

Product Technical Specification

Product Name: D23 display
Model: D23
Version Number: 01
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ANANDA	Product Technical Specification	Doc Number	AR-QP09-05
		Record Number	01040230

Preface

This document sets out the technical specifications for the products listed.

This document specifies the requirements for the functionality, operating environment, and reliability of this display, as well as the level at which these requirements are to be met.

Product Model: D23

Special Notice: Version updates should be communicated to marketing in a timely manner and released in accordance with the new version.

Versions Record:

Version	Change Document No. Change Content	Editor	Date of revision
00	First version	YUWANG SHENG	20240327
01	Adding dimensional descriptions and updating fault codes.	YUWANG SHENG	20240705

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I Product Introduction

1. Product model

LCD display, Model:D23 PC5B/PU5B

P Battery Wake-up

C CANBUS protocol

U UART protocol

5 Master control type

B Bluetooth

2. Product Characteristics

Simple and compact structure, beautiful and exquisite appearance

Ultra-high contrast LCD screen

Excellent outdoor design with IPX6 rated waterproof capability

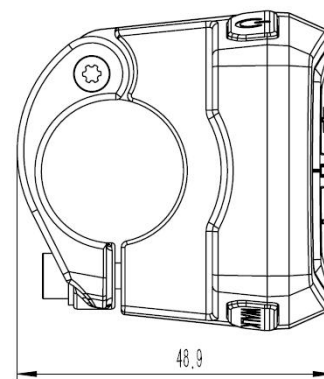
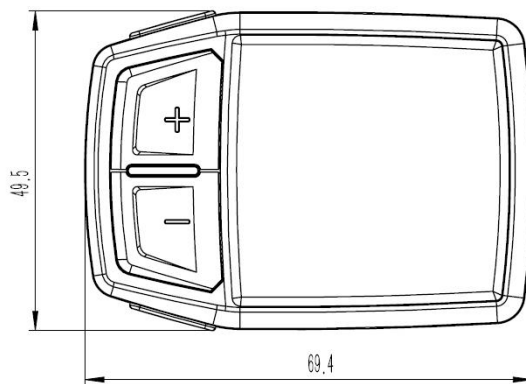
Waterproof plug for easy maintenance service

Optional Bluetooth function, can be adapted to cell phone APP use

3. Referenced Standards

Suitable for electrically assisted bicycles according to EN 15194.

4. Appearance and Dimensions



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II Product Description

1. Specification parameters

- ① Power supply: DC 24V/36V/48V
- ② Rated working current: <25mA@36V
- ③ Screen Specification: LCD screen
- ④ Protocol: UART/CANBUS/BLE
- ⑤ Operating temperature: -20~55°C
- ⑥ Storage temp: -20~60°C
- ⑦ Waterproof grade: IPX6

2. Function Overview

- ① “On/Off” button, “+” button, “-” button, “WALK” button
- ② Metric/imperial switching options
- ③ Speed display: real-time speed (km / h), average speed (km / h), maximum speed (km / h)
- ④ Five-speed power assisted gear control: 1/2/3/4/5, the other 0 gear means no power assisted mode.
- ⑤ Power indication: battery capacity indication, and under-voltage indication
- ⑥ Headlight indication: headlight switch status indication (requires controller support)
- ⑦ Mileage display: single mileage (TRIP), total mileage (ODO), remaining mileage (RANGE), mileage time (TRIP TIME)
- ⑧ power consumption display: power consumption (MP)
- ⑨ Pedal frequency display: pedal frequency data (RPM)
- ⑩ Connection line communication interface for system maintenance and parameter setting.
- ⑪ 6km/h assisted push function
- ⑫ Fault code indication, etc.

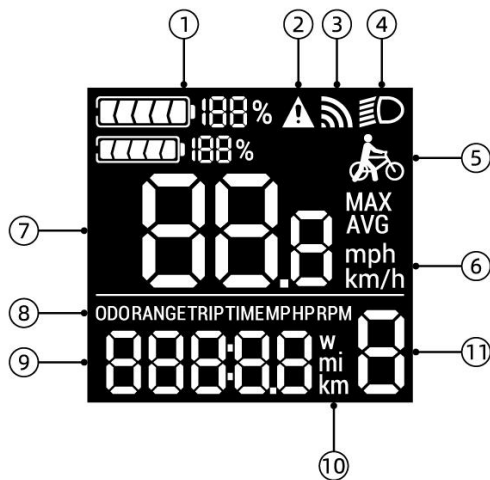
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3. Button Definition

