

# MANTSINEN

# 120

HybriLift®



More load, less energy.





MANTSINEN  
**120 HybriLift®**

Lift your efficiency  
to the next level  
with hydraulic speed  
and precision.



Joensuu, Finland



Piteå, Sweden



Lausanne, Switzerland



Frankfurt am Main, Germany

MANTSINEN  
**HybriLift®**  
Increases Energy  
Efficiency by up to  
**35%**



# MANTSINEN 120 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

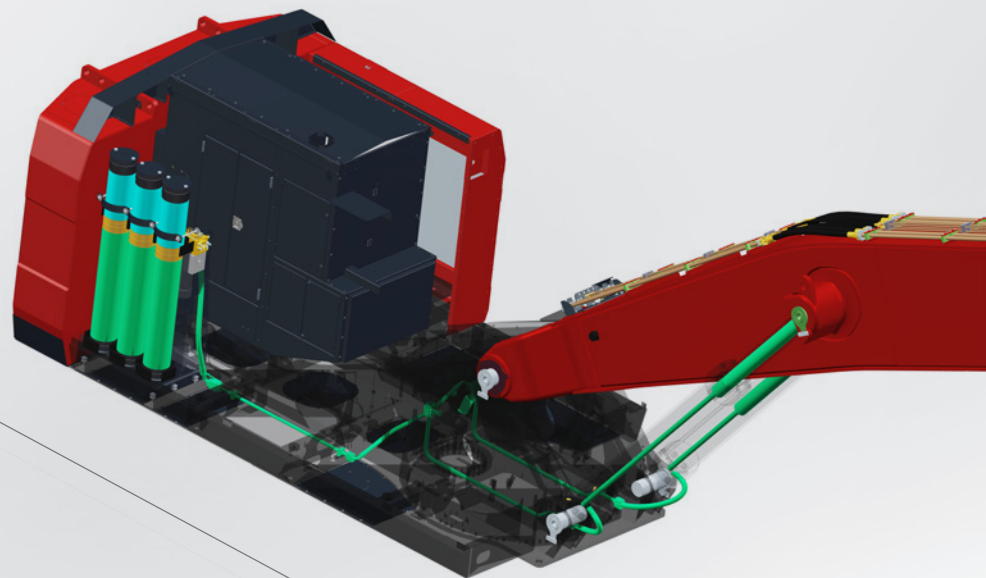
70 and 90 HybriLift® into production and operation

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

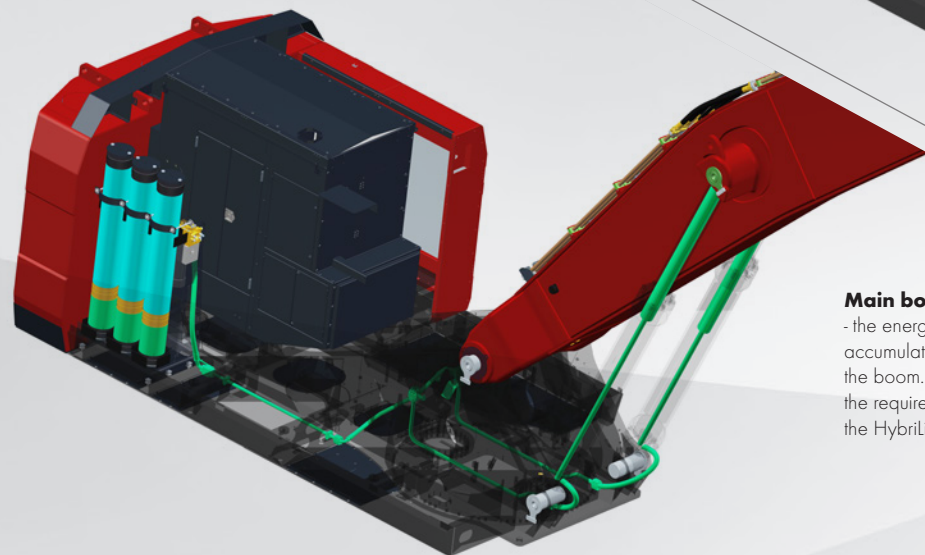
During each working cycle, energy is stored in hydraulic accumulator system and again recovered to lift the main boom.

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.

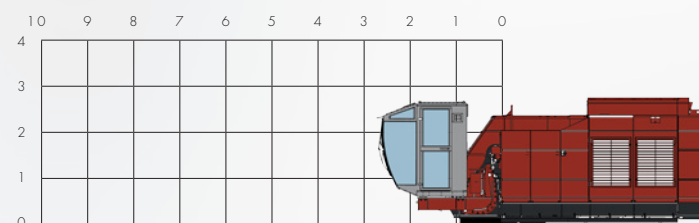


**Main boom down**  
- energy stored in increased nitrogen gas pressure in the accumulators.

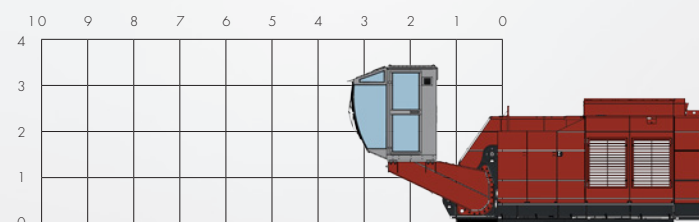


**Main boom up**  
- the energy stored in the accumulators has been used to lift the boom. Approximately 35 % of the required energy comes from the HybriLift system.

