

## Display Specification

08/2014

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**Product :** Middle Type Intelligent LCD Display

**Model :** APT12LCD800S –UART

**Abbreviation :** 800S-UART

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**Client :**

**Customer audit :**

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**Supplier :** Tianjin APT Science and Technology Co., Ltd.  
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## 1 . Product Name

The Middle type intelligent LCD Display, model number as APT12LCD800S-UART.

## 2 . Supplier Tianjin APT Science and Technology Co., Ltd.

## 3 . Electrical Parameters

- ◇ 24V/36V/48V battery output
- ◇ Rated operating current : 10mA
- ◇ Max operating current : 30mA
- ◇ Off leakage current < 1uA
- ◇ Output controller working current: 50mA
- ◇ Operating temperature : -30 ~ 70°C
- ◇ Storage temperature : -40 ~ 70°C

## 4 . Dimensions & Materials

Display shell is ABS, transparent window is made with high strength Acrylic with stiffness equals as the tempered glass.

Dimensions : L90mm \* W54mm \* H13.3mm

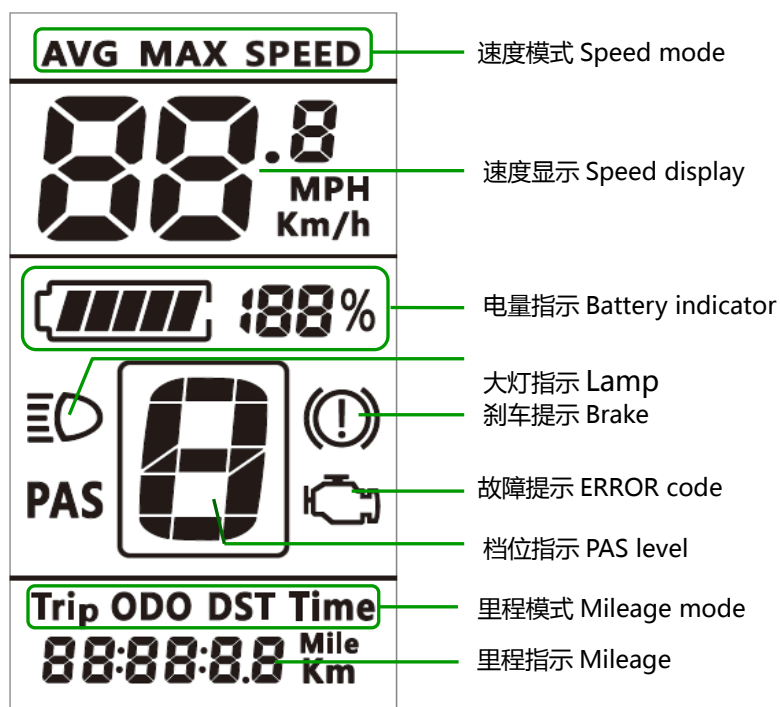


## 5 . Features

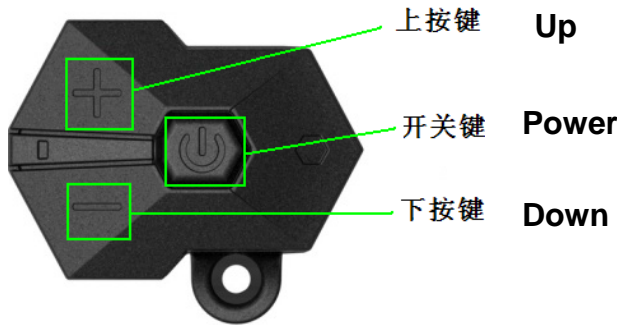
- ◇ Suitable for low temperature, Max -30℃.
- ◇ Ergonomic external button design, easy to operate.
- ◇ Speed display: AVG SPEED, MAX SPEED, AVERAGE SPEED(Real-time).
- ◇ Kilometer/ Mile : Can be set as per customers' habits.
- ◇ **Percentage battery indicator.**
- ◇ **Remaining mileage calculate(DST).**
- ◇ **Show battery information & error indicator.**
- ◇ 9-level Assit : Up to users' habit.
- ◇ Mileage indicator : Max trip distance(max 99,999.9)/ Odometer /DST/Riding time
- ◇ Parameter settings: Multiple parameters can be set through computer USB port, including Assist level / Wheel diameter / Voltage / Speed limit, etc. For detailed, pls refer to separate computer parameter setting files.

