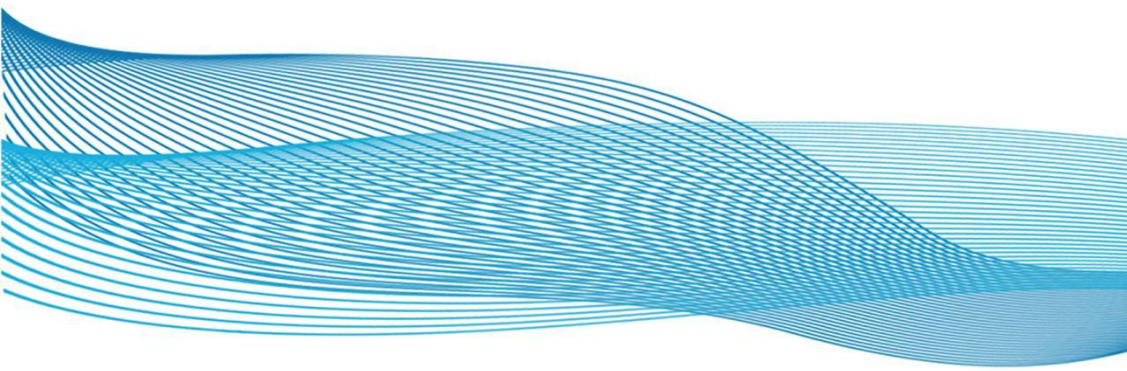
PS-06


5.5KW/7.5KW
RUN FWD/REV V A Hz
L/R TUNE/TC V A Hz
PRG
ENTER
RUN
>>
RMP.K
STOP/RES
DANGER
5 min

e

V3.0



Preface

First of all, thank you for purchasing the high-performance vector frequency VFD developed by our company!

The high-performance vector frequency VFD of our company is a universal multi-function frequency VFD, which can carry out V/F control or vector control on AC asynchronous motor, and can be used to drive textile, paper, wire drawing, machine tool, packaging, food, fan, water pump and various automatic production equipment. It has large starting torque, simple debugging, and can realize 16-segment speed operation, closed-loop process control and networking functions of the system.

This manual describes the configuration functions and use methods of the company's high-performance vector frequency VFD.

Please understand the safety precautions before using this product. Before using the frequency VFD for the first time (installation, operation, maintenance, inspection, etc.), please read this operation manual carefully. The equipment configuration manufacturer should send this manual to the end user along with the equipment for future reference.

Matters Needing Attention
• To explain the details of the product, the legends in this manual are sometimes the state of removing the cover or safety cover. When using this product, be sure to install the shell or cover as required and operate according to the manual. • The legends in this manual are for illustration only and may differ from the products you ordered. • Due to product upgrading or specification change, and to improve the convenience and accuracy of the manual, the contents of the manual will be changed in time. • If the user manual needs to be ordered due to damage or loss, please contact our regional agents or directly contact our customer service center. . If you still have some problems in use, please contact our customer service center.

Introduction

The company launched a new generation of modular high-performance frequency VFD that represents the development direction of the future frequency VFD. Compared with the traditional frequency VFD, in terms of meeting the different performance and functional requirements of customers, it is not achieved through multiple series of products (thus increasing additional manufacturing, sales, use and maintenance costs), but on the basis of reasonable segmentation of customer needs, modular design is carried out, and a customized platform is created through flexible combination of multiple modules of single series of products.

This manual provides users with relevant precautions and guidance for model selection, installation, parameter setting, field commissioning, fault diagnosis and routine maintenance. To use this series of frequency VFD correctly, please read this manual carefully in advance and keep it properly for future use. For equipment supporting customers, please send this manual to the end user along with the equipment.

Unpacking inspection:

Please confirm carefully when unpacking:

1）Whether the model of the nameplate and the rated value of the frequency VFD are consistent with your order. The box contains the machine you ordered, product certificate, user operation manual and warranty.

2）Whether the product is damaged during transportation; if any omission or damage is found, please contact our company or your supplier immediately for solution.

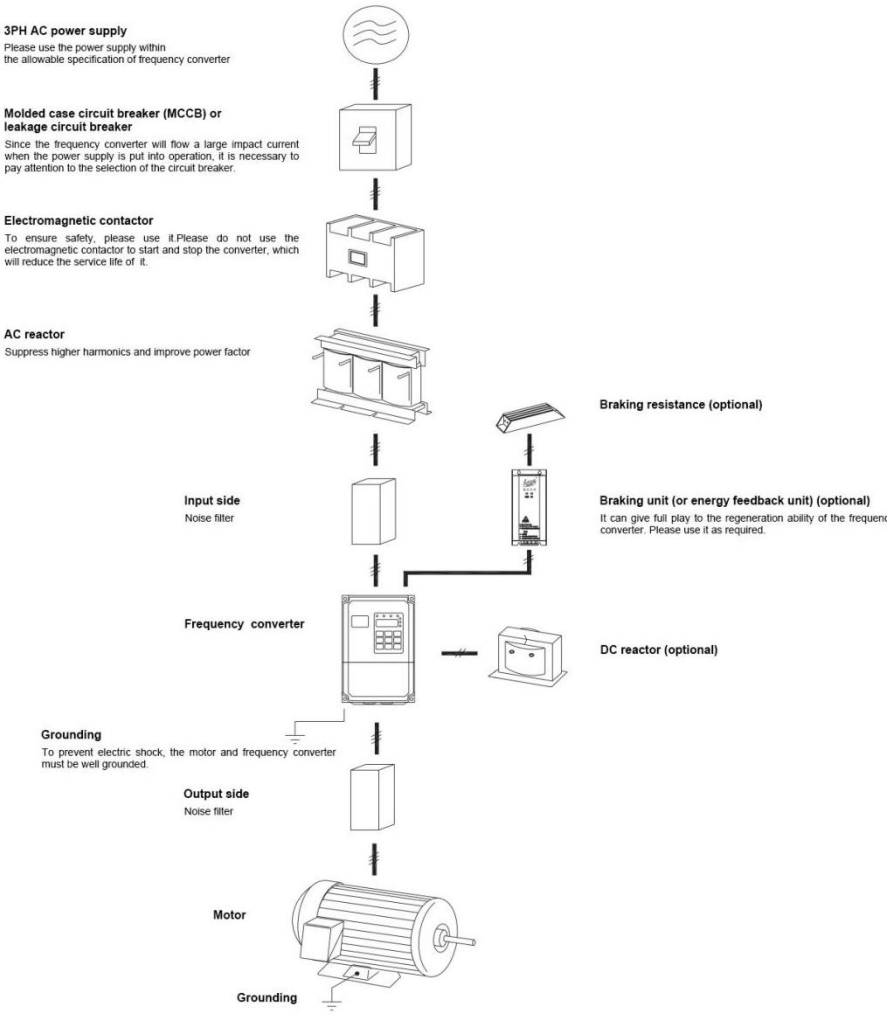
At first use:

Users who use this product for the first time should read this manual carefully. If you have doubts about some functions and performance, please consult our company's technical support personnel for help, which is beneficial to the correct use of this product to improve efficiency.

As we are committed to the continuous improvement of frequency VFD, the information provided by our company is subject to change without notice.

Catalogue

Connection with peripheral machines



Example of connection with peripheral machines

1 Do not install capacitors or surge suppressors on the output side of the VFD,which will cause the failure of it or damage to the capacitors and surge suppressors.

2 The input/output (main circuit) of the VFD contains harmonic components which may interfere with the communication equipment of the VFD accessories. Therefore, please install anti-interference filter to minimize interference.

③ Refer to the selection manual of peripheral equipment for details and options.

Safety Information And Precautions

Chapter I

Chapter 1 Safety and Precautions

Safety definition:

In this manual, safety precautions are classified as follows:

 Danger: Operations which are not performed according to requirements may cause serious equipment loss or personnel injury.

 Caution: Operations which are not performed according to requirements may cause medium hurt or light hurt or material loss.

During the installation, commissioning and maintenance of the system, please make sure to follow the safety and precautions of this chapter. In case of a result of illegal operations, caused any harm and losses is nothing to do with the company.

1.1 Safety Precautions

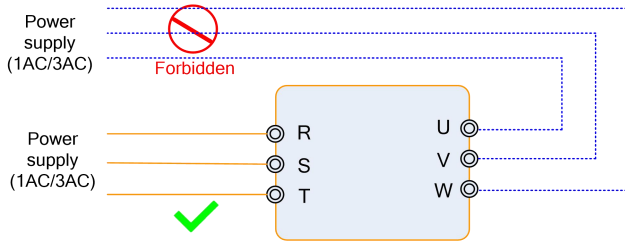
1.1.1 Before Installation:

 Danger	● Do not use the water-logged VFD, damaged VFD or VFD with missing parts. Otherwise, there may be risk of injury. ● Use the motor with Class B or above insulation. Otherwise, there may be risk of electric shock.
 Caution	● Carefully handled when loading, otherwise it may damage the VFD. ● Please don't use the damaged driver or VFD with missing parts, there may be risk of injury. ● Do not touch the electronic parts and components; otherwise it will cause static electricity.

1.1.2 During Installation:

 Danger	● Install the VFD on incombustible surface such as metal, and keep away from flammable substances. Otherwise it may cause fire. ● Do not loose the set screw of the equipment, especially the screws marked in RED.
 Caution	● Do not drop the cable residual or screw in the VFD. Otherwise it may damage the VFD. ● Please install the driver in the place where there is no direct sunlight or less vibratory. ● When more than two VFD are to be installed in one cabinet, due attention should be paid to the installation locations (refer to Chapter 3 Mechanical and Electrical Installation) to ensure the heat sinking effect.

1.1.3 During Wiring:

Danger	● Operation should be performed by the professional engineering technician. Otherwise there will be danger of electric shock! ● There should be circuit breaker between the VFD and power supply. Otherwise, there may cause fire! ● Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock! ● The ground terminal should be earthed reliably. Otherwise there may be danger of electric shock.
Caution	● Never connect AC power to output U, V, W terminals. Please note the remark of the wiring terminals, connect them correctly. Otherwise it will cause VFD be damaged!  ● Ensure the wiring circuit can meet the requirement of EMC and the area safety standard. Please follow the instructions in the manual before wiring. Otherwise may cause injury or electric shock. ● Never connect the braking resistor between DC Bus (+), (-) terminals. Otherwise may cause fire. ● Encoder must be used together with shielded wire, and ensure the single terminal of the shielded lay is connected with ground well.

1.1.4 Before Power-on:

Danger	● Please confirm whether the power voltage class is consistent with the rated voltage of the VFD and whether the I/O cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm. Otherwise it may damage the VFD. The cover must be well closed prior to the VFD power-on. Otherwise electric shock may be caused. ● The VFD is free from dielectric test because this test is performed prior to the delivery. Otherwise accident may occur.
Caution	● The cover must be well closed prior to the VFD power-on. Otherwise electric shock may be caused! ● Whether all the external fittings are connected correctly in accordance with the circuit provided in this manual. Otherwise accident may occur!

1.1.5 After Power-on:

 Danger	● Do not open the cover of the VFD upon power-on. Otherwise there will be danger of electric shock! ● Do not touch the VFD and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock! ● Do not touch the VFD terminals (including control terminal). Otherwise there will be danger of electric shock! ● At power-on, the VFD will perform the security check of the external heavy-current circuit automatically. Thus, at the moment please do not touch the terminals U, V and W, or the terminals of motor, otherwise there will be danger of electric shock.
 Caution	● If parameter identification is required, due attention should be paid to the danger of injury arising from the rotating motor. Otherwise accident may occur! ● Do not change the factory settings at will. Otherwise it may damage the equipment!

1.1.6 During Operation:

 Danger	● Do not touch the fan or discharge resistor to sense the temperature. Otherwise, you may get burnt! ● Detection of signals during the operation should only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused!
 Caution	● During the operation of the VFD, keep items from falling into the equipment. Otherwise, it may damage the equipment! ● Do not start and shut down the VFD by connecting and disconnecting the contactor. Otherwise, it may damage the equipment!

1.1.7 During Maintain:

 Danger	● Do not repair and maintain the equipment with power connection. Otherwise there will be danger of electric shock! ● Be sure to conduct repair and maintenance after the charge LED indictor of the VFD is OFF. Otherwise, the residual charge on the capacitor may cause personal injury! ● The VFD should be repaired and maintained only by the qualified person who has received professional training. Otherwise, it may cause personal injury or equipment damage! ● Carry out parameter setting after replacing the VFD, all the plug-ins must be plug and play when power outage.

1.2 Precautions

1.2.1Motor Insulation Inspection

Before the motor is used for the first time, after being stored for a long time, and before being used again and during regular inspection, the motor insulation shall be checked to prevent damage to the frequency VFD due to the insulation failure of the motor winding. During the insulation inspection, the motor wiring must be separated from the frequency VFD. It is recommended to use a 500V voltage type megohmmeter to ensure that the measured insulation resistance is not less than 5MΩ.

1.2.2Thermal Protection of Motor

If the selected motor does not match the rated capacity of the frequency VFD, especially if the rated power of the frequency VFD is greater than the motor, be sure to adjust the relevant parameter values of the motor protection in the frequency VFD or install a thermal relay in front of the motor to protect it.

1.2.3Operation Above Power Frequency

The frequency VFD can provide output frequency of 0Hz~500Hz. If the customer needs to operate above 50Hz, please consider the bearing capacity of the mechanical device.

1.2.4Vibration of Mechanical Device

At some output frequencies, the frequency VFD may encounter the mechanical resonance point of the load device, which can be avoided by setting the hopping frequency parameter in the frequency VFD.

1.2.5About Motor Heating and Noise

Because the output voltage of the frequency VFD is PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will slightly increase compared with the power frequency operation.

1.2.6 Voltage Sensitive Device or Capacitor to Improve Power Factor at Output Side

The output of the VFD is a PWM wave. If the output side is installed with a capacitor to improve the power factor or a voltage sensitive resistor for lightning protection, it is easy to cause the instantaneous over-current of the VFD or even damage it. Please do not use.

1.2.7Contactors and Other Switching Devices Used at the Input and Output Ends of Frequency VFD

If a contactor is installed between the power supply and the input end of the VFD, it is not allowed to use this contactor to control the start and stop of it. When the contactor must be used to control the start and stop of it, the interval shall not be less than one hour. Frequent charging and discharging can easily reduce the service life of the capacitor in the VFD. If there are switching devices such as contactors between the output end and the motor, it should be ensured that the VFD can be switched on and off when there is no output, otherwise the module in it may be damaged.

1.2.8 Use Other Than Rated Voltage

It is not suitable to use our series of frequency VFD outside the allowable working voltage range specified in the manual, which may easily cause damage to the components in it. If necessary, please use the corresponding boosting or reducing device for voltage transformation.

1.2.9Change Three-phase Input to Two-phase Input

Three-phase VFD can not be changed to two-phase use. Otherwise, it will cause failure or damage to the frequency VFD.

1.2.10 Lightning Impulse Protection

This series of VFD is equipped with lightning over-current protection device, which has certain self-protection ability for induction lightning. For customers in places with frequent lightning, protection should also be installed at the front end of the VFD.

1.2.11 Altitude and Derating Use

In areas with an altitude of more than 1,000m, the hat dissipation effect of the frequency VFD is poor due to the thin air, so it is necessary to reduce the rating. Please contact our company for technical consultation.

1.2.12 Some special uses

If the customer needs to use methods other than the recommended wiring diagram provided in this manual, such as common DC bus, please consult our company.

1.2.13Be careful when scrapping the frequency VFD

The electrolytic capacitor in the main circuit and on the printed board may explode when burned. The burning of plastic parts will produce toxic gas. Please treat it as industrial waste.

1.2.14Adaptive motor

1)The standard adaptive motor is a four-pole squirrel-cage asynchronous induction motor. If it is not the above motor, please select the frequency VFD according to the rated current of the motor. If you need to drive permanent magnet synchronous motor, please consult our company;

2)The cooling fan of the non-variable frequency motor is coaxial with the rotor shaft, and the cooling effect of the fan decreases when the speed decreases. Therefore, the strong exhaust fan should be installed or replaced with the variable frequency motor when the motor overheats;

3)The frequency VFD has built-in standard parameters for the motor. According to the actual situation, it is necessary to identify the motor parameters or modify the default values to meet the actual values as much as possible, otherwise the operation effect and protection performance will be affected;

4)A short circuit in the cable or motor may cause the frequency VFD to alarm or even explode. Therefore, please conduct insulation short circuit test on the initially installed motor and cable first, and this test also needs to be carried out frequently in daily maintenance. Please note that the frequency VFD must be disconnected from all the tested part during this test.

