Innovation Through Simplicity

**EP EQUIPMENT CO.,LTD**

V2412.01

www.ep-equipment.com

Email: info@ep-ep.com

EP Industrial Park, Xiaquan Village, Lingfeng Street, Anji County, Huzhou City, Zhejiang Province

Let's grow together

# EFL503/553-HVD
# EFL603-HV/703-HV

## High Capacity Electric Counterbalanced Forklift 5-7T

LI-ION TECHNOLOGY



# WHY HIGH VOLTAGE?

Introducing high-voltage electric forklifts with a complete lineup from 4 to 25-ton load capacities, marking the era of high-voltage high-capacity Li-ion trucks.
This groundbreaking development adopts world-leading high-voltage Lithium-ion power combined with advanced PMSM (Permanent Magnet Synchronous Motor) technology. These high-capacity forklifts ensure triple guarantees of high performance, long running time and safety while aligning with the current trend of green and sustainable development.



# HIGH PERFORMANCE: HIGH SPEED AND HIGH GRADEABILITY

High-voltage Li-ion batteries enable more power delivery to motors, improving acceleration and travel speeds for high-capacity trucks. PMSMs complement this with rapid response times, swiftly reaching required speeds and torques. This combination of PMSM and high voltage can provide stable and strong power output, which further gives high-capacity trucks excellent climbing capabilities ensuring that the forklift can cope with various applications with ease.

The high-voltage model offers a 1.5-2 times performance improvement over the low-voltage model. Taking the 10-ton model as an example:

**100%**

Improvement in travel speed for high voltage models in laden and unladen conditions.

**45%**

Faster lifting speed demonstrated by the high-voltage models.

**45%**

Improvement in gradeability when laden for high voltage models.

**100%**

Improvement in gradeability when unladen.

# ENERGY EFFICIENCY: EXTENDED RUNTIME AND FAST CHARGING

High-voltage Li-ion batteries have high energy density and can store more electrical energy within a compact volume. High-voltage systems consume less energy and provide longer battery running time comparing low-voltage systems. Notably, these high-voltage Li-ion batteries boast an impressive cycle life of up to 4000 cycles, ensuring long-term durability and minimizing the need for battery replacements.

The PMSMs incorporate advanced control technology to optimize motor efficiency. Unlike traditional AC motors, PMSMs have higher energy conversion efficiency and reduce energy waste. This means that high-capacity trucks can work continuously for prolonged hours at lower costs.

**4000**

**cycles for high-voltage Li-ion batteries**

Equipped with fast charging capabilities, high-capacity trucks offer a remarkable charging experience. The high-voltage models are compatible with vehicle-grade charging stations and support 1C charging rating, allowing them to be fully charged in as fast as 1-1.2 hours. This minimizes downtime and maximizes productivity, making it ideal for multi-shift operations

Lithium batteries present considerably lower charging costs than fuel expenses. The integration of high-voltage and PMSM technology achieves up to 15% greater electricity savings versus traditional lithium and AC technology configurations. This significantly reduces long-term energy consumption costs.



**1C**
Charging

**1 hour**
Fully charged

**15%**
Energy savings

## Smart and reliable strategy for thermal management

The high-capacity trucks utilize three distinct cooling systems to ensure optimal performance and reliability. Specifically, two water cooling systems are employed for the motor and the battery, while an oil cooling system is dedicated to the hydraulics system.



The water cooling systems provide superior cooling performance, preventing the truck from overheating even under the most demanding conditions or in the heat of summer. Water's higher heat transfer capacity compared to air allows it to dissipate heat more efficiently from critical components like the motor and battery. This efficient heat dissipation helps maintain the battery temperature around 30~35°C, protecting these vital components from overheating and potential damage or failure. Consequently, this enhances the overall reliability and longevity of the high-capacity trucks.

Additionally, water cooling systems typically operate with less noise compared to air cooling systems that rely on high-speed fans. This noise reduction is particularly beneficial in applications where a quieter operation is desirable, such as in urban areas or indoor facilities.

The oil cooling system, on the other hand, is used for the hydraulics system. This system ensures that the hydraulic components remain within optimal temperature ranges, thereby maintaining their efficiency and preventing overheating. By effectively managing the temperature of the hydraulics system, the oil cooling system contributes to the smooth and reliable operation of the truck's hydraulic functions.




