



EFL403/453/503-HV

EFL503-HV-6/553-HV-6

High Capacity Electric Counterbalanced Forklift 4-5.5T



Innovation Through Simplicity



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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%

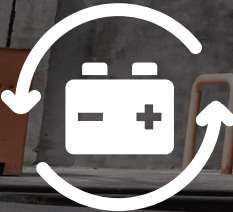
Improvement in gradeability when unladen.



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.

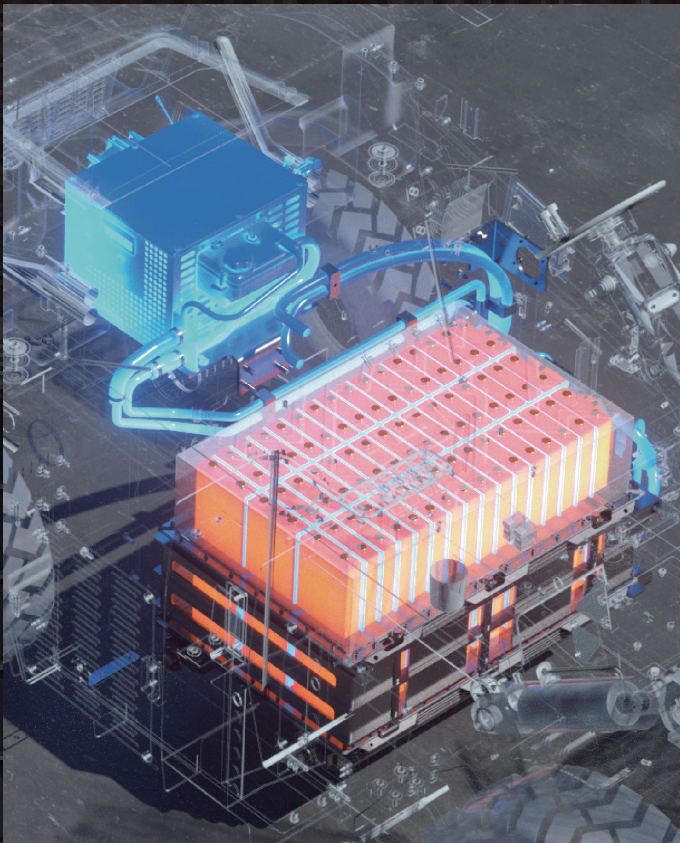


Low maintenance: Longer battery life span

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.

COMPACT AND MIGHTY

EFL403-553 HV offer more compact sizes while delivering enhanced performance over low-voltage forklift models. Their single front wheel design allows maneuverability in tighter spaces, making them ideal for industries like steel manufacturing, automotive, and heavy machinery production where space can be limited. With high-voltage Li-ion batteries, EFL403-553 can endure operating hours up to 6 hours. The 20-25% gradeability enables them to handle rough terrain and ramps with ease, making them suitable for outdoor applications with ease.



▣ No detail overlooked in the configurations

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


Fingertips*


Rear grab handle with horn

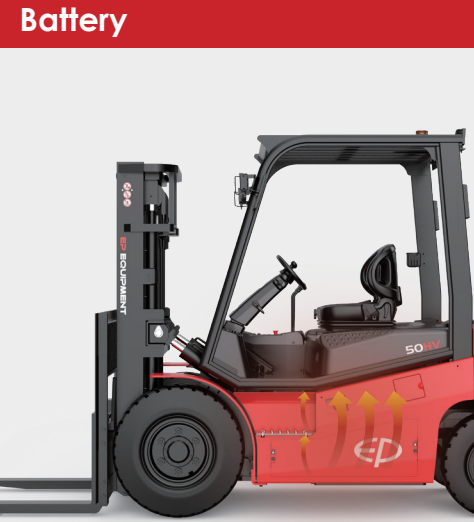

AC and heater*


Reversing radar and camera*


Reversing display*



Battery


309V173Ah 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 4-5T
EFL403/453/503-HV

