

30ET-X/50ET-X

Electric Tow Tractor

Operator's Manual



WARNING

Do not operate the tow tractor before reading and understanding the operating instructions.

NOTE:

- **Please check product type and parameters of your truck in this manual as well as on the ID-plate.**
- **Keep this instruction manual for future reference.**

FOREWORD

Before operating the tractor, please read this instruction manual carefully and understand the usage of the tractor completely. All instructions in this manual should be seriously followed, otherwise warranty will be invalid by default, and our company shall not be liable for any losses arising therefrom.

If the customer or a third party modifies the truck without manufacturer's permission, the warranty will be invalid by default, and our company shall not be liable for any loss arising therefrom.

This handbook describes the usage of different stand-on tow tractors. When operating and servicing the tractor, make sure that it applies to your truck type.

Our products are subject to ongoing developments, so the company reserves the right to modify the appearance, configuration and function of the products, therefore please have understanding, that any claims on performance shall not be derived from this manual.

Keep this manual for future reference. If this manual and the warning/ caution stickers are damaged or got lost, please contact your local dealer for replacement.

ATTENTION:

- Environmentally hazardous waste, such as batteries, oil and electronics, will have a negative effect on the environment, or health, if handled incorrectly.
- The waste packages should be sorted and put into solid dustbins according to the materials and be collected disposal by local special environment protection bureau. To avoid pollution, it's forbidden to throw away the wastes randomly.
- To avoid leaking during the use of the products, the user should prepare some absorbable materials (scraps of wooden or dry duster cloth) to absorb the leaking oil in time. To avoid second pollution to the environment, the used absorbable materials should be handed in to special departments in terms of local authorities.
- Our products are subject to ongoing developments. Because this handbook is only for the purpose of operating /servicing the pallet truck, therefore please have understanding, that there is no guarantee out of particular features out of this handbook.



NOTE: In this manual, the symbol on the left indicates warning and danger, which may lead to death or serious injury if not followed.

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1. CORRECT APPLICATION

It is only allowed to use the tractor following the instructions of this manual. Improper usage will cause human injuries or damage to the equipment. Meanwhile, the operator/ the operating company has to ensure the correct usage and has to ensure, that this tractor is used only by staff, which is trained and authorized to use this tractor.

The operator must pay attention to the information on the warning stickers, safety instructions and ID plate on the truck to ensure the proper usage.

The tractor has to be used on substantially firm, smooth, prepared, level and adequate surfaces.

The tractor should be operated with ambient temperatures between -5°C to + 40°C.

The tractor is intended to be used indoors with 50Lux operating lighting at least.

Operating sideways or diagonally on ramps is not allowed.

Lifting or transporting people is not allowed.

The tractor is not allowed to be used in an area with explosion hazard.

The tractor is not allowed to be used outdoors in bad weather.

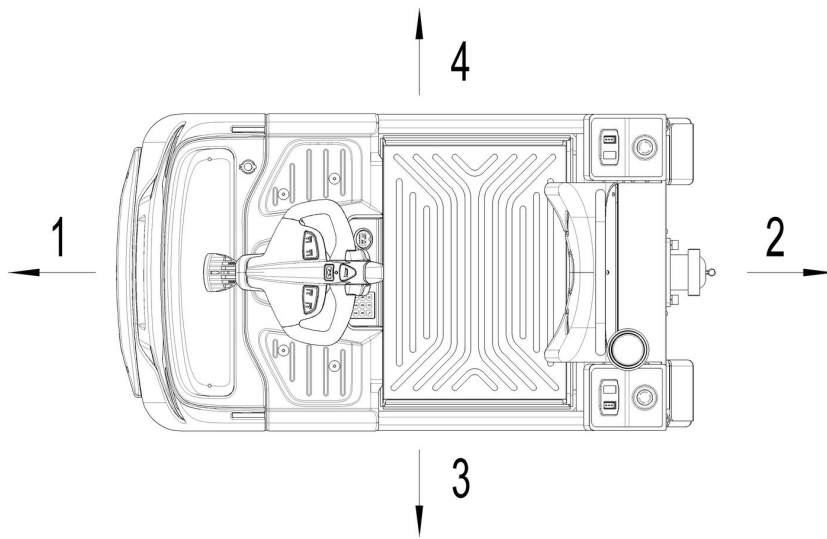
The tractor is not allowed to be used in a dusty or corrosive environment, unless it equips with special protective assembly approved by manufacturer.

No modifications or changes to this tractor which may affect rated traction capacity, stability or safety requirements of the tractor shall be made without the prior written approval of the original tractor manufacturer, its authorized representative, or a successor thereof. This includes changes affecting, for example, braking, steering, truck weight and the increase/ decrease of removable accessories. When the manufacturer or its successor approve a modification or change, they shall also make and approve appropriate changes to ID plate, operation and maintenance manuals.

Obeying these instructions will make the warranty invalid.

