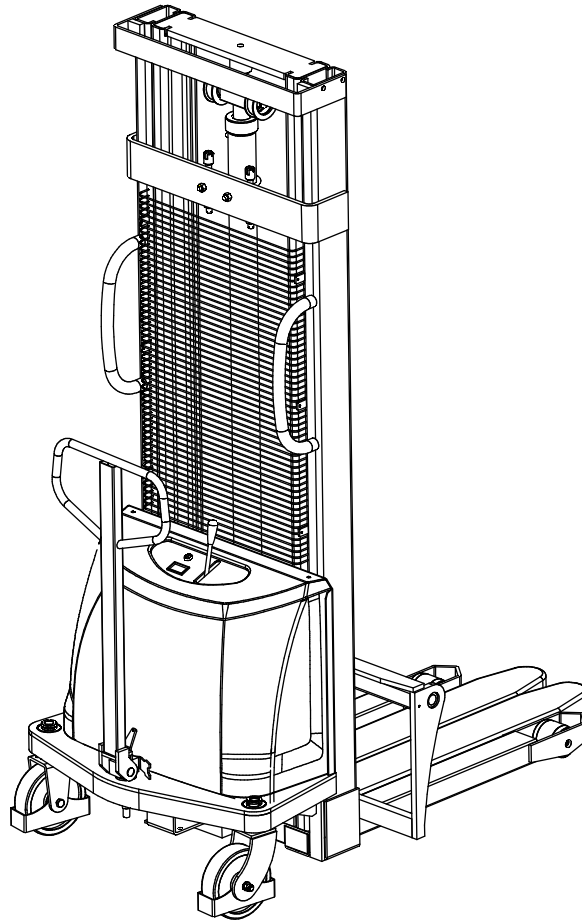


CDDB-E/ CTDB-E Semi-electric Stacker

- Operation Manual
- Parts Catalogue



Hope our semi-electric stackers will bring great convenience to your work!

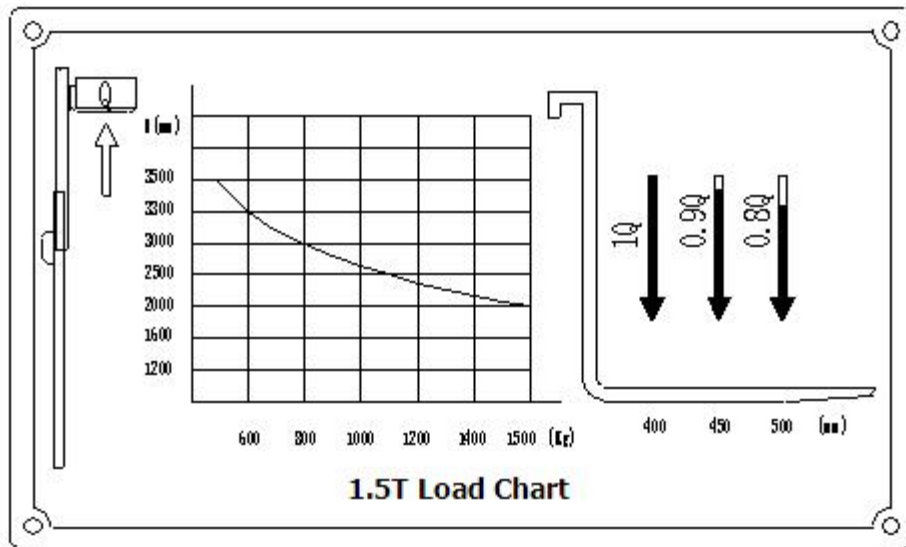
- Please read the manual carefully before operation.
- This manual is a common manual. We reserve the right to modify technology of the electric stacker. If there is anything in the manual that is not consistent with the actual stacker, the actual stacker should be considered correct and the manual is only for reference.

Warning!

Operators must strictly conform to ISO3691 *Safety Specifications of Motor Industrial Trucks*. Untrained personnel are not allowed to operate the stacker.

According to ISO 3691 *Safety Specification of Motor Industrial Trucks*, load capacity and lifting height of the CDDB-E aemi-electric stacker are stipulated as follow:

1. When the lifting height of CDDB-E stacker is below 2000mm (including 2000mm), the maximum load capacity is the rated capacity. Overloading is prohibited.
2. When the lifting height of CDDB-E stacker is above 2000mm (excluding 2000mm), the load capacity is less than the rated bearing capacity. Take the following diagrams as a reference.



