Foreword

Thank you very much for purchasing PI8600 Family Frequency Inverters. This family is designed based on the experience of POWTRAN Company in the professional manufacture and sale of the products, and suitable for general-purpose load machine.

This product adopts the advanced sensorless vector control technology, combined with China local frequency inverter application features to achieve high-performance V/F control (dead-time compensation + auto-torque upgrade + Slip Compensation) and high-performance non-sense vector control, and high-performance speed sensorless vector control.

This product adopts the advanced sensorless vector control technology, combined with the application of inverter technology in China features to achieve high-performance V/F control (dead-time compensation + auto-torque upgrade + Slip Compensation) and high-performance non-sense vector control, and high-performance speed sensorless vector control.

This User's Manual includes PI8600, the general purpose control F and G series.

F: FLOW LOAD

G: GENERAL LOAD

Directory

Section I Inspection &Safety Precautions

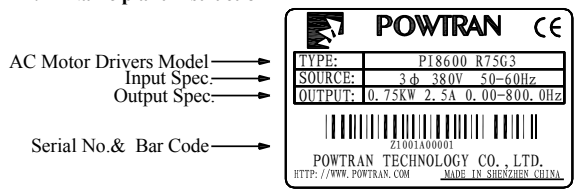
POWTRAN PI8000 frequency inverters have been tested and inspected before leaving the manufacturer. Before unpacking the product, please check if its package is damaged due to careless transportation, and if the specifications and type of the product complies with the order. Please contact the supplier of POWTRAN products if any problems are found.

1-1. Inspection after Unpacking

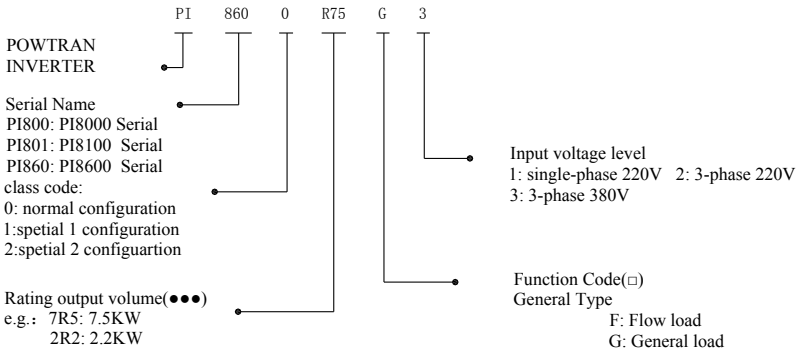
※ Inspect that the contents are complete (one unit of PI8000/8100 frequency inverter, one operation manual (with a copy of warranty card), one maintaince tips card.

※ Check the nameplate on the side of the frequency inverter to ensure that the product you have received is right the one you ordered.

1-1-1. Name plant Instruction 1



1-1-2. Model description 2:



1-2. Safety Precautions

※ Never connect the A.C. power supply to the output terminals (U, V, W) of the frequency inverter.

※ Fix and lock the panel before supplying power so as to avoid the danger caused by the poor capacity or other components inside the inverter.

※ After the power supply is switched on, do not perform wiring or check, etc.

※ Don't touch the circuit boards or its parts or components in the inverter when it is powered,

so as to avoid danger of electric shock.

※ If the power supply is switched off, do not touch the PCB or other parts inside the inverter within 5 minutes after the keyboard indicator lamp goes off, and you must check by using the instrument that the inverter has completely discharged all its capacity before you start to work inside the inverter. Otherwise, there will be the danger of electric shock.

※ The static electricity in human body will cause serious damage to the MOS field effect transistor in the inverter. Please keep your hands away from the PCB, IGBT and other internal parts before taking actions to prevent static electricity. Otherwise, faults may be caused.

※ In use, the earthing terminal (⏚) of the frequency inverter must be grounded to the earthing connections correctly and securely according to the national electrical safety specifications and other applicable standards.

※ Please don't shut off the unit by turning off the power supply. Turn off the power supply after the motor has stopped its operation.

※ Meet CE standard with EMI filter.

1-3. Application

※ Powtran inverter is generally applied to 3 phase AC asynchronism motors.

※ Powtran inverter is applied to the admisive occasion, the occasion where is not admissive may lead to fire, electric shock, explosion and so on.

※ If the inverter seizes up when it is applied to the equipment which may lead danger (e.g. lift tools of transportation, aviation system, saftety equipment, etc), it should be managed carefully. Do inquire the factory when it happens.

Only the well-trained personnel are allowed to use this unit, and such personnel must read through the parts of this manual relating to the safety, installation,operation and maintenance before using the unit. The safe operation of this unit depends on correct transport, installation, operation and maintenance!

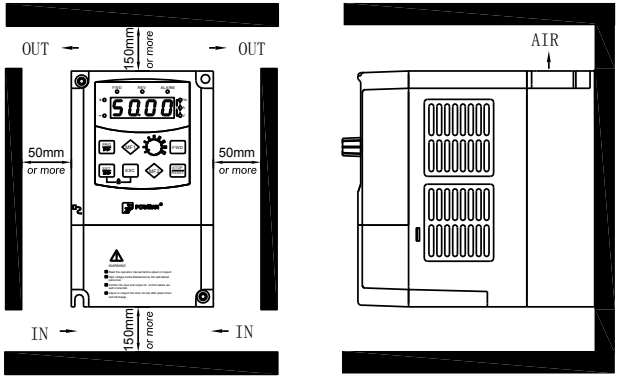
Section II Installtion &Standby Circuit

2-1. Conditions for Use

1) Ambient temperature -10℃~40℃.
2) Avoid electromagnetic interference and keep the unit away from the interference source.
3) Prevent dropping water, steam, dust, powder, cotton fiber or fine metal powder from entering it.
4) Prevent oil, salt and corrosive gas from entering it.
5) Avoid vibration.
6) Avoid high temperature and moisture and avoid being wetted due to raining, with the humidity below 90%RH (not dewing).
7) Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

2-2. Installation

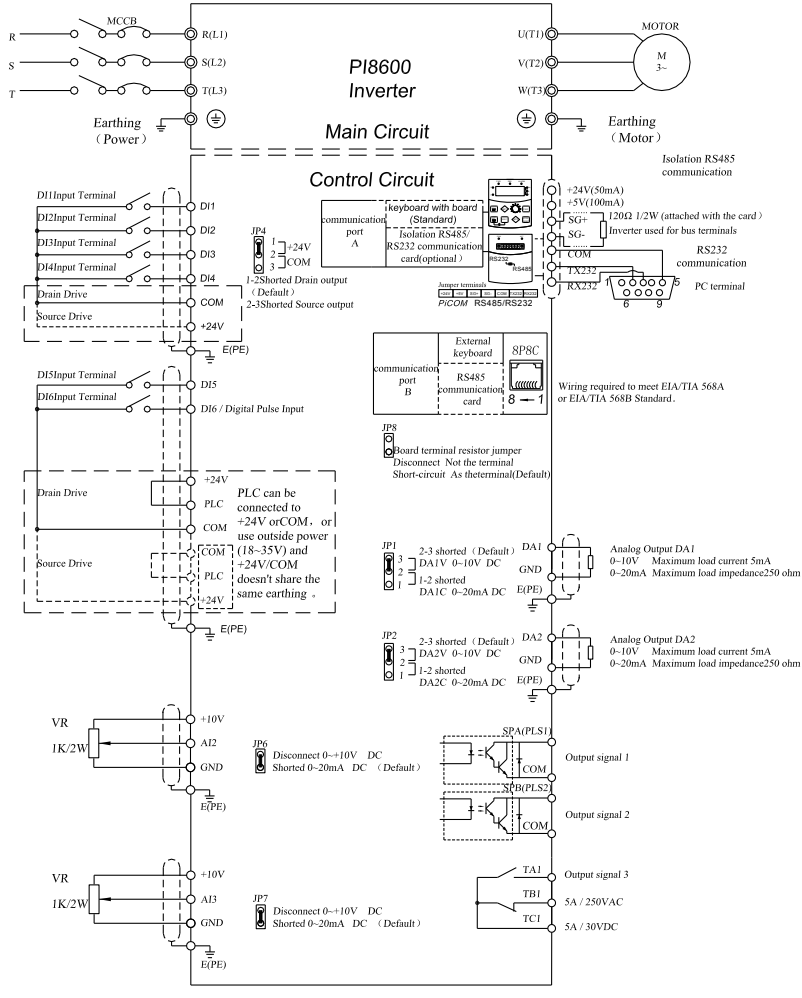
The frequency inverter must be installed by wall hooking in the indoor room with adequate ventilation, with enough space left between it and the adjacent objects or damper (walls) surrounding it, as shown in the below figure:



2-3. Wiring

The wiring of frequency inverter includes two parts: main circuit and control circuit. The user must ensure correct connections according to the following connection diagram.

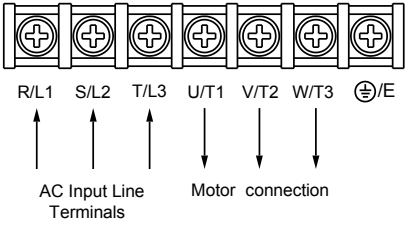
2-3-1. PI8600 Diagram



2-4. Main Circuit Terminals (G Series)

2-4-1. PI8600 Main Circuit Terminals

1. Main Circuit Terminals



Note: Single phase inverter hasn't S input terminal
The above kW categaries are for G type inverter.

2-4-2. Terminal Function

Terminal	Description	Functions
R/L1	Power input for frequency inverter	Connected to 3-phase power, **(Single input connected to R, T)**
S/L2		
T/L3		
⏚	Grounding point	Grounded to the earth
U/T1	Power output for frequency inverter	Connected to 3-phase motor
V/T2		
W/T3		

2-5. Control Circuit Terminals

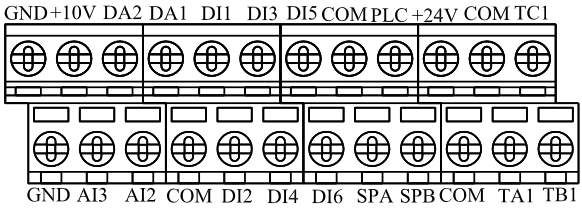
2-5-1. Control Circuit Terminals

Classify	Terminal	Description	Functions
Input signal	DI1	DI1 input terminal	Multi-functions input terminal. For details Please read o36~o46. Enter a valid polarity can be controlled by o47. DI1~DI4 Drive model can be controlled by JP4. Above 11kW: DI5~DI6Drive model can be controlled by PLC output terminal . Below 11kW: DI5~DI6Drive model can be controlled by PLC output terminal .
	DI2	DI2 input terminal	
	DI3	DI3 input terminal	
	DI4	DI4 input terminal	
	DI5	DI5 input terminal	
	DI6	DI6 input terminal	

			DI6 can as digital pulse input.
	PLC	PLC Control Terminal	PLC Control DI5~DI6 Drive model. Drain Drive : PLC connect 24VDC or external power . Source Drive: PLC connect COM.
Assistant Power	24V	Assistant Power	The biggest output 24V/200mA, Can not connect COM with GND in any situation.
	COM	Common terminal	
Output signal	SPA/COM	Output signal 1	Open Collector signal when the output action(24VDC/50mA)common terminal COM , the output function can set by o21, o22. SPA, SPB provide hi-speed pulse output function. After setting functions by o61~o64, **Frequency inverter will take effect again.**
	SPB/COM	Output signal 2	
	TA1/TB1/ TC1	Output signal 3	TA1-TC1open, TB1-TC1close, the output function can set by o23.
Analog input signal	+10V，GND	Analog power	+10V/50mA.
	AI2	Multifunction Analog input signal 2	JP6cut: 0~10V. JP6 connect: 0~20mA can be regulated o02/o03 can set input voltage/ current arrange. o08/o09 Set the input signal corresponding to set value.
	AI3	Multifunction Analog input signal 3	JP7cut: 0~10V. JP7connect: 0~20mA can be regulated. o04/o05can set input voltage/ current arrange. o10/o11 Set the input signal corresponding to set value.
	DA1	Multifunction Analog output signal 1	JP1 1-2: 0~+20mA . JP1 2-3: 0~+10VDC. o15 set analog output analog functions. o17/o18 set the output signal arrange.
	DA2	Multifunction Analog output signal 2	JP2 1-2: 0~+20mA. JP2 2-3: 0~+10VDC. o16 set analog output analog functions. o19/o20 set the output signal arrange.

2-5-2. Control circuit terminal

1. 8KMCB Control circuit terminal



2-6. Connection Precautions

※ Don't install power factor capacitance or resistance-capacitance absorbing device between the output terminals U, V, W of the frequency inverter.

※ To disassemble or replace the motor, the input power supply must be turned off for the frequency inverter.

※ Do not drop Metal scrap foam or lint into the frequency inverter, otherwise the machine will be faulted.

※ The motor or power supply can be switched on/off only after the inverter stops its output.

※ In order to minimize the effect of electromagnetic interference, a surge absorbing device should be installed if used electromagnetic contactor and relay, etc. is near to the frequency inverter.

※ For external control of frequency inverter, a isolation device should be used for the control lines or screened cable should be used.

※ A screened cable should be used as the signal connection line for input command and must be routed separately as well, and it had better be installed far from the main circuit.

※ When the carrier frequency is less than 3kHz, the distance between the frequency inverter and motor must not be greater than 50 meters (maximum). When it is above 4kHz, this distance should be reduced. The cable for this connection had better be laid in metal conduit.

※ If the frequency inverter is equipped with peripheral devices (such as filter, reactor), first measure its insulation resistance to the earth with 1000V megohm meter, and ensure the resistance value is not below 4MΩ.

※ If the frequency inverter must be started frequently, don't switch off its power supply, and the operator must start or stop the inverter by using the COM/FWD of the control terminal or Keyboard or RS485, in order to avoid damage to the bridge rectifier.

※ Don't connect A.C. input power to the output terminals U, V, W of the frequency inverter.

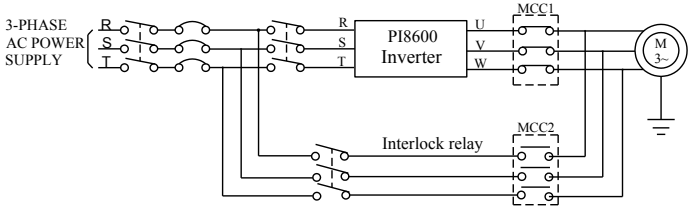
※ In order to prevent unexpected accidents, earthing terminal E or ⏚ must be grounded to the earth securely (the grounding resistance should be below 100Ω). The cable size should be greater than half of below- mentioned corresponding cable size; otherwise current leakage will happen possibly.

※ For wiring of main circuit, please refer to national rule.

※ Capacity of the motor should be equal to or smaller than that of the inverter.

※ Specification of MCCB、electric cable and contractor。

2-7. Standby circuit



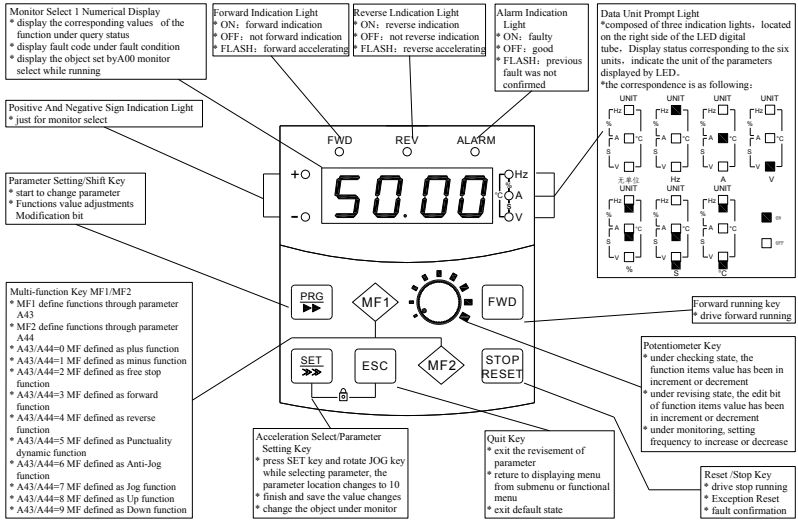
When the fault or trip of the inverter may cause great loss or accident, please add the standby circuit.

Note: Confirm and test the running characteristic of the standby circuit,in order to ensure the industrial phase and the converter phase are in the same direction.

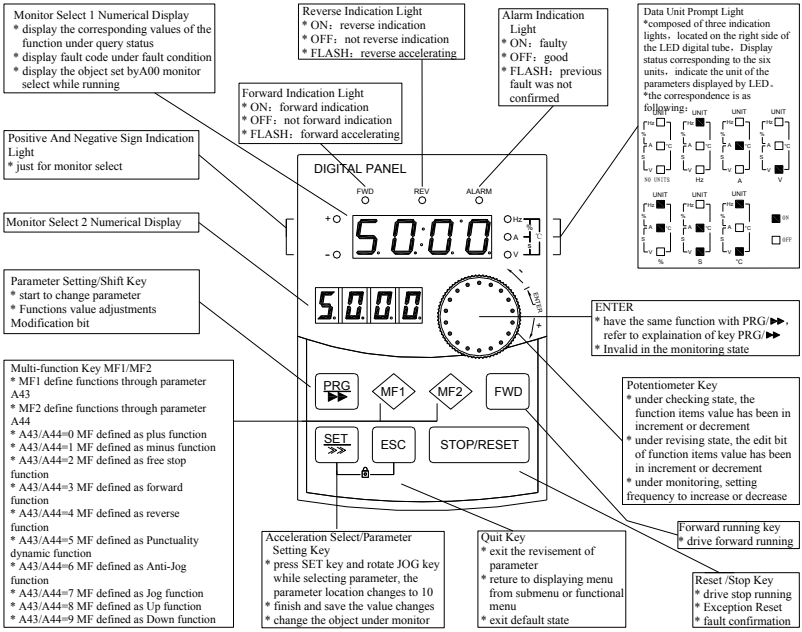
Section III Operation Keyboard

3-1. Operating keyboard

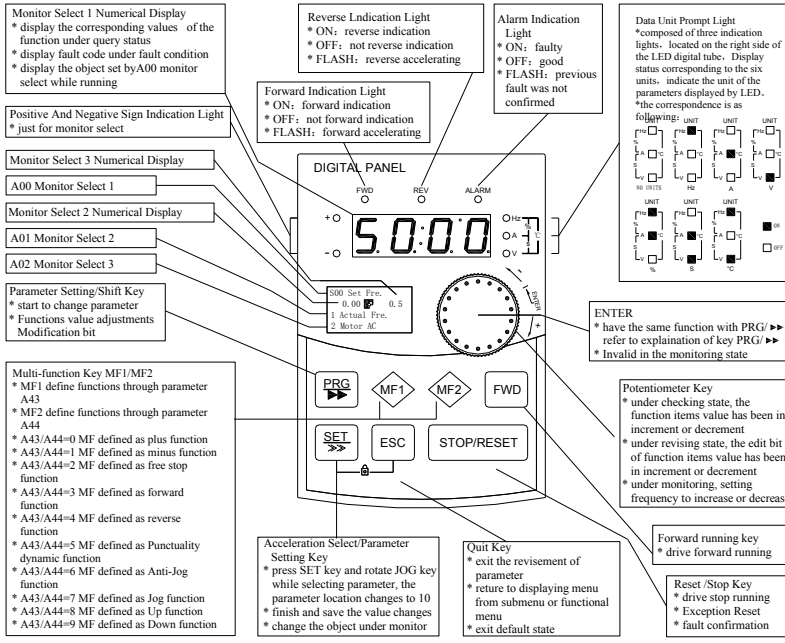
3-1-1. JP6E8600 specification and function description(Standard)



3-1-2. JP6E8000 keyboard specification and function description (Optional)



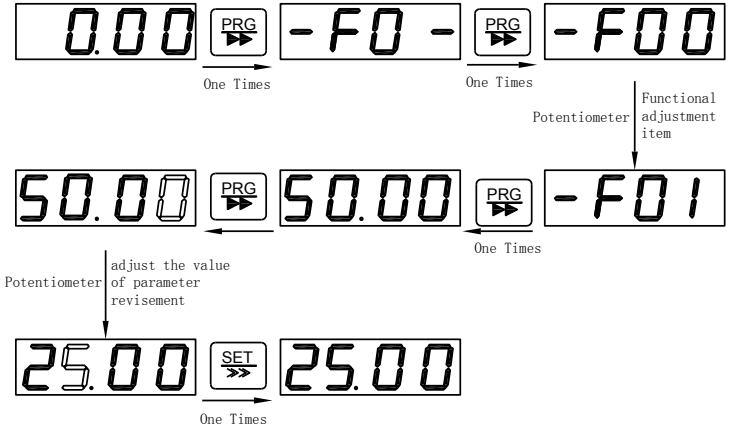
3-1-3. JP6C8000 keyboard specification and function description (Optional)



3-2. Example for parameters set

3-2-1. F01 keyboard set the frequency from 50.00Hz to 25.00Hz.

1. Under monitoring status, press PRG into parameter group to query status;
2. Through potentiometer Switch to F00-63 Basic FG;
3. Press PRG, or ENTER, enter into F00-63 Basic FG parameter group to query status;
4. Through potentiometer Switch to F01Fre. Set by K;
5. Press PRG, or ENTER, enter into F01 Fre. Set by K parameter modify status;
6. Through PRG, or ENTER, adjust the value is modified bit;
7. Through potentiometer Has been modified to adjust the bit values;
8. Finish the adjustment, press SET ;if cancle the change, press ESC to escape to the modify status;
9. Press ESC to exit to previous menul .

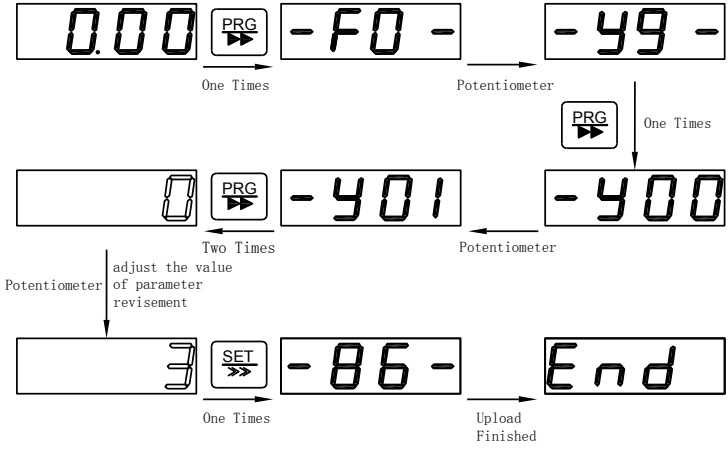


3-2-2. parameter upload to the keyboard

Parameter Item	Description	
y01 parameter upload to the keyboard	No function	0
	System parameter upload to the memory area1 in the keyboard	1
	System parameter upload to the memory area2 in the keyboard	2
	System parameter upload to the memory area3 in the keyboard	3
	System parameter upload to the memory area4 in the keyboard	4
	Clear memory area in the keyboard 1, 2, 3, 4	5

Example . System parameter upload to the memory area3 in the keyboard

1. Under monitoring status, press PRG into parameter group to check status;
2. Through potentiometer Switch to y00-23 System FG;
3. Press ENTER, enter into y00-23 System FG parameter group to check status;
4. Through potentiometer Switch to y01P Upload To Keyboard;
5. Press PRG, enter into y01P Upload To Keyboard parameter modify status;
6. Through potentiometer adjust value to be 3 ;
7. Finish the adjustment, press SET ;the speed for upload will display on the LED;if cancle the change, press ESC . to escape to the modification status;
8. Press ESC . to exit to previous menu.

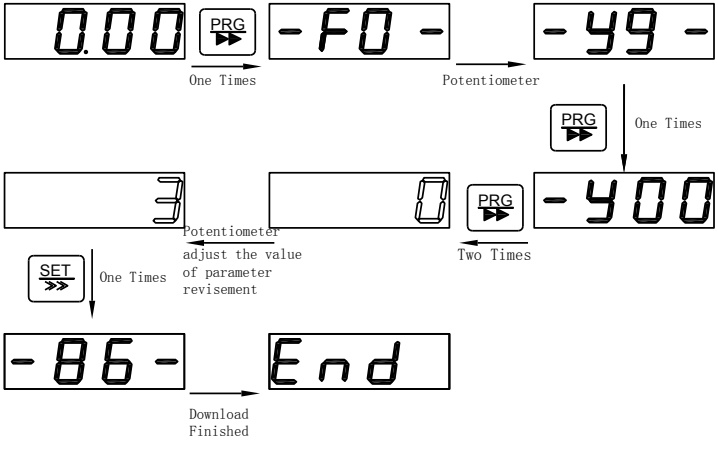


3-2-3. Reset system parameters

Parameter Item	Description	
y00 Reset system parameters	No function	0
	Memory area 1 in the keyboard to reset system parameter	1
	Memory area 2 in the keyboard to reset system parameter	2
	Memory area 3 in the keyboard to reset system parameter	3
	Memory area 4 in the keyboard 1to reset system parameter	4
	Use the factory setting reset system parameter	5

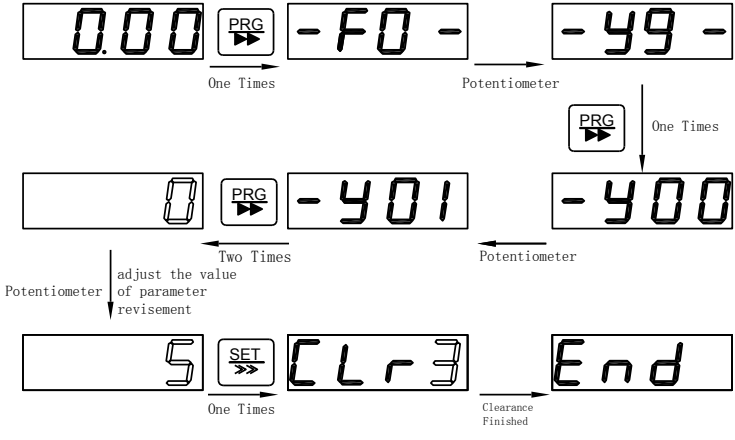
Example 1: memory area3 in the keyboard 1 to reset system parameter

1. Under monitoring status, press [PRG] into parameter group to query status
2. Through potentiometerSwitch to y00-23 System FG;
3. Press [PRG],enter into y00-23 System FG parameter group to query status;
4. Through potentiometerSwitch to y01 Upload To Keboard;
5. Press [PRG], enter into y00 Reset SP parameter modify status;
6. Through potentiometer adjust to 3 ;
7. Finish the adjustment, press [SET];the speed for download will display on the LED;if cancle the change, press [ESC];
8. Press [ESC] to exit to previous menu.



Example 2 Clear memory area 1, 2, 3, 4 in the keyboard

1. Under monitoring status, press [PRG] into parameter group to check status
2. Through potentiometer Switch to y00-23 System FG;
3. Press [PRG], enter into y00-23 System FG parameter group to check status;
4. Through potentiometer Switch to y01 Upload To Keyboard;
5. Press [PRG], enter into y01 Upload To Keyboard parameter modify status;
6. Through potentiometer adjust to 5 ;
7. Finish the adjustment, press [SET];the speed for Clear memory area will display on the LED;if cancle the change, press [ESC];
8. Press [ESC], to exit to previous menu.



3-2-4. F02 the main set mode of set frequency is set to 4, keyboard potentiometer setting !

1. Under monitoring status, Through potentiometer adjust the frequency, the resolution ratio potentiometer is 0.05Hz.

2. Range of set frequency can be set with the following parameters:

Parameter item	Description
F12 max. frequency	Inverter output maximum frequency allowed Setting range: 10.00~320.00Hz.
A45 keyboard potentiometer setting X1	Keyboard potentiometer setting the start value. Setting range: 0~100%.
A46 keyboard potentiometer setting X2	Keyboard potentiometer setting the end value. Setting range: 0~100%.
A47 keyboard potentiometer setting value	Display the value of potentiometer setting, range: A45~A46. Also can set diretly, Setting range: A45~A46.
A48 keyboard potentiometer setting X1 correspond to Y1	Keyboard potentiometer setting the starting point for the corresponding value. Setting range: -100%~+100%.
A49 keyboard potentiometer setting X2 correspond to Y2	Keyboard potentiometer settings corresponding to the value of the end. Setting range: -100%~+100%.
S00 setting frequency	Displays the current size of the set frequency,through the potentiometer setting. Setting range: F12*A48~ F12*A49.

Example:

F12=50.00Hz, A45=0%, A46=100%, A47 Shows the value of potentiometer settings 0%~100%, Numerical size can be adjusted by potentiometer.

(1) When A48=0%, A49=+100%, S00 Set Fre.range 0.00Hz~50.00Hz.

(2) When A48=0%, A49=+50%, S00 Set Fre.range 0.00Hz~25.00Hz.

(3) When A48=-100%, A49=+100%, S00 Set Fre.range -50.00Hz~50.00Hz.

Note: When the motor is in -50.00~0Hz realise reverse, another setting F45 Ten bit motor forward inverseas1 Command priority: Analog given positive and negative values, on the F45 details refer to F45 Parameter Description

3-2-5. F02 the main set mode of set frequency is set to 2, AI2 external analog given.

1. Under monitoring status, Through external analog input terminal Al2 adjust the frequency, the resolution ratio is 0.01Hz.
2. Set the frequency range can be set with the following parameters:

Parameter Item	Description
F12 most frequency	Inverter speed adjustment's allowed maximum output frequency Sett - ing range: 10.00~320.00Hz.
o02 AI2 input X1	Keyboard potentiometer setting the start value. Setting range: 0~100%.
o03 AI2 input X2	Keyboard potentiometer setting the end value. Setting range: 0~100%.
o08 AI2 input X1 correspond to Y1	Keyboard potentiometer setting the starting point for the corresponding value. Setting range: -100%~+100%.
o09 AI2 input X2 correspond to Y2	Keyboard potentiometer settings corresponding to the value of the end. Setting range: -100%~+100%.
S00 frequency setting	Display the frequency,Through out analog input terminal Al1 adjust the frequency. Setting range: F12*o08~ F12*o09.

Example:

F12=50.00Hz, o00=0%, o01=100%,

(1) When o08=0%, o09=+100%, S00 Set Fre.range 0.00Hz~50.00Hz.

(2) When o08=0%, o09=+50%, S00 Set Fre.range 0.00Hz~25.00Hz.

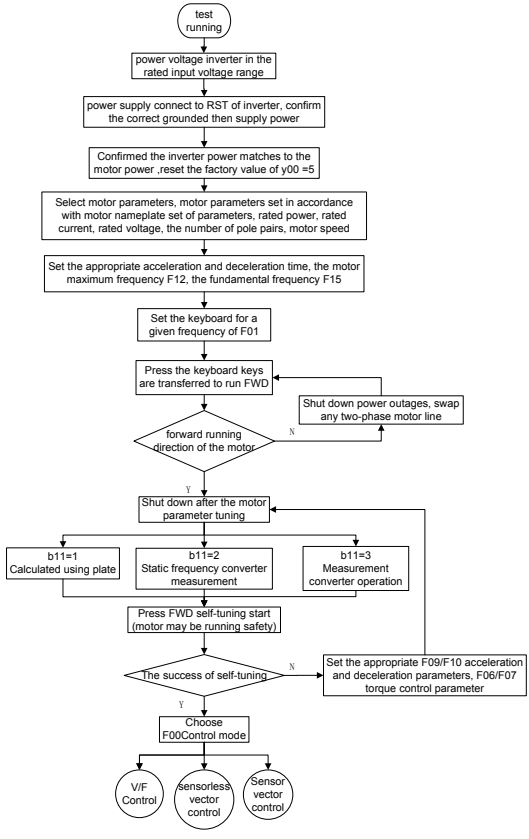
(3) When o08=-100%, o09=+100%, S00 Set Fre.range -50.00Hz~50.00Hz.

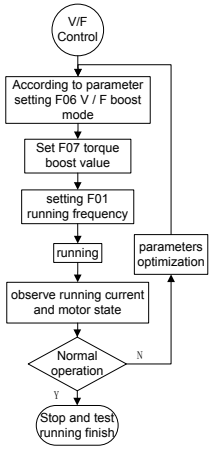
Note: When realize the motor reverse in -50.00~0Hz。

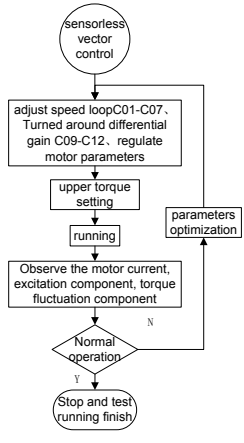
F45Ten bit motor forward reverseas1 Command priority: Analog given positive and negative values, on the F45 details see F45 Parameter Description.

