



# HzWP LC180-A30 Wireless Power System (Transmitter)

## Product Specifications

Product Model: HzWP LC180-A30

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Version: Rev. 02

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Revision date: 2025-07-10

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| LC180-A30-A component(recommended base pack) |  | Product code |
|----------------------------------------------|--|--------------|
| Transmitter Controller HzWP LC180- A30-TC    |  | 911906701810 |
| Transmitter coil HzWP LC180-A30-TX-A         |  | 911920701810 |

| LC180-A30-B assembly(recommended side-mounted) |  | Product code |
|------------------------------------------------|--|--------------|
| Transmitter Controller HzWP LC180- A30-TC      |  | 911906701810 |
| Transmitter coil HzWP LC180-A30-TX-B           |  | 911920701811 |

|        |                   |
|--------|-------------------|
| FCC ID | 2BH87-LC180A30TC  |
| IC ID  | 32872-LC180A30TC  |
| HVIN   | HzWP LC180-A30-TC |

## Revision history

| Editions        | Author      | Submitted date | Auditor | Issue date |
|-----------------|-------------|----------------|---------|------------|
| Version Rev. 01 | Sichao Liao | 2025-03-11     |         |            |
| Version Rev. 02 | Sichao Liao | 2025-03-11     |         |            |
|                 |             |                |         |            |
|                 |             |                |         |            |

### 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 by Shenzhen Hertz Innovations Technology Co., Ltd. (hereinafter referred to as "Hzl"). 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 charging system by Hzl 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 charging system is restricted to use within industrial areas and must only operate in conjunction with compatible Hzl wireless charging 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 | Maximum power 1.5kW, rated voltage 48V (range: 18-60V), maximum current 25A                                                                                              |
| HzWP LC180-A30-B | It is basically the same as the electrical of model A, with the main difference being that the dimensions of the Transmitter coil and the Receiver coil are not the same |

# 2 Product structure & dimensions

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

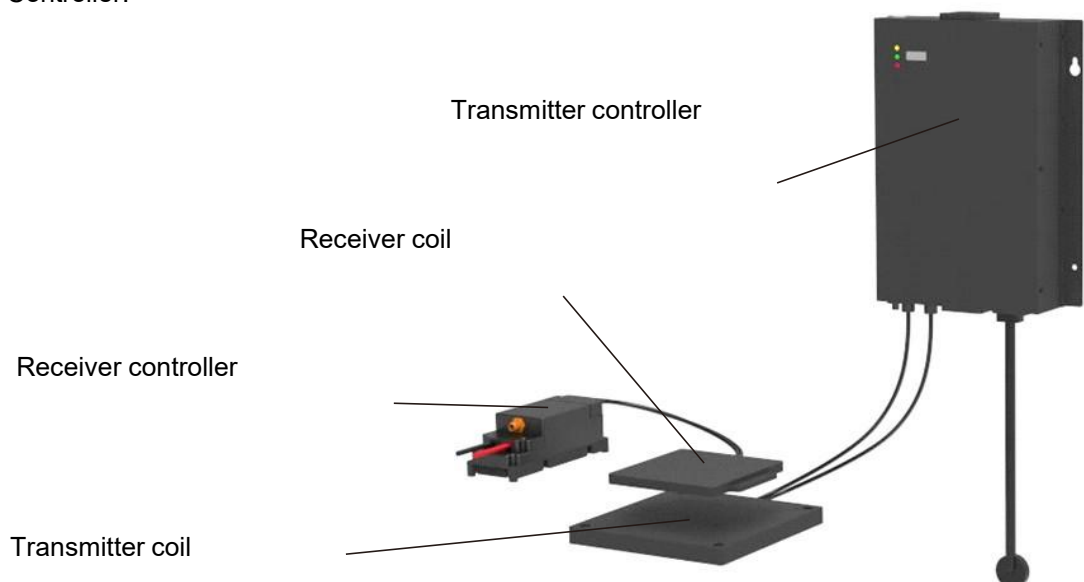


Fig 1 – Product Picture

## 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.

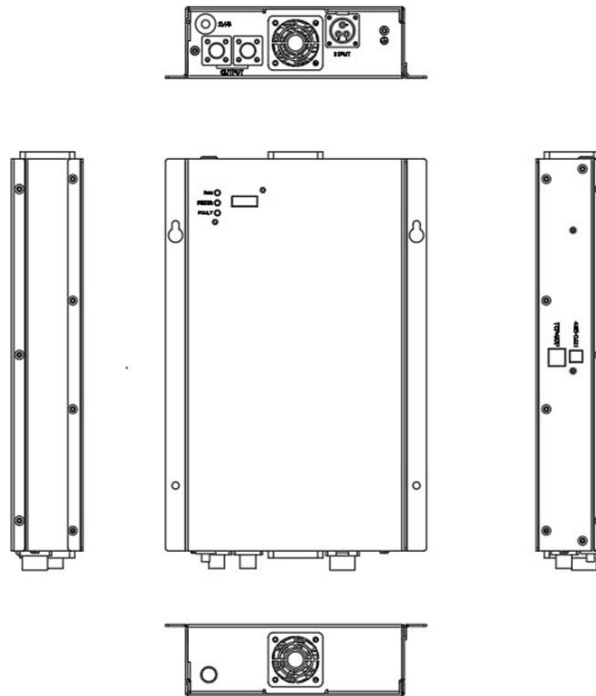


Fig 2 – Outline and size of transmitter controller (measurements in mm)

The Transmitter controller ports are defined in the following table:

| No. | Identification/Mark | Function Description                                                   |   |    |                                                                                               |
|-----|---------------------|------------------------------------------------------------------------|---|----|-----------------------------------------------------------------------------------------------|
| 01  | INPUT               | 90-264V AC input port, LP24 aviation plug                              | 1 | L  | <br>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              | Connect to the Transmitter Coil (Non- Polarized), male Connector       |   |    |                                                                                               |

