Z5000 -BF Series Vector Control Inverter

User's Manual

Thank you very much for choosing Z5000 series multi-function high-performance spindle servo drive.

Please read the 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 series accident. Please follow these important precautions in any situation.

The figures in this instruction manual are for convenience with description, they may have slight differences compared to the product, and the product update can also cause slight differences between the figure and product, the actual sizes are subject to actual products.

Please keep the operation manual handy for future reference, maintenance, inspection and repair.

If you have any questions, please contact us or our agents in time, you will always receive our best attention,Overview.

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

DANGER
• Risk of injury and electric shock. • Read the manual and follow the safety instruction before use. • Isolate from supply and wait 10minutes before removing this cover. • Ensure proper earth connection. • Mount the inverter on a non-combustible surface.

Inspect

• Don't install or use any inverter that is damaged or have fault part, otherwise may cause injury.

Check the following items when unpacking the inverter.
1. Inspect the entire exterior of the inverter to ensure there are no scratches or other damage caused by the transportation.
2. Ensure there is operation manual and warranty card in the packing box.
3. Inspect the nameplate and ensure it is what you ordered
4. Ensure the optional parts are what you need if have ordered any optional parts.
Please contact the local agent if there is any damage in the inverter or optional parts.

⚠ WARNING

The person without passing the training manipulate the device or any rule in the “warning” being violated, will cause severe injury or property loss.
Only the person, who has passed the training on the design, installation, commissioning and operation of the device an gotten the certification, is permitted to operate this equipment.
Input power cable must be connected tightly, and the equipment must be grounded securely.
Even if the inverter is not running, the following terminals still have dangerous voltage:
-Power terminals: R,S,T
-Moter connection terminals: U,V,W.
When power off, should not install the inverter until 10 minutes after, which can ensure the device discharge completely.
The section area of grounding conduction must be no less than 10mm^2, or Or corresponding to the data in the following table, it is required to select the largest value of the two as the section area of grounding conduction:

Power cable section area of conduction S mm2	The section area of grounding conduction
S≤16	S
16<S≤35	16
35<S	S/2

⚠ Caution

When moving the inverter please lift by its base and don’t lift by the panel,other wise may cause the main unit fall off which may result in personal injury.
Install the inverter on the fireproofing material(such as metal) to prevent fire.
When need install two or more inverters in one cabinet, cooing fan should be provided to make sure that the air temperature is lower than 40℃， otherwise it could cause fire or damage the device.

Chapter 1 Introduction

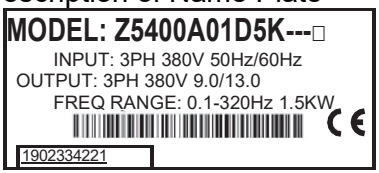
Technology Features

ITEM		Z5000-BF
Standard functions	Control mode	Sensorless flux vector control (SFVC) Voltage/Frequency (V/F) control
	Maximum frequency	Vector control: 0–320 Hz V/F control: 0–3200Hz
	Carrier frequency	1 kHz–16 kHz The carrier frequency can be automatically adjusted based on the load features.
	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%
	Startup torque	G type: 0.5 Hz/150% (SFVC); P type: 0.5 Hz/100%
	Speed range	1:100 (SFVC)
	Speed stability accuracy	± 0.5% (SFVC)
	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	Fixed boost Customized boost 0.1%–30.0%
	V/F curve	Straight-line V/F curve Multi-point V/F curve N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
	V/F separation	Two types: complete separation; half separation
	Ramp mode	Straight-line ramp S-curve ramp Four groups of acceleration/deceleration time with the range of 0.0–6500.0s
	DC braking	DC braking frequency: 0.00 Hz to maximum frequency; Braking time: 0.0-36.0s; Braking action current value: 0.0%–100.0%

ITEM		Z5000-BF
	JOG control	JOG frequency range: 0.00–50.00 Hz JOG acceleration/deceleration time: 0.0–6500.0s
	Onboard Multiple preset speeds	It implements up to 16 speeds via the simple PLC function or by input(X) 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.
	Over-voltage/ Over-current 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.
	Torque limit and torque control	It can limit the torque automatically and prevent frequent over-current tripping during the running process.
	Instantaneous stop doesn't stop	The load feedback energy compensates the voltage reduction so that the AC drive can continue to run for a short time.
	Rapid current limit	It helps to avoid frequent over-current faults of the AC drive.
	High performance	Control of asynchronous motor is implemented through the high-performance current vector control technology.
	Timing control	Time range: 0.0–6500.0 minutes
	Communication methods	RS485
	Running command channel	Given by the panel, control terminals, Serial communication port, can be switched by many ways
	Frequency source	10 kinds of frequency source, given by Digital analog voltage, analog current, Pulse, serial port. can be switched by many ways
	Auxiliary frequency source	10 kinds of Frequency source, given by Digital analog voltage, analog current, pulse, serial port. Can be switched by many ways.
Input and output	Input terminals	6 digital input terminals, one of which supports up to 100 kHz high-speed pulse input.(S3) 2 analog input terminal,one of which only supports 0-10V voltage input and the other supports 0–10 V voltage input and 4–20 mA current input.
	Output terminal	1 digital output terminal 1 relay output terminal (RA.RB.RC) 1 analog output terminal :that supports 0–20 mA current output or 0–10 V voltage output
	Frequency source	Digital setting, analog voltage setting, analog

ITEM		Z5000-BF
		current setting, pulse setting and serial communication port setting.
operation on the 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 malfunction.
	Protection mode	Motor short-circuit detection at power-on, output phase loss protection, over-current protection, over-voltage protection, under voltage protection, overheat protection and overload protection.

Description of Name Plate



Model： Z5400 A 01D5K -□

□:
Specific symbol（Blank for normal product）
3D7:3.7kW
11:11kW

Heavy load: 150% overload in 60
Z5000 series
Voltage：
200：1PH AC220V
400：3PHAC380V
600：3PHAC660V

Model	Input voltage	Rated Output Power (KW)	Rated Input current (A)	Rated Output Current (A))	Motor Power (kW)
Z5200A00D7K-BF	1PH AC220V ±15%	0.75	7.2	5	0.75
Z5200A01D5K-BF		1.5	10	7	1.5
Z5200A02D2K-BF		2.2	16	11	2.2
Z5400A0D75K-BF	3PH AC380V ±15%	0.75	3.8	2.5	0.75
Z5400A1D5K-BF		1.5	5	3.7	1.5
Z5400A02D2K-BF		2.2	5.8	5	2.2
Z5400A03D7K-BF		3.7	10	9	3.7
Z5400A05D5K-BF		5.5	15	13	5.5
Z5400A07D5K-BF		7.5	20	17	7.5
Z5400A0011K-BF		11	26	25	11
Z5400A0015K-BF		15	35	32	15

Z5400A0018K-BF		18.5	38	37	18.5
Z5400A0022K-BF		22	46	45	22
Z5400A0030K-BF		30	62	60	30
Z5400A0037K-BF		37	76	75	37

Installation and wiring

Environment and installation requirements

Inverter's installation environment on the service life of inverter, and has direct influence on the normal function, Inverter can't satisfy the specification of environment, protection or fault could lead to the Inverter.

