



HzWP LC180-A30

Wireless Charging Power System

Product Specifications

Product Model: HzWP LC180-A30

Version: Rev. 02

Revision date: 2025-11-03

LC180-A30-A (recommended bottom mounted)	Product code
Transmitter Controller HzWP LC180- A30-TC	911906701810
Transmitter coil HzWP LC180-A30-TX-A	911920701810
Receiver Controller HzWP LC150- A30-RC	911812703010
Receiver coil HzWP LC150-A30- RX-A	911890703010

LC180-A30-B (recommended side mounted)	Product code
Transmitter Controller HzWP LC180- A30-TC	911906701810
Transmitter coil HzWP LC180-A30-TX-B	911920701811
Receiver Controller HzWP LC150- A30-RC	911812703010
Receiver coil HzWP LC150-A30- RX-B	911890703010

Transmitter controller	
FCC ID	2BH87-LC180A30TC
IC ID	32872-LC180A30TC
HVIN	HzWP LC180-A30-TC
Receiver controller	
FCC ID	2BH87-LC180A30RC
IC ID	32872-LC180A30RC
HVIN	HzWP LC180-A30-RC

Revision history

Editions	Author	Submitted date	Auditor	Issue date
Version Rev. 01	Sichao Liao	2025-11-03	Chen Huang	2025-11-03

Notes:

1. This specification was originally written in Chinese. In case of any discrepancy, the Chinese version shall prevail.
2. This specification shall be effective upon delivery of products. The version number and release date are located on page 2. The specifications may be amended at any time without notice. Subsequent versions will replace all previous versions.

This model has passed the following international certifications:



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1 Product overview

1.1 Product Introduction

The HzWP LC180-A30 wireless power system is a wireless charging power supply based on magnetic coupling resonance technology. Designed to provide wireless charging solutions for industrial vehicles utilizing electric energy storage systems, such as AGVs, AMRs, unmanned forklift trucks, mobile robots, and other industrial vehicle applications. It is intended solely for this purpose.

This wireless power system is restricted to use within industrial areas and must only operate in conjunction with compatible Hzl wireless power system components. Compared to traditional charging methods, it features waterproof, no active dust generation, and no metal oxidation, while offering advantages such as safety, aesthetic design, and maintenance- free performance.

1.2 Model description

Model number	Instructions
HzWP LC180-A30-A	1. Maximum Power: 1.5 kW 2. Output Voltage: 18-60 V (Compatible with 24V/36V/48V systems) 3. Maximum Current: 30A 4. Except for the dimensions and installation methods Of the transmitter and receiver coils, all other Electrical parameters are consistent.
HzWP LC180-A30-B	

2 Product structure & dimensions

The HzWP LC180-A30 wireless power system consists of four parts: the transmitter controller, the Transmitter coil, the Receiver coil, and the Receiver Controller.

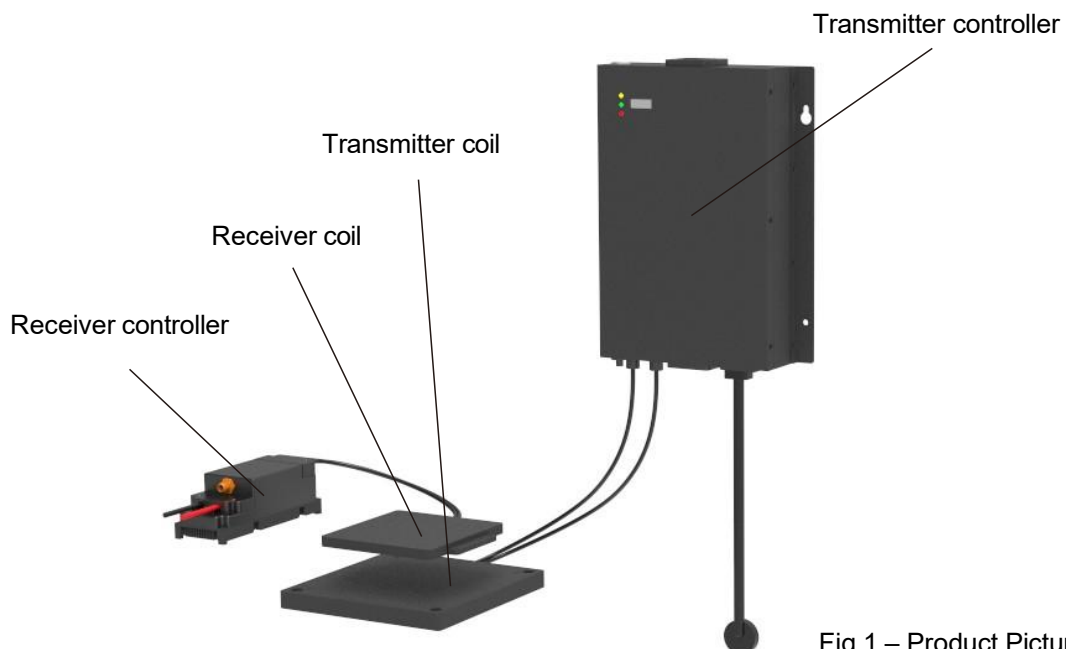


Fig 1 – Product Picture

2.1 Transmitter controller

The main body of the Transmitter Controller housing is made of aluminium, connected to 100-240V AC mains power supply to power the Transmitter Controller, the protection class is IP20, maximum dimensions L*W*H=390*260*71mm.

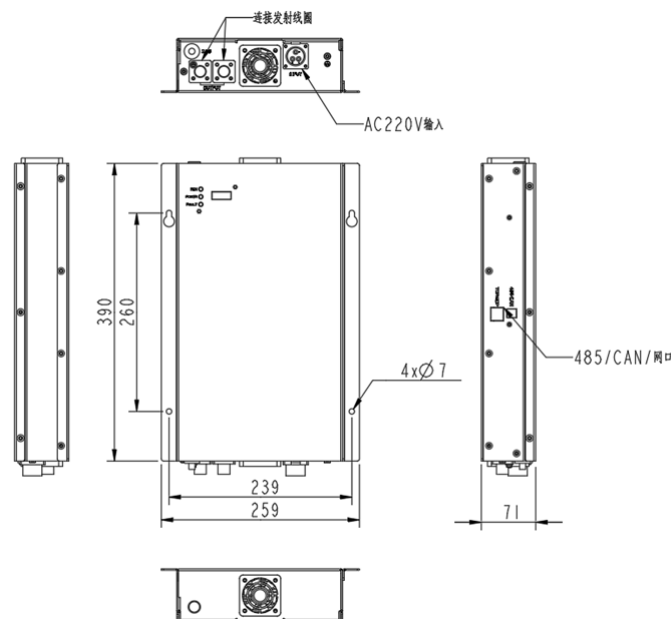
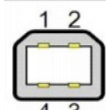


Fig 2 – Outline and size of transmitter controller (measurements in mm)

The Transmitter controller ports are defined in the following table:

No.	Identification/Mark	Function Description			
01	INPUT	100-240V AC input port, LP24 aviation plug	1	L	 3PIN
			2	N	
			3	PE	
02	2.4 G(SMA-K port)	Antenna port for connect to one of the transmitter coil output (SMA-J)			
03	OUTPUT	to Transmitter Coil (Non-Polarized), male Connector			
04	485/CAN(for debugging use)	Type-B USB connector	1	CANH	 Type B
			2	CANL	
			3	485 +	
			4	485 -	
05	TCP/DUP(for debugging use)	Standard RJ45 network port			

2.2 Transmitter coil

2.2.1 HzWP LC180-A30-TX-A

The outer shell of the coil is made of ABS+ PC and aluminum alloy, the inner part is filled with glue, the protection class is IP65, and the maximum load-bearing capacity is 1.2 tons. The maximum dimensions are L*W*H=225.6*225.6*17mm. (Suggested bottom mounted)

Note: For bottom-mounted installation, adequate heat dissipation relies on the robot chassis. If this condition cannot be met, additional cooling measures must be implemented.

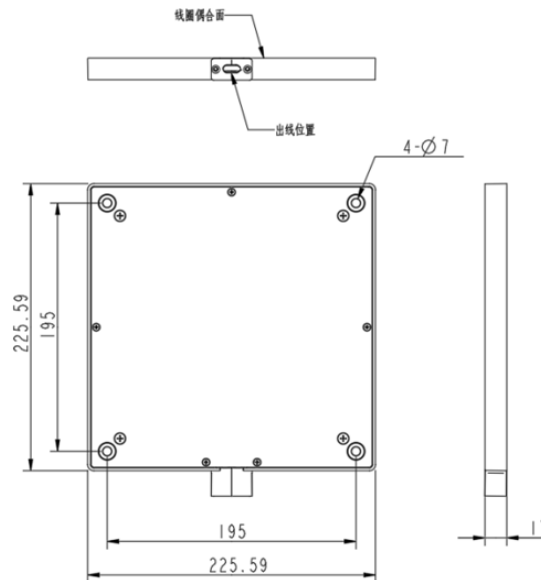


Fig 3 – Outline and size of transmitter coil HzWP LC180-A30-TX-A (measurements in mm)

2.2.2 HzWP LC180-A30-TX-B

The outer shell of the coil is made of ABS+ PC and aluminum alloy, the inner part is filled with glue, the protection class is IP65. The maximum dimensions are L*W*H=335*166.5*17.5mm. (Suggested side mounted)

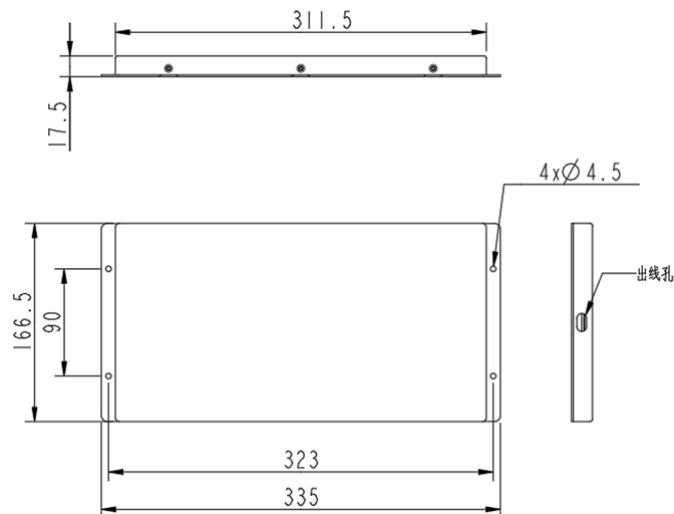


Fig 4 -Outline and size of transmitter coil HzWP LC180-A30-TX-B (measurements in mm)

2.3 Receiver coil

2.3.1 LC150-A30-RX-A

The outer shell of the Receiver coil is made of PC and aluminum alloy, and is filled with glue inside. It has a protection rating of IP65, Maximum dimensions: L * W * H = 182*155.4*12mm.

Note: For bottom-mounted installation, adequate heat dissipation relies on the robot chassis. If this condition cannot be met, additional cooling measures must be implemented.

