

Electronic overload protection, monitoring, and auto-joystick for safe handling of heavy loads, overload protection increases safety and reduces driver error. Monitoring increases reliability. Automatic RPM control of the engine when using joystick. Individual settings possible.

Joystick is standard.

The trucks are equipped with load-sensing hydraulics where the lifting power is adapted to the weight of the goods and the truck only provides maximum power on demand, when it's really needed. In other words, the truck consumes less power and fuel while reducing emissions and noise.

Electronic controlled monitoring of engine, transmission and spreader with CanBus technology which gives increased reliability.

Box-type chassis strongest on the market; provides high lifting capacity with a good margin. Available in several different wheel bases from 5.0 to 9.0 meters.

Maximum stability with box chassis design on a sufficiently long wheel base and wide drive/steering axles.

Maintenance-free brakes – trucks always have full braking power in every situation – all day, every day. The brakes feature continuous oil cooling with separate tank.

Strong, wide drive axles for safety and stability with high lifts and heavy loads.

Powerful low emission engines provide high torque at low revs, reduce consumption, and meet current environmental requirements.

Service and Maintenance To reduce maintenance costs during the lifetime of the truck we have extended the service interval on the engine (500 hrs), gearbox (1,000 hrs) and hydraulics (2,000/4,000 hrs).



# LIFT TRUCKS

A large selection of lift masts makes it possible to optimize the truck for your operation. Choose between Duplex (with/without free lift) and Triplex (with free lift).

The trucks are equipped with load-sensing hydraulics where the lifting power is adapted to the weight of the goods and the truck only provides maximum power on demand, when it's really needed. In other words, the truck consumes less power and fuel while reducing emissions and noise. [All lift trucks].

Lift masts adapted to container handling optimize the trucks for your operations. Minimum number of hoses and cables in the mast for decreased maintenance costs and more available working time.

Quick change system for different forks, coil rams or attachments. Offers unique flexibility and greater efficiency. For all materials handling, including steel, wood, paper, and containers.

Box-type chassis strongest in the market; provides higher lifting capacity. [All lift trucks].

**CONTAINER LIFT TRUCKS**  
(laden containers)

**Service and Maintenance**  
To reduce maintenance costs during the lifetime of the truck we have extended the service interval on the engine (500 hrs), gearbox (1,000 hrs) and hydraulics (2,000/4,000 hrs). [All lift trucks].

Maintenance-free brakes mean that the truck always has full braking power in every situation – all day long, every day of the year. Brakes feature continuous oil cooling. [All lift trucks].

Wide drive axle and long wheel base. Two important factors: for maximum stability. (Unbeatable formula for stability.)

With a attachment for double stacking of containers the truck can lift "2 over 5" and "2 over 6".

RAAS READY - DGPS TECHNOLOGY

SOLUTION SYNERGY

SERVICE MODULARITY

INTELLIGENT STRUCTURE





**FORK LIFT TRUCKS**  
(10-60 T)

Electronic controlled monitoring of engine, transmission and spreader with CanBus technology which gives increased reliability. [All lift trucks].

Wide mast enables the truck to lift 8 containers high (21 meters). Minimum number of hoses and cables in the mast for decreased maintenance costs and more available working time.

Ergonomic cabin built for the best in comfort, ergonomics, and visibility. The cabin has a low noise level, minimum vibration and a good overview of all instrument and controls.



**CONTAINER LIFT TRUCKS**  
(empty containers)

Powerful low emission engines provide high torque at low revs, reduce fuel consumption, and meet current environmental requirements. [All lift trucks].

## SMARTER FROM EVERY PERSPECTIVE

### Terminal & Operations

#### RELIABILITY & PERFORMANCE

- Robust mechanical design
- Precise load handling due to advanced load sensing system
- Service Modularity applied for quick recovery (unified spares across the truck fleet)

### Maintenance

#### COST-EFFICIENT MAINTENANCE

- Full access of the drive line and hydraulics
- Long service intervals on all systems
- Reduced wear and tear of hydraulics
- Service Modularity applied for reduced spares requirement (unified spares across the truck fleet)
- Optional Fleet Management System (FMS) for remote monitoring and trending

### Finances

### HIGHEST LIFE CYCLE VALUE

- Dedication to long-term partnership
- Equipment designed based on the Total Cost of Ownership approach
- Lower energy consumption (see Community)
- Less spares and maintenance (see Maintenance)
- Higher performance for reduced cost/TEU (see Operations)

