COMOTECH INDUSTRIES

In4Drive®

PI9000 Series
Control of drives in industrial applications
High-performance vector control inverter

ISO 9001
BUREAU VERITAS
Certification

Nameplate instruction:

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

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

ZPB1A0100001

Model Description:

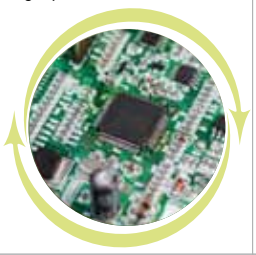
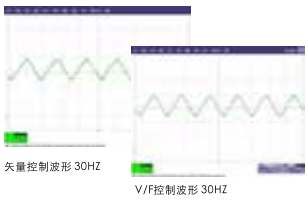
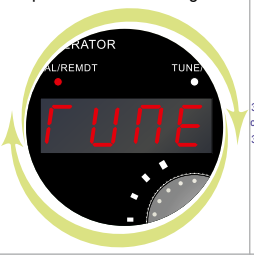
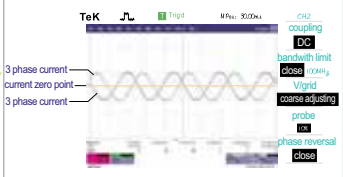
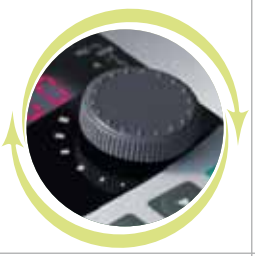
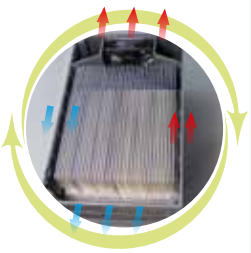
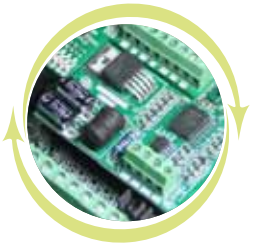
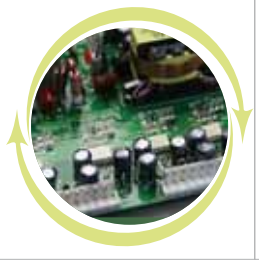
PI 910 0 b 1 7R5 G 3

- 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
  5: 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 com-munication protocol 	11.Strengthened coating, adapt to tough environment 	12.Unique EMC design, minimized the radiating interference to power grid. **EMC**

Standard specification:

Item		Specification
Power	Voltage and frequency levels	Single-phase 220,50/60Hz Three-phase 220V,50/60Hz Single-phase 380,50/60Hz Three-phase 480V,50/60Hz Three-phase 690V,50/60Hz
	Allowable fluctuation	Voltage:±15% 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 3200Hz
	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 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) 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) ⩽ 5ms (W/ 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% to 100.0%
	Jogging control	Jog Frequency Range: 0.00Hz to max. frequency; Jog Ac/deceleration time: 0.0s to 3600.0s
	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

Technical specifications:

Inverter model	input voltage	rated output power	rated input current	rated output current	match motor	Housing No
PI9100-0R4G2	3 phase220V ±15%	0.4	3.4	2.1	0.4	9S2
PI9100-0R7G2		0.75	5	3.8	0.75	9S2
PI9100-1R5G2		1.5	5.8	5.1	1.5	9S2
PI9100-2R2G2		2.2	10.5	9	2.2	9S3
PI9100-3R7G2		3.7	14.6	13	3.7	9S3
PI9200-5R5G2		5.5	26	25	5.5	9L1
PI9200-7R5G2		7.5	35	32	7.5	9L1
PI9200-011G2		11	46.5	45	11	9L1
PI9200-015G2		15.0	62	60	15.0	9L2
PI9200-018G2		18.5	76	75	18.5	9L2
PI9200-022G2		22.0	91	90	22.0	9L3
PI9200-030G2		30.0	112.0	110	30.0	9L3
PI9200-037G2		37.0	157	152	37.0	9L3
PI9200-045G2		45.0	180	176	45.0	9L4
PI9200-055G2		55.0	214	210	55.0	9L4
PI9200-075G2		75	307	304	75	9L4
PI9100-0R7G3	3 phase380V ±15%	0.75	3.4	2.1	0.75	9S2
PI9100-1R5G3		1.5	5.0	3.8	1.5	9S2
PI9100-2R2G3		2.2	5.8	5.1	2.2	9S2
PI9100-3R7G3		3.7	10.5	9	3.7	9S3
PI9100-5R5G3/ PI9100-5R5F3		5.5	14.6	13	5.5	9S3/9S3
PI9100-7R5G3/ PI9100-7R5F3		7.5	20.5	17	7.5	9S4/9S4
PI9200-011G3/PI9200-011F3/ PI9200-015F3		11/11/15	26/26/35	25/25/32	11/11/15	9L1/9L1/9L1
PI9200-015G3/ PI9200-018F3		15/18.5	35/38.5	32/37	15/18.5	9L1/9L1
PI9200-018G3/ PI9200-022F3		18.5/22	38.5/46.5	37/45	18.5/22	9L2/9L2
PI9200-022G3/ PI9200-030F3		22/30	46.5/62	45/60	22/30	9L2/9L2
PI9200-030G3/ PI9200-037F3		30/37	62/76	60/75	30/37	9L3/9L3
PI9200-037G3/ PI9200-045F3		37/45	76/91	75/90	37/45	9L3/9L3
PI9200-045G3/ PI9200-055F3		45/55	91/112	90/110	45/55	9L4/9L4
PI9200-055G3/ PI9200-075F3		55/75	112/157	110/150	55/75	9L4/9L4
PI9200-075G3/ PI9200-090F3		75/90	157/180	150/176	75/90	9L4/9L4
PI9200-090G3/ PI9200-110F3		90/110	180/214	176/210	90/110	9L5/9L5
PI9200-110G3/ PI9200-132F3		110/132	214/256	210/253	110/132	9L5/9L5
PI9200-132G3/ PI9200-160F3		132/160	256/307	253/304	132/160	9L6/9L6
PI9200-160G3/PI9200-187F3		160/187	307/345	304/340	160/187	9L6/9L6
PI9300-187G3/ PI9300-200F3		187/200	345/385	340/380	187/200	9C1/9C1
PI9300-187G3/ PI9300-200F3		187/200	345/385	340/380	187/200	9C2/9C2
PI9300-200G3/ PI9300-220F3		200/220	385/430	380/426	200/220	9C1/9C1
PI9300-200G3/ PI9300-220F3		200/220	385/430	380/426	200/220	9C2/9C2
PI9300-220G3		220	430	426	220	9C1
PI9300-220G3/ PI9300-250F3		220/250	430/468	426/465	220/250	9C2/9C2
PI9300-250G3/ PI9300-280F3		250/280	468/525	465/520	250/280	9C3/9C3
PI9300-280G3/ PI9300-315F3		280/315	525/590	520/585	280/315	9C3/9C3
PI9300-315G3/ PI9300-355F3		315/355	590/665	585/650	315/355	9C3/9C3
PI9300-355G3/ PI9300-400F3		355/400	665/785	650/725	355/400	9C3/9C3

