



**268** kW (Tier IIIa)  
**261** kW (Tier IVf)



**97 - 105** t



**18 - 23** m



**MAXCAB**

**MASTERCAB**

# 860E Hybrid

Mobile material handling machine

Tier IVf emission standards

# 860E Advanced. The E-Series. Hybrid



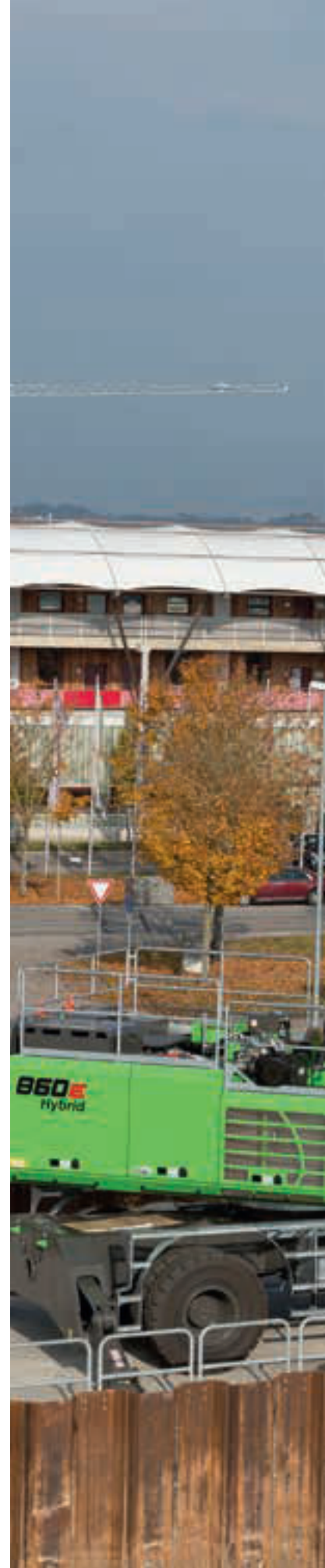
1962: rope-driven S833 with elevated operator cab

## What makes up the E-Series

- 60 years of experience in designing and constructing hydraulic material handling machines
- Uncompromisingly high performance in all areas: focus on material handling
- Technology that can be mastered: High-quality components without over-engineering
- Long product service life and high value retention

## Your top benefits:

- 1 Green Efficiency**  
Save fuel – reduce operating costs  
Work quietly – protect operator and environment
- 2 Peak performance**  
Durable mechanical systems – stressed parts optimized  
High speeds – high load capacities
- 3 Maximum operating comfort**  
Comfortable Maxcab operator cab – relaxed work  
SENCON – SENNEBOGEN Control System
- 4 Maximum safety**  
Safe entry and exit – no-slip steps  
State-of-the-art cameras – entire work area in view
- 5 Maintenance and service made easy**  
Easy fault diagnosis – central measuring points  
Easy maintenance – clear labeling
- 6 Consultation and support**  
3 production sites – 2 subsidiaries  
120 sales partners – over 300 service stations





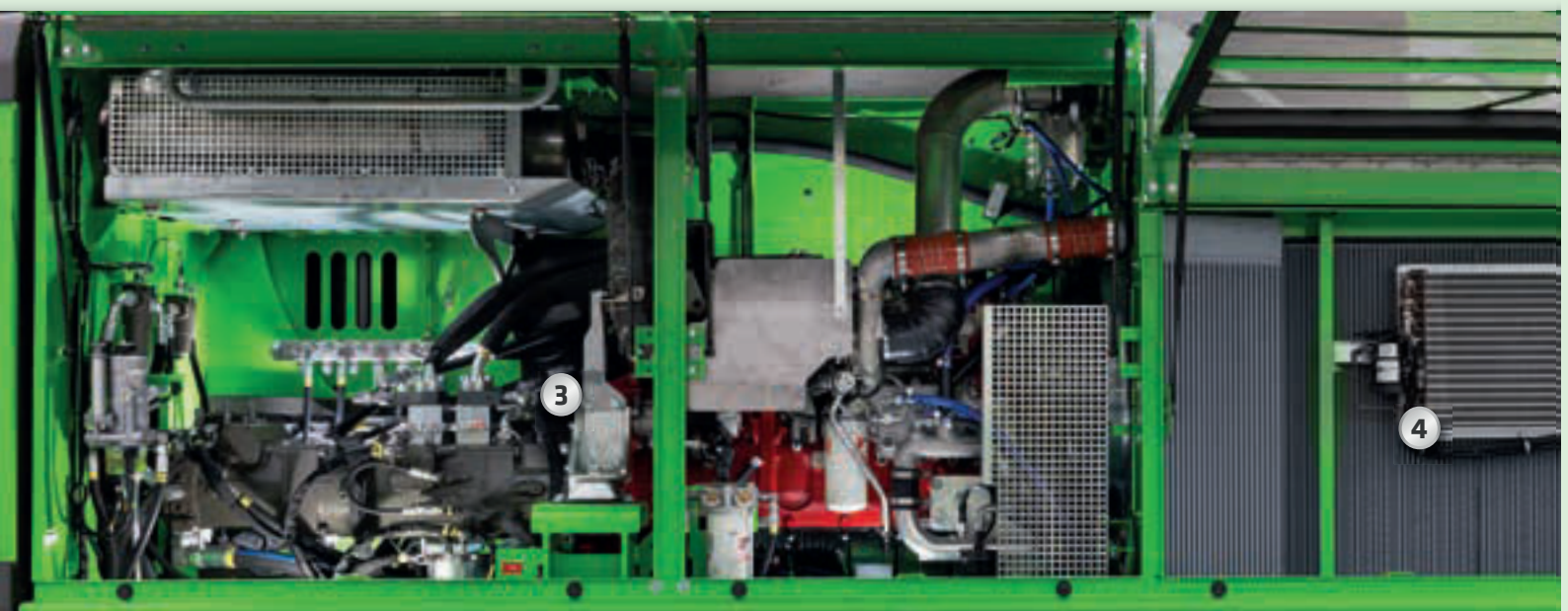
# 860E The E-Series. At a glance.

## Hybrid



### Four ways to save fuel

- Up to 20% savings: working in Eco Mode with reduced engine speed
- Idle automation reduces speed to 40% of operating speed
- Stop automation switches the engine off when not needed
- Optimized engine settings, reduced specific fuel consumption, state-of-the-art exhaust aftertreatment



### Quiet operation

- Consistently quiet operation thanks to decoupled engine mounts **3** and soundproofing in the doors
- Sound pressure level reduced by up to 4.5 dB; sound power level according to 2000/14/EC up to 2 dB lower than required

### High-capacity cooling

- Constant, reliable performance thanks to large-dimensioned and robust fans and coolers **4**
- Water and oil coolers with top-notch efficiency thanks to axial-piston pump and motor control and on-demand thermostatic control
- Charge-air cooler with mechanical drive



### Maximum safety

- No-slip work surfaces
- Peripheral railing 1
- 2 cameras to the right and rear
- Step grid with railing next to cab sliding door 2



### Smart cooler technology

- Standard features: automatic, fast and strong fan reversal for blowing out coolers and continuous cooling capacity
- Side-by-side coolers, easily accessible and clean cooling technology
- Fuel savings through optimized fan operation

### Powerful hydraulic system

- Strong pumps with power reserves
- Top efficiency thanks to large-dimensioned hydraulic valves and lines
- Extra-long change intervals of 4,000 operating hours through initial fill-up with special oil with extended service life when using SENNEBOGEN HydroClean 5

\* Optional



The premium cab.

Panoramic view

## Features

- optimum cab climate with automatic air conditioning system, partial tinted glass
- pleasant and equal temperature dispersion by means of 9 nozzles
- panoramic view
- climatic comfort seat with air suspension and air conditioning\*
- very quiet through optimized noise insulation
- Highest safety & comfort with sliding door, wide door opening
- ergonomically arranged operating controls for fatigue-free and relaxed working
- 12 V, 24 V, and USB charging sockets hands-free telephone preparation, document box
- various options: electric cooler behind`s, protective covers, seat air conditioning

## Our SENNEBOGEN joysticks

- consoles and ergonomic joysticks that move with the seat
- pleasant grip through ergonomic design
- precise control of all movements through direct and sensitive function activation
- quick access to all operating controls through optimized design of all push-buttons and switches



# 860E Maintenance and service made easy Hybrid



## Optimized for maintenance

- Fast and easy troubleshooting thanks to straightforward and clearly labeled electrical distributor
- Easy access to all service points on the machine
- Automatic central lubrication for equipment and slewing gear raceway



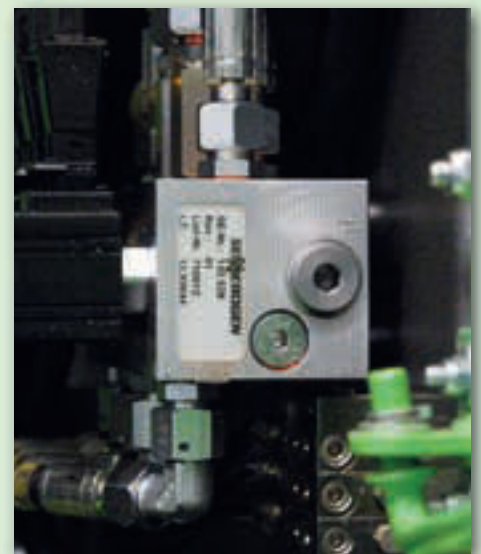
## HydroClean\*

- Optimal protection of hydraulic components thanks to 3  $\mu\text{m}$  micro-filter
- Cleaner hydraulic oil, longer service life