## 2.2 Transmitter coil 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 IP67, and the maximum load-bearing capacity is 1.2 tons. The maximum dimensions are L\*W\*H=225\*225\*17mm. (Suggested bottom mounted)

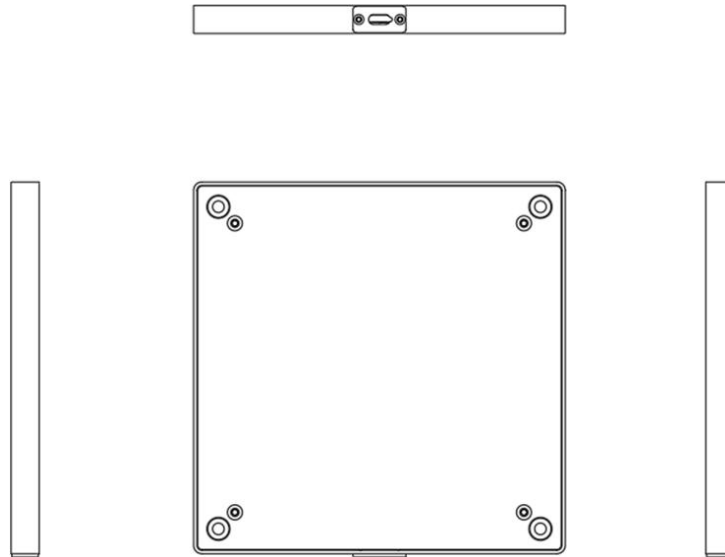


Fig 3 – Outline and size of transmitter coil HzWP LC180-A30-TX-A (measurements in mm)

## 2.3 Transmitter coil HzWP LC180-A30-TX-B

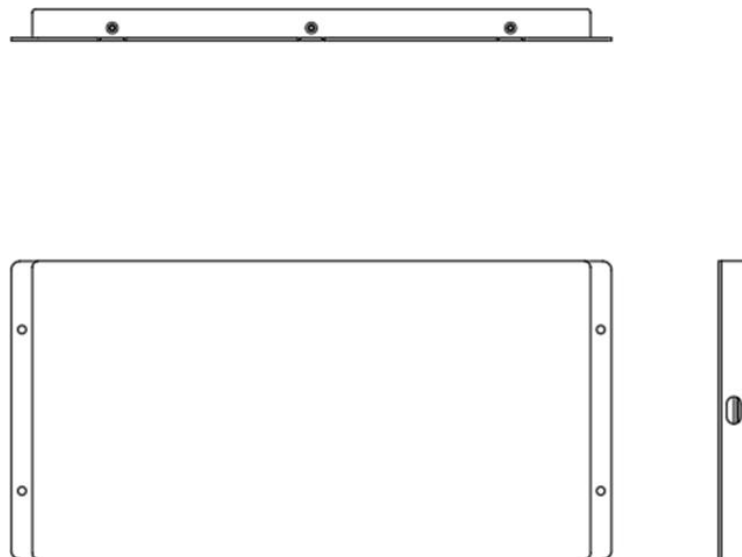


Fig 4 -Outline and size of transmitter coil HzWP LC180-A30-TX-B (measurements in mm)

### 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            | Port Definition table, 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                                        |

| 1. Coil input terminal |                                                                |
|------------------------|----------------------------------------------------------------|
| PIN                    | Description                                                    |
| INPUT1                 | The coil input port 1 is connected to the Receiver coil INPUT1 |
| INPUT2                 | The coil input port 1 is connected to the Receiver coil INPUT1 |

### 3 Product technical parameter

| SN                      | Description                                           | Data                                                                                                                                         |
|-------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic data</b>       |                                                       |                                                                                                                                              |
| 01                      | Output power                                          | 1.5kW Max                                                                                                                                    |
| 02                      | Transfer efficiency                                   | > 80%                                                                                                                                        |
| 03                      | Wireless charging distance                            | 10-30mm                                                                                                                                      |
| 04                      | Wireless charging operating frequency                 | 140kHz                                                                                                                                       |
| 05                      | Frequency Range(2.4G)                                 | 2402MHz to 2480MHz                                                                                                                           |
| 06                      | Antenna info                                          | FPC antenna-2.4-SMA. 2400-2500MHz                                                                                                            |
| 07                      | Part number                                           | HX-FPC24-289-8300D1                                                                                                                          |
| 08                      | Antenna type                                          | External with SMA connector                                                                                                                  |
| 09                      | Antenna gain                                          | 0.67dBi Max                                                                                                                                  |
| 10                      | Magnetic isolation protection                         | Magnetic material + aluminum plate shielding                                                                                                 |
| 11                      | Startup method                                        | Auto-detect auto-start                                                                                                                       |
| 12                      | Charging method                                       | Constant current and constant voltage                                                                                                        |
| 13                      | Operating ambient temperature                         | -20°C~50°C / -4°F~122°F                                                                                                                      |
| 14                      | Storage ambient temperature                           | -40°C~85°C / -40°F~185°F                                                                                                                     |
| 15                      | Operating environment humidity                        | ≤90%                                                                                                                                         |
| 16                      | Installation altitude                                 | max. 2000m above sea level                                                                                                                   |
| 17                      | Scenarios for use                                     | Non-residential environment                                                                                                                  |
| <b>Transmitter data</b> |                                                       |                                                                                                                                              |
| 01                      | Input voltage                                         | 100-240V AC 47-63Hz                                                                                                                          |
| 02                      | Input current                                         | 20A Max                                                                                                                                      |
| 03                      | Transmitter Controller size                           | 390*260*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*225*17mm                                                                                                                                 |
| 08                      | Transmitter coil size (bottom mounted)                | Approx. 3.5kg (including 8 m outgoing cable)                                                                                                 |
| 09                      | Transmitter coil size (side-mounted)                  | L*W*H=330*165*22mm                                                                                                                           |
| 10                      | Transmitter coil weight(side-mounted)                 | Approx. 2.5kg                                                                                                                                |
| 11                      | Transmitter coil lead cable length                    | ≤8 meters                                                                                                                                    |
| 12                      | Transmitter coil housing material and IP grade        | ABS+PC and aluminum alloy, IP65 (filling glue), maximum bearing capacity 1.2 tons                                                            |
| <b>Certifications</b>   |                                                       |                                                                                                                                              |
| 01                      | EMC                                                   | EN 301 489-1 V2.2.3<br>EN 301 489-3 V2.3.2<br>EN IEC 55014-1:2021<br>EN IEC 55014-2:2021<br>EN 55032:2015+A11:2020<br>EN 55035:2017+A11:2020 |

