

**ECO**  
EFFICIENCY  
IN ACTION

The Kalmar

# ELECTRIC MEDIUM FORKLIFT



ECG90-180  
Lithium-ion or Lead Acid

 **KALMAR**

# The time is **NOW** to go electric

Kalmar's electrically powered 9-18 tonne forklift trucks will help improve the eco-efficiency of your operations while maintaining the highest levels of productivity and safety. With a choice of either Lead Acid or Lithium-ion batteries and different charging solutions, we can work with you to design a solution that will deliver for your business.

#### **Eco-efficiency built in.**

Being electrically powered, your forklift truck will produce zero carbon emission at source, making them cleaner and safer to operate. You can cut your carbon emissions even further by using green energy sources where available or start to generate and use your own power. Getting an electrically powered forklift is only the start of our eco-efficient journey. One that we will be with you every step of the way.

#### **Productive by nature.**

With an electric powered driveline your drivers will notice a big difference with faster and smoother acceleration and more responsive handling while still being able to lift up to 18 tonnes efficiently and safely. Less time will be spent servicing and maintaining the electric powertrain since it has less moving and mechanical parts, plus you will be able to keep it running optimally within a broad range of temperatures, with Kalmar's Thermal Management System fitted to the Li-ion battery version as standard.

#### **Safety in focus.**

Kalmar's range of electrically powered 9-18T forklift trucks offer highly responsive handling and superior visibility from the cabin, helping to keep your driver safe and in control at all times. Your drivers and co-workers will also benefit from the reduced noise and vibrations with a smooth and quiet electric powertrain. There are also a large range of safety options available that can further enhance the safety of your equipment and the drivers operating them.



**BE SAFE**

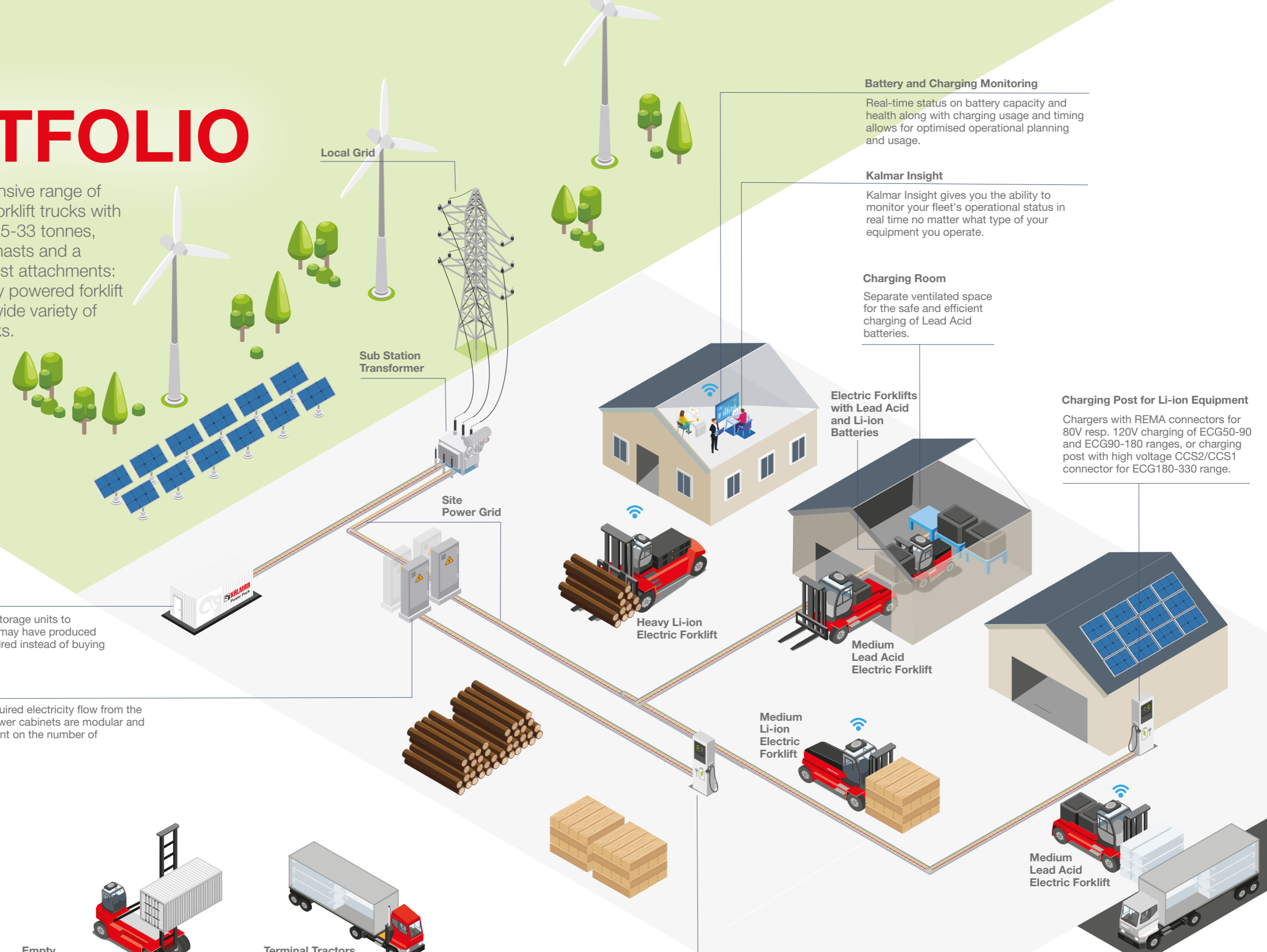
#### **A full range of electrically powered forklift trucks.**

Kalmar offers an extensive range of electrically powered forklift trucks with a choice of two different battery technologies, lifting capacities up to 33 tonnes, different masts and numerous attachments we can work with you to design a solutions that delivers against your exact requirements.



# Our electric PORTFOLIO

Kalmar offers an extensive range of electrically powered forklift trucks with lifting capacities from 5-33 tonnes, three different lifting masts and a wide range of specialist attachments: making our electrically powered forklift trucks suitable for a wide variety of material handling tasks.



## Battery and Charging Monitoring

Real-time status on battery capacity and health along with charging usage and timing allows for optimised operational planning and usage.

## Kalmar Insight

Kalmar Insight gives you the ability to monitor your fleet's operational status in real time no matter what type of your equipment you operate.

## Charging Room

Separate ventilated space for the safe and efficient charging of Lead Acid batteries.

## Electric Forklifts with Lead Acid and Li-ion Batteries

## Charging Post for Li-ion Equipment

Chargers with REMA connectors for 80V resp. 120V charging of ECG50-90 and ECG90-180 ranges, or charging post with high voltage CCS2/CCS1 connector for ECG180-330 range.

## Additional Energy Storage

You can use additional energy storage units to capture excess power that you may have produced to use at a later time when required instead of buying from the grid.

## Power Cabinets

Power cabinets manage the required electricity flow from the grid to your charging points. Power cabinets are modular and the number required is dependent on the number of charging points required.



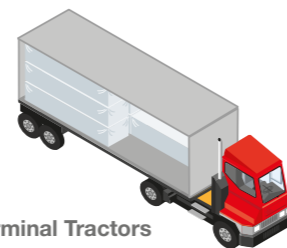
## Reachstackers

Kalmar offers a choice of electrically powered reachstackers with a wide range of lifting applications, battery solutions and 42 to 45 tonne lifting capacities.



## Empty Container Handler

Kalmar is currently developing a range of electrically powered empty container handlers that can run up to 17 hours on a single charge, which will be able to lift 8-11 tonnes up to 2 containers at a time and stack them up to 8+1 containers high.



## Terminal Tractors

Kalmar's T2E+ electrically powered terminal tractor has been designed specifically for distribution centres and container terminals. There is a choice of different battery solutions designed to meet your operational requirements.

## Charging Post

# GOOD

for business

Reducing your emission shouldn't come at a cost, it should be beneficial to both the environment and your bottom line.

Kalmar's electric forklift trucks deliver on both accounts. They are just as powerful and efficient as diesel models without producing any harmful carbon emissions. In fact, they produce zero emissions at source, which will help you substantially cut your fuel bills, while improving your environment credentials.

### It pays to go electric.

With our electrically powered forklift trucks, you will benefit from reduced fuel costs, spend up to 50% less on servicing - as electric machines have less moving parts - and longer service intervals, both helping to maximise machine availability. Even though electric forklift trucks cost a little more than diesel models, the payback period can be as little as two years. After this time, the savings really start to add up.

### Eco-efficiency at work.

Reducing the fuel consumption of your equipment also reduces your emissions, which will enhance your environmental reputation and help you meet current and future emissions standards. Together we can shape the future of cargo handling, with safe and eco-efficient solutions that improve your every move.



