山东能源
SHANDONG ENERGY

FGI新风光

HIGH VOLTAGE INVERTER

WINDSUN

SAVE **ENERGY** SERVE **SOCIETY**

Mission: Master core technology and continuously promote power electronic equipment and IOT to all industries

Vision: save energy, serve the society and achieve a century of new scenery

Core values: Integrity, Innovation, Cooperation and strive

CONTENTS

ABOUT **US**

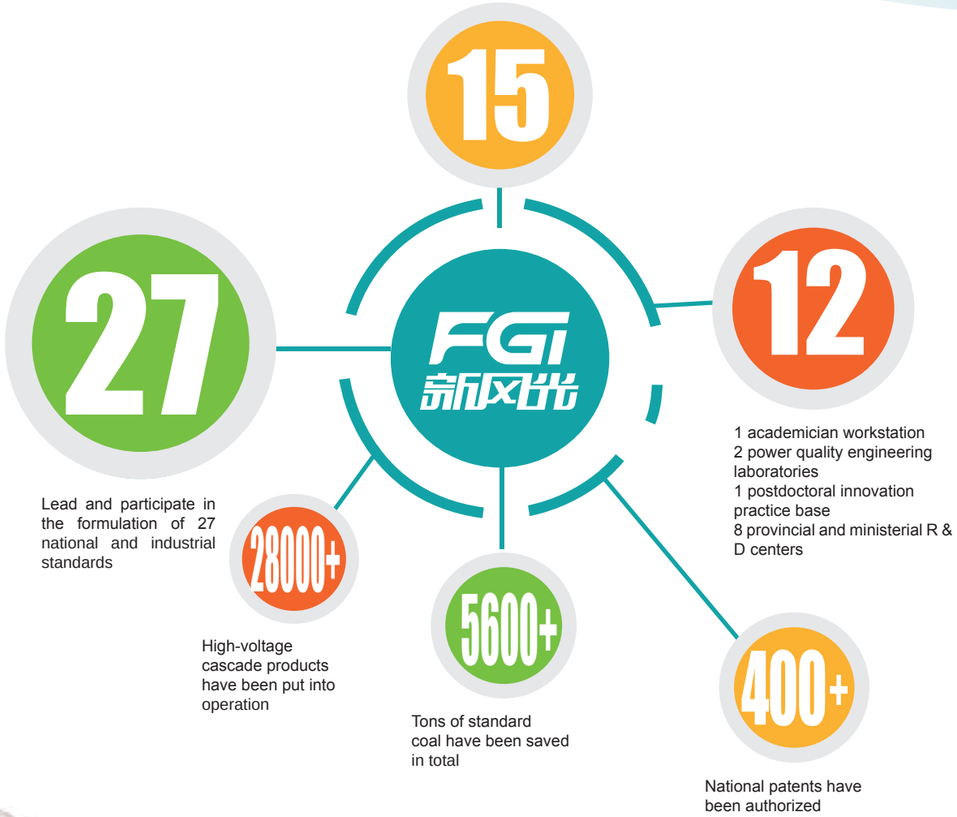
Accompanying China's 30-year history of energy-saving development
7 mergers and reorganizations, 4 factory relocations, over 300 product honors
Customer recognition stems from FGI's relentless pursuit of excellence
From 1970 to the present, half-century changes.

In 1970, the state-owned Wenshang Radio Factory was established. From 1990 to 1992, under the leadership of Li Rilai,(former factory director and chief engineer, the first generation of controllable thyristor low-voltage inverter was developed,pioneering the early research on low-voltage inverters in China. In 1992, the first low-voltage inverter was certified by the Shandong Electronic Product Supervision and Inspection Institute. Through the team's persistent efforts, the product gradually became serialized, contributing to the national energy conservation contribution and the development of the industry. Since then, the leading product-inverter, has been continuously developed and produced. In order to seek development, the enterprise has undergone multiple restructuring and reorganization. In August 2004, the company was restructured and reorganized as WindSun Science & Technology Co., Ltd. In 2008, it introduced venture capital from Shandong Energy Group, and the new Wenshang plant was completed and relocated.

In April 13, 2021, FGI successfully listed on the Science and Technology Innovation Board (STAR Market). It is the 7th "renewable energy industry" company, the 2nd "smart grid industry" company, and the 1st listed company of Shandong stateowned enterprise" on the STAR Market, achieving new development for a traditional enterprise.

Power electronics technology is profoundly changing the global energy system and will gradually reach every corner of the world.We always focus on power electronics technology, diligently explore and provide solutions and services covering the entire value chain and lifecycle for customers in the power, industrial, and infrastructure sectors. We are committed to building a new power system, accelerating energy transformation through digitization, and helping achieve carbon neutrality, creating a better future for humanity together.

Electronics performance laboratories: EMC laboratory, environmental laboratory, safety compliance Laboratory, failure analysis laboratory, material analysis laboratory, temperature rise laboratory, service life laboratory……



Lead and participate in the formulation of 27 national and industrial standards

1 academician workstation
2 power quality engineering laboratories
1 postdoctoral innovation practice base
8 provincial and ministerial R & D centers

High-voltage cascade products have been put into operation

Tons of standard coal have been saved in total

National patents have been authorized

MILESTONE

1970
"Four Oriented" Gathered talents

State owned Wenshang Radio Factory was established

2004
Property rights reform to inject vitality

Restructured to establish FGI

2011
Enterprise hybrid reform to enhance power

Attracted investment from Shandong Energy Group for flourishing development.

2019
Build a talent gathering place

Established Jinan Branch and R&D Center

2021
A new chapter of corporate listing

Listed on STAR Market.