|    |                      |                                                                                                          |
|----|----------------------|----------------------------------------------------------------------------------------------------------|
|    |                      | EN 300 440 V2.1.1<br>EN 62479:2010<br>EN IEC 61000-3-2:2019+A2:2024<br>EN 61000-3-3:2013+A1:2019+A2:2021 |
| 02 | Safety               | EN 62477-1:2012/A12:2021<br>UL 1564<br>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<br>Transmitter coil =2<br>Receiver controller =2<br>Receiver coil =2           |

## 4 Installation Instructions

1. The transmitter controller is connected to the transmitter coil and installed at the charging position, and the receiver controller is connected to the receiver coil and installed on the user device;
2. Wiring method as shown in Figure 8, the normal working vertical range of the transmitter coil to the receiver coil is 10-30mm (optimal charging distance is 20mm); The single-direction (X or Y) offset is  $\pm 20\text{mm}$ , and the bidirectional (X and Y simultaneously) offset is  $\pm 15\text{mm}$ .
3. The receiving end output is connected to the user device. The red wire is positive and the black wire is negative.
4. The coil is installed as shown in Figure 7. Pay attention to the coupling surface. There should be no metal or living organisms entering between the two coils and within 5cm around the coil (except the back).
5. Both the transmitting controller and the Receiver Controller have cooling fans. Be careful not to block the air inlet and outlet, and keep the gap between the air inlet and outlet and other objects  $\geq 3\text{cm}$ .
6. During operation, the area beyond 0.7 meters from the coil is considered a safe exposure zone for human presence (according to EN IEC 62311:2020, Annex III, Table 2 of 1999/519/EC). Therefore, it is essential to implement proper isolation and protective measures, as well as warning signs during installation to prevent personnel from entering within 0.7 meters of the coil when the equipment is in operation.
7. When connected to the battery, the output must not be reversed; If the output is connected in reverse, there is a high possibility of damaging the device or even the battery.
8. Do not install the coil in an embedded position (i.e., insert the coil into a metal cavity), otherwise there is a risk of the metal near the coil being heated by the magnetic field.

