



INNOVATIVE LITHIUM-ION



X SERIES

PALLET STACKER WITH INITIAL LIFT

with capacity of 1,200 to 1,600kg



X SERIES PALLET STACKER

X series pallet stackers with initial lift are a new generation of products newly developed by BULLDOG for warehousing and logistics applications. Using the advanced permanent magnet brushless drive technology and equipped with a new 48V system, the products have advanced performance, comfortable, safe and reliable operations and low use and maintenance costs, and are ideal tools for loading, unloading and handling palletized goods in warehouses, supermarkets, workshops.

REVOLUTIONARY PERFORMANCE

- The electric steering feature enables easier and more flexible operation (Stand-on/Rider model).
- The permanent magnet synchronous drive system has excellent performance and low energy consumption. The 48V power supply system has less heat generated.
- With the VCU control, the truck can be controlled accurately, stably and more efficiently.

48V
V O L T A G E
WITH
PERMANENT MAGNET
SYNCHRONOUS DRIVE MOTOR



RUGGED ON THE OUTSIDE

The X series pallet stacker with initial lift adopts a professional industrial design of exterior and a series family design. The truck has a smooth vivid profile and a fully ergonomic design, following the latest exterior design trend.

Made of high-strength steel plates that are molded by stamping, the truck exterior is robust, durable and high-grade, and meets environmental protection requirements.



With high power drive motor, provides fast travel speed and good gradeability.



COMFORTABLE EXPERIENCE

- Optimized designing structure can offer a good visibility and easy entrance of the pallet.
- The compact body and big rounded design provide an ideal operation in limited space, and the wedge designed chassis greatly increases the passing ability.
- Customer can choose different width of outside fork and length of forks to fit variable pallet.



RELIABILITY

- With the 4-pivot and low center of gravity design and a high-strength steel frame structure, the frame has a large residual load capacity.
- The lifting cylinders of the arm have been optimized for design, ensuring stability and reliability, with reduced stress and increased durability.
- Using non-contact proximity switch, it can provides long life and reliable operation.
- H-type mast profile section to provide more stable and rigid performance.
- This truck features a newly designed drive system, where the drive motor does not rotate with the steering tiller during turning, thus preventing the cables connected to the drive motor from easily breaking due to bending.



The proportional lifting/lowering speed regulation system enables more stable and accurate operation.



- Newly developed tiller is compact and stylish.



- Displayed turtle speed function applied to move slowly and helps to stack goods in narrow spaces.



- The hydraulic power unit applied to provide low noise, low vibration, smooth lifting and landing reliable operation.
- The battery is reliably fixed and the battery cover is support by soft materials, so that the vibration and noise generated during the operation of the vehicle are reduced.



The power plug is fixed on the truck body to avoid damage from battery installment.



The stamped fork with higher strength and impact resistance, and guided fork prongs, further improve operation efficiency.



[Option]Lithium battery with the on-board charger(48V,20A).

Water-proof plugs and connectors applied to provide a reliable protection to electric system.





For the stand-on model, a function of stopping lifting when the lifting height reaches the limit of 1.8m and resuming the lifting after the guardrails are retracted is provided to facilitate personnel to escape when high position goods fall.

SAFETY

- Turning speed is automatically reduced when steering (Stand-on/Rider model).
- With three braking types: releasing brake, reversing brake and emergency brake, the driving safety has been ensured.
- The applied slope anti-slip function ensures the safety of the operation.



The emergency button on the tiller head can effectively avoid the harm to the driver.



Foot detection sensor - trucks slows down or stops if operator's foot is detected outside of the platform contours (Rider model option).



Travel speed will be automatically reduced after fork lifting 500mm.



- The lifting buffering function can ensure the safety of the truck when the fork is lifted to the top.
- It has an intelligent soft landing that automatically slows down the lowering speed when the fork is less than 100mm above the ground, effectively protecting cargo safety. (Available for duplex mast)



The truck with assembly overhead guard can protect the driver's safety in case of high-position cargo falling. (Rider Model)



MAINTENANCE



- Permanent magnet synchronous motor need no maintenance.
- The fault information can be checked directly via the interactive instruments instead of the manual.
- Rear cover can be completely open, operator can see all the components, so the maintenance is very convenient.
- All shafts installed lubricated shaft sleeve and oil cup, provide convenient maintenance and long service life.



BULLDOG provides Li-ion battery (LiFePO4) with 6 years or 12000 hours warranty.



