T9000 Series Advanced Vector Control Inverter

User's Manual

● Thank you very much for your buying T9000 Series Advanced Vector Control Inverter.

● Before use, please read this manual thoroughly to ensure proper usage. Keep this manual at an easily accessible place so that can refer anytime as necessary.

Safety Precautions

Please read this operation manual carefully before installation, operation, maintenance or inspection In this manual, the safety precautions were sorted to "WARNING" or "CAUTION".

⚠ **WARNING**	Indicates a potentially dangerous situation which, if can not avoid will result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially dangerous situation which, if can not avoid will cause minor or moderate injury and damage the device. This Symbol is also used for warning any un-safety operation. In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

In some cases, even the contents of "CAUTION" still can cause serious accident. Please follow these important precautions in any situation.

★ NOTE indicate the necessary operation to ensure the device run properly.

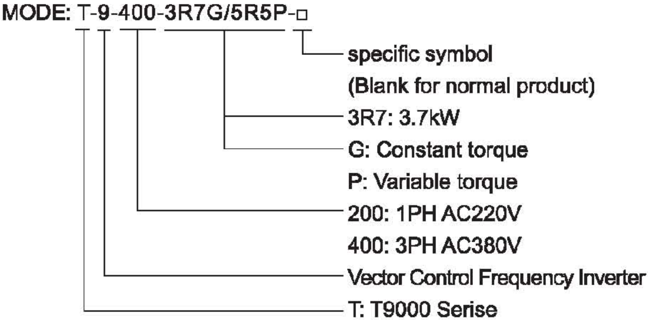
Warning Marks are placed on the front cover of the inverter.
Please follow these indications when using the inverter.

WARNING
● May cause injury or electric shock. ● Please follow the instructions in the manual before installation or operation. ● Disconnect all power line before opening front cover of unit. Wait at least 10 minutes until DC Bus capacitors discharge. ● Use proper grounding techniques. ● Never connect AC power to output UVW terminals.

Contents

Chapter 1 Introduction

1-1 Description of Name Plate



1-2 Technology Features

Item		T9000
Basic function	Control Mode	Sensorless flux vector control (SVC) Close-loop vector control (FVC)(Above 3.7KW) V/F control
	Maximum frequency	0~600Hz
	Carrier frequency	0.5kHz~16kHz The carrier frequency is automatically adjusted based on the load features.
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: Maximum frequency x 0.025%
	Start torque	G Type: 0.5Hz/150%(SVC) P Type: 0.5Hz/100%
	Speed range	1: 100 (SVC)

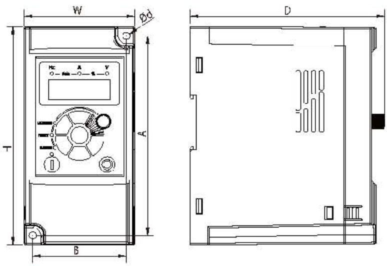
Item		T9000
Basic function	Speed stability accuracy	±0.5%(SVC)
	Overload capacity	G Type: 60s for 150% of the rated current, 3s for 180% of the rated current. P Type: 60s for 120% of the rated current, 3s for 150% of the rated current.
	Torque boost	Auto-boost; Customized boost: 0.1%~30.0%
	Ramp Mode	Straight-line ramp. Four groups of acceleration/deceleration time with the range of 0.00`6500.0s
	DC braking	DC braking frequency: 0.00Hz~Maximum frequency Braking time: 0.0s~36.0s Braking action current value: 0.0%~100.0%
	JOG control	JOG frequency range: 0.00Hz~50.00Hz. JOG acceleration/deceleration time: 0.0s~6500.0s.
	Simple PLC, Multiple preset speeds	It implements up to 16 speeds via the simple PLC function or combination of terminal states
	Onboard PID	It realizes process-controlled closed loop control system easily
	Auto voltage regulation(AVR)	It can keep constant output voltage automatically when the mains voltage changes
	Overvoltage/ overcurrent stall control	The current and voltage are limited automatically during the running process so as to avoid frequent tripping due to over voltage/over current
	Rapid current limit	It helps to avoid frequent over current faults of the AC drive.
	Torque limit and control	It can limit the torque automatically and prevent frequent over current tripping during the running process. Torque control can be implemented in the FVC mode.
Individualized functions	High performance	Control of asynchronous motor are implemented through the high-performance current vector control technology
	Rapid dip ride through	The load feedback energy compensates the voltage reduction so that the AC drive can continue to run for a short time

Item		T9000
Individualized functions	Support for multiple PG card	Support for differential input PG card,resolver PG card,rotating transformer PG card…
	Rapid current limit	It helps to avoid frequent over current faults of the AC drive.
	Timing control	Timing range: 0.0Min~6500.0Min
	Communication methods	RS - 485
Running	Command source	Operation panel/Control terminals/Serial communication port You can perform switchover between these sources in various ways.
	Frequency source	There are ten frequency sources. Digital setting, analog voltage setting, analog current setting, pulse setting, serial port setting. You can perform switchover in various ways.
	Auxiliary frequency source	There are ten auxiliary frequency sources. It can implement fine tuning of auxiliary frequency and frequency synthesis.
	Input terminal	Standard: 4 digital input terminals(Below 5.5KW) /6 digital input terminals(Above 7.5KW); 1 analog input terminal(Below 5.5KW)/2 analog input terminals(Above 7.5KW); 1 voltage input (only support for 0~10V, above 7.5KW), 1 voltage input(0~10V) or current input (4~20mA)
	Output terminal	1 High-speed pulse output terminal (Open-collector) (Above 3.7KW) 1 replay output terminal (Below 5.5KW)/2 replay output terminals(Above 7.5KW) 1 analog output terminal(3.7KW~5.5KW)/2 analog output terminal(Above 7.5KW), Support for 4~20mA current output or 0~10V voltage output
Display and operation panel	LED display	It displays the parameters
	Key locking and function selection	It can lock the keys partially or completely and define the function range of some keys so as to prevent mal-function.
	Protection mode	Motor short-circuit detection at power-on, input/ output phase loss protection, over current protection, over voltage protection, under voltage protection, overheat protection and overload protection

Item		T9000
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Lower than 1000m
	Ambient temperature	-10°C ~+ 40°C (de-rated if the ambient temperature is between 40°C ~50°C)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9m/s^2(0.6g)
	Storage temperature	-20°C ~+ 60°C

1-3 Installation

SIZE A



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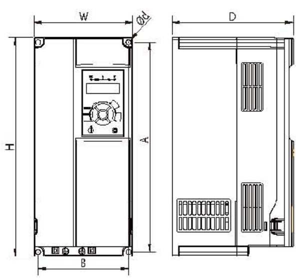
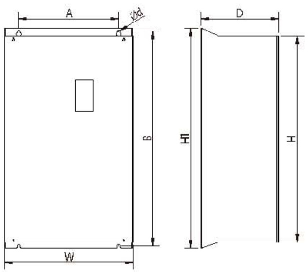


SIZE	Model	W	H	D	A	B	Φd
A	T9200-0R4G T9200-0R75G T9200-1R5G T9400-0R4G T9400-0R75G T9400-1R5G T9400-2R2G	72	142	127	130	61	4.5
A	T9200-2R2G T9200-3R7G T9400-3R7G/5R5P T9400-5R5G/7R5P	85	180	131	167	72	5.5
B	T9200-5R5G T9400-7R5G/11P T9400-11G/15P	106	240	168	230	96	4.5
B	T9200-7R5G T9400-15G/18.5P T9400-18.5G/22P T9400-22G/30P	151	332	183	318	137	7
B	T9400-30G/37P T9400-37G/45P	217	400	216	385	202	7

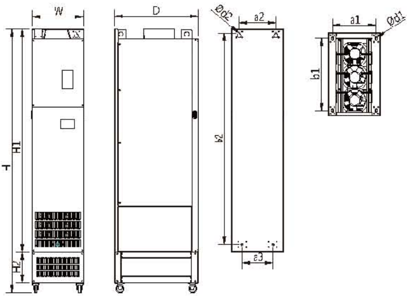
SIZE C



SIZE	Model	W	H	H1	D	A	B	Φd
C	T9400-45G/55P T9400-55G T9400-75P	300	440	470	240	200	455	9
C	T9400-75G/90P T9400-90G/110P T9400-110G/132P	275	590	630	310	200	612	9

SIZE	Model	W	H	H1	D	A	B	Φd
C	T9400-132G/160P T9400-160G/185P	400	675	715	310	320	695	11

SIZE D



SIZE	Model	Outline dimention (mm)					Installation Size (mm)			Wall-mounted Size (mm)			
		W	H	H1	H2	D	a1	b1	d1	a2	a3	b2	d2
D	T9400-185G/200P T9400-200G/220P T9400-220G/250P	300	1445	1180	200	500	250	430	14	220	150	1135	13
D	T9400-250G/280P	330	1595	1330	200	545	280	475	14	220	185	1275	13
D	T9400-280G/315P T9400-315G/350P	325	1495	1230	200	545	275	470	14	225	185	1175	14
D	T9400-350G/400P T9400-400G/450P T9400-450G/500P	335	1720	1455	200	545	285	470	14	240	200	1380	14

1-4 Selection Guide

Model	Input voltage	Rated output power (kW)	Rated input current (A)	Rated output current (A)	Motor Power (KW)
T9200-0R4G	1PH AC220V±15%	0.4	5.4	2.5	0.4
T9200-0R75G		0.75	7.2	5	0.75
T9200-1R5G		1.5	10	7	1.5
T9200-2R2G		2.2	16	11	2.2
T9200-3R7G		3.7	17	16.5	3.7
T9200-5R5G		5.5	26	25	5.5
T9200-7R5G		7.5	35	32	7.5
T9400-0R4G	3PH AC380V±15%	0.4	3.4	1.2	0.4
T9400-0R75G		0.75	3.8	2.5	0.75
T9400-1R5G		1.5	5	3.7	1.5
T9400-2R2G		2.2	5.8	5	2.2
T9400-3R7G/5R5P		3.7/5.5	10/15	9/13	3.7/5.5
T9400-5R5G/7R5P		5.5/7.5	15/20	13/17	5.5/7.5
T9400-7R5G/11P		7.5/11	20/26	17/25	7.5/11
T9400-11G/15P		11/15	26/35	25/32	11/15
T9400-15G/18.5P		15/18.5	35/38	32/37	15/18.5
T9400-18.5G/22P		18.5/22	38/46	37/45	18.5/22
T9400-22G/30P		22/30	46/62	45/60	22/30
T9400-30G/37P		30/37	62/76	60/75	30/37
T9400-37G/45P		37/45	76/90	75/90	37/45
T9400-45G/55P		45/55	92/113	90/110	45/55
T9400-55G		55	113	110	55
T9400-75P		75	157	150	75
T9400-75G/90P		75/90	157/180	150/176	75/90
T9400-90G/110P		90/110	180/214	176/210	90/110
T9400-110G/132P		110/132	214/256	210/253	110/132
T9400-132G/160P		132/160	256/307	253/300	132/160
T9400-160G/185P		160/185	307/355	300/340	160/185

Model	Input voltage	Rated output power (kW)	Rated input current (A)	Rated output current (A)	Motor Power (KW)
T9400-185G/200P	3PH AC380V±15%	185/200	355/385	340/380	185/200
T9400-200G/220P		200/220	385/430	380/420	200/220
T9400-220G/250P		220/250	430/475	420/470	220/250
T9400-250G/280P		250/280	475/525	470/520	250/280
T9400-280G/315P		280/315	525/610	520/600	280/315
T9400-315G/350P		315/350	610/665	600/640	315/350
T9400-350G/400P		350/400	665/700	640/690	350/400
T9400-400G/450P		400/450	700/800	690/790	400/450
T9400-450G/500P		450/500	800/865	790/860	450/500

1-5 Device recommended specifications

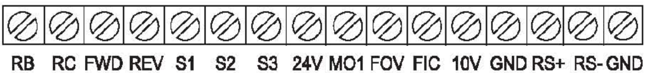
Model	Input voltage	Motor Output (kW)	Main Circuit Cable Type (mm^2)	Breaker Selection (A)	Input Side Magnetic contractor (A)
T9200-0R4G	1PH 220V 50/60Hz	0.4	0.75	10	9
T9200-0R75G		0.75	0.75	16	12
T9200-1R5G		1.5	1.5	25	18
T9200-2R2G		2.2	2.5	32	25
T9200-3R7G		3.7	2.5	40	32
T9200-5R5G		5.5	4	40	32
T9200-7R5G		7.5	6	50	38
T9400-0R4G	3PH 380V 50/60HZ	0.4	0.75	6	9
T9400-0R75G		0.75	0.75	6	9
T9400-1R5G		1.5	0.75	10	9
T9400-2R2G		2.2	0.75	10	9
T9400-3R7G/5R5P		3.7/5.5	1.5	16	12
T9400-5R5G/7R5P		5.5/7.5	2.5	20	18
T9400-7R5G/11P		7.5/11	4	32	25
T9400-11G/15P		11/15	4	40	32

Model	Input voltage	Motor Output (kW)	Main Circuit Cable Type (mm^2)	Breaker Selection (A)	Input Side Magnetic contractor (A)
T9400-15G/18.5P	3PH 380V 50/60HZ	15/18.5	6	50	38
T9400-18.5G/22P		18.5/22	10	80	65
T9400-22G/30P		22/30	10	80	65
T9400-30G/37P		30/37	16	100	65
T9400-37G/45P		37/45	25	100	80
T9400-45G/55P		45/55	35	160	95
T9400-55G		55	50	160	115
T9400-75P		75	50	160	115
T9400-75G/90P		75/90	70	250	150
T9400-90G/110P		90/110	95	250	170
T9400-110G/132P		110/132	120	400	205
T9400-132G/160P		132/160	150	400	245
T9400-160G/185P		160/185	185	400	300
T9400-185G/200P		185/200	185	500	410
T9400-200G/220P		200/220	185	500	410
T9400-220G/250P		220/250	240	630	410
T9400-250G/280P		250/280	240	630	475
T9400-280G/315P		280/315	150*2	700	620
T9400-315G/350P		315/350	185*2	800	620
T9400-350G/400P		350/400	185*2	800	620
T9400-400G/450P		400/450	240*2	1000	800
T9400-450G/500P		450/500	240*2	1000	800

Chapter 2 wiring

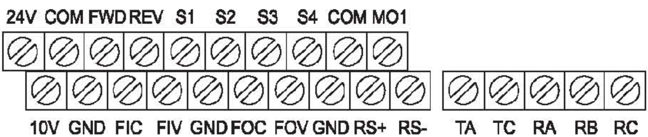
2-1 Terminal Configuration

1. 1PH/220V 0.4-3.7kW&3PH/380V 0.4-5.5kW (vector control)



Note: S3 terminal only supports NPN function, while other FWD, REV, S1, S2 can support PNP and NPN function

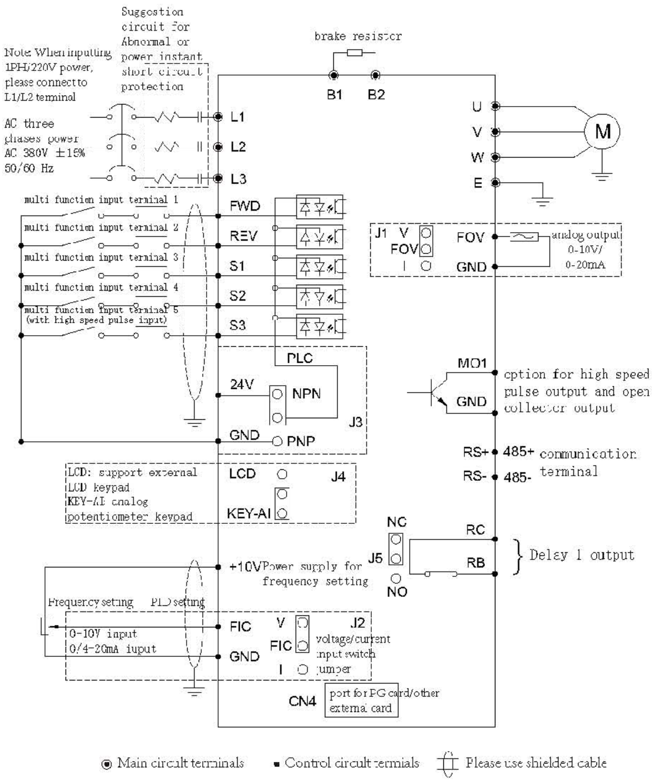
2. 220V/5.5-7.5kW&380V/7.5kW above



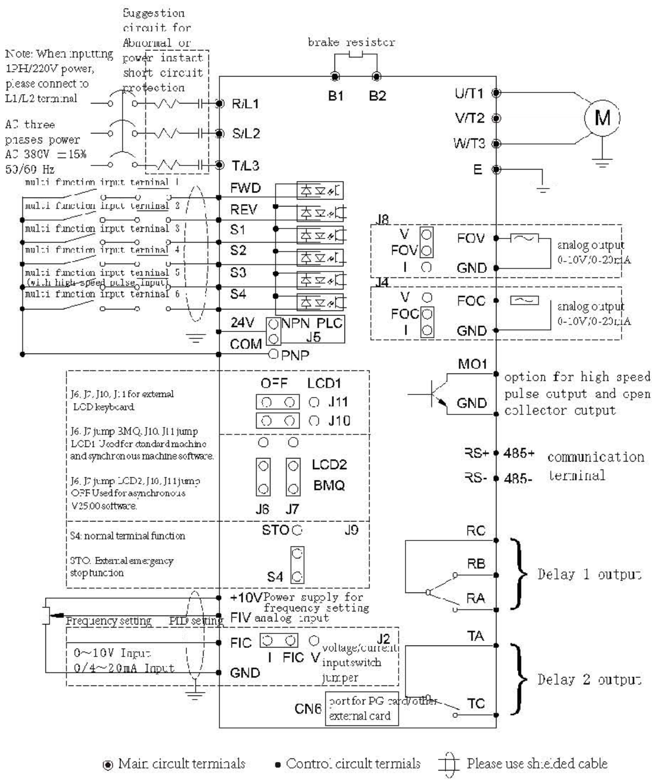
3. Air compressor special terminal

2-2 Wiring Diagram

1. 1PH/220V 0.4-3.7kW&3PH/380V 0.4-5.5kW (vector control)

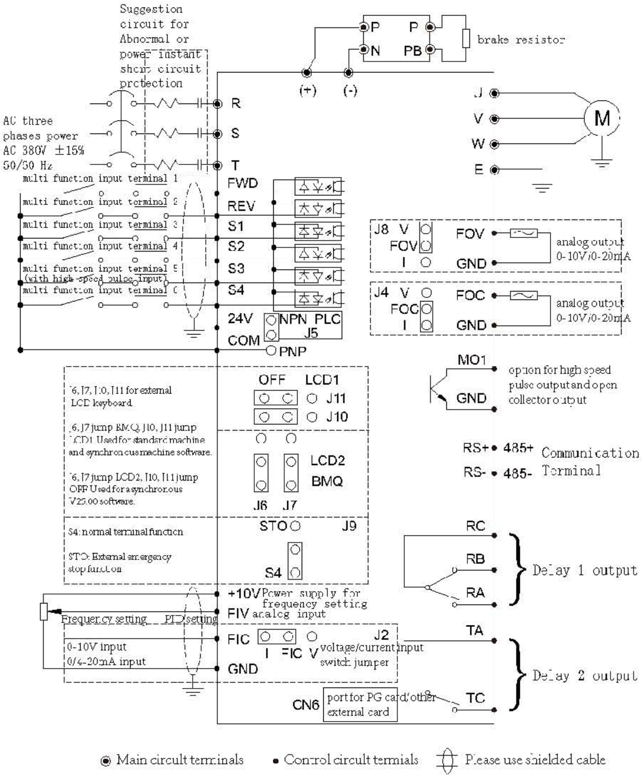


2. 220V/5.5-7.5kW&380V/7.5kW-160kW



Note: 220V/ 5.5-7.5kw &380V/ 7.5-37kw standard built-in braking unit, 45kW-160kW braking unit optional.

3. 380V/185kW-450kW

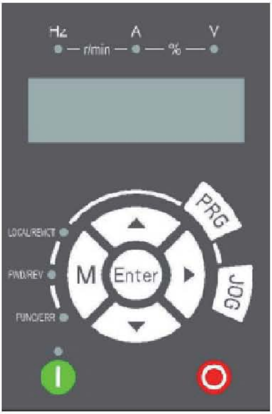


Chapter 3 Operation

3-1 Keypad Description

1) 0.4KW-5.5KW

2) 7.5KW-450KW



3) Function key description

Key	Name	Description
PRG	Programming key	Entry or escape of first-level menu
ENTER	Data enter key	Progressively enter menu and confirm parameters
▲	UP Increment Key	Progressively increase data or function codes
▼	DOWN Decrement Key	Progressively decrease data or function codes
►	Shift Key	In parameter setting mode, press this button to select the bit to be modified. In stop and running display modes, cyclically displays parameters by shift key.
	Run key	Start to run the inverter in keypad control mode
	Stop/Fault reset key	In running status, restricted by P7.02, can be used to stop the inverter. When fault alarm, can be used to reset the inverter without any restriction.
JOG	Shortcut Key	Determined by function code P7.01 0: No function 1: Switchover between operation panel command and remote operation command. It indicates the switchover between the current command source and operation panel control (local operation). If the current command source is operation panel control, the key is invalid. 2: Switch between forward and reverse, It only valid when command source is operation panel channel. 3: Forward JOG 4: Reverse JOG
M	No function	

4) Indicator light description

Indicator Light Name	Indicator light description
Hz	Frequency unit
A	Current unit
V	Voltage unit
FWD/REV	Extinguished: Forward operation Light on: Reverse operation

Indicator Light Name	Indicator light description
LOCAL/REMOT	Extinguished: Local operation Flickering: Terminal operation Light on: Communication control
FUNC/ERR	Extinguished: Running state Flickering: Pre-alarm of overload Light on: Fault
	Extinguished: Stop mode Flickering: In the process of auto-tuning Light on: Running mode

Chapter 4

Detailed Function Description

Group P0: Basic Parameters

P0.00	G/P type display		Default	Model dependent
	Setting Range	1	G type (constant torque load)	
		2	P type (variable torque load e.g. fan and pump)	

This parameter is used to display the delivered model and cannot be modified.

1: Applicable to constant torque load with rated parameters specified

2: Applicable to variable torque load (fan and pump) with rated parameters specified

P0.01	Control mode selection		Default	2
	Setting Range	0	Sensorless flux vector control (SFVC)	
		1	Closed-loop vector control (CLVC)	
		2	V/F control	

0: Sensorless flux vector control (SFVC)

It indicates open-loop vector control, and is applicable to high-performance control applications such as machine tool, centrifuge, wire drawing machine and crane. One AC drive can operate only one motor.

1: Closed-loop vector control (CLVC)

It is applicable to high-accuracy speed control or torque control applications such as high-speed paper making machine, crane and elevator. One AC drive can operate only one motor. An encoder must be installed at the motor side, and a PG card matching the encoder must be installed at the AC drive side.

Note:If vector control is used, motor auto-tuning must be performed because the advantages of vector control can only be utilized after correct motor parameters are obtained. Better performance can be achieved by adjusting speed regulator parameters in group P1.

2: V/F control

P0.02	Command source		Default	0
	Setting Range	0	Operation panel control (LED off)	
		1	Terminal control (LED on)	
		2	Communication control (LED blinking)	

It is used to determine the input channel of the AC drive control commands, such as run,stop, forward rotation, reverse rotation and jog operation. You can input the commands through below methods:

0: Operation panel control ("LOCAL/REMOT" indicator off)

Commands are given by pressing keys RUN and STOP/RES on the operation panel.

1: Terminal control ("LOCAL/REMOT" indicator on)

Commands are given by means of multifunctional input terminals with functions such as FWD, REV, JOGF, and JOGR.

2: Communication control ("LOCAL/REMOT" indicator blinking)

Commands are given from host computer. If this parameter is set to 2, a communication card might be installed.

P0.03	Main frequency source X selection		Default: 0
	Setting Range	0	Digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost don't memorise)
		1	Digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost memorise)
		2	FIV
		3	FIC
		4	Reserved
		5	Pulse setting (S3)
		6	Multspeed instruction
		7	PLC
		8	PID
		9	Communications command

Choose inverter main input channel of a given frequency.

A total of 10 main a given frequency channel:

0: digital setting (power lost doesn't memorise)

Set the initial value of frequency P0.08 (frequency preset) values. Can use the keyboard ▲ keys and ▼ keys (or multi-function input terminal of the UP and DOWN) to change the set frequency value of the inverter. Inverter after power off and power on again, set frequency values revert to P0.08 (digital frequency setting preset) values.

1: digital setting (power lost memorise)

Set the initial value of frequency P0.08(preset frequency)values. Can be brought though the keyboard ▲, ▼ keys (or though the multi-function input terminal of the UP and DOWN) to change the set frequency value of the inverter.

After the Inverter's power is off then the power is on again, set the frequency the same as the frequency last time when power supply drops,the freq. Corrections through the keyboard ▲, ▼ keys or by terminal UP and DOWN will be memorized.

Which need to be reminded is that P0.23 is to set the "digital frequency setting down memory selection", P0.23 is used to select whether inverter memorizes the freq or is reset during stopping time,P0.23 is related to the stop,isn't related to the drop memory, pay attention in the application

2: FIV

3: FIC

T9000 provides two analog input terminal (FIV, FIC).Among them, the FIV is from 0V to 10V voltage input, FICis from 0V to 10V voltage input or 4 ~ 20 mA current input, can be selected by the wire jumper of Control panel

The input voltage value of FIV, FIC and the corresponding relationship with the target frequency can be selected by the parameter setting. T9000 provide 5 set of corresponding relation curve, the user can set through the P4 group and C6 group function code.

P4.33 function code is used to set the FIV ~ FIC 2 channel analog inputs, selecting whichever the five groups of curve . the five corresponding relation curves.Please refer to the description of P4, L6 group function code for the curve.

5: Pulse frequency (S3) given: the given frequency is decided by terminal pulse input.

Pulse signal given specifications: voltage range: 9 v~ 30 v , frequency range:

0 kHz to 100 kHz. Input pulse can only be given from multifunctional input terminals S3.

The relation between S3 pulse frequency input and the corresponding setting relationship is set through parameter P4.28 ~ P4.31, the corresponding relations is linear of 2 points, the input pulses setting 100.0% is referred to the percentage of the maximum frequency P0.10.

6:More instructions to choose and more instructions operation mode: select speed through the digital input S terminal state of different combinations,T9000 can set up 4 multispeed instruction terminals and select 16 state of those terminals. Through the function of the PC group code corresponding to any 16 Multistage instruction .The Multistage instruction is referred to the percentage of the maximum frequency P0.10

When define digital input S terminal as multispeed selection terminal, The specific content can refer to parameter P4 group.

7: Simple PLC

When frequency source is in simple PLC mode, frequency source of Inverter can run between any frequency source from 1 to 16 , the hold time from 1 to16 frequency instruction and their respective acc. /dec. time can also be set by the user.The specific content can refer to PC group.

8: PID

Select the process of PID control output as the operating frequency. This function is commonly used in the scene of the procedure closed-loop control.such as the occasion of constant pressure closed-loop control and Constant tension closed-loop control . Apply the PID as frequency source,need to set up related parameters of PID function in PA group.

9: Communication given: the main frequency source is given by upper machine through communication Modbus (The standard configuration) , Profibus-DP (optional configuration).

P0.04	Auxiliary frequency source Y selection		Default	0
	Setting Range	0	digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost doesn't memorize)	
		1	digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost memorize)	
		2	FIV	
		3	FIC	
		4	Rervered	
		5	Pulse setting (S3)	
		6	Multispeed instruction	
		7	PLC	
		8	PID	
		9	Communications given	

Auxiliary frequency source as an independent frequency given channel (i.e. frequency source selection of X to Y switch), its usage is the same as the main frequency source X, method of application can refer to P0.03 related instructions.

When auxiliary frequency source is used as a superposition of given (i.e. frequency source selection of X + Y, X to X + Y switch or Y to X + Y),need to pay attention to:

1) When the auxiliary frequency source for digital timing, preset frequency (P0.08) doesn't work, the user can adjust through the keyboard ▲, ▼ button (or multi-function input terminal of UP and

DOWN) on the frequency ,directly adjust on the basis of the main given frequency.
2) When the auxlliary frequency source Is analog Input glven (FIV, FIC) or input pulse given, 100% of the input setting corresponding auxiliary frequency source range, can be set by P0.05 and P0.06.
3) When Frequency source is pulse input given similar to analog given. Tip: auxiliary frequency source Y selection and main frequency source X, can't be set to the same channel, namely P0.03 and P0.04 can't be set to the same value, otherwise can be easy to cause confusion.

P0.05	Auxiliary frequency source superposition Y range selection		Default	0
	Setting Range	0	Relative to the maximum frequency	
		1	Relative to the main frequency source X	
P0.06	Auxlliary frequency source superposition Y		Default	0
	Setting Range		0%~150%	

When selecting frequency source for "the superposition offrequency", these two parameters are used to determine the adjusting range of auxiliary frequency source.
P0.05 is used to determine the scope of the auxiliary frequency source of the object, can choose which is relative to the maximum frequency, can also be relative to the rate of frequency source X, if choice is relative to the main frequency source, the scope of the secondary frequency source will change as the change of main frequency X.

