

# MANTSINEN

GLOBAL PORT EQUIPMENT



# 160

HybriLift®



More load, less energy.





MANTSINEN

# 160 HybriLift®

Strong and fast for  
superior  
productivity.



Odense, Denmark



Hamina, Finland



Belfast, Northern Ireland

MANTSINEN  
HybriLift®

Increases Energy  
Efficiency by up to

35%



# MANTSINEN 160 HybriLift®

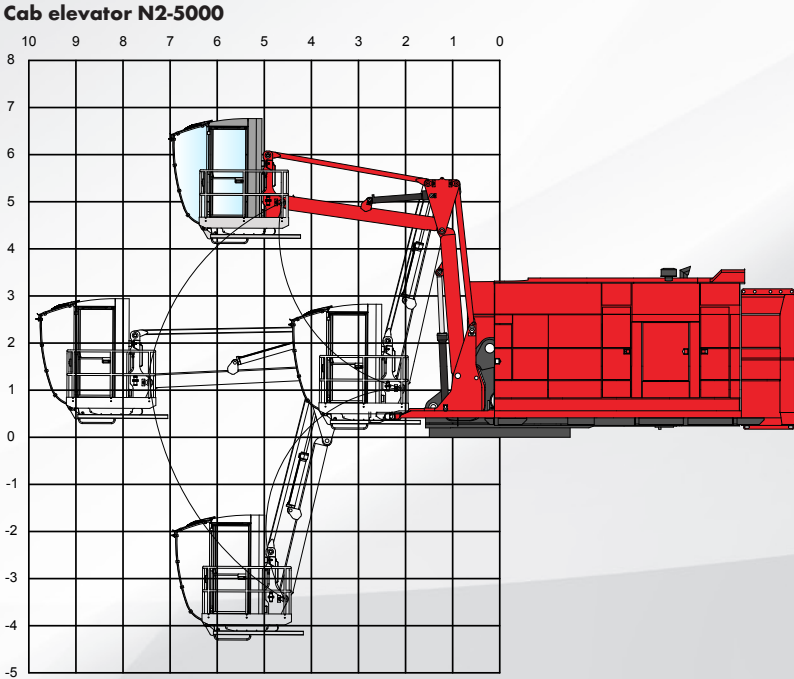
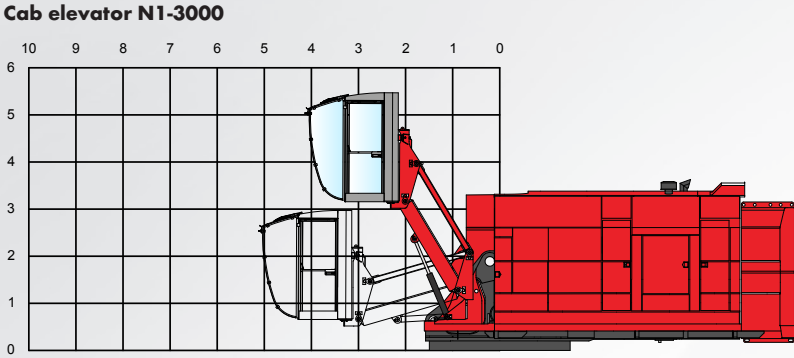
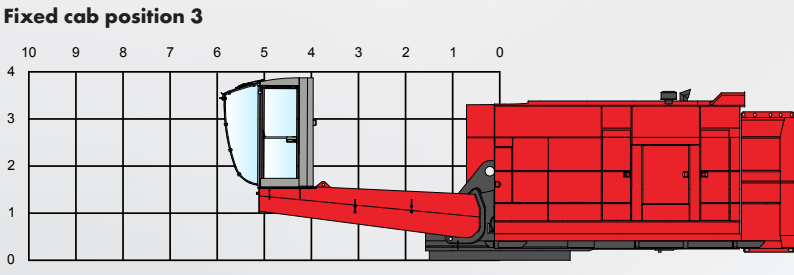
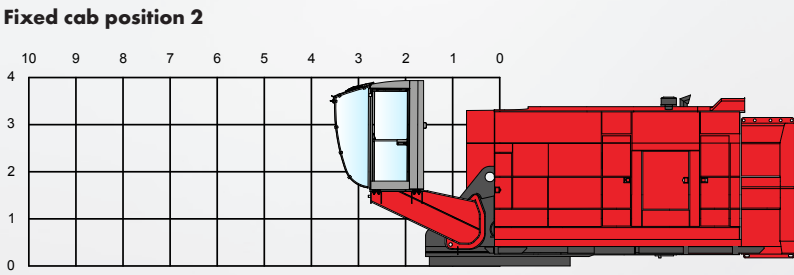
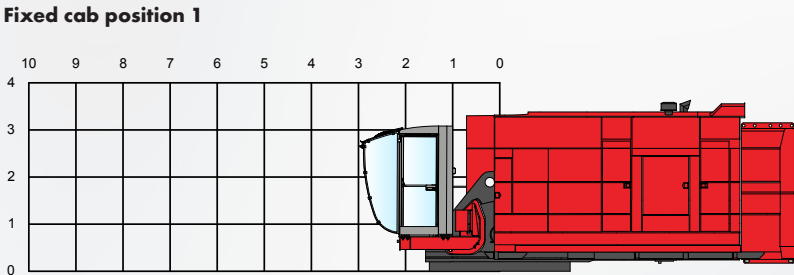
- 2006  
HybriLift® testing and development
- 2008  
200 HybriLift® into production and operation
- 2010  
120 HybriLift® into production and operation
- 2011  
160 HybriLift® into production and operation
- 2012  
70 and 90 HybriLift® into production and operation

The unique HybriLift® energy storage and recovery system improves energy efficiency by up to 35 %.

