Introduction

Thank you for choosing PT200 variable-frequency inverter of Shenzhen Powtech Co.,Ltd. And this product is a kind of variable-frequency inverter which can be applied to various industrial machineries, drive control of fan and pump and heavy load of grinding with intermediate frequency; and it is designed by Shenzhen Powtech Co.,Ltd via its professional production and sales experience for many years.

This introduction includes two series of PT200: general type and specific type; among them, general type can be divided into P, G, M and H type based on different load and specific type can be divided into S, T and Z type; and the detailed description is as follow:

P type: light load;
G type: standard load
M type: heavier load;
H type: heavy load;
S type: specific type for textile machine;
T type: specific type for winding machine;
Z type: specific type for injection molding machine;

This specification provides related notices, such as parameter setting of installation and operation, diagnosis of malfunctions, daily maintenance and safe use, for user. Please read this operation introduction in detail before install it in order to guarantee install and operate this variable-frequency inverter correctly.

Please contact with dealers of our company in various places or directly contact with our company if there is any difficult during your using process; and our professionals are glad to make service for you!

Please submit this introduction to ultimate user and ask the user to keep it properly, which will be beneficial for later maintenance and other applied occasions. If there is any trouble during the warranty period, please fill in the warranty card and fax it to the dealer or our company.

The information may be changed during the improving period of this project without prior notice. Please consult the website of our company if you want to obtain the latest information.

Please consult http://www.powtech.cn for information of our other products.

Shenzhen Powtech Co.,Ltd

CATALOGUE

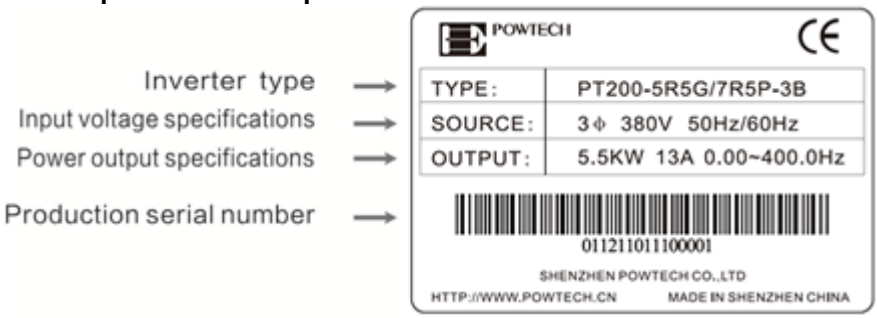
Chapter 1 Inspection and Safety Precautions

All inverters of Shenzhen Powtech Co.,Ltd are given strict test and quality inspection before leaving factory. Please firstly check whether the product package is damaged due to transportation carelessness after your purchasing and whether the specification and type is consistent with the machine you ordered. Please contact with dealers of our company in various places or directly contact with our company if there is any problem.

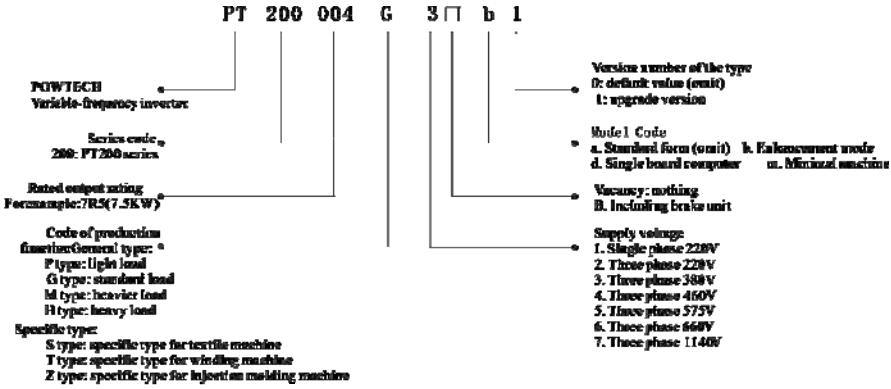
1-1 Inspect after unboxing

Inspect it includes one machine, an manual and a warranty card.Inspect name board at the side of variable-frequency inverter to confirm the product you obtain is the product you ordered.

1-1-1 Explanative to nameplate



1-1-2. Type inverter



1-2 Safety attentions

Safety precautions is divided into following two types in this manual:

Danger: the danger caused by not operating as required can cause serious injury or even death.

Notice: the danger caused by not operating as required can cause moderate harm or minor injury and damage of the equipment.

Process	Type of safety matters	Content of safety precautions
Preinstallation	danger	●Please don't install when it is found that control system has water, the part is insufficient or damaged when the box is opened. ●Please don't install when the packing list is in consistent with the matter time! ●Lift and put lightly when it is moved, or there will be danger of destroying the equipment! ●Please don't use the actuator with damage or AC frequency vector inverters with missing parts, or there will be danger of being injured! ● Don't touch the component of the control system with your hand, or there will be danger of static destroy!
Installation	danger	●Please install on flame retardant objects like metal; Be far away from combustible material. Or it may cause fire alarm! ●Don't screw fixed bolt of the equipment component randomly, particularly the bolt with red sign!
	notice	● Don't drop wire head or screw into the actuator. Or it may cause the damage of the actuator! ● Please install the actuator at a certain place with litter vibration and direct sunlight. ● Please pay attention to the installation location when put two inverters into one cabinet to guarantee the effect of heat dissipation.
Wiring	danger	●Please follow the guidance of this manual and the construction should be made by professional electrical engineering staff, or unexpected danger will appear! ●AC frequency vector inverters and power source should separated by circuit breaker, or it may cause fire alarm! ●Please confirm that the power source is at zero energy state before the wiring, or it will have electric shock hazard! ●Please make a correct and standard ground connection for the AC frequency vector inverters based on the standard, or it will have electric shock hazard! ● Never connect input power with output terminals (U, V and W) of the inverter. Pay attention to the sign of terminal blocks; don't connect the wire with mistake, or it may cause the damage of the actuator! ●Make sue circuit matched meets the requirement of EMC and the safety standard in its region. Please refer to the suggestion of this manual for wire diameter of the wire used . Or it may have accident! ● Never connect break resistor between (+) and (-) terminals of DC bus, or it may cause fire alarm! ●Encoder must use shielded wire; moreover, shielding layer must guarantee reliable ground connection of a single terminal.

Before electrifying	 notice	●Please confirm whether the voltage class of input power is consistent with rated voltage class of inverter, whether the circuit connected is firm enough, or it may cause the damage of the actuator! ● There is no need in making pressure test for any part of the inverter; the product is made such as test when it leaves the factor, Or it may have accident!
	 danger	●The AC frequency vector inverters must be electrified after its covered plates is covered well. Or it will have electric shock hazard! ●The wiring of all outside accessories must strictly follow the guidance of this manual; and their wirings should be connected correctly based on the circuit connect menthol provided by this manual. Or it may have accident!
After electrifying	 danger	●Don't open the cover plate after the electrifying. Or it will have electric shock hazard! ● Don't use a wet hand to touch actuator and peripheral circuit.. Or it will have electric shock hazard! ●Don't touch any input or output terminal of the inverter. Or it will have electric shock hazard! ●At the beginning of electrifying, the AC frequency vector inverters will automatically make a security detection for outside return circuit of the strong current; at that time, never touch U, V and W terminal blocks of the actuator, or it will have electric shock hazard! ● Parameter identification should be made and please pay more attention to the hazard hurting people during the rotation of electric machine. Or it may have accident! ● Please don't change manufacturer's parameter of the AC frequency vector inverters randomly. Or it may have hazard of damaging the equipment!
In service	 danger	●Never touch the cooling fan or discharge resistance to feel out the temperature. Or it may cause burning. ● Non-professional technicist can't detect the signal during the operation process. Or it may cause personal injury or equipment damage!
	 notice	● Anything should be avoided to drop into the equipment during the operation process of the inverter. Or it may cause equipment damage! ● Don't use contractor switching to control the start and stop of the actuator. Or it may cause equipment damage!
Maintenance	 danger	● Please don't repair and maintain the equipment with electricity . Or it will have electric shock hazard! ● Maintenance and preparing can be made to the actuator only after confirming the AC frequency vector inverters voltage is lower than 36V, subject to two minutes after power failure. Or residual charge on capacitance will harm people. ● Anybody without professional training can't make maintenance or preparing to the inverter. Or it may cause personal injury or equipment damage! ● Parameter setting must be made after changing the inverter; all pluggable parts must be inserted or seized under the condition of power failure!

1-3. Precautions

No.	Types of attention	Precautions contents
1	Insulation inspection of the motor	Insulation inspection of the motor should be made for the initial use of the motor, reusing after long-term placing when the motor is used or given regular inspection to avoid damaging the AC frequency vector inverters due to the insulation failure of machine winding, motor connection must be separated with the AC frequency vector inverterswhen insulation inspection is made; it is suggested to use megameter with 550V voltage type and guarantee the insulation resistance detected can't be smaller than 5MΩ.
2	Thermal protection of the motor	Make sure to adjust relevant parameter value of motor protection in the AC frequency vector inverters or install thermal relay before the motor to protect the motor when the rated capacity of the selected motor doesn't match with that of the inverter, particularly when the rated power of the AC frequency vector inverters is bigger than that of the motor.
3	Operation above the power frequency	This AC frequency vector inverters can provide 0Hz～400Hz output frequency. If the customer wants to make operation above 50 Hz, please take the endurance of the mechanical device into consideration.
4	Vibration of mechanical device	The setting for hopping frequency in the AC frequency vector inverters can be used to avoid mechanical resonance point of the load device which might be met by the AC frequency vector inverter sat some locations of output frequency.
5	About heating and noise of the motor	Compared with the operation of power frequency, the temperature rise, noise and vibration of the motor will increase slightly because the output voltage of the AC frequency vector inverters is PWM wave.
6	Pressure-sensitive device or capacitance improving the power factor at the output side	If the side the AC frequency vector inverters has capacitance improving the power factor or voltage dependent resistor for lighting protection, it will cause instant over current of the AC frequency vector inverters or damage the AC frequency vector inverters because the output voltage of the AC frequency vector inverters is PWM wave. Please don't use it.
7	Switching element such as contactor used by input and output terminal of the inverter	If contactor between the power supply and input end of the AC frequency vector inverters is installed, then it won't allow this contactor to control the start and stop of the inverter. If it is necessary to use this contactor to control the start and stop of the inverter, the interval can't be bigger than one hour. Frequent charge-discharge easily shortens the service life of the capacitor in the AC frequency vector inverters. If switching element such as contactor installed between output terminal and the motor, it should be guaranteed that the switching operation of the AC frequency vector inverters should be made without output. Or it easily causes the module damage in the inverter.
8	Use beside rated nominal voltage value	It is improper to use PT200 AC frequency vector inverters by and the voltage range stipulated in this manual; or it easily causes the device damage in the inverter. If it is necessary, please use corresponding rising and dropping equipment to make transformation disposal.
9	Change three- phase input to two-phase input	Don't change three-phase AC frequency vector inverters of PT 200 to two-phase for use. Or it may cause breakdown or damage the inverter.

No.	Types of attention	Precautions contents
10	Protection of lightning impulse	The AC frequency vector inverters has protection device for lighting strike and over current; and it has certain self-defensive ability for the inductive thunder. The customer should install protection device before the AC frequency vector inverters at frequent occurrence of the lightning.
11	Use of altitude and derating	It is necessary to use it via derating in the region where the altitude is above 1000m due to the weakening cooling effect of the AC frequency vector inverters caused by thin air. Please make a technology consulting to our company for such a condition.
12	Some special usages	Please consult our company if it is necessary for the customer to use the connection method beyond the suggestions provided in this manual, like DC bus.
13	Attention for the abandonment types of AC frequency vector inverters	It may cause explosion when the electrolytic capacitor of main circuit and printed board burn. And the burning of plastic parts will cause poisonous gas. Please dispose it as industrial refuse.
14	About adaptive motor	1） Standard adaptive motor is asynchronous induction like a quadrupole squirrel cage. If it is not the above motor, please select the AC frequency vector inverters based on the rated current of the motor. 2） Cooling fan 3） Zx67y non-variable frequency motor and rotor spindle is connected with the same axis; cooling effect of the fan reduces when the rotate speed reduces; therefore, install powerful cooling fan or replace variable frequency motor when the motor is too hot. 3）The AC frequency vector inverters has been installed with standard parameter of adaptive motor; it is necessary to make parameter identification or modify default value according to practical situation to correspond with the actual value; or it may affect the operation effect or protection performance. 4） short circuit in the cable or motor will cause the alarm of the AC frequency vector inverters or even explosion of the motor, so please make a short-circuit test of insulation for the motor with initial installation; and it is necessary to make such a test in daily maintenance. Notice: make sure to completely disconnect the AC frequency vector inverters with the part required to be testing when such a test is made.
15	Others	1）Never connect alternating current power supply with terminals like U, V and W for output end of the inverter. 2）The panel must be fixed and locked before electrifying in order to avoid personal injury caused by harmful components like internal capacitance. 3）Tasks such as wiring and inspection can’t be made after the power is connected. 4）After the electrifying of this device, please don’t touch its interior circuit and component to avoid electric shock hazard. 5）Don’t touch the circuit board or any component in the motor within five minutes shown on keyboard after the power is off; what is more, the meter should be used to confirm the capacitance in the motor has been discharged and then the task in the motor can be made; or it may have hazard of electric shock. 6）Electrostatic on human body will seriously affect MOS field effect transistor; don’t use your hand to touch any internal component such as printed circuit board and IGBT without anti-static precautions; or it may cause breakdown.

No.	Types of attention	Precautions contents
		7）Grounding terminal of the AC frequency vector inverters(E or ⏚)7）should be correctly and reliably connected to the ground based on salty requirement of national electricity and other related standards. Don't stop the motor via operating a switch or interruption of power supply; and the power can be off only after the stop of the motor operation when it is used . 8）It must select input filter accessory if it want to meet CE standard.

1-4 Range of application

※ This AC frequency vector inverters can be applied only to general three-phase AC induction motor of industry.

※ This AC frequency vector inverters can be only used in places approved by our company; it may cause accidents like fire, electric shock and explosion in the places not approved by our company.

If it used for the equipment (e.g. Lifting appliance, aviation system and safety equipment)which may cause personal injury due to the AC frequency vector inverters failure, such an occasion must be cautiously disposed and reported to our company.

This device is only allowed to be operated by the staff with qualified training. Please carefully read the content about safety, installation, operation and maintenance in this introduction before your use. Safe operation of this device depends on the correct transportation, installation, operation and maintenance.

Chapter 2 Standard specification

2-1 Technical specifications

2-1-1.Technical specifications of PT200

AC frequency vector inverters type	Input voltage	output rating （kW）	Rated input current（A）	Rated output current （A）	Adaptive motor
PT200-0R4G-1B	Single phase 220V ±15 %	0.4	5.4	2.3	0.4
PT200-0R7G-1B		0.75	8.2	4.5	0.75
PT200-1R5G-1B		1.5	14.2	7.0	1.5
PT200-2R2G-1B		2.2	23.0	10	2.2
PT200-004G-1B		3.7	34.0	16	3.7
PT200-0R7G-2B	Three phase 220V ±15%	0.75	5.0	4.5	0.75
PT200-1R5G-2B		1.5	7.7	7	1.5
PT200-2R2G-2B		2.2	11.0	10	2.2
PT200-004G-2B		3.7	17.0	16	3.7
PT200-5R5G-2B		5.5	21.0	20	5.5
PT200-7R5G-2B		7.5-	31.0	30	7.5
PT200-011G-2B		11.0	43.0	42	11.0
PT200-015G-2B		15.0	56.0	55	15.0
PT200-018G-2B		18.5	71.0	70	18.5
PT200-022G-2		22.0	81.0	80	22.0
PT200-030G-2		30.0	112.0	110	30.0
PT200-037G-2		37.0	132.0	130	37.0
PT200-045G-2		45.0	163.0	160	45.0
PT200-055G-2		55.0	200.0	200.0	55.0
PT200-0R7G-3B	Three phase 380V ±15% Notice: motor type above (including)350G G/P Can't integrate	0.75	3.4	2.5	0.75
PT200-1R5G-3B		1.5	5.0	3.7	1.5
PT200-2R2G-3B		2.2	5.8	5	2.2
PT200-004G-3B/ PT200-5R5P-3B		4.0/5.5	10/15	9/13	4.0/5.5
PT200-5R5G-3B/ PT200-7R5P-3B		5.5/7.5	15/20	13/17	5.5/7.5
PT200-7R5G-3B/ PT200-011P-3B		7.5/11.0	20/26	17/25	7.5/11.0
PT200-011G-3B/		11.0/15.0	26/35	25/32	11.0/15.0

AC frequency vector inverters type	Input voltage	output rating （kW）	Rated input current（A）	Rated output current （A）	Adaptive motor
PT200-015P-3B					
PT200-015G-3B/ PT200-018P-3B	Three phase 380V ±15%	15.0/18.5	35/38	32/37	15.0/18.5
PT200-018G-3B/ PT200-022P-3B		18.5/22.0	38/46	37/45	18.5/22.0
PT200-022G-3B/ PT200-030P-3B		22.0/30.0	46/62	45/60	22.0/30.0
PT200-030G-3/ PT200-037P-3		30.0/37.0	62/76	60/75	30.0/37.0
PT200-037G-3/ PT200-045P-3		37.0/45.0	76/90	75/90	37.0/45.0
PT200-045G/ PT200-055P-3		45.0/55.0	90/105	90/110	45.0/55.0
PT200-055G-3/ PT200-075P-3		55.0/75.0	105/140	110/150	55.0/75.0
PT200-075G-3/ PT200-093P-3		75.0/93.0	140/160	150/176	75.0/93.0
PT200-093G-3/ PT200-110P-3		93.0/110.0	160/210	176/210	93.0/110.0
PT200-110G-3/ PT200-132P-3		110.0/132.0	210/240	210/250	110.0/132.0
PT200-132G-3/ PT200-160P-3		132.0/160.0	240/290	250/300	132.0/160.0
PT200-160G-3/ PT200-185P-3		160.0/185.0	290/330	300/340	160.0/185.0
PT200-185G-3/ PT200-200P-3		185.0/200.0	330/370	340/380	185.0/200.0
PT200-200G-3/ PT200-220P-3		200.0/220.0	370/410	380/420	200.0/220.0
PT200-220G-3/ PT200-250P-3		220.0/250.0	410/460	420/470	220.0/250.0
PT200-250G-3/ PT200-280P-3		250.0/280.0	460/500	470/520	250.0/280.0
PT200-280G-3/ PT200-315P-3		280.0/315.0	500/580	520/600	280.0/315.0
PT200-315G-3/ PT200-350P-3		315.0/350.0	580/620	600/640	315.0/350.0
PT200-350G-3		350.0	620	640	350.0
PT200-400G-3		400.0	670	690	400.0
PT200-500G-3		500.0	835	860	500.0
PT200-560G-3		560.0	920	950	560.0
PT200-630G-3		630.0	1050	1100	630.0

2-1-2 See the following table for rated output current with different specifications

G/P/H/S/Z/T/M						
Voltage	**220V 1Φ**	**220V (240V)**	**380V (415V)**	**460V (440V)**	**575V**	**660V**
Power (Kw)	**Current (A)**	**Current (A)**	**Current (A)**	**Current (A)**	**Current (A)**	**Current (A)**
0.4	2.5	2.5	1.2	-	-	-
0.75	4.5	4.5	2.5	2.5	-	-
1.5	7	7	3.7	3.7	-	-
2.2	10	10	5	5	-	-
4	16	16	9	8	-	-
5.5	-	20	13	11	-	-
7.5	-	30	17	15	-	-
11	-	42	25	22	17	15
15	-	55	32	27	22	18
18.5	-	70	37	34	26	22
22	-	80	45	40	33	28
30	-	110	60	55	41	35
37	-	130	75	65	52	45
45	-	160	90	80	62	52
55	-	200	110	100	76	63
75	-	260	150	130	104	86
93	-	320	176	147	117	98
110	-	380	210	180	145	121
132	-	420	250	216	173	150
160	-	550	300	259	207	175
185	-	600	340	300	230	198
200	-	660	380	328	263	218
220	-	720	420	358	287	240
250	-	-	470	400	325	270
280	-	-	520	449	360	330
315	-	-	600	516	415	345
350	-	-	640	570	430	370
400	-	-	690	650	520	430
450	-	-	740	700	600	490
500	-	-	860	800	650	540

2-2 Standard specification

Item		Standard
Power supply	Level of voltage frequency	Single phase 200～240V, 50/60Hz three phase 200～240V，50/60Hz three phase 380～415V, 50/60Hz three phase 440～460V，50/60Hz three phase 575V，50/60Hz three phase 660V, 50/60Hz three phase 1140V, 50/60Hz
	Allowable fluctuation	Voltage :±15% frequency: ±5%
Control performance	Control system	AC frequency vector inverterswith vector control based the high performance of DSP
	Output frequency	G/P/Z/S/T/M type: 0.00～400.0Hz， The highest frequency can be set among 10.00～400.0Hz
	Control method	V/F control, vector control for flux with open loop 1，vector control for flux with open loop 2, vector control for PG
	Lifting function of automatic torque	Torque control for low frequency (1Hz) and great output in the control method of V/F
	Control on accelerating and decelerating	Setting method for subsections of accelerating and decelerating S curve; the longest operation time 9600 h
	Control on programme operation	Operation for speed program of 16 sections; the longest operation time 888.88 h
	Image resolution of frequency setting	Figure: 0.01Hz(below300Hz)，0.1Hz(above300Hz) simulation: 0.05Hz / 60Hz
	Frequency accuracy	Common difference of speed control 0.01%(25℃±10℃)
	V/F curve method	User defines V/F curve for linear and multiple power
	Overload capacity	G/S type: rated current 150%－1 minute, rated current 200%－0.1 second P type :rated current 120%－1 minute，rated current 150%－0.1 second Z/M/ T type:rated curren180%－1minute,rated curren250%－0.1 second H type :rated current 250%－1 minute, rated current 300%－0.1 second
	Slippage compensation	50～100%, compensation for automatic slippage
	The highest frequency	400Hz
	Carrier frequency	0.5KHz～15KHz; carrier frequency can be adjusted based on the load characteristics
	Image resolution of output frequency	Figure setting: 0.01Hz simulation setting: the highest frequency × 0.1%
	Starting torque	G motor: 0.5Hz/180% P motor: 0.5Hz/120%
	Speed range	1:200
	Accuracy of speed stabilizing	Vector control for flux with open loop:≤±0.5% （rated

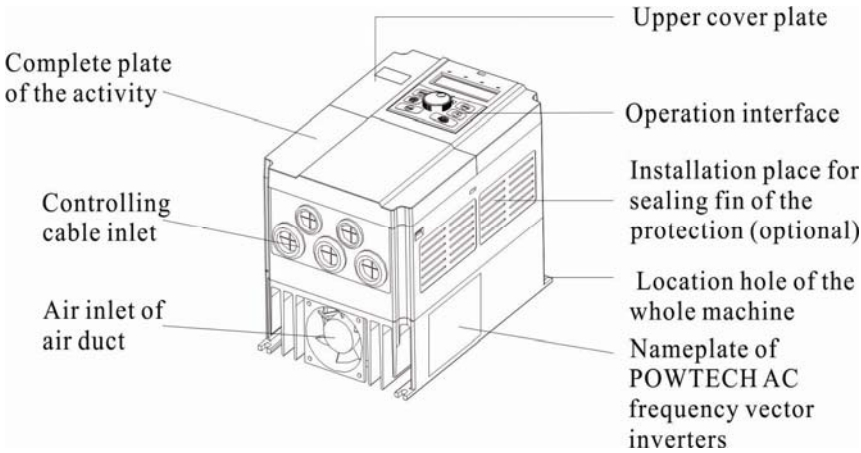
Item			Standard
	(accuracy of speed control)		synchronous speed）
	Stability of speed control		vector control for flux with open loop :≤±0.3%（rated synchronous speed）
	Torque response		≤40ms (vector control for flux with open loop)
	Torque boost		Automatic torque boost; manual torque boost 0.1%～30.0%
	acceleration and deceleration line		Acceleration and deceleration method for line; for acceleration and deceleration time; time scope for acceleration and deceleration 0.0s～3600.0s
	DC braking		DC braking frequency :0.0Hz～maximum frequency, braking tine: 0.0～36.0 second，current value for braking movement: 0.0%～100.0%
	Electronic control		Range of jog frequency :0.00Hz～maximum frequency; Acceleration and deceleration time of jog: 0.0s～3600.0s
	Operation on multi sections		Realize the maximum operation of 16 sections via control terminals
	Build-in PID		Realize closed-loop control system with process control conveniently:
	Automatic voltage regulation (AVR)		Automatically make the output voltage constant when the network voltage changes
	Torque limitation and control		Excavator characteristics: automatic limitation on torque during the operation period and prevention for frequent overcurrent trip; and vector model of close loop can realize the torque control
Personalized function	Self-checking for outside equipment safety of electrifying		Realize the security detection of electrifying on outside device like ground connection and short circuit
	Function of DC bus		Realize the function for many inverters to share DC bus
	 key		Programmable key: function choice for positive and negative operation and jog operation
	Pendulous control of textile		Multi control functions of triangular wave
	Current -limiting function of the carrier		Built- in current-limiting algorithm of waveband reduces the probability for the AC frequency vector inverters to report over current and improve the whole motor’s ability on resisting disturbance
	Timing control		Timing control function: setting time scope 0h～65535h
	Standardization for extension cord of the keyboard		The customer can use the standard network cable to prolong the keyboard
Operation	Inputting signal	Operation method	Keyboard/terminal/communication
		Frequency setting	Six frequency source in total: setting of keyboard, analogue voltage, analogue current, operation for multiple sections, PID control, remote communication and presetting of keyboard potentiometer can be changed via multiple methods
		Starting signal	Corotation and inversion
		Speed of	Speed for 16 sections can be set at most (using

Item			Standard
		multiple sections	multifunction terminal or program execution)
		Acceleration of multiple sections	Acceleration 4 sections can be set at most (using multifunction terminal)
		Emergency stop	Interrupt controller output
		Operation of pendulous frequency	Operation of process control
		Jog	Operation with low speed
		Fault resetting	Automatically or manually reset the fault state when the protection function is at an effective state
		PID feedback signal	Including DC 0～10V, DC 1～5V, DC 0～20mA and DC 4～20mA
	Outputting signal	Operating condition	Motor situation showing stop, acceleration and deceleration, constant speed and state of programme operation
		Fault output	Output of sensitive point-AC 250V 5A, DC 30V 5A
		Analog output	Two analog outputs can choose 8 signals such as frequency, current, voltage and so on; and output signal scope can be set randomly among 0~10V/0~20mA.
		Output of digital quantity	Up to three output signals; every output signal has nine signals for choice
	Operation function		Limiting frequency, avoiding frequency, slippage compensation, invert protection, self-adjusting and PID control
	Braking of direct current		Built-in PID adjusts brake current and protects sufficient braking torque without overcurrent
	Run command channel		Three channels: presetting of operation panel, control terminal and serial communication. The change via various methods
	Input terminal		Six digital input terminals can be compatible with active loudspeaker PNP or two input terminals of analog of NPN input method; among them, AI1 and AI2 can be input as voltage or current. (if it necessary to expand the function of input and output terminals, please use IO expansion cards)
	Output terminal		One digital output terminal (bipolar output), a relay output terminal, and an analog output terminal can respectively choose 0/4mA～20mA or 0/2V～10V and realize the output of physical quantities such as setting frequency, output frequency and rotate speed
Protection function	AC frequency vector inverters protection		Overvoltage protection, low-voltage protection, over current protection, overload protection, overheat protection, protection of overcurrent and speed reduction, protection of overvoltage and speed reduction, protection of default phase (optional functions), external fault, communication error, abnormal feedback signal of PID and PG fault
	IGBT temperature display		Display current IGBT temperature
	Control of AC frequency		Starting temperature for the fan can be set

Item			Standard
	vector inverters fan		
	Instant power failure and then restarting		Less than 15 millisecond: Continuous operation More than 15 millisecond: automatically detect the motor speed and restart after instant power failure
	Tracking method of rotat speed		Automatically track motor speed at the start of the inverter
	Protection function of parameter		Protect the AC frequency vector inverters parameter via setting supervisor password and decode
Display	LED/O LED show keyboar d	Operation information	18 monitoring objects of the operation in total: operation frequency, setting frequency, rated current of the motor, current percentage, DV bus voltage, output voltage, actual speed of the motor, accumulative operation time, IGBT temperature, PID given value, feedback value of PID, state of input terminal, state of output terminal, value of analog AI1, value of analog AI2A, current number for speed of multiple sections and setting value of torque
		Error message	Keep five error messages at most and inquire fault type, voltage, current, frequency and working condition when the fault occurs
	LED display		Display parameter
	OLED display		Options available; inverter in Chinese/English
	Parameter copy		Using special keyboard of parameter copy can realize the quick copy of the parameter (limited too OLED)
	Key lock and function choice		Realize partial or complete lock of the button; define the effect scope of partial buttons to prevent wrong operation
Communicati on	RS485/RS232		It can choose isolated RS485/RS232 communication module to realize the communication with the upper computer
Environment	Environment temperature		-10℃～40℃(environment temperature is among 40℃～50℃; please use it with derating）
	Storage temperature		-20℃～65℃
	Environment humidity		Less than 90 % R.H，not exceeding 90 % R.H
	Height; vibration		Below 1000 m, below 5.9m/s²（=0.6g）
	Application place		Indoor, without sunlight or corrosivity, explosive gas or water vapor, dust, combustible gas, oil mist, water vapor, dropping water or salinity
	Altitude		Belong 1000m
	Pollution degree		2
Product standard	The product implements safety standard		IEC61800-5-1:2007
	The product implements EMC standard		IEC61800-3:2005
Cooling method			Forced cooling and natural air cooling

2-3. Dimension

2-3-1 outline drawing of the product and dimension of installing hole



2-3-2 PT 200 series

1.2S1~2S3

1) 2S1

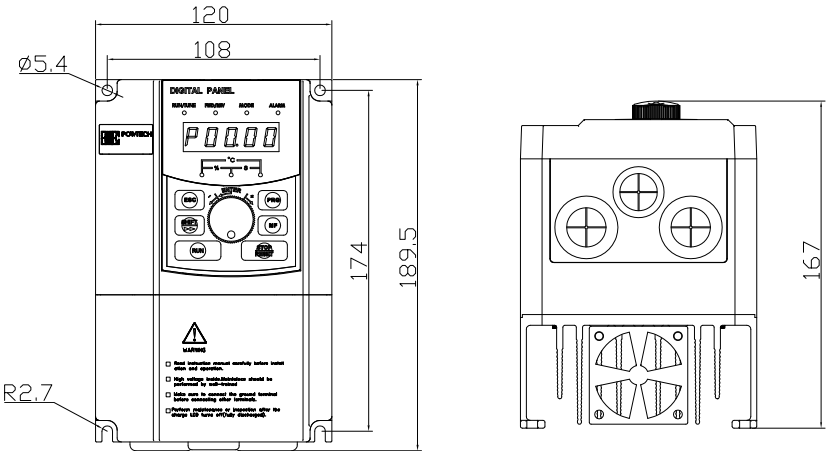


Chart 2-1 Dimension of 2S1

Level of power supply	Type	Power (kW)
Single phase 220V	G	0.4~1.5
	M	0.4~0.75
	H	0.4
Three phase 220V	P	0.75~1.5
	G	0.4~1.5
	M	0.4~0.75
	H	0.4
Three phase380V	P	0.75~1.5~2.2
	G	0.75~2.2
	M	0.75~2.2
	H	0.75~2.2

2) 2S2

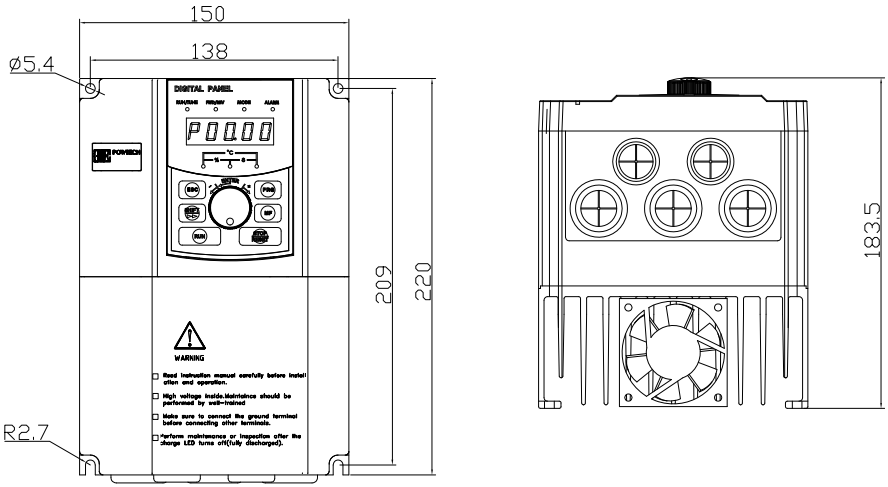


Chart 2-2 Dimension of 2S2

Level of power supply	Type	Power (kW)
Single phase 220V	P	2.2~4
	G	2.2~4
	M	1.5~2.2
	H	0.75~1.5
Three phase220V	P	2.2~4
	G	2.2~4
	M	1.5~2.2
	H	0.75~1.5
Three phase380V	P	4~5.5
	G	4~5.5
	M	4~5.5
	H	4

3) 2S3

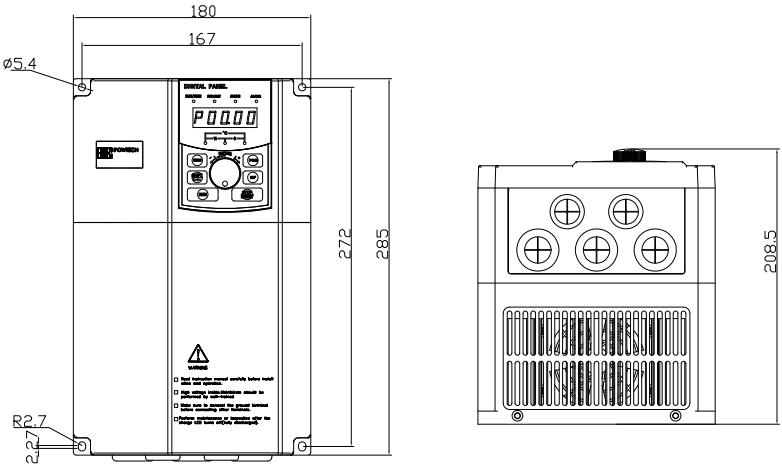


Chart 2-3 Dimension of 2S3

Level of power supply	Type	Power (kW)
Single phase 220V	P	5.5
	G	5.5
	M	4
	H	2.2
Three phase 220V	P	5.5
	G	5.5
	M	4
	H	2.2
Three phase380V	P	7.5~11
	G	7.5
	M	7.5
	H	5.5

