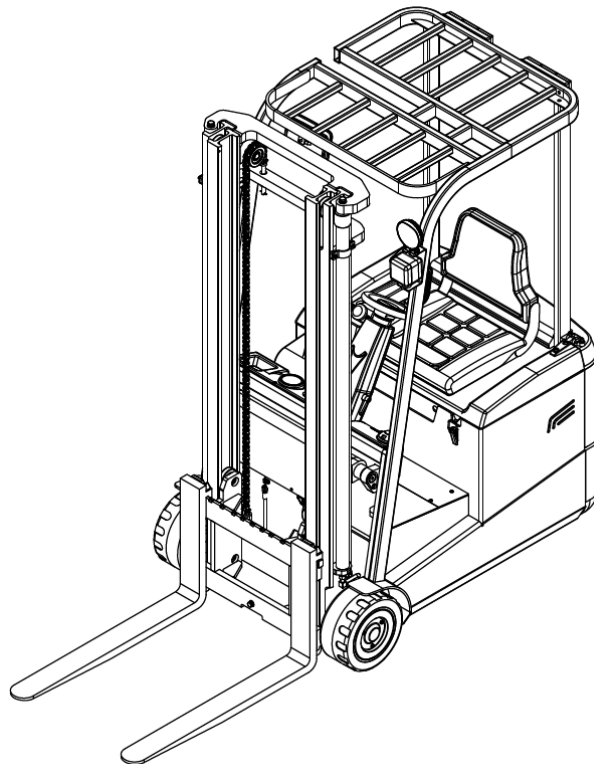




KELVIN Mini series electric counterbalance forklift

Maintenance Instruction Manual



Preface

Dear Customer

To make sure you operate this product correctly and safely, before using it, please read these instructions carefully and keep this document for reference.

The operator must use, operate and maintain the forklift according to the data in the instruction manual. The use of the equipment for any other purpose is not compliant operation and may result in personal injury and the loss of a forklift or other property. The user of the device must comply with the maximum loading capacity limitation specified on the nameplate or load chart to ensure that the forklift is used for the regulated purpose and to eliminate the danger of life and health of the user or a third party. In addition, equipment operators must strictly abide by accident prevention regulations, technical safety regulations and maintenance and repair guidelines. The operator of the machine must ensure that they carefully read and fully understand the contents of this instruction manual.

If you do not follow this instruction manual, our company's quality guarantee automatically expires. If the customer or a third party arbitrarily makes non-standard operations to the equipment, or Kelvin Engineering will not assume any responsibility for the resulting losses.

Special declarations:

- 1) This product is strictly not to be used in potentially explosive environment.
- 2) The environmental requirements for the normal use of this product: no more than 1500 meters elevation, 5°C~40°C temperature range and no more than 90% humidity. If it needs to be used in cold storage or other special environments for a long time, special modifications are required and please contact our technical department.

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Chapter 1 Safe Regulations

Safe Regulation Overview

- ※ Before using the forklift, all safety switches and equipment should be inspected beforehand to ensure that these safety facilities are in good condition.
- ※ Inspection of all warnings and design parameters signs on the vehicle.
- ※ The battery must be securely fixed in the battery box.
- ※ Do not use the forklift if the machine is damaged or has faults which will affect the safe use.
- ※ When the forklift is being repaired or adjusted, it should be carried out by a professional.

1. The forklift can have free lift at certain operation height

2. Operator responsibility

- ※ Operators of the forklift must be fully trained and have completed a driver training course.
- ※ Observe this manual and local safety regulations, rules, and traffic rules.
- ※ Do not operate the forklift with oily hands or feet.
- ※ The cab should always be clean. Do not put tools or other objects to avoid affecting operation of the controls or pedals.

3. Workplace

- ※ It can only run on a flat and hard ground such as concrete or asphalt ground. Do not work in oily areas to avoid slipping.
- ※ Make sure that the ground can bear the total weight of the stacking forklift, which is the weight of the forklift itself, the weight of the load, and the weight of the operator.

4. Driving and guidance during working

- ※ Do not suddenly brake and turn at high speed.
- ※ It should be driven slowly on a slope/gradient, keep the goods in the lowest position. It should be forwards or reverse on a slope and not advised to turn the body of the machine or lift the forks on the slope/ gradient.
- ※ Do not steer, load or unload on a ramp, otherwise the truck may tip over.
- ※ If the road is slippery, it should be driven slowly to prevent the forklift from overturning.
- ※ In addition to loading and unloading cargo, the forks should fall no more than 200mm above the ground during driving. Do not lift goods at the same time.
- ※ Keep a safe distance from vehicles, people, and objects in front of you.
- ※ Before entering the elevator, you need to make sure the elevator can bear all the weight.

5. Loading and Unloading goods

- ※ Only when unloading goods or taking cargo, you can lift the forks and keep a distance with the surrounding people. Do NOT lift the forks during the driving process and ensure that the height of the forks from the ground does not exceed 200mm.
- ※ When loading and unloading goods, the forks should be accurately inserted into the pallet so that the centre of the goods gravity is consistent with the centre of the forklift.
- ※ When carrying an unbalanced cargo, it can easily fall, and the forklift may tip over.
- ※ When lifting the goods, do NOT touch the gantry to prevent pinching.
- ※ The cargo can only be loaded and unloaded within the maximum allowed weight and load centre of the forklift. Please refer to the load curve for details.
- ※ When loading and unloading heavy and over-heavy goods, you need to be very careful. For larger cargo loads, forklifts should be equipped with backrest.
- ※ Do not drive or tilt the mast when lifting goods.

6. Parking precautions

- ※ After the forklift stops, the forks should be at the lowest point and the machine should be placed in brake.
- ※ The forklift is not allowed to park on a slope.
- ※ The forklift should be parked at appointed locations.
- ※ The forklift is not allowed to park at an emergency exit.
- ※ After parking the forklift, you need to turn off the machine and take the key away.

