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## Service Network:


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

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POWTRAN®

# PI9000 series

## High-performance vector control inverter

www.powtran.com

POWTRAN®

## Contents





PI9000 series

# Energy saving, low carbon, environmental-friendly

We dedicate ourself to provide global customers with frequency inverters which can be widely used for asychronous and permanent magnet synchronous motors in different kinds of application.

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## 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. 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

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
2001:Powtran Dalian office established, National High and New technology enterprise
1997:TUV Germany approve & CE Europe approve



## Certifications











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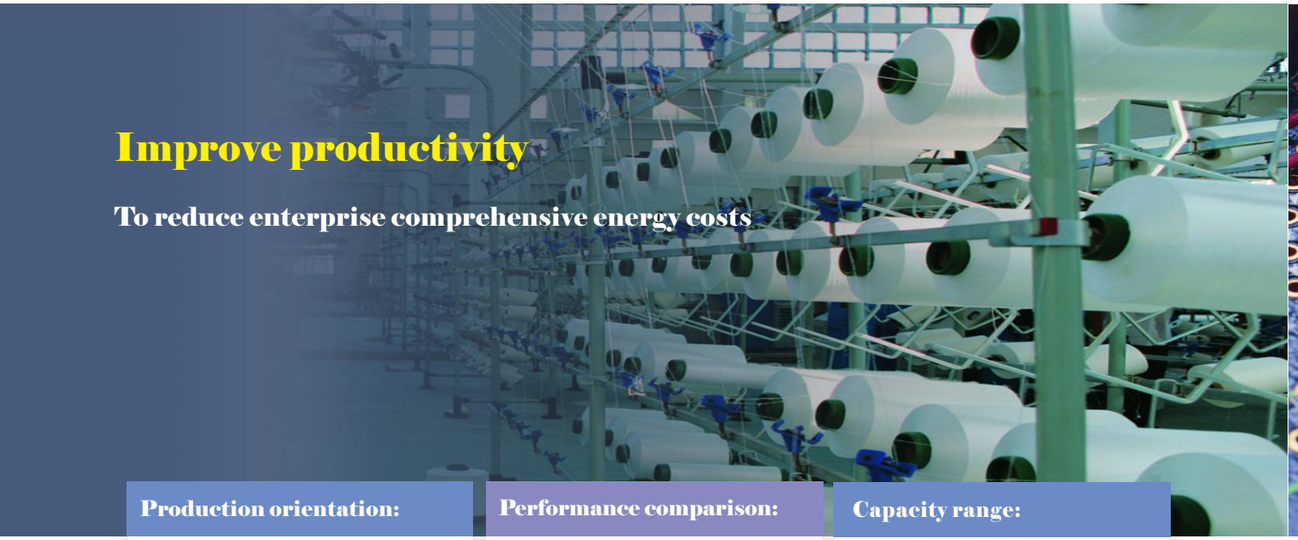
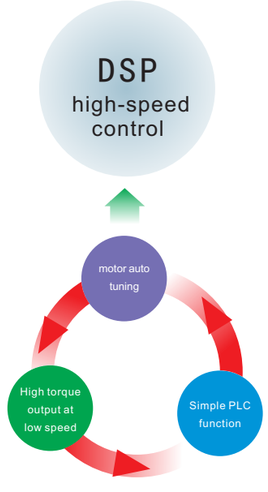


# Improve productivity

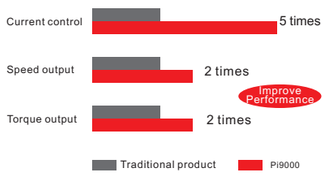
**To reduce enterprise comprehensive energy costs**

## Production orientation:

Based on the lasted theory and technology of motor running and control,Powtran invent a new high performance vector control frequency inverter .Through decoupling the motor flux current and torque current , it can achieve high rapid response and high accuracy torque control , gain high precision with more wider range control in speed control and torque control as well .




## Performance comparison:




## Capacity range:

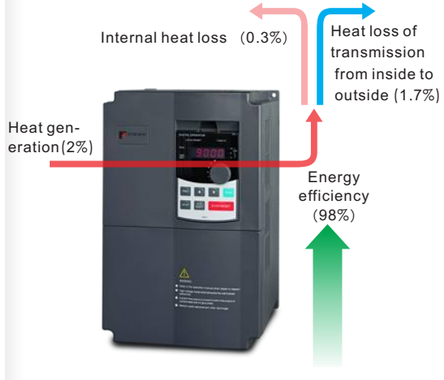
Power range: 0.4~550kW
Maximum frequency: 600.0Hz
Voltage level: 1-phase 220V
3-phase 220V
3-phase 380V
3-phase 480V
3-phase 690V

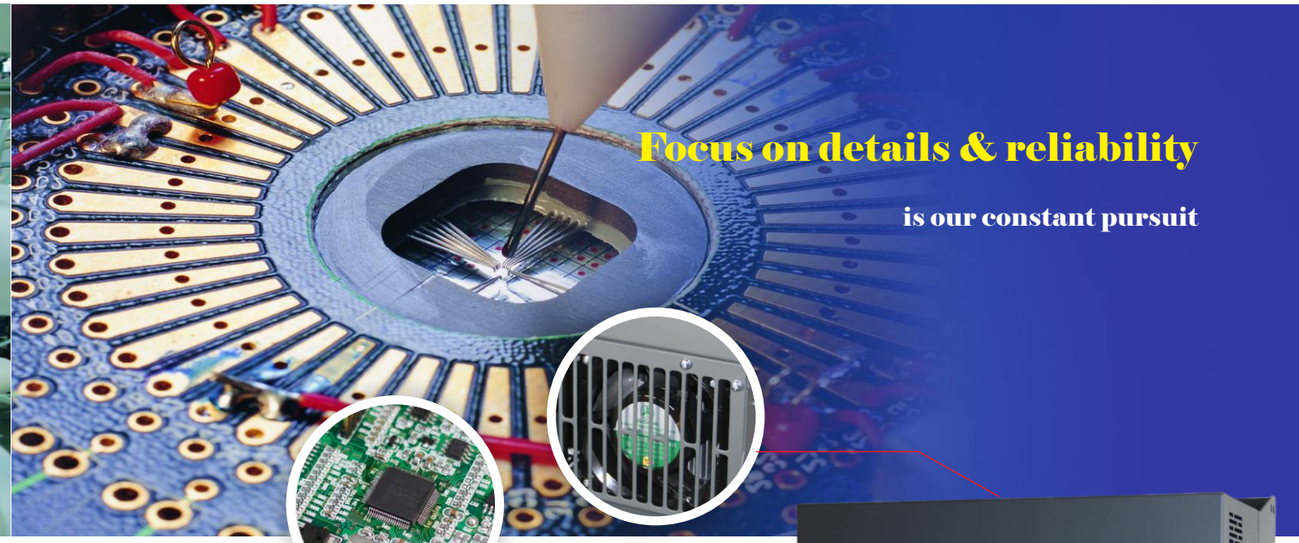
## Application field:

Metallurgy, petroleum, chemical, textile, building material, coal, medicine, food, paper making, plastic, printing, hoist, washing, water supply, sewage treatment, etc

Machine industry:

Wire drawing machine, mixer, compressor, extruder, pump, air blower, grinder, conveyor, lifting machine, etc



# Focus on details & reliability

**is our constant pursuit**



Optimized ventilation design, intelligent temperature control.



High quality DSP module

Reliable insulation design, ensure the safety of inverter

standard module design , flexible to expend more function.

