

## Foreword

Thank you very much for purchasing PI8000, PI8100 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 machine, fan/pump drive, **medium** frequency drive and heavy 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 PI8000/PI8100, the general purpose control and special purpose control. The general purpose control has F, G, M and H; The special purpose control has S, T and Z:

**F:** FLOW LOAD

**G:** GENERAL LOAD

**M:** MIDDLE LOAD

**H:** HEAVY LOAD.

**S:** TEXDRIVE.

**T:** WINDLASS.

**Z:** JETDRIVE.

Please contact the local dealers or directly contact our company.

Please keep this user's manual in good condition, for it will be helpful to the repair, maintenance, and applications in the future.

For information about other product, please visit our website:  
<http://www.powtran.com>.

# CONTENTS

Section I.	Inspection & Safety Precautions .....	1
Section II.	Installation & Standby Circuit.....	3
Section III.	Operating Keyboard.....	13
Section IV.	Test Running .....	21
Section V	Parameter Function Table.....	24
Section VI.	Fault Diagnosis & Solutions .....	96
Section VII	Standard Specifications .....	98
Section VIII.	Maintenance .....	113
Section IX.	Options .....	115
Section X	Quality Assurance .....	119
Appendix I.	RS485 Communication Protocol.....	120
Appendix II:	Instruction of the Proportional Linkage Function ....	128
Appendix III	PG Instruction .....	132
Appendix IV	Converter Water Supply Controller Instruction .....	133

## 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 maintenance 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

AC Motor Drivers Model →

Input Spec. →

Output Spec. →

Serial No. & Bar Code →

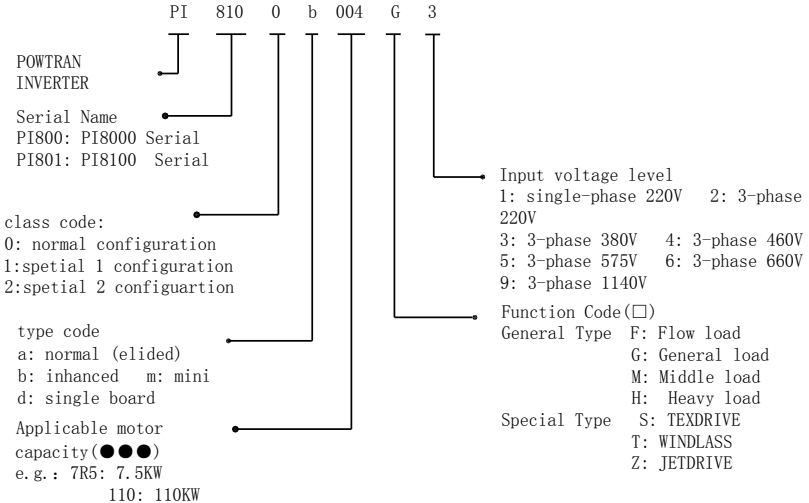
**POWTRAN**

TYPE:	PI8000 004G3
SOURCE:	3 φ 380V 50-60Hz
OUTPUT:	4KW 8.5A 0.00-800.0Hz

Z1001A0001

POWTRAN TECHNOLOGY CO., LTD.  
[HTTP://WWW.POWTRAN.COM](http://www.powtran.com)    MADE IN SHENZHEN CHINA

#### 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 ( $\perp$ ) 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 admisible occasion, the occasion where is not admisible 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, safety 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!**

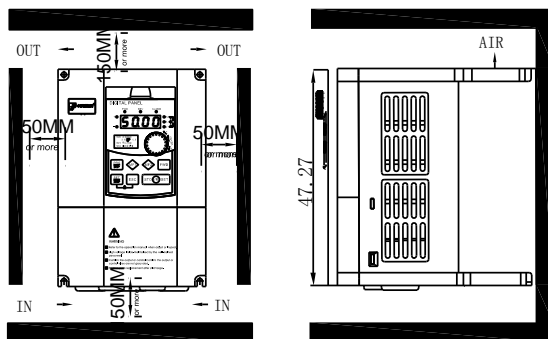
## Section II. Installation & Standby Circuit

### 2-1. Conditions for Use

- 1) Ambient temperature  $-10^{\circ}\text{C}\sim 40^{\circ}\text{C}$ .
- 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:



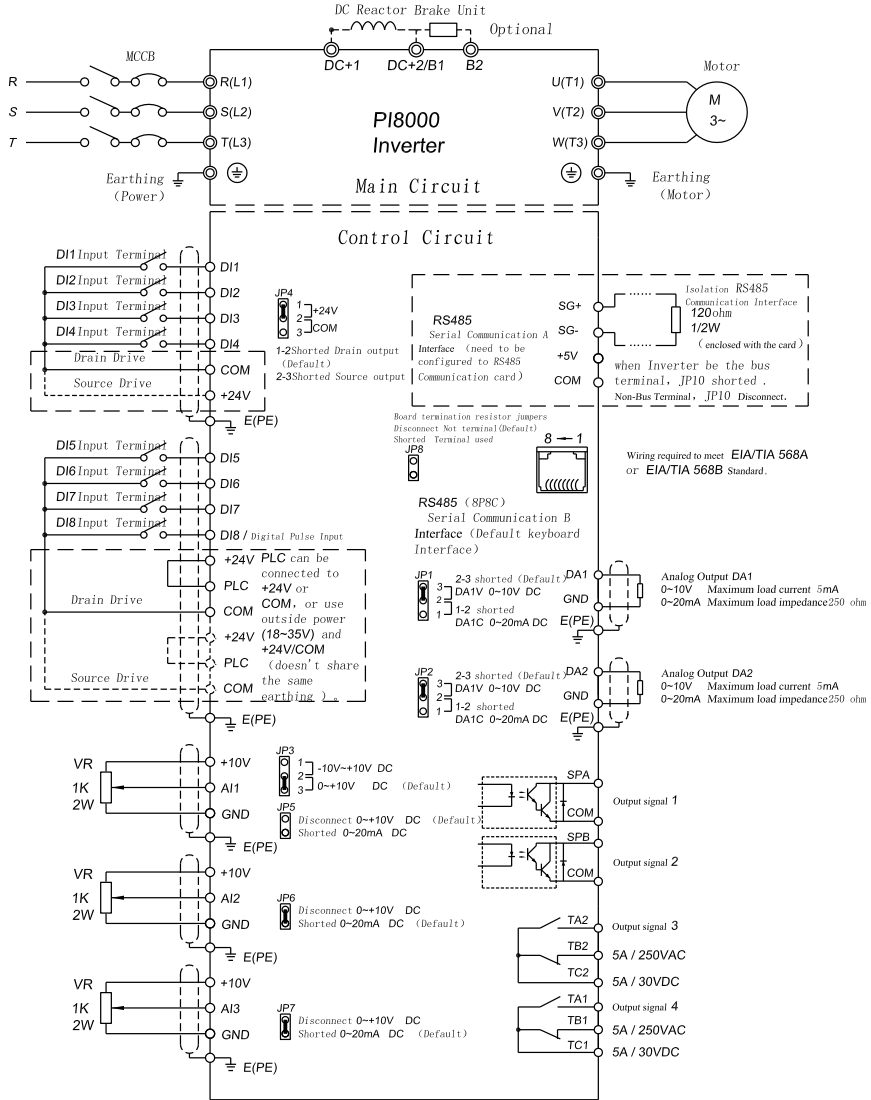
### 2-3. Wiring

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.

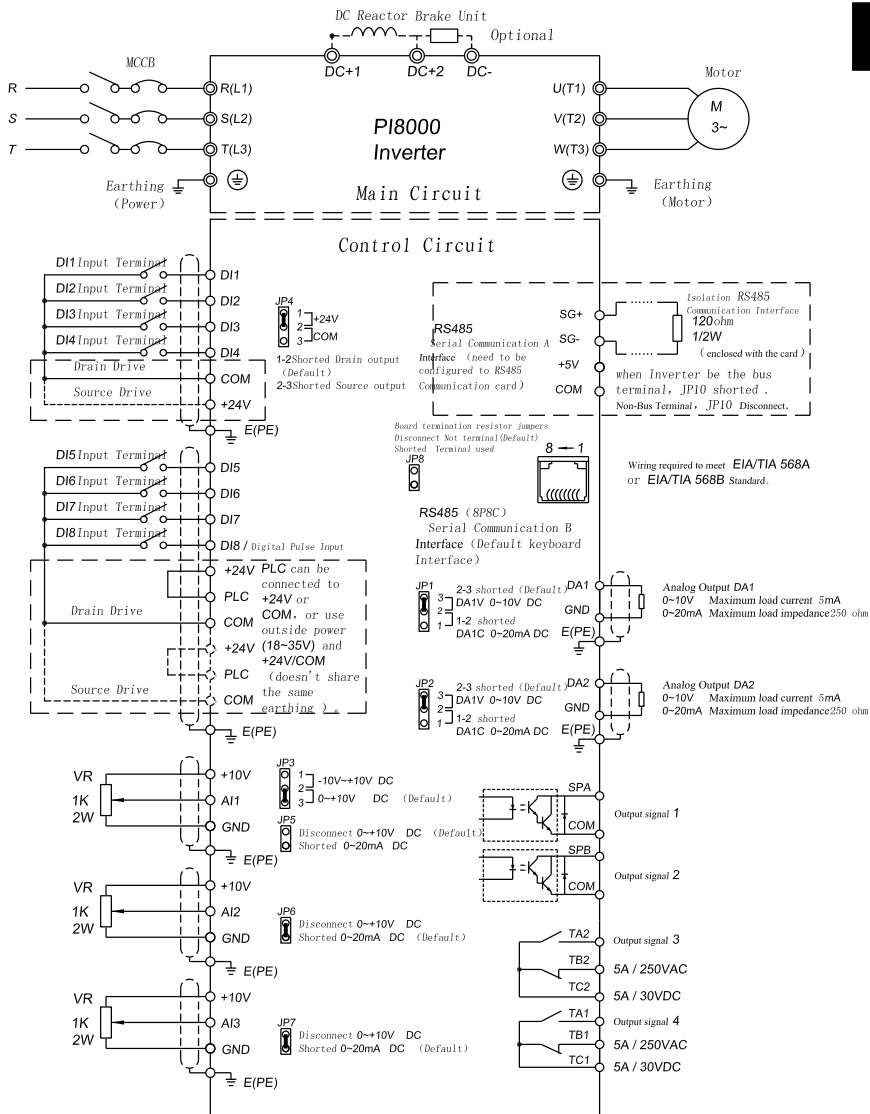
2-3-1. PI8000 Diagram

1. Wiring diagram 11kW ~15kW and below (8N3)

Section II



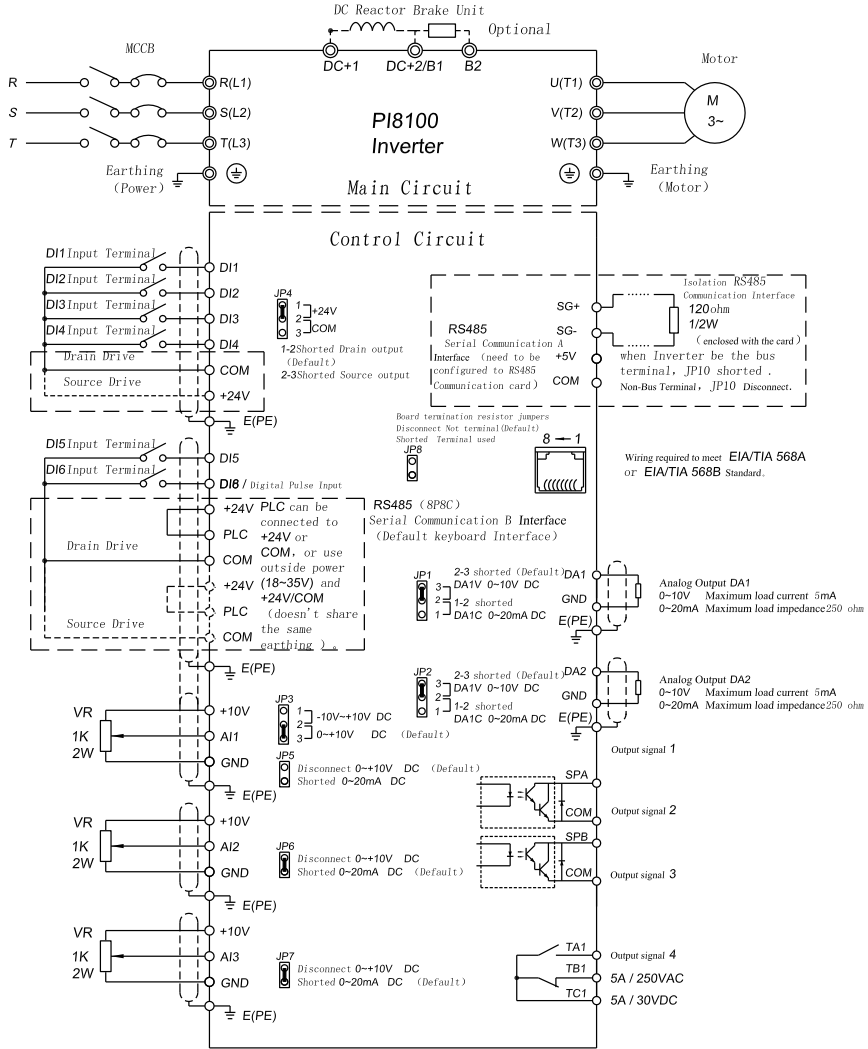
2. Wiring diagram 18.5kW~355kW(8N4 /8N5 /8N6 /8N7 /8N8 /8NA /8NB)



2-3-2. PI8100 Diagram

1. Wiring diagram 11kW and below (7N2 /7N3 /7N4)

Section II

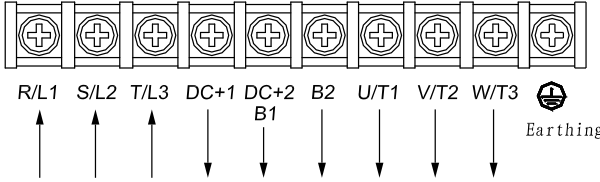




## 2-4. Main Circuit Terminals(G Series)

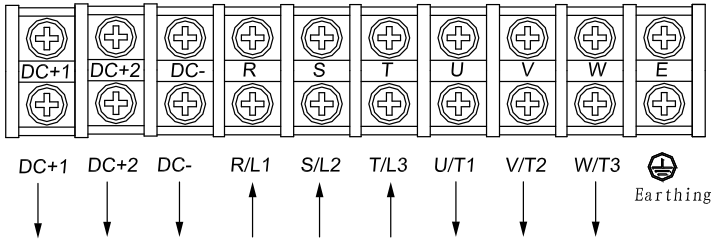
### 2-4-1. PI8000 Main Circuit Terminals

#### 1. 11kW~15kW(380V)Main Circuit Terminals



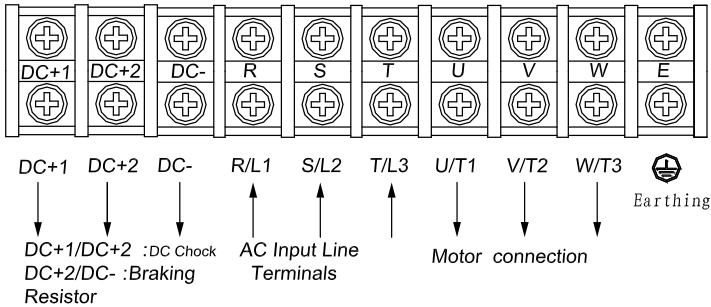
AC Input Line Terminals R/L1 S/L2 T/L3  
 B1/B2 :Braking Resistor B2  
 Motor connection U/T1 V/T2 W/T3  
 DC+1/DC+2 :DC Chock

#### 2. 18.5~22kW(380V)Main Circuit Terminals



DC+1/DC+2 :DC Chock  
 DC+2/DC- :Braking Resistor  
 AC Input Line Terminals R/L1 S/L2 T/L3  
 Motor connection U/T1 V/T2 W/T3

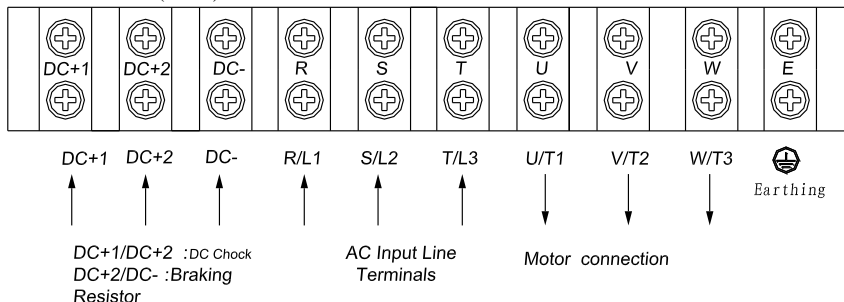
#### 3. 30~160kW(380V)Main Circuit Terminals



DC+1/DC+2 :DC Chock  
 DC+2/DC- :Braking Resistor  
 AC Input Line Terminals R/L1 S/L2 T/L3  
 Motor connection U/T1 V/T2 W/T3

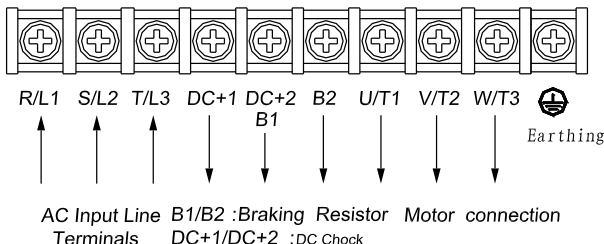
**Note:** DC+1/DC+2 Standard setting is short circuit; if it is with external reactance, please disconnect and then connect it.

4. 187~355kW(380V)Main Circuit Terminals



2-4-2. PI8100 Main Circuit Terminals

1. 7.5kW below(380V)Main Circuit Terminals



Note: The above kW categories are for G type inverter.

2-4-3. 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
B1, B2	Connection point for braking resistance	Connect brake resistance
U/T1	3 Phase Output	Connected to 3-phase motor
V/T2		
W/T3		
DC+2, DC-	DC Bus output	Connect the brake resistance
DC+1, DC+2	DC reactance	Connect DC reactance

2-5. Control Circuit Terminals

2-5-1. Control Circuit Terminals Description

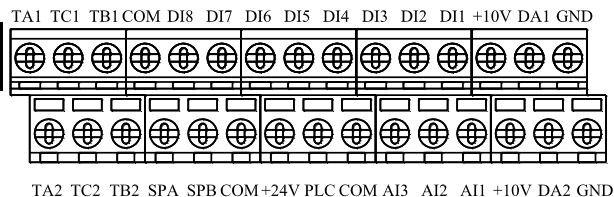
Classify	Terminal	Description	Functions
Input signal	DI1	DI1 Input Terminal	Multi-functions input terminal.For details Please read o36~o46
	DI2	DI2 Input Terminal	

Section II Inspection & Standby Circuit

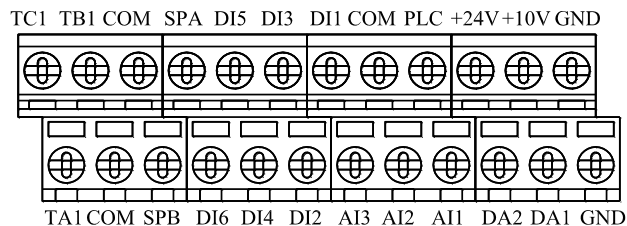
	DI3	DI3 Input Terminal	Enter a valid polarity can be controlled by o47 DI1~DI4 Drive model can be controlled by JP4 Above 11kW: DI5~DI8 Drive model can be controlled by PLC output terminal DI8can as digital pulse input Below 11kW: DI5~DI6 Drive model can be controlled by PLC output terminal DI6 can as digital pulse input
	DI4	DI4 Input Terminal	
	DI5	DI5 Input Terminal	
	DI6	DI6 Input Terminal	
	DI7	DI7 Input Terminal	
	DI8	DI8 Input Terminal	
	PLC	PLC Control Terminal	
Assistant Power	24V	Power positive	The biggest output 24V/200mA, Can not connect COM with GND in any situation
	COM	Common	
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 TA1-TC1open, TB1-TC1close, the output function can set by o23 TA2-TC2open, TB2-TC2close, the output function can set by o24
	SPB/COM	Output signal 2	
	TA1/TB1/TC1	Output signal 3	
	TA2/TB2/TC2	Output signal 4	
Analog input signal	+10V, GND	power	+10V, 50mA, GND
	AI1	Voltage input signal	JP5 cut/JP3 1-2: -10V~+10V JP5 cut/JP3 2-3: 0~10V JP5 connect: 0~20mA can be regulated o00/o01 Set the input voltage / current range o06/o07 Set the input signal corresponding to set value
	AI2	Current input signal	JP6cut: 0~10V JP6connect: 0~20mA can be regulated o02/o03can set input voltage/ current arrange o08/o09 Set the input signal corresponding to set value
	AI3	Current feed back input signal	JP7cut: 0~10V JP7connect: 0~20mA can be regulated o04/o05 can set input voltage/ current arrange o10/o11 Set the input signal corresponding to set value
	DA1	More function analog output 1	JP1 1-2: 0~20mA JP1 2-3: 0~10VDC o15 Set analog output analog functions o17/o18set the output signal arrange
	DA2	More function analog output 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. 8KLCB Control circuit terminal



#### 2. 8KSCB 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  $\perp$  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

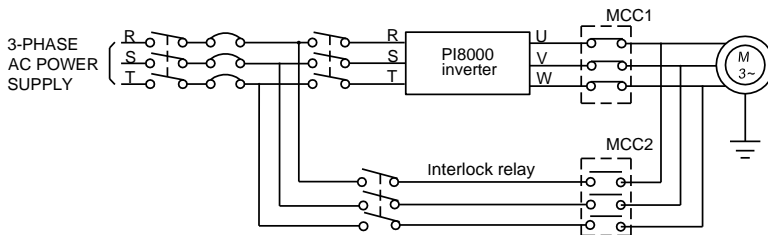
Type	MCCB(A)	In/out Cable (Copper Core) mm <sup>2</sup>	Rated Operational Current Of Contractor A (voltage:380V or 220V)
PI8100 R40G2	10A	1.5	10
PI8100 R75G2	16A	2.5	10
PI8100 1R5G2	20A	2.5	16
PI8100 2R2G2	32A	4	20
PI8100 004G2	40A	6	25
PI8100 5R5G2	63A	6	32
PI8000 7R5G2	100A	10	63
PI8000 011G2	125A	10	95
PI8000 015G2	160A	25	120
PI8000 018G2	160A	25	120
PI8000 022G2	200A	25	170
PI8000 030G2	200A	35	170
PI8000 037G2	250A	35	170
PI8000 045G2	250A	70	230
PI8000 055G2	315A	70	280
PI8000 R75G3	10A	1.5	10
PI8000 1R5G3	16A	1.5	10
PI8000 2R2G3	16A	2.5	10
PI8000 004G3	25A	2.5	16
PI8000 5R5G3	25A	4	16
PI8000 7R5G3	40A	4	25
PI8000 011G3	63A	6	32
PI8000 015G3	63A	6	50
PI8000 018G3	100A	10	63
PI8000 022G3	100A	10	80
PI8000 030G3	125A	16	95
PI8000 037G3	160A	25	120
PI8000 045G3	200A	35	135

PI8000 055G3	250A	35	170
PI8000 075G3	315A	70	230
PI8000 093G3	400A	70	280
PI8000 110G3	400A	95	315
PI8000 132G3	400A	95	380
PI8000 160G3	630A	150	450
PI8000 187G3	630A	185	500
PI8000 200G3	630A	240	580
PI8000 220G3	800A	150*2	630
PI8000 250G3	800A	150*2	700
PI8000 280G3	1000A	185*2	780
PI8000 315G3	1200A	240*2	900
PI8000 355G3	1280A	240*2	960
PI8000 400G3	1380A	185*3	1035
PI8000 500G3	1720A	185*3	1290

### 2-7. Standby circuit

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

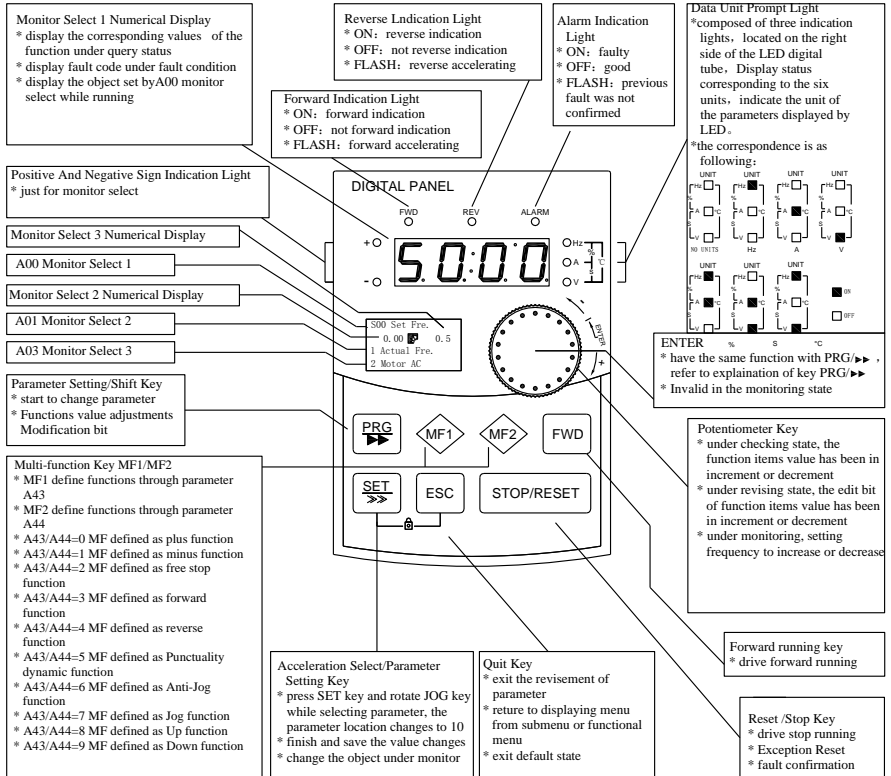
**Note:**confirm and test the running characteristic of the standby circuit, in order to ensure the industrial phase and the converter phase are in the same direction.



