



## Electric Vehicle Solution

Drivetrain Catalogue

**CONNECTING THE WORLD  
THROUGH BETTER MOBILITY**



**HUNAN CRRC TIMES ELECTRIC VEHICLE CO., LTD.**

Add: Block 57, Liyu Industrial Park, Hi-tech Development  
Zone, Zhuzhou, Hunan, P.R.China  
Tel: +86 731 2261 1276  
E-mail: crctev@csrzc.com

[www.evcrcc.com](http://www.evcrcc.com)



**HUNAN CRRC TIMES ELECTRIC VEHICLE CO., LTD.**



## Content

Company Profile .....	01
Industry Chain .....	03
Comprehensive Solution .....	07
Quality Control .....	09
Market .....	11
Product .....	13



CRRC is the world's largest supplier of rail transit equipment with the most complete product lines and leading technologies. Its main businesses cover the R&D, design, manufacture, repair, sale, lease and technical services for rolling stock, urban rail transit vehicles, engineering machinery, all types of electrical equipment, electronic equipment and parts, electric products and environmental protection equipment, consulting services, industrial investment and management, asset management, import and export.

## Hunan CRRC Times Electric Vehicle Co., Ltd.

Founded in July 2007, Hunan CRRC Times Electric Vehicle Co.,Ltd(CRRC.EV below) specializes in R&D, manufacture and after sales service of electric vehicles, with an annual production capacity of 10,000 vehicles and 20,000 sets of electric drivetrain.

CRRC.EV expanded the core technology from railway to electric vehicles, such as motor, control system, converter system and network control, etc. and built a whole industry-chain platform from key components to drivetrain to batteries and to whole vehicle.

Products of CRRC.EV cover 4-18m pure electric, hybrid and fuel cell vehicles, suitable for inner and inter city transportation, highway, tourism and special application.



By 2016



**266<sup>th</sup>**

The 266<sup>th</sup> of the top  
Forbes 500 companies  
Total revenue: RMB 241.9 billion  
Overall profit: RMB 11.8 billion