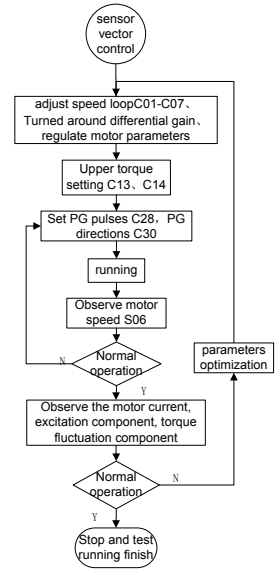
Section IV Test Running

- Failure occurred when test running, Please take reference of fault diagnosis in 6-1 to get rid of the breakdown.
- Inverter parameters have a strong adaptive ability, in general b11 = 1 calculation of electrical parameters with the name plate, on this basis, a little manual adjustment can get you high-performance vector control.
- Only when the motor completely without the load can set b11=3motor rotation measurements.
- Before the electrical parameter measurement finished, inverter can have the ourput voltage any time, please ensure the safety.




V/F Control
According to parameter setting F06 V / F boost mode
Set F07 torque boost value
setting F01 running frequency
running
observe running current and motor state
Normal operation
N
Y
Stop and test running finish
parameters optimization


sensorless vector control
adjust speed loopC01-C07、Turned around differential gain C09-C12、regulate motor parameters
upper torque setting
running
Observe the motor current, excitation component, torque fluctuation component
Normal operation
N
Y
Stop and test running finish
parameters optimization


sensor vector control
adjust speed loopC01-C07、Turned around differential gain、regulate motor parameters
Upper torque setting C13、C14
Set PG pulses C28，PG directions C30
running
Observe motor speed S06
Normal operation
N
Y
Observe the motor current, excitation component, torque fluctuation component
Normal operation
N
Y
Stop and test running finish
parameters optimization

Section V Parameter Function Table

Notice: ★mean that the factory setting value of the parameter is according to the power and model.The exact value is referred to the Parameter Function Table.Change limited mean that whether it can be modified while running.

Slant font [8000] means PI8600 do not have such function.

5-1 Menu Group

Code	Description / LCD	Function Discription	Group ID	Refer to page
S	Monitor function group	Monitor frequency, current and other 16 monitor objects	0B	20
F	Basic function group	Frequency setting, control mode,acceleration time and deceleration time	00	21
A	User function group	Monitor, protection, communication setting	01	38
o	IO function group	Analog, digital input, output function	02	50
H	Multi-speed PLC group	Multi-speed running, PLCrunning	03	70
U	V/F parameter group	User defined V/Fcurve	04	78
P	PID function group	Internal PID parameter setting	05	79
E	Extend function froup	Constant pressure water supply and other functions setting	06	82
C	Speed ring function group	Current ring, speed running, PG parameter	07	88
b	Motor parameter group	Motor parameter setting	08	94
y	System function group	Parameter reset, fault query, product information, parameter protection	09	96

5-2 Monitor Function:S00-S15(0x0B00-0x0B0F)

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
S00	Setting frequency	Current inverter real setting frequency	Hz	-	N
S01	Real frequency	Current inverter real output frequency	Hz	-	N
S02	Motor real current	Valid value of motor actual current	A	-	N
S03	Percentage of motor current	The percentage of actual motor current and rated current	%	-	N
S04	DC bus voltage	Detection value of DC bus voltage	V	-	N
S05	The output voltage	The real output voltage	V	-	N

S06	Motor real speed	Motor real running speed	-	-	N
Under running, the real speed of the motor＝60*the real output frequency *Gain Speed surveillance /pole of the motor . Example: the real output frequency50.00Hz, Gain Speed surveillance A35=100.0%, the pole of the motor b03/b16＝2, the real speed of the motor＝1500rpm. When stop, based Residual voltage test motor speed, renew speed 500ms. The real speed ＝60*residual frequency*Gain Speed surveillance / the pole of the motor Max display of motor real speed 9999rpm.					
S07	Total running time	The total running time for every time	hour	-	N
When the ouptput, the frequency inverter calculated the running time. Total running time can be cleared up automatically with A33 selecting reboot or continue accumulation after reboot Total running time of the units can be changed by parameter A34, you can choose hours or days as the unit					
S08	IGBT temperature℃	Test the temperature of IGBT in the frequency	℃	-	N
S09	PID set point	PID Adjust run-time values of the percentage of a given	%	-	N
S10	PID feedback	PID Adjust run-time values of the percentage of feed back	%	-	N
S11	Motor output frequency	The percentage of actual output power of motor	%	-	N
The output frequency of the motor＝the actual frequency of the motor *A36the regulate of the motor frequency Max display of the output frequency 2999.9					
S12	Excitation heft set value	Motor set excitation heft percentage	%	-	N
S13	Excitation heft actual value	Motor actual excitation heft percentage	%	-	N
S14	Torque heft Set value	Motor set torque percentage	%	-	N
S15	Torque heft actual value	Motor actual torque heft percentage	%	-	N

5-3 Basic Function Group:F00-F50(0x0000-0x0032)

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
F00	Control mode	V/Fcontrol	0	-	0	N
		Sensorless vector control	1			
		Sensor feedback close loop vector control	2			
Control mode choose, setting 0~2. 0 : V/ Fcontrol It is not sensitive to motor parameters, can be used as power supply; for motor control, using the combination of vector control and V / F control strategies, appropriately adjusts motor						

parameters, obtain high-performance control effect; suitable for a inverter driving a motor occasions; suitable for a inverter driving multiple motors occasions; suitable for the inverter as a variable frequency power supplies.

1 : Sensorless vector control
High-performance speed sensorless vector control; need to set the appropriate electrical parameters or the motor parameter tuning; truly achieved the decoupled AC motor, so that operational control of DC motors.

2 : Sensor feedback close loop vector control
Suitable for high precision speed control occasions, need to install PG card and pulse encoder shaft in the motor or mechanical equipment.

F01	Keyboard setting frequenc	Lower frequency~upper frequency	Hz	50.00	Y

The keyboard for a given operating frequency,it can be any frequency between lower frequency and upper frequency .
F02/F03setting to 0, Involved in setting frequency calculation.

F02	Frequency main set mode	Keyboard setting frequency or RS485	0	-	0	Y
		AI1 the external analog setting[8000]	1			
		AI2 the external analog setting	2			
		AI3 the external analog setting	3			
		Keyboard potentiometer setting	4			
		Multi-segment digital voltage setting	5			
		Digital Pulse Setting	6			

The main mode of the frequency running frequency:

0 : keyboard setting frequency or RS485 change F01 keyboard setting frequency
Multi-digital voltage terminal effective exchange, change F01keyboard setting value

1 : AI1 the external analog setting
Given the external analog0~10V,-10V~+10V,0~20mA.For detail please read the o group parameter.

2 : AI2 the external analog setting

3 : AI3 the external analog setting
Given the external analog 0~10V, 0~20mA. For detail please read the o group parameter.

4 : Keyboard potentiometer setting
Keyboard potentiometer setting, keyboard potentiometer for a given start and end values of the corresponding values can be positive role and negative effects. For detail please read the A group parameter.

5 : Multi-segment digital voltage setting
o36~o46 IO input terminal function set to 11, 12, 13, switch H47~H54 Multi-digital voltage setting, 100% Corresponding to the maximum frequency .

6 : Digital pulse setting
Digital pulse input frequency Corresponding to the setting frequency, For detail please read the o52 group parameter.
Pulse input terminal and DI8 terminal reset , after using the digital pulse input,o43 set to 0 ,Otherwise, the function settings will take effect, the pulse input on status of o58 can be checked, be limited to low-speed pulse.
Through o36~o46 IO input teminal set to 14, 15, 16 be configured to switch the source

F03	Auxiliary setting mode of frequency	Keyboard setting frequency or RS485	0	-	0	Y
		AI1 the external analog setting[8000]	1			
		AI2 the external analog setting	2			
		AI3 the external analog setting	3			
		Keyboard potentiometer setting	4			
		Multi-segment digital voltage setting	5			
		Digital Pulse Set	6			
		PID regulation mode	7			

Auxiliary setting mode of frequency set:

0 : Keyboard frequency setting frequency or RS485, change F01 kayboard setting frequency
After multi-digital voltage terminal effective switch, change F01keyboard setting.

1 : AI1 the external analog setting
Given the external analog0~10V,-10V~+10V,0~20mA.For detail please read the o group parameter.

2 : AI2 the external analog setting
Given the external analog 0~10V, 0~20mA.For detail please read the o group parameter.

3 : AI3 the external analog setting
Given the external analog 0~10V, 0~20mA.For detail please read the o group parameter.

4 : Keyboard potentiometer setting
Keyboard potentiometer setting, keyboard potentiometer for a given start and end values of the corresponding values can be positive role and negative effects. For detail please read the A group parameter.

5 : Multi-segment digital voltage setting
o36~o46 IO input terminal function set to 11, 12, 13, switch H47~H54 Multi-digital voltage setting, 100% Corresponding to the maximum frequency .

6 : Digital pulse set
Digital pulse input frequency corresponding to set the frequency, For detail please read o52 parameter.
Pulse input terminal and DI8 terminal reseting, After use digital pulse input, o43set to 0, Otherwise, the function settings will take effect, can check the pulse input status o58, be

limited to low-speed pulse.

7 : PID regulation mode

The completion of the main to the frequency of common analog feedback loop control. Speed control accuracy requirements applicable to the general occasions.

The given value can be given through the keyboard can also be given through the analog.

Analog feedback can represent the pressure, flow, temperature.

Details see the P group of parameters.

The completion of the main to the frequency of common analog feedback loop control. Speed control accuracy requirements applicable to the general occasions.

For a given value can be given through the keyboard can also be given through the analog.

Analog feedback can represent the pressure, flow, temperature.

Details see the P group of parameters.

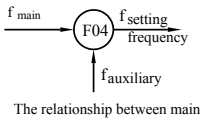
Through o36~o46 IO input terminal, set to 17, 18, 19 be configured to switch the source for a given ratio.

F04	The relationship between main and auxiliary setting frequency	The main setting individual control	0	-	0	Y
		The auxiliary setting individual control	1			
		Main + auxiliary	2			
		Main -auxiliary	3			
		(main*auxiliary)/maximum frequency	4			
		Maximum {main,auxiliary}	5			
		Minimum {main,auxiliary}	6			

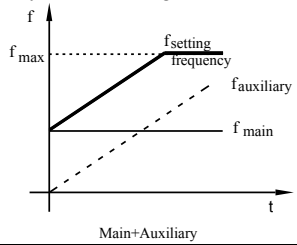
Main given and auxiliary given set frequency relations:

Main given value and auxiliary given value can be added up,subtracted, multiplied,maximum, minimum calculation.

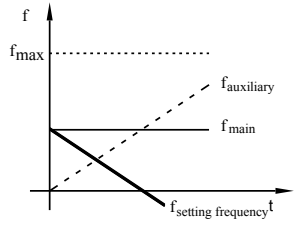
O group parameters can be adjusted to coordinate the main given and auxiliary given proportion, to meet the requirements of the system fine-tuning and bias.



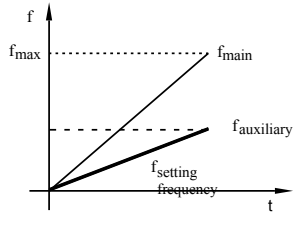
The relationship between main give and auxiliary given



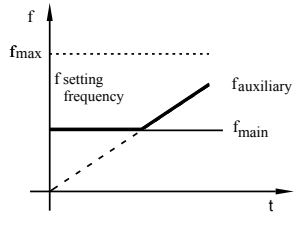
Main+Auxiliary



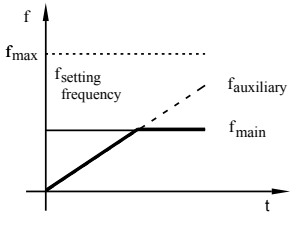
Main-Auxiliary



(Main*Auxiliary)/The Max Frequency



Maximum(Main&Auxiliary)



Manimum(Main&Auxiliary)

F05	Running control mode	Keyboard+Rs485/CAN	0	-	0	Y
		Keyboard+terminal+Rs485/ CAN	1			
		Rs485/CAN	2			
		Terminal control	3			
		The proportion linkage control	4			

Stop and running command control mode：

0 : keyboard+Rs485/CAN Control

1 : keyboard+Terminal+Rs485/CAN Control

control terminal, edge trigger, falling edge of the implementation of the Forward command FWD / Reverse command REV, rising edge of the implementation of the STOP command

2 : Rs485/CAN Control

Under this function, only free stop funciont is valid under the keyboard control, other operation control is invalid

3 : Terminal control, Level trigger.

Under this function,only free stop funciont is valid under the keyboard control,other operation control is invalid

4 : The proportion linkage control

Select this function, the slave unit would execute the command from the proportion linkage host unit.

Select this function, can also use keyboard, terminal, RS485 to control the proportion linkage slave unit to run.

The proportion of linkage running,after stop the proportion linkage slave unit with the keyboard terminal, Rs485, the slave unit will not run the proportion liknge host unit's command, it needs once again to respond to host commands through the keyboard, terminal, RS485, or the proportion linkage host sends stop command so that slave unit could respond to run commands.

F06	V/F boost mode	1 bit	Beeline V/F curve	0	-	0000	N
			Power of 1.2 V/F curve	1			
			Power of1.7 powerV/Fcurve	2			
			Power of 2 power V/F curve	3			
			Define mode V/Fcurve	4			
		10 bit	Close automatic torque boost	0			
			Automatic torqueboost	1			
		100 bit	VF mode 0 speed no Output	0			
			VF mode keep 0 speed	1			

1 bit: V/F promote curve

0 Line V/F curve: Suitable for ordinary constant torque load

1 Power of 1.2 V/F curve: Appropriate torque down V/F curve, Suitable for liquid loads

2 Power of 1.7 V/F curve: Appropriate torque down V/F curve, Suitable for liquid loads

3 Power of 2 V/F curve: Torque down V/F curve, It is suitable for fans, pumps, centrifugal load

4 Define mode V/Fcurve: Can be customized appropriate curve according to the actual situation .

10 bit: Auto-torque boost mode

0 Close Automatic torque boost

1 Open automatic torque boost

parameters which affect automatic torque enhance :

Actual value torque component S15

b06/b19 stator resistance

F07 torque enhance value

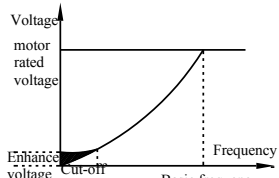
Automatic torque enhance value = actual value of torque component * stator resistance *torque enhance value.

100 bit: VF mode 0 speed maintain function

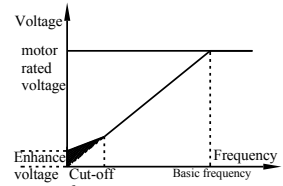
0 VF mode 0 Speed No Output: Output frequency is less than 0.5Hz, stop PWM output to reduce the switching loss.

1 VF mode keep 0 speed: the output frequency is 0Hz, in accordance with the DC braking current of starting F26, keep 0 speed.

F07	Torque boost value	0.0~30.0%	%	0.0	Y
F08	Torque boost cut-off frequency	0.00~maximum frequency	Hz	15.00	Y



down the torque curve torque boost



Constant torque curve torque boost

Torque increase is mainly used to improve the low-frequency torque characteristics under sensorlessV / F control mode.

Torque boost is too low, weak low speed motor

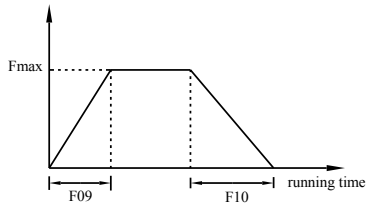
Torque boost is too high, motor over-excitation operation, large inverter output current, and low efficiency.

The setting frequency of the inverter is lower than the frequency of the torque rising,the torque rising will be valid;over than the setting frequency the torque rising will invalid.

F09	Accelerate time	0.0~3200.0	s	10.0	Y
F10	Decelerate time	0.0~3200.0	s	10.0	Y

F09 Accelerate time: accelerate time from 0Hz to maximum frequency.

F10 Decelerate time: decelerate time from maximum frequency to 0Hz



Linear Acceleration

F11	Percentage of output voltage	50~110	%	100	Y

The percentage of the actual output voltage and the rated output voltage.

Used to adjust the output voltage,output voltage＝inverter rated output voltage*percentage of output voltage.

F12	Maximum frequency	10.00~320.00	Hz	50.00	N

Inverter output maximum frequency allowed is also the setting basis of acceleration / deceleration time.

This parameter setting, you should consider characteristics of the motor speed and capacity.

F13	Lower frequency	0.00~Upper frequency	Hz	0.00	N
F14	Upper frequency	Lower frequency~Upper frequency	Hz	50.00	N

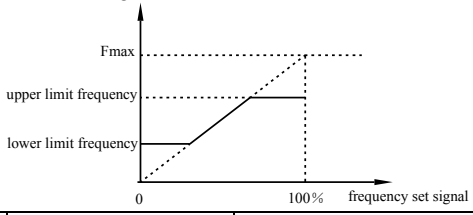
F13 Lower frequency: the lower limit of the output frequency.

F14 Upper frequency: the uppper limit of output frequency.

When the frequency setting command is higher than the upper frequency, the operating frequency

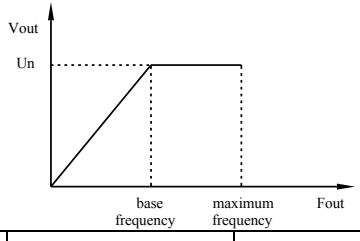
Will be the upper frequency;When the frequency setting command below the lower frequency

The operating frequency is lower frequency. Start the motor that in the status of stopping, the inverter outputs accelerate starting from 0Hz, accordance with the step 1 acceleration time towards the upper or the setting frequency to accelerate.when motor Stop,the operating frequency decelerate according to deceleration time down to 0Hz.



F15	Basic frequency	5.00~Maximum frequency	Hz	50.00	N

Corresponding to different fundamental frequency of the motor select this function. The basic V/F characteristic curve is as below:



F16	Carrier frequency	1.0~16.0	kHz	★	Y

This function is chiefly used to improve the possible noise and vibration during the operation of frequency converter. When carrier frequency is higher, the output current has better wave, the torque is great at lower frequency and the motor produces light noise. So it is very suitable for use in the applications where great torque is output at low frequency quietly. But in these applications, the damage to the switches of main components and the heat generated by the inverter are great, the efficiency is decreased and the output capacity is reduced. At the same time, more serious radio interference is resulted and special attention must be paid for application where very low EMI is needed, and filter option can be used if necessary. Another problem for application of high carrier frequency is the increase of capacitance-leakage current. The protector for leakage current may invalidate function, and over current is also possibly caused.

When low carrier frequency is applied, the case is almost contrary to the above-mentioned one.

Different motor has different reflection to the carrier frequency. The best carrier frequency is gained after regulation according to actual conditions. The higher the motor capacity is, the lower the carrier frequency should be selected.

The company reserves the right to limit maximum carrier frequency as following:

The relation between carrier frequency and Motor Noise, Electric disturbance, Switch dissipation is expressed as following:

Carrier frequency	Motor noise	Electric disturbance	Switch dissipation
1.0KHz	Big	Small	Small

8.0KHz 16.0KHz	↕ Small	↕ Big	↕ Big

The relationship of the carrier frequency and power :

Power(kw)	0.4-18.5	22-30	37-55	75-110	132-200	220above
Carrier frequency (Hz)	8.0K	7.0K	4.0K	3.6K	3.0K	2.5K

Note: Carrier frequency is bigger, the temperatuer of the machine is higher.

F17	Carrier frequency adjustment range		0.0~4.0		kHz	0.0	Y
F18	Carrier frequency adjustment mode	1 bit	No automatic adjustment	0	-	00	Y
			Automatic adjustment Mode	1			
		10 bit	Automatic adjustment,Fixed mode	0			
			Automatic adjustment, random mode	1			

F17 Carrier frequency adjustment range

0.0~4.0kHz, Actual Carrier frequency adjustment range 1.0~16.0kHz

F18 Carrier frequency adjustment Mode

1 bit: Carrier frequency automatic adjustment mode

0: No automatic adjustment

Carrier frequency according F16 to set .

1: automatic adjustment Mode

The carrier frequency automatically adjusts the model 10 can select random mode and fixed pattern.

10 bit: Stochastic adjustment mode

0: automatic adjustment, Fixed mode

Load current>80% Carrier frequency =F16-F17

Load current<60% Carrier frequency =F16+F17

1: automatic adjustment, random mode

Load current >80% Carrier frequency = (F16-F17)~F16

Load current <60% Carrier frequency = F16~(F16+F17)

F19	Waveform generation mode	Asynchronous space-vector PWM	0	-	0	N
		Stepless & subsection synchronous space vector PWM	1			
		Two-phase optimization space vector PWM	2			

PWM wave produce mode

0: Asynchronous space-vector PWM

1: Stepless & subsection synchronous space vector PWM

2: Two-phase optimization space vector PWM

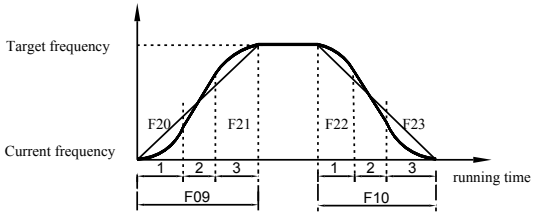
F20	Scurve start time at the acceleration step	0.0~50.0	%	0.0	Y

F21	Scurve stop time at the acceleration step	0.0~50.0	%	0.0	Y
F22	Scurve start time at the deceleration step	0.0~50.0	%	0.0	Y
F23	Scurve stop time at the deceleration step	0.0~50.0	%	0.0	Y

1 Indicate that the slope of the output frequency from 0 to the max.
2 Indicate that the slope of the output frequency at constant segment.
3 Indicate that the slope of the output frequency is reduced to 0 from the max.

Such as setting the S curve acceleration and deceleration, acceleration and deceleration time from 0Hz to the maximum frequency is calculated as follows:

Plus acceleration S characteristic time = F09 * F20
Constant extra acceleration S characteristic time = F09-(F09 * F20 + F09 * F21)
Minus acceleration S characteristic time = F09 * F21
Full acceleration time = F09 Acceleration time
Velocity S addition and subtraction characteristic time = F10 * F22
Constant deceleration S characteristics time = F10-(F10 * F22 + F10 * F23)
And reduction rate of S characteristic time = F10 * F23
All deceleration time = F10 deceleration time



S curve acceleration&deceleration

F24	V/F control slip compensation	Slip compensation invalid	0	-	0	N
		Slip compensation valid	1			

Valid only under V/F control mode.
0 : Slip compensation function is invalid.
1 : Slip compensation function is valid.

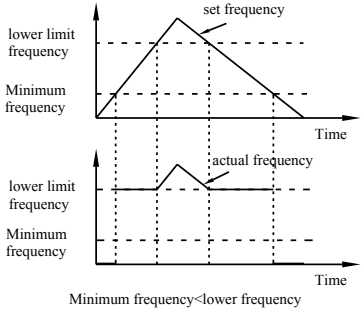
Slip compensation value adjusted by the following parameters to ensure stable speed under load fluctuations and heavy load,

C09 Low Slip Gain
C10 Low Slip switching frequency
C11 High-Speed Slip Gain
Slip C12 high-speed switching frequency

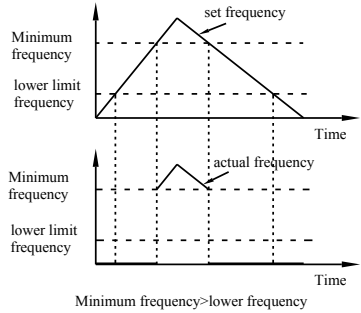
F25	Minimum running frequency	0.00~Maximum frequency	Hz	0.00	N

The set frequency lower than the minimum running frequency, the converter will stop, that is, when the set frequency is less than the minimum running frequency, are determined that the set frequency is 0.

Minimum running frequency" and "lower frequency" relationship is as follows.



Minimum frequency<lower frequency

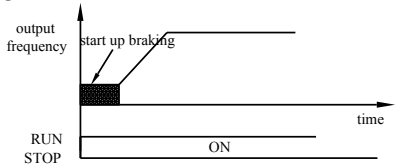


Minimum frequency>lower frequency

F26	DC braking current when starting	0~135	%	100	Y
F27	Braking time when starting	0.0~60.0	s	0.0	Y

When frequency Inverter starting, the first injection of DC current, the current size is determined by starting to set when the DC braking current and braking time, braking time from the start to set.

Value is based on inverter rated current as the benchmark, that is inverter rated current corresponds to 100%. During setting process, be sure to gradually increase, until adequate braking torque, and can not exceed the motor rated current.

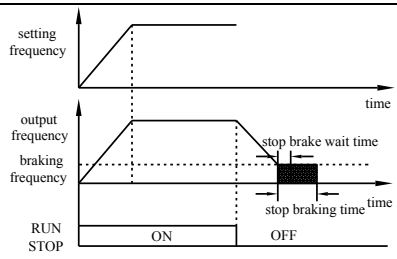


start up braking

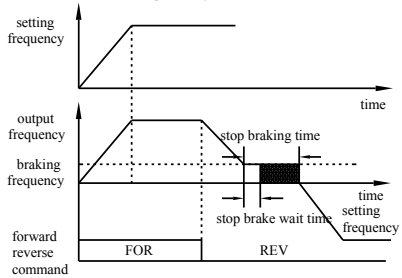
F28	Stop when the DC braking current	0~135	%	100	Y
F29	Stop and braking wait time	0.0~60.0	s	0.0	Y
F30	Brake time stop	0.0~60.0	s	0.0	Y
F31	Stop and brake starting frequency	0.00~ Max frequency	Hz	0.00	Y

Inverter slowing down to stop braking start frequency, stop the output PWM waveform to begin injection of DC current, the current size by the shutdown of DC braking current setting, braking time, braking time set by the downtime.

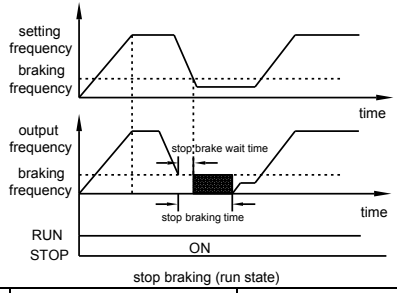
Value is based on inverter rated current as the benchmark, that is inverter rated current corresponds to 100%. Setting process, be sure to gradually increase from a small, until adequate braking torque, and can not exceed the motor rated current.



Stop braking (RUN→STOP)



stop braking (forward and reverse rotate)



stop braking (run state)

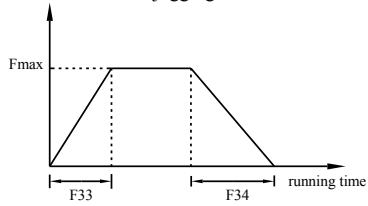
F32	Stop setting mode	Deceleration stop	0	-	0	N
		Free stop	1			

When the frequency inverter receives the "stop" command, it will set the parameters accordingly to this parameter to set the motor stop mode.

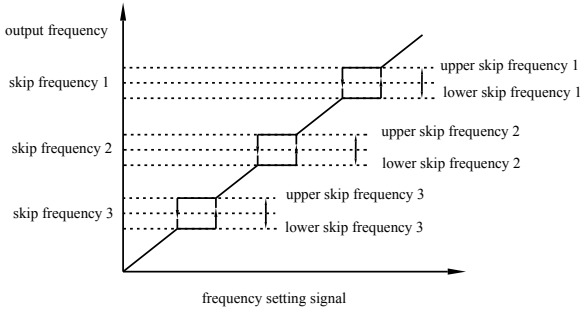
0 : Deceleration to stop
Mode converter according to parameters set by the deceleration time to set the deceleration mode to slow down to the lowest frequencies to stop.

1 : Free stop mode
Inverter receive "stop" command immediately stop output, according to the load inertia, motor free-run to stop.

F33	Jog acceleration time	0.0~3200.0	s	1.0	N

<table>
<tr><td>F34</td><td colspan="2">Jog deceleration time</td><td colspan="2">0.0~3200.0</td><td>s</td><td>1.0</td><td>N</td></tr>
<tr><td rowspan="7">F35</td><td rowspan="7">Jog mode setting</td><td rowspan="3">1 bit</td><td>Jog direction:forward</td><td>0</td><td rowspan="7">-</td><td rowspan="7">000</td><td rowspan="7">N</td></tr>
<tr><td>Jog direction:reverse</td><td>1</td></tr>
<tr><td>Jog direction: direction determined by the main terminal</td><td>2</td></tr>
<tr><td rowspan="2">10 bit</td><td>Jog end mode: stop running</td><td>0</td></tr>
<tr><td>Jog end mode:reset to the former state before jog</td><td>1</td></tr>
<tr><td rowspan="2">100 bit</td><td>Jog end and acceleration deceleration time: reset to the set acceleration and deceleration time before jog</td><td>0</td></tr>
<tr><td>Jog end and acceleration deceleration time: save the set acceleration and deceleration time before jog</td><td>1</td></tr>
<tr><td>F36</td><td colspan="2">Jog frequency setting</td><td colspan="2">Lower frequency~upper frequency</td><td>Hz</td><td>6.00</td><td>Y</td></tr>
<tr><td colspan="8">Jog acceleration/deceleration time configuration defines the same section of acceleration / deceleration time.
The direction of jog is set by the unit bit of F35,when the Jog command does not contain the direction of jog, the direction of job will run as to the unit bit designated by F35. It is set to 2, the direction of jog is run by the terminal or current direction.
The running status after jogging is identified by F35.
Whether jog acceleration/deceleration time is maintained through the confirmation on hundred bit of F35 after jogging.
 

Linear Acceleration</td></tr>
<tr><td>F37</td><td colspan="2">Skip frequency1 limit</td><td colspan="2">Skip frequency 1 limit</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td>F38</td><td colspan="2">Skip frequency 1 upper</td><td colspan="2">Skip frequency 1 upper</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td>F39</td><td colspan="2">Skip frequency2 limit</td><td colspan="2">Skip frequency 2 limit</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td>F40</td><td colspan="2">Skip frequency 2 upper</td><td colspan="2">Skip frequency 2 upper</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td>F41</td><td colspan="2">Skip frequency3 limit</td><td colspan="2">Skip frequency 3 limit</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td>F42</td><td colspan="2">Skip frequency 3 upper</td><td colspan="2">Skip frequency 3 upper</td><td>Hz</td><td>0.00</td><td>Y</td></tr>
<tr><td colspan="8">During running, to skip resonance produced by the immanent resonance point in the machine systems, skip mode can do this.
At most three resonance points could be set to skip.</td></tr>
</table>



Upper skip frequency and lower skip frequency define skip frequency range.

In the acceleration and deceleration process, inverter output frequency can normally through skip frequency area.

F43	Preset frequency		0.00~Max frequency	Hz	0.00	Y
F44	Preset frequency working time		0.0~60.0	s	0.0	Y

After inverter startup, it firstly run with preset frequency, running time is preset frequency time, then it will run with given frequency. Jog run will not be effective by preset frequency.

F45	Motor running direction	1 bit	Direction command: forward command FWD let motor forward running	0	-	0000	N
			Direction command: forward command FWD let motor reverse running	1			
		10 bit	Command prior: terminal / keyboard	0			
			Prior command: Analog given positive and negative values	1			
		100 bit	Reverse allow: reverse forbidden	0			
			Reverse allow:reverse allow	1			

1 bit: used to change the direction of motor running

0: Forward command FWD is to let motor forward running.

1: Forward command FWD is to let motor reverse running.

10 bit : Motor forward reverse running can be controlled by the keyboard potentiometer and analog input positive or negative value.

0: Prior command: terminal / keyboard, set frequency can be negative value, but running direction decided by terminal and keyboard command.

1: Prior command: positive or negative value of analog input, setting frequency positive value let motor forward running, setting negative value let motor reverse running.

