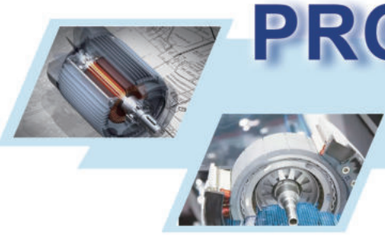
Lcgk®
联创高科



PRODUCT MANUAL

PMSM

Energy saving permanent magnet drive for ever

Shandong Lianchuang Gaoke Automation Co., Ltd.

Yanzhuang Industrial Zone, Gangcheng District,
Jinan, Shandong Province,China

www.lcgkvfd.com

400-138-3099

0086 15806535521

Shandong Lianchuang Gaoke Automation Co., Ltd.

CONTENTS

01 Company Introduction P01-P02

02 PMSM Advantage P03-P04

03 Product and Technology P05-P12

04 Product Introduction P13-P18

05 Company Case P19-P20

Honor

COMPANY

Introduction

Shandong Lianchuang High tech Automation Co., Ltd. was established in 2014. It is a high-tech enterprise specializing in the research and development, production, and sales of frequency converters and permanent magnet synchronous motors. The company covers an area of 37 acres and has more than 21000 square meters of self owned factory buildings. The company has passed the national level "High tech Enterprise", "Jinan City Specialized, Refined, Unique and New", "Provincial Specialized, Refined, Unique and New", and municipal level "Gazelle Enterprise" certification. The company has successively won various honorary titles such as the district level "Industrial Enterprise Contribution Award", "Advanced Enterprise in Science and Technology Innovation", "Excellent Innovation and Entrepreneurship Enterprise", and "One Enterprise, One Technology R&D Center". It has also passed various qualification certifications such as "ISO9001 Quality System Certification", "Intellectual Property Management System Certification", Export EU "CE Certification", "Software Copyright Certification", and "Integration of Informatization and Industrialization". The company's soft power has laid a solid foundation for its future development.

The enterprise has 9 invention patents, 32 utility model patents, 4 design patents, and 6 software copyrights. There are a total of 152 employees, including over 20 research and development technicians. The company has 182 sets of various frequency converters and permanent magnet motor production and testing equipment, dedicated to providing customers with high-quality products and comprehensive services.

At present, 10 regional sales centers and transfer warehouses in Xi'an, Zhengzhou, Wuhan, Shenyang, Xinjiang and other places have been established nationwide, with a complete sales network layout and timely and effective service response to meet customer needs.

PMSM Advantage

·Efficient and energy-saving

Permanent magnet synchronous motor is a widely used type of motor with a simple structure, high reliability, high average efficiency, low temperature rise, small size, and light weight;

·High quality, stable and reliable

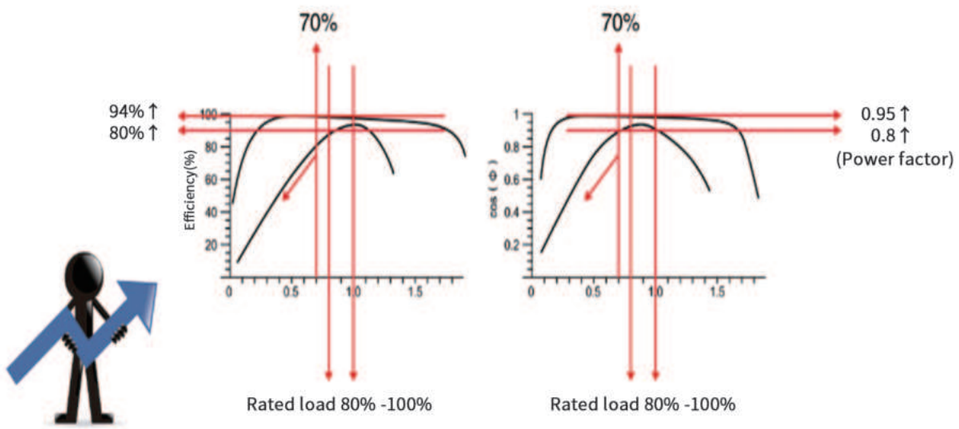
This product has stable performance, smooth operation, and greatly reduces the maintenance work for users in the later stage. In addition, this product has the advantages of low operating noise, low vibration, good starting performance, high torque, low operating temperature, and long service life;

·Cost-effective

The performance is comparable to international brands, with high-quality products, domestically produced patented designs, compact structure, beautiful appearance, strong applicability, high universality, and easy use and maintenance;

·Standard certification, quality assurance

Scientific quality system guarantee, authoritative certification guarantee! The product combines sophisticated professional equipment and patented production processes to ensure that it meets standards and customer requirements.