Z2000 series inverter of wall hung inverter, please use the vertical installation so that the air convection and the heat dissipation effect can be better.

Inverter's installation environment, please make sure must comply with

(01)- 10°C to + 40°C ambient temperature

(02) Environment humidity 0 ~ 95% and no condensation

(03) Avoid direct sunlight

(04) Environment does not contain corrosive gas and liquid

(05) Environment without dust, floating fiber, cotton and metal particles

(06) Away from the radioactive material and fuel

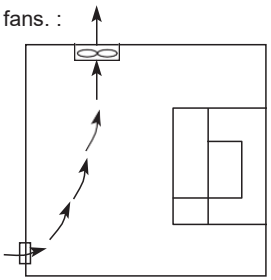
(07) Away from electromagnetic interference source (such as electric welding machine, big power machine)

(08) Installed planar solid, no vibration, if it cannot avoid vibration, please add antivibration pads to reduce the vibration (09) Please install the inverter in the well ventilated place, easy to check and maintain, and install on the solid non-combustible material, away from the heating element (such as braking resistance, etc.)

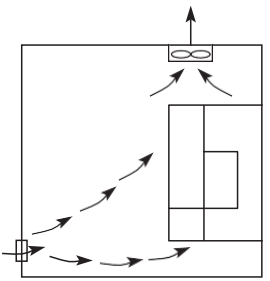
(10) Inverter installation please reserve enough space, especially many inverters' installation, please pay attention to the placement of the frequency Inverter, and configure cooling fans, make the environment temperature lower than 45°C.

(11) Inverter can output the rated power when installed with altitude of lower than 1000m. It will be derated when the altitude is higher than 1000m.

Multiple inverters installed in one control cabinet. please make sure there are enough space,and pay attention to the air convection in the cabinet and the installation of cooling fans. :

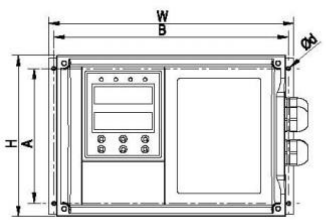


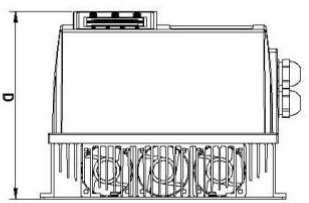
Incorrect installation position of the fan of the fan

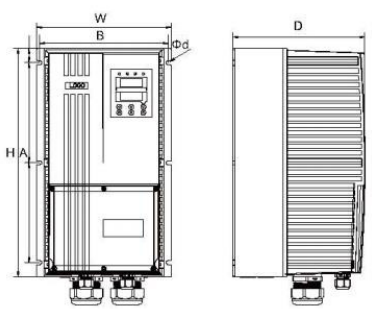


Correct installation position

The inverter's outside shape and the installation dimensions



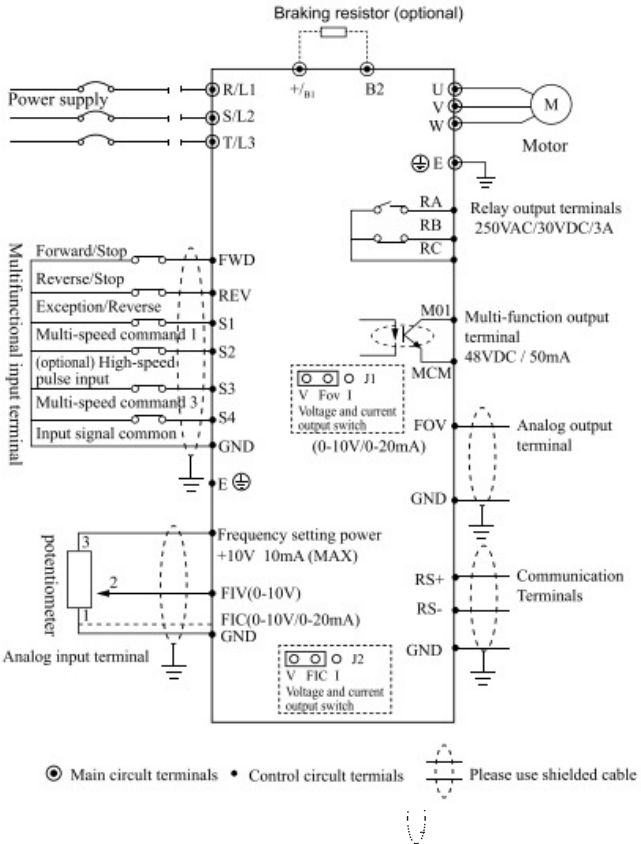




Unit:mm

Model	Motor	Output current	Outline dimension			Installation size(mm)		
			W	H	D	A	B	0d
Z5200A00D7K-BF	0.75	5	188	122	134	105	178	4
Z5200A01D5K-BF	1.5	7						
Z5200A02D2K-BF	2.2	11						
Z5400A0D75K-BF	0.75	2.5						
Z5400A1D5K-BF	1.5	3.7						
Z5400A02D2K-BF	2.2	5						
Z5400A03D7K-BF	3.7	9	235	154	179	129	225	4
Z5400A05D5K-BF	5.5	13						
Z5400A07D5K-BF	7.5	17						
Z5400A0011K-BF	11	25						
Z5400A0D75K-BF-V	0.75	2.5	140	190	138	130	160	4.5
Z5400A1D5K-BF-V	1.5	3.7						
Z5400A02D2K-BF-V	2.2	5						
Z5400A03D7K-BF-V	3.7	9	192	280	178	200	180	5.5
Z5400A05D5K-BF-V	5.5	13						
Z5400A07D5K-BF-V	7.5	17						
Z5400A0011K-BF-V	11	25						
Z5400A0015K-BF	15	32						
Z5400A0018K-BF	18.5	37	236	360	204	250	225	7
Z5400A0022K-BF	22	45						
Z5400A0030K-BF	30	60	236	400	231	175 + 175	225	7
Z5400A0037K-BF	37	75						

Basic wiring diagram



Control Terminal Description

Terminal Name	Function Description	Remark
FWD	Forward command input (multi-function input terminals)	Terminals S1 ~ S4, FWD, REV terminals by reference number of specific settings, set the terminal and GND closed effective
REV	Reverse command input (multi-function input terminals)	
S1	Multi-function input terminals	
S2	Multi-function input terminals	
S3	High-speed pulse input terminal	
S4	Multi-function input terminals	
FOV	Analog output terminal	0～10V/0～20mA
10V	Frequency setting power	
FIV	Analog voltage Input terminal	0～10V
FIC	Analog input terminal	0～20mA/0～10V
GND	Input signal common	
MCM	Optically coupled output common	
MO1	Multifunctional optical coupling output contacts	
RA	Relay output contacts (normally open)	
RB	Relay output contacts (normally closed)	
RC	Relay output contacts RA, RB common	

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.

