



EK10S-118LI/ EK10S-138LI
LITHIUM COUNTERBALANCE
STACKER
INSTRUCTION MANUAL

Welcome to the counterbalanced stacker
We hope our product brings you greater convenience!

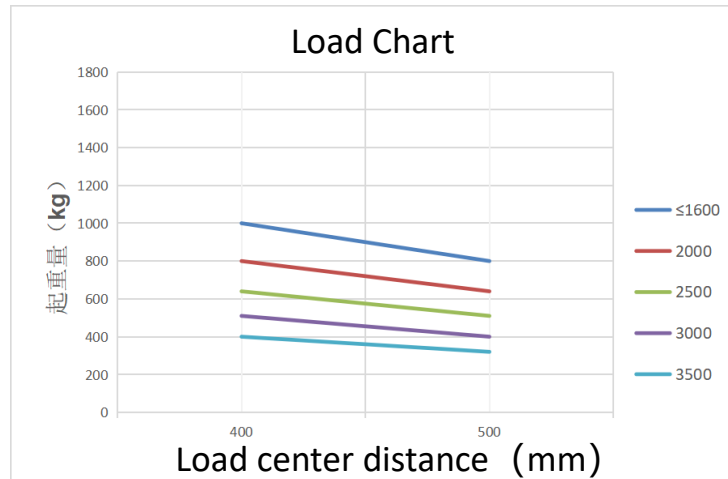
- Before using the counterbalanced stacker, please read the manual carefully.
- This manual is a general manual. We reserve the right to make technical modifications to the product. If there is any discrepancy between the manual and the actual product, the actual product shall prevail. The manual is for reference only.

Warning

Vehicle operators must strictly adhere to ISO 3691, "Safety Code for Powered Industrial Trucks." Untrained personnel are strictly prohibited from operating this vehicle.

According to ISO 3691, "Safety Code for Powered Industrial Trucks," the following regulations apply to the load and lifting height of our company's counterbalanced stacker:

Its load capacity can be referenced in the chart below, which illustrates the load capacity curve for a rated load of 1000 kg.



Use strictly according to the load chart. Overloading is prohibited.

Note:

When the fork lifting height exceeds 500mm, the vehicle must travel in a straight line at the lowest speed, must not turn, and the continuous travel distance must not exceed 2m.

Failure to comply with these rules will lead to:

- A Serious danger of injury to the driver or other personnel.
- B Damage to the vehicle and goods.

Preface

Before operating this stacker, please carefully read this operation manual and fully understand the methods for using this truck. Improper operation can easily cause danger.

This manual describes the usage methods and operation of different types of counterbalanced stackers. When maintaining the stacker, please ensure it corresponds to your company's model.

Please keep it properly for future use. If this manual or the caution/warning labels are damaged or lost, please contact your local dealer for a replacement.

This stacker complies with the requirements of EN 3691-1 (Industrial trucks - Safety requirements and verification - Part 1), EN 12895 (Industrial trucks - Electromagnetic compatibility), EN 12053 (Safety of industrial trucks - Test methods for measuring noise emissions), EN 1175 (Safety of industrial trucks - Electrical requirements). It must be ensured that the truck is used for the purposes specified above.

According to EN 12053, the noise level at the driver's ear is 69 dB(A).

According to EN 13059 (if the vehicle has a platform), the vibration is 0.85 m/s².

Note:

- Hazardous waste that is harmful to the environment, such as used batteries, waste oil, and electronic products, if not handled properly, will have a negative impact on the ecological environment or human health.
- Waste packaging should be sorted according to the material and placed in solid waste bins, and collected and processed by the local environmental protection bureau. To avoid pollution, littering is strictly prohibited.
- To prevent oil leakage during product use, users should prepare some absorbent materials (such as wood chips or dry cloths) to promptly absorb any leaked oil. To avoid secondary environmental pollution, used absorbent materials should be handed over to specialized departments in accordance with local regulations.
- Our products are continuously improved. Since this manual is intended solely for the operation/maintenance of forklift trucks, it cannot guarantee suitability for other special circumstances. Your understanding is appreciated.



Note: In this manual, the symbol on the left indicates warnings and hazards that, if not followed, could result in death or serious injury.

Copyright is reserved by the company mentioned last on the CE standards in this document.

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1、Proper Use

Only use this counterbalanced stacker according to this instruction manual.

The vehicle described in this manual is a self-propelled controlled pedestrian-type counterbalanced stacker with an electrically operable lifting and lowering function. It is designed for high-level stacking capability, precise positioning and placement, flexible cargo movement, and reduced labor costs.

Improper use can lead to personal injury or machine damage.

The operator/operating company is responsible for ensuring correct use and for ensuring that this stacker is only operated by personnel who have been trained and are authorized to use it.

This stacker must be used on a solid, level, intact, even surface and an appropriate subsurface. This truck is intended for indoor use in ambient temperatures from +5°C to +45°C and for light load conditions without crossing permanent obstacles or pits and grooves. Operation on slopes is prohibited. During operation, the load must be placed approximately at the vehicle's load center.

It is strictly forbidden to lift or carry people. When carrying loads, the load must be lowered to the lifting point.

It is forbidden to use this truck on tail lifts or loading ramps.

The rated load is marked on the capacity plate and nameplate. The operator must pay attention to these warning labels and safety instructions.

The operating illumination must be at least 50 lux.

