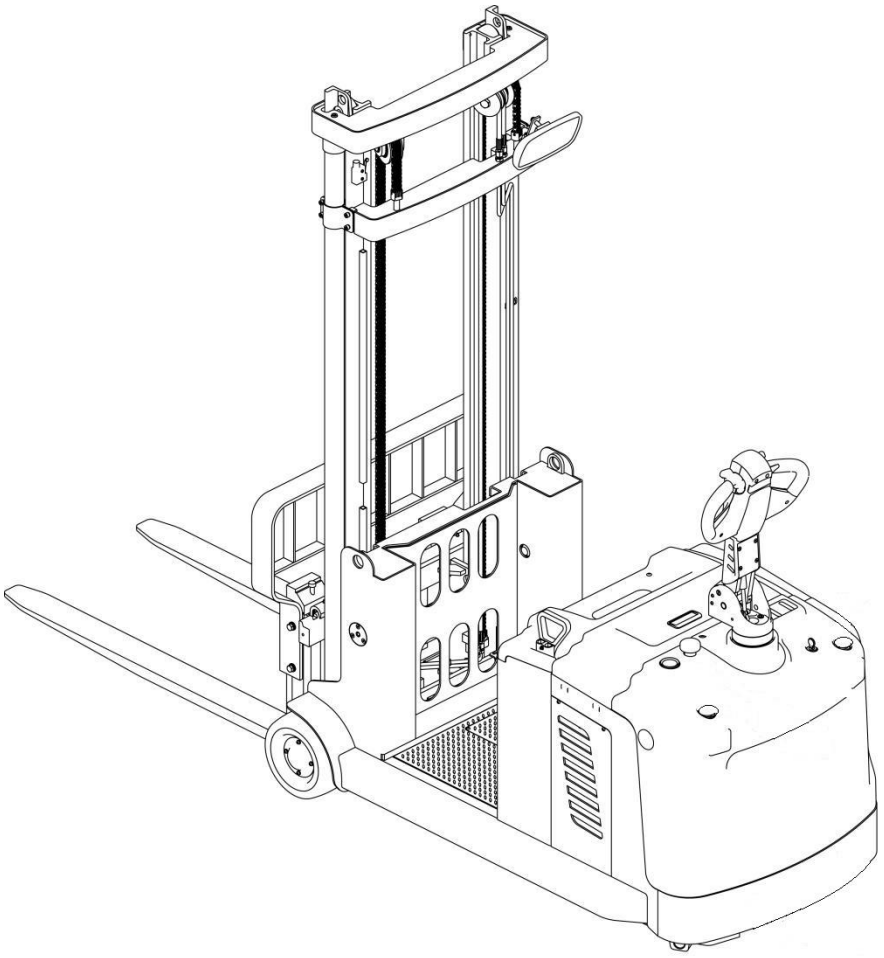
EKKO®

MATERIAL HANDLING EQUIPMENT

MOVING AHEAD

EK14S-130 / EK14S-189Li

The Specification



Introduction

In order to meet the needs of the national environmental protection request, To reduce industrial pollution and improve productivity, we design and produce new series of EK14S-130 Counter Balanced Electric Stacker on the basis of absorption of the advantages of domestic & overseas Electric Counter Balanced Electric Stacker ,they are especially suitable for cargo loading and unloading, handling, stacking, etc for food, bank, light textile, station, port, logistics and other enterprises. And it can apply widely if inter-grate with different fixture

The Counter balanced Electric stacker adopts advanced structures such as wild-field lifting system ,EPS system , new AC controller .It is equipped high-quality Motors, Battery and high-power pumping stations .Therefor it is Convenient operation .With Good view, Flexible steering ,Reliable braking ,Good power, Low noise, No pollution and Attractive appearance .

This manual describes the technical parameters of the Counterbalanced Electric stacker , working principle and operation, maintenance, and other aspects. It can help operators use the Counter balanced Electric stacker more reasonable, make its maximum effect.

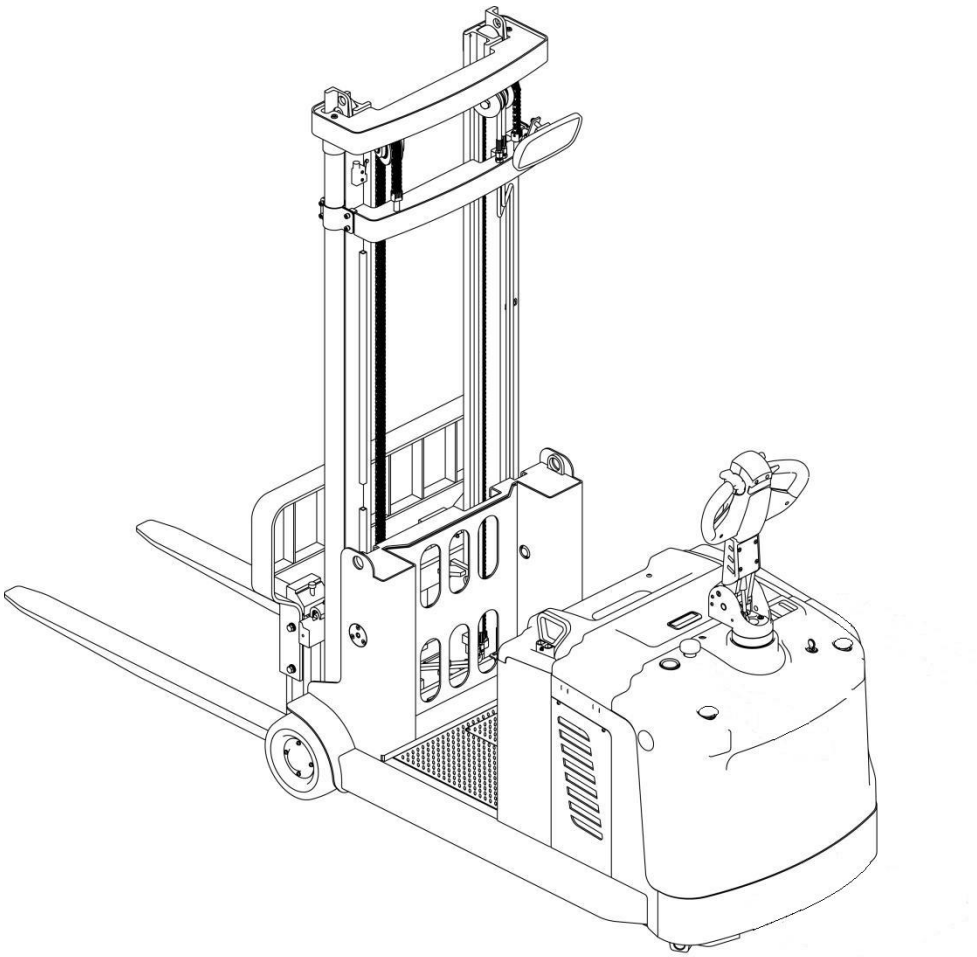
It is hoped that Operator strictly abide the regulations and the precautions in this manual when using the machine. Carefully use them so that your stacker can be in the best working condition for long period of time to maximize its effectiveness. And create better economic benefits.

