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# Varstrom TSDZ16 48V 1000W Mid Drive Motor Ebike Conversion Kit Instruction Manual

Model: TSDZ16

## 1. INTRODUCTION

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This manual provides detailed instructions for the installation, operation, and maintenance of your Varstrom TSDZ16 48V 1000W Mid Drive Motor Ebike Conversion Kit. Please read this manual thoroughly before attempting installation or operation to ensure proper function and safety.

The Varstrom TSDZ16 kit is designed to convert a standard bicycle into an electric bicycle, offering powerful assistance with its 1000W motor and 160N.m of torque. It features an advanced torque sensor for a natural riding experience and an IPX6 waterproof rating for durability.



Figure 1: Overview of the Varstrom TSDZ16 Mid Drive Motor Kit components, including the motor, battery (optional), display, and various accessories.

## 2. SAFETY INFORMATION

Always prioritize safety when installing and operating your ebike conversion kit. Failure to follow these safety guidelines may result in injury or damage to the product.

- **Professional Installation Recommended:** If you are unsure about any step of the installation process, seek assistance from a qualified bicycle mechanic.
- **Wear Protective Gear:** Always wear a helmet and appropriate safety gear when riding your ebike.
- **Inspect Before Each Ride:** Before each use, check all components, including brakes, tires, and electrical connections, to ensure they are in good working order.
- **Water Exposure:** While the motor has an IPX6 waterproof rating, avoid submerging the motor or other electrical components in water. Do not use a high-pressure washer directly on electrical parts.
- **Battery Handling:** Handle the battery with care. Do not puncture, drop, or expose it to extreme temperatures. Use only the charger provided or recommended by Varstrom.

- **Electrical Connections:** Ensure all electrical connections are secure and properly insulated to prevent short circuits.
- **Local Regulations:** Be aware of and comply with all local laws and regulations regarding ebike usage, speed limits, and power output.

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## 3. SETUP AND INSTALLATION

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This section outlines the steps for installing the Varstrom TSDZ16 mid-drive motor kit onto your bicycle. Ensure your bicycle has a bottom bracket shell compatible with 68-73mm width.

### 3.1. Unboxing and Component Check

Before beginning installation, verify that all components listed in the packing list are present and undamaged.

- Varstrom x Tongsheng 48V 1000W Mid Drive Motor
- Display (DZ40, SW2-M58, or EKD01 - Optional)
- Battery (Optional)
- Brake Levers (Default) OR Brake Sensors
- Thumb Throttle
- Cranks, Chainwheel (46T)
- Speed Sensor & Magnets
- 1T4 Wiring Harness
- Lock Nuts (1 set)
- Wrench
- Cable Ties
- Protection Board
- Headlight (Optional)
- Rear Lamp (Optional)
- Washers
- Fixed bracket accessories