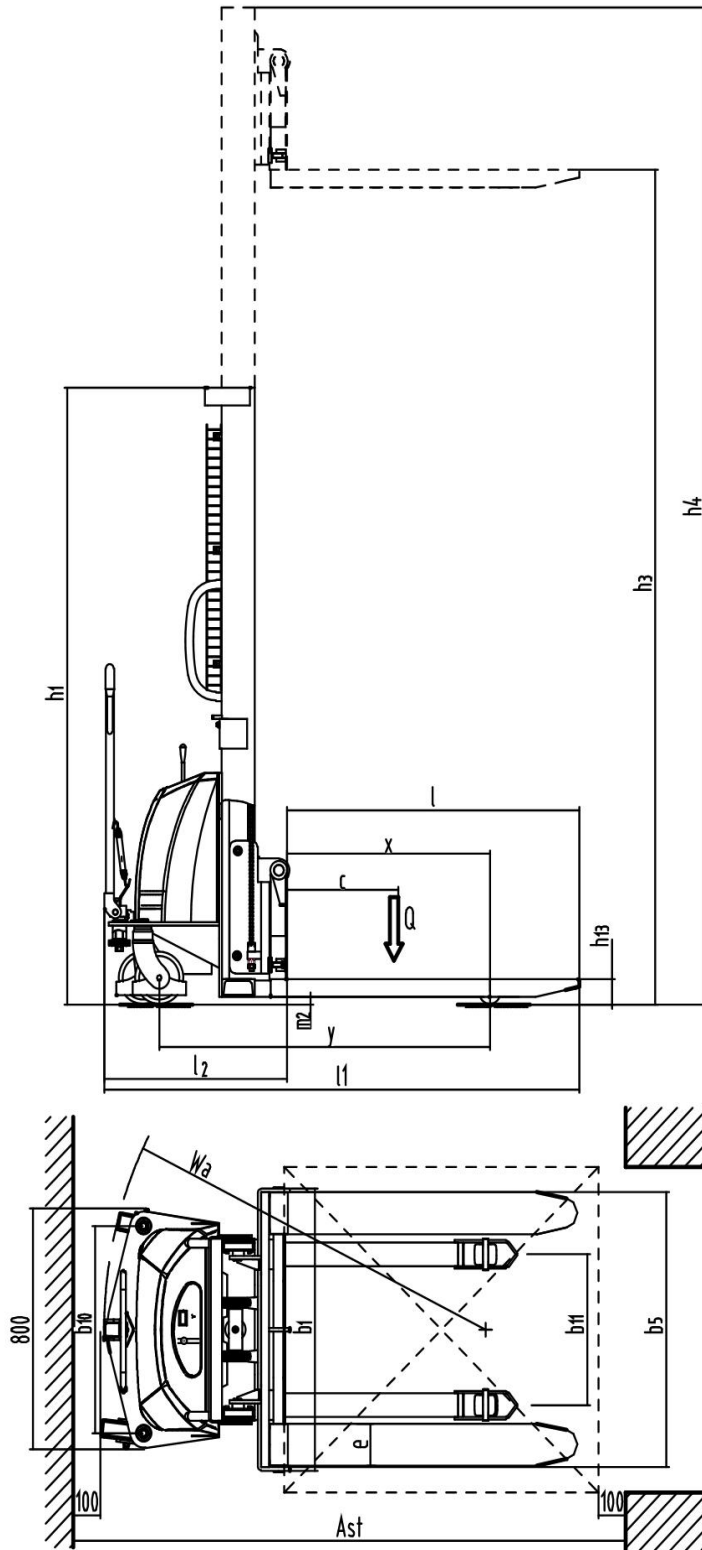
3. If the stacker is working with a lifting height over 500mm, drive it slowly and keep the consecutive traveling distance within 2m. Long-distance traveling is strictly forbidden under the circumstance.
4. Drivers of the stacker are required to work with the guidance of ISO3691 *Safety Specification of Motor Industrial Trucks*. Personnels without training is forbidden to operate the truck.

