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Product Technical Specification

Product Name: D19 display

Model No.: D19

Version number: 08

Release date: August 15, 2023

Draw up: Sheng Yuwang **Audit:** Zhen Yuejun

Standardization: _____ **Approval:** _____

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| ANANDA | Product technical specification | File number | AR-QP09-05 |
| | | Record Serial No | 01040124 |

Foreword

This document specifies the technical specifications of the listed products.

This document specifies the requirements of this display in terms of function, use environment, reliability, etc., and the level of meeting these requirements.

Products must comply with the laws and regulations of the place of sale and the restrictions of intellectual property rights.

Product model:

D19

SPECIAL NOTICE:

The version update should be informed to the marketing department in time and released according to the new version.

Version records:

| Version | Change document number/change content | Revised by | Date of modification |
|---------|--|--------------|----------------------|
| 01 | Modify some incorrect contents | Xu Fuxian | 20210813 |
| 02 | Newly added SOC power interface | He Tianyun | 20211009 |
| 03 | Supplement Bluetooth name display instructions, correct incorrect contents, and adjust some document formats | Ren Songlin | 20220119 |
| 04 | Instructions for adjustment of display mode of power SOC interface | Ren Songlin | 20220728 |
| 05 | Newly added operation instructions for slave implementation mode | Ren Songlin | 20221205 |
| 06 | Modify the document format | Xu Fuxian | 20230815 |
| 07 | Modify the document format | Sheng Yuwang | 20231020 |
| 08 | Modify partial contents and document formats | Sheng Yuwang | 20240111 |

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I. Product description

1. Product name and model

LED display, model: D19 PC5B/PU5B

P One key startup

C CANBUS communication

U UART communication

5 Main machine type

B Bluetooth

2. Product characteristics

The structure is simple and exquisite, and the appearance is beautiful and exquisite

Ultra-high contrast LED screen

Excellent outdoor design, IPX6 waterproof ability

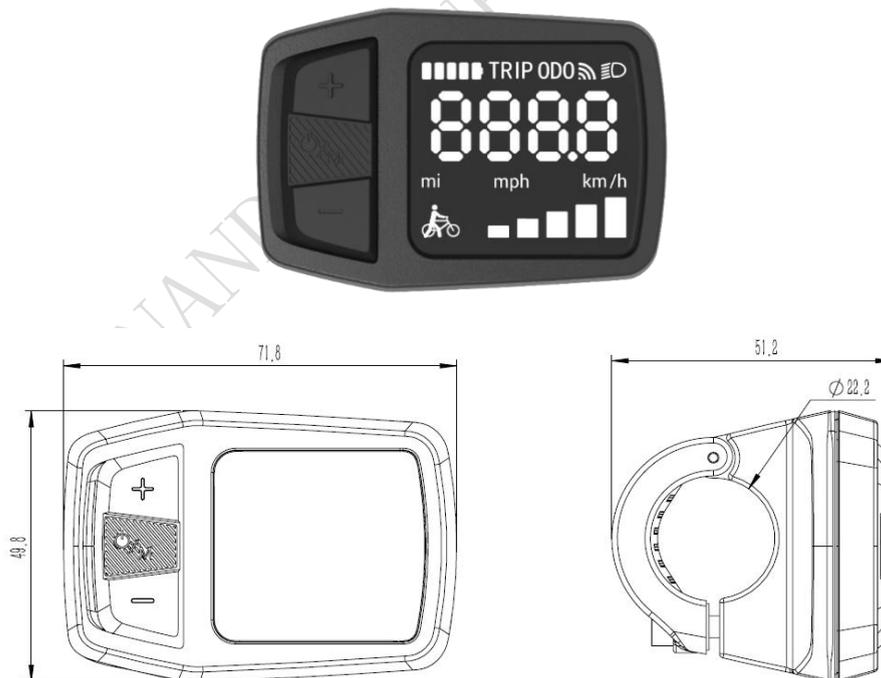
Waterproof head communication, convenient maintenance service

