



Manuals.plus /

› Varstrom /

› Varstrom Tong-Sheng TSDZ Mid-Drive Ebike Conversion Kit User Manual

## Varstrom TSD-Z2B, TSDZ8, TSDZ16 (48V 500W, 750W, 1000W)

# Varstrom Tong-Sheng TSDZ Mid-Drive Ebike Conversion Kit User Manual

Models: TSD-Z2B, TSDZ8, TSDZ16 (48V 500W, 750W, 1000W)

<a href="#">Introduction</a>	<a href="#">Safety Information</a>	<a href="#">Components</a>	<a href="#">Setup &amp; Installation</a>	<a href="#">Operation</a>	<a href="#">Maintenance</a>
	<a href="#">Troubleshooting</a>	<a href="#">Specifications</a>	<a href="#">Warranty &amp; Support</a>		

## 1. INTRODUCTION

---

This manual provides essential information for the installation, operation, and maintenance of your Varstrom Tong-Sheng TSDZ series mid-drive ebike conversion kit. This kit is designed to transform a standard bicycle into an electric bicycle, offering enhanced performance and a torque-sensing pedal assist system. Please read this manual thoroughly before installation and use to ensure proper function and safety.

## 2. SAFETY INFORMATION

---

- Always wear a helmet and appropriate safety gear when riding an ebike.
- Ensure all components are securely fastened before each ride. Regularly check bolts, nuts, and electrical connections.
- Do not attempt to modify the motor or battery system. Unauthorized modifications can lead to serious injury or damage and will void the warranty.
- Keep the battery away from water, heat sources, and direct sunlight. Use only the charger provided or recommended by Varstrom.
- Be aware of local regulations regarding ebike usage, speed limits, and power output.
- If you are unsure about any installation step, consult a professional bicycle mechanic or contact Varstrom support.

## 3. KIT COMPONENTS

---

Your Varstrom mid-drive conversion kit includes the following essential components:

- Mid-drive motor (TSD-Z2B, TSDZ8, or TSDZ16, depending on your selection)
- LCD display (DZ40, SW-M58, or EKD01, depending on your selection)
- Chainring (42T for 500W, 44T for 750W, 46T for 1000W)
- Thumb throttle
- Speed sensor
- 1T4 main cable harness
- Installation screws and washers
- Wrench
- Motor extension cables
- Brake levers (with motor cut-off function)
- *Optional: Battery and charger (if purchased as a bundle)*



Image: Overview of the Varstrom mid-drive ebike conversion kit components, including the motor, chainring, and various cables.

## 4. SETUP & INSTALLATION

## 4.1 Compatibility

The 48V 500W TSD-Z2B, 48V 750W TSDZ8, and 48V 1000W TSDZ16 mid-motors are designed to fit bicycles with 68-73mm bottom brackets. Please verify your bicycle's bottom bracket size before attempting installation.

## 4.2 TSDZ16 Motor Upgrades

The TSDZ16 motor features several enhancements for improved performance and durability:

- **Reinforcement Device:** A reinforcement device is integrated to prevent the motor from shaking downward, enhancing riding stability.
- **Additional Screw Holes:** Two extra screw holes allow for further motor reinforcement or custom mounting, particularly useful for electric tricycles or recumbent bikes.
- **New Motor Cover:** A redesigned motor cover helps keep the motor clean and facilitates neater wiring management for an aesthetically pleasing setup.
- **Bidirectional Free-Wheeling Clutch:** This new clutch design eliminates drag from traditional one-way clutches, allowing for motor-out power cycling.
- **Enhanced Nylon Design:** The nylon components are designed to support higher torque with an external clutch for superior performance.



Image: Detailed view of the TSDZ16 mid-motor upgrades, showing the reinforcement device, additional screw holes, and new motor cover.

### 4.3 Wiring Schematic

The kit utilizes a 1T4 main wiring harness for connecting the display, throttle, and brake levers to the motor. The speed sensor and optional battery connect directly to the motor unit.