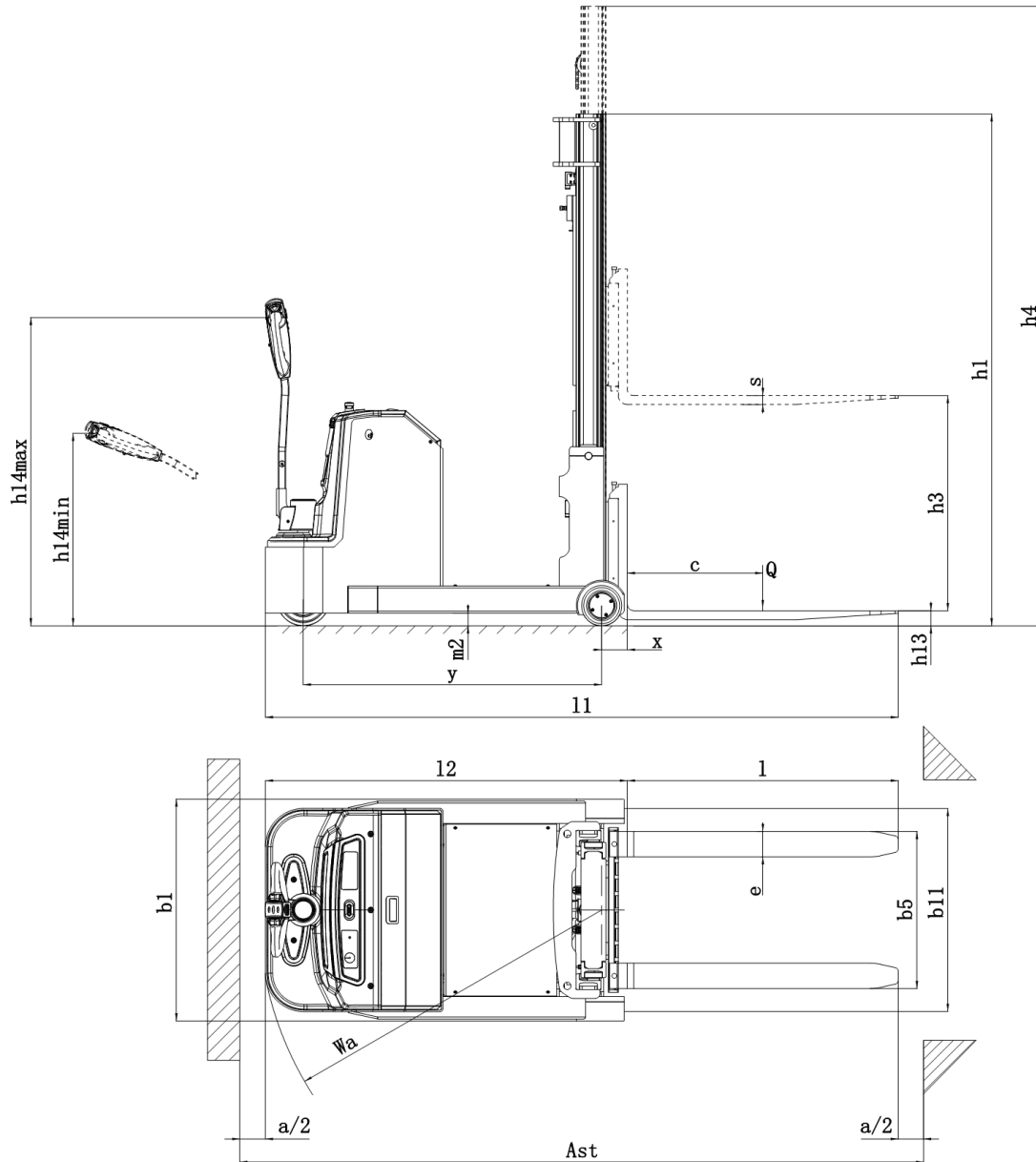
Modifications

Any changes or alterations that could affect the vehicle's rated load, stability, or safe operation must obtain prior written approval from the vehicle's original manufacturer, its authorized manufacturer, or its successor. This includes the effects of changes, such as: braking, steering, visibility, and the addition of movable attachments.

After modifications or changes are approved by the manufacturer or its successor, the capacity nameplate, labels, identification marks, and operation and maintenance manuals must be changed accordingly.

Vehicle damage resulting from failure to follow these instructions will void the warranty.

