

## Content

A.	Product introduce .....	4
1.	Product name and model .....	4
2.	Product Introduction .....	4
3.	Range of application .....	4
4.	Appearance and size.....	4
5.	Display coding rules .....	5
B.	Product manual .....	5
1.	Specifications .....	5
2.	Functional overview.....	6
3.	Installation .....	6
4.	Interface.....	6
4.1	Turn on display interface .....	7
5.	Button definition.....	8
6.	Operation .....	8
6.1	Turn on/off .....	8
6.2	Assist mode select.....	8
6.3	Display information switching.....	9
6.5	Headlight on/off (Backlight low light switch) .....	10
6.5	Automatic headlight function (off by default) .....	10
6.6	Power display.....	10
7.	User settings.....	11
7.1	enter setting status.....	11
7.2	Unit setting.....	11
7.3	Automatic shutdown time .....	12
7.3	Wheel diameter information .....	12
7.4	Speed limitation information .....	13
7.6	Automatic headlight setting .....	14
8.	Data reset.....	14

9. Error information.....	<b>15</b>
9.1 Error code showing .....	15
9.2 Error code definition .....	15
10. wire definition.....	<b>16</b>
C. Note.....	16

## A. Product introduce

### 1. Product name and model

Intelligent LED display, model: DZ41

### 2. Product Introduction

- ✧ Simple and light, left switch display
- ✧ High brightness 1.8-inch multi-color nixie tube screen
- ✧ Excellent outdoor design with IP65 waterproof
- ✧ Serial communication interface, convenient for maintenance services

### 3. Range of application

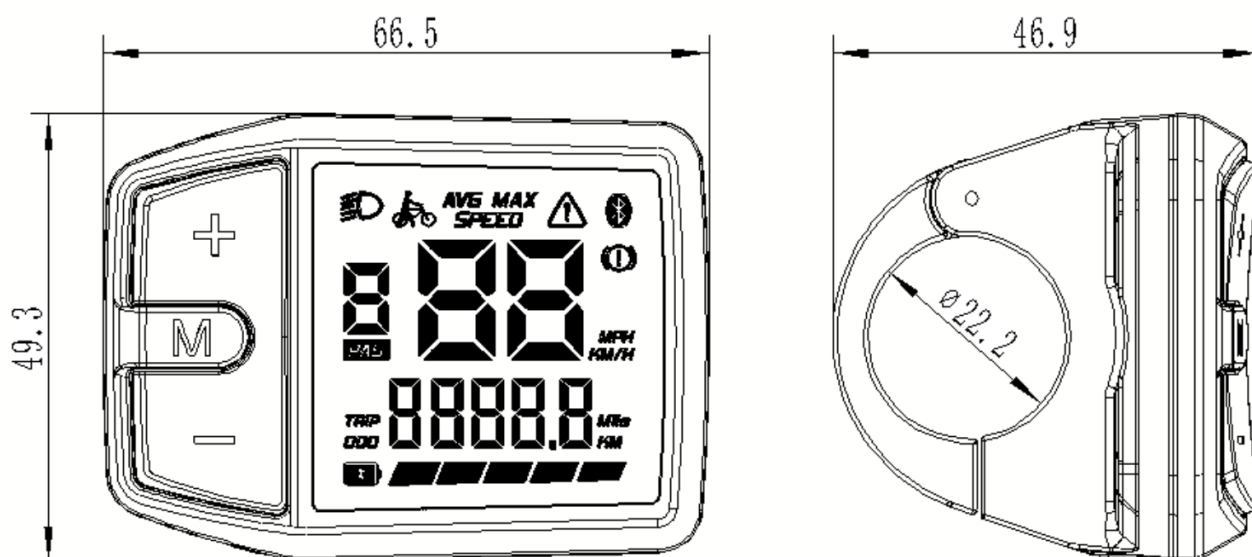
Suitable for electric power assist bicycle in accordance with the standard of EN15194

### 4. Appearance and size

The shell material of the product is ABS and the window is translucent PC.