The Statement

Our company production model EK14S-130 Counter balanced Electric stacker is a special motor vehicle used in Factory ,Tourist attractions ,Amusement places which is specified by “special equipment safety supervision regulations”

Content

1、General Introduction



EK14S-130 counterbalanced stacker uses a battery as the power source. The rear end of the frame is provided with a counterweight. Under the condition of ensuring the rated lifting, there is sufficient overturning torque to keep the longitudinal stability of the stacker.

The characteristics of this stacker are compact structure, simple, convenient maintenance, etc., and wide field of vision, no pollution, low noise and small vibration. The small turning radius makes it suitable for narrow passages and more complex areas. It can even perform flexible and efficient loading and unloading operations in containers, ships, and food depots. If it can be equipped with pallets and boxes, it can realize unitized transportation in the factory, which greatly improves production and reduces labor intensity.

The truck is suitable for stacking and handling cargo on hard, flat ground.

The service environment：

a. Altitude does not exceed 3937 ft.

b. Indoor room temperature at +5℃ to +40℃.

c. When environment temperature at +40℃,the relative humidity can’t over 50%,at low temperature ,allow bigger relative humidity

d. Firm, Flat ground 。

e. It is forbidden to use this car in corrosive environment such as flammable and explosive or acid base.

2、Proper use

Please using the Counterbalanced electric stacker according to this specification.

The stacker described in this manual is a self-controlled series of Counterbalanced stacker. With lifting and lowering is controlled by the handle button.

Improper use can cause personal injury or machine damage. Operators or operating companies need to ensure proper using, make sure that the truck is operated only by personnel who are trained and authorized to use the truck.

The Truck needs to be used on a firm ,flat ,intact surface and suitable surface; the truck is designed for indoor use at room temperature from+5° C to +40° C

Use under light load without using permanent barriers or pits ,It is forbidden to operate on the slope .During Operation ,The goods must be placed approximately at the center of the truck’s load center

Lifting or Carrying people is strictly prohibited ,if carried goods .The goods must fall on the lifting point 。

It is prohibited to use this truck on lifting or loading ramps。

The rated capacity is marked on the capacity label or nameplate. And the operator must pay attention to the warming signs and safety instructions

Operating lighting must be at least 50LUX

Modification

Any modification that may affect the truck rated capacity, stability or safety operations must be approved in advance by the Truck’s original manufacturer or Its authorized Manufacturer or its successor. This includes the effects of changes such as Braking ,steering , Visibility, and the addition of removable accessories.

After the manufacturer or its successor approves the modification or change ,the capacity name plate ,Label, identification marks, operation and maintenance manual must be changed accordingly

