

BAFANG



Max Drive System User Manual

Suzhou Bafang Electric Motor Science-Technology Co., Ltd.

www.szba.com

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Important Notice

- ✧ The Dealer Manual is to be used by professional e-bike mechanics。 Users who have not received training on electric bicycle assembly shall not attempt to assemble parts and components by following the Dealer Manual.
- ✧ If you doubt about any part of the manual, do not install the product. Please consult the local sales office or an electric bicycle dealer for help.
- ✧ Make sure to read all of the installation manuals delivered with the product.
- ✧ Do not disassemble or modify the product unless specified by the Dealer Manual.
- ✧ The Dealer Manual is available on our website (www.szbf.com).
- ✧ The dealer shall observe laws and regulations of the region, the state and the country where the product is sold.

Make sure you have read this user manual carefully in order to use the product properly.



For your Safety

Warning

◆ When installing this product, be sure to follow the instructions given in the user's manual.

It is recommended that you use only genuine Bafang parts at these times. The bicycle may suddenly fall over and serious injury may result if bolts and nuts are left loosened, or the product is damaged or improperly adjusted.

- ✧ When performing maintenance operations (for example parts replacement), be sure to wear goggles or eye patches to protect your eyes.
- ✧ Please refer to the manual provided together with the product for information uncovered by this manual.
- ✧ After reading the user's manual carefully, keep it in a safe place for later reference.

◆ You must be aware that:

- ✧ Do not give too much of your attention to the cycle display while riding, otherwise you may fall off the bike.
- ✧ Check that the wheels are securely installed to the bicycle before commencing riding. If the wheels are not securely installed, the bicycle may fall over and serious injury may result.
- ✧ When riding a pedal-assisted electric bicycle, make sure that you are fully familiar with the starting-off characteristics of the bicycle before riding it. If the bicycle starts off suddenly, accidents may result.
- ✧ Make sure the bicycle lights illuminate before riding at night.

◆ Instructions on bicycle installation and maintenance

- ✧ When cabling the product or installing the parts onto the bicycle, be sure to disconnect the battery. Not doing so may result in electric shock.
- ✧ When installing this product, be sure to follow the instructions given in the user's manual. If bolts and nuts are left loosened or the product is damaged, the bicycle may suddenly fall over and serious injury may result.
- ✧ The frequency of maintenance will vary depending on the riding conditions. Periodically clean the chain using an appropriate chain cleaner. Do not use alkaline or acidic cleaning agents to remove rust under any circumstances. If such cleaning agents are used, they may damage the chain and serious injury may result.

Note

◆ You must be aware of the following precautions:

- ✧ Please follow instructions given in the user manual for your riding safety.
- ✧ Examine the battery charger regularly for damage, especially the cable, plug and enclosure. If the battery charger is damaged, it must not be used until it has been repaired.
- ✧ Please follow the guidance given by the safety supervisor or the instructions indicated in the manual when using the product. This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lacking experience and knowledge, unless they have been given supervision or instruction concerning use of the product by a person responsible for their safety.
- ✧ Do not allow children to play near the product.
- ✧ Please consult the nearest dealer for any errors or problems.
- ✧ Do not modify the system. Doing so may lead to malfunction of the system.
- ✧ For information on product installation and adjustment, please consult your dealer.
- ✧ The product is designed to be fully waterproof to withstand wet weather riding conditions. However, do not deliberately immerse it into water.
- ✧ Do not clean the bicycle in a high-pressure wash. If water gets into any of the components, operation problems or rusting may result.
- ✧ When shipping the product with a high-speed vehicle in a rainy day, remove the battery and put it in a safe place to stop it from getting wet due to the rain.
- ✧ Handle the product carefully, and avoid subjecting it to any strong shocks.
- ✧ Some important information given in the user manual may also be found in product labels.
- ✧ When buying a spare key for the battery, be sure to provide the number on the battery key. Please keep the number in your mind or your notebook.
- ✧ Use a wrung-out damp cloth to clean the battery enclosure.
- ✧ For any questions regarding the maintenance and use of the product, please contact the dealer where you bought the product.
- ✧ Natural wear and tear due to normal use and aging is not within our scope of quality guarantee.
- ✧ Please contact the seller for software updates (if any). The newest information on software will be available on the home page of Bafang website: www.szbf.com

1. Drive Unit

1.1 Advantages

- The controller ensures system safety with the fed-back torque signals and dual speed signals (pedal assist signals and external bicycle speed-detecting signals);
- With a high starting torque and a maximum torque of no smaller than 80N.m, it is especially suitable for climbing;
- High efficiency, low power consumption, and longer riding distance.
- Low noise and smooth operation.

1.2 Scope of Application

The drive unit can work properly in the following environmental conditions:

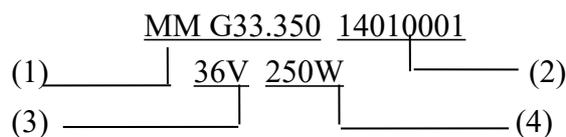
- Ambient temperature: (- 20- + 55) °C;
- Relative humidity: (15-95) % RH;

Note: The product can't work normally if there is any major corrosive gas, any medium that affects the product's electrical insulation properties or any high-intensity magnetic field.

1.3 Naming Rule

Naming Rule:

The nameplate is engraved on the shell, showing such information as follows:

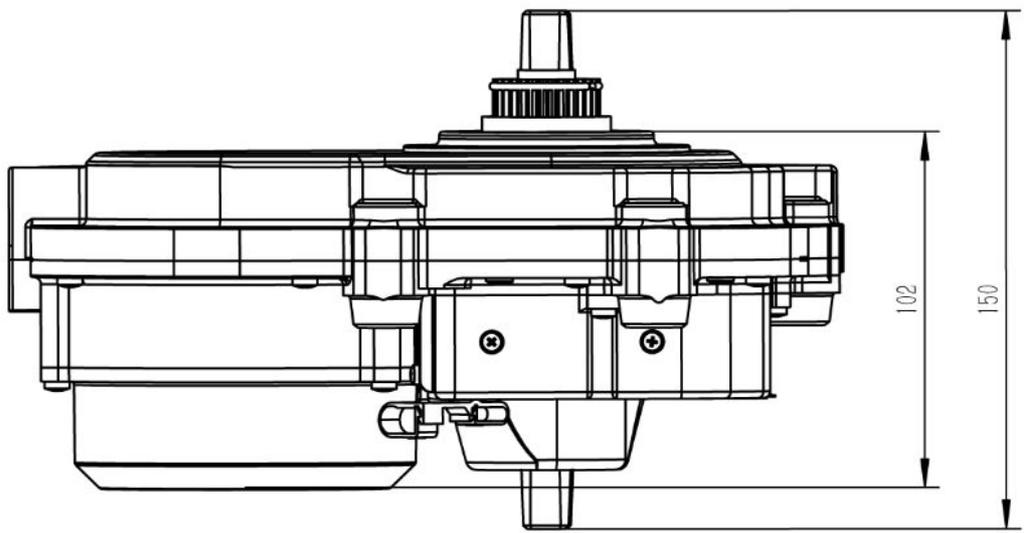
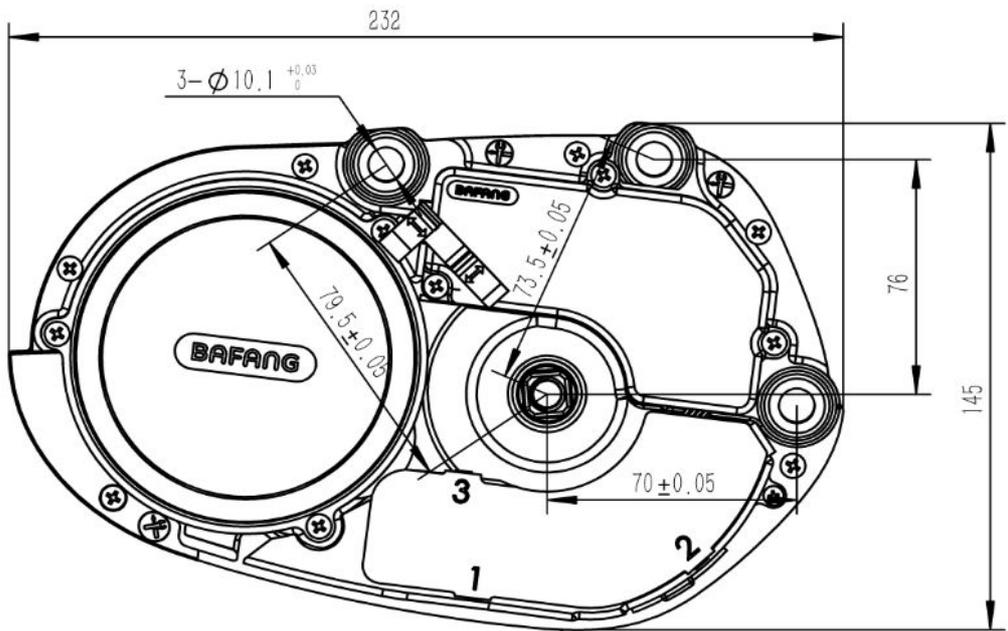


- (1)MM G33.250— Name of the drive unit;
- (2)1401— Date of production, January 2014 in this example;
0001— Production serial number, ranging from 0000 to 9999; 0001 is the production serial number of the first motor.
- (3)36V— Rated motor voltage;
- (4)250W— Rated motor power.

1.4 Main Technical Parameters

Rated voltage (DCV)	36		43	
Rated power(W)	250	350	250	350
Rated efficiency (%)	≥80%			
Rated rotating speed(rpm)	100±5			
Maximum torque(N.m)	≥80			
Chain wheel	36T (recommended), 38T (optional), 42T (optional)			
Optional chain cover	full chain cover / P-shaped chain cover			
Weight (Kg)	3.9			
Sensors	pedal assist speed sensor, pedal assist torque sensor and bicycle wheel speed sensor and temperature sensor			
Noise (dB)	<55			
Working environment	-20℃~55℃			
Dust-proof/ water-proof grade	IP66			
Certification	CE ROHS/ EN14766/ EN14764/ REACH			
Other functions	optional bluetooth module, gear sensor module, DC 500mA/ 6V headlight and taillight module, reprogramming function			

1.5 Drive Unit Structure and Dimensions

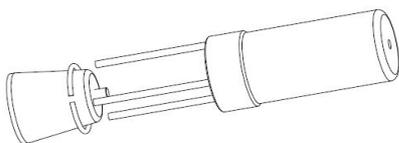


2. System Installation

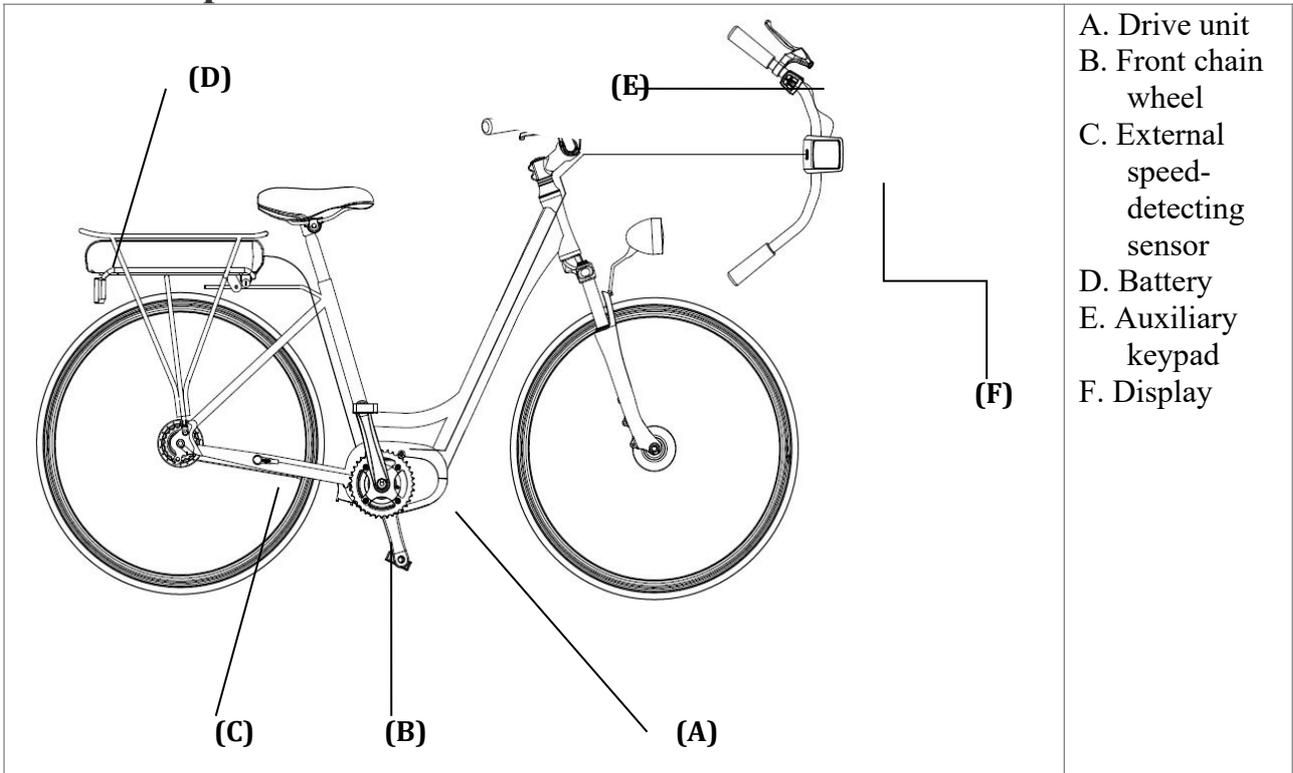
2.1 List of Tools to be Used

Components	Use of the Tools	Tools	
Display	To fix the screw M4	 	Internal hexagonal wrench
Drive Unit	To fix the chain wheel retaining ring		A special tool
	To remove the chain wheel retaining ring		Plier for the retaining ring
	To fasten M4 screws which are used to fix the chain cover binder plate onto the drive unit.		Cross screwdriver
	To fasten M6 bolts and nuts which are used to fix the frame adapter with the drive unit.		Internal hexagonal wrench
	To fasten the crank mounting screw M8.		Internal hexagonal wrench
Speed-detecting Sensor	To install the magnetic steel.		Straight screwdriver
	To fix the M5 screw for the speed-detecting sensor.		Cross screwdriver
Battery	To fix M5 screws used to fasten the battery pack onto the carrier.		Internal hexagonal wrench

