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POWTRAN®
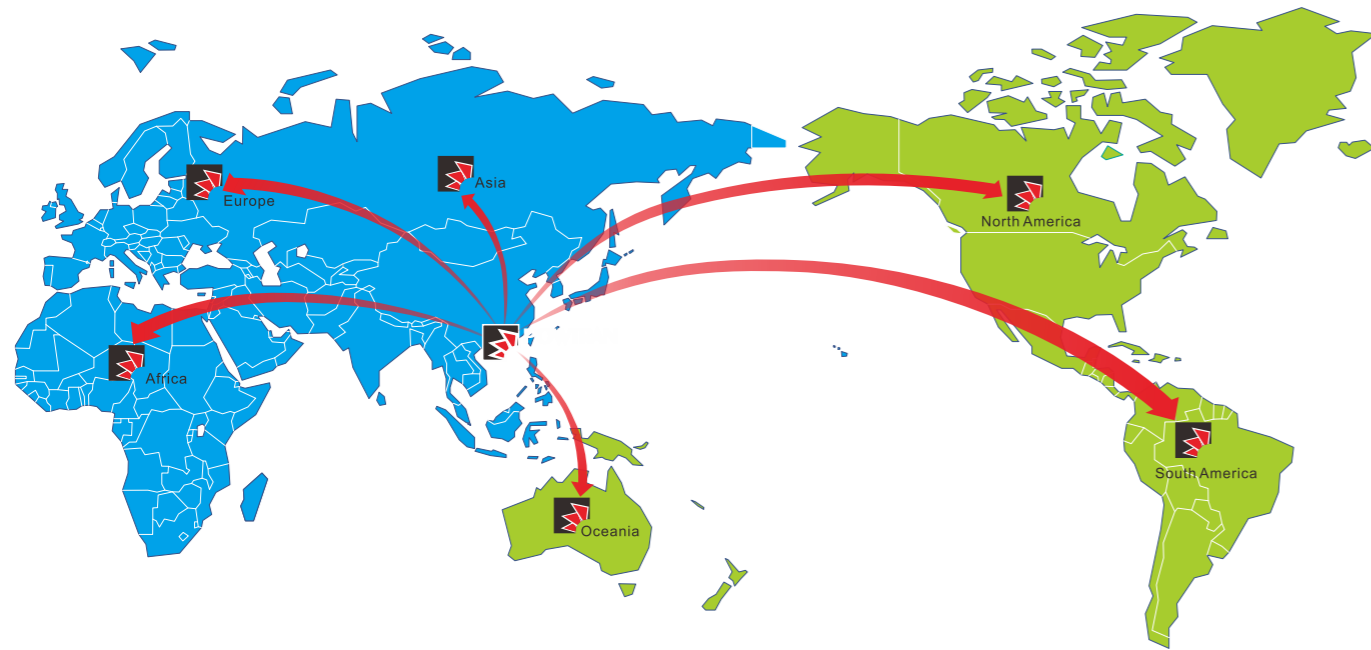
PI500 series

High-performance vector control inverter

Powtran technology
  Professional manufacturer of frequency inverter based on the motor design and manufacture.

Contact

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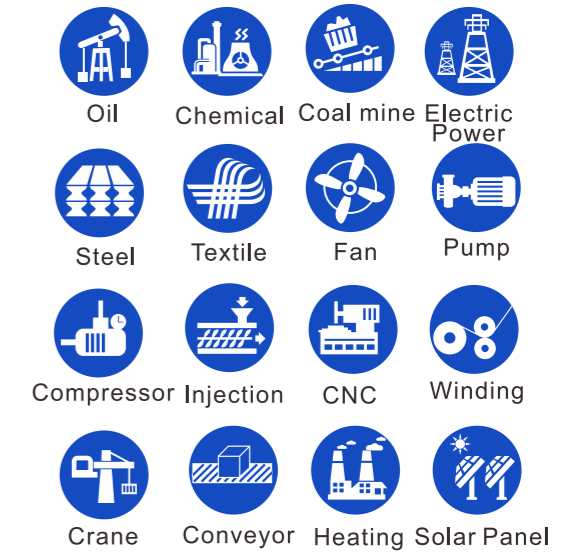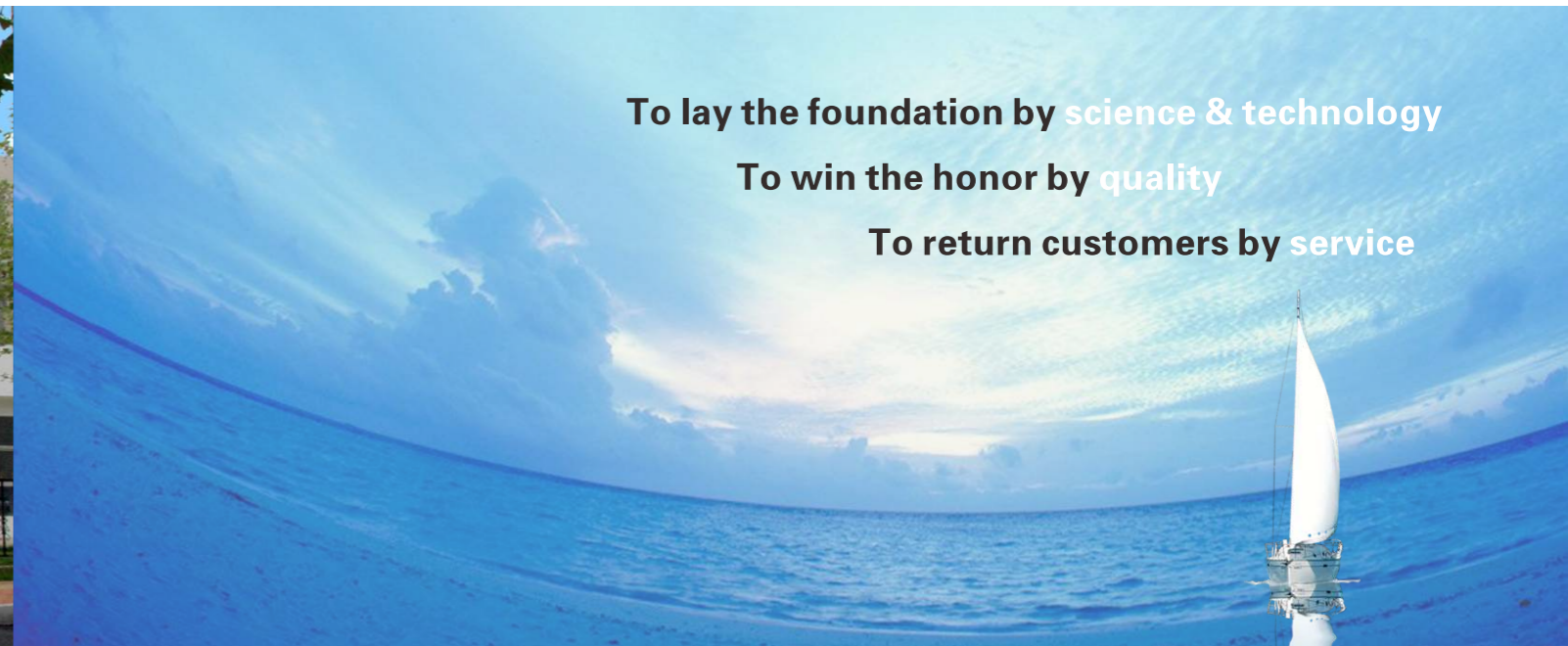
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Product Overview

PI500 series high-performance vector control inverter is based on the company's many years of design, production, sales experience, suitable for all kinds of industrial machinery, fan& water pump drive control and heavy industry such as medium frequency grinding. Products in duct design, hardware configuration, software functions, installation design has greatly improved the customer ease of use and environmental adaptability, function optimization, application is more flexible, more stable performance, greatly improve the product reliability.

