

# Electric Drive System Solutions for Electric Vehicles

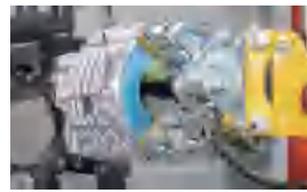
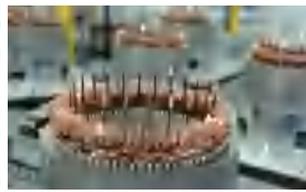
## R&D Center Laboratory

- 6 functional areas
- 14 laboratories
- More than 150 items are subject to test



## Manufacturing

By introducing advanced automated production equipment and new intelligent manufacturing technologies, we have achieved visual management of the entire product life cycle and manufacturing process, which can improve the production efficiency and ensure the product quality.



## Product Introduction

### EV Traction Motors

The series platform motors feature high speed, high efficiency and high power density, meeting the demands of passenger vehicles and commercial vehicles; the torque density is increased by 30% by upgrading the round wire motor to a hairpin flat copper solution.

#### High slot fill factor

With the hairpin solution, the slot filling factor and copper filling factor are improved, the copper consumption is increased, now the slot filling rate is as high as 85%

#### High speed

Optimize the rotor design to increase the peak speed of the motor, with the rotation speed of 220 platform reaching 20,000 rpm

#### Optimized magnetic pole structure

Adopting high reluctance torque design concept, double V-shaped magnetic circuit structure, V-shaped oblique pole method, improve NVH, increase the efficiency and reduce mechanical stress

#### high voltage

Upgrade the high-voltage platform to increase power; Adopt stator oil-through + rotor oil-swing cooling to improve heat dissipation and bearing lubrication, and increase continuous power density



## MCU



All-in-one electric control platform

MCU+OBC+DCDC+PDU

Passenger vehicle single electric control platform

100kw~120kw  
150kw~170kw

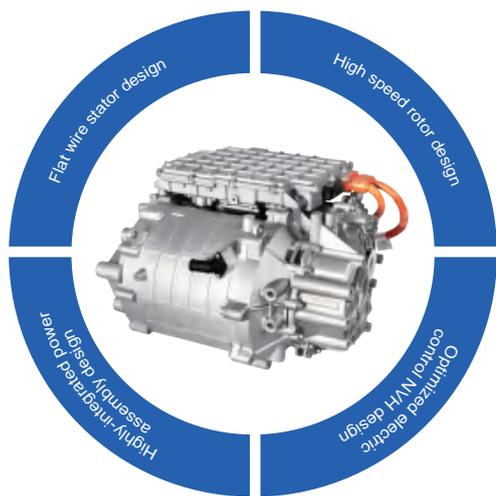
Dual electric control platform

60kw power generation + 120kw electric

Commercial vehicle electric control platform

Medium power: 120kw/180kw/220kw  
High power: 250kw/350kw/450kw

## Powertrain



The power assembly products cover 40 ~ 200Kw, and the input torque covers 1000 ~ 5000Nm, combining platform-based and customized products, covering all types of vehicles.

Platform-based products					
Power assembly model	P40	P70	P120	P170	P190
Rated voltage,VDC	350	350	360	380	380
Peak current,Arms	190	270	500	500	530
Wheel end peak power,kW	40	70	120	170	195
Wheel end rated power,kW	17	28	50	70	85
Wheel end peak speed,rpm	1085	1193	1284	1355	1425
Wheel end peak torque,Nm	1317	1633	2568	3700	3920

### 01

#### Flat wire stator design

The slot fill rate and copper fill factor are improved with the 6-layer flat wire hairpin solution, the copper consumption is increased, and the slot fill rate is as high as 85%, which effectively increases the copper consumption, reduces losses and improves motor efficiency. The motor power density is increased by more than 30% compared with ordinary round wire motors

### 02

#### High speed rotor design

Optimize the pole-slot ratio, adopt the high reluctance torque design concept, double V-shaped magnetic circuit structure, improve NVH, and increase efficiency; optimize the rotor magnetic bridge design to meet performance requirements while improving the punching strength and peak speed, the maximum rotor speed reaches 20,000 rpm

### 03

#### Optimized electric control NVH design

The electric control is subject to multiple control optimization strategies such as voltage gain overmodulation, active anti-jitter, harmonic injection, random carrier frequency, etc. to reduce noise and vibration, and improve the NVH performance of the assembly

### 04

#### Highly-integrated power assembly design

The motor and reducer share the same housing and shaft, with fewer bearings and parts, which greatly reduces the size and weight of the assembly and effectively improves NVH

## Application



Buses



Passenger Vehicles



Logistics Vehicles



Mining Vehicles



Racing Cars



Engineering Vehicles



sport utility vehicle



Agricultural Vehicles



Public Buses

## | Physis Headquarters



Established in 2001, Ningbo Physis Technology Co., Ltd. (referred to as Physis) is committed to the innovation and industrialization of electric drive technology of "high efficiency, energy saving and precise control" as the core, and is providing system products and comprehensive solutions for the fields of motion control and energy conversion. After years of brand accumulation, Physis has developed into a group-based high-tech enterprise integrating R&D, production and sales and possessing many holding subsidiaries of global.

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