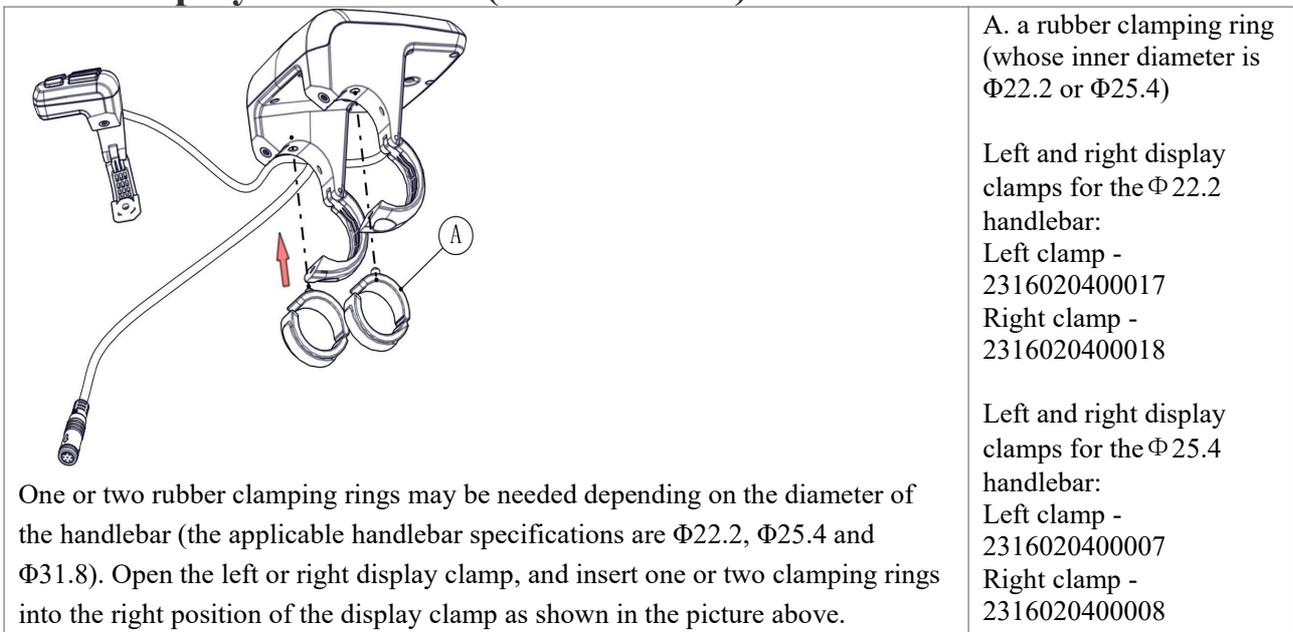
The tool used to install the retaining ring onto the spline shaft.
Tool code: GZ-MM G31-5025)

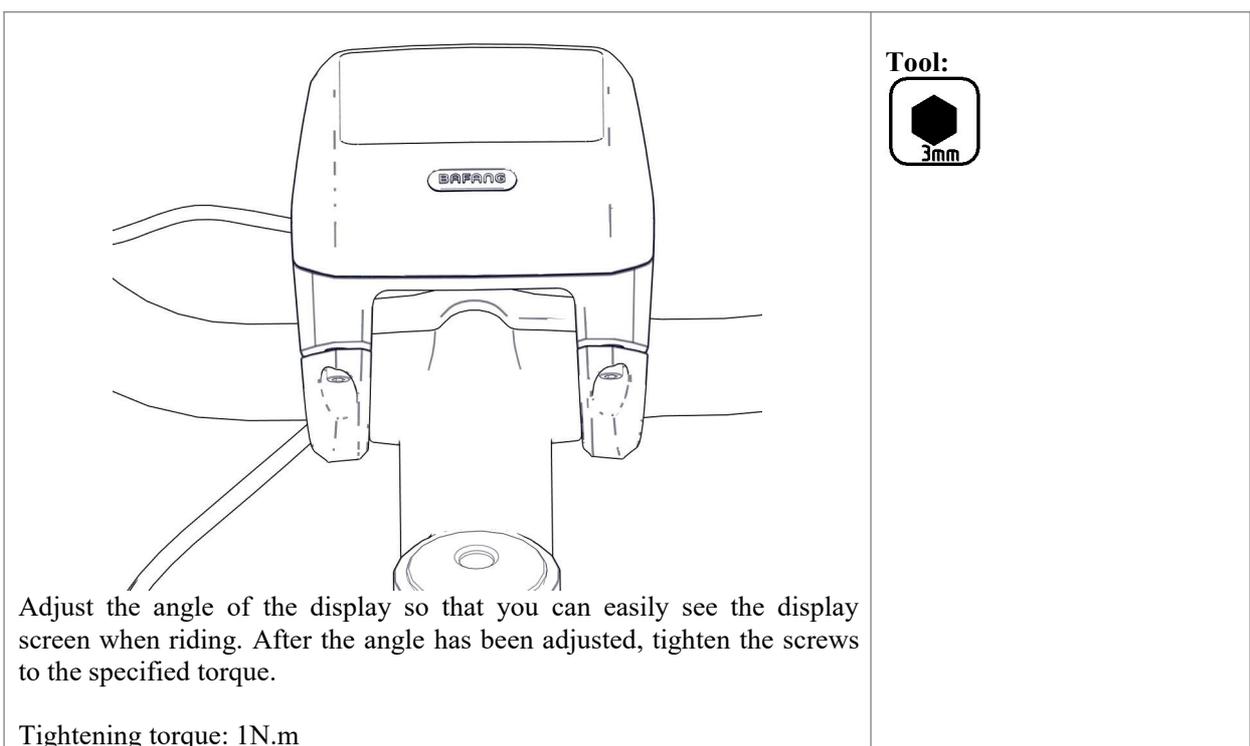
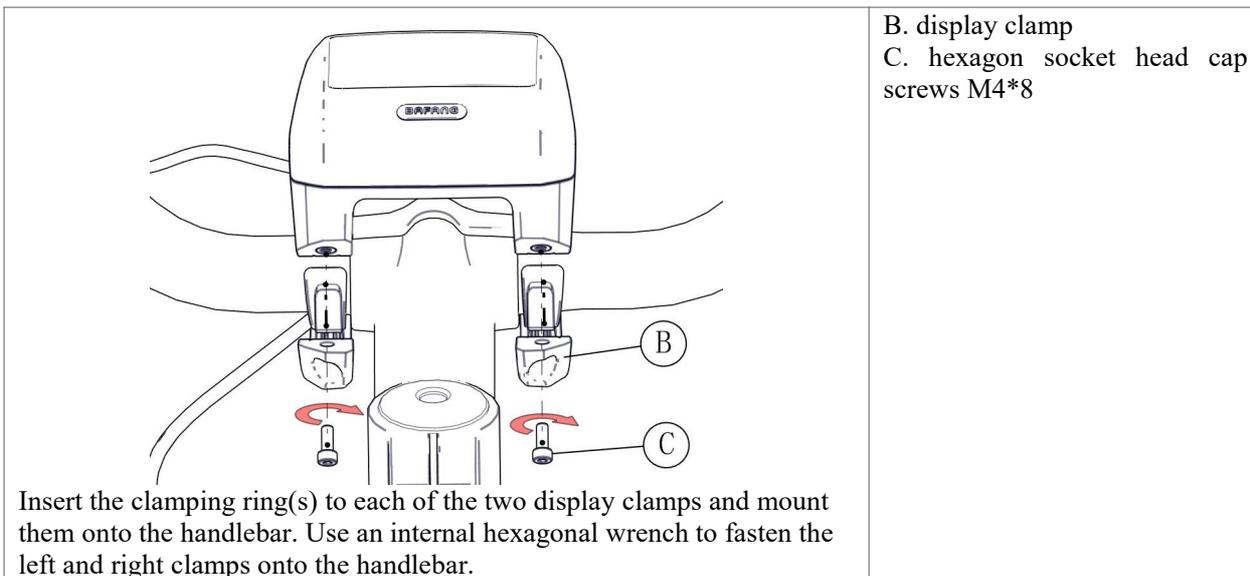


2.2 Component Names

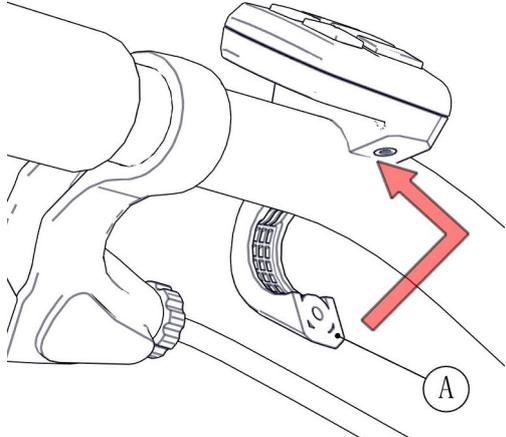


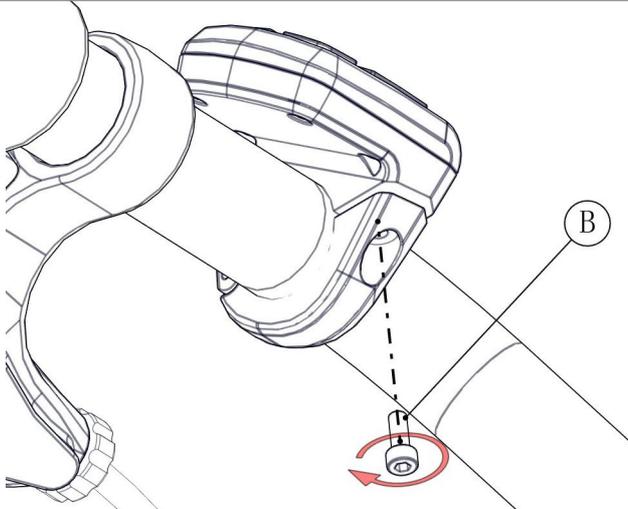
2.3 Display Installation (DP C01.RS232.7)

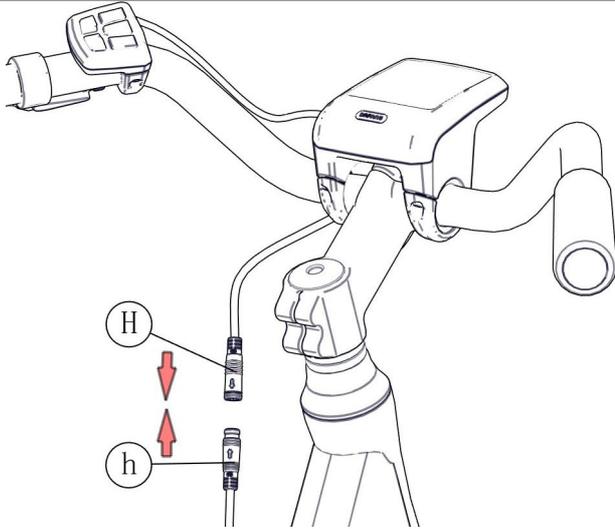




2.4 Auxiliary Keypad Installation

 <p>Open the auxiliary keypad and assemble it onto a position that is easy for operation. Adjust the angle of the auxiliary keypad to ensure that the keypad is easy to see seen during riding. (Applicable to the handlebar whose external diameter is $\Phi 22.2\text{mm}$)</p>	<p>A. keypad clamp</p>
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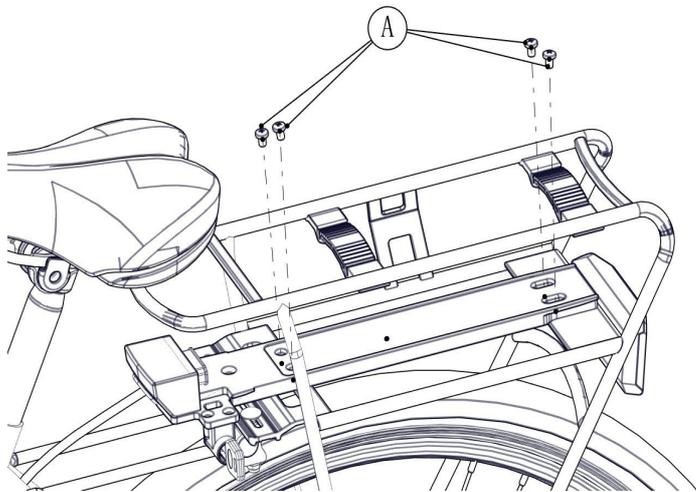
 <p>Fix the keypad onto the handlebar with a screw. Then tighten the fixing screw with an internal hexagonal wrench. Tightening torque: 1N.m</p>	<p>B. hexagon socket head cap screw M3*8</p> <p>Tool:</p> 
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H. female connector at the display
h. male connector at the EB-BUS

Match the female connector at the display with the male connector at the EB-BUS as shown in the picture above.

2.5 Battery Slideway Installation



A. hexagon socket head cap screw (M5)

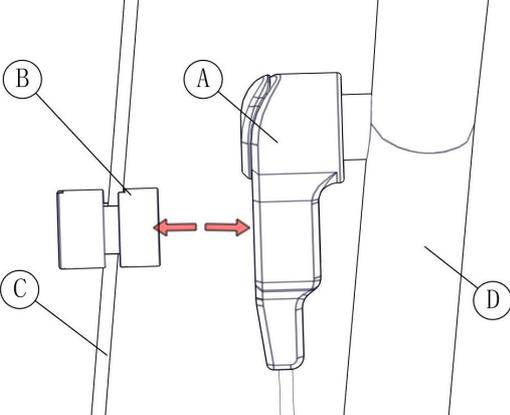
Tool:



Align the mounting holes of the carrier with the mounting holes of the battery slideway. Fasten the battery slideway onto the battery carrier with hexagon socket head screws (M5).

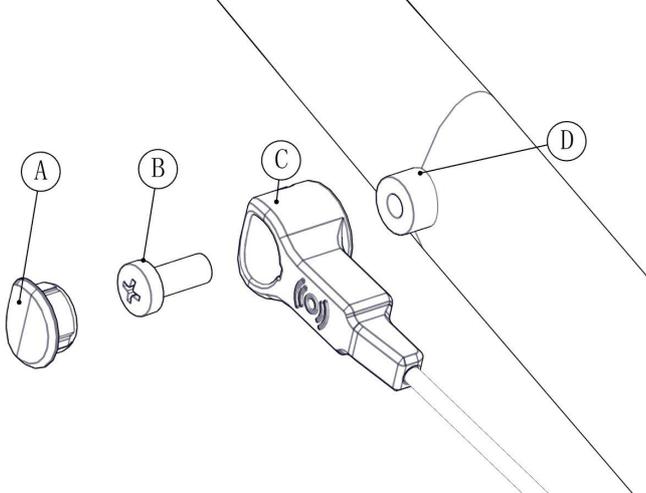
Tightening torque: 2N.m

2.6 External Speed-detecting Sensor Installation



A. external speed-detecting sensor
 B. magnetic unit
 C. spokes
 D. chain stay

Before installing the speed sensor, please make sure the gap between the speed-detecting sensor and the magnetic unit is between 5 to 25 mm.

