

# Tsuyo



**TSUYO MANUFACTURING PVT LTD**

## About Us

**TSUYO Manufacturing Pvt Ltd** is a subsidiary company of **JYVA Engineering Pvt Ltd**. This is a Make-In-India Start-Up company and registered as MSME in the year 2020. The company is founded by young founders who are serial entrepreneurs and professionals with more than 14 yr of corporate experience in various roles and capacities and hailing from India's top institutions like NITs and IIMs / SPJain / IIFT. They demonstrate a high expertise and knowledge in the area of product development, project management, operations, supply chain and marketing. Founding team diversified credentials and expertise make this company very competent and capable in putting forward best and innovative engineering solutions to the target customers.

We manufacture BLDC Motors with Brand, “ Tsuyo Motor” and compatible Controllers for Three Wheelers Electric vehicle like E-Auto, E-Rickshaw, E-cart, E-Loaders and others. We provide product range from 1000 W to 6000 W solutions. We are supplying leading OEMs in Three-Wheeler EV across India and also export to near Asian countries. The company also does boutique manufacturing and provide custom built solutions with in-house product development, design and testing facilities.

## Our Vision

To get into the list of Top-3 Indian EV companies and Auto-components ecosystem to provide the best powertrain solutions to Electric Vehicle OEMs in Three-Wheeler Industry.

## Our Mission

To attain & exceed customer expectations through providing innovative and custom-built solutions and creating an engineering niche.

## Our Leadership Principle

1. **Customer First:** We do maintain sufficient trust among customer for delivering the value and performance excellence while maintaining integrity.
2. **Long Term Vision:** We do hold a long-term vision and never compromise in lieu of short-term gains & quick results.
3. **Innovative & Sustainable practices:** To promote and seek to deploy and demonstrate innovative work of doing things and create sustainable business practices while maintaining benchmarked processes
4. **Best Hire & Develop:** We believe in hiring the best and develop the best capability out of our resources & team
5. **Believe in Action:** We do believe in action and maintain speed in delivering things with proper risk mitigation and care
6. **Think positive and Big:** We do believe in delivering results, no matters what is the situation or availability of resources & accomplish big goals & results to bring a turn around experience and value to our customers
7. **Corroboration, Cooperation and Collaboration (3Cs):** We do promote and seek to nurture strategic alliances for a holistic and rapid growth and scale
8. **Accountability:** We do understand our accountability towards nature and ecosystem and we strive to maintain and deliver our results without disturbing ecological balance or nature

## Products

We are manufacturing various range of BLDC Motors and compatible drives for different kind of Electric vehicles in Three-Wheeler category. We are partnered with 30yr old Design & manufacturing company in Europe to develop our custom-built solutions as per our Indian customers' requirement and products which are totally adaptable and affordable for Indian OEMs. Overall product configuration is done in view to create a robust and sustainable design for a long-term usage perspective.

### BLDC Motors and Drives for different EV applications like:

E-Auto, E-Rickshaw, E-Cart, E-loader, Golf-Cart



We at TSUYO, design and develop all kind of motors and controllers with specific parameters and attributes according to the end usage pattern and driver behaviour. Our Products are also easy to service and monitor. We finalize our products' BOM based on several re-engineering, benchmarking and supply chain feasibility way. Our motors' durability and efficiency are key highlights to look for.

Tsuyo Motors are best in class and Make-In-India Products with below key features

- ◆ High Strength to Weight Ratio Motor Body
- ◆ High RPM
- ◆ Higher Efficiency
- ◆ Regenerative Braking
- ◆ Current, Voltage & Temperature Control
- ◆ Better Cooling inside
- ◆ Hall Sensor Based
- ◆ Variable Speed
- ◆ CAN Communication
- ◆ IoT Function (Optional)

### Key Product Mix Highlights:

BLDC Motor & Controller	Type	Sine Wave
Wattage	Voltage	Application
1000 W	48 V	E-Rickshaw
1200 W	48/60 V	E-Rickshaw/E-Loader
1500 W	48/60V	E-Rickshaw/E-Loader
BLDC Motor & Controller	Type	Square Wave
1000 W	48 V	E-Rickshaw
1200 W	48/60 V	E-Rickshaw / E-Loader
1500 W	48/60 V	E-Rickshaw/E-Loader
1800 W	48/60V	E-Rickshaw/E-Loader
2000 W	48/60 V	E-Loader
2500 W	48/60 /72 V	E-Loader
3000 W	48/60/72 V	E-Loader, E-Cart
4000 W	48/60/72 V	E-Auto/Mini 4 Wheeler
4500 W	48/60/72 V	E-Auto/Mini 4 Wheeler
5000 W	48/60/72 V	E-Auto/Mini 4 Wheeler
6000 W	48/60/72 V	E-Auto/Mini 4 Wheeler

## E-Rickshaw Motor Info

These motors have been developed & tested in-house with multiple iteration and field feedback to achieve the best performing motor design with IP57 rating. Any kind of Customization is possible and extra features, product upgrade, safety features and other design requirements can be discussed and developed in-house.

