

## Varstrom TSDZ2B/TSDZ8/TSDZ16

# Varstrom TSDZ2B TSDZ8 TSDZ16 Mid Drive Motor Kit User Manual

48V 500W/750W/1000W Torque Sensor Ebike Conversion Kit

## 1. INTRODUCTION

This manual provides essential information for the installation, operation, and maintenance of your Varstrom TSDZ2B, TSDZ8, or TSDZ16 Mid Drive Motor Kit. This kit is designed to convert standard bicycles into electric bikes, offering pedal assistance through a torque sensor system. Please read this manual thoroughly before attempting installation or operation to ensure safe and correct usage.

## 2. PRODUCT OVERVIEW AND COMPONENTS

The Varstrom Mid Drive Motor Kit includes the motor unit, display, battery (optional), brake levers or sensors, thumb throttle, cranks, chainwheel, speed sensor, wiring harness, and various mounting hardware. The core of the system is the mid-drive motor, which integrates a torque sensor for a natural riding experience.



# WHAT'S IN THE BOX?



**TSDZ2B (Upgradeable to TSDZ8)**



**EKD01 Display (Optional)**



**Battery (Optional)**



**Brake Levers**

**1T4 Cable**



**Speed Sensor**



**Thumb Throttle**



**Ebike Crank Arm**



**Cable Ties**



**Wrench**



**Washers**



**Installation Manual**

Image 2.2: Detailed view of all components included in the Varstrom Mid Drive Motor Kit packaging.

- Varstrom x Tong-sheng 48V Mid Drive Motor (TSDZ2B, TSDZ8, or TSDZ16)
- Display (Optional: EKD01, M58, or DZ40)
- Battery (Optional)
- Brake Levers (Default) or Brake Sensors
- Thumb Throttle
- Cranks and Chainwheel
- Speed Sensor & Magnets
- 1T4 Wiring Harness
- Lock Nuts (1 set)
- Cable Ties
- Wrench
- Washers
- Installation Manual

## 3. SPECIFICATIONS

The Varstrom Mid Drive Motor Kit is available in several configurations, each offering different power outputs and torque levels. All models feature a torque sensor for responsive pedal assistance.

3.1 Motor Specifications

TSDZ2BTSDZ8TSDZ16

Rated Voltage Power	48V 500W	48V 750W	48V 1000W
Max Torque	80N.m	120N.m	160N.m
Max Speed	30-35KM/H	50-55KM/H	55-60KM/H
Weight	About 3.8KG	About 4.7KG	About 6KG
BB width	68-73mm	68-73mm	68-73mm
Waterproof grade	IPX5	IPX5	IPX6

Image 3.1: Comparative specifications for TSDZ2B, TSDZ8, and TSDZ16 mid-drive motors.

Feature	TSDZ2B	TSDZ8	TSDZ16
Rated Voltage Power	48V 500W	48V 750W	48V 1000W
Max Torque	80 N.m	120 N.m	160 N.m
Max Speed	30-35 KM/H	50-55 KM/H	55-60 KM/H
Weight	About 3.8 KG	About 4.7 KG	About 6 KG
BB Width Compatibility	68-73mm		
Waterproof Grade	IPX5	IPX5	IPX6

# MOTOR COMPATIBILITY AND SPECIFICATIONS



Image 3.2: Motor dimensions and detailed specifications for compatibility.

## 3.2 Display Options

Various display units are compatible with the Varstrom Mid Drive Motor Kit, offering different features and interfaces.



### EKD01 Display



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

Speed Limit: ✓  
 Battery Voltage: ✓  
 Battery Percentage: ✓  
 Boot Password: ✓  
 Light Sensor: ✗

### M58 Display



Screen:3.8"LCD  
 Handlebar Diameter:22.2/ 25.4/ 31.8  
 Operating Voltage:24V/36V/48V/52V  
 USB Port: ✗  
 Language:English

Speed Limit: ✓  
 Battery Voltage: ✓  
 Battery Percentage: ✓  
 Boot Password: ✓  
 Light Sensor: ✗

### DZ40 Display



Screen:1.68" IPS  
 Handlebar Diameter(mm):22.2  
 Operating Voltage:24V/36V/48V/52V  
 USB Port: ✗  
 Language:English

Speed Limit: ✓  
 Battery Voltage: ✓  
 Battery Percentage: ✓  
 Boot Password: ✗  
 Light Sensor: ✗

Image 3.3: Features and specifications of EKD01, M58, and DZ40 display options.

