



MANTSINEN 140 HYBRILIFT® **AGILE & EFFICIENT**





CONSIDER IT LOADED

Combining precision with efficiency, the Mantsinen multipurpose material handling machines are the perfect solution for various operations in ports and industrial terminals. They are suitable for handling any kind of bulk material, scrap, timber and breakbulk. Equipped with the Mantsinen quick coupling system, working with different attachments is easy, safe and efficient.

With in excess of 50 years experience in logistics services for heavy industry, Mantsinen immediately recognise the demands and challenges for material handling machines in differing operations. The balance of a contractor's mind together with world-class

manufacturing knowledge creates unique solutions for efficient handling operations. With our in-depth knowledge, we can optimise your operation and machine configuration.

LIFELONG PRODUCTIVITY

Mantsinen material handling machines are a generational investment, in respect of life and durability. In-house manufacturing of machines and attachments ensures high quality without compromise. All of the critical components are thoroughly Finite Element Method Analyzed based on strain gauge tests on real operation. Minimum lifetime expectancy is over two million work cycles with maximum load.

SUSTAINABLE BY NATURE

For in excess two decades, Mantsinen has paved the way in energy-saving innovations and sustainable solutions. Introduced in 2006, the Mantsinen HybriLift® potential energy storage and recovery system increases energy efficiency, by up to 50 per cent. Hybrilift is a standard feature in all Mantsinen 140 models.

When the main boom is lowered, the potential energy is stored in the hybrilift accumulators, and again recovered, when lifting the main boom. The hybrilift system is equivalent up to 210 kW of additional power, it allows using smaller engines that would otherwise be necessary in the process and minimising energy consumption and emissions. The system includes a temperature compensation, providing full lifting capacity, even

when working in varying ambient temperatures. Also the closed loop swing hydraulics returns kinetic energy back into the system, during swing deceleration. Hydraulic flow is created only on demand, and the thermostat adjusted fans run with optimum speed, thus saving power and keeping noise levels down.



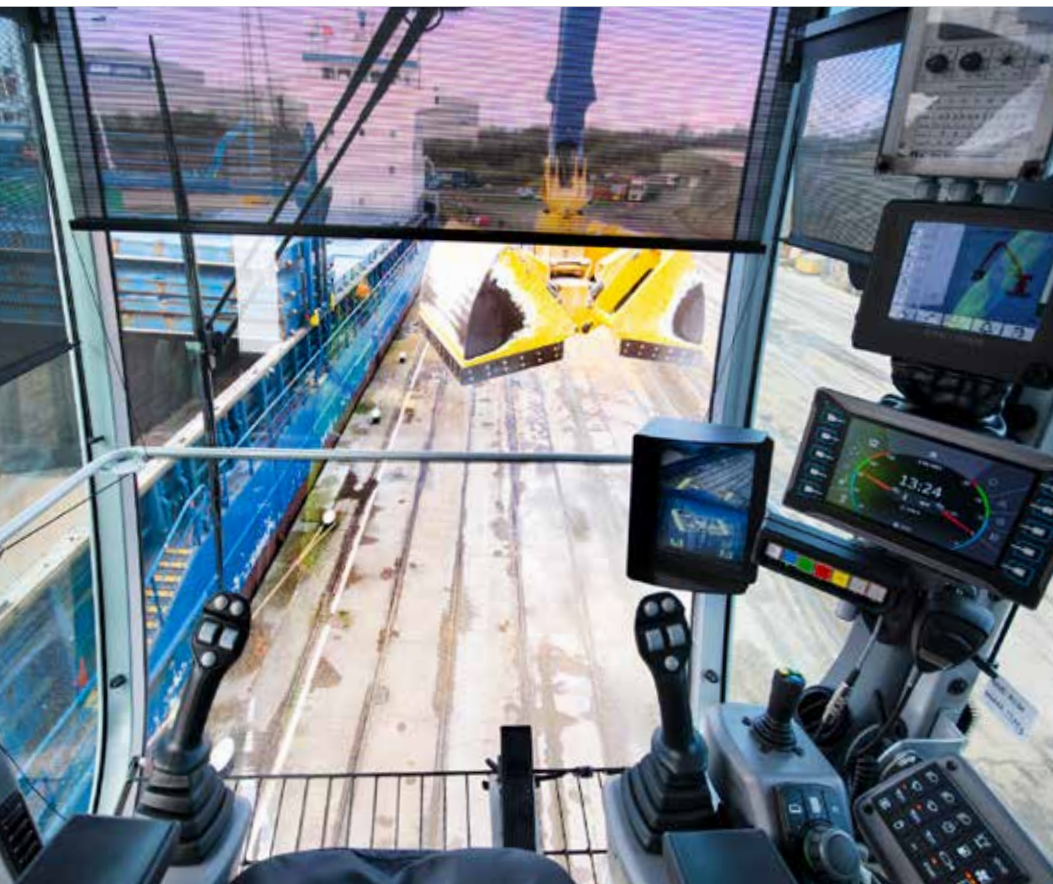
GET ELECTRIC

The electrically powered machines offer a cost-effective and ecological alternative to diesel powered machines. They provide the same performance level, with zero exhaust emissions, low noise level and lower energy and maintenance costs. The E-series machines are available with local voltages upon request.

A variety of cable reel solutions are available to meet differing travel demands, with all undercarriage types. An optional diesel-driven Mantsinen powerpack allows electric machines to travel independently from the electric supply. To keep the start currents low IE3 efficiency class motors are started with soft starter or frequency converter. Reactive power compensation system is also available as an option.