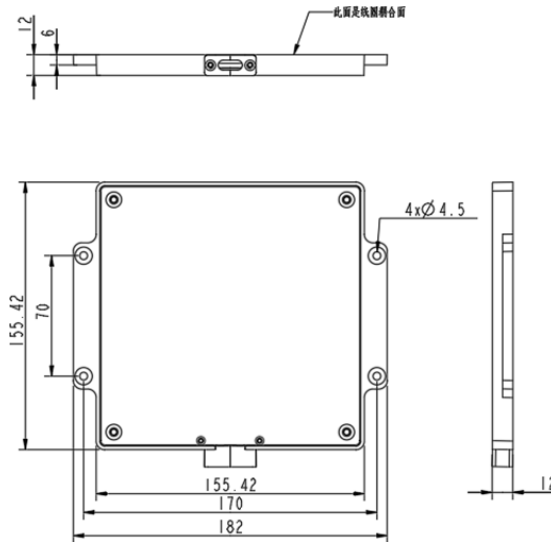


Fig 5 – Outline and size of receiver coil HzWP LC150-A30-TX-A (measurements in mm)

2.3.1 LC150-A30-RX-B

The outer shell of the Receiver coil is made of PC and aluminum alloy, and is filled with glue inside. It has a protection rating of IP65. Maximum dimensions: L * W * H = 235*111.8*29mm.

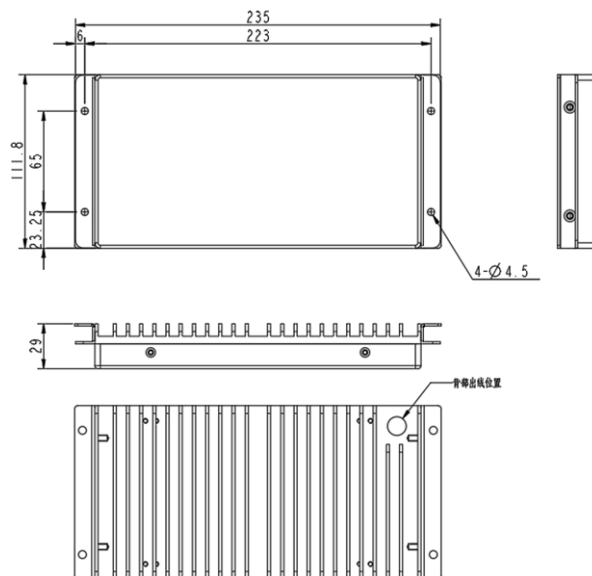


Fig 6 – Outline and size of receiver coil HzWP LC150-A30-TX-B (measurements in mm)

2.4 Receiver Controller

The main body of the receiver controller housing is made of aluminium alloy, with four input/output terminals, one CAN/485 port, and one 2.4G antenna interface. Two of them (DC+/-) are connected to the user's electrical equipment (battery), and the other two (INPUT) are connected to the Receiver coil, with protection class IP54. Maximum dimensions: L * W * H = 193*79*68.5mm.

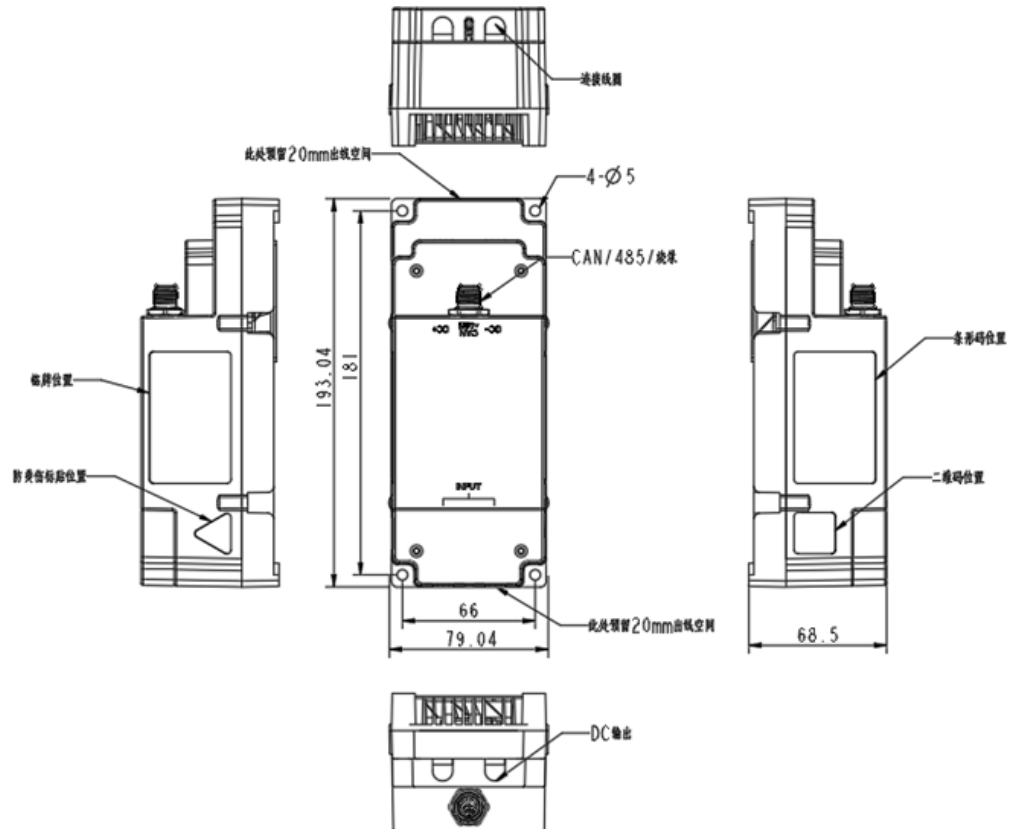


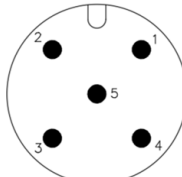
Fig 7 – Outline and size of receiver controller (active cooling) (measurements in mm)

The receiver port is defined as following:

(Note: DC+ and DC - positive and negative must not be reversed)

No.	Identifier/Mark	Function Description
01	BURN	Debug Port, 5Pin M12 female connector, Definitions are detailed in Form Debug Port
02	DC+	DC OUTPUT positive, connect to battery positive, M4 Lock Hole
03	DC-	DC OUTPUT negative, Connect to battery negative M4 Lock Hole
04	SMA-K port	Antenna port for connect to one of the receiver coil output (SMA-J)
05	INPUT	Connect to Receiver Coil (Non-Polarized), M4 Lock Hole

Receiver controller port definition description

1. Communication port/COM. Port				
PIN	Signal	Description	Color	 5Pin M12 male connector
1	485+	485_A	Brown	
2	485-	485_B	White	
3	CAN_GND	485&CAN Ground	Blue	
4	CAN_H	CAN_H bus line (dominant High)	Black	
5	CAN_L	CAN_L bus line (dominant Low)	Gray	
Debug Port (Note: For authorized service and firmware updates only. Unauthorized access is prohibited.)				

3 Product technical parameter

SN	Description	Data
Basic data		
01	Output power	1.5kW Max
02	Transfer efficiency	> 80%
03	Wireless charging distance	10-30mm
04	Position tolerance(X/Y)	20mm
05	The maximum tilt angle	10°
06	Wireless charging operating frequency	140kHz
07	Communication method (transmitter and receiver)	2.4 G
08	Communication Protocol	CAN / RS485
09	Magnetic isolation protection	Magnetic material + aluminum plate shielding
10	Startup method	Auto-detect auto-start
11	Charging method	Constant current and constant voltage
12	Operating ambient temperature	-20℃~50℃ / -4°F~122°F
13	Storage ambient temperature	-40℃~85℃ / -40°F~185°F
14	Operating environment humidity	≤90%
15	Installation altitude	max. 2000m above sea level
Transmitter data		
01	Input voltage	100-240V AC 47-63Hz
02	Input current	110V/25A ,220V/10A
03	Transmitter Controller size	390*259*71mm
04	Transmitter Controller weight	Approx. 5kg
05	Transmitter Controller housing material and IP rating	Aluminum plate, Ip20
06	AC input line interface	Cable length 2m
07	Transmitter coil size (bottom mounted)	225.6*225.6*17mm
08	Transmitter coil size (bottom mounted)	Approx. 2.5kg
09	Transmitter coil size (side-mounted)	L*W*H=335*166.5*17.5mm
10	Transmitter coil weight(side-mounted)	Approx. 2.1kg
11	Transmitter coil lead cable length	3m(bottom mounted), 0.8m(side mounted)
12	Transmitter coil housing material and IP grade	ABS+PC and aluminum alloy, IP65 (filling glue)

SN	Description	Data
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Receiver data

01	Output rated voltage	24V, 36V, 48V (Range:18-60V)
02	Output rated current	30A Max. (range: 0-30A)
03	Output voltage ripple	Approx. $\pm 1\%$ (load voltage 60V)
04	Output current ripple	Approx. $\pm 5\%$ (load current 30A)
05	Load type	Li-ion, Lead-acid, LTO, LiFePO4, NiCd, and Other Battery Types
06	Receiver coil size (bottom mounted)	182*155.4*12mm
07	Receiver coil weight (bottom mounted)	Approx.1.2kg
08	Receiver coil size (side-mounted)	235 * 111.8 * 29 mm
09	Receiver coil weight(side-mounted)	Approx.1.2kg
10	Receiver coil lead length	1.55 m(bottom mounted), 0.8 m(side-mounted)
11	Antenna lead length	Approx. 1.65 m
12	Receiver coil housing material and IP grade	PC and aluminum alloy, IP65 (filling glue), maximum bearing capacity 0.5 tons
13	Receive controller shell material and IP grade	Aluminum plate, IP54
14	Receiver controller size	193*79*68.5mm
15	Receiver controller weight	Approx.1.5kg
16	DC Output Cable (Not Provided)	1m 10AWG output leads

Other auxiliary power and signal data

Startup and signal parameters (no need for external power supply and boot signal)

01	Communication signals at transmitter side	485 / CAN / LAN
02	Communication signals at the receiver side	485 / CAN

Other

01	Protection features	Overload, over temperature, over current, short circuit, over voltage, Load dump etc
02	Special attention	Output must not be reversed
03	Boost Charge Default Current	10A (definable)
04	Multi-machine communication time	< 10s
05	Rise time of current	< 20s

SN	Description	Data
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Certifications

01	EMC	EN 301 489-1 V2.2.3 EN 301 489-3 V2.3.2 EN IEC 55014-1:2021 EN IEC 55014-2:2021 EN 55032:2015+A11:2020 EN 55035:2017+A11:2020 EN 300 440 V2.1.1 EN 62479:2010 EN IEC 61000-3-2:2019+A2:2024 EN 61000-3-3:2013+A1:2019+A2:2021
02	Safety	EN 62477-1:2012/A12:2021 UL 1564 CSA C22.2 No. 107.2-01
03	Immunity	EN 61000-6-2/4
04	FCC	FCC Part 15
05	Chemical Restriction	RoHS, Reach, TSCA
06	Protection class	Transmitter controller =1 Transmitter coil =2 Receiver controller =2 Receiver coil =2

4 Installation Instructions

4.1 Precautions before installation

Due to the magnetic heating effect of magnetic fields on metals and magnetic materials, it is important to ensure that no metals and magnetic materials are attached to the surface of the coil when powered on to prevent potentially causing fire. The wireless power system is designed for use in indoor conditions. If the on-site conditions are different, specific measures must be taken (e.g. : Mounting the Transmitter controller in an enclosure etc.).