# BATTERY PARAMETERS








	• 36V 15.6Ah Sh-ark Battery	• 48V 13Ah	• 48V 16Ah	• 48V 20Ah G80 Max Shark Battery	• 40V 20Ah VoltzX Battery
					
Battery Feature	36V 15.6Ah	48V 13Ah	48V 16Ah	48V 20Ah	48V 20Ah
Energy	561.6Wh	624Wh	768Wh	960Wh	960Wh
Cell	Grade A 18650 2600mAh	Grade A 18650 2600mAh	Grade A 18650 3200mAh	Samsung 21700 5000mAh	Samsung 21700 5000mAh
Array Mode	10S6P 60PCS	13S5P 65PCS	13S5P 65PCS	13S4P 52PCS	13S4P 52PCS
BMS Protection	30A	30A	30A	30A	30A
Charger	42V 3A	54.6V 2A	54.6V 3A	54.6V 3A	54.6V 3A
USB Port	5V 1A	5V 1A	5V 1A	5V 1A	5V 2A
Type-C Port	No	No	No	No	20V 3A
Size	368*90*111mm	368*90*111mm	368*90*111mm	367*90*127mm	365*109*140mm
Weight	About 3.9kg	About 4.25kg	About 4.23kg	About 4.7kg	About 5.2kg
Compatible Motor Power	250W 350W 500W 750W 1000W 1200W 1500W 2000W				
Protection Function	Overcurrent , overvoltage , overload , overcharge , over-discharge , temperature control , short-circuit protection, and cell voltage balancing				
	• 52V 20Ah DP-5 Yingwu Battery	• 48V 25Ah DP-7 Yingwu Battery	• 52V 25Ah	• 48V 30Ah Hai-long Battery	• 48V 17.5Ah Rear Rack Battery
					
Battery Feature	52V 20Ah	48V 25Ah	52V 25Ah	48V 30Ah	48V 17.5Ah
Energy	1040Wh	1200Wh	1300Wh	1440Wh	840Wh
Cell	Samsung 21700 5000mAh	EVE 21700 5000mAh	L*_G 21700 5000mAh	L*_G 21700 5000mAh	Grade A 18650 2600mAh
Array Mode	14S4P 56PCS	13S5P 65PCS	14S5P 60PCS	13S6P 78PCS	13S7P 91PCS
BMS Protection	30A	40A	40A	40A	30A
Charger	58.8V 3A	54.6V 3A	58.8V 3A	54.6V 3A	54.6V 3A
USB Port	No	No	No	No	5V 1A
Type-C Port	No	No	No	No	No
Size	368*95*125mm	368*95*156mm	368*95*156mm	395*95*156mm	476*162*89mm
Weight	About 5kg	About 5.9kg	About 5.9kg	About 6.9kg	About 6kg
Compatible Motor Power	250W 350W 500W 750W 1000W 1200W 1500W 2000W				
Protection Function	Overcurrent , overvoltage , overload , overcharge , over-discharge , temperature control , short-circuit protection, and cell voltage balancing				

Image: Diagram illustrating the wiring connections for the TSDZ2B mid-drive kit, showing the motor, 1T4 cable, display, throttle, brake levers, battery, and speed sensor.

For detailed installation instructions, it is recommended to consult the specific installation guide provided with your kit or refer to reputable online video tutorials. Professional installation is highly recommended to ensure correct and safe assembly.