Bluetooth function is optional, which can be adapted to mobile phone APP

3. Citation standards

Applicable to e-bike which conforming to EN15194 regulations and standards

4. Appearance and size



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II. Product instruction

1. Specification parameter

- ① Power supply: DC 24V/36V/48V
- ② Rated working current: <22mA@48V
- ④ Screen specification: LED display screen
- ⑤ Communication method: UART/CANBUS/BLE
- ⑥ Service temperature:-20 ~ 55 °C
- ⑦ Storage temperature:-20 ~ 60 °C
- ⑧ Waterproof grade: IPX6

2. Function overview

- ① Three keys, convenient and easy to operate: on/off key, + key,-key
- ② Metric/English system switching selection
- ③ Speed display: real-time speed (km/h)
- ④ Five level control: 1/2/3/4/5
- ⑤ Battery level indicator: battery capacity indication and lack voltage indication
- ⑥ Headlight indication: headlight switch status indication (supported by controller)
- ⑦ Mileage display: single mileage (TRIP), total mileage (ODO) and rest mileage (RANGE);
Speed display: TRIPTIME, Average Speed (AVG), Maximum Speed (MAX);
Power Display: Power Consumption (MP), Step Frequency Data (RPM)
- ⑧ Connection wire communication interface, which is convenient for system maintenance and parameter setting
- ⑨ 6km/h to booster implement/walk assist function
- ⑩ Error code indication, etc.

3. Key definition

On/off key: ; Adjust the gear key: + key  or-key 

4. Display interface

4.1 Basic interface

Support level: 5 levels, from low to high respectively: 1/2/3/4/5. The other 0 level indicates no support/booster mode.

Real-time speed: display the current riding speed and unit; Average speed: displays the average speed and unit of a single mileage; Maximum speed: display the maximum speed and unit of a single mileage;

Total mileage/ODO: display the total mileage and units, with the maximum value of 99999;

④ Single mileage/Trip: display single mileage and unit, with the maximum value of 9999.9;

⑤ TRIP time: display single mileage time;

Motor power consumption: display the power consumption and unit of the motor in the stroke;

⑦ Step frequency data/Pedal frequency data: display riding pedal frequency pulse data, unit RPM;;

⑧ Remaining mileage: the remaining mileage is displayed, and the maximum value is 99999

⑨ Power indication: display battery capacity grid number (when there is battery communication, display power percentage), and the icon box flashes when lack voltage;

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⑩ Headlight indication: it is displayed when the headlight is turned on.

4.2 Function interface

Full display screen when starting up:



After the whole picture disappears after 1 second, the display enters the working state, displaying the total riding mileage/ODO and real-time speed:



4.2. 1 Short press the power-on button to display the mileage of a single time riding/Trip:



4.2. 2 Short press the startup button again to display the total mileage of a single time/trip time:



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4.2. 3 Short press the startup button in a short time. If there is battery communication, the battery power SOC will be displayed. If there is no battery communication in the new software, there will be no such interface; The following figure shows battery communication (prototype)



4.2. 4 Short press ON/OFF button to display the riding speed:



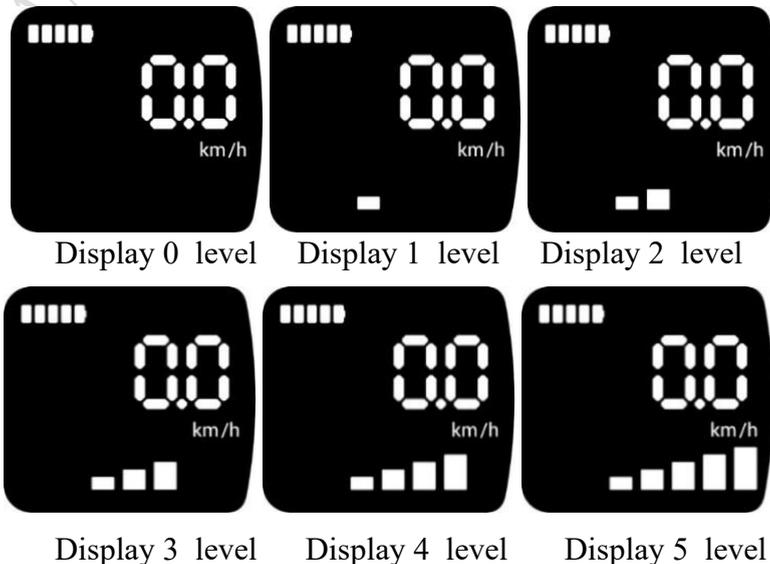
5. Functional operation

5.1 Sleep mode/wake up

Keep the normal connection state between the display and the controller, press the dormant/wake up key for a long time (1.5 seconds) in the sleep state of the display, and the display will wake up and enter the basic interface and start working; Press the dormant/wake key for a long time (2 seconds) in the startup state, and the display will enter the shutdown state.