7. Battery loading and unloading

- ※ You need to be careful when loading and unloading batteries and their plugs. Read the instructions carefully first and get to know the battery section for details.
- ※ Wear protective eyewear when replacing or charging the battery.

8. Maintenance

Maintenance can prevent accidents, please refer to the chapter about maintenance.
All replacement spare parts should be parts approved by Kelvin Engineering Ltd. The maintenance or modification of the forklift which will affect the safety or functions is not permitted.

Chapter 2 Warning, Nameplate and Symbols

The Battery forklift has the following symbols:

(Please read the related content on the labels)

1. Lifting and lowering control.
2. Safety marks nameplate.
3. Load chart label.
4. Lifting point.

Chapter 3 Forklift Introduction

Kelvin Mini series battery counterbalance forklift is powered by electric energy. It uses a foot accelerator to control speed and the steering wheel to control steering. We adopt a 24V electronic system, and steplessly adjust its speed with an integrated circuit controller to ensure available stable speed and acceleration during the running process. The forks are lifted by an advanced electric hydraulic pump through manual multi-way valves.

1.Forklifts purpose

The main purpose of the forklift is to carry the cargo placed on the pallet and stack it at a certain height.

2.Forklift not to be used.

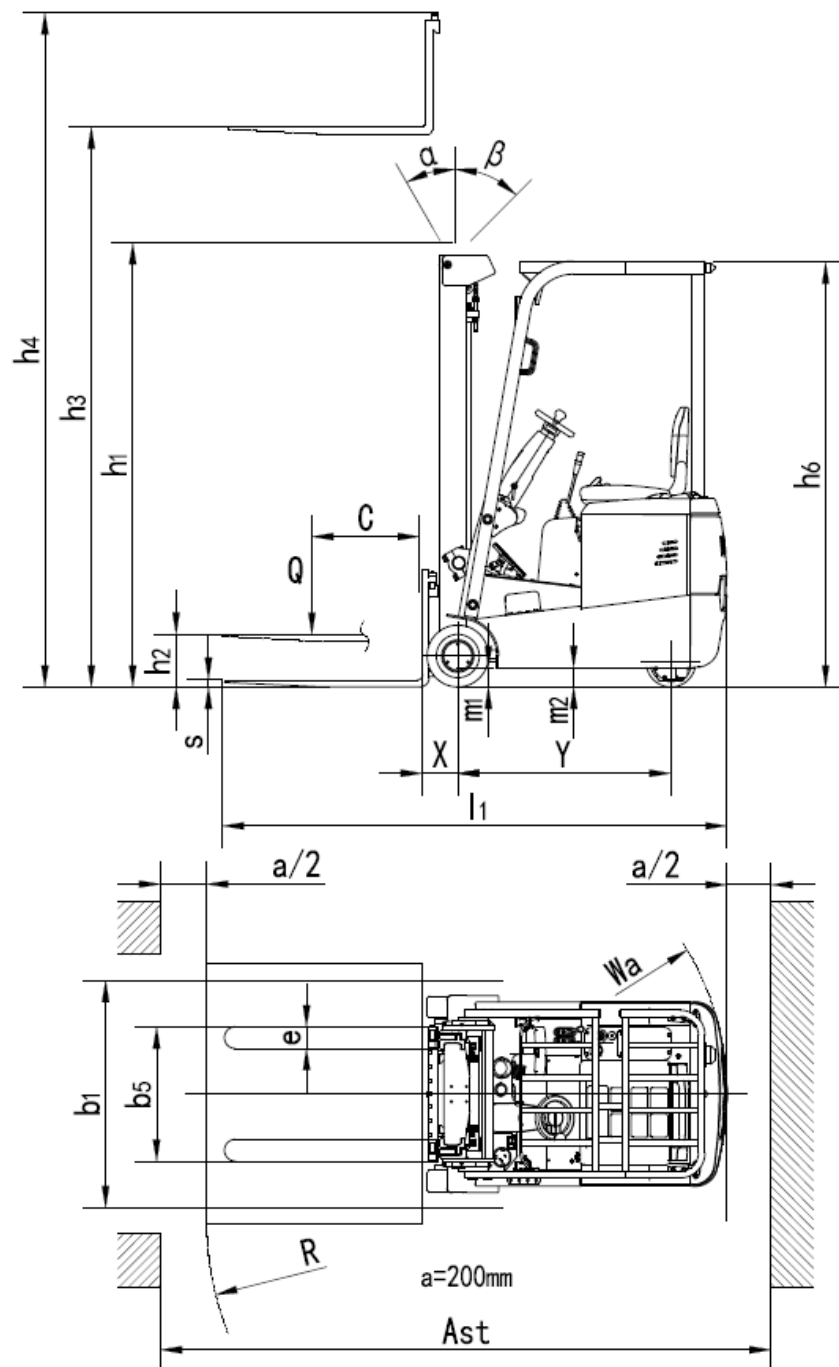
The forklift is not to be used in following areas:

- ※ Sites that can cause fire or explosion, such as slippery areas.
- ※ Using as tow tractor for other vehicles.
- ※ Using to transport or lift people.
- ※ Working on grass or sand.
- ※ Hanging the wire rope directly on the forks to hang the goods.
- ※ Using the forks to push cargo or other vehicles.
- ※ Using the forks to open and close other truck's door.