## Safety Assured: Battery, motor protection, monitoring and mast buffering

Both high-voltage lithium batteries and PMSM employ multiple protective measures to ensure safe operations including overcharge protection, over-temperature monitoring, short-circuit protection, etc. minimizing the risk of potential hazards and maximizing operational safety.



The central controlling module- VCU (Vehicle Control Unit) extends the safety of the high-voltage forklifts. VCU provides precise control and real-time monitoring of critical parameters to ensure the truck operates within safe limits.

It also features turn speed control, which adjusts the forklift's speed based on the turning angle, ensuring stability during turns. An over-speed alarm alerts the operator if the forklift exceeds the safe speed limit.*

The high-capacity forklift mast is equipped with a hydraulic buffering system that ensures smooth lifting and lowering of loads. With controlled deceleration, the fork movement is smooth with no abrupt stops that could damage the load or cause operator discomfort. This feature enhances operational safety and prolongs the lifespan of the mast components.



## Low maintenance: Longer battery life span

Operating at a higher voltage allows the battery to be designed with fewer individual cells. With fewer components and a simpler design, the risk of battery failure is lowered.

Thanks to advanced BMS (Battery Management System) which helps to regulate and monitor high-voltage battery, these batteries tend to have a longer life than low-voltage lithium batteries, reducing the need of battery replacement.

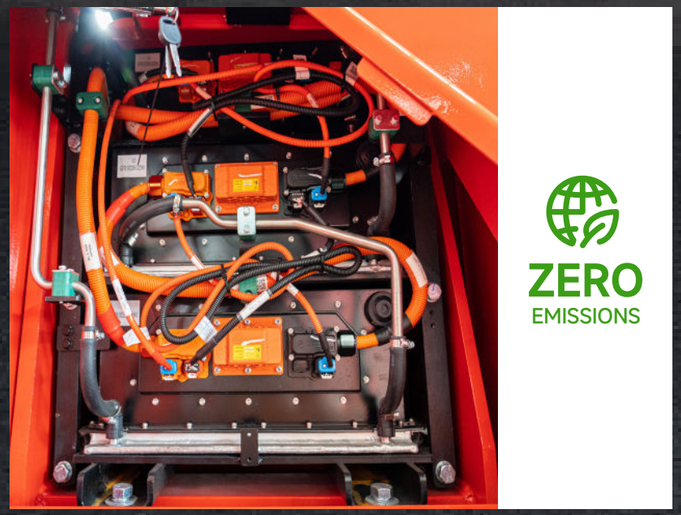
The brushless, simple rotor design of PMSM eliminates mechanical wear from brushes and commutators. This durable, low-friction construction requires minimal periodic maintenance, reducing associated labor costs and downtime.



## Sustainability : Zero emissions for cleaner environment

As fully electric trucks powered by lithium-ion batteries, these forklifts produce zero emissions during operation, eliminating exposure to toxic fumes like carbon monoxide and nitrogen oxides.

Unlike lead-acid batteries which can leak corrosive acid, lithium-ion batteries do not risk hazardous spills. The high-capacity li-ion trucks contribute to a cleaner and safer indoor working environment without compromising handling capabilities.




## Strong adaptability adaptable to harsh outdoor weather conditions

Experience uninterrupted productivity through rain, puddles, and damp conditions with the overall IPX4 rating. Plus an exceptional IP67 rating for high-voltage components. Engineered to withstand harsh temperature, high-capacity trucks offer an ambient temperature range of -20°C~40°C allowing them to perform no matter climate.

Battery heating when charging comes as a standard function for high capacity models, which is activated when the surrounding temperature is below zero to always offer an optimal temperature range for efficient and safe charging even in cold weather conditions.

The dual front wheels is a standard configuration on several models offering a wider base of support, which greatly improves the forklift's stability. Considering the capacity loads of the high-capacity trucks, the weight of the load is more evenly distributed across a larger surface area. The increased ground contact area provided by the dual wheels enhances traction. This is particularly beneficial in environments where the floor may be slippery or uneven while operating outdoors, ensuring that the forklift can maintain a firm grip and operate safely. This not only helps in maintaining balance but also minimizes the stress on individual tires, extending the lifespan of the tires.




## Great support for clients' investment: After-sales Service

**Remote/Online Services:**

Telematics technology enables remote monitoring of battery conditions, performance status, and other critical parameters for forklifts. Additionally, production, technical, and after-sales experts are available around the clock to provide prompt and comprehensive solutions for any maintenance issues through virtual support.