Technical specifications:

Inverter model	input voltage	rated output power	rated input current	rated output current	match motor	Housing No
PI9100-0R7G4	3 phase480V ±15%	0.75	3.4	2.1	0.75	9S2
PI9100-1R5G4		1.5	5.0	3.8	1.5	9S2
PI9100-2R2G4		2.2	5.8	5.1	2.2	9S2
PI9100-3R7G4		3.7	10.5	9	3.7	9S3
PI9100-5R5G4/ PI9100-5R5F4		5.5	14.6	13	5.5	9S3/9S3
PI9100-7R5G4/ PI9100-7R5F4		7.5	20.5	17	7.5	9S4/9S4
PI9200-011G4/PI9200-011F4/ PI9200-015F4		11/11/15	26/26/35	25/25/32	11/11/15	9L1/9L1/9L1
PI9200-015G4/ PI9200-018F4		15/18.5	35/38.5	32/37	15/18.5	9L1/9L1
PI9200-018G4/ PI9200-022F4		18.5/22	38.5/46.5	37/45	18.5/22	9L2/9L2
PI9200-022G4/ PI9200-030F4		22/30	46.5/62	45/60	22/30	9L2/9L2
PI9200-030G4/ PI9200-037F4		30/37	62/76	60/75	30/37	9L3/9L3
PI9200-037G4/ PI9200-045F4		37/45	76/91	75/90	37/45	9L3/9L3
PI9200-045G4/ PI9200-055F4		45/55	91/112	90/110	45/55	9L4/9L4
PI9200-055G4/ PI9200-075F4		55/75	112/157	110/150	55/75	9L4/9L4
PI9200-075G4/ PI9200-090F4		75/90	157/180	150/176	75/90	9L4/9L4
PI9200-090G4/ PI9200-110F4		90/110	180/214	176/210	90/110	9L5/9L5
PI9200-110G4/ PI9200-132F4		110/132	214/256	210/253	110/132	9L5/9L5
PI9200-132G4/ PI9200-160F4		132/160	256/307	253/304	132/160	9L6/9L6
PI9200-160G4/PI9200-187F4		160/187	307/345	304/340	160/187	9L6/9L6
PI9300-187G4/ PI9300-200F4		187/200	345/385	340/380	187/200	9C1/9C1
PI9300-187G4/ PI9300-200F4		187/200	345/385	340/380	187/200	9C2/9C2
PI9300-200G4/ PI9300-220F4		200/220	385/430	380/426	200/220	9C1/9C1
PI9300-200G4/ PI9300-220F4		200/220	385/430	380/426	200/220	9C2/9C2
PI9300-220G4		220	430	426	220	9C1
PI9300-220G4/ PI9300-250F4		220/250	430/468	426/465	220/250	9C2/9C2
PI9300-250G4/ PI9300-280F4		250/280	468/525	465/520	250/280	9C3/9C3
PI9300-280G4/ PI9300-315F4		280/315	525/590	520/585	280/315	9C3/9C3
PI9300-315G4/ PI9300-355F4		315/355	590/665	585/650	315/355	9C3/9C3
PI9300-355G4/ PI9300-400F4		355/400	665/785	650/725	355/400	9C3/9C3
PI9200-055G6/ PI9200-075F6	3 phase690V ±15%	55/75	70/90	62/85	55/75	9L4/9L4
PI9200-075G6/ PI9200-090F6		75/90	90/105	85/102	75/90	9L4/9L4
PI9200-090G6/ PI9200-110F6		90/110	105/130	102/125	90/110	9L5/9L5
PI9200-110G6/ PI9200-132F6		110/132	130/170	125/150	110/132	9L5/9L5
PI9200-132G6/ PI9200-160F6		132/160	170/200	150/175	132/160	9L6/9L6
PI9200-160G6/PI9200-187F6		160/187	200/210	175/198	160/187	9L6/9L6
PI9300-187G6/ PI9300-200F6		187/200	210/235	198/215	187/200	9C2/9C2
PI9300-200G6/ PI9300-220F6		200/220	235/247	215/245	200/220	9C2/9C2
PI9300-220G6/ PI9300-250F6		220/250	247/265	245/260	220/250	9C2/9C2
PI9300-250G6/ PI9300-280F6		250/280	265/305	260/299	250/280	9C3/9C3
PI9300-280G6/ PI9300-315F6		280/315	305/350	299/330	280/315	9C3/9C3
PI9300-315G6/ PI9300-355F6		315/355	350/382	330/374	315/355	9C3/9C3
PI9300-355G6/ PI9300-400F6		355/400	382/435	374/410	355/400	9C3/9C3
PI9300-400G6/ PI9300-450F6		400/450	435/490	410/465	400/450	9C3/9C3
PI9300-450G6/ PI9300-500F6		450/500	490/595	465/550	450/500	9C3/9C3
PI9300-500G6		500	595	550	500	9C3
PI9300-550G6		550	605	590	550	9C3