# WHAT'S IN THE BOX?

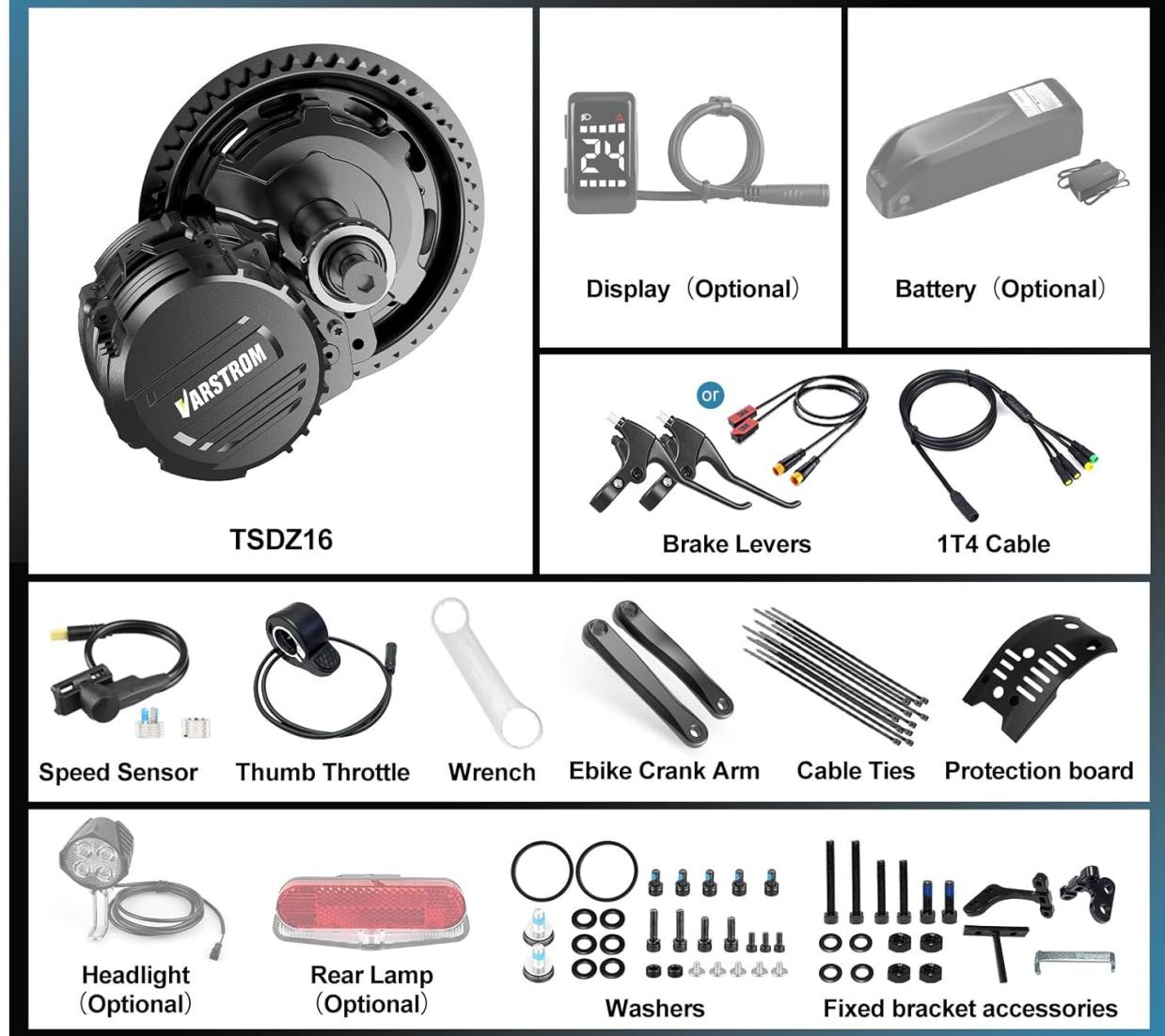


Figure 2: Visual representation of the components included in the Varstrom TSDZ16 kit.

## 3.2. Motor Installation

The mid-drive motor installs into the bicycle's bottom bracket shell. Ensure the bottom bracket width is between 68-73mm.

1. Remove the existing crankset, bottom bracket, and chain from your bicycle.
2. Carefully insert the TSDZ16 motor into the bottom bracket shell from the drive side. Ensure the motor is seated correctly and cables are routed without pinching.
3. Install the fixing plate and tighten the fixing nut with a torque of 40Nm.
4. Secure the motor to the frame using the provided mounting bracket and screws. This new bottom bracket fixing bracket enhances stability.

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Video 1: Installation guide for the Tongsheng Mid Drive Motor kit, demonstrating the process of mounting the motor to the bicycle frame, securing it with the fixing nut and bracket, and installing the speed sensor and cranks.