# Section III. Operating Keyboard

## 3-1. Operating keyboard

### 3-1-1. JPxC8000 specification and function description

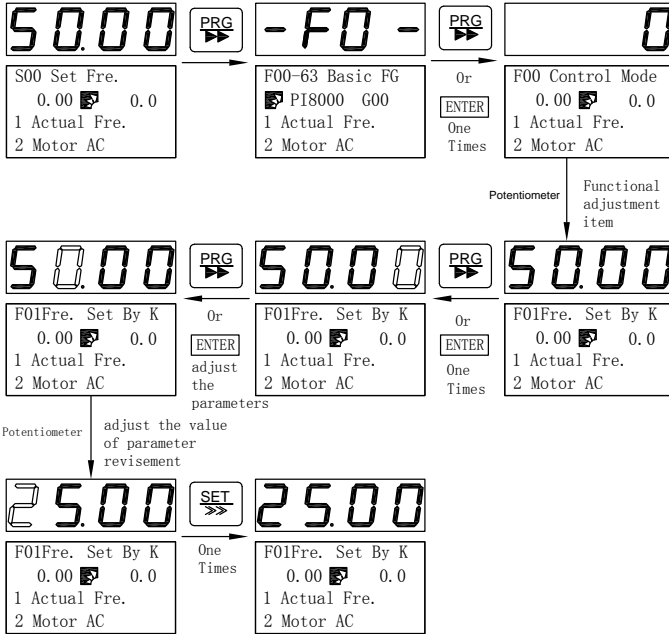






### 3-2. Example for parameters set

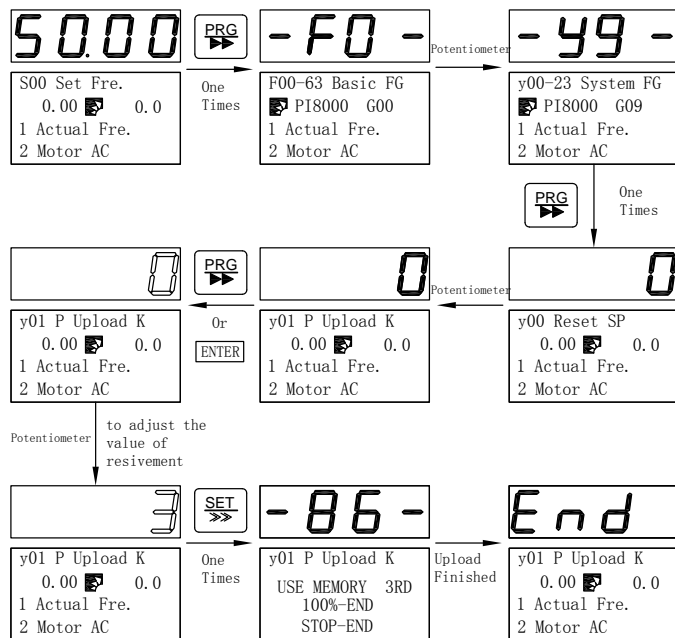
#### 3-2-1. F01 keyboard set the frequency from 50.00Hz to 25.00Hz.



1. Under monitoring status, press into parameter group to query status;
2. Through Switch to ;
3. Press , or , enter into parameter group to query status;
4. Through Switch to ;
5. Press , or , enter into parameter modify status;
6. Through , or , adjust the value is modified bit;
7. Through Has been modified to adjust the bit values;
8. Finish the adjustment, press ; if cancel the change, press to escape to the modify status;
9. Press to exit to previous menu .

3-2-2. Parameter upload to the keyboard

Parameter Item	Description	
y01 parameter upload to the keyboard	N 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 keyboard1, 2, 3, 4	5



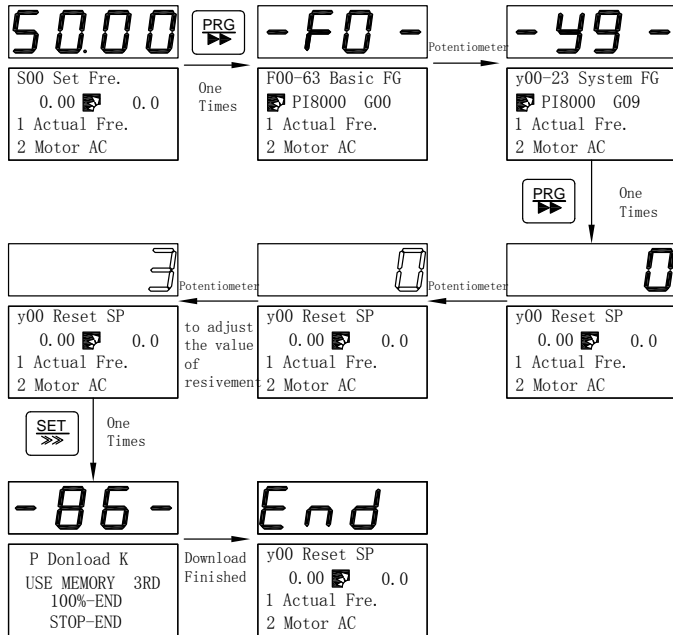
Example. System parameter upload to the memory area3 in the keyboard

- Under monitoring status, press **PRG** into parameter group to check status;
- Through **potentiometer** Switch to **y00-23 System FG**;
- Press **PRG**, or **ENTER**, enter into **y00-23 System FG** parameter group to check status;
- Through **potentiometer** Switch to **y01P Upload To K**;
- Press **PRG**, or **ENTER**, enter into **y01P Upload To K** 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	N function	0
	memory area1 in the keyboard to reset system parameter	1
	memory area2 in the keyboard to reset system parameter	2
	memory area3 in the keyboard to reset system parameter	3
	memory area4 in the keyboard lto reset system parameter	4
	Use the factory setting reset system parameter	5



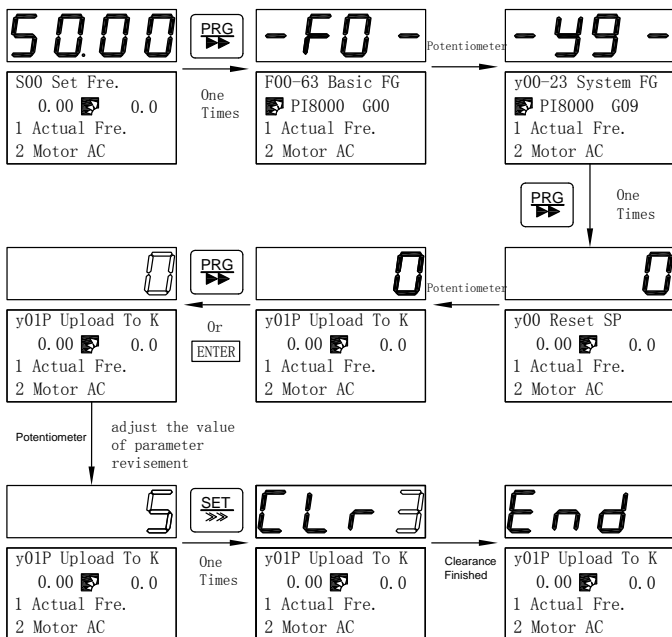
#### Example 1: memory area3 in the keyboard 1 to reset system parameter

1. Under monitoring status, press PRG into parameter group to query status
2. Through potentiometer Switch to y00-23 System FG;
3. Press PRG , or **ENTER**, enter into y00-23 System FG parameter group to query status;
4. Through potentiometer Switch to y01P Upload To K;

5. Press **PRG**, or **ENTER**, 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 in the keyboard1, 2, 3, 4**

Section III



1. Under monitoring status, press **PRG** into parameter group to check status
2. Through **potentiometer** Switch to **y00-23 System FG**;
3. Press **PRG**, or **ENTER**, enter into **y00-23 System FG** parameter group to check status;
4. Through **potentiometer** Switch to **y01P Upload To K**;
5. Press **PRG**, or **ENTER**, enter into **y01P Upload To K** 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 !**

- Under monitoring status, Through [potentiometer] adjust the frequency, the resolution ratio potentiometer is 0.05Hz.
- 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 directly, 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: $F12 \times A48 \sim F12 \times A49$

Example:

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

- when A48=0%, A49=+100%, [S00 Set Fre.] range 0.00Hz~50.00Hz.
- when A48=0%, A49=+50%, [S00 Set Fre.] range 0.00Hz~25.00Hz.
- 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 inverse] as

[I 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 1, AI1 external analog given.**

- Under monitoring status, Through external analog input terminal AI1 adjust the frequency, the resolution ratio is 0.01Hz.
- 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 Setting range: 10.00~320.00Hz
o00 AI1 input X1	Keyboard potentiometer setting the start value Setting range: 0~100%

### Section III Operating Keyboard

o01 AI1 input X2	Keyboard potentiometer setting the end value Setting range: 0~100%
o06 AI1 input X1 correspond to Y1	Keyboard potentiometer setting the starting point for the corresponding value Setting range: -100%~+100%
o07 AI1 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 AI1 adjust the frequency Setting range: $F12 \times o06 \sim F12 \times o07$

Example:

$F12=50.00\text{Hz}$ ,  $o00=0\%$ ,  $o01=100\%$ ,

(1) When  $o06=0\%$ ,  $o07=+100\%$ , S00 Set Fre. range 0.00Hz~50.00Hz.

(2) When  $o06=0\%$ ,  $o07=+50\%$ , S00 Set Fre. range 0.00Hz~25.00Hz.

(3) When  $o06=-100\%$ ,  $o07=+100\%$ , S00 Set Fre. range -50.00Hz~50.00Hz.

**Note:** When the motor is in -50.00~0Hz realise reverse, another setting

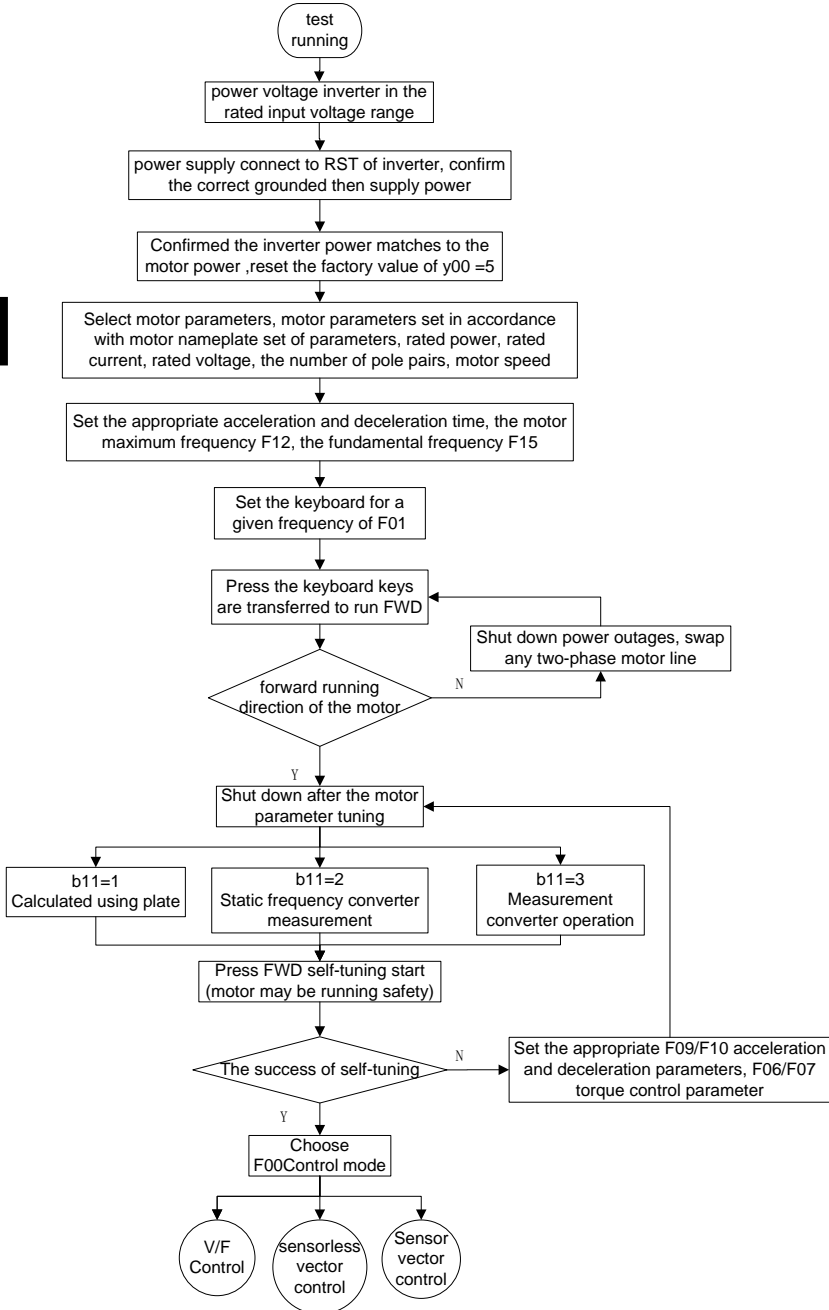
F45Ten bit motor forward reverse as

I Command priority: Analog given positive and negative values, on the F45 details see F45

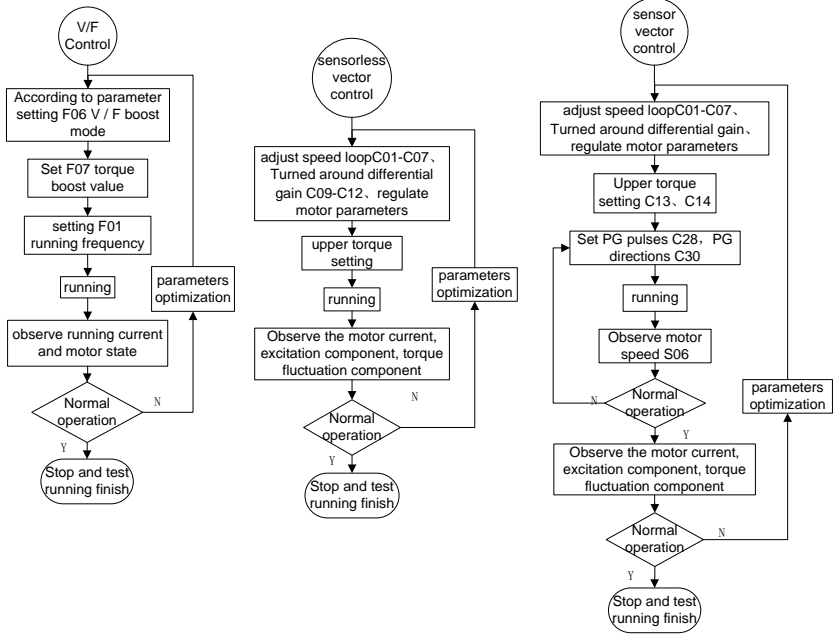
Parameter Description

## Section IV. Test Running

- Failure occurred when test running, please anomalies and Countermeasures against 6-1 fault diagnosis, processing, trouble shooting.
- 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  $b11 = 3$  motor rotation measurements
- Before the electrical parameter measurement finished, inverter can have the ourput voltage any time, please ensure the safety.







Section IV

## Section V Parameter Function Table

### 5-1. Menu Group

Code	Description / LCD	Function Description	Quantity	Group ID
S	Monitor Function Group	Monitor frequency, current and other 16 monitor objects	16	0B
F	Basic Function Group	Frequency setting, control mode, acceleration time and deceleration time	51	00
A	User Function Group	Monitor, protection, communication setting	56	01
o	IO Function Group	Analog, digital input, output function	61	02
H	Multi-speed PLC Group	Multi-speed running, PLC running	56	03
U	V/F Curve Group	User defined V/F curve	16	04
P	PID Function Group	Internal PID parameter setting	13	05
E	Extend Function Group	Constant pressure water supply and other functions setting	24	06
C	Speed ring function group	Current ring, speed running, PG parameter	32	07
b	Motor parameter group	Motor parameter setting	23	08
y	System Function Group	Parameter reset, fault query, product information, parameter protection	18	09

### 5-2. Monitor function

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	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
<p>Under running, the real speed of the motor = <math>60 \times \text{the real output frequency} \times \text{Gain Speed surveillance} / \text{pole of the motor}</math>.</p> <p>Example: the real output frequency 50.00Hz, Gain Speed surveillance A35=100.0%, the pole of the motor b03/b16=2, the real speed of the motor = 1500rpm.</p> <p>When stop, based Residual voltage test motor speed, renew speed 500ms.</p> <p>The real speed = <math>60 \times \text{residual frequency} \times \text{Gain Speed surveillance} / \text{the pole of the motor}</math></p> <p>Max display of motor real speed 9999rpm.</p>					
S07	Total Running Time	The total running time for every time	hour	-	N
<p>When the output, the frequency inverter calculated the running time.</p>					

Section V Parameter Function Table

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 °C	Test the temperature of IGBT in the frequency	°C	-	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's set excitation heft percentage	%	-	N
S13	Excitation Heft Actual Value	Motor's actual excitation heft percentage	%	-	N
S14	Torque Heft Set Value	Motor set torque percentage	%	-	N
S15	Torque Heft Actual Value	Motor actual torque hefts percentage	%	-	N

Section V

**5-3. Basic function Group**

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited
F00	Control Mode	V/Fcontrol	0	-	0
		Sensorless vector control	1		
		Sensor feedback close loop vector control	2		
F01	Keyboard Setting Frequency	Lower frequency~upper frequency	Hz	50.00	Y
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 of occasions, it is need to install PG card and install pulse encoder shaft in the motor or mechanical equipment, . The keyboard for a given operating frequency, the frequency can be any one between lower frequency and upper frequency to the upper frequency F02/F03setting to 0, Involved in setting frequency calculation.					

Section V Parameter Function Table

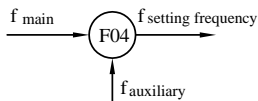
F02	Frequency Main Set Mode	Keyboard setting frequency or RS485	0	-	0	Y
		AI1 the external analog setting	1			
		AI2 the external analog setting	2			
		AI3 the external analog setting	3			
		Keyboard potentiometer setting	4			
		Multi-segment digital voltage setting	5			
		Digital Pulse Setting	6			
<p>The main mode of the frequency running frequency:</p> <p>0: keyboard setting frequency or RS485 change F01 keyboard setting frequency Multi-digital voltage terminal effective exchange, change F01 keyboard setting value</p> <p>1: AI1 the external analog setting Given the external analog 0~10V, -10V~+10V, 0~20mA. For detail please read the o group parameter.</p> <p>2: AI2 the external analog setting</p> <p>3: AI3 the external analog setting Given the external analog 0~10V, 0~20mA. For detail please read the o group parameter.</p> <p>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.</p> <p>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 .</p> <p>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, o43set 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 terminal set to 14, 15, 16 be configured to switch the source</p>						
F03	Auxiliary Setting Mode Of Frequency	Keyboard setting frequency or RS485	0	-	0	Y
		AI1 the external analog setting	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			
<p>Auxiliary setting mode of frequency set:</p> <p>0: keyboard frequency setting frequency or RS485, change F01 keyboard setting frequency After multi-digital voltage terminal effective switch, change F01 keyboard setting.</p> <p>1: AI1 the external analog setting Given the external analog 0~10V, -10V~+10V, 0~20mA. For detail please read the o group parameter.</p>						

Section V Parameter Function Table

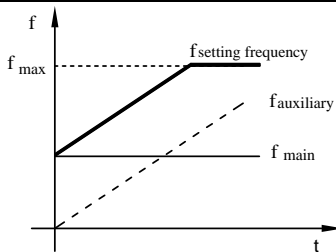
- 2: AI2 the external analog setting
- 3: AI3 the external analog setting  
Given the external analog 0~10V, 0~20mA. For detail please read the o group parameter.
- 4: Keyboard potentiometer setting  
Keyboard potentiometer setting, keyboard potentiometer for a given start and end values of the corresponding 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 set  
Digital pulse input frequency corresponding to set the frequency, For detail please read o52 parameter.  
Pulse input terminal and DI8 terminal resetting, 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			

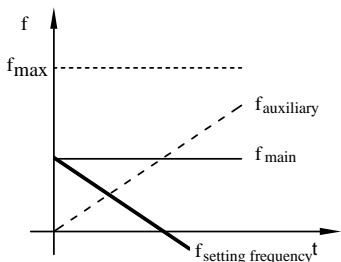
Main given and auxiliary given set frequency relations:  
Main given value and auxiliary given value can be added up, subtracted, multiplied, maximum, minimum calculation.  
O group parameters can be adjusted to coordinate the main given and auxiliary given proportion, to meet the requirements of the system fine-tuning and bias.



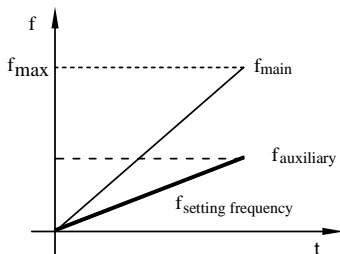
The relationship between main give and auxiliary given



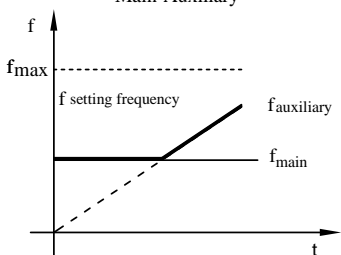
Main+Auxiliary



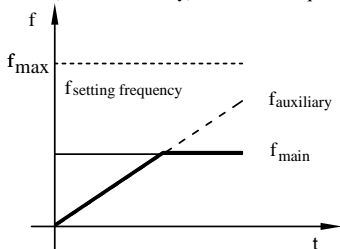
Main-Auxiliary



(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

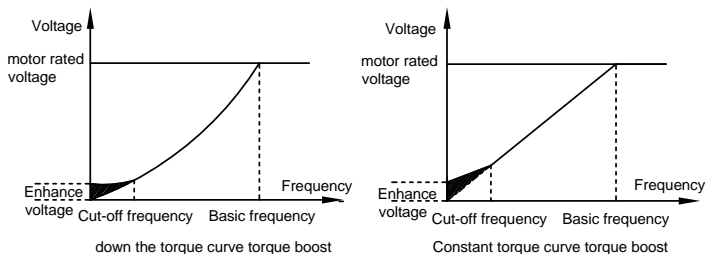
3: Terminal control, Level trigger.

Section V Parameter Function Table

<p>Under this function, only free stop function is valid under the keyboard control, other operation control is invalid</p> <p>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 linkage 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.</p>							
F06	V/F Boost Mode	1 bit	Beeline V/Fcurve	0	-	0000	N
			Power of 1.2 V/Fcurve	1			
			Power of 1.7 power V/Fcurve	2			
			Power of 2 power V/Fcurve	3			
			Define mode V/Fcurve	4			
		10 bit	Close Automatic torque boost	0			
			Automatic torqueboost	1			
		100 bit	Reserved				
		1000 bit	Reserved				
<p>1 Bit: V/F promote curve</p> <p>0 Line V/F curve: Suitable for ordinary constant torque load</p> <p>1 Power of 1.2 V/F curve: Appropriate torque down V/F curve, Suitable for liquid loads</p> <p>2 Power of 1.7 V/F curve: Appropriate torque down V/F curve, Suitable for liquid loads</p> <p>3 Power of 2 V/F curve: Torque down V/F curve, It is suitable for fans, pumps, centrifugal load</p> <p>4 Define mode V/Fcurve: Can be customized appropriate curve according to the actual situation .</p> <p>10 bit: Auto-torque boost mode</p> <p>0 Close Automatic torque boost</p> <p>1 Open automatic torque boost</p> <p>parameters which affect automatic torque enhance :</p> <p>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. VF mode 0 speed maintain function</p> <p>0 VF mode 0 Speed No Output: Output frequency is less than 0.5Hz, stop PWM output to reduce the switching loss.</p> <p>1 VF mode 0 speed to keep: the output frequency is less than 0.5Hz, in accordance with starting F26, the DC braking current keep 0 speed.</p>							
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		
<p>Torque increase is mainly used to improve the low-frequency torque characteristics under sensorless-V / F control mode.</p> <p>Torque boost is too low, weak low speed motor</p>							

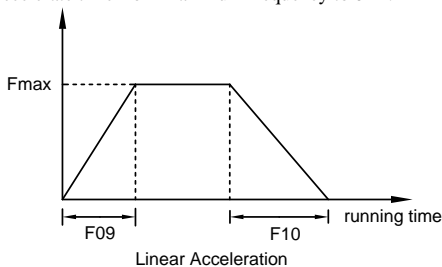
Torque boost is too high, motor over-excitation operation, large inverter output current, and low efficiency.