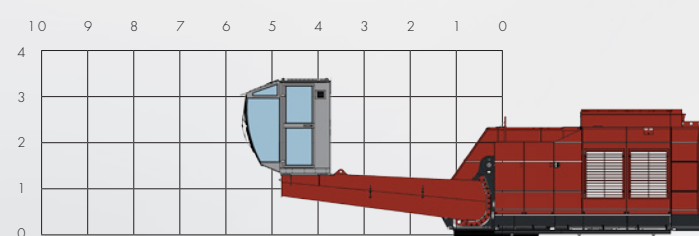
Fixed cab position 1



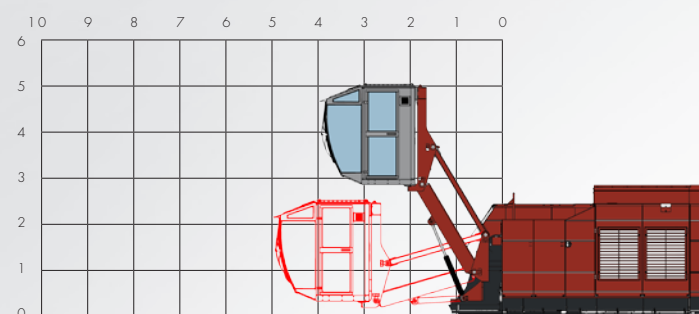
Fixed cab position 2



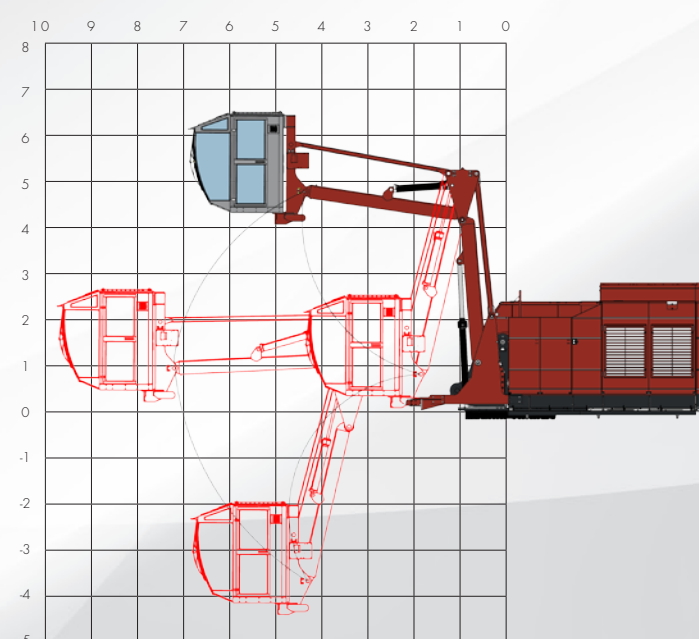
Fixed cab position 3



N1-3000



N2-5000



Maximum visibility.  
Optimum performance.

With Mantsinen material handlers the machine operator has always clear view on operations. Mantsinen 120 has three fixed cab options and two cab elevator options.