# GREAT

for the environment

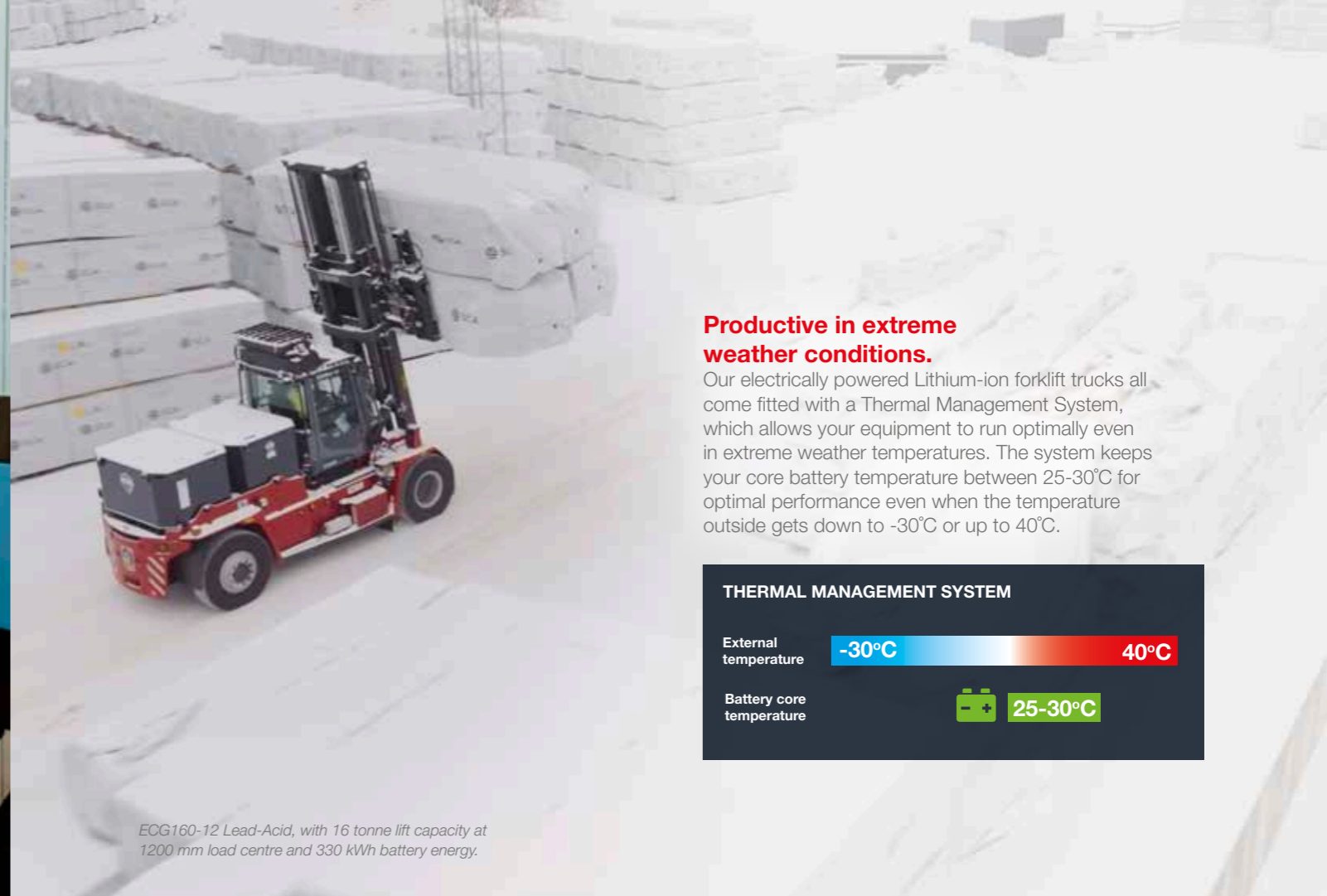
### What type of battery solution is right for you?

Kalmar offers two types of battery technology to power its forklifts, Lead Acid and Lithium-ion. Here is a chart that demonstrates the difference between the two battery types so you can decide which is the right solution for your operations. The Lead-Acid battery is generally removed after a shift and then fully charged prior to being refitted onto the forklift, it can be charged directly in a safe location. The Li-ion battery can be continuously recharged during operational downtime or statutory break.

	Lead-Acid	Lithium-ion
CHARGING PATTERN	<p>Lead Acid Discharge/Charge Cycle</p>	<p>Lithium-ion Discharge/Charge Cycle</p>
FEATURES	<ul style="list-style-type: none"> <li>Cell lifespan up to <b>1,400</b> cycles (1 cycle = 80% of nominal capacity)</li> <li>Battery efficiency <b>~70%</b></li> <li>Maintenance required: regular water topping and cleaning</li> <li>Requires ventilated charging space</li> <li>2 or 3 shift operation possible with exchange batteries. One battery set per shift.</li> </ul>	<ul style="list-style-type: none"> <li>Cell lifespan up to <b>4,000</b> cycles (1 cycle = 80% of nominal capacity)</li> <li>Battery efficiency <b>~95%</b></li> <li>Maintenance required: No regular maintenance</li> <li>No special requirements for charging space</li> <li>Requires time slots for opportunity charging defined by discharging:charging ratio.</li> </ul>
YOUR OPERATIONS	<p>What is your operational cycle?</p> <p><b>8hrs (6-12hrs)</b></p>	<p>What is your operational cycle?</p> <p><b>8hrs (4-8hrs)</b></p>
	<p>Are you operating more than one shift?</p> <p></p>	<p>Are you operating more than one shift?</p> <p></p>
	<p>Charging time  7 - 8 hours</p> <p>Cooling time  7 - 8 hours</p>	<p>Charging time  ~2 hours</p>

Based on full charge 80%

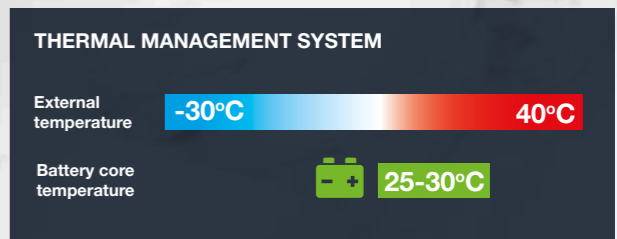
ECG160-12 Lead-Acid, with 16 tonne lift capacity at 1200 mm load centre and 260 kWh battery energy.



The **POWER** is in your hands

**Productive in extreme weather conditions.**

Our electrically powered Lithium-ion forklift trucks all come fitted with a Thermal Management System, which allows your equipment to run optimally even in extreme weather temperatures. The system keeps your core battery temperature between 25-30°C for optimal performance even when the temperature outside gets down to -30°C or up to 40°C.



ECG160-12 Lead-Acid, with 16 tonne lift capacity at 1200 mm load centre and 330 kWh battery energy.

**Eco-efficient by nature.**

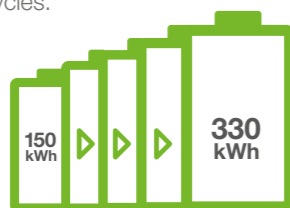
By combining four highly efficient AC-motors [2 for the traction drive and two for the hydraulic pumps] all with direct drive, removing the transmission you get a powertrain combination that will deliver on power and productivity while producing zero carbon emissions at source.

This electrically powered solution has been designed to offer a sustainable and highly efficient forklift range, with great performance, high productivity and is safe and smooth to operate with minimised energy losses - giving you more running hours on each charge. Regenerative power from the braking system returns power to the batteries, further enhancing the overall efficiency of the system. You just need to choose the optimal battery solution for your operation; Lead Acid or Lithium-ion.

**Lead Acid.**

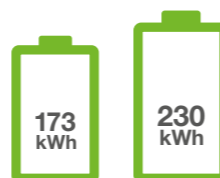
Kalmar's Lead Acid batteries come fully self-contained and can be charged in situ or removed from your forklift and charged in a ventilated charging space. Recharging your Lead Acid batteries normally takes place over night, if you need to run continuous shifts then you will need to have one set of batteries fitted to your forklift, while the second set charges. Three battery sets would be required for continuous operations across multiple shifts. Lead Acid batteries cannot be opportunity charged during your work cycles.

If you choose a Lead Acid battery solution to power your forklift you have the flexibility to upgrade this to a Lithium-ion solution in the future if required.



**Lithium-ion.**

There are two different Lithium-ion batteries to choose from which can be quickly opportunity charged during operational hours or fully charged overnight.



OPERATIONAL HOURS		173 kWh	173 kWh	173 kWh	230 kWh	230 kWh
		WB 2800	WB 3000	WB 3250	WB 3250	WB 3500
DRIVE CYCLE	Light	7.7	7.7	6.9	10.2	9.2
	Medium	6.0	6.0	5.5	8.0	7.4
	Heavy	4.9	4.9	4.6	6.5	6.1

**Modular by design.**

Batteries and chargers are a big part of your overall investment making it critical that you get a solution that is matched to your operational requirements, which is why Kalmar has taken a modular approach to our Lead Acid and Lithium-ion battery and charging solutions.

There are a number of different charging options available for your to choose from.

**Lead Acid solution:**

- charging power from 2 x 13kW up to 2 x 28kW
- full charging time 5-10 hours / cooling time 4-8 hours.

**Lithium-ion solution:**

- charging power up to 1 x 86kW
- full charging time 1.5-2 hours {no cooling needed}.

Kalmar can help you work out which battery option and charging solution is right for your business based on your current work cycles.



**Managing your power.**

With our Lead Acid solution, the Battery Monitoring Unit\* [BMU] is mounted within the battery cell and is connected to the battery, charger and cloud. This enables the BMU to monitor the current, voltage, water level, temperature and balance between cells.

For the Lithium-ion solution, the Battery Management System\*\* [BMS] is mounted within each battery cell, connecting the battery, charger and cloud. This enables the BMS to manage battery charging and all other important parameters.