**7.337**

Brand value:  
USD 7.337 billion



**190,000**

190,000 employees  
around the world



**102**

Products exported to  
102 countries and  
regions in 6 continents



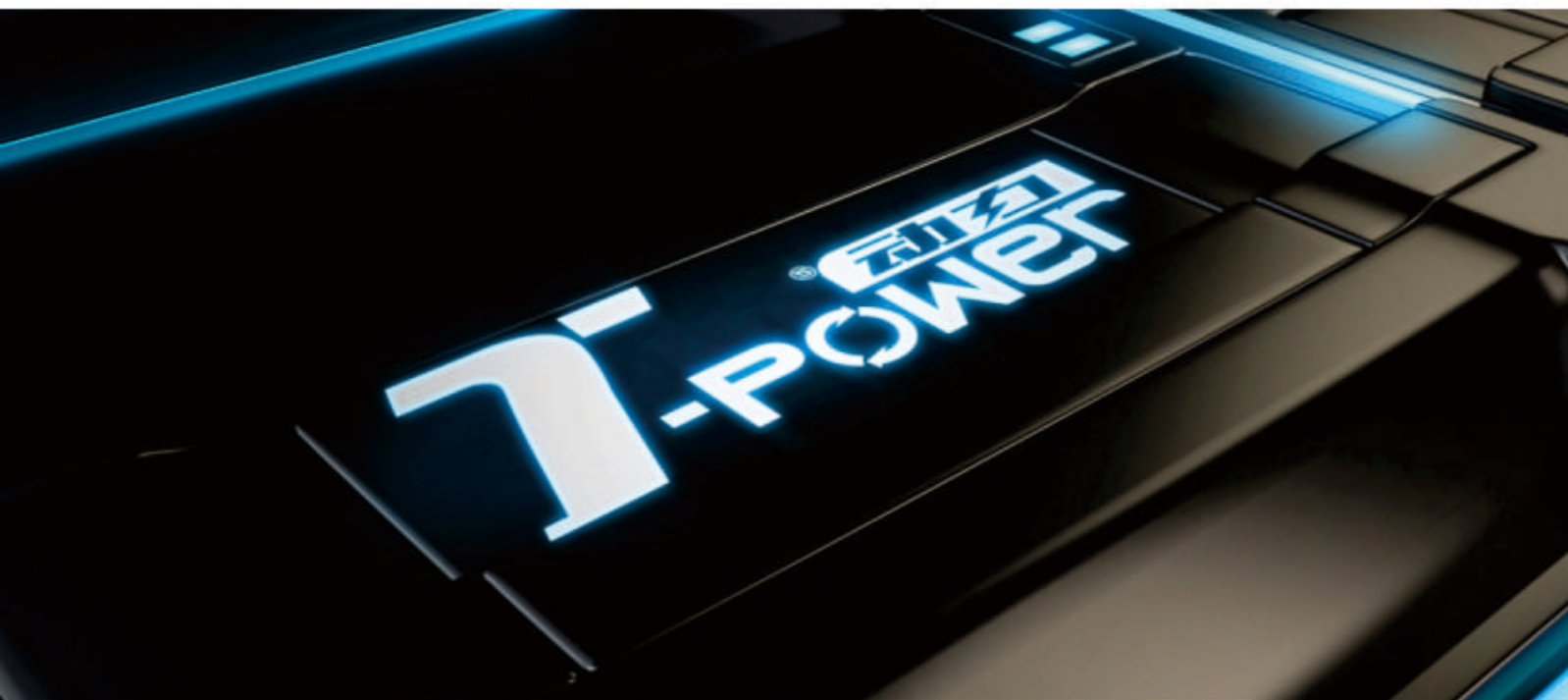
**9**

9 overseas  
R&D centers



**46**

46 wholly-owned  
subsidiaries



## IGBT

- One of the only two production lines of 8-inch IGBT chips in the world
- Technology from chip to housing

## t-Power Electric Drivetrain

### Safety

Intelligent diagnosis  
HV insulation monitoring

### Efficiency

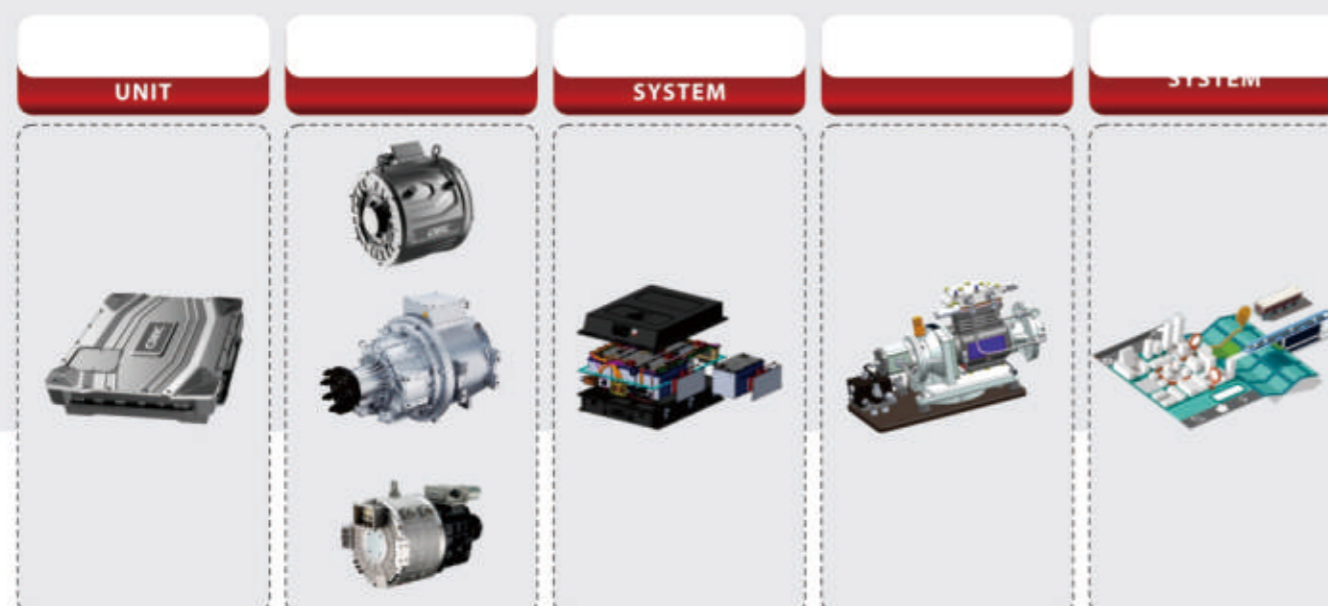
Precise vector control  
Efficient PMS motor  
Multi-module cooperative control  
Intelligence network control

### Reliability

Automobile class components  
20-year life span design  
Stringent reliability tests  
Ten years' volumn application

### Flexibility

Cloud data management  
Function modularization  
Flexible configuration



Drivetrain

25 types of motors:

- asynchronous drive motor
- permanent magnet synchronous motor
- electric excitation generator
- permanent magnet generator
- series of drive-assembly
- AMT assembly