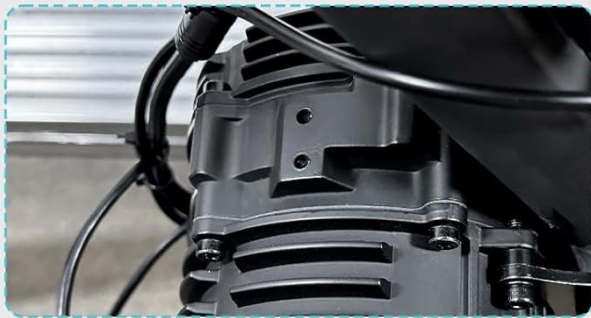
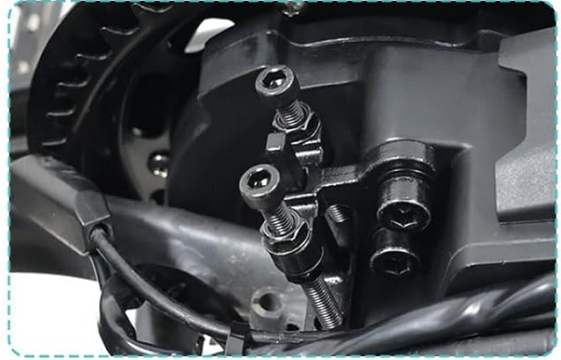
## 5. OPERATION

### 5.1 Display Functions

Your kit includes one of three display options: DZ40, SW-M58, or EKD01. Each display provides essential riding information and control over the assist levels.

# NEW UPGRADE OF TSDZ16 MID MOTOR

Unlike all other mid-drive motors, the TSDZ16 has added a reinforcement device to prevent the motor from shaking downward, thereby enhancing the riding experience.



Two additional screw holes have been added, allowing all modification enthusiasts to unleash their creativity and talent. You can not only reinforce the motor installation but also help you better install the mid-drive motor on your electric tricycle or recumbent bike



A new motor cover has been added, which can not only keep your motor clean but also help you manage the wiring more neatly, making it more aesthetically pleasing

Image: Comparison table detailing specifications for DZ40, SW-M58, and EKD01 LCD displays, including screen type, dimensions, speed metrics, voltage compatibility, and assist levels.

## Display Specifications Overview

Feature	DZ40 Display	SW-M58 Display	EKD01 Display
Screen	High-Brightness White Digital Tube	3.8 inch High-Brightness Color LCD	2.4-inch TFT
Dimensions (L*W*H)	48mm x 27mm x 15mm	93.4mm x 56.4mm x 6.4mm	86.8mm x 50.5mm x 12.5mm
Average Speed	No	Yes	Yes
Top Speed	No	Yes	Yes
KMH/MPH	No	Yes	Yes
Trip	No	Yes	Yes
ODC	No	Yes	Yes
Power Voltage	No	Yes	Yes
Power Percentage	Yes	Yes	Yes
Compatible Voltage	24V/36V/48V	24V/36V/48V/52V	12V/32V/48V/60V
Speed Limit	0-61km/h	0-100km/h	0-99km/h
Handle Bar Diameter	22.2mm	31.8mm/25.4mm/22.2mm (Button only supports 22.2mm)	25.4mm/22.2mm
Password	No	1919	2020
Assist Level	5	3, 5	3, 5, 9
USB for Charging	No	No	Type-C

### 5.2 Pedal Assist System (PAS)

The TSDZ mid-drive motor features a torque-sensing pedal assist system. This means the motor provides assistance proportional to the effort you put into pedaling, offering a natural and intuitive riding experience. Use the display to select your desired assist level.

### 5.3 Throttle Operation

The included thumb throttle provides on-demand power, allowing you to accelerate without pedaling. This is useful for starting from a stop or navigating steep inclines. Use the throttle judiciously to conserve battery life.

## 6. MAINTENANCE

---

- **Regular Cleaning:** Keep the motor, battery, and electrical connections clean and free from dirt and debris. Use a damp cloth; avoid high-pressure washing directly on electrical components.
- **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 extreme temperatures.
- Avoid fully discharging the battery.
- **Component Checks:** Periodically inspect all bolts, nuts, and mounting hardware for tightness. Check wiring for any signs of wear or damage.
- **Chainring and Chain:** Keep the chainring and bicycle chain clean and lubricated for optimal performance and longevity.
- **Professional Service:** For complex issues or annual checks, it is recommended to have your ebike serviced by a qualified technician.