While the forklift controller redirects recovered braking energy back into the battery packs.

Data from the BMU / BMS is displayed in Kalmar Insight\*\* allowing you to secure optimal battery use to ensure warranty conditions are met and the longest possible lifetime of the battery can be obtained.

\* First life, meaning until 80% capacity is left in the battery.

\*\*Kalmar Insight access is through a separate subscription agreement.

# EFFICIENT

and productive

Buying an electric forklift doesn't mean compromising on power, as electric powertrains provide full torque immediately and are smoother to operate. Making operating cycles shorter, driving up your operational productivity. With extended servicing cycles and improved diagnostic tools your machine will benefit from higher availability rates than the diesel alternatives.

## A simpler design.

Electric forklifts have less moving parts than diesel models. Without the need to change the starter motor, turbo or fuel filters, servicing and maintenance on the powertrain will take less time and cost up to 50% less. As less parts are required, your parts replacement costs and stock levels will also be substantially reduced.

All Kalmar electric forklifts have individual settings for acceleration (1-10) and brake retardation (1-10), both easily adjustable from the control panel.

## Reduce energy usage by up to 20%.

Kalmar ECO Drive allows you to optimise your truck's performance with three different modes:

<b>Power Mode:</b>	when high performance is required. With full motor power, you will be able to move quickly about, lift and lower at full speed, without compromising on safety.	
<b>Normal Mode:</b>	when you need a balance between energy usage and productivity. You can expect slightly lower acceleration and speeds.	<b>Save up to 15%</b>
<b>Economy mode:</b>	when you need the most efficient energy usage. With reduced acceleration and speeds - your batteries will run for longer.	<b>Save up to 20%</b>

# DESIGNED

for the driver



## Ergonomically designed.

Kalmar Electric Forklifts come fitted with our ergonomically designed EGO cabin. With slim line b-pillars, adjustable seating, steering wheel and control panel, your drivers will benefit from a superior operating environment and visibility.

## A healthier work environment.

Electric forklifts have always been seen as specialist machines for handling sensitive goods, in fact they deliver many additional benefits:



Less vibrations make handling sensitive goods safer and reduce stress and strain on your operator's body.



Electric forklifts are extremely quiet, making working indoors less disruptive for both operators and by-standers.



As electric forklifts produce no exhaust fumes they are safe to operate inside and where other staff are working or sensitive goods are stored.

## Easy to operate.

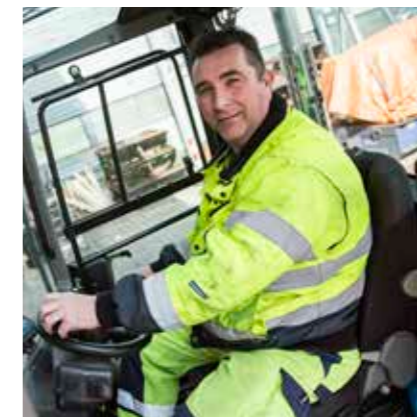
Our electrically powered forklift trucks give you a wide choice of joysticks or lifting levers, an electronically adjustable work console and side tilting steering wheel. All designed to make operating your reachstacker easier and more efficient to operate.

## More comfortable.

With a choice of comfortable driver seats, a fault safe pedal system and powerful Electronic Climate Control system with smarter controls your operator will benefit from improved ventilation heating and cooling, plus a cabin with superior comfort and lowest noise level inside and outside.

## Extra smart.

Our intuitive user interface combines visibility, sound and touch to create a perfectly balanced operating environment with an intelligent colour display at its heart. Advanced diagnostics, battery status overview and smart settings allow improved operational control and optimal opportunity charging planning.



# OPTIONS



Kalmar has a range of options that make operating your equipment even safer:



**Alcolock.** To ensure that your driver is at their best when operating your equipment you can install an Alcolock system. This system makes sure that the driver meets alcohol blood level standards before being able to start the machine, much like a breathalyser.



**Reverse Beeper System.** When your staff are working side by side with moving vehicles there is always a safety risk. Installing a reverse beeper system provides a clear acoustic alert when the machine is reversing so personnel can make sure that they are out of harm's way at all times.



**Additional lighting.** Extra lighting, particularly if you operate your machine at night, as you can bring greater operational visibility and safety for personnel working on the site. You can choose additional LED working lamps on specific positions.



**Reverse Warning System.** Knowing what's going on behind you is critical when other personnel are present. Rear sensors and a reversing camera relay real-time information to an in-cabin display, alerting the driver to any dangers, increasing personnel and driver safety. You can also add additional cameras e.g. on the front of the machine, on the mast, carriage or forks.



**Fire Suppression System.** To protect your operator and machine from fire you can fit a Fire Suppression System\* to your machine. The system utilises multiple spray nozzles that release a high pressure water mist where the fire has been detected from a re-chargeable water tank. This can be activated manually or automatically through an in-cabin temperature sensor.



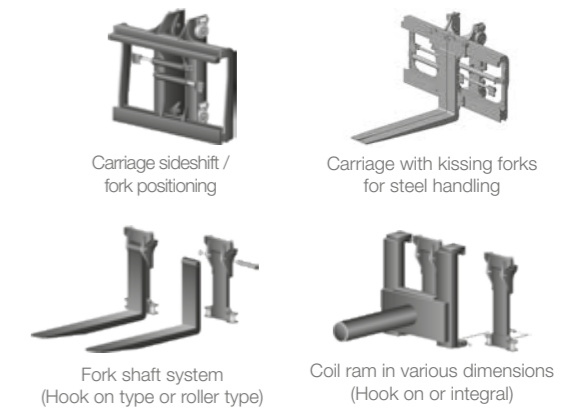
Kalmar has a range of solutions that will help make your equipment more eco-efficient and sustainable:



**Tyre Pressure Monitoring System.** Helps to reduce wear and tear on tyres which results in reduced fuel consumption. Bluetooth sensors keep the driver advised of the condition of the tyres continually. Active care of your tyres can result in a 10-40% increase in tyre life.

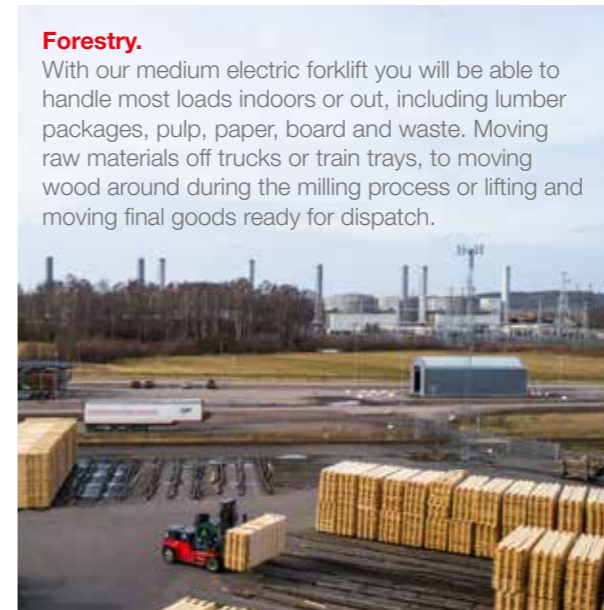
## What do you need to LIFT?

Choose between a wide range of lifting masts, carriages, forks and attachments. We offer complete solutions whereby we assemble the attachment in the factory and integrate it with the forklift's other functions.



### Forestry.

With our medium electric forklift you will be able to handle most loads indoors or out, including lumber packages, pulp, paper, board and waste. Moving raw materials off trucks or train trays, to moving wood around during the milling process or lifting and moving final goods ready for dispatch.



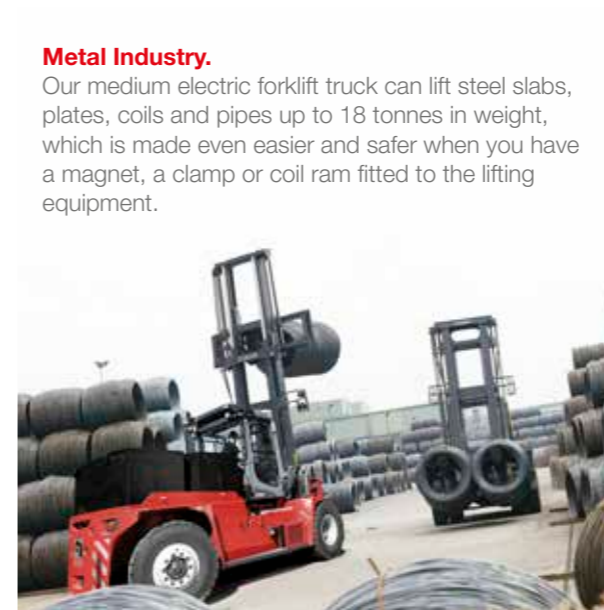
### Concrete, Energy and Heavy Industry.

Flat round or bulky pre-cast concrete, bricks and other heavy loads for the wind, oil, gas and biomass sectors will be handled with ease.