## Central reading points

- Easily accessible, central reading points
- Quickly inspect entire hydraulic system




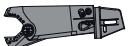



## Clear labeling

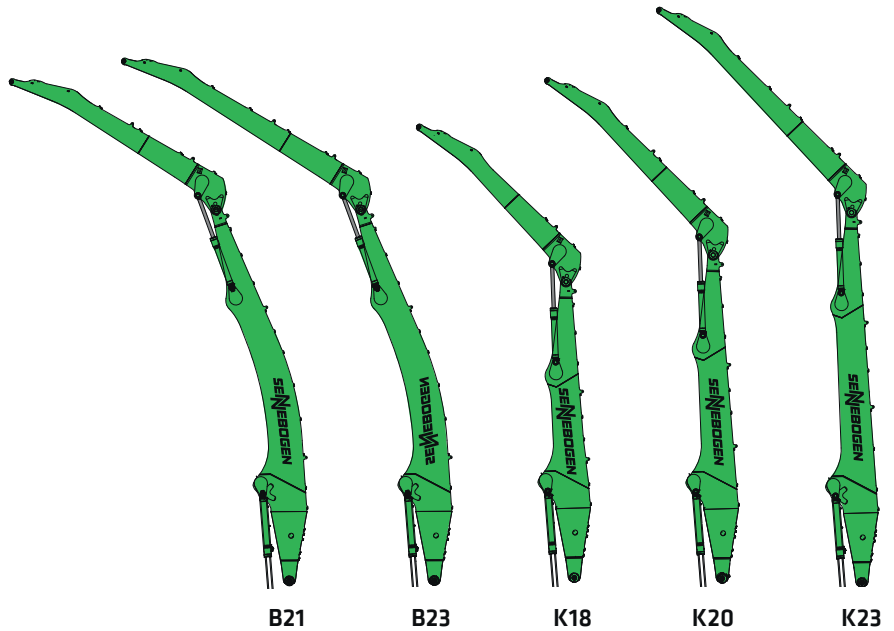
- All parts labeled with a unique part number
- Easy and reliable spare parts ordering

# 860E Hybrid Modular design – versatile solutions

## Attachments

-  Multi-shell grab
-  Double shell grab
-  Magnetic plate
-  Scrap metal shears
-  Vacuum traverse

## Equipment options (others available upon request)



## Cabs



Maxcab

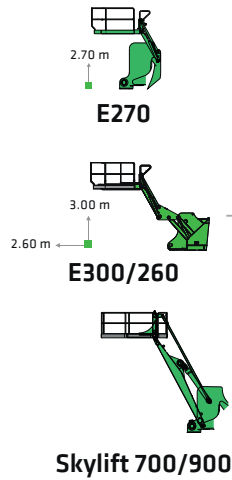


Maxcab Industry

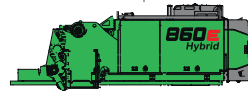


Mastercab

## Cab elevation



## Uppercarriage



Diesel-hydraulic drive



Electrohydraulic drive

## Options

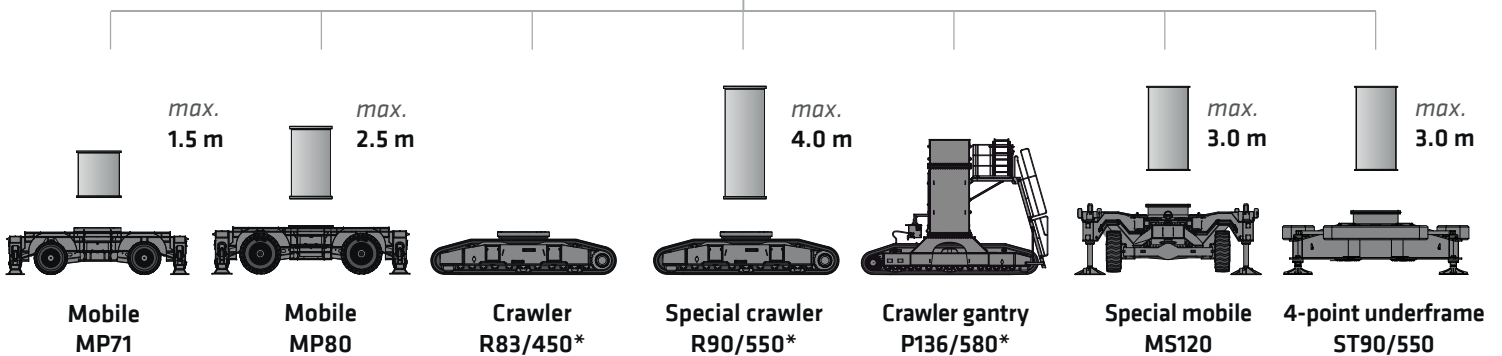


Engine line drum



Transformer

## Undercarriage variants





- Decade-long experience
- most advanced Computer simulation
- the greatest degree of stability and longest service life

**Reliable operation**  
through robust and FEM-  
optimized equipment

**Better illumination**  
of the work area through power-  
ful LED headlights\*

**Ideal overview**  
and safe working  
height thanks to  
stable cab elevation

**High load capacities**  
even when fully extended,  
thanks to massive cylinders

**Robust side cover**  
Made of recyclable  
sheet steel

**Safe entry and exit**  
thanks to railings, grip handles  
and no-slip steps

**Safe entry and exit**  
thanks to platform with railing

**High stability**  
due to the broad  
outrigger area



# 860E SENNEBOGEN Green Hybrid Hybrid Energy Recovery System



## Save 30 % energy with the Green Hybrid system

- A combination of hydraulic cylinders at the outrigger and nitrogen piston accumulators with gas recovers energy during the work procedure
- Use of the recovered energy during the next working cycle reduces the necessary engine power



### Safety

- Use of standard hydraulic components
- Energy storage in the enclosed rear section

### Reduce operating costs

- High quality components for a long service life and reliability
- Proven concept: successfully in use since 2013
- High efficiency of the system - already very effective in small lifting movements

# 860E Recommended grabs

## Hybrid

### SGM multi-shell grab (4 shells)



Design / size	Grapple capacity	Weight <sup>1</sup>		Maximum load capacity
		Shell shape		
		HO	G	
SGM	l	kg	kg	t
800.50-4	800	2245	2490	10.0
1000.50-4	1000	2345	2585	
1500.50-4	1500	2475	2830	
2000.50-4	2000	2660	3075	

### SGM multi-shell grab (5 shells)



Design / size	Grapple capacity	Weight <sup>1</sup>		Maximum load capacity
		Shell shape <sup>2</sup>		
		HO	G	
SGM	l	kg	kg	t
800.50	800	2420	2610	10.0
1000.50	1000	2480	2655	
1500.50	1500	2645	2930	
2000.50	2000	2800	3160	
2500.50	2500	3130	3615	
3000.50	3000	3250	3875	
3500.50	3500	3420	4140	

### Double-shell grab SGZ



Design / size	Grapple capacity	Weight <sup>1</sup>	Maximum load capacity
SGZ	l	kg	t
1500.50	1500	1950	12.0
2000.50	2000	2200	
2500.50	2500	2300	
3000.50	3000	2490	
4000.50	4000	2880	
2500.60	2500	3350	12.0
3000.60	3000	3530	
3500.60	3500	3720	
4000.60	4000	3920	

### Magnetic plates



Type series / model	Power	Deadweight	Breakaway force	Load-bearing capacity in kg
WOKO	kW	kg	kN	Slab (safety factor 2)
S-RSL 17	17.0	2500	460	23000
S-RLB 15	11.7	2400	380	19000
S-RLB 17	17.8	3300	640	32000
S-RLB 19	22.0	5090	790	39500
Recommended magnetic generator: 20-25 kW				

\*) Available upon request <sup>1</sup> Weight information without grapple suspension, stick bolts, hose system

<sup>2</sup> Half-open shells: shell sheet steel width 400 mm, 500 mm wide for 1250 l capacity and higher

# 860E Technical data, equipment

## Hybrid

### MACHINE TYPE

Model (type) **860**

### ENGINE

Power **261 kW/355 hp at 1,800 rpm (Tier IIIa)**  
**268 kW/364 hp at 1,500 rpm (Tier IV)**

Model **Cummins QSL 12- Tier IV**  
**Cummins QSM 11 - Tier IIIa**  
Direct injection, turbocharged, charge-air cooler, reduced emissions, EcoMode, automatic idle, auto-stop, fuel preheating

Cooling Water-cooled, cooler fan reversal

Diesel filter With water separator and heating system

Air filter Dry filter with integrated pre-separator, automatic dust discharge, main element and safety element, contamination indicator