Code No.:688668

2022
Focus on global development

Established Suzhou Branch and Overseas Department

2023
Layout of new industrial highland

Established Qingdao Branch

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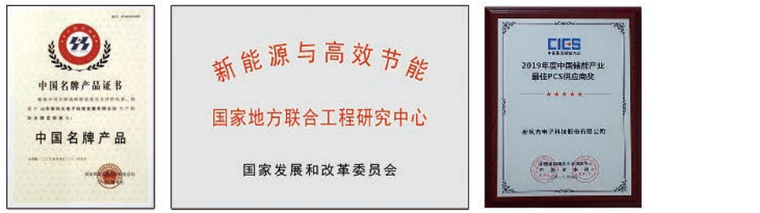
FGI

New voyage

Further development

HONORS AND CERTIFICATIONS



EU CE certification

Explosion proof certificate

National type test report

In 2023,FGI was successfully selected as the "National World-class Professional Leading Demonstration Enterprise"

PCCC certification

Invention patent

National standard

Software copyright certificate

Utility model patent certificate

Design Certificate

QUALITY ASSURANCE

FGI has passed the ISO certification of quality, environment and safety, and has been rated as an AAAA enterprise with good standardized behavior, an advanced enterprise with excellent performance in quality and management in Shandong Province, and a qualified enterprise with measurement assurance.
Production management has a rigorous quality control plan, strictly implements the requirements of ISO9001 standard, pays attention to PDCA management of production process, strict process control, production process control, and implements the whole process quality control. Combined with the on-site "6S" management tools, the qualified rate of factory inspection is 100%.
The company has a production and testing system covering an area of 80,000 square meters. It has a centralized control center for product testing equipped with fully automated and highly integrated testing capabilities. The company has imported automatic chip mounters, wave soldering machines, and automated painting lines from Germany and South Korea, R&D testing equipment and environmental testing equipment. With five module assembly production lines, the company has the production capacity to manufacture 3,000-5,000 sets of high-voltage products annually.

Purification parts manufacturing center


PCB board conformal coating painting line


PCB board testing - FCT, ICT function test line

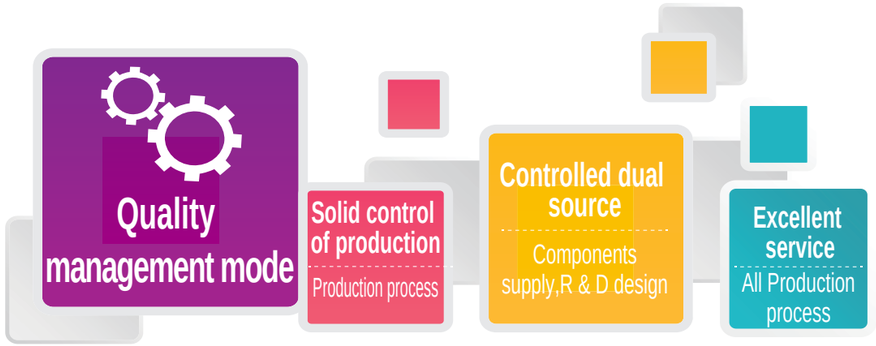

SMT-AOI automatic mounter —Optical detection line


Power module production line


Whole machine assembly line


High voltage whole machine test area


Automatic whole machine test system



Central control room of test system


10MW High Power full load test system


Low pressure, high and low temperature environment simulator

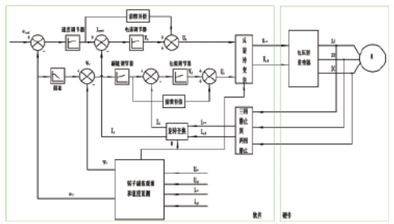

Temperature impact environment simulator


Salt spray environment simulator

Superior Algorithm, Excellent performance

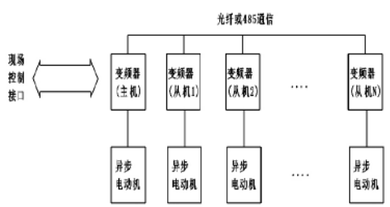
01 Vector control, fast response

●by measuring and controlling the stator current vector of AC motor, the excitation current and torque current of AC motor are controlled respectively according to the principle of magnetic field orientation, so as to achieve the purpose of controlling the torque of AC motor.
●large starting torque, fast torque dynamic response, high control accuracy and strong load capacity.
●it can drive synchronous or asynchronous motors, especially suitable for impact loads such as ball mill, belt conveyor and compressor.



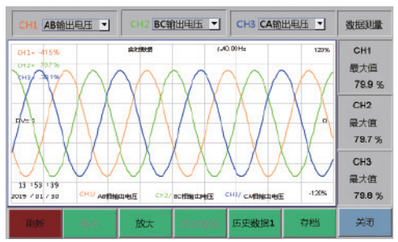
02 Master salve control, power balance

●Multiple frequency inverters can form a master-slave control network through data bus. One of them is set as the master and the other as the slave. The master collects the status information of each slave in real time and sends the frequency and torque commands to each slave at the same time, so as to realize the power balance and comprehensive control of each frequency inverter.
●The technology is applicable to belt conveyor, friction hoist and other occasions requiring power balance control.



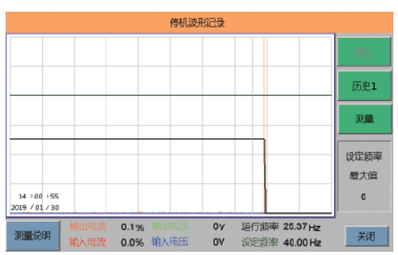
03 Waveform display and recording

●The main control system monitors the input current, voltage, output voltage and current in real time, and realizes the display of its waveform. It can also carry out harmonic analysis on each phase voltage and current, which is helpful for users to master various electrical parameters of the equipment.



04 Black box function and intelligent analysis

●The equipment has the function of automatically recording operation status and displaying, and can view the output current, output voltage, set frequency, operation frequency, input current and input voltage values of 200 points (100ms) before and after protection, so as to facilitate daily maintenance and rapid abnormal diagnosis.

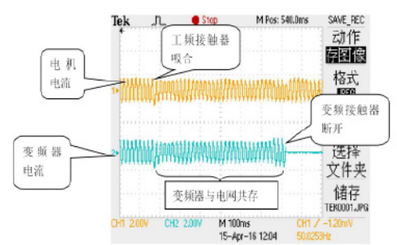


05 Temperature segmentation and pre-warning

●The main control system monitors and displays the temperature of each power unit in real time. When the temperature of multiple units exceeds the set alarm value, an audible and visual alarm will be given to prompt the user to deal with the problems such as tripping of cooling fan and blockage of filter screen in time.