Set the torque converter to enhance the frequency below the cutoff frequency, torque to enhance effective, more than this to set the frequency, torque increase is 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.



F11	Percentage Of Output Voltage	50~110	%	100	Y
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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.

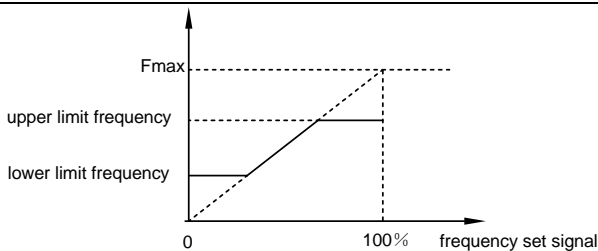
F12	Maximum Frequency	10.00~320.00	Hz	50.00	N
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Inverter output maximum frequency allowed is also the setting basis of acceleration / deceleration time.

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





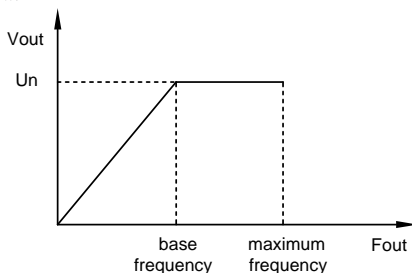
F13 Lower frequency: the lower limit of the output frequency.

F14 Upper frequency: the upper 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
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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
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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:

Section V Parameter Function Table

Carrier Frequency	Motor Noise	Electric disturbance	Switch dissipation
1.0KHz	Big ↓ Small	Small ↓ Big	Small ↓ Big
8.0KHz			
16.0KHz			

The relationship of the carrier frequency and power :

Power(kW)	0.4-18.5	22-30	37-55	75-110	132-200	220 以上
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	N 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: N 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	-	1	N
		Stepless & subsection synchronous space vector PWM	1			
		two-phase optimization space vector PWM	2			

PWM wave produce mode

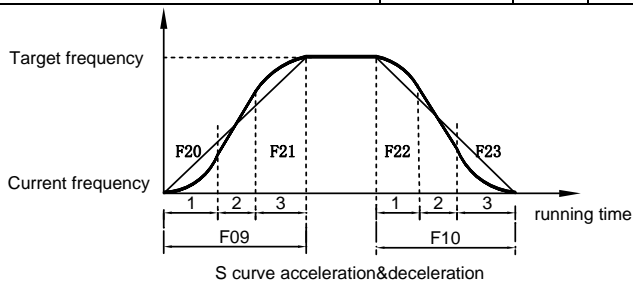
0: Asynchronous space-vector PWM

1: Stepless & subsection synchronous space vector PWM

2: two-phase optimization space vector PWM

Section V Parameter Function Table

F20	S Curve Start Time At The Acceleration Step	0.0~50.0	%	0.0	Y
F21	S Curve Stop Time At The Acceleration Astep	0.0~50.0	%	0.0	Y
F22	S Curve Start Time At The Deceleration Step	0.0~50.0	%	0.0	Y
F23	S Curve 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 =  $F09 \times F20$   
 Constant extra acceleration S characteristic time =  $F09 - (F09 \times F20 + F09 \times F21)$   
 Minus acceleration S characteristic time =  $F09 \times F21$   
 Full acceleration time = F09 Acceleration time  
 Velocity S addition and subtraction characteristic time =  $F10 \times F22$   
 Constant deceleration S characteristics time =  $F10 - (F10 \times F22 + F10 \times F23)$   
 And reduction rate of S characteristic time =  $F10 \times F23$   
 All deceleration time = F10 deceleration time

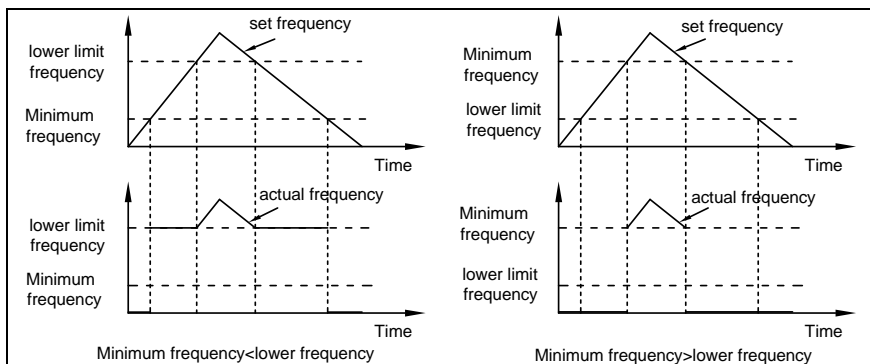
F24	V/F Control Slip Compensation	slip compensation invalid	0	-	0	N
		slip compensation valid	1			

0: Slip compensation function is invalid.  
 1: Run in the V / F control method, the slip compensation function effectively.  
 Slip compensation value to adjust 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
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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.

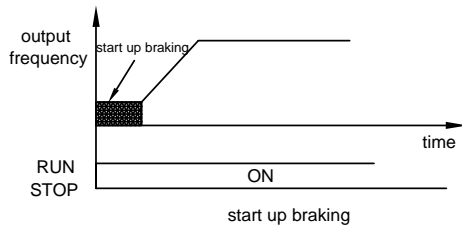
Section V Parameter Function Table



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.

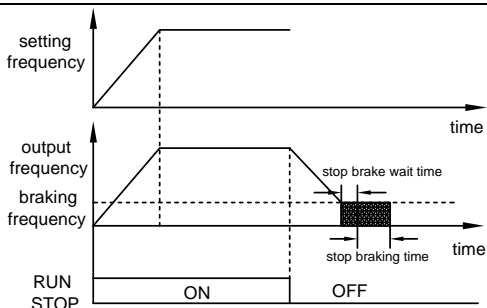


F28	Stop When The DC Braking Current	0~135	%	100	Y
F29	Stop And Braking Wait Time	0.0~60.0	s	0.0	Y
F30	Brake Time Stop	0.0~60.0	s	0.0	Y
F31	Stop And Brake Starting Frequency	0.00~most frequency	Hz	0.00	Y

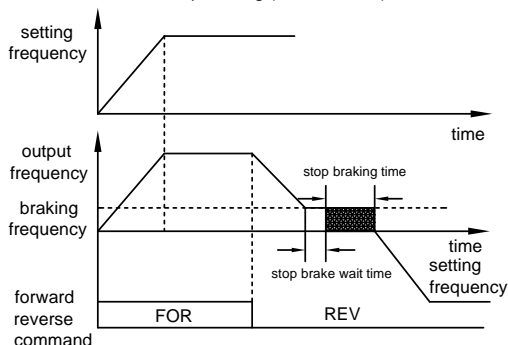
Inverter slowing down to stop braking start frequency, stop the output PWM waveform to begin injection of DC current, the current size by the shutdown of DC braking current setting, braking time, braking time set by the downtime.

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.

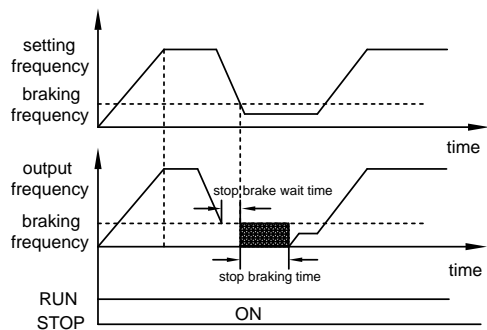
Section V



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.

Section V Parameter Function Table

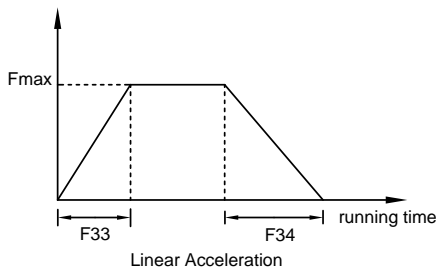
F33	Jog Acceleration Time	0.0~3200.0		s	1.0	N	
F34	Jog Deceleration Time	0.0~3200.0		s	1.0	N	
F35	Jog Mode Setting	1 bit	Jog direction: forward	0	-	000	N
			Jog direction: reverse	1			
			Jog direction: direction determined by the main terminal	2			
		10 bit	Jog end mode: Stop Running	0			
			Jog end mode:reset to the former state before jog	1			
		100 bit	Jog end and acceleration deceleration time: reset to the set acceleration and deceleration time before jog	0			
Jog end and acceleration deceleration time:save the set acceleration and deceleration time before jog	1						
F36	Jog Frequency Setting	Lower frequency ~upper frequency		Hz	6.00	Y	

Jog acceleration and deceleration time to configure the definition of the same section of acceleration / deceleration time.

Jog the direction of movement of bits determined by the F35, when moving the command does not contain Jog fixed direction, the direction will be moving inch F35-digit specified direction. This bit is set to 2 inch of movement from the terminal or the current direction of the direction of the decision.

Jog running after the end of the 10 identified by the F35.

Jog acceleration and deceleration time can be determined through the F35's hundred jog at the end had been maintained.

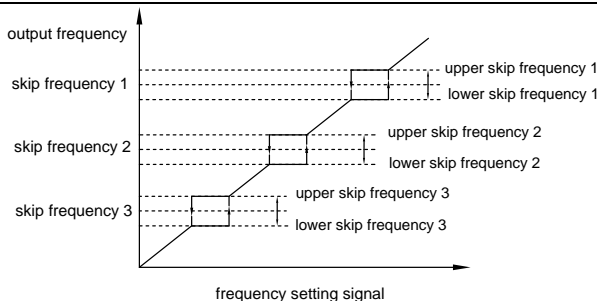


F37	Skip Frequency 1 Limit	0.00~Maximum frequency		Hz	0.00	Y
F38	Skip Frequency 1 Upper	0.00~Maximum frequency		Hz	0.00	Y
F39	Skip Frequency 2 Limit	0.00~Maximum frequency		Hz	0.00	Y
F40	Skip Frequency 2 Upper	0.00~Maximum frequency		Hz	0.00	Y
F41	Skip Frequency 3 Limit	0.00~Maximum frequency		Hz	0.00	Y
F42	Skip Frequency 3 Upper	0.00~Maximum frequency		Hz	0.00	Y

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.

Section V Parameter Function Table



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

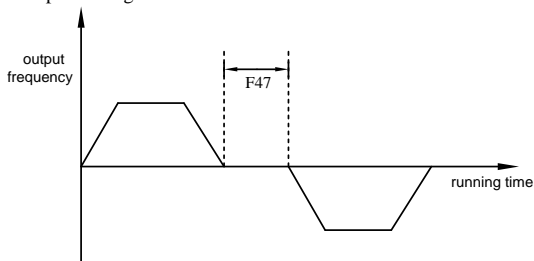
In the acceleration and deceleration process, inverter output frequency can normally through skip frequency area.

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	-	0100	N
			Direction command: forward command FWD let motor reverse running	1			
		10 bit	Command prior: terminal/keybord	0			
			Prior command: Analog given positive and negative values	1			
100 bit	Reverse allow: reverse forbidden	0					
	Reverse allow: can reverse	1					
<p>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.</p> <p>10: Motor forward reverse running can be controlled by the keyboard potentiometer and analog input input positive or negative value.                      0: Prior command: terminal/keybord, 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, seting negative value let motor reverse running.</p> <p>100: 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</p>							
F46	Pass 0 Stopping Time	0.0~60.0s	s	0	N		

Section V

Section V Parameter Function Table

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 accurat 0.01Hz, With this accuracy, F12 Maximum frequency setting range 10.00~320.00Hz.

1: Set frequency display accurat 0.1Hz, with this accuracy, F12 Maximum frequency setting range 100.0~800.0Hz.

After setting this parameter, there must be reset F12 maximum frequency.

F48	Acceleration And Deceleration Configuration Word	1 bit	N adjustment of acceleration time	0	-	0000	N
			AI1 adjustment of the external analog giving	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	N adjustment of deceleration time	0			
			AI1 adjustment of the external analog giving	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						
1000	Deceleration time: ×s	0					



Section V Parameter Function Table

	bit	Deceleration time: $\times$ min	1			
		Deceleration time: $\times$ h	2			
		Deceleration time: $\times$ day	3			

1 bit: Acceleration time adjustment mode

0	N Adjustment Of Acceleration Time	N adjustment
1	A11 Adjustment Of The External Analog Giving	Actual Acc. time=Acc. time*A11 giving percentage
2	A12 Adjustment Of The External Analog Giving	Actual Acc. time = Acc. time *A12 giving percentage
3	A13 Adjustment Of The External Analog Giving	Actual Acc. time = Acc. time *A13 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	N Adjustment Of Acceleration Time	N adjustment
1	A11 Adjustment Of The External Analog Giving	Actual Acc.time =Dec. time*A11 giving percentage
2	A12 Adjustment Of The External Analog Giving	Actual Acc.time = Dec. time *A12 giving percentage
3	A13 Adjustment Of The External Analog Giving	Actual Acc.time = Dec. time *A13 giving percentage
4	Adjustment Of Keyboard Potentiometer Giving	Actual Acc.time = Dec. time * keyboard potentiometer giving percentage
5	Adjustment Of Multi Steps Digital Voltage	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 speed

Acc. and Dec. time	1000 bit 100 bit	Range(e.g. F09, F10=3200.0)
$\times$ s	0	3200.0s
$\times$ Min	1	3200.0 Min
$\times$ H	2	3200.0 h
$\times$ Day	3	3200.0 Day

F49	Running Configuration	bit	Running direction: forward	0	-	0000	N
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Section V Parameter Function Table

Word	10 bit	Running direction: reverse	1			
		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.  
bit: Program running on multi-speed running period, Set bit to running direction of “0” step speed.

Running direction	Setting value
Forward	0
Reverse	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 run jointly decide the direction of 0 step speed, FWD priority.

FWD=1running direction	REV=1running direction	Setting value
FWD	REV	0
REW	FWD	1

10: unit of time running on “0” step speed.

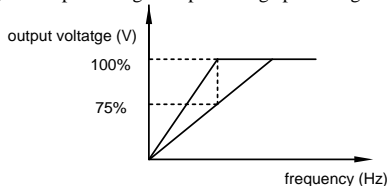
Running time	10 bit	Range(e.g. H18~H25=3200.0)
×S	0	3200.0s
×Min	1	3200.0Min
×H	2	3200.0H
×Day	3	3200.0 Day

F50	Energy Saving Running Percentage	30~100	%	100	N
-----	----------------------------------	--------	---	-----	---

This parameter describes the minimum output voltage of the percentage of energy-saving operation. In the constant speed operation, the inverter can be automatically calculated the best output voltage by the load conditions. 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

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display		Unit	Factory Setting	Change Limited
		Parameter group N:	Parameter group N:			
A00	Monitor 1	X1000/X100	X10/ bit	-	0B00	Y
A01	Monitor 2	00~0B	0~63(0x00~0x3F)	-	0B01	Y
A02	Monitor 3			-	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.

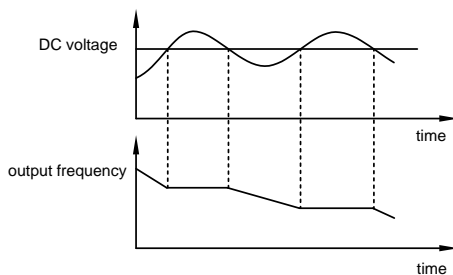
Monitor1 will be valid when first power on, and which decide keyboard display content.

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

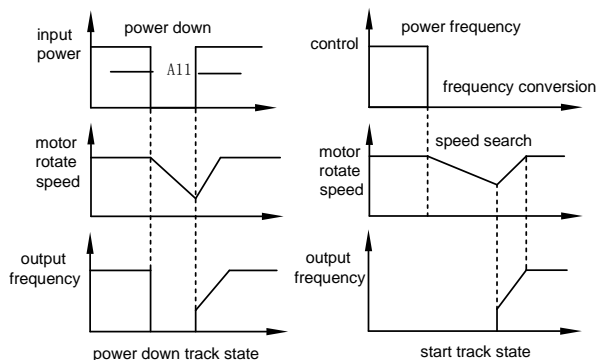
When the inverter deceleration, as the motor load inertia, motor will produce feedback voltage to inverter inside, which will increase DC bus voltage and surpass max voltage. When you choose Over /less voltage stall protection and it is valid, Inverter detects DC side voltage, if the voltage is too high,

Section V Parameter Function Table

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, unless 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 tTracking 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.						

Section V Parameter Function Table

- 2: Startup tracking means that 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	-	1	Y
		Y	1			
A15	Limit Fall Time	0.1~3200.0	s	3.0	Y	
A16	Limit Deceleration Protection Point	10~250	%	★	Y	
A17	Limit Fix-speed Protection Point	10~250	%	★	Y	

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

Section V Parameter Function Table

	170	A16
M、T、Z	170	A17
	190	A16
H	250	A17
	270	A16

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 systme 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.

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		%	150	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.

A23	Electronic Thermal Relay Protection Selection	N	0	-	1	Y
		Y	1			

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: N selecting this function

1: Select this function.

## Section V Parameter Function Table

A24	Electronic Thermal Protection Grade	120~250	%	★	Y
<p>This is current grade set by inverter analyzing motor overheat result. When current reach multiple of motor rated current and this parameter. Inverter will protect motor within one minute. The actual overheat protection current is A24 times of rated current within that one minute.</p> <p>This parameter default setting of F series is 120%, G/S series is 150%, Z/M/T series is 180%, H series is 250%.</p> <div style="text-align: center;"> </div>					
A25	Fault Reset Times	0~10	-	0	Y
<p>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 vottage "LU" fault, inverter will automatically recover without limitation.</p> <p>Restarting from fault and normally running over 36s, inverter will automatically recover fault reset times preset.</p> <p>Restarting from fault and normally running over 36s, inverter will automatically recover to display monitor parameter.</p> <p>After 10 s of meeting fault, inverter will not recover fault reset function.</p>					
A26	Fault Reset Time	0.5~20.0	s	1.0	Y
<p>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.</p>					
A27	Fan Startup Temperature	0.0~60.0	℃	0.0	Y
<p>This parameter used to set temperature of fan startup. When actual temperature is higher than set temperature, fan will startup.</p>					
A28	This Inverter Communication Address	1~128	-	8	Y
<p>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.</p> <p>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.</p> <p>Communication interface B can be treated as keyboard interface or "PC" Host Computer Interface.</p> <p>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.</p> <p>Seeing appendix 2 for detailed specification.</p>					

Section V Parameter Function Table

A29	Baud Rate	Baud rate is 1200	0	-	3	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			
The baud rate of communication interface A can be set accordingly. The baud rate of communication interface B is fixed 19200bps.						
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			
A32	Delay Inspection Time	0: N inspection		s	10	Y
		1~250: late inspection				
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.						
A33	Total Running Time Setting	Auto clear to zero after power on	0	-	1	Y
		Continue to accumulate running time after power on	1			
The set for whether accumulating time of inverter running. 0: Auto clear to zero after power on. 1: Continue to accumulate running time after power on.						
A34	Unit Of Total Running Time	hour	0	-	0	Y
		Day	1			
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.						
A35	Motor Output Speed Adjustment	0.1~1000.0		%	100.0	Y
Using for displaying adjustment of motor actual running speed. Seeing A00~A02 monitor options: 6: motor actual running speed. Setting 100%, corresponding display unit : rpm.						



Section V Parameter Function Table

The max speed of displaying after adjustment is 9999.																																																
A36	Adjustment Of Motor Output Power	0.1~1000.0	%	100.0	Y																																											
<p>Used for displaying motor output power of adjustment. Seeing A00~A02 monitor options: 11 :motor output power.</p> <p>Setting 100%, corresponding display unit:%.</p> <p>The max output power of displaying after adjustment is 2999.9.</p>																																																
A37	Keyboard Lock Function Options	0~OFF	-	OFF	Y																																											
<div style="text-align: center;"> <p>Diagram showing bit assignments for Set 0-10:</p> <ul style="list-style-type: none"> <li>Bit 7: FWD</li> <li>Bit 6: STOP</li> <li>Bit 5: PRG</li> <li>Bit 4: SET</li> <li>Bit 3: ESC</li> <li>Bit 2: MF1</li> <li>Bit 1: MF2</li> <li>Bit 0: Potentiometer</li> </ul> </div> <p>key SET+ESC in Keyboard can activate and cancel keyboard lock function.</p> <p>To lock which key will be decided by corresponding parameter :</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Set 0~10 bit</th> <th colspan="2">Keyboard locked state</th> </tr> </thead> <tbody> <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 rowspan="2">1</td> <td>0</td> <td>Unlock STOP key</td> </tr> <tr> <td>1</td> <td>Lock STOP key</td> </tr> <tr> <td rowspan="2">2</td> <td>0</td> <td>Unlock PRG key</td> </tr> <tr> <td>1</td> <td>Lock PRG key</td> </tr> <tr> <td rowspan="2">3</td> <td>0</td> <td>unlock SET key</td> </tr> <tr> <td>1</td> <td>Lock SET key</td> </tr> <tr> <td rowspan="2">4</td> <td>0</td> <td>Unlock ESC key</td> </tr> <tr> <td>1</td> <td>Lock ESC key</td> </tr> <tr> <td rowspan="2">5</td> <td>0</td> <td>Unlock MF1 key</td> </tr> <tr> <td>1</td> <td>Lock MF1 key</td> </tr> <tr> <td rowspan="2">6</td> <td>0</td> <td>Unlock MF2 key</td> </tr> <tr> <td>1</td> <td>Lock MF2 key</td> </tr> <tr> <td rowspan="2">7</td> <td>0</td> <td>Unlock potentiometer</td> </tr> <tr> <td>1</td> <td>Lock potentiometer</td> </tr> </tbody> </table>						Set 0~10 bit	Keyboard locked state		0	0	Unlock FWD key	1	Lock FWD key	1	0	Unlock STOP key	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
Set 0~10 bit	Keyboard locked state																																															
0	0	Unlock FWD key																																														
	1	Lock FWD key																																														
1	0	Unlock STOP key																																														
	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																																															

Section V Parameter Function Table

		1000 bit	Invalide adjustment	0			
			Valide ajustment	1			
<p>1 bit: UP/DN control saving state after power down          0: power down to save          1: power down to clear</p> <p>10 bit: UP/DN control saving after stopping          0: Keeping afer stopping          1: Stop command to clear saving          2: Cleared at the end of stopping</p> <p>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.</p> <p>1000 bit: UP/DN control validity of adjustment.          0: UP/DN invalid ajustment          1: UP/DN valid adjustment</p>							
Section V 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 adjustmentof speed ratio	0			
			AI1 adjustment of the external analog giving.	1			
			AI2 adjustment of the external analog giving.	2			
			AI3 adjustment of the external analog giving.	3			
			adjustment of Potentiometer giving	4			
			Adjustment of multi-steps digital voltage	5			
		1000 bit	DN N adjustmentof speed ratio	0			
			AI1 adjustment of the external analog giving	1			
			AI2 adjustment of the external analog giving	2			
			AI3 adjustment of the external analog giving.	3			
adjustment of Potentiometer giving	4						
Adjustment of multi-steps digital voltage	5						
<p>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.</p> <p>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.</p> <p>100 bit: UP adjustment mode of adjusting speed ratio</p>							

Section V Parameter Function Table

0	UP N Adjustment Of Speed Ratio	N adjustment
1	AI1 Adjustment Of The External Analog Giving	Actual UP adjustment ratio= percentage given by A41*AI1
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* potentiometer
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	N adjustment
1	AI1 Adjustment Of The External Analog Giving	Actual DN adjustment ratio =percentage given by A42*AI1
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*potentiometer
5	Adjustment Of Multi-steps Digital Voltage	Actual DN adjustment ratio=percentage given by A42*multi-steps digital volgte.