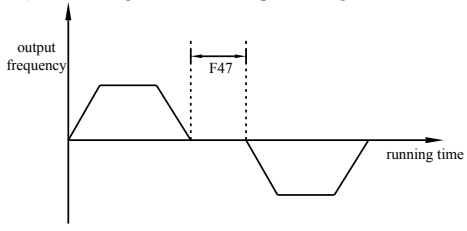
100 bit: motor reverse allow.

For some producing equipment, the reverse may lead to damage to the equipment, so this feature can be used to prevent motor reverse, Inverter default forbidden reverse. When the motor running direction opposes to equipment required direction, you can exchange the wiring of any two inverter output terminals to let equipment forward running direction is

consistent with motor running.
0: Reverse forbidden
1: Reverse allow

F46	Pass 0 stopping time	0.0~60.0s	s	0	N

Setting this parameter to achieve the motor forward to reverse (or from reverse running to forward), the waiting time of motor speed being zero。



F47	Frequency multiple setting	*1	0	-	0	N
		*10	1			

0 : Set frequency display accuracy 0.01Hz
With this accuracy, F12 Maximum frequency setting range 10.00~320.00Hz.
1 : Set frequency display accuracy 0.1Hz
with this accuracy, F12 Maximum frequency setting range 100.0~800.0Hz.
After setting this parameter, there must be reset F12 maximun frequency.

F48	Acceleration and deceleration configuration word	1 bit	No adjustment of acceleration time	0	-	0000	N
			AI1 adjustment of the external analog giving $_{8000}$	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			Adjustment of keyboard potentiometer giving	4			
			Adjustment of Multi steps digital voltage giving	5			
		10 bit	No adjustment of deceleration time	0			
			AI1 adjustment of the external analog giving $_{8000}$	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			Adjustment of keyboard potentiometer giving	4			
			Adjustment of Multi steps digital voltage giving	5			

		100 bit	Acceleration time:*s	0			
			Acceleration time:*min	1			
			Acceleration time:*h	2			
			Acceleration time:*day	3			
		1000bit	Deceleration time:*s	0			
			Deceleration time:*min	1			
			Deceleration time:*h	2			
			Deceleration time:*day	3			

1 bit: Acceleration time adjustment mode

0	No adjustment of acceleration time	No adjustment
1	*AI1 adjustment of the external analog giving*[8000]	-
2	AI2 adjustment of the external analog giving	Actual acc. time = Acc. time*AI2 giving percentage
3	AI3 adjustment of the external analog giving	Actual acc. time = Acc. time*AI3 giving percentage
4	Adjustment of keyboard potentiometer giving	Actual acc.time = Acc. time*keyboard potentiometer giving percentage
5	Adjustment of multi steps digital voltage giving	Actual acc.time=Acc.time*multi steps digital voltage giving percentage

10 bit: Deceleration time adjustment mode

0	No adjustment of acceleration time	No adjustment
1	*AI1 adjustment of the external analog giving*[8000]	-
2	AI2 adjustment of the external analog giving	Actual acc. time = Acc. time*AI2 giving percentage
3	AI3 adjustment of the external analog giving	Actual acc. time = Acc. time*AI3 giving percentage
4	Adjustment of keyboard potentiometer giving	Actual acc.time = Dec. time*keyboard potentiometer giving percentage
5	Adjustment of multi steps digital voltage giving	Actual acc.time=Dec.time*multi steps digital voltage giving percentage

100, 1000 bit: The unit of Acc. and Dec time when program running on 0 step spe

Acc. and dec. time	1000 bit 100 bit	Range(e.g. F09, F10=3200.0)
*s	0	3200.0 S
*Min	1	3200.0 Min
*H	2	3200.0 H
*Day	3	3200.0 Day

F49	Running configuration	1 bit	Running direction: forward	0	-	0000	N
			Running direction: reverse	1			

	word	10 bit	Running time: *s	0			
			Running time: *min	1			
			Running time: *h	2			
			Running time: *day	3			

Unit adjustment of actual running time.It is only valid on program running.

1 bit: Program running on multi-speed running period, Set bit to running direction of "0"step speed.

Running direction	Setting value
FWD	0
REV	1

When running control mode F05＝0/1/2, control direction of "0" step speed.

When running control mode F05＝3,Setting the value and terminal FWD/REV jointly decide the direction of 0 step speed, FWD priority.

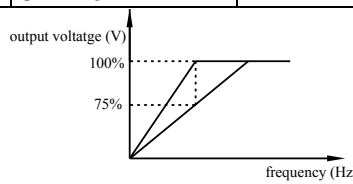
FWD=1runningdirection	REV=1runningdirection	Setting value
FWD	REV	0
REV	FWD	1

10 bit: Unit of time running when on "0" step speed.

The unit of O67、o68 limited time 1，limited time 2.

Running time	10 bit	Range(e.g. H18~H25=3200.0)
*s	0	3200.0 s
*min	1	3200.0 min
*h	2	3200.0 h
*day	3	3200.0 day

F50	Energy saving running percentage	30~100	%	100	N



This parameter describes the minimum output voltage percentage of energy-saving operation. In the constant speed operation, the inverter can be automatically calculated the best output voltage by the load condition. In the process of acceleration and deceleration is not to make such calculations.

Power-saving function is by lowering the output voltage and improve power factor to achieve the purpose of saving energy, this parameter determines the minimum value of reducing of output voltage; This parameter is set to 100%, then energy-saving function will take off.

When energy-saving function in effect, Actual output voltage value of inverter= The inverter rated output voltage*The percentage of output voltage*output voltage percentage of energy saving operation.

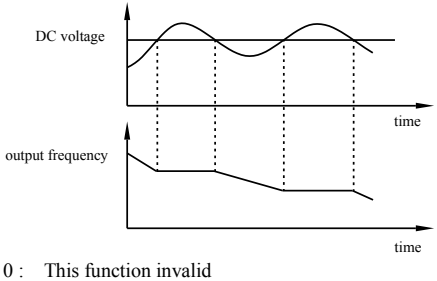
5-4 User Function Group:A00-A55(0x0100-0x0137)

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
A00	Monitor 1	Parameter group N:	Parameter group N:	-	0B00	Y
A01	Monitor 2	X1000/X100	X10/ bit	-	0B01	Y
A02	Monitor 3	00~0B	0~63(0x00~0x3F)	-	0B02	Y

Code	Keyboard display	Parameter group N	Function spec	Parameter N(16 hexadecimal input)
S	Monitor function group	0B	S	0~16(0x00~0x10)
F	Basic function group	00	F	0~60(0x00~0x3C)
A	User function group	01	A	0~56(0x00~0x38)
o	IO function group	02	o	0~61(0x00~0x3D)
H	Multi-step speed PLC group	03	H	0~56(0x00~0x38)
U	V/F curve group	04	U	0~16(0x00~0x10)
P	PID function group	05	P	0~13(0x00~0x0D)
E	Extend function group	06	E	0~14(0x00~0x0E)
C	Speed loop parameter group	07	C	0~32(0x00~0x20)
b	Motor parameter group	08	b	0~23(0x00~0x17)
y	System function group	09	y	0~18(0x00~0x12)

That parameter N. should be 16 hex input.
Monitor1 will be valid when first power on, and which decide keyboard display content.
Such as: monitor 1 S01 actual frequency, A00=0x0B01.
Monitor 2 o57 DI1~4 terminal status, A01=0x0239.
Monitor 3 H55 multi-steps speed status, A02=0x0337.

A03	Over /less voltage stall protection	N	0	-	1	Y
		Y	1			
A04	Overvoltage stall protection voltage	110%~140%(Standard bus voltage)		%	120	Y



0 : This function invalid
1 : This function valid
When the inverter deceleration, as the motor load inertia, motor will produce feedback

voltage to inverter inside, which will increase DC bus voltage and surpass max voltage. When you choose Over /less voltage stall protection and it is valid, Inverter detects DC side voltage, if the voltage is too high, the inverter to stop deceleration (the output frequency remains unchanged), until the DC side voltage is below the set value, the inverter will re-implement the deceleration

With braking models and external braking resistor, this function should be set to "0".

A05	Auto stabilize voltage	Invalid	0	-	0	Y
		Valid	1			
		Valid, useless for deceleration	2			

CPU automatically detect the inverter DC bus voltage and to make real-time optimized processing, when the grid voltage fluctuate, the output voltage fluctuation is very small, the V / F curve characteristic has always been close to setting state of rated input voltage..

0 : Function invalid.
1 : Function Valid.
2 : Function Valid, but useless for deceleration.

A06	Dynamic braking option	Invalid	0	-	0	Y
		Security type	1			
		General type	2			
A07	Hysteresis voltage	0~10%		%	2	Y
A08	Dynamic braking voltage	110%~140%(Standard bus voltage)		%	130	Y

0 : Invalid
1 : Security Type
Only in the inverter deceleration process, and detected high-voltage DC bus exceeds a predetermined value, the dynamic braking will be implemented
2 : General Type
Under any state, when the inverter detected high-voltage DC bus exceeds a predetermined Value, the dynamic braking will be implemented.

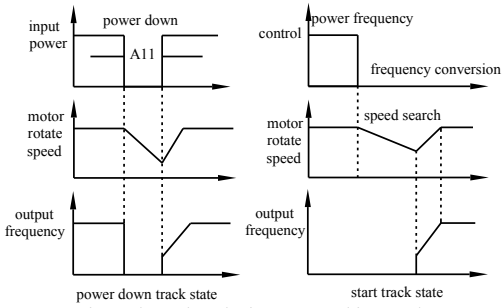
When the inverter is running on emergency deceleration state or load great fluctuation, it may appear over-voltage or over-current. This phenomenon is relatively prone to happen when the motor load inertia is heavy. When inverter The inverter internal DC bus detected voltage exceeds a certain value, the output brake signal through an external braking resistor implement energy-braking function. Users can select inverter models with a braking function to apply this feature.

A09	Less voltage level	60%~75%(Standard DC bus voltage)	%	70	Y

The definition of allowed the lower limit voltage of normal working inverter DC side .For some low power occasions, inverter less voltage value can be appropriately put down in order to ensure the inverter normal working.

Under normal condition, keeping default setting.

A10	Power-down tracking options	N	0	-	0	Y
		Power-off tracking mode	1			
		Startup tracking mode	2			
A11	Power-down tracking time	0.0~20.0		s	0.0	Y



This parameter is used to select the inverter tracking mode.

0 : N speed tracking means to start tracking from 0 Hz.

1 : Power-down tracking

When the inverter instantaneous power off and re-start, the motor will continue running with current speed and direction.

If the power off time is longer than A11 set time, the inverter will not re-start power on again.

2 : Startup tracking mode

When power on, inverter will first inspect motor direction and speed, and then driving motor with current speed and direction.

Set startup tracking function, power off tracking function is still valid.

A12	Power down frequency drop point	65~100%(standard DC bus voltage)	%	75	Y
A13	Power down frequency drop time	0.1~3200.0	s	5.0	Y

Correctly setting this parameter can let inverter does not less voltage stop in case of instantaneous power off.

When the DC bus voltage drop to frequency drop point A12 set, inverter will decelerate according to deceleration time A13 set and stop outputting power to load. Meanwhile, inverter will use load feedback energy to compensate DC bus voltage dropping and keep inverter working in short time.

Power down frequency drop time actually is deceleration time of frequency dropping after power off.

If this value set is too large, the load feedback energy is small, then inverter can not compensate for voltage dropping in DC.

If this value set is too small and there is large energy feedback from load, the excessive energy compensation may cause inverter over-voltage fault.

Set A12 100% to cancel power off frequency dropping function.

A14	Current limit	N	0	-	0	Y
		Y	1			
A15	Limit fall time	0.1~3200.0		s	10.0	Y
A16	Limit deceleration protection Point	10~250		%	★	Y
A17	Limit fix-speed protection point	10~250		%	★	Y

Current limitation function can effectively restrain over-current caused by motor load fluctuation in the process of acceleration and deceleration or constant speed operation.

This function will be good effect for V/F control mode.

Under protection of current lost- speed state, the motor speed will drop. so it is not adapted by system which is not allowed to automatically drop speed.

In operation process, when the motor current surpass value A16 set, motor will decelerate according to deceleration time A15 set until current below value A16 set.

In operation process, when the motor surpass value A17 set, motor will run with this speed until current below value A17 set.

Deceleration current limitation is prior of constant speed limitation.

Series	Current limitation%	Corresponding parameter
F	120	A17
	130	A16
G	150	A17
	170	A16

A18	Output phase lose protection	N protection of phase lost	0	-	0	Y
		Warning and constant running	1			
		Warning and deceleration	2			
		Warning and free stopping	3			
A19	Grade of phase lose protection	10~100		%	30	Y

When ratio of unbalance 3phase output surpass A19 Grade of phase lose protection, the inverter output phase lose protection i will action, and the system display fault PH-O.

Output frequency less than 2.00Hz, there is N output phase lose protection.

Phase lost protection grade=max current difference between phases, which will be according to load condition.

A20	Over torque inspected action	N torque inspection	0	-	0	Y
		Warning and running	1			
		Warning and decelerating stop	2			
		Warning and free stopping	3			
A21	Over torque grade	10~250		%	★	Y
A22	Over torque inspection time	0.0~60.0		s	0.1	Y

Motor output current surpass value A21 set, Over torque inspection will be force and the system will show OL2 fault.

Series	Over torque inspection class	Parameter
F	130	A21
G	170	A21

A23	Electronic thermal relay	N	0	-	1	Y

	protection selection	Y	1			
A24	Electronic thermal protection grade	120~250		%	★	Y

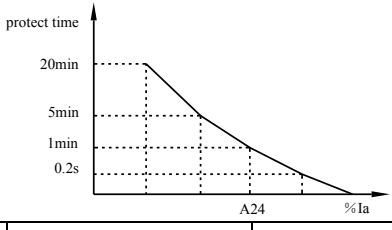
This function is to protect motor overheating when motor does not use thermal relay. Inverter using some parameters to calculate motor temperature rise, at the same time to determine whether the use of current caused motor overheat. When you choose electronic thermal protection function, the drive output is shutdown after overheating detected also shows information of protection.

0 : No selecting this function

1 : Select this function.

Series	Electronic Thermal Protection Level	Parameters
F	120	A24
G	150	A24

A24 set the electronic thermal protection level. When the current is the rated motor current multiples the parameter, the drive in 1 minute protects, thermal protection within one minute that means the actual current is A24 times of the rated current



A25	Fault reset times	0~10	-	0	Y

In the inverter operation process, Over Current expressed by OC、Over Voltage by OU, inverter can automatically recover and run with state of preceding fault. Recovering times will be according to this parameter. It can set 10 times at most. When this parameter is set “0”, inverter will not automatically recover after meeting fault. But if relay in DC main circuit meet fault “MCC” or less voltage “LU” fault, inverter will automatically recover without limitation.

Restarting from fault and normally running over 36s, inverter will automatically recover fault reset times preset.

Restarting from fault and normally running over 36s, inverter will automatically recover to display monitor parameter.

After 10 s of meeting fault, inverter will not recover fault reset function.

A26	Fault reset time	0.5~20.0	s	1.0	Y

Setting interval of fault reset time. When inverter met fault and stopped outputting, and when it inspected without fault time is longer than fault reset time, Inverter will automatically implement fault reset.

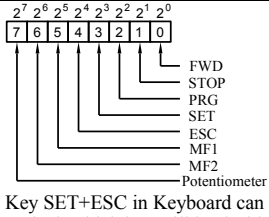
A27	Fan startup temperature	0.0~60.0	℃	0.0	Y

Set the fan start temperature. When the actual temperature of theS08is higher than the set temperature the fan starts.

To avoid the fan frequently starts and stops,the fan stop temperature=A27fan start temperature 1.0 ℃

A28	This inverter communication	1~128	-	8	Y

	address					
This Inverter communication address: it is the only code to differentiate from other inverters. Setting range "1~127" is slave inverter address, that can receive command and send out this inverter state. Seeing attachment 1 for detailed specification. The proportion of linkage function: The proportion of linkage host inverter: This inverter communication address=128, Communication interface A is set as host inverter communication interface for proportion of linkage. Communication interface B can be treated as keyboard interface or "PC" Host Computer Interface. The proportion of linkage slave inverter: This inverter communication address =1~127, Communication interface A and B both can be set as communication interface of slave inverter for the proportion of linkage. Seeing appendix 2 for detailed specification.						
A29	Baud rate	Baud rate is 1200	0	-	4	Y
		Baud rate is 2400	1			
		Baud rate is 4800	2			
		Baud rate is 9600	3			
		Baud rate is 19200	4			
		Baud rate is 38400	5			
This parameter only change the communication port A baud rate. Communication port B baud rate is fixed at 19200bps. A communication port using the onboard keypad (factory standard). Onboard keyboard default 19200bps, do not change. A communications port to use isolation RS485/Rs232 communication card (optional). May need to change						
A30	Communication format	8，N，1 for RTU	0	-	0	Y
		8，N，2 for RTU	1			
		8，E，1 for RTU	2			
		8，O，1 for RTU	3			
		8，E，2 for RTU	4			
		8，O，2 for RTU	5			
Seeing attachment for detailed specification.						
A31	Communications troubleshooting	N warning for communication fault	0	-	0	Y
		Warning and running	1			
		Warning and decelerating stop	2			
		Warning and free stopping	3			

<table>
<tr><td rowspan="2">A32</td><td rowspan="2">Delay inspection time</td><td>0: N inspection</td><td rowspan="2">s</td><td rowspan="2">10</td><td rowspan="2">Y</td></tr>
<tr><td>1~250: late inspection</td></tr>
<tr><td colspan="6">When communication time between interface A or B surpassed A32 delay inspection time, the system will warn according to A31 setting.
After power on, interface without communication will not implement warning.</td></tr>
<tr><td rowspan="2">A33</td><td rowspan="2">Total running time setting</td><td>Auto clear to zero after power on</td><td>0</td><td rowspan="2">-</td><td rowspan="2">1</td><td rowspan="2">Y</td></tr>
<tr><td>Continue to accumulate running time after power on</td><td>1</td></tr>
<tr><td colspan="6">To set whether the time of inverter running accumulating or not.
0 : Auto clear to 0 after power on.
1 : Continue to accumulate running time after power on.</td></tr>
<tr><td rowspan="2">A34</td><td rowspan="2">Unit of total running time</td><td>hour</td><td>0</td><td rowspan="2">-</td><td rowspan="2">0</td><td rowspan="2">Y</td></tr>
<tr><td>Day</td><td>1</td></tr>
<tr><td colspan="6">The set for unit of accumulation running time, only for display of running time.
0 : Unit /hour display range 0~3200.0 hour.
1 : Unit/day display range 0~3200.0 day.</td></tr>
<tr><td>A35</td><td>Motor output speed adjustment</td><td>0.1~1000.0</td><td>%</td><td>100.0</td><td>Y</td></tr>
<tr><td colspan="6">Using for displaying adjustment of motor actual running speed.SeeingA00~A02 monitor options: 6: motor actual running speed.
Setting 100%, corresponding display unit : rpm.
The max speed of displaying after adjustment is 9999.</td></tr>
<tr><td>A36</td><td>Adjustment of motor output power</td><td>0.1~1000.0</td><td>%</td><td>100.0</td><td>Y</td></tr>
<tr><td colspan="6">Used for displaying motor output power of adjustment. Seeing A00~A02 monitor options: 11 :motor output power.
Setting 100%, corresponding display unit:%.
The max output power of displaying after adjustment is 2999.9.</td></tr>
<tr><td>A37</td><td>Keyboard lock function options</td><td>0~0FF</td><td>-</td><td>0FF</td><td>Y</td></tr>
<tr><td colspan="6"> 

Key SET+ESC in Keyboard can activate and cancel keyboard lock function.
To lock which key will be decided by corresponding parameter :
<table>
<tr><td>Set 0~10 bit</td><td colspan="2">Keyboard locked state</td></tr>
<tr><td rowspan="2">0</td><td>0</td><td>Unlock FWD key</td></tr>
<tr><td>1</td><td>Lock FWD key</td></tr>
<tr><td>1</td><td>0</td><td>Unlock STOP key</td></tr>
</table></td></tr>
</table>

	1	Lock STOP key
2	0	Unlock PRG key
	1	Lock PRG key
3	0	unlock SET key
	1	Lock SET key
4	0	Unlock ESC key
	1	Lock ESC key
5	0	Unlock MF1 key
	1	Lock MF1 key
6	0	Unlock MF2 key
	1	Lock MF2 key
7	0	Unlock potentiometer
	1	Lock potentiometer

A38	UP/DN control	1 bit	Power down to save	0	-	0000	Y
			Power down to clear saving	1			
		10 bit	Saving after stopping	0			
			Stop command to clear saving	1			
			Cleared at the end of stopping	2			
		100 bit	One-direction adjustment	0			
			Double-direction adjustment	1			
		1000bit	Invalide adjustment	0			
			Valid adjustment	1			

1 bit: UP/DN control saving state after power down
0: Power down to save
1: Power down to clear
10 bit: UP/DN control saving after stopping
0: Keeping after stopping
1: Stop command to clear saving
2: Cleared at the end of stopping
100 bit: UP/DN control direction of adjustment.
0: One direction adjustment, it is one direction adjustment within 0~max frequency range.
1: Double direction adjustment, it is FEW and REW adjustment within 0~max frequency range.
1000 bit: UP/DN control validity of adjustment.
0: UP/DN invalid adjustment
1 : UP/DN valid adjustment

A39	UP/DN time	1 bit	UP fix speed	0	-	0000	N
			UP fix times	1			
		10 bit	DN fix speed	0			
			DN fix times	1			
		100 bit	UP N adjustment of speed ratio	0			
			AI1 adjustment of the external analog giving[8000]	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			Adjustment of Potentiometer giving	4			
			Adjustment of multisteps digital voltage	5			
		1000bit	DN N adjustment of speed ratio	0			
			AI1 adjustment of the external analog giving[8000]	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving	3			
			Adjustment of Potentiometer giving	4			
			Adjustment of multisteps digital voltage	5			

1 bit: UP acceleration mode

0: Fix speed acceleration, according to A41 fix speed: To increase frequency every 200ms.

1: Fix times acceleration, according to fix times: To increase frequency every triggering.

10 bit: DN deceleration mode

0: Fix speed deceleration, according to A42 fix speed: To reduce frequency every 200ms.

1: Fix times deceleration, according to A42 fix times: To reduce frequency every triggering.

100 bit: UP adjustment mode of adjusting speed ratio

0	UP N adjustment of speed ratio	No adjustment
1	*AI1 adjustment of the external analog giving*[8000]	-
2	AI2 adjustment of the external analog giving	Actual UP adjustment ratio= percentage given by A41*AI2
3	AI3 adjustment of the external analog giving	Actual UP adjustment ratio= percentage given by A41*AI3

4	Adjustment of potentiometer giving	Actual UP adjustment ratio= percentage given by A41* potentiomet
5	Adjustment of multi-steps digital voltage	Actual UP adjustment ratio=percentage given by A41* multi-steps digital voltage

1000 bit: DN adjustment mode of adjusting speed ratio

0	N adjustment of acceleration time	No adjustment
1	*AI1 adjustment of the external analog giving*[8000]	-
2	AI2 adjustment of the external analog giving	Actual DN adjustment ratio =percentage given by A42*AI2
3	AI3 adjustment of the external analog giving	Actual DN adjustment ratio=percentage given by A42*AI3
4	Adjustment of potentiometer giving	Actual DN adjustment ratio=percentage given by A42*AI3.
5	Adjustment of multi-steps digital voltage	Actual DN adjustment ratio=percentage given by A42*multi-steps digital voltage.

A40	UP/DN adjustment value	-300.00~300.00	-	0.00	N
	Frequency after adjustment＝set frequency + UP/DN adjustment value.				
A41	UP adjustment ratio	0.01~20.00	Hz	0.01	Y
	Fix speed: To increase frequency every 200ms. Fix times: To increase frequency every triggering.				
A42	DN adjustment ratio	0.01~20.00	Hz	0.01	Y
	Fix speed: To reduce frequency every 200ms. Fix times: To reduce frequency every triggering.				

A43 A44	The definition of multifunction keys MF1 and MF2	MF is defined as adding function key	0	- -	0 1	Y Y
		MF is defined as reducing function key	1			
		MF is defined as free stopping key	2			
		MF is defined as FWD running key	3			
		MF is defined as REV running key	4			
		MF is defined as forward JOG function key.	5			
		MF is defined as reverse JOG function key.	6			
		MF is defined as JOG function key.	7			
		MF is defined as UP function key	8			

		MF is defined as Down function key.	9			
		UP / DN adjusted value reset	10			
		keyboard potentiometer setting value reset	11			

Define a customer defined function key.

0: MF is defined as a plus function key
In monitoring the menu, add function keys a set of keyboard F01 frequency plus changes.
In menu of parameter selection, add function keys adjust the parameter choosen.
Modify the parameter of the menu, add function keys adjust the parameter values.

1: MF is defined as a decrease function key
In monitoring the menu, add function keys a set of keyboard F01 frequency decrease changes.
In menu of parameter selection, add function keys adjust the parameter choosen.
Modify the parameter of the menu, add function keys adjust the parameter values.

2: MF is defined as a freedom stop function key
Monitoring the menu，Parameter select a menu of the key to effectively，frequency inverter parking stopped.parking stopped freely，no start function will running again in 1s .

3: MF is defined as FWD function key.
Monitoring the menu and select the menu, the key will running in FWD.

4: MF is defined as REV function key.
Monitoring the menu and Parameter select a menu of the key effectively, the frequency inverter will running in REV.

5: MF is defined as move the function keys
Monitoring the menu and Parameter select a menu of the key effectively, the frequency inverter will running on the dot.

6: MF is defined as against the function keys
Monitoring the menu and Parameter select a menu of the key effectively, the frequency inverter will running on the jog.

7: MF is defined as jog function key
Monitoring the menu and Parameter select a menu of the key effectively, the frequency inverter will running in jog.Running direction is decisioned by F35 unit setting and terminal status

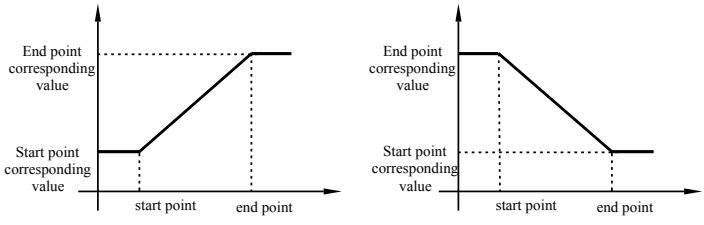
8: Mfisdefined as Up function key
Any moment the button effectively，frequency invertger Up control，control parameter A38~A42 decision.
UP/Dn function effectively set A38 kilobit=1.

9: Mfisdefined as Down function key
Keybaord effectively anytime ，frequency inverter Down control ，parameter can be control A38~A42 decided.
UP/DN Functions effectively to set A38 kilobit=1.

10: Mfis defined UP/DN regulate clearance
A40 UP/Dn regulate clearance，Electrical level trigger.

11: MF keyboard potential is defined as the set value
A47 keyboard potentiometer setting point clearance,Electrical level trigger.

A45	Potentiometer X1	0~100.00	%	0.00	Y
	The starting point of keyboard potentiometer				
A46	Potentiometer X2	0~100.00	%	100.00	Y
	The end point of keyboard potentiometer				
A47	The value of keyboard	0.0~100.00	%	-	Y

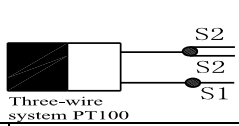
<table>
<tr><td></td><td>potentiometer set</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Displaying value potentiometer set, which can be revised by potentiometer under monitor menu.
Value potentiometer set can be regarded as analog of frequency giving , set value = max frequency*keyboard potentiometer set value.
Potentionmeter set value can be regarded as value of PID giving,value of PID giving=keybaord potentiometer set value.</td></tr>
<tr><td>A48</td><td>Keyboard potentiometer X1 corresponding value Y1</td><td>-100.00~100.00</td><td>%</td><td>0.00</td><td>Y</td></tr>
<tr><td>A49</td><td>Keyboard potentiometer X2 corresponding value Y2</td><td>-100.00~100.00</td><td>%</td><td>100.00</td><td>Y</td></tr>
<tr><td colspan="6"> 
</td></tr>
<tr><td rowspan="6">A50</td><td rowspan="6">Keyboad potentiometer control</td><td rowspan="2">1bit</td><td>Saving after power down</td><td>0</td><td rowspan="6">-</td><td rowspan="6">0000</td><td rowspan="6">Y</td></tr>
<tr><td>Cleared after power down</td><td>1</td></tr>
<tr><td rowspan="3">10bit</td><td>Saving after stoppoing</td><td>0</td></tr>
<tr><td>Clear saving after stopping command</td><td>1</td></tr>
<tr><td>Clear saving at end of stopping</td><td>2</td></tr>
<tr><td>100bit</td><td colspan="2">Reserved</td></tr>
<tr><td>1000bit</td><td colspan="2">Reserved</td></tr>
<tr><td colspan="6">1 bit: Saving state of potentiometer after power down.
0: Saving after power down.
1: Clearing saving after power down.
10 bit: Keeping potentiometer set after stopping.
0: Keeping after stopping
1: To clear saving after stop command.
2: To cear saving at end of stopping.</td></tr>
<tr><td>A51</td><td>Temperature adjustment of motor</td><td>0.0~200.0</td><td>%</td><td>100.0</td><td>N</td></tr>
<tr><td colspan="6">Being used to revise displaying of A54 motor temperature.</td></tr>
<tr><td>A52</td><td>Over-heat temperature of</td><td>0.0~300.0</td><td>℃</td><td>120.0</td><td>N</td></tr>
</table>

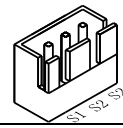
	motor					
A53	Reaction for motor over-heat	No reaction for motor over-heat	0	-	0	Y
		Warning and runing	1			
		Warning and deceleration stopping	2			
		Warning and free stopping	3			
When the displaying value of motor temperature A5 surpassed value A52, inverter will warn and react according to reaction for motor over-heat A53 set.						
A54	Display of motor temperature ^{8000}	-50.0~300.0		℃	-	N

Shows the motor temperature or temperature at other point.

Control card PT100 plug should plug into the optional PT100 thermocouple devices

Three lines PT100





A55	Proportion of linkage ratio	0.10~10.00	-	1.00	Y

In application of proportion of linkage, A55 setting is multiply ratio of that when slave inverter received setting frequency command from host inverter.

Setting this inverter as one slave inverter of system for proportion of linkage.