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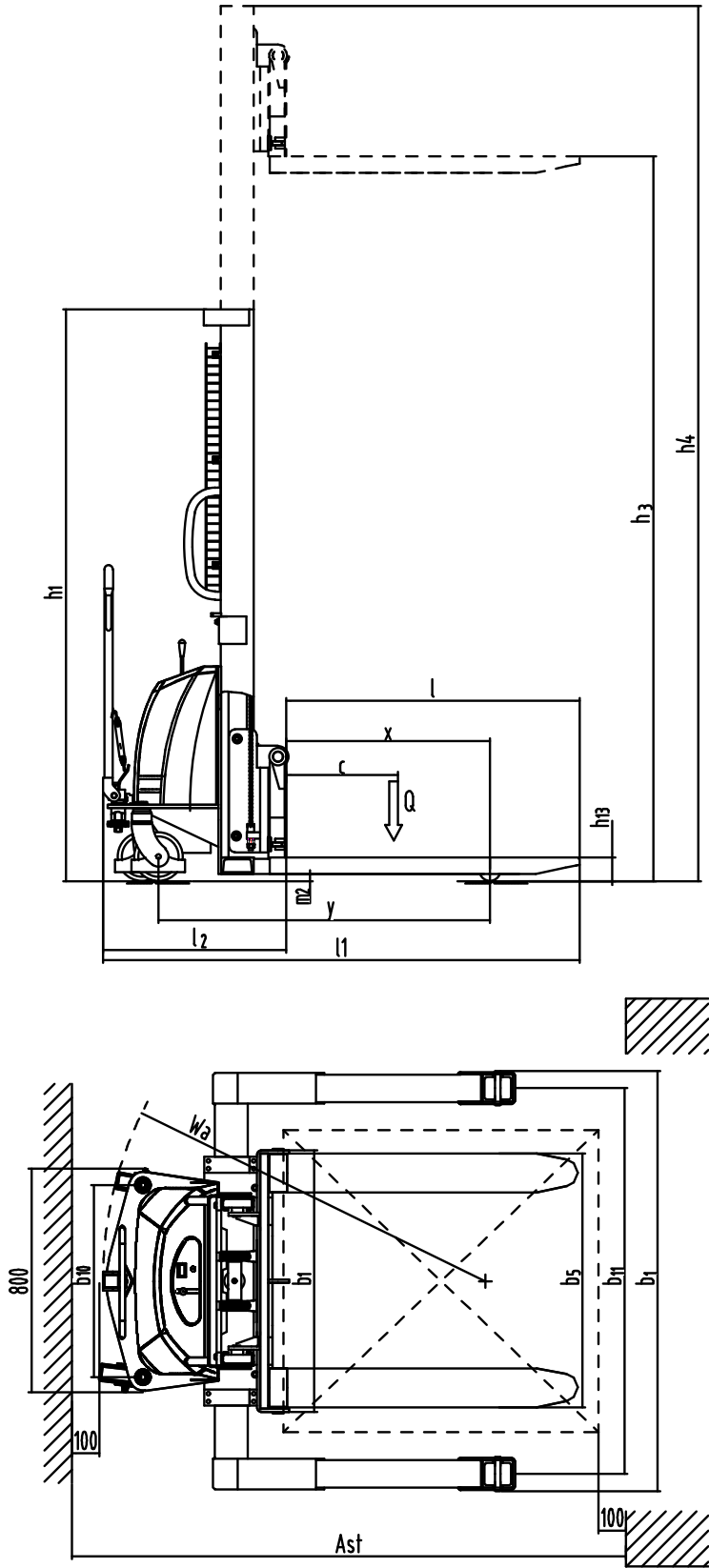
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1. Outline drawing

- CDDB-E



● CTDB-E



2. Main technical parameters

- CDDB-E

Characteristics	1.1	Manufacturer(abbreviated)		
	1.2	Model		CDD15B-E
	1.4	Driving model (Manual, Walking, Stand driving, Seat driving ,Order picking)		Manual
	1.5	Rated load	Q(kg)	1500
	1.6	Load center distance	c (mm)	500
	1.8	Front overhang	x (mm)	650
	1.9	Tread	γ (mm)	1235
Weight	2.1	Service weight(with battery)	kg	335/395/415/425/435
	2.2	Axle load, front/rear, laden	kg	375/1540
	2.3	Axle load, front/rear, unladen	kg	280/135
Wheel chassis	3.1	Wheels (rubber, high elasticity, pneumatic tyre, polyurethane wheel)		Nylon
	3.2	Wheel dimension, front		$\phi 180 \times 50$
	3.3	Wheel dimension, rear		$\phi 80 \times 78$
	3.5	Wheel number, front/rear		2/2
	3.6	Tread, front	b_{10} (mm)	700
	3.7	Tread, rear	b_{11} (mm)	428/531
Dimension	4.2	Height of mast, lowered	h_1 (mm)	2100/1850/2100/2250/2350
	4.4	Lift height	h_3 (mm)	1600/2500/3000/3300/3500
	4.5	Max. height of mast, extended	h_4 (mm)	2100/3060/3560/3860/4060
	4.15	Height, lowered	h_{13} (mm)	90
	4.19	Overall length	l_1 (mm)	1745/1825
	4.20	Length to fork face	l_2 (mm)	675
	4.21.1	Overall width of truck body	b_1 (mm)	967
	4.22	Fork dimension	$s/e/l$ (mm)	$60 \times 142 \times 1070/1150$
	4.25	Overall width of fork	b_5 (mm)	295-930
	4.32	Wheelbase ground distance	m_2 (mm)	20
	4.34.1	Aisle width, with pallet 1000x1200 crosswise	A_{st} (mm)	2288
	4.34.2	Aisle width, with pallet 800x1200 lengthwise	A_{st} (mm)	2267
	4.35	Turning radius	W_a (mm)	1425
Performance Data	5.2	Lifting speed, laden/unladen	m/s	0.05/0.08
	5.3	Descending speed, laden/ unladen	m/s	0.1/0.09
	5.8	Max. gradeability, laden/unladen	%	6/15
	5.10	Traveling brake		Electromagnetic brake
Motor	6.2	Lifting motor power	kW	1.5
	6.4	Battery voltage/rated capacity	V/Ah	12/120
	6.5	Battery weight	kg	45
		Battery dimension (LXWXH)	mm	$360 \times 170 \times 250$
	10.7	Noise level at operator's ear, according to DIN12053	dB(A)	<70