P0.07	Frequency source		Default	0
	Setting Range	Unit's digit (Frequency source)		
		1	X and Y operation(operation relationship determined by ten's digit)	
		2	Switchover between X and Y	
		3	Switchover between X and "X and Y operation"	
		4	Switchover between Y and "X and Y operation"	
		Ten's digit (X and Y operation)		
		0	X+Y	
		1	X-Y	
		2	Maximum of X and Y	
		3	Minimum of X and Y	

It is used to select the frequency setting channel. The final freq.

reference are determined by the combination of the main frequency source X and auxiliary frequency source Y.
Unit's digit (Frequency source)
0:The main frequency X as the target frequency.
1: Main frequency source X and auxiliary frequency source Y operation result as the target frequency, the operation relationship is decided by the function code "ten's digit".
2:Main frequency source X and auxiliary frequency source Y switch when the multifunctional input terminal 18 (frequency switch) is invalid, the main frequency X as the target frequency. When the multifunctional input terminals function 18 (frequency source switch) is valid, auxiliary frequency Y as the target frequency.
3:The main switch frequency source X and main/auxiliary operation results When the multi-function input terminals function 18 (frequency switch) is invalid, the main frequency X as the target frequency. When the multi-function input terminals function 18 (frequency switch) is valid, main/auxiliary computing results as the target frequency.
4:Auxiliary switch frequency source Y and main/auxiliary operation results When the multi-function input terminals function 18 (frequency switch) is invalid, auxiliary frequency Y as the target frequency. When the multi-function input terminals function 18 (frequency switch) is valid, main/auxiliary computing results as the target frequency.
Ten: frequency source main/auxiliary relationship between operation:
0:The main frequency of X and Y auxiliary frequency and frequency as the target.
1:Main frequency X minus Y auxiliary frequency difference as the target frequency.
2:Max(the main frequency source X, the auxiliary frequency source Y) take the absolute value of the largest in the X and Y auxiliary frequency as the target frequency.
3:Min (the main frequency source X, the auxiliary frequency source Y) take the the least absolute value of X and Y auxiliary frequency as the target frequency. In addition, when the frequency source selection of the main/auxiliary computing, offset frequency, can be set by P0.21 offset frequency, to compensate the main/auxiliary operation results in a flexible response to various needs.

P0.08	Frequency preset	Default	50.00Hz
	Setting Range	0.00 ~ maximum frequency (frequency source selection set for "digital" is effective)	

When frequency source selection set for "digital" or "terminal UP/ DOWN", the function code value is the frequency of the inverter digital set initial value

P0.09	Rotation direction		Default	0
	Setting Range	0	Same direction	
		1	Reverse direction	

By changing the function code, need not to change the motor wiring for the purpose of the motor's direction , its effect is equivalent to adjust electric machine's (U, V, W) any two lines for motor direction of rotation transformation.

Tip: after initialization parameter will restore the original state of the motor running direction.Pay attention to the good debugging system which is forbidden to change the motor's running direction

P0.10	Maximum frequency	Default	50.00Hz
	Setting Range	50.00Hz~320.00Hz	

In T9000 analog input and pulse input (S3), period of instruction, etc, as a frequency source 100.0% of their relatively P0.08 calibration.

P0.11	Upper limit frequency source		Default	0
	Setting Range	0	P0.12 setting	
		1	FIV	
		2	FIC	
		3	reserved	
		4	PULSE settings	
		5	communication settings	

Define the upper limit frequency source. Can come from upper limit frequency Define the upper limit frequency source . the upper limit frequency can be from the digital set (P0.12), can also be from the analog input. When was capped with analog input frequency, analog input set 100% is corresponding to P0.12.

For example, at the scene of the winding control using torque control mode, in order to avoid material break appear "ride" phenomenon, can use analog upper limit frequency, when the inverter runs to the upper limit frequency value, the inverter is in a maximum frequency operation.

P0.12	Upper limit frequency	Default	50.00Hz
	Setting Range	Frequency lower limit P0.14~Maximum frequency P0.10	

P0.13	Upper limit frequency offset	Default	0.00Hz
	Setting Range	0.00Hz~Maximum frequency P0.10	

When the upper limit set for analog or PULSE frequency, P0.13 as the set offset, superimpose the offset frequency and P0.11 setting upper limit frequency values, as the final limit frequency value.

P0.14	Frequency lower limit	Default	0.00Hz
	Setting Range	0.00Hz~Frequency upper limit P0.12	

Frequency instructions below P0.14 set the lower limit of frequency, inverter can stop and run at the lower frequency or at zero speed line, what operation mode can be P8.14 (set frequency is lower than the lower limit frequency operation mode) Settings.

P0.15	Carrier frequency	Default	Model dependent
	Setting Range	0.00Hz~16.0KHZ	

This function adjusting carrier inverter by adjusting the carrier frequency can reduce motor's noise, to avoid the resonance point of mechanical system, reduce the line of floor drain current and reduce interference caused by inverter

When the carrier frequency is low, the output current of higher harmonic component increases, motor loss increases, the motor temperature increases. When the carrier frequency is higher, the motor loss reduces, the motor temperature rise reduces, but the loss of the inverter increases, the temperature rise of the inverter increases, interference increases.

Adjusting the carrier frequency will affect the performance of the following:

Carrier frequency	low → high
The motor noise	large → small
The output current waveform	Bad → good
Temperature Rise in Electric Motors	High → low
The temperature rise of the inverter	Low → high
leak current	Small → large
Foreign raxated interference	Small → large

Different power inverters, the carrier frequency of the factory settings are different. Although the user can according to need to modify, but need to pay attention: if the carrier frequency set to a higher value than the factory, will lead to inverter radiator temperature increase, the user needs to derate to use the inverter. otherwise the inverter is in danger of overheating alarm.

P0.16	Carrier frequency adjustment with temperature	Default	0
	Setting Range	0: No 1: Yes	

Carrier frequency with the temperature adjustment, referred to the inverter is detected its radiator at high temperature, reduce the carrier frequency automatically, for lowering the temperature rise of the inverter.When the radiator is at low temperature, carrier frequency returning to the setting value.This feature can reduce the overheat alarm of inverter

P0.17	Acceleration time 1	Default	Model dependent
	Setting Range	0.00s~65000s	
P0.18	Deceleration time 1	Default	Model dependent
	Setting Range	0.00s~65000s	

Acceleration time refers to the inverter from zero,Acceleration, accelerate to deceleration reference frequency(P0.25 determine) time needed for reference frequency .

Deceleration time refers to the inverter from benchmark frequency (P0.25 determine), deceleration slowed to zero frequency time required.

P0.19	Acceleration/ Deceleration time unit		Default	1
	Setting Range	0	1s	
		1	0.1s	
		2	0.01s	

To meet the needs of all kinds of scene, T9000 provides three kinds of deceleration time units,respectively 1 seconds, 0.1 seconds and 0.01 seconds.

Note: modify the function parameters, four groups of decimal digits, as suggested by the deceleration time will change, the corresponding deceleration time changes, also pay special attention to the course of application.

P0.21	Frequency offset of auxiliary frequency source when superimposes	Default	0.00Hz
	Setting Range	0.00Hz~maximum frequencyP0.10	

This function code is only valid at the time of frequency source selection of the main/auxiliary computing.

When frequency source of the main/auxiliary is computing, P0.21 as offset frequency, and main/auxiliary computing results superposition frequency value, as the final frequency setting ,make frequency setting be more flexible.

P0.22	Frequency reference resolution		Default	2
	Setting Range	2	0.01Hz	

All the parameters used to determine the resolution of the function code are associated with the frequency.

P0.23	Retentive of digital setting frequency upon power failure		Default	0
	Setting Range	0	no memory	
		1	memory	

The function of frequency source for digital is only effective when digital setting.

"no memory" refers to the inverter after downtime, digital frequency values revert to P0.08 (frequency preset)value, the keyboard ▲, ▼ button or terminal UP and DOWN to correct the frequency is reset.

"Memory" refers to the inverter after downtime , digital set frequency keep set for the last moment of downtime, bring keyboard ▲, ▼ button or terminal UP and DOWN to correct the frequency of remain valid.

P0.25	Acceleration/ Deceleration time reference frequency		Default	0
	Setting Range	0	Maximum frequency (P0.10)	
		1	Set frequency	
		2	100Hz	

Acceleration/Deceleration time, refers to the frequency from zero to P0.25 set frequency between the Acceleration/Deceleration time. When the P0.25 is selected to 1, Acceleration/Deceleration time is associated with a set frequency, if set frequency change frequently, the acceleration of the motor is variable, pay attention to the application.

P0.26	Reference frequency for UP/DOWN modification during running		Default	0
	Setting Range	0	Running frequency	
		1	Set frequency	

This parameter is only valid when frequency source for the digital setting.

Used to determine ▲, ▼ button or terminal of the keyboard UP/

DOWN action, adopt which way set frequency correction, the target frequency is based on the operating frequency increase or decrease, or based on a set frequency increase or decrease. Two set of distinctions are obvious when inverter is in the Acceleration / Deceleration process, namely, if the operation of the inverter frequency and setting frequency is not at the same time, the parameters of the different selection difference is very big.

P0.27	Binding command source to frequency source		Default	000
	Setting Range	Unit's digit	Binding operation panel command to frequency source	
		0	No binding	
		1	Frequency source by digital setting	
		2	FIV	
		3	FIC	
		4	reserved	
		5	Pulse setting (S3)	
		6	Multi-reference	
		7	Simple PLC	
		8	PID	
		9	Communication setting	
		Ten's digit	Binding terminal command to frequency source (0~9, same as unit's digit)	
		Hundred's digit	Binding communication command to frequency source (0~9, same as unit's digit)	

It is used to bind the three running command sources with the nine frequency sources, facilitating to implement synchronous switchover.

For details on the frequency sources, see the description of P0.03 (Main frequency source X selection). different running command sources can be bound to the same frequency source.

If a command source has a bound frequency source, when the process of frequency source is effective,the command source set in P0.03 to P0.07 will no longer work.

Group P1: Motor Parameters

P1.00	Motor type selection	Default	0
	Setting Range	0: common asynchronous motor 1: variable frequency asynchronous motor 2: Permanent magnetic synchronous motor	

P1.01	Rated motor power	Default	Model dependent
	Setting Range	0.1kW~1000.0kW	
P1.02	Rated motor voltage	Default	Model dependent
	Setting Range	1V~2000V	
P1.03	Rated motor current	Default	Model dependent
	Setting Range	0.01A~655.35A (AC drive power<=55kW) 0.1A~6553.5A (AC drive power>55kW)	
P1.04	Rated motor frequency	Default	Model dependent
	Setting Range	0.01Hz~maximum frequency	
P1.05	Rated motor rotational speed	Default	Model dependent
	Setting Range	1rpm~65535rpm	
P1.06	Stator resistance (asynchronous motor)	Default	Model dependent
	Setting Range	0.001Ω~30.000Ω	
P1.07	Rotor resistance (asynchronous motor)	Default	Model dependent
	Setting Range	0.001Ω~65.535Ω (AC drive power<=55kW) 0.0001Ω~6.5535Ω (AC drive power>55kW)	
P1.08	Leakage inductive reactance (asynchronous motor)	Default	Model dependent
	Setting Range	0.01mH~655.35mH (AC drive power<=55kW) 0.001mH~65.535mH (AC drive power>55kW)	
P1.09	Mutual inductive reactance (asynchronous motor)	Default	Model dependent
	Setting Range	0.1mH~6553.5mH (AC drive power<=55kW) 0.01mH~655.35mH (AC drive power>55kW)	
P1.10	No-load current (asynchronous motor)	Default	Model dependent
	Setting Range	0.01A~P2.03 (AC drive power<=55kW) 0.1A~P2.03 (AC drive power>55kW)	

The motor auto-tuning accuracy depends on the correct setting of motor nameplate parameters.

The parameters in P1.06 to P1.10 are asynchronous motor parameters. These parameters are unavailable on the motor nameplate and are obtained by means of motor auto-tuning.

Only P1.06 to P1.08 can be obtained through static motor auto-tuning. Through complete motor auto-tuning, encoder phase sequence and current loop PI can be obtained besides the parameters in P1.06 to P1.10.

Each time "Rated motor power" (P1.01) or "Rated motor voltage" (P1.02) is changed, the AC drive automatically restores values of P1.06 to P1.10 to the parameter setting for the common standard Y series asynchronous motor.
If it is impossible to perform motor auto-tuning onsite, manually input the values of these parameters according to data provided by the motor manufacturer.

P1.16	Stator resistance (synchronous motor)	Default	Model dependent
	Setting Range	0.001Ω~65.535Ω (AC drive power<=55kW) 0.0001Ω~6.5535Ω (AC drive power>55kW)	
P1.17	Shaft D inductance (synchronous motor)	Default	Model dependent
	Setting Range	0.01mH~655.35mH (AC drive power<=55kW) 0.001mH~65.535mH (AC drive power>55kW)	
P1.18	Shaft Q inductance (synchronous motor)	Default	Model dependent
	Setting Range	0.01mH~655.35mH (AC drive power<=55kW) 0.001mH~65.535mH (AC drive power>55kW)	
P1.20	Back EMF (synchronous motor)	Default	Model dependent
	Setting Range	0.00V~6553.5V	

P1.16 to p1.20 are synchronous motor parameters. These parameters are unavailable on the nameplate of most synchronous motors and can be obtained by means of "Synchronous motor no-load auto-tuning". Through "Synchronous motor with-load auto-tuning", only the encoder phase sequence and installation angle can be obtained.
Each time "Rated motor power" (P1.01) or "Rated motor voltage" (P1.02) is changed, the AC drive automatically modifies the values of P1.16 to P1.20.
You can also directly set the parameters based on the data provided by the synchronous motor manufacturer.

P1.27	Encoder pulses per revolution	Default	1024
	Setting Range	1~65535	

This parameter is used to set the pulses per revolution (PPR) of ABZ or UVW incremental encoder. In CLVC mode, the motor cannot run properly if this parameter is set incorrectly.

P1.28	Encoder type		Default	0
	Setting Range	0	ABZ incremental encoder	
		1	UVW incremental encoder	
		2	Resolver	
		3	SIN/COS encoder	
		4	Wire-saving UVW encoder	

T9000 supports a variety of encoder types, different encoders need to match different PG cards, please correctly choose and buy the PG cards After installing the PG cards, according to the actual situation ,to set up correctly P1.28, otherwise inverter may not run properly. The function code applies only to ABZ incremental encoder, The function code is effective only when P1.28 = 0. Used to set the AB, ABZ incremental encoder signal phase sequence.

P1.30	ABZ encoder AB phase sequence.	Default	0
	Setting Range	0 forward 1 reverse	

P1.31	Encoder installation angle	Default	0.0°
	Setting Range	0.0°~359.9°	

This parameter is applicable only to synchronous motor. It is valid for ABZ incremental encoder, UVW incremental encoder, resolver and wire-saving UVW encoder, but invalid for SIN/COS encoder.

This parameter obtain through synchronous motor no-load auto-tuning or with-load auto-tuning. After installation of the synchronous motor is complete, the value of this parameter must be obtained by motor auto-tuning. Otherwise, the motor cannot run properly.

P1.32	U, V, W phase sequence of UVW encoder		Default	0
	Setting Range	0	Forward	
		1	Reverse	

P1.33	UVW encoder angle offset	Default	0.0°
	Setting Range	0.0°~359.9°	

These two parameters are valid only when the UVW encoder is applied to a synchronous motor. They can be obtained by synchronous motor no-load auto-tuning or with-load auto-tuning. After installation of the synchronous motor is complete, the values of these two parameters must be obtained by motor auto-tuning. Otherwise, the motor cannot run properly.

P1.34	Number of pole pairs of resolver	Default	1
	Setting Range	1~65535	

If a resolver is applied, set the number of pole pairs properly.

P1.36	Encoder wire-break fault detection time	Default	0.0s
	Setting Range	0.0s: No action 0.1s~10.0s	

This parameter is used to set the time that a wire-break fault lasts. If it is set to 0.0s, the AC drive does not detect the encoder wire-break fault. If the duration of the encoder wire-break fault detected by the AC drive exceeds the time P1.36 set in this parameter, the AC drive reports PG

P1.37	Auto-tuning selection		Default	0
	Setting Range	0	No auto-tuning	
		1	Asynchronous motor static auto-tuning	
		2	Asynchronous motor complete auto-tuning	
		3	Complete static au-to-tuning	
		11	Synchronous motor with-load auto-tuning	
		12	Synchronous motor no-load auto-tuning	

0: No auto-tuning

Auto-tuning is prohibited.

1: Asynchronous motor static auto-tuning

It is applicable to scenarios where complete auto-tuning cannot be performed because the asynchronous motor cannot be disconnected from the load.

Before performing static auto-tuning, properly set the motor type and motor nameplate parameters of P1.00 to P1.05 first. The AC drive will obtain parameters of P1.06 to P1.08 by static auto-tuning. Set this parameter to 1, and press RUN. Then, the AC drive starts static auto-tuning.

2: Asynchronous motor complete auto-tuning

To perform this type of auto-tuning, ensure that the motor is disconnected from the load.During the process of complete auto-tuning, the AC drive performs static auto-tuning first and then accelerates to 80% of the rated motor frequency within the acceleration time set in P008. The AC drive keeps running for a certain period and then decelerates to stop within deceleration time set in P009.Before performing complete auto-tuning, properly set the motor type, motor nameplate parameters of P1.00 to P1.05, "Encoder type" (P1.28) and "Encoder pulses per revolution" (P1.27) first.

The AC drive will obtain motor parameters of P1.06 to P1.10, "A/B phase sequence of ABZ incremental encoder" (P1.30) and vector control current loop PI parameters of P3.13 to P3.16 by complete auto-tuning. Set this parameter to 2, and press RUN. Then, the AC drive starts complete auto-tuning.

11: Synchronous motor with-load auto-tuning

It is applicable to scenarios where the synchronous motor cannot be disconnected from the load. During with-load auto-tuning, the motor rotates at the speed of 10 PRM. Before performing with-load auto-tuning, properly set the motor type and motor nameplate parameters of P1.00 to P1.05 first.

By with-load auto-tuning, the AC drive obtains the initial position angle of the synchronous motor, which is a necessary prerequisite of the motor's normal running. Before the first use of the synchronous motor after installation, motor auto-tuning must be performed.

Set this parameter to 11, and press RUN. Then, the AC drive starts with-load auto-tuning.

12: Synchronous motor no-load auto-tuning

If the synchronous motor can be disconnected from the load, no-load auto-tuning is recommended, which will achieve better running performance compared with with-load auto-tuning. During the process of no-load auto-tuning, the AC drive performs with-load auto-tuning first and then accelerates to P0.08 of the rated motor frequency within the acceleration time set in P0.17. The AC drive keeps running for a certain period and then decelerates to stop within the deceleration time set in P0.08. Before performing no-load auto-tuning, properly set the motor type, motor nameplate parameters of P1.00 to P1.05, "Encoder type" (P1.28) and "Encoder pulses per revolution" (P1.27) and "Number of pole pairs of resolver" (P1.34) first.

Note: Motor auto-tuning can be performed only in operation panel mode.

Group P2: Vector Control Parameters

P3 group function code applies only to the vector control, control of V/F is invalid.

P2.00	Speed loop proportional gain 1	Default	30
	Setting Range	1~100	
P2.01	Speed loop integral time 1	Default	0.50s
	Setting Range	0.01s~10.00s	

P2.02	Switchover frequency 1	Default	5.00Hz
	Setting Range	0.00~P3.05	
P2.03	Speed loop proportional gain 2	Default	15
	Setting Range	0~100	
P2.04	Speed loop integral time 2	Default	1.00s
	Setting Range	0.01s~10.00s	
P2.05	Switchover frequency 2	Default	10.00Hz
	Setting Range	P3.02~maximum output frequency	

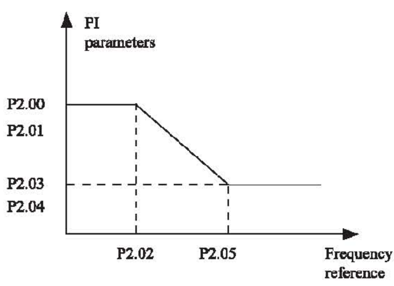
Speed loop PI parameters vary with running frequencies of the AC drive.

If the running frequency is less than or equal to "Switchover frequency 1" (P2.02), the speed loop PI parameters are P2.00 and P2.01.

If the running frequency is equal to or greater than "Switchover frequency 2" (P2.05), the speed loop PI parameters are P2.03 and P2.04.

If the running frequency is between P2.02 and P2.05, the speed loop PI parameters are obtained from the linear switchover between the two groups of PI parameters, as shown in Figure 4-1.

Figure 4-1 Relationship between running frequencies and PI parameters



The speed dynamic response characteristics in vector control can be adjusted by setting the proportional gain and integral time of the speed regulator.

To achieve a faster system response, increase the proportional gain and reduce the integral time. Be aware that this may lead to system oscillation.

The recommended adjustment method is as follows:

If the factory setting cannot meet the requirements, make proper adjustment. Increase the proportional gain first to ensure that the system does not oscillate, and then reduce the integral time to ensure that the system has quick response and small overshoot.

Note:Improper PI parameter setting may cause too large speed overshoot, and overvoltage fault may even occur when the overshoot drops.

P2.09	Torque upper limit source in speed control mode		Default	0
	Setting Range	0	P2.10	
		1	FIV	
		2	FIC	
		3	Reserved	
		4	Pulse setting	
		5	Communication setting	
P2.10	digital setting of torque upper limit in speed control mode		Default	150.0%
	Setting Range			0.0%~200.0%

In the speed control mode, the maximum output torque of the AC drive is restricted by P2.09. If the torque upper limit is analog, pulse or communication setting, 100% of the setting corresponds to the value of P2.10, and 100% of the value of P2.10 corresponds to the AC drive rated torque.

P2.13	Excitation adjustment proportional gain	Default	2000
	Setting Range	0~20000	
P2.14	Excitation adjustment integral gain	Default	1300
	Setting Range	0~20000	
P2.15	Torque adjustment proportional gain	Default	2000
	Setting Range	0~20000	
P2.16	Torque adjustment integral gain	Default	1300
	Setting Range	0~20000	

These are current loop PI parameters for vector control. These parameters are automatically obtained through "Asynchronous motor complete auto-tuning" or "Synchronous motor no-load auto-tuning", and commonly need not be modified.

The dimension of the current loop integral regulator is integral gain rather than integral time.

Note that too large current loop PI gain may lead to oscillation of the entire control loop. Therefore, when current oscillation or torque fluctuation is great, manually decrease the proportional gain or integral gain here.

P2.18	Field weakening mode of synchronous motor	Default	0
	Setting Range	0	No field weakening
		1	direct calculation
		2	Automatic adjustment
P2.19	Field weakening depth of synchronous motor	Default	100%
	Setting Range	50%~500%	
P2.20	Maximum field weakening current	Default	50%
	Setting Range	1%~300%	
P2.21	Field weakening automatic adjustment gain	Default	100%
	Setting Range	10%~500%	
P2.22	Field weakening integral multiple	Default	2
	Setting Range	2~10	

These parameters are used to set field weakening control for the synchronous motor.

If P2.18 is set to 0, field weakening control on the synchronous motor is disabled. In this case, the maximum rotational speed is related to the AC drive bus voltage. If the motor's maximum rotational speed cannot meet the requirements, enable the field weakening function to increase the speed.

The T9000 provides two field weakening modes: direct calculation mode and automatic adjustment mode. In direct calculation mode, directly calculate the demagnetized current and manually adjust the demagnetized current by means of P2.19. The smaller the demagnetized current is, the smaller the total output current is. However, the desired field weakening effect may not be achieved.

In automatic adjustment mode, the best demagnetized current is selected automatically.This may influence the system dynamic performance or cause instability.The adjustment speed of the field weakening current can be changed by modifying the values of P2.21 and P2.22. A quicker adjustment may cause instability. Therefore, generally do not need to modify them manually.

Group P3: V/F Control Parameters

The V/F control mode is applicable to low load applications (fan or pump) or applications where one AC drive operates multiple motors or there is a large difference between the AC drive power and the motor power.

P3.00	V/F curve setting		Default	0
	Setting Range	0	Linear V/F	
		1	Multi-point V/F	
		2	Square V/F	
		3	1.2-power V/F	
		4	1.4-power V/F	
		6	1.6-power V/F	
		8	1.8-power V/F	
		9	Reserved	
		10	V/F complete separation	
		11	V/F half separation	

0: Linear V/F

It is applicable to common constant torque load.

1: Multi-point V/F

It is applicable to special load such as dehydrator and centrifuge. Any such V/F curve can be obtained by setting parameters of P3.03 to P3.08.

2: Square V/F

It is applicable to centrifugal loads such as fan and pump.

3 to 8: V/F curve between linear V/F and square V/F

10: V/F complete separation

In this mode, the output frequency and output voltage of the AC drive are independent. The output frequency is determined by the frequency source, and the output voltage is determined by "Voltage source for V/F separation" (P3.13).

It is applicable to induction heating, inverse power supply and torque motor control.

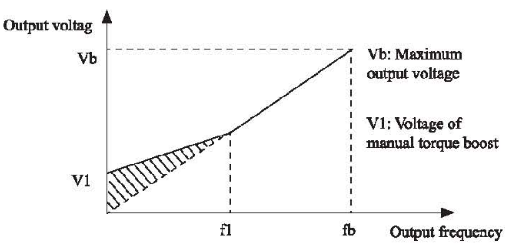
11: V/F half separation

In this mode, V and F are proportional and the proportional relationship can be set in P3.13. The relationship between V and F are also related to the rated motor voltage and rated motor frequency in Group P2.

Assume that the voltage source input is X (0 to 100%), the relationship between V and F is: V/F = 2 x X x (Rated motor voltage)/(Rated motor frequency)

P3.01	Torque boost		Default	Model dependent
	Setting Range	0.0%~30%		
P3.02	Cut-off frequency of torque boost		Default	50.00Hz
	Setting Range	0.00Hz~maximum output frequency		

To compensate the low frequency torque characteristics of V/F control, you can boost the output voltage of the AC drive at low frequency by modifying P3.01. If the torque boost is set to too large, the motor may overheat, and the AC drive may suffer over current. If the load is large and the motor startup torque is insufficient, increase the value of P3.01. If the load is small, decrease the value of P3.01. If it is set to 0.0, the AC drive performs automatic torque boost. In this case, the AC drive automatically calculates the torque boost value based on motor parameters including the stator resistance.
P3.02 specifies the frequency under which torque boost is valid. Torque boost becomes invalid when this frequency is exceeded, as shown in the following figure.



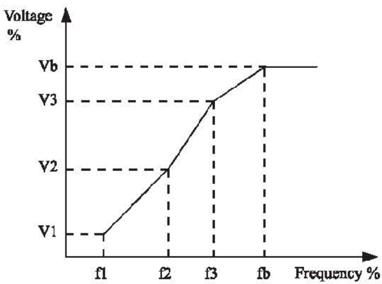
f1: Cutoff frequency of manual torque boost fb: Rated running frequency

Figure 4-2 Manual torque boost

P3.03	Multi-point V/F frequency 1 (F1)		Default	0.00Hz
	Setting Range	0.00Hz~P3.05		
P3.04	Multi-point V/F voltage 1 (V1)		Default	0.0%
	Setting Range	0.0%~100.0%		
P3.05	Multi-point V/F frequency 2 (F2)		Default	0.00Hz
	Setting Range	P3.03~P3.07		

P3.06	Multi-point V/F voltage 2 (V2)	Default	0.0%
	Setting Range	0.0%~100.0%	
P3.07	Multi-point V/F frequency 3 (F3)	Default	0.00Hz
	Setting Range	P3.05~rated motor frequency (P2.04)	
P3.08	Multi-point V/F voltage 3 (V3)	Default	0.0%
	Setting Range	0.0%~100.0%	

These six parameters are used to define the multi-point V/F curve. The multi-point V/F curve is set based on the motor's load characteristic. The relationship between voltages and frequencies is: V1 < V2 < V3, F1 < F2 < F3. At low frequency, higher voltage may cause overheat or even burnt out of the motor and overcurrent stall or overcurrent protection of the AC drive.



V1-V3: 1 st 2nd and 3rd voltage percebtages of multi-point V/F
F1-F3: 1 st 2nd and 3rd frequency percebtages of multi-point V/F
Vb: Rated motor voltage
Fb: Rated motor running frequency

Figure 4-3 Setting of multi-point V/F curve

P3.09	V/F slip compensation gain	Default	0.0%
	Setting Range	0%~200.0%	

This parameter is valid only for the asynchronous motor.

It can compensate the rotational speed slip of the asynchronous motor when the load of the motor increases, stabilizing the motor speed in case of load change. If this parameter is set to 100%, it indicates that the compensation when the motor bears rated load is the rated motor slip. The rated motor slip is automatically obtained by the AC drive through calculation based on the rated motor

frequency and rated motor rotational speed in group P2.
Generally, if the motor rotational speed is different from the target speed, slightly adjust this Parameter.

P3.10	V/F over-excitation gain		Default	64
	Setting Range	0~200		

During deceleration of the AC drive, over-excitation can restrain rise of the bus voltage, preventing the overvoltage fault. The larger the over-excitation is, the better the restraining result is.
Increase the over-excitation gain if the AC drive is liable to overvoltage error during deceleration. However, too large over-excitation gain may lead to an increase in the output current. Set P3.09 to a proper value in actual applications.
Set the over-excitation gain to 0 in the applications where the inertia is small and the bus voltage will not rise during motor deceleration or where there is a braking resistor.

P3.11	V/F oscillation suppression gain		Default	Model dependent
	Setting Range	0~100		

Set this parameter to a value as small as possible in the prerequisite of efficient oscillation suppression to avoid influence on V/F control. Set this parameter to 0 if the motor has no oscillation. Increase the value properly only when the motor has obvious oscillation. The larger the value is, the better the oscillation suppression result will be.
When the oscillation suppression function is enabled, the rated motor current and no- load current must be correct. Otherwise, the V/F oscillation suppression effect will not be satisfactory.