## 6 . LCD instructions

LCD display shown as below:



## 7 . Function Description

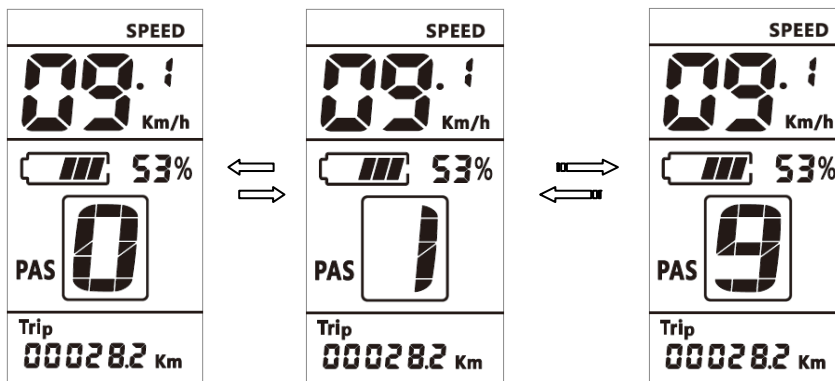


### 7.1 Power On/Off

Press and hold **Power** button for 1 second, then display will work and controller power supply turn on. During the working mode, if press and hold **Power** button for 1 second, then display will stop and controller output will be cut off. If no further action to display within 5 minutes(could be set), display will cut off automatically and power output cut off.

### 7.2 Assist level selecting

Short press **UP/DOWN** button to change the assist level. Top assist level is 9, 1 is the lowest, when display turn on, automatically it will be level 1. 0 level is without any assistance.

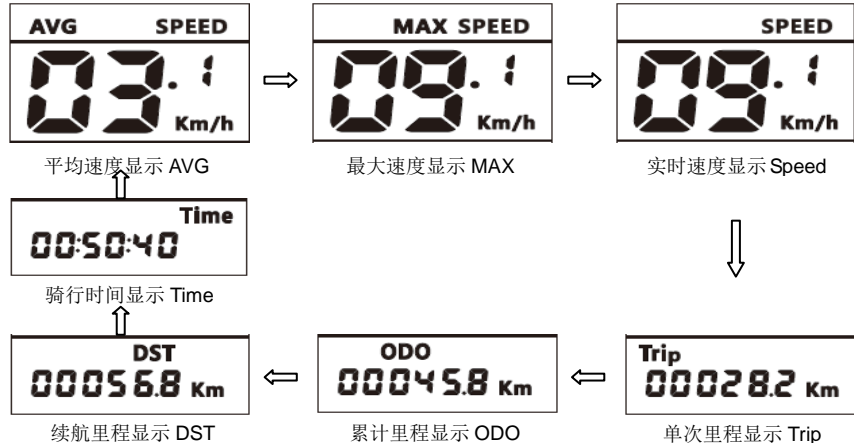


Assist operation manual

### 7.3 Speed mode switch& Mileage mode switch

Short press **POWER** button can switch change the speed mode & mileage mode, data sequence is as:

Average Speed->Max Speed->Actual Speed->Single Trip->ODO->DST-> Time.

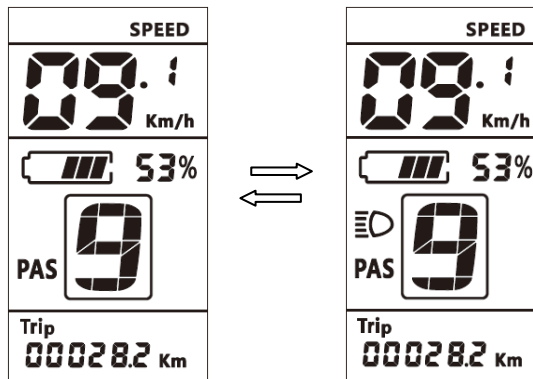


Speed Mode & Mileage mode Interface

\*If there is no operation for 5 seconds, display will return to Speed (Real-Time) display automatically.