Frequency Keyboard F01 set＝proportion of linkage ratio* frequency S00 set by host inverte

5-5 IO Function System：o00-o68(0x0200-0x0244)

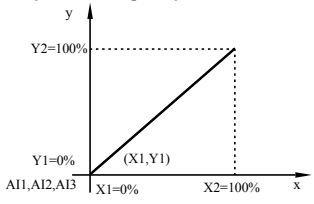
Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
o00	*AI1 nput X1*^{8000}	-	-	-	-
o01	*AI1input X2*^{8000}	-	-	-	-
o02	AI2input X1	0~100.0	%	0.0	Y
o03	AI2input X2	0~100.0	%	100.0	Y
o04	AI3input X1	0~100.0	%	0.0	Y
o05	AI3input X2	0~100.0	%	100.0	Y
o06	*AI1 input X1 corresponding value Y1*^{8000}	-	-	-	-
o07	AI1 input X2 corresponding value Y2^{8000}	-	-	-	-
o08	AI2 input X1 corresponding Value Y1	-100.0~100.0	%	0.0	Y

o09	AI2 input X2 corresponding value Y2	-100.0~100.0	%	100.0	Y
o10	AI3 input X1 corresponding value Y1	-100.0~100.0	%	0.0	Y
o11	AI3 input X2 corresponding value Y2	-100.0~100.0	%	100.0	Y

Max frequency ＝50.00hz：

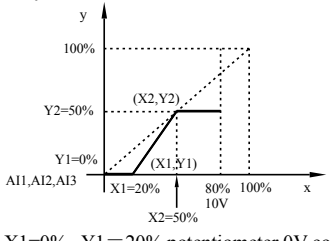
X1=0%,Y1＝0%potentiometer 0V corresponding set frequency:f=Max frequency*Y1=0.00Hz

X2=100%,Y2＝100%potentiometer10Vcorresponding set frequency:f=Maxfrequency*Y2=50.00Hz



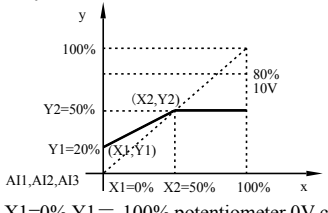
X1=20%, Y1＝0% potentiometer 2V corresponding set frequency: f=Max frequency*Y1=0.00Hz

X2=50%, Y2＝50% potentiometer 5V corresponding set frequency: f=Max frequency*Y2=25.00Hz



X1=0% , Y1＝20% potentiometer 0V corresponding set value: f=Max frequency*Y1=10.00Hz

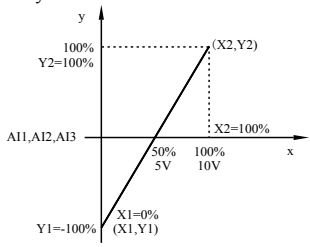
X2=50%, Y2＝50% potentiometer 5V corresponding set value: f=Max frequency*Y2=25.00Hz



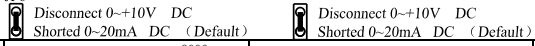
X1=0%,Y1＝-100% potentiometer 0V corresponding set frequency:f=Max frequency*Y1=-50.00Hz

X2=100%,Y2=100%potentiometer 10V correspond set frequency:f=maximum

frequency*Y2=50.00Hz



AI2，AI3jump as JP6，JP7，instruction as ：



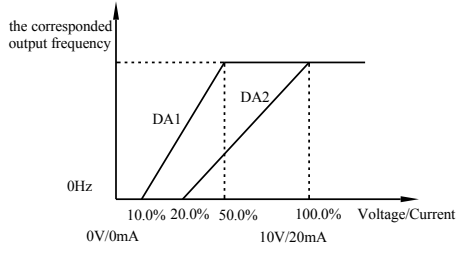
o12	*AI1 input filter time* [8000]	-	-	-	-
o13	AI2 input filter time	0.00~2.00	s	0.10	Y
o14	AI3 input filter time	0.00~2.00	s	0.10	Y

Filter time constant of analog signal input, that is 0.00~2.00s.If time parameter is set too long, the changement of setting frequency will be stable, but responsing speed will be slow;If time parameter is set too short, the changement of setting frequency will not be stable, but responsing speed will be quick.

o15 o16	DA1 output terminal DA2 output terminal	No reaction	0	- -	- -	Y Y
		Setting frequency	1			
		Actual frequency	2			
		Actual current	3			
		Output voltage	4			
		DC bus voltge	5			
		IGBT temperature	6			
		Output power	7			
		Output RPM	8			
		Actual value of torque	9			
o17	DA1 adjustment of lower limit output	0.0~200.0		%	0.0	Y
o18	DA1 adjustment of upper limit of output	0.0~200.0		%	100.0	Y
o19	DA2 adjustment of lower limit output	0.0~200.0		%	0.0	Y
o20	DA2 adjustment of upper limit output	0.0~200.0		%	100.0	Y

Output content	Setting value	Giving Output Singla Range

No reaction	0	No output
Setting frequency	1	0~max frequency
Actual frequency	2	0~max frequency
Actual current	3	0~200%, corresponding parameter: S03 percentage of output curent
Output voltage	4	0~200%, corresponding parameter: b02、b15 rate voltage of motor
DC bus voltage	5	0~1000VDC, DC voltage
IGBT temperature	6	0~100.0℃
Output frequency	7	0~200%
Output speed	8	0~max speed
Real torque	9	0~200% torque



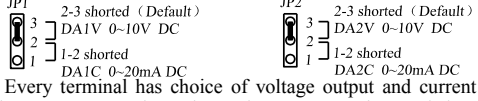
This parameter is used for setting upper/lower limitation of DA1/DA2 output signal.

Such as:

If DA1 output 1~5V voltage, setting parameter as: o17＝10.0%, o18＝50.0%

If DA2 output 4~20mA current, setting parameter as: o19＝20.0%, o20＝100.0%

DA1, DA2 Skipping thread:：



Caution: Every terminal has choice of voltage output and current output, the default setting is voltage output. When the voltage output is needed, please connect JP1/JP2 and DA1V/DA2V(seeing the panel); When the current output is needed, please connect JP1/JP2 and DA1C/DA2C.

o21	O1output signal select 1	No function	0	-	0	Y
		Fault warning	1			
o22	O2output signal select 2	Over current inspection	2	-	0	Y
o23	O3output signal select 3	Over load inspection	3	-	1	Y
o24	*O4*output signal select *4*^{8000}	Over voltage inspection	4	-	8	Y
		Less voltage inspection	5			
		Low load inspection	6			

		Over heat inspection	7			
		Running state with command	8			
		Abnormal PID feedback signal	9			
		Motor state of REW running	10			
		Arrival of setting the frequency	11			
		Arrival of upper frequency	12			
		Arrival of lower frequency	13			
		Arrival of FDT setting frequency 1	14			
		Arrival of FDT setting frequency 2	15			
		FDT frequency level inspection	16			
		Arrival of preset counter value	17			
		Arrival of upper limit counter	18			
		Program running one period completed	19			
		Speed tricking mode inspecition	20			
		N command running state	21			
		REV running from inverter command	22			
		Deceleration running	23			
		Acceleration running	24			
		Arrival of high pressure	25			
		Arrival of low pressure	26			
		Arrival of inverter rate current	27			
		Arrival of motor rate current	28			
		Arrival of input frequency lower limitation	29			
		Arrival of current upper	30			

		limitation				
		Arrival of current lower limitation	31			
		Time to reach limit time 1	32			
		Time to reach limit time 2	33			
		Inverter ready to run operation	34			

Setting value	Output content	Specification explaination
0	No function	Setting “0”, N output reaction, but inverter can be controlled by theoretical terminal.
1	Fault Warning	Inverter at fault or after fault with unconfirmed status.
2	Over current inspeciton	Inverter met fault of over current
3	Over load inspeciton	Inverter met fault of over load of heat protection
4	Over voltage inspeciton	Inverter met fault of over voltage
5	Less voltage inspeciton	Inverter met fault of less voltge
6	Lower load inspection	Inverter met fault of lower load
7	Over heat inspeciton	Inverter met fault of over heat.
8	Running state of command	Inverter is under running state of command
9	Abnormal PID feedback signal	PID feedback signal is abnormal
10	Motor state of REW running	Motor is reverse running
11	Arrival of setting frequency	Arrive at set frequency
12	Arrival of upper frequency	Arrive at upper frequency
13	Arrival of lower frequency	Arrive at lower frequency
14	Arrival of FDT set frequency1	Arrive at frequency 1 FDT set
15	Arrival of FDT set frequency2	Arrive at frequency 2 FDT set
16	Inspection Level Of FDT Frequency	FDT frequency levels to meet the inspection conditions,o29~ o31
17	Arrival of preset counting value	Present counting value arrives at preset counting value
18	Arrival of counting value upper limitation	Present counting value arrives at upper limitation of counting value.
19	Program ruuning one period completion	Program runs one period to complete.
20	Inspection in speed trick mode	Inverter is under speed trick state, the valid time is A11
21	No command running state	Inverter is under N command running state
22	REW command of inverter	Inverter is under reverse running command

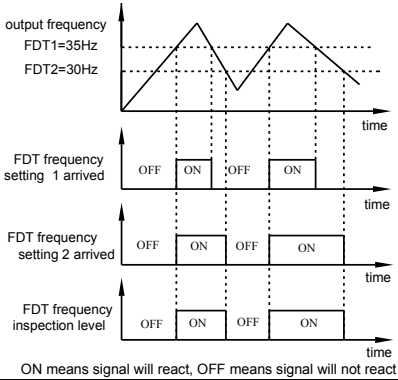
23	Deceleration running	Inverter is under deceleration running
24	Acceleration running celerate running	Inverter is under acceleration running
25	Arrival of high pressure	Arrival at hight pressure
26	Arrival of low pressure	Arrival at low pressure
27	Arrival of inverter rate current	Arrival at inverter rate current
28	Arrival of motor rate current	Arrival at motor rate current
29	Arrival of input frequency lower limitation	Present set frequency is less than frequency lower limitation
30	Arrival of current upper limitation	Arrive at current of upper limitation
31	Arrival of current lower limitation	Arrive at current of lower limitation
32	Time to reach limit time 1	Timing action mode refer to o65 configuration
33	Time to reach limit time 2	Timing action mode refer to o66 configuration
34	Inverter ready to run	The end of initialization when the drive power on , running command is acceptable.

o25	Output signal delay 1	0~32.000	s	0	Y
o26	Output signal delay 2	0~32.000	s	0	Y
o27	Output signal delay 3	0~32.000	s	0	Y
o28	Output signal delay 4 *8000*	-	s	0	Y

o25~o28 defines o21~o24 output signal reaction delay time, unit is S.
Output signal cut off action without delay.

o29	FDT set frequency 1	o30~Max frequency	Hz	0.00	Y
o30	FDT set frequency 2	0~o29	Hz	0.00	Y
o31	FDT inspection range	0.00~5.00	Hz	0.00	Y

Frequency detection range as 0， the output signal terminal movement is as below ：



ON means signal will react, OFF means signal will not react

When the choice of output signal(o21~o24)is set as14, inverter output frequency arrives at or surpass FDT set frequency 1, the corresponding signal output terminal will react; When inverter output frequency is below of frequency 1 FDT set, the corresponding signal output terminal will not react.

When the output signal options(o21~o24)is set as 15, inverter output frequency reaches or surpass FDT set frequency 2, the corresponding signal output terminal will react;When inverter output frequency is below of frequency 3 FDT set, the corresponding signal output terminal will not react.

When the output signal options (o21~o24)is set as16, inverter will firstly inspect FDT set freuqnecy 1, then inverter output frequency arrives at or surpass FDT set frequency 1, the corresponding signal output terminal will react;After terminal reaction, inverter will inspect FDT set frequency 2, When inverter output frequency is below of frequency 2 FDT set, the corresponding signal output terminal will not react.

o31 frequency inspection range

This parameter is used to define inspection range. When the difference of actual frequency and inspected frequency has surpassed inspection range, terminal will output react.

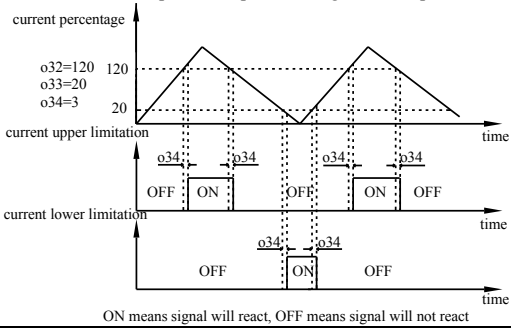
e.g.: FDT set frequency 1 as 35Hz, FDT set frequency 2 as 30Hz.

o32	Arrival of current upper limitation	o33~200%	%	120	Y
o33	Arrival of current lower limitation	o34~o32	%	20	Y
o34	Current inspection range	0~o33	%	3	Y

When the output signal options (o21~o24)is set as 30, and inverter output current reach or surpass “o32+o34”, the corresponding output signal terminal will react. When the inverter output current is less than o32-o34, The corresponding output signal terminal will not react.

When the output signal options (o21~o24)is set as 31, and inverter output frequency reach or less than o33-o34, the corresponding output signal terminal will react;When the inverter output current is more than o33+o34, The corresponding output signal terminal will not react.

o34 is used to define current inspection range. When the difference of actual current and inspected current has surpassed inspection range, The output terminal will react.



ON means signal will react, OFF means signal will not react

o35	Termianl control	1bit	Two - ware running	0	-	0000	N

	mode		control 1				
			Two - ware running control 2	1			
			Three - ware running control 1	2			
			Three - ware running control 2	3			
			Oneshot running control 1	4			
			Oneshot running control 2	5			
		10bit	Power on terminal running command invalid	0			
			Power on terminal running command valid	1			

Setting terminal running mode by this parameter.

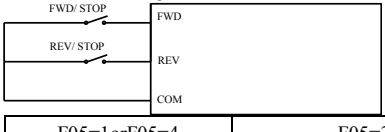
1 bit set terminal running mode:

The polarity of electrical level is o47 default setting polarity. Low electrical level or falling edge is valid, and the terminal is leakage-souce driving mode.

X Can be used to express high or low electrical level, rising or falling edge.

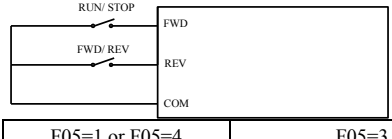
Running control mode	Keyboard running control	Running priority	Direction priority
Edge trigger	Valid	Same	Same
E-level trigger	Invalid	Prior running	Prior FWD

0 Two-ware running control 1.



F05=1orF05=4		F05=3		Command REV
FWD	REV	FWD	FWD	
Down edge	X	Low level	Down edge	X
X	Falling edge	High level	X	Falling edge
Up edge	Up edge	High level	Up edge	Up edge

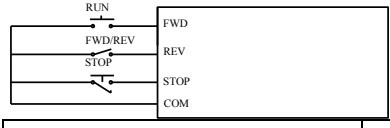
1 Two-ware running control 2.



F05=1 or F05=4		F05=3		Command REV
FWD	REV	FWD	FWD	

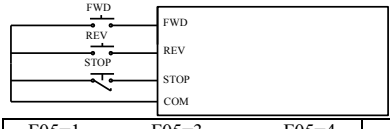
Falling edge	Falling edge	Low level	Falling edge	Falling edge
Falling edge	Up edge	Low level	Falling edge	Up edge
Up edge	X	High level	Up edge	X

2 Two-ware running control 1.



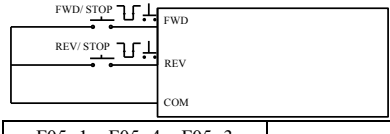
F05=1;	F05=3;	F05=4	Command
FWD	REV	FWD	REV
Falling edge	Low level	Falling edge	Low level
Falling edge	High level	Falling edge	High level
X	X	X	X

3 Three-ware running control 2.



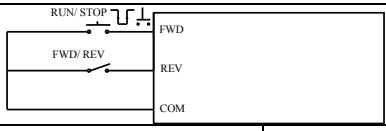
F05=1;	F05=3;	F05=4	Command
FWD	REV	FWD	REV
Falling edge	X	Falling edge	X
X	Falling edge	X	Falling edge
X	X	X	X

4 One shot running control 1.



F05=1; F05=4; F05=3		Command	Current status
FWD	REV		
⊓⊥	X	FWD	STOP
Keep	⊓⊥	REV	STOP
⊓⊥	X	STOP	FWD
Keep	⊓⊥	REV	FWD
⊓⊥	X	FWD	REV
Keep	⊓⊥	STOP	REV

5 One shot running control 2.



F05=1；F05=4；F05=3		Command	Current status
FWD	REV		
	Low level	FWD	STOP
	High level	REV	STOP
	X	STOP	FWD
	X	STOP	REV

10 bit: Set the terminal status when power on

0: Terminal run command invalid when Power on.

Terminal run command invalid when power on,. Only run 3S later after power on and set terminals invalid.

1: Terminal run command valid when Power on.

Terminal status is effective when power on, inverter will run immediately, in some cases such status will not be allowable.

		No function	0			
		FWD	1			
	(DI1)input terminal function selection	REV	2			
	(DI2) input terminal function selection	There-wire running STOP	3			
	(DI3)input terminal function selection	Multistage order 1	4			
o36	(DI4) input terminal function selection	Multistage order 2	5	-	0	Y
o37	(DI5) input terminal function selection	Multistage order 3	6	-	0	Y
o38	(DI6) input terminal function selection	Multistage order 4	7	-	0	Y
o39	*(DI7) input terminal function selection* [8000]	Multistage acceleration order 1	8	-	0	Y
o40	*(DI8) input terminal function selection* [8000]	Multistage acceleration order 2	9	-	0	Y
o41	*(AI1) input terminal function selection* [8000]	Multistage acceleration order 3	10	-	0	Y
o42	(AI2) input terminal function selection	Multi digital voltage 1	11	-	0	Y
o43	(AI3) input terminal function selection	Multi digital voltage 2	12	-	0	Y
o44		Multi digital voltage 3	13	-	0	Y
o45		Frequency setting main way 1	14	-	0	Y
o46		Frequency setting main way 2	15	-	0	Y

		Frequency setting main way 3	16			
		Frequency setting assist way 1	17			
		Frequency setting assist way 2	18			
		Frequency setting assist way 3	19			
		MSS timing running 1	20			
		MSS timing running 2	21			
		MSS timing running 3	22			
		Running control mode switch 1	23			
		Running control mode switch 2	24			
		Running control mode switch 3	25			
		FWD torque upper limit switch 1	26			
		FWD torque upper limit switch 2	27			
		FWD torque upper limit switch 3	28			
		REV torque upper limit switch 1	29			
		REV torque upper limit switch 2	30			
		REV torque upper limit switch 3	31			
		Torque speed switch	32			
		Fault involution command	33			
		FWD JOG order	34			
		REV JOG order	35			
		JOG order (as F35setting)	36			
		Accelerate and decelerate prohibit order	37			
		Motor 1、2 switch	38			
		Free stop	39			

		Up command	40			
		Down command	41			
		Automatic program running function cancel	42			
		Automatic program running stop	43			
		Program running start mode	44			
		Program running stop mode	45			
		Pulse counter clearance	46			
		Pulse counter input	47			
		Preset counter value loading	48			
		Upper counter value loading	49			
		Out fault signal input (level)	50			
		1 pump start	51			
		1 pump stop	52			
		2 pump start	53			
		2 pump stop	54			
		3 pump start	55			
		3 pump stop	56			
		4 pump start	57			
		4 pump stop	58			
		Manual rotate command	59			
		Time water supply time interval reset to 0	60			
		Extruder acceleration deceleration direction	61			
		Extruder acceleration deceleration permit	62			
		Time limit 1 input	63			
		Time limit 2 input	64			
		Program running switch next step	65			

		UP/DN regulate clearance	66			
		Keyboard potentiometer setting clearance	67			
		External fault signal input (edge)	68			

Setting value	Output connect	Explation
0	No function	No function
1	FWD	FWD,can set to edge trigger or level trigger.
2	REV	REV,can set to edge trigger or level trigger.
3	Three-wire running STOP	o35 set three-wire running,STOP function.
4	Multistage speed command 1	Combine 16 step multi-step setting.Detail H parameter system
5	Multistage speed command 2	
6	Multistage speed command 3	
7	Multistage speed command 4	
8	Multistage acceleration command 1	Combine 8 step acceleration setting.Detail H parameter system
9	Multistage acceleration command 2	
10	Multistage acceleration command 3	
11	Multistage digital voltage 1	Combine degital voltage setting.Detail H parameter system
12	Multistage digital voltage 2	
13	Multistage digital voltage 3	
14	frequency setting main way 1	Combine frequency setting main way switch.Detail F parameter system
15	frequency setting main way 2	
16	frequency setting main way 3	
17	frequency setting assistant way 1	Combine frequency setting assist way switch.Detail F parameter system
18	frequency setting assistant way 2	
19	frequency setting assistant way 3	
20	MSS timing running 1	Combine 8 step time setting.Detail H parameter system
21	MSS timing running 2	
22	MSS timing running 3	
23	Running control mode switch 1	Combine running control mode switch. Detail F05 parameter system
24	Running control mode switch 2	
25	Running control mode switch 3	
26	FWD torque up limit switch 1	Combine FWD torque upper limit switch.

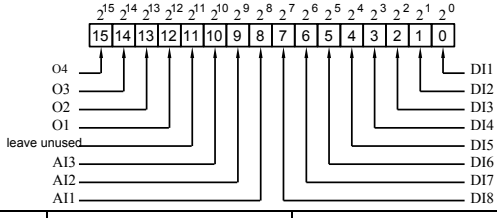
27	FWD torque up limit switch 2	Detail read C parameter system C15.
28	FWD torque up limit switch 3	
29	REV torque up limit switch 1	Combine REV torque upper limit switch. Detail read C parameter system C16.
30	REV torque up limit switch 2	
31	REV torque up limit switch 3	
32	Torque speed switch	Vector control mode, speed control mode and torque control mode switching. Disconnected status: Speed Control Closed Status: torque control Detail C parameter set C18
33	Fault reset command	Edge-triggered, the fault occurred on the current failure to confirm or not confirm
34	FWD JOG command	JOG forward running command
35	REV JOG command	JOG reverse running command
36	JOG order (as F35 setting)	JOG running order,the direction as F35 setting direction
37	Acceleration and deceleration forbid command	Keep current status , prohibit acceleration and deceleration movement.
38	Motor 1、2 shift	Motor 1、2 change Invalid status : Motor 1 Valid status : Motor 2 Off-status ： motor 1； Close status ： motor 2.
39	Free stop	Free stop ： free stop ， No starting command 1S later，allow running again.
40	Up command	Up command ,detail A38~A42.
41	Down command	Down command ,detail A38~A42.
42	Auto-run feature programs canceled	Cancel program running function.
43	Automatic procedures to suspend operation	Program running pause
44	Program running start mode	Program running start mode
45	Program running stop mode	Program running stop mode
46	Pulse count clearance	Edge trigger, frequency inverter pulse counter O53 clearance
47	Pulse count input	Edge-triggered, set the pulse counter input terminal
48	Before count loading	Edge-triggered pulse counter counts o5 maximum load o53
49	Upper count loading	Edge trigger,pluse counter O53 loading up count value O55.

50	External default signal input (level)	External default signal input(level)，level trigger , the system will alarm E_Set after valid
51	1 pump soft-start	Electric leverl spring, control 1 pump soft-start or stop. Soft-start control must use 2 terminal control , stop priority. Need to set E01 load model 9, E12 1pump is soft-start control pump.
52	1 pump stop	
53	2 pump soft-start	Electric leverl spring, control 2 pump soft-start or stop. Soft-start control must use 2 terminal control,stop priority. Need to set E01 load model 9, E12 2pump is soft-start control pump.
54	2 pump stop	
55	3 pump start	Electric leverl spring, control 3 pump soft-start or stop. Soft-start control must use 2 terminal control, stop priority. Need to set E01 load model 9 , E12 3pump is soft-start control pump.
56	3 pump stop	
57	4 pump soft-start	Electric leverl spring, control 4 pump soft-start or stop. Soft-start control must use two terminal control, stop has the priority. Need setting E01 load style 9, E12 4 pump is soft - start control pump.
58	4 pump stop	
59	Hand change command	Electric level spring, automation multi-pump constant water changed
60	Timing water supply reset to 0	Electric level spring the period of time water supply change to zero
61	Extruder acceleration deceleration direction	DIx input terminal function slection, detail in o36-o46
62	Extruder acceleration deceleration allow	DIx input terminal function slection, detail in o36-o46
63	Time limit 1 input	DIx input time limit 1,, detail in o65,o67
64	Time limit 2 input	DIx input time limit 2,, detail in o66,o68
65	Program switching to the next segment	Program running controlled, single trigger switch to the next segment
66	UP/DN adjusted value reset	A40 UP/DN adjusted value reset , level trigger.
67	Keyboard potentiometer set value reset	A47keyboard potentiometer setting value reset level trigger.
68	External fault signal input (edge)	External fault input,edge trigger(down edge)

		effective system E_set fault			
o47	Polarity of input and output terminals	0000~F7FF	-	0000	Y

This parameter is used to select each IO pin polarity in which the effective.

0~10	Input terminal polarity	12~15	Output terminal polarity
0	Low level valid (closed)	0	Low level valid (closed)
	Falling edge valid, rising edge invali		
1	High level valid(disconnect)	1	High level valid(disconnect)
	Falling edge valid, rising edge invalid		



o48	Input response time 0	0.001~30.000	s	0.005	Y
o49	Input response time 1	0.001~30.000	s	0.005	Y

o48，o49 Define the response time of input，Select the response time of corresponding input terminals by o50.

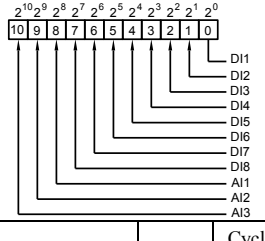
o50	Response time of input terminal selection	0~07FF	-	0	Y

o48，o49 define the response time of input terminal, o50 to select corresponding terminal response time.

The delay time of input terminal is valid for both closed and disconnected motion.

This parameter is used to choose input response time of each terminal

Set 0~10 bit	Polarity of input terminal
0	o48 input terminal response time 0
1	o49 input terminal response time 1



o51	Counter configuration	1 bit	Cycle counting operation	0	-	0	Y
			Single cycle counting operation	1			

		10 bit	reloading after the count value reaches maximum	0			
			count is cleared after the arrival maximum	1			
		100 bit	Reload after power on	0			
			Be cleared after powter on	1			
			Keep count after power on	2			
		1000bit	Counting period	0			
			Output signal valid time 20ms	1			
			Output signal valid time 100ms	2			
			Output signal valid time 500ms	3			

0 bit：Counting mode of control

0 Recycle count:the count value reaches maximum，Pulse output to reach（output terminal to set）.

1 Single circle count:the count value reaches maximum，Pulse output to reach , stoprunning.

10 bit：count value reaches maximum to act under recycle mode.

0 Reload

1 Clear to zero.

100 bit：to define the status of counter after power on.

0 Reload after power on.

1 Clear to zero after power on

2 Keep formal status after power on.

1000 bit：define o21~o24 as the delay time of output signal of preset value reach or upper value reach.

0 Counting period: when reach this value，to keep output statuse valid，until count value change.

1 Output signal valid time 10ms，when reach this value, keep output status valid 10ms.

2 Output single valid time 100ms，when reach this value, keep output status valid 100ms.

3 Output single valid time 500ms，when reach this value, keep output status valid 500ms.

o52	Maximal pulse input frequency	0.1~50.0	KHz	20.0	Y

This parameter define maximal pulse input frequency of analogy setting.

This input signal frequency is high, so it should be set by multifunctional terminalDI6.

Max input pulse frequency corresponding to analogy maximal input upper.

Pulse input frequency analog set，max input pulse frequency o52 corresponding to max output frequency F12.

Pulse input frequency f_pulse correspondint to set frequency f_set calculate formula ：f_set＝f_pulse/o52*F12.

Pulse input analog giving, max input pulse frequency o52 corresponding to 100.0%.

Pulse input frequency f_pulse corresponding analog formula of p_set：p_set＝ f_pulse/o52*100.0%.

o53	The current counter status	0~9999	-	0	Y

o54	Preset count value for a given	0~o55	-	0	Y
o55	Max count value for a given	o54~9999	-	9999	Y

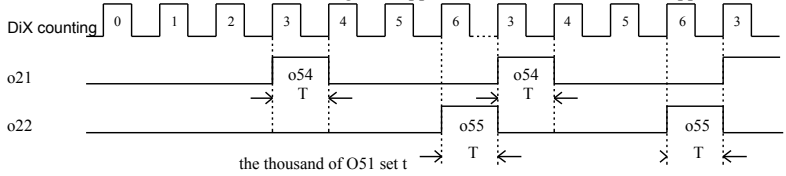
The correspondind indication of Yi terminal when input pulse signal count reach the preset value.

1、DiX（X=1~6）terminal to set "pulse count input"；and set o54、o55：

DiX（X=1~6）terminal to set pulse counter clear,terminal act to clear the count zero.

DiX（X=1~6）terminal to set loading with preset value. The counter will load preset value.

DiX（X=1~6）terminal to set loading with upper value. Terminal act to load upper value.



2、o21~o24 output signal option

o21 preset value reach,after reached upper value,the output signal valid time set byo51.

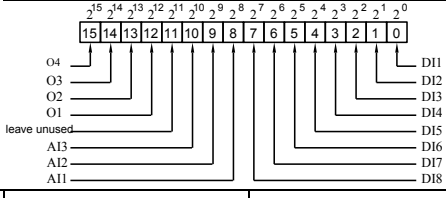
o22 upper count value reach, after reach upper value the valid time of output signal set by o51.

The frequency range of counter pulse signal：0~100Hz

o56	Analog terminal valid option	0000~F7FF	-	0000	Y

This parameter is used to choose analog terminal function valid of each terminal.

Set 0~10 bit	Analog terminal valid option
0	Actual terminal valid
1	Analog terminal valid



o57	DI1~4 terminal status	0000~1111	-	-	Y
o58	DI5~6 terminal status	0000~1111	-	-	Y
o59	AI2~3terminal status	000~111	-	-	Y
o60	O1~4 terminal status	0000~1111	-	-	Y

It can search terminal status that set actual terminal valid.

It can change terminal status that set analog terminal valid.

o61	SPA pulse output	No action	0	-	0	Y
		Set frequency	1			
o62	SPB pulse output	Actual frequency	2	-	0	Y
		Actual current	3			

		Output voltage	4			
		DC bus voltage	5			
		IGBT temperature	6			
		Output frequency	7			
		Output rpm	8			
		Torque actual value	9			
o63	SPA pulse output rate	1~1000		-	1	Y
o64	SPB pulse output rate	1~1000		-	1	Y

SPA, SPB provide two isolated pulse output signal can be analogical multiple analog output signals.

SPA, SPB provide high speed pulse output function. Set by o61~o64 and set functions valid when inverter power on again.

SPA corresponding output signal 1, this function selected, o21 DO1 output action is invalid.

SPB corresponding output signal 2, this function selected, o22 DO2 output action is invalid.

Pulse output ratio = 1, output signal range 0 ~ 50hz.

Maximum pulse output frequency 50 Khz, minimum frequency 1hz.

for example

SPA pulse output options = 2 Actual frequenciy ;

SPA pulse output options = 10

The actual output pulse frequency = actual frequency / maximum frequency * 50hzx10.

SPA pulse output options =3 Actual current

SPB pulse output ratio=20

The actual output pulse frequency = actual current percentage 200*50hz*2

Output	Set Value	Output Signal Range Definition
No action	0	No output
Set frequency	1	0~Max frequency
Actual frequency	2	0~Max frequency
Actual current	3	0~200%, corresponding paramerter: S03 output current percentage
Output voltage	4	0~200%, correlation parameter: b02、b15 motor rated voltage
Bus voltage	5	0~1000V DC voltage
IGBT temperature	6	0~100.0℃
Output power	7	0~200%
Output torque	8	0~Max torque
Actual torque value	9	0~200% torque

o65	Limit time 1 configuration	1 bit	Boot time	0	-	0000	Y
			Running timing	1	-	0000	Y
o66	Limit time 2 configuration	10bit	Reserved	-			

		100bit	Reserved	-			
		1000bit	Reserved	-			
1 bit: Timing mode 0 Boot time , timing of runnig and breaking 1 Running timing，only timing of running 10 bit：Reserved 100 bit：Reserved 1000 bit：Reserved							
o67	Limit Time 1		0.0~3200.0		s	2.0	Y
o68	Limit Time 2		0.0~3200.0		s	2.0	Y
Set timeing of limit time 1 , Time limit 2 Actual limit time on the basis of the set time multiplied by a run time multiple, such time multiple set by the ten bit of F49, refer to F49 instructions.							