EVERYTHING UNDER CONTROL



MANTSINEN CONTROL SYSTEM (MCS)

Mantsinen control system is engineered for cost efficient material handling with today's technology. Operator friendly user interface adopts an "Only important is shown" approach easing daily operation, and allows operator to concentrate on the current task. Adjustable multi-function joysticks for front equipment are totally ergonomic and comfortable.

Travel and steering are controlled by a one-grip joystick. The rail mounted machines are driven by pedals. Electrically controlled proportional main functions ensures smooth and efficient operating under all conditions.

The system has an electric end cushioning for boom, stick and cab elevator to avoid unpleasant dynamic shocks.

HUMAN-MACHINE INTERFACE

- Graphic user interface 7" display
- Easy to use multifunction control wheel
- Operating data and gauges
- Optional functions state information
- On board and remote diagnostics with detailed error description
- Acoustic signal for critical alarms
- Precision mode and heavy lift mode
- Settings for main functions and options
- Error logging
- Instant power consumption measurement
- Periodic fuel or electric power consumption



KEEP TRACK OF YOUR OPERATIONS

MANTSINEN SAFETY SYSTEM (MSS)

Mantsinen machines are equipped with an advanced safety system as standard and the machine operation is all the time under control. There is an overload and stability control function with motion cut-out and various other adjustable safety features included in the system.

- Graphic user interface with 5,7" display
- Animated machine operation
- Load, reach and height information
- Cabin collision prevention
- Attachment menu

STANDARD IoT – MANTSINEN TELEMATICS SYSTEM (MTS)

With the Mantsinen Telematic System (MTS) users can remotely monitor the operation and productivity of the material handling machine either from a computer or mobile device. Visualisation of the data makes interpretation quick and simple. Automatic scheduled operation reports

can be sent to e-mail or events history can be verified from the cloud service. Transferring the collected data to a terminal or factory IT-systems is possible through a standardised API interface built into the system.

DEVELOPED TO GET THE JOB DONE

UPPER STRUCTURE

The Mantsinen upper structure is specifically designed for fast and hard material handling applications. In-house experience of hundreds of millions tons in material handling gives the strong base for design, functionality and serviceability.

POWERLINE

Volvo Penta diesel engines are known in material handling industry for their high performance, low fuel consumption and durability. Diesel or electric motor is located in sound insulated compartment.

The doors ensure easy access for service both sides. To reduce fire risk, the pump compartment is isolated from the engine compartment by a firewall.

HYDRAULICS

The main hydraulics consist of two variable displacement axial piston pumps and a closed loop swing pump. There is a separate circuit for the rotator, cab elevator and optional attachment functions as well as for fans.

Efficient filtration and three-micron bleed-off fine filter with water absorption ensures continuously clean and dry oil which increases uptime and extends component and oil lifetime.

Hydraulic oil cooler and radiator are easily accessible for cleaning from the service platform. Fan reversing function cleans the cooler and radiator without interrupting the machine operation.

RIGID MAIN FRAME

The rigid main frame and the large diameter pin size guarantees a long lifetime to machine.

SERVICE WALKWAYS ALSO INSIDE

The wide inside and outside service walkways satisfy international safety standards provide unrestricted and safe access to all service points.

SWING MECHANISM

Mantsinen 140 has a large diameter heavy-duty three row roller type slewing ring with internal teeth running in grease bath.

Two heavy planetary swing gears have integrated automatic multi disc brakes and the swing mechanism is operating in a closed loop. Connected with state-of-art electric controls the machine swing is extremely smooth, controllable, saves a considerable amount of energy and provides maximum operator performance.



FRONT EQUIPMENT

A wide range of options with straight or curved booms and sticks are available to optimise the operation for maximum productivity. Mantsinen boom and stick structures are designed according to modern FEM-analyses based on real operation measurements and long-term practical experience.

Minimum lifetime expectation is over two million work cycles assuming maximum load. Booms and sticks are manufactured in-house under close quality supervision to ensure long lifetime of these structures under extreme fatigue stresses.

MAIN BOOM

The main boom foot and bosses are constructed of steel castings, providing excellent service life to one of the most critical structural components of the

machine. Optimized box structure which ensures maximum lifetime without compromise. Strong structure and large pin diameters minimize surface pressures and wear on bushings.

STICK

The stick box 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. As a consequence to the unique stick tip and rotator link design no hoses are exposed from the rotator link or attachment assemblies.

UNDERCARRIAGES

Robust and proven undercarriage versions are designed for every demand and conditions. Stability and robustness are the key features in all the Mantsinen undercarriages. All the machines are able to operate 360° sector with full load.

Undercarriages are available in several different heights to optimise the

operation, reach and visibility. Mantsinen organization provides with support load information and operational drawings on a case by case and individually tailored basis.

More detailed information on the undercarriages from the product pages.

STRENGTH IS NOTHING WITHOUT VISION

STAINLESS STEEL CABIN

The spacious and modern operator cabin has an excellent visibility with a large windscreen and floor window in one curved piece. The cabin is made of stainless steel for long lifetime even in the most demanding or corrosive working environments. Sound insulation, low vibration and high quality interiors create the most comfortable environment for the operator.

The automatic powerful heating and air conditioning, tinted glasses and adjustable sun shades make the cabin comfortable in all weather conditions. Windshield wiper has two speeds, an adjustable intermittent function and a washer. There is a separate wiper for the skylight.