Fuel tank **1000 l**

DEF tank **110 l**

Electrical system **24 V**

Batteries **2 x 180 Ah**, battery disconnect switch

Options

- Engine block heater
- Diesel refueling pump
- Jump-start terminals

### UPPERCARRIAGE

Design Torsion-resistant box design, precision crafted, steel bushings for boom bearings. Extremely service-friendly design, longitudinal engine

Central lubrication Automatic central lubrication for equipment and slewing gear raceway

Electrical system Central electrical distributor, battery disconnect switch

Cooling system 3-circuit cooling system with high cooling output, thermostatically regulated fan drive for oil cooler and water cooler, fan reversal for cleaning

Options

- Slewing gear brake via foot pedal
- LED lighting package
- Fire extinguisher
- Maritime climate varnish as corrosion protection
- Electric heater for hydraulic tank
- Low temperature package
- Hydraulically driven magnetic generator 20 kW/25 kW

### HYDRAULIC SYSTEM

Load sensing/LUDV hydraulic system, hydraulic pilot-controlled work functions, load limit sensing control

Pump type Swashplate-type variable-displacement piston pump, load pressure-independent flow distribution for simultaneous, independent control of work functions

Pump control Zero-stroke control, on-demand flow control – the pumps only pump as much oil as will actually be used, pressure purging, load limit sensing control

Delivery rate **2x 475 l/min** and **1x 274 l/min** for rotary drive in the closed circuit

Operating pressure **max. 340 bar**

Filtration High-performance filtration with long change interval

Hydraulic tank **900 l**

Control system Proportional, precision hydraulic actuation of work movements, 2 hydraulic servo joysticks for the work functions, additional functions via switches and foot pedals

Safety Hydraulic circuits with safety valves, secured emergency lowering of the equipment at engine standstill, pipe fracture safety valves for lift cylinder and stick cylinder

Options

- Bio-oil – environmentally friendly
- ToolControl for programming the pressure/rate for up to 10 tools
- Additional hydraulic circuit for shear attachment
- Load moment warning with capacity utilization indicator
- Overload safeguard with shutdown
- 60 µm pressure filter for attachments
- 3 µm hydraulic micro-filter - SENNEBOGEN HydroClean

### SLEWING DRIVE

Gearbox Compact planetary gear with slant-axis hydraulic motor, integrated brake valves

Parking brake Spring-loaded multi-disk brake

Slewing ring External gear slewing ring with 360° protection and pinion gear lubrication

Slewing speed 0-5.5 rpm, variable

# 860E Hybrid Technical data, equipment

## CAB **MAX** CR3

Cab type	Hydraulically elevating cab E270
Cab equipment	Sliding door, excellent ergonomics, automatic climate control, heated, air-suspension comfort seat, fresh/circulating air filter, joystick control, 12 V/24 V connections, SENCON
Options	<ul style="list-style-type: none"> <li>■ Active seat climatisation</li> <li>■ Cab E300/260 can be elevated 300 cm and moved forward 260 mm hydraulically</li> <li>■ Cab adjustment Skylift 700</li> <li>■ Cab adjustment Skylift 900</li> <li>■ Auxiliary heating system with timer</li> <li>■ Cabs with active carbon filter</li> <li>■ Armored-glass sunroof</li> <li>■ Safety side window and rear window</li> <li>■ Floor window for a better view</li> <li>■ Rolling shade for roof window and windshield</li> <li>■ Protective roof grating</li> <li>■ FOPS protective roof grating</li> <li>■ Protective front grating</li> <li>■ Radio with speakers</li> <li>■ Enlarged industrial cab with undivided armored glass windshield</li> <li>■ Mastercab large area port cab with second seat</li> </ul>

## ATTACHMENTS

Design	Decades of experience, state-of-the-art computer simulation, highest level of stability, longest service life, large-dimensioned and low-maintenance bearing points, sealed special bearing bushes, precision-crafted, quick-release couplings on the connections - open/close/rotate grapple
Cylinders	Hydraulic cylinders with high-quality sealing and guide elements, end position damping, sealed bearing points
Options	<ul style="list-style-type: none"> <li>■ Ball valves in the hydraulic lines for quick and easy grapple switching</li> <li>■ Maritime climate varnishing</li> <li>■ Maritime climate coating of all cylinders, nickel-plated and chrome-plated</li> <li>■ Float position of the equipment</li> <li>■ Adjustable hoisting limiter/stick limiter</li> <li>■ LED Lighting</li> <li>■ Camera on a stick</li> </ul>

## UNDERCARRIAGE

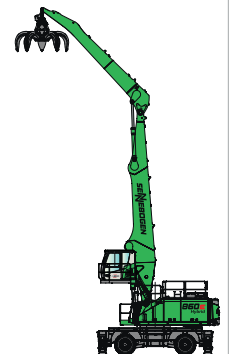
Design	MP71 E mobile undercarriage with integrated 4-point outrigger system, hydraulic locking pendulum steering axle and pendulum axle cylinder with pipe fracture safety valves
Drive	All-wheel drive powered by a variable-displacement hydraulic motor with direct-mounted, automatic brake valve and 2-gear power shift transmission Planetary axles with integrated steering cylinder and dual-circuit service brake
Parking brake	Spring-loaded multi-disk brake
Tires	Solid-rubber tires <b>14.00-24, 8</b>
Speed	<b>0-5.4 kph</b> Tier I, <b>0-10 kph</b> Tier II
Options	<ul style="list-style-type: none"> <li>■ Solid-rubber tires <b>16.00-25, 8</b></li> <li>■ Individual outrigger control for stability on uneven ground</li> <li>■ Traction drive protection</li> <li>■ Shunting coupler</li> <li>■ MP80: Solid rubber tires 23,5 - 25, 4-fach</li> <li>■ MS120: Solid rubber tires 23,5 - 25, 4-fach</li> </ul>

## ELECTRIC DRIVE **eGREEN**

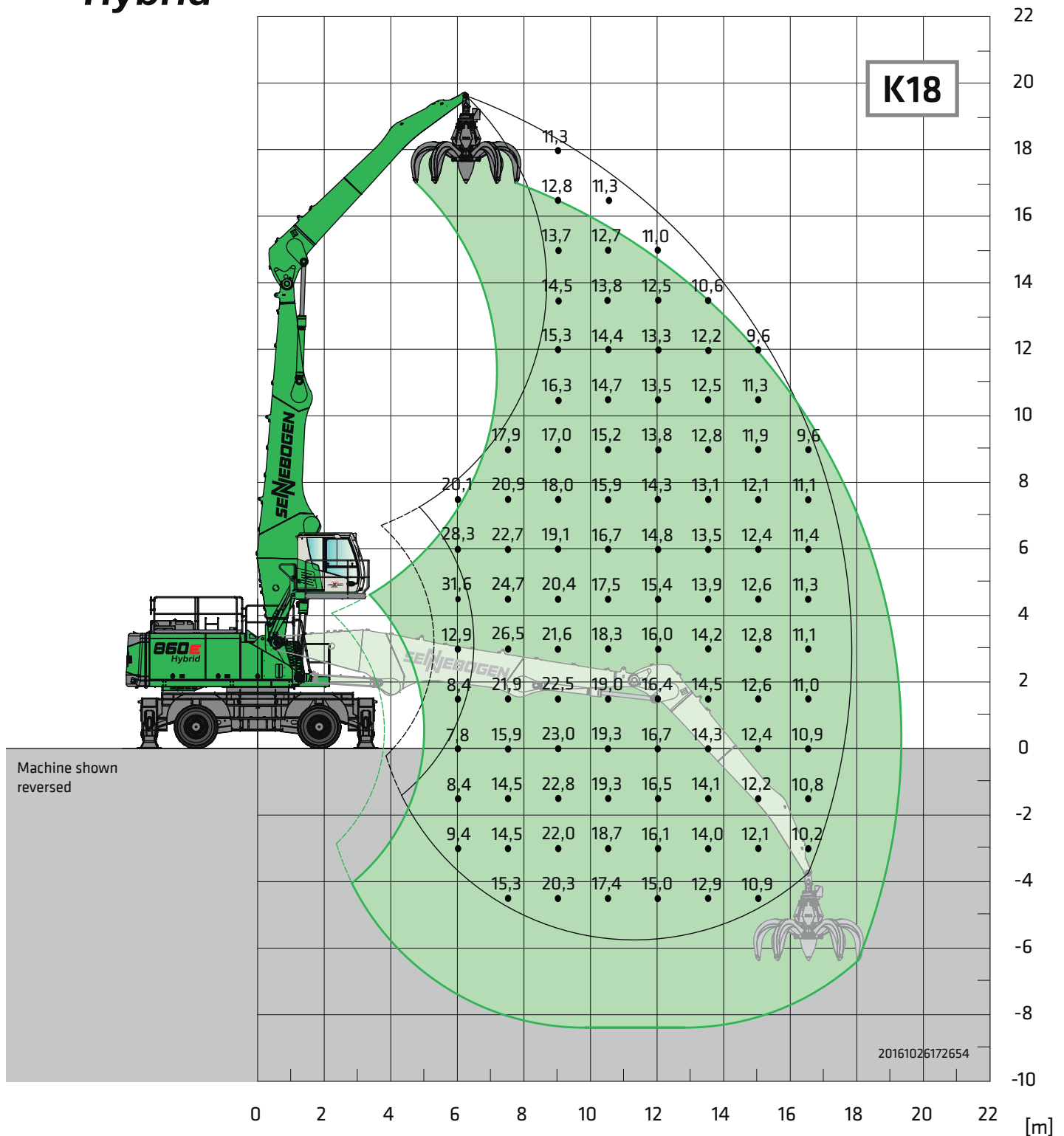
Option	<ul style="list-style-type: none"> <li>■ Power: <b>250 kW, 400 V, 50 Hz</b> Total connected load: 410 kVA, 500 A machine side fuse (alternatively 630 A with magnet system) for 400 V - star-delta connection motor start</li> <li>■ Advantages: Lowest operating costs, quiet and virtually vibration-free work, long service life of hydraulic components</li> </ul>
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## OPERATING WEIGHT

Mass	<b>approx. 93,500 kg</b> 860 M basic machine with K18 equipment and 3000 l multi-shell grab
Notice	Operating weight varies by design.