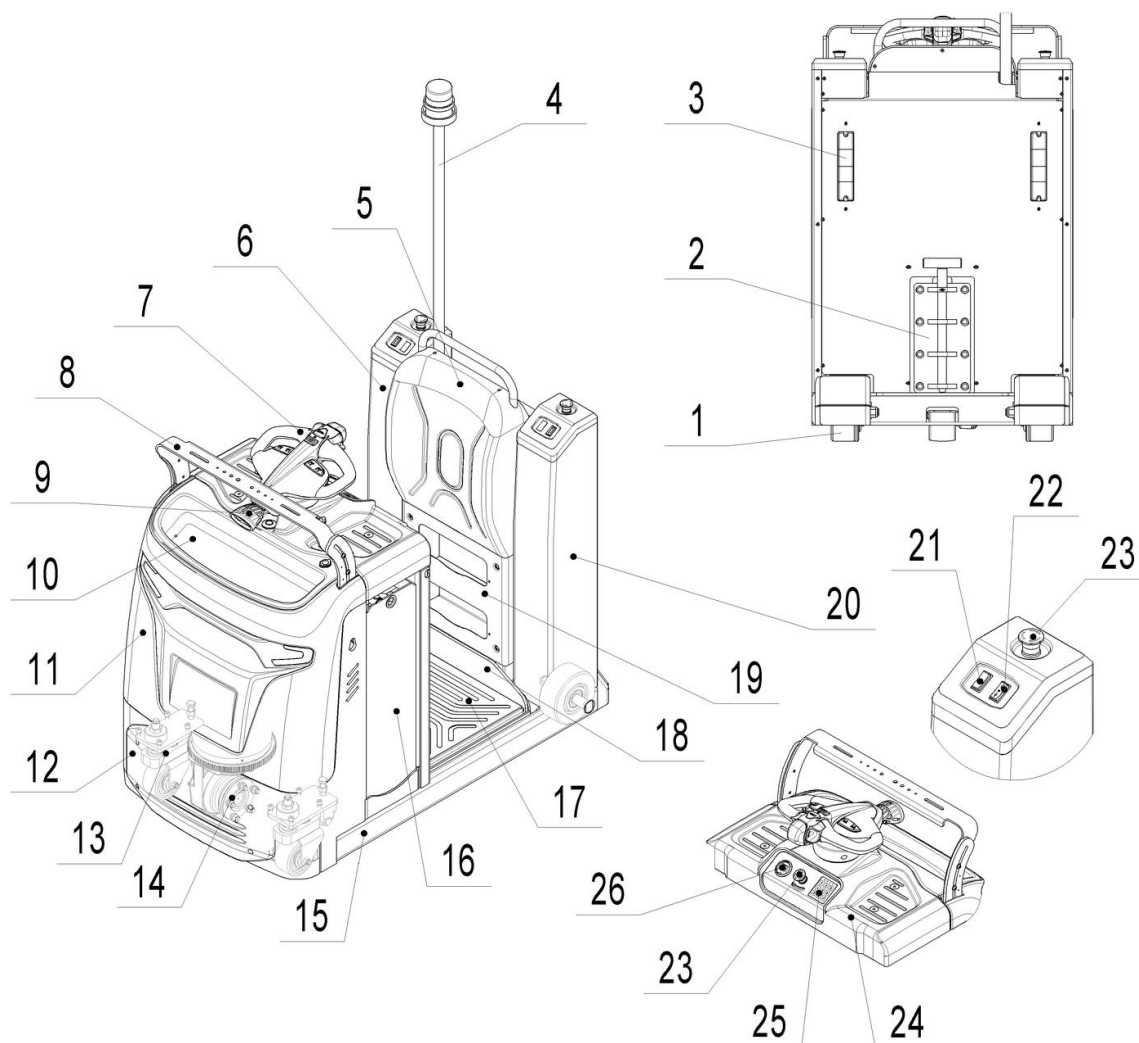
2. DESCRIPTION OF THE TOW TRACTOR

a. Definition of directions



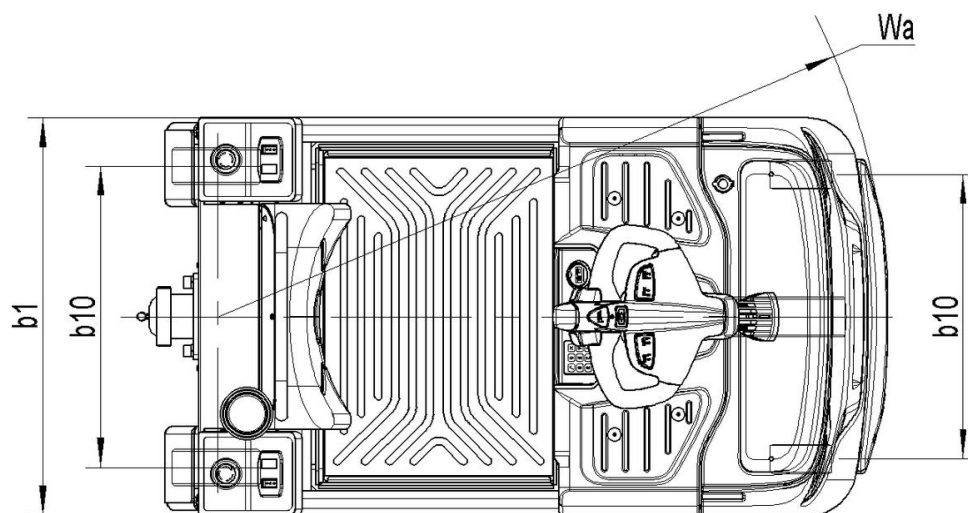
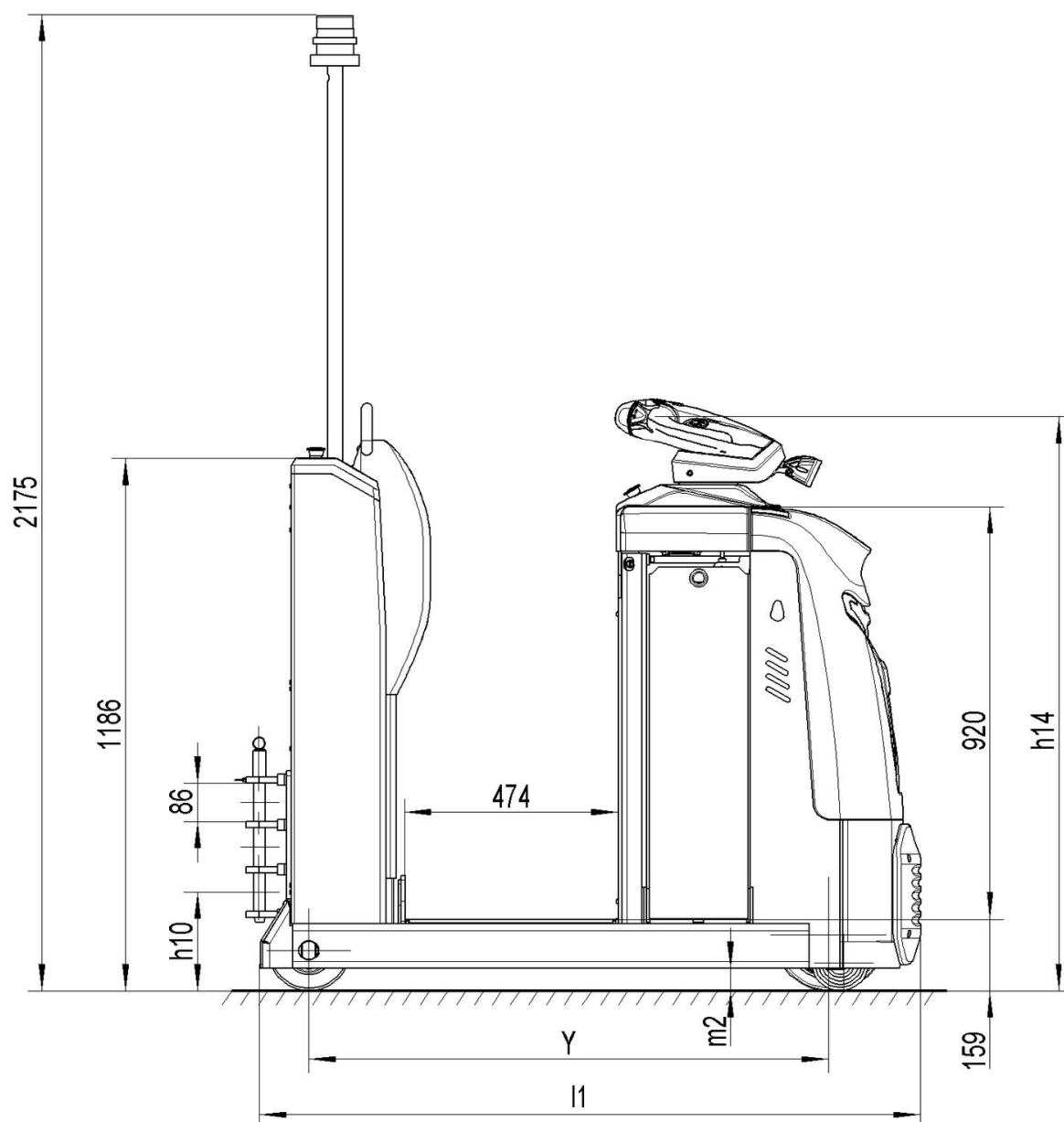
No.	Definition of directions	Note
1	Front	Driving side
2	Rear	Loading side
3	Left	
4	Right	

b. Overview of the main parts



No.		Description	No.		Description
1	●	Load wheel	14	●	Drive wheel
2	●	Draw bar	15	●	Chassis
3	○	Three-color tail-lamp	16	●	Lead-acid battery
4	●	Warning beacon (light)	16	○	Lithium battery
5	●	Backrest	17	●	Rubber mat
6	●	Right protective cover	18	●	Platform
7	●	Tiller	19	●	Storage compartment
8	●	Accessory bar	20	●	Left cover
9	●	Blue-ray light	21	●	Seal part
10	●	Storage compartment	22	●	Sideways control (FW./ BW.)
11	●	Front cover	23	●	Emergency button
12	●	Bumper	24	●	Upper panel
13	●	Side rollers(optional for 30ET-X)	25	●	Pin-code lock
			26	●	Indicator
●: Standard ○: Optional					

C. Main technical data



Type sheet for industrial tractor according to VDI 2198					
Identification	1.2	Model		30ET-X	50ET-X
	1.3	Drive		Electirc	Electirc
	1.4	Manual, pedestrian, stand-on, seated, order picker operation		Stand-on	Stand-on
	1.5	Load capacity/rated load	Q(t)	3.0	5.0
	1.7	Rated drawbar pull	F(N)	800	1000
	1.9	Wheelbase	Y(mm)	1155	1155
Weights	2.1	Net weight incl. battery	kg	950	1020
	2.3	Axle loading, unladen front/rear	kg	550/400	610/410
Wheels/ frame	3.1	Tires		PU	PU
	3.2	Tire size, front	Ø x w (mm)	Ø230×70	Ø250×80
	3.3	Tire size, rear	Ø x w (mm)	Ø180×76	Ø180×76
	3.4	Additional wheels(dimensions)	Ø x w (mm)		Ø124×60
	3.5	Wheels, number front/rear(X=driven wheels)		1x+2/2	1x+2/2
	3.6	Tread width, front	b ₁₀ (mm)	580	580
	3.7	Tread width, rear	b ₁₁ (mm)	614	614
Basic dimensions	4.9	Height of tiller in drive position min./max.	h ₁₄ (mm)	1280	1280
	4.12	Coupling height	h ₁₀ (mm)	230/330/430	230/330/430
	4.19	Overall length	l ₁ (mm)	1429 ¹⁾	1429 ¹⁾
	4.21	Overall width	b ₁ (mm)	810	810
	4.32	Ground clearance, center of wheelbase	m ₂ (mm)	50	50
	4.35	Turning radius	Wa (mm)	1333 ²⁾	1333 ²⁾
Performance data	5.1	Travel speed, laden/unladen	km/h	6/9	7/12
	5.5	Drawbar pull, laden/unladen	N	800	1000
	5.6	Max. drawbar pull, laden/unladen	N	2000	3000
	5.10	Service brake		regenerative	regenerative
Electrics	6.1	Drive motor, output S2 60 min.	kW	1.9	2.6
	6.3	Battery as per DIN 43531/35/36 A, B, C, no		no	no
	6.4	Battery voltage/nominal capacity	V/Ah	24/375	24/465
	6.5	Battery weight	kg	292	352
Misc.	8.1	Type of drive control		AC speedCONTROL	AC speedCONTROL
	8.4	Sound pressure level at operator's ear as per EN12053	dB(A)	<70	<70

1) With bumper l₁=1469mm;

2) With bumper Wa=1359mm;

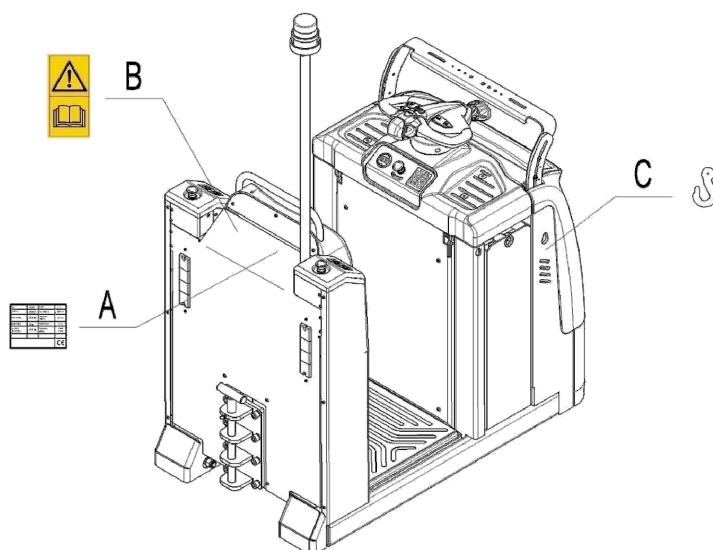
d. Description of the safety devices and warning stickers

- A Identification plate (ID plate)
- B Sticker to read and follow these instructions
- C Crane hook sticker

The tractor is equipped with three emergency buttons (23), pressing any one of the three buttons can turn off all the functions of the tractor.

The tiller of this tractor is equipped with a safety (belly) button (27), which switches the driving function away from the operator, if the tractor travels towards the operator and the tiller is activated in the tiller's operating position.

Follow also the instructions given on the stickers.
Replace the stickers if they are damaged or missing.



Identification plate

	
477, Bundangsuseo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, 13553, Korea MADE IN CHINA	
	
MODEL:	
TYPE: ELECTRIC PALLET TRUCK	
PRODUCT IDENTIFICATION NUMBER 	
Load capacity	kg
Lift Height	mm
Truck Weight (without battery)	kg
Max Battery Weight	kg
Min Battery Weight	kg
Voltage V	Rated Power kW
Year of construction	

3. WARNINGS, RESIDUAL RISK AND SAFETY INSTRUCTIONS



DO NOT

- Place your feet or hands under the tractor.
- Allow other person than the operator to stand in front of or behind the tractor when it is moving.
- Overload the tractor.
- Lift people. People could fall down and suffer severe injury.
- Push or pull loads.
- Drive laterally or diagonally on ramps.
- Refit the tractor without manufacturer's written consent.
- Leave the tractor for a long time without turning off the power.
- Operate the tractor without safety shoes.

4. COMMISSIONING, TRANSPORTING, DECOMMISSIONING

a. Commissioning

Type	30ET-X	50ET-X
Commissioning weight [kg](lbs)	Around 990 (2183)	Around 1050(2315)
Dimension [mm] (in)	1500X840X1500 (59x33x59)	1500X840X1500 (59x33x59)

After receiving the new tractor or for re-commissioning, you have to do followings before (firstly) operating the tractor:

- Check if all parts are included and not damaged.
- Check if all functions of the tiller work normally.
- Check if proper batteries and chargers are used.
- Do the work according to the daily inspections as well as functional checks

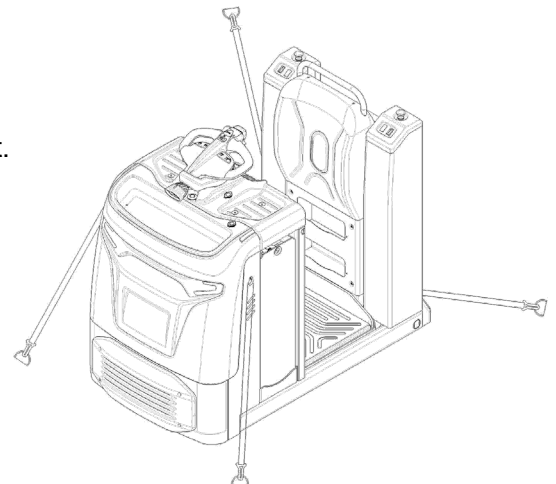
b. Transportation

Use proper crane equipment or forklift to place the tractor on the vehicle or other equipment for transportation, and fix the tractor as required.