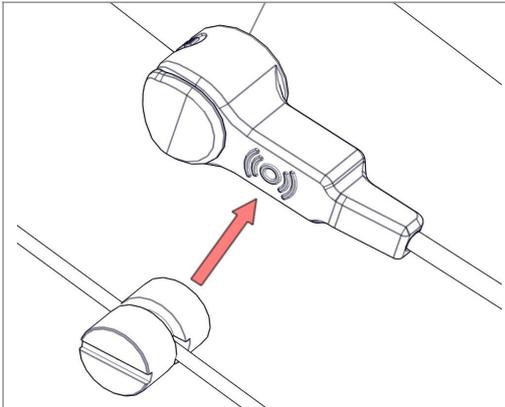


A. Dust cap
 (2301030000003)
 B. mounting bolt M5*12
 C. external speed-detecting sensor
 D. sensor bracket (chain stay boss)

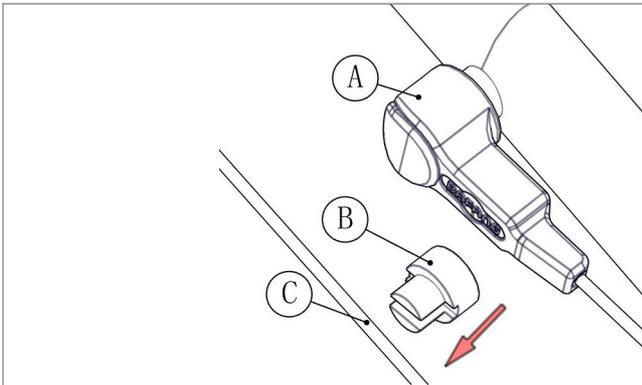
Tool:


If the gap is within the specified range, use the mounting bolt to fix the speed sensor.
 If the gap is over 25mm, please put spacers between the sensor and the chain stay boss to reduce this gap.

Tightening torque: 1.5 - 2 N·m

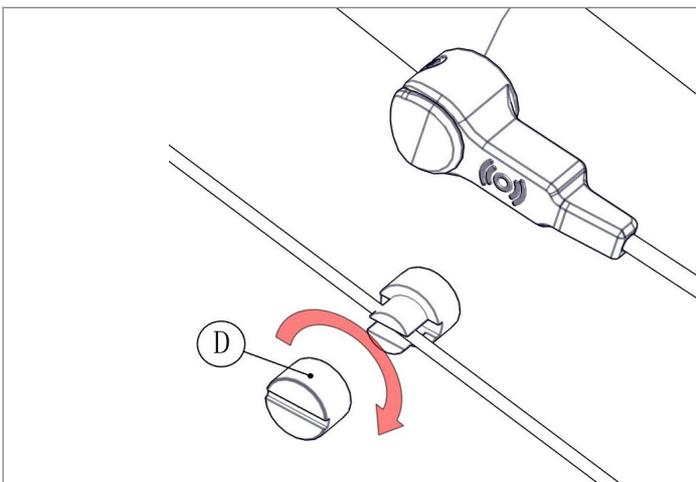


Arrange the speed sensor and the magnetic unit as shown in the picture above. When installing the magnetic unit, make sure its center faces the center of the speed sensor's induction zone.



Arrange the speed sensor and the magnetic unit as shown by the picture above. Mount the magnetic unit onto a spoke with the spoke stuck in the magnetic unit.

- A. external speed-detecting sensor
- B. magnetic unit (PS01010702/2308040000001)
- C. spokes



Tighten up the magnetic mounting nut with a straight screwdriver.
Tightening torque: 1.5 - 2 N·m

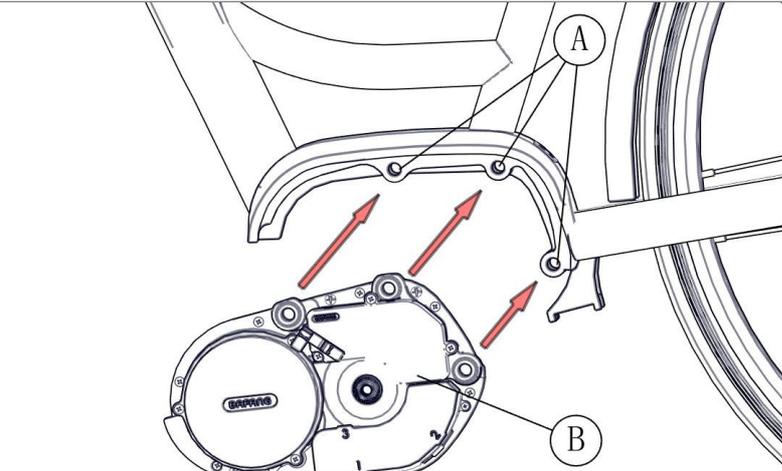
- D. Magnetic mounting nut (PS01010701/2327000000003)

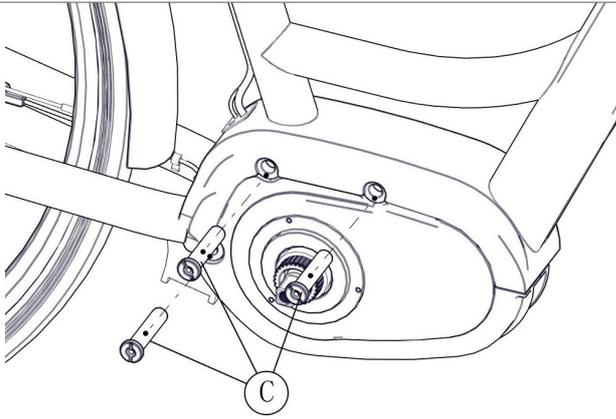
Tool:



2.7 Drive Unit Installation

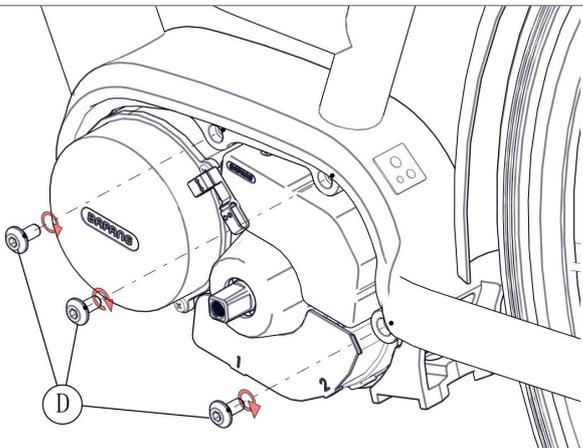
 <p>Cables should be arranged in advance according to the bicycle type and the cabling system before installing the drive unit.</p>	<ul style="list-style-type: none"> A. battery cable B. taillight cable C. external speed-detecting sensor cable D. headlight cable E. EB-BUS
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 <p>Align the three mounting holes of the drive unit with the mounting holes in the bicycle frame.</p> <p>Note: Pay attention to the outgoing directions of the cables. Please be noted that the cables shouldn't be squeezed by the drive unit.</p>	<ul style="list-style-type: none"> A. mounting holes B. drive unit (MM G33.350)
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C.M6 nuts
(1401080000101)

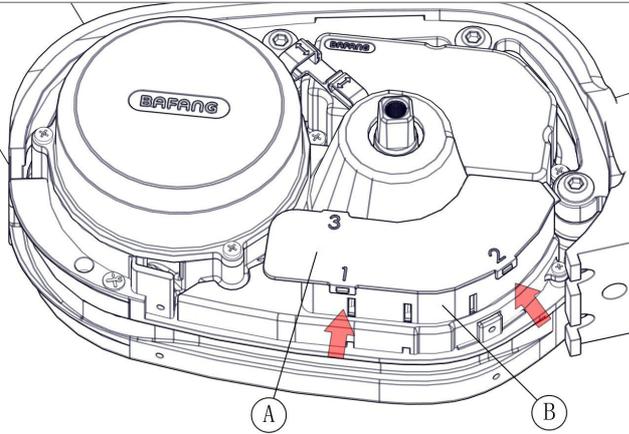
Insert, from the right, special M6 nuts into the mounting holes in the bicycle frame and the drive unit.



D.M6 bolts
(1401080000099)

Tool:
5mm

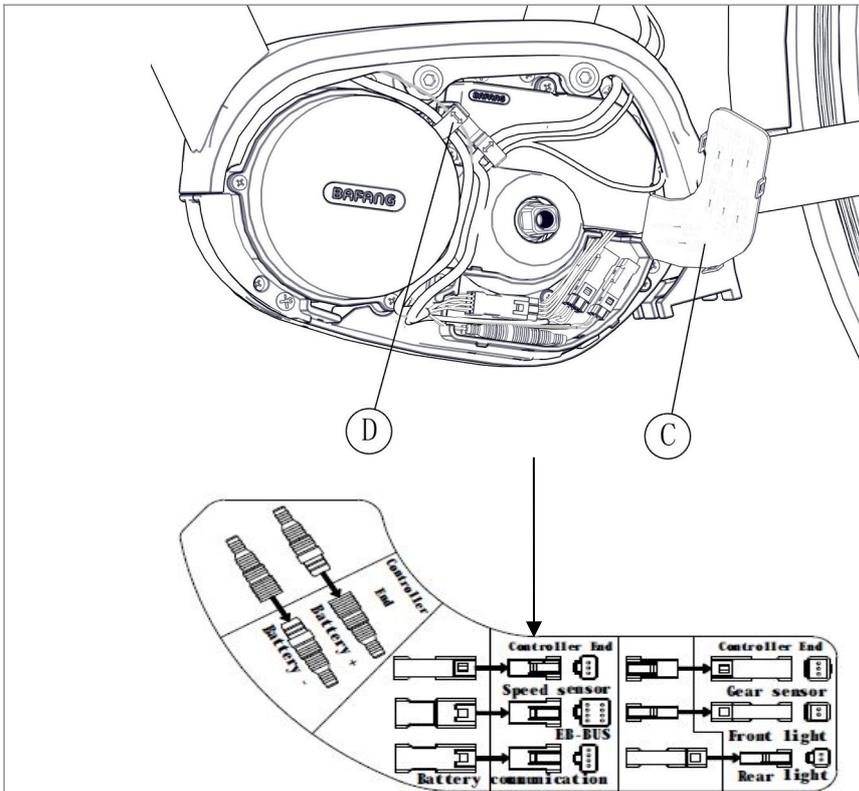
Insert, from the left, the M6 bolts into the bicycle frame so that they will come to contact with the nuts. Tighten bolts onto nuts with a specified torque.
Tightening torque: 18- 20 N·m



A. upper cover of the cabling box
B. the cabling box body

Open the terminal box and get ready to link female connectors with male connectors. Push the lower part of each of the male buckles on the cabling box body (in the

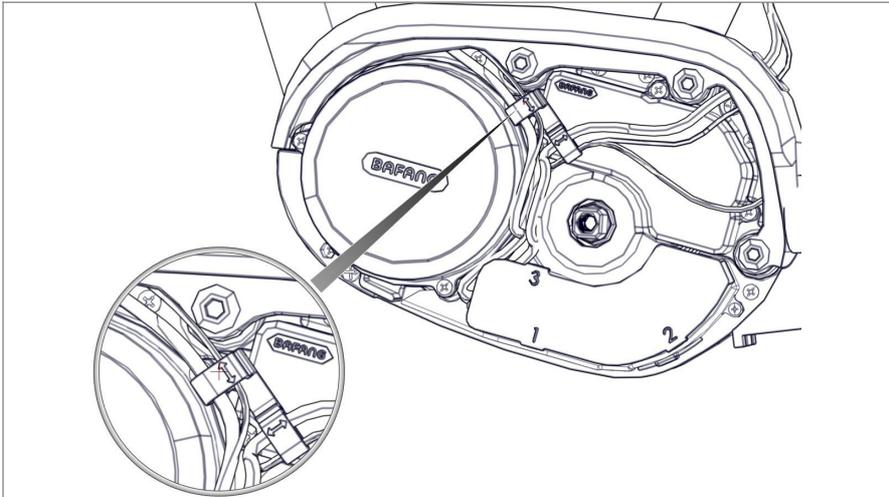
direction as show by the arrows in the picture above) to release the female buckles on the upper cover. Push the upper cover in the direction of moving towards Buckle 3 to fully open the upper cover.



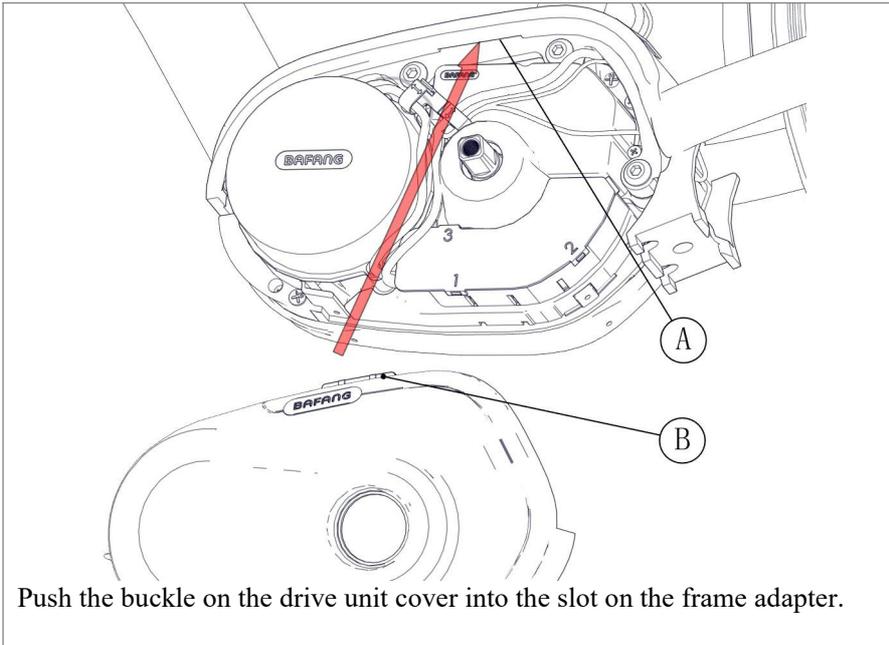
C. cabling layout
(2307070000001)
D. cable clips
(1401300000001)

Open the cabling box, link all cables to the drive unit and put all connectors in the cabling box according to the cabling diagram printed on the upper cover of the cabling box (see C in the picture above).

After matching all male connectors with female connectors, cover the cabling box with the upper cover and thread the cables through cable clips (D in the picture above) following the principle of "upper thin cables and lower thick cables" to ensure that the cables are neatly arranged.



The picture above shows how the drive unit looks like when the cables are re-arranged with the help of the two cable clips.
 Please be noted that all cables must thread through the cable clips after going out of the cabling box.



A. frame adapter
 B. drive unit cover
 1333000000001

Push the buckle on the drive unit cover into the slot on the frame adapter.