5-6 Multi-speed PLC Group:H00-H55(0x0300-0x0337)

Code	Description / LCD		Setting Range		Unit	Factory Setting	Change Limited
H00	Multi-speed collocation	1 bit	Program running function cancel	0	-	0000	Y
			Program running function	1			
		10 bit	Direction decided by H40~H46	0			
			Direction decised by terminal and keyboard	1			
		100 bit	Deceleration and acceleration time decised by H26~H39	0			
			Time of acceleration and deceleration isdecided by terminal	1			
		1000bit	Running time decised by H18~H25	0			
			Running time decised by terminal	1			
1 bit: Program running functions intelligent To use the program to run PLC functionality requires setting the bit to 1. Multi-segment speed run only need to set the corresponding multi-stage o36 ~ o46-speed switching can be used without the need to set this parameter. 0: Program running functions cancel 1: Program running function intelligent 10 bit: Define program runs or direction settings of multi-segment speed running 0: the direction decided by the H40 ~ H46 1: The directiondecided by the keyboard or terminal 100 bit:Define program runs or acceleration and deceleration time settings of multi-segment speed running 0: deceleration time decided by the H26 ~ H39 1: The acceleration and deceleration time determined by terminal							

1000 bit: Set running time of defined program running
0: Running-time decided by the H18 ~ H25
1: Running time decided by terminal

H01	Program running configuration	1 bit	Sequence control	0	-	0710	Y
			Terminal control	1			
		10 bit	Program running start segment	0~15			
		100 bit	Program running end segment	0~15			
		1000bit	Output signal valid time 8ms	0			
			Output signal valid time 20ms	1			
			Output signal valid time 100ms	2			
			Output signal valid time 500ms	3			

1 bit: program run control mode
0: Sequential control
Run automatically according to the start segment,end segment and program running time of program running.
You can use o36 ~ o46 switchover next function , switchover to the next program running .
1: Terminal control
Use multi segment control terminal o36 ~ o46 multi segment instruction 1, 2, 3, 4, Control program segment, running time arrives,Running based on the 0 paragraph speed. After Multi - stage speed control terminal switchover, reevaluate running time
Do not use of multi - stage speed control terminal o 36 ~ o46 multi - speed instruction, You can use o36 ~ o46 switchover next function. The terminal control for single trigger, triggered once, program running to next paragraph, running time recalculated.Running time of arrival, Running based on the 0 paragraph speed.
10 bit: Defining the start running of the Program
100 bit: Defines the end of the program period
1000 bit: Define effective time of the program output signal

H02	Program running mode	1 bit	Single-cycle	0	-	0000	Y
			Continuous cycle	1			
			One-cycle command running	2			
		10 bit	The zero speed running when pause	0			
			Fixed-speed running when the suspension	1			
		100 bit	Stop with the parameters set when stop	0			
			Stop with the settings of start up	1			
		1000bit	Running at the speed when start up segment	0			

			Running at the speed before the machine stopped	1			

1 bit: Running cycle

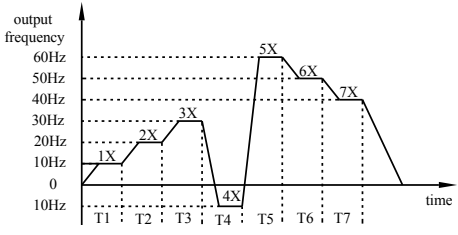
0: Single cycle

1: Continuous cycle

2: Single cycle, running according to H01 speed of the end,stop after accepted the stopped orders.

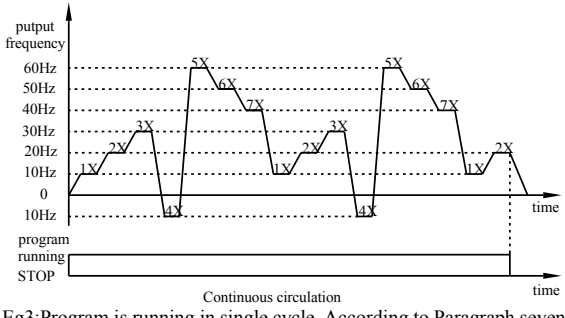
The program runs three styles as following:

Eg1:The program is run single - cycle mode



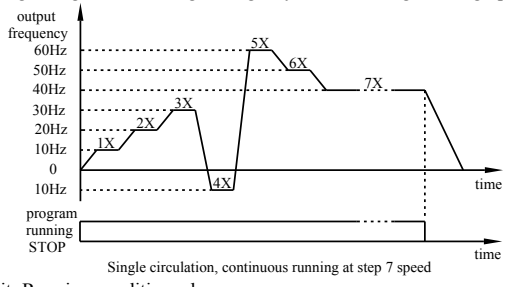
Single circulation

Eg2:program run Continuous cycle mode



Continuous circulation

Eg3:Program is running in single cycle, According to Paragraph seventh of Speed mode



Single circulation, continuous running at step 7 speed

10 bit: Running condition when pause

0: Speed run when pause

1: Fixed Segment Speed operation when pause

100 bit: Running Segment when stop

0: Set stopping according to the parameters of stop segment.

1: Set down to the initial segment

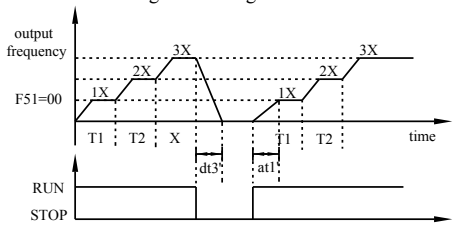
1000 bit: Start Running Segment

0: Set down to the speed running

1: Running at the speed before the machine stopped.

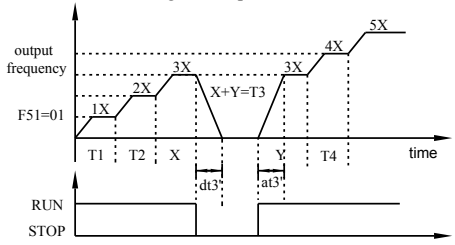
100 bit=0 Set stopping according to the parameters of stop segment

1000 bit=0 running at Start Segment



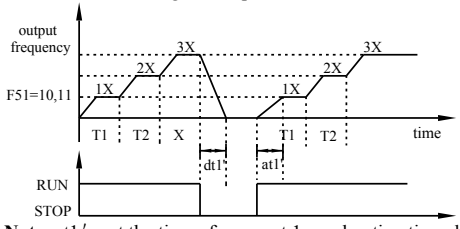
Eg:100 bit==0 Set stopping according to the parameters of stop segment

1000 bit==1 Running at the speed before the machine stopped.



Eg:100 bit=1 Set down to the initial segment

1000 bit=1 Running at the speed before the machine stopped.



Note: at1′: at the time of segment 1 acceleration time;dt1′: at the time of segment 1 deceleration time;at3′ at the time of segment 3 acceleration time;dt3′: at the time of segment 3 deceleration time.

H03	1 Segment speed setting 1X	Lower frequency ~ upper frequency	Hz	3.00	Y
H04	2 Segment speed setting 2X	Lower frequency ~ upper frequency	Hz	6.00	Y
H05	3 Segment speed setting 3X	Lower frequency ~ upper frequency	Hz	9.00	Y

H06	4 Segment speed setting 4X	Lower frequency ~ upper frequency	Hz	12.00	Y
H07	5 Segment speed setting 5X	Lower frequency ~ upper frequency	Hz	15.00	Y
H08	6 Segment speed setting 6X	Lower frequency ~ upper frequency	Hz	18.00	Y
H09	7 Segment speed setting 7X	Lower frequency ~ upper frequency	Hz	21.00	Y
H10	8 Segment speed setting 8X	Lower frequency ~ upper frequency	Hz	24.00	Y
H11	9 Segment speed setting 9X	Lower frequency ~ upper frequency	Hz	27.00	Y
H12	10 Segment speed setting 10X	Lower frequency ~ upper frequency	Hz	30.00	Y
H13	11 Segment speed setting 11X	Lower frequency ~ upper frequency	Hz	33.00	Y
H14	12 Segment speed setting 12X	Lower frequency ~ upper frequency	Hz	36.00	Y
H15	13 Segment speed setting 13X	Lower frequency ~ upper frequency	Hz	39.00	Y
H16	14 Segment speed setting 14X	Lower frequency ~ upper frequency	Hz	42.00	Y
H17	15 Segment speed setting 15X	Lower frequency ~ upper frequency	Hz	45.00	Y

Set the frequency of program running and the running frequency of 7-segment speed respectively. short-circuit the multi-terminal command 1, 2, 3, 4 with COM combinatorially to realized the 16-segment speed/acceleration speed.

0Xspeed is the regular running mode,setting source can be adjusted by F02,F03and other parameters, running time is controlled by the H18.

Terminal multi-segment speed is defined as follows(shorted with COM it is ON, disconnected then it is OFF)

Speed / Terminal	0X	1X	2X	3X	4X	5X	6X	7X
Multiterminal-speed command 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
Multiterminal-speed command 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
Multiterminal-speed command 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
Multiterminal-speed command 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Speed / Terminal	8X	9X	10X	11X	12X	13X	14X	15X
Multiterminal-speed command 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
Multiterminal-speed command 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
Multiterminal-speed command 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
Multiterminal-speed	ON	ON	ON	ON	ON	ON	ON	ON

command 4									

Acceleration and deceleration time and the direction of running

		0X-7X	8X-15X
H00 10 bit	0	0X -7X Direction controlled by parameter	8X-15X Direction controlled by keyboard and terminal
	1	0X -7X Direction controlled by keyboard and terminal	
H00 100 bit	0	0X -7Xdeceleration and accelertation time controlled by parameter	8X-15Xdeceleration and accelertation time controlled by keyboard and terminal
	1	0X -7X deceleration and accelertation time controlled by terminal	
H00 1000 bit	0	0X -7Xrunning time controlled by paremeter	8X-15Xrunning time controlled by terminal
	1	0X -7Xrunning time controlled by terminal	

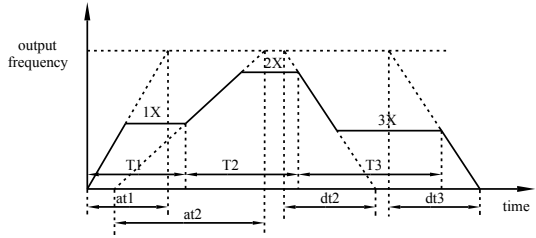
H18	0 Segment running time T0	0.0~3200.0	s	2.0	Y
H19	1 Segment running time T1	0.0~3200.0	s	2.0	Y
H20	2 Segment running time T2	0.0~3200.0	s	2.0	Y
H21	3 Segment running time T3	0.0~3200.0	s	2.0	Y
H22	4 Segment running time T4	0.0~3200.0	s	2.0	Y
H23	5 Segment running time T5	0.0~3200.0	s	2.0	Y
H24	6 Segment running time T6	0.0~3200.0	s	2.0	Y
H25	7 Segment running time T7	0.0~3200.0	s	2.0	Y
Actual running time equals to the set multi-segment running time multiples a time which is times of speed running time, and such actual running time decided by the tens digit of H40~H46. Please refer to H40~H46.					
H26	1 Segment deceleration time dt1	0.0~3200.0	s	10.0	Y
H27	2 Segment acceleration time at2	0.0~3200.0	s	10.0	Y
H28	2 Segment deceleration time dt2	0.0~3200.0	s	10.0	Y
H29	3 Segment acceleration time at3	0.0~3200.0	s	10.0	Y
H30	3 Segment deceleration time dt3	0.0~3200.0	s	10.0	Y
H31	4 Segment acceleration time at4	0.0~3200.0	s	10.0	Y
H32	4 Segment deceleration time dt4	0.0~3200.0	s	10.0	Y
H33	5 Segment acceleration time at5	0.0~3200.0	s	10.0	Y

H34	5 Segment deceleration time dt5	0.0~3200.0	s	10.0	Y
H35	6 Segment acceleration time at6	0.0~3200.0	s	10.0	Y
H36	6 Segment deceleration time dt6	0.0~3200.0	s	10.0	Y
H37	7 Segment acceleration time at7	0.0~3200.0	s	10.0	Y
H38	7 Segment deceleration time dt7	0.0~3200.0	s	10.0	Y
H39	1 Segment deceleration time dt1	0.0~3200.0	s	10.0	Y

Remark: at1: 1 segment acceleration time;at2: 2 segment acceleration time;dt2: 2 segment deceleration time;dt3: 3 segment deceleration time.

Set the Acc/Dec time of 7 steps respectively. They determine the time needed to reach the speed, respectively depending on the acceleration time for acceleration or on the deceleration time for deceleration, but the time is not the actual time needed. Actual acc/dec time equals to the set acc/dec time multiples a time multiple which is decided by the hundreds and thousands digit of H40~H46. Please refer to H40~H46.

Definite acceleration and deceleration time for multi-step speed:



Definition of multi-step speed acceleration/deceleration time

H40	1Segment speed configuration word	1 bit	Running direction:forward	0	-	0000	Y
			Running direction: reverse	1			
H41	2Segment speed configuration word	10 bit	Running time: *seconds	0	-	0000	Y
			Running time: *munites	1			
H42	3Segment speed configuration word		Running time: *hours	2	-	0000	Y
			Running time: *days	3			
H43	4Segment speed configuration word	100 bit	Acceleration time:*second	0	-	0000	Y
H44	5Segment speed configuration word		Acceleration time: * munites	1	-	0000	Y
H45	6Segment speed configuration word		Acceleration time:*hours	2	-	0000	Y
H46	7Segment speed configuration word		Acceleration time:*days	3			
		1000bit	Deceleration time:*second	0			
			Deceleration time:* munites	1			

			Deceleration time:*hours	2			
			Deceleration time:*days	3			

1 bit: Under multi-segment program running, the"1 bit"parameter decides the direction of each segment speed.

Running direction	Setting value
FWD	0
REV	1

When running control modeF05＝0/1/2,these parameters decide the direction of each segment speed.

When running control mode F05＝3, the setting value and terminal FWD/REV decide the direction of each segment speed together. FWD is prior.

FWD=1 Running direction	REV=1 Running direction	Setting value
FWD	REV	0
REV	FWD	1

10 bit: Unit of multi-segment speed program running time.

Running time	10 bit	Range(e.g.H18~H25=3200.0)
*seconds	0	3200.0 S
*minutes	1	3200.0 Min
*hours	2	3200.0 H
*days	3	3200.0 Day

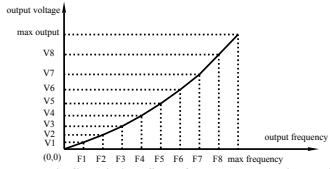
100 bit, 1000 bit : Unit of acc/deceleration time of multi-segment speed program running

Acceleration /deceleration time	1000 bit, 100bit	Range(e.g.H26~H39=3200.0)
×S	0	3200.0 S
×Min	1	3200.0 Min
×H	2	3200.0 H
×Day	3	3200.0 Day

H47	0 Segment digital voltage giving	-100.0~100.0	%	0.0	Y
H48	1 Segment digital voltage giving	-100.0~100.0	%	10.0	Y
H49	2 Segment digital voltage giving	-100.0~100.0	%	20.0	Y
H50	3 Segment digital voltage giving	-100.0~100.0	%	30.0	Y
H51	4 Segment digital voltage giving	-100.0~100.0	%	40.0	Y
H52	5 Segment digital voltage giving	-100.0~100.0	%	50.0	Y
H53	6 Segment digital voltage giving	-100.0~100.0	%	60.0	Y

H54	7 Segment digital voltage giving		-100.0~100.0	%	70.0	Y
Digital voltage set function can analogy give frequency, select by F02, F03;analogy give PID set or feedback, select by P02, P03;it can be shifted by the input terminal o36~o46.						
H55	Multi-speed status	1 bit	Current speed step	0~0xF	-	-	N
		10 bit	Current acceleration segment	0~0x7			
		100 bit	Current running time segment	0~0x7			
		1000bit	Current digit voltage segment	0~0x7			
1 bit: Current speed segment 0~16 segment, In hex, can be shifted t by o36~o46 10 bit: Current acceleration segment 0~7 segment, in hex, can be shifted by o36~o46 100 bit: Current running time segment 0~7 segment, in hex, can be shifted by o36~o46, valid when program running 1000 bit: Current digital voltage segment 0~7 segment, in hex, can by shifted by terminal o36~o46						

5-7 V/Fcurve Group:U00-U15(0x0400-0x040F)

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
U00	V/F setting frequency1	0.00~U02	Hz	5.00	N
 User-defined the first frequency value of V / F curve, corresponding to V1					
U01	V/F setting voltage 1	0~U03	%	10	N
User-defined the first voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency inverter, corresponding to F1.					
U02	V/F setting frequency2	U00~U04	Hz	10.00	N
User-defined the second frequency value of V / F curve, corresponding to V2.					
U03	V/F setting voltage 2	U01~U05	%	20	N
User-defined the second voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F2.					
U04	V/F setting frequency3	U02~U06	Hz	15.00	N
User-defined the third frequency value of V / F curve, corresponding to V3.					
U05	V/F setting voltage 3	U03~U07	%	30	N
User-defined the third voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F3.					

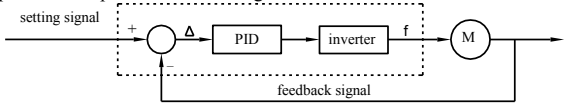
U06	V/F setting frequency4	U04~U08	Hz	20.00	N
User-defined the fourth frequency value of V / F curve, corresponding to V4.					
U07	V/F setting voltage 4	U05~U09	%	40	N
User-defined the fourth voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F4.					
U08	V/F setting frequency5	U06~U10	Hz	25.00	N
User-defined the fifth frequency value of V / F curve, corresponding to V5.					
U09	V/F setting voltage 5	U07~U11	%	50	N
User-defined the fifth voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F5.					
U10	V/F setting frequency6	U08~U12	Hz	30.00	N
User-defined the sixth frequency value of V / F curve, corresponding to V6.					
U11	V/F setting voltage 6	U09~U13	%	60	N
User-defined the sixth voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F6.					
U12	V/F setting frequency7	U10~U14	Hz	35.00	N
User-defined the seventh frequency value of V / F curve, corresponding to V7.					
U13	V/F setting voltage 7	U11~U15	%	70	N
User-defined the seventh voltage percentage of V/F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F7.					
U14	V/F setting frequency8	U12~Max frequency	Hz	40.00	N
User-defined the eighth frequency value of V / F curve, corresponding to V8.					
U15	V/F setting voltage 8	U13~100	%	80	N
User-defined the eighth voltage percentage of V / F curve, on the base of rated output voltage 100% of frequency converter, corresponding to F8.					

5-8 PID Parameter:P00-P12(0x0500-0x050C)

Code	Description / LCD		Setting Range		Unit	Factory Setting	Change Limited
P00	PID configuration	1 bit	Unidirectional regulation	0	-	0000	N
			Bidirectional regulation	1			
		10 bit	Negative effect	0			
			Positive effect	1			
		100 bit	PID fault, No action	0			
			Warning & continuous running	1			
			Warning & decelerating stop	2			
			Warning & free stop	3			

		1000bit	-	-			
			-	-			

When the inverter receives running command, it can control output frequency automatically in the PID regulation mode after comparing the setting signal and feedback signal from terminal. The process is explained as following:



(Δ= setting signal - feedback signal)

PI8000/PI8100 PID regulation

0: Negative action, when Δ＞0 is positive, frequency rises and when Δ＜0 is negative, frequency falls.

1: Positive action, when Δ＞0 is positive, frequency falls and when Δ＜0 is negative, frequency rises.

PID abnormity treatment:

1: Warning & Continuous running: continue running g after abnormity feedback signal.

2: Warning & Decelerating stop: decelerate and stop after abnormity feedback signal.

3: Warning & Free stop: free stop after abnormity feedback signal .

P01	PID Output Limit	0~100		%	100	Y

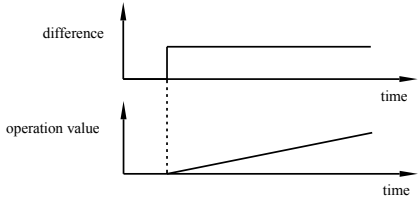
The parameter defines the limited range of the output when using PID control.

P02	Feedback signal selection	Set frequency by keyboard or RS485	0	-	2	Y
		AI1 external analogy giving [8000]	1			
		AI2 external analogy giving	2			
		AI3 external analogy giving	3			
		Keyboard potentiometer giving	4			
		muti-step digital voltage giving	5			
		Digital pulse set	6			

PID feedback signal selection, can select keyboard/Rs485, potentiometer, digital voltage, digital pulse for feedback signal.

P03	Setting signal selection	Set frequency by keyboard or RS485	0	-	2	Y
		AI1 external analogy giving [8000]	1			
		AI2 external analogy giving	2			
		AI3 external analogy giving	3			
		Keyboard potentiometer giving	4			

		Multi-step digital voltage giving	5			
		Digital pulse set	6			
PID giving signal selection, can select keyboard/Rs485, potentiometer, digital voltage,digital pulse for giving signal.						
P04	Keyboard set signal	0.0~100.0		%	50.0	Y
When P03 is 0, the setting pressure set by the keyboard. 0.0~100.0% is 0 to the maximum pressure respectively.						
P05	PID integral time	0.002~10.000		s	0.250	Y



The PID integral time determines the integral regulation speed,the regulation acts on the difference between PID feedback and setting value by PID regulator.

When the difference between PID feedback and setting value is 100% , integral regulator PID regulator ouput=(P01*F12*12.5%)Hz.(single direction PIDregulation,ignores proportion and differential effect).

If the value is great,the control is stable but response is slow;if the value is little,the system response is rapid but perhaps surge occurs.

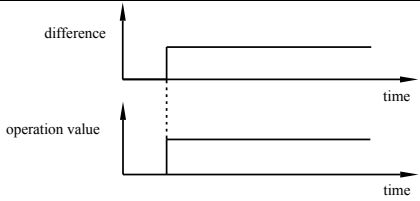
P06	PID differencial time	0.000~10.000		s	0.000	Y

The parameter determines the regulation intensity, the regulation acts on the change ratio of the difference between PID feedback and setting value by PID regulator.

When the change ratio of the difference between PID feedback and setting value is 100% in the differential time, PID regulator regulates output to(P01*F12*12.5%)Hz (single direction PID regulation, ignores proportion and integral effect).

If the value is great, the greater the intensity is, the system surge is to occur more easily

P07	PID proportion gain	0~1000.0		%	100.0	Y



The PID Proportion Gain defines regulation intensity of PID regulator, the larger the P is, the more the intensity is.

When proportion gain is 100%,and the difference between PID feedback and getting value is 100%, PID regulator's output is(P01*F12*12.5%)Hz(single direction PID regulation,ignores differential and integral effect).

Proportion gain is the parameter decides PID regulator's response extent.

If the gain is great, the response is rapid, but if too great, the surge will occur; the gain is

little, the response will lag.					
P08	PID sampling period	0.002~10.000	s	0.010	Y
Set Sampling period of feedback signal. When set this parameter small, the system response speed to the giving and feedback deviation is slow, but control is stable. When set this parameter low,the system response speed to the giving and feedback deviation is slow, but easy to cause vibration					
P09	Deviation limit	0.0~20.0	%	5.0	Y
Deviation limit effects system control accuracy and stability. When the deviation of feedback signal and giving signal <deviation limit, PID N regulation, keep output stable. When the deviation of feedback singnal and giving signal >deviation limit, PID regulates according to deviation, update output					
P10	PID fault detect time	0.0~3200.0	s	0.0	N
P11	PID fault detected value	0.0~100.0	%	10.0	N
Set P10 to 0. 0 for N fault inspection. When PID feedback signal <P11 set PID fault inspection value, last P10set time, regard it as PID regulation fault.					
P12	PID display range	0.00~100.00	-	1.00	Y
A09 PID set value＝PID set value(%)*P12 A10 PID feedback value＝PID feedback value(%)*P12 If PID feedback 10V corresponding 4.0Mpa pressure, if need A09, A10 to display actual value, only need to set P12 = 0.04.					

5-9 Expanding Parameters:E00-E23(0x0600-0x0617)

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
E00	Load type	General	0	-	0	N
		Pump	1			
		Fan	2			
		Injection machine	3			
		Textile machine	4			
		Hoist machine	5			
		Kowtow machine	6			
		belt conveyor	7			
		Variable frequency power	8			
		Multi-pumps constant pressure water supply	9			
		Reserved	10			
		Reserved	11			

		Torque control	12			
		Voltage regulation power	13			
		Current regulation power	14			
		Extruding machine	15			
Details, see Appendix IV.						
E01	Starting pressure deviation	0.0~100.0		%	10.0	Y
E02	Starting delay time	0.0~3200.0		s	5.0	Y
Feedback pressure <given pressure –starting pressure deviation. Continuously exceed E02 start delay time, the inverter will restart under in the standby mode This parameter is used to prevent the inverter from frequent start-stop.						
E03	Stop frequency	0~50.00		Hz	5.00	N
E04	Stop delay time	0.0~3200.0		s	5.0	Y

If the set frequency is less than or equal to E03 stop frequency, exceeding E04 stop delay time, the inverter will change from running to the stop standby state.

The bigger E03 parameter setting, the easier to stop, E03 parameter is set to 0, indicating the stop frequency and the start pressure control function is invalid

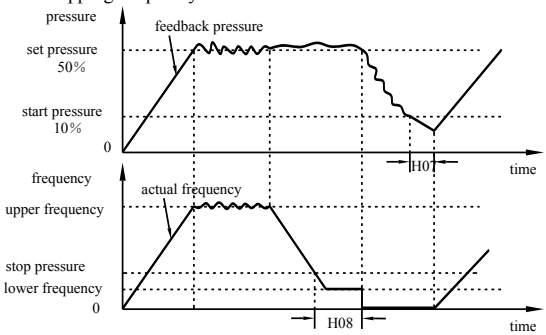
E01, E02, E03,E04 mix are used to control system energy-saving operation and continuous pressure regulation in water supply systems

For example ：

Given pressure = 50%

Starting pressure deviation =10%, starting pressure = given pressure - starting pressure deviation=40%

Stopping frequency= 5Hz



E05	High pressure arrival value	0~100.0		%	90.0	Y
When feedback pressure reach and exceed the high pressure reached value of this parameter, the I/O output terminal select 25, then it will output arrival signal.						
E06	Low pressure arrival value	0~100.0		%	10.0	Y
When feedback pressure less than the low pressure of the reached value of this parameter, the I / O output terminal select 26 and reach the low pressure, then it will give output arrival signal.						
E07	Timing to supply	1 bit	Timing to	Invalid	0	-	0000	Y

	water		supply water	Valid	1			
		10 bit	Pressure giving	Set according to P03	0			
				Set according to H47~H54	1			
		100 bit	Timing mode	Circle mode	0			
				Single circle	1			
		1000bit	The current timing step					

1 bit: Timing Supply Water

0 Timing Supply Water function is invalid

1 Timing Supply Water function is valid

10 bit: Pressure given

0 The pressure given during regular pressure water supply is set according PID given value selecting P03.

1 The pressure given during regular pressure water supply is set according the current corresponding H47~H54 digital voltage given.

100 bit: Timing mode

0 Cycle mode

Timing the operation time from the starting to the set watter supply time,the inverter will automatically move to the next period of time set, after the end of a loop, it will automatically re-start from the first paragraph 0, then cycle to run.

1 Single cycle

Start to time from start running, after it reached the setting time, the inverter will automatically move to the next period of time set, after the end of a loop, the inverter will stop and wait for the next running command.

1000 bit: The current regular time

When the water supply time set 0, it means cancel the water supply time setting of this period

Current time	Water supply tim	Pressure given
0	H18	H47
1	H19	H48
2	H20	H49
3	H21	H50
4	H22	H51
5	H23	H52
6	H24	H53
7	H25	H54

E08	Timing shift alternation time	0.0~3200.0	H	0.0	Y

Iming shift alternation time control the alternation ways and time of pump.

When Timing Shift Alternation Time is set to 0.0 hour and cancel Timing Shift Alternation function.

When the Timing Shift Alternation Time between 0.1~3,200 , after corresponding time of the stable running, in accordance with the principle of first stop for the one first started to control switch of pump.

First stop for the first pump started: When reduce pumps control, stop the first pump which

started first.

According to the principle of start first–stop first control, in order to ensure that every pump can have the chance to run to prevent some pumps rusted as a result of no use for long , such as the need to ensure that each operation of the pump can receive equal time, set timing shift alternation time.

Pump alternation order : E12 = 0x 0001

Starting State :
No. 1 pump frequency;
No. 2 pump frequency conversion;
No. 3 pump stops ;
Rotation :
No. 1 pump stops;
No. 2 pump frequency;
No. 3 pump frequency conversion ;
After the second rotation :
No.1pump frequency conversion;
No.2pump stops;
No.3pump power frequency.

E09	Electromagnetic switch action delay	0.000~10.000	s	0.500	Y

Electromagnetic switch action delay time when set up a pump (drive motor) to switch from variable frequency to industry frequency,or from industry frequency to variable frequency.

This is to avoid inverter output frequency meet with the AC power supply and occur short circuit caused because electromagnetic switch action too slow.

E10	Pumps shift judging time	0~9999	s	5	Y

Set when output frequency converter arrives to upper frequency, until the judgment time of

Increasing pumps (driving motor); or when output frequency converter arrives to lower frequency, until

The judgment time reducing pumps (driving motor). Set the time long or short according to the speed of

Pressure change, without oscillating range, the shorter the better.

Drives add or subtract pump control with E12 Water Supply Configuration

Add pump order No. 1 pump → No. 2 pump → No. 3 pump → No. 4 pump.

Reduce pump order No. 4 pump → No. 1 pump → No. 2 pump → No. 3 pump.

If the current : No. 1 pump frequency, No. 2 pump frequency, No. 3 pump convert frequency
after reduce pump: No. 1 pump frequency, No. 2 pump convert frequency,
after add pump: 1 pump frequency, No. 2 pump frequency, No. 4 pump convert frequency
after reduce pump :No. 1 pump frequency, No. 2 pump convert frequency,
after reduce pump: No. 1 pump frequency,
after add pump: No. 1 pump frequency, No. 3 pump convert frequency
after add pump: No. 3 pump frequency No. 4 pump convert frequency
after add pump: No. 1 pump frequency, No. 3 pump frequency No. 4 pump. frequency ,No. 2 pump converter frequency

E11	Constant pressure water supply configuration	1 bit	Stop mode	All pumps slow down stop	0	-	0000	Y
				Variable frequency pump stop	1			
				Free stop	2			

				Water supply pump stop	3			
		10 bit	all pumps status when fault occur	Keep current situation	0			
				All-pumps stop	1			
		100 bit	Altern ation shift mode	Variable frequency to working frequency	0			
				Variable frequency to stop	1			
		1000bit	Pump status keep	Keep status	0			
				Stop reset	1			

1 bit : Stop mode

0 All slow down, all pumps in turn slowing down.

1 Variable frequency pump stop:variable frequency pump stop running,variable frequency pump and soft start pump under frequency keep running.

Stop power frequency pump,you need to use o36~o46parking command or keyboard input terminal free multi - function keys MF1, MF2 set to 2 : Free Parking function.

2 Free stop, all pumps free stop

After free stop,E11 1000bit pump reset according to the order start and stop,but reorder according to E12 multi - pumps configuration.

3 Water supply pump stops,only those constant pressure water supplying pumps stop,soft start pump keep running under pump frequency.

Stop soft - starting pump, you need to use stop command of the soft star pump for o36 ~ o46 input terminal or keyboard multi - function keys MF1, MF2 set to 2 : Free stop function.

10 bit: Treatment under fault pump states

0 Maintain the status quo, when inverter failure, stop the current variable frequency pump operation and other power - frequency operation of variable frequency pump and soft start pump maintain the status

Fault occurs, if the following breakdown, select fault treatment according to failure action.

12	E.PId	PID regulating fault
13	E.OHt	Motor over heated fault
14	E.OL2	Motor over loading fault
15	E.PG	PG fault
16	E.PHo	Inverter output Phase lost
17	E.COA	RS485 communication A fault
18	E.COb	RS485 communication B fault

The feature only applies to the fault under the mode allowing fault runs. The fault is not allowed to run, all stop.

1 All pump stop, when inverter failure, all pumps free stop.

100 bit: Soft start switching mode

0 Convert frequency to power frequency, frequency control of the pump current increases the speed to the frequency, the rotation of the pump start and stop switch control or soft start

pump
1 Frequency conversion to stop, stopped the current frequency conversion control of pump and
pump rotation switch or soft start pump start - stop control.
1000 bit : pumping States maintain
0 Maintaining state, After multi pumps constant pressure water supply stop, keep the current multipumps at the first start- first stop order.
1 Stopping reset , After multi pumps constant pressure water supply stop , E12 multipumps configuration reorder multi - pump at the stop order.

E12	Multi-pumps configuration	1 bit	Pump 1 invalid	0	-	0001	N
			Pump1variable frequency to control pump	1			
			Pump1soft starts to contol pump	2			
		10 bit	Pump 2 invalid	0			
			Pump2variable frequency to control pump	1			
			Pump2soft starts to contro pump	2			
		100bit	Pump 3 invalid	0			
			Pump3variable frequency to control pump	1			
			Pump3soft starts to control pump	2			
		1000bit	Pump 4 invalid	0			
			Pump4variable frequency to control pump	1			
			Pump4soft starts to control pump	2			

Under Multi-pump control mode, set the control mode of each pump.