You will need to follow these instructions:

Please strictly follow the precautions and operating procedures given in this instruction, and do not attempt any unauthorised actions that jeopardise your safety and the operability of the charging system. When you observe all of the listed safety instructions.

When you use exclusively components of the specified Hzi charging system

Incorrect use

Failure to follow the safety instructions and assembly, maintenance and disposal information given in these instructions.

Using the product under conditions and prerequisites other than those the manufacturer has specified in its technical documentation, data sheets, operating and assembly instructions, and other specifications.

Using the product outdoors.

Connecting non-rechargeable batteries.

Connect to a non-intrinsically safe battery system.

Failing to implement on-site precautions against metal parts between the coils Place objects between coils.

Use the product or its parts as a storage surface or access aid. Modifications made to system components.

Using the product or parts thereof that are damaged or corroded. This applies also to the seals and connected cables.

This product is not designed for use in potentially explosive zones and therefore should not be used in these zones. This product is not designed to be explosion-proof.

Use this product in environments with an altitude of 2000 meters above. Use the product with live parts exposed.

Using the product in a wall housing with inadequately sealed inlets and/or with damaged or inadequately tightened cable glands.

Failure to use the product in accordance with the safety precautions provided by the manufacturer.

Manipulate or bypass installed safety equipment.

Hzi is responsible for and guarantees that the equipment complies with its published specifications.

Using the product in any manner or for any purpose other than that described in these instructions will compromise the protection of the device, and all warranty claims become void

Electromagnetic Compatibility

This device is not designed for use in residential zones, and may disrupt radio reception in these conditions. This is a Class A device. Class A devices are suitable for use in all conditions with the exception of residential and other zones supplied directly from a low voltage mains supply that (also) provides energy to residential buildings.

The wireless power system has been tested for electromagnetic compatibility (EMC) in free space. Hzi recommends re-evaluating the electromagnetic compatibility of the product based on the product's installation situation.

4.2 Personnel Qualifications

The qualifications of personnel who may be assigned to perform a range of installation and maintenance tasks are mentioned in multiple places in this instructions. These three groups of persons are:

1. Qualified personnel
2. Experienced personnel
3. Authorized personnel.

This product is not intended for use by children or persons with physical or mental disabilities, and is not intended for use by persons without relevant experience or who lack sufficient knowledge of the product, unless they are supervised by an authorized person responsible for the safety of such persons or given comprehensive instructions on how to use the device.

4.2.1 Qualified Personnel

Qualified personnel are those who have been specially trained, have specialized knowledge and experience, and understand relevant regulations to be able to assess assigned tasks and identify potential hazards.

4.2.2 Experienced personnel

Experienced personnel are those who have acquired sufficient professional knowledge and skills in relevant fields through special training, and are familiar with applicable national work safety regulations, accident prevention provisions, guidelines, and approved technical standards. Experienced personnel must be able to evaluate the results of their work and be familiar with the contents of these instructions.

4.2.3 Authorized personnel

An authorized person is a person who is permitted by regulations to perform related activities, or who has been approved by Hzi to perform a specific tasks.

4.3 Operator duties

Strict compliance with laws and regulations regarding accident prevention, work safety and environmental protection.

Ensure that the charging system, the AGV/AMR and the charging location are in a clean state.

The operator must set down unambiguously the responsibilities for operating the installation. The operating personnel must be instructed at regular intervals

Operators must comply with applicable national work safety laws. Strictly follow the instructions.

All work including maintenance on electricity supplies always involves potential risks. Persons unfamiliar with equipment and installations of this kind may cause injury to themselves and others.

Before starting to work, electrical equipment installation operators must be professionally trained, need to be aware of the potential risks, required safety measures and applicable safety regulations.

4.4 Range of delivery

4.4.1 HzWP LC180-A30-A: Key Components Delivery List

- (a) Transmitter Controller (HzWP LC180- A30-TC)
- (b) Connector LP24), without cables
- (c) Transmitter coil (HzWP LC180-A30-TX-A)
- (d) Receiver coil (HzWP LC150-A30- RX-A)
- (e) Receiver controller (HzWP LC150- A30-RC)

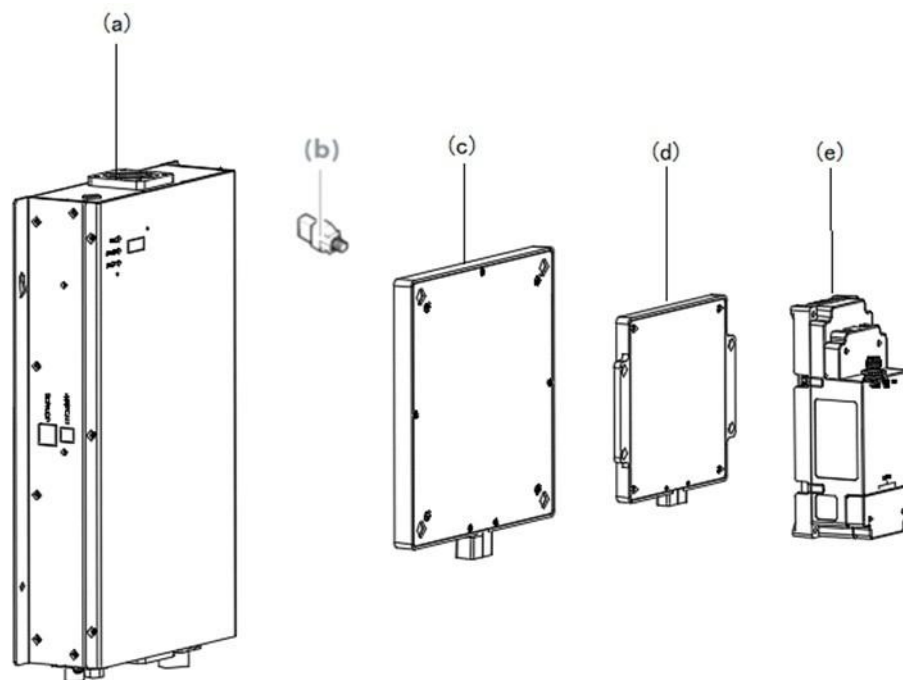


Fig 8– Range of delivery product

4.4.1 HzWP LC180-A30-A: Key Components Delivery List

- (a) Transmitter Controller (HzWP LC180- A30-TC)
- (b) Connector LP24), without cables
- (c) Transmitter coil (HzWP LC180-A30-TX-B)
- (d) Receiver coil (HzWP LC150-A30- RX-B)
- (e) Receiver controller (HzWP LC150- A30-RC)

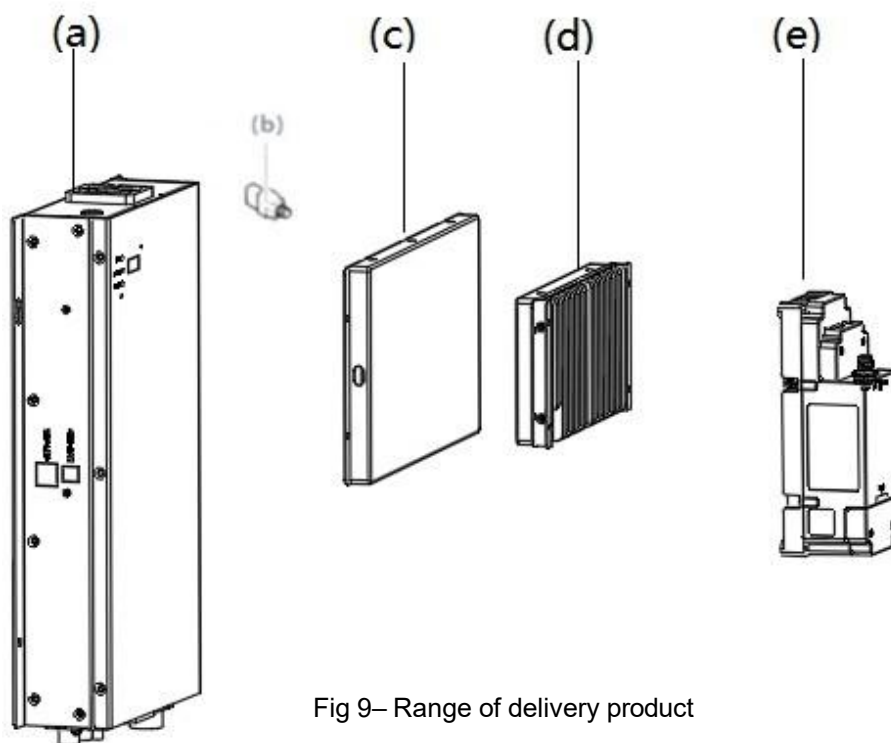


Fig 9– Range of delivery product

4.5 Symbols used on components

Dangerous zones of wireless power system components are marked with warning symbols. These symbols indicate potential hazards and must be followed strictly. These symbols must not be removed. They should be replaced if damaged or illegible.

Transmitter controller



Warning

Warning! High Voltage!

Open for qualified personnel only



Warning/Mandatory requirements

Disconnect the mains plug before opening the device

Dangerous voltage may be present for up to 120 seconds after disconnecting from the mains.



Mandatory

Read the instructions.

Transmitter coil/Receiver coil



Prohibition

No access for persons with cardiac pacemakers, implanted defibrillators, or other metal implants.



Prohibition

No access for persons with metallic implants.



Prohibition

Do not reach between the coils.



Warning/Mandatory requirements

Warning! Dangerous voltage!

Disconnect the mains plug before servicing the device. Hazardous voltages may still be present up to 120 s after disconnection from the mains.



Warning/Mandatory requirements

Risk of burns! Do not touch the housing and allow it to cool down before performing any maintenance work



Warning

Warning of non-ionising, electromagnetic radiation.



Mandatory

Read the instructions.

Receiver controller



Warning

Warning! High voltage!

Open for qualified personnel only.

Disconnect from the mains before opening the device



Warning/Mandatory requirements

Disconnect the battery before turning on the device.

There may be a dangerous voltage for up to 120 seconds after disconnectin from the mains.



Warning/Mandatory requirements

Risk of burns! Do not touch the housing and allow it to cool down before performing any maintenance work.



Mandatory

Read the instructions.



Level of protection

Class II equipment according to IEC 60335-1

4.6 Safety instructions

The transmitter coil and receiver coil must be separated from each other during installation. Only place the coils in their respective positions for final functional testing.

Warning!



Explosion and fire hazard

Connecting not intrinsically safe batteries may cause an explosion or fire.

- Use rechargeable batteries only.
- Use intrinsically safe batteries only.
- Follow the safety instructions and specifications provided by the battery manufacturer.

Warning!



Danger Of Electric Shock

Dangerous voltages between exposed live parts. Danger of residual voltage across DC links.