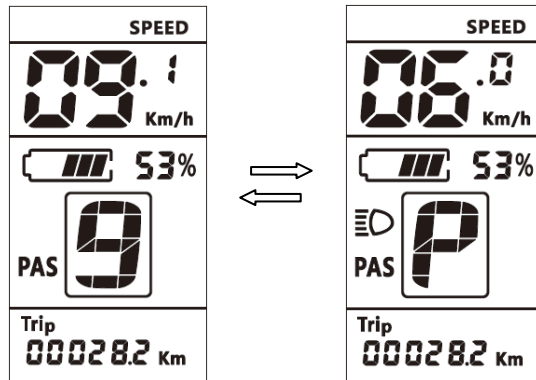
### 7.4 Headlight/backlight On/Off

Press and hold **UP** button for 1 second , then headlight/backlight will turn on, if press **UP** button for 1 second again, then display backlight/headlight will turn off.



### 7.5 Walk Assistance

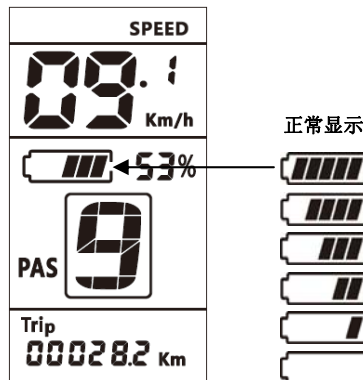
Press and hold **DOWN** button for 2 seconds can get into walk assistance mode, actual speed can be shown, mode as P, release **DOWN**, then exit from walk assistance mode.



May some controllers have not such function.

### 7.6 Battery Capacity Indication

5 bars in display to show battery capacity, if battery under voltage, then no bar in display, then battery needs to be charged immediately.



### 7.7 Data Reset

Press and hold **UP** & **DOWN** buttons together for 1 second can reset several temporary data including **MAX Speed / AVG Speed/ Trip / Time.**

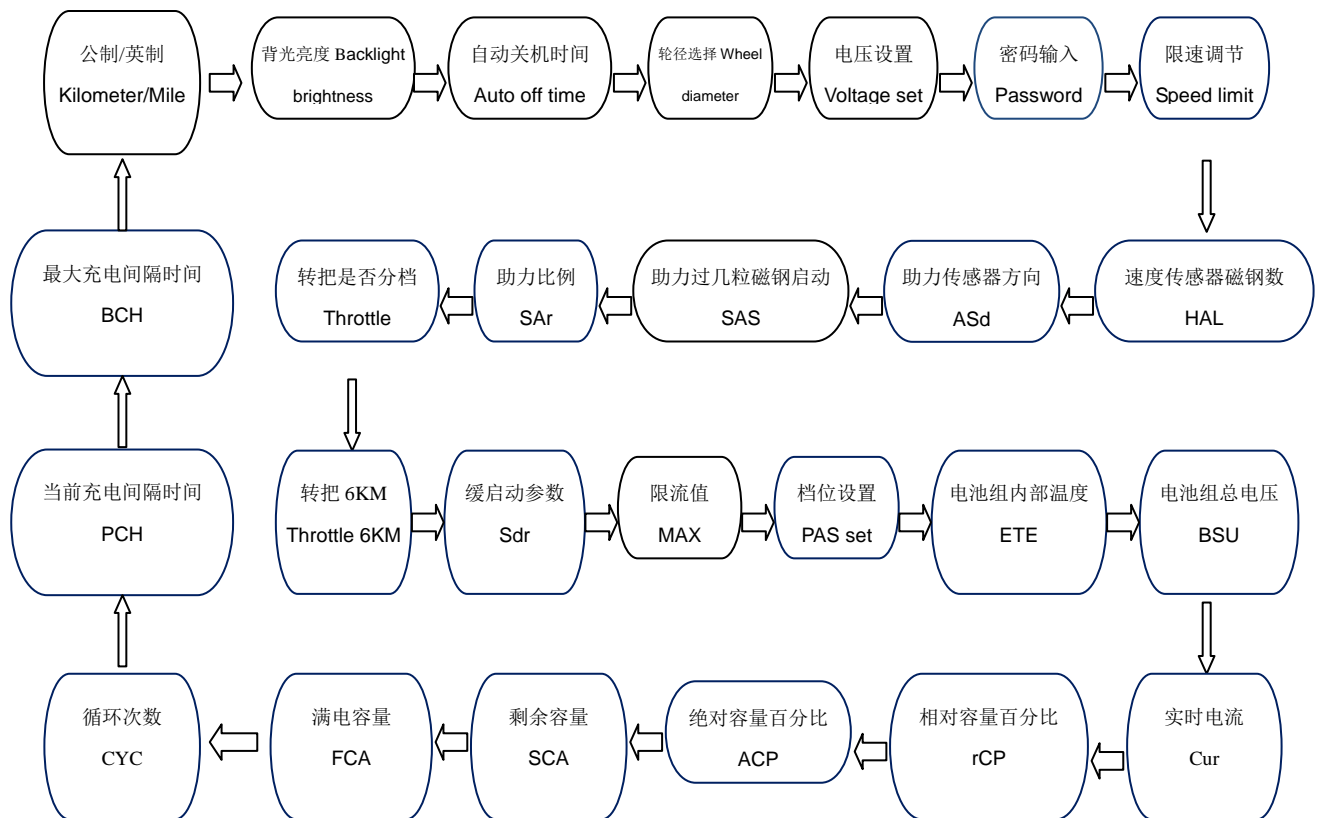
\*Reset could not be done when display or e-bike turn off.