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			
		MFis defined as free stopping key	2			
		MFis defined as FWD running key	3			

Section V Parameter Function Table

		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			
<p>The user defined keyboard can define MF key functions.</p> <p>0: MF is defined as adding function key: Under monitor menu, adding function key MF can adding revise frequency F01 set. Under parameter choosing menu, adding function key MF can adjust parameter choice. Under parameter revising menu, adding function key MF can adjust parameter value.</p> <p>1: MF is defined as reducing function key: Under monitor menu, reducing function key MF can reducing revise frequency F01 set Under parameter choosing menu, reducing function key MF can adjust parameter choice. Under parameter revising menu, reducing function key MF can adjust parameter value.</p> <p>2: MF is defined as free stopping key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be free stopping.</p> <p>3: MF is defined as FWD running key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be forward running.</p> <p>4: MF is defined as REV running key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be reverse running.</p> <p>5: MF is defined as forward JOG function key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be forward JOG running.</p> <p>6: MF is defined as reverse JOG function key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be reverse JOG running.</p> <p>7: MF is defined as JOG function key: Pressing MF key is valid under monitor menu and parameter choosing menu, inverter will be JOG running. Running direction decided by F35 bit setting and terminal state.</p> <p>8: MF is defined as UP function key: Pressing MF is always valid, inverter will be UP control, control parameter decided by A38~A42.</p> <p>9: MF is defined as Down function key: Pressing MF is always valid, inverter will be DOWN control, control parameter decided by A38~A42.</p>						
A45	Keyboard Potentiometer X1	0~100.0	%	0.0	Y	
The start point of value keyboard potentiometer set.						
A46	Keyboard PotentiometerX2	0~100.0	%	100.0	Y	
The end point of value keyboard potentiometer set.						
A47	The Value Of Keyboard	0.0~100.0%	%	-	Y	

Section V Parameter Function Table

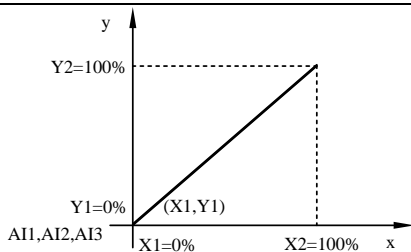
Potentiometer Set							
Displaying value potentiometer set, which can be revised by potentiometer under monitor menu. Value potentiometer set can be regarded as analog of frequency giving, set value=max frequency×keyboard potentiometer set value. Potentiometer set value can be regarded as value of PID giving, value of PID giving=keyboard potentiometer set value.							
A48	Keyboard Potentiometer X1 Corresponding Value Y1	-100.0~100.0	%	0.0	Y		
A49	Keyboard Potentiometer X2 Corresponding Value Y2	-100.0~100.0	%	100.0	Y		
A50	Keyboard Potentiometer Control	1 bit	Saving after power down	0	-	0000	Y
			Cleared after power down	1			
		10 bit	Saving after stoppoing	0			
			Clear saving after stopping command	1			
			Clear saving at end of stopping	2			
		100 bit	Reserved				
1000 bit	Reserved						
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 ceare saving at end of stopping.							
A51	Temperature Adjustment Of Motor	0.0~200.0	%	100.0	N		
Being used to revise displaying of A54 motor temperature.							
A52	Over-heat Temperature Of Motor	0.0~300.0	℃	120.0	N		
A53	Reaction For Motor Over-heat	N reaction for motor over-heat	0	-	0	Y	
		Warning and runing	1				
		Warning and deceleration stopping	2				

Section V Parameter Function Table

		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	-50.0~300.0	°C	-	N	
The motor temperature value measured by optional accessory PT100 can be used for temperature measurement of other parts.						
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 inverter						

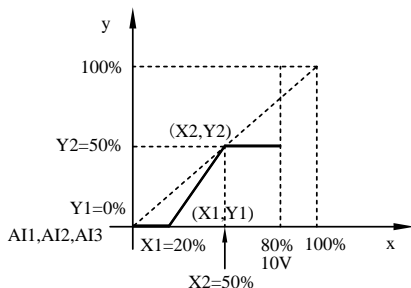
5-5. IO function group

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited
o00	<b>A11</b> Input X1	0~100.0	%	0.0	Y
o01	<b>A11</b> Input X2	0~100.0	%	100.0	Y
o02	<b>A12</b> Input X1	0~100.0	%	0.0	Y
o03	<b>A12</b> Input X2	0~100.0	%	100.0	Y
o04	<b>A13</b> Input X1	0~100.0	%	0.0	Y
o05	<b>A13</b> Input X2	0~100.0	%	100.0	Y
o06	<b>A11</b> Input X1 Corresponding Value Y1	-100.0~100.0	%	0.0	Y
o07	<b>A11</b> Input X2 Corresponding Value Y2	-100.0~100.0	%	100.0	Y
o08	<b>A12</b> Input X1 Corresponding Value Y1	-100.0~100.0	%	0.0	Y
o09	<b>A12</b> Input X2 Corresponding Value Y2	-100.0~100.0	%	100.0	Y
o10	<b>A13</b> Input X1 Corresponding Value Y1	-100.0~100.0	%	0.0	Y
o11	<b>A13</b> Input X2 Corresponding Value Y2	-100.0~100.0	%	100.0	Y
<p>Under the situation Max frequency=50.00hz:                      X1=0% , Y1=0% potentiometer 0V corresponding set frequency: f=Max frequency×Y1=0.00Hz                      X2=100%, Y2=100% potentiometer 10V corresponding set frequency: f=Max frequency×Y2=50.00Hz</p>					



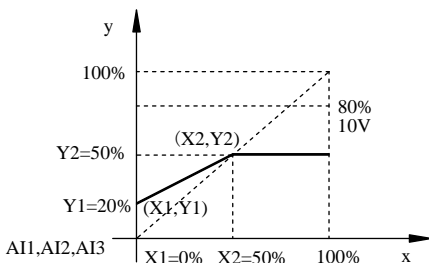
$X1=20\%$  ,  $Y1=0\%$   
 frequency  $\times Y1=0.00\text{Hz}$   
 $X2=50\%$  ,  $Y2=50\%$   
 frequency  $\times Y2=25.00\text{Hz}$

potentiometer 2V      corresponding set frequency:  $f=\text{Max}$   
 potentiometer 5V      corresponding set frequency:  $f=\text{Max}$



$X1=0\%$  ,  $Y1=20\%$   
 frequency  $\times Y1=10.00\text{Hz}$   
 $X2=50\%$  ,  $Y2=50\%$   
 frequency  $\times Y2=25.00\text{Hz}$

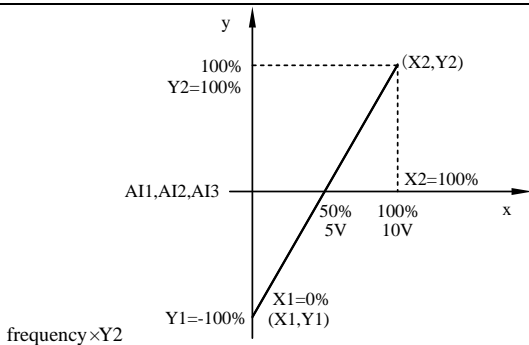
potentiometer 0V      corresponding set value:  $f=\text{Max}$   
 potentiometer 5V      corresponding set value:  $f=\text{Max}$



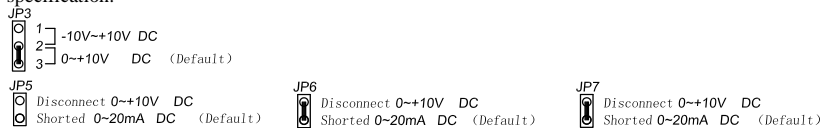
$X1=0\%$  ,  $Y1=-100\%$   
 frequency  $\times Y1=-50.00\text{Hz}$   
 $X2=100\%$  ,  $Y2=100\%$

potentiometer 0V      corresponding set frequency:  $f=\text{Max}$   
 potentiometer 5V      corresponding set frequency:  $f=\text{Max}$

Section V Parameter Function Table



Skipping thread of AI1, AI2, AI3 respectively are JP3/JP5, JP6, JP7, seeing the following detailed specification:



o12	AI1 Input Filter Time	0.00~2.00	s	0.10	Y
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 change of setting frequency will be stable, but responding speed will be slow; If time parameter is set too short, the change of setting frequency will not be stable, but responding speed will be quick.

o15 o16	DA1 Output Terminal DA2 Output Terminal	N reaction	0	-	-	Y
		Setting frequency	1			
		Actual frequency	2			
		Actual current	3			
		Output voltage	4			
		DC bus voltage	5			
		IGBT temperature	6			
		Output power	7			
		Output RPM	8			
	Actual value of torque	9				
o17	DA1 Adjustment Of Lower Limit Output	0.0~100.0	%	0.0	Y	
o18	DA1 Adjustment Of Upper Limit Of Output	0.0~100.0	%	100.0	Y	
o19	DA2 Adjustment Of Lower Limit Output	0.0~100.0	%	0.0	Y	

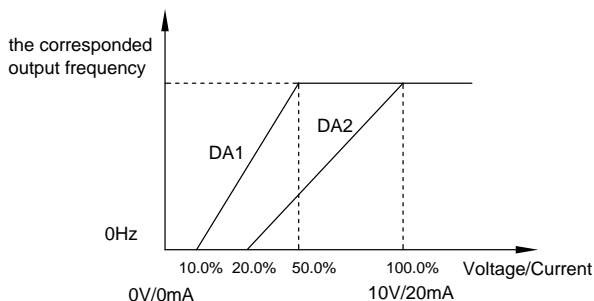


Section V Parameter Function Table

o20	DA2 Adjustment Of Upper Limit Output	0.0~100.0	%	100.0	Y
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Output Content	Setting Value	Giving Output Singla Range
N Reaction	0	N 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 Power	7	0~200%
Output RPM	8	0~Max RPM
Actual Value Of 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.

Section V Parameter Function Table

Section V	o21 o22 o23 o24	O1 Output Signal Option1 O2 Output Signal Option 2 O3 Output Signal Option 3 O4 Output Signal Option 4	N function	0	-	0 0 1 8	Y Y Y Y
			Fault warning	1			
			Over current inspection	2			
			Over load inspection	3			
			Over voltage inspection	4			
			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 inspection	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 limitation	30			
Arrival of current lower limitation	31						

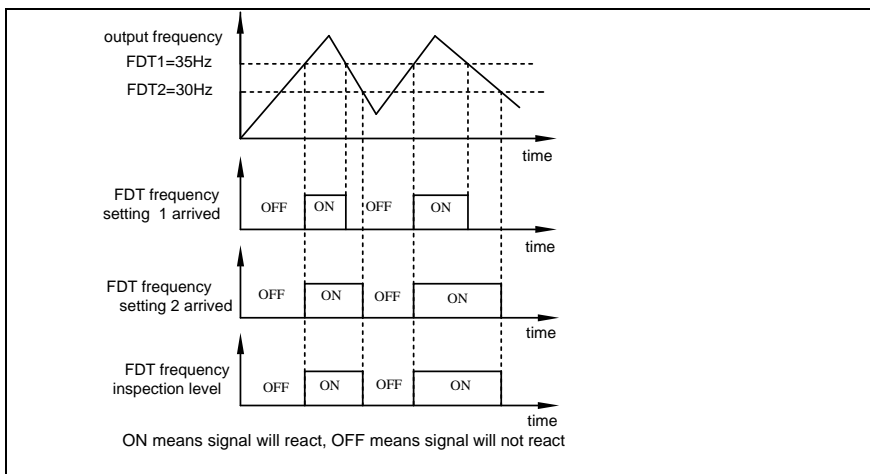
## Section V Parameter Function Table

Setting Value	Output Content	Specification Explanation
0	N 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 vltage
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 Frequency 1	Arrive at frequency 1 FDT set
15	Arrival Of FDT Set Frequency 2	Arrive at frequency 2 FDT set
16	Inspection Level Of FDT Frequency	FDT frequency levels to meet the inspection conditions, 029~031
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	N 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	Inverter is under acceleration running
25	Arrival Of High Pressure	Arrival at high pressure
26	Arrival Of Low Pressure	Arrival at low pressure

Section V Parameter Function Table

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			
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	0~32.000	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
<p>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.</p> <p>When the choice of output signal(o21~o24)is set as15, inverter output frequency arrives at or surpass FDT set frequency 3, 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.</p> <p>When the choice of output signal(o21~o24)is set as16, inverter will firstly inspect FDT set frequency 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.</p> <p>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, Frequency inspection range is 0, the signal output terminal will react as below:</p>					

Section V Parameter Function Table

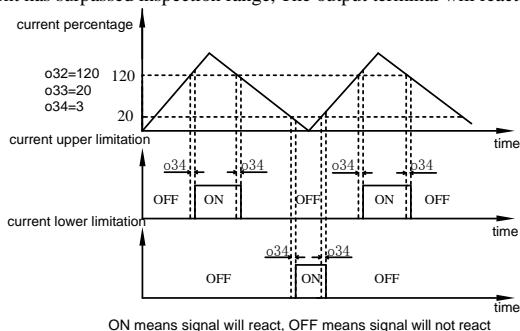


o32	Arrival Of Current Upper Limitation	o33~200%	%	120	Y
o33	Arrival Of Current Lower Limitation	o34~o32	%	20	Y
o34	Current Inspection Range	0~o33	%	3	Y

When the choice of output signal(o21~o24)is set as 30, and inverter output frequency arrived or surpassed of “o32+o34”, the corresponding output signal terminal will react. When the inverter output frequency is less than o32-o34, The corresponding output signal terminal will not react.

When the choice of output signal(o21~o24)is set as 31, and inverter output frequency arrived or less than o33-o34, the corresponding output signal terminal will react;When the inverter output frequency 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.



o35	Terminal Control Mode	bit	Two-wire running control 1	0	-	0x00 13	N
			Two-wire running control 2	1			
			Three-wire running control 1	2			
			Three-wire running control 2	3			

Section V Parameter Function Table

		10 bit	Terminal command is invalid after power on running	0			
			Terminal command is valid after power on running	1			

Setting terminal running mode by this parameter.

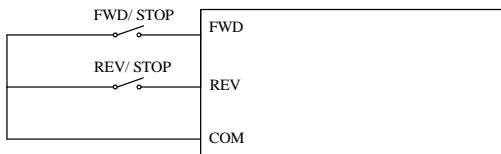
1 Bit set terminal running mode:

The polarity of electrical level is 047 default setting polarity. Low electrical level or falling edge is valid, and the terminal is leakage-source driving mode.

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

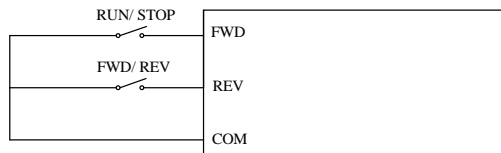
Running Control Mode	Keyboard Running Control	Prior Running	Prior Direction
Edge Trigger	Valid	Same	Same
E-level Trigger	Invalid	Prior running	Prior FWD

0: Two wire running control 1



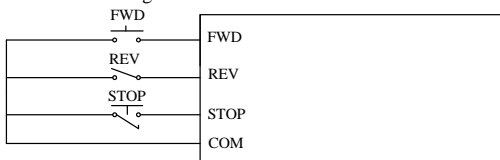
F05=1 or F05=4		F05=3		Command
FWD	REV	FWD	REV	
Falling edge	X	Low E Level	X	FWD running
X	Falling edge	High E-level	Low E-level	REV running
Rising edge	Rising edge	High E-level	High E-level	STOP running

1: Two wire running control 2



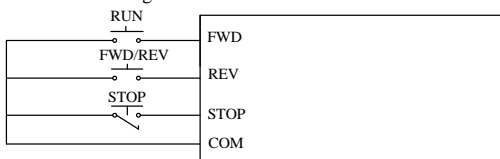
F05=1 or F05=4		F05=3		Command
FWD	REV	FWD	REV	
Falling edge	Falling edge	Low e-level	Low e-level	FWD running
Falling edge	Rising edge	Low e-level	High e-level	REV running
Rising edge	X	High e-level	X	STOP running

2: Three wire running control 1



F05=1 ;F05=3; F05=4			Command
FWD	REV	STOP	
Falling edge	Low e-level	Low e-level	FWD running
Falling edge	High e-level	Low e-level	REV running
X	X	High e-level	STOP running

3: Three wire running control 2



F05=1 ;F05=3; F05=4			Command
FWD	REV	STOP	
Falling edge	X	Low e-level	FWD running
X	Falling edge	Low e-level	REV running
X	X	High e-level	STOP running

10 bit set the terminal status when the power up

Power in an active state when the terminal state, the drive to run immediately, in some cases do not allow such situation happen.

set the terminal running command invalid when the power up, then power-on and after going through the terminal to set an invalid state 3S then running .

	N function	0			
	Forward running FWD	1			
	Reverse running REV	2			
	3-line mode running STOP	3			
	Multi-segment command 1	4			
	Multi-segment command 2	5			
	Multi-segment command 3	6			
	Multi-segment command	7			
	Multi-segment speed command 1	8			
	Multi-segment speed command	9			
	Multi-segment speed command 3	10			

Section V Parameter Function Table

		Multi-segment digital voltage 1	11			
		Multi-segment voltage 2	12			
		Multi-segment voltage 3	13			
		The main set mode 1 of set frequency	14			
		The main set mode 2 of set frequency	15			
		The main set mode 3 of set frequency	16			
	(DI1) Input Terminal Function Selection	The auxiliary setting mode 1 of frequency set	17			
	(DI2) Input Terminal Function Selection	The auxiliary setting mode 2 of frequency set	18			
	(DI3) Input Terminal Function Selection	The auxiliary setting mode 3 of frequency set	19			
o36	(DI4) Input Terminal Function Selection	MSS time running 1	20	-	0	Y
o37	(DI5) Input Terminal Function Selection	MSS time running 2	21	-	0	Y
o38	(DI5) Input Terminal Function Selection	MSS time running 3	22	-	0	Y
o39	(DI6) Input Terminal Function Selection	Operation control mode shift 1	23	-	0	Y
o40	(DI6) Input Terminal Function Selection	Operation control mode shift 2	24	-	0	Y
o41	(DI6) Input Terminal Function Selection	Operation control mode shift 3	25	-	0	Y
o42	(DI7) Input Terminal Function Selection	Forward torque limit shift 1	26	-	0	Y
o43	(DI8) Input Terminal Function Selection	Forward torque limit shift 2	27	-	0	Y
o44	(AI1) Input Terminal Function Selection	Forward torque limit shift 3	28	-	0	Y
o45	(AI2) Input Terminal Function Selection	Reverse torque limit shift 1	29			
o46	(AI3) Input Terminal Function Selection	Reverse torque limit shift 2	30			
		Reverse torque limit shift 3	31			
		Torque speed shift	32			
		fault reset command	33			
		FWD JOG command	34			
		REV JOG command	35			
		JOG order (as F35setting )	36			
		Acceleration and deceleration prohibition command	37			
		Motor 1、 2 shift	38			
		Free stop	39			
		Up command	40			
		Down command	41			
		Automation program running fuction cancel	42			
		Automation program running stop	43			



Section V Parameter Function Table

	Program running start mode	44			
	Program running stop mode	45			
	Pulse counter clearance	46			
	Pulse counter input	47			
	Counter loading	48			
	Upper counter loading	49			
	External fault signal input	50			
	1pump soft-start	51			
	1 pump stop	52			
	2pump soft-start	53			
	2 pump stop	54			
	3pump soft-start	55			
	3 pump stop	56			
	4pump soft-start	57			
	4 pump stop	58			
	handrotate command	59			
	Timing Water Supply change to zero	60			

Setting Value	Output Detail	Specification Explanation
0	N- function	N- function
1	Forward command FWD	Forward command FWD, Can be set to edge triggered or level-triggered
2	Reverse command REV	Reverse command REV, Can be set to edge triggered or level-triggered
3	Three line running STOP	o35 setting 3 line running, STOP function
4	Multi-speed command 1	Synthesis of 16 multi-speed settings. See H parameter Group
5	Multi-speed command 2	
6	Multi-speed command 3	
7	Multi-speed command 4	
8	multi-acceleration command 1	Synthesis of 8 acceleration settings. See H parameter Group
9	multi-acceleration command 2	
10	multi-acceleration command 3	
11	multi-segment digital voltage 1	Synthesis of 8 digital voltage settings. See H parameter Group
12	multi- segment digital voltage 2	
13	multi-segment digital voltage 3	
14	The main set mode 1 of set frequency	Synthesized frequency given to the way the main switch. See F parameter group
15	The main set mode 2 of set frequency	

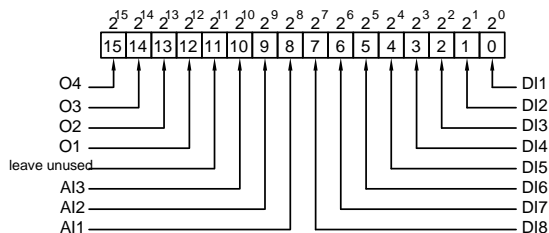
Section V Parameter Function Table

16	The main set mode 3 of set frequency	
17	The auxiliary setting mode 1 of frequency set 1	Synthesized frequency secondary to the way a given switch. See F parameter set
18	The auxiliary setting mode 2 of frequency set	
19	The auxiliary setting mode 3 of frequency set	
20	MSS timing running 1	Synthetic Forward torque limit switch. See C parameter set C15
21	MSS timing running 2	
22	MSS timing running 3	
23	Operation control mode shift 1	Synthesis of 8 run-time switch. See H parameter set
24	Operation control mode shift 2	
25	Operation control mode shift 3	
26	Forward torque limit shift 1	Synthesis of reverse torque limit switch. See C parameter set C15 Group
27	Forward torque limit shift 2	
28	Forward torque limit shift 3	
29	Reverse torque limit shift 1	Synthesis of reverse torque limit switch. See C parameter set C16 Group
30	Reverse torque limit shift 2	
31	Reverse torque limit shift 3	
32	Torque speed shift	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	electromotion forward running command
35	REV JOG command	Electric reverse running command
36	JOG command (as F35 setting )	Electric running the command, direction, set a direction in accordance with F35.
37	Acceleration and deceleration forbid commandr	To maintain the current state to prohibit the acceleration and deceleration movements.
38	Motor 1、2 shift	Motor 1、2 change Invalid status : Motor 1 Valid status : Motor 2
39	Free stop	Free stop machine
40	Up command	Up order, detail A38~A42
41	Down command	Down order, detail A38~A42
42	Auto-run feature programs canceled	Cancel program running function
43	Automatic procedures to suspend operation	program running pause

Section V Parameter Function Table

44	program running start mode	program running start mode			
45	program running stop mode	program running stop mode			
46	pulse count clearance	Edge-triggered, 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-load preset counter o53 counts to o54			
49	upper count loading	Edge-triggered, pulse counter counts o55 maximum load o53			
50	External fault signal input	External fault input, level-triggered, effective after the system reported E_Set failure.			
51	1 pump soft-start	Electric level 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 level 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	3pump soft-start	Electric level 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 start	Electric level 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 order	electric level spring, automation multi-pump constant water changed			
60	the period of time water supply change to zero	electric level spring, the period of time water supply change to zero			
o47	Polarity of input and output terminals	0000~F7FF	-	0000	Y
This parameter used to select every IO terminal is valid in which polarity and terminal running					

command is valid or not when power on.



0~10 bit	Input Terminal Polarity	12~15 bit	Output Terminal Polarity
0	Low level valid(closed)	0	Low level valid(closed)
	Falling edge valid, rising edge invalid		
1	High level valid(disconnected)	1	High level valid(cut off)
	Rising edge valid, falling edge invalid		

o48	Input Terminal Teponse Time 0	0.001~30.000	s	0.005	Y
o49	Input Terminal Reponse Time 1	0.001~30.000	s	0.005	Y

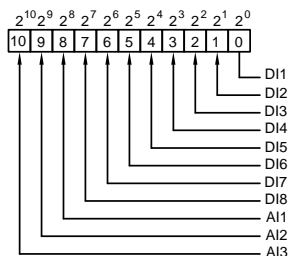
o48, o49 define Input terminal reponse time, through o50 select the reponse time according theterminal.

o50	Input Terminal Reponse Time Selection	0~07FF	-	0	Y
-----	---------------------------------------	--------	---	---	---

o48, o49 define Input terminal reponse time, through o50 select the reponse time according theterminal.

The delay time of the input terminal is valid to the close and cut off action!

Set the parameter choose Input terminal reponse time according every terminal.



Setting 0~10	the polarity of input terminal
0	o48 input terminal reponse time 0
1	o49 input terminal reponse time 1

Section V Parameter Function Table

o51	Counter Collocation	1 bit	Circle counter operating	0	-	0	Y
			Single cycle counter running	1			
		10 bit	Arrive at upper counter value and reload	0			
			Arrive at upper counter value and clear savings	1			
		100 bit	Power on to reload	0			
			power on to clear savings	1			
			power on to keep previous count status	2			
		1000 bit	Count period	0			
			Output signal valid time 20ms	1			
			Output signal valid time 100ms	2			
			Output signal valid time 500ms	3			

1 bit: Control count mode

0: Circulate count, Arrive at upper counter value, output the arrival pulse(output terminal setting)

1: single circulate count, after arrive at upper counter value, output the arrival pulse, stop running.

10bit : Operating after circulate mode reach upper limit count

0: Reload

1: Clear up

100 bit: Define the status of the counter after power on

0: Reload after power on

1: Clear up after power on

2: Keep the status of the previous count

1000 bit: Define o21~o24 is set to reach the preset count or counts to reach the maximum output signal delay time

0: Count period, when reach this digital, keep this status valid, direct the change of the count.

1: the valid time of the output signal 10ms, when reach this count, fixed keep the output status valid 10ms.

2: the valid time of the output signal 100ms, when reach this count, fixed keep the output status valid 100ms.

3: the valid time of the output signal 500ms, when reach this count, fixed keep the output status valid 500ms.

o52	Maximum Pulse Input Frequency	0.1~50.0	kHz	20.0	Y
-----	-------------------------------	----------	-----	------	---

This parameter define the most pulse input frequency of analog setting frequency .

Input high signal frequency, only through multi-function input terminal Di8 as the pulse input terminal.

input pulse setting frequency according the the most input upper limit.

input pulse setting frequency, most input pulse frequency o52 according the most output frequency F12.

Pulse input frequency  $f_{pulse}$  corresponding setting frequency  $f_{set}$  formula:  $f_{set} = f_{pulse}/o52 \times F12$ .

Pulse input analog setting, input most pulse frequency o52 according 100.0%.