Product Information

Chapter II

Chapter II Product Information

2.1Model and Technical Data

Table**2-1**

VFD Model	Input voltage	Power capacity **(kVA)**	Input current **(A)**	Output current **(A)**	Adaptive motor **(kW)**
G0R7/T2	Single-phase 220V Range: -15% ∽20%	1.5	8.2	4.0	0.75
G1R5/T2		3.0	14.2	7.0	1.5
G2R2/T2		4.0	23.0	9.6	2.2
G055/T6	Two-phase 690V 50/60HZ	85.0	65.0	63.0	55
G075/T6		114.0	86.0	85.0	75
G090/T6		134.0	98.0	95.0	90
G110/T6		160.0	121.0	118.0	110
G132/T6		192.0	170.0	150.0	132
G160/T6		231.0	200.0	175.0	160
G185/T6		240.0	215.0	195.0	185
G200/T6		250.0	235.0	215.0	200
G220/T6		280.0	247.0	245.0	220
G250/T6		355.0	265.0	260.0	250
G280/T6		396.0	305.0	299.0	280
G315/T6		445.0	355.0	330.0	315
G355/T6		500.0	382.0	374.0	355
G400/T6		565.0	435.0	410.0	400
G450/T6		630.0	490.0	465.0	450
G500/T6		700.0	595.0	550.0	500
G560/T6		760.0	605.0	590.0	560

VFD Model	Input Voltage	Power Capacity **(KVA)**	Input Current**(A)**	Output Current**(A)**	Adaptive Motor**(KW)**
G0R7/T4	Three-phase 380V Range: -15% ∽20%	1.5	3.4	2.1	0.75
G1R5/T4		3.0	5.0	3.8	1.5
G2R2/T4		4.0	5.8	5.1	2.2
G3R7/T4		5.9	10.5	9.0	3.7
G5R5/T4		8.9	14.6	13.0	5.5
G7R5/T4		11.0	20.5	17.0	7.5
G011/T4		17.0	26.0	25.0	11.0
G015/T4		21.0	35.0	32.0	15.0
G018/T4		24.0	38.5	37.0	18.5
G022/T4		30.0	46.5	45.0	22.0
G030/T4		40.0	62.0	60.0	30.0
G037/T4		57.0	76.0	75.0	37.0
G045/T4		69.0	92.0	91.0	45.0
G055/T4		85.0	113.0	112.0	55.0
G075/T4		114.0	157.0	150.0	75.0
G090/T4		134.0	180.0	176.0	90.0
G110/T4		160.0	214.0	210.0	110.0
G132/T4		192.0	256.0	253.0	132.0
G160/T4		231.0	307.0	304.0	160.0
G185/T4		240.0	345.0	340.0	185.0
G200/T4		250.0	385.0	377.0	200.0
G220/T4		280.0	430.0	426.0	220.0
G250/T4		355.0	468.0	465.0	250.0
G280/T4		396.0	525.0	520.0	280.0
G315/T4		445.0	590.0	585.0	315.0
G355/T4		500.0	665.0	650.0	355.0
G400/T4		565.0	785.0	725.0	400.0
G450/T4		630.0	885.0	820.0	450.0
G500/T4		700.0	920.0	860.0	500.0

2.2 Technical Specifications

2-3 Technical specification of frequency VFD

Item		Specification	
Basic function	Maximum frequency	Vector control: 0~500Hz V/F control: 0~2000Hz	
	Carrier frequency	0.5kHz ∽16kHz The carrier frequency can be automatically adjusted according to the load characteristics.	
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency X 0.025%	
	Control mode	Sensorless vector control (SVC) （FVC）Closed-loop vector control V/F control	
	Starting torque	G-type machine：0.25Hz/150% (SVC) ; 0Hz/180% (FVC) P-type machine: ：0.25Hz/150% (SVC) ; 0Hz/180% (FVC)	
	Speed range	1： 100 (SVC)	1： 1000 (FVC)
	Steady speed and accuracy	±0.5% (SVC)	±0.02% (FVC)
	Torque control accuracy	±5% (FVC)	
	Overload capacity	G type machine: 150% rated current for 60s; 180% rated current for 3s. P-type machine: 120% rated current 60s; 150% rated current for 3s.	
	Torque increase	Automatic torque increase; manual torque increase 0.1%~30.0%	
	V/F curve	Three ways: linear type; multi-point type; N^{th} power V/F curve (1.2 power, 1.4 power, 1.6 power, 1.8 power, 2 power)	
	V/F separation	Two methods: full separation and half separation	
	Acceleration and deceleration curve	Linear or S-curve acceleration and deceleration mode. 0.0-6500.0SFour kinds of acceleration and deceleration time, the acceleration and deceleration time range is 0.0s-6500.0S	
	DC braking	DC braking frequency: 0.00Hz-S large frequency Braking time: 0.0s~36.0s Braking action current value: 0.0%~100.0%	
	Inching control	Jog frequency range: 0.00Hz~50.00Hz Jog acceleration and deceleration time 0.0s~6500.0s	
	Simple PLC 、 multi-stage speed operation	Up to 16 segments of speed operation can be realized through built-in PLC or control terminal	
	Built-in PID	Convenient realization of process control closed-loop control system	
	Automatic voltage regulation (AVR)	When the grid voltage changes, it can automatically keep the output voltage constant	
	Over-voltage and over-current stall control	Automatic limit of current and voltage during operation to prevent frequent over-current and over-voltage tripping	
	current limiting function	Minimize over-current fault and protect normal operation of frequency VFD	
	Torque limitation and control	The "excavator" feature automatically limits the torque during operation to prevent frequent over-current tripping; closed-loop vector mode can realize torque control	

Item		Specification
Personalized function	Excellent performance	Asynchronous motor and synchronous motor control with high-performance current vector control technology
	Instantaneous stop	In case of transient power failure, the load feedback energy compensates the voltage reduction to maintain the continuous operation of the VFD for a short time
	Fast current limiting	Avoid frequent over-current fault of frequency VFD
	Virtual IO	Five groups of virtual DIDO can realize simple logic control
	Timing control	Timing control function: set the time range of 0.0Min~6500.0Min
	Multi-motor	Four sets of motor parameters can realize four motor switching control
	Multi-threaded bus support	Support field bus: RS-485
	Multiple encoder support	Support differential, open collector, UVW, resolver, sine and cosine encoders
	User programmable	Optional user programmable card can realize secondary development, and the programming mode is compatible with the PLC of Huichuan Company
	Powerful background software	Support VFD parameter operation and virtual oscilloscope function. Graphical monitoring of internal state of frequency VFD can be realized through virtual oscilloscope
Functioning	Command source	The operation panel is given, the control terminal is given, and the serial communication port is given. It can be switched in many ways
	Frequency source	10 kinds of frequency sources: digital setting, analog voltage setting, analog current setting, pulse setting and serial port setting. It can be switched in many ways
	Auxiliary frequency source	10 auxiliary frequency sources. Flexible realization of auxiliary frequency fine tuning and frequency synthesis
	Input terminal	Standard: Six digital input terminals, one of which supports high-speed pulse input up to 100kHz Two analog input terminals, one of which only supports 0~10V voltage input, 1 support 0∽ 10V voltage input or 4-20mA current input
	Output terminal	Standard: 1 high-speed pulse output terminal (optional open collector type), supporting 0~100kHz square wave signal output 1 digital output terminal 2 relay output terminals 2 analog output terminals, supporting 0~20mA current output or 0~10V voltage output
Environment	Place of use	Indoor, free from direct sunlight, dust, corrosive gas, flammable gas, oil mist, water vapor, dripping water or salt, etc
	Altitude	1000m Below 1,000m
	Ambient temperature	-10 ° C~+40°C (When ambient temperature is 40 ° C~50 ° C, please derate)
	Humidity	Less than 95% RH, no water condensation
	Vibration	Less than 5.9m/s^2 (0.6g)
	Storage temperature	—20°C~+60°C

2.3 Product outline drawing and installation hole size

2.3.1Product outline drawing:

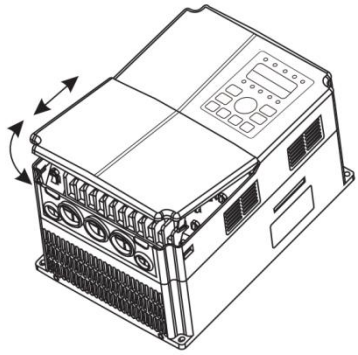


Figure 2-1Removal and installation diagram of plastic cover plate

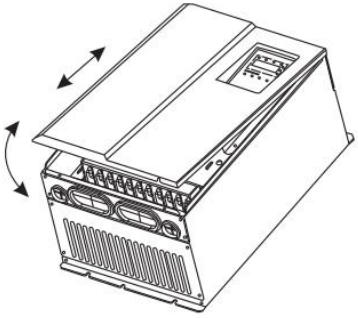


Figure 2-2 Removal and installation diagram of silver and gold cover plate

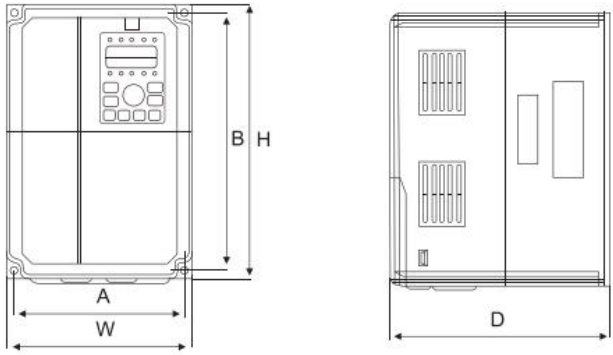


Figure 2-3 Dimensions below 22kw plastic model

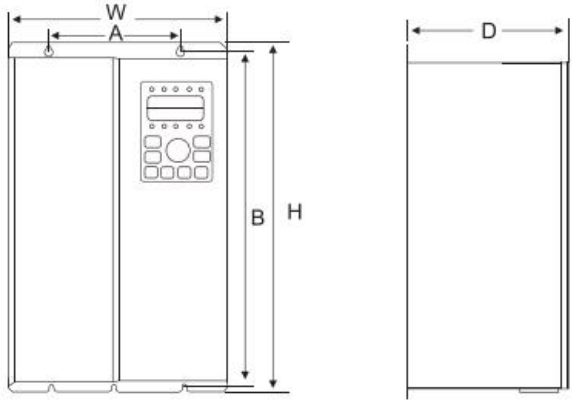
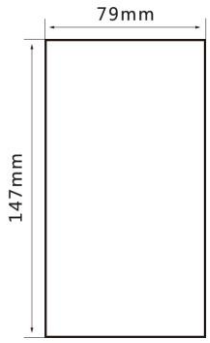


Figure 2-4 Boundary Dimensions of
30-500KW

Keypad bracket hole size



2-4 Appearance and installation hole size

Power(kw)	A(mm)	B(mm)	H (mm)	W (mm)	D (mm)	Mounting hole diameter (mm)	Remarks
	Installation dimension		Overall dimension				
1.5-4	113	172	186	125	177	5	
5. 5-11	148	236	248	160	192	5	
15-22	190	305	322	208	200	6	
30-37	235	447	463	285	243	6.5	
45-75	260	580	600	385	280	7	
90-132	343	678	700	473	322	9	
160-200	449	903	930	579	395	12.5	
220-315	420	1030	1060	650	395	12.5	
355-450	520	1300	1360	800	405	12.5	
500	700	1130	1175	840	415	12.5	

Note: Due to the upgrade of the product, the size has been changed. Please refer to the real object.

2.3.2 Dimensional drawing of external DC reactor

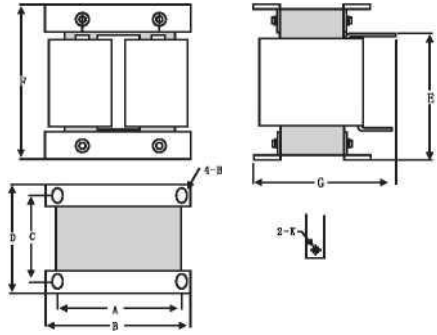


Figure 2-8 Dimension diagram of external reactor

Table 2-5 Applicable frequency VFD models

Applicable frequency VFD models	A	B	C	D	E	F	G	Fixing hole	Copper plate connection hole diameter	Reactor model
G75/P90/G90	160	190	125	161	192	255	195	10*15	Φ 12	DCL-0200
P110/G110/P132	160	190	125	161	192	255	195	10*15	Φ 12	DCL-0250
G132/P160/G160	160	190	125	161	192	255	195	10*15	Φ 12	DCL-0360
P200/G200/P220/ G220/P250	190	230	93	128	250	325	200	13*18	Φ 15	DCL-0600
G250/P280/G280/ P315	190	230	93	128	250	325	200	13*18	Φ 15	DCL-0700
G315/P355/G355/ P400/G400/P450	224	250	135	165	260	335	235	12*20	Φ 14	DCL-1000

Note: Non-standard products can be customized for special requirements

Installation method of external DC reactor:

During installation, the user needs to remove the direct short-circuit copper bar of the main circuit terminal P1 and (+) of the converter, and then connect the DC reactor between

P1 and (+). The connection between the reactor terminal and the converter terminals P1 and (+) has no polarity. After the DC reactor is installed, the short circuit copper bar between P1 and (+) is no longer used.

2.4 Selection of accessories

If you need the following optional accessories, please specify when ordering.

Table 2-6 Selection of frequency VFD accessories

Name	Model	Function	Remarks
Built-in brake unit	/	Three-phase 1.5KW~22kW built-in brake unit is standard configuration	30kW~37KW built-in brake unit optional
External brake unit	/	External brake unit of 45kW and above	
Extension cable	/	Standard 8-core network cable	Standard configuration 2m

2.5 Routine maintenance and repair of frequency VFD

2.5.1Routine maintenance

Due to the influence of ambient temperature, humidity, dust and vibration, the internal components of the VFD will be aged, resulting in potential failure of the VFD or reducing the service life of it. Therefore, it is necessary to carry out daily and regular maintenance and repair for the frequency VFD.

Daily inspection items:

1) Whether the sound changes abnormally during motor operation

2) Whether there is vibration during motor operation

3) Whether the installation environment of frequency VFD has changed

4) Whether the converter's cooling fan works normally

5) Whether the frequency VFD is overheated

Daily cleaning:

The frequency VFD should always be kept clean.

Effectively remove the dust on the upper surface of the VFD and prevent the dust from entering the inside of the VFD. Especially metal dust.

Effectively remove the oil dirt of the converter's cooling fan.

2.5.2 Regular inspection

Please regularly check the places that are difficult to check during operation.

Regular inspection items:

1） Check the air duct and clean it regularly

2) Check whether the screws are loose

3) Check that the frequency VFD is corroded

4) Check whether the wiring terminal has arcing traces

5) Main circuit insulation test

Reminder: When measuring insulation resistance with a megohmmeter (please use a 500V$_{DC}$ megohmmeter), disconnect the main circuit route from the frequency VFD. Do not use an insulation resistance meter to test the insulation of the control circuit. High voltage test is not necessary (completed at the factory).

2.5.3 Replacement of frequency converter's vulnerable parts

The vulnerable parts of frequency VFD mainly include cooling fan and electrolytic capacitor for filtering, whose service life is closely related to the use environment and maintenance condition. The general life time is:

Device name	Life time
Fan	2∽3 years
Electrolytic capacitor	4∽5 years

The user can determine the replacement period according to the operation time.

1） Cooling fan

Possible causes of damage: bearing wear, blade aging.

Criteria: whether there are cracks in fan blades, and whether there is abnormal vibration sound when starting.

2） Filtered electrolytic capacitor

Possible causes of damage: poor quality of input power supply, high ambient temperature, frequent load jump, electrolyte aging. Criteria: whether there is liquid leakage, whether the safety valve is protruding, the measurement of electrostatic capacitance, and the measurement of insulation resistance.

2.5.4 Storage of frequency VFD

After the user purchases the VFD, the following points must be paid attention to for temporary storage and long-term storage:

1） When storing, try to put it into the packaging box of the company according to the original packaging.

2） Long-term storage will lead to deterioration of electrolytic capacitor. It must be ensured that the electrolytic capacitor is powered on once within 2 years, and the power-on time is at least 5 hours. The input voltage must be slowly raised to the rated value with a voltage regulator.

2.6 Warranty description of frequency VFD

The free warranty only refers to the VFD itself.

1）

Under normal use, in case of failure or damage, our company is responsible for the 18-month warranty (from the date of manufacture, the barcode on the body shall prevail. For more than 18 months, we will charge a reasonable maintenance fee;

2）

Within 18 months, certain maintenance costs shall be charged if the following conditions occur:

a） The machine damage caused by the user's failure to comply with the provisions in the manual;

b) Damage caused by fire, flood, abnormal voltage,

c) Damage caused by using frequency VFD for abnormal functions;

The relevant service fees shall be calculated according to the uniform standard of the manufacturer. If there is a contract, the contract shall prevail.

2.7 Guidance for model selection

Three control modes can be provided: ordinary V/F, SVC, VCo

When selecting the frequency VFD, it is necessary to first clarify the technical requirements of the system for frequency conversion and speed regulation, the application situation of the frequency VFD and the specific conditions of the load characteristics, and comprehensively consider the factors such as the adaptive motor, output voltage, rated output current, and then select the model that meets the requirements and determine the operation mode.

The basic principle is that the rated load current of the motor cannot exceed the rated current of the frequency VFD. Generally, the selection shall be made according to the capacity of the matched motor specified in the manual, and the rated current of the motor and the frequency VFD shall be compared. The overload capacity of the frequency VFD is only meaningful for the starting and braking process. Any short-time overload during operation will cause changes in load speed. If there is a high requirement for speed and accuracy, please consider enlarging a grade.

Type of fan and water pump: the requirements for overload capacity are relatively low. Since the load torque is proportional to the square of speed, the load is relatively light at low speed (except for Roots blower, and because this type of load has no special requirements for speed accuracy, square torque V/F is selected.

Constant torque load: Most loads have constant torque characteristics, but the requirements for speed accuracy and dynamic performance are generally not high. Such as extruder, mixer, conveyor belt, transport trolley in the factory, translation mechanism of crane, etc. Multi-segment V/F operation mode is optional during model selection.

The controlled object has certain dynamic and static index requirements: this kind of load

generally requires hard mechanical characteristics at low speed to meet the dynamic and static index requirements of the production process for the control system. SVC control mode can be selected during model selection.

The controlled object has high dynamic and static index requirements: VC control mode can be used for occasions with high requirements for speed regulation accuracy and dynamic performance index and high-precision synchronous control. For example, elevator, paper making, plastic film processing production line.

2.8 Guide for selection of brake components

(*): Table 2- 7 is the guidance data. The user can select different resistance values and power according to the actual situation. (The resistance value must not be less than the recommended value in the table, and the power can be large.) The selection of braking resistance needs to be determined according to the power generated by the motor in the actual application system, which is related to the system inertia, deceleration time, potential energy load energy, etc., and needs to be selected by the customer according to the actual situation. The greater the inertia of the system, the shorter the deceleration time required, and the more frequent the braking, the greater the power and the smaller the resistance of the braking resistor.

2.8.1 Selection of resistance value

When braking, almost all the regenerative energy of the motor is consumed on the braking resistance.

According to the formula: U * U/R=Pb

- In the formula, U - braking voltage of system stable braking
- (Different systems are also different, generally 700V for 380VAC system)
- Pb----brake power

2.8.2 Power selection of braking resistor

In theory, the power of the braking resistor is consistent with the braking power, but considering the derating is 70%.

According to the formula: 0.7 * Pr=Pb * D

- Pr - resistance power
- D - braking frequency (proportion of regeneration process to the whole working process)

Elevator - 20%~30% Uncoiling - 20 - 30%

Centrifuge 50%~60% Accidental braking load - 5%

Generally 10%

Table 2-7 Selection of brake components of frequency VFD

VFD power	Recommended power of braking resistor	Recommended resistance of braking resistor	Braking unit	Remarks
1.5KWT4	150W	≥220Ω	Standard built-in	No special instructions
2.2KWT4	250W	≥200Ω		
3.7KWT4	300W	≥130Ω		
5.5KWT4	400W	≥90Ω		
7.5KWT4	500W	≥65Ω		
11KWT4	800W	≥43Ω		
15KWT4	1000W	≥32 Ω		
18.5KWT4	1300W	≥25Ω		
22KWT4	1500W	≥22 Ω		
30KWT4	2500W	≥16Ω	Built-in optional	Add "B" after VFD model
37KWT4	3.7 kW	≥16.0Ω		
45KWT4	4.5 kW	≥16Ω	External	VFDBU-35-B
55KWT4	5.5 kW	≥8Ω	External	VFDBU-70-B
75KWT4	7.5 kW	≥8Ω	External	VFDBU-70-B
90KWT4	4.5kWx2	≥8ΩX2	External	VFDBU-70-BX2
110KWT4	5.5 kWx2	≥8Ω X2	External	VFDBU-70-BX2
132KWT4	6.5 kWx2	≥8ΩX2	External	VFDBU-70-BX2
160KWT4	16kW	≥2.5Ω	External	VFDBU-200-B
200KWT4	20 kW	≥2.5Ω	External	VFDBU-200-B
220KWT4	22 kW	≥2.5Ω	External	VFDBU-200-B
250KWT4	12.5 kWx2	≥2.5Ω X2	External	VFDBU-200-BX2
280KWT4	14kWx2	≥2.5Ω X2	External	VFDBU-200-Bx2
315KWT4	16kWx2	≥2.5Ω X2	External	VFDBU-200-BX2
355KWT4	17kWx2	≥2.5Ω X2	External	VFDBU-200-BX2
400KWT4	14kWx3	≥2.5Ω X3	External	VFDBU-200-BX3
450KWT4	15kWx3	≥2.5Ω X3	External	VFDBU-200-BX3

Note: X2 means that two braking units are used in parallel with their respective braking resistors, and X3 is the same as X2.

Mechanical
And
Electrical Installation

Chapter III

Chapter III Mechanical and Electrical Installation

3.1 Mechanical installation

3.1.1: Installation environment:

1).Ambient temperature: the ambient temperature has a great impact on the life of the VFD. The operating ambient temperature of the VFD is not allowed to exceed the allowable temperature range（-10℃∽50℃).