Oil   Chemical Coal mine Electric Power

Steel   Textile   Fan   Pump

Compressor Injection   CNC   Winding

Crane   Conveyor   Heating Solar Panel

Company Introduction

Powtran Technology as a national high-tech enterprise, set up Wuxi, Guangzhou and more than 30 offices with the center of Shenzhen and Dalian cities and established a worldwide network of R & D, production, logistics and service. Composing the advanced technology from Japan Toshiba and Taiwan brand, Powtran provides a series of energy saving and automatic & drive control products. such as frequency inverters(including special power supply), soft starters, AC servo drive system, energy saver, vehicle motor drive system. Powtran products are verified by international authoritative organizations and now export to more than 100 countries.

Company History

2015: "30 years of the most influential brand"

2014: TUV factory-examining certification company .The standards that Powtran took part in drafting already implemented.

2013: PI9000 series new product has passed the EU CE security certification.

2012: Continuous 6 years of holding the "low voltage converter top ten domestic brand"

2011: Provincial electric drive engineering research center

2010: Ministry of science and technology innovation fund for the project

2009: National Top-new technical enterprise

2008: "The ten major energy conservation projects"

2007: The vice chairman of the association of frequency converter enterprise; PS7000 motor environmental protection energy efficient appliances, PI7900 electromagnetic stirring power be inspected by national authoritative organization

2006: Bear "Torch Plan" , 863 Plan Projects , PI7000 series inverter passed GB12668 inspection and Provincial scientific and technological achievements appraisal

2005: America ABS approve; National authoritative organization verification

2004: ISO9001 Quality Certificate

To lay the foundation by science & technology

To win the honor by quality

To return customers by service

Certifications

Superior performance in motor drive

Advanced motor drive technology

■ A variety of motor drive technology: no matter asynchronous motor or synchronous motor, it can implement high-performance current vector control. (eg: normal asynchronous motor Y2 series, Frequency conversion motor with encoder or W/O encode, asynchronous servo motor, permanent magnet synchronous motor etc).
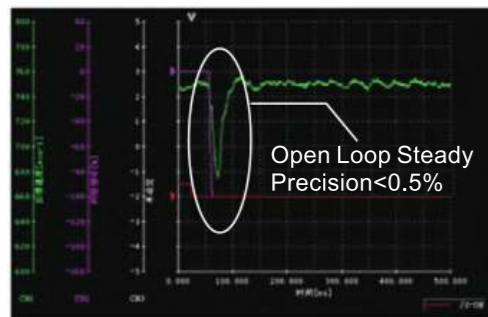
Asynchronous motor   Synchronous motor   Frequency conversion motor   Direct drive motor

Steady speed precision, wide speed range

Open Loop Steady Precision<0.5%

■ Open-loop steady speed precision <0.5%
High steady speed precision, wide adjust speed range
Steady speed precision: ±0.5% (open-loop vector control)
±0.02% (close-loop vector control)
Adjust speed range: 1:100 (open-loop vector control),
1:1000 (close-loop vector control),
Torque response: <20ms <20ms(open-loop vector control)
<5ms (close-loop vector control)
■ Heavy load overload capacity :110% rate stable operation
(110% continuously operation)
150% rate load 1Min
180% rate load 5S.

Low speed with high torque small torque ripple

The actual output torque (Nm)
26 24 22 20 18 16 14 12 10 8 6 4 2 0
0 10 20 30 40 50 60 70 80 90 100
torque rate value
—●—20%rated speed
—■—40%rated speed
—▲—60%rated speed
—✕—80%rated speed

The actual output torque (Nm)
30 25 20 15 10 5 0
0 20 40 60 80 100 120
rated torque
—■—PI9000
—■—PI500

■ stable Torque output , high torque with low frequency , to realize the stable load of low speed 0.01 Hz, torque mode and speed mode can be convenient to switch
■ In close-loop vector control , linear torque linearity deviation within 3%.

Precise motor parameter self learning

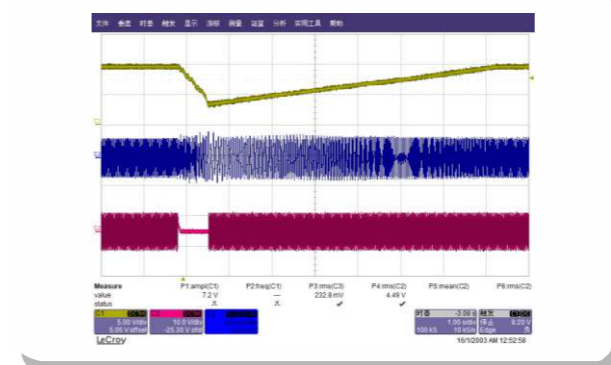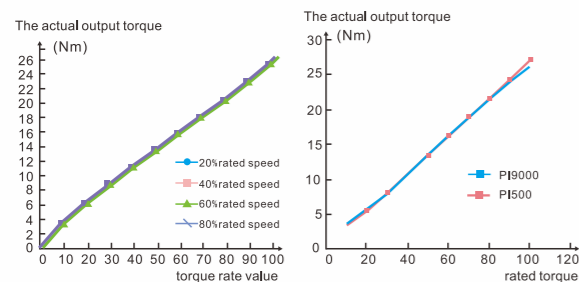| Rotary self learning	Static self learning
the learning must release load, it is suitable for requiring high control precision	it is suitable for motor occasions, to avoid can't rotate self-learning after installation

■ Motor parameters can be comprehensive self-study (rotary self learning) or still learning (motor) with the occasion of the load cannot escape, convenient debugging, simple operation, provide higher control accuracy and response speed.