Truck damage caused by not following Instruction will lose its warranty

3.Introduce of the product

3.1Overview of main components

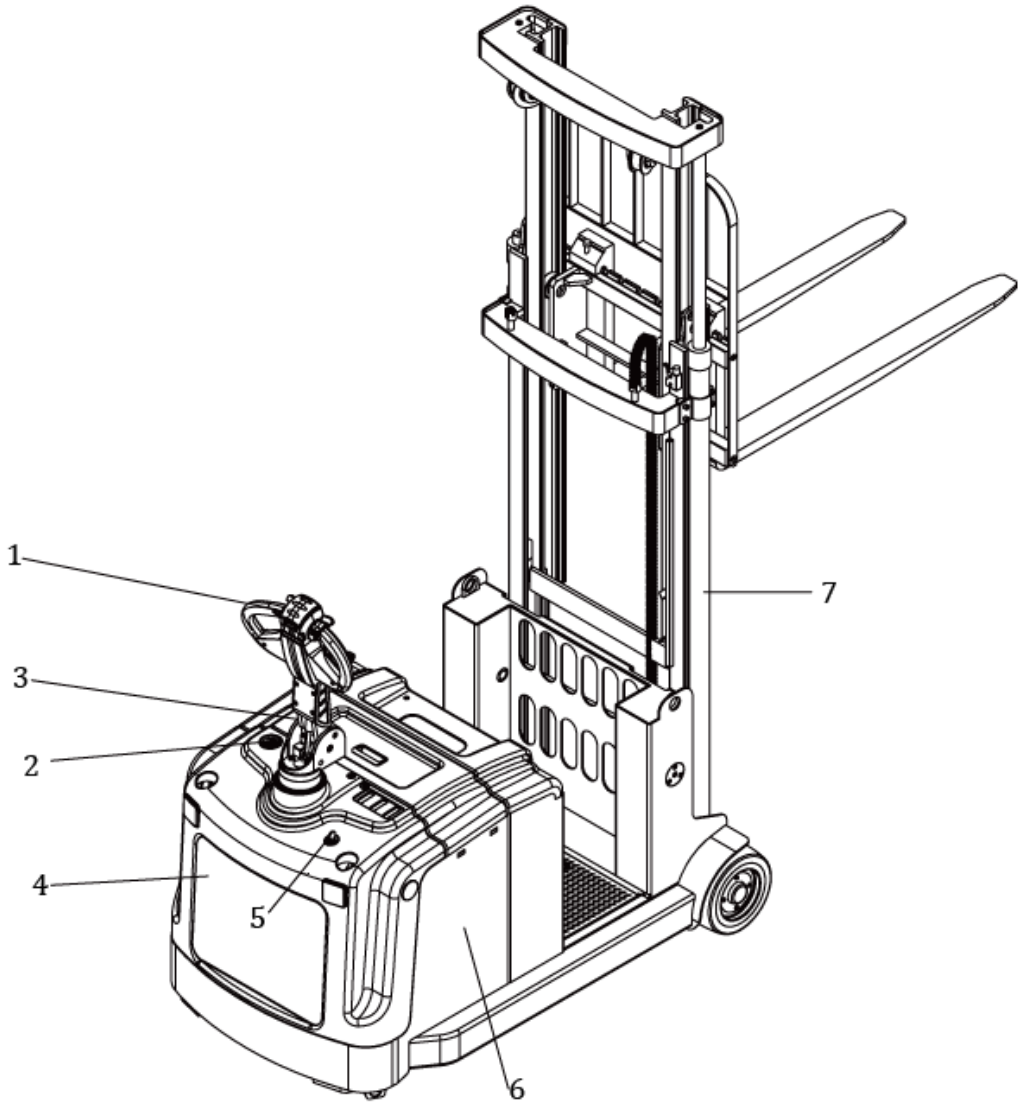


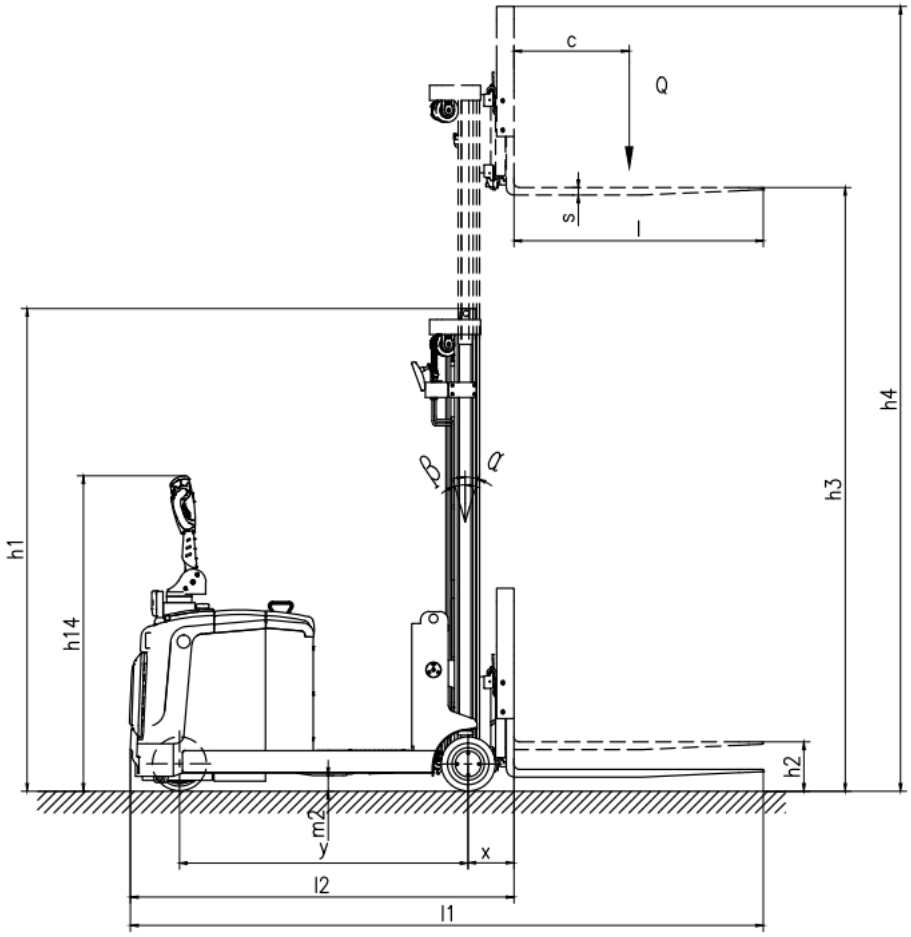
Figure 1 main components

Table 1 main components

No.	Description	No.	Description

1	Main frame assembly	5	Protection Arm
2	cover	6	Key switch
3	Operating handle	7	Emergency stop switch
4	Mast assembly	8	Electricity meter