Convenient and safe terminal ports

POWTRAN®


## Nameplate instruction:

inverter model →
input rating →
output rating →
Serial No. & Bar Code →

POWTRAN® | 普传科技 CE

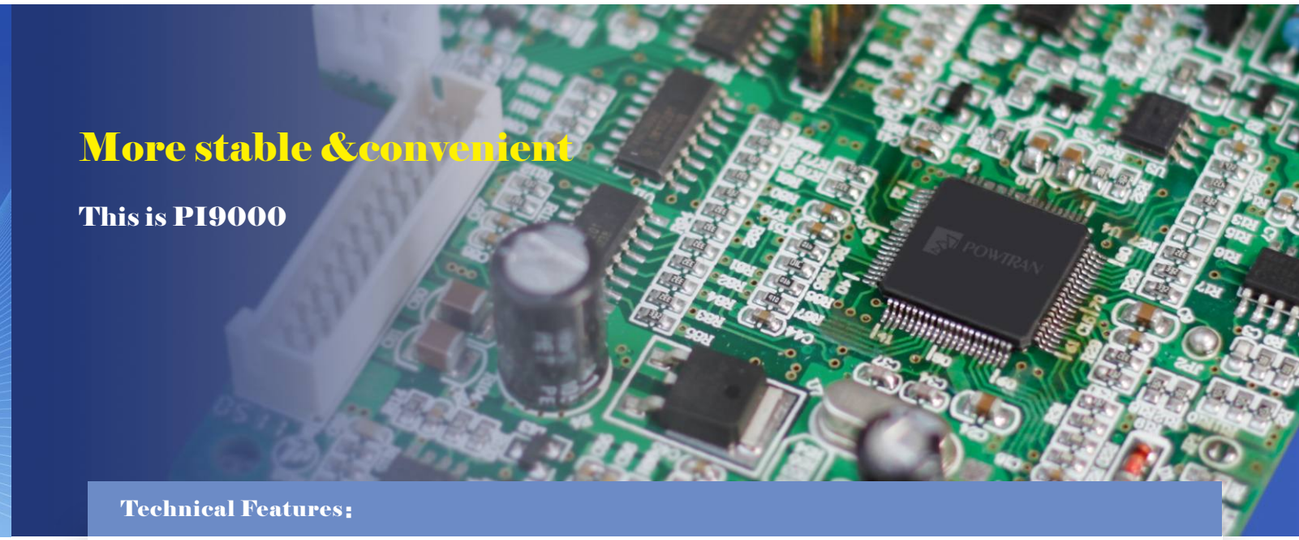
| TYPE | PI9100 7R5G3 |
|---|---|
| SOURCE | 3Φ 380V 50-60Hz |
| OUTPUT | 7.5KW 17A 0.00-400.0Hz |

ZPB1A0100001

## Model Description:

PI 910 0 b 1 7R5 G 3

- PI: POWTRAN INVERTER
- 910: Serial Name — 910: PI9100 Series 920: PI9200 Series 930: PI9300 Series
- 0: Class Code — 0: Normal Configuration 1: Special Configuration 1 2: Special Configuration 2
- b: Model code — a: normal (elided) b: enhanced d: single board m: mini machine
- 1: Model version — 0: default values(elided) 1: upgraded version
- 7R5: Power capacity (●●●) e.g.: 7R5: 7.5kW 132: 132kW
- G: Function Code (□) — Load Type: F: Flow Load (Air blower, Water pump) G: General Load
- 3: Input Voltage Level — 1: 1-phase 220V 2: 3-phase 220V 3: 3-phase 380V 4: 3-phase 480V 6: 3-phase 690V

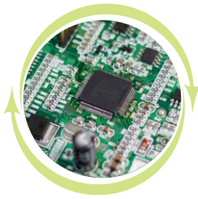



# More stable &convenient

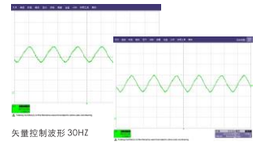
## This is PI9000

## Technical Features:

1.Based on 32-bit DSP and adopt an advanced vector control algorithm to realize a high-performance control.

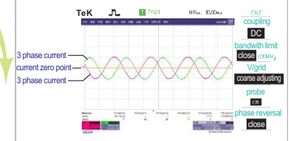


2.Mode of speed control: Senseless Vector Control, Sensor Close Loop Vector Control, V/F control




3.Vector control in asynchronous and permanent synchronous motor is available feature motor parameter auto- tuning.

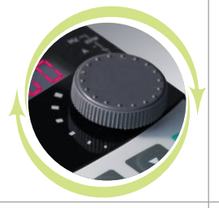

4.150% torque when at low speed (0.5) running in the sensorless vector control mode.



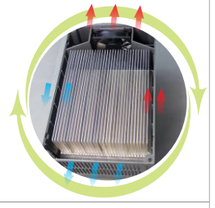

5.Built in simple PLC function ,16 sections speed is available.

6.Multi-language OLED could display 3 parameter groups at the same time

7.Rotating freely with “one key shuttle keyboard”

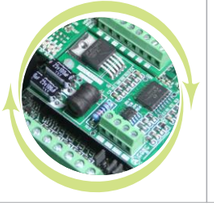


8.Optimized ventilation design

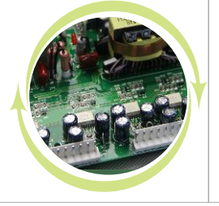


9.Reliable insulation design, ensure the safety of inverter

10.Support the standard Modbus communication protocol



11.Strengthened coating, adapt to tough environment



12.Unique EMC design, minimized the radiating interference to power grid.

EMC

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## Standard specification:

| Item | | Specification |
|---|---|---|
| Power | Voltage and frequency levels | Single-phase 220,50/60Hz Three-phase 220V,50/60Hz<br>Three-phase 380,50/60Hz Three-phase 480V,50/60Hz<br>Three-phase 690V,50/60Hz |
| | Allowable fluctuation | Voltage:±10% Frequency:±5% |
| Control system | Control system | High performance vector control inverter based on DSP |
| | Output frequency | Vector control:0 to 300Hz V/F control:0 to 600Hz |
| | 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<br>F type:rated current 120% - 1 minute, rated current 150% - 2 seconds |
| | Maximum frequency | Vector control:0 to 300Hz V/F control:0 to 600Hz |
| | Carrier Frequency | 0.5 to 15kHZ;automatically adjust carrier frequency according to the load characteristics. |
| | Input frequency resolution | Digital setting: 0.01Hz Analog setting: maximum frequency×0.025% |
| | 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)<br>Vector control W/ PG: ⩽ ± 0.02% (rated synchronous speed) |
| | Speed control accuracy | Vector control W/O PG⩽ ± 0.3% ( 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:<br>0.0 to 36.0 seconds, braking current value: 0.0~100.0s |
| | Jogging control | Jog Frequency Range: 0.00Hz to max. frequency;<br>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. |
| Persona-lization 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. |
| | Cycle-by-cycle 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 65535h). |



## Standard specification:

| Item | | | Specification |
|---|---|---|---|
| Running | input signal | Running method | Keyboard/terminal/communication |
| | | Frequency setting | 10 frequency settings available, including adjustable DC(0 to 10V),adjustable DC(0 to 20mA), panel potentiometer, etc. |
| | | 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 output - AC 250V 5A, DC 30V 5A |
| | | 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 3-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 switched through a variety of ways. |
| | Frequency source | | Total 5 frequency sources: digital,analog voltage,analog current, multi-speed and serial port. They can be switched through a variety of ways. |
| | Input terminals | | 6 digital input terminals, compatible with active PNP or NPN input mode, one of them can be for high-speed pulse input(0 to 100KHZ square wave); 2 analog input terminals for voltage or current 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 to 20mA or 0 to 10V),they can be used to set frequency, output frequency, speed and other physical parameters. |
| Protection function | Inverter protection | | Overvoltage protection, undervoltage protection, overcurrent protection, overload protection, overheat protection, overcurrent stall protection, overvoltage stall protection, losting-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. |
| | Copy parameter | | Quickly copy parameters by using the special keyboard( only for OLED) |
| | Key lock and function selection | | Lock part or all of keys, define the function scope of some keys to prevent misuse. |
| Communication | RS485/RS232 | | The optional completely isolated RS485/RS232 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 | | Less than 90% R.H, does not exceed 90% R.H |
| | Height and vibration | | Below 1000m, 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 |
| Product standard | Product adopts safety standards. | | IEC61800-5-1:2007 |
| | Product adopts EMC standards. | | IEC61800-3:2005 |
| | Cooling method | | Forced air cooling and natural air cooling |