P3.13	Voltage source for V/F separation		Default	0
	Setting Range	0	digital setting (P3.14)	
		1	FIV	
		2	FIC	
		3	Reserved	
		4	Pulse setting (X5)	
		5	Multi-reference	
		6	Simple PLC	
		7	PID	
		8	Communication setting	
		100.0% corresponds to the rated motor voltage.		

P3.14	Voltage digital setting for V/F separation	Default	0V
	Setting Range	0V~rated motor voltage	

V/F separation is generally applicable to scenarios such as induction heating, inverse power supply and motor torque control.

If V/F separated control is enabled, the output voltage can be set in P3.14 or by means of analog, multi-reference, simple PLC, PID or communication. If you set the output voltage by means of non-digital setting, 100% of the setting corresponds to the rated motor voltage. If a negative percentage is set, its absolute value is used as the effective value.

0: digital setting (P3.14)

The output voltage is set directly in P3.14.

1: FIV; 2:FIC; 3: Reserved.

4: Pulse setting (X5)

The output voltage is set by pulses of the terminal X5.

Pulse setting specification: voltage range 9–30 V, frequency range 0–100 kHz

5: Multi-reference

If the voltage source is multi-reference, parameters in group P3 and PC must be set to determine the corresponding relationship between setting signal and setting voltage.

100.0% of the multi-reference setting in group FC corresponds to the rated motor voltage.

6: Simple PLC

If the voltage source is simple PLC mode, parameters in group FC must be set to determine the setting output voltage.

7: PID

The output voltage is generated based on PID closed loop. For details, see the description of PID in group PA.

8: Communication setting

The output voltage is set by the host computer by means of communication.

The voltage source for V/F separation is set in the same way as the frequency source.100.0% of the setting in each mode corresponds to the rated motor voltage. If the corresponding value is negative, its absolute value is used.

P3.15	Voltage rise time of V/F separation	Default	0.0s
	Setting Range	0.0s~1000.0s	

P3.15 indicates the time required for the output voltage to rise from 0 V to the rated motor voltage shown as t1 in the following figure.

P3.16 indicates the time required for the output voltage to decline from the rated motor voltage to 0 V, shown as t2 in the following figure.

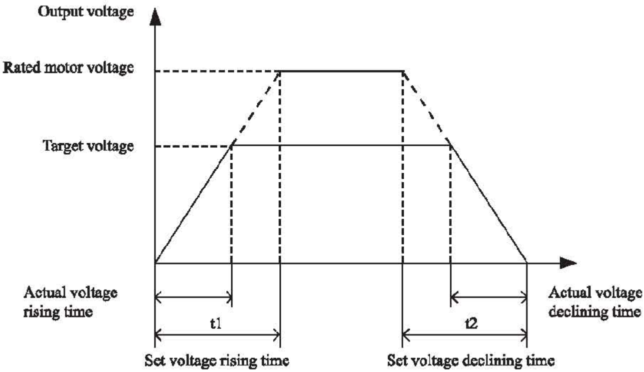


Figure 4-4 Voltage of V/F separation

Group P4: Input Terminals

T9000 series inverter with 8 multi-function digital inputs (S3 can be used as a high-speed pulse input terminal), two analog input terminals.

P4.00	FWD function selection	Default	1 Forward RUN (FWD)
P4.01	REV function selection	Default	4 Reverse RUN (REV)
P4.02	S1 function selection	Default	9 (Fault reset)
P4.03	S2 function selection	Default	12 (Multi-reference terminal 1)
P4.04	S3 function selection	Default	13 (Multi-reference terminal 2)
P4.05	S4 function selection	Default	0
P4.06		Default	0
P4.07		Default	0
P4.08		Default	0
P4.09		Default	0

The following table lists the functions available for the multi-function input terminals.

Can choose the functions in the table as follows:

Value	Function	Description
0	No function	Set 0 for reserved terminals to avoid malfunction.

Value	Function	Description
1	Forward RUN (FWD)	The terminal is used to control forward or reverse RUN of the AC drive.
2	Reverse RUN (REV)	
3	Three-line control	The terminal determines three-line control of the AC drive. For details, see the descriptions of P4.11.
4	Forward JOG (FJOG)	FJOG indicates forward JOG running, while RJOG indicates reverse JOG running. The JOG frequency, acceleration time and deceleration time are described respectively in P8.00, P8.01 and P8.02.
5	Reverse JOG (RJOG)	
6	Terminal UP	If the frequency is determined by external terminals, the terminals with the two functions are used as increment and decrement commands for frequency modification. When the frequency source is digital setting, they are used to adjust the frequency.
7	Terminal DOWN	
8	Coast to stop	The AC drive blocks its output, the motor coasts to rest and is not controlled by the AC drive.
9	Fault reset (RESET)	The terminal is used for fault reset function, the same as the function of RESET key on the operation panel.Remote fault reset can be implemented by this function.
10	RUN pause	The AC drive decelerates to stop, but the running parameters are all memorized, such as PLC, swing frequency and PID parameters. After this function is disabled, the AC drive resumes its status before stopping.
11	Normally open (NO) input of external fault	If this terminal becomes ON, the AC drive reports E15 and performs the fault protection action. For more details, see the description of P9.47.
12	Multi-reference terminal1	The setting of 16 speeds or 16 other references can be implemented through combinations of 16 states of these four terminals.Refer to table 1 for more details
13	Multi-reference terminal 2	
14	Multi-reference terminal 3	
15	Multi-reference terminal 4	
16	Terminal 1 for acceleration/ deceleration time selection	Totally four groups of acceleration/deceleration time can be selected through combinations of two states of these two terminals.
17	Terminal 2 for acceleration/ deceleration time selection	

Value	Function	Description
18	Frequency source switchover	The terminal is used to switch and choose different frequency source.Choose function code P0.07 setting according to the frequency source .when set two kinds of frequency source switching as frequency source.the terminal is used to realize switching between the two frequency source.
19	UP and DOWN setting clear (terminal, operation panel)	If the frequency source is digital setting, the terminal is used to clear the modification by using the UP/ DOWN function or the increment/decrement key on the operation panel, returning the set frequency to the value of P010.
20	Command source switchover terminal	If the command source is set to terminal control (P002 = 1), this terminal is used to perform switchover between terminal control and operation panel control. If the command source is set to communication control (P002 = 2), this terminal is used to perform switchover between communication control and operation panel control.
21	Acceleration/ Deceleration prohibited	It enables the AC drive to maintain the current frequency output without being affected by external signals (except the STOP command).
22	PID pause	PID is invalid temporarily. The AC drive maintains the current frequency output without supporting PID adjustment of frequency source.
23	PLC status reset	The terminal is used to restore the original status of PLC control for the AC drive when PLC control is started again after a pause.
24	Swing pause	The AC drive outputs the central frequency, and the swing frequency function pauses.
25	Counter input	This terminal is used to count pulses.
26	Counter reset	This terminal is used to clear the counter status.
27	Length count input	This terminal is used to count the length.
28	Length reset	This terminal is used to clear the length.
29	Torque control prohibited	The AC drive is prohibited from torque control and enters the speed control mode.
30	Pulse Input (enabled only for S3)	S3 is used as the function of pulse input.
31	Reserved	Reserved
32	Immediate DC braking	After this terminal becomes ON, the AC drive directly switches over to the DC braking state.

Value	Function	Description
33	Normally closed (NC) input of external fault	After this terminal becomes ON, the AC drive reports E15 and stops.
34	Frequency modification forbidden	If this terminal becomes effective , the AC drive will not respond to any frequency modification until this terminal becomes invalid.
35	Reverse PID action direction	After this terminal becomes effective, the PID action direction is reversed to the direction set in PA.03.
36	External STOP terminal 1	In operation panel mode, this terminal can be used to stop the AC drive, equivalent to the function of the STOP key on the operation panel.
37	Command source switchover terminal 2	It is used to perform switchover between terminal control and communication control. If the command source is terminal control, the system will switch over to communication control after this terminal becomes effective.
38	PID integral pause	After this terminal becomes effective, the integral adjustment function pauses. However, the proportional and differentiation adjustment functions are still valid.
39	Switchover between main frequency source X and preset frequency	After this terminal becomes effective, the frequency source X is replaced by the preset frequency set in P010.
40	Switchover between auxiliary frequency source Y and preset frequency	After this terminal is effective, the frequency source Y is replaced by the preset frequency set in P010.
41	Reserved	
42	Reserved	
43	PID parameter switchover	If the PID parameters switchover performed by means of X terminal (PA.18 = 1), the PID parameters are PA.05 to PA.07 when the terminal becomes invalid.; the PID parameters PA.15 to PA.17 are used when this terminal becomes effective.
44	Reserved	
45	Reserved	

Value	Function	Description
46	peed control/ Torque control switchover	This terminal enables the AC drive to switch over between speed control and torque control. When this terminal becomes invalid, the AC drive runs in the mode set in L0.00. When this terminal becomes effective, the AC drive switches over to another control mode.
47	Emergency stop	When this terminal becomes effective, the AC drive stops within the shortest time. During the stop process, the current remains at the set current upper limit. This function is used to satisfy the requirement of stopping the AC drive in emergency state.
48	External STOP terminal 2	In any control mode (operation panel, terminal or communication), it can be used to make the AC drive decelerate to stop. In this case, the deceleration time is deceleration time 4.
49	Deceleration DC braking	When this terminal becomes ON, the AC drive decelerates to the initial frequency of stop DC braking and then switches over to DC braking state.
50	Clear the current running time	When this terminal becomes ON, the AC drive's current running time is cleared. This function must be supported by P8.42 and P8.53.

Additional table 1 :The descriptions of multi-reference

The four multi-reference terminals have 16 state combinations, corresponding to 16 reference values, as listed in the following table1.

K4	K3	K2	K1	Reference Setting	CorresponXng Parameter
OFF	OFF	OFF	OFF	Reference 0	PC.00
OFF	OFF	OFF	ON	Reference 1	PC.01
OFF	OFF	ON	OFF	Reference 2	PC.02
OFF	OFF	ON	ON	Reference 3	PC.03
OFF	ON	OFF	OFF	Reference 4	PC.04
OFF	ON	OFF	ON	Reference 5	PC.05
OFF	ON	ON	OFF	Reference 6	PC.06
OFF	ON	ON	ON	Reference 7	PC.07
ON	OFF	OFF	OFF	Reference 8	PC.08
ON	OFF	OFF	ON	Reference 9	PC.09
ON	OFF	ON	OFF	Reference 10	PC.10
ON	OFF	ON	ON	Reference 11	PC.11
ON	ON	OFF	OFF	Reference 12	PC.12
ON	ON	OFF	ON	Reference 13	PC.13

ON	ON	ON	OFF	Reference 14	PC.14
ON	ON	ON	ON	Reference 15	PC.15

If the frequency source is multi-reference, the value 100% of PC.00 to PC.15 corresponds to the maximum frequency of P0.10

Besides the multi-speed function, the multi-reference can be also used as the PID setting source or the voltage source for V/F separation, satisfying the requirement on switchover of different setting values.

Additional table 2:Terminal function descriptions of acceleration/deceleration time selection

Terminal2	Terminal1	Acceleration/ Deceleration Time Selection	Corresponding Parameters
OFF	OFF	Acceleration time 1	P017, P018
OFF	ON	Acceleration time 2	P8.03, P8.04
ON	OFF	Acceleration time 3	P8.05, P8.06
ON	ON	Acceleration time 4	P8.07, P8.08

P4.10	X filter time		Default	0.010s
	Setting Range	0.000s~1.000s		

It is used to set the software filter time of X terminal status. If X terminals are liable to interference and may cause malfunction, increase the value of this parameter to enhance the anti-interference capability. However, increase of X filter time will reduce the response of X terminals.

P4.11	Terminal command mode		Default	0
	Setting Range	0	Two-line mode 1	
		1	Two-line mode 2	
		2	Three-line mode 1	
		3	Three-line mode 2	

This parameter defines the external terminal, control four different inverter running ways.

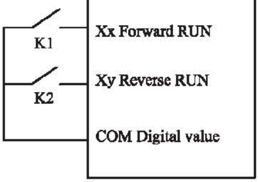
0:Two-line mode 1: this pattern is the most commonly used two line mode. Positive and reverse operation of the motor is determined by terminal Xx, Xy, .

The parameters are set as below:

Terminal	Set value	Function Description
Xx	1	Forward RUN (FWD)
Xy	2	Reverse RUN (REV)

Among them, Xx, Xy is FWD ~ S4 multi-function input terminals, level effectively.

Figure 4-5 Setting of two-line mode 1



K1	K2	Run Command
0	0	Stop
1	0	FWD
0	1	REV
1	1	Stop

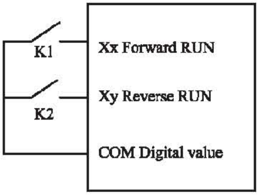
1:Two-line mode 2: use this pattern when Xx terminal function is running enabled terminal, and Xy terminal function determine the direction to run.

The parameters are set as below:

Terminal	Set value	Function Description
Xx	1	Forward RUN (FWD)
Xy	2	Reverse RUN (REV)

Among them, Xx, Xy is FWD ~ S4 multi-function input terminals, level effectively.

Figure 4-6 Setting of two-line mode 2



K1	K2	Run Command
0	0	Stop
1	0	FWD
1	1	REV
0	1	Stop

2: Three-line mode 1

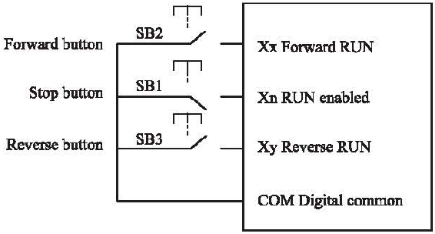
In this mode, Xn is RUN enabled terminal, and the direction is respectively decided by Xx and Xy.

The parameters are set as below:

Terminal	Set value	Function Description
Xx	1	Forward RUN (FWD)
Xy	2	Reverse RUN (REV)
Xn	3	Three-line operation control

Xn terminal must be closed when it need to run, to realize the forward and reverse control system of the motor by Xx or Xy pulse rising.

When it need to stop, must be done by disconnecting Xn terminal signal. Among them, the Xx, Xy, Xn as FWD ~ S4multi-function input terminals, Xx, Xy is the pulse effective, Xn is the level effective.



Among them,KB1: stop button KB2:forward button KB3:Reverse button

3: Three-line mode 2

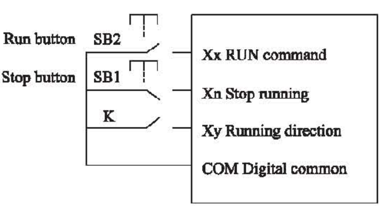
In this mode, Xn is RUN enabled terminal. The RUN command is given by Xx and the direction is decided by Xy.

The parameters are set as below:

Terminal	Set value	Function Description
Xx	1	Forward RUN enabled (FWD)
Xy	2	Reverse RUN (REV)
Xn	3	Three-line control

Xn terminals must be closed when there is a need to run, Xn terminals, produced by Xx pulse rising along the motor running signal, the state of the Xy produce motor direction signals. When there is a need to stop, by disconnecting Xn terminal signal to realize. Among them, the Xx, x, y, Xn is FWD ~ S4 multi-function input terminals, Xx is the pulse effective, Xy, Xn are the level effective.

Figure 4-7 :Setting of three-line mode 2



KB3	Running direction
0	Forward
1	Reverse

Among them:KB1:Stopping button KB2:Running button

P4.12	Terminal UP/DOWN changing rate	Default	1.00Hz/s
	Setting Range	0.01Hz/s~65.535Hz/s	

When it is used to set terminal UP/DOWN to adjust the set frequency .Frequency changing rate is the frequency variation per second

If P0.22 (Frequency reference resolution) is 2, the setting range is 0.001–65.535 Hz/s.

If P0.22 (Frequency reference resolution) is 1, the setting range is 0.01–655.35 Hz/s.

P4.13	FI curve 1 minimum input	Default	0.00V
	Setting Range	0.00V~P4.15	
P4.14	Corresponding setting of FI curve 1 minimum input	Default	0.0%
	Setting Range	-100.00%~100.0%	
P4.15	FI curve 1 maximum input	Default	10.00V
	Setting Range	P4.13~10.00V	
P4.16	Corresponding setting of FI curve 1 maximum input	Default	100.0%
	Setting Range	-100.00%~100.0%	
P4.17	FI curve 1 filter time	Default	0.10s
	Setting Range	0.00s~10.00s	

These parameters are used to define the relationship between the analog input voltage and the corresponding setting. When the analog input voltage exceeds the maximum value (P4.15), the analog voltage maximum value is calculated by "maximum input". When the analog input voltage is less than the setting minimum input (P4.13), the value set in P4.34 (Setting for FI less than minimum input) is calculated by the minimum input or 0.0%

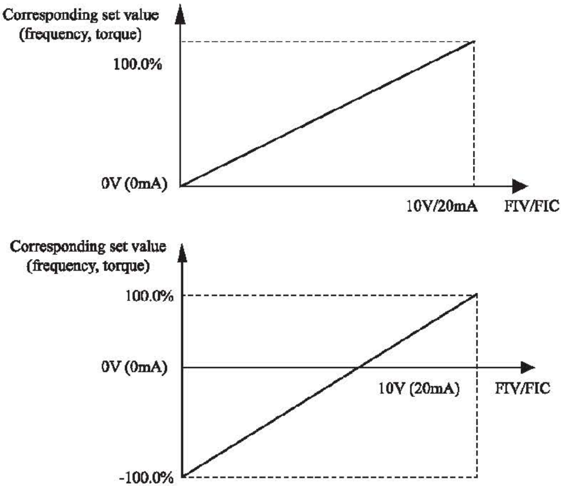
When the analog input is current input, 20mA current corresponds to 5V voltage.4mA current corresponds to 1V voltage.

FI input filter time is used to set the software filter time of FI. If the analog input is liable to interference, increase the filter time value of this parameter to stabilize the detected analog input.However, increase of the FI filter time will slow down the response of analog detection. Set this parameter properly based on actual conditions.

In different applications, 100% of analog input corresponds to different nominal values. For details, refer to the descriptions of different applications.

Two typical setting examples are shown in the following figure.

Figure 4-8 Corresponding relationship between analog input and set values



P4.18	FI curve 2 minimum input	Default	0.00V
	Setting Range	0.00V~P4.20	
P4.19	Corresponding setting of FI curve 2 minimum input	Default	0.0%
	Setting Range	-100.00%~100.0%	
P4.20	FI curve 2 maximum input	Default	10.00V
	Setting Range	P4.18~10.00V	
P4.21	Corresponding setting of FI curve 2 maximum input	Default	100.0%
	Setting Range	-100.00%~100.0%	
P4.22	FI curve 2 filter time	Default	0.10s
	Setting Range	0.00s~10.00s	

P4.23	FI curve 3 minimum input	Default	0.00V
	Setting Range	0.00s~P4.25	
P4.24	Corresponding setting of FI curve 3 minimum input	Default	0.0%
	Setting Range	-100.00%~100.0%	
P4.25	FI curve 3 maximum input	Default	10.00V
	Setting Range	P4.23~10.00V	

P4.26	Corresponding setting of FI curve 3 maximum input	Default	100.0%
	Setting Range	-100.00%~100.0%	
P4.27	FI curve 3 filter time	Default	0.10s
	Setting Range	0.00s~10.00s	

The method and functions of setting FI curve 3 are similar to that of setting FI curve 1 function.

P4.28	PULSE minimum Input	Default	0.00kHz
	Setting Range	0.00kHz~P4.30	
P4.29	Corresponding setting of pulse minimum input	Default	0.0%
	Setting Range	-100.00%~100.0%	
P4.30	PULSE maximum input	Default	50.00kHz
	Setting Range	P4.28~50.00kHz	
P4.31	Corresponding setting of pulse maximum input	Default	100.0%
	Setting Range	-100.00%~100.0%	
P4.32	PULSE filter time	Default	0.10s
	Setting Range	0.00s~10.00s	

These parameters are used to set the relationship between S3 pulse frequency and corresponding settings. The pulses can only be input by S3. The method of setting this function is similar to that of setting FI curve 1 function.Refer to the descriptions of FI curve 1

P4.33	FI curve selection	Default	321
	Setting Range	Unit's digit	FIV curve selection
		1	Curve 1 (2 points, see P4.13~P4.16)
		2	Curve 2 (2 points, see P4.18~P4.21)
		3	Curve 3 (2 points, see P4.23~P4.26)
		4	Curve 4 (4 points, see L6.00~L6.07)
		5	Curve 5 (4 points, see L6.08~L6.15)
		Ten's digit	FIC curve selection (1~5, same as FIV
		Hundred's digit	

The unit's digit, ten's digit and hundred's digit of this parameter are respectively used to select the corresponding curve of FIV,FIC and FIC. Any of the five curves can be selected for FIV,FIC and FIC.
Curve 1, curve 2 and curve 3 are all 2-point curves, set in group P5.
Curve 4 and curve 5 are both 4-point curves, set in group C6.
The T9000 provides two FI terminals as standard. FIA is provided by an optional extension Card.

P4.34	Setting for FI less than minimum input		Default	000
	Setting Range	Unit's digit	Setting for FIV less than minimum input	
		0	Minimum value	
		1	0.0%	
		Ten's digit	Setting for FIC less than minimum input (0~1, same as FIV)	
		Hundred's digit	Reserved	

The function code is used to determine the corresponding setting when the analog input voltage is less than the minimum value.

The unit's digit, ten's digit and hundred's digit of this function code respectively correspond to the setting for FIV,FIC

If the value of a certain digit is selected to 0, when analog input voltage is less than the minimum input, the corresponding setting of the minimum input (P4.14, P4.19, P4.24) is used.

If the value of a certain digit is selected to 1, when analog input voltage is less than the minimum input,the corresponding value of this analog input is 0.0%

P4.35	FWD delay time		Default	0.0s
	Setting Range	0.0s~3600.0s		
P4.36	REV delay time		Default	0.0s
	Setting Range	0.0s~3600.0s		
P4.37	S1 delay time		Default	0.0s
	Setting Range	0.0s~3600.0s		

These parameters are used to set the delay time of the AC drive when the status of S terminals changes.

Currently, only FWD, REV and S1 support the delay time function.

P4.38	S valid mode selection 1		Default	00000
	Setting Range	Unit's digit	FWD valid mode	
		0	High level valid	
		1	Low level valid	
		Ten's digit	REV valid mode (0~1, same as FWD)	
		Hundred's digit	S1 valid mode (0~1, same as REV)	
		Thousand's digit	S2 valid mode (0~1, same as S1)	
		Ten thousand's digit	S3 valid mode (0~1, same as S2)	

P4.39	S valid mode selection 2		Default	00000
	Setting Range	Unit's digit	S4 valid mode	
		0	High level valid	
		1	Low level valid	
		Ten's digit	reserved	
		Hundred's digit	reserved	
		Thousand's digit	reserved	
		Ten thousand's digit	reserved	

These parameters are used to set the valid mode of S terminals.
When this is high level valid,The S terminal is valid when being connected with COM, and invalid when it is disconnected to COM. When this is low level valid,The S terminal is invalid when being connected with COM, and valid when being disconnected to COM.

Group P5: Output Terminals

The T9000 provides two multi-function analog output terminals FOV, FOC, two multi-function relay output terminals and a YO terminal (used for high-speed pulse output or open-collector switch signal output) as standard. If output terminals above can't satisfy the scene with application, requires the expansion card equipped with multi-function input and output.

P5.00	YO terminal output mode		Default	0
	Setting Range	0	Pulse output (YO-P)	
		1	Switch signal output (YO-R)	

The YO terminal is programmable multiplexing terminal. It can be used for high-speed pulse output (YO-P), with maximum frequency of 50 kHz. Refer to P5.06 for relevant functions of Pulse output(YO-P). It can also be used as open collector switch signal output (YO-R).

P5.01	YO-R function (open-collector output terminal)	Default	0
P5.02	Relay output function (RA-RB-RC)	Default	2
P5.03	Relay output function (TA-TC)	Default	0
P5.04	reserved		
P5.05	reserved		

These five function codes are used to select three digital output terminals.
the functions of the multifunction output terminals are described in

the following table.

Value	Function	Description
0	No output	The terminal has no function.
1	AC drive running	When the AC drive is running and has output frequency (can be zero), the terminal becomes ON.
2	Fault output (stop)	When the AC drive stops due to a fault, the terminal outputs ON.
3	Frequency-level detection FDT1 output	Refer to the descriptions of P8.19 and P8.20.
4	Frequency reached	Refer to the descriptions of P8.21.
5	Zero-speed running (no output at stop)	If the AC drive runs with the output frequency of 0, the terminal becomes ON. If the AC drive is in the stop state, the terminal becomes OFF.
6	Motor overload pre-warning	The AC drive judges whether the motor load exceeds the overload pre-warning threshold before performing the protection action. If the pre-warning threshold is exceeded, the terminal becomes ON. For motor overload parameters, see the descriptions of P9.00 to P9.02.
7	AC drive overload pre-warning	The terminal becomes ON before the AC drive overload protection action is performed 10s.
8	Set count value reached	The terminal becomes ON when the count value reaches the value set in Pb.08.
9	Designated count value reached	The terminal becomes ON when the count value reaches the value set in Pb.09.
10	Length reached	The terminal becomes ON when the detected actual length exceeds the value set in Pb.05.
11	PLC cycle complete	When simple PLC completes one cycle, the terminal a pulse signal with width of 250 ms.
12	Accumulative running time reached	If the accumulative running time of the AC drive exceeds the time set in P8.17, the terminal outputs ON.
13	Frequency limiting	If the set frequency exceeds the frequency upper limit or lower limit and the output frequency of the AC drive reaches the upper limit or lower limit, the terminal outputs ON.
14	Torque limiting	In speed control mode, If the output torque reaches the torque limit, the AC drive enters the stall protection state , meanwhile the terminal outputs ON.

Value	Function	Description
15	Ready for RUN	If the AC drive main circuit and control circuit become stable, and the AC drive detects no fault and is ready for RUN, the terminal outputs ON.
16	FIV>FIC	When the input of FIV is larger than the input of FIC, the terminal outputs ON.
17	Frequency upper limit reached	If the running frequency reaches the upper limit, the terminal outputs ON.
18	Frequency lower limit reached (no output at stop)	If the running frequency reaches the lower limit, the terminal outputs ON. In the stop state, the terminal becomes OFF.
19	Lack voltage state output	If the AC drive is in lack voltage state, the terminal outputs ON.
20	Communication setting	Refer to the communication protocol.
21	Reserved	Reserved
22	Reserved	Reserved
23	Zero-speed running 2 (having output at stop)	If the output frequency of the AC drive is 0, the terminal becomes ON. In the state of stop, the signal is still ON.
24	Accumulative power-on time reached	If the AC drive accumulative power-on time (P7.13) exceeds the value set in P8.16, the terminal outputs ON.
25	Frequency level detection FDT2 output	Refer to the descriptions of P8.28 and P8.29.
26	Frequency 1 reached output	Refer to the descriptions of P8.30 and P8.31.
27	Frequency 2 reached output	Refer to the descriptions of P8.32 and P8.33.
28	Current 1 reached output	Refer to the descriptions of P8.38 and P8.39.
29	Current 2 reached output	Refer to the descriptions of P8.40 and P8.41.
30	Timing reached	If the timing function (P8.42) is valid, the terminal outputs ON after the current running time of the AC drive reaches the set time.
31	FIV input limit exceeded	If FIV input is larger than the value of P9.46 (FIV input voltage upper limit) or lower than the value of P9.45 (FIV input voltage lower limit), the terminal outputs ON.
32	Load becoming 0	If the load becomes 0, the terminaloutputs ON.
33	Reverse running	If the AC drive is in the reverse running state, the terminal outputs ON.
34	Zero current state	Refer to the descriptions of P8.28 and P8.29.

Value	Function	Description
35	Module temperature reached	If the heatsink temperature of the inverter module (P7.07) reaches the set module temperature threshold (P8.47), the terminal outputs ON.
36	Software current limit exceeded	Refer to the descriptions of P8.36 and P8.37.
37	Frequency lower limit reached (having output at stop)	If the running frequency reaches the lower limit, the terminal becomes ON. In the stop state, the signal is still ON.
38	Alarm output	If a fault occurs on the AC drive and the AC drive continues to run, the terminal outputs the alarm signal.
39	reserved	
40	one running time reached	If the one running time of AC drive exceeds the value of P8.53, the terminal outputs ON.

P5.06	YO-P function selection	Default	0
P5.07	FOV function selection	Default	0
P5.08	FOC function selection	Default	1

The output pulse frequency of the YO-P terminal ranges from 0.01 kHz to (Maximum YO-P output frequency) P5.09. The value of P5.09 can be set between 0.01 kHz and 100.00 kHz.

The output range of FOV and FOC is 0–10 V or 0–20 mA. The relationship between pulse and analog output ranges and corresponding functions is listed in the following table.

Value	Function	Range (Corresponding to Pulse or Analog Output Range 0.0%–100.0%)
0	Running frequency	0~maximum output frequency
1	Set frequency	0~maximum output frequency
2	Output current	0~2 times of rated motor current
3	Output torque	0~2 times of rated motor torque
4	Output power	0~2 times of rated power
5	Output voltage	0~1.2 times of rated AC drive voltage
6	Pulse input	0.01kHz~100.00kHz
7	FIV	0V~10V
8	FIC	0V~10V (or 0~20mA)
9	reserved	
10	Length	0~maximum set length
11	Count value	0~maximum count value
12	Communication setting	0.0%~100.0%

13	Motor rotational speed	0~rotational speed corresponding to maximum output frequency
14	Output current	0.0A~1000.0A
15	Output voltage	0.0V~1000.0V

P5.09	Maximum YO-P output frequency	Default	50.00kHz
	Setting Range	0.01kHz~100.00kHz	

If the YO terminal is used for pulse output, this function code is used to choose the maximum frequency of pulse output.