Instantaneous power off don't stop function

■ When grid instantaneous drops or outages, inverter can borrow feedback energy and keep running without stop in effective time,especially suitable for the equipments which needs higher continuity,such as textile production line, chemical fiber.

reliable design

Meet the international standard of wide voltage input range

wide voltage design

323 380   480 528   voltage（V）

■ Rated voltage: 3phase 380-480v 50Hz/60Hz

Allow voltage float range: rated voltage ±15%.
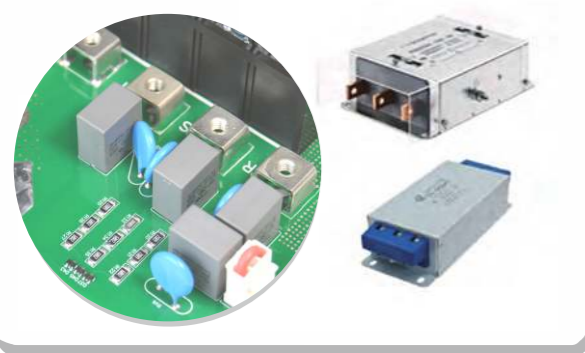
EMC Design specifications Improved

■ EMC built-in a set of safety capacitance, optional external capacitance group, simple filter, optional filter schaffner can meet C2 international standards
■ Using professional grounding pile design, convenient grounding and weaken the electromagnetic interference
■ At the scene of the bad to actual application provides EMC filter, common mode rejection, simple filter configuration of a complete set of plan, optimize the environment of EMC electric field devices
Remark: optional filter match CE approve, C2 EMC standard, recommend SCHAFFNER & JIA NLI model.
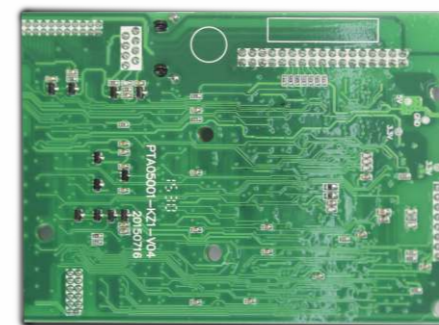
Anti-corrosion paint spraying process

■ High protection design, use the import anti-corrosion paint, moisture proof, dustproof, oil proof, corrosion resistance, improve the product reliability, 3D painting, no dead Angle

Meet a number of certification standards

■ Product is suitable for Euro < Technical coordination and standardization methods> requirements.
EMC directive 2004/108/CE Electromagnetic compatibility directive and LVD directive
2006/95/EC low voltage directive IEC61000-2-2:2002, IEC61000-4-2:2008, IEC61000-4-3:2008; IEC61800-5-1:2007 etc.
■ Meet the ROHS directive
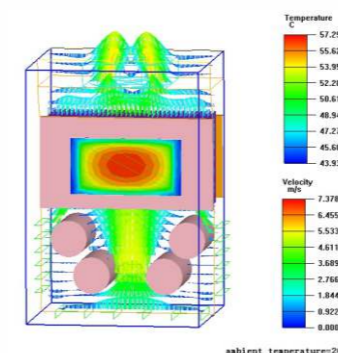
Thermal reliability of the machine

■ Adopted high precision thermal simulation platform software, ensuring the thermal reliability of the machine.
PI500 series inverter, all must go through thermal simulation test.Thermal design is scientific simulation tested, good accuracy, quick efficiency, good stability, especially in the condition of limit test, thermal simulation can replace the actual load test simulation, equivalent to more than a layer of scientific thermal test
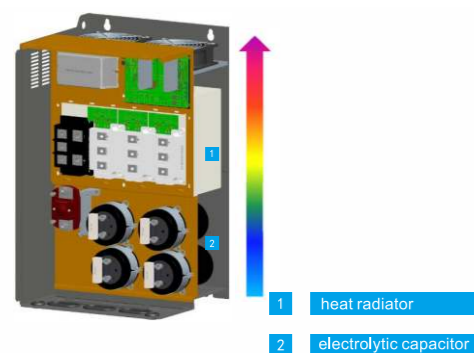
Independent air duct design

■ Independent air duct design, the effect of heat dispelling is better, improve the reliability, which can effectively prevent dust into the converter internal to avoid a short-circuit fault etc
■ Select longevity's deadly air cooling fan, effectively reduce the temperature rise of frequency converter, inverter reliable and stable operation

| 1 | heat radiator |
| 2 | electrolytic capacitor |

Machine temperature rise test

■ The full series of frequency converter had done the rated load temperature rise test and overload temperature rise test, test results accord with thermal design safety margin, ensure safe and stable operation of the converter

PI500 series
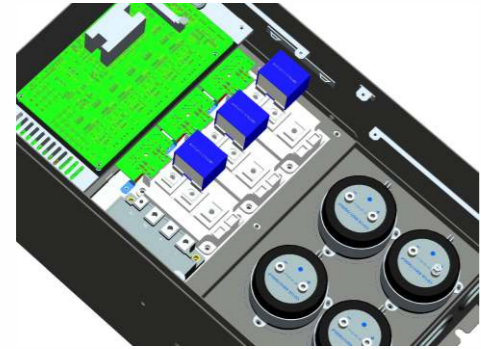
Long life design

■ Adopting the first class manufacturers of rectifier bridge and IGBT, higher configure, greater device selection, and monitor all the temperature rise of key components and pcb board;
■ Big temperature rise range, longer life;
■ Vibration test to make sure the safety of transportation design;
■ Internal logistic management(bar code technology, RF technology);
■ Sheet Metal design, adopting Cold-rolled steel and galvanized sheet and powder spraying process on the cover

Great environment friendly function

380v 7.5kw fan/ pump application

efficiency(%)

increase 13%

increase 6.6%

Synchronous Motor + energy saving controller

Asynchronous Motor + energy saving controller

Asynchronous Motor + without energy saving controller

speed(%)

New generation energy saving running

■ Adopt the advanced energy control technology
■ With the energy control technology to realize the high efficient running of motor;
■ Super energy saving while running with synchronous motor;
■ Super energy saving while running with synchronous motor, better than asynchronous motor,realize the super energy saving
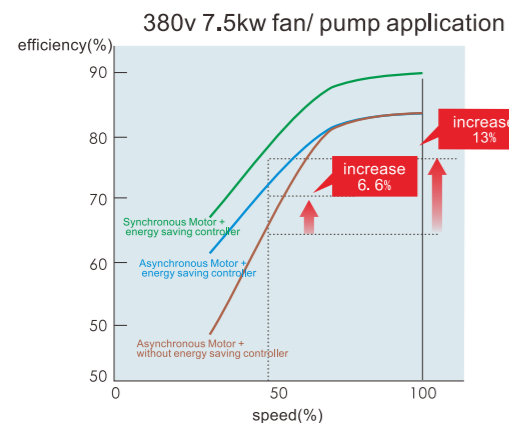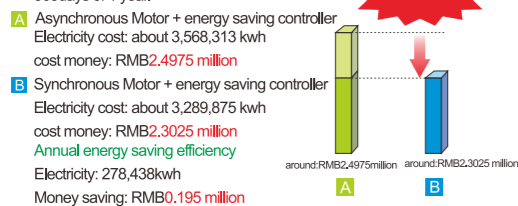■ ROSH approved, all components are environment friendly, no harm to people, no pollution..

PI500 energy saving for example

Before using controller, the fan of air conditioner 7.5kw*100 sets, price of electricity is RMB 0.7/Kwh, 365days of 1 year.