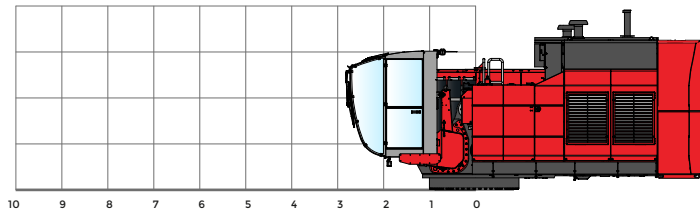
The operator works in an ergonomically designed environment. All joysticks, control panels and user interface displays can be easily controlled and operated.

	STANDARD	OPTION
EQUIPMENT FOR CABIN AND OPERATOR SEAT		
Windshield and floor window in one place	•	
Roof Window	•	
Tinted window glasses	•	
Automatic heating and air conditioning	•	
First aid kit	•	
Sun shades	•	
Folding instructor seat	•	
Bluetooth CD/USB, MP3/WMA receiver	•	
Cup holder	•	
Literature compartment	•	
Two 12 V plugs for chargers	•	
240 VAC plugs are standard in electric versions and optional in diesel machines	•	
Emergency exit harness	•	
Standard seat	•	
- Air suspension	•	
- Automatic weight adjustment	•	
- Swivel function	•	
- Seat belt	•	
- Heating	•	
- Fully adjustable; slide, front back, height, seat tilt, armrests, headrest, back rest	•	
Windshield with heating	•	
Seat Be-Ge with airvent		•
Cabin protection guards		•
Impact resistance front window 22 mm thick (BR4NS) with separate floor window		•
Integrated CAN-BUS anemometer with adjustable alarms		•
Stick or rear view camera with 7" display or several cameras with 12" shared display		•
Shortwave radio and customer IT-system readiness		•
Loudspeaker, activation with pedal		•
Alcolock system with SMS function		•

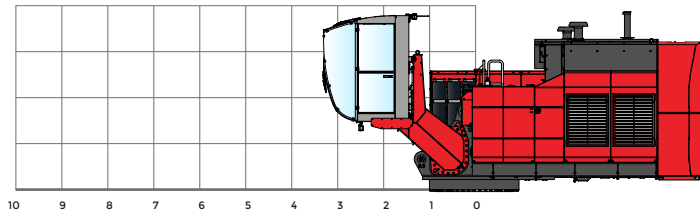
CABIN OPTIONS

Mantsinen 140 HybriLift® has three fixed cab positions.

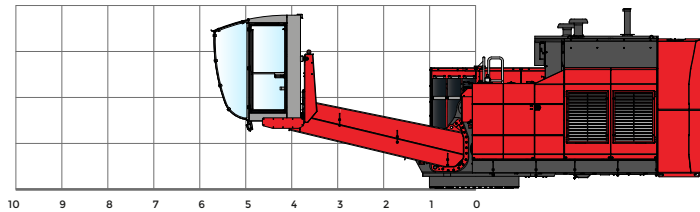
FIXED CAB POSITION 1.



FIXED CAB POSITION 2.



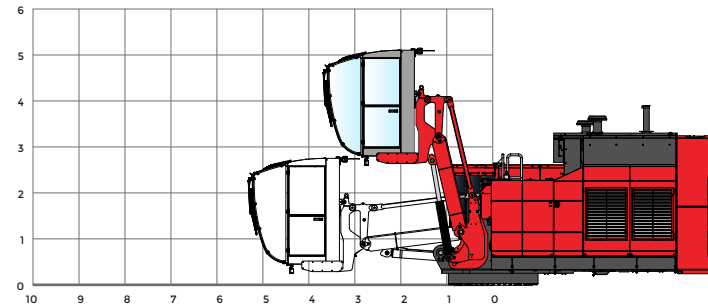
FIXED CAB POSITION 3.



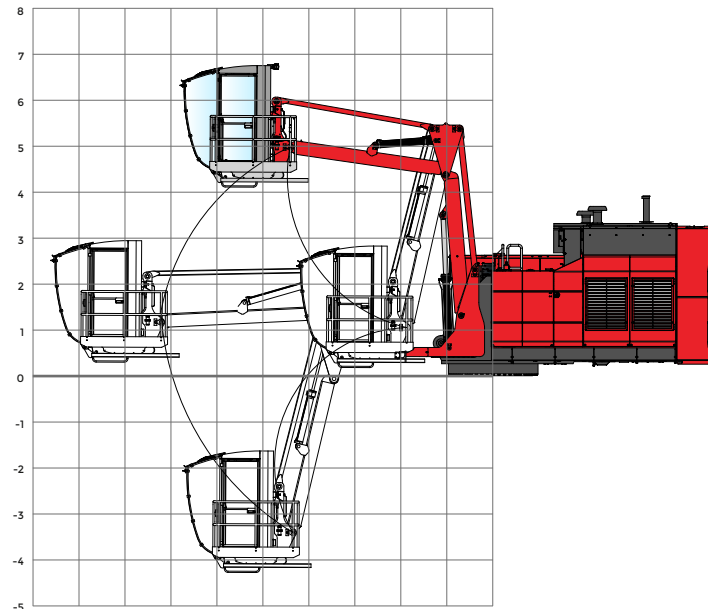
CABIN ELEVATORS

Mantsinen 140 HybriLift® has two cab elevator options. Robust Mantsinen N2-5000 cab elevator features independent vertical and horizontal movement to position the operator for maximum visibility of loading targets. One arm cab elevator N1-3000, simply brings operator high up.