#### 4.1 Overall dimension of display



## 5. Display coding rules



SW102 CS2C01B1010001

As shown as above picture,

SW102 is the product model  
C is the manufacture factory code  
S2 is the code of model  
C01 is the manufacture year and week number;  
B means the hardware version;  
101 is the firmware version number  
0001 is the product serial number

## B. Product manual

### 1. Specifications

- ①Power supply: DC 24V/36V/48V
- ②Rated current: 25mA@36V
- ③Shutdown leakage current: <1uA
- ④Screen specification: 1.8 "led nixie tube

- ⑤communication method: UART or CAN
- ⑥Operating temperature:  $-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$
- ⑦Storage temperature:  $-30^{\circ}\text{C} \sim 80^{\circ}\text{C}$
- ⑧Waterproof level: IP65

## 2. Functional overview

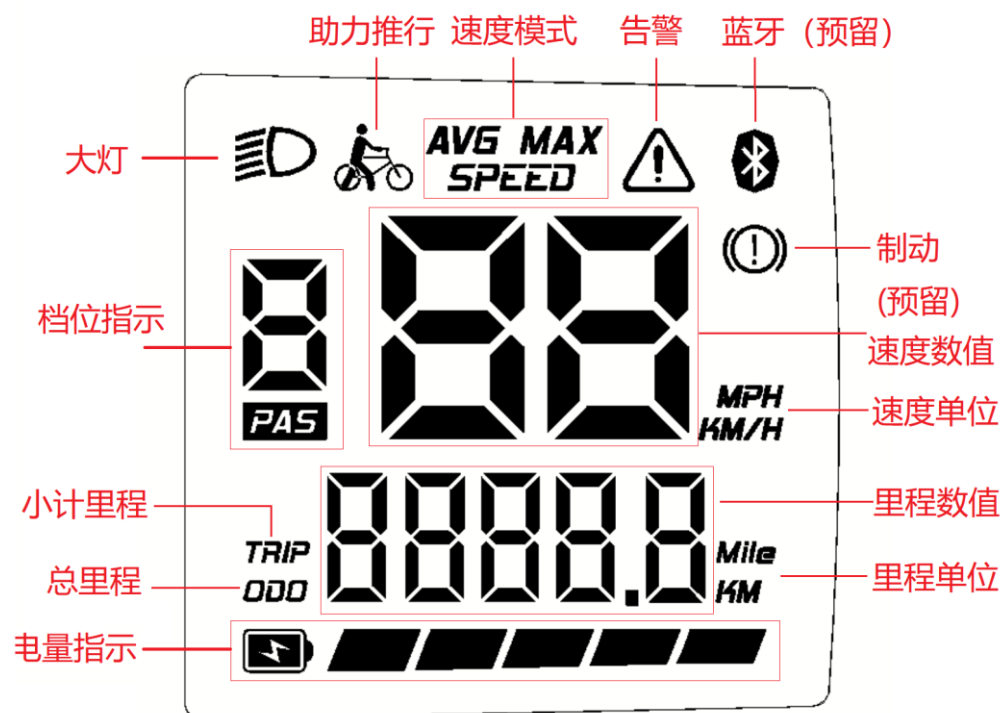
- ①Four buttons, easy to operate
- ②Metric / imperial switch selection
- ③Mileage display: subtotal mileage (trip), total mileage (ODO)
- ④Speed display: real time speed (speed), maximum speed (max), average speed (AVG)
- ⑤Power assist control: 0-5 levels default(maximum 9 levels are supported, and the number of levels is optional)
- ⑥Six levels of electricity instructions: 1-5level power, and under voltage prompts
- ⑦Headlamp indication: headlamp switch status indication (supported by controller)
- ⑧6km/h walk assist function
- ⑨Error code indication
- ⑦The communication interface of the connecting line is convenient for system maintenance and parameter setting

## 3. Installation

- ① Open the display lock clip, set the display in the left handlebar (standard handlebar size:  $\Phi 22.2$ ). Adjust to a position easy to operate tighten and fix the screw by M3 hexagon. Tightening torque: 0.8N.m.\***Note: Damage caused by excessive torque is not covered by the warranty.**
- ② display connected with controller by 5 pin connector as required drawings.