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



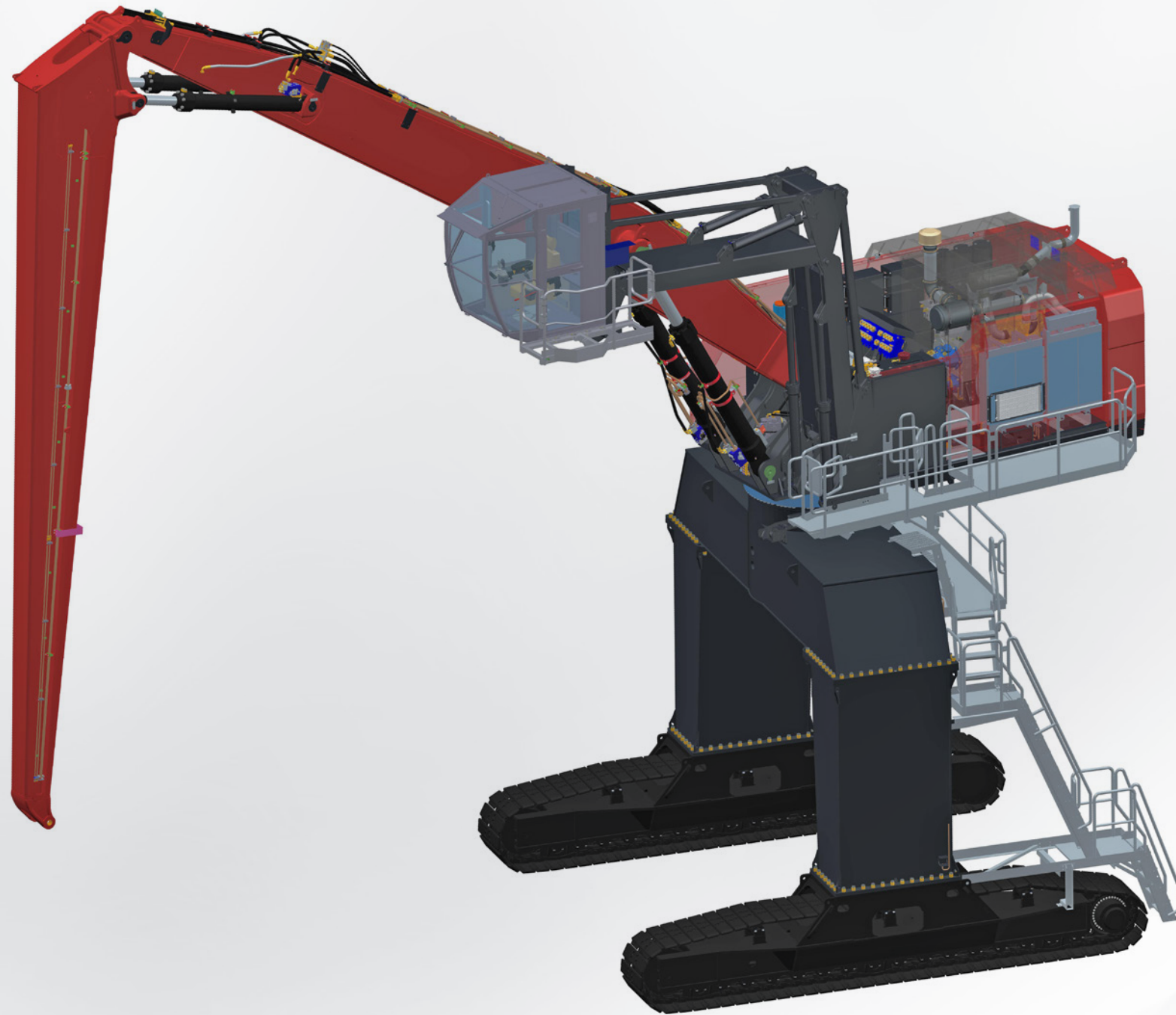
**MANTSINEN  
Safety  
System**



**MANTSINEN  
Control  
System**



# MANTSINEN 120 R



## MANTSINEN 120 ER HybriLift®

Mantsinen 120 ER HybriLift® with electric motor is ecological and economical. All Mantsinen crawler gantry features are combined with the benefits of electrically powered machines.

Lower operating and maintenance costs ensure shorter pay-back time on investment, while noise and particulate emissions decrease considerably.

Electrically powered machines are available with various supply voltages, 380 V to 690 V as standard and other voltages upon request.

With Mantsinen Power Pack electric machine can be driven totally independently from electric supply.

### FRONT EQUIPMENT

#### STICK FOOT & TIP

Stick foot and tip are made of cast steel. The extensive use of cast structures in the front equipment is the backbone of its durability.

#### STICK BOX

Stick box is made of two fine-grain steel C-profiles. 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 FOOT

Main boom foot is made of cast steel, which provides an extended service life to one of the most stressed structural components of the machine. The double steel plates of the upperstructure frame run all the way from front equipment pivot points to the counterweight making the frame extremely rigid.

#### MAIN BOOM BOSSES

Main boom bosses are made of high tensile cast steel. The optimized design ensures evenly distributed stresses on the boom box.

### UPPERSTRUCTURE

#### ENGINE

The longitudinally mounted engine is accessible from both sides. The sound isolated compartment keeps engine noise to a minimum. Hydraulic pumps are isolated from the engine by a fire-wall.

#### RADIATOR

Side by side mounted radiator and hydraulic oil cooler provide easy access and cleaning. Fan reversing function helps to keep the coolers clean also in dusty environments.

#### SWING MECHANISM

The Mantsinen 120 swing mechanism consists of two swing gears and a heavy-duty three-row roller type slewing ring. The internal teeth run in grease bath. The swing mechanism has a separate closed loop circuit pump. This makes the swing extremely smooth and controllable and saves a considerable amount of energy.

#### SERVICE WALKWAYS

The wide inside and outside service walkways provide an unprecedented access to all service points.

### UNDERCARRIAGE

#### 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 allows significant benefits for logistic layout planning. Also cycle time is optimized due to the minimized swing angle.

#### CRAWLER WITH PYLON

Side-mounted crawler undercarriage with pylon available as an option.

#### TRACKS

The tracks are long and wide apart. The machine has an excellent stability and rated loads can always be swung 360° on firm and even underfoot conditions.

#### TRACK SHOES

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

### CABIN AND CABIN ELEVATOR

#### OPERATOR'S CABIN

The spacious, air conditioned operator cab has large windows and a floor window for excellent visibility. The cabin is made of stainless steel for long lifetime even in the most demanding environments.

#### CAB ELEVATOR

Mantsinen N2-5000 cab elevator features independent vertical and horizontal movement to position the operator for maximum visibility of loading targets. Alternatives: cab elevator N1-3000, which brings operator high up or fixed cab positions.

