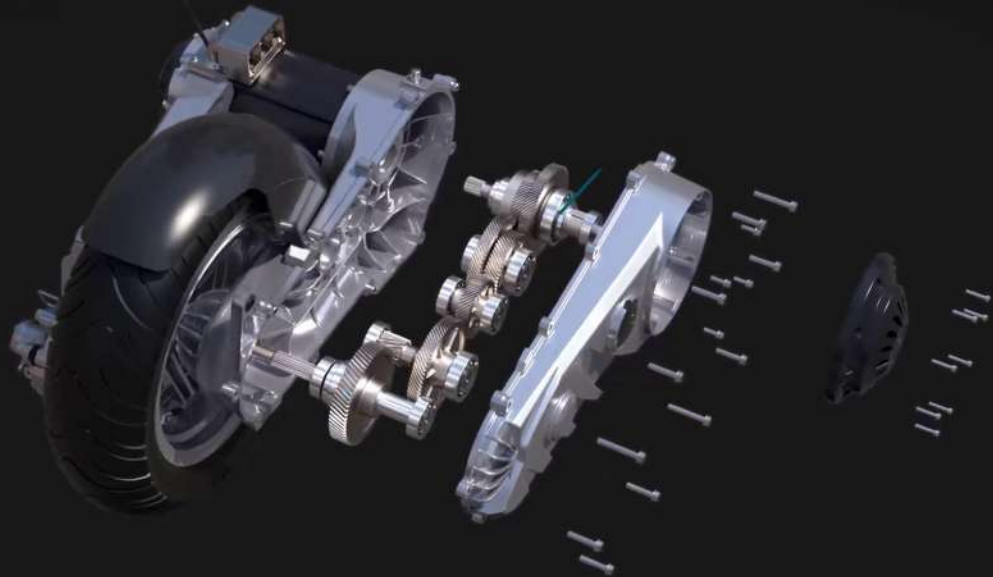


MTA ΣMTC

# 2-Speed Automatic Transmission Guide



Feel The #PowerofTwo



## SEAMLESS SHIFTS, LIMITLESS EXPERIENCE YOUR VEHICLE, OUR INNOVATION

Welcome to MTA EMTC, we envision a world where E-2W, E-3W, and E-4W vehicles revolutionize power, comfort, and efficiency. As an Indo-Korean joint venture between MT Autocraft and EMTC Co. Ltd, we specialize in designing and manufacturing of 2-Speed Automatic Transmissions for EVs in India with patented electromagnetic clutch technology.

At MTA EMTC, we are not merely designing transmissions, we are forging the future. Our unwavering commitment to innovation propels us to create cutting-edge solutions for the automotive industry. With a strong emphasis on compact design and 2-Speed Automatic Transmissions, we are rewriting the norms of what is achievable on the road.

Indulge in the excitement of our 2-Speed Automatic Transmission as it seamlessly combines advanced features like Electromagnetic clutch and continuous meshed gears. In an era of rapid transformations, MTA EMTC remains steadfast as the vanguard of innovation, reshaping the concept of "Seamless Shifts & Limitless experience".



***2-Speed Automatic Transmission***  
***#PowerofTwo***



# E1

## In-Wheel Type 2-Speed Automatic Transmission



### HIGHLIGHTS

- › In-wheel motor + gearbox integrated mechanism
- › Shifting by patented electromagnetic clutch technology
- › An optimized gear structure inside the wheel
- › Optimized for  $\geq 100\text{cc}$  2 wheelers
- › Dual speed gearbox improves gradeability, performance and range
- › Increases range upto 20%
- › Increases torque upto 50%

### APPLICATIONS

- › Mini-Scooters
- › Scooters
- › Motorcycles



### SPECIFICATIONS

ATTRIBUTES	E1 TRANSMISSION	
Gear Ratio*	First gear	1.8:1
	Second gear	1:1
Max Input Speed	Motor	890 rpm
Max Output Speed**	First gear	43 km/h
	Second gear	78 km/h
Input Torque	Motor	70 Nm
Max Output Torque	First gear	126 Nm
	Second gear	70 Nm
Efficiency	$\geq$	90%
IP Rating	-	IP67
Weight	-	18 kg
Wheel Size	inches	12" to 17"

\*Gear ratios can be altered as per vehicle requirements

\*\*Depends on motor and battery input

Disclaimer: the input parameters of motor characteristics for torque and rpm are examples taken for calculation demonstration. However, the actual specifications are subject to change according to requirements.