- Before all work, disconnect the system components from the power supply, and secure this against accidental reactivation.
- Wait for at least 2 minutes of discharging time before working on the system.
- Verify that there is no voltage across any of the poles .

Caution!



Risk of injury due to inadequate installation

- Incorrect installation of system components can lead to dangerous conditions.
Observe the assembly and installation instructions in each of the sections.

4.6.1 Intensified Magnetic Fields

In the zone between the coupling surfaces of the transmitter and receiver coils, the magnetic field is considerably strong.

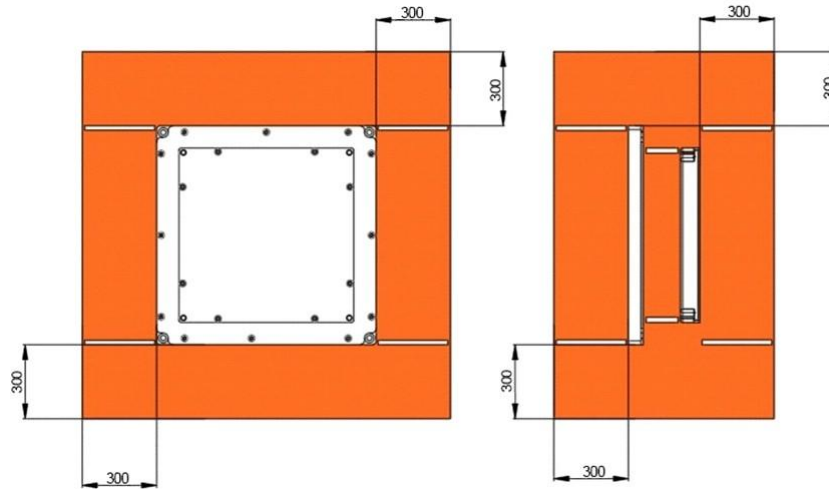


Fig 10 – Hazardous zone (orange zone) , side and front view (all measurements in mm)

Danger!



Disruptive effects on cardiac pacemakers

There may be disrupting effects on cardiac pacemakers. A malfunctioning cardiac pacemaker may prove life threatening to the bearer.

- Persons with a cardiac pacemaker or metal implants may not enter the danger zone (see Figure 10).

Attention!



Intensified magnetic fields

An intensified magnetic field can be harmful to living things.

- They should not stay within the marked zone shown in Figure 8 during charging process.

4.6.2 Increased Temperature

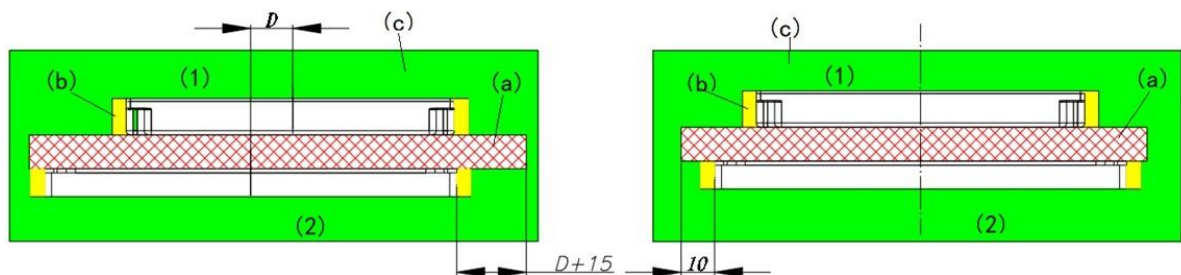


Fig 11 – Detailed hazard zone (green zone) - with and without coil displacement(all measurements are in mm)

Receiver coil
Transmitter coil

- (a) Hazardous zone → Do not place conductive objects
- (b) Near the edge of the coil → Avoid conductive objects (especially steel)
- (c) No special requirements

Warning!



Fire hazards

Electrically conductive objects (e.g., steel, carbon fiber, etc.) may heat up when placed in an alternating magnetic field. Therefore, it is important to consider the following information to ensure the safe operation of the system:

- No conductive objects should be in the hazardous zone (a) during charging. The danger zone (a) is the zone between the coils.
- In the case where the coils are not directly above each other, but show a displacement of a distance D, the danger zone (a) increases as shown in Fig 11.
- Placing conductive objects, especially steel objects, near the coil edge (b) must be avoided during charging. Such objects should be kept at least 20 mm away from the outside edge of the coil.
- There are no specific requirements for the location of conductive objects within zone ©.
- If the use of electrically conductive objects in the immediate vicinity of the coils is unavoidable, then their temperature should be measured with adequate equipment to ensure safe operation.
- Keep the hazardous zone (a) clean and free of dust.

Attention!



Danger of burns

The housings of the system components may be hot.

- Do not touch the housings and leave them to be cool before working on the system.

Connect cables

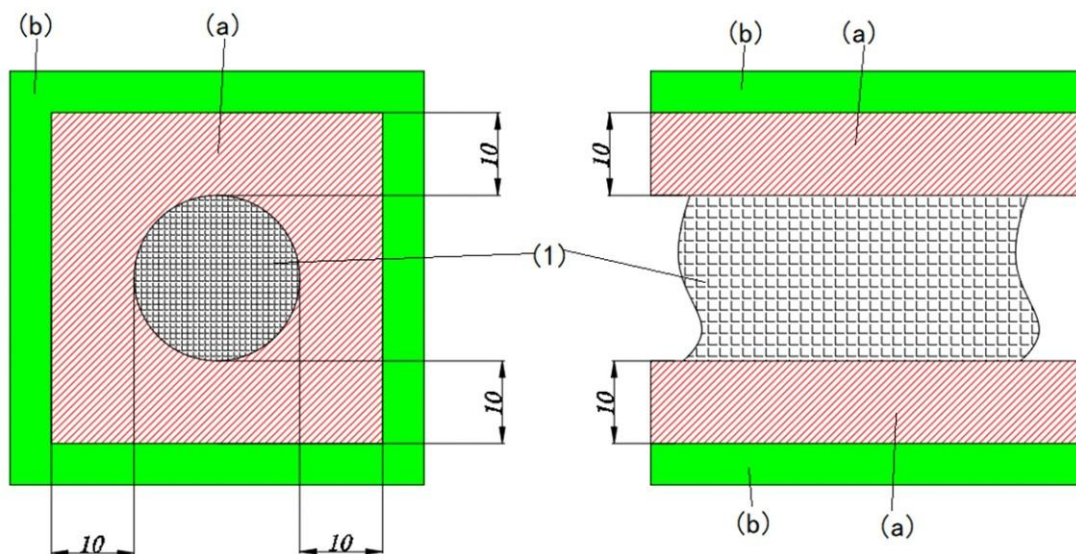


Fig 12 – Receiver coil cable distance (measurements in mm)

- Receiver coil cable
- (a) Hazardous zone → as far away from conductive objects as possible
 - (b) No special requirements

Warning!



Danger of burns

Do not touch connecting cables, and leave all system components to be cool sufficiently before working on the system.

- The connection cables of the mobile coil may not be installed with thermally insulating materials so that any heat generated can be dissipated to the surroundings.
- For the installation of the connection cables of the mobile coil, observe a distance from metallic elements (especially steel) of the structure.
- If the recommended distance cannot be maintained, the temperature of the affected vehicle component must be monitored to ensure that it is at a safe level.
- It is essential to check with adequate equipment the temperature of the power transmission system during commissioning in order to verify the safe operation of the installation.

4.7 Check the scope of delivery

According to the order, the system will be delivered in a pre-configured state. Please check whether the delivered items are intact and consistent with the order. If any shortages, defects, or errors are found, please notify Hzi immediately.

4.8 Transmitter Coil

Notes



It is recommended to install the transmitter coil (a) and the receiver coil (b) vertically

A horizontal installation requires additional on-site precautions that prevent heated foreign objects in the running system from posing a danger to persons and adjacent system parts in the danger zone.

- Connection cables must not be modified or extended.
- Please respect the ambient conditions of the coil (see LC180-A30 data sheet for details). The transmitter coil should be operated in a fixed installation only.
- The operator must ensure that no conductive object can be penetrate between the coils.
- The operator must ensure that there are no persons with a cardiac pacemaker or metal implants in the danger zone (see Figure 13).
- It is optimal to install the centers of the two coils at the same height to align their coupling surfaces.

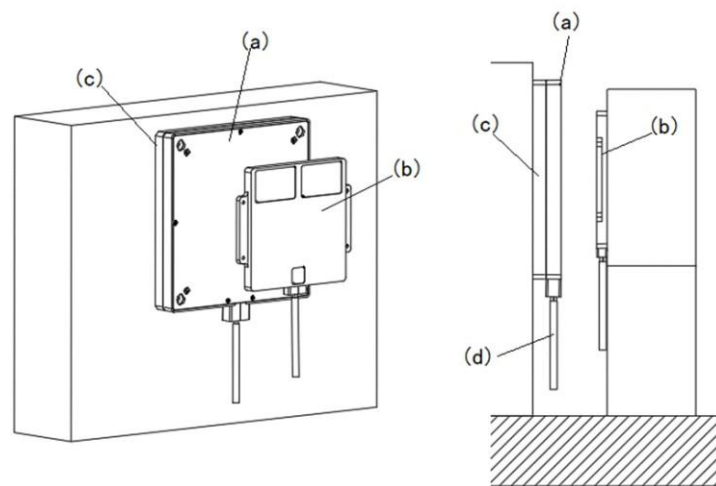


Fig 13 – Install the transmitter coil

(a) Transmitter coil (b) Receiver coi (a) Transmitter coil bracket (d) Coils outlet position

Install the transmitter coil

Four holes are provided to fix the coil to the wall (using stainless steel screws).

1. Make sure that the zone around the coil is free of conductive objects (see Figure 14).
2. When installing, take into account the length of the coil cable.
3. Note the location of the receiver coil mounted on the vehicle: both coil center points must be at exactly the same height.
4. Consult the product parameters for the correct mounting measurements.
5. Prepare the drilled holes and use the adequately sized assembly materials.
6. Attach the coil securely to the wall.
7. If the transmitter coil must be fitted with a shielding device, the material used must not be metal or insulating material, so as to avoid shielding the magnetic field or affecting heat dissipation.
8. When laying connection cables, the minimum permitted bending radius of 50 mm must be followed.

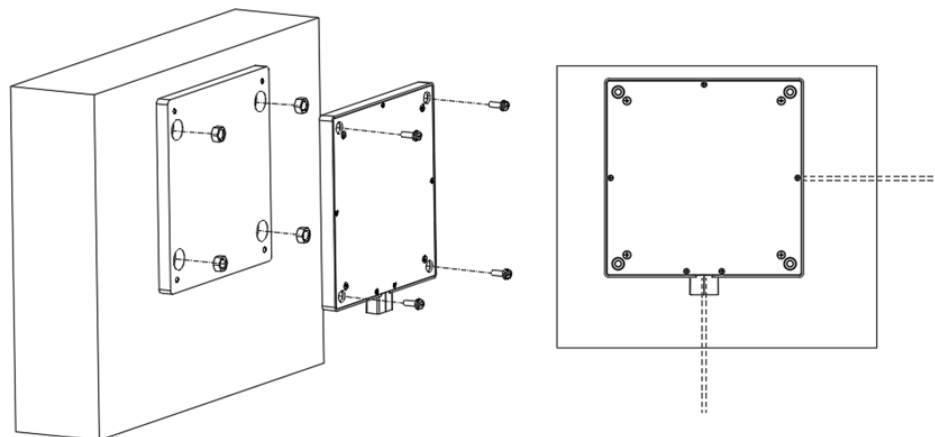


Fig 14 – Mounting coil (Diagram, unit: mm)

4.9 Transmitter controller

The Transmitter controller can be used under fixed mounting conditions only.