P5.10	FOV zero offset coeffcient	Default	0.0%
	Setting Range	-100.0%~+100.0%	
P5.11	FOV gain	Default	1.00
	Setting Range	-10.00~+10.00	
P5.12	FOC zero offset coeffcient	Default	0.00%
	Setting Range	-100.0%~+100.0%	
P5.13	FOC gain	Default	1.00
	Setting Range	-10.00~+10.00	

These function codes are used to correct the zero drift of analog output and the output amplitude deviation. They can also be used to define the desired FOV curve.

If "b" represents zero offset, "k" represents gain, "Y" represents actual output, and "X" represents standard output, the actual output is: $Y = kX + b$.

Among them,the zero offset coefficient 100% of FOV and FOC corresponds to 10 V (or 20 mA). The standard output refers to the value corresponding to the analog output of 0 to 10 V (or 0 to 20 mA) with no zero offset or gain adjustment.

For example, if the analog output is used as the running frequency, and it is expected that the output is 8 V when the frequency at the maximum frequency is 3V, the gain shall be set to -0.50, and the zero offset shall be set to 80%.

P5.17	YO-R output delay time	Default	0.0s
	Setting Range	0.0s~3600.0s	
P5.18	YA-YB-YC output delay time	Default	0.0s
	Setting Range	0.0s~3600.0s	
P5.19	RA-RB-RC output delay time	Default	0.0s
	Setting Range	0.0s~3600.0s	
P5.20	reserved		
P5.21	reserved		

These parameters are used to set the delay time of output terminals

YO-R, relay 1, relay 2, FOV and FOC from status change to actual output.

P5.22	YO valid mode selection		Default	00000
	Setting Range	Unit's digit	YO-R valid mode	
		0	Positive logic	
		1	Negative logic	
		Ten's digit	RA-RB-RC valid mode (0~1, same as YO-R)	
		Hundred's digit	YA-YB-YC valid mode (0~1, same as YO-R)	
		Thousand's digit	reserved	
		Ten thousand's digit	reserved	

It is used to definite the logic of output terminals YO-R, relay 1, relay 2, FOV and FOC.

0: Positive logic

The output terminal is valid when being connected with COM, and invalid when being disconnected to COM.

1: Positive logic

The output terminal is invalid when being connected with COM, and valid when being disconnected to COM.

Group P6: Start/Stop Control

P6.00	Start mode		Default	0
	Setting Range	0	direct start	

0: direct start

If the DC braking time is set to 0, the drive starts to run at the startup frequency.If the DC braking time is not 0, the drive performs DC braking first and then starts to run at the startup frequency. It is applicable to small-inertia load application where the motor is likely to rotate at startup time.

P6.03	Startup frequency	Default	0.00Hz
	Setting Range	0.00Hz~10.00Hz	
P6.04	Startup frequency holding time	Default	0.0s
	Setting Range	0.0s~100.0s	

To ensure the motor torque at AC drive startup, set a proper startup frequency. In addition,to build excitation when the motor starts up, the startup frequency must be held for a certain time.

The startup frequency (P6.03) is not restricted by the frequency lower limit. If the set target frequency is lower than the startup frequency, the drive will not start and stays in the standby state. During switchover between forward rotation and reverse rotation, the startup frequency holding time doesn't work. The holding time is not included in the acceleration time but in the running time of simple PLC.

Example 1:

P0.03=0 The frequency source is digital setting.

P0.08=2.00Hz The digital setting frequency is 2.00 Hz.

P6.03=5.00Hz The startup frequency is 5.00 Hz.

P6.04=2.0s The startup frequency holding time is 2.0s.

In this example, the AC drive stays in the standby state and the output frequency is 0.00 Hz.

Example 2:

P0.03=0 The frequency source is digital setting.

P0.08=10.00Hz The digital setting frequency is 10.00 Hz.

P6.03=5.00Hz The startup frequency is 5.00 Hz.

P6.04=2.0s The startup frequency holding time is 2.0s.

In this example, the AC drive accelerates to 5.00 Hz, and hold 2s,then accelerates to the set frequency 10.00 Hz after 2s.

P6.08	Time proportion of S-curve start segment	Default	30.0%
	Setting Range	0.0%~ (100.0%-P6.09)	
P6.09	Time proportion of S-curve end segment	Default	30.0%
	Setting Range	0.0%~ (100.0%-P6.08)	

These two parameters respectively define the time proportions of the start segment and the end segment of S-curve acceleration/deceleration. They must satisfy the requirement:

P6.08 + P6.09 ≤ 100.0%.

In Figure 4-1, t1 is the time defined in P6.08, within which the slope of the output frequency change increases gradually. t2 is the time defined in P6.09, within which the slope of the output frequency change gradually decreases to 0. Within the time between t1 and t2, the slope of the output frequency change remains unchanged, that is, linear acceleration/deceleration.

Figure 4-9 S-curve acceleration/deceleration A

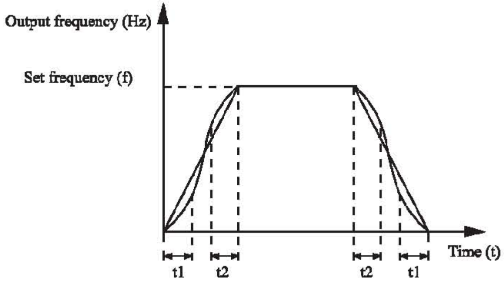
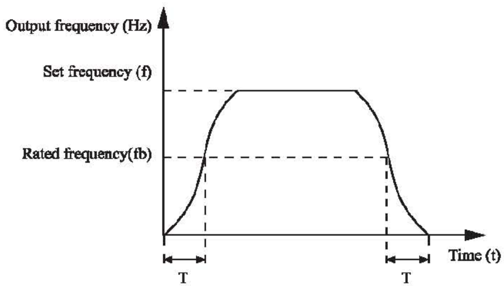


Figure 4-10 S-curve acceleration/deceleration B



P6.10	Stop mode		Default	0
	Setting Range	0	Decelerate to stop	
		1	Coast to stop	

0: Decelerate to stop

After the stop command is enabled, the AC drive decreases the output frequency according to the deceleration time and stops when the frequency decreases to zero.

1: Coast to stop

After the stop command is enabled, the AC drive immediately stops the output. The motor will coast to stop based on the mechanical inertia.

P6.11	Initial frequency of stop DC braking	Default	0.00Hz
	Setting Range	0.00 Hz ~ maximum frequency	

P6.12	Waiting time of stop DC braking	Default	0.0s
	Setting Range	0.0s~100.0s	
P6.13	Stop DC braking current	Default	0%
	Setting Range	0%~100%	
P6.14	Stop DC braking time	Default	0.0s
	Setting Range	0.0s~100.0s	

P6.11 (Initial frequency of stop DC braking)

During the process of decelerating to stop, the AC drive starts DC braking when the running frequency is lower than the value set in P6.11.

P6.12 (Waiting time of stop DC braking)

When the running frequency decreases to the initial frequency of stop DC braking, the AC drive stops output for a certain period and then starts DC braking. This prevents faults such as over current caused due to DC braking at high speed.

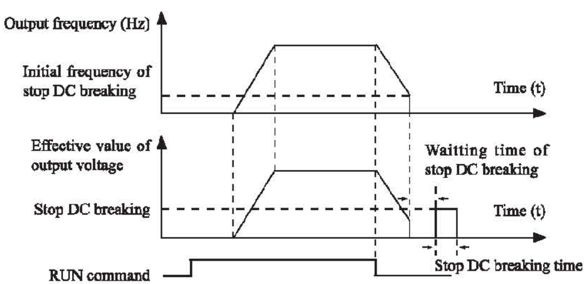
P6.13 (Stop DC braking current)

This parameter specifies the output current at DC braking and is a percentage relative to the base value.If the rated motor current is less than or equal to 80% of the rated AC drive current, the base value is the rated motor current. If the rated motor current is greater than 80% of the rated AC drive current, the base value is 80% of the rated AC drive current.

P6.14 (Stop DC braking time)

This parameter specifies the holding time of DC braking. If it is set to 0, DC braking is cancelled. The stop DC braking process is shown in the following figure.

Figure 4-11 Stop DC braking process



P6.15	Brake use ratio	Default	100%
	Setting Range	0%~100%	

It is valid only for the AC drive with internal braking unit and used to adjust the duty ratio of the braking unit. The larger the value of this parameter is, the better the braking result will be. However, too larger value causes great fluctuation of the AC drive bus voltage during the braking process.

Group P7: Operation Panel and Display

P7.01	JOG key function selection		Default	0
	Setting Range	0	JOG key disabled	
		1	Switchover between operation panel control and remote command control (terminal command channel or communication command channel)	
		2	Switchover between forward rotation and reverse rotation	
		3	Forward JOG	
		4	Reverse JOG	

JOG key is multifunctional key. You can set the function of the JOG key by using this function code. You can perform switchover by using this key both in stopping or running state.

0: JOG key disabled

This key is disabled.

1: Switchover between operation panel control and remote operation.You can perform switchover from the current command source to the operation panel control (local operation). If the current command source is operation panel control, this key is invalid.

2: Switchover between forward rotation and reverse rotation

You can change the direction of the frequency reference by using the JOG key. It is valid only when the current command source is panel command channel.

3: Forward JOG

You can perform forward JOG (JOG-FWD) by using the JOG key.

4: Reverse JOG

You can perform reverse JOG (JOG-REV) by using the JOG key.

P7.02	STOP/RESET key function		Default	1
	Setting Range	0	STOP/RESET key enabled only in operation panel control	
		1	STOP/RESET key enabled in any operation mode	

P7.03	LED display running parameters 1		Default	1F
	Setting Range	0000 ~FFFF	7 6 5 4 3 2 1 0 0: Running frequency 1 (Hz) 1: Set frequency (Hz) 2: Bus vottage (V) 3: Output vottage (V) 4: Output power (A) 5: Output torque (kW) 6: Output torque (%) 7: input status (V) 15 14 13 12 11 10 9 8 8: YO output status 9: FIV vottage (V) 10: FIC current (mA) 11: Reserved 12: Count value 13: Length value 14: Load speed display 15: PID setting If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set P7.03 to the hexadecimal equivalent of this binary number.	

P7.04	LED display running parameters 2	Default	0
	Setting Range	0000 ~FFFF	7 6 5 4 3 2 1 0 0: PID feedback 1: PLC stage 2: PULSE setting frequency (KHz) 3: Running frequency 2 4: Remaining running time 5: FIV voltage before correction 6: FIC current before correction 7: Reserved 15 14 13 12 11 10 9 8 8: Linear spped 9: current power-on time (Hour) 10: current running time (minute) 11: PULSE setting frequency (Hz) 12: Communication setting value 13: Encoder feedback speed (Hz) 14: Main frequency X display (Hz) 15: Auxliary frequency Y display (Hz) If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set P7.04 to the hexadecimal equivalent of this binary number.

Run the display parameters,used to set the parameters that can be viewed when the AC drive is in any running state.

P7.05	LED display stop parameters	Default	33
	Setting Range	0000 ~FFFF	7 6 5 4 3 2 1 0 Bit 0: Set frequency (Hz) Bit 1: Bus voltage (V) Bit 2: X input status Bit 3: YO output staus Bit 4: FIV voltage (V) Bit 5: FIC current (mA) Bit 6: Reserved Bit 7: Count value 15 14 13 12 11 10 9 8 Bit 8: Length value Bit 9: PLC stage Bit 10: Load speed Bit 11: PID setting Bit 12: PULSE setting frequency (Hz) Bit 13: Reserved Bit 14: Reserved Bit 15: Reserved If a parameter needs to be displayed during the running, set the corresponding bit to 1, and set P7.05 to the hexadecimal equivalent of this binary number.

P7.06	Load speed display coeffcient	Default	1.0000
	Setting Range	0.0001~6.5000	

This parameter is used to adjust the relationship between the output frequency of the AC drive and the load speed. For details, see the description of P7.12.

P7.07	Heatsink temperature of inverter module	Default	Read-only
	Setting Range	0.0°C~150.0°C	

It is used to display the insulated gate bipolar transistor (IGBT) temperature of the inverter module, and the IGBT overheat protection value of the inverter module depends on the model.

P7.08	Temporary software version	Default	Read-only
	Setting Range	0.0°C~150.0°C	

It is used to display the temporary software version of the control board.

P7.09	Accumulative running time	Default	0h
	Setting Range	0h~65535h	

It is used to display the accumulative running time of the AC drive. After the accumulative running time reaches the value set in P8.17, the terminal with the digital output function (12) outputs ON.

P7.10	reserve		Default	
P7.11	Software version		Default	Read-only
	Setting Range	Software version of control board		
P7.12	Number of decimal places for load speed display		Default	0
	Setting Range	0	0 decimal place	
		1	1 decimal place	
		2	2 decimal places	
		3	3 decimal places	

P7.12 is used to set the number of decimal places for load speed display. The following gives an example to explain how to calculate the load speed:

Assume that P7.06 (Load speed display coefficient) is 2.000 and P7.12 is 2 (2 decimal places). When the running frequency of the AC drive is 40.00 Hz, the load speed is 40.00 x 2.000 = 80.00 (display of 2 decimal places).

If the AC drive is in the stop state, the load speed is the speed corresponding to the set frequency, namely, "set load speed". If the set frequency is 50.00 Hz, the load speed in the stop state is 50.00 x 2.000 = 100.00 (display of 2 decimal places).

P7.13	Accumulative power-on time	Default	0h
	Setting Range	0h~65535h	

It is used to display the accumulative power-on time of the AC drive since the delivery. If the time reaches the set power-on time (P8.17), the terminal with the digital output function (24) outputs ON.

P7.14	Accumulative power consumption	Default	-
	Setting Range	0~65535kWh	

It is used to display the accumulative power consumption of the AC drive until now.

Group P8: Auxiliary Functions

P8.00	JOG running frequency		Default	2.00Hz
	Setting Range	0.00Hz~maximum frequency		
P8.01	JOG acceleration time		Default	20.0s
	Setting Range	0.0s~6500.0s		
P8.02	JOG deceleration time		Default	20.0s
	Setting Range	0.0s~6500.0s		

These parameters are used to define the set frequency and acceleration/deceleration time of the AC drive when jogging. The startup mode is "Direct start" (P1.00 = 0) and the stop mode is "Decelerate to stop" (P1.10 = 0) during jogging.

P8.03	Acceleration time 2		Default	Model dependent
	Setting Range	0. 0s~6500.0s		
P8.04	Deceleration time 2		Default	Model dependent
	Setting Range	0. 0s~6500.0s		
P8.05	Acceleration time 3		Default	Model dependent
	Setting Range	0. 0s~6500.0s		
P8.06	Deceleration time 3		Default	Model dependent
	Setting Range	0. 0s~6500.0s		
P8.07	Acceleration time 4		Default	Model dependent
	Setting Range	0. 0s~6500.0s		
P8.08	Deceleration time 4		Default	Model dependent
	Setting Range	0. 0s~6500.0s		

The T9000 provides a total of four groups of acceleration/ deceleration time, they are P0.17/P0.18 and the preceding three groups of acceleration/deceleration time.The four groups of acceleration/deceleration time are completely the same. Please refer to the descriptions of P0.17 and P0.18.You can switch over between the four groups of acceleration/deceleration time through different state combinations of X terminals. For more details, see the descriptions of P5.01 to P5.05.

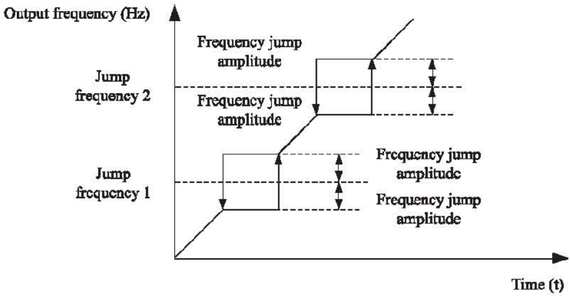
P8.09	Jump frequency 1		Default	0.00Hz
	Setting Range	0.00Hz~maximum frequency		
P8.10	Jump frequency 2		Default	0.00Hz
	Setting Range	0.00 Hz~maximum frequency		
P8.11	Frequency jump amplitude		Default	0.00Hz
	Setting Range	0.00~maximum frequency		

If the set frequency is within the frequency jump range, the actual running frequency is the jump frequency close to the set frequency.

Setting the jump frequency helps to avoid the mechanical resonance point of the load.

The T9000 supports two jump frequency. If both of them are set to 0, the frequency jump function will be disabled. The principle of the jump frequency and jump amplitude is shown in the following figure.

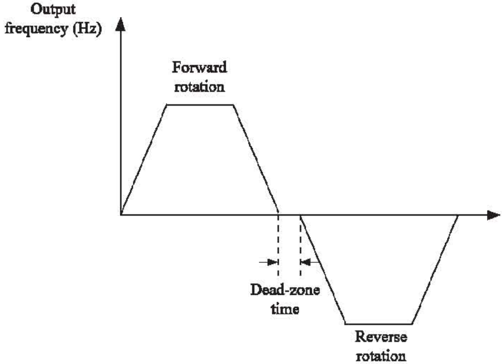
Figure 4-12 Principle of the jump frequencies and jump amplitude



P8.12	Forward/Reverse rotation dead-zone time	Default	0.0s
	Setting Range	0.00s~3000.0s	

It is used to set the time when the output is 0 Hz at transition of the AC drive forward rotation and reverse rotation, as shown in the following figure.

Figure 4-13 Forward/Reverse rotation dead-zone time



P8.13	Reverse control enabled		Default	0
	Setting Range	0	permitted	
		1	prohibited	

It is used to set whether the AC drive allows reverse rotation. In the applications where reverse rotation is prohibited, set this parameter to 1.

P8.14	Running mode when set frequency lower than frequency lower limit		Default	0
	Setting Range	0	Run at frequency lower limit	
		1	Stop	
		2	Run at zero speed	

It is used to set the AC drive running mode when the set frequency is lower than the frequency lower limit. The T9000 provides three running modes to satisfy requirements of various applications.

P8.15	Droop control		Default	0.00Hz
	Setting Range	0.00Hz~10.00Hz		

This function is used for balancing the workload allocation when multiple motors are used to drive the same load. The output frequency of the AC drives decreases as the load increases. You can educe the workload of the motor under load by decreasing the output frequency for this motor to decrese the workload, implementing workload balancing between multiple motors.

P8.16	Accumulative power-on time hreshold		Default	0h
	Setting Range	0h~65000h		

If the accumulative power-on time (P7.13) reaches the value P8.16 set in this parameter, the corresponding YO terminal becomes ON.(Function Code 24)

P8.17	Accumulative running time threshold		Default	0h
	Setting Range	0h~65000h		

It is used to set the accumulative running time threshold of the AC drive. If the accumulative running time (P7.09) reaches the value set in this parameter, the corresponding YO terminal becomes ON.(Function Code 40)

P8.18	Startup protection		Default	0
	Setting Range	0	No	
		1	Yes	

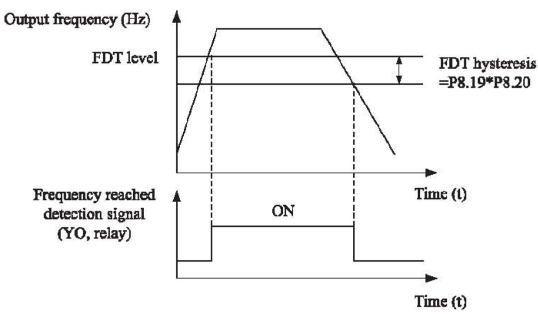
This parameter is used to set whether to enable the safety

protection.
If it is set to 1, the AC drive does not respond to the running command valid upon AC drive power-on (for example, an input terminal is ON before power-on). The AC drive responds only after the running command is cancelled and becomes valid again.
In addition, the AC drive does not respond to the running command valid upon fault reset of the AC drive. The run protection can be disabled only after the running command is cancelled.
In this way, this parameter is set to 1,the motor can be protected from responding to running commands upon power-on or fault reset in unexpected conditions.

P8.19	Frequency detection value (FDT1)	Default	50.00Hz
	Setting Range	0.00Hz~maximum frequency	
P8.20	Frequency detection hysteresis (FDT1)	Default	5.0%
	Setting Range	0.0%~100.0% (FDT1 level)	

If the running frequency is higher than the value of frequency detection , the corresponding YO terminal becomes ON. If the running frequency is lower than value of frequency detection. That YO becomes ON is Cancelled.
These two parameters are respectively used to set the detection value of output frequency and hysteresis value upon cancellation of the output. The value of P8.20 is a percentage of the hysteresis frequency to the frequency detection value (P8.19).The FDT function is shown in the following figure.

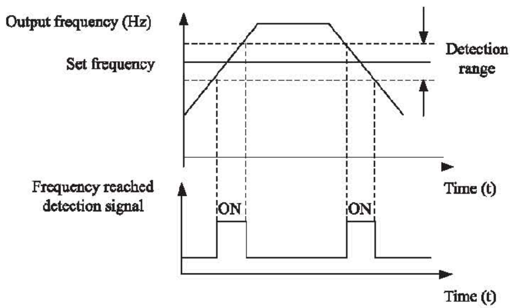
Figure 4-14 FDT level



P8.21	Detection range of frequency reached	Default	0.0%
	Setting Range	0.00~100% (maximum frequency)	

If the AC drive's running frequency is within the certain range of the set frequency, the corresponding YO terminal becomes ON.
This parameter is used to set the range within which the output frequency is detected to reach the set frequency. The value of this parameter is a percentage relative to the maximum frequency. The detection range of frequency reached is shown in the following figure.

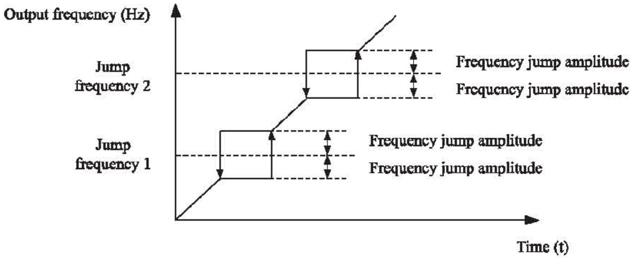
Figure 4-15 Detection range of frequency reached



P8.22	Jump frequency during the process of acceleration/deceleration	Default	1
	Setting Range	0: Disabled 1: Enabled	

It is used to set whether the jump frequency is valid during the process of acceleration/deceleration.
When the jump frequency is valid during the process of acceleration/deceleration, and the running frequency is within the frequency jump range, the actual running frequency will jump over the set frequency jump amplitude (rise directly from the lowest jump frequency to the highest jump frequency). The following figure shows the diagram when the jump frequency is valid during the process of acceleration/deceleration.

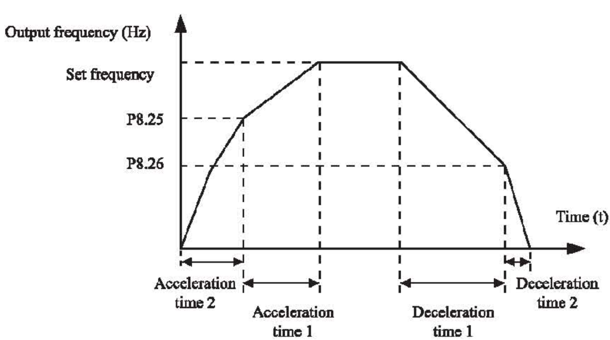
Figure 4-16 Diagram when the jump frequencies are valid during the process of acceleration/deceleration



P8.25	Frequency switchover point between acceleration time 1 and acceleration time 2		Default	0.00Hz
	Setting Range	0.00Hz~maximum frequency		
P8.26	Frequency switchover point between deceleration time 1 and deceleration time 2		Default	0.00Hz
	Setting Range	0.00Hz~maximum frequency		

This function is valid when the motor selects acceleration/deceleration time that is not performed by means of X terminal's switchover . It is used to select different groups of acceleration/deceleration time based on the running frequency range rather than X terminal during the running process of the AC drive.

Figure 4-17 Acceleration/deceleration time switchover



During acceleration, if the running frequency is smaller than the value of P8.25, acceleration time 2 is selected. If the running frequency is larger than the value of P8.25, acceleration time 1 is selected.
During deceleration, if the running frequency is larger than the value of P8.26, deceleration time 1 is selected. If the running frequency is smaller than the value of P8.26, deceleration time 2 is selected.

P8.27	Terminal JOG preferred	Default	0
	Setting Range	0: Disabled 1: Enabled	

It is used to set whether terminal JOG is the highest priority.
If terminal JOG is preferred, the AC drive switches to terminal JOG running state when there is a terminal JOG command during the running process of the AC drive.

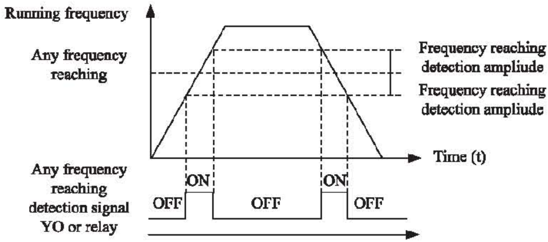
P8.28	Frequency detection value (FDT2)	Default	50.00Hz
	Setting Range	0.00Hz~maximum frequency	
P8.29	Frequency detection hysteresis (FDT2)	Default	5.0%
	Setting Range	0.0%~100.0% (FDT2 level)	

The frequency detection function is the same as FDT1 function. For details, refer to the descriptions of P8.19 and P8.20.

P8.30	Any frequency reaching detection value 1	Default	50.00Hz
	Setting Range	0.00 Hz ~ maximum frequency	
P8.31	Any frequency reaching detection amplitude 1	Default	0.0%
	Setting Range	0.0%~100.0% (maximum frequency)	
P8.32	Any frequency reaching detection value 2	Default	50.00Hz
	Setting Range	0.00Hz~maximum frequency	
P8.33	Any frequency reaching detection amplitude 2	Default	0.0%
	Setting Range	0.0%~100.0% (maximum frequency)	

If the output frequency of the AC drive is within the positive and negative amplitudes of the any frequency reaching detection value, the corresponding YO becomes ON.(function code 26/27)
The T9000 provides two groups of any frequency reaching detection parameters, including frequency detection value and detection amplitude, as shown in the following figure.

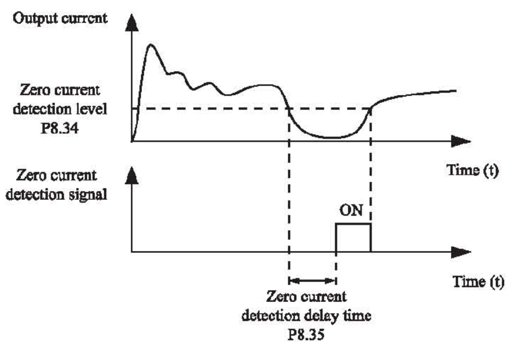
Figure 4-18 Any frequency reaching detection



P8.34	Zero current detection level	Default	5.0%
	Setting Range	0.0%~300.0% (rated motor current)	
P8.35	Zero current detection delay time	Default	0.10s
	Setting Range	0.00s~600.00s	

If the output current of the AC drive is equal to or less than the zero current detection level and the duration exceeds the zero current detection delay time, the corresponding YO becomes ON. The zero current detection is shown in the following figure.

Figure 4-19 Zero current detection

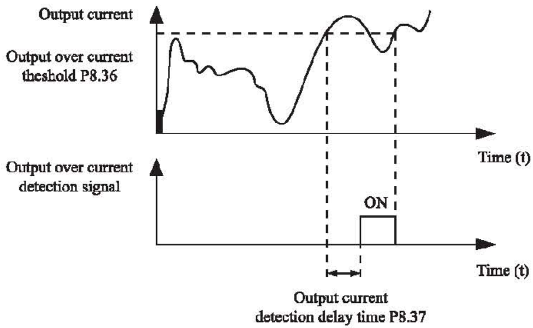


P8.36	Output over current threshold	Default	200.0%
	Setting Range	0.0% (no detection) 0.1%~300.0% (rated motor current)	

P8.37	Output over current detection delay time	Default	0.00s
	Setting Range	0.00s~600.00s	

If the output current of the AC drive is equal to or higher than the over current threshold and the duration exceeds the detection delay time, the corresponding YO becomes ON. The output over current detection function is shown in the following figure.

Figure 4-20 Output over current detection

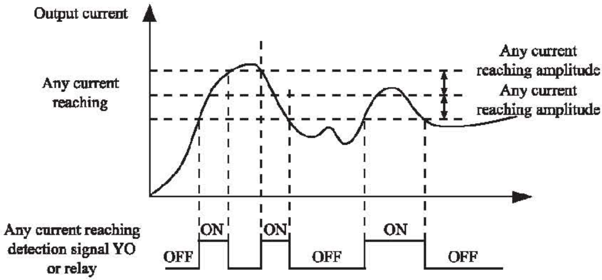


P8.38	Any current reaching 1	Default	100.0%
	Setting Range	0.0%~300.0% (rated motor current)	
P8.39	Any current reaching 1 amplitude	Default	0.0%
	Setting Range	0.0%~300.0% (rated motor current)	
P8.40	Any current reaching 2	Default	100.0%
	Setting Range	0.0%~300.0% (rated motor current)	
P8.41	Any current reaching 2 amplitude	Default	0.0%
	Setting Range	0.0%~300.0% (rated motor current)	

If the output current of the AC drive is within the positive and negative amplitudes of any current reaching detection value, the corresponding YO becomes ON (function code 28/29)

The T9000 provides two groups of any current reaching detection parameters, including current detection value and detection amplitudes, as shown in the following figure.

Figure 4-21 Any current reaching detection



P8.42	Timing function selection		Default	0
	Setting Range	0	Disabled	
		1	Enabled	
P8.43	Timing duration selection		Default	0
	Setting Range	0	P8.44	
		1	FIV	
		2	FIC	
		3	reserved	
		100% of analog input corresponds to the value of P8.44		
P8.44	Timing duration		Default	0.0Min
	Setting Range	0.0Min~6500.0Min		

These parameters are used to implement the AC drive timing function.