# E2 Series

## Mid Mount 2-Speed Automatic Transmission



### HIGHLIGHTS

- Can be used with both chain & belt systems
- Increases the road gradient climbing ability upto 50%
- Increases speed upto 50%
- Increases range upto 20%
- Shifting by patented electromagnetic clutch technology

### APPLICATIONS

- Scooters
- Motorcycles
- Heavy Duty Bikes



### SPECIFICATIONS

ATTRIBUTES	E2-1 TRANSMISSION	
Gear Ratio*	First gear	6.77:1
	Second gear	3.78:1
Max Input Speed	Motor	4200 rpm
Max Output Speed**	First gear	61 km/h
	Second gear	108 km/h
Input Torque	Motor	35 Nm
Max Output Torque	First gear	237 Nm
	Second gear	132 Nm
Efficiency	>=	90%
IP Rating	-	IP67
Weight	-	11 kg

\*Gear ratios can be altered as per vehicle requirements

\*\*Depends on motor and battery input

Disclaimer: the input parameters of motor characteristics for torque and rpm are examples taken for calculation demonstration. However, the actual specifications are subject to change according to requirements.



# E3

## Rear Mount 2-Speed Automatic Transmission



### HIGHLIGHTS

- 2-speed automatic transmission with differential
- Three-wheel gyro-system for 2 wheeler like experience on 3 wheeler Trike
- Gyro system allows smooth ride on sharp turns
- Increases range upto 20%
- Experience smooth & safe rides

### APPLICATIONS

- Scooters with three wheels



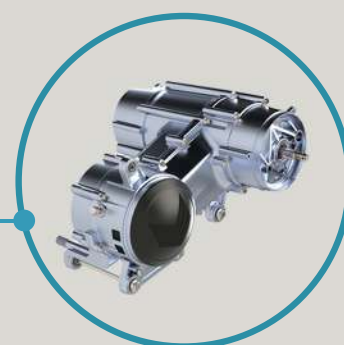
### SPECIFICATIONS

ATTRIBUTES	E3 TRANSMISSION	
Gear Ratio*	First gear	6.98:1
	Second gear	3.89:1
Max Input Speed	Motor	4200 rpm
Max Output Speed**	First gear	42 km/h
	Second gear	76 km/h
Input Torque	Motor	35 Nm
Max Output Torque	First gear	245 Nm
	Second gear	136 Nm
Efficiency	>=	90%
IP Rating	-	IP67
Weight	-	25.8 kg

\*Gear ratios can be altered as per vehicle requirements

\*\*Depends on motor and battery input

Disclaimer: the input parameters of motor characteristics for torque and rpm are examples taken for calculation demonstration. However, the actual specifications are subject to change according to requirements.



# E3-1

## Rear Mount 2-Speed Automatic Transmission



### HIGHLIGHTS

- › Differential integrated type 2-Speed Automatic Transmission
- › Automatic gear change in <0.19 second
- › Gradeability increases upto 50%
- › Increases the range upto 20%
- › Increases the speed upto 50%
- › Simplified structure using patented electromagnetic clutch technology
- › Can be used with fixed or independent drive shaft

### APPLICATIONS

- › Three wheeler passenger
- › Three wheeler cargo
- › Four wheeler-Urban Logistics Mobility
- › Light commercial vehicles upto 2.2T GVW



### SPECIFICATIONS

ATTRIBUTES	E3-1 TRANSMISSION	
Gear Ratio*	First gear	15.6:1
	Second gear	8.1:1
Max Input Speed	Motor	5000 rpm
Max Output Speed**	First gear	24 km/h
	Second gear	55 km/h
Input Torque	Motor	49 Nm
Max Output Torque	First gear	762 Nm
	Second gear	398 Nm
Efficiency	>=	90%
IP Rating	-	IP67
Weight	-	13 kg

\*Gear ratios can be altered as per vehicle requirements

\*\*Depends on motor and battery input

Disclaimer: the input parameters of motor characteristics for torque and rpm are examples taken for calculation demonstration. However, the actual specifications are subject to change according to requirements.