“On/off” button: ; Adjusting level button: “+”  or “-” button ; “WALK”: ;

4. Display interface

4.1 Basic Interface



- ① The area shows the current remaining battery power, the figure shows the power display grid mode.
- ② Area shows the fault code indication.
- ③ The area shows the wireless status mode.
- ④ Area shows headlights on.
- ⑤ The area shows the walk assisted mode.
- ⑥ Area shows the metric/imperial speed unit switching.
- ⑦ Area display for real-time speed display.
- ⑧ Area for display function status display such as total mileage, etc.
- ⑨ The area shows the time display of riding mileage.
- ⑩ The metric or imperial mileage unit display is displayed in the area.
- ⑪ Area shows the status of level adjustment.

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4.2 Function Interface

Full display screen when switched on:



After the full screen disappears after 1 second, the display goes into working status and displays the ODO/total mileage ridden and real-time speed;



4.2.1 Short press “on/off” button once to display TRIP;



4.2.2 Short press “on/off” button once again to display TRIP time.



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4.2.3 Short press “on/off” button once more to display the average speed for TRIP;



4.2.4 Short press “on/off” button once more to display the maximum speed for TRIP;



4.2.5 Short press “on/off” button once again to display the power consumption of the trip;



4.2.6 Short press “on/off” button once again to display the frequency data/RPM;



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4.2.7 Press “on/off” button once again to display RANGE.



4.2.8 Short press “on/off” button once again to return to the default display of the ODO/total mileage and real-time speed interface;

4.2.9 During the above process, you can short press “WALK” button once to return to the previous interface, i.e. short press “on/off” button to continue to the "next interface", short press “WALK” button to return to the "previous interface".

5. Function Operation

5.1 Sleep (power off) /Wake (power on)

Maintain the normal connection state between the display and the controller, long press (about 2 seconds) the sleep/wake up button  under the display sleep state, the display will power on to enter the basic interface and start to work; long press (about 2 seconds) the sleep/wake up button  under the power on state, the display will enter the power off state.

5.2 Assisted Level Shift

Press “+” or “-” button to switch assisted level, and change assisted mode; There are six modes: 0 level/1 level/2 level/3 level/4 level/5 level, the standard display defaults to 1 level when the display is turned on, and the display of 0 level is for the unassisted mode. The level selection screen is shown below:



Show level 0



show level 1



show level 2

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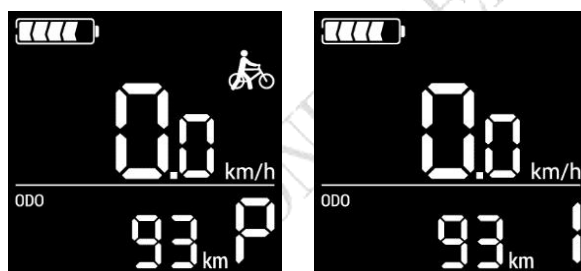
Show level 3

show level 4

show level 5

5.3 Walk Assist mode

Press and hold button , after 2 seconds display enter walk assist mode, icon  is played in the upper right corner of the screen; release  button to exit walk assist mode, and icon  in the upper right corner will disappear. The walk assist mode switching screen is shown below:

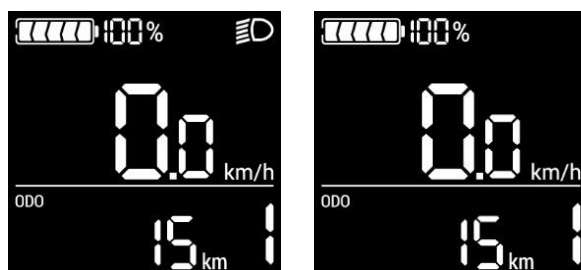


Walk assist ON

Walk assist OFF

5.4 Headlight switch

Press and hold  for about 2 seconds to switch on front light (need controller support); light icon  on display screen will be lighted up and overall darkening of the screen brightness; press and hold the “+” button once again for about 2 seconds to switch off the light, and light icon  will go out and screen brightness back to normal.