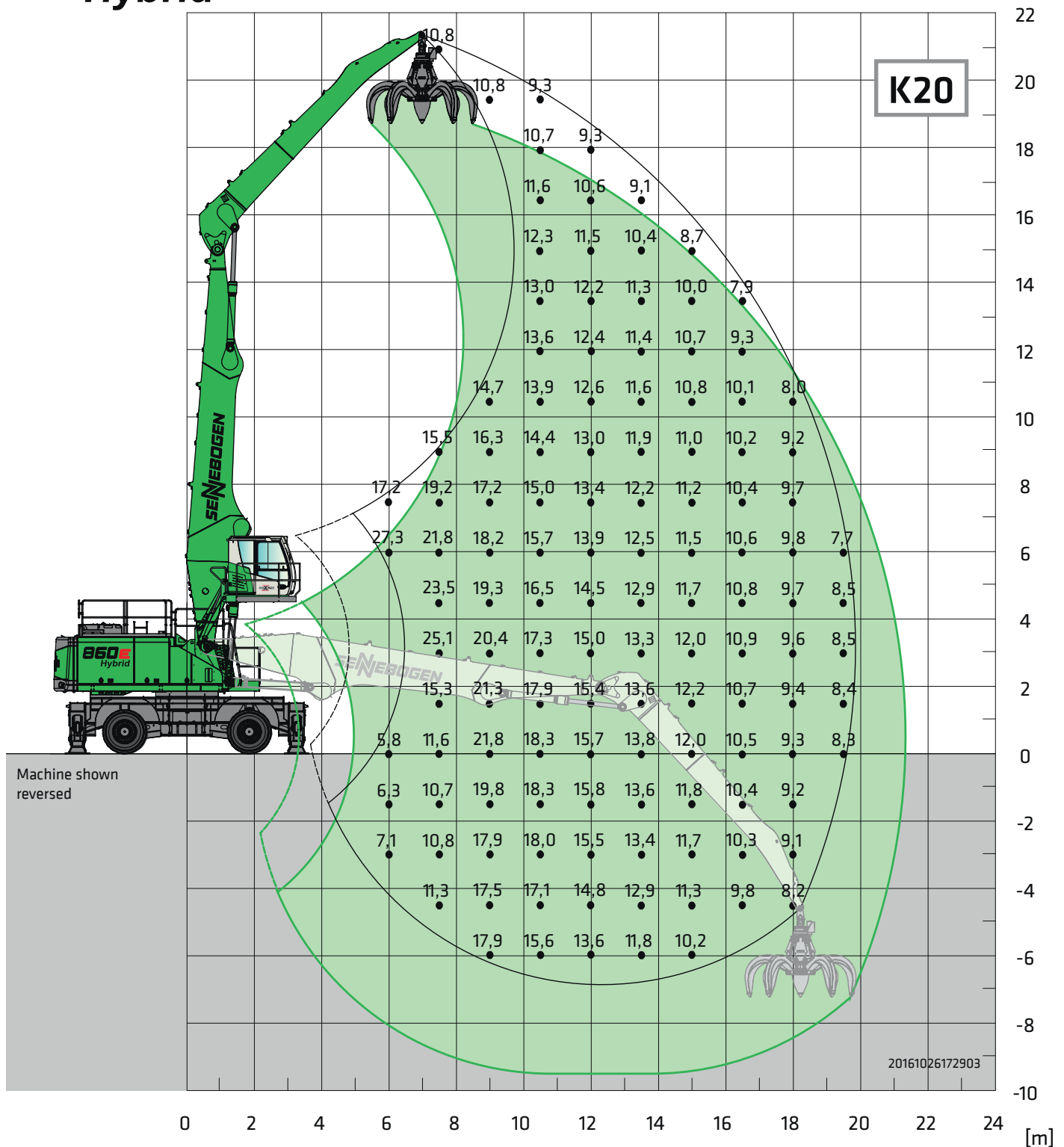
# 860E Load ratings Hybrid



<b>Undercarriage</b>	<b>MP71</b>	<b>Compact boom Dipper stick</b>	<b>10.8 m 7.8 m</b>	<b>Cab</b>	<b>Maxcab E270, hydraulic elevation feature</b>
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All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.

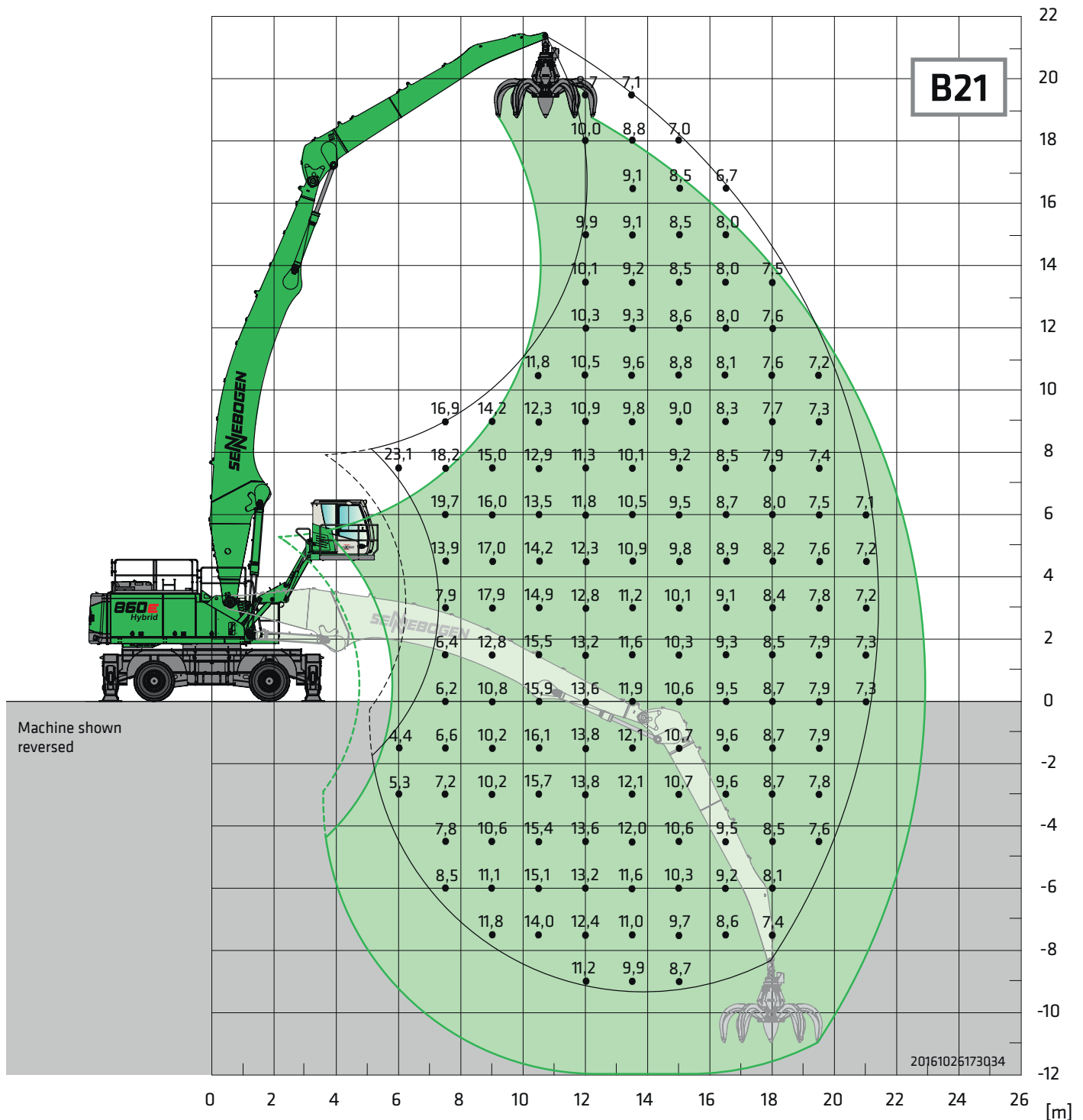
# 860E Load ratings Hybrid



**Undercarriage** MP71      **Compact boom** 11.8 m      **Cab** Maxcab E270, hydraulically elevating  
**Dipper stick** 8.8 m

All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.