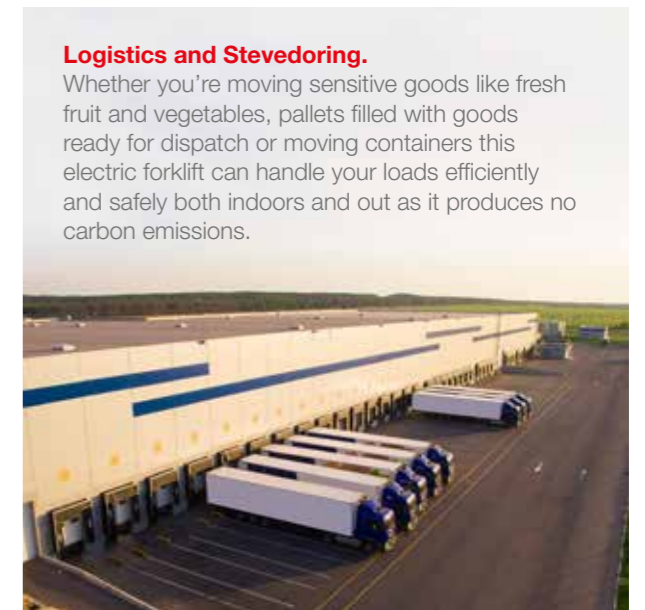
### Metal Industry.

Our medium electric forklift truck can lift steel slabs, plates, coils and pipes up to 18 tonnes in weight, which is made even easier and safer when you have a magnet, a clamp or coil ram fitted to the lifting equipment.



### Logistics and Stevedoring.

Whether you're moving sensitive goods like fresh fruit and vegetables, pallets filled with goods ready for dispatch or moving containers this electric forklift can handle your loads efficiently and safely both indoors and out as it produces no carbon emissions.



# KEEP MOVING

with Kalmar Service

To keep your business moving Kalmar Services offers a range of services that can help you keep your equipment moving optimally.



## Kalmar Care, making sure your business never stops.

Our job doesn't stop once we deliver your new machine, as Kalmar Care offers a range of service and maintenance contracts. Each of our Service Contracts are designed to meet your exact needs and will help you improve your operational efficiency, productivity and financial predictability. You just need to decide what you require to keep your day-to-day operations moving optimally.



### MyKalmar.

#### Keeping your cargo moving.

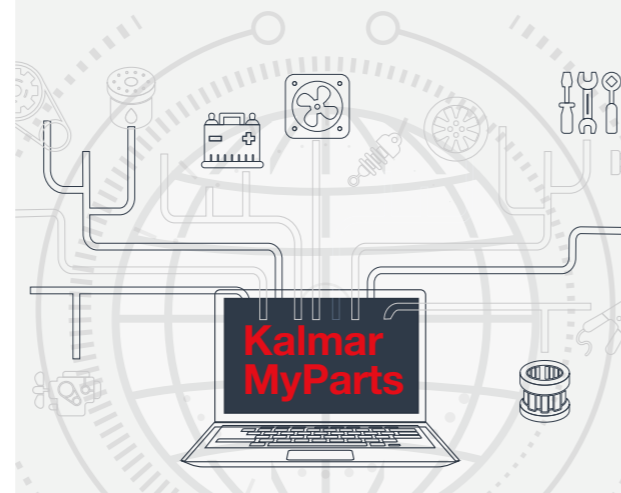
The MyKalmar portal brings together many of Kalmar's digital services into one place. With a single point of access and a user-friendly design you'll benefit from greater visibility and control over your maintenance activities, parts ordering and equipment performance - helping you improve your operational performance, safety and efficiency across your entire fleet.



### Kalmar MyParts.

#### A smarter way to order your parts.

Kalmar MyParts is your one stop shop for all the parts you need which is accessible through MyKalmar. Open 24/7, accessible on any screen and available in different languages, MyParts stocks 100s of thousands of Kalmar Genuine Parts at any given time and we can have them delivered quickly to you, no matter where you are in the world. You can search, order and then track your order all through the same application. MyParts has been designed to make your life easier.

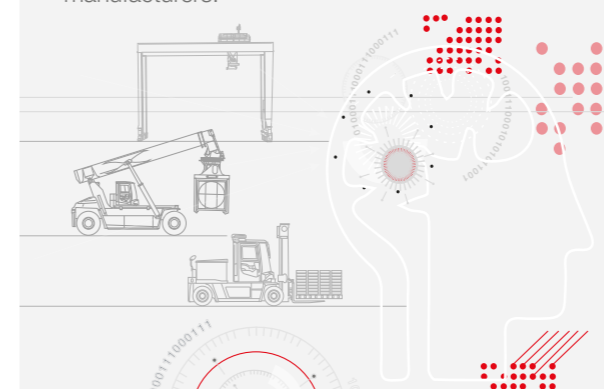


### Kalmar Insight.

#### Optimise your operations with Insight.

Kalmar Insight\* is a performance management tool for cargo handling, which gives you an easy to use overview of your fleet operations, by aggregating data from multiple sources, including equipment built by other manufacturers.

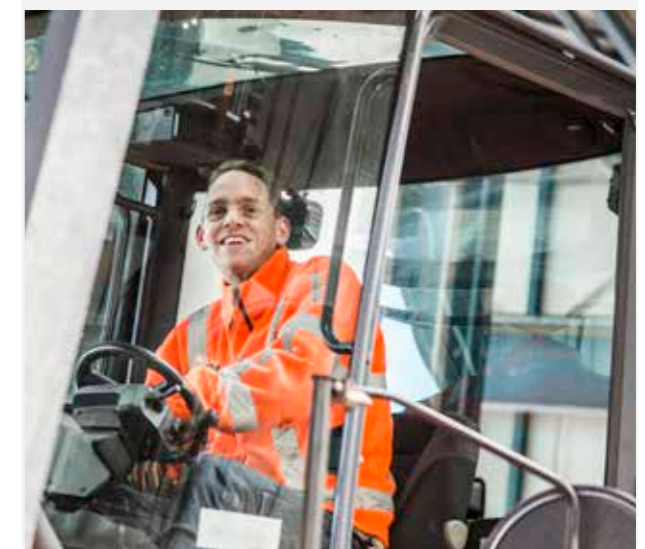
Review your entire fleet activities, schedule maintenance activities and order the required parts automatically. All enabling you to take action on real-time information, that will help improve your overall operations immediately. Kalmar Insight comes fitted and ready to be activated in all new Kalmar equipment, it can also be retrofitted into existing Kalmar equipment or those built by other manufacturers.



### Kalmar Training.

#### Enhance your skills.

To get the most out of your new machine our training centre offers a range of courses for both your technicians and operators. Operators can be taught how to drive the machine for optimum performance and minimum waste, and to learn what needs to be checked daily for optimal safety. Technicians can be educated with the knowledge they need to keep your new equipment in top condition in a safe way. Courses are a mix of theory and hands-on experience.



\*Installation costs and/or an annual subscription fee may apply.



# STANDARD

**Norms Standards and Regulations**

- Machinery Directive 2006/42/EC
- Safety Industrial Trucks ISO 3691-1 & EN 16307-1
- Safety Low & High Lift Trucks ANSI/ITSDF B56.1
- Stability test Masted Container Handlers EN 10525
- Low Voltage Directive 2014/35/EU
- CE-marking for trucks within EU/EEA
- ANSI/ITSDF-marking for North America trucks

**Chassis**

- Strong, durable and welded C-profile heavy-duty chassis
- Powerful front end unit for drive axle and lift mast fixations
- Solid tilt cylinder fixations in chassis and mast
- Full access to the entire powertrain with tilting cabin
- Easy access to battery, TMS and power distribution
- Very good visibility in forward, up, sideways and rearwards
- Low cabin mounting for easy access on both sides
- Dual access stairways on left / right sides (steps/handles)
- Lifting eyes and anchor points (front & rear)
- Towing pin through rear counter weight (long handle)

**Body**

- Strong and protective steel mudguards (front / rear)
- Long bottom step between the mudguards (anti-slip)
- Short access steps (2x) up to the cabin (anti-slip)
- Big rear view mirrors on front mudguards (2x)
- Welded lamp brackets on front mudguards (2x)
- Basic noise insulation kit of the forklift

**Steer Axle (Rear)**

- Kalmar steer axle mounted dual pivot bearings
- Steer axle with mechanical side stops
- El-servo power steering with double acting cylinder
- Steer axle with narrow turning radius
- Steer links of "dog-bone type" (easy to change)
- Steer angle sensors for safe steering at all speeds

**Drive Axle (Front)**

- Kessler D81 dual-input drive axle with hub reductions
- Motor drive, steer angle sensors for electronic differential
- Maintenance-free oil-cooled Wet Disc Brakes (WDB)
- Dual parking brake, spring loaded & hydraulic release
- High pressure filter (10 my) for the brakes

**Wheels (Tyres and Rims)**

- ECG90-120: diagonal tyre 11.00x20" / rim 8,00x20"
- ECG127-160: diagonal tyre 12.00x20" / rim 8,00x20"
- ECG180-180S: radial tyre 12.00R20" / rim 8,00x20"

**Powertrain**

- Schabmüller electric asynchron AC-motors (3-phase)
- Dual drive motors (2 x 37 kW) with electric fan cooling
- Dual pump motors (2 x 50 kW) with electric fan cooling
- Single brake pump motor (1 x 2,5 kW)
- Re-generative brake system / energy back to battery
- Electric cooling fans for drive / pump motors & inverters
- Electric motors are protected inside the chassis

**Power Electrics (120V)**

- Electric system voltage 120V (Low Voltage Directive)
- Dual power cables with REMA-640 power connectors (2x)
- Charging standards REMA-640 charging plugs (2x)
- Electric cabinet mounted on chassis with main parts (LHS)