Fast return on investment, Low Maintenance cost.

Remarkable enhancement on reliability and continuously running

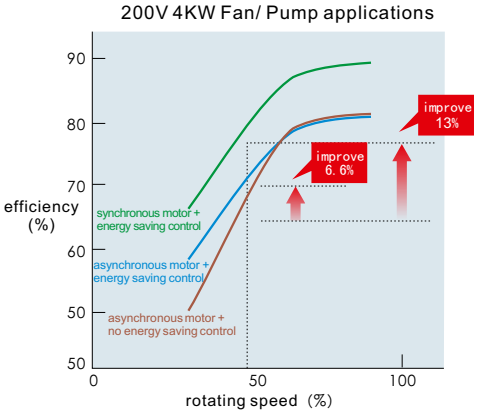
Energy-saving:

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 .

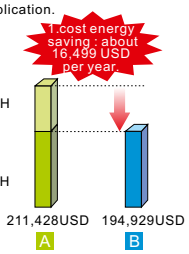


Pi9000 Energy-saving effect sample

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:

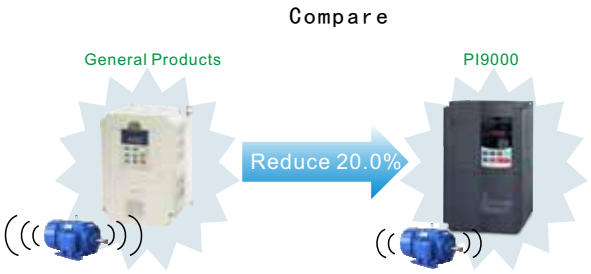
Corrosion resistance,resistance to dust, resistance to vibration and resistance to environment, the strengthening of the product and meanwhile with dust, drip-proof type taking protection structure.

Pass ROSH

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

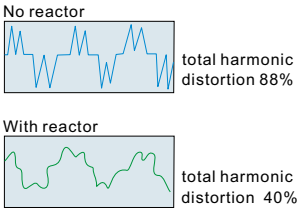
Reduce noise

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

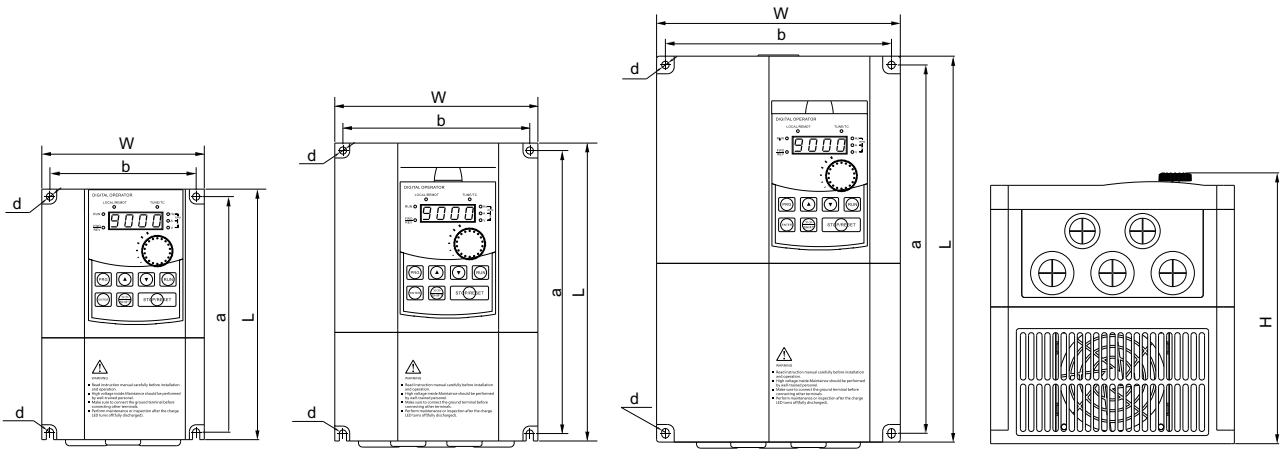


Suppress the high order harmonic in grid.