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## Technical specifications:

| Inverter model | rated output power | rated input current | rated output current | match motor | base No. | input voltage |
|---|---|---|---|---|---|---|
| PI9100-0R4G1 | 0.4 | 5.4 | 2.5 | 0.4 | 9S2 | 1-phase 220V ±10% |
| PI9100-0R7G1 | 0.75 | 8.2 | 4 | 0.75 | 9S2 | |
| PI9100-1R5G1 | 1.5 | 14 | 7 | 1.5 | 9S2 | |
| PI9100-2R2G1 | 2.2 | 23 | 10 | 2.2 | 9S3 | |
| PI9100-004G1 | 4.0 | 35 | 16 | 4.0 | 9S3 | |
| PI9200-5R5G1 | 5.5 | 50 | 25 | 5.5 | 9L1 | |
| PI9100-0R4G2 | 0.4 | 4.1 | 2.5 | 0.4 | 9S2 | 3-phase 220V ±10% |
| PI9100-0R7G2 | 0.75 | 5.3 | 4 | 0.75 | 9S2 | |
| PI9100-1R5G2 | 1.5 | 8.0 | 7 | 1.5 | 9S2 | |
| PI9100-2R2G2 | 2.2 | 11.8 | 10 | 2.2 | 9S3 | |
| PI9100-004G2 | 4.0 | 18.1 | 16 | 4.0 | 9S3 | |
| PI9200-5R5G2 | 5.5 | 28 | 25 | 5.5 | 9L1 | |
| PI9200-7R5G2 | 7.5 | 37.1 | 32 | 7.5 | 9L1 | |
| PI9200-011G2 | 11 | 49.8 | 45 | 11 | 9L1 | |
| PI9200-015G2 | 15.0 | 65.4 | 60 | 15.0 | 9L2 | |
| PI9200-018G2 | 18.5 | 81.6 | 75 | 18.5 | 9L2 | |
| PI9200-022G2 | 22.0 | 97.7 | 90 | 22.0 | 9L3 | |
| PI9200-030G2 | 30.0 | 122.1 | 110 | 30.0 | 9L3 | |
| PI9200-037G2 | 37.0 | 157.4 | 152 | 37.0 | 9L3 | |
| PI9200-045G2 | 45.0 | 185.3 | 176 | 45.0 | 9L4 | |
| PI9200-055G2 | 55.0 | 214 | 210 | 55.0 | 9L4 | |
| PI9200-075G2 | 75 | 307 | 304 | 75 | 9L4 | |
| PI9100-0R7G3 | 0.75 | 4.3 | 2.5 | 0.75 | 9S2 | 3-phase 380V ±10% |
| PI9100-1R5G3 | 1.5 | 5.0 | 3.8 | 1.5 | 9S2 | |
| PI9100-2R2G3 | 2.2 | 5.8 | 5.1 | 2.2 | 9S2 | |
| PI9100-004G3 | 4.0 | 10.5 | 9 | 4.0 | 9S3 | |
| PI9100-5R5G3 | 5.5 | 14.6 | 13 | 5.5 | 9S3 | |
| PI9100-7R5G3 | 7.5 | 20.5 | 17 | 7.5 | 9S4 | |
| PI9200-011G3/PI9200-011F3/ PI9200-015F3 | 11/11/15 | 26/26/35 | 25/25/32 | 11/11/15 | 9L1 | |
| PI9200-015G3/ PI9200-018F3 | 15/18.5 | 35/38.5 | 32/37 | 15/18.5 | 9L1 | |
| PI9200-018G3/ PI9200-022F3 | 18.5/22 | 38.5/46.5 | 37/45 | 18.5/22 | 9L2 | |
| PI9200-022G3/ PI9200-030F3 | 22/30 | 46.5/62 | 45/60 | 22/30 | 9L2 | |
| PI9200-030G3/ PI9200-037F3 | 30/37 | 62/76 | 60/75 | 30/37 | 9L3 | |
| PI9200-037G3/ PI9200-045F3 | 37/45 | 76/91 | 75/93 | 37/45 | 9L3 | |
| PI9200-045G3/ PI9200-055F3 | 45/55 | 91/112 | 93/110 | 45/55 | 9L4 | |
| PI9200-055G3/ PI9200-075F3 | 55/75 | 112/157 | 110/150 | 55/75 | 9L4 | |
| PI9200-075G3/ PI9200-093F3 | 75/93 | 157/180 | 150/176 | 75/93 | 9L4 | |
| PI9200-093G3/ PI9200-110F3 | 93/110 | 180/214 | 176/210 | 93/110 | 9L5 | |
| PI9200-110G3/ PI9200-132F3 | 110/132 | 214/256 | 210/253 | 110/132 | 9L5 | |
| PI9200-132G3/ PI9200-160F3 | 132/160 | 256/307 | 253/304 | 132/160 | 9L6 | |
| PI9200-160G3/PI9200-187F3 | 160/187 | 307/345 | 304/340 | 160/187 | 9L6 | |
| PI9300-187G3/ PI9300-200F3 | 187/200 | 345/385 | 340/380 | 187/200 | 9C1 | |
| PI9300-187G3/ PI9300-200F3 | 187/200 | 345/385 | 340/380 | 187/200 | 9C2 | |
| PI9300-200G3/ PI9300-220F3 | 200/220 | 385/430 | 380/426 | 200/220 | 9C1 | |
| PI9300-200G3/ PI9300-220F3 | 200/220 | 385/430 | 380/426 | 200/220 | 9C2 | |
| PI9300-220G3/ PI9300-250F3 | 220/250 | 430/468 | 426/465 | 220/250 | 9C1 | |
| PI9300-220G3/ PI9300-250F3 | 220/250 | 430/468 | 426/465 | 220/250 | 9C2 | |
| PI9300-250G3/ PI9300-280F3 | 250/280 | 468/525 | 465/520 | 250/280 | 9C3 | |
| PI9300-280G3/ PI9300-315F3 | 280/315 | 525/590 | 520/585 | 280/315 | 9C3 | |
| PI9300-315G3/ PI9300-355F3 | 315/355 | 590/665 | 585/650 | 315/355 | 9C3 | |
| PI9300-355G3/ PI9300-400F3 | 355/400 | 665/785 | 650/725 | 355/400 | 9C3 | |