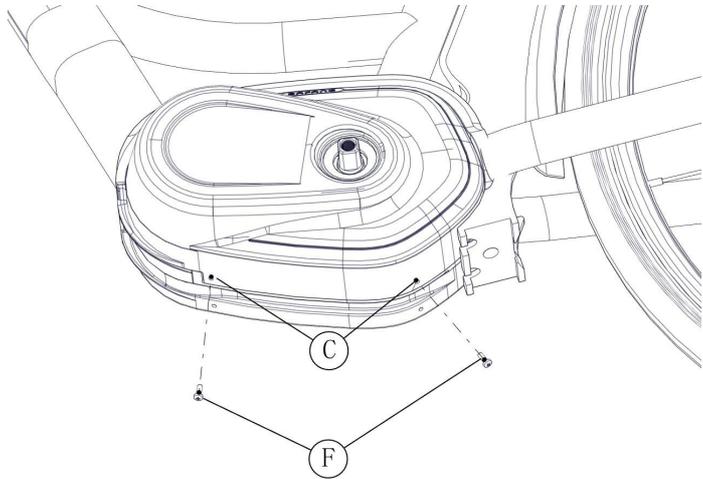


Figure 1

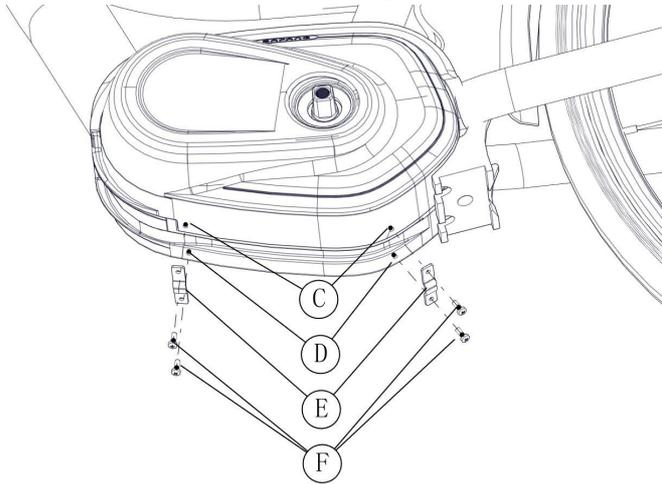


Figure 2

Make sure that the cover's bottom is fastened onto the drive unit's bottom with screws after the cover's upper part buckles into the slot (see Figure 1). If brake cables and gear cables are to be arranged under the drive unit's bottom, the cable gatherers can be fastened onto the cover's bottom and the drive unit's bottom (see Figure 2) to limit the cables into the channel. .

Tightening torque: 1N.m

- C. screw holes on the drive unit's cover
- D. end cover on the right
- E. cable gatherers
1401150100005
- F. cross head screw assembly M3*8
(1401020000127)

Tool:



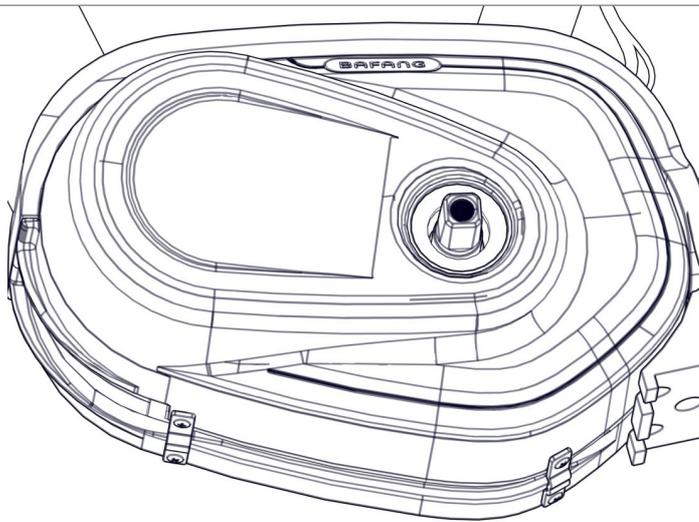


Figure 3

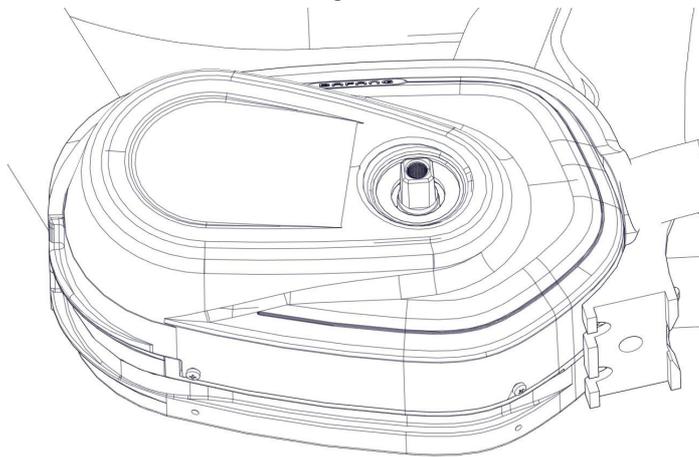


Figure 4

➤ Figures above show how the drive unit looks like when the drive unit cover has been fixed onto it. Brake cables and gear cables can either be arranged in the channel at the bottom of the drive unit (see Figure 3 where cable gatherers are provided) or within the inner space of the frame adapter (see Figure 4 where no cable gatherers are provided).

3. System Cabling

3.1 Link the Battery Cable to the Drive Unit

The power bus, which is made up of a positive battery cable, a negative battery cable, battery communication cables, is linked to the battery cables at the drive unit.

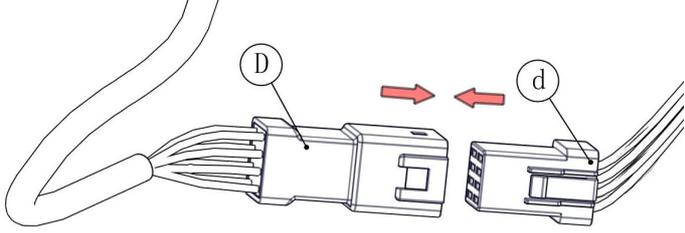
- A. female connector for the communication cables at the battery
- a. male connector for the communication cables at the drive unit
- B. female connector for the positive cable at the battery
- b. male connector for the positive cable at the battery
- C. male connector for the negative cable at the drive unit
- c. female connector for the negative cable at the drive unit

3.2 Link the External Speed-detecting Sensor to the Drive Unit

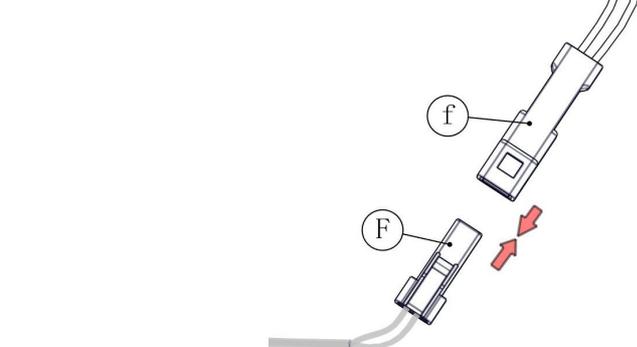
Link the male connector at the external speed-detecting sensor to the female connector for the external speed-detecting sensor cable at the drive unit.

- E. male connector at the external speed-detecting sensor
- e. female connector for the external speed-detecting sensor at the drive unit

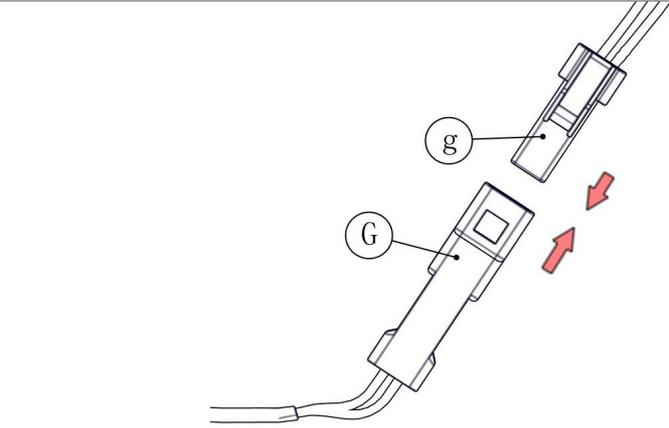
3.3 Link the EB-BUS to the Drive Unit

	<p>D. male connector at the EB-BUS (2105020000099) d. female connector for the EB-BUS at the drive unit</p>
<p>Link the EB-BUS cable to the EB-BUS connector at the drive unit.</p>	

3.4 Link the Headlight Cable to the Drive Unit

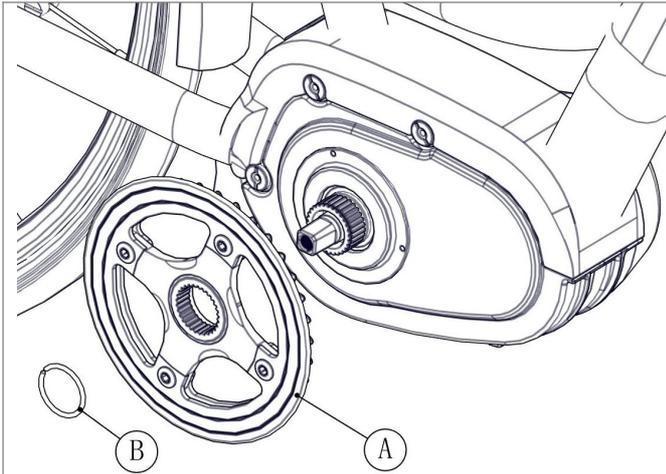
	<p>F. female connector at the headlight cable f. male connector for the headlight at the drive unit</p>
<p>Link the headlight cable to the connector for the headlight at the drive unit.</p>	

3.5 Link the Taillight to the Drive Unit

	<p>G. female connector at the taillight cable g. male connector for the taillight at the drive unit</p>
<p>Link the taillight cable to the connector for the taillight at the drive unit.</p>	

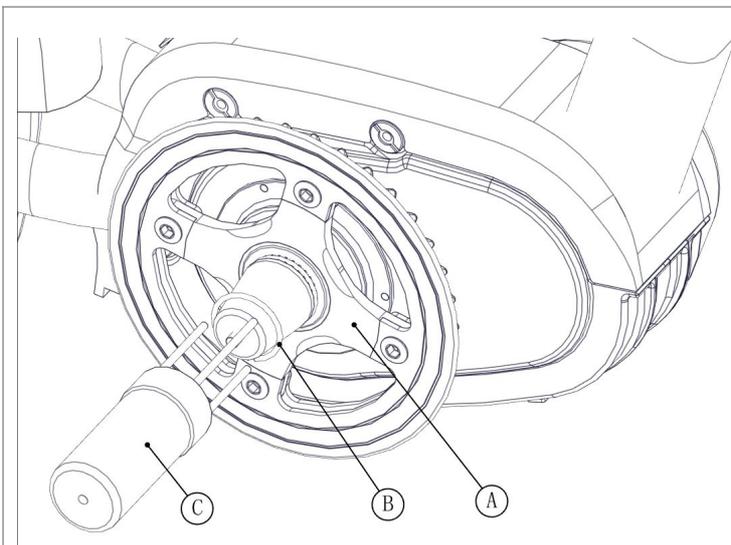
4. Installation of the Front Chainwheel and the Chain Cover

4.1 Installation of the Chainwheel (without a chain cover)



A. chain wheel
B. retaining ring
140101000026

Thread the spline shaft through the chain wheel holder with spline teeth engaged with spline holes.



B. retaining ring
C. a special tool used to install the retaining ring onto the spline shaft
Tool code: GZ-MM G31-5025)

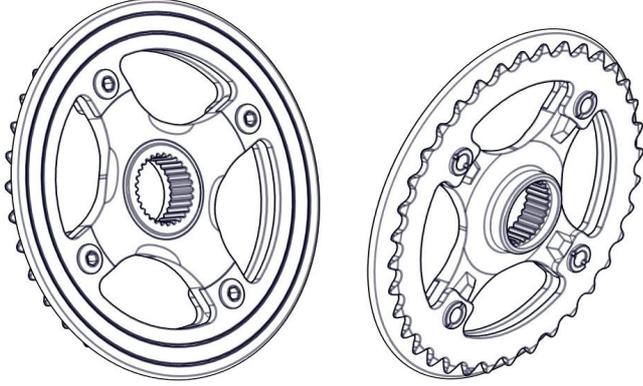
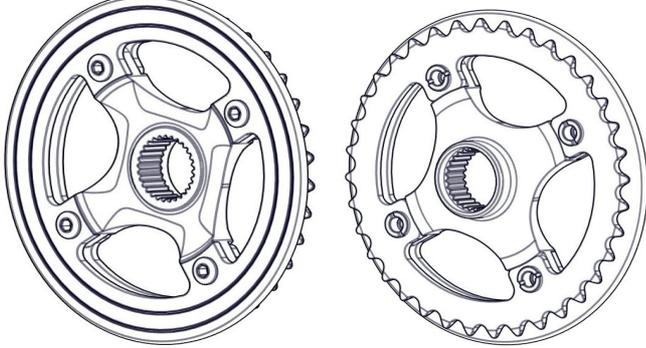
Use a special tool to seize the retaining ring in the spline shaft slot of the drive unit.

Noted: A used retaining ring cannot be reused any more.

Suggestion: A 36T or 38T chain wheel is recommended.

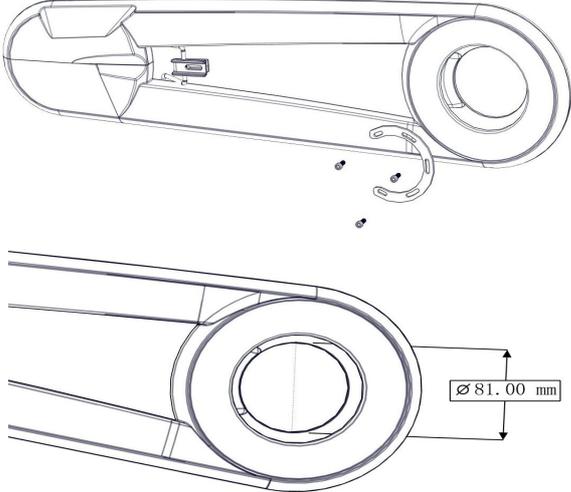
Tool:



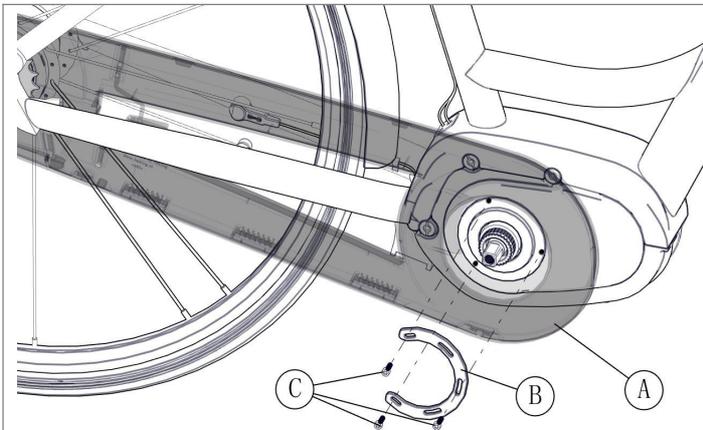
<p>Chain Line: 45mm Preferably 36-38T</p> <p>Applicable to a city bike which is equipped with an internal gearshift system but not a full chain cover.</p>		<p>integratable chain wheel guard (1325020000002)</p>
<p>Chain Line: 49mm Preferably 36-38T</p> <p>Applicable to a city or mountain bike with an external gearshift system.</p>		<p>integratable chain wheel guard (1325020000001)</p>

4.2 Chain Cover Installation (optional)

☛ Installation of a full chain cover



A chain cover binder plate and screws are necessary in order to mount the drive unit onto a bike with a full chain cover.