06 Bumpless switching, avoid impact

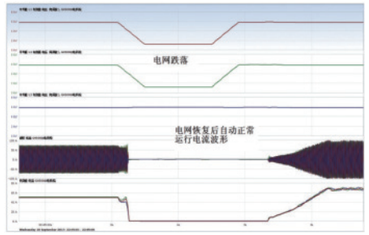
●Inverter mode to grid mode: The frequency inverter runs the motor to the power frequency, detects the frequency, phase and amplitude of the grid power, and then adjusts the output of the inverter and the same frequency and phase of the gird power. After adjustment, connect the motor to the grid power and then disconnect the frequency inverter.
●Grid mode to inverter mode: Firstly, the frequency inverter detects the frequency, phase and amplitude of the grid power, directly outputs the corresponding voltage vector to the motor after the frequency converter is switched in, and finally powers off the grid power.
●The technology can meet the needs of multi motor integrated control and soft start of large capacity motor. The maximum current is less than or equal to the rated current to truly achieve fast soft switching and no large current impact. The figure shows the motor current waveform at the moment of switching.



Ultimate process, Durable and reliable

01 Low voltage ride through (LVRT) and fearless fluctuation (0% - 100%)

●In case of instantaneous power failure, instantaneous drop of user's main power supply and switching of auxiliary power grid, the frequency inverter can ensure automatic normal operation after power grid recovery within a limited time, so as to enhance the adaptability of power grid. It can adapt to U0 (100% - 0%) grid drop.

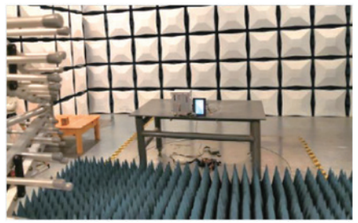


02 Dual control power supplies, stable and reliable

●Field power supply and secondary power supply of main transformer are adopted as the control power supply, and the two power supplies are on-line hot standby for each other; If one power supply fails, the other can be switched seamlessly. At the same time, the relay protection circuit alarm and HMI (Human Machine Interfaceman-machine interface) display which power supply fails.

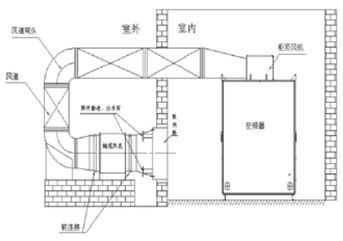
03 Cabinet anti-interference and electromagnetic compatibility

●The cabinet of the whole machine adopts anti-interference design, and has passed the electrostatic discharge immunity test, surge (impact) immunity test and RF electromagnetic field radiation test by the national authority.



04 Dust proof, waterproof and closed circulation

●Air-water cooling is especially suitable for the site with harsh environment. The hot air caused by equipment heating will return to the room after passing through the outdoor water-cooled heat exchange system to form a hot air cold air circulation system to realize the purpose of equipment heat dissipation. The circulating water used by the outdoor water cooling and heat exchange system can use external water sources on site, establish water towers, etc.



◎Other technical features

Flying start technology
When the motor is in any rotation state, whether it is forward rotation or reverse rotation, the frequency inverter can start directly to quickly find the motor state, start and run from the current state of the motor to the set frequency and state.

Color HMI
Accurate fault location and recording function, unit bus voltage and temperature display function, and operation voltage, current and frequency records can be queried.

Neutral drift technology
After the power unit is bypassed, the angle of three-phase output voltage is automatically adjusted through software control to balance the output line voltage and improve the voltage utilization to a great extent.

Multiple control modes
Local control, remote control and DCS control can be selected. Communication protocols such as MODBUS and PROFIBUS are supported. Frequency setting can be given on site, remote simulation and communication. Frequency preset, acceleration and deceleration functions are supported.

High power density
Small unit size, modular design, compact structure and small occupied space.

Perfect protection
The unit includes seven types of protection: phase loss, overvoltage, primary overvoltage, overcurrent, downlink communication, secondary overvoltage and under-voltage. When the number of faulty units is less than the set number, the whole machine can still operate. The whole machine protection includes software overcurrent, input overvoltage, input under-voltage, output phase loss, motor overload, output imbalance, etc.

DC braking technology
When the motor is in the rotating state (below 10Hz), DC braking current can be applied to force the motor to stop.

Current limiting technology
When the frequency inverter is started up and running, if the current exceeds the limit value, reducing the frequency until the current is less than the limit value, and the frequency inverter returns to the normal operation frequency.

Overvoltage stall Technology
During the frequency reduction, when the motor generates power and the DC bus voltagebus rises, the frequency inverter automatically prolongs the reduction time to prevent shutdown caused by bus overvoltage.

Acceleration and deceleration adaptive function
The frequency inverter adjusts the acceleration time or limits the motor operation frequency according to the motor current, so as to realize no overcurrent in the acceleration process. In the process of frequency reduction, the frequency reduction time is adjusted according to the bus voltage, so as to achieve no overvoltage in the process of frequency reduction.


HMIMHI


Main controller


AFE power unit


General power unit

JD - BP37/38 SERIES

JD–BP37/38 series high voltage frequency inverter

Model no.:G71 Standard High Voltage Inverter
Power range: 6kV：200kW-5000kW (Two quadrant)
10kV：200kW-9000kW (Two quadrant)
6kV：200kW-2600kW (Four quadrant)
10kV：200kW-8000kW (Four quadrant)
Cooling mode: forced air cooling, water cooling
Performance features: Based on two / four quadrant synchronous (including permanent magnet synchronous motor) / asynchronous motor platform design and unit sealing design, the whole machine adopts modular design idea and high production efficiency.
Competitive advantages: modular design of control system, small harmonic, accurate speed regulation, good sealing of power unit and strong environmental adaptability.
Load type: fan and water pump load; Hoist and belt conveyor loads

Model no.:G74 series High Voltage Inverter
Power range:6kV: 200kW-560kW
10kV: 200kW-1000kW
Cooling mode:forced air cooling
Performance features:Based on the design of two quadrant synchronous (including permanent magnet synchronous motor) / asynchronous motor platform, the whole machine integrates control cabinet, power cabinet, transformer cabinet and switching cabinet, which is convenient for on-site installation.
Competitive advantage:small size, saving space; Overall transportation, convenient installation.
Load type: fan and water pump load