5.2 Booster gear/support level switching

Press + key or-key to switch the booster gear/level and change the booster mode. There are six mode states: 0 level/1 level/2 level/3 level/4 level/5 level. When the display is turned on, the default gear/level is 1 level/0 level/5, and it shows that 0 level/0 is no booster level. (The booster level selection interface is as follows)



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5.3 Assisting implementation mode/ Walk Assist mode

D19 master: press the “-” key for about 2 seconds, and then enter the walking assist state, which

is displayed in the lower left corner of the screen . Release the “-” key, that is, withdraw from the walk assist mode;

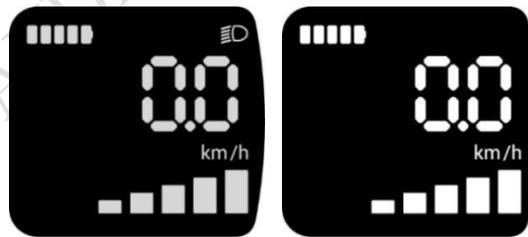
D19 slave: first, adjust the gear to negative 1 gear. At this time, the lower left corner of the screen  shows that the implementation mode is ready. Then press the decrease key for about 2 seconds, and then enter the assisted implementation state. Release the reduction key, that is, withdraw from the assistance implementation mode; If the reduction key is released, the push mode ready state will be automatically exited after 5 seconds of non-key action.

The walk assist mode switching interface is as follows:



5.4 Headlight switch

After pressing the add key for 2 seconds, the headlights turn on (need the support of the controller), the display display interface, and the headlight indicator icon lights up. After pressing the add key for 2 seconds again, the headlights turn off and the headlight indicator icon extinguished. When the headlights are turned on, the brightness of the display screen dims as a whole. When the headlights are turned off, the brightness of the display screen returns to normal as a whole.



Headlights on

Headlights off

5.5 Battery level display

The display of battery power is to obtain the power information from the battery or the controller and display it, and the power display is divided into 1-5 grids.

The meter preferentially uses the SOC value which sent by the battery. When there is no battery communication or the battery communication connection fails, the first grid display of battery power flashes for 3s after starting up, and then the analog SOC value is normally displayed.

Battery power information icon, displayed as follows:



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5.6 One-key battery startup

When the user turns on the battery, the meter starts automatically. This function is not standard configuration.

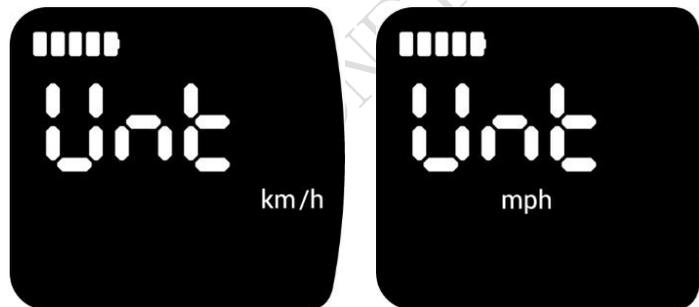
5.7 Function settings

Press the add key and reduce key for about 3 seconds at the same time, and the display enters the setting state.

5.7. 1 One time press the startup key, and the display will enter the metric/English system unit setting state:



5.7. 2 Switch Metric/English system Settings by pressing the Add or Reduce key:



Select Metric System Units

Select English System Units

After selecting and setting the unit, press the startup key for about 1.5 seconds and save it, and then automatically return to the previous menu.