LITHIUM POWERED

EMPOWER YOURSELF
WITH THE BEST



Li
Lithium

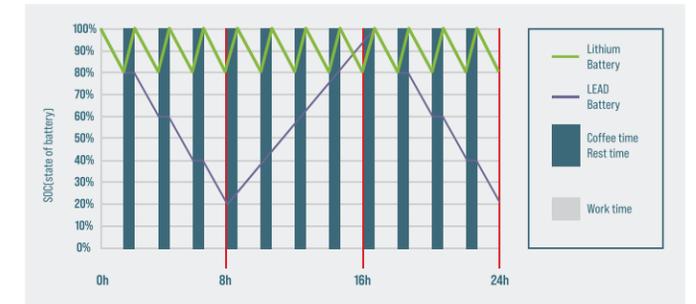


POWER THE POSSIBILITIES
RELIABLE LITHIUM-ION TECHNOLOGY

FEATURES & BENEFITS THE HANGCHA DIFFERENCE

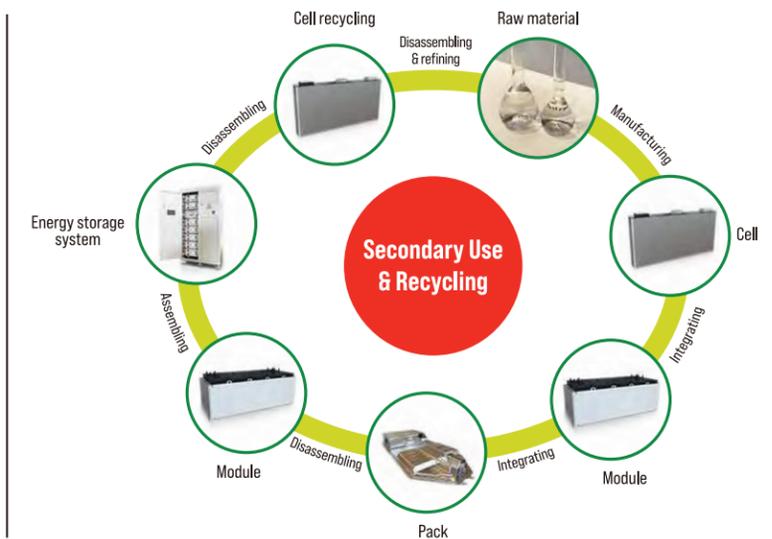
Efficiency

By quick opportunity charging any downtime, such as a lunch break, can be efficiently used and the battery is recharged in a very short period of time. Interim charging does not affect the battery service life.



Safety

- / Intelligent battery management monitoring every important function.
- / Higher user safety, thanks to acid-free use.
- / User friendly due to avoided battery change.
- / No emission of battery gasses.



LITHIUM BATTERY ADVANTAGES



Long service life

4000 full charging cycles with at least 75% residual capacity.



Cold area application

Li-Ion batteries maintain high performance at temperatures below freezing.



Return on investment

Add flexibility to your operation, cost-saving in the long term, increased efficiencies.



High safety and reliability

Intelligent battery management monitoring every important function, no emission of battery gasses.



Maintenance free

No topping up of water or checking acid levels.



Opportunity charging

Full performance during several shifts thanks to effective interim charging.



High energy density

The high energy density of the Li-Ion battery ensures long working times and increases the high availability.

QUESTION 1

Q: What are the characteristics of lithium batteries, especially when used in high and low temperature environments?

Charging temperature: -30 C -65 C
Discharge temperature: -30 C -65 C
Storage environment temperature: -30 C -65 C

After the truck key switch is closed, the instrument battery condition needs to be checked:

1. Confirm that there is no battery system alarm message on the instrument panel.
2. Please check the remaining power before use. It is recommended to use the SOC between 50% and 100%.
3. If the SOC is lower than 20%, it is not recommended to continue using it. Please charge it as soon as possible.

QUESTION 2

Q: What is the charging time and usage time calculation of forklift lithium battery?

1. Available power of lithium battery (kWh) = rated voltage * rated power * 90% (To avoid over-discharge damaging the battery, the forklift is equipped with low power protection [less than 10%]).
 2. Charging time (h) = rated capacity of lithium battery (Ah) * 90% * charger output current (A).
 3. The power consumed for charging (kWh) = the available power of the lithium battery * 93% (the charging efficiency of the charger is calculated as 93%).
 4. Usage time (h) = available power of lithium battery * energy consumption data.
- For specific energy consumption values, please refer to the technical table on the sharing platform.**

QUESTION 3

Q: How does Hangcha BMS work to ensure the safety of the lithium battery?