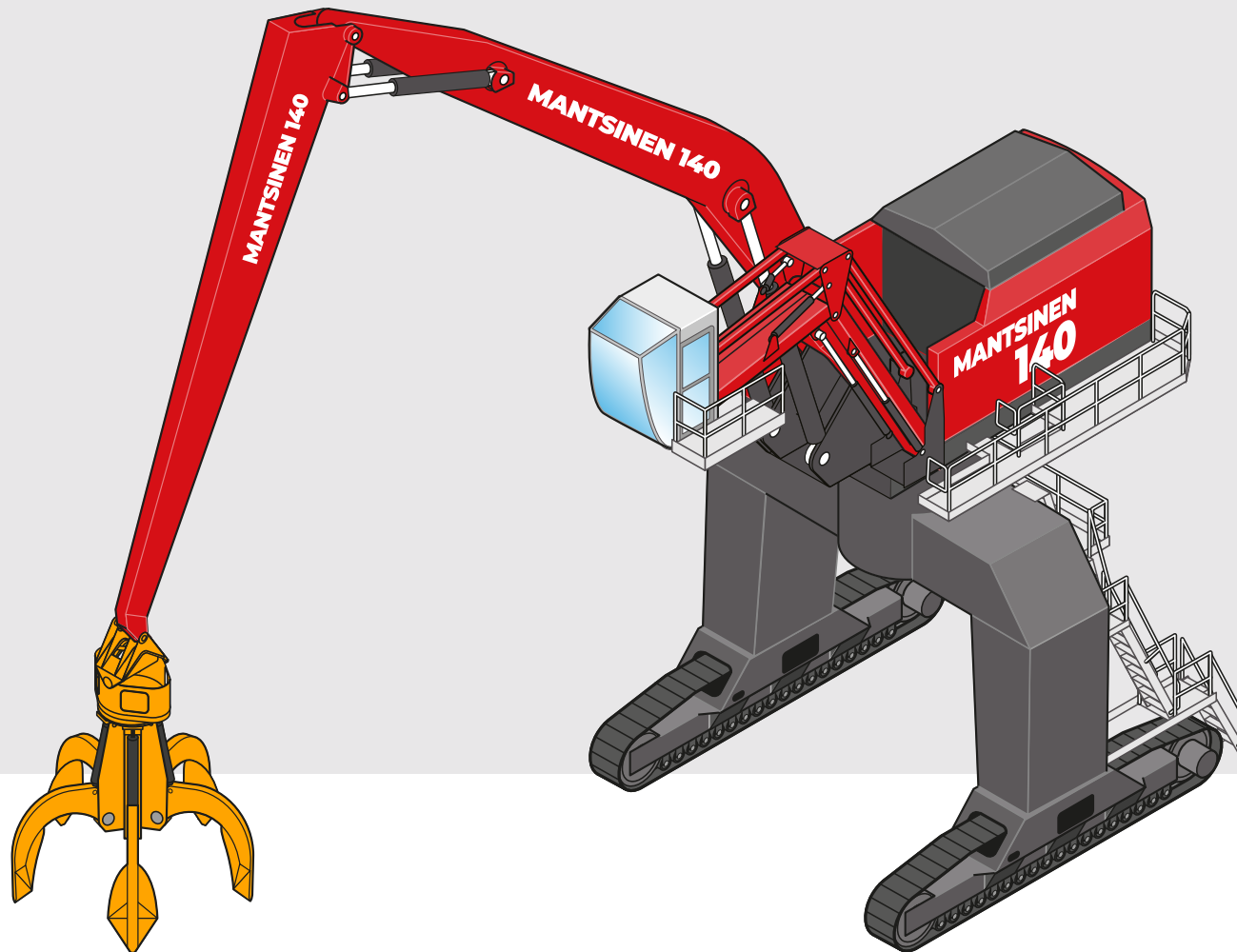
N1-3000



N2-5000



MANTSINEN 140R



CRAWLER GANTRY

Crawler gantry allows significant benefits for effective logistic layout design. The gantry style undercarriage allows trucks or rail cars to pass through. Additionally the machine cycle time and truck waiting times are minimised due to the optimised swing angle. One or two additional fuel tanks within the gantry leg structure are available as an option.

CRAWLER TRACKS

Long and wide apart tracks create an excellent stability foundation for the machine. Flat track shoes run smoothly on gravel, asphalt or concrete.