If P8.42 is effective, the AC drive starts to time at startup. When the set timing duration is reached, the AC drive stops automatically and meanwhile the corresponding YO becomes ON (function code 30). The AC drive starts timing from 0 each time it starts up and the remaining timing duration can be queried by D0.20.The timing duration is set in P8.43 and P8.44, in the unit of minute.

P8.45	FIV input voltage lower limit	Default	3.10V
	Setting Range	0.00V~P8.46	
P8.46	FIV input voltage upper limit	Default	6.80V
	Setting Range	P8.45~10.00V	

These two parameters are used to set the limits of the input voltage to provide protection on the AC drive. When the FIV input is larger than the value of P8.46 or smaller than the value of P8.45, the corresponding YO becomes ON, (function code 31) indicating that whether FIV input exceeds the limit.

P8.47	Module temperature threshold	Default	75□
	Setting Range	0.00V~P8.46	

When the heat sink temperature of the AC drive reaches the value of this parameter, the corresponding YO becomes ON(function code 35).

P8.48	Cooling fan control	Default	0
	Setting Range	0: Fan working during running 1: Fan working continuously	

It is used to set the working mode of the cooling fan. If this parameter is set to 0, the fan works when the AC drive is in running state. When the AC drive stops, the cooling fan works if the heat sink temperature is higher than 40°C, and stops working if the heat sink temperature is lower than 40°C.
If this parameter is set to 1, the cooling fan keeps working after power-on.

P8.49	Wakeup frequency	Default	0.00Hz
	Setting Range	Dormant frequency (P8.51)~maximum frequency (P010)	
P8.50	Wakeup delay time	Default	0.0s
	Setting Range	0.0s~6500.0s	
P8.51	Dormant frequency	Default	0.00Hz
	Setting Range	0.00Hz~wakeup frequency (P8.49)	
P8.52	Dormant delay time	Default	0.0s
	Setting Range	0.0s~6500.0s	

These parameters are used to implement the dormant and wakeup functions in the water supply application.
When the AC drive is in running state, the AC drive enters the dormant state and stops automatically after the dormant delay time (P8.52) if the set frequency is lower than or equal to the dormant frequency (P8.51).
When the AC drive is in dormant state and the current running command is effective, the AC drive starts up after the wakeup delay time (P9.50) if the set frequency is higher than or equal to the wakeup frequency (P9.49).
Generally, set the wakeup frequency equal to or higher than the dormant frequency. If the wakeup frequency and dormant frequency are set to 0, the dormant and wakeup functions are disabled.
When the dormant function is enabled, if the frequency source is

PID, whether PID operation is performed in the dormant state is determined by PA.28. In this case, select PID operation enabled in the stop state (PA.28 = 1).

P8.53	Current running time reached	Default	0.0Min
	Setting Range	0.0Min~6500.0Min	

If the current running time reaches the value set in this parameter, the corresponding YO becomes ON, indicating that the current running time is reached.

Group P9: Fault and Protection

P9.00	Motor overload protection selection	Default	1
	0	Disabled	Disabled
		1	Enabled
P9.01	Motor overload protection gain	Default	1.00
	Setting Range	0.20~10.00	

P9.00 = 0

The motor overload protective function is disabled. The motor is exposed to potential damage due to overheating. A thermal relay is suggested to be installed between the AC drive and the motor.

P9.00 = 1

The AC drive judges whether the motor is overloaded according to the inverse time-lag curve of the motor overload protection.

The inverse time-lag curve of the motor overload protection is:

220% *P9.01 * rated motor current (if the load remains at this value for one minute, the AC drive reports motor overload fault), or 150% *P9.01 * rated motor current (if the load remains at this value for 60 minutes, the AC drive reports motor overload fault).

Set P9.01 properly based on the actual overload capacity. If the value of P9.01 is set too large, the damage to the motor may result when the motor overheats but the AC drive does not report the alarm.

P9.02	Motor overload warning coeffcient	Default	80%
	Setting Range	50%~100%	

This function is used to give a warning signal to the control system via YO before motor overload protection. This parameter is used to determine the percentage, at which pre-warning is performed before motor overload. The larger the value is, the less advanced

the pre-warning will be.
When the accumulative output current of the AC drive is greater than the value of the overload inverse time-lag curve multiplied by P9.02, the multifunction digital YO terminal on the AC drive (Motor overload pre-warning) becomes ON.

P9.03	Overvoltage stall gain	Default	10
	Setting Range	0 (no stall overvoltage)~100	
P9.04	Overvoltage stall protective voltage	Default	130%
	Setting Range	120%~150% (Three phase)	

When the DC bus voltage exceeds the value of P9.04 (Overvoltage stall protective voltage) during deceleration of the AC drive, the AC drive stops deceleration and keeps the present running frequency. After the bus voltage declines, the AC drive continues to decelerate.
Overvoltage stall gain is used to adjust the overvoltage suppression capacity of the AC drive. The larger the value is, the greater the overvoltage suppression capacity will be.In the prerequisite of no overvoltage occurrence, set P9.03 to a small value.
For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an overvoltage fault may occur.
If the overvoltage stall gain is set to 0, the overvoltage stall function is disabled.

P9.05	Over current stall gain	Default	20
	Setting Range	0~100	
P9.06	Over current stall protective current	Default	150%
	Setting Range	100%~200%	

When the output current exceeds the over current stall protective current during acceleration/deceleration of the AC drive, the AC drive stops acceleration/deceleration and keeps the present running frequency. After the output current declines, the AC drive continues to accelerate/decelerate.
Over current stall gain is used to adjust the over current suppression capacity of the AC drive. The larger the value is, the greater the over current suppression capacity will be. In the prerequisite of no over current occurrence, set over current stall gain to a small value.
For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and over current fault may occur. If the over current stall gain

is set to 0, the over current stall function is disabled.

P9.07	Short-circuit to ground upon power-on		Default	1
	Setting Range	0	Disabled	
		1	Enabled	

It is used to determine whether to check the motor is short-circuited to ground at power-on of the AC drive. If this function is enabled, the AC drive's UVW will have voltage output a while after power-on.

P9.09	Fault auto reset times		Default	0
	Setting Range	0~20		

It is used to set the times of fault auto resets if this function is used. After the value is exceeded, the AC drive will remain in the fault state.

P9.10	YO action during fault auto reset		Default	0
	Setting Range	0: No action 1: Action		

It is used to decide whether the YO acts during the fault auto reset if the fault auto reset function is selected.

P9.11	Time interval of fault auto reset		Default	1.0s
	Setting Range	0.1s~100.0s		

It is used to set the waiting time from the alarm of the AC drive to fault auto reset.

P9.12	Input phase loss protection selection		Default	1
	Setting Range	Unit's digit: Input phase loss protection 0: Prohibited 1: Permitted Ten's digit: reserved		

It is used to determine whether to perform input phase loss or contactor energizing protection. T9000 11 kw inverter type G machine and above power, just have the input phase protection function, 11 kw G type machines and under power, no matter what P9.12 is set to 0 or 1 ,they are all no input phase protection function.

P9.13	Output phase loss protection selection		Default	1
	Setting Range	0: Prohibited 1: Permitted		

It is used to determine whether to perform output phase loss protection.

P9.14	1st fault type	0~99
P9.15	2nd fault type	
P9.16	3rd (latest) fault type	

It is used to record the types of the recent three faults of the AC drive. 0 indicates no fault. Possible causes and solution of each fault, refer to Chapter 5.

P9.17	Frequency upon 3rd fault	It displays the frequency when the latest fault occurs.
P9.18	Current upon 3rd fault	It displays the current when the latest fault occurs.
P9.19	Bus voltage upon 3rd fault	It displays the bus voltage when the latest fault occurs.
P9.20	Input terminal status upon 3rd fault	It displays the status of all input terminals when the latest fault occurs.The sequence is as follows: BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 X10 X9 X8 X7 X6 X5 X4 X3 X2 X1 If an input terminal is ON, the setting is 1. the OFF is 0, the setting is 0. The value is the equivalent decimal number converted from the X status.
P9.21	Output terminal status upon 3rd fault	It displays the status of all output terminals when the latest fault occurs. The sequence is as follows: BIT4 BIT3 BIT2 BIT1 BIT0 FOV FOC REL1 REL2 YO If an output terminal is ON, the setting is 1.the OFF is 0,The value is the equivalent decimal number converted from the X statuses.
P9.22	AC drive status upon 3rd fault	Reserved
P9.23	Power-on time upon 3rd fault	It displays the present power-on time when the latest fault occurs.
P9.24	Running time upon 3rd fault	It displays the present running time when the latest fault occurs.

P9.27	Frequency upon 2nd fault	The same as P9.17~P9.24
P9.28	Current upon 2nd fault	
P9.29	Bus voltage upon 2nd fault	
P9.30	input terminal status upon 2nd fault	
P9.31	Output terminal status upon 2nd fault	
P9.32	AC drive status upon 2nd fault	
P9.33	power-on time upon 2nd fault	
P9.34	Running time upon 2nd fault	
P9.37	Frequency upon 1st fault	The same as P9.17~P9.24
P9.38	Current upon 1st fault	
P9.39	Bus voltage upon 1st fault	
P9.40	input terminal status upon 1st fault	
P9.41	output terminal status upon 1st fault	
P9.42	AC drive status upon 1st fault	
P9.43	power-on time upon 1st fault	
P9.44	Running time upon 1st fault	

P9.47	Fault protection action selection 1		Default	00000
	Setting Range	Unit's digit	Motor overload (OL1)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		2	Continue to run	
		Ten's digit	Power input phase loss (LI) (the same as unit's digit)	
		Hundred's digit	Power output phase loss (LO) (the same as unit's digit)	
		Thousand's digit	External equipment fault (EF) (the same as unit's digit)	
		Ten thousand's digit	Communication fault (CE) (the same as unit's digit)	

P9.48	Fault protection action selection 2		Default	00000
	Setting Range	Unit's digit	Encoder fault (PG)	
		0	Coast to stop	
		1	Switch over to V/F control, stop according to the stop mode	
		2	Switch over to V/F control, continue to run	
		Ten's digit	function code read-write abnormal (EEP)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		Hundred's digit	reserved	
		Thousand's digit	reserved	
		Ten thousand's digit	Accumulative running time reached (END1) (the same as unit's digit in P9.47)	
P9.49	Fault protection action selection 3		Default	00000
	Setting Range	Unit's digit	reserved	
		Ten's digit	reserved	
		Hundred's digit	Accumulative power-on time reached (END2) (the same as unit's digit in P9.47)	
		Thousand's digit	Load becoming 0 (LOAD)	
		0	Coast to stop	
		1	Stop according to the stop mode	
		2	Continue to run at 7% of rated motor frequency and resume to the set frequency If the load recovers	
		Ten thousand's digit	PID feedback lost during running (PIDE) (the same as unit's digit in P9.47)	

P9.50	Fault protection action selection 4		Default	00000
	Setting Range	Unit's digit	Too large speed deviation (ESP) (the same as unit's digit in P9.47)	
		Ten's digit	Motor over-speed (OSP) (the same as unit's digit in P9.47)	
		Hundred's digit	Initial position fault (INI) (the same as unit's digit in P9.47)	
		Thousand's digit	Speed feedback fault (FSP) (the same as unit's digit in P9.47)	
		Ten thousand's digit	Reserved	

If "Coast to stop" is selected, the AC drive displays error code and directly stops.

If "Stop according to the stop mode" is selected, the AC drive displays alarm code and stops according to the stop mode. After stopping, the AC drive displays error code.

If "Continue to run" is selected, the AC drive continues to run and displays alarm code . The running frequency is set in P9.54.

P9.54	Frequency selection for continuing to run		Default	0
	Setting Range	0	Current running frequency	
		1	Set frequency	
		2	Frequency upper limit	
		3	Frequency lower limit	
		4	Backup frequency upon abnormality	
P9.55	Backup frequency upon abnormality		Default	100.0%
	Setting Range	0%~100.0%		

If a fault occurs during the running of the AC drive and the handling of fault is set to "Continue to run", the AC drive displays alarm code and continues to run at the frequency set in P9.54.

The setting of P9.55 is a percentage relative to the maximum frequency.

P9.56	reserved
P9.57	reserved
P9.58	reserved

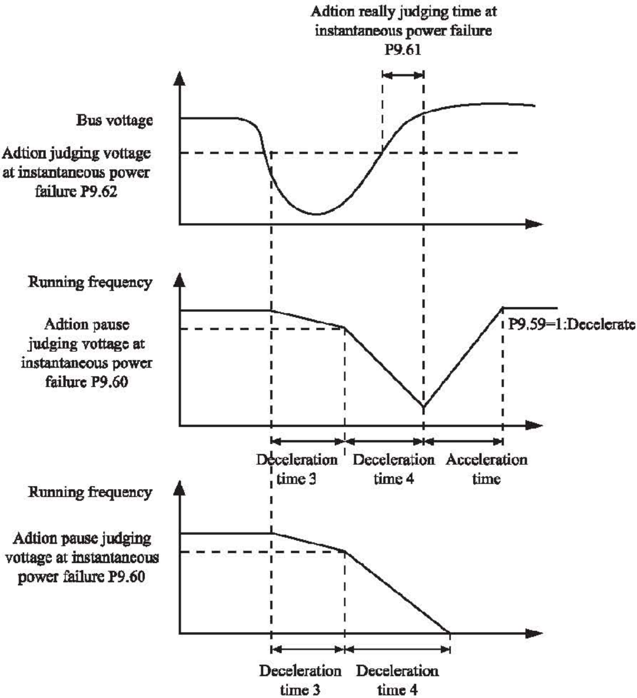
P9.59	Action selection at instantaneous power failure		Default	0
	Setting Range	0	Invalid	
		1	Decelerate	
		2	Decelerate to stop	
P9.60	Action pause judging voltage at instantaneous power failure		Default	90.0%
	Setting Range	0.0%~100.0%		
P9.61	Voltage rally judging time at instantaneous power failure		Default	0.50s
	Setting Range	0.00s~100.00s		
P9.62	Action judging voltage at instantaneous power failure		Default	80.0%
	Setting Range	60.0%~100.0% (standard bus voltage)		

Upon instantaneous power failure or sudden voltage dip, the DC bus voltage of the AC drive reduces. This function enables the AC drive to compensate the DC bus voltage reduction with the load feedback energy by reducing the output frequency so as to keep the AC drive running continuously.

If P9.59 = 1, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates. Once the bus voltage resumes to be normal, the AC drive accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in P9.61, it is considered that the bus voltage resumes to be normal.

If P9.59 = 2, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates to stop.

Figure 4-22 AC drive action diagram upon instantaneous power failure



P9.63	Protection upon load becoming 0		Default	0
	Setting Range	0	Disabled	
		1	Enabled	
P9.64	Detection level of load becoming 0		Default	10.0%
	Setting Range	0.0%~100.0% (rated motor current)		
P9.65	Detection time of load becoming 0		Default	1.0s
	Setting Range	0.0s~60.0s		

If protection upon load becoming 0 is enabled, when the output current of the AC drive is lower than the detection level (P9.64) and the continuous time exceeds the detection time (P9.65), the output frequency of the AC drive automatically declines to 7% of the rated frequency. During the protection, the AC drive automatically accelerates to the set frequency if the load resumes to be normal.

P9.67	Over-speed detection value	Default	20.0%
	Setting Range	0.0%~50.0% (maximum frequency)	
P9.68	Over-speed detection time	Default	1.0s
	Setting Range	0.0s~60.0s	

This function is valid only when the AC drive runs in the vector control mode.If the actual motor rotational speed detected by the AC drive exceeds the maximum frequency and the excessive value is greater than the value of P9.67 and the continuous time exceeds the value of P9.68, the AC drive reports OSP and acts according to the selected fault protection action.If the over-speed detection time is 0.0s, the over-speed detection function is cancelled.

P9.69	Detection value of too large speed deviation	Default	20.0%
	Setting Range	0.0%~50.0% (maximum frequency)	
P9.70	Detection time of too large speed deviation	Default	5.0s
	Setting Range	0.0s~60.0s	

This function is valid only when the AC drive runs in the vector control mode.

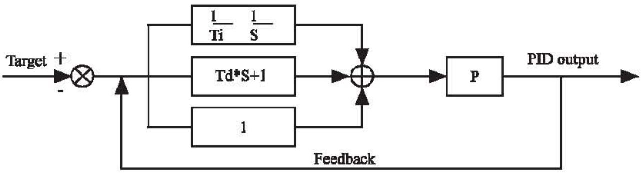
If the AC drive detects the deviation between the actual motor rotational speed detected by the AC drive and the set frequency is greater than the value of P9.69 and the continuous time exceeds the value of P9.70, the AC drive reports ESP and according to the selected fault protection action. If P9.70 (Detection time of too large speed deviation) is 0.0s, this function is cancelled.

Group PA: Process Control PID Function

PID control is a general process control method. By performing proportional, integral and differential operations on the difference between the feedback signal and the target signal,it adjusts the output frequency and constitutes a feedback system to stabilize the controlled counter around the target value.

It is applied to process control such as flow control, pressure control and temperature control. The following figure shows the principle block diagram of PID control.

Figure 4-23Principle block diagram of PID control



PA.00	PID setting source		Default	0
	Setting Range	0	PA.01	
		1	FIV	
		2	FIC	
		3	reserved	
		4	PULSE setting (S3)	
		5	Communication setting	
		6	Multi-reference	
PA.01	PID digital setting		Default	50.0%
	Setting Range	0.0%~100.0%		

PA.00 is used to select the channel of target process PID setting. The PID setting is a relative value and ranges from 0.0% to 100.0%. The PID feedback is also a relative value. The purpose of PID control is to make the PID setting and PID feedback the same.

PA.02	PID feedback source		Default	0
	Setting Range	0	FIV	
		1	FIC	
		2	reserved	
		3	FIV□FIC	
		4	PULSE setting (X5)	
		5	Communication setting	
		6	FIV+FIC	
		7	MAX (|FIV|,|FIC|)	
		8	MIN (|FIV|,|FIC|)	

This parameter is used to select the feedback signal channel of process PID.

The PID feedback is a relative value and ranges from 0.0% to 100.0%.

PA.03	PID action direction		Default	0
	Setting Range	0	Forward action	
		1	Reverse action	

Forward action

When the feedback value is smaller than the PID setting, the AC drive's output frequency rises. For example, the winding tension control requires forward PID action.

Reverse action

When the feedback value is smaller than the PID setting, the AC drive's output frequency reduces. For example, the unwinding tension control requires reverse PID action. Note that this function is influenced by reversing the multifunction terminal PID action.Pay attention in the application

PA.04	PID setting feedback range	Default	1000
	Setting Range	0~65535	

This parameter is a non-dimensional unit. It is used for PID setting display (D0.15) and PID feedback display (D0.16).

Relative value 100% of PID setting feedback corresponds to the value of PA.04. If PA.04 is set to 2000 and PID setting is 100.0%, the PID setting display (D0.15) is 2000.

PA.05	Proportional gain Kp1	Default	20.0
	Setting Range	0.0~100.0	
PA.06	Integral time Ti1	Default	2.00s
	Setting Range	0.01s~10.00s	
PA.07	Differential time Td1	Default	0.000s
	Setting Range	0.00~10.000	

Proportional gain Kp1

It decides the regulating intensity of the PID regulator. The higher the Kp1 is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.

Integral time Ti1

It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in PA.06. Then the adjustment amplitude reaches the maximum frequency.

Differential time Td1

It decides the regulating intensity of the PID regulator on the deviation change. The longer the differential time is, the larger the regulating intensity is. Differential time is the time within which the feedback value change reaches 100.0%, and then the adjustment amplitude reaches the maximum frequency.

PA.08	Cut-off frequency of PID reverse rotation	Default	2.00Hz
	Setting Range	0.00~maximum frequency	

In some situations, only when the PID output frequency is a negative value (AC drive reverse rotation), PID setting and PID feedback can be equal. However, too high reverse rotation frequency is prohibited in some applications, and PA.08 is used to determine the reverse rotation frequency upper limit.

PA.09	PID deviation limit	Default	0.00%
	Setting Range	0. 0%~100.0%	

If the deviation between PID feedback and PID setting is smaller than the value of PA.09,PID control stops. The small deviation between PID feedback and PID setting will make the output frequency stable and unchanging, especially effective for some closed-loop control applications.

PA.10	PID differential limit	Default	0.10%
	Setting Range	0.00%~100.00%	

It is used to set the PID differential output range. In PID control, the differential operation may easily cause system oscillation. Thus, the PID differential regulation is restricted to a small range.PA.10 is used to set the range of PID differential output.

PA.11	PID setting changing time	Default	0.00s
	Setting Range	0.00s~650.00s	

The PID setting changing time indicates the time required for PID setting changing from 0.0% to 100.0%. The PID setting changes linearly according to the changing time, reducing the impact caused by sudden setting change on the system.

PA.12	PID feedback filter time	Default	0.00s
	Setting Range	0.00s~60.00s	
PA.13	PID output filter time	Default	0.00s
	Setting Range	0.00s~60.00s	

PA.12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing down the response of the process closed-loop system.

PA.13 is used to filter the PID output frequency, helping to weaken sudden change of the AC drive output frequency but slowing down the response of the process closed-loop system.

PA.15	Proportional gain Kp2	Default	20.0
	Setting Range	0.0~100.0	

PA.16	Integral time Ti2		Default	2.00s
	Setting Range	0.01s~10.00s		
PA.17	Differential time Td2		Default	0.000s
	Setting Range	0.00~10.000		
PA.18	PID parameter switchover condition		Default	0
	Setting Range	0	No switchover	
		1	Switchover via X	
		2	Automatic switchover based on deviation	
PA.19	PID parameter switchover deviation 1		Default	20.0%
	Setting Range	0.0%~PA.20		
PA.20	PID parameter switchover deviation 2		Default	80.0%
	Setting Range	PA.19~100.0%		

In some applications, PID parameters switchover is required when one group of PID parameters cannot satisfy the requirement of the whole running process. These parameters are used for switchover between two groups of PID parameters.

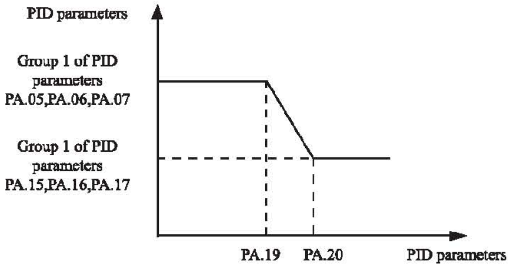
Regulator parameters PA.15 to PA.17 are set in the similar way as PA.05 to PA.07.

The switchover can be implemented either via a X terminal or automatically implemented based on the deviation.

If you select switchover via a X terminal, the X must be allocated with function 43 "PID parameter switchover". If the X is OFF, group 1 (PA.05 to PA.07) is selected. If the X is ON, group 2 (PA.15 to PA.17) is selected.

If you select automatic switchover, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of PA.19, PID parameter selects group 1 . When the absolute value of the deviation between PID feedback and PID setting is higher than the value of PA.20, PID parameter selects group 2. When the deviation is between PA.19 and PA.20, the PID parameters are the linear interpolated value of the two groups of parameter values.

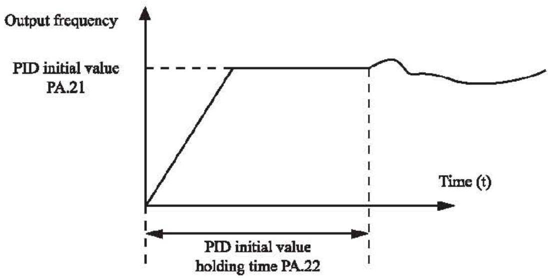
Figure 4-24 PID parameters switchover



PA.21	PID initial value		Defaul	0.0%
	Setting Range	0.0%~100.0%		
PA.22	PID initial value holding time		Defaul	0.00s
	Setting Range	0.00s~650.00s		

When the AC drive starts up, the PID starts closed-loop algorithm only after the PID output is fixed to the PID initial value (PA.21) and lasts the time set in PA.22.

Figure 4-25 PID initial value function



PA.23	Maximum deviation between two PID outputs in forward direction		Default	1.00%
	Setting Range	0.00%~100.00%		
PA.24	Maximum deviation between two PID outputs in reverse direction		Default	1.00%
	Setting Range	0.00%~100.00%		

This function is used to limit the deviation between two PID outputs (2 ms per PID output) to suppress the rapid change of PID output and stabilize the running of the AC drive.

PA.23 and PA.24 respectively correspond to the maximum absolute value of the output deviation in forward direction and in reverse direction.

PA.25	PID integral property		Default	00
	Setting Range	Unit's digit	Integral separated	
		0	Invalid	
		1	Valid	
		Ten's digit	Whether to stop integral operation when the output reaches the limit	
		0	Continue integral operation	
		1	Stop integral operation	

Integral separated:

If set the integral separated valid , the PID integral operation stops when the X allocated with function 38 "PID integral pause" is effective .In this case, only proportional and differential operations take effect.

If it is set invalid, the integral separated remains invalid no matter whether the X allocated with function "PID integral pause" is ON or not.

Whether to stop integral operation when the output reaches the limit.

If "Stop integral operation" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

PA.26	Detection value of PID feedback loss		Default	0.0%
	Setting Range	0.0%: Not judging feedback loss 0.1%~100.0%		
PA.27	Detection time of PID feedback loss		Default	1.0s
	Setting Range	0.0s~20.0s		

These parameters are used to judge whether PID feedback is lost.

If the PID feedback Is smaller than the value of PA.26 and the continuous time exceeds the value of PA.27, the AC drive reportsPIDE and acts according to the selected fault protection action.

PA.28	PID operation at stop		Default	0
	Setting Range	0	No operation at stop	
		1	operation at stop	

It is used to select whether to continue PID operation in the state of stop. Generally, the PID operation stops when the AC drive stops.

Group PC: Multi-Reference and Simple PLC Function

The T9000 multi-reference has more rich functions than multi-speed.Besides multi-speed, it can also be used as the setting source of the V/F separated voltage source and setting source of process PID. In addition, the multi-reference is relative value.

The simple PLC function is different from the T9000 user programmable function. Simple PLC can only complete simple combination of multi-reference, while the user programmable function is richer and more practical. For details, see the descriptions of group PC.

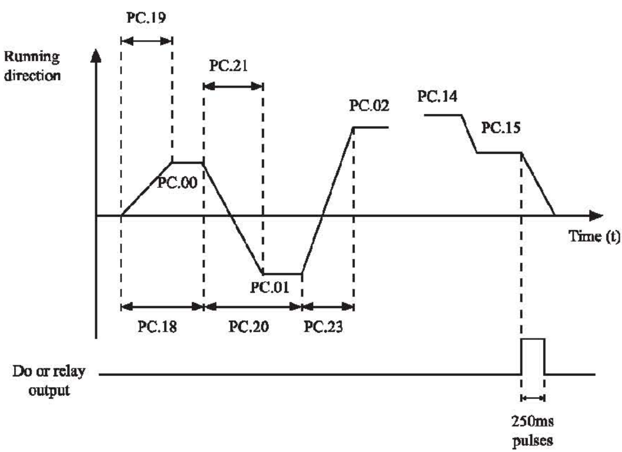
PC.00	multi-reference 0	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.01	multi-reference 1	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.02	multi-reference 2	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.03	multi-reference 3	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.04	multi-reference 4	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.05	multi-reference 5	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.06	multi-reference 6	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.07	multi-reference 7	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.08	multi-reference 8	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.09	multi-reference 9	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.10	multi-reference 10	Default	0.0Hz
	Setting Range	-100.0%~100.0%	
PC.11	multi-reference 11	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.12	multi-reference 12	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.13	multi-reference 13	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.14	multi-reference 14	Default	0.0%
	Setting Range	-100.0%~100.0%	
PC.15	multi-reference 15	Default	0.0%
	Setting Range	-100.0%~100.0%	

Multi-reference can be used in three occasions : as the source of frequency, V/F separated voltage source and the setting source of process PID. The multi-reference Is relative value and ranges from -100.0% to 100.0%.
As frequency source, it is a percentage relative to the maximum frequency. As V/F separated voltage source, it is a percentage relative to the rated motor voltage.
As process PID setting source, it does not require conversion.
Multi-reference can be switched over based on different states of multifunction digital S terminals. For details,see the descriptions of group P4.

PC.16	Simple PLC running mode		Default	0
	Setting Range	0	Stop after the AC drive runs one cycle	
		1	Keep final values after the AC drive runs one cycle	
		2	Repeat after the AC drive runs one cycle	

Simple PLC function has two effects: the frequency source or V/F separated voltage source.
When simple PLC is used as the frequency source, whether parameter values of PC. 00 to PC. 15 are positive or negative determines the running direction. If the parameter values are negative, it indicates that the AC drive runs in reverse direction.

Figure 4-26 Simple PLC when used as frequency source



As the frequency source,PLC has three running modes,as V/F separated voltage source,it doesn't have the three modes.Among them,

0: Stop after the AC drive runs one cycle
The AC drive stops after running one cycle, and will not start up until receiving another command.
1: Keep final values after the AC drive runs one cycle.The AC drive keeps the final running frequency and direction after running one cycle.
2: Repeat after the AC drive runs one cycle
The AC drive automatically starts another cycle after running one cycle, and will not stop until receiving the stopping command.

PC.17	Simple PLC retentive selection		Default	00
	Setting Range	Unit's digit	Retentive upon power failure	
		0	No	
		1	Yes	
		Ten's digit	Retentive upon stop	
		0	No	
		1	Yes	

PLC retentive upon power failure indicates that the AC drive memorizes the PLC running moment and running frequency before power failure and will continue to run from the memorized moment after it is powered on again. If the unit's digit is set to 0, the AC drive restarts the PLC process after it is powered on again.
PLC retentive upon stopping indicates that the AC drive records the PLC running moment and running frequency upon stop and will continue to run from the recorded moment after it starts up again. If the ten's digit is set to 0, the AC drive restarts the PLC process after it starts up again.