### ATTACHMENTS

The machine can be delivered with a wide range of attachments for bulk and general cargo handling. Customized attachments are available on request.

With Mantsinen hydraulic quick coupling system changing attachments is quick and safe. It only takes a few minutes to change from one attachment to another.



# MANTSINEN 120 M



## MANTSINEN 120 EM HybriLift® GANTRY

Mantsinen 120 EM HybriLift® is a unique rubber tyre gantry crane with electric motor. Gantry height is 6.7 meters, allowing trucks or rail cars to pass through.

Electrically powered machines are available with various supply voltages, 380 V to 690 V as standard and other voltages upon request.

With Mantsinen Power Pack electric machine can be driven totally independently from electric supply. Mantsinen 120 EM HybriLift® can also be delivered with a generator power package, which enables full machine operation independently from electric supply.

Mantsinen 120 rubber tyre gantry is also available with a diesel engine as Mantsinen 120 M HybriLift®.

### FRONT EQUIPMENT

#### STICK FOOT & TIP

Stick foot and tip are made of cast steel. The extensive use of cast structures in the front equipment is the backbone of its durability.

#### STICK BOX

Stick box is made of two fine-grain steel C-profiles. 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 FOOT

Main boom foot is made of cast steel, which provides an extended service life to one of the most stressed structural components of the machine. The double steel plates of the upperstructure frame run all the way from front equipment pivot points to the counterweight making the frame extremely rigid.

#### MAIN BOOM BOSSES

Main boom bosses are made of high tensile cast steel. The optimized design ensures evenly distributed stresses on the boom box.

### UPPERSTRUCTURE

#### ENGINE

The longitudinally mounted engine is accessible from both sides. The sound isolated compartment keeps engine noise to a minimum. Hydraulic pumps are isolated from the engine by a fire-wall.

#### RADIATOR

Side by side mounted radiator and hydraulic oil cooler provide easy access and cleaning. Fan reversing function helps to keep the coolers clean also in dusty environments.

#### SWING MECHANISM

The Mantsinen 120 swing mechanism consists of two swing motors and a heavy-duty three-row roller type slewing ring. The internal teeth run in grease bath. The swing mechanism has a separate closed loop circuit pump. This makes the swing extremely smooth and controllable and saves a considerable amount of energy.

#### SERVICE WALKWAYS

The wide inside and outside service walkways provide an unprecedented access to all service points.

### UNDERCARRIAGE

#### RUBBER TYRE UNDERCARRIAGE

Rubber tyre undercarriage is available in different heights. The four-wheel drive provides a good drawbar pull and facilitates operation on uneven surfaces. The extra wide and large rubber tyres keep ground pressure to a minimum.

Four individually controllable outriggers permit a full 360 degree of lifting. The large 950 x 1.500 mm stabilizer pads are equipped with spherical bearings to adapt to the ground and to reduce ground pressure.

### CABIN AND CABIN ELEVATOR

#### OPERATOR'S CABIN

The spacious, air conditioned operator cab has large windows and a floor window for excellent visibility. The cabin is made of stainless steel for long lifetime even in the most demanding environments.

#### CAB ELEVATOR

Mantsinen N2-5000 cab elevator features independent vertical and horizontal movement to position the operator for maximum visibility of loading targets. Alternatives: cab elevator N1-3000, which brings operator high up or fixed cab positions.