**Physical Services:**

Comprehensive manuals and supporting documents are provided for all forklift models. In case of breakdowns or replacements, spare parts are swiftly delivered to the clients' locations by global subsidiaries or domestic inventory, minimizing operational disruptions caused by equipment downtime.

# OVERCOMING THE MOST DEMANDING APPLICATIONS

EFL503-703 HV cater to industries dealing with extremely heavy loads, such as construction, metalworking, and more. The dual front wheels provide enhanced stability and traction when carrying massive weights.  The 30% gradeability, combined with a high ground clearance, makes them adept at navigating inclines, uneven surfaces, and challenging terrain commonly found in rugged applications. With a maximum travel speed of 30-34 km/h, these forklifts can swiftly handle operations even in extreme conditions, such as in front of incinerators or in high-heat areas. Additionally, their fast lifting speed ensures efficient material handling, further enhancing productivity in demanding industrial settings.









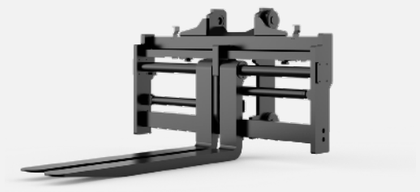
# Finely tuned down to the smallest detail

## Mast



Lifting and lowering Buffer
Max Lifting height up to 7000mm*

## Attachments



**Fork positioner with pin type forks***
This versatile combination allows handling different load sizes/positions

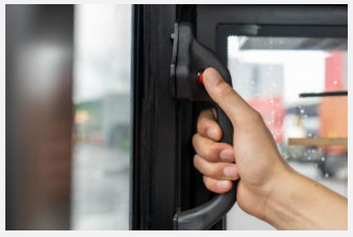
## Operating Compartment



Cabin with AC and heater*



Fingertips*



Rear grab handle with horn



Reversing radar and camera*



Reversing display*




## Battery




309V228Ah LFP battery
Battery heating when charging

## Lights



Front working lights



Strobe warning light



Area warning light*

The configurations marked with an asterisk (*) are optional.