## Technical specifications:

| Inverter model | base No. | rated output power | rated input current | rated output current | match motor | input voltage |
|---|---|---|---|---|---|---|
| PI9100-0R7G4 | 9S2 | 0.75 | 4.1 | 2.5 | 0.75 | 3-phase 480V ±10% |
| PI9100-1R5G4 | 9S2 | 1.5 | 4.9 | 3.7 | 1.5 | |
| PI9100-2R2G4 | 9S2 | 2.2 | 5.7 | 5.0 | 2.2 | |
| PI9100-004G4 | 9S3 | 4.0 | 9.4 | 8 | 4.0 | |
| PI9100-5R5G4/ PI9100-5R5F4 | 9S3 | 5.5 | 12.5 | 11 | 5.5 | |
| PI9100-7R5G4/ PI9100-7R5F4 | 9S4 | 7.5 | 18.3 | 15 | 7.5 | |
| PI9200-011G4/PI9200-011F4/ PI9200-015F4 | 9L1 | 11/11/15 | 23.1/23.1/29.8 | 22/22/27 | 11/11/15 | |
| PI9200-015G4/ PI9200-018F4 | 9L1 | 15/18.5 | 29.8/35.7 | 27/34 | 15/18.5 | |
| PI9200-018G4/ PI9200-022F4 | 9L2 | 18.5/22 | 35.7/41.7 | 34/40 | 18.5/22 | |
| PI9200-022G4/ PI9200-030F4 | 9L2 | 22/30 | 41.7/57.4 | 40/55 | 22/30 | |
| PI9200-030G4/ PI9200-037F4 | 9L3 | 30/37 | 57.4/66.5 | 55/65 | 30/37 | |
| PI9200-037G4/ PI9200-045F4 | 9L3 | 37/45 | 66.5/81.7 | 65/80 | 37/45 | |
| PI9200-045G4/ PI9200-055F4 | 9L4 | 45/55 | 81.7/101.9 | 80/100 | 45/55 | |
| PI9200-055G4/ PI9200-075F4 | 9L4 | 55/75 | 101.9/137.4 | 100/130 | 55/75 | |
| PI9200-075G4/ PI9200-093F4 | 9L4 | 75/93 | 137.4/151.8 | 130/147 | 75/93 | |
| PI9200-093G4/ PI9200-110F4 | 9L5 | 93/110 | 151.8/185.3 | 147/180 | 93/110 | |
| PI9200-110G4/ PI9200-132F4 | 9L5 | 110/132 | 185.3/220.7 | 180/216 | 110/132 | |
| PI9200-132G4/ PI9200-160F4 | 9L6 | 132/160 | 220.7/264.2 | 216/259 | 132/160 | |
| PI9200-160G4/PI9200-187F4 | 9L6 | 160/187 | 264.2/309.4 | 259/300 | 160/187 | |
| PI9300-187G4/ PI9300-200F4 | 9C1 | 187/200 | 309.4/334.4 | 300/328 | 187/200 | |
| PI9300-187G4/ PI9300-200F4 | 9C2 | 187/200 | 309.4/334.4 | 300/328 | 187/200 | |
| PI9300-200G4/ PI9300-220F4 | 9C1 | 200/220 | 334.4/363.9 | 328/358 | 200/220 | |
| PI9300-200G4/ PI9300-220F4 | 9C2 | 200/220 | 334.4/363.9 | 328/358 | 200/220 | |
| PI9300-220G4/ PI9300-250F4 | 9C1 | 220/250 | 363.9/407.9 | 358/400 | 220/250 | |
| PI9300-220G4/ PI9300-250F4 | 9C2 | 220/250 | 363.9/407.9 | 358/400 | 220/250 | |
| PI9300-250G4/ PI9300-280F4 | 9C3 | 250/280 | 407.9/457.4 | 400/449 | 250/280 | |
| PI9300-280G4/ PI9300-315F4 | 9C3 | 280/315 | 457.4/533.2 | 449/516 | 280/315 | |
| PI9300-315G4/ PI9300-355F4 | 9C3 | 315/355 | 533.2/623.3 | 516/570 | 315/355 | |
| PI9300-355G4/ PI9300-400F4 | 9C3 | 355/400 | 623.3/706.9 | 570/650 | 355/400 | |
| PI9200-055G6/ PI9200-075F6 | 9L4 | 55/75 | 70/90 | 62/85 | 55/75 | 3-phase 690V ±10% |
| PI9200-075G6/ PI9200-093F6 | 9L4 | 75/93 | 90/105 | 85/102 | 75/93 | |
| PI9200-093G6/ PI9200-110F6 | 9L5 | 93/110 | 105/130 | 102/125 | 93/110 | |
| PI9200-110G6/ PI9200-132F6 | 9L5 | 110/132 | 130/170 | 125/150 | 110/132 | |
| PI9200-132G6/ PI9200-160F6 | 9L6 | 132/160 | 170/200 | 150/175 | 132/160 | |
| PI9200-160G6/PI9200-187F6 | 9L6 | 160/187 | 200/210 | 175/198 | 160/187 | |
| PI9300-187G6/ PI9300-200F6 | 9C2 | 187/200 | 210/235 | 198/215 | 187/200 | |
| PI9300-187G6/ PI9300-200F6 | 9C1 | 187/200 | 210/235 | 198/215 | 187/200 | |
| PI9300-200G6/ PI9300-220F6 | 9C2 | 200/220 | 235/247 | 215/245 | 200/220 | |
| PI9300-200G6/ PI9300-220F6 | 9C1 | 200/220 | 235/247 | 215/245 | 200/220 | |
| PI9300-220G6/ PI9300-250F6 | 9C2 | 220/250 | 247/265 | 245/260 | 220/250 | |
| PI9300-220G6/ PI9300-250F6 | 9C1 | 220/250 | 247/265 | 245/260 | 220/250 | |
| PI9300-250G6/ PI9300-280F6 | 9C3 | 250/280 | 265/305 | 260/299 | 250/280 | |
| PI9300-280G6/ PI9300-315F6 | 9C3 | 280/315 | 305/350 | 299/330 | 280/315 | |
| PI9300-315G6/ PI9300-355F6 | 9C3 | 315/355 | 350/382 | 330/374 | 315/355 | |
| PI9300-355G6/ PI9300-400F6 | 9C3 | 355/400 | 382/435 | 374/410 | 355/400 | |
| PI9300-400G6/ PI9300-450F6 | 9C3 | 400/450 | 435/490 | 410/465 | 400/450 | |
| PI9300-450G6/ PI9300-500F6 | 9C3 | 450/500 | 490/595 | 465/550 | 450/500 | |
| PI9300-500G6 | 9C3 | 500 | 595 | 550 | 500 | |
| PI9300-550G6 | 9C3 | 550 | 605 | 590 | 550 | |

※Remarks:9300 9C1and 9C2 has the same power range,with the following differences:
A:Main power calbe layout is different,9C1 is to power in from upside and output from the underside,9C2 is to power in from the left side and output from the right side
B:9C1's bottom fix base is removable C:Construction and dimension is different

POWTRAN®

# Fast return on investment, Low Maintenance cost.

## Remarkable enhancement on reliability and continuously running

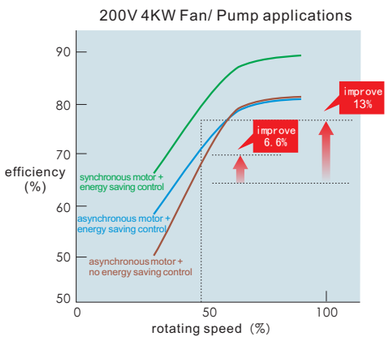
### Energy-saving:

**Advanced energy saving technology**

Use energy saving control of frequency converter to realize high efficient running of asynchronous motor

**Saving much more energy on synchronous motor**

The energy saving control of the inverter combine with high efficient synchronous motor together can gain super energy saving compare to asynchronous motor .



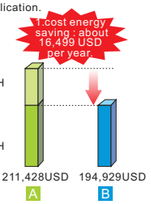

**Pi9000 Energy-saving effect sample**

100 sets ,4 KW fan service in air condition application.
Electricity price is 0.11USD/KWH, Service time :365 days per year.

A asynchronous motor + frequency inverter control
Energy consumption about 1,903,100 KWH
Cost of energy about 211,428 USD.

B synchronous motor + frequency inverter control
Energy consumption about 1,754,600 KWH
Cost of energy about 194,929USD.

energy saving per year
energy saving : about 148,500KWH.
Saving cost of energy about 16,499USD.




### Environmental resistance:

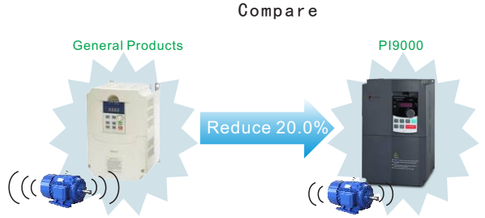
Corrosion resistance,resistance to dust, resistance to vibration and resistance to environment, the strengthening of the product and meanwhile with dust, drip-proof type taking protection structure.

**Pass ROSH**

Standard product pass ROHS( European specific harmful substance use restrictions).