**Battery (Lead Acid)**

- Lead-Acid batteries (2x), with dual trays, mounted rear
- Robust, simple and proven technology, 1200-1400 cycles
- Ventilated charging, maintenance needed, efficiency 70-80%
- Automatic central water topping system for battery cells
- Battery Monitoring Unit (BMU) for safe charging
- Charging power: 13-28 kW per unit (2 chargers)
- Chargers: acid-circulation or pulse charging and BMU

**Battery (Lithium-ion)**

- Lithium-ion integral battery unit, with TMS/BMS
- High capacity NMC-technology, 4000-5000 cycles
- Maintenance-free battery, need equalization-charging with efficiency 90-95%
- Battery capacity: 173 kWh (1.500 Ah) / 3-pack
- Battery with passive and active cooling and heating (TMS)
- Battery Management System (BMS) with CanBus
- Charging power: up to 86 kW per unit (1 charger)
- High-power Lithium-ion chargers with CanBus

**Thermal Management System (Lithium-ion)**

- Battery Management System (BMS) with CanBus
- Smart controls of cooling and heating units
- TMS with passive-active battery cooling & heating
- Cooling unit with water tank, pump and cooler
- Heating unit mounted on the battery cells
- Power limitation functions to optimise consumption
- Limp home function at low SOC (speed 8 km/h)

**Load Sensing Hydraulics**

- Parker load-sensing piston pumps (2x)
- Power-on-demand function with high lifting speeds
- Pumps for mast, tilt, fork carriage, brakes & steering
- Fixed pump for brake oil pressure / accumulator (1x)
- Pressure filter for hydraulics / brakes (2x/10 my)
- Power steering, power brakes and ORFS-couplings
- Hydraulic tank (220 lit), breath filter and level glass
- Main control valve, steering valve and accumulator
- Mast tilt angles: FW +5/ BW -10 deg (15 deg)

**Lifting Mast**

- Large selection of mast types and lifting heights.
- Duplex Standard; 2-stage mast, with free-visibility
- Strong, durable mast design (pair of cylinders/chains)
- Heavy-duty mast profiles and strong cross members
- Mast with strong mast wheels, bearings & guide pads
- Large shafts-bearing for mast, strong tilt fixation

**Fork Carriage**

- Large selection of fork carriages, types and optionals
- Carriage with strong wheels, bearings & guide pads
- Widths; 2450 / 2500 mm (90-140 / 100-180)

**Forks**

- Large selection of fork dimensions, tapering and designs
- Cross sections; from 200 x 65 up to 250 x100 mm

**Electrical System (24V)**

- Battery box, batteries 24V and main power switch
- Electric cabinet, mounted behind driver
- 2 LED working lights on front mudguards (main beam)
- 2 LED working lights on mast (first cross member)
- 2 LED working lights on rear counter weight
- 4 directional blinker lights (front / rear)
- 2 tail / 2 brake LED-lights rear in counter weight
- The tail / brake lights are flashing when reversing
- Reverse camera (wide angle/IR night light), colour monitor of 7in size (RHS mounted), full HD resolution (1920x1080p)

**Cabin EGO**

**Structure**

- Spacious, modern cabin with great ergonomy level
- Strong profiles, pillars and cross members
- FOPS certified drivers cabin (Fall-Over-Protection-Safety)
- Tiltable cabin with full access to powertrain & hydraulics
- Large window sections with great visibility in all directions
- Large access doors with air-damper & key-lock
- Doors; sliding windows + access handles

**Comfort**

- Drivers seat, mech. spring suspension, high back
- Comfort seat, adjustable, sensor & 2-point belt
- Electric adjustable work console (up-down/fw-rev)
- Work console; lift levers, controls, lamp buttons etc
- Inside rear view mirror (right side)
- Interior lights with fade away function
- Fully adjustable steering wheel incl tilt function
- Power steering wheel with steer knob
- LED background light for buttons & switches

**Controls**

- Electric levers / joystick for mast, tilt & forks
- Auto rev-up accelerator at lifting / tilting / fork position
- Electric accelerator pedal (hanging)
- Double brake pedals (L + R)
- Button for electronic hand brake (on/off)
- Safety override for hydraulic functions (by code)
- Multi-function lever LHS (parking brake/travel direction switch)
- Combined horn and blinker lever
- Warning - hand brake (on/off) leaving seat

**Climate**

- ECHV, electronic controlled heating & ventilation
- Powerful cab heater, power 6.0 kW (20.500 Btu)
- Smart controls of cooling and heating units
- Strong AC cooling unit, power 14.0 kW (47.700 Btu)
- High-capacity ventilation unit - max air flow 483 m3/h
- Multiple individual blowers (8x upwards / 2x downwards)
- Fresh air and recirculation filter (replaceable)
- Double wipers / washers on front window (larger area)
- Single wipers / washers on roof and rear windows
- Interval wiper functions on front, roof and rear windows

**Information Systems**

- Kalmar CanBus controls with 4,3" monitor
- Danfoss controls DM430E in RAM mount
- Menu controller with toggle wheel & push buttons
- Programmable settings and full monitoring of all main systems

**Accelerator / Brake Settings:**

- Programmable accelerator in 10 steps (1-10)
- Accelerator; from soft to fast (low to high energy)
- Programmable brake re-generation in 10 steps (1-10)
- Brake regeneration; feed energy back to the battery

**Operator menu:**

- System voltage
- Travelling speed (km/h or mph)
- Combined hydraulic and brake oil temperature
- Clock and date
- Operating time (hour meter)
- Service time indicator (hours)
- Status of heating system & AC system
- Estimated time before empty battery (hour/min)
- Service indicator
- Trip computer / statistics

**Various warning lights & signals:**

- Charging battery
- Safety system disconnected
- Failure indicator
- Low brake oil pressure
- Low coolant level battery
- Low coolant level electrical components
- High coolant temp battery
- High coolant temp electric components
- Low power battery volt level
- Low/high battery cell temp
- Low/high battery cell volt level unbalanced power battery
- Hydraulic and brake oil temperature
- Low washer fluid level

**Fleet Management**

- Equipped with telemetric hardware for Kalmar Insight

**Colour**

- Chassis, tanks & mudguards: Red RAL 3000
- Mast, carriages, forks and axles: Black RAL 7021
- Cabin: Iron-Grey RAL 7011
- Rims: Iron-Grey RAL 7011

**Documentation & Decals**

- Load chart diagram inside cabin
- Machine data sign on chassis (LHS) including load chart
- Warning, tyre pressure & oil pressure stickers
- Lift lever / joystick and function stickers in cabin
- Fuse diagram
- Instruction manual
- Maintenance manual
- Spare parts catalogue

**Warranty**

- Kalmar standard warranty: 12 months / 2.000 hours

# OPTIONS

**Chassis/Body**

- Models with standard and short wheelbases
- Wheelbase 3.750 mm with 298-330 kWh
- Anti-slip strips: mudguards, tanks & lamp brackets
- Extra mud flaps (front and rear)
- Steel grid protections: fender, mast & rear
- Stacking box for wood stick (LHS or rear)
- Additional Stacking box for wood stick (LHS or rear)

**Wheels (Tyres and Rims)**

- Spare wheels, tyres and rims of various brands
- Diagonal and radial tyres of well known brands
- Radials; Continental RT20 and Michelin XZM
- Super-elastic (CSE); Soli-Deal CSE
- Other brands up on request
- Stronger rim 8,50x20" (repl standard 8,00x20")

**Battery (Lead Acid)**

- Capacity: 149 - 330 kWh per set (1240 - 2752 Ah)
- 1-shift: 1 battery set (2 batteries + 2 chargers)
- 2-shift: 2 battery set (4 batteries + 2-4 chargers)
- 3-shift: 3 battery set (6 batteries + 2-4 chargers)
- Quick-change battery fork pockets on battery tray
- Battery combinations depending on energy consumption
- Chargers: acid-circulation or pulse charging and BMU

**Battery (Lithium-ion)**

- Capacity: 230 kWh only on wheelbase 3.25-3.50 m
- High-power Lithium-ion chargers with CanBus

**Hydraulics**

- Extra hydraulic function including hoses (per function)
- Push-button hydraulic function via magnet valve
- Quick release couplings "aerogrip" 1/2" (per function)
- Individual fork positioning including 5th hydraulic function
- Hydraulic accumulator for lifting functon
- Hydraulic accumulator for lifting function "auto on/off"
- Hydraulic oil cooler unit (on RHS)
- Hydraulic oil heater 1 kW (400V, 3-phase, 32A)
- Mast tilt angles: FW +11 / BW -8 deg (19 deg)
- Mast tilt angles: FW +14 / BW -11 deg (25 deg)
- Functions for attachments (paper, steel, precast)

**Lifting Mast**

- Duplex Standard (no FL); lift heights 3.00 - 7.00 m
- Duplex Freelift (full FL); lift heights 3.00 - 7.00 m
- Triplex Freelift (full FL); lift heights 4.50 - 7.00 m
- Duplex Heavy-Duty (no FL); lift heights 4.00 - 6.00 m
- Other lift heights / closed heights upon request