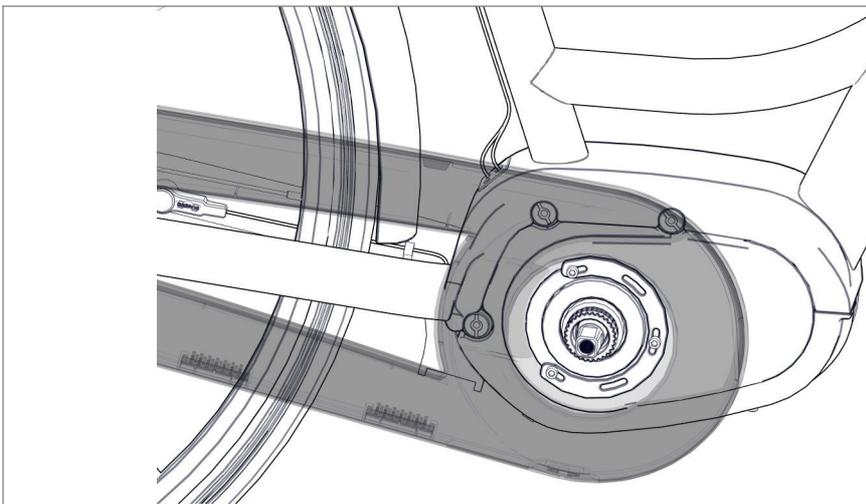


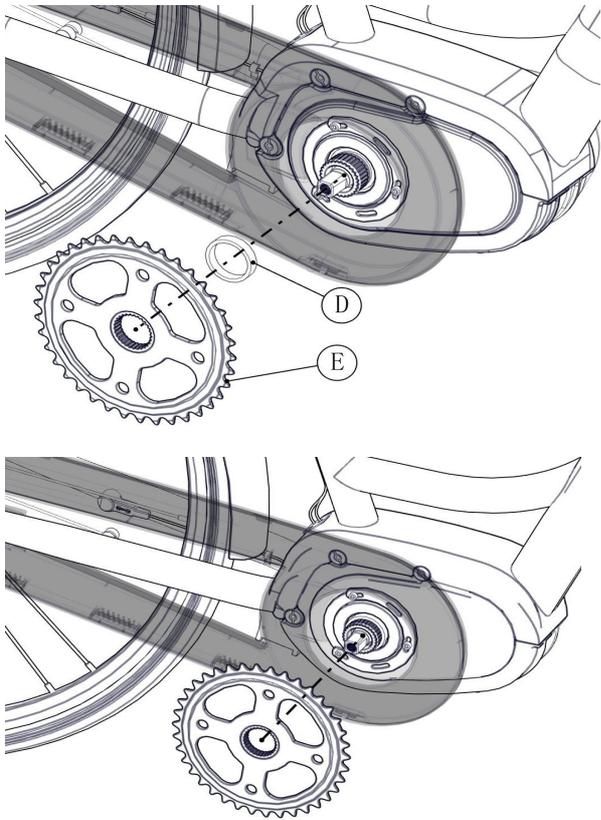
- A. full chain cover
- B. binder plate for the full chain cover (1401150100004)
- C. cross recessed pan head screw M4 (1401020000111)

Tool:

Open the full chain cover and adjust it by following the instruction book. Make sure the outer wall of the full chain cover stick close to the boss on the outer side of the drive unit. Then press the inner wall of the full chain cover with the binder plate and fasten them with screws.

Tightening torque: 2N.m

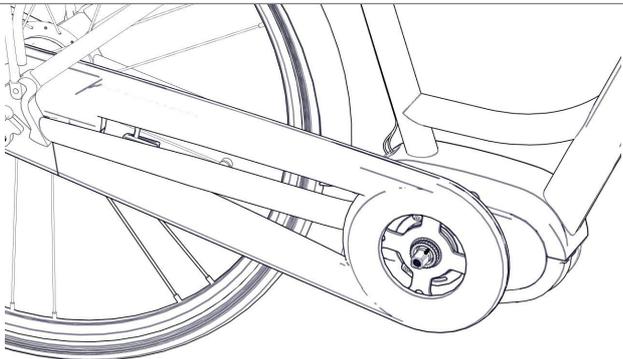




D. chain wheel bushing block
E. chain wheel
(132502000001)

Install the chain wheel following the installation method.

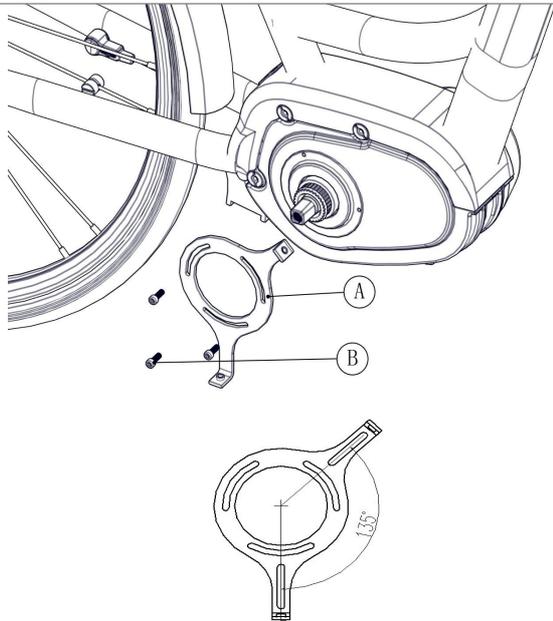
Chain Line: 48mm
Preferably 36-38T
Applicable to a city bike which is equipped with an internal gearshift system and a full chain cover.

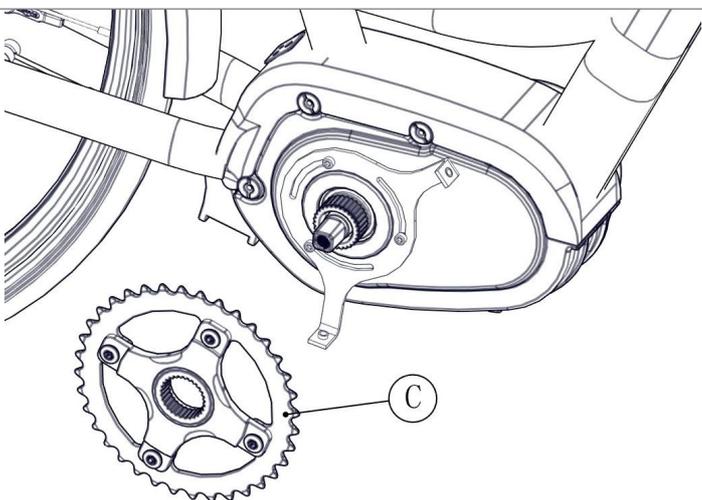


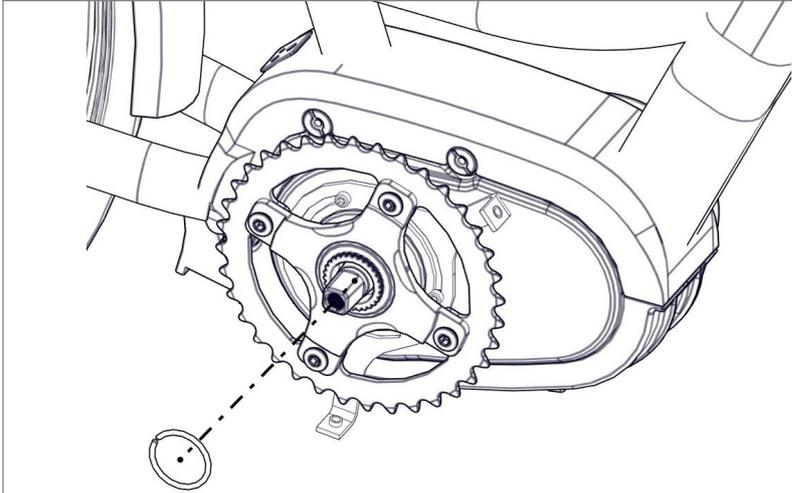
Refer to the chain cover instruction book and install the chain cover after the chain wheel has been installed.

- **Note:** Not all full chain covers are applicable to the Max drive unit. The full chain cover has to be a right one.

☞ P-shaped Chain Cover Installation

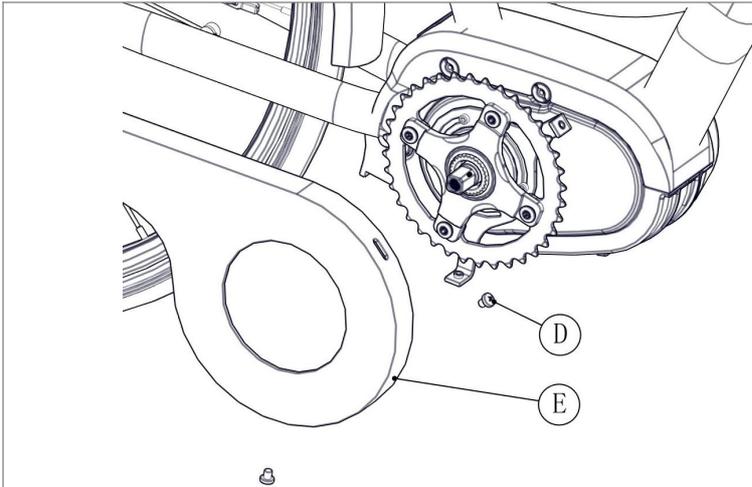
 <p>Adjust the position of the p-shaped chain cover holder and fasten it onto the drive unit with screws. Tightening torque: 2N.m</p>	<p>A. p-shaped chain cover holder (1401220200003) B. cross recessed pan head screw M4 (1401020000111)</p> <p>Tool:</p> 
---	--

 <p>Install the chain wheel onto the appropriate position by following the chain wheel installation method. Chain Line: 45mm Preferably 36-38T Applicable to a city bike with an internal gearshift system and a p-shaped chain cover.</p>	<p>C. CL-45mm chain wheel assembly (1325020000001)</p>
---	--



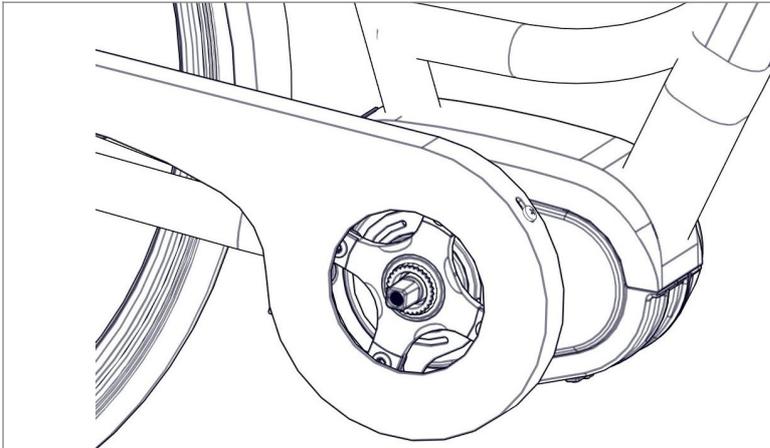
Install the chain wheel onto the spline shaft.

Tool:



- D. cross recessed pan head screw M5
- E. p-shaped chain cover

The figure above shows how a p-shaped chain cover is mounted onto the drive unit.

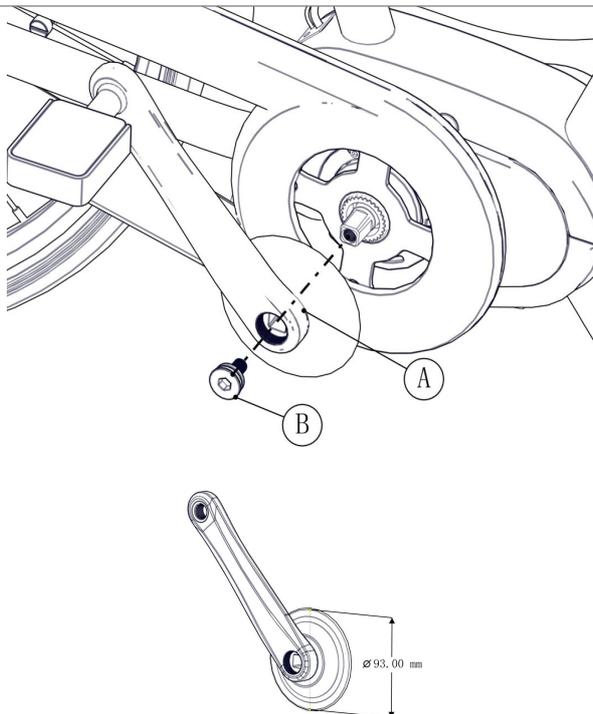


The figure above shows a bike frame, onto which both the p-shaped chain cover and the drive unit are mounded.

- **Note:** Not all p-shaped chain covers match the Max drive unit. Only a right p-shaped chain cover can be used.

4.3 Crank Installation

✎ **Installation of cranks onto a bottom bracket where a chain cover is also mounted.**



- A. cranks
right straight crank with a cap (1327040000001)
left straight crank (1327020000001)
- B. crank mounting screw M8 (1401020000109)

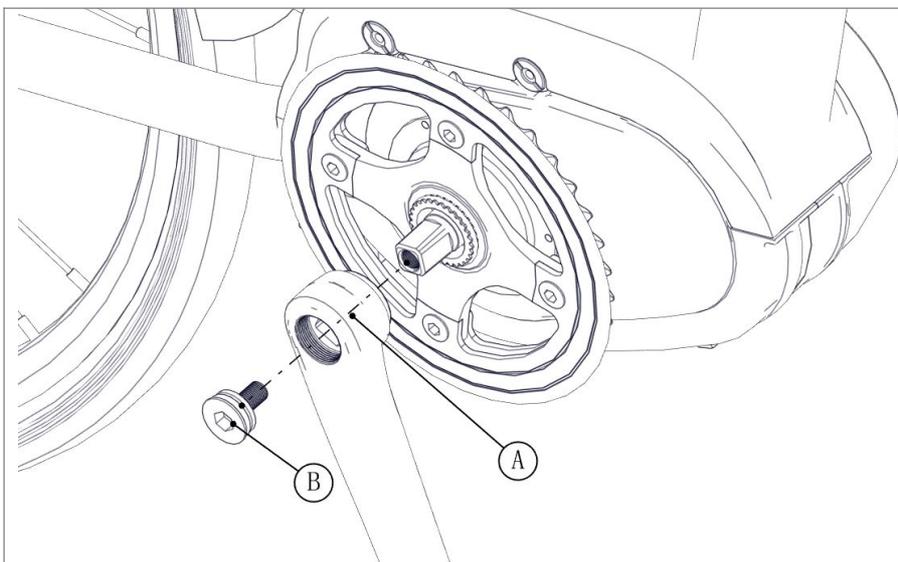
Note: The crank on the right varies as the chain cover varies.

Tool:



Fasten the right crank onto the bottom bracket on the right with a socket head cap screw M8. Install the left crank in the same way.
Fastening torque: 35-40N.m

🔧 **Installation of cranks onto a bottom bracket where no chain cover is mounted**



- A. right straight crank
(1327010000001)
left straight crank
(1327020000001)
- B. crank mounting screw
M8 (1401020000109)

Tool:



Fasten the right crank onto the bottom bracket on the right with a socket head cap screw M8. Install the left crank in the same way.