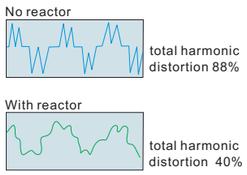
**Reduce noise**

Use Swing PWN to inhibition of electromagnetic interference and reduce the harsh noise

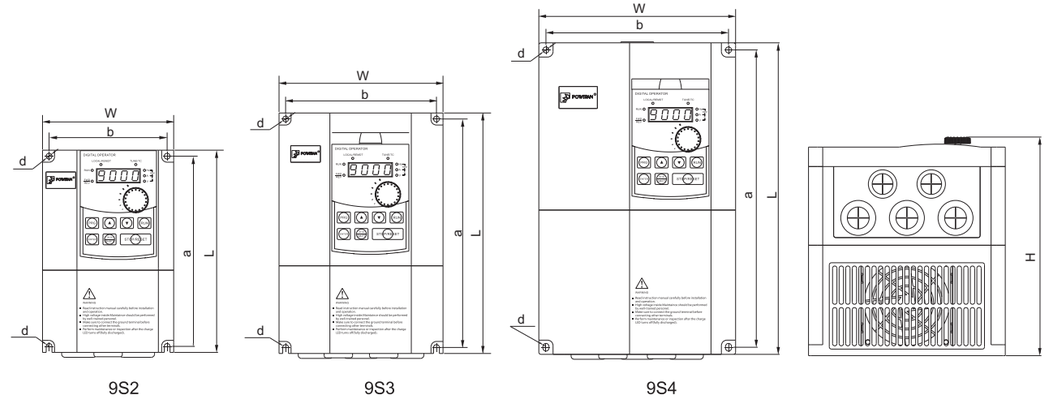



**Suppress the high order harmonic in grid.**

Built in DC reactor use for suppress high order harmonic.
( Optional from 22KW to 160KW, standard built in from 187KW and above)




### Specifications ( plastic housing: 982/983/984 )




| Base No. | Power(KW) | Voltage(V) | Current(A) | Shape dimensions(L*W*Hmm) | | | Installation dimensions(a*b dmm) | | |
|---|---|---|---|---|---|---|---|---|---|
| 9S2 | 0.4~1. 5 | 1 phase 220 | 2.5~7 | 185 | 120 | 178.5 | 174 | 108 | Ø5.3 |
| | 0.4~1. 5 | 3 phase 220 | 2.5~7 | | | | | | |
| | 0.75~2. 2 | 3 phase 380 | 2.5~5.1 | | | | | | |
| | 0.75~2. 2 | 3 phase 480 | 2.5~5.0 | | | | | | |
| 9S3 | 2.2~4.0 | 1 phase 220 | 10~16 | 220 | 150 | 185.5 | 209 | 138 | Ø5.3 |
| | 2.2~4.0 | 3 phase 220 | 10~16 | | | | | | |
| | 4.0~5. 5 | 3 phase 380 | 9~13 | | | | | | |
| | 4.0~5. 5 | 3 phase 480 | 8~11 | | | | | | |
| 9S4 | 7.5 | 3 phase 380 | 17 | 285 | 180 | 200 | 272 | 167 | Ø5.5 |
| | 7.5 | 3 phase 480 | 15 | | | | | | |

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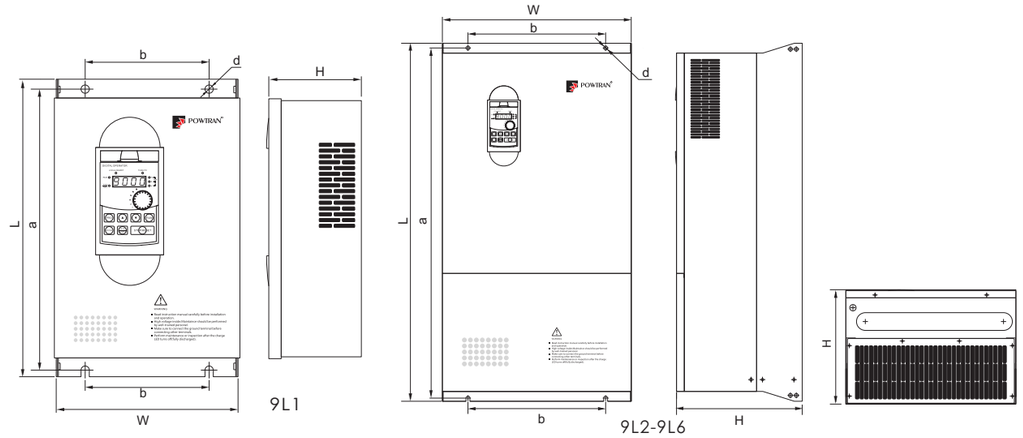
## Specification:

(wall-mounted metal housing, wiring layout from left to right 9L1—9L6 )

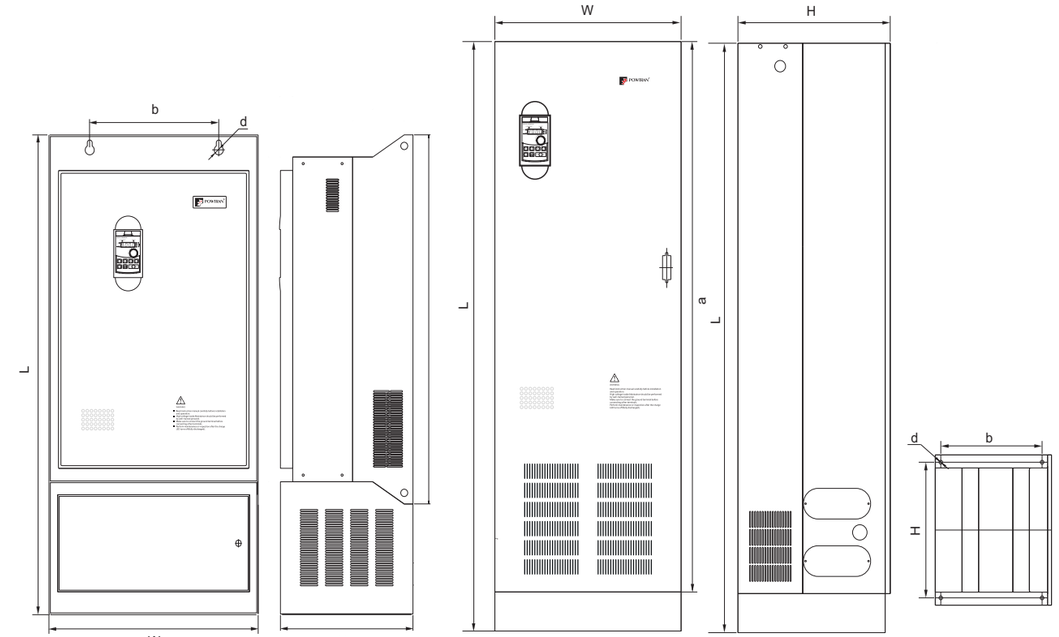



| Base No. | Power(KW) | Voltage(V) | Current(A) | Shape dimensions(L*W*Hmm) | Installation dimensions(a*b dmm) |
|---|---|---|---|---|---|
| 9L1 | 5.5 | 1 phase220 | 25 | 360 x 220 x 210 | 340 x 150 Ø10 |
| | 5.5~11 | 3 phase220 | 25~45 | | |
| | 11~15 | 3 phase380 | 25~32 | | |
| | 11~15 | 3 phase480 | 22~27 | | |
| 9L2 | 15~18.5 | 3 phase220 | 60~75 | 435 x 225 x 242 | 415 x 165 Ø10 |
| | 18.5~22 | 3 phase380 | 37~45 | | |
| | 18.5~22 | 3 phase480 | 34~40 | | |
| 9L3 | 22~37 | 3 phase220 | 90~152 | 480 x 296 x 246 | 460 x 200 Ø10 |
| | 30~37 | 3 phase380 | 60~75 | | |
| | 30~37 | 3 phase480 | 55~65 | | |
| 9L4 | 45~75 | 3 phase220 | 176~304 | 660 x 364 x 280 | 640 x 250 Ø10 |
| | 45~75 | 3 phase380 | 93~150 | | |
| | 45~75 | 3 phase480 | 80~130 | | |
| | 55~75 | 3 phase690 | 62~85 | | |
| 9L5 | 93~110 | 3 phase380 | 176~210 | 710 x 453 x 280 | 690 x 350 Ø10 |
| | 93~110 | 3 phase480 | 147~180 | | |
| | 93~110 | 3 phase690 | 102~125 | | |
| 9L6 | 132~160 | 3 phase380 | 253~304 | 910 x 480 x 323 | 890 x 350 Ø10 |
| | 132~160 | 3 phase480 | 216~259 | | |
| | 132~160 | 3 phase690 | 150~175 | | |



## Specification:

(floor type with metal housing , wiring layout from left to right 9C1—9C3)




| Base No. | Power(KW) | Voltage(V) | Current(A) | Shape dimensions(L*W*Hmm) | Installation dimensions(a*b dmm) |
|---|---|---|---|---|---|
| 9C1 | 187~220 | 3 phase380 | 340~426 | 1300 x 600 x 380 | 550 x 280 Ø13 |
| | 187~220 | 3 phase480 | 300~358 | | |
| | 187~220 | 3 phase690 | 198~245 | | |
| 9C2 | 187~220 | 3 phase380 | 340~426 | 1540 x 525 x 421 | 464.5 x 367 Ø13 |
| | 187~220 | 3 phase480 | 300~358 | | |
| | 187~220 | 3 phase690 | 198~245 | | |
| 9C3 | 250~355 | 3 phase380 | 465~650 | 1698 x 851 x 470 | 640 x 260 Ø13 |
| | 250~355 | 3 phase480 | 400~570 | | |
| | 250~550 | 3 phase690 | 260~590 | | |