3.Technical specifications

3.1 standard basic technical specifications

Item	Forklift Model	
	Kelvin Mini 10	Kelvin Mini 15
Rated Capacity (kg)	1000	1500
Standard Lifting Height h3(mm)	3000	3000
Overall Length (Inc. forks) l1(mm)	2330	2450
Overall Height (Mast lowered/extended) h1(mm)	1995/3530	1995/3500
Overall width b1(mm)	912	912
Min. Ground Clearance of Forks m1(mm)	90	50
Turning Radius Wa (mm)	1255	1380
Travel Speed (load/unload) (km/h)	6/7	6/7
Gradeability (load/unload) (%)	8/10	8/10
Service Weight (Inc. battery) (kg)	1700	1970
Tires Type (Front/rear)	PU wheels	PU wheels
Drive Motor (Power/type)	1.5kw/AC	2.3kw/AC
Lift Motor (Power/type)	2.0kw/DC	3.5kw/DC

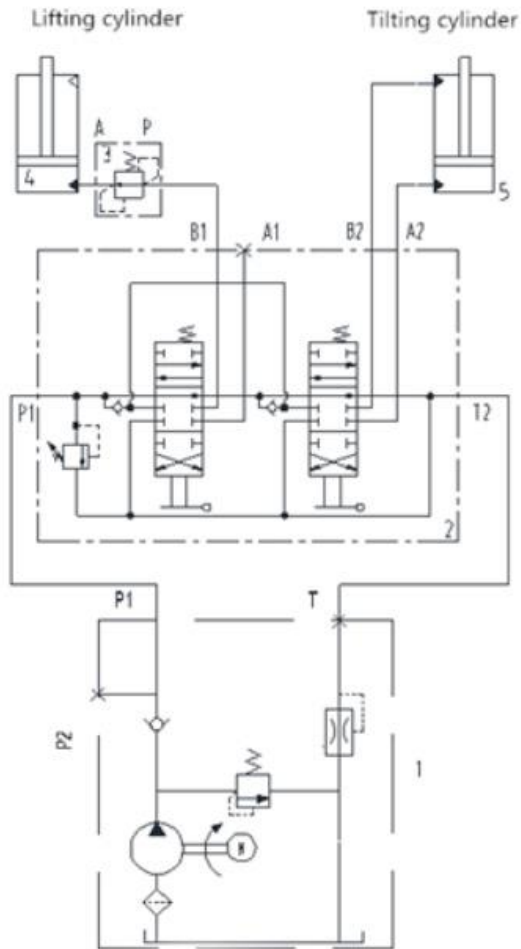


3.2 Environmental Requirement

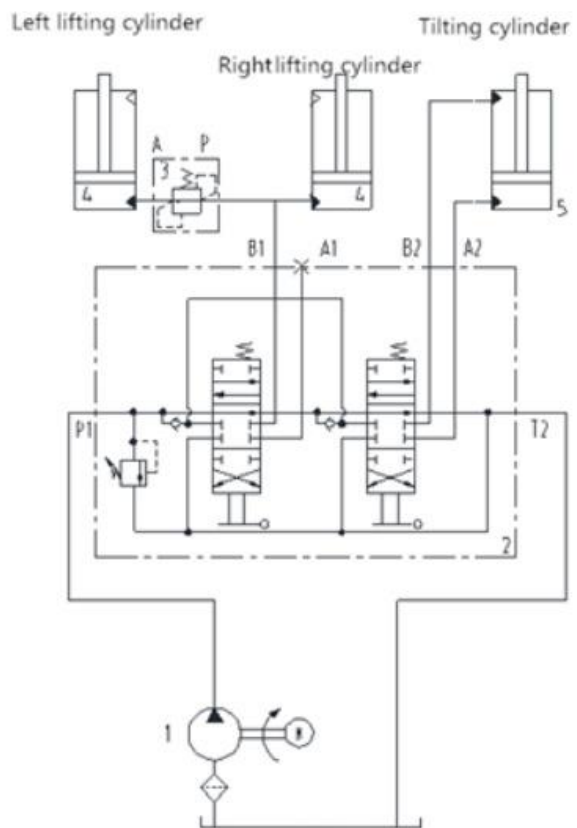
Ambient temperature: The forklift truck is suitable for 5 °C to 40 °C in the working environment.

If the forklift needs to be used for a long time in the environment of great changes in temperature or humidity, special equipment must be installed. Kelvin Engineering Limited's permission must be obtained.