During transportation on a lorry or truck always fasten the tractor securely.
Fix the tractor with a wedge in case of accidental movement.
The lashing band used should be strong enough.
Fix the loading and unloading AIDS (pallets, wedges) with anti-slide materials.

Fasten the tractor with lashing band according to the picture



on the right, find the proper location for the lashing band.
Or fasten the tractor via the man-up platform with lashing band.

C. Decommissioning

Remove the trailer before storing the tractor. Grease all greasing points mentioned in this manual (regular inspection), eventually protect the tractor against corrosion and dust. Remove the batteries and jack the tractor safely, so that there will be no flattening after storage.

For final decommissioning hand the tractor to a designated recycling company. Oil, batteries and electric components must be recycled due to legal regulations.

5. DAILY INSPECTION

This chapter describes pre-checks before operating the tractor.

Daily inspection is effective to find the malfunctions or faults on this tractor. Check the following items before operation.



DO NOT USE THE TRACTOR IF ANY MALFUNCTION IS FOUND.

- Check for scratches, deformation or cracks.
- Check the vertical creep of the tractor.
- Check the smooth movement of the wheels.
- Check the function of the emergency brake by activating the emergency button.
- Check the braking function of proximity switch of the tiller.
- Check if all bolts and nuts are tightened firmly
- Visual check if there are any broken electric wires.

6. OPERATING INSTRUCTIONS



ONLY PEOPLE TRAINED CAN OPERATE THE TRACTOR. BEFORE OPERATING THIS TRACTOR, PLEASE FOLLOW THE WARNINGS AND SAFETY INSTRUCTIONS (CHAPTER 3).

Operate the tractor with safety shoes.

Non-trained personnel are not allowed to operate and drive the tractor.

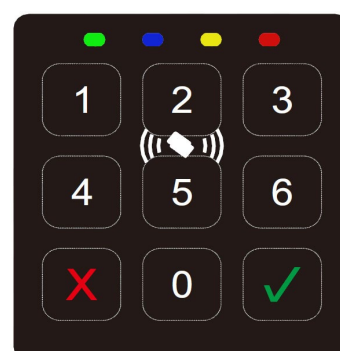
Lifting people is not allowed.

Stop operating immediately if any damages or defects are found, and report to the superior.

Modification or repair for the tractor without manufacturer's authorization is not allowed.

a. Pin-code lock Settings

The initial password of the pin-code lock is "1234", which should be changed after starting the tractor for the first time. The new password should not be the same as the administrator password. Please consult your local dealer or call the service hotline for the



administrator password.

Pin-code lock supports additional ID cards, password entry, pass-word modification and password reset.

Register additional ID cards: in standby mode, correctly enter the administrator password, press "√" button, the yellow indicator will flash, and then enter "3", press "√" button, the yellow indicator will continue flashing to enter the mode of registering additional ID card. At this time, put the additional ID card close to the pin-code lock and take it away. Press "x" button, the yellow indicator will be off and exit the mode of registering additional ID card, or wait for 5 seconds after the card is successfully registered, then the system will exit the current mode automatically.

Password entry: in standby mode, correctly enter the administrator password, press "√" button, the yellow light will flash, and then press "1" and "√" button, the yellow indicator will continue flashing to enter the mode of password entry. At this time, enter a 4-digit-code in turn and press "√" button, the password entry is successfully done if the buzzer rings once. Pin-code lock can support up to 10 sets of passwords. After recording 10 sets of passwords, the newly entered passwords will be overwritten one by one from the first set, please save the passwords that have been set.

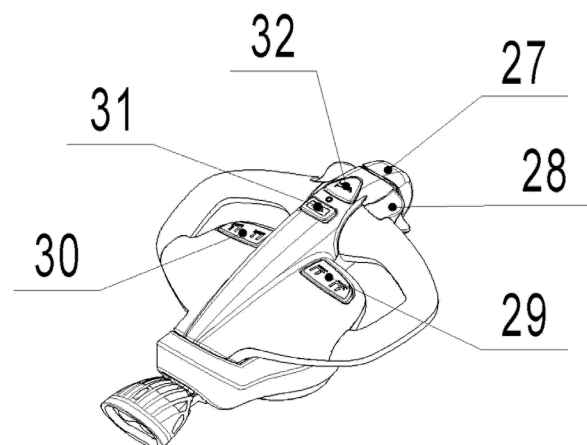
Password modification: in standby mode, correctly enter the administrator password and press "√" button, the yellow indicator starts flashing. Then press "2" button and "√" button, the yellow indicator continues flashing and entering the password modification mode. Enter the initial password and press "√" button, the buzzer will ring once. Then enter new password and press "√" button, after the one-time ring of the buzzer, the yellow indicator will be off and the password is successfully modified.

Password reset: in standby mode, correctly enter the administrator password and press "√" button, the yellow indicator starts flashing, and then press "0" button. The buzzer will ring once, which indicates that the passwords set by users are cleared and reset as initial password "1234".

As shown in the figure above, the four indicators on the pin-code lock are green indicator (power), blue indicator (working), yellow indicator (waiting) and red indicator (error).

b. Starting

After completing daily inspection, turn on emergency stop switch (23) to make the tractor connected to the power and standby. Enter the correct password and press "√" button and the buzzer rings once, the green indicator is on and the tractor is successfully started. Or put ID card close to the pin-code lock, after the buzzer rings once, the green indicator is on and the tractor is successfully started. Before starting the tractor, check if there is safety hazard around the tractor, and then press the horn button (32) to send out the warning signal of the working tractor.



c. Driving



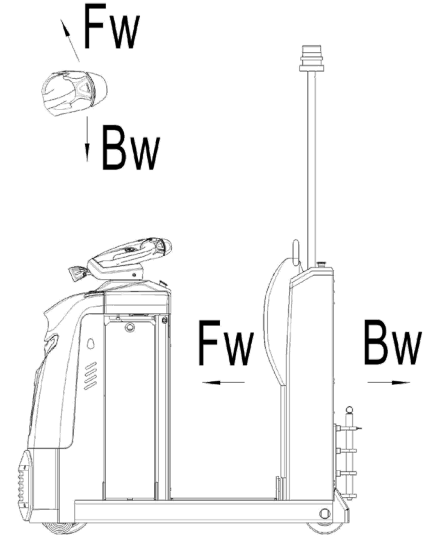
Do not overload.

Do not drive or park the tractor laden for a long time on ramps.

Slowly push the accelerator knob (28) to control the driving speed until reach the desired speed. If the accelerator knob is back to the neutral position, the controller slows the tractor until it stops. If the tractor stops, the parking brake starts working. Please carefully drive the tractor to your destination, watch the route conditions and adjust the driving speed via the accelerator knob operation.

Press "turtle speed" button (31) to activate the turtle speed function. The indicator turns red and the maximum speed of the tractor decreases; When press turtle button (31) again, the turtle speed function is closed, the indicator turns green and the maximum speed of the tractor will be as the initial speed.

Each time the tractor is restarted, the turtle speed function activated last time will be invalidated and needs to be reactivated for turtle speed. In addition, the turtle speed button can only be activated and closed when the accelerator knob (28) is released.



d. Steering

Steer the tractor by moving the tiller (7) to left/ right side. Left/ right rotation limit of the tiller is 60° , corresponds to the 90° left/ right rotation limit of the drive wheel.

If you steer the tiller when driving the tractor, the speed of the tractor will be gradually decreased with the increase of steering angle.

e. Braking

Braking performance depends on road conditions and the load conditions and speed of the tractor.

The braking function can be activated by several ways below:

- Operate the accelerator knob (28) back to the neutral position or release the accelerator knob, the regenerative braking is activated. The tractor brakes until it stops.
- Operate the accelerator knob (28) from one driving direction directly to the opposite direction, the regenerative braking is activated and the tractor starts driving into the opposite direction.

f. Parking



Do not park the tractor when on ramps.

Operators are not allowed to leave the tractor for a long time without power supply park

The tractor on firm and level ground.

Press emergency switch (23) if the operator is to leave the tractor for a long time.

g. Malfunctions

If there are any malfunctions or the tractor is inoperative, please stop using the tractor and press the emergency button (23). If possible, park the tractor on a safe area.

Inform immediately the manager and, or call for after-sales service. If necessary, tow the truck out of the operating area by using specific towing/ crane equipment.

h. Emergency

If emergency switch (23) is pressed during driving operation, the tractor will be stopped with maximum braking power, so the loads may drop off from the tractor or trailer, so emergency switch (23) cannot be used as the brake during driving.

Emergency switch (23) can only be used under dangerous conditions during driving.

If emergency switch is damaged or out of reach, there will be risk of accidents.

7. BATTERY MAINTENANCE, CHARGING AND REPLACEMENT



- Only trained technicians are allowed to maintain, charge or replace the battery.
- Recycling of batteries undergoes national regulations. Please follow these regulations.
- Protect batteries away from open fire for battery disposal, otherwise it will cause explosion.
- Smoking and open fire is not allowed around the battery. Keep the inflammable materials or equipment that is easily catching sparkles 2m away from the charging place. And the charging place must be ventilated and equips with fire extinguishers.
- Before finishing the maintenance work, make sure, that all cables are connected correctly and that there are no disturbing towards other components of the tractor.



The weight of the battery has great influence on the safety, stability and load capacity of the tractor.

Please consider the maximum operating temperature of the battery and check the battery manufacturer's manual for details.

If the tractor equips with lithium battery, please follow the lithium battery manual to maintain, charge and replace the battery.

a. Maintenance

Lead-acid battery terminals, cable terminals and battery caps must be fasten and clean, and properly grease these parts.

- For normal operation, add water once every 2 weeks; under high temperature or high intensity working conditions, add water once a week.
- Water should not exceed the maximum level.
- Better to add water in the last period of charging.

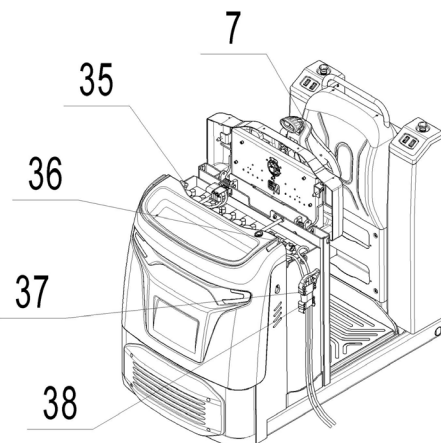
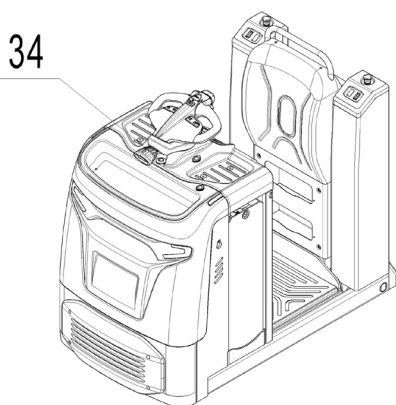


- Add deionized water (distilled water), do not add purified drinking water or acid liquid.
- Check details in the battery manual for other maintenance requirements.

b. Charging



- It is only allowed to use the supplied charger for charging the battery.
- The room where you are charging must be ventilated.
- Keep the inflammable materials or explosive articles 2m away from the charging place.