All sides of the housing must be at least 100 mm from adjacent installations if there is to be adequate air circulation.

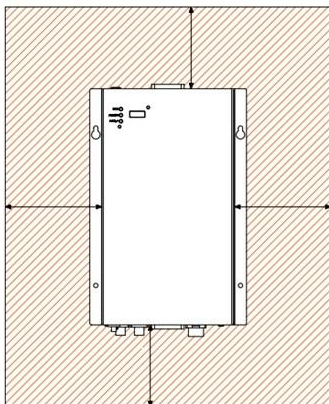


Fig 15 – Clear distance around stationary electronics

4.10 Mounting the Transmitter controller

This unit is equipped with four holes (for M6 screw fastening) to facilitate mounting onto walls or similar surfaces. During installation, the length of the coil cable shall be taken into consideration. The housing shall be installed with its connection end facing downward.

- Securely install wall plugs into the wall according to the mounting hole. Firmly mount the transmitter controller to the wall using M6 self-tapping screws.
- Verify that the installation is secure.

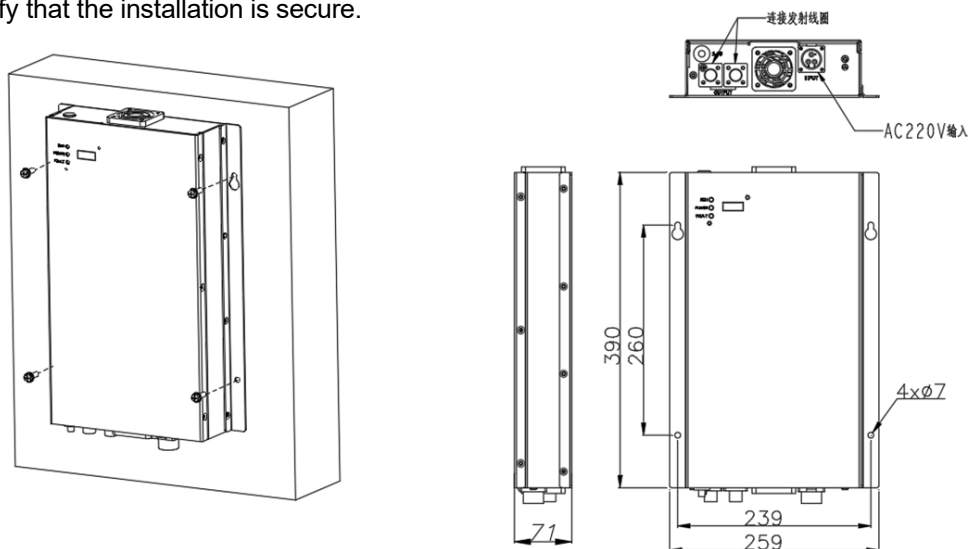


Fig 16 – Installing the housing (size unit: mm)

Notes



It is recommended to place the wall mounted enclosure in a position that is protected from direct sunlight and heat sources so as not to exceed the maximum ambient temperature (See LC180-A30 data sheet for details).

4.11 Electrical connections of the Transmitter side

Warning!



Dange of electric shock

- Installation should be carried out by qualified personnel only.
- Wait at least 1 minute for the discharge time before operating the system.
- Follow applicable safety regulations.

Before connecting the mains power, make sure the mains receiver is compliant and equipped with 100-240 VAC, 47-63Hz, with protective ground lead, emergency shut-off switch, 30A fuse, and full current sensitive type leakage protection (Type B is best). Charging devices should be connected only to an outlet with an earthing contact.

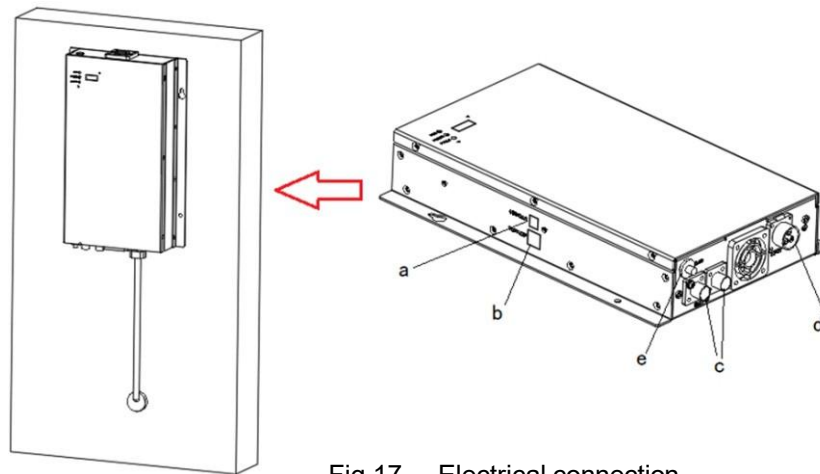


Fig 17 – Electrical connection

- | | |
|----------------------------|------------------------|
| (a) 485/CAN network port | (b) Network port |
| (c) Coil connection outlet | (d) Power input outlet |
| (e) 2.4G antenna interface | |

1. Plug the plug on the transmitter coil into the socket on the transmitter controller (c).
2. Connect the antenna to the connector (f).
3. When routing the cables, make sure the insulation of the cable is not damaged by sharp edges or moving parts.
4. The cables must be part of a fixed installation and the applicable regulations must be observed.
5. Connect the mains cable to the mains socket (e) on the Transmitter controller.
6. The mains cable must be suitable for the conditions of operation.

The Transmitter controller and the Transmitter coil are now properly connected.

A grid connections that comply with UL1564 and CSA22.2-No107.2 standard must be equipped with cables that have the following characteristics:

cable type S, SO, ST, STO, SJ, SJO, SJT, or SJTO

A minimum cable length of 6 feet (1.83 m)

A minimum electric strength of 265 V

A minimum current load rating of 30 A

4.12 Receiver coil

Attention!



Danger of burns

The connecting cables of the receiver coil must not be wrapped in insulation so that the heat generated can be dissipated into the surroundings.

For the installation of the receiver coil connection cable, a distance of at least 10 mm should be maintained from the metal parts (especially steel) in the structure (see Figure 17). If the recommended minimum distance is not reached, it must be checked that it is within the safe temperature range.

During commissioning, the temperature of the power transfer system must be checked with the adequate equipment to verify the safe operation of the installation.

Notes



It is recommended that the receiver coil (a) be mounted vertically.

A horizontal installation requires additional on-site precautions that prevent heated foreign objects from posing a danger to persons and adjacent system parts in the danger zone.

The outgoing direction of the receiver coil must be the same as that of the transmitter coil.

Make sure there are no conducting objects around the coil (see Figure 18).

- The receiver coil (a) must be secured to the vehicle body through all four fixing points (b) with screws (stainless steel recommended).
- Take into account the position of the transmitter coil.
- The installation of the coil must be taken into account and recorded in the operator's documentation for the vehicle..

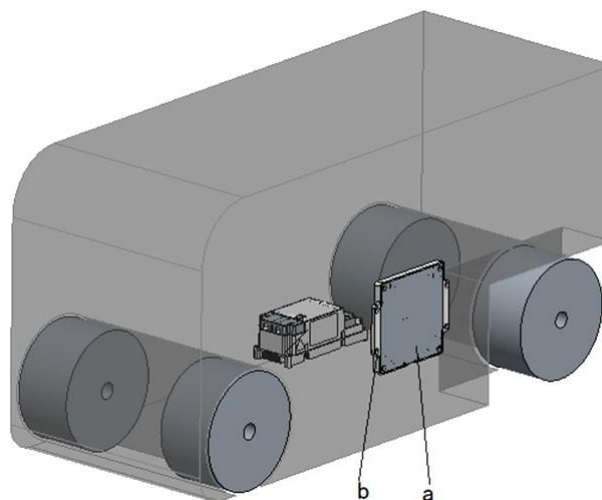


Fig 18 – Example installation on a vehicle

(a) receiver coil (b) fixing point

Install the receiver coil

Four holes ($\Phi 6.5\text{mm}$) are provided for securing the device to the vehicle body. It is at the discretion of the vehicle manufacturer as to what fasteners to use, their degree of fixation, and the tightening torque that should be applied.

1. Make sure that the zone around the coil is free of conductive objects (see Figure 19).
2. When installing, take into account the length of the coil cable.
3. Note the position of the transmitter coil: the centers of the two coils at the same height to align their coupling surfaces.
4. Consult the data sheet for the correct mounting dimensions.
5. Attach the receiver coil securely to the vehicle through all four fixing points.
6. Make sure that the direction of the outgoing wire of the receiver coil is the same as the direction of the outgoing wire of the transmitter coil.
7. Observe the minimum radial distance in Figure 19 when laying the connection cable. For example, use a non-magnetic gasket to guarantee a minimum distance from a steel member or pipe.
8. The minimum permitted bend radius of 50 mm must be followed when laying connection cables.
9. The connection cables can neither be shortened nor extended, and replacing a coil cable with an insulated core may cause a cable fire.

Notes



These minimum distances prevent the metal parts from heating up significantly. In the case of small distances, it is recommended to monitor any heating up in neighbouring metallic parts.