During each working cycle, energy is stored in a hydraulic accumulator system and again recovered to lift the main boom.

Mantsinen HybriLift® system allows using downsized engines and motors with lower emissions.

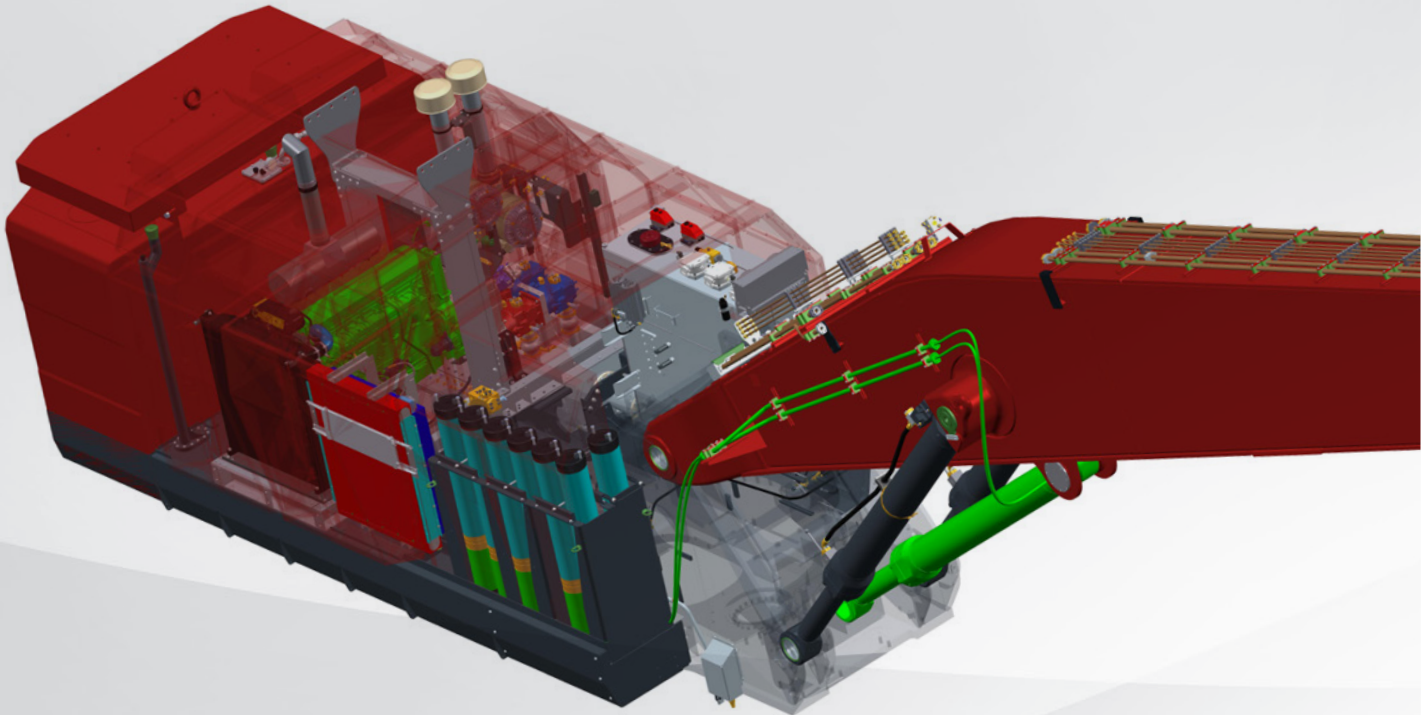
Mantsinen HybriLift® material handlers and attachments are designed for bulk material and general cargo handling.



Maximum  
visibility.  
Optimum  
performance.

The Mantsinen 160 has three fixed cab options and three cab elevator options for complete visibility of loading operations.

All options feature a stainless steel operator cab, which has large windows for an excellent visibility. Operator seat and surroundings are ergonomical. Mantsinen safety system and control system displays are easily checked and operated. The cab is also equipped with a folding instructor seat.



MANTSINEN  
Safety  
System

MANTSINEN  
Control  
System



# MANTSINEN

## 160 R



### FRONT EQUIPMENT

#### STICK

Stick foot is a high tensile cast steel structure. The use of cast structures in the high load stress areas ensures the component's strength, durability and long service life.

The box of the stick is constructed of four C-profiles using high tensile steel. The design allows the stick to be constructed with no welding seams in high stress areas, making it light and extremely durable. Hydraulic lines are well protected on sides of the stick.

#### MAIN BOOM

Main boom foot and bosses are constructed of cast steel, providing an extended service life to one of the most stressed structural components of the machine. The optimized design ensures evenly distributed stresses on the boom box structure. Robust structure and large pin diameters minimize surface pressures and wear on bushings.