### 7.8 Parameter Setting

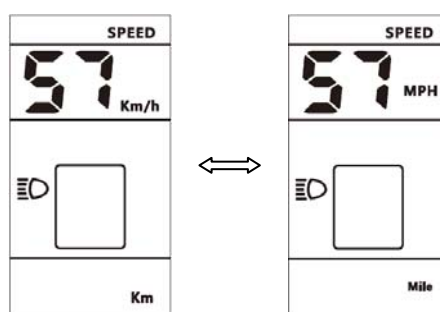
When system turn on, double press **POWER** button (press interval <0.3 second) can get into parameter setting state, under this, parameter could be set. And double press **POWER** button (press interval <0.3 second) to exit. In parameter setting state, when flashing, press **UP/DOWN** buttons to adjust parameters, short press **POWER** button to switch parameter items.

\*The display will automatically exit parameters setting state if no operation for 10 seconds.

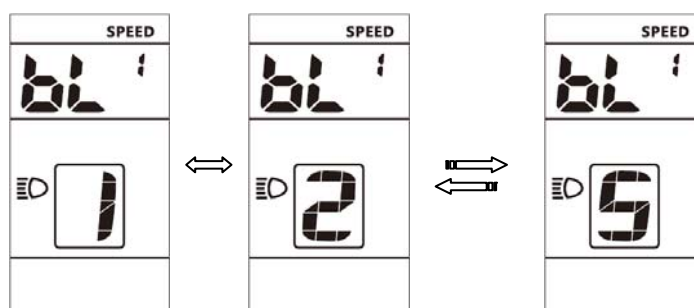
The order of parameters is as follows.



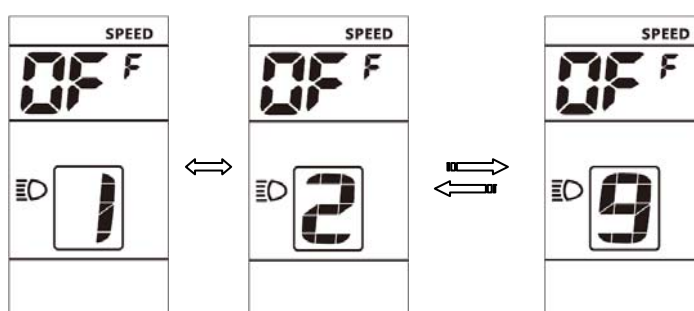
◇ **Kilometer / Mile** : The location of speed displays symbol S7, press **UP/DOWN** button to change between **km/h / MPH (Km / Mile)**



- ✧ **Backlight brightness** : The location of speed displays symbol **bl1**, press **UP/DOWN** button display symbol **1~5** to change the brightness of the backlight. 1-darkest, 5-brightest.