Section V Parameter Function Table

Pulse input frequency  $f_{pulse}$  corresponding analog  $p_{set}$  formula:  $p_{set} = f_{pulse}/o52 \times 100.0\%$ .

o53	Current Counter Status	0~9999	-	0	Y
o54	Preset Counter Setting	0~ o55	-	0	Y
o55	Upper Limit Counter Setting	o54-9999	-	9999	Y

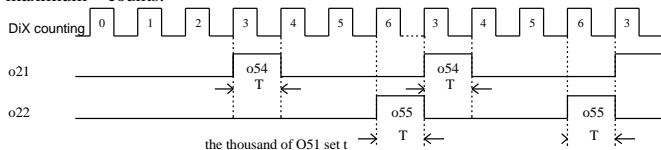
When the pulse signal of the input terminal satisfy with the preset condition, Yi terminal output the corresponding indication.

1、DiX (X = 1 ~ 8) terminal is set to "pulse count input"; and set o54, o55.

DiX (X = 1 ~ 8) terminal is set to pulse counter clearance, terminal moves, the counter is cleared.

DiX (X = 1 ~ 8) terminal is set to preset count loaded terminal moves, the counter load preset counts.

DiX (X = 1 ~ 8) terminal is set to the maximum counts loading terminal moves, the counter load the maximum counts.



2、o21 ~ o24 output signal options:

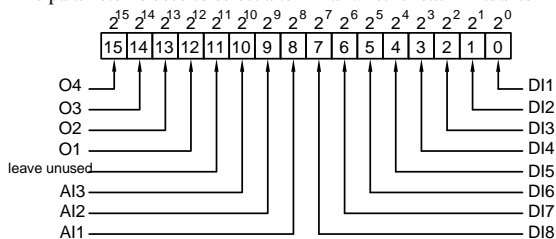
o21 preset counts to reach the maximum count output signal after the effective time setted by o51.

o22 counts to reach the ceiling and reached the maximum counter output signal after the effective time setted by o51.

Counter pulse signal frequency range: 0 ~ 100Hz.

o56	Virtual Terminal Effective Selection	0000~F7FF	-	0000	Y
-----	--------------------------------------	-----------	---	------	---

This parameter is used to select a terminal whether each virtual terminal functionality is valid.



Setting 0~10	Virtual terminal valid choose
0	Actual input terminal valid
1	Virtual input terminal valid

o57	DII~4 Terminal Status	0000~1111	-	-	Y
o58	DI5~8 Terminal Status	0000~1111	-	-	Y
o59	AI1~3 Terminal Status	000~111	-	-	Y
o60	O1~4 Terminal Status	0000~1111	-	-	Y

## Section V Parameter Function Table

Make the actual terminal can only be effective check terminal state.

Make the Virtual terminal can only be effective through register check terminal state.

o61 o62	PL1 Pulse Output PL2 Pulse Output	No action	0	-	0	Y Y
		Set frequency	1			
		Actual frequency	2			
		Actual current	3			
		Output voltage	4			
		DC bus voltage	5			
		IGBT temperature	6			
		Output power	7			
		Output rpm	8			
		Actual torque	9			
o63	PL1 Pulse Output Ratio	1~20	-	10	Y	
o64	PL2 Pulse Output Ratio	1~20	-	10	Y	

PL1, PL2 Provide two-way isolated pulse output signal, it can analogy multiple output signals.  
Pulse output ratio=10, output signal range 0~500hz.

Example:

PL1 pulse output option=2 actual frequency

PL1 pulse output ratio=10

Actual output pulse frequency=actual frequency/Max frequency\*500hz

PL2 pulse output option=3 actual current

PL2 pulse output ratio=20

Actual output ratio frequency=Actual current percentage /200\*1000hz

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 parameter: S03 output current percentage
Output voltage	4	0~200%, correlation parameter: b02、b15 rated voltages of motor
DC bus voltage	5	0~1000VDC
IGBT temperature	6	0~100.0℃
Output power	7	0~200%
Output torque	8	0~Max torque
Actual torque value	9	0~200% torque

When F00 control model=2 close loop vector control, the function is invalid.

## 5-6. Multi-speed PLC Group

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display		Unit	Factory Setting	Change Limited	
H00	Multi-speed Collocation	1 bit	PLC Cancele	0	-	0000	Y
			PLC intelligent	1			
		10 bit	Direction decided by H40~H46	0			
			Direction decided by Terminal and keyboard	1			
		100 bit	Deceleration and acceleration time decided by H26~H39	0			
			Time of acceleration and deceleration isdecided by terminal	1			
		1000 bit	Running time decided by H18~H25	0			
			Running time decided by terminal	1			
<p>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: PLC program runs Cancel            1: PLC program runs intelligent</p> <p>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</p> <p>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</p> <p>1000 bit: Set running time of defined program running            0: running-time decided by the H18 ~ H25            1: Running time decided by terminal</p>							
H01	Program Running Configuration	1 bit	Reserved		-	0710	Y
		10 bit	Program Running start up segment	0~15			
		100 bit	Program running end segment	0~15			
		1000 bit	Output signal valid time 8ms	0			
			Output signal valid time 20ms	1			
			Output signal valid time 100ms	2			
Output signal valid time 500ms	3						
<p>1 bit: function reserved            10 bit: Defining the program running start up segment            100 bit: Defining the end segment of the program running            1000 bit: Defining valid time of program running output signal.</p>							



Section V Parameter Function Table

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			
		1000 bit	Running at the speed when start up segment	0			
			Running at the speed before stop	1			

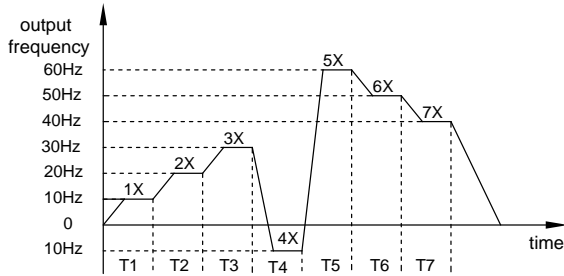
1 bit: Program running mode cycle

0: single-cycle.

1: continuous cycle.

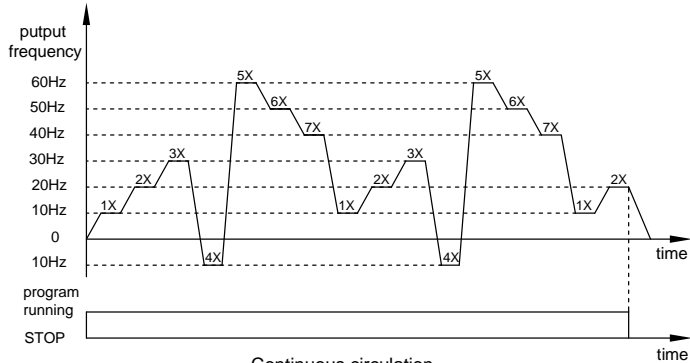
2: single cycle, according to the 7 segment continuously runs, receives STOP command and stop. Program runs in three ways as follows:

Example 1: The program runs single-cycle mode



Single circulation

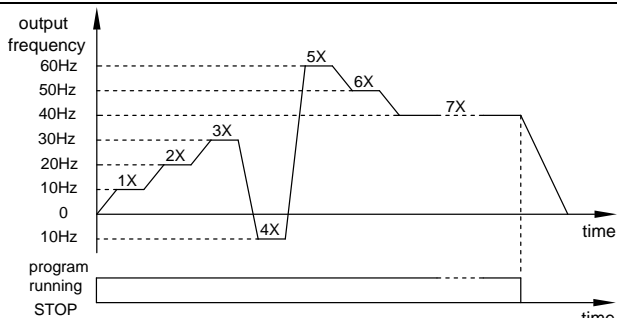
Example2:The program running continuous cycle mode



Continuous circulation

Example 3: The program is running in the single cycle, according to the 7 segment of the speed running mode

Section V



Single circulation, continuous running at step 7 speed

10 bit: The running status when pause

0: The zero speed running when pause.

1: Fixed-speed running when the suspension

100 bit: run segment when stop

0: Stop with the parameters set when stop

1: Stop with the settings of start up

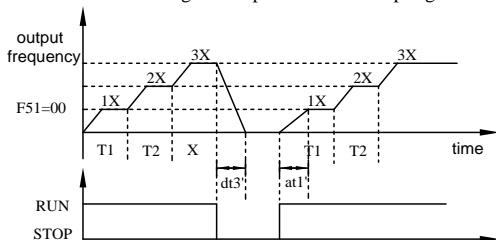
1000 bit : Running segment when start up.

0: Running at the speed when start up segment

1: Running at the speed before stop

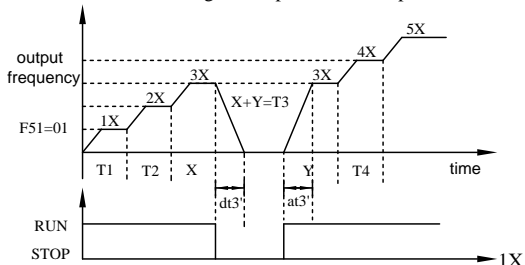
Example: Hundred = Stop with the parameters set when stop

Thousand = 0 Running at the speed when start up segment



Example: Hundred = 0 Stop with the parameters set when stop

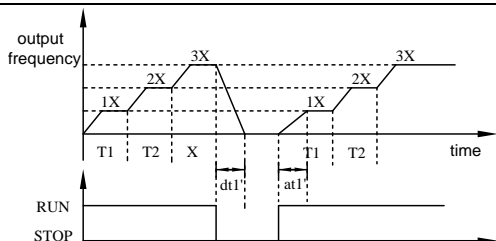
Thousand = Running at the speed before stop



Example: hundred=1 As start parameter is set to shut down

Thousand=1 stop front-end speeds

Section V Parameter Function Table



**Note:**

- at1': the acceleration time at the acc time at1;
- dt1': the deceleration time at the dcc time dt1 ;
- at3': the acceleration time at the acc time at3;
- dt3': the deceleration time at the dcc time dt3

H03	1 Segment Speed Setting 1X	Lower frequency ~ upper frequency	Hz	5.00	Y
H04	2 Segment Speed Setting 2X	Lower frequency ~ upper frequency	Hz	30.00	Y
H05	3 Segment Speed Setting 3X	Lower frequency ~ upper frequency	Hz	20.00	Y
H06	4 Segment Speed Setting 4X	Lower frequency ~ upper frequency	Hz	30.00	Y
H07	5 Segment Speed Setting 5X	Lower frequency ~ upper frequency	Hz	40.00	Y
H08	6 Segment Speed Setting 6X	Lower frequency ~ upper frequency	Hz	45.00	Y
H09	7 Segment Speed Setting 7X	Lower frequency ~ upper frequency	Hz	50.00	Y
H10	8 Segment Speed Setting 8X	Lower frequency ~ upper frequency	Hz	5.00	Y
H11	9 Segment Speed Setting 9X	Lower frequency ~ upper frequency	Hz	30.00	Y
H12	10 Segment Speed Setting 10X	Lower frequency ~ upper frequency	Hz	20.00	Y
H13	11 Segment Speed Setting 11X	Lower frequency ~ upper frequency	Hz	30.00	Y
H14	12 Segment Speed Setting 12X	Lower frequency ~ upper frequency	Hz	40.00	Y
H15	13 Segment Speed Setting 13X	Lower frequency ~ upper frequency	Hz	45.00	Y
H16	14 Segment Speed Setting 14X	Lower frequency ~ upper frequency	Hz	50.00	Y
H17	15 Segment Speed Setting 15X	Lower frequency ~ upper frequency	Hz	50.00	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.

0X speed is the regular running mode, setting source can be adjusted by F02, F03 and other parameters, running time is controlled by the H18.

Section V Parameter Function Table

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 Command 4	ON	ON	ON	ON	ON	ON	ON	ON

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 acceleration time controlled by parameter	8X-15Xdeceleration and acceleration time controlled by keyboard and terminal
	1	0X -7X deceleration and acceleration time controlled by terminal	
H00 1000 bit	0	0X -7Xrunning time controlled by parameter	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

Section V Parameter Function Table

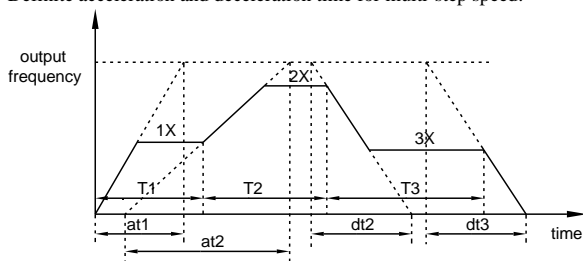
H22	4 Segment Running Time T4	0.0~3200.0	s	2.0	Y
H23	5 Segment Running Time T5	0.0~3200.0	s	2.0	Y
H24	6 Segment Running Time T6	0.0~3200.0	s	2.0	Y
H25	7 Segment Running Time T7	0.0~3200.0	s	2.0	Y

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 Acceleration Time at1	0.0~3200.0	s	10.0	Y																																																											
H27	1 Segment Deceleration Time dt1	0.0~3200.0	s	10.0	Y																																																											
H28	2 Segment Acceleration Time at2	0.0~3200.0	s	10.0	Y																																																											
H29	2 Segment Deceleration Time dt2	0.0~3200.0	s <td 10.0	Y	H30	3 Segment Acceleration Time at3	0.0~3200.0	s	10.0	Y	H31	3 Segment Deceleration Time dt3	0.0~3200.0	s	10.0	Y	H32	4 Segment Acceleration Time at4	0.0~3200.0	s	10.0	Y	H33	4 Segment Deceleration Time dt4	0.0~3200.0	s	10.0	Y	H34	5 Segment Acceleration Time at5	0.0~3200.0	s	10.0	Y	H35	5 Segment Deceleration Time dt5	0.0~3200.0	s	10.0	Y	H36	6 Segment Acceleration Time at6	0.0~3200.0	s	10.0	Y	H37	6 Segment Deceleration Time dt6	0.0~3200.0	s	10.0	Y	H38	7 Segment Acceleration Time at7	0.0~3200.0	s	10.0	Y	H39	7 Segment Deceleration Time dt7	0.0~3200.0	s	10.0	Y
H30	3 Segment Acceleration Time at3	0.0~3200.0	s	10.0	Y																																																											
H31	3 Segment Deceleration Time dt3	0.0~3200.0	s	10.0	Y																																																											
H32	4 Segment Acceleration Time at4	0.0~3200.0	s	10.0	Y																																																											
H33	4 Segment Deceleration Time dt4	0.0~3200.0	s	10.0	Y																																																											
H34	5 Segment Acceleration Time at5	0.0~3200.0	s	10.0	Y																																																											
H35	5 Segment Deceleration Time dt5	0.0~3200.0	s	10.0	Y																																																											
H36	6 Segment Acceleration Time at6	0.0~3200.0	s	10.0	Y																																																											
H37	6 Segment Deceleration Time dt6	0.0~3200.0	s	10.0	Y																																																											
H38	7 Segment Acceleration Time at7	0.0~3200.0	s	10.0	Y																																																											
H39	7 Segment Deceleration Time dt7	0.0~3200.0	s	10.0	Y																																																											

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

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

Section V Parameter Function Table

H40 H41 H42 H43 H44 H45 H46	1 Segment Speed Configuration Word	1 bit	Running direction: forward	0	-	0000	Y
			Running direction: reverse	1			
	2 Segment Speed Configuration Word	10 bit	Running time: ×seconds	0			
			Running time: ×minutes	1			
			Running time: ×hours	2			
	3 Segment Speed Configuration Word	100 bit	Running time: ×days	3			
			Acceleration time: ×seconds	0			
	4 Segment Speed Configuration Word	100 bit	Acceleration time: ×minutes	1			
			Acceleration time: ×hours	2			
	5 Segment Speed Configuration Word	100 bit	Acceleration time: ×days	3			
			Deceleration time: ×seconds	0			
	6 Segment Speed Configuration Word	1000 bit	Deceleration time: ×minutes	1			
			Deceleration time: ×hours	2			
	7 Segment Speed Configuration Word	1000 bit	Deceleration time: ×days	3			

In program multi-speed 1 running, the digit parameters decide the direction of each speed.

Running Direction	Setting Value
forward	0
reverse	1

When running control mode F05=0/1/2, these parameters decide the direction of each speed.

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

FWD=1 Running direction	FWD=1 Running direction	Setting Value
forward	reverse	0
reverse	forward	1

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

Running Time	Tens bit	Range(e.g.H18~H25=3200.0)
×seconds	0	3200.0 seconds
×minutes	1	3200.0 minutes
×hours	2	3200.0 hours
×days	3	3200.0 days

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

Acceleration /Decelationtime	KB, 100	Range(e.g.H26~H39=3200.0)
×second	0	3200.0 seconds
×minute	1	3200.0 minutes
×hour	2	3200.0 hours
×day	3	3200.0 days

Section V Parameter Function Table

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		
<p>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.</p>							
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			
		1000 bit	Current digit voltage segment	0~0x7			
<p>1 bit: Current speed segment                  0~16 segment, In hex, can be shift 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 be shifted by terminal o36~o46</p>							

Section V

5-7. V/Fcurve Group

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited
U00	V/Fsetting Frequency1	0.00~U02	Hz	5.00	N
<p>User-defined the first frequency value of V / F curve, corresponding to V1</p>					

## Section V Parameter Function Table

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 converter, corresponding to F1.					
U02	V/F Setting Frequency 2	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 Frequency 3	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 Frequency 4	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 Frequency 5	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 Frequency 6	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 Frequency 7	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 Frequency 8	U12~most 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

Code	Description/LCD Keyboard Display	Setting Range		Unit	Factory Setting	Change Limited	
		7 Step LED Display					
P00	PID Configuration	1 bit	Unidirection regulation	0	-	0000	N
			Bidirection regulation	1			
		10 bit	Negative effect	0			
			Positive effect	1			
		100 bit	PID fault, N action	0			
			Warning & Continuous running	1			
			Warning & Decelerating stop	2			
			Warning & Free stop	3			
		1000 bit	-	-			
		<p>When the inverter receives start 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:</p> <p style="text-align: center;">(Δ= setting signal - feedback signal)</p> <p style="text-align: center;">PI8000/PI8100 PID regulation</p> <p>0: negative action, when Δ is positive, frequency rises and when Δ is negative, frequency falls.  1: positive action, when Δ is positive, frequency falls and when Δ is negative, frequency rises.  PID abnormality treatment:  1: Warning &amp; Continuous running: continue running after abnormality feedback signal.  2: Warning &amp; Decelerating stop: decelerate and stop after abnormality feedback signal.  3: Warning &amp; Free stop: free stop after abnormality feedback signal.</p>					
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	-	1	Y	
		A11 external analogy giving	1				
		A12 external analogy giving	2				
		A13 external analogy giving	3				
		Keyboard potentiometer giving	4				
		multi-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	
		A11 external analogy giving	1				

Section V Parameter Function Table

		AI2 external analogy giving	2			
		AI3 external analogy giving	3			
		Keyboard potentiometer giving	4			
		muti-step digital voltage giving	5			
		Digital pulse set	6			
<p>PID giving signal selection, can select keyboard/Rs485, potentiometer, digital voltage, digital pulse for giving signal.</p>						
P04	Keyboard Set Signal	0.0~100.0	%	50.0	Y	
<p>When P03 is 4, the setting pressure set by the keyboard. 0.0~100.0% is 0 to the maximum pressure respectively.</p>						
P05	PID integral time integral time	0.002~10.000	s	0.250	Y	
<p>0.002~10.000s</p> <p>The parameter determines the integral regulation speed, the regulation acts on the difference between PID feedback and getting value by PID regulator.</p> <p>When the difference between PID feedback and getting value is 100%, integral regulator continues to regulate output to <math>(P01 \times F13 \times 12.5\%)</math>Hz during the PID integral time.(single direction PID regulation, ignores proportion and differential effect).</p> <p>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.</p> <div style="text-align: center;"> </div>						
P06	PID Differential Time	0.000~10.000	s	0.000	Y	
<p>0.000~1.000s</p> <p>The parameter determines the regulation intensity, the regulation acts on the change ratio of the difference between PID feedback and getting value by PID regulator.</p> <p>When the change ratio of the difference between PID feedback and getting value is 100% in the differential time, PID regulator regulates output to <math>(P01 \times F13 \times 12.5\%)</math>Hz (single direction PID regulation, ignores proportion and integral effect).</p> <p>If the value is great, the greater the intensity is, the system surge is to occur more easily</p>						
P07	PID Proportion Gain	0~1000.0	%	100.0	Y	
<p>0~100.0%</p> <p>The parameter defines regulation intensity of PID regulator, the larger the P is, the more the intensity is.</p> <p>When proportion gain is 100%, and the difference between PID feedback and getting value is 100%, PID regulator's output is <math>(P01 \times F13 \times 12.5\%)</math>Hz(single direction PID regulation, ignores differential and integral effect).</p> <p>Proportion gain is the parameter decides PID regulator's response extent.</p> <p>If the gain is great, the response is rapid, but if too great, the surge will occur; the gain is little,</p>						

## Section V Parameter Function Table

<p>the response will lag.</p>					
P08	PID Sampling Period	0.002~10.000	s	0.010	Y
<p>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</p>					
P09	Deviation Limit	0.0~20.0	%	5.0	Y
<p>Deviation limit effects system control accuracy and stability.                  When the deviation of feedback signal and giving signal &lt;deviation limit, PID N regulation, keep output stable.                  When the deviation of feedback signal and giving signal &gt;deviation limit, PID regulates according to deviation, update output</p>					
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
<p>Set P10 to 0. 0 for N fault inspection.                  When PID feedback signal &lt;P11 set PID fault inspection value, last P10set time, regard it as PID regulation fault.</p>					
P12	PID Display Range	0.00~100.00	-	1.00	Y
<p>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.</p>					

Section V

### 5-9. Extention parameters

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	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			

Section V Parameter Function Table

		Multi-pumps constant pressure water supply	9			
		Reserved	10			
		Reserved	11			
		Torque control	12			
		Voltage regulation power	13			
		Current regulation power	14			

Details, see Appendix 4.

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 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 ac drive will change from running to the stop standby state.

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

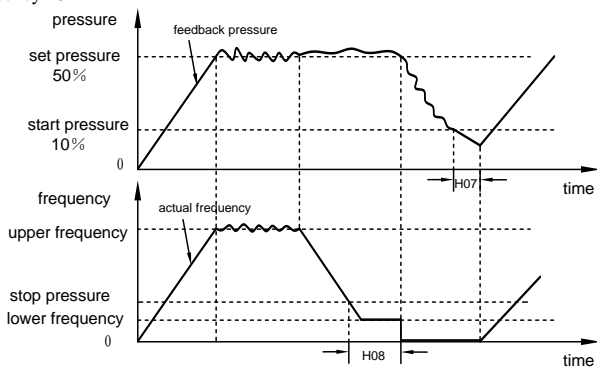
E01, E02, E03, E04 mix are used to control system operation and water supply systems in the energy-saving water pressure regulator.

For example:

Given pressure = 50%

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

Topping 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

Section V Parameter Function Table

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	Timing To Supply Water	1 bit	Timing water supply	invalid	0	-	0000	Y
			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			
1000 bit	Current timing step							

1 bit: Timing water supply

0 Timing water supply function is invalid

1 Timing water supply function is valid

10 bit: pressure giving

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

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, 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 time	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	Hours	0.0	N
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Timing shif alternation time can control the pump's rotation mode and time.

When the timing shif alternation time is set to 0.0 hours, it means cancel timing rotation function.

When the timing shif alternation time set between 0.1 to 3200.0, then after a stable operation for

Section V Parameter Function Table

a while, it will control the pump rotation at the principle of first start and first stop.

First start and first stop: if want stop some pumps, should firstly stop the first starting pump.

According first stop and first start principle to add or reduce pumps can help to ensure each pump has chance to run which can protect some pumps from being rust due to non-run for a long time. If user need keep each pump run at a average time, then just need set the timing shift alternation time

Order of adding pumps : pump 1→pump 2→pump 3→4

Order of reducing pumps: pump 4→pump 3→pump 2→pump 1

Same as currently: pump 1 at working frequency, pump 2 at working frequency, pump 3 at variable frequency

Reduce pumps: pump 1 at working frequency, pump 2 at variable frequency.

Then add pumps: pump 1 at working frequency, pump 2 at working frequency, 4# pump at variable frequency.

Reduce pump: pump 1 at working frequency, pump 2 at variable frequency.

Reduce pump: pump 1 at variable frequency

Add pump : pump 1 at working frequency, pump 3 at variable frequency.

Add pump: pump 1 at industry frequency, pump 3 at industry frequency, pump 4 at variable frequency.

Add pump: pump 1 at industry frequency, pump 3 at industry frequency, pump 4 at industry frequency, pump 2 at variable frequency.

E09	Electromagnetic Switch Action Delay	0.000~10.000	s	0.500	Y
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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
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To set the determine time from inverter output frequency reaches the upper frequency until increase pump (drive motor); or from inverter output frequency reaches the lower frequency until decrease pump (drive motor). Time setting is based on the pressure change speed, if it is within the scope of N oscillation occurred, the time set i is the shorter the better. Inverter will control E12 constant pressure water supply pump.