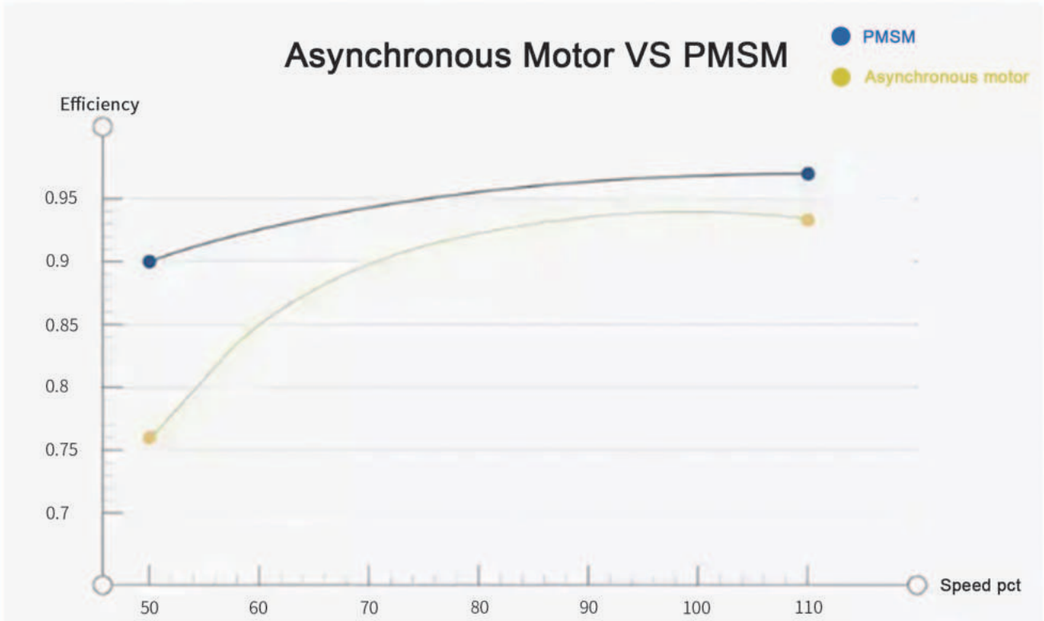
PMSM and AC Motor

Ordinary motor

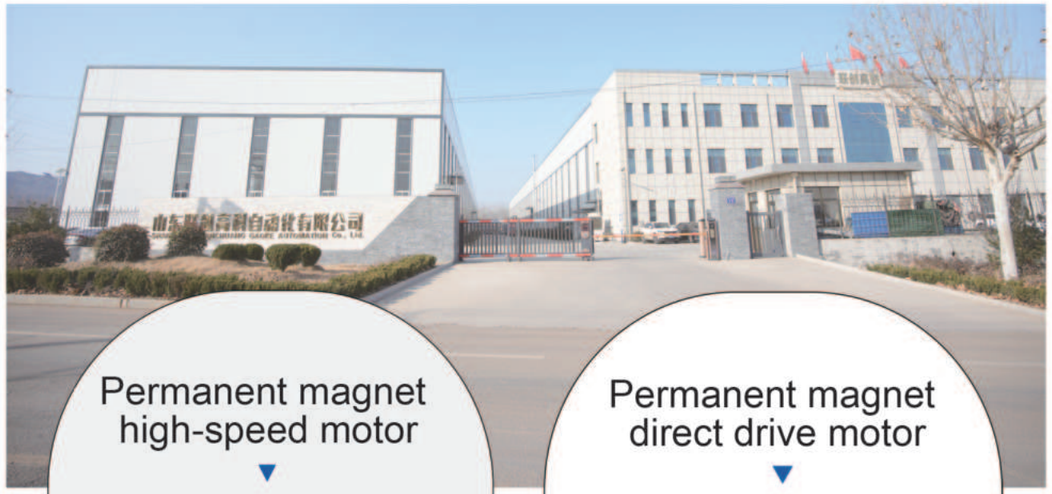
The stator coil of the motor is energized to generate a rotating magnetic field → the magnetic field cuts the rotor, and the rotor generates alternating current → the alternating current of the motor rotor generates a magnetic field → the fixed magnetic field drives the rotor magnetic field to rotate