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: 9S2/9S3/9S4)

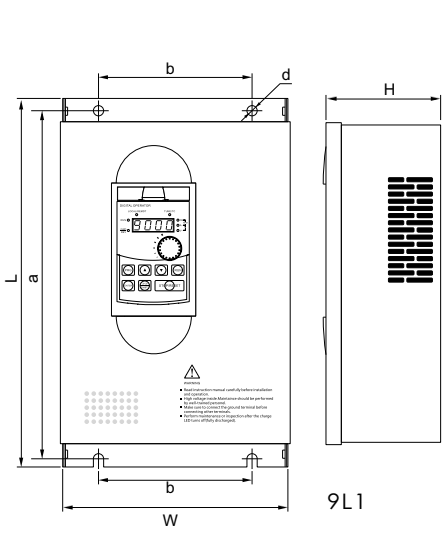


9S2 9S3 9S4

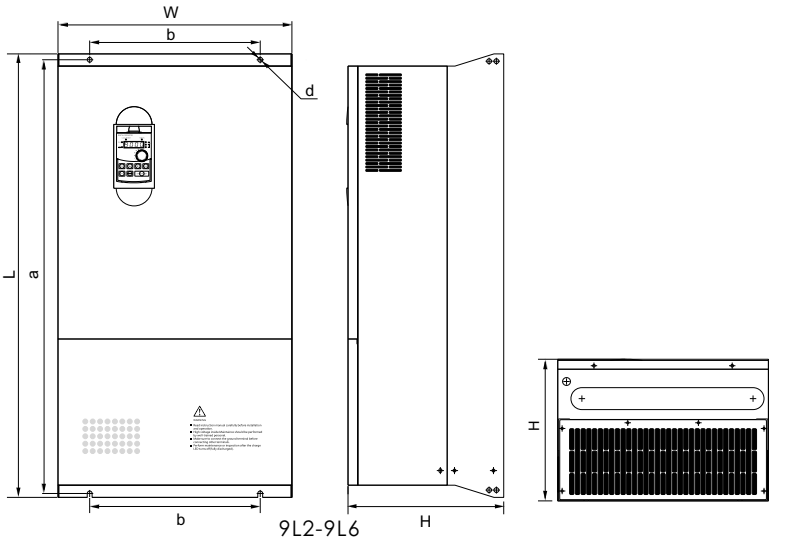
Model	Power(KW)	Voltage(V)	Current(A)	Shape dimensions(L*W*Hmm)			Installation dimensions(a*b*dmm)		
9S2	0.4~1. 5 0.75~2. 2	3 phase 220V 3 phase 380V	2.1~5.1 2.1~5.1	185	120	178.5	174	108	Ø5.3
9S3	2.2~3.7 4~5. 5	3 phase 220V 3 phase 380V	9~13 9~13	220	150	185.5	209	138	Ø5.3
9S4	7.5	3 phase 380V	17	285	180	200	272	167	Ø5.5

Specification:

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



9L1

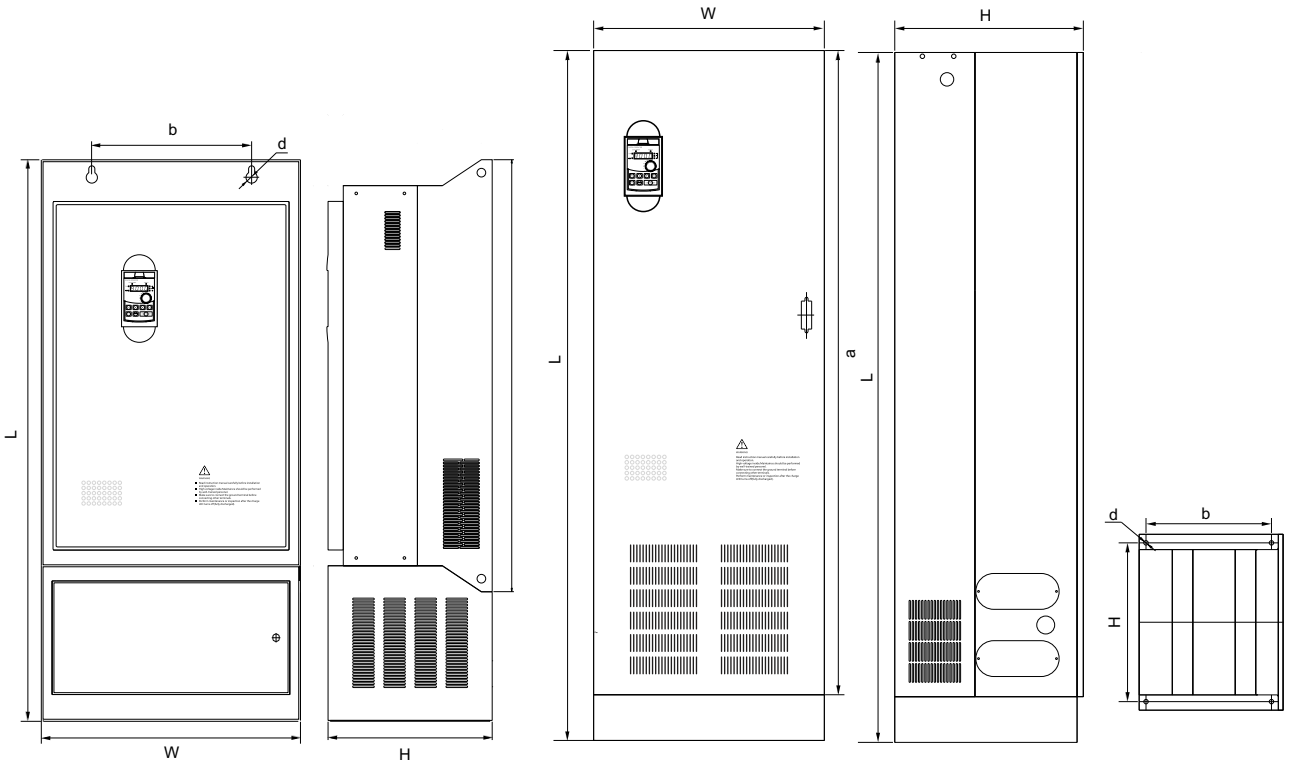


9L2-9L6

Model	Power(KW)	Voltage(V)	Current(A)	Shape dimensions(L*W*Hmm)	Installation dimensions(a*b*dmm)
9L1	5.5~11 11~15 11~18.5	3 phase220 3 phase380 3 phase480	25~45 25~32 25~37	360 x 220 x 210	340 x 150 Ø10
9L2	15~18 18.5~22 18.5~22	3 phase220 3 phase380 3 phase480	60~75 37~45 37~45	435 x 225 x 242	415 x 165 Ø10
9L3	22~37 30~37 30~37	3 phase220 3 phase380 3 phase480	90~152 60~75 60~75	480 x 296 x 246	460 x 200 Ø10
9L4	45~75 45~75 55~75	3 phase380 3 phase480 3 phase690	90~150 90~150 62~85	660 x 364 x 280	640 x 250 Ø10
9L5	90~110 90~110 90~110	3 phase380 3 phase480 3 phase690	176~253 176~214 102~125	710 x 453 x 280	690 x 350 Ø10