Money saving around:RMB0,195 million

A Asynchronous Motor + energy saving controller
Electricity cost: about 3,568,313 kwh
cost money: RMB2.4975 million

B Synchronous Motor + energy saving controller
Electricity cost: about 3,289,875 kwh
cost money: RMB2.3025 million
Annual energy saving efficiency
Electricity: 278,438kwh
Money saving: RMB0.195 million

around:RMB2.4975million   around:RMB2.3025 million

A   B

Remark: above example just for reference .
real energy saving will be influenced by running condition, load, price of electricity, motor character etc.

The advanced function of changing the class of machines
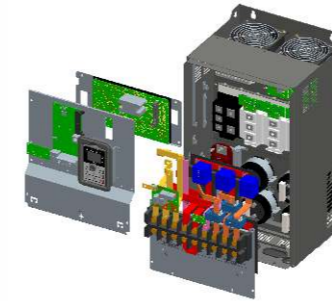
The compact design to improve the speed of realizing machines minimizing

■ Collect the minimum frequency inverter with small and light synchronous motor to speed up the machines minimizing;
■ Selecting the long life, big wind cooling fans, new generation IGBT module technology ,high efficiency of power, reducing the temperature rise of frequency inverter efficiently, make sure the frequency inverter run steadily.

Over-excitation function

Over-excitation function valid   Over-excitation function invalid

T1   T2
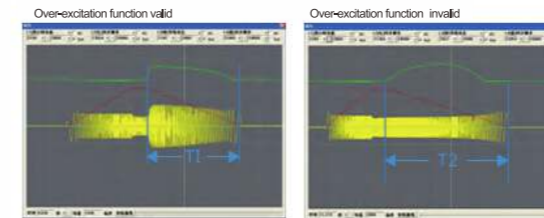
■ Fast braking and easy operating without any other periphery braking resistor, etc;
■ Inhibit the increasing of DC-bus voltage while deceleration, avoid the frequent err, and fast braking, fast stop.

Various kinds of terminals functions, easier for operation

■ There are 51kinds of multi-function terminals DI , 41 kinds of DO, and 16kinds of AO logical function choice, and meet general purpose frequency inverter normal requirements.
■ AI can be used as multi-function terminals'DI freely;
■ AI1~AI3 can be set 4 respectively polylines and five kinds of curves corresponding relationship separately, support the client to adjust the EXW parameters with the site, expanded AI3 is isolated inputs, support PT100 or ±10 v input,easily operation;
■ Good5groups of built-in analog DI and DO function choice, reducing external DI/DO cables,DI5 high-speed pulse input terminal and FM high-speed pulse output terminal support the highest 100khz pulse.A

POWTRAN®

Built in self-adjusting PID function module

■ Built in two groups of PID parameters, it is changeable automatically according to the deviation, DI terminal ,frequency ;
■ various given and feedback source, variable and practical type
■ PID feedback lost inspection function, it is convenient for user to inspect the fault function;
■ Setting factory parameters for special fields to meet the requirements, such as Printing and package, drawing machine, cables etc ,these sites are influenced by changeable diameters, simplify the debugging process ,and easy to maintain the device.

Easy to use PC software
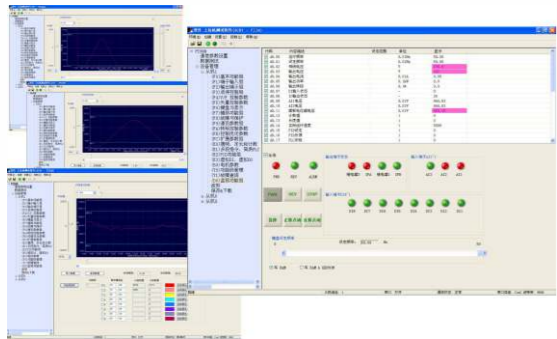
■ Easy to use PC monitoring software, enables tracking and fault location, and with oscilloscope function, it's more convenient for clients to program, debug, real time monitoring is very good for analyzing and management.

Communication interface application is very flexible
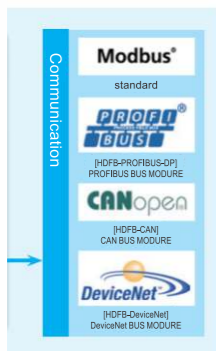
■ Support Modbus RTU,CANopen,Profibus-DP bus Protocol;
■ Through a dedicated distribution point of the inverter parameters, to realize a good multi-level load distribution, multi-machine control applications droop.

Supporting various kinds of installation ways
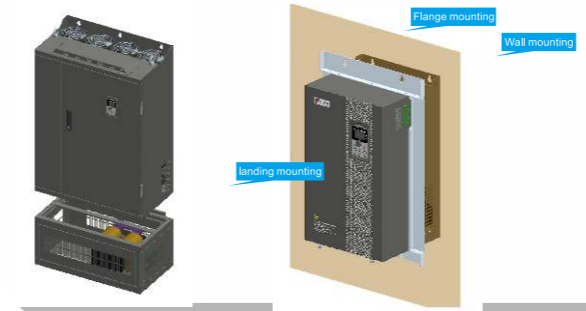
■ Wall-mounted, flange installation is available for 7.5-110kw (flange mounting needs peripheral accessories);
Wall-mounted, flange installation, floor installation is available for 132-220kw(flange mounting, floor installation needs peripheral accessories);
Wall-mounted, floor installation is available for 250-400kw (floor installation needs peripheral accessories);
Floor-mounted is available for 450-630kw

Simple maintenance

■ Fan can be disassembled, easy to install, clean and replace.
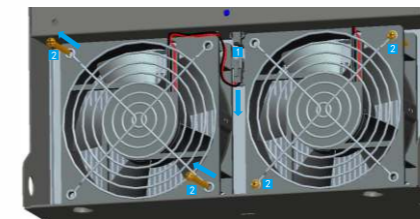
1 fans terminals
2 fans fastening screw

Improve the production efficiency!

Reduce the enterprise integrated energy costs

Technical Specification

7. 5~220kW   250~400kW   450~630kW
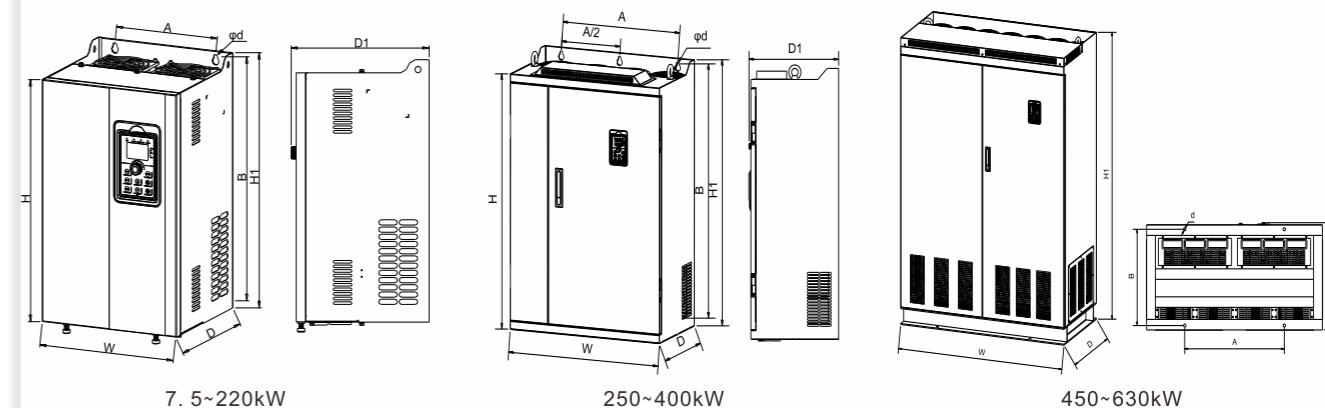
Nameplate instruction