2-3-3 PT200 series (three-phase power voltage 380~415V,50/60Hz)

1. 2N1~2N8

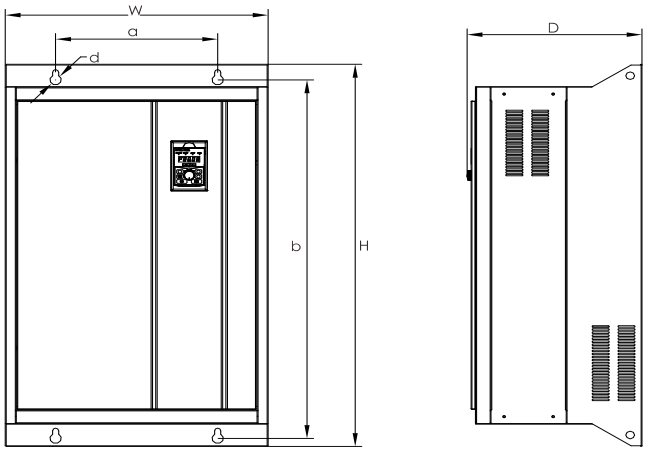


Chart 2-4 Dimension of 2N1-2N8

1) 2N1

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	15~18.5	2N1	345	203	230	150	325	Ø9
G	11~15							
M	7.5~11							
H	7.5							

2) 2N2

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	22~30	2N2	430	263	255	170	407	Ø9
G	18.5~22							
M	15~18.5							
H	11~15							

3) 2N3

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	37~45	2N3	490	310	274	190	468	Ø10
G	30~37							
M	22~30							
H	18.5~22							

4) 2N4

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	55~75	2N4	640	370	330	250	610	Ø12
G	45~55							
M	37~45							
H	30~37							

5) 2N5

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	93~110	2N5	786	500	345	300	748	Ø14
G	75~93							
M	55~75							
H	45~55							

6) 2N6

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	132~160	2N6	786	500	353	300	748	Ø14
G	110~132							
M	93~110							
H	75~93							

7) a.2N7(hanging)

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	185~250	2N7	1000	600	400	370	935	Ø14
G	160~220							
M	132~160							
H	**110~132**							

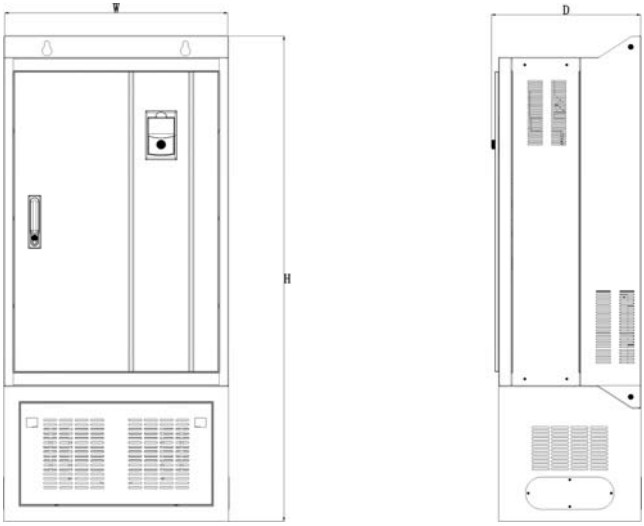


Chart 2-5 2N7 Dimension of cabinet type

b.2N7(cabinet type)

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	185~250	2N7	1300	600	400	370	935	Ø14
G	160~220							
M	132~160							
H	**110~132**							

8） a. 2N8(hanging)

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	280~315	2N8	1160	650	400	370	110	Ø14
G	250~280							
M	220~250							
H	200~220							

b.2N8(cabinet type)

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	280~315	2N8	1460	650	400	370	110	Ø14
G	250~280							
M	220~250							
H	200~220							

9） 2N9

Type	Power (kW)	Seat No.	Dimension			Installation dimension		
			H	W	D	a	b	d
P	350~500	2N9	1650	830	480	/	/	/
G	315~400							
M	280~350							
H	220~315							

2-3-4. Dimension figure of keyboard

JP6C200 dimension figure:

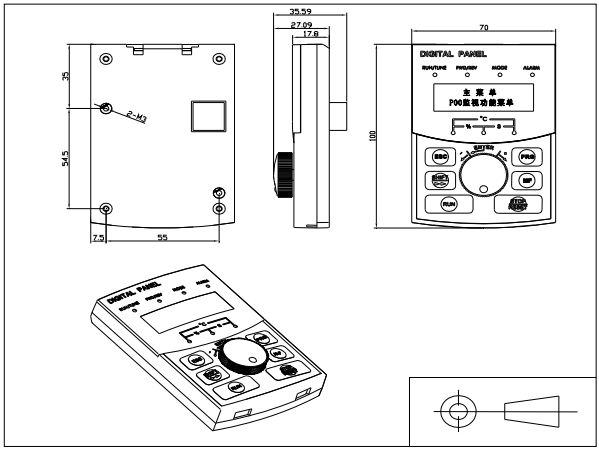


Chart 2-6 JP6C200 dimension

JP6E200 dimension:

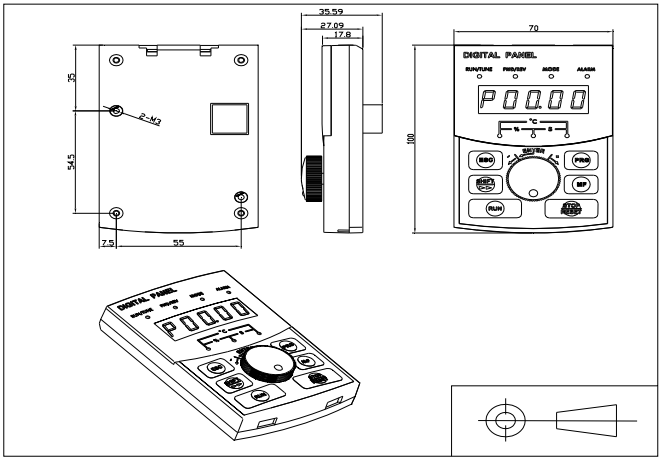


Chart2-7 JP6E200 dimension

JP6D200 dimension figure of keyboard cabin:

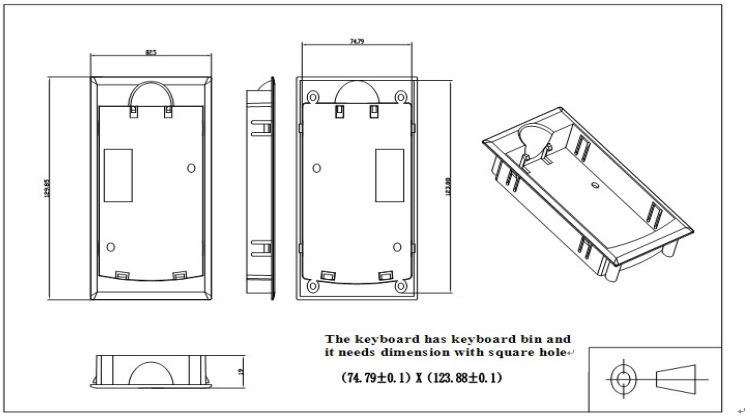


Chart 2-8 JP6D200 dimension

Chapter 3 Installation and redundant circuit

3-1 Service environment

(1) Environment temperature -10℃~40℃;

(2) Prevent electromagnetic interference and be far away from interference source.

(3) Prevent the invasion of water drop, vapor, dust, dirt, cotton fiber and lemel.

(4) Prevent the invasion of oil, salt and corrosive gas.

(5) Avoid vibration.

(6) Avoid high temperature and humidity and there is drench from the rain; and the humidity is smaller than 90%RH (without condensation).

(7) Prohibit being used in environment with inflammable, combustible and explosive air, liquid or solid.

3-2 Installation direction and room

Variable-frequency inverter should be installed at a indoor place with good ventilation and used the wall-mounted method; moreover, there must be enough room between it and its surrounding article or baffle (wall). It is shown as the following chart.

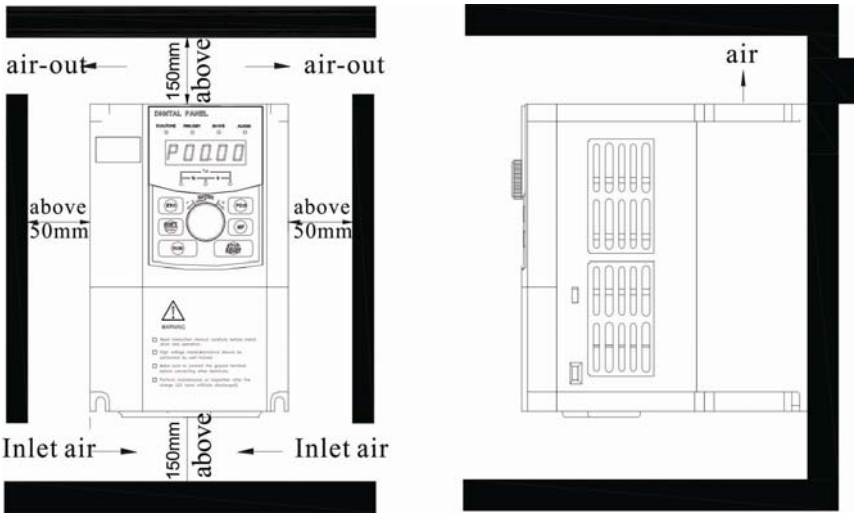
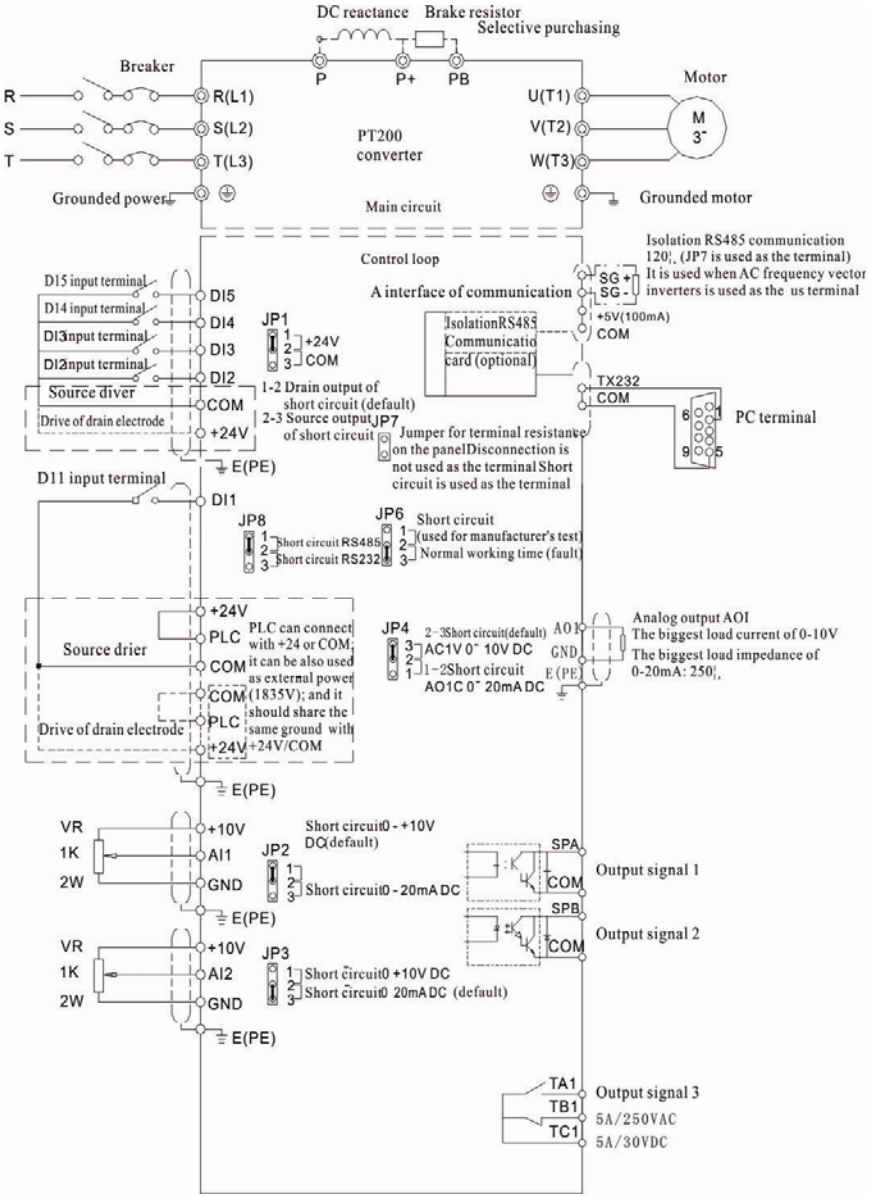


Chart 3-1 installation direction and room

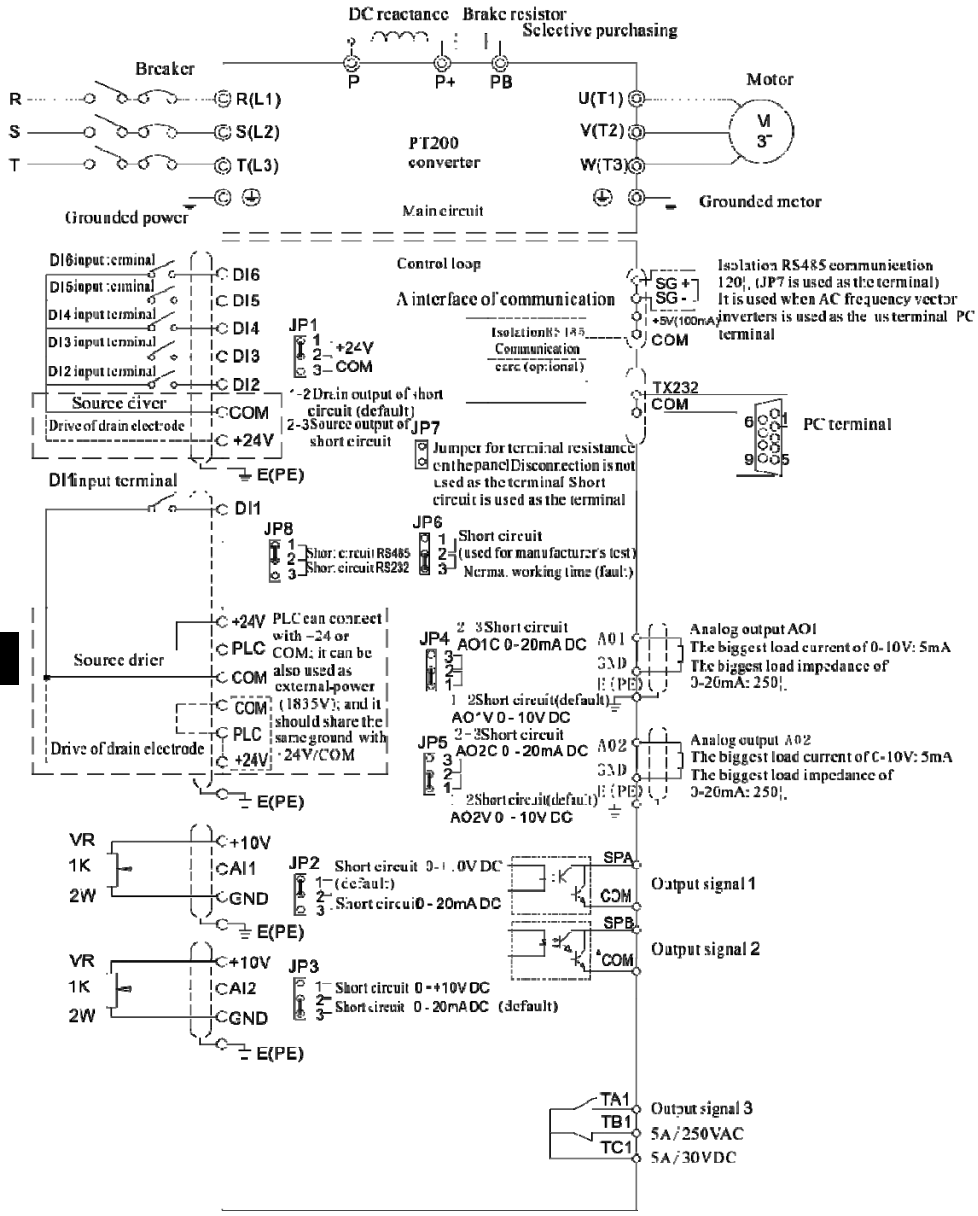
3-3 Wiring diagram

Wiring of variable-frequency inverter divides into main circuit and control loop. The user must make the connection correctly following the below wiring circuit.

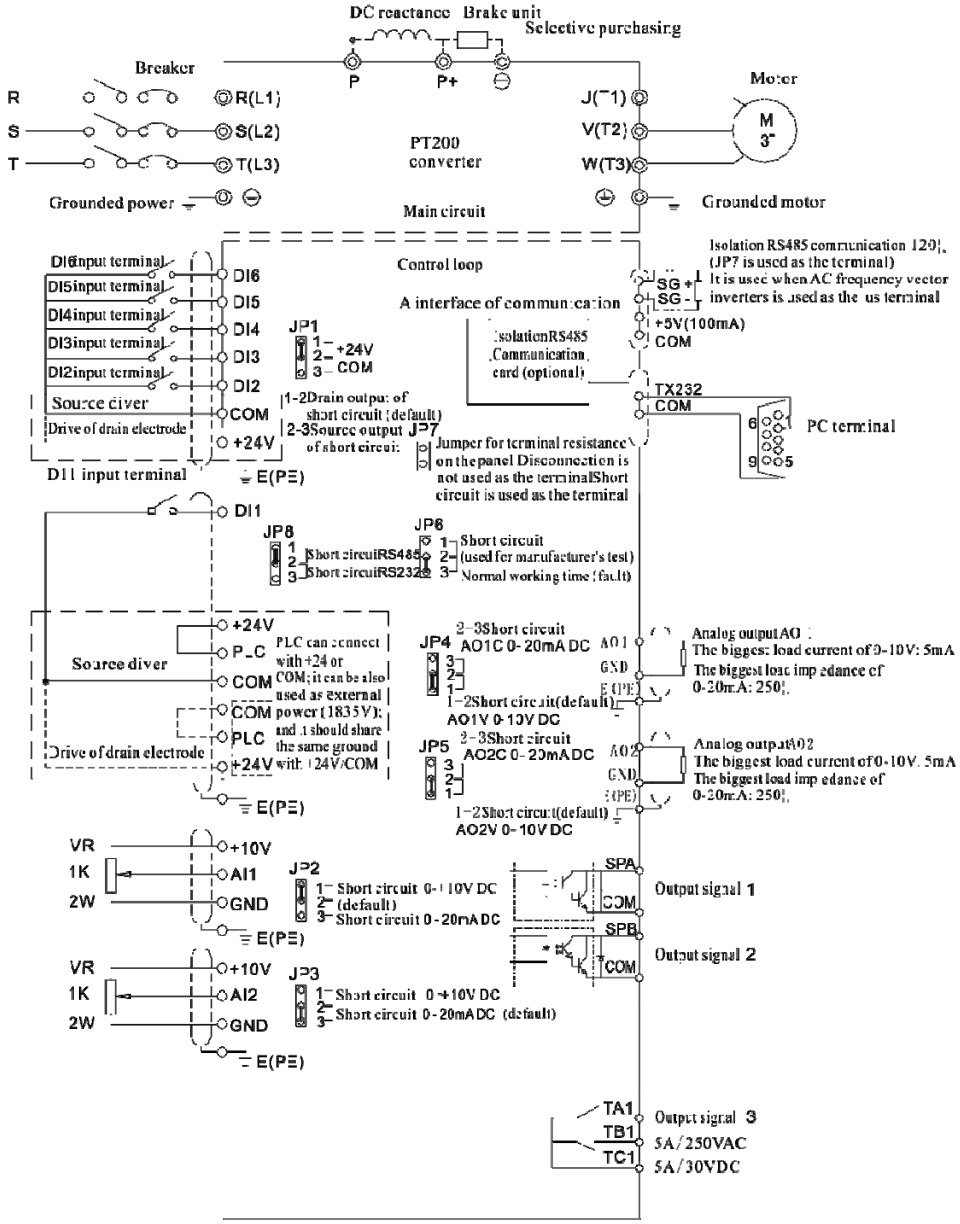
3-3-1 Wiring diagram below 7.5KW（2S1/2S2/2S3）



3-3-2. Wiring diagram for 11KW~22KW（2N1~2N2）



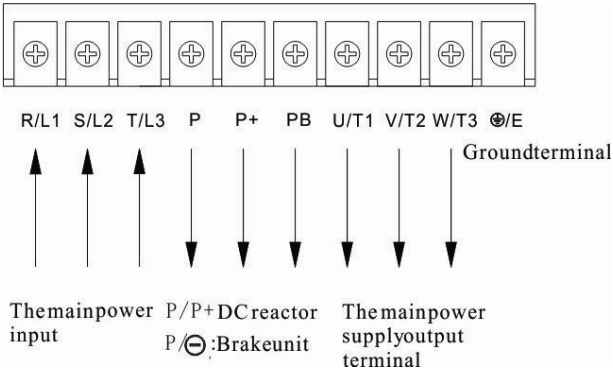
3-3-3 Wiring diagram for 30kW~630kW（2N3~2N10）



3-4. Main circuit terminal (G type)

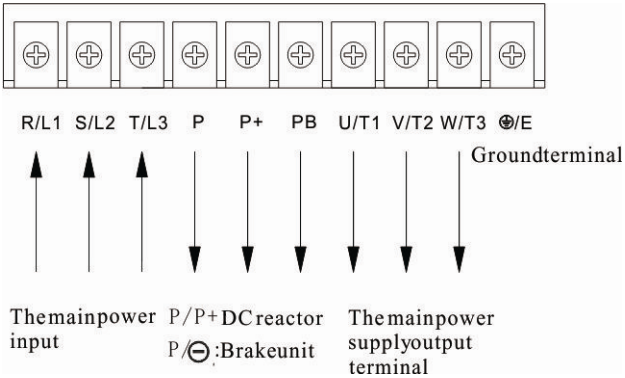
3-4-1.Main circuit terminal of PT200

1. Main circuit terminal below 7.5KW (380V)

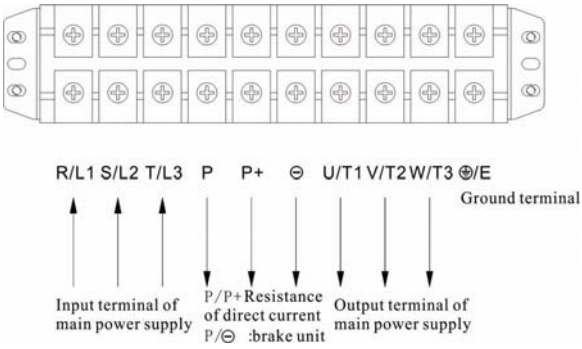


Notice: classification of the above power is only for machine of G type.

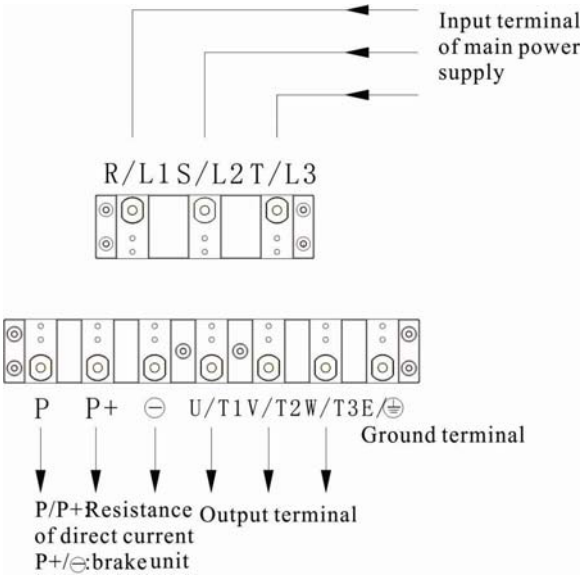
2. Main circuit terminal for 11KW~22KW(380V)



3. Main circuit terminal for 30~37KW（380V）

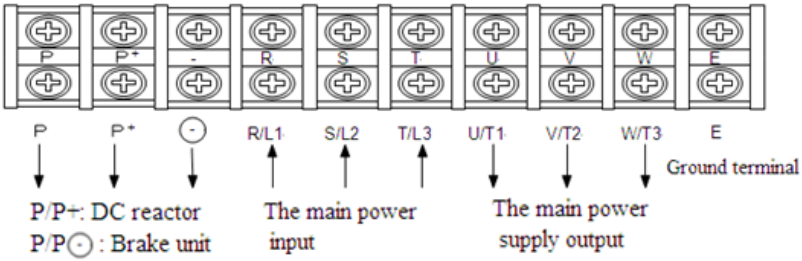


4. Main circuit terminal for 45~220KW（380V）



Notice: standard configuration of P/P+ is the state of short circuit; if it is necessary to connect resistance of direct current , it should firstly stop it and then connect.

5. Main circuit terminal for 250~630kW（380V）



3-4-2 Explanation for the function of terminal blocks

Terminal	Name	Explanation
R/L1	Input terminal of AC frequency vector inverters	Connect with three-phase power supply and connect single phase with R and T
S/L2		
T/L3		
⏚/E	Ground terminal	Connect with the ground
U/T1	Output terminal	Connect with three-phase motor
V/T2		
W/T3		
P+, PB/⊖	Connecting end for brake resistance or brake unit	Connect with brake resistance or brake unit
P,P+	Connection end for resistance of direct current	Connect with resistance of direct current (removing short circuit)

3-5 Control circuit terminal

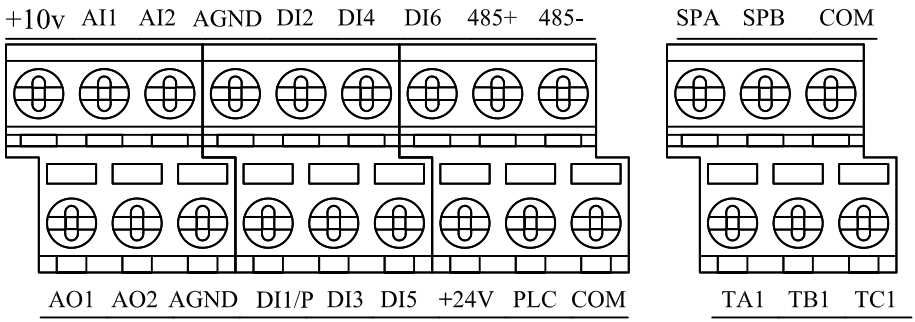
3-5-1. Explanation for control circuit terminal

Classification	Terminal	Name	function
Input signal	DI1～DI6	DI1～DI6 input terminal	See function P06.00～P06.05 for the detail of input terminal with multiple functions. Only 200 LCB control panel has DI6. PLC controls the driving form of DI. Drain driver: PLC connects with 24V DC or external power supply. Source driver: PLC connects with COM
	PLC	PLC control terminal	
Supplementary power supply	+24V	Plus end of power supply	The biggest output is +24V/200mA; never make a short circuit between COM and GND under any condition
	COM	Common terminal	
Out put signal	SPA/COM	Output signal 1	Signal for open collector of output when it moves: (24V DC/150Ma); common terminal is COM and function is set by P08.00 and P08.01
	SPB/COM	Output signal 2	

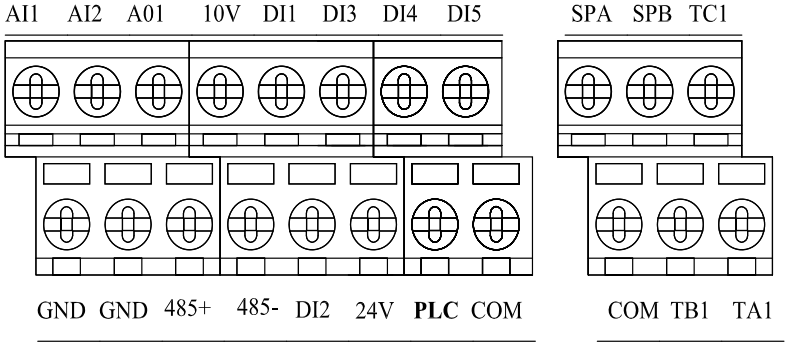
	TA1/TB1/TC1	Output signal 3	TA1→TC1 normally open，TB1→TC1 normally close; and output function is set by P08.02.
Input and output signal of analog	+10V→GND	Simulated power supply	Provide +10V power supply externally; and the biggest output current: 10mA It is generally used as external potentiometer; and scope for resistance value of potentiometer is 1K.
	AI1	Simulated input signal with multiple functions 1	Short circuit for JP2 1-2: it can be adjusted among 0- +10V. Short circuit for JP2 2-3:it can be adjusted among 0- +20mA. P06.09-P06.12 sets the scope of input voltage or current. P06.11 sets the setting value corresponded by input signal
	AI2	Simulated input signal with multiple functions 2	Short circuit for JP3 1-2:it can be adjusted among 0- +10V. Short circuit forJP3 2-3:it can be adjusted among 0- +20mA. P06.14-P06.17sets the scope of input voltage or current. P06.16the setting value corresponded by input signal
	AO1	Simulated output signal with multiple functions 1	Short circuit for JP4 1-2:0- +10V。 Short circuit forJP4 2-3:0- +20mA。 P08.03 sets the setting for analog output. PO8.04-P08.07 sets the scope of output signal
	AO2	Simulated output signal with multiple functions 2	Short circuit for JP5 1-2:0- +10V。 Short circuit for JP5 2-3:0- +20mA。 P08.08 sets the setting for analog output. PO8.09-P08.12sets the scope of output signal

3-5-2. **Arrangement of control circuit terminal**

1. Control circuit terminal of 200LCB panel



2. Control circuit terminal of 200SCB panel



3-6 Wiring precautions

※ Don't install absorption apparatus of static capacitance or resistance capacitance at the U, V and W output terminal of the inverter. The input power supply of the AC frequency vector inverters must be off when the motor is changed.

※ Don't drop the metal chip or thread residue into the AC frequency vector inverters when the wiring is made, or the AC frequency vector inverters may have fault due to this.

※ The motor or power supply of power frequency can be changed only after the AC frequency vector inverters stops outputting.

※ It should consider installing absorption apparatus of surging when the electromagnetic contactor and relay is near to the AC frequency vector inverters in order to reduce the influence of the electromagnetic interference.

※ External control line of the AC frequency vector inverters must have isolating device or adopt shielded wire.

※ Cable for signal of input order should have independent routing beside shieldling; and it is better to be far away main circuit wiring.

※ The maximal distance between the AC frequency vector inverters and motor should be within 50m when the carrier frequency is smaller than3KHz; and such a distance should be shortened when the carrier frequency is bigger than 4KHz; and it is better for this wiring to be laid in metal pipe.

※ When peripheral equipment (filter, electric reactor)is installed on the inverter, it should firstly use 1000 V megameter to measure its insulation resistance to the ground and it should be guaranteed it is no less than megohm.

※ Please don't close the power supply under the condition of frequent start of the inverter; control terminal or keyboard or RS 485 must be used to operate the order to make start-stop operation so that it can't destroy the rectifier bridge.

※ Don't connect AC input power with output terminals of inverter: U, V and

W.

※ In order to avoid the accident, ground terminal (⏚) must be connected to the ground reliably (ground impedance should be less than Ω, or leakage will appear.

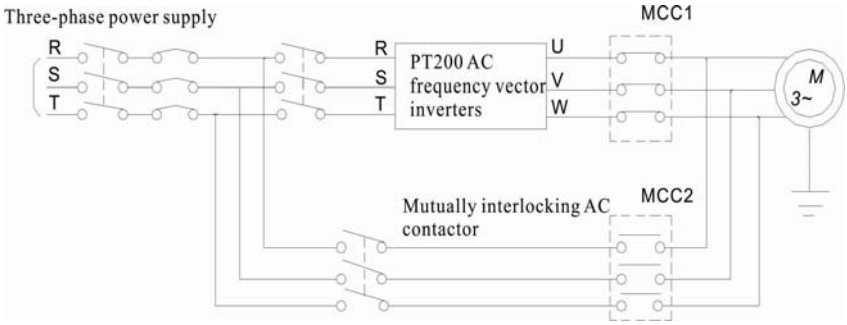
※ Choice for specification of wiring diameter should be according to related stipulation of National Electric Code when main circuit wiring is made.

※ Electric motor capacity should be equal to or less than the capacity of the inverter.

3-7 Redundant circuit

It will cause serious halt loss or other sudden failures due to the fault or tripping of the inverter. In order to avoid such a condition appears, please increase the following circuit backup for the sake of safety.

Notice: redundant circuit should be confirmed in advance and its operation feature should be tested in advance to guarantee the consistence between phase sequence of power frequency and variable frequency.