3.3 Hydraulic schematic diagram



kelvin mini 10

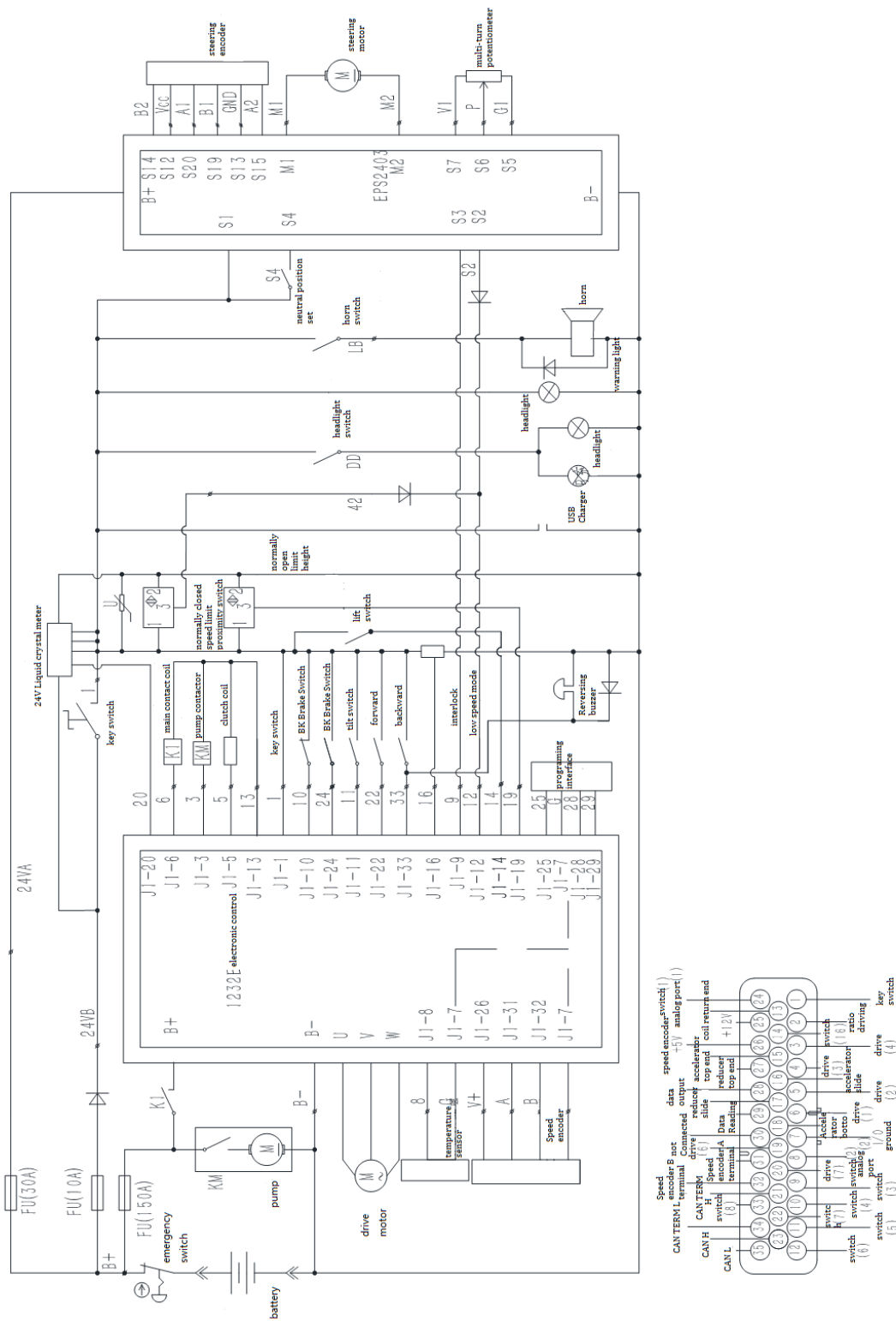


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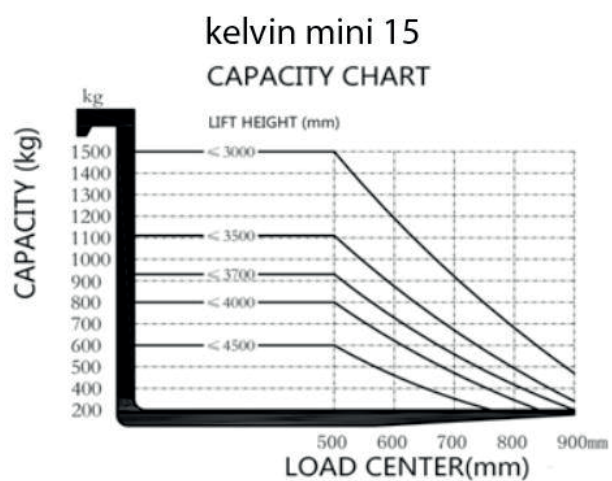
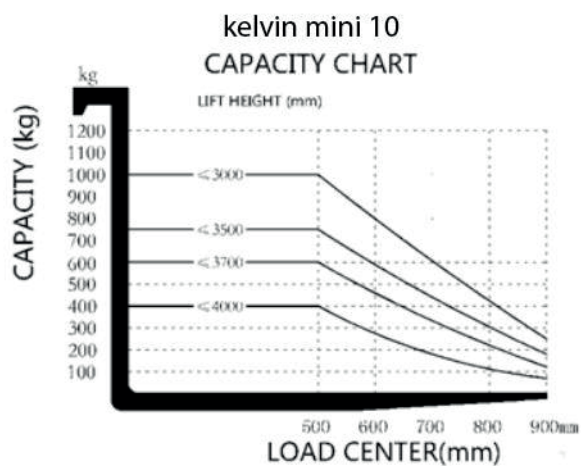
Spare parts name above :