# MOTOR COMPATIBILITY AND SPECIFICATIONS

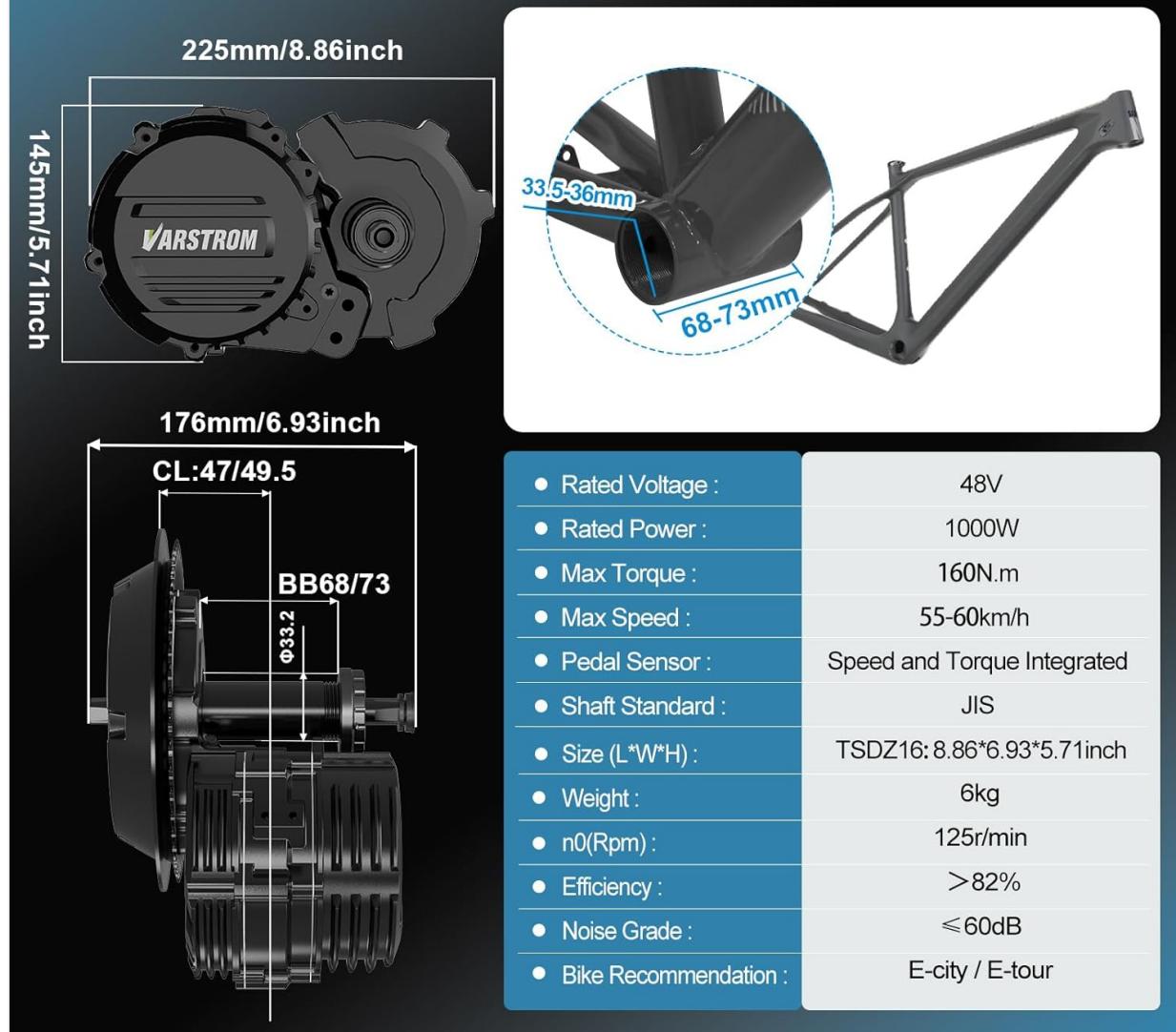


Figure 3: Detailed dimensions of the TSDZ16 motor and its compatibility with 68-73mm bottom brackets.

## 3.3. Speed Sensor Installation

Install the speed sensor on the chainstay, ensuring the magnet passes within 10-15mm of the sensor head when the wheel rotates.

1. Attach the speed sensor to the non-drive side chainstay using cable ties.
2. Mount the magnet to a spoke on the rear wheel.
3. Adjust the sensor position so that the magnet passes the sensor head at a distance of 10-15mm.

## 3.4. Cranks and Chainwheel Installation

Install the cranks and chainwheel onto the motor shaft.

1. Attach the chainwheel (46T) to the motor.
2. Install the left and right cranks onto the motor's spindle. Ensure they are securely fastened.
3. Install the chain, ensuring proper tension and alignment with the rear cassette.

# CHAINRING & BRAKE SYSTEM

III



Figure 4: Close-up of the 46T chainwheel and various brake system components.

## 3.5. Wiring Connections

Connect all electrical components using the provided 1T4 wiring harness. Refer to the wiring diagram for correct connections.

- Connect the motor to the main wiring harness.
- Connect the display, thumb throttle, brake levers/sensors, and speed sensor to the 1T4 harness.
- If using optional headlights or taillights, connect them to the designated ports.
- Finally, connect the battery (if optional) to the main power input. Ensure all connections are firm and waterproof where applicable.