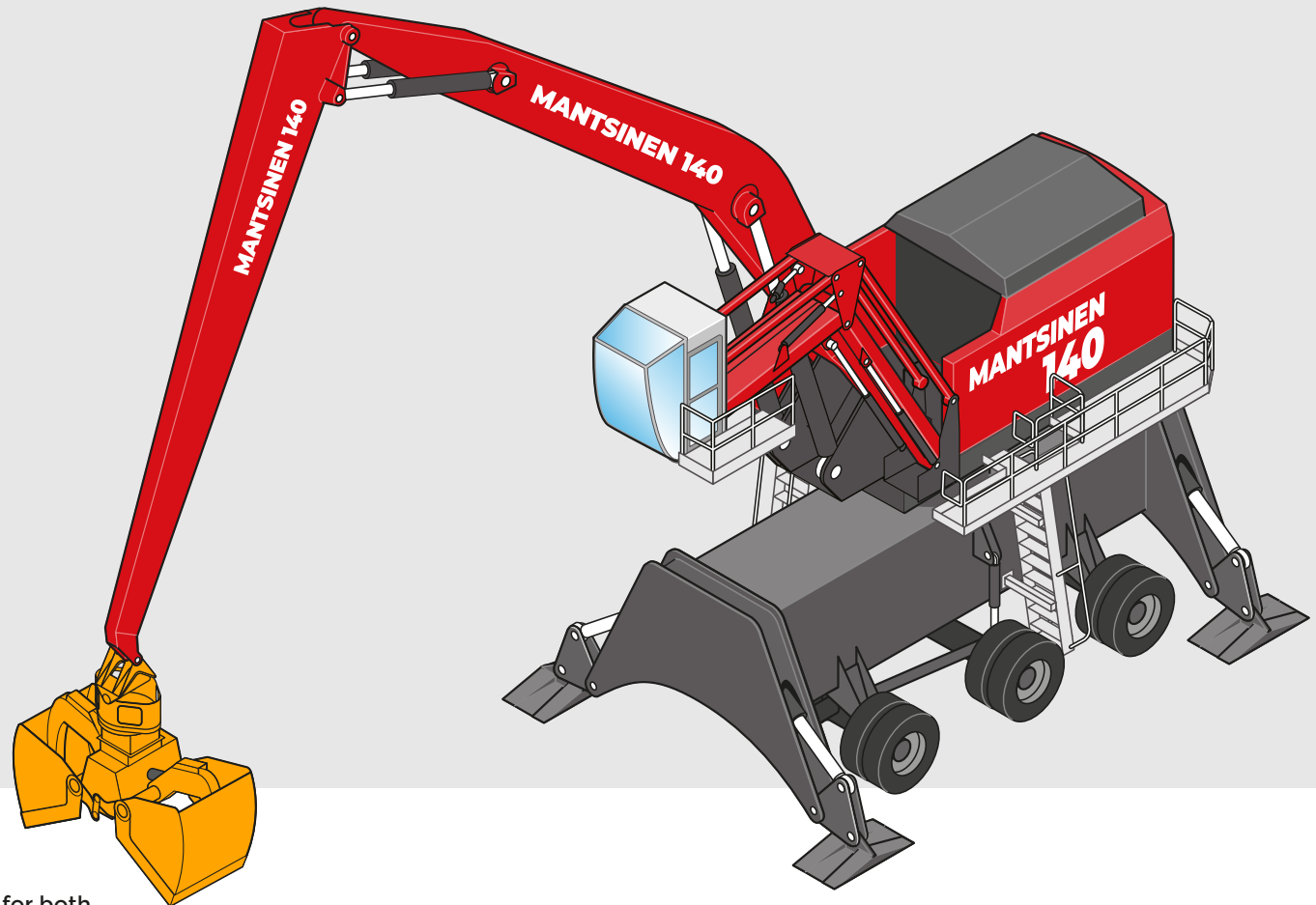
140ER Sidemounted, electric crawler machine with pylon.

MANTSINEN 140M

RUBBER TYRE

The three axel rubber tyre undercarriage provides great mobility in this machine size class with reduced axel loads. The four-wheel drive and steering provides a good drawbar pull and facilitates operation on uneven surfaces.

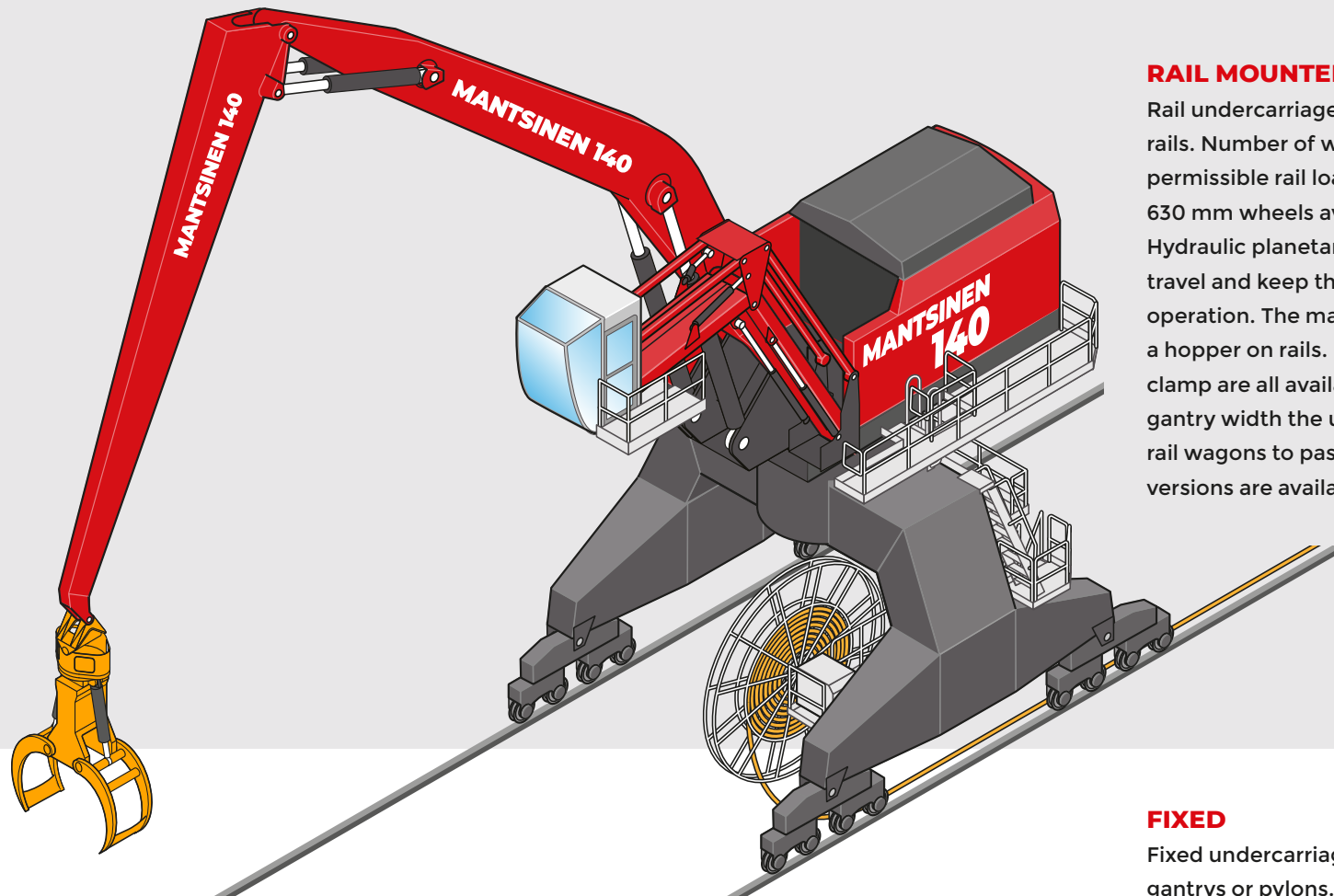
Four individually controllable outriggers permit a full 360° lifting sector with rated loads on firm and even underfoot conditions. Standard 1350 × 1500 mm stabilizer pads are equipped with spherical bearings to adapt to the ground and to reduce ground pressure. Optional 1500 × 2000 mm pads available to reduce ground pressure even more.