5.7. 3 Press the key to adjust the display to display "PASS":



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5.7. 3.1 Press the startup key for a short time and the display will display the "input password" state. If the user wants to set the Bluetooth state (the default Bluetooth state of the product is on) or restore the factory settings, the user needs to enter the password "6262":



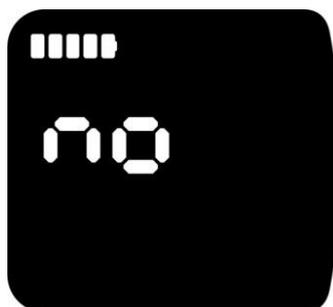
5.7. 3.2 Short time press the add or reduce key to increase or decrease the number, short time press the startup key to jump to the next number setting, and so on:



After entering the password "6262", one time press the startup key, and the display enters the next level menu. The display displays "Frt" to restore the factory settings:



5.7. 3.2. 1 One time press the startup key for a short time, and the display enters the selection state of restoring factory settings, and the display displays "NO". If you don't want to restore factory settings, press the startup key for a long time or press the add or reduce keys at the same time for about 1.5 seconds to return to the upper menu, that is, the "Frt" interface.



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5.7. 3.2. 2 If the factory settings are to be restored, in the "Frt" interface, one time press the startup key for a short time. When the meter displays "NO", press the add key or reduce key once for a short time, and the meter displays "YES". Press the startup key for about 1.5 seconds to confirm and automatically return to the previous menu, that is, the "Frt" interface, indicating that the factory settings have been successfully restored.



5.7. 3.2. 3 Press the reduce key briefly to adjust to the meter display "bLE" to set the Bluetooth state (if there is no Bluetooth, there is no interface for this option):



5.7. 3.2. 3.1 If you stay under the "bLE" page for 4 seconds without operation, the unique Bluetooth name title of the meter will be automatically displayed:



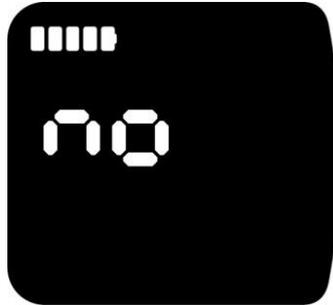
Bluetooth (name) number of prototype

5.7. 3.2. 3.2 Press the startup button once, and the display enters the interface of setting Bluetooth on or off options. The display defaults to Bluetooth on state at the factory. If you need to confirm that the Bluetooth function is turned on, when the interface is displayed as "YES", press the startup button for a long time or press the add or reduce keys at the same time for about 1.5 seconds until you return to the previous menu, that is, the "bLE" interface:



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5.7. 3.2. 3.3 If you need to turn off the Bluetooth function, press the startup key once, press the add key or reduce key once in the "bLE" interface to make the display display "NO", press the startup key for about 1.5 seconds to confirm and then automatically return to the upper menu, that is, the "bLE" interface, indicating that the Bluetooth function is successfully turned off.



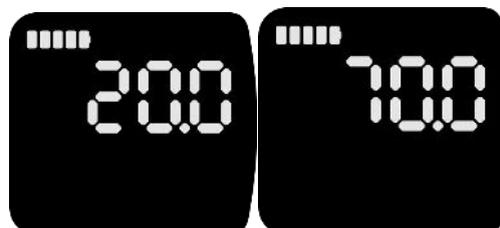
5.7. 3.3 Press the reduce key briefly and adjust to the display display "LSd" to set the speed limit function.



5.7. 3.3. 1 If it is not necessary to set the speed limit, press the startup key once in the "LSd" interface. When the meter displays "NO", press the startup key for about 1.5 seconds to confirm and automatically return to the previous menu.

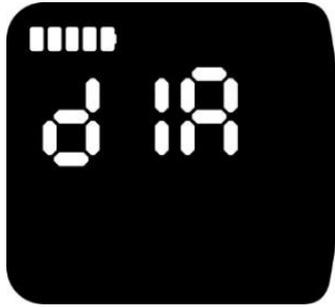


5.7. 3.3. 2 If it is necessary to set the speed limit, in the "LSd" interface, one time press the startup key for a short time. When the display displays "NO", press the add key for a short time to display "20.0" (press the reduce key for a short time to display "70.0"), adjust the speed limit (range 20.0-70.0, and decrease by 0.1 each time), and press the startup key for about 1.5 seconds to confirm and automatically return to the upper level menu.