● CTDB-E

Characteristics	1.1	Manufacturer(abbreviated)		
	1.2	Model		CTD15B-E
	1.3	Driving model (Manual, Walking, Stand driving, Seat driving ,Order picking)		Manual
	1.4	Rated load	Q(kg)	1500
	1.5	Load center distance	c (mm)	500
	1.8	Front overhang	x (mm)	650
	1.9	Tread	Y (mm)	1235
Weight	2.1	Service weight(with battery)	kg	370/430/450/460/470
	2.2	Axle load, front/rear, laden	kg	395/1555
	2.3	Axle load, front/rear, unladen	kg	300/150
Wheel chassis	3.1	Wheels (rubber, high elasticity, pneumatic tyre, polyurethane wheel)		Nylon
	3.2	Wheel dimension, front		$\phi 180 \times 50$
	3.3	Wheel dimension, rear		$\phi 80 \times 70$
	3.5	Wheel number, front/rear		2/2
	3.6	Tread, front	b_{10} (mm)	700
	3.7	Tread, rear	b_{11} (mm)	1042-1400
	Dimension	4.2	Height of mast, lowered	h_1 (mm)
4.4		Lift height	h_3 (mm)	1600/2500/3000/3300/3500
4.5		Max. height of mast, extended	h_4 (mm)	2145/3100/3600/3900/4100
4.15		Height, lowered	h_{13} (mm)	90
4.19		Overall length	l_1 (mm)	1745/1825
4.20		Length to fork face	l_2 (mm)	675
4.21.1		Overall width of truck body	b_1 (mm)	1167-1525
4.22		Fork dimension	$s/e/l$ (mm)	60 \times 142 \times 1070/1150
4.25		Overall width of fork	b_5 (mm)	295-930
4.32		Wheelbase ground distance	m_2 (mm)	20
4.34.1		Aisle width, with pallet 1000x1200 crosswise	A_{st} (mm)	2288
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	6.5	Battery weight	kg	45
		Battery dimension (LXWXH)	mm	360 \times 170 \times 250
	10.7	Noise level at operator's ear, according to DIN12053	dB(A)	<70

3. Purpose and scope of use

CDDB-E semi-electric stacker uses battery as power source and DC motor as power to drive oil pump to supply pressure oil to lifting cylinder, so that the cylinder moves up and down to lift fork and goods. Because the truck is mainly suitable for short-distance stacking and transportation, and its walking is driven by manpower. It is suitable for goods stacking and handling on hard and flat ground. It has the characteristics of smooth operation, simple operation, convenient maintenance, no noise, no pollution, etc.

Use environment:

- a. The altitude shall not exceed 1200m;
- b. The ambient air temperature shall not exceed + 40 °C and shall not be lower than - 25 °C;
- c. When the ambient temperature is + 40 °C, the relative humidity is not more than 50%. At a lower temperature, a larger relative humidity is allowed;
- d. Hard, flat ground;
- e. It is forbidden to use the truck in flammable, explosive or acid-base corrosive environment.

4. Brief introduction of structure (ref.to the structure diagram and the principle diagram of major parts)

The stacker is mainly consisted by the mast, rear frame, handle, universal wheel, hydraulic pump, electric control system.

5. Use and operation instruction

The semi-electric stacker adopts storage batteries as the dynamic source for short distance goods handling and stacking. Correct use and operation will bring great convenience to your work but incorrect use and operation will damage the stacker or pose risk to you and your goods.