PMSM

The stator coil of the motor is energized to generate a rotating magnetic field → the rotating magnetic field of the stator drives the rotor permanent magnet to rotate with its own magnetic field



Products and technology



Permanent magnet high-speed motor

Efficient and energy-saving, low noise, minimal vibration, capable of stable operation under various working conditions

Permanent magnet direct drive motor

Simplify the transmission system structure, improve efficiency, reduce noise, facilitate installation

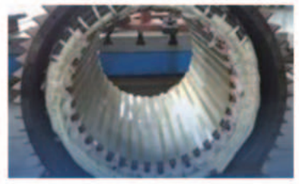
Coil vacuum pressure impregnation technology& Epoxy resin vacuum sealing technology

01 Improve the overall strength of the coil to prevent end short circuits

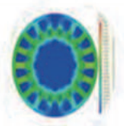
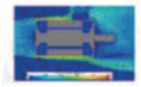
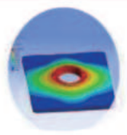
02 Improve the waterproof performance of the coil and enhance the insulation level

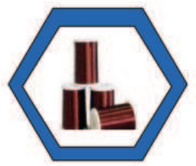
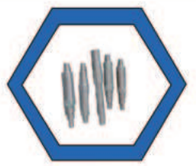
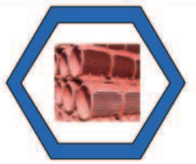
03 Prevent corona phenomenon and extend coil life

04 Improve motor heat dissipation capability and reduce motor temperature



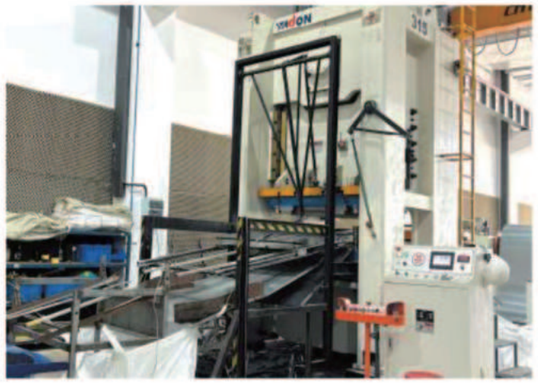
Products and technology

International leading electromagnetic and mechanical simulation technology Ensure high operating efficiency, low temperature, stability and reliability of permanent magnet motors.	
	Magnetic field lines and magnetic density distribution map
	Electromagnetic field analysis model
	Analysis of end cap stress
	Temperature distribution cloud map of permanent magnet direct drive motor
	Cloud map of cooling water velocity streamline
	Motor heat dissipation cloud map

High quality component selection and configuration		Adopting high-temperature resistant rare earth neodymium iron boron permanent magnets from listed companies
		H-grade insulation grade enameled wire
		The small motor shaft is made of 40Cr quenched and tempered material The large motor shaft adopts 42CrMo
		The fixed rotor iron core adopts Wuhan Iron and Steel High Performance Silicon Steel Sheet
		SKF imported brand bearings
		Small motor: made of ductile iron QT500 Large motor: welded shell

Products and technology

The company is equipped with advanced manufacturing and production equipment, and has a talent structure including research and development technology, quality management, and innovative thinking. It can design motors of different specifications and models for customers. In addition, the company is equipped with corresponding inspection equipment at every stage to ensure the quality of each motor during the production process and before leaving the factory, reducing quality defects caused by human factors.