Fastening torque: 35-40N.m

5. Battery

Precautions

- ✧ If any liquid leaking from the battery gets into your eyes, immediately wash the affected area thoroughly with clean water such as tap water without rubbing your eyes, and seek medical advice immediately. If this is not done, the battery liquid may damage your eyes.
- ✧ Do not recharge the battery in places with high humidity or outdoors. Doing so may result in electric shock.
- ✧ Do not insert or remove the plug while it is wet. If this is not observed, electric shocks may result. If there is water leaking out of the plug, dry it thoroughly before inserting it.
- ✧ If the battery does not become fully charged after 6 hours of charging, immediately unplug the battery from the outlet to stop charging, and contact the place of purchase. Not doing so may cause overheating, bursting, or ignition of the battery.
- ✧ Do not use the battery if it has any noticeable scratches or other external damage. Doing so may cause bursting, overheating or problems with operation.
- ✧ The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures outside these ranges, fire, injury or problems with operation may occur.
 1. Temperature for discharge: $-10\text{ }^{\circ}\text{C} - 50\text{ }^{\circ}\text{C}$
 2. Temperature for charging: $0\text{ }^{\circ}\text{C} - 40\text{ }^{\circ}\text{C}$

Danger

- ✧ Do not deform, modify, disassemble or apply solder directly to the battery. Doing so may cause leakage, overheating, bursting, or ignition of the battery.
- ✧ Do not leave the battery near sources of heat such as heaters. Do not heat the battery or throw it into a fire. Doing so may cause bursting or ignition of the battery.
- ✧ Do not subject the battery to strong shocks or throw it. If this is not observed, overheating, bursting, or fire may occur.
- ✧ Do not place the battery into fresh water or sea water, and do not allow the battery terminals to get wet. Doing so may cause overheating, bursting, or ignition of the battery.
- ✧ Use the specified charger and observe the specified charging conditions when charging the battery. Not doing so may cause overheating, bursting, or ignition of the battery.
- ✧ Do not short-circuit the discharge port with a metal part, or else it may cause overheating, bursting, or ignition of the battery
- ✧ Do not leave the battery in a place exposed to direct sunlight, inside a vehicle on a hot day, or other hot places. Doing so may result in battery leakage.
- ✧ If any leaked fluid gets on your skin or clothes, wash it off immediately with clean water. The leaked fluid may damage your skin.
- ✧ Store the battery in a safe place out of the reach of infants and pets.

5.1 Use the Battery Properly

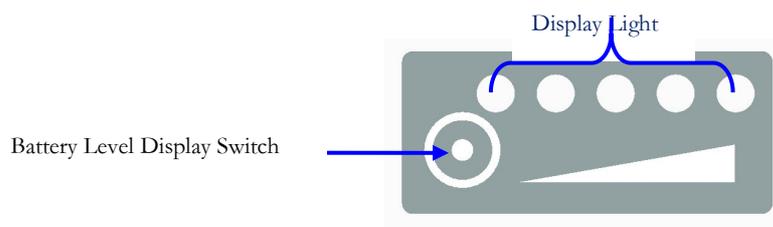
The battery can always be charged at any time no matter how much power is left. However, in the following cases, you should have the battery fully charged. Make sure to use the specified charger to charge the battery.

- The battery is usually not fully charged for the convenience of transport. Make sure the battery is fully charged before using the battery.
- If the battery is not intended for use in a long time, make sure the e-bike battery is charged before storage and is afterwards charged at least once every twelve months. Do not leave the battery completely discharged.
- Once you have begun to use the battery, please have it charged at least once every two weeks.

Note: If the battery is completely discharged, charge it as soon as possible. If you do not charge the battery, it will be damaged.

5.2 Charge the Battery

- When using the battery for the first time, check whether the battery has not run low due to transportation or storage.
- When the battery is not intended for use in a long time, charge the battery regularly to avoid excessive battery discharge.
- Please charge the battery as soon as possible before it runs out; over-discharge can cause permanent damage to the battery.
- No matter how much power is left, the battery can be charged at any time. However, the specified charger must be used to avoid overcharge of the battery.
- To maintain the proper use of the battery, do not subject the battery to heavy shocks or a heat source, or disfigure the battery or short circuit its terminals.



5.3 Battery Capacity Display

☞ **Press the battery level display switch and the lights indicating the left battery capacity will be on:**

Battery Capacity Display	Battery Level
●●●●●	< 10%
○●●●●	11~30 %
○○●●●	31~50 %
○○○●●	51~70 %
○○○○●	71~90 %
○○○○○	91~100 %

○Light on ●Light off

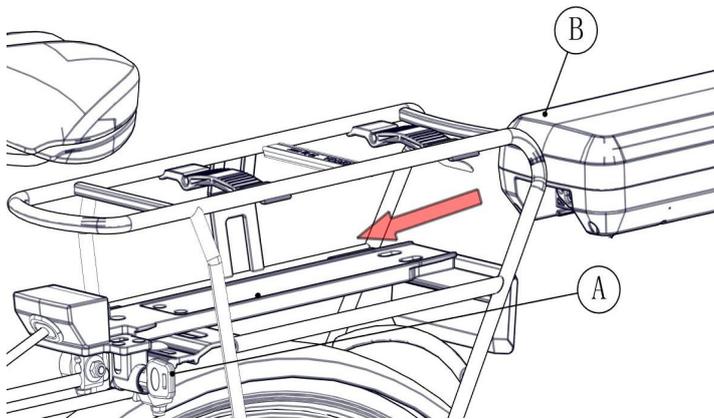
5.4 Battery Health Indication

☞ **Press the battery level display switch for a second to check how healthy the battery is:**

Battery Health Indication	Battery Health Condition
●●●●●	< 40%
○●●●●	41~50 %
○○●●●	51~60 %
○○○●●	61~70 %
○○○○●	71~80 %
○○○○○	81~100 %

○Light on ●Light off

5.5 Battery Installation



A. battery pack lock
B. battery

To ensure system security, insert the battery pack from the tail of the carrier onto the slideway. Make sure the battery is pushed to the right position on the slideway.

Note: Please make sure the battery pack is locked to prevent it from dropping off.

6. Display

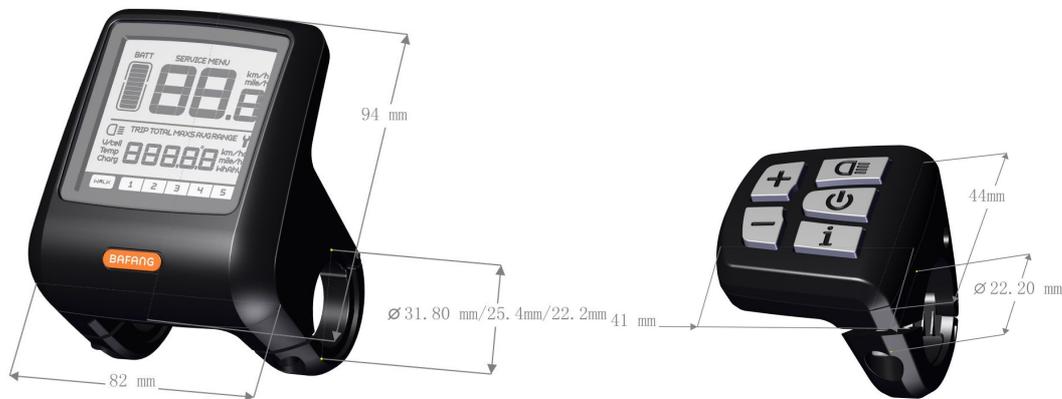
6.1 Specifications and Parameters of the Display

- ✧ 36V/48V Power Supply;
- ✧ Rated Current: 10mA
- ✧ Maximum Operating Current: 30mA
- ✧ Power-off Leakage Current: <1uA
- ✧ Operating Current Supplied to the Controller: 50mA
- ✧ Operation Temperature: -18 ~ 60 °C
- ✧ Storage Temperature: -30 ~ 70 °C
- ✧ Waterproof Grade: IP65
- ✧ Storage Humidity: 30%-70%

6.2 Appearance and Dimensions

Materials and Dimensions

- ✧ The shell is made of PC (poly carbonate). The liquid crystal interface is made of hard hardness acrylic.



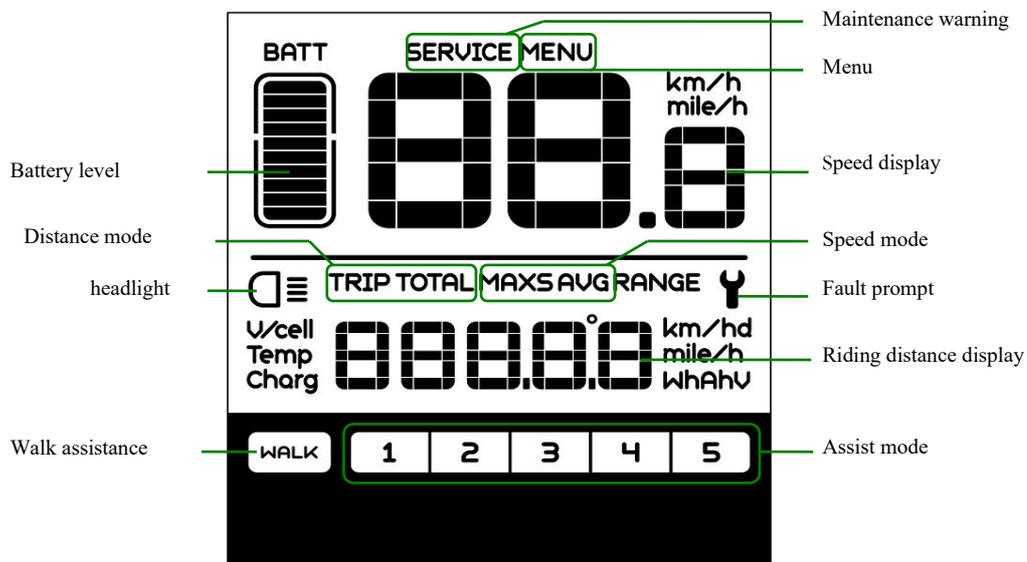
6.3 Function Overview and Key Definitions

Function Overview

- ✧ The display adopts a two-way serial communication protocol. The external five-key keypad enables users to operate the display conveniently.
- ✧ Speed display: displaying the real-time speed SPEED, the max speed MAXS and the average speed AVG.
- ✧ Km or mile: the user can set the unit of distance as km or mile according to personal habit.

- ✧ Intelligent battery level indication: with an optimization algorithm, a stable display of the battery level is ensured, and the problem of fluctuant battery level indication common with an average display is avoided.
- ✧ Automatic light-sensitive headlight/taillight: as the outside light changes, the headlight and taillight will be automatically turned on/ off.
- ✧ Backlight brightness: there are 5 levels of brightness for the display backlight, of which Level 1 indicates the darkest backlight while Level 5 indicates the brightest backlight.
- ✧ Mode indication: it displays the current assist mode (Mode 1 to Mode 5);
- ✧ Trip distance indication: there are two distance modes, single-trip distance TRIP and accumulated distance, TOTAL. The displayable max distance is 99999.
- ✧ Fault code prompt.
- ✧ Walk assistance.
- ✧ Parameter settings: various parameters, including mode, wheel diameter, speed limit, etc. can be set on the computer via a communication cable. See the parameter setting instruction document for details.
- ✧ Maintenance warning (this function is inactive by default): there prompts, on the display, maintenance warning information based on battery charge/discharge cycles and riding distance. The display automatically estimates the battery life, and gives battery maintenance warnings when the number of charge/discharge cycles exceeds the set value. When the accumulated riding distance exceeds the set value, the display will also prompt bicycle maintenance necessity.

Items to be Shown on the Display



- ✧ **Speed mode**: average speed (AVG km/h), maximum speed (MAXS km/h)
- ✧ **Speed display**: display of the speed, km/h or mile/h
- ✧ **Battery level**: 10-segment battery indication; the voltage that each segment represents can be

customized.

- ✧ **Headlight indication:** only active when the headlight and backlight are on.
- ✧ **Fault prompt:** the symbol  will be displayed when a fault is detected.
- ✧ **Maintenance warning** (inactive by default): the symbol **SERVICE** is displayed when there is a need for maintenance (the riding distance or the number of battery charge/discharge cycles exceeds the set value)
- ✧ **Mode indication:** it displays the current assistance mode (mode 1 to mode 5); if there is no numeric display, it means that there is no assistance. If the rider is walking and pushing his/her bicycle, only the symbol  will be displayed.
- ✧ **Distance mode:** there are two distance modes, single-trip range TRIP and accumulated distance, TOTAL.
- ✧ **Distance indication:** it displays the information on distance according to the settings.

Key Definitions



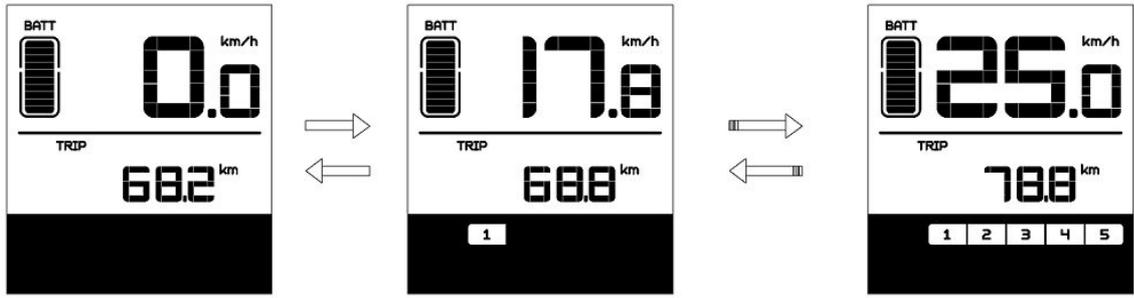
6.4 Normal Operation

On/off

Turn on the power. Press and hold the "on/off" key for 2 seconds to power on the display; when the display is on, pressing and holding the "on/off" key for 2 seconds will power off the display. If the bike is left unused and the display is left un-operated for 5 minutes (the time can be set by the user), the display will be automatically turned off.

Assist Mode Selection

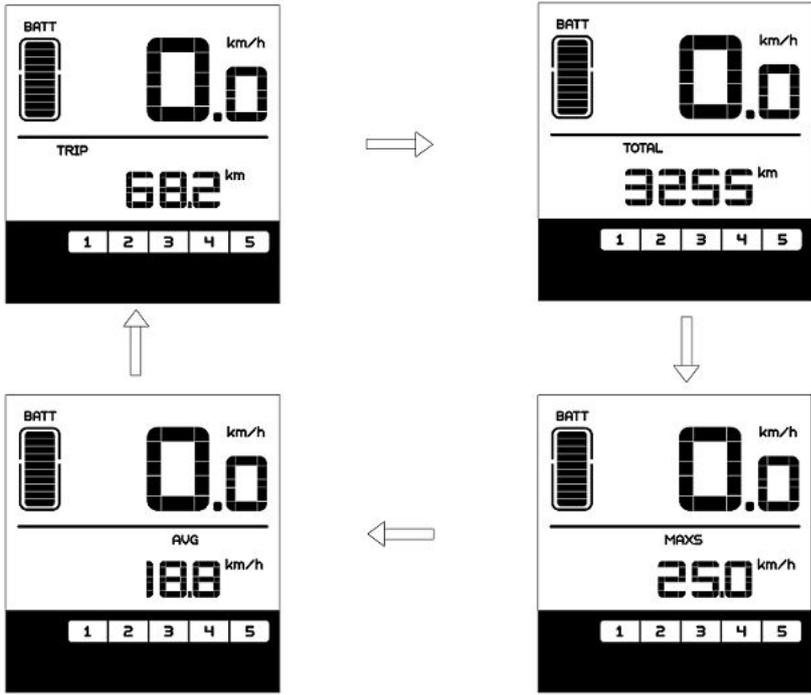
In the manual gearshift mode, press the "up" or "down" key to switch the assist mode to change the motor assist power. The lowest mode is Mode 1 and the highest mode is Mode 5. When the display is on, the default mode is Mode 1. It indicates no power assist when there is no numeric mode display.