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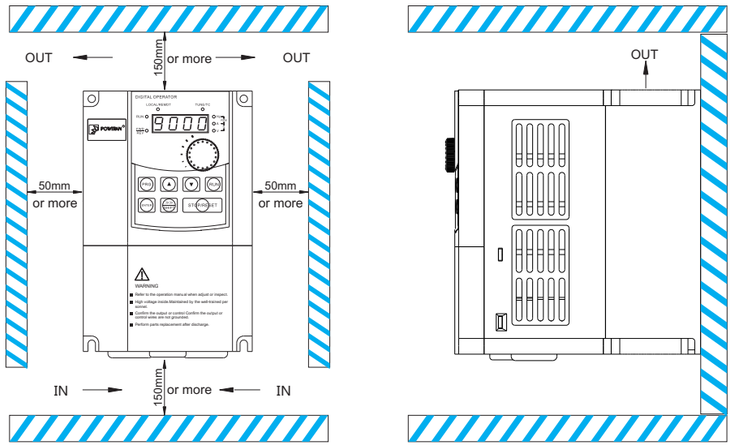
# Installation:

## Installation direction and Vacancy

The inverter shall be installed in the room where it is well ventilated, the wall-mounted installation shall be adopted, and the inverter must keep enough space around adjacent items or baffle (wall). As shown below figure:




## Environment:

Working conditions should be in comply with the regulations of IEC60721-3-3 level 3k3 and GB/T3859,1 section 2.

| | |
|---|---|
| environment temperature | -10℃--40℃ (when temperature is between 40-50℃, please consider degrading .) |
| Storage temperature | -20℃--65℃ |
| Humidity | below 90% RH |
| Height and Vibration | below 1000m ,below 5.9m/s2(equals 0.6g) |
| Application field | indoor, no solar radiation, no corrosive or explosive gas or steam, no dust or combustible gas, oil, dropping water, salt. |
| Altitude | below 1000m. |
| Class of pollution | 2 |
| protection class | IP20 |

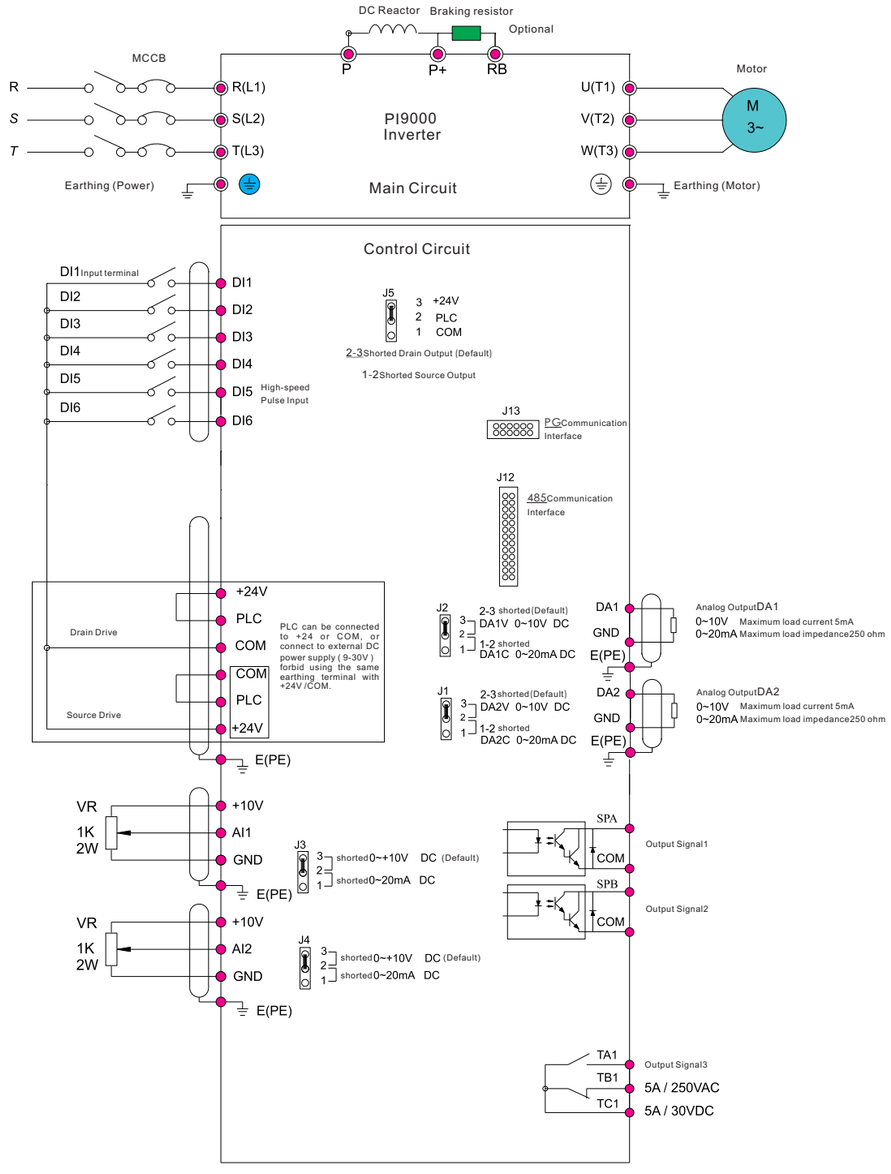
## Mechanical Installation :

Install on solid indoor basement, there should not be severe impact on ventilation or cooling system in the installation area or additional enclosure. Air-conditioner can be allocated to enhance CDM/BDM. Other installation condition should take special consideration, and manufacturer should offer technical explanation and consulting advices. For fixed devices, vibration should maintain within the maximum of IEC60721 class 3M1.

## Wiring

Frequency inverter wiring are divided into main circuit and control circuit two parts. Customers must follow the wiring diagram in the below correctly