Inverter model		POWTRAN	CE
Output rating		MODEL: PI500 018G3	
Input rating		POWER: 18.5kW	
Output specifications		INPUT: AC 3PH 380V(-15%)-440V(+10%) 50Hz/60Hz	
		OUTPUT: AC 3PH 0V-Vin37A 0~400Hz	

Inverter model ➡
Output rating ➡
Input rating ➡
Output specifications ➡
Bar code ➡
Serial No. ➡
Manufacturer address ➡

ZPB1A8888888
DALIAN POWTRAN TECHNOLOGY CO.,LTD.

Model Description

PI 500 018 G 3

POWTRAN INVERTER

Serial name
PI500 series product

Rated output power
018:18.5KW
132:132KW

Input voltage level
1：single phase220V
2：three phase220V
3：three phase380V
6：three phase690V

Function code
F: light load
G: General load

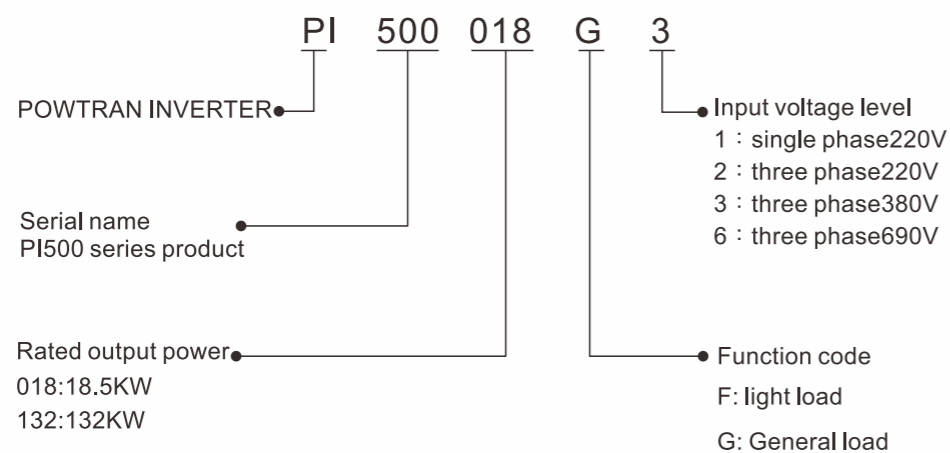| Inverter model	Output power（kW）	Input current（A）	Output current（A）	Dimension(H1xWxD1mm)					Installation（AxB dmm）		
				H	H1	W	D	D1	A	B	d
PI500 7R5G3/011F36	7.5/11	20.5/26	17/25	280	300	190	190	198	140	285	6
PI500 011G3/015F36	11/15	26/35	25/32								
PI500 015G3/018F36	15/18.5	35/38.5	32/37	330	350	210	190	198	150	335	6
PI500 018G3/022F36	18.5/22	38.5/46.5	37/45								
PI500 022G3/030F36	22/30	46.5/62	45/60								
PI500 030G3/037F36	30/37	62/76	60/75	380	400	240	215	223	180	385	7
PI500 037G3/045F36	37/45	76/91	75/90								
PI500 045G3/055F36	45/55	91/112	90/110								
PI500 055G3/075F36	55/75	112/157	110/150	500	520	300	275	283	220	500	10
PI500 075G36	75	157	150								
PI500 093F36	93	180	176								
PI500 93G3/110F36	93/110	180/214	176/210	550	575	355	320	328	250	555	10
PI500 110G3/132F36	110/132	214/256	210/253								
PI500 132G3/160F36	132/160	256/307	253/304	695	720	400	360	368	300	700	10
PI500 60G3/187F36	160/187	307/345	304/340								
PI500 187G3/200F36	187/200	345/385	340/380	790	820	480	360	368	370	800	11
PI500 200G3/220F36	200/220	385/430	380/426								
PI500 220G36	220	430	426								
PI500 250F36	250	468	465								
PI500 250G3/280F36	250/280	468/525	465/520	940	980	705	380	388	550	945	13
PI500 280G3/315F36	280/315	525/590	520/585								
PI500 315G3/355F36	315/355	590/665	585/650								
PI500 355G3/400F36	355/400	665/785	650/725								
PI500 400G36	400	785	725								
PI500 450F36	450	883	820								
PI500 450G3/500F36	450/500	883/920	820/860	/	1700	1200	600	612	680	550	17
PI500 500G3/560F36	500/560	920/1010	860/950								
PI500 560G3/630F36	560/630	1010/1160	950/1100								
PI500 630G3/700F36	630/700	1160/1310	1100/1250								

Remark: After installing the screw rings ,the height dimensions is :H1+15mm。

Standard specification

Item	Function	Specification
Power	Rated voltage level	AC 3PH 380V(-15%)-440V(+10%)
	Input frequency	50Hz/60Hz
	Allowable fluctuation	Voltage continued volatility ±10% input frequency volatility:±5% Voltage unbalance rate less than 3% Distortion meet IEC 61800-2 standard
Control System	Control system	High performance vector control inverter based on DSP
	Control method	V/F control, vector control W/O PG, vector control W/PG
	Automatic torque boost function	Realize low frequency (1Hz) and large output torque control under the V/F control mode.
	Acceleration/deceleration control	Straight or S-curve mode. Four times available and time range is 0.0 to 6500.0s.
	V/F curve mode	Linear,square root/m-th power,custom V/F curve
	Over load capability	G type:rated current 150% - 1 minute, rated current 180% - 2 seconds F type:rated current 120% - 1 minute, rated current 150% - 2 seconds
	Maximum frequency	Vector control:0 to 300Hz V/F control:0 to 3200Hz
	Carrier Frequency	0.5 to 16kHZ;automatically adjust carrier frequency according to the load characteristics.
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency×0.1%
	Start torque	G type: 0.5Hz/150% (vector control W/O PG) F type: 0.5Hz/100% (vector control W/O PG)
	Speed range	1:100 (vector control W/O PG) 1:1000 (vector control W/ PG)
	Steady-speed precision	Vector control W/O PG: ≤±0.5% (rated synchronous speed) Vector control W/ PG: ≤±0.02% (rated synchronous speed)
	Torque response	≤40ms (vector control W/O PG)
	Torque boost	Automatic torque boost; manual torque boost(0.1% to 30.0%)
	DC braking	DC braking frequency: 0.0Hz to max. frequency, braking time:0.0 to 36.0 seconds, braking current value: 0.0~100.0s
	Jogging control	Jog Frequency Range: 0.00Hz to max. frequency; Jog Ac/deceleration time: 0.0s~6500.0s
	Multi-speed operation	Achieve up to 16-speed operation through the control terminal
	Built-in PID	Easy to realize closed-loop control system for the process control.
	Automatic voltage regulation(AVR)	Automatically maintain a constant output voltage when the voltage of electricity grid changes
	Torque limit and control	"Excavator" feature - torque is automatically limited during the operation to prevent frequent overcurrent trip;the closed-loop vector mode is used to control torque.
Personalization function	Self-inspection of peripherals after power-on	After powering on, peripheral equipment will perform safety testing, such as ground, short circuit,etc.
	Common DC bus function	Multiple inverters can use a common DC bus.
	Quick current limiting	The current limiting algorithm is used to reduce the inverter overcurrent probability, and improve whole unit anti-interference capability.
	Timing control	Timing control function: time setting range(0h to 6500m).