## 4. Interface

#### 4.1 Turn on display interface



1.Headlamp: displayed when the headlamp is on; If the headlight is off or without this function, the icon will not be displayed

Boost push: it is displayed during boost push, and other states are not displayed;

2.6km/h walk assistant mode: it is displayed during walk assistant mode, and other states are not displayed;

3.Speed indicates that the speed displays the current speed, AVG speed indicates that the speed displays the average speed, and max speed indicates that the speed displays the maximum speed; when the system has a fault, it flashes and does not display if there is no fault;

4.Error code indication: when the system has a fault, it flashes and does not display if there is no fault

5.Bluetooth connection: displayed when the instrument Bluetooth is connected with the mobile phone; (optional with Bluetooth function)

6.PAS indication: displays the current power assisted levels

7.Speed display: power on status, display speed value, two digits;

8.Speed unit: display speed unit, km / h, MPH

9.Braking indication: indication when braking, and do not display when no braking (function reservation, only for some electrical systems);

10.Subtotal mileage: display subtotal mileage; Unit: mile or km;

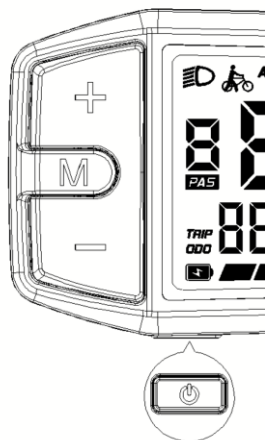
11 Total mileage: total mileage display, in mile or km;


12.mileage unit: subtotal mileage and total mileage unit, mile stands for miles and KM stands for kilometers;

13. Electric volume indication: five section electric volume and undervoltage indication;

14.photosensitive sensor: automatic light on and automatic brightness adjustment (function reserved)



## 5. Button definition





Turn on/off: , Function button: **M**, Adjustment button +: upper part of display area (for description), adjustment button -: lower part of display area (for description)

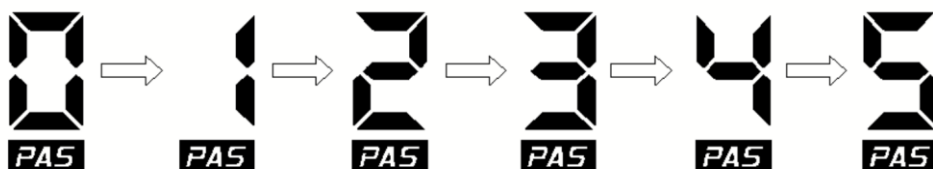
## 6. Operation

### 6.1 Turn on/off

Maintain the normal connection of the display and the controller. Long press (2 seconds)  button when display is off. Display enters the basic interface and starts to work. Long press (2 seconds)  button when the display is on. Display turned off. If no operation to the display and the speed is 0 for the time setting for auto off, display will turn off automatically.