## MOTOR CONNECTOR & WIRING

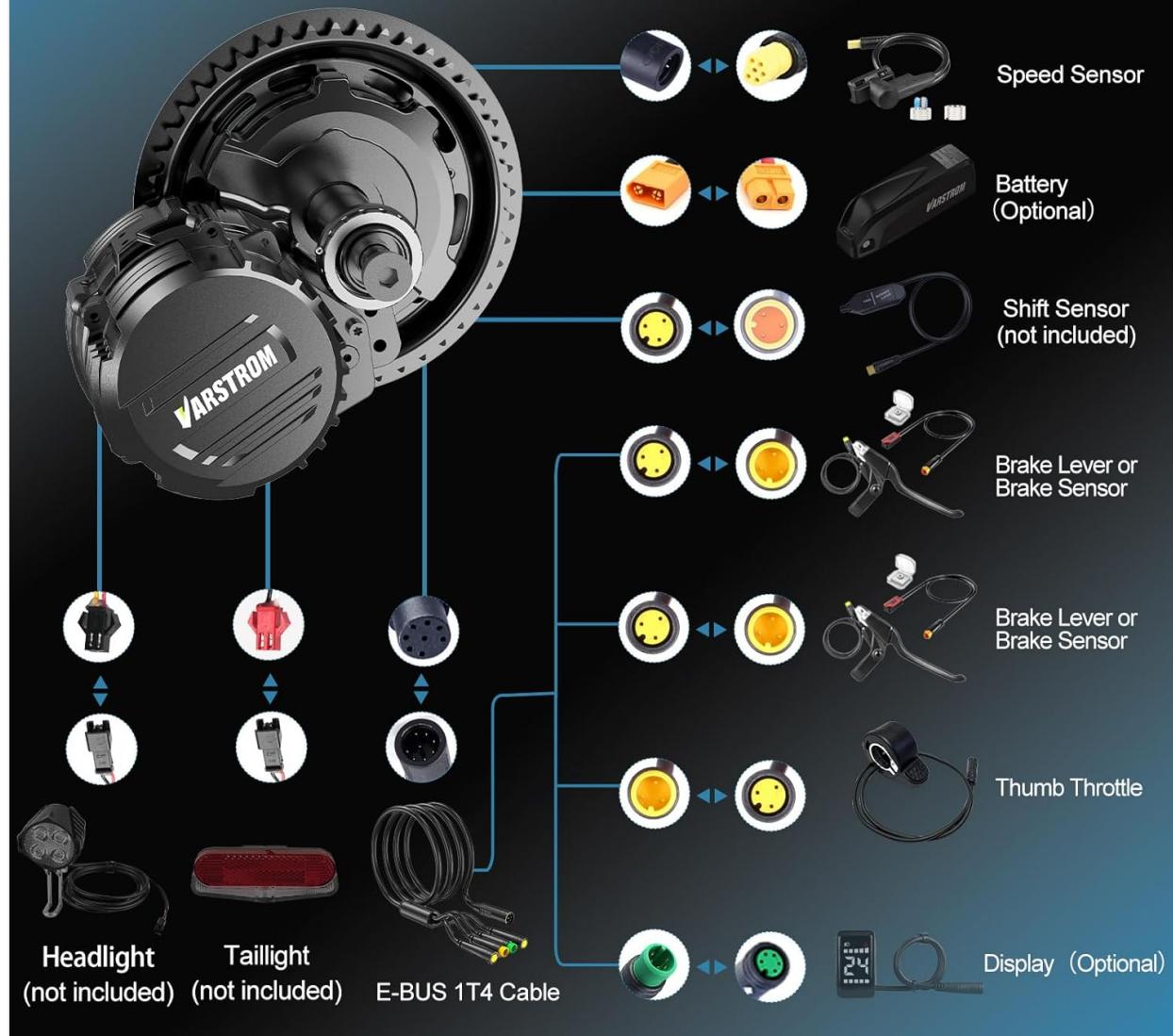


Figure 5: Detailed wiring diagram showing connections for the motor, display, battery, speed sensor, shift sensor, brake levers/sensors, thumb throttle, headlight, and taillight.

## 4. OPERATING INSTRUCTIONS

Once installed, your Varstrom TSDZ16 ebike kit offers various modes of operation for an enhanced riding experience.

### 4.1. Display Functions

The kit supports different display options (DZ40, SW2-M58, EKD01), each providing essential information and control over the ebike system.