2. Technical Parameters



According to the VDI 2198 standard industrial vehicle type table				
Features	1.2	Model		EK10S Series
	1.3	Power Source (Electric, Diesel, Gasoline, LPG, Electrical)		Electric
	1.4	Operating Mode (Pedestrian, Walk-Along, Stand-On, Sit-Down, Order Picker)		Pedestrian
	1.5	Rated Load Capacity	Q(t)	1.0
	1.6	Load Center Distance	C(in)	19.69"
	1.8	Fork Overhang	x(in)	3.98"
Weight	1.9	Wheelbase	y(in)	46.26"
	2.1	Weight (including battery)	Lb	34612
Wheels	3.1	Tires (Rubber, Performance Elastomer, Pneumatic, Polyurethane)		Polyurethane Wheels
	3.2	Wheel Size Drive Side	xW (in)	Φ8.27" x 2.95"
	3.3	Wheel Size Load Side	xW (in)	Φ6.3x2.87"
	3.5	Number of Wheels (x=drive wheel) Drive Side/Load Side		1x/2
Dimensions	3.7	Track Width (Rear) Load Side	b11(in)	31.5"
	4.2	Lowered Mast Height	h1(in)	79.5"
	4.4	Lift Height	h3(in)	118" 138"
	4.5	Mast Extended Height	h4(in)	139" 159"
	4.9	Height of Handle in Min/Max Drive Position	h14(in)	30.5 / 47.2"
	4.15	Lowered Height	h13(in)	2.36"
	4.19	Overall Length	l1(in)	98.43"
	4.20	Length to Fork Face	l2(in)	56.5"
	4.21	Overall Width	b1(in)	34.5"
	4.22	Fork Dimensions	s/e/l(in)	1.38/3.94/42.13"
	4.25	Distance between Fork Arms	b5(in)	7.9/25.2"
	4.32	Axle Center Ground Clearance	m2(in)	1.97
	4.33	Aisle Width for 1000x1200 Pallet Cross	Ast(in)	103.8"
	4.34	Aisle Width for 800x1200 Pallet Lengthways	Ast(in)	107.3"
	4.35	Turning Radius (without handle)	Wa(in)	53.5"
Performance	5.1	Travel Speed Laden/Unladen	mph	2.5/2.8
	5.2	Lift Speed Laden/Unladen	m/s	0.079/0.104
	5.3	Lowering Speed Laden/Unladen	m/s	0.11/0.12
	5.8	Max. Gradeability Laden/Unladen	%	6/10
	5.10	Service Brake		Electromagnetic Brake
Motor	6.1	Drive Motor Rating min. S2 60	kw	0.9
	6.2	Lift Motor Rating S3 10%	kw	2.2
	6.3	Battery Voltage and Capacity	V/Ah	24/100 Li-Ion
Other	8.1	Drive Control Type		DC Speed Control
	8.4	Sound Level at Driver's Ear	dB(A)	70

Features	Lowered Mast Height h1(mm)	Free Lift Height h2 (mm)	Lifting Height h3 (mm)	Extended Mast Height h4 (mm)	Lifting Height + Fork Minimum Height h3+h13 (mm)
Single Mast	2060	—	1540	2060	1600
Dual Mast	1520	—	1940	2500	2000
	1770	—	2440	3000	2500
	2020	—	2940	3500	3000
	2270	—	3440	4000	3500
Dual Mast Full Free	—	—	—	—	—
Triple Mast	—	—	—	—	—
Triple Mast Full Free	—	—	—	—	—

3.Purpose and Scope of Use

The counterbalanced stacker is powered by a battery and uses a DC motor as the power source. It drives the vehicle movement through gear transmission, while the lifting of the forks is achieved by the DC motor and hydraulic transmission, which push the cylinder to move up and down, thereby lifting the forks and the goods. This counterbalanced stacker features both electric travel and lifting functions, making it labor-saving, efficient, stable in cargo handling, easy to operate, safe and reliable, low in noise, and pollution-free.

This vehicle is suitable for stacking and transporting goods on hard, flat ground.

This vehicle is suitable for stacking and transporting goods on hard, flat ground :

- a. Altitude not exceeding 1200m;
- b. Ambient air temperature not exceeding +40°C and not below -25°C;
- c. When the ambient temperature is +40°C, the relative humidity should not exceed 50%. At lower temperatures, a higher relative humidity is allowed;
- d. Hard, flat ground;
- e. It is prohibited to use this vehicle in flammable, explosive, or corrosive environments such as those containing acids or alkalis.

4.Structure Introduction

The vehicle is mainly composed of the frame, mast, fork, lifting cylinder, control handle, steering unit, drive wheel, battery pack, hydraulic power unit, and electrical control system.

5.Usage and Operation Instructions

The counterbalanced stacker uses the battery as the power source for both traveling and lifting and is used for short-distance cargo handling and stacking. Correct use and operation of the vehicle will bring great convenience to your work. Operating and using the vehicle incorrectly may damage the vehicle or pose risks to your personal safety and the cargo.

5.1 Before Use:

5.1.1 Before use, check whether the vehicle is in normal condition: check for hydraulic pipeline leaks, ensure all supporting wheels are functioning properly, and check for any blockage. It is strictly prohibited to use a faulty vehicle.

5.1.2 Check whether the battery is charged. The method is shown in Figure 5-1. Pull the main power switch outward to turn on the main power, then turn on the ignition lock on the handle. Check the energy meter on the vehicle's dashboard. If the segment at the "0" end lights up, it indicates that the battery has no power and needs to be charged. It is strictly prohibited to use the vehicle when the battery is out of power, as this will significantly reduce the battery's service life and may even damage the battery.