### UPPERSTRUCTURE

#### MAIN FRAME

Double steel plates extend from the boom pivot points to the counterweight, providing an extremely rigid and strong upperstructure frame. Robust frame structure is essential also for long slewing ring lifetime.

#### SWING MECHANISM

The Mantsinen 160 swing mechanism consists of two robust swing gears and a heavy-duty three-row roller type slewing ring. Internal teeth run in a grease bath. The closed loop swing with a separate pump provides an extremely smooth and controllable swing function for accurate and safe placement of loads. The closed loop swing is also an important energy saving feature.

#### ENGINE

Volvo Penta engines are appreciated in material handling industry for their performance, low fuel consumption and durability. The sound insulated engine and pump compartment keeps noise levels at a minimum. The crosswise mounted engine is accessible from both sides. Hydraulic pumps are insulated from the engine by protective plates.

#### RADIATOR

Side by side mounted radiator and hydraulic oil cooler provide easy access and cleaning. Fan reversing function continuously cleans radiator screens without interrupting machine operation.

### UNDERCARRIAGE

#### HYDRAULIC AND CONTROL SYSTEM

Mantsinen purpose made control system and advanced hydraulic solutions guarantee an easy and accurate controllability as well as an unbeatable productivity. Special attention has been paid to total energy efficiency to keep fuel consumption remarkably low. Several modes are available to optimize each operation. Mantsinen machines are always equipped with Mantsinen Safety System MSS including load control system to meet EU-regulations.

#### SERVICE WALKWAYS

The wide and robust internal and external service walkways provide safe and easy access to all service points.

#### CRAWLER GANTRY

The gantry type undercarriage allows trucks or rail cars to pass through. Crawler gantry undercarriage is available in different heights. One or two additional fuel tanks are available as an option. Crawler gantry provides significant benefits for logistic layout planning. Machine cycle time is optimized due to the minimized swing angle.

#### CRAWLER WITH PYLON

Crawler undercarriages can also be supplied with an additional pylon to optimize loading geometry and operator visibility.

#### TRACKS

The long and wide undercarriage provides excellent stability and 360° lift capacities throughout all working ranges.

#### TRACK SHOES

The Mantsinen designed flat track shoes run smoothly on gravel, asphalt and concrete.

### CABIN AND CABIN ELEVATOR

#### OPERATOR CABIN

The spacious, air conditioned operator cab has large windows, and windshield and floor window in one piece for excellent visibility of loading operations. Stainless steel cab construction ensures a long service life in any environment.

#### CAB ELEVATOR

The extremely rigid Mantsinen N2-5000 and N2-6000 cab elevators feature independent vertical and horizontal movements to position the operator for maximum visibility of loading targets. Optional N1-3000 cab elevator and three fixed raised cab positions are available to meet the application requirement.

# MANTSINEN 160 M



## FRONT EQUIPMENT

### STICK

Stick foot is a high tensile cast steel structure. The use of cast structures in the high load stress areas ensures the component's strength, durability and long service life.

The box of the stick is constructed of four C-profiles using high tensile steel. The design allows the stick to be constructed with no welding seams in high stress areas, making it light and extremely durable. Hydraulic lines are well protected on sides of the stick.

### MAIN BOOM

Main boom foot and bosses are constructed of cast steel, providing an extended service life to one of the most stressed structural components of the machine. The optimized design ensures evenly distributed stresses on the boom box structure. Robust structure and large pin diameters minimize surface pressures and wear on bushings.

## UPPERSTRUCTURE

### MAIN FRAME

Double steel plates extend from the boom pivot points to the counterweight, providing an extremely rigid and strong upperstructure frame. Robust frame structure is essential also for long slewing ring lifetime.

### SWING MECHANISM

The Mantsinen 160 swing mechanism consists of two robust swing gears and a heavy-duty three-row roller type slewing ring. Internal teeth run in a grease bath. The closed loop swing with a separate pump provides an extremely smooth and controllable swing function for accurate and safe placement of loads. The closed loop swing is also an important energy saving feature.

### ENGINE

Volvo Penta engines are appreciated in material handling industry for their performance, low fuel consumption and durability. The sound insulated engine and pump compartment keeps noise levels at a minimum. The crosswise mounted engine is accessible from both sides. Hydraulic pumps are insulated from the engine by protective plates.

### RADIATOR

Side by side mounted radiator and hydraulic oil cooler provide easy access and cleaning. Fan reversing function continuously cleans radiator screens without interrupting machine operation.

### HYDRAULIC AND CONTROL SYSTEM

Mantsinen purpose made control system and advanced hydraulic solutions guarantee an easy and accurate controllability as well as an unbeatable productivity. Special attention has been paid to total energy efficiency to keep fuel consumption remarkably low. Several modes are available to optimize each operation. Mantsinen machines are always equipped with Mantsinen Safety System MSS including load control system to meet EU-regulations.

### SERVICE WALKWAYS

The wide and robust internal and external service walkways provide safe and easy access to all service points.