3.2Model parameters



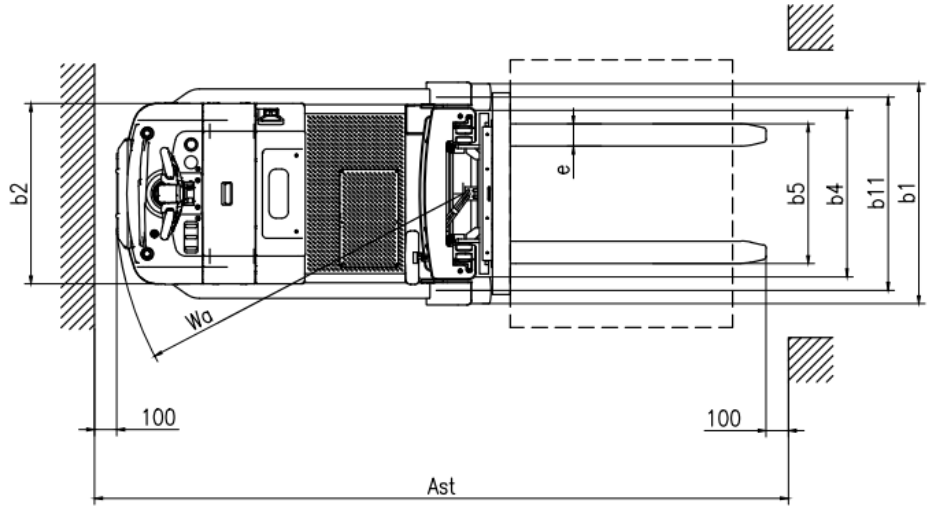


Fig 2 Schematic diagram of the stacker

Main technical parameter list

Mode		EK14S-130
Drive type		Electric
Type of operation		Stand on
Load Capacity	Q (lbs)	3300
Load Centre	c (inch)	23.6
Distance between fork backrest and front wheel	x (inch)	8.3
Wheelbase	y (inch)	52.36
Tire material		PU
Driving wheel size	Φ×w(inch)	Φ9.84×2.95
Bearing wheel size	Φ×w(inch)	Φ9.84×4.72
No of Driving wheel, Balance wheel/Bearing		2/1x
Front wheelbase	b11 (inch)	34.09
Mast/fork carriage tilt, forward/backward	α/β (°)	3°
Lowered mast height	h1 (inch)	87.52
Lift height	h3 (inch)	129.92
Extended mast height	h4 (inch)	165.67
The height of handle in the operation position	h14 (inch)	44.68/57.28
Overall Length	l1 (inch)	114.84
Body Length	l2 (inch)	69.57

Overall Width	b1/ b2 (inch)	31.8
Fork Size	s/e/l (inch)	1.38/3.94/45.3
Ground clearance under mast	m1 (inch)	3.54
Ground clearance at wheelbase center	m2 (inch)	2.87
Aisle width with pallet 39.37 x 47.24across forks）	Ast (inch)	122.8
Aisle width with pallet 31.5 x 47.24 along forks	Ast (inch)	127.36
Mi. Turning radius	Wa (inch)	61.8
Driving Speed load/unload	(km/h)	5.2/5.5
Maximum gradeability load/unload	(%)	5/8
Brake Type		Electromagnetic brake
Drive Motor	(kW)	2.5
Lift Motor	(kW)	3.0
Battery voltage/rate capacity	(V/Ah)	24/210
Battery Weight（±5%）	(lbs)	462
Type of drive control		AC
Noise level	(dB(A))	≤70
Steering type		EPS

4.Safety Caution

<u>Please don't</u>

- **When travel outdoor, the stacking operation makes the lifting height of the cargo higher than the lifting point**
- **Place the foot or hand under or into the lifting mechanism**
- **Allow Non-Operators to stand in front of or behind the truck during moving or lifting / lowering**
- **Overload**
- **Put your foot on the front of the wheel may cause injury**
- **When lifting person, they may fall and cause serious injury**
- **Push and pull cargo**
- **Use the car on the slope**
- **Use the car without Shielding panel**
- **Side load or tail load ,The cargo must be evenly distributed on the fork**
- **Use this car to load unstable ,unbalanced cargo**

- **Use this car without the manufacturer's written consent**

- **The uplifted cargo will become unstable because of wind .Don't lift the cargo in windy condition**

Observing different ground condition during driving .The cargo may fall down, or the car may lose control ,please check the loading situation frequently, If the cargo becomes unstable .Stop the operation of the truck immediately . When the cargo slide or slide off the truck, Stop the car by pressing emergency stop switch .Please refer to Chapter 6 for any truck Trouble .Maintain according to regular inspection. The Truck is not waterproof, Please use it in dry environment. Continuous operation for a long time may damage the power box ,please stop operating when Hydraulic oil temperature is too high .

- **The operator should put on safety shoes when operating the forklift**

- **The car is suitable for indoor use in temperature from +5° C to 40° C**

- **Operating lighting must be at least 50LUX**

- **Dont use the car on the slope**

- **In order to prevent sudden movement of the car when the car is not operated (such as caused by others),turn off the car power and remove the key when not operating**

5.Test run, Transportation, Outage

5.1Test run

Table 3 test data

Model	EK14S-130
Packing weight（LBS）	See technical parameter table 2
Lifting height（INCH）	129.92
Size（INCH）	114.84*31.8*87.52

After receiving our new forklift or when it needs to be retest please with process with following steps before (the first)operation of the forklift :

- Check if all parts are included .and there is no damage

- Battery installation and charging (refer to Chapter 7)
- Carry out daily inspection and machine function inspection

5.2 Transportation

Pls pay attention to below point When shipping by container or car:

1. The front and rear wheels are fixed with wedges to prevent sliding during transportation.

2. When using a lasso, be careful not to place it on the fragile structure of the forklift.

3. When using a forklift to handle, keep the center of gravity of the forklift in the middle of the two forks.

5.3Parking

When the forklift is not working, it should be parked in a dry and ventilated garage to prevent sun and rain. And also, pls attention to below point

1. turn off the key .cut off the emergency stop switch, and plug off the power connector
2. Front and rear wheels are cushioned well
3. If it is stopped for a long time, the battery should be recharged every 15 days

6.Routine Inspection

This Chapter Describes check the car before using

Routine inspection can effectively find out the defect or error of this car, The following points should be checked before operation.

Remove the cargo ,Lowered the fork. Please don't use the car if there is any Problem.

- Check the liquid level of the battery's electrolyte and add an appropriate amount of pure water. The liquid level will rise when charging.
- Check the condition of each pole, cable and protective cover of the battery.
- Check that the battery box is securely fastened
- Check the condition of the lifting chains, rollers, forks, tubing and horns.
- Check the oil leakage
- Press the emergency stop button to check the emergency brake function
- Check if the wheels can move smoothly
- Check the wear of the drive wheels, load wheels, etc.