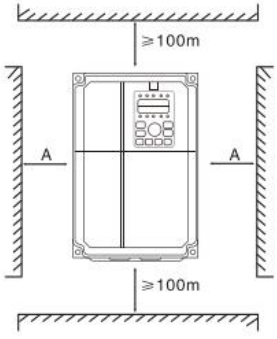
2).Install the frequency VFD on the surface of a flame-retardant object, and there should be enough space around it to dissipate heat. The frequency VFD is easy to generate a large amount of heat when working. And install it vertically on the mounting bracket with screws.

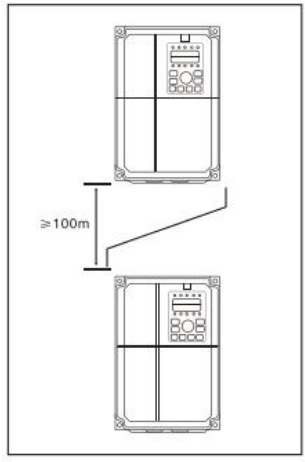
3.Please install it in a place that is not easy to vibrate. The vibration shall not be greater than 0.6G. Pay special attention to keep away from equipment such as punches.

4.Avoid installing it in places with direct sunlight, moisture and water droplets.

5.Avoid being installed in places with corrosive, flammable and explosive gases in the air.

6.Avoid installing it in places with oil dirt, dust and metal dust.





Single installation diagram　　Upper and lower installation diagram

For single installation: when the power of frequency VFD is not more than 22kW, dimension A may not be considered. When it is greater than 22kW, A should be greater than 50mm

When installing up and down: please install the heat insulation deflector as shown in the figure when installing the frequency VFD up and down.

Power level	Installation size	
	B	A
<15kW	≥100mm	No requirement
18.5kW—30kW	≥200mm	≥50mm
237kW	≥300mm	≥50mm

Figure 3-1 Installation diagram of frequency VFD

3.1.2

Mechanical installation needs to pay attention to heat dissipation. So please note the following points:

1）

Please install the frequency VFD vertically so that the heat can be distributed upwards. But it cannot be inverted. If there are many frequency VFD in the cabinet, it is better to install them side by side. When it is necessary to install up and down, please refer to the schematic diagram in Figure 3-1 to install the heat insulation deflector.

2）

The installation space is as shown in Figure 3-1 to ensure the heat dissipation space of the VFD. However, please consider the heat dissipation of other devices in the cabinet when arranging.

3）

The mounting bracket must be made of flame retardant material.

4）

For applications with metal dust, it is recommended to install the radiator outside the cabinet. At this time, the space inside the fully sealed cabinet should be as large as possible.

3.1.3 Removal and installation of lower cover plate

The frequency VFD below 22kW adopts plastic shell. See Figure 3-2 for the removal of the lower cover plate of the plastic shell. Use tools to force the hook of the lower cover plate to the inside.

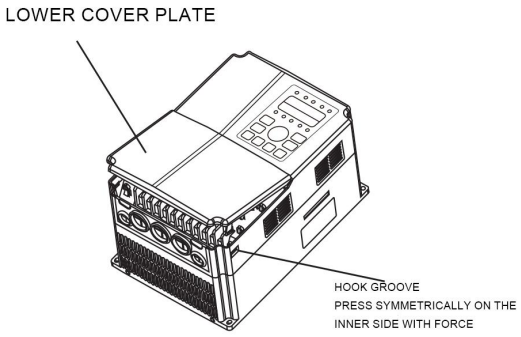


Figure 3-2 Removal diagram of the lower cover plate of the plastic shell

The frequency VFD above 30 kW uses a sheet metal shell. See Figure 3-3 for the removal of the lower cover plate of the sheet metal shell. Use tools to directly loosen the screws of the lower cover plate.

Danger
● When removing the lower cover plate, avoid falling off the lower cover plate, which may cause injury to equipment and personnel.

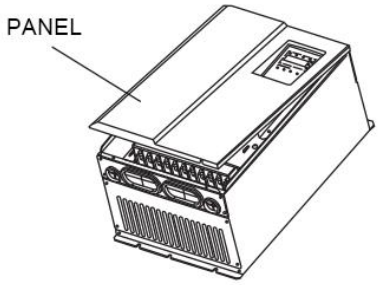


Figure 3-3 Removal of the lower cover plate of the sheet metal shell

3.2 Electrical installation

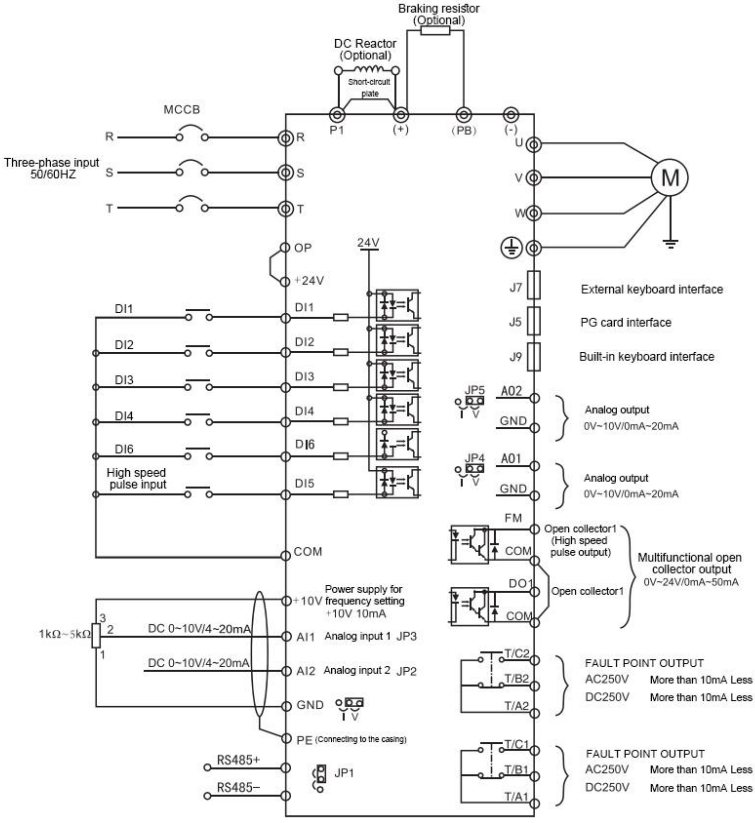
3. 2.1 Selection guide for external electrical components

Table 3-1 Selection guide for external electrical components of frequency VFD

VFD power	(Air switch (MCCB) A	Recommended contactor A	Recommended input side main circuit wire mm2	Recommended output side main circuit wire mm2	Recommended control circuit wire mm2
0.4KWT2	16	10	2.5	2.5	1.0
0.7KWT2	16	10	2.5	2.5	1.0
1.5KWT2	20	16	4.0	2.5	1.0
2.2KWT2	32	20	6.0	4.0	1.0
0.7KWT4	10	10	2.5	2.5	1.0
1.5KWT4	16	10	2.5	2.5	1.0
2.2KWT4	16	10	2.5	2.5	1.0
3.7KWT4	25	16	4.0	4.0	1.0
G5.5KWT4/P7.5KWT4	32	25	4.0	4.0	1.0
G7.5KWT4/P11KWT	40	32	4.0	4.0	1.0
G11KWT4/P15KWT	63	40	4.0	4.0	1.0
G15KWT4/P18.5KWT4	63	40	6.0	6.0	1.0
G18.5KWT4/P22KWT4	100	63	6	6	1.5
G22KWT4/P30KWT	100	63	10	10	1.5
G30KWT4/P37KWT	125	100	16	10	1.5
G37KWT4/P45KWT	160	100	16	16	1.5
G45KWT4/P55KWT	200	125	25	25	1.5
G55KWT4/P75KWT	200	125	35	25	1.5
G75KWT4-P90KWT4	250	160	50	35	1.5
G90KWT4/P110KWT4	250	160	70	35	1.5
G110KWT4/P132KWT	350	350	120	120	1.5
G132KWT4/P160KWT	400	400	150	150	1.5
G160KWT4/P200KWT	500	400	185	185	1.5
G200KWT4/P220KWT	600	600	150*2	150*2	1.5
G220KWT4/P250KWT	600	600	150*2	150*2	1.5
G250KWT4/P280KWT	800	600	185*2	185*2	1.5
G280KWT4/P315KWT	800	800	185*2	185*2	1.5
G315KWT4/P355KWT	800	800	150*3	150*3	1.5
G355KWT4/P400KWT	800	800	150*4	150*4	1.5
G400KWT4/P450KWT	1000	1000	150*4	150*4	1.5
660V series	Refer to parameters of 380V system with similar rated current				

3.2.2 Wiring mode

Wiring diagram of three-phase VFD:



1)Terminal ◎ represents the main circuit terminal and ○ represents the control circuit terminal.

2)1.5kW~22kW built-in brake unit is standard configuration, without additional installation.

3) The braking resistor is selected according to the user's needs, as detailed in the selection guide for braking resistors.

3.2.3 Main circuit terminals and wiring

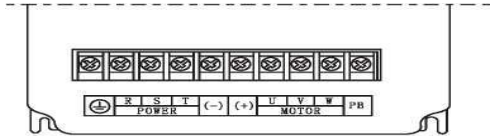
Danger

- Make sure that the power switch is at OFF status prior to perform wiring connection. Otherwise there may be danger of electric shock!
- Only the qualified and trained personnel can perform wiring connection. Otherwise it may cause equipment and human injuries!
- It should be earthed reliably. Otherwise there may be danger of electric shock or fire!

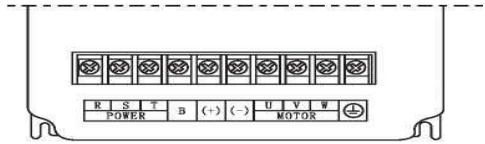
Caution

- Make sure that the rated value of the input power supply is consistent with that of the VFD. Otherwise it may damage the VFD!
- Make sure that the motor matches the VFD. Otherwise it may damage the motor or generate VFD protection!
- Do not connect the power supply to the terminals of U, V and W. Otherwise it may damage the VFD!
- Do not directly connect the brake resistor between the DC Bus terminals (+) and (-). Otherwise it may cause fire!

Main circuit wiring terminal diagram 11-22kw



Main circuit wiring terminal diagram 4-11GS



Main circuit wiring terminal diagram 1.5-4GS

Figure 3-6 Power terminal diagram of drive main circuit

1） Description of main circuit terminal of single-phase VFD:

Terminal tag	Name	Description
R、T	Single-phase power input terminal	Connection point of single-phase 220V AC power supply
(+)、(-)	Positive and negative terminals of DC bus	Common DC bus input point
(+)、PB	Braking resistor connection terminal	Connect braking resistor
U、V、W	VFD output terminal	Connect three-phase motor
⏚	Grounding terminal	Grounding terminal

2） Description of main circuit terminal of three-phase VFD:

Terminal tag	Name	Description
R、S, T	Three-phase power input terminal	AC input three-phase power connection point
（+）、（-）	Positive and negative terminals of DC bus	Common DC bus input point (connection point of external braking unit above 45kW)
(+)、PB	Braking resistor connection terminal	Connection point of braking resistor below 37 kW (optional for 30-37 kW braking unit)
P1、（+）	External reactor connection terminal	Connection point of external reactor
U、V、W	VFD output terminal	Connect three-phase motor
⏚	Grounding terminal	Grounding terminal

Wiring precautions:

a） Input power R, S, T:

The input side wiring of the frequency VFD has no phase sequence requirements.

b） DC bus (+ and (- terminals:

Note that there is residual voltage at the (+ and (- terminals of the DC bus just after the power failure. You must wait until the CHARGE light is off and confirm that it is less than 36V before contacting, otherwise there is a risk of electric shock.

When selecting external brake components above 45kW, pay attention that the (+) and (-) polarity cannot be reversed, otherwise the frequency VFD will be damaged or even fire will occur.

The wiring length of braking unit shall not exceed 10m. Twisted pair or tight double wire

parallel wiring shall be used.

Do not connect the braking resistor directly to the DC bus, which may cause damage to the VFD or even fire.

c） Braking resistor connection terminal (+, PB:

The connection terminal of braking resistor is only valid for models below 37kW and

confirmed to have built-in braking unit.

The selection of braking resistance shall refer to the recommended value and the wiring distance shall be less than 5m. Otherwise, the VFD may be damaged.

d） External reactor connection terminals P1, (+)

The power VFD and reactor of 45kW and above are externally installed. During assembly, remove the connecting piece between P1 and (+) terminals, and connect the reactor between two terminals.

e） VFD output side U, V, W:

Capacitors or surge absorbers cannot be connected to the output side of the VFD, otherwise the VFD will be frequently protected or even damaged.

When the motor cable is too long, due to the influence of the distributed capacitance, it is easy to generate electrical resonance, which may cause damage to the motor insulation or produce large leakage current to make the VFD over-current protection. When the length of motor cable is more than 100m, AC output reactor must be installed.

f） Grounding terminal PE:

The terminal must be reliably grounded, and the resistance of the grounding wire must be less than 0.1 Ω, otherwise the equipment will work abnormally or even be damaged.

Do not share the grounding terminal with the N terminal of the power zero line.

3. 2.4：Control terminal and wiring:

1） The control circuit terminal layout is as follows:

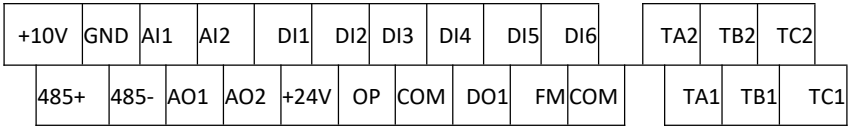


Figure 3-7 Control circuit terminal layout

2）Function description of control terminal:

Table 3-3

Category	Terminal symbol	Terminal name	Function description
Power Supply	+10V-GND	External+10V power supply	Provide+10V power supply outward, maximum output current: 10mA It is generally used as the working power supply of the external potentiometer. The resistance range of the potentiometer is 1k Ω~5k Ω
	+24V-COM	External+24V power supply	The+24V power supply is provided externally, which is generally used as the working power supply of digital input and output terminals and external sensor power supply Maximum output current: 200mA
	OP	External power input terminal	Factory default and+24V connection When using external signal to drive DI1~DI5, OP needs to be connected with external power supply and disconnected from+24V power supply terminal
Analog input	AI1-GND	Analog input terminal 1	1.Input voltage range: DC0V~10V Input impedance: 22k Ω
	AI2-GND	Analog input terminal 2	Input range: DC0V~10V/4mA~20mA, determined by the selection of JP2 jumper on the control board. Input impedance: 22k Ω for voltage input and 500 Ω for current input.
Digital input	DI1-COM	Digital input 1	Optical coupling isolation, compatible with bipolar input Input impedance: 2.4k Ω Voltage range at level input: 9V-30V
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	
	DI6-COM	Digital input 6	
	DI5-COM	High-speed pulse input terminal	In addition to the characteristics of DI1-DI4, it can also be used as a high-speed pulse input channel. Maximum input frequency: 50kHz
Analog output	A01-GND	Analog output 1	The voltage or current output is determined by the selection of JP4 jumper on the control board. Output voltage range: 0V-10V Output current range: 0mA~20mA
Analog output	AO2-GND	Analog output 2	The voltage or current output is determined by the selection of JP5 jumper on the control board. Output voltage range: 0V-10V Output current range: 0mA~20mA
Digital output	DO1-+24V	Digital output 1	Optical coupling isolation, bipolar open collector output voltage range: 0V-24V Output current range: 0mA~50mA
	FM-COM	High-speed pulse output	Restricted by function code P07.00 "FM terminal output mode selection"
Relay output	TA1-TB1	Normally closed terminal	Contact driving capacity: AC250V, 3A, COS0=O.4。 DC 30V, 1A
	TA1-TC1	Normally open terminal	
Relay output	TA2-TB2	Normally closed terminal	Contact driving capacity: AC250V, 3A, COS0=O.4o DC 30V, 1A
	TA2-TC2	Normally open terminal	
Auxiliary interface	J7	External keyboard interface	External keyboard, copy unit interface
Communication interface	485+ 485-	485 communication	Modbus protocol

Operation And Display

Chapter IV

4.1 Introduction to operation and display interface

The operation panel can be used to modify the functional parameters of the frequency VFD, monitor the working status of it and control the operation of it (start and stop). Its appearance and functional area are shown in the following figure:

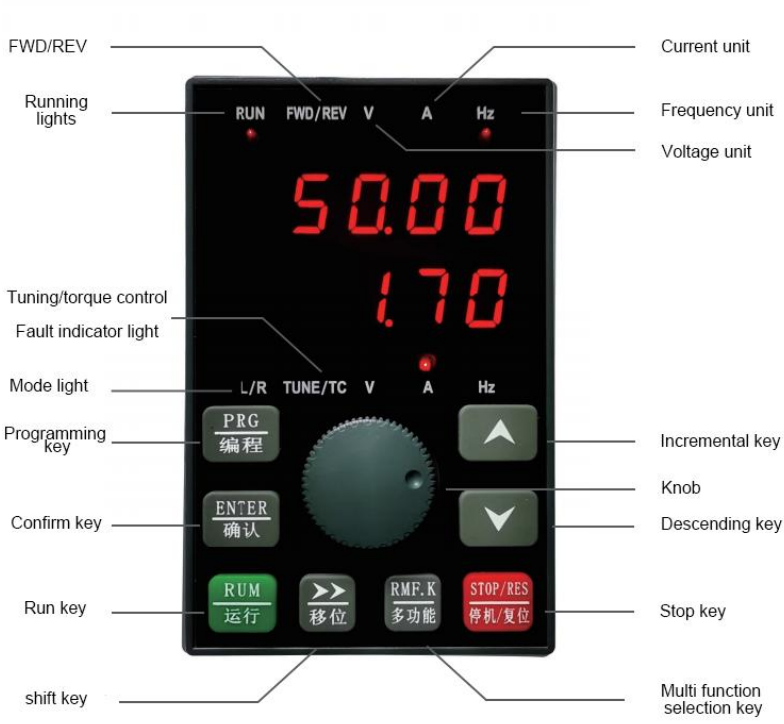


Figure 4-2 Schematic diagram of operation panel

Keyboard button description table

Table 4-1 Keyboard Functions Table

Key	Name	Function
PRG	Programming key	First-level menu entry or exit
ENTER	Confirm key	Enter the menu screen step by step and confirm the setting parameters
▲	Incremental key	Increment of data or function code
▼	Decrement key	Decrement of data or function code
▶	Shift key	Under the shutdown display interface and operation display interface, the display parameters can be selected circularly; when modifying a parameter, you can select the modification bit of the parameter
RUN	Run key	In keyboard operation mode, it is used for operation
STOP/RES	Stop/reset	In operation status, press this key to stop operation; In the fault alarm state, it can be used for reset operation. The characteristics of this key are restricted by function code P08.02.
MF.K	Multi-function selection key	Select according to function switch
KNOB	Incremental or decrement	Incremental or decrement of frequency or data

4.2 Automatic tuning of motor parameters

Select the vector control operation mode. Before the operation of the frequency VFD, the nameplate parameters of the motor must be accurately input, and the frequency VFD matches the standard motor parameters according to the nameplate parameters; vector control mode is highly dependent on motor parameters. To obtain good control performance, accurate parameters of the controlled motor must be obtained.

The automatic tuning steps of motor parameters are as follows:

First, select the command source (P0-025 as the command channel of the operation panel.