## UNDERCARRIAGE

### RUBBER TYRE UNDERCARRIAGE

The robust rubber tyre undercarriage is available in different heights. Four-wheel drive provides excellent drawbar pull for operation on uneven surfaces. Large and wide tyres minimize surface pressures.

Four individually controllable stabilizers permit a full 360 degrees of rated loads lifting. The large 2 000 mm x 2 500 mm stabilizer pads are equipped with spherical bearings to adapt to surface conditions. If ground pressure is critical, the machine can be equipped with optional extra large 2 000 x 4 000 mm stabilizer pads.

## CABIN AND CABIN ELEVATOR

### OPERATOR CABIN

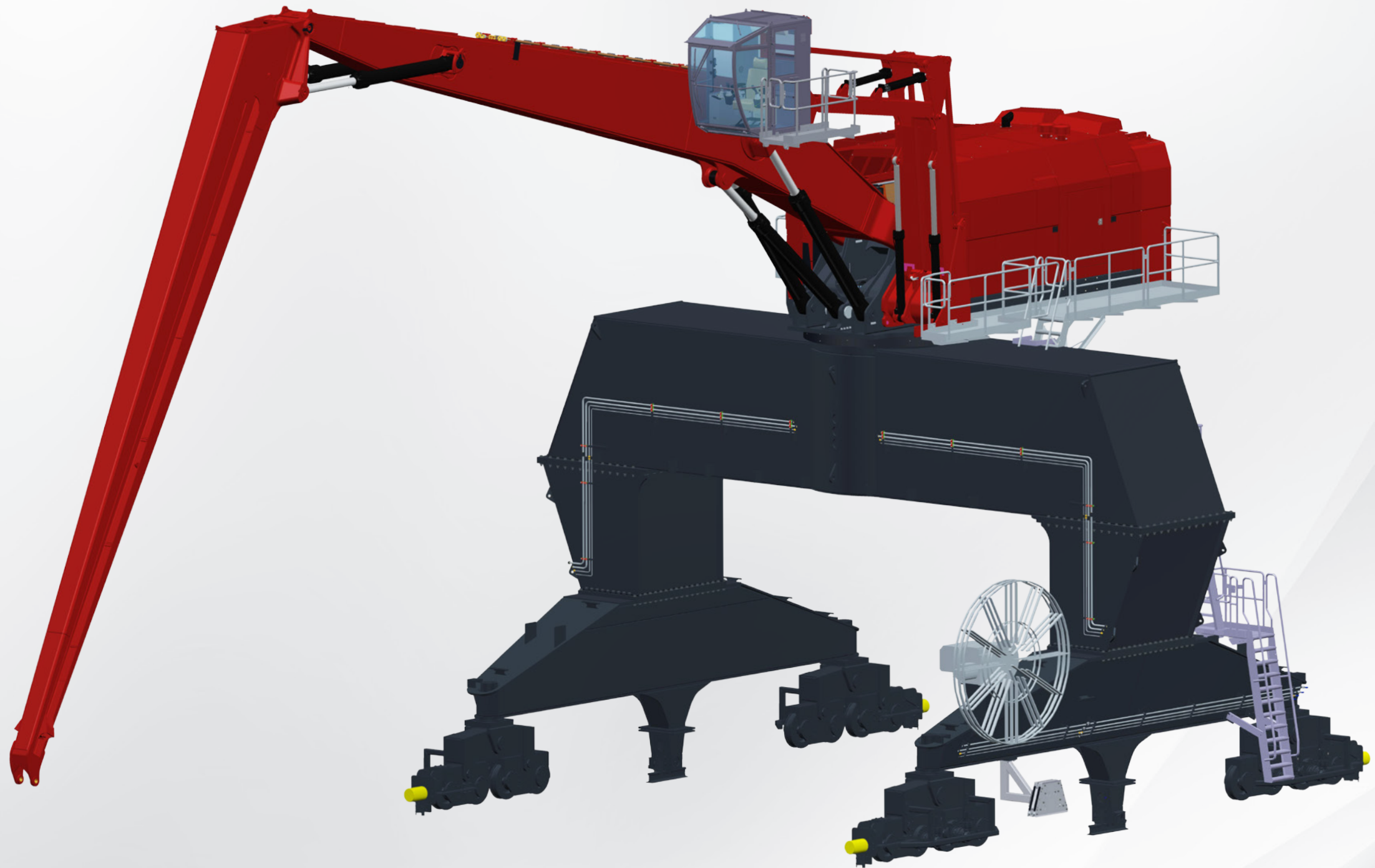
The spacious, air conditioned operator cab has large windows, and windshield and floor window in one piece for excellent visibility of loading operations. Stainless steel cab construction ensures a long service life in any environment.

### CAB ELEVATOR

The extremely rigid Mantsinen N2-5000 and N2-6000 cab elevators feature independent vertical and horizontal movements to position the operator for maximum visibility of loading targets. Optional N1-3000 cab elevator and three fixed raised cab positions are available to meet the application requirement.



# MANTSINEN 160 ES



## FRONT EQUIPMENT

### STICK

Stick foot is a high tensile cast steel structure. The use of cast structures in the high load stress areas ensures the component's strength, durability and long service life.