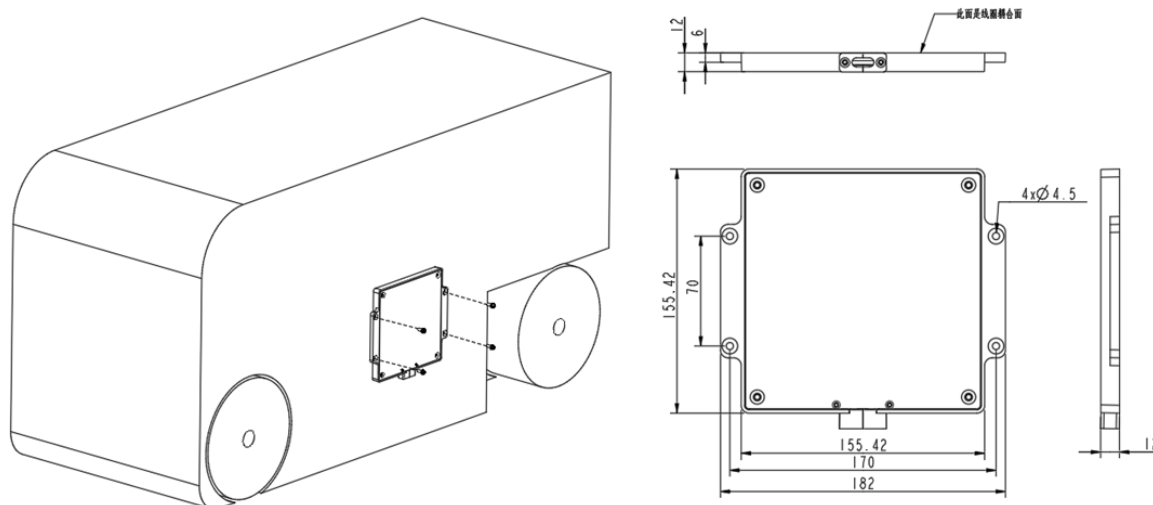


Fig 19 – Example installation on a vehicle (dimensional drawing, dimensional unit: mm)

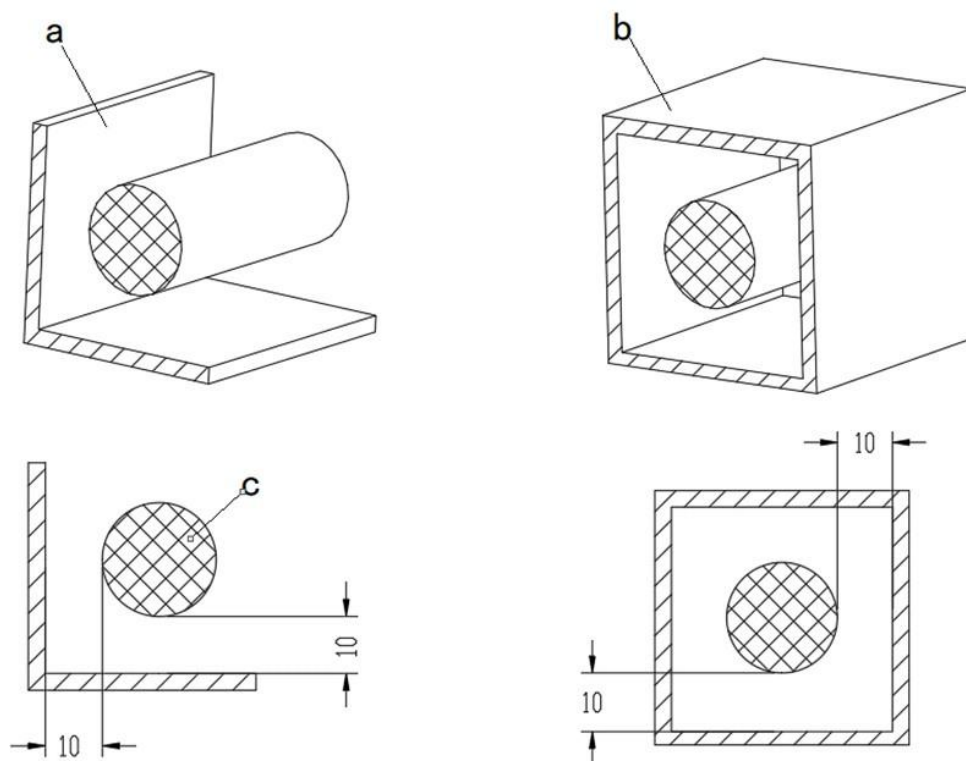


Fig 20 – Safe minimum distance for receiver coil cable (measurement unit: mm)

(a) Steel L profile (b) Square/round steel profiles (c) Connecting cables

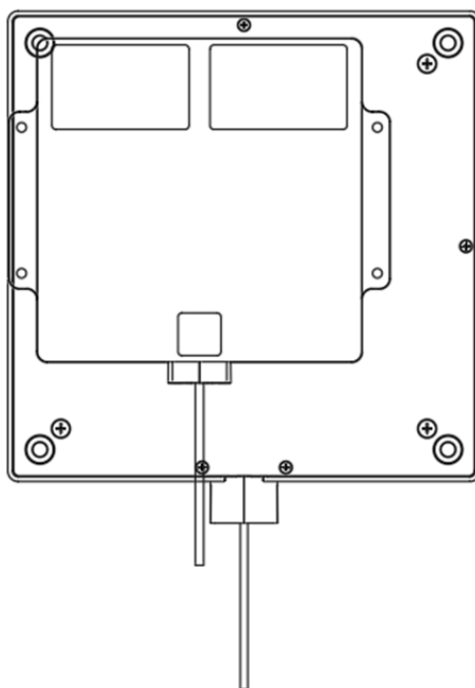


Fig 21 – Installation direction of the transmitter coil and receiver coil outlet

4.13 Receiver controller

Must have an electrical connection to the vehicle body (ground/equipotential).

The battery/energy storage device must be intrinsically safe according to applicable codes/standards (fuse, battery management system, etc.).

The permitted charging parameters/charging curves must be obtained from the technical documentation provided by the manufacturer of the energy storage device. Make sure that these requirements match the configuration of the wireless power system.

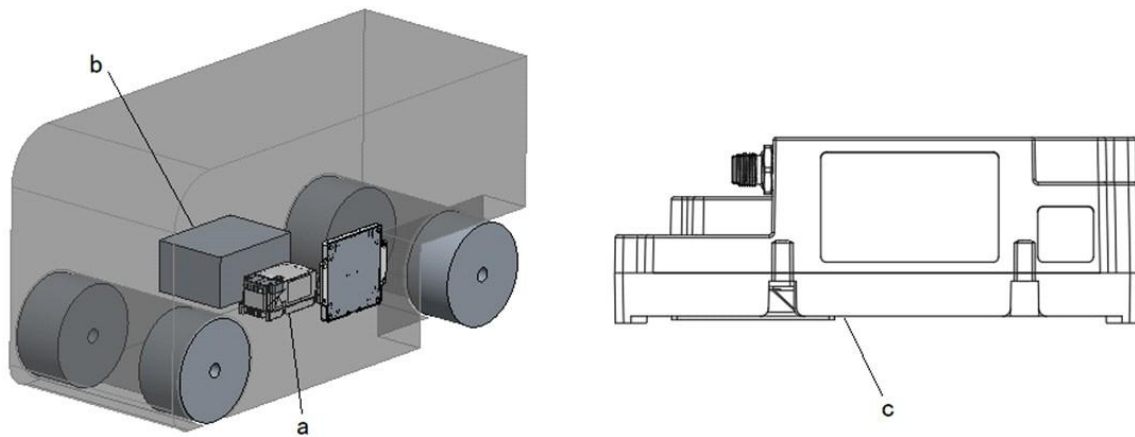


Fig 22 – Example installation in a vehicle

- (a) receiver controller
- (b) Battery/energy storage device

- (a) Active cooling (fan) version receiver controller
- (b) External Auxiliary heat dissipation (no fan) version Receive controller

4.14 Install the receiver controller

When installing the receiver controller, make sure its connection cable is easily accessible. Mount the mobile electronics securely to the vehicle body. The choice regarding the type of fasteners used, how secure they are and which tightening torque is to be applied is left to the vehicle manufacturer.

The receiver controller should be mounted in such a manner that no precipitating moisture can accumulate at the connection or the vacant connectors.

When installing, take into account the length of the receiver coil cable.

Make sure the receiver controller is securely secured to the vehicle structure.

There is a non-potential connection between the main connector and the housing. The housing for CAN, external power, and digital I/O connections is also non-potential.

Version with active cooling

Install the version with active cooling, leaving 20 mm (a) air gap in front of and behind the heat sink.

Hzl recommends an adequate air circulation around the heat sink if the optimal performance is to be achieved over the whole operating temperature range.

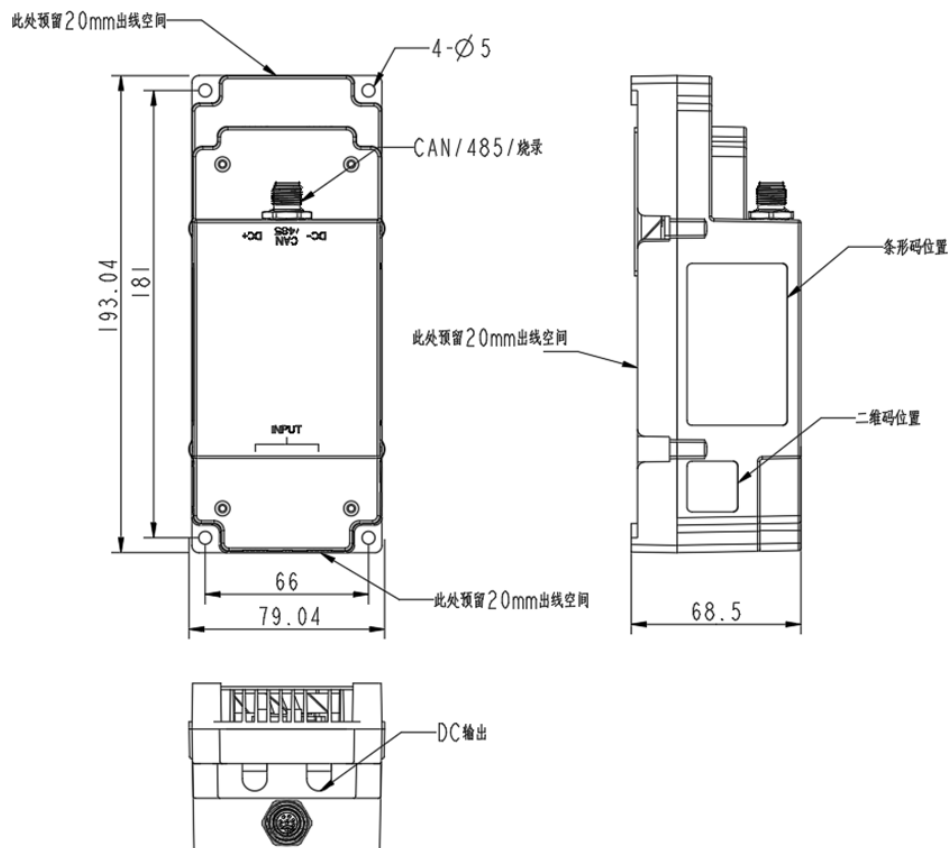


Fig 23 – Installation of receiver

Electrical connections to the receiver controller and the receiver coil

Warning!



Danger of electric shock

- Installation should be carried out by qualified personnel only.
- Wait for at least 2 minutes of discharging time before working on the system.
- Follow applicable safety regulations.

Warning!



Explosion and fire hazard

Connecting not intrinsically safe batteries may cause an explosion or fire

- Use rechargeable batteries only.
- Use intrinsically safe batteries only.
- Follow the safety instructions and specifications provided by the battery manufacturer.

Warning!



Danger of fire

A misconnected battery and coil cable can cause a cable fire.

- Use the attached screws only.
- The specified tightening torque must be used.

Attention!



Danger of burns

The connecting cable for the receiver coil must not be wrapped in insulation so that the heat generated can be dissipated into the surroundings.

- When installing the connection cable for the receiver coil, keep a distance from the metal parts of the structure, especially steel.
- During commissioning, the temperature of the power transfer system must be checked with adequate equipment to verify the safe operation of the installation.

The vehicle's battery and the receiver coil are connected to the terminals on the receiver controller.