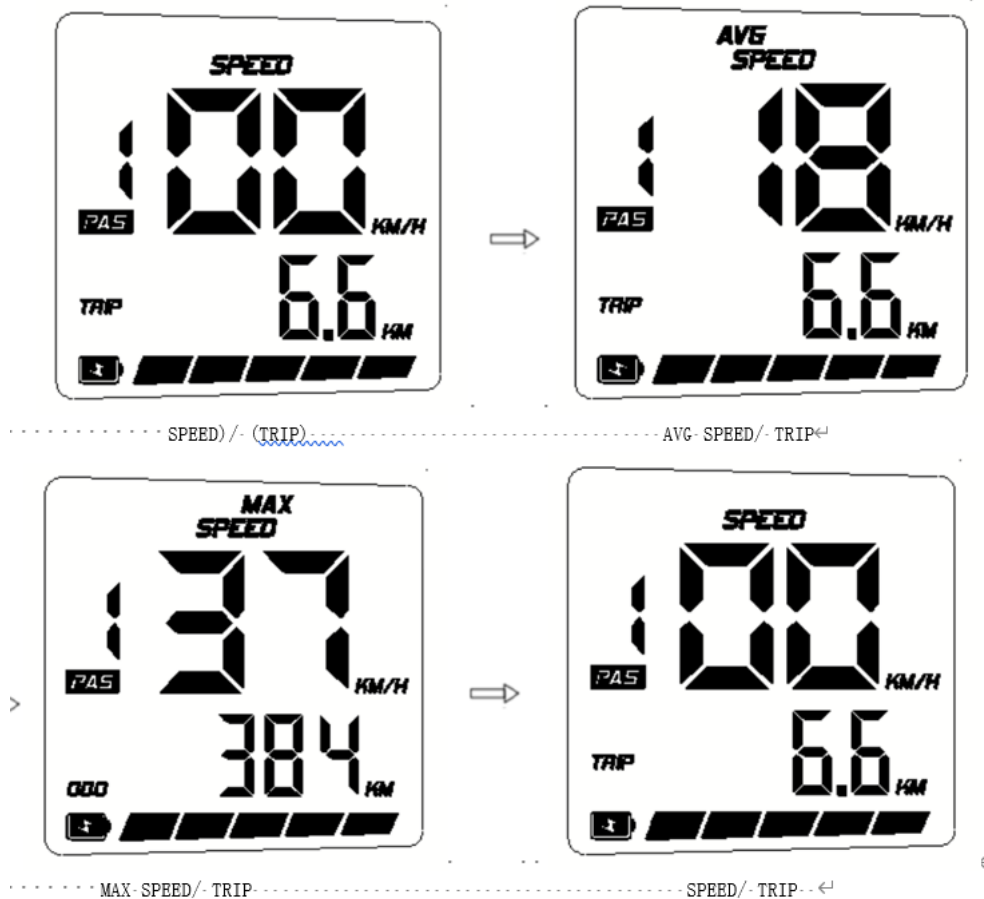
### 6.2 Assist mode select

Press  or  to select the assist mode and change the assist power mode. There are 6 modes(default): 0/1/2/3/4/5,( Number of levels that can be opened) When the display is turned on, it defaults to level 0. When level 0 is displayed, it is no power assisted. (the power assistant levels selection interface is shown in the figure below)



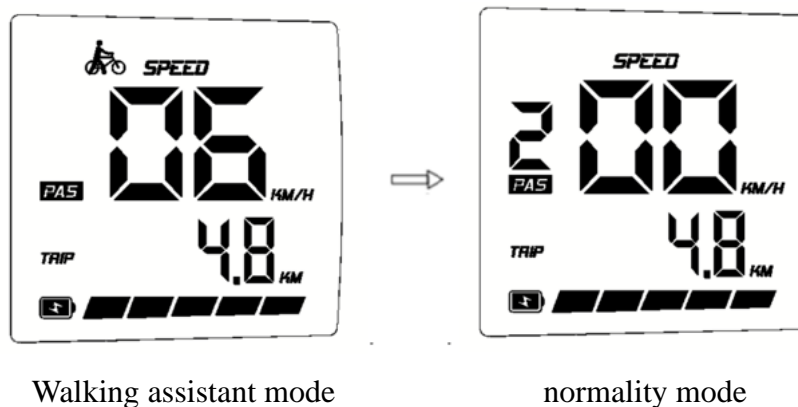
### 6.3 Display information switching

In the power on state, short press to switch the display information of subtotal mileage, average speed, maximum speed and total mileage, and cycle display: current speed / subtotal mileage (trip) - > average speed (AVG), total mileage (ODO) - > maximum riding speed (max), subtotal mileage (trip) - > current speed / subtotal mileage (trip).





### 6.4 Walking assistant mode

Long press -, 2 seconds later, enter the walking assistant state, display, release -, that is, exit the walking assistant mode and return to the normal display interface. The power assistant mode switching interface is shown in the figure below (only in the waking assistant state):





## 6.5 Headlight on/off (Backlight low light switch)

Long press  button for 1 second, the headlight is turned on (need support of controller). Headlight icon shows on the interface, meantime display back light low light. Long press  button for 1 second again, the headlight is turned off, the display back light high light.



## 6.5 Automatic headlight function (off by default)

In automatic headlamp mode, when the ambient light is dark, the photosensitivity is delayed for 2S, the headlamp indicator icon is on, and the display backlight is low; Three seconds after the ambient brightness is restored, the headlamp is turned off, the headlamp indicator icon is off, and the backlight is highlighted.

Note: the photosensitive sensor is in the window display area.

## 6.6 Power display

When the battery power is normal, the 5-segment LED of the battery is displayed according to the time and power, and the outer frame is on. When the battery is exhausted, the 5-segment LED of the battery is completely off and the battery identification flashes, so it needs to be charged immediately. The battery capacity is shown in the figure below:



