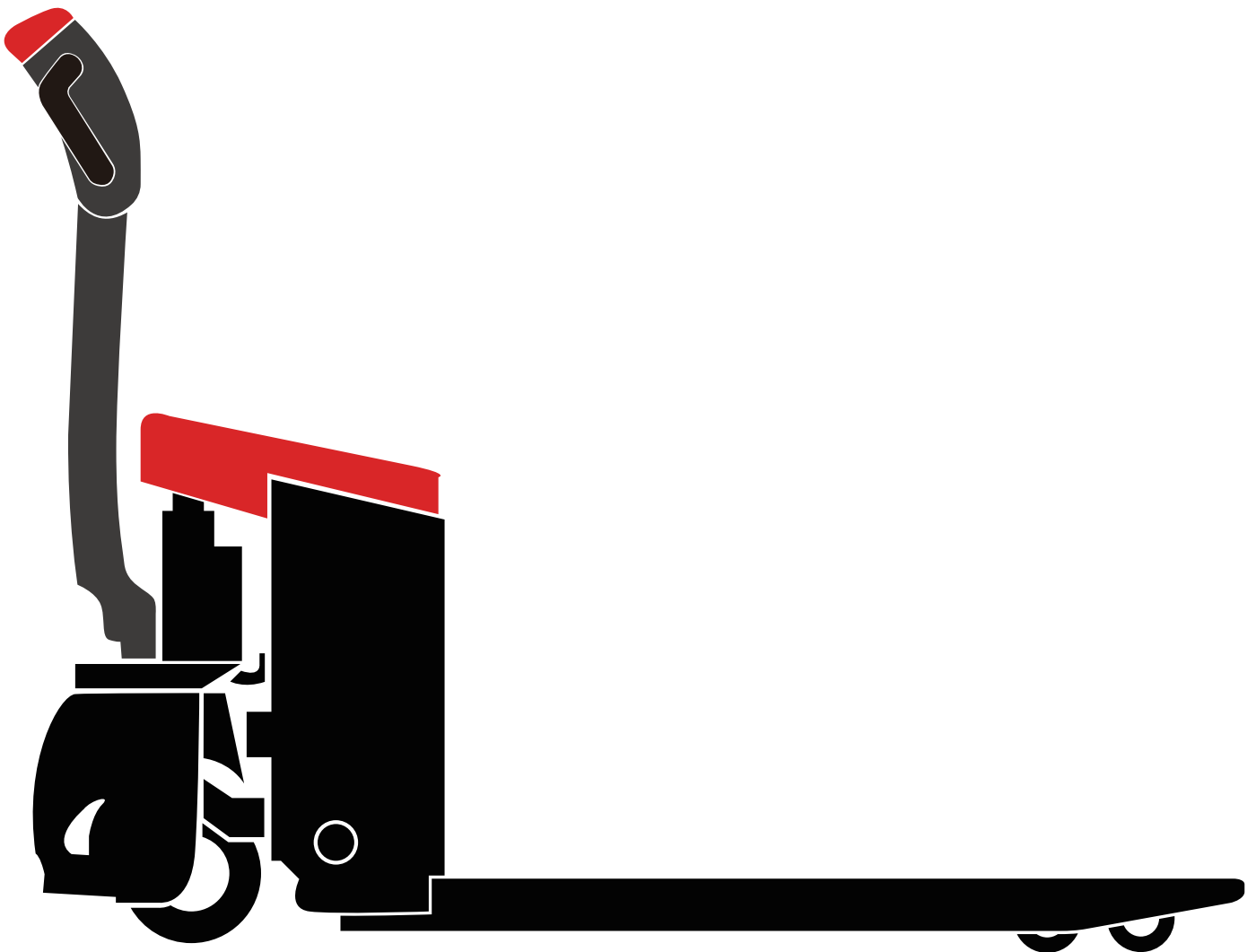




# Operation Manual

**EPL151 HPL152**  
**WPL201**  
**RPL201/RPL201H**  
**RPL202**





EP EQUIPMENT CO.,LTD. is one of the world's leading companies manufacture, design material handling equipment and provide related service. With over 100,000 square metres plant it produces over 100,000 trucks per year, and provides professional, effective and optimized material handling solutions worldwide, until now it has developed three major kinds of business:

- Material handling equipment: Focus on electric forklift and warehouse equipment
- OEM parts: Global parts supply
- Imow industry,online: One-stop industrial products supply

Guided by our customer-oriented concept, EP has developed service centers in more than 30 countries around the world, from which customers are able to receive timely local service. Moreover, 95% of warranty parts can be shipped out within 24 hours after been ordered. Through our online after-sales service system, customers can process their warranty claims, order spare parts and consult the operation manuals, maintenance materials and spare parts catalogs.

With business all over the world, EP has thousands of employees and hundreds of agents worldwide to provide our global customers with prompt local service.

Based on the concept of sharing economy , EP also offer rental service for various logistics equipment. Adhering to the idea "Making the leasing of logistic equipment more simple", EP is devoted to providing customized one-stop leasing solutions for our customers with our high quality, reasonable price and prompt rental service.

EP's mission&vision is " Let more people apply the electrical material handling equipment to relieve the intensity of labour" and "Let's grow together".

EP EQUIPMENT CO., LTD  
 Address: No.1 Xiaquan Village,  
 Lingfeng Street, Anji, Huzhou,  
 Zhejiang  
 Tel: + 86-0571-28023920  
 Website: www.ep-ep.com  
 Email: service@ep-ep.com

# Preface ►

---

Thank you for buying our products.

The manual will show you the way of correctly using the truck as well as relevant preventive maintenance and safety operation. The truck should be operated only by well-trained professionals and by no means by non-working personnel. Operators are supposed to read through the manual before actually operating the truck.

## ● Explanations on the manual

With the continuous upgradation and improvement of our company's products, you may find a slight difference existing between your carrier and some introductions in the manual.

All the information, specifications and illustrations in the manual are effective in times of printing and our company maintains the right to modify the specification (s) or design (s) of our products at any time without any beforehand notification.

## ● Safety signs and corresponding explanations



### **DANGER**

Means that failure to comply can cause risk to life and/or major damage to property.



### **WARNING**

Please strictly adhere to these safety instructions to avoid personal injury or major damage to equipment.



### **CAUTION**

Please pay attention to the important safety instructions.



### **NOTE**

Pay attention to Instruction.

## Internet address and QR code of Parts manual

By entering the address <http://www.ep-care.com> in a web browser or by scanning the QR code, Login after registration, Select "Parts purchase" function and input part number or model name to find the truck.



**Note:** After registration, please send email to [info@ep-care.com](mailto:info@ep-care.com) to activate your account

## Intended use ►

---

**The lift truck is designed for transporting and stacking the loads stated in the nameplate.**

**In particular we refer to:**

- the safety rules of your trade association.
- In accordance with the special provisions for driving on public roads specified by national specifications.
- Other local regulations.

The rules for the intended and approved use of industrial trucks must be followed under all circumstances by the responsible persons, especially by the operator and service personnel.

The user, and not EP, is responsible for any danger arising from applications not authorised by the manufacturer.

If you want to use the truck for applications not mentioned in this manual, please first contact your authorised dealer.

No changes, particularly no modifications and additions, may be made to the truck without the approval of the manufacturer.

### **Technical description**

These trucks consists of robust steel chassis and is driving on a traction wheel and 2 load wheels. Caster wheels provide for good stability even with high loads.

The truck will be stopped by a regenerative service brake and hold by an automatic electromagnetic parking brake in it's parking position.

The load is lifted by a hydraulic cylinder that activates a lifting shaft that transmits the lifting movement by a push-rod to the load wheels.

The control handle is used for smooth steering and control of drive speed, lifting and lowering, braking and the horn without changing the position of the hand. The long tiller shaft allows effortless steering and a safe distance to the truck. A gas spring returns the control handle always into a vertical position that activates the brake automatically.

An emergency reverse switch on the control head protects the operator from being squeezed by the truck in confined spaces.

An electronic controller operates all electric functions and guaranties safety.

A key switch secures the truck from unauthorized use.

The ergonomic design of the truck guaranties safe and easy operation.

### **i NOTE**

- This manual is used for operation and maintenance , the detail parameters, size and specifications in context is only for reference , the real parameters will depend on sale files.
- Manual pictures for reference only, the real car shall prevail, and shall not affect the manual use.
- Manual pictures only sign for one of the models in this series models.



## ● Obligations and responsibilities of equipment user

In the manual, “equipment user” refers to any natural person or legal person directly using or appointing or authorizing others to use the carrier. In such special situations as renting or sales, the “equipment user” represents the interested parties supposed to bear operation obligations as specified by the contractual terms concluded between equipment owner and corresponding users. Equipment users must ensure the use of the carrier only for purposes specified and timely eliminate all the dangers that may threaten the life and health of the users themselves or any other third party, in addition to which they must also strictly abide by accident prevention provisions, other safety technology provisions and equipment operation, maintenance and repair guidelines, and ensure that all the operators seriously read and completely understand the contents of the operation instruction.

Should any violation of the operation instruction occur, the quality guarantee of our company will be invalid automatically, and our company will assume none of the responsibilities for losses resulting from any nonstandard operation of the equipment implemented by any client, equipment user or any third party without the authorization of the client service department of our company.

## ● Equipment refit

Any installation or retrofitting of any additional device that may influence or enhance the functions of the carrier must be approved by our company in writing beforehand.

## Legal requirements for marketing

### Declaration

EP EQUIPMENT CO., LTD.

Address: No.1 Xiaquan Village, Lingfeng Street, Anji, Huzhou, Zhejiang

We declare that the machine

Industrial truck: according to this operation manual

Type: according to this operation manual

complies with the most recent version of Machinery Directive 2006/42/EC.

Personnel authorised to compile the technical documents:

See EC/EU Declaration of Conformity

EP EQUIPMENT CO., LTD.

### EC/EU Declaration of Conformity

The manufacturer declares that this industrial truck complies with the EC Machinery Directive and the provisions of other applicable EC/EU directives effective at the time of sale. This can be verified by means of the EC/EU Declaration of Conformity and the relevant certification label on the nameplate.

The industrial truck is supplied with the EC/EU Declaration of Conformity document. This declaration proves that this truck complies with the requirements of the EC Machinery Directive. Unauthorised modification or additional installation of equipment to the structure of the industrial truck may affect its safety, and will therefore invalidate the EC/EU Declaration of Conformity.

The EC/EU Declaration of Conformity must be carefully stored and made available to be presented to the relevant authorities when necessary. If this industrial truck is sold, this declaration document must be handed over to the new owner.

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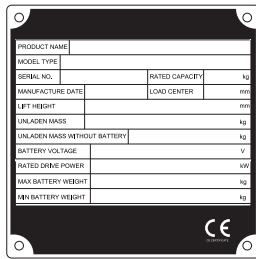
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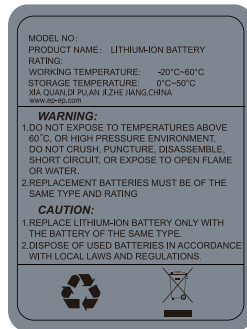
# A

## Nameplates and alarming labels

- Have the nameplates of a truck fixed its main body and alarming labels pasted on its outer cover.
- Should any nameplate or alarming label lose or be damaged, please conduct replacement immediately or contact with the sales department or corresponding agent of our company when necessary.
- Such truck-related information as product model, serial number, manufacturing date, rated load lifting capacity, lifting height, load centre distance and dead weight are all shown in the nameplates.



Nameplate



Battery nameplate



Lithium label



Anti-pinch label



Do not rest on the pallet label



Instructions label



**Do not rest on the side arms**

### Hoisting

Remove the load before hoisting the pallet truck.

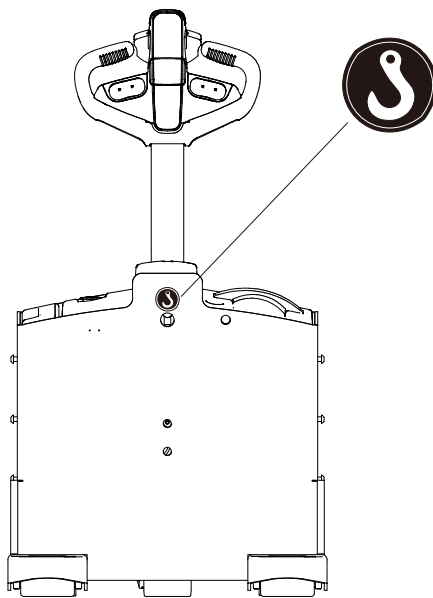
Disconnect the power supply.

Attach slings in the positions identified by the hook symbol.

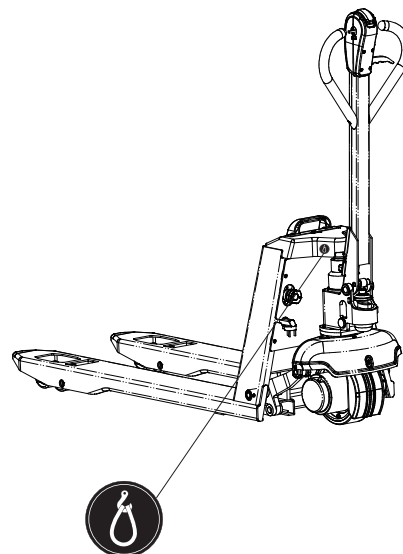


**DANGER**

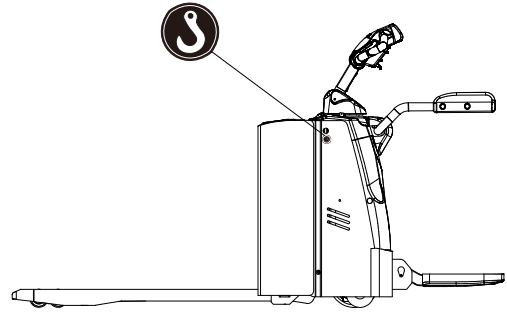
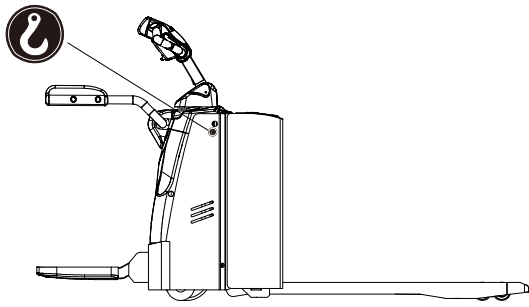
*Personnel must not stand below or near the truck when the pallet truck is being lifted.*



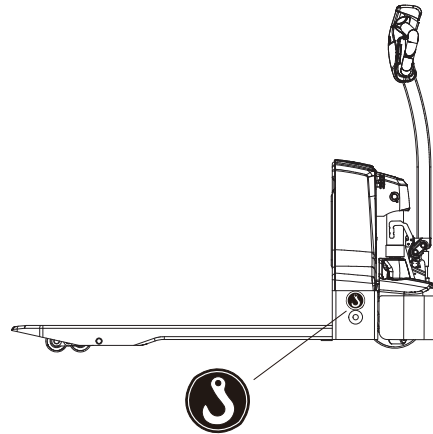
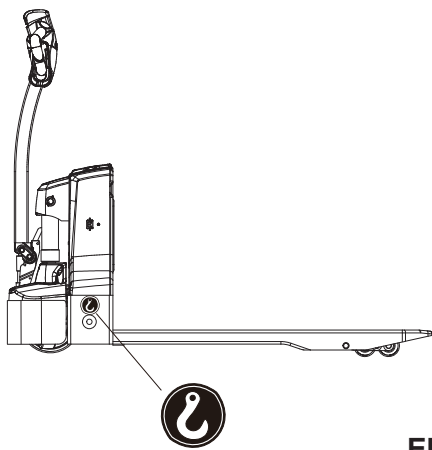
**WPL201**



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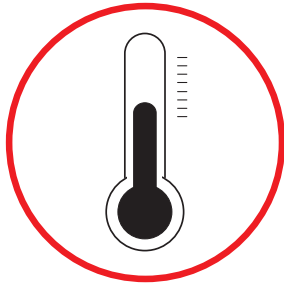


**EPL151**

# B

## Operation

### 2.1 Utilization safety specification



Applicable environment temperature: -10 °C - 40 °C



Don't use the truck in rainwater.



Don't use the truck in non-position.

#### **i** NOTE

*The ruck can by no means be used under the temperature lower than 5 °C for a long time, or in refrigeratory or under the condition that such environmental factor as temperature or humidity changes extremely before special equipment is additionally installed and the permit of the manufacturer is acquired.*



Avoid the use of the truck by non-working personnel.  
Don't ride on the truck.  
Don't carry or lift people by the truck.



Don't use the truck on slippery road surfaces. (such as road surfaces with oil stain or residual snow or those frozen ones )



Don't carry goods on steep slope to prevent goods from sliding off.

#### **i** NOTE

*Conditions of operation road surface: the truck should run on solid, flat, level and paved road surfaces (including both running and lifting)*





Don't leave the truck before it is parked as regulated.



Don't use the truck when any non-working personnel is in the dangerous area.  
Don't be distracted when using the truck.  
Don't be distracted when using the truck.



Don't place any part of your body in any moving part of the truck to avoid being clamped.

### 2.1.1 EN standards



**Continuous sound level:** < 74 dB(A)  
according to EN 12053 as stipulated in ISO 4871

The continuous sound level is a value averaged according to standard regulations, taking the sound pressure level into account when driving, lifting and idling. The sound pressure level is measured at the ear.

### Electromagnetic compatibility (EMC)

The manufacturer confirms compliance with the limit values for electromagnetic emission and interference immunity as well as testing of static electricity discharge according to EN 12895 and the references to other standards contained therein.

Electrical or electronic components and their arrangement may only be modified after written approval by the manufacturer has been obtained.