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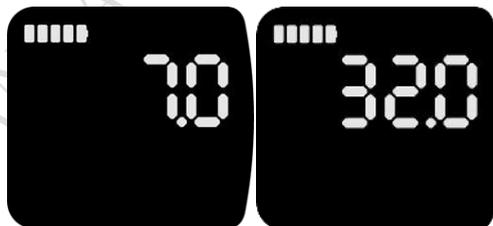
5.7. 3.4 Press the reduce key short and adjust to the display display "dIA" indicating setting the wheel diameter function:



5.7. 3.4. 1 If you don't need to set the wheel diameter, one time press the startup key in the "dIA" interface. When the meter displays "NO", press the startup key for about 1.5 seconds to confirm and automatically return to the upper menu.



5.7. 3.4. 2 If you need to set the wheel diameter, in the "dIA" interface, one time press the startup key for a short time. When the display displays "NO", press the addition key for a short time to display "7.0" (press the subtraction key for a short time to display "32.0"), press the add or reduce key for a short time to adjust the desired wheel diameter (range 7.0-32.0, increase/decrease by 0.1 each time), and press the startup key for about 1.5 seconds to confirm and automatically return to the upper level menu.



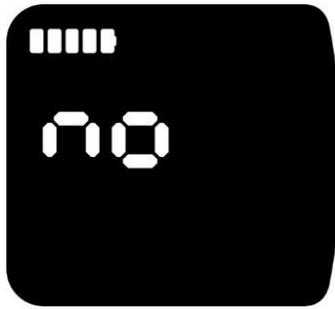
5.7. 3.4. 3 Press the add or reduce key for about 3 seconds at the same time to exit the second-level menu and return to the first-level menu.

5.7. 4 Continue to press the Add key briefly in the first-level menu interface, and the display will enter the data clearing setting option. Press the Start key briefly once, and the display will enter the data clearing setting state:



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5.7. 4.1 Press the add or reduce key to select whether to clear the data:



5.7. 4.2 If you do not want to clear the data, when the meter displays "NO". Press the boot key or press the add or reduce keys for about 1.5 seconds to exit and return to the superior menu, indicating that the data is not cleared.

5.7. 4.3 If you want to clear the data, press the add or reduce key for a short time to make the meter display "YES", then press the start key for about 1.5 seconds, and the meter will clear the data, and then automatically return to the main function interface:

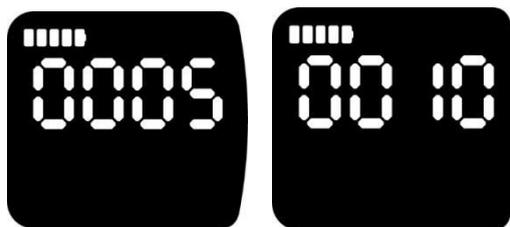


5.7. 5 When the display is in 'CLr', one time press the add key for a short time, and the display enters the automatic sleep time setting option. The display displays "SLP". Wait for about 4 seconds in the SLP state, and the display will automatically display the currently set dormant time:

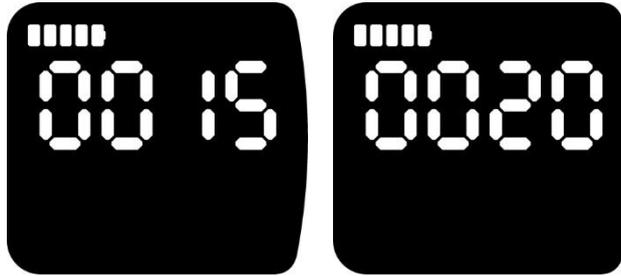


5.7. 5.1 One time press the startup key for a short time, and the display enters the dormant time setting state:

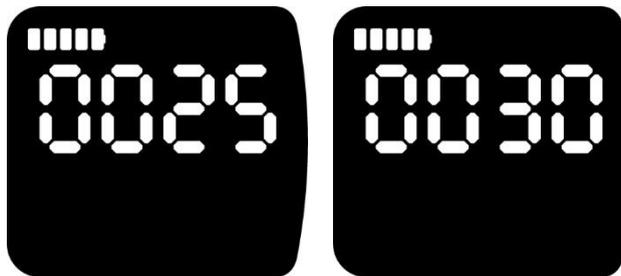
Press the add or reduce key to increase/decrease the automatic dormant time by 5min at a time, and the page shows as follows:



Choose 5 Minutes Hibernation Choose 10 Minutes Hibernation



Select 15 Minutes Hibernation Select 20 Minutes Hibernation



Select 25 Minutes Hibernation Select 30 Minutes Hibernation

After setting the sleep time, press the boot button for about 1.5 seconds to save and automatically return to the previous menu.