# 860E Load ratings Hybrid



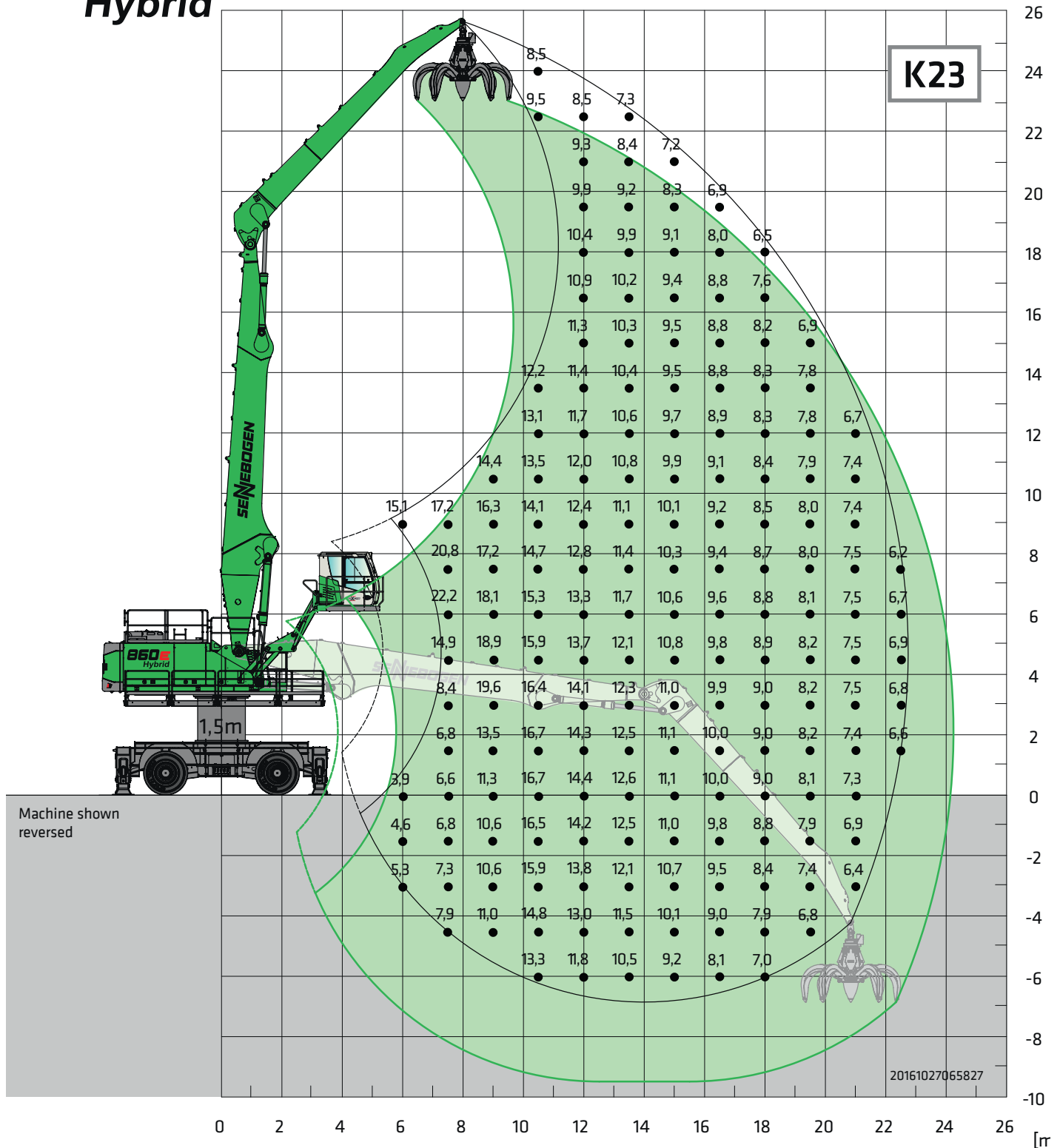
**Undercarriage** MP71      **Compact boom** 13.8 m      **Cab** Maxcab E300/260, hydraulic elevation and tilt feature  
**Dipper stick** 8.8 m

All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.



# 860E Load ratings

## Hybrid

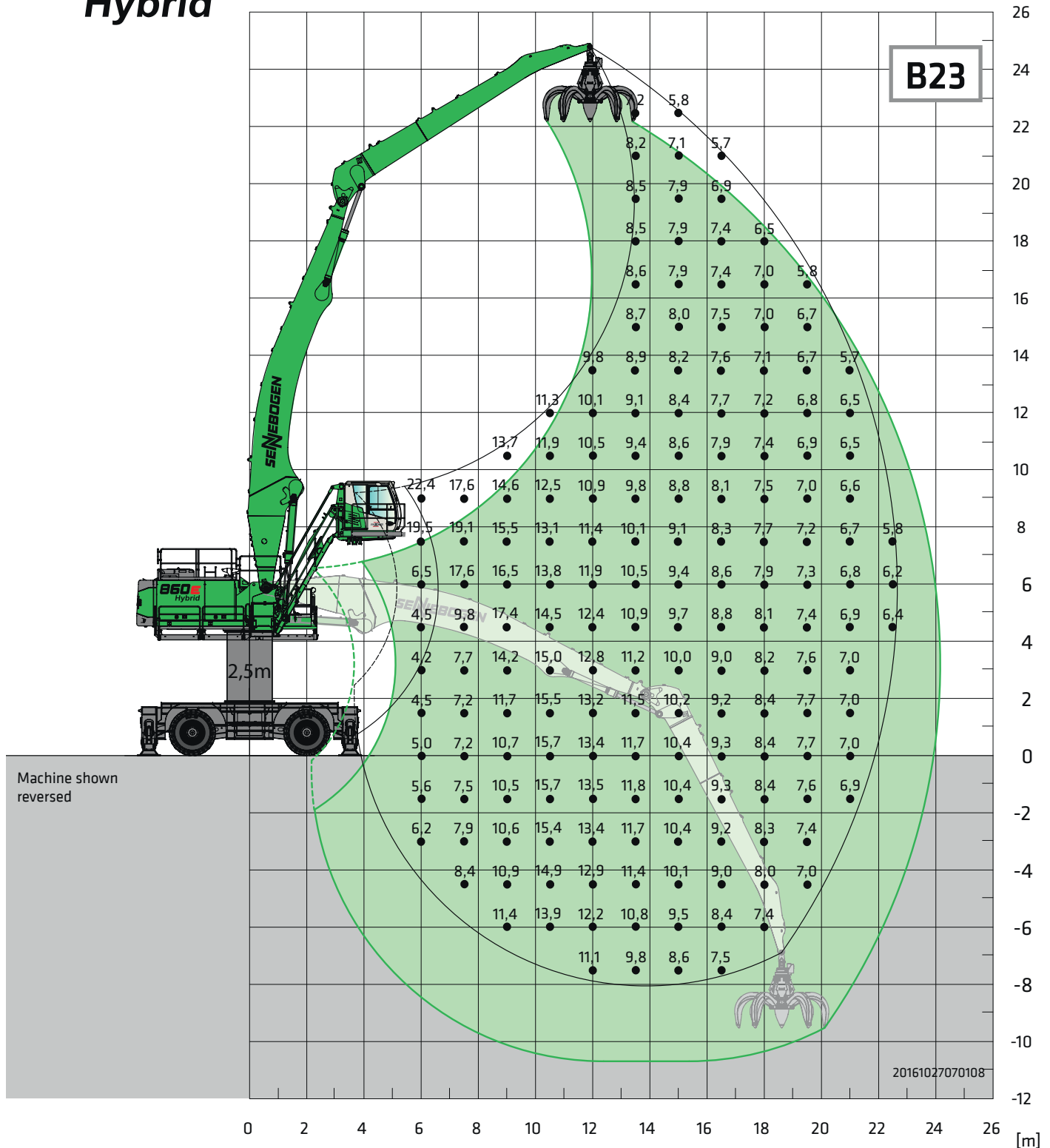


<b>Undercarriage Pylon</b>	<b>MP71 1.5 m</b>	<b>Compact boom Dipper stick</b>	<b>13.5 m 10.2 m</b>	<b>Cab</b>	<b>MaXcab E300/260, hydraulically elevating</b>
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All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.