Route the cables so that no dirt or moisture can penetrate the housing.

it is recommended that an anti-pull device is provided and the cable will not be subjected to wear.

Battery connections that comply with UL1564 (outdoor) and CSA22.2-No107.2 standards must comply with the following:

1. Use neoprene or equivalent insulated wires with an insulation of at least 1,52 mm for AWG 8 to 20 or 2,03 mm for AWG 1 to 4/0.
2. A minimum electrical strength of 60 volts and a minimum current load rating of 60A;
3. Acid and alkali resistance;
4. Capable of withstanding flexing, handling, and impact in the temperature range of -29 to $+54^{\circ}\text{C}$;
5. In the case of voltages over 50 V, the housing may not be connected to the battery potential. When the housing is connected to the battery potential for voltages under 50 V, it must bear a corresponding warning.

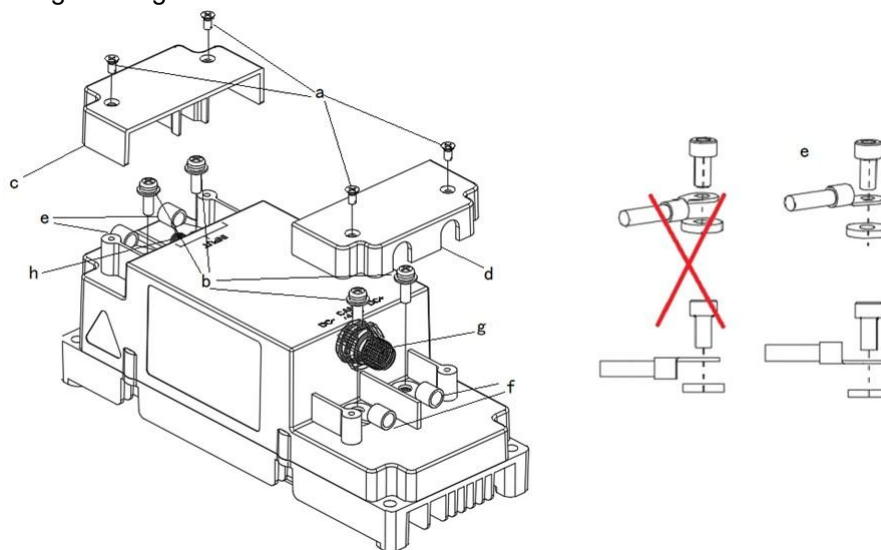


Fig 24 – Connecting the vehicle to ground/opening the receiver controller housing

1. Ensure that there is no voltage between the battery cables.
2. Unscrew the four M3 countersunk head screws shown in Figure 24(a).
3. Remove covers c and d (refer to Figure 24©, d)).
4. Connect the coil: Attach the coil cables (with 2x M4 ring terminals) to the terminals indicated in Figure 24(e). Use only the provided M4 screws (Figure 24(b)). Observe the correct orientation of the ring terminals (Figure 24(2)). Tightening torque: 2.0 N·m.
5. Connection to the battery (energy storage unit): Connect the cables (see Figure 24(f)) to the terminals. Note the terminal assignment/polarity: + (positive) and – (negative). Use only the provided M4 screws (see Figure 24(b)). Observe the correct orientation of the ring terminals (see Figure 24(h)). Tightening torque: 2.0 N·m.
6. Reinstall the covers shown in Figure 24©, d).
7. Secure the screws from Figure 24(a) into place. Tightening torque: 0.3 N·m.
8. Connect the communication interface plug shown in Figure 24(g).
9. Connect the 2.4G antenna interface shown in Figure 24(h).

The receiver controller is now correctly connected. The battery voltage can now be switched on.

4.15 Connect the plug to an external power supply

Warning!



Danger of electric shock

- Installation should be carried out by qualified personnel only.
- The connections' potential lies on the battery's minus potential.
- Wait for at least 2 minutes of discharging time before working on the system.
- Follow applicable safety regulations.

The external signal interfaces (CAN & 485) of this electronic device are implemented via a 5-pin male M12 connector.

5 Instructions for use

Power-on steps:

Step 1: In the power off state, install the Transmitter side and receiver side respectively according to Figure 6. Connect the input end of the transmitter controller to 100-240V AC.

Step 2: Connect the output cable of the receiver controller to the corresponding interface of the battery or load.

Step 3: Check that the distance between the two plane coupling surfaces of the Transmitter controller and the receiver controller coil is controlled within the charging range, and ensure that the deviation of the center point of the two coupling surfaces is not out of range, and confirm that there can be no metal between the Transmitter controller and the receiver controller coupling surface.

Step 4: Turn ON 100-240V AC, turn on the ship switch to ON, the green light on the Transmitter controller is steady on, and the device is in standby state; The Transmitter controller starts to periodically (about 5 seconds) try to detect the feedback of the receiver controller. When the receiver controller is within the effective charging distance, the yellow light of the Transmitter controller is steady on, and the green light is off. At this time, the device is in a rechargeable state; Press and hold the strong charge button for 5 seconds or receive the charging command from the BMS (vehicle side), start charging, when there is current at the output end ($\geq 5A$), the yellow light of the transmitter controller flashes, and the fan of the receiver controller starts to rotate.

Step 5: When the battery is fully charged, the yellow light is steady on and the fan of the receiving controller stops.

Step 6: After the receiver controller (generally on the user device) leaves, the Transmitter is in standby and the green light is steady on.

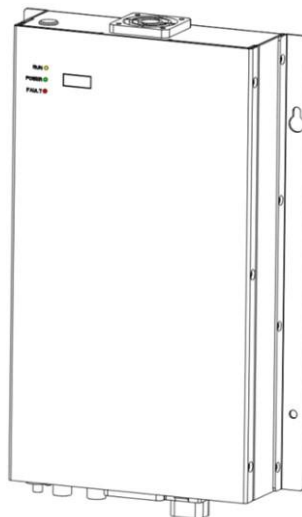


Fig 25 – Transmitter Controller Indicator Light Diagram

Power-off steps

Disconnect the 100-240V AC input.

Note: After power-on, if the load is light load or no load, the Transmitter controller will be in standby state, and the wave detection interval is about 5 seconds, so the output voltage may be low during no-load, but as long as the load is within the effective charging distance, it can work normally.

Special attention: strictly prohibit reverse polarity connection of output terminals and hot-swapping batteries during operation.

The automatic function of the charging system

When the receiver coil installed at the end of the car is close to the transmitter coil installed at a fixed position, and the two coils are kept at an adequate distance from each other, the data transfer interface integrated in the receiver coil will start the communication between the transmitter controller and the receiver controller.

The measured values and parameters for the charging process can be exchanged, and the system switches to charging mode (Figure 26). Moving the transmitter and receiver coils apart disrupts communication and automatically stops the charging process.