RUBBER TYRE GANTRY

Rubber tyre gantry undercarriage combines the benefits for both logistic layout design as well as mobility. Gantry type undercarriage allows trucks or rail cars to pass through. Also cycle time can be minimized due to the optimised swing angle.

MANTSINEN 140S



RAIL MOUNTED

Rail undercarriage can be tailored around existing rails. Number of wheels can be optimised to match permissible rail loads. There are Ø 400 mm or Ø 630 mm wheels available for different rail profiles. Hydraulic planetary wheel drives provide smooth travel and keep the machine steady throughout operation. The machine can be easily adapted to pull a hopper on rails. Rail cleaners, buffers and storm clamp are all available as options. Depending on gantry width the undercarriage allows one or more rail wagons to pass through. Both diesel and electric versions are available for a rail mounted machine.

FIXED

Fixed undercarriage can be optimised using differing gantrys or pylons. The machine, equipped with diesel engine or electric motor can be adapted to existing quay or pontoon.

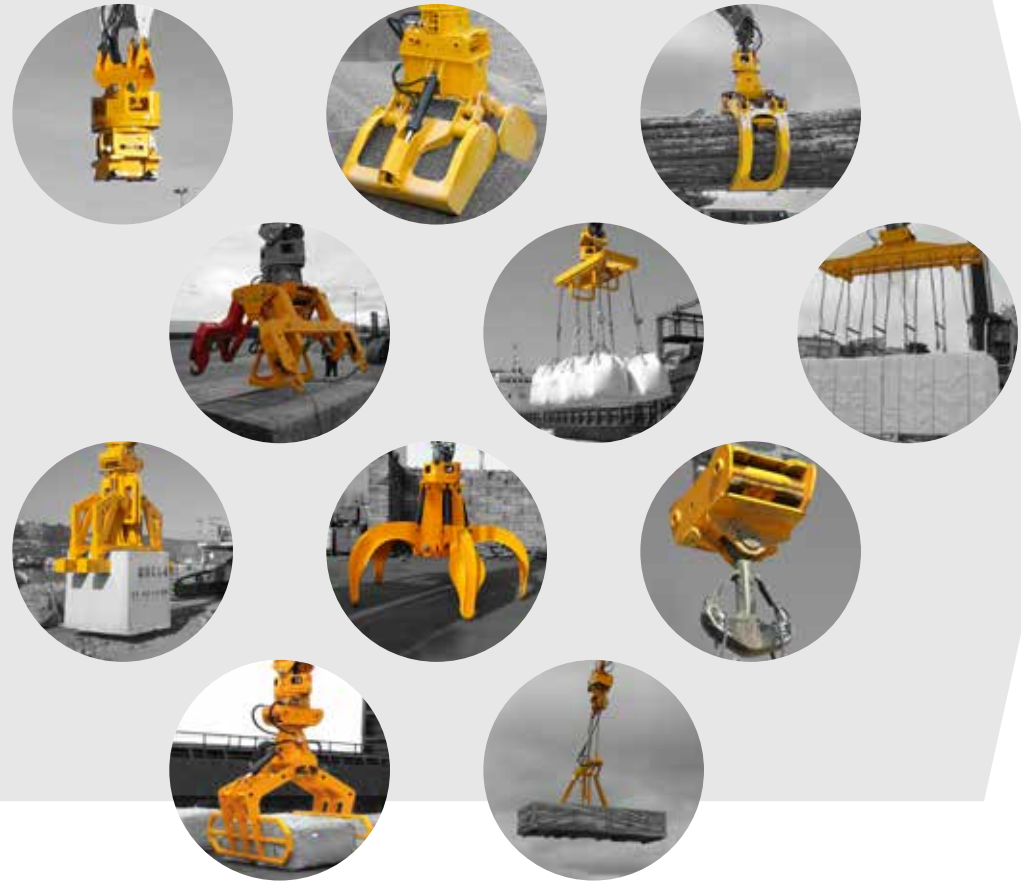
MAXIMUM PRODUCTIVITY

QUICK COUPLERS & ATTACHMENTS

Mantsinen offers a wide variety of attachments to maximise productivity for every operation. Semi-automatic attachments for example for big bags, pallets, and lumber bundles ensure an efficient and safe operation. Fully automatic attachments for example for handling pipes or pulp bales maximise production with minimal labour. Customised attachments are available on request.