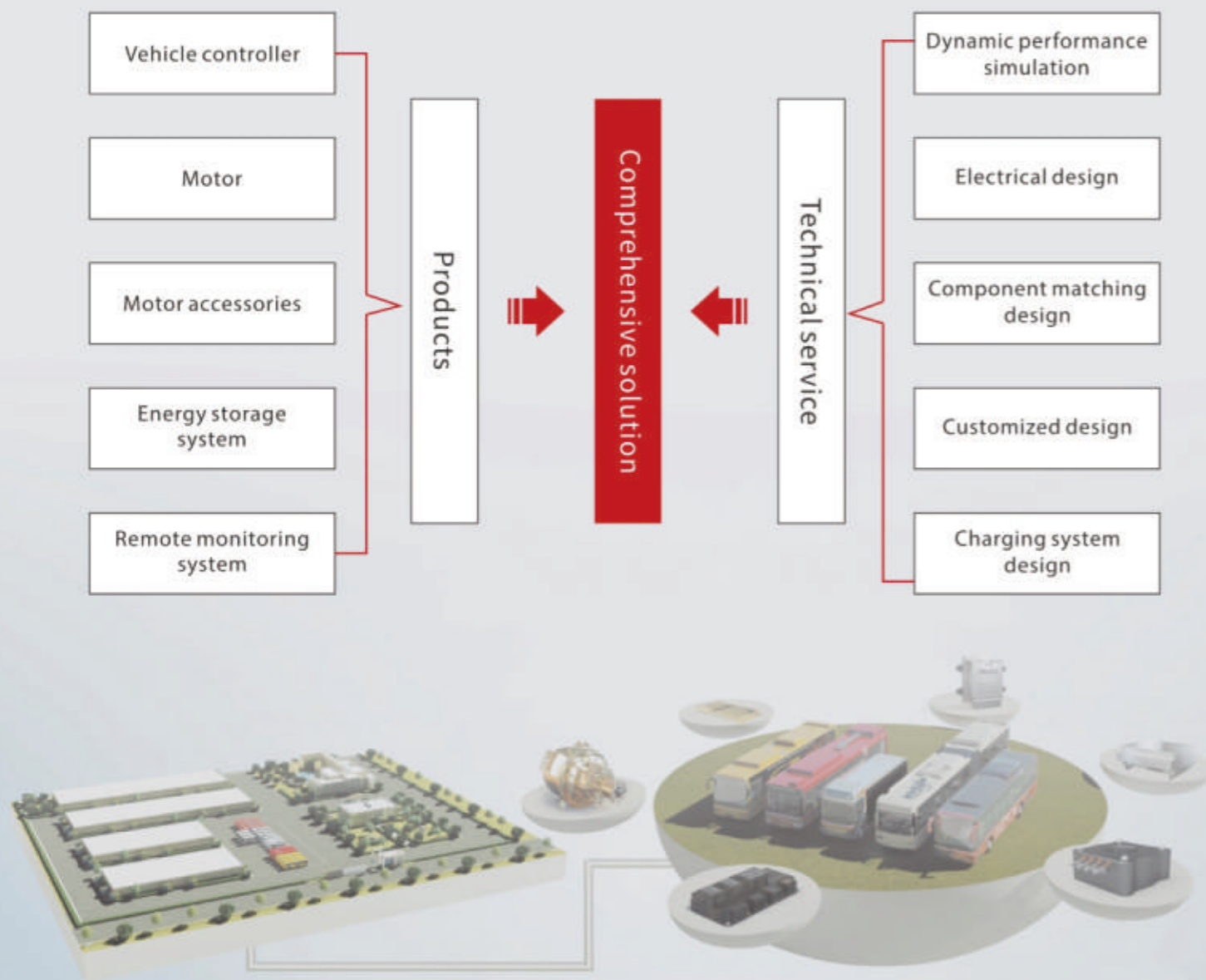
All in One Drivetrain Control Unit

- Integrate: converter for drive and auxiliaries, power distributor, and vehicle controller
- Reduce: electrical connection point, weight and volume
- Improve: reliability of the electrical connections, safety in high-voltage system