## 3.3 Battery Parameters (Optional)

If purchased with a battery, refer to the specific battery parameters for your model.

# BATTERY PARAMETERS

• 48V 13Ah | Shark Battery  
• 48V 16Ah



• 48V 19.2Ah | Shark Battery  
• 48V 20Ah

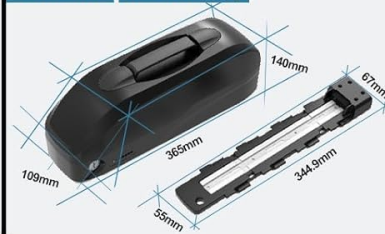


Type	48V 13Ah	48V 16Ah	48V 19.2Ah	48V 20Ah
Watt Hour	624Wh	768Wh	921.6Wh	960Wh
Battery Cell	18650 2600mAh	18650 3200mAh	L*/G 21700 4800mAh	Sam*/sung 21700 5000mAh
BMS	30A	30A	30A	30A
Charge voltage	54.6V	54.6V	54.6V	54.6V
Size (L*W*H)	368*90*111mm	368*90*111mm	367*90*127mm	367*90*127mm
Weight	4.25kg	4.23kg	4.95kg	4.7kg
USB Port	✓	✓	✓	✓
Cycle Life	1000 times			
Protection Function	Over charge, Over discharge, Over current, Short circuit, Balance			

• 52V 20Ah | YingWu Battery



• 48V 20Ah | Voltz X Battery



• 48V 17.5Ah | Rear Rack Battery



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		

Image 3.4: Specifications for various optional battery types, including Shark and YingWu models.

## 4. SETUP AND INSTALLATION

Installation of the mid-drive motor kit requires mechanical aptitude and specific tools. If you are unsure about any step, it is recommended to seek professional assistance.

### 4.1 Bottom Bracket Compatibility

The motor kit is designed to fit bicycles with a bottom bracket shell length of 68mm to 73mm and an inner diameter of 34mm to 36mm. Verify your bicycle's bottom bracket dimensions before proceeding with installation.

### 4.2 Wiring Diagram

Proper connection of all components is crucial for the system's functionality. Refer to the wiring diagram below for guidance.

## MOTOR CONNECTOR & WIRING



Image 4.1: Diagram illustrating the connections for the motor, speed sensor, battery, brake levers/sensors, thumb throttle, and display.

### 4.3 General Installation Steps (Summary)

1. Remove existing cranks and bottom bracket from your bicycle.
2. Install the mid-drive motor unit into the bottom bracket shell, ensuring it is securely fastened with the provided lock nuts.
3. Attach the chainwheel and cranks to the motor spindle.
4. Mount the display, thumb throttle, and brake levers/sensors onto the handlebars.
5. Install the speed sensor on the rear chainstay and attach the magnet to a spoke on the rear wheel.
6. Connect all components to the motor using the 1T4 wiring harness, following the wiring diagram.
7. Mount the battery securely to the bicycle frame (if applicable) and connect it to the motor system.
8. Perform a functional test to ensure all components are working correctly before riding.

## 5. OPERATING INSTRUCTIONS

The Varstrom Mid Drive Motor Kit provides a natural and intuitive riding experience thanks to its torque sensor



technology.

## 5.1 Powering On/Off

- To power on the system, press and hold the power button on your display unit.
- To power off, press and hold the power button again until the display turns off.

## 5.2 Assist Modes

The system offers multiple assist modes to suit different riding conditions:



Image 5.1: Illustration of the three primary assist modes: Electrical Throttle, Pedal Assist, and Walk Assist.

- **Pedal Assist Mode:** The motor provides assistance proportional to your pedaling effort, detected by the torque sensor. This creates a smooth and natural riding feel. You can typically adjust the level of assistance via the display unit.
- **Electrical Throttle Mode:** If equipped with a thumb throttle, you can engage the motor independently of pedaling. This mode is useful for quick acceleration or maintaining speed without pedaling.
- **Walk Assist Mode:** This mode provides low-speed assistance, typically around 6 km/h, to help you push the bicycle when walking alongside it. Activate this feature via the display unit.