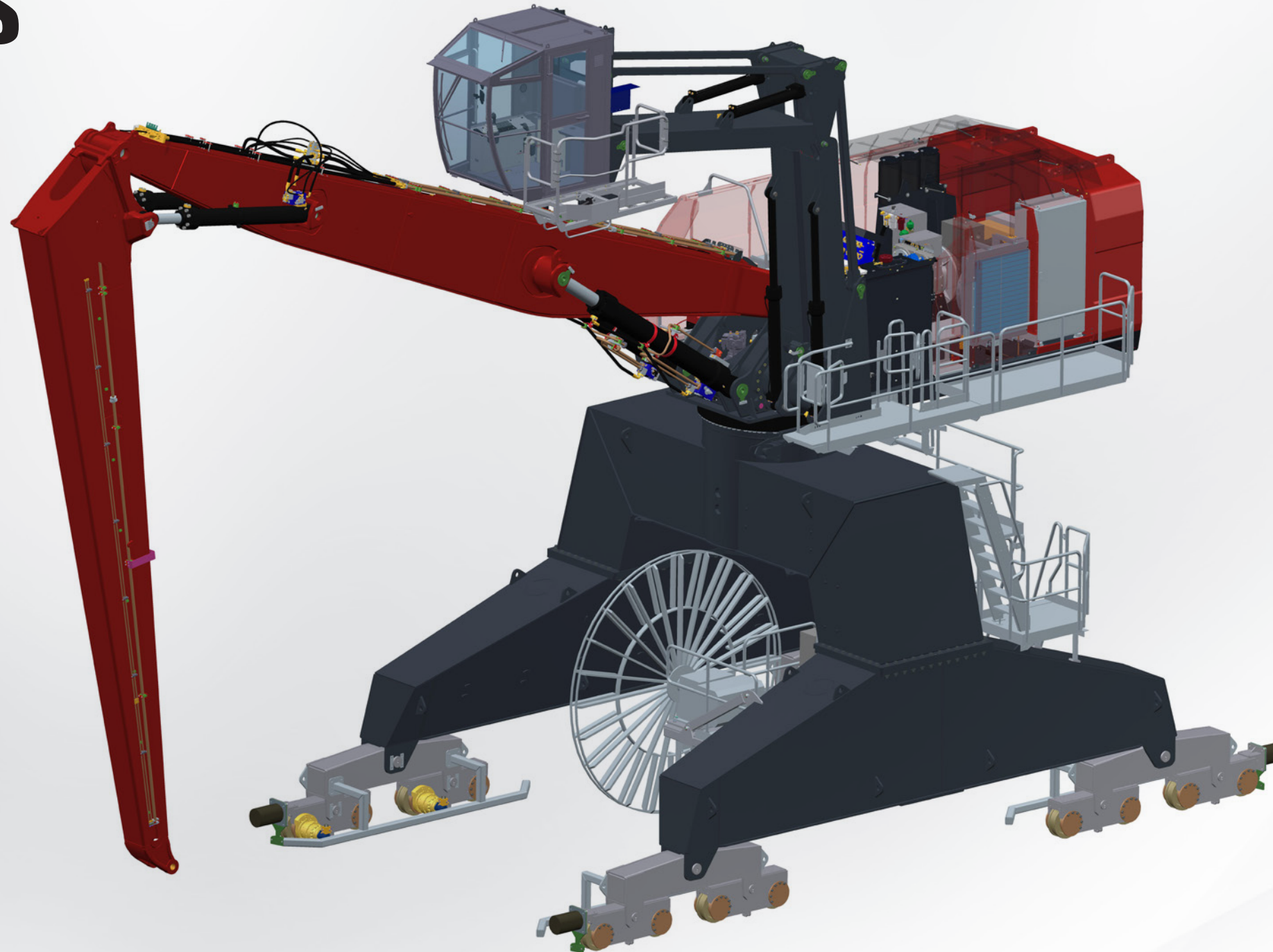
### ATTACHMENTS

The machine can be delivered with a wide range of attachments for bulk and general cargo handling. Customized attachments are available on request.

With Mantsinen hydraulic quick coupling system changing attachments is quick and safe. It only takes a few minutes to change from one attachment to another.



# MANTSINEN 120 ES



## MANTSINEN 120 EF HybriLift®

Mantsinen 120 EF HybriLift® is stationary version, which will be customized upon request.

Lower operating and maintenance costs ensure shorter pay-pack time on investment, while noise and particulate emissions decrease considerably.

Electrically powered machines are available with various supply voltages, 380 V to 690 V as standard and other voltages upon request.

### FRONT EQUIPMENT

#### STICK FOOT & TIP

Stick foot and tip are made of cast steel. The extensive use of cast structures in the front equipment is the backbone of its durability.

#### STICK BOX

Stick box is made of two fine-grain steel C-profiles. 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 FOOT

Main boom foot is made of cast steel. This provides an extended service life to one of the most stressed structural components of the machine. The double steel plates of the upperstructure frame run all the way from front equipment pivot points to the counterweight making the frame extremely rigid.

#### MAIN BOOM BOSSES

Also the bosses at the main boom are made of high-tensile cast steel. The optimized design ensures evenly distributed stresses on the boom box.

### UPPERSTRUCTURE

#### ENGINE

The longitudinally mounted electric motor is accessible from both sides. The sound insulated compartment keeps engine noise to a minimum. Hydraulic pumps are isolated from the engine by a firewall.

#### RADIATOR

Hydraulic oil cooler is very easily accessible for cleaning. Fan reversing function helps to keep the oil cooler clean also in dusty environments.

#### SWING MECHANISM

The Mantsinen 120 swing mechanism consists of two swing motors and a heavy-duty three-row roller type slewing ring. The internal teeth run in grease bath. The swing mechanism has a separate closed loop circuit pump. This makes the swing extremely smooth and controllable and saves a considerable amount of energy.

#### SERVICE WALKWAYS

The wide inside and outside service walkways provide an unprecedented access to all service points.

### UNDERCARRIAGE

#### RAIL MOUNTED UNDERCARRIAGE

The rail undercarriage can be adapted to existing rails. Gantry undercarriage width allows one or two rail wagons to pass trough. Cable reels are selected according to required travel distances and speeds.

#### BOGIES

Mantsinen 120 ES is available with 2, 3, 4 or 6 wheel bogies according to rail and quay carrying capacities. The distance between the bogies can also be chosen according to application.

#### WHEELS

Wheel diameter can be optimized to match the loads of the machine and bogie design. There are ø400 mm and ø630 mm wheels available.

### CABIN AND CABIN ELEVATOR

#### OPERATOR'S CABIN

The spacious, air conditioned operator cab has large windows and a floor window for excellent visibility. The cabin is made of stainless steel for long lifetime even in the most demanding environments.