				Distinguishing mark		
				1.1	1.2	1.3
				Manufacturer	EP	EP
				Model designation	EFL403-HV	EFL453-HV
				Drive	Electric	Electric
				Operator type	Seated	Seated
				Load capacity	4000	4500
				Load center distance	500	500
				Load distance, centre of drive axle to fork	545	545
				Wheelbase	2000	2000
				Service weight	6450	6900
				Axle loading, laden front/rear	9442/1008	10267/1133
				Axle loading, unladen front/rear	3352/3098	3415/3485
				Tyre type	pneumatic	pneumatic
				Tyre size, front	8.25-15-14PR	300-15-20PR
				Tyre size, rear	7.00-12-12PR	7.00-12-12PR
				Wheels, number front/rear (x=drive wheels)	2x/ 2	2x/ 2
				Tread width, front	1176	1176
				Tread width, rear	1190	1190
				Tilt of mast/fork carriage forward/backward	6/12	6/12
				Retracted mast height	2250	2250
				Free lift	150	150
				Lift height	3000	3000
				Height, mast extended	4243/3813	4243/3813
				Height of overhead guard (cabin)	2400	2400
				Seat height/standing height	1290	1290
				Tow coupling height	640	640
				Overall length	4125	4125
				Length to face of forks	3055	3055
				Overall width	1495	1495
				Fork dimensions	50×150×1070	50×150×1070
				A,B Fork carriage class/type A, B	/	/
				Fork carriage width	1500	1500
				Ground clearance, laden, below mast	150	150
				Ground clearance, center of wheelbase	180	180
				Aisle width for pallets 1000×1200 crossways	4495	4495
				Aisle width for pallets 800×1200 lengthways	4495	4495
				Turning radius	2680	2680
				Travel speed, laden/unladen	24/25	24/25
				Lifting speed, laden/unladen	0.46/0.53	0.43/0.53
				Lowering speed, laden/unladen	0.41/0.42	0.41/0.42
				Drawbar pull, laden/unladen	/	/
				Max. drawbar pull, laden/unladen	N	/
				Max. gradeability, laden/unladen	25/30	25/28
				Service brake	Hydraulic	Hydraulic
				Parking brake	Mechanical	Mechanical
				Drive motor rating S2 60 min	30	30
				Lift motor rating at S3 15%	27.8	27.8
				Battery voltage/nominal capacity	309V/173AH	309V/173AH
				Battery weight	473	473
				Type of drive control	PMSM	PMSM
				Steering design	Hydraulic	Hydraulic
				Sound pressure level at the driver's ear	/	/

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 5-5.5T
EFL503-HV-6/553-HV-6

				Distinguishing mark		
				1.1	1.2	1.3
				Manufacturer	EP	EP
				Model designation	EFL503-HV-6	EFL553-HV-6
				Drive	Electric	Electric
				Operator type	Seated	Seated
				Load capacity	5000	5500
				Load center distance	600	600
				Load distance, centre of drive axle to fork	555	555
				Wheelbase	2000	2000
				Service weight	7600	8150
				Axle loading, laden front/rear	11195/1405	12111/1539
				Axle loading, unladen front/rear	3308/4292	3435/4715
				Tyre type	pneumatic	pneumatic
				Tyre size, front	300-15-20PR	300-15-20PR
				Tyre size, rear	7.00-12-14PR	7.00-12-14PR
				Wheels, number front/rear (x=drive wheels)	2x/ 2	2x/ 2
				Tread width, front	1176	1176
				Tread width, rear	1190	1190
				Tilt of mast/fork carriage forward/backward	6/12	6/12
				Retracted mast height	2500	2500
				Free lift	160	160
				Lift height	3000	3000
				Height, mast extended	4243/3813	4243/3813
				Height of overhead guard (cabin)	2400	2400
				Seat height/standing height	1290	1290
				Tow coupling height	640	640
				Overall length	4370	4370
				Length to face of forks	3150	3150
				Overall width	1495	1495
				Fork dimensions	60×150×1220	60×150×1220
				A,B Fork carriage class/type A, B	/	/
				Fork carriage width	1500	1500
				Ground clearance, laden, below mast	150	150
				Ground clearance, center of wheelbase	180	180
				Aisle width for pallets 1000×1200 crossways	4705	4705
				Aisle width for pallets 800×1200 lengthways	4705	4705
				Turning radius	2730	2730
				Travel speed, laden/unladen	24/25	24/25
				Lifting speed, laden/unladen	0.38/0.48	0.36/0.48
				Lowering speed, laden/unladen	0.41/0.42	0.41/0.42
				Drawbar pull, laden/unladen	/	/
				Max. drawbar pull, laden/unladen	N	/
				Max. gradeability, laden/unladen	23/25	20/25
				Service brake	Hydraulic	Hydraulic
				Parking brake	Mechanical	Mechanical
				Drive motor rating S2 60 min	30	30
				Lift motor rating at S3 15%	27.8	27.8
				Battery voltage/nominal capacity	309V/173AH	309V/173AH
				Battery weight	473	473
				Type of drive control	PMSM	PMSM
				Steering design	Hydraulic	Hydraulic
				Sound pressure level at the driver's ear	/	/