## 2.1.2 Conditions for application



### Working condition requirements:

- Indoor use and outdoor use.
- The walking, lifting and lowering devices, harness and components are IP55 dust and water-resistant
- The truck's maximum operation altitude is up to 2000m.
- Trucks can only be operated in adequately illuminated working areas to avoid injuries. In case of insufficient light, an additional lighting equipment is needed to ensure that the driver can see properly.
- If you must travel on an incline, the gradients should be below A% at full load, or below B% without a load. (For the value of A and B, refer to the Gradability in technical data)

## 2.1.3 Stability



**Stability is guaranteed if your truck is used properly in accordance with its intended purpose. Common reasons for a loss of truck stability include:**

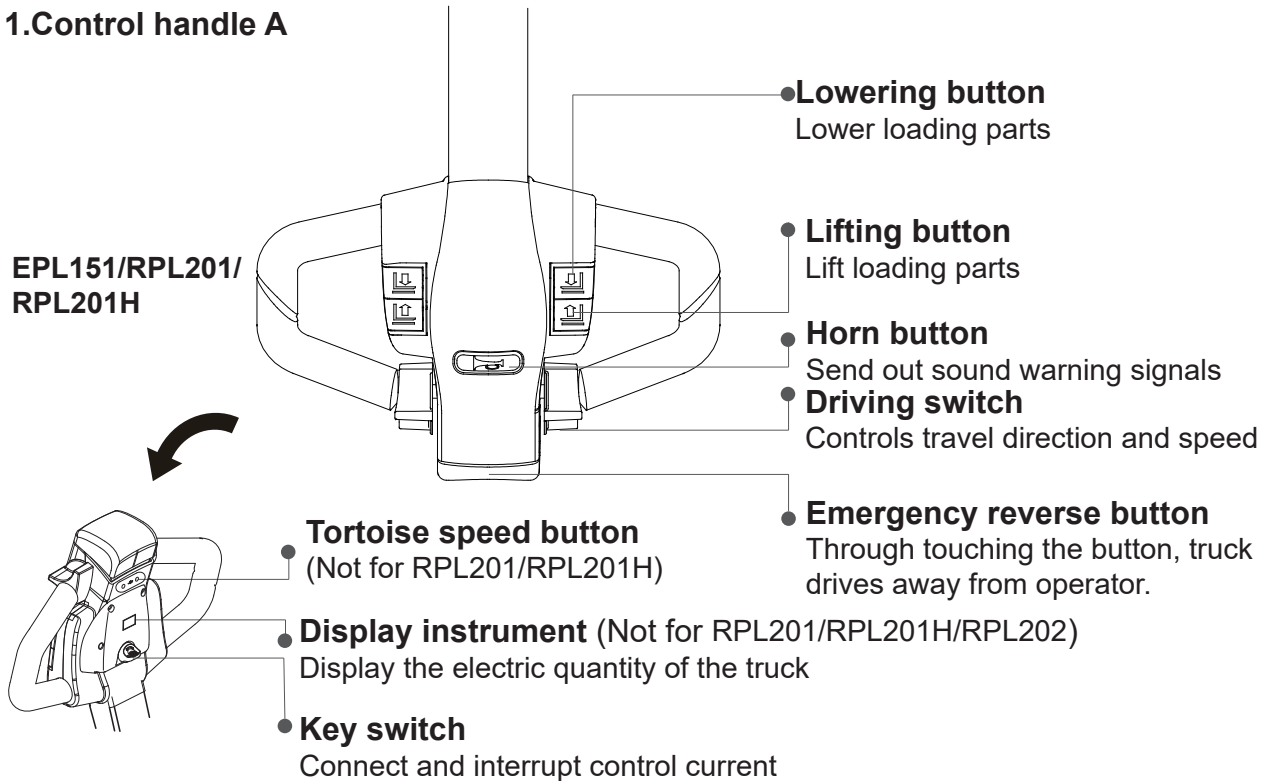
- Emergency stops or sharp turns
- Driving with a raised load or a load handling device
- Turning the vehicle around on or driving across a slope
- Driving up or down a slope with the load pointing downhill
- Driving with a wide load
- Carrying a swinging load
- Driving near the edge of a ramp or up steps
- Tilting the mast forward while carrying a raised load
- Driving on uneven surfaces
- Overloading the truck
- Carrying bulky loads in strong winds
- When carrying liquid, its centre of mass inside the container may shift due to inertial force (such as when pulling away, braking or turning)

## 2.2 Display and manipulation

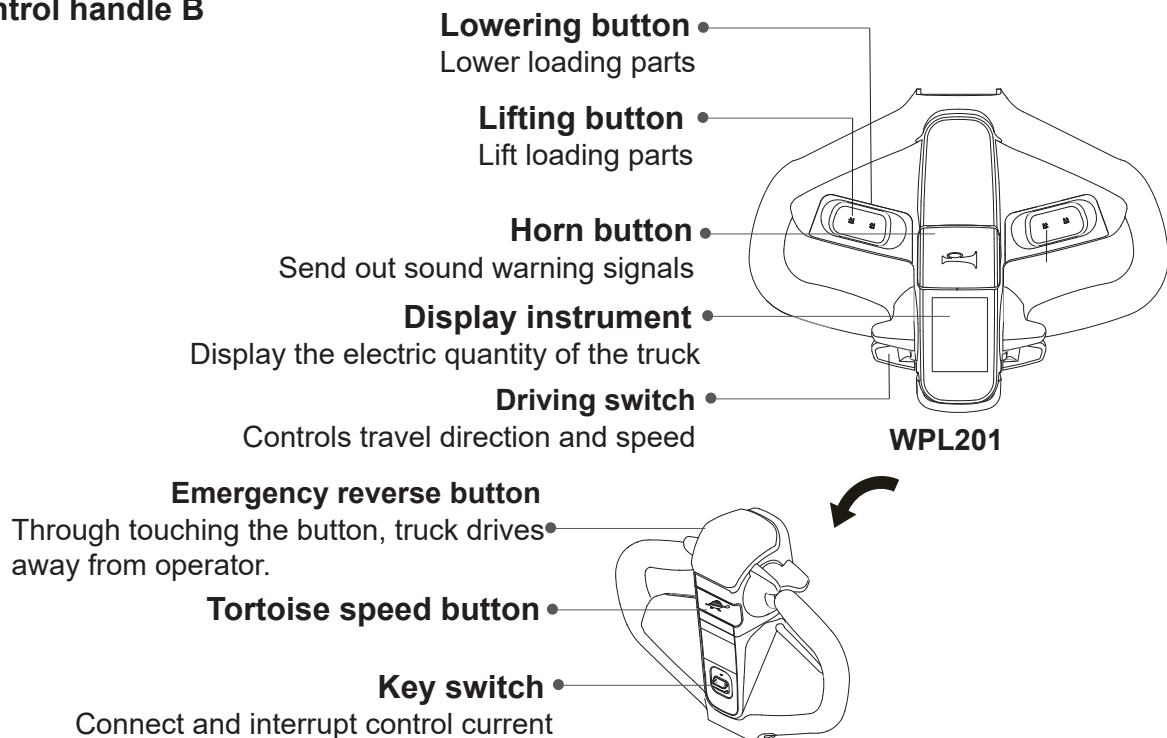
### 2.2.1 Control handle



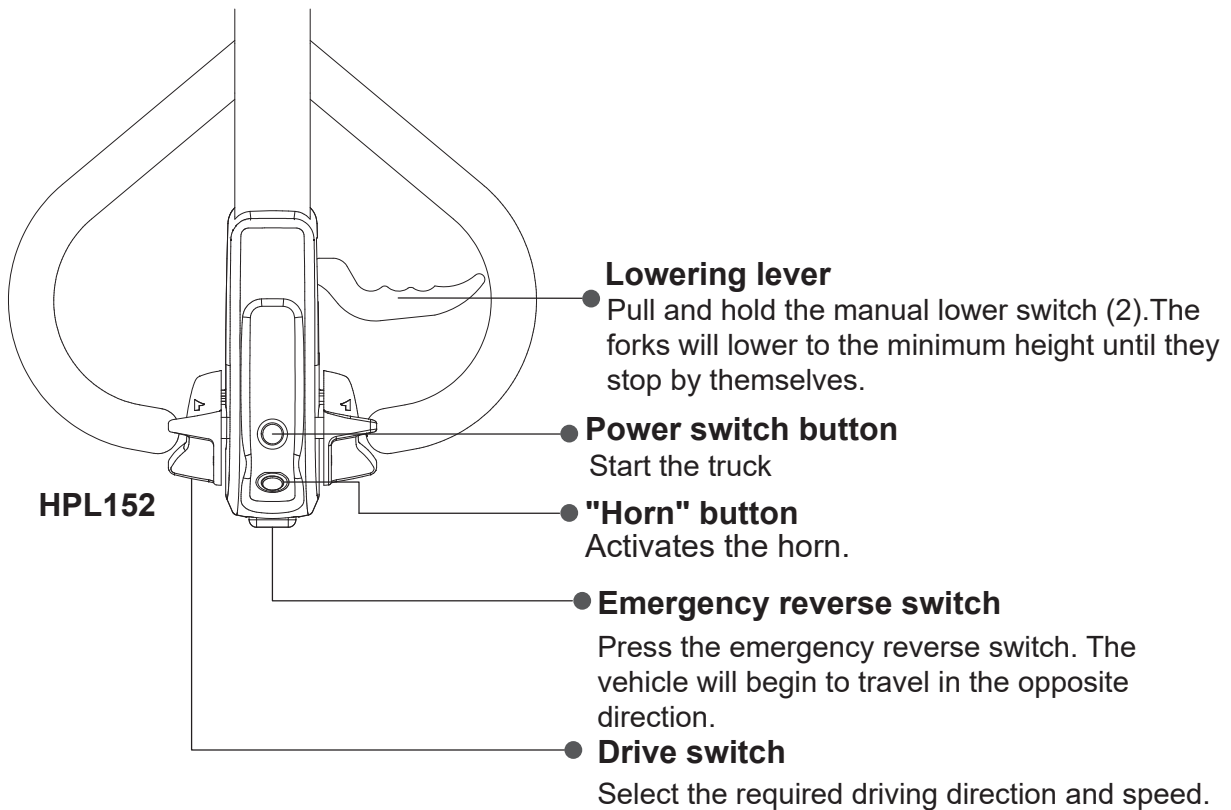
#### 1. Control handle A



#### 2. Control handle B



### 3. Control handle C



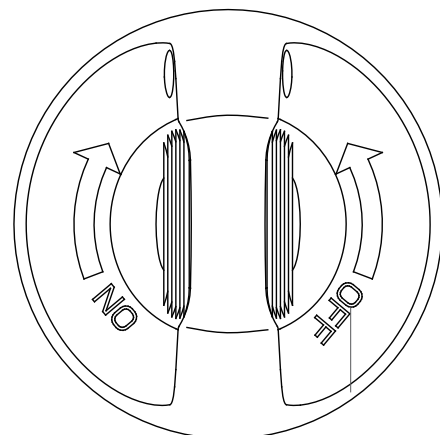
## 2.2.2 Key switch



### 1. Key switch A

#### Connect and interrupt control current.

- When the key rotates to gear "OFF", the control current of the truck will be interrupted;
- When the key rotates to gear "ON", the control current of the truck will be connected.



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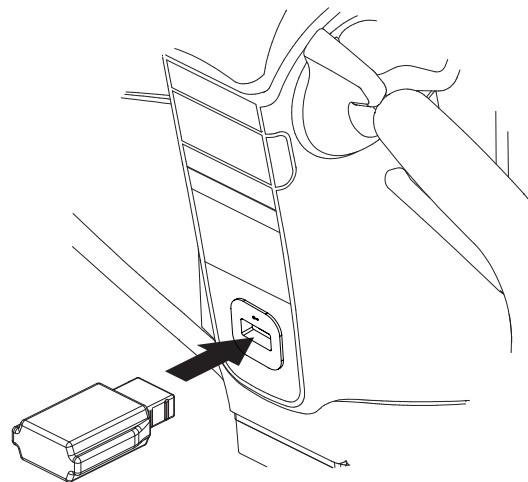
## 2.Key switch B

### Connect and interrupt the control current.

- When pulling out the induction key, the control current of the truck will be interrupted;
- When inserting the induction key, the control current of the truck will be connected.

#### **i** NOTE

*Pulling out the key switch of a forklift before leaving can prevent the forklift from starting accidentally.*

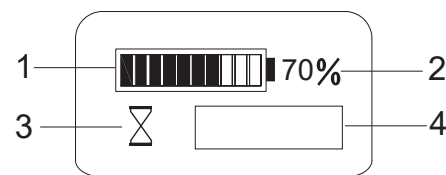


WPL201

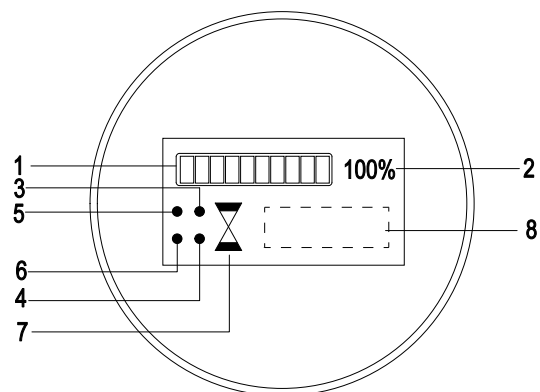
### 2.2.3 Display instrument



- LED (1) displays the remaining charge;
- LED (2) displays remaining charge percentage;
- LED (3) displays Interlock switch status indication;
- LED (4) displays the total running time normally. If fault, display the fault code.
- LED (1) displays the remaining charge.when 1st block and 2nd block blinks alternatively, it indicates low power needs to be charged
- LED (2) displays remaining charge percentage;
- LED (3) flashing, it indicates travel forward properly;
- LED (4) flashing, it indicates travel backward properly;
- LED (5) flashing, it indicates lifting properly;
- LED (6) flashing, it indicates lowering properly;
- LED (7) always on, it indicates interlock switch opened, LED(7) flashing, it indicates interlock switch closed, the display start timing.
- LED (8) displays the total running time normally. If fault, display the fault code.



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RPL201/RPL201H/RPL202

Error Code		
1	Controller number	2 = Traction controller 6 = Steering controller
2	Error code	note
Note: Consult the service manual		

- LED (1) displays the remaining charge;
- LED (9) indicate the the acceleration status of the accelerator.
- LED (2) indicate fault warning;
- LED (3) indicate charging status,when charging, it turns into a battery;
- LED (4) indicate emergency reverse switch status;
- LED (5) indicate truck stop or walk, if the truck stop display"P", if the truck travel display"N";
- LED (6) indicate turtle speed status;
- LED (7) indicate rise and fall indication.
- LED (8) indicate the operating hours.

**i NOTE**

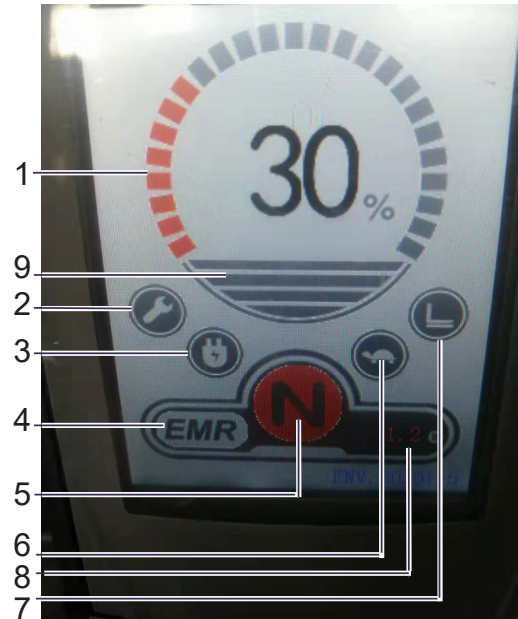
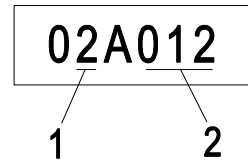
**Low Voltage Protection**

The car has low voltage protection function. When the battery power of forklift truck is 7%-15%, the display screen shows L1. At this time, the forklift truck can not lift goods, but it can run normally. When the battery power is less than 7%, the display screen shows L2. At this time, the forklift can not be lifted and the driving speed becomes slower.

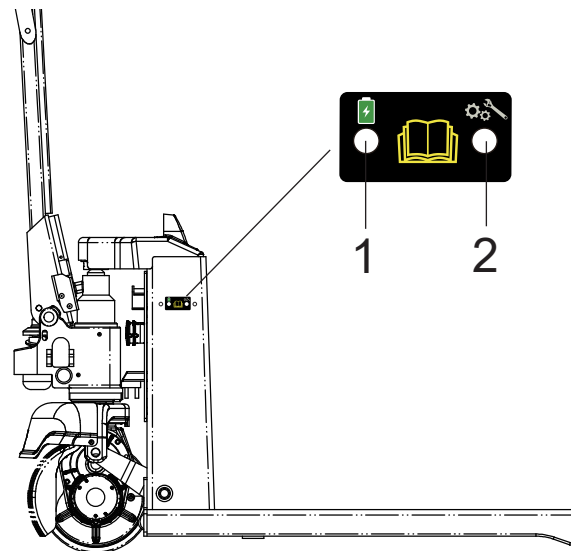
LCD (1) displays the state of charge;

DISPLAY	DESCRIPTION
Continuous red	Charge is charging
Continuous green	Battery charging is complete

The LCD (2) remain green light lit under normal, flashing show the failure state of truck.



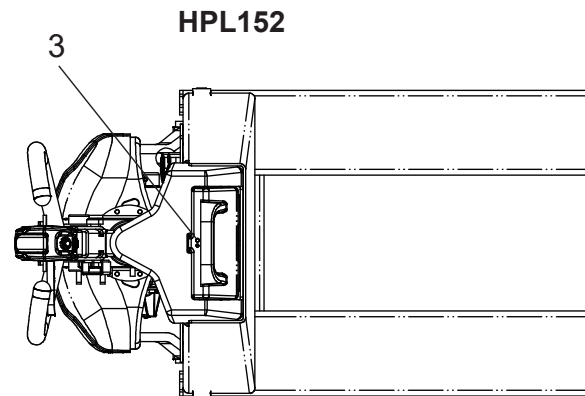
WPL201



HPL152

The LCD display (3) show battery residual capacity.  
The color of the LCD (3) represent the following conditions:

Component	LCD color	Residual capacity
Standard battery residual capacity	Green	30-100%
	Continuous Yellow	15-30%
	Slow flashing red light(Flashing period 2s)	7-15%
	Quick flashing red light (Flashing period 1s)	0-7%



**i NOTE**

After the red light starts flashing, the battery will enter the low-voltage protection state. According to the battery state, The truck will appear accidental power-off protection. Please charge the battery after restarting to avoid damage to the battery.