Park the tractor securely and switch off the tractor with pressing the emergency button (23). Press lock catch (34) and lift the tiller (7) to open the console. Unplug the battery connector (37) and connect it to the charger for charging. Battery assembling is in the opposite order.

c. Replacement

Take out the battery and place it on the equipment for battery replacement safely, and ensures that the battery replacement device does not move during the battery replacement.

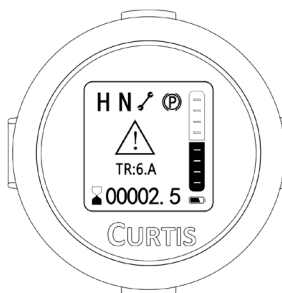
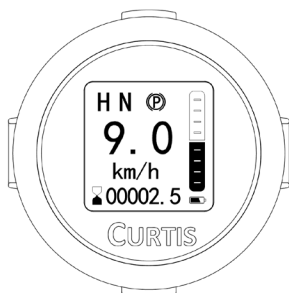
Incorrect use of the device may cause the battery being tipped over!

To remove the battery, press lock catch (34) and lift the tiller (7) to open the console. Flip the pad (35), loosen the battery lock lever (36) and turn it over, then remove the battery from the side of the tractor.

Battery assembling is in the opposite order.

d. Battery indicator

Indicator



Indicator

When the remaining battery power is more than 70%, the indicator shows the same value of battery power as the value before charging if the battery is charged.

Only when the remaining battery power is less than 70%, the indicator shows the correct value of battery power if the battery is charged.

e. Description of the lithium-ion battery

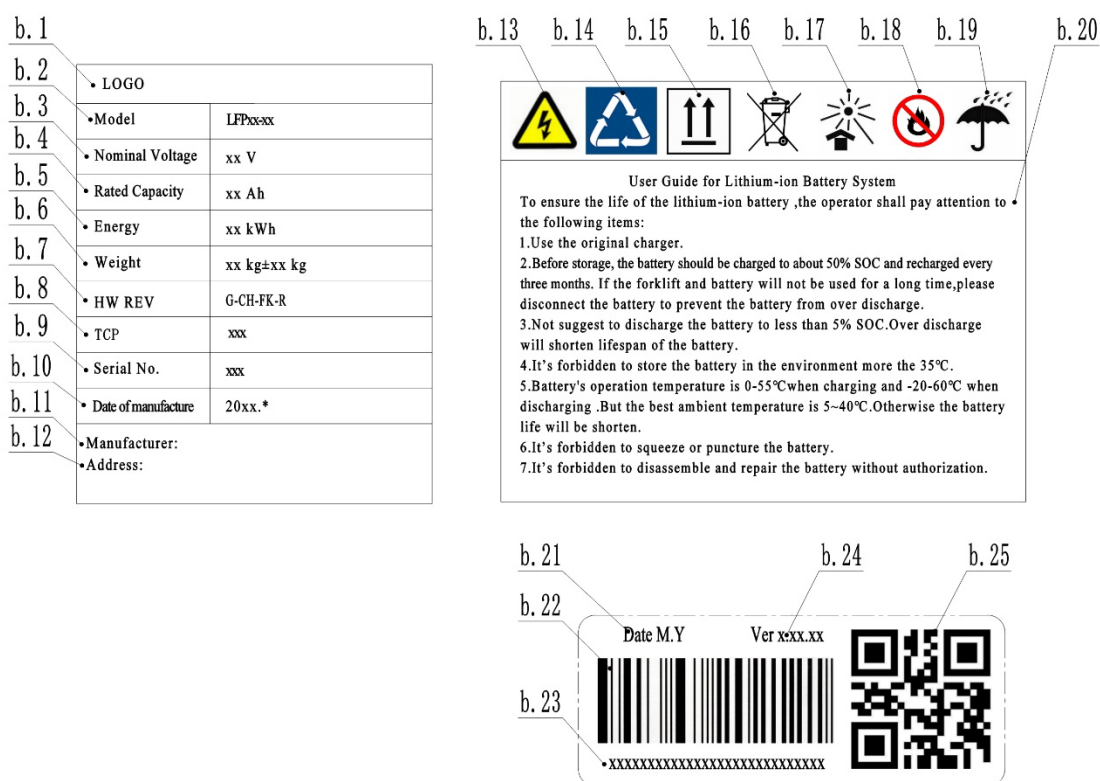
The lithium-ion battery is a battery with rechargeable cells, the battery is designed for industrial trucks and can withstand related vibrations during operation. The battery is equipped with special connections for charging and discharging operations. Do not try to install or connect improper connectors to the battery.

The battery is equipped with BMS – battery management system, which performs the control of battery condition and implements related safety protocols to protect the battery and cells from damages caused by operation or environmental conditions. The BMS controls the following safety functions and conditions: voltage, temperature, under voltage, over voltage, over temperature, over current, short circuit, etc. The internal resistance of lithium battery is generally low, which minimizes heat generation and maximizes the available power of the truck.

Temperature range for using the battery is from +5°C to +40°C. Low temperatures reduce the effective battery capacity, high temperatures reduce the battery's life time. The temperature difference between the two sides of the battery shall not exceed 5°C.

Only approved battery chargers must be used to charge the lithium battery.

Battery Decals



Item	Description	Item	Description
b.1	Manufacturer logo	b.14	Rechargeable logo
b.2	Battery model	b.15	Vertical upward packing, transportation
b.3	Nominal voltage of battery	b.16	No putting into ordinary garbage bins
b.4	Rated capacity of battery	b.17	No long-term exposure to sunshine
b.5	Battery energy of battery	b.18	Stay away from fire
b.6	Weight of battery	b.19	Keep out of the rain
b.7	Configuration of battery	b.20	Guide to use
b.8	Protocol version of battery	b.21	Production date
b.9	Production serial No.	b.22	Battery information bar code
b.10	Production date	b.23	Bar code interpretation
b.11	Name of manufacturer	b.24	Software version of battery
b.12	Manufacturer's address	b.25	Battery information by 2D code
b.13	Electrical hazard marker		

Service mass is indicated on the battery data plate, the center of gravity is located approximately at middle of the battery case.

Safety Instructions, Warning Indications and other Notes

Safety regulations for handling lithium-ion batteries

Do not try to make any repairs or servicing of lithium batteries. Replacement of parts is not assumed.



Risk of electric shock and burning

The battery's charging and discharging connectors have open terminals, avoid any body contacts, contamination or direct contacts with objects which can cause short circuit connection of terminals. Use necessary pre-cautions and protective caps to secure the open terminals. The connectors should be maintained in clean and dry conditions.



Use only batteries designed and approved by the manufacturer for the truck.

Do not try to modify or alter the battery.



Any damage or defects to the charger can result in accidents. Use only charger approved by the manufacturer of the truck, which is suitable for used battery.

In case charger has any damages or defects, exclude the charger from operation and contact your service provider. Do not modify or try to repair the charger.



Improper use of charger or use of wrong charger can cause damages to a battery or charger. Follow the required charger specifications; If the operation voltage of the charger is out of the applicable voltage range, the charger or battery may be damaged causing serious safety risks. The charger in use must be approved by the battery (truck) manufacturer.

Reversed connection of charging plug is prohibited. Follow the instruction for correct connection. For disconnection of charging plug use dedicated grip and never pull out the plug by means of cable.

Stop charging immediately if any abnormalities are detected, e.g. severe temperature increase, deformation of battery case, smoke, noise etc.



Intermediate charging

Lithium batteries support so called opportunity charging. The lithium battery, which is not fully discharged can be charged in any time. However, frequent opportunity charging not to the full charging state and stop of charging process before the appearance of corresponding indication of charger may result in dis-balance voltage of cells which increases the battery BMS calculation error. In order to effectively deal with this phenomenon, charge the battery in full allowing the automotive balancing process to be completed at least once a week.



Do not charge a fully charged battery

Note that in order to prevent the battery from continuing restart of charging under fully charged condition causing reduction of battery lifetime, the BMS has a protection function that prohibits recharging of fully charged battery. The charger will not work while battery is fully charged.

Potential hazards

If equipment is used according to its design purpose, following the correct operations procedures, there are no hazards anticipated.

The following hazards can arise in the event of improper use:

- Physical damage to the battery in case a battery falls or is deformed through impacts. Mechanical damages can cause leakages of harmful materials, fire or battery explosion.
- Short circuits may be caused by short connection of battery terminals, for instance, by water or other intentional/unintentional short connections.
- Temperature damages caused by placing of batteries in overheated environment conditions or being exposed to impact of fire, open sunlight etc. can cause leakages of harmful materials, fire or battery explosion.

In order to avoid fire, explosion and/or leakage of harmful materials, a safe place for storing non-functional or damaged batteries until the service arrives on site must satisfy the following criteria:

- Do not store in places where personnel is located.
- Do not store in places with valuable objects and close to valuable objects.
- A Class D fire extinguisher must be available on demand.
- There should not be any fire or smoke detectors in the storage area in order to ensure that an automatic fire detection system is only activated in the event of actual danger (e.g. flames).
- No ventilation intake pipes should be in the facility to exclude spreading of discharged content within a building.

Examples of where to store a non-functional battery:

- Roofed outdoor position.
- Ventilated container.
- Covered fire resistant box with pressure and smoke discharge option.

Symbols - Safety and Warnings

	Used lithium-ion batteries must be treated as hazardous waste. Lithium-ion batteries marked with the recycling symbol and the sign showing a crossed-out waste bin must not be disposed of with ordinary household waste.
	Avoid fire and short circuits causing overheating. Do not ignite or locate batteries close to open flame, heat sources or sparks. Keep lithium-ion batteries away from heat sources.
	Caution! Battery short-circuit is prohibited.
	Protect the lithium-ion battery from solar radiation or other forms of heat radiation. Do not expose the lithium-ion battery to heat sources.

Explosion and fire hazard



Physical damage, thermal impacts or incorrect storage in the event of a defect can result in explosions or fire. The battery materials can be flammable.

Particular hazard from combustion products

The lithium batteries may be damaged by a fire. When extinguishing a lithium battery fire, the following information must be taken into consideration.



Contact with combustion products can be hazardous

Fire produces combustion products, which can occur in the form of smoke, through leaking fluids, escaping gases, debris as well decomposition products of certain chemicals. These combustion products are substances that enter the body through the respiratory tract and/or the skin, can produce and adverse effects such as choking.



Avoid contact with combustion products.

Use protective equipment.

Special firefighting protective equipment

Use self-contained breathing apparatus.

Wear protective equipment.

Additional firefighting instructions

To prevent secondary fires, the lithium-ion battery must be cooled from the outside.