# 860E Load ratings

## Hybrid



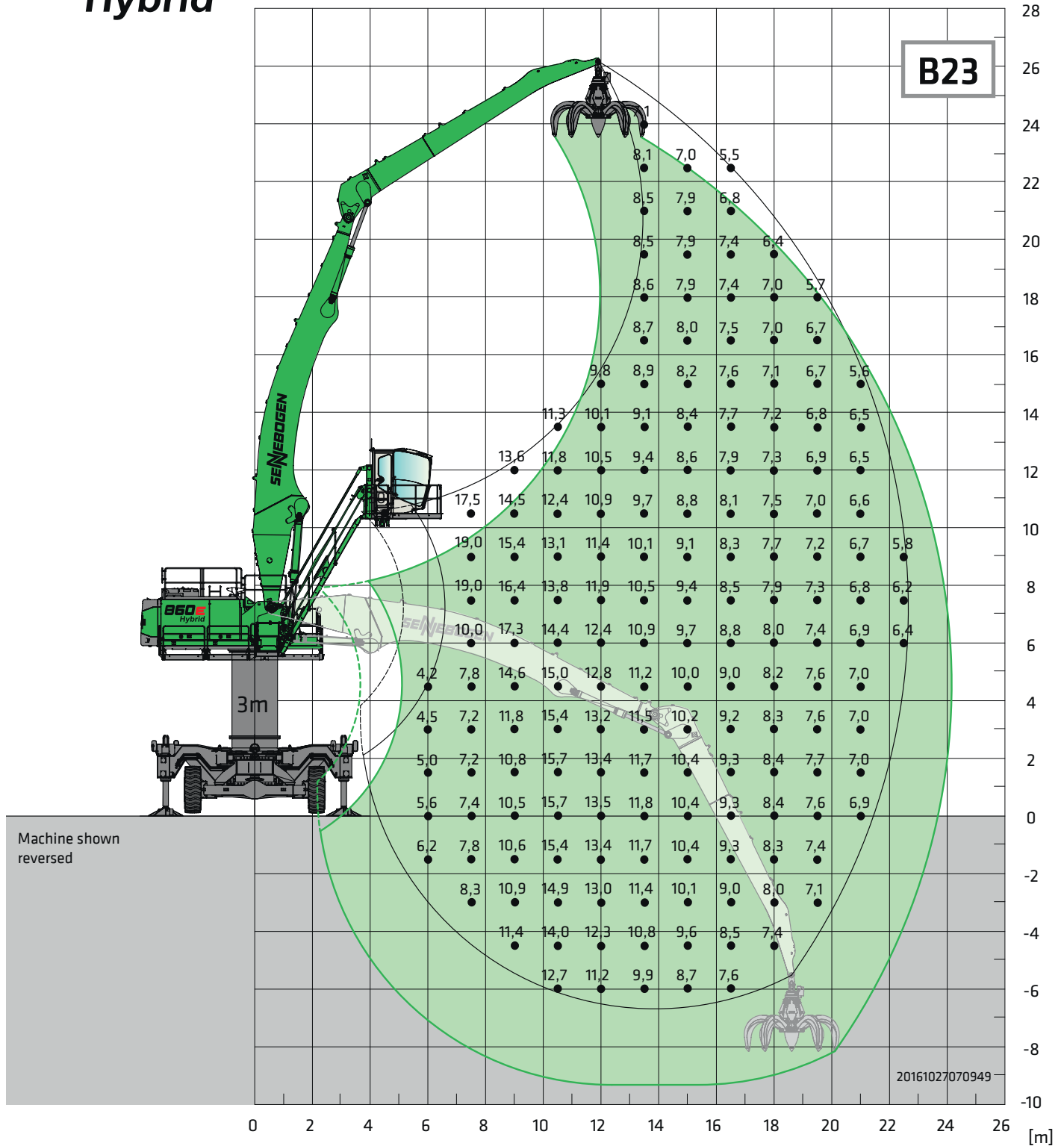
<b>Undercarriage Pylon</b>	<b>MP80 2.5 m</b>	<b>Compact boom Dipper stick</b>	<b>13.8 m 10.2 m</b>	<b>Cab</b>	<b>Maxcab Skylift 700, hydraulically elevating</b>
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All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.



# 860E Load ratings

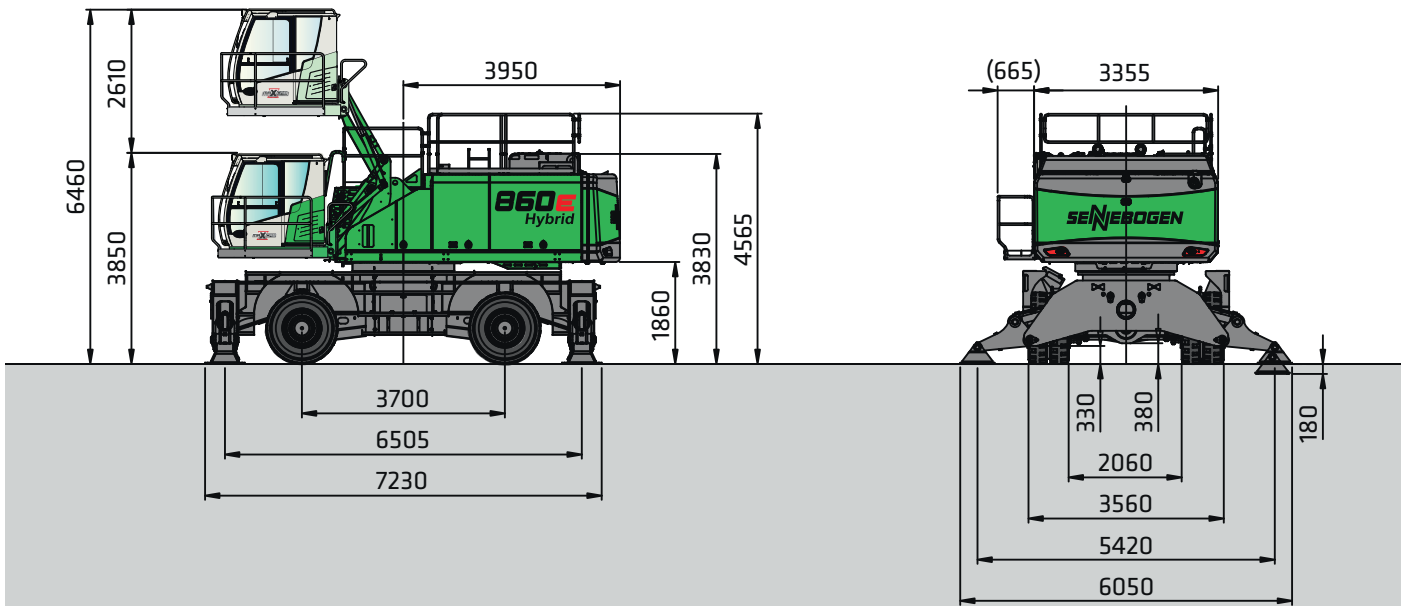
## Hybrid



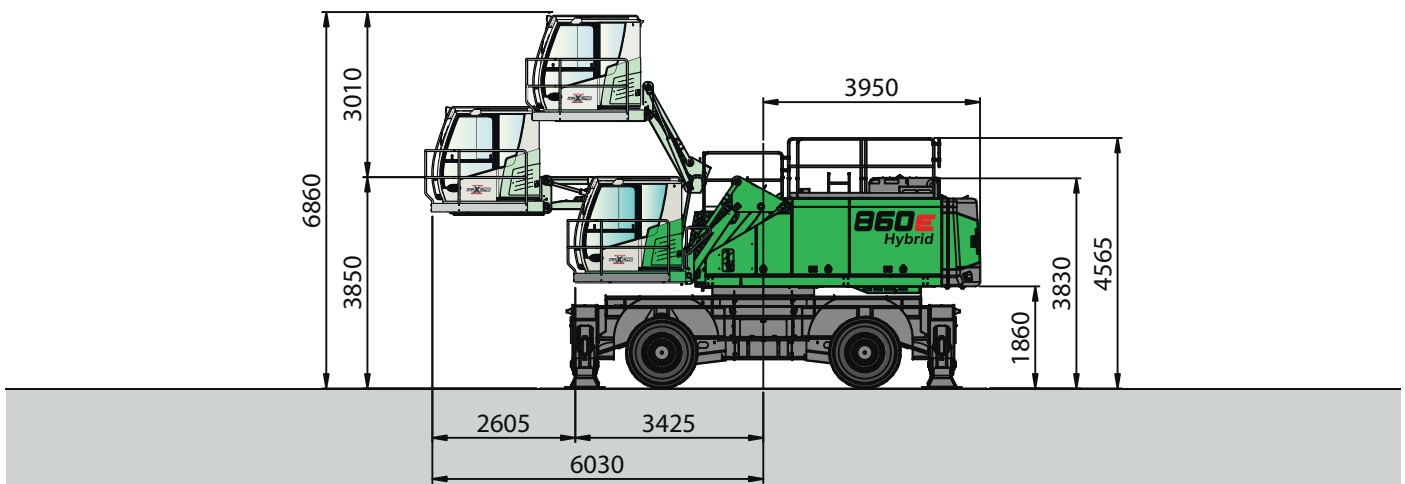
<b>Undercarriage Pylon</b>	<b>MS120 3.0 m</b>	<b>Compact boom Dipper stick</b>	<b>13.8 m 10.2 m</b>	<b>Cab</b>	<b>Mastercab Skylift 900, hydraulic elevation</b>
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All values are in tons (t) and are 75% of the static tipping load or 87% of the hydraulic lifting force in accordance with ISO 10567, and apply at the required operating temperature in the Green Hybrid system. They apply 360° on solid, level ground. Safe working loads include attachments such as multi-shell grapples, magnets, etc. According to harmonized EU standard EN 474-5, hydraulic excavators used for lifting must be equipped with pipe fracture safety devices on the hoist cylinders and an overload warning device.