Then enter the following parameters according to the actual parameters of the motor:

P01-01： Motor rated power **P1-02：** Motor rated voltage

P1-03： Motor rated current **P1-04：** Motor rated frequency

P1-05： Motor rated speed

If the motor can be completely disconnected from the load, please select 2 (complete tuning) for P1-37, and then press the RUN key on the keyboard panel. The converter will automatically calculate the following parameters of the motor:

P1-06： Stator resistance **P1-07：** Rotor resistance

P1-08: Leakage reactance **P1-09:** Mutual inductance reactance

P1-10： No-load excitation current

Complete automatic tuning of motor parameters.

If the motor cannot be completely disconnected from the load, P1-37 please select 1 (static tuning), and then press the RUN key on the keyboard panel.

The frequency VFD measures the stator resistance, rotor resistance and leakage reactance in sequence, and does not measure the mutual inductance reactance and no-load current of the motor. Users can calculate these two parameters by themselves according to the motor nameplate. The motor nameplate parameters used in the calculation include: rated voltage U, rated current I, rated frequency *f* and power factor n:

The calculation method of motor no-load current and motor mutual inductance is described in the following formula, where L6 is motor leakage reactance.

$$\text{No-load current: } I_0 = I \cdot \sqrt{1-\eta^2}$$

$$\text{Mutual inductance calculation: } L_m = \frac{U}{2\sqrt{3}\pi f \cdot I_0} - L_6$$

I_0: No-load current L_m: Common reactance L_6: Leakage inductance

Function Parameter Table

Chapter V

Chapter V Function Parameter Table

The parameter menu in the user-defined parameter mode is not protected by password. P group A group number basic function parameters, U group monitoring function parameters.

The symbols in the function table are described as follows:

"○" Means the parameter can be modified at stop and running status.

"◎" Means the parameter cannot be modified at the running status.

"●" Means the parameter is the real detection value which cannot be modified.

5.1 Basic Function Parameter Table

Function code	Name	Detailed instruction	Factory default	Modify
P0 Group: Basic Function				
P0-00	VFD model	1: G model (constant torque load model) 2: P model (fan and pump load model)	1	◎
P0-01	1# Motor control mode	0: Sensorless Vector Control (SVC) 1: Close-loop vector control (FVC) 2: V/f control	2	◎
P0-02	Running command source	0: Keypad (LED indicator OFF) 1: Terminal (LED indicator ON) 2: Communication (LED indicator flickers)	0	○
P0-03	Main frequency source A selection	0: Keypad (P0-08, UP and DOWN Adjustable, non-recorded after power off) 1: 0: Keypad (P0-08, UP and DOWN Adjustable, recorded after power off) 2: AI1 3: AI2 4: Keypad potentiometer 5: DI5 (High speed pulse) 6: Multi-step speed 7: Simple PLC 8: PID 9: Communication (Modbus)	4	◎
P0-04	Auxiliary frequency source B selection	Same as P0-03	0	◎
P0-05	Reference of Frequency source B	0: Relative to maximum frequency 1: Relative to frequency source A	0	○
P0-06	Range of Auxiliary Frequency source B	0%～150%	100%	○
P0-07	Frequency source selection	Units place: frequency source selection 0: Main frequency source A 1: Calculation result of frequency A and B (determined by tens place) 2: Switching between A and B 3: Switching between A and calculation result 4: Switching between B and calculation result Tens place: calculation relationship between frequency A and B 0: A + B 1: A - B	00	○

Function code	Name	Detailed instruction	Factory default	Modify
		2: Max (A, B) 3: Min (A, B)		
P0-08	Keypad reference frequency	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	○
P0-09	Running direction selection	0: Same direction 1: Reverse direction	0	○
P0-10	Maximum frequency	50.00Hz ~ 600.00Hz	50.00Hz	◎
P0-11	Frequency source of upper limit	0: P0-12 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (Modbus)	0	◎
P0-12	Frequency upper limit	P0-14 (frequency lower limit) ~ P0-10 (max. frequency)	50.00Hz	○
P0-13	Frequency upper limit offset	0.00Hz ~ P0-10 (max. frequency)	0.00Hz	○
P0-14	Frequency lower limit	0.00Hz ~ P0-12 (frequency upper limit)	0.00Hz	○
P0-15	Carrier frequency	0.5kHz ~ 16.0kHz	Model depend	○
P0-16	Carrier frequency adjusting according to temperature	0: No 1: Yes	1	○
P0-17	Acceleration time 1	0.00s ~ 65000s	Model depend	○
P0-18	Deceleration time 1	0.00s ~ 65000s	Model depend	○
P0-19	ACC/DEC time unit	0: 1s 1: 0.1s 2: 0.01s	1	◎
P0-20	Reserved			
P0-21	Auxiliary frequency source offset frequency when combination	0.00Hz ~ P0-10 (max. frequency)	0.00Hz	○
P0-22	Frequency command resolution	1: 0.1Hz 2: 0.01Hz	2	◎
P0-23	Digital setting frequency storage selection when stop	0: Not store 1: store	0	○
P0-24	Motor selection	0: Motor 1 1: Motor 2		

Function code	Name	Detailed instruction	Factory default	Modify
P0-25	ACC/DEC time reference frequency	0: P0-10 (max. frequency) 1: Setting frequency 2: 100Hz	0	◎
P0-26	Running frequency command UP/DOWN reference	0: Running frequency 1: Setting frequency	0	◎
P0-27	Command source combination with frequency source	**Units bit:**: Operation keypad command combine with frequency source 0: No combination 1: Keypad Potentiometer 2: AI1 3: AI2 4: Keypad potentiometer 5: DI5 (High speed pulse) 6: Multi-step speed 7: Simple PLC 8: PID 9: Communication **Tens bit:** Terminal command combine with frequency source **Hundreds bit:** Communication command combine with frequency source **Thousands bit**: Auto running combine with frequency source	0000	○
P0-28	Reserved			
P1 Group: 1# Motor Parameters				
P1-00	Motor type	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Synchronous motor (PM motor)	0	◎
P1-01	Motor rated power	0.1kW ~ 1000.0kW	Model depend	◎
P1-02	Motor rated voltage	1V ~ 2000V	Model depend	◎
P1-03	Motor rated current	0.01A ~ 655.35A (VFD power ≤ 55kW) 0.1A ~ 6553.5A (VFD power > 55kW)	Model depend	◎
P1-04	Motor rated frequency	0.01Hz ~ F0-10 (max. frequency)	Model depend	◎
P1-05	Motor rated speed	1 ~ 66635RPM	Model depend	◎

Function code	Name	Detailed instruction	Factory default	Modify
P1-06	Asynchronous motor stator resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.5mΩ (VFD power > 55kW)	Motor parameter	◎
P1-07	Asynchronous motor rotor resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.50mΩ (VFD power > 55kW)	Motor parameter	◎
P1-08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎
P1-09	Asynchronous motor mutual inductance	0.1mH ~ 6553.5mH (VFD power ≤ 55kW) 0.01mH ~ 655.35mH (VFD power > 55kW)	Motor parameter	◎
P1-10	Asynchronous motor no-load current	0.01A ~ P1-03 (VFD power ≤ 55kW) 0.1A ~ P1-03 (VFD power > 55kW)	Motor parameter	◎
P1-16	PMD motor stator resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.5mΩ (VFD power > 55kW)	Motor parameter	◎
P1-17	PM motor D axis inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎
P1-18	PM motor Q axis inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎
P1-20	PM motor counter electromotive force	0.1 ~ 6553.5V	Motor parameter	◎
P1-27	Encoder resolution	1 ~ 65535	1024	◎
P1-28	Encoder type	0: ABZ incremental encoder 1~5: Reserved	0	◎
P1-30	ABZ incremental encoder AB phase sequence	0: Forward direction 1: Reverse direction	0	◎
P1-31	Encoder installation angle	0.0~359.9°	0.0	◎
P1-32 ~ P1-34	Reserved			

Function code	Name	Detailed instruction	Factory default	Modify
P1-36	Encoder wires disconnection detection time	0.0: No detection 0.1~10.0s	0.0	◎
P1-37	Auto-tuning	0: No action 1: Asynchronous motor static auto-tuning 1 2: Asynchronous motor rotary auto-tuning 3: Asynchronous motor static auto-tuning 2 11: PM motor static auto-tuning 12: PM motor rotary auto-tuning	0	◎
P2 Group: 1# motor Vector Control Parameters				
P2-00	Speed loop proportional gain 1	1 ~ 100	30	○
P2-01	Speed loop integration time 1	0.01s ~ 10.00s	0.50s	○
P2-02	Switching frequency 1	0.00 ~ P2-05	5.00Hz	○
P2-03	Speed loop proportional gain 2	1 ~ 100	20	○
P2-04	Speed loop integration time 2	0.01s ~ 10.00s	1.00s	○
P2-05	Switching frequency 2	P2-02 ~ F0-10 (max. frequency)	10.00Hz	○
P2-06	Vector control slip compensation coefficient	50% ~ 200%	100%	○
P2-07	Speed loop filter time	0.000s ~ 0.100s	0.000s	○
P2-08	Vector control over-excitation gain	0 ~ 200	64	○
P2-09	Torque upper limit source selection in speed control mode	0: P2-10 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (%) 6: Min (AI1, AI2) 7: Max (AI1, AI2)	0	◎
P2-10	Torque control mode upper limit setting	0.0% ~ 200.0%	150.0%	○
P2-13	Excitation regulation proportion gain	0 ~ 60000	2000	○
P2-14	Excitation regulation integration gain	0 ~ 60000	1300	○

Function code	Name	Detailed instruction	Factory default	Modify
P2-15	Torque regulation proportion gain	0 ~ 60000	2000	○
P2-16	Torque regulation integration gain	0 ~ 60000	1300	○
P2-17	Speed-loop Integral attribute	Integral separation 0: Invalid 1: Valid	0	○
P2-18	PM motor weak magnetic control mode	0: Invalid 1: Direct calculation 2: Auto regulation	1	◎
P2-19	PM motor weak magnetic depth	50% ~ 500%	100%	○
P2-20	Maximum weak magnetic current	1% ~ 300%	50%	○
P2-21	Weak magnetic auto regulation gain	10% ~ 500%	100%	○
P2-22	Weak magnetic integral multiple	2 ~ 10	2	○
P3 Group: V/f Control Parameters				
P3-00	V/f curve setting	0: Linear 1: Multiple-points 2: Square 3: 1.2th power 4: 1.4th power 6: 1.6th power 8: 1.8th power 9: Reserved 10: V/f separate completely 11: V/f separate partially	0	◎
P3-01	Torque boost	0.0: auto 0.1% ~ 30.0%	Model depend	○
P3-02	Torque boost cutoff frequency	0.00Hz ~ P0-10 (max. frequency)	50.00Hz	◎
P3-03	V/f frequency point 1	0.00Hz ~ P3-05	0.00Hz	◎
P3-04	V/f voltage point 1	0.0% ~ 100.0%	0.0%	◎
P3-05	V/f frequency point 2	P3-03 ~ P3-07	0.00Hz	◎
P3-06	V/f voltage point 2	0.0% ~ 100.0%	0.0%	◎
P3-07	V/f frequency point 3	P3-05 ~ P1-04 (motor rated frequency)	0.00Hz	◎
P3-08	V/f voltage point 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	Name	Detailed instruction	Factory default	Modify
P3-11	V/f oscillation suppression gain	0 ~ 100	Model depend	○
P3-13	Voltage source of V/f separation	0: Digital setting (P3-14) 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Multi-step speed 6: Simple PLC 7: PID 8: Communication (Modbus) Note: 100% corresponds to motor rated voltage.	0	○
P3-14	Voltage setting of V/f separation	0V~P1-02 (Motor rated voltage)	0V	○
P3-15	Voltage rise up time of V/f separation	0.0s~1000.0s Note: means voltage rise up time from 0 to motor rated voltage	0.0s	◎
P3-16	Voltage fall time of V/f separation	0.0s~1000.0s Note: means voltage fall time from motor rated voltage to 0	0.0s	◎
P3-17	Stop mode selection of V/f separation	0: Frequency / voltage decrease to 0 separately 1: Voltage falls to 0 then frequency start to decrease	0	◎
P3-18	Stall over-current point	50% ~ 200%	150%	◎
P3-19	Stall over-current restrain enable	0: Invalid 1: Valid	1	◎
P3-20	Stall over-current restrain gain	0~100	20	◎
P3-21	Reserved			◎
F3-22	Stall over-voltage point / Braking threshold	200.0V ~ 2000.0V	Model depend	◎
F3-23	Stall over-voltage restrain enable	0: Invalid 1: Valid	1	◎
P3-24	Stall over-voltage restrain frequency gain	0 ~ 100	30	◎
F3-25	Stall over-voltage restrain voltage gain	0 ~ 100	20	◎
F3-26	Stall over-voltage maxi. Frequency rise up limitation	0 ~ 50Hz	5Hz	◎

Function code	Name	Detailed instruction	Factory default	Modify
F3-27	Time constant of slip compensation	0.1 ~ 10.0s	0.5s	◎
P4 Group: Input Terminals				
P4-00	DI1 terminal function	0: No function 1: Forward (FWD) 2: Reverse (REV) 3: Three-line running control 4: Forward Jog (FJOG) 5: Reverse Jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: Pause running 11: External fault (normal open) input 12: Multi-step speed terminal 1 13: Multi-step speed terminal 2 14: Multi-step speed terminal 3 15: Multi-step speed terminal 4 16: ACC/DEC selection terminal 1 17: ACC/DEC selection terminal 2 18: Main frequency source switching 19: UP and DOWN setting clear (terminal and keypad) 20: Running command switching terminal 21: ACC/DEC invalid 22: PID pause 23: PLC status reset 24: Wobble frequency pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control invalid 30: DI5 (high speed pulse) frequency input 31: Reserved 32: DC braking command 33: External fault (normal closed) input 34: Frequency modification enabled 35: PID action direction reverse 36: External stop terminal 1 37: Control command switching terminal 2	1	◎
P4-01	DI2 terminal function		2	◎
P4-02	DI3 terminal function		0	◎
P4-03	DI4 terminal function		0	◎
P4-04	DI5 terminal function		0	◎
P4-05	DI6 terminal function		0	◎

Function code	Name	Detailed instruction	Factory default	Modify
		38: PID integration stop 39: Switch frequency source A to preset frequency 40: Switch frequency source B to preset frequency 41: Motor select terminal 42: Reserved 43: PID parameters switching 44: User self-defined fault 1 45: User self-defined fault 2 46: Speed control / torque control switching 47: Emergency stop 48: External stop terminal 2 49: Deceleration DC braking 50: The running time reset 51: two-wire and three wire control switch 52: Reverse run forbidden		
P4-07 ～ P4-09	Reserved			
P4-10	DI terminals 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	UP/DOWN change rate	0.001Hz/s ~ 65.535Hz/s	1.00Hz/s	○
P4-13	AI1 minimum input	0.00V ~ P4-15	0.00V	○
P4-14	AI1 minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○
P4-15	AI1 maximum input	P4-13 ~ 10.00V	10.00V	○
P4-16	AI1 maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○
P4-17	AI1 input filter time	0.00s ~ 10.00s	0.10s	○
P4-18	AI2 minimum input	0.00V ~ P4-20	0.00V	○
P4-19	AI2 minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○

Function code	Name	Detailed instruction	Factory default	Modify
P4-20	AI2 maximum input	P4-18~ 10.00V	10.00V	○
P4-21	AI2 maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○
P4-22	AI2 input filter time	0.00s ~ 10.00s	0.10s	○
P4-23~ P4-27	Reserved			
P4-28	DI5 (High sped pulse) minimum input	0.00kHz ~ P4-30	0.00kHz	○
P4-29	DI5 (High sped pulse) minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○
P4-30	DI5 (High sped pulse) maximum input	P4-28~ 100.00kHz	50.00kHz	○
P4-31	DI5 (High sped pulse) maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○
P4-32	DI5 (High sped pulse) input filter time	0.00s ~ 10.00s	0.10s	○
P4-33	Reserved			
P4-34	Reaction select while AI signal is lower than minimum frequency set	**Unit bit:** Select for AI1 **Tens bit**: Select for AI2 **Hundreds bit**: Select for keypad potentiometer 0: Correspond to minimum input set 1: 0.0%	000	○
P4-35	DI1 delay time	0.0s ~ 3600.0s	0.0s	◎
P4-36	DI2 delay time	0.0s ~ 3600.0s	0.0s	◎
P4-37	DI3 delay time	0.0s ~ 3600.0s	0.0s	◎
P4-38	DI terminals valid mode selection 1	0: Active-high level signal 1: Active-low level signal **Units bit**: DI1 **Tens bit**: DI2 **Hundreds bit:** DI3 **Thousands bit**: DI4 **Ten thousands bit**: DI5	00000	◎
P4-39	DI terminals valid mode selection 2	0: Active-high level signal 1: Active-low level signal **Units bit**: DI6 **Tens bit**: Reserved **Hundreds bit:** Reserved **Thousands bit**: Reserved **Ten thousands bit**: Reserved	00000	◎

Function code	Name	Detailed instruction	Factory default	Modify
P4-40	Reserved			
P5 Group: Output Terminal				
P5-00	FM terminal output mode selection	0: High speed pulse output 1: open collector output	0	○
P5-01	FM output function selection (open collector output)	0: No output 1: VFD is running 2: Fault output (fault stop) 3: FDT1 output 4: Frequency arrival 5: Zero-speed running (no output when stop) 6: Motor overload pre-alarm 7: VFD overload pre-alarm 8: Setting count value arrival 9: Designated count value arrival 10: Length arrival 11: Simple PLC circulate running completed 12: Accumulated running time arrival 13: Frequency limiting 14: Torque limiting 15: Ready for running 16: AI1>AI2 17: Frequency upper limit arrival 18: Frequency lower limit arrival 19: Under voltage status output 20: Communication setting 21: Position fixed (reserved) 22: Position approach (reserved) 23: Zero-speed running 2 (output when stop) 24: Accumulated power-on time arrival 25: FDT2 output 26: Frequency 1 arrival output 27: Frequency 2 arrival output 28: Current 1 arrival output 29: Current 2 arrival output 30: Timing arrival output 31: AI1 input over limit 32: Off load 33: Reverse running 34: Zero-current status 35: Module temperature arrival 36: Output current over limit 37: Lower limit frequency arrival	0	○
P5-02	Relay 1 output selection (T/A, T/B, T/C)		2	○
P5-03	Extension relay card output selection (TA2, TB2, TC2)		0	
P5-04	DO1 output function selection (open collector output)		1	○
P5-05	Reserved		0	○

Function code	Name	Detailed instruction	Factory default	Modify
		(output when stop) 38: Warning output (keep running) 39: Motor over temperature pre-alarm 40: This running time arrival 41: Fault output 42: High pressure output 43: Low pressure output 44: Pressure feedback reaches the setting pressure value		
P5-06	FM output function selection (High speed pulse output)	0: Running frequency 1: Setting frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: DI5 input (100% corresponds to 100.0kHz) 7: AI1 8: AI2 9: Reserved 10: Length 11: Count value 12: Communication setting frequency 13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Reserved	0	○
P5-07	AO1 output function selection		0	○
P5-08	AO2 output function selection		1	○
P5-09	FM output upper limit (High speed pulse)	0.01kHz~100.00kHz	50.00 kHz	○
P5-10	AO1 offset coefficient	-100.0% ~ +100.0%	0.0%	○
P5-11	AO1 gain	-10.00V ~ +10.00	1.00	○
P5-12	AO2 offset coefficient	-100.0% ~ +100.0%	0.0%	○
P5-13	AO2 gain	-10.00V ~ +10.00	1.00	○
P5-17	FM output delay time (Open collector)	0.0s ~ 3600.0s	0.0s	○
P5-18	Relay 1 output delay time	0.0s ~ 3600.0s	0.0s	○
P5-19	Relay 2 output delay time (on extension card)	0.0s ~ 3600.0s	0.0s	○