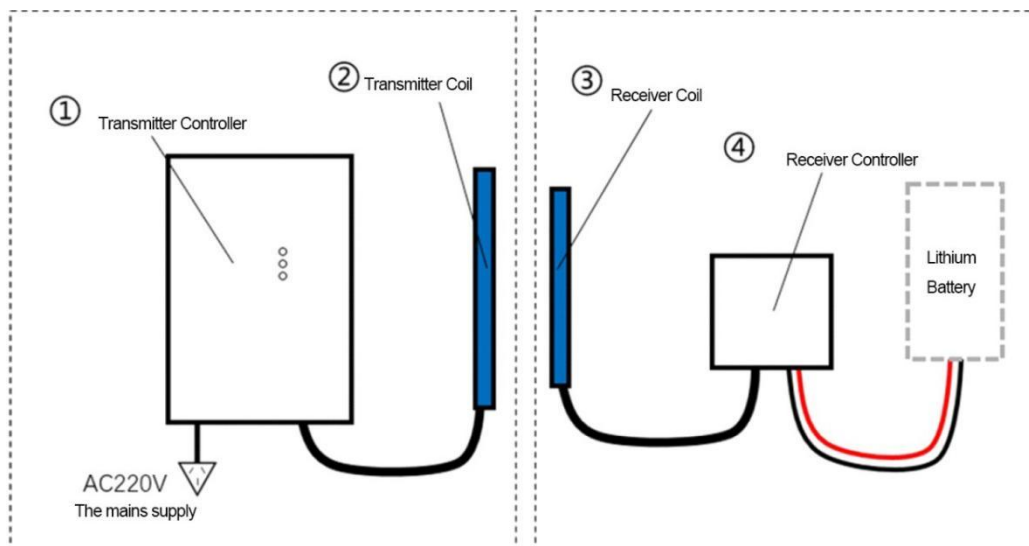


Fig 8 – System wiring diagram

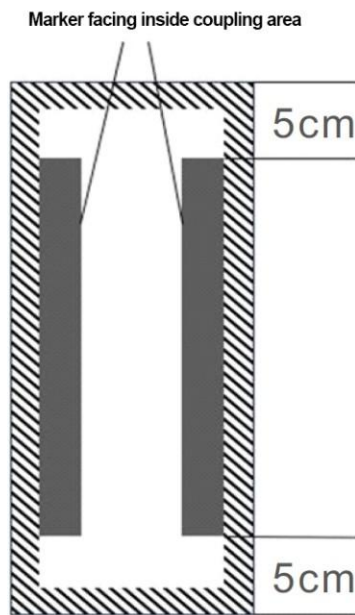


Fig 9 – Coil coupling area indication

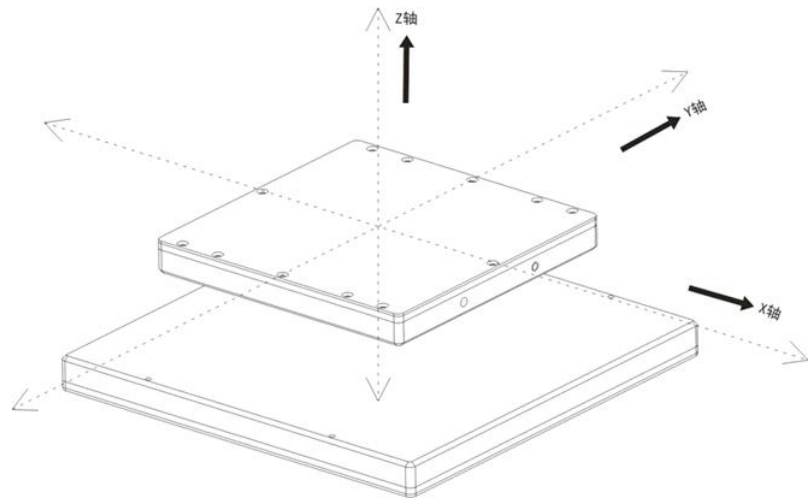


Figure 10 Coil offset indication

**This table shows offset conditions under different distance conditions**

| Coil distance<br>(Z- axis) (mm)                                | Offset (the transmitting and Receiver coils are installed vertically), the offset distance between the center points of the two coils                 |                                                     |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|                                                                | Single-direction offset (X or Y)                                                                                                                      | Offsets in both directions simultaneously (X and Y) |
| 10 ~ 30                                                        | 20mm                                                                                                                                                  | 15mm                                                |
| Relative Tilt Angle Between Coils<br>Coils installation method | 10°                                                                                                                                                   |                                                     |
|                                                                | Side mounting is recommended (be careful to prevent metal foreign objects/live objects from entering the coupling surface if installed at the bottom) |                                                     |

**Note:** The coil offset indication is shown in Figure 10. Assuming it is bottom - mounted, the offset between coils in the vertical (z-axis) direction is 10-30mm, the offset in the single direction (X or Y) is  $\pm 20\text{mm}$ , and the offset in both directions (X and Y simultaneously) is  $\pm 15\text{mm}$ .

## 5 Transmitter side packaging instructions

The launch piles are packed in wooden crates, each containing 4 Transmitter Controllers and 4 launch coils. The specific packaging steps are as follows:

- 1、Insert number ⑥ and number ⑩ into number ⑦;
- 2、Put serial number ⑤ into serial number ⑥, put serial number ⑩ into serial number ⑩, and wrap the output line of serial number ⑩ around serial number ⑩;
- 3、Repeat step 2 in sequence until all 4 transmitter controllers and 4 transmitter coils are wrapped, then place sequence ② and sequence ⑧ on sequence ④ and sequence ⑩;
- 4、Cover number ① and seal the box with a hammer to complete the packing process. Refer to Figures 11-1 and 11-2

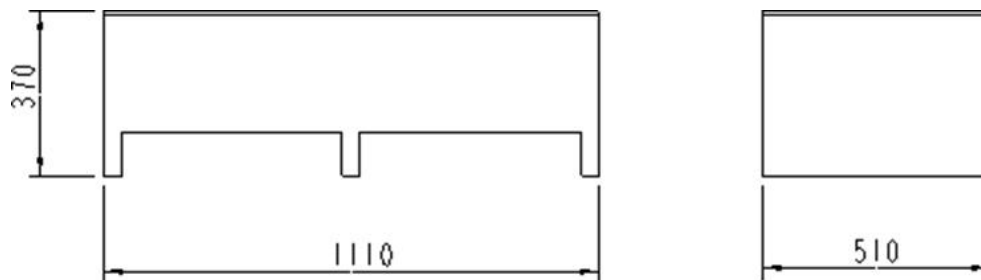


Fig 11-1 – Diagram of the external dimensions of the launch pile box

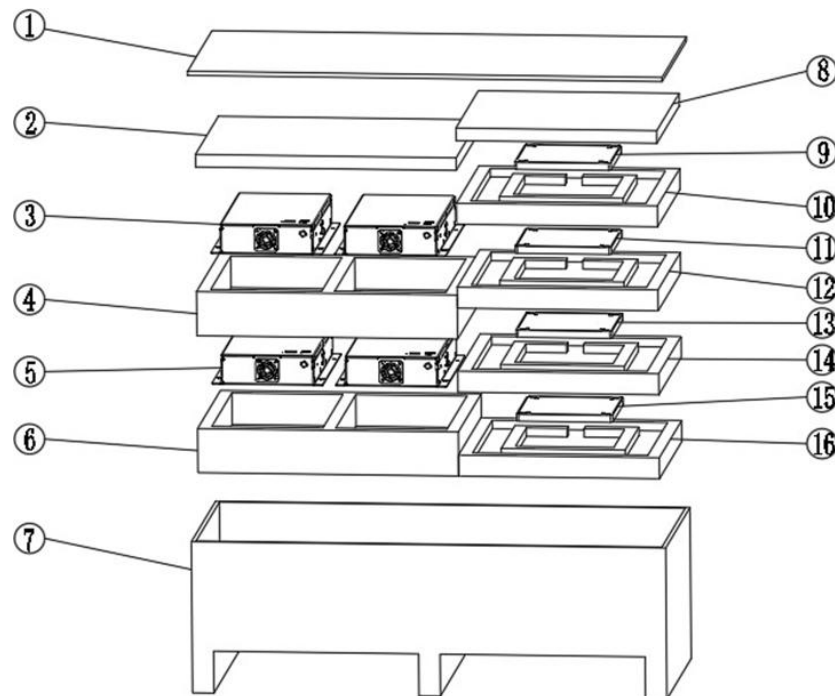


Fig 11-2 – Packaging diagram of the launch pile

- ① Box cover plate ⑦ box
- ② Emission controller pearl cotton 2 ⑧ emission coil pearl cotton 2
- ③⑤ Emission controller ⑨⑪⑬⑮ emission coil
- ④⑥ Emission controller pearl cotton 1 ⑩⑫⑭⑯ emission coil pearl cotton 1