7.The Schematic diagram of Operating Mechanism

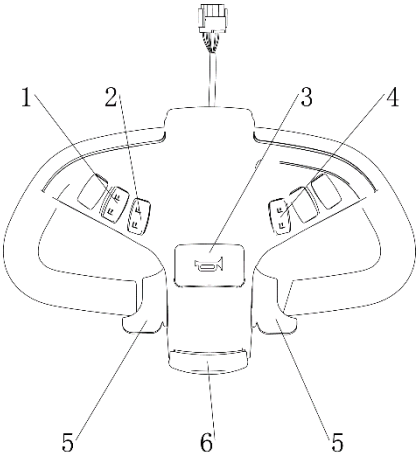


Fig 3 Operating console

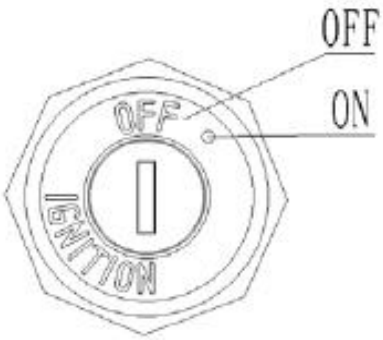


Fig 4 Key Switch

No	Description
1	Side shifter switch
2	Tilt backward &forward switch
3	Horn
4	Lift up/ Lower down switch
5	Accelerator
6	Emergency revise switch

P.S.: Electricity meter and Emergency stop switch pls refer to FIG 1

7Operating specification

Please familiarize yourself with the functions of the switches / buttons before operating the forklift.

7.1 Start, traveling and Parking:

1.Insert the key into Key switch(figure 4),Turn the key clockwise to “ON” position. Gently pull up the Emergency stop switch(Figure1-7).and the control circuit opens.

2.Lift the fork off the ground about 3.937 inch.

3. Slowly open the accelerator (Figure 3.3) until the required speed.

4.During the operation, if the forklift has an abnormal failure, it is necessary to quickly cut off the power. Press the emergency stop switch (Figure 1.7).

5.When the forklift is turning, the speed should be reduced. If possible, try not to make a sharp turn.

6.The full-load climbing gradient of the forklift is 6%, so you need to know the gradient when climbing, and the forklift must press the accelerator as much as possible in order to obtain the maximum climbing force.

7.When the forklift stops, lower the fork to the lowest position, press the emergency stop

switch (Figure 1.7), and pull out the key (Figure 4)

7.2 Use of emergency stop switch

The truck is out of control during driving, or it produces a scorching smell during use. Please press the emergency stop switch on the forklift and cut off the main power .Check the cause and clear the fault before opening. The opening method is: pull the red button gently, the button pops up, and the opening is completed.

The emergency stop switch button is made of plastic. Do not use excessive force when pressing down or pulling up to avoid damaging the switch.

7.3 Use of horn

For driving safety, the vehicle is equipped with a driving horn (Figure 3.5). To remind others when driving, press the horn button in the middle of the operation handle, and the horn will ring to remind pedestrians to pay attention.

7.4 Battery capacity display

The Electricity meter (Figure 1.8) has a capacity display function for the battery capacity of the forklift, and it can also use the power time statistics (calculated in cumulative hours) and undervoltage power-off functions.

7.5 Handling stacking operation

(1) How to carry heavy objects on the pile of goods

Slowly drive the forklift to the item to be transported, make the fork parallel to the ground, lift the fork to the height where it can be inserted, move the fork and slowly move forward, when the fork is fully inserted then parking, operate the lifting handle(figure 3.2) to raise the weight to a certain height, tilt the mast backwards, slowly reverse the forklift , do not touch the adjacent goods, Lowered the goods to a correct position when the heavy objects completely leave the cargo pile. and then carry it by walking.

(2) Putting heavy objects on the pile of goods

The weight is at a low position, the mast is tilted backward, and the stack is decelerated as it travels close to the cargo pile. When it is determined that the forklift is in a straight line with the stacking goods, the brake slowly adjust the title angle fo the mast to a vertical state . lifting the goods slightly exceeds the height of the pile, and then the forklift slowly travels forward to stop above the pile. Slowly push and lower button, Once the heavy objects handled by the stack are dragged, lower the fork to the hollow position. When the fork is pulled out from the heavy object, ensure that the retracted position is unobstructed before it can be reversed. After the fork has completely left the heavy object, lower the fork and the mast is tilted backwards before carrying out a round of handling operations.

P.s.: Note: Please carry the goods according to the load Chart, any use beyond the requirements of the load curve diagram is not allowed

7.6 Steering

The truck equips EPS (Electric Power steering system) must be handled with care.

Steer the truck by turning the handle left or right

7.7Braking system

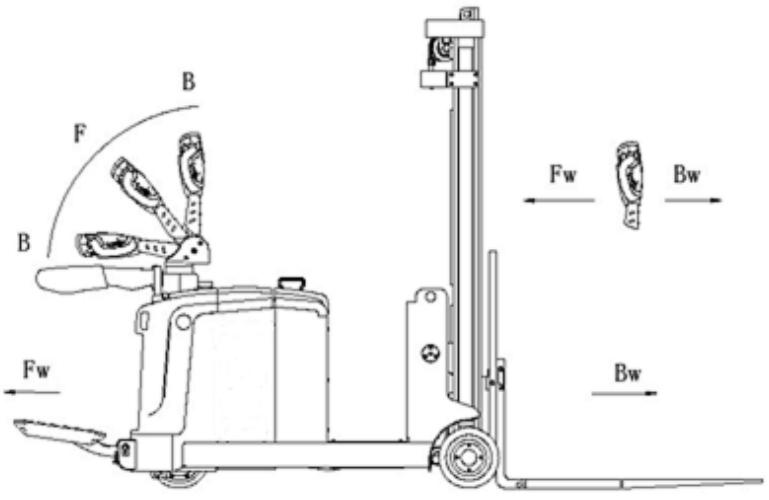


Figure 5 Location of the handle area

Braking performance depends on road conditions and the

loading conditions of car

The brake function can be activated in the following ways :

- By moving the accelerator (figure 3.3) to the “0)position or release the button, Regenerative braking is activated and the truck brakes until it stops .
- By moving the accelerator (figure3.3) directly from the drive direction to the opposite direction., the truck regenerates braking until it starts driving in the opposite direction
- The truck brakes if the handle moves up and down to the braking zone（‘B’）.If release the handle, it will automatically moves to the upper braking zone（‘B’）and the car brakes until it stops

Emergency reverse button(figure3.4)prevents the operator from being squeezed. And if this button is activated ,the car slows down /or begins to travel backwards（‘Bw’）and then stops. If the handle is in the operating area and the truck is not moving .consider that this button still works for this situation

7.8Brake structure &Brake Schematic

Braking principle：as figure12 shows including ：Brake by magnetic yoke assembly 6、Magnet exciting coil 7、Spring 2、brake disc 5、Armature 1、Geared sleeve 4、Mounting screw 3 .The brake is mounted on the end cap of the motor ,and the mounting screw is adjusted to the specified air gap value. The gear sleeve is fixed on the shaft .The external teeth cooperate with the internal teeth of the brake disc. And the torque is transmitted during operation. Then the brake disc can move axially on the gear sleeve .