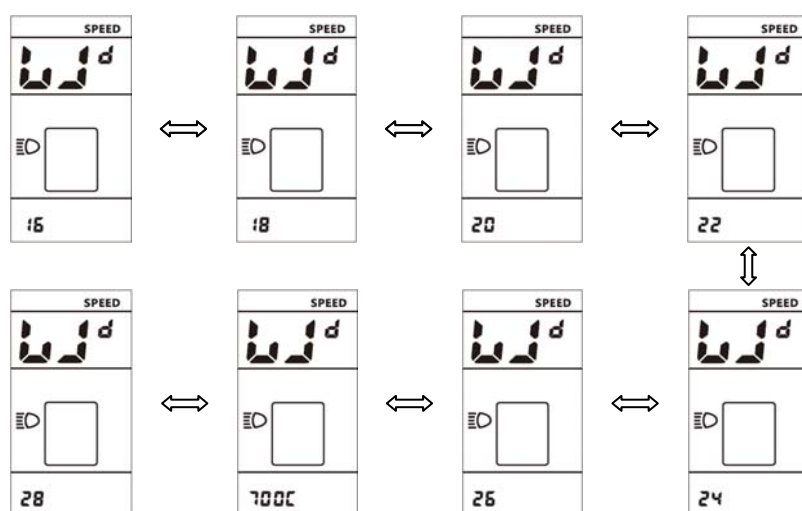


- ✧ **Auto off time** : The location of speed displays symbol **OFF**, press **UP/DOWN** button to change the value from **1** to **9**, the number represent delay time (minutes) before display shutdown automatically.

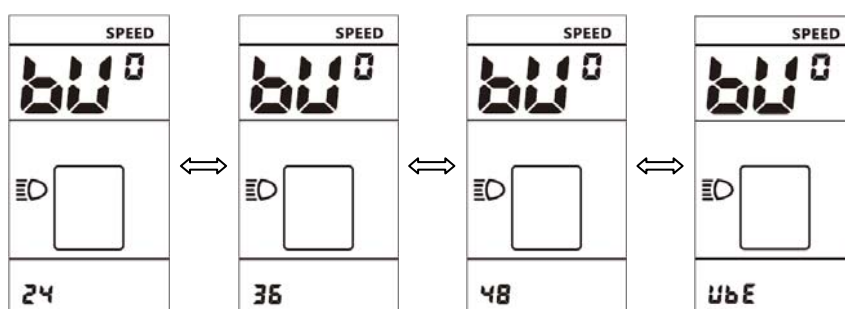


- ✧ **Wheel diameter**: The location of speed displays symbol **Wd**, press **UP/DOWN** button to change between **16/18/20/22/24/26/700C/28**, value represents the diameter of the wheel (inch). Wrong value for wheel diameter will cause speed & mileage abnormal.

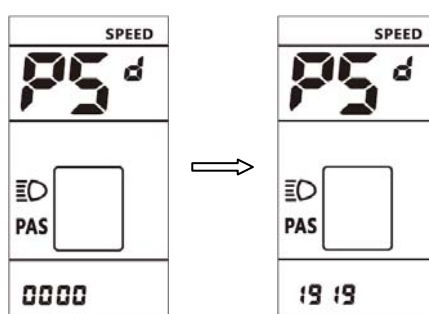




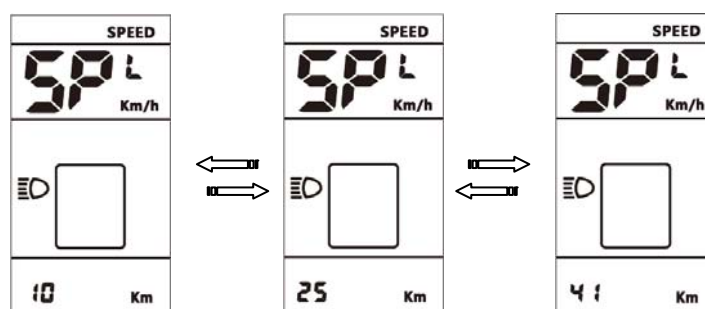
✧ **Voltage Setting** : The location of speed displays symbol **bU0**, press **UP/DOWN** button to switch between **24V/36V/48V/UbE**, **UbE** means user-defined voltage setting, this parameter can be set through computer.



✧ **Password/Speed Limit Setting** : The location of speeds displays symbol **PSd**, require to input passwords, press **UP/DOWN** buttons to change the password value (0~9), short press **POWER** button to switch the password item, password is 4 digits, the default password is "1919". Press **POWER** button when password adjustment is completed. Display will return to the **Voltage set** item if the password is incorrect. Correct password will enter the **Speed Limit Setting** item.