## 6 Transmitter coil installation

After the transmitter coil is installed and fixed, it should be level with the ground, and the output wire should be pre-buried underground. The specific steps are as follows:

- 1、Make grooves and holes on the ground according to the dimensions shown in Figure 12-1;
- 2、Insert number ③ at the hole position shown in Figure 10-1 and fix number ④ with M8 screws as shown in Figure 12-2;
- 3、Place number ② on top of number ④ and fix it with number ①M6 screw, as shown in Figure 12-2 and Figure 12-3;
- 4、Fill the gaps between the cable tray and the Transmitter coil with cement to ensure that the Transmitter coil is flush with the ground.
- 5、The overall installation effect diagram is shown in 12-7

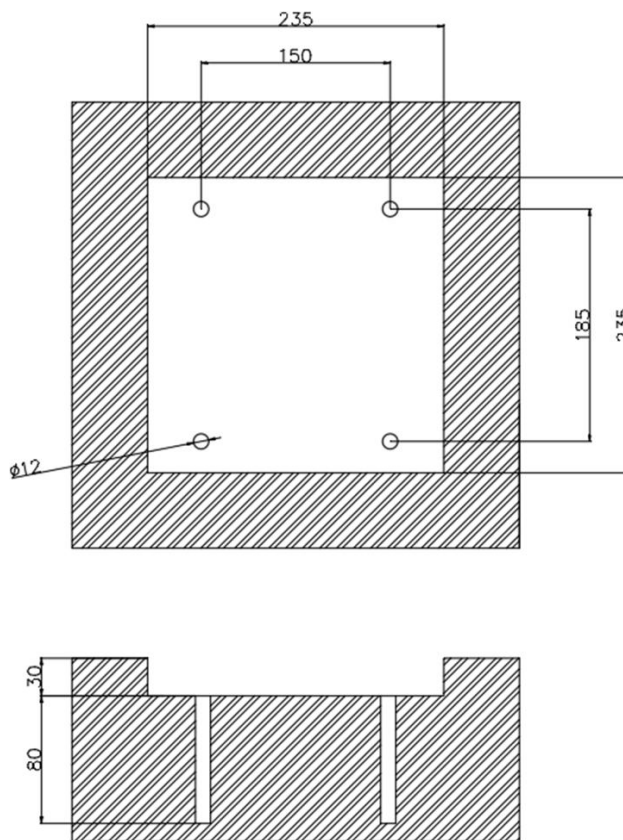


Fig 12-1 – Ground slotting of the Transmitter coil

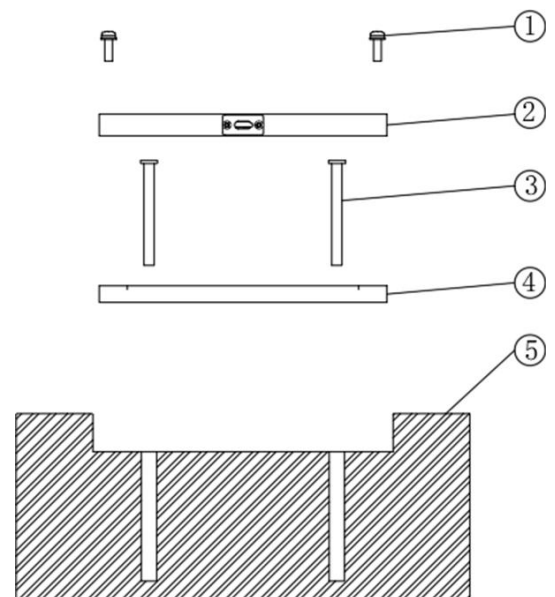


Fig 12-2 – Assembly drawing of the Transmitter coil

①M6 hex socket screw ② Emitter coil ③M8 expansion bolt tube ④ emitter coil bracket ⑤ ground