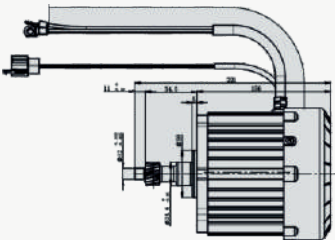
All these motors perform with average efficiency for more than 87%.



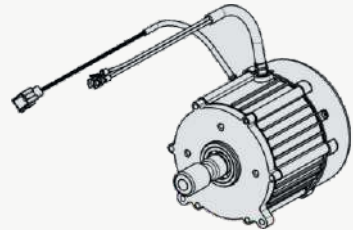
Model	Rated Power W	Voltage V	Max. Torque Nm	Max. Speed RPM	Warranty Months
MTB-10S-P	1000	48	23	3000	12
MTB-12S-P	1200	48	25	3200	12
MTB-15S-P	1500	48	29	3400	12
MTB-10T-P	1000	48	18	2850	12
MTB-12T-P	1200	48	20	3000	12
MTB-15T-P	1500	48	23	3200	12
MTB-10S-G	1000	48	16	2500	6
MTB-12S-G	1200	48	17	2650	6
MTB-15S-G	1500	48	17	2700	6
MTB-10T-G	1000	48	16	2500	6
MTB-12T-G	1200	48	17	2600	6
MTB-15T-G	1500	48	17	2650	6



## E-Rickshaw Motor Design



## 3D View of BLDC MOTOR (E-Rickshaw)



## E-Auto Motor Info

These motors have been developed and tested with European technology partner and provide best of technology and product experience. Any kind of Customization is possible and extra features, product upgrade, safety features and other design requirements can be discussed and developed in-house. All these motors perform with average efficiency for more than 95% with IP65 rating.

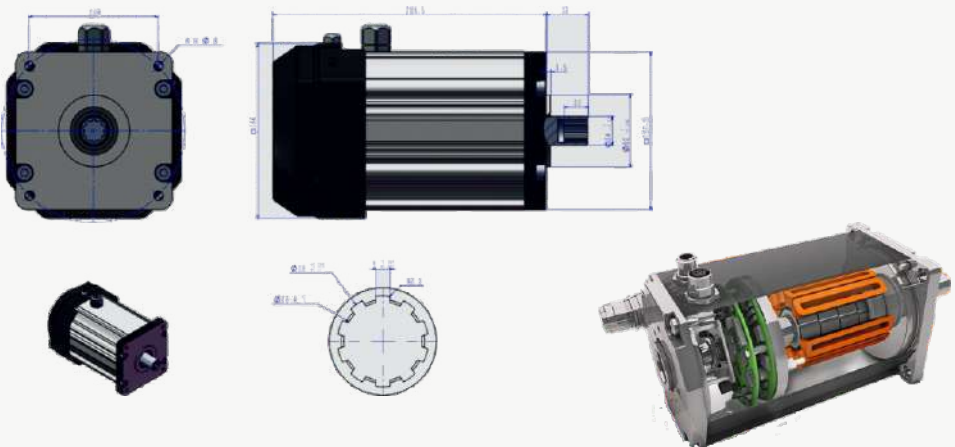


Model	Rated Power W	Voltage V	Max. Torque Nm	Max. Speed RPM	Warranty Months
ZTB-40S-P	4000	48/60	35/39	7000	36
ZTB-45S-P	4500	48/60/72	35/39/43	7000	36
ZTB-50S-P	5000	48/60	45/49	6500	36
ZTB-60S-P	5000	48/60/72	43/46/48	7500	36

### MOTOR IMAGES FOR REFERENCE



### E-Auto BLDC MOTOR Design



## Controllers

Tsuyo controllers are compatible to all in-house developed motors and perform the best in unison as the integrated powertrain unit. Programmable BLDC Motor Controller provides high efficiency, smooth and low noise control over BLDC motor. BLDC Motor Controller is having high quality Mosfets to drive the motor using PWM to achieve Efficiency >95% in most cases. Powerful Micro controller brings in comprehensive & precise control of BLDC motor during phase changes and current allocation.

### SALIENT FEATURES:

- ◆ Over temperature protection. Power limit when over temperature is sensed.
- ◆ Programmable Current limit, torque control and speed control.
- ◆ Intelligence with a powerful micro controller.
- ◆ Synchronous rectification, ultra-low drop, fast PWM to achieve very high efficiency.
- ◆ Low EMC.
- ◆ Configurable 60-degree or 120-degree hall position sensor.
- ◆ Supports any number of poles.
- ◆ Three modes of protection: brake switch, release throttle, 0-5V signals protections.



## E-RICKSHAW KIT



# Tsuyo

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