Attachments can be equipped with a fixed rotator or with a separate quick coupling system. In both cases the hydraulic hoses from the machine to the attachment are routed directly through the rotator link. The rotator swivel can be equipped with two to six hydraulic lines and optionally with an electric slip ring column.

The Mantsinen hydraulic quick coupling enables fast and safe attachment changes. It only takes a few minutes to swap from one attachment to another.



TECHNICAL SPECIFICATIONS

TOTAL WEIGHT	150 to 190 tons according to configuration
FRONT EQUIPMENT	
Max. horizontal reach	29 m
Main boom lengths, straight and curved	10.5 / 11.5 / 12.5 / 13.5 / 14.5 / 15.5 / 16.5 m
Stick lengths	9.0 / 10.0 / 11.0 / 12.0 / 13.0 / 14.0 m
DIESEL ENGINE	
Volvo	TAD1385VE 405 kW Stage V
	TAD1345VE 394 kW Stage II / Tier 2
Displacement	12,8 l
Number of cylinders	6
Electric system	24 VDC, alternator 150 A / 24 V, batteries 2 × 225 Ah / 12V
ELECTRIC MOTOR	
Motor type	250 kW IEC cast iron frame squirrel cage motor, 1500 rpm / 50 Hz
Voltages	380 to 690 V as standard, other voltages upon request
HYDRAULIC SYSTEM	
HybriLift® energy recovery system	Equivalent to 210 kW engine power
Oil flow, front equipment and travel	2 × 420 l/min
Operating pressure, front equipment	330 bar
Operating pressure, travel and Heavy Lift mode	350 bar
Oil flow, swing	410 l/min, closed loop system
Operating pressure, swing	270 bar
Max swing speed	4,7 r/min
Swing torque	280 kNm

140R / 140ER, CRAWLER UNDERCARRIAGE

Standard undercarriage height	2,5 m, with pylon 3,5 / 4,0 / 4,7 / 5,2 / 6,3 m
Gantry undercarriage height	6,5 / 7,0 / 8,0 m with gantry and with pylon 8,0 / 8,7 / 9,2 m
Track shoes	850 / 1050 flat shoe
Travel speed	Max 3 km/h

140 M / 140 EM, RUBBER TYRE UNDERCARRIAGE

Standard undercarriage height	3,2 m, with pylon 4,2 / 4,7 / 5,4 / 5,9 m
Wheelbase	2 × 2 900 mm
Wheel gauge	4 180 mm
Tyres	12 pcs, pair assembled 16.00 - 25 solid tyres
Service brakes	Wet multiple disc brakes on two axles
Brakes	Hydraulic wet disc service brakes and spring applied multi disc parking brakes on driven axels
Drive speed	Max 5 km/h
Stabilizer pads	1350 × 1500 mm (w × l) stabilizer pads with spherical bearings. Large 1500 × 2000 mm (w × l) stabilizer pads with spherical bearings (Option).

140M / 140EM, RUBBER TYRE GANTRY

Standard undercarriage heights	6,6 / 8,0 m. With pylon 8,7 / 9,2 m
Gantry free space	5,3 m wide on wheel level, 4,9 / 6,5 m high on wheels
Wheelbase	2 x 2900 mm, wheel track width 7040 mm c - c
Wheel units	Six independently hydraulically suspended and steered oscillating axle units. Crab drive mode provides extreme agility.
Tyres	12 pcs. 16.00-25 solid tyres
Drive / Drive speed	Eight-wheel hydraulic driven wheels. / 0 - 5 km/h.
Brakes	Hydraulic wet disc service brakes on driven wheels.
Stabilization	Automatic stabilization levelling with 4-point hydraulic stabilizer cylinders. Individual manual control possibility. Pads 1500 x 2500 (w x l) mm. Large 3000 x 2500 mm pads as option.

140S / 140ES, RAIL UNDERCARRIAGE According to customer specification

140F / 140EF, FIXED UNDERCARRIAGE According to customer specification

REFILL CAPACITIES

Hydraulic oil	1 000 l net volume
Fuel tank	1 500 l
Engine oil	40 l
AdBlue tank	160 l