**Fork Carriage**

- Fixed carriage: manual moving forks (width 2.50 m)
- Sideshift carriage: manual moving forks (width 2.50 m)
- Sideshift/fork positioning: (width 2.50 / 2.95 / 3.45 m)
- Sideshift/fork position: pin-type (width 2.50 m)
- Sideshift/fork position + center levelling: (width 2.50 m)
- Attachments: carriage sides, chain brackets & hoses
- Attachment of various brands for factory integration

**Forks**

- See fork dimensions under Specifications
- Length: 1200 up to 2400 mm in steps (special)
- Width: 200 - 250 mm / 300 - 400 mm
- Thickness: 65, 70, 80, 90 - 100 mm
- Fork mountings: roller-type or pin-type
- Tapering: standard 0-600 mm full thickness / 600-tip with taper
- Tapering: various optional tapering / short or full taper
- Fork Shaft System; hook-on type / forks, coil ram or attachment
- Fork Shaft System; pin-type / forks, coil ram or attachment
- Kissing forks with chamfer inside/outside (integral roller-type)
- Kissing forks with chamfer inside/outside (FSS hook-on type)
- Hydraulic levelling fork (up/down) on left fork or / and right fork

**Electrical System (24V)**

- Tuner FM-AM, RDS, MP3, USB, Bluetooth, Stream
- Tuner FM-AM, RDS, MP3, USB, Bluetooth, Stream / DAB
- Power sockets: 2x24V and 2x12V (in door columns)
- Power sockets: 2x24V / 1x12V / 2xUSB 5V
- Electric air pressure horn
- Reverse alarm (beeping or white noise - multi frequency)
- Protection against chain slack (electronics)
- Mast with automatic vertical function (auto-tilt)

**Lamps**

- 2 extra LED working lights - in mast (FW)
- 2 extra LED working lights - rear on cabin (FW)
- 4 extra LED working lights - rear on cabin (mix)
- 6 extra LED working lights - rear on cabin (mix)
- 2 extra LED working lights - front on cabin roof
- 1 extra LED working lights - between tilt cylinder
- 2 high/low beam Halogen working lights (repl LED)
- 1 LED rotating warning beacon (on adjustable pole LHS)
- Blue safety light, rearward (when reversing) or forward
- Red safety light, rearward (when reversing) or forward
- Red safety zone light, Left and Right direction
- Rotating beacon LED, activated via reverse gear

**Safety functions**

- Overload indication for lift/tilt incl. speed restriction
- Speed limitation; default 15 km/h (set by technician)
- Speed limitation at specified load (set by technician)
- Speed limitation at specified lift height (set by techn.)
- Speed restriction set by customer in display; default 15 km/h
- Tyre pressure monitoring system (TPMS / Bluetooth)
- Alcolock Draeger in cabin

**Cabin EGO**

**Structure**

- Globetrotter cabin +200 mm higher, roof 12 mm (repl 6 mm)
- Elevated cabin 300 mm
- Rotatable Driver Seat, electric 180 deg (to the left)
- Turnable Driver Seat, manual 55 deg (to the right)
- Steel grid protection for front window
- Steel grid protection for roof window
- Door opening holder (left side and / or right side)
- Flat front window with steel profiles, tinted and laminated
- Roof window 12 mm (repl standard 6 mm)
- Electric cabin tilt pump (up/down)
- Electric heated mirrors, front fender/standard pos
- External cabin reverse mirrors (2x)
- External cabin reverse mirrors (2x) with heating
- Electric heated + adjustable mirrors, front mudguards

**Comfort**

- Air cushioned driver seat with horizontal suspension
- 3-point seat belt
- Extended seat backrest
- Headrest for driver's seat
- Armrest adjustable left side
- Seat heating
- Seat cover in vinyl
- Leather reinforced seat, high backrest, 3-point belt and heating
- Grammer Actimo XL, air cushion, heating, high back, 2-point belt
- BE-GE 3700, air cushion, heating, high back, 2-point belt, leather reinforced seat
- Isringhausen 6830KA/880, air cushion, heating, high back, 2-point belt
- Extra trainer seat incl. 2-point belt
- Bracket for terminal and monitor (RHS)

**Controls**

- Travel direction button on 1st lift lever (F-N-R)
- Electronic joystick (EGO)
- Electronic lever steering (without feedback)
- Electronic mini-wheel steering
- Search light maneuverable via remote control

**Climate**

- ECC, electronic heating, cooling (AC) & ventilation
- Tinted windows including laminated front window
- Sun visors front, roof and rear windows

**Additional Equipment**

- Enhanced Safety Package
- Speed limitation default 15 km/h or free (set by technician)
- Blue safety light backwards via back alarm
- Rear warning radar (for reverse camera/monitor in cabin)
- Seat belt interlock (active before driving - seatbelt on)
- Semi-automatic fire suppression system (DAFO Forrex)
- Fire extinguisher 6 kg, powder (LHS / behind foot steps)
- Tool kit
- Central greasing system (14-18-24 grease points)
- Tilt indicator of mechanical type
- Tilt indicator of electronic type (in display)
- Electronic weight indicator in cabin control monitor
- Heat protection kit (incl hoses)
- Heat protection mechanical kit
- Wheelnut protection
- Additional equipment for roadtraffic (LGF-sign)

**Camera safety**

- Modular full HD solutions (1920x1080p)
- Extra front mast camera - to cab monitor
- Extra front carriage camera - to cab monitor
- Radar warning sensors rear (2x) to cab monitor
- Monitor 7in Quad, max 4 connections (repl Dual)
- Monitor 10in Quad, max 4 connections (repl Dual)
- DVR recorder, up to 4 channels, with SD-card (128 GB)

**Eco Drive Modes (EDM)**

- Performance mode settings: Power - Normal - Eco

**Information Systems**

- VDI - Vehicle Data Interface
- With EDM you can optimise productivity, performance and operational time

**Fleet Management (Kalmar Insight)**

- Insight licence (only certified countries)
- Insight Driver Monitor (RFID reader + 10 driver tags)
- Insight extra driver tags (10 tags)

**Colour**

- Other RAL colour than standard, chassis
- Special and multiple colours, chassis
- Other colour than standard, striping foil
- Reinforced anti-corrosion protection

**Documentation & Decals**

- Extra set of documentation
- Workshop manuals
- Load chart lbs/inch in cab & sign "no riders"
- Documentation on memory stick

**Training**

- Training packages (driver, service, maintenance, software)
- Contact Kalmar Training Centre for more information

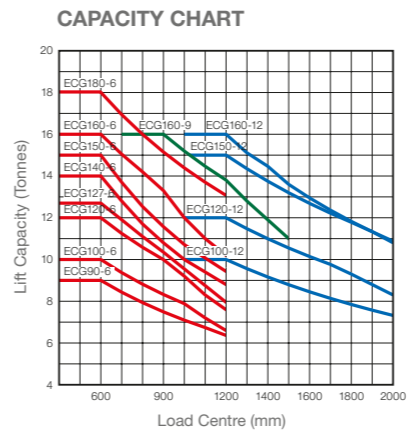
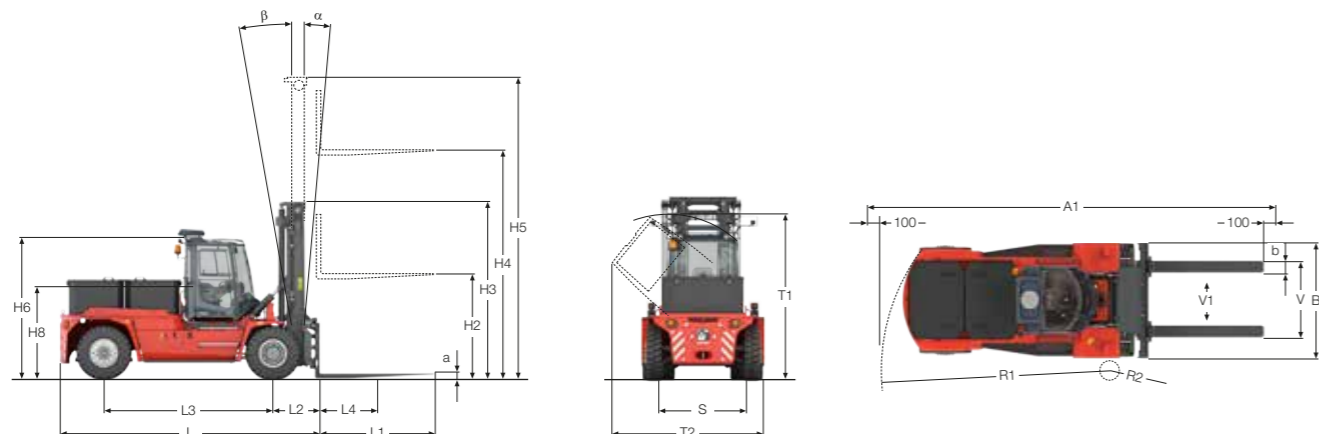
**Warranty**

- Additional warranty packages available:
  - Gold (complete forklift): max 5 yr/10.000h
  - Silver (drive line): max 8 yr/16.000h
  - Bronze (structural parts): max 10 yr/20.000h
  - Cobalt (battery + charger): up to 8 yr/16.000h\*
- Contact Kalmar for more information