Function Code	Parameter Name	Setting Range	Default	Property
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:Voltage/Frequency (V/F) control 1:Sensorless flux vector control (SFVC)	0	★
P0.02	Command source selection	0:Operation panel control 1:Terminal control 2:Communication control	0	☆
P0.03	Frequency source superposition selection	Unit's digit (Frequency source) 0:Main frequency source X 1 :X and Y	00	☆

		operation(operation relationship determined by ten's digit) 2: Switch over 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 3:Minimum		
P0.04	Main frequency Source X selection	0:Digital setting (P01.0 preset frequency, can modify the UP/DOWN, power lost don't memory) 1:Digital setting (P0.10 preset frequency, can modify the UP/ DOWN, power lost memory) 2:FIV 3:FIC 4:Reserved 5:Pulse setting(S3) 6:Multistage instruction 7:Simple PLC 8:PID 9:Communications	0	★
P0.05	Auxiliary frequency source Y selection	The same as P0.04 (Main frequency source X selection)	0	★
P0.06	Auxiliary frequency source superposition Y range selection	0: Relative to the maximum frequency 1: Relative to the main frequency source X	0	☆
P0.07	Auxiliary frequency source superposition Y range	0%~150%	100%	☆
P0.08	Acceleration time 1	0.00s~6500.0s	Model dependent	☆
P0.09	Deceleration time	0.00s~6500.0s	Model	☆

	1		dependent	
P0.10	Frequency preset	O.OOHz~maximum frequency(P0.12)	50.00Hz	☆
P0.11	Rotation direction	0: Same direction 1: Reverse direction	0	☆
P0.12	Maximum frequency	50.00HZ~320.00HZ	50.00Hz	★
P0.13	Upper limit frequency source	0: P0.12 1:FIV 2: FIC 3： Reserved 4: PULSE settings 5: Communication settings	0	★
P0.14	Upper limit frequency	Frequency lower limit P0.16~Maximum frequency P0.12	50.00Hz	☆
P0.15	Upper limit frequency offset	0.00Hz~Maximum frequent P0.12	0.00Hz	☆
P0.16	Frequency lower limit	0.00Hz~Upper limit frequency P0.14	0.00Hz	☆
P0.17	Carrier frequency	1kHz-16.0kHz	Model dependent	☆
P0.18	Carrier frequency adjustment with temperature	0: No 1： Yes	1	☆
P0.19	Acceleration/ Deceleration time unit	0:1s 1:0.1s	1	★
P0.21	Frequency offset of auxiliary frequency source for X and Y operation	0.00Hz~Maximum frequency P0.12	0.00Hz	☆
P0.22	Frequent reference	1:0.1 Hz 2:0.01 Hz	2	★
P0.23	Retentive of digital setting frequency upon power off	0:Not retentive 1:Retentive	0	☆
P0.24	Acceleration/ Deceleration time base frequency	0:Maximum frequency (P0.12) 1:Set frequency	0	★
P0.25	Base frequency for UP/DOWN modification during running	0: Running frequency 1: Set frequency	0	★
P0.26	Binding command source to	Unit's digit:Binding operation panel	000	☆

	frequency source	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-referenoe 7:Simple PLC 8:PID 9:Communication setting Ten^{T}s digit:Binding terminal command to frequency source Hundred's digit:Binding communication command to frequency source		
P0.27	Communication expansion card type	0：Modbus communication card	0	☆
P0.28	Reserved		0	★
Group P1 Start/Stop Control				
P1.00	Start mode	0: Direct start 1: Rotational speed tracking restart 2: Pre-excited start (asynchronous motor)	0	☆
P1.01	Rotational speed tracking mode	0: From frequency at stop 1: From zero speed 2: From maximum frequency	0	★
P1.02	Rotational speed tracking speed	1~100	20	☆
P1.03	Startup frequency	0.00Hz-10.00Hz	0.00Hz	☆
P1.04	Startup frequency holding time	0.0s~100.0s	0.0s	★
P1.05	Startup DC braking current/ Pre-excited current	0%-100%	0%	★
P1.06	Startup DC braking time/ Pre-excited time	0.0s~100.0s	0.0s	★

P1.07	Acceleration/ Deceleration mode	0: Linear acceleration/ deceleration 1: S-curve acceleration/ deceleration A 2: S-curve acceleration/ deceleration B	0	★
P1.08	Time proportion of S-curve start	0.0%~ (100.0%-P1.09)	30.0%	★
P1.09	Time proportion of S-curve end	0.0%- (100.0%-P1.08)	30.0%	★
P1.10	Stop mode	0: Decelerate to stop 1: Coast to stop	0	☆
P1.11	Initial frequency of stop DC braking	0.00Hz~maximum frequency	0.00Hz	☆
P1.12	Waiting time of stop DC braking	0.0s~100.0s	0.0s	☆
P1.13	Stop DC braking current	0%-100%	0%	☆
P1.14	Stop DC braking time	0.0s~100.0s	0.0s	☆
P1.15	Brake use ratio	0%-100%	100%	☆
Group P2 Motor parameters				
P2.00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
P2.01	Rated motor power	0.1kW~1000.0kW	Model dependent	★
P2.02	Rated motor voltage	1V-2000V	Model dependent	★
P2.03	Rated motor current	0.01A-655.35A	Model dependent	★
P2.04	Rated motor frequency	0.01 Hz-maximum frequency	Model dependent	★
P2.05	Rated motor rotational speed	1rpm-65535rpm	Model dependent	★
P2.06	Stator resistance (asynchronous motor)	0.001 Ω-65.535Ω	Auto-tuning parameter	★
P2.07	Rotor resistance (asynchronous motor)	0.001 Ω~65.535Ω	Auto-tuning parameter	★
P2.08	Leakage inductive reactance (asynchronous motor)	0.01mH-655.35mH	Auto-tuning parameter	★