### Fork Lift Trucks 10 – 60 tons

Technical Data	Small FLT's	Medium FLT's	Large FLT's
Lift capacity	10 – 18 tons	18-25 tons	28-60 tons
Lift height	3 – 12 m	3 – 15 m	4 – 15 m
Lift speeds	0,30 – 0,60 m/s	0,25 – 0,40 m/s	0,15 – 0,40 m/s
Drive speeds	30 - 30 km/h	27 - 29 km/h	22 – 24 km/h
Engine	EU stage 2 or 3a / US EPA Tier 2 or 3 (6-cylinder, turbo-charged, CanBus)		
Hydraulics	Load-sensing, low-energy, low fuel consumption		
Lift equipment	Forks, container spreaders, coil rams, paper clamps etc		

### Container Lift Trucks (EC = empty container) 8 – 10 tons / 4 – 8 high

Technical Data	Small CLT's	Medium CLT's	Large CLT's
Lift capacity	8 tons	9 tons	10 tons
Stacking height	4 – 6 containers	4 – 8 containers	4 – 8 containers
Lift speeds	0,45 – 0,52 m/s	0,73 – 0,63 m/s	0,73 – 0,63 m/s
Drive speeds	30 - 30 km/h	30 - 30 km/h	30 - 30 km/h
Engine	EU stage 2 or 3a / US EPA Tier 2 or 3 (6-cylinder, turbo-charged, CanBus)		
Hydraulics	Load-sensing, low-energy, low fuel consumption		
Spreaders	Sidelift 20-40ft (45-53ft in 40ft castings), single or double lift		
Functions	Sideshift ± 300/± 600 mm, MPS pile slope 0 – 225 mm		

### Container Lift Trucks (FC = full container) 22 – 45 tons / 3 – 5 high

Technical Data	Small CLT's	Medium CLT's	Large CLT's
Lift capacity	22 – 28 tons	33 – 35 tons	38 – 45 tons
Stacking height	3 – 4 containers	3 – 5 containers	3 – 5 containers
Lift speeds	0,27 – 0,40 m/s	0,21 – 0,35 m/s	0,21 – 0,35 m/s
Drive speeds	22 – 24 km/h	22 – 24 km/h	22 – 26 km/h
Engine	EU stage 2 or 3a / US EPA Tier 2 or 3 (6-cylinder, turbo-charged, CanBus)		
Hydraulics	Load-sensing, low-energy, low fuel consumption		
Spreaders	Toplift 20-40ft (45-53ft in 40ft castings), single lift only		
Functions	Sideshift ± 200 mm, pile slope ± 4,8 deg, slew ± 6,0 deg, reach 0 – 240 mm		

### All Fork Lift Trucks & Container Lift Trucks

Engine approvals	EU stage 2 or 3a / US EPA Tier 2 or 3
Engine types	6-cylinder, turbo-charged, intercooler, electronic controls, CanBus
Transmission	Full automatic, electronic-hydraulic shift, reverse protection, CanBus
Brake system	Maintenance-free Wet-Disc-Brakes on drive tyres, continuous oil cooling
Hydraulics	Load-sensing, power-on-demand, low-energy, low fuel consumption
Optional Controls	Remote service function (via GSM), Error code data log, ECO-driving, Multi-driver login, Mini-steering, Electronic weight scale, Fleet Management System (FMS)



## Why Choose Konecranes?

### **Turnaround Time:**

It costs plenty to have ships waiting in port, which means your profits depend on moving ships and trucks through on schedule. Our cranes' efficiency provides the key to a high-performing port facility: shorter turn-around times for both ships and trucks.

### **Community:**

Konecranes technology means less air pollution, a safer working environment, and more efficient land use. The reasons are clear: our equipment is more fuel efficient, takes up less space and requires less yard reinforcement. The result is better relationships with the communities you do business in.

### **Finance:**

Our equipment represents the lowest total cost of ownership, which quite simply means that over the long run you'll save money. In fact, everything we do at Konecranes is planned with the sole aim of reaching the lowest total cost of ownership for each of our customers.

**Konecranes** is a world-leading group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity-enhancing lifting solutions as well as services for lifting equipment and machine tools of all makes.

## **SMARTER THESE WAYS**

**When we say that Konecranes container handling equipment and services is SMARTER WHERE IT MATTERS, this is what we mean:**

Konecranes is a company with a deep history and knowledge of crane technology and container handling. We are servicing hundreds of thousands of maintenance contracts worldwide, and our customers know us as a trusted partner with a clear vision to help them succeed.

The efficiency of our cranes delivers shorter turn-around times for terminal customers – whether it's ships, trains or trucks. Our technology means less air and noise pollution, a safer working environment, and more efficient land use. Finally, we think that the formula for long term success is to deliver all of the above – with the lowest possible total cost of ownership.

**Smarter Where? Our Customers' Bottom Line.**

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