If the controller detects a battery failure, flashes of LCD (3) represent battery failure information until the failure is remedied. Details of failure information are shown as below:

- Under-voltage of single cell battery: The green light repeats in a cycle of flashing once in 1 second, pausing for 2 seconds and then flashing twice, pausing for 3 seconds.
- Over-voltage of single cell battery: The green light repeats in a cycle of flashing once in 1 second, pausing for 2 seconds and then flashing three times, pausing for 3 seconds.
- Short circuit protection: The green light repeats in a cycle of flashing once in 1 second, pausing for 2 seconds and then flashing four times, pausing for 3 seconds.
- Over-current protection: The green light repeats in a cycle of flashing once in 1 second, pausing for 2 seconds and then flashing five times, pausing for 3 seconds.
- Battery temperature is too high: The green light repeats in a cycle of flashing twice in 1 second, pausing for 2 seconds and then flashing three times, pausing for 3 seconds.
- Battery temperature is too low: The green light repeats in a cycle of flashing twice in 1 second, pausing for 2 seconds and then flashing four times, pausing for 3 seconds.
- Contactor-related failures: The green light repeats in a cycle of flashing three times in 1 second, pausing for 2 seconds and then flashing four times, pausing for 3 seconds.
- The yellow light flashes rapidly in 1 second when other failures happen.

**! CAUTION**

*When powered off, if the green light of power indicator is always on, it means that the battery is in a balanced state, which is a normal phenomenon.*

## 2.3 Truck use and operation

### 2.3.1 Preparation for use



The following are inspection and preparation operations that must be implemented before the truck is put into daily use.

**Table 1. Table of daily inspections by operators**

### Operator's Daily Checklist

Date _____ Operator _____ Truck No. _____ No. _____ Department _____ Runtime Meter Reading _____		
Daily Check Items	O.K.(√)	Remark
Check for Fluid Leakage		
Check for scratches, deformation or cracks.		
Check Decal Condition		
Check the smooth movement of the wheels.		
Check the function of the emergency brake by activating the emergency stop switch.		
Check, the tiller arm- switch braking function		
Check the lifting and lowering functions by operating the buttons.		
Check if all bolts and nuts are tightened firmly.		
Check the vertical creep of the truck.(if equipped)		
Check the lithium-ion installation, making sure not to damage the battery cables.		
Recharge the lithium-ion battery		

**Table 1:** Table of Daily Inspections by Operators is only a sample table for the daily inspections of operators, and it can be adjusted according to specific requirements.



### **WARNING**

*The truck should be regularly maintained by qualified maintenance engineers or technicians that have passed the training of and also been authorized by the manufacturer.*



### **NOTE**

*Precautions in the run-in period*

*After being put into use, the truck should operate under a low load at the initial stage and satisfy the following requirements, especially before its operation time reaches 100h:*

- *Prevent the new storage battery from discharging excessively during its initial use.*
- *Implement complete preventive maintenance as specified.*
- *Avoid emergency braking, starting or swerving during the use of the truck.*
- *Implement oil fluid replacement and lubrication before the time specified.*
- *Limit the loading weight at 70%-80% of the rated loading.*



### **WARNING**

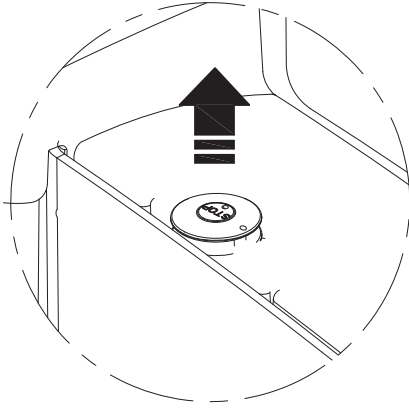
*Should it be necessary to repair the truck for any fault or the truck be found with any unsafe condition, please immediately report to designated competent department, and please don't use the truck before potential faults or hazards are eliminated. All the repairs or adjustments should be implemented under authorization, and all the services must be executed by qualified maintenance technicians.*

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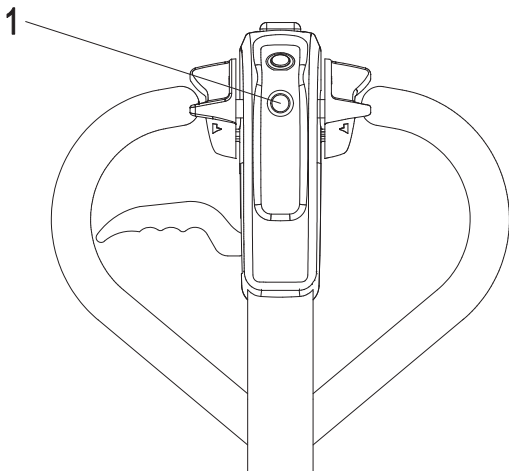
## 2.3.2 Truck starting



### 1. Release the emergency stop switch

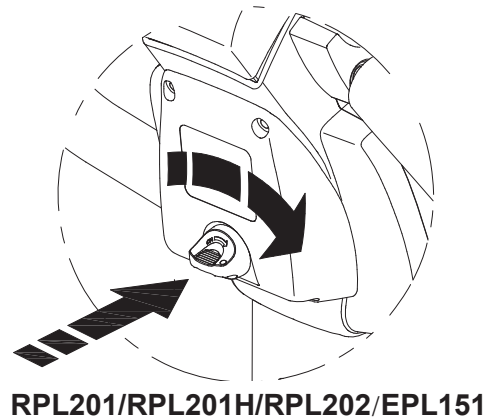
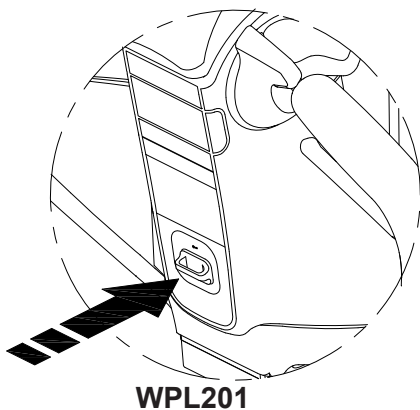


### 2. Press the button to start the truck



**HPL152**

## 2. Open the key switch to start the truck

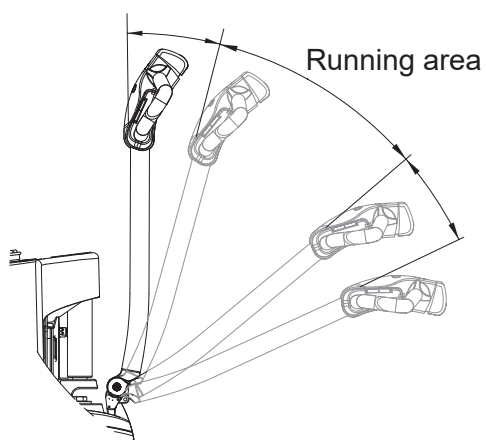


### 2.3.3 Running, swerving and braking



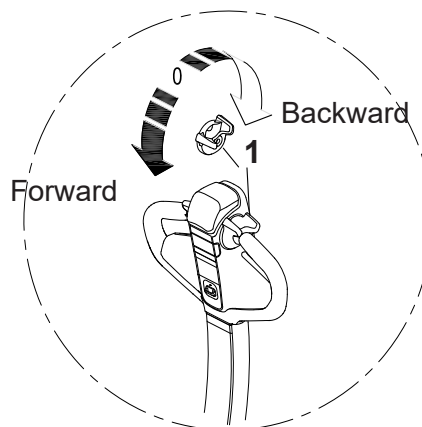
#### 1. Running

##### Running area



##### Rotary button

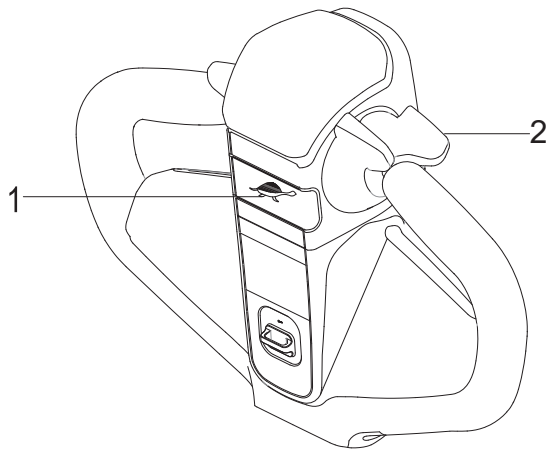
Control the running direction and speed of the truck using the drive switch (1). (the large the rotary angle, the faster corresponding speed)



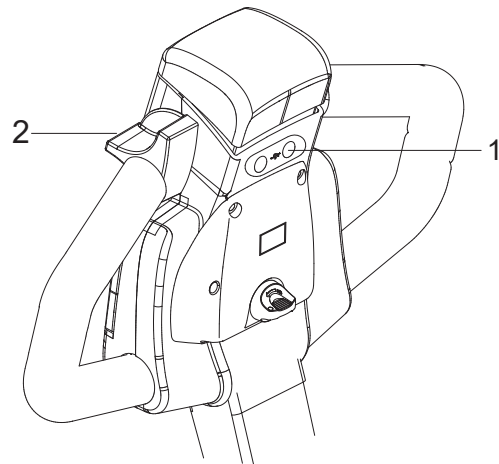
#### **i** NOTE

When using the truck on a ramp or a uneven road, please lift the leg of the forklift to prevent its bottom from colliding with the road surface.





**WPL201**



**EPL151/RPL202**

**i NOTE**

Keep the handle in the vertical state, and press tortoise speed button (1) and drive switch(2) at the same time, then the vehicle will move at a low speed.

**We distinguish between two travel modes for RPL202/RPL201/RPL201H:**

**Pedestrian mode:** Push the side arms in, fold up the operator platform. Operate the drive switch and press creep speed button(for RPL202) at the same time. The truck can travel at the low speed.

**! CAUTION**

*In pedestrian mode make sure you have sufficient distance from the truck.*

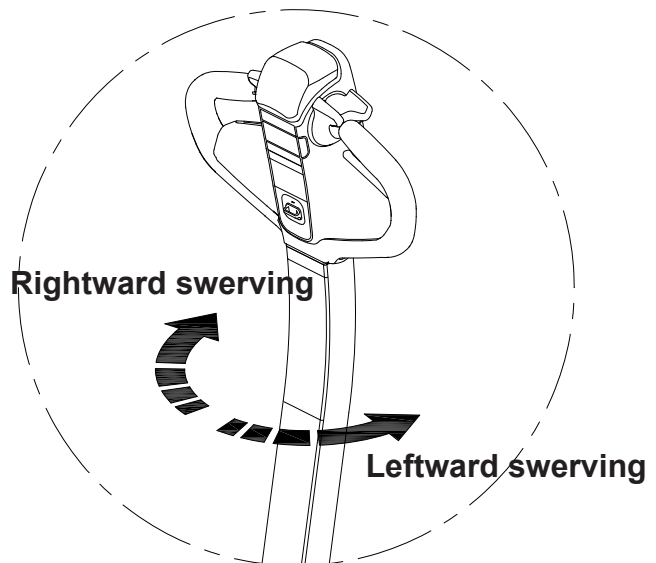
**Rider mode:** Push the side arms out, fold down the operator platform. The truck can be operated at maximum travel speed.

**i NOTE**

It's forbidden to operate the truck which you don't push the side arm out at the rider mode.

**2.Swerving**

Rotate the operation hand shank leftward or rightward as required.

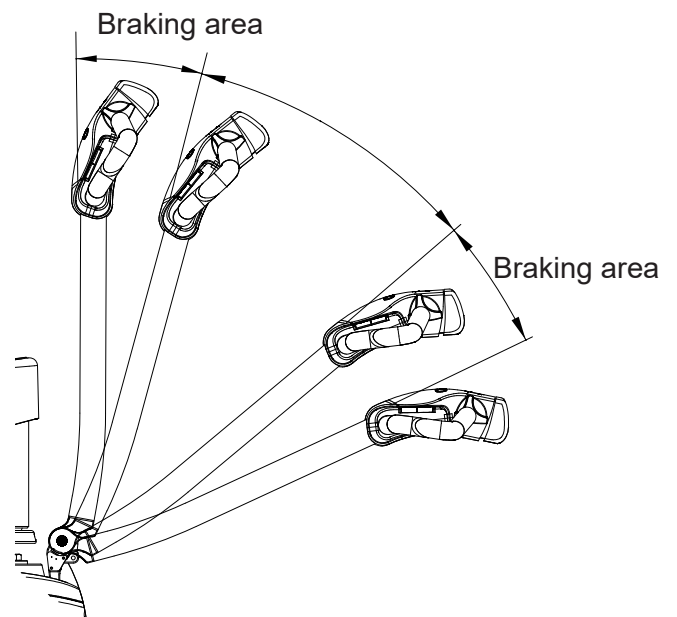


### 3.Braking

#### Mechanical operating brake

The truck is braked when the operating handle is released.

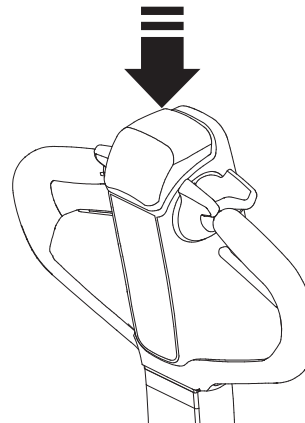
The mechanical brake engages when the tiller is positioned in Braking area.



#### Emergency reverse switch

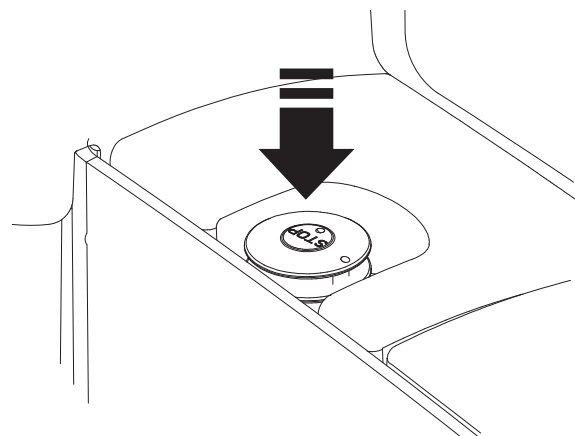
Braking can be accomplished by changing the direction of travel.

Press the reverse switch in the opposite direction until the truck comes to a stop, then release the drive switch.



#### Emergency stop switch

Press the emergency stop switch, and then all the electrically propelled functions will be interrupted.

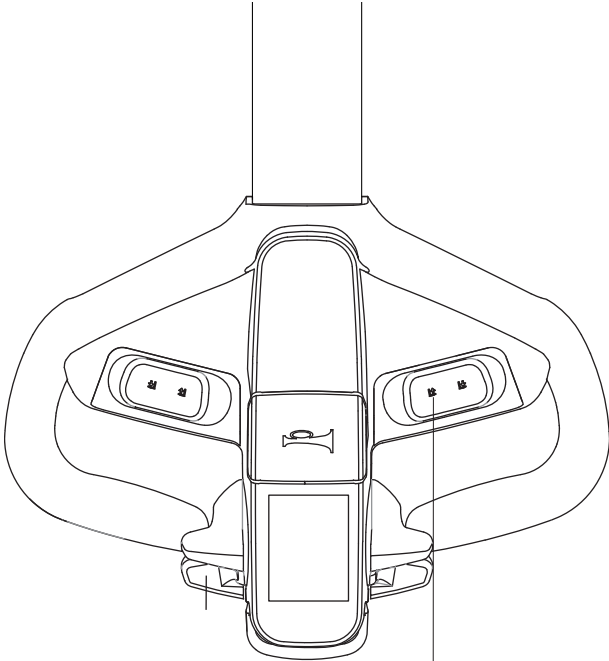


## 2.3.4 Goods picking

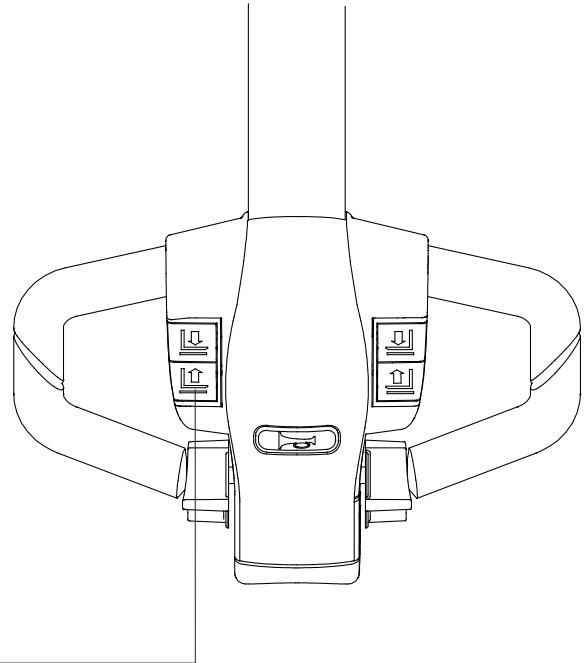


### 1. Lifting

WPL201

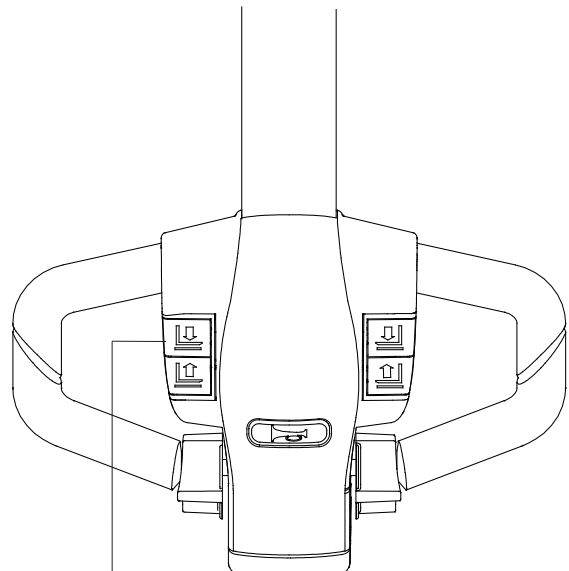
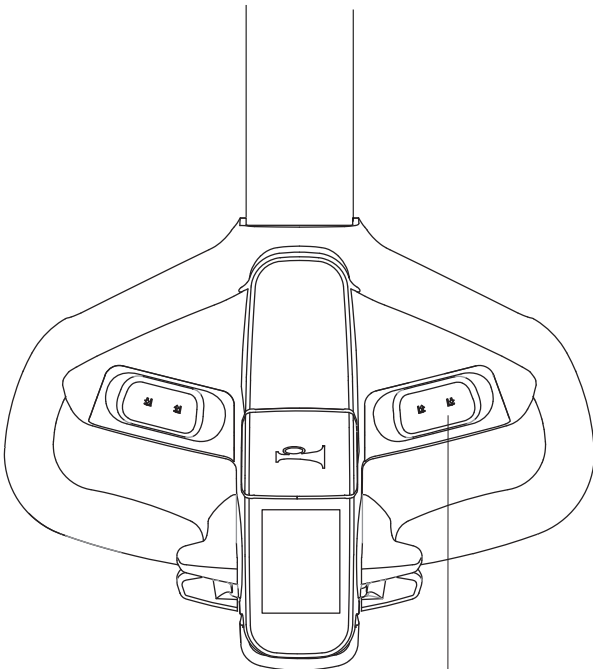


RPL201/RPL201H/EPL151/RPL202



Keep pressing the lifting button until reaching the required lifting height

### 2. Lowering



Lower the pallet forks to the bottom through pressing the lowering button.