Punch press

Gantry machining center

Permanent magnet motor test bench

Balancing Machine

Vacuum pressure impregnation device

Car milling composite machining center

Voltage resistance tester

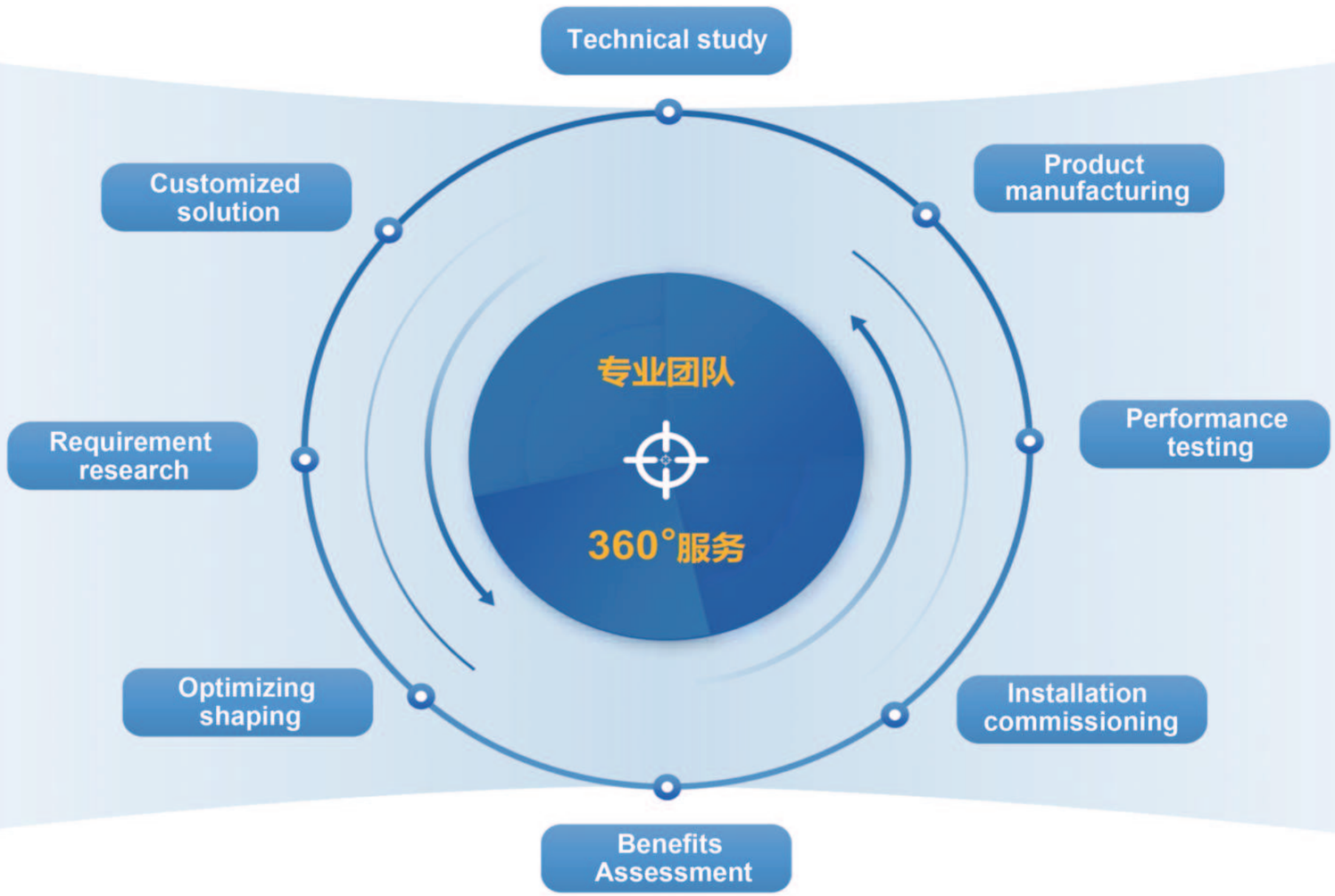
Magnetic flux tester

Winding machine

Press machine

Products and technology

Customized product development process



Product introduction

PMSM

Rated power(Kw): 1.5-355

Frame No: Refer the right image

RPM: 0-3000

IP code: IP55

Pole number: 6/8/12

Cooling type: Self cooling

Product Introduction:

Permanent Magnet Synchronous Motor (PMSM) is a type of synchronous motor that uses permanent magnets to generate a magnetic field, and its rotor speed is kept consistent with the current frequency of the stator winding.

Structure:

A permanent magnet synchronous motor is mainly composed of components such as stator, rotor, and end cover. The stator is made up of stacked sheets to reduce iron loss during motor operation, and it is equipped with three-phase AC windings called armature. The rotor can be made in solid form or pressed from laminated materials, and is equipped with permanent magnet materials. According to the different positions of the permanent magnet material on the motor rotor, permanent magnet synchronous motors can be divided into two structural forms: protruding and built-in. The magnetic circuit structure of the protruding rotor is simple and the manufacturing cost is low, but due to the inability to install starting windings on its surface, asynchronous starting cannot be achieved.

Application areas:

Permanent magnet synchronous motors have been widely used in medium and low voltage motors in industries such as metallurgy, ceramics, rubber, petroleum, textiles, wind power, electric vehicles, and construction machinery.

