

The e-Bike Display

# **Users Manual**

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## Product Name and Model

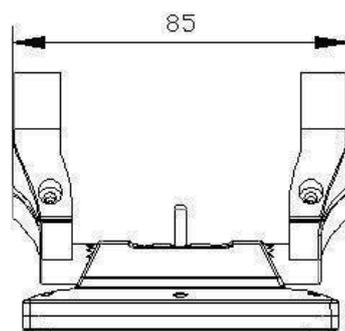
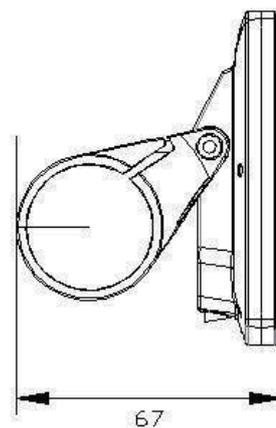
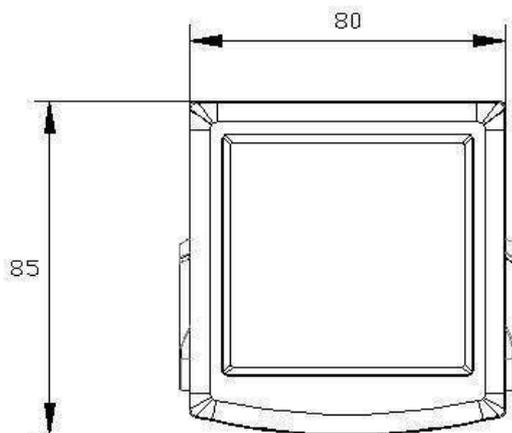
Intelligent LCD display for E-bike; model: KD51C.

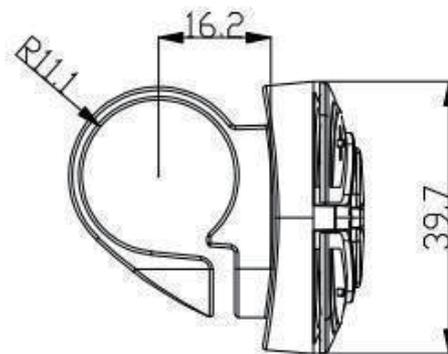
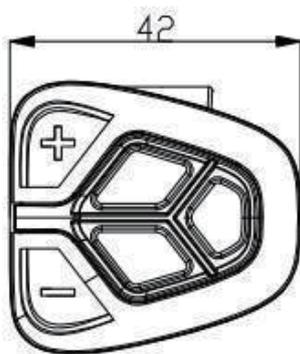
## Specifications

- 24V/36V/48V Power Supply
- Rated working current: 10mA
- The maximum working current: 30mA
- Off leakage current: <math><1\mu\text{A}</math>
- The supply controller working current: 50mA
- Working temperature:  $-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$
- Storage temperature:  $-30^{\circ}\text{C} \sim 70^{\circ}\text{C}$

## Appearance and Size

Display appearance and dimension figure (unit: mm)