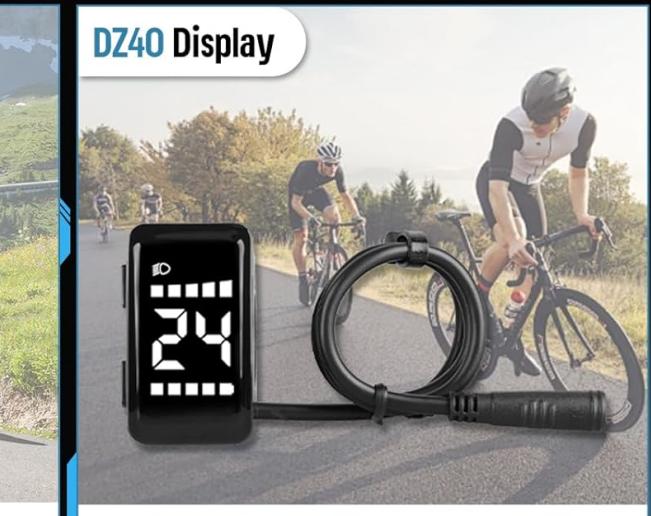
<h3>EKD01 Display</h3> 	<p>Screen: 2.4" TFT  Handlebar Diameter(mm): 22.2/ 25.4  Operating Voltage: 24V/36V/48V/52V  USB Port: ✓ Type C  Language: English, French, German, Spanish, Italian, Polish, Dutch, Czech</p> <p>Speed Limit: ✓  Battery Voltage: ✓  Battery Percentage: ✓  Boot Password: ✓  Light Sensor: ✗</p>
<h3>M58 Display</h3> 	<h3>DZ40 Display</h3> 
<p>Screen: 3.8"LCD  Handlebar Diameter: 22.2/ 25.4/ 31.8  Operating Voltage: 24V/36V/48V/52V  USB Port: ✗  Language: English</p> <p>Speed Limit: ✓  Battery Voltage: ✓  Battery Percentage: ✓  Boot Password: ✓  Light Sensor: ✗</p>	<p>Screen: 1.68" IPS  Handlebar Diameter(mm): 22.2  Operating Voltage: 24V/36V/48V/52V  USB Port: ✗  Language: English</p> <p>Speed Limit: ✓  Battery Voltage: ✓  Battery Percentage: ✓  Boot Password: ✗  Light Sensor: ✗</p>

Figure 6: Comparison of available display units (EKD01, M58, DZ40) and their features, including screen size, handlebar diameter compatibility, operating voltage, USB port, language options, speed limit, battery percentage, boot password, and light sensor availability.

- **Power On/Off:** Press and hold the power button on the display to turn the system on or off.
- **Assist Levels:** Use the '+' and '-' buttons to cycle through different pedal assist levels (PAS). Higher levels provide more motor assistance.
- **Information Display:** The display shows current speed, battery level, trip distance, total distance, and assist level.
- **Walk Assist Mode:** Most displays offer a walk assist function (usually by holding the '-' button) which provides low-speed motor assistance for pushing the bike.
- **Light Control:** If connected, lights can typically be controlled via the display.

## 4.2. Riding Modes

- **Pedal Assist Mode:** The motor provides assistance based on your pedaling input, detected by the torque sensor. The level of assistance is determined by the selected PAS level.
- **Electrical Throttle Mode:** If a thumb throttle is installed, it can be used to provide motor power independently of pedaling. Use with caution and according to local regulations.

- **Walk Assist Mode:** Provides low-speed assistance for walking alongside the bike.



Figure 7: Illustration of the TSDZ16 motor's features, including electrical throttle mode, pedal assist mode, and walk assist mode, along with a torque curve graph and IPX6 waterproof rating.

## 5. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your Varstrom TSDZ16 ebike kit.

- **Cleaning:** Clean the motor and other components with a damp cloth. Avoid high-pressure washing directly on electrical parts.
- **Battery Care:**
  - Charge the battery regularly, even when not in use, to maintain its health.
  - Store the battery in a cool, dry place, away from direct sunlight and extreme temperatures.
  - Do not fully discharge the battery.
- **Cable Inspection:** Periodically check all cables and connectors for wear, damage, or loose connections.

- **Fastener Check:** Ensure all bolts and nuts, especially those securing the motor and cranks, are tightened to the recommended torque specifications.
- **Chain and Drivetrain:** Keep the chain clean and lubricated. Check for wear on the chainring and cassette.
- **Brakes:** Regularly inspect brake pads and cables (or hydraulic fluid) for wear and proper function.

## 6. TROUBLESHOOTING

This section addresses common issues you might encounter with your ebike kit.

Problem	Possible Cause	Solution
Motor not providing assistance	Battery low or disconnected Display off or error code Speed sensor misaligned or damaged Brake sensor engaged	Check battery charge and connections. Turn on display, check for error messages. Verify speed sensor alignment (10-15mm gap). Ensure brake levers are not engaged.
Display not turning on	Loose power connection Battery discharged Damaged display cable	Check all power connections from battery to motor and display. Charge the battery. Inspect display cable for damage.
Unusual noise from motor	Loose motor mounting Debris in chainring/motor area Internal motor issue	Check motor mounting bolts and tighten if necessary. Clean the chainring and motor area. If noise persists, contact customer support.