The box of the stick is constructed of four C-profiles using high tensile steel. The design allows the stick to be constructed with no welding seams in high stress areas, making it light and extremely durable. Hydraulic lines are well protected on sides of the stick.

### MAIN BOOM

Main boom foot and bosses are constructed of cast steel, providing an extended service life to one of the most stressed structural components of the machine. The optimized design ensures evenly distributed stresses on the boom box structure. Robust structure and large pin diameters minimize surface pressures and wear on bushings.

## UPPERSTRUCTURE

### MAIN FRAME

Double steel plates extend from the boom pivot points to the counterweight, providing an extremely rigid and strong upperstructure frame. Robust frame structure is essential also for long slewing ring lifetime.

### SWING MECHANISM

The Mantsinen 160 swing mechanism consists of two robust swing gears and a heavy-duty three-row roller type slewing ring. Internal teeth run in a grease bath. The closed loop swing with a separate pump provides an extremely smooth and controllable swing function for accurate and safe placement of loads. The closed loop swing is also an important energy saving feature.

### ELECTRIC MOTOR

Electric motor is mounted in a container unit, making it easily accessible from both sides. The sound insulated compartment keeps noise at minimum. Hydraulic pumps are isolated from the motor by a firewall.

### OIL COOLER

Hydraulic oil cooler is very easily accessible for cleaning. Fan reversing function continuously cleans the cooler screen without interrupting machine operation.

### HYDRAULIC AND CONTROL SYSTEM

Mantsinen purpose made control system and advanced hydraulic solutions guarantee an easy and accurate controllability as well as an unbeatable productivity. Special attention has been paid to total energy efficiency to keep fuel consumption remarkably low. Several modes are available to optimize each operation. Mantsinen machines are always equipped with Mantsinen Safety System MSS including load control system to meet EU-regulations.

### SERVICE WALKWAYS

The wide and robust internal and external service walkways provide safe and easy access to all service points.

## UNDERCARRIAGE

### RAIL MOUNTED UNDERCARRIAGE

The configuration of the rail undercarriage can be adapted to the existing rails. The robust gantry type undercarriage allows truck traffic or railway wagons to pass through. Gantry configuration can be optimized according to rail and quay carrying capacities. A robust and compact hydraulic drive with planetary gears ensures smooth travel. Cable reels are available to meet requirements of drive distance and speed.

### BOGIES

Mantsinen 160 ES is available with 2 to 8 wheel bogies according to rail and quay carrying capacities. The distance between the wheelbase can also be chosen according to application. The number of powered wheels can be increased to meet requirements of hopper towing.

### WHEELS

Wheel diameter can be optimized to match the loads of the machine and bogie design. There are  $\varnothing$  400 mm and  $\varnothing$  630 mm wheels available.

## CABIN AND CABIN ELEVATOR

### OPERATOR CABIN

The spacious, air conditioned operator cab has large windows, and windshield and floor window in one piece for excellent visibility of loading operations. Stainless steel cab construction ensures a long service life in any environment.

### CAB ELEVATOR

The extremely rigid Mantsinen N2-5000 and N2-6000 cab elevators feature independent vertical and horizontal movements to position the operator for maximum visibility of loading targets. Optional N1-3000 cab elevator and three fixed raised cab positions are available to meet the application requirement.

TECHNICAL SPECIFICATIONS

Front equipment	
Max. horizontal reach	32 m with 17,5 m boom + 15 m stick
Main boom lengths, straight and curved	10,5 / 11,5 / 12,5 / 13,5 / 14,5 / 15,5 / 16,5 / 17,5 m
Stick lengths	8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 m
Diesel Engine	
Stage II/Tier2	Volvo Penta TAD1643VE 565 kW / 1800 r/min
Stage IV/Tier 4f	Volvo Penta TAD1672VE 515 kW / 1800 r/min
Displacement	16,1 l
Number of cylinders	6
Voltage	24 V
Batteries	2 x 225 Ah / 12V
Electric motor with soft starter	
Motor type	315 kW IEC cast iron motor 1500 r/min / 50 Hz (1800 r/min / 60 Hz)
Voltages	380 to 690 V as standard, other voltages upon request
Hydraulic system	
HybriLift® energy recovery system	Equivalent to 260 kW engine power
Oil flow, front equipment and drive	3 x 420 l/min
Operating pressure	330 bar
Operating pressure, travel and Heavy Lift mode	350 bar
Oil flow, swing	540 l/min, closed loop system
Swing pressure, max.	300 bar
Max. swing speed	4,7 r/min
Swing torque	410 kNm
160 M / 160 EM with rubber tyres	
Weight without attachments	185 to 210 t depending on configuration
Heights	3,8 m as standard. With pylon 4,8 / 5,3 / 6,0 / 6,5 m
Wheelbase	2 m / 4 m / 2 m
Tyres	16 pcs 16.00-25 solid rubber
Service brakes	Wet multidisk brakes
Parking brake	Automatic wet multidisc brakes
Drive speed	Max 5 km/h
Stabilizer pads	2 000 x 2 500 mm. As option 2 000 x 4 000 mm
160 R / 160 ER with crawler	
Weight without attachments	170 to 220 t depending on configuration
Heights	2,5 m as standard. With pylon 3,5 / 4,0 / 4,7 / 5,2 / 6,3 m Gantry: 6,9 / 7,6 m. With pylon 9,1 / 9,6 / 10,3 m
Load carrying track length	8 100 mm
Track shoes	1 000 mm or 1 200 mm flat shoes
Travel speed	0 - 2,8 km/h
160 S / 160 ES mounted on rails	
	According to customer specification.
160 F / 160 EF fixed	
	According to customer specification.
Refill capacities	
Hydraulic oil reservoir	1 650 l
Fuel tank	3 000 l
AdBlue tank for Stage IV / Tier 4f diesel	160 l