P2.09	Mutual inductive reactance (asynchronous motor)	0.1mH~6553.5mH	Auto-tuning parameter	★
P2.10	No-load current (synchronous motor)	0.01A-P2.03	Auto-tuning parameter	★
P2.11-P2.36 Reserved				
P2.37	Auto-tuning selection	0:No auto-tuning 1:Asynchronous motor static auto-tuning 2:Asynchronous motor complete auto-tuning	0	★
Group P3 Motor vector control parameters				
P3.00	Speed loop proportional gain 1	1~100	30	☆
P3.01	Speed loop integral time 1	0.01s~10.00s	0.50s	☆
P3.02	Switchover frequency 1	0.00-P3.05	5.00Hz	☆
P3.03	Speed loop proportional gain 2	1~100	20	☆
P3.04	Speed loop integral time 2	0.01s-10.00s	1.00s	☆
P3.05	Switchover frequency 2	P3.02～maximum output frequent	10.00Hz	☆
P3.06	Vector control slip gain	50%~200%	100%	☆
P3.07	Time constant of speed loop filter	0.000s~0.100s	0.000s	☆
P3.08	Vector control over-excitation gain	0-200	64	☆
P3.09	Torque upper limit source in speed control mode	0:P3.10 1:FIV 2:FIC 3:Reserved 4:Pulse setting 5:Communication setting 6:MIN(FIV，FIC) 7:MAX(FIV，FIC)	0	☆
P3.10	Digital setting of torque upper limit in speed control mode	0.0%~200.0%	150.0%	☆
P3.13	Excitation adjustment	0~60000	2000	☆

	proportional gain			
P3.14	Excitation adjustment Integral gain	0~60000	1300	☆
P3.15	Torque adjustment proportional gain	0~60000	2000	☆
P3.16	Torque adjustment integral gain	0~60000	1300	☆
P3.17	Speed loop integral property	Unit's digit: integral separation 0: Disabled 1: Enabled	0	☆
P3.18	Reserved			
P3.19	Reserved			
P3.20	Reserved			
P3.21	Reserved			
P3.22	Reserved			
Group 4 V/F control parameters				
P4.00	V/F 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:V/F complete separation 11:V/F half separation	0	★
P4.01	Torque boost	0.0%: (Automatic torque boost) 0.1%-30.0%	Model dependent	☆
P4.02	Cut-off frequency of torque boost	0.00 Hz-maximum output frequency	50.00Hz	★
P4.03	Multi-point V/F frequency 1 (F1)	0.00HZ-P4.05	0.00Hz	★
P4.04	Multi-point V/F voltage 1 (V1)	0.0%~100.0%	0.0%	★
P4.05	Multi-point V/F frequency 2 (F2)	P4.03-P4.07	0.00Hz	★
P4.06	Multi-point V/F voltage 2 (V2)	0_0%-100_0%	0.0%	★
P4.07	Multi-point V/F frequency 3 (F3)	P4.05～rated motor frequency (P1.04)	0.00Hz	★
P4.08	Multi-point V/F	0.0%~100.0%	0.0%	★

	voltage 3 (V3)			
P4.09	V/F slip compensation gain	0.0%~200.0%	0.0%	☆
P4.10	V/F overexcitation gain	0~200	64	☆
P4.11	V/F oscillation suppression gain	0-100	Model dependent	☆
P4.13	Voltage source for V/F separation	0:Digital setting(P4.14) 1:FIV 2:FIC 3:Reserved 4:PULSE setting(S3) 5:Multi-reference 6:Simple PLC	0	☆
P4.14	Voltage digital setting for V/F separation	0V~rated motor voltage	OV	☆
P4.15	Voltage rise time of V/F separation	0.0s-1000.0s It indicates the time for the voltage rising from 0 V to rated motor voltage.	0.0s	☆
Group P5 Input terminals				
P5.00	FWD function selection	0:No function 1-.Forward RUN(FWD) 2:Reverse RUN(REV) 3:Three-line control 4:Forward JOG(JOG-F) 5:Reverse JOG(JOG-R) 6:Terminal UP 7Terminal DOWN 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 14:Multi-refer0nce terminal 3 15:Multi-reference terminal 4 16:Terminal 1 for acceleration/ deceleration time selection 17:Terminal 2	1	★
P5.01	REV function selection		2	★
P5.02	S1 function selection		9	★
P5.03	S2 function selection		12	★

P5.04	S3 function selection	for acceleration/ deceleration time selection 18:Frequency source Switchover 19:UP and 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 29:Torque control prohibited 30:Pulse input (enabled only for S3) 31: Reserved 32:Immediately DC braking 33:Normally closed (NC) input of external fault 34: Frequency modification forbidden 35: Reverse PID action direction 36:External STOP terminal 1 37:Command source switchover terminal 2 38:PID integral pause 39:Switchover between main frequency source X and preset frequency 40:Switchover between auxiliary frequency source Y and preset frequency 41: Reserved 42: Reserved 43:PID parameter switchover 44: Reserved	13	★
P5.05	S4 function selection		0	★

		45: 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		
P5.10	S filter time	0.000s~1.000s	0.010s	☆
P5.11	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	★
P5.12	Terminal UP/ DOWN rate	0.001 Hz/s-65.535Hz/s	1.00Hz/s	☆
P5.13	FI curve 1 minimum input	0.00V~P5.15	0.00V	☆
P5.14	Corresponding setting of FI curve 1 minimum input	-100.0%~100.0%	0.0%	☆
P5.15	FI curve 1 maximum input	P5.13~ +10.00V	10.00V	☆
P5.16	Corresponding setting of FI curve 1 maximum input	-100.0%~100.0%	100.0%	☆
P5.17	FI curve 1 filter time	0.00s-10.00s	0.10s	☆
P5.18	FI curve 2 minimum input	0.00V-P5.20	0.00V	☆
P5.19	Corresponding setting of FI curve 2 minimum input	-100.0%～+100.0%	0.0%	☆
P5.20	FI curve 2 maximum input	P5.18~10.00V	10.00V	☆
P5.21	Corresponding setting of FI curve 2 maximum input	-100.0%~100.0%	100.0%	☆
P5.22	FI curve 2 filter time	0.00s~10.00s	0.10s	☆
P5.23	FI curve 3 minimum input	-10.00V~P5.25	0.00V	☆