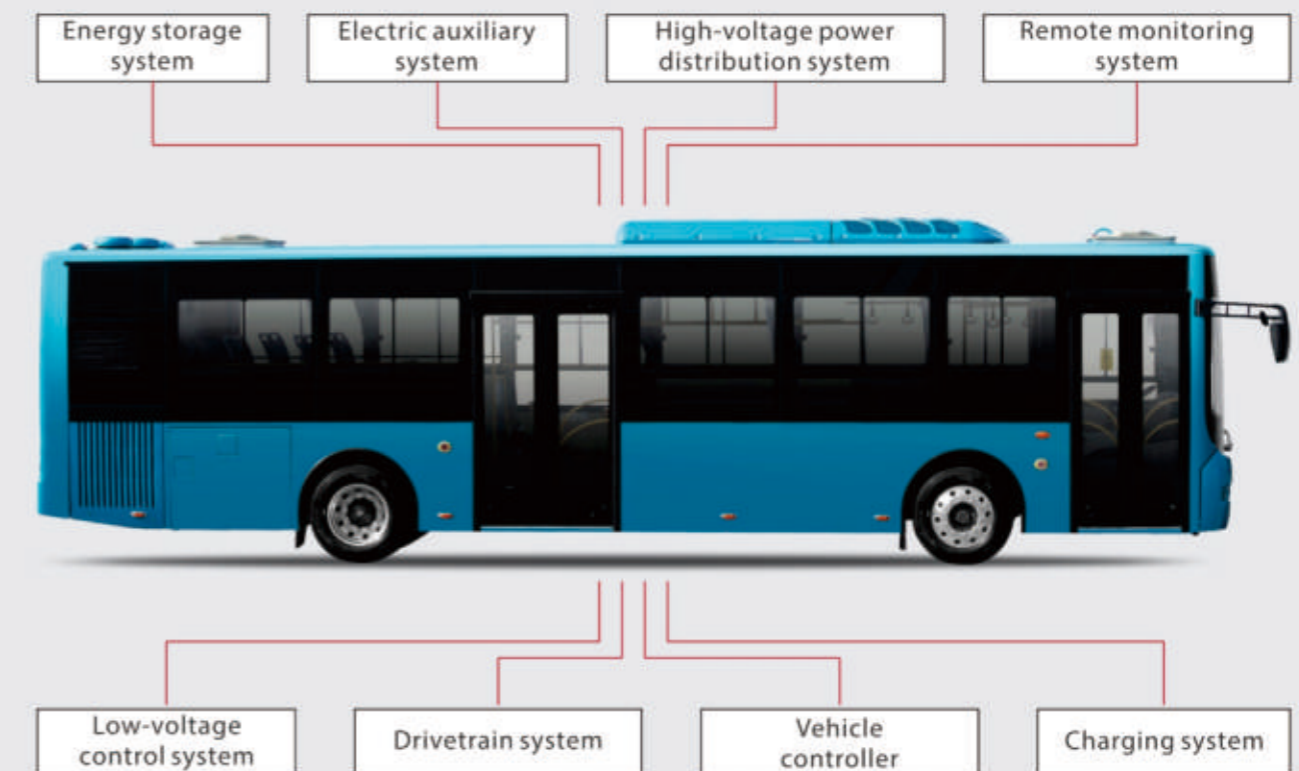
type	quantity	high-voltage connections	low-voltage connections	mechanical installation connections	weight	protection rate
discrete components	8	42	8	32	≥100kg	Ip67
t Drive-DE5	1	16	2	4	32kg	Ip67

## Comprehensive solution



## Comprehensive development and supply system

Since 2001, CRRC.EV has developed standard test and verification system. The pure electric drivetrain system has covered all types of motors, motor controllers, vehicle controllers, etc. and regulated testing and verification system including superior energy storage, electric auxiliary system.



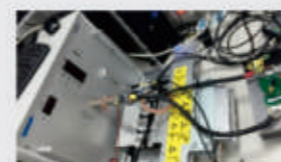
## Testing system

CRRC.EV has established the Three-level testing system(key components, systems and vehicles), including converting technology, comprehensive lab, EMC lab, harmonic flash testing lab, environmental testing lab, IT application lab, EV testing lab and etc.



### Component

Comprehensive performance test of IGBT module



The electrical performance test of capacitor



Comprehensive performance test of sensor



### System

System dynamic characteristic test



Network control test



Motor performance test



Energy storage test



### Environment

Vibration environment test



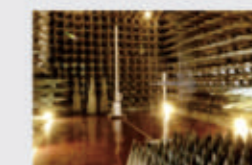
High temperature and humidity test



Waterproof test



EMC test



## Ten-year operation experience

By the end of 2016, 50,000 sets of electric drivetrain system and key components were sold, product service covers areas like Beijing, Hunan, Guangdong, Hebei, Shanxi, Guangxi, Yunnan, Hainan, Guizhou, Taiwan and successively reaches out to North America, Newzeland, Brazil and other overseas market.