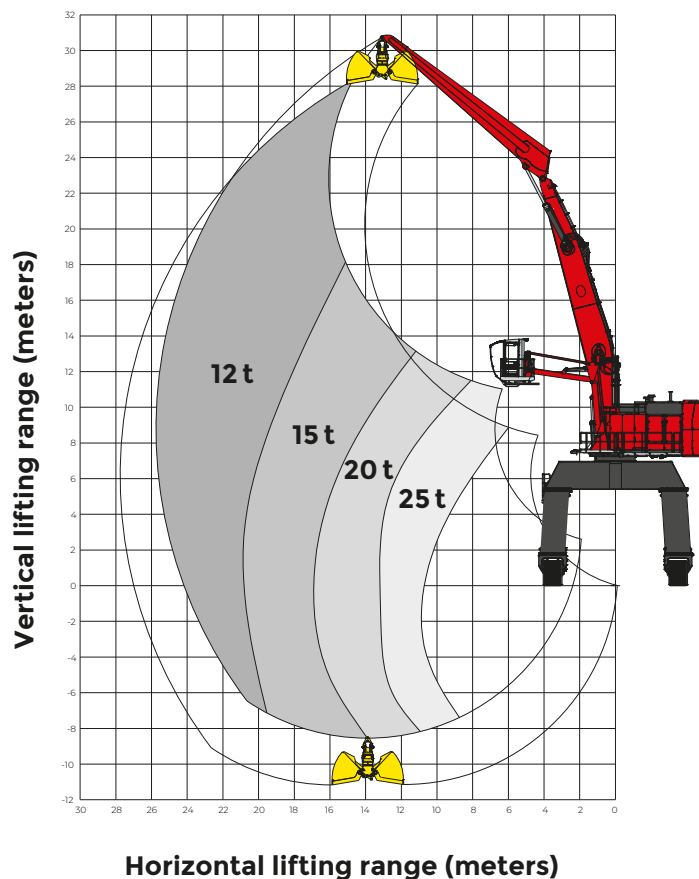
Specifications subject to change without prior notice. The photographs and/or drawings in this brochure are for illustrative purposes only. Refer to the Operator's Manual for instructions on the proper use of this equipment.

REACH FOR PRODUCTIVITY

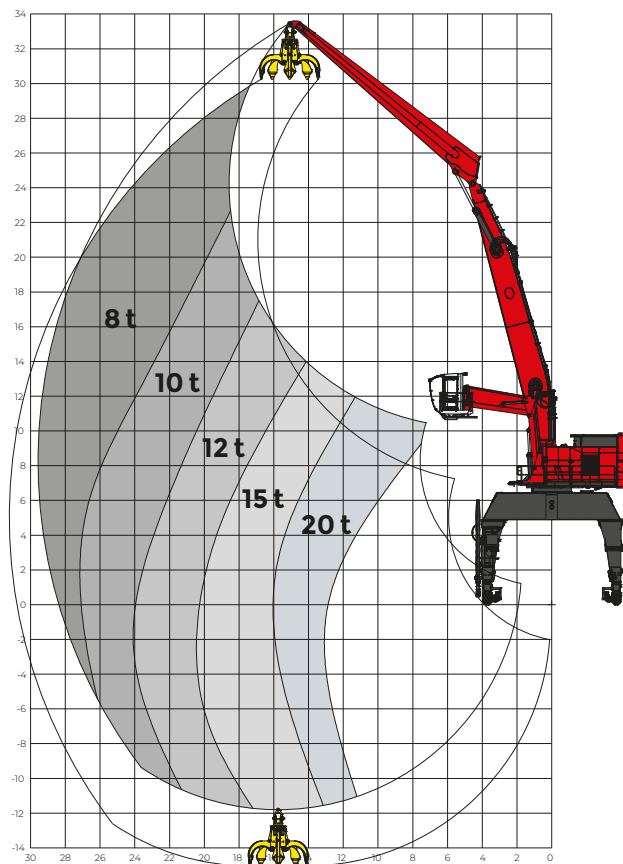
MANTSINEN 140 HYBRILIFT®

Contact your Mantsinen representative (www.mantsinen.com/en/sales/) for specific load diagrams for your operation.

Lifting capacity range with 14,5 m curved main boom and 12 m stick

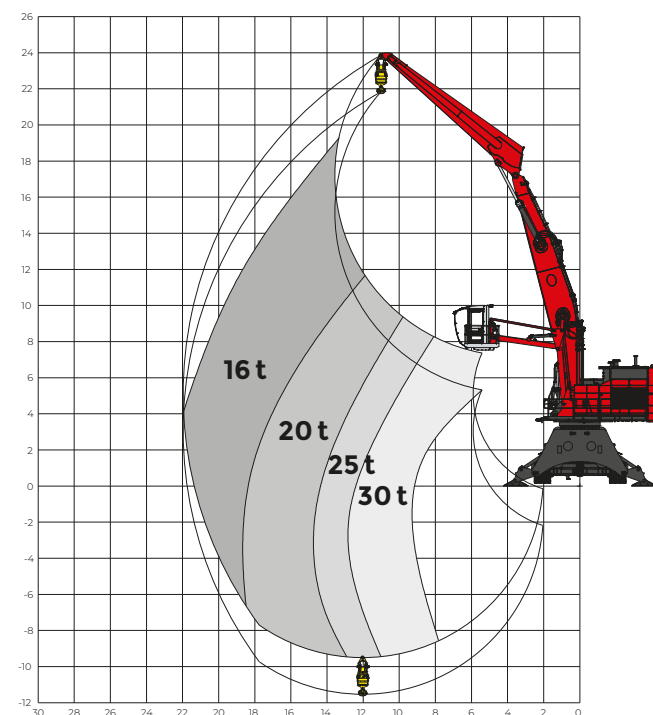


Lifting capacity range with 16,5 m curved main boom and 14 m stick



HEAVY LIFT

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



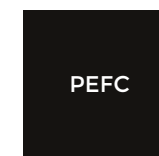


THE STRONGEST LINK IN THE GLOBAL LOGISTICS CHAIN

Mantsinen provides more efficiency, speed and capacity for our customers in global logistics chain, operating with heavy and basic industry raw materials and semi-finished products. We are the hands-on frontrunner in material handling.

MANTSINEN GROUP LTD OY

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