P5.24	Corresponding setting of FI curve 3 minimum input	-100.0%~100.0%	0.0%	☆
P5.25	FI curve 3 maximum input	P5.23-+10.00V	10.00V	☆
P5.26	Corresponding setting of FI curve 3 maximum input	-100.0%~100.0%	100.0%	☆
P5.27	FI curve 3 filter time	0.00s~10.00s	0.10s	☆
P5.28	PULSE minimum input	0.00kHz~P5.30	0.00kHz	☆
P5.29	Corresponding setting of pulse minimum input	-100.0%~100.0%	0.0%	☆
P5.30	PULSE maximum input	P5.28~100.00kHz	50.00kHz	☆
P5.31	Corresponding setting of pulse maximum input	-100.0%~100.0%	100.0%	☆
P5.32	PULSE filter time	0.00s-10.00s	0.10s	☆
P5.33	FI curve selection	Unit's digit:FIV curve selection 1:Curve 1{2 points, see P5.13-P5.16) 2:Curve 2(2 points, see P5.18-P5.21) 3:Curve 3{2 points, see P5.23-P5.26) 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(1-5,same as FIV)	321	☆
P5.34	Setting for FI less than minimum input	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)	000	☆
P5.35	FWD delay time	0.0s~3600.0s	0.0s	★
P5.36	REV delay time	0.0s-3600.0s	0.0s	★

P5.37	S1 delay time	0.0s~3600.0s	0.0s	★
P5.38	S 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	★
P5.39	S valid mode selection 2	0:High level valid 1:Low level valid Unifs digit:S4	0	★
Group P6 Output terminals				
P6.00	MO1 terminal output mode	1:Switch signal output(MO1)	0	☆
P6.01	MO1 function	0:No output 1:AC drive running 2:Fault output (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:Set 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	0	☆

P6.02	Control board relay function selection (RA- RB- RC)	16:FIV>FIC 17: Frequency upper limit reached 18: Frequency lower limit reached (Running related) 19:Under voltage state output 20:Communication setting 21: Positioning completed (Reserved) 22: Positioning approaching (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 27: Frequency 2 reached 28:Current 1 reached 29:Current 2 reached 30:Timing reached 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 (Continue running) 39: Reserved 40:Current running time reached	2	☆

P6.07	FOV output function selection	0:Running frequency 1:Set frequency 2: Output current 3:Output torque 4:Output power 5: Output voltage (100% for 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% for 1000.0A) 15:Output voltage(100.0% for 1000.0V) 16: Reserved	0	☆
P6.08	Reserved			
P6.09	Reserved			☆
P6.10	FOV offset coetfcient	-100.0%~100.0%	0.0%	☆
P6.11	FOV gain	-10.00~+10.00	1.00	☆
P6.12	Reserved			☆
P6.13	Reserved			☆
P6.17	MO1 output delay time	0.0s~3600.0s	0.0s	☆
P6.18	RA-RB-RC output delay time	0.0s~3600.0s	0.0s	☆
P6.19	reserved			☆
P6.20	reserved			
P6.21	reserved			
P6.22	Output terminal valid mode selection	0:Positive logic 1 .Negative logic Units digit:MO1 Ten's digit:RA-RB-RC	00000	☆
Group 7 **Operation Panel and Display**				
P7.00	Output power correction factor	0.0~200.0	100.0	☆
P7.01	Reserved			
P7.02	STOP/RESET key function	0:STOP/RESET key enabled only in operation panel control 1:STOP/RESET key	1	☆

		enabled in any operation mode		
P7.03	LED display running parameters 1	0000~FFFF Bit00: Running frequency 1 (Hz) Bit01: Set 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 (V) Bit10: FIC voltage (V) Bit11: Reserved Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆
P7.04	LED display running parameters 2	0000~FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse setting frequency(kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: FIV voltage before correction (V) Bit06: FIC voltage before correction (V) Bit07: Reserved Bit08: Linear speed Bit09: Current power-on time{Hour) Bit10: Current running time (Min) Bit11: Pulse input pulse frequency(Hz) Bit12: Communication setting value Bit13: Reserved Bit 14: Main frequency X display(Hz)	0	☆

		Bit 15:Auxiliary frequency Y display (Hz)		
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 (V) Bit05: FIC voltage (V) Bit06: Reserved Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: Pulse input pulse frequency (kHz)	33	☆
P7.06	Load speed display coefficient	0.0001~6.5000	1.0000	☆
P7.07	Inverter module radiator temperature	0.0°C~150.0°C	-	•
P7.08	Rectifier bridge radiator temperature	0.0*C~150.0°C	-	•
P7.09	Accumulative running time	0h-65535h	-	•
P7.10	Reserved	-	-	•
P7.11	Software version	-	-	•
P7.12	Numbers of decimal places for load speed display	0:0 decimal place 1:1 decimal place 2:2 decimal places 3:3 decimal places	1	☆
P7.13	Accumulative power-on time	0h_65535h	-	•
P7.14	Accumulative power consumption	0kW~65535kWh	-	•
Group P8: Auxiliary Functions				
P8.00	JOG running frequency	0.00Hz-maximum frequency	2.00Hz	☆
P8.01	JOG acceleration time	0.0s~6500_0s	20.0s	☆
P8.02	JOG deceleration	0.0s~6500.0s	20.0s	☆

	time			
P8.03	Acceleration time 2	0.0s~6500.0s	Model dependent	☆
P8.04	Deceleration time 2	0.0s~6500.0s	Model dependent	☆
P8.05	Acceleration time 3	0.0s~6500.0s	Model dependent	☆
P8.06	Deceleration time 3	0.0s-6500.0s	Model dependent	☆
P8.07	Acceleration time 4	0.0s~6500.0s	Model dependent	☆
P8.08	Deceleration time 4	0.0s~6500.0s	Model dependent	☆
P8.09	Jump frequency 1	0.00Hz-maximum frequency	0.00Hz	☆
P8.10	Jump frequency 2	0.00Hz-maximum frequency	0.00Hz	☆
P8.11	Frequency jump amplitude	0.00Hz~maximum frequency	0.01Hz	☆
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	Setting accumulative power-on reached time	0h~65000h	0h	☆
P8.17	Setting accumulative running reached time	0h~65000h	0h	☆
P8.18	Startup protection	0: No 1: Yes	0	☆
P8.19	Frequency detection value(FDTI)	0.00Hz~maximum frequent^	50.00Hz	☆
P8.20	Frequent^ detection hystere3is(FDT1)	0.0%~100.0% (FDT1 level)	5.0%	☆
P8.21	Frequency reach detection width	0.0%~100.0% (maximum frequency)	0.0%	☆