E13	Multi-pumps status	1 bit	Pump 1 stop	0	-	0000	N
			Pump 1 run in variable frequency	1			
			Pump 1 run in working frequency	2			
		10 bit	Pump 2 stop	0			
			Pump 2 run invariable frequency	1			
			Pump 2 run inworking frequency	2			
		100bit	Pump 3 stop	0			
			Pump 3 run invariable frequency	1			
			Pump 3 run in working frequency	2			

		1000bit	Pump 4 stop	0			
			Pump 4 run invariable frequency	1			
			Pump 4 run in working frequency	2			
Under Multi-pump control mode, displays the status of each pump.							
E14	Soft Starting pump control	1 bit	Pump 1soft-no command	0	-	0000	Y
			Pump 1soft-stop	1			
			Pump 1soft-start	2			
		10 bit	Pump 2soft-no command	0			
			Pump 2soft-stop commanc	1			
			Pump 2soft-start commanc	2			
		100bit	Pump 3soft-stop no command	0			
			Pump 3soft-stop commanc	1			
			Pump 3soft-start commanc	2			
		1000bit	Pump 4soft-no command	0			
			Pump 4soft-stop commanc	1			
			Pump 4soft-start commanc	2			
Under Multi-pump control mode, set the control mode of each pump.							
E15	User parameter 0	0~9999			-	0	Y
E16	User parameter 1	0~9999			-	0	Y
E17	User parameter 2	0~9999			-	0	Y
E18	User parameter 3	0~9999			-	0	Y
E19	User parameter 4	0~9999			-	0	Y
E20	User parameter 5	0~9999			-	0	Y
E21	User parameter 6	0~9999			-	0	Y
E22	User parameter 7	0~9999			-	0	Y
E23	User parameter 8	0~9999			-	0	Y

5-10 Speed-loop Parameter:C00-C31(0x0700-0x071F)

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
C00	Filter time of speed-loop	2~200	ms	10	Y
It defines the filter time of the speed-loop. The range is 0.01~100s.If the value is too great, the Control is stable but response is slow; if the value is too little, the system response is rapid					

but perhaps is unstable. So it is necessary to consider the stability and the response speed at the same time when setting the value					
C01	Speed-loop low speed Ti	0.01~100.00	s	0.25	Y
It defines the integral time of the speed-loop low speed. The range is 0.01~100.00s. If the integral time is too great, response is slow and the control of external disturbing signal become bad; if the time is too little, response is rapid, but perhaps brings the surge.					
C02	Speed-loop low speed Td	0.000~1.000	s	0.000	Y
It defines the differential time of the speed-loop low speed segment and the range is 0.000~1.000s. If the time is great enough, the surge which is caused by P action when difference occurring can attenuate quickly. But too great, the surge will happen contrary. When the time is little, the attenuation function is little too.					
C03	Speed-loop low speed P	0~150	%	100	Y
It defines the proportion gain of speed loop low speed segment.And the range is 0~1000%.If the gain is great, the response is rapid, but too great, surge perhaps occurs; if the gain is too little, response is slower					
C04	Speed-loop low speed shift frequency	0.0~C08	Hz	7.00	Y
It defines low-speed loop switching frequency, the parameter and switching frequency at high-speed optimize Speed-loop PID parameter.					
C05	Speed loop high speed Ti	0.01~100.00	s	0.50	Y
It defines integration time of High-speed section of the speed loop.Range is 0.01~100.00s.integration time too large and unresponsive, external interference control variation becomes weak ; integration time is small the reaction speed, oscillation occurs when it is too small					
C06	Speed loop high speed Td	0.000~1.000	s	0.000	Y
It defines the differential time of the speed-loop high speed segment and the range is 0.000~1.000s. If the time is great enough, the surge which is caused by P action when difference occurring can attenuate quickly. But too great, the surge will happen contrary. When the time is little, the attenuation function is little too.					
C07	Speed loop high speed P	0~150	%	75	Y
It defines the proportion gain of speed loop high-speed section, range from 0~1000%. Gain is large,response speed, but too large gain will occur vibration; if the gain is small, the reaction lag.					
C08	Speed Loop And High-speed Switching Frequency	C04~Max frequency	Hz	30.00	Y
It defines Integral time of speed loop high speed , the parameter and switching frequency at low -speed optimize the speed-loop PID parameter.					
C09	Low-speed slip gain	0~200	%	100	Y
Low-speed segment slip compensation gain。					
C10	Low speed slip switching frequency	0~C12	Hz	5.00	Y
Low speed segment slip compensation switching frequency					
C11	High speed slip gain	0~200	%	100	Y
High speed segment slip compensation gain					

C12	High speed slip switching frequency		C10~Max frequency		Hz	30.00	Y
	High speed segment slip compensation switching frequency						
C13	Upper froward torque		0.0~300.0		%	250.0	Y
	The parameter is a ratio，setting value is 100%. Responding to motor rated output torque. Set forward torque mode through C15. In speed control mode, it's upper forward torque. In torque control mode, it's forward torque setting value.						
C14	Upper reverse torque		0.0~300.0		%	250.0	Y
	The parameter is a ratio，setting value is 100%. Set reverse torque mode through C16. In speed control mode, it's upper reverse torque. In torque control mode, it's reverse torque setting value						
C15	Forward torque setting mode	1 bit	Setting mode	Set by keyboard or RS485	0	-	0000	Y
				AI1 external analogy giving^{8000}	1			
				AI2 external analogygiving	2			
				AI3 external analogygiving	3			
				Keypad potentiometer giving	4			
				Multi-step digita voltage giving	5			
				Digital pulse set	6			
		10bit	direction	Direction uncontrolled	0			
				Direction controlled	1			
C16	Reverse torque setting mode	1 bit	Setting mode	Set by keyboard or RS485	0	-	0000	Y
				AI1 external analogy^{8000}	1			
				AI2 external analogy giving	2			
				AI3 external analogy giving	3			
				Keypad potentiometer giving	4			
				Multi-step digita	5			

				Digital pulse set	6			
		10bit	direction	Direction uncontrolled	0			
				Direction controlled	1			
C17	Torque set gain		0.0~300.0			%	200.0	Y

C15 1 bit：Setting mode
C16 1 bit：Setting mode

0	Set by keyboard or RS485	Responding to C13/C14
1	*AI1 external analog setting*[8000]	-
2	AI2 external analog setting	As per AI2 external analog setting
3	AI3 external analog setting	As per AI3 external analog setting
4	Keyboard potentiometer setting	As per keyboard potentiometer setting
5	Multi segment digital voltage setting	As per multi segment digital voltage setting
6	Digital Pulse Setting	As per digital pulse setting

While the unit digit of C15,C16 is 1~6, the upper torque of C13,C14 is for checking.
C15 10 bit: Direction Control
C16 10 bit: Direction Control
0: No control Direction
Direction is controlled by terminal or keyboard
1:Control Direction
Setting value of forward torque > setting value of reverse torque, forward direction.
Setting value of forward torque < setting value of reverse torque, reverse direction.
C13 upper forward torque =setting value percentage * C17 torque given gain.
C14 upper reverse torque =setting value percentage * C17 torque given gain.
Example:
C15 forward torque setting way=4 keyboard potentiometer setting.
C16 reverse torque setting way=4 keyboard potentiometer setting.
Forward/reverse both can control direction, C15=0x14，C16=0x14.
Potentiometer corresponding setting value A48=-100%，A49=100%
Keyboard potentiometer set A47=100%，C17=200.0%
C13 forward upper torque =100%*200.0%=200.0%, control direction forward 200% torque
Keyboard potentiometer set A47=100%，C17=200.0%
C14 upper reverse torque =100%*200.0%=200.0%, control direction reverse 200% torque

C18	Speed /torque control shift	Speed control	0	-	0	Y
		Torque control	1			

F00 control method is to s select senseless vector control or sensor feedback close loop vector control can change speed or torque control through input terminal. After setting IP terminal change, keyboard set invalid, only for query.

C19	Upper speed setting mode	1 bit	Separate setting mode	keyboard or RS485 setting	0	-	0000	Y
				AI1 external analog[8000]	1			

				AI2 external analog setting	2			
				AI3 external analog setting	3			
				Keyboard potentiometer setting	4			
				Multi-segment digital voltage setting	5			
				Digital pulse detting	6			
		10bit	selection	C19 unit bit setting	0			
				S00 detting grequency	1			
C20	Upper speed		0.00~Max frequency			-	50.00	Y

While torque control, setting upper speed

C19 1 bit: Separate setting mode

0	keyboard or RS485 setting	As per C20 setting
1	*AI1 external analog setting*[8000]	-
2	AI2 external analog setting	As per AI2 external analog setting
3	AI3 external analog setting	As per AI3 external analog setting
4	Keyboard potentiometer setting	As per keyboard potentiometer setting
5	Multi-step digital voltage setting	As per Multi-step digital voltage setting
6	Digital Pulse Setting	As per Digital Pulse Setting

While the unit digit of C19 is 1~6, the upper speed of C20 is for checking

C19 10 bit; Select upper speed setting Ways

0: Separate setting, as per the selection of C19 unit digit

1:Setting frequency is according to S00,and affected by the following parameters.

F02 frequency main setting mode / F03 auxiliary setting mode of frequency /F04 between main and auxiliary setting frequency

C21	Torque acceleration time	0.0~200.0	s	1.0	Y
C22	Torque deceleration time	0.0~200.0	s	1.0	Y

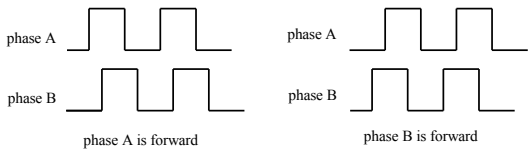
C21, C22 torque acceleration time, turning moment deceleration torque control mode and effective

Torque acceleration time, torque accelerated from 0 to 300 hours

Torque speed, torque, from 300 down to 0.

C23	Low speed excitation compensation	0~100	%	30	Y

Under low speed, compensate excitation quantity, increase torque feature, in case of meeting the requirement, try to make it lower, could reduce the motor heating up caused by magnetic path full.

C24	Current loop Ti	0~9999	ms	500	Y
Define the current loop integral time When integral time is too long, response is inactive; the ability to control external jamming becomes weak When integral time is short, response is fast, if too short, vibration will occur.					
C25	Current loop P	0~1000	%	100	Y
Define current loop proportion gain, When select big gain, response fast, but too big will occur vibration. when select low gain, response lag					
C26	PG electronic gear A	1~5000	-	1	Y
C27	PG electronic gear B	1~5000	-	1	Y
When encoder and motor is in different shaft, can calculate current motor speed according to encoder and gear ratio.Electronic gear A for denominator, B for molecule.					
C28	PG pulse	300~9999	-	2500	N
PG pulse quantity used, set value is the pulse quantity when motor rotates for a circle.					
C29	Action when PG break	No PG break protection: 0 Warning and keeping running: 1 Warning and deceleration stop: 2 Warning and free stop.: 3	-	3	y
Set the brake method when detect PG break. 0: NO PG break protection 1: Warning and keeping running 2: Warning and deceleration stop. 3: Warning and free stop.					
C30	PG rotating direction	When motor forward, phase A leads: 0 When motor forward, phase B leads: 1	-	0	Y
 Encoder rotating direction, refer to the motor forward direction 0: When motor forward, phase A leads, set C27= 0 1: When motor forward, phase B leads, set C27= 1 **Note**: above parameters are valid when with encoder(PG), need to layout PG card. If needed, please contact our company.					
C31	PG dropped inspection time	0.0~10.0	s	1.0	N
PG feedback signal is 0, exceed C31 set time, system reports PG dropped fault. Set speed to					

0, or set C31 to 0, don't check PG dropped fault.

5-11 Motor Parameter:b00-b22(0x0800-0x0816)

Code	Description / LCD	Setting Range	Unit	Factory Setting	Change Limited
b00	Motor 1 rated frequency	0.00~Max frequency	Hz	50.00	Y
b01	Motor 1 rated current	y09*(50%~100%)	A	★	Y
b02	Motor 1 rated voltage	100~1140	V	★	Y
b03	Motor 1 pole-pairs	1~8	-	2	Y
b04	Motor 1 rated speed	500~5000	rpm	1480	Y

b00~b04 are the motor's nameplate parameters which touch the precision.Set the parameters according to the motor's nameplate.

b00 ~ b04 motor nameplate in parameters, it is necessary to re-calculate motor parameters by using

b11.Excellent vector control performance requires exact motor parameters. Exact parameters are base on the correct setting of motor's rated parameters.

To assure the control performance, please match the right motor as per the inverter's standard,

Motor rated currents limited between 30%~120% of inverter rated current.The rated current can be set, but can't be more than the rated current of the inverter. The parameter

Confirms the OL protection capability of the motor and energy-saving running.

To prevent self-cooled motor form overheat when running in a low speed, and the motor capacity change when motor character change little, the user can correct the parameter to protect the motor.

The number of motor pole pairs, such as the four pole motor, the number of pole pairs is set to 2

b05	Motor 1 N load current	0.0~b01	A	★	Y
b06	Motor 1 stator resistance	0.000~30.000	ohm	★	Y
b07	Motor 1 rotor resistance	0.000~30.000	ohm	★	Y
b08	Motor 1 stator inductance	0.0~3200.0	mH	★	Y
b09	Motor 1 mutual inductance	0.0~3200.0	mH	★	Y

b05~b09 can by input by motor actual parameters value, also can define motor parameter by b11 parameter measure function.and save automatically. If know the correct motor parameter, can input by hand

When b11 is 1, 2, 3, the system calculates and measuresautomatically.

b05~b09 is the motor's basic electric parameters, these parameters is essential to achieve vector control calculation.

b10	Motor selection	Motor 1	0	-	0	N
		Motor 2	1			

The system can select any group motor parameters.

Motor parameter measurements modify and save to corresponding motor parameter area automatically.

b11	Motor parameter	No measurement	0	-	0	N

	measurement	Calculate by label data	1			
		Inverter static measurement	2			
		Inverter rotation measurement	3			

Set whether the measurement of electrical parameters in order to b10 motors choose motor 1 as an example.

0 : No measurement

1 : Calculate by label data

According to the motor nameplate parameters b00 ~ b04 , automatic calculation b05 ~ b09 and other electrical parameters,the advantage does not require power-on selftuning,suitable for general- purpose Y series of four pole motor, the other type motor can be adjusted based on this parameter.

2 : Inverter static measurement

If the motor parameters can not be measured without load,you can choose static frequency converter measurement. Make sure that motor in a static status ,after static measurement, it can be manually adjusted some parameters, optimal control.

The b11 is set to 2, the inverter automatically start parameter determination.

Keyboard figures area show "-RUN": waiting to run the command, start the measurement.

Keyboard figures area show "CAL1", inverter without output.

Keyboard figures area show "CAL2", inverter with output, static state.

Keyboard figures area show "-END": measuring ends.

Keyboard figures area show "E. CAL": the measurement process errors.

Process can be measured through the STOP key to stop.

3 : Inverter rotation measurement

Motor can be measured without load, can choose the rotation measurement. Measurements started, make sure the motor is static.Static measurement converter, the output DC voltage, pay attention to safety.

The b11 is set to 3, the inverter automatically start parameter determination.

Keyboard figures show that the regional show "-RUN": waiting to run the command, start the measurement.

Keyboard figures area show "CAL1", "CAL3": N output inverter.

Keyboard figures area show "CAL2", inverter with output, under static state.

Keyboard figures area show "CAL4", inverter with output, the motor forward in high-speed.

Keyboard figures area show "-END": measuring the end.

Keyboard figures area show "E. CAL": the measurement process errors.

Process can be measured through the STOP key to stop.

Set this parameter,the motor parameters will be determined dynamically.Be sure the motor is without load (N-load operation). Before setting,be sure to run well prepared,the motor will run in high speed during the measurement

Measurement is completed, b11 return to 0. The measured parameters will select parameters on the base of b10 motor parameters which is automatically saved to the b05 ~ b09 or b18 ~ b22.

Note: Before auto-measure the motor parameter, must input motor rated parameter b00~b04 or b13~17 correctly

Please regulate accelerating and deceleration time or torque increasing parameter, if there is over -current or over voltage faults while auto- measurement.

When automatic regulation, motor should be in stop status						
b12	Vector control initial inspection R1	Not inspection R1	0	-	0	N
		Inspection R1	1			
b13	Motor 2 rated frequency	0.00~Max frequency		Hz	50.00	Y
b14	Motor 2 rated current	y09*(50%~100%)		A	★	Y
b15	Motor 2 rated voltage	100~1140		V	★	Y
b16	Motor 2 pole pairs	1~8		-	2	Y
b17	Motor 2 rated speed	500~5000		rpm	1480	Y
b18	Motor 2 N load current	0.0~b14		A	★	Y
b19	Motor 2 stator resistance	0.000~30.000		ohm	★	Y
b20	Motor 2 rotator	0.000~30.000		ohm	★	Y
b21	Motor 2 stator inductance	0.0~3200.0		mH	★	Y
b22	Motor 2 mutual inductance	0.0~3200.0		mH	★	Y
The 2nd group motor parameters can be set by system. The definition is same with group 1.						

5-12 System Parameter:y00-y17(0x0900-0x0911)

Code	Description / LCD	Setting Range		Unit	Factory Setting	Change Limited
y00	Reset system parameter	No action	0	-	0	N
		Reset system parameter with keyboard storage1	1			
		Reset system parameter with keyboard storage 2	2			
		Reset system parameter with keyboard storage 3	3			
		Reset system parameter with keyboard storage 4	4			
		Reset system parameter with factory set value	5			
0 : No action 1 : Reset system parameter with keyboard storage 1 2 : Reset system parameter with keyboard storage 2 3 : Reset system parameter with keyboard storage 3 4 : Reset system parameter with keyboard storage 4 5 : Reset system parameter with factory set value When this parameter set valid, all the function parameter reset to factory setting. The parameters without factory setting will save the previous setting value.						
y01	Parameter upload to keyboard	No action	0	-	0	N
		Reset system parameter with keyboard memory area1	1			

		Reset system parameter with keyboard memory area2	2			
		Reset system parameter withb keyboard memory area3	3			
		Reset system parameter with keyboard memory area4	4			
		Clear up keyboard memory area 1, 2, 3, 4	5			

0 : No action;
1 : Reset system parameter with keyboard memory area1;
2 : Reset system parameter with keyboard memory area2;
3 : Reset system parameter with keyboard memory area3;
4 : Reset system parameter with keyboard memory area4;
5 : Clear up keyboard memory area 1, 2, 3, 4

y02	Lastest fault record	Lastest fault record number	-	0	Y
y03	Fault record 1	Press [PRG]and [▲/▼] key the frequency, crrent and running status of fault time can be known.	-	-	Y
y04	Fault record 2				
y05	Fault record 3				
y06	Fault record 4				
y07	Fault record 5				

These parameters register fault which happen in the last several times, and can inquire about the value of monitor object at the time of fault by 'PRG' and "plus or minus" key.

The monitor object of fault state:
0 : Fault type
The fault code is expressed as following:

Serial number	LED display	Fault
0	E.OCP	System is disturbed or impacted by instant over current
1	Reserved	
2	E.OC3	Inverter output exceeds 3 times the motor rated current
3	Reserved	
4	E.OU	Over voltage
5	E.LU	Under voltage
6	E.OL	Over load
7	E.UL	Under load warning
8	E.PHI	Power input Phase loss
9	E.EEP	EEPROM error
10	E.ntC	Over heat
11	E.dAt	Time limit fault

12	E.Set	External fault
13	Reserved	
14	Reserved	
15	Reserved	
16	E.PId	PID regulate fault
17	E.OHt	Motor over heat fault
18	E.OL2	Motor over load fault
19	E.PG	PG fault
20	E.PHo	Inverter output phase-lost
21	E.COA	RS485 communication terminal A failure
22	E.COb	RS485 communication terminal B failure
23	E.CAL	Parameter identification problems

1 : Set frequency at the time of fault
The output frequency of the inverter at the time of fault
2 : Output frequency at the time of fault
The output frequency of the inverter at the time of fault
3 : Output current at the time of fault
The actual output current at the time of fault
4 : Output DC voltage at the time of fault
The actual output voltage at the time of fault
5 : Running state at the time of fault
The running state at the time of fault
LEDdisplay is below:

The first LED		The second LED		The third LED	The fourth LED	
F	FWD command	F	FWD status	Separator	A	Accelerating
R	REV command	R	REV status		D	Deccelerating
S	STOP command	S	STOP status		E	Running in a even speed
					S	Stop status

6 : Running time at the time of fault
The running time at the time of fault
7 : Inverter IGBT temperature at the time of fault
Inverter IGBT temperat

y08	Fault record reset	No action	0	-	0	Y
		Reset	1			

0 : No action, the fault records retains
1 : The fault records resets

y09	Rated output current	0.1~1000.0	A	★	N

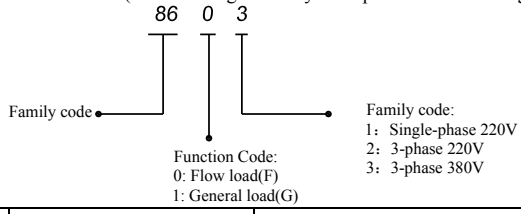
Inverter rated output current

y10	Rated input voltage	100~1140	V	★	N

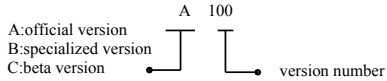
The rated input voltage of the inverter. It would be set as per inverter input voltage level before leaving factory.

y11	Product series	86 Family code	0 Product serial	3 Input oltage grade 1	-	★	N

Product series (set according to family code/product serial/voltage grade



y12	Software version	-	-	-	N



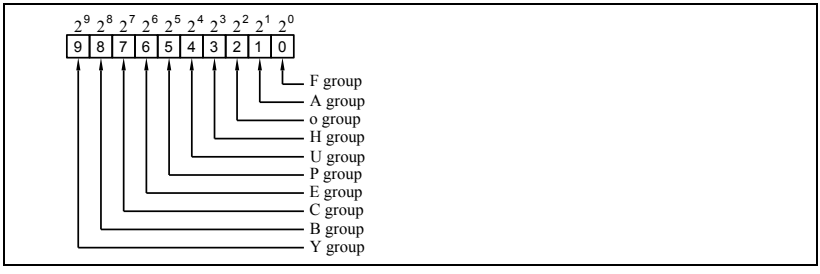
y13	Product date--year	YYYY	-	-	N
y14	Product date-month/day	MMDD	-	-	N
y15	User decode input	0~9999 Record password wrongly input times	Set range Display info	-	-	Y

In the state of locked parameter,LED displays the times of error input. There are three input limit,if input is wrong in continuous three times , the systems will prohibit input of the password . It can prevent testing password in an illegal way, and need restart the machine to input again.Once the input is right in any time during three times input limit, the parameter is unlocked

y16	User password key-in	0~9999		Set range	-	-	Y
		No password or decode input is correct	deco	Display info			
		Parameter lock-in	code				

The parameter sets the password , and the range is 0 ~ 9999 . After setting the password , parameter locks and keyboard displays “code”; if the password is unlocked or password input is right, the keyboard will display “deco”.Set password to 0, reset user password set, after reelectrify status is decode.

y17	Parameter group protection	Corresponding parameter group protection after set password Set to 0: change is not allowed Set to 1: change is allowed	-	0000	Y


2^9 2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0
9 8 7 6 5 4 3 2 1 0
F group
A group
o group
H group
U group
P group
E group
C group
B group
Y group

Section VI Fault Diagnosis & Solutions

6-1. Problems and solutions

Problems	Possible Causes	Solutions
Keyboard can not control	Running control mode setting is wrong	Check F05
	Frequency setting is wrong	Check F03、F04
Potentiometer can't regulate speed	Control mode setting is wrong	Check F05
	Frequency setting is wrong	Check F03、F04
The motor does not rotate	LED monitor dislay fault	Press RESET or terminal for fault reset, learn and fix the fault according to the fault info
	No voltage in terminals DC+1 and DC+2	Check the voltage at R, S or T and charging circuit.
	U, V or W terminals produce No output or abnormal output.	Check the control mode and frequency parameter. Check the terminal condition if it is operated by an external terminal
	Re-start after powering down or free run	Remember the set operating state.
	Too much load on the motor	Check the load condtion, and confirm the mode selection is right
Over current E.OC	Fault display E.OCP	System is disturbed or instant over current
	Fault display E.OC3	Motor over current, protect action when motor actual current is 3 times over than the motor rated current
	Over current during acceleration	Reset or adjust F09, F20, F21.
	Over current during deceleration	Reset or adjust F10, F22, F23.
	During starting, the low-frequency jitter over-current	Modify F06 setting
	Over current during operation	Check the load change and eliminate it.
	Over current during starting or operation sometime	Check if there is slight short circuit or grounding.
	Disturbance	Check the earthing wire, screened cable grounding and terminals.
Over load E.OL	Over load	Lower the load.or enlarge b04, b14 in the allowable load range or enlarge A24 to raise the thermal protection level.

	Inappropriate parameter is set	Modify b04、b14 in case of the motor overload allowed
Over voltage E.OU	Power voltage exceeds the limit	Check voltage is right or not. Frequency inverter rated voltage setting is Y or N.
	Too fast deceleration	Modify F10.
	The load has too much inertia	Reduce the load inertia, or raise the capacity of frequency converter, or add a braking resistor.
Low voltage E.LU	Too low power voltage	Checking voltage is normal or not. Frequency inverter rated voltage setting is Y or N.
	Power off transiently	Add options of capacitor boxes
	The line has too small capacity or great rush current exists on the lines.	Make renovation on power supply system.
Over heat E.OHt	Too high ambient temperature	Improve ambient conditions
	Cooling fans do not work	Check A27, reduce fan starting tamperaturer (when there is fan control)
	The carrier frequency is too high	Check the setting value of function F16

Note:

※ Switch off the power supply, and do not touch the PCBs and any parts inside in five minutes after the charging indicator light (！CHARGE) goes off. Ensure the capacitance has been discharged completely by measuring with the instrument before work inside. Otherwise, there is a danger of electric shock.

※ Do not touch the PCB or IGBT and other internal parts unless actions have been taken to prevent the static electricity. If not, the components may be damaged.

Section VII Standard Specifications

7-1. Specification

I-3-1. PI8600 Specification

Inverter type	Light Load F		Standard Load G		Structure item
	PF kW	IF A	PG kW	IG A	
Single phase voltage 220V 50/60Hz					
PI8600●●●□1	0.75	4	0.4	2.5	7N1
PI8600●●●□1	1.5	7	0.75	4	7N1
PI8600●●●□1			1.5	7	7N1
3 phase voltage 220V 50/60Hz					
PI8600●●●□2	0.75	4	0.4	2.5	7N1
PI8600●●●□2	1.5	7	0.75	4	7N1
PI8600●●●□2			1.5	7	7N1
3 phase voltage 380V 50/60Hz					
PI8600●●●□3			0.75	2.5	7N1
PI8600●●●□3	1.5	3.7	1.5	3.7	7N1
PI8600●●●□3	2.2	5	2.2	5	7N1

I-3-2. Table of rated current for different specifications

G/F			
Votage	220V 1Φ	220V (240V)	380V (415V)
Power (kW)	Current (A)	Current (A)	Current (A)
0.4	2.5	2.5	-
0.75	4	4	2.5
1.5	7	7	3.7
2.2	10	10	5

7-2. Standard specification

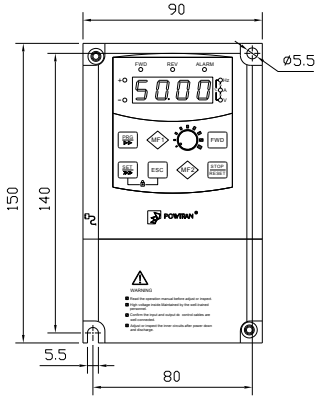
Items		Specifications		
Power	Voltage and frequency	Single-phase 200~240V, 50/60Hz Three-phase 200~240V, 50/60Hz Three-phase 380~415V, 50/60Hz		
	Allowable Fluctuation range	voltage: ±15% frequency: ±5%		
Control	Control system	high performance vector control inverter based on 32 bit DSP		
	Output frequency	G/F type: 0.00~800.0Hz, maxmum frequency can be set between 10.00 and 800.0Hz		
	control method	V/Fcontrol	control method	V/Fcontrol
	Start torque	0.50Hz 180%	Start torque	0.50Hz 180%
	speed adjustable range	1：100	speed adjustable range	1：100
	Speed stabilizing precision	±0.5%	Speed stabilizing precision	±0.5%
	waveform produce methods	Asynchronous space vector PWM, N-class subsynchronous space vector PWM, two-phase optimization of space vector PWM.		
	Auto torque boost function	Achieve low frequency (1Hz) and high output torque control under V.F control mode.		
	Accelerate / decelerate control	Sub-set S curve acceleration and deceleration mode , maximum acceleration and deceleration time is 3200 days		
	Long running time control	16 segments speed run,maximum running time is 3200 days		
	frequency setting accuracy	Digit: 0.01Hz(below 300Hz), 0.1Hz(above 300Hz); alalogue: 1% of maxmum frequency		
	frequency accuracy	Speed control tolerance 0.01%(25℃±10℃).		
	V/F curve mode	Linear, 1.2 times the power, 1.7 times the power, 2 times power, user-set 8 V / F Curve.		
	Over load capability	G type: 150% rated current -1 minute, rated current 200% -0.1 second; F: rated current 120%-1 minute,150% of rated current-0.1 second;		
	slip compensation	V / F control can automatically compensate for deterioration.		
Running	Running method	Keyboard/terminal/communication		
	Starting signal	Forward, reverse, jog (parameter control direction),forward jog, and reverse jog.		
	Emergency stop	Interrupt controller output.		
	fault reset	When the protection function is active, you can automatical or manually reset the fault condition.		