Function code	Name	Detailed instruction	Factory default	Modify
P5-20	DO1 output delay time	0.0s ~ 3600.0s	0.0s	○
P5-21	Reserved			
P5-22	Output terminal valid status selection	0: Positive logic 1: Negative logic Units place: FG Tens place: Relay 1 Hundreds place: Relay 2 Thousands place: DO1 Ten thousands Reserved	00000	○
P5-23	AO1 input signal type selection	0: 0~10V signal 1: 4~20mA signal	0	◎
P6 Group: Start and Stop control				
P6-00	Start mode	0: Direct start 1: Speed tracking and restart 2: Pre-excitation start	0	○
P6-01	Speed tracking mode	0: Begin from stop frequency 1: Begin from zero speed 2: Begin from maximum frequency	0	◎
P6-02	Speed tracking speed	1 ~ 100	20	○
P6-03	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	○
P6-04	Start frequency holding time	0.0s ~ 100.0s	0.0s	◎
P6-05	DC braking current before start/pre-excitation current	0% ~ 100%	0%	◎
P6-06	DC braking time before start/pre-excitation time	0.0s ~ 100.0s	0.0s	◎
P6-07	ACC/DEC mode	0: Linear ACC/DEC 1: S-curve ACC/DEC A 2: S-curve ACC/DEC B	0	◎
P6-08	Time of S curve's start part	0.0% ~ (100.0% - P6-09)	30.0%	◎
P6-09	Time of S curve's end part	0.0% ~ (100.0% - P6-08)	30.0%	◎
P6-10	Stop mode	0: Deceleration to stop 1: Coast to stop	0	○
P6-11	DC braking start frequency while stopping	0.00Hz ~ P0-10 (maximum frequency)	0.00Hz	○
P6-12	DC braking delay time while stopping	0.0s ~ 100.0s	0.0s	○
P6-13	DC braking current while stopping	0% ~ 100%	0%	○

Function code	Name	Detailed instruction	Factory default	Modify
P6-14	DC braking time while stopping	0.0s ~ 100.0s	0.0s	○
P6-15	Braking usage ratio	0% ~ 100%	100%	○
P6-18	Speed tracking current	30% ~ 200%	Model depend	○
P6-21	Demagnetization time	0.0 ~ 5.0s	Model depend	○
P7 Group: Keypad and Display				
P7-01	MF.K function selection	0: Invalid 1: Switching between keypad command and remote command (terminal command or communication command) 2: FDW/REV Switching 3: Forward Jog 4: Reverse Jog 5: Reverse run	0	◎
P7-02	STOP/RESET operation selection	0: Valid under keypad control mode 1: Always valid	1	○
P7-03	Running status display 1	0000 ~ FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: DC Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Bit08: Digital output terminals status Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: Keypad potentiometer voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	401F	○
P7-04	Running status display 2	0000 ~ FFFF Bit00: PID feedback Bit01: Simple PLC running step Bit02: DI5 input pulse (kHz) Bit03: Running frequency 2 (Hz) Bit04: Remain running time Bit05: AI1 voltage before calibration (V)	0000	○

Function code	Name	Detailed instruction	Factory default	Modify
		Bit06: AI2 voltage before calibration (V) Bit07: Reserved Bit08: Linear speed Bit09: Current power-on time (Hour) Bit10: Current running time (Min) Bit11: Reserved Bit12: Communication setting frequency Bit13: Encoder feedback (Hz) Bit14: Main frequency A display (Hz) Bit15: Auxiliary frequency B display (Hz)		
P7-05	Stop status display	0000 ~ FFFF Bit00: Setting frequency (Hz) Bit01: DC Bus voltage (V) Bit02: DI input status Bit03: Digital output terminals status Bit04: AI1 voltage(V) Bit05: AI2 voltage(V) Bit06: Reserved Bit07: Count value Bit08: Length value Bit09: Simple PLC running step Bit10: Load speed Bit11: PID setting Bit12: DI5 input frequency (kHz)	0033	○
P7-06	Load speed display coefficient	0.0001 ~ 6.5000	1.0000	○
P7-07	IGBT module radiator temperature	0.0℃~ 100.0℃	-	●
P7-08	Rectifier radiator temperature	0.0℃~ 100.0℃	-	●
P7-09	Accumulated running time	0h ~ 65535h	-	●
P7-10	Model No.	-	-	●
P7-11	Software version No.	-	-	●
P7-12	Load speed display decimal place	0: 0 decimal place 1: 1 decimal place 2: 2 decimal places 3: 3 decimal places	1	○
P7-13	Accumulated Power-on time	0h ~ 65535h	-	●
P7-14	Accumulated power consumption	0kWh ~ 65535kWh	-	●

Function code	Name	Detailed instruction	Factory default	Modify
P7-15	Window B (lower row) LED running Display parameter settings	0-33 0：Running frequency 1 1: Setting frequency 2: DC Bus voltage 3: Output voltage 4: Output current 5: Output power 6: Output torque 7: DI input status 8：DO output status 9:AI1 voltage 10: AI2 voltage 11:AI3 voltage 12:Counting value input 13:Length value input 14: Load speed 15: PID setting 16: PID feedback 17: PLC stage 18: PULSE input pulse frequency 19: Feedback speed 20: Remaining running time 21: Voltage before AI1 correction 22: Voltage before AI2 correction 23: Voltage before AI3 correction 24: Linear speed 25: Current power-on time 26: Current running time 27: Radiator temperature 28: Communication settings 29: Actual feedback speed 30: Main frequency X display 31: Auxiliary frequency Y display 32: View any memory address value 33: Synchronous machine rotor position	05	○
P7-16	Window B (lower row) LED shutdown Display parameter settings		02	○
P8 Group: Enhanced Function				
P8-00	Jog running frequency	0.00Hz ~ P0-10 (max. frequency)	2.00Hz	○
P8-01	Jog acceleration time	0.0s ~ 6500.0s	20.0s	○
P8-02	Jog deceleration time	0.0s ~ 6500.0s	20.0s	○
P8-03	Acceleration time 2	0.0s ~ 6500.0s	Model depend	○

Function code	Name	Detailed instruction	Factory default	Modify
P8-04	Deceleration time 2	0.0s ~ 6500.0s	Model depend	○
P8-05	Acceleration time 3	0.0s ~ 6500.0s	Model depend	○
P8-06	Deceleration time 3	0.0s ~ 6500.0s	Model depend	○
P8-07	Acceleration time 4	0.0s ~ 6500.0s	Model depend	○
P8-08	Deceleration time 4	0.0s ~ 6500.0s	Model depend	○
P8-09	Jump frequency 1	0.00Hz ~ P0-10 (maximum frequency)	0.00Hz	○
P8-10	Jump frequency 2	0.00Hz ~ P0-10 (maximum frequency)	0.00Hz	○
P8-11	Jump frequency amplitude	0.00Hz ~ P0-10 (maximum frequency)	0.01Hz	○
P8-12	FWD/REV dead time	0.0s ~ 3000.0s	0.0s	○
P8-13	Reverse control	0: Enable 1: Disable	0	○
P8-14	Action when setting frequency lower than frequency lower limit	0: Running at frequency lower limit 1: Stop 2: Zero-speed running	0	○
P8-15	Droop control	0.00Hz ~ 10.00Hz	0.00Hz	○
P8-16	Set accumulated power-on arrival time	0h ~ 65000h	0h	○
P8-17	Set accumulated running arrival time	0h ~ 65000h	0h	○
P8-18	Auto restart selection after power recovering	0: Auto restart 1: No action	1	○
P8-19	Frequency detection value (FDT1)	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
P8-20	Frequency detection lagging value (FDT1)	0.0% ~ 100.0% (P8-19)	5.0%	○
P8-21	Frequency arrival detection amplitude	0.0% ~ 100.0% (maximum frequency)	0.0%	○
P8-22	Jump frequency control during ACC/DEC	0: Invalid 1: Valid	1	○
P8-23~ P8-24	Reserved			
P8-25	Acceleration time 1 and acceleration time 2 switching frequency point	0.00Hz ~ P0-10 (maximum frequency)	0.00Hz	○

Function code	Name	Detailed instruction	Factory default	Modify
P8-26	Deceleration time 1 and deceleration time 2 switching frequency point	0.00Hz ~ P0-10 (maximum frequency)	0.00Hz	○
P8-27	Terminal jog priority	0: Invalid 1: Valid	0	○
P8-28	Frequency detection value (FDT2)	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
P8-29	Frequency detection lagging value (FDT2)	0.0% ~ 100.0% (P8-28)	5.0%	○
P8-30	Any arrival frequency detection value 1	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
P8-31	Any arrival frequency detection amplitude 1	0.0% ~ 100.0% (maximum frequency)	0.0%	○
P8-32	Any arrival frequency detection value 2	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
P8-33	Any arrival frequency detection amplitude 2	0.0% ~ 100.0% (maximum frequency)	0.0%	○
P8-34	Zero-current detection level	0.0% ~ 300.0% 100.0% corresponds to motor rated current	5.0%	○
P8-35	Zero-current detection delay time	0.10s ~ 600.00s	0.10s	○
P8-36	Output current over limit value	0.0% (No detection) 0.1% ~ 300.0% (motor rated current)	180.0%	○
P8-37	Output current over limit detection delay time	0.00s ~ 600.00s	0.00s	○
P8-38	Any arrival current 1	0.0% ~ 300.0% (motor rated current)	100.0%	○
P8-39	Any arrival current 1 amplitude	0.0% ~ 300.0% (motor rated current)	0.0%	○
P8-40	Any arrival current 2	0.0% ~ 300.0% (motor rated current)	100.0%	○
P8-41	Any arrival current 2 amplitude	0.0% ~ 300.0% (motor rated current)	0.0%	○
P8-42	Timing function selection	0: Invalid 1: Valid	0	○
P8-43	Timing running duration source selection	0: P8-44 1: AI1 2: AI2 3: Keypad potentiometer Analog input scale corresponds to P8-44	0	○
P8-44	Timing running duration	0.0Min ~ 6500.0Min	0.0Min	○

Function code	Name	Detailed instruction	Factory default	Modify
P8-45	AI1 input voltage protection lower limit	0.00V ~ P8-46	3.10V	○
P8-46	AI1 input voltage protection upper limit	P8-45 ~ 10.00V	6.80V	○
P8-47	Module temperature arrival	0℃ ~ 100℃	75℃	○
P8-48	Cooling fan control	0: Start the cooling fan while start the frequency VFD 1: Start the cooling fan while switch on the power supply	0	○
P8-49	Wake up frequency	P8-51 (Dormancy frequency) ~ P0-10 (max. frequency)	0.00Hz	○
P8-50	Wake up delay time	0.0s ~ 6500.0s	0.0s	○
P8-51	Dormancy frequency	0.00Hz ~ P8-49 (Wake up frequency)	0.00Hz	○
P8-52	Dormancy delay time	0.0s ~ 6500.0s	0.0s	○
P8-53	Running arrival time setting	0.0Min ~ 6500.0Min	0.0Min	○
P8-54	Output power adjustment coefficient	0.0% ~ 200.00%	100.0%	○
P9 Group: P9ult and Protection				
P9-00	Motor overload protection selection	0: Disable 1: Enable	1	○
P9-01	Motor overload protection gain	0.20 ~ 10.00	1.00	○
P9-02	Motor overload pre-alarm coefficient	50% ~ 100%	80%	○
P9-03	Stall over-voltage gain	0 ~ 100	0	○
P9-04	Stall over-voltage point / Braking threshold	120% ~ 150%	130%	○
P9-05	Stall over current gain	0 ~ 100	20	○
P9-06	Stall over-current point	100% ~ 200%	150%	○
P9-07	Short-circuit to ground protection selection when power-on	0: Invalid 1: Valid	1	○
P9-08	Braking unit reaction voltage	200.0 ~ 2000.0V	Model depend	○
P9-09	Fault auto-reset times	0 ~ 20	0	○

Function code	Name	Detailed instruction	Factory default	Modify
P9-10	DO terminal output selection during fault auto-reset	0: No action 1: Action	0	○
P9-11	Fault auto-reset interval	0.1s ~ 100.0s	1.0s	○
P9-12	Input phase failure protection and DC contactor actuation protection selection	**Unit bit:** Input phase failure **Tens bit:** DC contactor actuation 0: Disable 1: Enable	11	○
P9-13	Output phase failure protection selection	0: Disable 1: Enable	1	○
P9-14	The first fault type	0: No fault 1: Reserved 2: ACC over current	—	●
P9-15	The second fault type		—	●

Function code	Name	Detailed instruction	Factory default	Modify
P9-16	The third (latest) fault type	3: DEC over current 4: Over current in constant speed 5: Over voltage in ACC process 6: Over voltage in DEC process 7: Over voltage in constant speed 8: Buffer resistor overload 9: Under voltage 10: VFD overload 11: Motor overload 12: Input phase failure 13: Output phase failure 14: IGBT Module overheat 15: External fault 16: Communication fault 17: DC contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder / PG card abnormal 21: Parameter R/W fault 22: VFD hardware fault 23: Motor short-circuit to ground 24: Reserved 25: Reserved 26: Running time arrival 27: User self-defined fault 1 28: User self-defined fault 2 29: Power-on time arrival 30: Off load 31: PID feedback lost when running 40: Fast current limiting over time 41: Switch the motor during running 42 : Speed deviation is over imitation 43: Motor over speed 44: Reserved 51: Initial position error	—	●
P9-17	Frequency at the third (latest) fault	—	—	●
P9-18	Current at the third (latest) fault	—	—	●
P9-19	DC Bus voltage at the third (latest) fault	—	—	●
P9-20	Input terminal's status at the third (latest) fault	—	—	●
P9-21	Output terminal's status at the third (latest) fault	—	—	●
P9-22	VFD status at the third	—	—	●

Function code	Name	Detailed instruction	Factory default	Modify
	(latest) fault			
P9-23	Power-on time at the third (latest) fault	—	—	●
P9-24	Running time at the third (latest) fault	—	—	●
P9 -25 ~ P9-26	Reserved			
P9-27	Frequency at the second fault	—	—	●
P9-28	Current at the second fault	—	—	●
P9-29	DC Bus voltage at the second fault	—	—	●
P9-30	Input terminal's status at the second fault	—	—	●
P9-31	Output terminal's status at the second fault	—	—	●
P9-32	VFD status at the second fault	—	—	●
P9-33	Power-on time at the second fault	—	—	●
P9-34	Running time at the second fault	—	—	●
P9 -35 ~ P9-36	Reserved			
P9-37	Frequency at the first fault	—	—	●
P9-38	Current at the first fault	—	—	●
P9-39	DC Bus voltage at the first fault	—	—	●
P9-40	Input terminal's status at the first fault	—	—	●
P9-41	Output terminal's status at the first fault	—	—	●
P9-42	VFD status at the first fault	—	—	●
P9-43	Power-on time at the first fault	—	—	●
P9-44	Running time at the first fault	—	—	●
P9-47	VFD reaction select 1 while fault happen	**Unit bit**: Motor overload (11) **Tens bit**: Input phase failure (12) **Hundreds bit**: output phase failure (13) **Thousands bit**: external fault (15)	00000	○

Function code	Name	Detailed instruction	Factory default	Modify
		Ten thousands bit: Communication abnormal (16) 0: Coast to stop 1: Stop according to the set of P6-10 2: Keep running		
P9-48	VFD reaction select 2 while fault happen	**Unit bit**: Encoder / PG card abnormal (20) 0: Coast to stop **Tens bit**: Parameters R/W error (21) **Hundreds bit**: Reserved **Thousands bit**: Reserved **Ten thousands bit**: Running time arrival (26) 0: Coast to stop 1: Stop according to the set of P6-10	00000	○
P9-49	VFD reaction select 3 while fault happen	**Unit bit**: User self-defined fault 1(27) **Tens bit**: User self-defined fault 2 (28) **Hundreds bit**:Power on time arrival (29) **Ten thousands bit**: PID feedback signal lost during running (31) 0: Coast to stop 1: Stop according to the set of P6-10 2: Keep running **Thousands bit**:Off-load (30) 0: Coast to stop 1: Decelerate to stop 2: Keep running when the speed drops to 7% of VFD rated frequency. And recover to the set frequency if the load becomes normal.	00000	○
P9-50	VFD reaction select 4 while fault happen	**Unit bit**: speed deviation over limitation (42) **Tens bit**: Motor over speed (43) **Hundreds bit**: Initial position error (51) 0: Coast to stop 1: Stop according to the set of P6-10 2: Keep running	000	○

Function code	Name	Detailed instruction	Factory default	Modify
P9-54	Running speed selection while fault happen	0: Keep running at present speed 1: Keep running at set frequency 2: Keep running at upper limit frequency 3: Keep running at lower limit frequency 4: Keep running at abnormal standby frequency (P9-55)	0	○
P9-55	Abnormal standby frequency	60.0% ~100.0% (100.0% correspond to maximum frequency P0-10)	100.0%	○
P9-56 ~ P9-58	Reserved			
P9-59	Instantaneous power-off action selection	0: Invalid 1: Deceleration 2: Deceleration-to-stop	0	○
P9-60	Reserved			
P9-61	Recover judgment time when Instantaneous power-off	0.00s ~ 100.00s	0.50s	○
P9-62	Recover judgment voltage when Instantaneous power-off	60 ~ 100.0%	80.0%	○
P9-63	Off-load protection selection	0: Disable 1: Enable	0	○
P9-64	Off-load detection level	0.0 ~ 100.0%	10.0%	○
P9-65	Off-load detection time	0.0 ~ 60.0s	1.0s	○
P9-66	VFD overheat pre-alarm value	0 ~ 150℃	95℃	◎
P9-67	Over speed detection value	0.0% ~50.0% (Maximum frequency)	20.0%	○
P9-68	Over speed detection time	0.0s ~60.0s	5.0s	○
P9-69	Speed deviation over limitation detection value	0.0% ~50.0% (Maximum frequency)	20.0%	○
P9-70	Speed deviation over limitation detection time	0.0s ~60.0s	5.0s	○
P9-71 ~ P9-72	Reserved			
P9-73	Instantaneous power-off the VFD no stop and deceleration time	0 ~ 300.0s	30	○
PA Group: PID Function				

Function code	Name	Detailed instruction	Factory default	Modify
PA-00	PID given source	0: PA-01 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication (Modbus) 6: Multi-step command 7: Set by UP/DOWN	0	○
PA-01	PID set through keypad	0.0~10.0	3.0	○
PA-02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1-AI2 4: DI5 (High speed pulse) 5: Communication (Modbus) 6: AI1+AI2 7: MAX (|AI1|, |AI2|) 8: MIN (|AI1|, |AI2|)	0	○
PA-03	PID action direction	0: Positive 1: Negative	0	○
PA-04	PID given feedback range	0~100.0	10.0	○
PA-05	Proportional gain Kp1	0.0 ~ 100.0	20.0	○
PA-06	Integration time Ti1	0.01s ~ 10.00s	2.00s	○
PA-07	Differential time Td1	0.000s ~ 10.000s	0.000s	○
PA-08	Cutoff frequency of PID reverse	0.00 ~ P0-10 (maximum frequency)	0.00Hz	○
PA-09	PID deviation limit	0.0% ~ 100.0%	0.0%	○
PA-10	PID differential amplitude	0.00% ~ 100.00%	0.10%	○
PA-11	PID given filter 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	Dormancy pressure deviation percentage	0.0 ~ 100.0%	0.0%	○
PA-15	Proportional gain Kp2	0.0 ~ 100.0	20.0	○