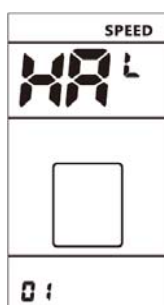


◇ **Speed Limit Setting** : The location of speed displays symbol **SPL**, the location of mileage displays speed limit value, the default value is **25km/h**. Press **UP/DOWN** buttons to modify the value, the value can be set from 10 to 41km/h. Short press **POWER** button to enter the next item.

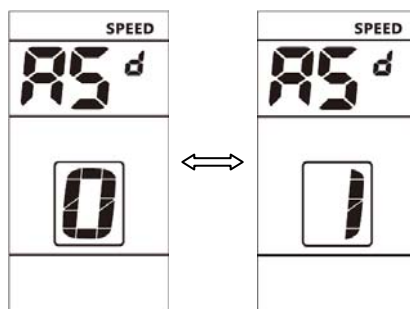


The maximum speed is restricted by the motor and controller, probably couldn't reach the setting value.

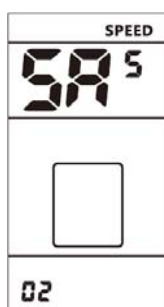
◇ **Magnetic Pole numbers of speed sensor** : The location of speed displays symbol **HAL**, the location of mileage displays magnetic pole number, press **UP/DOWN** buttons to modify the value. When setting finished, short press **POWER** to enter next setting.



**Direction of speed sensor:** The location of speed displays symbol **AS<sup>d</sup>**, press **UP/DOWN** button rotate display symbol **0/1**, 0 indicates forward, 1 indicates backward. When setting finished, short press **POWER** to enter next setting.



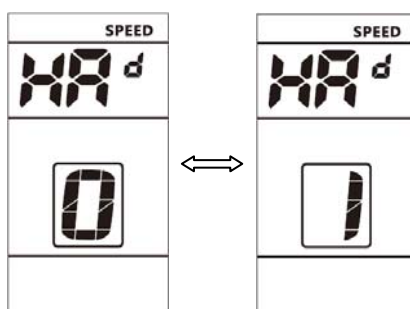
✧ **Power Assistance Start Over Set Magnet Qty:** The location of speed displays symbol **SAS**, the location of mileage shows pole number, press **UP/DOWN** buttons to modify the when power assistance start after certain qty of magnet. When setting finished, short press **POWER** to enter next setting.



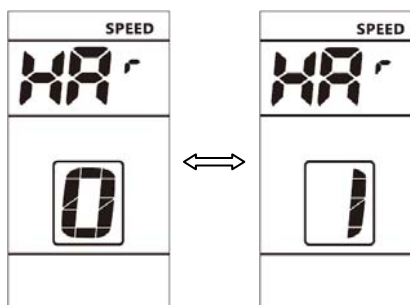
✧ **Assistance level:** The location of speed displays symbol **SAR**, the location of mileage shows assistance level value, press **UP/DOWN** buttons to modify the value. When setting finished, short press **POWER** to enter next setting.



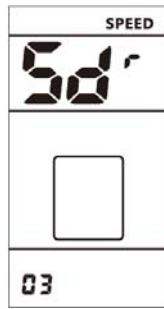
- ✧ **Throttle set** : The location of speed displays symbol **HAd**, press **UP/DOWN** button shows symbol **0~1** to change the throttle OFF or ON. When setting finished, short press **POWER** to enter next setting.



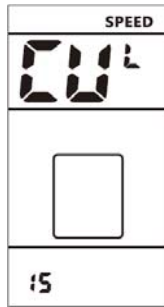
- Throttle 6KM set** : The location of speed displays symbol **HAr**, press **UP/DOWN** button shows symbol **0~1** to change the throttle 6km OFF or ON. When setting finished, short press **POWER** to enter next setting.