Model no.: G71 Liquid Cooling High Voltage Inverter
Power range: 6kV: 6000kW-31000kW
10kV: 10000kW-53000kW
Cooling mode:Water cooling
Performance features:Based on the design of two quadrant synchronous (including permanent magnet synchronous motor) / asynchronous motor platform, reliable high-power power electronic devices and water cooling and heat dissipation mode are adopted, with high power density and strong environmental adaptability.
Competitive advantages:high reliability design, water cooling and heat dissipation, low noise, high efficiency and stronger environmental adaptability.
Load type:blast furnace blower, oxygen compressor, boiler induced draft fan, sintering main exhaust fan, fan and water pump

◎Product structure

Transformer cabinet

It contains phase-shifting transformer, temperature sensor, current and voltage detection device. Phase -shifting transformer provides independent three-phase input power supply for power unit; The temperature sensor monitors the internal temperature of the transformer in real time to realize the functions of over temperature alarm and over temperature protection; The current and voltage detection device can monitor the input current and voltage of the transformer in real time to realize the protection function of the frequency converter. Independent air duct design reduces transformer temperature rise and prolongs service life.

Switching cabinet

When the frequency inverter fails, the motor can be switched to the grid power from the frequency conversion to continue operation. There are two types of switching: automatic and manual. The difference is that the manual switching cabinet needs to switch the main circuit according to the operating procedures; aAnd the automatic switching cabinet can automatically switch the main circuit under the system control, except during maintenance. The switching cabinet is non-standard and needs to be customized according to the user's on-site requirements.

Power unit cabinet

There are power units inside. Each power unit is completely consistent in structure and can be interchanged. Its shell adopts mold integrated design and has good sealing performance. It is suitable for occasions with high tide humidity, multi dust and multi corrosive gas. The power cabinet communicates with the control cabinet through optical fiber, which can effectively suppress electromagnetic interference.

Control cabinet

It contains HMI, armARM, FPGA, DSP and other high-precision chips. Multi language human-machine interface, less parameters and easy operation; Rich external interfaces, convenient for connection with user system and field expansion. The main controller uses the self-developed box structure for packaging. The box has passed the strict EMC certification and the treatment of temperature cycle and vibration test, with high reliability.

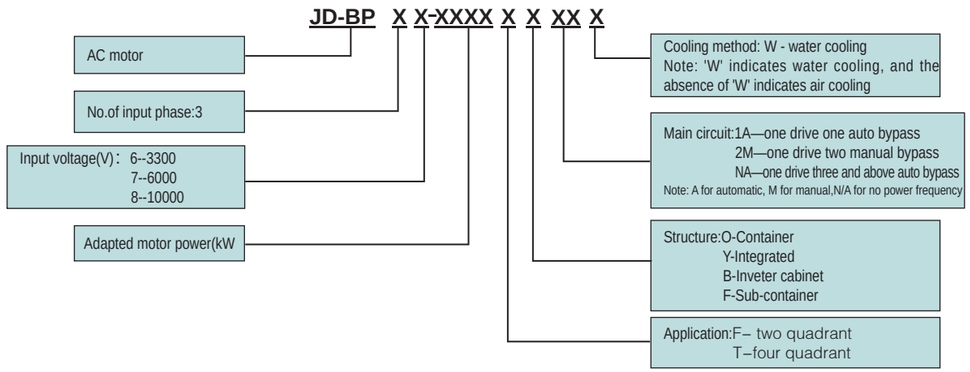
◎Product technical characteristics

Table 3.1 Product specifications

Model		JD-BP37/38-F	JD-BP37/38-T
Motor power (kW)		200kW-20000kW(Using 4-pole motors as standard, selecting the motor type for 6-12 pole motors based on current)	200kW-8000kW(Using 4-pole motors as standard,selecting for 6-12 pole motors based on current)
Output	Rated power(kW)	Power operated at rated voltage	Power operated at rated voltage
		200kW-20000kW	200kW-8000kW
	Rated current(A)	Current operated at rated voltage	Current operated at rated voltage
	Overload capacity	Continuous operation at 105%	Continuous operation at 105%
		Permitted for 1 minute at 130%	Permitted for 1 minute at 130%
		Permitted for 3 seconds at 150%	Permitted for 3 seconds at 150%
	Output voltage(kV)	Three phase 0-6kV, 0-10kV	
	Waveform	SPWM sinusoidal wave	
Input	Phase number, frequency, voltage	Three phase ,50Hz/60Hz,6kV(10kV)	
	Allowable fluctuation	Voltage: -10%~+10%,frequency:±5%,-10% ~ -35% continuous operation under derating	
Basic feature	Starting frequency	0—10Hz can set	
	Accuracy	Analog setting: 0.3% of the highest frequency setpoint value (25±10°C). Digital setting: 0.02% of the highest frequency setpoint value (-10~+50°C).	
	Resolution	Analog setting: 0.05% of the highest frequency setpoint value. Digital setting: 0.01Hz (for frequencies below 99.99Hz) and 0.1Hz (for frequencies above 100Hz).	
	Efficiency	>At 98% during rated output	
	Power factor	>0.95	
Control	Acceleration and deceleration time	0.1~6000.0 seconds, with the ability to set acceleration and deceleration times separately	
	Voltage/Frequency Characteristics	Determined by the selected V/F curve	
	PID	Manual setting of PID parameter	
	Additional functions	V/F curve, low-frequency compensation, rated current, current protection threshold settings	
	High-voltage isolation	Electromagnetic coupling, multi-channel optical fiber transmission	
	Control power input	AC 220V 2kVA	
Operation	Operation	Local control (touch screen, cabinet door switch) operation, remote control operation at a distance , upper-level computer operation (optional)	
	Frequency reference	Touch screen digital setpoint, multi-segment speed setpoint, external control analog signal (DC 4~20mA) setpoint	
	Status output	Relay status output, inverter fault, alarm, run/stop status indicators, etc	
	Touch screen	Input/output voltage, input/output current, setpoint, status of each unit, operating status, transformer status, voltage of each unit bus, etc	
	Protection function	"Motor overcurrent, system overvoltage/undervoltage, unit overcurrent/ overvoltage/overheating, input phase loss, optical fiber communication failure, etc.	
Environment	Environment	Indoor, free from corrosive or conductive gases, dust, and direct sunlight	
	Temperature, humidity	-10°C ~+40°C / 20~90%RH no condensation	
	Vibration	5m/ s^2(0.6g or less)	
	Storage temperature	-20 to +65°C (suitable for short-term storage, such as during transportation)	
	Altitude	≤ 1000m, customizable for altitudes exceeding 1000 meters	
Cooling method/IP degree		Forced air cooling /IP31 Liquid cooling/IP40	