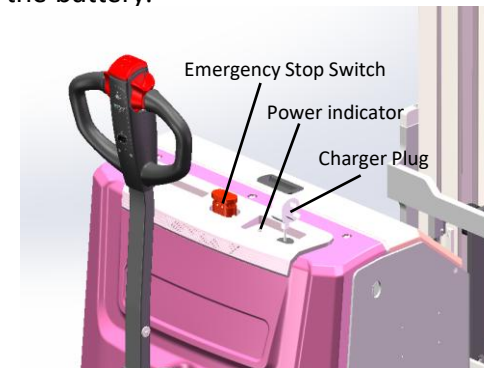


Figure 5-1

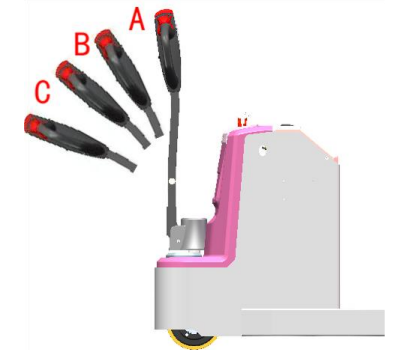


Figure5-2

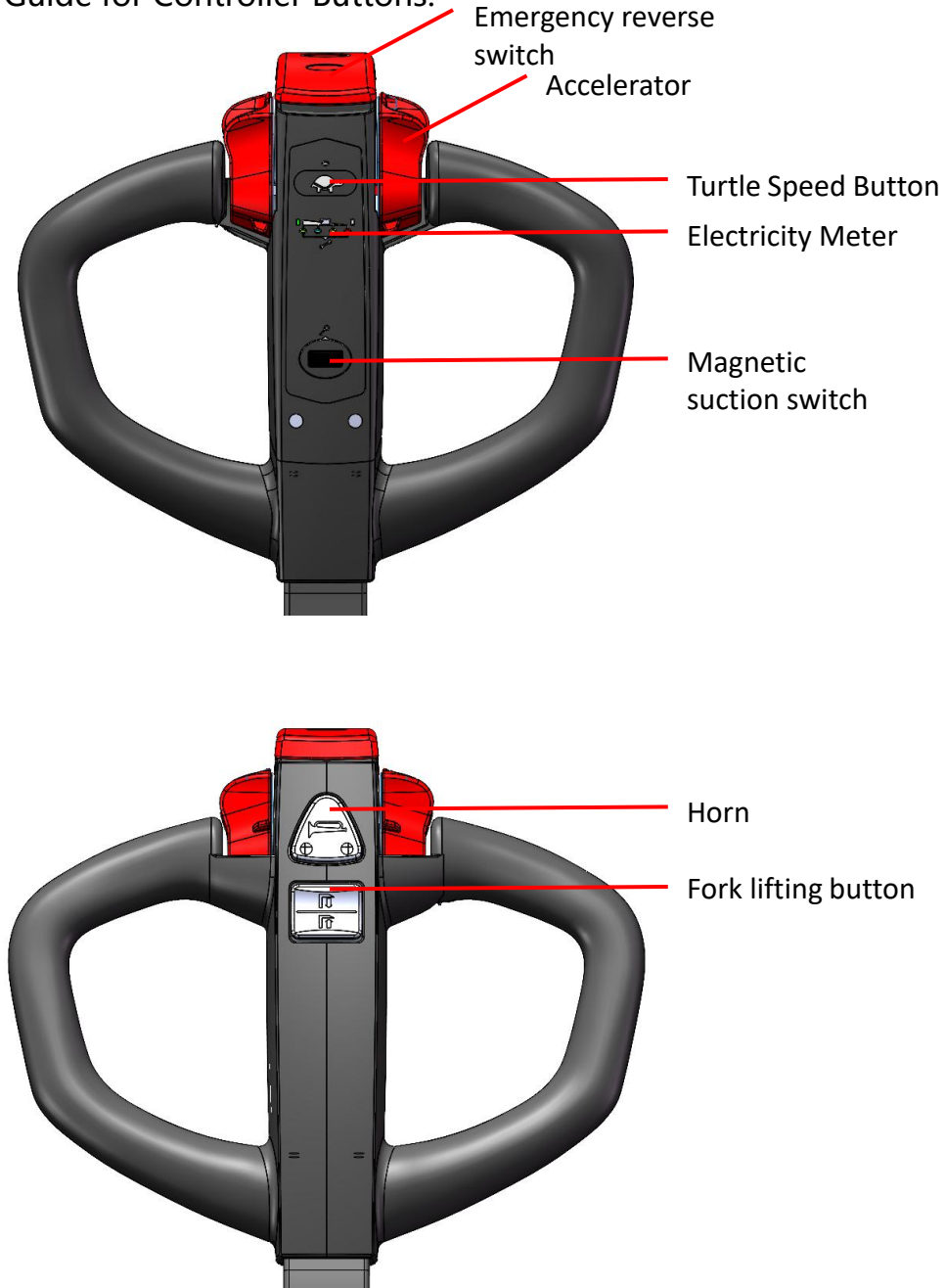
5.1.3 Check whether the vehicle braking is normal; check whether the vehicle's lifting, lowering, and forward/reverse travel operations are normal; check whether the vehicle's emergency reverse operation is normal. The method is shown in Figure 5-2:

Move the control handle to zone A or C as shown in Figure 5-2, press the lift/lower button on the control handle, and observe whether the fork lifts and lowers normally.

Then move the control handle to zone B as shown in Figure 5-2, slowly start the vehicle, press the handle down to the horizontal position, and observe whether the vehicle can travel and brake normally.

Move the control handle to zone B as shown in Figure 5-2, press the emergency reverse switch button on the top of the control handle, and observe whether the vehicle can travel forward. Through the above checks, if the vehicle is fault-free, it can be put into use. If any fault is found, please repair it immediately. The use of faulty vehicles is strictly prohibited.