1. Pump station or gear pump
2. Multi-way valve
3. Block valve
4. Lift cylinder
5. Tilting cylinder

3.4 Electrical schematic diagram



4. Capacity chart



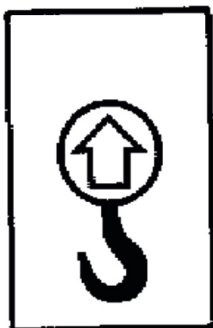
5. Safety signs



Do NOT Stand on or off



Caution nipping hand

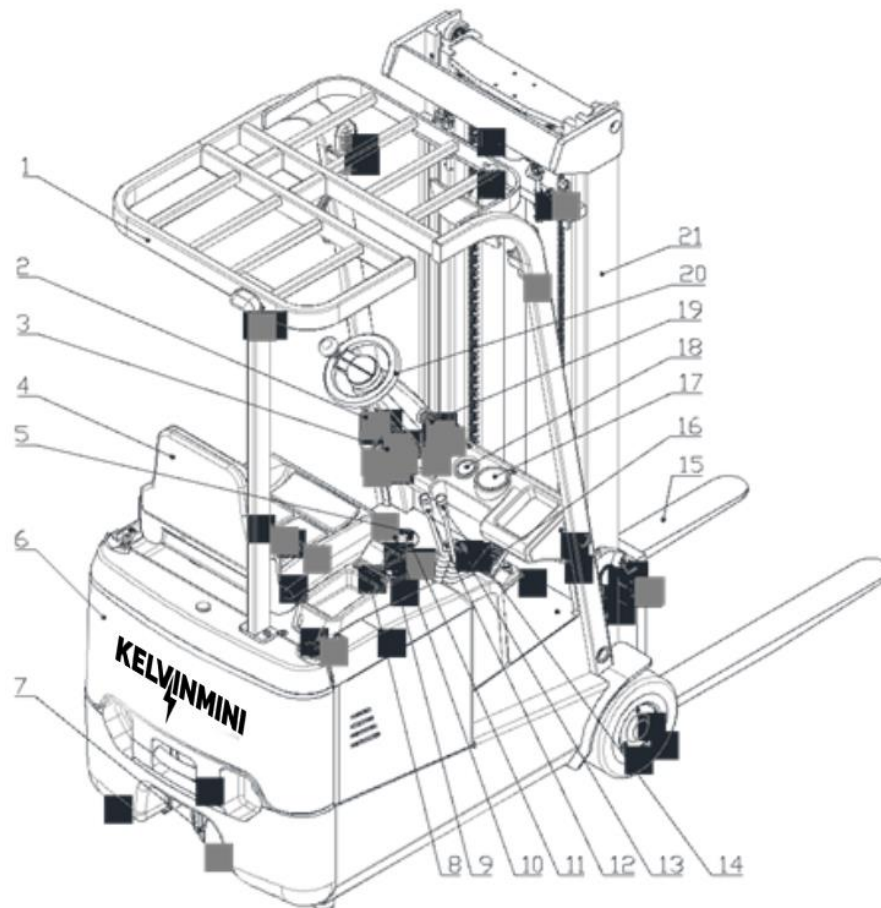


Lifting position



No access to the back of the mast

Chapter 4 Main Components and Control Devices



1. Overhead guard 2. Brake fluid injection port 3. Headlight switch 4. driver seat
 5. Pedal horn switch 6. Counterweight 7. Driving boxes 8. Folder 9. USB Power Interface
 10. Emergency Stop Switch 11. Driving direction switch 12. Lifting handle 13. Brake pedal 14. Tilt the handle
 15. Fork 16. Accelerator 17. Cup holder 18. Instrument 19. Key switch 20. steering wheel 21. Mast

Chapter 5 Driving

1.Start

Please proceed in the following order, otherwise the truck will not operate normally:

- 1.1 Make sure the power connector is plugged in firmly.
- 1.2 Turning on emergency stop switch
- 1.3 Turn the key switch to the open position.
- 1.4 Make sure the battery has enough power.

Note:

For a long time of low power operation of the forklift, the battery life will be drastically reduced. Do not start the forklift until the battery is charged.

- 1.4 Turn the driving switch to the desired direction.
- 1.5 Lightly step on the accelerator pedal, and the forklift can travel.
- 1.6 Push forward and pull up the lifting handle, the mast descends and lifts respectively, push forward and pull backward the tilt handle, and the mast tilts forward and backward, respectively. The speed is controlled by the tilt angle of the handle, the greater the angle, the faster the speed.

Note:

Do not suddenly stop when lowering the forks and lowering the fork.

Warning !

Non-operable forklifts with serious functional defects that endanger safety. Before working every day, you should check the following security features firstly:

- ✕ The horn function is normal.
- ✕ Manipulation function is in good condition.
- ✕ The brake function is normal.
- ✕ The hydraulic function is normal.

2. Braking

- 2.1 When the accelerator pedal is released, the electromagnetic brake at the rear end of the forklift drive motor starts to brake and the forklift can be stopped smoothly.
- 2.2 If you need to reduce the braking distance, you can use the brake pedal to control the braking distance.
- 2.3 Forklift parking.
Stop the truck by releasing the accelerator and switch the driving direction back to neutral.

2.4 The maximum noise value of the ear of the forklift truck is not more than 80dB (A). The test method is according to JB/T3300; the vibration is not more than 0.4m/s². The uneven road surface will increase the noise and vibration.

3. Steering

3.1 Steering is controlled by the steering wheel. The forklift is a speed-following type electric steering. The faster the steering wheel rotates, the faster the steering wheel turns. When the steering wheel is reversed, the steering wheel also reverses.

3.2 When the forklift encounters an obstacle, it should not be forced to pass and should pass by the obstacle.

Warning !

Do not allow wheels to slip.

If the operator's hands or shoes are stained with oil, it is easy to operate error and cause the forklift to lose control, so you should clean your hands and shoes before driving.

4. Parking

4.1 Release the accelerator.

4.2 Make direction switch to the middle.

4.3 Reduce the fork to the lowest position so that there is no system pressure in the hydraulic system.

4.4 Turn off the key switch.

4.5 Press the emergency stop switch.

Warning !

Do not allow unauthorised driving.

If you leave, take the key with you.

Chapter 6 Attachment

Forklifts can be equipped with different accessories to further enhance safety.

1. Load-backrest

When the height of the goods is too high, you can add a load-backrest to increase the stability of the goods.

Chapter 7 Cargo transportation

1. Transport

- 1.1 The weight of the goods should be within the permitted lifting capacity of the forklift.
- 1.2 When loading and unloading cargo, it should be stable and safe. Be careful with ultra-high and long goods.
- 1.3 When loading or unloading ultra-high cargo, the forklift should be equipped with suitable retaining shelves.
- 1.4 When the forklift is driving, the fork should be lowered to a height of about 200mm.
- 1.5 Uneven roads and tire wear can cause abnormal noise.
- 1.6 When turning, slow down.
- 1.7 Irregular objects should pay attention to safety during transportation. When turning, pay attention to space.
- 1.8 If the operator's frontal vision is affected, he should be asked to direct the direction.
- 1.9 When the upper and lower slopes are decelerated, it is prohibited to turn the head on the slope.

Warning!

When turning on a slope, the forklift is in danger of overturning.

On a downhill slope, the forklift's braking distance is extended and the braking time increases. Therefore, it should speed down to reduce the braking time. Do not force a steep slope.

- 1.10 Before the forklift enters the elevator, it shall be ensured that the elevator can withstand the entire load (the weight of the forklift, the weight of the cargo, and the weight of the operator). The forklift should first enter the elevator and finally leave the elevator.

Warning!

Before starting the elevator, the bearing capacity of the elevator should be clearly understood to avoid accidents.

- 1.11 Before the forklift approaches the bridge deck, it should decelerate and maintain a certain distance from the edge of the platform.

Danger!

The load capacity of the bridge board must be checked in advance to verify its safety to avoid overturning and falling. When working outdoors, if the wind is too strong, stop using it to avoid accidents.