For issues not listed here or if solutions do not resolve the problem, please contact Varstrom customer support.

## 7. SPECIFICATIONS

Detailed technical specifications for the Varstrom TSDZ16 48V 1000W Mid Drive Motor Kit.

Feature	Specification
Voltage	48V
Wattage	1000W
Motor Type	Brushless Geared Motor
Motor Model	TSDZ2B/TSDZ8 (TSDZ16 is the kit model)
Motor Position	Mid Mounted

Feature	Specification
Controller	Integrated, inside the Motor
Shaft Standard	JIS
Operating Temperature	-10 to 45 °C
Max Torque	160N.m
Max Speed	55-60KM/H
Pedal Sensor	Speed and Torque Integrated
Motor Weight	6kg
Efficiency	Over 83%
Noise Grade	≤60dB
Waterproof Rating	IPX6 (with dual oil seals)
Bottom Bracket Compatibility	68-73mm
Chainwheel	46T

# MOTOR SPECIFICATION

• RATED POWER:  
**1000W**

• MAX TORQUE:  
**160Nm**

• WEIGHT:  
**6KG**

• MAX SPEED  
**55-60KM/H**



Headlights and taillights



Battery



Speed sensor



EB-Bus



Gear Sensor



Figure 8: Key motor specifications including rated power, max torque, weight, and max speed, shown integrated with a bicycle.

## 7.1. Battery Parameters (Optional)

If an optional battery is purchased with the kit, refer to its specific parameters. Common options include:

# BATTERY PARAMETERS

<b>• 48V 13Ah   Shark Battery</b> <b>• 48V 16Ah</b>		<b>• 48V 19.2Ah   Shark Battery</b> <b>• 48V 20Ah</b>	
			
Type	48V 13Ah	48V 16Ah	48V 19.2Ah
Watt Hour	624Wh	768Wh	921.6Wh
Battery Cell	18650 2600mAh	18650 3200mAh	L*/G 21700 4800mAh
BMS	30A	30A	30A
Charge voltage	54.6V	54.6V	54.6V
Size (L*W*H)	368*90*111mm	368*90*111mm	367*90*127mm
Weight	4.25kg	4.23kg	4.95kg
USB Port	✓	✓	✓
Cycle Life	1000 times		
Protection Function	Over charge, Over discharge, Over current, Short circuit, Balance		
<b>• 52V 20Ah   YingWu Battery</b>		<b>• 48V 20Ah   Voltz X Battery</b>	
			
Type	52V 20Ah	48V 20Ah	48V 17.5Ah
Watt Hour	1040Wh	960Wh	840Wh
Battery Cell	Sam*/sung 21700 5000mAh	Sam*/sung 21700 5000mAh	18650 2500mAh
BMS	30A	30A	30A
Charge voltage	58.8V	54.6V	54.6V
Size (L*W*H)	368*95*125mm	365*109*140mm	476*165*89mm
Weight	5kg	5.2kg	6kg
USB Port	✗	✓ USB & Type-C Fast Charge	✓
Cycle Life	1000 times		
Protection Function	Over charge, Over discharge, Over current, Short circuit, Balance		

Figure 9: Table detailing parameters for various optional batteries, including voltage, watt-hour, battery cell type, BMS, charge voltage, size, weight, USB port availability, cycle life, and protection functions.

## 8. WARRANTY AND SUPPORT

### 8.1. Warranty Information

Varstrom products are covered by a manufacturer's warranty against defects in materials and workmanship. The specific warranty period and terms may vary by component. Please retain your proof of purchase for warranty claims.

The warranty typically covers manufacturing defects but does not cover damage resulting from:

- Improper installation or assembly.
- Negligence, misuse, or abuse.
- Unauthorized modifications or repairs.
- Normal wear and tear.
- Accidents or external factors.

For detailed warranty terms, please refer to the documentation included with your purchase or contact Varstrom customer service.

## **8.2. Customer Support**

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If you have any questions, require technical assistance, or need to make a warranty claim, please contact Varstrom customer support through the retailer where you purchased the product or visit the official Varstrom website for contact information.

When contacting support, please have the following information ready:

- Product Model: TSDZ16
- Date of Purchase
- Order Number or Proof of Purchase
- A detailed description of the issue

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