9L6	132~160 132~160 132~160	3 phase380 3 phase480 3 phase690	253~304 253~304 150~175	910 x 480 x 323	890 x 350 Ø10

Specification:

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

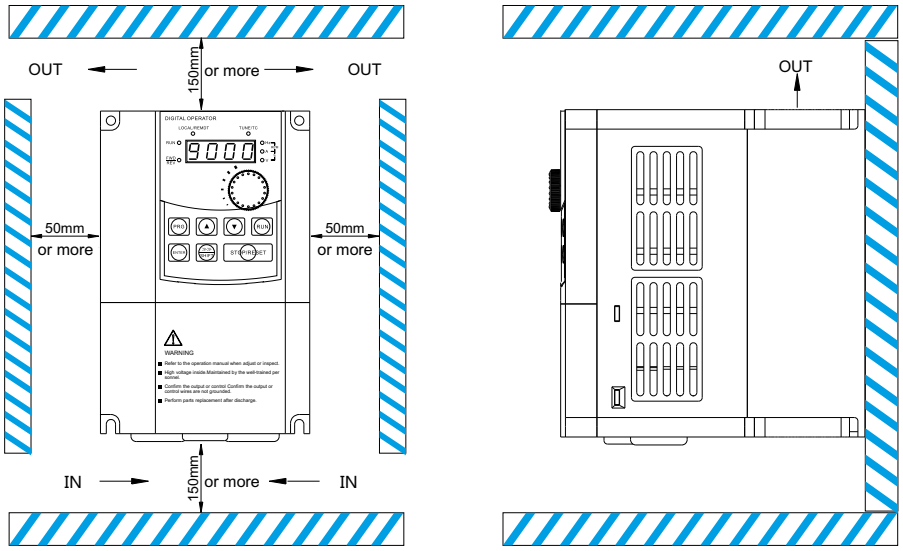


Model	Power(KW)	Voltage(V)	Current(A)	Shape dimensions(L*W*Hmm)	Installation dimensions(a*b*dmm)
9C1	200~220	3 phase380	380~426	1300 x 600 x 380	550 x 280 Ø13
	200~220	3 phase480	380~426		
9C2	200~220	3 phase380	380~426	1540 x 525 x 421	464.5 x 367 Ø13
	200~220	3 phase480	380~426		
	200~220	3 phase690	215~245		
9C3	250~355	3 phase380	465~650	1698 x 851 x 470	640 x 260 Ø13
	250~400	3 phase480	465~725		
	250~550	3 phase690	260~590		

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

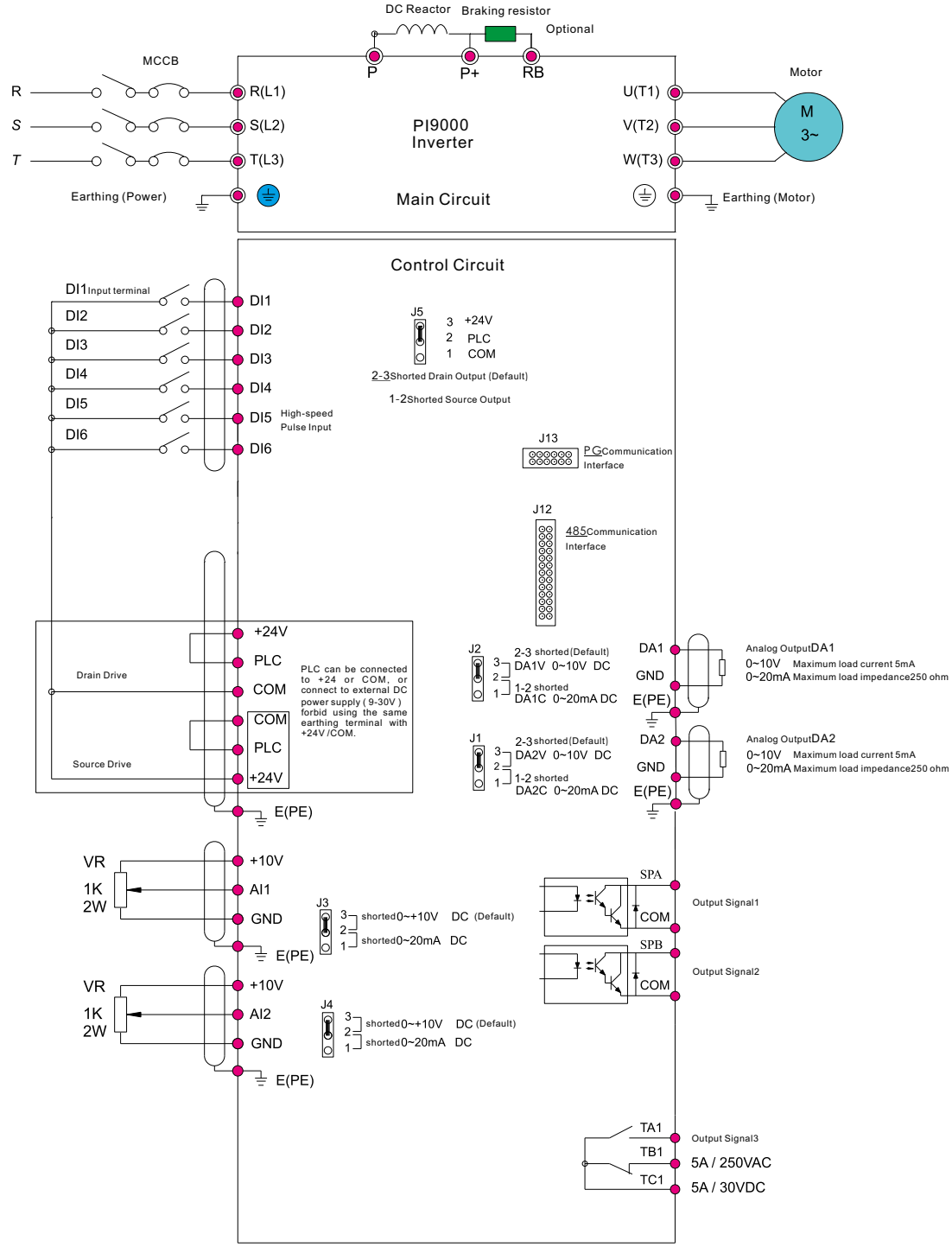
Mechanical Installation :