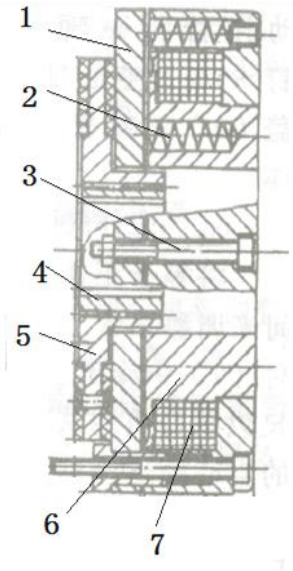


Figure 6 brake schematic

When Magnet exciting coil 7 of brake is energized .the coil produces a magnetic field that caused the armature 1 draw toward the magnetic yoke assembly 6.Armature 1

detached from the brake disc 5(Release).Then the motor drive shaft with brake disc 5 start and operate normally. When Magnet exciting coil 7 is de-energized., The magnetic flux disappears .Armature 1 is released .and spring 2 process armature 1,then the friction plate on the brake disc is pressed to generate frictional force for braking purposes

7.9Trouble

If there is any error or the car is not operate, Stop using and press the emergency stop switch(Figure 1.7).Parking the car in safe area if possible .Turn the key counterclockwise and remove the key(figure 4).Notify the manager or contact your after-sales service staff immediately .Use a special towing equipment /lifting equipment to pull the truck out of the operating area if necessary .

7.10Emergency situations

Keep a safe distance in an emergency situation or the car is turned over. Press the emergency stop switch(Figure 1.7) and all electrical functions will stop.

8.Changing and Replacement for battery

- **Only Qualified personnel are allowed to repair or recharge the battery .Please be sure to follow this manual and battery manufacturer's instructions.**
- **The battery is Lead-Acid battery.**
- **Battery recycling is subject to national regulations .Please follow these rules .**
- **When handling batteries .Don't use open flame which my cause gas explosion.**

- **Don’t place flammable materials and work equipment that may generate sparks within a distance of at least 2M around the forklift that needs to be recharged**
- **It is forbidden to burn materials or burn liquid in the charging area of the battery. It is strictly forbidden to smoke. The area must be well ventilated.**
- **Parking the car safely before you start charging ,installing /replacing the battery**
- **Before finishing the repairing .please make sure that all cables are connected and there is no interference to the other part of car .**

For standard batteries, this model is equipped with the following lead acid battery models:

1PC 2ZPS/24V/210AH/790X210X570(LXWXH)

Only lead-acid batteries are allowed

The battery weight has a certain influence on car operation .

Please consider the max working temperature of the battery.

8.1Replacement

Park the car safely, Move the Mast forward to the appropriate distance, Turn off the car by key(Figure 4) and press the emergency stop switch(Figure 1.7) to open the battery cover ,Remove the battery connector .Then lift the battery from the top of the frame directly .Caution: If the lifting equipment is not safe. The battery may tip over .Installation is the opposite procedure of remove ,Please connect the positive terminal firstly .Otherwise the car is easy to damage

Note: The used batteries must be recycled and stored in accordance with the relevant laws and regulations in the area where they are stored, or in the prescribed disposal area, and these tasks must be performed by a qualified professional

company.

8.2Battery display

Battery display table: The battery discharge situation is indicated on the battery display table by 10 display bars with an increase of 10% per cell.

As the battery capacity is consumed, the illuminated display bar will drop from the top.

The colors of the LEDs indicate the following different states:

name	LED color	Parameter value
Remaining power of standard battery	green	70-100%
	orange	30-60%
	Flashing red	0-20%

The battery is discharged up to 70%, and the red light flashes to issue a "charge storage" warning.

The battery is discharged up to 80%, and the two lights flashing to issue an "out of battery" alarm, the battery must be charged.

Sufficient battery

need to charge

low battery

8.3Charging

- **Only be charged with included charger**
- **Before using the charger ,Please fully understand the contents of the charger manual**
- **Ensure good ventilation in charging room**
- **Fully Charged situation can only be viewed from the display.to check this situation ,you need to interrupt the charging and start the car.**

Park the car in a safe area that provide dedicated power .Lower fork and remove the cargo. Turn off the power of car, Open the battery cover, then connect the connector and Charger. The charger starts charging .Finishing charging .Remove the connector from the charger, Connect the connector to the car and cover the battery cover .

9.Maintain Introduction

- **Only Qualified and trained personnel are allowed to maintain the car .**
- **Remove the cargo from the fork and lower the fork to the lowest point before maintenance .**
- **Please use the designated binding equipment or lifting equipment in accordance with chapter 4, if it is necessary to lift the car .Before operation .Place safety device(such as lifting jacks, Wedges or Wooden blocks)under the car to prevent accidental falling ,moving or sliding .**
- **Use approved and distributor 'S original accessories .**
- **Please consider the machine failure and accident that may be caused by the leakage of hydraulic oil.**
- **Only trained maintenance technicians are allowed to adjust the pressure Valve .**

If need to replace the wheel .Please follow the above instructions. Casters must be round and free of abnormal wear .Check the key point on the maintenance list .