# Wiring diagram: 11kW and below



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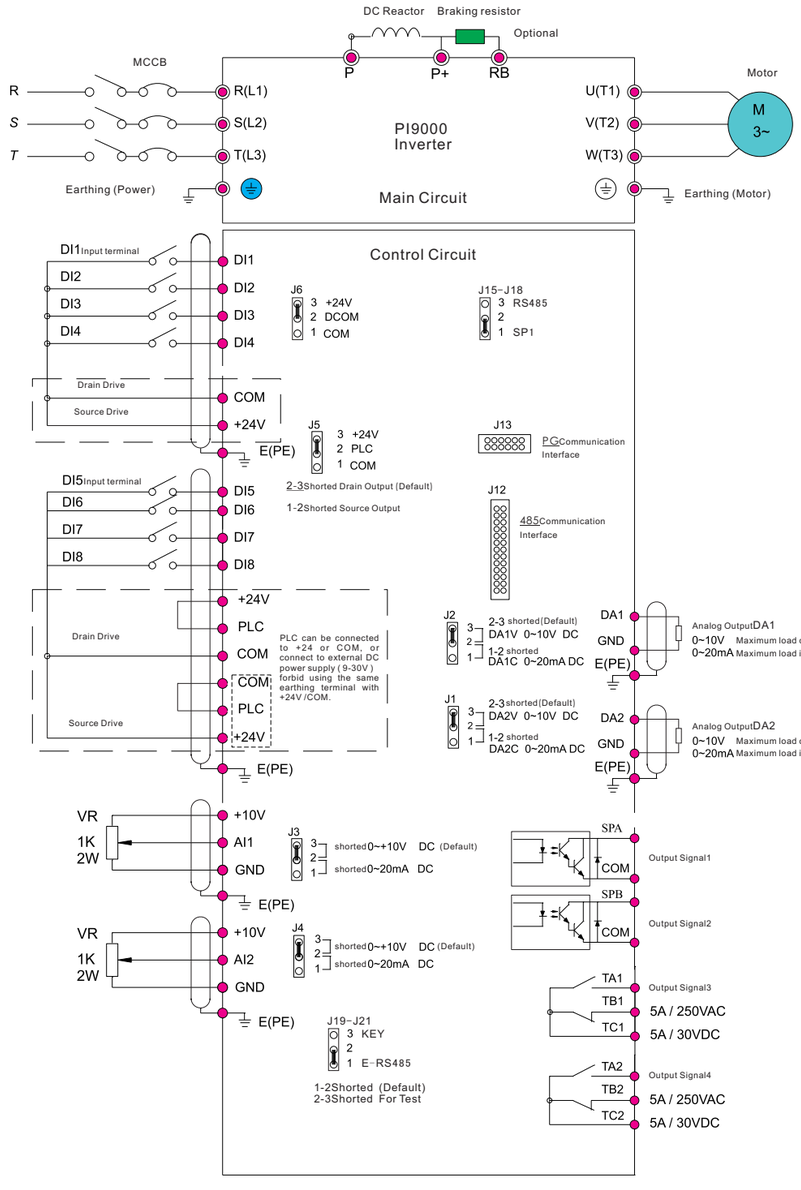
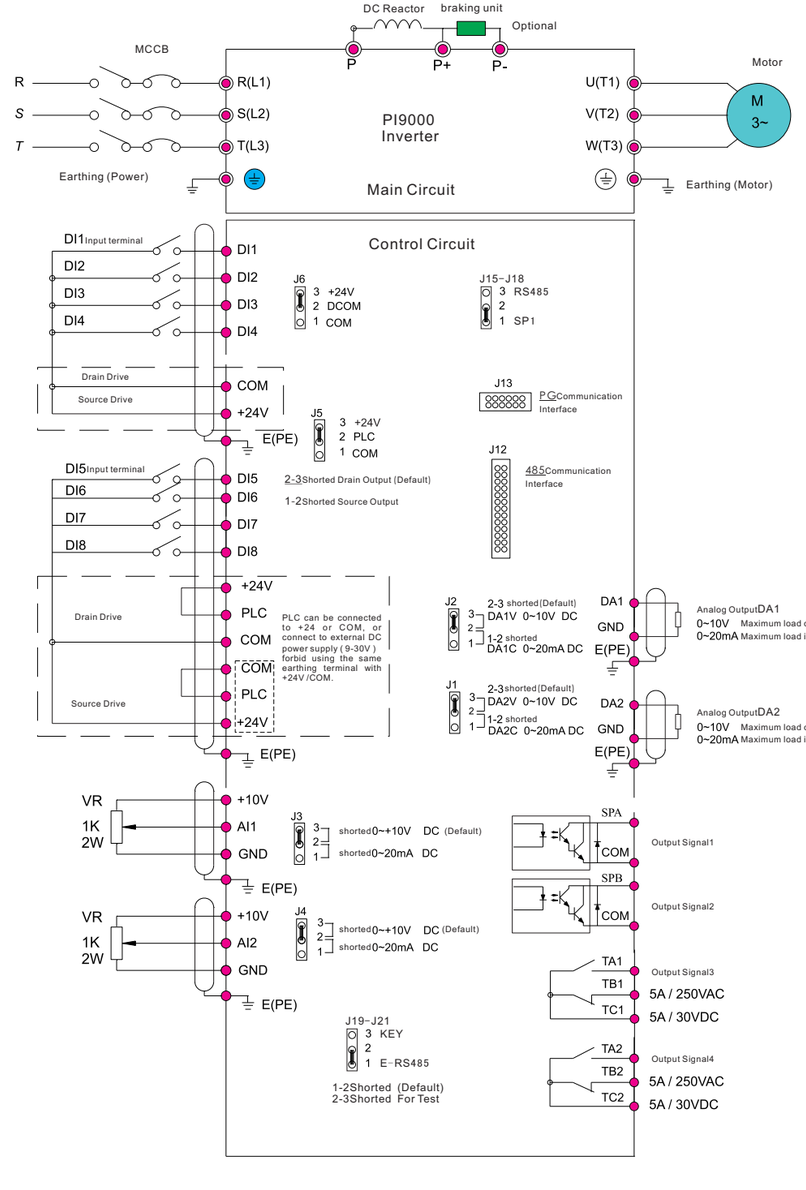
## Wiring diagram : 11KW-15KW




## Wiring diagram : 18.5KW-355KW



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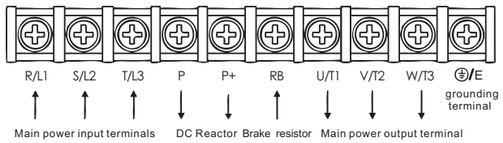
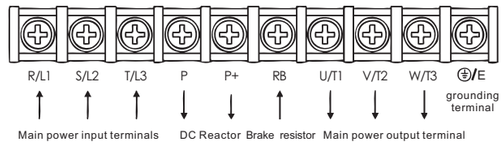
## Terminals Description:

### Below 7.5KW(380V) Main Circuit Terminals

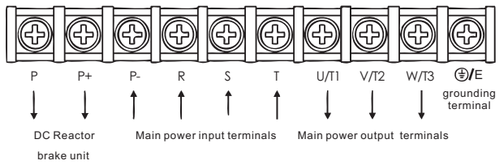



Note: The above power classifications are for G type inverter.

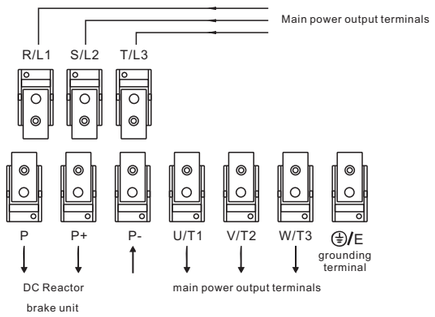
### 11KW-15KW (380V) Main Circuit Terminals




### 18.5KW-355KW (380V) Main Circuit Terminals (Left input right output)




### 45KW-250KW (380V) Main Circuit Terminals (Up input down output)




Note: P/P+ Standard setting is short circuit; if it is with external Dc Reactor , please disconnect and then connect it.

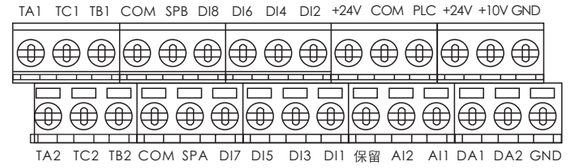
## Terminal Function

| Terminal | Name | Functions |
|---|---|---|
| R/L1<br>S/L2<br>T/L3 | Inverter input terminals | Connect to three-phase power supply,<br>single-phase connects to R, T |
| ⏚/E | Grounding terminal | Connect to ground |
| P+, RB | Braking resistor terminals | Connect to braking resistor |
| U/T1<br>V/T2<br>W/T3 | Output terminals | Connect to three-phase motor |
| P+, P- | DC bus output terminals | Connect to braking unit |
| P, P+ | DC reactor terminals | Connect to DC reactor(remove the shorting block) |