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.

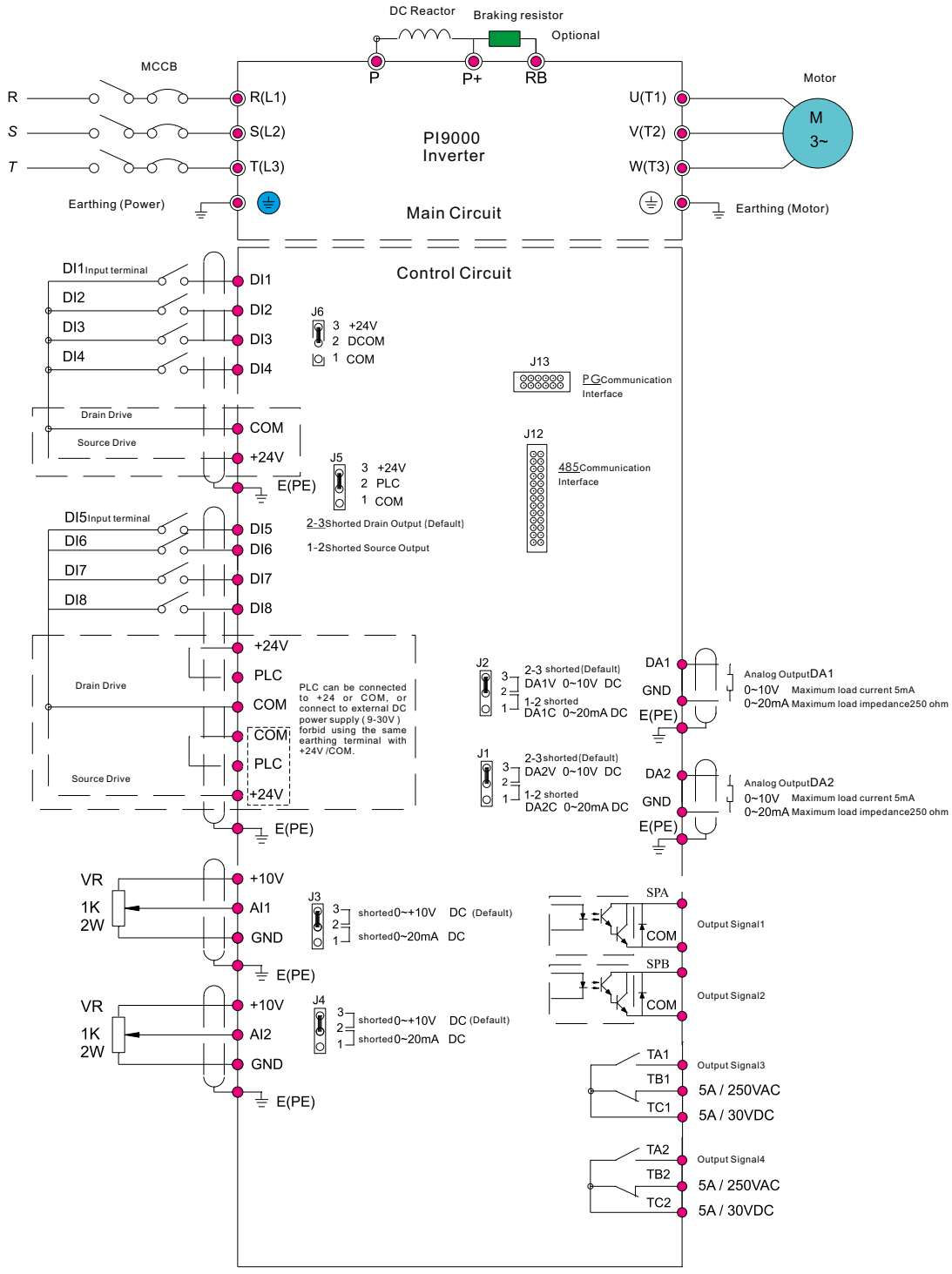
Wiring

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

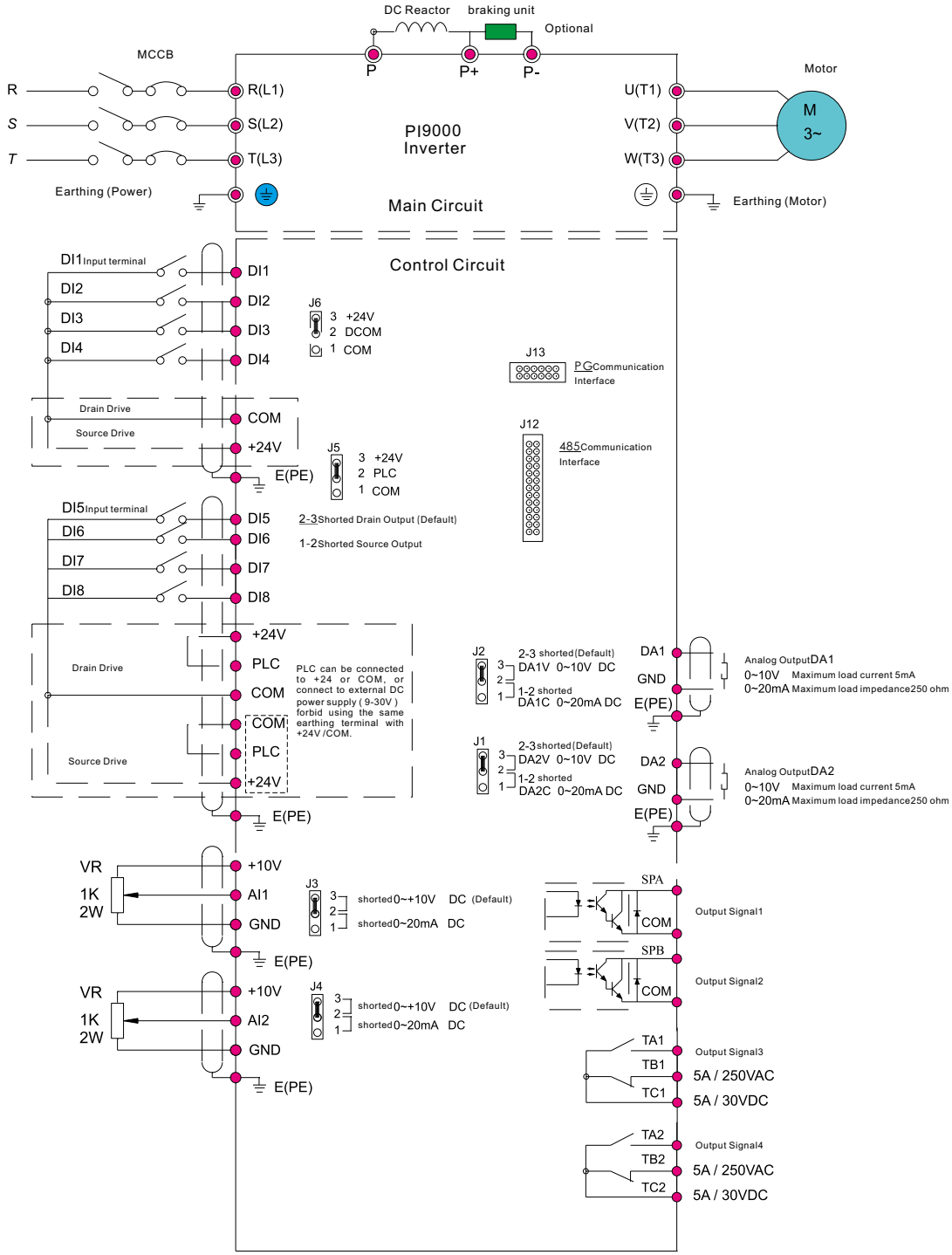
Wiring diagram: 11kW and below



Wiring diagram : 11KW-15KW

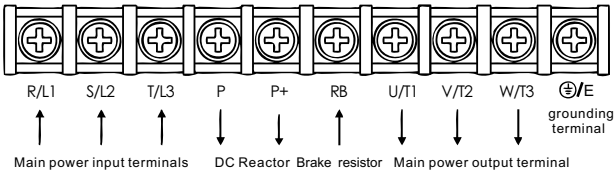


Wiring diagram : 18.5KW-355KW



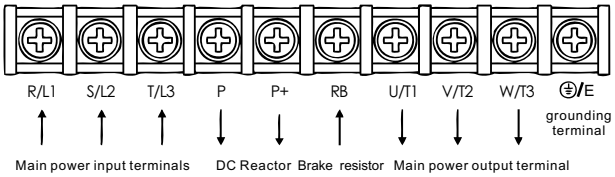
Terminals Description:

Below 7.5KW(380V) Main Circuit Terminals

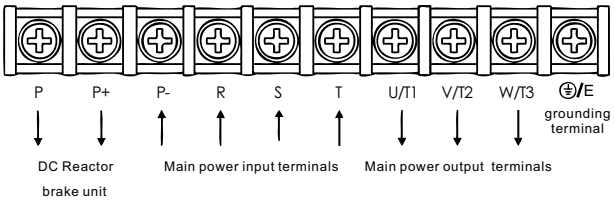


Note: The above power classifications are for G type inverter.