9.1 Maintain list

Table 4 Maintain list		Time interval(Month)			
		1	3	6	12
No.	Hydraulic system				

1	Check if there is any damaged noise and leakage for hydraulic cylinder and piston		•		
2	Check if there any damage and leakage for Hydraulic connector and tubing .		•		
3	Check hydraulic oil level and refill if necessary.		•		
4	Refill hydraulic oil(12 months or 1500 working hours)				•
	Mechanical system.				
5	Check the fork for deformation and cracks		•		
6	Check the base for deformation and cracks		•		
7	Check all screws are fully fixed		•		
8	Check the mast & chain for corrosion. Deformation or damage ,And replace if necessary	•			
9	Check the gear box for noise and leakage		•		
10	Check the wheels for deformation and damage and		•		
11	Lubricated steering bearing				•
12	Check and lubricate the pivot point		•		
13	Grease fitting	•			
14	Protect, protective plates and replace it if they are	•			
	Electric system				
15	Check the wires for damage		•		
16	Check electrical connections and terminal conditions		•		
17	Check the function of Emergency stop switch		•		
18	Check the electric motor for noise and damage		•		
19	Check the display		•		
20	Check if the fuse is used correctly and replace if		•		
21	Detection buzzer		•		
22	Check the current contactor		•		
23	Check the frame for leaks (Insulation test)		•		
24	Check the function and wear of the accelerator		•		
25	Check the electrical system of the drive motor		•		
	Braking system				
26	Check the braking performance		•		
	battery				
27	Check the battery voltage		•		
28	Clean and grease the terminal ,Check for corrosion and		•		
29	Check if battery box damage		•		
	Charger				
30	Check if the main power cord is damage			•	
31	Check the start protection procedure during charging			•	
	Function				
32	Detection buzzer	•			
33	Check the air gap for electromagnetic braking	•			
34	Check emergency braking function	•			
35	Detect reverse braking and regenerative braking	•			
36	Check steering function	•			
37	Check lift up & lift down function	•			
38	Check key switch for damage and function	•			

39	Check speed limit switch(lifting height >~400mm)	•			
	Comprehensive				
40	Check if all labels are clear and complete	•			
41	Check if the shield panel and protection is not damaged	•			
42	Check the caster ,to height adjust or replace it if worn		•		
43	Conduct a test run	•			

10.Trouble shooting

- If the car is still in trouble ,please follow the instruction in chapter 6

Table6 Fault analysis

Effect of fault	Cause	Solution

The truck can’t move	Battery connector is not connected	Check the battery connector and connect if necessary
	The electric lock switch is in the "OFF" position	The electric lock switch is placed at the “0” position
	Emergency stop switch did not open	Open Emergency stop switch
	Battery is exhausted	Check the battery charge and recharge if necessary
	Stacker is charging	Interrupt charging process
	Fuse damage	Check the fuse
Cargo can’t lift up	The truck is not running	Operate as listed in the "Vehicles Cannot Move" fault
	Too little hydraulic Oil	Check Hydraulic Oil
	Fuse damage	Check the fuse
	Cargo overweight	Only lift up the max Load shown on the nameplate
	Lifting micro switch is not good or damaged	Check the fuse
Cargo Can’t lower down	Oil dirty blockage control valve	Check hydraulic oil and purge control valve, replace hydraulic oil if necessary,
	he drop solenoid valve is not open or damaged	Check the drop solenoid valve or replace it
Can't stop when Lifting up	Lifting micro switch is damaged	Turn off the power and replace the lift micro switch
One direction move	Micro switch and connection cable are not in good contact	Check the micro switch and connecting cable in the control handle
Move slowly	insufficient battery or poor cable contact	Check the battery level indicator and the corresponding cable
The truck start suddenly	Controller damaged	Change Controller
	Control forward and reverse handles are not reset	Repair to reset or replace

If the fault cannot be eliminated by Trouble shooting list, please inform the manufacturer's

after-sales service team and let excluded by specially trained service personnel to Repair .

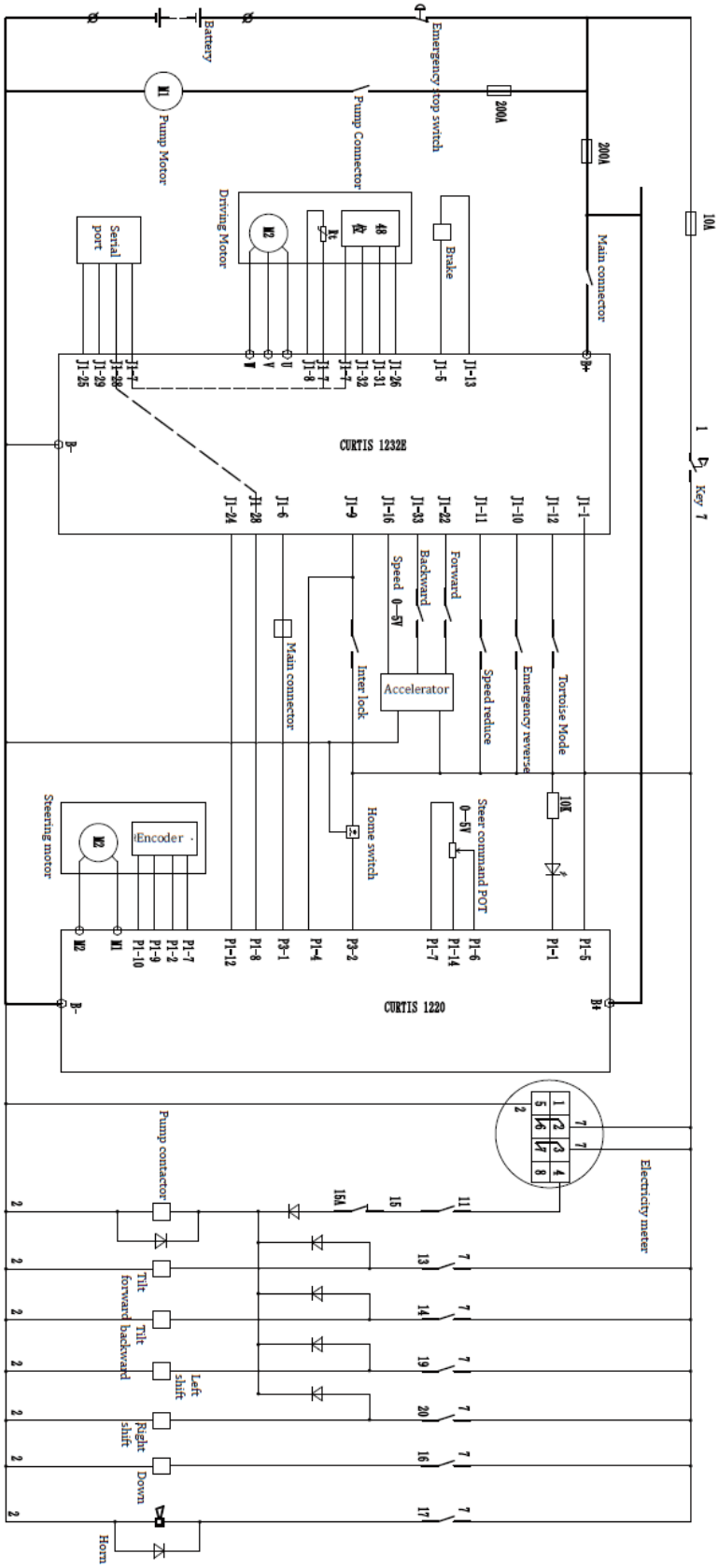
If the truck fails and cannot be operated outside the work area, lift the truck, place a load handling device under the truck and ensure the safety of the truck then remove the truck from the aisle.