## High Capacity Electric Counterbalanced Forklift 5-5.5T

# EFL503/553-HVD

| | | | | | | |
|---|---|---|---|---|---|---|
| Distinguishing mark | 1.1 | Manufacturer | | | EP | EP |
| | 1.2 | Model designation | | | EFL503-HVD-6 | EFL553-HVD-6 |
| | 1.3 | Drive | | | Electric | Electric |
| | 1.4 | Operator type | | | Seated | Seated |
| | 1.5 | Load capacity | Q | kg | 5000 | 5500 |
| | 1.6 | Load center distance | c | mm | 600 | 600 |
| | 1.8 | Load distance，centre of drive axle to fork | x | mm | 603.5 | 603.5 |
| | 1.9 | Wheelbase | y | mm | 2300 | 2300 |
| Service weight | 2.1 | Service weight | | kg | 8550 | 8950 |
| | 2.2 | Axle loading, laden front/rear | | kg | 12260/1290 | 13000/1450 |
| | 2.3 | Axle loading, unladen front/rear | | kg | 4650/3900 | 4615/4335 |
| Tyres/chassis | 3.1 | Tyre type | | | pneumatic | pneumatic |
| | 3.2 | Tyre size, front | | | 8.25-15-14PR | 8.25-15-14PR |
| | 3.3 | Tyre size, rear | | | 8.25-15-14PR | 8.25-15-14PR |
| | 3.5 | Wheels, number front/rear (x=drive wheels) | | mm | 4x/2 | 4x/2 |
| | 3.6 | Tread width, front | b10 | mm | 1498 | 1498 |
| | 3.7 | Tread width, rear | b11 | mm | 1718 | 1718 |
| Dimensions | 4.1 | Tilt of mast/fork carriage forward/backward | α/β | ° | 6/12 | 6/12 |
| | 4.2 | Retracted mast height | h1 | mm | 2480 | 2480 |
| | 4.3 | Free lift | h2 | mm | 160 | 160 |
| | 4.4 | Lift height | h3 | mm | 3000 | 3000 |
| | 4.5 | Height, mast extended | h4 | mm | 4470/3965 | 4470/3965 |
| | 4.7 | Height of overhead guard (cabin) | h6 | mm | 2590 | 2590 |
| | 4.8 | Seat height/standing height | h7 | mm | 1490 | 1490 |
| | 4.12 | Tow coupling height | h10 | mm | 600 | 600 |
| | 4.19 | Overall length | l1 | mm | 4720 | 4720 |
| | 4.20 | Length to face of forks | l2 | mm | 3500 | 3500 |
| | 4.21 | Overall width | b1/b2 | mm | 2028 | 2028 |
| | 4.22 | Fork dimensions | s/e/l | mm | 60x150x1220 | 60x150x1220 |
| | 4.23 | A,B Fork carriage class/type A, B | | | / | / |
| | 4.24 | Fork carriage width | b3 | mm | 1995 | 1995 |
| | 4.31 | Ground clearance, laden, below mast | m1 | mm | 160 | 160 |
| | 4.32 | Ground clearance, center of wheelbase | m2 | mm | 265 | 265 |
| | 4.34.1 | Aisle width for pallets 1000×1200 crossways | Ast | mm | 5260 | 5260 |
| | 4.34.2 | Aisle width for pallets 800×1200 lengthways | Ast | mm | 5260 | 5260 |
| | 4.35 | Turning radius | Wa | mm | 3235 | 3235 |
| Performance data | 5.1 | Travel speed, laden/unladen | | km/ h | 25/26 | 25/26 |
| | 5.2 | Lifting speed, laden/unladen | | m/s | 0.51/0.53 | 0.51/0.53 |
| | 5.3 | Lowering speed, laden/unladen | | m/s | 0.48/0.42 | 0.48/0.42 |
| | 5.5 | Drawbar pull, laden/unladen | | N | / | / |
| | 5.6 | Max. drawbar pull, laden/unladen | | N | / | / |
| | 5.8 | Max. gradeability, laden/unladen | | % | 30/34 | 30/34 |
| | 5.10 | Service brake | | | Hydraulic | Hydraulic |
| | 5.11 | Parking brake | | | Mechanical | Mechanical |
| Electric-engine | 6.1 | Drive motor rating S2 60 min | | kW | 60 | 60 |
| | 6.2 | Lift motor rating at S3 15% | | kW | 2x27.8 | 2x27.8 |
| | 6.4 | Battery voltage/nominal capacity | | V/Ah | 309V/228Ah | 309V/228Ah |
| | 6.5 | Battery weight | | kg | 693 | 693 |
| Addition data | 8.1 | Type of drive control | | | PMSM | PMSM |
| | 10.5 | Steering design | | | Hydraulic | Hydraulic |
| | 10.7 | Sound pressure level at the driver's ear | | dB(A) | / | / |

If there are improvements of technical parameters or configurations, no further notice will be given.
The diagram shown may contain non-standard configurations.