Light ON

Light OFF

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5.5 Battery level indication

The battery level display is obtained from the battery or controller and is displayed in 1~5 cells. The display prioritizes the SOC value sent by the battery, if there is battery communication and the communication is normal, the battery icon is displayed as follows:



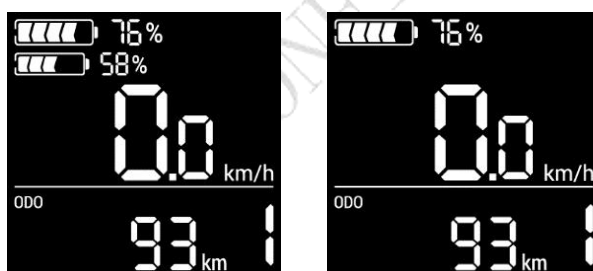
If there is no battery communication or battery communication is disconnected, analog power information is obtained from the controller and the battery icon is displayed as shown below:



When the battery communication connection fails or there is no battery communication, the battery level display flashes for 3s after power on and then the analog SOC value is displayed normally.

5.5.1 Dual Battery Level Indication Function

The CANBUS version of the D23 display supports the dual battery power display function, which is able to display the primary and auxiliary battery power at the same time when dual batteries are used and the battery communication is normal. The Dual Battery Display screen is shown below:



Dual Battery Level Indication

Single Battery Level Indication

5.6 Battery wake-up

When the user turns on the battery, the display automatically turns on. This function is not standard, non-special requirements do not have this function.

5.7 Function Setting Mode

Pressing the “+”/“-” button simultaneously for about 3 seconds, the display enters the setting mode. First is the brightness setting mode "bLG";

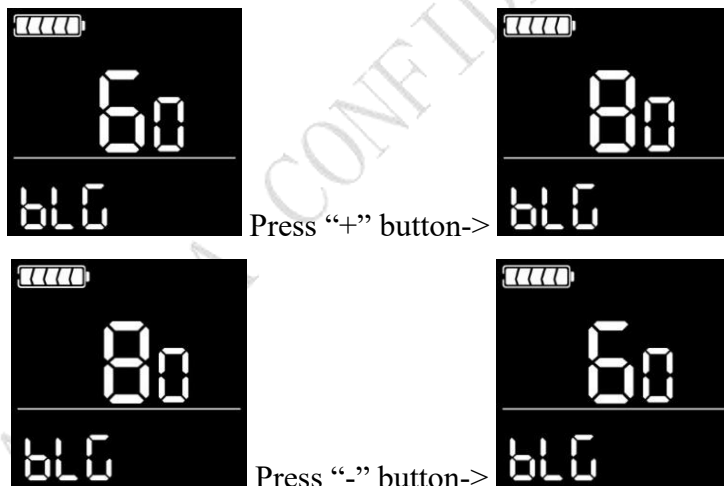
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5.7.1 Short press “on/off” button to enter the brightness setting state of the display, there are five brightness levels of 20%/40%/60%/80%/100% to choose from;

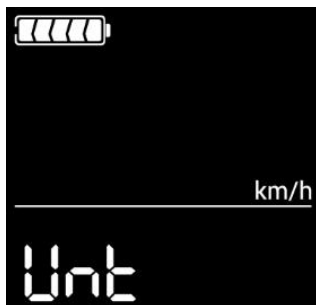


5.7.1.1 Short press “+”/“-” button for brightness level selection, as an example:



After selecting the desired brightness, press and hold the On button for about 1.5 seconds to save and exit the brightness setting status.

5.7.2 Short press “-”button to enter the metric/imperial unit setting interface, the title bar below the display indicates the "Unt" icon;



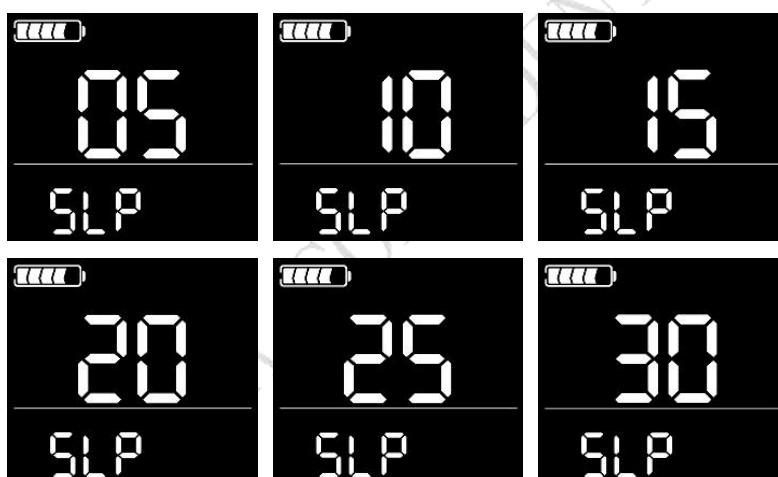
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5.7.2.1 Short press “on/off” button to enter the metric/imperial unit setting state, and short press “+”/“-” button to switch the metric/imperial unit;