Function code	Name	Detailed instruction	Factory default	Modify
PA-16	Integration time Ti2	0.01s ~ 10.00s	2.00s	○
PA-17	Differential time Td2	0.000s ~ 10.000s	0.000s	○
PA-18	PID parameter switching condition	0: No switching 1: Switching via DIn terminals 2: Automatic switching according to the deviation	0	○
PA-19	PID parameter switching deviation 1	0.0% ~PA-20	20.0%	○
PA-20	PID parameter switching 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	Forward maximum value between two output deviation	0.00% ~ 100.00%	1.00%	○
PA-24	Reverse maximum value between two output deviation	0.00% ~ 100.00%	1.00%	○
PA-25	PID integration attribute	Units place: Integration separate 0: Invalid 1: Valid Tens place: Stop integrating or not after output reach the limitation 0: Keep integrating 1: Stop integrating	00	○
PA-26	PID feedback lost detection value	0.0%: No judgment for feedback lost 0.1% ~ 100.0%	0.0%	○
PA-27	PID feedback lost detection time	0.0s ~ 20.0s	0.0s	○
PA-28	PID stop calculation	0: No calculation when stop 1: Calculation when stop	1	○
PA-29	Wake up pressure	0 ~PA-31	2.0	◎
PA-30	Wake up delay time	0.0s ~ 6500.0s	0.0s	◎
PA-31	Dormancy pressure	PA-29 ~PA-04	4.0	◎
PA-32	Dormancy delay time	0.0s ~ 6500.0s	60.0s	◎
PA-33	Dormancy mode set	0: Invalid 1: When feedback pressure is bigger than PA-31 2: Running frequency is lower than dormancy output frequency	0	◎

Function code	Name	Detailed instruction	Factory default	Modify
		3: feedback pressure is bigger than dormancy pressure but the running frequency is lower than dormancy output frequency		
PA-34	Sleep frequency	0-P0.10	30.00HZ	◎
PA-35	Enable of dormancy and wake up function	0 ~ 1	1	◎
PA-36	Difference value set for wake up pressure	0 ~ PA-01	0.0	◎
PA-37	Difference value set for dormancy pressure	0 ~ PA-01	0.0	◎
PA-38	High pressure alarm value	0 ~ PA-04	0	◎
PA-39	Low pressure alarm value	0 ~ PA-04	0	◎
PA-40	High pressure alarm delay time	0 ~ 6500.0s	0	◎
PA-41	Low pressure alarm delay time	0 ~ 6500.0s	0	◎
Pb Group: Wobble Frequency, Fixed Length, Counting				
Pb-00	Wobble frequency setting mode	0: Relative to center frequency 1: Relative to maximum frequency	0	○
Pb-01	Wobble frequency amplitude	0.0% ~ 100.0%	0.0%	○
Pb-02	Sudden Jump frequency amplitude	0.0% ~ 50.0%	0.0%	○
Pb-03	Wobble frequency cycle	0.1s ~ 3000.0s	10.0s	○
Pb-04	Triangular wave rise time coefficient	0.1% ~ 100.0%	50.0%	○
Pb-05	Setting 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	Setting count value	1 ~ 65535	1000	○
Pb-09	Designated count value	1 ~ 65535	1000	○
PC Group: Multi-step Command and Simple PLC				
PC-00	Multi-step speed 0	-100.0% ~ 100.0%	0.0%	○
PC-01	Multi-step speed 1	-100.0% ~ 100.0%	0.0%	○

Function code	Name	Detailed instruction	Factory default	Modify
PC-02	Multi-step speed 2	-100.0% ~ 100.0%	0.0%	○
PC-03	Multi-step speed 3	-100.0% ~ 100.0%	0.0%	○
PC-04	Multi-step speed 4	-100.0% ~ 100.0%	0.0%	○
PC-05	Multi-step speed 5	-100.0% ~ 100.0%	0.0%	○
PC-06	Multi-step speed 6	-100.0% ~ 100.0%	0.0%	○
PC-07	Multi-step speed 7	-100.0% ~ 100.0%	0.0%	○
PC-08	Multi-step speed 8	-100.0% ~ 100.0%	0.0%	○
PC-09	Multi-step speed 9	-100.0% ~ 100.0%	0.0%	○
PC-10	Multi-step speed 10	-100.0% ~ 100.0%	0.0%	○
PC-11	Multi-step speed 11	-100.0% ~ 100.0%	0.0%	○
PC-12	Multi-step speed 12	-100.0% ~ 100.0%	0.0%	○
PC-13	Multi-step speed 13	-100.0% ~ 100.0%	0.0%	○
PC-14	Multi-step speed 14	-100.0% ~ 100.0%	0.0%	○
PC-15	Multi-step speed 15	-100.0% ~ 100.0%	0.0%	○
PC-16	Simple PLC running mode	0: Stop after one cycle 1: Keep last frequency after one cycle 2: Circular running	0	○
PC-17	Simple PLC status memory selection	**Units bit:** Memory selection when power-off 0: Not memory 1: Memory **Tens bit:** Memory selection when stop 0: Not memory 1: Memory	00	○
PC-18	0^{th} step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-19	0^{th} step ACC/DEC time selection	0 ~ 3	0	○
PC-20	1^{st} step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○

Function code	Name	Detailed instruction	Factory default	Modify
PC-21	1st step ACC/DEC time selection	0 ~ 3	0	○
PC-22	2nd step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-23	2nd step ACC/DEC time selection	0 ~ 3	0	○
PC-24	3rd step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-25	3rd step ACC/DEC time selection	0 ~ 3	0	○
PC-26	4th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-27	4th step ACC/DEC time selection	0 ~ 3	0	○
PC-28	5th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-29	5th step ACC/DEC time selection	0 ~ 3	0	○
PC-30	6th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-31	6th step ACC/DEC time selection	0 ~ 3	0	○
PC-32	7th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-33	7th step ACC/DEC time selection	0 ~ 3	0	○
PC-34	8th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-35	8th step ACC/DEC time selection	0 ~ 3	0	○
PC-36	9th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-37	9th step ACC/DEC time selection	0 ~ 3	0	○
PC-38	10th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-39	10th step ACC/DEC time selection	0 ~ 3	0	○
PC-40	11th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-41	11th step ACC/DEC time selection	0 ~ 3	0	○
PC-42	12th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-43	12th step ACC/DEC time selection	0 ~ 3	0	○

Function code	Name	Detailed instruction	Factory default	Modify
PC-44	13th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-45	13th step ACC/DEC time selection	0 ~ 3	0	○
PC-46	14th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-47	14th step ACC/DEC time selection	0 ~ 3	0	○
PC-48	15th step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
PC-49	15th step ACC/DEC time selection	0 ~ 3	0	○
PC-50	Timing unit under simple PLC mode	0: s (second) 1: h (hour)	0	○
PC-51	Multi-step speed 0 given channel	0: PC-00 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: PID control 6: Keypad setting frequency (P0-08), can be modified via UP/DOWN	0	○
Pd Group: Communication Parameters				
Pd-00	Baud rate	**Unit bit**: Modbus 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS **Tens bit**: Reserved **Hundreds bit**: Reserved **Thousands bit**: Reserved	6005	○
Pd-01	Data format	0: No parity check (8-N-2) 1: Even parity check (8-E-1) 2: Odd parity check (8-O-1) 3: No parity check (8-N-1)	0	○
Pd-02	VFD address	1 ~ 247, 0 is broadcast address	1	○

Function code	Name	Detailed instruction	Factory default	Modify
Pd-03	Communication delay time	0ms ~ 20ms	2ms	○
Pd-04	Communication timeout time	0.0 (invalid) 0.1s ~ 60.0s	0.0	○
Pd-05	Communication protocol selection	**Unit bit**: Modbus **Tens bit**: Reserved 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	31	○
Pd-06	Communication read current resolution	0: 0.01A 1: 0.1A	0	○
PE Group: User self-defined Parameters				
PE-00	User self-defined parameter 0	P0-00 ~ PP-xx A0-00 ~ Ax-xx U0-00 ~ U0-xx	P0-10	○
PE-01	User self-defined parameter 1		P0-02	○
PE-02	User self-defined parameter 2		P0-03	○
PE-03	User self-defined parameter 3		P0-07	○
PE-04	User self-defined parameter 4		P0-08	○
PE-05	User self-defined parameter 5		P0-17	○
PE-06	User self-defined parameter 6		P0-18	○
PE-07	User self-defined parameter 7		P3-01	○
PE-08	User self-defined parameter 8		P3-01	○
PE-09	User self-defined parameter 9		P4-00	○
PE-10	User self-defined parameter 10		P4-01	○
PE-11	User self-defined parameter 11		P4-02	○
PE-12	User self-defined parameter 12		P5-04	○
PE-13	User self-defined parameter 13		P5-07	○
PE-14	User self-defined parameter 14		P6-00	○
PE-15	User self-defined parameter 15		P6-10	○

Function code	Name	Detailed instruction	Factory default	Modify
PE-16	User self-defined parameter 16		P0-00	○
PE-17	User self-defined parameter 17		P0-00	○
PE-18	User self-defined parameter 18		P0-00	○
PE-19	User self-defined parameter 19		P0-00	○
PE-20	User self-defined parameter 20		P0-00	○
PE-21	User self-defined parameter 21		P0-00	○
PE-22	User self-defined parameter 22		P0-00	○
PE-23	User self-defined parameter 23		P0-00	○
PE-24	User self-defined parameter 24		P0-00	○
PE-25	User self-defined parameter 25		P0-00	○
PE-26	User self-defined parameter 26		P0-00	○
PE-27	User self-defined parameter 27		P0-00	○
PE-28	User self-defined parameter 28		P0-00	○
PE-29	User self-defined parameter 29		P0-00	○
PP Group: User self-defined Parameters				
PP-00	User password	0 ~ 65535	0	○
PP-01	Parameters initialization	0: No action 01: Initialize basic parameters (Not includes motor parameters) 02: Clear the record 03: Initialize user backup parameters 501: Backup present setting parameters	0	◎
PP-02	Parameters display selection	**Unit bit:** U group display selection **Tens bit:** A group display selection 0: No display 1: Display	11	◎
PP-03	Customized parameters display selection	**Unit bit:** User self-defined parameters **Tens bit:** User changed parameters	0	○

Function code	Name	Detailed instruction	Factory default	Modify
		0: No display 1: Display		
PP-04	Parameters modification selection	0: Parameter can be modified 1: Parameter cannot be modified	0	○
PP-05	Reserved			
A0 Group: Torque Control & Optimized Parameters				
A0-00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	◎
A0-01	Torque setting source selection in torque control mode	0: A0-03 1: AI1 2: AI2 3: Keypad potentiometer 4: DI5 (High speed pulse) 5: Communication 6: Min (AI1, AI2) 7: Max (AI1, AI2) (Full scale of 0~7 settings correspond A0-03 set value)	0	◎
A0-02	Reserved			
A0-03	Torque setting through keypad in torque control mode	-200.0% ~ 200.0%	150.0%	○
A0-04	Reserved			
A0-05	Forward maximum frequency in torque control mode	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
A0-06	Reverse maximum frequency in torque control mode	0.00Hz ~ P0-10 (maximum frequency)	50.00Hz	○
A0-07	ACC time in torque control mode	0.00s ~ 65000s	0.00s	○
A0-08	DEC time in torque control mode	0.00s ~ 65000s	0.00s	○
A1 Group:Reserved				
A2 Group: 2# Motor Parameters				
A2-00	Motor type	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	◎

Function code	Name	Detailed instruction	Factory default	Modify
		2: Synchronous motor (PM motor)		
A2-01	Motor rated power	0.1kW ~ 1000.0kW	Model depend	◎
A2-02	Motor rated voltage	1V ~ 2000V	Model depend	◎
A2-03	Motor rated current	0.01A ~ 655.35A (VFD power ≤ 55kW) 0.1A ~ 6553.5A (VFD power > 55kW)	Model depend	◎
A2-04	Motor rated frequency	0.01Hz ~ F0-10 (max. frequency)	Model depend	◎
A2-05	Motor rated speed	1 ~ 66635RPM	Model depend	◎
A2-06	Asynchronous motor stator resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.5mΩ (VFD power > 55kW)	Motor parameter	◎
A2-07	Asynchronous motor rotor resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.50mΩ (VFD power > 55kW)	Motor parameter	◎
A2-08	Asynchronous motor leakage inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎
A2-09	Asynchronous motor mutual inductance	0.1mH ~ 6553.5mH (VFD power ≤ 55kW) 0.01mH ~ 655.35mH (VFD power > 55kW)	Motor parameter	◎
A2-10	Asynchronous motor no-load current	0.01A ~ A2-03 (VFD power ≤ 55kW) 0.1A ~ A2-03 (VFD power > 55kW)	Motor parameter	◎
A2-16	PMD motor stator resistance	1mΩ ~ 65535mΩ (VFD power ≤ 55kW) 0.1mΩ ~ 6553.5mΩ (VFD power > 55kW)	Motor parameter	◎
A2-17	PM motor D axis inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎
A2-18	PM motor Q axis inductance	0.01mH ~ 655.35mH (VFD power ≤ 55kW) 0.001mH ~ 65.535mH (VFD power > 55kW)	Motor parameter	◎

Function code	Name	Detailed instruction	Factory default	Modify
A2-20	PM motor counter electromotive force	0.1 ~ 6553.5V	Motor parameter	◎
A2-27	Encoder resolution	1 ~ 65535	1024	◎
A2-28	Encoder type	0: ABZ incremental encoder 1 ~ 4: Reserved	0	◎
A2-30	ABZ incremental encoder AB phase sequence	0: Forward direction 1: Reverse direction	0	◎
A2-31 ~ A2-33	Reserved			
A2-34	Pole-pairs number of rotary encoder	1~65535	1	◎
A2-36	Encoder wires disconnection detection time	0.0: No detection 0.1~10.0s	0.0	◎
A2-37	Auto-tuning	0: No action 1: Asynchronous motor static auto-tuning 1 2: Asynchronous motor rotary auto-tuning 3: Asynchronous motor static auto-tuning 2 11: PM motor static auto-tuning 12: PM motor rotary auto-tuning	0	◎
A2-38	Speed loop proportional gain 1	1 ~ 100	30	○
A2-39	Speed loop integration time 1	0.01s ~ 10.00s	0.50s	○
A2-40	Switching frequency 1	0.00 ~ P2-05	5.00Hz	○
A2-41	Speed loop proportional gain 2	1 ~ 100	20	○
A2-42	Speed loop integration time 2	0.01s ~ 10.00s	1.00s	○
A2-43	Switching frequency 2	P2-02 ~ F0-10 (max. frequency)	10.00Hz	○
A2-44	Vector control slip compensation coefficient	50% ~ 200%	100%	○
A2-45	Speed loop filter time	0.000s ~ 0.100s	0.000s	○
A2-46	Vector control over-excitation gain	0 ~ 200	64	○
A2-47	Torque upper limit source selection in speed control mode	0: A2-48 1: AI1 2: AI2 3: Keypad potentiometer	0	◎

Function code	Name	Detailed instruction	Factory default	Modify
		4: DI5 (High speed pulse) 5: Communication (%) 6: Min (AI1, AI2) 7: Max (AI1, AI2)		
A2-48	Torque control mode upper limit setting	0.0% ~ 200.0%	150.0%	○
A2-51	Excitation regulation proportion gain	0 ~ 60000	2000	○
A2-52	Excitation regulation integration gain	0 ~ 60000	1300	○
A2-53	Torque regulation proportion gain	0 ~ 60000	2000	○
A2-54	Torque regulation integration gain	0 ~ 60000	1300	○
A2-55	Speed-loop Integral attribute	Integral separation 0: Invalid 1: Valid	0	○
A2-56	PM motor weak magnetic control mode	0: Invalid 1: Direct calculation 2: Auto regulation	1	◎
A2-57	PM motor weak magnetic depth	50% ~ 500%	100%	○
A2-58	Maximum weak magnetic current	1% ~ 300%	50%	○
A2-59	Weak magnetic auto regulation gain	10% ~ 500%	100%	○
A2-60	Weak magnetic integral multiple	2 ~ 10	2	○
A2-61	2# motor control mode	0: Sensorless Vector Control (SVC) 1: Close-loop vector control (FVC) 2: V/f control	0	◎
A2-62	2# motor ACC / DEC time select	0: Same as 1# motor 1: ACC / DEC time 1 2: ACC / DEC time 2 3: ACC / DEC time 3 4: ACC / DEC time 4	0	○
A2-63	2# motor torque boost	0.0%: Auto boost 0.1% ~ 10.0%	Model depend	○
A2-65	2# motor oscillation restrain gain	0 ~ 100	Model depend	○
A5 Group: Control Optimized Parameters				
A5-00	DPWM switching upper limit frequency	0.00Hz ~ 15.00Hz	12.00Hz	○
A5-01	PWM regulation mode	0: Asynchronous mode 1: Synchronous mode	0	○

Function code	Name	Detailed instruction	Factory default	Modify
A5-02	Dead zone compensation mode selection	0: no compensation 1: compensation mode 1 2: compensation mode 2	1	○
A5-03	Depth of random PWM	0: Random PWM invalid 1~10: depth of random PWM	0	○
A5-04	Fast current limitation enable	0: Disable 1: Enable	1	○
A5-05	Current detection compensation	0~100	5	○
A5-06	Under voltage level setting	200.0V ~ 2200.0V	350.0V	○
A5-07	SVC optimized mode selection	0: No optimized 1: Optimized mode 1 2: Optimized mode 2	1	○
A5-08	Dead time adjustment	100% ~ 200%	150%	○
A5-09	Over voltage level setting	200.0V ~ 2200.0V	800.0V	○
A5-10	Enable of change the carrier frequency automatically at low frequency	0: Disable 1: Enable	1	○
A5-11	Enable of zero speed output	0: Disable 1: Enable	1	○
A5-12	Sensitivity adjustment of input phase failure protection	0 .0 ~ 30.0%	13.0%	○
A5-13	Voltage rise up percentage under over-modulation	0 ~ 110%	103%	○
A5-14	Reserved			
A6, A7 Group: Reserved				
AC Group: AIAO signal correction				
AC-00	AI1 detected voltage 1	0.500V ~ 4.000V		○
AC-01	AI1 displayed voltage 1	0.500V ~ 4.000V		○
AC-02	AI1 detected voltage 2	6.000V ~ 9.999V		○
AC-03	AI2 displayed voltage 2	6.000V ~ 9.999V		○
AC-04	AI2 detected voltage 1	0.500V ~ 4.000V		○

Function code	Name	Detailed instruction	Factory default	Modify
AC-05	AI2 displayed voltage 1	0.500V ~ 4.000V		○
AC-06	AI2 detected voltage 2	6.000V ~ 9.999V		○
AC-07	AI2 displayed voltage 2	6.000V ~ 9.999V		○
AC-08 ~ AC-11	Reserved			
AC-12	AO1 target voltage 1	0.500V ~ 4.000V		○
AC-13	AO1 detected voltage 1	0.500V ~ 4.000V		○
AC-14	AO1 target voltage 2	6.000V ~ 9.999V		○
AC-15	AO1 detected voltage 2	6.000V ~ 9.999V		○
AC-16	AO2 target voltage 1	0.500V ~ 4.000V		○
AC-17	AO2 detected voltage 1	0.500V ~ 4.000V		○
AC-18	AO2 target voltage 2	6.000V ~ 9.999V		○
AC-19	AO2 detected voltage 2	6.000V ~ 9.999V		○