HANGCHA BMS (battery management system) can monitor the cells at all times. As a result, hangcha lithium power is the reliable solution.



Battery Safety Management:

- Overcharge/over discharge protection
- Overcurrent/over-temperature/low-temperature protection
- Multi-level fault diagnosis protection
- Double fault monitoring



Battery Parameter Detection:

- Battery voltage detection and analysis
- Battery current detection and analysis
- Battery temperature detection and analysis



Equilibrium Management:

- Equalization based on voltage mode
- Equalization based on time mode
- Equalization based on battery cell SOC
- Active/passive equalization optional



Other Features:

- Low cost, low power consumption
- Historical data record
- Flexible cascade expansion
- CRC data validation

1.2t Mast Specification

Mast type	Max Lifting Height h ₃	Max.fork height (h ₃ + h ₁₃)	Lowered Height h ₁	Extended Height h ₄	Free lift	Load capacity at 600mm	
						1.2t	kg
	mm	mm	mm	mm	mm		
Double cylinders Duplex wide view	2100 ¹⁾	2190	1540	2590	90		1200
	2500 ¹⁾	2590	1740	2990	90		1200
	2700	2790	1840	3190	90		1200
	3000	3090	1990	3490	90		1150
	3200	3290	2090	3690	90		1020
	3400	3490	2190	3890	90		920
Duplex full-free wide view	3600	3690	2290	4090	90		880
	2100 ¹⁾	2190	1540	2590	1070		1200
	2500 ¹⁾	2590	1740	2990	1270		1200
	2700 ¹⁾	2790	1840	3190	1370		1200
	3000	3090	1990	3490	1520		1150
	3200	3290	2090	3690	1620		1020
Triplex full-free wide view	3400	3490	2190	3890	1720		920
	3600	3690	2290	4090	1820		880
	3600 ¹⁾	3690	1660	4080	1195		880
	3900 ¹⁾	3990	1760	4380	1295		820
	4100 ¹⁾	4190	1830	4580	1360		770
	4300	4390	1890	4780	1425		730
	4500	4590	1960	4980	1495		700
	4700	4790	2030	5180	1560		650

Note: 1) Optional feature for battery side roll out was necessary. It can make changing the battery easier.