Chapter 4 Operation keyboard

4-1. Introduction of operation keyboard

JP6E200 Keyboard control panel JP6C200 Keyboard control panel

Chart 4-1 Display of operation panel

4-2.Introduction for indicator light of the keyboard

Sign of indicator light		Name	Unit display	Implication	color
Status light	RUN/TUNE	Running lights		bright: the AC frequency vector inverters is at a normal operation state Off :the AC frequency vector inverters stops operation flicker: AC frequency vector inverters is at self-learning state of parameter	Green
	FWD/REV	Forward running lights		Bright : reversal state Off :forward state of AC frequency vector inverters	Green

	MODE	Lights of communication control		Indicator light of keyboard, terminal operation and control of remote communication Bright: control state of remote operation Off : control state of keyboard operation Flicker: operation state of the terminal	Green
	ALARM	Alarm light		Bright: the AC frequency vector inverters has fault Off :the AC frequency vector inverters has no fault Flicker: previous fault of the AC frequency vector inverters hasn't been confirmed	Red
indictor light of unit combination	Hz	Frequency light	Hz	Bright: current display parameter is operation frequency Flicker: current display parameter is setting frequency	Green
	A	Current indicator light	A	Bright: current display parameter is current	Green
	V	Voltage indictor light	V	Bright current display parameter is voltage	Green
	Hz+A	Percentage indictor light	%	Bright :current display parameter is percentage	Green
	A+V	User-defined indictor light	s	Bright/flicker: current display parameter is user-defined parameter	Green
	Hz+V	Temperature indictor light	℃	Bright: current display parameter is temperature	Green
	Hz+A+V	Time indictor light	RPM	Bright :current display parameter is RPM	Green
		indictor light without unit		Off :current display parameter has no unit	Green

4-3. Key description of operation panel

Sign	Name	Function
	Parameter setting/Escape key	* Exit the data modification of function item * Return to state display menu via submenu or function menu
	Shift key	* Under third level menu, use  to move data edit bit of function code * Under stop / operation state, recurrently select display parameter to make state of stop run, display inquiry (see P07.05-P07.06 for refer meaning of display)
	Forward Operation Key / Reverse Operation Key	* Inch runs of inverter *Switch between forward and reverse rotation of inverter *Inverter eliminate setting of increasing+ of clockwise rotation / decreasing- of counter clockwise rotation
	Confirm Key of the data	* Enter menu screen each level and confirm setting of parameter
	Operation key	* Use for operation under the method of keyboard operation
	Stop / Reset Key	* Actuator stops operation * Abnormal reset * Fault confirmation
	Increasing of clockwise rotation +	* Under the first-level menu, increasing of function code P00-P15 * Under the second-level menu, increasing for labeling of function code * Under the third-level menu, increasing for data of function code * Under stopping/operating state, increasing for frequency presetting or presetting of closed loop
	Decreasing of counterclockwise rotation -	*Under the first-level menu, decreasing of function code P00-P15 - Under the second-level menu, increasing for labeling of function code * Under the third-level menu, decreasing for data of function code *Under stopping/operating state, decreasing for frequency presetting or presetting of closed loop
		*  Press Potentiometer Key, the function is the same with pressing 

4-4. Menu style

Menu display adopts three-level menu style and they are shown as following respectively:

1) Group number of function code(first-level menu) 2) Label of function code(secondary menu)3) Set value of function code (three-level menu)

4-4-1. First-level menu style

●Structure of first-level menu

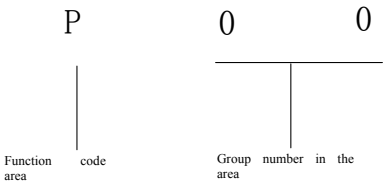


Chart4-2 Structure of first-level menu

●inverter for area of first-level menu

Active area of password	Area of function code	Group number in the area	Scope of function code
Protection area of user password P00-P14	User's operation area(P00-P14)	P00 group	P00.00~P00.18
		P01 group	P01.00~P01.16
		P02 group	P02.00~P02.12
		P03 group	P03.00~P03.11
		P04 group	P04.00~P04.07
		P05 group	P05.00~P05.15
		P06 group	P06.00~P06.18
		P07 group	P07.00~P07.14
		P08 group	P08.00~P08.12
		P09 group	P09.00~P09.21
		P10 group	P10.00~P10.10
		P11 group	P11.00~P11.50
		P12 group	P12.00~P12.06
		P13 group	P13.00~P13.10
		P14 group	P14.00~P14.08
Protection area of manufacturer's password	Obvious-hidden area of user defined function code (P15 area)	P15 group	P15.00

4-4-2.Form of secondary menu

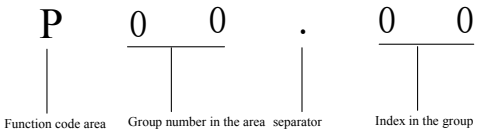


Chart4-3 Form of secondary menu

●Data display or setting form of secondary menu

Decimal display/setting:

Sign can be displayed or set by data bits 1~5 is 0-9.

4-4-3. Form of three-level menu

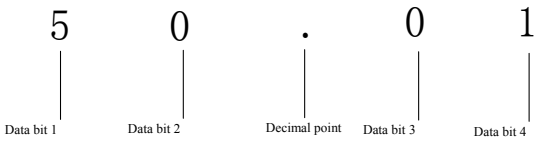


Chart4-4 Form of three-level menu

4-4-4. Common display symbol of LED

Besides function code, the first-level menu, secondary menu and three-level menu, the operation panel will show some prompting character; and see following table for detail:

Prompt	Implication	Prompt	Implication
PT200	The AC frequency vector inverters instantly show PT200 to represent PT200 product after electrifying	E.PHI	Default phase at the input side
E.oUP	U-phase protection of contravariant unit	E.PHo	Default phase at the output side
E.oUP	V-phase protection of contravariant unit	E.oH1	Overheating of rectifier module
E.oUP	W-phase protection of contravariant unit	E.oH2	Overheating of contravariant module
E.oC1	Overcurrent of acceleration	E.SET	External fault
E.oC2	Overcurrent of deceleration	E.CE	Communication fault
E.oC3	Overcurrent of constant speed	E.ItE	Fault of current detection
E.oU1	Overvoltage of acceleration	E.tE	Fault for self-study of motor
E.oU2	Overvoltage of deceleration	E.EEP	Operation fault of EEPROM
E.oU3	Overcurrent of constant speed	E.PId	Break-line fault for feedback of PID
E.LU	Undervoltage fault of generatrix	E.bCE	Brake unit fault

E.oL1	Motor overload	END	Retaining
E.oL2	AC frequency vector invertersoverload	0.0.0.0.0	Protection of user password

Notice: the menu specially shows the implication of 0.0.0.0.0

If the starting shows five points beside the data, it means it has password protection. The function code which can make password input is P15 which is retention parameter area of manufacturer and P07 is the setting area of user password.

Please contact with the local agency or the manufacturer when prompt which is not listed in the above table is met.

4-4-5.LED displays corresponding sign

Correspondence between the sign showed by LED and character or number is as following:

Letter displayed	Corresponding letter	Letter displayed	Corresponding letter	Letter displayed	Corresponding letter
0	0	1	1	2	2
3	3	4	4	5	5
6	6	7	7	8	8
9	9	A	A	b	B
C	C	d	d	E	E
F	F	H	H	I	I
L	L	n	N	n	N
o	o	P	P	r	R
S	S	t	t	U	U
v	v	r	T	-	-

4-5. Password operation and key

- Set password: enter into function code of password
- Verify password:

Enter into function code of password and the parameter in the password protection can be seen via inputting the password once; please refers to inverter of the password.

✶ Clear password:

After successively inputting verification password, directly enter into the menu or enter into the menu via ESC + SHIFT enter into the function code of password to set 00000; after successfully clearing the password, it is unnecessary to input password for verification when the password

protection area is entered.

✶ Effective method of password protection:

Two of the following methods can be chosen randomly:

1. Press ESC + PRG at the same time;
2. There is no key operation for successive five minutes;
3. Electrify again.

●Key lock and unlock

1. Key lock: it can be locked by pressing ESC + PRG at the same time.

2. Key unlock: it can be unlocked by pressing MF + SHIFT

At the same time

4-6. Display of operation panel and key operation

4-6-1. Classification of display state: display state of operation panel can be divided into 9 types:

No.	State name	Implication
1	Display state for the stop parameter	Display parameter can be changed via SHIFT and P07.06 can set display parameter
2	Display state for the operation parameter	Display parameter can be changed via SHIFT and P07.05 can set display parameter
3	Display state for the fault and alarm	Directly enter into this state when the fault occurs under other seven display states
4	Display state for the first-level menu	Press PRG or  to enter when the key is unlocked
5	Edit status of secondary menu	Press PRG or  to enter under the display state of the first-level menu
6	Edit status of three-level menu	Press PRG or  to enter under the display state of the secondary menu

7	State of password authentication	Press PRG or  to enter under the display state of the first-level menu when it has password protection
8	Modification state of direct parameter	Under display of the stop and parameter, press the shuttle key to enter via eft rotation and right rotation
9	State of information cue	Refer to 4-4-5 LED displays corresponding sign

4-6-2. Display status and SHIFT of operation process

Under the three-level menu and the state of password authentication, SHIFT is used for the bit choice of the data editing.

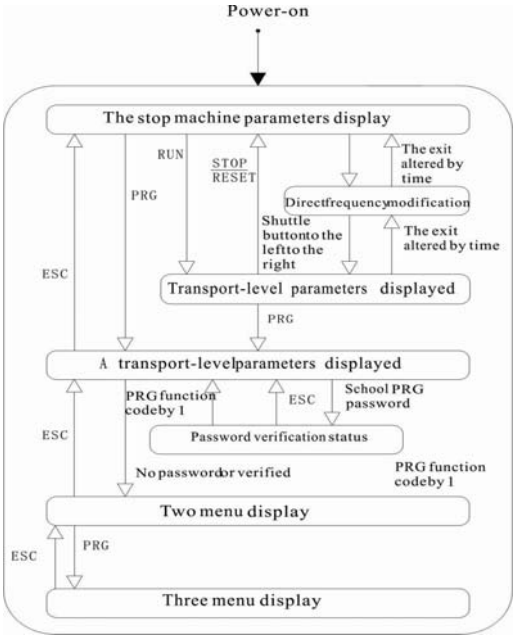
- Automatic switch of the state

It automatically returns to the display state of the stop parameter or operation parameter without key operation for one minute.

After removing the editing state of the menu, it returns to the display state of the stop parameter or operation parameter without key operation for one minute.

If it has the password setting or lock device of the key, it will automatically returns to the password protection and lock state of the operation panel without the key operation for 5 minutes.

- Display state and operation process



4-7.Operation examples

Display parameter for the stop in the following example is the set frequency and the factory setting is 50.00Hz. Anything with underline in the diagram represents current editing bit.

4-7-1. Recover factory parameter

For example, set P01.15=1:

Recover all parameters in P area beside parameter of generator system (P03group) to the factory setting

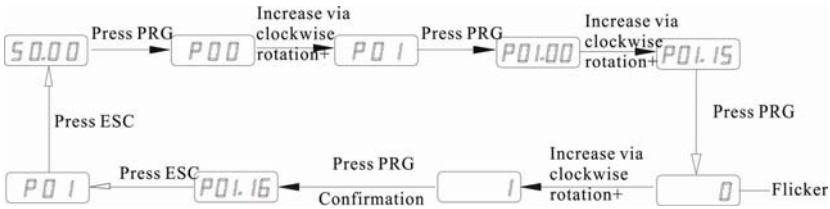


Chart 4-6 Recover factory parameter

4-7-2.Setup set frequency

For example, set P01.10=50Hz to 40Hz

The first step:P01.03→0(the default is 7 which shows the decoder is effective)
The second step: see the following chart

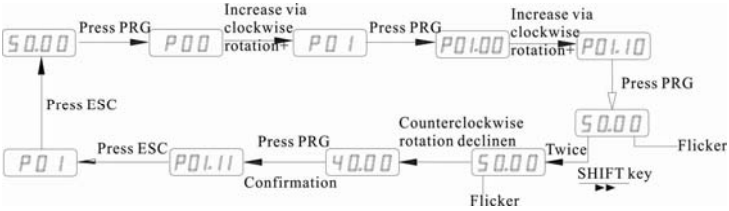


Chart4-7 Setup set frequency

4-7-3.Password setting

For example, set the user password from P07.00 to 0005.

Notice: it can be effective only after the second electrifying when thesetting is over.

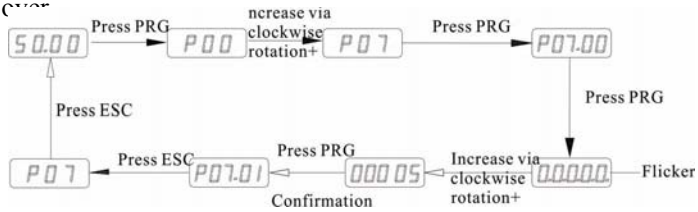


Chart4-8 Password setting

4-7-4.Password authentication

Suppose the function code after P00.00 had been protected by the password and the password was 5,

Make the password protection for P00.00 in the above example effective and then make the password authentication based on the following process.

Notice: please refer to II RS485 communication protocol when 485 communication method is used to make the check of password.

Chart 4-9 Password authentication

4-7-5. Password

For example, remove the user password P07.00.

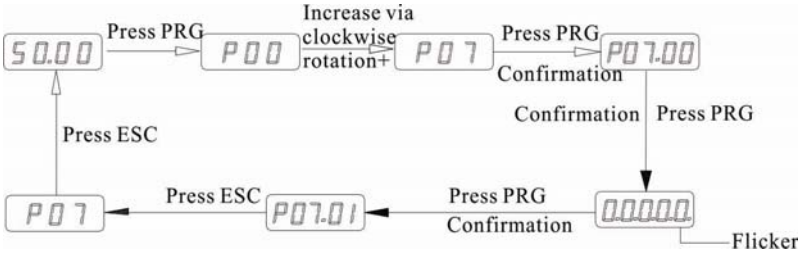


Chart 4-10 Password

4-8.Setting method of parameter

Example 1: let's take the acceleration of P09.00 from 5.0 to 25.0 as an example:

1. Under the state of P00, the encoder increases with clockwise rotation to function parameter P09.00, now the above LED shows 5.0.
2. Press SHIFT for three times, the flicker for decade of the above LED is 0.
3. Increase with clockwise rotation until the decade of LED shows 2.

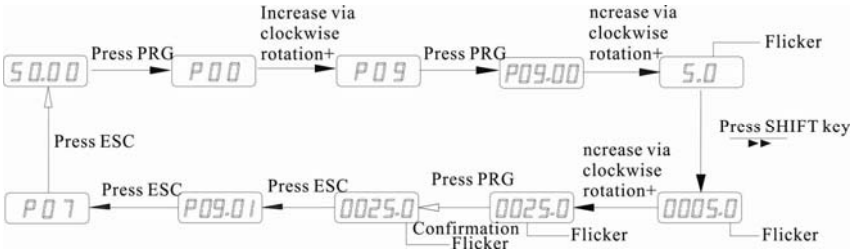


Chart4-11 Parameter setting

Chapter 5 Commissioning

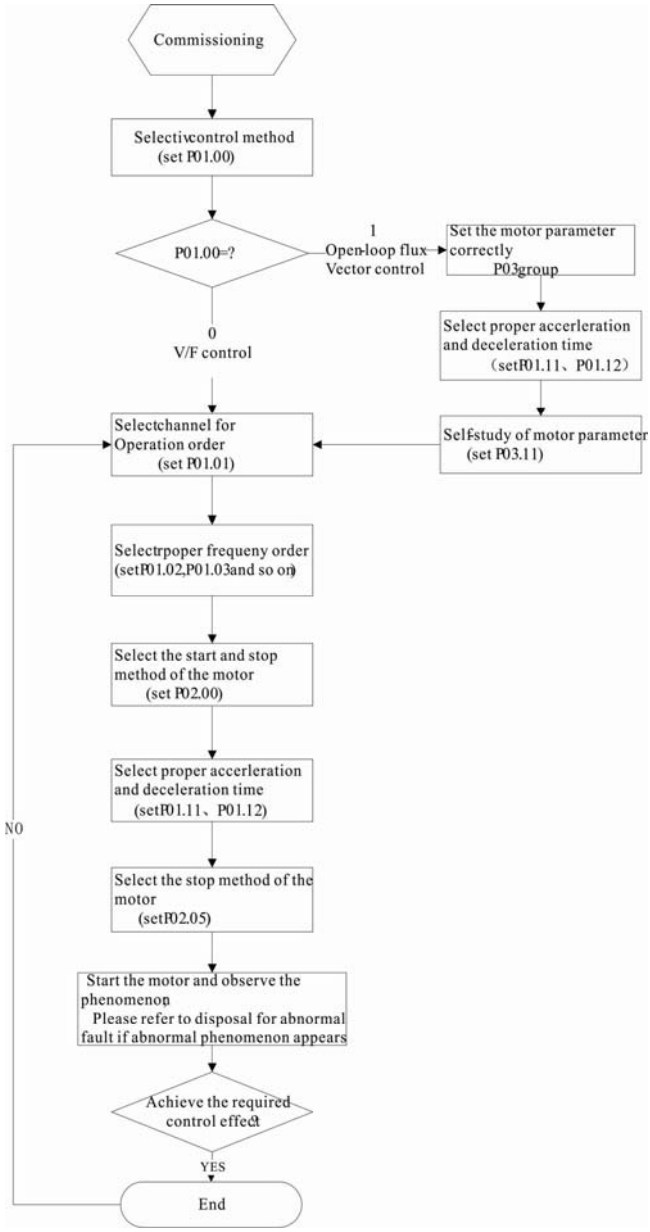


Chart 5-1 Commissioning

- Before Connect the power supply with the variable-frequency inverter, please firstly confirm the voltage of AC input power is within the scope of rated input voltage of variable-frequency inverter.
- Connect the power supply with the input terminal R, S and T of variable-frequency inverter.
- Select proper control method of rotation.

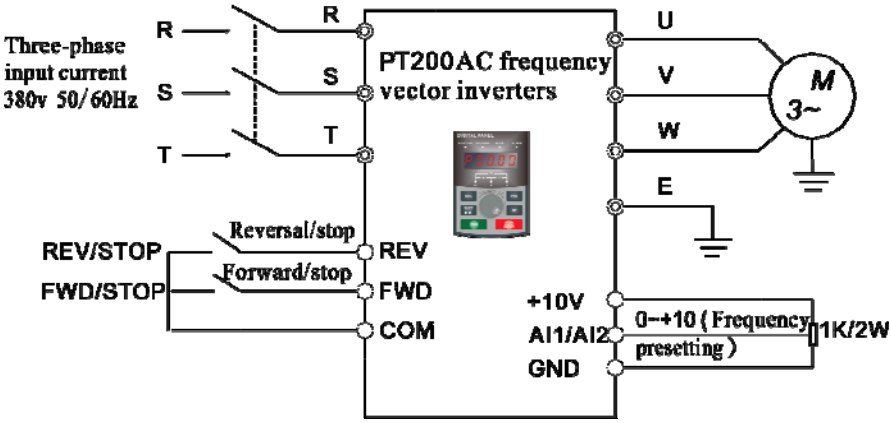


Chart 5-2 control method of rotation

Example: voltage input of analog (P01.00=1,P01.03=1 or 2)+ control operation of the terminal（P06.01=1、P06.02=2）;

Frequency order is given by terminal AI1/AI2 and terminal DI2 and DI3 control forward and reversal rotation.

Example: speed regulation of keyboard(P01.01=0, P01.03=7)+ reward and reversal switch operation of the keyboard（P07.03=1）

The frequency is preset by the increase of clockwise rotation and the decrease of counterclockwise rotation of the keyboard encoder; FWD/REV of operation keyboard change the forward and reversal rotation.

※ Empty running and check of speed regulation.
※ Confirm the set of the lowest and highest output frequency.
※ Inspection of inching control.
※ Affirm the acceleration and deceleration time.
※ Connect up the motor.
※ Operate with low speed and inspect the rotation direction of the motor.
※ Inspect whether the display and output during all operation processes is correct.

Chapter 6 inverter of function parameter

6-1. List of function parameter

Function of PT200 series AC frequency vector inverters can be divided into 15 groups, namely P01～P15 according to the function; and every function group includes several function codes. The function code adopts three-level menu; for example, P08.08 means the eighth function code in P08 function group ; and P15 is the manufacturer's function parameter and the user has no right to visit the parameter in this group.

In order to make convenience for the setting of function code, group number of the function, number of function code and parameter of function code respectively corresponds with the first-level menu, the secondary menu and three-level menu when the operation panel is used for operation.

1. inverter for the content in the line of menu is as following:

NUMBER in the first line: it is the serial number for this function code in the whole function code; meanwhile, it also shows the register address for the communication.

CODE in the second line: it is the serial number for the parameter group of the function and parameter.

DESCRIBING LED/OLED KEYBOARD DISPLAY in the third line: it is the detailed description of this function parameter.

SETTING RANGE in the fourth line: it is the effective setting range of the function parameter and it is shown on OLED liquid crystal screen of the operation panel.

FACTORY SETTING in the fifth line: it is the original set value for the function parameter when it leaves the factory;

ALTERATION in the sixth line: it is the alternative attributive of the function parameter (i.e. whether it allows alternation and alternating condition); and the inverter is as follow:

"◇" shows the set value of the parameter can be alternated whenever the AC frequency vector inverters is stopped or operated;

"□"shows the set value of the parameter can't be alternated when the AC frequency vector inverters operated;

"■" shows the value of the parameter is actual record value of the detection; and it can't be changed;

(the AC frequency vector inverters has made an automatic check and restriction on alternative attributive of every parameter and it can help the user to avoid wrong alternation.)

2. Parameter system is decimal system; if the parameter is shown via hexadecimal, every data is independent mutually when the parameter is edited; value range of partial bits can be hexadecimal (0～F).

3. Factory setting shows the value after the parameter of the function code is updated when the operation of recovering factory parameter; parameter or record value

of actual detection can't be updated.

4. In order to protect the parameter more effectively, the AC frequency vector inverters provides password protection for the function code. After the user password (namely, parameter for user password P07.00 is not 0) is set, the system will firstly enter into the state of user password authentication when the user press PRG to enter into the editing state of the function code; and then what is shown is 0.0.0.0.0.; the operator must input user password correctly, or the user can't enter. It is unnecessary to input manufacturer's password correctly for the parameter zone set the manufacturer. (warning: the user can't try to change the parameter set by the manufacturer; if the parameter is not set properly, it will easily cause the abnormal work or even destroy of the AC frequency vector inverters). The user password can be changed randomly under the condition that the password protection is unlocked; the user password is subject to the value input last. Setting P07.00 to 0 can cancel the user password; if P07.00 is not 0 when electrify, then it shows the parameter is protected by password.

5. Function of user password also follows the above principle when the serial communication is used to change the parameter of the function code.

6-1-1.Menu grouping

Code	Describing LED/OLED Keyboard display	Function description	Amount	Reference page
P00	Monitoring function group	Monitor frequency, current and so on; 18 monitoring objects	19	71
P01	Basic function group	Frequency set, control method, acceleration and deceleration time and so on	17	72
P02	Control group of start and stop	Parameter control of the start and stop	13	79
P03	parameter group of electrical machine	Set of electrical machine parameter	12	81
P04	Parameter of vector control	Parameter of vector control	8	83
P05	V/F controls parameter	User defined	16	85
P06	Input terminal group	Analog and digital input function	22	87
P07	Human-computer interface group	Parameter set of user menu	15	93

Code	Describing LED/OLED Keyboard display	Function description	Amount	Reference page
P08	Output terminal group	Analog and digital input function	16	97
P09	Enhancement group	Acceleration and deceleration and jog of pendulous frequency	23	100
P10	PID control group	Set of built-in PID parameter	11	104
P11	Control group of multiple speed	Set of multiple speed and PLC operation	39	108
P12	Communication interface group	Set for communication function of MODBUS	7	114
P13	Protection parameter group	Set of protection parameter	11	116
P14	Function group of water supply	Set for the parameter of constant pressure water supply	9	119
P15	Manufacturer's function group	Set of manufacturer's parameter	1	120

6-1-2. P00 group Monitoring function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
1	P00.00	Operation frequency	Currently actual output frequency of the AC frequency vector inverters	HZ	■	71
2	P00.01	Set the frequency	Currently actual constant frequency of the inverter	HZ	■	71
3	P00.02	DC bus voltage	Estimated value of DC bus voltage	V	■	71
4	P00.03	Output voltage of AC frequency vector inverters	Actual output voltage of inverter	V	■	71
5	P00.04	Output current of inverter	Actual output current of inverter	A	■	71
6	P00.05	Actual rotate speed of the motor	Actual running speed of the motor	RPM	■	71

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
7	P00.06	Output power of the AC frequency vector inverters	Percentage for actual output power of the AC frequency vector inverters	%	■	71
8	P00.07	Output torque of the inverter	Actual output torque of the inverter	N*m	■	71
9	P00.08	Given value of PID	Percentage for the given value of PID adjusts the operation	%	■	71
10	P00.09	Feedback value of PID	Percentage for the feedback value of PID adjusts the operation	%	■	71
11	P00.10	State of input terminal	State of input terminal	-	■	71
12	P00.11	State of output terminal	State of output terminal	-	■	71
13	P00.12	Value of analog AI1	Value of analog AI1	V	■	71
14	P00.13	Value of analog AI2	Value of analog AI2	V	■	71
15	P00.14	Current section of multiple speed	Current section of multiple speed	-	■	72
16	P00.15	Temperature of rectifier module	0～100.0℃	℃	■	72
17	P00.16	Temperature of contravariant module	0～100.0℃	℃	■	72
18	P00.17	Software version		-	■	72
19	P00.18	Total operation time of this machine	0～65535h	0	■	72
Notice: only IGBT module in the seventh unit in P00.16 group is effective						

6-1-3. P01 group Basic group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
20	P01.00	Control mode	0:V/F control 1: vector control for open-loop flux 1 2: vector control for open-loop flux 2 3: closed-loop vector control for feedback of sensor	0	□	72
21	P01.01	Operation inverter channel	0: inverter channel of keyboard （LED goes out） 1: inverter channel of terminal （LED flicks） 2: inverter channel of communication（LED lightens）	0	□	73

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
22	P01.02	Increasing+ or decreasing of decoder and terminal-set	0: valid; moreover, the AC frequency vector inverters saves without power supply 1: valid; moreover, the AC frequency vector inverters doesn't save without power supply 2: increasing+/decreasing- invalid setting 3: Setting is valid for the operation; reset when the machine stops	0	◇	73
23	P01.03	Selection of frequency inverter	0: Keyboard setting 1: Setting of analog AI1 2: Setting of analog AI2 3:K1*AI1+K2*AI2 4:Simple PLC run set 5: Setting for operation of multiple speed 6: Setting of PID control 7: Setting of remote communication 8: Presetting for keyboard potentiometer 9: Analog AI1 and Ascending(UP)/Descending(Down) 10 : Analog AI2 and Ascending(UP)/Descending(Down) 11: K1*AI1+K2*AI2+ and Ascending(UP)/Descending(Down)	7	◇	74
24	P01.04	Selection for the setting of torque	0: Keyboard sets torque (corresponding with P01.05) 1: analog AI1 sets torque (totally corresponds with two times as the rated current of the inverter） 2: analog AI2 sets torque (be the same as 1） 3 analog AI1+AI2 sets torque (be the same as 1） 4: setting of multi torques (be the same as 1） 5 Remote communication sets torque (be the same as 1）	0	◇	75
25	P01.05	Keyboard sets the torque	-200.0%～200.0%(rated current of the inverter）	50.0%	◇	76
26	P01.06	Choice for the setting source of upper limiting frequency	0: Keyboard sets upper limiting frequency (P01.07) 1: Analog AI1 sets upper limiting frequency (totally corresponds with maximum frequency） 2: Analog AI2 sets upper limiting frequency (be the same as 1) 3: Multi sections set upper limiting frequency (be the same as 1) 4: Remote communication sets upper limiting frequency (be the same as 1)	0	◇	76

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
27	P01.07	Maximum output frequency	10.00～400.00Hz	50.00Hz	□	76
28	P01.08	Upper- frequency limit	P01.09～P01.07（maximum frequency）	50.00Hz	◇	76
29	P01.09	Lower- frequency limit	0.00Hz～P01.08(Upper- frequency limit)	0.00Hz	◇	77
30	P01.10	Keyboard sets the frequency	0.00 Hz～P01.07(maximum frequency）	50.00Hz	◇	77
31	P01.11	Acceleration time1	0.1～3600.0s	Type setting	◇	77
32	P01.12	Deceleration time1	0.1～3600.0s	Type setting	◇	77
33	P01.13	Choice of operation direction	0: Operate towards defaulted direction 1: Operate towards opposite direction 2: Prohibit reversal operation	0	□	77
34	P01.14	Setting of carrier frequency	0.5～15.0kHz	Type setting	◇	78
35	P01.15	Recovery of function parameter	0: No operation 1: Recover default value beside the group of electric machine parameter 2: Recover default value including the group of electric machine parameter 3: Eliminate fault files	0	□	79
36	P01.16	Choice of AVR function	0: Invalid 1: The whole process is effective 2: It is invalid only for deceleration	2	◇	79

6-1-4. P02 group Control group for the stop and start

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
37	P02.00	Start operation mode	0: direct start 1: firstly DC brake and then start 2: firstly tracking of rotate speed and the start	0	□	79
38	P02.01	Launch the start frequency	0.00～10.00Hz	0.50Hz	◇	79
39	P02.02	Start the holding time of frequency	0.0～50.0s	0.0s	◇	79
40	P02.03	Start the front brake current	0.0～150.0%	0.0%	◇	80

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
41	P02.04	Start the front brake time	0.0～50.0s	0.0s	◇	80
42	P02.05	Selection of halt mode	0: slow down and stop 1: Random parking	0	◇	80
43	P02.06	Start frequency for the halt brake	0.00～P01.07（maximal requency）	0.00Hz	◇	80
44	P02.07	Waiting time of halt brake	0.0～50.0s	0.0s	◇	80
45	P02.08	DC brake current of halt	0.0～150.0%	0.0%	◇	80
46	P02.09	DC brake time of halt	0.0～50.0s	0.0s	◇	80
47	P02.10	Forward and reversal dead time	0.0～3600.0s	0.0s	◇	80
48	P02.11	Selection for the protection of terminal with electricity	0: Run command of the terminal is invalid when it is electrified 1: Run command of the terminal is valid when it is electrified	0	◇	81
49	P02.12	Reservation			◇	81

6-1-5. P03 group: Group of electric machine parameter

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
50	P03.00	AC frequency vector inverters type	0:G type（load type of constant torque） 1:P type (load type of fan and pump)	Type setting	□	81
51	P03.01	Rated power of motor	0.4～900.0KW	Type setting	□	82
52	P03.02	Rated frequency of motor	0.01Hz～P01.07（maximum frequency）	50.00Hz	□	82
53	P03.03	Rated rotate torque of motor	0～36000rPm	Type setting	□	82
54	P03.04	Rated voltage of motor	0～460V	Type setting	□	82

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
55	P03.05	Rated current of motor	0.1～2000.0A	Type setting	□	82
56	P03.06	Stator resistor of motor	0.001～65.535Ω	Type setting	◇	82
57	P03.07	Rotor resistance of motor	0.001～65.535Ω	Type setting	◇	82
58	P03.08	Stator and rotor inductance of motor	0.1～6553.5mH	Type setting	◇	82
59	P03.09	Mutual inductance for stator and rotor of motor	0.1～6553.5mH	Type setting	◇	82
60	P03.10	No-load current of the motor	0.01～655.35A	Type setting	◇	82
61	P03.11	Self-study of motor parameter	0: No operation 1: Comprehensive self-study of parameter 2: Static self-study of parameter	0	□	82

6-1-6. P04 group Vector control parameter

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
62	P04.00	Proportional gain of speed ring 1	0～100	20	◇	83
63	P04.01	Integral time of speed ring 1	0.01～10.00s	0.50s	◇	83
64	P04.02	Low frequency of low switch	0.00Hz～P04.05	5.00Hz	◇	83
65	P04.03	Proportional gain of speed ring 2	0～100	25	◇	83
66	P04.04	Integral time of speed ring 2	0.01～10.00s	1.00	◇	83
67	P04.05	High frequency of low switch	P04.02～P01.07（maximum frequency）	10.00Hz	◇	84
68	P04.06	Compensation factor of VC slippage	50%～200%	100%	◇	84
69	P04.07	Setting for upper limit of torque	0.0～200.0%(rated current of inverter)	150.0%	◇	84

6-1-7. P05 group V/F control parameter

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
70	P05.00	Setting of V/F curve	00: V/F curve of line 1:V/F curve of multipoints 2:1. V/F curve for dropping torque of 2 power 3:1. V/F curve for dropping torque of 4 power 4:1. V/F curve for dropping torque of 6 power 5:1. V/F curve for dropping torque of 8 power 6:2 V/F curve for dropping torque of 0 power	0	□	85
71	P05.01	Torque boost	0.0%:(automatic)0.1％～30.0％	0.0%	◇	86
72	P05.02	Deadline of torque boost	0.0%～50.0%(rated frequency of relative motor)	20.0%	□	86
73	P05.03	Limit for compensation of V/F slippage	0.0～200.0%	0.0%	◇	86
74	P05.04	Threshold value for low frequency of restricting vibration	0～500	5	◇	86
75	P05.05	Threshold value for high frequency of restricting vibration	0～500	100	◇	86
76	P05.06	Clipping value of restricting vibration	0～10000	5000	◇	87
77	P05.07	Demarcation frequency for low and high frequency of restricting vibration	0.00Hz～P01.07(maximum frequency)	12.50Hz	◇	87
78	P05.08	Restrict vibration	0: restricting vibration is valid 1: restricting vibration is invalid	1	◇	87
79	P05.09	V/F frequency point 1	0.00HZ～P05.11	0.00HZ	□	87

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
80	P05.10	V/F voltage point 1	0.0～100.0%	0.0%	□	87
81	P05.11	V/F frequency point 2	P5.09～P05.13	0.00HZ	□	87
82	P05.12	V/F voltage point 2	0.0～100.0%	0.0%	□	87
83	P05.13	V/F frequency point 3	P05.11～P03.02	0.00HZ	□	87
84	P05.14	V/F voltage point 3	0.0～100.0%	0.0%	□	87
85	P05.15	Selection for energy-saving operation	0: Failure to actuate 1:Automatic energy-saving operation	0	□	87

6-1-8. P06 group Input terminal group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
86	P06.00	Function selection of DI1 terminal	0: No function 1: Forward running 2: Reverse run 3: Trilinear operation control 4: Forward JOG 5: Reverse JOG 6: Random parking 7:Fault resetting 8: Input of external fault 9: UP for frequency setting 10: DOWN for frequency setting 11: Removal for UP and DOWN of frequency setting 12: Terminal of multiple speed 1 13: Terminal of multiple speed 2 14: Terminal of multiple speed 3 15: Terminal of multiple speed 4	1	□	87
87	P06.01	Function selection of DI2 terminal		2	□	87
88	P06.02	Function selection of DI3 terminal		4	□	88
89	P06.03	Function selection of DI4 terminal		0	□	88
90	P06.04	Function selection of DI5 terminal		0	□	88