◎ Specification

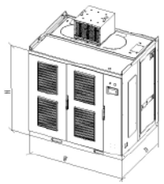
◎ Model no. description



For example:
6kV 560kW one-to-one automatic integrated high-voltage inverter for speed control, named JD-BP37-560FY1A
10kV 1600kW one-to-two manual sub-cabinet style high-voltage inverter for speed control named JD-BP38-1600FB2M
10kV 2500kW one-to-three automatic containerized water-cooled high-voltage inverter for speed control named JD-BP38-2500FONAW

G7 series general purpose high voltage frequency inverter

Table 3.2 JD-BP37-F series (6kV) Model no. and dimension(without switching/incoming cabinet)

	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP37-225F~ JD-BP37-560F	225kW/6kV~ 560kW/6kV	1700	1500	1900	1900~2410
	JD-BP37-630F~ JD-BP37-1120F	630kW/6kV~ 1120kW/6kV	2200	1700	2120	3250~4000
	JD-BP37-1250F~ JD-BP37-1400F	1250kW/6kV~ 1400kW/6kV	3300	1700	2420	4950~5600
	JD-BP37-1600F~ JD-BP37-2800F	1600kW/6kV~ 2800kW/6kV	3600	1700	2420	6900~7300
	JD-BP37-3250F	3250kW/6kV	4600	1700	2420	11750
	JD-BP37-4000F	4000kW/6kV	5900	1700	2420	11800
	JD-BP37-4500F~ JD-BP37-5000F	4500kW/6kV~ 5000kW/6kV	6500	1700	2620	12950~13600

Note:
1. The above dimensions are for reference only. Please refer to the project drawings and physical objects for details;
2. Due to product upgrading, the contents of this manual will be updated regularly. If you need to buy our products, please refer to the latest product manual;
3. For more information, please scan the QR code on the right or log in to the company's website.

Please scan the QR code for more information

Table 3.3 JD-BP38-F series (10kV) Model no. and dimension(without switching/incoming cabinet)

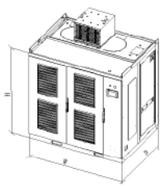
	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP38-250F~ JD-BP38-1000F	250kW/10kV~ 1000kW/10kV	1750	1500	1900	2160~3100
	JD-BP38-1120F~ JD-BP38-2000F	1120kW/10kV~ 2000kW/10kV	2800	1700	2120	4320~5720
	JD-BP38-2250F~ JD-BP38-2500F	2250kW/10kV~ 2500kW/10kV	4100	1700	2420	9380
	JD-BP38-2800F~ JD-BP38-4500F	2800kW/10kV~ 4500kW/10kV	4400	1700	2420	10900~12500
	JD-BP38-5000F~ JD-BP38-5600F	5000kW/10kV~ 5600kW/10kV	6200	1700	2620	14000~16500
	JD-BP38-5900F~ JD-BP38-6800F	5900kW/10kV~ 6800kW/10kV	8100	1700	2620	17600~20350
	JD-BP38-8000F~ JD-BP38-9000F	8000kW/10kV~ 9000kW/10kV	8300	1800	2720	21500~22800

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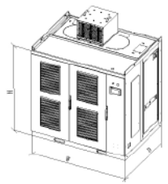
Table 3.4 JD-BP37-T series (6kV) Model no. and dimension(without switching/incoming cabinet)

	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP37-280T~ JD-BP37-1000T	280kW/6kV~ 1000kW/6kV	2200	1700	2120	2400~4430
	JD-BP37-1120T~ JD-BP37-1400T	1120kW/6kV~ 1400kW/6kV	3300	1700	2420	5520~5600
	JD-BP37-1600T~ JD-BP37-2000T~	1600kW/6kV~ 2000kW/6kV~	3600	1700	2420	5850~6090
	JD-BP37-2500T	2500kW/6kV	5550	1700	2420	10000

Note:
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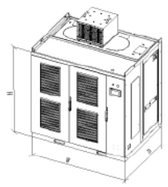
Please scan the QR code for more information

Table 3.5 JD-BP38-T series (10kV) Model no. and dimension(without switching/incoming cabinet)

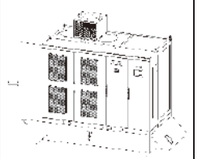
	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP38-250T~ JD-BP38-1600T	250kW/10kV~ 1600kW/10kV	2800	1700	2120	3500~6450
	JD-BP38-1800T~ JD-BP38-2500T	1800kW/10kV~ 2500kW/10kV	4100	1700	2420	9250~9400
	JD-BP38-2800T~ JD-BP38-3250T	2800kW/10kV~ 3250kW/10kV	4400	1700	2420	9900~9950

Note:
1. The above dimensions are for reference only. Please refer to the project drawings and physical objects for details;
2. Due to product upgrading, the contents of this manual will be updated regularly. If you need to buy our products, please refer to the latest product manual;
3. For more information, please scan the QR code on the right or log in to the company's website.