5.7. 6 When the display is in the SLP setting option, one time press the add key, and the display enters the display wheel diameter specification size, and the display displays "dIA":



5.7. 6.1 One time press the startup key or wait for about 4 seconds in the "dIA" interface, and the meter will display the matching wheel diameter specifications and dimensions of the system:



The picture shows the size of the prototype car

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5.7. 7 Under any level of menu, press the add or reduce key for 3 seconds at the same time, and you will return to the previous level of menu or main interface.

5.7. 8 Under any menu level, press the boot button for about 5 seconds, and the setting mode will be pushed back to the main interface (one-handed operation).

6. Fault information

The display can prompt and warn the whole vehicle fault, and display the fault code on the display interface when the fault is detected. The example is shown as follows:



Attached Table: UART Error Code Definition Table

| | |
|----|---|
| 21 | Abnormal bus line current |
| 22 | Abnormal rotating handle |
| 23 | Abnormal braking |
| 24 | Abnormal Hall signal of motor |
| 25 | Abnormal phase current |
| 26 | Lack voltage fault |
| 28 | European standard fault |
| 30 | display communication failure |
| 31 | Power switch failure |
| 32 | Carrying out failure |
| 33 | Microprocessor failure, voltage datum failure |

If the 5-core wire connecting the display to the controller fails:

The display cannot be turned on, and the LCD screen does not display. Possible reasons:
The main power cord is not connected properly/the controller is out of phase.

The display can be turned on, but it stops working after 3S. Possible reasons: any one of the green and yellow signal lines connecting the display to the controller is open.

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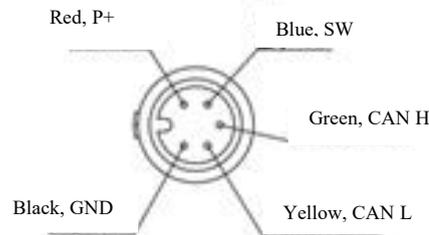
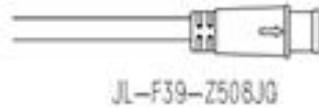
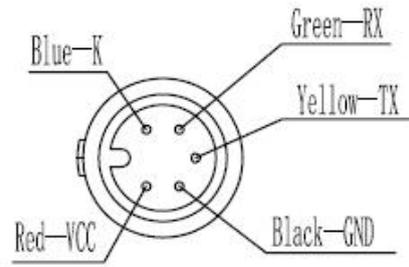
Attached Table: CANBUS Error Code Definition Table

| Fault code | Fault description | Troubleshooting |
|------------|---|---|
| 01 | Controller phase line over current fault | Restart the system. If the fault persists, please apply for warranty from an authorized dealer. |
| 02 | Controller bus over current fault | Restart the system or replace the controller. If the fault persists, apply for a warranty from an authorized reseller. |
| 03 | Controller HALL fault | Check that the cable is properly connected, and if the fault persists after connected again, seek assistance from an authorized dealer. |
| 05 | Controller temperature fault | If the fault persists, please apply for warranty from an authorized dealer. |
| 30 | display communication failure | Check that the display is properly connected. If the fault persists after connected again, replace the display or controller or extension cord. |
| 31~50 | Fault of controller new European standard | Reconnect the controller, update the software, or replace the controller. |
| 60 | display MCU fault, voltage reference fault | Replace the display |
| 06 | Motor temperature fault | Check the motor for overload by stopping the restart to see if the error code disappears, and if the fault persists, seek assistance from an authorized dealer. |
| 20 | Implementation, power switch failure | Check whether the key is stuck. If it is stuck, replace the meter. |
| 04 | Brake failure, knob failure | Check the brake line, or whether the brake is restored before the system starts. |
| 08 | Controller communication failure | Check that the controller is well connected. If the fault persists after connected again, replace the display or controller or extension cord. |
| 09 | Over voltage and lack voltage fault of controller | Check the battery voltage |