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
91	P06.05	Function selection of DI6 terminal	16: Temporary stop of PID control 17: Temporary stop of pendulous frequency (stop at current frequency) 18: Resetting of pendulous frequency (return to central frequency) 19: Prohibition of acceleration and deceleration 20: Prohibition of torque control 21: Temporary removal for UP and DOWN setting of frequency 22: DC brake of halt 23: Choice for terminal of acceleration and deceleration time 189 24: Choice for terminal of acceleration and deceleration time 2 25: Slow down and stop	0	□	88
92	P06.06	Filtering times of switching value	1～10	5	◇	90
93	P06.07	Operation mode of terminal control	0: Control like two lines 1 1: Control like two lines 2 2: Trilinear control 1 3: Trilinear control 2	0	□	90
94	P06.08	Increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal	0.01～50.00Hz/s	0.50Hz/s	◇	91
95	P06.09	Low limiting value of AI1	0.00V～10.00V	0.00V	◇	92
96	P06.10	Low limits of AI1 corresponds with the setting	-100.0%～100.0%	0.0%	◇	92
97	P06.11	Upper limiting value of AI1	0.00V～10.00V	10.00V	◇	92
98	P06.12	Upper limits of AI1 corresponds with the setting	-100.0%～100.0%	100.0%	◇	92

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
99	P06.13	Filtering time of AI1 input	0.00s～10.00s	0.10s	◇	92
100	P06.14	Low limiting value of AI2	0.00V～10.00V	0.00V	◇	92
101	P06.15	Low limits of AI2 corresponds with the setting	-100.0%～100.0%	0.0%	◇	92
102	P06.16	Upper limiting value of	0.00V～10.00V	10.00V	◇	92
103	P06.17	Upper limits of AI2 corresponds with the setting	-100.0%～100.0%	100.0%	◇	92
104	P06.18	Filtering time of AI2 input	0.00s～10.00s	0.10s	◇	93
105	P06.19	Gain for simulated input 1 K1	0.00～300.00	100.00	◇	93
106	P06.20	Gain for simulated input 2 K2	0.00～300.00	100.00	◇	93
107	P06.21	Main and auxiliary control function	0～1	0	◇	93

6-1-9. P07 group Human-computer interface group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
108	P07.00	User password	0～65535	0	◇	93
109	P07.01	OLED shows language choice	0:Chinese 1:English	0	◇	93
110	P07.02	Copy of function parameter	0: No operation 1: Function parameter of this machine is delivered to OLED keyboard 2: Download function parameter of OLED keyboard onto this machine Notice: the parameter automatically returns to 0 after 1-2 operations have been finished.	0	□	94

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
111	P07.03	Function choice of 	0:JOG operation 1: Switch of forward and reverse rotation 2: Remove increasing+ via clockwise rotation or decreasing- via counterclockwise rotation-setting	0	□	94
112	P07.04	Function choice for halt of 	0: it is only effective for panel control 1: it is effective for panel control and terminal control 2: it is effective for panel control and communication control 3: it is effective for all control modes	0	◇	94
113	P07.05	Choice for parameter showed by operation state	0～0x7FFF BIT0: operation frequency BIT1: setting frequency BIT2: busbar voltage BIT3: output voltage BIT4:output current BIT5:rotate speed of operation BIT6: output power BIT7: output torque BIT8:given value of PID BIT9:feedback value of PID BIT10: state of input terminal BIT11: state of output terminal BIT12: value of analog AI1 BIT13: value of analog AI2 BIT14: Current section of multiple speed BIT15: Setting value of torque	0x3FF	◇	95

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
114	P07.06	Choice for parameter showed by halt state	1～0x1FF BIT0: setting frequency BIT1:busbar voltage BIT2: state of input terminal BIT3: state of output terminal BIT4: given value of PID BIT5: feedback value of PID BIT6: value of analog AI1 BIT7: value of analog AI2 BIT8: Current section of multiple speed BIT9: Setting value of torque BIT10～ BIT15: Reservation	0xFF	◇	95
115	P07.07	First two fault types	0～24 0: Fault free 1: Protection for U phase		■	95
116	P07.08	The first two fault type			■	95

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
117	P07.09	Current fault type	of contravariant unit (E.oUP) 2: Protection for V phase of contravariant unit (E.oUP) 3:Protection for W phase of contravariant unit (E.oUP) 4: Overcurrent of acceleration （E.oC1) 5: Overcurrent of deceleration（E.oC2） 6: Overcurrent of constant speed（E.oC3） 7: Overvoltage of acceleration（E.oU1） 8: Overvoltage of deceleration（E.oU2） 9:Overvoltage of constant speed（E.oU3） 10:undervoltage fault of generatrix（E.LU） 11:Motor overload （E.oL1） 12: Overload of inverter （E.oL2） 13: Default phase at output side（E.PHI） 14: Default phase at input side（E.PHo） 15:Overheating of rectification module （E.oH1） 16: Fault for overheating of contravariant module (E.oH2) 17: External fault （E.SET） 18:Communication fault （E.CE） 19:Detection fault of current（E.ItE） 20:fault for self-study of motor（E.tE） 21: operation fault of EEPROM (E.EEP） 22: Fault for break line of PID feedback （E.PId) 23:Brake unit fault (E.bCE) 24:Reservation (END)		■	95

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
118	P07.10	Operation frequency of current fault		0.00Hz	■	96
119	P07.11	Output current of current fault		0.0A	■	96
120	P07.12	Busbar voltage of current fault		0.0V	■	96
121	P07.13	State for input terminal of current fault		0	■	97
122	P07.14	State for output terminal of current fault		0	■	97

6-1-10. P08 group output terminal group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
123	P08.00	Output choice for numerical magnitude of SPA	0: No output 1: Motor is at the state of forward rotation 2: Motor is at the state of reverse rotation 3: Fault output 4: Level detection of frequency and PDT output 5: Reach Frequency 6: Zero-speed operation 7: Reach frequency of upper limit 8: Reach frequency of lower limit 9:frequency of lower limit setting reached 10:FDT Reached 11:Inverter ready signal 12:Motor Forward /Reverse running 13:auxiliary motor1 start 14:auxiliary motor2 start	1	◇	97
124	P08.01	Output choice for numerical magnitude of SPB		1	◇	97
125	P08.02	Output choice of relay		3	◇	97
126	P08.03	SPA output terminal signal delay	0～3600.0s	0.0s	◇	98
127	P08.04	SPB output terminal signal delay	0～3600.0s	0.0s	◇	98
128	P08.05	Relay output terminal signal delay	0～3600.0s	0.0s	◇	98

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
129	P08.06	Output choice of AO1	0: operation frequency 1: setting frequency 2 :rotate speed of operation 3: output current 4: output voltage 5: output power 6 :output torque 7: Input value of analog AI1 8: Input value of analog AI2 9～10: Reservation	0	◇	98
130	P08.07	Lower limit for output of AO1	0.0%～100.0%	0.0%	◇	98
131	P08.08	Lower limit corresponds with output of AO1	0.00V ～10.00V	0.00V	◇	98
132	P08.09	Upper limit for output of AO1	0.0%～100.0%	100.0%	◇	98
133	P08.10	Upper limit corresponds with output of AO1	0.00V ～10.00V	10.00V	◇	99
134	P08.11	Output choice of AO2	0: operation frequency 1: setting frequency 2: rotate speed of operation 3: output current 4: output voltage 5 :output power 6: output torque 7: Input value of analog AI1 8: Input value of analog AI2 9～10: Reservation	0	◇	99
135	P08.12	Lower limit for output of AO2	0.0%～100.0%	0.0%	◇	99
136	P08.13	Lower limit corresponds with output of AO2	0.00V ～10.00V	0.00V	◇	99
137	P08.14	Upper limit for output of AO2	0.0%～100.0%	100.0%	◇	99
138	P08.15	Upper limit corresponds with output of AO2	0.00V ～10.00V	10.00V	◇	99

6-1-11. P09 group Enhancement group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
139	P09.00	Acceleration time 2	0.1～3600.0s	Type setting	◇	100
140	P09.01	Deceleration time 2	0.1～3600.0s	Type setting	◇	100
141	P09.02	Acceleration time 3	0.1～3600.0s	Type setting	◇	100
142	P09.03	Deceleration time 3	0.1～3600.0s	Type setting	◇	100
143	P09.04	Acceleration time 4	0.1～3600.0s	Type setting	◇	100
144	P09.05	Deceleration time 4	0.1～3600.0s	Type setting	◇	100
145	P09.06	Operation frequency of JOG	0.00～P01.07（maximum frequency）	5.00Hz	◇	100
146	P09.07	Acceleration time of JOG operation	0.1～3600.0s	Type setting	◇	100
147	P09.08	Deceleration time of JOG operation	0.1～3600.0s	Type setting	◇	100
148	P09.09	Hopping frequency	0.00～P01.07（maximum frequency）	0.00Hz	◇	100
149	P09.10	Range of hopping frequency	0.00～P01.07（maximum frequency）	0.00Hz	◇	100
150	P09.11	Range of pendulous frequency	0.0～100.0%(relative setting frequency）	0.0%	◇	100
151	P09.12	Range of jumping frequency	0.0～50.0%（relative range of pendulous frequency）	0.0%	◇	100
152	P09.13	Rise time pendulous frequency	0.1～3600.0s	5.0s	◇	100
153	P09.14	Fall time pendulous frequency	0.1～3600.0s	5.0s	◇	100
154	P09.15	Times for automatic reset of the fault	0～3	0	◇	101
155	P09.16	Setting for interval of automatic reset of the fault	0.1～100.0s	1.0s	◇	101
156	P09.17	Detection value for level of FDT	0.00～ P01.07 (maximum frequency)	50.00Hz	◇	102
157	P09.18	Detection value for hysteresis of FDT	0.0～100.0%（FDT level）	5.0%	◇	102

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
158	P09.19	Frequency reaches detection degree	0.0～100.0%（maximum frequency）	0.0%	◇	102
159	P09.20	Voltage of brake valve	115.0～140.0%（voltage of standard generatrix）(380V series）	130.0%	◇	103
			115.0～140.0%（voltage of standard generatrix）(220V series）	120.0%	◇	103
160	P09.21	Display coefficient of rotate speed	0.1～999.9% machinery rotate speed =120*operation frequency*P09.21/pole number	100.0%	◇	104
161	P09.22	Decrease loading frequency at low speed	0～1	1	◇	104

6-1-12. P10 group control group of PID

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
162	P10.00	Selection for given power supply of PID	0:keyboard presetting （P10.01） 1: Presetting for simulated channel AI1 2: Presetting for simulated channel AI2 3: Presetting of remote communication 4: Presetting of multistep speed	0	◇	104
163	P10.01	Keyboard presets the PID presetting	0.0%～100.0%	0.0%	◇	104
164	P10.02	Selection for feedback source of PID	0: Feedback for simulated channel AI1 1: Feedback for simulated channel AI2 2: Feedback of AI1+AI2 3: Feedback of remote communication	0	◇	105
165	P10.03	Selection for output characteristics of PID	0:PID output is positive 1:PID output is negative	0	◇	105
166	P10.04	Proportional gain （Kp）	0.00～100.00	1.00	◇	105
167	P10.05	Integral time（Ti）	0.01～10.00s	0.10s	◇	105

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
168	P10.06	Derivative time（Td）	0.00～10.00s	0.00s	◇	105
169	P10.07	Sampling period（T）	0.01～100.00s	0.10s	◇	106
170	P10.08	Deviation limit of PID control	0.0～100.0%	0.0%	◇	106
171	P10.09	Detection value for break line of feedback	0.0～100.0%	0.0%	◇	107
172	P10.10	Detection time for break line of feedback	0.0～3600.0s	1.0s	◇	107

6-1-13. P11 multistage speed control and simple PLC control

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
173	P11.00	Simple PLC running method	0～2	0	◇	108
174	P11.01	Simple PLC memory selection	0～1	0	◇	108
175	P11.02	Multi-speed 0	-100.0～100.0%	0.0%	◇	108
176	P11.03	The 0 stage running time	0.0～6553.5s	0.0s	◇	108
177	P11.04	Multistage speed 1	-100.0～100.0%	0.0%	◇	108
178	P11.05	The 1 stage running time	0.0～6553.5s	0.0s	◇	108
179	P11.06	Multistage speed 2	-100.0～100.0%	0.0%	◇	108
180	P11.07	The 2 stage running time	0.0～6553.5s	0.0s	◇	109
181	P11.08	Multistage speed 3	-100.0～100.0%	0.0%	◇	109
182	P11.09	The 3 stage running time	0.0～6553.5s	0.0s	◇	109
183	P11.10	Multistage speed 4	-100.0～100.0%	0.0%	◇	109
184	P11.11	The 4 stage running time	0.0～6553.5s	0.0s	◇	109
185	P11.12	Multistage speed 5	-100.0～100.0%	0.0%	◇	109
186	P11.13	The 5 stage running time	0.0～6553.5s	0.0s	◇	109
187	P11.14	Multistage speed 6	-100.0～100.0%	0.0%	◇	109

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
188	P11.15	The 6 stage running time	0.0～6553.5s	0.0s	◇	109
189	P11.16	Multistage speed 7	-100.0～100.0%	0.0%	◇	109
190	P11.17	The 7 stage running time	0.0～6553.5s	0.0s	◇	109
191	P11.18	Multistage speed 8	-100.0～100.0%	0.0%	◇	109
192	P11.19	The 8 stage running time	0.0～6553.5s	0.0s	◇	109
193	P11.20	Multistage speed 9	-100.0～100.0%	0.0%	◇	109
194	P11.21	The 9 stage running time	0.0～6553.5s	0.0s	◇	109
195	P11.22	Multistage speed 10	-100.0～100.0%	0.0%	◇	109
196	P11.23	The 10 stage running time	0.0～6553.5s	0.0s	◇	109
197	P11.24	Multistage speed 11	-100.0～100.0%	0.0%	◇	109
198	P11.25	The 11 stage running time	0.0～6553.5s	0.0s	◇	109
199	P11.26	Multistage speed 12	-100.0～100.0%	0.0%	◇	109
200	P11.27	The 12 stage running time	0.0～6553.5s	0.0s	◇	109
201	P11.28	Multistage speed 13	-100.0～100.0%	0.0%	◇	109
202	P11.29	The 13 stage running time	0.0～6553.5s	0.0s	◇	109
203	P11.30	Multistage speed 14	-100.0～100.0%	0.0%	◇	109
204	P11.31	The 14 stage running time	0.0～6553.5s	0.0s	◇	109
205	P11.32	Multistage speed 15	-100.0～100.0%	0.0%	◇	110
206	P11.33	The 15 stage running time	0.0～6553.5s	0.0s	◇	110
207	P11.34	Simple PLC the 0～7 stage Acceleration and deceleration time	0～0xFFFF	0	◇	112
208	P11.35	Simple PLC the 8～15 stage Acceleration and deceleration time selection	0～0xFFFF	0	◇	112

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
209	P11.36	PLC reboot selection	0～2	0	◇	113
210	P11.37	Multistage time selection	0～1	0	◇	113
211	P11.38	Multistage time selection	0～6	0	◇	114

6-1-14. P12group communication parameter group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
212	P12.00	Setting for Baud rate of communication	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps	4	◇	114

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
213	P12.01	Setting for bit check of data	0: Without verification （N，8，1）for RTU 1:Even parity check（E，8，1）for RTU 2:Odd parity check（O，8，1）for RTU 3: Without verification （N，8，2）for RTU 4: Even parity check（E，8，2）for RTU 5: Odd parity check（O，8，2）for RTU 6: Without verification (N，7，1)for ASCII 7: Even parity check (E，7，1)for ASCII 8: Odd parity check (O，7，1)for ASCII 9: Without verification (N，7，2)for ASCII 10: Even parity check (E,7,2)for ASCII 11: Odd parity check (O,7,2)for ASCII 12: Without verification (N,8,1)for ASCII 13: Even parity check (E,8,1)for ASCII 14: Odd parity check (O,8,1)for ASCII 15: Without verification (N,8,2)for ASCII 16: Even parity check (E,8,2)for ASCII 17: Odd parity check (O,8,2)for ASCII	1	◇	115
214	P12.02	Communication address of this method	1～247，0 is broadcast address	1	◇	115
215	P12.03	Delay for communication response	0～200ms	5ms	◇	115
216	P12.04	Delayed fault time of communication	0.0（invalid），0.1～100.0s	0.0s	◇	116

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
217	P12.05	Disposal for transmission error	0: alarm and random parking 1: No alarm and continuous operation 2: Halt according the halt method without alarm(only for communication method) 3: Halt according the halt method without alarm(for all control methods)	1	◇	116
218	P12.06	Disposal for transmission response	0: writing operation with response 1: writing operation without response	0	◇	116

6-1-15. P13 group Protection function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
219	P13.00	Input the protection selection of default phase	0: Prohibit 1: Permit	1	□	116
220	P13.01	Output the protection selection of default phase	0: Prohibit 1: Permit	1	□	117
221	P13.02	protection selection of motor overload	0: No protection 1: Ordinary motor (having compensation with low speed) 2: variable frequency motor (without compensation with low speed ）	2	□	117
222	P13.03	Protective current of motor overload	20.0%～120.0%(rated current of motor)	100.0%	◇	117
223	P13.04	Under-clocking point for instant power failure	70.0～110.0%(voltage of standard generamatrix)	80.0%	◇	117
224	P13.05	Descent rate for frequency of instant power failure	0.00Hz～ P01.07(Maximum frequency）	0.00Hz	◇	117
225	P13.06	Protection for overvoltage and speed reduction	0: Prohibit 1: Permit	0	◇	117
226	P13.07	Protective for voltage of	110～150%（380V series）	130%	◇	117

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
		overvoltage and speed reduction	110～150%（220V series）	120%	◇	117
227	P13.08	Level of automatic current limiting	100～200%	G type:160% P type :120%	◇	117
228	P13.09	Descent rate for frequency of current limiting	0.00～100.00Hz/s	10.00Hz/s	◇	118
229	P13.10	Choice for the selection of current limiting activity	0: current limiting is always effective 1: current limiting is ineffective for constant speed	0	◇	118

6-1-16. P14 group function group of water supply

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
230	P14.00	Operation function of PID	0: halt without operation 1: halt with operation	0	◇	119
231	P14.01	Awakening frequency	dormancy frequency（P14.03）～maximum frequency（P01.07）	10.00Hz	◇	119
232	P14.02	Delay time of awakening	0.0s～3600.0s	1000.0s	◇	119
233	P14.03	Dormancy frequency	0.00Hz～awakening frequency（P14.01）	5.00Hz	◇	119
234	P14.04	Delay time of dormancy	0.0s～3600.0s	50 0.0s	◇	119
235	P14.05	Droop control	0.00～10.00Hz	0.00Hz	◇	119
236	P14.06	Effective choice of helper motor	0～3	0	◇	119
237	P14.07	Delay time for the start and stop of helper motor 1	0.0s～3600.0s	5.0s	◇	119
238	P14.08	Delay time for the start and stop of helper motor 2	0.0s～3600.0s	5.0s	◇	119

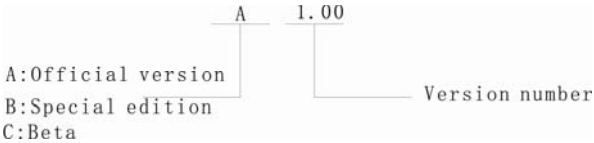
6-1-17. P15 group manufacturer’s function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change	Reference page
239	P15.00	Manufacturer password	0～65535	*****	■	120

6-2. inverter of function parameter

6-2-1.P00 group monitoring function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
1	P00.00	Operation frequency	Currently actual output frequency of the inverter	HZ	■
2	P00.01	Set the frequency	Currently actual setting frequency of the inverter	HZ	■
3	P00.02	DC bus voltage	Estimated value of DC bus voltage	V	■
4	P00.03	Output voltage of AC frequency vector inverters	Actual output voltage of inverter	V	■
5	P00.04	Output current of inverter	Actual output current of inverter	A	■
6	P00.05	Actual rotate speed of the motor	Actual running speed of the motor	RPM	■
7	P00.06	Output power of the AC frequency vector inverters	Percentage for actual output power of the AC frequency vector inverters	%	■
8	P00.07	Output torque of the inverter	Actual output torque of the inverter	N*m	■
9	P00.08	Given value of PID	percentage for the given value of PID adjusts the operation	%	■
10	P00.09	Feedback value of PID	percentage for the feedback value of PID adjusts the operation	%	■
11	P00.10	State of input terminal	State of input terminal	-	■
12	P00.11	State of output terminal	State of output terminal	-	■
13	P00.12	Value of analog AI1	Value of analog AI1	V	■
14	P00.13	Value of analog AI2	Value of analog AI2	V	■

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
15	P00.14	Current section of multiple speed	Current section of multiple speed	-	■
16	P00.15	Temperature of rectifier module	0～100.0℃	℃	■
17	P00.16	Temperature of contravariant module	0～100.0℃	℃	■
18	P00.17	Software version			■
					
19	P00.18	Total operation time of this machine	0～65535h	0	■

All of these function codes can be only referred without any change.

Temperature of rectifier module: it shows the temperature of rectifier module; different rectifier module of different types may have different protective value of over-temperature protection.

Temperature of contravariant module: it shows the temperature of rectifier module; different contravariant module of different types may have different protective value of over-temperature protection.

Software version: version number of DSP software

Total operation time of this machine, so far, it shows the total operation time of the inverter.

6-2-2.P01 group basic function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
20	P01.00	Control mode	0: V/F control 1: vector control for open-loop flux 1 2: vector control for open-loop flux 2 3: closed-loop vector control for feedback of sensor	0	□

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Select the operation mode of inverter: 0: V/F control: it is appropriate for the occasion which has no high requirement on accuracy such as the load of the fan and pump; and it can be also applied to the place where one AC frequency vector inverters can drive many motors. 1: vector control for open-loop flux 1: it is suitable for general place with high performance where has no encoder PG; and one AC frequency vector inverters can only drive one motor such as the load of machine tool, centrifugal machine, drawbench and injection molding machine. 2: vector control for open-loop flux 2: it is appropriate for the occasion which has no high requirement on accuracy of torque control like wire-wound and drawbench. Under the mode of torque control, the motor speed is controlled by the motor load; and its acceleration and deceleration isn't decided y acceleration and deceleration time of AC frequency vector inverters any more. 3: closed-loop vector control for feedback of sensor Notice: you must have self-study of motor parameter when you choose mode of vector control. Only accurate motor parameter is obtained can develop the advantage for mode of vector control. More excellent performance can be obtained via adjusting the parameter (P03 group) of speed. regulator					
21	P01.01	Operation inverter channel	0: inverter channel of keyboard （LED goes out） 1: inverter channel of terminal （LED flicks） 2: inverter channel of communication（LED lightens）	0	□
Change the channel for control inverter of inverter. Control inverter of the AC frequency vector inverters includes start, halt, forward rotation, reverse rotation, JOG and fault resetting. 0: inverter channel of keyboard（LED goes out）: operate via RUN and STOP/RESET the panel of the keyboard Command control. If multifunction key MF were set as MF to switch the function, then this key could be used to change the rotation direction. Under the operation state, if press RUN and STOP/RESET at the same time, it would make the AC frequency vector inverters stop freely 1: inverter channel of terminal （LED flicks）: forward rotation, reverse rotation of multifunction terminal, forward jog and reverse job make inverter control. 2: inverter channel of communication（LED lightens）: operation inverter is controlled by upper computer via communication.					
22	P01.02	Increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal –setting	0: valid; moreover, the AC frequency vector inverters saves without power supply 1: valid; moreover, the AC frequency vector inverters doesn't save without power supply 2: increasing+/decreasing-invalid setting 3: Setting is valid for the operation; reset when the machine stops	0	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Set the frequency by means of increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal as well increasing+ or decreasing- of the terminal (increasing frequency setting or decreasing frequency setting) of encoder; it has the highest authority and it can combine with channels set by any frequency. It is used mainly for accomplishing the output frequency of mini AC frequency vector inverters during the debugging period of the control system. 0: valid; moreover, the AC frequency vector inverters saves without power supply. It can set frequency inverter; what is more, it can saves this frequency value after the power failure of the inverter; and it can automatically combine with current setting frequency after next electrifying. 1: valid; moreover, the AC frequency vector inverters doesn't save without power supply. It can set frequency inverter; what the difference is that this frequency value can't be stored after the power failure of the inverter. 2: Invalid. increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal as well increasing+ or decreasing- of the terminal of encoder is invalid; and the setting will automatically reset. 3: the setting for increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal as well increasing+ or decreasing- of the terminal of encoder at operation state is valid; the setting for increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal as well increasing+ or decreasing- of the terminal of encoder at halt state reset. Notice: after the user makes the operation on recovering the default value for the function parameter of AC frequency vector inverter, frequency set by increasing + or decreasing- of the encoder and terminal automatically reset.					
23	P01.03	Selection of frequency inverter	0: Keyboard setting 1: Setting of analog AI1 2: Setting of analog AI2 3:K1*AI1+K2*AI2 4:Simple PLC run set 5: Setting for operation of multiple speed 6: Setting of PID control 7: Setting of remote communication 8: Presetting for keyboard potentiometer 9: Analog AI1 and Ascending(UP)/Descending(Down) 10: Analog AI2 and Ascending(UP)/Descending(Down) 11: K1*AI1+K2*AI2+ and Ascending(UP)/Descending(Down)	7	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Select the channel for inverter input of A frequency of AC frequency vector inverter and there are seven given frequency channels. 0: Keyboard setting: achieve the aim that the keyboard sets the frequency via altering the value of function code P01.03-keyboard sets the frequency. 1: Setting of analog AI1 2: Setting of analog AI2 3. Setting for analog K1*AI1+K2*AI2: it means that the frequency is determined by the input terminal of the analog. Standard configuration of PT200 AC frequency vector inverter provides two simulated input terminals ; among them, AI1 is the voltage input with 0～10V/0（4）～20mA and AI2 is the input with 0～10V/0（4）～20mA; and input of current or voltage can be switched via jumper JP2 and JP1. Notice: when analog AI2 selects 0～20mA for the input, what voltage corresponded by 20mAis 10V. 100.0% Set by simulated input corresponds with maximum frequency (P01.07) and-100.0% corresponds with maximum frequency of the response. Please refer to the inverter of P06.19 and P06.20 for K1/K2. 4:simple PLC run set, please check P11 group instruction for reference 5: Setting for operation of multiple speed: the AC frequency vector inverter will operation via the method of multistep speed after selecting this setting method of the frequency. It is necessary to set the parameter for control group of multistep speed in P06 and P11 for determine the corresponding relation between the given percentage and given frequency. 6: Setting of PID control: operation mode of AC frequency vector inverter is the control of process PID if this parameter is selected. At this moment, it is necessary to set PID control group in P10 group. The operation frequency of AC frequency vector inverter is the frequency value after the effect of PID. Please refer to the inverter of PID function for the implication of given source, fixed amount and feedback source of PID. 7: Setting of remote communication: the frequency is preset by the upper computer via communication method. Please see Attachment I communication protocol for detail. 8: Presetting for keyboard encoder: Corresponding value for the starting point and end point of keyboard encoder can be used as positive and negative effect. 9：Analog AI1 and Ascending(UP)/Descending(Down) Overlay 10：Analog AI2 and Ascending(UP)/Descending(Down) Overlay 11: K1*AI1+K2*AI2+ and Ascending(UP)/Descending(Down) Overlay				
24	P01.04	Selection for the setting of torque	0: Keyboard sets torque (corresponding with P01.05) 1: analog AI1 sets torque (totally corresponds with two times as the rated current of the inverter） 2: analog AI2 sets torque (be the same as 1） 3 analog AI1+AI2 sets torque (be the same as 1） 4: setting of multi torques (be the same as 1） 5 Remote communication sets torque (be the same as 1）	0	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
The torque control is effective only for P01.00=2; and only then can function code of P01.04 be effective. At the torque control, AC frequency vector inverter output the torque based on the torque inverter set; and the output frequency is limited by upper limiting frequency; when the load speed is higher than the upper limiting frequency set, output frequency of AC frequency vector inverter is restricted; and at this moment, the output torque is different from the torque set. When the torque inverter is the keyboard setting (i.e. P01.04=0), the torque inverter can be obtained via setting the function code P01.05. when the torque setting is negative, the motor will rotate reversely; 100.0% Set by analog, multistage speed and communication setting corresponds with double rated current of AC frequency vector inverter ; and-100.0% corresponds with negatively twice rated current of AC frequency vector inverter. The torque control and speed control can be switched via multifunctional input terminal. When the torque set by AC frequency vector inverter is bigger than the load torque, output frequency of AC frequency vector inverter will rise; when the output frequency of AC frequency vector inverter reaches the upper limit of frequency, output frequency of AC frequency vector inverter will always operate with upper limit frequency. When the torque set by AC frequency vector inverter is smaller than the load torque, output frequency of AC frequency vector inverter will fall; when the output frequency of AC frequency vector inverter reaches the lower limit of frequency, output frequency of AC frequency vector inverter will always operate with lower limit frequency. Notice: AC frequency vector inverter transfers from the torque control to speed control when the machine stops.					
25	P01.05	Keyboard sets torque	-200.0%～200.0%(rated current of AC frequency vector inverter）	50.0%	◇
26	P01.06	Choice for the setting source of upper limiting frequency	0: Keyboard sets upper limiting frequency (P01.08) 1: Analog AI1 sets upper limiting frequency (totally corresponds with maximum frequency） 2: Analog AI2 sets upper limiting frequency (be the same as 1) 3: Multi sections set upper limiting frequency (be the same as 1) 4: Remote communication sets upper limiting frequency (be the same as 1)	0	◇
Selection for given source of upper limiting frequency. Particularly, at the state of torque control, output power of AC frequency vector inverter can be changed via changing the upper limiting frequency.					
27	P01.07	Maximum output frequency	10.00～400.00Hz	50.00Hz	□
It is used to set the highest frequency of AC frequency vector inverter; and it is the base for setting the frequency and the speed of acceleration and deceleration. The user should pay more attention to it.					
28	P01.08	Upper limiting of operation frequency	P01.09～P01.07（Maximum frequency）	50.00Hz	◇
The upper limiting value for output frequency of AC frequency vector inverter and it should be smaller or equal to maximum output frequency.					

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
29	P01.09	Lower limiting of operation frequency	0.00Hz～P01.08(Upper limiting of operation frequency)	0.00Hz	◇
Lower limiting value of operation frequency. When the frequency set is lower than the lower limiting frequency, the lower limiting frequency operates. Maximum output frequency should be bigger or equally to upper limiting frequency which is bigger or equal to lower limiting frequency.					
30	P01.10	Keyboard sets the frequency	0.00 Hz～P01.07(Maximum frequency）	50.00Hz	◇
the When the frequency inverter selects KEYBOARD SETTING, then the value of the function code is initial value set by the figure for the frequency of AC frequency vector inverter					
31	P01.11	Acceleration time	0.1～3600.0s	Type selection	◇
32	P01.12	Deceleration time 1	0.1～3600.0s	Type selection	◇

Acceleration time of JOG refers to the time required by AC frequency vector inverter from 0Hz to maximum output power (P01.07)

Deceleration time of JOG refers to the time required by AC frequency vector inverter from maximum output power to 0Hz (P01.07)

It is shown as following:

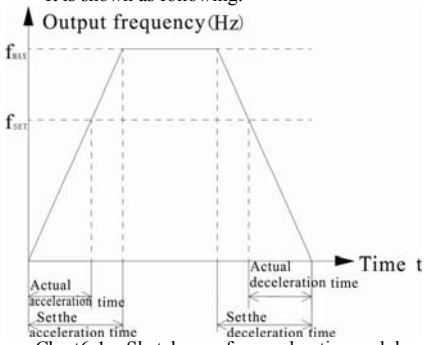


Chart6-1 Sketch map for acceleration and deceleration time

When the frequency set is equal to maximum frequency, actual acceleration and deceleration time is in accordance with acceleration and deceleration time set .

When the frequency set is smaller than maximum frequency, actual acceleration time is smaller than deceleration time set .

Actual acceleration time= deceleration time set*setting frequency or maximum frequency.

PT200 AC frequency vector inverter has four acceleration and deceleration time.

The first group: P01.11, P01.12； the second group: P09.00, P09.01

The third group: P09.02, P09.03； the fourth group: P09.04、P09.05

The acceleration and deceleration time can be selected via the combination for the selection terminal of acceleration and deceleration time in the digital input terminal with multifunctions.

33	P01.13	Choice of operation direction	0: Operate towards defaulted direction 1: Operate towards opposite direction 2: Prohibit reversal operation	)	□

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

0: Operate towards defaulted direction. AC frequency vector inverter will operate towards actual direction after it is electrified.

1: Operate towards opposite direction. It is used for changing the direction of motor; its effect is to change the rotate direction of the motor via adjusting two random motor lines.

Notice: after the parameter initialization, the operation direction of the motor will return to its original state; please use it carefully for the place where the rotation direction of the motor is banned after the debug of the system.

2: Prohibit reversal operation. Prohibit reversal operation of AC frequency vector inverter and it can be applied to specific place where the reverse rotation is prohibited.

34	P01.14	Setting of carrier frequency	1.0～15.0kHz	Type selection	◇

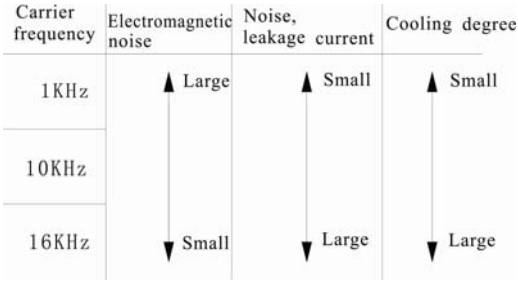


Chart 6-2 relation scheme for influence of carrier on the environment

Model	Max	Min	Factory default
1.5-11KW	15	0.5	8KHz
15-55KW	8	0.5	4KHz
15-185KW	6	0.5	2KHz
200-315KW	6	0.5	1KHz

Chart6-3 Relation form between the type and carrier

Advantage of high carrier frequency: ideal current waveform, few current harmonics and less motor noise.

Disadvantage of high carrier frequency: increasing switching loss, rising temperature of AC frequency vector inverter, influenced output capacity of AC frequency vector inverter; and under high carrier, AC frequency vector inverter should be used via derating; meanwhile, increasing leak current of AC frequency vector inverter and its increasing interruption on external electromagnetism .