1.4-1.6t Mast Specification

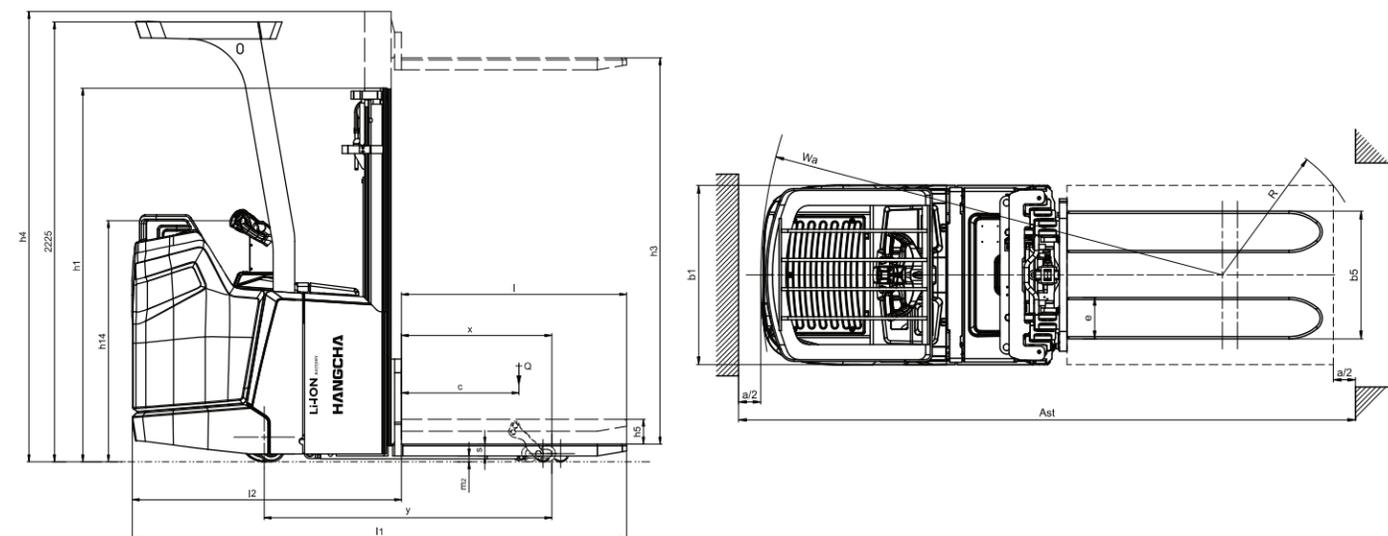
Mast type	Max Lifting Height h ₃	Max.fork height (h ₃ + h ₁₃)	Lowered Height h ₁	Extended Height h ₄	Free lift	Load capacity at 600mm		
						1.4t	1.6t	
	mm	mm	mm	mm	mm	kg	kg	
Double cylinders Duplex wide view	2000 ¹⁾	2090	1540	2540	90	1400	1600	
	2400 ¹⁾	2490	1740	2940	90	1400	1600	
	2700	2790	1890	3240	90	1300	1400	
	2900	2990	1990	3440	90	1200	1250	
	3000	3090	2040	3540	90	1150	1200	
	3300	3390	2190	3840	90	950	1000	
	3500	3590	2290	4040	90	900	950	
	3800	3890	2440	4340	90	850	900	
	4000	4090	2540	4540	90	800	850	
	4200	4290	2640	4740	90	750	800	
Duplex full-free wide view	4500	4590	2790	5040	90	700	750	
	2000 ¹⁾	2090	1540	2540	1020	1400	1600	
	2400 ¹⁾	2490	1740	2940	1220	1400	1600	
	2700	2790	1890	3240	1370	1300	1400	
	3000	3090	2040	3540	1520	1150	1200	
	3300	3390	2190	3840	1670	950	1000	
	3500	3590	2290	4040	1770	900	950	
	3500 ¹⁾	3590	1660	4020	1160	900	950	
	3800 ¹⁾	3890	1760	4320	1260	850	900	
	4000 ¹⁾	4090	1830	4520	1330	800	850	
Triplex full-free wide view	4200	4290	1890	4720	1390	750	800	
	4500	4590	1990	5020	1490	700	750	
	4700	4790	2060	5220	1560	650	700	
	4800	4890	2090	5320	1590	630	680	
	5000	5090	2160	5520	1660	600	650	
	5200	5290	2230	5720	1730	550	600	
	5500	5590	2330	6020	1830	450	500	
		6000	6090	2500	6520	2000	350	400

Note: 1) Optional feature for battery side roll out was necessary. It can make changing the battery easier.

Technical data (Rider pallet stackers)

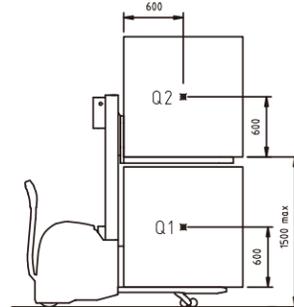
Distinguishing mark	BULLDOG GROUP CO., LTD.		
		CDD14-XT1S-SISUL	CDD16-XT1S-SISUL
1.1	Manufacturer (abbreviation)		
1.2	Manufacturer's type designation	CDD14-XT1S-SISUL	CDD16-XT1S-SISUL
1.3	Drive: electric (battery type, mains, ...), diesel, petrol, fuel gas	Electric	Electric
1.4	Operator type: hand, pedestrian, standing, seated, order-picker	standing	standing
1.51	Load capacity at load centre distance c1	kg	1400
1.52	Load capacity at load centre distance c2	kg	2000
1.6	Load centre distance	c (mm)	600
1.8	Load distance, centre of drive axle to fork	x (mm)	700/768
1.9	Wheelbase	y (mm)	1401/1469
2.1	Service weight	kg	1360
2.2	Axle loading, laden front/rear	kg	1080/1680
2.3	Axle loading, unladen front/rear	kg	965/395
3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		PU
3.2	Tyre size, front		Ø250-80
3.3	Tyre size, rear		Ø83-73
3.4	Additional wheels (dimensions)		Ø140-55
3.5	Wheels, number front/rear (+ = driven wheels)		1x + 1/4
3.6	Tread, front	b10 (mm)	516
3.7	Tread, rear	b11 (mm)	385
4.2	Height, mast lowered	h1 (mm)	1890
4.3	Free lift	h2 (mm)	90
4.4	Lift	h3 (mm)	2700
4.5	Height, mast extended	h4 (mm)	3240
4.6	Initial lift	h5 (mm)	125
4.9	Height drawbar in driving position	h14 (mm)	1220
4.15	Height, lowered	h13 (mm)	90
4.19	Overall length	l1 (mm)	2525 ²⁾
4.20	Length to face of forks	l2 (mm)	1375 ³⁾
4.21	Overall width	b1/b2 (mm)	800
4.22	Fork dimensions DIN ISO 2331	s/e/l (mm)	65/185/1150
4.25	Fork spread	b5 (mm)	570
4.32	Ground clearance, centre of wheelbase	m2 (mm)	15
4.34.1	Aisle width for pallets 1000 x 1200 crossways	Ast (mm)	2730 ¹⁾²⁾
4.34.2	Aisle width for pallets 800 x 1200 lengthways	Ast (mm)	2780 ²⁾³⁾
4.35	Turning radius	Wa (mm)	2080 ⁴⁾
5.1	Travel speed, laden/unladen	km/h	9/11
5.2	Lift speed, laden/unladen	m/s	0.195/0.4
5.3	Lowering speed, lade/unladen	m/s	0.45/0.4
5.8	Max. gradeability, laden/unladen	%	10/16
5.10	Service brake		Regenerative
6.1	Drive motor rating S2 60 min	kW	2.2
6.2	Lift motor rating at S3 15 %	kW	4.2
6.4	Battery voltage/nominal capacity	V/Ah	48/80
6.5	Battery weight	kg	60