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

Mast Option

EFL403-HV/EFL453-HV

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	2250	——	4243.5	150	150
	3500	2500	——	4743.5	150	150
	4000	2750	——	5243.5	150	150
	4500	3050	——	5743.5	150	150
	5000	3300	——	6243.5	150	150
	5500	3600	——	6743.5	150	150
	6000	3850	——	7243.5	150	150
	6500	4150	——	7743.5	150	150
2-Free Mast	3000	2250	——	4243.5	860	1364
	3500	2500	——	4743.5	1110	1614
	4000	2750	——	5243.5	——	——
3-Free Mast	4500	2248	5370	5880	——	1390
	5000	2410	5860	6370	——	1552
	5500	2575	6360	6870	——	1718
	6000	2790	6870	7380	——	1932
	6500	2980	7370	7880	——	2123
	7000	3155	7865	8375	——	2298

EFL503-HV/EFL503-HV-6/EFL553-HV-6

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	2250	——	4243.5	155	155
	3500	2500	——	4743.5	155	155
	4000	2750	——	5243.5	155	155
	4500	3050	——	5743.5	155	155
	5000	3300	——	6243.5	155	155
	5500	3600	——	6743.5	155	155
	6000	3850	——	7243.5	155	155
	6500	4150	——	7743.5	155	155
2-Free Mast	3000	2250	——	4243.5	860	1364
	3500	2500	——	4743.5	1110	1614
	4000	2750	——	5243.5	——	——
3-Free Mast	4500	2248	5370	5880	——	1390
	5000	2410	5860	6370	——	1552
	5500	2575	6360	6870	——	1718
	6000	2790	6870	7380	——	1932
	6500	2980	7370	7880	——	2123
	7000	3155	7865	8375	——	2298

Standard Configuration

- Hook-on forks
 - 1070mm forks (500mm LC) /1220mm forks (600mm LC)
 - 1424mm fork carriage width
 - Fork backrest with hook on type fork
 - 309V173Ah LFP battery
 - Pneumatic tyres
 - Buzzer

Heating system for lithium battery charging

 - Telematics
- Mechanical lever
 - Rear armrest horn
 - Upgrade mechanical suspension seat with armrest + headrest + safety belt switch
 - OPS system
 - Standard overhead guard
 - Mast lifting and lowering buffer
 - 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
 - Customized fork backrest
 - Attachments:

Hook-on sideshifter

Hook-on fork positioner with sideshifter

Fork positioner: Pin-type forks

 - Chargers

20kw (3 phase AC 370V-460V, 50-60HZ, 32A plug)

40kw (3 phase AC 370V-460V, 50-60HZ, 63A plug)

 - Fingertips
 - Grammer MSG65-531 mechanical suspension seat with armrest + safety belt switch
 - Solid tyres / non-marking tyres
 - Reversing radar/reversing camera/reversing radar and camera
- 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 light

 - 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 device

Upgrade full cabin: basic full cabin, air conditioner