Percentage of battery power (C) and power level table

No.	Percentage on the display (SOC)	Level on the display	Voltage (24V)	Voltage (36V)	Voltage (48V)
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1	$C \leq 5\%$	outer border flashes	$U \leq 23.1$	$U \leq 33$	$U \leq 42.9$
2	$5\% < C < 15\%$	1 level power	$23.1 < U < 24.5$	$33 < U < 34.7$	$42.9 < U < 45.1$
3	$15\% \leq C < 35\%$	2 level power	$24.5 \leq U < 25.1$	$34.7 \leq U < 35.8$	$45.1 \leq U < 46.5$
4	$35\% \leq C < 55\%$	3 level power	$25.1 \leq U < 25.6$	$35.8 \leq U < 36.7$	$46.5 \leq U < 47.5$
5	$55\% \leq C < 75\%$	4 level power	$25.6 \leq U < 27$	$36.7 \leq U < 38.5$	$47.5 \leq U < 50.1$
6	$C \geq 75\%$	5 level power	$U \geq 27$	$U \geq 38.5$	$U \geq 50.1$

## 7. User settings

Setting items: unit, wheel diameter, speed limitation information, battery information, (items marked with \* are fixed display items, and user setting options are not provided). (items marked with \* are display items, and user setting options are not provided by default)

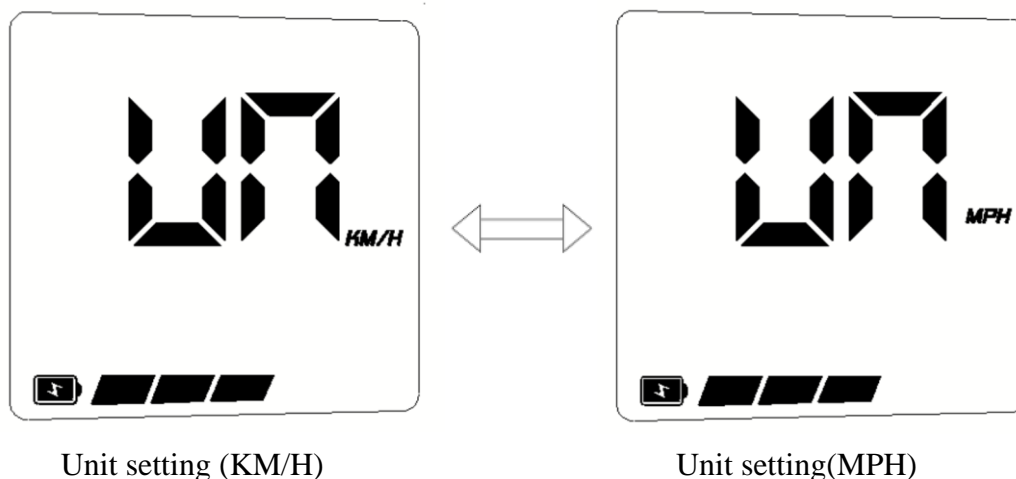
### 7.1 enter setting status

- ✧ 10 seconds within display turned on, long press **M** (3 seconds), system enter the data setting interface. On this status users can set and view the parameters of the display.
- ✧ Long press **M** (3 seconds) to exit and save the setting status.
- ✧ In the user setting interface state, if no operation is carried out for 10 seconds, the display returns to the normal riding state without saving the parameter
- ✧ In the user setting interface, short press / to switch the setting content in the setting item
- ✧ Short press to cycle through the settings

### 7.2 Unit setting

In the unit setting interface, press + / - to select the setting units km / h and mph, and briefly press to switch the setting interface.

The display interface is as follows:

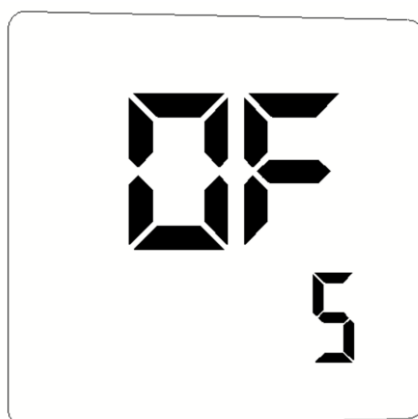


### 7.3 Automatic shutdown time

In the automatic shutdown setting interface, press + / - to select and set the shutdown time, and briefly press to switch the setting interface.