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Increases Energy Efficiency by up to

35%

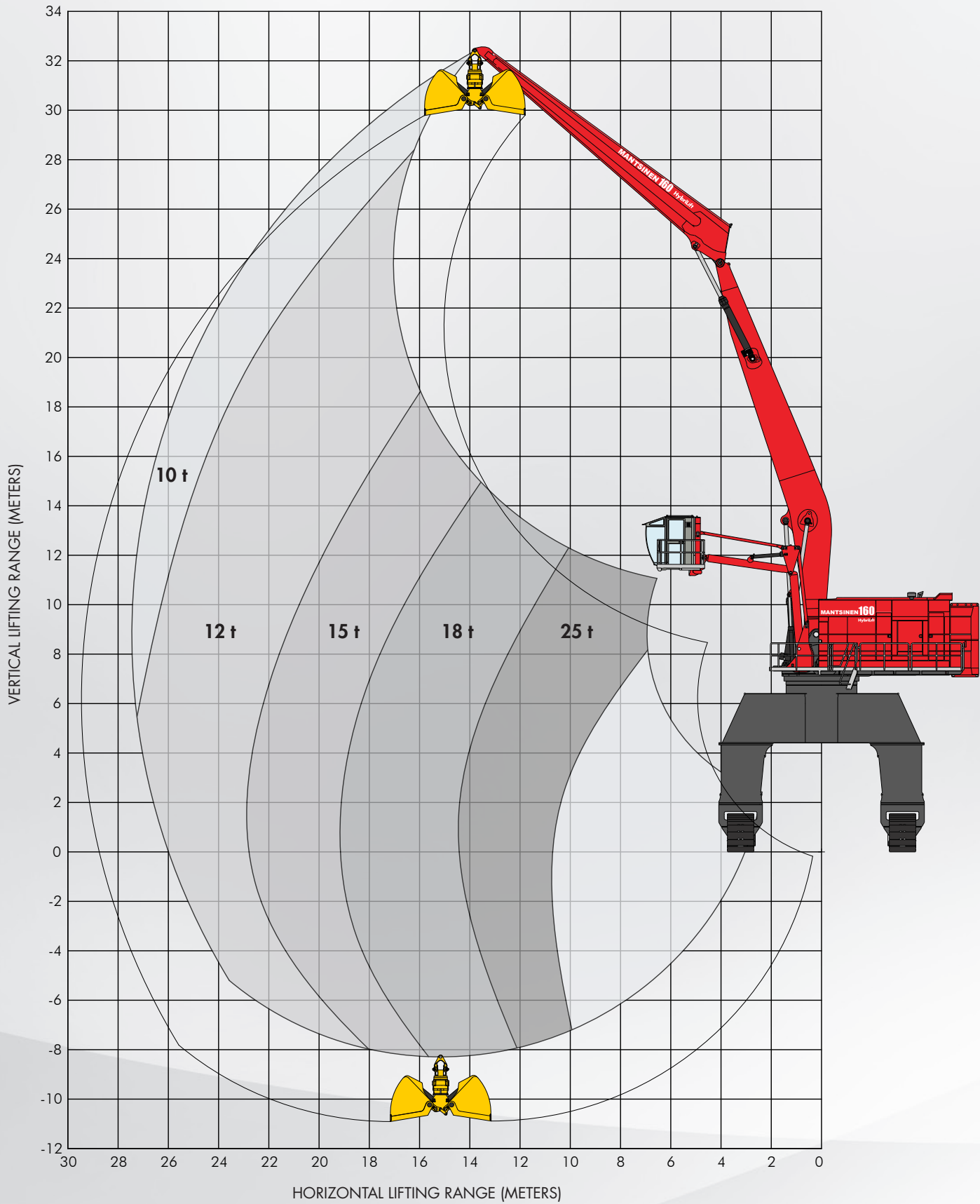
Operator cabin	Ergonomic seat
Standard equipment <ul style="list-style-type: none"><li>Windshield and floor window in one piece</li><li>Roof window</li><li>Tinted window glasses</li><li>Windshield wiper with adjustable intermittent function</li><li>Roof window wiper</li><li>Automatic heating and air conditioning</li><li>Sun shades</li><li>Folding instructor seat</li><li>Radio and CD player, MP 3 - compatible</li><li>Cup holder</li><li>Literature compartment</li></ul>	<ul style="list-style-type: none"><li>Air suspension</li><li>Automatic weight adjustment</li><li>Swivel function</li><li>Seat belt</li><li>Heating</li><li>Fully adjustable<ul style="list-style-type: none"><li>Slide, front - back</li><li>Height</li><li>Seat tilt</li></ul></li><li>Armrests</li><li>Headrest</li><li>Back rest</li></ul>
Mantsinen Control System MCS	
<ul style="list-style-type: none"><li>Ergonomic, adjustable multi-function joysticks</li><li>Travel and steering by one grip joystick</li><li>All front equipment and attachment functions are proportional</li><li>Function speeds, ramps and control curves are adjustable</li><li>Electric end cushion boom, stick and cab elevator</li><li>Precision mode</li><li>Heavy Lift mode</li><li>Remote MCS access (customers SIM-card)</li></ul>	<ul style="list-style-type: none"><li>Colour display 7.0" user interface<ul style="list-style-type: none"><li>Operating data and gauges</li><li>Warning signals, illuminated pop up symbols</li><li>Acoustic signal for critical alarms</li><li>Settings</li><li>Diagnostics</li><li>Log function</li><li>Instant power consumption</li><li>Periodic fuel or electric power consumption</li></ul></li></ul>
Mantsinen Safety System MSS	