QLP Series performance parameters (750r/min)

Model	Rated voltage (V)	Rated power (kW)	Rated current (A)	Synchronous speed (r/min)	Rated torque (N.m)	Efficiency η(%)	Power factor (cosφ)	Frequency (Hz)
QLP100L-8	380	1.5	2.7	750	19.1	87.2	0.96	50
		2.2	4		28	88.1		
QLP112M-12		3	5.3		38.2	88.9		75
		4	7		50.9	90.1		
QLP132S-12		5.5	9.6		70	90.9		
QLP132M-12		7.5	13		95.5	91.5		
QLP160M-12		11	18.8		140.1	92.7		
QLP160L-12		15	25.4		191	93.3		
QLP180M-12		18.5	31.3		235.6	94		
QLP180L-12		22	36.8		280.1	94.5		
QLP200L-12		30	50.1		382	94.7		
QLP225S-12		37	61.6		471.1	95		
QLP225M-12		45	74.8		573	95.2		
QLP250M-12		55	91.2		700.3	95.4		
QLP280S-12		75	124		955	95.6		
QLP280M-12		90	149		1146	95.6		
QLP315S-12		110	184		1400.7	94.7		
QLP315M-12		132	220		1680.8	94.9		
		160	266		2037.3	95.1		
QLP315L-12		185	307		2355.7	95.3		
		200	332		2546.7	95.4		
QLP355M-12		250	415		3183.3	95.4		

QLP Series performance parameters (1000r/min)

Model	Rated voltage (V)	Rated power (kW)	Rated current (A)	Synchronous speed (r/min)	Rated torque (N.m)	Efficiency η(%)	Power factor (cosφ)	Frequency (Hz)
QLP100L-8	380	2.2	3.8	1000	21	90.9	0.96	66.6
		3	5.2		28.7	91.8		
QLP112M-12		4	6.8		38.2	92.7		100
QLP132S-12		5.5	9.3		52.5	93.4		
		7.5	12.6		71.6	94		
QLP132M-12		11	18.4		105.1	94.5		
QLP160M-12		15	25		143.3	94.9		
QLP160L-12		18.5	30.7		176.7	95.3		
QLP180L-12		22	36.4		210.1	95.6		
QLP200L-12		30	49.6		286.5	95.8		
		37	61		353.4	96		
QLP225S-12		45	74		429.8	96.2		
QLP225M-12		55	90.4		525.3	96.3		
		75	123		716.3	96.4		
QLP280S-12		90	148		859.5	96.5		
QLP280M-12		110	182		1050.5	95.8		
QLP315S-12		132	218		1260.6	96		
		160	263		1528	96.2		
QLP315M-12		185	304		1766.8	96.2		
		200	329		1910	96.3		
QLP315L-12		220	361		2101	96.4		
		250	410		2387.5	96.5		
QLP355M-12		280	459		2674	96.6		
		315	516		3008	96.6		

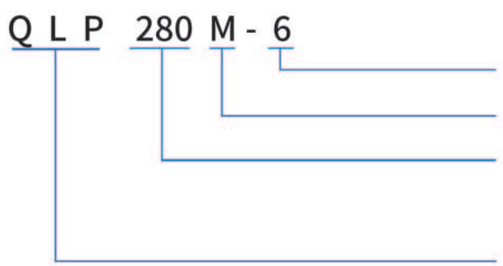
QLP Series performance parameters (2000r/min)

Model	Rated voltage (V)	Rated power (kW)	Rated current (A)	Synchronous speed (r/min)	Rated torque (N.m)	Efficiency η(%)	Power factor (cosφ)	Frequency (Hz)
QLP90L-8	380	2.2	3.9	1500	14	89.7	0.95	100
QLP100L-8		3	5.3		19.1	90.3		
		4	7		25.5	90.9		
QLP112M-8		5.5	9.5		35	92.1		
QLP112M-8		7.5	12.8		47.8	92.6		
QLP132S-8		11	18.6		70	93.6		
QLP132M-8		15	25.3		95.5	94		
QLP180M-6		18.5	31.4		117.8	94.3		75
QLP180M-6		22	37.2		140.1	94.7		
QLP180M-6		30	50.5		191	95		
QLP180M-6		37	62.1		235.6	95.3		
QLP200M-8		45	75.3		286.5	95.6		100
QLP200M-8		55	91.8		350.2	95.8		
QLP225M-8		75	125		477.5	96		
QLP250M-8		75	125		477.5	96		
QLP250M-8		90	150		573	96.2		
QLP280M-6		110	182		700.3	96.5		75
QLP280M-6		110	182		700.3	96.5		
QLP280M-6		132	219		840.4	96.6		
QLP280M-6		160	265		1018.7	96.7		
QLP280M-6		185	306		1177.8	96.7		
QLP315S-8		200	327		1273.3	96.7		100
QLP315M-8		220	360		1400.7	96.7		
QLP315M-8		250	413		1591.7	96.7		
QLP315L-8		280	458		1782.7	96.7		
QLP315L-8		315	518		2005.5	96.7		
QLP355L-8		355	581		2260	96.7		