## 5.3 Display Functions

---

Your display unit provides real-time information and allows you to control various settings. Common functions include:

- Current Speed
- Battery Level Indicator
- Assist Level Selection
- Trip Distance / Odometer
- Error Codes (if any)
- Headlight Control (if connected)

Refer to your specific display's manual for detailed instructions on its features and settings.

## 6. MAINTENANCE

---

Regular maintenance ensures the longevity and optimal performance of your Varstrom Mid Drive Motor Kit.

- **Cleaning:** Keep the motor unit and electrical connections clean and free from dirt and debris. Use a damp cloth; avoid high-pressure washing directly on electrical components.
- **Battery Care:** If using an optional battery, follow the manufacturer's guidelines for charging, storage, and temperature. Avoid fully discharging the battery and store it in a cool, dry place.
- **Cable Inspection:** Periodically check all cables and connectors for wear, damage, or loose connections. Ensure waterproof connections are properly sealed.
- **Fastener Check:** Regularly inspect all mounting bolts and nuts, especially those securing the motor to the bottom bracket, to ensure they are tight.
- **Chain and Drivetrain:** Maintain your bicycle's chain and drivetrain (chainwheel, cassette, derailleur) as you would a regular bike. Keep the chain lubricated and clean.
- **Software Updates:** Check the Varstrom website or contact support for any available firmware updates for your motor or display.

## 7. TROUBLESHOOTING

---

This section addresses common issues you might encounter. For more complex problems, contact Varstrom customer support.

### 7.1 No Power to Display/Motor

---

- **Check Battery:** Ensure the battery is fully charged and securely connected.
- **Check Connections:** Verify all electrical connections, especially the main power cable from the battery to the motor and the display cable.
- **Power Button:** Confirm the power button on the display is pressed correctly.

### 7.2 Motor Not Assisting

---

- **Assist Level:** Ensure a pedal assist level is selected on the display (not '0' or 'off').
- **Speed Sensor:** Check if the speed sensor is correctly installed and the magnet passes close enough to it. A loose or misaligned sensor can prevent assistance.
- **Brake Levers/Sensors:** Ensure brake levers are not engaged, as they cut off motor power. Check if

brake sensors are properly installed and not stuck.

- **Error Codes:** Look for any error codes displayed on your screen and refer to your display manual for their meaning.

### 7.3 Unusual Noises from Motor

- **Loose Components:** Check for any loose bolts or components on the motor or chainwheel.
- **Chain Alignment:** Ensure the chain is properly aligned and not rubbing against the motor casing or chain guard.
- **Internal Issue:** If the noise persists and is internal to the motor, discontinue use and contact support.

## 8. WARRANTY AND SUPPORT

### 8.1 Warranty Information

Varstrom offers a limited warranty for its products. The warranty typically includes:



- 30 days return policy.
- 365 days repair or replacement for manufacturing defects.

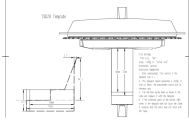
Please retain your proof of purchase for warranty claims. The warranty does not cover damage due to improper installation, misuse, neglect, accidents, or unauthorized modifications.

### 8.2 Customer Support

For technical assistance, troubleshooting beyond this manual, or warranty inquiries, please contact Varstrom customer support through the retailer where you purchased the product or visit the official Varstrom website for contact information.

### Related Documents - TSDZ2B/TSDZ8/TSDZ16

	<p><a href="#">EKD01-AKSM Displayer Manual: Comprehensive Guide for E-Bike Displays</a></p> <p>Explore the EKD01-AKSM and B02NU-AKSM e-bike display unit with this detailed user manual. Learn about installation, features, settings, Bluetooth connectivity, app integration, and troubleshooting for your electric bicycle.</p>
	<p><a href="#">Tongsheng TSDZ2B Mid-Drive Conversion Motor Product Manual</a></p> <p>Comprehensive product manual for the Tongsheng TSDZ2B mid-drive conversion motor, covering installation, specifications, features, safety, and usage guidelines for converting regular bikes into e-bikes.</p>



## TSDZ8 Motor Template and Installation Guide

This document provides a printable template for the TSDZ8 electric bike motor, including detailed dimensions and essential installation suggestions for ensuring proper fitment.



## EKD01-AKSM Displayer Manual: Comprehensive Guide for E-Bike Displays

Explore the EKD01-AKSM and B02NU-AKSM e-bike display unit with this detailed user manual. Learn about installation, features, settings, Bluetooth connectivity, app integration, and troubleshooting for your electric bicycle.