5.2 Monitoring Parameter Table (U0 group)

Function code	Name	Minimum unit
U0-00	Running frequency (Hz)	0.01Hz
U0-01	Set frequency (Hz)	0.01Hz
U0-02	DC Bus voltage (V)	0.1V
U0-03	Output voltage (V)	1V
U0-04	Output current (A)	0.01A

Function code	Name	Minimum unit
U0-05	Output power (kW)	0.1kW
U0-06	Output torque (%)	0.10%
U0-07	DI input status	1
U0-08	Output digital terminals status	1
U0-09	AI1 voltage (V)	0.01V
U0-10	AI2 voltage (V)	0.01V
U0-11	Keypad potentiometer voltage (V)	0.01V
U0-12	Count value	1
U0-13	Length value	1
U0-14	Load speed	1
U0-15	PID set value	1
U0-16	PID feedback value	1
U0-17	Simple PLC present running step	1
U0-18	DI5 (High speed pulse) input frequency (Hz)	0.01kHz
U0-19	Feedback speed (unit 0.1Hz)	0.1Hz
U0-20	Remain running time	0.1Min
U0-21	AI1 voltage before calibration	0.001V
U0-22	AI2 voltage before calibration	0.001V
U0-23	Reserved	0.001V
U0-24	linear speed	1m/Min
U0-25	Current power-on time	1Min
U0-26	Current running time	0.1Min
U0-27	DI5 input pulse frequency	1Hz
U0-28	Communication setting value	0.01%
U0-29	Encoder feedback speed	0.01Hz
U0-30	Main frequency A display	0.01Hz
U0-31	Auxiliary frequency B display	0.01Hz
U0-32	Check any memory address value	1
U0-33	Position of PM motor rotor	0.1°
U0-34	Reserved	
U0-35	Target torque (%)	0.1%
U0-36	Position of rotary encoder	1
U0-37	Reserved	
U0-38	ABZ encoder position	1
U0-39	Target voltage of V/f separate	1V
U0-40	Output voltage of V/f separate	1V

Function code	Name	Minimum unit
U0-41	DI terminals input status	1
U0-42	Output digital terminals status	1
U0-43	Reserved	
U0-44	Reserved	
U0-46	Wake up pressure	-
U0-47	Dormancy pressure	-
U0-48	Set of high pressure alarm value	-
U0-49	Set of high pressure alarm value	-
U0-59	Set frequency (%)	0.01%
U0-60	Running frequency (%)	0.01%
U0-61	VFD status	1
U0-62	Present error code	1
U0-63	Reserved	
U0-64	Quantity of slave VFD	1
U0-65	Upper limit of torque	0.01
U0-66	Reserved	
U0-67	Reserved	

Faultand DIagnosis

Chapter VI

6.1. Fault information and troubleshooting

Once a fault occurs, the protection function acts, the frequency VFD stops output, the fault relay contact of the frequency VFD acts, and the fault code is displayed on the display panel of the frequency VFD. Before seeking service, users can conduct self-inspection according to the prompts in this section, analyze the cause of failure and find solutions.

Fault Name	VFD short circuit protection
Fault Code	**Err01**
Reason	1. Short-circuit or ground fault occurred at VFD output side 2. The cable connecting the motor with the VFD is too long 3. The module is over-heat 4. The cable connections inside the VFD are loosen 5. The control board is abnormal 6. The power board is abnormal 7. The IGBT module is abnormal
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Install a reactor or output filter 3. Check if the air duct is blocked and if the fan is in normal status, and resolve the existing problems 4. Make sure the cables are connected well 5, 6, 7. Ask for technical support

Fault Name	Over current when acceleration
Fault Code	**Err02**
Reason	1. Short-circuit or ground fault occurred at VFD output side 2. Control mode is vector control but don't perform auto-tuning 3. The acceleration time is too short 4. The manual torque boost or V/f curve is not proper 5. The voltage is too low 6. Start the running motor 7. Load is added suddenly during the acceleration 8. Power selection of VFD is too small

Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Increase the acceleration time 4. Adjust the manual torque boost or V/f curve 5. Make the voltage in the normal range 6. Select speed tracking start or start the motor till it stops 7. Cancel the sudden added load 8. Select bigger power VFD

Fault Name	Over-current when deceleration
Fault Code	**Err03**
Reason	1. Short-circuit or ground fault occurred at VFD output side 2. Control mode is vector control but don't perform auto-tuning 3. The deceleration time is too short 4. The voltage is too low 5. Load is added suddenly during the deceleration 6. Have not installed braking unit and braking resistor
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Increase the deceleration time 4. Make the voltage in the normal range 5. Cancel the sudden added load 6. Install braking unit and braking resistor

Fault Name	Over-current when constant speed running
Fault Code	**Err04**
Reason	1. Short-circuit or ground fault occurred at VFD output 2. Control mode is vector control but don't perform auto-tuning 3. The voltage is too low 4. Load is added suddenly during running 5. Power selection of VFD is too small
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Identify the motor parameters 3. Make the voltage in the normal range 4. Cancel the sudden added load 5. Select bigger power VFD

Fault Name	Over-voltage when acceleration
Fault Code	**Err05**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during acceleration 3. The acceleration time is too short 4. Have not installed braking unit and braking resistor
Solution	1. Make the voltage in the normal range 2. Cancel the external force 3. Increase the acceleration time 4. Install braking unit and braking resistor

Fault Name	Over-voltage when deceleration
Fault Code	**Err06**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during deceleration 3. The deceleration time is too short 4. Have not installed braking unit and braking resistor
Solution	1. Make the voltage in the normal range 2. Cancel the external force 3. Increase the deceleration time 4. Install braking unit and braking resistor

Fault Name	Over-voltage when constant speed running
Fault Code	**Err07**
Reason	1. The input voltage is too high 2. There is external force driving the motor to run during the VFD running
Solution	1. Make the voltage in the normal range 2. Cancel the external force or install braking resistor

Fault Name	Power-supply fault
Fault Code	**Err08**
Reason	1. The input voltage is out of range
Solution	1. Make the voltage in the normal range

Fault Name	Under-voltage
Fault Code	**Err09**

Reason	1. Instantaneous power-off 2. The input voltage is out of range 3. DC Bus voltage is abnormal 4. The rectifier bridge and buffer resistor are abnormal 5. The power board is abnormal 6. The control board is abnormal
Solution	1. Fault Reset 2, 3. Make the voltage in the normal range 4, 5, 6. ask for technical support

Fault Name	VFD over load
Fault Code	**Err10**
Reason	1. The load is too heavy or motor blockage occurs 2. Power selection of VFD is too small
Solution	1. Reduce the load, check the status of motor & machinery 2. Select bigger power VFD

Fault Name	Motor over load
Fault Code	**Err11**
Reason	1. P9-00 and PA-01 is set improperly 2. The load is too heavy or motor blockage occurs 3. Power selection of VFD is too small
Solution	1. Set P9-00 and PA-01 properly 2. Reduce the load, check the status of motor & machinery 3. Select bigger power VFD

Fault Name	Input phase failure
Fault Code	**Err12**
Reason	1. The input power supply is abnormal 2. The power board is abnormal 3. The control board is abnormal
Solution	1. Check the power supply and eliminate the troubles 2, 3: ask for technical support

Fault Name	Output phase failure
Fault Code	**Err13**

Reason	1. The connection between VFD and motor is abnormal 2. Output voltage unbalance during the motor running 3. The power board is abnormal 4. The IGBT module is abnormal
Solution	1. Inspect whether motor damaged, insulation worn or cable damaged 2. Make sure the motor three phase winding is normal 3, 4. Ask for technical support

Fault Name	IGBT module over-heat
Fault Code	**Err14**
Reason	1. Ambient temperature is too high 2. Air duct is blocked 3. Cooling fans are broken 4. Thermal resistor(temperature sensor) of the module is broken 5. IGBT module is broken
Solution	1. Reduce the ambient temperature 2. Clear the air duct 3. Replace cooling fans 4, 5. Ask for technical support

Fault Name	External device fault
Fault Code	**Err15**
Reason	MI terminal receives an external fault signal generated by peripheral device
Solution	Find out the fault source, solve it and reset the VFD

Fault Name	Communication fault
Fault Code	**Err16**
Reason	1. Master computer works abnormal 2. Communication cable is abnormal 3. Pd group parameters are set improperly
Solution	1. Check the connection of master computer 2. Check the communication connection 3. Set Pd group parameters properly

Fault Name	DC contactor fault
Fault Code	**Err17**
Reason	1. Power board or power supply board are abnormal 2. DC contactor is abnormal
Solution	1. Replace power board or power supply board 2. Replace DC contactor

Fault Name	Current detection fault
Fault Code	**Err18**
Reason	1. Hall sensor is abnormal 2. The power board is abnormal
Solution	1. Check hall sensor and connection 2. Replace the power board

Fault Name	Motor auto-tuning fault
Fault Code	**Err19**
Reason	1. Motor parameters are set improperly 2. Parameter identification process is delayed
Solution	1. Set parameters according to the motor nameplate 2. Check the cables connecting VFD with motor

Fault Name	Reserved
Fault Code	**Err20**

Fault Name	EEPROM read/write fault
Fault Code	**Err21**
Reason	1. EEPROM chip is broken
Solution	1. Replace the control board

Fault Name	VFD hardware fault
Fault Code	**Err22**
Reason	1. Over voltage 2. Over current

Solution	1. Handle as over voltage fault 2. Handle as over current fault

Fault Name	Motor short-circuit to ground
Fault Code	**Err23**
Reason	1. The motor is short-circuit to ground
Solution	1. Replace cables or motor

Fault Name	Reserved
Fault Code	**Err24**

Fault Name	Reserved
Fault Code	**Err25**

Fault Name	Accumulated running time arrival
Fault Code	**Err26**
Reason	1. The accumulated running time reaches the setting value
Solution	1. Clear the record information via parameter initialization function

Fault Name	User self-defined fault 1
Fault Code	**Err27**
Fault Name	User self-defined fault 1
Fault Code	**Err28**
Reason	1. DI terminal input the user self-defined fault signal
Solution	1. Check the signal and reset it.

Fault Name	Accumulated power-on time arrival
Fault Code	**Err29**
Reason	1. The accumulated power-on time reaches the setting value
Solution	1. Clear the record information via parameter initialization function

Fault Name	Off-load fault
Fault Code	**Err30**
Reason	1. The VFD running current is smaller than P9-64
Solution	1. Confirm if the load breaks away and P9-64 & P9-65 are set properly

Fault Name	PID feedback lost when running
Fault Code	**Err31**
Reason	1. PID feedback is smaller than PA-26
Solution	1. Check PID feedback signal or set PA-26 properly

Fault Name	Current-limiting fault
Fault Code	**Err40**
Reason	Change the current motor selection through terminals during the operation of the frequency VFD
Solution	After the frequency VFD is shut down, click and switch again

Fault Name	Switching motor fault during operation
Fault Code	**Err41**
Reason	1. Whether the load is heavy or the motor is blocked 2. Power selection of VFD is too small.
Solution	1. Reduce the load and detect the motor & machinery condition 2. Select bigger power VFD

Fault Name	Speed deviation over limitation
Fault Code	**Err42**
Reason	1. The encoder parameter are set incorrect (when P0-01=1) 2. The motor is blocked 3. The parameters of P9-69 and P9-70 are set incorrect 4. The VFD output UVW terminals are connected to motor abnormally.

Solution	1. Set correct encoder parameters 2. Check the mechanical system of motor, whether is motor had done auto-tuning, and whether the set value of P2-10 is too small 3. Check and reset P9-69 and P9-70 4. Check the cables between motor and VFD, whether it is loose connected.

Fault Name	Motor over speed
Fault Code	**Err43**
Reason	1. The encoder parameter are set incorrect (when P0-01=1) 2. The motor auto-tuning is not done 3. The parameters of P9-69 and P9-70 are set incorrect
Solution	1. Set correct encoder parameters 2. Make motor auto-tuning; 3. Check and reset P9-69 and P9-70

Fault Name	Motor over temperature fault
Fault Code	**Err45**（reason：1.The temperature sensor wiring is loose. 2. The motor temperature is too high）
Fault Code	**Err46**（reason：High water pressure fault）
Fault Code	**Err47**（reason：low water pressure fault）
Solution	1. Monitor temperature sensor wiring and troubleshoot 2. Reduce the carrier frequency or take other heat dissipation measures to heat the motor

Fault Name	Motor Initial position wrong
Fault Code	**Err51**
Reason	Motor parameters have big difference with real values
Solution	1. Recheck the motor parameters one by one 2. Pay more attention on motor rated current set value.

Fault Name	Master slave control slave
Fault Code	**Err55**
Reason	If the slave machine malfunctions, check the slave machine
Solution	Conduct troubleshooting according to the slave fault code

Fault Name	Build-in braking unit fault
Fault Code	**Err60**
Reason	Braking resistor is short-circuited or braking module is abnormal
Solution	Check the braking resistor or asking for technical support

6.2 Common Faults and Solutions

Fault	Reason	Solution
No display when power-on	1, The input voltage is 0 or too low. 2, The switching power supply on the power board is broken. 3, Rectifier bridge is broken. 4, Buffer resistors are broken. 5, The control board or keypad is broken. 6, Cables are loose connection	1, Check the input power-supply. 2, Check the DC Bus voltage 3, Reconnect the cables 4~6, Ask for technical support
Display **IC** when power-on	1, Loose connection of the control board and power board. 2, Control board is broken. 3, Motor or motor cables short-circuited with ground. 4, Hall sensor is broken. 5, Input voltage is too low	1, Check the mentioned reasons one by one. 2, Ask for technical support
Display **IC** when starting the VFD, and VFD stops immediately	1, Fans are broken or air duct is blocked. 2, The control cables are short-circuited.	1, Change or clean the fan. 2, Measure the insulation of control cables with magneto-ohmmeter.
Err23 is displayed when power-on	1, The motor or the output line is short-circuited to the ground. 2, The VFD is damaged.	1, Measure the insulation of the motor and output line with magneto-ohmmeter. 2, Ask for technical support
Err14 is displayed frequently	1, Carrier frequency setting is too high. 2, Fans are broken or air duct is blocked. 3, The VFD inside components are broken (such as thermocouple).	1, Reduce the carrier frequency (P0-15). 2, Replace fans, clear the air duct. 3, Ask for technical support

Motor does not run after starting the VFD	1, Motor and motor cables are abnormal. 2, The VFD parameters are set improperly (motor parameters). 3, The connection of the cables of the driver board and control board are not good. 4, The power board is broken	1, Make sure the connection of the VFD and motor is very well. 2, Replace the motor or clear the mechanical failure. 3, Check & reset the motor parameters.
Digital input (DIn) terminal is invalid	1, The parameter is set improperly. 2, The external signal is wrong. 3, The jumper between OP and 24V is loose. 4, The control board is broken.	1, Check & reset P4 group parameters. 2, Reconnect the external signal cable. 3, Reconnect the jumper between OP and 24V.
The motor speed cannot rise up under closer-loop vector control mode	1, Encode fault. 2, The wiring of encoder is wrong or loose connected. 3: PG card fault. 4, Power card fault.	1, Check the encoder. 2, Check the encoder wiring connection. 3, Change a new PG card. 4: Ask for technical support.
Over voltage and over current fault happens frequently	1, Motor parameters are set improperly. 2, The ACC/DEC time is improper. 3, The load has big fluctuation.	1, Reset motor parameters or perform auto tuning. 2, Set proper ACC/DEC time.
Err17 is displayed when power-on or running	The DC contactor is not closed	1, Check if the contactor cables are loose.. 2, Check if the contactor is broken. 3, Check if the contactor 24V power supply is broken.
Power on display 	1, The control board is broken. 2, Loose connection of control board and power board.	1, Replace the control board. 2, Reconnect the control board and power board

Communication Protocol

Chapter VII

This series VFD provides RS485 communication interface, and adopts MODBUS communication protocol. User can realize centralized monitoring through PC/PLC, host computer, and also can set inverter's operating commands, modify or read function parameters, read operating status and fault information, etc.

7.1 About Protocol

This serial communication protocol defines the transmission information and use format in the series communication. It includes the formats of master-polling, broadcast and slave response frame, and master coding method with the content including slave address (or broadcast address), command, transmitting data and error checking. The response of slave adopts the same structure, including action confirmation, returning the data and error checking etc. If slave takes place the error while it is receiving the information or cannot finish the action demanded by master, it will send one fault signal to master as a response.

7.2 Application Method

The VFD could be connected into a "Single-master & Multi-slaves" PC/PLC control network with RS485 bus.

7.3 Bus Structure

(1) Interface mode

RS485

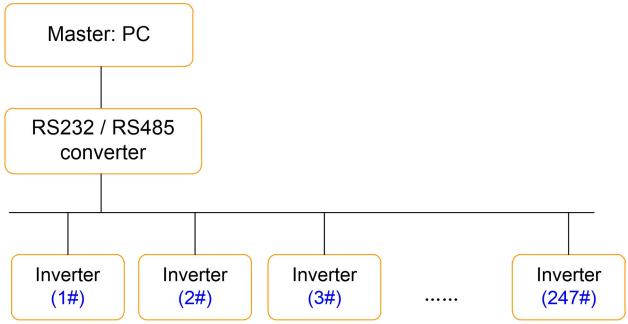
(2) Transmission mode

There provide asynchronous series and half-duplex transmission mode. At the same time, just one can send the data and the other only receives the data between master and slave. In the series asynchronous communication, the data is sent out frame by frame in the form of message.

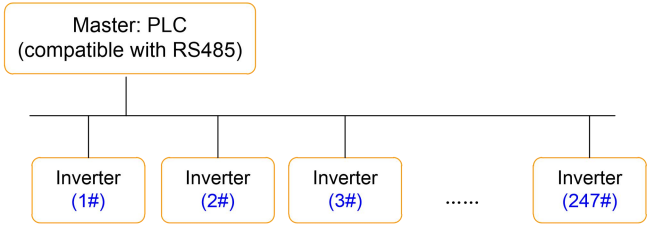
(3) Topological structure

In Single-master Multi-slave system, the setup range of slave address is 0 to 247. 0 refers to broadcast communication address. The address of slave must be exclusive in the network. That is basic condition of MODBUS communication.

a. Connect with PC



b. Connect with PLC

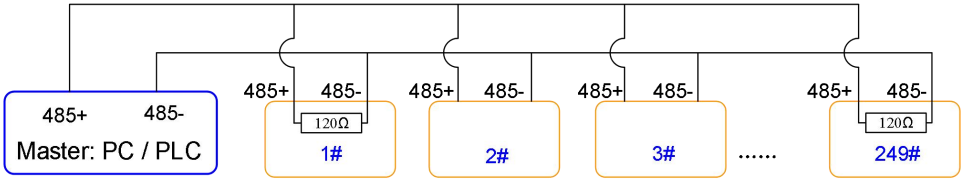


7.4 Interfaces and wiring connection

This series VFD provides 485+ and 485- interfaces for Modbus communication.