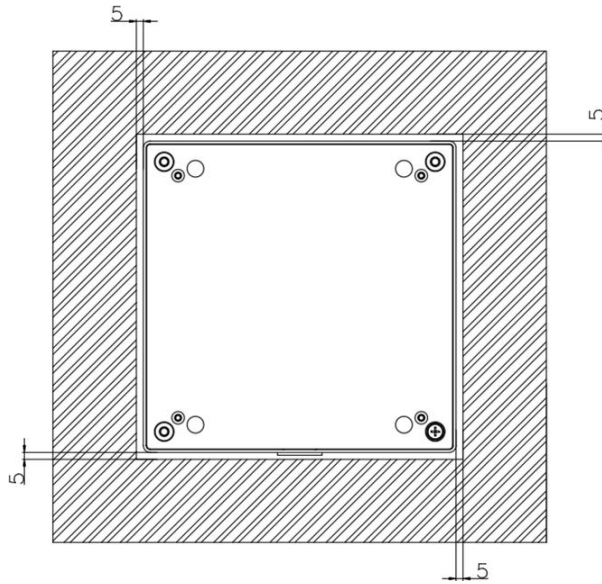


Fig 12-3 – Installation position diagram of the transmitter coil

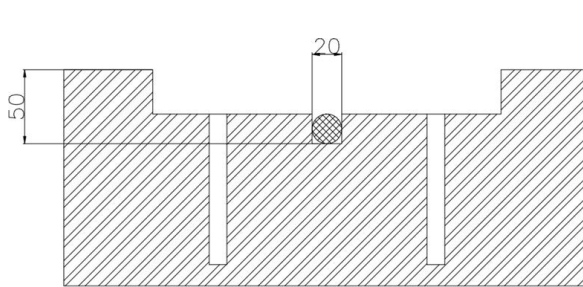


Fig 12-4 – Cable slot diagram for emitter coil outlet position

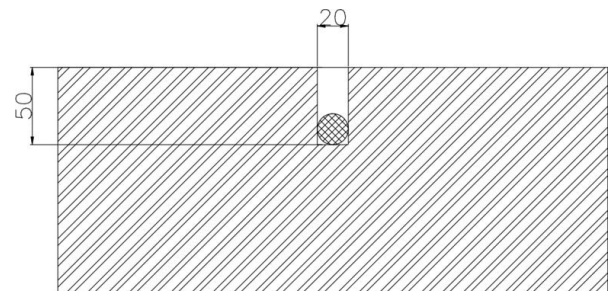


Fig 12-5 – Cable slotting diagram

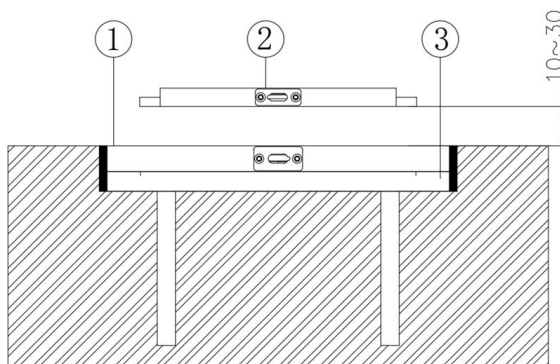


Fig 12-6 – Coil air gap diagram

① Transmitter coil ② Receiver coil ③ Transmitter coil bracket

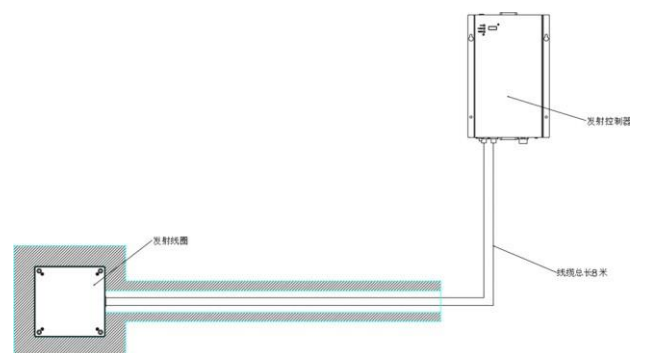


Fig 12-7 – Assembly effect diagram

## 7 Instructions for use

### Power-on steps:

**Step 1:** In the power-off state, install the transmitter and receiver respectively as shown in Figure 6. Connect the input end of the transmitter controller to the mains power through an air switch or a power strip with a switch (the air switch and power strip are guaranteed to be disconnected).

**Step 2:** Connect the Receiver Controller output line to the corresponding interface of the battery or load.

**Step 3:** Check that the distance between the two planes of the coupling surfaces of the transmitting controller and the Receiver Controller coils is controlled within the charging range, and ensure that the offset of the center points of the two coupling surfaces does not exceed the range, and confirm that there is no metal between the coupling surfaces of the transmitting controller and the Receiver Controller.

**Step 4:** Connect the mains power supply, keep the green light on the transmitter controller constantly on, and the equipment is in standby mode. The transmitter controller begins to periodically (about 5 seconds) attempt to detect feedback from the receiver controller. When the receiver controller is within the effective charging distance, the transmitter controller's yellow light remains on and the green light goes off, indicating that the device is in a rechargeable state. Press and hold the strong charge button for 5 seconds or after receiving the charging command from the BMS (vehicle end) to start charging. When there is current at the output ( $\geq 5A$ ), 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 remains on and the fan of the Receiver Controller stops.

**Step 6:** After the receiver controller (typically on the user's device) leaves, the transmitter is in standby mode with the green light constantly on.

**Note:** In strong charge mode, the default charging current is 10A. After the transmitter is powered on and the vehicle enters the charging area, hold down the strong charge button for 10 seconds before the system enters boost charging button.



When the user equipment reaches the designated area, the charging logic at the transmitter end is shown in Figure 1