QLP Series performance parameters (3000r/min)

Model	Rated voltage (V)	Rated power (kW)	Rated current (A)	Synchronous speed (r/min)	Rated torque (N.m)	Efficiency η(%)	Power factor (cosφ)	Frequency (Hz)
QLP100L-8	380	5.5	9.3	3000	17.5	94	0.96	200
QLP100L-8		7.5	12.6		23.9	94.5		
QLP112M-8		11	18.3		35	95		
QLP132S-8		15	24.9		47.8	95.3		
QLP132S-8		18.5	30.6		58.9	95.6		
QLP132M-8		22	36.3		70	95.9		
QLP160M-8		30	49.4		95.5	96.1		
QLP160L-8		37	60.8		117.8	96.3		
QLP180M-6		45	73.9		143.3	96.4		150
QLP180L-6		55	90.2		175.1	96.5		
QLP200L-8		75	123		238.8	96.6		200
QLP200L-8		90	147		286.5	96.7		
QLP225S-8		110	181		350.2	96		
QLP225M-8		132	217		420.2	96.2		
QLP250M-8		160	263		509.3	96.3		
QLP280S-6		185	304		588.9	96.4		150
QLP280M-6		200	328		636.7	96.5		
QLP315S-8		220	361		700.3	96.5		200
QLP315S-8		250	410		795.8	96.5		
QLP315S-8		280	459		891.3	96.5		
QLP315S-8		315	517		1002.8	96.5		
QLP355L-8		355	582		1130	96.5		

Model Description:



LC410Y Permanent magnet drive

Product Introduction:

Our company's direct torque control LC410Y series motor driver can achieve high-performance transmission control without the need for sensors, perfectly replacing closed-loop vector control or DC motor applications that do not require position control; At the same time, it can also be used in conjunction with permanent magnet synchronous motors to achieve open-loop direct drive in low-speed industrial equipment, reducing the need for reducers, improving energy efficiency and transmission performance. It has the following characteristics:

1. Leading energy-saving effect:

Excellent magnetic flux optimization technology achieves industry-leading energy-saving effects. Always maintain the perpendicularity of the stator magnetic field to minimize the loss of useless power during motor operation. It can be used in conjunction with permanent magnet synchronous motors to achieve direct drive control on low-speed industrial equipment, without the need for deceleration devices, saving costs, achieving higher energy efficiency and better control performance.

2.Excellent driving performance

①. Fast torque response, high torque linearity
The torque response time (time from 0 step to rated torque) for sensorless applications is less than 5ms, and the torque repeatability is less than or equal to 1%, which is equivalent to closed-loop or DC transmission.
②. Fast dynamic response, high speed accuracy
The dynamic response accuracy of the speed loop is 0.7% s.
The speed accuracy of sensorless applications is less than 0.5%, and sensors are not required in 95% of applications. The maximum operating frequency can reach 500Hz (special series models can>=2000Hz).
③. Low frequency high torque, ultra smooth operation
Sensorless control with zero speed twice the torque, no need for mechanical brakes, smooth switching between driving and braking, helping equipment achieve safer and more convenient operation.
④. Rapid acceleration/deceleration
Without mechanical constraints, it can achieve rapid acceleration, deceleration, and forward/reverse switching in the shortest possible time, optimize production process control, and improve production efficiency.
⑤. Wide applicability
Rich expansion functions, supporting almost all AC sine wave motor controls, can easily cope with harsh application environments, enhance product applicability, and combined with Chinese and multilingual large LCD interfaces, help you recognize transmission information and control drivers more intuitively, conveniently, quickly, and comprehensively.

Energy saving plan

Pre sales planning
(Understanding and Communication)

Service Customization
(Personalized Design and Customization)

Installation Guide
(Professional guidance for installation)

After-sale service
(Worry free, more reassuring)

Application cases