2. Loading

- 2.1 Decelerate and locate parking before shelves.
- 2.2 Raise the fork to the desired position.
- 2.3 Slowly drive the forklift forward so that the fork is inserted into the bottom of the pallet.
- 2.4 Raise the forks so that the goods rise to a certain height.
- 2.5 Slowly retreat the forklift to get the goods off the shelf.
- 2.6 Reduce the cargo to a height of about 200mm from the ground and carefully drive away.
- 2.7 Start slowly to speed up operation.

Danger!

Do not lift the goods during the driving of the forklift to avoid overturning.

3. Unloading

3.1 Decelerate parking and positioning before the shelf.

3.2 Raise the fork to the desired position.

3.3 Slowly move the forklift forward so that the goods are accurately positioned on the shelf.

3.4 Lower the fork to remove the cargo.

3.5 Slowly retreat the forklift.

3.6 Lower the fork to a height of about 200mm and carefully leave it.

3.7 Slow start can accelerate operation.

Danger!

Do not lift the forks during the forklift to avoid dropping the goods.

Chapter 8 Battery and motor

Check that the battery is charged.

1. Replace battery

The replacement battery must be the same with the original battery model and weight. (Battery weight can affect forklift performance and brake function)

Attention!

Do not change battery weight and size, otherwise it will affect the forklift gravity centre. The weight must be the same with digital on the nameplate.

1.1 Dismantle low electricity battery

- (1) Remove power supply plug wire
- (2) Open box cover
- (3) Switch off joint between battery connector lug and cable
- (4) Take off battery with suitable battery box hook

1.2 Battery installation order

- (1) Use lifting device to lift battery and put into battery box
- (2) Connect joint between battery connector lug and cable
- (3) Close battery box
- (4) Keep key switch off
- (5) Plug the socket

2. Charge

2.1 No smoking or using fire

Please do not charge too much or too less, to avoid battery damage.

Max charge current is as follows:

Battery (Ah)	Charger (A)
300	40~50

Dangerous!

There is Sulfuric acid in battery electrolyte, it is corrosive. If you splash the skin, please clean with water and soap immediately, contact the doctor if splash into eyes and clean eyes with water. When checking the battery, please wear protective glasses and gloves.

2.2 Charge preparation

You should charge the battery after using each time, the storage time shall not exceed 24 hours.

- (1) After parking, turn off the key switch and take it out.
- (2) Open battery box cover, make sure the top of the battery is ventilated and open the battery ventilator cover.

- (3) Remove power supply socket, connect battery plug with battery socket.
- (4) Open battery plus liquid hole cover to make it ventilated.
- (5) Switch on AC current and start charging.

Warning!

When charging, make sure there is good ventilation. Keep an open fire and spark far away, otherwise it may lead to an explosion.

Switch off the charge power supply before removing the socket.

2.3 During charging

Charging method and maintenance, please refer to battery manual. Use following method to judge whether electricity is enough:

- (1) Battery electrolyte proportion keep stable more than 2-3 hours
 - (2) Battery electrolyte liquid level has strong bubble
- Above situation means battery electricity is full enough.

2.4 After charge

- (1) Turn off AC power supply and charger
- (2) Remove charger plug from battery plug
- (3) Plug battery power supply socket into battery body plug
- (4) Close battery cover

After full charge, the comparison table between battery temperature and electrolyte proportion is as following

Temperature°	Proportion g/cm3
-15	1.31
0	1.30
+15	1.29
S+30	1.28
+45	1.27

Please add distilled water to adjust if proportion does not conform to this table

3. Battery maintenance

- (1) Make sure full charge before using each time
- (2) Avoid full charging and discharging, otherwise will affect battery life and performance
- (3) Keep the Battery fluid plug and vent cover clean, keep the battery surface, connecting wire and screw clean and dry. If there is sulfuric acid, clean it with cotton wool
- (4) After charging, check battery liquid level, add distilled water if level is low, do not add dilute sulfuric acid
- (5) Charge battery after using
- (6) Check whether battery box has liquid at the fixed period, use plastic long thin pipe to suck out, meantime to clean it with dry cloth
- (7) Keep good ventilation, no fire
- (8) Battery should be equalizing charged when have the following condition
 - a. Normal using battery (Equalizing charge every 3 months)
 - b. Long time no use battery

- (8) Equalizing charge method
 - a. Normally charge first
 - b. Stop 1 hours when full charge, then charge 1 hour with $0.05C_5$ (C_5 means battery rated capacity)
Repeat b with times until battery has fierce bubble when switch off
- (9) When not using a period of time, you must charge fully
- (10) The battery should avoid direct sunlight, keep at least 2M distance from heat source
- (11) Avoid contact with any liquids and hazardous substances, any metal impurities cannot fall into the battery.

4. Motor maintenance

- (1) Check motor at the fixed period
- (2) Use 250V ohmmeter to measure the cold insulation resistance of the motor, the resistance should more than $0.5M\Omega$, if less than $0.5M\Omega$, should do hot dry processing
- (3) Check whether motor outgoing connecting wire is correct and firm
- (4) Check whether commutator segment is clean, whether electric brush can slide freely in the brush box
- (5) Check whether all fasteners are tight
- (6) Check electric brush worn situation every 3 months and whether replace brush
- (7) Do a full maintenance of the motor each year

5. Electromagnetic brake maintenance





- 1) Use for a long time in a high humidity environment, should avoid rusting, clean rust if have
- 2) Do not touch friction surface with hand, no oil pollution, otherwise can't reach the maximum torque, please clean and wipe friction surface
- 3) When using temperature is high, please install it in ventilated place, applicable ambient temperature is $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$
- 4) The initial torque value is low, after some using time, torque value will be stable
- 5) Please check regularly for all parts

Chapter 9 Fault analysis

(Programmer fault diagnosis menu and status display LED)