10 years

Stable operation

50000 sets

Electric drive system and key components



2001

Member of National High-tech R&D program (863 program in China)

2003

The first pure electric bus in Hunan Province

2004

The second electric bus pilot operation line in China

2007

CRRC EV founded

2008

Contribute to Beijing Olympic Games

2010

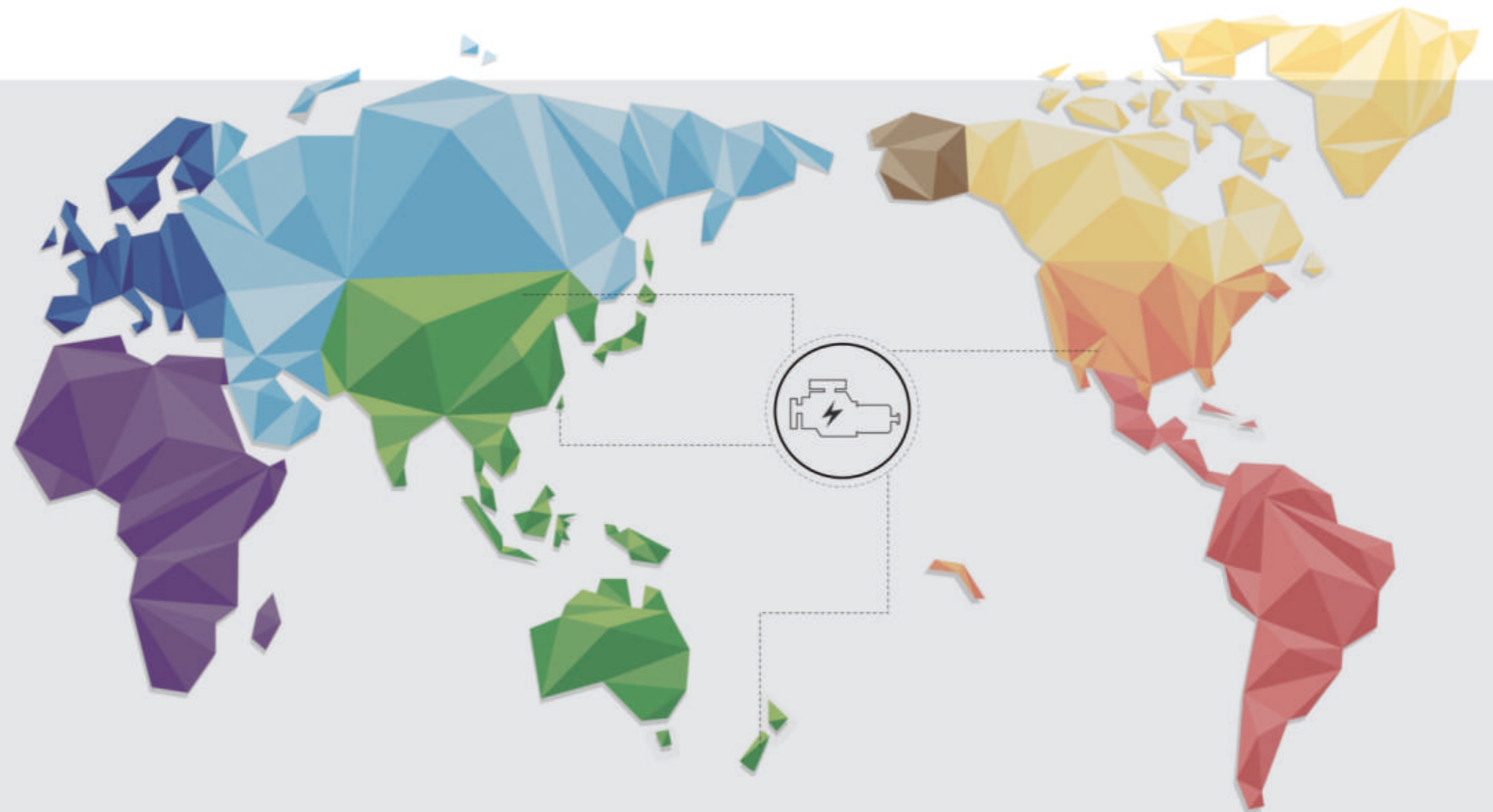
Contribute to Shanghai World Expo

2014




National strategic innovation products: extended-range plug-in bus and dual source dual charge bus