## High Capacity Electric Counterbalanced Forklift 6-7T

# EFL603-HV/703-HV

| | | | | | | |
|---|---|---|---|---|---|---|
| Distinguishing mark | 1.1 | Manufacturer | | | EP | EP |
| | 1.2 | Model designation | | | EFL603-HV-6 | EFL703-HV-6 |
| | 1.3 | Drive | | | Electric | Electric |
| | 1.4 | Operator type | | | Seated | Seated |
| | 1.5 | Load capacity | Q | kg | 6000 | 7000 |
| | 1.6 | Load center distance | c | mm | 600 | 600 |
| | 1.8 | Load distance，centre of drive axle to fork | x | mm | 603.5 | 608.5 |
| | 1.9 | Wheelbase | y | mm | 2300 | 2300 |
| Service weight | 2.1 | Service weight | | kg | 9250 | 9950 |
| | 2.2 | Axle loading, laden front/rear | | kg | 13755/1495 | 15200/1750 |
| | 2.3 | Axle loading, unladen front/rear | | kg | 4610/4640 | 4515/5435 |
| Tyres/chassis | 3.1 | Tyre type | | | pneumatic | pneumatic |
| | 3.2 | Tyre size, front | | | 8.25-15-14PR | 8.25-15-14PR |
| | 3.3 | Tyre size, rear | | | 8.25-15-14PR | 8.25-15-14PR |
| | 3.5 | Wheels, number front/rear (x=drive wheels) | | mm | 4x/2 | 4x/2 |
| | 3.6 | Tread width, front | b10 | mm | 1498 | 1498 |
| | 3.7 | Tread width, rear | b11 | mm | 1718 | 1718 |
| Dimensions | 4.1 | Tilt of mast/fork carriage forward/backward | α/β | ° | 6/12 | 6/12 |
| | 4.2 | Retracted mast height | h1 | mm | 2480 | 2480 |
| | 4.3 | Free lift | h2 | mm | 160 | 165 |
| | 4.4 | Lift height | h3 | mm | 3000 | 3000 |
| | 4.5 | Height, mast extended | h4 | mm | 4470/3965 | 4470/3965 |
| | 4.7 | Height of overhead guard (cabin) | h6 | mm | 2590 | 2590 |
| | 4.8 | Seat height/standing height | h7 | mm | 1490 | 1490 |
| | 4.12 | Tow coupling height | h10 | mm | 600 | 600 |
| | 4.19 | Overall length | l1 | mm | 4720 | 4775 |
| | 4.20 | Length to face of forks | l2 | mm | 3500 | 3555 |
| | 4.21 | Overall width | b1/b2 | mm | 2028 | 2028 |
| | 4.22 | Fork dimensions | s/e/l | mm | 60x150x1220 | 65x150x1220 |
| | 4.23 | A,B Fork carriage class/type A, B | | | / | / |
| | 4.24 | Fork carriage width | b3 | mm | 1995 | 1995 |
| | 4.31 | Ground clearance, laden, below mast | m1 | mm | 160 | 160 |
| | 4.32 | Ground clearance, center of wheelbase | m2 | mm | 265 | 265 |
| | 4.34.1 | Aisle width for pallets 1000×1200 crossways | Ast | mm | 5260 | 5265 |
| | 4.34.2 | Aisle width for pallets 800×1200 lengthways | Ast | mm | 5260 | 5265 |
| | 4.35 | Turning radius | Wa | mm | 3235 | 3255 |
| Performance data | 5.1 | Travel speed, laden/unladen | | km/ h | 25/26 | 25/26 |
| | 5.2 | Lifting speed, laden/unladen | | m/s | 0.51/0.53 | 0.51/0.53 |
| | 5.3 | Lowering speed, laden/unladen | | m/s | 0.48/0.42 | 0.48/0.42 |
| | 5.5 | Drawbar pull, laden/unladen | | N | / | / |
| | 5.6 | Max. drawbar pull, laden/unladen | | N | / | / |
| | 5.8 | Max. gradeability, laden/unladen | | % | 30/34 | 30/30 |
| | 5.10 | Service brake | | | Hydraulic | Hydraulic |
| | 5.11 | Parking brake | | | Mechanical | Mechanical |
| Electric-engine | 6.1 | Drive motor rating S2 60 min | | kW | 60 | 60 |
| | 6.2 | Lift motor rating at S3 15% | | kW | 2x27.8 | 2x27.8 |
| | 6.4 | Battery voltage/nominal capacity | | V/Ah | 309V/228Ah | 309V/228Ah |
| | 6.5 | Battery weight | | kg | 693 | 693 |
| Addition data | 8.1 | Type of drive control | | | PMSM | PMSM |
| | 10.5 | Steering design | | | Hydraulic | Hydraulic |
| | 10.7 | Sound pressure level at the driver's ear | | dB(A) | / | / |