Standard specification

Item	Function		Specification
Running	Input signal	Running method	Keyboard/terminal/communication
		Frequency setting	10 frequency setting available, including adjustable DC 0~10V，-10~+10V，adjustable DC 0~20mA，panel potentiometer
		Start signal	Rotate forward/reverse
		Multi-speed	At most 16-speed can be set(run by using the multi-function terminals or program)
		Emergency stop	Interrupt controller output
		Wobbulate run	Process control run
		Fault reset	When the protection function is active, you can automatically or manually reset the fault condition.
		PID feedback signal	Including DC(0 to 10V), DC(0 to 20mA)
	Output signal	Running status	Motor status display, stop, ac/deceleration, constant speed, program running status.
		Fault output	Contact capacity: normal-closed contact 3A/AC 250V; normal-opened contact 5A/AC 250V; 1A/DC 30V.
		Analog output	Two-way analog output, 16 signals can be selected such as frequency,current,voltage and other, output signal range(0 to 10V / 0 to 20mA).
		Output signal	At most 4-way output,there are 40 signals each way
	Run function		Limit frequency,jump frequency,frequency compensation,auto-tuning, PID control
	DC current braking		Built-in PID regulates braking current to ensure sufficient braking torque under no overcurrent condition.
	Running command channel		Three channels: operation panel,control terminals and serial communication port. They can be switchedthrough a variety of ways.
	Frequency source		Total 10 frequency sources: digital,analog voltage,analog current, multi-speed and serial port. They can be switched through a variety of ways.
	Input terminals		8 digital input terminals, compatible with active PNP or NPN input mode, one of them can be for high-speedpulse input(0~100Hz square wave); 3 analog output terminals,AI1 and AI2 can choose 0~10V or 0~20mA input, AI3 voltage is -10~+10V input.
	Output terminals		2 digital output terminals, one of them can be for high-speed pulse output(0 to 100kHz square wave); one relay output terminal; 2 analog output terminals respectively for optional range (0 to20mA or 0 to 10V),they can be used to set frequency, output frequency, speed and other physicalparameters.
Protection function	Inverter protection		Overvoltage protection, undervoltage protection, overcurrent protection, overload protection, overheat protection, overcurrent stall protection, overvoltage stall protection, losing-phase protection (optional), external fault, communication error, PID feedback signal abnormalities, PG failure and short circuit to ground protection.
	IGBT temperature display		Displays current temperature IGBT
	Inverter fan control		Can be set
	Instantaneous power-down restart		Less than 15 milliseconds: continuous operation. More than 15 milliseconds: automatic detection of motor speed, instantaneous power-down restart.
	Speed start tracking method		The inverter automatically tracks motor speed after it starts
	Parameter protection function		Protect inverter parameters by setting administrator Password and decoding
Display	LED/OLED display keyboard	Running information	Monitoring objects including : running frequency, set frequency, actual motor current, DC bus voltage, output voltage, actual motor speed, cumulative running time, IGBT temperature, PID reference value, PID feedback value, input terminal status, output terminal status, analog AI1 value, analog AI2 value, current stage of multi-speed, torque set value.
		Error message	At most save 3 error message, and the time, type, voltage, current, frequency and work status can be queried when the failure is occurred.
	LED display		Display parameters
	OLED display		Optional, prompts operation content in Chinese/English text.
	Parameters copy		Can uploading or downloading the function code information of frequency inverters, do the parameter copy quickly.
	Key lock and function selection		Lock part or all of keys, define the function scope of some keys to prevent misuse.
Communication	RS485		The optional completely isolated RS485 communication module can communicate with the host computer.
Environment	Environment temperature		-10 ℃ to 40 ℃ (temperature at 40 ℃ to 50 ℃, please derating for use)
	Storage temperature		-20 ℃ to 65 ℃
	Environment humidity		Does not exceed 90% R.H, no condensation of moisture
	Vibration		Below 5.9m/s² (= 0.6g)
	Application sites		Indoor where no sunlight or corrosive, explosive gas and water vapor, dust, flammable gas, oil mist, water vapor, drip or salt, etc.
	Altitude		Below 1000m
	Pollution degree		2
	IP degree		IP20
Product standard	Product adopts safety standards.		IEC61800-5-1:2007
	Product adopts EMC standards.		IEC61800-3:2005
	Cooling method		Forced air cooling

Operating keyboard(button key description)

| Sign	Name	Function
PRG	Parameter Setting/ Exit Key	*Enter top menu parameter change status *Exit from function option change *Return to status display menu from sub-menu or function option menu
>> SHIFT	Shift Key	*Select circularly parameters under run or stop interface; *Select parameters when modifying the parameters.
▲	Ascending Key	*UP key setted by parameter F6.18
▼	Decending Key	*DOWN key setted by parameter F6.19
RUN	Run Key	*Used for running operation in the keyboard mode.
STOP RST	Stop/Reset Key	*For stopping running in the running status; for resetting the operation in fault alarm status. *The function of the key is subject to F6.00
ENTER	Enter Key	*Enter into levels of menu screen,confirm settings.
QUICK	Quick multifunction key	*This key function is determined by the function code F6.21.
(encoder)	Keyboard encoder	*In query status: functional items increasing and decreasing *In modify status: function feagues or editing increasing or decreasing *In monitoring status: setting frequency increasing or decreasing