# 860E Dimensions Hybrid

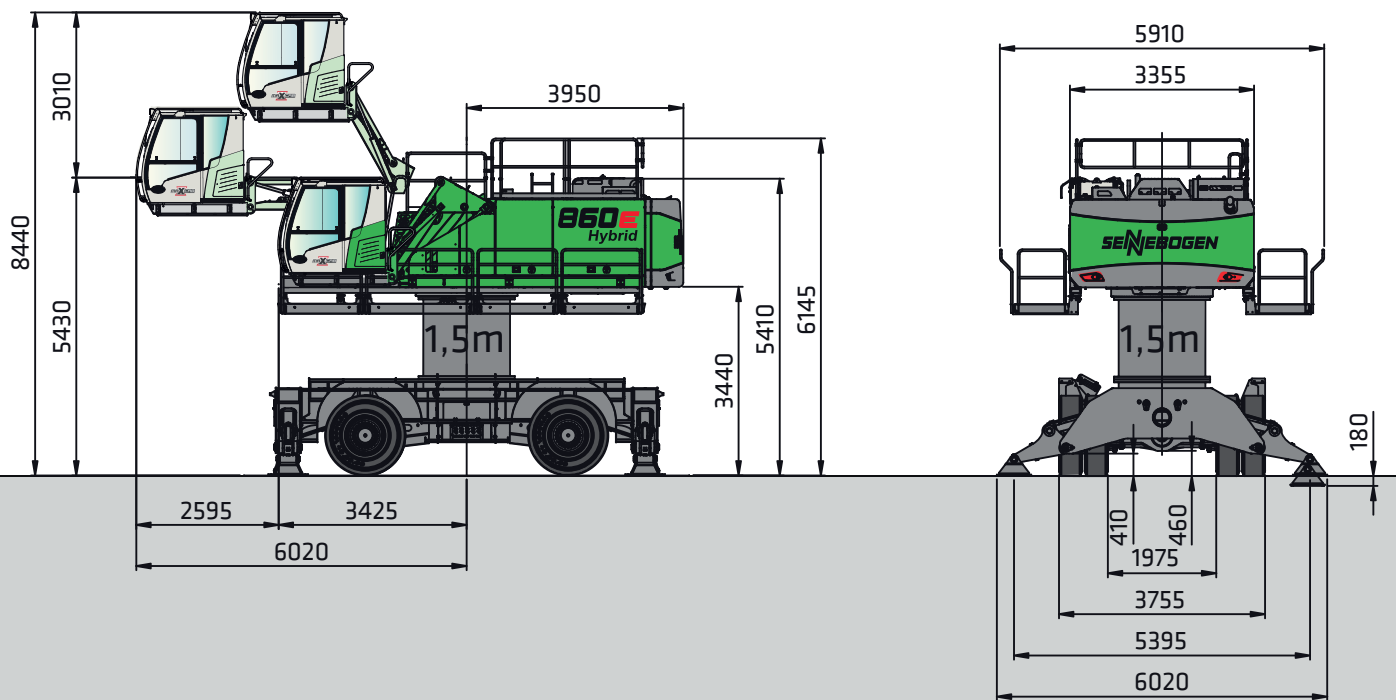


860 M with MP71 undercarriage and Maxcab E270 cab with hydraulic elevation feature

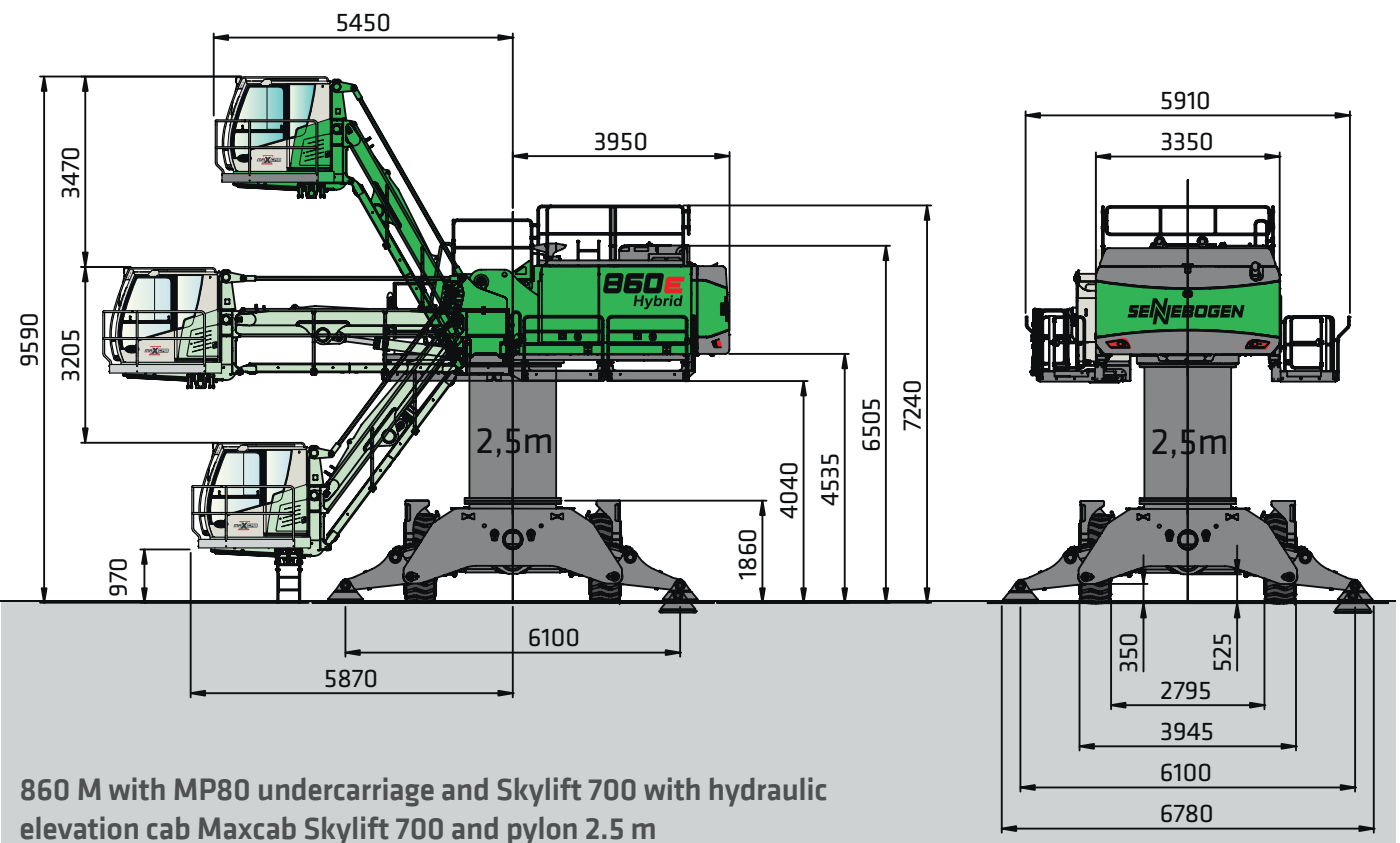


860 M with MP71 undercarriage Maxcab E300/260 cab with hydraulic elevation and tilt feature

# 860E Dimensions Hybrid

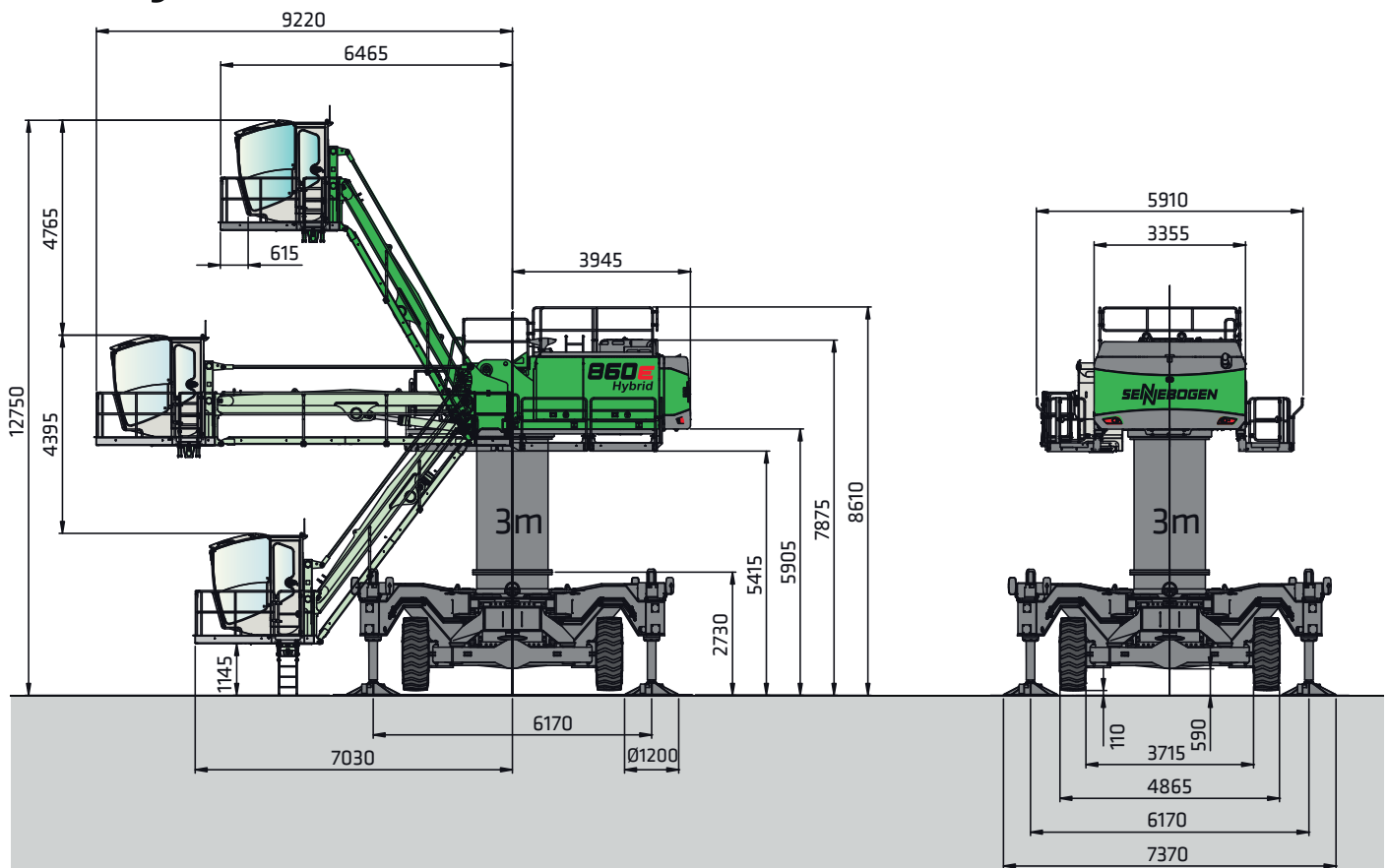


860 M with MP71, undercarriage, 16.00 - 25 solid-rubber tires and hydraulic elevation cab Maxcab E300/260 and pylon 1.5 m

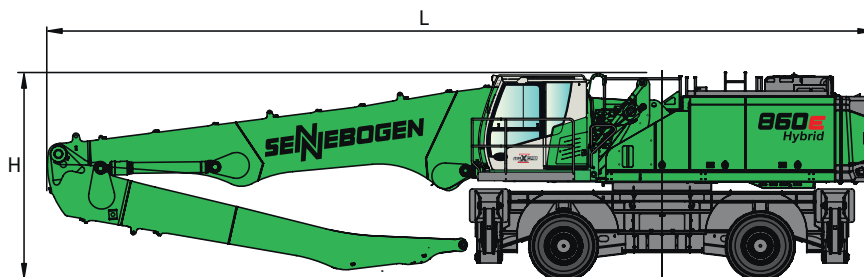


860 M with MP80 undercarriage and Skylift 700 with hydraulic elevation cab Maxcab Skylift 700 and pylon 2.5 m

# 860E Transport dimensions Hybrid



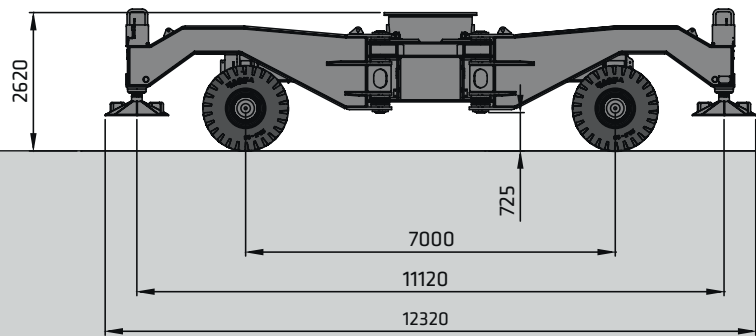
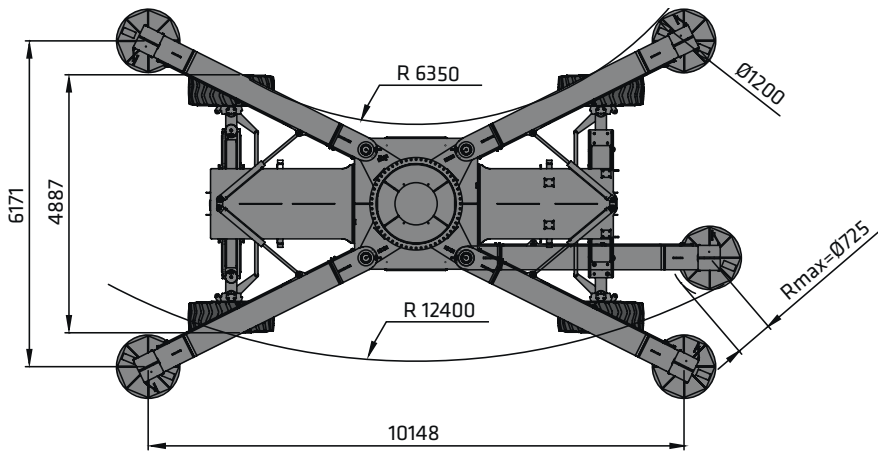
860 M with MS120 undercarriage and Skylift 900 with hydraulic elevation cab Mastercab and pylon 3.0 m



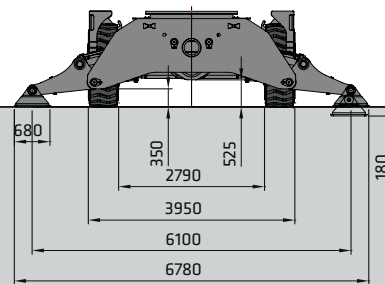