Adopting low carrier frequency is opposite to the above-mentioned status; too low carrier frequency will cause the fluctuation of the operation with low frequency, torque reduction or even vibration.

The carrier frequency has been set reasonably when AC frequency vector inverter leaves the factory. Generally speaking, it is unnecessary for the user to change the parameter.

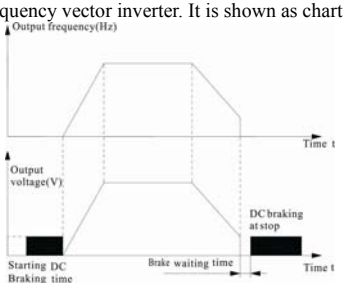
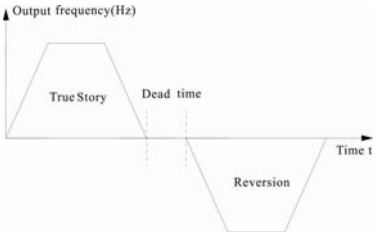
When the user uses carrier frequency exceeding the default, it should be used by derating; and the derating should be 20% with every 1K carrier.

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
35	P01.15	Recovery of function parameter	0: No operation 1: Recover default value beside the group of electric machine parameter 2: Recover default value including the group of electric machine parameter 3: Eliminate fault files	0	□
0: No operation 1.AC frequency vector inverter recovers default value for all parameters (beside P03 group). 2.AC frequency vector inverter recovers default value for all parameters (including P03 group). 3.AC frequency vector inverter eliminates recent fault files.					
36	P01.16	Choice of AVR function	0: Invalid 1: The whole process is effective 2: It is invalid only for deceleration	2	◇
AVR function is the automatic adjustment function of output voltage. When AVR function is invalid, output voltage will change with the change of input voltage (or DC bus voltage); When AVR function is valid, output voltage will not change with the change of input voltage (or DC bus voltage); and output voltage will basically keep constant within scope of the output capacity. Notice: when the motor stops with deceleration, it will automatically stabilize the voltage and AVR function closes; and it will stop the machine in much shorter time without overvoltage.					

6-2-3.P02 group control group of the start and stop

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
37	P02.00	Start operation mode	0: direct start 1: firstly DC brake and then start 2: firstly tracking of rotate speed and the start	0	□
0: direct start: start with starting the frequency. 1: firstly DC brake and then start: firstly make DC brake based on the setting of P02.03 and P02.04; and then start with starting the frequency. It is applied to the place with small inertia load; and it may cause reverse rotation at the start. 2: firstly tracking of rotate speed and the start: AC frequency vector inverter makes speed identification on the motor which is rotating; and it directly tracks the start for the identified frequency; during the start process, the current voltage is smooth without any crash.					
38	P02.01	Launch the start frequency	0.00～10.00Hz	0.50Hz	◇
39	P02.02	Start storage time of the frequency	0.0～50.0s	0.0s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
AC frequency vector inverter begins its start via starting frequency(P02.01) and accelerate to the targeted frequency based on the acceleration time set after it starts the storage time of the frequency; if targeted frequency is smaller than the start frequency, AC frequency vector inverter will be at a holding state. And the value for the start frequency is not limited by the lower limiting frequency.					
40	P02.03	Start front brake current	0.0～150.0%	0.0%	◇
41	P02.04	Start front brake time	0.0～50.0s	0.0s	◇
P02.03 Value of DC current for starting DC brake is the percentage for rated current of AC frequency vector inverter. P02.04 Duration for DC current. If the DC braking time is set to 0, then DC braking is invalid. The bigger the current of DCC braking, the stronger the braking force.					
42	P02.05	Selection of halt mode	0: Slowing down and stopping 1: Random parking	0	◇
0: Slowing down and stopping: after the halt inverter is valid, AC frequency vector inverter reduces the output frequency according to the deceleration method and deceleration time defined; and the machine stops when the frequency is 0. 1: Random parking: after the halt inverter is valid, AC frequency vector inverter stops the output instantly. The load stops freely based on mechanical inertia.					
43	P02.06	Start frequency for halt brake	0.00～P01.07（Maximum frequency）	0.00Hz	◇
44	P02.07	Waiting time for halt brake	0.0～50.0s	0.0s	◇
45	P02.08	DC braking current of halt	0.0～150.0%	0.0%	◇
46	P02.09	DC braking time of halt	0.0～50.0s	0.0s	◇
Start frequency for braking of halt: during the halt process of deceleration, when this frequency is reached, DC braking of the halt starts. Start frequency for the braking of halt is 0, then the DC braking is invalid; and the AC frequency vector inverter stops the machine based on the deceleration time set. Waiting time for halt brake: before the DC brake of the halt, AC frequency vector inverter blocks the output; it will start DC brake after this time delay, which is used to prevent overcurrent fault caused by DC brake which is started with high speed. DC braking current of halt: it refers to the increased DC braking capacity. The bigger of this value, the bigger the torque of the braking torque. DC braking time of halt: it refers to the time for the duration of DC braking capacity. It is shown as Chart 6-4.					
47	P02.10	Dead time for forward and reverse rotation	0.0～3600.0s	0.0s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Set the transient time at zero frequency of the output during the forward and reverserotation of AC frequency vector inverter. It is shown as chart 5-4:  Chart 6-4 sketch map of DC braking  Chart 6-5 Sketch map for dead time of forward and reverse rotation					
48	P02.11	Selection for the protection of terminal with electricity	0: Run command of the terminal is invalid when it is electrified 1: Run command of the terminal is valid when it is electrified	0	◇
When the channel of operation inverter is the terminal control, the system will automatically detect the state of the running terminal during the electrifying process of AC frequency vector inverter. 0: Run command of the terminal is invalid when it is electrified. AC frequency vector inverter won't operate even if it detects the command terminal is valid during the electrifying process of AC frequency vector inverter; and the system will be at a state of running protection; and AC frequency vector inverter will operate only after this terminal of run command is canceled and then use this terminal. 1: Run command of the terminal is valid when it is electrified. Namely, using the electrifying process of AC frequency vector inverter, if it detects the command terminal is valid, the system will automatically start the operation of AC frequency vector inverter after the initialization. Notice: the user must choose this function carefully because it may cause serious consequence.					
49	P02.12	Reservation			◇

6-2-4.P03 group motor parameter group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
50	P03.00	Type of AC frequency vector inverter	0:G type（load type of constant torque） 1:P type (load type of fan and pump)	Type setting	□
0: It is applied to the load of constant torque with assigned rated parameter 1: It is applied to the load of variable torque with assigned rated parameter. Notice: the user can set the parameters in this group for changing the type and realizing the integration of G/P. AC frequency vector inverter with 220V is only for G type.					

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
51	P03.01	Rated power of motor	0.4～900.0Kw	Type setting	□
52	P03.02	Rated frequency of motor	0.01Hz～P01.07(maximum frequency)	50.00Hz	□
53	P03.03	Rated rotate speed of motor	0～36000rPm	Type setting	□
54	P03.04	Rated voltage of motor	0～460V	Type setting	□
55	P03.05	Rated current of motor	0.1～2000.0A	Type setting	□
Notice: please make the setting based on the nameplate parameter of the motor. Excellent control performance of vector control requires accurate motor parameter. AC frequency vector inverter provides function for self-study of parameter. Accurate self-study of parameter comes from correct input for the nameplate parameter of the motor. Please guarantee the match between AC frequency vector inverter and motor in order to guarantee the control performance; if their difference is very obvious, the control performance of AC frequency vector inverter will obviously reduce. Notice: resetting rated power (P03.01) of the motor will initialize motor parameter of P03.06~P03.10.					
56	P03.06	Stator resistor of motor	0.001～65.535Ω	Type setting	◇
57	P03.07	Rotor resistance of motor	0.001～65.535Ω	Type setting	◇
58	P03.08	Stator and rotor inductance of motor	0.1～6553.5mH	Type setting	◇
59	P03.09	Mutual inductance for stator and rotor of motor	0.1～6553.5mH	Type setting	◇
60	P03.10	No-load current of the motor	0.01～655.35A	Type setting	◇
After normal self-study of motor parameter, setting value of P03.06～P03.10 will automatically update. These parameters are basic parameters for vector control with high performance; and they have direct effect on the performance of the control.					
61	P03.11	self-study of motor parameter	0: No operation 1: Comprehensive self-study of parameter 2: Static self-study of parameter	0	□

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

0: No operation.

1: Self-study of rotate parameter: nameplate parameter of the motor (P03.01～P03.05) must be input correctly before self-study of motor parameter; and separate the motor with the load and make the motor have a static and unloaded state, or the result for self-study of motor parameter may be wrong.

Before self-study of motor parameter, acceleration and deceleration time (P01.11, P01.12)should be set properly according to the inertia of the motor; or during the self-study period of motor parameter will have overcurrent and overvoltage fault.

Set P03.11 as 1 and the press PRG to start the self-study of motor parameter; now LED shows -TUN- and flicks. Press RUN to start the self-study of parameter; now it shows TUNE0 and TUNE1 ; and then the motor begins to operation; and RUN/TUNE flicks. After the self-study of parameter, it shows -END- and then it shows returning to the interface of halt state. When -TUN- flicks , press ESC to exit the state of self-study.

During the self-study period, STOP RESET can be pressed to terminate the operation for self-study of parameter.

Notice: the start and stop for self-study of parameter can be only controlled by the keyboard; after the self-study of parameter, this function will automatically reset to 0.

Static self-study of parameter: during the period for the static self-study of parameter, it is unnecessary to separate the motor with the load ;

and make the motor have a static and unloaded state, or the result for self-study of motor parameter may be wrong. Before self-study of motor parameter, nameplate parameter (P03.01～P03.05) of the motor must be input correctly; rotator resistance of the motor can be detected after the self-study. However, the mutual inductance and no-load current can't be detected and the user can input corresponding value depending on their experience.

6-2-5.P04 group parameter of vector control

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
62	P04.00	Proportional gain of speed ring 1	0～100	20	◇
63	P04.01	Integral time of speed ring 1	0.01～10.00s	0.50s	◇
64	P04.02	Low frequency of low switch	0.00Hz～P04.05	5.00Hz	◇
65	P04.03	Proportional gain of speed ring 2	0～100	25	◇
66	P04.04	Integral time of speed ring 2	0.01～10.00s	1.00	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
67	P04.05	High frequency of low switch	P04.02～ P01.07(maximum frequency)	10.00Hz	◇

The above parameters can be only applied to vector control mode. Below switching frequency 1 (P04.02), parameter of speed ring PI is P04.00 and P04.01; above switching frequency 2 (P04.05), parameter of speed ring PI is P04.03 and P04.04; among them, PI parameter can be obtained via the change of two parameter lines; it is shown as the following chart:

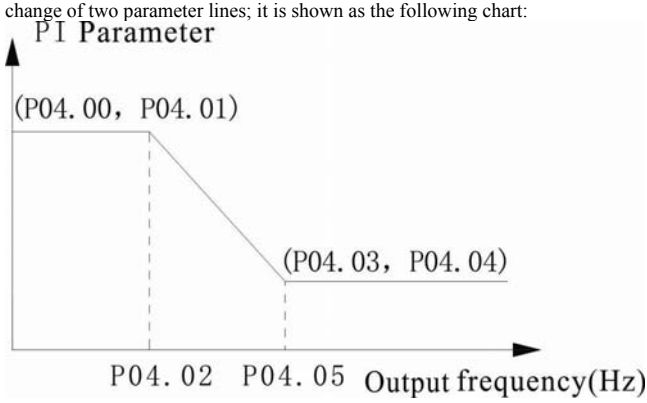


Chart 6-6 Sketch map for parameter of PI

Dynamic response of vector control can be adjusted via setting the proportionality coefficient and integral time of speed regulator. Dynamic response of speed ring can be strengthened via increasing proportional gain and reducing the integral time; however, too large proportional gain or too small integral time will easily cause the system vibration and overstrike. Too small proportional gain can also cause the vibration of stabilized system; what is worse, it may have speed offset.

Parameter for speed ring PI is closed with the inertia of the system; and it should be adjusted based on default PI aiming at different load features to meet the requirements of difference places.

68	P04.06	Compensation factor of VC slippage	50%～200%	100%	◇

Compensation factor of slippage is used for adjusting slippage frequency of the vector control and improving the accuracy for the speed control of the system; proper adjusting of this parameter can effectively restrain the offset of the speed.

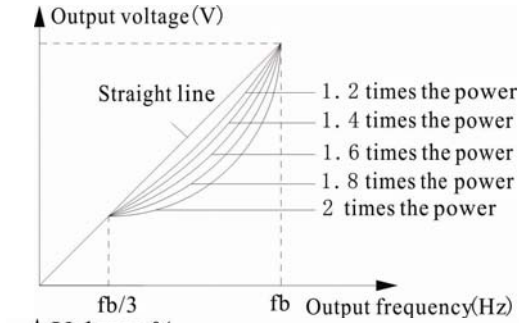
69	P04.07	Setting for the upper limit of the torque	0.0～200.0%(rated current of AC frequency vector inverter)	150.0%	◇

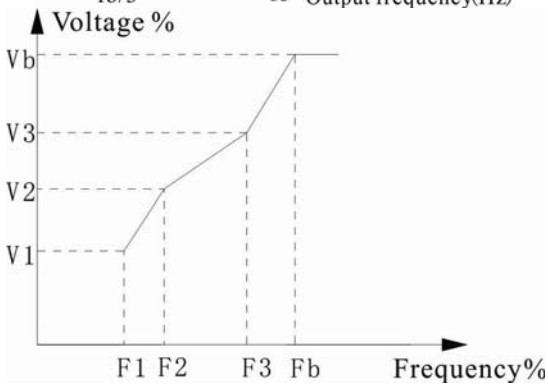
Set 100.0% to correspond with the rated output current of AC frequency vector inverter

6-2-6.P05 group V/F control parameter

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
70	P05.00	Setting of V/F curve	0: V/F curve of line 1:V/F curve of multipoints 2:1. V/F curve for drooping torque of 2 power 3:1. V/F curve for drooping torque of 4 power 4:1. V/F curve for drooping torque of 6 power 5:1. V/F curve for drooping torque of 8 power 6:2 V/F curve for drooping torque of 0 power	0	□

When PO5.00=0, V/F curve of line is suitable for the load of common constant torque.
When PO5.00=1, curve defined by the user is applied to the load for constant torque of subsections.
When PO5.00=2～5, curve with 1.2 power and 1.8 power is applied to liquid load of other mediums.
When PO5.00=6, V/F curve with 2.0 power is appropriate for centrifugal load such as fan and pump.





Noto:F1≤F2 ≤F3≤Fb V1≤V2≤V3≤100%

Chart 6-7 Sketch map of V/F curve

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
71	P05.01	Torque boost	0.0%:(automatic) 0.1%～30.0%	0.0%	◇
72	P05.02	Deadline of torque boost	0.0% ～ 50.0%(rated frequency of relative motor)	20.0%	□

Torque boost is mainly used below cut-off frequency (P05.02) and V/F curve after updating is shown as following; and the torque boost can improve torque feature with low frequency of V/F. the torque capacity should be chosen properly based on the load; the boost can be increased for large load; however, the boost value can't be too big; if the torque boost is too big, the motor will operate with overexcitation, output current of AC frequency vector inverter will increase, motor heating will increase and the efficiency will reduce.

When the setting of torque boost is 0.0%, AC frequency vector inverter has automatic torque boost.

Cut-off point of the torque boost: under such a frequency point, the torque boost is effective; and the torque boost will be invalid exceeding such a frequency set.

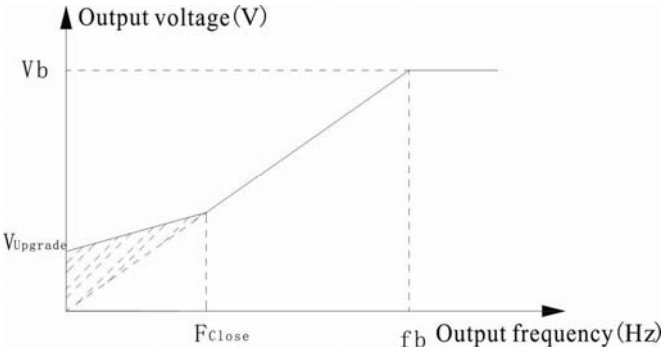


Chart 6-8 Sketch map for manual torque boost

73	P05.03	Limit for compensation of V/F slippage	0.0～200.0%	0.0%	◇

The setting of this parameter can compensate change of motor speed caused by load at V/F control and improve the hardness of mechanical properties. And such a value should be set as the rated slip frequency of the motor; the calculation of rated slip frequency is as follow:

P05.03=FB-n*p/60

In the formula: FB is rated frequency of the motor and its corresponding function code is P03.02; n is motor norm speed and its corresponding function code is; and P is the pole paries of the motor.

74	P05.04	Threshold value for low frequency of restricting vibration	0～500	5	◇
75	P05.05	Threshold value for high frequency of restricting vibration	0～500	100	◇

However, most motors can easily have current shock when they operate in some frequency sections; the slight cause caused by this is unstable operation of the motor, or even the overcurrent of AC frequency vector inverter severely. When P05.08=0, enabling restricts the vibration; when the setting of P05.04 and P05.05 is too small, the effect on restricting the vibration is very obvious; when the setting is too big, the effect on restricting the vibration is very weak.

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
76	P05.06	Clipping value of restricting vibration	0～10000	5000	◇
Boost value for voltage of restricting vibration can be limited via setting P05.06.					
77	P05.07	Demarcation frequency for low and high frequency of restricting vibration	0.00Hz ～ P01.07(maximum frequency)	12.50Hz	◇
P05.07 is the cut-off point for function code: P05.04 and P05.05.					
78	P05.08	Restrict vibration	0: restricting vibration is valid 1: restricting vibration is invalid	1	◇
0: Restricting vibration is valid 1: Restricting vibration is invalid. Function of restricting vibration is for VF control; common motor regularly has current shock for the no-load or light load operation, which can cause the abnormal operation of the motor; what is worse, it can also cause the overcurrent of AC frequency vector inverter. When P05.08=0, enabling restricts the vibration; and AC frequency vector inverter will control the vibration of the motor appeared based on the parameter in P05.04～P05.07 function group.					
79	P05.09	V/F frequency point 1	0.00HZ～P05.11	0.00HZ	□
80	P05.10	V/F voltage point 1	0.0～100.0%	0.0%	□
81	P05.11	V/F frequency point 2	P5.09～P05.13	0.00HZ	□
82	P05.12	V/F voltage point 2	0.0～100.0%	0.0%	□
83	P05.13	V/F frequency point 3	P05.11～P03.02	0.00HZ	□
84	P05.14	V/F voltage point 3	0.0～100.0%	0.0%	□
85	P05.15	Selection for energy-saving operation	0: Failure to actuate 1: Automatic energy-saving operation	0	□
During the process of no-load or light load operation, the motor can properly adjust output voltage to each the aim of automatic energy-saving via detecting the load current. Notice: this function is particularly effective for load of fan and pump.					
The function code in this group is only valid for V/F control (P01.00＝0).					

6-2-7.P06 group input terminal group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
86	P06.00	Function selection of DI1 terminal	0: No function 1: Forward running 2: Reverse run 3: Trilinear operation control	1	□
87	P06.01	Function selection of DI2 terminal		2	□

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
88	P06.02	Function selection of DI3 terminal	4: Forward JOG 5: Reverse JOG 6: Random parking 7: Fault resetting 8: Input of external fault 9: UP for frequency setting 10: DOWN for frequency setting 11: Removal for UP and DOWN of frequency setting 12: Terminal of multiple speed 1 13: Terminal of multiple speed 2 14: Terminal of multiple speed 3 15: Terminal of multiple speed 4 16: Temporary stop of PID control 17: Temporary stop of pendulous frequency (stop at current frequency) 18: Resetting of pendulous frequency (return to central frequency) 19: Prohibition of acceleration and deceleration 20: Prohibition of torque control 21: Temporary removal for UP and DOWN setting of frequency 22: DC brake of halt 23: Choice for terminal of acceleration and deceleration time 1 24: Choice for terminal of acceleration and deceleration time 2 25: Slow down and stop	4	□
89	P06.03	Function selection of DI4 terminal		0	□
90	P06.04	Function selection of DI5 terminal		0	□
91	P06.05	Function selection of DI6 terminal		0	□

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

This parameter is used to set the function corresponded multifunctional input terminal of the number.
0: No function
1: Forward running (FWD)
2: Reverse run (REV): when the running inverter is the terminal control, the run command of AC frequency vector inverter is preset by the above terminal function.
3: Trilinear operation control: see the inverter of trilinear function code in P06.07 for the input terminal of trilinear.
4: Forward JOG:
5: Reverse JOG: see the inverter of P09.06～P09.08 for specific JOG frequency and deceleration time.
6: Random parking: after the command is in effect, AC frequency vector inverter will block the output at once and the motor won't be limited to the control of AC frequency vector inverter during its halt process; and this method is suggested for load with large inertia and without any requirement on the halt time; and this method has the same implication with random parking introduced in P02.05.
7: Fault resetting: resetting function of external fault is used for the resetting of remote fault and it has the same function of STOP RESET .
8: Input of external fault: after the effectiveness of this signal, AC frequency vector inverter reports it to the opening of external fault (EF) and stops the machine.
9: UP for frequency setting
10: DOWN for frequency setting
11: Removal for UP and DOWN of frequency setting : three functions mentioned above are mainly used for changing given frequency via using external terminal; and UP is the inverter of increasing while UP is the inverter of decreasing; resetting for UP and DOWN of the frequency is used to reset the frequency value set via increasing+ of clockwise rotation and decreasing- of counterclockwise rotation; and it can make the given frequency recover to the frequency preset by the inverter channel of the frequency.
12, 13, 14 and 15: 1～4 terminal of multiple speed can realize the setting for speed of 16 sections.
Notice: 1 at the multiple speed terminal is a low post and 4 at the multiple speed terminal is a high poset.

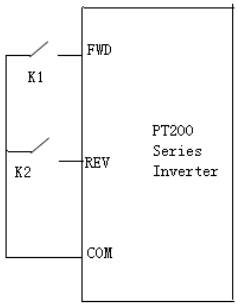
multistage speed 4	multistage speed 3	multistage speed 2	multistage speed 1
BIT3	BIT2	BIT1	BIT0

16: Temporary stop of PID control: PID is invalid temporarily and AC frequency vector inverter maintains the current frequency output.
17: Temporary stop of pendulous frequency: temporary stop of AC frequency vector inverter, after the withdrawal of current output and function, it will begin the operation of pendulous frequency with current frequency .
18: Resetting of pendulous frequency: setting frequency of AC frequency vector inverter returns to central frequency.
19: Prohibition of acceleration and deceleration: protect that AC frequency vector inverter is not affected by external signal (except the halt command) and maintains the current output frequency.
20: Prohibition of torque control: AC frequency vector inverter changes from the control model of torque to the control mode of the speed.
21: Temporary removal for UP and DOWN setting of frequency : when the terminal closes, the frequency value set via increasing+ of clockwise rotation and decreasing- of counterclockwise rotation can be removed; and it can make the given frequency recover to the frequency preset by the inverter channel of the frequency. When the terminal breaks, it will return to the frequency value after the setting for UP and DOWN of the frequency.
22: DC brake of halt: during the process of deceleration halt, when the terminal closes, it will make AC frequency vector inverter make brake immediately; and working condition of the braking can be decided among P02.07～P02.09
23: Choice for terminal of acceleration and deceleration time 1
24: Choice for terminal of acceleration and deceleration time 2
25: Slow down and stop

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
92	P06.06	Filtering times of switching value	1～10	5	◇
Set filtering time for the sampling of DI1～DI4 terminals. This parameter should be increased under the condition of serious interference to prevent fault operation.					
93	P06.07	Operation mode of terminal control	0: Double-line control model 1 1: Double-line control model 2 2: Three-line control model 1 3: Three-line control model 2	0	□

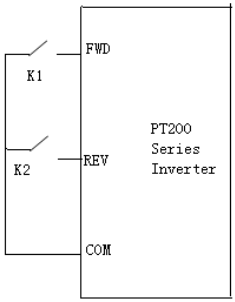
This parameter defines four different methods for controlling the operation of AC frequency vector inverter by means of external terminal.

0: Control like two lines: Enabling and the direction unifies. And this code is a code with two lines which is used most common. Defined terminal command of FWD and REV decides the forward and reverse rotation of the motor. (as chart6-9)



K1	K2	Select channel for operation order
OFF	OFF	Stop
ON	OFF	Forward run
OFF	ON	Reverse operation
ON	ON	Stop

Chart 6-9 control like two lines (enabling and the direction unifies)



K1	K2	Select channel for operation order
OFF	OFF	Stop
ON	OFF	Forward run
OFF	ON	Stop
ON	ON	Reverse operation

chart 6-10 control like two lines (enabling is separated from the direction)

1: Double-line control model separates the energy and direction. The defined FWD is enabling terminal. The defined REV status has to confirm the direction (Figure 6-10).

2: Three-line control model 1. DIn is enabling terminal in this model; the operation command is

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

produced by FWD and direction is controlled by REV. DIn is a closed input (Figure 6-11).

Once K is off, FWD and REV control is invalid and frequency converter stops;

Once K is on, FWD and REV control is valid;

Once SB1 is pressed, FWD terminal rises which means operation command;

Once K1 is off, REV terminal is off which means positive/reverse rotation command;

Once K1 is on, REV terminal is on which means positive/reverse rotation command;

K: Enabling switch

K1: Control switch of positive and reverse rotation

SB1: Operation button

DIn is a multi-functional input terminal with No. 3 function: “three-line operation control”

3: Three-line control model 2. DIn is enabling terminal in this model; the operation command is produced by SB1 or SB3 and direction is controlled by them at the same time. Stop command is controlled by switch K (Figure 6-12).

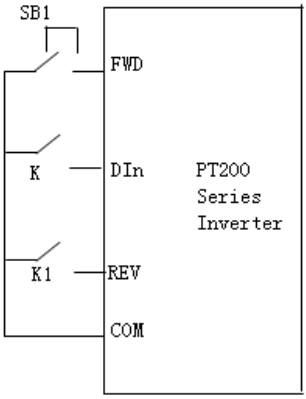


Figure 6-11 Three-line control model 1

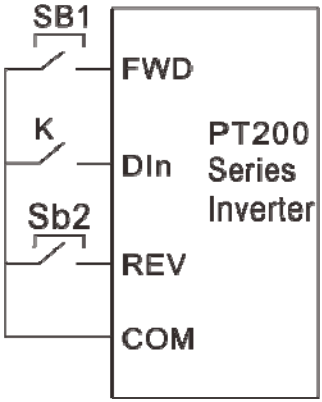


Figure 6-12 Three-line control model 2

Once K is off, FWD and REV control is invalid and frequency converter stops;

Once K is on, FWD and REV control is valid;

Once SB1 is pressed, FWD terminal rises which means positive rotation command;

Once SB2 is pressed, FWD terminal rises which means reverse rotation command;

K: Enabling switch

SB1: Operation button of positive rotation

SB2: Operation button of reverse rotation

Prompt: As for double-line operation model, once FWD/REV terminal is valid, other source sends out stop command and stops the frequency converter, the frequency converter is not operated upon vanishing of stop command even through control terminal FWD/REV remains valid; FWD/REV is triggered for the second time to operate the frequency converter.

94	P06.08	Increasing + via clockwise rotation of encoder and terminal or decreasing via counterclockwise rotation of encoder and terminal	0.01～50.00Hz/s	0.50Hz/s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Use increasing + via clockwise rotation of encoder or decreasing via counterclockwise rotation of encoder and terminal to adjust the change rate at the setting frequency.					
95	P06.09	Low limiting value of AI1	0.00V～10.00V	0.00V	◇
96	P06.10	Low limits of AI1 corresponds with the setting	-100.0%～100.0%	0.0%	◇
97	P06.11	Upper limiting value of AI1	0.00V～10.00V	10.00V	◇
98	P06.12	Upper limits of AI1 corresponds with the setting	-100.0%～100.0%	100.0%	◇
99	P06.13	Filtering time of AI1 input	0.00s～10.00s	0.10s	◇

The above function defines the corresponding relationship between simulated input voltage and simulated input; extra part will be calculated based on maximum input or minim input when the simulated voltage exceeds the scope of maximum input or minimal input .

When the simulated input is current input, what voltage corresponds with 0mA～20mA is 0V～10V.

Nominal value corresponded by 100.0% set by simulation at different application occasions will different; please see the inverter of every application part for the detail.

The following chart explains the conditions of several suppositions

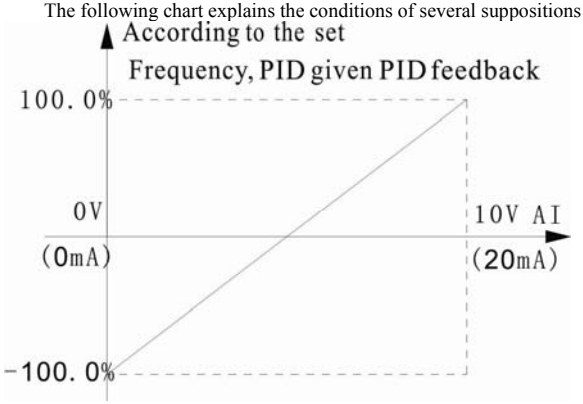


Chart 6-13 corresponding relationship between simulated presetting and presetting capacity

Corresponding with setting frequency, PID presetting and PID feedback.

Filtering time of AI1 input: adjust sensitivity of analog input; proper increasing of this value can enhance the ability of analog on anti-interference, but it will reduce the sensitivity of the analog input.

100	P06.14	Low limiting value of AI2	0.00V～10.00V	0.00V	◇
101	P06.15	Low limits of AI2 corresponds with the setting	-100.0%～100.0%	0.0%	◇
102	P06.16	Upper limiting value of	0.00V～10.00V	10.00V	◇
103	P06.17	Upper limits of AI2 corresponds with the setting	-100.0%～100.0%	100.0%	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
104	P06.18	Filtering time of AI2 input	0.00s～10.00s	0.10s	◇
105	P06.19	Gain for simulated input 1 K1	0.00～300.00	100.00	◇
106	P06.20	Gain for simulated input 2 K2	0.00～300.00	100.00	◇
107	P06.21	Main and auxiliary control function	0～1	0	◇

Main and auxiliary frequency setting control unrestricted
Main frequency setting: 0 , auxiliary frequency off working
Function of AI2 is similar to the setting method of AI1.
Analog AI2 can support the input with 0～10V or 0～20mA; when AI2 chooses the input with 0～ mA , voltage corresponding with 20mA is 10V.

There are 5 (below) multifunctional input terminals of the number and 2 input terminals of analog in the standard unit of PT200 series AC frequency vector inverter.

6-2-8.P07group human-computer interface group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
108	P07.00	User password	0～65535	0	◇

When the setting is any number except 0, the password protection takes effect. 00000: remove the user password value set before and make the protection function of password effective; and resetting to factory can also remove the password.

After the user password is set and effective, the user can't enter into the parameter menu if the user password is wrong; the user can view and change the parameters only by inputting correct user password. Please remember the user password set carefully.

Exit the editing state of function code, then the password protection will take effect in one minute; press PRG to enter into the editing state of function code after the password takes effect, it will show "0.0.0.0.0."; the operator must input the password correctly, or the operator can't enter.

109	P07.01	OLED shows language choice	0: Chinese 1:English	0	◇

0:Chinese
1:ENGLISH
The above function is only effective for outer keyboard of OLED. It is used for choose languages of liquid crystal display.

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
110	P07.02	Copy of function parameter	0: No operation 1: Function parameter of this machine is delivered to OLED keyboard 2: Download function parameter of OLED keyboard onto this machine Notice: the parameter automatically returns to 0 after 1-2 operations have been finished	0	□
This function code decides the method of parameter copy. And copy function of the parameter is built-in the outer keyboard of OLED. 1: Function parameter of this machine is delivered to OLED keyboard 2: Download function parameter of OLED keyboard onto this machine Notice: the parameter automatically returns to 0 after operations of parameter copy have been finished.					
111	P07.03	Function choice of 	0:JOG operation 1: Switch of forward and reverse rotation 2: Remove increasing+ via clockwise rotation or decreasing- via counterclockwise rotation-setting	0	□
Pressing  is the multifunctional key; the function of pressing  can be defined via parameter setting. 0: JOG OPERATION. Pressing  can realize the operation of JOG. 1. Switch of forward and reverse rotation. Pressing  can realize the switch for the direction of frequency inverter. 1. Notice: the switch of forward and reverse rotation set by  won't be remembered when the power of AC frequency vector inverter is off; after it is electrified again, AC frequency vector inverter will operation based on the operation direction set by parameter P01.13. operation direction set by parameter P01.13 will be remembered when the power of AC frequency vector inverter is off 2. setting for removing increasing + via clockwise rotation of encoder or decreasing via counterclockwise rotation of encoder. And pressing  can remove the setting value of increasing + via clockwise rotation of encoder or decreasing via counterclockwise rotation of encoder				
112	P07.04	Function choice for halt of 	0: it is only effective for panel control 1: it is effective for panel control and terminal control 2: it is effective for panel control and communication control 3: it is effective for all control modes	0	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
This function code defines effective choice for halt function of 0: it is only effective for panel control 1: it is effective for panel control and terminal control 2: it is effective for panel control and communication control 3: it is effective for all control modes STOP RESET is effective under any condition for fault resetting.					
113	P07.05	Choice for parameter showed by operation state	0～0x7FFF BIT0: operation frequency BIT1: setting frequency BIT2: busbar voltage BIT3: output voltage BIT4:output current BIT5:rotate speed of operation BIT6: output power BIT7: output torque BIT8:given value of PID BIT9:feedback value of PID BIT10: state of input terminal BIT11: state of output terminal BIT12: value of analog AI1 BIT13: value of analog AI2 BIT14: Current section of multiple speed BIT15: Setting value of torque	0x3FF	◇
Under the operation state, parameter of PT200series AC frequency vector inverter only shows the effect of this function code,namely a binary number with 16 bits.					
114	P07.06	Choice for parameter showed by halt state	1～0x1FF BIT0: setting frequency BIT1:busbar voltage BIT2: state of input terminal BIT3: state of output terminal BIT4: given value of PID BIT5: feedback value of PID BIT6: value of analog AI1 BIT7: value of analog AI2 BIT8: Current section of multiple speed BIT9: Setting value of torque BIT10～ BIT15: Reservation	0xFF	◇
Under the halt state, parameter of PT200series AC frequency vector inverter only shows the effect of this function code.					
115	P07.07	First two fault types	0～24 0: Fault free		■
116	P07.08	The first two fault types			■

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
117	P07.09	Current fault type	1: Protection for U phase of contravariant unit (E.oUP) 2: Protection for V phase of contravariant unit (E.oUP) 3:Protection for W phase of contravariant unit (E.oUP) 4: Overcurrent of acceleration （E.oC1) 5: Overcurrent of deceleration （E.oC2） 6: Overcurrent of constant speed（E.oC3） 7: Overvoltage of acceleration （E.oU1） 8: Overvoltage of deceleration （E.oU2） 9:Overvoltage of constant speed（E.oU3） 10:undervoltage fault of generatrix（E.LU） 11:Motor overload（E.oL1） 12: Overload of inverter （E.oL2） 13: Default phase at output side（E.PHI） 14: Default phase at input side （E.PHo） 15:Overheating of rectification module（E.oH1） 16: Fault for overheating of contravariant module (E.oH2) 17: External fault（E.SET） 18:Communication fault （E.CE） 19:Detection fault of current （E.ItE） 20:fault for self-study of motor （E.tE） 21: operation fault of EEPROM (E.EEP） 22: Fault for break line of PID feedback （E.PId) 23:Brake unit fault (E.bCE) 24:Reservation (END)		■
Record recent fault types of AC frequency vector inverter: 0: Fault free; 1～24 is about 24 different faults; see fault inspection and removal for detail.					
118	P07.10	Operation frequency of current fault		0.00Hz	■

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
119	P07.11	Output current of current fault		0.0A	■
120	P07.12	Busbar voltage of current fault		0.0V	■
121	P07.13	State for input terminal of current fault		0	■
122	P07.14	State for output terminal of current fault		0	■

State for input terminal of current is a decimal number; state order for all digital input terminal when it shows the latest fault is:

BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
DI6	DI5	DI4	DI3	DI2	DI1

Current input terminal is ON and its corresponding bit is 1;OFF is 0; and the state for digital input signal can be known via this value.