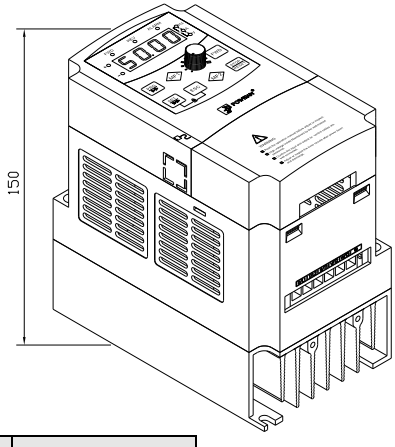
	Running status	Motor status display, stop, acceleration and deceleration, constant speed, the program running.
	DC brake	Built-in PID regulator brake current flow in the premise, however, to ensure adequate braking torque.
Protection	Inverter protection	Overvoltage protection, undervoltage protection, over-current protection , overload protection,over-temperature protection, over the loss of speed protection, over-voltage stall protection , phase protection (optional) , external fault , communication error , PID feedback signal abnormalities , PG failure
	IGBT temperature desplay	Display current IGBT temperature
	Inverter fan control	The fan starting temperature can be set(optional)
	Instant power-down re-start	Less than 15 milliseconds: continuous operation. Greater than 15 milliseconds: Automatic detection of motor speed, instantaneous power-down re-start.
	Speed starting track method	automatically track motor speed when inverter starts
	Parameter protection function	Protect inverter parameters by setting the password and decoding
IO	8 way switch input	Can be customized into 68 kinds of functions, to achieve forward, reverse, forward jog, and reverse jog, emergency stop, reset, speed, acceleration speed, run-time switch, and pulse counting.
	3 way analog inputs	Can be defined as a switch input; To allow for maximum input range-10V ~ +10V, 0 ~ 20mA
	2 way anolog output	Can achieve output range 0 ~ +10V, 0 ~ 20mA
	Virtual terminal function	Can be set to a virtual terminal, using communication or keyboard IO port, and with the IO port status display.
Keyboard	Frequency set	In 6 main ways + to 7 kinds of auxiliary to the way of the keyboard, three way analog input, pulse input, digital potentiometers.
	Keyboard cable	8-core cable,in line with EIA T568A,EIA T568B standards.
	Double keyboard port	Supports dual-keyboard,synchronous control,independently of each other.
	Double and multi function keys	MF1, MF2 can be customized as addition and subtraction, forward, reverse, forward jog, and reverse jog, emergency stop, rise and fall, and other 9 kinds of ways.
	4-parameter storages	Control panel can be realized four groups of inverter parameters of upload, download, with manufacturer password to reset factory setting.
	Running info	At most display 3 monitoring parameters. Select by A00, A01, A02

	Fault info	Store 5 groups error messages at most, you can check the type of failure time when failure occurrs, set frequency, output frequency, output voltage, output current, running state, running time, IGBT temperature.
Commu-nication	Double RS485 port	Rs485 port and an optional keyboard completely isolated RS485 communication module.
	CAN BUS	Can select can-bus module.
Speed	16-segment speed	At most 16 segments can be set(use multi-functional terminal to shift or program runs).
	8-segment running time	At most8segment running time can be set(multi-functional terminal can be used to shift)
	8 segment acceleration speed	At most 8 acceleration speed(can use the multi-functional terminal to switch).
	Seven-Segment Speed Configuration	At most 7 segment speed configuration can be set (multi-functional terminal can be used to switch).
PID	PID feedback signal	Six kinds of ways,keyboard,three way analog input,pulse input, digital potentiometers.
	PID giving signal	Six kinds of ways,keyboard,three wayl analog input,pulse input, digital potentiometers.
Motor	2 goups of motor parameters	With the motor parameters, parameter can be selected, parameter identification automatic storage.
	3 identification method	Name plate calculation, static measurement, rotation measurements.
	5 name plate parameters	Rated frequency, rated current, rated voltage, the number of pole pairs, rated speed.
	5 indentification parameters	N-load current, stator resistance, rotor resistance, stator inductance, mutual inductance.
Environ-ment	Environment temperature	-10℃ ~40℃, 40 ~ 50℃ derating between the use is increased by 1 ℃, rated output current decrease of 1%.
	Store temperature	-40℃~+70℃。
	Environment humidity	5~ 95 %, No condensation
	Height·vibration	0 ~ 2000 meters, 1000 meters above derating use, increased by 100 m, rated input decreased%
	Application location	Mounted vertically inside the control cabinet with good ventilation, do not allow the level , or other installation method . The cooling medium is air. Installed in the absence of direct sunlight, N dust, N corrosive and explosive gas, N oil mist, N steam, N drip environment
	Cooling method	Forced air cooling and natural air cooling

7-3. Shape Size

7-3-1. PI8600 Series

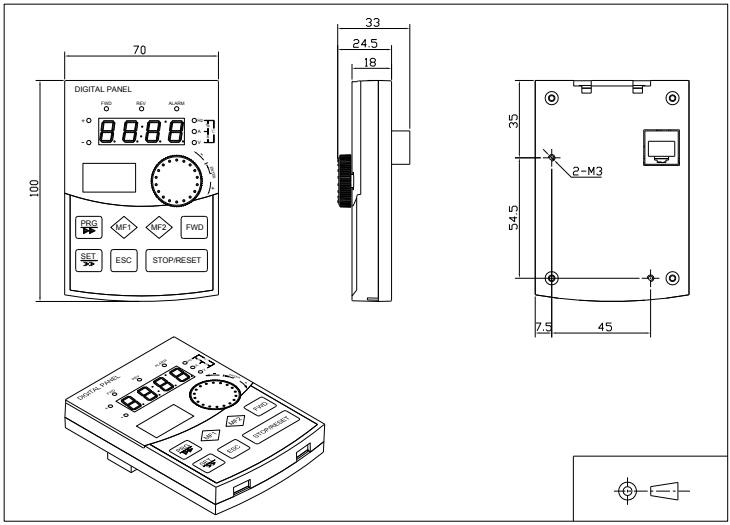




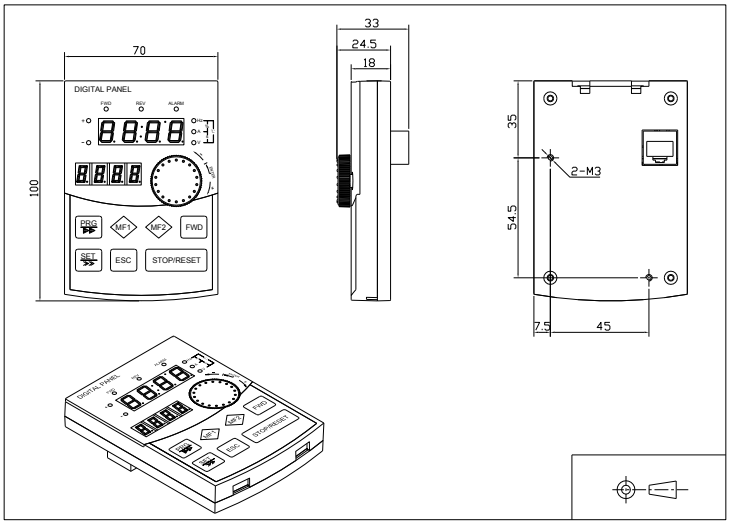
Power Tyep	Tyep	Power(KW)
Single 220V	F	0.75~1.5
	G	0.4~1.5
3-phase 220V	F	0.75~1.5
	G	0.4~1.5
3-pahse 380V	**F**	1.5~2.2
	G	0.75~2.2

7-3-2. Keyboard Size

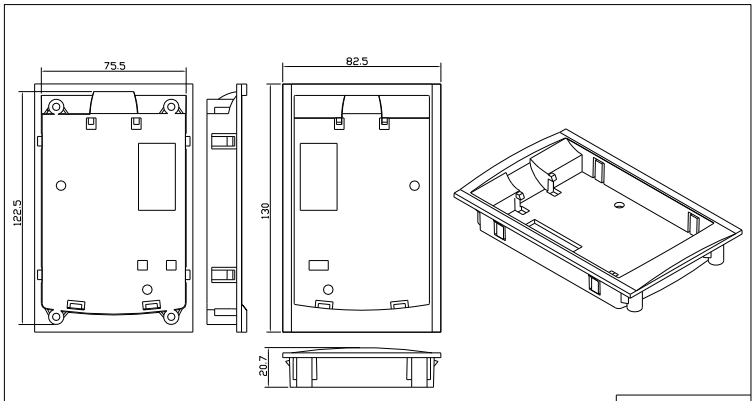
JP6C8000 Size:



JP6E8000 Size:



JP6D8000 keyboard rabbet size:



the dimension of aperture for installing keyboard in panel:
(75.5±0.1)*(122.5±0.1)

Section VIII Inspection & Maintenance

8-1. Inspection and Maintenance

Under normal working conditions, in addition to daily inspection, the frequency converter should be subject to regular inspection (for example inspection for overhaul or as specified but at an interval of six months at most). Please refe r to the following table in order to prevent faults.

Check time		Check point	Check item	Check to be done	Method	Criterion
D	R					
√		Display	LED and OLED display	If there is any abnormal display	Visual check	As per use state
√	√	Cooling system	Fan	If abnormal noise or vibration is produced.	Visual and audible check	No abnormal sound or vibration
√		Body	Surrounding conditions	Temperature,humidity, dust content, harmful gas, etc.	Check visually by smelling and feeling	As per Section 2-1
√		Input/ output terminal	Voltage	If input, output voltage is abnormal	Measure at R, S, T and U, V, W terminals	As per standard specifications
	√	Main circuit Body Input/ output terminal Main circuit	Overall conditions	If the fastenings come loose, if any signs show overheat,discharging,or too high dust content, or the air piping is blocked	Check visually tighten the fastenings, and clean the related parts	No abnormal condition
			Surrounding conditions	Temperature,humidity,dust content, harmful gas, etc.	Check visually, by smelling and feeling	As per Section 2-1
			Voltage	If input, output voltage is abnormal	Measure at R, S, T and U, V, W terminals	As per standard specifications
			Overall conditions	If the fastenings come loose, if any signs show overheat,discharging, or too high dust content, or the air piping is blocked	Check visually tighten the fastenings, and clean the related parts	No abnormal condition

"√" means need daily check or regularly check

For inspection, do not disassemble or shake the parts without reason, and still less pull off the plug-in-parts at random. Otherwise, the unit will not operate normally, or can not enter the mode of fault display, or causes faults of components or even parts of the main switch components IGBT

module is damaged.

If measuring is necessary, the user should note that much different results will be gained possibly if the measuring is performed with different instruments. It is recommended that the input voltage be measured with pointer-type voltmeter, output voltage with rectification voltmeter, input and output current with tong-test ammeter, and power with electrically-driven wattmeter.

8-2. Periodically-Replaced Parts

In order to ensure the operation reliability of the frequency converter, in addition to regular maintenance and inspection, all the parts suffering long-term mechanical wear should be replaced at a regular interval, which includes all cooling fans and the filtering capacitors of main circuits for energy buffer and interchange and PCBs. For continuous use under normal conditions, these parts can be replaced according to the following table and the operating environment, loads and the current state of frequency converter.

Part name	Interval for replacement
Cooling fan	1~3 Year
Filtering capacitor	4~5 Year
PCB (printed circuit board)	5~8 Year

8-3. Storage

The following actions must be taken if the frequency converter is not put into use immediately after delivery to the user and need to keep well for the time being or stored for a long time:

※ Stored in a dry and adequately-ventilated place without dust and metal powder at the temperature specified in the specifications.

※ If the frequency converter is not put into use after one year, a charge test should be made, so as to resume the performance of the filtering capacitor of main circuit in it. For charging, a voltage regulator should be used to slowly increase the input voltage of the frequency converter until it reaches the rating, and the charge should last more than 1~2 hours. This test should be made at least once a year.

※ Don't perform breakdown test at random, for this test will cause shorter life of the frequency converter. The insulation test must be performed after the insulation resistance is measured with a 500-volt megaohm and this value must not be less than 4MΩ.

8-4. Measuring and Judgment

※ If the current is measured with the general instrument, imbalance will exists for the current at the input terminal. Generally, differing by not more than 10% is normal. If it differs by 30%, inform the factory to replace the rectification bridge, or check if the error of three-phase input voltage is above 5V.

※ If the three-phase output voltage is measured with a general multi-meter, the reading is not accurate due to the interference of carrier frequency and only for reference.

Appendix I Rs485 communication protocol

I-1. Use introduction

This chapter introduces something about the install and handle of RS485 communication between inverter and PLC, PC, factory computer.

- Can communicate with all computer.
- Using multi-drop link system, can link more to 127 inverters.
- Completely isolated, and noise shield.
- The user would use all types of RS232-485 inverter, if only the inverter had “automatic RTS control” function inside.

I-2. Specification

I-2-1. Communication function

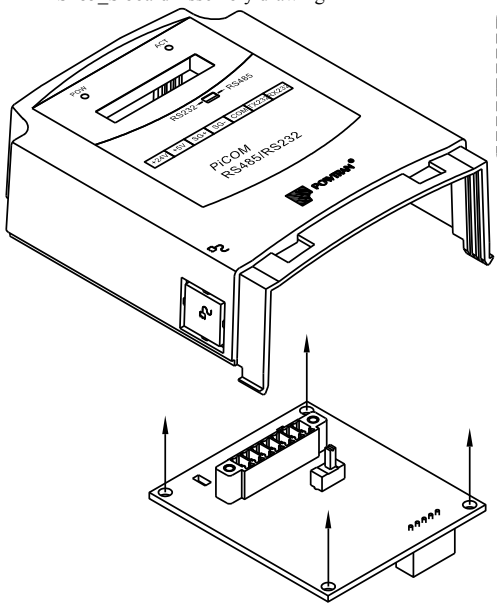
Items	Specification
Communication baud rate	38400/**19200**/9600/4800/2400/1200 bps is selectable.
Communication Protocol	Modbus protocol, RTU format
Interface methods	Asynchronism communication methods, semi-duplex, the previous high byte, low byte in the post, and low-effective-bit pre-emptive.
Data fumula	1 start bit, 8 data bits, 1 stop bit, invalid parity bit.
Slave address	Slave addresses can be set up 1~ 127.0 for broadcast address, host address 128 for the proportion of linkage, other addresses are reserved.
Communication port A	On-board keyboard (factory with standard), fixed 19200bps, **Please do not change baud rate.** Isolation RS485 / RS232 communication card (optional), the default 19200bps.
Communication port B	RJ45, 8-core shielded cable, fixed 19200bps.

I-3. Communication connection

I-3-1. Connecting Communication port A

- Connectting RS232 communication lines to frequency inverter control terminals row of RX232, TX232
- Connecting RS485 communication lines to frequency inverter control terminal row of (SG+) , (SG-)

RS485_S board Assembly drawing

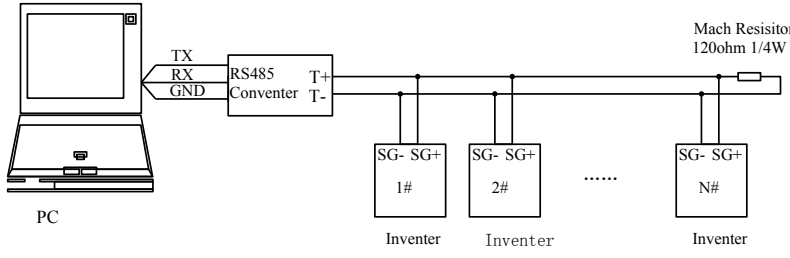


- When using RS232-485 transform, connect Inverter "SG+" to RS485 "T+", Inverter "SG-" to RS485 "T-".
- After Confirming connection again, turn on inverter power.
- If connection is right, set communication parameters as following:

  A29 baud rate 0：1200, 1：2400, 2：4800, 3：9600, 4：19200, 5：38400

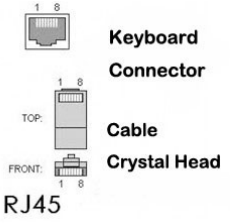
  A28 current inverter communication address 1~127 (If there are more than 1 inverters, don't use the same number);

- When using RS485 running control methods, set F04=0/1/2,choice RS485 running control method.



I-3-2. Definition for communication port B:

Communication port B pins	1	2	3	4	5	6	7	8
Communication port B signal	GND	+5V	485+	485-	485+	485-	+5V	GND
EIA/TIA T568A	White green	green	white orange	blue	white blue	orange	white brown	Brown
EIA/TIA T568B	White orange	orange	White green	blue	white blue	green	white brown	brown

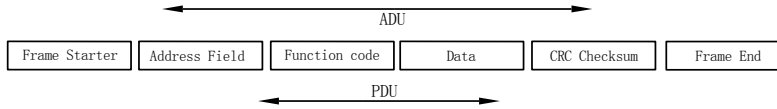


- 00H = 0 ID address is broadcast mailing address, 128 ~ 255 reserved. 00H = 0 ID address is broadcast mailing address, 128 ~ 255 reserved.The number of inverter can be connected is no more than 127.
- Though the length of communication cable can add up to 1300m, considering the stability, the length limit within 800m
- All the control signal cable use the shield cable, and is linked to the signal terminal “SH” of RS485.
- Data packet using CRC (vertical lengthy test) frame detection to ensure data reliability.
- Completely isolated RS485communication module to ensure reliable communications,support hot-swappable, after modular access, you can enter the work.
- The system is tested in 6 kinds of baud rate: 0:1200, 1:2400, 2:4800, 3:9600, 4:19200, 5:38400
- However, if under deteriorating environmental conditions, lowering the baud rate can improve the communication quality.
- Interval time of sending from frame to frame is more than 50 bytes.

I-4. Communication Protocol

Communication architecture is inverter as a slave, the computer as a host.

MODBUS protocol defines a simple protocol data unit (PDU) which has nothing to do with a basic communication layer, Specific bus or network MODBUS protocol mapping can introduce some additional domain from application data unit (ADU).



The basic format description

I-4-1. Start of frame, End of frame

interval≧3.5 bytes

I-4-2. Slave Address

From the machine's local address, through the A28 parameter settings, one network can only one local address uniquely identifed.

Setting range 1 ~ 127.

00H = 0 ID address is broadcast mailing address, 128 ~ 255 reserved.

I-4-3. Function Code

Host send commands, slave response.

- Function Code Categories

0x03＝read inverterp's multiple function codes, at most can read 16 registers(register pair of byte)

Host Command

Frame Start address	Slave Address	Function code	Registers address	Register number	CRC Checksum	Frame end address
≥3.5 bytes	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	≥3.5 bytes

Slave response

Frame Start address	Slave Address	Function code	Read byte	Read content	CRC Checksum	Frame end address
≥3.5 bytes	1 bytes	1 bytes	1 bytes	2bytes*register number	2 bytes	≥3.5 bytes

Note: **Read content**=2 bytes x register number

0x06＝write into inverter 1 function code

Host Command

Frame Start address	Slave Address	Function code	Registers address	Register number	CRC Checksum	Frame end address
≥3.5 bytes	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	≥3.5 bytes

Slave Response

Frame Start address	Slave Address	Function code	Registers address	Register number	CRC Checksum	Frame end address
≥3.5 bytes	bytes	bytes	2 bytes	2 bytes	2 bytes	≥3.5 bytes

0x10=Write multiple function in inverter, at most can be written in 16 registers(register pair of byte)

Host Command

Frame start address	Slave address	Function code	Register address	Register number	Register content byte	Register content	CRC checksum	Frame end address
≥3.5 bytes	1 bytes	1 bytes	2 bytes	2 bytes	1 bytes	2bytes*register number	2 bytes	≥3.5 bytes

Slave Response

Frame Start address	Slave Address	Function code	Registers address	Register number	CRC Checksum	Frame end
≥3.5 bytes	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	≥3.5 bytes

0x01=Read multiple switch status

Host Command

Frame start address	Slave address.	Function code	Register address	Register number	CRC check sum	Frame and address
≥3.5 bytes	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	≥3.5 bytes

Slave response

Frame start address	Slave address	Function code	Read byte number	switch state	CRC checksum	frame end address
≥3.5bytes	1 byte	1 byte	1byte(data N)	N bytes	2 bytes	≥3.5bytes

Note: read byte number N=output quanlity/8, if the remainder is not 0, read byte number is N=N+1

0x05=Write single switch status

Host Command

Frame start address	Slave address	Function code	Output address	Output value	CRC checksum	frame end address
≥3.5bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes	≥3.5bytes

Note: output value 0xFF00, switch ON; output value 0x0000, switch OFF. Other values are illegal, the switch does not work.

Slave response

Frame start address	Slave address	Function code	Output address	Output value	CRC checksum	frame end address
≥3.5bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes	≥3.5bytes

If slave response and get back to below function code, it means communications abnormal.

0xA0 =0x80+0x20= Invalid operation, setting under this state is invalid
0xA1 =0x80+0x21= function code is invalid
0xA2 =0x80+0x22= Fault record is empty
0xA3 =0x80+0x23= register address is invalid

0xA4 =0x80+0x24= slave is busy, EEPROM delay.
0xA5 =0x80+0x25= administrator restricted
0xA6 =0x80+0x26= set value is beyond limit.
0xA7 =0x80+0x27= CRC checksum error
0xA8 =0x80+0x28= frame format error

I-4-4. Register Address:

The register address includes two bytes, data setting is constituted by a two-byte.

Function code	Register Address high byte		Register Address low byte	
0x03read inverter multiple function.code parameter	Parameter group		Parameter serial number	
	F	0x00	0~63	
	A	0x01	0~63	
	o	0x02	0~71	
	H	0x03	0~55	
	U	0x04	0~15	
	P	0x05	0~15	
	E	0x06	0~23	
	C	0x07	0~47	
	b	0x08	0~23	
	y NOTE 1	0x09	0~23	
	S	0x0B	0~15	
0x03.read inverter status	Status		Status number	
	R	0x10	0x00	Running status NOTE 2
			0x01	Reserved status 1
			0x02	Reserved status 2
			0x03	Reserved status 3
0x03read inverter.fault history record	Fault record		Fault status history record content	
	Fault history record1 Fault history record2 Fault history record3 Fault history record4 Fault history record5	0x20 0x21 0x22 0x23 0x24	0x00	Fault type NOTE 4
			0x01	Set frequency
			0x02	Actual frequency
			0x03	Actual current
			0x04	DC voltage
			0x05	Running status NOTE 5
			0x06	Running time
			0x07	IGBT temperature
0x06.write	Register Address high byte		Register Address low byte	

inverter.single function.code parameter,only write RAM 0x10.write inverter multiple function.code parameter, only write RAM	parameter		Parameter serial number			
	F	0x00	0~63			
	A	0x01	0~63			
	o	0x02	0~71			
	H	0x03	0~55			
	U	0x04	0~15			
	P	0x05	0~15			
	E	0x06	0~23			
	C	0x07	0~47			
	b	0x08	0~23			
	y[NOTE 1]	0x09	0~23			
0x06.write inverter command	Command		Command number			
	R	0x10	0x00	Running command [NOTE 3]		
			0x01	Reserved command 1		
			0x02	Reserved command 2		
			0x03	Reserved command 3		
Function parameter write EEPROM, register address high byte=original register address high byte+0x80						
0x06.write inverter.single function.code parameter 0x10.write inverter multiple function code parameter	Register address high byte		Register address low byte			
	parameter		Parameter serial number			
	F	0x80	0~63			
	A	0x81	0~63			
	o	0x82	0~71			
	H	0x83	0~55			
	U	0x84	0~15			
	P	0x85	0~15			
	E	0x86	0~23			
	C	0x87	0~47			
	b	0x88	0~23			
	y[NOTE 1]	0x89	0~23			
0x01.read multiple switch status	Register address high byte		Register address low byte			
	Switch classify	address	Switch classify			
	Running status	0x00	0	Control method	0	V/F control
					1	SV control

			1	Reserved		
			2	Running status	0	Stop
					1	Run
			3	Direction status	0	Reverse
					1	Forward
			5，4	Speed up status	00	Stop
					01	Acceleration
					10	Deceleration
					11	Uniform speed
			6	Upper frequency	0	Upper frequency not arrive
					1	Arrive
			7	Lower frequency	0	Lower frequency
					1	Arrive
			8	JOG running	0	No JOG running
					1	JOG running
			9	Reserved		
			10	Reserved		
			11	Reserved		
			12	Fault confirm	0	Confirmed fault
					1	Unconfirmed fault
			13	Direction status	0	No fault
					1	alarming fault
			14	JOG status	0	No fault
					1	Deceleration stop fault
			15	Fault status	0	No fault
					1	Urgent stop fault
	Input.terminal function	0x01	0	DI1 input	0	Invalid
					1	Valid
			1	DI2 input	0	Invalid
					1	Valid
			2	DI3 input	0	Invalid
					1	Valid

			3	DI4 input	0	Invalid
					1	Valid
			4	DI5 input	0	Invalid
					1	Valid
			5	DI6 input	0	Invalid
					1	Valid
			6	DI7 input	0	Invalid
					1	Valid
			7	DI8 input	0	Invalid
					1	Valid
			8	AI1 input	0	Invalid
					1	Valid
			9	AI2 input	0	Invalid
					1	Valid
			10	AI3 input	0	Invalid
					1	Valid
	Output.terminal function	0x02	0	O1 input	0	Invalid
					1	Valid
			1	O2 input	0	Invalid
					1	Valid
			2	O3 input	0	Invalid
					1	Valid
			3	O4 input	0	Invalid
					1	Valid
	Fault type	0x03	0	E.OCP	System is disturbed or impacted by instant over current,over current signal from current inspected circuit or drive circuit	
			1	Reserved		
			2	E.OC3	Inverter output current exceeded 3times the motor rated current	
			3	Reserved		
			4	E.OU	Over voltage	
			5	E.LU	Under voltage	

			6	E.OL	Over load	
			7	E.UL	Under load warming	
			8	E.PHI	Phase loss	
			9	E.EEP	EEPROM error	
			10	E.ntC	Over heat	
			11	E.dAt	Time limit fault	
			12	E.Set	External fault	
			13	Reserved		
			14	Reserved		
			15	Reserved		
			16	E.PId	PID regulation fault	
			17	E.OHt	Motor over heat fault	
			18	E.OL2	Motor over load fault	
			19	E.PG	PG error	
			20	E.PHo	Inverter output phase loss	
			21	E.COA	Rs485.communication port A fault	
			22	E.COb	Rs485.communication port B fault	
			23	E.CAL	Parameter indentification fault	
0x05.Write single.switch status	Register address high byte		Register address low byte			
	Switch classify	address	Switch classify			
	Running status	0x00	0	Run command	0	Stop
					1	Run
			1	Reserved		
			2	Direction command	0	Reverse
					1	Forward
			3	Reserved		
			4	Reserved		
			5	JOG command	0	Reverse
					1	Forward
			6	Reserved		
			7	Free stop	0	Reverse
					1	Forward

			8	Reserved		
			9	Reserved		
			10	Reserved		
			11	Reserved		
			12	Reserved		
			13	Reserved		
			14	Reserved		
			15	Reserved		
	Input.terminal function	0x01	0	DI1 input	0	Invalid
					1	Valid
			1	DI2 input	0	Invalid
					1	Valid
			2	DI3 input	0	Invalid
					1	Valid
			3	DI4 input	0	Invalid
					1	Valid
			4	DI5 input	0	Invalid
					1	Valid
			5	DI6 input	0	Invalid
					1	Valid
			6	DI7 input	0	Invalid
					1	Valid
			7	DI8 input	0	Invalid
					1	Valid
			8	AI1 input	0	Invalid
					1	Valid
			9	AI2 input	0	Invalid
					1	Valid
			10	AI3 input	0	Invalid
					1	Valid
	Output.terminal function	0x02	0	O1 output	0	Invalid
					1	Valid
			1	O2 output	0	Invalid

					1	Valid
			2	O3 output	0	Invalid
					1	Balid
			3	O4 output	0	Invalid
					1	Valid

NOTE 1：

Function	0x03 reading operation			0x06/0x10 writing operation
y00 reset the factory setting	Return 0			Only can write into 5
y01 upload parameter onto keyboard	Return 0			Invalid operation
y02 latest fault record	Valid operation			Invalid operation
y03～y07 fault history record	Empty record		00H	Invalid operation
	New record		01H	
	Confirmed record		02H	
y08reset fault record	Return 0			Valid operation
y09 rated output current	Valid operation			Invalid operation
y10 rated output voltage	Valid operation			Invalid operation
y11 products series	80	0	3	Invalid operation
	Family serial	products series	Input voltage level	
	The number should be decimalization			
y12 soft ware version	Valid operation			Invalid operation
y13 product date–year	Valid operation			Invalid operation
y14 product month–date	Valid operation			Invalid operation
y15 user decode input	Valid operation			Invalid operation
y16 user input password	Valid operation			Valid operation
y17 parameter group protection	Valid operation			Valid operation

NOTE 2：running status byte

bit	15 bit	14 bit	13 bit	12 bit
Meaning	0:No fault 1:Urgent stopping fault	0:No fault 1:Decelerating fault	0:No fault 1:Alarming fault	0:Confirmed fault 1:Unconfirmed fault
bit	11 bit	10 bit	9 bit	8 bit
meaning	reserved	reserved	reserved	0:No JOG 1:JOG running

bit	7 bit	6 bit	5 bit 、 4 bit	
Neaning	0:Lower frequency not arriving 1:Arrive lower frequency	0:Upper frequency not arriving 1:Arrive upper frequency	00:Stopping 01:Accelerating 10:Decelerating 11:Running in a even speed	
bit	3 bit	2 bit	1 bit	0 bit
Meaning	0:Running reverse 1:Running forward	0:Stopping 1:Running	Reserve	0: V/F control 1:SV control

NOTE 3：Running command

bit	15 bit	14 bit	13 bit	12 bit
Meaning	Reserve	Rreserve	Reserve	Reserve
bit	11 bit	10 bit	9 bit	8 bit
Meaning	Reserve	Reserve	Reserve	Reserve
bit	7 bit	6 bit	5 bit	4 bit
Meaning	0：No free-stop 1:Free-stop command	Reserve	0：JOG stopping 1：JOG running	Reserve
bit	3 bit	2 bit	1 bit	0 bit
Meaning	Reserve	0:Reverse command 1:Forward command	Reserve	0:Stop command 1:Run command

NOTE 4：Fault style code

Serial.number	LED display	Fault message
0	E.OCP	System is disturbed or impacted by instant over current, over current signal from current inspected circuit or drive circuit
1	Reserve	
2	E.OC3	Inverter output current exceeded 3 times of motor rated current
3	Reserve	
4	E.OU	Over voltage
5	E.LU	Under voltage
6	E.OL	Over load
7	E.UL	Under load warm
8	E.PHI	Input phase loss
9	E.EEP	EEPROM error
10	E.ntC	Over heat
11	E.dAt	Time limit fault
12	E.Set	External fault
13	Reserve	

14	Reserve	
15	Reserve	
16	E.PId	PID regulation fault
17	E.OHt	Motor over heat fault
18	E.OL2	Motor over load fault
19	E.PG	PG error
20	E.PHo	Inverter output loss phase
21	E.COA	Rs485 communication port A fault
22	E.COb	Rs485 communication port B fault
23	E.CAL	Parameter indentification fault

NOTE 5：Fault funning status

LED first position			LED second position			LED third position			LED fourth position		
bit15-bit12			bit11-bit8			bit7-bit4			bit3-bit0		
F	0	Forward command	F	0	Forward status	-	0	Separative sign	A	1	Accelerating running
R	1	Reverse command	R	1	Reverse status				D	2	Decelerating running
S	2	Stop command	S	2	Stop status				E	3	running in a even speed
									S	0	stop

E.g. keyboard display FF-A（return data 0001），said when fault occurs the inverter state：forward command、forward state、accelerating running

I-4-5. CRC checkup sum

Data meaning：data frame CRC checkup sum, using 2 bytes.

Checkup sum ＝ address + function code + data

Enclose：CRC computation program：

```
unsigned int cal_crc16   (unsigned char *data, unsigned int length)
{
unsigned int i,crc_result=0xffff;
  while(length--)
  {
    crc_result^=*data++;
    for(i=0;i<8;i++)
    {
```

```
    if(crc_result&0x01)
    crc_result=(crc_result>>1)^0xa001;
    else
    crc_result=crc_result>>1;
    }
  }
crc_result=((crc_result&0xff)<<8)|(crc_result>>8);
return(crc_result);
```

I-5. Example of communication protocol:

Valid setup and communications under normal circumstances, the host command and slave responses are as follows:

0x03= read inverter multiple function code, at most can read 16 registers (register 2bytes)

Host command read inverter F01 keyboard set frequency、F02 frequency set up method

Slave address	Function code	Register address	Register number	CRC checksum
0x08	0x03	0x0001	0x0002	0x9552

Slave response inverter F01 keyboard set frequency to 50.00Hz、F02 frequency set up method to 0（keyboard set frequency orRS485）

Slave address	Function code	**Read byte number**	Read content	CRC checksum
0x08	0x03	0x04	0x1388,0x0000	0xE79D

Read byte number=2byte*register number

0x06＝write inverter single function code

Host command set up inverter F01 keyboard set frequency to 50.00Hz

Slave address	Function code	Register address	Register data	CRC checksum
0x08	0x06	0x0001	0x1388	0xD5C5

Slave response inverter F01 keyboard set frequency to 50.00Hz

Slave address	Function code	Register address	Register data	CRC checksum
0x08	0x06	0x0001	0x1388	0xD5C5

0x10＝write inverter multiple function code, at most can write 16 registers(register 2bytes)

Host command inverter F01 keyboard set frequency to 50.00Hz、F02 frequency set up method to 0（keyboard set frequency or RS485）

Slave address	Function code	Register address	Register number	**Register content byte number**	Register content	CRC checksum
0x08	0x10	0x0001	0x0002	0x04	0x1388,0x0000	0x9851

Register content byte number=2 bytes * register number

Slave response

Slave address	Function code	Register address	Register number	CRC checksum
0x08	0x10	0x0001	0x0002	0x1091

0x01＝read multiple switch status

Host command read inverter whether arrive lower frequency, or arrive upper frequency

Slave address	Function code	Starter to end address	Switch number	CRC checksum
0x08	0x01	0x0006	0x0002	0x5D53

Slave response inverter not arrive lower frequency nor upper frequency

Slave address	Function code	Read byte number	Switch state	CRC checksum
0x08	0x01	0x01	0x40	0x53E4

Host command read inverter fault

Slave address	Function code	Starter to end address	Switch number	CRC checksum
0x08	0x01	0x0300	0x0020	0x3D0F

Salve response inverter low voltage (E.LU switch address 0x0305)

Slave address	Function code	Read byte number	Switch state	CRC checksum
0x08	0x01	0x04	0x20,0x00,0x00,0x00	0x6911

Note：return byte ：4 bytes；

Return date in order：bit7-bit0, bit15-bit8, bit23-bit16, bit31-bit24

0x05＝write single switch status

Host command control inverter running

Slave address	Function code	Output address	Output value	CRC checksum
0x08	0x05	0x0000	0xFF00	0x8CA3

Slave response

Slave address	Function code	Output address	Output value	CRC checksum
0x08	0x05	0x0000	0xFF00	0x8CA3

Host command control inverter stop

Slave address	Function code	Output address	Output value	CRC checksum
0x08	0x05	0x0000	0x0000	0xCD53

Slave response

Slave address	Function code	Output address	Output value	CRC checksum
0x08	0x05	0x0000	0x0000	0xCD53

Note: set switch to 1,output value is 0xFF00;set switch to 0,output value is 0x0000.