Note: 1) According to VDI2198 standard+261mm. 2) According to VDI2198 standard+157mm. 3) Triplex full-free+21mm 4) Lowering+68mm



Technical data

Distinguishing mark	BULLDOG GROUP CO., LTD.				
	1.1	1.2	1.3	1.4	1.51
1.1	Manufacturer	BULLDOG GROUP CO., LTD.			
1.2	Manufacturer's type designation	CDD12-XT1-SIL	CDD14-XT1-SIL	CDD16-XT1-SIL	
1.3	Drive: electric (battery type, mains, ...), diesel, petrol, fuel gas	Electric	Electric	Electric	
1.4	Operator type: hand, pedestrian, standing, seated, order-picker	pedestrian	pedestrian	pedestrian	
1.51	Load capacity at load centre distance c ₁	kg	1200	1400	1600
1.52	Load capacity at load centre distance c ₂	kg	2000	2000	2000
1.6	Load centre distance	c (mm)	600	600	600
1.8	Load distance, centre of drive axle to fork	x (mm)	700/768	700/768	700/768
1.9	Wheelbase	y (mm)	1387/1455	1387/1455	1387/1455
2.1	Service weight	kg	1090	1120	1120
2.2	Axle loading, laden front/rear	kg	780/1510	860/1660	930/1790
2.3	Axle loading, unladen front/rear	kg	740/350	760/360	760/360
3.1	Tyres: solid rubber, superelastic, pneumatic, polyurethane		PU	PU	PU
3.2	Tyre size, front		Ø250x80	Ø250x80	Ø250x80
3.3	Tyre size, rear		Ø83x73	Ø83x73	Ø83x73
3.4	Additional wheels (dimensions)		Ø140x55	Ø140x55	Ø140x55
3.5	Wheels, number front/rear (x = driven wheels)		1x+1/4	1x+1/4	1x+1/4
3.6	Tread, front	b ₁₀ (mm)	510	510	510
3.7	Tread, rear	b ₁₁ (mm)	385	385	385
4.2	Height, mast lowered	h ₁ (mm)	1840	1890	1890
4.3	Free lift	h ₂ (mm)	90	90	90
4.4	Lift	h ₃ (mm)	2700	2700	2700
4.5	Height, mast extended	h ₄ (mm)	3190	3240	3240
4.6	Initial lift	h ₅ (mm)	125	125	125
4.9	Height drawbar in driving position min./max.	h ₁₄ (mm)	790/1205	790/1205	790/1205
4.15	Height, lowered	h ₁₃ (mm)	90	90	90
4.19	Overall length	l ₁ (mm)	2000 ³⁾	2000 ³⁾	2000 ³⁾
4.20	Length to face of forks	l ₂ (mm)	850 ³⁾	850 ³⁾	850 ³⁾
4.21	Overall width	b ₁ /b ₂ (mm)	800	800	800
4.22	Fork dimensions DIN ISO 2331	s/e/l (mm)	65/185/1150	65/185/1150	65/185/1150
4.25	Fork spread	bs (mm)	570	570	570
4.32	Ground clearance, centre of wheelbase	m ₂ (mm)	15	15	15
4.34.1	Aisle width for pallets 1000 x 1200 crossways	Ast (mm)	2267 ⁴⁾	2267 ⁴⁾	2267 ⁴⁾
4.34.2	Aisle width for pallets 800 x 1200 lengthways	Ast (mm)	2317 ⁴⁾	2317 ⁴⁾	2317 ⁴⁾
4.35	Turning radius	Wa (mm)	1620	1620	1620
5.1	Travel speed, laden/unladen	km/h	6/6	6/6	6/6
5.2	Lift speed, laden/unladen	m/s	0.225/0.47	0.195/0.4	0.18/0.4
5.3	Lowering speed, laden/unladen	m/s	0.45/0.4	0.45/0.4	0.45/0.4
5.8	Max. gradeability, laden/unladen	%	8/16	8/16	6/16
5.10	Service brake		Regenerative	Regenerative	Regenerative
6.1	Drive motor rating S2 60 min	kW	2.2	2.2	2.2
6.2	Lift motor rating at S3 15%	kW	4.2	4.2	4.2
6.4	Battery voltage/nominal capacity	[V]/[Ah] or kWh	48/80	48/80	48/80
6.5	Battery weight	kg	60	60	60