LED display code	Programmer display	Fault phenomenon	Fault reason
1,2	HW FAILSAFE	Hardware invalid protection error	1.Controller damage
1,3	M-FAULT	M-output short circuit	1.M-output to ground short circuit 2.The directional contactor does not have actuation 3.The actuation speed of direction contactor is too slow
1,4	SRO	SRO fault	1.Key switch, braking and direction input order is not correct 2.SRO type wrong choice 3.Braking and direction switch line open circuit 4.The sequential delay is too short
2,1	THROTTLE FAULT 1	Accelerator fault	1.Accelerator input line open circuit 2.Accelerator input line to ground or B+ short circuit 3.Accelerator potentiometer fault 4.Wrong accelerator type choice
2,2	BB WIRING CHECK	Emergency reverse connection line fault	1.BB connection line open circuit 2.BB detection line open circuit
2,3	HPD	HPD sequence fault	1.KSI , Brake and accelerator input sequence is not correct 2.Wrong HPD type choice 3.Wrong accelerator potentiometer adjustment choice
2,4	THROTTLE FAULT 2	Low end break or short circuit of potentiometer	1.Accelerator low end connection line open circuit 2.Accelerator low end connection line short circuit 3.Wrong accelerator type choice
3,1	CONT DRVR OC	The drive outputs overflows	1.Commutator contactor coil short circuit 2.Shunt field short circuit
3,2	DIR CONT WELDED	Commutator contactor adhesion	1.The Commutator contactor contacts close
3,4	MISSING ONTACTOR	No finding contactor	1.Commutator contactor coil open circuit 2.Commutator contactor coil lost 3.Shunt field open circuit 4.Connection commutator contactor or shunt field open circuit
4,1	LOW BATTERY VOLTAGE	Battery voltage is too low	1.Battery voltage <16V 2.Battery terminal corrode or loosen 3.Controller terminal loose
4,2	OVER VOLTAGE	Battery voltage is too high	1.Battery voltage >33V 2.Charger still connects when in operation

4,3	THERMAL CUTBACK	Beyond the operating temperature area, the current decreases	1.Temperature >85 or <-25 2.Vehicle is overloading 3.Wrong controller installation 4.Working in extreme environment
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For example, LED display code, (2,4):     means LED light flash 2 times, pause for a few seconds and then flash four more times.

Chapter 10 Maintenance

After the forklift has been running for 500 hours, routine maintenance is required. The efficiency, life and safety of the forklift depends on the routine maintenance.

For forklift maintenance, replacement spare parts should be provided by our company to ensure quality. It is recommended to contact Kelvin Engineering Ltd or the company's after-sales service department. So that your forklift can operate more safely and economically.

1. Maintenance Safety Rule

Maintenance work can only be conducted by an authorized, fully qualified engineer.

- (1) Keep the maintenance site clean and hygienic.
- (2) During maintenance, do not carry loose objects or valuables on your body.

Note!

When repairing the electrical system of a forklift, if metal contacts the energized electronic components, it may cause a short circuit or burn. So, please take off your watch, earrings, or other accessories.

- (3) Before the forklift is repaired, unplug the power socket, and disconnect the power supply.
- (4) Before opening the left and right box covers or the electrical system, turn off the key switch of the forklift.
- (5) Before checking the hydraulic system, the fork should be lowered to release the system pressure.
- (6) When checking the oil leakage of the forklift body, please wipe it with paper or cardboard, and do not touch it directly with your hands. To avoid burns.
- (7) Please note that the oil temperature in the transmission or hydraulic system may be high. The forklift should be cooled first, and then the gear oil or hydraulic oil should be replaced to prevent high oil temperature from causing combustion.
- (8) The hydraulic system should be filled with new clean hydraulic oil that meets the requirements.

Note!

If the hydraulic oil is not clean, it will affect the precision hydraulic components and reduce the capacity of the entire hydraulic system or even collapse.

If varied brands of hydraulic oil are used, it will damage the hydraulic components and affect the system capability. Therefore, when adding or replacing hydraulic oil, pay attention to the use of uniform grades.

- (9) Please abide by relevant laws and regulations, protect the environment, store and discharge oil in accordance with regulations, and do not discharge it into the sewer pipe.
- (10) When welding the forklift body, disconnect the battery power supply. Because the welding current may enter the battery during welding, to avoid this kind of situation, please cut off the battery.
- (11) When working under the forklift, the forklift should be supported by the bracket.

Warning!

Improper support may cause the forklift to tip over and injure people. If the forklift does not have lifting equipment or support protection, it is forbidden to work under the forklift.

2. User can complete the maintenance work

2.1 Daily maintenance and safety inspection.

- (1) It is the operator's responsibility to perform routine maintenance and inspection of the forklift.
- (2) If the forklift does not perform routine maintenance, it will affect the safety and reliability of the forklift and may easily lead to serious accidents.
- (3) Check for problems or discover faults, repair them immediately and stop using them.

2.Can complete the maintenance work in one day, one week and one month as indicated in the maintenance table.

t No	Checking parts	Content
1	Operate control	Check whether its function is normal
2	Safety switch	Check whether its function is normal
3	Horn	Check whether its function is normal
4	Steering	Check whether its function is normal
5	Hydraulic device	Check whether its function is normal
6	Meter	Check whether its function is normal
7	Hydraulic system	Oil level and leak oil or not
8	Drive device	Noise and leak oil
9	Electromagnetic clutch	Check whether normal work, whether contact is bad
10	Transmission	Good or not
11	Wheel	Check for damage, remove oil stains and metal chips
12	Frame	Check for damage and remove oil stains
13	Battery	Check the electrolyte level
14	Fork	Check for deformation or cracks
15	Lift device	Check for damage and remove oil stains
16	Hydraulic cylinder	Check for damage and oil leakage

2.2 The maintenance work that can be completed within 1 day, 1 week and 1 month indicated in the maintenance table can be completed.

(See Chapter4 Maintenance Table)

2.3 Other maintenance parts given in the maintenance table. It can only be completed by the maintenance personnel of the company, or the maintenance organisation approved by the company.