State for output terminal of current is a decimal number; state order for all digital input terminal when it shows the latest fault is:

BIT2	BIT1	BIT0
OUT	SPA	SPB

Current output terminal is ON and its corresponding bit is 1;OFF is 0; and the state for digital output signal can be known via this value.

6-2-9.P08 group output terminal group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
123	P08.00	Output choice for numerical magnitude of SPA	0: No output 1: Motor is at the state of forward rotation 2: Motor is at the state of reverse rotation 3: Fault output	1	◇
124	P08.01	Output choice for numerical magnitude of SPB		1	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
125	P08.02	Output choice of relay	4: Level detection of frequency and PDT output 5: Reach Frequency 6: Zero-speed operation 7: Reach frequency of upper limit 8: Reach frequency of lower limit 9:frequency of lower limit setting reached 10:FDT Reached 11:Inverter ready signal 12:Motor Forward /Reverse running 13:auxiliary motor1 start 14:auxiliary motor2 start	3	◇
0: No output 1. Forward rotation of AC frequency vector inverter. If there is frequency is output when the AC frequency vector inverter rotates forward , then ON signal will be output. 2. Reverse rotation of AC frequency vector inverter. If there is frequency is output when the AC frequency vector inverter rotates reversely , then ON signal will be output. 3. Fault output : when AC frequency vector inverter has fault, the ON signal will be output. 4. Frequency level detects the reach of PDT and please refer to the detailed inverter for function code of P09.17 and P09.18. 5. please refer to the detailed inverter for function code of P09.17 and P09.18 for the reach of frequency. 6. During the operation of zero-speed, when the output frequency of AC frequency vector inverter and presetting frequency is zero at the same time, the ON signal will be output. 7. Reach frequency of upper limit: when the operation frequency reaches the upper-limiting frequency, the ON signal will be output. 8. Reach frequency of lower limit: when the operation frequency reaches the lower-limiting frequency, the ON signal will be output.. 9:frequency of lower limit setting reached 11:Inverter ready signal 12:Motor Forward /Reverse running 13:auxiliary motor1 start 14:auxiliary motor2 start			
126	P08.03	SPA output terminal signal delay	0～3600.0s	0.0s	◇
127	P08.04	SPB output terminal signal delay	0～3600.0s	0.0s	◇
128	P08.05	Relay output terminal signal delay	0～3600.0s	0.0s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
129	P08.06	Output choice of AO1	0: operation frequency 1: setting frequency 2 :rotate speed of operation 3: output current 4: output voltage 5: output power 6 :output torque 7: Input value of analog AI1 8: Input value of analog AI2 9～10: Reservation	0	◇
Standard output of simulated output is 0～20mA(or 0～10V) and current and voltage output can be chosen via jumping line JP4. the scope for corresponding capacity represented by it is shown as following:					
130	P08.07	Lower limit for output of AO1	0.0%～100.0%	0.0%	◇
131	P08.08	Lower limit corresponds with output of AO1	0.00V ～10.00V	0.00V	◇
132	P08.09	Upper limit for output of AO1	0.0%～100.0%	100.0%	◇
133	P08.10	Upper limit corresponds with output of AO1	0.00V ～10.00V	10.00V	◇

The above function defines the corresponding relationship between simulated input voltage and simulated input; extra part will be calculated based on maximum input or minima input when the simulated voltage exceeds the scope of maximum input or minimal input .

When the simulated output is current output, what voltage corresponds with 1mA is 0.5V.

Simulated output capacity corresponded by 100.0% of the output value at different application occasion will be different; please see the inverter of every application part for the detail.

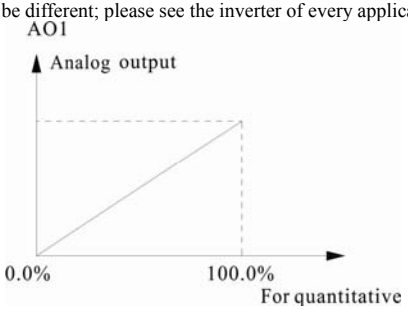


chart6-14 corresponding relation between fixed variable and analog output

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
134	P08.11	Output choice of AO2	0: operation frequency 1: setting frequency 2: rotate speed of operation 3: output current 4: output voltage 5 :output power 6: output torque 7: Input value of analog AI1 8: Input value of analog AI2 9～10: Reservation	0	◇
135	P08.12	Lower limit for output of AO2	0.0%～100.0%	0.0%	◇
136	P08.13	Lower limit corresponds with output of AO2	0.00V ～10.00V	0.00V	◇
137	P08.14	Upper limit for output of AO2	0.0%～100.0%	100.0%	◇
138	P08.15	Upper limit corresponds with output of AO2	0.00V ～10.00V	10.00V	◇
There are one multifunctional output terminals of the number and one multifunctional output terminal of relay as well as a multifunctional output terminal of of analog in the standard unit of PT200 series AC frequency vector inverter.					

6-2-10.P09 group enhancement group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
139	P09.00	Acceleration time 2	0.1～3600.0s	Type setting	◇
140	P09.01	Deceleration time 2	0.1～3600.0s	Type setting	◇
141	P09.02	Acceleration time 3	0.1～3600.0s	Type setting	◇
142	P09.03	Deceleration time 3	0.1～3600.0s	Type setting	◇
143	P09.04	Acceleration time 4	0.1～3600.0s	Type setting	◇
144	P09.05	Deceleration time 4	0.1～3600.0s	Type setting	◇
As for the acceleration and deceleration time, please choose P01.11and P01.12 and the acceleration and deceleration time mentioned above; please refer to relative inverter of P01.11and P01.12. Acceleration and deceleration time 1 and acceleration and deceleration time 2, 3 and 4 can be switched via multifunctional input terminal of the number. Please see P06 group-input terminal group for detail.					
145	P09.06	Operation frequency of JOG	0.00～P01.07(maximum frequency)	5.00Hz	◇
146	P09.07	Acceleration time of JOG operation	0.1～3600.0s	Type setting	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
147	P09.08	Deceleration time of JOG operation	0.1～3600.0s	Type setting	◇
Define the presetting frequency and acceleration and deceleration time for the JOG operation. The start and stop method of JOG operation is: direct start and halt with deceleration. Acceleration time of JOG refers to the time required by AC frequency vector inverter from 0Hz to maximum output power (P01.07) Deceleration time of JOG refers to the time required by AC frequency vector inverter from maximum output power to 0Hz (P01.07)					
148	P09.09	Hopping frequency	0.00～P01.07(maximum frequency)	0.00Hz	◇
149	P09.10	Range of hopping frequency	0.00～P01.07(maximum frequency)	0.00Hz	◇
When the frequency set is within the scope of hopping frequency, actual operation frequency will be the boundary of hopping frequency.. The setting of hopping frequency can make AC frequency vector inverter avoid mechanical resonance point of load. And this AC frequency vector inverter can set one hopping frequency point. If set all hopping frequency points to zero, then this function wouldn't take effect. Just as chart 5-14.					
150	P09.11	Range of pendulous frequency	0.0～100.0%(relative setting frequency）	0.0%	◇
151	P09.12	Range of jumping frequency	0.0～50.0%（relative range of pendulous frequency）	0.0%	◇
152	P09.13	Rise time pendulous frequency	0.1～3600.0s	5.0s	◇
153	P09.14	Fall time pendulous frequency	0.1～3600.0s	5.0s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

Pendulous frequency is appropriate for industries such as textile and chemical fiber and occasions requiring traversing and winding function. As chart 5-15.

Function of pendulous frequency refers the output frequency of AC frequency vector inverter makes up and down swing centralizing the setting frequency; track of operation frequency at the timer shaft is shown by the following chart; among them, the swinging range is set by P09.11; when P09.11 is set to 0, namely the swing range is 0; then pendulous frequency doesn't take effect.

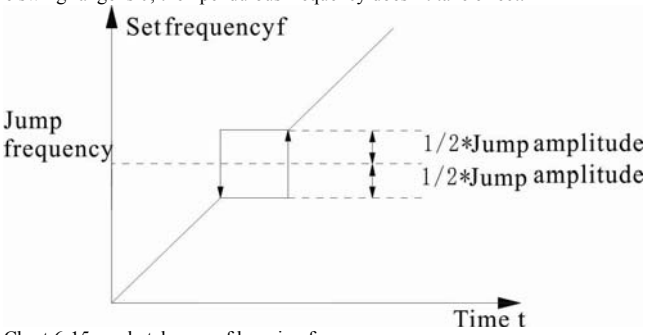


Chart 6-15 sketch map of hopping frequency

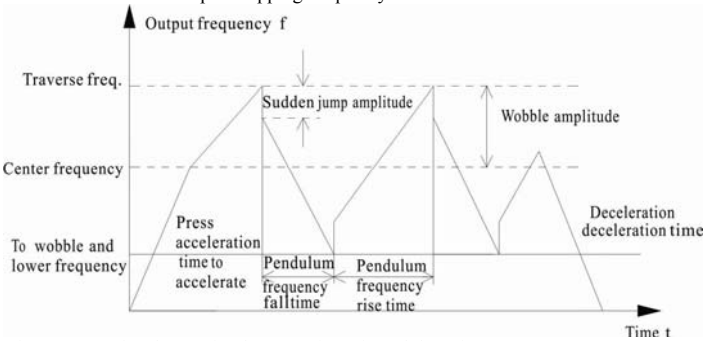


Chart 6-16 Sketch map for the operation of pendulous frequency

Range of pendulous frequency: operation frequency of pendulous frequency is limited to upper and lower limit frequency.

The swing range is relative to center frequency: swing range AW＝center frequency* swing range P09.11。

Jumping frequency＝swing range AW×range of jumping frequency P09.12. namely, when the pendulous frequency operates, the value corresponded by the jumping frequency to the swing range.

Rising time of pendulous frequency: the time required from the lowest point of pendulous frequency to the highest point of pendulous frequency.

Fall time of pendulous frequency: the time required from the highest point of pendulous frequency to the lowest point of pendulous frequency

154	P09.15	Times for automatic reset of the fault	0～3600	0	◇
155	P09.16	Setting for interval of automatic reset of the fault	0.1～100.0s	1.0s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
156	P09.17	Detection value for level of FDT	0.00 ～ P01.07(maximum frequency)	50.00Hz	◇
Times for automatic reset of the fault: when AC frequency vector inverter chooses automatic reset of the fault which can be used to set the times of automatic reset. When continuous reset of AC frequency vector inverter exceeds this value, then the fault of AC frequency vector inverter should await the opportune moment and require manual intervention. Setting for interval of automatic reset of the fault: select the interval from the occurrence of the fault to the automatic reset.					
157	P09.18	Detection value for hysteresis of FDT	0.0～100.0%（FDT level）	5.0%	◇
When the output frequency exceeds certain setting frequency PDT level, indicator signal of the output and output frequency reduces to a lower frequency than PDT level (detection value for hysteresis of PDT level-PDT); and see chart5-16 for concrete wave form.					
158	P09.19	Frequency reaches detection degree	0.0～100.0%(maximum frequency)	0.0%	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

When the output frequency of AC frequency vector inverter outputs pulse signal within the range of plus-minus detection width of the setting frequency; and see the following charts for detail:

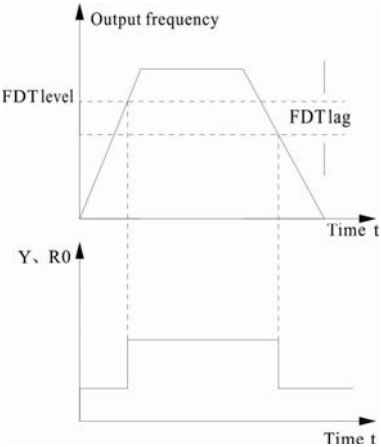


Chart6-17 Sketch map of FDT level

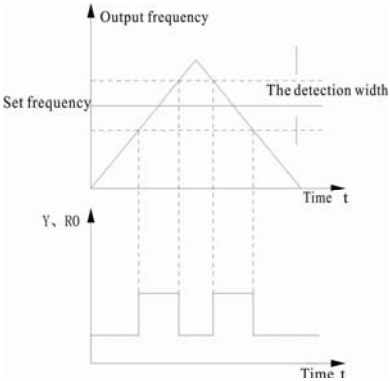


Chart 6-18 Sketch map for amplitude of frequency reaching the detection

159	P09.20	Voltage of brake valve	115.0～140.0%（voltage of standard generatrix）(380V series）	130.0%	◇
			115.0～140.0%（voltage of standard generatrix）(220V series）	120.0%	

This function code is the voltage of initial generatrix for setting dynamic braking; proper adjusting for this value can effectively make brake for the load.

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
160	P09.21	Display coefficient of rotate speed	0.1～999.9% machinery rotate speed =120*operation frequency*P09.21/pole number	100.0%	◇
machinery rotate speed =120*operation frequency*P09.21/pole number; this function code is used for correcting the error displayed by ruling of rotate speed and it has no effect on actual rotate speed.					
161	P09.22	Decrease loading frequency at low speed	0～1	1	◇
P09.22＝0Decrease loading frequency at low speed, function off Decrease loading frequency at low speed, function on					

6-2-11.P10 group PID control group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
162	P10.00	Selection **for** given power supply of PID	0:keyboard presetting （P10.01） 1: Presetting for simulated channel AI1 2: Presetting for simulated channel AI2 3: Presetting of remote communication 4: Presetting of multistep speed	0	◇
0: keyboard presetting（P10.01） 1: Presetting for simulated channel AI1 2: Presetting for simulated channel AI2 3: Presetting of remote communication 4: Presetting of multistep speed When the frequency source selects PID, namely the selection of P01.03 is 5; the function in this group takes effect. And this parameter decides the given channel for target value of process PID. Value for target setting of process PID is the relative value; and 100% set is corresponding with 100% for the feedback signal of the controlled system. The system always makes calculation according to relative value (0～100.0%). Notice: presetting of multistep speed can be achieved via the parameter in P10 group.					
163	P10.01	Keyboard presets the PID presetting	0.0%～100.0%	0.0%	◇
Select P10.00=0, namely the target source is the presetting of keyboard. And this parameter need resetting. Base value of this parameter is the feedback variable of the system.					

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
164	P10.02	Selection for feedback source of PID	0: Feedback for simulated channel AI1 1: Feedback for simulated channel AI2 2: Feedback of AI1+AI2 3: Feedback of remote communication	0	◇
0: Feedback for simulated channel AI1 1: Feedback for simulated channel AI2 2: Feedback of AI1+AI2 3: Feedback of remote communication Select feedback channel of PID via this parameter. Notice: the given channel can't be coincidence with the feedback channel; or PID can't be controlled effectively					
165	P10.03	Selection for output characteristics of PID	0:PID output is positive 1:PID output is negative	0	◇
0: PID output is positive: when the feedback signal is bigger than the presetting of PID, output frequency of AC frequency vector inverter will reduce to make PID in balance. 1: PID output is negative: when the feedback signal is bigger than the presetting of PID, output frequency of AC frequency vector inverter will rise to make PID in balance.					
166	P10.04	Proportional gain（Kp）	0.00～100.00	1.00	◇
167	P10.05	Integral time（Ti）	0.01～10.00s	0.10s	◇
168	P10.06	Derivative time（Td）	0.00～10.00s	0.00s	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
Proportional gain(Kp): decides the regulation strength of the whole PID regulator; the bigger P, the bigger the regulation strength. If the parameter is 100, it shows when the bias between the feedback variable and given variable of PID is 100%, the regulation range of PID regulator on the inverter of output frequency is maximum frequency (ignoring integral action and derivative action). Integral time (Ti): decides the speed of integral regulation for the bias between the feedback variable and given variable of PID regulator; integral time refers when the bias between the feedback variable and given variable of PID is 100%, integral controller (ignoring integral action and derivative action) makes continuous regulation via this period and then the regulation variable reaches maximum frequency (P01.07). The shorter the integral time, the stronger the regulation strength. Derivative time(Td): decide the strength for PID regulator to regulate the change rate of bias between the feedback variable and given variable of PID. Derivative time refers if the change of the feedback variable is 100% during this period, regulation variable of differential regulator is maximum frequency (P01.07) (ignoring integral action and derivative action). The longer the derivative time, the stronger the regulation strength. PID is a control method which is frequently used PID; every part of PID has different effect; the following is a brief introduction about its work principle and regulation method: Proportional control (P): when there is deviation between the feedback and presetting, the output and deviation forms proportionable regulating variable; if the deviation is constant, then the regulating variable is also constant. Proportional regulation can quickly response to the change of feedback; however, the control without deviation can't be obtained only by means of proportional regulation. The bigger the proportional gain, the quicker the regulating speed of the system; if the proportional gain is too big, it will cause vibration. Adjusting method is to firstly set a very long time for the integral time and set derivative time to 0; use proportional regulation to make the system operate and then change the presetting; observe the stable deviation (offset); if the offset is at the change direction of the presetting (e.g. increase the presetting, the feedback variable is always smaller than the presetting after the stabilization of the system); then increase the proportional gain continuously; conversely, reduce proportional gain; repeat the above process until the offset is very small (it is difficult to have no offset). Integral time(I): when there is deviation between the feedback and presetting, then regulating variable of output will increase continuously; if the deviation exists continuously , then the regulating variable increases continuously till there is no deviation; integral controller can effectively eliminate the offset. If the integral controller is too strong, it will cause repeated overstrike which can make the system unstable until the vibration appears. Characteristics for the vibration caused by strong vibration is that the feedback signal swings up and down the presetting; and its ranges increases gradually till vibration. Regulation for parameter of integral time is generally from big to small; and the integral time is regulated gradually and observe the effect of the system regulation until the stable speed of the system reaches the requirement. Derivative time(D): when the deviation between the feedback and presetting changes, the output and change rate of deviation forms proportionable regulating variable; this regulating variable is only related with the direction and size of the deviation change and it has nothing to do with the direction and size of the deviation. The effect of derivative time is to feedback when the signal changes and then make regulation based on the change tendency; consequently, it can restrict the change of feedback signal. Please use the derivative regulator carefully because the derivative regulator can easily amplify the interference of the system, particularly, the interference with a higher change frequency.					
169	P10.07	Sampling period（T）	0.01～100.00s	0.10s	◇
170	P10.08	Deviation limit of PID control	0.0～100.0%	0.0%	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

Sampling period (T): it refers the sampling period for the feedback variable; and the regulator calculates once in every sampling period. The longer the sampling, the slower the response.

Limit for control deviation of PID: output value of PID system is corresponding with maximum deviation allowed by the given value of closed loop; just as the chart shows that PID regulator stops regulating in the deviation limit. Proper adjusting this function code can regulate the accuracy and stability of PID system.

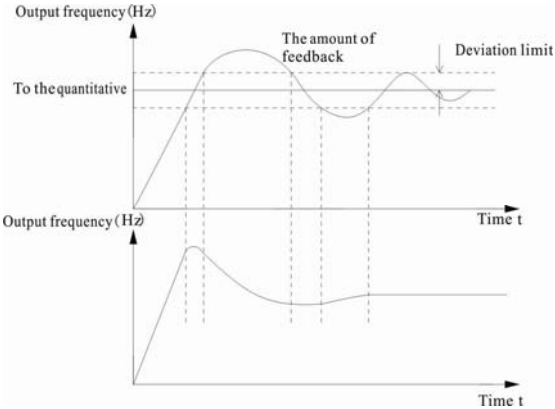


Chart 6-19 corresponding relation between the deviation limit and the output frequency

171	P10.09	Detection value for break line of feedback	0.0～100.0%	0.0%	◇
172	P10.10	Detection time for break line of feedback	0.0～3600.0s	1.0s	◇

Detection value for breakline of feedback: what corresponds with this detection value is full range (100%) ; the system will always detect the feedback variable of PID; when the detection variable is smaller or equal to the detection value for the break line of feedback; the system begins to inspect the timing. When the detection time exceeds the detection time for the break line of feedback, the system will report the fault (E.PId) for break line of feedback.

PID control is a common method for the process control; it make proportional, integral and derivative calculation via the deviation between the feedback variable of controlled variable and signal of the targeted variable to adjust the output frequency of AC frequency vector inverter, form negative feedback system and make the controlled variable stabilize at the targeted variable; it is suitable for process control such as flow control, pressure control and temperature control. Framework for basic principle of the control is as follow:

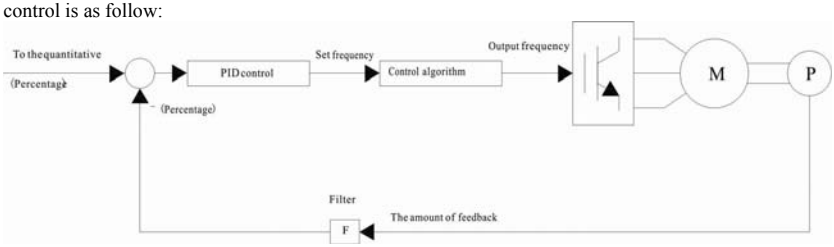


Chart 6-20 Functional block diagram of process PID

6-2-12.P11 group control group of multistep speed

Item	Code	Description of LED/OLED Keyboard display	SETTING RANGE	FACTORY SETTING	Change
Simple PLC function is inverter built a programmable controller (PLC) to complete the multi-frequency logic for automatic control . You can set operating time, running direction and operating frequency , in order to meet process requirements. The inverters can achieve 16 speed change control , there are four kinds of acceleration and deceleration time for selection. Set by the PLC to complete a cycle, the switch output terminal will output an ON signal .					
173	P11.00	Simple PLC Operation mode	0～2	0	◇
0 : Stop after the first run . The inverter automatically shut down after completing a round robin , you need to run the command is given before starting again . 1: The final value after the first run to keep running . Inverter automatically after completing a round robin at the operating frequency of the last paragraph , direction. 2: The loop runs . After the completion of a cycle inverter automatically starts the next cycle until the shutdown command, the system downtime .					

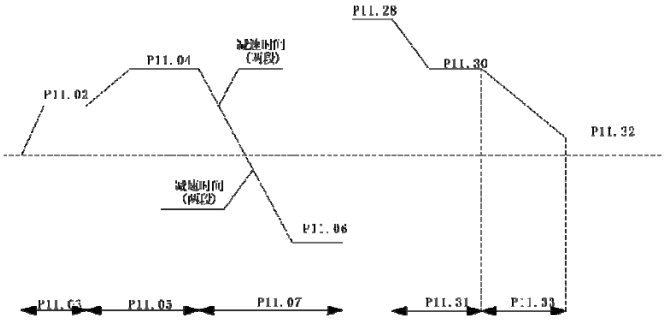


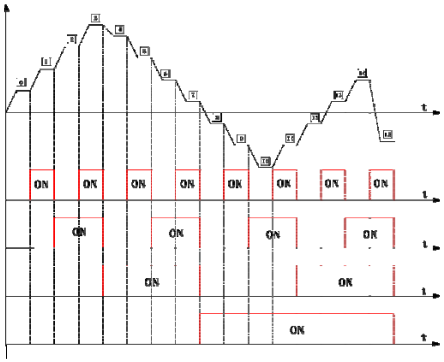
Diagram 6-21 Simple PLC description

174	P11.01	Simple PLC memory selection	0～1	0	◇
0 : Power off, no memory 1: Power off memory PLC down memory refers to the memory of the PLC before power operation phase , the operating frequency .					
175	P11.02	Multi-speed 0	-100.0～100.0%	0.0%	◇
176	P11.03	Segment 0 : running time	0.0～6553.5s	0.0s	◇
177	P11.04	Multi-speed 1	-100.0～100.0%	0.0%	◇
178	P11.05	Segment 1 running time	0.0～6553.5s	0.0s	◇
179	P11.06	Multi-speed 2	-100.0～100.0%	0.0%	◇

180	P11.07	Segment 2 running time	0.0～6553.5s	0.0s	◇
181	P11.08	Multi-speed 3	-100.0～100.0%	0.0%	◇
182	P11.09	Segment 3 running time	0.0～6553.5s	0.0s	◇
183	P11.10	Multi-speed 4	-100.0～100.0%	0.0%	◇
184	P11.11	Segment 4 running time	0.0～6553.5s	0.0s	◇
185	P11.12	Multi-speed 5	-100.0～100.0%	0.0%	◇
186	P11.13	Segment 5 running time	0.0～6553.5s	0.0s	◇
187	P11.14	Multi-speed 6	-100.0～100.0%	0.0%	◇
188	P11.15	Segment 6 running time	0.0～6553.5s	0.0s	◇
189	P11.16	Multi-speed 7	-100.0～100.0%	0.0%	◇
190	P11.17	Segment 7 running time	0.0～6553.5s	0.0s	◇
191	P11.18	Multi-speed 8	-100.0～100.0%	0.0%	◇
192	P11.19	Segment 8 running time	0.0～6553.5s	0.0s	◇
193	P11.20	Multi-speed 9	-100.0～100.0%	0.0%	◇
194	P11.21	Segment 9 running time	0.0～6553.5s	0.0s	◇
195	P11.22	Multi-speed 10	-100.0～100.0%	0.0%	◇
196	P11.23	Segment 10 running time	0.0～6553.5s	0.0s	◇
197	P11.24	Multi-speed 11	-100.0～100.0%	0.0%	◇
198	P11.25	Segment 11 running time	0.0～6553.5s	0.0s	◇
199	P11.26	Multi-speed 12	-100.0～100.0%	0.0%	◇
200	P11.27	Segment 12 running time	0.0～6553.5s	0.0s	◇
201	P11.28	Multi-speed 13	-100.0～100.0%	0.0%	◇
202	P11.29	Segment 13 running time	0.0～6553.5s	0.0s	◇
203	P11.30	Multi-speed 14	-100.0～100.0%	0.0%	◇
204	P11.31	Segment 14 running time	0.0～6553.5s	0.0s	◇

205	P11.32	Multi-speed 15	-100.0～100.0%	0.0%	◇
206	P11.33	Segment 15 running time	0.0～6553.5s	0.0s	◇

Frequency setting 100.0% corresponds to the maximum frequency (P01.07). When determining the PLC operation mode, you need to set P11.02 ~ P11.33 to determine its characteristics.
Description: Simple PLC depends on the direction of multi-speed setting symbols. If negative , then the reverse direction.



6-22 Multi-speed operation logic Diagram

Multi-speed in -Fmax ~ Fmax range , continuous setting. PT200 series inverter stage speed can be set to 16 by the external terminals DI1, DI2, DI3, DI4 combination of coding options , corresponding to the multi- step speed up speed 0 15 Figure 6-22 for the multi-speed operation logic diagram.

DI1 = DI2 = DI3 = DI4 = OFF , the frequency input mode selected by the code P01.03 . DI1 = DI2 = DI3 = DI4 terminal insufficiency is OFF, the multi -speed operation , multi-speed higher priority than the keyboard, analog , PLC, communication frequency input via DI1, DI2, DI3, DI4 combination of encoding , select up to 16 speeds.

Multi-speed run-time start- stop determined by the same function code P01.10 , multi-speed control process shown in Figure 6-21 . DI1, DI2, DI3, DI4 terminal and multi-speed section of the relationship as follows:

DI1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
DI2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
DI3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
DI4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
段	0	1	2	3	4	5	6	7
DI1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
DI2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
DI3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
DI4	ON	ON	ON	ON	ON	ON	ON	ON
段	8	9	10	11	12	13	14	15

207	P11.34	Simple PLC sector 0 to 7, acceleration &deceleration time selection	0～0xFFFF	0	

Bits		segment	Acceleration & deceleration time 0	Acceleration & deceleration time 1	Acceleration & deceleration time 2	Acceleration & deceleration time 3
BIT1	BIT0	1	00	01	10	11
BIT3	BIT2	2	00	01	10	11
BIT5	BIT4	3	00	01	10	11
BIT7	BIT6	4	00	01	10	11
BIT9	BIT8	5	00	01	10	11
BIT11	BIT10	6	00	01	10	11
BIT3	BIT12	7	00	01	10	11
BIT15	BIT14	8	00	01	10	11

208	P11.35	Simple PLC segment 8-15 Acceleration & deceleration time selection	0～0xFFFF	0	

Bits		segment	Acceleration & deceleration time 0	Acceleration & deceleration time 1	Acceleration & deceleration time 2	Acceleration & deceleration time 3
BIT1	BIT0		00	01	10	11
BIT3	BIT2		00	01	10	11
BIT5	BIT4	0	00	01	10	11
BIT7	BIT6	1	00	01	10	11
BIT9	BIT8	2	00	01	10	11
BIT11	BIT10	3	00	01	10	11
BIT3	BIT12	4	00	01	10	11
BIT15	BIT14	5	00	01	10	11

After the user selects the corresponding segment of acceleration, deceleration time, the combination of a 16-bit binary number to decimal conversion , set into the corresponding function code can be.

209	P11.36	PLC Re-Start mode selection	0～2	0	

0 : From the first paragraph starts running . From the first paragraph starts running , running down (by the stop command , failure or brownout causes) , and then start running after starting from the first paragraph .

1 : From the moment the stage interrupt frequency continues to run, run shutdown (or failure caused by a stop command) , the drive automatically record the current phase of the running time , re-start automatically after entering the stage to the stage to continue the remaining defined frequency time of operation, as shown below

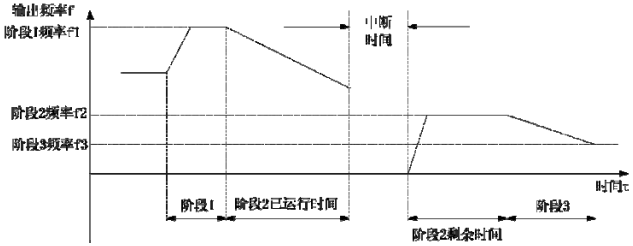


Diagram 6-23 Simple PLC start mode 1

2.Operating frequency from the interrupt time continues to run

210	P11.37	Multi time unit selection	0～1	0	◇

0：Second

1：Minute

Define the operational phase of time units PLC。

211	P11.38	Multi frequency 0 setting mode	0～6	0	◇

These parameters determine the multi-stage instruction 0 given channel .

0: The function code P11.02 given .

1: The function code P01.10 keyboard given .

2: AI1 given .

3: AI2 given .

4: AI1 + AI2 given .

5: PID setpoint.

6: potentiometer given .

In addition to multi-stage instruction 0 can choose P11.02 , there are many other options to facilitate the multi-stage instruction given with other switch between . In the multi- frequency source or instruction as simple PLC is the frequency source, can achieve two kinds of frequency source switching.

6-2-13.P12 group communication parameter group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
212	P12.00	Setting for Baud rate of communication	0:1200bps 1:2400bps 2:4800bps 3:9600bps 4:19200bps 5:38400bps	4	◇
This parameter is used to set the transmission rate of data between upper computer and AC frequency vector inverter. Notice: Baud rate of upper computer and AC frequency vector inverter must be accordant; or the communication can't be made. The bigger the Baud rate, the quicker the communication speed.					
213	P12.01	Setting for bit check of data	0: Without verification（N，8，1）for RTU 1: Even parity check（E，8，1）for RTU 2: Odd parity check（O，8，1）for RTU 3: Without verification（N，8，2）for RTU 4: Even parity check（E，8，2）for RTU 5: Odd parity check（O，8，2）for RTU 6: Without verification (N，7，1)for ASCII 7: Even parity check (E，7，1)for ASCII 8: Odd parity check (O，7，1)for ASCII 9: Without verification (N，7，2)for ASCII 10: Even parity check (E,7,2)for ASCII 11: Odd parity check (O,7,2)for ASCII 12: Without verification (N,8,1)for ASCII 13: Even parity check (E,8,1)for ASCII 14: Odd parity check (O,8,1)for ASCII 15: Without verification (N,8,2)for ASCII 16: Even parity check (E,8,2)for ASCII 17: Odd parity check (O,8,2)for ASCII	1	◇
Data format of upper computer and AC frequency vector inverter must be accordant, or the communication can't be made.					
214	P12.02	Communication address of this method	1～247，0 is the broadcast address	1	◇

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
When the host machine is writing frame and the setting for communication address of from machine is zero, namely, communication address of broadcast; all from machines on MODBUS will receive this frame, but the from machine makes no response. Notice, the address of from machine can't be set as 0. Communication address of this machine is unique in the network, which is the base for realizing point-to-point communication between upper computer and AC frequency vector inverter					
215	P12.03	Delay for communication response	0～200ms	5ms	◇
Delay of response: it refers to the interval from the accomplishment for data acceptance of AC frequency vector inverter to sending response data to upper computer. If the delay of response is shorter than the processing time of the system, then the delay of response is subject to the processing time of the system; if the delay of response is longer than the processing time of the system, then it will prolong the waiting after the system disposes the data until it is time for the delay of response; and then can the data be sent to upper computer.					
216	P12.04	Delayed fault time of communication	0.0 (invalid)，0.1～100.0s	0.0s	◇
When the setting of this function code is 0.0s, parameter for timeout of communication is invalid When this function code is set to an effective value, if the interval time between a communication and next communication exceeds timeout of the communication, the system will report fault error of communication (E.CE). Generally speaking, it is set to a invalid state. If set this parameter in the system of continuous communication, it can monitor the communication condition.					
217	P12.05	Disposal for transmission error	0: alarm and random parking 1: No alarm and continuous operation 2: Halt according the halt method without alarm(only for communication method) 3: Halt according the halt method without alarm(for all control methods)	1	◇
0: alarm and random parking 1: No alarm and continuous operation 2: Halt according the halt method without alarm(only for communication method) 3: Halt according the halt method without alarm(for all control methods) AC frequency vector inverter can choose whether to shield CE fault, halt or maintain continuous operation via setting disposal activities of communication error under abnormal communication condition.					
218	P12.06	Disposal for transmission response	0: writing operation with response 1: writing operation without response	0	◇
When the unit for LED of this function code is set to 0, AC frequency vector inverter responses to the reading and writing order of upper computer. When the unit for LED of this function code is set to 1, AC frequency vector inverter only responses to the reading order of upper computer and has no response to writing order; and this method can improve the communication efficiency.					