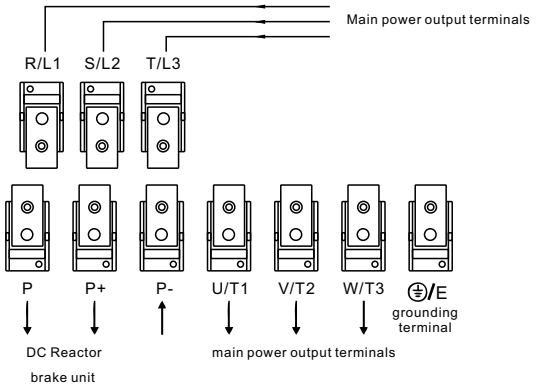
11KW-15KW (380V) Main Circuit Terminals



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



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



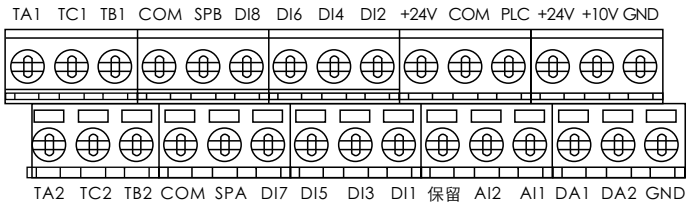
Note: P/P+ Standard setting is short circuit; if it is with external Dc Reactor , please disconnect and then connect it.

Terminal Function

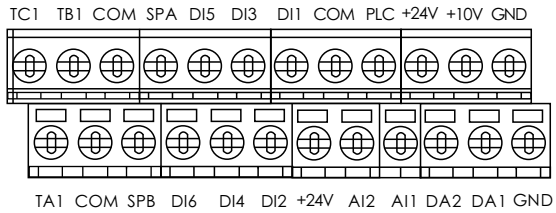
Terminal	Name	Functions
R/L1 S/L2 T/L3	Inverter input terminals	Connect to three-phase power supply, single-phase connects to R, T
⏚/E	Grounding terminal	Connect to ground
P+, RB	Braking resistor terminals	Connect to braking resistor
U/T1 V/T2 W/T3	Output terminals	Connect to three-phase motor
P+, P-	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

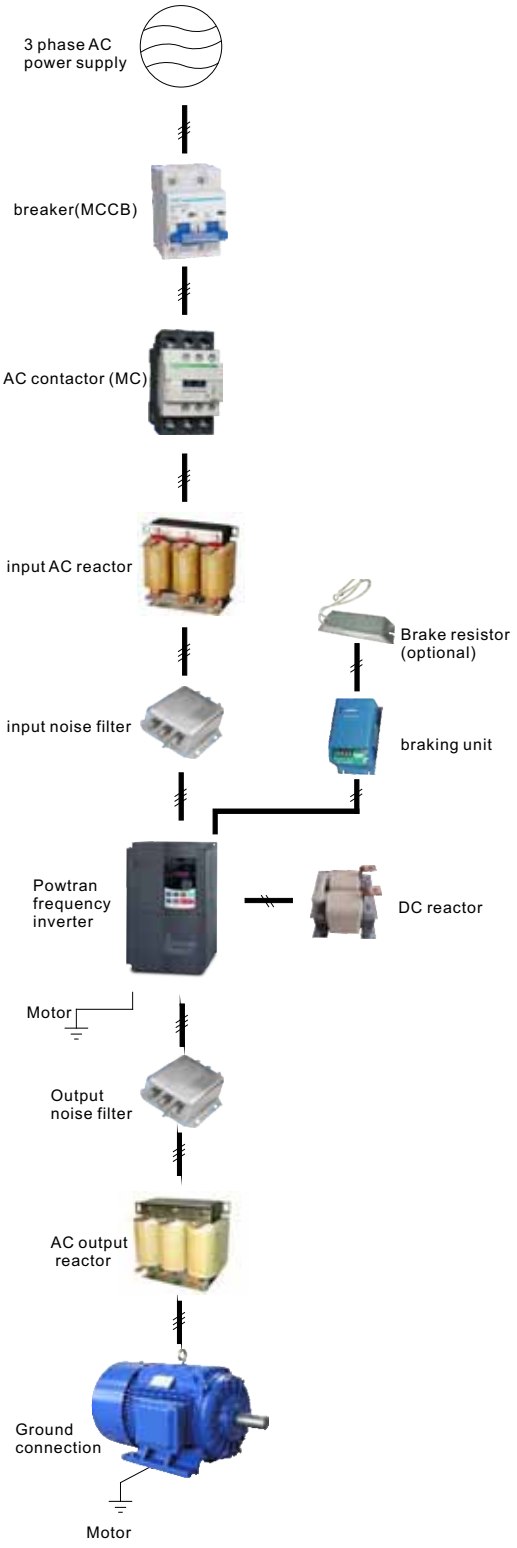


Description of control circuit terminals

Category	Symbol	Name	Function
Power supply	+10V-GND	External + 10V power supply	Output +10V power supply, maximum output current: 10mA 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/4mA to 20mA), depends on the selected J3 jumper on control panel. 2.Input impedance: 22kΩ with voltage input, 500Ω with current input.
	AI2-GND	Analog input terminal 2	1.Input range:(DC 0V to 10V/4mA 20mA), depends on the selected J4 jumper on control panel. 2.Input impedance: 22kΩ with voltage input, 500Ω with current input.
Digital input	Di1 DI2 DI3 DI4 DI5 DI6 DI7 DI8	Digital input 1 Digital input 2 Digital input 3 Digital input 4 Digital input 5 Digital input 6 Digital input 7 Digital input 8	1.Opto-coupler isolation, compatible with bipolar input 2.Input impedance: 2.4kΩ 3.Voltage range with level input: 9V to 30V 4. below 11KW: (DI1 to DI6)drive manner is controlled by J5, when external power supply is used to drive, please unplug J5 jumpers , 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. Maximum input frequency: 100kHz
Analog output	DA1-GND	Analog output 1	The selected J2 jumper on control panel determines voltage or current output. 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. 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 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" 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

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.



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	
	1 road analog voltage signal input	With isolation, support - 10 v ~ 10 v voltage input signal
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.

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