2016

First fuel cell truck developed with a Canada company



## Control Unit

Controller and control assembly			
Product series	Tp5 series control assembly		Tp4 series controller
Product model	DE5	DM5	DM12
Outlook			
Functions	VCU, drive, power distribution, DC/DC, oil pump, air pump, insulation detection	drivetrain	drivetrain
Applicable vehicle	Bus, logistics, sanitary vehicle	Bus, logistics, sanitary vehicle	Bus, logistics, sanitary vehicle
Rated Capacity(KVA)	120	120	30
Max. capacity (KVA)	200	200	70
Working voltage range (V)	200 ~ 720	250 ~ 720	240 ~ 420
Continuous operating Current(A)	260	260	85
Max. working voltage (A)	400	400	140
Output frequency range(Hz)	0 ~ 600	0 ~ 600	0 ~ 600
Power supply voltage(V)	12/24	12/24	12
Operating temperature(°C)	-40 ~ +85	-40 ~ +85	-40 ~ +85
cooling method/Cooling medium flow (L/min)	Liquid cooling/15	Liquid cooling/15	Liquid cooling/20
Dimensions(mm)	565×515×205	388×308×140.5	295×275×105
Weight(kg)	35	15	7
Protection rate	IP67	IP67	IP67

Controller and control assembly				
Product series	Tp4s System control assembly		Tp4s System controller	
Product model	DE1	DE2	TVN7	DKQ108
Outlook				
Functions	VCU, drive, power distribution, DC/DC, oil pump, air pump, insulation detection	VCU, drive, power distribution, DC/DC, oil pump, air pump, insulation detection	drivetrain	drivetrain
Applicable vehicle	Bus, logistics, sanitary vehicle	Bus, logistics, sanitary vehicle	Bus, logistics, sanitary vehicle	trolley bus
Rated Capacity(KVA)	200	120	200	150
Max. capacity (KVA)	300	200	300	300
Working voltage range (V)	250 ~ 720	250 ~ 720	250 ~ 720	250 ~ 800
Continuous operating Current(A)	390	260	390	280
Max. working voltage (A)	600	400	600	450
Output frequency range(Hz)	0 ~ 600	0 ~ 600	0 ~ 600	0 ~ 500
Power supply voltage(V)	12/24	12/24	12/24	24
Operating temperature(°C)	-40 ~ +85	-40 ~ +85	-40 ~ +85	-40 ~ +55
cooling method/Cooling medium flow (L/min)	Liquid cooling/15	Liquid cooling/15	Liquid cooling/15	Air cooling
Dimensions(mm)	670x630x180	688x388x177	498x417x182	709×466×420
Weight(kg)	75	40	36	86
Protection rate	IP67	IP67	IP67	IP56

## Motor and drivetrain



Product series	Direct drive motor					
Product model	tDriver-MD2000	tDriver-MD2007	tDriver-MD2001	tDriver-MD2009	tDriver-MD31	tDriver-MD2017
Outlook						
Applicable vehicle	6~7 meter bus	8 meter bus	8 meter bus	8~10 meter bus	10~12 meter bus	10~15 meter logistics
Rated/Peak torque	358/1000N.m	557/1500N.m	636/1700N.m	887/2000 N.m	1057/2500 N.m	1200/3000N.m
Rated/Peak power	60/100kW	70/135kW	90/150kW	65/135kW	100/150kW	150/220kW
Rated/Peak current	143/400A	149/400A	150/400A	177/400A	169/400A	240/560A
Overload factor	2.7933	2.6930	2.6729	2.2548	2.3652	2.3652
Working temperature	-40~85	-40~85	-40~85	-40~85	-40~85	-40~85
Cooling method	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling
Dimensions	Φ340x417	Φ445x306	Φ460*380	Φ460*380	Φ460*400	Φ460x400
Weight	148	160	208	228	258	262
Protection rate	IP67	IP67	IP67	IP67	IP67	IP67

Product series	Direct drive motor				
Product model	tDriver-MD2010	tDriver-MD2015	tDriver-MD2018	tDriver-MD2008	tDriver-MD2017
Outlook					
Applicable vehicle	2.5t logistics	4.5~6t logistics	6~8t logistics	6~8t logistic car	10~15t logistics
Rated/Peak torque	64/180N.m	201/450N.m	330/760 N.m	418/800 N.m	1200/3000N.m
Rated/Peak power	25/45kW	40/90kW	45/100kW	70/100kW	150/220kW
Rated/Peak current	92/260A	156/350A	143/330A	209/400A	240/560A
Overload factor	2.8125	2.2388	2.3030	1.9138	2.3652
Working temperature	-40~85	-40~85	-40~85	-40~85	-40~85
Cooling method	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling
Dimensions	Φ232*270	Φ306*415.5	Φ340x417	Φ340x417	Φ460x400
Weight	47	150	130	130	262
Protection rate	IP67	IP67	IP67	IP67	IP67