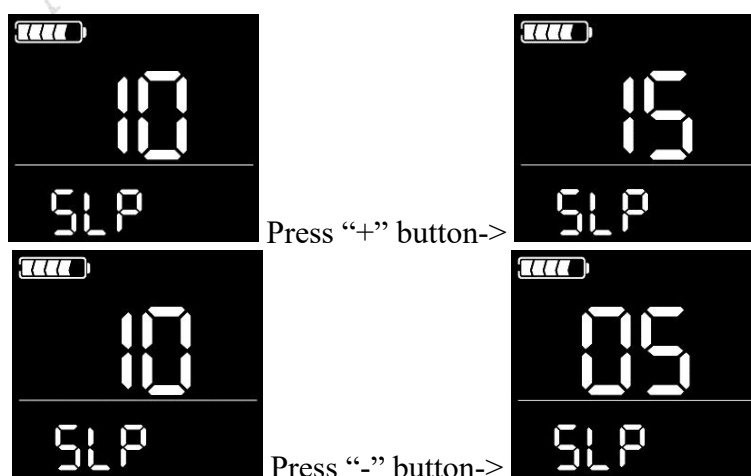


After selecting the unit you want to set, press and hold “on/off” button for about 1.5 seconds to save and exit the metric/imperial unit setting status.

5.7.3 Short press the “-” button to enter the auto sleep time setting interface, the title bar below the display indicates the "SLP" icon; Short press “on/off” button to enter the automatic shutdown time setting state, a total of 5/10/15/20/25/30 Min six time options.



5.7.3.1 Short press “+”/“-”button for sleep time value selection, as an example;



After selecting the auto power off time to be set, press “on/off” button for about 1.5 seconds to save and exit sleep time setting status.

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5.7.4 Short press “-” button to enter the TIRP data clear selection interface, and the "CLr" icon is displayed in the title bar at the bottom of the display;



5.7.4.1 Short press “on/off” button to enter the state of whether to clear the TIRP clear setting, the "no" icon starts flashing.



5.7.4.2 Short press “+”/”-” button to select "yes" or "no" to indicate whether you want to clear the single mileage/TRIP data; The display indicates "no" to indicate that the TIRP data is not cleared; the display indicates "yes" to indicate that the TIRP data is to be cleared.



Clear

Short press “+”/”-” button->



Not clear

After confirming the selection, press and hold “on/off” button for about 1.5 seconds to save and exit the clear data setting status. If "yes" is selected, it will automatically jump back to the default interface of the basic mode after confirming the selection; if "no" is selected, it will return to the current interface of the previous menu.

5.7.5 Short press “-” button to enter the wheel size display interface, and the "dIA" icon is displayed in the title bar below the display;

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5.7.6 Short press “-” button to enter the secondary menu setting entry interface, the title bar below the display indicates "Pass" icon;



5.7.6.1 Short press “on/off” button to enter the "Enter Password" status, if you want to set the Bluetooth on (the product factory default Bluetooth is on) or off function and restore the factory settings, users need to enter the password "6262";



Press “+”/“-” button to increase or decrease the number, short press “on/off” button to jump the cursor to the next number setting, and so on;



Short press “on/off” button after password is input->



After entering the password "6262", press the power on button once, the display will enter the next level of setting menu.

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5.7.6.3 Short press “+”/”-”button to switch the secondary menu directory.

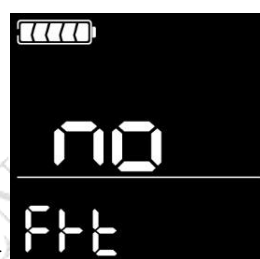
- 1)  Indicating that the user restores the factory setting function;
- 2)  Indicating user wireless Bluetooth setup function;
- 3)  Indicating that the user sets the speed limit function;
- 4)  Indicates user set wheel diameter function;

5.7.6.4 Short press “on/off” button to enter the state of whether to restore factory settings, short press “+”/”-” button to select "yes" or "no";



Restore Factory Setting

short press “+”/”-” button->



No factory settings restored

After confirming the selection, press and hold “on/off” button for about 1.5 seconds to save and exit whether to restore factory settings selection status.