Appendix II Instruction of the Proportional Linkage Function

II-1. Proportional linkage function:

The proportion interaction host computer:

Communication address = 128,

Communications port A is the communication port of host computer.

Communication port B can be used as the keyboard interface, or a PC host computer interface.

There is only one host inverter in one proportional linkage.

The host inverter control the running state, the slave inverter follow the host's running state.

The proportion interaction slave computer:

Communication Address = 1 ~ 127,

Both communication port A and communication port B can be the communication port of slave inverter.

In the slave inverter follow the host running and it can realize forced stopping by terminal or keyboard if need.

For this function, the host computer should be set with the following parameters:

A28	Local communication address	128

For this function, the slave computer should be set with the following parameters:

F01	Keyboard set the frequency / Rs485	Command from proportion linkage Host	
F02	Frequency main set mode	Keyboard setting frequency or RS485	0
		AI1 the external analog setting[8000]	1
		AI2 the external analog setting	2
		AI3 the external analog setting	3
		Keyboard potentiometer setting	4
		Multi-segment digital voltage set	5
		Digital Pulse Setting	6
F03	Auxiliary setting mode of frequency set	Keyboard setting frequency or RS485	0
		AI1 the external analog setting[8000]	1
		AI2 the external analog setting	2
		AI3 the external analog setting	3
		Keyboard potentiometer setting	4
		Multi-segment digital voltage setting	5
		Digital Pulse Set	6

		PID regulation mode	7
F04	relationship between main and auxiliary frequencies	The main setting individual control	0
		The auxiliary setting individual control	1
		main + auxiliary	2
		main -auxiliary	3
		(main *auxiliary)/maximum frequency	4
		Maximum {main, auxiliary}	5
		Minimum {main, auxiliary}	6
F05	Running control mode	Proportional linkage control	4
Select this function, the slave inverter will follow the command of host inverter to run. After select this function, it can also use keyboard, terminal and RS485 to control the slave inverter's running. In the proportion of linkage during operation, if control by the keyboard, terminal,RS485 control, once the slave inverter stopped, the slave will N longer respond to the host command, if need the slave once again to respond to host commands, it should control through the keyboard, terminal and RS485, or after the host sends cease and desist commands then the slave will respond the command again to run.			
A28	communication address	1~127	
A29	Baud rate	Same as host	
A30	Communication format	Same as host	
A55	Proportional linkage factor	0.10~10.00	

During the proportional of linkage, the running state of slave inverter is controlled by the host inverter.

Slave inverter F01 = proportional factor*the actual set frequency of host inverter of proportion linkage.

Slaver S00 actual set frequency = slave F01 + frequency give and secondary amend +ascend/descend adjusting.

II-2. Proportion linkage application Cases:

Features of proportional function:

1: The host inverter using the potentiometer to control the system speed and use the terminals to control the forward/reverse running.

2: The slave follows the host running, the proportional linkage factor is 1.00

3: After get the running speed command from host inverter, the slave will store this command into to F01.

4: The slave actual frequency is set through the keyboard or through terminal ascend/descend adjusting.

5: The slave actual frequency is set through potentiometer adjusting.

6: The slave actual frequency = F01 + slave potentiometer adjusting + A40

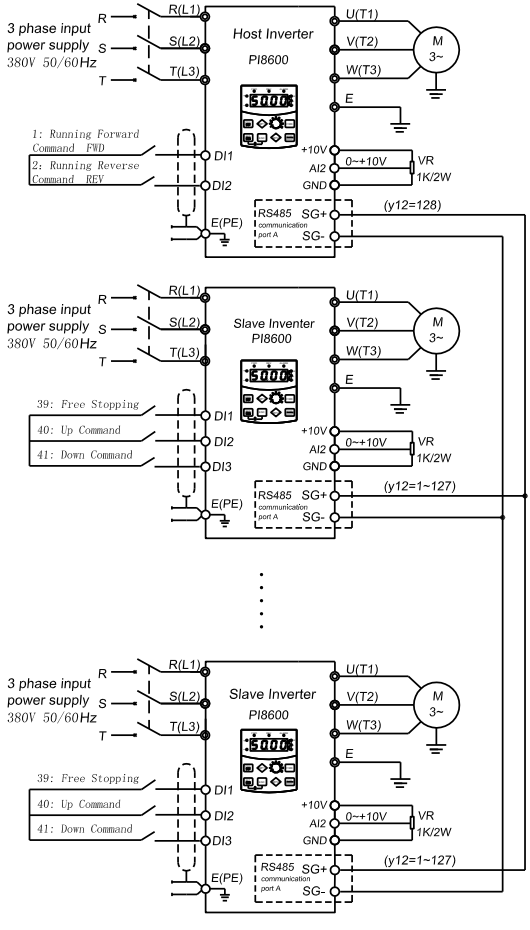
The proportional linkage host settings:

F02	Frequency main set mothod	AI2 external analog setting
A28	Communication address	Host 128
A29	Baud rate	3: 9600bps
A30	Communication format	0
o36	DI1 input terminal function select selection	1:forward running
o37	DI2 input terminal function select	2:reverse running

比例联动从机设置：

F02	Frequency main set	keyboard set the frequency or Rs485	0
F03	Auxiliary setting mode of frequency set	AI2 external analog setting	1
F04	relationship between main and auxiliary frequencies	main+Auxiliary	2
F05	Running control mode	Proportional linkage control	4
A28	Communication address	1~127	
A29	Baud rate	Same as host inverter	
A30	Communication format	Same as host inverter	
o36	DI1 input terminal function select	39:Free stopping	
o37	DI2 input terminal function select	40:Up command	
o38	DI3 input terminal function select	41:Down command	
A43	Multi-function key MF1	8:MF key is appointed to be Up command	
A44	Multi-function key MF2	9:MFkey is appointed to be Down command	

System wire connections:



Appendix III PG Card Instruction

III-1. Use range

Type	Encoder output method
1	+5V LINE DRIVER output
2	OPEN COLLECTOR output
3	Push-pull output type (complementary)
4	Voltage output type VOLTAGE

III-2. Terminal function instruction

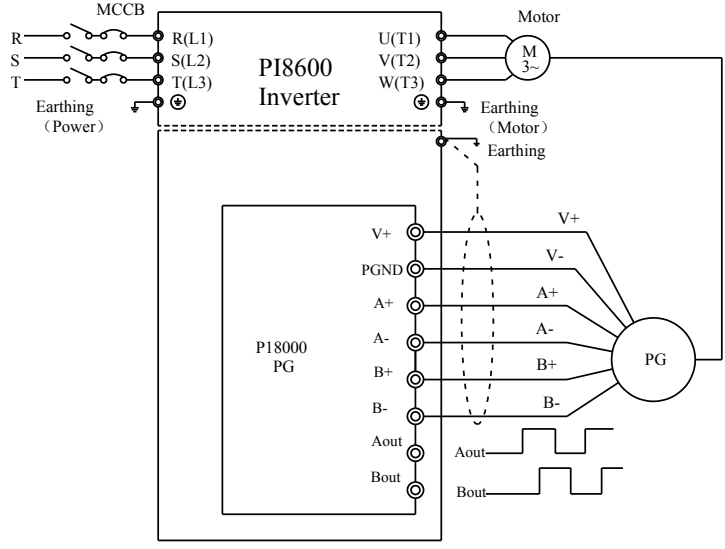
terminal	Terminal function
A+ A- , B+ B-	PG signal input Encoder output method: 1 : +5V LINE DRIVER output; JP1/JP2 jump to LD; connect method: A+->A+ , B+->B+ A- ->A-, B- ->B- R16/R17/R18/R19 disconnect. 2 : OPEN COLLECTOR output; JP1/JP2 jump tp OC; Connect method: A ->A+ , B ->B+ R2/R4/R10/R11/R13/R15 disconect 3 : Push-pull output type (complementary); JP1/JP2 jump tp OC; Connect method: A ->A+ , B ->B+ R2/R4/R10/R11/R13/R15 disconnect 4 : VOLTAGE output; JP1/JP2 jump to OC; Connect method: A ->A+ , B ->B+ R2/R4/R10/R11/R13/R15 disconnect The adjustment of resistance associated with the output voltage: V+ =5V, R16/R17/R28/R29＝200Ω V+ =12V，R16/R17/R28/R29=1KΩ V+ =24V，R16/R17/R28/R29＝2KΩ V+encoder power，through JP3 to select
Aout,Bout	PG signal output Voltage output, voltage level determined by the encoder power supply
V+	Encoder power, through JP3 to select：

	JP3 +5V V + +12V Internal+5V power supply JP3 +5V V + +12V Internal+12V power supply JP3 +5V V + +12V External+5V ~ 24V power supply
PGND	Encoder

Encoder PG pulses range 300~9999

Maximum pulses frequency receiver 1MHz，when PG pulses=2500，maximum speed=400Hz

III-3. Terminal connection instruction:



Appendix IV Extend Functions supplement

Number	E00 function	Parameter setting	definition	Reference page
1	Special power supply	8	Inverter power	134
		13	Stable voltage power	135
		14	Constant current power	-
2	Constant pressure water supply	9	Pump constant pressure water supply	135
3	Extruding machine	15	Extruding machine	-

Extend function instruction have not been fully listed, any query, please directly inquiry to our technician.

IV-1. Special power supply

IV-1-1. E00=8: variable frequency power

P03 PID given signal selection, you can set through the keyboard, analog AI2, pulse and other means to set a given voltage.

Given voltage is calculated as follows:

Given voltage:220VAC

Given voltage setting =220*1.414/500*100%=62.2%

Frequency Power specific parameters:

No.	Name	Scope	Unit	Meanings	Factory setting
E16	User parameter 1	0~9999	-	Voltage increasing time	0
E17	User parameter 2	0~9999	-	Voltage decreasing time	0
In regulated power supply mode, the output and input voltage are both adjustable. The increasing time and decreasing time of output voltage is adjusted by F09 and F10. E16 is the voltage increasing time, the definition of the output voltage increasing time is from9999 corresponds to 999.9 seconds. E17 is the voltage decreasing time, the definition of the output voltage decreasing time is from9999 corresponds to 999.9 seconds. Voltage increasing/decreasing time just used to adjust the accelerate/decelerate time of output frequency when the inverter running. After the stopping command issued, the controller will stop the frequency output when the output frequency decelerate to 0hz.					
E18	User parameter 3	0~9999	-	The max output voltage	0
For safety and reliability to ensure that the output voltage to bear the load within the system, we need to define the maximum output voltage of the system. If the system highest withstand voltage 250VAC，then a maximum outout voltage= 250；E18=250。					

IV-1-2. E00=13: Voltage regulation power

In this mode,connect AI2,AI3 to Hall,then measure the output voltage and use2Halls to do redundant work to ensure the output voltage will not exceed the Hall voltage limitation.

In this mode, the following parameters should be adjusted:

PID function group, P02 PID feedback signal selection.

AI2 is detected by analog and AI3 works as a redundant configuration to ensure the output voltage safe and reliable.

When Feedback voltage is 100%, the corresponding Hall voltage is 500VAC, Hall output voltage is 5V.

Set o03=50%, o05=50%.

P03 PID given signal selection, you can set through the keyboard, analog AI2, pulse and other means to set a given voltage.

Given voltage is calculates as follows:

When the given voltage =220VAC, given voltage setting =220*1.414/500*100%=62.2%

Other PID parameters are adjusted according to the site.

Under PID regulated power supply mode, the voltage acceleration and deceleration time is controlled by PID parameters, it won't affect by voltage acceleration and deceleration time.

Voltage regulation power specific parameters:

No.	Name	Scope	Unit	Meanings	Factory setting
E16	User parameter 1	0~9999	-	Voltage increasing time	0
E17	User parameter 2	0~9999	-	Voltage decreasing time	0
In Voltage regulation power mode, the output and input voltage are both adjustable. The increasing time and decreasing time of output voltage is adjusted by F09 and F10. E16 is the voltage increasing time, the definition of the output voltage increasing time is from 9999 corresponds to 999.9 seconds. E17 is the voltage decreasing time, the definition of the output voltage decreasing time is from 9999 corresponds to 999.9 seconds. Voltage increasing/decreasing time just used to adjust the accelerate/decelerate time of output frequency when the inverter running. After the stopping command sent, the controller will stop the frequency output when the output frequency decelerate to 0 hz.					
E18	User parameter 3	0~9999	-	Max output voltage	0
For safety and reliability to ensure that the output voltage to bear the load within system,we need to define the maximum output voltage of the system. If the System highest withstand voltage 250VAC； Then E18=250VAC.					

IV-2. Converter water supply controller instruction

IV-2-1. Constant water supply system parameters:

1、 loading types with constant water supply function:

Parameter	Keyboard display	Setting	Meaning
E00	Load type	9	E12 set to be single pump，no need the constant pressure water supply interface board

			E12 set to multi-pump,need constant pressure water supply interface board , while realize 4-pumps constant pressure water supply function.

2、PID adjusting in constant water supply system

Parameter	Keyboard display	Setting	Meaning
F01	Keyboard set frequency	0	Keyboard set the frequency 0hz
F02	Frequency main set mode	0	Keyboard set frequency or RS485 set frequency.
F03	Frequency auxiliary set mode	7	PID adjusting mode
F04	main and auxiliary frequencies set	2	main+ auxiliary set mode
P00	PID configure	0000	single-way,the negative regulator, failure is not action
P02	Feedback signal select	1~3	External analog feedback signal given by the AI2 / AI3
P03	Given signal select	0~6	Given signal can select the keyboard / Rs485 , potentiometers, digital voltage, digital pulse, etc.
P05	PID integration time	★	Setting according the site.
P06	PID differential time	★	Setting according the site.
P07	PID proportional gain	★	Setting according the site.
P09	Deviation Limit	★	Setting according the site.
P12	PID Display Range	★	Setting according the site.

3、Constant pressure water supply special parameters

Parameter	Keyboard display	Setting	Meaning
E01	Keyboard Display	10%	Starting pressure deviation is 10%
E02	Starting pressure deviation	2.0	Starting delay time is second.
E03	Starting time delay	15.00	stop at frequency 15HZ.
E04	Stop frequency	2.0	Stop time is 2 second.
E05	stop time delay	80%	feedback pressure reach and exceed the value of this parameter, the I / O output terminal select 25, then it will output arrival signal.
E06	High pressure arrival value	60%	when feedback pressure less than the low pressure reached value of this parameter, the I / O output terminal select 26, then it will output arrival signal.
E07	Low pressure arrival	0000	Timing to water supply function invalid

4、Multi-function constant pressure water supply pump specific parameters

Parameter	Keyboard display	setting	Meaning
E08	Timing shift alternation time	0.25	According to first start first stop principles to con - - trol pump rotation,rotation time of 0.25 hours
E09	electromagnetic switching action delay	0.500	When set up a station pump (drive motor) to switch from variable frequency industry frequ - ency, or from industry frequency to variable frequency, and set its electromagnetic switching action delay time is 0.5 seconds.
E10	Pumps shift judging time	100	To set the determine time 100 seconds from inverter output frequency reaches the upper limit frequencies until increase pump (drive motor); or from inverter output frequency reaches the lower limit frequencies until decrease pump (drive motor).
E11	Constant Pressure Water Supply Configuration	0000	Decelerating stop: When the inverter failure, the rotation switching way is from variable frequency pump to industry frequency and the pump maintain the status.
E12	Multi-pump configuration	1111	N. 1 ~ 4 pumps are frequency controlled pump
E13	Multi-pumps status	★	Multi-pump control mode, displays the status of each pump
E14	Soft-start Pump Control	0000	Multi-pump control mode, set the control mode of each pump, currently set to Full Stop

5、Constant pressure water supply IO parameter:

Parameter	Keyboard display	setting	Meaning
o21~o24	Output signal select	25	High pressure arrival
o21~o24	Output signal select	26	Low pressure arrival
o36~o46	Input terminal function select	51	Pump 1 soft start
o36~o46	Input terminal function select	52	Pump 1 stop
o36~o46	Input terminal function select	53	Pump 2 soft starter
o36~o46	Input terminal function select	54	Pump 2 stop
o36~o46	Input terminal function select	55	Pump 3 soft starter
o36~o46	Input terminal function select	56	Pump 3 stop
o36~o46	Input terminal function select	57	Pump 4 soft state
o36~o46	Input terminal function select	58	Pump 4 stop
o36~o46	Input terminal function select	59	Manual shift command
o36~o46	Input terminal function select	60	Timing of water supply time-zero

IV-2-2. Application

It is special appendix for multiple pumps, which run with PI7000 family inverter to control the multiple pumps water supply system effectively.

IV-2-3. Operation and connection notice:

※ If it is power frequency motor, probable thermal relay must be used to protect motor.

※ AC contactor with machinery chain equipment should be used between the power frequency bypass and inverter output of aside the motor, lock logically on the electri control circuit to avoid the short circuit of the power frequency and inverter output which damage the inverter and equipments.

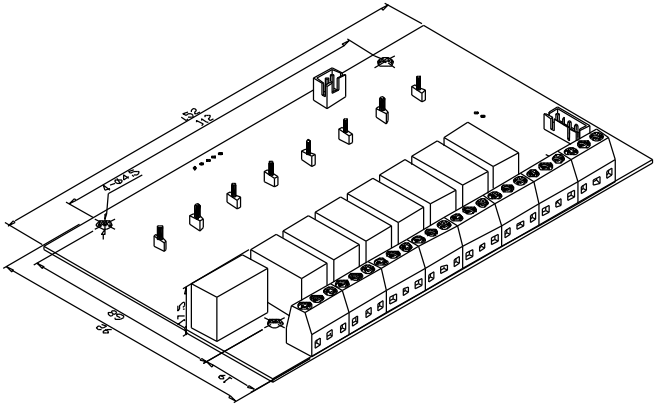
※ The phase order of the power frequency to the motor should be the same with the phase order of the inverter output to avoid the motor reverse. Please confirm the phase order and operate.

※ When wiring the control signal of the inverter, please leave it away with the driving line, and do not make them in the same wire, otherwise it will lead wrong action.

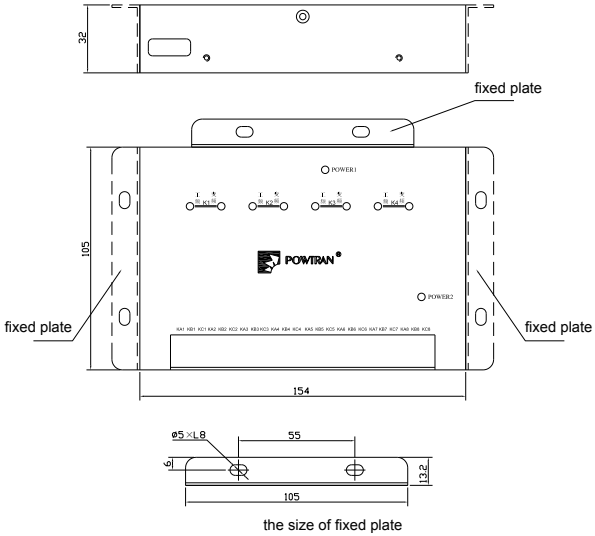
※ Screen cable is used for Pressure set signal and pressure feedback signal

IV-2-4. Dimension

1. Dimension of water supply control card



2. Dimension of water supply controller

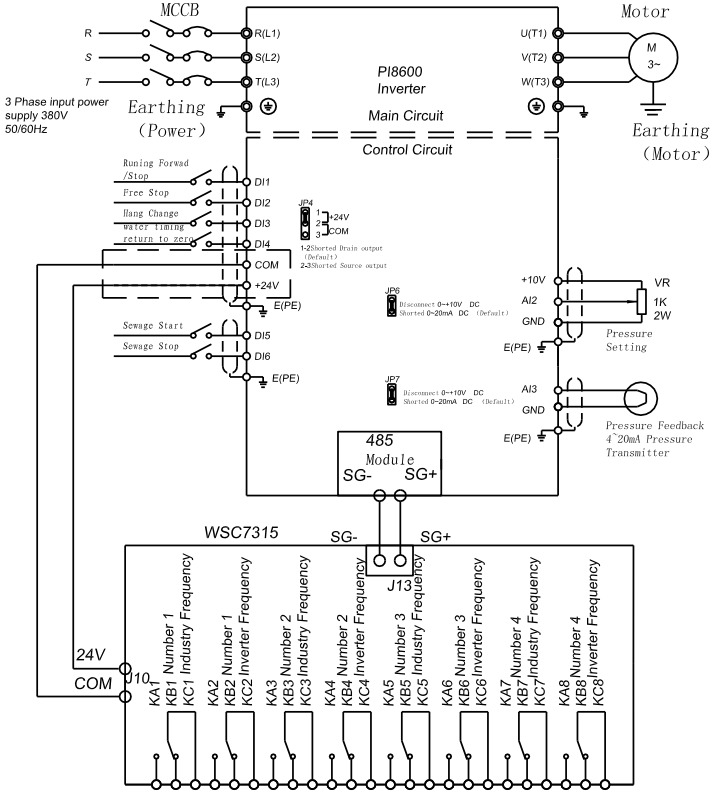


the size of fixed plate

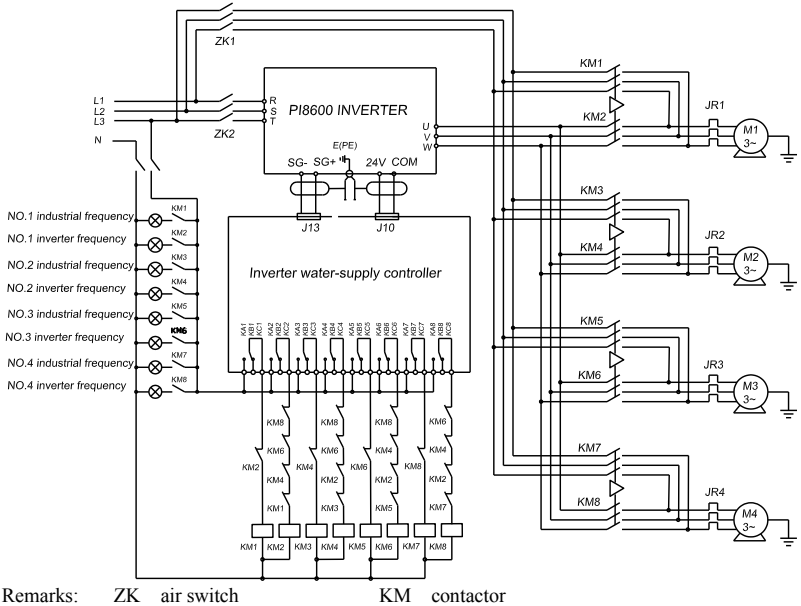
Note: The fixed plate can be fixed by any mounting hole in the figure.

IV-2-5. Frequency of water supply connection to the drive controller

Connection of water supply controller with inverter, the communiction cable and power cable are connected as below：



IV-2-6. System diagram



Remarks: ZK air switch KM contactor
JR thermo-relay M motor

IV-2-7. Water supply control mode

When several pumps supply water meanwhile, because of the different time(daytime and night), different season(winter and summer), the variation of the water flow is great. To save energy and protect the equipment, please run pumps as many as you need and stop pumps as many as you do not need.

Inverter will confirm the number of the running pumps according to the requirement of the pressure close loop control. In the set range, only one pump is controlled by the inverter at the same time.

If the timing shift interval time is set 0.05~100.00, when the related running time is stable, inverter inverter will shift up the pumps according to stop first or open first to ensure each pump has the chance to run and avoid the pump rusted because of long time N use.

After the pumps run to the upper and lower, arrive the adding pumps or reducing pumps time, inverter will add or redcue the pumps according to stop first or open first to ensure each pump can run and avoid the pump rusted because of long time N use.

IV-2-8. Soft-start pump control mode

Set the soft start pump by E12 and through the input terminals o36 ~ o46, respectively

controlled soft-start pump start and stop.

Soft-start pump terminal control, stop first.

Soft-start pump is not controlled by constant pressure water supply system.Soft-start pump can be used as sewage pumps and fire pumps.

IV-2-9. Application Guide

3 Pumps constant pressure water supply + sewage pump

a) pump configurations: variable frequency pump 3 units, 15kW,1 unit sewage pump,15kW.

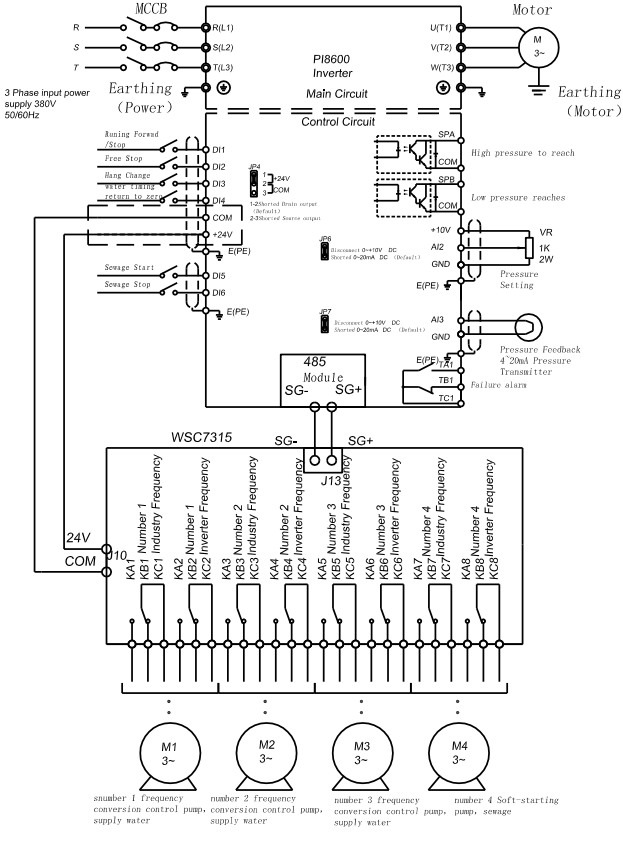
b) The set pressure 0.8Mpa.

c) pressure gauge options: pressure transmitter, DC 4 ~ 20mA output, 1.6Mpa.

d) Inverter choice: PI8000 015F3 and WSC_RS485 water supply board.

e) Hardware Connection.

f) Parameter setting



①loading types with a constant pressure water supply function:

Parameter	Keyboard display	setting	Meaning
E00	Loading type	9	Multi-pump constant pressure water supply, need constant pressure water supply interface board, while realize 4 pump constant pressure water supply pump function.

②PID adjust in constant pressure water supply

Parameter	Keyboard display	setting	Meaning
F01	Keyboard set frequency	0	Keyboard set the frequency 0hz
F02	Frequency main set mode	0	Keyboard set frequency or RS485 set frequency
F03	Frequency secondary set mode	7	PID adjusting mode
F04	elationship between main and auxiliary frequencies given	2	main+ auxiliary set mode
F05	Running control mode	3	Terminal control
A29	baud rate	3	baud rate 9600
P00	PID configure	0000	single-way, the negative regulator, failure is not action
P02	Feedback signal select	3	External analog feedback signal given by the AI3
P03	Give signal select	2	External analog given by AI2
P05	PID integration time	0.250	Setting according the site.
P06	PID differential time	0	Setting according the site.
P07	PID proportional gain	100.0	Setting according the site.
P09	Deviation Limit	5.0	Setting according the site.
P12	PID Display Range	1.6	adjust according actual requirement,display the actual pressure value is160.0,it means 1.6 Mpa.

③Constant pressure water supply specific parameters

Parameter	Keyboard display	setting	Meaning
E01	Starting pressure deviation	10%	Starting pressure deviation is 10%
E02	Starting time delay	2.0	Starting delay time is second.
E03	shutdown frequency	15.00	shutdown at frequency 15HZ.
E04	Shutdown time delay	2.0	shutdown time is 2 second.
E05	High pressure arrival	80%	hen feedback pressure reach and exceed the

			high pressure reached value of this parameter, the I / O output terminal select 25, then it will output arrival signal.
E06	Low pressure arrival	60%	when feedback pressure less than the low pressure reached value of this parameter, the I / O output terminal select 26, then it will output arrival signal.
E07	Regular time water supply	0	Regular time water supply function invaid

④Multi-function constant pressure water supply pump specific parameters

Parameter	Keyboard display	setting	Meaning
E08	E08 regular rotation interval	0.25	According first start first stop principles to control pump rotation, rotation time of 0.25 hours
E09	Electromagnetic switching action delay	0.500	When set up a station pump (drive motor) to switch from variable frequency industry frequency , or from industry frequency to variable frequency, and set its electromagnetic switching action delay time is 0.5 seconds.
E10	Pump switch to judge the time	100	To set the determine time 100 seconds from inverter output frequency reaches the upper limit frequencies until increase pump (drive motor); or from inverter output frequency reaches the lower limit frequencies until decrease pump (drive motor).
E11	Constant pressure water supply configuration	0	Shutdown: When the inverter failure,the rotation switching way is from variable frequency pump to industry frequency and the pump maintain the status.
E12	Multi-pump configuration	0000	N. 1 ~ 3 pumps are frequency controlled pump, pump 4 is soft-starter controlled pump.
E13	Multi-pump status	1112	Multi-pump control mode, displays the status of each pump
E14	Soft-start pump control	★	Multi-pump control mode, set the control mode of each pump, i currently set to Full Stop

⑤Constant pressure water supply IO parameters:

Parameter	Keyboard display	setting	Meaning
o21	o1 input signal select 1	25	High pressure arrival
o22	o2 input signal select 2	26	Low pressure arrival
o23	o3 input signal select 3	1	Fault input alarm
o36	(DI1) input terminal function selection	1	FWD
o37	(DI2)input terminal function selection	39	Free parking

o38	(DI3) input terminal function selection	59	Manual rotation command
o39	(DI4) input terminal function selection	60	Timing of water supply time-zero
o40	(DI5) input terminal function selection	55	Pump 3 soft starting
o41	(DI6) input terminal function selection	56	Pump 3 stopping

Powtran frequency inverter failure feedback form

Dear

Customers, in order to provide better service for you, please kindly complete the following form in details:

<table>
<tr><td colspan="6">Load and controls</td></tr>
<tr><td>Motor power and poles</td><td></td><td>Motor rated current</td><td></td><td>Frequency range under normal working</td><td></td></tr>
<tr><td>Load Type</td><td colspan="2">□ Fan □ Textile Machine
□ Extruder □ Injection machine
□ Pump □ Other load</td><td>Speed mode</td><td colspan="2">□ Keyboard □ Terminals
□ PID □ PLC</td></tr>
<tr><td>Control Mode</td><td colspan="5">□ V/F, No PG, □ PG+ V/F □PG+ Vector control</td></tr>
<tr><td colspan="6">Failure description</td></tr>
<tr><td>When Failure occurs</td><td colspan="5">□ When power on □ When start run □When after run some time
□ When speed up □ When speed down</td></tr>
<tr><td colspan="6">Failure Type</td></tr>
<tr><td>OC</td><td colspan="5">□OC-P □OC-C □OC-FA □OC-2</td></tr>
<tr><td>Abnormal voltage</td><td colspan="5">□ OU □ LU □ OL □ UL</td></tr>
<tr><td>Other display fault</td><td colspan="5">□ OH □ E-FL □ PH-O □ PID
□PG(PG Error) □DATE(use date expired) □EEPR(EEPROM)</td></tr>
<tr><td>Board Failure</td><td colspan="5">□ No display after power on □ Smoking after power on
□ Power board and relay does not pull–in.</td></tr>
<tr><td>Keyboard Failure</td><td colspan="5">□ Button failure □ Parameter can not be modified
□ LED display miss segment □ Knob malfunction</td></tr>
<tr><td>Device Failure</td><td colspan="5">□ Burnt □ Fan does not turn □ Power Resistors burned
□ Main circuit relay or contactor does not pull-in</td></tr>
<tr><td>Output abnormal</td><td colspan="5">□ No output voltage □ Output voltage unbalance
□ Motor vibrations □ Motor power inadequate</td></tr>
<tr><td colspan="6">If the fault is not in above ranks, please describe below:</td></tr>
<tr><td colspan="6">Failure description:</td></tr>
</table>