E11	Constant Pressure Water Supply Configuration	1 bit	Stop mode	all pumps slow down stop	0	-	0000	N
				Variable frequency pump stop	1			
				Free stop	2			
				Water supply Pump stop	3			
	10 bit	Pumps status when fault occurs	Keep current situation	0				
			All-pumps stop	1				
	100 bit	Alternation shift mode	Variable frequency to working frequency	0				
			Variable frequency to stop	1				
1000 bit	Pump status keep	Keep status	0					
		Stop reset	1					

Bit: stop mode

Section V Parameter Function Table

<p>0 All deceleration stop: All pumps deceleration stop in turn.                  A Variable Frequency pump stop: Variable Frequency stop running, power frequency operation of Variable Frequency pump and soft-starting pump to keep running.                  Stop power frequency pump, need to use the o36 ~ o46 input terminals of free stop commands or multi-function keyboard keys MF1, MF2 is set to 2: free stop feature.                  2 Free stop: all pumps free stop.                  3 for the water supply pump stop: Only involved in constant pressure water pump stop, the softstart frequency pump to keep running.                  10 bits: failure of state handling pump                  0 maintaining the status: when inverter fault occurs, stop the current variable frequency pump unning, the other power frequency pump operation of variable frequency pump and soft starting pumps maintain the status.                  1 all pump stop: When the inverter fails, all the pumps free stop.                  100 bits: take turns for switch mode                  0 Variable frequency to power frequency: the current variable frequency control pump up the speed to power frequency, the pump switch in turn or soft start pump start and stop control.                  1 Variable frequency to stop: when the current Variable frequency control pump stopped, the pump switch in turn or soft start pump start and stop control.</p>							
E12	Multi-pumps Configuration	1 bit	Pump 1 invalid	0	-	1111	N
			Pump 1 variable frequency to control pump	1			
			Pump 1 soft starts to control pump	2			
		10 bit	Pump 2 invalid	0			
			Pump 2 variable frequency to control pump	1			
			Pump 2 soft starts to control pump	2			
		100 bit	Pump 3 invalid	0			
			Pump 3 variable frequency to control pump	1			
			Pump 3 soft starts to control pump	2			
		1000 bit	Pump 4 invalid	0			
			Pump 4 variable frequency to control pump	1			
			Pump 4 soft starts to control pump	2			
Underling 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 in variable frequency	1			

Section V Parameter Function Table

		100 bit	Pump 2 run in working frequency	2			
			Pump 3 stop	0			
			Pump 3 run in variable frequency	1			
			Pump 3 run in working frequency	2			
		1000 bit	Pump 4 stop	0			
			Pump 4 run in variable frequency	1			
			Pump 4 run in working frequency	2			

Underling Multi-pump control mode, displays the status of each pump.

E14	Soft Starting Pump Control	1 bit	Pump 1 stop	0	-	0000	Y
			Pump 1 soft-start	1			
		10 bit	Pump 2 stop	0			
			Pump 2 soft-start	1			
		100 bit	Pump 3 stop	0			
			Pump 3 soft-start	1			
		1000 bit	Pump 4 stop	0			
			Pump 4 soft-start	1			

Underling 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

※Please check appendix 4 for the detailed extension parameter instruction.

### 5-10. Speed-loop parameter [SPD]

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited
C00	Filter Time Of Speed-loop	2~200	ms	10	Y
<p>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.</p>					



## Section V Parameter Function Table

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	%	80	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 sement 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	%	200.0	Y
This parameter is a ratio, that is, the user can set the maximum forwarding torque.					

Section V Parameter Function Table

C14	Upper Reverse Torque	0.0~300.0	%	200.0	Y	
This parameter is a ratio, that is, the user can set the maximum reversing torque.						
C15	Forward Torque Set Mode	Sey by keyboard or RS485	0	-	0	Y
		AI1 external alalogy giving	1			
		AI2 external alalogy giving	2			
		AI3 external alalogy giving	3			
		Keyboard potentiometer giving	4			
		muti-step digital voltage giving	5			
		Digital pulse set	6			
C16	Reverse Torque Set Mode	Keyboard set or RS485	0	-	0	Y
		AI1 external alalogy giving	1			
		AI2 external alalogy giving	2			
		AI3 external alalogy giving	3			
		Keyboard potentiometer giving	4			
		muti-step digital voltage giving	5			
		Digital pulse set	6			
C17	Torque Set Gain	0.0~300.0	%	200.0	Y	
<p>Forward torque set mode and reverse torque set mode, can select keyboard/RS485, potentiometer, digital voltage, digital pulse for giving signal.</p> <p>0: keyboard set, set by C13、C14.</p> <p>1~6: C13 forward torque upper = set value percentage × C17 torque giving gain                      C14 reverse torque upper = set value percentage × C17 torque giving gain                      Example.: C15 forward torque giving method = 4 keyboard pretentimometer giving                      When keyboard pretentimometer giving A47=100%, C17=200.0%, C13 forward torque upper = 100% × 200.0% = 200.0%</p>						
C18	Speed /Torque Control Shift	Speed control	0	-	0	Y
		Torque control	1			
<p>F00 control method is to selecte 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.</p>						
C19	Forward Speed Limit	0.00~Maxmum frequency	-	50.00	Y	
Forward speed limit when torque control						
C20	Reverse Speed Limit	0.00~ Maxmum frequency	-	50.00	Y	
Reverse speed limit when torque control.						
C21	Torque Acceleration Time	0.0~200.0	s	1.0	Y	
Torque accelerate time, Torque accelerate time from 0 to 300.0%						
C22	Torque Deceleration Time	0.0~200.0	s	1.0	Y	
Torque decelerate time, Torque decelerate time from 300.0% to 0						
C23	Low Speed Exitation Compensation	0~100	%	30	Y	
Under low speed, compensate exitation quantity, increase torque feature, in case of meetingthe						

Section V Parameter Function Table

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 intergral time. When Intergral time is too long, response is inactive; the ability to control external jamming becomes weak. When intergral 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	N PG break protection	0	-	3	Y
		Warning and keeping running	1			
		Warning and deceleration stop.	2			
		Warning and free stop.	3			
Set the brake method when detect PG break. 0: N 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	-	0	Y
		When motor forward, phase B leads	1			
<p>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 <b>Note:</b> above parameters are valid when with encoder(PG), need to layout PG card. If needed, please contact our company.</p>						
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 sert C31 to 0, don't check PG dropped fault.						

## 5-11. Motor parameter [MOT]

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited	
b00	Motor 1 Rated Frequency	0.00~Maximum 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	
<p>b00~b04 are the motor's nameplate parameters which touch the precision. Set the parameters according to the motor's nameplate.</p> <p>b00 ~ b04 motor nameplate in parameters, it is necessary to re-calculate motor parameters by using b11.</p> <p>Excellent vector control performance requires exact motor parameters. Exact parameters are based on the correct setting of motor's rated parameters.</p> <p>To assure the control performance, please match the right motor as per the inverter's standard, motor rated current is limited between 30%~120% of inverter rated current.</p> <p>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.</p> <p>To prevent self-cooled motor from overheating when running in a low speed, and the motor capacity change when motor characteristics change little, the user can correct the parameter to protect the motor.</p> <p>The number of motor pole pairs, such as the four pole motor, the number of pole pairs is set to 2</p>						
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	
<p>b05~b09 can be input by motor actual parameters value, also can define motor parameter by b11 parameter measurement function and save automatically. If you know the correct motor parameter, you can input by hand.</p> <p>When b11 is 1, 2, 3, the system calculates and measures automatically.</p> <p>b05~b09 is the motor's basic electric parameters, these parameters are essential to achieve vector control calculation.</p>						
b10	Motor Selection	Motor 1	0	-	0	N
		Motor 2	1			
<p>The system can select any group motor parameters.</p> <p>Motor parameter measurement modify and save to corresponding motor parameter area automatically.</p>						
b11	Motor Parameter Measurement	N measurement	0	-	0	N
		calculate by label data	1			
		inverter static measurement	2			
		inverter rotation measurement	3			
<p>Set whether the measurement of electrical parameters in order to b10 motors choose motor 1 as an example.</p> <p>0: N measurement</p>						

## 1: Calculate by table data

According to the motor nameplate parameters b00 ~ b04, automatic calculation b05 ~ b09 and other electrical parameters, the advantage does not require power-on self-tuning, 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 static, 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-messure the motor parameter, must input motor rated parameter b00~b04or b13~17 correctly

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

When automatic regulation, motor should be in stop status.

b12	Vector Control Cstarting	Not inspection R1	0	-	0	N
	Inspection R1	Inspection R1	1			
b13	Motor 2 Rated Frequency	0.00~Maxmum 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

Section V Parameter Function Table

b19	Motor 2 Stator Resistance	0.000~30.000	ohm	★	Y
b20	Motor 2 Rotator Resistance	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 [SYS]**

Code	Description/LCD Keyboard Display	Setting Range 7 Step LED Display	Unit	Factory Setting	Change Limited	
y00	Reset System Parameter	N action	0	-	0	N
		Reset system parameter with keyboard storage 1	1			
		Reset system parameter with keyboard storage 2	2			
		Reset system parameter with keyboard storage a3	3			
		Reset system parameter with keyboard storage 4	4			
		Reset system parameter with factory set value	5			
0: N 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	N action	0	-	0	N
		Reset system parameter with keyboard memory area1	1			
		Reset system parameter with keyboard memory area2	2			
		Reset system parameter with keyboard memory area3	3			
		Reset system parameter with keyboard memory area4	4			
		Clear up keyboard memory area 1, 2, 3, 4	5			
0: N 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	

Section V Parameter Function Table

y03	Fault Record 1	Press [PRG]and [▲/▼] key the frequency, current 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	LED display	Fault message
0	E.OCP	System is disturbed or impacted by instant over current
1	E.OCC	Over current signal from current inspected circuit.
2	E.OCF	Over current or over voltage signal from drive circuit.
3	E.OU	Over voltage
4	E.LU	Under voltage
5	E.OL	Over load
6	E.UL	Under load
7	E.PHI	Phase loss
8	E.EEP	EEPROM error
9	E.ntC	Over heat
10	E.dAt	Time limit fault
11	E.Set	External fault
12	E.PId	PID regulation fault
13	E.OHt	Motor over heat fault
14	E.OL2	Motor over load fault
15	E.PG	PG error
16	E.PHo	Inverter output phase-loss
17	E.COA	Rs485 communication terminal A fault
18	E.COOb	Rs485 communication terminal B fault
19	E.CAL	Parameter identification fault

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

6: running time at the time of fault

Section V Parameter Function Table

The running time at the time of fault

7: Inverter IGBT temperature at the time of fault

Inverter IGBT temperature

LED display expresses the running state, and explains as following:

The First Bit Of LED		The Second Bit Of LED		The Third Bit Of LED	The Fourth Bit Of LED		
F	forward command	F	forward state		compartmentation code	A	accelerating
R	reverse command	R	forward state			D	decelerating
S	stop command	S	stop state			E	running in a even speed
				S		stop state	

y08	Fault Record Reset	N action	0	-	0	Y
		Reset	1			

0: N action, the fault records retains

1: the fault records resets

y09	Rated Output Current	0.1~1000.0	A	★	N
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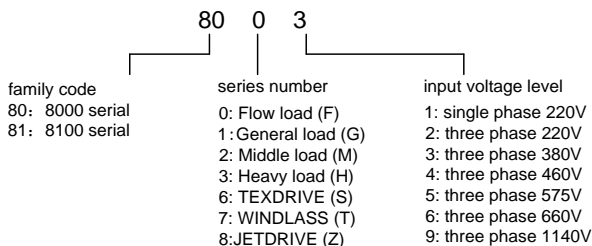
Inverter rated output current.

y10	Rated Input Voltage	100~1140	V	★	N
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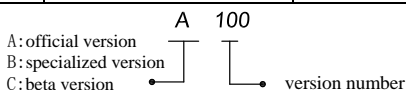
The rated input voltage of the inverter. It would be set as per inverter input voltage level before leaving factory.

y11	Product Series	80	0	3	-	★	N
		Family code	Product serial	Input voltage grade			

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



y12	Software Version	-	-	-	N
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y13	Product Date-- Year	YYYY	-	-	N
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y14	Product Date -Month/Day	MMDD	-	-	N
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Section V Parameter Function Table

y15	User Decode Input	0~9999		Set range	-	-	Y
		Record password wrongly input times		Display info			
<p>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.</p> <p>Once the input is right in any time during three times input limit, the parameter is unlocked.</p>							
y16	User password key-in	0~9999		Set range	-	-	Y
		N password or decode input is correct	code	Display info			
		Parameter lock-in	code				
<p>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”.</p> <p>Set password to 0, reset user password set, after re-electrify status is decode.</p>							
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

Section V

## Section VI. Fault Diagnosis & Solutions

### 6-1. Problems and solutions

Problems	Possible causes	Solutions
Keyboard can not control	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 indicates error message	KeyRESET or terminal for fault reset, learn and fix the fault according to the fault info
	N 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 N 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 condition, and confirm the model selection is right
Overcurrent E.OC	Fault display E.OCP	System is disturbed or instant over current
	Fault display E.OCC	OC signal from current self-inspected circuit impact
	Fault display E.OCF	OC signal from drive circuit
	Fault display E.OC3	Motor over current and current exceed 3 times of motor's rated current
	Over current during acceleration	Reset or modify the parameters of the functions F09, F20, F21
	Over current during deceleration	Reset or modify the parameters of the functions 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	Too much 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 <u>b04</u> , <u>b14</u> in case of the motor over-load allowed

Over voltage E.OU	Power voltage exceeds the limit	Check voltage is right or not. Frequency inverter rated voltage setting is right or not.
	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 right or not.
	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 temperature (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

#### 7-1-1. PI8000 Specification

Inverter type	Light Load F		Standard Load G		Medium Load M		Heavy Load H		Structure item
	P <sub>F</sub> kW	I <sub>F</sub> A	P <sub>G</sub> kW	I <sub>G</sub> A	P <sub>M</sub> kW	I <sub>M</sub> A	P <sub>H</sub> kW	I <sub>H</sub> A	
3 phase voltage 380V 50/60Hz									
PI8000●●●□3	15	32	11	25	7.5	16	7.5	16	8N3
PI8000●●●□3	18.5	38	15	32	11	25	11	25	8N3
PI8000●●●□3	22	45	18.5	38	15	32	11	25	8N4
PI8000●●●□3	30	60	22	45	18.5	38	15	32	8N4
PI8000●●●□3	37	75	30	60	22	45	18.5	38	8N5
PI8000●●●□3	45	90	37	75	30	60	22	45	8N5
PI8000●●●□3	55	110	45	90	37	75	30	60	8N6
PI8000●●●□3	75	150	55	110	45	90	37	75	8N6
PI8000●●●□3	93	170	75	150	55	110	45	90	8N7
PI8000●●●□3	110	210	93	170	75	150	55	110	8N7
PI8000●●●□3	132	250	110	210	93	170	75	150	8N8
PI8000●●●□3	160	300	132	250	110	210	93	170	8N8
PI8000●●●□3	187	340	160	300	132	250	110	210	8NA
PI8000●●●□3	200	380	187	340	160	300	132	250	8NA
PI8000●●●□3	220	415	200	380	187	340	160	300	8NA
PI8000●●●□3	250	470	220	415					8NA
PI8000●●●□3	280	520	250	470	200	380	187	340	8NB
PI8000●●●□3	315	600	280	520	220	415	200	380	8NB
PI8000●●●□3	355	640	315	600	250	470	220	415	8NB
PI8000●●●□3	400	750	355	640	280	520	250	470	8NB

## 7-1-2. PI8100 Specification

Inverter type	Light Load F		Standard Load G		Medium Load M		Heavy Load H		Structure item
	P <sub>F</sub> kW	I <sub>F</sub> A	P <sub>G</sub> kW	I <sub>G</sub> A	P <sub>Z</sub> kW	I <sub>Z</sub> A	P <sub>H</sub> kW	I <sub>H</sub> A	
<b>Single phase voltage 220V 50/60Hz</b>									
PI8100...□1	0.75	4	0.4	2.5					7N3
PI8100...□1	1.5	7	0.75	4	0.4	2.5			7N3
PI8100...□1			1.5	7	0.75	4	0.4	2.5	7N3
PI8100...□1	2.2	10	2.2	10	1.5	7	0.75	4	7N4
PI8100...□1	4	16	4	16	2.2	10	1.5	7	7N4
PI8100...□1	5.5	20	5.5	20	4	16	2.2	10	7N5
<b>3 phase voltage 220V 50/60Hz</b>									
PI8100...□2	0.75	4	0.4	2.5					7N3
PI8100...□2	1.5	7	0.75	4	0.4	2.5			7N3
PI8100...□2			1.5	7	0.75	4	0.4	2.5	7N3
PI8100...□2	2.2	10	2.2	10	1.5	7	0.75	4	7N4
PI8100...□2	4	16	4	16	2.2	10	1.5	7	7N4
PI8100...□2	5.5	20	5.5	20	4	16	2.2	10	7N5
<b>3 phase voltage 380V 50/60Hz</b>									
PI8100...□3			0.75	2.5	0.75	2.5	0.75	2.5	7N3
PI8100...□3	1.5	3.7	1.5	3.7	1.5	3.7	1.5	3.7	7N3
PI8100...□3	2.2	5	2.2	5	2.2	5	2.2	5	7N3
PI8100...□3	4	8.5	4	8.5	4	8.5	4	8.5	7N4
PI8100...□3	5.5	13	5.5	13	5.5	13			7N4
PI8100...□3	7.5	16	7.5	16	7.5	16	5.5	13	7N5
PI8100...□3	11	25					7.5	16	7N5

7-1-3. Table of rated current for different specifications

G/F/H/S/Z/T/M						
Voltage	220V 1Φ	220V (240V)	380V (415V)	460V (440V)	575V	660V
Power (kW)	Current (A)	Current (A)	Current (A)	Current (A)	Current (A)	Current (A)
0.4	2.5	2.5	-	-	-	-
0.75	4	4	2.5	2.5	-	-
1.5	7	7	3.7	3.7	-	-
2.2	10	10	5	5	-	-
4	16	16	8.5	8	-	-
5.5	-	20	13	11	-	-
7.5	-	30	16	15	-	-
11	-	42	25	22	17	15
15	-	55	32	27	22	18
18.5	-	70	38	34	26	22
22	-	80	45	40	33	28
30	-	110	60	55	41	35
37	-	130	75	65	52	45
45	-	160	90	80	62	52
55	-	200	110	100	76	63
75	-	260	150	130	104	86
93	-	320	170	147	117	98
110	-	380	210	180	145	121
132	-	420	250	216	173	150
160	-	550	300	259	207	175
187	-	600	340	300	230	198
200	-	660	380	328	263	218
220	-	720	415	358	287	240
250	-	-	470	400	325	270
280	-	-	520	449	360	330
315	-	-	600	516	415	345
355	-	-	640	570	430	370
400	-	-	690	650	520	430
500	-	-	860	800	650	540

## 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 Three-phase 440~460V, 50/60Hz Three-phase 575V, 50/60Hz Three-phase 660V, 50/60Hz Three-phase 1140V, 50/60Hz		
	Allowable Fluctuation range	voltage: $\pm 15\%$ frequency: $\pm 5\%$		
Control	Control system	high performance vector control inverter based on 32 bit DSP		
	Output frequency	G/F/Z/S/T/M type: 0.00~800.0Hz, maximum frequency can be set between 10.00 and 800.0Hz H type: 0.00~2000.0Hz, maximum frequency can be set between 10.00 and 2000.0Hz		
	control method	V/Fcontrol	Sensorless vector control	Sensor close loop vector control
	Start torque	0.50Hz 180%	0.25Hz 180%	0.00Hz 180%
	speed adjustable range	1: 100	1: 200	1: 2000
	Speed stabilizing precision	$\pm 0.5\%$	$\pm 0.2\%$	$\pm 0.02\%$
	waveform produce methods	Asynchronous space vector PWM, N-class sub-synchronous 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 maximum frequency		
	frequency accuracy	Speed control tolerance 0.01%(25°C $\pm 10^{\circ}\text{C}$ ).		
	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 / S 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; Z / M / T type: rated current 180% -1 minute 250% rated current -0.1 second; H: rated current 250% -1 minute 300% rated current -0.1 second.		
slip compensation	V / F control can automatically compensate for deterioration.			

Section VII Standard Specifications

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 automatically 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, overcurrent 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 display	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 47 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 analog 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



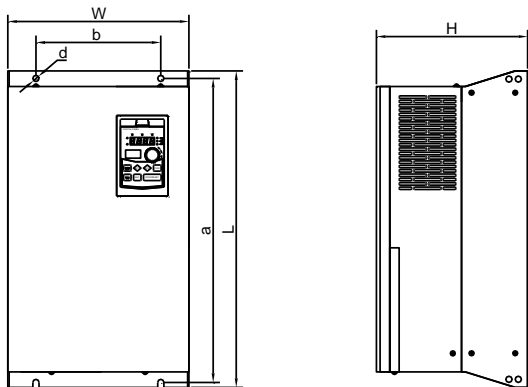
Section VII Standard Specifications

	Fault info	Store 5 groups error messages at most, you can check the type of failure time when failure occurs, 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 most 8 segment 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 way analog input, pulse input, digital potentiometers.
Motor	2 groups 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 identification 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 %, N 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. Sharp Size

#### 7-3-1. PI8000 family (3 phase voltage 380~415V, 50/60Hz)

1. 8N3~8N8



1) 8N3

Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
F	15~18.5	8N3	360	235	207	340	150	Ø10
G	11~15							
M	7.5~11							
H	7.5~11							

2) 8N4

Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
F	22~30	8N4	410	264	242	390	165	Ø10
G	18.5~22							
M	15~18.5							
H	11~15							

3) 8N5

Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
F	37~45	8N5	560	300	243	540	200	Ø10
G	30~37							
M	22~30							
H	18.5~22							

4) 8N6

Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
<b>F</b>	55~75	8N6	660	365	293	640	250	Ø10
<b>G</b>	45~55							
<b>M</b>	37~45							
<b>H</b>	30~37							

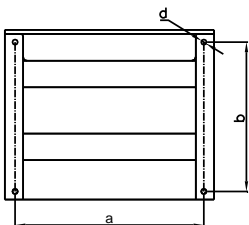
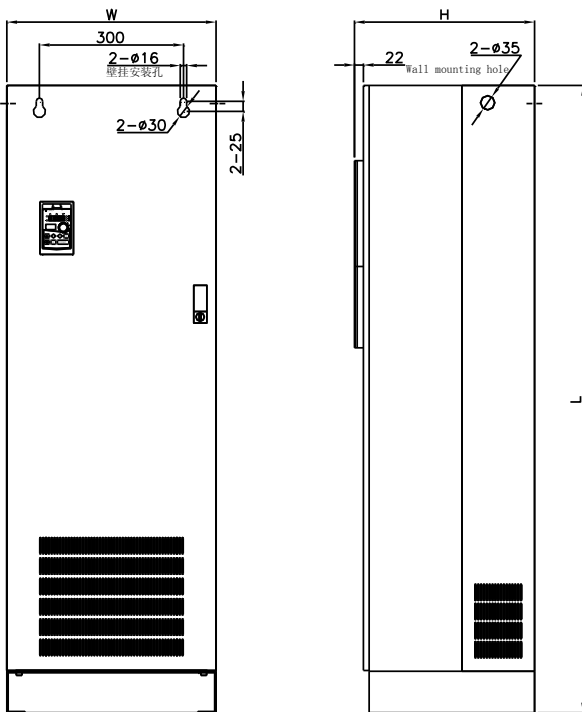
5) 8N7

Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
<b>F</b>	93~110	8N7	710	455	293	690	350	Ø10
<b>G</b>	75~93							
<b>M</b>	55~75							
<b>H</b>	45~55							

6) 8N8

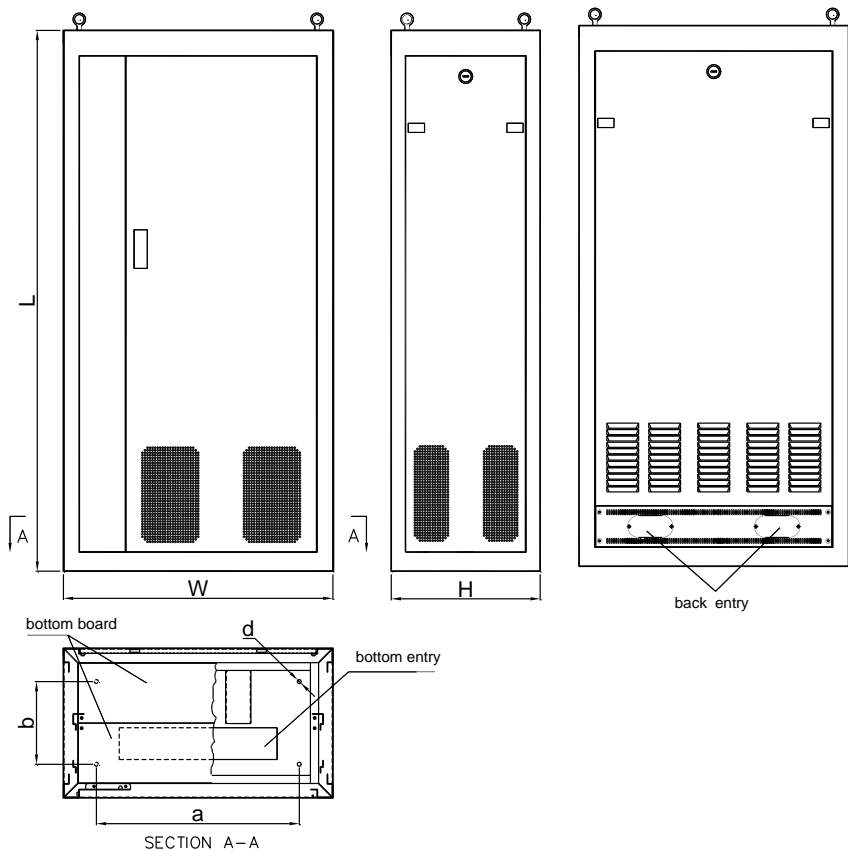
Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
<b>F</b>	132~160	8N8	910	480	342	890	350	Ø10
<b>G</b>	110~132							
<b>M</b>	93~110							
<b>H</b>	75~93							