#### CAB ELEVATOR

Mantsinen N2-5000 cab elevator features independent vertical and horizontal movement to position the operator for maximum visibility of loading targets. Alternatives: cab elevator N1-3000, which brings operator high up or fixed cab positions.

### ATTACHMENTS

The machine can be delivered with a wide range of attachments for bulk and general cargo handling. Customized attachments are available on request.

With Mantsinen hydraulic quick coupling system changing attachments is quick and safe. It only takes a few minutes to change from one attachment to another.

# TECHNICAL SPECIFICATIONS

Front equipment	
Max. horizontal reach	27.4 m with 15.0 m main boom and 13.0 m stick
Main boom lengths, straight and curved	10.0 / 12.0 / 13.0 / 14.0 / 15.0 m
Stick lengths	8.0 / 10.0 / 11.0 / 12.0 / 13.0 m
Diesel engine	
Engine type	Volvo TAD 1374 VE, Stage IV
Power	375 kW / 1 800 rpm
Displacement	12.8 l
Number of cylinders	6
Electric system	24 VDC, alternator 110 A / 24 V, batteries 2 x 225 Ah /12V
Electric motor with soft starter	
Motor type	250 kW IEC cast iron motor, 1500 rpm / 50 Hz
Voltages	380 to 690 V as standard, other voltages upon request
Hydraulic system	
HybriLift® energy recovery system	Equivalent to 124 kW engine power
Oil flow, front equipment and travel	2 x 420 l/min
Operating pressure, front equipment	330 bar
Operating pressure, travel and Heavy Lift mode	350 bar
Oil flow, swing	395 l/min, closed loop system
Operating pressure, swing	270 bar
Max swing speed	5.2 rpm
Swing torque	240 kNm
120 R / 120 ER, crawler undercarriage	
Weight without attachments	110 to 135 t, depending on configuration
Standard undercarriage height	2.5 m
Undercarriage height with pylon	4.0 / 4.7 / 5.2 m
Undercarriage height with gantry	4.0 / 6.5 / 7.0 m; with gantry and pylon 8.0 / 8.7 m
Track shoes	550 mm three grouser, 670 / 850 mm flat
Travel speed	Max 3.5 km/h
120 M / 120 EM, rubber tyre undercarriage	
Weight without attachments	125 to 140 t, depending on configuration
Standard undercarriage height	3.0 m
Undercarriage height with pylon	4.5 / 5.2 / 5.7 m
Wheelbase	2 x 2 800 mm
Wheel gauge	4 145 mm
Tyres	6 x 18.00-25 air inflated or optional 12 x 14.00-25 solid rubber
Service brakes	Wet multiple disc brakes on two axles
Parking brakes	Automatic wet multiple-disc parking brakes on two axles
Drive speed	Max 5 km/h
Stabilizer pads	950 x 1 500 mm, with spherical bearings
120 M / 120 EM, rubber tyre gantry	
	Undercarriage height 6.7 m
120 S / 120 ES, rail undercarriage	
	According to customer specification
120 F / 120 EF, fixed undercarriage	
	According to customer specification
Refill capacities	
Hydraulic oil reservoir	1 000 l net volume
Fuel tank	1 500 l
Engine oil	40 l
AdBlue tank	200 l