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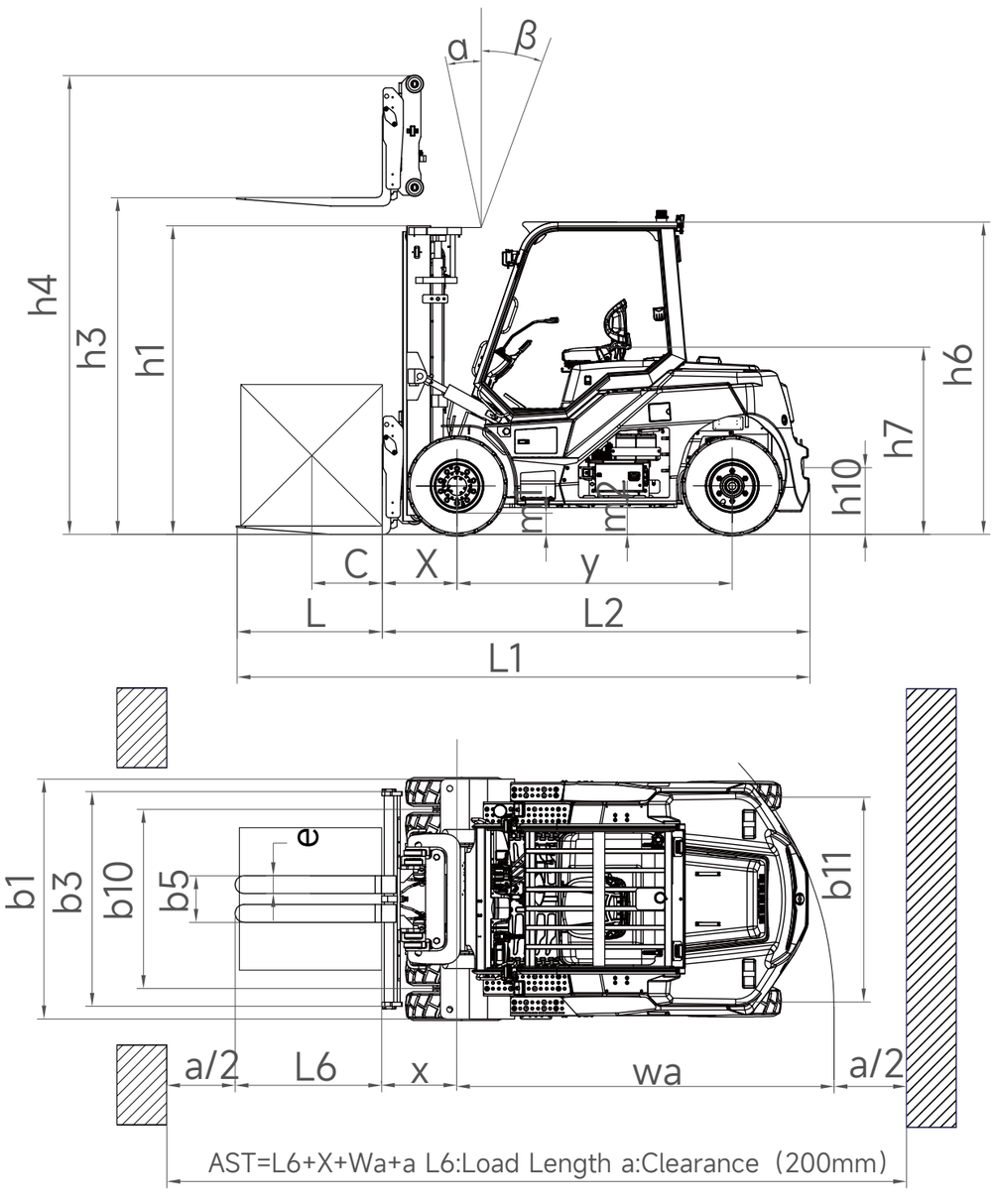
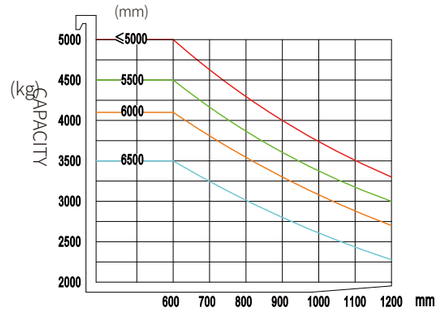
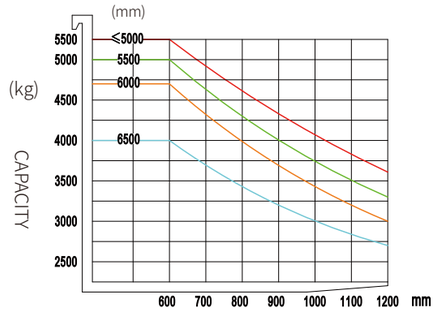



**EFL503-HVD-6**
**RATED CAPACITIES AND LOAD CENTERES GRAPH**



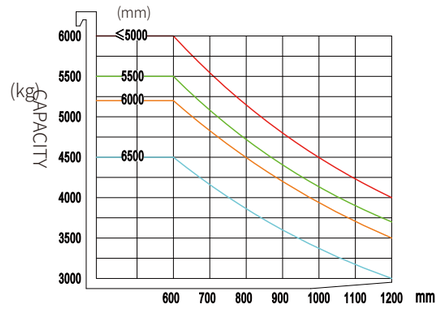

LOAD CENTRE POSITION (mm)