2. 8NA



Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
F	187~250	8NA	1540	515	443	465	367	Ø13
G	160~220							
M	132~187							
H	110~160							

3. 8NB

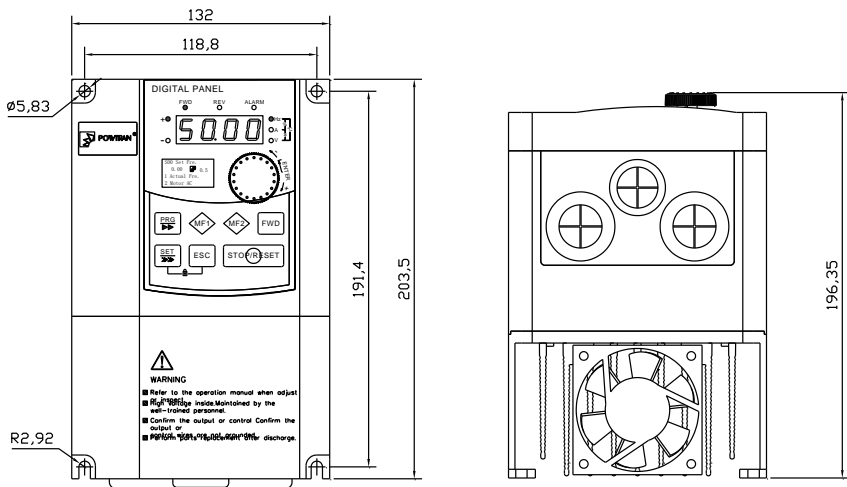


Type	Power (kW)	Structure item	Shape			Installation dimension		
			L	W	H	a	b	d
<b>F</b>	280~400	8NB	1700	850	492	640	260	Ø13
<b>G</b>	250~355							
<b>M</b>	200~280							
<b>H</b>	187~250							

7-3-2. PI8100 Family

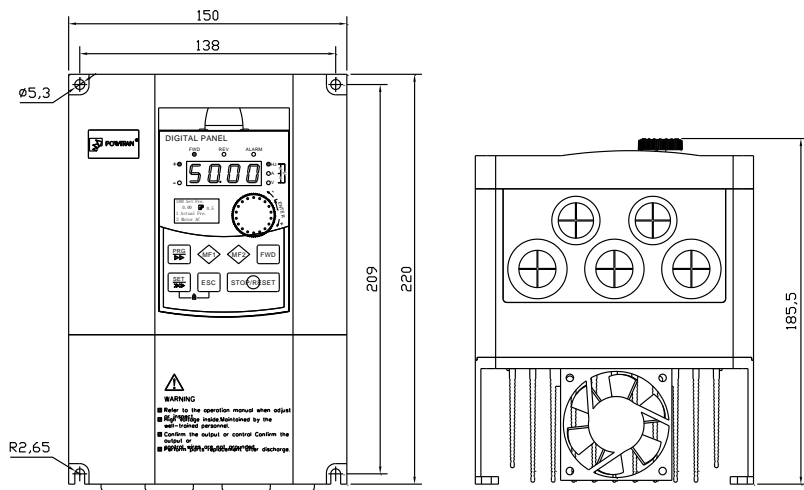
1. 7N2~7N4

1) 7N2



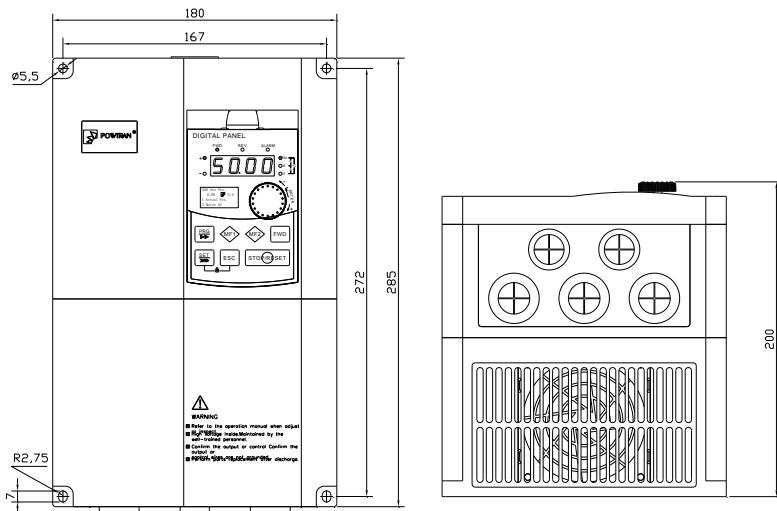
Power type	Type	Power (kW)
Single phase 220V	F	0.75~1.5
	G	0.4~1.5
	M	0.4~0.75
	H	0.4
3 phase 220V	F	0.75~1.5
	G	0.4~1.5
	M	0.4~0.75
	H	0.4
3 phase 380V	F	1.5~2.2
	G	0.75~2.2
	M	0.75~2.2
	H	0.75~2.2

2) 7N3



Power type	Type	Power (kW)
Single phase 220V	F	2.2~4
	G	2.2~4
	M	1.5~2.2
	H	0.75~1.5
3 phase 220V	F	2.2~4
	G	2.2~4
	M	1.5~2.2
	H	0.75~1.5
3 phase 380V	F	4~5.5
	G	4~5.5
	M	4~5.5
	H	4

3) 7N4

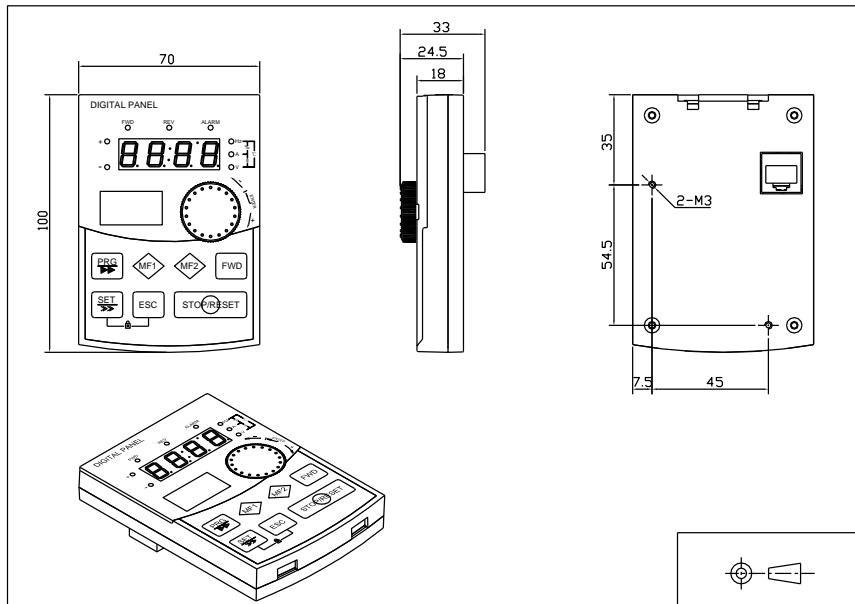


Power type	Type	Power (kW)
Single phase 220V	F	5.5
	G	5.5
	M	4
	H	2.2
3 phase 220V	F	5.5
	G	5.5
	M	4
	H	2.2
3 phase 380V	F	7.5~11
	G	7.5
	M	7.5
	H	5.5~7.5

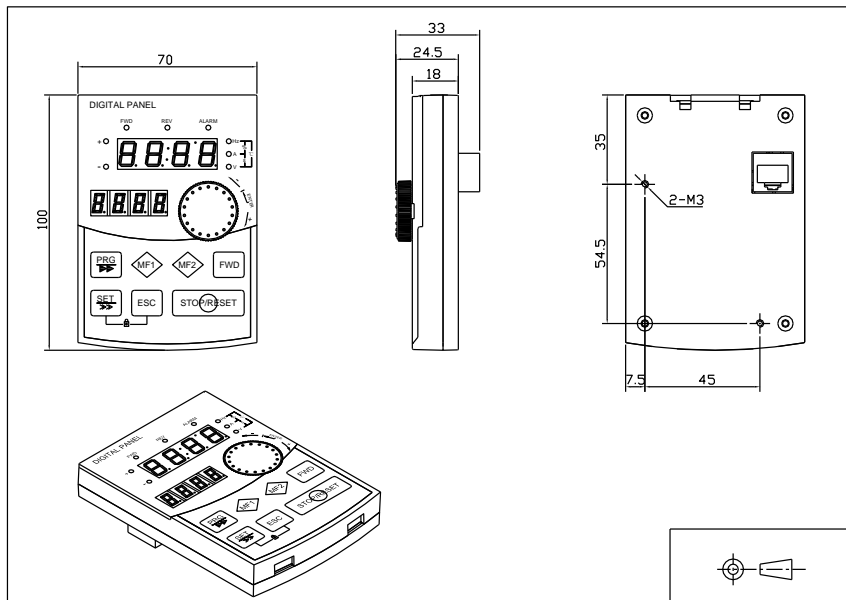


7-3-3. Keyboard size

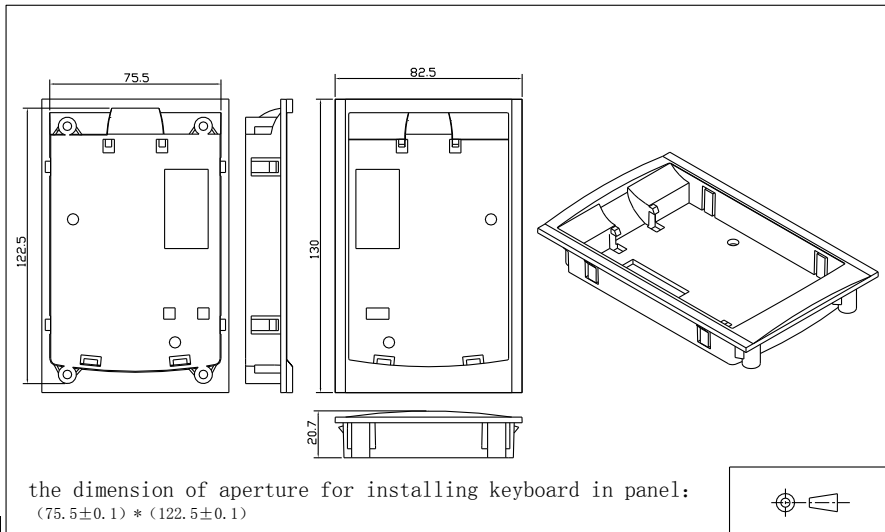
JP6C8000:



JP6E8000:



JP6D8000 the dimension of keyboard rabbit:



## Section VIII. 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 refer 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	N 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	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	N abnormal conditions
			Electrolytic capacitance	If there is abnormal appearance	Check visually	N abnormal condition
			Current-conducting leads or blocks	If the parts come loose	Check visually	N abnormal condition
			Terminals	If the screws or bolts come loose	Tighten the loose screws or bolts	N abnormal condition

“D” means daily check and “R” means regularly check.

“√” 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 years
Filtering capacitor	4~5 years
PCB (printed circuit board)	5~8 years

### 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:

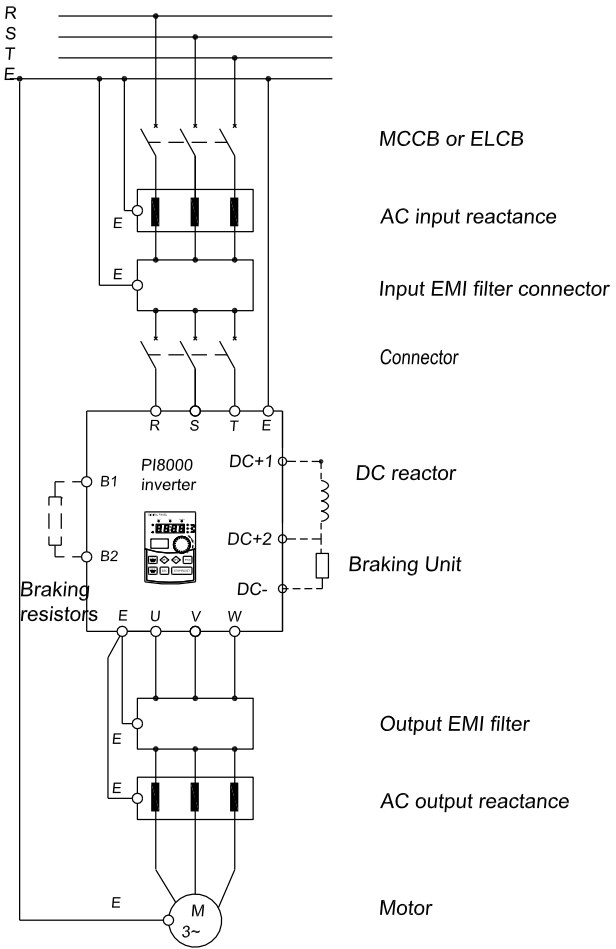
- ※ Stored in a dry and adequately-ventilated place without dust and metal powder at the temperature specified in the specifications.
- ※ If the frequency converter is not put into use after one year, a charge test should be made, so as to resume the performance of the filtering capacitor of main circuit 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 exist 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.

# Section IX. Options

The series can acquire the peripheral equipment by user because of the different using condition and requirement. See the wiring diagram as below:



## 9-1. MCCB OR ELCB

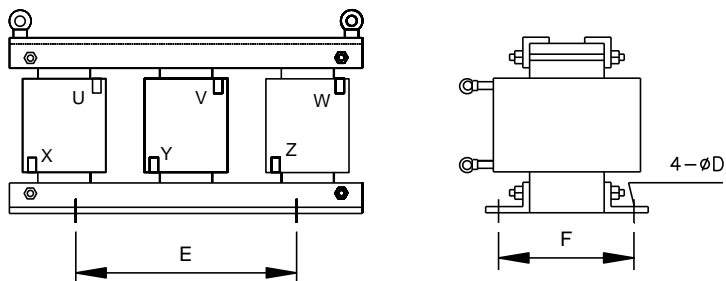
As power switch of the inverter, MCCB or ELCB can protect supply power, but can't control inverter to run or stop.

### 9-2. AC reactance

AC reactance is able to restrain the high harmonic wave of converter input current and improve converter's power factor obviously. It's recommended that AC reactance will be used in the following condition:

- ※ The capacity of power source is ten times more than the capacity of converter.
- ※ SCR load or power factor compensated device with ON/OFF is connected with the same power supply.
- ※ Unbalanced 3-phase voltage is bigger (more than 3%).

The common size of AC input reactance:



#### Sharp size:

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

380V 460V	0.75	155	125	95	7	89	60	3.0
	1.5	155	125	95	7	89	60	3.0
	2.2	155	125	95	7	89	60	3.0
	4	155	125	95	7	89	60	3.5
	5.5	155	125	100	7	89	60	3.5
	7.5	155	125	112	7	89	70	4.0
	11	155	125	112	7	89	70	6.0
	15	180	140	112	8	90	80	8.0
	18.5	180	140	112	8	90	90	8.0
	22	180	140	112	8	90	90	8.0
	30	230	175	122	10	160	90	12.0
	37	230	175	132	10	160	100	15.0
	45	230	175	150	10	160	110	23.0
	55	230	175	160	10	160	120	23.0
	75	285	220	230	14	180	130	30.0
	110	285	250	230	14	210	140	33.0
	160	360	260	230	14	210	140	40.0
	200	360	270	230	14	210	140	45.0
250	400	330	240	14	240	140	55.0	
315	400	350	285	14	270	160	90.0	

### 9-3. Noise filter

The filter is used to restrain the conduction of electrical magnetic wave interference noise produced by the converter or shock the interferential form radio or momentary concussion. The common size of 3-phase EMI noise filter is shown as following: confirm the power supply is 3-phase three lines or 3-phase four lines or single phase. Earthling wire is as short as possible, try to place the filter near the converter.

Please choose EMI filter when the converter is used in residential area, commercial area, science area or other. Please need to prevent magnetic interference, or need meet CE, UL, and CSA standard.

**Note:** If needing the filter, please connect with our company.

### 9-4. Connector

It can cut off the supply power in action of the system protection function, to prohibit fault enlarging. But can't control the motor start or stop by connector.

### 9-5. Braking Unit & braking resistor

There is braking unit inside when using "B" type frequency converter, the maximum braking torque is 50%. Please choose braking resistor according to the following table:

Type	Converter power (kW)	Braking resistor ( $\Omega$ )	Braking resistor Power (W)
220V	0.75	200	120
	1.5	100	300
	2.2	70	300
	4	40	500
	5.5	30	500
	7.5	20	780
	11	13.6	2000
	15	10	3000
	18	8	4000
	22	6.8	4500
380V	0.75	750	120
	1.5	400	300
	2.2	250	300
	4	150	500
	5.5	100	500
	7.5	75	780
	11	50	1000
	15	40	1500

Please choose POWTRAN BRAKING UNIT if you need more braking torque. Please refer to the catalog of braking unit.

There is N braking unit inside the large capacity frequency converter. Please choose POWTRAN BRAKING UNIT if you need braking.

#### 9-6. output EMI filter

The fittings can restrain the disturbance noise and lead leak current produced in the output side.

#### 9-7. AC output reactor

When the line from inverter to motor is longer than 20 meters, it can restrain the over-current caused by the distributing current and the wireless disturbance of the inverter.



## Section X Quality Assurance

The product quality assurance is in accordance with the following regulations:

1. The manufacturer should take responsibility for below specific elements:
  - 1-1. in domestic use (as calculated from the date of shipment)
    - ※ shipped within one month should accept refund, replacement and repair.
    - ※ shipped within three months should accept replacement and repair.
    - ※ ship packages within 15 months should accept repair.
  - 1-2. Goods exported overseas (excluding China) and shipped within six months, the local seller is responsible for repair.
2. regardless of when and where to use POWTRAN branded products are paid to enjoy lie-long service.
3. All the distributors, agency or production place of POWTRAN in whole China can provide after-sales service for powtran product, their conditions of service as follows:
  - 3-1. We provide a 3-level inspection service on the local selling place (including troubleshooting).
  - 3-2. All services comply with the related after-sale service terms and conditions stated on the agency agreement between powtran and distributors.
  - 3-3. Buyers can pay to any Powtran agent if need any after-sales services (whether or not the warranty).
4. If this product has some quality problem or product liability accidents, we will take the responsibility to terms 1-1 or 1-2 at most. if users need more liability guarantee, please apply for insurance company in advance to insure your own property insurance.
5. the product's warranty period is one year from the date of shipment.
6. in the case of the following causes of failure, even in the warranty period is also a paid repair:
  - 6-1. incorrect operation (depending on the use of manual), or modified without permission to repair the problems caused.
  - 6-2. the problems caused by using the inverters beyond its standard specifications requirement.
  - 6-3. damage caused by drop down or improper handling.
  - 6-4. inverters components aged or failure caused by improper environment.
  - 6-5. due to an earthquake, fire, wind and water disasters, lightning, abnormal voltage or other natural disasters and disasters, accompanied by the damage caused.
  - 6-6. the damage during transport (Note: The mode of transport designated by the customer, the company's help on behalf of the procedures for handling the transfer of goods).
  - 6-7. when the manufacture's brand, trademark, serial number, nameplate and other damage or can not be recognized.
  - 6-8. if the buyer has not paid full money according to purchase agreement.
  - 6-9. the installation, wiring, operation, maintenance or other use of objective reality can not be described to the company's service office.
7. concerning refund, replacement and repair services, goods shall be returned powtran company, after confirmed the attribution of responsibility then they are allowed to be returned or repaired.

# Appendix I. RS485 Communication Protocol

## I-1. Use introduce

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

### RS485 standard interface

- 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

Communication function

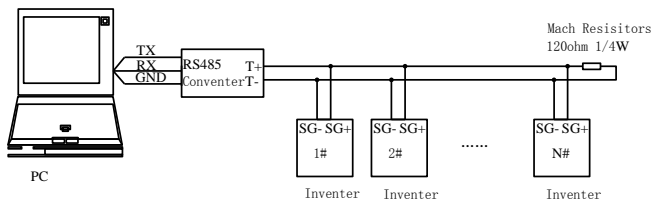
Items	Specification
Communication baud rate	38400/19200/9600/4800/2400/1200 bps is selectable.
Communication Protocol	Modbus protocol, RTU format
Interface methods	Asynchronism communication methods, semi-duplex, the previous high byte, low byte in the post, and low-effective-bit pre-emptive.
Data formula	1 start bit, 8 data bits, 1 stop bit, No parity bit.
	1 start bit, 8 data bits, 1 stop bit, even parity bit.
	1 start bit, 8 data bits, 1 stop bit, odd parity bit.
	1 start bit, 8 data bits, 2 stop bit, No parity bit.
	1 start bit, 8 data bits, 2 stop bit, even parity bit.
	1 start bit, 8 data bits, 2 stop bit, odd parity bit.
Slave address	Slave addresses can be set up 1~ 127 0 for broadcast address, host address 128 for the proportion of linkage
Communication connect A	Terminals SG+, SG-, shield SH, Default 19200bps.
Communication connect B	RJ45, 8-core shielded cable, fixed 19200bps, N parity bit

## I-3. Communication connection

### I-3-1. Definition for Communication port A:

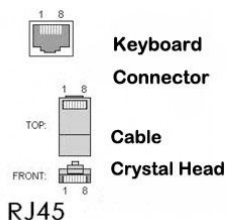
- Link RS485 communication cables to inverter control terminals (SG+), (SG-).
- When using RS232-485 transform, connect Inverter “SG+” to RS485 “T+”, Inverter “SG-” to RS485 “T-”.
- After Confirming connection again, turn on inverter power.
- If connection is right, set communication parameters as following:

- A26 baud rate 0: 1200, 1: 2400, 2: 4800, 3: 9600, 4: 19200, 5: 38400
- A27 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 F05=0/1/2(Keypad + RS485/CAN)



**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



**I-3-3. Data safety and reliability**

- 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 screen 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 RS485 communication 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 50ms.

## I-4. Communication Protocol

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

### I-4-1. The basic format description

1: start of frame  
Interval > 2ms,

### I-4-2. Slave Address

From the machine's local address, through the A27 parameter settings, can only have that uniquely identifies a network's local address.

Setting Range 1 ~ 127.

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

### I-4-3. Function Code

Host to send commands from the machine to the command response.

### Function Code Categories

0x02 = read slave fault record

Frame start address	Slave address	Function code	Registers address	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

Slave response

Frame start address	Slave address	Function code	Registers address	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

0x03 = read single register

Host command

Frame start address	Slave address	Function code	Registers address	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

Slave response

Frame start address	Slave address	Function code	Registers address	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

0x13 = Read multiple registers

Host command

Frame start address	Slave address	Function code	Register N.	Register add.1	...	Register add. n.	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	1 bytes	2 bytes	...	2 bytes	2 bytes	Interval > 2ms idle bit

## Slave response

Frame start address	Slave address	Function code	Register N.	Register add.1	...	Register add. n.	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	1 bytes	2 bytes	...	2 bytes	2 bytes	Interval > 2ms idle bit

0x06 = write to slave a single register (power-down does not save)

0x26 = write to slave a single register (power-down save)

## Host Command

Frame start address	Slave address	Function code	Register address	Register data	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

## Slave response

Frame start address	Slave address	Function code	Register address	Register data	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	1 bytes	2 bytes	2 bytes...	Interval > 2ms idle bit

0x16 = Write multiple registers to the slave (power-down does not save)

0x36 = Write multiple registers to the slave (power-down save)

## Host Command

Frame start address	Slave address	Function code	Register N.	Register add.1	Register data 1	...	Register add. n	Register data n	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	1 bytes	2 bytes	2 bytes	...	2 bytes	2 bytes	2 bytes	Interval > 2ms idle bit

## Response command

Frame start address	Slave address	Function code	Registers N.	CRC checksum	frame end address
Interval > 2ms idle bit	1 bytes	1 bytes	1 bytes	2 bytes	Interval > 2ms idle bit

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

0xA0 = Invalid operation, setting under this state is invalid

0xA1 = function code is invalid

0xA2 = Fault record is empty

0xA3 = register address is invalid

0xA4 = slave is busy, EEPROM delay.

0xA5 = administrator restricted

0xA6 = set value is beyond limit.