5.1.4 Operation Guide for Controller Buttons:



5.2 Operation:

5.2.1 Note: This vehicle is equipped with a side-magnetic brake at the drive wheel motor output shaft end, as shown in Figure 5-1. Pull the main power switch outward to turn on the main power. Turn the key switch on. When the travel adjuster is pushed, the side-magnetic brake is energized and releases, allowing the stacker to be powered and operate. In all other states, the stacker is powered off and braked. Ensure that the stacker is in a stationary state and the side-magnetic brake is in the locked state before lifting the load. The vehicle must not travel while lifting the load. During transport and stacking, ensure the load's center of gravity is within the specified load center position, and the load weight is less than the weight indicated by the load curve. During stacking, only slow forward and reverse movement is permitted; turning operations are prohibited.

5.2.2 Transport and Stacking Operation:

Pull the main power switch outward as shown in Figure 5-1 to turn on the main power. Turn the key switch on. Drive the vehicle near the load pile (with the fork tips approximately 300mm from the load pile). Press the lowering button to adjust the fork height to a suitable position. Slowly insert the forks as deeply as possible into the pallet. Press the lifting button to raise the forks until they are 200-300mm from the ground. Drive the vehicle to the rack location and slowly stop when the fork tips are about 300mm from the rack. Press the lifting button to raise the forks to the appropriate rack height (approximately 100mm above the rack surface). Slowly move the load to the precise position on the rack. Press the lowering button to carefully place the load on the rack and disengage the forks from the load. Slowly drive the vehicle to withdraw the forks from the pallet (until the fork tips are about 300mm from the rack). Lower the forks to about 100mm from the ground. Drive the vehicle away from the rack. During travel, pay attention to obstacles in all directions. Reduce speed when turning.

5.2.3 Operation for Removing Load from Rack:

Pull the main power switch outward as shown in Figure 5-1 to turn on the main power. Turn the key switch on. Drive the vehicle near the rack (with the fork tips approximately 300mm from the rack). Press the lifting button to adjust the fork height to the appropriate rack position. Slowly insert the forks as deeply as possible into the pallet on the rack. Press the lifting button to lift the load until the pallet bottom is about 100mm above the rack. Slowly drive the vehicle to withdraw the load from the rack (until the fork tips are about 300mm from the rack). Press the lowering button to lower the forks until they are 200-300mm from the ground. Drive the vehicle away from the rack to the required location, then slowly bring the vehicle to a stable stop. Press the lowering button to place the load down, ensuring the forks completely disengage from the load. Slowly withdraw the forks from the pallet.

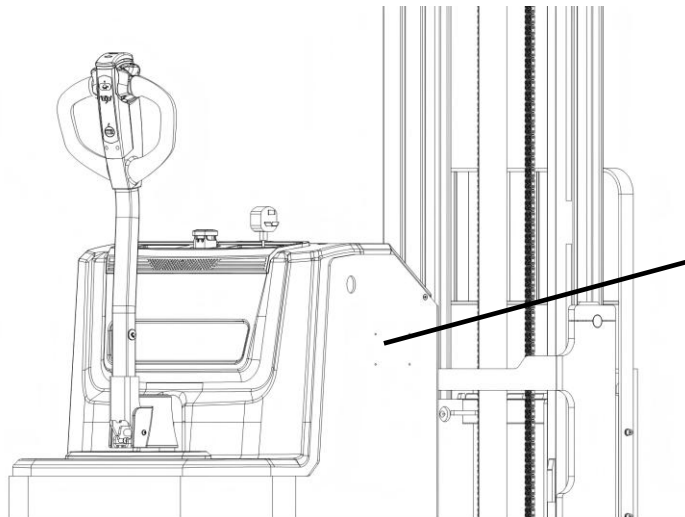
5.3 Handling of Abnormal Situations During Use:

1. When the up button is pressed, the forks can rise. However, if the forks continue to rise after the up button is released, indicating a loss of control during ascent, the main power switch should be immediately turned off to cut the power. Move the vehicle to a safe location, lower the load manually, and conduct a circuit inspection of the vehicle.
2. If brake failure is detected during use, the vehicle must be stopped immediately and inspected for repairs.
3. If the vehicle pushes the operator against a wall or other object while reversing, pressing the emergency reverse switch button on top of the operating handle will automatically make the vehicle move forward in the opposite direction, preventing injury to the operator.

5.4 After Use:

After use, park the vehicle at a designated parking spot and perform daily maintenance as specified in Section 7. Recharge the vehicle as needed.

5.5 Vehicle Identification Number (Stamped) Location Specification: (As shown in Figure 5-3)

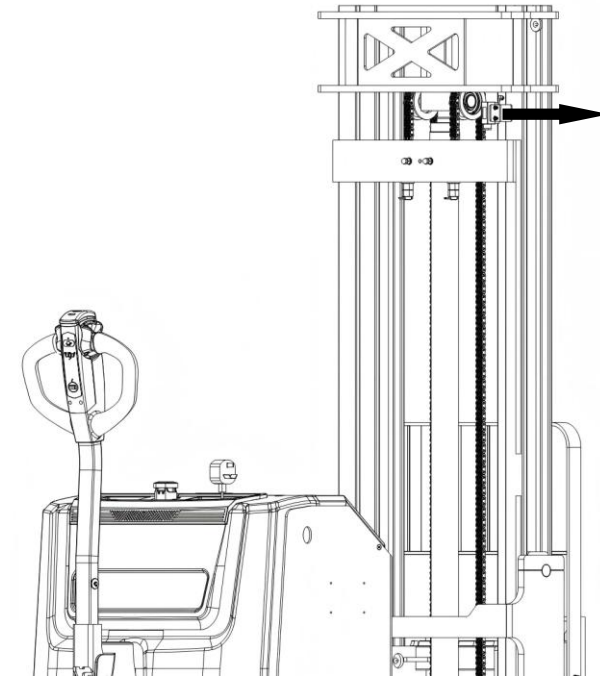


Vehicle
identification
number:
QS0000001

Figure5-3

6. Safety Devices and Safety Markings Description

6.1 Vehicle Height Limitation Description: As shown in Figure 6-1, the portal frame uses methods such as micro-switches or mechanical limits to restrict the height of the pallet frame, preventing it from exceeding the maximum height.