5.1 Before operation:

5.2.1 Before operation, please check if the truck is in normal condition: Is there any oil leakage in the hydraulic pipes? Are the supporting wheels able to operate normally? Is there any block? The trucks with problems are prohibited for operation.

5.2.2 Check whether the battery has power, open the switch lock, and check the electric energy meter on the truck dashboard. If the left side is on, it means that the battery has no power at this time. Charge the battery. It is forbidden to use the truck without power, which will greatly reduce the service life of the battery and even damage the battery.

5.2.3 Check whether lifting, lowering and other actions are normal.

5.2.4 The truck is ready to work after inspections mentioned above. Repair the truck once it has any problem. Using a faulty truck is strictly prohibited.

5.2 In operation:

5.2.1 Operation of handling and stacking:

Turn on the power switch, turn on the switch lock, pull the truck near the aimed pile (300 mm from the head of the fork), press the lowering button, adjust the height of the fork to a proper position, slowly insert the fork into the pallet as deep as possible, press the lifting button, to the height 200-300 mm from the fork to the ground, pull the truck to the rack and slowly stop at the position where the distance between the fork and the rack is 300mm. Press the lifting button at to raise the fork to the proper height of the rack (the bottom of the pallet is about 100 mm higher than the rack), slowly move the loads to the exact position of the rack, press the lowering button to place the loads onto the rack. Then slowly pull the truck, move the fork out of the pallet (the head of the fork is 300 mm away from the rack), and lower the fork to about 300 mm from the ground, pull the truck away from the rack.

5.2.2 Operation of taking goods off the rack:

Turn on the power switch, turn on the switch lock, pull the truck near the shelf (300 mm from the head of the fork to the rack), press the lifting button, adjust the height of the fork to the appropriate position of the rack, slowly insert the fork into the pallet as deep as possible, press the lifting button, lift the loads to the bottom of the pallet 100 mm from the rack, slowly start the truck to slowly move the loads out of the rack (the head of the fork is 30 cm away from the rack), press the lowering button, the fork will descend to a height of 200-300 mm from the ground, pull the truck off the rack, drive to the required position, then slowly stop the truck, press down the lowering button, put the goods down, use the fork to completely separate from the goods, and slowly move the fork out of the goods pallet.

6. Maintenance

6.1 Fine maintenance matters to the truck. Ignoring of the maintenance may cause hazards which threaten personnel and property. Thus regular inspection shall be made to eliminate odd phenomena. In addition, never use a faulty truck for the sake of personnel security as well as prolonging the lifetime of the truck.

6.2 Maintenance: It's generally divided into daily maintenance and regular maintenance of mechanical, hydraulic and electrical parts.

Daily maintenance: Keep the truck body surface clean, clean the battery surface and check whether the power cord is firm.

- a. Mechanical maintenance: once every six months, the main content is to add lubricating oil to the wheel bearings and mast bearings, and check whether the fasteners are tight, whether the wheels and mast rollers rotate flexibly, and whether the fork lifting is normal. The running noise of the truck after maintenance shall not be more than 70 dB.
- b. Hydraulic maintenance: every six months, mainly check whether the oil cylinder is in normal state, whether there is internal and external leakage, and whether the hydraulic joint and hydraulic rubber tube are reliable without leakage. Check whether the hydraulic oil is clean. Generally, replace the hydraulic oil once every 12 months. ISO oil standard is adopted for hydraulic oil. HL-N46 or HL-N 68 is used when the ambient temperature is $-5 \sim 40$ °C, and HV-N46 or HV-N 68 low temperature hydraulic oil is used when the ambient temperature is $-35 \sim -5$ °C. The replaced waste oil shall be treated according to the relevant local regulations.
- c. Electrical maintenance: every three months, first of all, check whether the specific gravity of battery electrolyte is appropriate (in tropical areas, the specific gravity is 1.24 (at 25 °C), and in other areas, the specific gravity is 1.26 (at 25 °C). Check whether the battery terminals are clean. Otherwise, adjust the specific gravity of electrolyte as required, clean the terminals, and apply a little Vaseline. Tighten firmly. Then check whether the electrical connectors are reliable, whether the switches are normal, and whether the electrical insulation is normal (the insulation resistance between the electrical part and the truck body shall be more than $0.5\text{m}\Omega$).