Off: represents the unit setting

- 1: 1 minute automatic shutdown time
- 2: 2 minutes automatic shutdown time
- 3: 3 minutes automatic shutdown time
- 4: 4 minutes automatic shutdown time
- 5: 5 minutes automatic shutdown time
- 8: 8 minutes automatic shutdown time
- 10: 10 minutes automatic shutdown time



### 7.3 Wheel diameter information

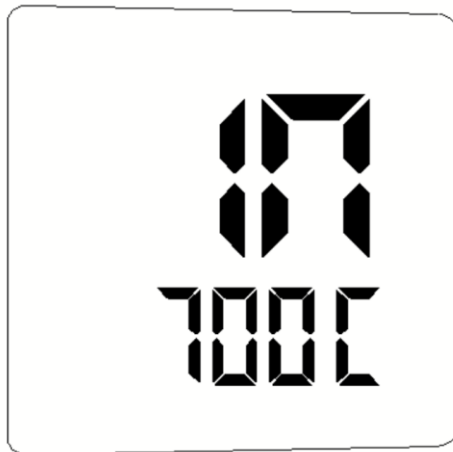
After entering the setting interface, briefly press / switch the setting content to enter the wheel diameter information

IN: Wheel size

700C: indicates that the current display is applicable to 700C wheel size vehicles

The wheel diameter can be set to 16inch, 18inch, 20Inch, 22inch, 24Inch, 26inch, 700cinch, 28Inch and 29inch (depending on different communication protocols)

The display interface is as follows:



Wheel size (700C)

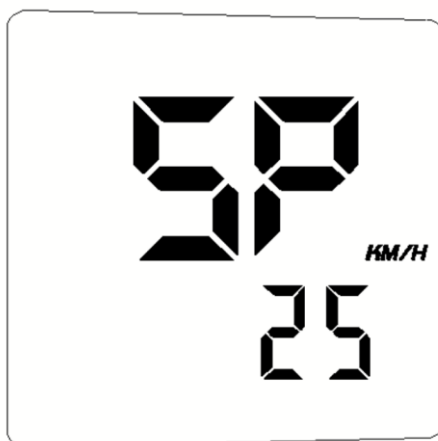
#### 7.4 Speed limitation information

After entering the setting interface, briefly press / switch the setting content to enter the speed limitation information

SP: speed limit information

25KM: speed limit is 25KM/H

The display interface is as follows:



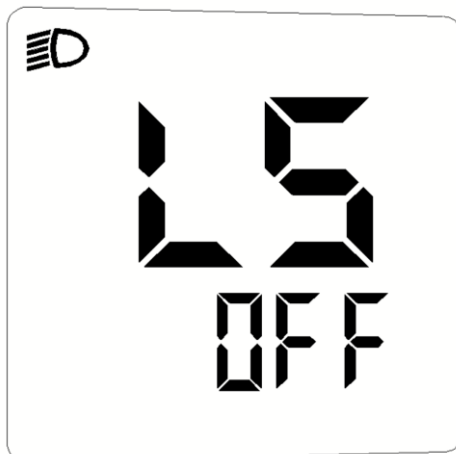
## 7.6 Automatic headlight setting

In the automatic headlamp setting interface, press + / - to select the setting on or off, and short press to return to the unit setting interface

On: automatic headlamp on

Off: automatic headlamp off

The display interface is as follows:

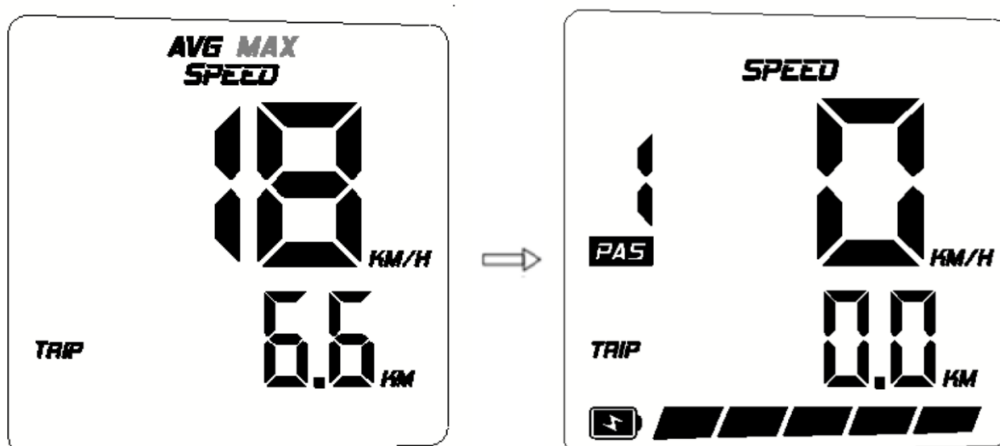


## 8. Data reset

After 10 seconds of startup, long press (3 seconds) to enter the data clearing interface, which displays: the average speed and maximum speed are displayed alternately, and the subtotal mileage and its unit are displayed;

Short press to clear the trip, AVG and Max and return to the operation interface; if no operation is performed within 5 seconds, return to the operation interface without clearing the data.