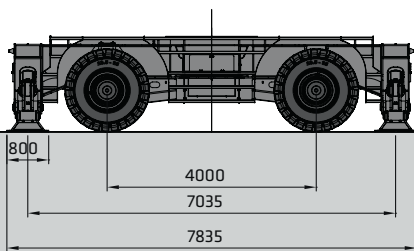
860 M with MP71 undercarriage

	Compact boom	Dipper stick	Transport length (L)	Transport height (H)
K18	10.8 m	7.8 m	15.75 m	4.10 m
K20	11.8 m	8.8 m	16.60 m	4.10 m
B21	13.5 m	8.8 m	18.30 m	3.90 m*
K23	13.5 m	10.2 m	18.30 m	3.95 m*
B23	13.8 m	10.2 m	18.60 m	4.10 m*

# 860E Dimensions Hybrid

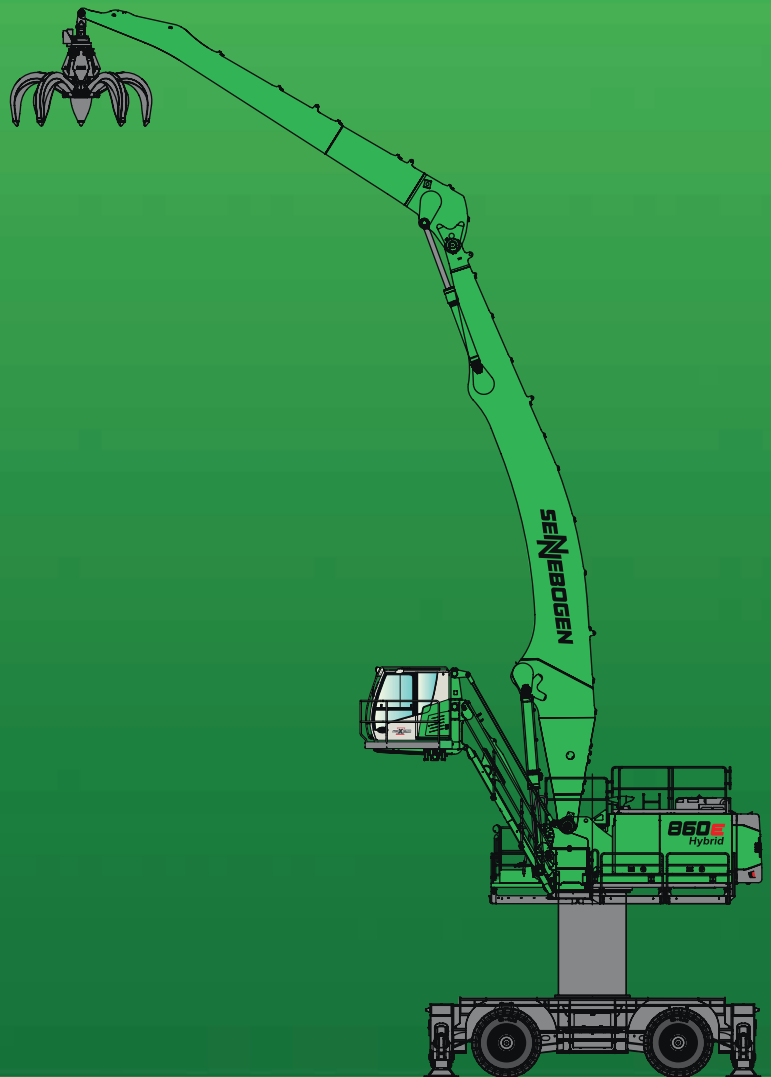


MS 120 undercarriage



MP80 undercarriage

# 860E Hybrid



This catalog describes machine models, scopes of equipment of individual models, and configuration options (standard equipment and optional equipment) of the machines supplied by SENNEBOGEN Maschinenfabrik. Machine illustrations can contain optional equipment and supplemental equipment. Actual equipment may vary depending on the country to which the machines are delivered, especially in regard to standard and optional equipment.

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