7. Common problem and troubleshooting

No.	Fault	Cause	Solution
1	The forks fail to lift	① Overloaded	Cut the load
		② Low pressure of the relief valve	Adjust the pressure
		③ Leakage inside the cylinder	Replace the sealing
		④ Lack of hydraulic oil	Add filtered hydraulic oil
		⑤ Low pressure of the battery	Charge
		⑥ Power supply disconnection	Turn on the power
		⑦ E-lock is off or damaged	Turn it on or repair
		⑧ Oil pump motor is damaged	Repair or replace
		⑨ Oil pump is damaged	Repair or replace
		⑩ Switch of the lifting button is damaged	Repair or replace
2	The forks fail to descent after lifting	① Inner mast is overloaded and deformed	Repair or replace
		② Outer mast is overloaded and deformed	Repair or replace
		③ Mast rolling bearing is stuck	Repair or replace
		④ Mast guiding rod is bent	Repair or straighten it.
		⑤ Oil returning hole is blocked	Clean
		⑥ Solenoid valve of the hydraulic pump is out of control	Eliminate the solenoid valve failure.
3	Battery terminal voltage reduction (charged)	① Individual single battery damaged	Repair or replace
		② Low level of the electrolyte	Add electrolyte
		③ Impurities in electrolyte	Replace electrolyte

8. Use maintenance and charge of the storage batteries

8.1 Initial charge

Note: the charging environment should have good ventilation conditions, no open fire, otherwise it will cause explosion

8.1.1 Unused batteries should be initially charged before use. Clean the surface of the battery before initial charging, check for any damage, and tighten the bolts to ensure reliable connection.

8.1.2 Unplug the sealing cap, replace the lid liquid hole plug and open the lid.

8.1.3 The sulfuric acid electrolyte with a density of 1.260 (+) 0.005 (25 (+) and a temperature of less than 30 (+) is poured into the battery when the charging device can operate normally, and the liquid level is 15-25 (mm) higher than the protection panel. In order to reduce the temperature rise of electrolyte due to chemical reaction and allow electrolyte to penetrate into the plate sufficiently, the battery needs to be stationary for 3-4 hours, not more than 8 hours in the pore of the separator. The initial charging can be truckried out only when the liquid temperature drops below 35 C. (Cool down in cold water tank if necessary) The electrolyte should be replenished when the liquid level drops after stationing.

8.1.4 Sulfuric acid electrolyte is made of batteries sulfuric acid and distilled water which meet the national standard GB4554-84. Never use industrial sulfuric acid or tap water instead. The standard temperature (25 C) of the electrolyte is converted by pressing down the density.

$$D_{25} = D_t + 0.0007 (t - 25)$$

In the formula: Electrolyte density at D_{25} : 25 C.

The density of electrolyte was measured at D_t : t temperature.

T : The electrolyte temperature at which the density is measured.

- 8.1.5 Dry the electrolytes splashed on the surface of the battery, connect the positive and negative electrodes of the battery pack with the positive and negative ends of the DC power source (charger) respectively, and connect them to the power supply. Charge the battery pack with 18A (stage 1 current) first, and charge it until the voltage reaches 14.4V ($6 \times 2.4V = 14.4V$) and continue charging with stage 2 9A current. The temperature of the electrolyte must not exceed 45 C during charging. When approaching 45 C, the charging current should be reduced by half or the charging should be suspended. When the temperature of the electrolyte drops below 35 C, the charging should be resumed. However, the charging time should be extended appropriately.
- 8.1.6 Basis for full charge: Charge to 15.6V ($6 \times 2.6V = 15.6V$) at the second stage, the voltage change is not greater than 0.005 (V); the electrolyte density reaches $1.280 + 0.005$ (25 C); the battery is considered fully charged when there is no significant change in 2 hours and intense fine bubbles occur. The charging capacity is 4-5 times the rated capacity and the charging time is about 70 hours.
- 8.1.7 In order to accurately control the sulfuric acid content in the electrolyte, the electrolyte density of each battery should be checked at the end of charging; if there is any discrepancy, it should be adjusted with distilled water or sulfuric acid with a density of 1.40, and the electrolyte density and level should be adjusted to the specified value within 2 hours of charging.
- 8.1.8 After initial charging, wipe the battery surface clean and close the lid of the lid liquid hole plug before putting it into use.