Suitable extinguishing agents

- Carbon dioxide extinguisher (CO₂)
- Water (not on mechanically opened or damaged batteries)

Unsuitable extinguishing agents

- Foam
- Grease fire extinguishing agents
- Powder extinguishers
- Metal fire extinguishers (PM 12i extinguishers)
- Metal fire powder PL-9/78 (DIN EN 3SP-44/95)
- Dry sand

Instructions for cooling an overheated, non-physically damaged battery

This type of damage may be caused by a short circuit inside the battery, which may result in leakage of harmful materials, fire or battery explosion.

Material discharge



Battery electrolyte fluid can be hazardous

Electrolyte fluid can be discharged if the battery is physically damaged. Avoid its contact with skin or eyes. If the contact happened:

- Rinse the affected parts with big amount of water and request for medical assistance immediately.
- In case of skin irritation or if any substances are breathed in request the medical assistance immediately.

Precautionary measures for personnel

- Keep personnel away, avoid any contact with smoke or discharged materials.
- Block off the affected area and ensure its reasonable ventilation.
- Wear personal protective equipment. If vapors, dust or aerosols are presented use self-contained breathing apparatus.

Precautionary measures for the environment

Do not allow spilled fluids to enter the water system, drainage system or the underground water.

Cleaning measures

The leaked fluid must be removed professionally following the related protocols.

Battery lifetime, maintenance and storage

The lithium-ion batteries are maintenance-free.

Deep discharge can damage the battery

Self-discharge without periodical recharge can lead the battery to fully discharged state. Full discharge shortens the service life of the battery and can cause deep discharge and activation of related safety protocols when battery will not be able to be charged anymore.

Before a long period of inactivity, the battery must be charged to 40%~60%.

Control the level of battery charge at least every 12 weeks and re-charge if necessary.

The temperature range for storing of the battery should be within the range of 0°C to 30°C.

If the battery is deeply discharged or if the battery temperature is below the permissible level, the battery cannot be charged. Deeply discharged batteries can never be charged. Due to the risk of condensate formation, batteries that have been stored at 0°C or below must only be charged after natural warming up to at least +5°C, forced heating is forbidden.

Instructions for safe handling of batteries

- Do not modify the battery.
- Do not open, damage, drop, penetrate or deform the battery.
- Do not throw the battery into a fire.
- Protect the battery from overheating.
- Protect the battery from direct sun light.
- Follow storage and charging procedures
- Protect the battery from water damages and other impacts

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

Pre-shift checks before the system is put into operation

Check that the battery is in its normal condition, has no evidence of damages, leakages, abnormal findings, e.g. high temperature, smell, smoke etc. The surface of the battery should be clean and dry, without evidence of water damages, marks of rust on terminals and housing (if applicable). Connecting cables and plugs are in good condition.

Faults



If any damage is found to the battery or battery charger contact the service provider immediately.

Do not open the battery or attempt to repair it.

Disposal and transport of a lithium-ion battery

Instructions for disposal

Lithium-ion batteries must be disposed in accordance with the relevant national environmental protection regulations. Batteries must be treated as hazardous waste. Batteries must not be disposed with ordinary waste.

Shipping information

The lithium-ion battery is a hazardous material. The applicable regulations must be fulfilled during transportation.

Shipping functional batteries

Functioning batteries can be shipped in accordance with the related regulations

Shipping faulty batteries

To transport faulty lithium-ion batteries, contact the service provider. Faulty lithium batteries require following of special transporting procedures.

8. REGULAR MAINTENANCE



- Only trained personnel are allowed to do maintenance on this tractor.
- Before maintaining, turn off the power and remove the trailer from the tractor.
- If you need to lift the tractor, please use the specific binding equipment or lifting equipment mentioned in Chapter 4. Before lifting the tractor, please put the safety device (for instance designated jack, wedge, or wooden blocks) under the tractor to avoid accidental fall, movement or sliding.

- Use approved and from your dealer released original spare parts.

If you need to replace the wheel, please follow the instructions above. Casters must be round and free from abnormal wear.

Check the key items emphasized in the maintenance checklist.

a. Maintenance checklist

MAINTENANCE CHECK LIST		Interval (Month)			
		1	3	6	12
Mechanical system					
1	Check the chassis for deformation and cracks		•		
2	Check if all screws are fixed		•		
3	Check the gearbox for noise and leakage		•		
4	Check the wheels for deformation and damages		•		
5	Check and lubricate the steering bearing				•
6	Check and lubricate the grease nipple	•			
Electrical system					
7	Check if the electric wiring is damaged		•		
8	Check the electric connections and terminals		•		
9	Test the emergency switch function		•		
10	Check the electric drive motor for noise and damages		•		
11	Test the display		•		
12	Check if correct fuses are used		•		
13	Test the warning signal		•		
14	Check the contactor (s)		•		
15	Check if the chassis is conductive (insulation test)		•		
16	Check functions and mechanical wear of the drive controller		•		
17	Check the electrical system of the drive motor		•		
Braking system					
18	Check brake performance, if it is necessary to replace the brake disc or adjust the air gap		•		
Battery					
19	Check the battery voltage		•		
20	Clean and grease the terminals and check for corrosion and damages		•		
21	Check the battery housing for damages		•		
22	Check if it is necessary to add distilled water	•			
Charger					
23	Check the main power cable for damages			•	
24	Check the fail-safe protection during charging			•	
Functions					
25	Check the horn function	•			
26	Check the air gap of the electromagnetic brake	•			
27	Test the emergency braking	•			
28	Test the reverse and regenerative braking	•			
29	Test the safety (belly) button function	•			
30	Check the steering function	•			
31	Check the function of proximity switch of the tiller	•			
General					
32	Check if all stickers are clear and complete	•			
33	Inspect the castors and adjust the height, replace the worn casters		•		
34	Carry out a test run	•			

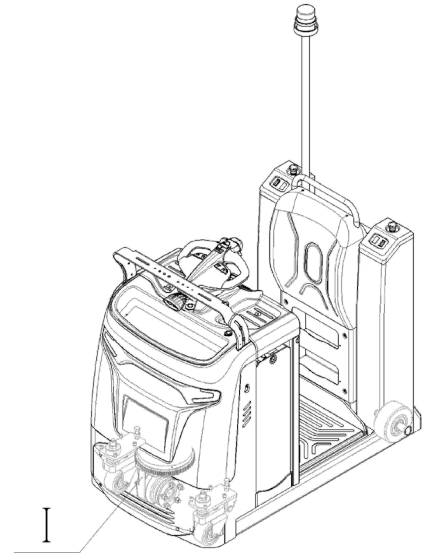
b. Lubricating points

Lubricate the marked points according to the maintenance checklist. The required grease specification is: DIN 51825, standard grease.

1. Driving wheel
2. Steering wheel
3. Driving wheel

I . Gearbox

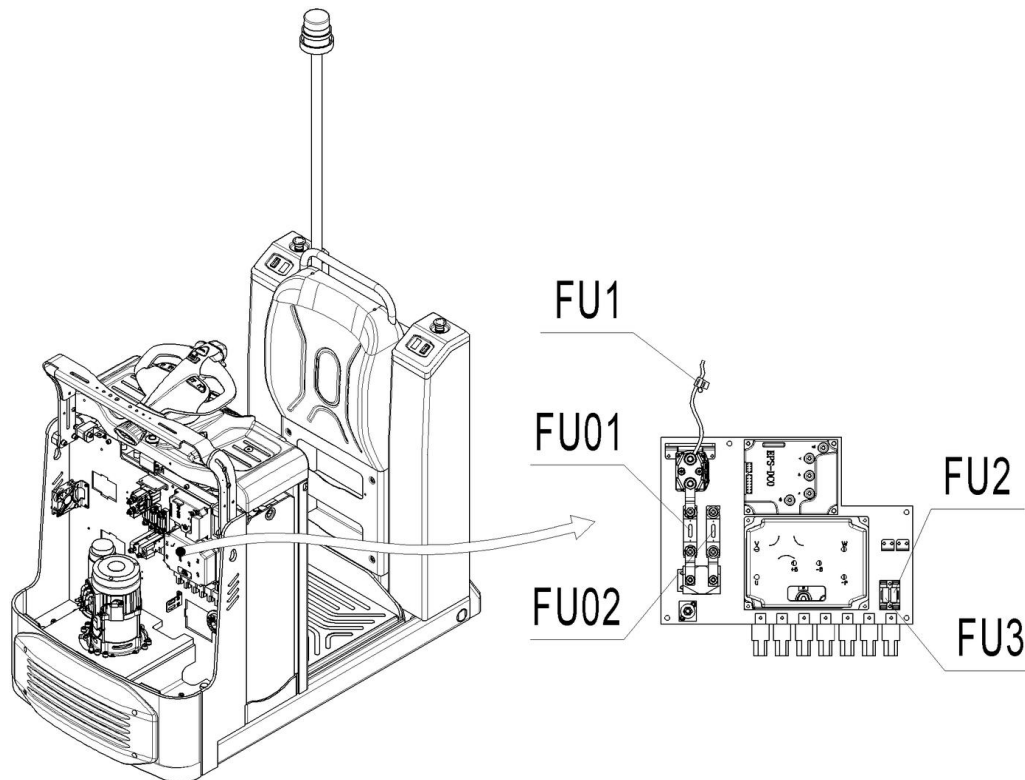
Waste material like used oil, waste batteries or others must be properly disposed and recycled according to the national regulations and if necessary brought to a recycling company. The oil level in the oil tank should not be under the min marks for starting the tractor.



C. Checking electrical components and fuses

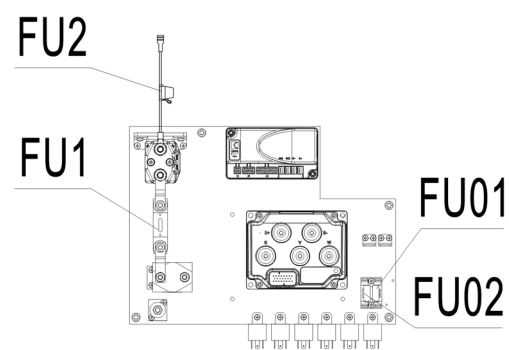
Remove the front panel, the fuses are located as shown in the following figure.