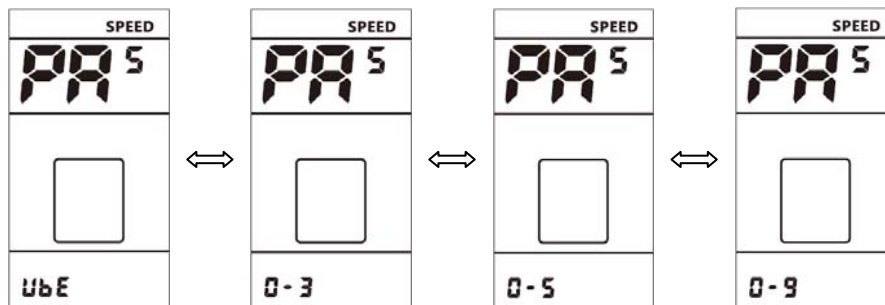
- ✧ **Soft startup parameters**: The location of speed displays symbol **Sdr**, the location of mileage shows value, press **UP/DOWN** button to modify the value. When setting finished, short press **POWER** to enter next setting.



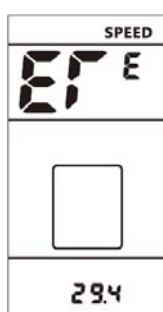
✧ **MAX Current Limit set:** The location of speed displays symbol **CUL**, the location of mileage displays current limit value, the default value is **15A**. Press **UP/DOWN** button to modify the value. When setting finished, short press **POWER** to enter next setting.



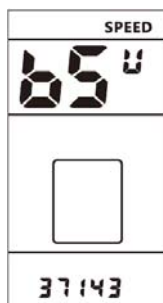
✧ **Range of assistance level setting:** The location of speed shows symbol **PAS**, the location of mileage shows assist range, the default is **UBE**. Press **UP/DOWN** button to change the value from **0-3** to **UBE**. When setting finished, short press **POWER** to enter next setting.



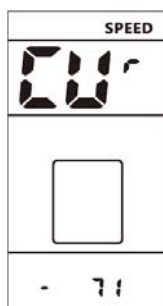
✧ **Battery Pack Temperature:** The location of speed shows symbol **ETE**, the location of mileage shows battery pack temperature. Unit: °C.



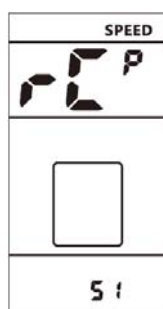
✧ **Battery Pack Voltage:** The location of speed displays symbol **bSU**, the location of mileage shows battery pack voltages. Unit: mV.



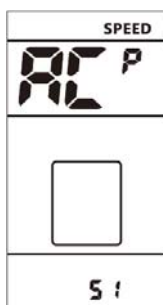
✧ **Real-time current:** The location of speed displays symbol **CUr**, the location of mileage shows real-time current value. Unit: mA.



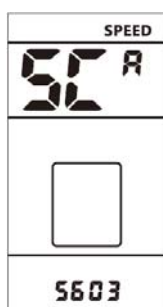
✧ **Percentage of relative capacity:** The location of speed displays symbol **rCP**, the location of mileage displays percentage of relative capacity value. Unit: %



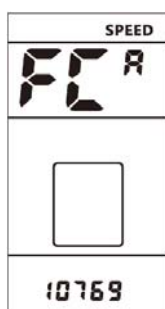
- ✧ **Absolute Battery Capacity SOC:** Such data will be calculated by BMS, the location of speed shows symbol **ACP**, battery absolute capacity SOC. Unit: %.



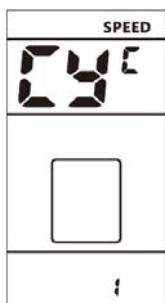
- ✧ **Battery Remaining Capacity:** The location of speed displays symbol **SCA**, the location of mileage shows battery remaining capacity value. Unit: mAh.



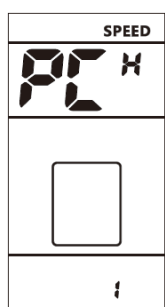
- ✧ **Full Charged Capacity:** The location of speed displays symbol **FCA**, the location of mileage displays full capacity value. Unit: mAh.



✧ **Battery cycle times:** The location of speed displays symbol **CYC**, the location of mileage shows the cycle value. Unit: times.



✧ **The current charging interval:** The location of speed displays symbol **PCH**, the location of mileage shows current charging interval value. Unit: hr.




✧ **Maximum charge time interval:** The location of speed displays symbol **bCH**, the location of mileage shows the maximum charge time interval value. Unit: hr.