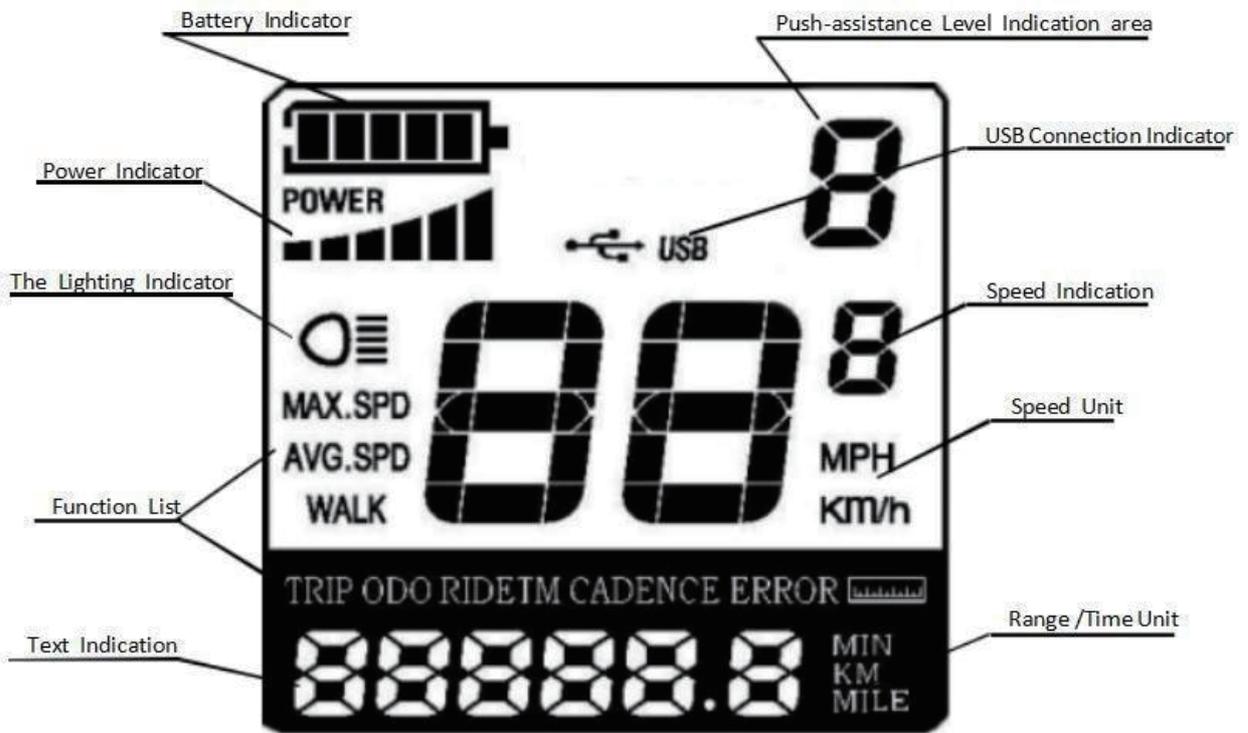
## Function Summary

### ◆ Function Summary

KD51C can provide a lot of functions to fit the users' needs. The indicating contents are as follows:

- Smart battery indicator
- Assistance-level indication
- Speed indication (incl. running speed, max speed and average speed)
- Odometer and trip distance
- The push-assistance function
- Trip time indication
- Backlight On/Off
- Error code indication
- USB port
- Motor-output indicator
- Various parameters settings (e.g., wheel size, speed-limit, battery level bar, assistance level, controller limited current, power-on password, etc.)
- Recover default settings

◆ **Functional Area Distribution**



Functional Area Distribution

**General Operation**

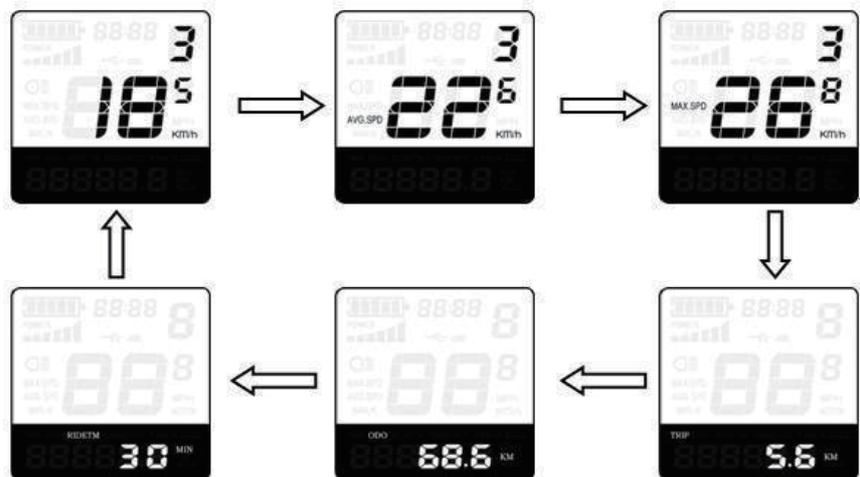
◆ **Switching the E-bike System On/Off**