1) ZAPI CONTROLLER



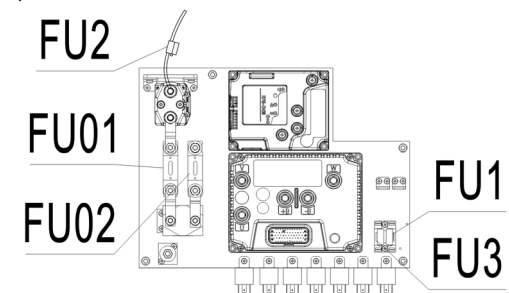
Fuse	Specification
FU1	10 A
FU2	10 A
FU3	15 A
FU01	350 A
FU02	30 A

2) 30ET-X



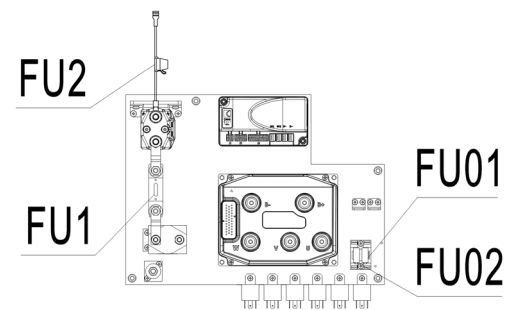
Fuse	Specification
FU1	350A
FU2	30A
FU01	10A
FU02	15A

3) ZAPI CONTROLLER



Fuse	Specification
FuseFU01	350A
FuseFU02	30A
FuseFU1	10A
FuseFU2	10A
FuseFU3	15A

4) 50ET-X



Fuse	Specification
FU1	350A
FU2	30A
FU01	10A
FU02	15A

9. TROUBLE SHOOTING

Fault	Possible cause	Solution
The truck cannot move	The battery connector is not connected well	Check and well-connected the connector well
	The emergency switch is pressed	Release emergency switch
	The pin-code lock is not activated	Activate the pin-code lock
	Low battery	Check SOC and must charge the battery
	Protection device is damaged	Check the protection device
Low driving speed	SOC is under 10%	Charge the battery
	Turtle speed button is pressed	Release turtle speed button
Drive wheel slippage	Overload	Remove load that exceeds the rated capacity
	Floor is not clean	Clean the floor
	Pits on the floor	Remove the trailer and drive out of the pit
	Low ground clearance for side wheels	Adjust ground clearance for side wheels

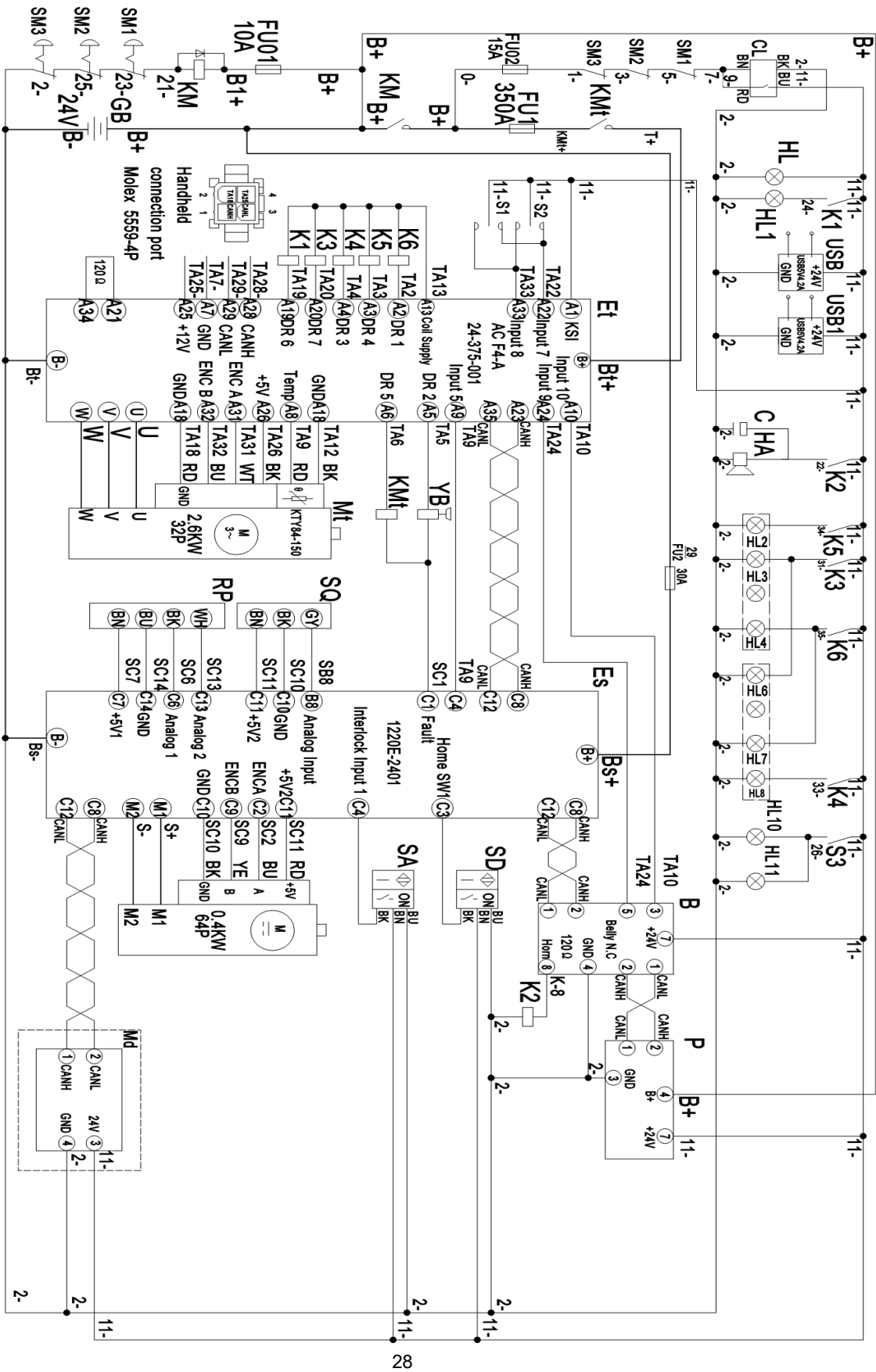
If you are unable to troubleshoot the tractor after trying all the solutions listed above, contact your local dealer or our after-sales department, who will be responsible for further troubleshooting.

In order to find out the cause of the fault more accurately and quickly, please provide the following important information when you are to contact the local dealer or the after-sales department::

- Serial number of the truck (on the ID plate);
- Fault code on the indicator display;
- Description of the fault;
- The specific part of the tractor with fault;
- Contact details.