3. Cleaning forklift

It is important to conduct routine cleaning every week to ensure its reliability. Please remove the power socket before cleaning to avoid damage to the electrical system caused by a short circuit.

3.1 External cleaning

(1) Every day to remove attachments on the wheel, to maintain flexible rotation.

(2) After cleaning, lubricating oil should be added to the parts to be lubricated according to the given parts in the table of lubrication parts.

3.2 Clean electrical components

Use compressed air to blow clean motor dust.

Note!

Electrical components should not be flushed with high pressure flushing devices.

Do not destroy the electrical components on the circuit board. To maintain the position of electrical components to avoid short circuit.

4. Maintenance sheet

P a r t	Interval hours	1 d a y	1 w e k	1 m o n t h	3 m o n t h s	6 m o n t h s	12 m o n t h s	36 m o n t h s
1	Body system							
1.1	Check Lid (Left, Right)					★		
1.2	Check battery case firmed parts					★		
1.3	Check the frame for cracks					★		
1.4	Check frame to firm or not					★		
2	Motor							
2.1	Check joint loose or not					★		
2.2	Wipe motor					★		
2.3	Check installed bolt firm or not					★		
2.4	Check for abnormal bearing noise					★		
2.5	Check Insulator resistance				★			
2.6	Check commutator and carbon brush				★			
3	Drive system							
3.1	Check leak					★		

3.2	Check oil level				★			
3.3	Check noise					★		
3.4	Change oil							★
4	Wheel							
4.1	Remove the rope and debris from the wheel	★						
4.2	Check the drive wheel wear and bolts				★			
4.3	Remove and lubricate the wheel bearing						★	
5	Brake							
5.1	Clean the brake part				★			
5.2	Check the wear of the brake pads				★			
5.3	Check the brake condition when the brake is released			★				
6	Controller board							
6.1	Cleaning and installation inspection					★		
6.2	Fix the cable connector tightly				★			
6.3	Check the contactor contacts					★		
7	Battery							
7.1	Check the electrolyte level (the level should be 10-15mm above the plate)		★					
7.2	Check whether the connection between the battery forklift and the charger is tight		★					
7.3	Check each battery and its insulation sheath		★					
7.4	Check the electrolyte specific gravity and temperature			★				
7.5	Clean the battery	★						
8	Hydraulic system							
8.1	Check the pipeline and joints for leaks					★		
8.2	Check the pipeline wear					★		
8.3	Check the fuel tank for leaks					★		
8.4	Check the oil level					★		
8.5	Oil change						★	
9	Cylinder							

9.1	Checking					★		
9.2	Check the installation					★		
10	Mast							
10.1	Check for damage and cracks					★		
10.3	Check the running of the roller					★		
10.4	Whether the lifting chain and pin are damaged and the sprocket wear				★			
10.5	Check if the oil pipes and joints are leaking					★		
10.6	Check for signs of broken forks				★			

5.Lubrication parts table

Part No.	Part	Interval hour(H)			Lube oil, grease
		500	1000	3000	
1	Wheel bearing(steering) Mast rotation axis		L		A
2	Hydraulic system	H	O		B
3	Drive gear box	H		O	C
4	Lifting chain	L			D
5	Bearing of lifting system	L			G

L= Lubricate H= Check O= Change Oil

6.Lube and grease

Grease type		Specification		Suitable parts
		>-15。 C	<-15。 C	
A	Lubricate grease	3#Lithium grease drop point170		Bearings and bushings
B	Hydraulic oil	YB-32 (Foreign ISO-L-HM46)	YC-32 (Foreign ISO-VG46)	Hydraulic system
C	Transmission oil	85W/90 (Foreign SAE80W/90)	70W/75 (Foreign SAE75W)	Gearbox
D	Lubricate oil	CC30 (Normal temperature SAE20W)	CC15W (Low temperature SAE10W)	Chain and pipeline
G	Lubricate grease	3#Lithium grease drop point170		Lifting system bearings

Chapter 11 Transport & storage

1. Lifting forklift

When lifting the whole truck, use lifting equipment to lift the forklift from the lifting point.

Danger!

Do not lift the forklift from other lifting points, otherwise the vehicle may lose its balance, roll over, and injure people and equipment. Therefore, it must be lifted from the marked lifting point.

(1) When lifting or overhead forklifts for maintenance, pay attention to the position of the centre of gravity of the truck.

(2) The spreader must have sufficient strength, safety and reliability.

2. Towing and transport faulty forklifts

(1) When using a traction or rope towing the forklift, the towed forklift must have the driver to operate the steering and release the brake.

(2) If the driving wheel has faults, the forklift cannot be dragged with a trailer or tractor.

Note!

The driving wheels of the forklift must be lifted off the ground, otherwise the wheels and motors will be seriously damaged.

(3) If the electromagnetic brake has faults, the brake cannot be applied. Otherwise, the forklift will move with the terrain after it is parked. At this time, the wedges must be used to cushion the wheels to prevent movement.

3. Storage of forklift

If the forklift needs to be stored for a long time, please take the following measures for the following parts:

Battery:

(1) Recharge the battery, and then perform maintenance according to the daily battery maintenance method.

(2) Perform charging maintenance and check the electrolyte level every 3 months.

Hydraulic system:

When the forklift has been stored for more than one year, the hydraulic oil of the hydraulic system must be replaced.

Please refer to the chapter about maintenance and the table of lubrication parts.

Drive System:

When the storage time exceeds one week, the drive wheel should be fixed and cushioned, or it can be suspended in the air to prevent it from moving. At the same time, the cargo must be unloaded.

4. Precautions for reusing the forklift after storage:

(1) After being stored for a period of time, before reuse, the use function and safety inspection should be conducted in the same way as the routine maintenance and safety inspection.

(2) When the storage time exceeds 3 months, preventive maintenance can be conducted according to the 500-hour requirement of this manual.

Chapter 12 Product warranty and after-sales service

For product warranty and after-sales service, please refer to our after-sales service description.