Briefly press the power button to switch on the E-bike system,  
 To hold the power button for 2 s again, the E-bike system will be switched off.  
 When switching off the E-bike system, the leakage current is less than 1 uA.

■ When parking the E-bike for more than 10 minutes, the E-bike system switches off automatically.

◆ **Display Interface**

After switching on the E-bike system, the display will show Speed and Total Distance by default. Pressing the “i” button will show more riding data as follows: Running Speed (Km/h)→ Ave. Speed (Km/h) →Max. Speed (Km/h) → Trip Distance (Km) → Total Distance (Km)→ Trip Time (Min.) .



Display interface cycle

#### ◆ Switching Push-assistance Mode On/Off

To activate the push-assistance function, hold the “-” button always. The E-bike’s drive is activated at a uniform speed of 6 Km/h. And “WALK” shows on the screen.

The push-assistance function is switched off as soon as you release the “-” button on the operating unit.



Push-assistance Mode

■ Push-assistance function may only be used when pushing the E-bike. Danger of injury when the wheels of the E-bike do not have ground contact while using the push- assistance function.

#### ◆ Switching the Lighting On/Off

To switch on the lighting (headlights, taillights and display backlight), briefly press the “” button. In the same way to press the “” button again, the lighting can be switched off.



Switching the Lighting On/Off Interface

#### ◆ Assistance Level Selection

The level of assistance of the E-bike drive when pedaling can be adjusted via the display. The assistance level can be changed anytime, even during riding.

The default assistance level ranges from level “0” to level “5”. The output power is zero on Level “0”. Level “1” is the minimum power. Level “5” is the maximum power.

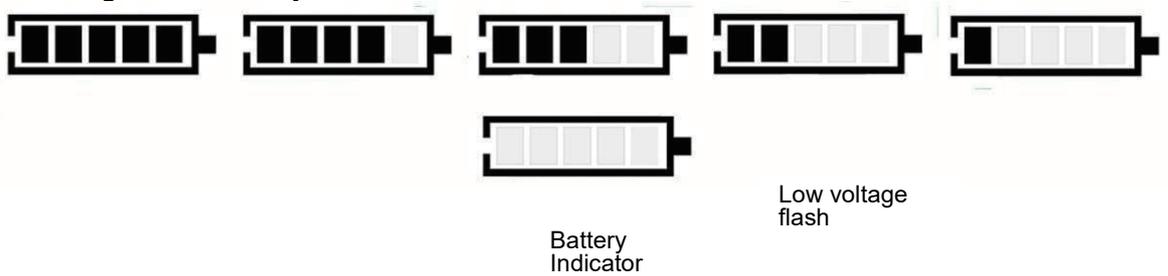
To increase the assistance level, press the “+” button until the desired assistance level is displayed; to decrease the assistance level, press the “-” button. The default value is level “1”.



Assistance Level "5"

◆ **Battery Indicator**

The five battery bars represent the capacity of the battery. Each bar of the battery pack symbol is equivalent to a capacity of approx. 20%. When the battery is at low voltage, the battery frame will flash at frequency of 1 HZ to give notice that the battery needs to be recharged immediately.



◆ **Motor Power Indicator**

The power of the motor can be read via the interface.



Motor Power Indication

◆ **USB Connection Indicator**

External devices connect with the USB port of the display. The USB icon shows in below picture:



USB Connection Indicator

#### ◆ Error Code Indication

The components of the E-bike system are continuously and automatically monitored. When an error is detected, the respective error code is indicated in the text indication area. Here is the detailed message of the error code in **Attached list 1**.