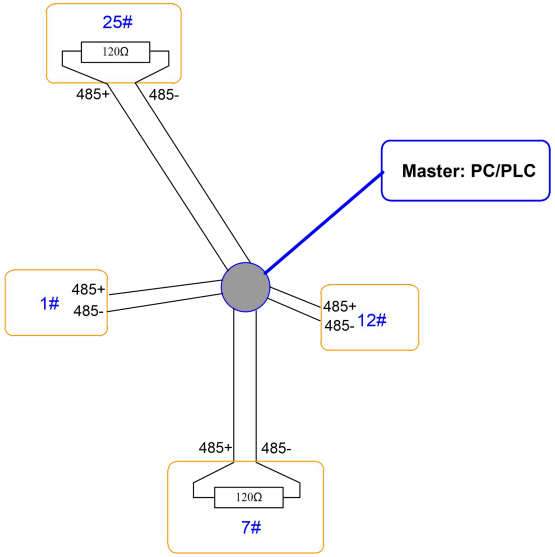
There are two kinds of communication type suitable for Modbus connection;

(1) Daisy chain connection



Notice: the **first one** and **last one VFD** should connect the terminal resistor.

(2) star connection



Notice: the **furthest one (25#)** and **second furthest one (7#)** VFD should connect the terminal resistor.

7.5 Protocol Description

This series VFD communication protocol is a kind of asynchronous serial master-slave communication protocol. In the network, only one equipment (master) can build a protocol (Named as “Inquiry/Command”). Other equipment (slave) response “Inquiry/Command” of master only by providing the data, or doing the action according to the master’s “Inquiry/Command”. Here, master is Personnel Computer, Industrial control equipment or Programmable logical controller, and the slave is VFD or other communication equipment with the same communication protocol. Master not only can visit some slave separately for communication, but also sends the broadcast information to all the slaves. For the single “Inquiry/Command” of master, all of slaves will return a signal that is a response; for the broadcast information provided by master, slave needs not feedback a response to master.

7.6 Communication Data Structure

MODBUS protocol communication data format of this VFD is shown as below:

In RTU mode, the Modbus minimum idle time between frames should be no less than 3.5 bytes. The checksum adopts CRC-16 method. All data except checksum itself sent will be counted into the calculation. Please refer to section: CRC Check for more information. Note that at least 3.5 bytes of Modbus idle time should be kept and the start and end idle time need not be summed up to it.

The entire message frame must be transmitted as a continuous data stream. If a idle time is more than 1.5 bytes before completion of the frame, the receiving device flushes the incomplete message and assumes that the next byte will be the address field of a new message. Similarly, if a new message begins earlier than 3.5 bytes interval following a previous message, the receiving device will consider it as a continuation of the previous message. Because of the frame’s confusion, at last the CRC value is

incorrect and communication fault will occur.

RTU frame format:

START	Transmission time of 3.5 bytes
Slave Address	Communication address : 0 to 247
Command Code	03H: Read slave parameters 06H: Write slave parameters
DATA (N-1)	Data: Function code parameter address, the number of function code parameter, Function code parameter, etc.
DATA (N-2)	
……	
DATA 0	
CRC Low byte	Detection Value: CRC value
CRC High byte	
END	Transmission time of 3.5 bytes

7.7 Command Code and Communication Data Description

7.7.1 Command code: 03H, reads N words. (There are 12 characters can be read at the most.)

For example: The VFD start address P0-02 of the slave 01 continuously reads two consecutive values.

Master command information

Address	01H
Command Code	03H
Start Address High byte	P0H
Start Address Low byte	02H
Register Number High byte	00H
Register Number Low byte	02H
CRC Low byte	56H
CRC High byte	CBH

Slave responding information

Address	01H
Command Code	03H

Byte Number	04H
Data P002H High byte	00H
Data P002H Low byte	00H
Data P003H High byte	00H
Data P003H Low byte	01H
CRC Low byte	3BH
CRC High byte	P2H

7.7.2 Command code: 06H, write a word

For example: Write 5000(1388H) into address P00AH, slave address 02H.

Master command information

Address	02H
Command Code	06H
Data Address High byte	P0H
Data Address Low byte	0AH
Data Content High byte	13H
Data Content Low byte	88H
CRC Low byte	97H
CRC High byte	ADH

Slave responding information

Address	02H
Command Code	06H
Data Address High byte	P0H
Data Address Low byte	0AH
Data Content High byte	13H
Data Content Low byte	88H
CRC Low byte	97H
CRC High byte	ADH

7.7.3 CRC checking

In RTU mode, messages include an error-checking field that is based on a CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message. The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value received in the CRC field. If the two values are not equal, an error results.

The CRC is started by 0xFFFF. Then a process begins of applying successive eight-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC.

During generation of the CRC, each eight-bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is exclusive ORed with the register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value.

When the CRC is appended to the message, the low byte is appended first, followed by the high byte. The following are C language source code for CRC-16.

```
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);
}
```

7.7.4 Address definition of communication parameter

Here is about address definition of communication parameter. It's used to control the VFD operation, status and related parameter setting.

The mark rules of function code parameters address:

The group number and mark of function code is the parameter address for indicating the rules.

High byte: P0 ~PF (P group), A0~AF (A group),70~7F (U group)

Low byte: 00 to FF

For example:

P2-12, address indicates to 0xF20C

Pd-05, address indicates to 0xFC05

U0-03, address indicates to 0x7003

Note:

1. Group PF: Either the parameter cannot be read, nor be changed.
2. Group U0: Only for reading parameter, cannot be changed parameters.
3. Some parameters cannot be changed during operation; some parameters regardless of what kind of status the VFD in, the parameters cannot be changed. Change the function code parameters, pay attention to the scope of the parameters, units, and relative instructions.

Besides, due to EEPROM be frequently stored, it will reduce the lifetime of EEPROM. So in the communication mode, some function codes needn't be stored, only change the RAM value.

For P group parameters, to achieve this function, just change high bit P of the function code into 0.

For A group parameters, to achieve this function, just change high bit A of the function code into 4.

Corresponding function code addresses are indicated below:

(1) P group parameter address:

High byte: 00 to FF,

Low byte: 00 to FF

(2) A group parameter address:

High byte: 40H,

Low byte: 00 to FF

For example:

P3-12, address indicates to 030C

A0-05, address indicates to 4005

These addresses can only act writing RAM, it cannot act reading. When act reading, it is an invalid address.

(2) Stop/start parameter address

Parameter Address	Parameter Description
1000H	* Communication setting frequency (-10000 ~ 10000) (Decimal)

Parameter Address	Parameter Description
1001H	Running frequency
1002H	DC Bus voltage
1003H	Output voltage
1004H	Output current
1005H	Output power
1006H	Output torque
1007H	Running speed
1008H	DIn input status
1009H	DO output status
100AH	AI1 voltage
100BH	AI2 voltage
100CH	Reserved
100DH	Counting value input
100EH	Length value input
100FH	Load speed
1010H	PID setting
1011H	PID feedback
1012H	Simple PLC running step
1013H	High speed input pulse frequency setting (kHz)
1014H	Feedback speed, unit is 0.1Hz
1015H	Remain running time
1016H	AI1 voltage before calibration
1017H	AI2 voltage before calibration
1018H	Reserved
1019H	Linear speed
101AH	Current power on time
101BH	Current running time
101CH	DI5 setting (High speed pulse input) (Hz)
101DH	Communication setting value
101EH	Actual feedback speed

Parameter Address	Parameter Description
101FH	Main frequency A display
1020H	Auxiliary frequency B display

Note:

Communication setting value is the percentage of relative value, and 10,000 corresponds to 100.00%, -10000 corresponds to -100.00%.

To the data of frequency, the percentage is the percentage of relative maximum frequency (P0-10).

To the data of torque, the percentage is P2-10 (torque upper limit).

(3) Control command input to VFD (write only)

Command Word Address	Command Function
2000H	0001: Forward running
	0002: Reverse running
	0003: Forward jog
	0004: Reverse jog
	0005: Coast to stop
	0006: Deceleration to stop
	0007: Fault reset

(4) Read VFD status: (read only)

Status Word Address	Status Word Function
3000H	0001: Forward running
	0002: Reverse running
	0003: Stop

(5) Parameters locking password check: (If the return is 8888H, it means the password check passes.)

Password Address	Content of Input password
1F00H	*****

(6) Digital output terminal control: (write only)

Command Address	Command Content

2001H	BIT0: DO1 output control
	BIT1: FM output control
	BIT2: RELAY1 output control
	BIT3: RELAY2 output control
	BIT4 ~ BIT9: Reserved

(7) Analog output AO1 control: (write only)

Command Address	Command Content
2002H	0～7FFF refers to 0%～100%

(8) Analog output AO2 control: (write only)

Command Address	Command Content
2003H	0～7FFF refers to 0%～100%

(9) Pulse output control: (write only)

Command Address	Command Content
2004H	0～7FFF refers to 0% ～100%

(10) VFD fault code description:

VFD Fault Address	VFD Fault Information
8000H	0000: No fault
	0001: Reserved
	0002: Over current when acceleration
	0003: Over current when deceleration
	0004: Over current when constant speed running
	0005: Over voltage when acceleration
	0006: Over voltage when deceleration
	0007: Over voltage when constant speed running
	0008: Buffer resistor overload
	0009: Under voltage
	000A: VFD overload

	000B: Motor overload
	000C: Reserved
	000D: Output phase failure
	000E: Module overheat
	000F: External fault
	0010: Communication fault
	0011: Contactor fault
	0012: Current detection fault
	0013: Motor auto-tuning fault
	0014: Reserved
	0015: Parameter R/W fault
	0016: VFD hardware fault
	0017: Motor short circuit to ground
	0018: Reserved
	0019: Reserved
	001A: Running time arrival
	001B: User self-defined fault 1
	001C: User self-defined fault 2
	001D: Power on time arrival
	001E: Off load
	001F: PID feedback lost when running
	0028: Fast current limiting over time
	0029: Switch the running motor
	002A: Speed deviation oversize
	002B: Motor over speed
	005A: Encoder resolution set incorrect
	005B: Not connect the encoder
	005C: Motor initial position wrong
	005E: Speed feedback wrong

7.8 Pd Group Communication Parameter Description

Pd-00	Baud Rate	Factory Setting	6005
	Setting range	**Unit bit**: Baud rate of Modbus 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS **Tens bit**: Reserved **Hundred bit**: Reserved **Thousands bit**: Reserved	

This parameter is used to set the data transmission rate between host computer and the VFD. Please note that baud rate of the host computer and VFD must be the same. Otherwise, the communication is impossible. The bigger baud rate is, the faster communication is.

Pd-01	Data Format	Factory Setting	0
	Setting range	0: No check: Data format <8-N-2> 1: Even parity Check :data format <8-E-1> 2: Odd Parity Check : data format <8-O-1> 3: No check: Data format <8-N-1>	

The setting data format of host computer and VFD must be the same; otherwise, the communication is impossible.

Pd-02	Local Address	Factory Setting	1
	Setting range	1~247, 0 is broadcast address	

When the local address is set to be 0, that is broadcast address, it can realize the broadcast function of host computer.

Local address must be unique (except broadcast address). This is the base of point-to-point communication between host computer and VFD.

Pd-03	Response Delay	Factory Setting	2ms

	Setting range	0~20ms

Response delay: It refers to the interval time from the VFD finishes receiving data to sending data to the host computer. If the response delay is less than system processing time, then the response delay is based on the system processing time. If the response delay is more than system processing time, after the system processing the data, it should be delayed to wait until the response delay time arrives, then sending data to host computer.

Pd-04	Communication Timeout	Factory Setting	0.0s
	Setting range	0.0s (invalid) 0.1~60.0s	

When the function code set to be 0.0 s, the communication timeout parameter is invalid.
When the function code set to be valid value, if the interval time between the communication and the next communication is beyond the communication timeout, the system will report communication failure error (Err16). At normal circumstances, it is set to be invalid. If in the continuous communication system, set the parameter, you can monitor the communication status.

Pd-05	Communication Protocol selection	Factory Setting	1
	Setting range	0: Nonstandard Modbus protocol 1: Standard Modbus protocol	

Pd-05=1: Select standard MODBUS protocol
Pd-05=0: When reading the command, the slave return is one byte than the standard MODBUS protocol's, for details refer to communications Data Structure of this protocol.

Pd-06	Communication Read Current Resolution	Factory Setting	0
	Setting range	0: 0.01A 1: 0.1A	

It is used to confirm the output current unit when communication reads output current.

Setting Scheme

Chapter VIII

8.1 Three Wire Running

P01.05: 1: External terminal control

P06.00:1: When the DI1 terminal is pressed for forward operation, this terminal is a normally open button

P06.01: 2: Press and flip the DI2 terminal, which is a normally open button

P06.02:3: Three wire operation control, DI3 press to stop, this terminal is a normally closed button

P06.09:2: Three wire 1

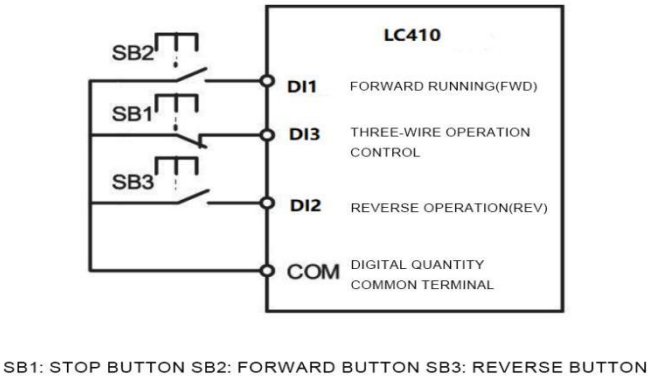


Figure 6-8 Three-wire control mode 1

8.2Multi-segment speed setting case

P01.05 1；Set as terminal control;

P01. 06 6；Select multi-segment instructions;

P06.02 12, P06.03 13； Set DI3 and DI4 as multi-section command terminals 1 and 2;

The terminal command combination table is as follows:

When the frequency source is selected as multi-speed, 100.0% of the function code P13.00~P013.15 corresponds to the maximum power P01.13. The attached multi-segment command function describes four multi-segment command terminals, which can be combined into 16 states, and these 16 states correspond to 16 command settings.

The details are shown in the table:

K4	K3	K2	KI	Command setting	Corresponding parameters
OFF	OFF	OFF	OFF	Multi-segment instruction 0	P 13.00
OFF	OFF	OFF	ON	1	P13.01
OFF	OFF	ON	OFF	2	P13.02
OFF	OFF	ON	ON	3	P13.03
OFF	ON	OFF	OFF	4	P13.04
OFF	ON	OFF	ON	5	P13.05
OFF	ON	ON	OFF	6	P13.06
OFF	ON	ON	ON	7	P13.07
ON	OFF	OFF	OFF	8	P13.08
ON	OFF	OFF	ON	9	P13.09
ON	OFF	ON	OFF	10	P13.10
ON	OFF	ON	ON	11	P13.ll
ON	ON	OFF	OFF	12	P13.12
ON	ON	OFF	ON	13	P13.13
ON	ON	ON	OFF	14	P13.14
ON	ON	ON	ON	15	P13.15

Example:

The customer requires that the start switch be pressed to operate for 10Hz. When the start switch and speed 1 switch are pressed simultaneously, it is 30Hz, and when the start switch and speed 2 switch are closed simultaneously, it is 40Hz.

The setting scheme is as follows:	
P01. 05：	1, External terminal operation control.
P01.06：	6；Multi-segment speed.
P06. 00：	1;Forward start.
P06. 02：	12； DI3 terminal is set as multi-section command terminal 1.
P06. 03：	13； DI4 terminal is set as multi-section command terminal 2.
P13.00：	20；Run 10HZ when DI1 start switch is closed.
P13.01：	60
	When only DI1 and DI3 are closed, it is set to 30HZ here.
P13.02：	80；
	When only DI1 and DI4 are closed, it is set to 40HZ here.

8. 3 Constant pressure water supply parameter setting case

P01.06： 8；The frequency source is set to PID control.

P11.00： 0；Digital set pressure, 0 indicates that the set pressure can be modified by setting P11.01, 3 indicates that the set pressure can be adjusted by the potentiometer on the display panel, and 7 indicates that the set pressure can be adjusted by the up and down keys on the display panel.

P11.01：3.0;The user set pressure, the default value is 3.0, which means the set pressure is 0 .3MPA

P11.04： 10；The default value of the user's pressure gauge range is 10.0, indicating that the pressure gauge range is IMPa. If the pressure gauge range is 1.6MPa, this parameter needs to be set to 16.

P08. 06： 8011；When the frequency VFD is running, the set pressure on the upper row of the digital tube can be checked through the shift key.

P08.08： 0803；When the frequency VFD is stopped, the set pressure on the upper row

of the digital tube can be checked through the shift key.

P08. 09： 16；The PID feedback pressure can be viewed through the lower window of the digital tube. The corresponding speed of constant pressure water supply can be adjusted through P11.05 and P11.06.

Pressure gauge connection
- Red GND
- Yellow All
- Green +10V

The following parameters need to be set for hibernation:

P11.28： 1；Set to operate at shutdown.

P15. 33： 1；Set the sleep mode to sleep when the sleep pressure is reached.

P15. 05： 1； Set the proportional linkage enable, that is, the sleep pressure and wake-up pressure change with the set pressure.

P15. 06： 0.5；Wake-up pressure linkage difference, this value is set to 0.5, that is, wake-up pressure=set pressure 3 - this value 0.5=2. 5.

P15. 07: 0.5； Sleep pressure linkage difference, this value is set to 0.5, that is, sleep pressure=set pressure 3+this value 0.5=3. 5.

P15.02： 5；Wake-up delay time, this value is set to 5, that is, the pressure is lower than the wake-up pressure and the VFD starts after 5s.

P15. 04： 5；Sleep delay time, this value is set to 5, that is, the pressure reaches the sleep pressure and the VFD stops after 5s.

8.4: Special parameter setting of machine tool

P01.05： 1；Terminal control

P01. 06： 2；Analog quantity Al1 control frequency

P01. 20： 1.5；Acceleration time

P01. 21： 1.5；Deceleration time

P06. 00： 1；Forward running

P06. 01： 2；Reverse operation

Product Warranty Card

<table>
<tr><td rowspan="3">Customer information</td><td colspan="2">Unit address:</td></tr>
<tr><td>Unit name:

Postal code:</td><td>Contact:

Contact number:</td></tr>
<tr><td rowspan="3">Product information</td><td colspan="2">Product model:</td></tr>
<tr><td colspan="2">Body barcode (pasted here):</td></tr>
<tr><td colspan="2">Agent name:</td></tr>
<tr><td>Fault information</td><td colspan="2">(Maintenance time and content):

Maintained by:</td></tr>
</table>

Warranty Agreement

1.The warranty period of this product is 18 months (subject to the barcode information of the machine body). During the warranty period, under the normal use of the user manual, our company is responsible for free repair of the product sales failure or damage.

2.During the warranty period, certain maintenance costs will be charged for damage caused by the following reasons:

The machine is damaged due to errors in use and unauthorized repair and transformation;

Machine damage caused by fire, flood, abnormal voltage, other premature disasters and secondary disasters;

Hardware damage caused by artificial fall and transportation after purchase;

Machine damage caused by not operating according to the user manual provided by our company;

Faults and damages caused by obstacles outside the machine (such as external equipment factors);

In case of product failure or damage, please fill in the contents of the “Product Warranty Card” correctly and in detail.

The charge of maintenance costs shall be subject to the latest adjusted “Maintenance Price List” of our company.

This warranty card will not be reissued under normal circumstances. Please be sure to keep this card and show it to the maintenance personnel during warranty.

In case of any problem during the service, please contact our agent or our company in time.

The Company reserves the right to interpret this agreement.