0xA7 = CRC checksum error

0xA8 = frame format error

**I-4-4. Register Address:**

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

Appendix I.RS485 Communication Protocol

Function code	Register Address high byte		Register Address low byte		
0x03/0x13 (read slave 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	0x09	0~23		
	L	0x0A	0~31		
	S	0x0B	0~15		
	R	0x10	0x00	Running status <sup>NOTE 2</sup>	
		0x01	Reserved status 1		
		0x02	Reserved status 2		
		0x03	Reserved status 3		
0x06/0x16(set slave function code parameter and write RAM)  0x26/0x36(set slave function code parameter and write EEPROM)	Parameter group	High byte data	Low byte data		
	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	0x09	0~23		
	L	0x0A	0~31		
	R	0x10	0x00	Running command <sup>NOTE 3</sup>	
			0x01	Reserved status 1	
		0x02	Reserved status 2		
		0x03	Reserved status 3		
0x02(read the fault record)	<b>Fault record</b>	<b>data</b>	<b>Fault inquiry content</b>		
				<b>data</b>	
	Fault history record 1	0x00	Faulty type <sup>NOTE 4</sup>		
	Fault history record 2	0x01	Set frequency		
	Fault history record 3	0x02	Actual frequency		
	Fault history record 4	0x03	Actual current		
	Fault history record 5	0x04	Dc voltage		
			Running status <sup>NOTE 2</sup>		
			Running time		
		IGBT temperature			

## NOTE 1:

Function	0x03/0x13 reading operation			0x06/0x16 writing operation 0x26/0x36 reading 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	
y08 reset 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	Function code	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	Valid operation			Invalid operation
y16 user input password	Valid operation			Valid operation
y17 parameter group protection	Valid operation			Valid operation

## NOTE 2:

BIT	15 BIT	14 BIT	13 BIT	12 BIT
meaning	0: N fault 1: urgent stopping fault	0: N fault 1: decelerating fault	0: N fault 1: alarming fault	0: confirmed fault 1: unconfirmed fault
bit	11 BIT	10 BIT、	9 BIT	8 BIT
meaning	reserved	reserved	reserved	0: N JOG. 1: JOG running
bit	7 BIT	6 BIT	5 BIT 、 4 BIT	
meaning	0: lower frequency not arriving 1: arrive lower frequency	0: upper frequency not arriving 1: arrive upper frequency	00: stopping accelerating 10: decelerating 11: running in a even speed	01:
bit	3 BIT	2 BIT	1 BIT	0 BIT
meaning	0: running reverse 1: running forward	reserve	reserve	0: V/F control 1: SV control

NOTE 3:

bit	15 BIT	14 BIT	13 BIT	12 BIT
meaning	reserve	reserve	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: N 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 nnnumber	LED display	Fault message
0	E.OCP	IGBT power driver protect and produce hardware interrupt.
1	E.OCC	OC signal from current self-inspected circuit impact.
2	E.OCF	OC signal from drive circuit.
3	E.OU	Over voltage
4	E.LU	Lower voltage
5	E.OL	Over load
6	E.UL	Lower load
7	E.PHI	Input phase lose
8	E.EEP	EEPROM error
9	E.ntC	Over heat
10	E.dAt	Time limit fault
11	E.Set	External fault
12	E.PId	PID regulation fault
13	E.OHt	Motor over heat fault
14	E.OL2	Motor over load falult
15	E.PG	PG error
16	E.PHo	Output phase lose
17	E.COA	Rs485 communication connect A fault
18	E.COb	Rs485 communication connect B fault
19	E.CAL	Parameter Identification Failure



**I-4.5. CRC checkup sum**

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

Checksum sum = all the CRC checkup sum in one data frame.

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

Host Command

Frame start address	Slave address	Host command code	Registers address	Setting data	CRC checkup sum
Interval> 2ms idle bit	0x08	0x06	0x0001	0x1388	0xD5C5

Slave response

Frame start address	Slave address	Host response code	Registers address	Setting data	CRC checkup sum
Interval> 2ms idle bit	0x08	0x06	0x0001	0x1388	0xD5C5

**I-5. Example of communication protocol:**

```
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);
}
```

# 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	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	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
F04	relationship between main and auxiliary frequencies	PID regulation mode	7
		The main setting individual control	0
		The auxiliary setting individual control	1

Appendix II

		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
<p>Select this function, the slave inverter will follow the command of host inverter to run.</p> <p>After select this function, it can also use keyboard, terminal and RS485 to control the slave inverter's running.</p> <p>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.</p>			
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

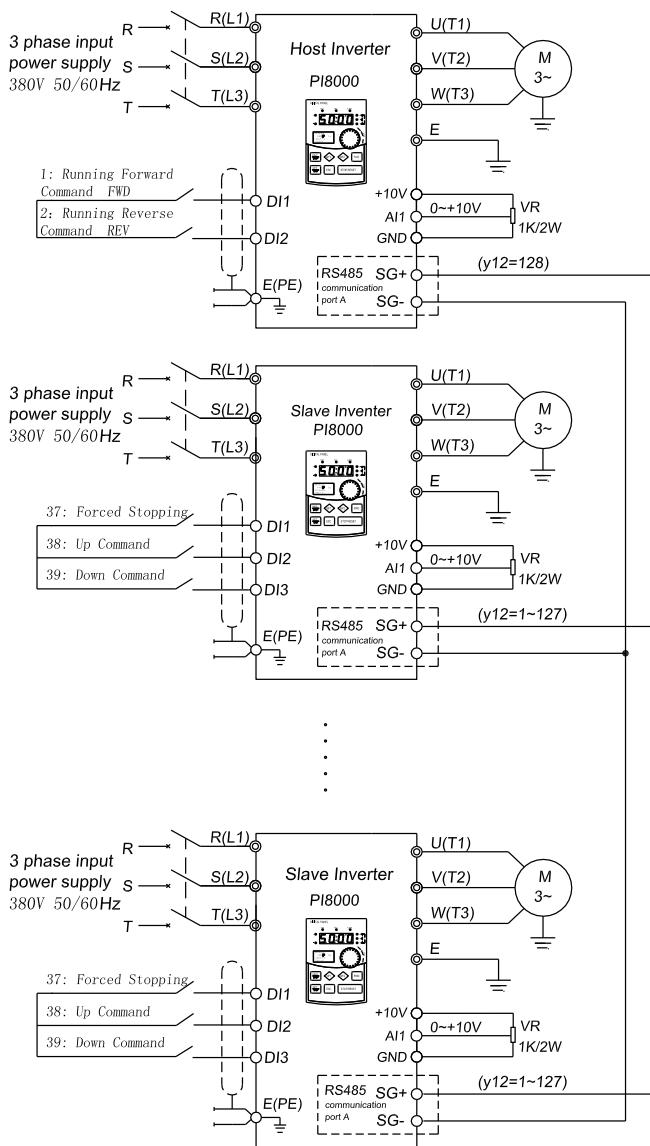
### The proportional linkage host settings:

F02	Frequency main set mode	A11 external analog setting
A28	Communication address	Host 128
A29	Baud rate	3: 9600bps
A30	Communication format	0
o36	DI1 input terminal function	1:forward running
o37	DI2 input terminal function	2:reverse running

**The proportional linkage slave settings:**

F02	Frequency main set	keyboard set the frequency or Rs485	0
F03	Auxiliary setting mode of frequency set	A11 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	37:forced stopping	
o37	DI2 input terminal function select	38:Up command	
o38	DI3 input terminal function select	39:Down command	
A43 A44	Multi-function key MF1	8:MF key is appointed to be Up command	
A44 A44	Multi-function key MF2	9:MFkey is appointed to be Down command	

System wire connections:



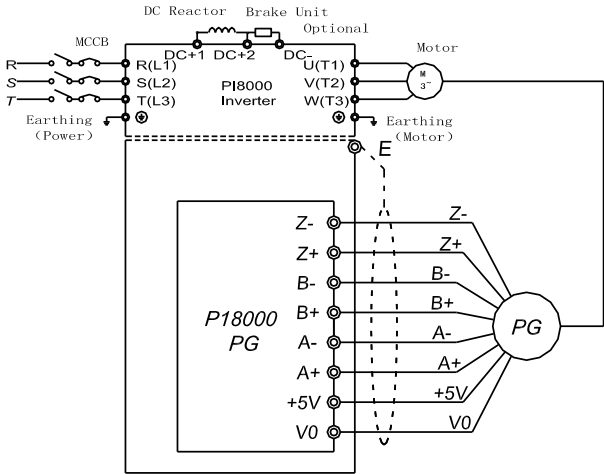
# Appendix III PG Instruction

## III-1. PI8000 PG.V1 can use for 5V line-driven encoder.

### Terminal function instruction

Terminals	functions
A+ A-, B+ B-, Z+ Z-	Encoder signal input
+5V	Encoder power supply, 5V
GND	Encoder earthing

### Terminal connections:



# Appendix IV Converter Water Supply Controller Instruction

E00 function	parameter setting	definition
special power supply	8	inverter power
	13	stable voltage power
	14	constant current power
constant pressure water supply	1	pump
	9	double pump constant pressure water supply

## IV-1. Extend functions supplement

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

P03 PID given signal selection, you can set through the keyboard, analog AI1, pulse and other means to set a given voltage.

Given voltage is calculated as follows:

Given voltage:220VAC

Given voltage setting = $220 \times 1.414 / 500 \times 100\% = 62.2\%$

#### 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
<p>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 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 issued, the controller will stop the frequency output when the output frequency decelerate to 0hz.</p>					
E18	User parameter 3	0~9999	-	The max output voltage	0
<p>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.                      If the system highest withstand voltage 250VAC.                      Then a maximum output voltage = 250                      E18=250</p>					

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

In this mode, connect AI2, AI3 to Hall, then measure the output voltage and use 2 Halls 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.

A12 is detected by analog and A13 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 A11, pulse and other means to set a given voltage.

Given voltage is calculates as follows:

When the given voltage =220VAC, given voltage setting = $220 \times 1.414 / 500 \times 100\% = 62.2\%$

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	Range	unit	Description	Factory setting
E16	User parameter 1	0~9999	-	Voltage increasing time	0
E17	User parameter 2	0~9999	-	Voltage decreasing time	0
<p>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.</p>					
E18	User parameter 3	0~9999	-	Max output voltage	0
<p>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.                      If the system highest voltage 250VAC.                      Then a maximum output voltage = <math>=250 \times 1.414 / 500 \times 100\% = 70.7\%</math>                      E18=707</p>					

**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	Meanings
E00	Starting pressure deviation	1	Single Pump constant pressure water supply, N need the constant pressure water supply interface board.
E00	Starting pressure deviation	9	Multi-pump constant pressure water supply, need constant pressure water supply interface board, while realize 4- pumps constant pressure water supply



**(2) PID adjusting in constant water supply system**

Parameter	Keyboard Display	Setting	Meanings
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 AI1/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	Meanings
E01	Starting pressure deviation	10%	Starting pressure deviation is 10%
E02	Starting time delay	2.0	Starting delay time is second.
E03	Stop frequency	15.00	stop at frequency 15HZ.
E04	stop time delay	2.0	Stop time is 2 second.
E05	High pressure arrival value	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	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	Timing to water supply	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 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	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	Meanings
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**

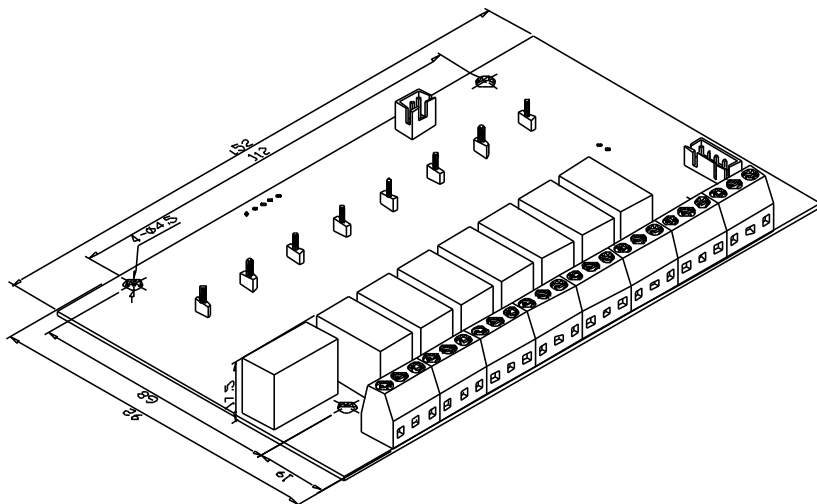
It is special appendix for multiple pumps, which run with PI7000 family inverter to control the multiple pumps water supply system effectively.

**IV-2-3. Operation and connection notice:**

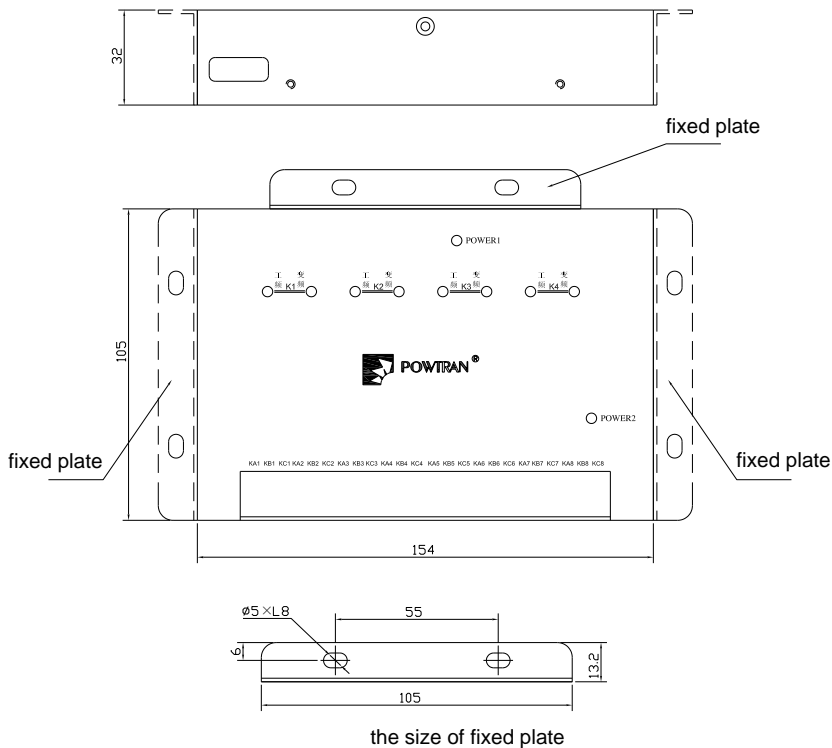
- ◇ If it is power frequency motor, probable thermal relay must be used to protect motor.
- ◇ AC contactor with machinery chain equipment should be used between the power frequency bypass and inverter output of aside the motor, lock logically on the electric control circuit to avoid the short circuit 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

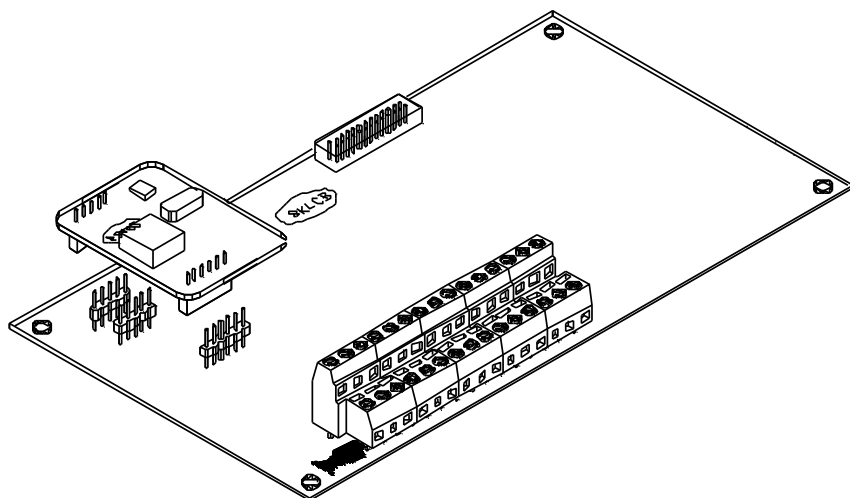


Note: The fixed plate can be fixed by any mounting hole in the figure.

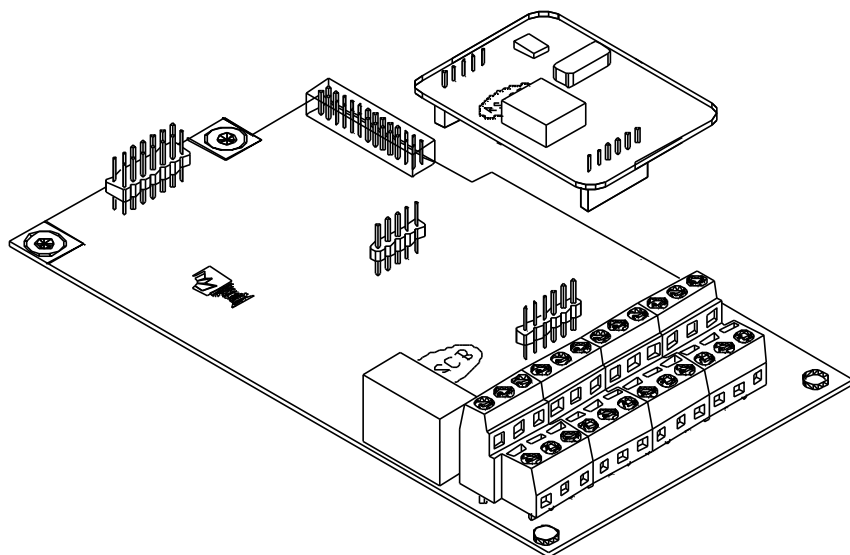
**IV-2-5. Connection of water supply controller with inverter**

(1) Install RS485 on the control card, the installation of the RS485 is showed below:

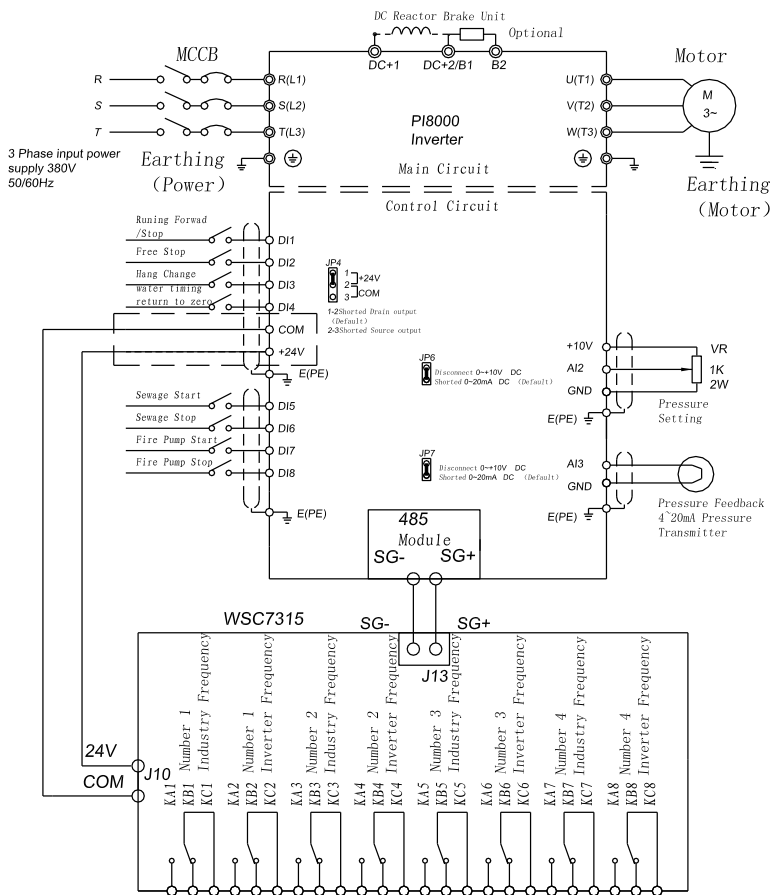
**7K-RS485\_S with 8KLCB**



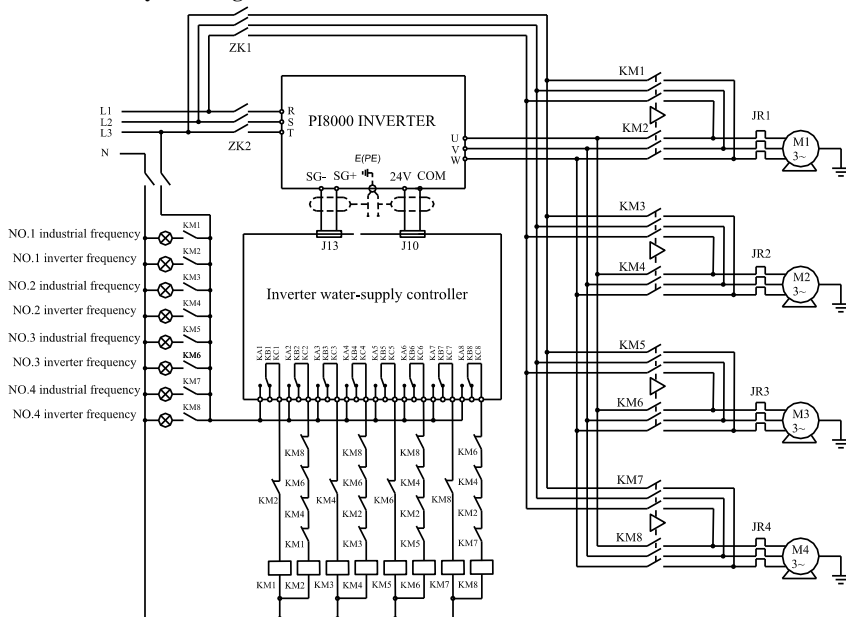
**7K-RS485 With 8KSCB**



(2) Connection of water supply controller with inverter, the communciation 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 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 reduce 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.

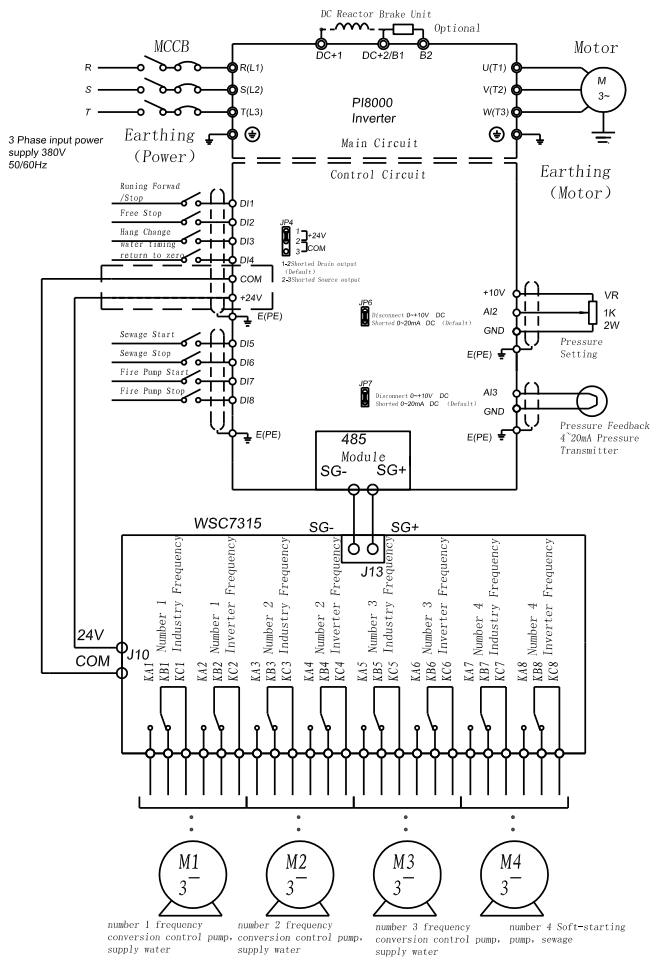
Soft-start pump is not controlled by constant pressure water supply system.Soft-start pump can be used as sewage pumps and fire pumps.

IV-2-9. Application Guide

3 Pumps constant pressure water supply + sewage pump

- (1) **pump configurations: variable frequency pump 3 units, 15kW , 1 unit sewage pump, 15kW.**
- (2) **The set pressure 0.8Mpa.**
- (3) **pressure gauge options: pressure transmitter, DC 4 ~ 20mA output, 1.6Mpa.**
- (4) **Inverter choice: PI8000 015F3 and WSC\_RS485 water supply board.**
- (5) **Hardware Connection.**

Appendix IV





**(6) Parameter setting****① loading types with a constant pressure water supply function:**

Parameter	Keyboard Display	Setting	Meanings
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.

**② PID adjust in constant pressure water supply**

Parameter	Keyboard Display	Setting	Meanings
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	relationship between main and auxiliary frequencies given	2	main+ auxiliary set mode
F05	Running control mode	3	Terminal control
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 means1.6Mpa.

## ③ Constant pressure water supply specific parameters

Parameter	Keyboard Display	Setting	Meanings
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%	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	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	0000	Regular time water supply function invalid

## ④ Multi-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

## ⑤ constant pressure water supply IO parameters:

Parameter	Value read On Keyboard Display	Setting Value	Meanings
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:

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

# Product Feedback

Dear users:

Thank you for your interest and purchase powtran products! In order to provide better service for you, we hope to be able to timely access to your personal information and your purchased powtran products information .we hope to learn about your present and future demand for powtran products and also your valuable feedback on our products. In order to help you get our service faster and more convenient, please visit our company web site <http://www.powtran.com> and refer to column "technologies and services" and "Download" for feedback. 1) download the updated manual for your products.

2) read and download various of product technical information, such as operation instruction, product specification and features, FAQ, etc.

3) application case sharing.

4) technical consult, on-line feedback

5) feedback product information and customer requirement information through e-mail.

6) inquiry for the latest products, obtain various types of additional services such as warranty and extended.