Error Code Indication

- Make the display repaired when an error code appears. Or else you can not ride the bike.

## General Settings

To access the general settings menu, hold both the “+” button and the “-” button for 2 s.

- All the Settings are operated in the case of parking the E-bike.

#### ◆ Trip Distance Clearance

TC represents trip distance clearance setting.

To clear the trip distance, press the “+” button or the “-” button until the Y/N is displayed. Y represents clearing a trip distance and N represents NOT clearing a trip distance.

To store a changed setting, press the “i” button and then access backlight contrast settings.



Trip Distance Clearance Settings Interface

#### ◆ Backlight Contrast Settings

BL represents backlight contrast settings. Level “1” is the low brightness, Level “2” is the middle brightness, Level “3” is high brightness. The default level is “1”.

To modify the backlight brightness, press the “+” button or the “-” button to choose the desired setting item.

To store a changed setting, press the “i” button and then access the unit Conversion Settings.



Backlight Brightness Settings Interface

◆ **Unit km/mi Conversion**

U represents unit settings, “1” is mile and “2” is kilometer. The default value is “2”.

To convert a unit, press the “+” button or the “-” button to choose the desired setting item, and then press the “i” button to confirm.

To store a changed setting, press the “i” button and then access trip distance clearance settings.

Or, hold the “i” button for 2 s and then exit General Settings.

Mile and Kilometer Conversion Settings Interface



**General Parameter Settings**

To access the general parameter Settings interface, hold both the “+” and the “-” button for 2 s and then hold both the “-” and the “i” button for 2 s again.

◆ **Wheel Diameter Settings**

Ld represents wheel diameter settings. Electable values include 16, 18, 20, 22, 24, 26, 700C and 28.

To change basic settings, press the “+” or the “-” button to increase or decrease until the desired value is displayed.

To store a changed setting, press the “i” button. Then access the speed-limit settings interface. The default value is 26 inch.



Wheel Diameter Settings Interface

◆ **Speed-limit Settings**

LS represents the limit speed settings. When the current speed is faster than the speed limit, the E-bike system will switch off automatically. Speed limit range is 12Km/h to 40Km/h.

The default value is 25Km/h.

To change basic settings, press the “+” or the “-” button to increase or decrease until the desired value is displayed.

To store a changed setting and exit General Parameter Settings, hold the “i” button for 2 s.