8.2 Use and Maintenance

- 8.2.1 To ensure battery life, all batteries put into use should be fully charged; batteries with insufficient charge should not be used. During use, close attention should be paid to the degree of discharge, and no excessive discharge should be allowed - that is, when the voltage drops to 1.7V/unit (when the total voltage drops to $1.7V \times 6 = 10.2V$), when the density of electrolyte drops to 1.17, the discharge should be stopped and the charging should be done immediately; and no long-term shelving should be allowed. This kind of supplementary power which needs to be done frequently during use is called normal charging.
- 8.2.2 Normal charging: The normal charging current is 26A in the first stage and 13A in the second stage. The charging method is the same as the initial charging. The charging amount is 130-140% of the discharged power and the charging time is about 15 hours.
- 8.2.3 Normal-use batteries should be avoided from overcharging, but batteries must be properly overcharged in the following circumstances, i.e. balanced charging.
 - a. "Backward battery" in a battery pack - refers to a battery whose voltage value during charging and discharging is lower than that of other batteries and batteries that have been repaired due to faults. (The positive and negative poles of the backward batteries should be separately connected with the positive and negative ends of the DC power supply when charging equally).
 - b. Batteries in normal use are equally charged every 2-3 months.
 - c. Batteries that have not been used for a long time should be equally charged before use.
- 8.2.4 Balanced charging:
 - a. Charge with 4A current.
 - b. The charging voltage reaches 15.6V ($6 \times 2.6V = 15.6V$), and the half current (2A) continues to charge when bubbles occur in the electrolyte.

- c. When fully charged, stop charging for 0.5 hours and restart to charge with 1A current for another 1 hour.
- d. Stop charging for 0.5 hours again and restart to charge with 1A current for another 1 hour.
- e. Repeat d several times until the charger is switched on and the battery has strong bubbles.

8.3 Storage and storage

8.3.1 Batteries should be stored in a clean, dry and ventilated warehouse at 5-40 C for a valid storage period of two years. During the storage period, proper storage shall be truckried out in accordance with the following requirements.

- a. Not exposed to direct sunlight, no less than 2m from the heat source.
- b. Avoid contact with any harmful substances and no metal impurities may fall into the battery.
- c. Do not turn upside down and shall not be subjected to any mechanical impact or heavy pressure.
- d. Storage of charged electrolyte is not allowed. When special circumstances require storage of charged electrolyte, sufficient batteries should be used to adjust the density and level of electrolyte to the specified value. One month after the expiration of the storage period, a recharge should be made according to the normal charging method.

9. Lists of accessories, spare parts and wearing parts

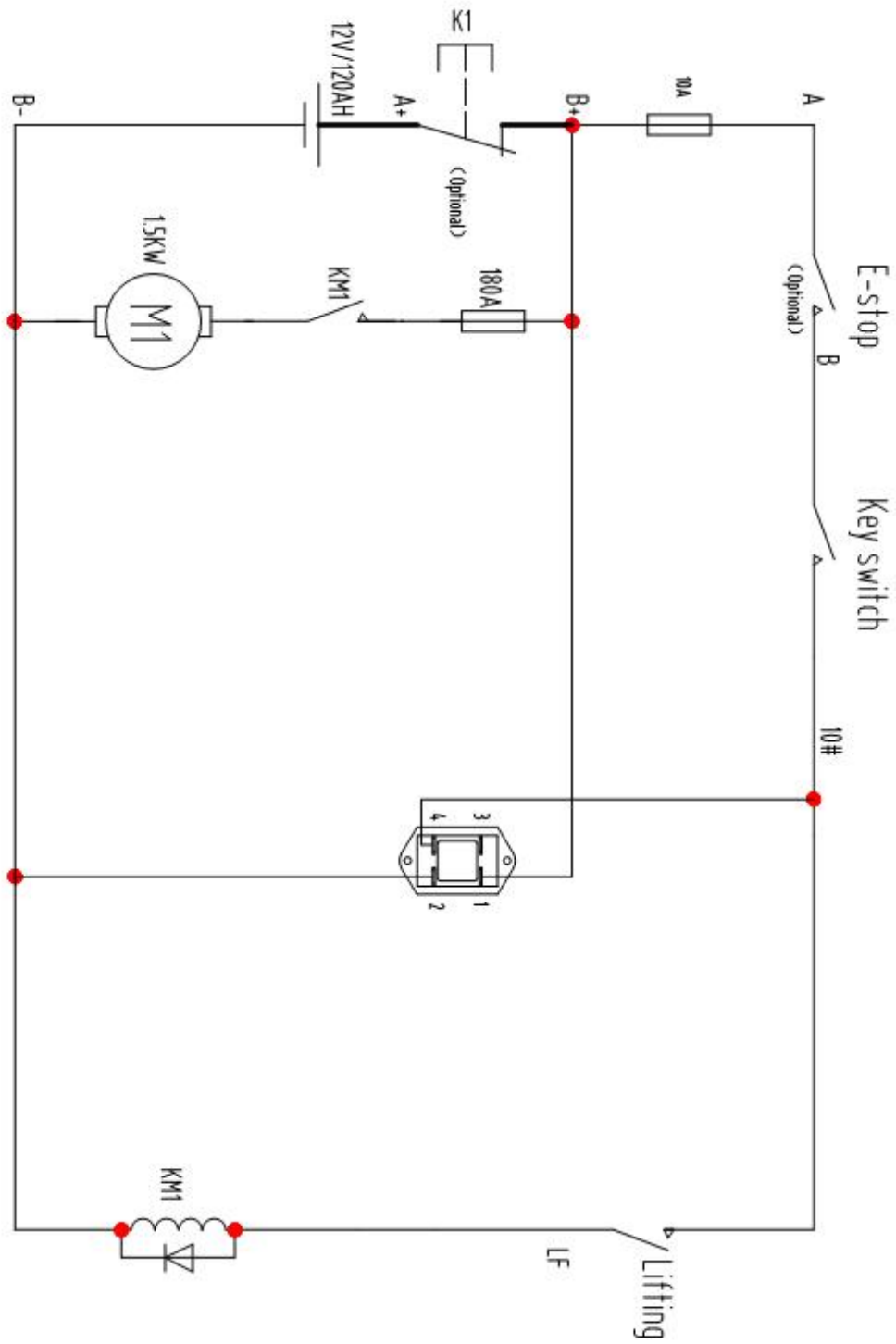
No.	Name	Use position	Type & specification	Quantity	Remarks
1	Switch lock key	Switch lock		2	
2	Plug and socket for charging	Match to the charger		1set	
3	Fuse	E-parts	10A	1	
4	Fuse	E-parts	160A	1	
5	Seal ring	Cylinder	UHS40	1	
6	O-ring	Cylinder	50×3.55	1	
7	O-ring	Cylinder	23.6×3.55	1	
8	Combined seal ring	Cylinder inlet	d14	1	
9	Dust ring	Cylinder	DH40	1	