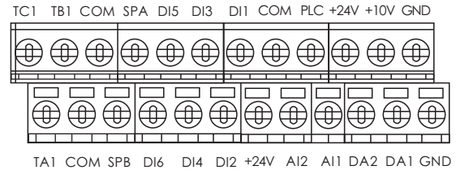


## Terminals Description:

### 9KLCB Control circuit terminal




### 9KSCB Control circuit terminal




## Description of control circuit terminals

| Category | Symbol | Name | Function |
|---|---|---|---|
| Power supply | +10V-GND | External + 10V power supply | Output +10V power supply, maximum output current: 10mA<br>Generally it is used as power supply of external potentiometer, potentiometer resistance range: 1kΩ to 5kΩ |
| | +24V-COM | External+24V power supply | Output +24V power supply, generally it is used as power supply of digital input and output terminals and external sensor. Maximum output current: 200mA |
| | PLC | External power input terminal | When external signal is used to drive, please unplug J5 jumpers ,PLC must be connected to external power supply, and to +24V (default). |
| Analog input | AI1-GND | Analog input terminal 1 | 1.Input range:(DC 0V to 10V/0~20mA), depends on the selected J3 jumper on control panel.<br>2.Input impedance: 22kΩ with voltage input, 500Ω with current input. |
| | AI2-GND | Analog input terminal 2 | 1.Input range:(DC 0V to 10V/0~20mA), depends on the selected J4 jumper on control panel.<br>2.Input impedance: 22kΩ with voltage input, 500Ω with current input. |
| Digital input | Di1<br>DI2<br>DI3<br>DI4<br>DI5<br>DI6<br>DI7<br>DI8 | Digital input 1<br>Digital input 2<br>Digital input 3<br>Digital input 4<br>Digital input 5<br>Digital input 6<br>Digital input 7<br>Digital input 8 | 1.Opto-coupler isolation, compatible with bipolar input<br>2.Input impedance: 2.4kΩ<br>3.Voltage range with level input: 9V to 30V<br>4. below 11KW: (DI1 to DI6)drive manner is controlled by J5, when external power supply is used to drive, please unplug J5 jumpers ,<br>5. below 11KW: (DI1 to DI4)drive manner is controlled by J6, (DI5 to DI8)drive manner is controlled by J5,when external power supply is used to drive, please unplug J5 jumpers . |
| | DI5 | High-speed pulse input terminals | DI5 can also be used as high-speed pulse input channels.<br>Maximum input frequency: 100kHz |
| Analog output | DA1-GND | Analog output 1 | The selected J2 jumper on control panel determines voltage or current output.<br>Output voltage range: 0V to 10V , output current range: 0mA to 20mA |
| | DA1-GND | Analog output 2 | The selected J1 jumper on control panel determines voltage or current output.<br>Output voltage range: 0V to 10V , output current range: 0mA to 20mA |
| Digital output | SPA-COM | Digital output 1 | Opto-coupler isolation, bipolar open collector output<br>Output voltage range: 0V to 24V , output current range: 0mA to 50mA |
| | SPB-COM | Digital output 2 | |
| | SPB- COM | High-speed pulse output | Subject to function code(U5.00)"SPB terminal output mode selection"<br>As a high-speed pulse output, the highest frequency up to 100kHz; |
| relay output | T/A1-T/C1 | Normally open terminal | Contactor drive capacity: AC250V, 3A, COSø = 0.4. |
| | T/B1-T/C1 | Normally closed terminal | |
| Auxiliary interface | J12 | 485 card interface | 26 pin terminal |
| | J13 | PG card interface | 12 pin terminal |

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Optional Components JP6E93 JP6E9300 keyboard (LED)

## Operating keyboard: button key description

| Sign | name | function |
|---|---|---|
| PRG | Parameter Setting/ Exit Key | Enter top menu parameter change status<br>Exit from function option change<br>Return to status display menu from sub-menu or function option menu |
| SHIFT | Shift Key | Select circularly parameters under run or stop interface;<br>select parameters when modifying the parameters. |
| ▲ | Ascending Key | Data or function code ascending |
| ▼ | Decending Key | Data or function code decending |
| RUN | Run Key | Used for running operation in the keyboard mode. |
| STOP/RESET | Stop/Reset Key | Press the key to stop running in running status; press the key to reset in fault alarm status, can be used to reset the operation, the key is subject to function code U7.00. |
| ENTER | Enter Key | Enter into levels of menu screen,confirm settings. |
| | Keyboard potentiometer | F0.03 is set to 4,keyboard potentiometer is used to set the running frequency. |



## Quality and R&D management:

Quality management operation standard: ISO9001

Quality control management system: Research and development of quality management, supplier quality management, manufacturing quality management, service quality management

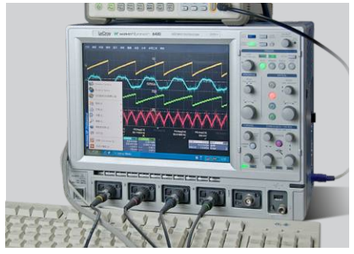
Information management system: Kingdee K3 WISE V13.0 enterprise resource planning management system, CRM customer management system, PLM product life cycle management system, Bar code management product quality traceability System, OA collaborative work system, Electronic post office management system


Motor control laboratory


constant temperature experimental facilities


Vibration test bench


Electronic measuring instrument


600MHz oscilloscope


Power analyzer and dynamometer controller


Fluke thermal imager


DC test


Semi-automatic test


aging test


automatic test with load


PCB burn-in test

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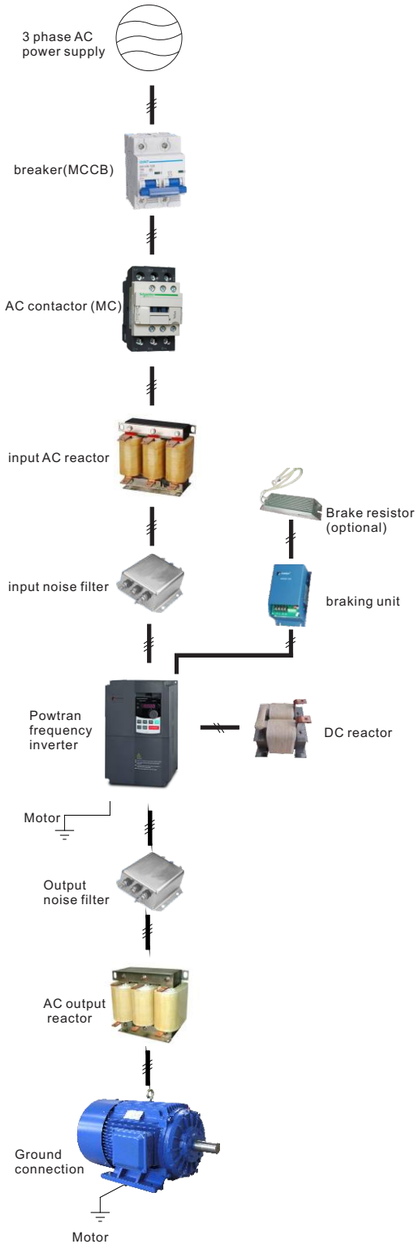
## Peripheral equipment:

| 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 instruction input and frequency 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. |




## Various of expansion cards:

PI9000 is equipped with a variety of universal encoder expansion card (PG card), as an optional accessory, it is necessary part for the inverter closed-loop vector control, please select PG card according to the form of encoder output, the specific models are as follows:

| Options | Description | Others |
|---|---|---|
| PI9000_PG1 | Differential input PG card, without frequency dividing output | Terminal wiring |
| PI9000_PG3 | UVW differential input PG card, without frequency dividing output | Terminal wiring |
| PI9000_PG4 | Rotational transformer PG card | Terminal wiring |
| PI9000_PG5 | OC input PG card, with 1:1 frequency dividing output | Terminal wiring |

PI9000_PC1 the user programmable card is one integrated PLC function expansion card. The user can install the expansion card to make PI9000 series frequency inverter support simple PLC (User programmable) function. In addition, the card has integrated interface of the extended IO and universal communication.

| Item | Specification | Description |
|---|---|---|
| Input terminal | 5 road digital signal input | With isolation, support - 10 v ~ 10 v voltage input signal |
| | 1 road analog voltage signal input | |
| Output terminal | 2 road relay signal output | |
| | 1 road analog signal output | |
| Communication | RS - 485 communication interface | |

## Braking unit and brake resistor:

Braking unite is mainly used in motor controlled by frequency inverter, which applied to and brand frequency inverter for the drop speed, brake positioning, hoisting and declining.

The inverter-controlled motor in rapid speed decrease and dropping in the operation, because of the load inertia, the kinetic energy will transferred into electrical energy and will be stored in the DC bus which will cause the jump of over-voltage or fault. Braking unit through the automatic detection of the DC bus voltage and self–switching, the renewable energy will be released into the braking resistor which ensures the drive to smooth control of the motor at various operating condition.

## AC Reactor:

AC reactor can inhibit higher harmonic of frequency inverter input current, it can effective to improve inverter of power factor. Suggest that should use AC reactor in the following cases:

The ratio of the power supply capacity of frequency inverter used in and the frequency inverter capacity for more than 10:1.