Product series	Integrated motor with gear box			Integrated motor with AMT	
Product model	tDriver-MD2012	tDriver-MD2014	tDriver-MD2002	tDriver-MD2004D+4D500	tDriver-MD2002J1+4D1000
Outlook					
Applicable vehicle	10~12meter bus	8~10meter bus	8~12meter bus	8~10meter bus	10~12meter bus
Rated/Peak torque	250/550N.m	300/700N.m	1057/3800N.m	335/500 N.m	340/900 N.m
Rated/Peak power	45/70kW	75/130kW	100/150kW	70/120kW	100/150kW
Rated/Peak current	182/400A	184/430A	151/400A	174/260A	151/400A
Overload factor	2.2	2.3333	2.6490	1.4925	2.6470
Working temperature	-40~85	-40~85	-40~85	-40~85	-40~85
Cooling method	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling	Liquid cooling
Dimensions	Φ402x202	Φ445x306	634x470x473	238x433x479	709x346x630
Weight	80	110	177	151	285
Protection rate	IP67	IP67	IP67	IP67	IP67
Remark	Near wheel motor	Integrated axle motor	Planetary deceleration assembly	—	—

## Drivetrain for 2 -3.5t logistics



### Parameter<<

Motor: MD2010

Torque : 80/200N.m

Speed : 3000/9000rpm

Power : 25/50kW

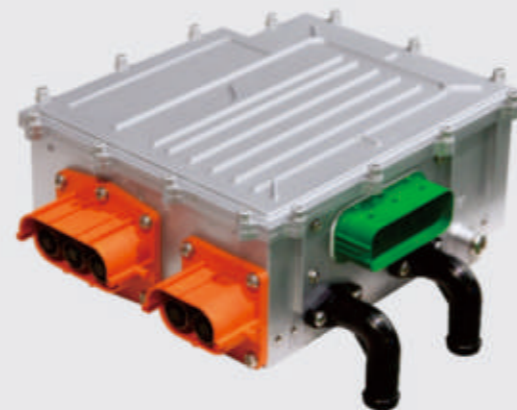
Controller: DM12

Capacity : 80KVA

Input voltage : 250-420V



Motor: MD2010



Controller: DM12

## Drivetrain for 4.5 -5.5t logistics



### Parameter<<

Motor: MD2008

Torque : 358/800N.m

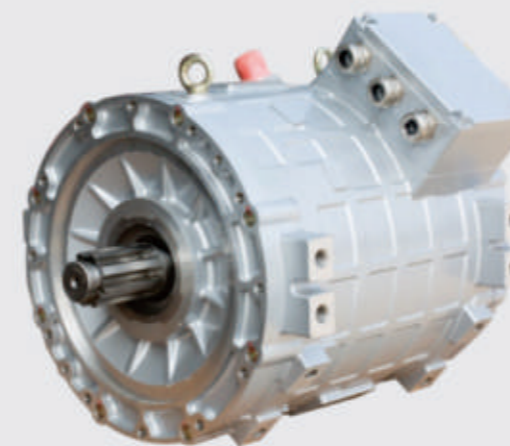
Speed : 1600/4000rpm

Power : 60/100kW

Controller: DM5

Capacity : 100/150KVA

Input voltage : 250-720V



Motor: MD2008



Controller: DM5

## Drivetrain for 7-10t logistics



### Parameter<<

Motor: MD2000

Torque : 358/1000N.m

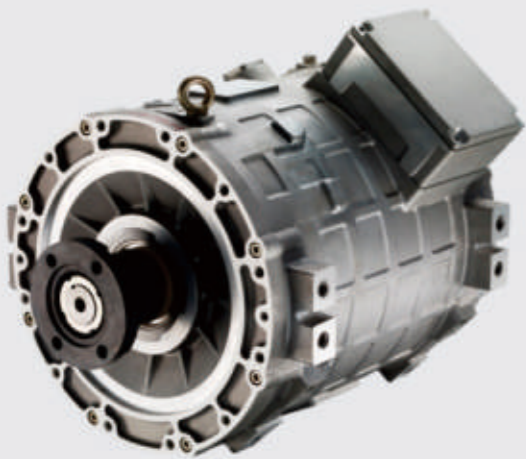
Controller: DM5

Capacit : 100/150KVA

Speed : 10000/3600rpm

Input voltage : 250-720V

Power : 80/130kW



Motor: MD2000



Controller: DM5