6-2-14.P13 group protection function group

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
219	P13.00	Input the protection selection of default phase	0: Prohibit 1: Permit	1	□
Select whether to protect the default phase of the input. 18.5KW AC frequency vector inverter for G type of of POWTECH or above this power can have the protection function of input default; no matter the setting of P13.00 is 0 or 1, power below 18.5KW P type has no protection function of input default					
220	P13.01	Output the protection selection of default phase	0: Prohibit 1: Permit	1	□
Select whether to protect the input default					
221	P13. 02	0: No protection 1: Ordinary motor (having compensation with low speed) 2: variable frequency motor (without compensation with low speed ）	protection selection of motor overload	2	□
0: No protection. Have no protective feature of motor overload (please use it carefully); at this moment, AC frequency vector inverter has no overload protection for the load motor. 1: Ordinary motor (having compensation with low speed). Corresponding thermal protection of the electron should be adjusted properly because heat dissipation for common motor becomes weaker; so-called compensation with low speed herein refers adjusting protective value value for motor overload whose operation frequency is lower than 30HZ. 2: Variable frequency motor (without compensation with low speed). It is unnecessary to adjust the protection value of the operation with low speed because the heat dissipation for the motor exclusively used by variable frequency is not influenced by the rotate speed.					
222	P13.03	Protective current of motor overload	20.0%～120.0%(rated current of motor)	100.0%	◇
223	P13.04	Underclocking point for instant power failure	70.0～110.0%(voltage of standard generamatrix)	80.0%	◇
224	P13.05	Descent rate for frequency of instant power failure	0.00Hz～P01.07(maximum frequency)	0.00Hz	◇
225	P13.06	Protection for overvoltage and speed reduction	0: Prohibit 1: Permit	0	◇
226	P13.07	Protective for voltage of overvoltage and speed reduction	110～150%（380V series)	120%	◇
			110～150%（220V series)	120%	◇
P13.06 0: Prohibit 1: Permit During the operation process of AC frequency vector inverter, actual descent rate for rotate speed of motor is lower than descent rate of output frequency due to the influence of load inertia; at this moment,motor will feedback the electric energy to AC frequency vector inverter; it will cause the rise for generatrix voltage of AC frequency vector inverter; if measures won't be taken for this, it will cause the rise of genertrix voltage and the tripping and overvoltage fault of of AC frequency vector inverter.					

Speed reduction protection of overvoltage refers making comparing with speed reduction point of overvoltage defined in P13.07 (with respective to standard generatrix voltage) via detecting the generatrix voltage during the operation process of AC frequency vector inverter; if it exceeds the speed reduction point of the overvoltage, then the output frequency of of AC frequency vector inverter will stop falling; and it will continuously decelerate until it detects the generatrix voltage is lower than the speed reduction point of overvoltage. As chart 5-22:

227	P13.08	Level of automatic current limiting	100～200%	G type: 160% P type :120%	◇
228	P13.09	Descent rate for frequency of current limiting	0.00～100.00Hz/s	10.00Hz/s	◇

During the operation process of AC frequency vector inverter, actual rate of rise for rotate speed of motor is lower than the rise rate of output frequency due to high load; if measures won't be taken for this, it will cause overcurrent fault with acceleration and the tripping of AC frequency vector inverter.

During the operation process of AC frequency vector inverter, automatic current-limit function will make a comparison with the current-limit level point defined in P13.08 via detecting the output current; if it exceeds the level point of the current limit, then the output frequency of of AC frequency vector inverter will reduce based on droop rate of overfrequncy (P13.09); it will return to to normal operation after it detects the current is lower than the level point of current limit. As chart 5-23:

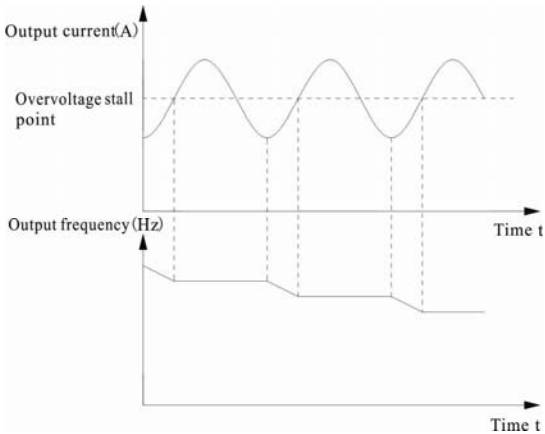


Chart6-21 Speed reduction function of overvoltage

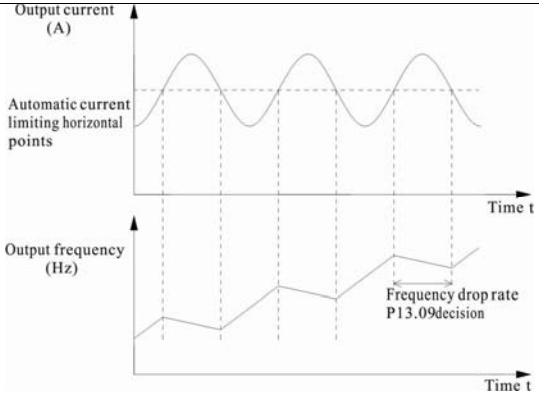


Chart 6-22 Speed reduction function of overcurrent

229	P13.10	Choice for the selection of current limiting activity	0: current limiting is always effective 1: current limiting is ineffective for constant speed	0	◇

Function of automatic current-limit is always effective under the state of deceleration; whether the function of automatic current-limit is effective is decided by the selection of automatic current-limit (P13.100).

P13.10＝0 shows current-limit is effective when constant speed operates;

P13.10＝1 shows current-limit is ineffective when constant speed operates;

When the current-limit operates, output frequency may change to some extent; so it is not suitable to use the function of current-limit for the place where requires statable output frequency for constant speed.

When current-limit is effective, it may affect the overload capacity due to the lower setting of current-limit level.

6-2-15.P14 group water supply function

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
230	P14.00	Operation function of PID	0: halt without operation 1: halt with operation	0	□
231	P14.01	Awakening frequency	dormancy frequency （P14.03）～maximum frequency（P01.07）	10.00Hz	□
232	P14.02	Delay time of awakening	0.0s～3600.0s	1000.0s	□
233	P14.03	Dormancy frequency	0.00Hz～wakening frequency （P14.01）	5.00Hz	□
234	P14.04	Delay time of dormancy	0.0s～3600.0s	500.0s	□

The parameter in this group is used to realize the dormancy and awakening function for function of water supply.

During the operation process of AC frequency vector inverter, when the setting frequency is smaller or equal to dormancy frequency in P14.03, AC frequency vector inverter enters into dormancy

state and stops automatically after the delay time in P14.04.

When AC frequency vector is at a dormancy state and the current operation command is effective and the setting frequency is bigger or equal to awakening frequency in P14.01, AC frequency vector inverter begins to start after the delay time in P14.02.

As a general rule, please make the awakening frequency bigger or equal to the dormancy frequency. Suppose awakening frequency and dormancy frequency were 0.00Hz, then the dormancy and awakening function is invalid.

When the dormancy function is started, if frequency source uses PID, the calculation for dormancy state is influenced by function code P14.00; at this moment, PID must be used to select PID to operate enabling(P14.00=10).

235	P14.05	Droop control	0.00～10.00Hz[0.00H]	0.00Hz	□
236	P14.06	Effective choice of helper motor	0～3[0]	0	□
237	P14.07	Delay time for the start and stop of helper motor 1	0.0～3600.0[5.0s]	5.0s	□
238	P14.08	Delay time for the start and stop of helper motor 2	0.0～3600.0[5.0s]	5.0s	□

When the same load is driven by many AC frequency vector inverters, unbalanced distribution of the load will be caused due to different speed; consequently, it will AC frequency vector inverter with higher load bear heavier load. Characteristic of droop control is that it can make the speed droop change with the increase of the load and make a balanced distribution for the load.

6-2-16.P15 group manufacturer's function

No.	Code	Describing LED/OLED Keyboard display	Setting range	Factory setting	Change
239	P15.00	Manufacturer password	0～65535	*****	■

This group is the manufacturer's parameter and the user should not try to open the parameter in this group, or it will make abnormal operation or damage of AC frequency vector inverter.

Chapter 7 EMC(Electro Magnetic Compatibility）

7-1. Definition

Electromagnetic compatibility refers to the operation of electrical equipment in the environment with electromagnetic interference; it doesn't disturb the electromagnetic environment and stabilize its ability on realizing its function.

7-2. Introduction of EMC standard

Based on the requirement of national standard GB/T12668.3,AC frequency vector inverter should meet the requirement of electromagnetic interference and anti-electromagnetic interference.

The existing products of our company implements the latest international standard: IEC/EN61800-3:2004 （Adjustable speed electrical power drive systems part 3:EMC requirements and specific test methods）and national standard GB/T12668.3. IEC/EN61800-3 mainly inspects AC frequency vector inverter from electromagnetic interference and anti-electromagnetic interference. Electromagnetic interference makes test on the radiated interference, conducted interference and harmonic interference of AC frequency vector inverter (for civil AC frequency vector inverter).

anti-electromagnetic interference mainly makes test on conducted immunity, radiated susceptibility, SURGE, quick and sudden EFT, ESD immunity and immunity at the bottom of power supply of AC frequency vector inverter (specific test project includes : 1. Test on immunity for temporary reduction, interruption and change of AC frequency vector inverter; 2. Test on the immunity at the breach of commutation; 3. Test on the immunity of harmonic wave input; 4. Test on the change of input frequency; 5. Test on imbalance of input voltage; 6. Test on immunity of input voltage). The test is made according to the strict requirement of the above IEC/EN61800-3; products of our company are installed and used based on the guidance shown in 7.3 and they will have good electromagnetic compatibility under normal industrial environment.

7-3.EMC guidance

7-3-1. Influence of harmonic wave

Higher harmonic of the power supply will damage AC frequency vector inverter; as a result, it is suggested to install AC input reactor for the place with low quality of power grid.

7-3-2.Electromagnetic interference and installation notes

Electromagnetic interference has two types; one is the interference for electromagnetic noise of the surrounding to AC frequency vector inverter; and the other is the interference caused by AC frequency vector inverter to surrounding devices

Installation notes:

1）ground lead of **A**C frequency vector inverter and other electrical products should be connected with the ground well;

2）Input and output power line for the motive power of **A**C frequency vector inverter and signal line of weak current (like control wiring) should not be laid horizontally and lay them vertically if necessary.

3）power line for the output of **A**C frequency vector inverter is suggested to use shield cable or shielding power line of steel tube; and the shielding layer should be connected with ground reliably; leading wire for equipment disturbed is suggested to use shielding control line with twisted pair and the shielding layer should be connected with ground reliably ;

4）It is required to install output filter or electric reactor for the motor whose cable length is more than 100m.

7-3-3. Solution for the interference of surrounding electromagnetic equipment on AC frequency vector inverter

Generally speaking, the reason for causing electromagnetic effect on AC frequency vector inverter is there is a lot of relays, contactors or electromagnetic brakes surrounding **A**C frequency vector inverter; the following methods is suggested to use when **A**C frequency vector inverter is disturbed by them and operates wrongly:

1) install surge suppression on the device giving interference;

2) Install filter on the input terminal of **A**C frequency vector inverter; please refer to 7.3.6 for operation detail;

3) Use shielding cable for control signal line and leading wire for detection circuit of **A**C frequency vector inverter and connect the shielding layer to the ground reliably.

7-3-4. Solution for the interference of AC frequency vector inverter on its surrounding electromagnetic equipment

the noise in this part is divided into two types: one is the radiated interference of **A**C frequency vector inverter; and the other is the conducted interference of **A**C frequency vector inverter; the interference makes the surrounding electrical equipment have electromagnetic or electrostatic induction; then the interference can further make the device have wrong operation. Please refer to the following solutions for different interferences:

1) generally speaking, meter, receiver and sensor used for measuring has weak signal; and they are easy to interfere and cause wrong operation when they are near to **A**C frequency vector inverter or in the same control cabinet with **A**C frequency vector inverter; it is suggested to use the following methods to solve it: be away from the interference as far as possible; don't lay the signal line and power line horizontally; in particular, don't bind them together; signal line and power line uses shielding cable and connects with the ground well; add ferrite bead to the output side of **A**C frequency

vector inverter (blanketing frequency should be within 30～1000MHz) and roll 2-3 rings; EMC output filter can be installed for worse condition.

2) When the equipment disturbed and **A**C frequency vector inverter uses the same power supply, it will also cause conducted interference; if the methods mentioned above can't eliminate the interference, then install EMC filter between **A**C frequency vector inverter and power supply (please refer to 7.3.6 for detail of type operation) .

3)Independent grounding of external equipment can eliminate the interference caused by leak current which is caused by the grounding wire of **A**C frequency vector inverter when they share the ground together.

7-3-5. Leakage current and disposal

Leakage current of **A**C frequency vector inverter has two types: one is leakage current for the ground; and the other in leakage current among lines.

1) Factors affecting leakage current for ground and solution:

The wire and the ground has distributed capacitance; the bigger the distributed capacitance, the bigger the leakage current; effectively shorten the distance between **A**C frequency vector inverter and motor to reduce the distributed capacitance. The bigger the carrier frequency, the bigger the leakage current. Reduce carrier frequency to reduce the leakage current. However, reducing carrier frequency can cause the increase of motor noise; please pay attention to installing electric reactor is also an effective way to solve the leakage current. leakage current will increase with the increase of loop current; as a result, corresponding leakage current will be big when the motor power is large.

2）Factors affecting leakage current among lines and solution:

Output wirings have distributed capacitance; if the current passing through the circuit includes higher harmonic, then it is very likely to cause resonance and then result in leakage current. At this moment, if thermal relay is used, it may make it have wrong action.

The solution is to reduce carrier frequency or install output reactor. It is suggested not to install thermal relay before the motor when **A**C frequency vector inverter is used. And use the protective function for overcurrent of electron of **A**C frequency vector inverter.

7-3-6. Precautions for installing EMC input filter at the input terminal of the power supply :

1）Notice: rated value must be strictly followed when the filter is sued; mental case ground of filter should be connect with metal ground of installation cabinet because filter belongs to I electrical equipment; moreover, it should have good continuousness of electric, conduction , or it may have electric shock hazard or seriously affect EMC effect; it is discovered via EMC test that filter ground and ground at PE terminal of **A**C frequency vector inverter should be connected to the same public ground, or it will seriously affect EMC effect.

2）Install the filter at the input terminal for the power supply of AC frequency vector inverter as close as possible.

Chapter 8 Failure checking and removal

8-1. Failure information and removal method

No.	Failure code	Failure type	Possible reason of the failure	Countermeasures
1	E.oUP	U-phase protection of contravariant unit	1. Acceleration is to fast 2. Internal breakdown for IGBT of this phase 3. Interference causes wrong activity 4. whether the grounding is good enough	1. Increase acceleration time 2. Look for help 3. Inspect whether peripheral equipment has strong interference source
2	E.oUP	V-phase protection of contravariant unit		
3	E.oUP	W-phase protection of contravariant unit		
4	E.oC1	Overcurrent of acceleration	1. Acceleration is to fast 2. Low network voltage 3.Low power of AC frequency vector inverter	1. Increase acceleration time 2. Inspect input power 3. Select AC frequency vector inverter with a larger power
5	E.oC2	Overcurrent of constant speed	1. Deceleration is to fast 2. Large torque of load inertia 3. Low power of AC frequency vector inverter	1. Increase deceleration time 2. Add suitable dynamic braking component 3. Select AC frequency vector inverter with a larger power
6	E.oC3	Overcurrent of constant speed	1. Mutation or abnormality of the load 2. Low network voltage 3. Low power of AC frequency vector inverter	1. Inspect the load or reduce the mutation of the load 2. Inspect input power 3. Select AC frequency vector inverter with a larger power
7	E.oU1	Overvoltage of acceleration	1. Abnormal input voltage 2. Restart the motor in rotation after instant power off	1. Inspect input power 2. Avoid stopping and restarting
8	E.oU2	Overvoltage of deceleration	1. Deceleration is to fast 2. Large inertia of load 3 Abnormal input voltage	1. Increase deceleration time 2. Increase dynamic braking component 3. Inspect input power
9	E.oU3	Overvoltage of constant speed	1. Abnormal change of input voltage 2. Large inertia of load	1. Install input reactor 2. Add suitable dynamic braking component
10	E.LU	Undervoltage fault of generatrix	1. Low network voltage	1. Inspect input power of power grid
11	E.oL1	Motor overload	1. Low network voltage 2. Incorrect setting for rated current of the motor 3. Motor block or too large load sudden change 4. High-power heavy truck	1. Inspect network voltage 2. Set rated current of the motor again 3. Inspect load and adjust lifting capacity of the torque 4.Select proper motor

No.	Failure code	Failure type	Possible reason of the failure	Countermeasures
12	E.oL2	overload of AC frequency vector inverter	1.Acceleration is to fast 2. Restart the motor in rotation 3. Low network voltage 4. Too big load	1. increase acceleration time 2. Avoid stopping and restarting 3. Inspect network voltage 4. Choose AC frequency vector inverter with a much bigger power
13	E.PHI	Default phase at the input side	Input R, S and T has default phase	1. Inspect input power 2. Inspect installation wiring
14	E.PHo	Default phase at the output side	Output for U, V and W default phase(or load three-phase is seriously asymmetric	1. Inspect output wiring 2. Inspect motor and cable
15	E.oH1	Overheating of rectifier module	1. Instant overcurret of AC frequency vector inverter 2. Output three-phase has interphase or grounded short circuit 3. Block of air channel or fan damage 4. Too high temperature 5. Looseness for cable of control panel or plug-in unit 6. Damage of auxiliary power supply and undervoltage driving voltage 7. Direct connection for bridge arm of power module 8. Abnormal control panel	Refer to countermeasures of overcurrent 2. Wire again 3. Dredge air flue or replace the fan 4. Reduce environment temperature 5. Inspect and connect again 6. look for service 7. look for service 8. look for service
16	E.oH2	Overheating of contravariant module (only for 11kw~37kw)	1. Instant overcurret of AC frequency vector inverter 2. Output three-phase has interphase or grounded short circuit 3. Block of air channel or fan damage 4. Too high temperature 5. Looseness for cable of control panel or plug-in unit 6. Damage of auxiliary power supply and undervoltage driving voltage 7. Direct connection for bridge arm of power module 8. Abnormal control panel	1. Refer to countermeasures of overcurrent 2. Wire again 3. Dredge air flue or replace the fan 4. Reduce environment temperature 5. Inspect and connect again 6. look for service 7. look for service 8. look for service
17	E.SET	External fault	1. Activity for external input terminal of SI	1．Inspect the input of external equipment
18	E.CE	Communication fault	1. Improper setting of Baud rate 2. Adopt the communication mistake of serial communication 3.Long-term interrupt of communication	1．Set proper Baud rate 设 2．Press ⏎ to reset and look for service

No.	Failure code	Failure type	Possible reason of the failure	Countermeasures
				3． Inspect the wire at the communication interface
19	E.oCC	Fault of current detection on circuit	1. Bad contact for connector of control panel 2. Damage of auxiliary power 3. Damage of Hall device 4. Abnormal amplifying circuit	1． Inspect connector and insert the cable again 2．Look for service 3．Look for service 4．Look for service
20	E.TE	Fault for self-study of motor	1. Mismatching between the motor capacity and capacity of AC frequency vector inverter 2. Improper setting for rated parameter of the motor 3. Large deviation between the parameter obtained by self-study and standard parameter 4．Overtime self-study	1．Change the type of AC frequency vector inverter 2. Set rated parameter based on the nameplate of motor 3．Make the motor empty and recognize it again 4. Check motor connection and parameter setting
21	E.EEP	Reading and writing fault of EEPROM	1. Mistake for the reading and writing of control parameter 2. Damage of EEPROM	1. Press [=] to reset and look for service 2．Look for service
22	E.PId	Break-line fault for feedback of PID	1．Break-line for feedback of PID 2. Disappearance for feedback source of PID	1 Inspect break-line for feedback of PID 2．Inspect feedback source of PID
23	E.bCE	Brake unit fault	1. Fault of brake circuit and damage of brake pipe 2. Small external brake resistor value	1.Inspect brake unit and renew new brake pipe 2．Increase brake resistor
24	P．oFF	Shutdown display	1. Low input voltage 2. Improper setting of parameter 3. Shutdown display	1．Inspect whether the voltage is correct 2．Inspect whether the parameter is correct
25	END	Manufacturer's preservation		

Chapter 9 Maintenance and overhauling

9-1. Inspection and maintenance

Under the normal use of **A**C frequency vector inverter , it needs regular inspection(e.g . Overhauling of the machine or 6 months at most based on the stipulation) besides daily inspection; please implement it based on the following table to prevent the potential danger.

Inspection time		Inspection part	Inspection item	Inspection matter	Inspection method	Judgment standard
Everyday	Regular					
√		display	LED/OLED display	Whether the display has exception	Visual sense	Confirm based on the use condiition
√	√	Cooling system	Fan	Whether it has abnormal sound or	Visual sense and hearing	No abnormalities
√		reality	surrounding	Temperature, moisture, dust and	Visual sense, sense of	Based on 2-1 clause
√		Input and output terminal	Voltage	Whether the input and output voltage is abnormal	Measure terminal of R, S, T and U, V and W	Based on the stipulation of standard regulation
	√	Main circuit	General view	Whether the fastener loosens, has overhearing trace, electric discharge phenomenon, too much dust and whether its air flue is blocked	Visual contract, fastening and cleaning	No abnormalities
			Electrolytic capacitor	Whether its surface is	Visual contract	No abnormalities
			Conducting bar of wire	Whether it loosens	Visual contract	No abnormalities
			Terminal	Whether the bolt or screw	Fastening	No abnormalities

"√"means it needs daily or regular inspection.

The device can't be disassembled or shaken without excuse; connector can't be taken out randomly, or it won't work normally or enter into the display state of fault and the fault of component; what is worse, it may cause the fault of the device or the damage for IGBT module of main switching element.

Much attention should be given when the measurement is required that different meters may obtain different measurement result with obvious

differences. Indictor voltmeter is recommended to measure the input voltage; and use voltmeter of rectifier type to measure the output voltage; and use tong-type ammeter to measure the output current and use electrodynamic-type voltmeter to measure the power.

9-2. Device required regular change

In order to guarantee the reliable operation of **A**C frequency vector inverter, the component-all fans used for the cooling, filter condenser used for energy storage and exchange and printed circuit board bearing physical deterioration for a long time in **A**C frequency vector inverter should be changed regularly. The change can be made based on the stipulation in the following table for continuous use; and it can be also subject to specific condition of service environment, load situation and current status of AC frequency vector inverter.

Component name	Standard renewal period
Cooling fan	1～3 year
Filter capacitance	4～5 year
Printed circuit board	5～8 year

9-3. Storage and custody

After the purchasing of **A**C frequency vector inverter, if it doesn't be used at once (temporary custody or long-term storage), the following aspects should be obtained:

※ It should be put in a place within the stipulated temperature range, and having no moisture, dust, mental dust and have a good ventilation .

※ If it doesn't be used exceeding a year, then the charging test should be made for it in order to renew the filter condenser of main circuit in **A**C frequency vector inverter. Voltage regulator should be used to make the input voltage of **A**C frequency vector inverter rise gradually up to the rated output voltage when it is charged; and the charging time should be more than 1-2 hours. The test mentioned above should be made once every year.

※ Pressure test can't be made randomly; it will make the lifetime of **A**C frequency vector inverter shorten. As for insulation test, it can be measure by means of a 500V megger before the use; and its insulation resistance can't be smaller than 4MΩ.

9-4.Measurement and judgment

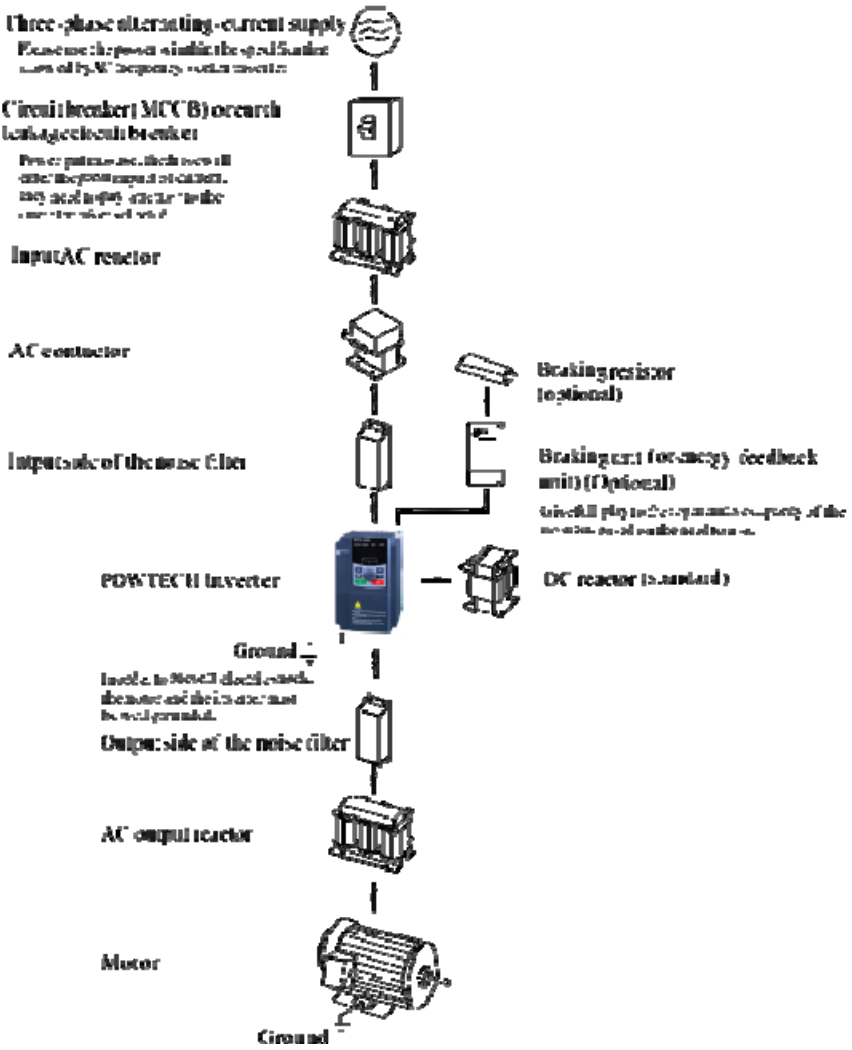
※ When normal meter is used for measure the current, the current at the input terminal will have imbalanced phenomenon; it belongs to a normal phenomenon when the difference is within 10%; if the differency is 30%, the original factory

should be informed to change the rectifier bridge; or check whether the deviation of three-phase voltage exceeds 5V.

When three-phase voltage of the output adopts is measured by normal multimeter, the data read by it is not inaccurate due to the interference of carrier frequency and it can be only used for reference.

Chapter 10 Option

The user can install the peripheral equipment for the products of this group due to their different service conditions and requirements; see the following chart for their connections.



10-1. Optional components

See relative inverter of optional component for detailed function and inverter of optional component; if the above optional components is required, please make an explanation in your order.

Name	Type	Function	Remarks
Built-in brake unit	"B"after the product type	Used for dynamic braking	Built-in brake unit is standard configuration
Operation panel of outer LED	-	Display of outer LED and operation keyboard	Apply universally for PT200 series RS485 interface
Operation panel of outer OLED	-	Display of outer OLED and operation keyboard	RS485 interface
Keyboard of parameter copy	-	Keyboard with the function of parameter copy	Apply universally for PT200series General RS485 interface
Extension cable	-	Standard network cable with 8 cores; and it can be connected with the keyboard	For 1m, 3m, 5m and 10m
If the extension function of other function modules (for example, I/0 clip, PG clip and EPS clip) is required, please choose PT200 series **A**C frequency vector inverter; please appoint function module card required in your order.			

10-2. Moulded case circuit breaker(MCCB)or earth leakage circuit breaker(ELCB)

Being the power switch of **A**C frequency vector inverter, MCCBor ELCB can also protect the power supply; notice, MCCB or ELCB can't be used to control the start and stop of **A**C frequency vector inverter.

10-3. AC reactor

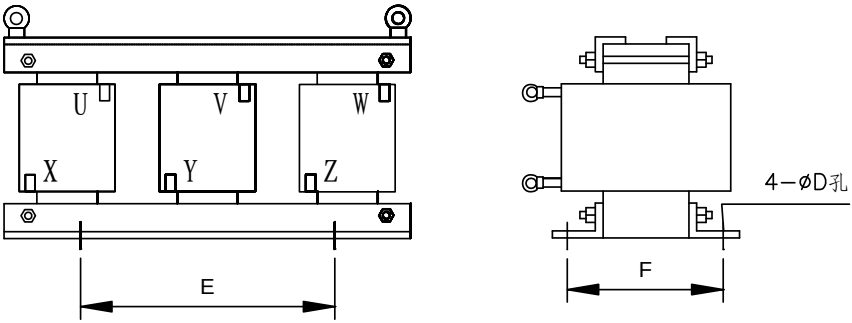
AC reactor can restrict higher harmonic for the input current of **A**C frequency vector inverter and obviously improve the power factor of **A**C frequency vector inverter. It is suggested to use AC reactor in the following situation.

※ Proportion between power capacity at the place of **A**C frequency vector inverter and capacity of **A**C frequency vector inverter is higher than 10:1.

※ Thyristor load or power factor compensation device with ON/OFF control is connected to the same power supply.

※ Unbalance factor for the voltage of three-phase supply is too high（≥3%）.

Dimension for AC input reactor with regular size is as follow:


U
V
W
X
Y
Z
E
4−øD孔
F

Dimension

Specification of AC frequency vector inverter		Size (mm) (mm)						Net weight(kg)
Voltage	Capacity (kW)	A	B	C	D	E	F	
200V 230V	0.75	155	125	95	7	89	60	3.0
	1.5	155	125	95	7	89	60	3.0
	2.2	155	125	95	7	89	60	3.0
	4	155	125	95	7	89	60	3.5
	5.5	155	125	100	7	89	60	3.5
	7.5	155	125	112	7	89	70	4.0
	11	155	125	112	7	89	70	6.0
	15	180	140	112	8	90	80	8.0
	18.5	180	140	112	8	90	90	8.0
	22	180	140	112	8	90	90	8.0
	30	230	175	122	10	160	90	12.0
	37	230	175	132	10	160	100	15.0
	45	230	175	150	10	160	110	23.0
	55	230	175	160	10	160	120	23.0
	75	285	220	230	14	180	130	30.0
380V 460V	0.75	155	125	95	7	89	60	3.0
	1.5	155	125	95	7	89	60	3.0
	2.2	155	125	95	7	89	60	3.0
	4	155	125	95	7	89	60	3.5
	5.5	155	125	100	7	89	60	3.5
	7.5	155	125	112	7	89	70	4.0
	11	155	125	112	7	89	70	6.0
	15	180	140	112	8	90	80	8.0
	18.5	180	140	112	8	90	90	8.0
	22	180	140	112	8	90	90	8.0
	30	230	175	122	10	160	90	12.0
	37	230	175	132	10	160	100	15.0
	45	230	175	150	10	160	110	23.0
	55	230	175	160	10	160	120	23.0
	75	285	220	230	14	180	130	30.0

	110	285	250	230	14	210	140	33.0
	160	360	260	230	14	210	140	40.0
	200	360	270	230	14	210	140	45.0
	250	400	330	240	14	240	140	55.0
	315	400	350	285	14	270	160	90.0

10-4. Noise filter

This filter is used to restrict the conduction for the electromagnetic interference noise caused by **A**C frequency vector inverter; it can also restrict external radio interference and the interference to this machine coming from surge of temporary impact.

Before the use, please firstly confirm the power supply belongs to three-phase three-wire system or three-phase four wire system; if it belongs to single phase, its ground wire should be as stubby as possible; and the filter should be close the **A**C frequency vector inverter to the greatest extent.

This filter can be applied to the occasions such as residential area, commercial area, research and development institution and place which has a high requirement on the interference of radio interference as well as the situation where meets CE, UL and CSA standard but without enough device to fight against the interference. 。

If you want to purchase this product, please contact with our company.

10-5. Contactor

Shut off the power at the movement for the protection function of the system to prevent the fault expanding. Don't use the contactor to control the start and stop of the motor.

10-6. Brake unit and brake resistor

When the user chooses the type with brake, the inside of **A**C frequency vector inverter has brake unit; and its maximum brake torque is 50%. The user can refer to the following table for separately purchasing brake resistor to make a match with it.