<ul style="list-style-type: none"><li>Overload and stability control with motion cut</li><li>Cab collision prevention with motion cut</li><li>Adjustable operation limitations</li><li>Can Open CAN-bus technology</li></ul>	<ul style="list-style-type: none"><li>Colour display 5.7" user interface<ul style="list-style-type: none"><li>Animated machine operation</li><li>Load, reach and height information</li><li>Attachment menu</li></ul></li></ul>
Standard equipment	
<ul style="list-style-type: none"><li>Load control valves on boom and stick cylinders including hose rupture valves</li><li>Thermostat controlled fans</li><li>Full flow filters</li><li>By-pass fine filter 3 µm with water absorption</li><li>Second pressure adjustment for attachments</li><li>Central lubrication system for front equipment and slewing ring race way</li></ul>	<ul style="list-style-type: none"><li>Central lubrication system for rubber tyre undercarriage</li><li>LED working lights, 4 underneath the cabin and 4 on stick</li><li>Acoustic travel alarm</li><li>Signal horn</li><li>Service platforms</li><li>Heavy Lift</li></ul>
Options	
<ul style="list-style-type: none"><li>Fixed cab positions</li><li>Cab elevator N1-3000</li><li>Cab elevator N2-5000</li><li>Cab elevator N2-6000</li><li>Operator seat BE-GE 3000 SE<ul style="list-style-type: none"><li>Airvent function</li><li>Air-cushioned</li><li>Centralized control panel</li></ul></li><li>Camera under stick</li><li>Rear view camera</li><li>Beacon light travel alarm</li><li>Loudspeaker</li><li>Bullet proof windshield</li></ul>	<ul style="list-style-type: none"><li>Automatic clamshell bucket leveling while closing</li><li>Biodegradable hydraulic oil</li><li>Large by-pass fine filter with water absorption</li><li>Second hydraulic function for attachment</li><li>Additional filters for attachment hydraulic lines</li><li>Engine preheating</li><li>Hydraulic oil preheating</li><li>Cab preheating</li><li>Magnet generator 20 or 30 kW</li><li>Additional fuel tanks, depending on configuration</li><li>Electric re-fuelling and AdBlue pump</li><li>Extra large stabilizer pads 2 000 x 4 000 mm</li></ul>