5.7.6.5 Short press “on/off”button to enter the Bluetooth setting selection state, short press “+”/”-”button to select "yes" or "no".



No Bluetooth connection enabled

short press “+”/”-” button->



Enable Bluetooth connection

After confirming the selection, press and hold “on/off” button for about 1.5 seconds to save and exit the Bluetooth setting status.

5.7.6.6 Short press “+”button and adjust until the display indicates "LSd" to show that the speed limit function is set.

If you need to set the speed limit, in the "LSd" interface, short press “on/off”button once, when the display indicates "no", short press “_”button to display "20.0" (short press “_”button to display "70.0"); then adjust the speed limit (range 20.0-70.0, each time in 0.1 increments). When the display

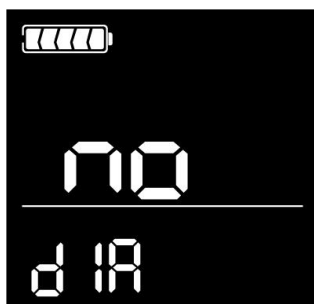
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indicates "no", short press “-” button to display "20.0" (short press “-”button to display "70.0"); adjust the speed limit (the range is 20.0-70.0, each time increase or decrease by 0.1 increment), and then press and hold “on/off” button for about 1.5 seconds to confirm the adjustment and return to the previous level menu automatically.



5.7.6.7 Short press “+” button and adjust until the display indicates "dIA" to set the wheel diameter function.

If you need to set the wheel diameter, in the "dIA" interface, press “on/off” button once, when the display shows "no", press “+”to display "7.0" (press “-”button to display "32.0"). If you want to set the wheel diameter, in the "dIA" interface, short press “on/off”button once, when the display shows "no", short press “+”button and the display will show "7.0" (short press “-” button and the display will show "32.0"), short press “+”button and “-”button to adjust to the wheel diameter you want to set (the range is from 7.0 to 32.0, each time will increase/decrease in 0.1 increments), then press and hold “on/off”button about 1.5 seconds to confirm and go back to the previous menu.



If you want to return to the previous menu level, press and hold “+”and “-” buttons for about 3 seconds.

If you want to go back to the main function display interface directly in any setting interface, press and hold “on/off” button for about 5 seconds.

5.7.7 In the first level menu, press and hold “+” and “-” buttons for 3 seconds to exit the first level menu and return to the basic function display mode.

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Default Display Interface

6. Error Message

The display can prompt alarms for the whole vehicle faults, and the display interface indicates error codes when a fault is detected. Examples are as follows:



Motor hall signal error



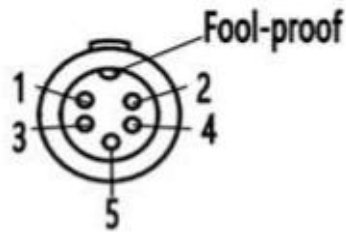
Display communication error

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Attachment: UART/CAN Error Codes

Previous UART Error Code	Current Uart/Can Error Code	Content	故障排除 Troubleshooting
28	37	Vehicle Speed Sensor Detection	Adjust the position of the speed magnet, whether it meets the requirements; replace the wheel sensor.
25	04	Brake Sensor Detection	Check that the connection between the brake level and the controller is intact.
28	36	Dynamic Torque Detection	Replace torque sensor; if problem not solved, please replace controller.
28	50	Handlebar Signal Detection	Replace handlebar; if problem not solved replace controller.
24	03	Motor Hall Detection	Replace the controller; if the fault persists then the motor needs to be replaced.
21	01	Motor phase current detection	If the cable connection is normal, replace the controller; if the problem is not solved, replace the motor.
21	02	Controller Bus Current Detection	If the cable connection is normal, replace the controller; if the problem is not solved, replace the motor.
30	30	Communication failure	Check whether the display connection is intact; if the fault is not solved, replace the controller.
/	05	Controller Temperature Detection	If it is a large load operation failure, please stop running, wait until the temperature is reduced and then normal use; if the problem is not solved, replace the controller.
/	06	Motor Temperature Inspection	If it is a large load operation failure, please stop running, wait until the temperature is reduced and then normal use; if the problem is not solved, replace the controller.
/	09	Controller Bus Voltage Measurement	Check if the battery power is too low. If the power is too low, please charge; if the problem is not solved, replace the controller.