Specification of AC frequency vector inverter	Power of AC frequency vector inverter(kW)	Brake resistor value (Ω)	Brake resistor power (W)
220V	0.75	200	120
	1.5	100	300
	2.2	70	300
	4	40	500
	5.5	30	500
	7.5	20	780
	11	13.6	2000
	15	10	3000

	18	8	4000
	22	6.8	4500
380V	0.75	750	120
	1.5	400	300
	2.2	250	300
	4	150	500
	5.5	100	500
	7.5	75	780
	11	50	1000
	15	40	1500

If a bigger brake torque of the above built-in brake is required, please choose brake unit of POWTECH; please see the inverter for brake unit of POWTECH for detailed material.

Other types with high power don't have built-in brake. Please choose brake unit of POWTECH if the type with high power requires brake function.

10-7. EMI filter of output

It is used to restrict the interfering noise caused by the output side of **A**C frequency vector inverter and leakage current of the wire.

10-8. AC output reactor

When the wiring between **A**C frequency vector inverter and motor is too long (more than 20 m), it is used to restrict the overcurrent caused by distributed capacitance. Meanwhile, it can also restrict the radio interference of **A**C frequency vector inverter.

10-9. Input filter

10-9-1.Input filter（380V）

No.	Voltage (V)	Power (KW)	Current (A)	Net weight (kg)	Dimension L/W/H(mm)	Installation dimension a/b/d(mm)
1	380	0.75~1.5	5	0.7	130/105/44	51/95
2	380	2.2~4	10	1.3	202/86/58	184/60
3	380	5.5~7.5	20	2.5	261/100/90	243/70
4	380	11~15	36	2.7	261/100/90	243/70
5	380	18.5~22	50	3.5	261/100/90	243/70
6	380	30	65	4.5	240/190/90	180/175

7	380	37	80	6.6	390/200/90	260/185
8	380	45	100	7	390/200/90	260/185
9	380	55~75	150	7.7	400/200/90	260/185
10	380	93	200	5.2	340/190/90	180/175
11	380	110~132	250	7.7	380/210/90	180/195
12	380	160	300	7.7	380/210/90	180/195
13	380	200	400	9	470/260/128	165/245

10-9-2.Input filter（690V）

No.	Voltage (V)	Power (KW)	Current (A)	Net weight (kg)	Dimension L/W/H(mm)	Installation dimension a/b/d(mm)
1	690	0.75~1.5	5	0.7	130/105/44	51/95
2	690	2.2~4	10	1.3	202/86/58	184/60
3	690	5.5~7.5	20	2.5	261/100/90	243/70
4	690	11~15	36	2.7	261/100/90	243/70
5	690	18.5~22	50	3.5	261/100/90	243/70
6	690	30	65	4.5	240/190/90	180/175
7	690	37	80	6.6	390/200/90	260/185
8	690	45	100	7	390/200/90	260/185
9	690	55~75	150	7.7	400/200/90	260/185
10	690	93	200	5.2	340/190/90	180/175
11	690	110~132	250	7.7	380/210/90	180/195
12	690	160	300	7.7	380/210/90	180/195
13	690	200	400	9	470/260/128	165/245
14	690	215~250	600	14.2	470/245/128	165/245

10-10. Output filter

10-10-1.Output filter（380v）

No.	Voltage (V)	Power (KW)	Current (A)	Net weight (kg)	Dimension L/W/H(mm)	Installation dimension a/b/d(mm)
1	380	0.75~1.5	5	0.75	135/105/44	51/95
2	380	2.2~4	10	1.25	202/86/58	184/60
3	380	5.5~7.5	20	1.47	202/86/58	184/60
4	380	11~15	36	2.35	215/100/70	200/70
5	380	18.5~22	50	2.37	215/100/70	200/70
6	380	30	65	2.73	261/100/90	243/70
7	380	37	80	3.19	261/100/90	243/70
8	380	45	100	3.34	261/100/90	243/70
9	380	55~75	150	5.04	320/190/90	180/175

10	380	93	200	4.58	320/190/90	240/175
11	380	110~132	250	6.9	380/210/90	180/195
12	380	160	300	7.2	380/210/90	180/195
13	380	200	400	13.2	378/220/155	230/195
14	380	215~250	600	13.4	320/260/128	165/245

10-10-2.Output filter（690v）

No.	Voltage (V)	Power (KW)	Current (A)	Net weight (kg)	Dimension L/W/H(mm)	Installation dimension a/b/d(mm)
1	690	0.75~1.5	5	0.75	135/105/44	51/95
2	690	2.2~4	10	1.25	202/86/58	184/60
3	690	5.5~7.5	20	1.47	202/86/58	184/60
4	690	11~15	36	2.35	215/100/70	200/70
5	690	18.5~22	50	2.37	215/100/70	200/70
6	690	30	65	2.73	261/100/90	243/70
7	690	37	80	3.19	261/100/90	243/70
8	690	45	100	3.34	261/100/90	243/70
9	690	55~75	150	5.04	320/190/90	180/175
10	690	93	200	4.58	320/190/90	240/175
11	690	110~132	250	6.9	380/210/90	180/195
12	690	160	300	7.2	380/210/90	180/195
13	690	200	400	13.2	378/220/155	230/195
14	690	215~250	600	13.4	320/260/128	165/245

10-11 Input reactor

10-11-1.Input reactor（380V）

No.	Voltage (V)	Power (KW)	Rated current(A)	Net weight (kg)	Pressure drop（V）	inductance （mH）	Installation dimension a/b/d(mm)
1	380	1.5	5	2.48	2.00%	2.8	91/65
2	380	2.2	7	2.54	2.00%	2	91/65
3	380	3.7	10	2.67	2.00%	1.4	91/65
4	380	5.5	15	3.45	2.00%	0.93	95/61
5	380	7.5	20	3.25	2.00%	0.7	95/61
6	380	11	30	5.13	2.00%	0.47	95/80
7	380	15	40	5.20	2.00%	0.35	95/80
8	380	18.5	50	6.91	2.00%	0.28	120/72
9	380	22	60	7.28	2.00%	0.24	120/72
10	380	30	80	7.55	2.00%	0.17	120/72
11	380	37	90	7.55	2.00%	0.16	120/72
12	380	45	120	10.44	2.00%	0.12	120/92
13	380	55	150	14.8	2.00%	0.095	182/76
14	380	75	200	19.2	2.00%	0.07	182/96
15	380	110	250	22.1	2.00%	0.056	182/96
16	380	132	290	28.3	2.00%	0.048	214/100
17	380	160	330	28.3	2.00%	0.042	214/100
18	380	185	390	31.8	2.00%	0.036	243/112
19	380	220	490	43.6	2.00%	0.028	243/122
20	380	240	530	43.6	2.00%	0.026	243/122
21	380	280	600	52	2.00%	0.023	243/137
22	380	300	660	52	2.00%	0.021	243/137
23	380	380	800	68.5	2.00%	0.0175	260/175
24	380	450	1000	68.5	2.00%	0.014	260/175
25	380	550	1250	106	2.00%	0.0011	275/175

26	380	630	1600	110	2.00%	0.0087	275/175

10-12 utput reactor

10-12-1.Output reactor(380V)

No.	Voltage (V)	Power (KW)	Rated current(A)	Net weight(kg)	Pressure drop （V）	inductance （mH）	Installation dimension a/b/d(mm)
1	380	1.5	5	2.48	0.50%	1.4	91/65
2	380	2.2	7	2.54	0.50%	1	91/65
3	380	3.7	10	2.67	0.50%	0.7	91/65
4	380	5.5	15	3.45	0.50%	0.47	95/61
5	380	7.5	20	3.25	0.50%	0.35	95/61
6	380	11	30	5.5	0.50%	0.23	95/81
7	380	15	40	5.5	0.50%	0.18	95/81
8	380	18.5	50	5.6	0.50%	0.14	95/81
9	380	22	60	5.8	0.50%	0.12	120/72
10	380	30	80	6.0	0.50%	0.087	120/72
11	380	37	90	6.0	0.50%	0.078	120/72
12	380	45	120	9.6	0.50%	0.058	120/92
13	380	55	150	15	0.50%	0.047	182/87
14	380	75	200	17.3	0.50%	0.035	182/97
15	380	110	250	17.8	0.50%	0.028	182/97
16	380	132	290	24.7	0.50%	0.024	214/101
17	380	160	330	26	0.50%	0.021	214/106
18	380	185	390	26.5	0.50%	0.018	214/106
19	380	220	490	36.6	0.50%	0.014	243/113
20	380	240	530	36.6	0.50%	0.013	243/113
21	380	280	600	43.5	0.50%	0.012	243/128
22	380	300	660	44	0.50%	0.011	243/128
23	380	380	800	60.8	0.50%	0.0087	260/175
24	380	450	1000	61.5	0.50%	0.007	260/175

25	380	550	1200	89	0.50%	0.0058	275/175
26	380	630	1600	92	0.50%	0.0043	275/175

10-13 C reactor

No.	Voltage (V)	Power (KW)	Rated current(A)	Net weight(kg)	Pressure drop （V）	Inductance （mH）
1	380	0.4	3	1.5	28	80/65/110
2	380	0.75	3	1.5	28	80/65/110
3	380	1.5	6	2.3	11	80/85/110
4	380	2.2	6	2.3	11	80/85/110
5	380	3.7	12	3.2	6.3	100/100/125
6	380	5.5	23	3.8	3.6	110/120/135
7	380	7.5	23	3.8	3.6	110/120/135
8	380	11	33	4.3	2	110/120/135
9	380	15	33	4.3	2	110/120/135
10	380	18.5	40	4.3	1.3	110/120/135
11	380	22	50	5.5	1.08	120/135/145
12	380	30	65	7.2	0.8	138/150/170
13	380	37	78	7.5	0.7	138/150/170
14	380	45	95	7.8	0.54	138/150/170
15	380	55	115	9.2	0.45	155/160/195
16	380	75	160	10	0.36	165/130/215
17	380	93	180	20	0.33	165/130/215
18	380	110	250	23	0.26	210/150/255
19	380	132	250	23	0.26	210/150/255
20	380	160	340	23	0.17	210/150/255
21	380	185	460	28	0.09	220/150/280
22	380	220	460	28	0.09	220/150/280
23	380	300	650	33	0.072	235/160/280

10-14 Specification of breaker, cable and contactor

Type	Breaker (A)	Input line /output line (copper wire cable)mm2	Rated operational current A of contactor (380V OR 220V)
PT200-0R4G-2B	10A	1.5	10
PT200-0R7G-2B	16A	2.5	10
PT200-1R5G-2B	20A	2.5	16
PT200-2R2G-2B	32A	4	20
PT200-004G-2B	40A	6	25
PT200-5R5G-2B	63A	6	32
PT200-7R5G-2B	100A	10	63
PT200-011G-2B	125A	10	95
PT200-015G-2B	160A	25	120
PT200-018G-2B	160A	25	120
PT200-022G-2	200A	25	170
PT200-030G-2	200A	35	170
PT200-037G-2	250A	35	170
PT200-045G-2	250A	70	230
PT200-055G-2	315A	70	280
PT200-R75G-3B	10A	1.5	10
PT200-1R5G-3B	16A	1.5	10
PT200-2R2G-3B	16A	2.5	10
PT200-004G-3B	25A	2.5	16
PT200-5R5G-3B	25A	4	16
PT200-7R5G-3B	40A	4	25
PT200-011G-3B	63A	6	32
PT200-015G-3B	63A	6	50
PT200-018G-3B	100A	10	63
PT200-022G-3B	100A	10	80
PT200-030G-3B	125A	16	95
PT200-037G-3B	160A	25	120
PT200-045G-3	200A	35	135
PT200-055G-3	250A	35	170
PT200-075G-3	315A	70	230
PT200-093G-3	400A	70	280

PT200-110G-3	400A	95	315
PT200-132G-3	400A	95	380
PT200-160G-3	630A	150	450
PT200-185G-3	630A	185	500
PT200-200G-3	630A	240	580
PT200-220G-3	800A	150x2	630
PT200-250G-3	800A	150x2	700
PT200-280G-3	1000A	185x2	780
PT200-315G-3	1250A	240x2	900
PT200-355G-3	1250A	240x2	960
PT200-400G-3	1600A	185x3	1035
PT200-450G-3			
PT200-500G-3	2000A	185x3	1290

Chapter 11 Quality guarantee

The quality guarantee of the project should be transacted based on the following stipulations:

1. It really belongs to the concrete content for the quality guarantee within the manufacturer's responsibility.

1-1 When it is used in China (calculated since the date of delivery)

※ Guarantee for return, change and maintenance within one month after the delivery;

※Guarantee for return and maintenance within three months after the delivery;

※Guarantee for maintenance within 12 months after the delivery;

1-2 When it is exported to foreign country, it is guaranteed for maintenance at the purchasing place within six months after the delivery.

2. No matter when and where the product of our company is used, you can enjoy a lifelong service with payment.

3. Sale, manufacturing and agency unit of our company all over the country can provide after-sale service for the product; and the service condition is as following:

3-1 Make a three-level inspection service at the place where the company is (including fault removal).

3-2 It should be made according to the relative responsibility requirement in the contract content signed by our company with the agency.

3-3 You can ask agencies of POWTECH for after-sale service with payment (whether the product is maintained or not).

4 If the responsibility for quality and product accident of the product appears, responsibilities in article 1-1 or 1-2 can be undertaken at most; if the user requires more warranties of professional liability, please insure property insurance in insurance company in advance.

5 warranty period of the product is a year since the date of dispatch.

6 If the fault is caused by the following reasons, it will be maintained with money even if it is within the warranty period:

6-1 Incorrect operation (subject to the inverter) or the problem caused by voluntary repairing or transformation without authority.

6-2 The problem caused by using AC frequency vector inverter exceeding the requirement of standard specification.

6-3 Damage caused by falling or improper movement after the purchasing.

6-4 Device aging or fault caused by bad environment.

6-5 Damage caused by earthquake, fire, wind and water disaster, lightning stroke, abnormal voltage or other natural disaster or the reasons for the disaster.

6-6 Damage occurred during the transportation period (notice: the transportation method should be designed by the customer and our company will assist in handling procedure of goods transportation).

6-7 Damage or non-identification for brand, trademark, sequential number,

nameplate signed by the manufacturer.

6-8 Pay off the money according to the purchasing contract.

6-9 The installation, firing, operation, maintenance or other use conditions can't be objectively described to the service unit of our company.

7 The goods with guarantee for return, change and maintenance must be returned to our company; and the goods can be only returned or maintained after the attribution of liability is decided.

Attachment RS485 communication protocol

1. Introduction for use

PT200 series AC frequency vector inverter provides RS232/RS485 communication interface and adopts MODBUS communication with international standard to make principal and subordinate communication. The user can realize centralized control via PC/PLC, control for upper computer (set control inverter, operation frequency of AC frequency vector inverter and the change for relative function code parameter, working condition of AC frequency vector inverter and motoring of fault information) to fit specific application requirement.

2. Specification

1) Protocol content

This serial communication protocol defines the information content and using format for the transmission of serial communication, including polling format (or broadcast) of host machine, coding method of host machine; the content includes function code of required activity, data transmission and error check. The response of the subordinate machine also adopts the same structure and the content includes activity confirmation, data return and error check. If the subordinate machine has mistake when it receives information, or it can't accomplish the activity required by host machine, it will organize a fault information to feed it back to host machine as a response.

2) Application mode

AC frequency vector inverter connects with PC/PLC control network with a host machine and many subordinate machines of RS232/RS485 bus.

3) Bus structure

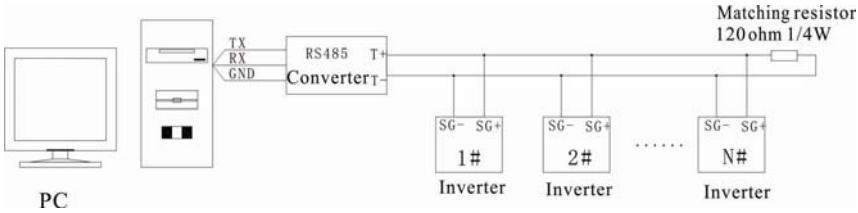
（1） Interface mode: RS232(JP8 2-3 short circuit)/RS485（JP8 1-2 short circuit）hardware interface

（2） transmission mode:

Asynchronous series and half-duplex transmission mode. During the same period, either the host machine or the subordinate machine sends data, and the other can only receive data. During the communication process of asynchronous series, either the host machine or the subordinate machine sends one frame one after another by means of the message format.

(3) Topological structure

System with one host machine and many subordinate machines. Setting scope for the address of subordinate is 1~247; 0 is the address of broadcast communication. The address of subordinate machine must be unique in the network. As the following chart:



4) Protocol inverter

Communication protocol of PT200 series AC frequency vector inverter is a kind of principal and subordinate MODBUS communication protocol of asynchronous series; and there is only one device (host machine) in the internet which can establish protocol (it is called as query or command). Other devices (subordinate machine) can only response to the query/command of the host machine via providing data, or make corresponding activities based on query/command of host machine. Host machine refers industrial control equipment or programmable logic controller (PLC) on personal computer (PC) and subordinate machine refers to PT200 AC frequency vector inverter. Host can not only make communication with a subordinate machine, but also issue the broadcast message to all subordinate machines. The subordinate machine will give a message (it is called response) for query/command with independent visit; as for the broadcast information given by host machine, it is unnecessary for the subordinate machine to feed it back to the host machine.

5) Structure of communication material

Communication data format for MODBUS protocol of PT200 AC frequency vector inverter is RTU（module of remote terminal unit）and ASCII（American Standard Code for Information International Interchange.

(1)In RTU mode, the format for every byte is as follow:

Instant messaging should start within the interval time of at least 3.5 characters when RTU mode is used. Multiple character time under Baud rate of the internet is easiest to realize (it is shown as the following T1-T2-T3-T4). The first zone of transmission is equipment address. And transmission character which can be used is hexadecimal 0...9, A...F. network equipment constantly detects network bus, including the time of pause interval. When the first address field is received, every device will decode to judge whether address field is sent to it. After the transmission of the last character, the pause for at least the interval of 3.5 characters shows the completion of the message. And a new message can start again after the pause. The whole message frame must be transmitted as a continuous flow. If there still a pause with the interval time of 1.5 characters before the completion of the frame, the receiving equipment will renew incomplete information and suppose that next character would be the address field of a new message. Similarly, if a new message starts after the period which is shorter than the interval time of 3.5 characters of the previous message, the receiving equipment will regard it as the continuation of the previous message. This will cause a mistake because the last value appearing in CRC field is wrong

Frame format of RTU:

Frame header START	T1-T2-T3-T4(transmission time for 3.5 bytes)
Address field of subordinate machine ADDR	Communication address: 0～247（decimal system）（0 is the broadcast address）
Function field CMD	03H: read the parameter of the subordinate machine; 06H: write the parameter of the subordinate machine;
Data field DATA（N-1）… DATA（0）	Data for 2*N bytes and this part is the main content of the communication and it is also the core for data exchange in the communication.
CRC CHK low post	Estimated value: CRC proof test value（16BIT）
CRC CHK high post	
Frame END	T1-T2-T3-T4 transmission time for 3.5 bytes)

(2) In ASCII mode, the format for every byte is as follow:

In ASCII mode, frame header is ":"（"0x3A"）and frame default is "CRLF"（"0x0D""0x0A"）. In ASCII mode, all data bytes are transmitted by means of ASCII mode except frame header and end; ten bytes at the first four highest place will be firstly sent and then ten bytes at the last four highest place will be sent. In ASCII mode, the data has 8-bit. As for 'A'～'F', adopt the ASCII coder of their capital letter. Now the data should be checked by using LRC. And the check covers the address of subordinate machine and partial information of the data. The checksum is equal to complement code for character sum of all data (giving up carry bit)participating in the check.

Standard structure of ASCII frame:

START	':'（0x3A）

Address Hi Address Lo	Communication address: 8-bit the address is composed by two ASCII codes
Function Hi Function Lo	function: 8-bit the address is composed by two ASCII codes
DATA（N-1） … DATA（0）	Data content: nx8-bit Data content is composed by 2n ASCII codes n<=16, 32 ASCII codes at most
LRC CHK Hi LRC CHK Lo	LRC check code: 8-bit check code is composed by two ASCII codes
END Hi	Terminator:END Hi=CR（0x0D），END Lo=LF（0x0A）

CMD (command inverter) and DATA(description for data word) Command code: 03H，read N words (Word)(it can read 16 words at most). For example, the start address 0107 for AC frequency vector inverter whose address of subordinate is 01 reads two value continuously, the host machine orders the message RTU and the host machine orders the message .

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
High position of the start address	01H
Low position of the start address	07H
High position for the number of the date	00H
Low position for the number of the date	02H
CRC CHK low position CRC CHK high position	Its CRC CHK value need calculating
END	T1-T2-T3-T4

RTU response message of subordinate machine

START	T1-T2-T3-T4
ADDR	01H
CMD	03H
The number of byte	04H
High position for data address 0007H	13H
Low position for data address 0007H	88H
High position for data address 0008H	13H
Low position for data address 0008H	88H
CRC CHK low position CRC CHK high position	Its CRC CHK value need calculating
END	T1-T2-T3-T4

Command message for ASCII host machine

START	‘:’
ADDR	‘0’

	'1'
CMD	'0'
	'3'
High position of the start address	'0'
	'0'
High position of the start address	'0'
	'4'
High position for the number of the date	'0'
	'0'
High position for the number of the date	'0'
	'2'
LRC CHK Hi	'F'
LRC CHK Lo	'6'
END Hi	CR
END Lo	LF

response message of subordinate machine of ASCII

START	':'
ADDR	'0'
	'1'
CMD	'0'
	'3'
The number of byte	'0'
	'4'
High position for data address 0004H	'1'
	'3'
High position for data address 0004H	'8'
	'8'
High position for data address 0005H	'1'
	'3'
High position for data address 0005H	'8'
	'8'
LRC CHK Hi	'C'
LRC CHK Lo	'2'
END Hi	CR
END Lo	LF

Verification mode-CRC verification mode: CRC (Cyclical Redundancy Check)

When RTU frame format is used, the message includes error detection field which is based on CRC. CRC field inspects the content of the whole message. CRC is two bytes and includes binary value with 16 bits. It is added to the message after the calculation of transmission equipment. The receiving equipment will calculate CRC again which receives the message andmake a comparison with the received value in CRC field; if two CRC value is different, it means the transmission is erroneous.

CRC is stored into 0xFFFF in advance; and then use a process to compare the

continuous 8 bytes in the message with value in current register. Only the data with 8 Bit is effective for the character; the start bit, stop bit and parity check bit is invalid. During the producing process of CRC, every character with 8 bits is different from the register content independently or (XOR) the result moves towards the direction of least significant bit; and the most significant bit is filled by 0. LSB is drawn to make an inspection; if LSB is 1, the register will be different from the preset value independently, or if LSB is 0, it won't make the inspection. The whole process should be made for eight times. When the last bit (the 8^{th} bit) is completed, 8 bits for PT200 user manual of next attachment will be different from the current value in register independently; finally, the value in the register will be CRC value after all bits in the message have been implemented.

When CRC is added to the message, low byte should be firstly added and then the high byte. Simple function of CRC is as follow:

```
unsigned int crc_chk_value（unsigned char *data_value,unsigned char length）
{
unsigned int crc_value=0xFFFF;
int i;
while（length--）
{
crc_value^=*data_value++;
for（i=0;i<8;i++）
{
if（crc_value&0x0001）
{
crc_value=（crc_value>>1）
^0xa001;
}
else
{
crc_value=crc_value>>1;
}
}
}
return（crc_value）;
}
```

Definition for the address of communication parameter

This part is the communication part and is used for controlling the operation of AC frequency vector inverter, the setting for the state of AC frequency vector inverter and relative parameters.

Read and write the parameter of function code (some function code can't be changed and only be used for the manufacturer):

Marking principle for parameter address of function code:

Expression rule for parameter address by using group number and mark number of function code:

High byte: 00~01

Low byte: 00~FF

e.g. :P03.12，it address is shown as 0312;

notice: P00 group: can only read the parameter and not change the parameter;

P15 group: can not read the parameter nor change the parameter; some parameters can't be changed no matter what the state of AC frequency vector inverter is; much attention should be given to the scope, unit and relative inverter of the parameter when the parameter of function code is changed.

In addition, because EEPROM is stored frequently, it will make the service life of EEPROM shorten; as a result, some function codes doesn't need storing in communication code; what should do is to change the value in RAM. Only change F at high bit to 0 for the address of this function code can realize this function.

Corresponding function code is as follow:

High byte :00~01

Low byte :00~FF

For example: function code P03.12 can't be stored into EEPROM; its address is shown as 0312; and this address can make activity for writing RAM ; and it can't make activity for reading; if it is read, it is an ineffective address.

Halt/ operation parameter:

Parameter address and parameter description	**parameter description**
3000H	Operating speed
3001H	Setting speed
3002H	Busbar voltage
3003H	Output voltage
3004H	Output current
3005H	Rotate speed of the operation
3006H	Output power
3007H	Output torque
3008H	Given value of PID
3009H	Feedback of PID
300AH	Indicating state of terminal input
300BH	Indicating state of terminal output
300CH	Value of analog AI1
300DH	Value of analog AI2
300EH	Value of analog AI3
300FH	Value of analog AI4
3010H	Impulse frequency with high speed（HDI1）
3011H	Impulse frequency with high speed（HDI2）
3012H	Multistep speed and current stage of PLC
3013H	Length value

3014H	Input value of external counter
3015H	Torque direction (0: forward direction, 1: reverse direction)
3016H	Device code

The set value is the percentage of relative value: 10000 corresponding with 100.00% and -10000 corresponding with -100.00%.

Data corresponding with the frequency dimension; and this percentage is the percentage corresponding with maximum frequency （P0-10）; Data corresponding with the torque dimension, the percentage is P2-10(setting for upper limiting number of the torque).

Input the control command into AC frequency vector inverter (only for writing)

Address of command word	**Command function**
1000H	0001H: forward rotation
	0002H: reverse rotation
	0003H: normal inching turning
	0004H: point turning of inversion
	0005H: halt
	0006H: random halt(emergency stop)
	0007H: fault resetting
	0008H: inching stop

Read the state of AC frequency vector inverter(only for reading)

Address of status word and function of status word	Address of status word and function of status word
1001H	0001H: in forward operation
	0002H: in reverse operation
	0003H: standby of AC frequency vector inverter
	0004H:breakdown

Check for the lock of parameter on password:（if the return is 8888H, it means the password check is passed）

Password address	Input the content of password
4000	*****

Parameter locks the command (only for writing)

Lock the address of password command	Lock the content of password command
4001	55AAH

Control for digital output terminal: (only for writing)

Description for fault of C frequency vector inverter:

Fault address of AC frequency vector inverter	Fault code	Fault information of AC frequency vector inverter
5000H		0000: No fault
	E.oUP	0001: U-phase protection of contravariant unit（oUP）
	E.oUP	0002: -phase protection of contravariant unit (oUP）
	E.oUP	0003: W-phase protection of contravariant unit (oUP）
	E.oC1	0004: Overcurrent of acceleration（oC1）
	E.oC2	0005: Overcurrent of deceleration（oC2）
	E.oC3	0006: Overcurrent of constant speed（oC3）
	E.oU1	0007: Overvoltage of acceleration（oU1）
	E.oU2	0008: Overvoltage of deceleration（oU2）

	E.oU3	0009: Overvoltage of constant speed（oU3）
	E.LU	000A: Undervoltage fault of generatrix（LU）
	E.oL1	000B: Motor overload（oL1）
	E.oL2	000C:overload of AC frequency vector inverter（oL2）
	E.PHI	000D: Default phase at the input side（PHI）
5000H	E.PHo	000E: Default phase at the output side（PHo）
	E.oH1	0010: Overheating of rectifier module（oH1）
	E.oH2	0011: Overheating of contravariant module（oH2）
	E.SET	0012: External fault（EF）
	E.CE	0013: Communication faul（CE）
	E.oCC	0014: Fault of current detection（ITE）
	E.TE	0015: Fault for self-study of motor（TE）
	E.EEP	0016: Operation fault of EEPROM（EEP）
	E.PId	0017: Break-line fault of PID PID
	E.bCE	0018: Brake unit fault（bCE）
	END	0019: Retaining

Data for information description of communication fault(fault code):

The when the device makes the response, the function code used is to show it is normal response (without mistake) or a mistake occurs (it is called dissent response). The equipment responses corresponding function code, data address or subfunction code for normal code. The equipment returns a code which is equal to normal code for dissent response, but the first position is 1.

For example, the message sent from a host equipment to the subordinate equipment is required to read the address data for the function code of AC frequency vector inverter; and the following function code will be produced: 00000011 (hexadecimal 03H) corresponding with normal response; and subordinate equipment responses with the same function code. As for dissent response, it returns 10000011 (hexadecimal 83H）; the subordinate equipment will response to the abnormal code of a byte except the function code is changed due to the dissent error; and this defines the reason for producing the abnormal phenomenon.

After the application of principle equipment receives the dissent response, typical treating process is to send the message again, or change the command aiming the corresponding fault.

Abnormal code of MODBUS		
Code	Name	Implication
01H	Illegal function	When the function code received by upper computer is not allowed to operate; or the subordinate machine deals with the requirement in a wrong state.
02H	Illegal data address	The data address required by the upper computer is unallowable address; in particular, the combination between the register address and byte number transmitted is invalid.
03H	Illegal data value	When the data field received includes un allowable value. Notice: it never means there is a value beyond the expectation of application program for the data in the register submitted to store

Abnormal code of MODBUS		
Code	Name	Implication
06H	Busy subordinate equipment	Busy AC frequency vector inverter (EPPROM is being stored
10H	Wrong password	The password input for the validation address of password is different from the password set by P07.00 user.
11H	Wrong verification	When RTU format, CRC check bit or ASCII format and LRC check bit is different from check computation of lower computer in the frame information sent by upper computer; and report the wrong information of the check .
12H	Invalid change of the parameter	In writing command of parameter sent by upper computer, when the data sent is beyond the scope of the parameter or current writing address is at a unchangeable state.
13H	The lock of the system	Set the user password when the upper computer reads or writes; if it is set the user password and had no unlock for password lock, it will report the lock of the system.

inverter

1. inverter of PG card
2. inverter for control of variable frequency water supply.
3. inverter for isolation RS 385
4. inverter of RS232
5. inverter of Ethernet card
6. inverter of Profibus card
7. inverter of tension card
8. inverter for card of injection molding machine
9. inverter for data reading card of USB AC frequency vector inverter

See specific inverter for the above content

Product warrant card of POWTECH product

Thank you sincerely for purchasing the product of POWTECH

This product has been passed the strict quality inspection of POWTECH, in warranty period, any hardware fault caused by the quality of this product within the normal use, based on the inverter of this guarantee card, POWTECH will provide free maintenance for the fault.

Product type:			Serial number:	
Warranty period:				
Purchasing date:	Year	Month	Date	
Invoice number:				
Customer name: (or company name)				
Address:				
Post code:	Telephone:		Fax:	
Agency name:				
Address:				
Address:	Telephone:		Fax:	
Agency seal				

User's feedback form for the fault of POWTECH AC frequency vector inverter

Dear users: please fill in the following form for us to provide a better service for you

<table>
<tr><td colspan="6">Condition of load and control</td></tr>
<tr><td>Motor power and poles</td><td></td><td>Rated current of the motor</td><td></td><td>Frequency range of normal work</td><td></td></tr>
<tr><td>Load type</td><td colspan="2">□fan□textile machine□ extruder
□pump□injection molding machine □other loads</td><td>Speed adjustment mode</td><td colspan="2">□keyboard speed control □ terminal speed control
□PID speed control □speed control of upper computer</td></tr>
<tr><td>Control method</td><td colspan="5">□ No PG V/F control □ Having PG V/F control □ Having PG vector contro</td></tr>
<tr><td colspan="6">Fault phenomenon</td></tr>
<tr><td>Fault time</td><td colspan="5">□ Failure for the jumping of electrifying □ Operation failure □ Failure after operating a period
□Failure of acceleration □Failure of deceleration</td></tr>
<tr><td colspan="6">Failure types</td></tr>
<tr><td>Overcurrent OC</td><td colspan="5">□E.oCC □E.oC1 □E.oC2 □E.oC3</td></tr>
<tr><td>Abnormal voltage</td><td colspan="5">□E.oU（overvoltage） □E.LU（under voltage） □E.oL（overload）</td></tr>
<tr><td>Fault of other displays</td><td colspan="5">□E.oH（overheating） □E.SET(external fault) □E.PHI(Input the protection of default phase)□E.PHo(Output the protection of default phase) □E.PId □E.EEP(EEPROM error)</td></tr>
<tr><td>Panel failure</td><td colspan="5">□ No display for electrifying □ Smoking after electrifying □ No actuation for relay of power panel</td></tr>
<tr><td>Keyboard failure</td><td colspan="5">□Key failure □ Unable change of the parameter □ Display default writing □Knob failure</td></tr>
<tr><td>Device failure</td><td colspan="5">□ Machine explosion □ Unable rotation of the fan □No actuation for relay of main circuit □ Burning out of power resistor</td></tr>
<tr><td>Abnormal output</td><td colspan="5">□ No output voltage □ Unbalance of output voltage □Serious vibration of motor □ Insufficient motor capacity</td></tr>
<tr><td colspan="6">Please describe the detail of your fault here if it is not listed in the above:</td></tr>
<tr><td colspan="6">Fault description:</td></tr>
</table>

Maintenance record should be filled by the following maintenance agencies:

Maintenance record:

The first name	Name of the maintenance unit		Telephone	
	Address		Post code	
	Receipt number of the maintenance		Signature of serviceman	
The second time	Name of the maintenance unit		Telephone	
	Address		Post code	
	Receipt number of the maintenance		Signature of serviceman	
The third time	Name of the maintenance unit		Telephone	
	Address		Post code	
	Receipt number of the maintenance		Signature of serviceman	

Information feedback of the product

Dear users:

Thank you for concerning and purchasing the product of POWTECH; we are eager to obtain your information and relative information for the pruduct purchased by you; and why we want to obtain your valuable feedback is that we also want know your further requirement for POWTECH product. Please log in column of TECHNOLOG and SERVICE ; RESOURCE DOWNLOAD to make information feedback on Http://www.powtech.cn

1) Download and update the product introduction required by you;

2) Refer to various technical data such as application method, specification feature and regular question of the product.

3) Sharing for the application case of the product.

4) Consultation and online feedback of technical issues.

5) Feedback the application information of the product and user demand information via e-mail.

6) Inquire the latest product and obtain various warranties and additional service of extension.