PC.18	Running time of simple PLC reference 0	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.19	Acceleration/deceleration time of simple PLC reference 0	Default	0
	Setting Range	0~3	
PC.20	Running time of simple PLC reference 1	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	

PC.21	Acceleration/deceleration time of simple PLC reference 1	Default	0
	Setting Range	0~3	
PC.22	Running time of simple PLC reference 2	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.23	Acceleration/deceleration time of simple PLC reference 2	Default	0
	Setting Range	0~3	
PC.24	Running time of simple PLC reference 3	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.25	Acceleration/deceleration time of simple PLC reference 3	Default	0
	Setting Range	0~3	
PC.26	Running time of simple PLC reference 4	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.27	Acceleration/deceleration time of simple PLC reference 4	Default	0
	Setting Range	0~3	
PC.28	Running time of simple PLC reference 5	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.29	Acceleration/deceleration time of simple PLC reference 5	Default	0
	Setting Range	0~3	
PC.30	Running time of simple PLC reference 6	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.31	Acceleration/deceleration time of simple PLC reference 6	Default	0
	Setting Range	0~3	
PC.32	Running time of simple PLC reference 7	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	

PC.33	Acceleration/deceleration time of simple PLC reference 7	Default	0
	Setting Range	0~3	
PC.34	Running time of simple PLC reference 8	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.35	Acceleration/deceleration time of simple PLC reference 8	Default	0
	Setting Range	0~3	
PC.36	Running time of simple PLC reference 9	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.37	Acceleration/deceleration time of simple PLC reference 9	Default	0
	Setting Range	0~3	
PC.38	Running time of simple PLC reference 10	Default	0.0s (h)
	Setting Range	0.0 s (h)~6500.0s (h)	
PC.39	Acceleration/deceleration time of simple PLC reference 10	Default	0
	Setting Range	0~3	
PC.40	Running time of simple PLC reference 11	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.41	Acceleration/deceleration time of simple PLC reference 11	Default	0
	Setting Range	0~3	
PC.42	Running time of simple PLC reference 12	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	
PC.43	Acceleration/deceleration time of simple PLC reference 12	Default	0
	Setting Range	0~3	
PC.44	Running time of simple PLC reference 13	Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)	

PC.45	Acceleration/deceleration time of simple PLC reference 13		Default	0
	Setting Range	0~3		
PC.46	Running time of simple PLC reference 14		Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)		
PC.47	Acceleration/deceleration time of simple PLC reference 14		Default	0
	Setting Range	0~3		
PC.48	Running time of simple PLC reference 15		Default	0.0s (h)
	Setting Range	0.0s (h)~6500.0s (h)		
PC.49	Acceleration/deceleration time of simple PLC reference 15		Default	0
	Setting Range	0~3		
PC.50	Time unit of simple PLC running		Default	0
	Setting Range	0	S (second)	
		1	h (hour)	
PC.51	Reference 0 source		Default	0
	Setting Range	0	function code is set by PC.00	
		1	FIV	
		2	FIC	
		3	reserved	
		4	PULSE setting	
		5	PID	
		6	Set by preset frequency (P010), modified via terminal UP/DOWN	

It determines the setting channel of reference 0.You can perform convenient switchover between the setting channels. When multi-reference or simple PLC is used as frequency source, the switchover between two frequency sources can be realized easily.

Group PD: Communication Parameters

Please refer to the "T9000 communication protocol"

Group PP: User-Defined Function Codes

PP.00	User password		Default	0
	Setting Range	0~65535		

If it is set to any non-zero number, the password protection function is enabled. After a password has been set and taken effect, you must input the correct password in order to enter the menu. If the password is incorrect ,you cannot view or modify parameters.
If PP.00 is set to 00000, the previously set user password is cleared, and the password protection function is disabled.

PP.01	Restore default settings		Default	0
	Setting Range	0	No operation	
		1	Restore factory settings except motor parameters	
		2	Clear records	

1: Restore default settings except motor parameters
If PP.01 is set to 1, most function codes are restored to the default settings except
motor parameters, frequency reference decimal point(P022, fault records, accumulative running time (P7.09), accumulative power-on time (P7.13) and accumulative power consumption (P7.14).
2: Clear records
If PP.01 is set to 2, the fault records, accumulative running time (P7.09), accumulative power-on time (P7.13) and accumulative power consumption (P7.14) are cleared.

Group C0: Torque Control and Restricting Parameters

C0.00	Speed/Torque control selection		Default	0
	Setting Range	0	Speed control	
		1	Torque control	

It is used to select the AC drive's control mode: speed control or torque control.
The T9000 provides S terminals with two torque related functions,Torque control prohibited (function 29)and Speed control/ Torque control switchover(function 46). The two S terminals need to be used together with C0.00 to implement speed control/torque control switchover.
If the S terminal allocated with speed control/torque control switchover is OFF, the control mode is determined by C0.00. If the X terminal allocated with function 46 is ON, the control mode is to reverse the value of C0.00.
However, if the Torque control prohibited terminal is ON, the AC

drive is fixed to run in the speed of control mode.

C0.01	Torque setting source in torque control		Default	0
	Setting Range	0	Digital setting (C0.03)	
		1	FIV	
		2	FIC	
		3	reserved	
		4	PULSE setting	
		5	Communication setting	
		6	MIN (FIV,FIC)	
		7	MAX (FIV,FIC)	
C0.03	Torque digital setting in torque control		Default	150%
	Setting Range	-200.0%~200.0%		

C0.01 is used to selected the torque setting source. There are a total of eight torque setting sources. The torque setting is a relative value. 100.0% corresponds to the AC drive's rated torque. The setting range is -200.0% to 200.0%, indicating the AC drive's maximum torque is twice of the AC drive's rated torque.
When the torque setting using 1 ~ 7, communication, analog input and pulse input. 100% corresponds to the value of C0.03.

C0.05	Forward maximum frequency in torque control		Default	50.00Hz
	Setting Range	0.00Hz~ maximum frequency (P012)		
C0.06	Reverse maximum frequency in torque control		Default	50.00Hz
	Setting Range	0.00Hz~ maximum frequency (P012)□		

This two parameters are used to set the maximum frequency in forward or reverse rotation in torque control mode.
In torque control, if the load torque is smaller than the motor output torque, the motor's rotational speed will rise continuously. To avoid runaway of the mechanical system, the motor maximum rotating speed must be limited in torque control.

C0.07	Acceleration time in torque control		Default	0.00s
	Setting Range	0.00s~650.00s		
C0.08	Deceleration time in torque control		Default	0.00s
	Setting Range	0.00s~650.00s□		

In torque control, the difference between the motor output torque and the load torque determines the speed change rate of the motor and load. The motor rotational speed may change quickly and this will result in noise or too large mechanical stress. The setting of acceleration/deceleration time in torque control makes the motor rotational speed change smoothly.

However, in applications requiring rapid torque response, set the acceleration/deceleration time in torque control to 0.00s. For example, two AC drives are connected to drive the same load. To balance the load allocation, set one AC drive as master in speed control and the other as slave in torque control. The slave receives the master's output torque as the torque command and must follow the master rapidly. In this case, the acceleration/deceleration time of the slave in torque control is set to 0.00s.

Group C5: Control Optimization Parameters

C5.00	PWM switchover frequency upper limit		Default	8.00Hz
	Setting Range	5.00Hz~MAX frequency		

This parameter is valid only for V/F control.

It is used to determine the wave modulation mode in V/F control of asynchronous motor.

If the frequency is lower than the value of this parameter, the waveform is 7-segment continuous modulation. If the frequency is higher than the value of this parameter, the waveform is 5-segment intermittent modulation.

The 7-segment continuous modulation causes more loss to switches of the AC drive but smaller current ripple. The 5-segment intermittent modulation causes less loss to switches of the AC drive but larger current ripple. This may lead to motor running instability at high frequency. Do not modify this parameter generally.

For instability of V/F control, refer to parameter P4.11. For loss to AC drive and temperature rise, refer to parameter P0.17.

C5.01	PWM modulation		Default	0
	Setting Range	0	asynchronous modulation	
		1	synchronous modulation	

Only V/F control is effective.asynchronous modulation is used when the output frequency is high(over 100HZ),conducive to the quality of the output voltage

C5.02	Dead compensation way		Default	1
	Setting Range	0	No compensation	
		1	compensation mode 1	
		2	compensation mode 2	

It doesn't have to modify it generally.

C5.03	Random PWM depth		Default	0
	Setting Range	0	Random PWM Invalid	
		1	1~10	

Random PWM depth is set to improve the motor's noise,reduce electromagnetic interference

C5.04	Fast current limiting open		Default	1
	Setting Range	0	No	
		1	Yes	

Opening fast current limiting can reduce overcurrent fault,make the inverter work normally. Opening fast current limiting for a long time ,can make the inverter overheat,Report a fault CBC.CBC represents fast current limiting fault and need to stop.

C5.05	Current detection compensation		Default	5
	Setting Range	0~100		

Used to set current detection compensation, Not recommended modification.

C5.06	Lack voltage setting		Default	100%
	Setting Range	60.0~140.0%		

Used to set the voltage of inverter's lack voltage fault LU,Different voltage levels of inverter's 100%,corresponding to different voltages, Respectively single-phase 220V or three-phase 220V: three-phase 380V:350;three-phase 690V:650V

C5.07	SFVC optimization mode selection		Default	1
	Setting Range	0	No optimization	
		1	Optimization mode 1	
		2	Optimization mode 2	

1: Optimization mode 1

It is used when the requirement on torque control linearity is high.

2: Optimization mode 2

It is used for the requirement on speed stability is high.

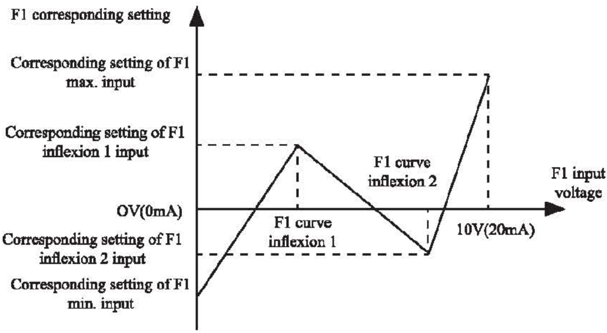
Group C6: FI Curve Setting(FI is FIV or FIC)

C6.00	FI curve 4 minimum input		Default	0.00V
	Setting Range	0.00 V~C6.02		

C6.01	Corresponding setting of FI curve 4 minimum input	Default	0.0%
	Setting Range	-100.0%~100.0%	
C6.02	FI curve 4 inflexion 1 input	Default	3.00V
	Setting Range	C6.00~C6.04	
C6.03	Corresponding setting of FI curve 4 inflexion 1 input	Default	30.0%
	Setting Range	-100.0%~100.0%	
C6.04	FI curve 4 inflexion 2 input	Default	6.00V
	Setting Range	C6.02~C6.06	
C6.05	Corresponding setting of FI curve 4 inflexion 2 input	Default	60.0%
	Setting Range	-100.0%~100.0%	
C6.06	FI curve 4 maximum input	Default	10.00V
	Setting Range	C6.06~10.00V	
C6.07	Corresponding setting of FI curve 4 maximum input	Default	100.0%
	Setting Range	-100.0%~100.0%	
C6.08	FI curve 5 minimum input	Default	0.00V
	Setting Range	-10.00V~C6.10	
C6.09	Corresponding setting of FI curve 5 minimum input	Default	0.0%
	Setting Range	-100.0%~100.0%	
C6.10	FI curve 5 inflexion 1 input	Default	3.00V
	Setting Range	C6.08~C6.12	
C6.11	Corresponding setting of FI curve 5 inflexion 1 input	Default	30.0%
	Setting Range	-100.0%~100.0%	
C6.12	FI curve 5 inflexion 2 input	Default	6.00V
	Setting Range	C6.10~C6.14	
C6.13	Corresponding setting of FI curve 5 inflexion 2 input	Default	60.0%
	Setting Range	-100.0%~100.0%	
C6.14	FI curve 5 maximum input	Default	10.00V
	Setting Range	C6.14~10.00V	
C6.15	Corresponding setting of FI curve 5 maximum input	Default	100.0%
	Setting Range	-100.0%~100.0%	

The function of curve 4 and curve 5 is similar to that curve 1 to curve 3, but curve 1 to curve 3 are lines, and curve 4 and curve 5 are 4-point curves, implementing more flexible corresponding relationship. The schematic diagram of curve 4 and curve 5 is shown in the following figure.

Figure 4-27 Schematic diagram curve 4 and curve 5



When setting curve 4 and curve 5, note that the curve's minimum input voltage, inflexion 1 voltage, inflexion 2 voltage and maximum voltage must be in increment order.
P4.33 (FI curve selection) is used to determine how to select curves FIV to FIC from the five curves

C6.16	Jump point of FIV input corresponding setting	Default	0.0%
	Setting Range	-100.0%~100.0%	
C6.17	Jump amplitude of FIV input corresponding setting	Default	0.5%
	Setting Range	0.0%~100.0%	
C6.18	Jump point of FIC input corresponding setting	Default	0.0%
	Setting Range	-100.0%~100.0%	
C6.19	Jump amplitude of FIC input corresponding setting	Default	0.5%
	Setting Range	0.0%~100.0%	

The analog input terminals (FIV to FIC) of the T9000 all support the corresponding setting jump function, which fixes the analog input corresponding setting at the jump point when analog input corresponding setting jumps around the jump range.
For example, FIV input voltage jumps around 5.00 V and the jump range is 4.90–5.10V.FIV minimum input 0.00 V corresponds to 0.0% and maximum input 10.00 V corresponds to 100.0%. The detected FIV input corresponding setting varies between 49.0% and 51.0%.
If you set C6.16 to 50.0% and C6.17 to 1.0%, then the obtained

stable input FIV corresponding setting is fixed to 50.0% after the jump function, eliminating the fluctuation effect.

Group CC: FI/FO Correction

CC.00	FIV measured voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.01	FIV displayed voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.02	FIV measured voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.03	FIV displayed voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.04	FIC measured voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.05	FIC displayed voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.06	FIC measured voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.07	FIC displayed voltage 2		Default	Factory-corrected
	Setting Range	-9.999V~10.000V		
CC.08	reserved			
CC.09	reserved			
CC.10	reserved			
CC.11	reserved			

These parameters are used to correct the FI to eliminate the impact of FI zero offset and gain.They have been corrected upon delivery. When you resume the factory values, these parameters will be restored to the factory-corrected values. Generally, you need not perform correction in the applications.

Measured voltage indicates the actual output voltage value measured by instruments such as the multimeter. Displayed voltage indicates the voltage display value sampled by the AC drive. For details, refer to D0.21, D0.22 .During correction, send two voltage values to each FI terminal, and save the measured values and displayed values to the function codes CC.00 to CC.11. Then the AC drive will automatically perform FI zero offset and gain correction.

CC.12	FOV target voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		

CC.13	FOV measured voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.14	FOV target voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.15	FOV measured voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.16	FOV target voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.17	FOV measured voltage 1		Default	Factory-corrected
	Setting Range	0.500V~4.000V		
CC.18	FOV target voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		
CC.19	FOV measured voltage 2		Default	Factory-corrected
	Setting Range	6.000V~9.999V		

These parameters are used to correct the FOV/FOC.

They have been corrected upon delivery.When you resume the factory values, these parameters will be restored to the factory-corrected values. You need not perform correction in the applications.

Target voltage indicates the theoretical output voltage of the AC drive. Measured voltage indicates the actual output voltage value measured by instruments such as the multimeter.

Group D0: Monitoring Parameters

Group D0 is used to monitor the AC drive's running state. You can view the parameter values by using operation panel, convenient for on-site commissioning, or from the host computer by means of communication .

D0.00 to D0.31 are the monitoring parameters in the running and stopping state defined by P7.03 and P7.04.

For more details, see Table 6-1

Parameters of Group D0:

Function Code	Parameter Name	Unit
D0.00	Running frequency (Hz)	0.01Hz
D0.01	Set frequency (Hz)	0.01Hz
D0.02	Bus voltage (V)	0.1V
D0.03	Output voltage (V)	1V
D0.04	Output current (A)	0.01A
D0.05	Output power (kW)	0.1kW
D0.06	Output torque (%)	0.1%

Function Code	Parameter Name	Unit
D0.07	S input state	1
D0.08	YO output state	1
D0.09	FIV voltage (V)	0.01V
D0.10	FIC voltage (V)	0.01V
D0.11	reserved	
D0.12	Count value	1
D0.13	Length value	1
D0.14	Load speed display	1
D0.15	PID setting	1
D0.16	PID feedback	1
D0.17	PLC stage	1
D0.18	Input pulse frequency (HZ)	0.01kHz
D0.19	Feedback speed (the unit :0.1 HZ)	0.1Hz
D0.20	Remaining running time	0.1Min
D0.21	FIV voltage before correction	0.001V
D0.22	FIC voltage before correction	0.001V
D0.23	reserved	
D0.24	Linear speed	1m/Min
D0.25	the current Power-on time	1Min
D0.26	The current running time	0.1Min
D0.27	Pulse input frequency	1Hz
D0.28	Communication setting value	0.01%
D0.29	Encoder feedback speed	0.01Hz
D0.30	Main frequency X	0.01Hz
D0.31	Auxiliary frequency Y	0.01Hz
D0.32	View any memory address values	1
D0.33	Synchronous motor rotor position	0.0°
D0.34	the motor's temperature	
D0.35	Target torque(%)	0.1%
D0.36	Resolver position	1
D0.37	Power factor angle	0.1
D0.38	ABZ position	0.0
D0.39	Target voltage upon V/F separation	1V
D0.40	Output voltage upon V/F separation	1V
D0.41	S state visual display	1
D0.42	YO state visual display	1
D0.43	X function state visual display 1	1
D0.44	X function state visual display 2	1
D0.45	Fault information	0

Appdenix 1

List of Function Parameters

If PP-00 is set to a non-zero number, parameter protection is enabled. You must enter the correct user password to enter the menu. To cancel the password protection function, enter with password and set PP-00 to 0.

Parameters menu the user customizes are not protected by password.Group P is the basic function parameters , Group D is to monitor the function parameters.The symbols in the function code table are described as follows:

"☆": The parameter can be modified when the AC drive is in either stop or running state.

"★": The parameter cannot be modified when the AC drive is in the running state.

"●": The parameter is the actually measured value and cannot be modified.

"*": The parameter is factory parameter and can be set only by the manufacturer.

Standard Function Parameters:

Function code	Parameter Name	Setting range	Default	Property
Group P0 Standard Function Parameters				
P0.00	G/P type display	1: G type (Constant torque load) 2: P type (variable torque load e.g. fan and pump)	Model dependent	●
P0.01	Control mode selection	0: No PG (speed sensor) vector control 1: With PG (speed sensor) vector control 2: V/F control	2	★

Function code	Parameter Name	Setting range	Default	Property
P0.02	Command source selection	0: Operation panel control (LED off) 1: Terminal control (LED on) 2: Communication control (LED linking)	0	☆
P0.03	Main frequency source X selection	0: Digital setting (P0.08 preset frequency, can modify the UP/DOWN, power lost don't memory) 1: Digital setting (P0.08, preset frequency, can modify the UP/DOWN, power lost memory) 2: FIV (above 7.5KW) 3: FIC 4: Potentiometer on operation panel (below 5.5KW) 5: PULSE (S3, Above 3.7KW) 6: Multistage instruction 7: Simple PLC 8: PID 9: Communication setting	0	★
P0.04	Auxiliary frequency source Y selection	The same as P0.03 (frequency source X selection)	0	★
P0.05	Auxiliary frequency source superposition Y range selection	0: Relative to the maximum frequency 1: Relative to the main frequency source X	0	☆
P0.06	Auxiliary frequency source superposition Y range	0%~150%	100%	☆

Function code	Parameter Name	Setting range	Default	Property
P0.07	Frequency source superposition selection	Unit's digit (Frequency source) 0: Main frequency source X 1: X and Y operation (operation relationship determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and "X and Y operation" 4: Switchover between Y and "X and Y operation" Ten's digit (X and Y operation) 0: X+Y 1: X-Y 2: Both the maximum 3: Both the minimum	00	☆
P0.08	Frequency preset	0.00Hz~maximum frequency (P0.10)	50.00Hz	☆
P0.09	Rotation direction	0: Same direction 1: Reverse direction	0	☆
P0.10	Maximum frequency	50.00Hz~600.00Hz	50.00Hz	★
P0.11	Upper limit frequency source	0: P0.12 setting 1: Potentiometer on operate panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting	0	★
P0.12	Upper limit frequency	Frequency lower limit P0.14~Maximum frequency P0.10	50.00Hz	☆
P0.13	Upper limit frequency offset	0.00Hz~Maximum frequency P0.10	0.00Hz	☆
P0.14	Frequency lower limit	0.00Hz~Upper limit frequency P0.12	0.00Hz	☆
P0.15	Carrier frequency	0.5kHz~16.0kHz	Model dependent	☆

Function code	Parameter Name	Setting range	Default	Property
P0.16	Carrier frequency adjustment with temperature	0: No 1: Yes	1	☆
P0.17	Acceleration time 1	0.00s~65000s	Model dependent	☆
P0.18	Deceleration time 1	0.00s~65000s	Model dependent	☆
P0.19	Acceleration/ Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0.21	Frequency offset of auxiliary frequency source for X and Y operation	0.00Hz~Maximum frequency P0.10	0.00Hz	☆
P0.22	Frequency instruction resolution	2: 0.01Hz	2	★
P0.23	Retentive of digital setting frequency upon power	0: Not retentive 1: Retentive	1	☆
P0.25	Acceleration/ Deceleration time base frequency	0: Maximum frequency (P0.10) 1: Set frequency 2: 100Hz	1	★
P0.26	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	0	★

Function code	Parameter Name	Setting range	Default	Property
P0.27	Binding command source to frequency source	Unit's digit: Binding operation panel command to frequency source 0: No binding 1: Frequency source by digital setting 2: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 3: FIC 4: Reserved 5: PULSE (S3, above 3.7KW) 6:Multi-Reference 7:Simple PLC 8:PID 9:Communication setting Ten's digit: Binding terminal command to frequency source Hundred's digit: Binding communication command to frequency source	0000	☆
Group P1 Motor parameter				
P1.00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Permanent magnetic synchronous motor	0	★
P1.01	Rated motor power	0.1kW~1000.0kW	Model dependent	★
P1.02	Rated motor voltage	1V~2000V	Model dependent	★
P1.03	Rated motor current	0.01A~655.35A (AC drive power <=55kW) 0.1A~6553.5A (AC drive power >55kW)	Model dependent	★
P1.04	Rated motor frequency	0.01Hz~maximum frequency	Model dependent	★
P1.05	Rated motor rotational speed	1rpm~65535rpm	Model dependent	★

Function code	Parameter Name	Setting range	Default	Property
P1.06	Stator resistance (asynchronous motor)	0.001Ω~65.535Ω (AC drive power <=55kW) 0.0001Ω~6.5535Ω (AC drive power >55kW)	Tuned parameter	★
P1.07	Rotor resistance (asynchronous motor)	0.001Ω~65.535Ω (AC drive power <=55kW) 0.0001Ω~6.5535Ω (AC drive power >55kW)	Tuned parameter	★
P1.08	Leakage inductive reactance (asynchronous motor)	0.01mH~655.35mH (AC drive power <=55kW) 0.001mH~65.535mH (AC drive power >55kW)	Tuned parameter	★
P1.09	Mutual inductive reactance (asynchronous motor)	0.1mH~6553.5mH (AC drive power <=55kW) 0.01mH~655.35mH (AC drive power >55kW)	Tuned parameter	★
P1.10	No-load current (synchronous motor)	0.01A~P1.03 (AC drive power <=55kW) 0.1A~P1.03 (AC drive power >55kW)	Tuned parameter	★
P1.16	Shaft D inductance (synchronous motor)	0.001Ω~65.535Ω (AC drive power<=55kW) 0.0001Ω~6.5535Ω (AC drive power>55kW)	Model dependent	★
P1.17	Shaft Q inductance (synchronous motor)	0.01mH~655.35mH (AC drive power<=55kW) 0.001mH~65.535mH (AC drive power>55kW)	Model dependent	★
P1.18	Shaft Q inductance (synchronous motor)	0.01mH~655.35mH (AC drive power<=55kW) 0.001mH~65.535mH (AC drive power>55kW)	Model dependent	★
P1.20	Back EMF (synchronous motor)	0.1V~6553.5V	Model dependent	★
P1.27	Encoder pulses per revolution	1~65535	1024	★
P1.28	Encoder type	0: ABZ incremental encoder 2: Resolver	0	★

Function code	Parameter Name	Setting range	Default	Property
P1.30	AB phase sequence of ABZ incremental encoder AB phase sequence	0: Forward 1: Reverse	0	★
P1.31	Encoder install angle	0.0~359.9°	0.0°	★
P1.34	Rotation pole logarithm	1~65535	1	★
P1.36	Speed feedback PG card break line detection time	0.0: No action 0.1s~10.0s	0.0	★
P1.37	Auto tuning selection	0: No operation 1: static auto-tuning 2: dynamic auto-tuning 3: complete static auto-tuning 11: Synchronous motor with-load auto-tuning 12: Synchronous motor no-load auto-tuning	0	★
P2 Motor vector control parameter				
P2.00	Speed loop proportional gain 1	1~100	30	☆
P2.01	Speed loop integral time 1	0.01s~10.00s	0.50s	☆
P2.02	Switchover frequency 1	0.00~P2.05	5.00Hz	☆
P2.03	Speed loop proportional gain 2	1~100	20	☆
P2.04	Speed loop integral time 2	0.01s~10.00s	1.00s	☆
P2.05	Switchover frequency 2	P2.02~Maximum frequency	10.00Hz	☆
P2.06	Vector control slip gain	50%~200%	100%	☆
P2.07	Time constant of speed loop filter	0.000s~0.100s	0.015s	☆
P2.08	Vector control over-excitation gain	0~200	64	☆

Function code	Parameter Name	Setting range	Default	Property
P2.09	Torque upper limit sourcein speed control mode	0: P2.10 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: MIN (Potentiometer on operation panel, FIC) (below 5.5KW) MIN (FIV,FIC) (above 7.5KW) 7: MAX (Potentiometer on operation panel, FIC) (below 5.5KW) MAX (FIV,FIC) (above 7.5KW) The full range of 1-7 is correspond to P2.10	0	☆
P2.10	Torque upper limit setting in speed control mode (electrical)	0.0%~200.0%	150.0%	☆

Function code	Parameter Name	Setting range	Default	Property
P2.11	Torque upper limit instruction selection In speed control mode (generation)	0: P2.10 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: MIN (Potentiometer on operation panel, FIC) (below 5.5KW) MIN (FIV,FIC) (above7.5KW) 7: MAX (Potentiometer on operation panel, FIC) (below 5.5KW) MAX (FIV,FIC) (above 7.5KW) 8: P2.12 setting Full range of 1-7 corresponding to P2.12	0	☆
P2.12	Torque upper limit digital setting in speed control mode (generation)	0.0%~200.0%	150.0%	☆
P2.13	Excitation adjustment proportional gain	0~60000	2000	☆
P2.14	Excitation adjustment integral gain	0~60000	1300	☆
P2.15	Torque adjustment proportional gain	0~60000	2000	☆
P2.16	Torque adjustment integral gain	0~60000	1300	☆
P2.17	Speed loop integral property	Unit's digit: integral separation 0: Disabled 1: Enabled	0	☆

Function code	Parameter Name	Setting range	Default	Property
P2.21	Maximum torque coefficient of field weakening	50%~200%	100%	☆
P2.22	Generation power limit enabled	0: Disabled 1: Enabled always 2: Enabled when constant speed 3: Enabled when deceleration	0	☆
P2.23	Generation power upper limit	0.0%~200.0%	Model dependent	☆
Group P3 V/F control parameters				
P3.00	VF curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: VF complete separation 11: VF half separation	0	★
P3.01	Torque boost	0.0%: (fixed torque boost) 0.1%~30.0%	Model dependent	☆
P3.02	Cut-off frequency of torque boost	0.00Hz~Maximum frequency	50.00Hz	★
P3.03	Multi-point VF frequency 1	0.00Hz~P3.05	0.00Hz	★
P3.04	Multi-point voltage 1	0.0%~100.0%	0.0%	★
P3.05	Multi-point VF frequency 2	P3.03~P3.07	0.00Hz	★
P3.06	Multi-point voltage 2	0.0%~100.0%	0.0%	★
P3.07	Multi-point VF frequency 3	P3.05~rated motor frequency (P1.04)	0.00Hz	★
P3.08	Multi-point voltage 3	0.0%~100.0%	0.0%	★
P3.09	V/F slip compensation gain	0.0%~200.0%	0.0%	☆
P3.10	V/F over-excitation gain	0~200	64	☆

Function code	Parameter Name	Setting range	Default	Property
P3.11	V/F oscillation suppression gain	0~100	Model dependent	☆
P3.13	Voltage source for V/F separation	0: Digital setting (P3.14) 1: Potentiometer on operation panel (below 5.5KW) FIV (above 7.5KW) 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Multi-reference 6: Simple PLC 7: PID 8: Communication setting Note: 100.0% corresponding to the rated motor voltage	0	☆
P3.14	Voltage digital setting for V/F separation	0V~rated motor voltage	0V	☆
P3.15	Voltage acceleration time for V/F separation	0.0s~1000.0s Note: it indicated the time for the voltage change from 0V to rated motor voltage	0.0s	☆
P3.16	Voltage deceleration time for V/F separation	0.0s~1000.0s Note: it indicated the time for the voltage change from the rated motor voltage to 0V	0.0s	☆
P3.17	Stop mode selection for V/F separation	0: Frequency/voltage independent decline to 0 1: After voltage decline to 0 then decline the frequency	0	☆
P3.18	Action current of the over current lost speed	50%~200%	150%	★
P3.19	Over current lost speed enabled	0: Disabled 1: Enabled	1	★
P3.20	Over current lost speed suppression gain	0~100	20	☆