6.2 Vehicle Lifting Speed Limitation Description: The vehicle uses a sensor switch to limit speed when the pallet frame is lifted to 400mm.

7.Maintenance

Note: Prohibit untrained personnel from performing vehicle maintenance.

6.3 Safety Sign Instructions:



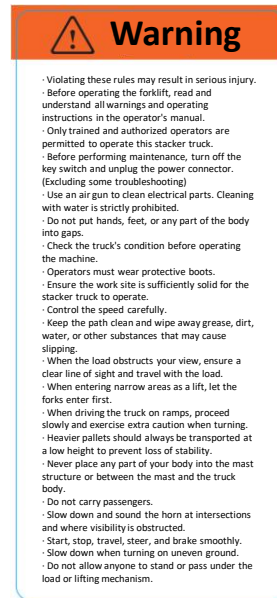
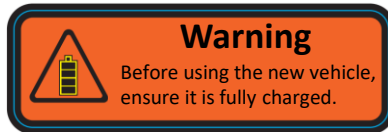
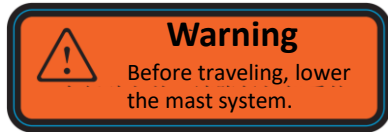
Keep Dry Sign



Lifting Point Sign



Warning: Risk of Pinching Sign



Safety Warning Signs

7.1 Whether the vehicle can be used satisfactorily depends on careful maintenance. Neglecting maintenance may endanger personal safety, damage the vehicle, and property. Therefore, during use, regular routine inspections should be carried out, abnormalities should be promptly addressed, and vehicles with malfunctions should not be used to ensure safety and extend the vehicle's service life.

7.2 Maintenance: The maintenance of this vehicle is generally divided into three levels: daily maintenance, primary maintenance, and secondary maintenance.

Daily maintenance: Should be performed once a day. The main tasks include keeping the body surface clean, cleaning the battery surface, checking whether the power lines are secure, and whether the chain tension is normal.

Level 1 Maintenance: Conduct once a week. In addition to the daily maintenance content, the focus should be on checking whether the working conditions of various components are normal, whether fasteners are loose, whether the chain tension is appropriate, whether the chain link connecting pin is bent or twisted, whether the inner and outer masts move up and down normally, whether hydraulic joints are leaking oil, whether there is abnormal wear in mechanical parts, and whether there are abnormal temperature rises or sparks in electrical parts, etc. If any abnormal phenomena are found, they should be adjusted and eliminated promptly.

Level 2 Maintenance: Should be carried out periodically, and a comprehensive inspection of the vehicle should be performed according to the following requirements.

a. Mechanical Maintenance: Conduct every six months. The main contents include lubricating the drive wheel transmission gears and bearings, lubricating various rotating joints, and simultaneously checking whether all fasteners are tight, whether the wheels rotate flexibly, and whether the fork lifting and lowering are normal. Clean the accumulated dirt and dust from the electromagnetic brake friction pads and adjust the gap between the friction pads to a suitable distance. The operational noise of the vehicle after maintenance should not exceed 70 dB.

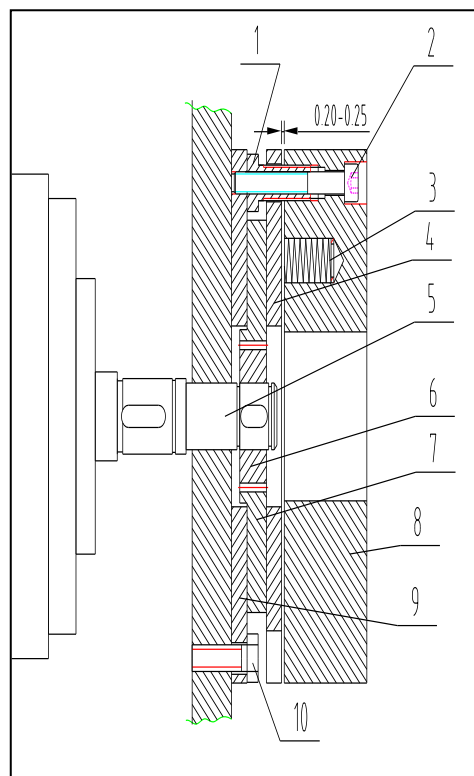
b. Hydraulic Maintenance: Conduct every 12 months. Check whether the oil cylinders are in normal condition, whether there is internal or external leakage, and whether hydraulic joints and hoses are reliable and leak-free. Check whether the hydraulic oil is clean; generally, replace the hydraulic oil every 12 months. Hydraulic oil should conform to the ISO oil standard. . When the ambient temperature is -5 ~ 40°C, use HL-N46 or HL-N68; when the ambient temperature is -35 ~ -5°C, use HV-N46 or HV-N68 low-temperature hydraulic oil. Dispose of the waste oil replaced according to local relevant regulations.