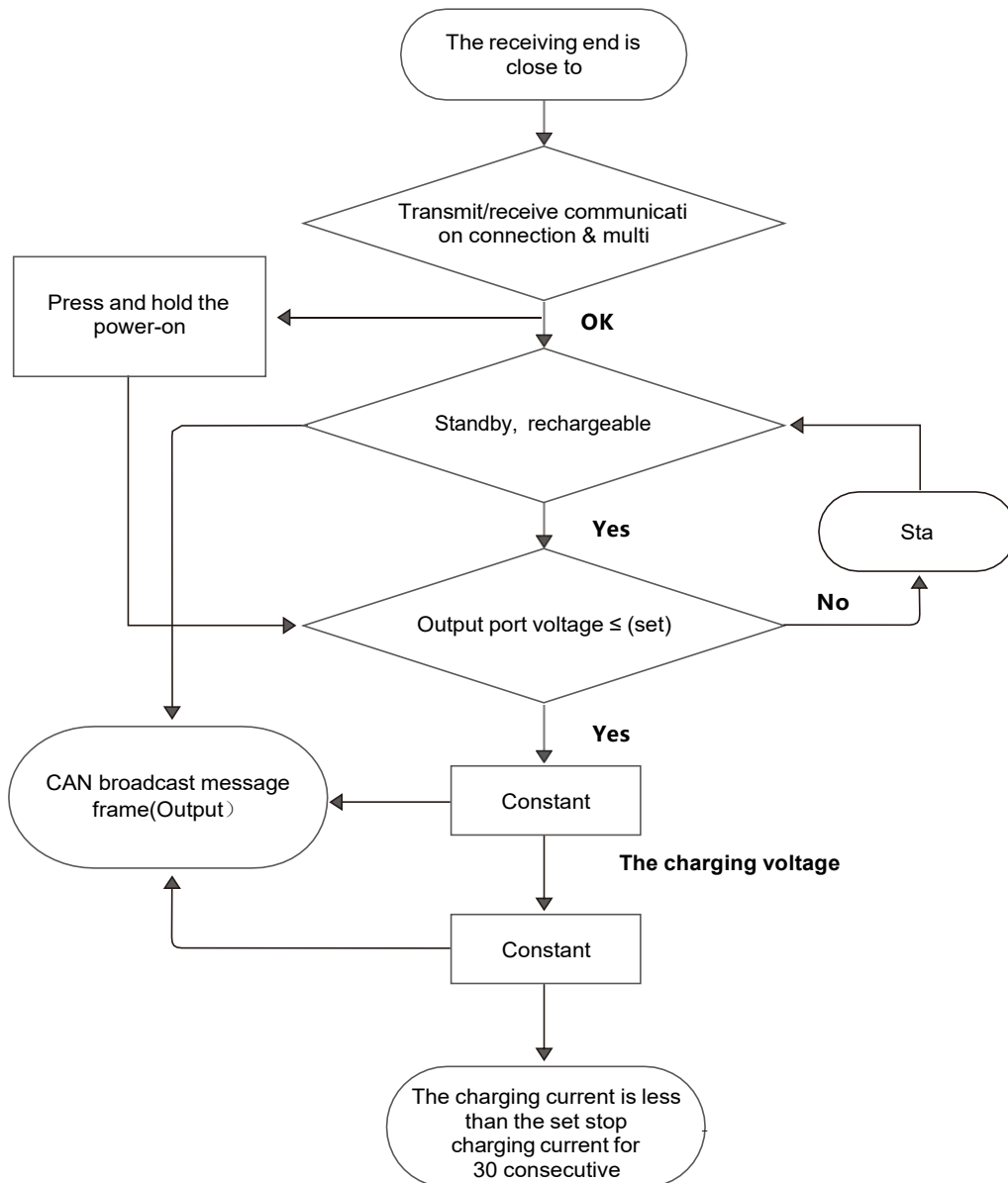


Fig 13 – Charging control logic diagram

## Indicator light description:

- (1) **Red light:** Flashes when there is a fault and goes off when the fault is eliminated or the device is restarted; For specific faults, check the CAN message reported by the host computer or the receiving end.
- (2) **Green light:** The light remains on when the transmitter is powered on and in standby mode, and goes off in other states.
- (3) **Yellow light:** Yellow light: The light remains on after normal communication is established with the receiver, indicating that the system is in a rechargeable state and flashes when there is an output current ( $\geq 5A$ ) at the receiver.

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

## 8 Fault analysis and troubleshooting

| SN | Fault manifestations                                      | Fault cause analysis                                                                  | Solution                                                                                                                                                                                                                                               |
|----|-----------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | The product connection does not respond and does not work | 1. There is a mistake in the wiring of the product<br>2. The antenna is not connected | 1. Check if the wiring is correct, if the positive and negative poles are accurate, if the parameters correspond, and if the coil coupling surface is normal. Check if the coil is placed in reverse;<br>2. Check if the antenna is properly connected |
| 2  | The yellow light is off                                   | Poor 2.4G communication between transmit/receive                                      | 1. Check if the antenna is broken and if the connector is properly installed;<br>2. Check if the coil distance is within the nominal range.<br>3. Leave the charging position and re-enter, and try the multi-machine communication check again.       |
| 3  | After setting up the charging position, do not charge     | 1. No load<br>2. Load short circuit<br>3. No charging command was issued              | 1. Check if the load battery is properly connected;<br>2. Check if the battery's internal charging relay is open;<br>3. Whether there is a CAN communication command.                                                                                  |
| 4  | The indicator light is not on                             | There is a problem with the power supply or the transmitter is damaged                | 1. The wiring of the indicator board is loose or detached;<br>2. Contact the original factory after-sales service for confirmation                                                                                                                     |

## 9 Precautions

**For the safe and reliable use of our wireless chargers, please be sure to note the following:**

1. The input voltage of the charger is designed to be 100 -240V, 50/60Hz by default, subject to the specification sheet. Static electricity may be generated while the machine is in operation. The transmitter controller (or transmitter post) must be reliably grounded. Note: Do not expose to rain.
2. The transmitter coil must be connected to the transmitter controller (or transmitter post) before powering on the main power supply of 100 -240V. There is a risk of damaging the internal circuits if 100 -240V is applied without connecting the transmitter coil.
3. The Receiver coil must be connected to the Receiver Controller before it can enter the range of the Transmitter coil to function properly. If the Receiver coil is not connected to the controller, high voltage will couple out from both ends of the coil in the magnetic field, which is quite dangerous.
4. The positive and negative lines of the Receiver Controller output must not be reversed, otherwise

there is a high possibility of damaging the machine.

5. Danger: There is an electric shock hazard. Do not touch uninsulated parts of the output connector or uninsulated battery terminals.

6. Output parameters are based on the specification sheet. If the customer changes the load (battery) specification in actual application, please modify the output voltage/output current parameters on the upper computer according to the actual load parameters used. If you do not understand how to modify, please consult the manufacturer.

7. There are certain range requirements for the charging distance of the charger (i.e., the distance between the two coils). If it is not within the nominal distance range, it may result in no charging or very small charging current. Please refer to the specification sheet for details. If the nominal charging distance range is 10 - 30 mm, the optimal charging distance is between 20 mm, at which point the charging efficiency of the system is the highest. When installing the coil, it is recommended to install it at the optimal charging distance, of course, leaving a margin for deviation.

8. When in operation, the current and voltage inside the transmitting/Receiver coil are relatively high, and the parameters have been strictly designed and tested. The wire used is a high-frequency dedicated multi-strand Leeds wire, not a common wire. Customers should not extend or shorten the extended output wire of the coil by themselves. If you need to change the length of the wire, be sure to consult the manufacturer to determine whether it can be changed and how to change it.