## Lifting

Press lowering lever(2) to the bottom. Lift the forks by moving the control shaft (1) up and down until the desired lifting height is achieved. Reset the lowering lever(2).

## Lowering

Set forks to the lowest position by pulling lowering lever(2) upward.



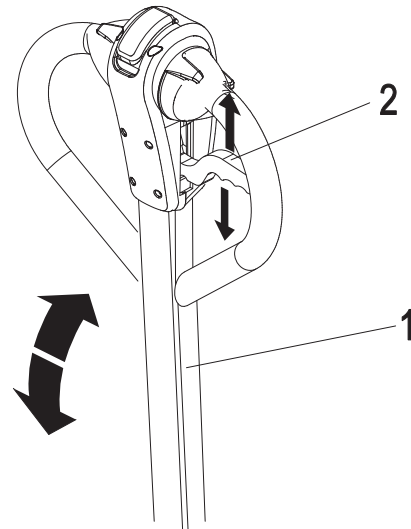
### WARNING

*Goods failing to be arranged and fixed may result in accidents.*



### NOTE

*To avoid shortening the service life of the oil cylinder, try not to lift the pallet forks to the highest state for every lifting operation.*

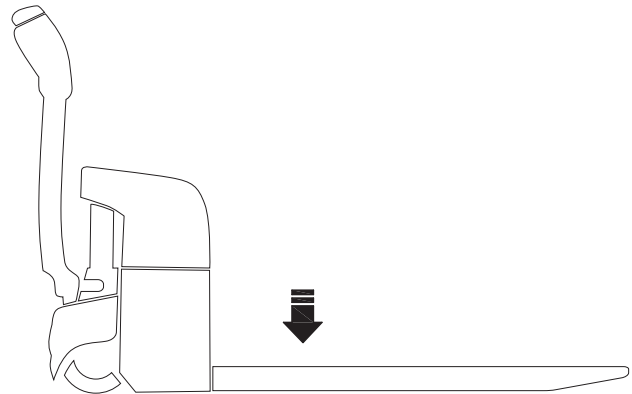


HPL152

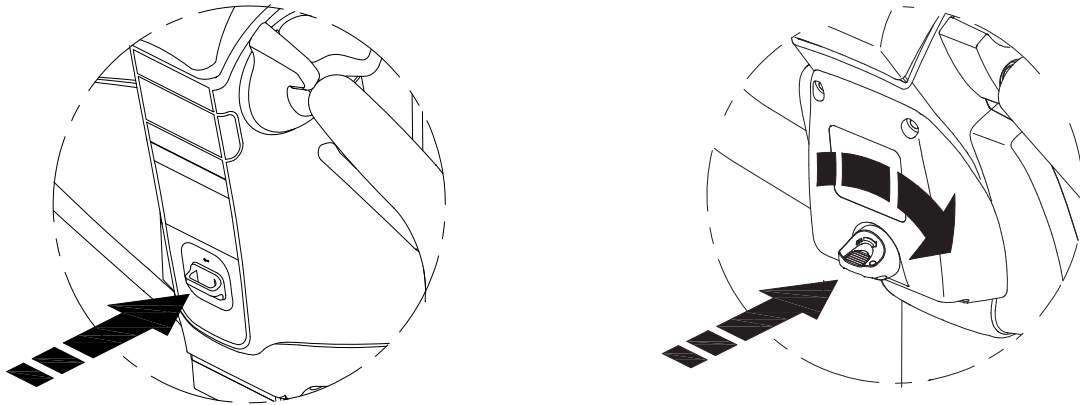
## 2.3.5 Parking the truck securely



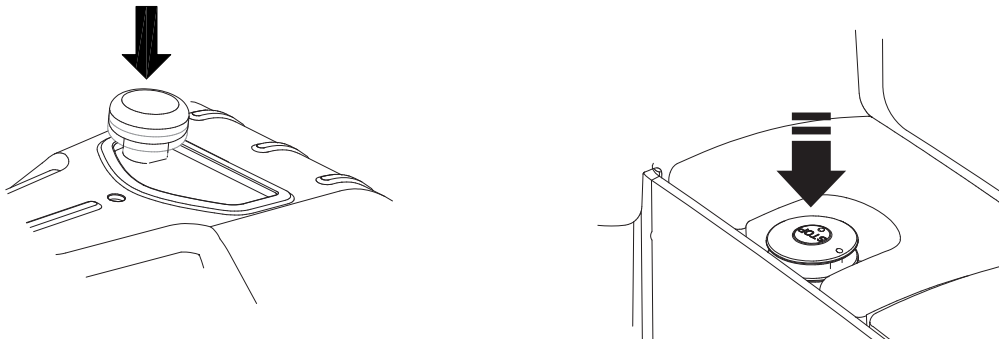
- Lower the forks to the bottom;



➤ Turn off the key switch or pull out the key;



➤ Press the emergency stop switch to cut off storage battery connection;



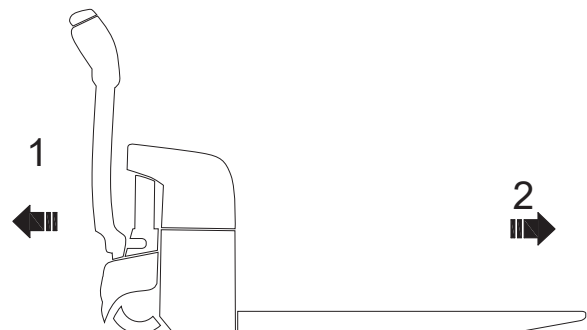
**WARNING**

- Should it be necessary for operators to leave the truck, even for just a moment, the truck should also be well parked as specified.
- Never park the truck on a slope;
- The forks must be lowered to the bottom.

**2.3.6 Drive directions**



The drive directions of the truck are forward (1) and reverse (2).



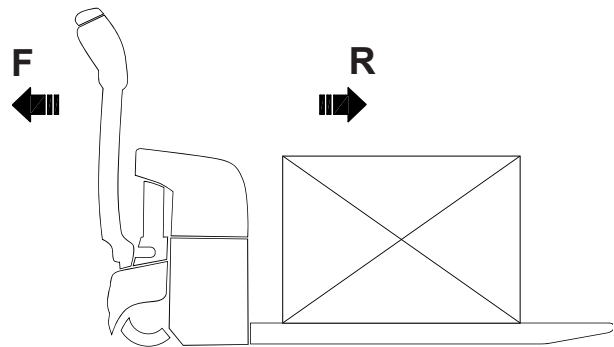
## 2.3.7 Loading



- Approach the load carefully.
- Adjust the height of the forks until they can be easily inserted into the pallet.
- Insert the forks under the load.
- If the load is shorter than the forks, position the forks so that the front of the load overhangs them by a few centimeters, to avoid interference with the load immediately ahead.
- Raise the load a few centimeters above its support.
- Back the truck away from the stack or any neighbouring loads, gently and in a straight line.

### ➤ Transporting loads

Always carry loads in the forward direction of travel (R) in order to have the best visibility.



### WARNING

When carrying a load on a slope, always ascend or descend with the load uphill. Never drive sideways across a slope or perform a U-turn.

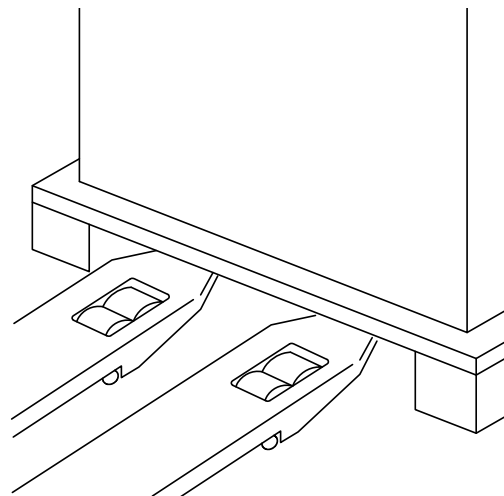


### NOTE

Since visibility is reduced when travelling in this direction, drive only at very slow speed.

### ➤ Unloading

Carefully drive the truck to the desired location.  
Carefully drive the truck to the unloading area.  
Lower the load until the fork arms are free from the pallet.  
Back the truck away in a straight line.  
Raise the forks to proper height.



### CAUTION

*If the field of vision is poor, ask a guide for assistance.*

## 2.3.8 Using the truck on a slope



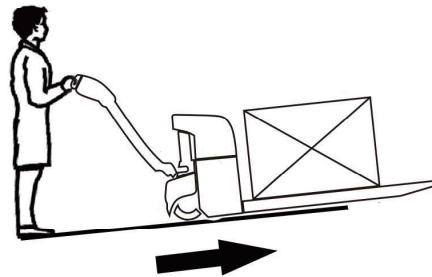
### **i** NOTE

*Incorrect use of the truck on slopes places stress on the traction motor, brakes and battery.*

Be particularly careful near slopes:  
Never attempt a slope with a gradient greater than that specified in the truck's data sheet. Make sure that the ground is dry with a non-slip surface and that the route is clear.

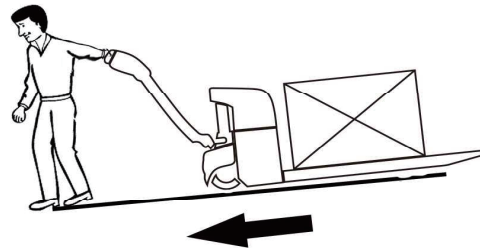
#### ➤ **Ascending slopes**

Always ascend slopes travelling in the reverse direction, with the load facing uphill. Without a load, it is recommended to ascend slopes forwards.



#### ➤ **Descending slopes**

Travel down slopes must always be forwards, with the load uphill. Without a load, it is recommended to descend slopes forwards. In all cases, travel at a very low speed and brake very gradually.



### **DANGER**

*Risk to life and/or risk of major equipment damage.*

*Never park the truck on a slope.*

*Never make a U-turn or take shortcuts on a slope. On a slope, the operator must drive very slowly.*

#### ➤ **Starting on a slope**

If you have to stop and then start on slope, proceed as follows:

- Stop on the slope by pressing the accelerator in the opposite direction until the machine comes to a standstill.
- Return the accelerator to the neutral position, then release the accelerator control button to apply the parking brake.
- To restart, press the accelerator button for the desired direction.
- The truck will move.

**i** NOTE

*Incorrect use of the truck on slopes places stress on the traction motor, brakes and battery.*

### 2.3.9 Truck transport

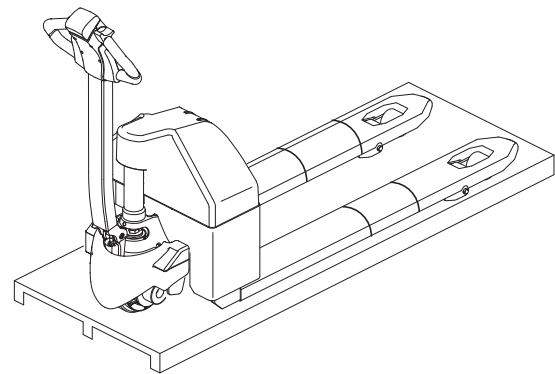


- Place the truck on a wooden pallet.
- Fix the truck to the pallet to prevent loosening.

**i** NOTE

*Only use haulage equipment with sufficient load capacity.*

- The load weight includes the net weight of the truck (including battery weight) and the wooden pallet.
- The pallet or wooden box should be large and strong enough to withstand the weight of the truck.
- Pay attention to the fork blades when lifting the truck onto the pallet, to prevent injuries caused by the forks.



*Follow the prescribed steps and park the vehicle correctly.*

- *Make sure the forks are aligned with the pallet, move slowly and stop after inserting the forks as far into the pallet as possible.*

**!** CAUTION

*Operate on open, level ground and pay attention to ground conditions when lifting and lowering the pallet to prevent the truck from tipping.*

*When transporting the truck, make sure it is fully secured and take precautionary measures against bad weather.*



## 2.3.10 Operating the truck without its own drive system



If the truck has to be moved after a failure has rendered it immobile, proceed as follows:

Set the emergency stop switch "OFF".

- Set the key switch "OFF" and remove the key.
- Prevent the truck from rolling away.

Remove the cover.

Screw in two screws(1), M4\*35mm)until the truck can be moved (no braking action).

Tighten two screws(1), the truck can be moved (no braking action) for RPL201/RPL201H/RPL202.

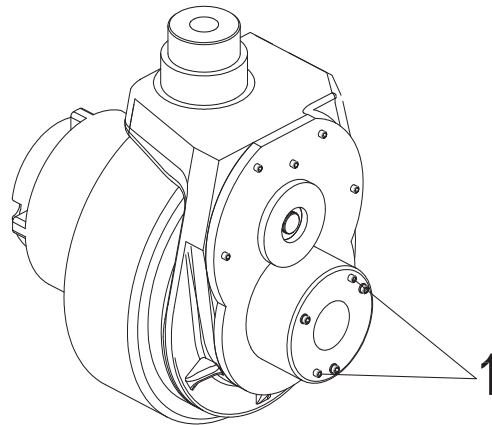
After setting down the truck at the destination, unscrew two screws(1).

Braking action is restored.

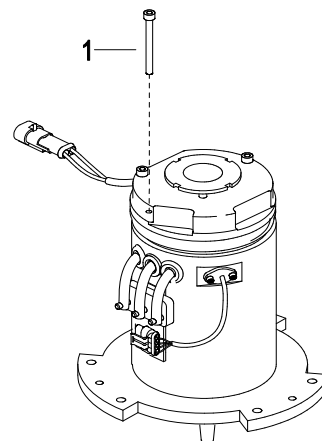


### **WARNING**

*This operating mode is not permitted when negotiating inclines and gradients.*



**WPL201/HPL152/EPL151**



**RPL201/RPL201H/RPL202**

# C

## Battery use and maintenance

### 3.2 Battery charging

#### 3.2.1 Precautions

- The truck must be parked within a shady and ventilated room;
- Avoid the existence of any metal object in the surface of the storage battery;
- All the cable and plug connection parts should be inspected in terms of obvious damages before charging;
- The charger to be connected or disconnected must be under the state of not connecting to the circuit;
- The safety provisions related to the storage battery and the manufacturer of charging station must be strictly abode by.



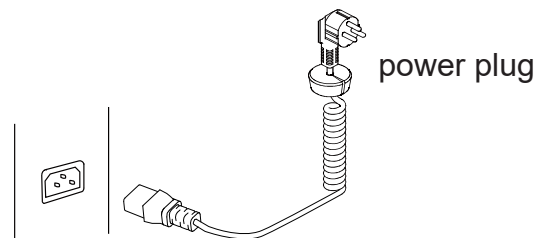
#### Charging environment:

Lithium battery must be charged above 0°C, as excessively low charging temperature is likely to result in the short circuit of battery cell.

#### 3.2.2 Charging the battery with internal charger

Charge maintenance-free or lithium battery through a built-in charger

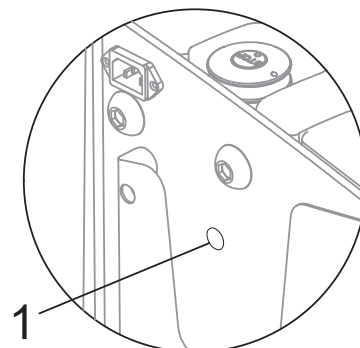
- Inspect whether relevant charging requirements are satisfied according to “3.2.1 precautions”;
- Park the truck securely as described 2.3.5;
- Connect the specialized connector(1) to a proper power supply outlet, then plug it into the socket on the truck to start charging.