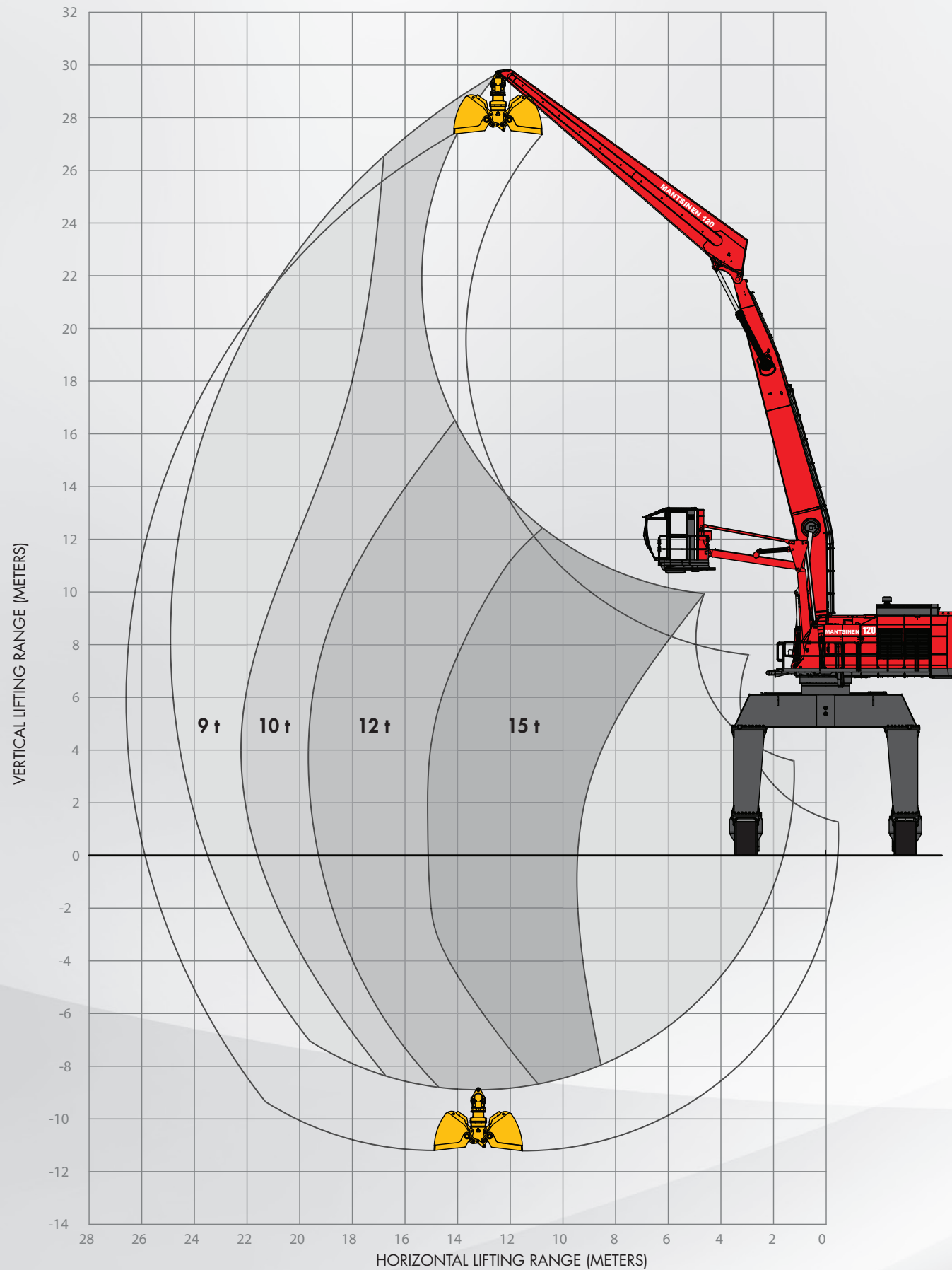
Operator cabin, made of stainless steel	
<ul style="list-style-type: none"> <li>• Heating and air conditioning</li> <li>• Ergonomic air-cushioned seat                             <ul style="list-style-type: none"> <li>- Adjustable armrests</li> <li>- Seat belt</li> <li>- Heating</li> <li>- Adjustable lumbar support</li> <li>- Adjustable headrest</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Radio with CD and MP3</li> <li>• Floor and roof window</li> <li>• Tinted window glasses</li> <li>• Two speed windshield wiper with intermittent function and washer</li> <li>• Roof window wiper</li> <li>• Sun shades</li> </ul>
Mantsinen Control System MCS	
<ul style="list-style-type: none"> <li>• Ergonomic, adjustable multi-function joysticks</li> <li>• Drive and steering by one grip joystick</li> <li>• All front equipment and attachment functions proportional</li> <li>• Function speeds and ramps adjustable</li> <li>• Electric end cushioning for boom, stick and cab elevator cylinders</li> <li>• Precision mode</li> <li>• Heavy lift mode</li> </ul>	<ul style="list-style-type: none"> <li>• Colour display 5.7" user interface                             <ul style="list-style-type: none"> <li>- Operating data and gauges</li> <li>- Warning signals, illuminated 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>• Can Open CAN-bus technology</li> <li>• Adjustable limitations to operation</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 hydraulic fans</li> <li>• Cooler cleaning with reversing fan</li> <li>• Full flow filters</li> <li>• By-pass fine filter with water absorption</li> <li>• Second pressure adjustment for attachments</li> </ul>	<ul style="list-style-type: none"> <li>• Service platforms</li> <li>• Central lubrication system for front equipment and slewing ring raceway</li> <li>• Working lights, 4 underneath cabin, 4 on front equipment</li> <li>• Signal horn</li> <li>• Acoustic travel alarm</li> <li>• Automatic central lubrication system for rubber tyre undercarriage</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>• Operator seat BE-GE 3000                             <ul style="list-style-type: none"> <li>- Air vent function</li> <li>- Air-cushioned</li> <li>- Centralized control panel</li> </ul> </li> <li>• Xenon or LED working lights</li> <li>• Camera under stick</li> <li>• Rear view camera</li> <li>• Beacon light travel alarm</li> <li>• Loudspeaker</li> <li>• Mantsinen Control System remote access</li> <li>• Automatic clamshell bucket levelling while closing</li> </ul>	<ul style="list-style-type: none"> <li>• Biodegradable hydraulic oil</li> <li>• Large by-pass fine filter with water absorption</li> <li>• Second hydraulic function for attachment</li> <li>• Engine preheating</li> <li>• Hydraulic oil preheating</li> <li>• Cab preheating</li> <li>• Bullet proof windshield</li> <li>• Magnet generator 20 or 30 kW</li> <li>• Additional fuel tanks</li> <li>• Electric re-fuelling pump</li> <li>• Heavy duty tracks</li> <li>• Solid rubber tyres for 120 M / 120 EM</li> </ul>