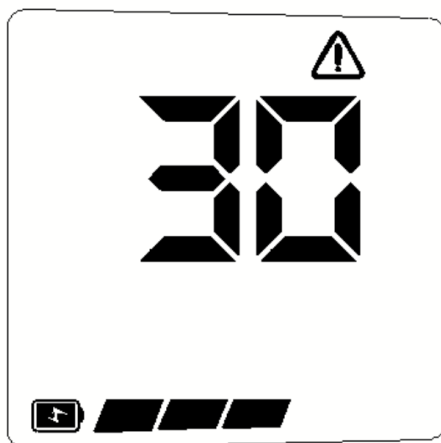
Normal shutdown and power failure do not automatically clear the above data.



## 9. Error information

### 9.1 Error code showing

The fault icon and fault code are displayed



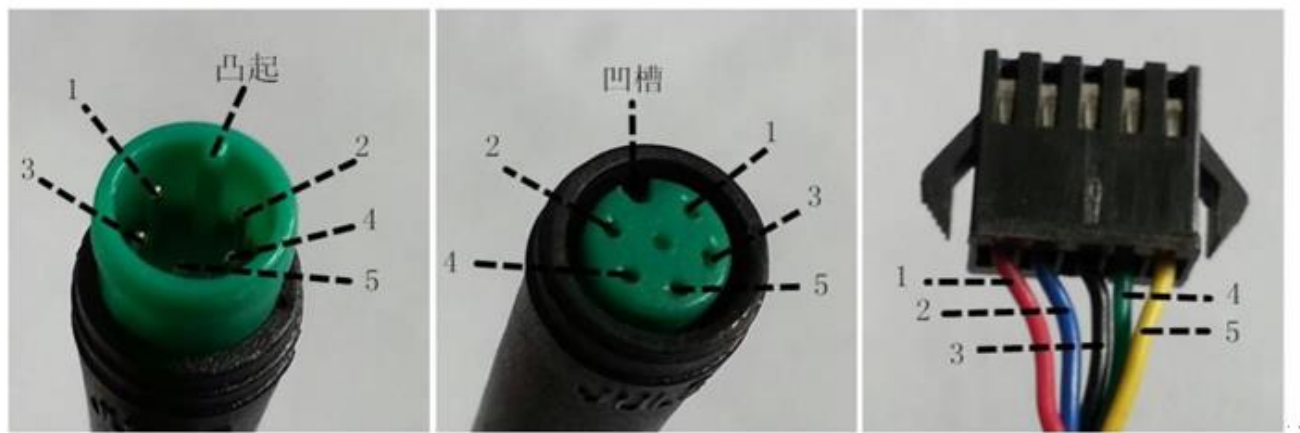
### 9.2 Error code definition

The error code comparison table is as follows: (for reference only, consult the protocol definition or controller side)

Error	Error code description	Troubleshooting and analysis
04	Throttle does not return	Check whether the throttle returns
05	Throttle fault	Check throttle
07	Overvoltage protection	Check battery voltage
08	Motor hall sensor fault	Check motor
09	Motor phase line fault	Check motor
11	Controller temperature sensor fault	Check controller
12	Current sensor fault	Check controller
13	Battery temperature fault	Check battery
14	Motor temperature fault	Check motor
21	Speed sensor fault	Check speed sensor installation position
22	BMS communication fault	Replace battery

30	Communication fault	Check connector of display and controller
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## 10. wire definition



Wires out of the display

wires connect to the display

wire connect to controller

Table 1 wires definition

No.	Color	Function
1	Red(VCC)	GND of display VCC
2	Blue(Kp)	Power control line of controller
3	Black(GND)	Display GND
4	Green(RX)	Data receive of the display
5	Yellow(TX)	Data transmission of display

Note: the leads of some products are waterproof plug-ins, and the user cannot see the color of the leads in the harness.

## C. Note

- ✧ In the use of the display, pay attention to the security, do not plug the display in and out the when the power is on.
- ✧ Try to avoid use exposure in harsh environments like heavy rain, heavy snow, and strong sunlight.
- ✧ When the display can't be used normally, it should be send to repair as soon as possible.