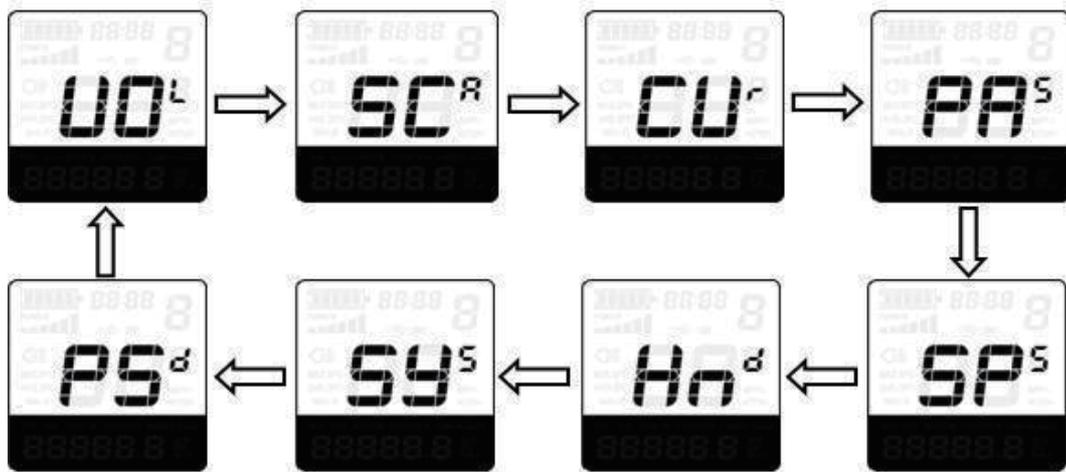
Limit Speed Settings Interface

## Personalized Parameter Settings

Personalized Parameter Settings can match a variety of requirements in use. There are 8 settings items, such as Battery Power Bar Settings, Power Assistant Level Settings, Over-current Cut Settings, Power Assistant Sensor Settings, Speed Sensor Settings, Throttle Function Settings, System Settings and Power-on Password Settings.

To access Personalized Parameter Settings items option page, hold both the “+” and the “-” button for 2 s, then hold both the “+” and the “-” button for 2 s again.

To access the corresponding settings page, press the “+” or the “-” button to increase or decrease until the desired item is displayed, and then press the “i” button to confirm.



Options Selection Interface

### ◆ Battery Power Bar Settings

VOL represents voltage settings. Each bar represents a voltage value. 5 bars voltage values must be entered one by one. For example, VOL 1 is the first bar voltage value. The default value is 31.5V.

To set the battery power bar, press the “+” or the “-” button to increase or decrease the number. To store a changed setting and access the second bar, press the “i” button.

Likewise, after 5 bars voltage values are entered completely, hold the “i” button to confirm and then return to the previous menu.



Battery Power Bar Settings

### ◆ Assistance Level Settings (optional)

#### Assistance Level Option

In assistance level settings, there are 8 modes to select: 0-3, 1-3, 0-5, 1-5, 0-7, 1-7, 0-9, 1-9. The default value is 0-5.

To change the mode of assistance-level, press the “+” or the “-” button to choose the desired mode, and then press the “i” button to confirm, then access the PAS ratio settings page automatically.



PAS Mode Option Interface

### PAS Ratio Settings

To modify the value of PAS ratio, press the "+" button or "-" button to choose the desired value, and then press the "i" button to confirm

For example, the range is "45-55 percent" for level "1", ratio value can be modified, and the default value is 50 percent.

To store the modified setting, press the "i" button and move to the next PAS ratio settings.

After all PAS ratios input, hold the "i" button for 2 s to confirm and then return to the previous menu. Please refer to **Attached list 2** for PAS ratio default values.



PAS Ratio Interface

### ◆ Controller Over-current Cut Settings (optional)

CUR represents controller over-current cut settings. CUR value can be changed from 7.0A to 25.0A. The default value is 15A.

To change basic settings, press the "+" or the "-" button to increase or decrease the value of the current.

To store a changed setting, hold the "i" button and then return to the previous menu.



CUR Settings Interface

### ◆ Power Assistant Sensor Settings (optional)

#### The Direction of PAS Settings

PAS represents power assistant sensor settings. “run-F” means forward direction, while “run-b” means backward direction. The default value is “run-F”.

To change The Direction of Power Assistant Sensor Settings, press the “+” or the “-” button to select F or b.

To store a changed setting, press the “i” button and then access settings mode of PAS sensitivity.



Direction of PAS Sensor Settings

#### The Sensitivity of PAS Settings

SCN represents the sensitivity of PAS settings. The sensitivity value is “2” to “9”. “2” is the strongest, “9” is the weakest. The default value is “2”.

To change the sensitivity of PAS settings, press the “+” or the “-” button to select sensitivity value.

To store a changed setting, press the “i” button and then access magnet disk settings mode.



The Sensitivity of PAS Settings

#### ◆ Magnet Quantity Settings

n represents magnet numbers on the PAS disk. The default value is 6.

To change magnet numbers on the PAS disk, press the “+” or the “-” button to select the quantity according to the PAS disk.

To store a changed setting, hold the “i” button and then return to the previous menu.



