



Tianjin Bewo Science & Technology Co., Ltd.

## BWB Mid-drive system of electric bicycle

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### I. Company Profile

BewoTech mid-drive power system of electric bicycle, a product with intellectual property right of Tianjin Bewo Science & Technology Co., Ltd., has been developed and improved by a group of experts and experienced engineers for several years. The research and development of the system is based on the advantage of technical resources from Tianjin University and Tianjin Internal Combustion Engine Research Institute.

The concentric output shaft of the system is installed with one pivot by using the remaining in the original space of bicycle so as not to change the structure, which makes it possible to assemble the system onto almost any type of bicycle such as 12 inches, 14 inches, 16 inches, 20 inches, 24 inches, 26 inches or 700 centimeter and so on.

The mid-drive system is featured by lower noise and smooth riding from the ultra-low noise design.

### II. Accordance with the requirement of standards

Base on Directives-EN15194 and Chinese national standard-GB17761.

### III. Principle features

#### 1. Riding modes

Our bicycle can be ridden in two modes: power assistance riding, riding as bicycle.

1) In power assistance riding mode, electric generator outputs the same power as that of rider riding mode, which makes rider feel the system provide power obviously and ride in easy way.

2) In riding as bicycle mode, no additional resistance comes from the magnetic resistance of electric generator which makes bicycle running as ordinary bicycle.

#### 2. Ultra-low noise

Ultra-low noise application is used in the product, which ensures the starting noise and running noise keep 10% below the noise of hub motor.

3. Transmission structure well-designed with high safety performance and powerful climbing capability

The power output is generated at the location of mid-shaft of the product where the concentric output shaft is applied to match the traditional transmission structure of bicycle. The arrangement of mid-drive system ensures the mass distribution of bicycle fitting enough to improve the safety performance of bicycle. In addition, the shift system assembled at rear shaft enhances climbing capacity which is 2 times more than that of hub generator.

4. Easy to assembly

The structure of the system is simple in the way of installation, i. e It can be installed in the normal bicycle..

5. Compact structure of the system

The compact structure does not affect the structure of the frame so much that bicycle looks like ordinary bike.

6. Lower power consumption and longer driving range

The perfect structural combination between the system and entire bicycle saves power consumption well so as to extend driving range. The driving range of bicycle assembled with lithium battery of 36V/9Ah will be 40km in electricity mode while 100km in power assistance mode.

7. Perfect design

The most advance design concept is performed with adjusting the hysteresis loop of permanent magnetic material and controlling algorithm to fulfill perfect integration of power system optical property and entire bicycle dynamics.

8. Stringent requirement of standards to ensure quality control system implemented

In the process of the development and production of the system, company works with National Motorcycle Quality Supervisory & Testing Center (Tianjin) to conduct all performance tests according to relevant standards to ensure the reliability and stability performance of the system.

#### **IV. Stringent verification in durability test for the system**

In the standardized process of BewoTech mid-drive power system of electric bicycle, the system has been tested in accordance with standards to ensure quality performance. The following durability tests have been conducted.

1. Durability road test

Comprehensive durability road tests was performed with overall 5000km long road, the test track includes Even road, Belgian road, Washboard road, Sand and

dust road, Big sine wave road, Ramping road and so on.

2. Durability bench test

Driving speed at 20km, test duration lasts more than 500 hours, the equivalent driving range is more than 10000 km.

3. Peak torque impact test

Continuously starting the system is more than 10,000 times under peak torque.

4. Dust proof and water proof test

Continuously performing the tests lasts more than 2 hours under the requirement at the level of IP54.

5. Strength durability test

Continuously performing pedal treading test is more than 100,000 times with 150kg rider.

**V. Specification:**

Parameters	BWB
Items	
Rated Voltage(V)	36
No Load Value	
Speed(r/min)	$85 \pm 5$
Current(A)	$<1.0$
Rated Value	
Speed(r/min)	$75 \pm 5$
Power(W)	250
Torque(N·m)	$>30$
Current(A)	9
Peak Value	
Power(W)	350W
Torque(N·m)	50
Other Value	
Motor Type	Permanent magnet, direct current, non-brush, non-Hall
Gear system	Steel gear
Profile dimension(mm)	200×205×165
Weight(kg)	$\leq 4.3$
Noise(dB)	$\leq 50$
Dust proof, water proof	IP54
Chain Wheel	48T or 44T
Bottom Bracket	D-inner screw thread

Assistance Sensor

Inner embedded, speeding type, 12  
signal/circle

**Attachment: The 2D drawing of Motor**