P8.22	Jump frequency during 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	☆
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	Frequent 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 width1	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% for rated motor current	5.0%	☆
P8.35	Zero current detection delay time	0.01s~600.00s	0.10s	☆
P8.36	Output over current limit exceed	0.0% (no detection) 0.1%~300.0% (rated motor current)	200.0%	☆
P8.37	Output over current exceed detection delay	0.00s~600.00s	0.00s	☆

	time			
P8.38	Any current reaching 1	0.0%~300.0% (rated motor current)	100.0%	☆
P8.39	Any current reaching 1 width	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 width	0.0%-300.0% (rated motor current)	0.0%	☆
P8.42	Timing function	0:Disabled 1 .Enabled	0	☆
P8.43	Timing running time selection	0: P8.44 1:FIV 2: FIC Analog input range corresponds to the value of P8.44	0	☆
P8.44	Timing running time	0.00Min ∽6500.0Min	0.0Min	☆
P8.45	FIV input voltage lower limit	0.00V~P8.46	3.10V	☆
P8.46	FIV input voltage upper limit	P8.45~10.00V	6.80V	☆
P8.47	Module temperature reached	0°C~150°C	100°C	☆
P8.48	Cooling fan control	0: Fan working during running 1: Fan working continuously	0	☆
P8.49	Wake up frequency	Dormant frequency (P8.51) ~maximum frequency (P0.12)	0.00Hz	☆
P8.50	Wakeup delay time	0.0s~6500.0s	0.0s	☆
P8.51	Dormant frequency	0.00Hz~wake up frequency (P8.49)	0.00Hz	☆
P8.52	Dormant delay time	0.0s-6500.0s	0.0s	☆
P8.53	Current running time reached	0.0Mln-6500.0Mln	0.0Min	★
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	50%~100%	80%	☆

	warning coetfcient			
P9.03	Overvoltage stall gain	0~100	0	☆
P9.04	Over voltage stall protective voltage	120%-150%	130%	☆
P9.05	Over current stall gain	0~100	20	☆
P9.06	Over current stall protective current	100%~200%	150%	☆
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	MO1 action during fault auto reset	0: Not act 1:Act	0	☆
P9.11	Time interval of fault auto reset	0.1s - 100.0s	1.0s	☆
P9.12	Reserved			☆
P9.13	Output phase loss protection selection	0: Disabled 1: Enabled	1	☆
P9.14	1st fault type	0: No fault 1: Inverter unit protection 2: Over current during acceleration 3: Over current during deceleration 4: Over current at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Control power fault		•

P9.15	2nd fault type	9: Undervoltage 10: Inverter overload 11: Motor overload 12: Reserved 13: Power output phase loss 14: Module overheat 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Reserved 21: EEPROM read-write fault 22: Inverter hardware fault 23: Short circuit to ground 24: Reserved 25: Reserved 26:Accumulative running time reached 27: Reserved 28: Reserved 29: Accumulative power-on time reached 30: Load becoming 0 31: PID feedback lost during running 40: Ramp current limit fault 41-43: Reserved	■	•
P9.16	3rd (latest)fault type			•
P9.17	Frequency upon 3rd fault	-	-	•
P9.18	Current upon 3rd fault	-	-	•
P9.19	Bus voltage upon 3rd fault	-	-	•
P9.20	Input terminal status upon 3rd fault	-	-	•
P9.21	Output terminal status upon 3rd fault	-	-	•
P9.22	Inverter status upon 3rd fault	-	-	•

P9.23	Power-on time upon 3rd fault	-	-	•
P9.24	Running time upon 3rd fault	-	-	•
P9.27	Frequency upon 2nd fault	-	-	•
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	Inverter 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	-	-	•
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	Inverter status upon 1st fault	-	-	•
P9.43	Power-on time status upon 1st fault	-	-	•
P9.44	Running time upon 1st fault	-	-	•
P9.47	Fault protection action selection 1	Unit's digit:Motor overload (OL1) 0:Coast to stop 1:Stop according to the stop mode 2:Continue to run Ten's digit:Reserved	00000	☆

		Hundred's digit:Power output phase loss(LO) Thousand's digit:External equipment fault(EF) Ten thousand's digit: Communication fault(CE)		
P9.48	Fault protection action selection 2	Unit's digit:Reserved 0:Coast to stop Ten's digit:EEPROM read-write fault (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)	00000	☆
P9.49	Fault protection action selection 3	Unit's digit: Reserved Unit's digit:Reserved 0:Coast to stop 1:Stop according to the stop mode 2:Continue to run Ten's digit:Reserved 0:Coast to stop 1 .Stop according to the stop mode 2:Continue to run Hundred's digit: Accumulative power-on time reached (END2) 0:Coast to stop 1:Stop according to the stop mode 2:Continue to run Thousand's digit: Load becoming 0 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	00000	☆

		recovers Ten thousand's digit: PID feedback loss of running 0:Coast to stop 1:Stop according to the stop mode 2:Continue to run		
P9.50	Reserved			☆
P9.54	Frequency selection for continuing to run when fault	0. Running at current running frequency 1:Running at set frequency 2:Running at frequency upper limit 3:Running at frequency lower limit 4:Running at backup frequency upon abnormality	0	☆
P9.55	Backup frequency upon abnormality	60.0%~100.0% (100.0% for maximum frequency P0.12)	100.0%	☆
P9.59	Action selection at instantaneous power failure	0: Invalid 1: Decelerate 2: Decelerate to stop	0	☆
P9.60	Deceleration frequency switch at instantaneous power failure	0.0%~100.0%	0.0%	☆
P9.61	Voltage rally judging time at instantaneous power failure	0.00s~100.00s	0.50s	☆
P9.62	Action judging voltage at instantaneous power failure	60.0%~100.0% (standard bus voltage)	80.0%	☆
P9.63	Protection upon load becoming 0	0: Disabled 1: Enabled	0	☆
P9.64	Detection level of load becoming 0	0.0-100.0%	10.0%	☆
P9.65	Detection time of load becoming 0	0.00~60.0s	1.0s	☆
P9.67	Reserved			☆
P9.68	Reserved			☆
Group PA PID function				

PA.00	PID setting source	0:PA.01 1:FIV 2:FIC 3:Reserved 4:PULSE setting(S3) 5:Communication setting 6:Multi-reference	0	☆
PA.01	PID digital setting	0.0%~100.0%	50.0%	☆
PA.02	PID feedback source	0:FIV 1:FIC 2:Reserved 3:FIV-FIC 4:PULSE setting(S3) 5:Communication setting	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	☆
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 Kp2	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 2:Automatic switchover based on deviation	0	☆
PA.19	PID parameter switchover	0.0%~PA.20	20.0%	☆

	deviation 1			
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	☆
PA.23	Maximum deviation between two PID outputs in forward	0.00%~100.00%	1.00%	☆
PA.24	Maximum deviation between two PID outputs in reverse	0.00%~100.00%	1.00%	☆
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 **Group Pb: Swing Frequency, Fixed Length and Count**				
Pb.00	Swing frequency setting mode	0: Relative to the central frequent 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	0.1%~100.0%	50.0%	☆