PAS Disk magnet number Settings

◆ **Speed Sensor (optional)**

SPS represents speed sensor settings. The default value is 1

To change speed sensor settings, press the “+” or the “-” button to select the quantity of magnet head on the wheel spoke (the range is from 1 to 15).

To store a changed setting, hold the “i” button and then return to the previous menu.



Speed Sensor Selection

◆ **Throttle Definition (optional)**

Hnd, it refers to throttle function setting, including 2 sections: HL and HF

HL represents "throttle-6km" setting, i.e. push-assistance by turning the throttle.

HL-N means throttle push-assistance function is disabled. HL-y means throttle push-assistance function is enabled. The default value is HL-N. means throttle- 6km is disabled and will enter Throttle-PAS setting. If HL-y, then will return to the previous menu



Throttle Enable/Disable Interface

**Throttle -PAS Enable/Disable**

HF represents the "throttle-PAS" setting.

HF-y means throttle speed is limited by current assist level while HF-n means throttle speed is not limited by current pedal assist level. The default value is "n".

If you choose "y", the maximum speed can only be the highest speed powered by current pedal assist level when you twist the throttle.

If you choose "n", the maximum speed is not limited by current pedal assist level and you can override whatever pedal assist level you are at and reach rated maximum speed when you twist the throttle.



Throttle Level Enable or Disable Interface

## System Settings (optional)

### ◆ Delay Time Settings of Battery Power

dLY represents delay time of battery power settings. The default value is 3 s.

To change delay time settings, press the “+” or the “-” button to select delay time 3 s, 6 s, 12 s.

To store a changed setting, press the “i” button and then access the max speed limit.



Delay Time of Battery Power Interface

### ◆ Button Push-assistance Enable/Disable

PUS represents button push-assistance settings. Y represents button push is enabled, N represents button push is disabled. The default value is Y.

To change button push-assistance settings, press the “+” or the “-” button to choose Y or N.

To store a changed setting, press the “i” button and then access PAS speed settings.



Interface of Push-assistance

### ◆ Push-assistance Speed Settings

To change PAS speed settings, press the “+” or the “-” button to adjust from 20% to 35%.

To store a modified setting, press the “i” button and then access slowly start up. The default value is 25%.



Interface of PAS Speed Settings

#### ◆ Slowly Start Up Settings

SSP represents a slow start up. The range is “1-4”, “4” is the slowest. The default value is “1”.

To slowly start up settings, press the “+” or the “-” button to select the desired value.

To return to the previous menu, hold the “i” button for 2 s.



Interface of Slowly Settings Up

#### ◆ Power-on Password Settings

P2, 0000 on the screen means power-on password settings. The default password is 1212.

To access the power-on password settings, press the “+” or the “-” button to modify the value and then press the “i” button to confirm digit one by one until the correct 4-digit password is completed, and then press the “i” button to access power-on password enable settings interface, otherwise stay on the password input state.



Power-on Password Entering Interface

#### ◆ Power-on Password Enable/Disable

To change power-on password enable/disable settings, press the “+” or the “-” button to select Y or N.

If it is Y, press the “i” button and then access the power-on password modify interface, otherwise exit the power-on password settings interface. The default value is N.

Y is power-on password enable.

N is power-on password disable.



Power-on Password Disable Interface

### ◆ Power-on Password Modify

When the display shows P3, 0000, to set a new power-on password, press the “+” or the “-” button to modify the value and then press the “i” button to confirm digit one by one until the new 4-digit password is completed.

To store the new power-on password, hold the “i” button for 2 s and then exit settings.

When switching the E-bike system on next time, the display will show P1,0000, please input the new password to power on.



Power-on Password Modify Interface

### ◆ Exit Settings

In the settings state, pressing the “i” button is to confirm the input. Holding the “i” button is to store the settings, and then exit the current settings. Holding the “-” button is to cancel the operating but not storing settings data, and then return to the previous menu.

■ If there are not any operations in one minute, the display will exit the settings state.