11After-sales service

If there is a fault that cannot be eliminated by professional service personnel, please contact our after-sales service personnel in timer .

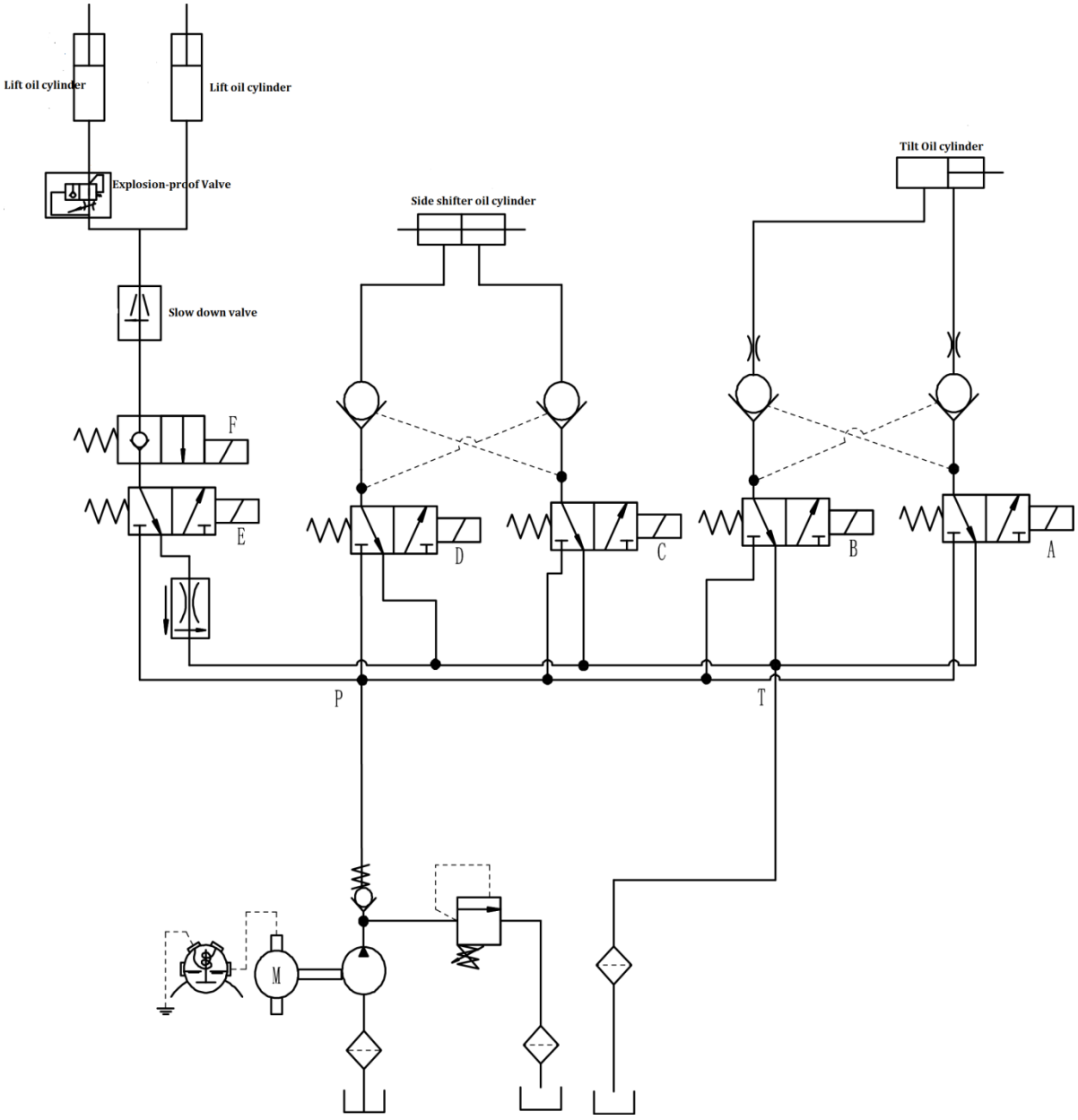
12Electrical Schematic diagram

12.1 EK14S-130 Electrical Schematic diagram



13Hydraulic Schematic diagram

13.1 EK14S-130 Hydraulic Schematic diagram



This manual final interpretation retained by manufacturers.