	coefficient			
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	Reference 0	-100.0%~100.0%	0.0%	☆
PC.01	Reference 1	-100.0%~100.0%	0.0%	☆
PC.02	Reference 2	-100.0%~100.0%	0.0%	☆
PC.03	Reference 3	-100.0%~100.0%	0.0%	☆
PC.04	Reference 4	-100.0%~100.0%	0.0%	☆
PC.05	Reference 5	-100.0%~100.0%	0.0%	☆
PC.06	Reference 6	-100.0%~100.0%	0.0%	☆
PC.07	Reference 7	-100.0%~100.0%	0.0%	☆
PC.08	Reference 8	-100.0%~100.0%	0.0%	☆
PC.09	Reference 9	-100.0%~100.0%	0.0%	☆
PC.10	Reference10	-100.0%~100.0%	0.0%	☆
PC.11	Reference11	-100.0%~100.0%	0.0%	☆
PC.12	Reference12	-100.0%~100.0%	0.0%	☆
PC. 13	Reference13	-100.0%-100.0%	0.0%	☆
PC.14	Reference14	-100.0%~100.0%	0.0%	☆
PC.15	Reference15	-100.0%~100.0%	0.0%	☆
PC.16	Simple PLC running mode	0:Stop after the inverter runs one cycle 1:Keep final values after the inverter runs one cycle 2:Repeat after the inverter runs one cycle	0	☆
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)~6553.5s(h)	0.0s(h)	
PC.19	Acceleration/ deceleration time	0-3	0	

	of simple PLC reference 0			
PC.20	Running time of simple PLC reference 1	0.0s(h)-6553.5s(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)-6553.5s(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)~6553.5s(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)-6553.5s(h)	0.0s(h)	☆
PC.27	Acceleration/ deceleration time of simple PLC reference 4	0~3	0	☆
PC.28	Running time of simple PLC reference 5	0.0s(h)-6553.5s(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)~6553.5s(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) ~ 6553.5s(h)	0.0s(h)	☆
PC.33	Acceleration/	0-3	0	☆

	deceleration time of simple PLC reference 7			
PC.34	Running time of simple PLC reference 8	0.0s(h)-6553.5s(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)-6553.5s(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)~6553.5s(h)	0.0s (h)	☆
PC.39	Acceleration/ deceleration time of simple PLC reference 10	0-3	0	☆
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	☆
PC.51	Reference 0 setting	0: Set by PC.00 1:FIV 2: FIC 3: Reserved 4: PULSE setting 5: PID 6:Set by preset frequency (P0.10), modified via terminal UP/DOWN	0	☆
Group PD: Communication Parameters				
PD.00	Baud rate	Units 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, data format <8,N,2> 1: Even parity check, data format<S,E,1> 2: Odd Parity check, data format<8,0,1> 3: No check, data format <8,N,1> Valid for	0	☆

		Modbus		
PD.02	Local address	1~247, 0: Broadcast address	1	☆
PD.03	Response delay	0ms~20ms	2	☆
PD.04	Communication timeout	0.0 (invalid), 0.1s~60.0s	0.0	☆
PD.05	Modbus protocol selection	Unit's digit: Modbus protocol 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	☆
Group PP: User-Defined Function Codes				
PP.00	User password	0~65535	0	☆
PP.01	Restore default settings	0: No operation 01: Restore factory settings except motor parameters 02: Clear records 04: Restore user backup parameters 501: Back up current user parameters	0	★
Group C0: Torque Control and Restricting Parameters				
C0.00	Speed/torque control selection	0: Speed control 1: Torque control	0	★
C0.01	Torque setting source in torque control	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) (1-7 full range selection are corresponding to the setting of C0.03)	0	★
C0.03	Torque digital setting in	-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 C1-C4: Reserved				
Group C5: Control Optimization Parameters				
C5.00	PWM switchover frequency upper limit	0.00Hz-15.00Hz	12.00Hz	☆
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 2: Compensation mode 2	1	☆
C5.03	Random PWM depth	0: Random PWM invalid 1~10:RWM carrier frequency random depth	0	☆
C5.04	Rapid current limit	0: Disabled 1: Enabled	1	☆
C5.05	Current detection compensation	0~100	5	☆
C5.06	Undervoltage threshold	60-0%~140.0%	100.0%	☆
C5.07	SFVC optimization mode selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	☆
Group C6: FIV/FIC Curve Setting				
C6.00	FI curve 4 minimum input	-10.00V~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%	☆
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	-10.00V-C6.10	0.00V	☆
C6.09	Corresponding setting of FI curve 5 minimum input	-100.0%~+100.0%	-100.0%	☆
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%	30.0%	☆
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%	☆
Group CC: FI/FO **Correction**				
CC.00	FIV measured voltage 1	0.500V~4.000V	Factory-corrected	☆
CC.01	FIV displayed voltage 1	0.500V~4.000V	Factory-corrected	☆
CC.02	FIV measured voltage 2	6.000V~9.999V	Factory-corrected	☆
CC.03	FIV displayed voltage 2	6.000V~9.999V	Factory-corrected	☆
CC.04	FIC measured voltage 1	0.500V~4.000V	Factory-corrected	☆

CC.05	FIC displayed voltage 1	0.500V~4.000V	Factory-corrected	☆
CC.06	FIC measured voltage 2	6.000V~9.999V	Factory-corrected	☆
CC.07	FIC displayed voltage 2	6.000V~9.999V	Factory-corrected	☆
CC.12	FOV target voltage 1	0.500V~4.000V	Factory-corrected	☆
CC.13	FOV measured voltage 1	0.500V~4.000V	Factory-corrected	☆
CC.14	FOV target voltage 2	6.000V~9.999V	Factory-corrected	☆
CC.15	FOV measured voltage 2	6.000V~9.999V	Factory-corrected	☆

Group DO: Monitoring Paramaters

Function Code	Parameter Name	Unit
Group D0 Basic monitoring parameters		
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%
D0.07	S input state	1
D0.08	MO1 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	1
D0.14	Load speed	1

D0.15	PID setting	1
D0.16	PID feedback	1
D0.17	PLC stage	1
D0.18	Input pulse frequency (kHz)	0.01kHz
D0.19	Reserved	
D0.20	Remaining running time	0.1 Min
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	On the current time	1Min
D0.26	The current running time	0.1 Min
D0.27	Pulse input frequency	1Hz
D0.28	Communication setting value	0.01%
D0.29	Reserved	
D0.30	Reserved	
D0.31	Auxiliary frequency Y	0.01Hz
D0.32	View any memory address values	1
D0.33	Reserved	
D0.34	Motor temperature	1℃
D0.35	Target torque（%）	0.1%
D0.36	Reserved	
D0.37	Power factor angle	0.1°
D0.38	Reserved	
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 code	0

Fault checking and ruled out

Fault alarm and countermeasures

Z5000 inverter with kinds of warning information and the protection function, once the failure occurs, protection function action, inverter stop output, inverter fault relay contact action, and the inverter fault code shown on the display panel, the user can check according to the tips before seeking service, analyze the cause of the problem, find out the solution. If it belongs to the dotted line frame stated reason, please seek service, with your purchased inverter agents or contact us directly.