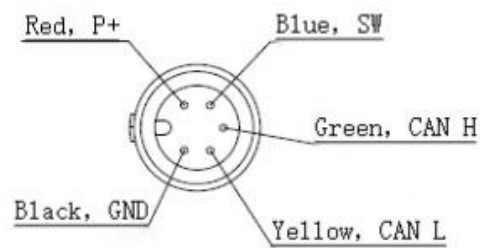
7. Wiring Definition



connector model	JULET JL-F-Z509AG				
Pin NO.	1	2	3	4	5
Color	Red	Blue	Black	Green	Yellow
Definition	VCC	LOCK	GND	RX	TX



JL-F39-Z508JG



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8. App Application

D23 Bluetooth icon on the Bluetooth communication connection between the display and the cell phone is shown in the figure  below;



Keep the distance between the cell phone and the D23 display about 5 meters, turn the crank of the whole bike, the interface has the corresponding information such as battery power, average speed, etc., and the interactive data between the display and the APP can be synchronized, which means that the Bluetooth communication between the D23 display and the cell phone is normal, and the function is normal.

III Precaution

- 1, in the process of use, pay attention to the use of safety, do not plug and unplug the display in the energized working state.
- 2, try to avoid the use of harsh environments, heavy rain, heavy snow, sun exposure.
- 3, when the display can not be used normally should be sent for repair as soon as possible.
- 4, Retain authority to change specifications.

IV Product packaging specification standard

Display single box packing requirement

1. single box packaging in accordance with the BOM table materials and SOP specification requirements;
2. Single box carton all ribs and intermediate joints with tape for sealing neat, flat;
3. Labels and logos are attached to the outside of single box packing cases as required.

Accessory Boxing Requirement

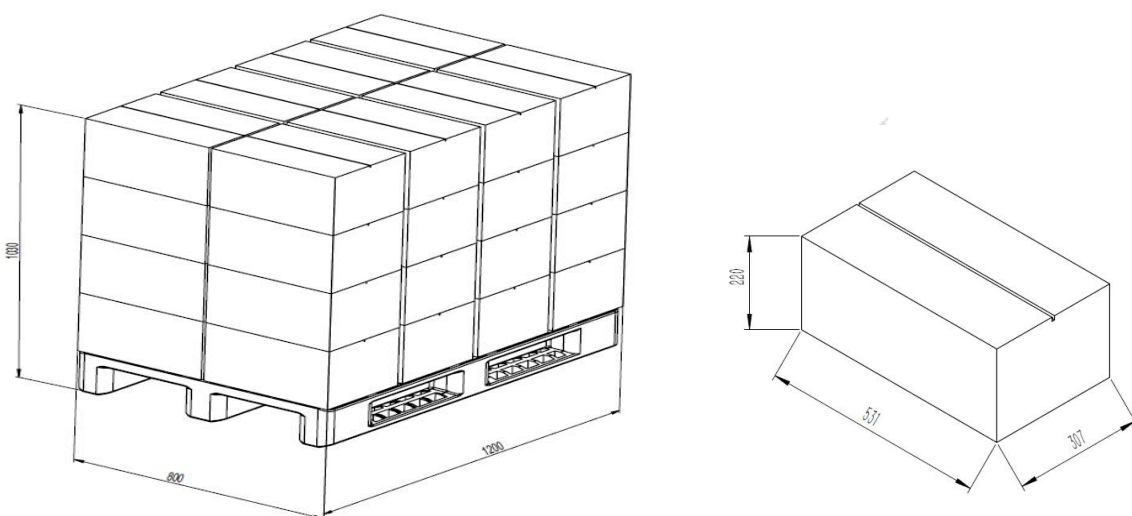
1. The whole box must be full, single-layer accessories neatly placed, each layer must have cardboard isolation, if the product can not fill the whole box, it is necessary to increase the filler (pearl cotton);

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2. The inside corners of the single box must be supported by paper corner protectors;
3. Single box carton all ribs and intermediate joints with tape for sealing neat, flat;
4. Labels and logos are attached to the outside of single box packing cases as required.