c. Electrical equipment maintenance: Carry out every three months. First, check whether the specific gravity of the storage battery electrolyte is appropriate [tropical regions: use specific gravity 1.24 (at 25°C); other regions: use specific gravity 1.26 (at 25°C)], and whether the battery terminals are clean. Otherwise, the specific gravity of the electrolyte must be adjusted according to regulations, the terminals cleaned, a small amount of vaseline applied, and properly tightened. Then, check whether all electrical connections are secure, whether switches are functioning normally, and verify that the electrical insulation is normal (the insulation resistance between the electrical parts and the vehicle body should be greater than 0.5 MΩ). Remove dirt, dust, and carbon deposits from the motor, inspect the wear of the brushes, and replace the brushes as necessary.

7.3 Adjustment of Brake Clearance:

- ① Hollow screw ② Connecting screw ③ Spring ④ Armature ⑤ Motor shaft
⑥ Splined sleeve ⑦ Friction plate ⑧ Electromagnetic coil ⑨ Mounting cover plate ⑩ Mounting screw

The structure of the brake is shown in the figure. After the vehicle has been used for a period of time, the braking performance of the brake may decrease due to wear of the brake pads, or the brake pads may lock up and fail to release. At this time, the brake clearance needs to be adjusted. As shown in the figure, in the braked state, first use a feeler gauge to check the clearance between the brake pad and the magnet. If the clearance is greater than 0.5mm, adjustment is required. Before adjustment, clean any dirt and dust from the friction plate. During adjustment, first loosen the connecting screw ②, then adjust the length of the adjustment screw ①, and finally tighten the fastening screw. After adjustment, the clearance between the brake pad and the magnet should be between 0.2-0.3mm. During adjustment, ensure that the three adjustment screws are adjusted evenly so that the clearance between the brake pad and the magnet is uniform around the perimeter. After adjustment, connect the brake to a 24V DC power supply; a clear suction sound from the brake should be heard.



8. Common Faults and Troubleshooting Methods

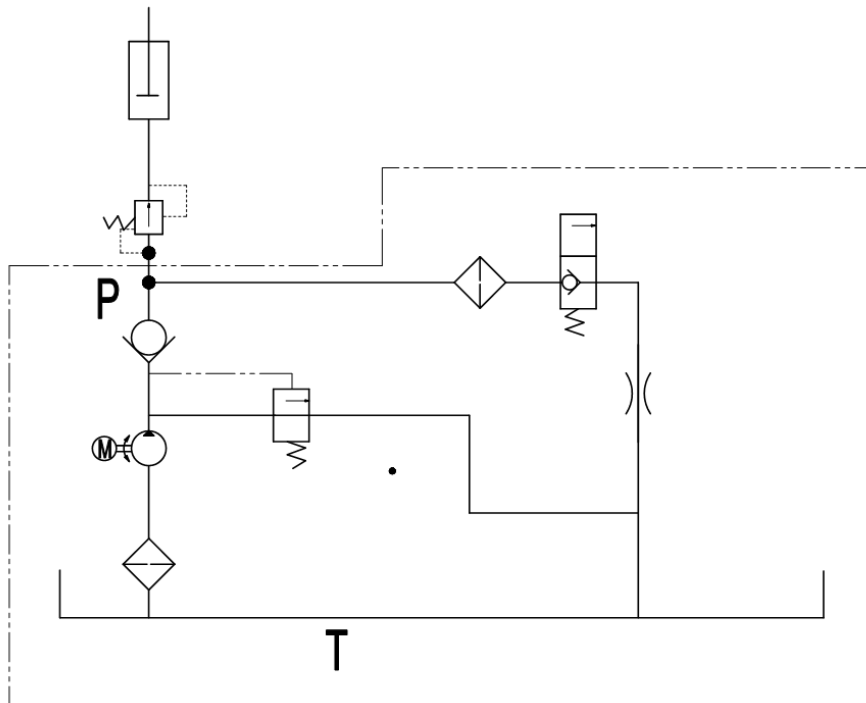
No.	Fault	Cause	Elimination Method
1	The vehicle cannot move (contactor not working)	① The control circuit fuse has blown.	Replace
		② The power switch has poor contact or is damaged.	Repair or Replace
		③ The main circuit fuse has blown.	Replace
		④ The ignition switch has poor contact or is damaged.	Repair or Replace
		⑤ The battery connection is loose or detached.	Tighten
	The vehicle cannot move (contactor working)	① The travel motor carbon brush is worn.	Repair or Replace
		② The travel motor field coil is broken or has poor contact at the terminals.	Repair or Replace
		③ The contactor contacts have poor contact.	Repair or Replace
		④ The MOSFET circuit board is faulty.	Repair or Replace
2	The vehicle can only move forward (or backward)	① The contactor has poor contact or is burnt out.	Repair or Replace
		② The circuit board is faulty.	Repair or Replace
3	The vehicle cannot stop while moving	The contactor contacts are damaged, and the moving contact does not reset.	Emergency power cut-off, replace contactor contacts
4	Brake failure	① The micro switch mounting bolt is loose or damaged.	Adjust or tighten bolts, or replace the micro switch
		② The side magnetic brake wiring is loose, or the side magnetic brake is damaged.	Tighten bolts or repair the peripheral brake
		③ The side magnetic brake friction plate is worn.	Replace brake pads
5	Steering stuck	① The steering bearing is damaged.	Replace bearings
		② The steering bearing lacks lubrication or has excessive dust buildup.	Clean bearings
6	Forklift forks do not rise	① Overloaded use.	Reduce load
		② The relief valve pressure is too low.	Increase
		③ The lifting cylinder has abnormal internal leakage.	Replace seals
		④ Insufficient hydraulic oil.	Add an appropriate amount of filtered and clean hydraulic oil
		⑤ Insufficient battery voltage.	Battery charging
		⑥ The oil pump motor is damaged.	Repair or Replace
		⑦ The oil pump is damaged.	Repair or Replace
		⑧ The lift button switch is damaged.	Repair or Replace
		⑨ The ignition switch is not turned on or is damaged.	Repair or Replace
		⑩ The battery voltage is severely insufficient.	Charging
8	Forks do not descend after rising	① The inner mast is overloaded and deformed.	Repair or Replace
		② The outer mast is overloaded and deformed.	Repair or Replace
		③ The mast roller is stuck.	Repair or Adjust
		④ The mast guide rod is bent.	Repair or Straighten
		⑤ The oil return hole is blocked.	Clean
		⑥ The hydraulic station solenoid valve is out of control.	Troubleshoot solenoid valve failure
9	Terminal voltage of the battery decreases (after charging)	① Individual battery cells are damaged.	Repair or Replace