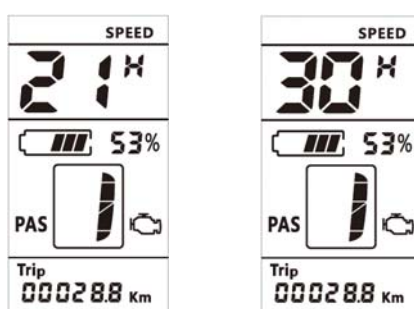




## 8 . Error Code definition

800S-UART gives warning message when E-bike error, LCD display  icon and the error code in speed position area, error code is from 01 E~07 E, the error codes definition as below table:

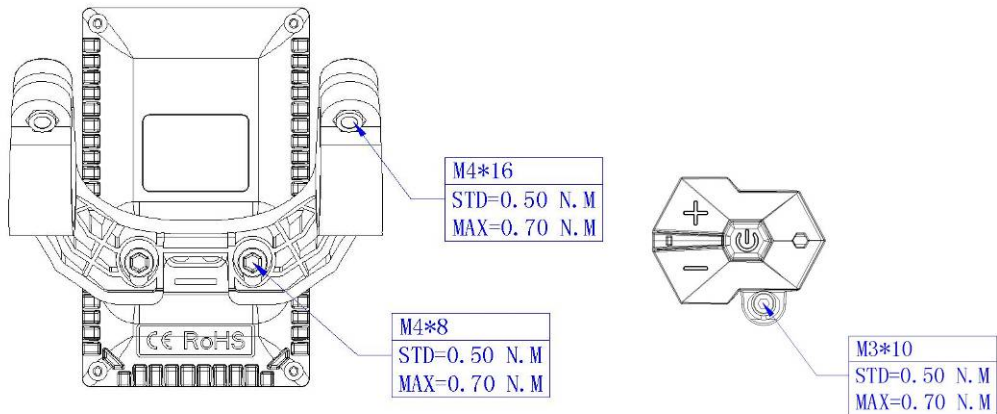
Error Code	Error description	Handle
0x21	Current abnormal	/
0x22	Throttle error	Check turn to connect.
0x23	Motor phase lost	/
0x24	Motor hall error	Check the hall connection
0x25	Brake error	Check the brake connection.
0x30	Controller communication error	/
0x31	Battery communication error	/



## 9 . Assembly Instructions

Please pay attention to the screw's torque value, damaged caused by excessive torque is not within the

warranty.

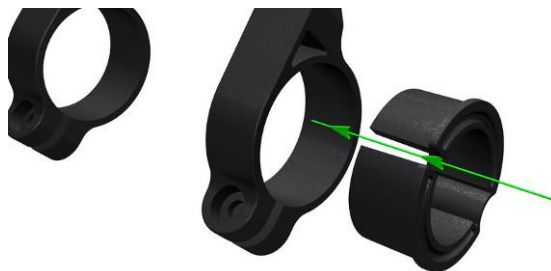


There are 2 directions for the clamp installation, forward or backward.

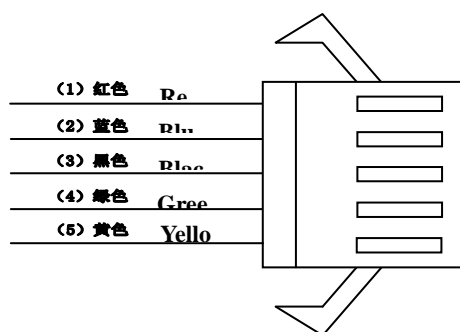
Different assembly methods will need different cable length.



Clamps suit for 3 sizes of handlebar, 31.8mm, 25.4mm, 22.2mm, there are adaptor rings for 25.4mm and 22.2mm, adaptor ring must be assembled with the required directions, pay attention to the green arrow below.



## 10 . Output Wire Instructions



- 1、 Red wire : Anode(24v/36v) ;
- 2、 Blue wire : Power cord to the controller ;
- 3、 Black wire : GND ;
- 4、 Green wire : RxD (controller -> display) ;
- 5、 Yellow wire : TxD (display -> controller) ;

## 11 . Assistance Level Instructions

Assist level can be customized, the highest level is 9, common used assist level see the table below:

3 level	5 level	9 level	Description
0		0	No power assist
	1	1	
		2	
1	2	3	
		4	
	3	5	
2		6	
	4	7	
		8	
3	5	9	