Please scan the QR code for more information

G7 series integrated high voltage frequency inverter

Table 3.6 JD-BP37-F series (6kV) Model no. and dimension(with switching cabinet)

	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP37-225F~ JD-BP37-560F	225kW/6kV~ 560kW/6kV	2700	1500	1900	1900~2410

Note:
1. The above dimensions are for reference only. Please refer to the project drawings and physical objects for details;
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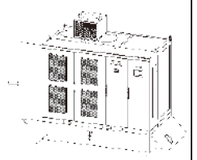
Table 3.7 JD-BP38-F series (10kV) Model no. and dimension(with switching cabinet)

	Model no.	Power rating	Dimension and weight			
			Width (mm)	Depth (mm)	Height (mm)	Weight(kg)
	JD-BP38-250F~ JD-BP38-1000F	250kW/10kV~ 1000kW/10kV	2700	1500	1900	2160~3100

Note:
1. The above dimensions are for reference only. Please refer to the project drawings and physical objects for details;
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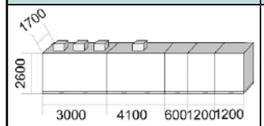
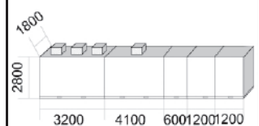
G7 series water cooling high voltage frequency inverter

Table 3.8 JD-BP37-W series (6kV) Model no. and dimension(with switching cabinet)

Dimensioning	Model no.	Power rating	Dimension and weight Width*Depth*Height(mm)	Weight(kg)
	JD-BP37-6000FF1MW ~JD-BP37-7000FF1MW	6000~7000	10100*1700*2600	16800~17700
	JD-BP37-8000FF1MW ~JD-BP37-11500FF1MW	8000~11500	10300*1800*2800	21300~26500

Note:
1. The above dimensions are for reference only. Please refer to the project drawings and physical objects for details;
2. Due to product upgrading, the contents of this manual will be updated regularly. If you need to buy our products, please refer to the latest product manual;
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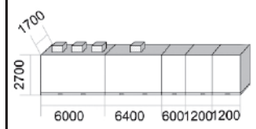
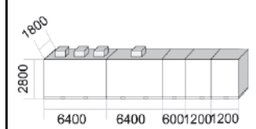
Table 3.9 JD-BP38-W series (10kV) Model no. and dimension(with switching cabinet)

Dimensioning	Model no.	Power rating	Dimension and weight Width*Depth*Height(mm)	Weight(kg)
	JD-BP38-10500FF1MW ~JD-BP38-11500FF1MW	10500~11500	15400*1700*2600	26500~27900
	JD-BP38-14000FF1MW ~JD-BP38-19000FF1MW	14000~19000	15800*1800*2800	32100~39100

Note:
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◎ Applications

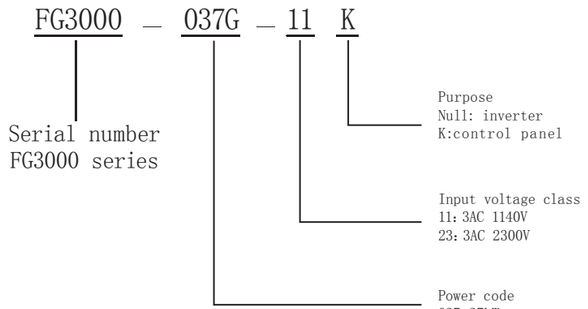
Power generation	Boiler feed pump, forced draft fan, induced draft fan, condensate pump, circulating water pump, mortar pump, compressor, dust suction fan and booster fan. There are more than 2000 sets of high-voltage frequency converters in the power generation industry.
Petroleum, petrochemical and natural gas	Air compressor, induced draft fan, pipeline pump, water injection pump, oil transfer pump, feed pump, submersible pump, circulating water pump and brine pump. Daqing Oilfield, Shengli Oilfield, Qinghai Oilfield, Liaohe Oilfield and other groups continue to cooperate, and the number of high and low voltage frequency converters exceeds 2500 sets.
Coal and mine	Mine hoist, counter-rotating fancounter cyclone, axial flow fan, descaling pump, mixing pump, dust removal fan, mud pump, slurry pump, clean water pump, feed pump, drainage pump and medium pump. Shenhua Ningxia coal industry group has more than 100 high-voltage frequency converters.
Metallurgy	Dust removal fan, blast furnace blower, induced draft fan, compression fan, oxygen compressor, forced draft fan, feed pump, feed pump, descaling pump, SO2 fan, slag flushing machine, converter, electric furnace, blast furnace, descaling pump and gas compressor.
Cement, building materials	Raw meal grinding induced draft fan, cement grinding fan, sorter fan, kiln induced draft fan, kiln air supply fan, kiln tail exhaust fan, high temperature fan, coal mill, dust removal fan, circulating fan and pressure supply fan.
Municipal	Booster pump, hot water circulating pump, sewage pump, clean water pump, water supply pump, induced draft fan, forced draft fan
Light industry, chemical industry	Booster pump, compressor, axial flow pump, soft water pump, water supply pump, blower, induced draft fan
Others	Air pump test bench, wind tunnel test device

FG3000 SERIES

FG3000 series medium voltage inverter

The input voltage of FG3000 series is 3AC 1140V and 3AC 2300V, and input frequency is 50/60Hz.

◎ Model no.



Model no. description

Table4.1 FG3000 series inverter rated specification

Rate voltage	Model no.	Rated power(kW)	Rated current(A)
3AC 1140V	FG3000-037G-11	37	23
	FG3000-045G-11	45	28
	FG3000-055G-11	55	34
	FG3000-075G-11	75	48
3AC 2300V	FG3000-125G-23	125	39
	FG3000-200G-23	200	62

Note:
When GD3000 series inverter used for electric submersible pump, the model selection need to follow the max running current, due to multiple voltage level.
For more information, please scan the QR code on the right or log in to the company's website.