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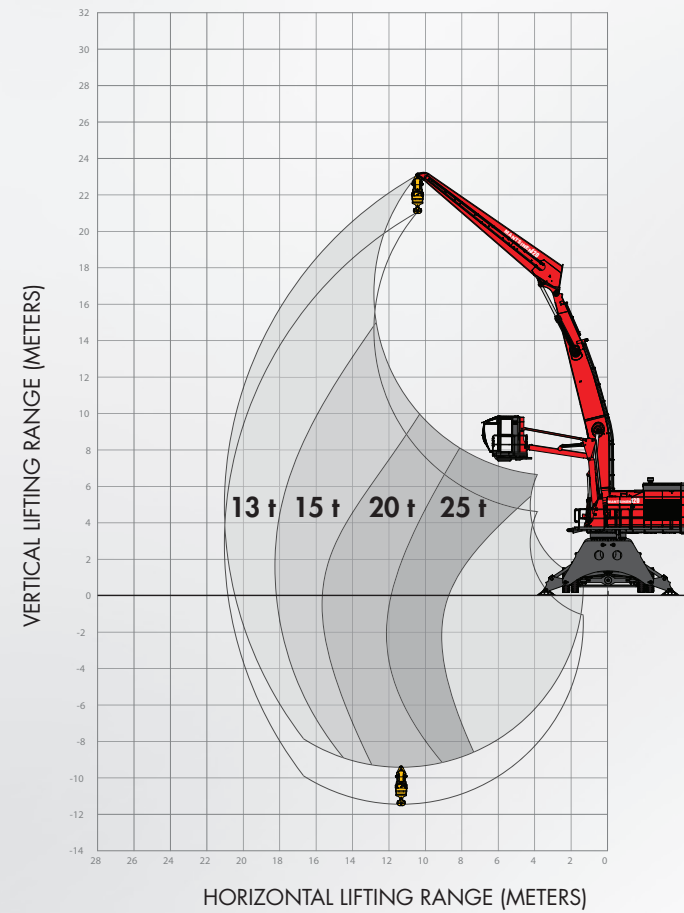
# 120 HybriLift®

Lifting capacity range with 14 m main boom and 12 m stick

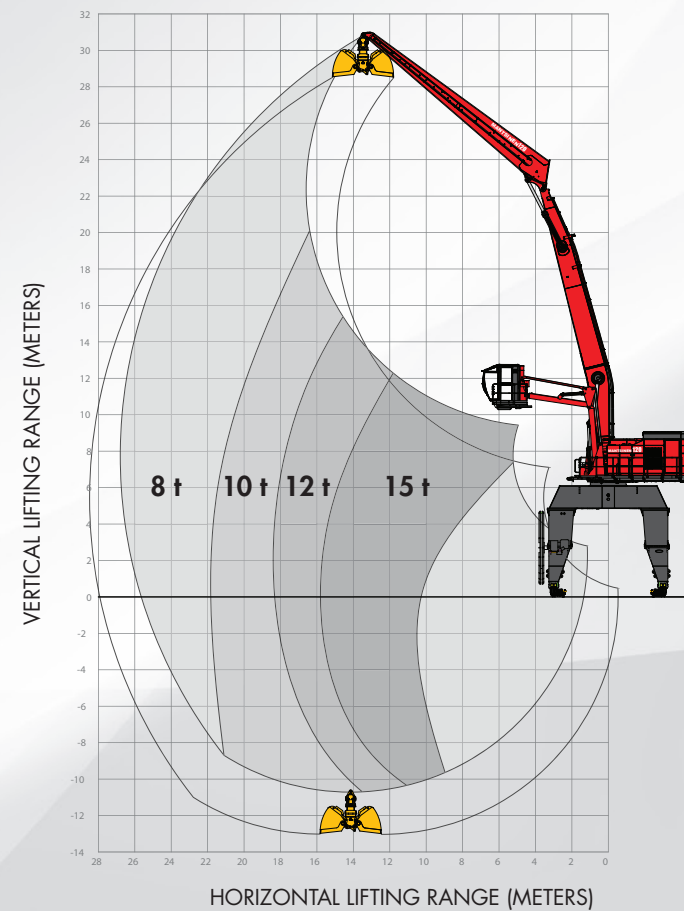


## HEAVY LIFT

Lifting capacity range with 12 m main boom and 10 m stick



Lifting capacity range with 15 m main boom and 13 m stick



## ATTACHMENTS

Mantsinen offers a wide variety of attachments for several different applications. With Mantsinen hydraulic quick coupling system changing attachments is quick and safe. It only takes a few minutes to change from one attachment to another. Customized attachments are available on request.



Quick Coupling



Clamshell Buckets



Orange Peel Grabs



Roundwood Grapples



Lifting Hooks



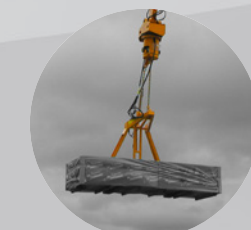
Sawn Timber Spreader



Big Bag Spreader



Pulp Bale Spreader



Pallet Fork



Customized Tools



# More load, less energy.

## MANTSINEN 120 IN ACTION

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



**YOUR DEALER:**

**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.*

ISO 9001 ISO 14001  
OHSAS 18001



**DNV**  
CERTIFIED  
ORGANISATION



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