## Drivetrain for 15t vehicle



### Parameter<<

Motor: MD2017

Torque : 1200/3000N.m

Control assembly: DE5

Capacity : 100/150KV

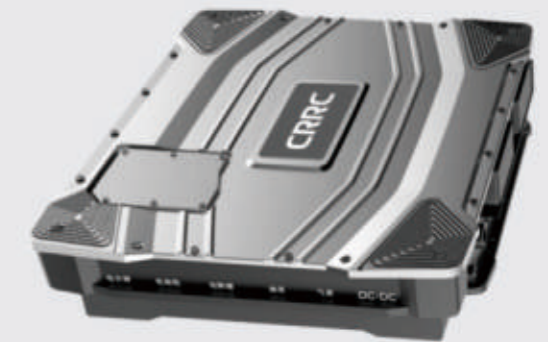
Speed : 3300rpm

Input voltage : 250-720V

Power : 150/220kW



Motor: MD2017



Control assembly: DE5

## Drivetrain for 8-9m bus



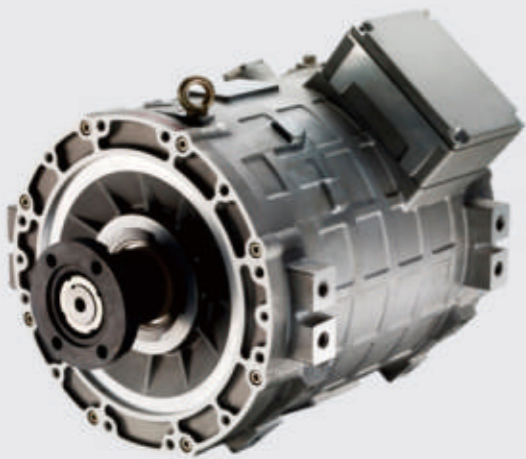
### Parameter<<

Motor: MD2007/  
MD2001/ MD2009

Torque : 611/1500-2000N  
Speed : 1000/3000rpm  
Power : 80/130kW

Controller: DM5

Capacity : 100/150KVA  
Input voltage : 250-720V



Motor: MD2007



Controller: DM5

## Drivetrain for 10-12m bus



### Parameter<<

Motor: MD31

Motor: MD2002

Torque : 1057/3000N.m  
Speed : 3600rpm  
Power : 100/150kW

Control assembly: DE5

Motor controller: DM5

Capacity : 100/150KVA  
Input voltage : 250-720V



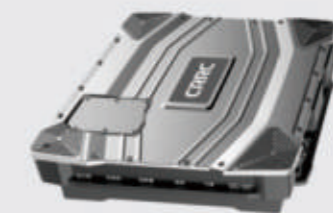
Motor: MD2002



Motor: MD31



Motor controller: DM5



Control assembly: DE5

## Drivetrain for 8-9m coach



### Parameter<<

AMT power assembly:  
MD2004+4D500

Power : 70/120kW

Torque : 320/500N.m

Speed : 2090/6000rpm

First gear : 4.655  
Second gear : 2.731

Third gear : 1.441  
Fourth gear : 1.0

Controller: DM5

Capacity 100/150KVA

Input voltage : 250-720V



AMT: MD2004+4D500



Controller: DM5

## Drivetrain for 10-12m coach



### Parameter<<

AMT powertrain:  
MD2004+4D1000

Power : 70/120kW

Torque : 320/500N.m

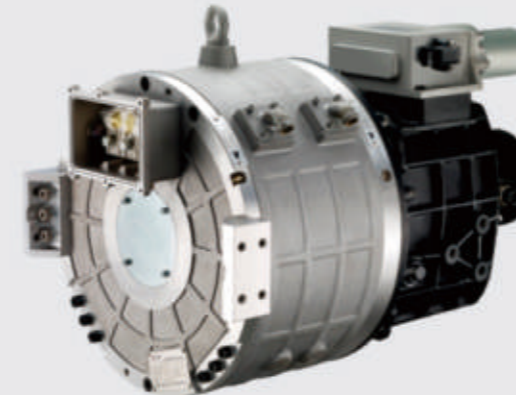
Speed : 2090/6000rpm

First gear : 4.396  
Second gear : 2.427

Third gear : 1.483  
Fourth gear : 1.0

Control assembly: DE5  
controller: DM5

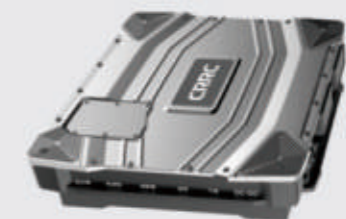
Capacity : 100/150KVA  
Input voltage : 250-720V



AMT: MD2004+4D1000



Motor controller: DM5



Control assembly: DE5