Please scan the QR code for more information

◎ Product specification

Table. 4.2 Product specification

Function		Specification
Power input	Input voltage (V)	AC 3PH 970V–1310V; rated voltage: 1140V AC 3PH 1955V–2645V; rated voltage: 2300V
	Input current (A)	Refer to the rated value
	Input frequency (Hz)	50Hz or 60Hz Allowed range: 47~63Hz
Power output	Output voltage (V)	0~input voltage
	Output current (A)	Refer to the rated value
	Output power (kW)	Refer to the rated value
	Overload capability	150% of rated current: 1 minute 180% of rated current: 2 seconds
	Output frequency (Hz)	0~600Hz
Technical control feature	Control mode	V/F, sensorless vector control
	Resolution	Digital: 0.01Hz
	Starting frequency	0-10Hz settable
	Torque booster	0.0~20% settable
	VF curve	Linear type, multipoint type and multiple oder type
	ACC/DEC curve	Linear, S curve
	DC braking	0-15Hz, 0-60s, 0-150% current
	Multi-step speed	Simple PLC function or S terminals
	AVR function	When the grid voltage changes by 10%, keep the output voltage constant
	Auto energy saving	According to the load condition, the V / F curve is automatically optimized to realize energy-saving operation
	Communication	RS485
	Running command	Keypad, terminal, communication
	Frequency command	Digital setting, analog setting, pulse frequency setting, multi-stage speed running setting, simple PLC setting, PID setting, MODBUS communication setting. Realize the shifting between the set combination and set channel.
I/O interface	Analog input	2 channels 0~10V/0(4)~20mA
	Analog output	2 channels 0~10V /0(~20mA
	Digital input	8 channels common input, the Max. frequency: 1kHz, internal impedance: 3.3kΩ;
	Digital output	2 channels Y terminal open collector pole output
	Relay output	2 channels programmable relay output
Keypad	LED keypad	Display and setting parameters
Protection		Short circuit, overcurrent, overload, underload, overvoltage, undervoltage, phase loss, overheating, external fault, PID feedback disconnection, 485 disconnection and other protection functions
Optional parts		HMI, installation room
Environment	Installation	Indoor(No corrosive or conductive gases, dust, direct sunlight)
	Temperature	-10℃~+40℃
	Humidity	20~90%RH, no condensation
	Vibration	5m/ s2 (0.6g and below)
	Storage	-20~+65℃
	Altitude	1000m, derate above 1000m
Structure	IP degree	IP20
	Cooling mode	Forced air cooling
Installation mode		Wall mounting and floor mounting

(1) The main circuit topology adopts three-level structure and uses low-voltage power devices to realize medium voltage inverter output, with high reliability;
(2) Compared with the two-level circuit, due to the large output level, the output side is connected with RLC low-pass filter, which improves the output voltage and current waveform, and the motor runs without noise.
No and vibration. Ordinary motors can be used without derating;
(3) The dv/dtDV / DT is relatively small, which improves the electromagnetic compatibility of the frequency converter;
(4) It can automatically stabilize the voltage fluctuation on the power grid side;
(5) The starting voltage can be compensated. If the output terminal is connected with a long cable, the voltage loss on the cable can be better compensated;
(6) Power frequency / frequency conversion switch (special for electric submersible pump load) is set in the cabinet.

Application case


Mining


Buliding materials


Chemical


Metallurgiccal


Oil


Electric power


Refrigeration


Water conservancy


Motor test


Permanent magnet

◎ Mining industry

01 Equipment

Customer: Asia's deepest well.
Power: 10kV/3150kW

02 Feature

- Four-quadrant control
- Zero-speed hovering control algorithm
- Brake logic control technology
- The motor can feed regenerative energy back to the power grid, resulting in energy savings and reduced consumption, supporting the operation of Asia's deepest well.

01 Equipment

Customer: A Coal Mine Company
in Shandong Province
Power: 6kV/710kW

02 Feature

- Achieving a power saving rate of 30%.
- Improved power factor
- Avoided the occurrence of surging,Reduced mechanical impact ,and reduced maintenance costs

◎ Building materials industry

01 Equipment

Customer: A cement company
Power: 10kV/4200kW

02 Feature

- The inverter has the feature of maintenance
- The inverter itself has comprehensive protection functions,the ability to set a frequency jump at the resonance point.
- Extends the lifespan of the fan, and improves the utilization rate of the fan.

◎ Chemical industry

01 Equipment

Customer: A chemical Plant in Daqing City, Heilongjiang Province
Power: 10kV/8500kW

02 Feature

- The equipment features mechanical redundancy
- Flexible control, with soft start and stop
- Fast adjustment rate and smooth operation to meet various operating conditions

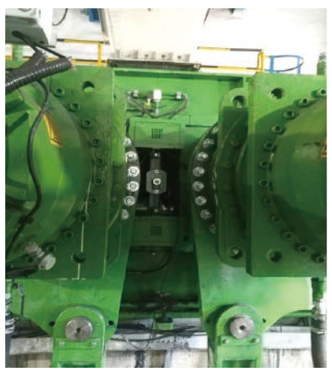
◎ Metallurgical industry

01 Equipment

Customer: A Shandong Iron &Steel Group
Power: 10kV/400kW

02 Feature

- With the master-slave control technology and low-frequency heavy-load starting capability
- Multiple motor protections,achieving a zero-impact soft start for the roller press system



◎ Oil industry

01 Equipment

Customer: An oil port Co., LTD
in Qingdao port
Power: 10kV/1400kW

02 Feature

- The closed-loop vector control algorithm is adopted to improve the power factor and improve the energy saving by 10%

◎ Electric power industry

01 Equipment

Customer: JinChuan Group
Power: 6kV/510kW

02 Feature

- Auto instant stop protection design
- Flying start technology
- Complete power frequency / frequency conversion automatic mutual cutting technology
- Line voltage automatic equalization technology

◎ Refrigeration industry

01 Equipment

Customer: A company in RenYuan
Power: 6kV/1120kW

02 Feature

- Realize the closed-loop adjustment of the temperature PID, stable indoor temperature change, greatly improve the comfort level, and prolong the service life of the pipe group

◎ Water conservancy industry

01 Equipment

Customer: A water plant
Power: 10kV/500kW

02 Feature

- Realize constant water pressure water supply
- Flexible start of the frequency conversion unit
- Reduce the start current
- Reduce water and electricity energy consumption
- Stable and reliable performance

◎ Motor test platform

01 Equipment

Customer: A southern pump company
Power:10kV/700kW

02 Feature

- To the pump flow, head, rotation speed, shaft power and efficiency Rate and other performance parameters, the actual test, with load transport Stability, voltage, current, harmonics and other aspects The energy indicators meet the requirements.

◎Application of high speed permanent magnet synchronizer

01 Equipment

Customer: A automobile manufacturing company
Power: 10kV/1400kW

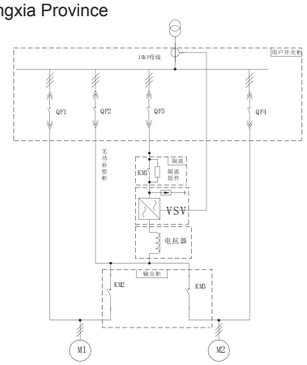
02 Feature

- Soft start, to achieve the stepless speed regulation, comprehensive Combined with the energy saving effect of at least 16%, prolong the life of the motor.