7. Wiring definition

| | |
|-----------------|-------------------|
| connector model | JULET JL-F-Z509AG |
|-----------------|-------------------|

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8. The display can be connected to the mobile phone App

The Bluetooth icon displayed on the Bluetooth communication connection between D19 display and mobile phone  is shown in the following figure:



Keep the distance between the mobile phone and the D19 display 10-15m, turn the crank of the whole vehicle, and the interface has corresponding information such as battery power, average speed, etc., indicating that the Bluetooth communication between the D19 display and the mobile phone is normal and the function is normal. Shut down the whole vehicle system, exit the mobile phone APP software, and the test is completed.

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III. Cautions

1. In the process of use, pay attention to the safety of use, and do not plug and unplug the display under the power-on working state;
2. Try to avoid using it in harsh environment, heavy rain, heavy snow and exposure;
3. When the display cannot be used normally, it should be repaired as soon as possible;
4. Retain the right to change the specification.

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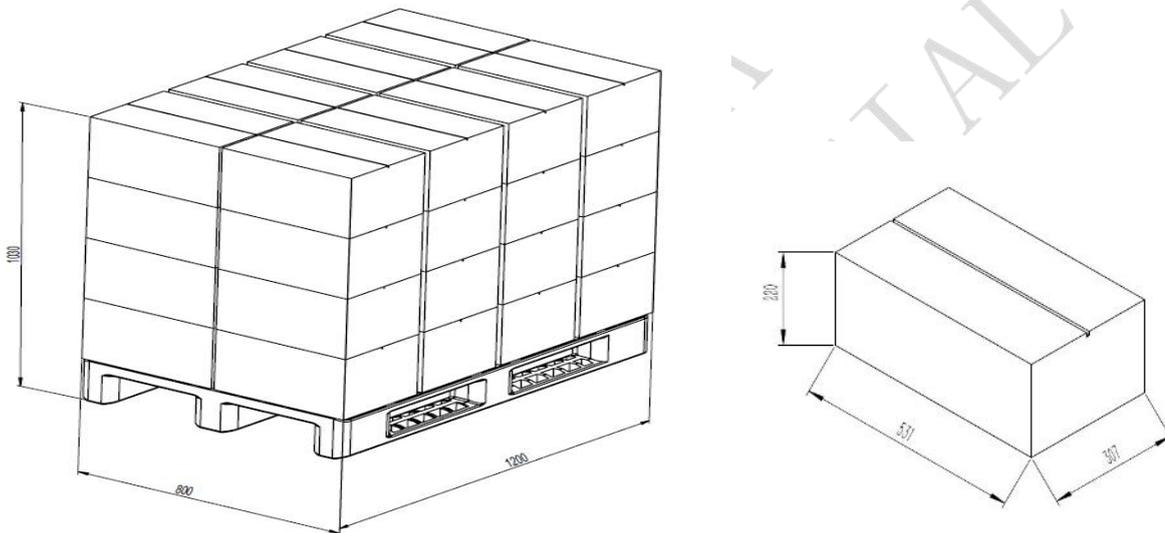
IV. Specification and standard for leave factory packaging of products

Packing requirements of display single box:

1. The whole box must be filled with displays. If the product cannot be filled with cartons, it is necessary to add fillers, which are pearl cotton;
2. Each layer must be isolated by cardboard, which shall be implemented according to drawings, BOM and SOP;
3. All edges and middle joints of the carton are sealed and glued neatly and evenly with adhesive tape;
4. Paste labels and marks outside the packing box as required;
5. The total weight of each box is less than 20Kg.