WPL201/EPL151/HPL152

#### **i** NOTE

*The charging voltage is single-phase, ranging from 100V to 240V, please don't exceed the voltage range mentioned above.*



WPL201

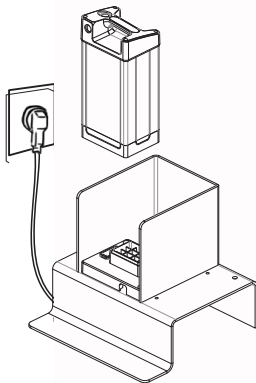
### Charging indicator(1)

NO.	LED status	Phenomenon	Cause	Remedy	Description
1	Red light is on		Trouble free	/	Charging
2	Green light is on		Trouble free	/	End of charging
3		Current/ voltage changes	Indicator failure	Return to factory maintenance	Charger failure
4	No indicator light	No change in current/voltage	The power input line is in good contact with the socket and the charger	Charger failure,return to factory maintenance	Charger failure
5	Red light flashes		The power input cable is not in good contact with the socket	Check if the input power line is in good contact	
6	Yellow light is on		Storage battery fails. (battery reverse connection)	Eliminate battery failure	
7			Storage battery fails.(battery is not connected)	Eliminate battery failure	
8			Ambient temperature is too high	Ambient temperature drops to normal	
9	Yellow light flashes		Storage battery voltage exceeds 32.5V (65V for WPL201)	Eliminate battery failure	
10			Charger failure	return to factory maintenance	

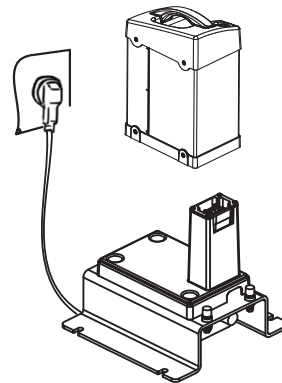
### 3.2.3 Charging the battery with external charger

- Inspect whether relevant charging requirements are satisfied according to “3.2.1 precautions”;
- Park the truck securely as described 2.3.5;
- Remove the battery; (see section 3.4)
- Plug into charging stand and charge;
- The LED light on the charging stand comes on.

A fully charging time see described in paragraph 3.2.4.



**EPL151**



**WPL201**

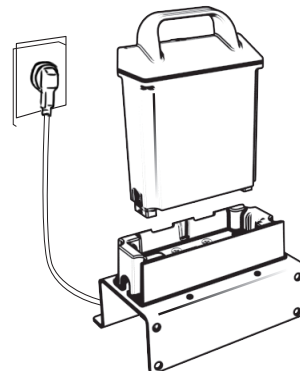
**i** **NOTE**

*Correctly plug the battery into the charging stand.*

**i** **NOTE**

*LED light mode on the charging stand*

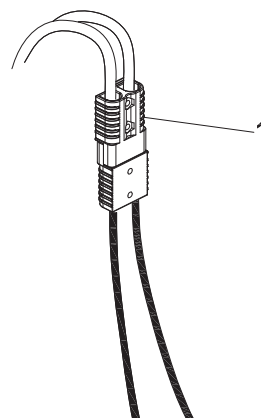
- Charging:red LED light
- Fully charged:green LED light
- Charging fault:flashing yellow LED light
- Battery fault:steady yellow LED light



**HPL152**

Charge the storage battery through an external charger

- Inspect whether relevant charging requirements are satisfied according to “3.2.1 precautions”;
- Park the truck securely as described 2.3.5;
- Pull out the storage battery plug (1) and have it connected with the charger joint (2), so as to facilitate charging through connecting to the charger.



**RPL201/RPL201H/RPL202**

### 3.2.4 Battery type & dimensions&Charging time

All the batteries are maintenance free.

Battery types & dimensions are as follows:

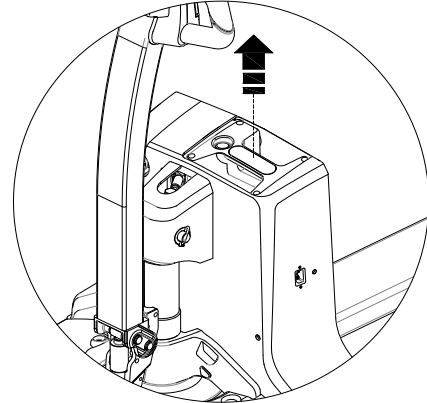
Tuck type	battery type	Voltage/ Rated capacity	Dimensions	Charger		Charging time
				Internal	External	
WPL201	Li-ion	48V/30Ah	245×160×380	15A	15A	2h
RPL201/ RPL201H	Li-ion	24V/160Ah	550×190×500	/	50A/100A	3h/1.6h
EPL151	Li-ion	24V/55Ah	175×124×407	10A	20A	5.5h/2.5h
HPL152	Li-ion	24/20AH	193x81x300	10A	10A	2h
RPL202	Li-ion (optional)	24V/160Ah	550 x 190 x 500	/	50A/100A	3h/1.6h
RPL202	lead-acid	24V/280Ah	621 x 281 x 625	/	30A/50A	9.5h/6h

### 3.3 Battery removal and installation

Park the truck securely as described in paragraph 2.3.5 and turn off the power before removal and installation of the battery.

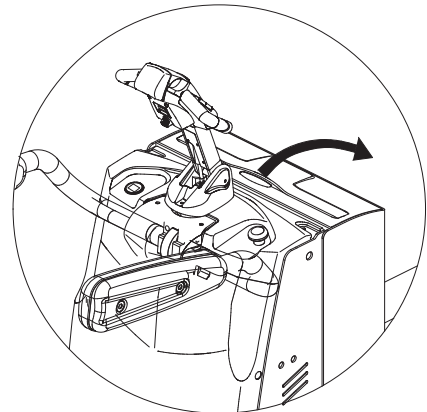
#### Battery removal and installation steps:

- Just hold the handle and pull the battery out.
- Install in reverse order.



WPL201, EPL151

- Open the battery cover;
- Unplug the battery;
- Attach the hooks to the battery handle or strap;
- Carefully lift the battery out of the truck;
- Install the battery in reverse order.



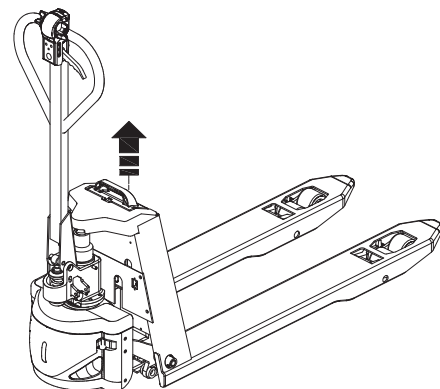
RPL201/RPL201H/RPL202

- Just hold the handle and pull the battery out.
- Install in reverse order.



#### WARNING

*Before removing the battery, make sure the vehicle is completely powered off.*



HPL152

# D

## Maintenance

### 4.1 Truck maintenance

Only through regularly implementing truck maintenance work can the sustainable and reliable use of the forklift be ensured.

Only those receiving professional training and approved as qualified can be competent in various equipment care maintenance operations. If you intend to independently implement maintenance, you are recommended to have your maintenance personnel receive on-site training from the service representative of the equipment supplier.

#### **Safety announcement:**

- Tyre replacement: please implement tire replacement using the tires designated by the manufacturer, as unqualified tires may influence the properties and stability of the products.
- It is improper to clean the truck using inflammable liquid.
- Ensure that the power supply has been completely disconnected before actual maintenance operation.

#### **Long-term parking:**

- If required to be parked for over one month, the truck must be placed in a dry and frost-free environment.
- Clean the truck carefully.
- Coat any unpainted metal parts with a thin layer of oil or grease.
- In case that the truck is out of use for a long time, the storage battery should better be taken out.
- Recharge the lithium-ion battery every 2 months. Please observe the above instructions.
- Raise and chock the truck: the wheels must not touch the ground in order to prevent irreversible deformation of the tyres.

#### **Discharge can damage the battery**

If the battery is not used for a long period of time, it can become damaged through discharge.

- Before a long period of inactivity, the battery must be fully charged.
- To ensure a long battery life, we recommend charging the battery every 14 days when it is not being used.

#### **Restoring the truck to operation**

- Thoroughly clean the truck.
- Clean the battery. Grease the pole screws using pole grease and reconnect the battery.
- Recharge the battery.
- Check if the hydraulic oil contains condensed water and change if necessary.
- Follow the daily checklist.

### Safety tests to be performed at intervals and after unusual incidents

The truck must be inspected at least annually (refer to national regulations) or after any unusual event by a qualified inspector. The manufacturer offers a safety inspection service which is performed by personnel specifically trained for this purpose.

A complete test must be carried out on the technical condition of the truck with regard to safety.

The truck must also be examined thoroughly for damage.

The operating company is responsible for ensuring that faults are rectified immediately.

### Spare parts:

Only original spare parts have been certified by our quality assurance department. To ensure safe and reliable operation of the Pallet truck, use only the manufacturer's spare parts. Used parts, oils and fuels must be disposed of in accordance with the relevant environmental protection regulations. For oil changes, contact the manufacturer's specialist department.

### Tyre replacement

Any repairs or maintenance to the truck must be performed only by trained and authorized technicians. Remove and install the tyre see the service manual.

### Troubleshooting

If the fault cannot be rectified after carrying out the remedial procedure, notify the Manufacture's service department, as any further troubleshooting can only be performed by specially trained and qualified service personnel.

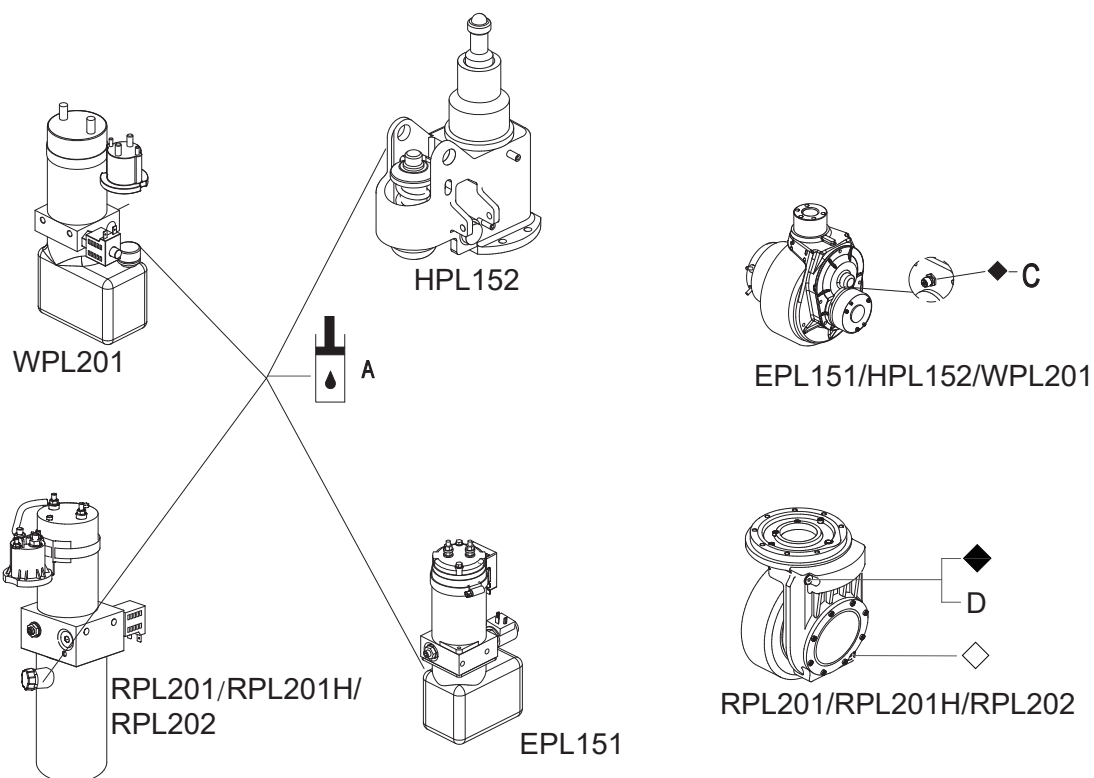
Fault	Probable Cause	Action
Truck does not start.	<ul style="list-style-type: none"> <li>-Battery connector not plugged in</li> <li>-Key switch in "0" position</li> <li>-Incorrect CanCode code</li> <li>-Battery charge too low</li> <li>-Faulty fuse</li> <li>-Truck in charge mode</li> </ul>	<ul style="list-style-type: none"> <li>-Check the battery connector and connect if necessary.</li> <li>-Set key switch to "1"</li> <li>-Check code</li> <li>-Check battery charge, charge battery if necessary</li> <li>-Check fuses.</li> <li>-Interrupt charging</li> </ul>
Load cannot be lifted	<ul style="list-style-type: none"> <li>-Charging capacity below 15%</li> <li>-Truck not operational</li> <li>-Hydraulic oil level too low</li> <li>-Faulty fuse</li> </ul>	<ul style="list-style-type: none"> <li>-Charging the battery</li> <li>-Carry out all measures listed under "Truck does not start"</li> <li>-Check the hydraulic oil level</li> <li>-Check fuses.</li> </ul>



## 4.2 Maintenance table

50-hour/7-Day maintenance	
Check the functions of the operation switches and display	
Check alarm system functions	
Check the emergency switch functions	
Check steering system functions	
Check the drive wheel and load wheel for worn or damage	
Check the functions of hydraulic system	
250-hour/2-month maintenance	
8	Inspect where there is any damage in the cables and whether the terminals are reliable
9	Inspect whether there is any screw losing or slipping out
10	Inspect whether there is any abrasion or damage in the oil pipes
11	Inspect where is any leakage in the hydraulic oil
500-hour/3-month maintenance	
After operating for 500 hours in total, the truck should also be maintained according to the following procedures in addition to the 250-hour maintenance mentioned above	
12L	Inspect or add the gear grease(for WPL201 and EPL151)
13L	Inspect and lubricate using the lithium-based lubrication grease the lubrication mouths in moving parts
14	Inspect and lubricate using the lithium-based lubrication grease the bearing between the driving engine and the gear box
After operating for 1000 hours in total, the truck should also be maintained according to the following procedures in addition to the 250-hour maintenance and 500-hour maintenance mentioned above	
15	Inspect and fasten the controller and other electrical apparatus elements
16	Inspect whether there is any abnormal sound or disclosure of the gear box
17	Inspect the abrasion situations of the driving wheel/bearing wheel/universal wheel and please timely replace seriously abraded ones
18	Inspect whether all the oil pipes, pipelines and joints are reliably connected and whether all the sealing elements are reliable
19L	Inspect the level of the oil liquid, and if the level fails to reach the minimum one as required, please timely add hydraulic oil with the same specifications
20	Inspect the air gap of the electromagnetic brake, and if the air gap is larger than 0.4mm, please replace the friction plates.
21	Inspect where is any abrasion or damage in the link mechanism

After operating for 1000 hours in total, the truck should also be maintained according to the following procedures in addition to the 250-hour maintenance, 500-hour maintenance and 1000-hour maintenance mentioned above	
22	Inspect the running, lifting and lowering speed, braking distance and other operation performances of the truck Inspect and add gearbox lubrication grease
23L	Inspect and replace gearbox gear oil (for RPL201/ RPL201H、 RPL202 WPL201)
24	Inspect where there is any damage in the oil cylinders and whether corresponding installations are reliable
25L	Clean the oil tank and replace the hydraulic oil
26	Inspect and replace the hydraulic filter
27	Inspect whether the bearing capacity reaches the rated load and implement corresponding adjustment through the flood valve adopted in the hydraulic station
28	Inspect whether all the labels are clear and intact



Code	Type	Specification	Amount	Position
A	Anti-wear hydraulic oil	L-HM32	0.48 L((WPL201/EPL151/ HPL152)1.25(RPL201/ RPL201H/RPL202)	Hydraulic System
	Low temperature anti-wear hydraulic oil (cold storage)	L-HV32		
C	Grease 3#(MoS <sub>2</sub> )	-	110 grams(EPL151/ HPL152/WPL201)	Gearbox
D	Heavy duty gear oil	85W-90 GL-5	1500ml(RPL201/RPL201H/ RPL202)	Gearbox

# E Technical data

## Standard Version Specifications

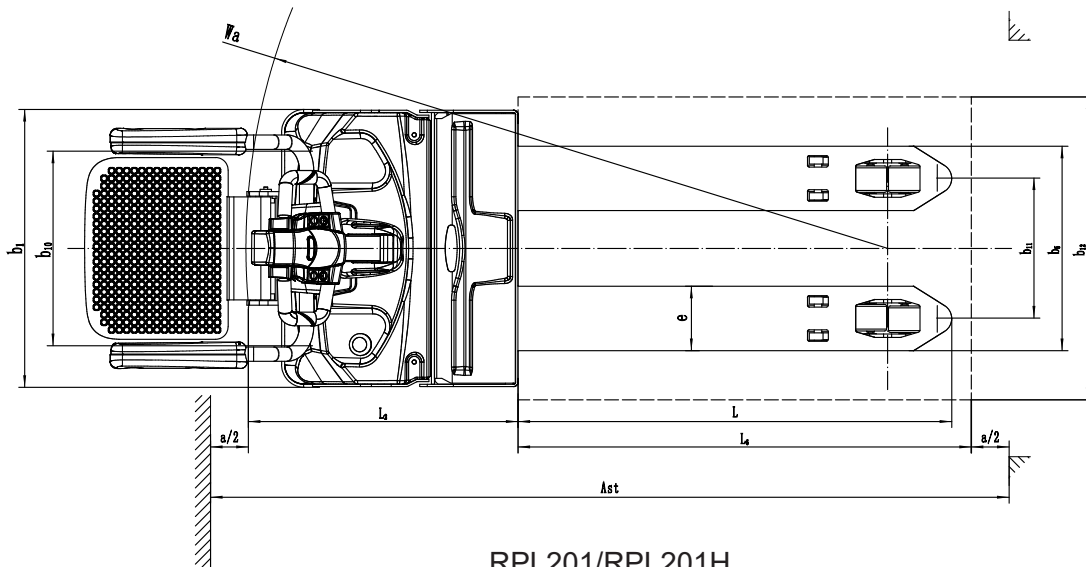
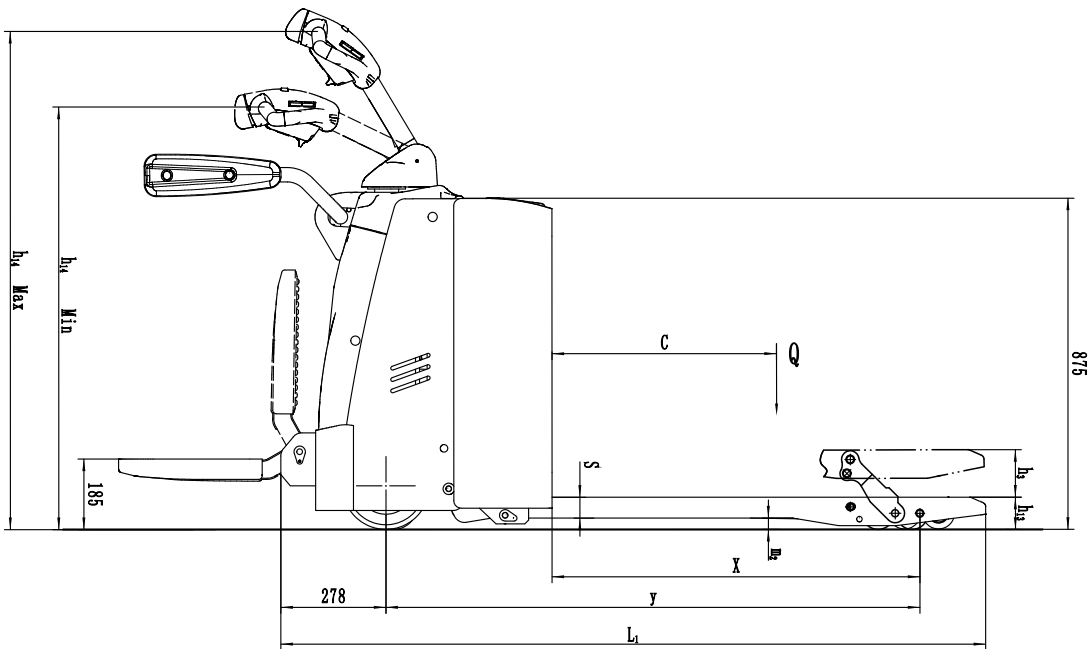
Technical specification details in accordance with VDI 2198. Technical modifications and additions reserved.