<sup>[1]</sup> \* Depending on battery technology and brands

# TECHNICAL INFORMATION

			ECG 90-6	ECG 100-6	ECG 120-6	ECG 127-6	ECG 140-6S	ECG 140-6	ECG 100-12S	ECG 100-12	ECG 120-12S	ECG 120-12	ECG 150-6S	ECG 150-6	ECG 150-12	ECG 160-6S	ECG 160-6	ECG 160-9S	ECG 160-9	ECG 160-12	ECG 180-6S	ECG 180-6		
<b>LIFTING CAPACITY</b>	Rated capacity		kg	9000	10000	12000	12700	14000	14000	10000	10000	12000	12000	15000	15000	15000	16000	16000	16000	16000	18000	18000	18000	
	Load centre distance	L4	mm	600	600	600	600	600	600	1200	1200	1200	1200	600	600	1200	600	600	900	900	1200	600	600	
<b>FORKLIFT DIMENSIONS</b>	Truck length (to fork face front)	L	mm	4615	4615	4620	4620	4630	4830	4710	4910	4910	5160	4700	4900	5420	4900	5150	5160	5410	5420	5160	5410	
	Distance, centre drive axle - fork face front	L2	mm	895	895	900	900	910	910	990	990	990	990	980	980	1000	980	980	990	990	1000	990	990	
	Wheelbase	L3	mm	2800	2800	2800	2800	2800	3000	2800	3000	3000	3250	2800	3000	3500	3000	3250	3250	3500	3500	3250	3500	
	Truck width (over tires)	B	mm		2480			2480		2540			2540			2540		2540		2540			2540	
	Roof height cabin (basic forklift)	H6	mm		2895			2920		2920			2920			2920		2920		2920			2920	
	Seat height cabin	H8	mm		1770			1790		1790			1790			1790		1790		1790			1790	
	Height / width, max (with tilted cabin)	T1 / T2	mm		3370 / 3350			3390 / 3380		3390 / 3380			3390 / 3380			3390 / 3380		3390 / 3380		3390 / 3380			3390 / 3380	
	Track (c-c), front / rear	S1 / S2	mm		1840 / 1960			1855 / 1960		1855 / 1960			1855 / 1960			1855 / 1960		1855 / 1960		1855 / 1960			1855 / 1960	
	Turning radius, outer / inner	R1	mm		3950 / 75			3950 / 75	4180 / 75	3950 / 75	4180 / 75	4180 / 75	4360 / 125	3950 / 75	4180 / 75	4785 / 420	4180 / 75	4360 / 125	4360 / 125	4785 / 420	4785 / 420	4570 / 420	5015 / 510	
	Aisle width min, at 90° driving with forks	A1	mm		6250			6250	6490	7540	7770	7770	7950	6330	6560	8385	6560	6740	7350	7775	8385	6960	7405	
	Ground clearance, min - max	T1	mm		200 - 330			200 - 350		200 - 350			200 - 350			200 - 350		200 - 350		200 - 350			200 - 350	
<b>LIFTING EQUIPMENT</b>	<b>Duplex Standard</b>																							
	Lifting height	H4	mm		5000			5000		5000			5000			5000		5000		5000			5000	
	Mast height, min	H3	mm		4015			4040		4195			4195			4195		4195		4195			4195	
	Mast height, max	H5	mm		6515			6540		6695			6695			6695		6695		6695			6695	
	Mast tilt, forward – backward	a – β	°		5 / 10			5 / 10		5 / 10			5 / 10			5 / 10		5 / 10		5 / 10			5 / 10	
	<b>Forks</b>																							
	Width x Thickness	b	mm		200 x 65	200 x 65	200 x 70	200 x 70	200 x 80	200 x 80	220 x 90	220 x 90	220 x 90	220 x 90	200 x 80	200 x 80	250 x 100	200 x 80	200 x 80	220 x 90	220 x 90	250 x 100	220 x 90	220 x 90
Length	l	mm		1200			1200		2400			2400	1200	1200	2400	1200	1200	1800	1800	2400	1200	1200		
Forks position, outside width, min-max.	V	mm		570 - 2330			570 - 2330		640 - 2360			640 - 2360	600 - 2360	600 - 2360	700 - 2360	600 - 2360	600 - 2360	640 - 2360	640 - 2360	700 - 2360	640 - 2360	640 - 2360		
Forks sideshift, max stroke at opening (c-c)	V1 – V	mm		440 - 1450			440 - 1450		430 - 1500			430 - 1500	440 - 1480	440 - 1480	415 - 1530	440 - 1480	440 - 1480	430 - 1500	430 - 1500	415 - 1530	430 - 1500	430 - 1500		
<b>WEIGHT (Lead-Acid)</b>	<b>Service Weight*</b>																							
	Double batteries (Lead-Acid / standard)		kg	18700	18700	18800	18800	18900	20400	20300	21600	22200	23000	20900	21500	24400	21700	22800	23500	24200	25000	22900	24000	
	Without double batteries		kg	13900	13900	14000	14000	14100	14700	15500	15900	16500	16200	16100	15800	16600	16000	16000	16700	16400	17200	16100	16200	
	<b>Axle load front</b>		kg	8500	8500	8600	8600	8700	9400	10200	10900	10900	11500	10000	10700	12100	10700	11200	11400	11800	12100	11300	11600	
	At rated load		kg	22300	23800	27000	28100	30300	30500	28000	28200	31700	31600	33500	33600	36500	35100	35000	36700	36500	38100	38100	37800	
<b>WEIGHT (Li-ion)</b>	<b>Service Weight*</b>																							
	Integral battery (Li-ion / 3-pack)		kg	16600	16600	17300	17800	N/A	18700	N/A	20700	N/A	22100	N/A	21200	24400	N/A	21300	N/A	23800	25000	N/A	23500	
	<b>Axle load front</b>		kg	8500	8500	8600	8600	N/A	9400	N/A	10900	N/A	11500	N/A	10700	12100	N/A	11200	N/A	11800	12100	N/A	11600	
	At rated load		kg	22300	23800	27000	28100	N/A	30500	N/A	28200	N/A	31600	N/A	33600	36500	N/A	35000	N/A	36400	38100	N/A	37800	
	<b>Axle load rear</b>		kg	8100	8100	8700	9200	N/A	9300	N/A	9800	N/A	10600	N/A	10500	12300	N/A	10100	N/A	12000	12900	N/A	11900	
At rated load		kg	3300	2800	2300	2400	N/A	2200	N/A	2500	N/A	2500	N/A	2600	2900	N/A	2300	N/A	3400	2900	N/A	3700		
<b>WHEELS</b>	<b>Wheels*</b>																							
	Number of wheels, front – rear (x = driven)																							
	4x – 2																							
	<b>Tires</b>		MPa		Diagonal / 0,9			Diagonal / 0,9		Diagonal / 0,9			Diagonal / 0,9			Diagonal / 0,9		Diagonal / 1,0		Diagonal / 1,0		Radial / 1,0		
Dimensions, front – rear		tum		11.00x20*/PR16			12.00x20*/PR20		12.00x20*/PR20			12.00x20*/PR20			12.00x20*/PR20		12.00x20*/PR20		12.00x20*/PR20		12.00R20*			
<b>Rims</b>		tum		8,00x20*			8,00x20*		8,00x20*			8,00x20*			8,00x20*		8,00x20*		8,00x20*		8,00x20*			
<b>AXLES</b>	<b>Steer axle</b>																							
	Manufacturer, type - designation																							
	Kalmar steer axle / power steering / double acting single cylinder																							
	<b>Drive axle</b>																							
Manufacturer, type - designation																								
Kessler D81-dual drive / electronic differential / hub reduction																								
<b>Service brakes</b>																								
Type – affected wheels																								
Oil cooled wet disc brakes (WDB) / drive wheels																								
<b>Parking brake</b>																								
Type – affected wheels																								
Single dry big disc / spring activated - hydraulic release / drive wheels																								
<b>HYDR.</b>	<b>Hydraulics</b>																							
	System type / pump type																							
	Load-sensing / power -on-demand / piston pumps																							
<b>Oil pressure</b>		MPa		16,0	17,0	17,5	18,0	19,0	19,0	12,5	12,5	15,0	15,0	16,5	16,5	17,0	17,0	17,5	17,5	18,0	19,0	19,0		
<b>Tank</b>		Lit		220			220		220			220			220		220		220		220		220	



Information correct at time of publication and is subject to change.