9. The transmitting/Receiver coil has the characteristics of high frequency, high voltage and large current during operation. Please keep the wire intact and undamaged during installation and use. In application environments where there is trampling or crushing, please add corresponding protective measures.

10. Due to the magnetic heating effect of the magnetic field on metals, magnetic materials and living creatures, it is necessary to ensure that there are no metals, magnetic materials or living creatures adhering to the surface of the coil when it is powered on.

11. The transmitting controller (or transmitting post) has a protection class of IP20, the Receiver Controller has a protection class of IP54, and the coil has a protection class of IP67. When used in an environment beyond these protection classes, additional protection measures should be taken.

12. The burning port is exclusively for program updates. Do not use it without authorization, otherwise there is a possibility of damaging the machine.

13. Do not disassemble/repair the machine without authorization. There are high-voltage capacitors and other components in the internal circuit, and there may still be high-voltage residual power after a period of power-off. If you need to repair the machine, please consult the manufacturer.

14. The surface temperature of the coil may be a little high when it is powered on or has just stopped working (depending on the heat dissipation conditions). Do not touch it to prevent high-temperature burns.

15. When powered on, due to ionizing radiation within the coil's magnetic field range, work around the coil. Within 0.75 meters is the radiation zone where the human body can be safely exposed. Therefore, when installing, be sure to take isolation protection measures and warning signs to prevent non-professionals from entering within 0.75 meters of the coil.

16. This machine is an industrial wireless charger and is suitable for lithium batteries. Other types of batteries may burst, causing personal injury and damage. Only use the battery pack that includes the battery management system and all necessary protection. Important Safety Instructions

(a) Keep these instructions. This manual contains important safety and operation instructions;

(b) Working near lead- acid batteries is dangerous. Batteries can produce explosive gases during normal use. Therefore, it is crucial to read and follow the instructions provided before each use of the charger;

(c) To reduce the risk of battery explosion, follow these instructions and the markings on the battery;

(d) Do not smoke near the battery or engine or allow open sparks or flames;

(e) The charger is only for charging lithium batteries. It is not intended to power ultra-low voltage power systems or charge dry batteries. Charging a dry battery may cause the battery to burst, resulting in personal injury and property damage;

(f) Do not charge frozen batteries;

(g) If it is necessary to remove the battery from the vehicle for charging, be sure to remove the ground terminal from the battery first. Make sure all attachments on the vehicle are closed to prevent arcs;

(h) Study the specific precautions of all battery manufacturers, such as whether to remove or not to remove the battery cap during charging, and the recommended charging rate;

(i) For chargers with an output voltage selection switch, refer to the owner's manual to determine the battery voltage and make sure the output voltage is set at the correct voltage. Do not use the battery charger unless the battery voltage matches the charger's output rated voltage if an output voltage selector is not provided;

(j) Do not place the charger directly above or below a battery that is charging; Gases or liquids in the battery can corrode and damage the charger. Place the charger farthest from the battery where the DC cable allows;

(k) Do not operate the charger in a closed area or in any way that restricts ventilation;

- (l) Connect and disconnect the DC output clip only after any charger switch is set to the off position and the AC power line is removed from the power socket. Do not allow the clips to touch each other;
- (m) When the battery is installed on the vehicle, follow these steps. Sparks near the battery may cause the battery to explode. Reduce the risk of sparks near the battery:
- (l) Place AC and DC power lines to reduce the risk of damage to the hood, doors, or moving engine parts;
- (ii) Stay away from fan blades, belts, pulleys and other components that may cause personal injury;
- (iii) Check the polarity of the battery terminals. Positive (POS, P, +) battery terminals are typically larger in diameter than negative (NEG, N,-) terminals;
- (iv) Determine which battery terminal is grounded (connected) to the chassis. If the negative terminal is grounded to the chassis (as in most vehicles), see item (v). See item (vi) if the positive terminal is grounded to the chassis;
- (v) For vehicles with the negative terminal grounded, connect the positive (red) clip of the battery charger to the positive terminal of the battery (POS, P, +) on the ungrounded terminal. Attach the negative (black) clip to the vehicle chassis or engine block away from the battery. Do not attach the clips to carburetors, fuel lines, or sheet metal. Heavy metal parts attached to the frame or engine block;
- (vi) For positively charged vehicles, attach the battery charger's negative (black) clip to the battery's negative (negative, N, -) ungrounded post. Attach the positive (red) clip to the vehicle chassis or engine block that is far from the battery. Do not attach the clips to carburetors, fuel lines, or sheet metal. Heavy metal parts attached to the frame or engine block;
- (vii) Connect the charger AC power cord to the power socket;
- (viii) When disconnecting the charger, turn the switch to the off position, disconnect the AC power cord, remove the clips from the vehicle chassis, and then remove the clips from the battery terminals.
- (n) Follow these steps when the battery is out of the vehicle. Sparks near the battery may cause the battery to explode. Reduce the risk of sparks near the battery:
- (l) Check the polarity of the battery terminals. Positive (POS, P, +) battery terminals are typically larger in diameter than negative (NEG, N,-) terminals;
- (ii) Connect at least one 60 CM 6-wire gauge (AWG) insulated battery cable to the battery's negative terminal (negative terminal, N,-) to the terminal
- (iii) Attach the charging positive (red) clip to the battery positive (POS, P, +) terminal;
- (iv) Place yourself and the free end of the cable as far away from the battery as possible, then connect the negative (black) charger clip to the free end of the cable;
- (v) Do not face the battery when making the final connection;
- (vi) Connect the charger AC power cord to the power socket;
- (vii) When disconnecting the charger, be sure to follow the reverse sequence of the connection procedure and disconnect the first connection as far away from the battery as possible in practice.
- (o) When the instruction manual involves an adapter, it should include the following statement: Adapters are not allowed in Canada. Do not use this device until a qualified electrician installs a suitable socket if there is no grounded socket.

## 10 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.

## **11 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.

## 12 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.



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