Function code	Parameter Name	Setting range	Default	Property
P3.21	Triple-speed suppression of action current compensation coefficient	50%~200%	50%	★
P3.22	Action voltage of the over voltage lost speed	650.0V~800.0V	770.0V	★
P3.23	Over voltage lost speed enabled	0: Disabled 1: Enabled	1	★
P3.24	Suppression frequency gain of over voltage lost speed	0~100	30	☆
P3.25	Suppression voltage gain of over voltage lost speed	0~100	30	☆
P3.26	Maximum rising frequency limit of over voltage lost speed	0~50Hz	5Hz	★
Group P4 Input terminal				
P4.00	FWD terminal function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) 3: Three-line control 4: Forward JOG (JOGF) 5: Reverse JOG (JOGR) 6: Terminal UP 7: Terminal DOWN	1	★
P4.01	REV terminal function selection	8: Coast to stop 9: Fault reset (RESET) 10: Run pause 11: Normally open(NO) input of external fault 12: Multi-reference terminal 1 13: Multi-reference terminal 2	2	★

Function code	Parameter Name	Setting range	Default	Property
P4.02	S1 terminal function selection	14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Terminal 1 for acceleration/ deceleration time selection 17: Terminal 2 for acceleration/ deceleration time selection 18: Frequency source switchover 19: UP/DOWN setting clear (terminal, operation panel) 20: Command source switchover terminal 21: Acceleration/ Deceleration prohibited 22: PID pause 23: PLC status reset 24: Swing pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset	0	★
P4.03	S2 terminal function selection		0	★
P4.04	S3 terminal function selection	29: Torque control prohibited 30: PULSE frequency input (Enabled only for S3, above 3.7KW) 31: Reserved 32: Immediate DC braking 33: Normally closed (NC) input of external fault 34: Frequency modification enabled 35: Reverse PID action direction 36: External stop terminal 1	0	★

Function code	Parameter Name	Setting range	Default	Property
P4.05	S4 terminal function selection	37: Command source switchover terminal 2 38: PID integral pause 39: Switchover between main frequency source X and preset frequency	0	★
P4.06	Reserved	40: Switchover between auxiliary frequency source Y and preset frequency 41~42: Reserved 43: PID parameter switchover 44~45: Reserved	0	★
P4.07	Reserved	46: Speed control /Torque control switchover 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: Clear the current running time 51-59:Reserved	0	★
P4.10	X filter time	0.000s~1.000s	0.010s	☆
P4.11	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	★
P4.12	Terminal UP/ DOWN rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	☆
P4.13	FI curve 1 minimum input	0.00V~P4.15	0.00V	☆
P4.14	Corresponding setting of FI curve 1 minimum input	-100.0%~+100.0%	0.0%	☆
P4.15	FI curve 1 maximum input	P4.13~+10.00V	10.00V	☆
P4.16	Corresponding setting of FI curve 1 maximum Input	-100.0%~+100.0%	100.0%	☆
P4.17	FI curve 1 filter time	0.00s~10.00s	0.10s	☆

Function code	Parameter Name	Setting range	Default	Property
P4.18	FI curve 2 minimum input	0.00V~P4.20	0.00V	☆
P4.19	Corresponding setting of FI curve 2 minimum input	-100.0%~+100.0%	0.0%	☆
P4.20	FI curve 2 maximum input	P4.18~+10.00V	10.00V	☆
P4.21	Corresponding setting of FI curve 2 maximum input	-100.0%~+100.0%	100.0%	☆
P4.22	FI curve 2 filter time	0.00s~10.00s	0.10s	☆
P4.23	FI curve 3 minimum input	-10.00V~P4.25	-10.00V	☆
P4.24	Corresponding setting of FI curve 3 minimum input	-100.0%~+100.0%	-100.0%	☆
P4.25	FI curve 3 maximum input	P4.23~+10.00V	10.00V	☆
P4.26	Corresponding setting of FI curve 3 maximum input	-100.0%~+100.0%	100.0%	☆
P4.27	FI curve 3 filter time	0.00s~10.00s	0.10s	☆
P4.28	PULSE minimum input	0.00kHz~P4.30	0.00kHz	☆
P4.29	Corresponding setting of PULSE minimum input	-100.0%~100.0%	0.0%	☆
P4.30	PULSE maximum input	P4.28~100.00kHz	50.00kHz	☆
P4.31	Corresponding setting of PULSE maximum input	-100.0%~100.0%	100.0%	☆
P4.32	PULSE filter time	0.00s~10.00s	0.10s	☆

Function code	Parameter Name	Setting range	Default	Property
P4.33	FI curve selection	Unit's digit: Potentiometer on operation panel /FIV curve selection 1: Curve 1 (2 points, See P4.13~P4.16) 2: Curve 2 (2 points, See P4.18~P4.21) 3: Curve 3 (2 points, See P4.23~P4.26) 4: Curve 4 (4 points, See C6.00~C6.07) 5: Curve 5 (4 points, See C6.08~C6.15) Ten's digit: FIC curve selection, Sam as FIV Hundred's digit: Reserved	321	☆
P4.34	Setting selection for FI less than minimum input	Unit's digit: Potentiometer on operation panel/Setting for FIV less than minimum input 0: Corresponds to the minimum input settings 1:0.0% Ten's digit: Setting selection for FIC less than minimum input (same as FIV)	000	☆
P4.35	FWD delay time	0.0s~3600.0s	0.0s	★
P4.36	REV delay time	0.0s~3600.0s	0.0s	★
P4.37	S1 delay time	0.0s~3600.0s	0.0s	★
P4.38	S terminal valid mode selection 1	0: High level valid 1: Low level valid Unit's digit: FWD Ten's digit: REV Hundred's digit: S1 Thousand's digit: S2 Ten thousand's digit: S3	00000	★

Function code	Parameter Name	Setting range	Default	Property
P4.39	S terminal valid mode selection 2	0: High level valid 1: Low level valid Unit's digit: S4 Ten's digit: Reserved Hundred's digit: Reserved Thousand's digit: Reserved Ten thousand's digit: Reserved	00000	★
Group P5 Output terminals				
P5.00	MO1 terminal output mode selection	0: Pulse output (YOP) 1: Switch signal output (YOR)	0	☆
P5.01	YOR output function selection	0: No output 1: AC drive running 2: Fault output (fault stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running(no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Setting count value Reached 9: Designated count value reached 10: Length reached 11: PLC cycle complete 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: FIV>FIC 17: Frequency upper limit reached 18: Frequency lower limit reached (Relate to running) 19: Under voltage state output	0	☆
P5.02	Relay function selection on control board (RA-RB-RC/RB-RC)		2	☆

<table>
<tr><th>Function code</th><th>Parameter Name</th><th>Setting range</th><th>Default</th><th>Property</th></tr>
<tr><td>P5.03</td><td>Relay function selection (TA-TC)</td><td>20: Communication setting
21: (Reserved)
22: (Reserved)
23: Zero-speed running 2 (having output at stop)
24: Accumulative power-on time reached
25: Frequency level detection FDT2 output
26: Frequency 1 reached output</td><td>0</td><td>☆</td></tr>
<tr><td>P5.04</td><td>Reserved</td><td rowspan="2">27: Frequency 2 reached output
28: Current 1 reached output
29: Current 2 reached output
30: Timing reached output
31: FIV input limit exceeded
32: Load becoming 0
33: Reverse running
34: Zero current state
35: Module temperature reached
36: Output current limit exceeded
37: Frequency lower limit reached (having output at stop)
38: Alarm output(Keep running)
40: Current running time reached
41: Fault</td><td>1</td><td>☆</td></tr>
<tr><td>P5.05</td><td>Reserved</td><td>4</td><td>☆</td></tr>
</table>

Function code	Parameter Name	Setting range	Default	Property
P5.06	YOP output function selection	0: Running frequency 1: Setting frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage	0	☆
P5.07	FOV output function selection (above 3.7KW)	6: PULSE input (100.% corresponding to 100.0kHz) 7: FIV 8: FIC 9: Reserved 10: Length 11: Count value 12: Communication setting 13: Motor rotational speed 14: Output current (100.0% corresponding to 1000.0A) 15: Output voltage (100.0% corresponding to 1000.0V)	0	☆
P5.08	FOC output function selection (above 7.5KW)	16: Motor output torque (Actual value, corresponding to the motor percentage)	1	☆
P5.09	YOP output maximum frequency	0.01kHz~100.00kHz	50.00kHz	☆
P5.10	FOV bias coefficient	-100.0%~+100.0%	0.0%	☆
P5.11	FOV gain	-10.00~+10.00	1.00	☆
P5.12	FOC bias coefficient	-100.0%~+100.0%	0.0%	☆
P5.13	FOC gain	-10.00~+10.00	1.00	☆
P5.17	YOR output delay time	0.0s~3600.0s	0.0s	☆
P5.18	RA-RB-RC/RB-RC output delay time	0.0s~3600.0s	0.0s	☆
P5.19	TA-TC output delay time	0.0s~3600.0s	0.0s	☆
P5.20	Reserved	0.0s~3600.0s	0.0s	☆
P5.21	Reserved	0.0s~3600.0s	0.0s	☆

Function code	Parameter Name	Setting range	Default	Property
P5.22	Output terminal valid mode selection	0: Positive logic 1: Negative logic Unit's digit: YOR Ten's digit: RA-RB-RC/RB-RC Hundred's digit: TA-TC Thousand's digit: FOV (Above 3.7KW) Ten thousand's digit: FOC (above 7.5KW)	00000	☆
Group P6 Start/Stop parameter				
P6.00	Start mode	0: Direct start 1: Rotational speed tracking restart Speed tracking restarts 2: Pre-excited start (AC asynchronous motor) 3: SVC quick start	0	☆
P6.01	Rotational speed tracking mode	0: Start from the stop frequency 1: Start from 0 2: Start from maximum frequency	0	★
P6.02	Rotational speed tracking	1~100	20	☆
P6.03	Startup frequency	0.00Hz~10.00Hz	0.00Hz	☆
P6.04	Startup frequency holding time	0.0s~100.0s	0.0s	★
P6.05	Startup DC braking current/ Pre-excited current	0%~100%	50%	★
P6.06	Startup DC braking time/Pre-excited time	0.0s~100.0s	0.0s	★
P6.07	Acceleration/ Deceleration mode	0: Straight-line acceleration/ deceleration 1: S curve acceleration/ deceleration A 2: Dynamic S curve acceleration/ deceleration	0	★

Function code	Parameter Name	Setting range	Default	Property
P6.08	S curve of beginning segment time proportional	0.0%~(100.0%-P6.09)	30.0%	★
P6.09	S curve of end segment time proportional	0.0%~(100.0%-P6.08)	30.0%	★
P6.10	Stop mode	0: Deceleration to stop 1: Coast to stop	0	☆
P6.11	Initial frequency of stop DC braking	0.00Hz~maximum frequency	0.00Hz	☆
P6.12	Waiting time of stop DC braking	0.0s~100.0s	0.0s	☆
P6.13	Stop DC braking current	0%~100%	0%	☆
P6.14	Stop DC braking time	0.0s~100.0s	0.0s	☆
P6.15	Brake use rate	0%~100%	100%	☆
P6.18	Rotational speed tracking current	30%~200%	Model dependent	★
P6.21	Demagnetization time (Valid for SVC)	0.00~5.00s	Model dependent	☆
P6.23	Over-excitation selection	0: Not effective 1: Effective only when deceleration 2: Effective always	0	☆
P6.24	Over-excitation suppression current value	0~150%	100%	☆
P6.25	Over-excitation gain	1.00~2.50	1.25	☆
Group P7 Operation display and Display				

Function code	Parameter Name	Setting range	Default	Property
P7.01	JOG function parameter	0: No function 1: Switchover between operation panel command and remote operation command. It indicates the switchover between the current command source and operation panel control (local operation). If the current command source is operation panel control, the key is invalid. 2: Switchover between forward and reverse through JOG, it only valid when command source is operation panel channel. 3: Forward Jog (JOG-FWD) 4: Reverse Jog (JOG-REV)	0	★
P7.02	STOP/RESET key function	0: STOP/RESET key enabled only in operation panel control 1: STOP/RESET key enabled in any operation mode	1	☆

Function code	Parameter Name	Setting range	Default	Property
P7.03	LED display running parameter 1	0000~FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: S input status Bit08: MO1 output status Bit09: FIV/Voltage of potentiometer on operation panel (V) Bit10: FIC Voltage (V) Bit11: Reserved Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆

Function code	Parameter Name	Setting range	Default	Property
P7.04	LED display running parameter 2	0000~FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse input frequency(kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: FIV/Voltage of potentiometer on operation panel before correction (V) Bit06: FIC voltage before correction (V) Bit07: Reserved Bit08: Motor rotational speed Bit09: Current power-on time(Hour) Bit10: Current running time (Min) Bit11: Pulse input frequency(Hz) Bit12: Communication setting value Bit13: Speed feedback of Encoder(Hz) Bit14: Main frequency X display(Hz) Bit15:Auxiliary frequency Y display (Hz)	0	☆

Function code	Parameter Name	Setting range	Default	Property
P7.05	LED display stop parameter	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: S input status Bit03: MO1 output status Bit04: FIV/Voltage of potentiometer on operation panel(V) Bit05: FIC voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: Pulse input frequency(kHz)	33	☆
P7.06	Load speed display coeffcient	0.0001~6.5000	1.0000	☆
P7.07	Heatsink temperature of inverter IGBT	0.0°C ~120.0°C	-	●
Group P8 Auxiliary Functions				
P8.00	JOG running frequency	0.00Hz~maximum frequency	2.00Hz	☆
P8.01	JOG running frequency	0.0s~6500.0s	20.0s	☆
P8.02	JOG running frequency	0.0s~6500.0s	20.0s	☆
P8.03	JOG running frequency	0.00s~65000s	Model dependent	☆
P8.04	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.05	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.06	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.07	JOG running frequency	0.0s~65000s	Model dependent	☆
P8.08	deceleration time 4	0.0s~65000s	Model dependent	☆
P8.09	Jump frequency 1	0.00Hz~maximum frequency	0.00Hz	☆
P8.10	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆

Function code	Parameter Name	Setting range	Default	Property
P8.11	Frequency jump amplitude	0.00Hz~maximum frequency	0.00Hz	☆
P8.12	Forward/Reverse rotation dead-zone time	0.0s~3000.0s	0.0s	☆
P8.13	Reverse control	0: Enabled 1: Disabled	0	☆
P8.14	Running mode when set frequency lower than frequency lower limit	0: Run at frequency lower limit 1: Stop 2: Run at zero speed	0	☆
P8.15	Droop control	0.00Hz~10.00Hz	0.00Hz	☆
P8.16	Accumulative power-on time threshold setting	0h~65000h	0h	☆
P8.17	Accumulative running time threshold setting	0h~65000h	0h	☆
P8.18	Startup protection	0: No protect 1: Protect	0	☆
P8.19	Frequency detection value (FDT1)	0.00Hz~maximum frequency	50.00Hz	☆
P8.20	Frequency detection hysteresis (FDT1)	0.0%~100.0% (FDT1 level)	5.0%	☆
P8.21	Detection range of frequency reached	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.22	Jump frequency during the process of acceleration/ deceleration	0: Disabled 1: Enabled	0	☆
P8.25	Frequency switchover point between acceleration time 1 and acceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆

Function code	Parameter Name	Setting range	Default	Property
P8.26	Frequency switchover point between deceleration time 1 and deceleration time 2	0.00Hz~maximum frequency	0.00Hz	☆
P8.27	Terminal JOG preferred	0: Disabled 1: Enabled	0	☆
P8.28	Frequency detection value (FDT2)	0.00Hz~maximum frequency	50.00Hz	☆
P8.29	Frequency detection hysteresis (FDT2)	0.0%~100.0% (FDT2 level)	5.0%	☆
P8.30	Any frequency reaching detection value 1	0.00Hz~maximum frequency	50.00Hz	☆
P8.31	Any frequency reaching detection amplitude 1	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.32	Any frequency reaching detection value 2	0.00Hz~maximum frequency	50.00Hz	☆
P8.33	Any frequency reaching detection amplitude 2	0.0%~100.0% (maximum frequency)	0.0%	☆
P8.34	Zero current detection level	0.0%~300.0% 100.0% corresponding to rated motor current	5.0%	☆
P8.35	Zero current detection delay time	0.01s~600.00s	0.10s	☆
P8.36	Output over-current threshold	0.0% (no detection) 0.1%~300.0% (rated motor current)	200.0%	☆
P8.37	Output over-current detection delay time	0.00s~600.00s	0.00s	☆
P8.38	Any current reaching 1	0.0%~300.0% (rated motor current)	100.0%	☆

Function code	Parameter Name	Setting range	Default	Property
P8.39	Any current reaching 1 amplitude	0.0%~300.0% (rated motor current)	0.0%	☆
P8.40	Any current reaching 2	0.0%~300.0% (rated motor current)	100.0%	☆
P8.41	Any current reaching 2 amplitude	0.0%~300.0% (rated motor current)	0.0%	☆
P8.42	Timing function selection	0:Disabled 1:Enabled	0	☆
P8.43	Timing duration source	0: P8.44 1: FIV/potentiometer on operation panel 2: FIC 3: Reserved 100% of analog input corresponds to the value of P8.44	0	☆
P8.44	Timing duration	0.0Min~6500.0Min	0.0Min	☆
P8.45	FIV input voltage lower limit protection value	0.00V~P8.46	3.10V	☆
P8.46	FIV input voltage upper limit protection value	P8.45~10.00V	6.80V	☆
P8.47	Module temperature threshold	0°C ~100°C	75°C	☆
P8.48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	☆
P8.49	Wakeup frequency	Dormant frequency (P8.51)~maximum frequency (P0.10)	0.00Hz	☆
P8.50	Wakeup delay time	0.0s~6500.0s	0.0s	☆
P8.51	Dormant frequency	0.00Hz~wakeup frequency (P8.49)	0.00Hz	☆
P8.52	Dormant delay time	0.0s~6500.0s	0.0s	☆
P8.53	Current running time reached	0.0Min~6500.0Min	0.0Min	☆

Function code	Parameter Name	Setting range	Default	Property
P8.54	Output power correction coefficient	0~200%	100%	☆
P8.55	Emergency deceleration time	0~6553.5s	Model dependent	☆
Group P9: Fault and Protection				
P9.00	Motor overload protection selection	0: Disabled 1: Enabled	1	☆
P9.01	Motor overload protection gain	0.20~10.00	1.00	☆
P9.02	Motor overload warning coefficient	50%~100%	80%	☆
P9.03	Over voltage stall gain	0~100	30	☆
P9.04	Protection voltage of over voltage stall	120%~150%	130%	☆
P9.07	Short-circuit to ground upon power on	0: Disabled 1: Enabled	1	☆
P9.09	Fault auto reset times	0~20	0	☆
P9.10	YO action selection during fault auto reset	0: No act 1: Act	0	☆
P9.11	Time interval of fault auto reset	0.1s~100.0s	1.0s	☆
P9.12	Input phase lost/ contactor suction protection selection	Unit's digit: Input phase lost protection Ten's digit: contactor suction protection 0: disabled 1: enabled	00	☆
P9.13	Output phase loss protection selection	0: Disabled 1: Enabled Unit's digit: output phase loss protection Ten's digit: output phase loss protection before running	1	☆

Function code	Parameter Name	Setting range	Default	Property
P9.14	1st fault type	0: No fault 1: Reserved 2: Over-current during acceleration 3: Over-current during deceleration 4: Over-current at constant speed 5: Over-voltage during acceleration 6: Over-voltage during deceleration 7: Over-voltage at constant speed 8: Over-load of butter resistance 9: Under voltage 10:AC drive overload 11: Motor overload 12: Input Phase lost		●
P9.15	2nd fault type	13: Power output phase loss 14: Module overheat 15: External equipment fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder/PG card fault 21: Parameters read-write fault 22: AC drive hardware fault 23: Short circuit to ground 24: Reserved 25: Reserved 26:Running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Power-on time reached 30: Load becoming 0 31: PID feedback lost during running 40: Fast limit overtime	-	●

Function code	Parameter Name	Setting range	Default	Property
P9.16	3rd (latest) fault type	41: Switchover motor when running 42: Speed deviation too large 43: Motor over speed 45: Motor over temperature 51: Initial position fault	-	●
Group PA PID function				
PA.00	PID setting source	0: PA.01 1: FIV/potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: Multi-reference	0	☆
PA.01	PID digit setting	0.0%~100.0%	50.0%	☆
PA.02	PID feedback source	0: FIV/potentiometer on operation panel 1: FIC 2: Reserved 3: FIV-FIC/ potentiometer on operation panel-FIC 4: PULSE (S3, above 3.7KW) 5: Communication setting 6: FIV+FIC/ potentiometer on operation panel +FIC 7: MAX (|FIV|, |FIC|)/ MAX (| potentiometer on operation panel |, |FIC|) 8: MIN (|FIV|, |FIC|)/ MIN (| potentiometer on operation panel |, |FIC|)	0	☆
PA.03	PID action direction	0: Forward action 1: Reverse action	0	☆
PA.04	PID setting feedback range	0~65535	1000	☆
PA.05	Proportional gain Kp1	0.0~100.0	20.0	☆
PA.06	Integral time Ti1	0.01s~10.00s	2.00s	☆

Function code	Parameter Name	Setting range	Default	Property
PA.07	Differential time Td1	0.000s~10.000s	0.000s	☆
PA.08	Cut-off frequency of PID reverse rotation	0.00~maximum frequency	2.00Hz	☆
PA.09	PID deviation limit	0.0%~100.0%	0.0%	☆
PA.10	PID differential limit	0.00%~100.00%	0.10%	☆
PA.11	PID setting change time	0.00~650.00s	0.00s	☆
PA.12	PID feedback filter time	0.00~60.00s	0.00s	☆
PA.13	PID output filter time	0.00~60.00s	0.00s	☆
PA.14	Reserved	-	-	☆
PA.15	Proportional gain KP1	0.0~100.0	20.0	☆
PA.16	Integral time Ti2	0.01s~10.00s	2.00s	☆
PA.17	Differential time Td2	0.000s~10.000s	0.000s	☆
PA.18	PID parameter switchover condition	0: No switchover 1: Switchover via S terminal 2: Automatic switchover based on deviation 3: Automatic switchover based on running frequency	0	☆
PA.19	PID parameter switchover deviation 1	0.0%~PA.20	20.0%	☆
PA.20	PID parameter switchover deviation 2	PA.19~100.0%	80.0%	☆
PA.21	PID initial value	0.0%~100.0%	0.0%	☆
PA.22	PID initial value holding time	0.00~650.00s	0.00s	☆

Function code	Parameter Name	Setting range	Default	Property
PA.25	PID integral property	Unit's digit: Integral separated 0: Invalid 1: Valid Ten's digit: Whether to stop integral operation when the output reaches 0: Continue integral operation 1: Stop integral operation	00	☆
PA.26	Detection value of PID feedback loss	0.0%: Not judging feedback loss 0.1%~100.0%	0.0%	☆
PA.27	Detection time of PID feedback loss	0.0s~20.0s	0.0s	☆
PA.28	PID operation at stop	0: No PID operation at stop 1: PID operation at stop	0	☆
Group Pb: Swing Frequency, Fixed Length and Count				
Pb.00	Swing frequency setting mode	0: Relative to the central frequency 1: Relative to the maximum frequency	0	☆
Pb.01	Swing frequency amplitude	0.0%~100.0%	0.0%	☆
Pb.02	Jump frequency amplitude	0.0%~50.0%	0.0%	☆
Pb.03	Swing frequency cycle	0.1s~3000.0s	10.0s	☆
Pb.04	Triangular wave rising time coefficient	0.1%~100.0%	50.0%	☆
Pb.05	Set length	0m~65535m	1000m	☆
Pb.06	Actual length	0m~65535m	0m	☆
Pb.07	Number of pulses per meter	0.1~6553.5	100.0	☆
Pb.08	Set count value	1~65535	1000	☆
Pb.09	Designated count value	1~65535	1000	☆
Group PC Multi-Reference and Simple PLC Function				
PC.00	Multi-Reference 0	-100.0%~100.0%	0.0%	☆

Function code	Parameter Name	Setting range	Default	Property
PC.01	Multi-Reference 1	-100.0%~100.0%	0.0%	☆
PC.02	Multi-Reference 2	-100.0%~100.0%	0.0%	☆
PC.03	Multi-Reference 3	-100.0%~100.0%	0.0%	☆
PC.04	Multi-Reference 4	-100.0%~100.0%	0.0%	☆
PC.05	Multi-Reference 5	-100.0%~100.0%	0.0%	☆
PC.06	Multi-Reference 6	-100.0%~100.0%	0.0%	☆
PC.07	Multi-Reference 7	-100.0%~100.0%	0.0%	☆
PC.08	Multi-Reference 8	-100.0%~100.0%	0.0%	☆
PC.09	Multi-Reference 9	-100.0%~100.0%	0.0%	☆
PC.10	Multi-Reference 10	-100.0%~100.0%	0.0%	☆
PC.11	Multi-Reference 11	-100.0%~100.0%	0.0%	☆
PC.12	Multi-Reference 12	-100.0%~100.0%	0.0%	☆
PC.13	Multi-Reference 13	-100.0%~100.0%	0.0%	☆
PC.14	Multi-Reference 14	-100.0%~100.0%	0.0%	☆
PC.15	Multi-Reference 15	-100.0%~100.0%	0.0%	☆
PC.16	Simple PLC running mode	0: Stop after the AC drive runs one cycle 1: Keep final values after the AC drive runs one cycle 2: Repeat after the AC drive runs one cycle	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.17	Simple PLC retentive selection	Unit's digit: Retentive upon power failure 0: No 1: Yes Ten's digit: Retentive upon stop 0: No 1: Yes	00	☆
PC.18	Running time of simple PLC reference 0	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.19	Acceleration/ deceleration time of simple PLC reference 0	0~3	0	☆
PC.20	Running time of simple PLC reference 1	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.21	Acceleration/ deceleration time of simple PLC reference 1	0~3	0	☆
PC.22	Running time of simple PLC reference 2	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.23	Acceleration/ deceleration time of simple PLC reference 2	0~3	0	☆
PC.24	Running time of simple PLC reference 3	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.25	Acceleration/ deceleration time of simple PLC reference 3	0~3	0	☆
PC.26	Running time of simple PLC reference 4	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.27	Acceleration/ deceleration time of simple PLC reference 4	0~3	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.28	Running time of simple PLC reference 5	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.29	Acceleration/ deceleration time of simple PLC reference 5	0~3	0	☆
PC.30	Running time of simple PLC reference 6	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.31	Acceleration/ deceleration time of simple PLC reference 6	0~3	0	☆
PC.32	Running time of simple PLC reference 7	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.33	Acceleration/ deceleration time of simple PLC reference 7	0~3	0	☆
PC.34	Running time of simple PLC reference 8	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.35	Acceleration/ deceleration time of simple PLC reference 8	0~3	0	☆
PC.36	Running time of simple PLC reference 9	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.37	Acceleration/ deceleration time of simple PLC reference 9	0~3	0	☆
PC.38	Running time of simple PLC reference 10	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.39	Acceleration/ deceleration time of simple PLC reference 10	0~3	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.40	Running time of simple PLC reference 11	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.41	Acceleration/ deceleration time of simple PLC reference 11	0~3	0	☆
PC.42	Running time of simple PLC reference 12	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.43	Acceleration/ deceleration time of simple PLC reference 12	0~3	0	☆
PC.44	Running time of simple PLC reference 13	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.45	Acceleration/ deceleration time of simple PLC reference 13	0~3	0	☆
PC.46	Running time of simple PLC reference 14	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.47	Acceleration/ deceleration time of simple PLC reference 14	0~3	0	☆
PC.48	Running time of simple PLC reference 15	0.0s(h)~6500.0s(h)	0.0s(h)	☆
PC.49	Acceleration/ deceleration time of simple PLC reference 15	0~3	0	☆
PC.50	Time unit of simple PLC running	0: s (second) 1: h (hour)	0	☆

Function code	Parameter Name	Setting range	Default	Property
PC.51	Reference 0 source	0: Set by PC.00 1: FIV/Potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE 5: PID 6: Set by preset frequency (P0.08), UP/DOWN can be modified	0	☆
Group PD: Communication Parameters				
PD.00	Baud rate	Unit's digit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Ten's digit: Reserved Hundred's digit: Reserved Thousand's digit: Reserved	0005	☆
PD.01	Data format	0: No check, <8-N-2> 1: Even parity check, <8-E-1> 2: Odd Parity check, <8-O-1> 3: 8-N-1	3	☆
PD.02	Local address	1~247	1	☆
PD.03	Response delay	0ms~20ms	2	☆
PD.04	Communication timeout	0.0 (Invalid), 0.1s~60.0s	0.0	☆
PD.05	Data transfer format selection	Unit's digit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Ten's digit: Reserved	1	☆
PD.06	Communication reading current resolution	0: 0.01A 1: 0.1A	0	☆