## Performance data for standard trucks

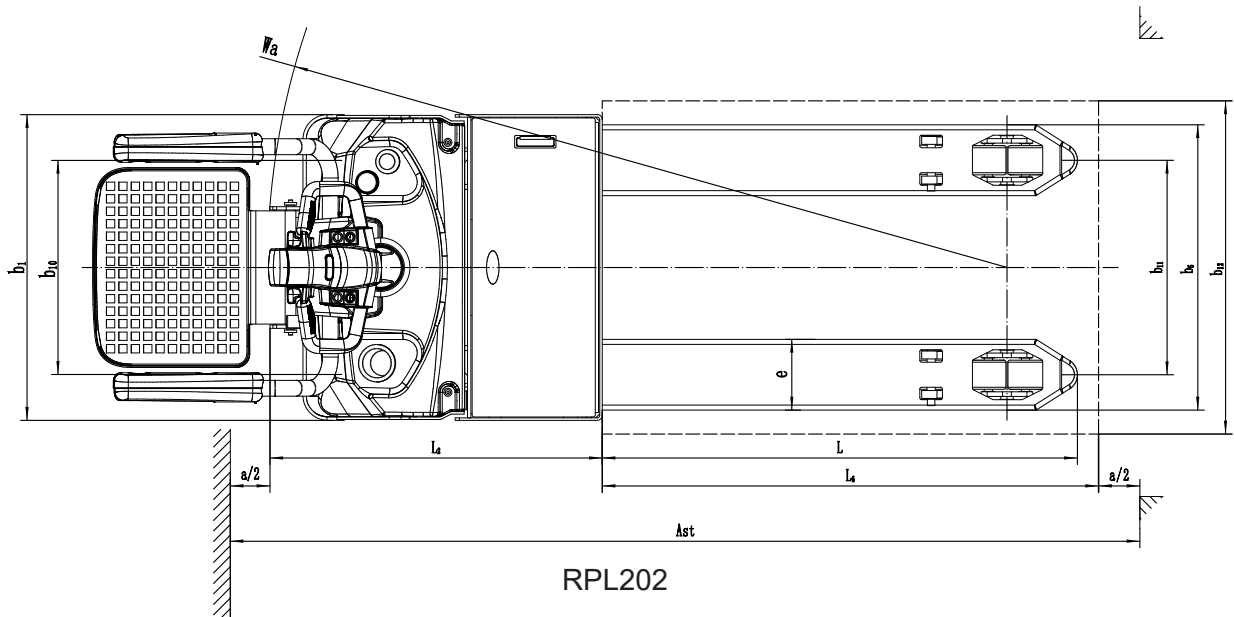
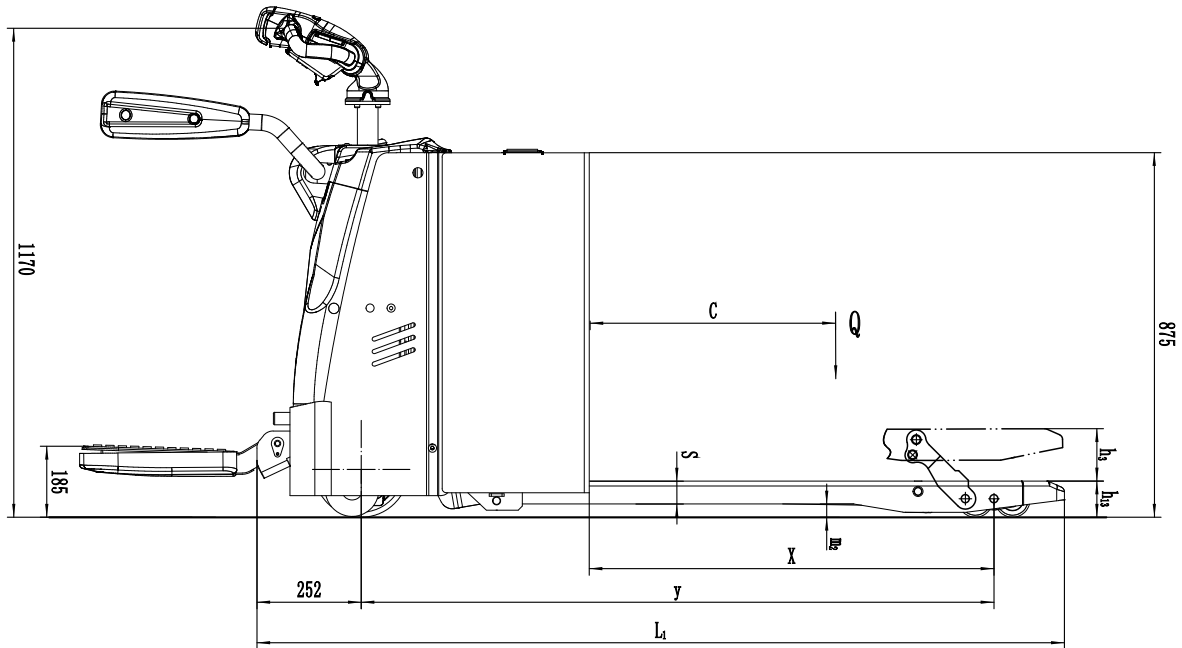
Distinguishing mark									
1.1	Manufacturer			EP	EP	EP			
1.2	Model designation			RPL201H	RPL201	RPL202			
1.3	Drive unit			Electrics	Electrics	Electrics			
1.4	Operator type			standing	Pedestrian	Pedestrian			
1.5	rated capacity	Q	kg	2000	2000	2000			
1.6	Load center distance	c	mm	600	600	600			
1.8	Load distance	x	mm	916/982	937/1003	916/982	937/1003	980	1000
1.9	Wheelbase	y	mm	1418	1438	1418	1438	1531	1551
Weight									
2.1	Service weight (include battery)		kg	630	630	755			
2.2	Axle loading, laden driving side/ loading side		kg	1020/1610	1020/1610	1090 / 1665			
2.3	Axle loading, unladen driving side/loading side		kg	500/130	500/130	620 / 135			
Types, Chassis									
3.1	"Tyre type driving wheels/loading wheels"			Polyurethane	Polyurethane	Polyurethane			

3.2	Tyre size, driving wheels(diameter×width)		mm	Φ230x75	Φ230x75	Φ230 x 75
3.3	Tyre size, loading wheels(diameter×width)		mm	Φ85x70 / Φ83x115	Φ85x70 / Φ83x115	Φ85 x 70 / Φ83 x 115
3.4	Tyre size, caster wheels(diameter×width)		mm	Φ130x55	Φ130x55	Φ130 x 55
3.5	Wheels, number driving, caster/loading (x=drive wheels)		mm	1x,2/4(1x,2/2)	1x,2/4(1x,2/2)	1 x +2 / 4
3.6	Track width, front,driving side	b10	mm	510	510	510
3.7	Track width,rear,loading side	b11	mm	370/430/515	370/430/515	370 / 515
<b>Dimensions</b>						
4.4	Lift height	h3	mm	120	120	120
4.9	Height drawbar in driving position min./max.	h14	mm	1150 / 1470	1150 / 1470	1170
4.15	Lowered height	h13	mm	85	85	85
4.19	Overall length	l1	mm	1860   1930	1860   1930	1954   2024
4.20	Length to face of forks	l2	mm	710	710	804
4.21	Overall width	b 1 / b2	mm	730	730	730
4.22	Fork dimensions	s/ e/ l	mm	55×170×1170	55x170x1150	55 x 170 x 1150
				55×170×1220	55x170x1220	55 x 170 x 1220
4.25	Distance between fork-arms	b5	mm	540/600/685	540/600/685	540 / 685
4.32	Ground clearance, center of wheelbase	m2	mm	30	30	30
4.34.1	Aisle width for pallets 1000 × 1200 crossways	Ast	mm	2523	1984	2590
4.34.2	Aisle width for pallets 800 × 1200 lengthways	Ast	mm	2372	2184	2448
4.35	Turning radius	Wa	mm	1700	1700	1790
<b>Performance data</b>						
5.1	Travel speed, laden/ unladen	km/ h	km/h	9.0 / 12.0	5.5 / 6	5.5 / 6
5.2	Lifting speed, laden/ unladen		m/ s	0.050/0.054	0.050 / 0.054	0.050 / 0.054

5.3	Lowering speed, laden/ unladen	fpm	m/ s	0.067 / 0.054	0.067 / 0.054	0.067 / 0.054
5.8	Max. gradeability, laden/ unladen	%		8 / 16	8 / 16	8 / 16
5.10	Service brake type			Electrom agnetic	Electrom agnetic	Electrom agnetic
<b>Electric-engine</b>						
6.1	Drive motor rating S2 60 min	hp	kW	2.5	1.6	1.6
6.2	Lift motor rating at S3 15%	hp	kW	2.2	2.2	2.2
6.3	The maximum allowed size battery	in.	mm	550×190×500	550×190×500	621 x 281 x 625
6.4	Battery voltage/nominal capacity K5	V/ Ah		24 / 210	24 / 160	24 / 280
6.5	Battery weight	lb.	kg	70	70	255
<b>Addition data</b>						
8.1	Type of drive control			AC	AC	AC
10.5	Steering type			electronic	electronic	electronic
10.7	Sound pressure level at the driver's ear	dB (A)		<74	<74	74



RPL201/RPL201H

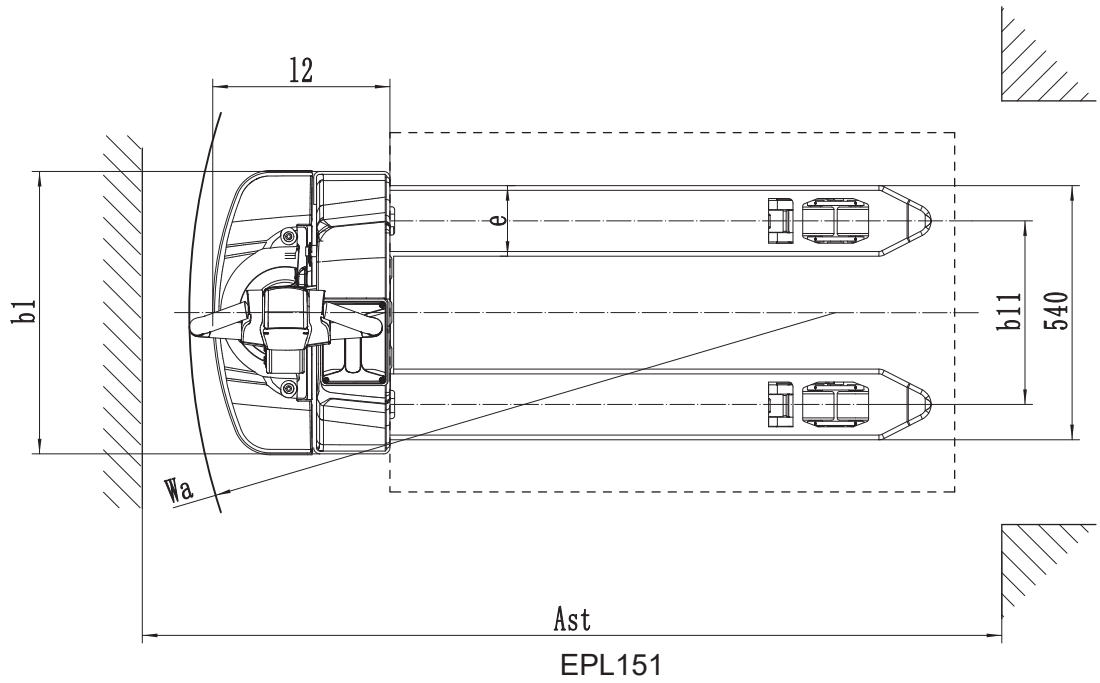
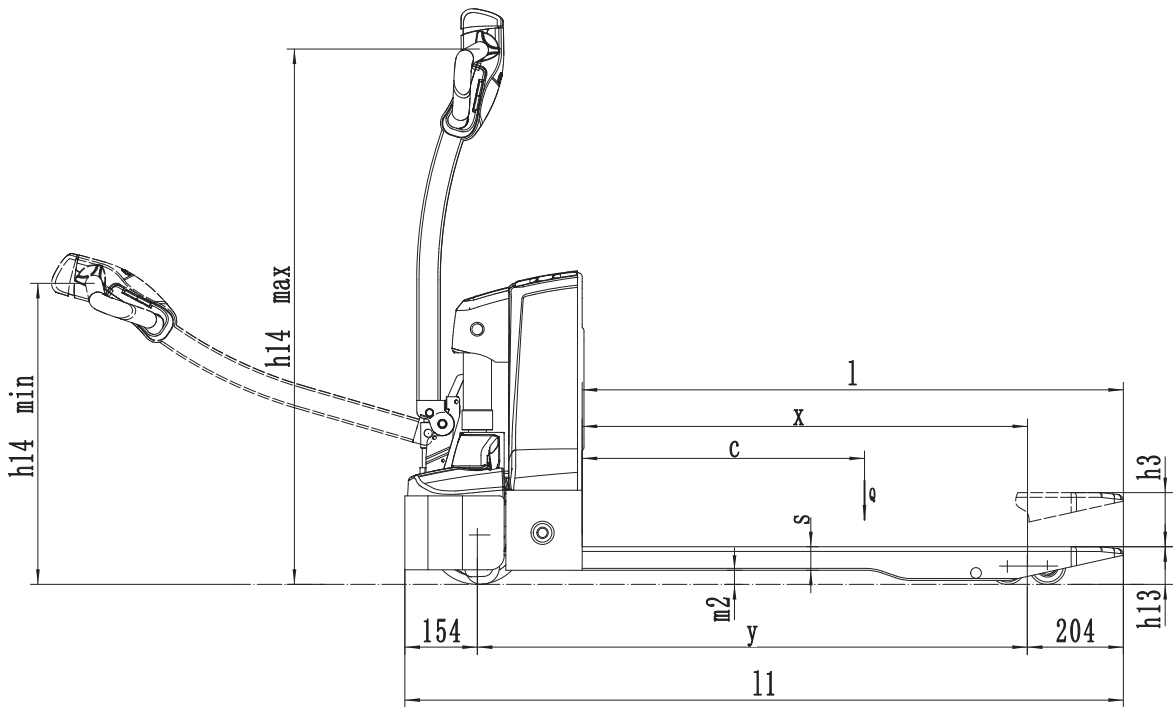