# PERFORMANCE

				ECG90-6		ECG127-6		ECG150-6		ECG150-12	
				ECG100-6	ECG120-6	ECG140-6S	ECG140-6	ECG100-12S	ECG120-12S	ECG150-6S	ECG160-6
SPEEDS	Travel speed, forward - reverse	Unloaded	km/h	25 - 25		25 - 25		25 - 25		25 - 25	
		At rated load	km/h	25 - 25		25 - 25		25 - 25		25 - 25	
	Lifting speed	Unloaded	m/s	0,55	0,45	0,45		0,35		0,35	
		At 70% of rated load	m/s	0,50	0,40	0,40		0,35		0,35	
Lowering speed	Unloaded	m/s	0,40		0,40		0,40		0,40		
	At rated load	m/s	0,40		0,40		0,40		0,40		
POWER	Gradeability, max	Unloaded	%	32	32	30	27	26	24	23	22
		At rated load	%	20	19	17	16	17	16	15	14
	Gradeability, at 5 km/h	Unloaded	%	28	28	26	24	23	21	23	21
		At rated load	%	18	17	15	14	15	14	13	12
Drawbar pull		kN	56	56	53	53	53	53	53	53	
SOUND	Noise level, inside EGO cabin	EN12053, L <sub>PAZ</sub>	dB(A)	69		69		69		69	
	Noise level, outside	EN12053, L <sub>WAZ</sub>	dB(A)	100		100		100		100	
	Noise level, outside	2000/14/EC, L <sub>WAZ</sub>	dB(A)	104		104		104		104	

# POWERTRAIN

				ECG90-6		ECG127-6		ECG150-6		ECG150-12	
				ECG100-6	ECG120-6	ECG140-6S	ECG140-6	ECG100-12S	ECG150-6	ECG160-6S	ECG160-9S
MODELS	Wheelbase (L3)	mm		2800		3000		3250		3500	
ELECTRIC POWERTRAIN	Motor, manufacturer			Schabmüller Germany							
	Motor, type / model / active cooling			AC motor / asynchronous / air-cooled							
	Motor, speed control type / number of steps			High frequency MOSFET / Stepless							
	Output power - drive motor (at duty class)	kW		2 x 37 kW (S2 60 min) / with air cooling							
	Output power - pump motor (at duty class) intermittent	kW		2 x 50 kW (S3 15%) / with air cooling							
	Output power - brake motor (at duty class) intermittent			1 x 2,5 kW (S1) / no cooling							
	Regenerative brake function			Yes / charging of battery							
	Acceleration settings / power programming			In 10 steps (1 - 10)							
	Retardation settings / brake programming			In 10 steps (1 - 10)							
	Energy consumption*, normal driving, average values	kWh/h		Lower: 18 / Medium: 23 / Higher: 28							
BATTERY (Lead-Acid)	Battery / charger, type - voltage - number of units	V		Lead-Acid / 120V / 2+2							
	Nominal energy capacity* (min-max) at SOC 100%	kWh		149 - 165		186 - 206		223 - 248		260 - 289	
	Useable energy capacity* (min-max) at SOC 80%	kWh		119 - 132		149 - 165		178 - 198		208 - 231	
	Capacity at 5h discharge, current, min-max	Ah		1240 - 1376		1550 - 1720		1830 - 2064		2170 - 2408	
	Battery weight, min-max (per battery)	kg		2330 - 2420		2820 - 2965		3390 - 3415		3760 - 3920	
	Battery dimensions (W x H x L)	cm		184 x 78 x 72		184 x 78 x 87		184 x 78 x 100		184 x 78 x 115	
	Charging power, min / max (per charger)	kW		13 / 14		13 / 14		21 / 26		26 / 28	
	Charging power supply* (per charger)	A		1 x CCE 32		1 x CCE 32		1 x CCE 63 (2 x CCE 32)		1 x CCE 63 (2 x CCE 32)	
	Charger / battery connector, type - size			REMA-640							
	BATTERY (Lithium-ion)	Battery / charger, type - voltage - number of units	V		Lithium-ion (NMC) integral / 117V / 1+1						
Nominal energy capacity (min-max) at SOC 100%		kWh		173		173		173 or 230*			
Useable energy capacity (min-max) at SOC 80%		kWh		138		138		138 or 184*			
Capacity at 5h discharge, current, min-max		Ah		1500 (3-pack)		1500 (3-pack)		1500 (3-pack) or 2000 (4-pack)*			
Charging power, max		kW		86		86		86			
Charging power supply*		A		4 x CCE 63		4 x CCE 63		4 x CCE 63			
Charger / battery connector, type - size - amount			REMA-640 (2x)								

Note:  
 Lead-Acid: Optional wheelbase 3.750 mm has battery energy 298 - 330 kWh (2480 - 2752 Ah).  
 Li-ion: Optional wheelbase 3.750 mm has battery energy 173 - 230 kWh (1500 - 2000 Ah).

# Lifting data.

DUPLEX STANDARD (2-stage / NFL)	ECG90-140				ECG100-180										
	Lift height		Mast height		Free lift		Lift height		Mast height		Free lift				
	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2			
	3000	3015	4515	-	3000	3195	4695	-	3000	3195	4695	-	3000	3195	4695
3250	3140	4765	-	3250	3320	4945	-	3250	3320	4945	-	3250	3320	4945	-
3500	3265	5015	-	3500	3445	5195	-	3500	3445	5195	-	3500	3445	5195	-
3750	3390	5265	-	3750	3570	5445	-	3750	3570	5445	-	3750	3570	5445	-
4000	3515	5515	-	4000	3695	5695	-	4000	3695	5695	-	4000	3695	5695	-
4500	3765	6015	-	4500	3945	6195	-	4500	3945	6195	-	4500	3945	6195	-
5000	4015	6515	-	5000	4195	6695	-	5000	4195	6695	-	5000	4195	6695	-
5500	4265	7015	-	5500	4445	7195	-	5500	4445	7195	-	5500	4445	7195	-
6000	4515	7515	-	6000	4695	7695	-	6000	4695	7695	-	6000	4695	7695	-
6500	4765	8015	-	6500	4945	8195	-	6500	4945	8195	-	6500	4945	8195	-
7000	5015	8515	-	7000	5195	8695	-	7000	5195	8695	-	7000	5195	8695	-

DUPLEX FREE LIFT (2-stage / FFL 50%)	CG90-140				ECG100-180										
	Lift height		Mast height		Free lift		Lift height		Mast height		Free lift				
	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2			
	3000	3015	4515	1500	3000	3195	4695	1500	3000	3195	4695	1500	3000	3195	4695
3250	3140	4765	1625	3250	3320	4945	1625	3250	3320	4945	1625	3250	3320	4945	1625
3500	3265	5015	1750	3500	3445	5195	1750	3500	3445	5195	1750	3500	3445	5195	1750
3750	3390	5265	1875	3750	3570	5445	1875	3750	3570	5445	1875	3750	3570	5445	1875
4000	3515	5515	2000	4000	3695	5695	2000	4000	3695	5695	2000	4000	3695	5695	2000
4500	3765	6015	2250	4500	3945	6195	2250	4500	3945	6195	2250	4500	3945	6195	2250
5000	4015	6515	2500	5000	4195	6695	2500	5000	4195	6695	2500	5000	4195	6695	2500
5500	4265	7015	2750	5500	4445	7195	2750	5500	4445	7195	2750	5500	4445	7195	2750
6000	4515	7515	3000	6000	4695	7695	3000	6000	4695	7695	3000	6000	4695	7695	3000
6500	4765	8015	3250	6500	4945	8195	3250	6500	4945	8195	3250	6500	4945	8195	3250
7000	5015	8515	3500	7000	5195	8695	3500	7000	5195	8695	3500	7000	5195	8695	3500

TRIPLEX FREE LIFT (3-stage / FFL 33%)	ECG90-140				ECG100-180										
	Lift height		Mast height		Free lift		Lift height		Mast height		Free lift				
	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2			
	4500	2970	5950	1500	4500	3130	6190	1500	4500	3130	6190	1500	4500	3130	6190
5000	3137	6450	1667	5000	3297	6690	1667	5000	3297	6690	1667	5000	3297	6690	1667
5500	3303	6950	1833	5500	3463	7190	1833	5500	3463	7190	1833	5500	3463	7190	1833
6000	3470	7450	2000	6000	3630	7690	2000	6000	3630	7690	2000	6000	3630	7690	2000
6500	3637	7950	2167	6500	3797	8190	2167	6500	3797	8190	2167	6500	3797	8190	2167
7000	3803	8450	2333	7000	3963	8690	2333	7000	3963	8690	2333	7000	3963	8690	2333

DUPLEX HEAVY-DUTY (2-stage / NFL)	ECG90-140				ECG100-180										
	Lift height		Mast height		Free lift		Lift height		Mast height		Free lift				
	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2	H4	H3 min	H5 max	H2			
	4000	4065	5885	-	4000	4065	5885	-	4000	4065	5885	-	4000	4065	5885
4500	4315	6385	-	4500	4315	6385	-	4500	4315	6385	-	4500	4315	6385	-
5000	4565	6885	-	5000	4565	6885	-	5000	4565	6885	-	5000	4565	6885	-
5500	4815	7385	-	5500	4815	7385	-	5500	4815	7385	-	5500	4815	7385	-
6000	5065	7885	-	6000	5065	7885	-	6000	5065	7885	-	6000	5065	7885	-

1. ECG90-140: models ECG90-6, 100-6, 120-6, 127-6 and 140-6.  
 2. ECG100-180: models ECG150-6, 160-6, 180-6, 160-9, 100-12, 120-12, 150-12 and 160-12.  
 3. ECG90/100/120-6 has 11.00x20" tires, when using 12.00x20" tires, please add +25 mm on H3 and H5.  
 4. ECG127/140-6 has 12.00x20" tires, please add +25 mm on H3 and H5.  
 5. Duplex Heavy-Duty: mast range with additional reinforcements.  
 6. The lifting cylinders are mounted behind the mast profiles on Duplex Standard, Duplex Freelift & Triplex freelift.  
 7. The lifting cylinders are mounted outside the mast profiles on Duplex Heavy-Duty.  
 8. The freelift cylinders are mounted inside the mast profiles on Duplex Freelift and Triplex freelift.

# Mast options.

Duplex Standard NFL mast: 3000-7000 mm



Duplex Full Free Lift mast: 3000-7000 mm



Triplex Full Free Lift mast: 4500-7000 mm





# KALMAR

Making your every move count

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