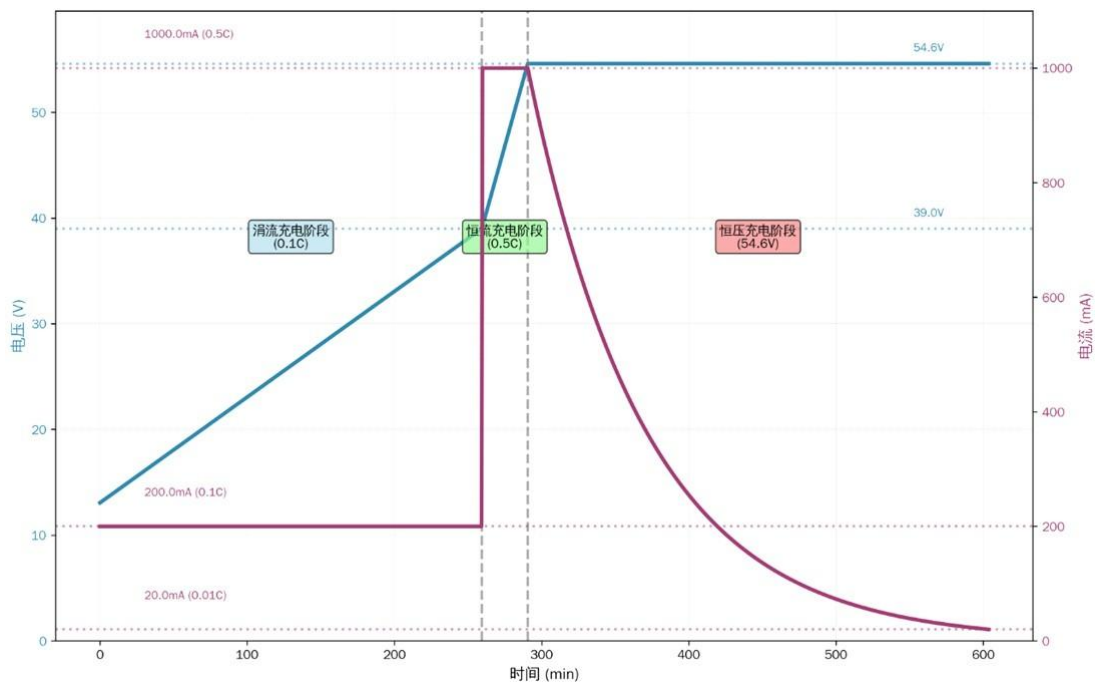


Fig 26 – Example of a charging curve for the LC180-A30

Transmitter Side Charging Logic Diagram

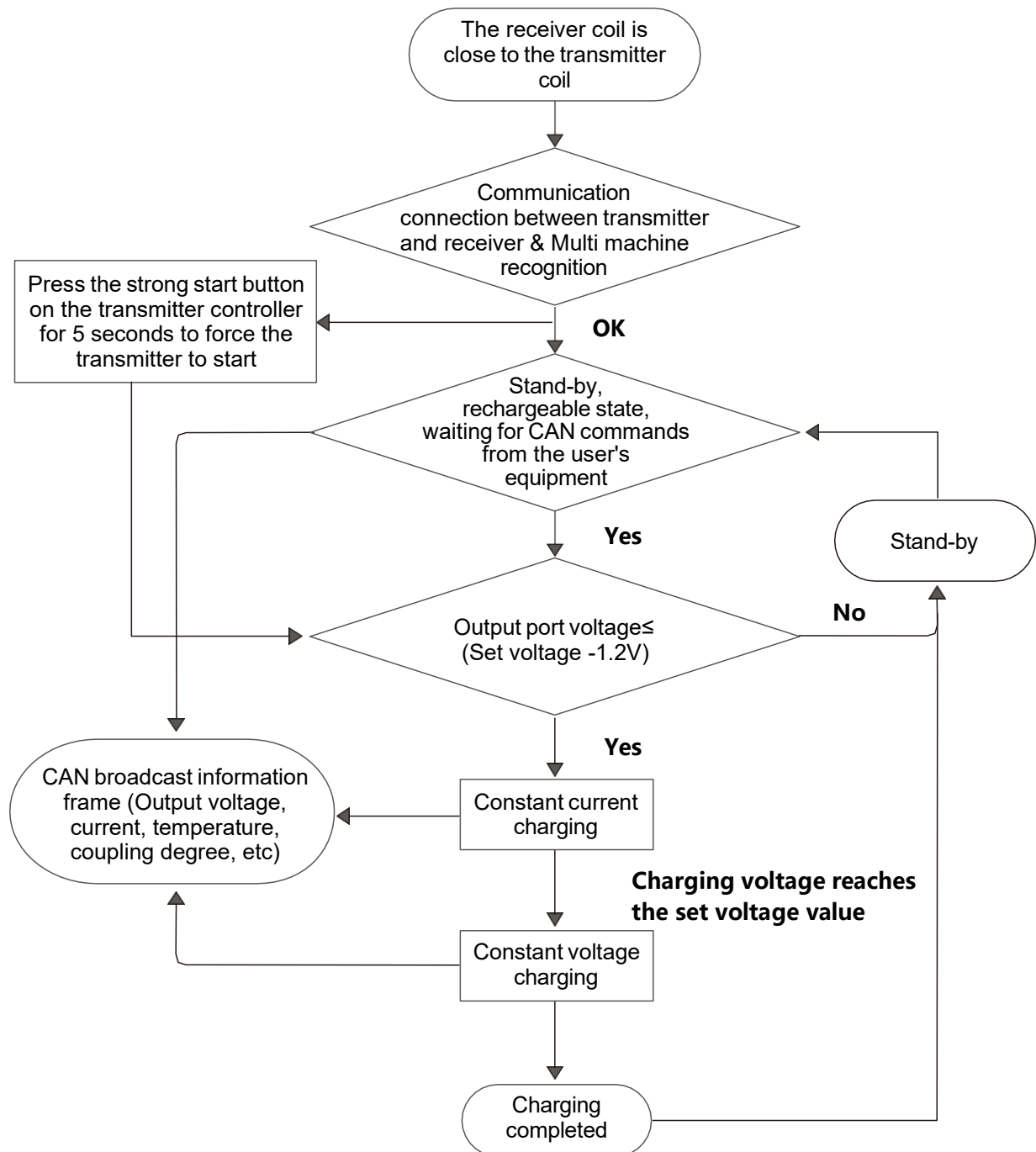


Fig 27 – Charging control logic diagram

Indicator light description:

- (1) **Red light:** Blinks when there is a fault, extinguishes after the fault is eliminated or restarted; For specific faults, check the CAN packets reported by the host computer or receiver.
- (2) **Green light:** After the Transmitter is powered on, the indicator is steady on in the standby state and off in other states.
- (3) **Yellow light:** When the communication between the Transmitter and the receiver is established, the indicator is steady on, indicating that the system is in the rechargeable state. The indicator blinks when the output current ($\geq 5A$) is generated at the receiver.

All lights blink 600ms(on 300ms off 300ms) at 900ms intervals.

6 Fault analysis and troubleshooting

SN	Fault manifestations	Fault cause analysis	Solution
1	When the product is connected, it does not work	1. a link of the product connection is wrong 2. The antenna is not connected	1. Check whether the wiring is wrong, whether the positive and negative are correct , whether the parameters correspond, and whether the coil coupling surface is normal. Whether the coil is inverted; 2. Check that the antenna is connected correctly
2	Yellow light is not on	Poor 2.4G communication between transmitter & receiver	1. Check that the antenna is not broken and the connector is properly installed; 2. Whether the coil distance is within the nominal range. 3. Leave the charging station and re-enter, then try to verify multi machine communication again.
3	No charging after aligning the charging position	1. no load 2. short circuit of load 3. No charging command has been issued	1. Check that the load battery is properly connected. 2. check whether the battery internal charging relay is open; 3. whether there is CAN communication instruction.
4	Indicator light is not on	There is a problem with the power supply or the Transmitter is damaged	1. The wiring of indicator board is loose or falls off; 2. Contact the original after-sales service for confirmation.

7 Precautions

In order to use the company's wireless charger safely and reliably, please be sure to pay attention to the following:

1. The default input voltage of the charger is 100-240V, 47-63Hz, which is subject to the specifications. There may be static electricity generated when the machine is working, the transmitter controller must be reliably grounded, and note: do not expose to rain.
2. The Transmitter coil must be connected to the Transmitter controller (or Transmitter pile) before the main power 100-240V can be connected. If the transmitter coil is not connected, the main power is turned on 100-240V, there is the possibility of damage to the internal circuit.
3. Please confirm that the receiver coil is connected to the receiver controller before it can enter the range of the transmitter coil and work normally. If the receiver coil is not connected to the controller, it enters the magnetic field range of the transmitter coil, and the two sides of the coil will be coupled with high voltage, which is more dangerous.
4. It is strictly forbidden to reverse the positive and negative lines of the receiver controller output, otherwise there is a great possibility of damage to the machine.
5. Danger: There is danger of electric shock. Do not touch the uninsulated parts of the transmitter controller and receiver controller.
6. The output parameters are subject to the specifications, if the customer changes the parameters of the load (battery) in the actual application, please modify the output voltage/output current parameters on the host computer according to the actual load parameters, if you do not know the modification, please consult the manufacturer.
7. The charging distance of the charger (the distance between the two coils) has strict requirements, and if it is not within the specified range, it may lead to the failure to charge or the charging current is very small, please refer to the specification for details. If the nominal charging distance range is 10 - 30mm, the optimal charging distance is between 20mm, when the charging efficiency is the highest. When installing the coil, it is recommended to install it according to the optimal charging distance, of course, leaving a margin for deviations.
8. When working, the current and voltage inside the Transmitter/receiver coil are relatively high, and it is high frequency. Its parameters have been strictly designed and tested. The cable is a multi-strand Leeds wire dedicated to high frequency, which is not a general cable. If you need to change the length of the cable, please be sure to consult the manufacturer, and the manufacturer will determine whether it can be changed and how to change.
9. The Transmitter/receiver coil has the characteristics of high frequency, high voltage and high current when working. Please be sure to keep the wire intact during installation and use. For the application environment with trampling or rolling, be sure to increase the corresponding protective measures.
10. Since the magnetic field has a magnetic heating effect on metals and magnetic materials, it must be ensured that no metal and magnetic materials are attached to the surface of the coil when the power is working.

11. The protection level of the Transmitter controller (or Transmitter pile) is IP20, the protection level of the receiver controller is IP54, and the protection level of the coil is IP65. When used in an environment beyond its protection level, please add other protective measures.
12. The burning port is special for the update program, please do not use it without authorization, otherwise the machine may be damaged.
13. Do not disassemble/repair the machine without authorization. There are high-voltage capacitors and other devices in the internal circuit. There may still be high-voltage surplus electricity after Turning off the power for a period of time. If you need to repair the machine, please consult the manufacturer.
14. When the power is on or just off, the surface temperature of the coil may be a little high (depending on the heat dissipation conditions), do not touch to prevent high temperature burns.
15. When powered on, due to the phenomenon of non-ionizing radiation within the magnetic field range of the coil, the radiation area around the coil is safe for the human body to be exposed outside the range of 0.3 meters during operation, so please be sure to do isolation protective measures and warning signs when installing, to prevent non-professionals from entering the coil range within 0.3 meters.
16. The machine is an industrial wireless charger, suitable for lithium batteries, other types of batteries may burst and cause personal injury and damage, only use the battery pack that contains the battery management system and all the necessary protection.

Important Safety Instructions

- (a) Save these instructions. This manual contains important safety and operating instructions
- (b) Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason it is of the utmost importance that each time before using your charger, you read and follow the instructions provided exactly
- (c) To reduce risk of battery explosion, follow these instructions and those marked on the battery
- (d) Never smoke or allow an open spark or flame in the vicinity of the battery or engine
- (e) Use charger for charging a lead-acid battery only. It is not intended to supply power to an extra-low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property
- (f) Never charge a frozen battery
- (g) If it is necessary to remove battery from vehicle to charge it, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off in order to prevent an electric arcing.
- (h) Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge
- (i) Never place the charger directly above or below the battery being charged; gases or fluids from the battery will corrode and damage the charger. Locate the charger as far away from the battery as dc cables permit
- (j) Do not operate charger in a closed-in area or restrict ventilation in any way
- (k) Connect and disconnect dc output clips only after setting any charger switches to the off position and removing ac cord from the electric outlet. Never allow clips to touch each other
- (l) Follow these steps when battery is installed in vehicle. A spark near battery may cause a battery explosion. To reduce risk of a spark near battery:
 - (i) Position ac and dc cords to reduce risk of damage by hood, door, or moving engine part;
 - (ii) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons;
 - (iii) Check polarity of battery posts. A positive (pos, p, +) battery post usually has a larger diameter than a negative (neg, n, -) post;
 - (iv) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see item (v). If positive post is grounded to the chassis, see item (vi);
 - (v) For a negative-grounded vehicle, connect the positive (red) clip from battery charger to positive (pos, p, +) ungrounded post of battery. Connect the negative (black) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block;

- (vi) For a positive-grounded vehicle, connect the negative (black) clip from battery charger to negative (neg, n, –) ungrounded post of battery. Connect the positive (red) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block;
- (vii) Connect charger ac supply cord to electric outlet; and
- (viii) When disconnecting charger, turn switches to off, disconnect ac cord, remove clip from vehicle chassis, and then remove clip from battery terminal
- (i) Follow these steps when battery is outside vehicle. A spark near the battery may cause a battery explosion. To reduce risk of a spark near battery:
 - (i) Check polarity of battery posts. A positive (pos, p, +) battery post usually has a larger diameter than a negative (neg, n, –) post;
 - (ii) Attach at least a 60 cm 6-gauge (awg) insulated battery cable to a negative (neg, n, –) battery post
 - (iii) Connect the positive (red) charger clip to the positive (pos, p, +) post of battery;
 - (iv) Position yourself and the free end of cable as far away from battery as possible, then connect the negative (black) charger clip to free end of cable;
 - (v) Do not face battery when making final connection;
 - (vi) Connect charger ac supply cord to electrical outlet; and
 - (vii) When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while standing as far away from battery as practical
- (j) When the instructions refer to adapters, the following statement shall be included: Use of an adapter is not allowed in Canada. If a grounding type receptacle is not available, do not use this appliance until the proper outlet is installed by a qualified electrician

8 FCC Statement

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the.

following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device must not be co-located or operating in conjunction with any other antenna or transmitter.
FCC RF Radiation Exposure Statement Caution: To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.

9 IC Statement

This device complies with Innovation, Science and Economic Development Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Sciences et développement économique canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device is compliance with RF field strength limits, users can obtain Canadian information on RF exposure and compliance.

Le présent appareil est conforme de ce matériel aux conformités ou aux limites d'intensité de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité d'acquérir les informations correspondante.

This Class B digital apparatus complies with Canadian ICES-003 (B)/NMB-003(B).

Cet appareil numérique de la classe B est conforme à la norme ICES-003 (B)/NMB-003(B). du Canada.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

10 Professional Installation Warning:

This device must be professionally installed, this should be noted on grantee. To maintain compliance, only the antenna types that have been tested shall be used, which listed as below: This device requires a significant technology engineering expertise towards understanding of the tools and relevant technology, not readily available to the average consumer. Only a person professionally trained in technology is competent. This device is not directly marketed or sold to the general public.