## 7. TROUBLESHOOTING

---

### Common Issues and Solutions

Problem	Possible Cause	Solution
Motor not providing assist	Battery low or disconnected; loose electrical connections; speed sensor misalignment; display error.	Check battery charge and connection. Ensure all cables are securely plugged in. Verify speed sensor is correctly positioned and detecting magnet. Check display for error codes and consult display manual.
Display not turning on	Battery off or low; loose display cable; faulty display.	Ensure battery is turned on and charged. Check the display cable connection to the 1T4 harness. If issue persists, contact support.
Unusual noises from motor	Loose motor mounting; debris in motor; internal component issue.	Check motor mounting bolts for tightness. Inspect for any foreign objects. If noise continues, discontinue use and seek professional inspection.
Throttle not working	Loose throttle connection; faulty throttle; display settings.	Check throttle cable connection. Ensure throttle is enabled in display settings if applicable.

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

## 8. SPECIFICATIONS

---

### 8.1 Motor Performance

- **TSD-Z2B 500W Kit:** 80 N·m torque, up to 45 km/h speed.
- **TSDZ8 750W Kit:** 140 N·m torque, up to 50 km/h speed.
- **TSDZ16 1000W Kit:** 160 N·m torque, up to 55 km/h speed.

All motors are 48V compatible and designed for 68-73mm bottom brackets.

### 8.2 Battery Parameters (Optional, if purchased with kit)

Various battery options are available, each with specific capacities and dimensions. Below is a general overview; refer to your specific battery's label for exact details.

# DISPLAY SPECIFICATION

## • DZ40 Display



## • SW-M58 Display



## • EKD01 Display



	DZ40	SWM58	EKD01
Screen	High-Brightness White Digital Tube	3.8 inch High-Brightness Color LCD	2.4-inch TFT
Dimensions (L*W*H)	48mm x 27mm x 15mm	93.4mm x 56.4mm x 6.4mm	86.8mm x 50.5mm x 12.5mm
Average Speed	✗	✓	✓
Top Speed	✗	✓	✓
KMH/MPH	✓	✓	✓
Trip	✗	✓	✓
ODC	✗	✓	✓
Power Voltage	✗	✓	✓
Power Percentage	✓	✓	✓
Compatible Voltage	24V/36V/48V	24V/36V/48V/52V	12V/32V/48V/60V
Speed Limit	0-61km/h	0-100km/h	0-99km/h
Handle Bar Diameter	22.2mm	31.8mm/25.4mm/22.2mm (Bottom only supports 22.2mm)	25.4mm/22.2mm
Password	✗	1919	2020
Assist Level	5	3, 5	3, 5, 9
USB for Charging	✗	✗	Type-C

Image: Table showing various ebike battery parameters, including voltage, capacity, cell type, BMS protection, charger specifications, and dimensions for different models like Shark, G80 Max, VoltzX, Yingwu, and Hailong batteries.

### Example Battery Parameters (48V Options)

Feature	48V 13Ah	48V 16Ah	48V 20Ah
Battery Feature	48V 13Ah	48V 16Ah	48V 20Ah
Energy	624Wh	768Wh	960Wh
Cell	Grade A 18650 2600mAh	Grade A 18650 3200mAh	Samsung 21700 5000mAh
Array Mode	13S5P 65PCS	13S5P 65PCS	13S4P 52PCS
BMS Protection	30A	30A	30A
Charger	42V 3A	54.6V 2A	54.6V 3A
USB Port	5V 1A	5V 1A	5V 2A
Type-C Port	No	No	No
Size	368*90*111mm	368*90*111mm	387*90*127mm
Weight	About 4.25kg	About 4.23kg	About 4.7kg
Compatible Motor Power	250W 350W 500W 750W 1000W 1200W 1500W 2000W		
Protection Function	Overcurrent, overvoltage, overload, overdischarge, over-temperature control, short-circuit protection, and cell voltage balancing.		

## 9. WARRANTY & SUPPORT

---

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

For technical assistance, warranty inquiries, or to purchase replacement parts, please contact Varstrom customer support through the retailer where you purchased the kit or visit the official Varstrom website.

**Contact Information:** Refer to your purchase documentation or the Varstrom brand store on Amazon for the most current support contact details.