Installation

Installation direction and Vacancy

PI500 series inverter according to different power rating, the requirements of around installation and reserved space is different, specifically as shown below:
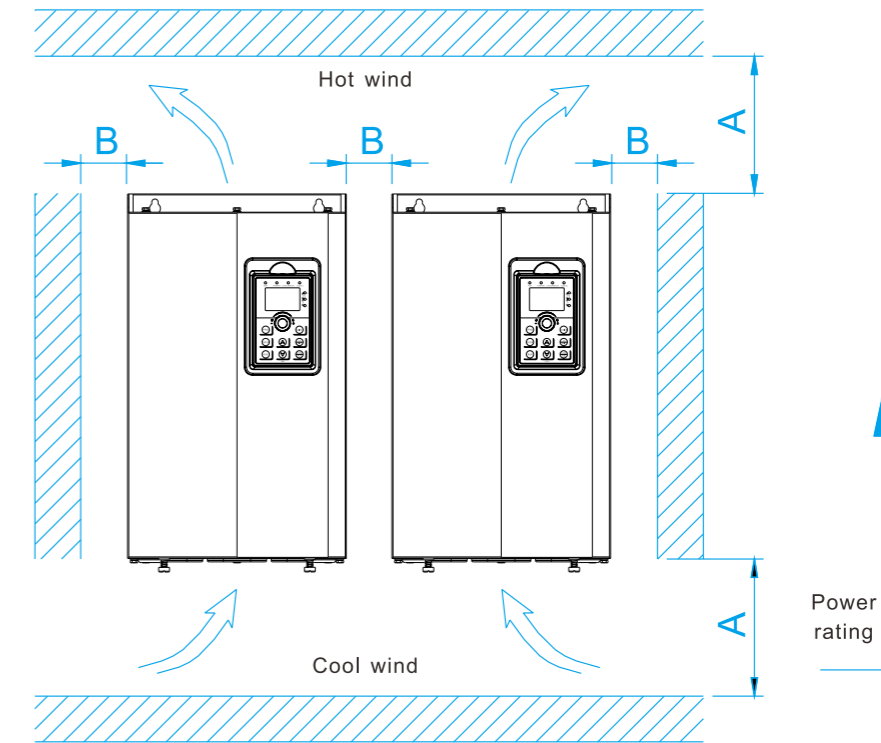
Mounted vertically upwards	Dimension requirement
7. 5～22KW	A≥200mm；B≥10mm
30～75KW	A≥200mm；B≥50mm
93～400KW	A≥300mm；B≥50mm

Pi500 Series frequency inverter heat radiator circulated from bottom to top, when more than one inverter work together, usually mounted side by side. In the case of the need to install them by upper and lower rows, due to the heat of the lower inverters rising to the upper equipment, fault maybe caused, heat insulation deflector and other objects to be installed.

Use of the environment

1. Environmental temperature -10℃ to 50℃ Above 40℃, the capacity will decrease 3% by each 1℃.So it is not advisable to use inverter above 50℃

2.Prevent electromagnetic interference, and away from interference sources.

3. Prevent the ingress of droplets, vapor, dust, dirt, lint and metal fine powder.

4. Prevent the ingress of oil, salt and corrosive gases.

5.Avoid vibration，Maximum amplitude is less than5. 9m/s（0. 6g）.

6. Avoid high temperature and humidity or exposure to rain, humidity shall be less than 90% RH (non-condensing). In the presence of corrosive gas , maximum relative humidity is no more than 60%。

7.Altitude below 1000 meters.

8.Never use in the dangerous environment of flammable, combustible, explosive gas, liquid or solid.

Wiring

Frequency inverter wiring is divided by main circuit and control circuit. Users must properly connect frequency inverter in accordance with the wiring connection diagram showing below.

Wiring diagram

Brake unit

DC Reactor Break Resisto Optional

P + RB −

MCCB Contacts

R R(L1) U(T1) Motor
S S(L2) V(T2) M 3~
T T(L3) W(T3)

Earthing (Motor) Earthing (Motor)

PI500 inverter

Main circuit

Control circuit

DI1 Input digital terminal DI1
DI2 Input digital terminal DI2
DI3 Input digital terminal DI3
DI4 Input digital terminal DI4
DI5 Input digital terminal (High speed pulse input) DI5
DI6 Input digital terminal DI6
DI7 Input digital terminal DI7
DI8 Input digital terminal DI8

ON 485
(Default)OFF 485+
485−

J10
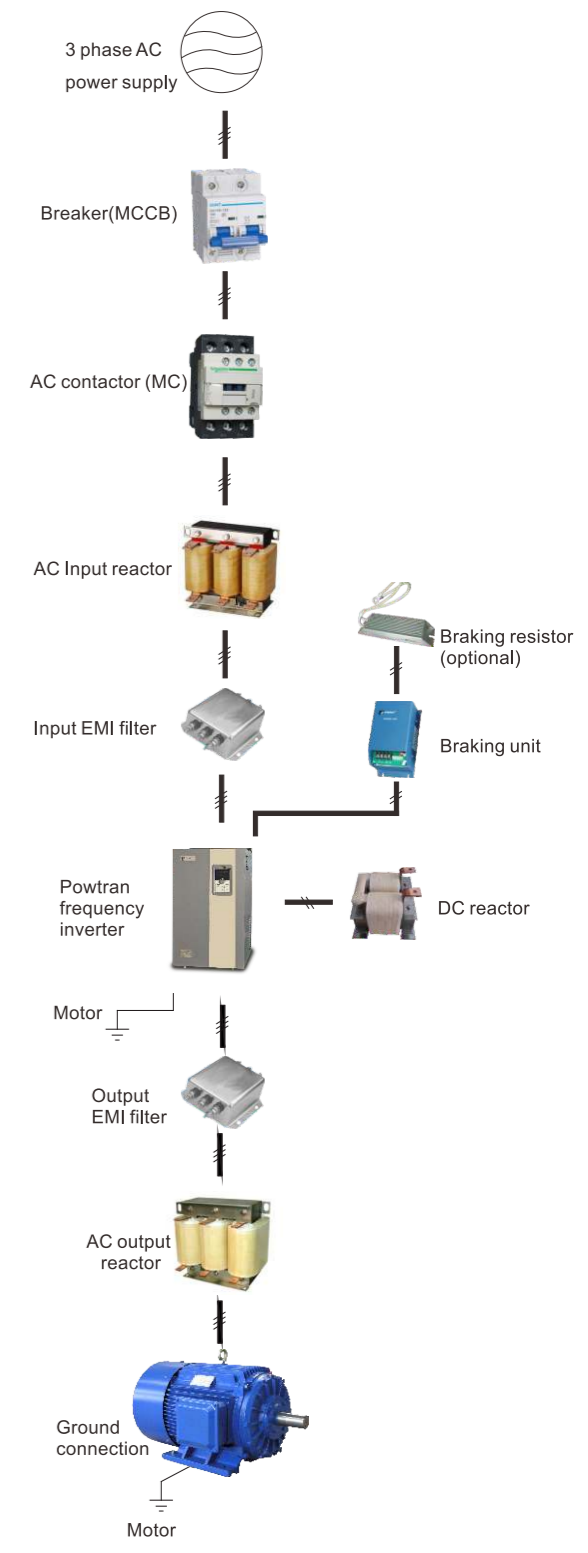PG Card port vcc
S2
J13 S1

COM
E(PE) Communication card port
PLC +24V (Default)
PLC COM

+24V

PLC can connect +24V or COM, external power supply (24V±20%) also available, without +24V/COM

DA1 DA1
V 0~10V DC(Default) GND
I 0~20mA DC E(PE)
Analog output DA1
0~10V max loading current 5mA
0~20mA max loading impedance 250ohm