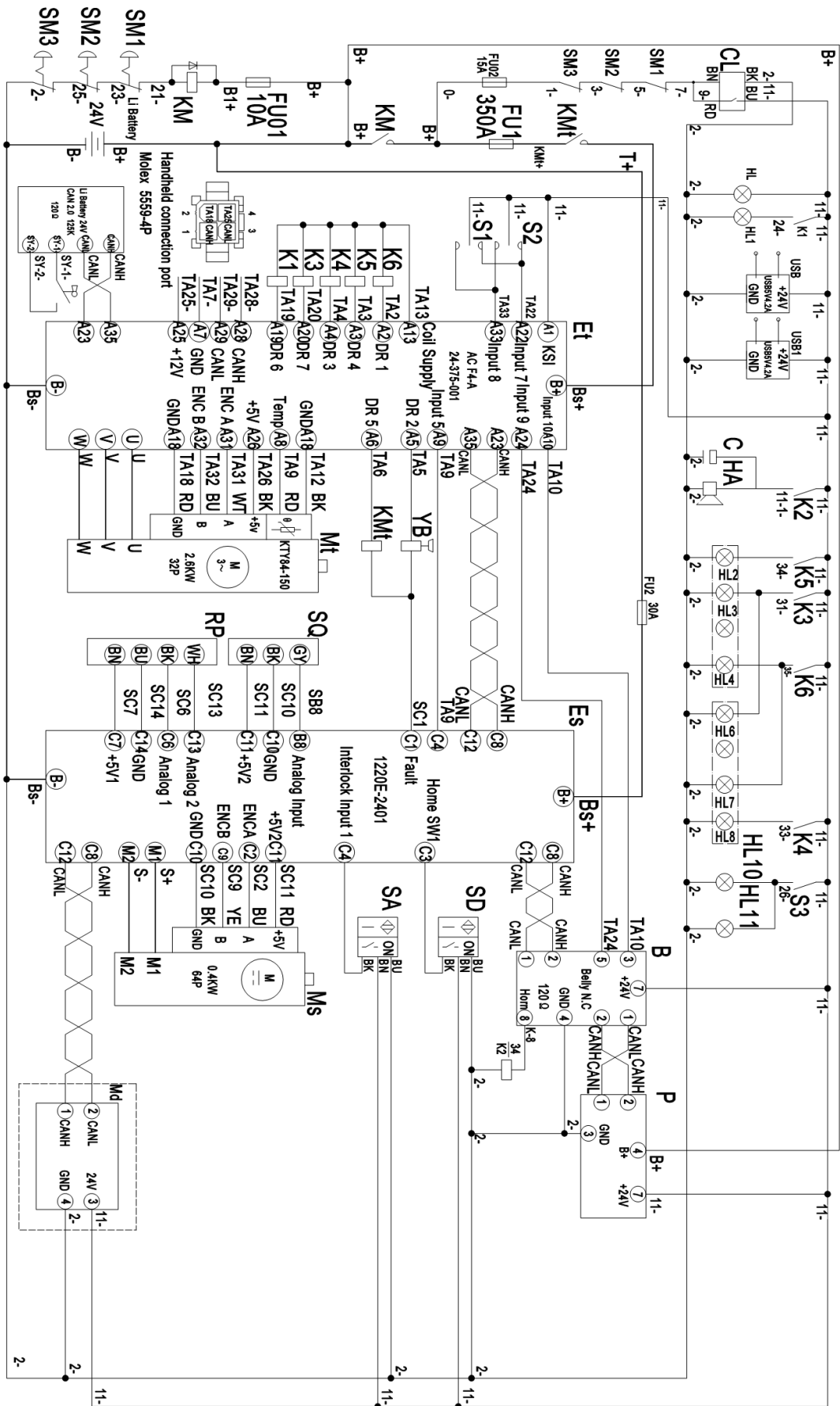
10. WIRING/ CIRCUIT DIAGRAM

a. 50ET-X(Lead-acid battery)circuit diagram



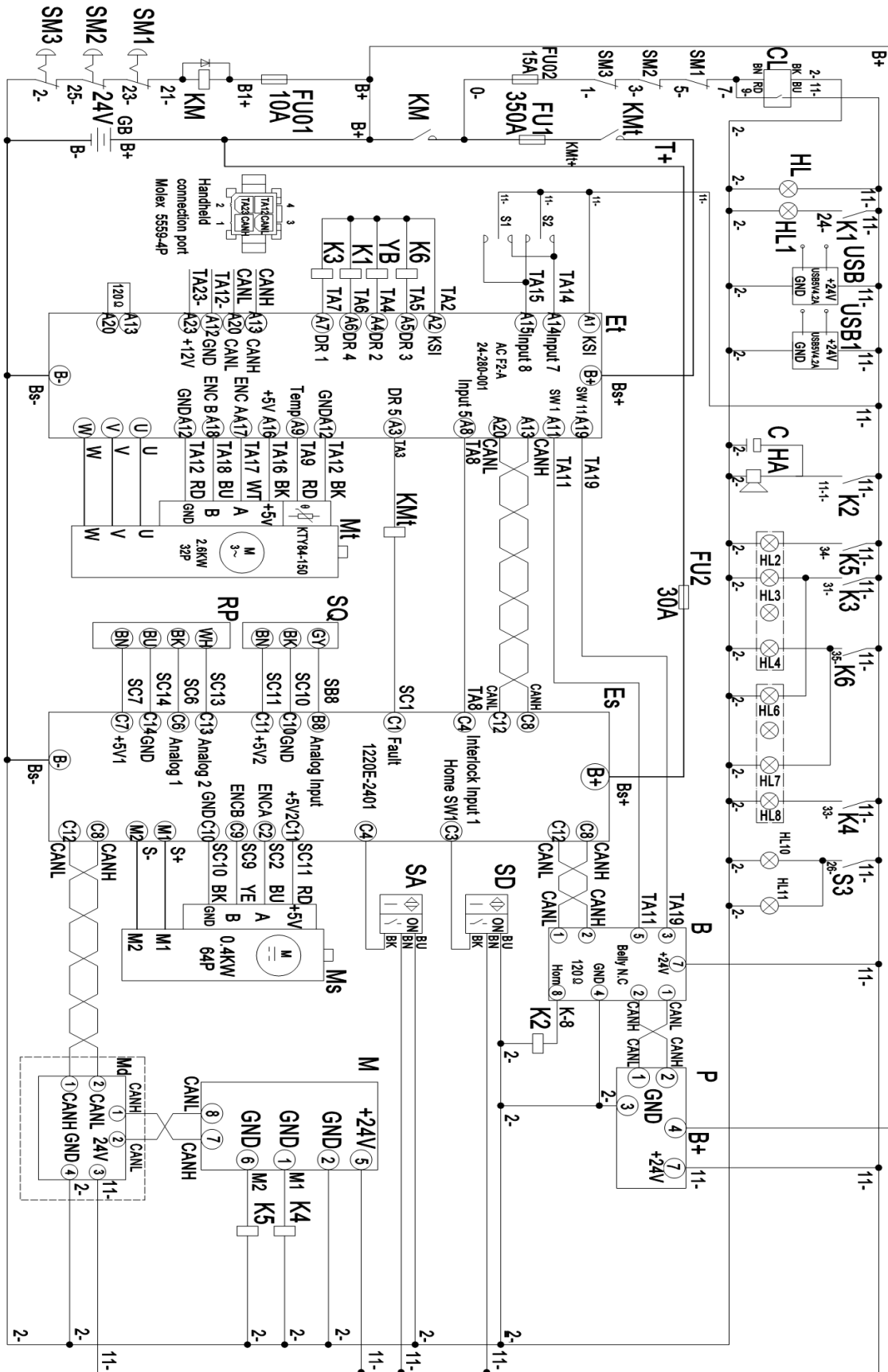
No.	Code	Name	No.	Code	Name
1	CL	Password lock	21	YB	Elec. brake
2	SM1、SM2、SM3	Stop switch	22	Mt	Traction motor
3	FU02	Fuse15A	23	HL2、HL3、 HL5、HL6、 HL8、HL9	Tri-color Taillight
4	KMt	Main contactor	24	SQ	Position sensor
5	FU1	Fuse350A	25	RP	Potentiometer
6	KM	Main contactor	26	Es	Steering controller
7	FU01	Fuse10A	27	HL10、HL11	Headlamp
8	GB	Battery24V	28	B	Tiller
9	HL	Warning lamp	29	FU2	Fuse30A
10	HL1	Blue lamp	30	SD	Mid-position switch
11	S1、S2、S3	switch	31	SA	Pedal switch
12	K6	Interlock Relay	32	Ms	Steering motor
13	K5	Left turn light Relay	33	P	Indicator
14	K4	Right turn light Relay	34	K2	Horn Relay
15	K3	Astern Relay	35	Md	Lot terminal
16	K1	Blue lamp Relay			
17	USB、USB1	USB			
18	Et	Traction controller			
19	C	Capacitance			
20	HA	Horn			

b. 50ET-X (Lithium battery) circuit diagram



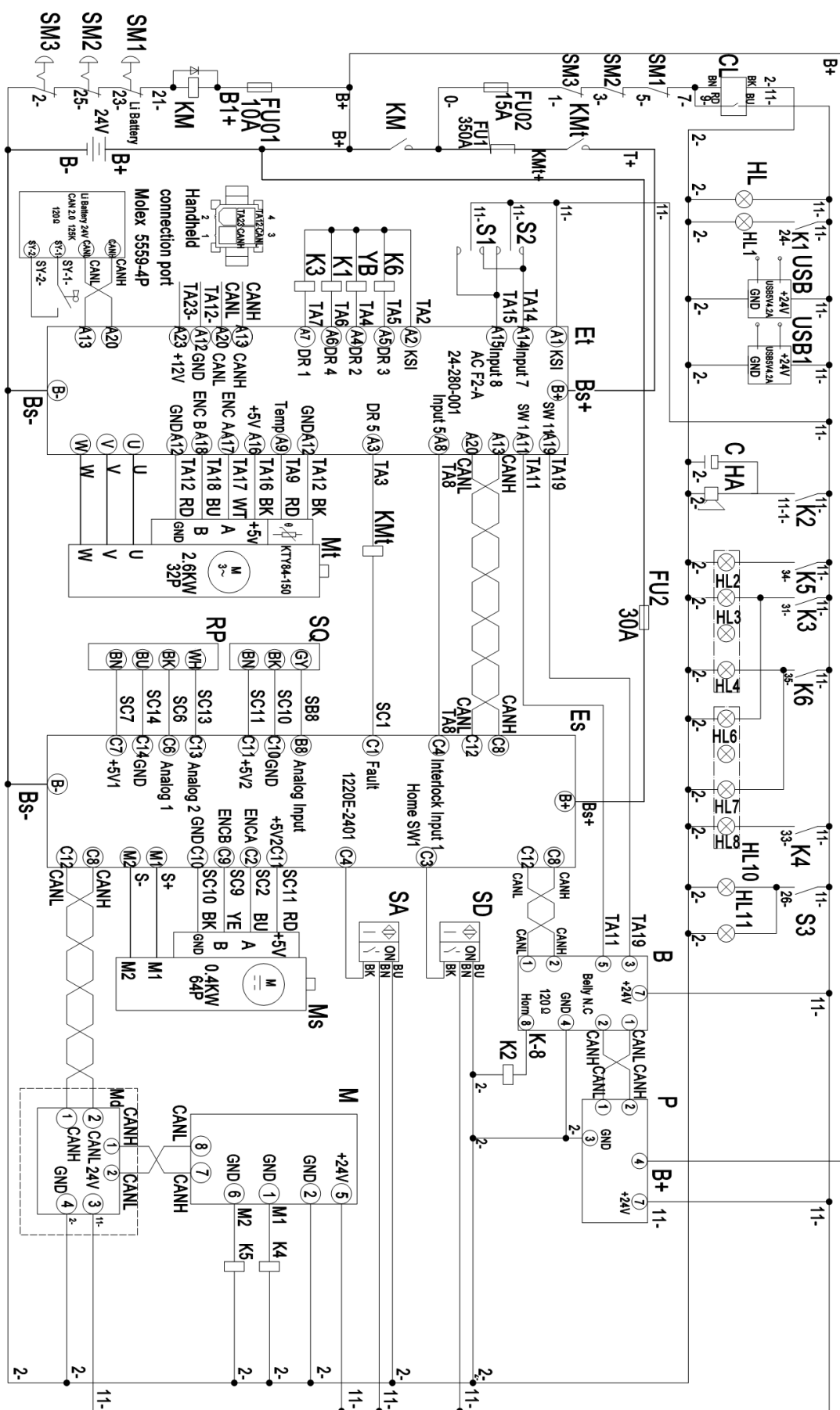
No.	Code	Name	No.	Code	Name
1	CL	Password lock	21	YB	Elec. brake
2	SM1、SM2、SM3	Stop switch	22	Mt	Traction motor
3	FU02	Fuse15A	23	HL2、HL3、 HL5、HL6、 HL8、HL9	Tri-color Taillight
4	KMt	Main contactor	24	SQ	Position sensor
5	FU1	Fuse350A	25	RP	Potentiometer
6	KM	Main contactor	26	Es	Steering controller
7	FU01	Fuse10A	27	HL10、HL11	Headlamp
8	Li Battery	Battery24V	28	B	Tiller
9	HL	Warning lamp	29	FU2	Fuse30A
10	HL1	Blue lamp	30	SD	Mid-position switch
11	S1、S2、S3	switch	31	SA	Pedal switch
12	K6	Interlock Relay	32	Ms	Steering motor
13	K5	Left turn light Relay	33	P	Indicator
14	K4	Right turn light Relay	34	K2	Horn Relay
15	K3	Astern Relay	35	Md	Lot terminal
16	K1	Blue lamp Relay			
17	USB、USB1	USB			
18	Et	Traction controller			
19	C	Capacitance			
20	HA	Horn			

c. 30ET-X (Lead-acid battery) circuit diagram



No.	Code	Name	No.	Code	Name
1	CL	Password lock	21	YB	Elec. brake
2	SM1、SM2、SM3	Stop switch	22	Mt	Traction motor
3	FU02	Fuse15A	23	HL2、HL3、 HL5、HL6、 HL8、HL9	Tri-color Taillight
4	KMt	Main contactor	24	SQ	Position sensor
5	FU1	Fuse350A	25	RP	Potentiometer
6	KM	Main contactor	26	Es	Steering controller
7	FU01	Fuse10A	27	HL10、HL11	Headlamp
8	GB	Battery24V	28	B	Tiller
9	HL	Warning lamp	29	FU2	Fuse30A
10	HL1	Blue lamp	30	SD	Mid-position switch
11	S1、S2、S3	switch	31	SA	Pedal switch
12	K6	Interlock Relay	32	Ms	Steering motor
13	K5	Left turn light Relay	33	P	Indicator
14	K4	Right turn light Relay	34	K2	Horn Relay
15	K3	Astern Relay	35	Md	Lot terminal
16	K1	Blue lamp Relay	36	M	Expansion module
17	USB、USB1	USB			
18	Et	Traction controller			
19	C	Capacitance			
20	HA	Horn			

d. 30ET-X(Lithium battery) circuit diagram



No.	Code	Name	No.	Code	Name
1	CL	Password lock	21	YB	Elec. brake
2	SM1、SM2、SM3	Stop switch	22	Mt	Traction motor
3	FU02	Fuse15A	23	HL2、HL3、 HL5、HL6、 HL8、HL9	Tri-color Taillight
4	KMt	Main contactor	24	SQ	Position sensor
5	FU1	Fuse350A	25	RP	Potentiometer
6	KM	Main contactor	26	Es	Steering controller
7	FU01	Fuse10A	27	HL10、HL11	Headlamp
8	Li Battery	Battery24V	28	B	Tiller
9	HL	Warning lamp	29	FU2	Fuse30A
10	HL1	Blue lamp	30	SD	Mid-position switch
11	S1、S2、S3	switch	31	SA	Pedal switch
12	K6	Interlock Relay	32	Ms	Steering motor
13	K5	Left turn light Relay	33	P	Indicator
14	K4	Right turn light Relay	34	K2	Horn Relay
15	K3	Astern Relay	35	Md	Lot terminal
16	K1	Blue lamp Relay	36	M	Expansion module
17	USB、USB1	USB			
18	Et	Traction controller			
19	C	Capacitance			
20	HA	Horn			