Function code	Parameter Name	Setting range	Default	Property
Group PP: User-Defined Function Codes				
PP.00	User password	0~65535	0	☆
PP.01	Parameter Initialization	0: No operation 01: Restore factory settings except motor parameters	0	★
Group C0 Torque control parameter				
C0.00	Speed/Torque control mode selection	0: Speed control 1: Torque control	0	★
C0.01	Torque setting source selection in torque control mode	0: Digital setting 1 (C0.03) 1: FIV/ Potentiometer on operation panel 2: FIC 3: Reserved 4: PULSE 5: Communication setting 6: MIN (FIV,FIC)/ MIN (Potentiometer on operation panel,FIC) 7: MAX (FIV,FIC)/ MAX (Potentiometer on operation panel,FIC) (The full range of 1-7 corresponding to the digit setting of C0.03)	0	★
C0.03	Torque digit setting in torque control	-200.0%~200.0%	150.0%	☆
C0.05	Forward maximum frequency in torque control	0.00Hz~maximum frequency	50.00Hz	☆
C0.06	Reverse maximum frequency in torque control	0.00Hz~maximum frequency	50.00Hz	☆
C0.07	Acceleration time in torque control	0.00s~65000s	0.00s	☆
C0.08	Deceleration time in torque control	0.00s~65000s	0.00s	☆
Group C5 Control optimization parameters				

Function code	Parameter Name	Setting range	Default	Property
C5.00	DPWM switchover frequency upper limit	5.00Hz~maximum frequency	8.00Hz	☆
C5.01	PWM modulation mode	0: Asynchronous modulation 1: Synchronous modulation	0	☆
C5.02	Dead zone compensation mode selection	0: No compensation 1: Compensation mode 1	1	☆
C5.03	Random PWM depth	0: Random PWM invalid 1~10: PWM carrier frequency random depth	0	☆
C5.04	Rapid current limit	0: Disabled 1: Enabled	1	☆
C5.05	Voltage over modulation coefficient	100~110	105	☆
C5.06	Under voltage threshold setting	210~420	350	☆
C5.08	Dead zone time adjustment	100%~200%	150%	☆
C5.09	Over voltage threshold setting	200.0V~2500.0V	Model dependent	
Group C6: FI Curve Setting(FI is FIV or FIC)				
C6.00	FI curve 4 minimum input	0.00V~C6.02	0.00V	☆
C6.01	Corresponding setting of FI curve 4 minimum input	-100.0%~+100.0%	0.0%	☆
C6.02	FI curve 4 inflexion 1 input	C6.00~C6.04	3.00V	☆
C6.03	Corresponding setting of FI curve 4 inflexion 1 input	-100.0%~+100.0%	30.0%	☆
C6.04	FI curve 4 inflexion 2 input	C6.02~C6.06	6.00V	☆
C6.05	Corresponding setting of FI curve 4 inflexion 2 input	-100.0%~+100.0%	60.0%	☆

Function code	Parameter Name	Setting range	Default	Property
C6.06	FI curve 4 maximum input	C6.06~+10.00V	10.00V	☆
C6.07	Corresponding setting of FI curve 4 maximum input	-100.0%~+100.0%	100.0%	☆
C6.08	FI curve 5 minimum input	0.00V~C6.10	0.00V	☆
C6.09	Corresponding setting of FI curve 5 minimum input	-100.0%~+100.0%	0.0%	☆
C6.10	FI curve 5 inflexion 1 input	C6.08~C6.12	3.00V	☆
C6.11	Corresponding setting of FI curve 5 inflexion 1 input	-100.0%~+100.0%	30.0%	☆
C6.12	FI curve 5 inflexion 2 input	C6.10~C6.14	6.00V	☆
C6.13	Corresponding setting of FI curve 5 inflexion 2 input	-100.0%~+100.0%	60.0%	☆
C6.14	FI curve 5 maximum input	C6.12~+10.00V	10.00V	☆
C6.15	Corresponding setting of FI curve	-100.0%~+100.0%	100.0%	☆
C6.16	Jump point of FIV	-100.0%~100.0%	0.0%	☆
C6.17	Jump amplitude of FIV input	0.0%~100.0%	0.5%	☆
C6.18	Jump point of FIC input	-100.0%~100.0%	0.0%	☆
C6.19	Jump amplitude of FIC input	0.0%~100.0%	0.5%	☆

Monitoring parameters:

Function Code	Parameter Name	Unit
Group D0 Basic monitoring parameters		
D0.00	Running frequency (Hz)	0.01Hz

Function Code	Parameter Name	Unit
D0.01	Set frequency (Hz)	0.01Hz
D0.02	Bus voltage (V)	0.1V
D0.03	Output voltage (V)	1V
D0.04	Output current (A)	0.01A
D0.05	Output power (kW)	0.1kW
D0.06	Output torque (%)	0.1%
D0.07	S input status	1
D0.08	MO1 output status	1
D0.09	Potentiometer on operation panel/FIV Voltage (V)	0.01V
D0.10	FIC Voltage (V)	0.01V
D0.11	Reserved	
D0.12	Count value	1
D0.13	Length value	1
D0.14	Load speed display	1
D0.15	PID setting	1
D0.16	PID feedback	1
D0.17	PLC stage	1
D0.18	PULSE input pulse frequency (kHz)	0.01kHz
D0.19	Reserved	
D0.20	Remaining running time	0.1Min
D0.21	Potentiometer on operation panel /FIV voltage before correction	0.001V
D0.22	FIC voltage before correction	0.001V
D0.23	Reserved	
D0.24	Linear speed	1m/Min
D0.25	On the current power-on time	1Min
D0.26	The current running time	0.1Min
D0.27	Input pulse frequency	1Hz
D0.28	Communication setting value	0.01%
D0.29	Reserved	
D0.30	Reserved	

Function Code	Parameter Name	Unit
D0.31	Auxiliary frequency Y display	0.01Hz
D0.32	View any memory address values	1
D0.33	Reserved	
D0.34	Motor temperature value	1°C
D0.35	Target torque (%)	0.1%
D0.36	Reserved	1
D0.37	Power factor angle	0.1°
D0.38	Reserved	1
D0.39	Target voltage upon V/F separation	1V
D0.40	Output voltage upon V/F separation	1V
D0.41	Reserved	
D0.42	Reserved	
D0.43	Reserved	
D0.44	Reserved	
D0.45	Fault info	0
D0.58	Z signal counter	1
D0.59	Set frequency (%)	0.01%
D0.60	Running frequency (%)	0.01%
D0.61	AC drive status	1
D0.74	AC drive output torque	0.1
D0.76	Accumulative power consumption low level	0.1°C
D0.77	Accumulative power consumption high level	1°C
D0.78	Linear speed	1m/min

Fault code list:

Fault code	Name	Fault code	Name
OC1	Over current during acceleration		
OC2	Over current during deceleration	IE	Current detection fault

Fault code	Name	Fault code	Name
OC3	Over current during constant speed	TE	Motor auto-tuning fault
OU1	Over voltage during acceleration		
OU2	Over voltage during deceleration	EEP	EEPROM read-write fault
OU3	Over voltage during constant speed	GND	Short circuit to ground fault
POF	Control power fault	END1	Accumulative running time reached fault
LU	Under voltage fault	END2	Accumulative power on time reached fault
OL2	AC drive over load	LOAD	Load becoming 0 fault
OL1	Motor over load	PIOE	PID feedback lost during running fault
LI	Input phase loss	CBC	Rapid current limit fault
LO	Output phase loss	ESP	Speed deviation too large fault
OH	Module over heat	OSP	Motor over speed fault
EF	External equipment fault		
CE	Communication fault		

Appdennix 2 Troubleshooting

1 Fault alarm and countermeasures

The drive has a number of warning messages and protection functions. Once the fault occurs, the protection function operates, the drive stops outputting, the drive fault relay contacts act, and the fault code is displayed on the drive display panel. Before seeking service, users can perform self-checking according to the tips in this section, analyze the cause of the fault, and find a solution. If it is the reason listed in the dotted box, please seek service, contact the agent of the drive you purchased or contact us directly.
The OUOC in the warning message is a hardware overcurrent or overvoltage signal. In most cases, the hardware overvoltage fault causes the OUOC alarm.

Fault Name	Display	Possible Causes	Solutions
servo drive unit protection	OC	1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The module overheats. 4: The internal connections become loose. 5:The main control board is faulty. 6: The drive board is faulty. 7: The servo drive module is faulty	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables Properly. 5, 6, 7: Looking for technical support

Fault Name	Display	Possible Causes	Solutions
Overcurrent during acceleration	OC1	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not Performed. 3: The acceleration time Is too Short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during Acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto-tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
Overcurrent during acceleration	OC2	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The deceleration time is too Short. 4: The voltage is too low. 5: A sudden load is added during Deceleration. 6: The braking unit and braking resistor are not installed.	1: Eliminate external faults. 2: Perform the motor auto- tuning. 3: Increase the deceleration time. 4: Adjust the voltage to normal range. 5: Remove the added load. 6: Install the braking unit and braking resistor.
Overcurrent at constant speed	OC3	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The voltage is too low. 4: A sudden load Is added during operation. 5: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto- tuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select an AC drive of higher power class.

Fault Name	Display	Possible Causes	Solutions
Overvoltage during acceleration	OU1	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too Short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.
Overvoltage during deceleration	OU2	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too Short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor. 4: Install the braking unit and braking resistor.
Overvoltage at constant speed	OU3	1: The input voltage is too high. 2: An external force drives the motor during deceleration.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
Control power supply fault	POF	1: The input voltage is too high. 2: An external force drives the motor during deceleration.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
Undervoltage	LU	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal. 4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to normal range. 3, 4, 5, 6: Looking for technical support

Fault Name	Display	Possible Causes	Solutions
AC drive overload	OL2	1: The load is too heavy or locked-rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class
Motor overload	OL1	1: P9.01 is set improperly. 2: The load is too heavy or locked- rotor occurs on the motor. 3: The AC drive model is of too small power class.	1: Set P9.01 correctly. 2: Reduce the load and check the motor and the mechanical condition. 3: Select an AC drive of higher power class.
Power input phase loss	LI	1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightening board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2, 3, 4: Looking for technical support
Power output phase loss	Lo	1: The cable connecting the AC drive and the motor Is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3:Looking for technical support .
Module overheat	OH	1: The ambient temperature is too temperature. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The servo drive module is damaged.	1: Lower the ambient High. 2: Clean the air filter. 3: Replace the damaged fan 4: Replace the damaged thermally sensitive resistor. 5: Replace the servo drive module.
External equipment fault	EF	1: External fault signal is input via X. 2: External fault signal is input via virtual I/O.	Reset the operation.

Fault Name	Display	Possible Causes	Solutions
Communication fault	CE	1: The host computer is in abnormal state. 2: The communication cable is faulty. 3: P028 is set improperly. 4: The communication parameters in group PD are set improperly.	1: Check the cabling of host computer. 2: Check the communication cabling. 3: Set P028 correctly. 4:Set the communication parameters properly.
Contactor fault	rAy	1: The drive board and power supply are faulty. 2: The contactor is faulty.	1: Replace the faulty drive board or power supply board. 2: Replace the faulty Contactor.
Current detection fault	IE	1: The HALL device is faulty. 2: The drive board is faulty.	1: Replace the faulty HALL device. 2: Replace the faulty drive board.
Motor auto-tuning fault	TE	1: The motor parameters are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the AC drive and the motor.
Encoder fault	PG	1: The encoder type is incorrect. 2: The cable connection of the encoder is incorrect. 3: The encoder is damaged. 4: The PG card is faulty.	1: Set the encoder type correctly based on the actual situation. 2:Eliminate external faults. 3: Replace the damaged Encoder. 4: Replace the faulty PG card.
EEPROM read-write fault	EEP	The EEPROM chip is damaged.	Replace the main control board.
AC drive hardware fault	OUOC	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on Overvoltage. 2: Handle based on overcurrent.
Short circuit to ground	GND	The motor is short circuited to the ground.	Replace the cable or motor.
Accumulative running time reached	END1	The accumulative running time reaches the setting value.	Clear the record through The parameter initialization function.

Fault Name	Display	Possible Causes	Solutions
Accumulative power-on time reached	END2	The accumulative power-on timereaches the setting value.	Clear the record through The parameter initialization function.
Load becoming 0	LOAD	The AC drive running current is lower than P9.64.	Check that the load is disconnected or the setting of P9.64 and P9.65 is correct.
PID feedback lost during running	PIDE	The PID feedback is lower than the setting of PA.26.	Check the PID feedback signal or set PA.26 to a proper value.
Pulse-by-pulse current limit fault	CBC	1: The load is too heavy or locked-rotor occurs on the motor. 2: The AC drive model is of toosmall power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Too large speed deviation	ESP	1: The encoder parameters are set Incorrectly. 2: The motor auto-tuning is not Performed. 3: P9.69 and P9.70 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor auto- tuning. 3: Set P9.69 and P9.70 correctly based on the actual situation.
Motor over-speed	oSP	1: The encoder parameters are set Incorrectly. 2: The motor auto-tuning is not Performed. 3: P9.69 and P9.70 are set incorrectly.	1: Set the encoder parameters properly. 2: Perform the motor auto- tuning. 3: Set P9.69 and P9.70 correctly based on the actual situation.
Initial position fault	ini	The motor parameters are not set based on the actual situation.	Check that the motor parameters are set correctly and whether the setting of rated current is too small.

2 Common Faults and Solutions

You may come across the following faults during the use of the AC drive. Refer to the following table for simple fault analysis.

Table 6-1 Troubleshooting to common faults of the AC drive

SN	Fault	Possible Causes	Solutions
1	There is no display at power-on.	1: There is no power supply to the AC drive or the power input to the AC drive is too low. 2: The power supply of the switch on the drive board of the AC drive is Faulty. 3: The rectifier bridge is damaged. 4: The control board or the operation panel is faulty. 5: The cable connecting the control board and the drive board and the operation panel breaks.	1: Check the power supply. 2: Check the bus voltage. 3:Looking for technical support
2	"9000" is displayed at power-on.	1: The cable between the drive board and the control board is in poor contact. 2: Related components on the control board are damaged. 3: The motor or the motor cable is short circuited to the ground. 4: The HALL device Is faulty. 5: The power input to the AC drive is too low.	Looking for technical support
3	"GND" is displayed at power-on.	1: The motor or the motor output cable is short-circuited to the ground. 2: The AC drive is damaged.	1: Measure the insulation of the motor and the output cable with a megger. 2: Looking for technical support

SN	Fault	Possible Causes	Solutions
4	The AC drive display is normal upon power-on. But "9000" is displayed after running and stops immediately.	1:The cooling fan is damaged or locked-rotor occurs. 2: The external control terminal cable is short circuited.	1: Replace the damaged fan. 2: Eliminate external fault.
5	OH (module overheat) fault is reported frequently.	1: The setting of carrier frequency is too high. 2: The cooling fan is damaged, or the air filter is blocked. 3: Components inside the AC drive are damaged (thermal coupler or others).	1: Reduce the carrier frequency (P017). 2: Replace the fan and clean the air filter. 3: Looking for technical support
6	The motor does not rotate after the AC drive runs.	1: Check the motor and the motor Cables. 2: The AC drive parameters are set improperly (motor parameters). 3: The cable between the drive board and the control board is in poor contact. 4: The drive board is faulty.	1: Ensure the cable between the AC drive and the motor is normal. 2: Replace the motor or clear mechanical faults. 3: Check and re-set motor parameters.
7	The S terminals are disabled.	1: The parameters are set Incorrectly. 2: The external signal is incorrect 3: The jumper bar across OP and +24 V becomes loose. 4: The control board is faulty.	1: Check and reset the parameters in group P5. 2: Re-connect the external signal cables. 3: Re-confirm the jumper bar across OP and +24 V. 4:Looking for technical support
8	The motor speed is always low in CLVC mode.	1: The encoder is faulty. 2: The encoder cable is connected incorrectly or in poor contact. 3: The PG card is faulty. 4: The drive board is faulty.	1: Replace the encoder and ensure the cabling is proper. 2: Replace the PG card. 3: Looking for technical support

SN	Fault	Possible Causes	Solutions
9	The AC drive reports overcurrent and overvoltage frequently.	1: The motor parameters are set improperly. 2: The acceleration/ deceleration time is improper. 3: The load fluctuates.	1:Re-set motor parameters or re-perform the motor auto-tuning. 2: Set proper acceleration/ deceleration time. 3: Looking for technical support
10	rAy is reported upon power-on or running.	The soft startup contactor is not picked up.	1: Check whether the contactor cable is loose. 2: Check whether the contactor is faulty. 3: Check whether 24 V power supply of the contactor is faulty. 4: Looking for technical support

Appendix 3

Communication Protocol

T9000 series inverter provides RS232 / RS485 communication interface, and support the Modbus communication protocol. Users can be achieved by computing machine or PLC central control, through the communication protocol set inverter running commands, modify or read function code parameters, read the inverter working condition and fault information, etc.

1, The agreement content

The serial communication protocol defines the serial communication transmission of information content and format.Including: host polling or wide planting format;Host encoding method, the content includes: the function of the required action code, data transmission and error checking, etc.From the ring of machine should be used is the same structure, content including: action confirmation, return the data and error checking, etc.If there was an error in receiving information from a machine, or cannot achieve the requirements of the host, it will organize a fault feedback information in response to the host.

2, Application methods

Application mode inverter with RS232 / RS485 bus access to the "from" single main PC/PLC control network.

3, Bus structure

(1) The interface way RS232 / RS485 interface hardware

(2) Asynchronous serial transmission mode, half-duplex transmission mode.At the same time the host and the only one to send data from the machine and the other can only receive data. Data in the process of serial asynchronous communication, the form of a message, a frame of a frame to send

(3)Topological structure from single host machine system.From the machine address set in the range of 1 ~ 247, 0 for broadcast communication address.In the network from the machine address must be unique.

4, Protocol Description

T9000 series inverter is a kind of asynchronous serial port communication protocol of master-slave Modbus communication protocol, the network has only one equipment (host) to establish agreement (called "query/command").Other equipment (machine) can only by providing data response of the main machine "query/ command", or "query/command" according to the host to make the corresponding action.Host in this refers to the personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc., from machine refers to T9000 inverter.The host can communicate to a separate from the machine, also can to all under a broadcast information from machine release.For access to the host alone "query/command", from the machine to return to a information (called response), for radio host information, from the machine without feedback response to the host.

5, Communications data structure

Communication data structure T9000 series inverter of the Modbus protocol communication data format is as follows: using the RTU mode, messages are sent at least begin with 3.5 characters pause time interval.

In network wave rate under varied characters of the time, this is the most easy to implement (below T1, T2, T3, T4).Transmission equipment is the first domain address.

The transmission character of you can use is the hex 0...9, A...F.Continuously detect network bus network facilities, including pause interval of time.When the first domain (domain) to receive, every equipment decoding to determine whether to own.After the last transmission character, a pause at least 3.5 characters time calibration for the end of the message.A new message can be started after the pause.

The entire message frame must be as a continuous flow of transmission.If the time frame to complete more than 1.5 characters before pause time, receiving equipment will refresh incomplete message and assume that the next byte is a new message the address of the domain.Likewise, if a new message in less than 3.5 characters of time and then a message before, receiving equipment will think it is a continuation of the previous message.This will result in an error, because in the final CRC field value can't be right.

RTU frame format:

The frame header START	3.5 characters
Slave address ADR	Communication address: 1~247
command code CMD	03: Read the machine parameters; 06: write the machine parameters
Date content DATA (N-1)	Information content: Function code parameter address, function code number of parameters, function code parameter values, etc
Data content DATA (N-2)	
……	
Data contentDATA0	
high-order position of CRC CHK	estimated value: CRC value
low-order position of CRC CHK	
END	3.5 characters'time

CMD(Command instruction)and DATA(the description of data word) command code:03H,read N word(Word)(Can read the most words of 12)For example,From the machine address of 01 inverter startup F105 continuous read for two consecutive values

The host command information

ADR	01H
CMD	03H
high-order position of the starting address	F1H
low-order position of the starting address	05H
high-order position of register	00H
low-order position of register	02H
low-order position of CRC CHK	Wait to calculate the CRC CHK values
high-order position of CRC CHK	

In response to information from the slave machine

Set PD.05 to 0:

ADR	01H
CMD	03H
high-order position of bytes	00H
low-order position of bytes	04H
Data high-order position of F002H	00H
Data low-order position of F002H	00H
Data high-order position of F003H	00H
Data low-order position of F003H	01H
low-order position of CRC CHK	Wait to calculate the CRC CHK values
high-order position of CRC CHK	

Set PD.05 to 1:

ADR	01H
CMD	03H
The number of bytes	04H
Data high-order position of F002H	00H
Data low-order position of F002H	00H
Data high-order position of F003H	00H
Data low-order position of F003H	01H
low-order position of CRC CHK	Wait to calculate the CRC CHK values
high-order position of CRC CHK	

The command code:06H write a word(Word)For example,write 000(BB8H)to slave machine.
Address 05H inverter's F00AH address.
The host command information

ADR	05H
CMD	06H
high-order position of data address	F0H
low-order position of data address	0AH
high-order position of information content	0BH
low-order position of information content	B8H
low-order position of CRC CHK	Wait to calculate the CRC CHK values
high-order position of CRC CHK	

In response to information from the slave machine

ADR	02H
CMD	06H
high-order position of data address	F0H
low-order position of data address	0AH
high-order position of information content	13H
low-order position of information content	88H
low-order position of CRC CHK	Wait to calculate the CRC CHK values
high-order position of CRC CHK	

Check way——CRC Check way:CRC(Cyclical Redundancy Check) use RTU frame format,The message includes error detection field based on the method of CRC .CRC domain test the whole content of a message. CRC domain is two bytes,contains a 16-bit binary values.it is calculated by the transmission equipment, added to the message.receive messages the device recalculate.And compared with receives the CRC in the domain of value, if the two CRC value is not equal, then there is an error in transmission.

CRC is saved in 0xFFFF,Then call a process to continuous 8-bit bytes of the message and the values in the current register for processing.Only 8 bit data in each character of CRC is effective,Starting bit and stopping bit and parity bits are invalid.

In the process of CRC,Each of the eight characters are separate and dissimilar or register contents(XOR),The results move to the least significant bit direction, set the most significant bit to 0. LSB is extracted to test,if set LSB to 1,Register and preset value dissimilarity or alone,if set LSB to 0, is not to.The whole process will repeat 8 times.when the last time (the eighth time) is completed,next 8-bit bytes and separate and register under the current value of the alien or.The values in the final register,Is all bytes in the message is executed after the CRC value.

When CRC added to the messages .The low byte to join first and then high byte.CRC Simple function is as follows:

```
 unsigned int crc_cal_value(unsigned char *data_value,unsigned char data_length)
{
int i;
unsigned int crc_value=0xffff;
 while(data_length--)
{
crc_value^=*data_value++;
 for(i=0;i<8;i++)
 {
If(crc_value&0x0001)
crc_value=(crc_value>>1)^0xa001;
  else
crc_value=crc_value>>1;
 }
 }
Return(crc_value);
}
```

Address definition of communication parameters

This part is the content of the communication, used to control the operation of the inverter, inverter status and related parameters setting.Read and write functional code parameter (some function code which can not be changed, only for the use of manufacturers or monitoring) : function code parameter address label rules:

By function block number and the label for the parameter address representation rules .High byte: F0~FF(P group),A0~AF(C group),70~7F(D group)low byte:00~FF

Such as:P3.12,The address is expressed as F30C; attention: PF group:Neither read the parameters, and do not change parameters;Group D group: only can read, do not change the parameters.

When some parameters in inverter is in operation, do not change;Some parameters of the inverter in any state, cannot be changed;Change function code parameters, but also pay attention to the range of parameters, units, and related instructions.

In addition, because the EEPROM is stored frequently, the service life of the block can reduce the the life of the block EPROM, so some function code under the mode of communication, do not need to be stored, just change the value of RAM.If it is P group of parameters, in order to realize the function, as long as putting this function code address high F into 0 can be achieved.If it is C group of parameters, in order to realize the function, as long as putting the function code the address of high A into 4 can be achieved. Corresponding function codes are shown as the following address: the high byte: 00 ~ 0F (P group), 40 ~ 4F(group B) low byte: 00 to FF

Such as:

Function code P3.12 is not stored in the EEPROM,The address is expressed as 030C;Function code C0-05 is not stored in the EEPROM,The address is expressed as 4005; The address representation can only do writing RAM,can't do reading action,when reading,it is invalid address. For all the parameters, can also use the command code 7H to implement this function.

Stopping/starting parameters:

Parameter address	Parameter description
1000	Communication Setting value (-10000~10000) (decimal system)
1001	Operating frequency
1002	Bus voltage
1003	output voltage
1004	current output
1005	output power
1006	output torque
1007	running velocity
1008	S Input Flag
1009	M01 output Flag
100A	FIV voltage
100B	FIC voltage

100C	Reserved
100D	count value input
100E	The length of the input
100F	The load speed
1010	PID setting
1011	PID feedback
1012	PLC steps
1013	PULSE the input pulse frequency,unit 0.01kHz
1014	Reserved
1015	The remaining running time
1016	FIV before correction voltage
1017	FIC before correction voltage
1018	Reserved
1019	Linear velocity
101A	the current access to electricity time
101B	the current running time
101C	PULSE input pulse frequency,unit 1Hz
101D	Communication Setting value
101E	Reserved
101F	The main frequency X show
1020	Auxiliary frequency Y show

attention:

Communication setting value is relative percentage, 10000 corresponds to 100.00% and - 10000-100.00%.The frequency of dimensional data, the percentage is relative to the percentage of maximum frequency (P0.12);Counter rotating torque dimensional data, the percentage is P2.10.

Control command input to the inverter:(write-only)

The command word address	Command function
2000	0001:Running forward
	0002:Reverse running
	0003:normal inching turning
	0004:Reversal point move
	0005:Free downtime
	0006:Slowing down
	0007:Failure reset

Read the inverter state: (read-only)

Status word address	Status word function

3000	0001:Running forward
	0002:Reverse running
	0003:closing down

Parameters lock password check: (if return for 8888H,it indicates that the password check through)

Password address	The content of the input password
1F00	*****

Command address	Command content
2001	BIT0:(reserved) BIT1:(reserved) BIT2:RA-RB-RC output control BIT3:reserved BIT4:M01 output control

Analog output FOV control: (write-only)

Command address	Command content
2002	0~7FFF represent 0%~100%

Analog output control:(Reserved)

Command address	Command content
2003	0~7FFFrepresent 0%~100%

PULSE (PULSE) output control: (write -only)

Command address	Command content
2004	0~7FFFrepresent 0%~100%

Inverter fault description:

Inverter fault address	Inverter fault information
8000	0000:failure-free 0001:reserve 0002:Accelerate over current 0003:Slow down over current 0004:Constant speed over current 0005:Accelerate over the voltage 0006:Slow down over voltage 0007:Constant speed over voltage 0008:Buffer resistance overload fault 0009:Under-voltage fault 000A:The inverter overload 000B:Motor overload 000C:reserved 000D:The output phase 000E:Module is overheating 000F:External fault 0010:Abnormal communication

8000	0011:Abnormal contactor 0012:Current detection fault 0013:Motor tuning fault 0014:reserved 0015:Abnormal parameters, reading and writing 0016:Inverter hardware failure 0017:Motor for short circuit fault 0018:reserved 0019:reserved 001A:Running time reached 001B: reserved 001C: reserved 001D: Accumulative power-on time reached 001E:Load becoming 0 001F:PID feedback lost during running 0028:With-wave current limit fault 0029:Motor switchover fault during running 002A: Too large speed deviation 002B: Motor over-speed 002D:Motor overheat 005A:Encoder line number setting error 005B:Don't connect the encoder 005C:Initial position fault 005E:Speed feedback error

Communication failures address	Fault feature description
8001	0000:failure-free 0001:Password mistake 0002:The command code error 0003:CRC Checking error 0004:Invalid address 0005:Invalid parameter 0006:correcting parameter is invalid 0007:System is locked 0008:Block is EEPROM operation

PD group Communication parameters show

PD.00	Baud rate	The factory value	0005
	setting range	units' digit:MODUBS Baud rate 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS	

This parameter is used to set data transfer rate between the PC and inverter.Notice that setting the baud rate of upper machine and inverter must agree, otherwise, the communication can't carry on.The faster the baud rate, the greater the communication.

PD.01	The data format	The factory value	3
	setting range	0:No check:The data format<8,N,2> 1:Even-parity:The data format<8,E,1> 2:Odd parity check:The data format<8,O,1> 3:No check:The data format<8-N-1>	

PC and data format set by the inverter must agree, otherwise, the communication can't carry on.

PD.02	The machine address	The factory value	1
	setting range	1~247, 0 is the broadcast address	

When the machine address set to 0, namely for the broadcast address, realize PC broadcasting functions.

The machine address has uniqueness (except the broadcast address), which is to achieve the basis of upper machine and inverter peer-to-peer communications.

PD.03	Response latency	The factory value	2ms
	setting range	0~20ms	

Response latency: refers to the inverter data to accept the end up to a upper machine to send data in the middle of the interval of time. If the response time delay is less than the system processing time, the response time delay will be subject to system processing time, processing time, such as response time delay is longer than system after processing the data, the system will delay waiting, until the response delay time to up to a upper machine to send data.

PD.04	Communication timeout	The factory value	0
	setting range	0.0 s (invalid) 0.1~60.0s	

When the function code is set to 0.0 s, communication timeout parameter is invalid.

When the function code set to valid values, if a communication and the interval time of the next communication beyond the communication timeout, system will be submitted to the communication failure error (CE).Usually, it is set into is invalid.If, in the continuous communication system parameter set the time, you can monitor the communication status.

PD.05	Communication protocol selection	The factory value	1
	setting range	0: Non standard Modbus protocol 1: The standard Modbus protocol	

PD.05=1:choose the standard Modbus protocol

PD.05=0: when reading command ,Returns number of bytes from the machine is a byte more than the standard Modbus protocol, detailed in this agreement

5 Communication data structures.

PD.06	Read the current resolution	The factory value	1
	setting range	0: 0.01A 1: 0.1A	

Used to determine the communication while reading the output current, current value of the output units.

We reserve the right of this manual contained information
change without prior notice 2019.12