**EFL553-HVD-6**
**RATED CAPACITIES AND LOAD CENTERES GRAPH**



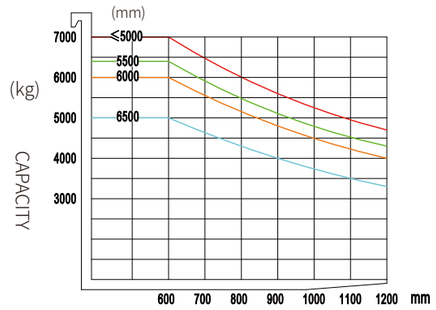

LOAD CENTRE POSITION (mm)

**EFL603-HV-6**
**RATED CAPACITIES AND LOAD CENTERES GRAPH**




LOAD CENTRE POSITION (mm)

**EFL703-HV-6**
**RATED CAPACITIES AND LOAD CENTERES GRAPH**




LOAD CENTRE POSITION (mm)

# Mast Option

| Mast types | Lift height ( h3 ) | Height, Mast | | | Height,Free lift(h2) | |
|---|---|---|---|---|---|---|
| | | Height, mast lowered(h1) | Height, mast extended(h4) | | No backrest | With backrest |
| | | | No backrest | With backrest | | |
| | mm | mm | mm | mm | mm | mm |
| 2-Standard Mast | 3000 | 2480 | 3960 | 4470 | 160 | 160 |
| | 3500 | 2730 | 4460 | 4970 | 160 | 160 |
| | 4000 | 2980 | 4960 | 5470 | 160 | 160 |
| | 4500 | 3280 | 5460 | 5970 | 160 | 160 |
| | 5000 | 3530 | 5960 | 6470 | 160 | 160 |
| | 5500 | 3830 | 6460 | 6970 | 160 | 160 |
| | 6000 | 4080 | 6960 | 7470 | 160 | 160 |
| | 6500 | 4380 | 7460 | 7970 | 160 | 160 |
| 2-Free Mast | 3000 | 2480 | 4310 | 4470 | 1495 | 1313 |
| | 3500 | 2730 | 4810 | 4970 | 1700 | 1580 |
| | 4000 | 2980 | 5310 | 5470 | 1995 | 1813 |
| 3-Free Mast | 4500 | 2660 | 5636 | 5976 | 1560 | 1220 |
| | 4800 | 2760 | 5936 | 6276 | 1660 | 1320 |
| | 5000 | 2810 | 6086 | 6476 | 1760 | 1370 |
| | 5500 | 3010 | 6686 | 6976 | 1860 | 1570 |
| | 6000 | 3160 | 7136 | 7476 | 2060 | 1720 |
| | 6500 | 3310 | 7586 | 7976 | 2260 | 1870 |
| | 7000 | 3610 | 8286 | 8476 | 2360 | 2170 |

# Standard Configuration

- Hook-on forks
- 1220mm forks
- 1995mm load backrest
- 309V228Ah LFP battery
- Heating system for lithium battery charging
- Mechanical lever
- Pneumatic tyres
- Standard overhead guard
- Mast lifting and lowering buffer
- Buzzer
- Rear grab handle with horn
- Upgraded suspension seat with armrest + headrest + safety seat-belt switch
- OPS system
- Lighting package: LED front working light, turn signal light, market light, LED rear working light, strobe warning light

# Options

○ Customized fork length/non-standard accessories

○ Customized fork carriage width

○ Attachments:

Hook on type sideshift

Hook on type fork positioner with sideshift

Fork positioner with pin type forks

○ 309V304Ah LFP battery

○ Charger

20kw (AC 370V-460V, 50-60HZ, 32A plug)

40kw (AC 370V-460V, 50-60HZ, 63A plug)

○ Solid tyres / non-marking tyres

○ Fingertips

○ Reversing radar/reversing camera/reversing radar and camera

○ Grammer MSG65-531 (suspension seat with armrest + safety belt switch)

○ Lights:

LED working lights on mast

Rotating warning light / rotating buzzer warning light

Rear/rear and front blue lamp

Front fog light

Customized area warning lamp

○ Cigarette lighter socket 12V5A

○ USB interface 24V

○ Turn speed control

○ Adjustable overspeed alarm

○ Cabin options:

Basic half-cabin: front windshield, front wiper (including sprinkler), roof

Upgrade half-cabin: basic half-cabin, rear windshield, rear wiper

Basic full cabin: upgrade half-cabin, left and right doors, defogging function

Upgrade full cabin: basic full cabin, air conditioner