◎ Soft start + reactive power compensation

01 Equipment

Customer: A energy company in Ningxia Province
Power: 10kV/2000kW



02 Feature

- The frequency conversion soft start + reactive power compensation integrated device is adopted, with the function of soft start and reactive power compensation.

◎ Overseashigh-power fieldapplications

01 Equipment

Customer: A foreign compressor user

Power:10kV/17MW

02 Effect

- Energy saving: the exhaust volume is adjusted according to customer needs, with a small load energy loss
- Soft start: the compressor starts smoothly to avoid mechanical impact and extend the equipment life length
- Control: through the pressure closed-loop control, the adjustment speed, small fluctuation,supply The gas pressure is stable
- Power supply: using overmodulation technology, the voltage exceeds the limit, can still output Enough torque drive

◎ High speed fan industry

◎ High-speed permanent magnet synchronous motor

01 Equipment

Customer: A certain automobile manufacturing company
Project: Automotive Intelligent Connected Super Factory Refrigeration Project
Model:JD-BP38-1400FB
Address: Wuhu, Anhui Province
Load: High-speed permanent magnet synchronous centrifugal chiller unit

Motor parameter:

Rated power	850kW
Rated voltage	10kV
Rated current	61A
Rated speed	7500r/min
Rated frequency	250Hz

02 Effect

- The inverter adjusts the speed of the high-speed permanent magnet synchronous motor to meet the cooling capacity requirements. The overall energy savings are at least 16%, and the energy efficiency benefits are significant, making it widely applicable.
- The motor operates at high speeds, with the frequency ranging from 180Hz to 250Hz, depending on environmental temperature and control settings.

Skilled in design, Fearless of tough environment

(alpine, high temperature, high humidity, high salt spray, high altitude)

◎ A water pump project in Changsha, Hunan

Model no.:10kV/7000kW

Project features:the field equipment has the characteristics of high voltage, large capacity, large start-up impact and water hammer.

Performance:improve starting characteristics, realize soft start and soft stop, and reduce system impact. The equipment operates stably, avoids water hammer effect, realizes closed-loop control, and has remarkable energy-saving.

◎ A permanent magnet synchronous mill project in Jining, Shandong

Model no.: 10kV/4500kW

Project features:the field equipment has the characteristics of high voltage, large capacity and difficult start-up

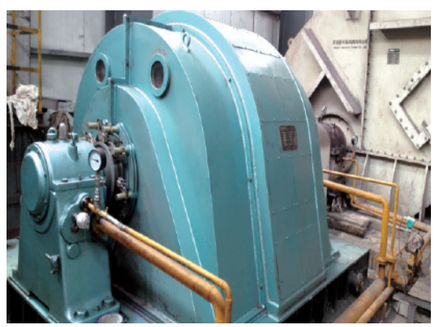
Performance:through automatic parameter identification, weak magnetic field processing and vector control, the undisturbed switching of equipment between grid power and frequency conversion is realized, with high control precision and small system impact.

◎ Excitation synchronous main exhaust fan project in Hebei

Model no.: 10kV / 5000kW

Project features: large capacity, difficult start-up and shutdown, and slow response of flow control.

Performance: the equipment can be started smoothly through automatic parameter identification and vector control; Fast torque response, high control accuracy and controllable power factor.



◎ A 5000t / d clinker circulating fan project in Quanzhou, Fujian

Model no.: 10kV / 5000kW

Project features: large equipment capacity and large start-up impact. The installation environment has high dust content and high humidity in summer.

Performance: improve starting characteristics and reduce system impact; High protection grade, intelligent temperature control and strong environmental adaptability.

◎ A leaching oil fan project in belogorsk, Russia

Model no.: 10kV / 630kW, 10kV / 400kW

Project features: harsh environment, high cold area, complex process and high stability.

Performance: low voltage ride through, dual power supply, strong environmental adaptability; Modular design, high protection level, vector control, intelligent temperature control, superior performance.

◎ A 2 * 300MW PA and SA fan project in Huangling, Shaanxi

Model no.: 2 * 6kV / 3000kW, 2 * 6kV / 3600kW

Project features: the original hydraulic coupler has low speed regulation efficiency, large equipment wear, high maintenance cost and high proportion of power consumption.

Performance: the air-cooled cooling mode is adopted, and the operation is stable and reliable; Improve the automation control level, reduce the power consumption rate by 1%, prolong the service life and reduce the maintenance cost.

◎ A mine hoisting project in Shaling, Shandong

Model no.: 8 * 6kV / 1400kW parallel connection (inconsistent motor power)
Project features: the system is required to be able to start with low frequency and heavy load, and the system is smooth without impact. Two machines in parallel, power balance.
Performance: the master and slave control the same frequency mode to realize the same frequency operation of two machines and automatically balance the power; Different frequency control, automatic allocation of output frequency and allocation of output current; Soft start and soft stop, convenient operation, small impact and less maintenance.

◎ 200 sets inverters for an aluminum company in Shandong

Project characteristics: Aluminum company's subsidiaries include alumina, electrolytic aluminum, power plants, chemical, and other enterprises, with requirements for process control and energy efficiency and emissions reduction.
Effect:Improving equipment startup characteristics to reduce system impact, optimizing production processes, enhancing automation control, and achieving significant energy saving.

◎Worry-free service life cycle

Pre sales, in-sales and after-sales services

•life cycle management mechanism
• It is more reasonable for professional technicians to diagnose power consumption and select equipment
• Site installation, commissioning, training and Q & A

Remote monitoring

•Remote data monitoring center
• Master the equipment operation status in real time
• Prompt maintenance in time
• Predict the occurrence of failure

Sunshine Service

• Regularly launch the activity of "Caring for customers and sunshine Service", and actively go deep into the user site to provide one-stop free service.
• Users can visit the company for free at any time. The company headquarters organizes training four times a year (at the end of each quarter) and invites customers to the company for training.

Service organization

•5 service centers
• 21 offices
• 2-hour response and 24-hour arrival at the site
• Service radius less than 200 km
• Experienced and skilled service team

Stock abbr: FGI
Stock Code: 688663

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