## Recover Default Settings

dEF represents recovery default settings. The default value is N.

To access and recover default settings, hold both the “+” and the “i” button for 2 s.

Press the “+” or the “-” button to choose Y or N again. N means that you do not recover default settings. Y means that it recovers default settings.

When it is Y, hold the “i” button for 2 s to recover default settings; the display shows DEF-00 at the same time, and then return to general display state.



Recover Default Settings Interface

# Quality Assurance and Warranty Scope

## I Warranty

- 1) The warranty will be valid only for products used in normal usage and conditions.
- 2) The warranty is valid for 24 months after the shipment or delivery to the customer.

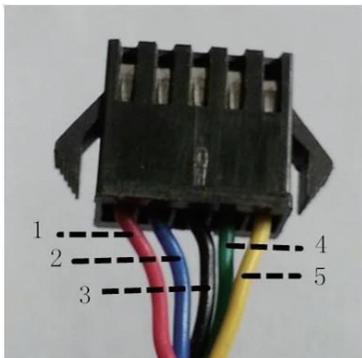
## II Others

The following items do not belong to our warranty scope.

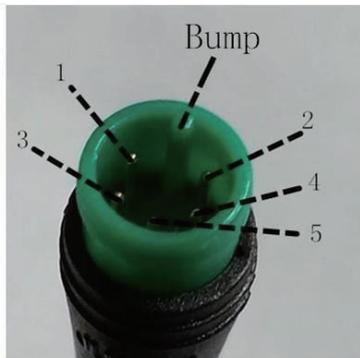
- 1) The display is demolished.
- 2) The damage of the display is caused by wrong installation or operation.
- 3) Shell of the display is broken when the display is out of the factory.
- 4) Wire of the display is broken.
- 5) Beyond warranty period.
- 6) The fault or damage of the display is caused by force majeure. (e.g. fire, earthquake, etc.).

# Connection Layout

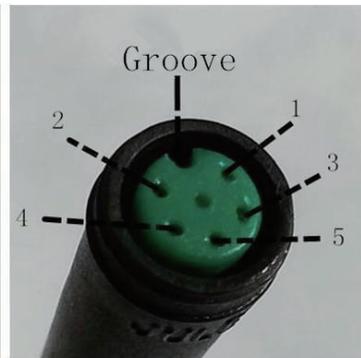
Connector line sequence



SM Connector



Waterproof connector



mating connector

Line sequence table

| Line | Color      | Function |
|------|------------|----------|
| 1    | Red (VCC)  | +        |
| 2    | Blue(K)    | Lock     |
| 3    | Black(GND) | -        |
| 4    | Green(RX)  | RX       |
| 5    | Yellow(TX) | TX       |

■ Some display cables use the water-proof connector, users can not see the inside color.

## Operation Cautions

Be careful of safe use. Don't attempt to release the connector when the battery is on power.

- Try to avoid hitting.
- Do not modify system parameters to avoid parameters disorder.
- Make the display repaired when an error code appears.

**Attached list 1: Error code definition**

| Error Code | Definition                    |
|------------|-------------------------------|
| 21         | Current Abnormality           |
| 22         | Throttle Abnormality          |
| 23         | Motor Abnormality             |
| 24         | Motor Hall Signal Abnormality |
| 25         | Brake Abnormality             |
| 30         | Communication Abnormality     |

**Attached list 2: PAS level ratio defaults table**

| Level<br>Level selection | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0-3/1-3                  | 50% | 74% | 92% | —   | —   | —   | —   | —   | —   |
| 0-5/ 1-5                 | 50% | 61% | 73% | 85% | 96% | —   | —   | —   | —   |
| 0-7/ 1-7                 | 40% | 50% | 60% | 70% | 80% | 90% | 96% | —   | —   |
| 0-9/ 1-9                 | 25% | 34% | 43% | 52% | 61% | 70% | 79% | 88% | 96% |