Warning information OUOC is over current or over voltage signals, it is the hardware over voltage cause OUOC alarm.

Fault Name	Display of Panel	Possible Causes	Solutions

Inverter unit protection	OC	1: The inverter output circuit is short circuited. 2: The connecting cable of the motor and inverter is too long. 3: The module overheats. 4: The internal connections of inverter become loose. 5:The main control board is faulty. 6: The drive board is faulty. 7: The inverter model	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filler and the cooling fan. 4: Connect all cables property. 5,6,7:Looking for technical support
Overcunrent during acceleration	OC1	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not Performed in vector control. 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 inverter model	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 inverter of higher power class.

Overcunrent during acceleration	OC2	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed in vector control 3: The deceleration time is too Short. 4: The vottage is too low. 5: A sudden load is added during deceleration. 6: The braking unit and braking resistor	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 in vector control. 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 ftujlte. 2: Perform the motor auto- tuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select a inverter of higher power class.
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 1he braking unit and braking resistor.

Over voltage during deceleration	OU2	1: The input vottage 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	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range.
Lack of voltage	LU	1: Instantaneous power failure 2: The inverter's input voltage is not within the allowable range. 3: The bus voltage Is abnormal. 4: The rectifier bridge and buffer resistor are abnormal. 5: The drive board is abnormal. 6: The main control	1: Reset the fault. 2: Adjust the voltage to normal range. 3,4,5,6: Looking for technical support
Inverter overload	OL2	1: The load is too heavy or motor-stalled occurs on the motor. 2: The inverter model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select a inverter of higher power class
Motor overload	OL1	1: P9.01 is set improperly. 2: The load is too heavy or motor-stalled occurs on the motor. 3: The inverter 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 a inverter of higher power class.

Power output phase loss	Lo	1: The cable connecting the inverter and the motor is faulty. 2: The inverter's three-phase output is unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external fault. 2: Check whether the motor three-phase winding is normal. 3:Looking for technical support.
Module overheat	OH	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The inverter module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
External equipment fault	EF	1: External fault signal is Input via S. 2: External fault signal is input via virtual I/O.	Reset the operation.
Communication fault	CE	1: The host computer is in abnormal state. 2: The communication cable is faulty.. 3: The communication parameters in group PD are set improperly.	1: Check the cabling of host computer. 2: Check the communication cabling. 3: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 parameter are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate property. 2: Check the cable connecting the AC drive and the motor.
EEPROM read-write fault	EEP	The EEPROM chip is damaged.	Replace the main control board.
Inverter hardware fault	OUOC	1: Overvoltage exists. 2: Overcurrent exists.	1: Handle based on Overvoltage. 2: Handle based on overcurrent.

Short circuit to ground fault	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.
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 inverter 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 fault	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 too small 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 fault	ESP	1: The motor auto-tuning is not Performed.	1::Perform the motor auto- tuning.
Motor over speed fault	oSP	1: The motor auto-tuning is not Performed.	.1::Perform the motor auto- tuning.

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 inverter

SN	Fault	Possible Causes	Solutions
1	There is no display when the power is on.	1: There is no power supply to the inverter or the power input to the inverter is too low. 2: The power supply of the switch on the drive board of the inverter is faulty. 3: The rectifier bridge is damaged. 4:The inverter buffer resistance is damaged 5: The control board or the operation panel is faulty. 6: 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	“2000” is displayed when the power is 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 inverter is too low.	Looking for technical support
3	“GND” is displayed when the power is on.	1: The motor or the motor output cable is short-circuited to the ground. 2: The inverter is damaged.	1: Measure the insulation of the motor and the output cable with a megger. 2: Looking for technical support
4	The inverter display is normal when the power is on,but-“2000" 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 inverter are damaged (thermal coupler or	1: Reduce the carrier frequency (P0.17). 2: Replace the fan and clean the air filter. 3: Looking for technical support

		others).	
6	The motor does not rotate after the inverter runs.	1: Check the motor and the motor Cables. 2: The inverter 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 inverter and the motor Is normal. 2: Replace the motor or dear mechanical faults. 3: Check and re-set motor parameters.
7	The S terminals are disabled.	1: The parameter are set incorrectly. 2: The external signal is incorrect 3: The jumper bar across PLC 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:Looking for technical support
8	Reserved		
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 when the power is on or the inverter is 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

Z5000 Modbus Communication Protocol

Z5000 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 slave 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

Z5000 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 Z5000 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 Z5000 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 tims.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 frama to complete more than 1.5 characters before pause time, receiving equipment will refresh incomplete message and assume that the next byte is a nsw 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 cant 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 vaules, etc
Data content DATA (N-2)	
.....	
Data content DATA0	
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 3000(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	FOH
low-order position of data address	OAH
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 effsctivB,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 timss.when the last time (the eighth tims) 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
datajength)
{
inti;
unsigned int crc_value=Oxffff;
while(data_length-)
{
crc_value^A=*data_value++;
for(i=0;i<8;i++)
{
If(crc_value&0x0001) crc_va l
ue={crc_va l ue» 1 ^OxaOOI; else
crc_value=crc_value»1;


Retum(crc_val ue);
}
```

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:Nsither 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 - OF (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	MO1 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 corresponding to -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:Reverse JOG
	0005:Free downtime
	0006:Slowing down
	0007:Failure reset

Read the invertor 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	0~7FFF represent 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:No fault 0001:Inverter unit fault 0002:Accelerate over current 0003:Decelerate over current 0004:Constant speed over current 0005:Accelerate over the voltage 0006:Decelerate over voltage 0007:Constant speed over voltage 0008: Control power 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 parameter read and write 0016:Inverter hardware failure 0017:Motor short circuit fault 0018:Reserved 0019:Reserved 001A:Running time reached 001B: Reserved 001C: Reserved 001D: Accumulative power-on time reached 001E:Load becoming 0 001 F:PID feedback lost during running 0028: Rapid current limit fault
Communication fault address	Fault feature description
8001	0000: No fault 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[1] 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.Note 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	Default	0
	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<8,0,1> 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	Default	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 delay	Default	0
	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	Default	0.0s
	Setting range	0.0s(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	Default	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	Default	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.