Assist Mode Selection Interface

Distance Mode and Speed Mode Switch

Press the "mode" key to switch distance/speed display information, giving a display of single-trip distance (TRIP km), accumulated distance (TOTAL km), maximum riding speed (MAXS km/h) and average riding speed (AVG km/h) sequentially.

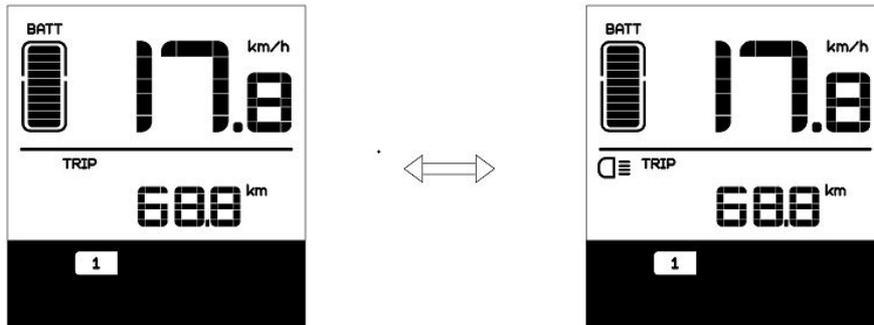


Mode Switch Interface

Headlight/ Backlight Switch

After pressing and holding the "headlight" key for 2 seconds, both the backlight of the display, and the headlight (needing the support of the controller) will be turned on. Hold and press the headlight again for 2 seconds to power off the headlight and the display backlight (If the display is turned on in a dark

environment, the backlight/ headlight will be automatically turned on. But if the backlight/ headlight is then manually turned off, they have to be manually turned on afterwards).

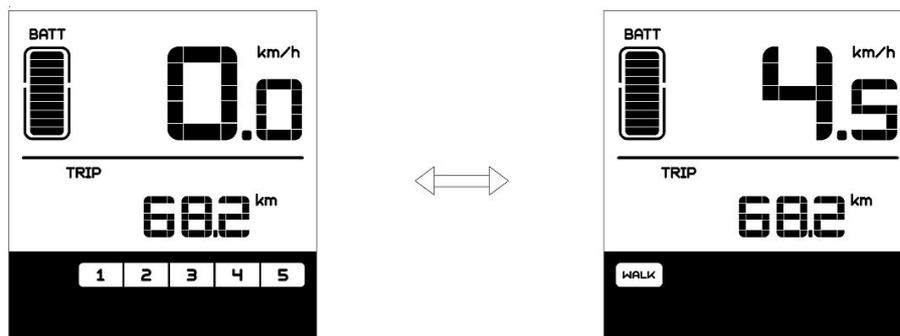


Headlight/Backlight On/off Interface

* There are 5 levels of backlight brightness for selection and the user can set the value as needed.

Walk Assistance Mode

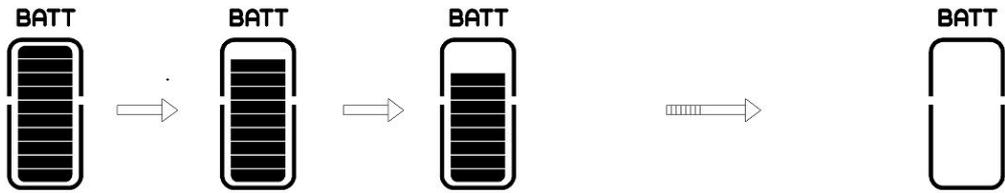
After pressing and holding the “down” key for 2 seconds, the electric bicycle enters the state of walk assistance, and the symbol **WALK** is displayed in the field of assistance mode. Once the “down” key is released, the electric bicycle will exit the mode of walk assistance.



Walk Assistance Mode Switch Interface

Battery Level Indication

When the battery voltage is normal, the battery is indicated by a certain number of segments with the border lighted according to the actual quantity of electricity. If the battery is under-voltage, all of the 10 segments will black out with the border blinking, indicating that the battery needs to be charged immediately.



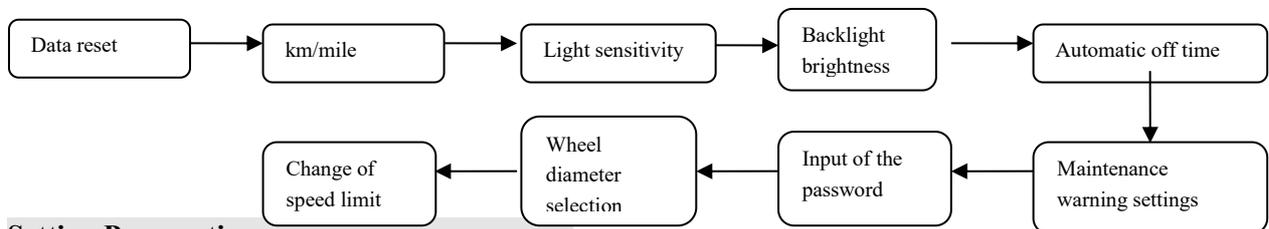
Battery Level Indication

Table for Battery Level Check:

Number of Segments	Electric Quantity in Percentage	Number of Segments	Electric Quantity in Percentage	Number of Segments	Electric Quantity in Percentage
10	$\geq 90\%$	6	$50\% \leq C < 60\%$	2	$15\% \leq C < 25\%$
9	$80\% \leq C < 90\%$	5	$45\% \leq C < 50\%$	1	$5\% \leq C < 15\%$
8	$70\% \leq C < 80\%$	4	$35\% \leq C < 45\%$	border blinking	$C < 5\%$
7	$60\% \leq C < 70\%$	3	$25\% \leq C < 35\%$		

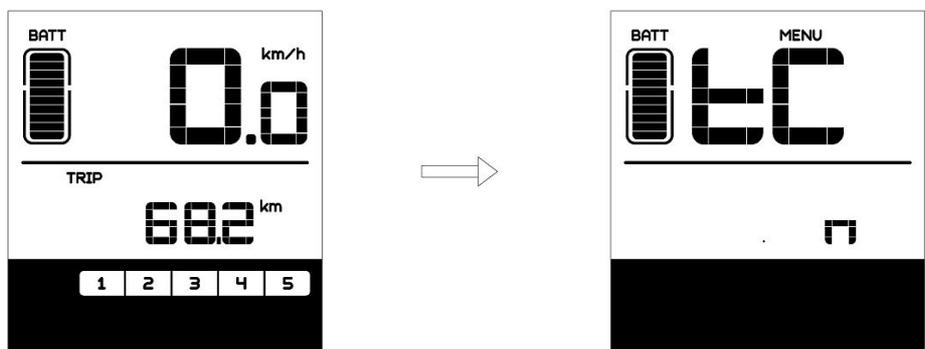
6.5 Parameter Setting

Items to be Set:



Setting Preparation

When the display is active, pressing the “mode” key two times (the interval between the two pressing actions should be shorter than 0.3 seconds), the system will enter the MENU parameter setting state, in which the display parameters can be set. Press the “mode” key two times (the interval between the two pressing actions should be shorter than 0.3 seconds) once again to exit the parameter setting state.



Enter the Parameter Setting Interface

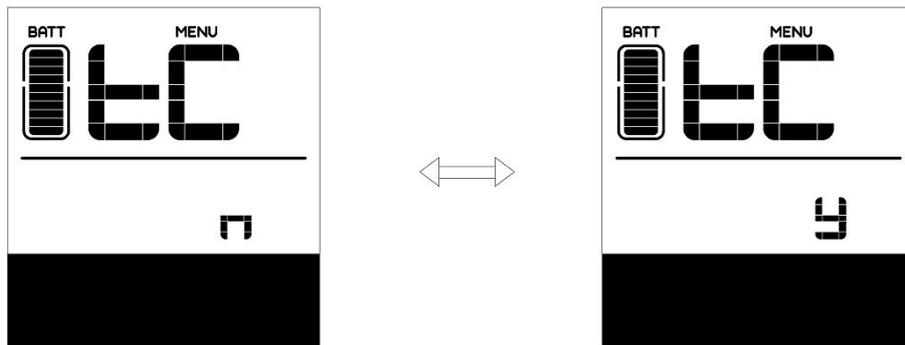
In the parameter setting state, when the parameter to be set begins to flash, press the "up" or "down" key to adjust the parameter value. Press the "mode" key to switch among the to-be-set parameters. Press the "mode" key two times (the interval between the two pressing actions should be shorter than 0.3 seconds) to exit the parameter setting state.

*** In the parameter setting state, if no operation is performed to the display for 10 seconds, the display will return to the normal riding state.**

Data Reset:

After pressing the "mode" key 2 times (the interval between the two pressing actions should be shorter than 0.3 seconds), the display enters the MENU state. In this state, the speed field displays tC and then also displays y after pressing the "up" key. At this moment, the temporary data, including maximum speed (MAXS), average speed (AVG) and single-trip distance (TRIP) can be cleared. After this setting, press the "mode" key for shorter than 0.3 seconds to enter the km/mile setting interface.

If the user has never made any reset operation, the single trip distance and the accumulated riding time will be automatically cleared when the accumulated riding time exceeds 99 hours and 59 minutes.

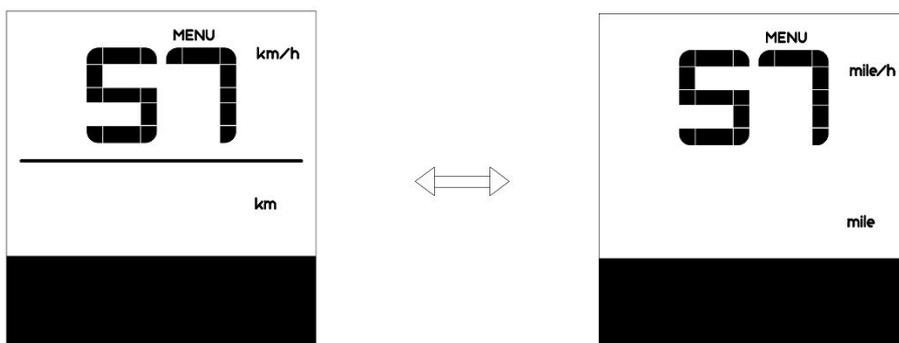


***When the display or the bicycle powers off, the above-mentioned data won't be cleared!**

Km/ mile:

When the speed field displays S7, press the "up" or "down" key to switch between km/h and mile/h or km and mile.

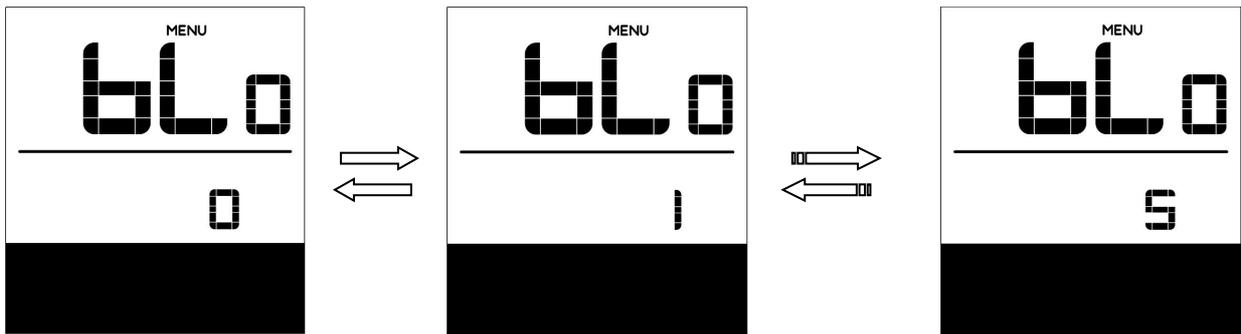
After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of light sensitivity.



Light Sensitivity:

When the speed field displays bL0, press the “up” or “down” key to display a figure between 0 to 5. 0 represents the shutdown of light-sensing function. As the figure increases, light sensitivity gradually increases.

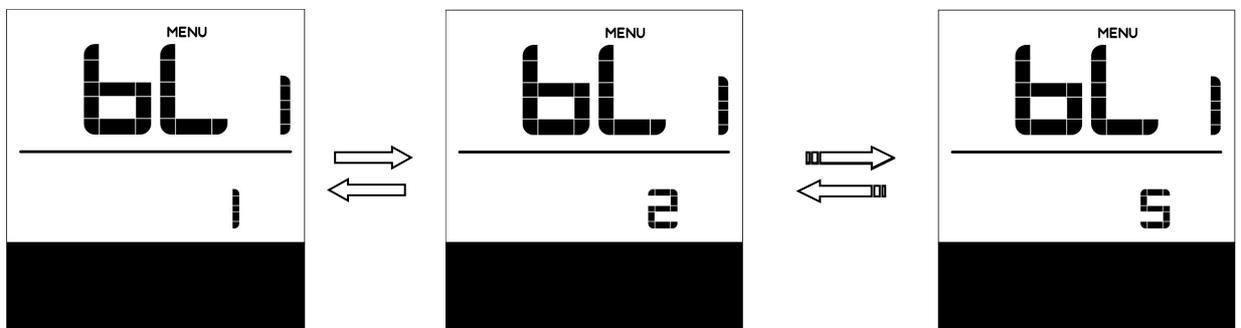
After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of backlight brightness.



Backlight Brightness:

When the speed field displays bL1, press the “up” or “down” key to display a figure between 1 to 5. The figure 1 represents the lowest backlight brightness while 5 indicates the highest backlight brightness.

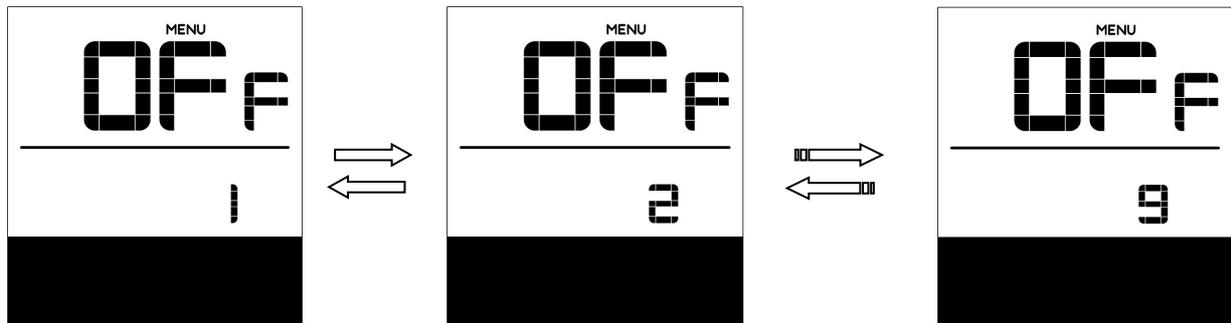
After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of automatic off time.