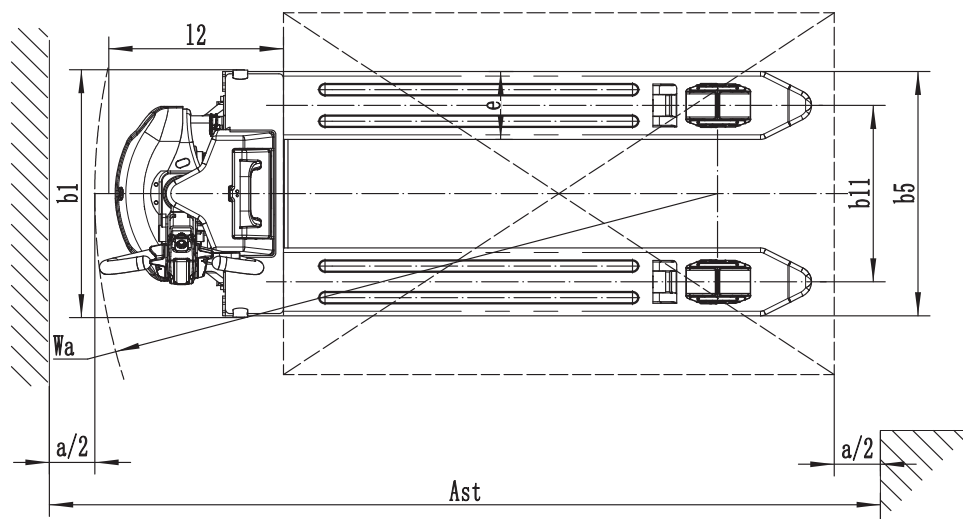
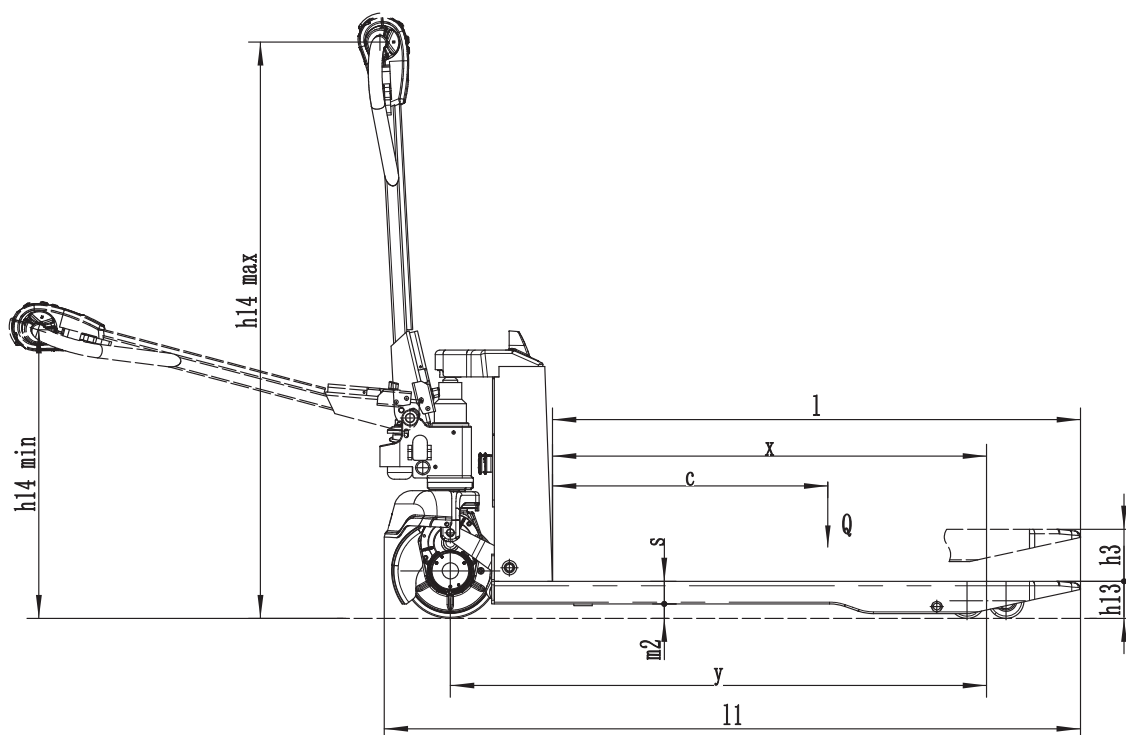
Distinguishing mark						
1.1	Manufacturer			EP	EP	EP
1.2	Model designation			EPL151	HPL152	WPL201
1.3	Drive unit			Electrics	Electrics	Electrics
1.4	Operator type			Pedestrian	Pedestrian	Pedestrian
1.5	rated capacity	Q	kg	1500	1500	2000
1.6	Load center distance	c	mm	600	600	600
1.8	Load distance	x	mm	883/946	883/946	1000
1.9	Wheelbase	y	mm	1105/1168	1105/1168	1268
Weight						
2.1	Service weight (include battery)		kg	165	130	250
2.2	Axle loading, laden driving side/loading side		kg	574/1091	558/1172	685/1565
2.3	Axle loading, unladen driving side/loading side		kg	130/35	84/46	185/65
Types, Chassis						
3.1	"Tyre type driving wheels/loading wheels"			PU/ PU	PU/ PU	Polyurethane



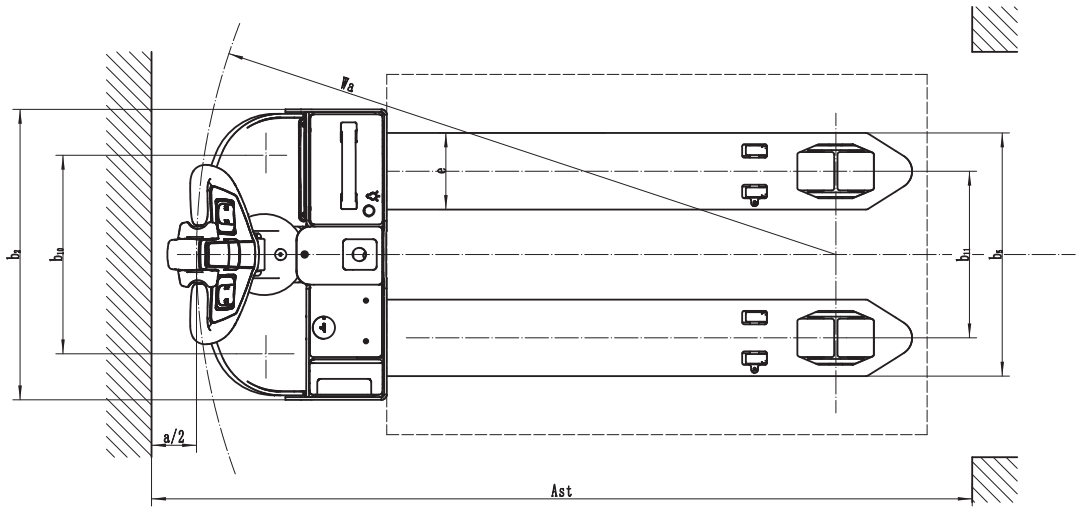
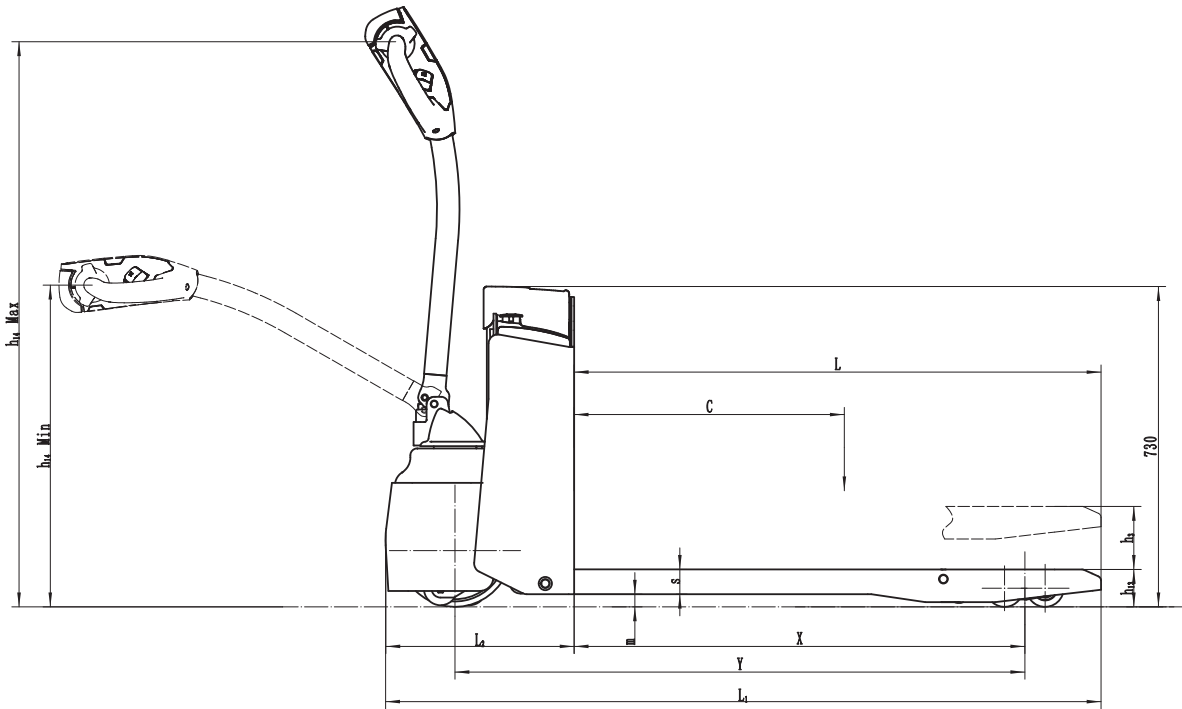
3.2	Tyre size, driving wheels(diameter×width)		mm	Φ210x70	Φ210x70	Φ250x102
3.3	Tyre size, loading wheels(diameter×width)		mm	2x Φ78x60 (Φ78x88)	2x Φ78x60 (Φ78x88)	2×Φ82x85/ Φ82×115
3.4	Tyre size, caster wheels(diameter×width)		mm	Φ74x48	/	Φ74x48
3.5	Wheels, number driving, caster/loading (x=drive wheels)		mm	1×,2/4(1× 2/2)	1x,4(1x,2)	1×,2/4(1× 2/2)
3.6	Track width, front,driving side	b10	mm	438	/	441
3.7	Track width,rear,loading side	b11	mm	390	390	370/(515)
<b>Dimensions</b>						
4.4	Lift height	h3	mm	115	115	140
4.9	Height drawbar in driving position min./max.	h14	mm	700 / 1170	638/ 1275	716 / 1240
4.15	Lowered height	h13	mm	80	80	82.5
4.19	Overall length	l1	mm	1523	1518	1592
4.20	Length to face of forks	l2	mm	375	381	423
4.21	Overall width	b 1 / b2	mm	600	548	645 / 625
4.22	Fork dimensions	s/ e/ l	mm	50/150/1150	50/150/1150	55×170×1170
4.25	Distance between fork-arms	b5	mm	540	540	540(685)
4.32	Ground clearance, center of wheelbase	m2	mm	30	30	27
4.34.1	Aisle width for pallets 1000 × 1200 crossways	Ast	mm	1584	1612	1850
4.34.2	Aisle width for pallets 800 × 1200 lengthways	Ast	mm	1784	1812	2050
4.35	Turning radius	Wa	mm	1330	1358	1428
<b>Performance data</b>						
5.1	Travel speed, laden/ unladen	km/ h	km/h	4/4.5	3.5/4	5 / 5.5
5.2	Lifting speed, laden/ unladen		m/ s	0.022/0.025	100mm/per time	0.028/0.04

5.3	Lowering speed, laden/ unladen		fpm	m / s	0.034/0.023	Hand down	0.04 / 0.022
5.8	Max. gradeability, laden/ unladen		%		5/16	5 / 10	8 / 16
5.10	Service brake type				Electroma gnetic	Electroma gnetic	Electrom agnetic
<b>Electric-engine</b>							
6.1	Drive motor rating S2 60 min		hp	kW	0.65	0.75	0.75
6.2	Lift motor rating at S3 15%		hp	kW	0.8	man-up	0.84
6.3	The maximum allowed size battery		in.	mm	175*124*407	193*81*300	245×160×380
6.4	Battery voltage/nominal capacity K5		V/ Ah		24V*1/40Ah	24 / 20AH	48/30(Li-ion)
6.5	Battery weight		lb.	kg	13*1	5*1	14
<b>Addition data</b>							
8.1	Type of drive control				DC	DC	DC
10.5	Steering type				mechanical	mechanical	mechanical
10.7	Sound pressure level at the driver's ear		d B (A)		<74	<74	<74





HPL152



WPL201

**Lithium-ion battery**

## 1 Information on the conformity of lithium-ion batteries

The manufacturer of the lithium-ion battery declares that: the lithium-ion battery conforms with the provisions of the following EU directive 2014/30/EU in accordance with EN12895.

These batteries has been certified according to EN 62619:2017 for safe use and according to UN38.3 for safe transport.

## 2 It is necessary to respect the following guidelines:

- Read the documents provided with the battery carefully.
- Only persons who have been trained to work with lithium-ion technology are permitted to work on the batteries (for example After-Sales Service Centre technicians).
- Do not drop it or allow anything to fall on it.
- Do not expose the battery unit to humidity or water ( > 80%).
- Protect the battery from solar irradiation.
- Do not physically machine or modify the battery.
- Do not open the battery. Electrical risk. Only the After-Sales Service Centre technicians can open the battery.
- Do not place lithium-ion batteries on or near flames or hot heat sources (> 65°C). This may cause the batteries to overheat or burst into flames. This type of use also impairs the performance of the batteries and reduces their service life.
- It is forbidden to take out the battery in the charging state state.
- It is forbidden to use and store the battery at low power (the use and storage of power loss will cause the early loss of battery system capacity and accelerate the service life of the battery pack);
- During the charging process, liquid and metal substances are not allowed on the charger, and it is forbidden to use the charger in a high temperature and high humidity environment;
- It is forbidden for unqualified personnel to dismantle and overhaul the battery system and supporting charger and other devices; the battery system is a dangerous product, and maintenance and replacement can only be performed by professionals;
- Before the vehicle is started, power on through the button switch. After the vehicle is stopped, the battery system must be powered off and stopped through the button switch, which can be judged by the state of the display screen. If the time is too long, the battery will be over-discharged. In severe cases, it will affect the battery performance);
- The battery should be fully charged for the first time;
- After each use, it should be charged in time (the initial state of charging should keep the battery system temperature below 40° C to ensure the smoothness of charging);
- Have class D fire extinguishers or inert gas, carbon dioxide, powder or foam fire extinguishers near the zone in which the lithium-ion batteries are used.
- Do only use in trucks manufactured by EP and if the battery type is released for that truck.

### 3 Intended use

- Operational application temperature 0° C-40° C, humidity < 80%;
- Charging application temperature 5° C-40° C;
- The battery's maximum operation altitude is up to 2000m;
- Do not pull out the battery for emergency stopping, use instead the emergency switch (see page B14).
- The truck shall not be used in a potentially explosive atmosphere or in an especially dusty environment.

### 4 Reasonably foreseeable misuse

- Never short circuit the battery terminals.
- Do not reverse the battery polarity.
- Do not overcharge.



#### **DANGER**

*Failure to comply with these safety instructions can result in fire and explosion or the leakage of harmful materials.*

### 5. Accessories

*Do not use a charger that is not released by EP for lithium-ion battery.*



#### **WARNING**

*Should such issues as failing to abide by the operation manual, failing to use the original parts for maintenance or damaging caused by users themselves occur, the quality guarantee will be invalid automatically!*

### 6. BMS (Battery Management System)

The battery is permanently monitored by the BMS (Battery Management System).

This provides the communication with the truck.

The BMS continually monitors items such as the cell temperature, the voltage and the charge status of the cells.



## 7.1 Safety and warning



- Abide by the operation manual!
- All the operations related to the storage battery must be implemented under the instruction of professionals!



Always wear protective clothing (e.g. safety goggles and safety gloves) when working on cells and batteries.



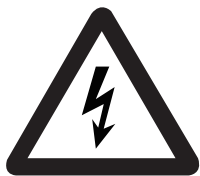
- No smoke and fire!
- Avoid the existence of open fire, fiery metal wire or sparks around the storage battery, otherwise explosion or fire disaster may occur!



- Explosion or fire disaster is likely to occur; avoid short circuit!
- Keep the battery away from all fire sources, heat sources and flammable or explosive materials.



- Don't knock over the storage battery!
- Using lifting and delivery devices as specified. Prevent the storage battery cell, interface and connection cable from being damaged by the lifting hook!
- If the materials leak out, do not inhale the fumes. Wear safety gloves.



- Dangerous voltage!
- Avoid hot plugging!
- Notice: the metal part of the storage battery cell is electrified, so don't place any external object or tool on the battery cell!



Do not place the battery on top of conductive objects.



- Don't trample on the battery to prevent it from fierce shaking or shacking!

## 8 Transportation

Before transporting any lithium-ion battery, check the current regulations on the transport of dangerous goods. Comply with these when preparing the packaging and transport. Train authorised staff to dispatch lithium-ion batteries.



### NOTE

*It is recommended that the original packaging is kept for any subsequent dispatch.*

*A lithium-ion battery is a special product.*


*Special precautions should be taken when:*

- *Transporting a truck equipped with alithium-ion battery*
- *Transporting only the lithium battery*

*A class 9 danger label must be affixed to the packaging for transport.*

*It is different if the battery is transported on its own or in a truck. An example of a label appears in this supplement(see figure below). Refer to the latest current regulations before dispatch as the information might have changed since this supplement was written.*

*Special documents must be sent with the battery. Refer to the applicable standards or regulations.*

<b>For UN3480</b>	Lithium Ion Batteries	
<b>For UN3481</b>	Lithium Ion Batteries packed with Equipment or Lithium batteries built into Equipment	



### WARNING

*Do not pack higher than 1.2 m above the floor of the container and secure properly.*



### NOTE

*"Overpack" is the name for the outer packaging of the dangerous goods.*



### NOTE

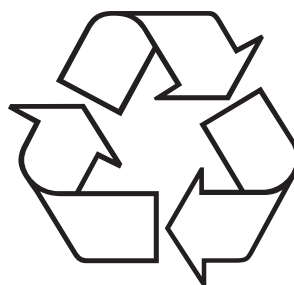
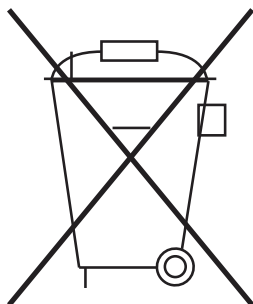
*Recharge the lithium-ion battery before transporting it taking account of the transport mode ( boat, road). Excessive discharge on arrival could damage the performance of the battery.*

#### 8.1 Shipping faulty batteries

To transport these faulty lithium-ion batteries, contact the manufacturer's customer service department. Faulty lithium-ion batteries must not be transported independently.

## 9 Instructions for disposal

- Lithium ion batteries must be disposed of in accordance with the relevant environmental protection regulations.
- Used cells and batteries are recyclable economic goods. In accordance with the mark showing a crossed rubbish bin, these batteries may not be disposed of as domestic waste. Return and / or recycling must be ensured as required by the Batteries Legislation.
- The method of battery recovery and reuse can be discussed with our company. We reserve the right to change the technology.



## 10 Storage

Before a long period of inactivity, the battery must be fully charged.

We recommend that batteries are stored at a height between 60 and 120 cm.