Whole support requirements:

1. Packing box size

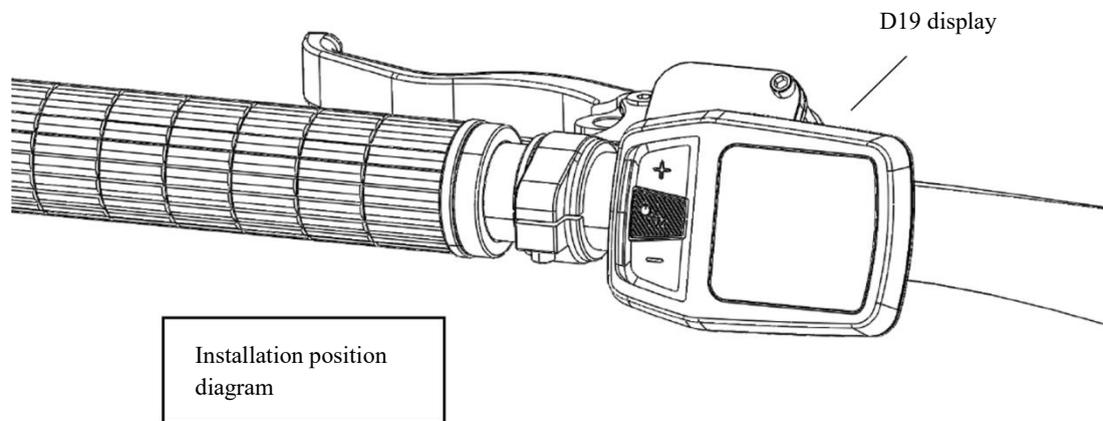


2. Packaging quantity: 75pcs per box (D19 display);
3. displays are packed and shipped in pallets. The stacking height and quantity of each pallet are limited to 1200mmX800mmX1100mm according to the order. The height of 1100mm includes pallet height. Parts are packed separately and cannot be mixed. In addition to display cartons, there are additional cartons with separate packaging of parts on the pallet;
4. Each outer box needs to display information: logistics, product content, quantity and model; Attach the existing label of material control, the information is executed according to the existing label, and print the LOGO of ANANDA company;;
5. The packaging materials are environmentally friendly and recyclable, and the packaging design makes effective use of the pallet area as much as possible;
6. The whole towing needs to be completely wrapped with a winding film, which requires rain protection;
7. It is necessary to add 50X50X5mm for the whole towing, and then use the packing belt to pack the carton with a length of 150mm;
8. The total height of the whole towing (including pallet) is 900 ~ 1100mm;;
9. Each row and column of the carton need to be tightened with packing tape;
10. The packing belt shall not deform or break the carton.

| | | | |
|---------------|--|---------------|------------|
| ANANDA | Product technical specification | File number | AR-QP09-05 |
| | | Record number | 01040124 |

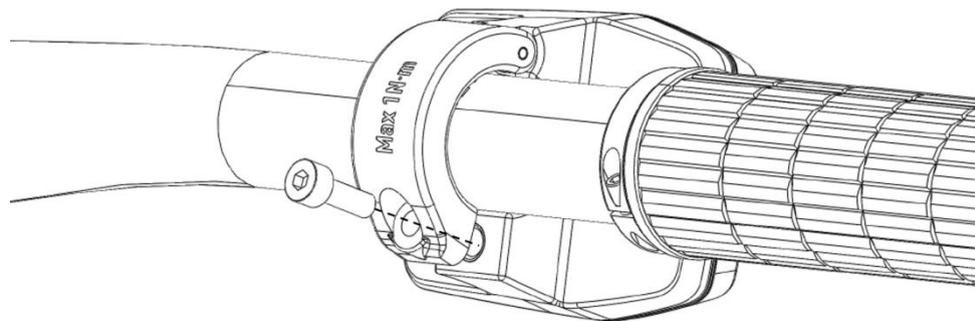
V. display installation instructions

Installation example:



D19 display:

- 1) Loosen the hexagon screw, open the key clasp, put it on the left handlebar (standard handle specification: $\varnothing 22$). 2), adjust it to an easy-to-operate position, fix and tighten it with M4 hexagon screw (maximum locking torque: 1N m);
* display damage caused by excessive torque is not covered by warranty.



- 2) Connect the display 5/6 pin connector to the controller butt connector.

VI. Common problems and Answers

Q: Why can't it be turned on?

Answer: check whether the contact between the display harness and the connector of the controller is reliable.

Q: how to deal with the fault code which displayed by the display?

Answer: first, find the corresponding problem according to the displayed error code. If you can't solve it by yourself, go to the repair point where the electric vehicle is repaired in time.