Automatic Off Time:

When the speed field displays OFF, press the “up” or “down” key to display a figure between 1 to 9. This figure indicates the minute that it takes to automatically shut down the display.

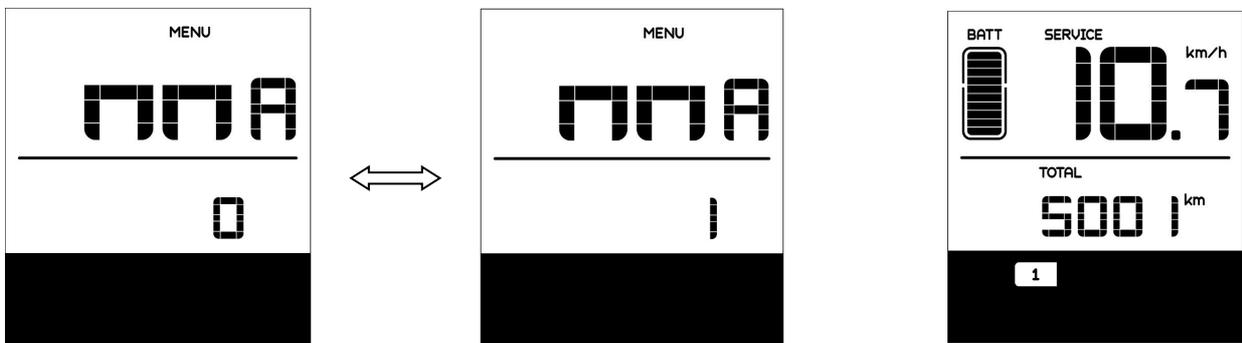
After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of maintenance warning.



Maintenance Warning (inactive by default):

When the speed field displays nnA, press the up or down to display 0 or 1. 0 disables the maintenance warning function while 1 enables the maintenance warning function.

After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of password input.



Maintenance Warning Interface

The display will prompt maintenance necessity based on such information as the accumulated riding distance and the battery charge/discharge cycles.

- ✧ When the accumulated riding distance exceeds 5,000 km (can be customized by the bicycle manufacturer) , there will prompt, on the display, the symbol **SERVICE** and the sign of accumulated riding distance will flash for 4 seconds when the display is started up, indicating the bicycle needs maintenance.
- ✧ When the number of battery charge/discharge cycles exceeds 100 (can be customized by the bicycle manufacturer), there will prompt, on the display, the symbol **SERVICE** and the sign of battery will flash for 4 seconds when the display is started up, indicating the battery needs maintenance.

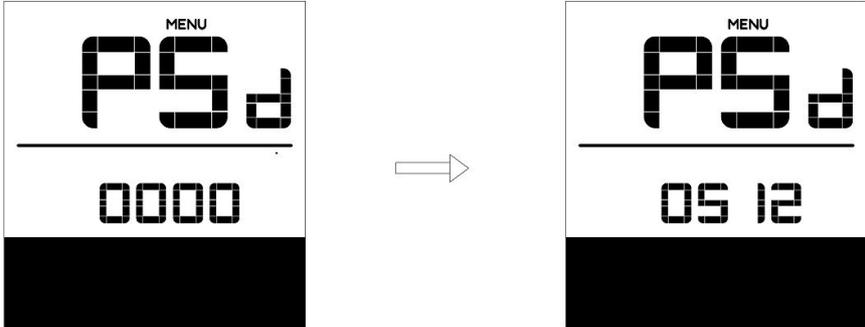
Proceed in order parameter setting -> maintenance alert (MA) -> 0 to disable the maintenance alert function. (With a USB communication module, maintenance alert can be programmed by a computer. See the parameter setting instruction document) .

Items for Secondary Setting:

Password Input:

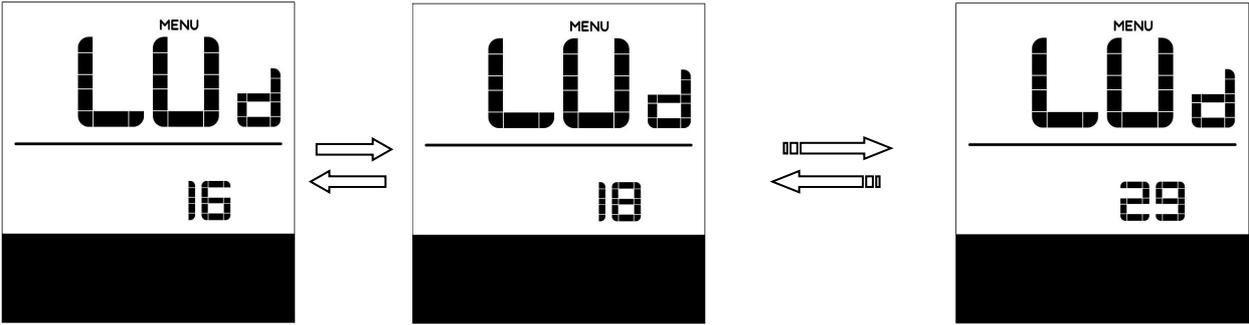
When the speed field displays PSd, it's a prompt to enter a password. Press the "up" or "down" key to set the value (0 to 9) of each password entry. Press the "mode" key to switch among password

entries. The password is in four digits and the default password is "0512". Press the "mode" key to confirm the setting. If the set password is wrong, the system automatically returns to the previous interface. If the set password is correct, the system will enter <wheel diameter selection>.



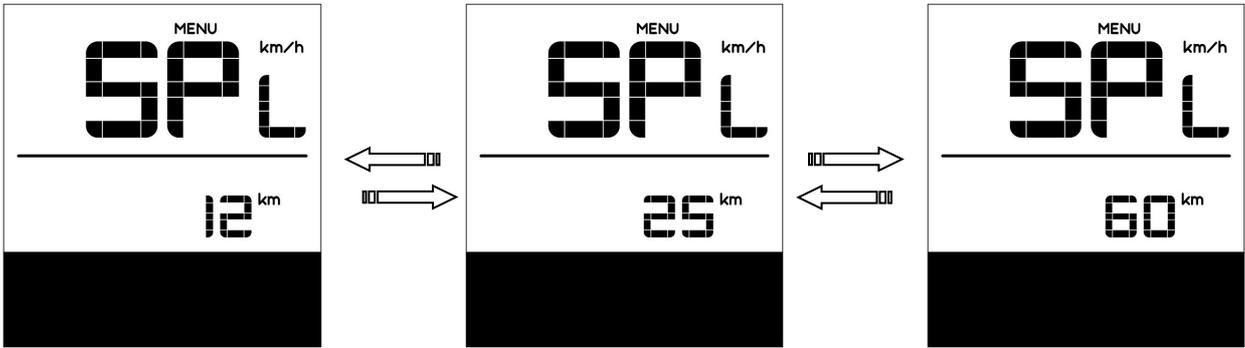
Wheel Diameter Selection:

When the speed position displays Wd, press the "up" or "down" key to switch among 16, 18, 20, 22, 24, 26, 700c, 28 and 29. These figures represent different wheel diameters in inch. A wrong wheel diameter can lead to speed anomalies. After this setting, press the "mode" key for shorter than 0.3 seconds to enter the setting interface of speed limit change.



Speed Limit Change:

When the speed field displays SPL, the distance field displays the value of speed limit whose default is 25km/h. Press the "up" or "down" key to adjust the speed limit. The minimum speed limit is 12 km/h and the maximum speed limit is 60 km/h. After the adjustment, press the "mode" button for shorter than 0.3 seconds to enter the interface of battery communication.

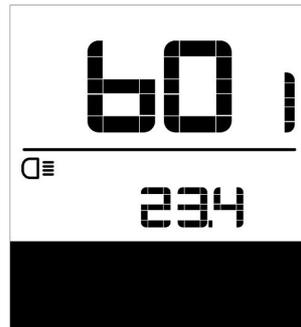


Battery Communication:

At this moment, the speed field displays b01 and the distance field displays the speed limit. Press

the “mode” key for shorter than 0.3 seconds to set the other communication items in sequence. After all these settings, double press the “mode” key for shorter than 0.3 seconds to exit the interface of battery communication settings.

- ✧ The following information will not be displayed unless communication has been established between the battery and the controller. If there is no communication between the battery and the controller, the display will only show "- - -" when entering the battery communication interface.



Information to be displayed on the interface of battery communication:

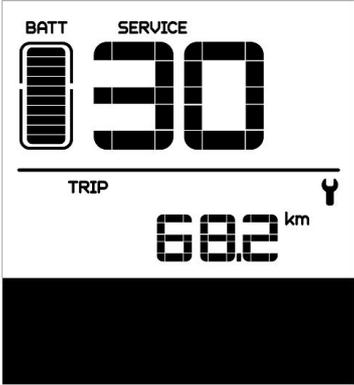
Information Displayed in the Speed Field	Definition
b01	current temperature
b02	maximum temperature
b03	lowest temperature
b04	total voltage
b05	current
b06	average current
b07	remaining capacity
b08	full capacity
b09	relative state of charge
b10	absolute state of charge
b11	charge/discharge cycles
b12	the longest time that the battery was left uncharged after a charge in the past
b13	the time that the battery has been left uncharged since last charge
d01	1st cell voltage
d02	2nd cell voltage

.....
dn	voltage of the nth cell

6.6 Error Code Definitions

The MAX-C966 display can give warnings on bicycle faults. When a fault is detected, the icon  will be displayed on the LCD screen, and there will be an error code "n" in the speed display field. Definitions of error codes are listed in the table below:

Error Code	Error Description	Error-shooting Method
"03" is displayed in the field for speed display.	The braking system has been applied.	Check whether a brake cable is stuck.
"04" is displayed in the field for speed display.	The throttle has not returned home	Check whether the throttle has returned home.
"05" is displayed in the field for speed display.	Throttle fault	Check the throttle.
"06" is displayed in the field for speed display.	Low voltage protection	Check the battery voltage.
"07" is displayed in the field for speed display.	Overvoltage protection	Check the battery voltage.
"08" is displayed in the field for speed display.	Motor hall signal cable fault	Check the motor module.
"09" is displayed in the field for speed display.	Motor phase cable fault	Check the motor module.
"11" is displayed in the field for speed display.	Controller temperature sensor failure	Check the controller.
"12" is displayed in the field for speed display.	Current sensor failure	Check the controller.
"13" is displayed in the field for speed display.	Battery temperature fault	Check the battery.
"21" is displayed in the field for speed display.	External speed-detecting sensor fault	Check the installation position of the external speed-detecting sensor.
"22" is displayed in the field for speed display.	BMS communication failure	Replace the battery.
"30" is displayed in the field for speed display.	Communication failure	Check the controller connectors.



Fault Alert Interface

7. List of Materials

Model	Unit	Name	Material No.	Quantity	Specification	
DP C01.RS2 32.7	Dsisplay Unit					
	Display Accessorie s	Φ 22.2 rubber clamping ring (optional)	left display clamp	231602040001 7	1	Φ 22.2
			right display clamp	231602040001 8	1	
		Φ 25.4 rubber clamping ring (optional)	left display clamp	231602040000 7	1	Φ 25.4
			right display clamp	231602040000 8	1	
		hexagon socket head cap screw			1	M3*8
		hexagon socket head cap screw			2	M4*8
	MM G31.250	Drive Unit				
Drive Unit Accessorie s		Cabling box		140108000009 7	1	
		Cable clip		140130000000 1	1	
		M6 nut		140108000010 1	3	M6
		M6 bolt		140108000009 9	3	M6
Motor Cover Accessorie s		Motor cover		133300000000 1	1	
		Cable gather		140115010000 5	2	
		cross head screw assembly M3*8		140102000012 7	2	M3*8
Chain cover Assembly		Full chain cover binder plate		140115010000 4	1	
		P-shaped chain cover holder		140122020000 3	1	

	Tools	M4 cross recessed pan head screw	140102000011 1		M4*8
	Chain Wheel	Chain wheel assembly A	132502000000 1		CL-49mm/38T
		Chain wheel assembly B (optional)	132502000000 2		CL-45mm/38T
		Chain wheel assembly C (optional)	132502000000 3		CL-48mm/38T
	Cranks	Right straight crank with a cover	132704000000 1	1	170mm
		Right straight crank (optional)	132701000000 1	1	170mm
		Left straight crank	132702000000 1	1	170mm
		Crank mounting screws	140102000010 9	2	M8
Cables	Cables	EB-BUS		1	Follow the order requirements.
		External speed-detecting sensor cable		1	Follow the order requirements.
		Battery cable		1	Follow the order requirements.
		Headlight cable		1	Follow the order requirements.
		Taillight cable		1	Follow the order requirements.

8. After-sales and Warranty Policy

Suzhou Bafang Motor Science-Technology Co., Ltd (hereinafter referred to as the "Bafang Motor") guarantees: During the warranty period, customers enjoy warranty service from Bafang for products bought from Bafang as long as the products are within the warranty period and the issues are indeed quality issues concerning material and workmanship.

Warranty Period and Scope

Warranty period starts from the date of leaving factory, and is 30 months for motor, and 18 months for controller, display, sensor and other components.

Bafang limited warranty does not cover or apply to the following situations:

- 1) Damage, failure and/or loss caused by refitting, neglect, improper maintenance, accident, misuse, abuse or use for competition or commercial purpose;
- 2) Damage, failure and/or loss due to shipping ;
- 3) Damage, failure and/or loss caused by improper installation, adjustment or repairing.
- 4) Damage, failure and/or loss irrelevant to material and workmanship, e.g., failure to follow instructions by users;
- 5) Damage, failure and/or loss caused by product' s appearance or surface change which doesn' t affect its function;
- 6) Damage, failure and/or loss due to maintenance or installation by repair stations or dealers unauthorized by Bafang;
- 7) Damage, failure or loss caused by normal wear and tear.

Bafang reserves the right to repair or replace the components, and is only responsible for repairing or replacing them.

In case bike manufacturers or dealers encounter quality issues when using or selling Bafang's products, they can report the purchase order number and products' serial number to Bafang's technology service department who will check whether the products are under warranty or not. For products under warranty, if it is a small problem, Bafang will provide customers (dealers or bike manufacturers) with free spare parts so that they can correct the problem themselves; if it's a big issue, Bafang will provide customers with free spare parts, show them what to do by sending them videos or documents or on some special occasions repairing the products for them. For products out of warranty, Bafang can still provide spare parts or repair the products for customers, but the incurred material cost, labor cost, freight etc. shall be undertaken by customers

If an end user has a bike equipped with Bafang components which need repairing, he/she should contact the bike manufacturer or dealer directly.

If this warranty statement is against a current Chinese law, the Chinese law shall prevail. Bafang reserves the right to modify the terms without announcement in advance.

For more latest information, please visit the company website: www.szba.com