- Store the battery in a dry place at a temperature between 0 and 40° to preserve its service life. This area must not be hermetically sealed to allow air renewal;
- If the battery system needs to be placed on hold for a long time, it would better keep the battery in the semi-electric state and charge the battery every 2 months to ensure that the battery system is in the semi-electric state;
- The positive and negative terminals of the battery system are prohibited from contacting with metal objects during storage.

## 11 Common Problems and Solutions

During the use and maintenance of the lithium-ion battery, the battery or battery system may have one or more of the following abnormal conditions, please organize the professional engineers and technicians to perform the necessary processing according to the instructions in this manual; if you have any questions about the status or solutions, please contact ep dealer or after-sales service department of the company to obtain professional technical support.

- If the battery is found to have abnormal mechanical characteristics such as swelling, cracked casing, melted casing, and distortion of the casing before and during installation, stop using the battery immediately, place it in open and well-ventilated space, and contact the after-sales service.
- If abnormalities such as looseness, cracks, cracks in the insulation layer, burn marks, etc. of the battery's pole pressing bolts, conductive strips, main circuit wires and connectors are found before and during the installation, stop using the battery immediately, check the reason for analysis and give it a fix;
- If the polarity of the positive and negative terminals of the battery is found not match the polarity identification before installation, please stop using the battery immediately and contact the after-sales service department to replace the battery or obtain other solutions;
- If there is fire or smoke happens to the battery, move it to the open air immediately, evacuate people in time, and pour a large amount of cold water onto the battery to cool it down and put out the fire.
- If the battery is found to emit smoke before and during installation, immediately stop using the battery and bury it with sand, and notify the after-sales service department of the company for record and obtain technical support;

**Lead-acid battery**

## 1 Safety and Warnings

When operating on battery, you must wear protective glasses and protective clothing!

Electrolyte contains sulfuric acid and is highly corrosive. If it accidentally comes into contact with the skin, wash immediately with plenty of water, if the situation is serious, immediately seek medical advice.

The battery will produce hydrogen during charging, which may produce an explosive mixture. Smoking or ignition is prohibited near the battery that is being charged or just completes charging, there should not be flame or a hot wire, otherwise there may be fire or explosion hazards!



### CAUTION

*To avoid accumulation of hydrogen gas, keep the battery cover open during charging, charge the battery at a cool, well-ventilated place.*

Dumping of battery is prohibited. Only use proper lifting equipment to lift or transport the battery.



### WARNING

- *It is necessary to add water regularly, other-wise may cause damage to the battery due to water loss.*

- *The water must be added after the battery is fully charged, adding water before charging can cause electrolyte overflow.*

- *The amount of water to be added must be strictly controlled, excessive adding of water may lead to electrolyte overflow.*

- *Only distilled water can be added, the adding of tap water or mineral water is prohibited.*

- *As for the decrease of battery capacity, or even damage to the battery due to failure to comply with the above provisions, the quality assurance will automatically void.*

As for failure to comply with instructions for use, maintenance without using original parts, user corruption, or violation of provisions when adding electrolyte and other circumstances, the quality assurance will automatically void.

### ➤ Accessories

- Do not use a charger that is not released by EP for lead-acid battery.

## 2 Use of Battery

### 2.1 Pre-use Checks

Check if the battery status is normal and also check for mechanical failures;

Connect the battery connectors, make sure the contact is solid, the electrodes are connected properly, otherwise may cause damage to the battery, truck or charger;

Check if the electrode bolt of each battery interface is tightened;

Check electrolyte fluid level. It must be ensured that the electrolyte level is higher than the upper edge of overflow outlet or separator;

Charge the battery according to the instructions on the operation manual;

Refill the electrolyte with distilled water to make the electrolyte level reach standard level.

### 2.2 Discharging

Do not close or cover the ventilation openings with objects;

When connecting or disconnecting the battery connector (such as, plug), the power supply must be disconnected first;

In order to meet or exceed the rated battery service life, the battery should avoid excessive discharge during runtime (capacity less than 20% of the rated capacity);

Re-charge the battery immediately after discharging without delay.

### 2.3 Charging

When charging, only DC can be used. Connect the battery with proper charger for specification and size to avoid overload of circuit and interface, and to avoid electrolyte foaming or overflow from the cell;

The charger purchased separately must be checked by the after-sales service department of our company before it can be used;

When connecting the battery with the charger, the circuit switch should be at "OFF" position, make sure the connection is correct. It is prohibited to connect the battery with live charger.

Before battery charging, make sure the electrolyte temperature is within the range of 10 ° C~ 45 ° C;

When charging, the cover or cover plate of the battery compartment must be opened or removed to ensure that the gas generated during charging can be smoothly discharged.

When the concentration of the electrolyte and battery voltage remain constant (for more than 2 hours), it indicates that the charging is completed.

## 2.4 Temperature

Rated temperature of electrolyte is 30 °C.

If the temperature is too high, it will reduce the service life of the battery; too low may reduce the battery capacity.

When the temperature reaches the limit temperature of 55 ° C, it is prohibited to run the battery.

## 3 Maintenance & Care

### 3.1 Daily Maintenance

Charge the discharged battery;

Visual inspection for excessive dirtiness and mechanical damage after the charging.

### 3.2 Weekly Maintenance

Control the electrolyte fluid level. Check the electrolyte fluid level when the charging is about to complete. If necessary, add distilled water into the electrolyte when the charging is about to complete to make the fluid level reach the rated standard.

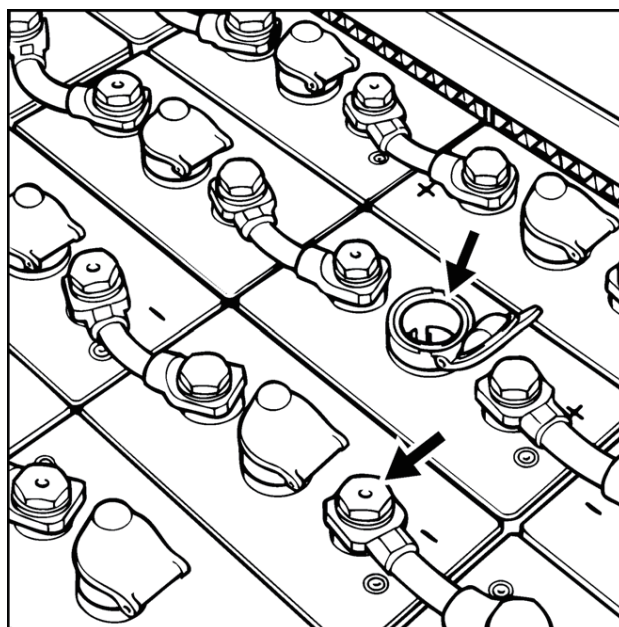


#### CAUTION

*Lower fluid level may reduce the battery capacity, and thus reduce the service life of battery. Higher liquid level may lead to electrolyte overflow when charging, which may cause corrosion to the battery compartment or even the vehicle.*

### Checking the battery condition, electrolyte level and specific gravity

- Inspect battery for cracks, raised plates and electrolyte leaks.
- Unscrew the battery cover and check the electrolyte level.
- If the battery has an inspection tube, then the electrolyte level should be at the base of the tube. If there is no inspection pipe, then the electrolyte level should be 10-15 mm higher than the plate.
- If the electrolyte level is excessively low, it can only be filled up with distilled water.
- Remove any sediment from the electrodes and lubricate with non-acidic lubricating grease.
- Retighten the electrode holder.
- Use a hydrometer to check the electrolytes. The specific gravity should be between 1.24-1.28.

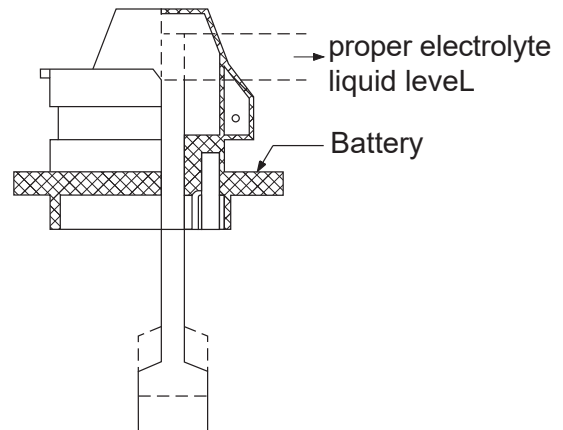




There are two types of battery filler cap used on battery cell:

1) Filler cap with buoy

Add distilled water, red buoy will float until while rod appears under the red scale.



**WARNING**

*Add only distilled water.*

*Before adding distilled water, check if the buoy can move up and down properly to prevent the buoy from failing to float up and resulting in excessive filling.*

2) Filler cap without buoy

When adding water, stop filling when the electrolyte level is higher than the protective plate for 15~20 mm.



**CAUTION**

*Please operate the electric watering device in accordance with its operating manual.*

### 3.3 Monthly Maintenance

Before the charging is completed (while the charger is still energized), measure and record the voltage of battery cell the entire battery;

After the charging is completed, measure and record the electrolyte concentration and temperature of the battery cell.

#### How to tell if the battery is normal

As for a normal set of fully charged batteries, the voltage of each of the battery cell should be around 2.08V, specific gravity of electrolyte should be around 1.28;



**CAUTION**

*After being fully charged, if the voltage of battery cell is lower than 1.85V or the specific gravity of electrolyte is less than 1.05, then that battery cell has been damaged and needs to be replaced.*

As for a group of normal batteries, when the battery is discharged for 80% (the instrument alarms and prompts low battery, you should recharge in a timely manner), the open circuit voltage should be around 1.93V, specific gravity of electrolyte (under 30°C) should be around 1.14.



**CAUTION**

*And you can identify if the battery is fully discharged according to the specific gravity of battery electrolyte when the instrument alarms, and identify if the capacity indicated on the instrument is accurate.*

### 3.4 Care

#### 1. Keep it clean

Battery surface should be clean and dry to prevent the occurrence of leakage currents;

Battery cables, terminals and connectors must be tightened and clean, a small amount of special grease should also be applied.



#### **WARNING**

- Do not use a dry cloth or fabric to clean the surface of the battery, so that to prevent the occurrence of static electricity, resulting in explosion;
- Unplug the power plug;
- Wipe clean with a damp cloth;
- Please wear goggles, rubber boots and rubber gloves.

2. Make sure that the cable insulation is not damaged and the connection layer has no signs of heating.

3. Make sure that the "+" and "-" output terminals are not sulfated (with white salt).

Slight sulfation: clean top of the element with a damp cloth.

Severe sulfation: the battery must be removed for powerful cleaning; the battery base should also be cleaned.

Very severe sulfation (or a large amount of electrolyte overflow): please contact the after-sales service department as soon as possible.

DO NOT arbitrarily discharge acidic wastewater after cleaning, dispose such water in accordance with national laws and regulations!

#### 4 Storage

When the battery is not used for a long time, the battery should be filled up and stored in a dry, frost-free space.

Regular equalizing charge may help extend the service life of battery and ensure that the capacity won't be reduced.

#### 5 Troubleshooting

Upon battery or charger failure, please promptly notify the after-sales service department.

Refer to battery failure analysis to facilitate troubleshooting and elimination.

<b>Battery Fault Analysis</b>			
<b>Fault</b>	<b>Negative Phenomena</b>	<b>Cause</b>	<b>Handling Methods</b>
Insufficient Battery Charge	<ol style="list-style-type: none"> <li>1. Low static voltage</li> <li>2. Low density, cannot meet the requirements after being charged</li> <li>3. Short working time</li> <li>4. When running, the instrument displays quick drop of capacity</li> </ol>	<ol style="list-style-type: none"> <li>1. Charger voltage and current are set too low</li> <li>2. Insufficient initial charge</li> <li>3. Charger failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust and repair the charger</li> <li>2. Battery supplemental charge</li> <li>3. Battery needs to be replaced in severe situations</li> </ol>
Electrolyte has been improperly added to the battery	<p>- In case of high intensity:</p> <ol style="list-style-type: none"> <li>1. Electrolyte density is not less than 1.300g/cm<sup>3</sup> after charging</li> <li>2. Battery static voltage is higher</li> <li>3. Initial capacity is good, but reduced after a period of use</li> <li>4. Electrolyte is turbid</li> </ol> <p>- Low density:</p> <ol style="list-style-type: none"> <li>1. Electrolyte density is still lower than the specified value after charging</li> <li>2. Battery capacity is low</li> </ol> <p>- Adding impure liquid:</p> <ol style="list-style-type: none"> <li>1. Battery capacity is low</li> <li>2. Electrolyte is turbid and of abnormal color</li> <li>3. Battery with severe self-discharge</li> </ol>	<ol style="list-style-type: none"> <li>1. Initial adding of electrolyte with excessive high or low density</li> <li>2. Liquid level reduces, adding errors, failed to add pure water in accordance with provisions, but mistakenly adding dilute acid</li> <li>3. Initial adding of liquid is impure (containing impurities and with odor)</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the battery electrolyte</li> <li>2. Battery needs to be replaced in severe situations</li> </ol>

<b>Battery Fault Analysis</b>			
<b>Fault</b>	<b>Negative Phenomena</b>	<b>Cause</b>	<b>Handling Methods</b>
Electrode plate sulfation	<ol style="list-style-type: none"> <li>1. Battery capacity drops during normal discharge</li> <li>2. Density drops to be lower than normal value</li> <li>3. Voltage drops quickly when discharging</li> <li>4. Start charging under high voltage</li> <li>5. Bubbles generated during charging</li> <li>6. Coarse crystallization of PbSO<sub>4</sub></li> </ol>	<ol style="list-style-type: none"> <li>1. Insufficient initial charge</li> <li>2. Long time of storage under the state of discharge</li> <li>3. Long-term insufficient charged</li> <li>4. Electrolyte density is too high</li> <li>5. Electrolyte level is too low, the upper part of electrode plate is exposed outside of the electrolyte</li> <li>6. Impure electrolyte</li> <li>7. Internal short circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Over-discharge method</li> <li>2. Repeated charging method</li> <li>3. Water treatment method</li> </ol>
Excessive shedding of active substances	<ol style="list-style-type: none"> <li>1. There is gray-brown substance rising from the bottom when charging</li> <li>2. Battery capacity reduced</li> </ol>	<ol style="list-style-type: none"> <li>1. Brown precipitation is due to excessive large charging current</li> <li>2. White sediment is due to over-discharge</li> <li>3. Battery electrolyte is impure</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean up the precipitation</li> <li>2. Adjust the density</li> <li>3. Battery needs to be replaced if necessary</li> </ol>
Battery overcharged	<ol style="list-style-type: none"> <li>1. Color of battery filling cap becomes yellow, and then red</li> <li>2. Battery casing deformation</li> <li>3. Battery spacers carbonization, deformation</li> <li>4. Positive electrode corrosion, broken</li> <li>5. Electrode pole rubber bushing raised, aged and cracked</li> <li>6. Frequent water-adding, electrolytic turbidity during charging</li> <li>7. Evenly shedding of active substances from electrode plate</li> <li>8. Positive electrode plate detonation</li> </ol>	<ol style="list-style-type: none"> <li>1. Charger voltage and current are set too high</li> <li>2. Charging time is too long</li> <li>3. Frequent charging</li> <li>4. Less discharging, but much charging</li> <li>5. Charger failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust and repair the charger</li> <li>2. Adjust the charging system</li> <li>3. Battery needs to be replaced in severe situations</li> </ol>
Battery Over-discharge	<ol style="list-style-type: none"> <li>1. Low static voltage</li> <li>2. Electrolyte density is still low after charging</li> <li>3. Positive and negative electrode plates curved or fractured</li> </ol>	<ol style="list-style-type: none"> <li>1. Go on using the battery despite of insufficient charge</li> <li>2. Battery pack short circuit</li> <li>3. Small current long time discharge</li> </ol>	<ol style="list-style-type: none"> <li>1. Supplementary charging</li> <li>2. Repair the vehicle</li> <li>3. Battery needs to be replaced in severe situations</li> </ol>

<b>Battery Fault Analysis</b>			
<b>Fault</b>	<b>Negative Phenomena</b>	<b>Cause</b>	<b>Handling Methods</b>
Battery Short Circuit	<ol style="list-style-type: none"> <li>1. Low static voltage below 2V</li> <li>2. Electrolyte density is too low</li> <li>3. High temperature during charging</li> <li>4. Truck is with short working time</li> </ol>	<ol style="list-style-type: none"> <li>1. Electrode plate deformed and short circuit</li> <li>2. Spacer missing or broken during assembly</li> <li>3. Positive electrode active substances shedding, short circuit at bottom</li> </ol>	Battery needs to be replaced
Broken circuits	<ol style="list-style-type: none"> <li>1. Abnormal and unstable voltage upon external connection with load</li> <li>2. Current fails to input when charging</li> </ol>	<ol style="list-style-type: none"> <li>1. Poor welding during assembly of electrode pole or electrode plate</li> <li>2. External short circuit</li> <li>3. Large current discharge</li> <li>4. Poor wiring connection or disconnected</li> <li>5. Electrode plate corrosion</li> </ol>	<ol style="list-style-type: none"> <li>1. Battery needs to be repaired</li> <li>2. Battery needs to be replaced if necessary</li> </ol>
Battery Reverse Electrodes	<ol style="list-style-type: none"> <li>1. Negative voltage values</li> <li>2. Electrolyte density is lower than 1.20g/cm<sup>3</sup> after charging</li> <li>3. Positive and negative electrode lugs, colors of electrode plates are reversed</li> </ol>	Wrong connections of positive and negative electrodes during charging	<ol style="list-style-type: none"> <li>1. Reverse charging is allowable</li> <li>2. Battery needs to be replaced in severe situations</li> </ol>
Battery Leaks	<ol style="list-style-type: none"> <li>1. Filling hole leaks</li> <li>2. Leaks at sealing seams of tank and filling cap</li> <li>3. Drainage</li> <li>4. Marks of bumps on external surface of tank</li> </ol>	<ol style="list-style-type: none"> <li>1. Tank, filling cap with poor heat sealing</li> <li>2. Electrode lug rubber ring problems</li> <li>3. Sealing compound cracked</li> <li>4 External impact due to negligence during use</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair</li> <li>2. Battery needs to be replaced if necessary</li> </ol>