9. Packaging and Transportation

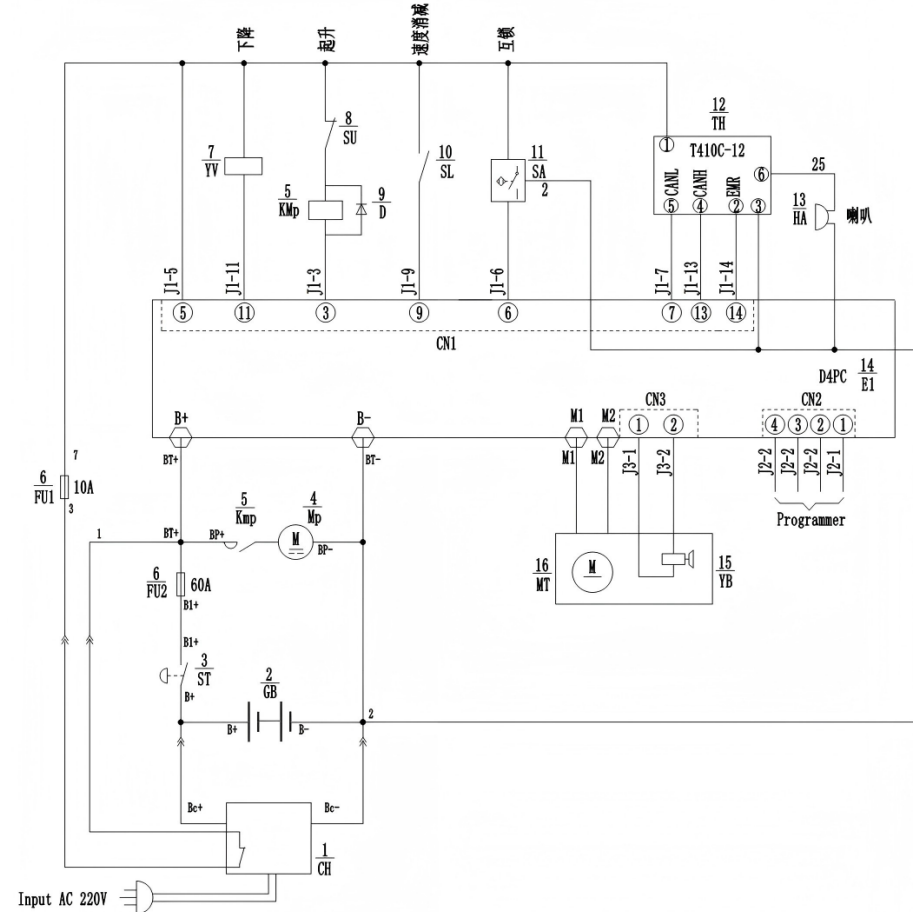
The vehicle is packaged on a pallet and must not be turned over or placed upside down during transportation. Avoid collisions during lifting and loading, and do not damage the exterior surface when unpacking.

10. Schematic Diagram

1. Hydraulic Schematic



2. Electrical Schematic



16	MT	牵引电机 Traction motor	24V 900W
15	YB	制动器 Brake	24V 6N.m
14	EI	控制器 Controller	DAPC
13	HA	喇叭 Horn	XJF-65/24V
12	TH	手柄 Handle	T410C-12
11	SA	互锁开关 Interlock switch	AZ17M05P8B
10	SL	削减开关 Cutback switch	KZ-15GW2S-B03
9	D	二极管 diode	HER307
8	SU	限高开关 Height limit switch	KZ-15GW2S-B03
7	YV	电磁阀 Valve	
6	FU1, FU2	保险丝 Fuse	
5	Kmp	泵接触器 Pump contractor	
4	Mp	泵电机 Pump motor	24V 2.2Kw 2.0CC
3	ST	急停开关 Emergency stop switch	ED7350-2-AB
2	GB	电池 Battery	24V 100Ah
1	CH	充电器 Charger	24V 15A
序号	符号	描述	备注

3.Brake Principle Diagram