10. Package and transportation

The truck is packaged in the pallet, and it is not allowed to turn over or upside down during transportation, collision is not allowed when lifting it, and the outer surface shall not be damaged when unpacking.

11. Warning

- 11.1 Read the manual before operating the truck and master the truck performance.
- 11.2 It is strictly prohibited to press the up or down button when pushing the truck to walk. It is strictly prohibited to switch the up and down buttons quickly and frequently, which will cause damage to the truck and goods!
- 11.3 It is not allowed to load the heavy object on the fork rapidly!
- 11.4 Do not overload the truck. When overloaded, the truck will not work normally!
- 11.5 The center of gravity of the goods shall be between two forks, otherwise it may damage the forks or cause the goods to fall during operation.
- 11.6 Do not load loose or unstable goods!
- 11.7 Do not leave the goods on the fork for a long time!
- 11.8 When the stacker is not used, the fork shall be lowered to the lowest position.
- 11.9 It is strictly prohibited to put any part of the body under heavy objects and forks!
- 11.10 This stacker is suitable for use on flat ground. It is strictly prohibited to park on the slope for a long time.
- 11.11 It is forbidden to lift the goods under the specified voltage of 10.2v, otherwise the battery will be damaged.
- 11.12 It is forbidden to directly connect the power plug to the AC power supply for charging.
- 11.13 Operators must wear safety helmets when working.
- 11.14 When the lifting height of the fork exceeds 500mm, the continuous traveling distance of the truck shall not exceed 2m.



Electrical schematic diagram

13. Packing list

Packing list of CDDB-E semi-electric stacker

Consignee:

Ex-work No.:

Contract No.:

Ex-work Date:

No.	Name	Quantity	Net weight (kg)	Dimension (L×W×H)	Remarks
1	CDDB-E semi-electric stacker	1			A complete set.
2	Accessory box	1			Technical documents, accessories and spare parts.

Note: 1. following documents are in the file bag:

- | | |
|---|----------|
| ①Operation manual of CDDB-E Semi-electric stacker | 1 volume |
| ②Packing list | 1 copy |
| ③Qualification certificate | 1 copy |

2. Accessories and spare parts

No.	Name	Use position	Type & specification	Quantity	Remarks
1	Switch lock key	Switch lock		2	
2	Plug and socket for charging	Match to the charger		1set	
3	Fuse	E-parts	10A	1	
4	Fuse	E-parts	160A	1	
5	Seal ring	Cylinder	UHS40	1	
6	O-ring	Cylinder	50×3.55	1	
7	O-ring	Cylinder	23.6×3.55	1	
8	Combined seal ring	Cylinder inlet	d14	1	
9	Dust ring	Cylinder	DH40	1	