Whole tray requirements:

1. Packing box size

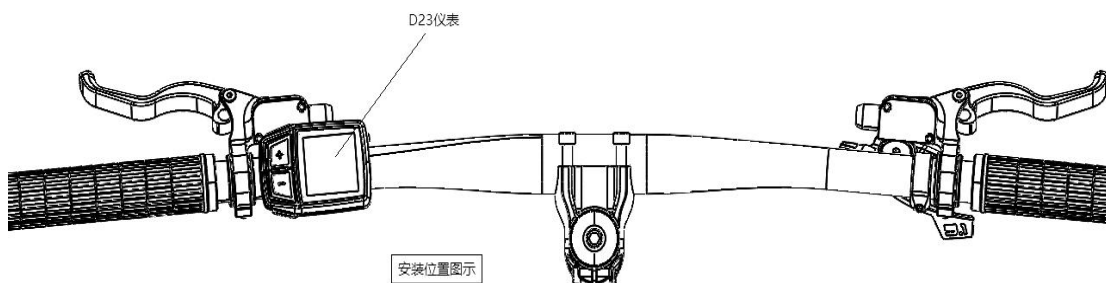


2. The motor, controller and display is packed and shipped on pallets, the length, width and height of each pallet is limited to 1200mmX800mmX1100mm, and the height is 1100mm including the pallet height. 1100mm including the height of the pallet, according to the order of the whole pallet yard; parts are packed separately, can not be mixed, in addition to the instrument on the pallet carton, additional parts are packed separately carton; In addition to the display carton, there are additional parts packed in separate cartons.
3. Each outer box is required to display information: logistics, product content, quantity, model number; with the existing labels of the material control, information in accordance with the existing labels. The information should be executed according to the existing labels, with the ANANDA company logo printed on it;
4. Mixed pallets, if any, must be labeled with pallet details;
5. Packaging materials are environmentally friendly and recyclable, and the packaging design utilizes the pallet area as effectively as possible; The entire tow needs to be completely wrapped with wrap around film and requires protection from rain;
6. The whole tow need to add 50X50X5mm, length 150mm carton corner protector and then use the packing tape to pack;
7. Total weight per box is less than 20Kg;
8. Each row and column of the carton needs to be tightened with packing tape;
9. The packing tape must not distort or break the carton.

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V Display installation instruction

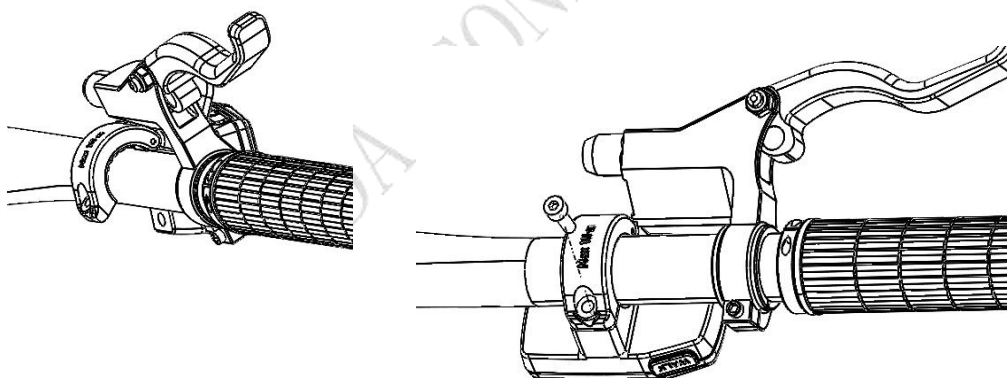
Installation example:



D23 Display

1) Loosen the socket head cap screw, open the button ring, attach it to the left handlebar (standard handlebar tube size: $\Phi 22.2$), adjust it to an easy-to-operate position, and then fasten it with the M4 hexagon socket head cap screw and tighten it (max. locking torque: 1Nm);

*Damage to the display caused by excessive torque is not covered by the warranty.



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

VI Frequently Asked Questions and Answers

Q: Why display can't be switched on?

A: Check if it is contacting with the controller's plug properly.

Q: What should I do if the display show an error code?

A: First if all, according to the display of the error code to find the corresponding problem; and if you can not solve the problem in time, please go to electric bike repair point for repairing.