Specifications subject to change without prior notice. The photographs and/or drawings in this brochure are for illustrative purposes only, and the machines in the photographs can have optional equipment. Refer to the Operator's Manual for instructions on the proper use of this equipment.

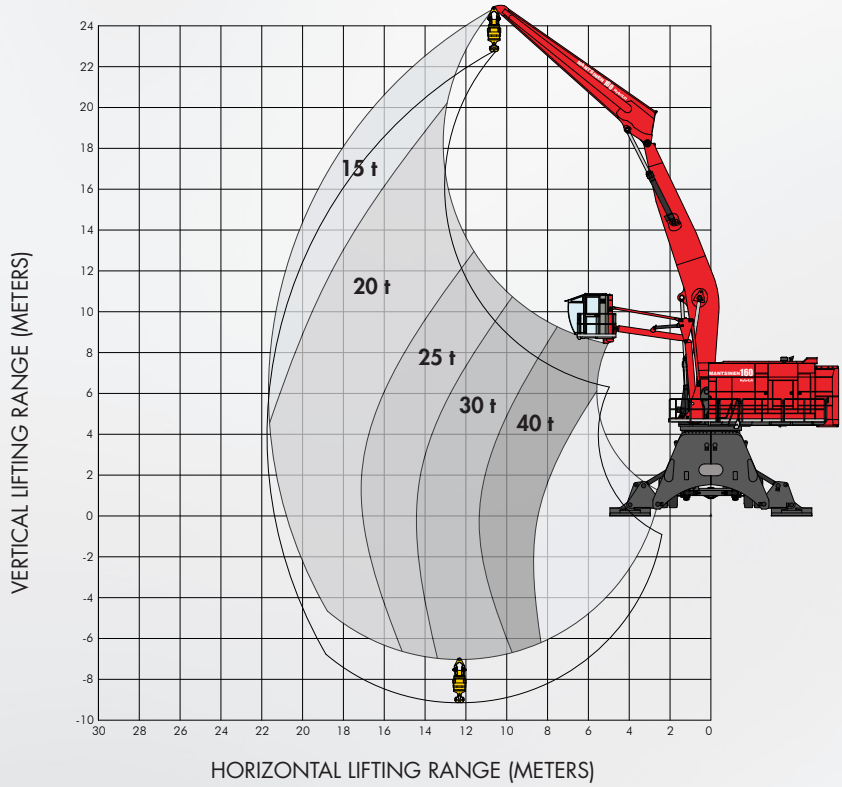


MANTSINEN  
160 HybriLift®

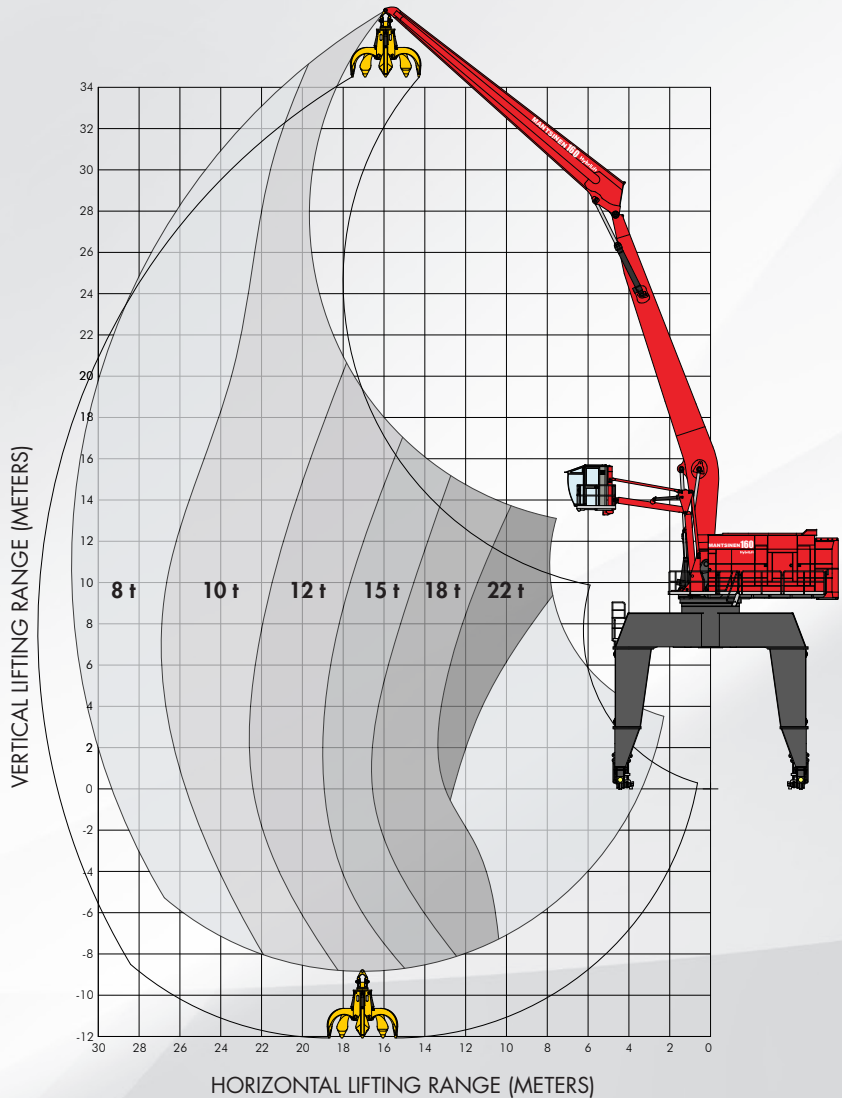
Lifting capacity range with 15,5 m curved main boom and 13 m stick



HEAVY LIFT  
Lifting capacity range with 12,5 m curved main boom and 10 m stick

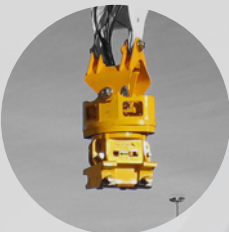


Lifting capacity range with 17,5 m curved main boom and 15 m stick



ATTACHMENTS

Mantsinen offers a wide variety of attachments to optimize production in any application. The Mantsinen hydraulic quick coupling enables fast and safe attachment changes. It only takes a few minutes to change from one attachment to another. Customized attachments are available on request.



Quick Couplers



Clamshell Buckets



Orange Peel Grabs



Roundwood Grapples



Lifting Hooks



Lumber Spreaders



Big Bag Spreaders



Pulp Bale Spreaders



Pallet Forks



Customized Attachments

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# More load, less energy.

## MANTSINEN 160 IN ACTION

For more information, images  
and videos visit our website  
**[mantsinen.com](http://mantsinen.com)**



Kiel, Germany

#### YOUR DEALER:

**GLOBAL PORT EQUIPMENT**

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**ISO 9001  
ISO 14001  
OHSAS 18001**

*We are committed to improve our integrated operational system continuously. We take care of environment and health&safety issues in all our operations.*



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