DA2 DA2
V 0~10V DC(Default) GND
I 0~20mA DC E(PE)
Analog output DA2
0~10V max loading current 5mA
0~20mA max loading impedance 250ohm

VR 1K/2W +10V
AI1 AI1
V Short-circuit 0~+10V DC (Default)
I Short-circuit 0~20mA DC
VR 1K/2W
AI2 AI2
V Short-circuit 0~+10V DC
I Short-circuit 0~20mA DC (Default)
GND

E(PE)

SPA COM Output signal 1
SPB COM Output signal 2

VR 1K/2W +10V
AI3
GND
E(PE)
(External connection) −10V

Com HI

TA1 Output signal 3
TB1 Normally-closed contact 3A/AC 250V & normally open contact 5A/AC 250V
TC1

GND
NC short-circuit PE(Default)
COM

TA2 Output signal 4
TB2 Normally-closed contact 3A/AC 250V & normally open contact 5A/AC 250V
TC2

NC short-circuit PE(Default)

Peripheral equipment

Purpose	Name	Specification
Protect frequency inverter wiring	Wiring breaker or leakage protector	To protect frequency inverter connection, please set wiring breaker or leakage protector by the side of power supply. Please use preventing ultra-harmonics leakage protector.
Prevent braking resistor burning-out	AC contactor	To prevent braking resistor burning-out when connecting, please set AC contactor, meanwhile, please connect surge absorber on the coil.
Preventing switching surge leaking out	Surge absorber	Surge absorber absorbing electromagnetic contactor and control relay switching surge, please install surge absorber on the electromagnetic contactor and control relay of frequency inverter.
Insulation input/ output signal	Isolator	Due to frequency inverter insulation input/output signal, isolator can reduce inductive interference effectively
Improve frequency inverter input power factor	DC reactor/AC reactor	Apply to improve frequency inverter input power factor, please set DC reactor or AC reactor, when using large capacity power supply (above 600kW)
Reduce noise disturbance	Input noise filter	Input wiring can reduce noise flow into frequency inverter input power supply system. Please install the filter close to frequency inverter.
	Output noise filter	From frequency inverter output wiring reduce noise, please install the filter close to frequency inverter.
Machine stop running on setting time	Braking resistor	Braking unit will consume machine regenerated energy, which will reduce decrease time
	Braking unit	Braking unit and braking resistor combined using on machine, this will reduce motor decrease time.
Control frequency inverter operation from outside	Operator(small plastic –made device)	Control frequency setting and operation/stop operation by analog quantity instructions from distance.
	Operator (standard nickel clad made)	Control frequency setting and operation/stop operation by analog quantity instructions from distance.
Ensure frequency inverter sudden power failure compensation	Sudden power failure/ compensate unit	To control power supply sudden failure compensation.
Setting and monitoring frequency and voltage from outside	Frequency meter	Outside setting and monitoring frequency device.
	Frequency setting device	
	Frequency setting device knob	
	Output voltmeter	Outside setting output volt device is PWM frequency inverter specialized voltmeter.
Adjust frequency instr-uction input and frequ-ency meter, ampere meter full scale	Frequency instruction using thyrecotor baseboard	Install and control circuit terminal, input frequency instruction.
	Frequency meter full scale adjust resistor	Adjust frequency meter and ampere meter full scale.

3 phase AC power supply

Breaker(MCCB)

AC contactor (MC)

AC Input reactor

Input EMI filter

Braking resistor (optional)

Braking unit

Powtran frequency inverter

DC reactor

Motor

Output EMI filter

AC output reactor

Ground connection

Motor

Some application cases

Fan Industry
- centrifugal compressor, axial-flow compressor centrifugal blower, roots blower centrifugal fan, axial flow fan enke blower
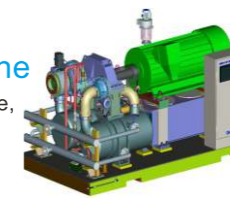
Machine Tool Industry
- ncelectro-spindle,vertical lathe spindle,surface grinder spindle,boring machine spindle, sawing machine

Coal Mining Industry
- engine analyzer,slag pot carrier，feeding machine iron ladle motor, fireproof door motor ore washing pump，suction fan in the pit，air supply system，hauling machine

Injection Molding Machine
- extruding machine,injection machine, dise refiner,internal mixer,granulate machine

Pump
- petroleum pump,metallurgical pump, chemical pump,fishing pump,mining pump,power pump,water conservancy pump,sewage pump,food pump, brewing pump,pharmacy pump, beverage pump,fuel pump,condiment pump,paper pump,textile pump,printing and dyeing pump,ceramic pump, paint conveyer pump,agricultural chemical pump,fertilizer pump,sugar-syrup pump, methanol pump,spary pump,salt pump, beer pump,starch pump,feed pump

Hoisting Industry
- mine hoist,mining electric locomotive port hoist,builders' lift,pile driver,large crane motor,tower crane lifting

Petroleum Industry
- plunger pump, beam pumping unit, oil transfer pump,gas transmission pipeline system compressor,

Chemical Industry
- vacuum kneader(agitator),dryer film blowing machine,plastic mill,pulverizer drafting device for short fiber,high speed spinning machine for chemical fiber feedstock pump for oil refinery, pump for coking unit

Winding Machine
- lithium battery winding machine, capacitor core winding machine, textile winding machine

Conveyor Belt
- belt-type conveyer,plate conveyer, car type conveyer,escalator,passenger conveyor,scraper conveyer,embedded scraper conveyor,bucket conveyor, bucket elevator,underslung conveyor, underslung conveyor

Iron And Steel Industry
- winding engine for iron-smelting blast furnace, dust removing blower for blast furnace, air blower for blast furnace gas blanketing blowing engine,roots blower for digital thermometer,variable frequency exhaust fan for steel furnace roasting and purifing fan,hot rolling machine,cold tandem rolling mill, feeding system,mill exhauster,vibrating sieving machine,wire drawing machine,winding machine,blender mixer,drying machine,slime pump，draining pump,water supply pump,unbender,pipemaking machine, ladle crane motor

Heating System
- constant pressure water supply system for boiler,mill exhauster, belt conveyer for coal,coal breaker,air blower,induced draft fan,cold-rolling mill

Power Industry
- boiler blower,induced draft fan,boiler feeding pump,circulating water pump,low pressure drain pump,condensate pump,cooling water pump,mortar pump,coal feeder.

Compressor
- piston compressor, screw compressor,centrifugal compressor,linear compressor

Textile Industry
- spinning machine,fagoting machine,pounding machine, knitting machine,centrifugal dehydrator,spinning frame, aeration machine for print works,tentering and thermo-fixing machine,high temperature dyeing machine,decorating machine,bleaching machine, dyeing jiggers

Photovoltaic
- microwave relay station,optical cable communication system, wireless paging station,satellite communication and satellite television receiving system. computerized telephone system in countryside,communication system in troops,railway and highway signalling system, lighthouse and beacon light, meteorological station,seismic station

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