# E-Controllers

**MTA EMTC** motor controllers are suitable for vehicle applications with a wide range of hall and encoder version with hub motors, mid-mounted motors and high performance electric vehicles. It has high-quality MOS core, all-metal shielding and aluminum heat dissipation structure, which has a fine optimization in the hardware architecture and software implementation.

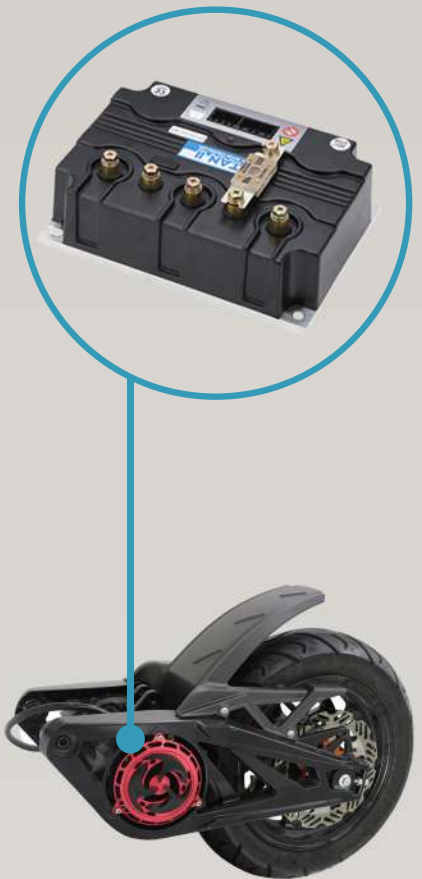
An intelligent microcontroller has matching high-precision motor angle encoder, hall sensor, as well as innovative vector control algorithms and intelligent control technology. The wide high-efficiency dynamic range enables the driving vehicle to obtain strict cruising range requirements under comprehensive road conditions. Expands and highlights the benefits of comfort and smooth performance.

## HIGHLIGHTS

- › Drive for AC Induction/ IPMSM/ BLDC/ IM Motor series
- › Field-oriented control (FOC) motor control algorithms
- › Internal battery-state-of-charge, hour meter, and maintenance timers
- › Easily programmable through the CAN-Bus tool
- › Complies with AIS 004 | SAE-J1939 | AIS038 | AIS041 | AIS156
- › Anti-slipping function on the slope to improve driving safety

## SPECIFICATIONS

Signal Name	Definition	Remark
Motor Signal	Encoder BLDC Hall sensor Signal	Sensor Based Motor
Neutral	Neutral	At that time Reverse and Forward digital signal low
CAN Bus	2.0 B	SEA-J1939
Gear Position	F/N/R and 1 & 2	Digital & Analog
Speed	Motor RPM	Come through the CAN bus Message
Odometer	Wheel RPM	Come through the CAN bus Message



## PRODUCTS



AC Motor Controller



Brushless Motor Controller



VCU Controller



PM Motor Controller



DC Motor Controller



EPS Controller



# MTA Σ MTC

## Indo-Korean Joint Venture

Beyond Excellence, A greener tomorrow MTA EMTC's aspirations transcend excellence. We're driven to elevate the quality and performance of transmissions, while also upholding our responsibility to the environment. Our strides in innovation align with resource conservation and sustainable mobility for a promising future with MTA EMTC, every satisfied customer becomes a testament to our dedication. We're not just shaping gears; we're crafting a legacy of partnership, progress, and a road ahead that's brighter than ever.

*Join Us in Shaping Tomorrow's Drive – MTA EMTC Leading Sustainability Through Innovation.*

## Connect with us

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