11. DECLARATION OF CONFORMITY (valid if sold within EU area)

[GB] Original CE Declaration of conformity

The signatory hereby declares that the specified machine conforms to the EC Directive 2006/42/EC (Machine Directive), and 2014/30/EU (Electro-Magnetic Compatibility, EMC) including their amendments as translated into national legislation of the member countries. The signatory is individually authorized to compile the technical documents and declares that the following standards, including the normative procedures contained therein, have been applied:

[D] Original EG- Konformitätserklärung

Der Unterzeichner erklärt hiermit, dass die angegebene Maschine den EG-Richtlinien 2006/42/EG (Maschinenrichtlinie) und 2014/30/EU (Elektromagnetische Verträglichkeit, EMV) einschließlich ihrer Änderungen in der Umsetzung in die nationale Gesetzgebung der Mitgliedsländer entspricht. Der Unterzeichner ist zur Zusammenstellung der technischen Unterlagen einzeln befugt und erklärt, dass folgende Normen, einschließlich der darin enthaltenen normativen Verfahren, angewendet wurden:

[E] Original DECLARACIÓN DE CONFORMIDAD CE

El signatario declara por la presente que la máquina especificada cumple con la Directiva CE 2006/42/EC (Directiva de Máquinas) y 2014/30/EU (Compatibilidad Electromagnética, EMC) incluidas sus enmiendas traducidas a la legislación nacional de los países miembros. El firmante está autorizado individualmente para compilar los documentos técnicos y declara que se han aplicado los siguientes estándares, incluidos los procedimientos normativos contenidos en ellos:

[F] Originale DECLARATION DE CONFORMITE CE

Le signataire déclare par la présente que la machine spécifiée est conforme à la directive CE 2006/42/CE (directive machine) et 2014/30/UE (compatibilité électromagnétique, CEM), y compris leurs modifications telles que traduites dans la législation nationale des pays membres. Le signataire est individuellement autorisé à compiler les documents techniques et déclare que les normes suivantes, y compris les procédures normatives qu'elles contiennent, ont été appliquées:

[NL] Origineel EG-CONFORMITEITSVERKLARING

De ondertekenaar verklaart hierbij dat de gespecificeerde machine voldoet aan de EG-richtlijnen 2006/42/EG (machinerichtlijn) en 2014/30/EU (elektromagnetische compatibiliteit, EMC) inclusief hun amendementen zoals vertaald in de nationale wetgeving van de aangesloten landen. De ondertekenaar is individueel gemachtigd om de technische documenten samen te stellen en verklaart dat de volgende normen, inclusief de normatieve procedures die daarin zijn opgenomen, zijn toegepast:

[PT] Original DECLARAÇÃO DE CONFORMIDADE CE

O signatário declara que a máquina especificada está em conformidade com a Diretiva EC 2006/42/EC (Diretiva de Máquinas) e 2014/30/EU (Compatibilidade Eletromagnética, EMC), incluindo suas emendas traduzidas para a legislação nacional dos países membros. O signatário está individualmente autorizado a compilar os documentos técnicos e declara que as seguintes normas, incluindo os procedimentos normativos neles contidos, foram aplicadas:

[I] Originale DICHIARAZIONE DI CONFORMITÀ CE

Il firmatario dichiara che la macchina specificata è conforme alla Direttiva CE 2006/42/CE (Direttiva macchine) e 2014/30/UE (Compatibilità elettromagnetica, EMC) compresi i relativi emendamenti tradotti nella legislazione nazionale dei paesi membri. Il firmatario è autorizzato individualmente alla compilazione dei documenti tecnici e dichiara che sono state applicate le seguenti norme, comprese le procedure normative ivi contenute:

[BG] Оригинален ЕВРОПЕЙСКА ОБЩНОСТ - ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

С настоящото подписаното лице декларира, че посочената машина отговаря на Директива на ЕО 2006/42/ЕС (Директива за машини) и 2014/30/EU (Електромагнитна съвместимост, EMC), включително техните изменения, преведени в националното законодателство на страните-членки. Подписаното лице е лично упълномощено да съставя техническите документи и декларира, че са приложени следните стандарти, включително съдържащите се в тях нормативни процедури:

[CZ] Originál EG - PROHLÁŠENÍ OSHODĚ

Signatář tímto prohlašuje, že uvedený stroj je ve shodě se směrnicí ES 2006/42/ES (Směrnice o strojích) a 2014/30/EU (Elektromagnetická kompatibilita, EMC) včetně jejich změn ve znění přeložené do národní legislativy členských zemí. Podepisující osoba je samostatně oprávněna sestavit technické dokumenty a prohlašuje, že byly použity následující normy, včetně normativních postupů v nich obsažených:

[DK] Original EF-OVERENSSTEMMELSESESKLÆRING

Underskriveren erklærer hermed, at den specificerede maskine er i overensstemmelse med EF-direktivet 2006/42/EC (maskindirektivet) og 2014/30/EU (elektro-magnetisk kompatibilitet, EMC) inklusive deres ændringer som oversat til national lovgivning i medlemslandene. Underskriveren er individuelt bemyndiget til at udarbejde de tekniske dokumenter og erklærer, at følgende standarder, inklusive de normative procedurer indeholdt deri, er blevet anvendt:

[EST] Originaal EL vastavusavaldus

Allakirjutanu kinnitab käesolevaga, et nimetatud masin vastab EÜ direktiivile 2006/42/EÜ (masinadirektiiv) ja 2014/30/EL (elektromagnetilise ühilduvus, EMC), sealhulgas nende muudatustele, nagu on tõlgitud liikmesriikide siseriiklikesse õigusaktidesse. Allakirjutanut on individuaalselt õigus koostada tehnilisi dokumente ja ta kinnitab, et on kohaldatud järgmisi standardeid, sealhulgas neis sisalduvaid normatiivprotseduure:

[FIN] Alkuperäinen EU-YHDENMUKAISUUSLOSTUS

Allekirjoittaja vakuuttaa täten, että määrätty kone on EY-direktiivin 2006/42/EY (konedirektiivi) ja 2014/30/EU (sähkömagneettinen yhteensopivuus, EMC) mukainen, mukaan lukien niiden muutokset, sellaisina kuin ne on käännetty jäsenmaiden kansalliseen lainsäädäntöön. Allekirjoittaja on henkilökohtaisesti valtuutettu kokoamaan tekniset asiakirjat ja vakuuttaa, että seuraavia standardeja, mukaan lukien niihin sisältyvät normatiiviset menettelyt, on sovellettu:

[GR] Πρωτότυπο ΑΗΛΕΚΤΡΟΜΑΓΝΗΤΙΚΗΣ ΣΥΜΜΟΡΦΩΣΗΣ

Ο υπογράφωντος δηλώνει με το παρόν ότι το συγκεκριμένο μηχάνημα συμμορφώνεται με την Οδηγία 2006/42/ΕΚ (Οδηγία Μηχανών) και 2014/30/ΕΕ (Ηλεκτρομαγνητική Συμβατότητα, EMC) συμπεριλαμβανομένων των τροποποιήσεών τους όπως έχουν μεταφραστεί στην εθνική νομοθεσία των χωρών μελών. Ο υπογράφωντος είναι ατομικά εξουσιοδοτημένος να συντάξει τα τεχνικά έγγραφα και δηλώνει ότι έχουν εφαρμοστεί τα ακόλουθα πρότυπα, συμπεριλαμβανομένων των κανονιστικών διαδικασιών που περιέχονται σε αυτά:

[H] Eredeti EU ATITIKIMÓ DEKLARÁCIA

Az aláíró ezennel kijelenti, hogy a megadott gép megfelel a 2006/42/EC (gépirányelv) és a 2014/30/EU (elektromágneses összeférhetőség, EMC) irányelveknek, beleértve azok módosításait a tagországok nemzeti jogszabályaiba lefordítva. Az aláíró egyénileg jogosult a műszaki dokumentumok összeállítására, és kijelenti, hogy a következő szabványokat, beleértve az abban foglalt normatív eljárásokat, alkalmazták:

[LT] Originalus ES atitikimo deklaracija

Pasirašęs asmuo pareiškia, kad nurodyta mašina atitinka EB direktyvą 2006/42/EB (mašinų direktyvą) ir 2014/30/ES (elektromagnetinį suderinamumą, EMC), įskaitant jų pakeitimus, išverstus į šalių narių nacionalinius teisės aktus. Pasirašęs asmuo yra individualiai įgaliotas rengti techninius dokumentus ir pareiškia, kad buvo taikomi šie standartai, įskaitant juose nurodytas normines procedūras:

[LV] Orģināls ES atbilstības deklarācija

Parakstītājs ar šo apliecina, ka norādītā iekārta atbilst EK Direktīvai 2006/42/EK (Mašīnu direktīva) un 2014/30/ES (Elektromagnētiskā saderība, EMC), ieskaitot to grozījumus, kas ir tulkoti dalībvalstu nacionālajos tiesību aktos. Parakstītājs ir individuāli pilnvarots sastādīt tehniskos dokumentus un apliecina, ka ir piemēroti šādi standarti, tostarp tajos ietvertās normatīvās procedūras:

[N] Opprinnelig EU-KONFORMITETSERKLÆRING

Underskriveren erklærer herved at den spesifiserte maskinen er i samsvar med EC-direktivet 2006/42/EC (maskindirektivet), og 2014/30/EU (elektromagnetisk kompatibilitet, EMC) inkludert deres endringer som oversatt til nasjonal lovgivning i medlemslandene. Underskriveren er individuelt autorisert til å sammenstille de tekniske dokumentene og erklærer at følgende standarder, inkludert de normative prosedyrene som finnes deri, er brukt:

[PL] Oryginalny DEKLARACJA ZGODNOŚCI WE

Sygnatariusz niniejszym oświadcza, że określona maszyna jest zgodna z dyrektywą WE 2006/42/WE (dyrektywa maszynowa) i 2014/30/UE (kompatybilność elektromagnetyczna, EMC) wraz z ich poprawkami w tłumaczeniu na ustawodawstwo krajowe krajów członkowskich. Sygnatariusz jest indywidualnie

[RO] Original DECLARAȚIE DE CONFORMITATE CE

[RUS] Оригинал Декларация соответствия стандартам ЕС

[S] Original EG-KONFORMITÄTSFÖRKLARING

[SK] Originál vyhlásenie o zhode

[SLO] Original EU IZJAVA O SKLADNOSTI

[TR] Orijinal AB Uygunluk Açıklaması

<the applied standards have to be shown here>