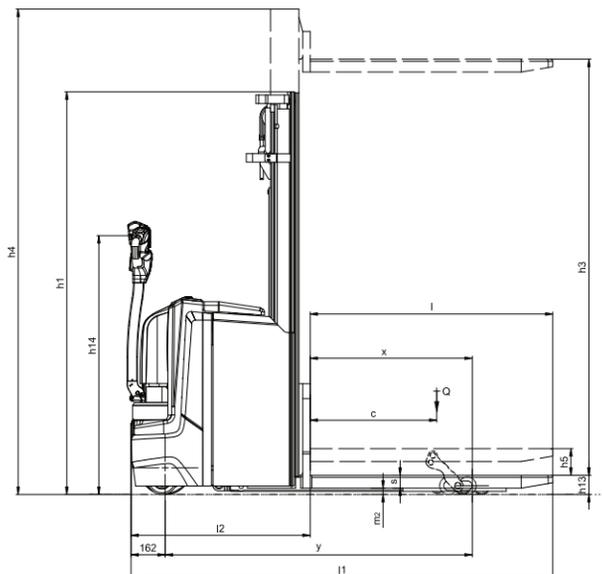


Q1(kg)		Q2(kg)	Q1-Q2(kg)
max	min	max	max
2000	0	0	2000
1100	100	100	1200
1000	200	200	
900	300	300	
800	400	400	
700	500	500	
600	600	600	

Q1(kg)		Q2(kg)	Q1-Q2(kg)
max	min	max	max
2000	0	0	2000
1300	100	100	1400
1200	200	200	
1100	300	300	
1000	400	400	
900	500	500	
800	600	600	
700	700	700	

Q1(kg)		Q2(kg)	Q1-Q2(kg)
max	min	max	max
2000	0	0	2000
1500	100	100	1600
1400	200	200	
1300	300	300	
1200	400	400	
1100	500	500	
1000	600	600	
900	700	700	
800	800	800	

Note: 1) According to VDI2198 standard+261mm. 2) According to VDI2198 standard+157mm. 3) Triplex full-free+21mm 4) Lowering+68mm



Features

Truck	Standard	Options
48V permanent magnet synchronous drive motor	●	
Hydraulic power unit	●	
PU wheel	●	
1150mm fork length	●	
570mm outside fork width	●	
Wheel arms lifting limitation	●	
Lifting damping system	●	
Multi-function tiller	●	
48V/80Ah lithium battery(EVE)	●	
Additional wheels	●	
Dual load wheels	●	
USB power supply	●	
Fork lift & lower adopts stepless speed regulating	●	
Different length of forks		○
Different width of outside fork		○
Key switch		○
48V/105Ah lithium battery [EVE]		○
48V/125Ah lithium battery [CATL]		○
Load backrest		○
Lithium battery(48V/80Ah,EVE) with the on-board charger(48V,20A)		○
Lithium battery(48V/105Ah,EVE) with the on-board charger(48V,20A)		○
Controls and instruments		
Electric steering (Stand-on and Rider model)	●	
System controller	●	
Interactive meter	●	
Non contact interlock switch	●	
Safety		
Emergency disconnect switch	●	
Horn	●	
PIN code access	●	
Turning deceleration(Stand-on and Rider model)	●	
Mast protection		○

